I/O solutions for the control cabinet
The Company

TURCK is one of the world’s leading groups of companies in the field of industrial automation. With more than 3,350 employees in 27 countries and with sales partners in a further 60 countries, we are always close to our customers worldwide. As specialists in sensor, fieldbus, connection and interface technology, as well as HMI (human machine interfaces) and RFID (radio frequency identification), we offer efficient solutions for manufacturing and process automation. State-of-the-art production facilities in Germany, Switzerland, the USA, Mexico and China enable our family-owned enterprise to meet the requirements of the local markets quickly and flexibly at any time.

The Program

Whether in machine building or system building, in the automotive sector, transport and handling sector, in the food and beverage sector or in the chemical and pharmaceutical industry: automation solutions and products from TURCK increase the availability and efficiency of your machines and plants. The effective standardization of the products also reduces costs for procurement, inventory management, installation and operational reliability selectively. Sector-specific application know-how, resulting from a close dialog with customers, coupled with electronic development and manufacturing at the highest level, ensure optimum solutions for your automation tasks.
The Company

The Service

With almost 50 years of experience and an extensive know-how, we can support you in every project phase with efficient services – from the initial analysis right through to the tailored solution and commissioning of your application. The prime objective of our activities is to continuously improve the efficiency and productivity of your manufacturing process or machine. The excellent quality of our products, combined with the supportive services of our specialists and a fast delivery service, ensures the high availability of your systems.

The Product Database

Regardless of whether you require software tools for programming, configuration or commissioning support, detailed data sheets or CAD data in almost 80 export formats, you will find the right solution quickly in just a few clicks at the TURCK product database at www.turck.com – offering 24/7 worldwide access in nine different languages. Virtually all products and solutions can be accessed directly – clearly structured, fully documented and free of charge, without any registration required.
I/O solutions for the control cabinet

Whether as a modular system or in a block design, in standard or ECO versions, for the Ex or non-Ex area – TURCK offers you flexible solutions for the cabinet. The BL20 bus terminal system makes it possible to plan and implement tailored IP20 I/O solutions. The user can freely combine all I/O modules regardless of the fieldbus and implement the required number of I/O channels. Gateways are used to provide the connection to the master. The excom® system provides distributed I/O modules with protection to IP20 for connecting binary and analog intrinsically safe and non-intrinsically safe field devices. The TURCK interface technology program offers the right functions, designs and variants for isolating, conditioning, processing, converting and matching digital and analog signals.

How do I find the right solution for my application?

The catalog offers a selection of flexible I/O solutions for installation in the control cabinet. In addition to the IP20 I/O systems BL20 and excom® the product groups of IP20 I/O block modules and interface modules are introduced. A first overview offers the complete table of contents. Detailed information on product groups is provided in the relevant chapter. The first pages of these chapters provide a brief description of the product group as well as a tabular overview of the available products and functions. The overview also provides page references on the detailed product information, which are presented in the subsequent pages of the chapters. If you already know the type code the type index will guide you directly to the required product.
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Open, modular, highly flexible: The BL20 universal bus terminal system makes it possible to plan and implement tailored I/O solutions for the IP20 area. The user can freely combine all I/O modules irrespective of the fieldbus and implement the required I/O channels to the precise number of bits: analog and digital signal types, 1, 2, 4, 8, 16 or 32 channels, block or slice designs.

Technology modules with IO-Link, counter, PWM, SSI, RS232, RS485, RS422 or RFID interfaces for the TURCK identification system are available to integrate more complex field devices. The base modules are used to connect the sensors, actuators and field devices. Variants are available with different numbers of cage clamp or screw terminals.

The power feeding modules enable the provision of a new field supply. The use of these modules may be necessary for high power outputs; it also offers the possibility of forming application-specific potential groups at any location in the BL20 system.

The BL20 gateways feature an integrated power supply for the module bus in order to supply the I/O modules. If the power supply for the modules is not sufficient (up to 74 modules depending on gateway), the power supply can be refreshed with a bus refreshing module. Gateways, which control the entire data exchange between the PLC and the I/O modules, are used to connect to the fieldbus. Proven standards such as PROFIBUS-DP, DeviceNet™, CANopen, Modbus RTU/ASCII, Modbus TCP, EtherNet/IP™, PROFINET and EtherCAT® can be used here.

CODESYS programmable gateways are available for complex applications. The gateways handle local control tasks autonomously and can be used for remote pre-processing in order to relieve the load on the higher-level controller.

FDT/DTM technology enables the user to set the parameters for the BL20 system via a graphical user interface. Whether in online or offline mode, commissioning or testing, the FDT/DTM technology simplifies the planning of modules as well as the configuration and parametrization, irrespective of the fieldbus used.

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Our Strengths – Your Advantages

**Gateways – Communication with fieldbus and Ethernet**

The BL20 I/O system features gateways for the PROFIBUS-DP, DeviceNet™, CANopen and Modbus RTU/ASCII fieldbuses, as well as gateways for integration in industrial Ethernet networks. In addition, multiprotocol solutions are available that unite the three Ethernet protocols Ethernet/IP™, Modbus TCP and PROFINET in an I/O device: The Ethernet multiprotocol gateways automatically detect which of the three Ethernet networks is being used. High-feature gateways for PROFINET IRT and EtherCAT®, as well as CODESYS programmable gateways for Modbus TCP and EtherNet/IP™ round off the program.

**Electronic modules – With a wide range of signal types**

The large number of I/O modules available allows the user the possibility of integrating virtually any required signal type in the BL20 system. The program includes digital and analog I/O modules for standard I/O signals, relay modules, as well as technology modules with I/O, Link, counter, PWM, SSI, RS232, RS485, RS422 or RFID interfaces. The digital I/O modules for 24 VDC are available as PNP or NPN versions with different numbers of channels and output ratings. Device variants, such as for NAMUR signals or 230 VAC signals round off the range of products. Besides the analog I/O modules for current or voltage signals, there are also combination modules, giving the possibility to choose between current, voltage and also Pt/Ni elements for each channel. Modules for thermocouples or with HART® compatibility round off the range.

**Base modules – With different connection options**

The BL20 system offers the user the possibility of choosing between different connection options. The standard I/O modules consist of two components – the electronic module and a separate connection level, the base module, which is available either with tension spring connection or screw terminals. The base modules are available in different versions, for instance, with or without separate terminals for the sensor supply. The ECO modules feature an integrated terminal level, thus eliminating the need for a separate base module. In this way, considerably more I/O channels can be integrated in restricted spaces.
ECO housings – Space-saving with a high channel density

Besides the gateways and I/O modules in the standard housing, versions are also available in the ECO housing. The gateways in the ECO housing have a particularly slimline design, enabling the user to save space on the DIN rail. Unlike the standard gateways, the ECO versions are provided with push-in terminals instead of screw or tension spring connection. Unlike the standard I/O modules, the I/O modules in the ECO housing have the connection level already integrated. In this way a higher channel density can be achieved with the ECO I/O modules.

Power supply modules – Flexible supply concepts

Special bus refreshing and power feeding modules are available for the system and field supply. Above a specific number of I/O modules, the bus refreshing modules must be integrated in the BL20 system in order to refresh the internal system power supply. This makes it possible to create extensive stations with a large number of I/O modules. Redundant bus refreshing modules make it possible to create redundant supplied systems. Power feeding modules are used for re-powering the field devices. This may be necessary when using several I/O modules, especially output modules, if the field supply current exceeds 10 A. Power feeding modules are used for instance to create new potential groups in order to implement the safety-related off switching of outputs or to implement the potential isolation of plant sections.

Redundant power supply – Increased availability

The use of BR-24VDC-RED modules enables the user to turn the BL20 I/O system into a redundantly supplied system. In this way it is possible to redundantly supply both the I/O system itself as well as the field devices connected to it. This considerably reduces the risk of failure and increases system availability accordingly. Different potential groups can be created in redundancy mode as well as in normal operation, in order, for example, to implement the safety-related off switching of specific outputs.
Remote signal processing

The programmable gateways can be programmed using the IEC 61131-3 compliant CODESYS vendor-neutral programming software and can thus be formed into distributed control units. Possible applications include for example the stand-alone control of an application or use in networks for the remote pre-processing of signals. The graphical programming user interface supports all IEC-61131-3 programming languages:
- Instruction list (IL)
- Ladder diagram (LD)
- Function block diagram (FBD)
- Structured text (ST)
- Sequential function chart (SFC)

Simple network of several I/O stations

The global network variables function integrated in CODESYS enables the simple interconnection and communication of several I/O stations. This makes it possible to network heterogeneous systems quickly and simply. The use of standard transmission protocols such as TCP/IP and UDP/IP enables the implementation of bidirectional data exchange between CODESYS systems without any additional programming. For example, several decentralized systems can interact with each other without the need for a higher-level controller. Connection to CODESYS-3 controllers is also straightforward.

Flexible programming in CODESYS

In order to ensure the simple integration of the hardware in CODESYS, TURCK provides for the programming gateways several target support packages as drivers for the target system. The I/O modules can be simply added to the hardware configuration using drag and drop. A standard editor offers a particularly clearly designed interface for the I/O configuration and parameter setting. Symbolic variables can be declared for the I/O addresses in order to simplify the use of and access to the I/Os. Furthermore, several diagnostics and commissioning functions, as well as function blocks such as for the BLident® RFID system, support the user in programming and commissioning.
Efficient parameter setting with FDT/DTM

The BL20 system can be configured and parametrized via a graphical user interface based on FDT/DTM technology. For this TURCK provides special DTMs which can be incorporated in any FDT frame application for its I/O systems and modules. This enables the reading and setting of process data, and the simple execution of diagnostic functions, even without a controller. This simplifies both the testing of the application as well as commissioning in the field. Both the PACTware™ FDT/DTM frame application as well as the DTMs are available free of charge from the TURCK website at www.turck.com.

Supporting software tools

Whether online or offline, PACTware™ simplifies the planning and implementation of your I/O system. The software provides some excellent services, even for commissioning and the execution of tests. The range of functions in the software includes a selection aid for the modules required, the offline planning and design, as well as the configuration, parameterization and commissioning of individual modules. Other functions include the reading and setting of process data, a commissioning tool for checking the wiring and sensors without a PLC, the realistic display of the configured BL20 components and an automatic documentation of the configured BL20 systems.
BL20 – System overview

Redundant power supply
- BR-RED modules for redundant power supply to the I/O system and the connected periphery
- More redundantly powered potential groups possible

HART® communication
- Analog input and output modules with HART® communication

Gateway
- The interface to the higher-level control
- Gateways for PROFIBUS, CANopen, DeviceNet®, Modbus RTU/ASCII, Modbus TCP, EtherNet/IP®, PROFINET and EtherCAT®

CODESYS programmable (optional)
- Distributed pre-processing
- Relief of the control
- Self-contained units possible
- Royalty-free programming according to IEC 61131

FDT/DTM
- DTM for Remote I/O
- Topology scan
- Commissioning
- Simulation and diagnostics

Standard I/Os - flexible and user-friendly
- Interchangeable electronic modules - without disconnecting the field wiring
- Single or block modules
- Screw or tension spring terminals
Technology modules
- Serial interfaces RS232, RS485/422 for the integration of complex field devices
- SSI
- Counter and pulse width modulation
- IO-Link master
- RFID

Analog I/O modules
- Current / Voltage
- Pt/Ni temperature probes
- Thermocouples

RFID
- 2-channel RFID modules
- Integration of HF and UHF read/write heads of the TURCK RFID System BL ident®

Digital I/O modules
- 24 VDC PNP
- 24 VDC NPN
- 120/230 VAC
- Relay modules

NAMUR inputs
- 4-channel NAMUR input modules acc. to EN 60947-5-6

ECO I/Os
- Up to 16 I/Os on 12.5 mm
- Integrated connection level with push-in connection technology
- Extremely compact design
BL20 – System and field supply

General system power supply
The BL20 system features two power circuits:
- The internal module bus feeds the module electronics and the gateway.
- The field supply feeds all connected field devices.

Module bus supply
The voltage supply for the module bus is integrated in the BL20 gateways. If the module bus is not sufficiently supplied (max. 1.5 A), a second refreshing module has to be applied – see chapter Supply concept on the next page.

NOTE: Bus refreshing modules can not be used in combination with the ECO gateway for PROFIBUS-DP.

Field supply
The field supply is provided by the gateway. A power feeding module has to be used if the field supply of fieldbus nodes reaches 8/10 A (depending on the gateway) or a new potential group is required.

For details on the system and field supply, please refer to the technical data of the individual gateways.

Forming potential groups
Bus-Refreshing modules as well as power-feeding modules can be used for the creation of potential groups. Modules with 24 VDC and 120/230 VAC field supply cannot be used in the same potential group. The use of digital input modules for 120/230 VAC requires the creation of a separate potential group with the power feeding module BL20-PF-120/230VAC-D.

System planning
For the planning of many complex BL20 stations, different factors have to be considered. For example rated current consumption of the modules, number of modules, parameters and data volume and possible restrictions imposed by the higher level fieldbus.

The I/O-ASSISTANT (PACTware™ and BL20-DTM), which can be downloaded from our website, checks all relevant parameters and simplifies project planning considerably. The I/O-ASSISTANT is also able to generate dimension drawings and documentation of the stations. Reading and setting of I/Os is also possible which proves very helpful for commissioning. Furthermore, module parameters can also be set.
**BL20 – System and field supply**

The BL20 system features two power circuits:

- The internal module bus feeds the module electronics and the gateway.
- The field supply feeds all connected field devices.

### Forming potential groups

Bus-refreshing modules as well as power-feeding modules can be used for the creation of potential groups. Modules with 24 VDC and 120/230 VAC field supply cannot be used in the same potential group. The use of digital input modules for 120/230 VAC requires the creation of a separate potential group with the power feeding module BL20-PF-120/230VAC-D.

### Module bus supply

The voltage supply for the module bus is integrated in the BL20 gateways. If the module bus is not sufficiently supplied (max. 1.5 A), a second refreshing module has to be applied.

**NOTE:** Bus-refreshing modules cannot be used in combination with the ECO gateway for PROFIBUS-DP.

### Gateways in Standard L-Design

<table>
<thead>
<tr>
<th>Power feeding module</th>
<th>Bus refreshing module</th>
</tr>
</thead>
<tbody>
<tr>
<td>(V_{MB}) = Internal module bus</td>
<td>(V_{MB}) = Internal module bus</td>
</tr>
<tr>
<td>(V_{SYS}) = System supply</td>
<td>(V_{SYS}) = System supply</td>
</tr>
<tr>
<td>(V_{F1}) = Field supply 1</td>
<td>(V_{F1}) = Field supply 1</td>
</tr>
<tr>
<td>(V_{F2}) = Field supply 2</td>
<td>(V_{F2}) = Field supply 2</td>
</tr>
<tr>
<td>(I_{MB}) = 1.5 A</td>
<td>(I_{MB}) = 0.4...1.0 A</td>
</tr>
<tr>
<td>(I_{F1}) = 10 A</td>
<td>(I_{F1}) = 8...10 A</td>
</tr>
<tr>
<td>(I_{F2}) = 10 A</td>
<td>(I_{F2}) = 10 A</td>
</tr>
</tbody>
</table>

\(V_{SYS}(24\text{ VDC})\)

\(V_{F1}(24\text{ VDC})\)

\(V_{F2}(24\text{ VDC}/120/230\text{ VAC})\)

\(V_{MB}\) = Internal module bus

\(V_{SYS}\) = System supply

\(V_{F1}\) = Field supply 1

\(V_{F2}\) = Field supply 2

### Gateways in ECO-Design*

<table>
<thead>
<tr>
<th>Power feeding module</th>
<th>Bus-refreshing module</th>
</tr>
</thead>
<tbody>
<tr>
<td>(V_{MB}) = Internal module bus</td>
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</tr>
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</tr>
<tr>
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<td>(V_{F1}) = Field supply 1</td>
</tr>
<tr>
<td>(V_{F2}) = Field supply 2</td>
<td>(V_{F2}) = Field supply 2</td>
</tr>
<tr>
<td>(I_{MB}) = 0.4...1.0 A</td>
<td>(I_{MB}) = 0.4...1.0 A</td>
</tr>
<tr>
<td>(I_{F1}) = 8...10 A</td>
<td>(I_{F1}) = 8...10 A</td>
</tr>
<tr>
<td>(I_{F2}) = 10 A</td>
<td>(I_{F2}) = 10 A</td>
</tr>
</tbody>
</table>

\(V_{SYS}(24\text{ VDC})\)

\(V_{F1}(24\text{ VDC})\)

\(V_{F2}(24\text{ VDC}/120/230\text{ VAC})\)

**NOTE:** Bus-refreshing modules cannot be used in combination with the ECO gateway for PROFIBUS-DP.

---

*NOTE: Bus-refreshing modules can not be used in combination with the ECO gateway for PROFIBUS-DP.*
### Type code BL20 – Base modules

<table>
<thead>
<tr>
<th>Type code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20</td>
<td>Product series</td>
</tr>
<tr>
<td>S3T</td>
<td>Device design</td>
</tr>
<tr>
<td>SBBB</td>
<td>Connection levels</td>
</tr>
</tbody>
</table>

#### Details:
- **Product series**
  - BL20: BL20 system
- **Device design**
  - S: Base module for power supply
  - B: Block design
  - P: Base module for power supply
  - C: Slice design
- **Connection levels**
  - 3: 3 connection levels
  - 4: 4 connection levels
  - 6: 6 connection levels
- **Connection technology**
  - S: Screw connection
  - T: Tension spring connection
- **1st Connection levels**
  - S: Non-bridged connectors
- **2nd Connection levels**
  - B: Bridged connectors
- **3rd Connection levels**
  - B: Bridged connectors
  - C: Access to C rail
- **4th Connection levels**
  - C: Access to C rail
  - S: Non-bridged connectors
  - Blank: Connection level not available
- **5th Connection levels**
  - B: Bridged connectors
  - Blank: Connection level not available
- **6th Connection levels**
  - B: Bridged connectors
  - C: Access to C rail
  - Blank: Connection level not available
- **Additional function**
  - B: For BR refreshing modules
  - CJ: Internal cold junction compensation
  - G: Modules for the redundant power supply of the gateway
Type code BL20 – Gateways and electronic modules

<table>
<thead>
<tr>
<th>BL20</th>
<th>E</th>
<th>16</th>
<th>DO</th>
<th>24VDC</th>
<th>0.5A</th>
<th>P</th>
</tr>
</thead>
</table>

**Product series**
- BL20 – BL20 system

**Design**
- E – ECO housing

**Channels**
- Number of channels
  - 2: 2 channels
  - 4: 4 channels
  - 8: 8 channels
  - 16: 16 channels
  - 32: 32 channels

**Module type**

<table>
<thead>
<tr>
<th>DO</th>
<th>Module type</th>
<th>24VDC</th>
<th>Signal type</th>
<th>0.5A</th>
<th>Output current</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>analog input module</td>
<td></td>
<td>A</td>
<td>acyclic communication</td>
<td>0.5A</td>
</tr>
<tr>
<td>AIH</td>
<td>analog input module with HART® communication</td>
<td></td>
<td>CANOPEN</td>
<td>CANopen®</td>
<td>0.5A</td>
</tr>
<tr>
<td>AO</td>
<td>analog output module</td>
<td></td>
<td>CO</td>
<td>CANopen®</td>
<td>0.5A</td>
</tr>
<tr>
<td>AOH</td>
<td>analog output module with HART® communication</td>
<td></td>
<td>DN</td>
<td>DeviceNet™</td>
<td>0.5A</td>
</tr>
<tr>
<td>BR</td>
<td>bus refreshing module</td>
<td></td>
<td>DNET</td>
<td>DeviceNet™</td>
<td>0.5A</td>
</tr>
<tr>
<td>CNT</td>
<td>counter module</td>
<td></td>
<td>DP</td>
<td>PROFIBUS-DP</td>
<td>2A</td>
</tr>
<tr>
<td>DI</td>
<td>digital input module</td>
<td></td>
<td>DPV1</td>
<td>PROFIBUS-DP</td>
<td>2A</td>
</tr>
<tr>
<td>DO</td>
<td>digital output module</td>
<td></td>
<td>EC</td>
<td>EtherCAT®</td>
<td>2A</td>
</tr>
<tr>
<td>GW</td>
<td>gateway</td>
<td></td>
<td>EN</td>
<td>Ethernet</td>
<td>2A</td>
</tr>
<tr>
<td>GWBR</td>
<td>gateway</td>
<td></td>
<td>EN-IP</td>
<td>EtherNet/IP™</td>
<td>2A</td>
</tr>
<tr>
<td>GWOL</td>
<td>IO-Link master module</td>
<td></td>
<td>I</td>
<td>current signal</td>
<td>2A</td>
</tr>
<tr>
<td>PF</td>
<td>power feeding module</td>
<td></td>
<td>NAMUR</td>
<td>digital input module for NAMUR sensors</td>
<td>2A</td>
</tr>
<tr>
<td>PG</td>
<td>programmable gateway</td>
<td></td>
<td>PN</td>
<td>PROFINET</td>
<td>2A</td>
</tr>
<tr>
<td>PWM</td>
<td>PWM module</td>
<td></td>
<td>PT/NI</td>
<td>RTDs</td>
<td>2A</td>
</tr>
<tr>
<td>RFID</td>
<td>RFID interface module</td>
<td></td>
<td>R</td>
<td>relay module</td>
<td>2A</td>
</tr>
<tr>
<td>RS232</td>
<td>RS232 communication module</td>
<td></td>
<td>S</td>
<td>simplified communication via process data</td>
<td>2A</td>
</tr>
<tr>
<td>RS485/422</td>
<td>RS485/422 communication module</td>
<td></td>
<td>THERMO</td>
<td>thermocouple</td>
<td>2A</td>
</tr>
<tr>
<td>SSI</td>
<td>SSI (Synchronous Serial Interface) module</td>
<td></td>
<td>U</td>
<td>voltage signal</td>
<td>2A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>U/I</td>
<td>current/voltage signal (adjustable)</td>
<td>2A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24VDC</td>
<td>24 VDC</td>
<td>2A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>120/230VAC</td>
<td>120/230 VAC</td>
<td>2A</td>
</tr>
</tbody>
</table>
Gateway for PROFIBUS-DP

Features

- Rotary coding switch for adjustment of the node address
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and PROFIBUS-DPV0/DPV1
- 12 Mbps
- 9-pin sub-D female connector

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>The USYS system supply feeds power to the gateway and the I/O modules. The UL field supply feeds power to the sensors and actuators.</td>
<td><img src="image" alt="Pinning diagram" /></td>
</tr>
</tbody>
</table>

**PROFIBUS-DP**

Fieldbus cable (example):

- D9T451-2M (ident no. 6915759) or RSSW-D9T451-2M (ident no. 6915779)

- 1 = shield
- 2 = n.c.
- 3 = RD (Bus B)
- 4 = n.c.
- 5 = GND
- 6 = 5 VDC
- 7 = n.c.
- 8 = GN (Bus A)
- 9 = n.c.
## Technical data

### Type
- BL20-GW-DPV1
- Ident no.: 6827234

### Power supply
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 18...30 VDC
- **Max. system supply current**: 1.2 A
- **Max. field supply current**: 10 A
- **Nominal current from module bus**: ≤ 430 mA
- **Voltage supply connection**: screw terminals

### System data
- **Fieldbus transmission rate**: 9.6 kbps ... 12 Mbps
- **Fieldbus addressing**: 2 rotary switches
- **Fieldbus address range**: 1...99
- **Fieldbus connection technology**: 1 x female sub-D connector
- **Fieldbus termination**: external
- **Max. number of I/O modules**: 64
- **Service interface**: PS/2 socket

### Environmental conditions
- **Ambient temperature**: 0...+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25...+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 50.6 x 114.8 x 74.4 mm

### Accessories
- **Included in delivery**: 2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL

### Approval | Certification
- ATEX, IECEx, ULc, FM, GOST
BL20 – Modular I/O system in IP20

Gateway for PROFIBUS-DP

Features
- DIP switch for adjustment of the node address
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and PROFIBUS-DPV0/DPV1
- 12 Mbps
- Push-in terminals

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power supply</strong></td>
<td>The USYS system supply feeds power to the gateway and the I/O modules. The UI field supply feeds power to the sensors and actuators.</td>
<td></td>
</tr>
<tr>
<td><strong>PROFIBUS-DP</strong></td>
<td>Fieldbus cable (example): D9T451-2M (ident no. 6915759) or RSSW-451-2M (ident no. 6914229)</td>
<td></td>
</tr>
</tbody>
</table>

Pinning assignment:
- **UI**, **GNDsys**: Field supply
- **UL**, **GNDL**: System supply
- **A**, **B**, **SHLD**: PROFIBUS-DP

Hans Turck GmbH & Co. KG • Tel. +49 208 49 52-0 • Fax +49 208 49 52-264
## Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>BL20-E-GW-DP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>6827250</td>
</tr>
</tbody>
</table>

### Power supply
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 18 ... 30 VDC
- **Max. system supply current**: 1 A
- **Max. field supply current**: 8 A
- **Nominal current from module bus**: ≤ 400 mA
- **Voltage supply connection**: Push-in terminals

### System data
- **Fieldbus transmission rate**: 9.6 kbps ... 12 Mbps
- **Fieldbus addressing via DIP switch**: via DIP switch
- **Fieldbus address range**: 1 ... 126
- **Fieldbus connection technology**: Push-in terminals
- **Max. number of I/O modules**: 48
- **Service interface**: PS/2 socket

### Environmental conditions
- **Ambient temperature**: 0 ... +55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25 ... +85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 33.5 x 129.5 x 74.4 mm

### Accessories
- **Included in delivery**: 2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL

### Approval | Certification
- ATEX, IECEx, ULc, FM, GOST
Gateway for CANopen

Features
- Rotary coding switch for adjustment of the node address
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- 1 x open style connector
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and CANopen
- 20 kbps up to 1000 kbps
- The connection to CANopen is established via an open-style connector

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>The USYS system supply feeds power to the gateway and the I/O modules. The UL field supply feeds power to the sensors and actuators.</td>
</tr>
<tr>
<td>CANopen</td>
<td>Fieldbus cable (example): CBCS-572-2M (ident no. 6606065) or RKCS701-5M (ident no. 6931035)</td>
</tr>
</tbody>
</table>

Pinning assignment

- **V+**
- **CAN_H**
- **shield**
- **CAN_L**
- **V–**
## Technical data

### Power supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>18...30 VDC</td>
</tr>
<tr>
<td>Max. system supply current</td>
<td>1.2 A</td>
</tr>
<tr>
<td>Max. field supply current</td>
<td>10 A</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 350 mA</td>
</tr>
<tr>
<td>Voltage supply connection</td>
<td>screw terminals</td>
</tr>
</tbody>
</table>

### System data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus transmission rate</td>
<td>20 kbps … 1 Mbps</td>
</tr>
<tr>
<td>Fieldbus addressing</td>
<td>2 rotary switches</td>
</tr>
<tr>
<td>Fieldbus address range</td>
<td>1…99</td>
</tr>
<tr>
<td>Fieldbus connection technology</td>
<td>open style connector</td>
</tr>
<tr>
<td>Fieldbus termination</td>
<td>external</td>
</tr>
<tr>
<td>Max. number of I/O modules</td>
<td>74</td>
</tr>
<tr>
<td>Service interface</td>
<td>PS/2 socket</td>
</tr>
</tbody>
</table>

### Environmental conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0…+55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25…+85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>50.6 x 114.8 x 74.4 mm</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Included in delivery</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>2 x end brackets BL20-WEW-35/2-SW</td>
<td></td>
</tr>
<tr>
<td>1 x end plate BL20-ABPL</td>
<td></td>
</tr>
<tr>
<td>1 x open style connector</td>
<td></td>
</tr>
</tbody>
</table>

### Approval | Certification

<table>
<thead>
<tr>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX, IECEx, UL, FM, GOST</td>
</tr>
</tbody>
</table>
**Gateway for CANopen**

**Features**
- DIP switch for adjustment of the node address
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and CANopen
- 1 Mbps
- Push-in terminals

### Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>The USYS system supply feeds power to the gateway and the I/O modules. The UL field supply feeds power to the sensors and actuators.</td>
<td>![Pinning diagram]</td>
</tr>
</tbody>
</table>

**CANopen**
- Fieldbus cable (example): CBCS-572-2M (ident no. 6606065) or RKCS701-5M (ident no. 6931035)
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-E-GW-CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827252</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>18…30 VDC</td>
</tr>
<tr>
<td>Max. system supply current</td>
<td>0.7 A</td>
</tr>
<tr>
<td>Max. field supply current</td>
<td>8 A</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 350 mA</td>
</tr>
<tr>
<td>Voltage supply connection</td>
<td>Push-in terminals</td>
</tr>
</tbody>
</table>

### System data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus transmission rate</td>
<td>20 kbps … 1 Mbps</td>
</tr>
<tr>
<td>Fieldbus addressing</td>
<td>via DIP switch</td>
</tr>
<tr>
<td>Fieldbus address range</td>
<td>1…63</td>
</tr>
<tr>
<td>Fieldbus connection technology</td>
<td>Push-in terminals</td>
</tr>
<tr>
<td>Fieldbus termination</td>
<td>via DIP switch</td>
</tr>
<tr>
<td>Max. number of I/O modules</td>
<td>62</td>
</tr>
<tr>
<td>Service interface</td>
<td>PS/2 socket</td>
</tr>
</tbody>
</table>

### Environmental conditions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0…+55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25…+85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>33.5 x 129.5 x 74.4 mm</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in delivery</td>
<td>2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL</td>
</tr>
</tbody>
</table>

### Approval | Certification

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved</td>
<td>ATEX, IECEx, UL, FM, GOST</td>
</tr>
</tbody>
</table>
Gateway for DeviceNet™

Features
- Rotary coding switch for adjustment of the node address
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- 1 x open style connector
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and DeviceNet™
- 125 / 250 / 500 kbps
- The connection to DeviceNet™ is established via an open-style connector

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>The USYS system supply feeds power to the gateway and the I/O modules. The U₁ field supply feeds power to the sensors and actuators.</td>
</tr>
</tbody>
</table>

DeviceNet™

Fieldbus cable (example):
CBC5-572-2M (ident no. 6606065) or RKC5701-5M (ident no. 6931035)

Pinning table:

- Field supply
- System supply
- $V_+\,$
- $\text{CAN}_{\text{H}}$
- shield
- $\text{CAN}_{\text{L}}$
- $V_-\,$
## Technical data

### Type
- **BL20-GWBR-DNET**
- **Ident no.**: 6827168

### Power supply
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 18…30 VDC
- **Max. system supply current**: 1.2 A
- **Max. field supply current**: 10 A
- **Nominal current from module bus**: ≤ 250 mA
- **Voltage supply connection**: screw terminals

### System data
- **Fieldbus transmission rate**: 125 / 250 / 500 kbps
- **Fieldbus addressing**: 2 rotary switches
- **Fieldbus address range**: 0…63
- **Fieldbus connection technology**: open style connector
- **Fieldbus termination**: external
- **Max. number of I/O modules**: 74
- **Service interface**: PS/2 socket

### Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 50.6 x 114.8 x 74.4 mm

### Accessories
- **Included in delivery**: 2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL, 1 x open style connector

### Approval | Certification
- ATEX, IECEx, ULc, FM, GOST
**Gateway for DeviceNet™**

**Features**
- DIP switch for adjustment of the node address
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- 1 x open style connector
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and DeviceNet™
- 125 / 250 / 500 kbps
- The connection to DeviceNet™ is established via an open-style connector

**Pinning overview**

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>The USYS system supply feeds power to the gateway and the I/O modules. The U1 field supply feeds power to the sensors and actuators.</td>
<td>U1, GND, field supply</td>
</tr>
<tr>
<td>DeviceNet™</td>
<td>Fieldbus cable (example): CBCS-572-2M (ident no. 6606065) or RKCS701-5M (ident no. 6931035)</td>
<td>V+, CAN_H, shield, CAN_L, V–</td>
</tr>
</tbody>
</table>
## Technical data

### Power supply
- **Type**: BL20-E-GW-DN
- **Ident no.**: 6827301
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 18 ... 30 VDC
- **Max. system supply current**: 0.7 A
- **Max. field supply current**: 8 A
- **Nominal current from module bus**: ≤ 250 mA
- **Voltage supply connection**: Push-in terminals

### System data
- **Fieldbus transmission rate**: 125 ... 500 kbps
- **Fieldbus addressing**: via DIP switch
- **Fieldbus address range**: 0 ... 63
- **Fieldbus connection technology**: open style connector
- **Fieldbus termination**: via DIP switch
- **Max. number of I/O modules**: 62
- **Service interface**: PS/2 socket

### Environmental conditions
- **Ambient temperature**: 0 ... +55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25 ... +85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 33.5 x 129.5 x 74.4 mm

### Accessories
- **Included in delivery**: 2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL, 1 x open style connector

### Approval | Certification
- ATEX, IECEx, ULus, FMus, GOST
Gateway for Modbus RTU / ASCII

**Features**
- DIP switch for adjustment of the node address
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and Modbus RTU / ASCII
- RS485 or RS232, configurable
- 9.6 kbps … 115.2 kbps
- Push-in terminals
- Circuit boards with conformal coating

**Pinning overview**

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>The USYS system supply feeds power to the gateway and the I/O modules. The UL field supply feeds power to the sensors and actuators.</td>
<td>U_L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GND</td>
</tr>
<tr>
<td>Modbus RTU/ASCII</td>
<td>Fieldbus cable for RS485 (example): RSC5701-5M (ident no. 6931036)</td>
<td>Tx / A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rx / B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shield</td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>BL20-E-GW-RS-MB/ET</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>6827381</td>
</tr>
</tbody>
</table>

### Power supply
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 18…30 VDC
- **Max. system supply current**: 0.7 A
- **Max. field supply current**: 8 A
- **Nominal current from module bus**: ≤ 200 mA
- **Voltage supply connection**: Push-in terminals

### System data
- **Fieldbus transmission rate**: 9.6 kbps … 115.2 kbps
- **Fieldbus addressing** via DIP switch, I/O-ASSISTANT
- **Fieldbus address range**: 1…31 (via DIP switch)1…247 (via I/O-ASSISTANT)
- **Fieldbus connection technology**: Push-in terminals
- **Fieldbus termination**: via DIP switch
- **Max. number of I/O modules**: 32
- **Service interface**: Mini USB

### Environmental conditions
- **Ambient temperature**: -25…+60 °C
- **Relative humidity**: ≤ 15 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+70 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 33.5 x 129.5 x 74.4 mm

### Accessories
- **Included in delivery**: 2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL

### Approval | Certification
- cULus, GOST
Gateway for PROFINET, EtherNet/IP™ and Modbus TCP

Features
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- LEDs for display of supply voltage, group and bus errors
- Multiprotocol gateway between the BL20 system and the Ethernet protocols Modbus TCP, EtherNet/IP™ and PROFINET (from VN 03-00)
- PROFINET supports fast start-up (FSU)
- EtherNet/IP™ supports QuickConnect (QC)
- Integrated switch 10/100 Mbps
- Two RJ45 ports for fieldbus connection
- Push-in terminals for connection of power supply

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>Fieldbus cable (example): RJ45S-RJ45S-441-2M (ident no. 6932517) or RJ45-FKSDD-441-0.5M/S2174 (ident no. 6914221)</td>
<td>ETH2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = TX +</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 = TX -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 = RX +</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 = n.c.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 = n.c.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 = RX -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 = n.c.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 = n.c.</td>
</tr>
</tbody>
</table>

Power supply
The USYS system supply feeds power to the gateway and the I/O modules.
The Uf field supply feeds power to the sensors and actuators.
## Technical data

### Power supply
- **Type**: BL20-E-GW-EN
- **Ident no.**: 6827329

#### System data
- **Fieldbus transmission rate**: 10/100 Mbps, Full/Half Duplex, Auto Negotiation, Auto Crossing
- **Max. number of I/O modules**: 31
- **Connection technology Ethernet**: 2 x RJ45, female
- **Protocol detection**: automatic
- **Web server**: 192.168.1.254 (Default)
- **Service interface**: Ethernet

#### Modbus TCP
- **Addressing**: Static IP, BOOTP, DHCP
- **Supported function codes**: FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23
- **Simultaneous connections**: 8
- **Input Data Size**: max. 1024 register
- **Input register start address**: 0 (0x0000 hex)
- **Output Data Size**: max. 1024 register
- **Output register start address**: 2048 (0x0800 hex)

#### EtherNet/IP™
- **Addressing**: acc. to EtherNet/IP™ specification
- **Device Level Ring (DLR)**: supported
- **Simultaneous CIP connections**: 8

#### PROFINET
- **Addressing**: DCP
- **Conformance Class**: B (RT)
- **MinCycleTime**: 1 ms
- **Diagnostics**: acc. to PROFINET alarm handling
- **Topology detection**: supported
- **Automatic addressing**: supported

#### Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 33.5 x 129.5 x 74.4 mm

### Accessories
- **Included in delivery**: 2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL

### Approval | Certification
- ATEX, IECEx, UL listed, FM certified, GOST
Gateway for PROFINET (IRT)

Features
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and PROFINET (IRT)
- Supports topology recognition and LLDP
- 10/100 Mbps, Auto MDIX
- 2 x RJ45 port

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFINET</td>
<td>Fieldbus cable (example): RJ45S-RJ45S-441-2M (ident no. 6932517) or RJ45-FKSDD-441-0.5M/52174 (ident no. 6914221)</td>
<td>ETH1 1 = TX + 2 = TX – 3 = RX + 4 = n.c. 5 = n.c. 6 = RX – 7 = n.c. 8 = n.c. ETH2</td>
</tr>
</tbody>
</table>

Power supply

The USYS system supply feeds power to the gateway and the I/O modules. The U_f field supply feeds power to the sensors and actuators.

\[ USYS \rightarrow \text{Gateway} \rightarrow \text{I/O modules} \]

\[ U_f \rightarrow \text{Sensors and Actuators} \]
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-E-GW-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827377</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>18 ... 30 VDC</td>
</tr>
<tr>
<td>Max. system supply current</td>
<td>0.8 A</td>
</tr>
<tr>
<td>Max. field supply current</td>
<td>8 A</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 200 mA</td>
</tr>
<tr>
<td>Voltage supply connection</td>
<td>Push-in terminals</td>
</tr>
</tbody>
</table>

### System data

<table>
<thead>
<tr>
<th>Fieldbus transmission rate</th>
<th>10/100 Mbps, Full/Half Duplex, Auto Negotiation, Auto Crossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of I/O modules</td>
<td>72</td>
</tr>
<tr>
<td>Connection technology Ethernet</td>
<td>2 x RJ45, female</td>
</tr>
<tr>
<td>Service interface</td>
<td>Mini USB</td>
</tr>
</tbody>
</table>

### PROFINET

<table>
<thead>
<tr>
<th>Addressing</th>
<th>DCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conformance Class</td>
<td>C (IRT)</td>
</tr>
<tr>
<td>MinCycleTime</td>
<td>1 ms</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>acc. to PROFINET alarm handling</td>
</tr>
<tr>
<td>Topology detection</td>
<td>supported</td>
</tr>
<tr>
<td>Automatic addressing</td>
<td>supported</td>
</tr>
<tr>
<td>Media Redundancy Protocol (MRP)</td>
<td>supported</td>
</tr>
</tbody>
</table>

### Environmental conditions

| Ambient temperature     | 0 ... +55 °C          |
| Relative humidity       | ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage) |
| Storage temperature     | -25 ... +85 °C        |
| Vibration test          | acc. to EN 61131     |
| Shock test              | acc. to IEC 68-2-27   |
| Drop and topple         | acc. to IEC 68-2-31 and free fall to IEC 68-2-32 |
| Electro-magnetic compatibility | acc. to EN 61131-2 |

### Mechanical data

<table>
<thead>
<tr>
<th>Protection class</th>
<th>IP20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>33.5 x 129.5 x 74.4 mm</td>
</tr>
</tbody>
</table>

### Accessories

| Included in delivery | 2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL |

### Approval | Certification

| ULc, GOST |
Gateway for EtherCAT®

Features

- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and EtherCAT®
- Modular Device Profile (MDP) supported
- 10/100 Mbps, Auto MDIX
- 2 x RJ45 port

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
</table>
| EtherCAT® Fieldbus cable (example): RJ45S-RJ45S-441-2M (ident no. 6932517) or RJ45-FKSDD-441-0.5M/52174 (ident no. 6914221) | ETH2 | 1 = TX +  
2 = TX –  
3 = RX +  
4 = n.c.  
5 = n.c.  
6 = RX –  
7 = n.c.  
8 = n.c. |

Power supply

The USYS system supply feeds power to the gateway and the I/O modules. The UL field supply feeds power to the sensors and actuators.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-E-GW-EC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827380</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>18 ... 30 VDC</td>
</tr>
<tr>
<td>Max. system supply current</td>
<td>0.8 A</td>
</tr>
<tr>
<td>Max. field supply current</td>
<td>8 A</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 200 mA</td>
</tr>
<tr>
<td>Voltage supply connection</td>
<td>Push-in terminals</td>
</tr>
</tbody>
</table>

### System data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus transmission rate</td>
<td>10/100 Mbps, Full/Half Duplex, Auto Negotiation, Auto Crossing</td>
</tr>
<tr>
<td>Max. number of I/O modules</td>
<td>72</td>
</tr>
<tr>
<td>Connection technology Ethernet</td>
<td>2 x RJ45, female</td>
</tr>
<tr>
<td>Service interface</td>
<td>Mini USB</td>
</tr>
</tbody>
</table>

### EtherCAT®

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address allocation</td>
<td>automatic</td>
</tr>
<tr>
<td>MinCycleTime</td>
<td>250 µs</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>CoE Emergencies, DiagnosisHistory</td>
</tr>
<tr>
<td>CAN over EtherCAT</td>
<td>acc. to modular device profile</td>
</tr>
</tbody>
</table>

### Environmental conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0 ... +55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25 ... +85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>33.5 x 129.5 x 74.4 mm</td>
</tr>
</tbody>
</table>

### Accessories

| Included in delivery | 2 x end brackets BL20-VEW-35/2-SW, 1 x end plate BL20-ABPL |

### Approval | Certification

| ULc, GOST |

more@turck.com • www.turck.com • Edition I/2014
Gateway for Modbus TCP

Features
- Rotary coding switch to adjust the node address
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and Modbus TCP
- 10/100 Mbps
- RJ45 port

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modbus TCP</strong></td>
<td>Fieldbus cable (example): RJ45S-RJ45S-441-2M (ident no. 6932517) or RJ45-FKSD-441-0.5M/52174 (ident no. 6914221)</td>
<td>1 = TX +&lt;br&gt;2 = TX –&lt;br&gt;3 = RX +&lt;br&gt;4 = n.c.&lt;br&gt;5 = n.c.&lt;br&gt;6 = RX –&lt;br&gt;7 = n.c.&lt;br&gt;8 = n.c.</td>
</tr>
</tbody>
</table>

Power supply

The USYS system supply feeds power to the gateway and the I/O modules. The Uf field supply feeds power to the sensors and actuators.
# Technical data

## Type

<table>
<thead>
<tr>
<th>Power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td><strong>Ident no.</strong></td>
</tr>
</tbody>
</table>

## Power supply

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>18 ... 30 VDC</td>
</tr>
<tr>
<td>Max. system supply current</td>
<td>1.2 A</td>
</tr>
<tr>
<td>Max. field supply current</td>
<td>10 A</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 500 mA</td>
</tr>
<tr>
<td>Voltage supply connection</td>
<td>screw terminals</td>
</tr>
</tbody>
</table>

## System data

<table>
<thead>
<tr>
<th>System data</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus transmission rate</td>
<td>10/100 Mbps, Full/Half Duplex, Auto Negotiation, Auto Crossing</td>
</tr>
<tr>
<td>Fieldbus addressing</td>
<td>Rotary switch, BOOTP, DHCP, IO-ASSISTANT</td>
</tr>
<tr>
<td>Fieldbus connection technology</td>
<td>RJ45 port</td>
</tr>
<tr>
<td>Max. number of I/O modules</td>
<td>74</td>
</tr>
<tr>
<td>Web server</td>
<td>192.168.1.254 (Default)</td>
</tr>
<tr>
<td>Service interface</td>
<td>PS/2 socket</td>
</tr>
</tbody>
</table>

## Environmental conditions

<table>
<thead>
<tr>
<th>Environmental conditions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0 ... +55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25 ... +85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

## Mechanical data

<table>
<thead>
<tr>
<th>Mechanical data</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>50.6 x 114.8 x 74.4 mm</td>
</tr>
</tbody>
</table>

## Accessories

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in delivery</td>
<td>2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL</td>
</tr>
</tbody>
</table>

## Approval | Certification

<table>
<thead>
<tr>
<th>Certification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX, IECEx, UL, FM, GOST</td>
<td></td>
</tr>
</tbody>
</table>
Gateway for EtherNet/IP™

Features
- Rotary coding switch to adjust the node address
- Protection class IP20
- 2 x end brackets BL20-WEW35/2-SW
- 1 x end plate BL20-ABPL
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and EtherNet/IP™
- 10/100 Mbps
- RJ45 port

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>EtherNet/IP™</td>
<td>Fieldbus cable (example): RJ45S-RJ45S-441-2M (ident no. 6932517) or RJ45-FKSDD-441-0.5M/52174 (ident no. 6914221)</td>
<td>1 = TX +&lt;br&gt;2 = TX –&lt;br&gt;3 = RX +&lt;br&gt;4 = n.c.&lt;br&gt;5 = n.c.&lt;br&gt;6 = RX –&lt;br&gt;7 = n.c.&lt;br&gt;8 = n.c.</td>
</tr>
</tbody>
</table>

Power supply
The USYS system supply feeds power to the gateway and the I/O modules. The UL field supply feeds power to the sensors and actuators.
## Technical data

### Type
- **Ident no.** 6827247

### Power supply
- **Supply voltage** 24 VDC
- **Operating voltage range** 18...30 VDC
- **Max. system supply current** 1.2 A
- **Max. field supply current** 10 A
- **Nominal current from module bus** ≤ 500 mA
- **Voltage supply connection** screw terminals

### System data
- **Fieldbus transmission rate** 10/100 Mbps, Full/Half Duplex, Auto Negotiation, Auto Crossing
- **Fieldbus addressing** Rotary switch, BOOTP, DHCP, IO-ASSISTANT
- **Fieldbus connection technology** RJ45 port
- **Max. number of I/O modules** 74
- **Web server** 192.168.1.254 (Default)
- **Service interface** PS/2 socket

### Environmental conditions
- **Ambient temperature** 0...+55 °C
- **Relative humidity** ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature** -25...+85 °C
- **Vibration test** acc. to EN 61131
- **Shock test** acc. to IEC 68-2-27
- **Drop and topple** acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility** acc. to EN 61131-2

### Mechanical data
- **Protection class** IP20
- **Dimensions** 50.6 x 114.8 x 74.4 mm

### Accessories
- **Included in delivery** 2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL

### Approval | Certification
- ATEX, IECEx, ULus, FMus, GOST
CODESYS programmable gateway for Modbus TCP

Features
- CODESYS programmable acc. to IEC 61131-3
- Ethernet and RS232 programming interface
- 512 kB program memory
- 32 bit RISC processor
- < 1 ms for 1000 commands
- 3 decimal rotary coding switches
- Protection class IP20
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and Modbus TCP
- 10/100 Mbps

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modbus TCP</strong></td>
<td>Fieldbus cable (example): RJ45S-RJ45S-441-2M (ident no. 6932517) or RJ45-FKSDD-441-0.5M/52174 (ident no. 6914221)</td>
<td></td>
</tr>
</tbody>
</table>

Power supply
The USYS system supply feeds power to the gateway and the I/O modules.
The Uf field supply feeds power to the sensors and actuators.
# Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-PG-EN</th>
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</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827249</td>
</tr>
</tbody>
</table>

## Power supply
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 18…30 VDC
- **Max. system supply current**: 1.2 A
- **Max. field supply current**: 10 A
- **Nominal current from module bus**: ≤ 500 mA
- **Voltage supply connection**: screw terminals

## System data
- **Fieldbus transmission rate**: 10/100 Mbps, Full/Half Duplex, Auto Negotiation, Auto Crossing
- **Fieldbus addressing**: Rotary switch, BOOTP, DHCP, IO-ASSISTANT
- **Fieldbus connection technology**: RJ45 port
- **Max. number of I/O modules**: 74
- **Web server**: 192.168.1.254 (Default)
- **Service interface**: PS/2 socket

## PLC data
- **Programming**: CODESYS V2.3
- **Released for CODESYS version**: V 2.3.9.35
- **Programming languages**: IEC 61131-3 (IL, LD, FBD, SFC, ST)
- **Application tasks**: 1
- **Number of POU's**: 1024
- **Programming interface**: RS232 interface, Ethernet
- **Processor**: RISC, 32 bit
- **Cycle time**: < 1 ms for 1000 IL commands (without I/O cycle)
- **Program memory**: 512 kByte
- **Data memory**: 512 kByte
- **Input data**: 4 kByte
- **Output data**: 4 kByte
- **Non-volatile memory**: 16 kByte

## Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

## Mechanical data
- **Protection class**: IP20
- **Dimensions**: 50.6 x 114.8 x 74.4 mm

## Accessories
- **Included in delivery**: 2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL

## Approval | Certification
- ATEX, IECEx, ULعر, FMعر, GOST
**CODESYS programmable gateway for EtherNet/IP™**

**Features**

- CODESYS programmable acc. to IEC 61131-3
- Ethernet and RS232 programming interface
- 512 kB program memory
- 32 bit RISC processor
- < 1 ms for 1000 commands
- 3 decimal rotary coding switches
- Protection class IP20
- Integrated power supply
- LEDs for display of supply voltage, group and bus errors
- Gateway between the BL20 system and EtherNet/IP™
- 10/100 Mbps

**Pinning overview**

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
</table>
| EtherNet/IP™ | Fieldbus cable (example): RJ45S-RJ45S-441-2M (ident no. 6932517) or RJ45-FKSDD-441-0.5M/52174 (ident no. 6914221) | 1 = TX +  
2 = TX -  
3 = RX +  
4 = n.c.  
5 = n.c.  
6 = RX -  
7 = n.c.  
8 = n.c. |

**Power supply**
The USYS system supply feeds power to the gateway and the I/O modules. The Uᵢ field supply feeds power to the sensors and actuators.
# Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-PG-EN-IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
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</table>

## Power supply

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
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<td>Voltage supply connection</td>
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<td>Fieldbus transmission rate</td>
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<td>Rotary switch, BOOTP, DHCP, IO-ASSISTANT</td>
</tr>
<tr>
<td>Fieldbus connection technology</td>
<td>RJ45 port</td>
</tr>
<tr>
<td>Max. number of I/O modules</td>
<td>74</td>
</tr>
<tr>
<td>Web server</td>
<td>192.168.1.254 (Default)</td>
</tr>
<tr>
<td>Service interface</td>
<td>PS/2 socket</td>
</tr>
</tbody>
</table>

## PLC data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Programming</td>
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<td>IEC 61131-3 (IL, LD, FBD, SFC, ST)</td>
</tr>
<tr>
<td>Application tasks</td>
<td>1</td>
</tr>
<tr>
<td>Number of POU's</td>
<td>1024</td>
</tr>
<tr>
<td>Programming interface</td>
<td>RS232 interface, Ethernet</td>
</tr>
<tr>
<td>Processor</td>
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<td>Cycle time</td>
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<tr>
<td>Program memory</td>
<td>512 kByte</td>
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</tr>
<tr>
<td>Input data</td>
<td>4 kByte</td>
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<tr>
<td>Output data</td>
<td>4 kByte</td>
</tr>
<tr>
<td>Non-volatile memory</td>
<td>16 kByte</td>
</tr>
</tbody>
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## Environmental conditions

<table>
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<tr>
<th>Description</th>
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<tbody>
<tr>
<td>Ambient temperature</td>
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<tr>
<td>Vibration test</td>
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<tr>
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<tr>
<td>Drop and topple</td>
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<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
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## Mechanical data

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<tr>
<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>50.6 x 114.8 x 74.4 mm</td>
</tr>
</tbody>
</table>

## Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in delivery</td>
<td>2 x end brackets BL20-WEW-35/2-SW, 1 x end plate BL20-ABPL</td>
</tr>
</tbody>
</table>

## Approval/Certification

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX, IECEx, ULus, FMus, GOST</td>
<td></td>
</tr>
</tbody>
</table>
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Bus refreshing module

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicating system status, field supply and diagnostic information
- Can be used to form potential groups
- BL20 I/O modules powered with 5 VDC nominal voltage via the internal module bus
- Supplies field with 24 VDC nominal voltage

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-P3T-SBB-B</td>
<td>6827040</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-P3S-SBB-B</td>
<td>6827041</td>
<td>Screw connection</td>
</tr>
<tr>
<td>BL20-P4T-SBBC-B</td>
<td>6827042</td>
<td>Tension spring connection, C rail</td>
</tr>
<tr>
<td>BL20-P4S-SBBC-B</td>
<td>6827043</td>
<td>Screw connection, C rail</td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-BR-24VDC-D</th>
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</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827006</td>
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</table>

### Power supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>18…30 VDC</td>
</tr>
<tr>
<td>Max. system supply current</td>
<td>1.5 A</td>
</tr>
<tr>
<td>Max. field supply current</td>
<td>10 A</td>
</tr>
</tbody>
</table>

### Environmental conditions

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<th>Parameter</th>
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<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
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### Mechanical data

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<tbody>
<tr>
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<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>12.6 x 74.1 x 55.4 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

- ATEX
- IECEx
- UL
- FM
- GOST
Redundant bus refreshing module

Features

- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicating system status, field supply and diagnostic information
- Can be used to form potential groups
- Two modules can be connected in series for redundant power supply of a BL20 system
- BL20 I/O modules and gateway powered with 5 VDC via the internal module bus
- Supplies field with 24 VDC nominal voltage

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="BL20-P4T-SBBC-G" /></td>
<td>BL20-P4T-SBBC-G 6827378</td>
<td>Tension spring connection - slot 1 next to the gateway</td>
</tr>
<tr>
<td><img src="image" alt="BL20-S4T-SBBC" /></td>
<td>BL20-S4T-SBBC 6827050</td>
<td>Tension spring connection - slot 2 next to the gateway</td>
</tr>
<tr>
<td><img src="image" alt="BL20-P4S-SBBC-G" /></td>
<td>BL20-P4S-SBBC-G 6827379</td>
<td>Screw connection - slot 1 next to the gateway</td>
</tr>
<tr>
<td><img src="image" alt="BL20-S4S-SBBC" /></td>
<td>BL20-S4S-SBBC 6827051</td>
<td>Screw connection - slot 2 next to the gateway</td>
</tr>
<tr>
<td><img src="image" alt="BL20-P4T-SBBC-B" /></td>
<td>BL20-P4T-SBBC-B 6827042</td>
<td>Tension spring connection - slot n+1 next to the gateway</td>
</tr>
<tr>
<td><img src="image" alt="BL20-S4T-SBBC" /></td>
<td>BL20-S4T-SBBC 6827050</td>
<td>Tension spring connection - slot n+2 next to the gateway</td>
</tr>
<tr>
<td><img src="image" alt="BL20-P4S-SBBC-B" /></td>
<td>BL20-P4S-SBBC-B 6827043</td>
<td>Screw connection - slot n+1 next to the gateway</td>
</tr>
<tr>
<td><img src="image" alt="BL20-S4S-SBBC" /></td>
<td>BL20-S4S-SBBC 6827051</td>
<td>Screw connection - slot n+2 next to the gateway</td>
</tr>
</tbody>
</table>

...-G ...SBBC

...-B ...SBBC
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-BR-24VDC-RED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827366</td>
</tr>
</tbody>
</table>

### Power supply
- **Operating voltage range**: 18…30 VDC
- **Max. system supply current**: 0.7 A
- **Max. field supply current**: 5 A

### Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
| cULus |
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Power feeding module, 24 VDC

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicating system status, field supply and diagnostic information
- Can be used to form potential groups
- Supplies field with 24 VDC nominal voltage

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-P3T-SBB</td>
<td>6827036</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-P3S-SBB</td>
<td>6827037</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>

| BL20-P4T-SBBC     | 6827038       | Tension spring connection, access to C rail |
| BL20-P4S-SBBC     | 6827039       | Screw connection, access to C rail   |
Technical data

**Type**
BL20-PF-24VDC-D

**Ident no.**
6827007

**Power supply**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>18...30 VDC</td>
</tr>
<tr>
<td>Max. field supply current</td>
<td>10 A</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 28 mA</td>
</tr>
</tbody>
</table>

**Environmental conditions**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0…+55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25…+85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

**Mechanical data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>12.6 x 74.1 x 55.4 mm</td>
</tr>
</tbody>
</table>

**Approval | Certification**

ATEX, IECEx, ULus, FMus, GOST
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Power feeding module, 120/230 VAC

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicating system status, field supply and diagnostic information
- Can be used to form potential groups
- Supplies field with 120/230 VAC nominal voltage

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-P3T-SBB</td>
<td>6827036</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-P3S-SBB</td>
<td>6827037</td>
<td>Screw connection</td>
</tr>
<tr>
<td>BL20-P4T-SBBC</td>
<td>6827038</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-P4S-SBBC</td>
<td>6827039</td>
<td>Screw connection, access to C rail</td>
</tr>
</tbody>
</table>

Tension spring connection

Screw connection
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-PF-120/230VAC-D</th>
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</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827008</td>
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</table>

### Power supply

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>102…253 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>50…60 Hz</td>
</tr>
<tr>
<td>Max. field supply current</td>
<td>10 A</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 25 mA</td>
</tr>
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</table>

### Environmental conditions

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0…+55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25…+85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>12.6 x 74.1 x 55.4 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approval</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UL</td>
</tr>
</tbody>
</table>
**Input module, digital, 120/230 VAC, 2-channel**

**Features**
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 digital inputs, 120/230 VAC

**Compatible base modules**

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S3T-SBB</td>
<td>6827044</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S3S-SBB</td>
<td>6827045</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>

**BL20-S4T-SBBC**

- 6827050
- Tension spring connection, access to C rail

**BL20-S4S-SBBC**

- 6827051
- Screw connection, access to C rail
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-2DI-120/230VAC-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827011</td>
</tr>
</tbody>
</table>

### Power supply
- Number of channels: 2
- Nominal current from module bus: ≤ 28 mA
- Nominal current from field supply: ≤ 20 mA
- Power loss, typical: ≤ 1 W

### Inputs
- Low level signal voltage: 0…20 VAC
- High level signal voltage: 79…265 VAC
- Frequency range: 47.5…63 Hz
- Low level signal current: 0…1 mA
- High level signal current: 3…10 mA
- Input delay: < 20 ms
- Electrical insulation: electronics to the field level

### Environmental conditions
- Ambient temperature: 0…+55 °C
- Relative humidity: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- Storage temperature: -25…+85 °C
- Vibration test: acc. to EN 61131
- Shock test: acc. to IEC 68-2-27
- Drop and topple: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- Electro-magnetic compatibility: acc. to EN 61131-2

### Mechanical data
- Protection class: IP20
- Dimensions: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
- ULus
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Input module, digital, 24 VDC, PNP, 4-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 4 digital inputs, 24 VDC, PNP switching

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>Screw connection</td>
</tr>
<tr>
<td>BL20-S6T-SBBSSBB</td>
<td>6827052</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S6S-SBBSSBB</td>
<td>6827053</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-4DI-24VDC-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827012</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Number of channels</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 28 mA</td>
</tr>
<tr>
<td>Nominal current from field supply</td>
<td>≤ 40 mA</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 1 W</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Input type</th>
<th>pnp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low level signal voltage</td>
<td>-30…+5 V</td>
</tr>
<tr>
<td>High level signal voltage</td>
<td>15…30 V</td>
</tr>
<tr>
<td>Low level signal current</td>
<td>0…1.5 mA</td>
</tr>
<tr>
<td>High level signal current</td>
<td>2…10 mA</td>
</tr>
<tr>
<td>Input delay</td>
<td>&lt; 0.2 ms</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>electronics to the field level</td>
</tr>
</tbody>
</table>

### Environmental conditions

| Ambient temperature | 0…+55 °C                        |
| Relative humidity    | ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage) |
| Storage temperature  | -25…+85 °C                      |
| Vibration test       | acc. to EN 61131               |
| Shock test           | acc. to IEC 68-2-27            |
| Drop and topple      | acc. to IEC 68-2-31 and free fall to IEC 68-2-32 |
| Electro-magnetic compatibility | acc. to EN 61131-2            |

### Mechanical data

| Protection class | IP20                          |
| Dimensions       | 12.6 x 74.1 x 55.4 mm          |

### Approval | Certification

| ATEX, IECEx, UL/C, FM/C, GOST |
Input module, digital, 24 VDC, NPN, 4-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 4 digital inputs, 24 VDC, NPN switching

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>Screw connection</td>
</tr>
<tr>
<td>BL20-S6T-SBBSBB</td>
<td>6827052</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S6S-SBBSBB</td>
<td>6827053</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>
# Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-4DI-24VDC-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827013</td>
</tr>
</tbody>
</table>

## Power supply

- **Number of channels**: 4
- **Nominal current from module bus**: \( \leq 28 \text{ mA} \)
- **Nominal current from field supply**: \( \leq 40 \text{ mA} \)
- **Power loss, typical**: \( \leq 1 \text{ W} \)

## Inputs

- **Input type**: npn
- **Low level signal voltage**: \( > 13 \text{ V} \)
- **High level signal voltage**: \( 0 \ldots 5 \text{ V} \)
- **Low level signal current**: \( 0 \ldots 1.2 \text{ mA} \)
- **High level signal current**: \( 1.3 \ldots 6 \text{ mA} \)
- **Input delay**: \( < 0.2 \text{ ms} \)
- **Electrical isolation**: electronics to the field level

## Environmental conditions

- **Ambient temperature**: \( 0 \ldots +55 \text{ °C} \)
- **Relative humidity**: \( \leq 5 \text{ to } 95 \% \) (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: \( -25 \ldots +85 \text{ °C} \)
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

## Mechanical data

- **Protection class**: IP20
- **Dimensions**: 12.6 x 74.1 x 55.4 mm

## Approval | Certification

- ATEX, IECEx, ULus, FMus, GOST
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Input module, digital, NAMUR, 4-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- NAMUR inputs acc. to DIN EN 60947-5-6

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>

Tension spring connection

Screw connection
## Technical data

### Type

**Type**
- BL20-4DI-NAMUR

**Ident no.**
- 6827212

### Power supply

**Number of channels**
- 4

**Nominal current from module bus**
- ≤ 40 mA

**Nominal current from field supply**
- ≤ 30 mA

**Power loss, typical**
- ≤ 1 W

### Inputs

**Input wire-break**
- Switch on threshold: 0.08 mA
- Switch off threshold: 0.12 mA

**Input - short-circuit**
- Switch on threshold: 6.2 mA
- Switch off threshold: 5.9 mA

**Input type**
- NAMUR acc. to DIN EN 60947-5-6

**No-load voltage**
- 8.2 ... 8.6 VDC

**Input - status**
- Switch on threshold: 1.74 mA
- Switch off threshold: 1.45 mA

**Input delay**
- 0.25 or 2.5 ms

**Electrical isolation**
- electronics to the field level

### Environmental conditions

**Ambient temperature**
- 0 ... +55 °C

**Relative humidity**
- ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)

**Storage temperature**
- -25 ... +85 °C

**Vibration test**
- acc. to EN 61131

**Shock test**
- acc. to IEC 68-2-27

**Drop and topple**
- acc. to IEC 68-2-31 and free fall to IEC 68-2-32

**Electro-magnetic compatibility**
- acc. to EN 61131-2

### Mechanical data

**Protection class**
- IP20

**Dimensions**
- 12.6 x 74.1 x 55.4 mm

### Approval | Certification

- ATEX, IECEx, ULc, FMc, GOST

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**more@turck.com ■ www.turck.com ■ Edition I/2014**
Input module, digital, 24 VDC, PNP, 8-channel

Features

- Fieldbus-independent
- Electronics and connection technology in one housing
- Connectivity: Push-in terminals
- Protection class IP20
- 8 digital inputs, 24 VDC, PNP switching

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital inputs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED</td>
<td>72,6</td>
<td></td>
</tr>
<tr>
<td>73,1</td>
<td>128,9</td>
<td>12,6</td>
</tr>
</tbody>
</table>
## Technical data

### Type
- BL20-E-8DI-24VDC-P
- Ident no. 6827227

### Power supply
- **Number of channels**: 8
- **Nominal current from module bus**: ≤ 15 mA
- **Nominal current from field supply**: ≤ 2 mA
- **Power loss, typical**: ≤ 1.5 W

### Inputs
- **Input type**: pnp
- **Low level signal voltage**: -30...+5 V
- **High level signal voltage**: 11...30 V
- **Low level signal current**: -1...+1.5 mA
- **High level signal current**: 2...5 mA
- **Input delay**: < 0.2 ms
- **Electrical isolation**: electronics to the field level

### Environmental conditions
- **Ambient temperature**: 0...+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25...+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 128.6 x 74.6 mm

### Approval | Certification
- ATEX, IECEx, ULus, FMus, GOST
Input module, digital, 24 VDC, PNP, 16-channel

Features
- Fieldbus-independent
- Electronics and connection technology in one housing
- Connectivity: Push-in terminals
- Protection class IP20
- 16 digital inputs, 24 VDC, PNP switching

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital inputs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of digital inputs](image-url)
**Technical data**

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>BL20-E-16DI-24VDC-P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>6827231</td>
</tr>
</tbody>
</table>

**Power supply**

| **Number of channels** | 16 |
| **Nominal current from module bus** | ≤ 15 mA |
| **Nominal current from field supply** | ≤ 3 mA |
| **Power loss, typical** | ≤ 1.5 W |

**Inputs**

| **Input type** | pnp |
| **Low level signal voltage** | -30…+5 V |
| **High level signal voltage** | 11…30 V |
| **Low level signal current** | -1…+1.5 mA |
| **High level signal current** | 2…5 mA |
| **Input delay** | < 0.3 ms |
| **Electrical isolation** | electronics to the field level |

**Environmental conditions**

| **Ambient temperature** | 0…+55 °C |
| **Relative humidity** | ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage) |
| **Storage temperature** | -25…+85 °C |
| **Vibration test** | acc. to EN 61131 |
| **Shock test** | acc. to IEC 68-2-27 |
| **Drop and topple** | acc. to IEC 68-2-31 and free fall to IEC 68-2-32 |
| **Electro-magnetic compatibility** | acc. to EN 61131-2 |

**Mechanical data**

| **Protection class** | IP20 |
| **Dimensions** | 12.6 x 160 x 74.6 mm |

**Approval | Certification**

ATEX, IECEx, ULus, FMus, GOST
Input module, digital, 24 VDC, PNP, 16-channel

Features

- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 16 digital inputs, 24 VDC, PNP switching

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BL20-B3T-SBB</td>
<td>6827054</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tension spring connection</td>
</tr>
<tr>
<td></td>
<td>BL20-B3S-SBB</td>
<td>6827055</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Screw connection</td>
</tr>
<tr>
<td></td>
<td>BL20-B4T-SBBC</td>
<td>6827056</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td></td>
<td>BL20-B4S-SBBC</td>
<td>6827057</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Screw connection, access to C rail</td>
</tr>
</tbody>
</table>
## Technical data

### Type
- **Type**: BL20-16DI-24VDC-P
- **Ident no.**: 6827014

### Power supply
- **Number of channels**: 16
- **Nominal current from module bus**: ≤ 45 mA
- **Nominal current from field supply**: ≤ 40 mA
- **Power loss, typical**: ≤ 2.5 W

### Inputs
- **Input type**: pnp
- **Low level signal voltage**: -30…+5 V
- **High level signal voltage**: 15…30 V
- **Low level signal current**: 0…1.5 mA
- **High level signal current**: 2…10 mA
- **Input delay**: < 0.2 ms
- **Electrical isolation**: electronics to the field level

### Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 100.8 x 74.1 x 55.4 mm

### Approval | Certification
- ATEX, IECEx, ULc, FMc, GOST
Input module, digital, 24 VDC, PNP, 32-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 32 digital inputs, 24 VDC, PNP switching

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-B6T-SBBSBB</td>
<td>6827065</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-B6S-SBBSBB</td>
<td>6827067</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>

Hans Turck GmbH & Co. KG • Tel. +49 208 49 52-0 • Fax +49 208 49 52-264
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-32DI-24VDC-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827015</td>
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### Power supply

<table>
<thead>
<tr>
<th>Number of channels</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 45 mA</td>
</tr>
<tr>
<td>Nominal current from field supply</td>
<td>≤ 30 mA</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 4.2 W</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Input type</th>
<th>pnp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low level signal voltage</td>
<td>-30…+5 V</td>
</tr>
<tr>
<td>High level signal voltage</td>
<td>15…30 V</td>
</tr>
<tr>
<td>Low level signal current</td>
<td>&lt; 1.5 mA</td>
</tr>
<tr>
<td>High level signal current</td>
<td>2…10 mA</td>
</tr>
<tr>
<td>Input delay</td>
<td>&lt; 0.2 ms</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>electronics to the field level</td>
</tr>
</tbody>
</table>

### Environmental conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>0…+55 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25…+85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Protection class</th>
<th>IP20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>100.8 x 74.1 x 55.4 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

| ATEX, IECEx, UL, FM, GOST                           |
Output module, digital, 24 VDC, 0.5 A, NPN, 2-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 digital outputs, 24 VDC, max. 0.5 A, NPN switching

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S3T-SBC</td>
<td>6827058</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S3S-SBC</td>
<td>6827059</td>
<td>Screw connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S4T-SBCS</td>
<td>6827063</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S4S-SBCS</td>
<td>6827060</td>
<td>Screw connection, access to C rail</td>
</tr>
</tbody>
</table>
## Technical data

### Type

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-2DO-24VDC-0.5A-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827025</td>
</tr>
</tbody>
</table>

### Power supply

| Number of channels | 2 |
| Nominal current from module bus | ≤ 32 mA |
| Nominal current from field supply | ≤ 20 mA |
| Power loss, typical | ≤ 1 W |

### Outputs

| Output voltage | 24 VDC |
| Output current per channel | 0.5 A |
| Output type | npn |
| Load type | resistive, inductive, lamp load |
| Load resistance, resistive | > 48 Ω |
| Load resistance, inductive | < 1.2 H |
| Lamp load | < 12 W |
| Switching frequency, resistive | < 100 Hz |
| Inductive switching frequency | < 2 Hz |
| Switching frequency, lamp load | < 10 Hz |
| Output delay | 0.1 ms |
| Short-circuit protection | yes |
| Simultaneity factor | 1 |
| Electrical isolation | electronics to the field level |

### Environmental conditions

| Ambient temperature | 0 … +55 °C |
| Relative humidity | ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage) |
| Storage temperature | -25 … +85 °C |
| Vibration test | acc. to EN 61131 |
| Shock test | acc. to IEC 68-2-27 |
| Drop and topple | acc. to IEC 68-2-31 and free fall to IEC 68-2-32 |
| Electro-magnetic compatibility | acc. to EN 61131-2 |

### Mechanical data

| Protection class | IP20 |
| Dimensions | 12.6 x 74.1 x 55.4 mm |

### Approval | Certification

| Approval | ATEX, IECEx, ULc, FMc, GOST |
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Output module, digital, 24 VDC, 2.0 A, PNP, 2-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 digital outputs, 24 VDC, max. 2 A, PNP switching

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S3T-SBC</td>
<td>6827058</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S3S-SBC</td>
<td>6827059</td>
<td>Screw connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S4T-SBCS</td>
<td>6827063</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S4S-SBCS</td>
<td>6827060</td>
<td>Screw connection, access to C rail</td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-2DO-24VDC-2A-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827026</td>
</tr>
</tbody>
</table>

### Power supply

- **Number of channels**: 2
- **Nominal current from module bus**: \( \leq 33 \, \text{mA} \)
- **Nominal current from field supply**: \( \leq 50 \, \text{mA} \)
- **Power loss, typical**: \( \leq 1 \, \text{W} \)

### Outputs

- **Output voltage**: 24 VDC
- **Output current per channel**: 2 A
- **Output type**: pnp
- **Load type**: resistive, inductive, lamp load
- **Load resistance, resistive**: \( > 12 \, \Omega \)
- **Load resistance, inductive**: \( < 1.2 \, \text{H} \)
- **Lamp load**: \( < 6 \, \text{W} \)
- **Switching frequency, resistive**: \( < 5000 \, \text{Hz} \)
- **Switching frequency, lamp load**: \( < 10 \, \text{Hz} \)
- **Output delay**: 0.1 ms
- **Short-circuit protection**: yes
- **Simultaneity factor**: 1
- **Electrical isolation**: electronics to the field level

### Environmental conditions

- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data

- **Protection class**: IP20
- **Dimensions**: 12.6 x 74.1 x 55.4 mm

### Approval | Certification

ATEX, IECEx, UL\textsuperscript{Gr}, FM\textsuperscript{Gr}, GOST
Output module, digital, 120/230 VAC, 0.5 A, 2-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 digital outputs, 120/230 VAC, max. 0.5 A

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S3T-SBC</td>
<td>6827058</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S3S-SBC</td>
<td>6827059</td>
<td>Screw connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S4T-SBCS</td>
<td>6827063</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S4S-SBCS</td>
<td>6827060</td>
<td>Screw connection, access to C rail</td>
</tr>
</tbody>
</table>
# Technical data

## Type

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-2DO-120/230VAC-0.5A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827137</td>
</tr>
</tbody>
</table>

## Power supply

- **Number of channels**: 2
- **Nominal current from module bus**: ≤ 35 mA
- **Nominal current from field supply**: ≤ 20 mA
- **Power loss, typical**: ≤ 1 W

## Outputs

- **Output voltage**: 120 / 230 VAC
- **Output current per channel**: 0.5 A
- **Load type**: resistive, inductive, lamp load
- **Load resistance, resistive**: > 48 Ω
- **Load resistance, inductive**: < 1.2 H
- **Output delay**: 0.1 ms
- **Short-circuit protection**: yes
- **Simultaneity factor**: 1
- **Electrical isolation**: electronics to the field level

## Environmental conditions

- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

## Mechanical data

- **Protection class**: IP20
- **Dimensions**: 12.6 x 74.1 x 55.4 mm

## Approval | Certification

ULus
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Output module, relay, changeover, 2-channel

Features

- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 channels as changeover contacts

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>

Wiring diagram

Module wiring diagram

Load limit curve
## Technical data

### Type
- **Type**: BL20-2DO-R-CO
- **Ident no.**: 6827030

### Power supply
- **Number of channels**: 2 changeover contacts, galvanically isolated
- **Nominal current from module bus**: ≤ 28 mA
- **Nominal current from field supply**: ≤ 20 mA
- **Power loss, typical**: ≤ 1 W

### Outputs
- **Load type**: resistive, inductive, lamp load
- **Rated load voltage**: 230/30 VAC/DC
- **Simultaneity factor**: 1
- **Lifespan at 230 VAC, 5A**: 100000 switching cycles
- **Lifespan at 230 VAC, 0.5A**: 1000000 switching cycles
- **Output current with DC voltage (resistive)**: see load limit curve
- **Electrical isolation**: electronics to the field level

### Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
- ATEX, IECEx, ULc, FM, GOST
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Output module, digital, 24 VDC, 0.5 A, PNP, 4-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 4 digital outputs, 24 VDC, max. 0.5 A, PNP switching

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S4T-SBCS</td>
<td>6827063</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S4S-SBCS</td>
<td>6827060</td>
<td>Screw connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S6T-SBCSBC</td>
<td>6827064</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-S6S-SBCSBC</td>
<td>6827066</td>
<td>Screw connection, access to C rail</td>
</tr>
</tbody>
</table>
## Technical data

**Type**  
BL20-4DO-24VDC-0.5A-P  
Ident no.  
6827023

### Power supply

<table>
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<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of channels</td>
<td>4</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 30 mA</td>
</tr>
<tr>
<td>Nominal current from field supply</td>
<td>≤ 25 mA</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 1 W</td>
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</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Output current per channel</td>
<td>0.5 A</td>
</tr>
<tr>
<td>Output type</td>
<td>pnp</td>
</tr>
<tr>
<td>Load type</td>
<td>resistive, inductive, lamp load</td>
</tr>
<tr>
<td>Load resistance, resistive</td>
<td>&gt; 48 Ω</td>
</tr>
<tr>
<td>Load resistance, inductive</td>
<td>&lt; 1.2 H</td>
</tr>
<tr>
<td>Lamp load</td>
<td>&lt; 6 W</td>
</tr>
<tr>
<td>Switching frequency, resistive</td>
<td>&lt; 5000 Hz</td>
</tr>
<tr>
<td>Inductive switching frequency</td>
<td>&lt; 2 Hz</td>
</tr>
<tr>
<td>Switching frequency, lamp load</td>
<td>&lt; 10 Hz</td>
</tr>
<tr>
<td>Output delay</td>
<td>0.25 ms</td>
</tr>
<tr>
<td>Short-circuit protection</td>
<td>yes</td>
</tr>
<tr>
<td>Simultaneity factor</td>
<td>1</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>electronics to the field level</td>
</tr>
</tbody>
</table>

### Environmental conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0 … +55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25 … +85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
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### Mechanical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>12.6 x 74.1 x 55.4 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

ATEX, IECEx, UL, FM, GOST
Output module, digital, 24 VDC, 0.5 A, PNP, 8-channel

Features

- Fieldbus-independent
- Electronics and connection technology in one housing
- Connectivity: Push-in terminals
- Protection class IP20
- 8 digital outputs, 24 VDC, max. 0.5 A, PNP switching

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital outputs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Technical data

## Type

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-E-8DO-24VDC-0.5A-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827226</td>
</tr>
</tbody>
</table>

## Power supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of channels</td>
<td>8</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 15 mA</td>
</tr>
<tr>
<td>Nominal current from field supply</td>
<td>≤ 3 mA</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 1.5 W</td>
</tr>
</tbody>
</table>

## Outputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Output current per channel</td>
<td>0.5 A</td>
</tr>
<tr>
<td>Output type</td>
<td>pnp</td>
</tr>
<tr>
<td>Load type</td>
<td>resistive, inductive, lamp load</td>
</tr>
<tr>
<td>Load resistance, resistive</td>
<td>&gt; 48 Ω</td>
</tr>
<tr>
<td>Lamp load</td>
<td>&lt; 6 W</td>
</tr>
<tr>
<td>Switching frequency, resistive</td>
<td>&lt; 100 Hz</td>
</tr>
<tr>
<td>Switching frequency, lamp load</td>
<td>&lt; 10 Hz</td>
</tr>
<tr>
<td>Output delay</td>
<td>0.3 ms</td>
</tr>
<tr>
<td>Short-circuit protection</td>
<td>yes</td>
</tr>
<tr>
<td>Simultaneity factor</td>
<td>1</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>electronics to the field level</td>
</tr>
</tbody>
</table>

## Environmental conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0 . . . +55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25 . . . +85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

## Mechanical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>12.6 x 128.6 x 74.6 mm</td>
</tr>
</tbody>
</table>

## Approval | Certification

ATEX, IECEx, UL, FM, GOST
Output module, digital, 24 VDC, 0.5 A, PNP, 16-channel

Features
- Fieldbus-independent
- Electronics and connection technology in one housing
- Connectivity: Push-in terminals
- Protection class IP20
- 16 digital outputs, 24 VDC, max. 0.5 A, PNP switching

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital outputs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-E-16DO-24VDC-0.5A-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827230</td>
</tr>
</tbody>
</table>

## Power supply
- **Number of channels**: 16
- **Nominal current from module bus**: ≤ 25 mA
- **Nominal current from field supply**: ≤ 3 mA
- **Power loss, typical**: ≤ 1.5 W

## Outputs
- **Output voltage**: 24 VDC
- **Output current per channel**: 0.5 A
- **Output type**: pnp
- **Load type**: resistive, inductive, lamp load
- **Load resistance, resistive**: > 48 Ω
- **Lamp load**: < 6 W
- **Switching frequency, resistive**: < 100 Hz
- **Switching frequency, lamp load**: < 10 Hz
- **Output delay**: 0.3 ms
- **Short-circuit protection**: yes
- **Simultaneity factor**: 0.5
- **Electrical isolation**: electronics to the field level

## Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

## Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 160 x 74.6 mm

## Approval | Certification
- ATEX, IECEx, UL listed, FM approved, GOST
Output module, digital, 24 VDC, 0.5 A, PNP, 16-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 16 digital outputs, 24 VDC, max. 0.5 A, PNP switching

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-B3T-SBC</td>
<td>6827061</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-B3S-SBC</td>
<td>6827062</td>
<td>Screw connection, access to C rail</td>
</tr>
</tbody>
</table>
### Technical data

#### Type
- BL20-16DO-24VDC-0.5A-P
- Ident no. 6827027

#### Power supply
- Number of channels: 16
- Nominal current from module bus: ≤ 120 mA
- Nominal current from field supply: ≤ 50 mA
- Power loss, typical: ≤ 4 W

#### Outputs
- Output voltage: 24 VDC
- Output current per channel: 0.5 A
- Output type: pnp
- Load type: resistive, inductive, lamp load
- Load resistance, resistive: > 48 Ω
- Load resistance, inductive: < 1.2 H
- Lamp load: < 6 W
- Switching frequency, resistive: < 100 Hz
- Output delay: 0.1 ms
- Short-circuit protection: yes
- Simultaneity factor: 1
- Electrical isolation: electronics to the field level

#### Environmental conditions
- Ambient temperature: 0…+55 °C
- Relative humidity: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- Storage temperature: -25…+85 °C
- Vibration test: acc. to EN 61131
- Shock test: acc. to IEC 68-2-27
- Drop and topple: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- Electro-magnetic compatibility: acc. to EN 61131-2

#### Mechanical data
- Protection class: IP20
- Dimensions: 100.8 x 74.1 x 55.4 mm

#### Approval | Certification
- ATEX, IECEx, UL/cUL, FM/cFM, GOST
Output module, digital, 24 VDC, 0.5 A, PNP, 32-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 32 digital outputs, 24 VDC, max. 0.5 A, PNP switching

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-B6T-SBCSBC</td>
<td>6827218</td>
<td>Tension spring connection, access to C rail</td>
</tr>
<tr>
<td>BL20-B6S-SBCSBC</td>
<td>6827219</td>
<td>Screw connection, access to C rail</td>
</tr>
</tbody>
</table>
## Technical data

### Type

| Power supply |  
|---|---|
| Number of channels | 32 |
| Nominal current from module bus | ≤ 120 mA |
| Nominal current from field supply | ≤ 50 mA |
| Power loss, typical | ≤ 4 W |

### Outputs

| Outputs |  
|---|---|
| Output type | pnp |
| Load type | resistive, inductive, lamp load |
| Load resistance, resistive | > 48 Ω |
| Load resistance, inductive | < 1.2 H |
| Lamp load | < 6 W |
| Switching frequency, resistive | < 100 Hz |
| Output delay | 0.3 ms |
| Short-circuit protection | yes |
| Simultaneity factor | 1 |
| Electrical isolation | electronics to the field level |

### Environmental conditions

| Environmental conditions |  
|---|---|
| Ambient temperature | 0 … +55 °C |
| Relative humidity | ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage) |
| Storage temperature | -25 … +85 °C |
| Vibration test | acc. to EN 61131 |
| Shock test | acc. to IEC 68-2-27 |
| Drop and topple | acc. to IEC 68-2-31 and free fall to IEC 68-2-32 |
| Electro-magnetic compatibility | acc. to EN 61131-2 |

### Mechanical data

| Mechanical data |  
|---|---|
| Protection class | IP20 |
| Dimensions | 100.8 x 74.1 x 55.4 mm |

### Approval | Certification

<table>
<thead>
<tr>
<th>Approval</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX, IECEx, ULus, FMus, GOST</td>
<td></td>
</tr>
</tbody>
</table>

---

**Type**

BL20-32DO-24VDC-0.5A-P

**Ident no.**

6827220
**Input module, analog, current, 2-channel**

**Features**
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 analog inputs 0/4…20 mA

**Compatible base modules**

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BL20-S3T-SBB</strong></td>
<td>6827044</td>
<td>Tension spring connection with external sensor supply</td>
</tr>
<tr>
<td><strong>BL20-S3S-SBB</strong></td>
<td>6827045</td>
<td>Screw connection with external sensor supply</td>
</tr>
</tbody>
</table>

**Features**

- 2-wire connection
- 3-wire connection
Technical data

Type
BL20-2AI-I(0/4…20MA)

Ident no.
6827021

Power supply
Number of channels
2
Nominal current from module bus
\leq 35 \text{ mA}
Nominal current from field supply
\leq 12 \text{ mA}
Power loss, typical
\leq 1 \text{ W}

Inputs
Input type
0/4…20 mA
Input resistance
< 0.125 k\Omega
Max. input current
50 mA
Electrical isolation
electronics to the field level

Response characteristic
Resolution
16 Bit
Basic fault limit at 23 °C
< 0.2 \%
Repeatability
0.05 \%
Temperature coefficient
< 300 ppm / °C of full scale
Measuring principle
Delta Sigma
Measured-value display
16 bit signed integer
12 bit full range left-justified
Cycle time
\leq 10 \text{ ms}

Environmental conditions
Ambient temperature
0…+55 °C
Relative humidity
\leq 5 \text{ to } 95 \% \text{ (internal), Level RH-2, no condensation (at 45 °C storage)}
Storage temperature
-25…+85 °C
Vibration test
acc. to EN 61131
Shock test
acc. to IEC 68-2-27
Drop and topple
acc. to IEC 68-2-31 and free fall to IEC 68-2-32
Electro-magnetic compatibility
acc. to EN 61131-2

Mechanical data
Protection class
IP20
Dimensions
12.6 x 74.1 x 55.4 mm

Approval | Certification
ATEX, IECEx, UL\textit{IP}, FM\textit{US}, GOST
Input module, analog, current, HART®, 2-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 analog inputs 0/4…20 mA
- HART®

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
<td>2-wire connection for passive HART® sensors</td>
</tr>
<tr>
<td></td>
<td>Tension spring connection</td>
<td></td>
</tr>
<tr>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>4-wire connection for active HART® sensors</td>
</tr>
<tr>
<td></td>
<td>Screw connection</td>
<td></td>
</tr>
</tbody>
</table>

Tension spring connection

4-wire connection for active HART® sensors
## Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>BL20-2AIH-I</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>6827331</td>
</tr>
</tbody>
</table>

### Power supply
- **Number of channels**: 2
- **Nominal current from module bus**: ≤ 30 mA
- **Nominal current from field supply**: ≤ 20 mA
- **Power loss, typical**: ≤ 1 W

### Inputs
- **Input type**: 0/4…20 mA
- **Input resistance**: > 250 Ω
- **Max. input current**: 24 mA
- **Electrical isolation**: electronics to the field level

### Response characteristic
- **Resolution**: 16 Bit
- **Basic fault limit at 23 °C**: < 0.1 %
- **Repeatability**: 0.1 %
- **Temperature coefficient**: < 150 ppm / °C of full scale
- **Measuring principle**: Delta Sigma
- **Measured-value display**: 16 Bit signed integer, NE43(PA), extended
- **Cycle time**: ≤ 250 ms

### Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
- ATEX, IECEx, UL61010, FM, GOST
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Input module, analog, voltage, 2-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 analog inputs -10/0 …+10 VDC

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BL20-S3T-SBB</td>
<td>6827044</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tension spring connection with external sensor supply</td>
</tr>
<tr>
<td></td>
<td>BL20-S3S-SBB</td>
<td>6827045</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Screw connection with external sensor supply</td>
</tr>
<tr>
<td></td>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tension spring connection</td>
</tr>
<tr>
<td></td>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Screw connection</td>
</tr>
</tbody>
</table>

2-wire connection

3-wire connection
## Technical data

### Type
- **BL20-2AI-U(-10/0…+10VDC)**
  - Ident no.: 6827022

### Power supply
- **Number of channels**: 2
- **Nominal current from module bus**: ≤ 35 mA
- **Nominal current from field supply**: ≤ 12 mA
- **Power loss, typical**: ≤ 1 W

### Inputs
- **Input type**: -10/0…+10 VDC
- **Input resistance**: < 98.5 kΩ
- **Max. input voltage**: 35 V continuous
- **Electrical isolation**: electronics to the field level

### Response characteristic
- **Resolution**: 16 Bit
- **Basic fault limit at 23 °C**: < 0.2 %
- **Repeatability**: 0.05 %
- **Temperature coefficient**: < 150 ppm / °C of full scale
- **Measuring principle**: Delta Sigma
- **Measured-value display**: 16 bit signed integer
- **Cycle time**: ≤ 10 ms

### Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
- ATEX, IECEx, UL, FM, GOST
Input module, analog, temperature, Pt/Ni, 2/3-wire, 2-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 analog inputs for Pt100, Pt200, Pt500 and Pt1000 as well as for Ni100 and Ni1000

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S3T-SBB</td>
<td>6827044</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S3S-SBB</td>
<td>6827045</td>
<td>Screw connection</td>
</tr>
<tr>
<td>BL20-S4T-SBBBS</td>
<td>6827046</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S4S-SBBBS</td>
<td>6827047</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>
**Technical data**

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>BL20-2AI-PT/NI-2/3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>6827017</td>
</tr>
</tbody>
</table>

**Power supply**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of channels</td>
<td>2</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 45 mA</td>
</tr>
<tr>
<td>Nominal current from field supply</td>
<td>≤ 30 mA</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 1 W</td>
</tr>
</tbody>
</table>

**Inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input type</td>
<td>Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>electronics to the field level</td>
</tr>
<tr>
<td>Measuring current</td>
<td>&lt; 1 mA</td>
</tr>
</tbody>
</table>

**Response characteristic**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>16 Bit</td>
</tr>
<tr>
<td>Basic fault limit at 23 °C</td>
<td>&lt; 0.2 %</td>
</tr>
<tr>
<td>Repeatability</td>
<td>0.05 %</td>
</tr>
<tr>
<td>Temperature coefficient</td>
<td>&lt; 300 ppm / °C of full scale</td>
</tr>
<tr>
<td>Measured-value display</td>
<td>16 bit signed integer</td>
</tr>
<tr>
<td>Cycle time</td>
<td>≤ 200 ms</td>
</tr>
</tbody>
</table>

**Environmental conditions**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0 . . . +55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25 . . . +85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

**Mechanical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>12.6 x 74.1 x 55.4 mm</td>
</tr>
</tbody>
</table>

**Approval | Certification**

<table>
<thead>
<tr>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX, IECEx, ULus, FMus, GOST</td>
</tr>
</tbody>
</table>
Input module, analog, temperature, thermocouples, 2-channel

Features

- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 analog inputs for connection of thermocouples, types B, E, J, K, N, R, S and T
- Base module with internal cold junction compensation

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20 - S4T-SBBS-CJ</td>
<td>6827048</td>
<td>Tension spring connection, a: Internal cold junction compensation in the base module</td>
</tr>
<tr>
<td>BL20 - S4S-SBBS-CJ</td>
<td>6827049</td>
<td>Screw connection, a: Internal cold junction compensation in the base module</td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-2AI-THERMO-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827020</td>
</tr>
</tbody>
</table>

### Power supply

| Number of channels | 2 |
| Nominal current from module bus | ≤ 45 mA |
| Nominal current from field supply | ≤ 30 mA |
| Power loss, typical | ≤ 1 W |

### Inputs

| Input type | types B, E, J, K, N, R, S, T |
| Electrical isolation | electronics to the field level |
| Voltage resolution | ± 50 mV: < 2 µV |
| | ± 100 mV: < 4 µV |
| | ± 500 mV: < 20 µV |
| | ± 1000 mV: < 50 µV |

### Response characteristic

| Resolution | 16 Bit |
| Basic fault limit at 23 °C | < 0.2 % |
| Repeatability | 0.05 % |
| Temperature coefficient | < 300 ppm / °C of full scale |
| Measured-value display | 16 bit signed integer |
| Cycle time | ≤ 300 ms |

### Environmental conditions

| Ambient temperature | 0…+55 °C |
| Relative humidity | ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage) |
| Storage temperature | -25…+85 °C |
| Vibration test | acc. to EN 61131 |
| Shock test | acc. to IEC 68-2-27 |
| Drop and topple | acc. to IEC 68-2-31 and free fall to IEC 68-2-32 |
| Electro-magnetic compatibility | acc. to EN 61131-2 |

### Mechanical data

| Protection class | IP20 |
| Dimensions | 12.6 x 74.1 x 55.4 mm |

### Approval | Certification

| ATEX, IECEx, ULc, FM, GOST |
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Input module, analog, voltage/current, 4-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 4 analog inputs
- 0/4 … 20 mA or 10/0 … +10 VDC
- Selectable per channel

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S6T-SBCSBC</td>
<td>6827064</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S6S-SBCSBC</td>
<td>6827066</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>

3-wire connection

4-wire connection
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-4AI-U/I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827217</td>
</tr>
</tbody>
</table>

### Power supply
- **Number of channels**: 4
- **Nominal current from module bus**: \( \leq 50 \text{ mA} \)
- **Nominal current from field supply**: \( \leq 20 \text{ mA} \)
- **Power loss, typical**: \( \leq 1 \text{ W} \)

### Inputs
- **Input type**: 0/4 … 20 mA or -10/0 … 10 VDC
- **Input resistance**:
  - \(< 62 \Omega \) (current) resp. \(> 98.5 \text{k}\Omega \) (voltage)
- **Max. input current**: 50 mA
- **Max. input voltage**: 35 V continuous
- **Electrical isolation**: electronics to the field level

### Response characteristic
- **Resolution**: 16 Bit
- **Basic fault limit at 23 \(^\circ\text{C}\)**: \(< 0.3 \% \)
- **Repeatability**: 0.05 %
- **Temperature coefficient**: \(< 300 \text{ ppm} / \degree\text{C} \) of full scale
- **Measuring principle**: Delta Sigma
- **Cycle time**: \( \leq 25 \text{ ms} \)

### Environmental conditions
- **Ambient temperature**: 0 … +55 \(^\circ\text{C}\)
- **Relative humidity**: \(< 5 \text{ to } 95 \% \) (internal), Level RH-2, no condensation (at 45 \(^\circ\text{C}\) storage)
- **Storage temperature**: -25 … +85 \(^\circ\text{C}\)
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 74.1 x 55.4 mm

### Approval/Certification
- ATEX, IECEx, UL \(_{4x}\), FM \(_{4x}\), GOST
Input module, analog, temperature, thermocouples, 4-channel

Features
- Fieldbus-independent
- Electronics and connection technology in one housing
- Connectivity: Push-in terminals
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 4 analog inputs for the connection of thermocouples
- Cold junction compensation via integrated Pt1000 probe

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermocouple inputs</td>
<td>TC1</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>TC2</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>TC3</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>TC4</td>
<td>-</td>
</tr>
</tbody>
</table>
Technical data

**Type**
BL20-E-4AI-TC

**Ident no.**
6827367

**Power supply**
- Number of channels: 4
- Nominal current from module bus: $\leq 50$ mA
- Nominal current from field supply: $\leq 30$ mA
- Power loss, typical: $\leq 1$ W

**Inputs**
- Input resistance: $> 7$ MΩ
- Electrical isolation: electronics to the field level
- Voltage resolution:
  - $\pm 50$ mV: $< 2$ µV
  - $\pm 100$ mV: $< 4$ µV
  - $\pm 500$ mV: $< 20$ µV
  - $\pm 1000$ mV: $< 50$ µV

**Response characteristic**
- Resolution: 16 Bit
- Basic fault limit at 23 °C: $< 0.2$ %
- Repeatability: 0.05 %
- Temperature coefficient: $< 150$ ppm / °C of full scale
- Measured-value display:
  - 16 bit signed integer
  - 12 bit full range left-justified

**Environmental conditions**
- Ambient temperature: 0…+55 °C
- Relative humidity: $\leq 5$ to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- Storage temperature: -25…+85 °C
- Vibration test: acc. to EN 61131
- Shock test: acc. to IEC 68-2-27
- Drop and topple: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- Electro-magnetic compatibility: acc. to EN 61131-2

**Mechanical data**
- Protection class: IP20
- Dimensions: 12.6 x 128.6 x 74.6 mm

**Approval | Certification**
- UL, GOST
Input module, analog, voltage/current/temperature, 8-channel

Features
- Fieldbus-independent
- Electronics and connection technology in one housing
- Connectivity: Push-in terminals
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 8 analog 2-wire inputs U/I
- Passive input - External supply
- 0 … 20 mA, 4 … 20 mA, -10 … +10 VDC or 0 … +10 VDC, selectable per channel
- Alternatively: 4PT/NI inputs (always 2 analog inputs are combined to a PT/NI 2/3-wire input)

Pinning overview

Position | Note | Pinning assignment
--- | --- | ---
Analog inputs
The pin assignment is dependent on the sensor type. Examples of the most common 2- and 4-wire sensors with electric current or voltage signal are listed below.

**Note:** Open inputs and/or unused channels should not be parameterized in the Pt/Ni or resistance (R) mode, because this may lead to minor measurement errors at adjacent channels. However, if this is necessary, the affected channels must be terminated with a resistance. Thereby the resistance value must be in the parameterized measuring range.

4-wire sensor (U/I)
The sensor and \( U_1 \) of the BL20 system are fed from a common source. The sensor and \( U_1 \) of the BL20 system are automatically on the same GND potential.

4-wire sensor (U/I)
The sensor and \( U_1 \) of the BL20 system are fed from different sources. \( U_1 \) of the BL20 system and AI – of the sensor must be on the same GND-potential. For this, \( U_1 \) and AI – must be bridged.

2-wire sensor (U/I)
The sensor and \( U_1 \) of the BL20 system are fed from a common source. The sensor and \( U_1 \) of the BL20 system are automatically on the same GND potential.
## Technical data

**Type**
- BL20-E-8AI-U/I-4PT/NI

**Ident no.**
- 6827325

### Power supply
- **Number of channels**: 8/4
- **Nominal current from module bus**: ≤ 35 mA
- **Nominal current from field supply**: ≤ 35 mA
- **Power loss, typical**: ≤ 1.5 W

### Inputs
- **Input type**: 0/4...20 mA, -10/0...10 VDC, Pt100, Pt200, Pt500, Pt1000, NI100, NI1000, 0...250 Ω, 0...400 Ω, 0...800 Ω, 0...2000 Ω, 0...4000 Ω
- **Input resistance**: < 62 Ω (current) resp. > 98.5 kΩ (voltage)
- **Max. input current**: current: 50 mA
- **Max. input voltage**: Voltage: -20 VDC < U < 20 VDC
- **Electrical isolation electronics to the field level**

### Response characteristic
- **Resolution**: 16 Bit
- **Basic fault limit at 23 °C**: < 0.2 %
- **Temperature coefficient**: < 200 ppm / °C of full scale
- **Measured-value display**: 16 bit signed integer
- **Conversion time**: < (44 x [ number of actively parametrized channels]) ms

### Environmental conditions
- **Ambient temperature**: 0...+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25...+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 160 x 74.6 mm

### Approval | Certification
- ATEX, IECEx, ULus, FMus, GOST
Output module, analog, current, 2-channel

Features

- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 analog outputs 0/4…20 mA

Compatible base modules

<table>
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<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
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<tbody>
<tr>
<td>BL20-S3T-SBB</td>
<td>6827044</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S3S-SBB</td>
<td>6827045</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-2AO-I(4…20mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827034</td>
</tr>
</tbody>
</table>

### Power supply
- **Number of channels**: 2
- **Nominal current from module bus**: \(\leq 40\) mA
- **Nominal current from field supply**: \(\leq 50\) mA
- **Power loss, typical**: \(\leq 1\) W

### Outputs
- **Load resistance, resistive**: \(< 0.45\) k\(\Omega\)
- **Load resistance, inductive**: \(< 1\) m\(H\)
- **Output type**: 0/4…20 mA
- **Electrical isolation**: electronics to the field level

### Response characteristic
- **Resolution**: 16 Bit
- **Basic fault limit at 23 °C**: \(< 0.2\) %
- **Repeatability**: 0.05 %
- **Temperature coefficient**: \(< 150\) ppm / °C of full scale
- **Measured-value display**: 16 bit signed integer
- **Cycle time**: \(\leq 10\) ms

### Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: \(\leq 5\) to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
- ATEX, IECEx, ULc, FMc, GOST
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

Output module, analog, current, HART®, 2-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 analog outputs 0/4…20 mA
- HART®

Compatible base modules

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>

Dimensions (in mm):
- LED 74.1
- 73.1
- 117.6
- 128.9
- 154.5
- 12.6
## Technical data

### Type
- BL20-2AOH-I
- Ident no. 6827332

### Power supply
- Number of channels: 2
- Nominal current from module bus: ≤ 30 mA
- Nominal current from field supply: ≤ 20 mA
- Power loss, typical: ≤ 1 W

### Outputs
- Load resistance, resistive: < 0.60 kΩ
- Load resistance, inductive: < 1 mH
- Short circuit: 24 mA
- Output type: 0/4…20 mA
- Electrical isolation: electronics to the field level

### Response characteristic
- Resolution: 16 Bit
- Basic fault limit at 23 °C: < 0.2 %
- Repeatability: 0.1 %
- Temperature coefficient: < 150 ppm / °C of full scale
- Measured-value display: 16 Bit signed integer, NE43 (PA), extended
- Cycle time: ≤ 250 ms

### Environmental conditions
- Ambient temperature: 0…+55 °C
- Relative humidity: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- Storage temperature: -25…+85 °C
- Vibration test: acc. to EN 61131
- Shock test: acc. to IEC 68-2-27
- Drop and topple: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- Electro-magnetic compatibility: acc. to EN 61131-2

### Mechanical data
- Protection class: IP20
- Dimensions: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
- ATEX, IECEx, UL_{c}, FM_{exp}, GOST
Output module, analog, voltage, 2-channel

Features

- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 2 analog outputs -10/0 …+10 VDC

Compatible base modules

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<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S3T-SBB</td>
<td>6827044</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S3S-SBB</td>
<td>6827045</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-2AO-U(-10/0…+10VDC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827033</td>
</tr>
</tbody>
</table>

### Power supply
- Number of channels: 2
- Nominal current from module bus: \(\leq 43 \, \text{mA}\)
- Nominal current from field supply: \(\leq 50 \, \text{mA}\)
- Power loss, typical: \(\leq 1 \, \text{W}\)

### Outputs
- Load resistance, resistive: \(> 1 \, \text{k}\Omega\)
- Load resistance, capacitive: \(< 1 \, \mu\text{F}\)
- Short circuit: 40 mA
- Output type: -10/0…+10 VDC
- Electrical isolation: electronics to the field level

### Response characteristic
- Resolution: 16 Bit
- Basic fault limit at 23 \(^\circ\text{C}\): < 0.2 %
- Repeatability: 0.05 %
- Temperature coefficient: < 300 ppm / \(^\circ\text{C}\) of full scale
- Measured-value display: 16 bit signed integer, 12 bit signed integer left-justified, 12 bit full range left-justified
- Cycle time: \(\leq 10 \, \text{ms}\)

### Environmental conditions
- Ambient temperature: \(0 \ldots +55 \, ^\circ\text{C}\)
- Relative humidity: \(\leq 5 \text{ to } 95 \% \text{ (internal), Level RH-2, no condensation (at 45 } ^\circ\text{C storage)}\)
- Storage temperature: \(-25 \ldots +85 \, ^\circ\text{C}\)
- Vibration test: acc. to EN 61131
- Shock test: acc. to IEC 68-2-27
- Drop and topple: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- Electro-magnetic compatibility: acc. to EN 61131-2

### Mechanical data
- Protection class: IP20
- Dimensions: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
- ATEX, IECEx, UL\textsubscript{US}, FM\textsubscript{US}, GOST
Output module, analog, voltage/current, 4-channel

Features
- Fieldbus-independent
- Electronics and connection technology in one housing
- Connectivity: Push-in terminals
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- 4 analog outputs
- 0...20 mA, 4...20 mA, -10...+10 VDC or 0...+10 VDC
- Selectable per channel

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog outputs</td>
<td></td>
<td><img src="image" alt="Pinning diagram" /></td>
</tr>
</tbody>
</table>
## Technical data

### Type
- BL20-E-4AO-U/I
- Ident no.: 6827328

### Power supply
- **Number of channels**: 4
- **Nominal current from module bus**: ≤ 50 mA
- **Nominal current from field supply**: ≤ 130 mA
- **Power loss, typical**: ≤ 2.6 W

### Outputs
- **Load resistance, resistive**: < 0.45 kΩ (current) or > 1 kΩ (voltage)
- **Load resistance, inductive**: < 0.01 mH (voltage mode)
- **Load resistance, capacitive**: < 1 µF (current mode)
- **Short circuit**: 40 mA
- **Output type**: 0/4 … 20 mA or -10/0 … +10 VDC
- **Electrical isolation**: electronics to the field level

### Response characteristic
- **Resolution**: 16 bit
- **Basic fault limit at 23 °C**: < 0.2 %
- **Temperature coefficient**: < 200 ppm / °C of full scale
- **Measured-value display**: 16 bit signed integer
  - 12 bit left-justified
- **Cycle time**: ≤ 50 ms

### Environmental conditions
- **Ambient temperature**: 0…+55 °C
- **Relative humidity**: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- **Storage temperature**: -25…+85 °C
- **Vibration test**: acc. to EN 61131
- **Shock test**: acc. to IEC 68-2-27
- **Drop and topple**: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- **Electro-magnetic compatibility**: acc. to EN 61131-2

### Mechanical data
- **Protection class**: IP20
- **Dimensions**: 12.6 x 160 x 74.6 mm

### Approval/Certification
- ATEX, IECEx, UL/cUL, FM/cFM, GOST
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

RS232 module, 1-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- Transmission of serial data via RS232 interface
- For connection of printers, light screens and bar code scanners e.g.

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
<td>Tension spring connection</td>
</tr>
<tr>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-RS232</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827169</td>
</tr>
</tbody>
</table>

### Power supply
- Number of channels: 1
- Nominal current from module bus: ≤ 140 mA
- Nominal current from field supply: ≤ 25 mA
- Power loss, typical: ≤ 1 W

### Transmission
- Transmission level active (URS1): -15 to -3 VDC
- Transmission level inactive (URS0): 3 to 15 VDC
- Common-mode range (UGL): -7 to 12 VDC
- Transmission signals: RxO, TxO, RTS, CTS
- Data buffer received / sent: 128 / 64 Byte
- Cable length: 15 m
- Connection type: full duplex
- Transmission rate: 300 to 115200 bps
- Parameters: Transmission rate, diagnostics, data bits, stop bits, XON - character, XOFF - character, parity, flow control
- Electrical isolation: isolation of electronics and field level via optocouplers

### Environmental conditions
- Ambient temperature: 0…+55 °C
- Relative humidity: ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)
- Storage temperature: -25…+85 °C
- Vibration test: acc. to EN 61131
- Shock test: acc. to IEC 68-2-27
- Drop and topple: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- Electro-magnetic compatibility: acc. to EN 61131-2

### Mechanical data
- Protection class: IP20
- Dimensions: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
- ATEX, IECEx, UL, FM, GOST
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

RS485/422 module, 1-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- Transmission of serial data via RS485/422 interface
- For connection of printers, light screens and bar code scanners e.g.

Compatible base modules

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<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>Screw connection</td>
</tr>
</tbody>
</table>

Wiring diagram for RS422

Wiring diagram for RS485
Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-1RS485/422</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827165</td>
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<table>
<thead>
<tr>
<th>Power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of channels</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
</tr>
<tr>
<td>Nominal current from field supply</td>
</tr>
<tr>
<td>Power loss, typical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission signals</td>
</tr>
<tr>
<td>Data buffer received / sent</td>
</tr>
<tr>
<td>Cable length</td>
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<tr>
<td>Connection type</td>
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<tr>
<td>Transmission rate</td>
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<tr>
<td>Parameters</td>
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<tr>
<td>Line impedance</td>
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<tr>
<td>Terminating resistor</td>
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<tr>
<td>Electrical isolation</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental conditions</th>
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<tbody>
<tr>
<td>Ambient temperature</td>
</tr>
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<td>Relative humidity</td>
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</tr>
<tr>
<td>Drop and topple</td>
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<td>Electro-magnetic compatibility</td>
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</table>

<table>
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<tbody>
<tr>
<td>Protection class</td>
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<tr>
<td>Dimensions</td>
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<tbody>
<tr>
<td>ATEX, IECEx, ULc, FM, GOST</td>
<td></td>
</tr>
</tbody>
</table>
BL20 – Modular I/O system in IP20
Electronic module with separate terminal level

SSI module, 1-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- Connection of SSI encoder
- Transmission rate, max. 1Mbps

Compatible base modules

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Features

- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- Connection of SSI encoder
- Transmission rate, max. 1Mbps
## Technical data

### Type

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-1SSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827166</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Nominal current from module bus</th>
<th>≤ 50 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal current from field supply</td>
<td>≤ 25 mA</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 1 W</td>
</tr>
</tbody>
</table>

### Transmission

<table>
<thead>
<tr>
<th>Transmission signals</th>
<th>CL, D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length</td>
<td>30 m</td>
</tr>
<tr>
<td>Connection type</td>
<td>4-wire full duplex (clock output/signal input)</td>
</tr>
<tr>
<td>Transmission rate</td>
<td>62.5 kbps up to 1 Mbps</td>
</tr>
<tr>
<td>Parameters</td>
<td>Transmission rate, diagnostics, data format (binary / GRAY coded), data frame bits (1-32), number of invalid bits (LSB: 0-15, MSB 0-7)</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>isolation of electronics and field level via optocouplers</td>
</tr>
</tbody>
</table>

### Environmental conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>0 ... +55 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25 ... +85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Protection class</th>
<th>IP20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>12.6 x 74.1 x 55.4 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

| ATEX, IECEx, ULcUL, FMdUL, GOST |
**BL20 – Modular I/O system in IP20**
*Electronic module with integrated terminal level*

## Counter/Encoder, PWM outputs, 2-channel

---

### Features

- Fieldbus-independent
- Electronics and connection technology in one housing
- Connectivity: Push-in terminals
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically isolated from the field level via optocouplers
- 2 x counter/encoder channels 200 kHz
- 2 PWM outputs 20 kHz / 0.5 A
- 2 digital outputs 20 kHz / 0.5 A
- Counting mode: Continuous, single or periodic count
- Measuring principle: Frequency, rotational speed or period duration measurement

---

### Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter 1</td>
<td>Counter 1</td>
<td>P1 / DI1 (200kHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P2 / DI2 (200kHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+UB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GND</td>
</tr>
<tr>
<td>Counter 2</td>
<td>Counter 2</td>
<td>P1 / DI3 (10kHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P2 / DI4 (200kHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+UB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GND</td>
</tr>
<tr>
<td>PWM 1</td>
<td>PWM 1</td>
<td>P1 / DI5 (20kHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Direction / DO1 (0.5A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GND</td>
</tr>
<tr>
<td>PWM 2</td>
<td>PWM 2</td>
<td>P2 / DI6 (20kHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Direction / DO2 (0.5A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GND</td>
</tr>
</tbody>
</table>

---

### Pinning assignment

<table>
<thead>
<tr>
<th>Counter or PWM channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Counter 1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Counter 2</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>PWM 1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>PWM 2</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
**Technical data**

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-E-2CNT-2PWM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827341</td>
</tr>
</tbody>
</table>

**Power supply**

<table>
<thead>
<tr>
<th>Number of channels</th>
<th>2/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 50 mA</td>
</tr>
<tr>
<td>Nominal current from field supply</td>
<td>≤ 20 mA</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 1 W</td>
</tr>
</tbody>
</table>

**Transmission**

<table>
<thead>
<tr>
<th>Frequency measurement</th>
<th>up to 200 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed measurement</td>
<td>factor parametrizable</td>
</tr>
<tr>
<td>Period duration measurement</td>
<td>resolution 200 ns, max. period duration $(2^{24} - 1) \times 200$ ns</td>
</tr>
<tr>
<td>Upper count limit</td>
<td>0x00000000 up to 0xFFFFFFFF</td>
</tr>
<tr>
<td>Lower count limit</td>
<td>0x80000000 up to 0xFFFFFFFF</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>isolation of electronics and field level via optocouplers</td>
</tr>
</tbody>
</table>

**Inputs**

| Low level signal voltage | 0 to 1 VDC / 0 to 4.5 VDC |
| High level signal voltage | 3.5 to 30 VDC / 7.5 to 30 VDC |
| Low level signal current | 0 . . . 0.1 mA / 0 . . . 0.4 mA |
| High level signal current | 0.3 . . . 3 mA / 0.6 . . . 3 mA |
| Filter on | > 16 µs (62.5 kHz) |
| Filter off | < 2.5 µs (200 kHz) |

**Outputs**

| Switching frequency | ≤ 20000 Hz |
| Output voltage | 24 VDC |
| Output current per channel | 0.5 A |
| Output type | PNP |
| Load type | resistive, inductive, lamp load |
| Load resistance, resistive | > 48 Ω |
| Lamp load | < 10 W |
| Switching frequency, resistive | < 100 Hz |
| Inductive switching frequency | < 2 Hz |
| Switching frequency, lamp load | < 10 Hz |
| Output delay | 0.2 ms |
| Short-circuit protection | yes |
| Simultaneity factor | 1 |

**Environmental conditions**

| Ambient temperature | 0 . . . +55 °C |
| Relative humidity | ≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage) |
| Storage temperature | -25 . . . +85 °C |
| Vibration test | acc. to EN 61131 |
| Shock test | acc. to IEC 68-2-27 |
| Drop and topple | acc. to IEC 68-2-31 and free fall to IEC 68-2-32 |
| Electro-magnetic compatibility | acc. to EN 61131-2 |
RFID module (advanced), 2-channel

Features
- Fieldbus and connection technology independent
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- Connection of 2 BL ident® read/write heads (HF or UHF)
- Mixed operation of HF and UHF read/write heads
- Transmission rate: 115.2 kbps
- Cable length max. 50 m

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
<td>Connectors …/S2500</td>
</tr>
<tr>
<td></td>
<td>Tension spring connection</td>
<td></td>
</tr>
<tr>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>Connectors …/S2501</td>
</tr>
<tr>
<td></td>
<td>Screw connection</td>
<td>Connectors …/S2503</td>
</tr>
</tbody>
</table>

Connectors …/S2500

Connectors …/S2501

Connectors …/S2503
## Technical data

### Type
- BL20-2RFID-A
- Ident no. 6827233

### Power supply
- Number of channels: 2
- Nominal current from module bus: \( \leq 30 \, \text{mA} \)
- Nominal current from field supply: \( \leq 100 \, \text{mA} \)
- Power loss, typical: \( \leq 1 \, \text{W} \)

### Transmission
- Cable length: 50 m
- Transmission rate: 115.2 kbps
- Electrical isolation: isolation of electronics and field level via optocouplers

### Outputs
- Sensor supply: 0.25 A per channel, short-circuit proof

### Environmental conditions
- Ambient temperature: 0…+55 °C
- Relative humidity: \( \leq 5 \) to 95 \% (internal), Level RH-2, no condensation (at 45 °C storage)
- Storage temperature: -25…+85 °C
- Vibration test: acc. to EN 61131
- Shock test: acc. to IEC 68-2-27
- Drop and topple: acc. to IEC 68-2-31 and free fall to IEC 68-2-32
- Electro-magnetic compatibility: acc. to EN 61131-2

### Mechanical data
- Protection class: IP20
- Dimensions: 12.6 x 74.1 x 55.4 mm

### Approval | Certification
- ATEX, IECEx, ULcUL, FMcUL, GOST
RFID module (simple), 2-channel

Features

- Fieldbus and connection technology independent
- A special software (function module) for integration in PLC systems is not required.
- 8 bytes of process data per read/write cycle
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- Connection of 2 BL ident® read/write heads (HF or UHF)
- Mixed operation of HF and UHF read/write heads
- Transmission rate: 115.2 kbps
- Cable length max. 50 m

Compatible base modules

<table>
<thead>
<tr>
<th>Dimension drawing</th>
<th>Type</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL20-S4T-SBBS</td>
<td>6827046</td>
<td>Connectors .../S2500</td>
</tr>
<tr>
<td></td>
<td>Tension spring connection</td>
<td></td>
</tr>
<tr>
<td>BL20-S4S-SBBS</td>
<td>6827047</td>
<td>Connectors .../S2501</td>
</tr>
<tr>
<td></td>
<td>Screw connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Connectors .../S2503</td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>BL20-2RFID-S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827306</td>
</tr>
</tbody>
</table>

### Power supply

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of channels</td>
<td>2</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 30 mA</td>
</tr>
<tr>
<td>Nominal current from field supply</td>
<td>≤ 100 mA</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 1 W</td>
</tr>
</tbody>
</table>

### Transmission

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length</td>
<td>50 m</td>
</tr>
<tr>
<td>Transmission rate</td>
<td>115.2 kbps</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>isolation of electronics and field level via optocouplers</td>
</tr>
</tbody>
</table>

### Outputs

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor supply</td>
<td>0.25 A per channel, short-circuit proof</td>
</tr>
</tbody>
</table>

### Environmental conditions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0…+55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25…+85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
</tbody>
</table>

### Mechanical data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>12.6 x 74.1 x 55.4 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX, IECEx, ULus, FMus, GOST</td>
<td></td>
</tr>
</tbody>
</table>
IO-Link master, 4-channel

Features
- Fieldbus-independent
- Electronics and connection technology in one housing
- Connectivity: Push-in terminals
- Protection class IP20
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- IO-Link master acc. to specification V1.1, 4-channel
- 4 universal digital channels, PNP, channel diagnostics, 0.5 A

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Note</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C/Q (Channel 1)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>C/Q (Channel 2)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>C/Q (Channel 3)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>C/Q (Channel 4)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>XSG (Channel 5)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>XSG (Channel 6)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>XSG (Channel 7)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>XSG (Channel 8)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>GNDL</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>+ UL</td>
<td></td>
</tr>
</tbody>
</table>

I/O channels

The channels 1 to 4 are IO-Link master channels. Channels 5 to 8 are XSG channels (optionally usable as digital inputs or outputs). The terminals 9 and 10 are used for sensor supply.

Attention:
The IO-Link devices must be supplied with the same potential as U_L of the gateway or the BR / PF module (if used).
### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>BL20-E-4IOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6827385</td>
</tr>
</tbody>
</table>

#### Power supply

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. field supply current</td>
<td>10 A</td>
</tr>
<tr>
<td>Galvanic separation</td>
<td>500 VDC between Usys, Ul and FE</td>
</tr>
<tr>
<td>Number of channels</td>
<td>4/4</td>
</tr>
<tr>
<td>Nominal current from module bus</td>
<td>≤ 40 mA</td>
</tr>
<tr>
<td>Nominal current from field supply</td>
<td>≤ 80 mA</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 2 W</td>
</tr>
</tbody>
</table>

#### Inputs

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input type</td>
<td>PNP</td>
</tr>
<tr>
<td>Low level signal voltage</td>
<td>&lt; 5 V</td>
</tr>
<tr>
<td>High level signal voltage</td>
<td>&gt; 11 V</td>
</tr>
<tr>
<td>Low level signal current</td>
<td>&lt; 1.5 mA DI / &lt; 5 mA SIO</td>
</tr>
<tr>
<td>High level signal current</td>
<td>2.1 ... 3.7 mA DI / 5 ... 11 mA SIO</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>electronics to the field level</td>
</tr>
</tbody>
</table>

#### Outputs

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Output type</td>
<td>PNP</td>
</tr>
<tr>
<td>Load type</td>
<td>resistive, inductive, lamp load</td>
</tr>
<tr>
<td>Load resistance, resistive</td>
<td>&gt; 48 Ω</td>
</tr>
<tr>
<td>Load resistance, inductive</td>
<td>&lt; 1.2 H</td>
</tr>
<tr>
<td>Lamp load</td>
<td>&lt; 3 W</td>
</tr>
<tr>
<td>Switching frequency, resistive</td>
<td>&lt; 200 Hz</td>
</tr>
<tr>
<td>Switching frequency, inductive</td>
<td>&lt; 2 Hz</td>
</tr>
<tr>
<td>Switching frequency, lamp load</td>
<td>&lt; 20 Hz</td>
</tr>
<tr>
<td>Output delay</td>
<td>3 ms</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>electronics to the field level</td>
</tr>
<tr>
<td>Connectivity</td>
<td>push-in</td>
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</table>

#### IO-Link

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO-Link specification</td>
<td>Version 1.1</td>
</tr>
<tr>
<td>IO-Link port type</td>
<td>Class A</td>
</tr>
<tr>
<td>Frame type</td>
<td>Supports all specified framet types</td>
</tr>
<tr>
<td>Supported devices</td>
<td>Max. 14 byte input / 14 byte output</td>
</tr>
<tr>
<td>Transmission rate</td>
<td>4.8 kbps (COM 1) / 38.4 kbps (COM 2) / 230 kbps (COM 3)</td>
</tr>
</tbody>
</table>

#### Environmental conditions

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0 ... +55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 5 to 95 % (internal), Level RH-2, no condensation (at 45 °C storage)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... +85 °C</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to EN 61131</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 68-2-27</td>
</tr>
<tr>
<td>Drop and topple</td>
<td>acc. to IEC 68-2-31 and free fall to IEC 68-2-32</td>
</tr>
<tr>
<td>Electro-magnetic compatibility</td>
<td>acc. to EN 61131-2</td>
</tr>
<tr>
<td>MTTF</td>
<td>388 years acc. to SN 29500 (Ed. 99)</td>
</tr>
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### Mechanical data

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>12.6 x 128.6 x 74.6 mm</td>
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</tbody>
</table>

### Approval | Certification

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
</table>
| ULc, GOST | }
BL20 System – Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O-ASSISTANT-KABEL-BL20/BL67</td>
<td>6827133</td>
<td>RS232 service cable for Gateways with PS2 interface</td>
</tr>
<tr>
<td>USB-2-RS232 II</td>
<td>7504030</td>
<td>Adapter from RS232 to USB</td>
</tr>
<tr>
<td>MINI USB 2.0 cable 1.5 m</td>
<td>6827388</td>
<td>USB 2.0 service cable for gateways with USB port</td>
</tr>
<tr>
<td>USB 2.0 extension 5 m</td>
<td>6827389</td>
<td>USB 2.0 extension, 5 m</td>
</tr>
<tr>
<td>USB 2.0 extension active 5 m</td>
<td>6827390</td>
<td>USB 2.0 extension, 5 m, active, with integrated repeater</td>
</tr>
<tr>
<td>ZBW5-2 Betätigungswerkzeug</td>
<td>6827129</td>
<td>Tension spring tool</td>
</tr>
<tr>
<td>BS3511/KLBUE4-31.5</td>
<td>6827342</td>
<td>Shield terminal and strain relief for bus cable</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
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<tr>
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<tr>
<td>BL20-ABPL</td>
<td>End plate for a BL20 station after the last I/O module (2 pieces)</td>
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<tr>
<td>6827123</td>
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<tr>
<td>BL20-WEW-35/2-SW</td>
<td>End retainers for fixation of a BL20 station (10 pieces)</td>
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<tr>
<td>6827124</td>
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<tr>
<td>BL20-LABEL-SCHEIBE</td>
<td>Labels for standard electronic modules, DIN A5 sheets, perforated, laser printing, 5 x 37 labels</td>
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<tr>
<td>6827070</td>
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<tr>
<td>BL20-LABEL-BLOCK</td>
<td>Labels for block electronic modules, DIN A5 sheets, perforated, laser printing, 5 x 6 labels</td>
<td></td>
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<tr>
<td>6827071</td>
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<tr>
<td>BL20-QV/1</td>
<td>Jumper bar for bridging connection level 4 (14/24) of the base modules of the relay modules, 1 module wide (10 pcs.)</td>
<td></td>
</tr>
<tr>
<td>6827104</td>
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<tr>
<td>BL20-QV/2</td>
<td>Jumper bar for bridging connection level 4 (14/24) of the base modules of the relay modules, 2 modules wide (10 pcs.)</td>
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<tr>
<td>6827105</td>
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<tr>
<td>BL20-QV/3</td>
<td>Jumper bar for bridging connection level 4 (14/24) of the base modules of the relay modules, 3 modules wide (10 pcs.)</td>
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<tr>
<td>6827106</td>
<td></td>
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<tr>
<td>BL20-QV/4</td>
<td>Jumper bar for bridging connection level 4 (14/24) of the base modules of the relay modules, 4 modules wide (10 pcs.)</td>
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<tr>
<td>6827107</td>
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<tr>
<td>BL20-QV/5</td>
<td>Jumper bar for bridging connection level 4 (14/24) of the base modules of the relay modules, 5 modules wide (10 pcs.)</td>
<td></td>
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<tr>
<td>6827108</td>
<td></td>
<td></td>
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<tr>
<td>BL20-QV/6</td>
<td>Jumper bar for bridging connection level 4 (14/24) of the base modules of the relay modules, 6 modules wide (10 pcs.)</td>
<td></td>
</tr>
<tr>
<td>6827109</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BL20-QV/7</td>
<td>Jumper bar for bridging connection level 4 (14/24) of the base modules of the relay modules, 7 modules wide (10 pcs.)</td>
<td></td>
</tr>
<tr>
<td>6827110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BL20-QV/8</td>
<td>Jumper bar for bridging connection level 4 (14/24) of the base modules of the relay modules, 8 modules wide (10 pcs.)</td>
<td></td>
</tr>
<tr>
<td>6827111</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## BL20 System – Accessories

<table>
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<tr>
<th>Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BL20-ANBZ-BL</td>
<td>Markers for labelling base modules, clear color identification of potentials on the connection level, 10 x strips of 6, blue</td>
</tr>
<tr>
<td>6827072</td>
<td></td>
</tr>
<tr>
<td>BL20-ANBZ-RT</td>
<td>Markers for labelling base modules, clear color identification of potentials on the connection level, 10 x strips of 6, red</td>
</tr>
<tr>
<td>6827073</td>
<td></td>
</tr>
<tr>
<td>BL20-ANBZ-GN</td>
<td>Markers for labelling base modules, clear color identification of potentials on the connection level, 10 x strips of 6, green</td>
</tr>
<tr>
<td>6827074</td>
<td></td>
</tr>
<tr>
<td>BL20-ANBZ-SW</td>
<td>Markers for labelling base modules, clear color identification of potentials on the connection level, 10 x strips of 6, black</td>
</tr>
<tr>
<td>6827075</td>
<td></td>
</tr>
<tr>
<td>BL20-ANBZ-BR</td>
<td>Markers for labelling base modules, clear color identification of potentials on the connection level, 10 x strips of 6, brown</td>
</tr>
<tr>
<td>6827076</td>
<td></td>
</tr>
<tr>
<td>BL20-ANBZ-RT/BL-BED</td>
<td>Markers for labelling base modules, clear color identification of potentials on the connection level, 10 x strips of 6, red/blue</td>
</tr>
<tr>
<td>6827077</td>
<td></td>
</tr>
<tr>
<td>BL20-ANBZ-GN/GE-BED</td>
<td>Markers for labelling base modules, clear color identification of potentials on the connection level, 10 x strips of 6, green/yellow</td>
</tr>
<tr>
<td>6827078</td>
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</tr>
<tr>
<td>BL20-ANBZ-WS</td>
<td>Markers for labelling base modules, clear color identification of potentials on the connection level, 10 x strips of 6, white</td>
</tr>
<tr>
<td>6827079</td>
<td></td>
</tr>
</tbody>
</table>
### PROFIBUS-DP – Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>REP-DP 0002</td>
<td>PROFIBUS-DP repeater, M12 B-coded, up to 12 Mbps, IP67</td>
</tr>
<tr>
<td>RSS4.5-PDP-TR</td>
<td>PROFIBUS-DP terminating resistor, 1 x M12 male, 5-pin, B-coded, passive</td>
</tr>
<tr>
<td>PDP-TRA</td>
<td>PROFIBUS-DP terminating resistor, 1 x M12 male, B-coded, 5-pin, active, feeding via 1 x 7/8” male, 5-pin</td>
</tr>
<tr>
<td>RKWS4.5(5)-2RSSWS</td>
<td>PROFIBUS-DP T piece, M12, 5-pin, B-coded, shielded, 12 Mbps</td>
</tr>
<tr>
<td>RKSW-2RSSW45-0001</td>
<td>PROFIBUS-DP T piece, M12, 5-pin, B-coded, shielded, 12 Mbps, direct T piece coupling possible</td>
</tr>
<tr>
<td>VB2-FSW-FKW-FSW-45</td>
<td>PROFIBUS-DP Y piece, M12, 5-pin, B-coded, shielded, 12 Mbps</td>
</tr>
<tr>
<td>VB2-FSW/RSSW-RKSW455-0,5M-0,5M</td>
<td>PROFIBUS-DP Y piece, M12, 5-pin, B-coded, shielded, 12 Mbps, 2 x 0.5 m</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>S89/VB2-Befestigungsset 8036078</td>
<td>Assembly kit for PROFIBUS-DP, CANopen/DeviceNet™, power supply Y piece</td>
</tr>
<tr>
<td>FW-M12STSW-G-ZF-MESH-9 6604211</td>
<td>PROFIBUS-DP field-wireable 1 x M12 male, 5-pin, B-coded, straight, metal housing, shieldable</td>
</tr>
<tr>
<td>FW-M12KUSW-G-ZF-MESH-9 6604210</td>
<td>PROFIBUS-DP field-wireable 1 x M12 female, 5-pin, B-coded, straight, metal housing, shieldable</td>
</tr>
<tr>
<td>BMSWS8251-8,5 6904724</td>
<td>PROFIBUS-DP field-wireable 1 x M12 male, 5-pin, B-coded, angled, metal housing, shieldable</td>
</tr>
<tr>
<td>BMWS8251-8,5 6904723</td>
<td>PROFIBUS-DP field-wireable 1 x M12 female, 5-pin, B-coded, angled, metal housing, shieldable</td>
</tr>
<tr>
<td>FW-D9TLEDKU9PG-W-FC-MESH-8,5 6604220</td>
<td>PROFIBUS-DP field-wireable 9-pin Sub-D connector, male/female, angled, insulation displacement contact (IDC), metal housing, 12 Mbps, switchable terminating resistor</td>
</tr>
<tr>
<td>6ES7972-0BA12-0XA0 6890934</td>
<td>PROFIBUS-DP field-wireable 9-pin Sub-D male, angled, screw clamp contact, 12 Mbps, switchable terminating resistor</td>
</tr>
</tbody>
</table>
PROFIBUS-DP – Accessories

**FW-D9TLEDKU9XX-G-FC-ME-SH-8,5**

6604221

PROFIBUS-DP field-wireable 9-pin Sub-D male, straight, cutting clamp contact, metal housing, 12 Mbps, switchable terminating resistor

**FKW-FSW45-M12**

6602309

PROFIBUS-DP wall bushing, 1 x M12 male/female, 5-pin, B-coded, hole diameter 12.7 mm

**EC-FSDW4.54-0,5/16**

8030756

PROFIBUS-DP flange, 1 x M12 male, 5-pin, B-coded, front-panel mounting (M16), rotatable, 0.5 m braid

**EC-FKDW4.54-0,5/16**

8030752

PROFIBUS-DP flange, 1 x M12 female, 5-pin, B-coded, front-panel mounting (M16), rotatable, 0.5 m braid

**EC-FSFDW4.54-0,5/16**

8030757

PROFIBUS-DP flange, 1 x M12 male, 5-pin, B-coded, rear-panel mounting (M16), rotatable, 0.5 m braid

**EC-FKFDW4.54-0,5/16**

8030753

PROFIBUS-DP flange, 1 x M12 female, 5-pin, B-coded, rear-panel mounting (M16), rotatable, 0.5 m braid

**FSW4.54-0,5**

8016038

PROFIBUS-DP flange, 1 x M12 male, 5-pin, B-coded, front-panel mounting (PG9), 0.5 m braid
<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>FSDW4.54-0.5</td>
<td>PROFIBUS-DP flange, 1 x M12 male, 5-pin, B-coded, front-panel mounting (PG9), rotatable, 0.5 m braid</td>
</tr>
<tr>
<td>FSFDW4.54-0.5</td>
<td>PROFIBUS-DP flange, 1 x M12 male, 5-pin, B-coded, rear-panel mounting (PG9), 0.5 m braid</td>
</tr>
<tr>
<td>FSW5L</td>
<td>PROFIBUS-DP flange, 1 x M12 male, 5-pin, B-coded, front-panel mounting (PG9), solder tail</td>
</tr>
<tr>
<td>FKW4.54-0.5</td>
<td>PROFIBUS-DP flange, 1 x M12 female, 5-pin, B-coded, front-panel mounting (PG9), 0.5 m braid</td>
</tr>
<tr>
<td>FKDW4.54-0.5</td>
<td>PROFIBUS-DP flange, 1 x M12 female, 5-pin, B-coded, front-panel mounting (PG9), rotatable, 0.5 m braid</td>
</tr>
<tr>
<td>FKFDW4.54-0.5</td>
<td>PROFIBUS-DP flange, 1 x M12 female, 5-pin, B-coded, rear-panel mounting (PG9), rotatable, 0.5 m braid</td>
</tr>
<tr>
<td>FKWS5L</td>
<td>PROFIBUS-DP flange, 1 x M12 female, B-coded, front-panel mounting (PG9), solder tail</td>
</tr>
</tbody>
</table>
DeviceNet™/CANopen – Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>REP-DN 6825349</td>
<td>CANopen/DeviceNet™ repeater, 7/8&quot; 5-pin, up to 500 kbps, IP67</td>
</tr>
<tr>
<td>FDN-DN1 6603596</td>
<td>CANopen/DeviceNet™ spanner, 7/8&quot; 5-pin, up to 128 data bytes, IP67</td>
</tr>
<tr>
<td>RSM57-TR2 6602011</td>
<td>CANopen/DeviceNet™ terminating resistor, 1 x 7/8&quot; male, 5-pin, passive</td>
</tr>
<tr>
<td>RKM57-TR2 6602065</td>
<td>CANopen/DeviceNet™ terminating resistor, 7/8&quot; female, 5-pin, passive</td>
</tr>
<tr>
<td>RSE57-TR2 6602308</td>
<td>CANopen/DeviceNet™ terminating resistor, 1 x M12 male, 5-pin, passive</td>
</tr>
<tr>
<td>RKE57-TR2 6602629</td>
<td>CANopen/DeviceNet™ terminating resistor, 1 x M12 female, 5-pin, passive</td>
</tr>
<tr>
<td>RSM-2RKM57 6602007</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x 7/8&quot; male, 2 x 7/8&quot; female, 5-pin, 0° / 0° / 0°, 9 A nominal current</td>
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</table>
## DeviceNet™/CANopen – Accessories

<table>
<thead>
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<th>Part Number</th>
<th>Description</th>
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<tr>
<td>RSM-2RKM50</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x 7/8&quot; male, 2 x 7/8&quot; female, 5-pin, 0° / 180° / 0°, 9 A nominal current</td>
</tr>
<tr>
<td>RSM-FKM-RKM57</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x 7/8&quot; male, 1 x M12 female, 1 x 7/8&quot; female, 5-pin</td>
</tr>
<tr>
<td>FSM-2FKM57</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x M12 male, 2 x M12 female, 5-pin</td>
</tr>
<tr>
<td>RSM-2RKM57-DGT</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x 7/8&quot; male, 2 x 7/8&quot; female, 5-pin, incl. closure cap for unused outlet used e.g. as diagnostic interface</td>
</tr>
<tr>
<td>RSM-RKM57-WSM40-PST</td>
<td>CANopen/DeviceNet™ T piece, 1 x 7/8&quot; male, 1 x 7/8&quot; female, 5-pin, 1 x 7/8&quot; male, 4-pin for power supply, 9 A nominal current</td>
</tr>
<tr>
<td>RSM52-WKM52-0.5-RKM50</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x 7/8&quot; male, 2 x 7/8&quot; female, 5-pin, 0.5 m cable, 9 A nominal current</td>
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<tr>
<td>RSM50-WKM50-0.3XOR-RKM50</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x 7/8&quot; male, 2 x 7/8&quot; female, 5-pin, 0.3 m cable, irradiated, 9 A nominal current</td>
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<tr>
<td>VB2-FKM-FKM-FSM57</td>
<td>CANopen/DeviceNet™ / Power supply Y piece, 1 x M12 male, 2 x M12 female, 5-pin</td>
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DeviceNet™/CANopen – Accessories

<table>
<thead>
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<th>Product Code</th>
<th>Description</th>
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<tr>
<td>VB2-RKC572-1M-FKM-FSM</td>
<td>CANopen/DeviceNet™ / Power supply Y piece, 1 x M12 male, 2 x M12 female, 5-pin, 1 m cable</td>
</tr>
<tr>
<td>VB2-FKM-RKC-RSC572-0,5M-0,5M</td>
<td>CANopen/DeviceNet™ / Power supply Y piece, 1 x M12 male, 2 x M12 female, 5-pin, 2 x 0.5 m cable</td>
</tr>
<tr>
<td>VB2-FKM-FKM-RSC572-1M</td>
<td>CANopen/DeviceNet™ / Power supply Y piece, 1 x M12 male, 2 x M12 female, 5-pin, 1 x 1 m cable</td>
</tr>
<tr>
<td>S89/VB2-Befestigungsset</td>
<td>Assembly kit for PROFIBUS-DP, CANopen/DeviceNet, power supply Y piece</td>
</tr>
<tr>
<td>JBBS-57-E411</td>
<td>CANopen/DeviceNet™ junction box, 4-port , 1 x M12 male, 4 x M12 female, 5-pin, passive, IP67</td>
</tr>
<tr>
<td>JBBS-57-E811-VM</td>
<td>CANopen/DeviceNet™ junction box, 8-port, 1 x 7/8&quot; male, 1 x 7/8&quot; female, 8 x M12 female, 5-pin, passive, voltage monitoring, IP67</td>
</tr>
<tr>
<td>RSM-RSM57</td>
<td>CANopen/DeviceNet™ / Power supply adapter, 2 x 7/8&quot; male, 5-pin, 9 A nominal current</td>
</tr>
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</table>
RKM-RKM57  
6603372  
CANopen/DeviceNet™ / Power supply adapter,  
2 x  7/8" female, 5-pin, 9 A nominal current

WSM-RKM57  
6603370  
CANopen/DeviceNet™ / Power supply 90° adapter,  
1 x  7/8" male, angled, 1 x  7/8" female, straight,  
5-pin, 9 A nominal current

RSM57-FK4.5  
6603454  
CANopen/DeviceNet™ / Power supply adapter,  
1 x  7/8" male, 1 x M12 female 5-pin, 4 A nominal current

BS4151-0/9  
6904718  
CANopen/DeviceNet™ / Power supply field-wire-able 1 x  7/8" male, 5-pin, straight, clamping width 6…8 mm, 9 A nominal current

B4151-0/9  
6904717  
CANopen/DeviceNet™ / Power supply field-wire-able 1 x  7/8" female, 5-pin, straight, clamping width 6…8 mm, 9 A nominal current

BS4251-0/9  
6901112  
CANopen/DeviceNet™ / Power supply field-wire-able 1 x  7/8" male, 5-pin, angled, clamping width 6…8 mm, 9 A nominal current

B4251-0/9  
6901113  
CANopen/DeviceNet™ / Power supply field-wire-able 1 x  7/8" female, 5-pin, angled, hole diameter 8 mm, 9 A nominal current
DeviceNet™/CANopen – Accessories

**BS4151-0/13.5**
6904716
CANopen/DeviceNet™ / Power supply, field-wireable 7/8" male, 5-pin, straight, PG13.5 screw-in thread, 9 A nominal current

**B4151-0/13.5**
6904715
CANopen/DeviceNet™ / Power supply field-wireable 7/8" female, 5-pin, straight, PG13.5 screw-in thread, 9 A nominal current

**BS8151-0/9**
6904613
CANopen/DeviceNet™ / Power supply field-wireable 1 x M12 male, 5-pin, straight, clamping width 6…8 mm, 4 A nominal current

**B8151-0/9**
6904604
CANopen/DeviceNet™ / Power supply field-wireable 7/8" female, 5-pin, straight, clamping width 6…8 mm, 4 A nominal current

**BS8251-0/9**
6904615
CANopen/DeviceNet™ / Power supply field-wireable 1 x M12 male, 5-pin, angled, clamping width 6…8 mm, 4 A nominal current

**B8251-0/9**
6904603
CANopen/DeviceNet™ / Power supply field-wireable 1 x M12 female, 5-pin, angled, clamping width 6…8 mm, 4 A nominal current

**RSF-RKF-57/22**
6602218
CANopen/DeviceNet™ / Power supply wall bushing 1 x 7/8" male/female, 5-pin, hole diameter 22.5 mm, 9 A nominal current
DeviceNet™/CANopen – Accessories

**FKM-FS57-M12**  
6602223  
CANopen/DeviceNet™ / Power supply wall bushing, 1 x M12 male/female, 5-pin, hole diameter 12.7 mm

**RSF57**  
6602342  
CANopen/DeviceNet™ / Power supply flange, 1 x 7/8" male, 5-pin, front-panel mounting (1/2-14 NPT) solder tails, 9 A nominal current

**RKF57**  
6602217  
CANopen/DeviceNet™ / Power supply flange, 1 x 7/8" female, 5-pin, front-panel mounting (1/2-14 NPT) solder tails, 9 A nominal current

**FSS7**  
6602314  
CANopen/DeviceNet™ / Power supply flange, 1 x M12 male, 5-pin, front-panel mounting (PG9) solder tails, 4 A nominal current

**FKS7**  
6602216  
CANopen/DeviceNet™ / Power supply flange, 1 x M12 female, 5-pin, front-panel mounting (PG9) solder tails, 4 A nominal current

**LOCKNUT G1/2”**  
6900493  
1/2” counter nut, for G thread, 100 pcs.

**LN1/2-14NPT/10**  
6961002  
1/2” counter nut, for NPT thread, 10 pcs.
### Ethernet – Accessories

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE20-84X-RJ522</td>
<td>Ethernet switch, 5-port, unmanaged, 10/100 Mbps, RJ45, IP20, mounting on standard DIN rail TS-35</td>
</tr>
<tr>
<td>SE20-84XT-RJ822</td>
<td>Ethernet switch, 8-port, unmanaged, 10/100 Mbps, RJ45, IP20, mounting on standard DIN rail TS-35</td>
</tr>
<tr>
<td>SE20-84MT-RJ822</td>
<td>Ethernet switch, 8-port, managed, 10/100 Mbps, RJ45, IP20, mounting on standard DIN rail TS-35</td>
</tr>
<tr>
<td>SE20-84XT-RJ422-FO</td>
<td>Ethernet switch, 5-port, unmanaged, 10/100 Mbps, 4 x RJ45 port, 1 x SC-Duplex port, IP20, mounting on standard DIN rail TS-35</td>
</tr>
<tr>
<td>SE-44X-E524</td>
<td>Ethernet switch, 5-port, unmanaged, 10/100 Mbps, M12 female, 4-pin, D-coded, IP67</td>
</tr>
<tr>
<td>SE-44X-E924</td>
<td>Ethernet switch, 9-port, unmanaged, 10/100 Mbps, M12 female, 4-pin, D-coded, IP67</td>
</tr>
<tr>
<td>SE-44M-E924</td>
<td>Ethernet switch, 9-port, managed, 10/100 Mbps, M12 female, 4-pin, D-coded, IP67</td>
</tr>
<tr>
<td>Part Number</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>6GK1901-1BB10-2AA0/FC-RJ45</td>
<td>Ethernet field-wireable RJ45 male, straight, metal housing, shieldable</td>
</tr>
<tr>
<td></td>
<td>6780031</td>
</tr>
<tr>
<td>FW-M12ST5D-G-SB-ME-SH-8</td>
<td>Ethernet field-wireable 1 x M12 male, 4-pin, D-coded, straight, metal housing, shieldable</td>
</tr>
<tr>
<td></td>
<td>6604218</td>
</tr>
<tr>
<td>FW-M12KU5D-G-SB-ME-SH-8</td>
<td>Ethernet field-wireable 1 x M12 female, 4-pin, D-coded, straight, metal housing, shieldable</td>
</tr>
<tr>
<td></td>
<td>6604219</td>
</tr>
<tr>
<td>FKSDD-RJ45SF-44</td>
<td>Ethernet wall bushing, rear-panel mounting, 1 x RJ45 female, 1 x M12 female, 4-pin, D-coded</td>
</tr>
<tr>
<td></td>
<td>6611523</td>
</tr>
<tr>
<td>BIC-44-E424</td>
<td>Ethernet wall bushing, front-panel mounting, 4-port, RJ45 female, M12 female, 4-pin, D-coded</td>
</tr>
<tr>
<td></td>
<td>6604407</td>
</tr>
<tr>
<td>RJ45-FKSDD-441-0,5M/S2174</td>
<td>Ethernet flange, 1 x RJ45 male, 1 x M12 female, 4-pin, D-coded, rear-panel mounting (PG9)</td>
</tr>
<tr>
<td></td>
<td>6914221</td>
</tr>
</tbody>
</table>
## Power Supply – Accessories

<table>
<thead>
<tr>
<th>Power supplies in IP20</th>
<th>Power supply units in IP20, see chapter Interface Technology</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSU67-11-2420/M</td>
<td>Power supply unit in IP67, 24 VDC, 2 A output current</td>
<td>6884140</td>
</tr>
<tr>
<td>PSU67-11-2440/M</td>
<td>Power supply unit in IP67, 24 VDC, 4 A output current</td>
<td>6884141</td>
</tr>
<tr>
<td>PSU67-11-2480/M</td>
<td>Power supply unit in IP67, 24 VDC, 8 A output current</td>
<td>6884147</td>
</tr>
<tr>
<td>PSU67-12-2480/M</td>
<td>Power supply unit in IP67, 24 VDC, 2 x 4 A output current</td>
<td>6884148</td>
</tr>
<tr>
<td>RSM-2RKMS7</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x 7/8&quot; male, 2 x 7/8&quot; female, 5-pin, 0° / 0° / 0°, 9 A nominal current</td>
<td>6602007</td>
</tr>
<tr>
<td>RSM-2RKMS0</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x 7/8&quot; male, 2 x 7/8&quot; female, 5-pin, 0° / 180° / 0°, 9 A nominal current</td>
<td>6914950</td>
</tr>
<tr>
<td>RSM-FKM-RKM57</td>
<td>CANopen/DeviceNet™ / Power supply T piece, 1 x 7/8&quot; male, 1 x M12 female, 1 x 7/8&quot; female, 5-pin</td>
<td>6602392</td>
</tr>
</tbody>
</table>
**Power Supply – Accessories**

---

**FSM-2FKM57**

6622101

CANopen/DeviceNet™ / Power supply T piece,
1 x M12 male, 2 x M12 female, 5-pin

---

**RSM-2RKM57-DGT**

6602482

CANopen/DeviceNet™ / Power supply T piece,
1 x 7/8" male, 2 x 7/8" female, 5-pin, incl. closure cap for unused outlet used e.g. as diagnostic interface

---

**RSM52-WKM52-0.5-RKM50**

6914160

CANopen/DeviceNet™ / Power supply T piece,
1 x 7/8" male, 2 x 7/8" female, 5-pin, 0.5 m cable,
9 A nominal current

---

**RSM50-WKM50-0.3XOR-RKM50**

6914951

CANopen/DeviceNet™ / Power supply T piece,
1 x 7/8" male, 2 x 7/8" female, 5-pin, 0.3 m cable, irradiated, 9 A nominal current

---

**RSM-2RKM40**

6914828

Power supply T piece, 1 x 7/8" male, 2 x 7/8" female, 4-pin, 0° / 0° / 0°, 9 A nominal current

---

**RKM40-RKM40-L-RSM40**

6914866

Power supply T piece, 1 x 7/8" male, 2 x 7/8" female, 4-pin, 90° / 270° / 270°, 9 A nominal current

---

**VB2-FKM-FKM-FSM57**

6602331

CANopen/DeviceNet™ / Power supply Y piece,
1 x M12 male, 2 x M12 female, 5-pin

---

**VB2-RKC572-1M-FKM-FSM**

6996011

CANopen/DeviceNet™ / Power supply Y piece,
1 x M12 male, 2 x M12 female, 5-pin, 1 m cable
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>VB2-FKM-RKC-RSC572-0.5M-0.5M</td>
<td>CANopen/DeviceNet™ / Power supply Y piece, 1 x M12 male, 2 x M12 female, 5-pin, 1 m cable</td>
<td></td>
</tr>
<tr>
<td>S89/VB2-Befestigungsset</td>
<td>Assembly kit for PROFIBUS-DP, CANopen/DeviceNet™, power supply Y piece</td>
<td></td>
</tr>
<tr>
<td>RSM-RSM57</td>
<td>CANopen/DeviceNet™ / Power supply adapter, 2 x 7/8&quot; male, 5-pin, 9 A nominal current</td>
<td></td>
</tr>
<tr>
<td>RKM-RKM57</td>
<td>CANopen/DeviceNet™ / Power supply adapter, 2 x 7/8&quot; female, 5-pin, 9 A nominal current</td>
<td></td>
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<tr>
<td>WSM-RKM57</td>
<td>CANopen/DeviceNet™ / Power supply 90° adapter, 1 x 7/8&quot; male, angled, 1 x 7/8&quot; female, straight, 5-pin, 9 A nominal current</td>
<td></td>
</tr>
<tr>
<td>RSM57-FK4.5</td>
<td>CANopen/DeviceNet™ / Power supply adapter, 1 x 7/8&quot; male, 1 x M12 female 5-pin, 4 A nominal current</td>
<td></td>
</tr>
</tbody>
</table>
### Power Supply – Accessories

**BS4151-0/9**
6904718  
CANopen/DeviceNet™ / Power supply field-wireable 7/8" male, 5-pin, straight, clamping width 6…8 mm, 9 A nominal current

**B4151-0/9**
6904717  
CANopen/DeviceNet™ / Power supply field-wireable 7/8" female, 5-pin, straight, clamping width 6…8 mm, 9 A nominal current

**BS4251-0/9**
6901112  
CANopen/DeviceNet™ / Power supply field-wireable 7/8" male, 5-pin, angled, clamping width 6…8 mm, 9 A nominal current

**B4251-0/9**
6901113  
CANopen/DeviceNet™ / Power supply field-wireable 7/8" female, 5-pin, angled, clamping width 6…8 mm, 9 A nominal current

**BS4151-0/13.5**
6904716  
CANopen/DeviceNet™ / Power supply, field-wireable 7/8" male, 5-pin, straight, PG13.5 screw-in thread, 9 A nominal current

**B4151-0/13.5**
6904715  
CANopen/DeviceNet™ / Power supply field-wireable 7/8" female, 5-pin, straight, PG13.5 screw-in thread, 9 A nominal current

**BS4140-0/9**
6914550  
Power supply field-wireable 7/8" male, 4-pin, straight, clamping width 6…8 mm, 9 A nominal current
**Power Supply – Accessories**

- **BK4140-0/9**  
  6914551  
  Power supply field-wireable 1 x 7/8" female, 4-pin, straight, clamping width 6…8 mm, 9 A nominal current

- **BS8151-0/9**  
  6904613  
  CANopen/DeviceNet™ / Power supply field-wireable 1 x M12 male, 5-pin, straight, clamping width 6…8 mm, 4 A nominal current

- **B8151-0/9**  
  6904604  
  CANopen/DeviceNet™ / Power supply field-wireable M12 female, 5-pin, straight, clamping width 6…8 mm, 4 A nominal current

- **BS8251-0/9**  
  6904615  
  CANopen/DeviceNet™ / Power supply field-wireable 1 x M12 male, 5-pin, angled, clamping width 6…8 mm, 4 A nominal current

- **B8251-0/9**  
  6904603  
  CANopen/DeviceNet™ / Power supply field-wireable 1 x M12 female, 5-pin, angled, clamping width 6…8 mm, 4 A nominal current

- **RSF-RKF-57/22**  
  6602218  
  CANopen/DeviceNet™ / Power supply wall bushing 1 x 7/8" male/female, 5-pin, hole diameter 22.5 mm, 9 A nominal current

- **RSF-RKF-40/22**  
  6915014  
  Power supply wall bushing, 1 x 7/8" male/female, 4-pin, hole diameter 22.5 mm, 9 A nominal current
### Power Supply – Accessories

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FKM-FS57-M12</td>
<td>CANopen/DeviceNet™ / Power supply wall bushing, 1 x M12 male/female, 5-polig, hole diameter 12.7 mm</td>
</tr>
<tr>
<td>RSF57</td>
<td>CANopen/DeviceNet™ / Power supply flange, 1 x 7/8&quot; male, 5-pin, front-panel mounting (1/2-14 NPT) solder tails, 9 A nominal current</td>
</tr>
<tr>
<td>RKF57</td>
<td>CANopen/DeviceNet™ / Power supply flange, 1 x 7/8&quot; female, 5-pin, front-panel mounting (1/2-14 NPT) solder tails, 9 A nominal current</td>
</tr>
<tr>
<td>RSFL46</td>
<td>Power supply flange, 1 x 7/8&quot; male, 4-pin, front-panel mounting (1/2-14, NPSM) solder tails, 9 A nominal current</td>
</tr>
<tr>
<td>RKFL46</td>
<td>Power supply flange, 1 x 7/8&quot; female, 4-pin, front-panel mounting (1/2-14 NPSM) solder tails, 9 A nominal current</td>
</tr>
<tr>
<td>FSS7</td>
<td>CANopen/DeviceNet™ / Power supply flange, 1 x M12 male, 5-pin, front-panel mounting (PG9) solder tails, 4 A nominal current</td>
</tr>
<tr>
<td>FKS7</td>
<td>CANopen/DeviceNet™ / Power supply flange, M12 female, 5-pin, front-panel mounting (PG9) solder tails, 4 A nominal current</td>
</tr>
</tbody>
</table>
### Power Supply – Accessories

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LOCKNUT G1/2”</strong></td>
<td>1/2” counter nut, for G thread, 100 pcs.</td>
</tr>
<tr>
<td>6900493</td>
<td></td>
</tr>
<tr>
<td><strong>LN1/2-14NPT/10</strong></td>
<td>1/2” counter nut, for NPT thread, 10 pcs.</td>
</tr>
<tr>
<td>6961002</td>
<td></td>
</tr>
</tbody>
</table>

Further accessories available on request or at www.turck.com
Compact block I/O modules in IP20

The compact IP20 block I/O modules for DIN rails can not only be installed in control cabinets, they can also be used to integrate small, decentralized control boxes with a few I/O-signals to a fieldbus network. Block I/O modules are available for the fieldbus systems PROFIBUS-DP and DeviceNet™ as well as modules with multiprotocol Ethernet functionality that can be automatically run in each of the three Ethernet systems PROFINET, EtherNet/IP™ and Modbus TCP. The devices are available in two different designs: The small design provides 4 digital inputs and 4 universal digital channels; the large design is available in versions with 16 digital inputs or with 16 universal digital I/Os that can be used both as input and as output. The modules can be fitted directly to a standard TS 35 DIN rail.
## Compact block I/O modules in IP20

<table>
<thead>
<tr>
<th>Type</th>
<th>Ident No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDP20-16S</td>
<td>6611465</td>
<td>PROFIBUS-DP slave, 16 digital inputs, 24 VDC, PNP, SUB-D</td>
<td>156</td>
</tr>
<tr>
<td>FDP20-16S-T</td>
<td>6611485</td>
<td>PROFIBUS-DP slave, 16 digital inputs, 24 VDC, PNP, screw-clamp terminal block</td>
<td>158</td>
</tr>
<tr>
<td>FDP20-16XSG</td>
<td>6611466</td>
<td>PROFIBUS-DP slave, 16 universal digital channels, 24 VDC, PNP, SUB-D</td>
<td>160</td>
</tr>
<tr>
<td>FDP20-16XSG-T</td>
<td>6611486</td>
<td>PROFIBUS-DP slave, 16 universal digital channels, 24 VDC, PNP, screw-clamp terminal block</td>
<td>162</td>
</tr>
<tr>
<td>FDN20-16S</td>
<td>6611312</td>
<td>DeviceNet™ slave, 16 digital inputs, 24 VDC, PNP</td>
<td>168</td>
</tr>
<tr>
<td>FDN20-16XSG</td>
<td>6611373</td>
<td>DeviceNet™ slave, 16 universal digital channels, 24 VDC, PNP</td>
<td>170</td>
</tr>
<tr>
<td>FDN20-16S</td>
<td>6611359</td>
<td>DeviceNet™ slave, 4 digital inputs, 4 universal digital channels, 24 VDC, PNP</td>
<td>164</td>
</tr>
<tr>
<td>FDN20-16XSG-E</td>
<td>6611343</td>
<td>DeviceNet™ slave, 4 digital inputs, 4 universal digital channels, 24 VDC, PNP, rear M12 connector</td>
<td>166</td>
</tr>
<tr>
<td>FEN20-4DIP-4DXP</td>
<td>6931090</td>
<td>Multiprotocol Ethernet slave, 4 digital inputs, 4 universal digital channels, 24 VDC, PNP</td>
<td>172</td>
</tr>
<tr>
<td>FEN20-16DXP</td>
<td>6931089</td>
<td>Multiprotocol Ethernet slave, 16 universal digital channels, 24 VDC, PNP</td>
<td>174</td>
</tr>
</tbody>
</table>
Our Strengths – Your Advantages

IP20 block I/O modules with multiprotocol Ethernet

The compact Ethernet multiprotocol modules of the FEN20 series can be operated in any of the three Ethernet systems PROFINET, EtherNet/IP™ and Modbus TCP. Two IP20 rated designs are available: The small FEN20-4DIP-4XP design comes with four digital input channels and four universal digital channels. The module has two drill holes for easy mounting on a mounting plate. The FDN20-BKT-DIN mounting adapter also enables the device to be fitted to a standard TS 35 DIN rail. The larger variant FEN20-16DXP comes with 16 universal digital channels. The I/O signals of these modules are distributed over three independent potential groups that are isolated from each other. This makes it possible, for example, to implement the safety-related off switching of the outputs. The modules can be fitted directly to a standard DIN rail.

IP20 block I/O modules for PROFIBUS-DP

The FDP20 product series offers compact block I/O modules in IP20 for PROFIBUS-DP. Four device types are available – two modules with 16 digital inputs as well as two modules with 16 universal digital channels. The modules are available either with SUB-D connectors or a removable screw terminal block, so that the SUB-D male connector is unnecessary. The I/O signals of these modules are distributed over three independent potential groups that are isolated from each other. This makes it possible, for example, to implement the safety-related off switching of the outputs. The modules can be fitted directly to a standard DIN rail.

IP20 block I/O modules for DeviceNet™

The FDN20 product series offers a selection of compact block I/O modules in IP20 for DeviceNet™. Two modules come with four digital inputs and four universal digital channels. Both modules are provided with a screw terminal block for the bus connection; the rear of a module is also provided with an M12 × 1 male connector which can be routed directly outside of the control cabinet wall. The two modules are either mounted on a mounting plate using two drill holes provided, directly on the control cabinet wall, or on a standard TS 35 DIN rail using the FDN20-BKT-DIN mounting adapter. Each module is also provided with 16 digital inputs and 16 universal digital channels for mounting on a standard TS 35 DIN rail. The I/O signals of these modules are distributed over three independent potential groups that are isolated from each other. This makes it possible, for example, to implement the safety-related off switching of the outputs.
Multiprotocol technology and universal digital channels

Thanks to the TURCK multiprotocol technology, the FEN20 block IO modules can be used in any of the three Ethernet systems PROFINET, EtherNet/IP™ and Modbus TCP. The modules detect the bus protocol used automatically during the startup phase. This makes it possible to considerably reduce the number of device variants required and operate a machine on different controller systems without any additional effort required for configuration or module selection. The user can configure the universal channels either as digital inputs or outputs and thus use the modules flexibly as required. Free channels can be used flexibly later as inputs or outputs.

Ultra-compact design also for the smallest control box

Thanks to their ultra-compact design, the I/O modules of the Fxx20 series can be fitted in virtually any control cabinet. This makes it possible to easily provide bus capability to small local stations or operator panels, and to utilize the benefits of fieldbus technology quickly and effectively as an alternative to conventional cabling, even when only a few I/O signals are involved. The 8-channel version is only 62.5 × 55 × 28.5 mm! The program also includes a module that is provided with an M12 × 1 male connector on the back. If the device is fitted on the control cabinet wall, the user can simply route the bus terminal out of the control cabinet.

Integrated web server for simple commissioning and diagnostics

The Ethernet multiprotocol I/O modules of the FEN20 series are provided with an integrated web server, thus simplifying commissioning and diagnostics. This enables the user to view the station information, such as module type or firmware version, independently of the controller. Data for the network configuration, such as the IP address or the PROFINET name, can also be viewed and modified. Furthermore, additional information such as the station configuration, channel settings and Ethernet statistics are provided. Diagnostic information such as the short circuit of an output are shown on the web server clearly in plain text. An integrated ring buffer also enables the viewing of a diagnostics history. A link enables the user to access the current data sheet of the respective module quickly and simply.
# Type code Fxx20

<table>
<thead>
<tr>
<th>Type code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fxx20</td>
<td>Compact block I/O modules in IP20</td>
</tr>
</tbody>
</table>

### Product series

- **F**: compact I/O fieldbus module

### Bus system

- **DN**: DeviceNet™
- **DP**: PROFIBUS-DP
- **EN**: Multiprotocol Ethernet
  - PROFINET
  - EtherNet/IP™
  - Modbus TCP

### Protection class

- **20**: IP20

### Channels

- **4**: 4 channels
- **16**: 16 channels

### Signal type

- **DIP**: digital input channels
- **DXP**: universal input channels
- **S**: digital input channels
- **XSG**: universal input channels

### Connection type

- **E**: rear M12 connector for the DeviceNet™ connection
- **T**: 5-pole removable screw terminals for the PROFIBUS-DP connection
<table>
<thead>
<tr>
<th>Type code</th>
<th>Product series – compact I/O fieldbus module</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDN 20</td>
<td>DeviceNet™</td>
</tr>
<tr>
<td>– 4 S</td>
<td>DP  PROFIBUS-DP</td>
</tr>
<tr>
<td>– 4 XSG</td>
<td>EN  Multiprotocol Ethernet</td>
</tr>
<tr>
<td>– E</td>
<td>– PROFINET</td>
</tr>
<tr>
<td></td>
<td>– EtherNet/IP™</td>
</tr>
<tr>
<td></td>
<td>– Modbus TCP</td>
</tr>
<tr>
<td>20</td>
<td>Protection class – IP20</td>
</tr>
<tr>
<td>4</td>
<td>Channels – 4 channels</td>
</tr>
<tr>
<td>S</td>
<td>Signal type – DIP  universal input channels</td>
</tr>
<tr>
<td>XSG</td>
<td>Signal type – universal digital channels</td>
</tr>
</tbody>
</table>
| E        | Connection type – T  5-pole removable screw terminals for the PROFIBUS-DP connection
|          |                                            |
16 digital inputs, 24 VDC, PNP

**Features**

- PROFIBUS-DP slave
- 9-pin SUB-D female, for PROFIBUS fieldbus connection
- Rotary coding switch for setting the PROFIBUS address
- 3 I/O power supply groups each galvanically separated
- 16 digital inputs
- 24 VDC, PNP
- Protection class IP20

**Pinning overview**

**Position**

**Notice**

**Pinning assignment**

**Power supply and I/O channels**

AUX1: Supply of the internal module electronics and the I/O channels 0 to 7
AUX2: Supply of the I/O channels 8 to 13
AUX3: Supply of the I/O channels 14 to 15

Via the terminals V+ and V- more devices can be fed with 24 VDC up to 0.7 A.
## Technical data

### Type
- **FDP20-16S**
- **Ident no.** 6611465

### Power supply
- **Supply voltage** 24 VDC
- **Operating voltage range** 18…30 VDC
- **Galvanic separation** 500 V I/Os to PROFIBUS
- **Number of channels** 16
- **Power loss, typical** ≤ 1.8 W
- **Voltage supply connection** pluggable screw terminal

### System data
- **Fieldbus transmission rate** 9.6 kbps … 12 Mbps
- **Fieldbus addressing** 2 decimally coded rotary switches
- **Fieldbus address range** 1…99
- **Fieldbus connection technology** 1 x female sub-D connector

### Inputs
- **Number of channels** 16
- **Input voltage** 18…30 VDC
- **Input type** PNP
- **Type of input diagnostics** common diagnostics
- **Low level signal voltage** < 4 V
- **High level signal voltage** 8…24 V
- **Low level signal current** < 0.5 mA
- **High level signal current** 1…3.4 mA
- **Input delay** 2.5 ms
- **Max. input current** total: 700 mA

### Environmental Conditions
- **Ambient temperature** -40…+55 °C
- **MTTF** 255 years acc. to SN 29500 (Ed. 99) 20 °C

### Mechanical data
- **Mounting instruction** for DIN rail
- **Protection class** IP20
- **Dimensions** 57.1 x 152.2 x 46.8 mm

### Approval | Certification
- ATEX, IECEx, ULus, FMus, CSAus
Compact block I/O modules in IP20
PROFIBUS-DP slave

16 digital inputs, 24 VDC, PNP

Features

- PROFIBUS-DP slave
- Removable 5-pin screw-clamp terminal block, for PROFIBUS fieldbus connection
- Rotary coding switch for setting the PROFIBUS address
- 3 I/O power supply groups each galvanically separated
- 16 digital inputs
- 24 VDC, PNP
- Protection class IP20

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Notice</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFIBUS-DP</td>
<td>Fieldbus cable (example): D9T451-2M (ident no. 6915759) or RSSW-451-2M (ident no. 6914229)</td>
<td>1 = V+ 2 = V- 3 = AUX1 + 4 = AUX1 - 5 = I/O 0 6 = I/O 1 7 = I/O 2 8 = I/O 3 9 = I/O 4 10 = I/O 5 11 = I/O 6 12 = I/O 7 13 = AUX2 + 14 = AUX2 - 15 = I/O 8 16 = AUX1 + 17 = I/O 9 18 = I/O 10 19 = I/O 11 20 = I/O 12 21 = I/O 13 22 = I/O 14 23 = I/O 15</td>
</tr>
</tbody>
</table>

Power supply and I/O channels

AUX1: Supply of the internal module electronics and the I/O channels 0 to 7
AUX2: Supply of the I/O channels 8 to 13
AUX3: Supply of the I/O channels 14 to 15
Via the terminals V+ and V- more devices can be fed with 24 VDC up to 0.7 A.
## Technical data

### Type
- FDP20-16S-T
- Ident no. 6611485

### Power supply
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 18…30 VDC
- **Galvanic separation**: 500 V I/Os to PROFIBUS
- **Number of channels**: 16
- **Power loss, typical**: ≤ 1.8 W
- **Voltage supply connection**: pluggable screw terminal

### System data
- **Fieldbus transmission rate**: 9.6 kbps … 12 Mbps
- **Fieldbus addressing**: 2 decimally coded rotary switches
- **Fieldbus address range**: 1…99
- **Fieldbus connection technology**: pluggable screw terminal

### Inputs
- **Number of channels**: 16
- **Input voltage**: 18…30 VDC
- **Input type**: PNP
- **Type of input diagnostics**: common diagnostics
- **Low level signal voltage**: < 4 V
- **High level signal voltage**: 8…24 V
- **Low level signal current**: < 0.5 mA
- **High level signal current**: 1…3.4 mA
- **Input delay**: 2.5 ms
- **Max. input current**: total: 700 mA

### Environmental Conditions
- **Ambient temperature**: -40…+55 °C

### Mechanical data
- **Mounting instruction**: for DIN rail
- **Protection class**: IP20
- **Dimensions**: 57.1 x 152.2 x 46.8 mm

### Approval | Certification
- ATEX, IECEx, ULrip, FMrip, CSAus
Compact block I/O modules in IP20

**PROFIBUS-DP slave**

### 16 universal digital channels, 24 VDC, PNP

**Features**

- PROFIBUS-DP slave
- 9-pin SUB-D female, for PROFIBUS fieldbus connection
- Rotary coding switch for setting the PROFIBUS address
- 3 I/O power supply groups each galvanically separated
- 16 universal digital channels, DI / DO
- 24 VDC, PNP
- Output current: 0.5 A
- Protection class IP20

**Pinning overview**

<table>
<thead>
<tr>
<th>Position</th>
<th>Notice</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFIBUS-DP</td>
<td>Fieldbus cable (example): D9T451-2M (ident no. 6915759) or RSSW-D9T451-2M (ident no. 6915779)</td>
<td></td>
</tr>
</tbody>
</table>

**Power supply and I/O channels**

AUX1: Supply of the internal module electronics and the I/O channels 0 to 7
AUX2: Supply of the I/O channels 8 to 13
AUX3: Supply of the I/O channels 14 to 15
Via the terminals V+ and V- more devices can be fed with 24 VDC up to 0.7 A.
## Technical data

### Type
- **FDP20-16XSG**
- **Ident no.** 6611466

### Power supply
- **Supply voltage** 24 VDC
- **Operating voltage range** 18…30 VDC
- **Galvanic separation** 500 V I/Os to PROFIBUS
- **Number of channels** 16
- **Power loss, typical** ≤ 1.8 W
- **Voltage supply connection** pluggable screw terminal

### System data
- **Fieldbus transmission rate** 9.6 kbps … 12 Mbps
- **Fieldbus addressing** 2 decimally coded rotary switches
- **Fieldbus address range** 1…99
- **Fieldbus connection technology** 1 x female sub-D connector

### Inputs
- **Number of channels** 16
- **Input voltage** 18…30 VDC
- **Input type** PNP
- **Type of input diagnostics** common diagnostics
- **Low level signal voltage** < 4 V
- **High level signal voltage** 8…24 V
- **Low level signal current** < 0.5 mA
- **High level signal current** 1…3.4 mA
- **Input delay** 2.5 ms
- **Max. input current** total: 700 mA

### Outputs
- **Number of channels** 16
- **Switching frequency** ≤ 100 Hz
- **Output voltage** 18…30 VDC
- **Output current per channel** 0.5A (from Aux)
- **Output type** PNP
- **Short-circuit protection** yes

### Environmental Conditions
- **Ambient temperature** -40…+55 °C
- **MTTF** 170 years acc. to SN 29500 (Ed. 99)

### Mechanical data
- **Mounting instruction** for DIN rail
- **Protection class** IP20
- **Dimensions** 57.1 x 152.2 x 46.8 mm

### Approval | Certification
- ATEX, IECEx, ULc, FM, CSA
Compact block I/O modules in IP20
PROFIBUS-DP slave

16 universal digital channels, 24 VDC, PNP

Features

- PROFINET-DP slave
- Removable 5-pin screw-clamp terminal block, for PROFIBUS fieldbus connection
- Rotary coding switch for setting the PROFIBUS address
- 3 I/O power supply groups each galvanically separated
- 16 universal digital channels, DI / DO
- 24 VDC, PNP
- output current: 0.5 A
- Protection class IP20

Features

- PROFINET-DP slave
- Removable 5-pin screw-clamp terminal block, for PROFIBUS fieldbus connection
- Rotary coding switch for setting the PROFIBUS address
- 3 I/O power supply groups each galvanically separated
- 16 universal digital channels, DI / DO
- 24 VDC, PNP
- output current: 0.5 A
- Protection class IP20

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Notice</th>
<th>Pinning assignment</th>
</tr>
</thead>
</table>
| PROFIBUS-DP | Fieldbus cable (example): D9T451-2M (ident no. 6915759) or RSSW-451-2M (ident no. 6914229) | 1 = 5 VDC  
2 = GND (Bus A)  
3 = Shield  
4 = PD (Bus B)  
5 = GND |

Power supply and I/O channels

AUX1: Supply of the internal module electronics and the I/O channels 0 to 7
AUX2: Supply of the I/O channels 8 to 13
AUX3: Supply of the I/O channels 14 to 15
Via the terminals V+ and V- more devices can be fed with 24 VDC up to 0.7 A.
## Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>FDP20-16XSG-T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>6611486</td>
</tr>
</tbody>
</table>

### Power supply
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 18...30 VDC
- **Galvanic separation**: 500 V I/Os to PROFIBUS
- **Number of channels**: 16
- **Power loss, typical**: ≤ 1.8 W
- **Voltage supply connection**: pluggable screw terminal

### System data
- **Fieldbus transmission rate**: 9.6 kbps ... 12 Mbps
- **Fieldbus addressing**: 2 decimally coded rotary switches
- **Fieldbus address range**: 1...99
- **Fieldbus connection technology**: pluggable screw terminal

### Inputs
- **Number of channels**: 16
- **Input voltage**: 18...30 VDC
- **Input type**: PNP
- **Type of input diagnostics**: common diagnostics
- **Low level signal voltage**: < 4 V
- **High level signal voltage**: 8...24 V
- **Low level signal current**: < 0.5 mA
- **High level signal current**: 1...3.4 mA
- **Input delay**: 2.5 ms
- **Max. input current**: total: 700 mA

### Outputs
- **Number of channels**: 16
- **Switching frequency**: ≤ 100 Hz
- **Output voltage**: 18...30 VDC
- **Output current per channel**: 0.5A (from Aux)
- **Output type**: PNP
- **Short-circuit protection**: yes

### Environmental Conditions
- **Ambient temperature**: -40...+55 °C

### Mechanical data
- **Mounting instruction**: for DIN rail
- **Protection class**: IP20
- **Dimensions**: 57.1 x 152.2 x 46.8 mm

### Approval | Certification
- ATEX, IECEx, ULc, FM, CSA
Compact block I/O modules in IP20
DeviceNet™ slave

4 digital inputs, 4 universal digital channels, 24 VDC, PNP

Features
- DeviceNet™ slave
- Screw-clamp terminal block, 5-pin, for DeviceNet™ fieldbus connection
- Rotary coding switch for setting the DeviceNet™ address
- 4 digital inputs
- 4 universal digital channels, DI / DO
- 24 VDC, PNP
- Output current 0.5 A
- Protection class IP20

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Notice</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V +</td>
<td>1 = V +</td>
</tr>
<tr>
<td>2</td>
<td>CANH</td>
<td>2 = CANH</td>
</tr>
<tr>
<td>3</td>
<td>SHD</td>
<td>3 = SHD</td>
</tr>
<tr>
<td>4</td>
<td>CANL</td>
<td>4 = CANL</td>
</tr>
<tr>
<td>5</td>
<td>V –</td>
<td>5 = V –</td>
</tr>
</tbody>
</table>

DeviceNet™ and power supply
Fieldbus cable (example):
CBC5-572-2M (ident no. 6606065) or RKCS701-5M (ident no. 6931035)

I/O channels

1 = V –
2 = I/O 0
3 = I/O 1
4 = I/O 2
5 = I/O 3
6 = I/O 4
7 = I/O 5
8 = I/O 6
9 = I/O 7
10 = V +
## Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>FDN20-4S-4XSG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>6611359</td>
</tr>
</tbody>
</table>

### Power supply

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supply voltage</strong></td>
<td>24 VDC</td>
</tr>
<tr>
<td><strong>Operating voltage range</strong></td>
<td>11…26 VDC</td>
</tr>
<tr>
<td><strong>Number of channels</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Power loss, typical</strong></td>
<td>≤ 1.2 W</td>
</tr>
</tbody>
</table>

### System data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fieldbus transmission rate</strong></td>
<td>125…500 kbps</td>
</tr>
<tr>
<td><strong>Fieldbus addressing</strong></td>
<td>2 decimally coded rotary switches</td>
</tr>
<tr>
<td><strong>Fieldbus address range</strong></td>
<td>0…63</td>
</tr>
<tr>
<td><strong>Fieldbus connection technology</strong></td>
<td>screw terminals</td>
</tr>
</tbody>
</table>

### Inputs

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of channels</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Input voltage</strong></td>
<td>11…26 VDC</td>
</tr>
<tr>
<td><strong>Input type</strong></td>
<td>PNP</td>
</tr>
<tr>
<td><strong>Type of input diagnostics</strong></td>
<td>common diagnostics</td>
</tr>
<tr>
<td><strong>Low level signal voltage</strong></td>
<td>&lt; 4 V</td>
</tr>
<tr>
<td><strong>High level signal voltage</strong></td>
<td>8…24 V</td>
</tr>
<tr>
<td><strong>Low level signal current</strong></td>
<td>&lt; 0.5 mA</td>
</tr>
<tr>
<td><strong>High level signal current</strong></td>
<td>1…3.4 mA</td>
</tr>
<tr>
<td><strong>Max. input current</strong></td>
<td>Total: 700 mA</td>
</tr>
</tbody>
</table>

### Outputs

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of channels</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>Switching frequency</strong></td>
<td>≤ 100 Hz</td>
</tr>
<tr>
<td><strong>Output voltage</strong></td>
<td>18…26 VDC</td>
</tr>
<tr>
<td><strong>Output current per channel</strong></td>
<td>0.5 A (from DeviceNet™)</td>
</tr>
<tr>
<td><strong>Output type</strong></td>
<td>PNP</td>
</tr>
<tr>
<td><strong>Type of output diagnostics</strong></td>
<td>common diagnostics</td>
</tr>
<tr>
<td><strong>Short-circuit protection</strong></td>
<td>yes</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>Screw</td>
</tr>
</tbody>
</table>

### Environmental Conditions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>-40…+70 °C</td>
</tr>
</tbody>
</table>

### Mechanical data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mounting instruction</strong></td>
<td>for mounting on panel; on DIN rail with optional adapter FDN20-BKT-DIN ( # 6937105)</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>IP20</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>55 x 62.5 x 23.5 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATEX, IECEx, cULus, FM, CSA</strong></td>
<td>CAA</td>
</tr>
</tbody>
</table>

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more@turck.com ● www.turck.com ● Edition I/2014
Compact block I/O modules in IP20

DeviceNet™ slave

4 digital inputs, 4 universal digital channels, 24 VDC, PNP

Features
- DeviceNet™ slave
- Screw-clamp terminal block, 5-pin, for DeviceNet™ fieldbus connection
- Rotary coding switch for setting the DeviceNet™ address
- M12 built-in flange for easy mounting and connection to DeviceNet™
- 4 digital Inputs
- 4 universal digital channels, DI / DO
- 24 VDC, PNP
- Output current 0.5 A
- Protection class IP20

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Notice</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeviceNet™ and power supply</td>
<td>Fieldbus cable (example): CBC5-572-2M (ident no. 6606065) or RKCS701-5M (ident no. 6931035)</td>
<td>1 = V + 2 = CANH 3 = SHD 4 = CANL 5 = V –</td>
</tr>
<tr>
<td>I/O channels</td>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>DeviceNet™ and power supply</td>
<td>Rear M12 connector for direct feeding through the cabinet wall. Fieldbus cable (example): RSC-RKCS701-2M (ident no. 6604833) or RSC-WKCS701-1M (ident no. 6931039)</td>
<td>1 = Shield 2 = RD (V +) 3 = BK (V –) 4 = WH (CAN H) 5 = BU (CAN L)</td>
</tr>
</tbody>
</table>
## Technical data

### Power supply
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 11…26 VDC
- **Number of channels**: 8
- **Power loss, typical**: $\leq 1.2 \text{ W}$
- **Voltage supply connection**: Screw terminals or M12

### System data
- **Fieldbus transmission rate**: 125…500 kbps
- **Fieldbus addressing**: 2 decimally coded rotary switches
- **Fieldbus address range**: 0…63
- **Fieldbus connection technology**: Screw terminals or M12

### Inputs
- **Number of channels**: 8
- **Input voltage**: 11…26 VDC
- **Input type**: PNP
- **Type of input diagnostics**: common diagnostics
- **Low level signal voltage**: < 4 V
- **High level signal voltage**: 8…24 V
- **Low level signal current**: < 0.5 mA
- **High level signal current**: 1…3.4 mA
- **Max. input current**: Total: 700 mA

### Outputs
- **Number of channels**: 4
- **Switching frequency**: $\leq 100 \text{ Hz}$
- **Output voltage**: 18…26 VDC
- **Output current per channel**: 0.5 A (from DeviceNet™)
- **Output type**: PNP
- **Type of output diagnostics**: common diagnostics
- **Short-circuit protection**: yes
- **Connectivity**: Screw

### Environmental Conditions
- **Ambient temperature**: -40…+70 °C

### Mechanical data
- **Mounting instruction**: for mounting on control cabinet wall
- **Protection class**: IP20
- **Dimensions**: 55 x 62.5 x 23.5 mm

### Approval | Certification
- ATEX, IECEx, ULc, FM, CSA
Compact block I/O modules in IP20
DeviceNet™ slave

16 digital inputs, 24 VDC, PNP

Features
- DeviceNet™ slave
- Removable screw-clamp terminal block, 5-pin, for DeviceNet™ fieldbus connection
- Rotary coding switch for setting the DeviceNet™ address
- 3 I/O power supply groups each galvanically separated
- 16 digital inputs
- 24 VDC, PNP
- Protection class IP20

Pinning overview

<table>
<thead>
<tr>
<th>DeviceNet™ and power supply</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus cable (example): CBCS-572-2M (ident no. 6606065) or RKCS5701-5M (ident no. 6931035)</td>
<td>1 = V +, 2 = CANH, 3 = SHD, 4 = CANL, 5 = V –</td>
</tr>
</tbody>
</table>

Power supply and I/O channels
AUX1: Supply of the I/O channels 0 to 7
AUX2: Supply of the I/O channels 8 to 13
AUX3: Supply of the I/O channels 14 to 15
Via terminals V+ and V- more devices can be fed from the DeviceNet™ supply with 24 VDC up to 0.7 A.
## Technical data

### Type
- **FDN20-16S**
- **Ident no.** 6611312

### Power supply
- **Supply voltage** 24 VDC
- **Operating voltage range** 11…26 VDC
- **Number of channels** 16
- **Power loss, typical** \( \leq 1.2 \) W

### System data
- **Fieldbus transmission rate** 125…500 kbps
- **Fieldbus addressing** 2 decimally coded rotary switches
- **Fieldbus address range** 0…63
- **Fieldbus connection technology** pluggable screw terminal

### Inputs
- **Number of channels** 16
- **Input voltage** 11…26 VDC
- **Input type** PNP
- **Type of input diagnostics** common diagnostics
- **Low level signal voltage** < 4 V
- **High level signal voltage** 8…24 V
- **Low level signal current** < 0.5 mA
- **High level signal current** 1…3.4 mA
- **Max. input current** Total: 700 mA

### Environmental Conditions
- **Ambient temperature** -40…+70 °C

### Mechanical data
- **Mounting instruction** for DIN rail
- **Protection class** IP20
- **Dimensions** 57.1 x 152.2 x 44.1 mm

### Approval | Certification
- ATEX, IECEx, UL, FM, CSA
Compact block I/O modules in IP20

DeviceNet™ slave

16 universal digital channels, 24 VDC, PNP

Features
- DeviceNet™ slave
- Removable screw-clamp terminal block, 5-pin, for DeviceNet™ fieldbus connection
- Rotary coding switch for setting the DeviceNet™ address
- 3 I/O power supply groups each galvanically separated
- 16 universal digital channels, DI / DO
- 24 VDC, PNP
- output current: 0.5A
- Protection class IP20

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Notice</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeviceNet™ and power supply</td>
<td>Fieldbus cable (example): CBC5-572-2M (ident no. 6606065) or RKCS701-5M (ident no. 6931035)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>V+</td>
<td>CANH</td>
</tr>
</tbody>
</table>

Power supply and I/O channels

AUX1: Supply of the I/O channels 0 to 7
AUX2: Supply of the I/O channels 8 to 13
AUX3: Supply of the I/O channels 14 to 15

Via terminals V+ and V- more devices can be fed from the DeviceNet™ supply with 24 VDC up to 0.7 A.
**Technical data**

<table>
<thead>
<tr>
<th>Type</th>
<th>FDN20-16XSG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6611373</td>
</tr>
</tbody>
</table>

**Power supply**

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>11…26 VDC</td>
</tr>
<tr>
<td>Number of channels</td>
<td>16</td>
</tr>
<tr>
<td>Power loss, typical</td>
<td>≤ 1.2 W</td>
</tr>
</tbody>
</table>

**System data**

| Fieldbus transmission rate | 125…500 kbps       |
| Fieldbus addressing       | 2 decimally coded rotary switches |
| Fieldbus address range    | 0…63                |
| Fieldbus connection technology | pluggable screw terminal |

**Inputs**

| Number of channels | 16                     |
| Input voltage      | 11…26 VDC              |
| Input type         | PNP                    |
| Type of input diagnostics | common diagnostics |
| Low level signal voltage | < 4 V               |
| High level signal voltage | 8…24 V              |
| Low level signal current | < 0.5 mA              |
| High level signal current | 1…3.4 mA             |
| Max. input current | Total: 700 mA          |

**Outputs**

| Number of channels | 16                     |
| Switching frequency | ≤ 100 Hz            |
| Output voltage      | 18…26 VDC             |
| Output current per channel | 0.5A (from Aux) |
| Output type         | PNP                   |
| Type of output diagnostics | common diagnostics |
| Short-circuit protection | yes               |

**Environmental Conditions**

| Ambient temperature | -40…+70 °C |

**Mechanical data**

| Mounting instruction | for DIN rail |
| Protection class     | IP20         |
| Dimensions           | 57.1 x 152.2 x 44.1 mm |

**Approval | Certification**

| ATEX, IECEx, UL, FM, CSA | |
4 digital inputs, 4 universal digital channels, 24 VDC, PNP

Features
- EtherNet/IP™ slave
- Modbus TCP slave
- PROFINET slave
- 2 RJ45 ports for the Ethernet connection
- Integrated Ethernet switch
- 10/100 Mbps
- 4 digital Inputs
- 4 universal digital channels, DI / DO
- 24 VDC, PNP
- Output current: 1.0 A
- Protection class IP20

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Notice</th>
<th>Pinning assignment</th>
</tr>
</thead>
</table>
| Ethernet | Fieldbus cable (example): RJ45S-RJ45S-441-2M (ident no. 6932517) or RJ45-FKSDD-441-0.5M/S2174 (ident no. 6914221) | 1 = TX +
2 = TX –
3 = RX +
4 = n.c.
5 = n.c.
6 = RX –
7 = n.c.
8 = n.c. |
| Power supply | | 1 = V1 –
2 = V1 –
3 = V1 + |
| I/O channels | | 1 = V1 –
2 = I/O 1
3 = I/O 2
4 = I/O 3
5 = I/O 4
6 = VOUT 1 +
7 = VOUT 2 +
8 = VOUT 3 +
9 = VOUT 4 +
10 = VOUT 5 + |
## Technical data

### Type
- **FEN20-4DIP-4DXP**
- **Ident no.** 6931090

### Power supply
- **Supply voltage**: 24 VDC
- **Operating voltage range**: 12…30 VDC
- **Galvanic separation**: 500 V I/Os to Ethernet
- **Number of channels**: 8
- **Power loss, typical**: ≤ 2.4 W
- **Voltage supply connection**: screw terminals

### System data
- **Connection technology**: Ethernet
- **Protocol detection**: automatic
- **Web server**: 192.168.1.254 (Default)
- **Service interface**: Ethernet

#### Modbus TCP
- **Addressing**: Static IP, BOOTP, DHCP
- **Supported function codes**: FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23
- **Simultaneous CIP connections**: 6
- **Input Data Size**: max. 1 register
- **Input register start address**: 0 (0x0000 hex)
- **Output Data Size**: max. 1 register
- **Output register start address**: 2048 (0x0800 hex)

#### EtherNet/IP™
- **Addressing**: acc. to EtherNet/IP™ specification
- **Quick Connect (QC)**: < 150 ms
- **Device Level Ring (DLR)**: supported
- **Simultaneous CIP connections**: 6

#### PROFINET
- **Addressing**: DCP
- **Conformance Class**: B (RT)
- **MinCycleTime**: 1 ms
- **Fast Start-Up (FSU)**: < 150 ms
- **Diagnostics**: acc. to PROFINET alarm handling
- **Topology detection**: supported
- **Automatic addressing**: supported

### Outputs
- **Number of channels**: 4
- **Output voltage**: 12…30 VDC
- **Output current per channel**: 1 A
- **Output total current**: 4 A
- **Output type**: PNP
- **Load type**: resistive, inductive, lamp load
- **Short-circuit protection**: yes

### Environmental Conditions
- **Ambient temperature**: -40…+70 °C
- **Storage temperature**: -40 … +85 °C

### Mechanical data
- **Mounting instruction**: for mounting on panel; on DIN rail with optional adapter FDN20-BKT-DIN (# 6931105)
- **Protection class**: IP20
- **Dimensions**: 55 x 62.5 x 30 mm

### Approval / Certification
- **cULus**

### Inputs
- **Number of channels**: 8
- **Input voltage**: 24 VDC
- **Input type**: PNP
- **Type of input diagnostics**: summarized diagnostics
- **Low level signal voltage**: < 7 VDC
- **High level signal voltage**: 7…30 VDC
- **Low level signal current**: < 1.5 mA
- **High level signal current**: > 2 mA
- **Input delay**: 2.5 ms
- **Max. input current**: 6 mA
Compact block I/O modules in IP20
Multiprotocol Ethernet slave

16 universal digital channels, 24 VDC, PNP

Features
- EtherNet/IP™ slave
- Modbus TCP slave
- PROFINET slave
- 2 RJ45 ports for the Ethernet connection
- Integrated Ethernet switch
- 10/100 Mbps
- 16 universal digital channels, DI / DO
- 24 VDC, PNP
- Output current: 1.0 A
- Protection class IP20

Pinning overview

<table>
<thead>
<tr>
<th>Position</th>
<th>Notice</th>
<th>Pinning assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>Fieldbus cable (example): RJ45S-RJ45S-441-2M (ident no. 6932517) or RJ45-FKSDD-441-0.5M/S2174 (ident no. 6914221)</td>
<td>1 = TX +&lt;br&gt;2 = TX -&lt;br&gt;3 = RX +&lt;br&gt;4 = n.c.&lt;br&gt;5 = n.c.&lt;br&gt;6 = RX -&lt;br&gt;7 = n.c.&lt;br&gt;8 = n.c.</td>
</tr>
</tbody>
</table>

Power supply and I/O channels
The internal module electronics and the I/O channels 0 to 7 are supplied via AUX1.
The I/O channels 8 to 13 are supplied via AUX2.
The I/O channels 14 to 15 are supplied via AUX3.
Via terminals V+ and V- more devices can be fed with 24 VDC up to 0.7 A.
### Technical data

**Type**
- FEN20-16DXP
- Ident no. 6931089

**Power supply**
- Supply voltage: 24 VDC
- Operating voltage range: 12...30 VDC
- Galvanic separation: 500 V I/Os to Ethernet
- Number of channels: 16
- Power loss, typical: ≤ 2.4 W
- Voltage supply connection: pluggable screw terminal

**System data**
- Connection technology: Ethernet
- Protocol detection: automatic
- Web server: 192.168.1.254 (Default)
- Service interface: Ethernet

**Modbus TCP**
- Addressing: Static IP, BOOTP, DHCP
- Supported function codes: FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23
- Simultaneous CIP connections: 6
- Input Data Size: max. 1 register
- Input register start address: 0 (0x0000 hex)
- Output Data Size: max. 1 register
- Output register start address: 2048 (0x0800 hex)

**EtherNet/IP™**
- Addressing: acc. to EtherNet/IP™ specification
- Quick Connect (QC): < 150 ms
- Device Level Ring (DLR): supported
- Simultaneous CIP connections: 6

**PROFINET**
- Addressing: DCP
- Conformance Class: B (RT)
- MinCycleTime: 1 ms
- Fast Start-Up (FSU): < 150 ms
- Diagnostics: acc. to PROFINET alarm handling
- Topology detection: supported
- Automatic addressing: supported

### Outputs
- Number of channels: 16
- Output voltage: 12...30 VDC
- Output current per channel: at 70 °C: 0.5 A (8 A in total) or 0.75 A (6 A in total); at 50 °C: 0.75 A (12 A in total) or 1 A (8 A in total)
- Output type: PNP
- Load type: resistive, inductive, lamp load
- Short-circuit protection: yes

**Environmental Conditions**
- Ambient temperature: -40...+70 °C
- Storage temperature: -40...+85 °C

**Mechanical data**
- Mounting instruction: for DIN rail
- Protection class: IP20
- Dimensions: 57.1 x 152.2 x 46.7 mm

**Approval | Certification**
- cULus
Block I/O Modules Fxx20 – Accessories

FDN20-BKT-DIN  6931105
Mounting adapter for mounting of 8-channel Fxx20 modules on DIN rail (TS 35)
excom® – Remote-I/O system
Short Description
excom® – Remote-I/O system

excom® is a remote I/O system for use in Ex and non-Ex areas. This benefits the user not only in terms of system components optimized for a particular zone, but also because of the standard concept for configuring and parametrizing the periphery and field instrumentation. The excom® system provides bus-capable, decentralized input and output modules with protection to IP20 for connecting intrinsically safe and non-intrinsically safe digital and analog field devices. Depending on the periphery used, the type of explosion protection provided by the system allows operation in zones 1 and 2. The field circuits are approved for zone 0.

The main elements of the modular system consist of power supply units, gateways and I/O modules, as well as the module racks for housing the components. The backplane is integrated in the module racks. The backplane contains the terminal level for the field devices and is used to distribute energy and transmit data. The power supply units provide the power supply of the entire system and the periphery.

All modules can be connected particularly easily: The gateways, power supply units, and I/O modules, are fitted easily to the module rack. This provides all the internal connections; only the peripheral devices have to be connected. All modules can be fitted or removed (hot swapped) during operation. The system checks automatically whether the new module matches the settings of the slot. The excom® DTM (Device Type Manager) makes it possible to easily commission the periphery and the field instrumentation via the PROFIBUS network – even without a higher-level Class 1 master of the distributed control system. The integrated system scan function enables fast and error-free commissioning. The excom® system also supports the connection of HART® compatible field devices. This makes it possible to implement end-to-end HART® communication via PROFIBUS-DPV1 right down to the process control system; HART® secondary variables can also be transmitted cyclically via DPV0 communication.
Standard system features

- **Redundancy possible through two power supply units**
- **Local diagnostics through LED indication**
- **Redundancy possible through two gateways**
- **Choice of bus address via rotary coding switches**
- **Connection to the power supply (on Ex-e terminals under the end cap)**
- **Connection of the higher-level PROFIBUS-DP fieldbus**
- **Labeling options**

**Application range:**
- Non-intrinsically safe applications: MT08, MT16, MT24
- Intrinsically safe circuits and installation in the non-Ex area and in zone 2: MT08, MT16, MT24
- Intrinsically safe circuits and installation in zone 1: MT16, 6
**Standardized system features**

- **Redundancy** possible through two power supply units
- Choice of bus address via rotary coding switches
- Different I/O module types
- Connection of the Ex-i field devices via removable screw terminals or cage clamp terminals
- Connection of the higher-level PROFIBUS-DP fieldbus
- Redundancy possible through two gateways
- Local diagnostics through LED indication
- Connection to the power supply (on Ex-e terminals under the end cap)
- Labeling options

**Application range:**
- **non-intrinsically safe applications**
  - MT08
  - MT16
  - MT24

- **intrinsically safe circuits and installation in the non-Ex area and in zone 2**
  - MT08
  - MT16
  - MT24

- **intrinsically safe circuits and installation in zone 1**
  - MT16
**Our Strengths – Your advantages**

**excom® Remote I/O – One system for all zones**

The Remote-I/O system excom® allows the user to freely select the location of installation. The system can be installed both in zone 1 and in zone 2 or in the non-Ex area. This benefits the user not only in terms of components optimized for a particular zone, but also because of the standard concept for configuring and parametrizing the periphery and field instrumentation. If this system is installed in zones 1 and 2, a specially optimized power supply unit is available that generates the intrinsically safe system voltage. The interface to the fieldbus, in this case PROFIBUS-DP, is also intrinsically safe. A new module rack offers here the possibility of operating up to 24 I/O modules in the non-Ex area and in zone 2, which further reduces the basic installation costs.

**Plug and Play – Also during ongoing operation**

Hot swapping makes the excom® system particularly user-friendly: The system can be serviced and changed at any time. The I/O modules – including the power supply modules – can be plugged and unplugged during ongoing operation, even in zone 1, without disturbing the field communication. This increases plant availability and saves time when the system is commissioned and extended.

**DTM-based – Online parametrization and configuration**

The new excom® DTM and the advanced gateway communication mechanisms in the gateway allow the user to easily operate the periphery and the field instrumentation at any time via the PROFIBUS network, with or without the higher-level master Class 1 control system. With the help of an FDT frame such as PACTware™, all systems present on the PROFINET can be scanned and copied to the project tree of the frame application. All peripheral modules and HART® field devices will then be available online for the operator. The entire field wiring can thus be checked and the HART® field devices with their associated DTM diagnosed and configured. In this way, a validated transfer of the field installation to the control system is possible.
HART® – End-to-end parametrization from the process control system down to the field device

excom® takes advantage of the worldwide use of HART® communication and allows field devices to be HART® parametrized seamlessly via the bus. The system transmits the process and diagnostic data of the periphery and communicates, if necessary, with the HART® field instrumentation. This gives the control system additional information on process values, diagnostics and asset management directly in digital form. Since the communication protocol allows the transmission of data over already installed lines, the user can build, service and maintain the last mile with little effort.

High availability – Redundant power supply and communication

The Remote-I/O system excom® from TURCK has proven its worth in the process industry and the associated demanding requirements in terms of equipment safety. The system allows a fully redundant setup for the power supply and the communication interface. Either a 24 VDC or 230 VAC power supply is possible. As a standard feature, excom® also provides a system-redundancy solution for the bus structure. This allows the redundant excom® system to be connected via redundant bus technology to a process control system with a PROFIBUS master. Thanks to the open standard, the redundancy system can be operated with any master available on the market.

System enclosures – Fieldbus system with full approval

TURCK offers a comprehensive enclosure concept for the excom® system. The enclosures are made of robust stainless steel, feature ignition protection type Ex-e and allow installation in zone 1. In order to save the user the trouble of getting approvals for each system component, TURCK has obtained a system approval for the stainless steel enclosures with integrated module rack. All components used have been individually tested and approved. In this way customized solutions are also possible. Assembly and installation are carried out directly at TURCK in order to ensure that the required clearance and creepage distances are met.
System installation – Overview

excom® – Remote-I/O system

Non Ex Area

Zone 2
- Sensor, NAMUR
- Mechanical contact with resistor circuitry
- Mechanical contact
- Pulse (external switch source)
- Current source
- Voltage source

Zone 1
- Actuator
- Thermocouple
- RTD
- Potentiometer

Zone 0

System redundancy and line redundancy possible
Solutions for the Ex area

The excom® series gives the user complete freedom in the choice of the installation location. It can be installed in zones 1 and 2 and in the non-Ex area. The user benefits here not only from the components that were optimized for the particular zone provided, but also from a standard concept for the configuration and parametrization of the periphery and field instrumentation.

A standard Ex-i periphery supports signal processing and field device control from zones 0, 1 and 2. If this periphery is installed in zones 1 and 2 in order to detect signals as closely as possible to the location of the instrumentation, an optimized power supply module is available specially for this application, which generates an intrinsically safe system voltage.

The interface to the fieldbus, in this case PROFIBUS-DP, is also intrinsically safe. This configuration enables the entire system to be fully maintained during operation in the Ex area. In the cabinets previously used in excom® installations in zone 2, the space now available can be used for additional components, such as valve blocks or load switches.

A special gateway provides the necessary protection of the Ex-i periphery to the bus so that a separate segment coupler is not required for implementing the intrinsically safe physical bus characteristics of RS485-IS, if the excom® system is installed in the safe area.
## excom® – Remote I/O system

**Short description/Table of contents**

**Solutions for the Ex area**

<table>
<thead>
<tr>
<th>Type</th>
<th>Ident No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
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<td>I/O module, digital, 8-channel</td>
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<tr>
<td>DF20EX</td>
<td>6884061</td>
<td>Frequency module, 2-channel</td>
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<tr>
<td>DI401EX</td>
<td>6884232</td>
<td>Input module, digital, 4-channel</td>
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<tr>
<td>DO401EX</td>
<td>6884203</td>
<td>Output module, digital, 4-channel</td>
<td>194</td>
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<tr>
<td>AI401Ex</td>
<td>6884204</td>
<td>Input module, analog, 4-channel</td>
<td>196</td>
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<tr>
<td>AI41EX</td>
<td>6884020</td>
<td>Input module, analog, passive, 4-channel</td>
<td>198</td>
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<td>AI43EX</td>
<td>6884137</td>
<td>Potentiometer module, 4-channel</td>
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<td>AO401Ex</td>
<td>6884001</td>
<td>Input module, analog, active, HART®, 4-channel</td>
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<td>AIH41EX</td>
<td>6884005</td>
<td>Input module, analog, passive, HART®, 4-channel</td>
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<td>AOH40EX</td>
<td>6884003</td>
<td>Output module, analog, HART®, 4-channel</td>
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<tr>
<td>TI40Ex</td>
<td>6884000</td>
<td>Input module, temperature, 4-channel</td>
<td>210</td>
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<tr>
<td>TI41Ex</td>
<td>6884190</td>
<td>Input module, temperature, 4-channel</td>
<td>212</td>
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<td>GDP-IS/FW2.2</td>
<td>6884210</td>
<td>PROFIBUS-DP interface</td>
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<tr>
<td>GDP-NI/FW2.2</td>
<td>6884225</td>
<td>PROFIBUS-DP interface</td>
<td>216</td>
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<tr>
<td>PSD24EX</td>
<td>6881721</td>
<td>Power supply module, 24 VDC, zone 1</td>
<td>218</td>
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<tr>
<td>PPSA230EX</td>
<td>6900293</td>
<td>Converter, 230 VAC</td>
<td>220</td>
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<tr>
<td>PPSA115EX</td>
<td>6900294</td>
<td>Converter, 115 VAC</td>
<td>222</td>
</tr>
<tr>
<td>PSM24-3G</td>
<td>6881722</td>
<td>Power supply module, 24 VDC, zone 2</td>
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<tr>
<td>MT-PPS</td>
<td>9100516</td>
<td>Upstream subrack for PPSA</td>
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<td>MT08-2G</td>
<td>9100684</td>
<td>Module rack, zone 1, for 8 modules</td>
<td>228</td>
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<tr>
<td>MT16-2G</td>
<td>9100687</td>
<td>Module rack, zone 1, for 16 modules</td>
<td>230</td>
</tr>
<tr>
<td>MT16-2G/MSA</td>
<td>9100688</td>
<td>Module rack, zone 1, for 16 Modules, marine ship approved</td>
<td>232</td>
</tr>
<tr>
<td>MT08-3G</td>
<td>9100680</td>
<td>Module rack for 8 modules, zone 2</td>
<td>234</td>
</tr>
<tr>
<td>MT16-3G</td>
<td>9100681</td>
<td>Module rack for 16 modules, zone 2</td>
<td>236</td>
</tr>
<tr>
<td>MT24-3G</td>
<td>9100682</td>
<td>Module rack for 24 modules, zone 2</td>
<td>238</td>
</tr>
<tr>
<td>SC12EX</td>
<td>6884047</td>
<td>PROFIBUS-DP segment coupler</td>
<td>240</td>
</tr>
<tr>
<td>OC11Ex/2G.2</td>
<td>6890427</td>
<td>PROFIBUS-DP optocoupler for zone 1</td>
<td>242</td>
</tr>
<tr>
<td>OC11Ex/3G.2</td>
<td>6890428</td>
<td>PROFIBUS-DP optocoupler for zone 2</td>
<td>244</td>
</tr>
</tbody>
</table>
The I/O module DM80Ex is designed for the connection of NAMUR sensors (DIN EN 60 60947-5-6) and actuators. When wire-break or short-circuit monitoring are activated, mechanical contacts can only be connected with a corresponding resistor circuitry (WM1, Ident no. 0912101).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. The explosion protection category of inputs/outputs is Ex ia IIC.

When connecting the field devices, care has to be taken that all inputs and/or outputs are on a common potential.

Input and output mode can be adjusted via the PROFIBUS-DP master. The following parameters can be adjusted: switching behaviour, switch-on delay, default value, wire-break and short circuit monitoring.

The user can furthermore determine whether an input or an output should be provided at the connecting point. The following configurations are possible: 8 inputs/0 outputs; 6 inputs/2 outputs up to 0 inputs/8 outputs (GSD-file, Mode 2). This guarantees optimal adaptation to the corresponding application environment.
## Technical data

### Type

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>Type</td>
<td>DM80EX</td>
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<tr>
<td>Ident no.</td>
<td>6884006</td>
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### Power supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>Supply voltage</td>
<td>via the backplanes, central power supply</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 1 W</td>
</tr>
<tr>
<td>Galvanic separation</td>
<td>to int. bus and supply circuit</td>
</tr>
<tr>
<td>Number of channels</td>
<td>8-channel</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input circuits</td>
<td>acc. to EN 60947-5-6 (NAMUR), intrinsically safe acc. to EN 60079-11</td>
</tr>
<tr>
<td>No-load voltage</td>
<td>8 VDC</td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>4 mA</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 100 Hz</td>
</tr>
<tr>
<td>Short-circuit</td>
<td>&lt; 367 Ω</td>
</tr>
<tr>
<td>Wire-break</td>
<td>&lt; 0.2 mA</td>
</tr>
<tr>
<td>Switch-on threshold:</td>
<td>1.8 mA</td>
</tr>
<tr>
<td>Switch-off threshold:</td>
<td>1.4 mA</td>
</tr>
</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output circuits</td>
<td>for intrinsically safe actuators</td>
</tr>
<tr>
<td>No-load voltage</td>
<td>8 VDC</td>
</tr>
<tr>
<td>Nominal current</td>
<td>4 mA</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 100 Hz</td>
</tr>
<tr>
<td>Short circuit</td>
<td>&lt; 367 Ω</td>
</tr>
<tr>
<td>Wire-break</td>
<td>&lt; 0.2 mA</td>
</tr>
<tr>
<td>Internal resistance $R_i$</td>
<td>320 Ω</td>
</tr>
</tbody>
</table>

### Approvals and declarations

- PTB 00 ATEX 2178
- II 2 (1) G Ex ib [ia] IIC T4
- II (1) D [Ex ia IIIC]

Max. values:
- Terminal connection: 1+2 / 3+4
- Max. output voltage $U_o$ ≤ 9.6 V
- Max. output current $I_o$ ≤ 44 mA
- Max. output power $P_o$ ≤ 106 mW

### Environmental Conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-20…+70 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 % at 55 °C acc. to EN 60068-2</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 60068-2-27</td>
</tr>
<tr>
<td>MTTF</td>
<td>141 years acc. to SN 29500 (Ed. 99) 40 °C</td>
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</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing material</td>
<td>plastic</td>
</tr>
<tr>
<td>Connection mode</td>
<td>module, plugged on rack</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 118 x 103 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

- ATEX, IECEx, FM, TR CU, KOSHA, NEPSI, INMETRO, GL, DNV, BV, LR

### Indication

- Operational readiness: 1 x green / red
- State/ Fault: 8 x yellow / red
The input module DF20EX is equipped with 8 channels according to NAMUR which are split into two blocks. There is one frequency input per block and three control inputs/outputs.

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. When connecting the field devices, care has to be taken that all inputs and/or outputs are on a common potential. The explosion protection category of inputs/outputs is Ex ia IIC.

The module can be used as a counter or frequency module: It is thus suited for pulse counting of binary input signals or frequency measurements of binary pulse sequences of NAMUR sensors.

The counting direction can either be set externally via a control input or internally by setting a parameter. The maximum frequency of one block is 4 kHz; with 2 blocks the frequency is reduced to 2 kHz.

Input and output mode can be adjusted via the PROFIBUS-DP master. Each channel is equipped with parametrizable wire-break/short-circuit monitoring.
Technical data

**Type**  
DF20EX

**Ident no.**  
6884061

**Power supply**

Supply voltage via the backplanes, central power supply

Power consumption ≤ 1 W

Galvanic separation to int. bus and supply circuit

Number of channels 2-channel

**Inputs**

Input circuits acc. to EN 60947-5-6 (NAMUR), intrinsically safe acc. to EN 60079-11

No-load voltage 8 VDC

Short-circuit current 4 mA

Switching frequency ≤ 4000 Hz

Short-circuit < 367 Ω

Wire-break < 0.2 mA

Switch-on threshold: 1.8 mA

Switch-off threshold: 1.4 mA

**Response characteristic**

Measuring accuracy ≤ 0.1 % of full scale

**Approvals and declarations**

Ex approval acc. to conformity certificate PTB 00 ATEX 2178

Device designation

II 2 (1) G Ex ib [ia] IIC T4

II 1 (1) D [Ex ia IIIC]

Max. values: Terminal connection: 1+2 / 3+4

Max. output voltage \( U_o \) ≤ 9.6 V

Max. output current \( I_o \) ≤ 44 mA

Max. output power \( P_o \) ≤ 106 mW

Characteristic linear

**Internal inductance/capacitance \( L_i/C_i \)**

\( L_i \) negligibly small

\( C_i \) negligibly small

**External inductance/capacitance \( L_o/C_o \)**

<table>
<thead>
<tr>
<th>( L_o ) [mH]</th>
<th>( C_o ) [µF]</th>
<th>( C_o ) [µF]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>0.9</td>
<td>5.1</td>
</tr>
<tr>
<td>1.0</td>
<td>1.1</td>
<td>6.1</td>
</tr>
<tr>
<td>0.5</td>
<td>1.3</td>
<td>7.3</td>
</tr>
<tr>
<td>0.2</td>
<td>1.7</td>
<td>8.6</td>
</tr>
</tbody>
</table>

**Indication**

Operational readiness 1 x green / red

State/ Fault 8 x yellow / red

**Environmental Conditions**

Ambient temperature -20 . . . +70 °C

Relative humidity ≤ 95 % at 55 °C acc. to EN 60068-2

Vibration test acc. to IEC 60068-2-6

Shock test acc. to IEC 60068-2-27

**EMC**

acc. to EN 61126-1 (2006)

acc. to NAMUR NE21 (2007)

**MTTF**

101 years acc. to SN 29500 (Ed. 99)

40 °C

**Mechanical data**

Housing material plastic

Connection mode module, plugged on rack

Protection class IP20

Dimensions 18 x 118 x 103 mm

**Approval / Certification**

ATEX, IECEx, FM, TR CU, CMI, KOSHA, INMETRO, GL, DNV, BV, LR
Input module, digital, 4-channel

The input module DI401-EX is designed for the connection of NAMUR sensors (DIN EN 60947-5-6) or mechanical contacts.

When wire-break or short-circuit monitoring are activated, mechanical contacts can only be connected with a corresponding resistor circuitry (WM1, Ident no. 0912101).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. The explosion protection category of the inputs is Ex ia IIC. The inputs are galvanically isolated from each other.

The behaviour of the inputs can be adjusted via the PROFIBUS-DP master. The following parameters can be adjusted:

- switching behaviour, switch-on delay, default value, wire-break and short circuit monitoring.

Features

- Input module for intrinsically safe sensors
- Complete galvanic isolation
## Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>DI401EX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>6884232</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th><strong>Supply voltage</strong></th>
<th>via the backplanes, central power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power consumption</strong></td>
<td>≤ 0.75 W</td>
</tr>
<tr>
<td><strong>Galvanic separation</strong></td>
<td>complete galvanic isolation acc. to EN 60079-11</td>
</tr>
<tr>
<td><strong>Number of channels</strong></td>
<td>4-channel</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th><strong>Input circuits</strong></th>
<th>acc. to EN 60947-5-6 (NAMUR), intrinsically safe acc. to EN 60079-11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No-load voltage</strong></td>
<td>8.2 VDC</td>
</tr>
<tr>
<td><strong>Short-circuit current</strong></td>
<td>2.7 mA</td>
</tr>
<tr>
<td><strong>Switching frequency</strong></td>
<td>≤ 100 Hz</td>
</tr>
<tr>
<td><strong>Short-circuit</strong></td>
<td>&lt; 367 Ω</td>
</tr>
<tr>
<td><strong>Wire-break</strong></td>
<td>&lt; 0.15 mA</td>
</tr>
<tr>
<td><strong>Switch-on threshold</strong></td>
<td>1.8 mA</td>
</tr>
<tr>
<td><strong>Switch-off threshold</strong></td>
<td>1.3 mA</td>
</tr>
</tbody>
</table>

### Approvals and declarations

| **Ex approval acc. to conformity certificate** | PTB 14 ATEX 2003 |
| **Device designation** | II 2 (1) G Ex ib [ia] IIC T4 II (1) D [Ex ia] IIIC |
| **Max. values:** | Terminal connection: 1+2 |
| **Max. output voltage U₀** | ≤ 8.7 V |
| **Max. output current I₀** | ≤ 9.3 mA |
| **Max. output power P₀** | ≤ 21 mW |
| **Characteristic** | linear |

### Internal inductance/capacitance Lᵢ/Cᵢ

| **Lᵢ** | negligibly small |
| **Cᵢ** | ≤ 2.0 nF |

### External inductance/capacitance Lₒ/Cₒ

| **Lₒ [mH]** | 2.0 | 5.0 |
| **Cₒ [µF]** | 1.2 | 5.2 |

### Indication

| **Operational readiness** | 1 x green / red |
| **State/ Fault** | 4 x yellow / red |

### Environmental Conditions

| **Ambient temperature** | -20...+70 °C |
| **Relative humidity** | ≤ 95 % at 55 °C acc. to EN 60068-2 |
| **Vibration test** | acc. to IEC 60068-2-6 |
| **Shock test** | acc. to IEC 60068-2-27 |
| **MTTF** | 111 years acc. to SN 29500 (Ed. 99) 40 °C |

## Mechanical data

| **Housing material** | plastic |
| **Connection mode** | module, plugged on rack |
| **Protection class** | IP20 |
| **Dimensions** | 18 x 118 x 103 mm |

### Approval | Certification

| | ATEX |
Output module, digital, 4-channel

The output module DO401Ex is designed for the connection of intrinsically safe actuators such as valves or indicator lights.

One actuator per channel can be connected. The choice of connection enables two intrinsically safe circuits with different Ex-data per channel.

The following values are supported for example:
- 22.5 V / 5 mA
- 19.0 V / 15 mA
- 16.0 V / 25 mA
- 14.0 V / 35 mA
- 12.0 V / 45 mA

Please see the load curve for the valve control values. Please refer to the Ex-approval of the valve manufacturer for the admissible limit values.

Features
- Output module for intrinsically safe actuators
- Complete galvanic isolation
### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>DO401EX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884203</td>
</tr>
</tbody>
</table>

#### Power supply

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>via the backplanes, central power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>≤ 4.5 W</td>
</tr>
<tr>
<td>Galvanic separation</td>
<td>complete galvanic isolation acc. to EN 60079-11</td>
</tr>
<tr>
<td>Number of channels</td>
<td>4-channel</td>
</tr>
</tbody>
</table>

#### Outputs

<table>
<thead>
<tr>
<th>Output circuits</th>
<th>for intrinsically safe actuators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching frequency</td>
<td>≤ 50 Hz</td>
</tr>
<tr>
<td>Short circuit</td>
<td>≥ 50 mA</td>
</tr>
<tr>
<td>Wire-break</td>
<td>&lt; 1 mA</td>
</tr>
</tbody>
</table>

#### Approvals and declarations

- Ex approval acc. to conformity certificate: PTB 10 ATEX 2024
- Device designation: Ex II 2 (1) G Ex ib (ia) IIC T4
- Ex II (1) D [Ex ia IIIC]  
- Max. values:
  - Terminal connection: 1+2
  - Max. output voltage $U_o$ ≤ 25 V
  - Max. output current $I_o$ ≤ 80 mA
  - Max. output power $P_o$ ≤ 750 mW
  - Characteristic angular
  - Ex-inflexion point $U_e/I_e$ 18.2 V / 41.2 mA

#### Indication

- Operational readiness 1 x green / red
- State/ Fault 4 x yellow / red

#### Environmental Conditions

- Ambient temperature -20…+70 °C
- Relative humidity ≤ 95 % at 55 °C acc. to EN 60068-2
- Vibration test acc. to IEC 60068-2-6
- Shock test acc. to IEC 60068-2-27
- EMC acc. to EN 61326-1 (2006)
- acc. to NAMUR NE21 (2007)
- MTTF 79 years acc. to SN 29500 (Ed. 99)
  - 40 °C

#### Mechanical data

- Housing material: plastic
- Connection mode: module, plugged on rack
- Protection class: IP20
- Dimensions: 18 x 118 x 103 mm

#### Approvals | Certification

- ATEX, IECEx, FMus, TR CU, KOSHA,
- INMETRO, GL, DNV, BV, LR
Input module, analog, 4-channel

The input module AI401Ex is designed for the connection of 2-wire transducers (active input = source mode / transducer passive) or 4-wire transducers (passive input = sink mode / transducer active).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. The field circuits feature protection class Ex ia IIC resp. Ex iaD.

The field circuits are galvanically isolated from each other.

HART® compatible transducers can be connected to the module. The field device can thus be parametrized directly at the terminals on the DIN rail with a licensed modem. An additional impedance in the circuit is not necessary.

The measuring range is digitized in the scope of 0…21 mA. For clear reading, the digitized value is displayed in a range of 0 … 21000 (independent of the parametrized measuring range) and transmitted to the host system.

Features

- Input module for the connection of passive transmitters (active inputs) or active transmitters (passive inputs).
- Complete galvanic isolation
## Technical data

### Type
- **Type**: AI401Ex
- **Ident no.**: 6884204

### Power supply
- **Supply voltage**: via the backplanes, central power supply
- **Power consumption**: ≤ 2.2 W
- **Galvanic separation**: complete galvanic isolation acc. to EN 60079-11
- **Number of channels**: 4-channel

### Inputs
- **Input circuits**: intrinsically safe acc. to EN 60079-11, 0/4…20 mA
- **Supply voltage**: 15 VDC at 20 mA
- **Overload capability**: > 21 mA
- **Low level control**: < 3.6 mA
- **Short-circuit**: > 24 mA (only in live zero mode)
- **Wire-break**: < 2 mA (only in live zero mode)

### Response characteristic
- **Resolution**: 14 Bit
- **Linearity deviation**: ≤ 0.05 % full scale
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time/fall time**: ≤ 50 ms (10 … 90 %)
- **Max. measurement tolerance under EMC influence**: ≤ 0.1 %

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: PTB 03 ATEX 2217
- **Device designation**:
  - II 2 (1) G Ex ib [ia] IIC T4
  - II (1) D [Ex iaD]
- **Max. values**: Terminal connection: 1+2
  - Max. output voltage $U_o$: ≤ 19.1 V
  - Max. output current $I_o$: ≤ 90 mA
  - Max. output power $P_o$: ≤ 615 mW
  - Internal resistance $R_i$: 304 Ω
- **Characteristic**: trapezoidal

### Internal inductance/capacitance $L_i/C_i$
- $L_i$: negligibly small
- $C_i$: negligibly small

### External inductance/capacitance $L_o/C_o$

<table>
<thead>
<tr>
<th></th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ [mH]</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>$C_o$ [nF]</td>
<td>1900</td>
<td>8600</td>
</tr>
</tbody>
</table>

### Indication
- **Operational readiness**: 1 x green / red
- **State/Fault**: 4 x red

### Environmental Conditions
- **Ambient temperature**: -20…+70 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **EMC**: acc. to EN 61326-1 (2006)
  - acc. to NAMUR NE21 (2007)
- **MTTF**: 77 years acc. to SN 29500 (Ed. 99)
  - 40 °C

### Mechanical data
- **Housing material**: plastic
- **Connection mode**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm

### Approval | Certification

- ATEX, FM, cFMus, TR CU, CMI, INMETRO, GL, DNV, BV, LR
**Input module, analog, passive, 4-channel**

The input module AI41Ex is designed for the connection of 4-wire transducers (passive input = sink mode / transducer active).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. The explosion protection category of the inputs is Ex ia IIC. The inputs are galvanically isolated from each other.

The resolution is 14 bit, i.e. the analog value between 0…21 mA is represented as a number between 0 and 16383. For clear reading, the digitized value is displayed in a range of 0…21000 and transmitted to the host system. For transmission to the host system, voltage is indicated as a value in a range between 0…10000.

### Features
- Input module for the connection of active transmitters (passive inputs)
- Complete galvanic isolation
### Technical data

**Type**
- A41EX

**Ident no.**
- 6884020

**Power supply**
- **Supply voltage**
  - via the backplanes, central power supply
- **Power consumption**
  - ≤ 1 W
- **Galvanic separation**
  - complete galvanic isolation acc. to EN 60079-11
- **Number of channels**
  - 4-channel

**Inputs**
- **Input circuits**
  - intrinsically safe acc. to EN 60079-11, 0/4…20 mA
- **Overload capability**
  - > 22 mA
- **Low level control**
  - < 3.6 mA
- **Short-circuit**
  - < 5 V (only in live zero mode)
- **Wire-break**
  - < 2 mA (only in live zero mode)

**Response characteristic**
- **Resolution**
  - 14 Bit
- **Linearity deviation**
  - ≤ 0.1 % full scale
- **Temperature drift**
  - ≤ 0.005 % / K
- **Rise time/fall time**
  - ≤ 50 ms (10 … 90 %)

**Approvals and declarations**
- **Ex approval acc. to conformity certificate**
  - PTB 03 ATEX 2023
- **Device designation**
  - Ex II 2 (1GD) G Ex ib [ia] IIC T4
- **Max. output voltage Uo**
  - ≤ 6.6 V
- **Max. output current Io**
  - ≤ 2.1 mA
- **Max. output power Po**
  - ≤ 3.5 mW
- **Characteristic**
  - linear

**External inductance/capacitance L/C**

<table>
<thead>
<tr>
<th></th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lᵣ [mH]</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Cᵣ [µF]</td>
<td>2.0</td>
<td>11</td>
</tr>
<tr>
<td>Cₐ [µF]</td>
<td>2.3</td>
<td>12</td>
</tr>
<tr>
<td>Cₐ [µF]</td>
<td>2.7</td>
<td>15</td>
</tr>
<tr>
<td>Cₐ [µF]</td>
<td>3.3</td>
<td>19</td>
</tr>
</tbody>
</table>

**Environmental Conditions**
- **Ambient temperature**
  - -20…+60 °C
- **Relative humidity**
  - ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**
  - acc. to IEC 60068-2-6
- **Shock test**
  - acc. to IEC 60068-2-27
- **EMC**
  - acc. to EN 61326-1 (2006)
  - acc. to NAMUR NE21 (2007)
- **MTTF**
  - 98 years acc. to SN 29500 (Ed. 99)

**Mechanical data**
- **Housing material**
  - plastic
- **Connection mode**
  - module, plugged on rack
- **Protection class**
  - IP20
- **Dimensions**
  - 18 x 118 x 103 mm

**Approval | Certification**
- ATEX, TR CU, CMI, INMETRO
Potentiometer module, 4-channel

The analog input module AI43Ex is designed for the connection of potentiometers in 3 or 4-wire technology. If 3-wire potentiometers are used, the terminals at the module rack have to be bridged. Resistance measurements, i.e. the evaluation of potentiometers with a 2-wire connection, is not possible.

The module has four field circuits to control 3 or 4-wire potentiometers. The field circuits are galvanically isolated from the power supply, from the internal bus and from each other. The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. The explosion protection category of the inputs is Ex ia IIC.

Each potentiometer input is monitored for wire break. The interruption of a single connection line is securely detected, as well as any combination of interruptions occurring at the four input connection lines. Short-circuit monitoring is not carried out. In case of a line error, the parametrized substitute value is immediately output and the output value is set to ‘invalid-bit’. This state is maintained until valid measured values are provided again.

The resolution is 14 bit. For clear reading, 0…100 % is digitized and displayed in a range of 0…10000 (independent of the parametrized measuring range) and transmitted to the host system.

Features

- Input module for the connection of potentiometers
- Complete galvanic isolation
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>AI43EX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884137</td>
</tr>
</tbody>
</table>

### Power supply

- **Supply voltage**: via the backplanes, central power supply
- **Power consumption**: ≤ 1.5 W
- **Galvanic separation**: complete galvanic isolation acc. to EN 60079-11
- **Number of channels**: 4-channel

### Inputs

- **Input circuits**: intrinsically safe acc. to EN 60079-11, potentiometer
- **Nominal resistance**: 400 Ω … 12 kΩ

### Response characteristic

- **Resolution**: 14 Bit
- **Linearity deviation**: ≤ 0.1 % full scale
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time/fall time**: ≤ 50 ms (10 … 90 %)
- **Max. measurement tolerance under EMC influence**: ≤ 0.1 % with shielded signal cable

### Approvals and declarations

- **Ex approval acc. to conformity certificate**: PTB 06 ATEX 2026
- **Device designation**: Ex II 2 (1GD) G Ex ib [ia] IIC T4
- **Max. values**:
  - Terminal connection: 1 … 4
  - Max. output voltage $U_o$: ≤ 6.6 V
  - Max. output current $I_o$: ≤ 25 mA
  - Max. output power $P_o$: ≤ 42 mW
- **Characteristic**: linear

### Environmental Conditions

- **Ambient temperature**: -20…+60 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **EMC**: acc. to EN 61326-1 (2006)  
  acc. to NAMUR NE21 (2007)
- **MTTF**: 71 years acc. to SN 29500 (Ed. 99)  
  40 °C

## Mechanical data

<table>
<thead>
<tr>
<th>Housing material</th>
<th>plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection mode</td>
<td>module, plugged on rack</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 118 x 103 mm</td>
</tr>
</tbody>
</table>

## Approval / Certification

- ATEX, TR CU, CMI, GL, DNV, BV, LR
**Output module, analog, 4-channel**

The output module AO401Ex is designed for the connection of intrinsically safe analog actuators such as control valves or process indicators.

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. The explosion protection category of the outputs is Ex ia IIC resp. Ex iaD. The outputs are galvanically isolated from each other.

HART® compatible transducers can be connected to the module. The field device can thus be parametrized directly at the terminals on the DIN rail with a licensed modem. An additional impedance in the circuit is not necessary.

The host system transmits a digitized control value 0…21000 (independent of the parametrized measuring range). This raw value is then transformed by the AO401Ex into a signal between 0…21 mA.

---

**Features**

- Output module for the connection of analog actuators
- Complete galvanic isolation
**Technical data**

**Type**
- AO401Ex

**Ident no.**
- 6884205

**Power supply**
- Supply voltage: via the backplanes, central power supply
- Power consumption: ≤ 2.2 W
- Galvanic separation: complete galvanic isolation acc. to EN 60079-11
- Number of channels: 4-channel

**Outputs**
- Output circuits: intrinsically safe acc. to EN 60079-11, 0/4...20 mA
- No-load voltage: 16 VDC
- External load: ≤ 640 Ω
- Short circuit: < 50 Ω (only in live zero mode)
- Wire-break: < 2 mA (only in live zero mode)

**Response characteristic**
- Resolution: 13 Bit
- Linearity deviation: ≤ 0.05 % full scale
- Temperature drift: ≤ 0.005 % / K
- Rise time/fall time: ≤ 50 ms (10…90 %)
- Max. measurement tolerance under EMC influence: ≤ 0.1 %

**Approvals and declarations**
- Ex approval acc. to conformity certificate: PTB 00 ATEX 2179
- Device designation: Ex II 2 (1) G Ex ib [ia] IIC T4
- Max. values: Terminal connection: 1+2
  - Max. output voltage $U_o$: ≤ 18.9 V
  - Max. output current $I_o$: ≤ 80 mA
  - Max. output power $P_o$: ≤ 510 mW
  - Internal resistance $R_i$: 334 Ω
- Characteristic: trapezoidal

**Internal inductance/capacitance $L_i/C_i$**
- $L_i$: negligibly small
- $C_i$: negligibly small

**External inductance/capacitance $L_o/C_o$**

<table>
<thead>
<tr>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ [mH]</td>
<td>$C_o$ [$\mu$F]</td>
</tr>
<tr>
<td>2.0</td>
<td>0.12</td>
</tr>
<tr>
<td>1.0</td>
<td>0.12</td>
</tr>
<tr>
<td>0.5</td>
<td>0.14</td>
</tr>
<tr>
<td>0.2</td>
<td>0.18</td>
</tr>
</tbody>
</table>

**Indication**
- Operational readiness: 1 x green / red
- State/ Fault: 4 x red

**Environmental Conditions**
- Ambient temperature: -20...+70 °C
- Relative humidity: ≤ 95 % at 55 °C acc. to EN 60068-2
- Vibration test: acc. to IEC 60068-2-6
- EMC: acc. to NAMUR NE21 (2007)
- MTTF: 78 years acc. to SN 29500 (Ed. 99)
- 40 °C

**Mechanical data**
- Housing material: plastic
- Connection mode: module, plugged on rack
- Protection class: IP20
- Dimensions: 18 x 118 x 103 mm

**Approval | Certification**
- ATEX, FM, TR CU, CMI, INMETRO, GL, DNV, BV, LR
Input module, analog, active, HART®, 4-channel

The input module AlH40Ex is designed for the connection of 2-wire transducers (active input = source mode/transducer passive).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. The explosion protection category of the inputs is Ex ia IIC.

The inputs are not galvanically isolated from each other. When connecting the field devices, care has to be taken that all inputs are on a common potential.

HART® compatible sensors connected to the module communicate with the integrated HART® controller.

The resolution is 14 bit, i.e. the analog value between 0...21 mA is represented as a number between 0 and 16383. For clear reading, the digitized value is displayed in a range of 0...21000 and transmitted to the host system.

Up to 8 HART® variables (max. 4 per channel) can be read via the cyclical PROFIBUS data traffic. The bidirectional exchange of variables between the host system and the HART® transmitter is implemented via PROFIBUS-DPV1.

Parameters like wire-break or short-circuit monitoring, measuring range, HART® communication etc., can be adjusted for each channel separately and are solely initialized by the PROFIBUS master.

Features

- Input module for connection of 2-wire transmitters
- Transmission of HART® data

The input module AlH40Ex has a terminal configuration allowing connection of 4 channels.
## Technical data

**Type**

<table>
<thead>
<tr>
<th>Type</th>
<th>Ident no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIH40EX</td>
<td>6884001</td>
</tr>
</tbody>
</table>

**Power supply**

- **Supply voltage**: via the backplanes, central power supply
- **Power consumption**: ≤ 3 W
- **Galvanic separation**: to int. bus and supply circuit
- **Number of channels**: 4-channel

**Inputs**

- **Input circuits**: intrinsically safe acc. to EN 60079-11, 0/4…20 mA
- **Supply voltage**: 15 VDC at 22 mA
- **HART® Impedance**: > 240 Ω
- **Overload capability**: > 22 mA
- **Low level control**: < 3.6 mA
- **Short-circuit**: < 5 V (only in live zero mode)
- **Wire-break**: < 2 mA (only in live zero mode)

**Response characteristic**

- **Resolution**: 14 Bit
- **Linearity deviation**: ≤ 0.1 % full scale
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time/fall time**: ≤ 50 ms (10 … 90 %)
- **Max. measurement tolerance under EMC influence**: ≤ 0.1 % with shielded signal cable ≤ 1 % with unshielded signal cable

**Approvals and declarations**

- **Ex approval acc. to conformity certificate**: PTB 00 ATEX 2059 X
- **Device designation**: II 2 (1) G Ex ib [ia] IIC T4 II (1) D [Ex ia IIIC]
- **Max. values**: Terminal connection: 1+2
- **Max. output voltage**: Uo ≤ 22.1 V
- **Max. output current**: Io ≤ 93 mA
- **Max. output power**: Po ≤ 640 mW
- **Characteristic**: trapezoidal

**Internal inductance/capacitance** $L_i/C_i$

- $L_i$ ≤ 0.22 mH
- $C_i$ ≤ 1.1 nF

**External inductance/capacitance** $L_o/C_o$

<table>
<thead>
<tr>
<th></th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ [mH]</td>
<td>0.5</td>
<td>2.0</td>
</tr>
<tr>
<td>$C_o$ [nF]</td>
<td>65</td>
<td>270</td>
</tr>
</tbody>
</table>

**Indication**

- **Operational readiness**: 1 x green / red
- **State/Fault**: 4 x red

**Environmental Conditions**

- **Ambient temperature**: -20…+60 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6

**Shock test**

acc. to IEC 60068-2-27

**EMC**


**MTTF**

61 years acc. to SN 29500 (Ed. 99) 40 °C

**Mechanical data**

- **Housing material**: plastic
- **Module, plugged on rack**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm

**Approval/Certification**

ATEX, IECEx, FM, TR CU, CMI, KOSHA, NEPSI, INMETRO, GL, DNV, BV, LR
Input module, analog, passive, HART®, 4-channel

The input module AIH41Ex is designed for the connection of 4-wire transducers (passive input = sink mode / transducer active).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. The explosion protection category of the inputs is Ex ia IIC.

The inputs are not galvanically isolated from each other. When connecting the field devices, care has to be taken that all inputs are on a common potential.

HART® compatible sensors connected to the module communicate with the HART® controller.

The resolution is 14 bit, i.e. the analog value between 0…21 mA is represented as a number between 0 and 16383. For clear reading, the digitized value is displayed in a range of 0…21000 and transmitted to the host system.

Up to 8 HART® variables (max. 4 per channel) can be read via the cyclical PROFIBUS data traffic. The bidirectional exchange of variables between the host system and the HART® transmitter is implemented via PROFIBUS-DPV1.

Parameters like wire-break or short-circuit monitoring, measuring range, HART® communication etc., can be adjusted for each channel separately and are solely initialized by the PROFIBUS master.
## Technical data

### Type
- Type: AIH41EX
- Ident no.: 6884005

### Power supply
- Supply voltage: via the backplanes, central power supply
- Power consumption: ≤ 1 W
- Galvanic separation: to int. bus and supply circuit
- Number of channels: 4-channel

### Inputs
- Input circuits: intrinsically safe acc. to EN 60079-11, 0/4...20 mA
- HART® Impedance: > 240 Ω
- Overload capability: > 22 mA
- Low level control: < 3.6 mA
- Short-circuit: < 5 V (only in live zero mode)
- Wire-break: < 2 mA (only in live zero mode)

### Response characteristic
- Resolution: 14 Bit
- Linearity deviation: ≤ 0.1 % full scale
- Temperature drift: ≤ 0.005 % / K
- Rise time/fall time: ≤ 50 ms (10...90 %)
- Max. measurement tolerance under EMC influence: ≤ 0.1 % with shielded signal cable
- MTTF: 93 years acc. to SN 29500 (Ed. 99)

### Approvals and declarations
- Ex approval acc. to conformity certificate: PTB 00 ATEX 2059 X
- Max. values: Terminal connection: 3+4
- Max. output voltage Uo: ≤ 7.2 V
- Max. output current Io: ≤ 16 mA
- Max. output power Po: ≤ 29 mW
- Characteristic linear

### Internal inductance/capacitance L_i/C_i
- L_i ≤ 0.11 mH
- C_i ≤ 1.1 nF

### External inductance/capacitance L_o/C_o
- IIC: 0.39 mH, 63.9 nF
- IIB: 1.89 mH, 268 nF

### Indication
- Operational readiness: 1 x green / red
- State/ Fault: 4 x red

### Environmental Conditions
- Ambient temperature: -20...+60 °C
- Relative humidity: ≤ 95 % at 55 °C acc. to EN 60068-2
- Vibration test: acc. to IEC 60068-2-6
- Shock test: acc. to IEC 60068-2-27
The output module AOH40Ex is designed for the connection of intrinsically safe analog actuators such as control valves or process indicators. The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom\(^*\). Explosion protection category is Ex ia IIC.

The outputs are not galvanically isolated from each other. When connecting the field devices, care has to be taken that all outputs are on a common potential. HART\(^*\) compatible actuators connected to the module communicate directly with the HART\(^*\) controller.

The resolution is 13 bit, i.e. the analog value of 0…21 mA is represented as a number between 0 and 8191. For easier operation, the host system operates in a value range between 0…21000. This raw value is reduced by the AOH40EX to a 13-bit resolution.

Parameters such as line monitoring, substitute values etc. can be adjusted for each channel separately and are initialized solely by the master.
# Technical data

## Type
- **Type**: AOIH40EX
- **Ident no.**: 6884003

## Power supply
- **Supply voltage**: via the backplanes, central power supply
- **Power consumption**: ≤ 3 W
- **Galvanic separation**: to int. bus and supply circuit
- **Number of channels**: 4-channel

## Outputs
- **Output circuits**: intrinsically safe acc. to EN 60079-11, 0/4…20 mA
- **No-load voltage**: 16 VDC
- **HART™ Impedance**: > 240 Ω
- **External load**: ≤ 600 Ω
- **Short circuit**: < 50 Ω (only in live zero mode)
- **Wire-break**: > 15 V (only in live zero mode)

## Response characteristic
- **Resolution**: 13 Bit
- **Linearity deviation**: ≤ 0.1 % full scale
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time/fall time**: ≤ 50 ms (10 … 90 %)
- **Max. measurement tolerance under EMC influence**: ≤ 1 % with shielded signal cable

## Approvals and declarations
- **Ex approval acc. to conformity certificate**: PTB 02 ATEX 2051
- **Device designation**: É II 2 (1) G Ex ib [ia] IIC T4
- **Max. values**: Terminal connection: 1+2
- **Max. output voltage**: $U_o \leq 22.1$ V
- **Max. output current**: $I_o \leq 93$ mA
- **Max. output power**: $P_o \leq 640$ mW
- **Characteristic**: trapezoidal

## Internal inductance/capacitance $L_i/C_i$
- $L_i \leq 0.22$ mH
- $C_i \leq 1.1$ nF

## External inductance/capacitance $L_o/C_o$

<table>
<thead>
<tr>
<th></th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ [mH]</td>
<td>0.5</td>
<td>2.0</td>
</tr>
<tr>
<td>$C_o$ [nF]</td>
<td>65</td>
<td>270</td>
</tr>
</tbody>
</table>

## Indication
- **Operational readiness**: 1 x green / red
- **State/ Fault**: 4 x red

## Environmental Conditions
- **Ambient temperature**: -20 … +60 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **EMC**: acc. to EN 61326-1 (2006)
  - acc. to NAMUR NE21 (2007)

## Mechanical data
- **Housing material**: plastic
- **Connection mode**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm

## Approval | Certification
- ATEX, IECEx, TR CU, CMI, KOSHA, NEPSI, INMETRO, GL, DNV, BV, LR

## MTTF
- 66 years acc. to SN 29500 (Ed. 99)
- 40 °C
The input module T140Ex is designed for the connection of 2, 3 and 4-wire temperature probes of the types Pt100, Pt200, Pt500, Pt1000, Ni100 and Cu100, as well as for the connection of thermocouples of the types B, E, J, K, L, N, R, S, T and U. The module can also be used for the measurement of low voltages (-75...+75 mV, -1.2...+1.2 V) and resistance measurements (0...30 Ω, 0...300 Ω, 0...3 kΩ).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom*. The explosion protection category of the inputs is Ex ia IIC.

Line compensation of 2-wire temperature resistors is done by means of parametrized resistance values. These values have to be determined first through measurements.

When using thermocouples, external cold junction compensation can be carried out separately for each channel by connecting resistors such as the Pt100 to the two unused terminals. Internal compensation instead is parametrized for all channels via an integrated PT100 resistor.

The internal resolution is 16 bit, the analog value is represented as a number between 0 and 32767 on the PROFIBUS-DP. The temperature is indicated in Kelvin. For conversion to °C, please observe an offset of 273.2.

Parameters such as line monitoring, substitute values etc. can be adjusted for each channel separately and are initialized solely by the master.
Technical data

**Type**
Type: TH40Ex
Ident no.: 6884000

**Power supply**
Supply voltage: via module rack, central power supply module
Power consumption: \( \leq 1 \text{ W} \)
Galvanic separation: complete galvanic isolation acc. to EN 60079-11
Number of channels: 4-channel

**Inputs**
Input circuits: intrinsically-safe acc. to EN 60079-11, Cu100, Ni 100, Pt100, Pt200, Pt500, Pt1000, thermocouple

**Response characteristic**
Resolution: 16 Bit
Linearity deviation: \( \leq 0.05 \% \) measuring range
Temperature drift: \( \leq 0.005 \% / \text{K} \)
Rise time/fall time: \( \leq 1.3 \text{ s} (10 \ldots 90 \%) \)
Max. measurement tolerance under EMC influence: \( \leq 1 \% \) with shielded signal cable

**Approvals and declarations**
Ex approval acc. to conformity certificate: PTB 00 ATEX 2181
Device designation: II 2 (1) G Ex ib [ia] IIC T4
Max. values:
- Max. output voltage \( U_0 \): \( \leq 5.5 \text{ V} \)
- Max. output current \( I_i \): \( \leq 25 \text{ mA} \)
- Max. output power \( P_i \): \( \leq 35 \text{ mW} \)
Characteristic: linear

**Internal inductance/capacitance \( L_i/C_i \)**
- \( L_i \): negligibly small
- \( C_i \): \( \leq 60.0 \text{ nF} \)

**External inductance/capacitance \( L_e/C_e \)**

<table>
<thead>
<tr>
<th>( L_e ) (mH)</th>
<th>( C_e ) (( \mu \text{F} ))</th>
<th>( C_e ) (( \mu \text{F} ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>1.6</td>
<td>9.8</td>
</tr>
<tr>
<td>1.0</td>
<td>1.9</td>
<td>12</td>
</tr>
<tr>
<td>0.5</td>
<td>2.3</td>
<td>14</td>
</tr>
<tr>
<td>0.2</td>
<td>3.0</td>
<td>19</td>
</tr>
</tbody>
</table>

**Indication**
Operational readiness: 1 x green / red
State/ Fault: 4 x red

**Environmental Conditions**
Ambient temperature: \(-20 \ldots +60 \text{ °C}\)
Relative humidity: \( \leq 95 \% \) at 55 \text{ °C} acc. to EN 60068-2
Vibration test: acc. to IEC 60068-2-6
Shock test: acc. to IEC 60068-2-27
EMC: acc. to EN 61326-1 (2006)
acc. to NAMUR NE21 (2007)
MTTF: 62 years acc. to SN 29500 (Ed. 99) 40 °C

**Mechanical data**
Housing material: plastic
Connection mode: module, plugged on rack
Protection class: IP20
Dimensions: 18 x 118 x 103 mm

**Approval | Certification**
ATEX, IECEx, FM, TR CU, CMI, KOSHA, NEPSI, INMETRO, GL, DNV, BV, LR
The input module TI41Ex is designed for the connection of the 2, 3 and 4-wire temperature probes Pt100, Ni100 and CU100.

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom®. The explosion protection category of the inputs is Ex ia IIC.

Line compensation of 2-wire temperature resistors is done by means of parametrized resistance values. These values have to be determined first through measurements.

The analog resistance value is digitized to 16-bit. The temperature is given in Kelvin, the resolution in 0.1 K steps. For conversion to °C, please observe an offset of 273.2.

Features

- Input module for the connection of RTDs (resistance thermo detectors)
- Complete galvanic isolation

Parameters such as line monitoring, substitute values etc. can be adjusted for each channel separately and are initialized solely by the master.
## Technical data

| Type | TI41Ex |
| Ident no. | 6884190 |

### Power supply
- **Supply voltage**: via module rack, central power supply module
- **Power consumption**: ≤ 1 W
- **Galvanic separation**: complete galvanic isolation acc. to EN 60079-11
- **Number of channels**: 4-channel

### Inputs
- **Input circuits**: intrinsically-safe acc. to EN 60079-11, Cu100, Ni100, Pt100

### Response characteristic
- **Resolution**: 16 Bit
- **Linearity deviation**: ≤ 0.01 \% measuring range
- **Temperature drift**: ≤ 0.002 \% / K
- **Rise time/fall time**: ≤ 50 ms (10 … 90 \%)
- **Max. measurement tolerance under EMC influence**: ≤ 0.1 \% with shielded signal cable

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: PTB 13 ATEX 2014
- **Device designation**: ÉII 2 (1) G Ex ib [ia] IIC T4
- **Max. output voltage U_o**: ≤ 5.3 V
- **Max. output current I_o**: ≤ 4.5 mA
- **Max. output power P_o**: ≤ 6 mW

### External inductance/capacitance L_e/C_e

<table>
<thead>
<tr>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_e (mH)</td>
<td>C_e (µF)</td>
</tr>
<tr>
<td>3.0</td>
<td>1.6</td>
</tr>
<tr>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>1.0</td>
<td>2.5</td>
</tr>
<tr>
<td>0.5</td>
<td>3.0</td>
</tr>
<tr>
<td>0.2</td>
<td>4.0</td>
</tr>
<tr>
<td>0.1</td>
<td>5.1</td>
</tr>
</tbody>
</table>

### Indication
- **Operational readiness**: 1 x green / red
- **State/ Fault**: 4 x red

### Environmental Conditions
- **Ambient temperature**: -20 … +70 °C
- **Relative humidity**: ≤ 95 \% at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
**PROFIBUS-DP interface**

The GDP-IS gateway serves to connect the `excom*` system to PROFIBUS-DP networks. Connection to the PROFIBUS-DP is established via optical fibers or copper cables. When using optical fibers for data transmission an optocoupler pair must be installed between wired and optical PROFIBUS which also adapts the level to the IS layer. When using copper cables a segment coupler (RS485-IS coupler) must be installed to ensure explosion protection.

The gateway can be operated at a maximum transmission rate of 1500 kbps. The bus is connected to a standard miniature SUB-D slot on the module rack.

A GSD file containing all configuration files and parameter sets is available for system configuration. When connected to suitable host systems, you can change the system configuration during operation.

The gateway provides the entire range of PROFIBUS diagnostic functions including port-related diagnostics. Additionally, manufacturer-specific error codes are generated. For example HART® communication errors, power supply errors, planning errors as well as information on simulators, internal communication and redundancy status.

**Features**
- Intrinsically safe gateway for PROFIBUS-DPV1
- Connection of the `excom*` station to the PROFIBUS-DP networks
- Baud rate max. 1.5 Mbps
- PROFIBUS interface acc. to PROFIBUS user organization (PNO) with RS485-IS layer

**Redundancy**: The use of two gateways and two bus cables ensures error-free communication, in case one gateway or one bus line may fail. If one gateway fails, the other takes over smoothly, this is called line redundancy. System redundancy (two masters, each connected to a gateway) is also supported.

**Recommended wiring components:**
- PROFIBUS-DP cable, type 452B
- D9T-RS485IS male
- Segment coupler SC12Ex
- Fiber-optic coupler OC11Ex/…
## Technical data

### Type
- **GDP-IS/FW2.2**
- **Ident no.** 6884210

### Power supply
- **Supply voltage** via module rack, central power supply module
- **Power consumption** \( \leq 1 \text{ W} \)
- **Galvanic separation** complete galvanic isolation acc. to EN 60079-11

### System data
- **Fieldbus transmission rate** 9.6 kbps ... 1.5 Mbps
- **Fieldbus address range** 1 ... 99

### Approvals and declarations
- **Ex approval acc. to conformity certificate** PTB 09 ATEX 2013
- **Device designation** Ex ib IIC T4
- **Max. values:**
  - Max. output voltage \( U_o \) \( \leq 3.6 \text{ V} \)
  - Max. output current \( I_o \) \( \leq 125 \text{ mA} \)
  - Max. output power \( P_o \) \( \leq 112.5 \text{ mW} \)
  - Characteristic linear
- **Max. input voltage \( U_i \) ** \( \leq 4.2 \text{ V} \)

### External RS485 fieldbus system:
- **Protection type** Ex ib IIC
- **Highest value of each terminal pair:** \( U_i = 4.2 \text{ V} \)
- **Highest value of the terminal pairs:** \( \sum I_i = 4.8 \text{ A} \)

### Cables type A resp. B acc. to EN 60079-25 with the following assignments:
- \( L'/R' \leq 15 \mu \text{H/} \Omega \)
- \( C' \leq 250 \text{ nF/km} \)
- Ø lead \( \geq 0.2 \text{ mm} \)

Massed inductances and capacitances in the external fieldbus system are not permitted

### Indication
- **Operational readiness** 1 x green / red
- **Int. communication (CAN)** 1 x yellow / red
- **Ext. Communication (PDP)** 1 x yellow / red
- **Redundancy readiness (PRIO)** 1 x yellow / red
- **Error indication** 1 x red

### Environmental Conditions
- **Ambient temperature** -20...+70 °C
- **Relative humidity** \( \leq 95\% \) at 55 °C acc. to EN 60068-2
- **Vibration test** acc. to IEC 60068-2-6
- **Shock test** acc. to IEC 60068-2-27
- **MTTF** 126 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Housing material** plastic
- **Connection mode** module, plugged on rack
- **Protection class** IP20
- **Dimensions** 18 x 118 x 103 mm

### Approval | Certification
- ATEX, IECEx, FM, TR CU, KOSHA, INMETRO, GL, DNV, BV, LR
**PROFIBUS-DP interface**

The GDP-NI gateway serves to connect the excom® system to PROFIBUS-DP networks. Connection to the PROFIBUS-DP is established via optical fibers or copper cables. When using optical fibers for data transmission, an optocoupler pair must be installed between wired and optical PROFIBUS.

The gateway can be operated at a maximum transmission rate of 1500 kbps. The bus is connected to a standard miniature SUB-D slot on the module rack.

A GSD file containing all configuration files and parameter sets is available for system configuration. When connected to suitable host systems, you can change the system configuration during operation.

The gateway provides the entire range of PROFIBUS diagnostic functions including port-related diagnostics. Additionally, manufacturer-specific error codes are generated. For example HART® communication errors, power supply errors, planning errors as well as information on simulators, internal communication and redundancy status.

**Redundancy**: The use of two gateways and two bus cables ensures error-free communication, in case one gateway or one bus line may fail. If one gateway fails, the other takes over smoothly, this is called line redundancy. System redundancy (two masters, each connected to a gateway) is also supported.

**Recommended wiring components:**
- PROFIBUS-DP cable, type 452
- D9T-RS485 male

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**Features**

- Gateway for PROFIBUS-DPV1 communication
- Connection of the excom® station to the PROFIBUS-DP networks
- Baud rate max. 1.5 Mbps
- PROFIBUS interface acc. to PROFIBUS user organization (PNO)
## Technical data

### Type
- **GDP-NI/FW2.2**
- **Ident no.** 6884225

### Power supply
- **Supply voltage** via module rack, central power supply module
- **Power consumption** \( \leq 1 \text{ W} \)
- **Galvanic separation** complete galvanic isolation

### System data
- **Fieldbus transmission rate** 9.6 kbps \( \ldots \) 1.5 Mbps
- **Fieldbus address range** 1 \( \ldots \) 99

### Approvals and declarations
- **Ex approval** acc. to conformity certificate PTB 13 ATEX 2013 X
- **Device designation** \( \mathbb{E} \) II (2) G [Ex ib] IIC

### Indication
- **Operational readiness** 1 x green / red
- **Int. communication (CAN)** 1 x yellow / red
- **Ext. Communication (PDP)** 1 x yellow / red
- **Redundancy readiness (PRI0)** 1 x yellow / red
- **Error indication** 1 x red

### Environmental Conditions
- **Ambient temperature** \(-20 \ldots +70 \text{ °C}\)
- **Relative humidity** \( \leq 95 \% \) at 55 °C acc. to EN 60068-2
- **Vibration test** acc. to IEC 60068-2-6
- **Shock test** acc. to IEC 60068-2-27
- **EMC** acc. to EN 61326-1 (2006)
  acc. to NAMUR NE21 (2007)
- **MTTF** acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Housing material** plastic
- **Connection mode** module, plugged on rack
- **Protection class** IP20
- **Dimensions** 18 x 118 x 103 mm

### Approval | Certification
- **ATEX**
excom® – Remote-I/O system
Power supply module for installation in zone 1

Power supply module, 24 VDC, zone 1

The PSD24Ex module supplies the excom® system with power to the full extension. The module rack is designed in a combined protection rating of Ex m, Ex e and Ex i and can therefore be used in zone 1. It is also fully potted and installed in a die-cast aluminium enclosure.

The module is powered with 24 VDC. The external power supply is plugged on the module rack via Ex e clamps. Any contact with the clamps under power should be avoided. The clamps are located under a closure cap. Interventions are only allowed after switching off the respective supply voltage.

Features
- DC power supply module, supplies a fully assembled module rack in zone 1

Redundancy: Two power supply modules can be installed together with an appropriate module rack. In case of power cut or failure of one device, the second unit provides the power for the whole system. Different potentials can be supplied.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>PSD24EX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6881721</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>19.2…32 VDC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>( \leq 66.5 \text{ W} )</td>
</tr>
<tr>
<td>Output power</td>
<td>( \leq 60 \text{ W} )</td>
</tr>
<tr>
<td>Galvanic separation</td>
<td>Galvanically isolated input and output circuit, rated voltage 60 V</td>
</tr>
</tbody>
</table>

### Approvals and declarations

| Ex approval acc. to conformity certificate | PTB 00 ATEX 2193 |
| Device designation | II 2 G Ex eb mb [ib] IIC T4 |

### Indication

| Operational readiness | 1 x green |
| Supply voltage | 1 x green |

### Environmental Conditions

| Ambient temperature | -20…+70 °C |
| Relative humidity | \( \leq 95 \% \) at 55 °C acc. to EN 60068-2 |
| Vibration test | acc. to IEC 60068-2-6 |
| Shock test | acc. to IEC 60068-2-27 |
| MTTF | 78 years acc. to SN 29500 (Ed. 99) at 40 °C |

### Mechanical data

| Electrical connection | via backplane |
| Terminal cross-section | 2.5 mm\(^2\) flexible / 4.0 mm\(^2\) rigid |
| Housing material | Aluminium |
| Connection mode | Flange, 4 x M4 screws |
| Protection class | IP50 |
| Dimensions | 45 x 155 x 106 mm |

### Approval | Certification

ATEX, IECEx, FM\textsubscript{US}, TR CU, KOSHA, NEPSI, INMETRO, GL, DNV, BV, LR
The AC/DC converter PPSA230Ex supplies the excom® system with power to the full extension. A combined protection rating of Ex m and Ex e enables application in zone 1. It is also fully potted and installed in a die-cast aluminium enclosure.

The module is powered with 230 VAC. The external power supply is plugged on the module rack via Ex e clamps. Any contact with the clamps under power should be avoided. The clamps are located under a closure cap. Interventions are only allowed after switching off the respective supply voltage.

**Features**
- AC/DC converter for AC supply of DC power supply module

**Redundancy:** Two power supply modules can be installed together with an appropriate module rack. In case of power cut or failure of one device, the second unit provides the power for the whole system. Different potentials can be supplied.

---

**Diagram:**

The diagram shows the connections for power supply and protection.

**Features diagram:**

- **PPS:** Power supply connections
- **PE:** Protective earth
- **L:** Line
- **N:** Neutral
- **+** and **-** indicate polarity

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**Excom® – Remote-I/O system**

Power supply module for installation in zone 1

**Converter, 230 VAC**
## Technical data

### Power supply
- **Type**
  - PPSA230EX
- **Ident no.**
  - 6900293
- **Nominal voltage**
  - 230 VAC
- **Operating voltage range**
  - 200…250 VAC
- **Power consumption**
  - ≤ 85 VA
- **Output power**
  - ≤ 66.5 W
- **Galvanic separation**
  - Galvanically isolated input and output circuit, rated voltage 250 V

### Approvals and declarations
- **Ex approval acc. to conformity certificate**
  - PTB 04 ATEX 2047
- **Device designation**
  - Ex II 2 G Ex e m IIC T4

### Environmental Conditions
- **Ambient temperature**
  - -20…+70 °C
- **Relative humidity**
  - ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**
  - acc. to IEC 60068-2-6
- **Shock test**
  - acc. to IEC 60068-2-27
- **EMC**
  - acc. to EN 61326-1 (2006)
  - acc. to NAMUR NE21 (2007)
- **MTTF**
  - 919 years acc. to SN 29500 (Ed. 99) at 40 °C

### Mechanical data
- **Electrical connection**
  - via backplane
- **Terminal cross-section**
  - 2.5 mm² flexible / 4.0 mm² rigid
- **Housing material**
  - Aluminium
- **Connection mode**
  - Flange, 4 x M4 screws (Torx)
- **Protection class**
  - IP50
- **Dimensions**
  - 45 x 155 x 106 mm

### Approval | Certification
- ATEX, TR CU, INMETRO
The AC/DC converter PPSA115Ex supplies the excom® system with power to the full extension. A combined protection rating of Ex m and Ex e enables application in zone 1. It is also fully potted and installed in a die-cast aluminium enclosure.

The module is powered with 115 VAC. The external power supply is plugged on the module rack via Ex e clamps. Any contact with the clamps under power should be avoided. The clamps are located under a closure cap. Interventions are only allowed after switching off the respective supply voltage.

**Features**

- AC/DC converter for AC supply of DC power supply module

**Redundancy:** Two power supply modules can be installed together with an appropriate module rack. In case of power cut or failure of one device, the second unit provides the power for the whole system. Different potentials can be supplied.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6900294</td>
</tr>
</tbody>
</table>

### Power supply
- **Nominal voltage:** 115 VAC
- **Operating voltage range:** 100…125 VAC
- **Power consumption:** ≤ 85 VA
- **Output power:** ≤ 66.5 W
- **Galvanic separation:** Galvanically isolated input and output circuit, rated voltage 250 V

### Approvals and declarations
- **Ex approval acc. to conformity certificate:** PTB 04 ATEX 2047
- **Device designation:** II 2 G Ex e m IIC T4

### Environmental Conditions
- **Ambient temperature:** -20…+70 °C
- **Relative humidity:** ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test:** acc. to IEC 60068-2-6
- **Shock test:** acc. to IEC 60068-2-27
- **EMC:** acc. to EN 61326-1 (2006) acc. to NAMUR NE21 (2007)
- **MTTF:** 829 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Electrical connection:** via backplane
- **Terminal cross-section:** 2.5 mm² flexible / 4.0 mm² rigid
- **Housing material:** Aluminium
- **Connection mode:** Flange, 4 x M4 screws (Torx)
- **Protection class:** IP50
- **Dimensions:** 45 x 155 x 106 mm

### Approval | Certification
- ATEX, TR CU, INMETRO
excom® – Remote-I/O system
Power supply module for installation in zone 2

Power supply module, 24 VDC, zone 2

The PSM24-3G module supplies the excom® system with power to the full extension. The power supply module can be used in zone 2. The module is powered with 24 VDC. The external power supply is plugged on the module rack via Ex e clamps. The clamps are located under a closure cap. Any contact with the clamps under power should be avoided. Interventions are only allowed after switching off the respective supply voltage.

Features
- DC power supply module, supplies a fully assembled module rack in zone 2

Redundancy: Two power supply modules can be installed together with an appropriate module rack. In case of power cut or failure of one device, the second unit provides the power for the whole system. Different potentials can be supplied.
## Technical data

### Type
- **Ident no.**: 6881722

### Power supply
- **Type**: PSM24-3G
- **Nominal voltage**: 24 VDC
- **Operating voltage range**: 19.2…32 VDC
- **Power consumption**: ≤ 66.5 W
- **Output power**: ≤ 60 W
- **Galvanic separation**: Galvanically isolated input and output circuit, rated voltage 40 V

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: PTB 12 ATEX 2009
- **Device designation**: II 3 (2) G Ex nAc ic (ib) IIIC T4

### Indication
- **Operational readiness**: 1 x green
- **Error indication**: 1 x red

### Environmental Conditions
- **Ambient temperature**: −20…+70 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **MTTF**: 61 years acc. to SN 29500 (Ed. 99) at 40 °C

### Mechanical data
- **Electrical connection**: via backplane
- **Terminal cross-section**: 2.5 mm² flexible / 4.0 mm² rigid
- **Housing material**: plastic
- **Connection mode**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm

### Approval | Certification
- ATEX, TR CU, INMETRO
The module rack MT-PPS consists of a backplane and the actual rack system. It can accommodate two AC converters for the supply of downstream connected 24 VDC module racks.

To plug and unplug AC converters power has to be switched off first. (Do not work on connecting terminals prior to removing the AC converters).

The module rack is designed in a combined protection rating of Ex e and Ex q and can therefore be used in zone 1.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall mounting and fits in the system enclosures.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>9100516</td>
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</table>

### Ports

| AC converter | 2               |

### Approvals and declarations

| Ex approval acc. to conformity certificate | PTB 04 ATEX 2091 X |
| Device designation                       | Ex II 2 G Ex eb IIC T4 |

### Environmental Conditions

| Ambient temperature  | -20…+70 °C       |
| Relative humidity    | ≤ 95 % at 55 °C acc. to EN 60068-2 |
| Vibration test       | acc. to IEC 60068-2-6 |
| Shock test           | acc. to IEC 60068-2-27 |
| MTTF                 | 1211 years acc. to SN 29500 (Ed. 99) 40 °C |

### Mechanical data

| Housing material     | continuously cast aluminium |
| Connection mode      | wall mounting               |
| Protection class     | IP20                        |
| Dimensions           | 110 x 260 x 130 mm          |
excom® – Remote-I/O system
Module rack for installation in zone 1

Module rack, zone 1, for 8 modules

The module rack MT08-2G consists of a backplane and the actual rack system. It can accommodate a gateway, a power supply unit as well as 8 I/O modules. Up to 64 binary inputs/outputs or 32 analog inputs/outputs resp. a mix of both can be connected to it. Unlike the MT16, neither gateways nor power supply units can be connected redundantly to the MT08.

All modules can be plugged and unplugged under power without interrupting the data transmission.

The module rack is designed in a combined protection rating of Ex e and Ex i and can therefore be used in zone 1.

The power supply of modules on the backplane is limited to prevent sparking.

This allows you to pull and plug modules in powered state with excom® mounted in zone 1.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall and 19" rack mounting.

Features
- Module rack for max. 8 I/O modules, 1 gateway and 1 power supply module
- The terminals for the signal connection level are available as accessories
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>MT08-2G</th>
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</thead>
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<tr>
<td>Ident no.</td>
<td>9100684</td>
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### System data

<table>
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<tr>
<th>Fieldbus addressing</th>
<th>3 x decimal-coded rotary switches</th>
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</thead>
<tbody>
<tr>
<td>Fieldbus connection technology</td>
<td>1 x 9-pin D-SUB</td>
</tr>
</tbody>
</table>

### Ports

| DC power supply | 1 |
| Gateway | 1 |
| Block I/O | 8 |

### Approvals and declarations

| Ex approval acc. to conformity certificate | PTB 00 ATEX 2194 U |
| Device designation | II 2 (1) G Ex eb ib [ia] IIC T4 |

### Environmental Conditions

| Ambient temperature | -20...+70 °C |
| Relative humidity | ≤ 95 % at 55 °C acc. to EN 60068-2 |
| Vibration test | acc. to IEC 60068-2-6 |
| Shock test | acc. to IEC 60068-2-27 |
| MTTF | 1211 years acc. to SN 29500 (Ed. 99) 40 °C |

### Mechanical data

| Electrical connection | 4 x 4 clamps per module |
| Terminal cross-section | 1.5 mm² |
| Housing material | continuously cast aluminium |
| Connection mode | wall mounting |
| Protection class | IP20 |
| Dimensions | 227 x 260 x 130 mm |

### Approval | Certification

| ATEX |
Module rack, zone 1, for 16 modules

The module rack MT16-2G consists of a backplane and the actual rack system. It can accommodate 2 gateways, 2 power supply units as well as 16 I/O modules. Up to 128 binary inputs/outputs or 64 analog inputs/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged under power without interrupting the data transmission. The same applies to redundant gateways and power supply modules.

The module rack is designed in a combined protection rating of Ex e and Ex i and can therefore be used in zone 1.

The power supply of modules on the backplane is limited to prevent sparking.

This allows you to pull and plug modules in powered state with excom® mounted in zone 1.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall and 19” rack mounting.

Features

- Module rack for max. 16 I/O modules, 2 gateways and 2 power supply modules
- The terminals for the signal connection level are available as accessories
## Technical data

### Type
- **MT16-2G**
- **Ident no.** 9100687

### System data
- **Fieldbus addressing**: 3 x decimal-coded rotary switches
- **Fieldbus connection technology**: 2 x 9-pin D-SUB

### Ports
- **DC power supply**: 2
- **Gateway**: 2
- **Block I/O**: 16

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: PTB 00 ATEX 2194 U
- **Device designation**: II 2 (1) G Ex eb ib [ia] IIC T4

### Environmental Conditions
- **Ambient temperature**: -20...+70 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **MTTF**: 1211 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Electrical connection**: 4 x 4 clamps per module
- **Terminal cross-section**: 1.5 mm²
- **Housing material**: continuously cast aluminium
- **Connection mode**: wall mounting
- **Protection class**: IP20
- **Dimensions**: 440 x 260 x 130 mm

### Approval | Certification
- **ATEX**
Module rack, zone 1, for 16 Modules, marine ship approved

The module rack MT16-2G/MSA consists of a backplane and the actual rack system. It can accommodate 2 gateways, 2 power supply units as well as 16 I/O modules. Up to 128 binary inputs/outputs or 64 analog inputs/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged under power without interrupting the data transmission. The same applies to redundant gateways and power supply modules.

The module rack is designed in a combined protection rating of Ex e and Ex i and can therefore be used in zone 1.

The power supply of modules on the backplane is limited to prevent sparking. This allows you to pull and plug modules in powered state with excom® mounted in zone 1.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall and 19" rack mounting.

The module rack MT16-2G/MSA is especially adapted to the requirements for maritime applications. It is certified acc. to the ship classes GL, DNV, BV and LR.

Features

- Module rack for max. 16 I/O modules, 2 gateways and 2 power supply modules
- The terminals for the signal connection level are available as accessories
- Module rack approved for maritime applications (certification according to GL, DNV, BV and LR)
## Technical data

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### System data

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</thead>
<tbody>
<tr>
<td>Fieldbus connection technology</td>
<td>2 x 9-pin D-SUB</td>
</tr>
</tbody>
</table>

### Ports

| DC power supply | 2 |
| Gateway         | 2 |
| Block I/O       | 16 |

### Approvals and declarations

- **Ex approval acc. to conformity certificate**: PTB 00 ATEX 2194 U
- **Device designation**: Ex II 2 (1) G Ex eb ib [ia] IIC T4

### Environmental Conditions

- **Ambient temperature**: -20…+70 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **MTTF**: acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data

- **Electrical connection**: 4 x 4 clamps per module
- **Terminal cross-section**: 1.5 mm²
- **Housing material**: continuously cast aluminium
- **Connection mode**: wall mounting
- **Protection class**: IP20
- **Dimensions**: 440 x 260 x 130 mm

### Approval | Certification

- ATEX, GL, DNV, BV, LR
Module rack for 8 modules, zone 2

The module rack MT08-3G consists of a backplane and the actual rack system. It can accommodate a gateway, a power supply unit as well as 8 I/O modules. Up to 64 binary inputs/outputs or 32 analog inputs/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged under power without interrupting the data transmission. The same applies to redundant gateways and power supply modules.

The module rack is designed in a combined protection rating of Ex e and Ex i and can therefore be used in zone 2.

The power supply of modules on the backplane is limited to prevent sparking.

This allows you to pull and plug modules in powered state with excom® mounted in zone 2.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall and rack mounting.

Features

- Module rack for max. 8 I/O modules, 2 gateways and 2 power supply modules
- Terminals for signal connection level available as accessories
Technical data

<table>
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<tr>
<th>Type</th>
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**System data**

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<td>Fieldbus connection technology</td>
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</tbody>
</table>

**Ports**

| DC power supply | 2 |
| Gateway         | 2 |
| Block I/O       | 8 |

**Approvals and declarations**

| Ex approval acc. to conformity certificate | PTB 00 ATEX 2194 U |
| Device designation                      | Ex II 3 (1) G Ex nAc ib ic [ia] IIC T4 |

**Environmental Conditions**

| Ambient temperature | -20...+70 °C |
| Relative humidity   | ≤ 95 % at 55 °C acc. to EN 60068-2 |
| Vibration test      | acc. to IEC 60068-2-6 |
| Shock test          | acc. to IEC 60068-2-27 |
| MTTF                | acc. to SN 29500 (Ed. 99) 40 °C |

**Mechanical data**

| Electrical connection | 4 x 4 clamps per module |
| Terminal cross-section | 1.5 mm² |
| Housing material      | continuously cast aluminium |
| Connection mode       | wall mounting |
| Protection class      | IP20 |
| Dimensions            | 235 x 260 x 130 mm |

**Approval | Certification**

| ATEX |
Module rack for 16 modules, zone 2

The module rack MT16-3G consists of a backplane and the actual rack system. It can accommodate 2 gateways, 2 power supply units as well as 16 I/O modules. Up to 128 binary inputs/outputs or 64 analog inputs/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged under power without interrupting the data transmission. The same applies to redundant gateways and power supply modules.

The module rack is designed in a combined protection rating of Ex e and Ex i and can therefore be used in zone 2.

The power supply of modules on the backplane is limited to prevent sparking.

This allows you to pull and plug modules in powered state with excom® mounted in zone 2.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall and rack mounting.

Features

- Module rack for max. 16 I/O modules, 2 gateways and 2 power supply modules
- The terminals for the signal connection level are available as accessories
**Technical data**

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<td>Fieldbus connection technology</td>
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<th><strong>Ports</strong></th>
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<tbody>
<tr>
<td>DC power supply</td>
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<tr>
<td>Gateway</td>
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<tr>
<td>Block I/O</td>
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<td>Vibration test</td>
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<td>Shock test</td>
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<tbody>
<tr>
<td>Electrical connection</td>
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<td>Terminal cross-section</td>
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<td>Housing material</td>
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<td>Connection mode</td>
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<tr>
<td>Protection class</td>
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<tr>
<td>Dimensions</td>
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<tr>
<th>**Approval</th>
<th>Certification**</th>
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<tbody>
<tr>
<td>ATEX, IECEx, INMETRO</td>
<td>ATEX, IECEx, INMETRO</td>
</tr>
</tbody>
</table>
Module rack for installation in zone 2

The module rack MT24-3G consists of a backplane and the actual rack system. It can accommodate 2 gateways, 2 power supply units as well as 24 I/O modules. Up to 192 binary inputs/outputs or 96 analog inputs/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged under power without interrupting the data transmission. The same applies to redundant gateways and power supply modules.

The module rack is designed in a combined protection rating of Ex e and Ex i and can therefore be used in zone 2.

The power supply of modules on the backplane is limited to prevent sparking.

This allows you to pull and plug modules in powered state with excom® mounted in zone 2.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall and rack mounting.

Features

- Module rack for max. 24 I/O modules, 2 gateways and 2 power supply modules
- The terminals for the signal connection level are available as accessories
## Technical data

### Type
- **Ident no.**: MT24-3G
- **Ident no.**: 9100682

### System data
- **Fieldbus addressing**: 2 x decimal-coded rotary switches
- **Fieldbus connection technology**: 2 x 9-pin D-SUB

### Ports
- **DC power supply**: 2
- **Gateway**: 2
- **Block I/O**: 24

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: PTB 00 ATEX 2194 U
- **Device designation**: Ex II 3 (1) G Ex nAc ib ic [ia] IIC T4

### Environmental Conditions
- **Ambient temperature**: -20...+70 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **MTTF**: 1211 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Electrical connection**: 4 x 4 clamps per module
- **Terminal cross-section**: 1.5 mm²
- **Housing material**: continuously cast aluminium
- **Connection mode**: wall mounting
- **Protection class**: IP20
- **Dimensions**: 525 x 260 x 130 mm

### Approval | Certification
- **ATEX, IECEx, INMETRO**
The PROFIBUS-DP segment coupler SC12Ex from TURCK has been developed for intrinsically safe PROFIBUS connection.

Equipped with one RS485 and two RS485-IS interfaces, this coupler is suited for many Ex-area applications. The RS485-IS interface is entirely realized according to the PNO PROFIBUS guideline. The coupler can thus supply both lines of the TURCK Ex-Remote-I/O system excom® simultaneously (line redundancy). Just one device is required for Ex-separation and line redundancy.

The segment coupler SC12Ex is IP20 rated, suited for mounting in the non-Ex area and can be supplied redundantly. Both power supply inputs are decoupled by diodes. The load distribution depends on the level of operating voltage. Operating voltage 18…32 VDC.

In switch position 0, the coupler identifies the baud rate automatically. For this, the start-delimiter of the PROFIBUS telegrams is evaluated. Three consecutive and valid start-delimiters have to be received before identification locks in.

All received telegrams are checked for plausibility by means of start-delimiter sequences. Baud rate detection is started after reset. If telegrams are not received within 1.7 seconds, baud rate search is activated. Alternatively, the baud rate used can be set via rotary switch.

In order not to limit the number of nodes and cable length of a PROFIBUS-DP segment, amplitude and phase are reproduced in the coupler. The user can choose between capacitive and direct earthing.

Features

- Device for intrinsically safe separation of RS485 and RS485-IS
- Connection of max. 62 bus nodes (31 in redundant mode)
- Redundant power supply
- Automatic baud rate detection
### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>SC12EX</th>
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<tbody>
<tr>
<td>Ident no.</td>
<td>6884047</td>
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</tbody>
</table>

#### Power supply
- **Nominal voltage**: 24 VDC
- **Operating voltage range**: 18…32 VDC
- **Current consumption**: < 200 mA
- **Galvanic separation**: complete galvanic isolation acc. to EN 60079-11
- **Number of channels**: 2-channel

#### Approvals and declarations
- **Ex approval acc. to conformity certificate**: PTB 03 ATEX 2115
- **Device designation**: II (2) GD [Ex ib] IIC
- **Max. output voltage** $U_o$ ≤ 3.71 V
- **Max. output current** $I_o$ ≤ 129 mA
- **Max. output power** $P_o$ ≤ 120 mW
- **Characteristic**: linear
- **Max. input voltage** $U_i$ ≤ 4.2 V

#### Indication
- **Operational readiness**: 2 x green
- **State / Fault**: 3 x yellow / red
- **Baud rate detection**: 1 x yellow

#### Environmental Conditions
- **Ambient temperature**: -20…+70 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **MTTF**: 106 years acc. to SN 29500 (Ed. 99) 40 °C

#### Mechanical data
- **Housing material**: anodized aluminium
- **Connection mode**: snap-fit on DIN rail (DIN 60715)
- **Front plate**: FR4, grey / blue
- **Protection class**: IP20
- **Dimensions**: 142 x 105.5 x 31 mm

#### Approval | Certification
- **ATEX, FM, TR CU, KOSHA, INMETRO, GL, DNV, BV, LR**
The optocoupler OC11Ex/2G.2 converts the PROFIBUS-DP signals into optical signals. In this way the bus signals are transmitted potential-free and safely over long distances from the non-Ex to the Ex area.

The OC11Ex/3G.2 in zone 2 transmits the signals via the optical interface to the OC11Ex/2G.2 in zone 1 which converts them. The signals are then output intrinsically safe at the RS485-IS interface.

Up to 31 bus nodes can be connected to the optocoupler. Baud rates of 9.6 kbps up to 1.5 Mbps are possible, or will be automatically detected.

For diagnostic purposes there are four status LEDs that indicate power ON, fiber-optic segment, RS485 interface and baud rate. The device features an M8 communication interface. Two OC11Ex devices can be coupled together via the M8 interface. Wire-break and short-circuit are not transmitted from one segment to the next one. All segments can thus be operated trouble-free and independently of one another.

In order not to limit the number of nodes and cable length of a PROFIBUS-DP segment, amplitude and phase are reproduced in the coupler. The OC11Ex/2G.2 shield is always capacitively coupled to the equipotential bonding.

Features
- Device for data transmission between electrical and optical fieldbus circuits
- Power supply of max. 31 nodes
- Mounting in zone 1 possible
- Note: Idle level corresponds to active light!
Technical data

**Type**  
OC1Ex/2G.2

**Ident no.**  
6890427

**Power supply**

- **Nominal voltage:** 24 VDC
- **Operating voltage range:** 18 … 32 VDC
- **Current consumption:** < 100 mA
- **Galvanic separation:** complete galvanic isolation acc. to EN 60079-11
- **Number of channels:** 1-channel

**Approvals and declarations**

- **Ex approval acc. to conformity certificate:** PTB 05 ATEX 2051 X
- **Device designation:** II 2 G Ex e mb ib [ib op is] IIC T4
- **Max. values:**  
  - Max. output voltage \( U_o \) ≤ 3.64 V
  - Max. output current \( I_o \) ≤ 127 mA
  - Max. output power \( P_o \) ≤ 116 mW
  - Characteristic: linear
  - Max. input voltage \( U_i \) ≤ 4.2 V

**Indication**

- **Operational readiness:** 1 x green
- **State/ Fault:** 2 x yellow / red
- **Baud rate detection:** 1 x yellow

**Environmental Conditions**

- **Ambient temperature:** -20…+70 °C
- **Relative humidity:** ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test:** acc. to IEC 60068-2-6
- **Shock test:** acc. to IEC 60068-2-27
- **EMC:** acc. to EN 61326-1 (2006) acc. to NAMUR NE21 (2007)
- **MTTF:** 234 years acc. to SN 29500 (Ed. 99) 40 °C

**Mechanical data**

- **Housing material:** anodized aluminium
- **Connection mode:** snap-fit on DIN rail (DIN 60715) or wall mounting
- **Front plate:** FR4, grey
- **Protection class:** IP20
- **Dimensions:** 72 x 105.5 x 31 mm

**Approval | Certification**

- ATEX, TR CU, KOSHA, INMETRO, GL, DNV, BV, LR
The optocoupler OC11Ex/3G.2 converts the PROFIBUS-DP signals into optical signals. In this way the bus signals are transmitted potential-free and safely over long distances from the non-Ex to the Ex area.

The optocoupler can be installed in the non-Ex area or in zone 2. The OC11Ex/3G.2 receives the PROFIBUS-DP signals at its standard interface RS485 and transmits them via the intrinsically safe optical interface to the optocoupler OC11Ex/2G.2 in zone 1.

The optocoupler OC11Ex/3G.2 is equipped with:

- RS485 interface – standard PROFIBUS-DP interface with RS485 level acc. to EIA 485 (the control cable for direction control is not connected)
- Intrinsically safe optical interface with ST connectors for emitter and receiver

Up to 31 bus nodes can be connected to the optocoupler. Baud rates of 9.6 kbps up to 1.5 Mbps are possible or will be automatically detected.

For diagnostic purposes there are four status LEDs that indicate power ON, fiber-optic segment, RS485 interface and baud rate. The device features an M8 communication interface. Two OC11Ex devices can be coupled together via the M8 interface. Wire-break and short-circuit are not transmitted from one segment to the next one. All segments can thus be operated trouble-free and independently of one another.

In order not to limit the number of nodes and cable length of a PROFIBUS-DP segment, amplitude and phase are reproduced in the coupler. The user can choose between capacitive and direct earthing.
## Technical data

### Type
- **Type:** OC1Ex/3G.2
- **Ident no.:** 6890428

### Power supply
- **Nominal voltage:** 24 VDC
- **Operating voltage range:** 18 ... 32 VDC
- **Current consumption:** < 100 mA
- **Galvanic separation:** complete galvanic isolation acc. to EN 60079-11
- **Number of channels:** 1-channel

### Approvals and declarations
- **Ex approval acc. to conformity certificate:** PTB OS ATEX 2052 X
- **Device designation:** II (2) G [Ex ib op is] IIC
- **Ex approval acc. to conformity certificate:** PTB OS ATEX 2053 X
- **Device marking:** II 3 G Ex na II T4

### Indication
- **Operational readiness:** 1 x green
- **State/ Fault:** 2 x yellow / red
- **Baud rate detection:** 1 x yellow

### Environmental Conditions
- **Ambient temperature:** -20 ... +70 °C
- **Relative humidity:** ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test:** acc. to IEC 60068-2-6
- **Shock test:** acc. to IEC 60068-2-27
- **EMC:** acc. to EN 61326-1 (2006)
  acc. to NAMUR NE21 (2007)
- **MTTF:** 442 years acc. to SN 29500 (Ed. 99)
  40 °C

### Mechanical data
- **Housing material:** anodized aluminium
- **Connection mode:** snap-fit on DIN rail (DIN 60715) or wall mounting
- **Front plate:** FR4, grey
- **Protection class:** IP20
- **Dimensions:** 72 x 105.5 x 31 mm

### Approval | Certification
- **ATEX, TR CU, KOSHA, INMETRO, GL, DNV, BV, LR**
Solutions for the non-Ex area

excom® – Solutions for the non-Ex area

The excom® series gives the user complete freedom in the choice of the installation location. It can be installed in zones 1 and 2 and in the non-Ex area. This benefits the user not only in terms of components optimized for a particular zone, but also because of the standard concept for configuring and parameterizing the periphery and field instrumentation.

The same peripherals that are used in the Ex area can also be used in the non-Ex area. A new module rack offers here the possibility of operating up to 24 I/O modules in the non-Ex area, which further reduces the basic installation costs. As TURCK has also developed a special power supply unit for this application area, the entire system is considerably more compact. Even with exclusively non-Ex area applications, the user benefits from the further developments of the excom® series – particularly with the digital outputs: For example, an additional relay output is also provided that allows the switching of outputs with up to 0.5 A.
### Short description/Table of contents

**excom® – Remote-I/O system**

#### Solutions for the non-Ex area

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<tr>
<td>MT24-N</td>
<td>9100683</td>
<td>Module rack, non-Ex, for 24 modules</td>
<td>284</td>
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</table>
The I/O module DM80-N is designed for the connection of NAMUR sensors (DIN EN 60 60947-5-6) and actuators. When wire-break or short-circuit monitoring are activated, mechanical contacts can only be connected with a corresponding resistor circuitry (WM1, Ident no. 0912101).

When connecting the field devices, care has to be taken that all inputs and/or outputs are on a common potential. Input and output mode can be adjusted via the PROFIBUS-DP master. The following parameters can be adjusted: switching behaviour, switch-on delay, default value, wire-break and short circuit monitoring.

The user can furthermore determine whether an input or an output should be provided at the connecting point. The following configurations are possible: 8 inputs/0 outputs; 6 inputs/2 outputs up to 0 inputs/8 outputs (GSD-file, Mode 2). This way, optimal adaptation to the corresponding application environment is guaranteed.
# Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>DM80-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884211</td>
</tr>
</tbody>
</table>

## Power supply

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>via the backplanes, central power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>≤ 1 W</td>
</tr>
<tr>
<td>Galvanic separation</td>
<td>to int. bus and supply circuit</td>
</tr>
<tr>
<td>Number of channels</td>
<td>8-channel</td>
</tr>
</tbody>
</table>

## Inputs

<table>
<thead>
<tr>
<th>Input circuits</th>
<th>acc. to EN 60947-5-6 (NAMUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-load voltage</td>
<td>8 VDC</td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>4 mA</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 100 Hz</td>
</tr>
<tr>
<td>Short-circuit</td>
<td>&lt; 367 Ω</td>
</tr>
<tr>
<td>Wire-break</td>
<td>&lt; 0.2 mA</td>
</tr>
<tr>
<td>Switch-on threshold:</td>
<td>1.8 mA</td>
</tr>
<tr>
<td>Switch-off threshold:</td>
<td>1.4 mA</td>
</tr>
</tbody>
</table>

## Outputs

<table>
<thead>
<tr>
<th>Output circuits</th>
<th>for low-power actuators</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-load voltage</td>
<td>8 VDC</td>
</tr>
<tr>
<td>Nominal current</td>
<td>4 mA</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 100 Hz</td>
</tr>
<tr>
<td>Short circuit</td>
<td>&lt; 367 Ω</td>
</tr>
<tr>
<td>Wire-break</td>
<td>&lt; 0.2 mA</td>
</tr>
<tr>
<td>Internal resistance Ri</td>
<td>320 Ω</td>
</tr>
</tbody>
</table>

## Indication

<table>
<thead>
<tr>
<th>Operational readiness</th>
<th>1 x green / red</th>
</tr>
</thead>
<tbody>
<tr>
<td>State/ Fault</td>
<td>8 x yellow / red</td>
</tr>
</tbody>
</table>

## Environmental Conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>-20…+70 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative humidity</td>
<td>≤ 95 % at 55 °C acc. to EN 60068-2</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to IEC 60068-2-6</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 60068-2-27</td>
</tr>
<tr>
<td>EMC</td>
<td>acc. to EN 61326-1 (2006)</td>
</tr>
<tr>
<td></td>
<td>acc. to NAMUR NE21 (2007)</td>
</tr>
<tr>
<td>MTTF</td>
<td>141 years acc. to SN 29500 (Ed. 99)</td>
</tr>
<tr>
<td></td>
<td>40 °C</td>
</tr>
</tbody>
</table>

## Mechanical data

<table>
<thead>
<tr>
<th>Housing material</th>
<th>plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection mode</td>
<td>module, plugged on rack</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 118 x 103 mm</td>
</tr>
</tbody>
</table>
Frequency module, 2-channel

The input module DF20-N is equipped with 8 channels acc. to NAMUR, which are grouped together in two blocks. There is one frequency input per block and three control inputs/outputs.

The module can be used as a counter or frequency input module: It is thus suited for pulse counting of binary input signals or frequency measurements of binary pulse sequences of NAMUR sensors.

The counting direction can either be set externally via a control input or internally by setting a parameter. The maximum frequency of one block is 4 kHz; with 2 blocks the frequency is reduced to 2 kHz.

Input and output mode can be adjusted via the PROFIBUS-DP master. Each channel is equipped with parametrizable wire-break/short-circuit monitoring.

Features

- Frequency module for the connection of NAMUR sensors
### Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>DF20-N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>6884212</td>
</tr>
</tbody>
</table>

#### Power supply

<table>
<thead>
<tr>
<th><strong>Supply voltage</strong></th>
<th>via the backplanes, central power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power consumption</strong></td>
<td>≤ 1 W</td>
</tr>
<tr>
<td><strong>Galvanic separation</strong></td>
<td>to int. bus and supply circuit</td>
</tr>
<tr>
<td><strong>Number of channels</strong></td>
<td>2-channel</td>
</tr>
</tbody>
</table>

#### Inputs

<table>
<thead>
<tr>
<th><strong>Input circuits</strong></th>
<th>acc. to EN 60947-5-6 (NAMUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No-load voltage</strong></td>
<td>8 VDC</td>
</tr>
<tr>
<td><strong>Short-circuit current</strong></td>
<td>4 mA</td>
</tr>
<tr>
<td><strong>Switching frequency</strong></td>
<td>≤ 4000 Hz</td>
</tr>
<tr>
<td><strong>Short-circuit</strong></td>
<td>&lt; 367 Ω</td>
</tr>
<tr>
<td><strong>Wire-break</strong></td>
<td>&lt; 0.2 mA</td>
</tr>
<tr>
<td><strong>Switch-on threshold:</strong></td>
<td>1.8 mA</td>
</tr>
<tr>
<td><strong>Switch-off threshold:</strong></td>
<td>1.4 mA</td>
</tr>
</tbody>
</table>

#### Response characteristic

| **Measuring accuracy** | ≤ 0.1 % of full scale |

#### Indication

| **Operational readiness** | 1 x green / red         |
| **State/ Fault**          | 8 x yellow / red        |

#### Environmental Conditions

| **Ambient temperature** | -20 . . +70 °C          |
| **Relative humidity**   | ≤ 95 % at 55 °C acc. to EN 60068-2 |
| **Vibration test**      | acc. to IEC 60068-2-6    |
| **Shock test**          | acc. to IEC 60068-2-27   |
| **EMC**                | acc. to EN 61326-1 (2006) |
|                       | acc. to NAMUR NE21 (2007) |
| **MTTF**               | 101 years acc. to SN 29500 (Ed. 99) |
|                       | 40 °C                     |

#### Mechanical data

| **Housing material** | plastic                   |
| **Connection mode**  | module, plugged on rack    |
| **Protection class** | IP20                      |
| **Dimensions**       | 18 x 118 x 103 mm         |
excom® – Remote-I/O system
Modules for the non-Ex system

Input module, digital, 4-channel

Features

- Input modules for NAMUR and 3-wire sensors (NPN and PNP)
- Power supply of the sensors out of the module (max. 20 mA at 12 VDC)
- Complete galvanic isolation

The input module DI40-N is designed for the connection of NAMUR sensors (DIN EN 60947-5-6), 3-wire sensors (NPN, PNP) or mechanical contacts.

When wire-break or short-circuit monitoring are activated, mechanical contacts can only be connected with a corresponding resistor circuitry (WM1, Ident no. 0912101).

The inputs are galvanically isolated from each other.

The behaviour of the inputs can be adjusted via the PROFIBUS-DP master. The following parameters can be adjusted: switching behaviour, switch-on delay, default value, wire-break and short circuit monitoring.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>DI40-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884213</td>
</tr>
</tbody>
</table>

### Power supply
- Supply voltage: via the backplanes, central power supply
- Power consumption: ≤ 2 W
- Galvanic separation: complete galvanic isolation
- Number of channels: 4-channel

### Inputs
- Input circuits: acc. to EN 60947-5-6 (NAMUR)
- No-load voltage: 8.2 VDC
- Short-circuit current: 2.7 mA
- Switching frequency: ≤ 100 Hz
- Short-circuit: < 367 Ω
- Wire-break: < 0.15 mA
- Switch-on threshold: 1.8 mA
- Switch-off threshold: 1.3 mA
- 3-wire input
  - No-load voltage: 12 VDC
  - Current: ≤ 20 mA
  - 0-signal: ≤ 4.5 V
  - 1-signal: ≥ 6.5 V

**Remark**
The power supply for 3-wire sensors is also monitored for wire breaks and short circuits

### Indication
- Operational readiness: 1 x green / red
- State/ Fault: 4 x yellow / red

### Environmental Conditions
- Ambient temperature: -20...+70 °C
- Relative humidity: ≤ 95 % at 55 °C acc. to EN 60068-2
- Vibration test: acc. to IEC 60068-2-6
- Shock test: acc. to IEC 60068-2-27
- MTTF: 111 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- Housing material: plastic
- Connection mode: module, plugged on rack
- Protection class: IP20
- Dimensions: 18 x 118 x 103 mm
Output module, digital, 4-channel

The output module DO40-N is designed for the connection of low-power actuators such as valves or indicator lights. The outputs of this module are galvanically isolated from each other.

One actuator per channel can be connected. Via selection of connecting terminals, two circuits per channel are made available with different supply data.

Please see the load curve, showing the connection values for valve control. The following values are supported for example:
- 22.5 V / 5 mA
- 19.0 V / 15 mA
- 16.0 V / 25 mA
- 14.0 V / 35 mA
- 12.0 V / 45 mA

Features
- Output module for low-power actuators
- Complete galvanic isolation

Load curve terminal connection 1+2

Load curve terminal connection 3+4
# Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>DO40-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884214</td>
</tr>
</tbody>
</table>

## Power supply
- Supply voltage: via the backplanes, central power supply
- Power consumption: ≤ 4.5 W
- Galvanic separation: complete galvanic isolation
- Number of channels: 4-channel

## Outputs
- Output circuits: for low-power actuators
- No-load voltage: 24 VDC
- Switching frequency: ≤ 50 Hz
- Short circuit: ≥ 50 mA
- Wire-break: < 1 mA
- Internal resistance $R_i$: 300 Ω

## Indication
- Operational readiness: 1 x green / red
- State/ Fault: 4 x yellow / red

## Environmental Conditions
- Ambient temperature: -20 ... +70 °C
- Relative humidity: ≤ 95 % at 55 °C acc. to EN 60068-2
- Vibration test: acc. to IEC 60068-2-6
- Shock test: acc. to IEC 60068-2-27
- MTTF: 79 years acc. to SN 29500 (Ed. 99) 40 °C

## Mechanical data
- Housing material: plastic
- Connection mode: module, plugged on rack
- Protection class: IP20
- Dimensions: 18 x 118 x 103 mm
Relay module, 6-channel

The relay module DO60R-N is designed for the connection of non-intrinsically safe actuators such as valves or indicator lights.

The outputs are designed as zero-potential relay contacts.
- 2 x changeover contacts (channel 1 and 2)
- 4 x NO contacts (channel 3 to 6)

The channels 3/4 and 5/6 are separately switchable to changeover function. For this, an external bridge at the terminals is needed.

**Features**
- Relay output for higher switching capacity
- NO/NC configurable output
- Configurable as 4 x changeover contact
- Configurable as 6 x NO contact

**Note:**
To protect the module rack, the contact circuits inside the DO60R-N module are safeguarded by fuses (1 AT). The module must be replaced after tripping the fuses. The connections 12-13 and 22-23 are not further protected and should maximally be loaded with the switching current of a relay contact. Use preferably terminal 12 resp. 22 for connection.

Status and error messages of the single outputs and the module are indicated via LEDs on the front.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>DO60R-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884196</td>
</tr>
</tbody>
</table>

### Power supply
- **Supply voltage**: via the backplanes, central power supply
- **Power consumption**: ≤ 2 W
- **Galvanic separation**: complete galvanic isolation
- **Number of channels**: 6-channel

### Outputs
- **Output circuits**: 6 x relays (2 x changeover contacts, 4 x NO)
- **Switching current**: ≥ 10 mA

### Indication
- **Operational readiness**: 1 x green / red
- **State/ Fault**: 6 x yellow / red

### Environmental Conditions
- **Ambient temperature**: -20...+60 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **EMC**: acc. to EN 61326-1 (2006), acc. to NAMUR NE21 (2007)
- **MTTF**: 224 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Housing material**: plastic
- **Connection mode**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm
Input module, analog, 4-channel

The input module AI40-N is designed for the connection of 2-wire transducers (active input = source mode / transducer passive) or 4-wire transducers (passive input = sink mode / transducer active). The field circuits are galvanically isolated from each other.

HART® compatible transducers can be connected to the module. The field device can thus be parametrized directly at the terminals on the DIN rail with a licensed modem. An additional impedance in the circuit is not necessary. The measuring range is digitized in the scope of 0…21 mA. For clear reading, the digitized value is displayed in a range of 0 … 21000 (independent of the parametrized measuring range) and transmitted to the host system.

### Features
- Input module for the connection of passive transmitters (active inputs) or active transmitters (passive inputs).
- Complete galvanic isolation

---

<table>
<thead>
<tr>
<th>Terminal Configuration</th>
<th>Connection</th>
<th>Active</th>
<th>Passive (Alternative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Technical data

### Type
- **Type**: AI40-N
- **Ident no.**: 6884215

### Power supply
- **Supply voltage**: via the backplanes, central power supply
- **Power consumption**: ≤ 2.2 W
- **Galvanic separation**: complete galvanic isolation
- **Number of channels**: 4-channel

### Inputs
- **Input circuits**: 0/4…20 mA
- **Supply voltage**: 15 VDC at 20 mA
- **Overload capability**: > 21 mA
- **Low level control**: < 3.6 mA
- **Short-circuit**: > 24 mA (only in live zero mode)
- **Wire-break**: < 2 mA (only in live zero mode)

### Response characteristic
- **Resolution**: 14 Bit
- **Linearity deviation**: ≤ 0.05 % full scale
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time/fall time**: ≤ 50 ms (10 … 90 %)
- **Max. measurement tolerance under EMC influence**: ≤ 0.1 %

### Indication
- **Operational readiness**: 1 x green / red
- **State/ Fault**: 4 x red

### Environmental Conditions
- **Ambient temperature**: -20…+70 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **MTTF**: 77 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Housing material**: plastic
- **Connection mode**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm
Input module, analog, passive, 4-channel

The input module AI41-N is designed for the connection of 4-wire transducers (passive input = sink mode / transducer active).

The inputs are galvanically isolated from each other.

The resolution is 14 bit, i.e. the analog value between 0…21 mA is represented as a number between 0 and 16383. For clear reading, the digitized value is displayed in a range of 0…21000 and transmitted to the host system. For transmission to the host system, voltage is indicated as a value in a range between 0…10000.

Features

- Input module for the connection of active transmitters (passive inputs)
- Complete galvanic isolation
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>AI41-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884216</td>
</tr>
</tbody>
</table>

### Power supply

- **Supply voltage** via the backplanes, central power supply
- **Power consumption** ≤ 1 W
- **Galvanic separation** complete galvanic isolation
- **Number of channels** 4-channel

### Inputs

- **Input circuits** 0/4…20 mA
- **Overload capability** > 22 mA
- **Low level control** < 3.6 mA
- **Short-circuit** < 5 V (only in live zero mode)
- **Wire-break** < 2 mA (only in live zero mode)

### Response characteristic

- **Resolution** 14 Bit
- **Linearity deviation** ≤ 0.1 % full scale
- **Temperature drift** ≤ 0.005 % / K
- **Rise time/fall time** ≤ 50 ms (10 … 90 %)

### Indication

- **Operational readiness** 1 x green / red
- **State/ Fault** 4 x red

### Environmental Conditions

- **Ambient temperature** -20 … +70 °C
- **Relative humidity** ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test** acc. to IEC 60068-2-6
- **Shock test** acc. to IEC 60068-2-27
- **MTTF** 98 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data

- **Housing material** plastic
- **Connection mode** module, plugged on rack
- **Protection class** IP20
- **Dimensions** 18 x 118 x 103 mm
The analog input module AI43-N is designed for the connection of potentiometers in 3 or 4-wire technology. If 3-wire potentiometers are used, the terminals at the module rack have to be bridged. Resistance measurements, i.e. the evaluation of potentiometers with a 2-wire connection, is not possible.

The module has four field circuits to control 3 or 4-wire potentiometers. The field circuits are galvanically isolated from the power supply, from the internal bus and from each other.

Each potentiometer input is monitored for wire break. The interruption of a single connection line is securely detected, as well as any combination of interruptions occurring at the four input connection lines. Short-circuit monitoring is not carried out. In case of a line error, the programmed substitute value is immediately output and the output value is set to 'invalid-bit'. This state is maintained until valid measured values are provided again.

The resolution is 14 bit. For clear reading, 0...100 % is digitized and displayed in a range of 0...10000 (independent of the parametrized measuring range) and transmitted to the host system.
## Technical data

### Type

<table>
<thead>
<tr>
<th>Type</th>
<th>AI43-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884217</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>via the backplanes, central power supply</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 1.5 W</td>
</tr>
<tr>
<td>Galvanic separation</td>
<td>complete galvanic isolation</td>
</tr>
<tr>
<td>Number of channels</td>
<td>4-channel</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input circuits</td>
<td>potentiometer</td>
</tr>
<tr>
<td>Nominal resistance</td>
<td>400 Ω ... 12 kΩ</td>
</tr>
</tbody>
</table>

### Response characteristic

<table>
<thead>
<tr>
<th>Response characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>14 Bit</td>
</tr>
<tr>
<td>Linearity deviation</td>
<td>≤ 0.1 % full scale</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>≤ 0.005 % / K</td>
</tr>
<tr>
<td>Rise time/fall time</td>
<td>≤ 50 ms (10 ... 90 %)</td>
</tr>
</tbody>
</table>

### Indication

<table>
<thead>
<tr>
<th>Indication</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational readiness</td>
<td>1 x green / red</td>
</tr>
<tr>
<td>State/ Fault</td>
<td>4 x red</td>
</tr>
</tbody>
</table>

### Environmental Conditions

<table>
<thead>
<tr>
<th>Environmental Conditions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-20 ... +70 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 % at 55 °C acc. to EN 60068-2</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to IEC 60068-2-6</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 60068-2-27</td>
</tr>
<tr>
<td>MTTF</td>
<td>71 years acc. to SN 29500 (Ed. 99) at 40 °C</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Mechanical data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing material</td>
<td>plastic</td>
</tr>
<tr>
<td>Connection mode</td>
<td>module, plugged on rack</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 118 x 103 mm</td>
</tr>
</tbody>
</table>
### Output module, analog, 4-channel

<table>
<thead>
<tr>
<th>Terminal Configuration</th>
<th>Connection Possibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel 1</td>
<td>0/4...20 mA</td>
</tr>
<tr>
<td>Channel 2</td>
<td>0/4...20 mA</td>
</tr>
<tr>
<td>Channel 3</td>
<td>0/4...20 mA</td>
</tr>
<tr>
<td>Channel 4</td>
<td>0/4...20 mA</td>
</tr>
</tbody>
</table>

#### Features
- Output module for the connection of analog actuators
- Complete galvanic isolation

The output module AO40-N is designed for the connection of analog actuators such as control valves or process indicators. The outputs are galvanically isolated from each other.

HART® compatible transducers can be connected to the module. The field device can thus be parametrized directly at the terminals on the DIN rail with a licensed modem. An additional impedance in the circuit is not necessary.

The host system transmits a digitized control value 0…21000 (independent of the parametrized measuring range). This raw value is then transformed by the AO40-N into a value between 0…21 mA.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>AD40-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884218</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>via the backplanes, central power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>≤ 2.2 W</td>
</tr>
<tr>
<td>Galvanic separation</td>
<td>complete galvanic isolation</td>
</tr>
<tr>
<td>Number of channels</td>
<td>4-channel</td>
</tr>
</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Output circuits</th>
<th>0/4…20 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-load voltage</td>
<td>16 VDC</td>
</tr>
<tr>
<td>External load</td>
<td>≤ 640 Ω</td>
</tr>
<tr>
<td>Short circuit</td>
<td>&lt; 50 Ω (only in live zero mode)</td>
</tr>
<tr>
<td>Wire-break</td>
<td>&lt; 2 mA (only in live zero mode)</td>
</tr>
</tbody>
</table>

### Response characteristic

<table>
<thead>
<tr>
<th>Resolution</th>
<th>13 Bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linearity deviation</td>
<td>≤ 0.05 % full scale</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>≤ 0.005 % / K</td>
</tr>
<tr>
<td>Rise time/fall time</td>
<td>≤ 50 ms (10…90 %)</td>
</tr>
<tr>
<td>Max. measurement tolerance under EMC influence</td>
<td>≤ 0.1 %</td>
</tr>
</tbody>
</table>

### Indication

<table>
<thead>
<tr>
<th>Operational readiness</th>
<th>1 x green / red</th>
</tr>
</thead>
<tbody>
<tr>
<td>State/ Fault</td>
<td>4 x red</td>
</tr>
</tbody>
</table>

### Environmental Conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>-20…+70 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative humidity</td>
<td>≤ 95 % at 55 °C acc. to EN 60068-2</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to IEC 60068-2-6</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 60068-2-27</td>
</tr>
<tr>
<td>EMC</td>
<td>acc. to EN 61326-1 (2006)</td>
</tr>
<tr>
<td></td>
<td>acc. to NAMUR NE21 (2007)</td>
</tr>
<tr>
<td>MTTF</td>
<td>78 years acc. to SN 29500 (Ed. 99)</td>
</tr>
<tr>
<td></td>
<td>40 °C</td>
</tr>
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</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Housing material</th>
<th>plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection mode</td>
<td>module, plugged on rack</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 118 x 103 mm</td>
</tr>
</tbody>
</table>
Input module, analog, active, HART®, 4-channel

The input module AIH40-N is designed for the connection of 2-wire transducers (active input = source mode / transducer passive).

The inputs are not galvanically isolated from each other. When connecting the field devices, care has to be taken that all inputs are on a common potential.

HART® compatible sensors connected to the module communicate with the integrated HART® controller.

The resolution is 14 bit, i.e. the analog value between 0...21 mA is represented as a number between 0 and 16383. For clear reading, the digitized value is displayed in a range of 0...21000 and transmitted to the host system.

Up to 8 HART® variables (max. 4 per channel) can be read via the cyclical PROFIBUS data traffic. The bidirectional exchange of variables between the host system and the HART® transmitter is implemented via PROFIBUS-DPV1.

Parameters like wire-break or short-circuit monitoring, measuring range, HART® communication etc., can be adjusted for each channel separately and are solely initialized by the PROFIBUS master.

Features

- Input module for connection of 2-wire transmitters
- Transmission of HART® data
## Technical data

### Type
- **Type**: AIH40-N

### Ident no.
- **Ident no.**: 6884219

### Power supply
- **Supply voltage**: via the backplanes, central power supply
- **Power consumption**: ≤ 3 W
- **Galvanic separation**: to int. bus and supply circuit
- **Number of channels**: 4-channel

### Inputs
- **Input circuits**: 0/4…20 mA
- **Supply voltage**: 15 VDC at 22 mA
- **HART® Impedance**: > 240 Ω
- **Overload capability**: > 22 mA
- **Low level control**: < 3.6 mA
- **Short-circuit**: < 5 V (only in live zero mode)
- **Wire-break**: < 2 mA (only in live zero mode)

### Response characteristic
- **Resolution**: 14 Bit
- **Linearity deviation**: ≤ 0.1 % full scale
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time/fall time**: ≤ 50 ms (10…90 %)
- **Max. measurement tolerance under EMC influence**: ≤ 0.1 % with shielded signal cable

### Indication
- **Operational readiness**: 1 x green / red
- **State/ Fault**: 4 x red

### Environmental Conditions
- **Ambient temperature**: -20…+60 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **EMC**: acc. to EN 61326-1 (2006)
- **MTTF**: 61 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Housing material**: plastic
- **Connection mode**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm
Input module, analog, passive, HART®, 4-channel

The input module AIH41-N is designed for the connection of 4-wire transducers (passive input = sink mode / transducer active).

The inputs are not galvanically isolated from each other. When connecting the field devices, care has to be taken that all inputs are on a common potential.

HART® compatible sensors connected to the module communicate with the HART® controller.

The resolution is 14 bit, i.e. the analog value between 0…21 mA is represented as a number between 0 and 16383. For clear reading, the digitized value is displayed in a range of 0…21000 and transmitted to the host system.

Up to 8 HART® variables (max. 4 per channel) can be read via the cyclical PROFIBUS data traffic. The bidirectional exchange of variables between the host system and the HART® transmitter is implemented via PROFIBUS-DPV1.

Parameters like wire-break or short-circuit monitoring, measuring range, HART® communication etc., can be adjusted for each channel separately and are solely initialized by the PROFIBUS master.

Features
- Input module for connection of 4-wire transmitters
- Transmission of HART® data
## Technical data

### Type
- **AIH41-N**
- **Ident no.** 6884220

### Power supply
- **Supply voltage**: via the backplanes, central power supply
- **Power consumption**: $\leq 1$ W
- **Galvanic separation**: to int. bus and supply circuit
- **Number of channels**: 4-channel

### Inputs
- **Input circuits**: 0/4…20 mA
- **HART™ Impedance**: $> 240$ Ω
- **Overload capability**: $> 22$ mA
- **Low level control**: $< 3.6$ mA
- **Short-circuit**: $< 5$ V (only in live zero mode)
- **Wire-break**: $< 2$ mA (only in live zero mode)

### Response characteristic
- **Resolution**: 14 Bit
- **Linearity deviation**: $\leq 0.1$ % full scale
- **Temperature drift**: $\leq 0.005$ % / K
- **Rise time/fall time**: $\leq 50$ ms (10 … 90 %)
- **Max. measurement tolerance under EMC influence**: $\leq 0.1$ % with shielded signal cable
  $\leq 1$ % with unshielded signal cable

### Indication
- **Operational readiness**: 1 x green / red
- **State/ Fault**: 4 x red

### Environmental Conditions
- **Ambient temperature**: $-20 \ldots +60$ °C
- **Relative humidity**: $\leq 95$ % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **EMC**: acc. to EN 61326-1 (2006)
  acc. to NAMUR NE21 (2007)
- **MTTF**: 93 years acc. to SN 29500 (Ed. 99)
- **40 °C**

### Mechanical data
- **Housing material**: plastic
- **Connection mode**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm
Output module, analog, HART®, 4-channel

The output module AOH40-N is designed for the connection of analog actuators such as control valves or process indicators.

The outputs are not galvanically isolated from each other. When connecting the field devices, care has to be taken that all outputs are on a common potential.

HART® compatible actuators connected to the module communicate directly with the HART® controller.

The resolution is 13 bit, i.e. the analog value of 0...21 mA is represented as a number between 0 and 8191. For easier operation, the host system operates in a value range between 0...21000. This raw value is reduced by the AOH40-N to a 13-bit resolution.

Parameters such as line monitoring, substitute values etc. can be adjusted for each channel separately and are initialized solely by the master.

Features
- Output module for the connection of analog actuators
- Transmission of HART® data
# Technical data

**Type**

| AOIH40-N | 6884221 |

**Power supply**

| Supply voltage | via the backplanes, central power supply |
| Power consumption | ≤ 3 W |
| Galvanic separation | to int. bus and supply circuit |
| Number of channels | 4-channel |

**Outputs**

| Output circuits | 0/4…20 mA |
| No-load voltage | 16 VDC |
| HART® Impedance | > 240 Ω |
| External load | ≤ 600 Ω |
| Short circuit | < 50 Ω (only in live zero mode) |
| Wire-break | > 15 V (only in live zero mode) |

**Response characteristic**

| Resolution | 13 Bit |
| Linearity deviation | ≤ 0.1 % full scale |
| Temperature drift | ≤ 0.005 % / K |
| Rise time/fall time | ≤ 50 ms (10 … 90 %) |
| Max. measurement tolerance under EMC influence | ≤ 0.1 % with shielded signal cable |
| | ≤ 1 % with unshielded signal cable |

**Indication**

| Operational readiness | 1 x green / red |
| State/ Fault | 4 x red |

**Environmental Conditions**

| Ambient temperature | -20 … +60 °C |
| Relative humidity | ≤ 95 % at 55 °C acc. to EN 60068-2 |
| Vibration test | acc. to IEC 60068-2-6 |
| Shock test | acc. to IEC 60068-2-27 |
| EMC | acc. to EN 61326-1 (2006) |
| | acc. to NAMUR NE21 (2007) |
| MTTF | 66 years acc. to SN 29500 (Ed. 99) |
| | 40 °C |

**Mechanical data**

| Housing material | plastic |
| Connection mode | module, plugged on rack |
| Protection class | IP20 |
| Dimensions | 18 x 118 x 103 mm |
**Input module, temperature, 4-channel**

The input module TI40-N is designed for the connection of 2, 3 and 4-wire temperature probes of the types Pt100, Pt200, Pt500, Pt1000, Ni100 and Cu100, as well as for the connection of thermocouples of the types B, E, D, J, K, L, N, R, S, T and U. The module can also be used for the measurement of low voltages (-75...+75 mV, -1.2...+1.2 V) and resistance measurements (0...30 Ω, 0...300 Ω, 0...3 kΩ).

Line compensation of 2-wire temperature resistors is done by means of parametrized resistance values. These values have to be determined first through measurements.

When using thermocouples, external cold junction compensation can be carried out separately for each channel by connecting resistors such as the Pt100 to the two unused terminals. Internal compensation instead is parametrized for all channels via an integrated Pt100 resistor.

The resolution is 16 bit, i.e. the analog value is represented as a number between 0 and 65535. The temperature is indicated in Kelvin. For conversion to °C, please observe an offset of 273.2.

Parameters such as line monitoring, substitute values etc. can be adjusted for each channel separately and are initialized solely by the master.

### Features
- Input module for the connection of temperature probes
- Complete galvanic isolation
# Technical data

## Type
- **Ident no.**: 6884222

## Power supply
- **Supply voltage**: via module rack, central power supply module
- **Power consumption**: ≤ 1 W
- **Galvanic separation**: complete galvanic isolation
- **Number of channels**: 4-channel

## Inputs
- **Input circuits**: Pt100, Pt200, Pt500, Pt1000, Ni 100, Cu100, thermocouple

## Response characteristic
- **Resolution**: 16 Bit
- **Linearity deviation**: ≤ 0.05 % measuring range
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time/fall time**: ≤ 1.3 s (10 … 90 %)
- **Max. measurement tolerance under EMC influence**: ≤ 0.1 % with shielded signal cable, ≤ 1 % with unshielded signal cable

## Indication
- **Operational readiness**: 1 x green / red
- **State/ Fault**: 4 x red

## Environmental Conditions
- **Ambient temperature**: -20 … +60 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **EMC**: acc. to EN 61326-1 (2006), acc. to NAMUR NE21 (2007)
- **MTTF**: 62 years acc. to SN 29500 (Ed. 99) 40 °C

## Mechanical data
- **Housing material**: plastic
- **Connection mode**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm
The input module TI41-N is designed for the connection of the 2, 3 and 4-wire temperature probes Pt100, Ni100 and Cu100.

Line compensation of 2-wire temperature resistors is done by means of parametrized resistance values. These values have to be determined first through measurements.

The analog resistance value is digitized to 16-bit. The temperature is given in Kelvin, the resolution in 0.1 K steps. For conversion to °C, please observe an offset of 273.2.

Parameters such as line monitoring, substitute values etc. can be adjusted for each channel separately and are initialized solely by the master.

Features
- Input module for the connection of RTDs (resistance thermo detectors)
- Complete galvanic isolation
## Technical data

### Type
- **Ident no.**
  - TI41-N 6884223

### Power supply
- **Supply voltage**
  - via module rack, central power supply module
- **Power consumption**
  - ≤ 1 W
- **Galvanic separation**
  - complete galvanic isolation
- **Number of channels**
  - 4-channel

### Inputs
- **Input circuits**
  - Pt100, Ni100, Cu100

### Response characteristic
- **Resolution**
  - 16 Bit
- **Linearity deviation**
  - ≤ 0.01 % measuring range
- **Temperature drift**
  - ≤ 0.002 % / K
- **Rise time/fall time**
  - ≤ 50 ms (10 … 90 %)
- **Max. measurement tolerance under EMC influence**
  - ≤ 0.1 % with shielded signal cable
  - ≤ 0.5 % with unshielded signal cable

### Indication
- **Operational readiness**
  - 1 x green / red
- **State/ Fault**
  - 4 x red

### Environmental Conditions
- **Ambient temperature**
  - -20…+70 °C
- **Relative humidity**
  - ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**
  - acc. to IEC 60068-2-6
- **Shock test**
  - acc. to IEC 60068-2-27
- **EMC**
  - acc. to EN 61326-1 (2006)
  - acc. to NAMUR NE21 (2007)
- **MTTF**
  - 80 years acc. to SN 29500 (Ed. 99)
  - 40 °C

### Mechanical data
- **Housing material**
  - plastic
- **Connection mode**
  - module, plugged on rack
- **Protection class**
  - IP20
- **Dimensions**
  - 18 x 118 x 103 mm
The GDP-N gateway serves to connect the excom® system to PROFIBUS-DP networks. Connection to the PROFIBUS-DP is established via optical fibers or copper cables. When using optical fibers for data transmission, an optocoupler pair must be installed between wired and optical PROFIBUS.

The gateway can be operated at a maximum transmission rate of 1500 kbps. The bus is connected to a standard miniature SUB-D slot on the module rack.

A GSD file containing all configuration files and parameter sets is available for system configuration. When connected to suitable host systems, you can change the system configuration during operation.

The gateway provides the entire range of PROFIBUS diagnostic functions including port-related diagnostics. Additionally, manufacturer-specific error codes are generated. For example HART® communication errors, power supply errors, planning errors as well as information on simulators, internal communication and redundancy status.

Redundancy: The use of two gateways and two bus cables ensures error-free communication, in case one gateway or one bus line may fail. If one of the components fails, the other immediately takes over, this is called line redundancy. System redundancy (two masters, each with its own segment coupler connected to a gateway) is also supported.

Recommended wiring components:
▪ PROFIBUS-DP cable, type 452
▪ D9T-RS485 male

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Recommended wiring components:
▪ PROFIBUS-DP cable, type 452
▪ D9T-RS485 male
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>GDP-N /FW2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>6884224</td>
</tr>
</tbody>
</table>

### Power supply
- **Supply voltage**: via module rack, central power supply module
- **Power consumption**: ≤ 1 W
- **Galvanic separation**: to int. bus and supply circuit

### System data
- **Fieldbus transmission rate**: 9.6 kbps … 1.5 Mbps
- **Fieldbus address range**: 1…99

### Indication
- **Operational readiness**: 1 x green / red
- **Int. communication (CAN)**: 1 x yellow / red
- **Ext. Communication (PDP)**: 1 x yellow / red
- **Redundancy readiness (PRIO)**: 1 x yellow / red
- **Error indication**: 1 x red

### Environmental Conditions
- **Ambient temperature**: -20…+70 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **MTTF**: 144 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Housing material**: plastic
- **Connection mode**: module, plugged on rack
- **Protection class**: IP20
- **Dimensions**: 18 x 118 x 103 mm
The PSM24-N unit supplies the excom® system with power to the full extension. The power supply module can only be used in non-Ex areas.

The PSM24-N supplies 24 VDC.

The external power supply is connected via clamps on the module rack. The clamps should not be contacted under power. They are located below a closure cap. Switch off power before contact.

**Redundancy:** Two power supply modules can be installed together with an appropriate module rack. In case of power cut or failure of one device, the second unit provides the power for the whole system. Different potentials can be supplied.

**Features**

- DC power supply module, supplies a module rack in the non-Ex area
Technical data

**Type**
- PSM24-N

**Ident no.**
- 6881723

**Power supply**
- Nominal voltage: 24 VDC
- Operating voltage range: 19.2…32 VDC
- Power consumption: ≤ 66.5 W
- Output power: ≤ 60 W
- Galvanic separation: Galvanically isolated input and output circuit, rated voltage 40 V

**Indication**
- Operational readiness: 1 x green
- Error indication: 1 x red

**Environmental Conditions**
- Ambient temperature: -20…+70 °C
- Relative humidity: ≤ 95 % at 55 °C acc. to EN 60068-2-2
- Vibration test: acc. to IEC 60068-2-6
- Shock test: acc. to IEC 60068-2-27
- MTTF: 61 years acc. to SN 29500 (Ed. 99) 40 °C

**Mechanical data**
- Electrical connection: via backplane
- Terminal cross-section: 2.5 mm² flexible / 4.0 mm² rigid
- Housing material: plastic
- Connection mode: module, plugged on rack
- Protection class: IP20
- Dimensions: 18 x 118 x 103 mm
The module rack MT08-N consists of a backplane and the actual rack system. It can accommodate a gateway, a power supply unit as well as 8 I/O modules. Up to 64 binary inputs/outputs or 32 analog inputs/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged under power without interrupting the data transmission. The same applies to redundant gateways and power supply modules.

The module rack can only be used in non-Ex areas for non-Ex signals.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall and rack mounting.

Features

- Module rack for max. 8 I/O modules, 2 gateways and 2 power supply modules
- The terminals for the signal connection level are available as accessories
## Technical data

**Type**  
MT08-N

**Ident no.**  
9100689

### System data

- **Fieldbus addressing**: 2 x decimal-coded rotary switches
- **Fieldbus connection technology**: 2 x 9-pin D-SUB

### Ports

- **DC power supply**: 2
- **Gateway**: 2
- **Block I/O**: 8

### Environmental Conditions

- **Ambient temperature**: -20 ... +70 °C
- **Relative humidity**: ≤ 95 % at 55 °C acc. to EN 60068-2
- **Vibration test**: acc. to IEC 60068-2-6
- **Shock test**: acc. to IEC 60068-2-27
- **MTTF**: acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data

- **Electrical connection**: 4 x 4 clamps per module
- **Terminal cross-section**: 1.5 mm²
- **Housing material**: continuously cast aluminium
- **Connection mode**: wall mounting
- **Protection class**: IP20
- **Dimensions**: 235 x 260 x 130 mm
Module rack, non-Ex, for 16 modules

The module rack MT16-N consists of a backplane and the actual rack system. It can accommodate 2 gateways, 2 power supply units as well as 16 I/O modules. Up to 128 binary inputs/outputs or 64 analog inputs/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged under power without interrupting the data transmission. The same applies to redundant gateways and power supply modules.

The module rack can only be used in non-Ex areas for non-Ex signals.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall and rack mounting.

Features

- Module rack for max. 16 I/O modules, 2 gateways and 2 power supply modules
- The terminals for the signal connection level are available as accessories
# Technical data

## Type
- **Ident no.** MT16-N
  - 9100686

## System data
- **Fieldbus addressing** 2 x decimal-coded rotary switches
- **Fieldbus connection technology** 2 x 9-pin D-SUB

## Ports
- **DC power supply** 2
- **Gateway** 2
- **Block I/O** 16

## Environmental Conditions
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-20...+70 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 % at 55 °C acc. to EN 60068-2</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to IEC 60068-2-6</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 60068-2-27</td>
</tr>
<tr>
<td>EMC</td>
<td>acc. to EN 61326-1 (2006)</td>
</tr>
<tr>
<td></td>
<td>acc. to NAMUR NE21 (2007)</td>
</tr>
<tr>
<td>MTTF</td>
<td>acc. to SN 29500 (Ed. 99) 40 °C</td>
</tr>
</tbody>
</table>

## Mechanical data
<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical connection</td>
<td>4 x 4 clamps per module</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>continuously cast aluminium</td>
</tr>
<tr>
<td>Connection mode</td>
<td>wall mounting</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>380 x 260 x 130 mm</td>
</tr>
</tbody>
</table>
Module rack, non-Ex, for 24 modules

The module rack MT24-3G consists of a backplane and the actual rack system. It can accommodate 2 gateways, 2 power supply units as well as 24 I/O modules. Up to 192 binary inputs/outputs or 96 analog inputs/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged under power without interrupting the data transmission. The same applies to redundant gateways and power supply modules.

The module rack can only be used in non-Ex areas for non-Ex signals.

The rack system is made of continuously cast aluminium. This ensures increased stability and shielding. The module rack is suited for wall and rack mounting.

Features

- Module rack for max. 24 I/O modules, 2 gateways and 2 power supply modules
- The terminals for the signal connection level are available as accessories
### Technical data

<table>
<thead>
<tr>
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<td>Ident no.</td>
<td>9100683</td>
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#### System data

<table>
<thead>
<tr>
<th>Fieldbus addressing</th>
<th>2 x decimal-coded rotary switches</th>
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</thead>
<tbody>
<tr>
<td>Fieldbus connection technology</td>
<td>2 x 9-pin D-SUB</td>
</tr>
</tbody>
</table>

#### Ports

<table>
<thead>
<tr>
<th>DC power supply</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway</td>
<td>2</td>
</tr>
<tr>
<td>Block I/O</td>
<td>24</td>
</tr>
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#### Environmental Conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>-20...+70 °C</th>
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</thead>
<tbody>
<tr>
<td>Relative humidity</td>
<td>≤ 95 % at 55 °C acc. to EN 60068-2</td>
</tr>
<tr>
<td>Vibration test</td>
<td>acc. to IEC 60068-2-6</td>
</tr>
<tr>
<td>Shock test</td>
<td>acc. to IEC 60068-2-27</td>
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<tr>
<td>MTTF</td>
<td>1211 years acc. to SN 29500 (Ed. 99) 40 °C</td>
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#### Mechanical data

<table>
<thead>
<tr>
<th>Electrical connection</th>
<th>4 x 4 clamps per module</th>
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<tbody>
<tr>
<td>Terminal cross-section</td>
<td>1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>continuously cast aluminium</td>
</tr>
<tr>
<td>Connection mode</td>
<td>wall mounting</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>525 x 260 x 130 mm</td>
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</tbody>
</table>
### System enclosure

#### Type code of system enclosure

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>EC-VA</td>
<td>System enclosure</td>
</tr>
<tr>
<td></td>
<td>Optional labelling</td>
</tr>
<tr>
<td>65 55 26</td>
<td>Dimensions</td>
</tr>
<tr>
<td>Width</td>
<td>... housing depth in cm</td>
</tr>
<tr>
<td>Height</td>
<td>... housing height in cm</td>
</tr>
<tr>
<td>Depth</td>
<td>... housing width in cm</td>
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</table>

#### Material

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>0</td>
<td>stainless steel 1.4301</td>
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<tr>
<td>1</td>
<td>stainless steel 1.4404</td>
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#### Inspection window

<table>
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<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
<td>without inspection window</td>
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<tr>
<td>1</td>
<td>with inspection window</td>
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</tbody>
</table>

#### Drilling pattern

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
<td>dummy plate</td>
</tr>
<tr>
<td>1</td>
<td>flange plate M16</td>
</tr>
<tr>
<td>2</td>
<td>flange plate M20</td>
</tr>
<tr>
<td>3</td>
<td>special version e.g. drilling pattern, recorded by special number</td>
</tr>
</tbody>
</table>

#### Module rack

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>no module rack</td>
</tr>
<tr>
<td>01</td>
<td>module rack MT08-2G</td>
</tr>
<tr>
<td>02</td>
<td>module rack MT16-2G</td>
</tr>
<tr>
<td>04</td>
<td>module rack MT08-3G</td>
</tr>
<tr>
<td>05</td>
<td>module rack MT16-3G</td>
</tr>
<tr>
<td>06</td>
<td>module rack MT24-3G</td>
</tr>
<tr>
<td>07</td>
<td>module rack MT08-N</td>
</tr>
<tr>
<td>08</td>
<td>module rack MT16-N</td>
</tr>
<tr>
<td>09</td>
<td>module rack MT24-N</td>
</tr>
<tr>
<td>10</td>
<td>module rack MT16-2G/MSA</td>
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</tbody>
</table>

#### Upstream sub-rack

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
<td>without upstream sub-rack MT-PPS</td>
</tr>
<tr>
<td>1</td>
<td>with upstream sub-rack MT-PPS</td>
</tr>
</tbody>
</table>

#### Segment coupler

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>without installed OC11 segment coupler</td>
</tr>
<tr>
<td>1</td>
<td>with installed OC11 segment coupler</td>
</tr>
<tr>
<td>2</td>
<td>with two installed OC11 segment couplers</td>
</tr>
</tbody>
</table>

#### Special number

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>special number for all extra fitments such as trace heating, circuit breaker, fuses or lightning components</td>
</tr>
</tbody>
</table>

---

*excom® – Remote-I/O system

System enclosure
The system enclosures of the EG-VA series contain a module rack, either with 16 or 24 slots. The enclosures are made of stainless steel, feature ignition protection type Ex-e and allow installation in zone 1 even in harsh and aggressive environments. In order to save the user the trouble of getting approvals for each system component, TURCK has obtained a single system approval for the stainless steel enclosures with integrated module rack. All components used have been individually tested and approved. In this way customized solutions are also possible. Assembly and installation are carried out directly at TURCK in order to ensure that the required clearance and creepage distances are met.

Features

- Stainless steel housing with integrated module rack
- Housing door with inspection window
- Integrated module rack MT16-2G, terminal clamps (see accessories)
- Flange plate equipped with cable glands
- Dimensions (w x h x d):
  - Type 400 x 550 x 210 [mm]
  - Type 460 x 550 x 260 [mm]
  - Type 650 x 550 x 210 [mm]
  - Type 650 x 550 x 260 [mm]
  - Type 800 x 550 x 210 [mm]
  - Type 800 x 550 x 260 [mm]
## excom® – Accessories

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>OC11-LINKCABLE 8031339</td>
<td>Extension cable to connect two identical OC11Ex devices (2G i.e. 3G), length 0.24 m</td>
</tr>
<tr>
<td>D9T-RS485 6890942</td>
<td>PROFIBUS bus connector for RS485, Fast Connect, without PG gland, 35° outlet</td>
</tr>
<tr>
<td>D9T-RS485PG 6890943</td>
<td>PROFIBUS bus connector for RS485, Fast Connect, with PG gland, 35° outlet</td>
</tr>
<tr>
<td>D9T-RS485IS 6890944</td>
<td>PROFIBUS bus connector for RS485-IS, Fast Connect, only for use with IS devices!</td>
</tr>
<tr>
<td>STB16-4RS/1,5-BU 9909622</td>
<td>16-pcs. set: 4-pin terminal block, screw clamps blue</td>
</tr>
<tr>
<td>STB16-4RC/1,5-BU 9909623</td>
<td>16-pcs. set: 4-pin terminal block, cage clamps blue</td>
</tr>
<tr>
<td>STB16-4RS/1,5-BK 9909624</td>
<td>16-pcs. set: 4-pin terminal block, screw clamps black</td>
</tr>
</tbody>
</table>
### Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>STB16-4RC/1,5-BK</td>
<td>16-pcs. set: 4-pin terminal block, cage clamps black</td>
<td></td>
</tr>
<tr>
<td>ELST-M20EX</td>
<td>Pressure compensation element (plastic), prevents condensation inside the housing</td>
<td></td>
</tr>
<tr>
<td>ELVA-M20EX</td>
<td>Pressure compensation element (stainless steel), prevents condensation inside the housing</td>
<td></td>
</tr>
<tr>
<td>SK8</td>
<td>Shield terminal for bus bars</td>
<td></td>
</tr>
<tr>
<td>BM-PS</td>
<td>Closure cap for redundant power supply slot in zone 1</td>
<td></td>
</tr>
<tr>
<td>BM1</td>
<td>Dummy module for unused slots on the module rack, version 1</td>
<td></td>
</tr>
<tr>
<td>BM-N</td>
<td>Dummy module for unused slots on the module rack, version N</td>
<td></td>
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</tbody>
</table>
### excom® – Accessories

<table>
<thead>
<tr>
<th>MODEX-SCHALTKLEMME</th>
<th>Switching terminal for manual switching in Ex areas (enable function for downstream connected devices)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6884069</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODEX-TRENNRELAIS</th>
<th>Isolating relay for the connection of non-intrinsically safe circuits (e.g. Ex e valves with auxiliary voltage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6884070</td>
<td></td>
</tr>
</tbody>
</table>
Interface technology
Interface technology

The TURCK Interface technology program offers a complete range of functions, designs and variants for isolating, conditioning, processing, converting and matching digital and analog signals in control and automation. The various designs meet the highest industrial standards and ensure flexibility in the planning, construction and expansion of industrial plants:

▪ IM series – Universally applicable devices for DIN rail mounting with universal power supply unit and removable terminal blocks
▪ IMS series – Slim 6.2 mm modular housing for DIN rail mounting as analog signal isolators and temperature measuring amplifiers
▪ IME series – For DIN rail mounting, for high efficiency with reduced cabling and power consumption
▪ IMC series – In a compact IP67 housing with rich functionality for distributed use directly in the field
IM, IME, IMS and IMSP series – interface technology in modular housings

The interface modules of the IM, IME, IMS and IMSP series are integrated in a compact modular housing that can be snap fitted easily onto a DIN EN 60715 mounting rail. The devices can be mounted horizontally or vertically next to each other. The 1 and 2-channel IMS modules (Interface Module Small) are only 6.2 mm wide and offer galvanic isolation, signal conditioning and temperature measuring with maximum packing density. The compact surge protection devices of the IMSP series are also only 6.2 mm wide and are connected in front of the corresponding interface modules. The 18 or 27 mm wide devices of the IM series are particularly versatile thanks to a wide range of functions and parameter setting options. Equipped with a universal voltage power supply unit with 20...250 VUC and 20...250 VAC/20...125 VDC for Ex devices, the modules of the IM series can be connected to virtually any industrial supply network.

<table>
<thead>
<tr>
<th>Type</th>
<th>Ident No.</th>
<th>Description</th>
<th>Page</th>
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<tbody>
<tr>
<td>IM1-12EX-MT</td>
<td>7541228</td>
<td>Isolating switching amplifier, 1-channel</td>
<td>302</td>
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<tr>
<td>IM1-12EX-R</td>
<td>7541226</td>
<td>Isolating switching amplifier, 1-channel</td>
<td>304</td>
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<tr>
<td>IM1-12EX-T</td>
<td>7541227</td>
<td>Isolating switching amplifier, 1-channel</td>
<td>306</td>
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<tr>
<td>IM1-12-T</td>
<td>7541268</td>
<td>Isolating switching amplifier, 1-channel</td>
<td>308</td>
</tr>
<tr>
<td>IM1-121EX-R</td>
<td>7541229</td>
<td>Isolating switching amplifier, 1-channel</td>
<td>310</td>
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<tr>
<td>IM1-121EX-T</td>
<td>7541230</td>
<td>Isolating switching amplifier, 1-channel</td>
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<tr>
<td>IM1-22EX-MT</td>
<td>7541213</td>
<td>Isolating switching amplifier, 2-channel</td>
<td>314</td>
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<tr>
<td>IM1-22EX-R</td>
<td>7541231</td>
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<td>316</td>
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<tr>
<td>IM1-22EX-T</td>
<td>7541232</td>
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<td>318</td>
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<tr>
<td>IM1-22EX-R/K51</td>
<td>7541238</td>
<td>Isolating switching amplifier, 2-channel</td>
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<td>IM1-22-R</td>
<td>7541234</td>
<td>Isolating switching amplifier, 2-channel</td>
<td>322</td>
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<tr>
<td>IM12-22EX-R</td>
<td>7541233</td>
<td>Isolating switching amplifier, 2-channel</td>
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<tr>
<td>IM12-22EX-R/230VAC</td>
<td>7505641</td>
<td>Isolating switching amplifier, 2-channel</td>
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<td>7505640</td>
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<tr>
<td>IM1-231EX-R</td>
<td>7541239</td>
<td>Isolating switching amplifier, 2-channel</td>
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<td>IM1-451-R</td>
<td>7541190</td>
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<td>332</td>
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<td>IM1-451-T</td>
<td>7520721</td>
<td>Isolating switching amplifier, 4-channel</td>
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<td>IM21-14-CPT</td>
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<td>IM21-14EX-CPT</td>
<td>7505651</td>
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<tr>
<td>IM31-11EX-I</td>
<td>7506320</td>
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<tr>
<td>IM31-11EX-U</td>
<td>7506327</td>
<td>Input analog signal isolator, 1-channel</td>
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<tr>
<td>IM31-11-I</td>
<td>7506323</td>
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## Short description and table of contents

<table>
<thead>
<tr>
<th>Type</th>
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<th>Description</th>
<th>Page</th>
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<tbody>
<tr>
<td>IM31-12-I</td>
<td>7506324</td>
<td>Input analog signal isolator, 1-channel – Signal duplicating</td>
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<tr>
<td>IM31-12EX-I</td>
<td>7506321</td>
<td>Input analog signal isolator, 1-channel – Signal duplicating</td>
<td>352</td>
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<tr>
<td>IM31-22-I</td>
<td>7506325</td>
<td>Input analog signal isolator, 2-channel</td>
<td>354</td>
</tr>
<tr>
<td>IM31-22EX-I</td>
<td>7506322</td>
<td>Input analog signal isolator, 2-channel</td>
<td>356</td>
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<tr>
<td>IM31-22EX-U</td>
<td>7506326</td>
<td>Input analog signal isolator, 2-channel</td>
<td>358</td>
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<tr>
<td>IM33-11-HI/24VDC</td>
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<td>HART* isolating transducer, 1-channel</td>
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<tr>
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<tr>
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<td>HART* isolating transducer, 1-channel</td>
<td>366</td>
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<tr>
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Our Strengths – Your Advantages

Universal power supply unit – One for all

As the IM modules are designed for a voltage range between 20...250 VUC and 20...250 VAC/20...125 VDC for Ex devices, they can be connected to any industrial supply network. This therefore considerably simplifies device selection, stock-keeping and spare parts management. TURCK's universal power supply units offer reliable protection against undervoltage and overvoltage, offer sufficient power reserves and also meet explosion protection requirements. Another benefit of the modern interface devices is their flexibility and simple use: The modules just have two terminals for the power supply. The terminals can be connected to both an AC and DC power supply. A bipolar DC power supply connection is also possible.

Removable terminal blocks – Simple and error-free installation

The interface modules of the IM series feature removable terminals to simplify the design, conversion and maintenance of installations. This makes handling easier for installations, prevents wiring errors when replacing devices and reduces mounting and associated costs. The devices are available with screw and cage clamp terminals and provide a highly accessible terminal chamber for cable cross sections up to 2.5 mm² (14 AWG). The male connectors are coded with red pins in order to prevent the incorrect connection of a terminal block.

Slim design, multichannel devices – High packing density

The isolation, conditioning, processing, conversion and matching of digital and analog signals – these are offered by the IM and IMS series in a compact, space-saving design, also in two and 4-channel versions. The universal IM series offers the complete solution range in a snap-on modular housing, with a depth of only 110 mm, and a width of 18 mm or 27 mm. With a mounting width of only 6.2 mm and a signal adaption function that can be set easily by DIP switches, the 1 and 2-channel IMS modules set new standards in terms of channel density and flexibility. The devices can be mounted directly next to each other. This saves space in the control cabinet without any loss in the usual level of user-friendliness and reliability.
Screw and snap fastening – Flexible mounting

The IM and IMS series interface modules are designed for snap-on mounting on DIN rails acc. to DIN EN 60715. Screw fastening on a mounting plate is also possible. The devices can be mounted horizontally or vertically next to each other.

Different operating concepts – The right one for any application

In daily routine tasks, the simple handling of interface devices is critical. For this an interface device should have precisely the range of functions that the user requires for his application. In order to meet all requirements in terms of handling, commissioning and diagnostics, the interface program offers a selection of different operating concepts, suitably packaged in the required design. From the compact variant with DIP and rotary coding switch to teachable devices with intuitive menu guidance in the display, to modules with convenient parameter setting and diagnostics, to FDT/DTM technology – a tailored solution for every requirement.

Wide selection range – Tailored solutions

The interface modules of the IM series provide you with the flexibility and versatility you need in order to create tailored solutions for your application: compact designs, flexible operating concepts and configurations, as well as a wide range of functions for isolating, conditioning, processing, converting and matching digital and analog signals in 1 to 4-channel versions. The program also includes solution for the Ex area and devices with SIL certification. Regardless of whether for standard or special applications, for simple or complex requirements, with manual setting or PC programming, with status indication or differentiated diagnostic functions: The IM series is suitable for universal use and covers the entire range of high performance tasks in interface technology.
## Interface technology in modular housing

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</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>24 VDC</td>
</tr>
<tr>
<td></td>
<td>82</td>
<td>Power supply</td>
<td></td>
</tr>
</tbody>
</table>
Interface technology in modular housing

<table>
<thead>
<tr>
<th>Type code</th>
<th>Functional principle</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM 12</td>
<td>1 – isolating switching amplifier with line monitoring</td>
</tr>
<tr>
<td></td>
<td>2 – isolating switching amplifier without line monitoring</td>
</tr>
<tr>
<td></td>
<td>3 – rotation speed monitor/ frequency converter</td>
</tr>
<tr>
<td></td>
<td>3 – analog input amplifier</td>
</tr>
<tr>
<td></td>
<td>3 – isolating transducer</td>
</tr>
<tr>
<td></td>
<td>3 – temperature amplifier</td>
</tr>
<tr>
<td></td>
<td>3 – analog output amplifier</td>
</tr>
<tr>
<td></td>
<td>3 – potentiometer amplifier</td>
</tr>
<tr>
<td></td>
<td>4 – limit value indicator</td>
</tr>
<tr>
<td></td>
<td>7 – digital output/ valve control module</td>
</tr>
<tr>
<td></td>
<td>7 – relay coupling module</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ex</th>
<th>Device class</th>
<th>MT</th>
<th>Output type</th>
<th>24VDC</th>
<th>Power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex</td>
<td>associated device with intrinsically safe field circuits</td>
<td>R</td>
<td>relay switching output</td>
<td>24 VDC</td>
<td>supplied with 24 VDC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T</td>
<td>transistor switching output</td>
<td>not specified</td>
<td>wide-range power supply</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I</td>
<td>analog current output 0/4…20 mA</td>
<td>L</td>
<td>loop powered, supplied by the control circuit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>U</td>
<td>analog voltage output 0/2…10 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MT</td>
<td>MOSFET switching output</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>FDT/DTM parameterizable via computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>D</td>
<td>display</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H</td>
<td>HART*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Interface technology in modular housing
DIN rail devices, IM series

Isolating switching amplifier, 1-channel

The 1-channel isolating switching amplifier IM1-12EX-MT is equipped with an intrinsically safe input circuit.

Sensors according to EN 60947-5-6 (NA-MUR) or potential-free contact transmitters can be connected to the device.

The output circuits feature two potential-free and parallel controlled MOSFET transistors for switching voltages of up to 250 VAC at a maximum frequency of 1 kHz.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the MOSFET outputs are blocked.

Features

- ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TII, CCOE
- Installation in zone 2
- 2 transistor outputs (MOSFET)
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break and short-circuit
- Complete galvanic isolation
## Technical data

### Type
IM1-12EX-MT

### Ident no.
75412B

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20...125 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 3 W

### Inputs
- **No-load voltage**: 8.2 VDC
- **Short-circuit current**: 8.2 mA
- **Input resistance**: 1 kΩ
- **Cable resistance**: ≤ 50 Ω
- **Switch-on threshold**: 1.55 mA
- **Switch-off threshold**: 1.75 mA
- **Short-circuit threshold**: ≥ 6 mA
- **Wire breakage threshold**: ≤ 0.1 mA

### Outputs
- **Output circuits (digital)**: 2 x MOSFET (potential-free, short-circuit proof)
- **Switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 90 mA
- **Switching frequency**: ≤ 1000 Hz

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: TÜV 04 ATEX 2553
- **Device designation**: II (1) G, II (1) D [Ex ia Ga] IIC; [Ex ia Da] IIC
- **Max. values**: Terminal connection: 1+4
- **Max. output voltage Uo**: ≤ 9.6 V
- **Max. output current Io**: ≤ 11 mA
- **Max. output power Po**: ≤ 26 mW
- **Rated voltage**: 250 V
- **Characteristic**: Linear
- **Internal inductance/capacitance L/C**: L = 65 µH, C negligibly small

### External inductance/capacitance L/C

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L (mH)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>C (µF)</td>
<td>1.1</td>
<td>0.83</td>
</tr>
</tbody>
</table>

- **Ex approval acc. to conformity certificate**: TÜV 06 ATEX 552968 X

### Indication
- **Operational readiness**: green
- **Switching state**: yellow
- **Error indication**: red

### Environmental Conditions
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction for DIN rail / panel**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 104 x 110 mm

### Approval | Certification
- ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIS, CCCE
Isolating switching amplifier, 1-channel

The 1-channel isolating switching amplifier IM1-12EX-R is equipped with an intrinsically safe input circuit. Sensors according to EN 60947-5-6 (NA-MUR) or potential-free contact transmitters can be connected to the device.

The output circuit features two relays, each with NO contact.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output relays drop out.

Features
- ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE
- Installation in zone 2
- 2 relay outputs (NO)
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break and short-circuit
- Complete galvanic isolation

Output relay – Load curve

Output relay – Electrical lifetime
Technical data

**Type**

<table>
<thead>
<tr>
<th>Type</th>
<th>IM1-12EX-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7541226</td>
</tr>
</tbody>
</table>

**Power supply**

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Universal voltage supply unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20…125 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40…70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 3 W</td>
</tr>
</tbody>
</table>

**Inputs**

<table>
<thead>
<tr>
<th>No-load voltage</th>
<th>8.2 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-circuit current</td>
<td>8.2 mA</td>
</tr>
<tr>
<td>Input resistance</td>
<td>1 kΩ</td>
</tr>
<tr>
<td>Cable resistance</td>
<td>≤ 30 Ω</td>
</tr>
<tr>
<td>Switch-on threshold</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Switch-off threshold</td>
<td>1.75 mA</td>
</tr>
<tr>
<td>Short-circuit threshold</td>
<td>≥ 6 mA</td>
</tr>
<tr>
<td>Wire breakage threshold</td>
<td>≤ 0.1 mA</td>
</tr>
</tbody>
</table>

**Outputs**

<table>
<thead>
<tr>
<th>Output circuits (digital)</th>
<th>2 x relays (NO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching frequency</td>
<td>≤ 10 Hz</td>
</tr>
<tr>
<td>Relay switching voltage</td>
<td>≤ 250 VAC/120 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 2 A</td>
</tr>
<tr>
<td>Switching capacity per output</td>
<td>≤ 500 VA/60 W</td>
</tr>
<tr>
<td>Contact quality</td>
<td>AgNi, 3µ Au</td>
</tr>
</tbody>
</table>

**Approvals and declarations**

| Ex approval acc. to conformity certificate | TÜV 04 ATEX 2553 |

**Ex ia**

<table>
<thead>
<tr>
<th>Max. values</th>
<th>Terminal connection: 1+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. output voltage $U_o$</td>
<td>≤ 9.6 V</td>
</tr>
<tr>
<td>Max. output current $I_o$</td>
<td>≤ 11 mA</td>
</tr>
<tr>
<td>Max. output power $P_o$</td>
<td>≤ 26 mW</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>250 V</td>
</tr>
<tr>
<td>Characteristic</td>
<td>linear</td>
</tr>
</tbody>
</table>

**External inductance/capacitance $L_i/C_i$**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_i$ [mH]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>$C_i$ [µF]</td>
<td>1.1</td>
<td>0.83</td>
</tr>
</tbody>
</table>

**Ex approval acc. to conformity certificate**

| TÜV 06 ATEX 552968 X |

**Environmental Conditions**

| Ambient temperature | -25…+70 °C |
| Storage temperature | -40…+80 °C |
| Relative humidity | ≤ 95 % |
| Test voltage | 2.5 kV |
| MTTF | 272 years acc. to SN 29500 (Ed. 99) |
| °C | 40 |

**Mechanical data**

| Tightening torque | 0.5 Nm |
| Electrical connection | 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection |
| Terminal cross-section | 1 x 2.5 mm² / 2 x 1.5 mm² |
| Housing material | Polycarbonate/ABS |
| Mounting instruction | for DIN rail / panel |
| Protection class | IP20 |
| Flammability class acc. to UL 94 | V-0 |
| Dimensions | 18 x 104 x 110 mm |

**Approvals | Certification**

| ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE | ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE |

**External inductance/capacitance $L_e/C_e$**

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_e$ [mH]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>$C_e$ [µF]</td>
<td>1.9</td>
<td>1.4</td>
</tr>
</tbody>
</table>

**Declaration**

| SIL 2 acc. to EXIDA FMEDA |

**Indication**

| Operational readiness | green |
| Switching state | yellow |
| Error indication | red |

**External inductance/capacitance $L_e/C_e$**

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_e$ [mH]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>$C_e$ [µF]</td>
<td>1.9</td>
<td>1.4</td>
</tr>
</tbody>
</table>

**Declaration**

| SIL 2 acc. to EXIDA FMEDA |

**Indication**

| Operational readiness | green |
| Switching state | yellow |
| Error indication | red |

**Environmental Conditions**

| Ambient temperature | -25…+70 °C |
| Storage temperature | -40…+80 °C |
| Relative humidity | ≤ 95 % |
| Test voltage | 2.5 kV |
| MTTF | 272 years acc. to SN 29500 (Ed. 99) |
| °C | 40 |

**Mechanical data**

| Tightening torque | 0.5 Nm |
| Electrical connection | 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection |
| Terminal cross-section | 1 x 2.5 mm² / 2 x 1.5 mm² |
| Housing material | Polycarbonate/ABS |
| Mounting instruction | for DIN rail / panel |
| Protection class | IP20 |
| Flammability class acc. to UL 94 | V-0 |
| Dimensions | 18 x 104 x 110 mm |

**Approvals | Certification**

| ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE | ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE |

**External inductance/capacitance $L_e/C_e$**

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_e$ [mH]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>$C_e$ [µF]</td>
<td>1.9</td>
<td>1.4</td>
</tr>
</tbody>
</table>

**Declaration**

| SIL 2 acc. to EXIDA FMEDA |

**Indication**

| Operational readiness | green |
| Switching state | yellow |
| Error indication | red |

**Environmental Conditions**

| Ambient temperature | -25…+70 °C |
| Storage temperature | -40…+80 °C |
| Relative humidity | ≤ 95 % |
| Test voltage | 2.5 kV |
| MTTF | 272 years acc. to SN 29500 (Ed. 99) |
| °C | 40 |

**Mechanical data**

| Tightening torque | 0.5 Nm |
| Electrical connection | 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection |
| Terminal cross-section | 1 x 2.5 mm² / 2 x 1.5 mm² |
| Housing material | Polycarbonate/ABS |
| Mounting instruction | for DIN rail / panel |
| Protection class | IP20 |
| Flammability class acc. to UL 94 | V-0 |
| Dimensions | 18 x 104 x 110 mm |

**Approvals | Certification**

| ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE | ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE |
Isolating switching amplifier, 1-channel

The 1-channel isolating switching amplifier IM1-12EX-T is equipped with an intrinsically safe input circuit. Sensors according to EN 60947-5-6 (NA-MUR) or potential-free contact transmitters can be connected to the device.

The output circuits feature 2 potential-free and short-circuit protected transistors.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output transistors are blocked.

Features

- ATEX, IECEx, UL, cFMus, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE
- Installation in zone 2
- 2 transistor outputs, short-circuit proof, potential-free and reverse-polarity protected
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Complete galvanic isolation
Interface technology in modular housing  
DIN rail devices, IM series

**Technical data**

**Type**
IM1-12EX-T

**Ident no.**
7541227

**Power supply**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>Universal voltage supply unit</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…125 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40…70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 3 W</td>
</tr>
</tbody>
</table>

**Inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-load voltage</td>
<td>8.2 VDC</td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>8.2 mA</td>
</tr>
<tr>
<td>Input resistance</td>
<td>1 kΩ</td>
</tr>
<tr>
<td>Cable resistance</td>
<td>≤ 50 Ω</td>
</tr>
<tr>
<td>Switch-on threshold</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Switch-off threshold</td>
<td>1.75 mA</td>
</tr>
<tr>
<td>Short-circuit threshold</td>
<td>≥ 6 mA</td>
</tr>
<tr>
<td>Wire breakage threshold</td>
<td>≤ 0.1 mA</td>
</tr>
</tbody>
</table>

**Outputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output circuits (digital)</td>
<td>2 x transistor (potential-free, short-circuit proof)</td>
</tr>
<tr>
<td>Switching voltage</td>
<td>≤ 30 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 50 mA</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 5000 Hz</td>
</tr>
<tr>
<td>Voltage drop</td>
<td>≤ 2.5 V</td>
</tr>
</tbody>
</table>

**Approvals and declarations**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex approval acc. to conformity certificate</td>
<td>TÜV 04 ATEX 2553</td>
</tr>
<tr>
<td>Device designation</td>
<td>Ex ia II (1) G, II (1) D (Ex ia Ga) IIC, Ex ia Da IIC</td>
</tr>
<tr>
<td>Max. values:</td>
<td>Terminal connection: 1+4</td>
</tr>
<tr>
<td>Max. output voltage Uo</td>
<td>≤ 9.6 V</td>
</tr>
<tr>
<td>Max. output current Io</td>
<td>≤ 11 mA</td>
</tr>
<tr>
<td>Max. output power Po</td>
<td>≤ 26 mW</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>250 V</td>
</tr>
<tr>
<td>Characteristic</td>
<td>linear</td>
</tr>
<tr>
<td>Internal inductance/capacitance Lc/Cc</td>
<td>Lc = 65 µH, Cc negligibly small</td>
</tr>
</tbody>
</table>

**External inductance/capacitance Lc/Cc**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lc (mH)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Cc (µF)</td>
<td>1.1</td>
<td>0.83</td>
</tr>
</tbody>
</table>

**Environmental Conditions**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25…+70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40…+80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 %</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
<tr>
<td>MTTF</td>
<td>314 years acc. to SN 29500 (Ed. 99)</td>
</tr>
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</table>

**Mechanical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>0.5 Nm</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 104 x 110 mm</td>
</tr>
</tbody>
</table>

**Approval | Certification**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE</td>
<td></td>
</tr>
</tbody>
</table>

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more@turck.com  •  www.turck.com  •  Edition I/2014
Isolating switching amplifier, 1-channel

The isolating switching amplifier IM1-12-T is a 1-channel device.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits feature 2 potential-free and short-circuit protected transistors.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output transistors are blocked.

Features

- TR CU
- 2 transistor outputs, short-circuit proof, potential-free and reverse-polarity protected
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break and short-circuit
- Complete galvanic isolation

The power symbol reads 12 VDC ≤ 50 mA. The symbols for wire-break monitoring and short-circuit monitoring are shown as well.
## Technical data

**Type**
- IM1-12-T
- Ident no. 7541268

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20…125 VDC
- **Operating voltage range**: 20…250 VAC
- **Frequency**: 40…70 Hz
- **Power consumption**: ≤ 3 W

### Inputs
- **No-load voltage**: 8.2 VDC
- **Short-circuit current**: 8.2 mA
- **Input resistance**: 1 kΩ
- **Cable resistance**: ≤ 50 Ω
- **Switch-on threshold**: 1.55 mA
- **Switch-off threshold**: 1.75 mA
- **Short-circuit threshold**: ≥ 6 mA
- **Wire breakage threshold**: ≤ 0.1 mA

### Outputs
- **Output circuits (digital)**: 2 x transistor (potential-free, short-circuit proof)
- **Switching voltage**: ≤ 30 VDC
- **Switching current per output**: ≤ 50 mA
- **Switching frequency**: ≤ 5000 Hz
- **Voltage drop**: ≤ 2.5 V

### Approvals and declarations
- **Declaration**: SIL 2 acc. to EXIDA FMEDA

### Indication
- **Operational readiness**: green
- **Switching state**: yellow
- **Error indication**: red

### Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 104 x 110 mm

### Approval | Certification
- TR CU
Interface technology in modular housing
DIN rail devices, IM series

Isolating switching amplifier, 1-channel

The 1-channel isolating switching amplifier IM1-12EX-R is equipped with an intrinsically safe input circuit.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits feature two relays each with NO contact, one of which works as alarm output.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm relay drop out.

Features
- ATEX, IECEx, UL, C, FM, CSA, TR CU, NEPSI, KOSHA, TII, CCC, CEE
- Installation in zone 2
- 2 relay outputs (NO)
- Output mode adjustable (NO/NC mode)
- Common alarm output
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Complete galvanic isolation

The 1-channel isolating switching amplifier IM1-12EX-R is equipped with an intrinsically safe input circuit.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits feature two relays each with NO contact, one of which works as alarm output.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm relay drop out.
## Technical data

### Type
- **IM1-121EX-R**
- **Ident no.** 7541229

### Power supply
- **Nominal voltage** Universal voltage supply unit
- **Operating voltage range** 20 … 125 VDC
- **Operating voltage range** 20 … 250 VAC
- **Frequency** 40 … 70 Hz
- **Power consumption** ≤ 3 W

### Inputs
- **No-load voltage** 8.2 VDC
- **Short-circuit current** 8.2 mA
- **Input resistance** 1 kΩ
- **Cable resistance** ≤ 50 Ω
- **Switch-on threshold** 1.55 mA
- **Switch-off threshold** 1.75 mA
- **Short-circuit threshold** ≥ 6 mA
- **Wire breakage threshold** ≤ 0.1 mA

### Outputs
- **Output circuits (digital)** 2 x relays (NO)
- **Switching frequency** ≤ 10 Hz
- **Relay switching voltage** ≤ 250 VAC/120 VDC
- **Switching current per output** ≤ 2 A
- **Switching capacity per output** ≤ 500 VA/60 W
- **Contact quality** AgNi, 3µ Au

### Approvals and declarations
- **Ex approval acc. to conformity certificate** TÜV 04 ATEX 2553
- **Device designation** II (1) G, II (1) D [Ex ia Ga] IIC; [Ex ia Da] IIC
- **Max. values:**
  - Terminal connection: 1+4
  - Max. output voltage $U_o$ ≤ 9.6 V
  - Max. output current $I_o$ ≤ 11 mA
  - Max. output power $P_o$ ≤ 26 mW
- **Rated voltage** 250 V
- **Characteristic** linear
- **Internal inductance/capacitance $L_i/C_i$** $L_i = 65 \mu H$, $C_i$ negligibly small

### Environmental Conditions
- **Ambient temperature** -25 … +70 °C
- **Storage temperature** -40 … +80 °C
- **Relative humidity** ≤ 95 %
- **Test voltage** 2.5 kV
- **MTTF** 272 years acc. to SN 29500 (Ed. 99) 40 °C
- **Mechanical data**
  - **Tightening torque** 0.5 Nm
  - **Electrical connection** 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
  - **Terminal cross-section** 1 x 2.5 mm² / 2 x 1.5 mm²
  - **Housing material** Polycarbonate/ABS
  - **Dimensions** 18 x 104 x 110 mm

### Indication
- **Operational readiness** green
- **Switching state** yellow
- **Error indication** red

### Approval | Certification
- ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIS, CCOE

### External inductance/capacitance $L_o/C_o$

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ [mH]</td>
<td>1 5 10</td>
<td>2 10 20</td>
</tr>
<tr>
<td>$C_o$ [µF]</td>
<td>1.9 1.4 1.2</td>
<td>11 7.5 6.6</td>
</tr>
</tbody>
</table>

### Declaration
- **SIL 2 acc. to EXIDA FMEDA**
Isolating switching amplifier, 1-channel

The 1-channel isolating switching amplifier IM1-121EX-T is equipped with an intrinsically safe input circuit.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits feature two potential-free and short circuit protected transistors, one of which works as alarm output.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm transistor are blocked.

Features

- ATEX, IECEx, UL, cFMus, CSA, TR CU, NEPSI, KOSHA, TIlS, CCOE
- Installation in zone 2
- 2 transistor outputs, potential-free
- Common alarm output
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Complete galvanic isolation

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm transistor are blocked.
Interface technology in modular housing
DIN rail devices, IM series

Technical data

**Type**
IM1-121EX-T
**Ident no.**
7541230

**Power supply**
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20…125 VDC
- **Operating voltage range**: 20…250 VAC
- **Frequency**: 40…70 Hz
- **Power consumption**: ≤ 3 W

**Inputs**
- **No-load voltage**: 8.2 VDC
- **Short-circuit current**: 8.2 mA
- **Input resistance**: 1 kΩ
- **Cable resistance**: ≤ 50 Ω
- **Switch-on threshold**: 1.55 mA
- **Switch-off threshold**: 1.75 mA
- **Short-circuit threshold**: ≥ 6 mA
- **Wire breakage threshold**: ≤ 0.1 mA

**Outputs**
- **Output circuits (digital)**: 2 x transistor (potential-free, short-circuit proof)
- **Switching voltage**: ≤ 30 VDC
- **Switching current per output**: ≤ 50 mA
- **Switching frequency**: ≤ 5000 Hz
- **Voltage drop**: ≤ 2.5 V

**Approvals and declarations**
- **Ex approval acc. to conformity certificate**: TÜV 04 ATEX 2533
- **Device designation**: C (II (1) G, II (1) D [Ex ia Ga] IIC; [Ex ia Da] IIIC
- **Max. values**: Terminal connection: 1+4
- **Max. output voltage Uo**: ≤ 9.6 V
- **Max. output current Io**: ≤ 11 mA
- **Max. output power Po**: ≤ 26 mW
- **Rated voltage**: 250 V
- **Characteristic**: linear

**Ex internal inductance/capacitance L/C**
- **L_1 = 65 µH, C_1 negligibly small**

**External inductance/capacitance L/C**

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_1 [mH]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>C_1 [µF]</td>
<td>1.9</td>
<td>1.4</td>
</tr>
</tbody>
</table>

**Ex indication**
- **Operational readiness**: green
- **Switching state**: yellow
- **Error indication**: red

**Environmental Conditions**
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV
- **MTTF**: 314 years acc. to SN 29500 (Ed. 99) 40 °C

**Mechanical data**
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 104 x 110 mm

**Approval | Certification**
- ATEX, IECEx, UL, FMus, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE
Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IM1-22EX-MT is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NA-MUR) or potential-free contact transmitters can be connected to the device.

The output circuits feature two potential-free MOSFET transistors.

Six front panel switches are available to set the output mode separately for each channel (NO/NC mode), as well as to enable/disable wire-break (WB) and short-circuit (SC) monitoring separately.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LEDs 1 and 2 light yellow to indicate the switching status of the associated output. In the event of an input circuit error, the 2-color LED associated to the affected input turns red, provided the input circuit monitoring function is activated. Thereupon the associated output transistor is blocked.

Features

- ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TII, CCOE
- Installation in zone 2
- 2 transistor outputs (MOSFET)
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Complete galvanic isolation
### Technical data

#### Power supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>Universal voltage supply unit</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…125 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40…70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 3 W</td>
</tr>
</tbody>
</table>

#### Inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-load voltage</td>
<td>8.2 VDC</td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>8.2 mA</td>
</tr>
<tr>
<td>Input resistance</td>
<td>1 kΩ</td>
</tr>
<tr>
<td>Cable resistance</td>
<td>≤ 50 Ω</td>
</tr>
<tr>
<td>Switch-on threshold</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Switch-off threshold</td>
<td>1.75 mA</td>
</tr>
<tr>
<td>Short-circuit threshold</td>
<td>≥ 6 mA</td>
</tr>
<tr>
<td>Wire breakage threshold</td>
<td>≤ 0.1 mA</td>
</tr>
</tbody>
</table>

#### Outputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output circuits (digital)</td>
<td>2 x MOSFET (potential-free, short-circuit proof)</td>
</tr>
<tr>
<td>Switching voltage</td>
<td>≤ 250 VAC/120 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 100 mA</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 1000 Hz</td>
</tr>
</tbody>
</table>

#### Approvals and declarations

| Ex approval acc. to conformity certificate | TÜV 04 ATEX 2553 |
| Device designation               | Ex ia (1) G, II (1) D [Ex ia Da] IIC [Ex ia Da] IIC |
| Max. values:                     | Terminal connection: 1+4 / 2+5 |
| Max. output voltage $U_o$        | ≤ 9.6 V                        |
| Max. output current $I_o$        | ≤ 11 mA                        |
| Max. output power $P_o$          | ≤ 26 mW                        |
| Rated voltage                   | 250 V                          |
| Characteristic                  | linear                         |
| Internal inductance/capacitance $L_i/C_i$ | $L_i = 65 \mu H$, $C_i$ negligibly small |

#### External inductance/capacitance $L_j/C_j$

<table>
<thead>
<tr>
<th>$L_j$ (mH)</th>
<th>$C_j$ (µF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>5</td>
<td>0.83</td>
</tr>
<tr>
<td>10</td>
<td>0.74</td>
</tr>
<tr>
<td>2</td>
<td>5.2</td>
</tr>
<tr>
<td>10</td>
<td>3.8</td>
</tr>
<tr>
<td>20</td>
<td>3.4</td>
</tr>
</tbody>
</table>

| Ex approval acc. to conformity certificate | TÜV 06 ATEX 552968 X |
| Application area                           | II 3 G               |
| Protection type                            | Ex na (ic Gc) IIC/IIB T4 Gc |
| Max. values:                                | Terminal connection: 1+4 / 2+5 |
| Max. output voltage $U_o$                  | ≤ 9.6 V               |
| Max. output current $I_o$                  | ≤ 11 mA               |
| Max. output power $P_o$                    | ≤ 26 mW               |
| Characteristic                             | linear                |
| Internal inductance/capacitance $L_i/C_i$  | $L_i = 65 \mu H$, $C_i$ negligibly small |

#### External inductance/capacitance $L_j/C_j$

<table>
<thead>
<tr>
<th>$L_j$ (mH)</th>
<th>$C_j$ (µF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td>5</td>
<td>1.4</td>
</tr>
<tr>
<td>10</td>
<td>1.2</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>7.5</td>
</tr>
<tr>
<td>10</td>
<td>6.6</td>
</tr>
</tbody>
</table>

### Indication

<table>
<thead>
<tr>
<th>State</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational readiness</td>
<td>green</td>
</tr>
<tr>
<td>Switching state</td>
<td>yellow</td>
</tr>
<tr>
<td>Error indication</td>
<td>red</td>
</tr>
</tbody>
</table>

### Environmental Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25…+70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40…+80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 %</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>0.5 Nm</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 104 x 110 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

| ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIS, CCOE |

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Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IM1-22EX-R is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits have 2 relays, each with 1 NO contact.

Six front panel switches are available to set the output mode separately for each channel (NO/NC mode), as well as to enable/disable wire-break (WB) and short-circuit (SC) monitoring separately.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LEDs 1 and 2 light yellow to indicate the switching status of the associated output. In the event of an input circuit error, the 2-color LED associated to the affected input turns red, provided the input circuit monitoring function is activated. Thereupon the output relay drops out.
## Technical data

### Type
- **Ident no.**: IM1-22EX-R 7541231

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**:
  - DC: 20...125 V
  - AC: 20...250 V
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 3 W

### Inputs
- **No-load voltage**: 8.2 VDC
- **Short-circuit current**: 8.2 mA
- **Input resistance**: 1 kΩ
- **Cable resistance**: ≤ 50 Ω
- **Switch-on threshold**: 1.55 mA
- **Switch-off threshold**: 1.75 mA
- **Short-circuit threshold**: ≥ 6 mA
- **Wire breakage threshold**: ≤ 0.1 mA

### Outputs
- **Output circuits (digital)**: 2 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VDC/120 VAC
- **Switching current per output**: ≤ 2 A
- **Switching capacity per output**: ≤ 500 VA/60 W
- **Contact quality**: AgNi, 3µ Au

### Approvals and declarations
- **Device designation**: Ex ia Ga IIC; Ex ia Da IIC
- **Max. values**: Terminal connection: 1+4 / 2+5
- **Max. output voltage Uo**: ≤ 9.6 V
- **Max. output current Io**: ≤ 11 mA
- **Max. output power Po**: ≤ 26 mW
- **Rated voltage**: 250 V
- **Characteristic**: linear
- **Internal inductance/capacitance L/C**: L = 65 µH, C, negligibly small

### External inductance/capacitance L/C
<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L₁ [mH]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>L₂ [µF]</td>
<td>0.83</td>
<td>0.74</td>
</tr>
</tbody>
</table>

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction for DIN rail / panel**: Ex ic IIC IIB
- **Protection class**: V-0
- **Dimensions**: 18 x 104 x 110 mm

### Approval | Certification
- **ATEX, IECEx, UL, FMus, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE**
Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IM1-22EX-T is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NA-MUR) or potential-free contact transmitters can be connected to the device.

The output circuits feature 2 potential-free and short-circuit protected transistors.

Six front panel switches are available to set the output mode separately for each channel (NO/NC mode), as well as to enable/disable wire-break (WB) and short-circuit (SC) monitoring separately.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LEDs 1 and 2 light yellow to indicate the switching status of the associated output. In the event of an input circuit error, the 2-color LED associated to the affected input turns red, provided the input circuit monitoring function is activated. Thereupon the associated output transistor is blocked.

Features
- ATEX, IECEx, UL, cFMus, CSA, TR CU, NEPSI, KOSHA, TiIs, CCOE
- Installation in zone 2
- 2 transistor outputs
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Complete galvanic isolation
## Technical data

### Power supply
- **Nominal voltage:** Universal voltage supply unit
- **Operating voltage range:** 20...125 VDC
- **Operating voltage range:** 20...250 VAC
- **Frequency:** 40...70 Hz
- **Power consumption:** ≤ 3 W

### Inputs
- **No-load voltage:** 8.2 VDC
- **Short-circuit current:** 8.2 mA
- **Input resistance:** 1 kΩ
- **Cable resistance:** ≤ 50 Ω
- **Switch-on threshold:** 1.55 mA
- **Switch-off threshold:** 1.75 mA
- **Short-circuit threshold:** ≥ 6 mA
- **Wire breakage threshold:** ≤ 0.1 mA

### Outputs
- **Output circuits (digital):** 2 x transistor (potential-free, short-circuit proof)
- **Switching voltage:** ≤ 30 VDC
- **Switching current per output:** ≤ 50 mA
- **Switching frequency:** ≤ 5000 Hz
- **Voltage drop:** ≤ 2.5 V

### Approvals and declarations
- **Ex approval acc. to conformity certificate:** TÜV 04 ATEX 2553
- **Device designation:** Ex i ia IIC IIB
- **Internal inductance/capacitance L_i/C_i:** L_i = 65 µH, C_i negligibly small
- **External inductance/capacitance L_e/C_e:**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_e [mH]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>C_e [µF]</td>
<td>1.9</td>
<td>1.4</td>
</tr>
</tbody>
</table>

### Environmental Conditions
- **Ambient temperature:** -25...+70 °C
- **Storage temperature:** -40...+80 °C
- **Relative humidity:** ≤ 95 %
- **Test voltage:** 2.5 kV
- **MTTF:** 314 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Tightening torque:** 0.5 Nm
- **Electrical connection:** 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section:** 1 x 2.5 mm² / 2 x 1.5 mm²
- **Rated voltage:** 250 V
- **Characteristic:** linear
- **Internal inductance/capacitance L_i/C_i:** L_i = 65 µH, C_i negligibly small
- **External inductance/capacitance L_e/C_e:**

### Approvals and certifications
- **Ex approval acc. to conformity certificate:** TÜV 06 ATEX 552968 X
- **Application area:** II 3 G
- **Protection type:** Ex nA [ia Ga] IIC/IIB T4 Gc
- **Max. values:** Terminal connection: 1+4 / 2+5
- **Max. output voltage U_o:** ≤ 9.6 V
- **Max. output current I_o:** ≤ 11 mA
- **Max. output power P_o:** ≤ 26 mW
- **Characteristic:** linear

### Approval | Certification
- ATEX, IECEx, UL, FMus, CSA, TR CU, NEPSI, KOSHA, TIS, CCOE

---

Interface technology in modular housing
DIN rail devices, IM series
Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IM1-22EX-R/K51 is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits have 2 relays, each with 1 NO contact.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LEDs 1 and 2 light yellow to indicate the switching status of the associated output. In the event of an input circuit error, the 2-color LED associated to the affected input turns red, provided the input circuit monitoring function is activated. Thereupon the output relay drops out.

Features

- ATEX, IECEx, UL, cFMUS, CSA, TR CU, KOSHA, CCOE
- Installation in zone 2
- 2 relay outputs (NO)
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Test voltage 4.0 kV
- Complete galvanic isolation

Output relay – Load curve

Output relay – Electrical lifetime

Power
Switching status
Channel 1
Output mode
Wire-break
monitoring
Short-circuit
monitoring
Channel 2
Interface technology in modular housing  
DIN rail devices, IM series

Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM1-22EX-R/K51</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7541238</td>
</tr>
</tbody>
</table>

Power supply

Nominal voltage | Universal voltage supply unit
Operating voltage range | 20…125 VDC
Operating voltage range | 20…250 VAC
Frequency | 40…70 Hz
Power consumption | ≤ 3 W

Inputs

No-load voltage | 8.2 VDC
Short-circuit current | 8.2 mA
Input resistance | 1 kΩ
Cable resistance | ≤ 50 Ω
Switch-on threshold | 1.35 mA
Switch-off threshold | 1.75 mA
Short-circuit threshold | ≥ 6 mA
Wire breakage threshold | ≤ 0.1 mA

Outputs

Output circuits (digital) | 2 x relays (NO)
Switching frequency | ≤ 10 Hz
Relay switching voltage | ≤ 250 VAC/120 VDC
Switching current per output | ≤ 2 A
Switching capacity per output | ≤ 500 VA/60 W
Contact quality | AgNi, 3µ Au

Indication

Operational readiness | green
Switching state | yellow
Error indication | red

Environmental Conditions

Ambient temperature | -25…+70 °C
Storage temperature | -40…+80 °C
Relative humidity | ≤ 95 %
Test voltage | 4.0 kV

Mechanical data

Tightening torque | 0.5 Nm
Electrical connection | 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
Terminal cross-section | 1 x 2.5 mm² / 2 x 1.5 mm²
Housing material | Polycarbonate/ABS
Mounting instruction | for DIN rail / panel
Protection class | IP20
Flammability class to UL 94 | V-0
Dimensions | 18 x 104 x 110 mm

Approvals and declarations

Ex approval acc. to conformity certificate | TÜV 04 ATEX 2553
Device designation | Ex ia IIC, II ia Da [Ex ia Gb] IIC; [Ex ia Da] IIC
Max. values: Terminal connection: 1+4 / 2+5
Max. output voltage $U_o$ | ≤ 9.6 V
Max. output current $I_o$ | ≤ 11 mA
Max. output power $P_o$ | ≤ 26 mW
Characteristic | linear
Internal inductance/capacitance $L_i/C_i$ | $L_i = 65 \mu H$, $C_i$ negligibly small

External inductance/capacitance $L/C$

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ (mH)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>$C_i$ (µF)</td>
<td>1.1</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Ex approval acc. to conformity certificate | TÜV 06 ATEX 552968 X
Application area | II 3 G
Protection type | Ex nA [ic Gb] IIC/IIB T4 Gc
Max. values: Terminal connection: 1+4 / 2+5
Max. output voltage $U_o$ | ≤ 9.6 V
Max. output current $I_o$ | ≤ 11 mA
Max. output power $P_o$ | ≤ 26 mW
Characteristic | linear
Internal inductance/capacitance $L_i/C_i$ | $L_i = 65 \mu H$, $C_i$ negligibly small

External inductance/capacitance $L/C$

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ (mH)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>$C_i$ (µF)</td>
<td>1.9</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Approval | Certification
ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, CCCE
The isolating switching amplifier IM1-22-R is a 2-channel device.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits have 2 relays, each with 1 NO contact.

Six front panel switches are available to set the output mode separately for each channel (NO/NC mode), as well as to enable/disable wire-break (WB) and short-circuit (SC) monitoring separately.

The Pwr LED lights green to indicate operational readiness. The 2-color LEDs 1 and 2 light yellow to indicate the switching status of the associated output. In the event of an input circuit error, the 2-color LED associated to the affected input turns red, provided the input circuit monitoring function is activated. Thereupon the output relay drops out.
## Technical data

### Type
- IM1-22-R
- Ident no.: 7541234

### Approval | Certification
- TR CU

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20...125 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 3 W

### Inputs
- **No-load voltage**: 8.2 VDC
- **Short-circuit current**: 8.2 mA
- **Input resistance**: 1 kΩ
- **Cable resistance**: ≤ 50 Ω
- **Switch-on threshold**: 1.55 mA
- **Switch-off threshold**: 1.75 mA
- **Short-circuit threshold**: ≥ 6 mA
- **Wire breakage threshold**: ≤ 0.1 mA

### Outputs
- **Output circuits (digital)**: 2 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 2 A
- **Switching capacity per output**: ≤ 500 VA/60 W
- **Contact quality**: AgNi, 3µ Au

### Approvals and declarations
- **Declaration**: SIL 2 acc. to EXIDA FMEDA

### Indication
- **Operational readiness**: green
- **Switching state**: yellow
- **Error indication**: red

### Environmental Conditions
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV
- **MTTF**: 272 years acc. to SN 29500 (Ed. 99)
- **40 °C**

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 104 x 110 mm
Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IM12-22EX-R is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits have 2 relays, each with 1 NO contact.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. LED 1 lights yellow to indicate the switching status of the output.

Features

- ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TII, CCOE
- Installation in zone 2
- 2 relay outputs (NO)
- Output mode adjustable (NO/NC mode)
- Duplicating of signals possible
- Complete galvanic isolation

Output relay – Load curve

Output relay – Electrical lifetime
Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM12-22EX-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7541233</td>
</tr>
</tbody>
</table>

**Power supply**

- Nominal voltage: Universal voltage supply unit
- Operating voltage range: 20...125 VDC
- Operating voltage range: 20...250 VAC
- Frequency: 40...70 Hz
- Power consumption: ≤ 3 W

**Inputs**

- No-load voltage: 8.2 VDC
- Short-circuit current: 8.2 mA
- Input resistance: 1 kΩ
- Cable resistance: ≤ 50 Ω
- Switch-on threshold: 1.55 mA
- Switch-off threshold: 1.75 mA

**Outputs**

- Output circuits (digital): 2 x relays (NO)
- Switching frequency: ≤ 10 Hz
- Relay switching voltage: ≤ 250 VAC/120 VDC
- Switching current per output: ≤ 2 A
- Switching capacity per output: ≤ 500 VA/60 W
- Contact quality: AgNi, 3µ Au

**Approvals and declarations**

- Ex approval acc. to conformity certificate: TÜV 04 ATEX 2553
- Device designation: Ex ia (1) G, II (1) D [Ex ia Ga] IIIC; [Ex ia Da] IIC
- Max. values: Terminal connection: 1+4 / 2+5
- Max. output voltage $U_o$: ≤ 9.6 V
- Max. output current $I_o$: ≤ 11 mA
- Max. output power $P_o$: ≤ 26 mW
- Rated voltage: 250 V
- Characteristic: Linear
- Internal inductance/capacitance $L_i/C_i$: $L_i = 65 \mu H$, $C_i$ negligibly small

**External inductance/capacitance $L_i/C_i$**

<table>
<thead>
<tr>
<th>$L_i$ (mH)</th>
<th>$C_i$ (µF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>5</td>
<td>0.83</td>
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<tr>
<td>10</td>
<td>0.74</td>
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<td>20</td>
<td>5.2</td>
</tr>
<tr>
<td>30</td>
<td>3.8</td>
</tr>
<tr>
<td>40</td>
<td>3.4</td>
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</table>

- Ex approval acc. to conformity certificate: TÜV 06 ATEX 552968 X
- Application area: II 3 G
- Protection type: Ex nA nC [ic Ga] IIIC/IIIB T4 Ga
- Max. values: Terminal connection: 1+4 / 2+5
- Max. output voltage $U_o$: ≤ 9.6 V
- Max. output current $I_o$: ≤ 11 mA
- Max. output power $P_o$: ≤ 26 mW
- Characteristic: Linear
- Internal inductance/capacitance $L_i/C_i$: $L_i = 65 \mu H$, $C_i$ negligibly small

**External inductance/capacitance $L_i/C_i$**

<table>
<thead>
<tr>
<th>$L_i$ (mH)</th>
<th>$C_i$ (µF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td>5</td>
<td>1.4</td>
</tr>
<tr>
<td>10</td>
<td>1.2</td>
</tr>
<tr>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>30</td>
<td>7.5</td>
</tr>
<tr>
<td>40</td>
<td>6.6</td>
</tr>
</tbody>
</table>

**Environmental Conditions**

- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Relative humidity: ≤ 95%
- Test voltage: 2.5 kV

**Mechanical data**

- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: IP20
- Dimensions: 18 x 104 x 110 mm

**Approvals | Certification**

- ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE

**Indication**

- Operational readiness: green
- Switching state: yellow
- Error indication: red

**Environmental Conditions**

- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Relative humidity: ≤ 95%
- Test voltage: 2.5 kV

**Indication**

- Operational readiness: green
- Switching state: yellow
- Error indication: red

**Environmental Conditions**

- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Relative humidity: ≤ 95%
- Test voltage: 2.5 kV

**Mechanical data**

- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: IP20
- Dimensions: 18 x 104 x 110 mm

**Approvals | Certification**

- ATEX, IECEx, UL, FM, CSA, TR CU, NEPSI, KOSHA, TIIS, CCOE
The 2-channel isolating switching amplifier IM12-22EX-R/230VAC is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits have 2 relays, each with 1 NO contact.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. LED 1 lights yellow to indicate the switching status of the output.

The Pwr LED lights green to indicate operational readiness. LED 1 lights yellow to indicate the switching status of the output.

Features

- ATEX, TR CU
- Output mode adjustable (NO/NC mode)
- Duplicating of signals possible
- Complete galvanic isolation

Output relay – Electrical lifetime

Output relay – Load curve
## Technical data

### Type
- **Ident no.** 7505641

### Power supply
- **Nominal voltage** 230 VAC
- **Operating voltage range** 196…253 VAC
- **Frequency** 48…62 Hz
- **Power consumption** ≤ 7 VA

### Inputs
- **No-load voltage** 8.2 VDC
- **Short-circuit current** 8.2 mA
- **Input resistance** 1 kΩ
- **Cable resistance** ≤ 50 Ω
- **Switch-on threshold** 1.55 mA
- **Switch-off threshold** 1.75 mA

### Outputs
- **Output circuits (digital)** 2 x relays (NO)
- **Switching frequency** ≤ 10 Hz
- **Relay switching voltage** ≤ 250 VAC/120 VDC
- **Switching current per output** ≤ 2 A
- **Switching capacity per output** ≤ 500 VA/60 W
- **Contact quality** AgNi, 3µ Au

### Approvals and declarations
- **Ex approval acc. to conformity certificate** PTB 00 ATEX 2013
- **Device designation** Ex ia IIC II(1) G, II (1) D [Ex ia Ga] IIC, [Ex ia Da] IIC
- **Max. values:**
  - Terminal connection: 1…6
  - Max. output voltage \( U_o \) ≤ 9.6 V
  - Max. output current \( I_o \) ≤ 21.4 mA
  - Max. output power \( P_o \) ≤ 26 mW
  - Rated voltage 250 V
  - Characteristic linear
- **Internal inductance/capacitance** \( L/C_i \)
- **C, negligibly small, L, negligibly small**
- **External inductance/capacitance** \( L_o/C_o \)

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L ) [mH]</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>( C ) [µF] (2 terminals)</td>
<td>1.1</td>
<td>0.84</td>
</tr>
<tr>
<td>( C ) [µF] (3 terminals or more)</td>
<td>1.1</td>
<td>0.8</td>
</tr>
</tbody>
</table>

### Indication
- **Operational readiness** green
- **Switching state** yellow
- **Error indication** red

### Environmental Conditions
- **Ambient temperature** -25…+60 °C
- **Storage temperature** -40…+80 °C
- **Relative humidity** ≤ 95 %
- **Test voltage** 2.5 kV

## Mechanical data
- **Tightening torque** 0.5 Nm
- **Electrical connection** 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section** 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material** Polycarbonate/ABS
- **Mounting instruction** for DIN rail / panel
- **Protection class** IP20
- **Dimensions** 18 x 104 x 110 mm

### Approval | Certification
- ATEX, TR CU
Interface technology in modular housing
DIN rail devices, IM series

Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IM12-22EX-R/24VDC is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits have 2 relays, each with 1 NO contact.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. LED 1 lights yellow to indicate the switching status of the output.

Features

- ATEX, FM, TR CU
- Output mode adjustable (NO/NC mode)
- Duplicating of signals possible
- Complete galvanic isolation

Output relay – Load curve

Output relay – Electrical lifetime

Power
Switching status
Selector switch for output mode
Contact multiplication

Pwr
GN

The 2-channel isolating switching amplifier IM12-22EX-R/24VDC is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits have 2 relays, each with 1 NO contact.

You can set each channel separately to work/closed current, i.e. NO/NC mode and duplicate signals via 3 switches on the front. The switching state of channel 1 is thereby transmitted to the outputs 1 and 2. You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. LED 1 lights yellow to indicate the switching status of the output.
### Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>IM12-22EX-R/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>7505640</td>
</tr>
</tbody>
</table>

**Power supply**

<table>
<thead>
<tr>
<th><strong>Nominal voltage</strong></th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating voltage range</strong></td>
<td>10…30 VDC</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>≤ 1.5 W</td>
</tr>
</tbody>
</table>

**Inputs**

| **No-load voltage**       | 8.2 VDC                |
| **Short-circuit current** | 8.2 mA                 |
| **Input resistance**      | 1 kΩ                   |
| **Cable resistance**      | ≤ 50 Ω                 |
| **Switch-on threshold:**  | 1.55 mA                |
| **Switch-off threshold:** | 1.75 mA               |

**Outputs**

| **Output circuits (digital)** | 2 x relays (NO) |
| **Switching frequency**      | ≤ 10 Hz           |
| **Relay switching voltage**  | ≤ 250 VAC/120 VDC  |
| **Switching current per output** | ≤ 2 A               |
| **Switching capacity per output** | ≤ 500 VA/60 W   |
| **Contact quality**          | AgNi, 3µ Au        |

**Approvals and declarations**

| **Ex approval acc. to conformity certificate** | PTB 00 ATEX 2033 |
| **Device designation**                         | II (1) G, II (1) D [Ex ia Ga] IIIC, [Ex ia Da] IIC |
| **Max. values:**                               | Terminal connection: 1…6 |
| **Max. output voltage** $U_o$                  | ≤ 9.6 V               |
| **Max. output current** $I_o$                  | ≤ 21.4 mA             |
| **Max. output power** $P_o$                    | ≤ 26 mW               |
| **Rated voltage**                             | 250 V                 |
| **Characteristic**                            | linear                |
| **Internal inductance/capacitance $L_i/C_i$**   | $C_i$ negligibly small, $L_i$ negligibly small |

**External inductance/capacitance $L_i/C_i$**

<table>
<thead>
<tr>
<th><strong>Ex ia</strong></th>
<th>IIIC</th>
<th>IIIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_i$ [mH]</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>$C_i$ [µF]</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
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<td>0.84</td>
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<td>6.2</td>
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<tr>
<td></td>
<td>4.3</td>
<td>4.4</td>
</tr>
</tbody>
</table>

**Indication**

| **Operational readiness** | green |
| **Switching state**       | yellow |
| **Error indication**      | red   |

**Environmental Conditions**

| **Ambient temperature** | -25…+60 °C |
| **Storage temperature**  | -40…+80 °C  |
| **Relative humidity**    | ≤ 95 %      |
| **Test voltage**         | 2.5 kV      |

### Mechanical data

| **Tightening torque** | 0.5 Nm |
| **Electrical connection** | 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection |
| **Terminal cross-section** | 1 x 2.5 mm² / 2 x 1.5 mm² |
| **Housing material**    | Polycarbonate/ABS |
| **Mounting instruction** | for DIN rail / panel |
| **Protection class**    | IP20 |
| **Flammability class acc. to UL 94** | V-0 |
| **Dimensions**          | 18 x 104 x 110 mm |
| **Approval | Certification** | ATEX, FM, TR CE |
Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IM1-231EX-R is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NA-MUR) or potential-free contact transmitters can be connected to the device.

The output circuits each have a relay with a changeover contact. In addition, the device features a common alarm output.

Four front panel switches are available to set the output mode separately for each channel (NO or NC mode), as well as to enable/disable line monitoring (LM).

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm relay drop out.

Features

- ATEX, IECEx, TR CU, INMETRO
- Installation in zone 2
- 2 relay outputs (changeover)
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Common alarm output
- Complete galvanic isolation

Output relay – Load curve

Output relay – Electrical lifetime

330 Hans Turck GmbH & Co. KG • Tel. +49 208 49 52-0 • Fax +49 208 49 52-264
### Technical data

#### Type

<table>
<thead>
<tr>
<th>Type</th>
<th>IM-23EX-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7541239</td>
</tr>
</tbody>
</table>

#### Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Universal voltage supply unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20...125 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20...250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40...70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 3 W</td>
</tr>
</tbody>
</table>

#### Inputs

<table>
<thead>
<tr>
<th>No-load voltage</th>
<th>8.2 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-circuit current</td>
<td>8.2 mA</td>
</tr>
<tr>
<td>Input resistance</td>
<td>1 kΩ</td>
</tr>
<tr>
<td>Cable resistance</td>
<td>≤ 50 Ω</td>
</tr>
<tr>
<td>Switch-on threshold:</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Switch-off threshold:</td>
<td>1.75 mA</td>
</tr>
<tr>
<td>Short-circuit threshold</td>
<td>≥ 6 mA</td>
</tr>
<tr>
<td>Wire breakage threshold</td>
<td>≤ 0.1 mA</td>
</tr>
</tbody>
</table>

#### Outputs

<table>
<thead>
<tr>
<th>Output circuits (digital)</th>
<th>2 x relay (change-over)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching frequency</td>
<td>≤ 10 Hz</td>
</tr>
<tr>
<td>Relay switching voltage</td>
<td>≤ 250 VAC/120 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 2 A</td>
</tr>
<tr>
<td>Switching capacity per output</td>
<td>≤ 500 VA/60 W</td>
</tr>
<tr>
<td>Contact quality</td>
<td>AgNi, 3µ Au</td>
</tr>
</tbody>
</table>

#### Approvals and declarations

<table>
<thead>
<tr>
<th>Ex approval acc. to conformity certificate</th>
<th>TÜV 04 ATEX 2604</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device designation</td>
<td>II (1) G, II (1) D Ex ia Ga IIC; [Ex ia Da] IIIC</td>
</tr>
<tr>
<td>Max. output voltage</td>
<td>U_o ≤ 11.3 V</td>
</tr>
<tr>
<td>Max. output current</td>
<td>I_o ≤ 13 mA</td>
</tr>
<tr>
<td>Max. output power</td>
<td>P_o ≤ 36 mW</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>250 V</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Linear</td>
</tr>
<tr>
<td>Internal inductance/capacitance</td>
<td>L_i/C_i</td>
</tr>
</tbody>
</table>

#### External inductance/capacitance L_i/C_i

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>II B</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_i [mH]</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>IIC</td>
<td>2.0</td>
<td>10.0</td>
</tr>
<tr>
<td>C_i [µF]</td>
<td>0.84</td>
<td>0.62</td>
</tr>
<tr>
<td>II B</td>
<td>4.0</td>
<td>2.8</td>
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#### Indication

<table>
<thead>
<tr>
<th>Operational readiness</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching state</td>
<td>Yellow</td>
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<tr>
<td>Error indication</td>
<td>Red</td>
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</table>

#### Environmental Conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>-25...+70 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-40...+80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 %</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
</tbody>
</table>

#### Mechanical data

<table>
<thead>
<tr>
<th>Tightening torque</th>
<th>0.5 Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical connection</td>
<td>4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>27 x 104 x 110 mm</td>
</tr>
</tbody>
</table>

#### Approval | Certification

| ATEX, IECEx, TR CU, INMETRO | TÜV 06 ATEX 552967 X |

### External inductance/capacitance L_o/C_o

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_o [mH]</td>
<td>10</td>
</tr>
<tr>
<td>IIC</td>
<td>5.0</td>
</tr>
<tr>
<td>C_o [µF]</td>
<td>0.91</td>
</tr>
<tr>
<td>II B</td>
<td>4.3</td>
</tr>
</tbody>
</table>

### Ex approval acc. to conformity certificate

<table>
<thead>
<tr>
<th>Application area</th>
<th>II 3 G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection type</td>
<td>Ex nA nC (ic Gc) IIC T4</td>
</tr>
<tr>
<td>Max. values: Terminal connection:</td>
<td>1+2 / 4...7 / 9+10</td>
</tr>
<tr>
<td>Max. output voltage</td>
<td>U_o ≤ 11.3 V</td>
</tr>
<tr>
<td>Max. output current</td>
<td>I_o ≤ 13 mA</td>
</tr>
<tr>
<td>Max. output power</td>
<td>P_o ≤ 36 mW</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Linear</td>
</tr>
<tr>
<td>Internal inductance/capacitance</td>
<td>L_i/C_i</td>
</tr>
</tbody>
</table>

| L_i/C_i | 100 µH; C_i = 1.1 nF |

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_o [mH]</td>
<td>10</td>
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<td>5.0</td>
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<tr>
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### Ex approval acc. to conformity certificate

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<tr>
<td>Max. output current</td>
<td>I_o ≤ 13 mA</td>
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<td>Characteristic</td>
<td>Linear</td>
</tr>
<tr>
<td>Internal inductance/capacitance</td>
<td>L_i/C_i</td>
</tr>
</tbody>
</table>

| L_i/C_i | 100 µH; C_i = 1.1 nF |

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331
Isolating switching amplifier, 4-channel

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact makers can be connected to the 4-channel isolating transducer IM1-451-R.

The output circuits each feature a relay with NO contact. In addition, the device features a common alarm output.

The output mode (NO/NC) can be set separately for each channel and wire-break (WB) and short-circuit (SC) can be switched on/off via the eight switches on the front.

When using mechanical contacts, wire-break and short-circuit monitoring must be switched off or the contacts must be wired with resistors (II) (see circuit diagram).

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm relay drop out.

Features

- TR CU
- 5 relay outputs (NO)
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Common alarm output
- Complete galvanic isolation
# Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM1-451-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7541190</td>
</tr>
</tbody>
</table>

## Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Universal voltage supply unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20...250 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20...250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40...70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 3 W</td>
</tr>
</tbody>
</table>

## Inputs

<table>
<thead>
<tr>
<th>No-load voltage</th>
<th>8.2 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-circuit current</td>
<td>8.2 mA</td>
</tr>
<tr>
<td>Input resistance</td>
<td>1 kΩ</td>
</tr>
<tr>
<td>Cable resistance</td>
<td>≤ 50 Ω</td>
</tr>
<tr>
<td>Switch-on threshold:</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Switch-off threshold:</td>
<td>1.75 mA</td>
</tr>
<tr>
<td>Short-circuit threshold</td>
<td>≥ 6 mA</td>
</tr>
<tr>
<td>Wire breakage threshold</td>
<td>≤ 0.1 mA</td>
</tr>
</tbody>
</table>

## Outputs

<table>
<thead>
<tr>
<th>Output circuits (digital)</th>
<th>5 x relays (NO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching frequency</td>
<td>≤ 10 Hz</td>
</tr>
<tr>
<td>Relay switching voltage</td>
<td>≤ 250 VAC/120 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 2 A</td>
</tr>
<tr>
<td>Switching capacity per output</td>
<td>≤ 750 VA/60 W</td>
</tr>
<tr>
<td>Contact quality</td>
<td>AgNi, 3µ Au</td>
</tr>
</tbody>
</table>

## Indication

<table>
<thead>
<tr>
<th>Operational readiness</th>
<th>green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching state</td>
<td>yellow</td>
</tr>
<tr>
<td>Error indication</td>
<td>red</td>
</tr>
</tbody>
</table>

## Environmental Conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>-25...+70 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-40...+80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 %</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
</tbody>
</table>

## Mechanical data

<table>
<thead>
<tr>
<th>Tightening torque</th>
<th>0.5 Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical connection</td>
<td>4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>27 x 104 x 110 mm</td>
</tr>
</tbody>
</table>

## Approval | Certification

| TR CU |
Isolating switching amplifier, 4-channel

Sensors according to EN 60947-5-6 (NA-MUR) or potential-free contact makers can be connected to the 4-channel isolating transducer IM1-451-T.

The output circuits each feature a potential-free and short-circuit proof transistor and the device also has a common alarm output.

The output mode (NO/NC) can be set separately for each channel and wire-break (WB) and short-circuit (SC) can be switched on/off via the eight switches on the front.

When using mechanical contacts, wire-break and short-circuit monitoring must be switched off or the contacts must be wired with resistors (II) (see circuit diagram).

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm transistor are blocked.

Features

- TR CU
- 5 transistor outputs, short-circuit proof, potential-free and reverse-polarity protected
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Common alarm output
- Complete galvanic isolation
## Technical data

### Type
- IM1-451-T
- Ident no. 7520721

### Power supply
- Nominal voltage: Universal voltage supply unit
- Operating voltage range: 20...250 VDC
- Operating voltage range: 20...250 VAC
- Frequency: 40...70 Hz
- Power consumption: ≤ 3 W

### Inputs
- No-load voltage: 8.2 VDC
- Short-circuit current: 8.2 mA
- Input resistance: 1 kΩ
- Cable resistance: ≤ 50 Ω
- Switch-on threshold: 1.55 mA
- Switch-off threshold: 1.75 mA
- Short-circuit threshold: ≥ 6 mA
- Wire breakage threshold: ≤ 0.1 mA

### Outputs
- Output circuits (digital): 5 x transistor (potential-free, short-circuit proof)
- Switching voltage: ≤ 30 VDC
- Switching current per output: ≤ 50 mA
- Switching frequency: ≤ 5000 Hz
- Voltage drop: ≤ 2.5 V

### Indication
- Operational readiness: green
- Switching state: yellow
- Error indication: red

### Environmental Conditions
- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Relative humidity: ≤ 95 %
- Test voltage: 2.5 kV

### Mechanical data
- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 27 x 104 x 110 mm

### Approval | Certification
- TR CU
Isolating switching amplifier, 4-channel

The 4-channel isolating switching amplifier IM1-451EX-R is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits each feature a relay with NO contact. In addition, the device features a common alarm output.

Six front panel switches are available to set the output mode separately for each channel (NO/NC mode), as well as to enable/disable wire-break (WB) and short-circuit (SC) monitoring separately.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm relay drop out.
### Technical data

#### Type
- IM1-451EX-R
- Ident no. 7541188

#### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20...125 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 3 W

#### Inputs
- **No-load voltage**: 8.2 VDC
- **Short-circuit current**: 8.2 mA
- **Input resistance**: 1 kΩ
- **Cable resistance**: ≤ 50 Ω
- **Switch-on threshold**: 1.55 mA
- **Switch-off threshold**: 1.75 mA
- **Short-circuit threshold**: ≥ 6 mA
- **Wire breakage threshold**: ≤ 0.1 mA

#### Outputs
- **Output circuits (digital)**: 5 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 2 A
- **Switching capacity per output**: ≤ 750 VA/60 W
- **Contact quality**: AgNi, 3µ Au

#### Approvals and declarations
- **Ex approval acc. to conformity certificate**: TÜV 04 ATEX 2604
- **Device designation**: II (1) G, II (1) D [Ex ia Ga] IIC ; [Ex ia Da] IIC
- **Max. values**: Terminal connection: 1+2 / 4...7 / 9+10
- **Max. output voltage Uo**: ≤ 11.3 V
- **Max. output current Io**: ≤ 13 mA
- **Max. output power Po**: ≤ 36 mW
- **Rated voltage**: 250 V
- **Characteristic**: linear
- **Internal inductance/capacitance L/C**: L = 100 µH; C = 1.1 nF

#### External inductance/capacitance L_o/C_o

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_o [mH]</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>C_o [µF]</td>
<td>0.84</td>
<td>0.62</td>
</tr>
</tbody>
</table>

#### Application area
- II 3 G

#### Protection type
- Ex nA nc [ic Gc] IIC T4

#### Max. values:
- **Terminal connection**: 1+2 / 4...7 / 9+10
- **Max. output voltage Uo**: ≤ 11.3 V
- **Max. output current Io**: ≤ 13 mA

#### Max. output power P_o:
- Linear
- L = 100 µH; C = 1.1 nF

#### Environmental Conditions
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV

#### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Dimensions**: 27 x 104 x 110 mm

#### Approval | Certification
- ATEX, IECEx, UL, FM, CSA, TR CU, INMETRO, TIIS

---

**Operational readiness**: green
- **Switching state**: yellow
- **Error indication**: red
Isolating switching amplifier, 4-channel

The 4-channel isolating switching amplifier IM1-451EX-T is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits each feature a potential-free and short-circuit proof transistor and the device also has a common alarm output.

Six front panel switches are available to set the output mode separately for each channel (NO/NC mode), as well as to enable/disable wire-break (WB) and short-circuit (SC) monitoring separately.

You can also set the output mode separately for each channel.

The Pwr LED lights green to indicate operational readiness. The 2-color LED 1 lights yellow to indicate the switching status of the associated output. In the event of an input circuit error, the associated 2-color LED turns red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm transistor are blocked.

Features

- ATEX, IECEX, UL, cFMUS, CSA, TR CU, INMETRO, TIIS
- Installation in zone 2
- 5 transistor outputs, short-circuit proof, potential-free and reverse-polarity protected
- Output mode adjustable (NO/NC mode)
- Input circuits monitored for wire-break/short-circuit (ON/OFF switchable)
- Common alarm output
- Complete galvanic isolation
## Technical data

### Power supply

<table>
<thead>
<tr>
<th>Type</th>
<th>IM 1-451 EX-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7541189</td>
</tr>
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</table>

### Nominal voltage

<table>
<thead>
<tr>
<th>Voltage Type</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal voltage supply unit</td>
<td></td>
</tr>
</tbody>
</table>

### Operating voltage range

<table>
<thead>
<tr>
<th>Voltage Type</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 ... 125 VDC</td>
<td></td>
</tr>
<tr>
<td>20 ... 250 VAC</td>
<td></td>
</tr>
</tbody>
</table>

### Frequency

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 ... 70 Hz</td>
<td></td>
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</tbody>
</table>

### Power consumption

<table>
<thead>
<tr>
<th>Power Consumption</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 3 W</td>
<td></td>
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</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>No-load voltage</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2 VDC</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Short-circuit current</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2 mA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input resistance</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kΩ</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable resistance</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 50 Ω</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switch-on threshold</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.55 mA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switch-off threshold</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.75 mA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Short-circuit threshold</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 6 mA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wire breakage threshold</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 0.1 mA</td>
<td></td>
</tr>
</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Output circuits (digital)</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 x transistor (potential-free, short-circuit proof)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switching voltage</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 30 VDC</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switching current per output</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 50 mA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switching frequency</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 5000 Hz</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltage drop</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 2.5 V</td>
<td></td>
</tr>
</tbody>
</table>

### Approvals and declarations

| Ex approval acc. to conformity certificate | TÜV 04 ATEX 2604                       |

<table>
<thead>
<tr>
<th>Device designation</th>
<th>Terminal connection: 1+2 / 4...7 / 9+10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex ia II (1) G, II (1) D [Ex ia Ga] IIC ; [Ex ia Da] IIC</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. values:</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal connection: 1+2 / 4...7 / 9+10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. output voltage</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uo ≤ 11.3 V</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. output current</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Io ≤ 13 mA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. output power</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Po ≤ 36 mW</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 V</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>linear</td>
<td></td>
</tr>
</tbody>
</table>

### External inductance/capacitance $L / C$

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_1$ [mH]</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>$C_1$ [µF]</td>
<td>0.84</td>
<td>0.62</td>
</tr>
</tbody>
</table>

### Environmental Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25 ... +70 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage temperature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40 ... +80 °C</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relative humidity</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 95 %</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test voltage</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 kV</td>
<td></td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Tightening torque</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 Nm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical connection</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Terminal cross-section</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Housing material</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polycarbonate/ABS</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mounting instruction</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>for DIN rail / panel</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protection class</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP20</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flammability class acc. to UL 94</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 x 104 x 110 mm</td>
<td></td>
</tr>
</tbody>
</table>

### Approval | Certification

<table>
<thead>
<tr>
<th>TÜV 04 ATEX 2604</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Ex ia II (1) G, II (1) D [Ex ia Ga] IIC ; [Ex ia Da] IIC</th>
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<tr>
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<td>0.84</td>
<td>0.62</td>
</tr>
</tbody>
</table>

### Indication

<table>
<thead>
<tr>
<th>Operational readiness</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>green</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switching state</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>yellow</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error indication</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>red</td>
<td></td>
</tr>
</tbody>
</table>

### Approval | Certification

| ATEX, IECEx, UL, FM, CSA, TR CU, INMETRO, TIIS | TÜV 06 ATEX 552967 X |

<table>
<thead>
<tr>
<th>Ex ia II (1) G, II (1) D [Ex ia Ga] IIC ; [Ex ia Da] IIC</th>
<th>Terminal connection: 1+2 / 4...7 / 9+10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex approval acc. to conformity certificate</td>
<td>TÜV 06 ATEX 552967 X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application area</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 3 G</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protection type</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex nA [ic Ga] IIC T4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. values:</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal connection: 1+2 / 4...7 / 9+10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. output voltage</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uo ≤ 11.3 V</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. output current</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Io ≤ 13 mA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. output power</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Po ≤ 36 mW</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>linear</td>
<td></td>
</tr>
</tbody>
</table>

### Indication

<table>
<thead>
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<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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</tr>
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| ATEX, IECEx, UL, FM, CSA, TR CU, INMETRO, TIIS | TÜV 06 ATEX 552967 X |

<table>
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<tr>
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<th>Terminal connection: 1+2 / 4...7 / 9+10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex approval acc. to conformity certificate</td>
<td>TÜV 06 ATEX 552967 X</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Application area</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 3 G</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protection type</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex nA [ic Ga] IIC T4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. values:</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
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<td></td>
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<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>linear</td>
<td></td>
</tr>
</tbody>
</table>
The rotation speed monitor IM21-14-CDTRI analyses frequencies, rotation speeds and pulse trains of rotating motor, gear or turbine parts according to over or undershoot of adjusted limit values. The current value is indicated on a display on the front of the device.

NAMUR sensors monitor the cables for wire-break and/or short-circuit depending on the setting. In the event of an input circuit error the relays drop out, the transistor is blocked and the Pwr LED changes to red.

The device can be configured and parametrized via PC (FDT / DTM); the appropriate TURCK-PROG III transmission cable is available from TURCK. A basic scope of parameters can be set via buttons and display on the front or remotely via the current interface and HART®.

At each of the two relay outputs a predefined limit value can be monitored. The two relays also monitor overshoot/undershoot of window limits. The transistor output can also be used as a pulse divider. The measured value is permanently written to a ring buffer with space for 8000 values. The writing process is stopped with a predefined trigger event, like for example “excess of limit value”. After that, the stored signal sequence can be read out.

A switching hysteresis is defined by setting a switch-on and off point. A switch-off delay can also be set to avoid shut down due to sudden frequency hops.
# Technical data

## Type
- **IM21-14-CDTRI**
- **Ident no.** 7505650

## Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20...250 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 3 W

## Inputs
- **No-load voltage**: 8.2 VDC
- **Short-circuit current**: 8.2 mA
- **Max. input frequency**: 600 000 min⁻¹
- **Pulse time**: ≥ 0.02 ms
- **Pulse stop**: ≥ 0.02 ms
- **Input resistance**: 1 kΩ
- **Cable resistance**: ≤ 50 Ω
- **Switch-on threshold**: 1.55 mA
- **Switch-off threshold**: 1.75 mA
- **Short-circuit threshold**: ≥ 6 mA
- **Wire breakage threshold**: ≤ 0.1 mA
- **Current**: ≤ 20 mA
- **0-signal**: 0...3 VDC
- **1-signal**: 5...30 VDC
- **Input resistance**: 26 000 Ω

## Outputs
- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4...20 mA
- **Output circuits (digital)**: 2 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 2 A
- **Switching capacity per output**: ≤ 500 VA/60 W
- **Fault current**: 0 / 22 mA adjustable
- **Contact quality**: AgNi, 3µ Au
- **Output circuits (digital)**: 1 x transistor (potential-free, short-circuit proof)
- **Switching voltage**: ≤ 30 VDC
- **Switching current per output**: ≤ 50 mA
- **Switching frequency**: ≤ 10 000 Hz
- **Voltage drop**: ≤ 2.5 V
- **Voltage**: ≤ 30 V
- **Current**: ≤ 10 mA

## Indication
- **Operational readiness**: green
- **Pulse input**: yellow
- **Error indication**: red

## Environmental Conditions
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV

## Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 27 x 104 x 110 mm

## Approval | Certification
- **TR CU**
Rotation speed monitor, 1-channel

The rotation speed monitor IM21-14EX-CDTRI monitors frequencies, rotation speeds and pulse trains of rotating motor, gear or turbine parts according to over or undershoot of adjusted limit values. The current value is indicated on a display on the front of the device.

Intrinsically safe sensors acc. to EN 60947-5-6 (NAMUR) can be connected. The line is monitored for wire-break and/or short-circuit depending on the setting. In the event of an input circuit error the relays drop out, the transistor is blocked and the Pwr LED changes to red.

The device can be configured and parametrized via PC (FDT/DTM); the appropriate TURCK-PROG III transmission cable is available from TURCK. A basic scope of parameters can be set via buttons and display on the front or remotely via the current interface and HART®.

At each of the two relay outputs a predefined limit value can be monitored. The two relays also monitor overshoot/undershoot of window limits. The transistor output can also be used as a pulse divider. The measured value is permanently written to a ring buffer with space for 8000 values. The writing process is stopped with a predefined trigger event, like for example “excess of limit value”. After that, the stored signal sequence can be read out.

A switching hysteresis is defined by setting a switch-on and off point. A switch-off delay can also be set to avoid shutting down due to sudden frequency hops.

Features
- ATEX, IECEx, cFMUS, TR CU, NEPSI, TIIS
- Installation in zone 2
- Monitors over and underrange of limit values and window limits
- Operating range 0.06 ... 600000 min⁻¹
- Control of sensors acc. to EN 60947-5-6 (NAMUR)
- 2 x relay outputs and 1 x transistor output
- Current output 0/4...20 mA reversible
- Pulse output Ex nL II C/II B
- Parametrized via PC (FDT / DTM), front-panel switch or HART®
- Complete galvanic isolation

Output relay – Load curve

Output relay – Electrical lifetime
### Interface technology in modular housing

**DIN rail devices, IM series**

**Rotation speed monitor, 1-channel**

#### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM21-14EX-CDTRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7505651</td>
</tr>
</tbody>
</table>

**Power supply**

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Universal voltage supply unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20…125 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40…70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 3 W</td>
</tr>
</tbody>
</table>

**Inputs**

| No-load voltage | 8.2 VDC |
| Short-circuit current | 8.2 mA |
| Max. input frequency | 600000 min⁻¹ |
| Pulse time | ≥ 0.02 ms |
| Pulse stop | ≥ 0.02 ms |
| Input resistance | 1 kΩ |
| Cable resistance | ≤ 50 Ω |
| Switch-on threshold: | 1.55 mA |
| Switch-off threshold: | 1.75 mA |
| Short-circuit threshold | ≥ 6 mA |
| Wire breakage threshold | ≤ 0.1 mA |

**Outputs**

| Load resistance, current output | ≤ 0.6 kΩ |
| Output current | 0/4…20 mA |
| Output circuits (digital) | 2 x relays (NO) |
| Switching frequency | ≤ 10 Hz |
| Relay switching voltage | ≤ 250 VAC/120 VDC |
| Switching current per output | ≤ 2 A |
| Switching capacity per output | ≤ 500 VA/60 W |
| Fault current | 0 / 22 mA adjustable |
| Contact quality | AgNi, 3uAu |
| Output circuits (digital) | 1 x transistor (potential-free, short-circuit proof) |
| Switching voltage | ≤ 30 VDC |
| Switching current per output | ≤ 50 mA |
| Switching frequency | ≤ 10000 Hz |
| Voltage drop | ≤ 2.5 V |
| Voltage | ≤ 30 V |
| Current | ≤ 10 mA |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

**Approvals and declarations**

| Ex approval acc. to conformity certificate | IBEExU 07 ATEX B010 X |
| Application area | II 3 G |
| Protection type | Ex nA nC [ic Gc] IIIC/IIB T4 Gc |
| Max. output voltage U_o | ≤ 9.6 V |
| Max. output current I_o | ≤ 10.7 mA |
| Max. output power P_o | ≤ 25 mW |
| Internal resistance R_i | 900 Ω |

### External inductance/capacitance \( L_o/C_o \)

| \( L_o \) [mH] | 100 | 5.0 | 1 |
| \( C_o \) [μF] | 0.51 | 0.84 | 1.2 |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

**Approvals and declarations**

| Ex approval acc. to conformity certificate | IBEExU 07 ATEX B010 X |
| Application area | II 3 G |
| Protection type | Ex nA nC [ic Gc] IIIC/IIB T4 Gc |
| Max. output voltage U_o | ≤ 9.6 V |
| Max. output current I_o | ≤ 10.7 mA |
| Max. output power P_o | ≤ 25 mW |
| Internal resistance R_i | 900 Ω |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

**Approvals and declarations**

| Ex approval acc. to conformity certificate | IBEExU 07 ATEX B010 X |
| Application area | II 3 G |
| Protection type | Ex nA nC [ic Gc] IIIC/IIB T4 Gc |
| Max. output voltage U_o | ≤ 9.6 V |
| Max. output current I_o | ≤ 10.7 mA |
| Max. output power P_o | ≤ 25 mW |
| Internal resistance R_i | 900 Ω |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

**Mechanical data**

| Tightening torque | 0.5 Nm |
| Electrical connection | 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection |
| Terminal cross-section | 1 x 2.5 mm² / 2 x 1.5 mm² |
| Housing material | Polycarbonate/ABS |
| Mounting instruction | for DIN rail / panel |
| Protection class | IP20 |
| Flammability class acc. to UL 94 | V-0 |
| Dimensions | 27 x 104 x 110 mm |

**Approval | Certification**

| ATEX, IECEx, FM, TR CU, NEPSI, TIIIS | ATEX, IECEx, FM, TR CU, NEPSI, TIIIS | ATEX, IECEx, FM, TR CU, NEPSI, TIIIS | ATEX, IECEx, FM, TR CU, NEPSI, TIIIS |

**Environmental Conditions**

| Ambient temperature | -25…+70 °C |
| Storage temperature | -40…+80 °C |
| Relative humidity | ≤ 95 % |
| Test voltage | 2.5 kV |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

**Approvals and declarations**

| Ex approval acc. to conformity certificate | IBEExU 07 ATEX B010 X |
| Application area | II 3 G |
| Protection type | Ex nA nC [ic Gc] IIIC/IIB T4 Gc |
| Max. output voltage U_o | ≤ 9.6 V |
| Max. output current I_o | ≤ 10.7 mA |
| Max. output power P_o | ≤ 25 mW |
| Internal resistance R_i | 900 Ω |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

**Approvals and declarations**

| Ex approval acc. to conformity certificate | IBEExU 07 ATEX B010 X |
| Application area | II 3 G |
| Protection type | Ex nA nC [ic Gc] IIIC/IIB T4 Gc |
| Max. output voltage U_o | ≤ 9.6 V |
| Max. output current I_o | ≤ 10.7 mA |
| Max. output power P_o | ≤ 25 mW |
| Internal resistance R_i | 900 Ω |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

**Approvals and declarations**

| Ex approval acc. to conformity certificate | IBEExU 07 ATEX B010 X |
| Application area | II 3 G |
| Protection type | Ex nA nC [ic Gc] IIIC/IIB T4 Gc |
| Max. output voltage U_o | ≤ 9.6 V |
| Max. output current I_o | ≤ 10.7 mA |
| Max. output power P_o | ≤ 25 mW |
| Internal resistance R_i | 900 Ω |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

**Approvals and declarations**

| Ex approval acc. to conformity certificate | IBEExU 07 ATEX B010 X |
| Application area | II 3 G |
| Protection type | Ex nA nC [ic Gc] IIIC/IIB T4 Gc |
| Max. output voltage U_o | ≤ 9.6 V |
| Max. output current I_o | ≤ 10.7 mA |
| Max. output power P_o | ≤ 25 mW |
| Internal resistance R_i | 900 Ω |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

**Approvals and declarations**

| Ex approval acc. to conformity certificate | IBEExU 07 ATEX B010 X |
| Application area | II 3 G |
| Protection type | Ex nA nC [ic Gc] IIIC/IIB T4 Gc |
| Max. output voltage U_o | ≤ 9.6 V |
| Max. output current I_o | ≤ 10.7 mA |
| Max. output power P_o | ≤ 25 mW |
| Internal resistance R_i | 900 Ω |

**Response characteristic**

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |
The 1-channel analog signal isolator IM31-11EX-I is designed to transmit normalized active voltage or current signals galvanically isolated from the Ex area to the non-Ex area.

The device is equipped with one input circuit of 0/2…10 V or 0/4…20 mA and one short-circuit proof output circuit of 0/4…20 mA.

The transmission characteristic is adjusted via a DIP switch on the front. In switch position “1:1”, the input signal is transmitted directly to the output in the non-Ex area. In “LZ” switch position, a dead-zero signal at the input (0…10 V / 0…20 mA) is converted and provided as a live-zero signal at the associated output (4…20 mA).

A green LED indicates operational readiness.

Features
- ATEX, IECEx, UL, FM, TR CU, NEPSI
- Installation in zone 2
- Transmission of normalized analog signals from the Ex area to the non-Ex area
- Input circuit: 0/2…10 V or 0/4…20 mA
- Output circuit: 0/4…20 mA
- Complete galvanic isolation
Technical data

**Type**
- IM31-11EX-I
- Ident no. 7506320

**Power supply**
- Nominal voltage: Universal voltage supply unit
- Operating voltage range: 20...125 VDC
- Operating voltage range: 20...250 VAC
- Frequency: 40...70 Hz
- Power consumption: ≤ 2.2 W

**Inputs**
- Voltage input: 0/2...10 VDC
- Input resistance (voltage): ≥ 50 kΩ
- Current input: 0/4...20 mA
- Input resistance (current): ≤ 50 Ω

**Outputs**
- Load resistance, current output: ≤ 0.5 kΩ
- Output current: 0/4...20 mA

**Response characteristic**
- Measuring accuracy: ≤ 0.2 % of full scale
- Reference temperature: 23 °C
- Temperature drift: ≤ 0.01 % / K
- Rise time (10-90%): ≤ 50 ms
- Dropout time (90...10%): ≤ 50 ms

**Approvals and declarations**
- Ex approval acc. to conformity certificate: TÜV 04 ATEX 2679
- Device designation: Ex ia II (I) G; II (1) D [Ex ia Ga] IIC/IIB;
  [Ex ia Da] III C
- Max. values: Terminal connection: 1...3
- Max. output voltage: U_o ≤ 7.2 V
- Max. output current: I_o ≤ 1 mA
- Max. output power: P_o ≤ 2 mW
- Rated voltage: 250 V
- Characteristic: linear
- Internal inductance/capacitance: L_/C_ = 65 µH/52 nF

**External inductance/capacitance L_/C_**
- Ex ia: IIC | IIB
- L_ (mH): 0.5 | 4.5 | 9.5 | 1.5 | 9.5 | 20
- C_ (µF): 2 | 1.5 | 1.3 | 9 | 6.7 | 6.1

**Ex approval acc. to conformity certificate**
- TÜV 06 ATEX 553387 X
- Application area: II 3 G
- Protection type: Ex nA [ic Gc] IIC/IIB T4 Gc
- Max. values: Terminal connection: 1...3
- Max. output voltage: U_o ≤ 7.2 V
- Max. output current: I_o ≤ 1 mA
- Max. output power: P_o ≤ 2 mW
- Characteristic: linear

**External inductance/capacitance L_/C_**
- Ex ic: IIC | IIB
- L_ (mH): 0.5 | 4.5 | 9.5 | 1.5 | 9.5 | 20
- C_ (µF): 3.9 | 2.5 | 2.2 | 17 | 12 | 10

**Environmental Conditions**
- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Relative humidity: ≤ 95 %
- Test voltage: 2.5 kV

**Mechanical data**
- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: V-0
- Flammability class acc. to UL 94: V-0
- Dimensions: 18 x 104 x 110 mm

**Approval | Certification**
- ATEX, IECEx, UL, _FM_, TR CU, NEPSI

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**Indication**
- Operational readiness: green
Interface technology in modular housing
DIN rail devices, IM series

Input analog signal isolator, 1-channel

Standard active voltage or current signals are transmitted via the 1-channel analog signal isolator IM31-11Ex-U.

The device is equipped with one input circuit of 0/2...10 V or 0/4...20 mA and one short-circuit proof output circuit of 0/2...10 V.

The transmission characteristic is adjusted via a DIP switch on the front. In switch position “1:1”, the input signal is transmitted directly to the output in the non-Ex area. In “LZ” switch position, a dead-zero signal at the input (0...10 V / 0...20 mA) is converted and provided as a live-zero signal at the associated output (2...10 V).

A green LED indicates operational readiness.

Features

- ATEX, IECEx, UL, CFCU, TR CU, NEPSI
- Installation in zone 2
- Transmission of normalized analog signals from the Ex area to the non-Ex area
- Input circuit: 0/2...10 V or 0/4...20 mA
- Output circuit: 0/2...10 V
- Complete galvanic isolation

Standard active voltage or current signals are transmitted via the 1-channel analog signal isolator IM31-11Ex-U.

The device is equipped with one input circuit of 0/2...10 V or 0/4...20 mA and one short-circuit proof output circuit of 0/2...10 V.

The transmission characteristic is adjusted via a DIP switch on the front. In switch position “1:1”, the input signal is transmitted directly to the output in the non-Ex area. In “LZ” switch position, a dead-zero signal at the input (0...10 V / 0...20 mA) is converted and provided as a live-zero signal at the associated output (2...10 V).

A green LED indicates operational readiness.
# Technical data

## Type
- **Type**: IM31-11EX-U
- **Ident no.**: 7506327

## Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20...125 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 2.2 W

## Inputs
- **Voltage input**: 0/2...10 VDC
- **Input resistance (voltage)**: ≥ 50 kΩ
- **Current input**: 0/4...20 mA
- **Input resistance (current)**: ≤ 50 Ω

## Outputs
- **Load resistance voltage output**: ≥ 0.5 kΩ
- **Output voltage**: 0/2...10 V

## Response characteristic
- **Measuring accuracy**: ≤ 0.2 % of full scale
- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.01 % / K
- **Rise time (10-90%)**: ≤ 50 ms
- **Dropout time (90...10%)**: ≤ 50 ms

## Approvals and declarations
- **Ex approval acc. to conformity certificate**: TÜV 04 ATEX 2679
- **Device designation**: Ex ia IIC IIB; Ex ia Da IIIC
- **Max. values**: Terminal connection: 1...3
- **Max. output voltage Uo**: ≤ 7.2 V
- **Max. output current Io**: ≤ 1 mA
- **Max. output power Po**: ≤ 2 mW
- **Rated voltage**: 250 V
- **Characteristic**: linear
- **Internal inductance/capacitance L_i/C_i**: L_i = 65 µH; C_i = 52 nF

## External inductance/capacitance L_o/C_o

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_o [mH]</td>
<td>0.5</td>
<td>4.5</td>
</tr>
<tr>
<td>C_o [µF]</td>
<td>2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

## Ex approval acc. to conformity certificate
- **TÜV 06 ATEX 553387 X**
- **Application area**: II 3 G
- **Protection type**: Ex na [ic Ga] IIC/IIB T4 Gc
- **Max. values**: Terminal connection: 1...3
- **Max. output voltage U_o**: ≤ 7.2 V
- **Max. output current I_o**: ≤ 1 mA
- **Max. output power P_o**: ≤ 2 mW
- **Characteristic**: linear

## External inductance/capacitance L_o/C_o

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_o [mH]</td>
<td>0.5</td>
<td>4.5</td>
</tr>
<tr>
<td>C_o [µF]</td>
<td>3.9</td>
<td>2.5</td>
</tr>
</tbody>
</table>

## Indication
- **Operational readiness**: green

## Environmental Conditions
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV

## Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: V-0
- **Flammability class acc. to UL 94**: IIC
- **Dimensions**: 18 x 104 x 110 mm

## Approval | Certification

- **ATEX, IECEx, UL, cFMus, TR CU, NEPSI**
Interface technology in modular housing
DIN rail devices, IM series

Input analog signal isolator, 1-channel

Standard active voltage or current signals are transmitted galvanically isolated via the 1-channel analog signal isolator IM31-11-I.

The device is equipped with one input circuit of 0/2…10 V or 0/4…20 mA and one short-circuit proof output circuit of 0/4…20 mA.

The transmission characteristic is adjusted via a DIP switch on the front. In switch position “1:1”, the input signal is transmitted directly to the output. In “LZ” switch position, a dead-zero signal at the input (0…10 V / 0…20 mA) is converted and provided as a live-zero signal at the output (4…20 mA).

A green LED indicates operational readiness.

Features

- TR CU
- Transmission of normalized analog signals
- Input circuit: 0/2…10 V or 0/4…20 mA
- Output circuit: 0/4…20 mA
- Complete galvanic isolation
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM31-11-I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7506323</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Universal voltage supply unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20…125 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40…70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 2.2 W</td>
</tr>
</tbody>
</table>

### Inputs

| Voltage input | 0/2…10 VDC |
| Input resistance (voltage) | ≥ 50 kΩ |
| Current input | 0/4…20 mA |
| Input resistance (current) | ≤ 50 Ω |

### Outputs

| Load resistance, current output | ≤ 0.5 kΩ |
| Output current | 0/4…20 mA |

### Response characteristic

| Measuring accuracy | ≤ 0.1 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift | ≤ 0.005 % / K |
| Rise time (10-90%) | ≤ 50 ms |
| Dropout time (90…10%) | ≤ 50 ms |

### Indication

| Operational readiness | green |

### Environmental Conditions

| Ambient temperature | -25…+70 °C |
| Storage temperature | -40…+80 °C |
| Relative humidity | ≤ 95 % |
| Test voltage | 2.5 kV |

### Mechanical data

| Tightening torque | 0.5 Nm |
| Electrical connection | 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection |
| Terminal cross-section | 1 x 2.5 mm² / 2 x 1.5 mm² |
| Housing material | Polycarbonate/ABS |
| Mounting instruction | for DIN rail / panel |
| Protection class | IP20 |
| Flammability class acc. to UL 94 | V-0 |
| Dimensions | 18 x 104 x 110 mm |

### Approval | Certification

| TR CU |
Standard active voltage or current signals are transmitted galvanically isolated via the 1-channel analog signal isolator IM31-12-I. The signal is duplicated and provided at both outputs.

The device features one input circuits of 0/2…10 V or 0/4…20 mA as well as two short-circuit proof output circuits of 0/4…20 mA.

The transmission characteristic is adjusted via a DIP switch on the front. In switch position “1:1”, the input signal is transmitted directly to the outputs. In “LZ” switch position, a dead-zero signal at the input (0…10 V / 0…20 mA) is converted and provided as a live-zero signal at the output (4…20 mA).

A green LED indicates operational readiness.
## Technical data

**Type**
- IM31-12-I
- Ident no. 7506324

**Power supply**
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20...125 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 2.2 W

**Inputs**
- **Voltage input**: 0/2...10 VDC
- **Input resistance (voltage)**: ≥ 50 kΩ
- **Current input**: 0/4...20 mA
- **Input resistance (current)**: ≤ 50 Ω

**Outputs**
- **Load resistance, current output**: ≤ 0.5 kΩ
- **Output current**: 0/4...20 mA

**Response characteristic**
- **Measuring accuracy**: ≤ 0.1 % of full scale
- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time (10-90%)**: ≤ 50 ms
- **Dropout time (90...10%)**: ≤ 50 ms

**Indication**
- **Operational readiness**: green

**Environmental Conditions**
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV

**Mechanical data**
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 104 x 110 mm

**Approval | Certification**
- TR CU
The 1-channel analog signal isolator IM31-12EX-I is designed to transmit normalized active voltage or current signals galvanically isolated from the Ex area to the non-Ex area. The signal is duplicated and provided at both outputs.

The device features one input circuit of 0/2…10 V or 0/4…20 mA as well as two short-circuit proof output circuits of 0/4…20 mA.

The transmission characteristic is adjusted via a DIP switch on the front. In switch position "1:1", the input signal is transmitted directly to the outputs in the non-Ex area. In "LZ" switch position, a dead-zero signal at the input (0…10 V / 0…20 mA) is converted and provided as a live-zero signal at the output (4…20 mA).

A green LED indicates operational readiness.
Interface technology in modular housing
DIN rail devices, IM series

Technical data

**Type**
IM31-12EX-I

**Ident no.**
7506321

**Power supply**
- Nominal voltage: Universal voltage supply unit
- Operating voltage range: 20...125 VDC
- Operating voltage range: 20...250 VAC
- Frequency: 40...70 Hz
- Power consumption: ≤ 2.2 W

**Inputs**
- Voltage input: 0/2...10 VDC
- Input resistance (voltage): ≥ 50 kΩ
- Current input: 0/4...20 mA
- Input resistance (current): ≤ 50 Ω

**Outputs**
- Load resistance, current output: ≤ 0.5 kΩ
- Output current: 0/4...20 mA

**Response characteristic**
- Measuring accuracy: ≤ 0.2 % of full scale
- Reference temperature: 23 °C
- Temperature drift: ≤ 0.01 % / K
- Rise time (10-90%): ≤ 50 ms
- Dropout time (90...10%): ≤ 50 ms

**Approvals and declarations**
- Ex approval acc. to conformity certificate: TÜV 04 ATEX 2679
- Device designation:
  - II (1) G; II (1) D [Ex ia Ga] IIIC/IIB;
  - [Ex ia Da] IIC
- Max. values:
  - Terminal connection: 1...3
  - Max. output voltage Uo: ≤ 7.2 V
  - Max. output current Io: ≤ 1 mA
  - Max. output power Po: ≤ 2 mW
  - Rated voltage: 250 V
  - Characteristic: linear
  - Internal inductance/capacitance L_i/C_i:
    - L_i = 65 μH; C_i = 52 nF

**External inductance/capacitance L_i/C_i**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_i [mH]</td>
<td>0.5</td>
<td>4.5</td>
</tr>
<tr>
<td>C_i [μF]</td>
<td>2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Ex approval acc. to conformity certificate**
TÜV 06 ATEX 553387 X

**Application area**
-II 3 G

**Protection type**
Ex na [IC GC] IIC/IIB T4 Gc

**Max. values:**
- Terminal connection: 1...3
- Max. output voltage U_o: ≤ 7.2 V
- Max. output current I_o: ≤ 1 mA
- Max. output power P_o: ≤ 2 mW
- Characteristic: linear

**External inductance/capacitance L_i/C_i**

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_i [mH]</td>
<td>0.5</td>
<td>4.5</td>
</tr>
<tr>
<td>C_i [μF]</td>
<td>3.9</td>
<td>2.5</td>
</tr>
</tbody>
</table>

**Indication**
Operational readiness: green

**Environmental Conditions**
- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Relative humidity: ≤ 95 %
- Test voltage: 2.5 kV

**Mechanical data**
- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: V-0
- Flammability class acc. to UL 94: V-0
- Dimensions: 18 x 104 x 110 mm

**Approval | Certification**
ATEX, IECEx, UL, cFMus, TR CU, NEPSI
Standard active voltage or current signals are transmitted galvanically isolated via the 2-channel analog signal isolator IM31-22-I.

The device features two input circuits of 0/2…10 V or 0/4…20 mA as well as two short-circuit proof output circuits of 0/4…20 mA.

The transmission characteristic is adjusted via a DIP switch on the front. In “1:1” switch position, the input signals are transmitted directly to the outputs. In “LZ” switch position, a dead-zero signal at the input (0…10 V / 0…20 mA) is converted and provided as a live-zero signal at the output (4…20 mA).

A green LED indicates operational readiness.

**Features**

- TR CU
- Transmission of normalized signals
- Input circuit: 2 x 0/2…10 V or 0/4…20 mA
- Output circuit: 2 x 0/4…20 mA
- Complete galvanic isolation
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th><strong>Power supply</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>Universal voltage supply unit</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…125 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40…70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 2.2 W</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Inputs</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage input</td>
<td>0/2…10 VDC</td>
</tr>
<tr>
<td>Input resistance (voltage)</td>
<td>≥ 50 kΩ</td>
</tr>
<tr>
<td>Current input</td>
<td>0/4…20 mA</td>
</tr>
<tr>
<td>Input resistance (current)</td>
<td>≤ 50 Ω</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Outputs</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Load resistance, current output</td>
<td>≤ 0.5 kΩ</td>
</tr>
<tr>
<td>Output current</td>
<td>0/4…20 mA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Response characteristic</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring accuracy</td>
<td>≤ 0.1 % of full scale</td>
</tr>
<tr>
<td>Reference temperature</td>
<td>23 °C</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>≤ 0.005 % / K</td>
</tr>
<tr>
<td>Rise time (10-90%)</td>
<td>≤ 50 ms</td>
</tr>
<tr>
<td>Dropout time (90…10%)</td>
<td>≤ 50 ms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Indication</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational readiness</td>
<td>green</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Environmental Conditions</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25…+70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40…+80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 %</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mechanical data</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>0.5 Nm</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 104 x 110 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>**Approval</th>
<th>Certification**</th>
<th>TR CU</th>
</tr>
</thead>
</table>
Input analog signal isolator, 2-channel

The 2-channel analog signal isolator IM31-22EX-I is designed to transmit normalized active voltage or current signals galvanically isolated from the Ex area to the non-Ex area.

The device features two input circuits of 0/2…10 V or 0/4…20 mA as well as two short-circuit proof output circuits of 0/4…20 mA.

The transmission characteristic is adjusted via a DIP switch on the front. In switch position “1:1”, the input signals are transmitted directly to the outputs in the non-Ex area. In “LZ” switch position, a dead-zero signal at the input (0…10 V / 0…20 mA) is converted and provided as a live-zero signal at the output (4…20 mA).

A green LED indicates operational readiness.

Features

- ATEX, IECEx, ULcFMUS, TR CU, NEPSI
- Installation in zone 2
- Transmission of normalized analog signals from the Ex area to the non-Ex area
- Input circuits: 0/2…10 V or 0/4…20 mA
- Output circuits: 0/4…20 mA
- Complete galvanic isolation
## Technical data

### Power supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>Universal voltage supply unit</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20...125 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20...250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40...70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 2.2 W</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage input</td>
<td>0/2...10 VDC</td>
</tr>
<tr>
<td>Input resistance (voltage)</td>
<td>≥ 50 kΩ</td>
</tr>
<tr>
<td>Current input</td>
<td>0/4...20 mA</td>
</tr>
<tr>
<td>Input resistance (current)</td>
<td>≤ 50 Ω</td>
</tr>
</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load resistance, current output</td>
<td>≤ 0.5 kΩ</td>
</tr>
<tr>
<td>Output current</td>
<td>0/4...20 mA</td>
</tr>
</tbody>
</table>

### Response characteristic

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring accuracy</td>
<td>≤ 0.2 % of full scale</td>
</tr>
<tr>
<td>Reference temperature</td>
<td>23 °C</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>≤ 0.01 % / K</td>
</tr>
<tr>
<td>Rise time (10-90%)</td>
<td>≤ 50 ms</td>
</tr>
<tr>
<td>Dropout time (90...10%)</td>
<td>≤ 50 ms</td>
</tr>
</tbody>
</table>

### Approvals and declarations

| Ex approval acc. to conformity certificate | TÜV 04 ATEX 2679                            |
| Device designation                  | Ex ia G; Ex ia Da IIC/IIB; Ex ia Da IIC  |
| Max. values:                        | Terminal connection: 1...3 / 4...6          |
| Max. output voltage Uo              | ≤ 7.2 V                                    |
| Max. output current Io              | ≤ 1 mA                                     |
| Max. output power Po                | ≤ 2 mW                                     |
| Rated voltage                       | 250 V                                      |
| Characteristic                      | linear                                     |

### External inductance/capacitance L/C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L [mH]</td>
<td>0.5 4.5 9.5 1.5 9.5 20</td>
</tr>
<tr>
<td>C [µF]</td>
<td>2 1.5 1.3 9 6.7 6.1</td>
</tr>
</tbody>
</table>

### Environmental Conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25...+70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40...+80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 %</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>0.5 Nm</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>V-0</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 104 x 110 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

| ATEX, IECEx, UL, FMus, TR CU, NEPSI |

---

### Indication

| Operational readiness | green |

---

### External inductance/capacitance L/C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L [mH]</td>
<td>0.5 4.5 9.5 1.5 9.5 20</td>
</tr>
<tr>
<td>C [µF]</td>
<td>2 1.5 1.3 9 6.7 6.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L [mH]</td>
<td>0.5 4.5 9.5 1.5 9.5 20</td>
</tr>
<tr>
<td>C [µF]</td>
<td>3.9 2.5 2.2 17 12 10</td>
</tr>
</tbody>
</table>
The 2-channel analog signal isolator IM31-22EX-U is designed to transmit normalized active voltage or current signals galvanically isolated from the Ex area to the non-Ex area.

The device features two input circuits of 0/2…10 V or 0/4…20 mA as well as two short-circuit proof output circuits of 0…10 V.

The transmission characteristic is adjusted via a DIP switch on the front. In switch position "1:1", the input signals are transmitted directly to the outputs in the non-Ex area. In "LZ" switch position, a dead-zero signal at the input (0…10 V / 0…20 mA) is converted and provided as a live-zero signal at the output (0…10 V).

A green LED indicates operational readiness.

**Features**
- ATEX, IECEx, UL, FM, TR CU, NEPSI
- Installation in zone 2
- Transmission of normalized analog signals from the Ex area to the non-Ex area
- Input circuits: 0/2…10 V or 0/4…20 mA
- Output circuits: 0/2…10 V
- Complete galvanic isolation
### Technical data

**Type**
- IM31-22EX-U
- Ident no. 7506326

**Power supply**
- Nominal voltage: Universal voltage supply unit
- Operating voltage range: 20…125 VDC
- Operating voltage range: 20…250 VAC
- Frequency: 40…70 Hz
- Power consumption: ≤ 2.2 W

**Inputs**
- Voltage input: 0/2…10 VDC
- Input resistance (voltage): ≥ 50 kΩ
- Current input: 0/4…20 mA
- Input resistance (current): ≤ 50 Ω

**Outputs**
- Load resistance voltage output: ≥ 0.5 kΩ
- Output voltage: 0/2…10 V

**Response characteristic**
- Measuring accuracy: ≤ 0.2 % of full scale
- Reference temperature: 23 °C
- Temperature drift: ≤ 0.01 % / K
- Rise time (10-90%): ≤ 50 ms
- Dropout time (90…10%): ≤ 50 ms

**Approvals and declarations**
- Ex approval acc. to conformity certificate: TÜV 04 ATEX 2679
- Device designation: II (1) G; II (1) D [Ex ia Ga] IIC/IIB; [Ex ia Da] IIC/IIC
- Max. values:
  - Terminal connection: 1…3 / 4…6
  - Max. output voltage U_{O}: ≤ 7.2 V
  - Max. output current I_{O}: ≤ 1 mA
  - Max. output power P_{O}: ≤ 2 mW
- Rated voltage: 250 V
- Characteristic: linear
- Internal inductance/capacitance L_{I}/C_{I}
  - L_{I} = 65 µH; C_{I} = 52 nF

**External inductance/capacitance L_{E}/C_{E}**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_{E} [mH]</td>
<td>0.5</td>
<td>4.5</td>
</tr>
<tr>
<td>C_{E} [µF]</td>
<td>2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

- Ex approval acc. to conformity certificate: TÜV 06 ATEX 553387 X
- Application area: II 3 G
- Protection type: Ex na [Ic Gc] IIC/IIB T4 Gc
- Max. values:
  - Terminal connection: 1…3 / 4…6
  - Max. output voltage U_{O}: ≤ 7.2 V
  - Max. output current I_{O}: ≤ 1 mA
  - Max. output power P_{O}: ≤ 2 mW
- Characteristic: linear

**External inductance/capacitance L_{E}/C_{E}**

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_{E} [mH]</td>
<td>0.5</td>
<td>4.5</td>
</tr>
<tr>
<td>C_{E} [µF]</td>
<td>3.9</td>
<td>2.5</td>
</tr>
</tbody>
</table>

**Indication**
- Operational readiness: green

**Environmental Conditions**
- Ambient temperature: -25…+70 °C
- Storage temperature: -40…+80 °C
- Relative humidity: ≤ 95 %
- Test voltage: 2.5 kV

**Mechanical data**
- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: V-0
- Flammability class acc. to UL 94: V0
- Dimensions: 18 x 104 x 110 mm

**Approval | Certification**
- ATEX, IECEx, UL, fFMus, TR CU, NEPSI
The 1-channel HART® isolating transducer IM33-11-HI/24VDC is designed to operate 2-wire HART® transducers (III) and to transmit the measured signal galvastically isolated. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Alternatively, active 2-wire HART® transmitters (II) and passive 3-wire HART® transmitters (I) can be operated.

The device features one input and one output circuit, each with 0/4...20 mA. A green LED indicates operational readiness.

The input signal is transmitted 1:1 and is presented to the relevant output in the non-Ex area.

Due to the 1:1 transmission characteristic, wire-break or short-circuit of in the measuring transducer circuit are indicated as currents of 0 mA resp. > 22.5 mA.

The removable terminal blocks feature test sockets (Ø 2 mm) for connection of a HART® handheld. Other device variants are available on request.
## Technical data

### Type
<table>
<thead>
<tr>
<th>Type</th>
<th>IM33-11-HI/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7506447</td>
</tr>
</tbody>
</table>

### Power supply
<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>19…29 VDC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 2.2 W</td>
</tr>
</tbody>
</table>

### Inputs
<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>≥ 17 V / 20 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>25 mA</td>
</tr>
<tr>
<td>Current input</td>
<td>0/4…20 mA</td>
</tr>
<tr>
<td>Input resistance (current)</td>
<td>≤ 250 Ω</td>
</tr>
</tbody>
</table>

### Outputs
| Load resistance, current output | ≤ 0.5 kΩ        |
| Output current               | 0/4…20 mA       |
| Wire break monitoring        | ≤ 0 mA           |
| Short circuit monitoring     | ≥ 22 mA          |

### Response characteristic
| Measuring accuracy       | ≤ 0.1 % of full scale |
| Reference temperature    | 23 °C               |
| Temperature drift        | ≤ 0.005 % / K       |
| Rise time (10-90%)       | ≤ 50 ms             |
| Dropout time (90…10%)    | ≤ 50 ms             |

### Approvals and declarations
| Declaration              | SIL 2 acc. to EXIDA FMEDA |

### Indication
| Operational readiness   | green               |

### Environmental Conditions
| Ambient temperature      | -25…+70 °C         |
| Storage temperature      | -40…+80 °C         |
| Relative humidity        | ≤ 95 %              |
| Test voltage             | 2.5 kV              |
| MTTF                    | 159 years acc. to SN 29500 (Ed. 99) |

### Mechanical data
| Tightening torque        | 0.5 Nm             |
| Electrical connection    | 4 x 3-pin removable terminal blocks with test socket, reverse polarity protected, screw connection |
| Terminal cross-section   | 1 x 2.5 mm² / 2 x 1.5 mm² |
| Housing material         | Polycarbonate/ABS   |
| Mounting instruction     | for DIN rail / panel |
| Protection class         | IP20                |
| Flammability class acc.  | V-0                 |
| Dimensions               | 18 x 110 x 110 mm   |

### Approval | Certification
| TR CU       |
HART® isolating transducer, 1-channel

The 1-channel HART® isolating transducer IM33-22EX-HI/24 VDC is designed to operate intrinsically safe HART® 2-wire transducers (III) in the Ex area and to transmit the measured signals to the non-Ex area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Alternatively, active 2-wire HART® transmitters (II) and passive 3-wire HART® transmitters (I) can be operated.

The device features one input and one output circuit, each with 0/4...20 mA. A green LED indicates operational readiness.

The input signal is transmitted 1:1 and is presented to the relevant output in the non-Ex area.

Due to the 1:1 transmission characteristic, wire-break or short-circuit of in the measuring transducer circuit are indicated as currents of 0 mA resp. > 22.5 mA.

The removable cage clamp terminals feature test sockets (Ø 2 mm) for connection of a HART® handheld.

Features
- ATEX, IECEX, UL, cFM-US, TR CU, TIIS, CCEO
- Installation in zone 2
- Power supply of 2-wire measuring transducers with HART® communication as well as connection to active 2-wire and passive 3-wire transmitters
- Input circuit: 0/4...20 mA
- Output circuit: 0/4...20 mA
- SIL2
- Removable terminal blocks, screwable, with 2 mm test socket
- Complete galvanic isolation

The 1-channel HART® isolating transducer IM33-22EX-HI/24 VDC is designed to operate intrinsically safe HART® 2-wire transducers (III) in the Ex area and to transmit the measured signals to the non-Ex area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Alternatively, active 2-wire HART® transmitters (II) and passive 3-wire HART® transmitters (I) can be operated.

The device features one input and one output circuit, each with 0/4...20 mA. A green LED indicates operational readiness.

The input signal is transmitted 1:1 and is presented to the relevant output in the non-Ex area.

Due to the 1:1 transmission characteristic, wire-break or short-circuit of in the measuring transducer circuit are indicated as currents of 0 mA resp. > 22.5 mA.

The removable cage clamp terminals feature test sockets (Ø 2 mm) for connection of a HART® handheld.
## Technical data

**Type**

<table>
<thead>
<tr>
<th>ID</th>
<th>IM33-11EX-HI/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7506440</td>
</tr>
</tbody>
</table>

**Power supply**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>19…29 VDC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 2.2 W</td>
</tr>
</tbody>
</table>

**Inputs**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>≥ 17 V / 20 mA</td>
</tr>
<tr>
<td>Current</td>
<td>25 mA</td>
</tr>
<tr>
<td>Current input</td>
<td>0/4…20 mA</td>
</tr>
<tr>
<td>Input resistance (current)</td>
<td>≤ 250 Ω</td>
</tr>
</tbody>
</table>

**Outputs**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load resistance, current output</td>
<td>≤ 0.5 kΩ</td>
</tr>
<tr>
<td>Output current</td>
<td>0/4…20 mA</td>
</tr>
<tr>
<td>Internal resistance Ri</td>
<td>317 Ω</td>
</tr>
</tbody>
</table>

**Response characteristic**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring accuracy</td>
<td>≤ 0.1 % of full scale</td>
</tr>
<tr>
<td>Reference temperature</td>
<td>23 °C</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>≤ 0.005 % / K</td>
</tr>
<tr>
<td>Rise time (10-90%)</td>
<td>≤ 50 ms</td>
</tr>
<tr>
<td>Dropout time (90…10%)</td>
<td>≤ 50 ms</td>
</tr>
</tbody>
</table>

**Approvals and declarations**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex approval acc. to conformity certificate</td>
<td>TÜV 00 ATEX 1595</td>
</tr>
<tr>
<td>Device designation</td>
<td>Ex ia IIC, Ex ia Ga IIC, Ex ia Da IIC</td>
</tr>
<tr>
<td>Max. values:</td>
<td>Terminal connection: 1…3</td>
</tr>
<tr>
<td>Max. output voltage Uo</td>
<td>≤ 21.9 V</td>
</tr>
<tr>
<td>Max. output current Io</td>
<td>≤ 95 mA</td>
</tr>
<tr>
<td>Max. output power Po</td>
<td>≤ 747 mW</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>250 V</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Trapezoidal</td>
</tr>
<tr>
<td>Max. input voltage Ui</td>
<td>≤ 40 V</td>
</tr>
<tr>
<td>Max. input power Pi</td>
<td>≤ 650 mW</td>
</tr>
</tbody>
</table>

### External inductance/capacitance \( L_c/C_f \)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex ia IIC</td>
<td>IIB</td>
</tr>
<tr>
<td>( L_c ) (mH)</td>
<td>2.8</td>
</tr>
<tr>
<td>( C_f ) (µF)</td>
<td>0.057</td>
</tr>
</tbody>
</table>

**Environmental Conditions**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25…+70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40…+80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 %</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
<tr>
<td>MTTF</td>
<td>159 years acc. to SN 29500 (Ed. 99)</td>
</tr>
</tbody>
</table>

**Mechanical data**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>0.5 Nm</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>4 x 3-pin removable terminal blocks with test socket, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 110 x 110 mm</td>
</tr>
</tbody>
</table>

## External inductance/capacitance \( L_c/C_f \)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex ia IIC</td>
<td>IIB</td>
</tr>
<tr>
<td>( L_c ) (mH)</td>
<td>10.0</td>
</tr>
<tr>
<td>( C_f ) (µF)</td>
<td>0.81</td>
</tr>
<tr>
<td>Internal resistance Ri</td>
<td>331 Ω</td>
</tr>
<tr>
<td>Declaration</td>
<td>SIL 2 acc. to EXIDA FMEDA</td>
</tr>
</tbody>
</table>

**Indication**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational readiness</td>
<td>green</td>
</tr>
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</table>

**Approvals | Certification**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Approval</td>
<td>ATEX, IEEEx, UL, FMus, TR CU, TIIS, CCOE</td>
</tr>
</tbody>
</table>

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Interface technology in modular housing
DIN rail devices, IM series
Isolating transducer, 1-channel

The 1-channel isolating transducer for fire and smoke detectors IM33-FSD-EX/L is designed especially for connection of conventional fire and smoke detectors in the Ex-area.

They are supplied with energy. Actuation of a smoke detector results in a current change and the according signal is transmitted to the non-Ex area. Several detectors can be connected to one circuit.

The isolating transducer is loop-powered and has to be connected directly to power-supplying input circuits of evaluation units. Thereby normalized current signals of 0/4...20 mA are transmitted. The voltage drop across the device is to be observed.

Input and output circuits are galvanically isolated from each other. The inputs of the isolating transducer are reverse polarity protected.

A current-to-ground error can be detected safely via an external current-to-ground detector.
Technical data

**Type**
IM33-FSD-EX/L
Ident no.
7506433

**Power supply**
Nominal voltage
24 VDC loop-powered

**Inputs**
Supply voltage
$U_{W} = 1 \text{ VDC} - 300 \Omega \times I_{A}$
Supply voltage
$\geq 17 \text{ V} / 20 \text{ mA}$
Input resistance
300 $\Omega$
Voltage input
max. 30 VDC
Current input
0/4…20 mA

**Outputs**
Output circuits
0…40 mA
Load
$\leq 500 \Omega$
Output current
0/4…20 mA

**Response characteristic**
Measuring accuracy
$\leq 2 \%$ of full scale
Reference temperature
23 °C
Temperature drift
$\leq 0.1 \% / K$
Rise time (10-90%)
$\leq 10 \text{ ms}$
Dropout time (90…10%)$\leq 10 \text{ ms}$

**Approvals and declarations**
Ex approval acc. to conformity certificate
TÜV 02 ATEX 1862
Device designation
$\odot$ II (1) GD $[$EEx ia $]$ IIC
Max. output voltage $U_{o}$
$\leq 27.3 \text{ V}$
Max. output current $I_{o}$
$\leq 90 \text{ mA}$
Max. output power $P_{o}$
$\leq 615 \text{ mW}$
Rated voltage
250 V
Characteristic linear

**External inductance/capacitance $L_{o}/C_{o}$**
| $E_{Ex} \ iA$ | IIC | IIB |
| $L_{o}[\text{mH}]$ | 1 | 5 |
| $C_{o}[\text{nF}]$ | 70 | 300 |

**Environmental Conditions**
Ambient temperature
-20…+70 °C
Storage temperature
-40…+80 °C
Test voltage
2.5 kV

**Mechanical data**
Tightening torque
0.5 Nm
Electrical connection
4 x 3-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
Terminal cross-section
1 x 2.5 mm² / 2 x 1.5 mm²
Housing material
Polycarbonate/ABS
Mounting instruction
for DIN rail / panel
Protection class
IP20
Flammability class acc. to UL 94
V-0
Dimensions
18 x 110 x 110 mm

**Approval | Certification**
ATEX, FM, TR CU
**HART® isolating transducer, 1-channel**

The 1-channel HART® isolating transducer IM33-22Ex-HI/24 VDC is designed to operate intrinsically safe HART® 2-wire transducers (III) in the Ex area and to transmit the measured signals to the non-Ex area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Alternatively, active 2-wire HART® transmitters (II) and passive 3-wire HART® transmitters (I) can be operated.

The device features one input and two output circuits, for 0/4…20 mA. A green LED indicates operational readiness.

The input signal is transmitted 1:1 and is presented to the relevant outputs in the non-Ex area. The HART® signal is transmitted to output 1.

Due to the 1:1 transmission characteristic, wire-break or short-circuit of the measuring transducer circuit are indicated as currents of 0 mA resp. > 22.5 mA.

The removable cage clamp terminals feature test sockets (Ø 2 mm) for connection of a HART® handheld.

---

**Features**

- ATEX, IECEx, UL, cFM-US, TR CU, TIIS, CCEO
- Installation in zone 2
- Power supply of 2-wire measuring transducers with HART® communication as well as connection to active 2-wire and passive 3-wire transmitters
- Input circuit: 0/4…20 mA
- Output circuits: 0/4…20 mA
- SIL2
- Removable terminal blocks, screwable, with 2 mm test socket
- Complete galvanic isolation
## Technical data

### Power supply

- **Nominal voltage**: 24 VDC
- **Operating voltage range**: 19...29 VDC
- **Power consumption**: ≤ 3.2 W

### Inputs

- **Supply voltage**: ≥ 17 V / 20 mA
- **Current input**: 0/4…20 mA
- **Input resistance (current)**: ≤ 250 Ω

### Outputs

- **Load resistance, current output**: ≤ 0.5 kΩ
- **Output current**: 0/4…20 mA
- **Internal resistance **$R_i$: 317 Ω

### Response characteristic

- **Measuring accuracy**: ≤ 0.1 % of full scale
- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time (10-90%)**: ≤ 50 ms
- **Dropout time (90…10%)**: ≤ 50 ms

### Approvals and declarations

- **Ex approval acc. to conformity certificate**: TÜV 00 ATEX 1595
- **Device designation**: Ex ia IIC IIB
- **Max. values:**
  - Max. output voltage $U_o$: ≤ 21.9 V
  - Max. output current $I_o$: ≤ 95 mA
  - Max. output power $P_o$: ≤ 747 mW
- **Rated voltage**: 250 V
- **Characteristics**: Trapezoidal
- **Max. input voltage $U_i$: ≤ 40 V
- **Max. input power $P_i$: ≤ 650 mW

### External inductance/capacitance $L_o/C_o$

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ [mH]</td>
<td>2.8</td>
<td>11</td>
</tr>
<tr>
<td>$C_o$ [μF]</td>
<td>0.057</td>
<td>0.370</td>
</tr>
</tbody>
</table>

### Environmental Conditions

- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV
- **MTTF**: 159 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data

- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Dimensions**: 18 x 110 x 110 mm

### Approval | Certification

- ATEX, IECEx, UL, FMus, TR CU, TIIIS, CCOE

---

**External inductance/capacitance $L_o/C_o$**

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ [mH]</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>$C_o$ [μF]</td>
<td>0.12</td>
<td>0.81</td>
</tr>
</tbody>
</table>

**Internal resistance **$R_i$: 331 Ω

**Declaration**: SIL 2 acc. to EXIDA FMEDA

**Indication**

- **Operational readiness**: green

---

**Environmental Conditions**

- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV
- **MTTF**: 159 years acc. to SN 29500 (Ed. 99) 40 °C

**Mechanical data**

- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Dimensions**: 18 x 110 x 110 mm

**Approval | Certification**

- ATEX, IECEx, UL, FMus, TR CU, TIIIS, CCOE
Interface technology in modular housing
DIN rail devices, IM series

HART® isolating transducer, 1-channel

The 1-channel HART® isolating transducer IM33-11EX-HI is designed to operate intrinsically safe HART® 2-wire transducers (III) in the Ex area and to transmit the measured signal to the non-Ex area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Alternatively, active 2-wire HART® transmitters (II) and passive 3-wire HART® transmitters (I) can be operated.

The device features one input and one output circuit, for 0/4…20 mA. A green LED indicates operational readiness.

The input signal is transmitted 1:1 and is presented to the relevant output in the non-Ex area.

Due to the 1:1 transmission characteristic, wire-break or short-circuit of the measuring transducer circuit are indicated as currents of 0 mA resp. > 22.5 mA.

The removable cage clamp terminals feature test sockets (Ø 2 mm) for connection of a HART® handheld.

Features

- ATEX, IECEx, FM, TR CU, INMETRO
- Installation in zone 2
- Power supply of 2-wire measuring transducers with HART® communication as well as connection to active 2-wire and passive 3-wire transmitters
- Input circuit: 0/4…20 mA
- Output circuit: 0/4…20 mA
- Removable terminal blocks, screwable, with 2 mm test socket
- Complete galvanic isolation
### Technical data

**Type**
- IM33-11EX-HI
- Ident no. 7506443

**Power supply**
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20...125 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 3 W

**Inputs**
- **Supply voltage**: ≥ 17 V / 20 mA
- **Current**: 25 mA
- **Current input**: 0/4...20 mA
- **Input resistance (current)**: ≤ 250 Ω

**Outputs**
- **Load resistance, current output**: ≤ 0.5 kΩ
- **Output current**: 0/4...20 mA

**Response characteristic**
- **Measuring accuracy**: ≤ 0.1 % of full scale
- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time (10-90%)**: ≤ 50 ms
- **Dropout time (90...10%)**: ≤ 50 ms

**Approvals and declarations**
- Ex approval acc. to conformity certificate: TÜV 05 ATEX 2910
- Device designation: Ex ia IIC; Ex ia Da IIC
- **Max. values**: Terminal connection: 1...3
- **Max. output voltage U_o**: ≤ 21.3 V
- **Max. output current I_o**: ≤ 86 mA
- **Max. output power P_o**: ≤ 675 mW
- **Internal resistance R_i**: 365 Ω
- **Rated voltage**: 250 V
- **Characteristics**: Trapezoidal

**External inductance/capacitance L_i/C_i**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_i [mH]</td>
<td>0.47</td>
</tr>
<tr>
<td>C_i [µF]</td>
<td>0.093</td>
</tr>
</tbody>
</table>

**Ex approval acc. to conformity certificate**: TÜV 06 ATEX 2967 X

**Application area**: II 3 G

**Protection type**: Ex nL IIC

**Max. values**: Terminal connection: 1...3

**Max. output voltage U_o**: ≤ 21.3 V

**Max. output current I_o**: ≤ 86 mA

**Max. output power P_o**: ≤ 675 mW

**Characteristics**: Trapezoidal

**Environmental Conditions**
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Test voltage**: 2.5 kV

**Mechanical data**
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 5-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²

**Housing material**: Polycarbonate/ABS

**Mounting instruction**: for DIN rail / panel

**Protection class**: IP20

**Flammability class acc. to UL 94**: V-0

**Dimensions**: 27 x 110 x 110 mm

**Approval | Certification**: ATEX, IECEx, FM, TR CU, INMETRO
HART® isolating transducer, 1-channel

The 1-channel isolating transducer IM33-14EX-CDRI is designed to operate intrinsically safe transmitters in the Ex area and to transmit the measured signals to the non-Ex area.

The device features one output for analog signals 0/4...20 mA and three outputs for limit value relays. The measured value can be viewed on a 2-line display. A green LED indicates operational readiness, 3 yellow LEDs indicate the switching status of the individual channels.

The measured value is permanently written to a ring buffer with space for 8000 values. The writing process is stopped with a predefined trigger event, like for example “excess of limit value”. After that, the stored signal sequence can be read out.

The device can be parametrized and configured via PC (FDT / DTM). For this, connect the device to the PC via the 3.5 mm jack on the front (the matching transmission cable IM-PROG III can be ordered separately from TURCK). A basic scope of parameters can be set via buttons and display on the front or remotely via the current interface and HART®.
### Technical data

**Type**
IM33-14EX-CDRI

**Ident no.**
7560015

### Power supply

**Nominal voltage**
Universal voltage supply unit

**Operating voltage range**
20…125 VDC

**Operating voltage range**
20…250 VAC

**Frequency**
40…70 Hz

**Power consumption**
≤ 3 W

**Residual ripple**
≤ 10 mVrms

### Inputs

**Supply voltage**
≥ 17 V / 20 mA

**Current**
25 mA

**Voltage input**
0/2…10 VDC

**Current input**
0/4…20 mA

### Outputs

**Load resistance, current output**
≤ 0.6 kΩ

**Output current**
0/4…20 mA

**Output circuits (digital)**
3 x relays (NO)

**Switching frequency**
≤ 10 Hz

**Relay switching voltage**
≤ 250 VAC/120 VDC

**Switching current per output**
≤ 2 A

**Switching capacity per output**
≤ 500 VA/60 W

**Fault current**
0 / 22 mA adjustable

**Contact quality**
AgNi, 3µ Au

### Response characteristic

**Measuring accuracy**
≤ 0.05 % of full scale

**Reference temperature**
23 °C

**Temperature drift analogue output**
0.0025 %/K

### Approvals and declarations

**Ex approval acc. to conformity certificate**
IBExU 07 ATEX 1156

**Device designation**
Ex ia IIC

**Max. values:**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_m [mH]</td>
<td>0.3</td>
<td>0.15</td>
</tr>
<tr>
<td>C_m [µF]</td>
<td>30</td>
<td>50</td>
</tr>
</tbody>
</table>

**Ex approval acc. to conformity certificate**
IBExU 07 ATEX B015 X

**Application area**
II 3 G

**Protection type**
Ex nA nC [Ic Gc] IIC T4 Gc
Interface technology in modular housing
DIN rail devices, IM series

HART® isolating transducer, 1-channel

The 1-channel HART® isolating transducer IM33-12EX-HI is designed to operate intrinsically safe HART® 2-wire transducers (III) in the Ex area and to transmit the measured signals to the non-Ex area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Alternatively, active 2-wire HART® transmitters (II) and passive 3-wire HART® transmitters (I) can be operated.

The device features one input and two output circuits, for 0/4…20 mA. A green LED indicates operational readiness.

The input signal is transmitted 1:1 and is presented to the relevant outputs in the non-Ex area. The HART® signal is transmitted to output 1.

Due to the 1:1 transmission characteristic, wire-break or short-circuit of the measuring transducer circuit are indicated as currents of 0 mA resp. > 22.5 mA.

The removable cage clamp terminals feature test sockets (Ø 2 mm) for connection of a HART® handheld.

Features
- ATEX, IECEx, cFMUS, TR CU, INMETRO
- Installation in zone 2
- Power supply of 2-wire measuring transducers with HART® communication as well as connection to active 2-wire and passive 3-wire transmitters
- Input circuit: 0/4…20 mA
- Output circuit: 0/4…20 mA
- Removable terminal blocks, screwable, with 2 mm test socket
- Complete galvanic isolation
## Technical data

### Type
- **IM33-12EX-HI**
- **Ident no.** 7506444

### Power supply
- **Nominal voltage** Universal voltage supply unit
- **Operating voltage range**
  - DC: 20…125 VDC
  - AC: 20…250 VAC
- **Frequency** 40…70 Hz
- **Power consumption** ≤ 3 W
- **Residual ripple** ≤ 10 mV

### Inputs
- **Supply voltage** ≥ 17 V / 20 mA
- **Current** 25 mA
- **Current input** 0/4…20 mA
- **Input resistance (current)** ≤ 250 Ω

### Outputs
- **Load resistance, current output** ≤ 0.5 kΩ
- **Output current** 0/4…20 mA

### Response characteristic
- **Measuring accuracy** ≤ 0.1 % of full scale
- **Reference temperature** 23 °C
- **Temperature drift** ≤ 0.005 % / K
- **Rise time** (10-90%) ≤ 50 ms
- **Dropout time** (90…10%) ≤ 50 ms

### Approvals and declarations
- **Ex approval acc. to conformity certificate** TÜV 05 ATEX 2910
- **Device designation**
  - Ex ia IIC
  - Ex ia Da IIC
- **Max. values**: Terminal connection: 1...3
  - Max. output voltage $U_o$ ≤ 21.3 V
  - Max. output current $I_o$ ≤ 86 mA
  - Max. output power $P_o$ ≤ 675 mW
  - Internal resistance $R_i$ 365 Ω
- **Rated voltage** 250 V
- **Characteristic** Trapezoidal

### External inductance/capacitance $L_o/C_o$

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_o$ [mH]</td>
<td>4.5</td>
<td>10</td>
</tr>
<tr>
<td>$C_o$ [µF]</td>
<td>157</td>
<td>890</td>
</tr>
</tbody>
</table>

### Ex aL IIC Ex aL IIB

| $L_o$ [mH] | 4.5 | 10 |
| $C_o$ [µF] | 0.093 | 0.45 |

### Environmental Conditions
- **Ambient temperature** -25…+70 °C
- **Storage temperature** -40…+80 °C
- **Test voltage** 2.5 kV

### Mechanical data
- **Tightening torque** 0.5 Nm
- **Electrical connection** 4 x 5-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- **Terminal cross-section** 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material** Polycarbonate/ABS
- **Mounting instruction** for DIN rail / panel
- **Protection class** IP20
- **Flammability class acc. to UL 94** V-0
- **Dimensions** 27 x 110 x 110 mm

### Approvals | Certification
- ATEX, IECEx, cFMus, TR CU, INMETRO
Interface technology in modular housing
DIN rail devices, IM series

HART® isolating transducer, 2-channel

The 2-channel HART® isolating transducer IM33-22-HI/24VDC is designed to operate intrinsically safe HART® transducers. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Alternatively, active 2-wire HART® transmitters (II) and passive 3-wire HART® transmitters (I) can be operated.

The device features 0/4…20 mA input and output circuits. A green LED indicates operational readiness.

The input signals are transmitted 1:1 and are presented to the relevant outputs in the non-Ex area.

Due to the 1:1 transmission characteristic, wire-break or short-circuit of the measuring transducer circuit are indicated as currents of 0 mA resp. > 22.5 mA.

The removable terminal blocks feature test sockets (Ø 2 mm) for connection of a HART® handheld.

Features
- TR CU
- Power supply of 2-wire measuring transducers with HART® communication as well as connection to active 2-wire and passive 3-wire transmitters
- Input circuit: 0/4…20 mA
- Output circuit: 0/4…20 mA
- SIL 2
- Removable terminal blocks, screwable, with 2 mm test socket
- Complete galvanic isolation
## Technical data

### Type
<table>
<thead>
<tr>
<th>IM33-22-HI/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>19…29 VDC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 3.2 W</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>≥ 17 V / 20 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current input</td>
<td>0/4…20 mA</td>
</tr>
<tr>
<td>Input resistance (current)</td>
<td>≤ 250 Ω</td>
</tr>
</tbody>
</table>

### Outputs

| Load resistance, current output | ≤ 0.5 kΩ |
| Output current                | 0/4…20 mA |

### Response characteristic

| Measuring accuracy                  | ≤ 0.1 % of full scale |
| Reference temperature               | 23 °C                 |
| Temperature drift                   | ≤ 0.005 % / K         |
| Rise time (10-90%)                  | ≤ 50 ms               |
| Dropout time (90…10%)               | ≤ 50 ms               |

### Approvals and declarations

| Declaration                  | SIL 2 acc. to EXIDA FMEDA |

### Indication

| Operational readiness | green |

### Environmental Conditions

| Ambient temperature | -25…+70 °C |
| Storage temperature  | -40…+80 °C |
| Relative humidity    | ≤ 95 %     |
| Test voltage         | 2.5 kV     |
| MTTF                 | 159 years acc. to SN 29500 (Ed. 99) 40 °C |

### Mechanical data

<table>
<thead>
<tr>
<th>Tightening torque</th>
<th>0.5 Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical connection</td>
<td>4 x 3-pin removable terminal blocks with test socket, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 110 x 110 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification

| TR CU |

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Interface technology in modular housing
DIN rail devices, IM series

more@turck.com  ■  www.turck.com  ■  Edition I/2014
The 2-channel HART® isolating transducer IM33-22EX-HI/24VDC is designed to operate intrinsically safe HART® 2-wire transducers (III) in the Ex area and to transmit the measured signals to the non-Ex area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Alternatively, active 2-wire HART® transmitters (II) and passive 3-wire HART® transmitters (I) can be operated.

The device features 0/4…20 mA input and output circuits. A green LED indicates operational readiness.

The input signals are transmitted 1:1 and are presented to the relevant outputs in the non-Ex area.

Due to the 1:1 transmission characteristic, wire-break or short-circuit of in the measuring transducer circuit are indicated as currents of 0 mA resp. > 22.5 mA.

The removable cage clamp terminals feature test sockets (Ø 2 mm) for connection of a HART® handheld.
## Technical data

### Type
- **Type**: IM33-22EX-HI/24VDC
- **Ident no.**: 7506441

### Power supply
- **Nominal voltage**: 24 VDC
- **Operating voltage range**: 19…29 VDC
- **Power consumption**: ≤ 3.2 W

### Inputs
- **Supply voltage**: ≥ 17 V / 20 mA
- **Current input**: 0/4…20 mA
- **Input resistance (current)**: ≤ 250 Ω

### Outputs
- **Load resistance, current output**: ≤ 0.5 kΩ
- **Output current**: 0/4…20 mA
- **Internal resistance \( R_i \)**: 317 Ω

### Response characteristic
- **Measuring accuracy**: ≤ 0.1 % of full scale
- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time (10-90%)**: ≤ 50 ms
- **Dropout time (90...10%)**: ≤ 50 ms

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: TÜV 00 ATEX 1595
- **Device designation**: Ex ia IIC IIB [Ex ia Da] [Ex ia Ga] IIC
- **Max. values:
  - Max. output voltage \( U_o \)**: ≤ 21.9 V
  - Max. output current \( I_o \)**: ≤ 95 mA
  - Max. output power \( P_o \)**: ≤ 747 mW
  - Rated voltage**: 250 V
  - Characteristic**: Trapezoidal
  - Max. input voltage \( U_i \)**: ≤ 30 V
  - Max. input power \( P_i \)**: ≤ 650 mW

### External inductance/capacitance \( L_{ix}/C_{ix} \)
- **Ex ia IIC IIB**:
  - \( L_{ix} \) (mH): 2.8 / 11
  - \( C_{ix} \) (μF): 0.057 / 0.370
- **Ex approval acc. to conformity certificate**: TÜV 06 ATEX 552977 X
- **Application area**: II 3 G
- **Protection type**: Ex na [ic Gc] IIC T4 Gc
- **Max. values:
  - Max. output voltage \( U_o \)**: ≤ 21.9 V
  - Max. output current \( I_o \)**: ≤ 95 mA
  - Characteristic**: Trapezoidal
  - Max. input voltage \( U_i \)**: ≤ 30 V
  - Max. input power \( P_i \)**: ≤ 650 mW

### External inductance/capacitance \( L_{ix}/C_{ix} \)
- **Ex ic IIC IIB**:
  - \( L_{ix} \) (mH): 3 / 10.0
  - \( C_{ix} \) (μF): 0.12 / 0.81
  - Internal resistance \( R_i \)**: 331 Ω
  - Declaration**: SIL 2 acc. to EXIDA FMEDA

### Indication
- **Operational readiness**: green

### Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Relative humidity**: ≤ 95 %
- **Test voltage**: 2.5 kV
- **MTTF**: 159 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 110 x 110 mm

### Approval | Certification
- **ATEX, IECEx, UL, cFMus, TR CU, TIIS, CCOE**
HART® isolating transducer, 2-channel

The 2-channel HART® isolating transducer IM33-22EX-HI is designed to operate intrinsically safe HART® 2-wire transducers (III) in the Ex area and to transmit the measured signals to the non-Ex area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Alternatively, active 2-wire HART® transmitters (II) and passive 3-wire HART® transmitters (I) can be operated.

The device features 0/4…20 mA input and output circuits. A green LED indicates operational readiness.

The input signals are transmitted 1:1 and are presented to the relevant outputs in the non-Ex area.

Due to the 1:1 transmission characteristic, wire-break or short-circuit of in the measuring transducer circuit are indicated as currents of 0 mA resp. > 22.5 mA.

The removable cage clamp terminals feature test sockets (Ø 2 mm) for connection of a HART® handheld.

Features
- ATEX, IECEx, cFMUS, TR CU, INMETRO
- Installation in zone 2
- Power supply of 2-wire measuring transducers with HART® communication as well as connection to active 2-wire and passive 3-wire transmitters
- Input circuits: 0/4…20 mA
- Output circuits: 0/4…20 mA
- Complete galvanic isolation
# Technical data

**Type**
- IM33-22EX-HI
- Ident no. 7506445

**Power supply**
- Nominal voltage: Universal voltage supply unit
- Operating voltage range: 20...125 VDC
- Operating voltage range: 20...250 VAC
- Frequency: 40...70 Hz
- Power consumption: ≤ 3 W

**Inputs**
- Supply voltage: ≥ 17 V / 20 mA
- Current: 25 mA
- Current input: 0/4...20 mA
- Input resistance (current): ≤ 250 Ω

**Outputs**
- Load resistance, current output: ≤ 0.5 kΩ
- Output current: 0/4...20 mA

**Response characteristic**
- Measuring accuracy: ≤ 0.1 % of full scale
- Reference temperature: 23 °C
- Temperature drift: ≤ 0.005 % / K
- Rise time (10-90%): ≤ 50 ms
- Dropout time (90...10%) : ≤ 50 ms

**Approvals and declarations**

| Ex approval acc. to conformity certificate | TÜV 05 ATEX 2910 |
| Device designation | Ex ia [Ga] IIC; Ex ia Da IIC |
| Max. values: Terminal connection: | 1...3 / 6...8 |
| Max. output voltage U_o | ≤ 21.3 V |
| Max. output current I_o | ≤ 86 mA |
| Max. output power P_o | ≤ 675 mW |
| Internal resistance R_i | 365 Ω |
| Rated voltage | 250 V |
| Characteristic | Trapezoidal |

**External inductance/capacitance L_o/C_o**

| L_o [mH] | 4.5 |
| C_o [pF] | 157 |

**Internal inductance/capacitance L_i/C_i**

| L_i [μH] | 75 |
| C_i [nF] | negligibly small |

**Indication**
- Operational readiness: green

**Environmental Conditions**
- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Test voltage: 2.5 kV

**Mechanical data**
- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 5-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Flammability class: V-0
- Dimensions: 27 x 110 x 110 mm

**Approval | Certification**
- ATEX, IECEx, FM, TR CU, INMETRO
Temperature measuring amplifier, 1-channel

The 1-channel temperature measuring amplifier IM34-11-CI is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs, thermocouples types B, E, J, K, L, N, R, S and T or low voltages in a range of -160…+160 mV and to output them as linear temperature current signals.

Alternatively, Ni100/Pt100 in 2, 3 or 4-wire technology can be operated at the measuring amplifier’s input circuit. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple or as independent measuring input.

The device can be configured via PC with the software tool Device Type Manager (DTM); the appropriate transmission cable IM-PROG III is available from TURCK.

The following settings are available:
- Connection mode (2, 3 and 4-wire technology)
- Measuring range start
- Measuring range end
- Input circuit monitoring for wire-break
- Current output behaviour in the event of input circuit errors: 0 or > 22 mA
- Internal or external cold junction compensation
- Output current (0/4…20 mA)
- Temperature (°C or °K)
- Mode (resistor, thermocouples, low voltage, line compensation)

Features

- TR CU
- Input for Pt100/ Ni100 resistors, thermocouples and millivolt signals in 2, 3 or 4-wire technology
- Output circuit: 0/4…20 mA
- Parametrized via PC (FDT / DTM)
- Complete galvanic isolation
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM34-11-CI</th>
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</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7506638</td>
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</table>

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20…125 VDC
- **Operating voltage range**: 20…250 VAC
- **Frequency**: 40…70 Hz
- **Power consumption**: ≤ 3 W

### Inputs
- **Input circuits**: thermocouple, Ni100, Pt100, mV signals
- **Pt100 (IEC 751)**, 2, 3 and 4-wire technology
- **Ni100 (DIN 43760)**, 2, 3 and 4-wire technology
- **Probe current**: ≤ 0.2 mA
- **Thermocouples**: B, E, J, K, N, R, S, T (ITS 90/IEC 584), L (DIN 43710)
- **Voltage input**: -0.160…+0.160 VDC

### Outputs
- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4…20 mA
- **Fault current**: 0 / 22 mA adjustable

### Response characteristic
- **Reference temperature**: 23 °C
- **Accuracy current output**: ≤ 5 µA
- **Temperature drift analogue output**: 0.0025 %/K
- **Temperature drift RTD input**: ≤ 3 mΩ/K
- **Temperature drift TC input**: 3.2 µV / K (of 320 mV)
- **Accuracy RTD input**: ± 50 mΩ
- **Accuracy TC input**: ± 15 µV

#### Cold junction compensation error
- 2-wire < 100 mΩ after line compensation
- 3-wire < 100 mΩ with asymmetrical wiring
- 4-wire < 50 mΩ with cold junction compensation < 2 K with IM-3-CJT < 1 K

- **Rise time (10-90 %)**: ≤ 1000 ms
- **Dropout time (90…10 %)**: ≤ 1000 ms

### Indication
- **Operational readiness**: green
- **Error indication**: red

### Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 2.5 kV

### Approval | Certification
- TR CU

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## Mechanical data

<table>
<thead>
<tr>
<th>Tightening torque</th>
<th>0.5 Nm</th>
</tr>
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<tbody>
<tr>
<td>Electrical connection</td>
<td>4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 104 x 110 mm</td>
</tr>
</tbody>
</table>

## Mechanical data

<table>
<thead>
<tr>
<th>Tightening torque</th>
<th>0.5 Nm</th>
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<tr>
<td>Electrical connection</td>
<td>4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection</td>
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<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
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<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 104 x 110 mm</td>
</tr>
</tbody>
</table>

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## Interface technology in modular housing

DIN rail devices, IM series

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more@turck.com • www.turck.com • Edition I/2014
**Temperature measuring amplifier, 1-channel**

The 1-channel Ex-area temperature measuring amplifier IM34-11EX-CI is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs, thermocouples types B, E, J, K, L, N, R, S and T or low voltages in a range of -160…+160 mV and to output them as temperature-linear current signals 0/4…20 mA.

Alternatively, Ni100/Pt100 in 2, 3 or 4-wire-technology can be operated at the measuring amplifier’s input circuit. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple or as independent measuring input.

The device can be configured via PC with the software tool Device Type Manager (DTM); the appropriate transmission cable IM-PROG III is available from TURCK.

The following settings are available:
- Connection mode (2, 3 and 4-wire technology)
- Measuring range start
- Measuring range end
- Input circuit monitoring for wire-break
- Current output behaviour in the event of input circuit errors: 0 or > 22 mA
- Internal or external cold junction compensation
- Output current (0/4…20 mA)
- Temperature (°C or °K)
- Mode (resistor, thermocouples, low voltage, line compensation)

Features

- ATEX, IECEx, cFM UL, TR CU, INMETRO, CCOE
- Installation in zone 2
- Input for Pt100/ Ni100 resistors, thermocouples and millivolt signals in 2, 3 or 4-wire technology
- Output circuit: 0/4…20 mA
- Parametrized via PC (FDT / DTM)
- Complete galvanic isolation
Temperature measuring amplifier, 1-channel

Technical data

**Type**
IM34-11EX-CI

**Ident no.**
7506633

**Power supply**
- **Operating voltage range**: 20…125 VDC
- **Operating voltage range**: 20…250 VAC
- **Frequency**: 40…70 Hz
- **Power consumption**: ≤ 3 W

**Inputs**
- **Input circuits**: intrinsically safe acc. to EN 60079, thermocouple, Pt100, Ni100, mV signals
- **Pt100**: (IEC 751), 2, 3 and 4-wire technology
- **Ni100**: (DIN 43760), 2, 3 and 4-wire technology
- **Probe current**: ≤ 0.2 mA
- **Thermocouples**: B, E, J, K, N, R, S, T (ITS 90/IEC 584), L (DIN 43710)
- **Voltage input**: -0.160…+0.160 VDC

**Outputs**
- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4…20 mA
- **Fault current**: 0 / 22 mA adjustable
- **Output**: adjustable output mode

**Response characteristic**
- **Reference temperature**: 23 °C
- **Accuracy current output**: ± 5 µA
- **Temperature drift analogue output**: 0.0025 %/K
- **Temperature drift RTD input**: ± 3 mΩ/K
- **Temperature drift TC input**: 3.2 µV / K (of 320 mV)
- **Accuracy RTD input**: ± 50 mΩ
- **Accuracy TC input**: ± 15 µV
- **Cold junction compensation error**: 2-wire < 100 mΩ after line compensation, 3-wire < 100 mΩ with asymmetrical wiring, 4-wire < 50 mΩ with cold junction compensation < 2 K with IM-3-CJT < 1 K ≤ 1000 ms

**Rise time (10-90%)**: ≤ 1000 ms

**Dropout time (90…10%)**: ≤ 1000 ms

**Indication**
- **Operational readiness**: green
- **Error indication**: red

**Environmental Conditions**
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 2.5 kV

**Mechanical data**
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²

**Housing material**: Polycarbonate/ABS
- **Mounting instruction for DIN rail / panel**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 104 x 110 mm

**Approval | Certification**
ATEX, IECEx, UL, FM, TR CU, INMETRO, CCOE

**External inductance/capacitance L<sub>e</sub>/C<sub>e</sub>**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
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<tbody>
<tr>
<td>L&lt;sub&gt;e&lt;/sub&gt; (mH)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>C&lt;sub&gt;e&lt;/sub&gt; (µF)</td>
<td>2</td>
<td>9.1</td>
</tr>
</tbody>
</table>

**Ex approval acc. to conformity certificate**: TÜV 06 ATEX 552978 X

**Application area**: II 3 G

**Protection type**: Ex ia [IC Gc] IIC T4

**Max. values**: Terminal connection: 1…6
- **Max. output voltage U<sub>e</sub>**: ≤ 5 V
- **Max. output current I<sub>e</sub>**: ≤ 2.5 mA
- **Max. output power P<sub>e</sub>**: ≤ 3 mW

**Characteristic**: linear

**Internal inductance/capacitance L<sub>i</sub>/C<sub>i</sub>**

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
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<tr>
<td>L&lt;sub&gt;i&lt;/sub&gt; (mH)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>C&lt;sub&gt;i&lt;/sub&gt; (µF)</td>
<td>3.6</td>
<td>18</td>
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</table>

**Cold junction compensation error**
- **2-wire**: < 100 mΩ after line compensation
- **3-wire**: < 100 mΩ with asymmetrical wiring
- **4-wire**: < 50 mΩ with cold junction compensation < 2 K with IM-3-CJT < 1 K

**Rise time (10-90%)**: ≤ 1000 ms

**Dropout time (90…10%)**: ≤ 1000 ms

**Approvals and declarations**
- **Ex approval acc. to conformity certificate**: TÜV 02 ATEX 1898
- **Device designation**: Ex ia (1) G, II (1) D [Ex ia Ga] IIC ; [Ex ia Da] IIC ;
- **Max. values**: Terminal connection: 1…6
- **Max. output voltage U<sub>e</sub>**: ≤ 5 V
- **Max. output current I<sub>e</sub>**: ≤ 2.5 mA
- **Max. output power P<sub>e</sub>**: ≤ 3 mW
- **Rated voltage**: 250 V
- **Characteristic**: linear
- **Internal inductance/capacitance L<sub>i</sub>/C<sub>i</sub>** negligibly small

**Mounting instruction for DIN rail / panel**: for DIN rail / panel

**Protection class**: IP20

**Flammability class acc. to UL 94**: V-0

**Dimensions**: 18 x 104 x 110 mm

**Approval | Certification**
ATEX, IECEx, UL, FM, TR CU, INMETRO, CCOE
Interface technology in modular housing
DIN rail devices, IM series

Temperature measuring amplifier, 1-channel

The 1-channel Ex-area temperature measuring amplifier IM34-11EX-I is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs, thermocouples types B, E, J, K, L, N, R, S and T or low voltages in a range of -100...+160 mV and to output them as temperature-linear current signals 0/4...20 mA.

Alternatively, Ni100/Pt100 RTDs in 2, 3 or 4-wire technology can also be operated at the input circuit of the measuring amplifier. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple or as independent measuring input.

The measuring range and the device functions are set via coded rotary switches or slide switches (located on the right side of the device).

The following settings are available:
- Type of probe
- Connection of the Ni100/Pt100 resistor in 2, 3 or 4-wire technology
- Measuring range, lower limit 0...1 °C in 1-K steps, 0...990 °C in 10-K steps
- Measuring range upper limit 0...1990 °C in 10-K steps
- Input circuit monitoring for wire-break
- Current output behaviour in the event of input circuit errors: 0 or > 22 mA
- Internal or external cold junction compensation

Features
- ATEX, IECEx, cFMus, UL, TR CU, INMETRO, CCOE
- Installation in zone 2
- Input for Pt100/ Ni100 resistors, thermocouples and millivolt signals in 2, 3 or 4-wire technology
- Output circuit: 0/4...20 mA
- Upper and lower limit adjustable via rotary coding switch
- Complete galvanic isolation

The 1+1 Ex-area temperature measuring amplifier IM34-11EX-I is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs, thermocouples types B, E, J, K, L, N, R, S and T or low voltages in a range of -100...+160 mV and to output them as temperature-linear current signals 0/4...20 mA.
Technical data

**Interface technology in modular housing**

**DIN rail devices, IM series**

**Temperature measuring amplifier, 1-channel**

### Technical data

#### Power supply
- **Operating voltage range**: 20...125 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 3 W

#### Inputs
- **Input circuits**: Intrinsically safe acc. to EN 60079, thermocouple, Ni100, Pt100, mV signals
- **Pt100 (IEC 751)**, 2, 3 and 4-wire technology
- **Ni100 (DIN 43760)**, 2, 3 and 4-wire technology
- **Probe current**: ≤ 0.2 mA
- **Thermocouples**: B, E, J, K, N, R, S, T (ITS 90/IEC 584), L (DIN 43710)
- **Voltage input**: -0.160...+0.160 VDC

#### Outputs
- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4...20 mA
- **Fault current**: 0 / 22 mA adjustable
- **Output**: adjustable output mode

#### Response characteristic
- **Reference temperature**: 23 °C
- **Accuracy current output**: ± 5 µA
- **Temperature drift analogue output**: 0.0025 %/K
- **Temperature drift RTD input**: ± 3 mΩ/K
- **Temperature drift TC input**: 3.2 µV / K (of 320 mV)
- **Accuracy RTD input**: ± 50 mΩ
- **Accuracy TC input**: ± 15 µV

#### Cold junction compensation error
- **2-wire < 100 mΩ after line compensation**
- **3-wire < 100 mΩ with asymmetrical wiring**
- **4-wire < 50 mΩ with cold junction compensation < 2 K**
- **with IM-3-CJT < 1 K**: ≤ 1000 ms

#### Rise time (10-90%)
- ≤ 1000 ms

#### Dropout time (90...10%)
- ≤ 1000 ms

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: TÜV 02 ATEX 1898
- **Device designation**: Ex ia IIC [Ex ia Da] IIC ; Ex ia Da IIC ; Terminal connection: 1...6
- **Max. values**: Uo ≤ 5 V
- **Max. output current Io**: ≤ 2.5 mA
- **Max. output power Po**: ≤ 3 mW
- **Rated voltage**: 250 V
- **Characteristic**: Linear

### External inductance/capacitance \( L_r/C_r \)

<table>
<thead>
<tr>
<th></th>
<th>IIC</th>
<th>IIB</th>
</tr>
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<tbody>
<tr>
<td>( L_r ) [mH]</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>( C_r ) [µF]</td>
<td>2</td>
<td>9.1</td>
</tr>
</tbody>
</table>

### Environmental Conditions
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Test voltage**: 2.5 kV

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction for DIN rail / panel**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 104 x 110 mm

### Approval / Certification
- ATEX, IECEx, UL, FM, TR CU, INMETRO, CCOE
The temperature measuring amplifier IM34-11Ex-C/24VDC is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs, thermocouples types B, E, J, K, L, N, R, S and T or low voltages in a range of -160…+160 mV and to output them as temperature-linear current signals.

Alternatively, Ni100/Pt100 in 2, 3 or 4-wire-technology can be operated at the measuring amplifier’s input circuit. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple or as independent measuring input.

The device can be configured and parametrized via PC (FDT/DTM); the appropriate TURCK-PROG III transmission cable is available from TURCK.

The following settings can be adjusted via DTM:
▪ Connection mode (2, 3 and 4-wire technology)
▪ Measuring range start
▪ Measuring range end
▪ Input circuit monitoring for wire-break
▪ Current output behaviour in the event of input circuit errors: 0 or > 22 mA
▪ Internal, external or constant cold junction compensation
▪ Output current (0/4...20 mA)
▪ Temperature (°C or °K)
▪ Mode (resistor, thermocouples, low voltage, line compensation)
## Technical data

**Type**
IM34-11Ex CI/24 VDC
Ident no. 7506637

**Power supply**
Nominal voltage: 24 VDC
Operating voltage range: 20...30 VDC
Power consumption: ≤ 1.5 W

**Inputs**
Input circuits: intrinsically safe acc. to EN 60079, thermocouple, N100, Pt100, mV signals
RTD: Pt100 (IEC 751), Ni100, Cu50, Cu53, Cu100, CuZn100 (DIN 43760), 2, 3 and 4-wire technology
Ni100
Probe current: ≤ 0.2 mA
Voltage input: -0.160...+0.160 VDC

**Outputs**
Load resistance, current output: ≤ 0.6 kΩ
Output current: 0/4...20 mA
Fault current: 0 / 22 mA adjustable
Output: adjustable output mode

**Response characteristic**
Reference temperature: 23 °C
Accuracy current output: ± 20 µA
Temperature drift analogue output: 0.0025 %/K
Temperature drift RTD input: ± 3 mΩ/K
Temperature drift TC input: 3.2 µV/K (of 320 mV)
Accuracy RTD input: ± 50 mΩ
Accuracy TC input: ± 15 µV
Cold junction compensation error: 2-wire < 100 mΩ after line compensation
3-wire < 100 mΩ with asymmetrical wiring
4-wire < 50 mΩ with cold junction compensation < 2 K
with IM-3-CJT < 1 K
Rise time (10-90%): ≤ 1000 ms
Dropout time (90...10%): ≤ 1000 ms

**Approvals and declarations**
Ex approval acc. to conformity certificate: TÜV 02 ATEX 1898
Device designation: Ex ia IIC IIB
Max. values:
- Terminal connection: 1...6
- Max. output voltage Uo: ≤ 5 V
- Max. output current Io: ≤ 2.5 mA
- Max. output power Po: ≤ 3 mW
Rated voltage: 250 V
Characteristic: linear
Internal inductance/capacitance L_i/C_i: negligibly small

### External inductance/capacitance L_i/C_i

<table>
<thead>
<tr>
<th></th>
<th>IEC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_i (mH)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>C_i (µF)</td>
<td>2</td>
<td>9.1</td>
</tr>
</tbody>
</table>

### Indication
Operational readiness: green
Error indication: red

### Environmental Conditions
Ambient temperature: -25...+70 °C
Storage temperature: -40...+80 °C
Test voltage: 2.5 kV

### Mechanical data
Tightening torque: 0.5 Nm
Electrical connection: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
Terminals: 1 x 2.5 mm² / 2 x 1.5 mm²
Housing material: Polycarbonate/ABS
Mounting instruction: for DIN rail / panel
Protection class: IP20
Flammability class acc. to UL 94: V-0
Dimensions: 18 x 104 x 110 mm

### Approval/Certification
ATEX, IECEx, TR CU, INMETRO, CCOE
The 1-channel Ex-area temperature measuring amplifier IM34-12EX-CRI is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs, thermocouples types B, E, J, K, L, N, R, S and T or low voltages in a range of -160…+160 mV and to output them as temperature-linear current signals 0/4…20 mA.

Alternatively, Ni100/Pt100 RTDs in 2, 3 or 4-wire technology can also be operated at the input circuit of the measuring amplifier. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple or as independent measuring input.

The device has an additional relay output to monitor over or underrange of a limit value.

The device can be configured and parameterized via PC (FDT / DTM); the appropriate TURCK-PROG III transmission cable is available from TURCK.

The following settings are available:
- Connection mode (2, 3 and 4-wire technology)
- Measuring range start
- Limit value
- Measuring range end
- Input circuit monitoring for wire-break
- Current output behaviour in the event of input circuit errors: 0 or > 22 mA
- Internal or external cold junction compensation
- Output current (0/4…20 mA)
- Temperature (°C or °K)
- Mode (resistor, thermocouples, low voltage, line compensation)
## Interface technology in modular housing

**DIN rail devices, IM series**

### Technical data

#### Type

<table>
<thead>
<tr>
<th>IM34-12EX-CRI</th>
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</table>

<table>
<thead>
<tr>
<th>Ident no.</th>
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<tr>
<td>7506632</td>
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#### Power supply

<table>
<thead>
<tr>
<th>Operating voltage range</th>
<th>20...125 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20...250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40...70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 3 W</td>
</tr>
</tbody>
</table>

#### Inputs

- **Input circuits**: intrinsically safe acc. to EN 60079, thermocouple, Pt100, Ni100, mV signals
- **Pt100** (IEC 751), 2, 3 and 4-wire technology
- **Ni100** (DIN 43760), 2, 3 and 4-wire technology
- **Probe current**: ≤ 0.2 mA
- **Thermocouples**: B, E, J, K, N, R, S, T (ITS 90/IEC 584), L (DIN 43710)
- **Voltage input**: -0.160...+0.160 VDC

#### Outputs

- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4...20 mA
- **Output circuits (digital)**: 1 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 2 A
- **Switching capacity per output**: ≤ 0.6 kΩ
- **Fault current**: 0 / 22 mA adjustable
- **Contact quality**: AgNi, 3µ Au
- **Output**: adjustable output mode

#### Response characteristic

- **Reference temperature**: 23 °C
- **Accuracy current output**: ± 5 µA
- **Temperature drift analogue output**: 0.0025 %/K
- **Temperature drift RTD input**: ± 3 mΩ/K
- **Temperature drift TC input**: 3.2 µV/K (of 320 mV)
- **Accuracy RTD input**: ± 50 mΩ
- **Accuracy TC input**: ± 15 µV
- **Cold junction compensation error**: 2-wire < 100 mΩ after line compensation
- **3-wire < 100 mΩ with asymmetrical wiring**
- **4-wire < 50 mΩ with cold junction compensation < 2 K with IM-3-CJT < 1 K**
- **Rise time (10-90%)**: ≤ 1000 ms
- **Dropout time (90...10%)**: ≤ 1000 ms

#### Approvals and declarations

- **Ex approval acc. to conformity certificate**: TÜV 06 ATEX 552978 X
- **Application area**: II 3 G
- **Protection type**: Ex ia Da IIC T4
- **Max. values**: Terminal connection: 1...6
- **Max. output voltage Uo**: ≤ 5 V
- **Max. output current Io**: ≤ 2.5 mA
- **Max. output power Po**: ≤ 3 mW
- **Characteristic**: linear
- **Internal inductance/capacitance L/C**: negligibly small

#### Ex inductance/capacitance L/C

<table>
<thead>
<tr>
<th>L C [mH]</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>C C [µF]</td>
<td>9.1</td>
</tr>
</tbody>
</table>

#### Environmental Conditions

- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Test voltage**: 2.5 kV

#### Mechanical data

- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 104 x 110 mm

#### Approval | Certification

- **ATEX, IECEx, UL, FM, TR CU, INMETRO, CCOE**
The 1-channel Ex-area temperature measuring amplifier IM34-12EX-RI is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs, thermocouples types B, E, J, K, L, N, R, S and T or low voltages in a range of -100...+160 mV and to output them as temperature-linear current signals 0/4...20 mA.

Alternatively, Ni100/Pt100 RTDs in 2, 3 or 4-wire technology can also be operated at the input circuit of the measuring amplifier. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple or as independent measuring input. The device has an additional relay output to monitor over or underrange of a limit value.

The measuring range, limit value and the device functions are set via rotary coding switches or rather slide switches.

The following settings are available:

- Type of probe
- Connection of the Ni100/Pt100 resistor in 2, 3 or 4-wire technology
- Measuring range, lower limit -100...-1 °C in 1-K steps, upper limit 0...990 °C in 10-K steps
- Limit value
- Measuring range upper limit 0...1990 °C in 10-K steps
- Input circuit monitoring for wire-break
- Current output behaviour in the event of input circuit errors: 0 or > 22 mA
- Internal or external cold junction compensation
- Relay output mode

Output relay – Load curve

[Diagram of load curve]

Output relay – Electrical lifetime

[Diagram of electrical lifetime]
# Technical data

## Type
- IM34-12EX-BI
- Ident no. 7506631

## Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20...125 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 3 W

## Inputs
- **Input circuits**: intrinsically safe acc. to EN 60079, thermocouple, Ni100, Pt100, mV signals
  - **Pt100 (IEC 751), 2, 3 and 4-wire technology**
  - **Ni100 (DIN 43760), 2, 3 and 4-wire technology**
- **Probe current**: ≤ 0.2 mA
- **Thermocouples**: B, E, J, K, N, R, S, T (ITS 90/IEC 584), L (DIN 43710)
- **Voltage input**: -0.160...+0.160 VDC

## Outputs
- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4...20 mA
- **Output circuits (digital)**: 1 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 2 A
- **Switching capacity per output**: ≤ 500 VA/60 W
- **Fault current**: 0 / 22 mA adjustable
- **Contact quality**: AgNi, 3µ Au
- **Output adjustable output mode**:

## Response characteristic
- **Reference temperature**: 23 °C
- **Accuracy current output**: ± 5 µA
- **Temperature drift analogue output**: 0.0025 %/K
- **Temperature drift RTD input**: ± 3 mΩ/K
- **Temperature drift TC input**: 3.2 µV / K (of 320 mV)
- **Accuracy RTD input**: ± 50 mΩ
- **Accuracy TC input**: ± 15 µV
- **Cold junction compensation error**: 2-wire < 100 mΩ after line compensation
  3-wire < 100 mΩ with asymmetrical wiring
  4-wire < 50 mΩ with cold junction compensation < 2 K with IM-3-CJT < 1 K
- **Rise time (10-90%)**: ≤ 1000 ms
- **Dropout time (90...10%)**: ≤ 1000 ms

## Approvals and declarations
- **Ex approval acc. to conformity certificate**: TÜV 02 ATEX 1898
- **Device designation**: II (1) G, II (1) D [Ex ia Ga] IIC ; [Ex ia Da] IIC ;

<table>
<thead>
<tr>
<th>Max. values:</th>
<th>Terminal connection: 1...6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. output voltage $U_o$</td>
<td>≤ 5 V</td>
</tr>
<tr>
<td>Max. output current $I_o$</td>
<td>≤ 2.5 mA</td>
</tr>
<tr>
<td>Max. output power $P_o$</td>
<td>≤ 3 mW</td>
</tr>
<tr>
<td>Characteristic</td>
<td>linear</td>
</tr>
</tbody>
</table>

| Internal inductance/capacitance $L/C$ | negligibly small |

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>II B</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_i$ (mH)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>$C_i$ (µF)</td>
<td>9.1</td>
<td>9.1</td>
</tr>
</tbody>
</table>

## External inductance/capacitance $L$/C

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>II B</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_i$ (mH)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>$C_i$ (µF)</td>
<td>3.6</td>
<td>18</td>
</tr>
</tbody>
</table>

## Environmental Conditions
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Test voltage**: 2.5 kV

## Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: V-0
- **Flammability class acc. to UL 94**: 18 x 104 x 110 mm

## Approval | Certification
- ATEX, IECEx, UL, FMUS, TR CU, INMETRO, CCOE
Temperature measuring amplifier, 1-channel

The temperature measuring amplifier IM34-12EX-CRI/K63 is designed to evaluate the temperature-dependent changes of RTDs, thermocouples or low voltages and to output them as temperature-linear current signals between 0/4...20 mA. The special device K63 analyzes standard Pt100/N100 RTDs acc. to IEC 751, as well as Pt100 acc. to Gost, also CU50, CU53 CU100 and CuZn100 acc. to Gost. Moreover, standard thermocouples B, E, J, K, L, N, R, S and T, also the types L, A1, A2, A3 and M acc. to Gost can be connected. The device has an additional relay output to monitor over or underrange of a limit value.

The devices are parametrized and configured via PC with the software tool „Device Type Manager“ (DTM). For this, connect the temperature measuring amplifier to the PC with the 3.5 mm jack plug on the front.

The ready-made transmission cable can be ordered from TURCK under the type name IM-PROG (ident no. 6890422).

The following settings can be adjusted via DTM:

- Connection mode (2, 3 and 4-wire technology)
- Measuring range start
- Measuring range end
- Limit value
- Input circuit monitoring for wire-break
- Behaviour of current output in the event of input circuit errors: 0 resp. > 22 mA
- Internal or external cold junction compensation
- Output current (0/4...20 mA)
- Temperature (°C or °K)
- Mode (resistor, thermocouples, low voltage, line compensation)

### Features

- ATEX, IECEx, cFMus, UL, TR CU, INMETRO, CCOE
- Installation in zone 2
- Connection of thermocouples acc. to IEC 751 and GOST
- Connection of thermocouples acc. to IEC 584 and GOST
- Parametrized via FDT / DTM
- Complete galvanic isolation

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**Output relay – Load curve**

**Output relay – Electrical lifetime**
## Technical data

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20…125 VDC
- **Operating voltage range**: 20…250 VAC
- **Frequency**: 40…70 Hz
- **Power consumption**: ≤ 3 W

### Inputs
- **Input circuits**: intrinsically safe acc. to EN 60079, thermocouple, Ni100, Pt100, mV signals
- **Pt100** (IEC 751), 2, 3 and 4-wire technology, acc. to Gost: Pt100, Cu50, Cu100, CuZn100
- **Ni100** (DIN 43760), 2, 3 and 4-wire technology
- **Probe current**: ≤ 0.2 mA
- **Voltage input**: -0.160…+0.160 VDC

### Outputs
- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4…20 mA
- **Output circuits (digital)**: 1 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 2 A
- **Switching capacity per output**: ≤ 500 VA/60 W
- **Fault current**: 0 / 22 mA adjustable
- **Contact quality**: AgNi, 3µ Au
- **Output**: adjustable output mode

### Response characteristic
- **Reference temperature**: 23 °C
- **Accuracy current output**: ± 5 μA
- **Temperature drift analogue output**: 0.0025 %/K
- **Temperature drift RTD input**: ± 3 mΩ/K
- **Temperature drift TC input**: 3.2 μV/K (of 320 mV)
- **Accuracy RTD input**: ± 50 mΩ
- **Accuracy TC input**: ± 15 μV

### Cold junction compensation error
- **2-wire**: < 100 mΩ after line compensation
- **3-wire**: < 100 mΩ with asymmetrical wiring
- **4-wire**: < 50 mΩ with cold junction compensation < 2 K
- **IM-3-CJT**: < 1 K
- **Rise time (10-90%)**: ≤ 1000 ms
- **Dropout time (90…10%)**: ≤ 1000 ms

## Approvals and declarations
- **Ex approval acc. to conformity certificate**: TÜV 02 ATEX 1898
- **Device designation**: II (1) G, II (1) D ; [Ex ia Ga] IIC ; [Ex ia Da] IIIC ;
- **Max. values**: Terminal connection: 1…6
  - **Max. output voltage Uo**: ≤ 5 V
  - **Max. output current Io**: ≤ 2.5 mA
  - **Max. output power Po**: ≤ 3 mW
  - **Rated voltage**: 250 V
  - **Characteristic**: linear
- **Internal inductance/capacitance Lc/Cc**: negligibly small

### External inductance/capacitance Lc/Cc
- **Ex ia**
  - **Lc [mH]**: 100
  - **Cc [µF]**: 2
  
- **Ex ic**
  - **Lc [mH]**: 100
  - **Cc [µF]**: 3.6

### Indication
- **Operational readiness**: green
- **Switching state**: yellow
- **Error indication**: red

## Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 2.5 kV

## Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction for DIN rail / panel**: IP20
- **Protection class**: V-0
- **Dimensions**: 18 x 104 x 110 mm

## Approvals | Certification
- **ATEX, IECEx, UL, FMus, TR CU, INMETRO, CCOE**
The 1-channel Ex-area temperature measuring amplifier IM34-11EX-CI/K51 is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs, thermocouples types B, E, J, K, L, N, R, S and T or low voltages in a range of -160...+160 mV and to output them as temperature-linear current signals 0/4...20 mA. Alternatively, Ni100/Pt100 RTDs in 2, 3 or 4-wire technology can also be operated at the input circuit of the measuring amplifier. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple or as independent measuring input.

The device can be configured and parametrized via PC with the software tool Device Type Manager (DTM). For this, connect the device to the PC via the 3.5 mm jack on the front (the matching transmission cable IM-PROG III can be ordered separately from TURCK).

The following settings are available:
- Connection mode (2, 3 and 4-wire technology)
- Measuring range start
- Measuring range end
- Input circuit monitoring for wire-break
- Current output behaviour in the event of input circuit errors: 0 or > 22 mA

The signals are transformed according to ITS 90/IEC 584 for thermocouples and IEC 751 for Pt100 RTDs and provided as temperature-linear signals at the current output.

Features
- ATEX, IECEx, cFMUS, UL, TR CU, INMETRO, CCOE
- Installation in zone 2
- Input for Pt100/ Ni100 resistors, thermocouples and millivolt signals in 2, 3 or 4-wire technology
- Parametrized via PC using PACTware™
- Output: 0/4...20 mA
- Complete galvanic isolation

The signals are transformed according to ITS 90/IEC 584 for thermocouples and IEC 751 for Pt100 RTDs and provided as temperature-linear signals at the current output.
Technical data

Type
Im34-11EX-CI/KS1
Ident no. 7506635

Power supply
Nominal voltage Universal voltage supply unit
Operating voltage range 20...125 VDC
Operating voltage range 20...250 VAC
Frequency 40...70 Hz
Power consumption ≤ 3 W

Inputs
Input circuits intrinsically safe acc. to EN 60079, thermocouple, Ni100, Pt100, intrinsically safe acc. to EN 60079 (IEC 751), 2, 3 and 4-wire technology
Pt100 (DIN 43760), 2, 3 and 4-wire technology
Probe current ≤ 0.2 mA
Thermocouples B, E, J, K, N, R, S, T (ITS 90/IEC 584), L (DIN 43710)
Voltage input -0.160...+0.160 VDC

Outputs
Load resistance, current output ≤ 0.6 kΩ
Output current 0/4...20 mA
Switching frequency ≤ 1 Hz
Fault current 0 / 22 mA adjustable

Response characteristic
Reference temperature 23 °C
Accuracy current output ± 5 µA
Temperature drift analogue output 0.0025 %/K
Temperature drift RTD input ± 3 mΩ/K
Temperature drift TC input 3.2 µV / K (of 320 mV)
Accuracy RTD input ± 50 mΩ
Accuracy TC input ± 15 µV
Cold junction compensation error 2-wire < 100 mΩ after line compensation
3-wire < 100 mΩ with asymmetrical wiring
4-wire < 50 mΩ with cold junction compensation< 2 K with IM-3-CJT < 1 K
Rise time (10-90%) ≤ 1000 ms
Dropout time (90...10%) ≤ 1000 ms

Approvals and declarations
Ex approval acc. to conformity certificate TÜV 02 ATEX 1989
Device designation II (1) G, II (1) D [Ex ia Ga] IIC ; [Ex ia Da] IIC ;
Max. values: Terminal connection: 1...6
Max. output voltage Uo ≤ 5 V
Max. output current Io ≤ 2.5 mA
Max. output power Po ≤ 3 mW
Rated voltage 250 V
Characteristic linear
Internal inductance/capacitance L_i/C_i negligibly small

External inductance/capacitance L_e/C_e
Ex ia IIC IIB
L_e (mH) 100 100
C_e (µF) 2 9.1
Ex approval acc. to conformity certificate TÜV 06 ATEX 552978 X
Application area II 3 G
Protection type Ex nA [ic Gc] IIC T4
Max. values: Terminal connection: 1...6
Max. output voltage Uo ≤ 5 V
Max. output current Io ≤ 2.5 mA
Max. output power Po ≤ 3 mW
Characteristic linear
Internal inductance/capacitance L_i/C_i negligibly small

Environment Conditions
Ambient temperature -25...+70 °C
Storage temperature -40...+80 °C
Test voltage 4.0 kV

Mechanical data
Tightening torque 0.5 Nm
Electrical connection 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
Terminal cross-section 1 x 2.5 mm² / 2 x 1.5 mm²
Housing material Polycarbonate/ABS
Mounting instruction for DIN rail / panel IP20
Protection class V-0
Dimensions 18 x 104 x 110 mm

Approval | Certification
ATEX, IECEx, UL, FM, TR CU, INMETRO, CCEx

Indication
Operational readiness green

External inductance/capacitance L_e/C_e
Ex ia IIC IIB
L_e (mH) 100 100
C_e (µF) 2 9.1
Ex approval acc. to conformity certificate TÜV 06 ATEX 552978 X
Application area II 3 G
Protection type Ex nA [ic Gc] IIC T4
Max. values: Terminal connection: 1...6
Max. output voltage Uo ≤ 5 V
Max. output current Io ≤ 2.5 mA
Max. output power Po ≤ 3 mW
Characteristic linear
Internal inductance/capacitance L_i/C_i negligibly small

Environmental Conditions
Ambient temperature -25...+70 °C
Storage temperature -40...+80 °C
Test voltage 4.0 kV

Mechanical data
Tightening torque 0.5 Nm
Electrical connection 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
Terminal cross-section 1 x 2.5 mm² / 2 x 1.5 mm²
Housing material Polycarbonate/ABS
Mounting instruction for DIN rail / panel IP20
Protection class V-0
Dimensions 18 x 104 x 110 mm

Approval | Certification
ATEX, IECEx, UL, FM, TR CU, INMETRO, CCEx

Indication
Operational readiness green
The 1-channel temperature measuring amplifier IM34-11Ex-CI/K60 is designed to evaluate the temperature-dependent changes of Ni100/Pt100 (RTD), thermocouples (TC) types B, E, J, K, L, N, R, S and T or low voltages in a range of -160...+160 mV and to output them as temperature-linear current signals of 0/4...20 mA. Alternatively, Ni100/Pt100 RTDs in 2, 3 or 4-wire technology can also be operated at the input circuit of the measuring amplifier. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple or as independent measuring input.

If the thermocouples lines are routed to the temperature measuring amplifier TURCK recommends the use of the cold junction compensation module IM-3-CJT (ident no.: 6900524) This way the maximum possible accuracy is achieved. In order to increase the measurement speed with fast temperature changes on thermocouples, the device switches into the „Fast Mode“ after 200 ms at the very latest after a gradient of 200 µV/s has been exceeded. Thereafter the cycle time of the thermal voltage measurement is < 80 ms. This means that no wire-break monitoring and no measurement of the cold junction temperature will occur. After the gradient drops below 80 µV/s the device will switch back to „Normal Mode“.

Features
- ATEX, IECEx, FM, UL, TR CU, INMETRO, CCOE
- Installation in zone 2
- Input for Pt100/ Ni100 resistors, thermocouples and millivolt signals in 2, 3 or 4-wire technology
- Suitable for fast temperature changes, starting with a thermal gradient of 200 µV/s
- Parametrized via PC using PACTware™
- Output: 0/4...20 mA
- Complete galvanic isolation
### Technical data

#### Type
- IM34-11EX-CI/K60
- Ident no. 7506636

#### Power supply
- Operating voltage range: 20 … 125 VDC
- Operating voltage range: 20 … 250 VAC
- Frequency: 40 … 70 Hz

#### Inputs
- Input circuits: intrinsically safe acc. to EN 60079, thermocouple, Pt100, Ni 00, mV signals
  - Pt100 (IEC 751), 2, 3 and 4-wire technology
  - Ni100 (DIN 43760), 2, 3 and 4-wire technology
- Probe current ≤ 0.2 mA
- Voltage input: -0.160 … +0.160 VDC

#### Outputs
- Output current: 0/4 … 20 mA
- Switching frequency: ≤ 1 Hz
- Fault current: 0 / 22 mA adjustable
- Output: adjustable output mode

#### Response characteristic
- Reference temperature: 23 °C
- Accuracy current output: ± 5 µA
- Temperature drift analogue output: 0.0025 %/K
- Temperature drift RTD input: ± 3 mΩ/K
- Temperature drift TC input: 3.2 µV / K (of 320 mV)
- Accuracy RTD input: ± 50 mΩ
- Accuracy TC input: ± 15 µV
- Cold junction compensation error:
  - 2-wire < 100 mΩ after line compensation
  - 3-wire < 100 mΩ with asymmetrical wiring
  - 4-wire < 50 mΩ with cold junction compensation < 2 K with IM-3-CJT < 1 K

#### Approvals and declarations
- Ex approval acc. to conformity certificate: TÜV 02 ATEX 1898
- Application area: II 3 G
- Protection type:
  - Max. values: Terminal connection: 1 … 6
  - Max. output voltage Uo: ≤ 5 V
  - Max. output current Io: ≤ 2.5 mA
  - Max. output power Po: ≤ 3 mW
- Characteristic:
  - Internal inductance/capacitance L_i/C_i: negligibly small
- External inductance/capacitance L_e/C_e:

#### Environmental Conditions
- Ambient temperature: -25 … +70 °C
- Storage temperature: -40 … +80 °C
- Test voltage: 2.5 kV

#### Mechanical data
- Tightening torque: 0.5 Nm
- Electrical connection:
  - 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 18 x 104 x 110 mm

#### Approval | Certification
- ATEX, IECEx, UL, cFMus, TR CU, INMETRO, CCOE
The 1-channel Ex-area temperature measuring amplifier IM34-14Ex-CDRI is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs and thermocouples types B, E, J, K, L, N, R, S, T and to output them as temperature-linear current signals 0/4…20 mA. Furthermore, resistors, potentiometers or low voltages can be mapped linearly as current signals in a range between -160…+160 mV.

The device features one output for analog signals 0/4…20 mA and three outputs for limit value relays. The measured value can be viewed on a 2-line display.

The measured value is permanently written to a ring buffer with space for 8000 values. The writing process is stopped with a predefined trigger event, like for example “limit value exceeded”. After that, the stored signal sequence can be read out.

The device can be configured and parametrized via PC (FDT/DTM); the appropriate TURCK-PROG III transmission cable is available from TURCK. A basic scope of parameters can be set via buttons and display on the front or remotely via the current interface and HART®.

Cold junction compensation of thermocouples is either realized via an externally connected Pt100/Ni100 resistor, via temperature measured inside the amplifier or via an individually adjustable constant temperature value.

Features

- ATEX, IECEx, FMApprovals TIIS
- Installation in zone 2
- Monitors over and underrange of analog values and window limits
- Line monitoring
- Parametrized via PC (FDT / DTM), front-panel switch or HART®
- Input for Pt100 / Ni100 resistors, variable resistors, thermocouples and millivolt signals
- Output circuit: 0/4…20 mA
- 3 relay outputs
- Universal operating voltage
- Complete galvanic isolation

Output relay – Load curve

Output relay – Electrical lifetime
Technical data

Type
IM34-14EX-CDRI
Ident no.
7506634

Power supply
Operating voltage range
20...125 VDC
Operating voltage range
20...250 VAC
Frequency
40...70 Hz
Power consumption
≤ 3 W

Inputs
Input circuits
intrinsically safe acc. to EN 60079, thermocouple, Ni100, Pt100, mV signals

Pt100
IEC 751, 2, 3 and 4-wire technology

Ni100
DIN 43760, 2, 3 and 4-wire technology

Probe current
≤ 0.2 mA

Thermocouples
B, E, J, K, N, R, S, T (ITS 90/IEC 584), L (DIN 43710)

Nominal resistance
0...1.5 kΩ

Voltage input
-0.160...+0.160 VDC

Outputs
Load resistance, current output
≤ 0.6 kΩ

Output current
0/4...20 mA

Output circuits (digital)
3 x relays (NO)

Switching frequency
≤ 10 Hz

Relay switching voltage
≤ 250 VAC/120 VDC

Switching current per output
≤ 2 A

Switching capacity per output
≤ 500 VA/60 W

Fault current
0/22 mA adjustable

Contact quality
AgNi, 3µ Au

Output adjustable output mode

Response characteristic
Reference temperature
23 °C

Accuracy current output
± 5 µA

Temperature drift analogue output
0.0025 %/K

Temperature drift RTD input
± 3 mΩ/K

Temperature drift TC input
3.2 µV/K (of 320 mV)

Accuracy RTD input
± 50 mΩ

Accuracy TC input
± 15 µV

Cold junction compensation error
2-wire < 100 mΩ after line compensation
3-wire < 100 mΩ with asymmetrical wiring
4-wire < 50 mΩ
with cold junction compensation < 2 K
with IM-3-CJT < 1 K

Rise time (10-90%)
≤ 1000 ms

Dropout time (90...10%)
≤ 1000 ms

Ex ix IIC IIB
Lc [mH] 10 20
C [µF] 2.9 13

Ex approval acc. to conformity certificate
TÜV 05 ATEX 2889 X

Application area
II 3 G

Protection type
Ex aIa [nL]

Max. values:
Terminal connection: 4...10
Max. output voltage Uo
≤ 5 V

Max. output current Io
≤ 9 mA

Max. output power Po
≤ 11 mW

Characteristic
linear

Internal inductance/capacitance Lc/Cc
Lc = 75 µH, Cc negligibly small

External inductance/capacitance L/C
Ex ia IIC IIB
L [mH] 10 20
C [µF] 4.4 21

Indication
Operational readiness
green

Switching state
yellow

Error indication
red

Environmental Conditions
Ambient temperature
-25...+70 °C

Storage temperature
-40...+80 °C

Relative humidity
≤ 95 %

Test voltage
2.5 kV

Mechanical data

Mechanical data

 Tightening torque
0.5 Nm

Electrical connection
4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection

Terminal cross-section
1 x 2.5 mm² / 2 x 1.5 mm²

Housing material
Polycarbonate/ABS

Mounting instruction
for DIN rail / panel

Protection class
IP20

Flammability class acc. to UL 94
V-0

Dimensions
27 x 104 x 110 mm

Approval / Certification
ATEX, IECEx, cFMus, TIIS
The 1-channel signal isolator IM35-11EX-HI/24VDC is designed to transmit the normalized current signal galvanically isolated 1:1 from the non-Ex area to the Ex-area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Typical applications are for example, the control of I/P converters (at control valves for example) or indicators in the Ex-area.

The actuators are connected to the output terminals 1/2. Handheld terminals [HHT] can be connected to the output and input terminals 7/10.

In addition, the removable terminal blocks are equipped with 2 mm test sockets for signal control.
## Technical data

### Power supply

<table>
<thead>
<tr>
<th>Type</th>
<th>IM35-11EX-HI/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7506516</td>
</tr>
</tbody>
</table>

| Nominal voltage | 24 VDC |
| Operating voltage range | 19…29 VDC |
| Power consumption | ≤ 2.2 W |

### Inputs

| Current input | 0/4…20 mA |
| Input resistance (current) | ≤ 110 Ω |

### Outputs

| Load resistance, current output | ≤ 0.6 kΩ |
| Output current | 0/4…20 mA |

### Response characteristic

| Measuring accuracy | ≤ 0.1 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift | ≤ 0.005 % / K |
| Rise time (10-90%) | ≤ 90 ms |
| Dropout time (90…10%) | ≤ 90 ms |

### Approvals and declarations

- Ex approval acc. to conformity certificate: TÜV 03 ATEX 2311
- Device designation: IIC II (1) G, II (1) D [Ex ia Ga] IIC; [Ex ia Da] IIC
- Max. values:
  - Terminal connection: 1+2
  - Max. output voltage \( U_o \): 15.9 V
  - Max. output current \( I_o \): 60 mA
  - Max. output power \( P_o \): 470 mW
  - Internal resistance \( R_i \): 528 Ω
  - Rated voltage: 250 V
  - Characteristic: Trapezoidal
- Internal inductance/capacitance \( L_i/C_i \):
  - \( L_i \)=negligibly small; \( C_i \)=5nF

### External inductance/capacitance \( L_o/C_o \)

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_o ) [mH]</td>
<td>5 0.5 10 0.5</td>
<td></td>
</tr>
<tr>
<td>( C_o ) [nF]</td>
<td>135 330 860 2200</td>
<td></td>
</tr>
</tbody>
</table>

- Ex approval acc. to conformity certificate: TÜV 06 ATEX 553057 X
- Application area: II 3 G
- Protection type: Ex na [ia Gc] IIC T4 Gc
- Max. values:
  - Terminal connection: 1+2
  - Max. output voltage \( U_o \): 15.9 V
  - Max. output current \( I_o \): 60 mA
  - Max. output power \( P_o \): 470 mW
  - Internal resistance \( R_i \): 528 Ω
  - Characteristic: trapezoidal
- Internal inductance/capacitance \( L_i/C_i \):
  - \( L_i \)=negligibly small; \( C_i \)=5nF

### External inductance/capacitance \( L_o/C_o \)

<table>
<thead>
<tr>
<th>Ex ic</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_o ) [mH]</td>
<td>5 0.5 10 0.5</td>
<td></td>
</tr>
<tr>
<td>( C_o ) [nF]</td>
<td>290 640 1700 3900</td>
<td></td>
</tr>
</tbody>
</table>

### Declaration

- SIL 2 acc. to EXIDA FMEDA

## Indication

- Operational readiness: green

## Environmental Conditions

| Ambient temperature | -25…+70 °C |
| Storage temperature | -40…+80 °C |
| Test voltage | 4.0 kV |
| MTTF | 162 years acc. to SN 29500 (Ed. 99) |

## Mechanical data

- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 3-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Flammability class acc. to UL 94: V-0
- Dimensions: 18 x 110 x 110 mm

## Approval | Certification

- ATEX, IECEx, UL, cFMus, TR CU
Ouput analog signal isolator, 2-channel

The 2-channel signal isolator IM35-22EX-HI/24VDC is designed to transmit the normalized current signal galvanically isolated 1:1 from the non-Ex area to the Ex-area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Typical applications are for example, the control of I/P converters (at control valves for example) or indicators in the Ex-area.

The actuators are connected to the output terminals 1/2 and 4/5. Handheld terminals [HHT] can be connected to the output and input terminals 7/10 and 8/9.

In addition, the removable terminal blocks are equipped with 2 mm test sockets for signal control.

Features
- ATEX, IECEx, UL, CE, FM, IP67, TR CU
- Installation in zone 2
- Intelligent actuators supplied via HART® communication interface
- Input circuits: 0/4…20 mA
- Output circuits: 0/4…20 mA, intrinsically-safe
- SIL2
- Removable terminal blocks, screwable, with 2 mm test socket
- Complete galvanic isolation
Interface technology in modular housing
DIN rail devices, IM series

Technical data

Type
IM35-22EX-HI/24VDC
Ident no.
7506515

Power supply
Nominal voltage
24 VDC
Operating voltage range
19…29 VDC
Power consumption
≤ 2.2 W

Inputs
Current input
0/4…20 mA
Input resistance (current)
≤ 110 Ω

Outputs
Load resistance, current output
≤ 0.6 kΩ
Output current
0/4…20 mA

Response characteristic
Measuring accuracy
≤ 0.1 % of full scale
Reference temperature
23 °C
Temperature drift
≤ 0.005 % / K
Rise time (10-90%)
≤ 90 ms
Dropout time (90…10%)
≤ 90 ms

Approvals and declarations
Ex approval acc. to conformity certificate
TÜV 03 ATEX 2311
Device designation
II (1) G, II (1) D [Ex ia Ga] IIC, [Ex ia Da] IIC
Max. values:
Terminal connection: 1+2 / 4+5
Max. output voltage Uo
≤ 15.9 V
Max. output current Io
≤ 60 mA
Max. output power Po
≤ 470 mW
Internal resistance R0
528 Ω
Rated voltage
250 V
Characteristic
Trapezoidal
Internal inductance/capacitance L0/C0
L0=negligibly small; C0=5nF

External inductance/capacitance L/C

Ex ia
IIC
IIB
L0 [mH] 5 0.5 10 0.5 135 330 860 2200
C0 [nF] 15

Ex ic
IIC
IIB
L0 [mH] 5 0.5 10 0.5 290 640 1700 3900
C0 [nF] 29

Declaration
SIL 2 acc. to EXIDA FMEDA

Indication
Operational readiness green

Environmental Conditions
Ambient temperature
-25…+70 °C
Storage temperature
-40…+80 °C
Test voltage
4.0 kV
MTTF
162 years acc. to SN 29500 (Ed. 99)

Mechanical data
Tightening torque
0.5 Nm
Electrical connection
4 x 3-pin removable terminal blocks with test socket, reverse polarity protected, screw connection

Terminal cross-section
1 x 2.5 mm² / 2 x 1.5 mm²
Housing material
Polycarbonate/ABS
Mounting instruction
for DIN rail / panel
Protection class
IP20
Flammability class acc. to UL 94
V-0
Dimensions
18 x 110 x 110 mm

Approval | Certification
ATEX, IECEx, UL, FM, TR CU
Output analog signal isolator, 1-channel

The 1-channel signal isolator IM35-11EX-HI is designed to transmit the normalized current signal galvanically isolated 1:1 from the non-Ex area to the Ex-area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Typical applications are for example, the control of I/P converters (at control valves for example) or indicators in the Ex-area.

The actuators are connected to the output terminals 1/2. Handheld terminals [HHT] can be connected to the output and input terminals 16/17.

In addition, the removable terminal blocks are equipped with 2 mm test sockets for signal control.

Features

- ATEX, TR CU
- Installation in zone 2
- Intelligent actuators supplied via HART® communication interface
- Input circuit: 0/4...20 mA
- Output circuit: 0/4...20 mA, intrinsically-safe
- Universal operating voltage
- Complete galvanic isolation
## Technical data

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20…125 VDC
- **Operating voltage range**: 20…250 VAC
- **Frequency**: 40…70 Hz
- **Power consumption**: ≤ 2 W

### Inputs
- **Current input**: 0/4…20 mA
- **Input resistance (current)**: ≤ 110 Ω

### Outputs
- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4…20 mA

### Response characteristic
- **Measuring accuracy**: ≤ 0.1 % of full scale
- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time (10-90%)**: ≤ 90 ms
- **Dropout time (90…10%)**: ≤ 90 ms

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: IBExU 08 ATEX 1130
- **Device designation**: II (1) G, II (1) D [Ex ia] IIC/IIB; [Ex ia Da]
- **Max. values: Terminal connection**: 1+2
  - **Max. output voltage** $U_o$: ≤ 15.9 V
  - **Max. output current** $I_o$: ≤ 59.5 mA
  - **Max. output power** $P_o$: ≤ 467 mW
- **Rated voltage**: 250 V
- **Characteristics**: Trapezoidal
- **Internal inductance/capacitance $L_i/C_i$**: $L_i$ negligible, $C_i = 5.2$ nF

### External inductance/capacitance $L_o/C_o$

<table>
<thead>
<tr>
<th>$L_o$ [mH]</th>
<th>$C_o$ [µF]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.135</td>
<td>0.285</td>
</tr>
<tr>
<td>1.1</td>
<td>1.8</td>
</tr>
</tbody>
</table>

### Ex approval acc. to conformity certificate
- **IBEXU 08 ATEX B020 X**

### Application area
- **Ex nA (nL) IIC/JIIB T4 X**

### Protection type
- **Terminal connection**: 1+2
- **Max. output voltage** $U_o$: ≤ 15.9 V
- **Max. output current** $I_o$: ≤ 59.5 mA
- **Max. output power** $P_o$: ≤ 467 mW
- **Internal resistance** $R_i$: 528 Ω
- **Characteristics**: Trapezoidal
- **Internal inductance/capacitance $L_i/C_i$**: $L_i$ negligible, $C_i = 5.2$ nF

### External inductance/capacitance $L_o/C_o$

<table>
<thead>
<tr>
<th>$L_o$ [mH]</th>
<th>$C_o$ [µF]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.285</td>
<td>0.515</td>
</tr>
<tr>
<td>2.1</td>
<td>3.2</td>
</tr>
</tbody>
</table>

### Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 4.0 kV

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 5-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 27 x 110 x 110 mm

### Approval | Certification
- **ATEX, TR CU**

### Indication
- **Operational readiness**: green

### Environmental Conditions

### Mechanical data

### Approval | Certification

### Indication | Operational readiness | green

### Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 4.0 kV

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 5-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 27 x 110 x 110 mm

### Approval | Certification
- **ATEX, TR CU**

### Indication | Operational readiness | green
Output analog signal isolator, 2-channel

The 2-channel signal isolator IM35-22EX-HI is designed to transmit the normalized current signal galvanically isolated 1:1 from the non-Ex area to the Ex-area. Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

Typical applications are for example, the control of I/P converters (at control valves for example) or indicators in the Ex-area.

The actuators are connected to the output terminals 1/2 and 6/7. Handheld terminals [HHT] can be connected to the output and input terminals 16/17 and 11/12.

In addition, the removable terminal blocks are equipped with 2 mm test sockets for signal control.

Features:
- ATEX, TR CU
- Installation in zone 2
- Intelligent actuators supplied via HART® communication interface
- Input circuits: 0/4...20 mA
- Output circuits: 0/4...20 mA, intrinsically-safe
- Universal operating voltage
- Complete galvanic isolation
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM35-22EX-HI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7506518</td>
</tr>
</tbody>
</table>

### Power supply

- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20...125 VDC
- **Operating voltage range**: 20...250 VAC
- **Frequency**: 40...70 Hz
- **Power consumption**: ≤ 2.7 W

### Inputs

- **Current input**: 0/4...20 mA
- **Input resistance (current)**: ≤ 110 Ω

### Outputs

- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4...20 mA

### Response characteristic

- **Measuring accuracy**: ≤ 0.1 % of full scale
- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time (10-90%)**: ≤ 90 ms
- **Dropout time (90...10%)**: ≤ 90 ms

### Approvals and declarations

- **Ex approval acc. to conformity certificate**: IBExU 08 ATEX T130
- **Device designation**: II (1) G, II (1) D [Ex ia] IIC/IIB; [Ex ia Da]
- **Max. values**: Terminal connection: 1+2 / 6+7
- **Max. output voltage U_o**: ≤ 15.9 V
- **Max. output current I_o**: ≤ 59.5 mA
- **Max. output power P_o**: ≤ 467 mW
- **Rated voltage**: 250 V
- **Characteristics**: Trapezoidal
- **Internal inductance/capacitance L_i/C_i**: L_i negligible, C_i = 5.2 nF
- **External inductance/capacitance L_o/C_o**: Ex ia IIC IIB

<table>
<thead>
<tr>
<th>L_i [mH]</th>
<th>C_i [µF]</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0.135</td>
</tr>
<tr>
<td>1</td>
<td>0.285</td>
</tr>
</tbody>
</table>

### Indication

- **Operational readiness**: green

### Environmental Conditions

- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Test voltage**: 4.0 kV

### Mechanical data

- ** Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 5-pin removable terminal blocks with test socket, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction for DIN rail / panel**: Polycarbonate/ABS
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 27 x 110 x 110 mm

### Approval | Certification

- **ATEX, TR CU**

### Approval | Certification

- **ATEX, TR CU**

<table>
<thead>
<tr>
<th>Ex nl</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_i [mH]</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>C_i [µF]</td>
<td>0.285</td>
<td>0.515</td>
</tr>
</tbody>
</table>
The 1-channel potentiometer amplifier IM36-11EX-I/24VDC is designed to transmit signals from 3 or 5-wire potentiometers galvanically isolated from the Ex area to the non-Ex area and to convert them into normalized 0…20 mA analog signals. The resistance value of the wiper contact is collected in a range between 0 Ω and the nominal resistance value (end value) of the potentiometer and converted into a linear value.

A potentiometer is defined by its nominal resistance. Any potentiometer can be connected, provided the nominal resistance is 800…200000 Ω. Common potentiometers featuring a nominal resistance of 1 kΩ or 10 kΩ can thus be used. The admissible line resistance is maximally 50 Ω with a potentiometer resistance of 800 Ω.

**Features**

- ATEX, TR CU
- Transmission of potentiometer signals from the Ex area
- Potentiometer, nominal resistance: 0.8…20 kΩ
- Output circuit: 0…20 mA
- Complete galvanic isolation
# Technical data

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>IM36-11EX-I/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ident no.</strong></td>
<td>7509525</td>
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</table>

## Power supply

<table>
<thead>
<tr>
<th><strong>Nominal voltage</strong></th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating voltage range</strong></td>
<td>19…29 VDC</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>≤ 2 W</td>
</tr>
</tbody>
</table>

## Inputs

<table>
<thead>
<tr>
<th><strong>Input circuits</strong></th>
<th>potentiometer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cable resistance</strong></td>
<td>≤ 50 Ω</td>
</tr>
<tr>
<td><strong>Voltage on resistor</strong></td>
<td>5 VDC</td>
</tr>
<tr>
<td><strong>Nominal resistance</strong></td>
<td>0.8…20 kΩ</td>
</tr>
</tbody>
</table>

## Outputs

| **Output current** | 0…20 mA |

## Response characteristic

| **Measuring accuracy** | ≤ 0.3 % of full scale |

## Approvals and declarations

| **Ex approval acc. to conformity certificate** | TÜV 99 ATEX 1405 |
| **Device designation** | Ex II (1) G [EEx ia] IIC |
| **Max. values:** | Terminal connection: 1…6 |
| **Max. output voltage Uo** | ≤ 13.8 V |
| **Max. output current Io** | ≤ 35 mA |
| **Max. output power Po** | ≤ 121 mW |
| **Rated voltage** | 250 V |
| **Characteristic** | linear |

### External inductance/capacitance \( L_o/C_o \)

<table>
<thead>
<tr>
<th>( EEx\ ia\ IIC )</th>
<th>( EEx\ ia\ IIB )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_o ) (mH)</td>
<td>20.0</td>
</tr>
<tr>
<td>( C_o ) (nF)</td>
<td>760</td>
</tr>
</tbody>
</table>

## Indication

| **Operational readiness** | green |

## Environmental Conditions

| **Ambient temperature** | -25…+60 °C |
| **Storage temperature** | -40…+80 °C |
| **Test voltage** | 2.5 kV |

## Mechanical data

| **Tightening torque** | 0.5 Nm |
| **Electrical connection** | 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection |
| **Terminal cross-section** | 1 x 2.5 mm² / 2 x 1.5 mm² |
| **Housing material** | Polycarbonate/ABS |
| **Mounting instruction** | for DIN rail / panel |
| **Protection class** | IP20 |
| **Flammability class acc. to UL 94** | V-0 |
| **Dimensions** | 18 x 104 x 110 mm |

## Approval | Certification

| ATEX, TR CU |
The 1-channel potentiometer amplifier IM36-11EX-U/24VDC is designed to transmit signals from 3 or 5-wire potentiometers galvanically isolated from the Ex area to the non-Ex area and to convert them into normalized 0…10 V analog signals. The resistance value of the wiper contact is collected in a range between 0 Ω and the nominal resistance value (end value) of the potentiometer and converted into a linear value.

A potentiometer is defined by its nominal resistance. Any potentiometer can be connected, provided the nominal resistance is 800…200000 Ω. Common potentiometers featuring a nominal resistance of 1 kΩ or 10 kΩ can thus be used. The admissible line resistance is maximally 50 Ω with a potentiometer resistance of 800 Ω.
## Technical data

### Type
- IM36-11EX-U/24VDC
- Ident no. 7509526

### Power supply
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>19...29 VDC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 2 W</td>
</tr>
</tbody>
</table>

### Inputs
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input circuits</td>
<td>potentiometer</td>
</tr>
<tr>
<td>Cable resistance</td>
<td>≤ 50 Ω</td>
</tr>
<tr>
<td>Voltage on resistor</td>
<td>5 VDC</td>
</tr>
<tr>
<td>Nominal resistance</td>
<td>0.8...20 kΩ</td>
</tr>
</tbody>
</table>

### Outputs
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output voltage</td>
<td>0...10 V</td>
</tr>
</tbody>
</table>

### Response characteristic
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring accuracy</td>
<td>≤ 0.3 % of full scale</td>
</tr>
</tbody>
</table>

### Approvals and declarations
- Ex approval acc. to conformity certificate: TÜV 99 ATEX 1405
- Device designation: II (1) G EEx ia IIC
- Max. values:
  - Terminal connection: 1...6
  - Max. output voltage U_o ≤ 13.8 V
  - Max. output current I_o ≤ 35 mA
  - Max. output power P_o ≤ 121 mW
- Rated voltage 250 V
- Characteristic linear

### External inductance/capacitance L_o/C_o

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEx ia IIC</td>
<td>20.0 [mH]</td>
</tr>
<tr>
<td>EEx ia IIB</td>
<td>100.0 [mH]</td>
</tr>
</tbody>
</table>

### Indication
- Operational readiness green

### Environmental Conditions
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25...+60 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40...+80 °C</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
</tbody>
</table>

### Mechanical data
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>0.5 Nm</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1 x 2.5 mm² / 2 x 1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail / panel</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class acc. to UL 94</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 104 x 110 mm</td>
</tr>
</tbody>
</table>

### Approval | Certification
- ATEX, TR CU
Potentiometer amplifier, 2-channel

The 2-channel potentiometer amplifier IM36-22EX-U is designed to transmit signals from 3 or 5-wire potentiometers galvanically isolated from the Ex area to the non-Ex area and to convert them into normalized 0…20 mA analog signals. Live-zero operation is activated for both channels through bridging terminals 14 and 15. The resistance value of the wiper contact is collected in a range between 0 Ω and the nominal resistance value (end value) of the potentiometer and converted into a linear value.

A potentiometer is defined by its nominal resistance. Any potentiometer can be connected, provided the nominal resistance is 800…100000 Ω. Common potentiometers featuring a nominal resistance of 1 kΩ or 10 kΩ can thus be used. The admissible line resistance is maximally 50  Ω with a potentiometer resistance of 800 Ω.

The incremental potentiometer’s start and end point can be adjusted separately for each channel. This is necessary to protect the incremental potentiometer from damage which can be caused by critical rotation angles smaller than 5 % and greater than 95 % of the absolute rotational torque.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM36-22EX-I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7509528</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Universal voltage supply unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20…125 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40…70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 2.2 W</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Input circuits</th>
<th>Potentiometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable resistance</td>
<td>≤ 50Ω</td>
</tr>
<tr>
<td>Voltage on resistor</td>
<td>5 VDC</td>
</tr>
<tr>
<td>Nominal resistance</td>
<td>0.8…100 kΩ</td>
</tr>
</tbody>
</table>

### Outputs

| Output current        | 0/4…20 mA                 |

### Response characteristic

| Rise time (10-90%)     | ≤ 35 ms                    |
| Dropout time (90…10%)  | ≤ 40 ms                    |

### Approvals and declarations

| Ex approval acc. to conformity certificate | TÜV 12 ATEX 093477          |
| Ex ia IIC | [Ex ia Ga] IIC | [Ex ia Da] IIC |
| Max. values: | Terminal connection: 1…5 / 6…10 |
| Max. output voltage $U_o$ | ≤ 14.1 V |
| Max. output current $I_o$ | ≤ 40.6 mA |
| Max. output power $P_o$ | ≤ 143 mW |
| Characteristic | Linear |
| Internal inductance/capacitance $L_i/C_i$ | $L_i = 87 \mu H; C_i = 15 n\Phi$ |

### External inductance/capacitance $L_i/C_i$

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_i$ [mH]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>$C_i$ [nF]</td>
<td>425</td>
<td>285</td>
</tr>
<tr>
<td>$L_i$ [mH]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>$C_i$ [nF]</td>
<td>4200</td>
<td>1700</td>
</tr>
</tbody>
</table>

### Environmental Conditions

| Ambient temperature | -25…+70 °C |
| Storage temperature | -40…+80 °C |
| Test voltage        | 2.5 kV     |

### Mechanical data

| Tightening torque | 0.5 Nm |
| Electrical connection | 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection |
| Terminal cross-section | 1 x 2.5 mm² / 2 x 1.5 mm² |
| Housing material | Polycarbonate/ABS |
| Mounting instruction | for DIN rail / panel |
| Protection class | IP20 |
| Flammability class acc. to UL 94 | V-0 |
| Dimensions | 27 x 104 x 110 mm |

### Approval | Certification

| ATEX, IECEx, TR CU |

### Indication

| Operational readiness | green |

---

**Environmental Conditions**

- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Test voltage: 2.5 kV

**Mechanical data**

- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 27 x 104 x 110 mm

**Approval | Certification**

- ATEX, IECEx, TR CU

**Indication**

- Operational readiness: green
The 2-channel potentiometer amplifier IM36-22EX-U is designed to transmit signals from 3 or 5-wire potentiometers galvanically isolated from the Ex area to the non-Ex area and to convert them into normalized 0...10 V analog signals. The resistance value of the wiper contact is collected in a range between 0 Ω and the nominal resistance value (end value) of the potentiometer and converted into a linear value.

A potentiometer is defined by its nominal resistance. Any potentiometer can be connected, provided the nominal resistance is 800...100000 Ω. Common potentiometers featuring a nominal resistance of 1 kΩ or 10 kΩ can thus be used. The admissible line resistance is maximally 50 Ω with a potentiometer resistance of 800 Ω.

The incremental potentiometer's start and end point can be adjusted separately for each channel. This is necessary to protect the incremental potentiometer from damage which can be caused by critical rotation angles smaller than 5 % and greater than 95 % of the absolute rotational torque.

Features

- ATEX, IECEx, TR CU
- Installation in zone 2
- Transmission of potentiometer signals from the Ex area
- Potentiometer, nominal resistance: 0.8...100 kΩ
- Output circuit: 0...10 V
- Complete galvanic isolation

The incremental potentiometer’s start and end point can be adjusted separately for each channel. This is necessary to protect the incremental potentiometer from damage which can be caused by critical rotation angles smaller than 5 % and greater than 95 % of the absolute rotational torque.
Interface technology

Technical data

Type | IM36-22EX-U
Ident no. | 7509530

Power supply
- Nominal voltage: Universal voltage supply unit
- Operating voltage range: 20...125 VDC
- Operating voltage range: 20...250 VAC
- Frequency: 40...70 Hz
- Power consumption: ≤ 2.2 W

Inputs
- Input circuits: potentiometer
- Cable resistance: ≤ 50 Ω
- Voltage on resistor: 5 VDC
- Nominal resistance: 0.8...100 kΩ

Outputs
- Output voltage: 0...10 V

Response characteristic
- Rise time (10-90%): ≤ 35 ms
- Dropout time (90...10%): ≤ 40 ms

Approvals and declarations
- Ex approval acc. to conformity certificate: TÜV 12 ATEX 093477
- Device designation: Ex ia Ga | Ex ia Da | IIIC, II (1) G, II (1) D
- Max. values: Terminal connection: 1...5 / 6...10
- Max. output voltage Uo: ≤ 14.1 V
- Max. output current Io: ≤ 40.6 mA
- Max. output power Po: ≤ 143 mW
- Characteristic: linear
- Internal inductance/capacitance Li/Ci: L = 87 µH; C = 15 nF

External inductance/capacitance Lx/Cx

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lx (mH)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Cx (nF)</td>
<td>425</td>
<td>285</td>
</tr>
<tr>
<td>Ex approval acc. to conformity certificate: TÜV 12 ATEX 093479 X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Application area: II 3 G
Protection type: Ex nA nC (ic Gc) IIC T4 Gc
Max. values: Terminal connection: 1...5 / 6...10
Max. output voltage Ux: ≤ 14.1 V
Max. output current Ix: ≤ 40.6 mA
Max. output power Px: ≤ 143 mW
Characteristic: linear
Internal inductance/capacitance Lx/Cx: L = 87 µH; C = 15 nF

External inductance/capacitance Lx/Cx

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lx (mH)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Cx (nF)</td>
<td>735</td>
<td>515</td>
</tr>
<tr>
<td>Ext</td>
<td>4300</td>
<td>3000</td>
</tr>
</tbody>
</table>

Indication
- Operational readiness: green

Environmental Conditions
- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Test voltage: 2.5 kV

Mechanical data
- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 27 x 104 x 110 mm

Approval | Certification
- ATEX, IECEx, TR CU

Interface technology in modular housing
DIN rail devices, IM series
The IM43-14-SRI 1-channel trip amplifier monitors 0/4…20 mA currents or 0/2…10 V voltages according to over/underrange of limit values.

The three limit values are set via teach buttons at the front.

Additionally 18 V (at max. 35 mA) are provided for transmitters or sensors.

The measured values are transmitted via a galvanically isolated analog output to other devices.

The green LED indicates operational readiness. Three yellow LEDs indicate the switching status of the corresponding output.

The output mode is adjusted via bridges at the terminals 5 to 8.

Live-zero signals are converted into dead-zero through bridging terminals 5/9. In live-zero mode the range between 4…20 mA is monitored. Any state outside this range (< 3.6 mA or > 24 mA) is signalled with an error message. In this case the power LED will illuminate red, the relays drop off and a fault current of > 22 mA is output. If a faulty transmitter causes a short circuit, the relays drop off and a fault current of > 22 mA is output.
## Technical data

### Type
- IM43-14-SRI
- Ident no. 7540043

### Power supply
- Nominal voltage: Universal voltage supply unit
- Operating voltage range: 20...250 VDC
- Operating voltage range: 20...250 VAC
- Frequency: 40...70 Hz
- Power consumption: ≤ 5 W

### Inputs
- Supply voltage: ≥ 17 V / 20 mA
- Current: 35 mA
- Voltage input: 0/2...10 VDC
- Input resistance (voltage): ≥ 50 kΩ
- Current input: 0/4...20 mA
- Input resistance (current): ≤ 50 Ω

### Outputs
- Load resistance, current output: ≤ 0.6 kΩ
- Output current: 0/4...20 mA
- Output circuits (digital): 3 x relays (NO)
- Switching frequency: ≤ 10 Hz
- Relay switching voltage: ≤ 250 VAC/120 VDC
- Switching current per output: ≤ 6 A
- Switching capacity per output: ≤ 1500 VA
- Contact quality: AgNi, 3µ Au

### Response characteristic
- Measuring accuracy: ≤ 0.1 % of full scale
- Reference temperature: 23 °C
- Temperature drift: ≤ 0.00075 % / K

### Indication
- Operational readiness: green
- Switching state: yellow
- Error indication: red

### Environmental Conditions
- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Test voltage: 2.5 kV

### Mechanical data
- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel

### Approval / Certification
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 27 x 104 x 110 mm
- Approval | Certification: cFMus, TR
The IM43-14-RI 1-channel trip amplifier monitors 0/4…20 mA currents or 0/2…10 V voltages according to over/underrange of limit values.

The three limit values are set via the lateral rotary coding switches.

Additionally 18 V (at max. 35 mA) are provided for transmitters or sensors. The measured values are transmitted via a galvanically isolated analog output to other devices.

The green LED indicates operational readiness. Three yellow LEDs indicate the switching status of the corresponding output.

The output mode of the relays and the hysteresis are set via DIP switches.

Live-zero signals are converted into dead-zero signals via DIP switches. In live-zero mode the range between 4…20 mA is monitored. Any state outside this range (< 3.6 mA or > 24 mA) is signalled with an error message. In this case the power LED will illuminate red, the relays drop off and a fault current is output. If a faulty transmitter causes a short circuit, the relays drop off and a fault current is also output. The fault current can be 0 mA or > 22 mA, depending on the DIP switch activated.

### Features
- CFMUS, TR CU
- Monitors 3 limit values at a current or voltage input
- Power supply of 2-wire or 3-wire transmitters/sensors
- Input circuit: 0/4…20 mA; 0/2…10 V
- Output circuit: 0/4…20 mA, 3 independent limit value relays
- Limit value relay adjusted via rotary coding switches
- Hysteresis and relay outputs adjusted via DIP switch
- Universal operating voltage
- Complete galvanic isolation
## Technical data

### Type
- **Type**: IM43-14-RI
- **Ident no.**: 7540042

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20…250 VDC
- **Operating voltage range**: 20…250 VAC
- **Frequency**: 40…70 Hz
- **Power consumption**: ≤ 5 W

### Inputs
- **Supply voltage**: ≥ 17 V / 20 mA
- **Current**: 35 mA
- **Voltage input**: 0/2…10 VDC
- **Input resistance (voltage)**: ≥ 50 kΩ
- **Current input**: 0/4…20 mA
- **Input resistance (current)**: ≤ 50 Ω

### Outputs
- **Load resistance, current output**: ≤ 0.6 kΩ
- **Output current**: 0/4…20 mA
- **Output circuits (digital)**: 3 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 6 A
- **Switching capacity per output**: ≤ 1500 VA
- **Contact quality**: AgNi, 3µ Au
- **Response characteristic**
  - **Measuring accuracy**: ≤ 0.1 % of full scale
  - **Reference temperature**: 23 °C
  - **Temperature drift**: ≤ 0.00075 % / K

### Indication
- **Operational readiness**: green
- **Switching state**: yellow
- **Error indication**: red

### Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 2.5 kV

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 27 x 104 x 110 mm

### Approval / Certification
- **cFMus, TR**
The IM43-13-SR 1-channel trip amplifier monitors 0/4…20 mA currents or 0/2…10 V voltages according to over/underrange of limit values.

The three limit values are set via teach buttons at the front.

Additionally, 18 V (with max. 35 mA) are provided for transmitters or sensors.

The green LED indicates operational readiness. Three yellow LEDs indicate the switching status of the corresponding output.

The output mode is adjusted via bridges at the terminals 5 to 8.
## Technical data

### Type
<table>
<thead>
<tr>
<th>Type</th>
<th>IM43-13-SR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7540041</td>
</tr>
</tbody>
</table>

### Power supply

- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20…250 VDC
- **Operating voltage range**: 20…250 VAC
- **Frequency**: 40…70 Hz
- **Power consumption**: ≤ 5 W

### Inputs

- **Supply voltage**: ≥ 17 V / 20 mA
- **Current**: 35 mA
- **Voltage input**: 0/2…10 VDC
- **Input resistance (voltage)**: ≥ 50 kΩ
- **Current input**: 0/4…20 mA
- **Input resistance (current)**: ≤ 50 Ω

### Outputs

- **Output circuits (digital)**: 3 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 6 A
- **Switching capacity per output**: ≤ 1500 VA
- **Contact quality**: AgNi, 3µ Au

### Response characteristic

- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.00075 % / K

### Indication

- **Operational readiness**: green
- **Switching state**: yellow
- **Error indication**: red

### Environmental Conditions

- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 2.5 kV

### Mechanical data

- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 27 x 104 x 110 mm

### Approval | Certification

<table>
<thead>
<tr>
<th>Approval</th>
<th>FMus, TR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification</td>
<td>TR CU</td>
</tr>
</tbody>
</table>
The IM43-13-R 1-channel trip amplifier monitors 0/4…20 mA currents or 0/2…10 V voltages according to over/underrange of limit values.

The three limit values are set via the lateral rotary coding switches.

Additionally, 18 V (with max. 35 mA) are provided for transmitters or sensors.

The green LED indicates operational readiness. Three yellow LEDs indicate the switching status of the corresponding output.

The output mode of the relays and the hysteresis are set via DIP switches.

Features

- CFMUS, TR CU
- Monitors 3 limit values at a current or voltage input
- Power supply of 2-wire or 3-wire transmitters/sensors
- Input circuit: 0/4…20 mA; 0/2…10 V
- Output circuit: 3 independent limit value relays
- Limit value relay adjusted via rotary coding switches
- Hysteresis and relay outputs adjusted via DIP switch
- Universal operating voltage
- Complete galvanic isolation
## Technical data

### Type
- **Type**: IM43-13-R
- **Ident no.**: 7540040

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 20…250 VDC
- **Operating voltage range**: 20…250 VAC
- **Frequency**: 40…70 Hz
- **Power consumption**: ≤ 5 W

### Inputs
- **Supply voltage**: ≥ 17 V / 20 mA
- **Current**: 35 mA
- **Voltage input**: 0/2…10 VDC
- **Input resistance (voltage)**: ≥ 50 kΩ
- **Current input**: 0/4…20 mA
- **Input resistance (current)**: ≤ 50 Ω

### Outputs
- **Output circuits (digital)**: 3 x relays (NO)
- **Switching frequency**: ≤ 10 Hz
- **Relay switching voltage**: ≤ 250 VAC/120 VDC
- **Switching current per output**: ≤ 6 A
- **Switching capacity per output**: ≤ 1500 VA
- **Contact quality**: AgNi, 3µ Au

### Response characteristic
- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.00075 % / K

### Indication
- **Operational readiness**: green
- **Switching state**: yellow
- **Error indication**: red

### Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 2.5 kV

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 27 x 104 x 110 mm

### Approval | Certification
- cFMus, TR
- CU
The 1-channel trip amplifier IM43-14-CDR is designed to operate 2-wire transducers (III) and to galvanically isolate and transmit the measured signals. Alternatively, active 2-wire transmitters (II) and passive 3-wire transmitters (I) can also be operated.

The three limit values are set via teach buttons at the front.

The device features one output for analog signals 0/4…20 mA and three outputs for limit value relays. The unit of the measured value is freely selectable and indicated on a 2-line display. A green LED indicates operational readiness, 3 yellow LEDs indicate the switching status of the individual channels.

At each of the three outputs a predefined setpoint value can be monitored according to overshoot/undershoot. The switching hysteresis is defined by programming the switch-on and switch-off point. Furthermore, a switch-off delay can be set individually for each output.

The measured value is permanently written to a ring buffer with space for 8000 values. The writing process is stopped with a predefined trigger event, like for example “excess of limit value”. After that, the stored signal sequence can be read out.

The device can be parametrized and configured via PC (FDT/DTM). For this, connect the device to the PC via the 3.5 mm jack on the front (the matching transmission cable IM-PROG III can be ordered separately from TURCK). A basic scope of parameters can be set via buttons and display on the front or remotely via the current interface and HART®.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM43-14-CDRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7540045</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Universal voltage supply unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20 ... 250 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20 ... 250 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>40 ... 70 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 3 W</td>
</tr>
<tr>
<td>Residual ripple</td>
<td>≤ 10 mVss</td>
</tr>
</tbody>
</table>

### Inputs

| Supply voltage | ≥ 17 V / 20 mA |
| Current | 25 mA |
| Voltage input | 0/2 ... 10 VDC |
| Current input | 0/4 ... 20 mA |

### Outputs

| Output current | 0/4 ... 20 mA |
| Output circuits (digital) | 3 x relays (NO) |
| Switching frequency | ≤ 10 Hz |
| Relay switching voltage | ≤ 250 VAC/120 VDC |
| Switching current per output | ≤ 2 A |
| Switching capacity per output | ≤ 500 VA/60 W |
| Fault current | 0 / 22 mA adjustable |
| Contact quality | AgNi, 3µ Au |

### Response characteristic

| Measuring accuracy | ≤ 0.05 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift analogue output | 0.0025 %/K |

### Indication

| Operational readiness | green |
| Switching state | yellow |
| Error indication | red |

### Environmental Conditions

| Ambient temperature | -25 ... +70 °C |
| Storage temperature | -40 ... +80 °C |
| Test voltage | 2.5 kV |

### Mechanical data

| Tightening torque | 0.5 Nm |
| Electrical connection | 4 x 5-pin removable terminal blocks, reverse polarity protected, screw connection |
| Terminal cross-section | 1 x 2.5 mm² / 2 x 1.5 mm² |
| Housing material | Polycarbonate/ABS |
| Mounting instruction | for DIN rail / panel |
| Protection class | IP20 |
| Flammability class acc. to UL 94 | V-0 |
| Dimensions | 27 x 104 x 110 mm |

### Approval | Certification

TR CU
### Solonoid driver, 1-channel

The 1-channel solonoid driver IM72-11EX/L provides intrinsically safe limited power at the output. This enables them to be used directly for supplying loads in the Ex area.

Within the area of applicability of the European directive 94/9/EC (ATEX) it is permitted to operate connected loads in potentially explosive atmospheres caused by dust or gas, provided they comply with the applicable regulations.

Typical applications are the control of Exi pilot valves as well as the supply of displays and transmitters. The output values of the two connections U1 and U2 per channel differ in terms of their no-load voltage and are adapted to the valves of different manufacturers (see output curve on next page).

The loads are actuated by applying the operating voltage.

A yellow LED indicates the switching state of the associated output.

### Features
- ATEX, IECEx, UL, cFMus, TR CU, NEPSI, INMETRO
- Installation in zone 2
- Voltage input max. 30 VDC
- Voltage output 15 VDC resp. 24 VDC
- Output current ≤ 40 mA
- Switching frequency ≤ 500 Hz
- SIL3
- Removable terminal blocks
- Galvanic isolation between input circuits and output circuits
Technical data

**Type**
- IM72-11EX/L
- Ident no.: 7520703

**Power supply**
- Nominal voltage: 24 VDC loop-powered
- Power consumption: ≤ 1.5 W

**Inputs**
- 0-signal: 0...5 VDC
- 1-signal: 19...30 VDC
- Voltage input max.: 30 VDC
- Current input: 45 mA
- Input delay: ≤ 2 ms

**Outputs**
- Output circuits: intrinsically safe acc. to EN 60079
- Output current: 40 mA
- Output voltage U1: 24 V
- Output voltage U2: 15 V
- Output curve:

<table>
<thead>
<tr>
<th>U1 (V)</th>
<th>U2 (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>24</td>
<td>15</td>
</tr>
</tbody>
</table>

**Response characteristic**
- Limit frequency: ≤ 500 Hz

**Approvals and declarations**
- Ex approval acc. to conformity certificate: TÜV 05 ATEX 2846 X
- Device designation: II (1) GD [Ex ia] IIC
- Max. values:
  - Terminal connection: 1+3
  - Max. output voltage Uo: ≤ 27 V
  - Max. output current Io: ≤ 96 mA
  - Max. output power Po: ≤ 678 mW
- Characteristic: Trapezoidal
- Internal inductance/capacitance L/iCi negligibly small

**External inductance/capacitance L/eCi**
- Ex nL IIC IIB
  - L_e [mH]: 0.68, 0.5, 13, 2
  - C_e [nF]: 62, 70, 260, 300
- Ex nL II 3 G
  - L_e [mH]: 1.2, 0.5, 13.0, 2.0
  - C_e [µF]: 0.13, 0.15, 0.47, 1.1

**Environmental Conditions**
- Ambient temperature: -25...+70 °C
- Storage temperature: -40...+80 °C
- Test voltage: 2.5 kV

**Mechanical data**
- Tightening torque: 0.5 Nm
- Electrical connection: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- Terminal cross-section: 1 x 2.5 mm² / 2 x 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail / panel
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 18 x 104 x 110 mm

**Approval / Certification**
- ATEX, IECEx, UL, FM, TR CU, NEPSI, INMETRO
Solonoid driver, 2-channel

The 1-channel solonoid driver IM72-22EX/L provides intrinsically safe limited power at the output. This enables them to be used directly for supplying loads in the Ex area.

Within the area of applicability of the European directive 94/9/EC (ATEX) it is permitted to operate connected loads in potentially explosive atmospheres caused by dust or gas, provided they comply with the applicable regulations.

Typical applications are the control of Ex pilot valves as well as the supply of displays and transmitters. The output values of the two connections U1 and U2 per channel differ in terms of their no-load voltage and are adapted to the valves of different manufacturers (see output curve on next page).

The loads are actuated by applying the operating voltage.

A yellow LED indicates the switching state of the associated output.

Features
- ATEX, IECEx, UL, FM, TR CU, NEPSI, INMETRO
- Installation in zone 2
- Voltage input max. 30 VDC
- Voltage output 15 VDC resp. 24 VDC
- Output current ≤ 40 mA
- Switching frequency ≤ 500 Hz
- SIL3
- Removable terminal blocks
- Galvanic isolation between input and output circuits
Interface technology in modular housing
DIN rail devices, IM series

Technical data

Type
IM72-22EX/L

Ident no.
7520702

Power supply
Nominal voltage
24 V DC loop-powered
Power consumption
≤ 2.2 W

Inputs
0-signal
0…5 V DC
1-signal
19…30 V DC
Voltage input
max. 30 V DC
Current input
45 mA
Input delay
≤ 2 ms

Outputs
Output circuits
intrinsically safe acc. to EN 60079
Output current
40 mA
Output voltage
U1=24 V
Output voltage
U2=15 V
Output curve

Response characteristic
Limit frequency
≤ 500 Hz

Approvals and declarations
Ex approval acc. to conformity certificate
TÜV 05 ATEX 2846 X
Device designation
Ex ia II (1) GD [Ex ia] IIC
Max. values:
Terminal connection: 1+3 / 4+6
Max. output voltage \( U_o \)
≤ 27 V
Max. output current \( I_o \)
≤ 96 mA
Max. output power \( P_o \)
≤ 678 mW
Rated voltage
250 V
Characteristic
Trapezoidal
Internal inductance/capacitance \( L_i/C_i \)
negligibly small

External inductance/capacitance \( L_{ex}/C_{ex} \)

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_i ) [mH]</td>
<td>0.68</td>
<td>13</td>
</tr>
<tr>
<td>( C_i ) [nF]</td>
<td>62</td>
<td>260</td>
</tr>
</tbody>
</table>

Max. values:
Terminal connection: 2+3 / 5+6
Max. output voltage \( U_o \)
≤ 17.6 V
Max. output current \( I_o \)
≤ 96 mA
Max. output power \( P_o \)
≤ 678 mW
Characteristic
Trapezoidal
Internal inductance/capacitance \( L_i/C_i \)
negligibly small

External inductance/capacitance \( L_{ex}/C_{ex} \)

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_i ) [mH]</td>
<td>1.2</td>
<td>13.0</td>
</tr>
<tr>
<td>( C_i ) [µF]</td>
<td>0.13</td>
<td>0.47</td>
</tr>
</tbody>
</table>

Ex approval acc. to conformity certificate
TÜV 06 ATEX 553388 X

Application area
II 3 G
Protection type
Ex na [nl] IIC/IIB T4
Max. values:
Terminal connection: 1+3 / 4+6
Max. output voltage \( U_o \)
≤ 27 V
Max. output current \( I_o \)
≤ 96 mA
Max. output power \( P_o \)
≤ 678 mW
Characteristic
Trapezoidal
Internal inductance/capacitance \( L_i/C_i \)
negligibly small

External inductance/capacitance \( L_{ex}/C_{ex} \)

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_i ) [mH]</td>
<td>0.68</td>
<td>0.5</td>
</tr>
<tr>
<td>( C_i ) [nF]</td>
<td>120</td>
<td>130</td>
</tr>
</tbody>
</table>

Max. values:
Terminal connection: 2+3 / 5+6
Max. output voltage \( U_o \)
≤ 17.6 V
Max. output current \( I_o \)
≤ 96 mA
Max. output power \( P_o \)
≤ 678 mW
Characteristic
Trapezoidal
Internal inductance/capacitance \( L_i/C_i \)
negligibly small

Environmental Conditions

Ambient temperature
-25…+70 °C
Storage temperature
-40…+80 °C
Test voltage
2.5 kV

Mechanical data

Tightening torque
0.5 Nm
Electrical connection
4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
Terminal cross-section
1 x 2.5 mm² / 2 x 1.5 mm²
Housing material
Polycarbonate/ABS
Mounting instruction
for DIN rail / panel
Protection class
IP20
Flammability class acc. to UL 94
V-0
Dimensions
18 x 104 x 110 mm

Approval | Certification
ATEX, IECEx, UL, FM, TR CU, NEPSI, INMETRO

more@turck.com  www.turck.com  Edition I/2014  429
The IM73-12-R/230VAC 1-channel relay coupler is particularly suitable for use as a coupling module for the safe galvanic isolation of binary signals. 2 synchronous controlled relays, each with 1 changeover contact are provided at the output.

If applied in SIL-3 circuits, the following conditions have to be observed:
- If the output relay triggers a contactor directly, the contactor must be equipped with a protective circuitry at the coil connection.
- Both relays have to be connected in series.

Features
- TR CU
- Output circuit: 2 relays each with 1 changeover contact
- 5 A switching current at 250 VAC
- Operating voltage 184…276 VDC
- SIL3
- Galvanic isolation between input circuits and output circuits

- The contact circuit is equipped with a fuse and is activated at 60 % nominal current.
- The status of the relay is indicated via LED on the front.
## Technical data

### Type
- **IM73-12-R/230VAC**
- **Ident no.** 7520511

### Power supply
- **Nominal voltage** 230 VAC
- **Operating voltage range** 184…276 VAC
- **Frequency** 48…62 Hz
- **Power consumption** ≤ 3.5 VA

### Inputs
- **Current input** 15 mA

### Outputs
- **Output circuits (digital)** 2 x relay (change-over)
- **Switching frequency** ≤ 5 Hz
- **Relay switching voltage** ≤ 250 VAC
- **Switching current per output** ≤ 5 A
- **Switching capacity per output** ≤ 2000 VA/180 W
- **Contact quality** AgNi, 3µ Au

### Approvals and declarations
- **Declaration** SIL 3 acc. to EXIDA FMEDA

### Indication
- **Switching state** yellow

### Environmental Conditions
- **Ambient temperature** -25…+70 °C
- **Storage temperature** -40…+80 °C
- **Test voltage** 2.5 kV
- **MTTF** 947 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data
- **Tightening torque** 0.5 Nm
- **Electrical connection** 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section** 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material** Polycarbonate/ABS
- **Mounting instruction** for DIN rail / panel
- **Protection class** IP20
- **Flammability class acc. to UL 94** V-0
- **Dimensions** 18 x 104 x 110 mm

### Approval | Certification
- **TR CU**
Relay coupler, 1-channel

The IM73-12-R/24VUC 1-channel relay coupler is particularly suitable for use as a coupling module for the safe galvanic isolation of binary signals. 2 synchronous controlled relays, each with 1 changeover contact are provided at the output.

If applied in SIL-3 circuits, the following conditions have to be observed:
- If the output relay triggers a contactor directly, the contactor must be equipped with a protective circuitry at the coil connection.
- Both relays have to be connected in series.

Features
- TR CU
- Output circuit: 2 relays each with 1 changeover contact
- 5 A switching current at 250 VAC
- Operating voltage 19…29 VDC
- Removable terminal blocks
- SIL3
- Galvanic isolation between input circuits and output circuits

The contact circuit is equipped with a fuse and is activated at 60 % nominal current.

The status of the relay is indicated via LED on the front.

Load curve

Switching status

Factor nom.
0.1
0.2
0.5
1
2
5
10

AC resistive load
DC resistive load

10 20 50 100 200 500 [V]
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM73-12-R/24VUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7520712</td>
</tr>
</tbody>
</table>

### Power supply

- **Nominal voltage**: 24 VUC
- **Operating voltage range**: 19…29 VDC
- **Operating voltage range**: 19…29 VAC
- **Frequency**: 48…62 Hz
- **Power consumption**: ≤ 0.6 VA

### Inputs

- **Voltage input**: 19…29 VAC/ VDC
- **Current input**: 25 mA

### Outputs

- **Output circuits (digital)**: 2 x relay (change-over)
- **Switching frequency**: ≤ 5 Hz
- **Relay switching voltage**: ≤ 250 VAC
- **Switching current per output**: ≤ 5 A
- **Switching capacity per output**: ≤ 2000 VA/180 W
- **Contact quality**: AgNi, 3µ Au

### Approvals and declarations

- **Declaration**: SIL 3 acc. to EXIDA FMEDA

### Indication

- **Switching state**: yellow

### Environmental Conditions

- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 2.5 kV
- **MTTF**: 963 years acc. to SN 29500 (Ed. 99) 40 °C

### Mechanical data

- **Tightening torque**: 0.5 Nm
- **Electrical connection**: 4 x 3-pin removable terminal blocks, reverse polarity protected, screw connection
- **Terminal cross-section**: 1 x 2.5 mm² / 2 x 1.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail / panel
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 18 x 104 x 110 mm

### Approval | Certification

- **TR CU**
### Relay coupler, 2-channel

The 2-channel relay coupler IM73-22Ex-R/24VUC is used for the switching of intrinsically safe circuits and for galvanically isolating contact and control circuitry according to EN 60079-11.

### Features
- ATEX, TR CU
- Installation in zone 2
- Relay coupler for switching of intrinsically safe and current limited circuits
- High-quality reed relays with rhodium contacts
- Switching frequency up to 50 Hz
- Galvanic isolation between input and output circuits

LEDs on the front indicate the switching status.

With 50 Hz the switching frequency of the reed relay is significantly higher than that of standard relays.

The reed relay with Rhodium contacts are also suitable for general control tasks, especially if normal relays reach their limits in terms of switching frequency and the permissible contact data.
## Technical data

### Type

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>IM73-22Ex-R/24VUC</td>
</tr>
<tr>
<td>Ident no.</td>
<td>7520513</td>
</tr>
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</table>

### Power supply

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>24 VUC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>10...30 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>10...30 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>48...62 Hz</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage input</td>
<td>10...30 VAC/VDC</td>
</tr>
<tr>
<td>Current input</td>
<td>30 mA</td>
</tr>
</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output circuits (digital)</td>
<td>2 x relay (change-over)</td>
</tr>
<tr>
<td>Relay switching voltage</td>
<td>≤ 28 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 240 mA</td>
</tr>
<tr>
<td>Switching capacity per output</td>
<td>≤ 7 W</td>
</tr>
<tr>
<td>Contact quality</td>
<td>AgNi, 3µ Au</td>
</tr>
</tbody>
</table>

### Response characteristic

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit frequency</td>
<td>≤ 50 Hz</td>
</tr>
</tbody>
</table>

### Approvals and declarations

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Ex approval acc. to conformity certificate</td>
<td>BVS 03 ATEX E 335</td>
</tr>
<tr>
<td>Device designation</td>
<td>II (1) G, II (1) D [Ex ia Ga] IIC; [Ex ia Da] IIC</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>250 V</td>
</tr>
<tr>
<td>Max. values:</td>
<td>Terminal connection: 1...3 / 4...6</td>
</tr>
<tr>
<td>Max. input voltage Uj</td>
<td>≤ 28 V</td>
</tr>
<tr>
<td>Max. input current Ij</td>
<td>≤ 240 mA</td>
</tr>
<tr>
<td>Max. input power Pj</td>
<td>≤ 7000 mW</td>
</tr>
<tr>
<td>Internal inductance/capacitance Lj/Cj</td>
<td>negligibly small</td>
</tr>
<tr>
<td>Ex approval acc. to conformity certificate</td>
<td>Turck Ex-06007M X</td>
</tr>
<tr>
<td>Application area</td>
<td>II 3 G</td>
</tr>
<tr>
<td>Protection type</td>
<td>Ex nC [ic Gc] IIC T4 Gc</td>
</tr>
<tr>
<td>Max. values:</td>
<td>Terminal connection: 1...3 / 4...6</td>
</tr>
<tr>
<td>Max. input voltage Uj</td>
<td>≤ 28 V</td>
</tr>
<tr>
<td>Max. input current Ij</td>
<td>≤ 240 mA</td>
</tr>
<tr>
<td>Max. input power Pj</td>
<td>≤ 7000 mW</td>
</tr>
<tr>
<td>Internal inductance/capacitance Lj/Cj</td>
<td>negligibly small</td>
</tr>
</tbody>
</table>

### Indication

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching state</td>
<td>yellow</td>
</tr>
</tbody>
</table>

### Environmental Conditions

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25...+70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40...+80 °C</td>
</tr>
<tr>
<td>Test voltage</td>
<td>1.5 kV</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>0.5 Nm</td>
</tr>
</tbody>
</table>
The IM82-24-2.5 power supply units are designed for DC loads, particularly the switching and monitoring devices of the TURCK IM, IME, IMS and IMC interface module series.

The power supply provides 24 VDC output voltage and 2.5 A output current. The output voltage is adjusted in a range between 24...28 VDC with the potentiometer $V_{\text{out}}$. The device provides safety extra-low voltage (SELV) according to EN 60950.

The power supply can be set to single or parallel operating mode (with decoupling diode).

### Features
- Safety extra-low voltage SELV IEC/EN 60950
- Output voltage adjustable 24...28 VDC
- Nominal current 2.5 A
- Single/parallel operating mode
- Surge protection
- Mains buffering up to 30 ms
- Power-good relay

### Derating

<table>
<thead>
<tr>
<th>$P_{\text{out}}$ [%]</th>
<th>-25</th>
<th>0</th>
<th>50</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T^\circ$C</td>
<td>60</td>
<td>70</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

### Short-circuit behaviour

<table>
<thead>
<tr>
<th>$U_{\text{out}}$ [%]</th>
<th>0</th>
<th>50</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t$ [s]</td>
<td>0</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
</tbody>
</table>

### Parallel operation

Parallel operation diagram showing the connections for parallel operation.
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM82-24-2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7545041</td>
</tr>
</tbody>
</table>

### Power supply
- **Nominal voltage**: Universal voltage supply unit
- **Operating voltage range**: 90…370 VDC
- **Operating voltage range**: 85…264 VAC
- **Frequency**: 47…63 Hz
- **Power consumption**: ≤ 83 VA
- **Efficiency**: 89 %
- **Internal fuse**: T 2 A / 250 VAC
- **Inrush current**: Ui = 115 VAC, 20 A; Ui = 230 VAC, 40 A
- **Mains buffering**: Ui = 115 VAC, 20 ms; Ui = 230 VAC, 30 ms

### Outputs
- **Nominal output voltage**: 24 V
- **Nominal current**: 2.5 A
- **Output circuits (digital)**: 1 x transistor (potential-free, short-circuit proof), > 18.8…19.6 V
- **Switching voltage**: ≤ 24 VDC
- **Switching current per output**: ≤ 35 mA
- **Surge limiting**: 125-138 %
- **Overload protection**: 110-150 %
- **Parallel mode**: yes, via diodes
- **Pollution degree**: 2
- **Surge category**: II
- **Short-circuit behaviour**: Hiccup mode

### Response characteristic
- **Limit frequency**: ≤ 80000 Hz

### Indication
- **Operational readiness**: green

### Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -25…+85 °C
- **Relative humidity**: ≤ 95 %
- **Derating**: -2.5%/°C from 60 °C
- **Test voltage**: 3.0 kV

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: screw terminals
- **Terminal cross-section**: 0.2 … 2.0 mm²
- **Housing material**: plastic
- **Mounting instruction**: for DIN rail
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 40.5 x 90 x 114 mm
The IM82-24-5.0 power supply units are designed for DC loads, particularly the switching and monitoring devices of the TURCK IM, IME, IMS and IMC interface module series. The power supply provides 24 VDC output voltage and 5.0 A output current. The output voltage is adjusted in a range between 22.5…28.5 VDC with the potentiometer $V_{\text{out}}$. The device provides safety extra-low voltage (SELV) according to EN 60950.

The power supply can be set to single or parallel operating mode.

---

**Features**

- UL Class 1, Div 2
- Safety extra-low voltage SELV IEC/EN 60950
- SEMI-F47
- Output voltage adjustable 22.5…28.5 VDC
- Nominal current 5 A
- Single/parallel operating mode
- Surge protection
- Removable terminals
- Mains buffering up to 30 ms
- Power-good relay

---

**Parallel operation**

**Derating**

**Short-circuit behaviour**

**Features**

- UL Class 1, Div 2
- Safety extra-low voltage SELV IEC/EN 60950
- SEMI-F47
- Output voltage adjustable 22.5…28.5 VDC
- Nominal current 5 A
- Single/parallel operating mode
- Surge protection
- Removable terminals
- Mains buffering up to 30 ms
- Power-good relay

---

**Features**

- UL Class 1, Div 2
- Safety extra-low voltage SELV IEC/EN 60950
- SEMI-F47
- Output voltage adjustable 22.5…28.5 VDC
- Nominal current 5 A
- Single/parallel operating mode
- Surge protection
- Removable terminals
- Mains buffering up to 30 ms
- Power-good relay

---

**Features**

- UL Class 1, Div 2
- Safety extra-low voltage SELV IEC/EN 60950
- SEMI-F47
- Output voltage adjustable 22.5…28.5 VDC
- Nominal current 5 A
- Single/parallel operating mode
- Surge protection
- Removable terminals
- Mains buffering up to 30 ms
- Power-good relay

---

**Features**

- UL Class 1, Div 2
- Safety extra-low voltage SELV IEC/EN 60950
- SEMI-F47
- Output voltage adjustable 22.5…28.5 VDC
- Nominal current 5 A
- Single/parallel operating mode
- Surge protection
- Removable terminals
- Mains buffering up to 30 ms
- Power-good relay

---

**Features**

- UL Class 1, Div 2
- Safety extra-low voltage SELV IEC/EN 60950
- SEMI-F47
- Output voltage adjustable 22.5…28.5 VDC
- Nominal current 5 A
- Single/parallel operating mode
- Surge protection
- Removable terminals
- Mains buffering up to 30 ms
- Power-good relay

---

**Features**

- UL Class 1, Div 2
- Safety extra-low voltage SELV IEC/EN 60950
- SEMI-F47
- Output voltage adjustable 22.5…28.5 VDC
- Nominal current 5 A
- Single/parallel operating mode
- Surge protection
- Removable terminals
- Mains buffering up to 30 ms
- Power-good relay
## Technical data

### Power supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>Universal voltage supply unit</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>210 ... 370 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>90 ... 132 VAC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>186 ... 264 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>47 ... 73 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 145 VA</td>
</tr>
<tr>
<td>PFC</td>
<td>0.7</td>
</tr>
<tr>
<td>Efficiency</td>
<td>86 %</td>
</tr>
<tr>
<td>Internal fuse</td>
<td>T 3.15 A / 250 VAC</td>
</tr>
<tr>
<td>Inrush current</td>
<td>Ui = 115 VAC, 24 A; Ui = 230 VAC, 48 A</td>
</tr>
<tr>
<td>Mains buffering</td>
<td>Ui = 115 VAC, 25 ms; Ui = 230 VAC, 30 ms</td>
</tr>
</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal output voltage</td>
<td>24 V</td>
</tr>
<tr>
<td>Nominal current</td>
<td>5 A</td>
</tr>
<tr>
<td>Output circuits (digital)</td>
<td>relay (NO), &gt; 17.6 ... 19.4 V</td>
</tr>
<tr>
<td>Relay switching voltage</td>
<td>≤ 60 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 300 mA</td>
</tr>
<tr>
<td>Surge limiting</td>
<td>125-145 %</td>
</tr>
<tr>
<td>Overload protection</td>
<td>105-145 %</td>
</tr>
<tr>
<td>Parallel mode</td>
<td>yes, switchover initiated by a switch, max. 3 devices each with 90 % load current</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2</td>
</tr>
<tr>
<td>Surge category</td>
<td>II</td>
</tr>
<tr>
<td>Short-circuit behaviour</td>
<td>Current limiting</td>
</tr>
</tbody>
</table>

### Response characteristic

- Limit frequency: ≤ 80000 Hz

### Indication

- Operational readiness: green
- Error indication: red

### Environmental Conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25 ... +70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25 ... +85 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 %</td>
</tr>
<tr>
<td>Derating</td>
<td>-2.5%/°C from 60 °C</td>
</tr>
<tr>
<td>Test voltage</td>
<td>3.0 kV</td>
</tr>
</tbody>
</table>

### Mechanical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>0.5 Nm</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>screw terminals</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>0.2 ... 2.0 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>metal</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail</td>
</tr>
</tbody>
</table>
The IM82-24-10 power supply units are designed for DC loads, particularly the switching and monitoring devices of the TURCK IM, IME, IMS and IMC interface module series. The power supply provides 24 VDC output voltage and 10 A output current. The output voltage is adjusted in a range between 22.5…28.5 VDC with the potentiometer $V_{\text{out}}$. The device provides safety extra-low voltage (SELV) according to EN 60950.

The power supply can be set to single or parallel operating mode.

### Derating

<table>
<thead>
<tr>
<th>$P_{\text{out}}$ [%]</th>
<th>100</th>
<th>75</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T$ [°C]</td>
<td>-25</td>
<td>60</td>
<td>70</td>
</tr>
</tbody>
</table>

### Short-circuit behaviour

- $U_{\text{out}}$ [%] at $115$ VAC
- $U_{\text{out}}$ [%] at $230$ VAC

### Parallel operation

- $-V_O$ and $+V_O$
- $Rdy$ and $Rdy$

### Features

- UL Class 1, Div 2
- Safety extra-low voltage SELV IEC/EN 60950
- SEMI-F47
- Output voltage adjustable 22.5…28.5 VDC
- Nominal current 10 A
- Single/parallel operating mode
- Surge protection
- Mains buffering up to 30 ms
- Power-good relay
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IM82-24-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7545043</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Universal voltage supply unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>210…370 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>90…132 VAC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>186…264 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>47…73 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 276 VA</td>
</tr>
<tr>
<td>PFC</td>
<td>0.7</td>
</tr>
<tr>
<td>Efficiency</td>
<td>89 %</td>
</tr>
<tr>
<td>Internal fuse</td>
<td>T 6.3 A / 250 VAC</td>
</tr>
<tr>
<td>Inrush current</td>
<td>Ui = 115 VAC, 30 A; Ui = 230 VAC, 60 A</td>
</tr>
<tr>
<td>Mains buffering</td>
<td>Ui = 115 VAC, 25 ms; Ui = 230 VAC, 30 ms</td>
</tr>
</tbody>
</table>

### Outputs

| Nominal output voltage | 24 V |
| Nominal current | 10 A |
| Output circuits (digital) | relay (NO), > 17.6 … 19.4 V |
| Relay switching voltage | ≤ 60 VDC |
| Switching current per output | ≤ 300 mA |
| Surge limiting | 120-145 % |
| Overload protection | 110-150 % |
| Parallel mode | yes, switchover initiated by a switch, max. 3 devices each with 90 % load current |
| Pollution degree | 2 |
| Surge category | II |
| Short-circuit behaviour | Current limiting |

### Response characteristic

| Limit frequency | ≤ 40000 Hz |

### Indication

| Operational readiness | green |
| Error indication | red |

### Environmental Conditions

| Ambient temperature | -25…+70 °C |
| Storage temperature | -25…+85 °C |
| Relative humidity | ≤ 95 % |
| Derating | -2.5%/°C from 60 °C |
| Test voltage | 3.0 kV |

### Mechanical data

| Tightening torque | 0.5 Nm |
| Electrical connection | screw terminals |
| Terminal cross-section | 0.2 … 2.0 mm² |
| Housing material | metal |

### Approval | Certification

| cULus | UL 94 V-0 |
The IM82-24-20 power supply units are designed for DC loads, particularly the switching and monitoring devices of the TURCK IM, IME, IMS and IMC interface module series.

The power supply provides 24 VDC output voltage and 20 A output current. The output voltage is adjusted in a range between 22.5...28.5 VDC with the potentiometer $V_{out}$. The device provides safety extra-low voltage (SELV) according to EN 60950.

The power supply can be set to single or parallel operating mode.
# Technical data

**Type**
- IM82-24-20
- Ident no. 7545044

**Power supply**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>Universal voltage supply unit</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>120…370 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>90…264 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>47…63 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 564 VA</td>
</tr>
<tr>
<td>PFC</td>
<td>0.99</td>
</tr>
<tr>
<td>Efficiency</td>
<td>89 %</td>
</tr>
<tr>
<td>Internal fuse</td>
<td>T 10 A / 250 VAC</td>
</tr>
<tr>
<td>Inrush current</td>
<td>Ui = 115 VAC, 25 A; Ui = 230 VAC, 50 A</td>
</tr>
<tr>
<td>Mains buffering</td>
<td>Ui = 115 VAC, 30 ms; Ui = 230 VAC, 30 ms</td>
</tr>
</tbody>
</table>

**Outputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal output voltage</td>
<td>24 V</td>
</tr>
<tr>
<td>Nominal current</td>
<td>20 A</td>
</tr>
<tr>
<td>Output circuits (digital)</td>
<td>relay (NO), &gt; 17.6 … 19.4 V</td>
</tr>
<tr>
<td>Relay switching voltage</td>
<td>≤ 60 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 300 mA</td>
</tr>
<tr>
<td>Surge limiting</td>
<td>125–137 %</td>
</tr>
<tr>
<td>Overload protection</td>
<td>120–140 %</td>
</tr>
<tr>
<td>Parallel mode</td>
<td>yes, switchover initiated by a switch, max. 3 devices each with 90 % load current</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2</td>
</tr>
<tr>
<td>Surge category</td>
<td>II</td>
</tr>
<tr>
<td>Short-circuit behaviour</td>
<td>Current limiting</td>
</tr>
</tbody>
</table>

**Response characteristic**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit frequency</td>
<td>≤ 60000 Hz</td>
</tr>
</tbody>
</table>

**Indication**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational readiness</td>
<td>green</td>
</tr>
<tr>
<td>Error indication</td>
<td>red</td>
</tr>
</tbody>
</table>

**Environmental Conditions**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25…+70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25…+85 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95 %</td>
</tr>
<tr>
<td>Derating</td>
<td>4%/°C from 61 °C</td>
</tr>
<tr>
<td>Test voltage</td>
<td>3.0 kV</td>
</tr>
</tbody>
</table>

**Mechanical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>0.6 Nm</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>screw terminals</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>0.2 … 6.0 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>metal</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail</td>
</tr>
</tbody>
</table>

**Protection class**
- IP20

**Flammability class acc. to UL 94**
- V-0

**Dimensions**
- 175.5 x 124.5 x 116.6 mm
Interface Technology in Modular Housing
DIN rail mounted devices of the IME series

Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IME-Di-22EX-T/24VDC is equipped with intrinsically safe input circuits. Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits each feature a potential-free transistor output. You can toggle between working or closed current, resp. NO or NC mode via a wire jumper.

When using mechanical contacts, the contacts must be wired with resistors (II) because of wire-break and short-circuit monitoring (see circuit diagram). For this, use the resistor module WM1, ident no. 0912101.

The Pwr LED lights green to indicate operational readiness.

The 2-color LEDs 1 and 2 light yellow to indicate the switching status of the associated output. In the event of an input circuit error, the 2-color LED associated to the affected input turns red. Thereupon the associated output transistor is blocked.

Features
- ATEX, IECEx, TR CU, NEPSI
- Installation in zone 2
- Isolating switching amplifier, 2-channel
- Transistor outputs
- Input circuit monitoring of wire-break/short-circuit
- Galvanic isolation of input circuits, output circuits and supply voltage
Technical data

**Type**
IME-DI-22EX-T/24VDC

**Ident no.**
7541197

**Power supply**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20…30 VDC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 1.5 W</td>
</tr>
</tbody>
</table>

**Inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-load voltage</td>
<td>8.2 VDC</td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>8.2 mA</td>
</tr>
<tr>
<td>Input resistance</td>
<td>1 kΩ</td>
</tr>
<tr>
<td>Cable resistance</td>
<td>≤ 50 Ω</td>
</tr>
<tr>
<td>Switch-on threshold</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Switch-off threshold</td>
<td>1.75 mA</td>
</tr>
<tr>
<td>Short-circuit threshold</td>
<td>≥ 6 mA</td>
</tr>
<tr>
<td>Wire breakage threshold</td>
<td>≤ 0.1 mA</td>
</tr>
</tbody>
</table>

**Outputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output circuits (digital)</td>
<td>2 x transistor</td>
</tr>
<tr>
<td>Switching voltage</td>
<td>≤ 30 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 100 mA</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 3000 Hz</td>
</tr>
<tr>
<td>Voltage drop</td>
<td>≤ 2.5 V</td>
</tr>
</tbody>
</table>

**Approvals and declarations**

| Ex approval acc. to conformity certificate | TÜV 07 ATEX 553234 |
| Device designation               | Ex ia II (I) GD [Ex ia] IIC/IIB |
| Max. values:                     | Terminal connection: 3+4 / 5+6 |
| Max. output voltage Uo           | ≤ 9.6 V               |
| Max. output current Io           | ≤ 10 mA               |
| Max. output power Po             | ≤ 24 mW               |
| Rated voltage                    | 250 V                 |
| Characteristic                   | Linear                |
| Internal inductance/capacitance L/C | L_i = 150 µH, C_i = negligibly small |

**External inductance/capacitance L/C**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_i [mH]</td>
<td>10</td>
<td>0.85</td>
</tr>
<tr>
<td>C_i [µF]</td>
<td>0.75</td>
<td>1.1</td>
</tr>
</tbody>
</table>

| Max. output voltage Uo | ≤ 9.6 V |
| Max. output current Io | ≤ 10 mA  |
| Max. output power Po  | ≤ 24 mW  |
| Characteristic        | Linear  |
| Internal inductance/capacitance L/C | L_i = 150 µH, C_i = negligibly small |

**External inductance/capacitance L/C**

<table>
<thead>
<tr>
<th>Ex nl</th>
<th>IIC</th>
<th>IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_i [mH]</td>
<td>5</td>
<td>0.85</td>
</tr>
<tr>
<td>C_i [µF]</td>
<td>1.4</td>
<td>1.9</td>
</tr>
</tbody>
</table>

| Ex approval acc. to conformity certificate | TÜV 07 ATEX 554299 X |
| Application area | II 3 G |
| Protection type   | Ex nA nC (nl) IIC/IIB T4 |
| Max. values:      | Terminal connection: 3+4 / 5+6 |
| Max.output voltage Uo | ≤ 9.6 V |

**Mechanical data**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical connection</td>
<td>Spring terminal made of Beryllium-Bronze</td>
</tr>
<tr>
<td>Terminal cross-section</td>
<td>1.5 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polycarbonate/ABS</td>
</tr>
<tr>
<td>Mounting instruction</td>
<td>for DIN rail</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class</td>
<td>V-0</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 x 112 x 110 mm</td>
</tr>
</tbody>
</table>

**Environmental Conditions**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25…+70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40…+80 °C</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
<tr>
<td>MTTF</td>
<td>407 years acc. to SN 29500 (Ed. 99)</td>
</tr>
</tbody>
</table>

**Approvals**

| Certification | ATEX, IECEx, TR CU, NEPSI |

**Indication**

| Operational readiness | green |
| Switching state       | yellow |
| Error indication      | red   |

**Declaration**

SIL 2 acc. to EXIDA FMEDA
Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IME-Di-22EX-R/24VDC is equipped with intrinsically safe input circuits. Sensors according to EN 60947-5-6 (NAMUR) or potential-free contact transmitters can be connected to the device.

The output circuits each feature a relay with NO contact. You can toggle between working or closed current, resp. NO or NC mode for both channels via a wire jumper.

When using mechanical contacts, the contacts must be wired with resistors (II) because of wire-break and short-circuit monitoring (see circuit diagram). For this, use the resistor module WM1, ident no. 092101.

The Pwr LED lights green to indicate operational readiness.

The 2-color LEDs 1 and 2 light yellow to indicate the switching status of the associated output. In the event of an input circuit error, the 2-color LED associated to the affected input turns red, provided the input circuit monitoring function is activated. Thereupon the output relay drops out.

Features

- ATEX, IECEx, TR CU, NEPSI
- Installation in zone 2
- Isolating switching amplifier, 2-channel
- Relay output
- Input circuit monitoring of wire-break/short-circuit
- Galvanic isolation of input circuits, output circuits and supply voltage
## Technical data

**Type**
IME-DI-22Ex-R/24VDC

**Ident no.**
7541191

### Power supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>20...30 VDC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 1.7 W</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-load voltage</td>
<td>8.2 VDC</td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>8.2 mA</td>
</tr>
<tr>
<td>Input resistance</td>
<td>1 kΩ</td>
</tr>
<tr>
<td>Cable resistance</td>
<td>≤ 50 Ω</td>
</tr>
<tr>
<td>Switch-on threshold</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Switch-off threshold</td>
<td>1.75 mA</td>
</tr>
<tr>
<td>Short-circuit threshold</td>
<td>≥ 6 mA</td>
</tr>
<tr>
<td>Wire breakage threshold</td>
<td>≤ 0.1 mA</td>
</tr>
</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output circuits (digital)</td>
<td>2 x relays (NO)</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 10 Hz</td>
</tr>
<tr>
<td>Relay switching voltage</td>
<td>≤ 250 VAC/120 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 2 A</td>
</tr>
<tr>
<td>Switching capacity per output</td>
<td>≤ 500 VA/60 W</td>
</tr>
<tr>
<td>Contact quality</td>
<td>AgNi, 3µ Au</td>
</tr>
</tbody>
</table>

### Approvals and declarations

- Ex approval acc. to conformity certificate: TÜV 07 ATEX 553234
- Device designation: II (1) GD [Ex ia] IIC/IIB
- Max. values:
  - Max. output voltage $U_o$: ≤ 9.6 V
  - Max. output current $I_o$: ≤ 10 mA
  - Max. output power $P_o$: ≤ 24 mW
- Rated voltage: 250 V
- Characteristic: linear
- Internal inductance/capacitance $L/C$: $L = 150 \mu$H, $C = $ negligibly small

### External inductance/capacitance $L/C$

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L$ [mH]</td>
<td>10</td>
<td>0.85</td>
</tr>
<tr>
<td>$C$ [µF]</td>
<td>0.75</td>
<td>1.1</td>
</tr>
</tbody>
</table>

### Environmental Conditions

- Ambient temperature: -25…+70 °C
- Storage temperature: -40…+80 °C
- Test voltage: 2.5 kV
- MTTF: 235 years acc. to SN 29500 (Ed. 99)

### Mechanical data

- Electrical connection: Spring terminal made of Beryllium-Bronze
- Terminal cross-section: 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 18 x 112 x 110 mm

### Approval / Certification

- ATEX, IECEx, TR CU, NEPSI

---

**Max. output voltage $U_o$:** ≤ 9.6 V
**Max. output current $I_o$:** ≤ 10 mA
**Max. output power $P_o$:** ≤ 24 mW
**Characteristics:** linear
**Internal inductance/capacitance $L/C$:** $L = 150 \mu$H, $C = $ negligibly small

### External inductance/capacitance $L/C$

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L$ [mH]</td>
<td>5</td>
<td>0.85</td>
</tr>
<tr>
<td>$C$ [µF]</td>
<td>1.4</td>
<td>1.9</td>
</tr>
</tbody>
</table>

### Declaration

- SIL 2 acc. to EXIDA FMEDA

### Indication

- Operational readiness: green
- Switching state: yellow
- Error indication: red

### Approvals and declaration certificate

- TÜV 07 ATEX 553299 X
- Application area: II 3 G
- Protection type: Ex na nC [nL] IIC/IIB T4
- Max. values:
  - Terminal connection: 3+4 / 5+6
Interface Technology in Modular Housing
DIN rail mounted devices of the IME series

Input analog signal isolator, 1-channel

Standard active current signals are galvanically isolated and transmitted via the 1-channel analog signal isolator IME-AI-11EX-i/L from the Ex area to the non-Ex area.

The device features one input circuit 0/4…20 mA and one short-circuit proof output circuit 0/4…20 mA.

Input and output circuit are safely galvanically isolated. The input signals are transmitted 1:1 and are presented to the relevant outputs in the non-Ex area.

The device is loop-powered and HART® transmissible.

Features
- ATEX, IECEx, TR CU, NEPSI
- Installation in zone 2
- HART® transmissible
- Complete galvanic isolation
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IME-AI-11Ex-Hi/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7541192</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>24 VDC loop-powered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>≤ 0.75 W</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Voltage input</th>
<th>max. 30 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current input</td>
<td>0…20 mA</td>
</tr>
<tr>
<td>Control circuits</td>
<td>Current limiting 42 mA</td>
</tr>
</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Load resistance, current output</th>
<th>≤ 0.4 kΩ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output current</td>
<td>0…20 mA</td>
</tr>
<tr>
<td>Output voltage</td>
<td>max. 13 V</td>
</tr>
</tbody>
</table>

### Response characteristic

| Measuring accuracy             | ≤ 0.1 % of full scale |
| Reference temperature          | 23 °C                |
| Temperature drift              | ≤ 0.001 % / K        |
| Rise time (10-90%)             | ≤ 10 ms              |
| Dropout time (90…10%)          | ≤ 10 ms              |

### Approvals and declarations

<table>
<thead>
<tr>
<th>Ex approval acc. to conformity certificate</th>
<th>TÜV 08 ATEX 553236</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device designation</td>
<td>Ex (1) G, II (1) D [Ex ia] IIIB/IIC; [Ex iaD]</td>
</tr>
<tr>
<td>Max. values:</td>
<td>Terminal connection: 3+4</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>250 V</td>
</tr>
<tr>
<td>Max. input voltage U_i</td>
<td>≤ 27 V</td>
</tr>
<tr>
<td>Max. input current I_i</td>
<td>≤ 150 mA</td>
</tr>
<tr>
<td>Max. input power P_i</td>
<td>≤ 1000 mW</td>
</tr>
<tr>
<td>Internal inductance/capacitance L_i/C</td>
<td>negligibly small</td>
</tr>
<tr>
<td>Ex approval acc. to conformity certificate</td>
<td>TÜV 08 ATEX 554624 X</td>
</tr>
<tr>
<td>Application area</td>
<td>II 3 G</td>
</tr>
<tr>
<td>Protection type</td>
<td>Ex ra (nL) IIIC/IIB T4</td>
</tr>
<tr>
<td>Max. values:</td>
<td>Terminal connection: 3+4</td>
</tr>
<tr>
<td>Max. input voltage U_i</td>
<td>≤ 27 V</td>
</tr>
<tr>
<td>Max. input current I_i</td>
<td>≤ 150 mA</td>
</tr>
<tr>
<td>Max. input power P_i</td>
<td>≤ 1000 mW</td>
</tr>
<tr>
<td>Internal inductance/capacitance L_i/C</td>
<td>negligibly small</td>
</tr>
<tr>
<td>Declaration</td>
<td>SIL 2 acc. to EXIDA FMEDA</td>
</tr>
</tbody>
</table>

### Environmental Conditions

| Ambient temperature                   | -25…+70 °C         |
| Storage temperature                   | -40…+80 °C         |
| Test voltage                          | 2.5 kV              |
| MTTF                                  | 537 years acc. to SN 29500 (Ed. 99) 40 °C |

### Mechanical data

<table>
<thead>
<tr>
<th>Electrical connection</th>
<th>Spring terminal made of Beryllium-Bronze</th>
</tr>
</thead>
</table>

| Terminal cross-section                | 1.5 mm² |
| Housing material                      | Polycarbonate/ABS |
| Mounting instruction                  | for DIN rail |
| Protection class                      | IP20 |
| Flammability class acc. to UL 94      | V-0 |
| Dimensions                            | 18 x 112 x 110 mm |

<table>
<thead>
<tr>
<th>Approval</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX, IECEx, TR CU, NEPSI</td>
<td></td>
</tr>
</tbody>
</table>
Input analog signal isolator, 1-channel

Standard active current signals are galvanically isolated and transmitted via the 1-channel analog signal isolator IME-AL-11EX-HI/24VDC from the Ex area to the non-Ex area.

Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

The device features one input and one output circuit, each with 0/4...20 mA. A green LED indicates operational readiness.

Input and output circuit are safely galvanically isolated. The input signal is transmitted 1:1 and is presented to the relevant output in the non-Ex area. As a result of the 1:1 transmission behaviour, wire-break and short circuit are output as currents of 0 mA or > 22.5 mA in the measuring transducer circuit.

Features
- ATEX, IECEx, TR CU, NEPSI
- Installation in zone 2
- HART® transmissible
- Complete galvanic isolation
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IME-AI-11Ex-Hi/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7541198</td>
</tr>
</tbody>
</table>

### Power supply

| Nominal voltage | 24 VDC |
| Operating voltage range | 20…30 VDC |
| Power consumption | ≤ 0.75 W |

### Inputs

| Current input | 0/4…20 mA |
| Control circuits | Current limiting 42 mA |

### Outputs

| Load resistance, current output | ≤ 0.7 kΩ |
| Output current | 0/4…20 mA |
| Wire break monitoring | ≤ 1 mA |
| Short circuit monitoring | ≥ 22.5 mA |

### Response characteristic

| Measuring accuracy | ≤ 0.1 % of full scale |
| Temperature drift | ≤ 0.001 % / K |
| Rise time (10-90%) | ≤ 10 ms |
| Dropout time (90…10%) | ≤ 10 ms |

### Approvals and declarations

- Ex approval acc. to conformity certificate: TÜV 10 ATEX 555275
- Device designation: II (1) G, II (1) D [Ex ia IIB/IIC; [Ex ia Da]
- Max. values: Terminal connection: 3+4
- Rated voltage: 250 V
- Max. input voltage $U_i$: ≤ 27 V
- Max. input current $I_i$: ≤ 150 mA
- Max. input power $P_i$: ≤ 1000 mW
- Internal inductance/capacitance $L_i/C_i$: negligibly small
- Ex approval acc. to conformity certificate: TÜV 10 ATEX 555276 X
- Application area: II 3 G
- Protection type: Ex nA [nL] IIC/IIB T4
- Max. values: Terminal connection: 3+4
- Max. input voltage $U_i$: ≤ 27 V
- Max. input current $I_i$: ≤ 150 mA
- Max. input power $P_i$: ≤ 1000 mW
- Internal inductance/capacitance $L_i/C_i$: negligibly small
- Declaration: SIL 2 acc. to EXIDA FMEDA

### Mechanical data

- Electrical connection: Spring terminal made of Beryllium-Bronze
- Terminal cross-section: 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 18 x 112 x 110 mm

### Approval | Certification

- ATEX, IECEx, TR CU, NEPSI

## Indication

- Operational readiness: green

## Environmental Conditions

| Ambient temperature | -25…+70 °C |
| Storage temperature | -40…+80 °C |
| Test voltage | 2.5 kV |
| MTTF | 435 years acc. to SN 29500 (Ed. 99) |
| | 40 °C |
HART® isolating transducer, 1-channel

The 1-channel HART® isolating transducer IME-AIA-11EX-HI/24VDC is used to energize intrinsically safe 2-wire HART® transducers (III) in the Ex area and to transmit the measured signal to the non-Ex area.

Besides the analog signals, digital HART® communication signals can also be transmitted bidirectionally.

The device features one input and one output circuit for 4…20 mA.

A green LED indicates operational readiness.

Input and output circuit are safely galvanically isolated. The input signal is transmitted 1:1 and is presented to the relevant output in the non-Ex area. As a result of the 1:1 transmission behaviour, wire-break and short circuit are output as currents of 0 mA or > 22.5 mA in the measuring transducer circuit.
**Interface Technology in Modular Housing**

**DIN rail mounted devices of the IME series**

### Technical data

**Type**

- **Ident no.:** IME-AiA-11Ex-Hi/24VDC
- **7541193**

**Power supply**

- **Nominal voltage:** 24 VDC
- **Operating voltage range:** 20 ... 30 VDC
- **Power consumption:** ≤ 1 W

**Inputs**

- **Input circuits:** isolating transducer
- **Supply voltage:** ≥ 13 V / 20 mA
- **Current:** 35 mA
- **Current input:** 4 ... 20 mA

**Outputs**

- **Load resistance, current output:** ≤ 0.5 kΩ
- **Output current:** 4 ... 20 mA

**Response characteristic**

- **Measuring accuracy:** ≤ 0.1 % of full scale
- **Reference temperature:** 23 °C
- **Rise time (10-90%):** ≤ 10 ms
- **Dropout time (90...10%):** ≤ 10 ms

**Approvals and declarations**

- **Ex approval acc. to conformity certificate:** TÜV 08 ATEX 554801
- **Device designation:** Ex ia IIC IIB
- **Max. values:**
  - Terminal connection: 3+4
  - Max. output voltage \( U_0 \) ≤ 23 V
  - Max. output current \( I_0 \) ≤ 64.5 mA
  - Max. output power \( P_0 \) ≤ 799 mW
  - Rated voltage: 250 V
  - Characteristic: Trapezoidal
  - Internal inductance/capacitance \( \frac{L_i}{C_i} \)
  - \( L_i = 76.5 \mu H, C_i = 22 nF \)
  - **External inductance/capacitance \( \frac{L_o}{C_o} \)**
    | Ex ia | IIC | IIB |
    |-------|-----|-----|
    | \( L_o [mH] \) 0.804 | 0.424 | 0.024 |
    | \( C_o [nF] \) 46 | 62 | 121 |
    | \( \frac{L_o}{C_o} \) 358 | 418 | 718 |

- **Ex approval acc. to conformity certificate:** TÜV 08 ATEX 554909 X

**Environmental Conditions**

- **Ambient temperature:** -25 ... +70 °C
- **Storage temperature:** -40 ... +80 °C
- **Test voltage:** 2.5 kV
- **MTTF:** 474 years acc. to SN 29500 (Ed. 99)

**Mechanical data**

- **Electrical connection:** Spring terminal made of Beryllium-Bronze
- **Terminal cross-section:** 1.5 mm²
- **Housing material:** Polycarbonate/ABS
- **Mounting instruction:** for DIN rail
- **Protection class:** IP20
- **Flammability class acc. to UL 94:** V-0
- **Dimensions:** 18 x 112 x 110 mm

**Indication**

- **Operational readiness:** green

**Approval | Certification**

- ATEX, IECEx, TR CU, NEPSI

**Mechanical data**

- **Application area:** II 3 G
- **Protection type:** Ex na [nL] IIB/IIC T4
- **Max. values:**
  - Terminal connection: 3+4
  - Max. output voltage \( U_0 \) ≤ 23 V
  - Max. output current \( I_0 \) ≤ 64.5 mA
  - Max. output power \( P_0 \) ≤ 799 mW
  - Characteristic: Trapezoidal
  - Internal inductance/capacitance \( \frac{L_i}{C_i} \)
  - \( C_i = 22 nF, L_i = 76.5 \mu H \)
  - **External inductance/capacitance \( \frac{L_o}{C_o} \)**
    | Ex nL | IIC | IIB |
    |-------|-----|-----|
    | \( L_o [mH] \) 0.12 | 19.9 |
    | \( C_o [nF] \) 188 | 786 |

**Declaration**

- **SIL 2 acc. to EXIDA FMEDA**
The temperature measuring amplifier IME-TI-11ExCl/24VDC is designed to evaluate the temperature-dependent changes of Ni100/Pt100 RTDs, thermocouples types B, E, J, K, L, N, R, S and T or low voltages in a range of -160...+160 mV and to output them as linear temperature current signals 0/4...20 mA.

Alternatively, Ni100/Pt100 RTDs in 2, 3 or 4-wire technology can also be operated at the input circuit of the measuring amplifier. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple (2-wire) or as independent measuring input.

The devices are parametrized and configured via PC with the software tool „Device Type Manager“ (DTM). For this, connect the temperature measuring amplifier to the PC with the 3.5 mm jack plug on the front. The ready-made transmission cable can be ordered from TURCK under the type name IM-PROG (ident no. 6890422).

The following settings can be adjusted via DTM:
- Connection mode (2, 3 and 4-wire technology)
- Measuring range start
- Measuring range end
- Input circuit monitoring for wire-break
- Current output behaviour in the event of input circuit errors: 0 or > 22 mA
- Internal or external cold junction compensation
- Output current (0/4...20 mA)
- Temperature (°C or °K)
- Mode (resistor, thermocouples, low voltage, line compensation)

The signals are transformed according to ITS 90/IEC 584 for thermocouples and IEC 751 for Pt100 RTDs and provided as temperature-linear signals at the current output.

Features
- ATEX, IECEx, TR CU, NEPSI
- Installation in zone 2
- Input for Pt100/Ni100 resistors, thermocouples and millivolt signals in 2, 3 or 4-wire technology
- Parametrized via PACTware™
- Output: 0/4...20 mA
- Line monitored for wire-break/short-circuit (ON/OFF switchable)
- Complete galvanic isolation
Technical data

Type
IME-TI-11Ex-CI/24VDC
Ident no.
7541199

Power supply
Nominal voltage
24 VDC
Operating voltage range
20…30 VDC
Power consumption
≤ 1.5 W

Inputs
Input circuits
thermocouple, Pt100, Ni100
Pt100
(IEC 751), 2, 3 and 4-wire technology
Ni100
(DIN 43760), 2, 3 and 4-wire technology
Probe current
≤ 0.2 mA
Thermocouples
B, E, J, K, N, R, S, T (ITS 90/IEC 584), L (DIN 43710)
Nominal resistance
0…1.5 kΩ
Voltage input
-0.160…+0.160 VDC

Outputs
Load resistance, current output
≤ 0.6 kΩ
Output current
0/4…20 mA
Switching frequency
≤ 1 Hz
Fault current
0 / 22 mA adjustable

Response characteristic
Reference temperature
23 °C
Accuracy current output
± 20 µA
Temperature drift analogue output
0.0025 %/K
Temperature drift RTD input
± 3 mΩ/K
Temperature drift TC input
3.2 µV / K (of 320 mV)
Accuracy RTD input
± 50 mΩ
Accuracy TC input
± 15 µV
Cold junction compensation error
2-wire < 100 mΩ after line compensation
3-wire < 100 mΩ with asymmetrical wiring
4-wire < 50 mΩ with cold junction compensation < 2 K
with IM-3-CJT < 1 K
≤ 30 ms

Rise time (10-90%)

Approvals and declarations
Ex approval acc. to conformity certificate
TÜV 09 ATEX 555273
Device designation
Ex ia IIB / IIC
Max. values:
Max. output voltage Uo
≤ 5 V
Max. output current I0
≤ 2 mA
Max. output power Po
≤ 2.5 mW
Rated voltage
250 V
Characteristic
linear
Internal inductance/capacitance L/C
negligibly small

External inductance/capacitance Lm/Cm

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIB</th>
<th>IIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lm (mH)</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>Cm (µF)</td>
<td>10</td>
<td>13</td>
</tr>
</tbody>
</table>

Application area
II 3 G
Protection type
Ex ia [nl] IIB/IIC T4
Max. values:
Max. output voltage Uo
≤ 5 V
Max. output current I0
≤ 2 mA
Max. output power Po
≤ 2.5 mW
Characteristic
linear
Internal inductance/capacitance Lm/Cm
negligibly small

Environmental Conditions
Ambient temperature
-25…+70 °C
Storage temperature
-40…+80 °C
Test voltage
2.5 kV

Mechanical data
Electrical connection
Spring terminal made of Beryllium-Bronze
Terminal cross-section
1.5 mm²
Housing material
Polycarbonate/ABS
Mounting instruction
for DIN rail
Protection class
IP20
Flammability class acc. to UL 94
V-0
Dimensions
18 x 112 x 110 mm

Approval | Certification
ATEX, IECEx, TR CU, NEPSI
Ouput analog signal isolator, 1-channel

The 1-channel analog data transmitter IME-AO-11Ex-i/L has an intrinsically safe output circuit.

The normalized current signal is transmitted, galvanically isolated 1:1, from the non-Ex to the Ex-area.

The output circuit is equipped with a short-circuit proof power source. Intrinsically analog actuators like I/P converters (e.g. at control valves) or displays can be applied in the Ex area.

The device is loop-powered.

Features

- ATEX, IECEx, TR CU, NEPSI
- Installation in zone 2
- Output isolator, 1-channel
- HART® transmissible
- Connection of positioners, displays etc.
- Complete galvanic isolation
## Technical data

### Type
- IME-AO-11Ex-Hi/L
- Ident no.: 7541194

### Power supply
- Nominal voltage: 24 VDC loop-powered
- Power consumption: ≤ 0.75 W

### Inputs
- Voltage input: max. 30 VDC
- Current input: 0…20 mA
- Control circuits: Current limiting 42 mA

### Outputs
- Output circuits: 0…20 mA
- Load resistance, current output: ≤ 0.4 kΩ
- Output current: 0…20 mA
- Output voltage: max. 13 V

### Response characteristic
- Measuring accuracy: ≤ 0.1 % of full scale
- Reference temperature: 23 °C
- Temperature drift: ≤ 0.001 % / K
- Rise time (10-90%): ≤ 10 ms
- Dropout time (90…10%): ≤ 10 ms

### Approvals and declarations
- Ex approval acc. to conformity certificate: TÜV 08 ATEX 554800
- Device designation: Ex ia II (1) G, II (1) D [Ex ia] IIB/IIC, [Ex iaD]

<table>
<thead>
<tr>
<th>Max. values:</th>
<th>Terminal connection: 3+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. output voltage U_o</td>
<td>≤ 13.3 V</td>
</tr>
<tr>
<td>Max. output current I_i</td>
<td>≤ 97 mA</td>
</tr>
<tr>
<td>Max. output power P_o</td>
<td>≤ 322 mW</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>250 V</td>
</tr>
<tr>
<td>Characteristic</td>
<td>linear</td>
</tr>
<tr>
<td>Internal inductance/capacitance L_i/C_i</td>
<td>negligibly small</td>
</tr>
<tr>
<td>Ex nL</td>
<td>IIC</td>
</tr>
<tr>
<td>L_i [mH]</td>
<td>5</td>
</tr>
<tr>
<td>C_i [µF]</td>
<td>0.51</td>
</tr>
</tbody>
</table>

### Environmental Conditions
- Ambient temperature: -25…+70 °C
- Storage temperature: -40…+80 °C
- Test voltage: 2.5 kV
- MTTF: 515 years acc. to SN 29500 (Ed. 99)

### Mechanical data
- Electrical connection: Spring terminal made of Beryllium-Bronze
- Terminal cross-section: 1.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 18 x 112 x 110 mm

### Approval | Certification
- ATEX, IECEx, TR CU, NEPSI

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**Interface Technology in Modular Housing**

DIN rail mounted devices of the IME series

more@turck.com  ■  www.turck.com  ■  Edition I/2014

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Interface Technology in Modular Housing
DIN rail mounted devices of the IME series

Solonoid driver, 1-channel

The 1-channel solonoid driver IME-DO-11Ex/L provides limited current and voltage at the intrinsically safe output. This enables them to be used directly for supplying loads in the Ex area.

Within the area of applicability of the European directive 94/9/EC (ATEX) it is permitted to operate connected loads in potentially explosive atmospheres caused by dust or gas, provided they comply with the applicable regulations. Typical applications are the control of Ex i pilot valves as well as the supply of displays and transmitters.

The output values of the two connections U1 and U2 per channel differ in terms of their no-load voltage (see output curve on next page). They are adapted to the valves of different manufacturers. The loads are actuated by applying the operating voltage.

A yellow LED indicates the switching state of the associated output.

Features

- ATEX, IECEx, TR CU, NEPSI
- Installation in zone 2
- Solonoid driver (intrinsically safe power source), 1-channel
- 2 output values selectable per channel
- LED status indication
- Complete galvanic isolation
**Technical data**

**Type**
IME-DO-11EX/L
Ident no. 7541196

**Power supply**
Nominal voltage 24 VDC loop-powered
Power consumption ≤ 1.5 W

**Inputs**
- 0-signal: 0...5 VDC
- 1-signal: 20...30 VDC
Voltage input max. 30 VDC
Current input 45 mA
Input delay ≤ 0.4 ms

**Outputs**
- Output current 40 mA
- Output voltage U1=24 V
- Output voltage U2=15 V
- Output curve

**Response characteristic**
Limit frequency ≤ 500 Hz

**Approvals and declarations**
- Ex approval acc. to conformity certificate TÜV 06 ATEX 2977 X
- Device designation II (1) GD [Ex ia] IIC/IIB
- Max. output voltage Uo ≤ 25.4 V
- Max. output current Io ≤ 96 mA
- Max. output power P0 ≤ 678 mW
- Rated voltage 250 V
- Characteristic Trapezoidal
- Internal inductance/capacitance L/Ci negligibly small

**External inductance/capacitance L/Cl**

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lc (mH)</td>
<td>0.68</td>
<td>0.5</td>
</tr>
<tr>
<td>Cc (µF)</td>
<td>0.067</td>
<td>0.076</td>
</tr>
</tbody>
</table>

- Max. output voltage Uo ≤ 17.6 V
- Max. output current Io ≤ 96 mA
- Max. output power P0 ≤ 678 mW
- Characteristic Trapezoidal
- Internal inductance/capacitance L/Ci negligibly small

**External inductance/capacitance L/Cl**

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lo (mH)</td>
<td>1.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Co (µF)</td>
<td>0.13</td>
<td>0.15</td>
</tr>
</tbody>
</table>

- Ex approval acc. to conformity certificate TÜV 06 ATEX 2979 X
- Application area II 3 G
- Protection type Ex nL [nL] IIC / IIB T4
- Characteristic Trapezoidal

**Indication**
Switching state yellow

**Environmental Conditions**
- Ambient temperature -25...+70 °C
- Storage temperature -40...+80 °C
- Test voltage 2.5 kV
- MTTF 363 years acc. to SN 29500 (Ed. 99) 40 °C

**Mechanical data**
- Electrical connection Spring terminal made of Beryllium-Bronze
- Terminal cross-section 1.5 mm²
- Housing material Polycarbonate/ABS
- Mounting instruction for DIN rail
- Protection class IP20
- Flammability class acc. to UL 94 V-0
- Dimensions 18 x 112 x 110 mm

**Approval | Certification**
ATEX, IECEx, TR CU, NEPSI
The 2-channel solenoid driver IME-DO-22Ex/L provides limited current and voltage at the intrinsically safe output. This enables them to be used directly for supplying loads in the Ex area. Within the area of applicability of the European directive 94/9/EC (ATEX) it is permitted to operate connected loads in potentially explosive atmospheres caused by dust or gas, provided they comply with the applicable regulations. Typical applications are the control of Ex pilot valves as well as the supply of displays and transmitters.

The output values of the two connections U1 and U2 per channel differ in terms of their no-load voltage (see output curve on next page). They are adapted to the valves of different manufacturers. The loads are actuated by applying the operating voltage.

A yellow LED indicates the switching state of the associated output.
## Technical data

### Type
- **IME-DD-22EX/L**
- **Ident no.**: 7541195

### Power supply
- **Nominal voltage**: 24 VDC loop-powered
- **Power consumption**: ≤ 3 W

### Inputs
- **0-signal**: 0...5 VDC
- **1-signal**: 20...30 VDC
- **Voltage input**: max. 30 VDC
- **Input delay**: ≤ 0.4 ms

### Outputs
- **Output current**: 40 mA
- **Output voltage**: U1=24 V
- **Output voltage**: U2=15 V
- **Output curve**: MT85/MT49/MT32/MT50/MT52

### Response characteristic
- **Limit frequency**: ≤ 500 Hz

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: TÜV 06 ATEX 2977 X
- **Device designation**: Ex II (1) GD [Ex ia] IIC/IIB
- **Max. output voltage**: Uo ≤ 25.4 V
- **Max. output current**: Io ≤ 96 mA
- **Max. output power**: Po ≤ 678 mW
- **Rated voltage**: 250 V
- **Characteristics**: Trapezoidal
- **Internal inductance/capacitance L/C**: negligibly small

### External inductance/capacitance L/C

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L₁ [mH]</td>
<td>0.68</td>
<td>0.5</td>
</tr>
<tr>
<td>C₁ [µF]</td>
<td>0.067</td>
<td>0.076</td>
</tr>
<tr>
<td>Max. output voltage Uo</td>
<td>≤ 17.6 V</td>
<td></td>
</tr>
<tr>
<td>Max. output current I₀</td>
<td>≤ 96 mA</td>
<td></td>
</tr>
<tr>
<td>Max. output power P₀</td>
<td>≤ 678 mW</td>
<td></td>
</tr>
<tr>
<td>Characteristic</td>
<td>Trapezoidal</td>
<td></td>
</tr>
<tr>
<td>Internal inductance/capacitance L/C</td>
<td>negligibly small</td>
<td></td>
</tr>
</tbody>
</table>

### External inductance/capacitance L/C

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>L₁ [mH]</td>
<td>1.2</td>
<td>0.5</td>
</tr>
<tr>
<td>C₁ [µF]</td>
<td>0.13</td>
<td>0.15</td>
</tr>
</tbody>
</table>

### Ex approval acc. to conformity certificate
- **TÜV 06 ATEX 2979 X**

### Application area
- **II 3 G**

### Protection type
- **Ex nA (nL) IIC / IIB T4**

### Characteristic
- **Trapezoidal**

### Environmental Conditions
- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Test voltage**: 2.5 kV
- **MTTF**: 363 years acc. to SN 29500 (Ed. 99)

### Mechanical data
- **Electrical connection**: Spring terminal made of Beryllium-Bronze
- **Terminal cross-section**: 1.5 mm² / 0.75 mm² flexible
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail
- **Protection class**: IP20
- **Dimensions**: 18 x 112 x 110 mm

### Indication
- **Switching state**: yellow

### Declaration
- **SIL 3 acc. to EXIDA FMEDA**
Interface technology in modular housing
DIN rail devices, IMS series

Input analog signal isolator, 1-channel

Standard active voltage or current signals are transmitted galvanically isolated and converted to other signal types via the 1-channel universal analog signal isolator IMS-AI-UNI/24VDC.

The device is equipped with available input circuit of 0/4…20 mA or 0…10 V and a variable short-circuit proof output circuit of 0/4…20 mA or 0…10 V.

The transmission characteristic (for input and output signal type) is adjusted via side-mounted DIP switches. The input signals are transmitted according to the setting and made available at the output.

The green LED indicates operational readiness.

With a width of 6.2 mm, the device is galvanically isolated up to 1.5 kV.

Features

- UL: Class 1, Div 2, Group A, B, C, D; GOST
- Input circuit: 0/4…20 mA or 0…10 V
- Output circuit: 0/4…20 mA or 0…10 V
- Type of input and output signal adjusted via DIP switch
- Linearity < 0.1 % f.s.
- Accuracy < 0.1 % f.s.
- Complete galvanic isolation
- 6.2 mm width
## Technical data

### Type
IMS-AI-UNI/24V
Ident no. 7504009

### Power supply
- **Nominal voltage**: 24 VDC
- **Operating voltage range**: 19…29 VDC
- **Power consumption**: ≤ 0.312 W
- **Residual ripple**: ≤ 5 mV

### Inputs
- **Voltage input**: 0/2…10 VDC
- **Input resistance (voltage)**: ≥ 330 kΩ
- **Current input**: 0/4…20 mA
- **Input resistance (current)**: ≤ 100 Ω

### Outputs
- **Load resistance, current output**: ≤ 0.4 kΩ
- **Load resistance voltage output**: ≥ 1 kΩ
- **Output current**: 0/4…20 mA
- **Output voltage**: 0…10 V

### Response characteristic
- **Measuring accuracy**: ≤ 0.1 % of full scale
- **Temperature drift**: ≤ 0.00015 % / K
- **Rise time (10-90%)**: ≤ 10 ms
- **Dropout time (90…10%)**: ≤ 10 ms

### Indication
- **Operational readiness**: green

### Environmental Conditions
- **Ambient temperature**: -20…+60 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 1.5 kV

### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: screw terminals
- **Terminal cross-section**: 2.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 6.2 x 114.5 x 90 mm

### Approval | Certification
- **cULus, GOST**
Input analog signal isolator, 2-channel

The 2-channel analog signal isolator IMS-AI-DLI-22-DLI/L is designed to transmit normalized active current signals galvanically isolated.

The device features two input circuits 0/4…20 mA and two short-circuit proof output circuits 0/4…20 mA.

The device is loop powered, transmission starts with 250 µA. Required minimum voltage $2.8 \, V + (20 \, mA \times R_{\text{load}})$.

The input signals are transmitted 1:1 and are presented to the relevant output.

The device is loop-powered. Separate power supply is not necessary.

Features

- UL: Class1, Div 2, Group A, B, C, D; GOST
- Input circuits: 0/4…20 mA
- Output circuits: 0/4…20 mA
- Linearity < 0.1 % f.s.
- Accuracy < 0.1 % f.s.
- Complete galvanic isolation
- 6.2 mm width
## Technical data

### Type
IMS-AI-DLI-22-DLI/L

### Ident no.
7504011

### Power supply
- Nominal voltage: 24 VDC loop-powered
- Power consumption: ≤ 0.312 W
- Residual ripple: ≤ 5 mV

### Inputs
- Voltage input: max. 29 VDC
- Current input: 0/4…20 mA
- Input resistance (current): ≤ 100 Ω

### Outputs
- Load resistance, current output: ≤ 0.4 kΩ
- Output current: 0/4…20 mA

### Response characteristic
- Measuring accuracy: ≤ 0.1 % of full scale
- Temperature drift: ≤ 0.00015 % / K
- Rise time (10-90%): ≤ 10 ms
- Dropout time (90…10%): ≤ 10 ms

### Environmental Conditions
- Ambient temperature: -20…+60 °C
- Storage temperature: -40…+80 °C
- Test voltage: 1.5 kV

### Mechanical data
- Tightening torque: 0.5 Nm
- Electrical connection: screw terminals
- Terminal cross-section: 2.5 mm²
- Housing material: Polycarbonate/ABS
- Mounting instruction: for DIN rail
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 6.2 x 114.5 x 90 mm

### Approval | Certification
- UL, GOST
Interface technology in modular housing
DIN rail devices, IMS series

Temperature measuring amplifier, 1-channel

The 1-channel temperature measuring amplifier IMS-Ti-Pt100/24V is designed to evaluate the temperature-dependent changes of Pt100 RTDs, to isolate them galvanically and to output them as temperature-linear voltage or current signals of 0...10 V, 0...20 mA or 4...20 mA.

Alternatively, Pt100 RTDs in 2, 3 or 4-wire technology can also be operated at the input circuit of the measuring amplifier.

The number of Pt100 wires, the transmission characteristic (0...20 mA, 4...20 mA or 0...10 V) as well as the measuring range are adjusted via DIP switch.

Wire-break and short-circuit are detected. In the event of error, 12 V or 22 mA are provided at the output and the error is additionally signalled by the flashing power LED.

The following measuring ranges can be adjusted:
- -50...+150 °C
- 0...+100 °C
- 0...+200 °C

In the event of error (wire-break or short-circuit), 12 V or 22 mA are provided at the output and the error is additionally signalled by the flashing power LED.

The IM34 temperature measuring amplifiers from TURCK offer more solutions for applications with other measuring ranges and temperature probes.

Features
- UL: Class1, Div2, Group A, B, C, D; GOST
- Connection of temperature probes Pt100
- Output circuit: 0/4…20 mA or 0…10 V
- Linearity < 0.1 % f.s.
- Accuracy < 0.3 % f.s.
- Complete galvanic isolation
- 6.2 mm width
### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IMS-TI-PT100/24V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7504012</td>
</tr>
</tbody>
</table>

#### Power supply
- **Nominal voltage**: 24 VDC
- **Operating voltage range**: 19…29 VDC
- **Power consumption**: ≤ 0.32 W
- **Residual ripple**: ≤ 5 mVss

#### Inputs
- **Pt100**: -50…150°C; 0…100°C; 0…200°C
- **Input resistance (voltage)**: ≥ 1000 kΩ

#### Outputs
- **Load resistance, current output**: ≤ 0.4 kΩ
- **Load resistance voltage output**: ≥ 1 kΩ
- **Output current**: 0/4…20 mA
- **Output voltage**: 0…10 V

#### Response characteristic
- **Measuring accuracy**: ≤ 0.3 % of full scale
- **Temperature drift**: ≤ 0.00015 % / K
- **Rise time (10-90%)**: ≤ 30 ms
- **Dropout time (90…10%)**: ≤ 30 ms

#### Indication
- **Operational readiness**: green

#### Environmental Conditions
- **Ambient temperature**: -20…+60 °C
- **Storage temperature**: -40…+80 °C
- **Test voltage**: 1.5 kV

#### Mechanical data
- **Tightening torque**: 0.5 Nm
- **Electrical connection**: screw terminals
- **Terminal cross-section**: 2.5 mm²
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for DIN rail
- **Protection class**: IP20
- **Flammability class acc. to UL 94**: V-0
- **Dimensions**: 6.2 x 114.5 x 90 mm

#### Approval | Certification
- **cULus, GOST**
Surge protection – 1 floating signal circuit

The IMSP-1X2-24 is a surge protection module, designed for the MSR technology. It protects one floating 2-wire signal circuit.

The HART® transmissible devices are IP20 rated and can be installed in Ex as well as non-Ex areas.

The only 6.2 mm slim housing can be mounted on DIN rail acc. to DIN NS35.

Features

- ATEX, IECEx, UL
- Nominal voltage 24 VDC
- For one floating 2-wire signal circuit
- IEC category: C1 / C2 / C3 / D1
- Flammability class V-0
- HART® transmissible
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IMSP-1x2-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7504050</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal voltage $U_n$</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC category</td>
<td>C1; C2; C3; D1</td>
</tr>
<tr>
<td>Surge arrester, rated voltage $U_c$</td>
<td>25 VAC / 36 VDC</td>
</tr>
</tbody>
</table>

### Nominal current $I_n$ ($\leq 40 \degree C$)

| Active current $I_w$ with given $U_c$ | 2 μA |
| Leakage current acc. to PE with given $U_c$ | 2 μA |
| Nominal discharge surge current $I_s$ (8/20) μs (core-core) | 5 kA |
| Nominal discharge surge current $I_s$ (8/20) μs (core-ground) | 5 kA |
| Total surge current (8/20) μs | 20 kA |
| Total surge current (10/350) μs | 1 kA |
| Discharge surge current $I_{sp}$ (8/20) μs (core-to-core) | 10 kA |
| Discharge surge current $I_{sp}$ (8/20) μs (core-to-earth) | 10 kA |
| Nominal pulse current $I_{sp}$ (10/1000) μs (core-core) | 50 A |
| Nominal pulse current $I_{sp}$ (10/1000) μs (core-ground) | 50 A |
| Lightning test current (10/350) μs, peak current $I_{lp}$ | 500 A |

### Output voltage limitation $1kV/\mu s$ (core-to-core)

<table>
<thead>
<tr>
<th>Output voltage limitation $1kV/\mu s$ (core-to-earth)</th>
<th>$\leq 60$ V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual voltage $I_{sp}$ (core-to-core)</td>
<td>$\leq 70$ V</td>
</tr>
<tr>
<td>Residual voltage $I_{sp}$ (core-to-ground)</td>
<td>$\leq 50$ V</td>
</tr>
<tr>
<td>Protection level $U_{sp}$ C2 - 10 kV/5 kA (core-core)</td>
<td>$\leq 70$ V (C2 - 10 kV / 5 kA)</td>
</tr>
<tr>
<td>Protection level $U_{sp}$ C3 - 10 A (core-core)</td>
<td>$\leq 50$ V (C3 - 10 A)</td>
</tr>
<tr>
<td>Protection level $U_{sp}$ D1 - 500 A (core-core)</td>
<td>$\leq 80$ V (D1 - 500 A)</td>
</tr>
<tr>
<td>Protection level $U_{sp}$ C1 - 500 V/250 A (core-core)</td>
<td>$\leq 650$ V (C1 - 500 V / 250 A)</td>
</tr>
<tr>
<td>Protection level $U_{sp}$ C2 - 10 kV/5 kA (core-ground)</td>
<td>$\leq 700$ V (C2 - 10 kV / 5 kA)</td>
</tr>
<tr>
<td>Protection level $U_{sp}$ D1 - 500 A (core-ground)</td>
<td>$\leq 700$ V (D1 - 500 A)</td>
</tr>
</tbody>
</table>

### Response time $t_A$ (core-to-core)

<table>
<thead>
<tr>
<th>Response time $t_A$ (core-to-earth)</th>
<th>$\leq 1$ ns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion loss $aE$, sym.</td>
<td>Typ 0.7 dB (1 MHz / 50 Ω)</td>
</tr>
<tr>
<td>Insertion loss $aE$, asym.</td>
<td>Typ 0.3 dB (350 MHz / 150 Ω)</td>
</tr>
<tr>
<td>Cutoff frequency $f_g$ (3dB), asym. (GND) 50 Ω system</td>
<td>Typ. 6 MHz</td>
</tr>
<tr>
<td>Cutoff frequency $f_g$ (3dB), asym. (GND) 150 Ω system</td>
<td>Typ. 2 MHz</td>
</tr>
<tr>
<td>Capacitance</td>
<td>$\leq 1.3$ nF (per path)</td>
</tr>
<tr>
<td>Resistance per path</td>
<td>$3.3 \Omega$ 20 %</td>
</tr>
<tr>
<td>Required backup fuse, max.</td>
<td>315 mA</td>
</tr>
<tr>
<td>Surge protection acc. to IEC 61643-21 (core-to-core)</td>
<td>C2 (10 kV / 5 kA); C3 (25 A)</td>
</tr>
<tr>
<td>Surge protection acc. to IEC 61643-21 (core-to-earth)</td>
<td>C2 (10 kV / 5 kA); C3 (25 A); D1 (500 A)</td>
</tr>
<tr>
<td>AC protection acc. to IEC 61643-21</td>
<td>5 A - 1 s</td>
</tr>
</tbody>
</table>

### Standards for air and creepage distances

| IEC 60664-1 / EN 60079-11 |

### Approvals and declarations

<p>| Ex approval acc. to conformity certificate | DEKRA 11 ATEX 0016 X |</p>
<table>
<thead>
<tr>
<th>Device designation</th>
<th>Ex ia IIC T4…T6; Ex iaD 20 T85°C…T135°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. values:</td>
<td>Terminal connection: 5+7 / 6+8</td>
</tr>
<tr>
<td>Max. input voltage $U_i$</td>
<td>$\leq 36$ V</td>
</tr>
<tr>
<td>Max. input current $I_i$</td>
<td>$\leq 350$ mA</td>
</tr>
<tr>
<td>Max. input power $P_i$</td>
<td>$\leq 3000$ mW</td>
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<tr>
<td>Internal inductance/capacitance $L_i/C_i$</td>
<td>$L_i = 1$ μH; $C_i = 1.3$ nF</td>
</tr>
<tr>
<td>Declaration</td>
<td>SIL 2 acc. to EXIDA FMEDA</td>
</tr>
</tbody>
</table>

### Environmental Conditions

| Ambient temperature | -40°…+80°C |
| Storage temperature | -40°…+80°C |

### Mechanical data

| Tightening torque | 0.8 Nm |
| Electrical connection | screw terminals |
| Terminal cross-section | 2.5 mm² |
| Housing material | plastic |
| Mounting instruction | for DIN rail |
| Protection class | IP20 |
| Flammability class acc. to UL 94 | V-0 |
| Dimensions | 6.2 x 93.1 x 102.5 mm |

### Approval | Certification

| ATEX, IECEx, UL | IEC 60664-1 / EN 60079-11 |
**Surge protection – 2 floating signal wires**

The IMSP-2-12 is a surge protection module, designed for the MSR technology. It protects two 12 V operated floating signal conductors.

The devices are IP20 protected and can be installed in Ex as well as non-Ex areas.

The only 6.2 mm slim housing can be mounted on DIN rail acc. to DIN NS35.

**Features**
- ATEX, IECEx, UL
- Nominal voltage 12 VDC
- For 2 floating signal conductors
- IEC category: C1 / C2 / C3 / D1
- Flammability class V-0
Technical data

**Type**
- IMSP-2-12

**Ident no.**
- 7504054

**Nominal voltage $U_n$**
- 12 VDC

**IEC category**
- C1; C2; C3; D1

**Surge arrester, rated voltage $U_c$**
- 13 Vac / 18 VDC

**Nominal current $I_n$ (≤ 40 °C)**
- 500 mA

**Active current $I_a$ with given $U_n$**
- 2 μA (per path)

**Leakage current $I_l$ (per path)**
- 2 μA

**Nominal discharge surge current $I_d$ (8/20) μs**
- 350 A

**Nominal discharge surge current $I_d$ (8/20) μs (core-ground)**
- 5 kA

**Total surge current (8/20) μs**
- 20 kA

**Total surge current (10/350) μs**
- 1 kA

**Discharge surge current $I_{dmp}$ (8/20) μs (core-to-core)**
- 350 A

**Discharge surge current $I_{dmp}$ (8/20) μs (core-to-earth)**
- 10 kA

**Nominal pulse current $I_{n}$ (10/1000) μs (core-core)**
- 70 A

**Nominal pulse current $I_{n}$ (10/1000) μs (core-ground)**
- 50 A

**Lightning test current (10/350) μs, peak current $I_{tp}$**
- 500 A

**Output voltage limitation 1kV/μs (core-to-core)**
- ≤ 50 V

**Output voltage limitation 1kV/μs (core-to-earth)**
- ≤ 650 V

**Residual voltage $I_r$ (core-to-core)**
- ≤ 50 V

**Residual voltage $I_r$ (core-to-earth)**
- ≤ 50 V

**Protection level $U_p$ C1 - 500 V / 250 A (core-core)**
- ≤ 50 V (C1 - 500 V / 250 A)

**Protection level $U_p$ C1 - 500 V / 250 A (core-ground)**
- ≤ 650 V (C1 - 500 V / 250 A)

**Protection level $U_p$ C2 - 10 kV / 5 kA (core-ground)**
- ≤ 650 V (C2 - 10 kV / 5 kA)

**Protection level $U_p$ D1 - 500 A (core-ground)**
- ≤ 700 V (D1 - 500 A)

**Response time $T_A$ (core-to-core)**
- ≤ 1 ns

**Response time $T_A$ (core-to-earth)**
- ≤ 100 ns

**Insertion loss $A_\text{sl}$, sym.**
- Typ. 0.1 dB (1 MHz / 50 Ω)

**Insertion loss $A_\text{sl}$, asym.**
- Typ. 0.1 dB (300 kHz / 150 Ω)

**Cutoff frequency $f_g$ (3dB), asym. (GND) 50 Ω system**
- Typ. 5 MHz

**Cutoff frequency $f_g$ (3dB), asym. (GND) 150 Ω system**
- Typ. 1.5 MHz

**Capacitance**
- ≤ 1.5 nF (per channel)

**Resistance per path**
- 0 Ω

**Required backup fuse, max.**
- 500 mA

**Surge protection acc. to IEC 61643-21 (core-to-core)**
- C1 (500 V / 250 A); C3 (25 A)

**Surge protection acc. to IEC 61643-21 (core-to-earth)**
- C2 (10 kV / 5 kA); C3 (25 A); D1 (500 A)

**AC protection acc. to IEC 61643-21**
- 5 A - 1 s

**Standards for air and creepage distances**
- IEC 60664-1 / EN 60079-11

**Standards/Regulations**
- IEC 61643-21 / DIN EN 61643-21

**Approvals and declarations**
- Ex approval acc. to conformity certificate DEKRA 11 ATEX 0016 X

**Device designation**
- É II T G, II T D Ex ia IIC T4…T6; Ex iaD 20 T85°C…T135°C

**Max. values:**
- Terminal connection: 5+7 / 6+8
- Max. input voltage $U_i$ ≤ 18 V
- Max. input current $I_i$ ≤ 500 mA
- Max. input power $P_i$ ≤ 635 mW

**Internal inductance/capacitance $L_i/\text{C}_i$**
- Declaration

**SIL 2 acc. to EXIDA FMEDA**

**Environmental Conditions**
- Ambient temperature -40…+80 °C
- Storage temperature -40…+80 °C

**Mechanical data**
- Terminal cross-section 2.5 mm²
- Housing material plastic
- Mounting instruction for DIN rail
- Protection class IP20
- Flammability class acc. to UL 94 V-0
- Dimensions 6.2 x 93.1 x 102.5 mm

**Approval | Certification**
- ATEX, IECEx, UL

**Standards/Regulations**
- IEC 61643-21 / DIN EN 61643-21

**Approvals and declarations**
- Ex approval acc. to conformity certificate DEKRA 11 ATEX 0016 X

**Device designation**
- É II T G, II T D Ex ia IIC T4…T6; Ex iaD 20 T85°C…T135°C

**Max. values:**
- Terminal connection: 5+7 / 6+8
- Max. input voltage $U_i$ ≤ 18 V
- Max. input current $I_i$ ≤ 500 mA
- Max. input power $P_i$ ≤ 635 mW

**Internal inductance/capacitance $L_i/\text{C}_i$**
- Declaration

**SIL 2 acc. to EXIDA FMEDA**

**Environmental Conditions**
- Ambient temperature -40…+80 °C
- Storage temperature -40…+80 °C

**Mechanical data**
- Terminal cross-section 2.5 mm²
- Housing material plastic
- Mounting instruction for DIN rail
- Protection class IP20
- Flammability class acc. to UL 94 V-0
- Dimensions 6.2 x 93.1 x 102.5 mm

**Approval | Certification**
- ATEX, IECEx, UL
The IMSP-2-24 is a surge protection module, designed for the MSR technology. It protects two 24 V operated floating signal conductors.

The devices are IP20 protected and can be installed in Ex as well as non-Ex areas.

The only 6.2 mm slim housing can be mounted on DIN rail acc. to DIN NS35.

Features

- ATEX, IECEx, UL
- Nominal voltage 24 VDC
- For 2 floating signal conductors
- IEC category: C1 / C2 / C3 / D1
- Flammability class V-0
## Interface technology
### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IMSP-2-24</th>
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<tbody>
<tr>
<td>Ident no.</td>
<td>7504052</td>
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<table>
<thead>
<tr>
<th>Nominal voltage $U_n$</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC category</td>
<td>C1; C2; C3; D1</td>
</tr>
<tr>
<td>Surge arrester, rated voltage $U_i$</td>
<td>25 VAC / 36 VDC</td>
</tr>
</tbody>
</table>

### Nominal current $I_{n}$ (≤ 40 °C)
- Active current $I_a$ with given $U_i$:
  - 2 μA (per path)
- Leakage current acc. to PE with given $U_i$:
  - 2 μA
- Nominal discharge surge current $I_{ds}$ (8/20 μs)
  - Core-core: 250 A
  - Core-ground: 5 kA
- Nominal discharge surge current $I_{ds}$ (8/20 μs)
  - Core-core: 10 kA
  - Core-ground: 1 kA
- Discharge surge current $I_{ds}$ (8/20 μs)
  - Core-core: 250 A
  - Core-earth: 10 kA
- Nominal pulse current $I_{pm}$ (10/1000 μs)
  - Core-core: 50 A
  - Core-ground: 50 A
- Lightning test current (10/350 μs), peak current $I_{lp}$:
  - Core-to-core: 500 A
  - Core-to-ground: 250 A

### Output voltage limitation 1kV/μs (core-to-core)
- Output voltage limitation 1kV/μs (core-to-core):
  - ≤ 60 V
- Residual voltage $I_{r}$ (core-to-core):
  - ≤ 60 V
- Residual voltage $I_{r}$ (core-to-core):
  - ≤ 60 V
- Protection level $U_p$, C1 - 500 V/250 A
  - (core-core): ≤ 60 V (C1 - 500 V / 250 A)
- Protection level $U_p$, C3 - 10 A
  - (core-core): ≤ 60 V (C3 - 10 A)
- Protection level $U_p$, C1 - 500 V/250 A
  - (core-ground): ≤ 650 V (C1 - 500 V / 250 A)
- Protection level $U_p$, C2 - 10 kV/5 kA
  - (core-ground): ≤ 650 V (C2 - 10 kV / 5 kA)
- Protection level $U_p$, D1 - 500 A
  - (core-ground): ≤ 700 V (D1 - 500 A)

### Response time $t_a$ (core-to-core)
- Response time $t_a$:
  - ≤ 1 ns
  - ≤ 100 ns
- Insertion loss $a_{in}$, sym.
  - Typ. 0.1 dB (1 MHz / 50 Ω)
- Insertion loss $a_{in}$, asym.
  - Typ. 0.1 dB (450 kHz / 150 Ω)
- Cutoff frequency $f_g$ (3dB), asym. (GND) 50 Ω system
  - Typ. 7.5 MHz
- Cutoff frequency $f_g$ (3dB), asym. (GND) 100 Ω system
  - Typ. 2.5 MHz
- Capacitance
  - ≤ 1.3 nF (per path)
- Resistance per path
  - 0 Ω
- Required backup fuse
  - 500 mA
- Surge protection acc. to IEC 61643-21 (core-to-core)
  - C1 (500 V / 250 A); C3 (25 A)
- Surge protection acc. to IEC 61643-21 (core-to-earth)
  - C2 (10 kV / 5 kA); C3 (25 A); D1 (500 A)
- AC protection acc. to IEC 61643-21
  - 5 A - 1 s

### Approvals and declarations
- Ex approval acc. to conformity certificate
  - DEKRA 11 ATEX 0016 X
- Device designation
  - É II 1 G, É II 1 D Ex ia IIC T4...T6; Ex iaD 20 T85°C...T135°C
- Max. values:
  - Max. input voltage $U_i$
    - ≤ 36 V
  - Max. input current $I_i$
    - ≤ 500 mA
  - Max. input power $P_i$
    - ≤ 635 mW
  - Internal inductance/capacitance $L_i / C_i$
  - $L_i = 1 \mu \text{H}; C_i = 1.3 \text{nF}$
  - SIL 2 acc. to EXIDA FMEDA

### Environmental Conditions
- Ambient temperature
  - -40...+80 °C
- Storage temperature
  - -40...+80 °C

### Mechanical data
- Tightening torque
  - 0.8 Nm
- Electrical connection
  - screw terminals
- Terminal cross-section
  - 2.5 mm²
- Housing material
  - plastic
- Mounting instruction
  - for DIN rail
- Protection class
  - IP20
- Flammability class acc. to UL 94
  - V-0
- Dimensions
  - 6.2 x 93.1 x 102.5 mm

### Approvals | Certification
- ATEX, IECEx, UL
Surge protection – 2 floating signal circuits

The IMSP-2X2-24 is a surge protection module, designed for the MSR technology. It protects two floating 2-wire signal circuits.

The HART® transmissible devices are IP20 rated and can be installed in Ex as well as non-Ex areas.

The only 6.2 mm slim housing can be mounted on DIN rail acc. to DIN NS35.

Features
- ATEX, IECEx, UL
- Nominal voltage 24 VDC
- For two floating 2-wire signal circuits
- IEC category: C1 / C2 / C3 / D1
- Flammability class V-0
- HART® transmissible
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IMSP-2x2-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7504051</td>
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</tbody>
</table>

### Nominal voltage $U_n$

- **24 VDC**
- IEC category: C1; C2; C3; D1
- Surge arrester, rated voltage $U_c$: 25 VAC / 36 VDC

### Nominal current $I_n$ ($\leq 40°C$)

- Active current $I_a$ with given $U_n$: 2 μA
- Leakage current acc. to PE with given $U_n$: 4 μA
- Nominal discharge surge current $I_{ds}$ (8/20) μs (core-core): 5 kA
- Nominal discharge surge current $I_{ds}$ (8/20) μs (core-ground): 5 kA
- Total surge current (8/20) μs: 20 kA
- Total surge current (10/350) μs: 2 kA
- Discharge surge current $I_{ds}$ (8/20) μs (core-to-core): 10 kA
- Discharge surge current $I_{ds}$ (8/20) μs (core-to-earth): 10 kA
- Nominal pulse current $I_{up}$ (10/1000) μs (core-core): 50 A
- Nominal pulse current $I_{up}$ (10/1000) μs (core-ground): 50 A
- Lightning test current (10/350) μs, peak current $I_{lp}$: 500 A

### Output voltage limitation 1kV/μs (core-to-core)

- $\leq 60$ V

### Response time $t_A$ (core-to-core)

- $\leq 1$ ns
- $\leq 100$ ns

### Mechanical data

- Tightening torque: 0.8 Nm
- Electrical connection: screw terminals
- Terminal cross-section: 2.5 mm²
- Housing material: plastic
- Mounting instruction: for DIN rail
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 6.2 x 93.1 x 102.5 mm

### Environmental Conditions

- Ambient temperature: -40°...+80°C
- Storage temperature: -40°...+80°C

### Approval | Certification

- ATEX, IECEx, UL

### Approvals and declarations

- Ex approval acc. to conformity certificate: DEKRA 11 ATEX 0016 X
- Device designation: Ex ia IIC T4…T6; Ex iaD 20 T85°C…T135°C
- Max. values:
  - Max. input voltage $U_i$: $\leq 36$ V
  - Max. input current $I_i$: $\leq 350$ mA
  - Max. input power $P_i$: $\leq 3000$ mW
- Internal inductance/capacitance $L_i/C_i$
- Declaration: SIL 2 acc. to EXIDA FMEDA

### Standards for air and creepage distances

- IEC 60664-1 / EN 60079-11
- IEC 61643-21 / DIN EN 61643-21
Surge protection – 4 floating signal wires

The IMSP-4-24 is a surge protection module, designed for the MSR technology. It protects four 24 V operated floating signal conductors.

The devices are IP20 protected and can be installed in Ex as well as non-Ex areas.

The only 6.2 mm slim housing can be mounted on DIN rail acc. to DIN NS35.

Features

- ATEX, IECEx, UL
- Nominal voltage 24 VDC
- For 4 floating signal conductors
- IEC category: C1 / C2 / C3 / D1
- Flammability class V-0
## Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>IMSP-4-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7504053</td>
</tr>
</tbody>
</table>

### Nominal voltage $U_n$

- **IEC category:** C1; C2; C3; D1
- **Surge arrester, rated voltage $U_c$:** 25 VAC / 36 VDC

### Nominal current $I_{n}$ (≤ 40 °C)

| Active current $I_a$ with given $U_n$ | 2 μA (per path) |
| Leakage current acc. to PE with given $U_n$ | 4 μA |
| Nominal discharge surge current $I_{dp}$ (8/20) μs (core-core) | 500 mA |
| Nominal discharge surge current $I_{dp}$ (8/20) μs (core-ground) | 5 kA |
| Total surge current (8/20) μs | 20 kA |
| Total surge current (10/350) μs | 2 kA |
| Discharge surge current $I_{dp}$ (8/20) μs (core-to-core) | 250 A |
| Discharge surge current $I_{dp}$ (8/20) μs (core-to-earth) | 10 kA |
| Nominal pulse current $I_{ps}$ (10/1000) μs (core-core) | 50 A |
| Nominal pulse current $I_{ps}$ (10/1000) μs (core-ground) | 50 A |
| Lightning test current (10/350) μs, peak current $I_{tp}$ | 500 A |

### Output voltage limitation 1kV/μs (core-to-core)

- **Residual voltage $I_a$ (core-to-core):** ≤ 60 V
- **Residual voltage $I_a$ (core-to-ground):** ≤ 60 V
- **Protection level $U_p C1 - 500 V/250 A$:** ≤ 60 V (C1 - 500 V / 250 A)
- **Protection level $U_p C3 - 10 A$:** ≤ 60 V (C3 - 10 A)
- **Protection level $U_p C1 - 500 V/250 A$:** ≤ 650 V (C1 - 500 V / 250 A)
- **Protection level $U_p C2 - 10 kV/5 kA$:** ≤ 650 V (C2 - 10 kV / 5 kA)
- **Protection level $U_p D1 - 500 A$:** ≤ 700 V (D1 - 500 A)

### Response time $t_R$ (core-to-core)

- **Response time $t_R$ (core-to-earth):** ≤ 1 ns
- **Response time $t_R$ (core-to-ground):** ≤ 100 ns
- **Insertion loss $a_E$, sym.:** Typ. 0.1 dB (1 MHz / 50Ω)
- **Cutoff frequency $f_g$ (3dB), asym. (GND) 50Ω system:** Typ. 7.5 MHz
- **Cutoff frequency $f_g$ (3dB), asym. (GND) 100Ω system:** Typ. 2.5 MHz
- **Capacitance:** ≤ 1.3 nF (per path)
- **Resistance per path:** 0 Ω
- **Surge protection acc. to IEC 61643-21 (core-to-core):** C1 (500 V / 250 A); C3 (25 A)
- **Surge protection acc. to IEC 61643-21 (core-to-earth):** C2 (10 kV / 5 kA); C3 (25 A); D1 (500 A)
- **AC protection acc. to IEC 61643-21:** 5 A - 1 s

### Standards for air and creepage distances

- **IEC 60664-1 / EN 60079-11**
- **IEC 61643-21 / DIN EN 61643-21**

### Approvals and declarations

- **Ex approval acc. to conformity certificate:** DEKRA 11 ATEX 0016 X
- **Device designation:** Ex ia IIC T4…T6; Ex iaD 20 T85°C…T135°C
- **Max. values:**
  - Max. input voltage $U_i$ ≤ 36 V
  - Max. input current $I_i$ ≤ 500 mA
  - Max. input power $P_i$ ≤ 550 mW
  - Internal inductance/capacitance $L_a/C_a$
- **Declaration:** SIL 2 acc. to EXIDA FMEDA

### Environmental Conditions

- **Ambient temperature:** -40…+80 °C
- **Storage temperature:** -40…+80 °C

### Mechanical data

- **Tightening torque:** 0.8 Nm
- **Electrical connection:** screw terminals
- **Terminal cross-section:** 2.5 mm²
- **Housing material:** plastic
- **Mounting instruction:** for DIN rail
- **Protection class:** IP20
- **Flammability class acc. to UL 94:** V-0
- **Dimensions:** 6.2 x 93.1 x 102.5 mm

### Approval | Certification

- **ATEX, IECEx, UL**
The IMSP-4-12 is a surge protection module, designed for the MSR technology. It protects four 12 V operated floating signal conductors. The devices are IP20 protected and can be installed in Ex as well as non-Ex areas. The only 6.2 mm slim housing can be mounted on DIN rail acc. to DIN NS35.

**Features**

- ATEX, IECEex, UL
- Nominal voltage 12 VDC
- For 4 floating signal conductors
- IEC category: C1 / C2 / C3 / D1
- Flammability class V-0
## Technical data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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<tbody>
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<td>Type</td>
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<td>Ident no.</td>
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<tr>
<td>Nominal voltage $U_n$</td>
<td>12 VDC</td>
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<tr>
<td>IEC category</td>
<td>C1; C2; C3; D1</td>
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<tr>
<td>Surge arrester, rated voltage $U_i$</td>
<td>13 VAC / 18 VDC</td>
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<tr>
<td>Nominal current $I_{n}$ (≤ 40 °C)</td>
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<tr>
<td>Active current $I_a$ with given $U_i$</td>
<td>2 μA (per path)</td>
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<tr>
<td>Leakage current acc. to PE with given $U_i$</td>
<td>4 μA</td>
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<tr>
<td>Nominal discharge surge current $I_{D}$ (8/20) μs (core-core)</td>
<td>350 A</td>
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<tr>
<td>Nominal discharge surge current $I_{D}$ (8/20) μs (core-ground)</td>
<td>5 kA</td>
</tr>
<tr>
<td>Total surge current (8/20) μs</td>
<td>20 μA</td>
</tr>
<tr>
<td>Total surge current (10/350) μs</td>
<td>2 μA</td>
</tr>
<tr>
<td>Discharge surge current $I_{D}$ (8/20) μs (core-to-core)</td>
<td>350 A</td>
</tr>
<tr>
<td>Discharge surge current $I_{D}$ (8/20) μs (core-to-earth)</td>
<td>10 kA</td>
</tr>
<tr>
<td>Nominal pulse current $I_{p}$ (10/1000) μs (core-core)</td>
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</tr>
<tr>
<td>Nominal pulse current $I_{p}$ (10/1000) μs (core-ground)</td>
<td>50 A</td>
</tr>
<tr>
<td>Lightning test current (10/350)μs, peak current $I_{tp}$</td>
<td>500 A</td>
</tr>
<tr>
<td>Output voltage limitation 1kV/μs (core-to-core)</td>
<td>≤ 50 V</td>
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<tr>
<td>Output voltage limitation 1kV/μs (core-to-earth)</td>
<td>≤ 650 V</td>
</tr>
<tr>
<td>Residual voltage $I_{r}$ (core-to-core)</td>
<td>≤ 50 V</td>
</tr>
<tr>
<td>Residual voltage $I_{r}$ (core-to-ground)</td>
<td>≤ 50 V</td>
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<tr>
<td>Protection level $U_p$, C1 - 500 V/250 A (core-core)</td>
<td>≤ 50 V (C1 - 500 V / 250 A)</td>
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<td>Protection level $U_p$, C3 - 10 A (core-core)</td>
<td>≤ 50 V (C3 - 10 A)</td>
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<td>Protection level $U_p$, C1 - 500 V/250 A (core-ground)</td>
<td>≤ 650 V (C1 - 500 V / 250 A)</td>
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<td>Protection level $U_p$, C2 - 10 kV/5 kA (core-ground)</td>
<td>≤ 650 V (C2 - 10 kV / 5 kA)</td>
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<tr>
<td>Protection level $U_p$, D1 - 500 A (core-ground)</td>
<td>≤ 700 V (D1 - 500 A)</td>
</tr>
<tr>
<td>Response time $t_A$ (core-to-core)</td>
<td>≤ 1 ns</td>
</tr>
<tr>
<td>Response time $t_A$ (core-to-earth)</td>
<td>≤ 100 ns</td>
</tr>
<tr>
<td>Insertion loss $a_E$, sym.</td>
<td>Typ 0.1 dB (1 MHz / 50 Ω)</td>
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<tr>
<td>Insertion loss $a_E$, asym.</td>
<td>Typ 0.1 dB (300 kHz / 150 Ω)</td>
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<tr>
<td>Cutoff frequency $f_g$ (3dB), asym. (GND) 50 Ω system</td>
<td>Typ 5 MHz</td>
</tr>
<tr>
<td>Cutoff frequency $f_g$ (3dB), asym. (GND) 150 Ω system</td>
<td>Typ 1.5 MHz</td>
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<tr>
<td>Capacitance</td>
<td>≤ 1.5 nF (per channel)</td>
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<tr>
<td>Resistance per path</td>
<td>0 Ω</td>
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<tr>
<td>Required backup fuse, max.</td>
<td>500 mA</td>
</tr>
<tr>
<td>Surge protection acc. to IEC 61643-21 (core-to-core)</td>
<td>C1 (500 V / 250 A); C3 (25 A)</td>
</tr>
<tr>
<td>Surge protection acc. to IEC 61643-21 (core-to-earth)</td>
<td>C2 (10 kV / 5 kA); C3 (25 A); D1 (500 A)</td>
</tr>
<tr>
<td>AC protection acc. to IEC 61643-21</td>
<td>5 A - 1 s</td>
</tr>
<tr>
<td>Standards for air and creepage distances</td>
<td>IEC 60664-1 / EN 60079-11</td>
</tr>
<tr>
<td>Standards/Regulations</td>
<td>IEC 61643-21 / DIN EN 61643-21</td>
</tr>
</tbody>
</table>

## Approvals and declarations

- Ex approval acc. to conformity certificate: DEKRA 11 ATEX 0016 X
- Device designation: II 1 G, II 1 D Ex ia IIC T4…T6; Ex ieD 20 T85°C…T135°C
- Max. values: Terminal connection: 1…8
  - Max. input voltage $U_i$ ≤ 18 V
  - Max. input current $I_i$ ≤ 500 mA
  - Max. input power $P_i$ ≤ 550 mW
- Internal inductance/capacitance $L_i/C_i$
- Declaration: SIL 2 acc. to EXIDA FMEDA

## Environmental Conditions

- Ambient temperature: -40…+80 °C
- Storage temperature: -40…+80 °C

## Mechanical data

- Tightening torque: 0.8 Nm
- Electrical connection: screw terminals
- Terminal cross-section: 2.5 mm²
- Housing material: plastic
- Mounting instruction: for DIN rail
- Protection class: IP20
- Flammability class acc. to UL 94: V-0
- Dimensions: 6.2 x 93.1 x 102.5 mm

## Approval | Certificate

- ATEX, IECEx, UL

---

Interface technology in modular housing
DIN rail devices, IMSP series
IMC – Interface module cartridge

IMC – Distributed interface technology in IP67

With the highly compact and rugged devices of the IMC series the Ex junction plane can be moved from the control cabinet directly into the field, thus providing more flexibility to the system. The vibration resistant connectors of the IP67 modules ensure safe and reliable operation, even under harsh environmental conditions. In addition to the galvanic isolation, the devices provide “intrinsically safe” explosion protection. Field use is made possible by means of approval to 3 GD, i.e. allows use in zone 2/22 potentially explosive areas caused by combustible dusts or gases (only permissible in combination with the IMC-SG protective housing).
<table>
<thead>
<tr>
<th>Typ</th>
<th>Ident-Nr.</th>
<th>Beschreibung</th>
<th>Seite</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMC-Di-22Ex-PNO/24VDC</td>
<td>7560003</td>
<td>Isolating switching amplifier, 2-channel</td>
<td>486</td>
</tr>
<tr>
<td>IMC-Di-22Ex-PNC/24VDC</td>
<td>7560010</td>
<td>Isolating switching amplifier, 2-channel</td>
<td>488</td>
</tr>
<tr>
<td>IMC-DO-11EX/L</td>
<td>7560008</td>
<td>Solonoid driver, 1-channel</td>
<td>490</td>
</tr>
<tr>
<td>IMC-AI-11EX-I/L</td>
<td>7560004</td>
<td>Input analog signal isolator, 1-channel</td>
<td>492</td>
</tr>
<tr>
<td>IMC-AIA-11EX-I/24VDC</td>
<td>7560009</td>
<td>Isolating transducer, 1-channel</td>
<td>494</td>
</tr>
<tr>
<td>IMC-AO-11EX-I/L</td>
<td>7560006</td>
<td>Ouput analog signal isolator, 1-channel</td>
<td>496</td>
</tr>
</tbody>
</table>
Protection class IP67

The Interface module cartridge (IMC) series opens up new possibilities in the field of process automation. The IS barrier is moved from the control cabinet directly to the installation, thus making it possible to create further decentralized structures in the installation. The use of distributed IMC modules – in parallel with the standard control cabinet solutions – provides additional flexibility for the installation. The IMC modules are highly compact, rugged and IP67 rated. The vibration resistant connectors ensure safe and reliable operation, even under harsh environmental conditions.

Installation in Ex zone 2/22

In addition to the galvanic isolation, the devices provide “intrinsically safe” explosion protection. Field use is made possible by means of approval to 3 GD, i.e. allows use in in explosion hazardous areas (zone 2) with combustible dusts or gases. Different lengths of connection cables are available. The IS cables are provided with premolded connectors at one end. Note: Use in zone 2 is only permissible in combination with the IMC-SG protective housing (can be ordered as a separate accessory).
Wide range of functions

The Interface module cartridge (IMC) series offers a selection of modules with intrinsically safe input/output circuits for different functions and normalized signals in distributed applications. The IMC series with protection to IP67 includes 2-channel isolating switching amplifiers, analog signal isolators with 0...20 mA analog input/output circuits, isolating transducers with a 0...20 mA analog output circuit as well as valve control modules.

Plug-and-play with M12 connectors

The modules of the IMC series are equipped with standard M12 connectors for the electrical connection. This enables the interface devices to be installed and commissioned simply and safely using plug-and-play.
## Interface technology in IP67 housing

### Type code

<table>
<thead>
<tr>
<th>IMC</th>
<th>DI</th>
<th>-</th>
<th>2</th>
<th>2 Ex</th>
<th>PNO</th>
<th>/</th>
<th>24VDC</th>
</tr>
</thead>
</table>

**IMC** Design

- IMC: Interface modul cartridge

**DI** Functional principle

- DI: isolating switching amplifier with line monitoring
- SG: additional protection for IMC housing
- AI: analog input amplifier
- AIA: isolating transducer
- AO: analog output amplifier
- DO: digital output/solenoid driver

**- 2 2** Number of channels

- Number of channels on control side
  - 1: one output channel
  - 2: two output channels

- Number of channels on field side
  - 1: one input channel
  - 2: two input channels
## Interface technology in IP67 housing

**Type code**

<table>
<thead>
<tr>
<th>Device class</th>
<th>Output type</th>
<th>Power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex</td>
<td>PNO</td>
<td>24VDC</td>
</tr>
<tr>
<td>-</td>
<td>/</td>
<td></td>
</tr>
<tr>
<td>Ex associated device with intrinsically safe field circuits</td>
<td>Ex associated device with intrinsically safe field circuits</td>
<td>Ex associated device with intrinsically safe field circuits</td>
</tr>
<tr>
<td>P O</td>
<td>PNP transistor output NO</td>
<td>24 VDC supplied with 24 VDC</td>
</tr>
<tr>
<td>P N C</td>
<td>PNP transistor output NC</td>
<td>loop powered, supplied by the control circuit</td>
</tr>
<tr>
<td>I</td>
<td>analog current output 0/4...20mA</td>
<td>loop powered, supplied by the control circuit</td>
</tr>
<tr>
<td>2 2</td>
<td>Number of channels</td>
<td>Number of channels on control side</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Number of channels on field side</td>
<td>Number of channels on field side</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Distributed interface modules in IP67 housing
For direct field installation, IMC series

Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IMC-Di-22Ex-PNO/24VDC is equipped with intrinsically safe input circuits.

Sensors according to EN 60947-5-6 (NAMUR), variable resistors or potential free contactors can be connected to the device.

The output circuits feature two NO transistors. A green LED indicates operational readiness.

Features
- ATEX, IECEx, TR CU
- Installation in zone 2/22
- Isolating switching amplifier with M12 x 1 connectors, 2-channel
- Line monitored for wire-break/short-circuit (ON/OFF switchable)
- PNP transistor output NO
- Complete galvanic isolation
- Protection class IP67

The device must be protected against mechanical load on connector and housing when mounted in zone 2 or 22. For this, use the TURCK cover plate IMC-SG (ident no. 7560016).

Pin assignment male M12

Pin assignment female M12 (intrinsically safe end)
# Technical data

**Type**
- IMC-Di-22Ex-PNO/24VDC

**Ident no.**
- 7560003

## Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20…30 VDC</td>
</tr>
</tbody>
</table>

## Inputs

<table>
<thead>
<tr>
<th>No-load voltage</th>
<th>8.2 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-circuit current</td>
<td>8.2 mA</td>
</tr>
<tr>
<td>Input resistance</td>
<td>1 kΩ</td>
</tr>
<tr>
<td>Cable resistance</td>
<td>≤ 50 Ω</td>
</tr>
<tr>
<td>Switch-on threshold:</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Switch-off threshold:</td>
<td>1.75 mA</td>
</tr>
</tbody>
</table>

## Outputs

<table>
<thead>
<tr>
<th>Output circuits (digital)</th>
<th>2 x transistors (pnp, short-circuit proof)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching voltage</td>
<td>≤ 30 VDC</td>
</tr>
<tr>
<td>Switching current per output</td>
<td>≤ 50 mA</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 3000 Hz</td>
</tr>
</tbody>
</table>

## Approvals and declarations

| Ex approval acc. to conformity certificate | TÜV 07 ATEX 553447 |
| Device designation | Ex ia II (1) GD [Ex ia] IIC/IIB |
| Max. output voltage $U_0$ | ≤ 9.6 V |
| Max. output current $I_0$ | ≤ 10 mA |
| Max. output power $P_0$ | ≤ 24 mW |
| Rated voltage | 250 V |
| Characteristic | linear |
| Internal inductance/capacitance $L_i/C_i$ | $L_i = 0.15 \text{ mH}, C_i = \text{negligibly small}$ |

### External inductance/capacitance $L_e/C_e$

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_e$ (mH)</td>
<td>0.85</td>
<td>1.85</td>
</tr>
<tr>
<td>$C_e$ (nF)</td>
<td>1100</td>
<td>750</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ex nl</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_e$ (mH)</td>
<td>5.0</td>
<td>0.85</td>
</tr>
<tr>
<td>$C_e$ (nF)</td>
<td>1400</td>
<td>1900</td>
</tr>
</tbody>
</table>

### Max. values:
- M12 female connection: 1+4 / 2+3
- $U_0 ≤ 9.6$ V
- $I_0 ≤ 10$ mA
- $P_0 ≤ 24$ mW

### Characteristic
- Linear
- $L_i = 0.15 \text{ mH}, C_i = \text{negligibly small}$

### Environmental Conditions

| Ambient temperature | -25 ... +70 °C |
| Storage temperature | -40 ... +80 °C |
| Test voltage | 2.5 kV |
| MTTF | 295 years acc. to SN 29500 (Ed. 99) 40 °C |

## Indication

| Operational readiness | green |
| Switching state | yellow |
| Error indication | red |

## Mechanical data

- Tightening torque: 3.5 Nm
- Electrical connection: M12 flange connection
- Housing material: Polycarbonate/ABS
- Mounting instruction: for panel
- Protection class: IP67
- Dimensions: 32 x 100 x 25 mm

## Approval | Certification

- ATEX, IECEx, TR CU
- TÜV 07 ATEX 554027 X
- SIL2 acc. to EXIDA FMEDA
Isolating switching amplifier, 2-channel

The 2-channel isolating switching amplifier IMC-DI-22EX-PNC/24VDC is equipped with intrinsically safe input circuits. Sensors according to EN 60947-5-6 (NAMUR), variable resistors or potential free contactors can be connected to the device. The output circuits feature two NO transistors. A green LED indicates operational readiness.

- ATEX, IECEx, TR CU
- Installation in zone 2/22
- Isolating switching amplifier with M12 x 1 connectors, 2-channel
- Line monitored for wire-break/short-circuit (ON/OFF switchable)
- PNP transistor output, NC
- Complete galvanic isolation
- Protection class IP67

The device must be protected against mechanical load on connector and housing when mounted in zone 2 or 22. For this, use the TURCK cover plate IMC-SG (ident no. 7560016).
Interface technology

Isolating switching amplifier, 2-channel

Technical data

Type
IMC-DI-22EX-PNC/24VDC
Ident no.
7560010

Power supply
Nominal voltage
24 VDC
Operating voltage range
20…30 VDC

Inputs
No-load voltage
8.2 VDC
Short-circuit current
8.2 mA
Input resistance
1 kΩ
Cable resistance
≤ 50 Ω
Switch-on threshold:
1.55 mA
Switch-off threshold:
1.75 mA

Outputs
Output circuits (digital)
2 x transistors (pnp, short-circuit proof)
Switching voltage
≤ 30 VDC
Switching current per output
≤ 50 mA
Switching frequency
≤ 3000 Hz

Approvals and declarations
Ex approval acc. to conformity certificate
TÜV 07 ATEX 554027 X
Device designation
II 3 GD [Ex ia] IIC/IIB
Max. values:
Max. output voltage $U_o$ ≤ 9.6 V
Max. output current $I_o$ ≤ 10 mA
Max. output power $P_o$ ≤ 24 mW
Rated voltage
250 V
Characteristic
linear
Internal inductance/capacitance $L_i/C_i$
$L_i = 0.15 \text{ mH}, C_i = \text{negligibly small}$
External inductance/capacitance $L_e/C_e$

<table>
<thead>
<tr>
<th>Ex</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex nl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$L_e$ [mH]</td>
<td>5.0</td>
<td>0.85</td>
</tr>
<tr>
<td>$C_e$ [nF]</td>
<td>1400</td>
<td>1900</td>
</tr>
</tbody>
</table>

Ex approval acc. to conformity certificate
TÜV 07 ATEX 554027 X
Approval
SIL2 acc. to EXIDA FMEDA

Environmental Conditions
Ambient temperature
-25…+70 °C
Storage temperature
-40…+80 °C
Test voltage
2.5 kV
MTTF
295 years acc. to SN 29500 (Ed. 99)

Mechanical data
Tightening torque
3.5 Nm
Electrical connection
M12 flange connection
Housing material
Polycarbonate/ABS
Mounting instruction
for panel
Protection class
IP67
Dimensions
32 x 100 x 25 mm

Approval | Certification
ATEX, IECEx, TR CU

Indication
Operational readiness
green
Switching state
yellow
Error indication
red

Electrical connection
M12 flange connection
Housing material
Polycarbonate/ABS
Mounting instruction
for panel
Protection class
IP67
Dimensions
32 x 100 x 25 mm

Approval | Certification
ATEX, IECEx, TR CU
Distributed interface modules in IP67 housing
For direct field installation, IMC series

Solonoid driver, 1-channel

The 1-channel solonoid driver IMC-DO-11Ex/L features an intrinsically safe output circuit. The device can be mounted in zone 2.

The device must be protected against mechanical load on connector and housing when mounted in zone 2 or 22. For this, use the TURCK cover plate IMC-SG (ident no. 7560016).

Typical applications are the control of Ex i pilot valves and pilot lights as well as the supply of transmitters.

The device is loop-powered. External power supply is not required.

Features

- ATEX, IECEx, TR CU
- Installation in zone 2/22
- Valve control module with M12 x 1 connectors, 1-channel
- Complete galvanic isolation
- Protection class IP67

Pin assignment male M12

Switching status

2
3
4
5

Pin assignment female M12 (intrinsically safe end)

1
2
3
4
5
## Technical data

**Type** IMC-DO-11EX/L  
**Ident no.** 7560008

### Power supply

- **Nominal voltage**: 24 VDC loop-powered  
- **Power consumption**: ≤ 1.3 W

### Inputs

- **0-signal**: 0...5 VDC  
- **1-signal**: 20...30 VDC
- **Voltage input**: max. 30 VDC  
- **Current input**: 45 mA  
- **Input delay**: ≤ 1 ms

### Outputs

- **Output circuits**: intrinsically safe acc. to EN 60079
- **Output current**: 40 mA  
- **Output voltage**: 24 V
- **Output curve**

![Output curve diagram]

- **Response characteristic**
  - **Limit frequency**: ≤ 500 Hz  
  - **Measuring accuracy**: ≤ 0.1 % of full scale

### Approvals and declarations

- **Ex approval acc. to conformity certificate**: TÜV 07 ATEX 553265  
- **Device designation**: M12 female connection: 1+3
- **Max. values:**  
  - **Max. output voltage** $U_o$: ≤ 27 V  
  - **Max. output current** $I_o$: ≤ 95 mA  
  - **Max. output power** $P_o$: ≤ 674 mW
- **Characteristics**
  - **Internal inductance/capacitance** $L_i/C_i$ negligible small

### External inductance/capacitance

<table>
<thead>
<tr>
<th>Ex nl</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_i$ [mH]</td>
<td>4.0</td>
<td>0.5</td>
</tr>
<tr>
<td>$C_i$ [nF]</td>
<td>74</td>
<td>130</td>
</tr>
</tbody>
</table>

### Indication

- **Switching state**: yellow

### Environmental Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25...+70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40...+80 °C</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2.5 kV</td>
</tr>
<tr>
<td>MTTF</td>
<td>326 years acc. to SN 29500 (Ed. 99)</td>
</tr>
</tbody>
</table>

### Mechanical data

- **Tightening torque**: 3.5 Nm  
- **Electrical connection**: M12 flange connection  
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for panel  
- **Protection class**: IP67
- **Dimensions**: 32 x 100 x 25 mm

### Approval and Certification

- **ATEX, IECEx, TR CU**
### Input analog signal isolator, 1-channel

The 1-channel analog signal isolator IMC-AI-11EX-I/L features an intrinsically safe input circuit. The device can be mounted in zone 2.

The device must be protected against mechanical load on connector and housing when mounted in zone 2 or 22. For this, use the TURCK cover plate IMC-SG (Ident no. 7560016).

The standard current signal is transmitted from the Ex-area to the safe area without attenuation (1:1). The output circuit is equipped with a short-circuit protected power source.

**Features**

- ATEX, IECEx, TR CU
- Installation in zone 2/22
- Analog signal isolator with M12 x 1 connectors, 1-channel
- Input circuit: 0/4…20 mA
- Output circuit: 0/4…20 mA
- Complete galvanic isolation
- Protection class IP67

**Pin assignment male M12**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input</td>
</tr>
<tr>
<td>2</td>
<td>Input</td>
</tr>
<tr>
<td>3</td>
<td>Output</td>
</tr>
<tr>
<td>4</td>
<td>Output</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
</tr>
</tbody>
</table>

**Pin assignment female M12 (intrinsically safe end)**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input</td>
</tr>
<tr>
<td>2</td>
<td>Input</td>
</tr>
<tr>
<td>3</td>
<td>Output</td>
</tr>
<tr>
<td>4</td>
<td>Output</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Intrinsically save analog data transmitters can be connected to the device in the Ex area.

The device is loop-powered.
## Technical data

### Type
- **Type**: IMC-AI-11EX-I/L
- **Ident no.**: 7560004

### Power supply
- **Nominal voltage**: 24 VDC loop-powered
- **Power consumption**: ≤ 3 W

### Inputs
- **Voltage input**: max. 30 VDC
- **Current input**: 0…20 mA

### Outputs
- **Load resistance, current output**: ≤ 0.4 kΩ
- **Output voltage**: max. 13 VDC
- **Output current**: 0…20 mA

### Response characteristic
- **Measuring accuracy**: ≤ 0.1 % of full scale
- **Reference temperature**: 23 °C
- **Temperature drift**: ≤ 0.005 % / K
- **Rise time (10-90%)**: ≤ 10 ms
- **Dropout time (90…10%)**: ≤ 10 ms

### Approvals and declarations
- **Ex approval acc. to conformity certificate**: TÜV 07 ATEX 553222
- **Device designation**: II (1) GD [Ex ia] IIIC/IIB
- **Rated voltage**: 250 V
- **Max. values: M12 female connection**: 2+4
- **Max. input voltage U_i**: ≤ 27 V
- **Max. input current I_i**: ≤ 150 mA
- **Max. input power P_i**: ≤ 1000 mW
- **Internal inductance/capacitance L_i/C_i**: negligibly small
- **Ex approval acc. to conformity certificate**: TÜV 07 ATEX 553945 X
- **Application area**: II 3 GD
- **Protection type**: Ex nA [nL] IIC/IIB T4 or rather Ex tDA 22 IB67 T80°C
- **Max. values: M12 female connection**: 2+4
- **Max. input voltage U_i**: ≤ 27 V
- **Max. input current I_i**: ≤ 150 mA
- **Max. input power P_i**: ≤ 1000 mW
- **Approval**: SIL2 acc. to EXIDA FMEDA

### Environmental Conditions
- **Ambient temperature**: -25…+70 °C
- **Storage temperature**: -40…+80 °C

### Mechanical data
- ** Tightening torque**: 3.5 Nm
- **Electrical connection**: M12 flange connection
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction**: for panel
- **Protection class**: IP67
- **Dimensions**: 32 x 100 x 25 mm

### Approval | Certification
- **ATEX, IECEx, TR CU**
The 1-channel isolating transducer IMC-AIA-11Ex-i/24VDC features an intrinsically safe input circuit. The device can be mounted in zone 2.

The device must be protected against mechanical load on connector and housing when mounted in zone 2 or 22. For this, use the TURCK cover plate IMC-SG (Ident no. 7560016).

The standard current signal is transmitted from the Ex-area to the safe area without attenuation (1:1). The output circuit is equipped with a short-circuit protected power source.

Intrinsically save analog data transmitters can be connected to the device in the Ex area.

The device is designed for a 24 VDC supply. A green LED indicates operational readiness.

Features

- ATEX, IECEx, TR CU
- Installation in zone 2/22
- Isolating transducer with M12 x 1 connectors, 1-channel
- Output circuit: 0/4…20 mA
- Complete galvanic isolation
- Protection class IP67
### Technical data

#### Type

<table>
<thead>
<tr>
<th>Type</th>
<th>IMC-AIA-11EX-I/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident no.</td>
<td>7560009</td>
</tr>
</tbody>
</table>

#### Power supply

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>20...30 VDC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 1.5 W</td>
</tr>
</tbody>
</table>

#### Inputs

| Supply voltage | ≤ 14 V / 20 mA |
| Current | 25 mA |
| Current input | 4...20 mA |

#### Outputs

| Load resistance, current output | ≤ 0.5 kΩ |
| Output current | 0...20 mA |

#### Response characteristic

| Measuring accuracy | ≤ 0.1 % of full scale |
| Reference temperature | 23 °C |
| Temperature drift | ≤ 0.005 % / K |
| Rise time (10-90%) | ≤ 10 ms |
| Dropout time (90...10%) | ≤ 10 ms |

#### Approvals and declarations

- **Ex approval acc. to conformity certificate**: TÜV 07 ATEX 553644
- **Device designation**: Ex (I) GD [Ex ia] II B
- **Max. values**: M12 female connection: 1+2
  - Max. output voltage $U_o$ ≤ 21.8 V
  - Max. output current $I_o$ ≤ 64.5 mA
  - Max. output power $P_o$ ≤ 1130 mW
- **Rated voltage**: 250 V
- **Characteristics**: Trapezoidal
  - Internal inductance/capacitance $L_i/C_i$: $L_i$ = negligibly small; $C_i$ = 11 nF
  - External inductance/capacitance $L_e/C_e$

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_i$ [mH]</td>
<td>5.8</td>
</tr>
<tr>
<td>$C_i$ [nF]</td>
<td>469</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ex nL</th>
<th>IIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_e$ [mH]</td>
<td>0.85</td>
</tr>
<tr>
<td>$C_e$ [nF]</td>
<td>129</td>
</tr>
</tbody>
</table>

#### Approval | Certification

- **Ex approval acc. to conformity certificate**: TÜV 07 ATEX 554129 X
- **Ex nL**: II 3G, II 3D
- **Ex approval according to standard**: TÜV A22 IP67 T 80 °C Dc

---

#### Environmental Conditions

- **Ambient temperature**: -25...+70 °C
- **Storage temperature**: -40...+80 °C
- **Test voltage**: 2.5 kV
- **MTTF**: 294 years acc. to SN 29500 (Ed. 99)

#### Mechanical data

- **Tightening torque**: 3.5 Nm
- **Electrical connection**: M12 flange connection
- **Housing material**: Polycarbonate/ABS
- **Mounting instruction for panel**: for panel
- **Protection class**: IP67
- **Dimensions**: 32 x 100 x 25 mm

---

**Indication**

Operational readiness: green
The 1-channel analog signal isolator IMC-AO-11Ex-i/L features an intrinsically safe output circuit. The device can be mounted in zone 2.

The device must be protected against mechanical load on connector and housing when mounted in zone 2 or 22. For this, use the TURCK cover plate IMC-SG (Ident no. 7560016).

The normalized current signal is transmitted, galvanically isolated 1:1, from the non-Ex to the Ex-area. The output circuit is equipped with a short-circuit proof power source.

Intrinsically analog actuators like I/P converters (e.g. at control valves) or displays can be applied in the Ex area.

The device is loop-powered.

**Features**

- ATEX, IECEx, TR CU
- Installation in zone 2/22
- Analog signal isolator with M12 x 1 connectors, 1-channel
- Input circuit: 0/4…20 mA
- Output circuit: 0/4…20 mA
- Complete galvanic isolation
- Protection class IP67
Technical data

**Type**
IMC-AO-11EX-I/L

**Ident no.**
7560006

**Power supply**
Nominal voltage
24 VDC loop-powered

Power consumption
≤ 3.5 W

**Inputs**
Voltage input
max. 30 VDC

Current input
0…20 mA

**Outputs**
Load resistance, current output
≤ 0.4 kΩ

Output current
0…20 mA

**Response characteristic**
Measuring accuracy
≤ 0.1 % of full scale

Reference temperature
23 °C

Temperature drift
≤ 0.005 % / K

Rise time (10-90%) ≤ 10 ms

Dropout time (90…10%) ≤ 10 ms

**Approvals and declarations**
Ex approval acc. to conformity certificate
TÜV 07 ATEX 553223

Device designation
II (1) GD Ex ia IIC/IIB

Max. values:
M12 female connection: 1+3

Max. output voltage $U_o$
≤ 13.3 V

Max. output current $I_o$
≤ 97 mA

Max. output power $P_o$
≤ 322 mW

Rated voltage
250 V

Characteristic
linear

Internal inductance/capacitance $L_i/C_i$
negligibly small

**External inductance/capacitance $L_e/C_e$**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_e$ [mH]</td>
<td>2</td>
<td>0.2</td>
</tr>
<tr>
<td>$C_e$ [nF]</td>
<td>420</td>
<td>910</td>
</tr>
</tbody>
</table>

Ex approval acc. to conformity certificate
TÜV 07 ATEX 553946 X

Application area
II 3G, II 3D

Protection type
Ex nA (nL) IIC/IIB T4 or rather Ex tD A22 IP67 T80°C

Max. values:
M12 female connection: 1+3

Max. output voltage $U_o$
≤ 13.3 V

Max. output current $I_o$
≤ 97 mA

Max. output power $P_o$
≤ 322 mW

Characteristic
linear

Internal inductance/capacitance $L_e/C_e$
negligibly small

**Environmental Conditions**
Ambient temperature
-25…+70 °C

Storage temperature
-40…+80 °C

Test voltage
2.5 kV

MTTF
566 years acc. to SN 29500 (Ed. 99)

40 °C

**Mechanical data**

| Tightening torque | 3.5 Nm |
| Electrical connection | M12 flange connection |
| Housing material | Polycarbonate/ABS |
| Mounting instruction | for panel |
| Protection class | IP67 |
| Dimensions | 32 x 100 x 25 mm |

**Approvals | Certification**

ATEX, IECEx, TR CU
Interface Technology – Accessories

**WM1 WIDERSTANDSMODUL 0912101**
The resistor module WM1 meets the requirements for line monitoring between a mechanical contact and a TURCK signal processor. The input circuit of the signal processor is designed for sensors acc. to EN 60947-5-6 (NAMUR) and equipped with a wire-break and short-circuit monitoring function.

**IM-3-CJT 6900524**
Cold junction compensation module for IM 34 temperature measuring amplifiers, width 18 mm

**IM-PROG 6890422**
The programming adapter IM-PROG III is used for the parametrization of TURCK IM devices via FDT/DTM. In addition, the in-PROG III provides galvanic isolation.

**IM-PROG III 7525111**
The IM-PROG is intended for the parametrization of TURCK devices with PACTware™ via the serial interface of a PC.

**IM-CC-3X2BU/2BK 6900475**
Cage clamp terminals for IM modules (Ex-devices with 18 mm overall width); includes: 2 pcs. 3-pin blue terminals and 2 pcs. 3-pin black terminals.

**IM-CC-3X2BK/2BK 7541218**
Cage clamp terminals for IM modules (Ex-devices with 18 mm overall width); includes: 4 pcs. of 3-pin black terminals

**IM-CC-5X2BU/2BK 7504031**
Cage clamp terminals for IM modules (Ex-devices with 27 mm overall width); includes: 2 pcs. 5-pin blue terminals and 2 pcs. 5-pin black terminals.

**IM-CC-5X2BK/2BK 7541219**
Cage clamp terminals for IM modules (Ex-devices with 27 mm overall width); includes: 4 pcs. of 5-pin black terminals

**PB-08/03 6900370**
Power-supply bus for 8 TURCK IM interface modules

**PB-16/03 6900371**
Power-supply bus for 16 TURCK IM interface modules

**PB-32/03 6900372**
Power-supply bus for 32 TURCK IM interface modules
<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMC-SG</td>
<td>Metal cover plate for IMC modules (required for application in zones 2/22)</td>
<td>7560016</td>
</tr>
<tr>
<td>SC-M12/3GD</td>
<td>Captive safety clip for sensors with M12 x 1 connectors and approval acc. to ATEX II 3 G or II 3 D.</td>
<td>6900390</td>
</tr>
</tbody>
</table>
Basics of explosion protection

Terms and explanations

Directives and standards

Development of directives

Up to the end of 1975, only national regulations covering the field of explosion protection existed in the individual European states. On 18 December 1975, the first framework directive for above ground explosion protection came into effect, and became applicable in the member states of the European Union: Directive 76/117/EEC.

By 1990 Directive 76/117/EEC had been modified several times. This directive referred to the characteristics and structure of the equipment at issue and was directly related to standards which applied exclusively to electrical equipment and explosion protection (except mining). As national regulations were still in force, the free transport of goods was still restricted.

At the beginning of 1994, the “Framework Directive 94/9/EC of the European Parliament and Council of 23 March 1994 on the approximation of laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres” was passed. This directive refers to the “Single European Act” of 1985 in accordance with Article 100a of the First Treaty for Establishing the European Community in the version of February 7, 1992. “ATEX 100a” is the standard abbreviation (ATEX derived from the French term “atmosphère explosible”). Besides Article 100a, there are other articles that have not been transposed in directives. In TURCK catalogs, the term ATEX always refers to the regulations pertaining to ATEX 100a.

The ATEX 100a Directive was integrated into national laws in the individual Member States of the EU, such as in Germany, with the Gerätesicherheitsgesetz (§11 GSGV - Equipment Safety Law) – since 1 December 2011, Produktsicherheitsgesetz (§34 ProdSG – Product Safety Law) – and the Explosionsschutzverordnung ExVO (11. ProdSV - Explosion Protection Ordinance).

The validity of the previous regulations for explosion protection expired on 30.06.2003. ATEX 100a came into force on 1 July 2003, and was superseded by ATEX 95a.

Efforts to harmonize explosion protection regulations worldwide led to the creation of IEC 60079. The aim here is to enable the free movement of goods worldwide. The IECEx scheme specifying approval requirements for equipment was first of all defined for this purpose. This also stipulates the provision of a quality management system which is binding for the manufacturer.

Installation and operation of electrical equipment in hazardous areas – standards and regulations

The following persons are involved in the installation, acceptance and operation of electrical equipment:

- The legislator responsible for industrial supervision, trade organizations, TÜV and experts as supervisory authorities.
- All plant personnel are required to act responsibly and observe precautionary measures such as smoking restrictions and work regulations during the servicing and operation of electrical equipment located in the hazardous area.
- Plant builders who must meet safety requirements according to EN 60079-14, (RL 1999/92/EC), ATEX 137.
- The manufacturers of components subject to construction requirements set forth by IEC/EN 60079 and ATEX 95a (RL 94/9/EC).

EN 60079-14 and DIN VDE 0165 – Installation of electrical equipment in explosion hazardous areas

The DIN VDE 0165 standard includes the safety requirements that must be observed (e.g. classification of explosion hazardous areas into zones, temperature classes, cable routing, requirements for the installation of electrical devices in zones 0, 1 and 2, many specific provisions). Unlike the standards described above, which are primarily for manufacturers, this standard applies to plant builders, operators and test personnel.

The rules for the interconnection are based on the installation requirements of IEC 60079-14 and EN 60079-14. These stipulate that the safety-related maximum values of the input and output parameters of the equipment must be compared in order to assess if the interconnection of several devices with intrinsically safe circuits complies with the requirements of intrinsic safety.

Ordinance on Industrial Safety and Health – (BetrSichV)

The industrial safety ordinance BetrSichV governs the health and safety aspects of the provision of work equipment and its use at work. Furthermore BetrSichV regulates the operation of equipment requiring supervision and the organization of occupational health and safety precautions.

ATEX 137 – Directive for plant operators

The 1999/92/EC Directive of the European Parliament and Council, dated 16 December 1999, describes the minimum health and safety requirements for improving the health and safety of employees exposed to the potential hazards of a potentially explosive atmosphere (previously ATEX 118, now ATEX 137). The directive is aimed at plant operators and employers and stipulates the requirements to be observed. These include the assessment of the risks resulting from a potentially explosive atmosphere, the classification of areas exposed to potentially explosive atmospheres, and the keeping of an explosion protection document.
Basics of explosion protection

Definition of terms

Explosion

By an explosion is meant an exothermic reaction of material (gas, vapor, mist or dust) that takes place at a very high speed of reaction. The risk of an explosion exists wherever there is the probability of an explosive atmosphere. This is possible wherever dust, flammable gases or liquids are manufactured, processed, transported or stored. Such hazardous atmospheres can be present for instance in chemical industries, gas stations, refineries, power plants, paint shops, vehicles, sewage plants, grain mills, airports, grain silos and filling plants.

Explosion hazards

Explosion hazards only exist in locations
- in which ignitable concentrations of flammable substances can exist under normal operating conditions or in the event of faults, and when these conditions provide the probability that a dangerous substance to air mixture is enough to form an explosive mixture;
- where the explosive or ignitable mixtures can come in contact with a source of ignition and continue to burn after ignition.

Explosive mixture (generic term)

An explosive mixture is a mixture of gases or vapors, mists or dusts, capable of propagating a reaction after ignition.

Potentially explosive atmosphere

A potentially explosive atmosphere contains gases, vapors, mists or dusts mixed with air, as well as the usual filler materials that can explode spontaneously under atmospheric conditions (see also ‘Explosive mixture’). This can occur wherever dust, flammable gases or liquids are manufactured, processed, transported or stored.

Potentially explosive atmosphere (hazardous)

A hazardous explosive atmosphere is a mixture containing concentrations of flammable gases or vapors that, when ignited, can cause damage to persons directly or indirectly through an explosion (see also ‘Hazardous explosive atmosphere’).

Hazardous area

A hazardous area is an area in which there is a risk of explosion, i.e. a hazardous explosive atmosphere can occur due to local operating conditions. Such hazardous atmospheres can be present for instance in chemical industries, gas stations, refineries, power plants, paint shops, vehicles, sewage plants, grain mills, airports, grain silos and filling plants.
Basics of explosion protection
Terms and explanations

Ignition triangle
An ignition is only possible if three factors are present at the same time:

- oxygen
- ignition source
- fuel

Possible ignition sources:
- hot surfaces
- flames and hot gases
- mechanically generated sparks
- electrical installations
- transient currents
- static electricity
- lightning, ultrasonic energy...

Oxidizers:
- air (21 % oxygen)
- pure oxygen
- oxygen releasing compounds (potassium permanganate etc.)

Combustible substances:
- Gases and dusts arising from flammable liquids and solid materials and present in the correct concentration for an explosion.

Explosive limits
A mixture is only explosive if the concentration is within certain material specific limits. These limits are called the upper and lower explosion limits and are listed in appropriate tables.

Flash-point
The flash-point is the lowest temperature at which a liquid releases sufficient vapors that can be ignited when close to an energy source and extinguished when the energy source is removed.

Primary and secondary explosion protection
Primary and secondary explosion protection measures are used to prevent explosions.

Primary explosion protection
Primary explosion protection consists of measures with which the formation of a hazardous atmosphere can be prevented:
- Avoiding the use of flammable liquids
- Increasing the flash point
- Limiting the concentration
- Natural and technical ventilation
- Monitoring the concentration...

(see also 'Secondary explosion protection')

Secondary explosion protection
Secondary explosion protection consists of measures with which the ignition of a hazardous atmosphere is prevented. For this purpose the electrical equipment is designed so that
- the equipment does not form an effective ignition source and the combining of ignition source and potentially explosive atmosphere is prevented.
- the penetration of ignition into the surrounding explosive atmosphere is prevented.

(see also 'Primary explosion protection')

Electrical equipment featuring ignition protection class „Intrinsic Safety“ (IEC/EN 60079-11)

Intrinsically safe and associated electrical equipment
By "intrinsic safety" is meant the reduction of energy in an intrinsically safe circuit so that a thermal effect or spark is incapable of igniting a potentially explosive atmosphere under specified test conditions.

TURCK devices for use in explosion hazardous locations comply with protection type “intrinsic safety”. The devices are categorized as intrinsically safe equipment and associated equipment. This distinction is clearly indicated by the marking of the devices (see section „Marking of equipment“). Intrinsically safe electrical equipment consists of devices that are provided exclusively with intrinsically safe circuits. They can be installed directly in the explosion hazardous area provided that the necessary requirements are observed (example: an approved NAMUR sensor in accordance with EN 60947-5-6 or transmitter).

Associated equipment is equipment that incorporates non-intrinsically safe circuits as well as intrinsically safe circuits. Intrinsically safe equipment may be connected to associated equipment, provided that all essential conditions for this kind of interconnected assembly are fulfilled. For example, an isolating switching amplifier is classed as associated equipment and the connected NAMUR sensor as intrinsically safe equipment.

Associated equipment must be installed outside of the Ex area or must be protected additionally by means of another protection type, e.g. flameproof enclosure or pressurized enclosure. A number of TURCK devices are approved for zone 2, enabling the installation of a device in the Ex area. All TURCK devices with intrinsically safe circuits (such as the interface module types) are classified as associated equipment.

Simple electrical equipment
Simple components and simple equipment that do not generate or store more than 1.5 V, 0.1 A and 25 mW do not require a test certificate and are classified as "simple electrical equipment" (e.g. thermocouples). This equipment is defined in the standard EN 60079-14.
Categories

Intrinsically safe and associated electrical equipment are subdivided into three categories according to EN 60079-11. The subdivision is based on the fault probability in the intrinsically safe circuit in conjunction with the possibility of ignition.

Category ia

Category “ia” indicates that the electrical equipment should not be able to ignite a dangerous mixture during normal operation, in the event of a single fault, and in the event of any combination of two faults. Intrinsic safety must be maintained when two independent faults occur at the same time. Components of any equipment of category “ia” that are susceptible to faults must therefore be available in triplicate.

Category ib

Category “ib” states that no ignition must occur in normal operation in the event of a fault. The intrinsic safety must be ensured in the event of a fault. A fault could be the failure of a safety-relevant component. With category ib equipment, safety-related components must therefore be provided in duplicate.

Category ic

Category “ic” denotes that no ignition must occur in normal operation. From 2011 this protection type replaces protection “nL” for use in zone 2. The benefits of intrinsically safe circuits are thus also available in this zone.

Ignition protection class n (EN 60079-15)

Devices with ignition protection class “n” must only be installed in zone 2 or 22. The devices must not provide any ignition sources in normal operation; no maintenance must be carried out during the operation. This must be ensured by means of suitable marking and mechanical locking.

Groups and temperature classes

Electrical equipment for use in explosion hazardous areas is classified into groups and classes based on the likelihood of an explosion hazard. This is of special importance in terms of safety and financial considerations because it determines the requirements that must be met by the electrical equipment. The division into groups is based on the location where the equipment is going to be used:

- Group I classified equipment may be used in mines susceptible to firedamp and must conform to EN 60079 and additional mining standards (e.g. EN 50303).
- Group II classified equipment may not be used in mining applications susceptible to firedamp but in all other explosion hazardous areas.

Group II classified equipment is used in all explosion hazardous areas except mining applications susceptible to firedamp. However, group II devices must be further classified depending on the application area in which they are used and the different flammable substances and ignition energy involved. A further subdivision of group II is therefore necessary and also useful for financial reasons.

The subdivision of group II equipment is based on the different ignition energy of the flammable materials. The different groups are classified by capital letters in ascending alphabetical order according to the hazard risk of the associated materials. Materials belonging to group C require less ignition energy than Group A materials. (see Tab. 1)

<table>
<thead>
<tr>
<th>Group</th>
<th>Subdivision</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>ethic acid</td>
<td>methan, ethane, benzene, aldehyde, acetate, acetone, carbon monoxide, methanol, propane, toluene</td>
</tr>
<tr>
<td>II A</td>
<td>acetone, ethane, acetic acid, carbon monoxide, methanol, propane, toluene</td>
<td>benzen, acetaldehyde, ethyl aether</td>
</tr>
<tr>
<td>II B</td>
<td>town gas (coal gas)</td>
<td>ethylene*</td>
</tr>
<tr>
<td>II C</td>
<td>hydrogen</td>
<td>ethylene*</td>
</tr>
</tbody>
</table>

*) no authorized regulations available

Tab. 1: Division of flammable materials – groups and temperature classes

Temperature class

The temperature class is the maximum permissible surface temperature of a device. The explosion protected apparatus can also be approved for several temperature classes – depending on technical and financial considerations.

Depending on the protection type the lowest possible temperature class is thus usually achieved with relatively extensive technical effort and accordingly high expense. The effort required for “intrinsic safety” is relatively low in comparison. Only intrinsically safe equipment that is installed directly in the explosion hazardous area requires a temperature class. The specification of a temperature class for associated equipment is not required.
**Ignition temperature**

The ignition temperature (defined as the temperature at which a mixture is susceptible to ignition in the course of a defined test procedure) is directly related to the temperature class. The temperature class indicates the maximum surface temperature of the electrical equipment and must be lower than the ignition temperature of the flammable material in order to prevent an ignition. (see Tab. 2)

<table>
<thead>
<tr>
<th>IEC/EN NEC 505-10 temperature class</th>
<th>Maximum surface temperature of the equipment (°C)</th>
<th>Ignition temperature of the flammable material (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>450</td>
<td>&gt;450</td>
</tr>
<tr>
<td>T2</td>
<td>300</td>
<td>&gt;300 ≤ 450</td>
</tr>
<tr>
<td></td>
<td>280</td>
<td>&gt;280 ≤ 300</td>
</tr>
<tr>
<td></td>
<td>260</td>
<td>&gt;260 ≤ 280</td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>&gt;230 ≤ 260</td>
</tr>
<tr>
<td></td>
<td>215</td>
<td>&gt;215 ≤ 230</td>
</tr>
<tr>
<td>T3</td>
<td>200</td>
<td>&gt;200 ≤ 300</td>
</tr>
<tr>
<td></td>
<td>180</td>
<td>&gt;180 ≤ 200</td>
</tr>
<tr>
<td></td>
<td>165</td>
<td>&gt;165 ≤ 180</td>
</tr>
<tr>
<td></td>
<td>160</td>
<td>&gt;160 ≤ 180</td>
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<tr>
<td>T4</td>
<td>135</td>
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<td></td>
<td>120</td>
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<tr>
<td>T5</td>
<td>100</td>
<td>&gt;100 ≤ 135</td>
</tr>
<tr>
<td>T6</td>
<td>85</td>
<td>&gt;85 ≤ 100</td>
</tr>
</tbody>
</table>

Tab. 2: Temperature classes with maximum permissible surface temperatures and ignition temperatures

**Device groups and equipment categories according to ATEX**

The ATEX device marking directive specifies an unambiguous marking for the application range and the design safety level of a device. EN 60079-11 also provides detailed information on how the protection measures were implemented and which applications are permitted and uses similar terms, but the information provided by EN 60079-11 and ATEX may be essentially different.

The first criterion of the ATEX Directive is the device group. Like the groups described above, the different groups are defined and described according to their place of use:

- Device group I: for mining underground with a potential hazard due to firedamp and/or combustible dusts
- Device group II: for all other locations in which a potentially explosive atmosphere exists

The second feature is the equipment category and describes the achieved safety level of a device:

- Equipment category 1: Very high level of safety; there are two independent protection measures; the device is also protected from ignition in the event of rare device faults
- Equipment category 2: high level of safety; there is a protection measure to ensure that the device is protected from ignition in the event faults that are frequent or are normally expected
- Equipment category 3: Normal safety; the device is protected from ignition in normal operation.

Devices classified as Group I (firedamp) use the prefix M, e.g. M1, in addition to the category classification.

The third feature is the Substance group which characterizes the application of devices in particular atmospheres:

- Substance group G: Explosion protection in potentially explosive atmospheres due to gases, vapor or mists (G: Gas)
- Substance group D: Explosion protection in potentially explosive atmospheres due to dusts (D: Dust)

The device marking also determines whether the device is associated equipment or intrinsically safe equipment. If it is associated equipment, the equipment category is placed in round brackets, e.g. II (1) G.

**Equipment protection level (EPL)**

Devices are classified according to their potential hazard. According to IEC 60079-0 the following equipment protection levels are defined for gas and dust explosion protection:

**Gas explosion protection**

- EPL Ga: Device with very high protection level
- The device does not constitute a potential source of ignition when used for its intended purpose and when subject to faults which cannot necessarily be expected on a regular basis

- EPL Gb: Device with high protection level
- The device does not constitute a potential source of ignition when used for its intended purpose and when subject to faults which cannot necessarily be expected on a regular basis

- EPL Gc: Device with increased protection level
- The device does not constitute a potential source of ignition when used for its intended purpose
- The device is provided with additional protection, to prevent an ignition source with regularly expected faults.

**Dust explosion protection**

- EPL Da: Device with very high protection level
- The device does not constitute a potential source of ignition when used for its intended purpose and when subject to faults which cannot necessarily be expected on a regular basis

- EPL Db: Device with high protection level
- The device does not constitute a potential source of ignition when used for its intended purpose and when subject to faults which cannot necessarily be expected on a regular basis

- EPL Dc: Device with increased protection level
- The device does not constitute a potential source of ignition when used for its intended purpose
- The device is provided with additional protection, to prevent an ignition source with regularly expected faults.

**EPL and zones**

Devices with a higher protection level can be used in applications with lower protection levels. Devices approved for zone 0 can also be used in zone 1 and devices for zone 20 in zone 21.
### Equipment protection level

<table>
<thead>
<tr>
<th>Equipment protection level</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ga</td>
<td>0</td>
</tr>
<tr>
<td>Gb</td>
<td>1</td>
</tr>
<tr>
<td>Gc</td>
<td>2</td>
</tr>
<tr>
<td>Da</td>
<td>20</td>
</tr>
<tr>
<td>Db</td>
<td>21</td>
</tr>
<tr>
<td>Dc</td>
<td>22</td>
</tr>
</tbody>
</table>

### Zone classification

In accordance with EN 60079-10 and EN 1127-1, hazardous areas are classified into zones for flammable gases, vapors, fumes and combustible dusts. The classification is based on the likelihood that a hazardous explosive atmosphere can occur. The ATEX Directive has re-defined the zone divisions. The different definitions are listed as follows.

**Classification according to**
- Zone 0, 1 and 2 for gases, vapors and mists
- Zone 20, 21 and 22 for dusts

### Zone classification for gases

**Zone 0**

Zone 0 consists of areas in which a hazardous explosive atmosphere is present continuously or frequently. The definition has been extended with the term “frequently” in the ATEX Directive. The example shows a gas station with the areas of zone 0.

All equipment designed for use in zone 0 must meet category “ia” of equipment category 1 and must not contain any open switch contacts. Galvanic isolation between intrinsically safe and non-intrinsically safe equipment is recommended. If the intrinsically safe circuit has to be grounded for functional reasons, this must be implemented outside of zone 0, however, as close as possible to it. The devices must also be approved for gas group IIA, IIB and IIC.

### Zone 1

Zone 1 consists of areas in which a hazardous explosive atmosphere is present occasionally. No change has been made here by the ATEX Directive. The example shows zone 1 is present during refueling in the area of the gas pump.

In industrial plants zone 1 is normally present in the following areas:
- in the close vicinity of zone 0
- in the area surrounding inspection openings
- in the area of filling and draining equipment
- inside equipment.

A test certificate from a test authority is not required for use in zone 2 as is compulsory in zone 0 and zone 1. Devices must comply with category 3. The equipment must meet the following criteria (EN 60079-15):
- restricted breathing enclosures (10 K overtemperature only)
- sealed enclosures (various test methods and requirements)
- simple pressurized enclosure (like “p” without purging)
- limited energy (intrinsic safety without safety factor)
- encapsulated switching devices (simple “pressurized enclosure”)
- lower requirements for equipment in zone 1, e.g. clearance and creepage distances
- housing impact test
- plastic materials
- construction of lampholders and starters

### Use of devices in Zone 0 to 2

The intrinsically safe and associated equipment used in Zone 0 to 2 (gases, vapors) must comply at least with the requirements stipulated for the zone at the location where the intrinsically safe equipment is used. If the equipment meets higher requirements, operation is obviously permitted. The national regulations apply to THE interconnected assembly and installation of devices. (For this refer to the information stated under General Notes for the User on the Use of Equipment with Intrinsically Safe Circuits).
Zone classification for combustible dusts and fibers

Zone 20

According to the ATEX Directive, zone 20 is an area in which during normal operation, a potentially explosive atmosphere in the form of a dust cloud can occur continuously or for long periods or frequently. Dust deposits in a known or excessive thickness can be formed. Dust deposits alone do not form a zone 20. Normally these conditions can only be present inside containers, pipes, apparatus etc.

Areas in which dust deposits are present but dust clouds are not present permanently or for long periods or frequently are not assigned to this zone.

Zone 21 and zone 22

Zone 21:
Zone 21 is an area in which a potentially explosive atmosphere in the form of a dust cloud can occur occasionally during normal operation. Dust deposits or layers of combustible dust will usually be present.

These can include areas in the close vicinity of filling or dust extraction stations, where dust deposits form and potentially explosive concentrations of flammable dust mixed with air may occur during normal operation.

Zone 22:
Zone 22 is an area in which it is unlikely that a potentially explosive atmosphere in the form of a dust cloud occurs during normal operation. However if such an atmosphere does occur, then only for a short period, or as a result of dust accumulation or layers of combustible dust.

Use of devices in Zone 20 to 22

National regulations (EN 60079-14/EN 61241-14) must be applied to the selection, installation and maintenance of devices in the area where flammable dust is present. Intrinsically safe devices installed in zone 20 to 22 must therefore have the appropriate approval. Associated equipment, on the other hand, does not require an approval for flammable dusts, and an approval for gases and vapor is sufficient. It is only necessary to ensure that the limit values of intrinsic safety of the EC type examination certificate are met for an interconnected assembly. In this case the intrinsically safe device can then be marked for example as II 1 D and the associated equipment as II (1) G. To prevent misunderstandings, it is standard practice to use the marking II (1) G, II (1) D.

The special requirements for dust protection must be observed for the installation. For example, simple equipment for use in zones 20 to 22 must have an approval, whereas this is not necessary for simple equipment used in zones 0 to 2.

Marking of equipment

Device marking according to CENELEC regulations

Equipment for explosion protected areas must be clearly marked. There are two different types of marking. According to CENELEC, marking of equipment conforming to EN 60079-0/…-11 must provide the following information:

- Manufacturer’s name or trademark
- Type designation
- Serial number
- Test authority
- Ex symbol
- Ignition category code (e.g. “ia”)
- If special conditions must be observed: the “X” after the certificate number.

Tab.3: Zone classification – Equipment categories

<table>
<thead>
<tr>
<th>Zone classification</th>
<th>Likelihood of an explosive atmosphere</th>
<th>Compliance with safety requirements by</th>
<th>Equipment group</th>
<th>Requirements fulfilled by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 0 (gas, …) Zone 20 (dust)</td>
<td>Continuously, for long periods or frequently</td>
<td>2 independent means of protection</td>
<td>II</td>
<td>1G (for gas, …) –</td>
</tr>
<tr>
<td>Zone 1 Zone 21</td>
<td>Occasionally</td>
<td>1 independent means of protection</td>
<td>II</td>
<td>2 G</td>
</tr>
<tr>
<td>Zone 2 Zone 22</td>
<td>Unlikely or infrequently - for a short period only</td>
<td>Normal operation</td>
<td>II</td>
<td>3 G</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>III</td>
<td>3 D</td>
</tr>
</tbody>
</table>
Group with the appropriate subdivision (e.g. IIC)
Temperature class or maximum surface temperature (for group II devices)
Enter of test authority with date and consecutive number
Equipment protection level (e.g. “Ga”)

An intrinsically safe device is marked as follows:

**Ex ia IIC T6 Ga**

- Ex: Complies with explosion protection regulations
- ia: Protection type (Category)
- IIC: Explosion group
- T6: Temperature class
- Ga: Equipment protection level

Associated equipment for example is marked as follows:

**[Ex ia Ga] IIC**

- Ex: Complies with explosion protection regulations
- ia: Protection type (Category)
- IIC: Explosion group
- Ga: Equipment protection level

Marking in accordance with the ATEX Directive

According to the ATEX Directive, the certificate number of the EC type examination certificate must have the following type of marking:

**PTB 97 ATEX 2128X**

- PTB: Authorized body
- 97: Test year
- ATEX: In accordance with 94/9/EC Directive
- 2128: Consec. no. of the certificate
- X: Special conditions

Within the European Union the devices must meet the relevant requirements. If the manufacturer fulfills these, he is permitted to affix the CE mark with the identification number of the notified body, which carried out the quality assurance system approval.

The test authority TÜV Hannover has the ID number 0044, EXAM (BVS) Bochum 0158 and PTB in Braunschweig 0102.

The marking of the device must also indicate the year of production and the constructional level of safety acc. to ATEX.

For intrinsically safe devices the marking would be:

**II 1 G**

- II: All areas except mining
- 1: Suitable for a very high level of safety for zone 0
- G: Explosion protected against gas, vapor and mist

With associated equipment, the equipment category is placed in round brackets:

**II (1) G**

- II: All areas except mining
- (1): Must not be installed in the explosion hazardous area
- G: Explosion protected against gas, vapor and mist

Manufacturer obligations

Conformity certificates of the manufacturer and EC type examination certificate of a certification body

A test authority must examine and certify that the devices are suited for use in explosion hazardous areas and comply with the relevant regulations and standards. For this the manufacturer submits a test sample to the test authority. The testy authority then issues the test report which is passed on to a certification body. The certification body decides on the basis of the test report whether an EC type examination certificate is issued. The test and certification bodies in the EC are registered centrally.

The type examination certificate contains all relevant explosion protection data for devices of zone 0 and zone 1. This certificate is kept exclusively with the manufacturer of the device. The manufacturer provides operating instructions for its device containing the relevant explosion protection data. The manufacturer also certifies with his conformity declaration that the defined standards and directives have been observed. These two documents are required by the user for the documentation of his installation.

CE marking procedures

Devices for use in explosion hazardous areas are provided with the CE marking and the identification code of the testing authority. The procedure for issuing the CE marking is clearly defined and depends on the equipment category. The example shown for equipment category 1 illustrates the highest safety level and the applicable annexes of the 94/9/EC Directive are also shown.

Different annexes apply to the various equipment categories.
QA system approval

The manufacturer of category 1 and 2 intrinsically safe devices must have an approved quality management system. The approval is designed to ensure that manufacturers produce their devices in accordance with the type examination certificate and that the relevant safety regulations are observed. The system approval is carried out by an approved body. This can be achieved in two ways.

Approval can be achieved directly within the scope of certification according to ISO 9000ff. Approval of those fields associated with explosion protection is accomplished in cooperation with an expert from the approval body. If the ISO certificate has already been granted, it is possible to certify those parts relating to explosion protection subsequently within the scope of an additional audit. The following illustration shows both methods.

![Diagram of QA system approval](image)

TURCK’s manufacturing sites for explosion protected devices are certified according to ISO 9001 and have a QA system approval.

General guidelines on the use of devices with intrinsically safe circuits

The relevant national regulations and standards are the basis for the use of devices with intrinsically safe circuits. These must be strictly observed and followed. The user is obliged to keep up-to-date with the latest revisions. The following guidelines relate to the ATEX (94/9/EC) Directive of the member states of the European Union, especially to the field of explosion protection in areas exposed to hazards by gas.

If the device is classified as an associated apparatus equipped with intrinsically safe and non-intrinsically safe circuits, it may not be installed in explosion hazardous areas. Intrinsically safe devices located in the hazardous area can only be connected to the intrinsically safe circuits. With the TURCK devices, the intrinsically safe connections are provided with a blue marking.

When interconnecting devices within such an assembly, the “Veri- fication of intrinsic safety” must be completed without fail (EN 60079-14: 2004, chap. 12.2.5). This examines whether all data related to explosion protection of the different devices can be operated together. Verification must take into account the internal capacitances and inductances of the cable used. Please refer to the separate section “Verification of intrinsic safety”.

Intrinsically safe circuits must never be connected to non-intrinsically safe circuits. A single operation may result in critical protective devices being destroyed without the user noticing anything. A function test does not provide the satisfactory information to determine this. The use of equipment with intrinsically safe circuits connected to non-intrinsically safe circuits is no longer permissible in explosion protection applications.

The installation of intrinsically safe circuits, mounting to external connections, cable characteristics and cable installation must comply with the relevant regulations. Cables and terminals with intrinsically safe circuits must be marked and separated from non-intrinsically safe circuits or provided with appropriate isolation (> 1500 VAC).

The following is an extract of the requirements according to EN 60079-14:

- protection against external electrical or magnetic fields (e.g. power current cables)
- prevent conductor splicing of fine wires using ferrules
- min. cross section (also for single wires of a conductor): 0.1 mm
- protection from damage (mechanical, chemical, thermal…)
- armoring, metal cladding, shielding of cables and lines
- no common use of single-core cables for intrinsically and non-intrinsically safe circuits in one line
- separate fault assessment when using multi-core cables and lines
- when marking cables by color, light-blue must be used
about the protection measures available, and is it possible to ensure that the device continues to comply with the regulations. Visible changes to the housing, such as brown-black colorations caused by heat, holes or deformations indicate a serious fault. The device must be switched off immediately and examined. If necessary, the connected devices must also be examined.

The inspection of a device with regard to all relevant aspects of explosion protection may only be carried out by an expert or the manufacturer. Operation of the device is only permitted within the specified limits. For example, the supply voltage may never exceed the maximum rating, and the temperature range during operation must be strictly observed.

Intrinsically safe circuits with galvanic isolation - as is the case with TURCK devices - should not be grounded unless absolutely necessary from a functional point of view. Circuits without galvanic isolation, e.g. Zener barriers, always require grounding. The relevant grounding regulations are laid down in EN 60079-14. The grounding of a circuit in zone 0 is not necessary. If grounding is necessary for functional reasons, then it must be carried out in close proximity to zone 0.

Prior to every commissioning or after any change of the device interconnection within the assembly, it must be ensured that all applicable regulations, directives and framework directives are met, that all safety regulations are fulfilled and that the device is functioning properly. Only then is operation permitted.

Mounting and connection of the device should only be carried out by qualified and trained staff familiar with the relevant national and international regulations of explosion protection to ensure correct operation. Only in this way can it be ensured that the system is always in the required safe condition.

The operator of a system is responsible for its proper working order, and must ensure that it is supervised continuously, that necessary maintenance and work is carried out immediately, and that the relevant safety measures are implemented. If necessary, a system must be tested at least every three years.

Verification of intrinsic safety

EN 60079-14 stipulates that the intrinsic safety of interconnected devices must be verified. There are two basic types of circuits:

- First case: Simple intrinsically safe circuit with only one associated apparatus and at least one intrinsically safe apparatus without further supply
- Second case: Several associated apparatus which can supply electrical energy to the intrinsically safe circuit in normal operation and in the event of a fault.

Simple circuit

In the first case of a simple intrinsically safe circuit, only the electrical limit values from the type examination certificates and the rating values have to be examined for the verification of intrinsic safety. The inductance and capacitance values of the cables used must also be taken into account here. The intrinsic safety of a simple current circuit is verified if the limit values examined meet the following requirements:

\[ U_0 \leq U_i \quad I_0 \leq I_i \quad P_0 \leq P_i \quad L_0 \geq L_i + \frac{C_0}{C_i} \quad C_0 \geq \frac{C_i}{2} \]

This applies to circuits with:
- A non-linear output characteristic of the associated equipment and (at the same time)
- Exclusive occurrence of distributed reactances.

If massed reactances are present and the associated equipment has linear limitation, a check must be made whether:
- \( C_0 \geq 1 \% \ of \ C_i \)
- \( L_0 \geq 1 \% \ of \ L_i \)
- As soon as one of the two conditions is fulfilled, the percentage of \( C_0 \) and \( L_0 \) must be reduced by half, (so-called 50 % rule).

Example: Verification of intrinsic safety

<table>
<thead>
<tr>
<th>Associated equipment</th>
<th>Manufacturer</th>
<th>Test certificate no.</th>
<th>Expl. group</th>
<th>( U_0 ) [V]</th>
<th>( I_0 ) [mA]</th>
<th>( P_0 ) [mW]</th>
<th>( L_0 ) [mH]</th>
<th>( C_0 ) [µF]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolating switching amplifier</td>
<td>TURCK</td>
<td>TÜV D4 ATEX 2553</td>
<td>[Ex ia Ga] IIIC</td>
<td>9.6</td>
<td>11.0</td>
<td>26.0</td>
<td>1.0</td>
<td>1.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intrinsically safe equipment</th>
<th>Manufacturer</th>
<th>Test certificate no.</th>
<th>Expl. group</th>
<th>( U_0 ) [V]</th>
<th>( I_0 ) [mA]</th>
<th>( P_0 ) [mW]</th>
<th>( L_0 ) [µH]</th>
<th>( C_0 ) [nF]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Proximity switch</td>
<td>BIM-INT-Y1X</td>
<td>TURCK</td>
<td>KEMA 01 ATEX 1264 X</td>
<td>EEx ia IIC T6</td>
<td>20.0</td>
<td>60.0</td>
<td>80.0</td>
<td>150.0</td>
</tr>
<tr>
<td>2 Proximity switch</td>
<td>BI1-EG05-Y1</td>
<td>TURCK</td>
<td>KEMA 02 ATEX 1090 X</td>
<td>Ex ia IIC T6</td>
<td>20.0</td>
<td>60.0</td>
<td>130.0</td>
<td>150.0</td>
</tr>
</tbody>
</table>

⇒ Cable inductances and capacitances:
(Manufactures spec. or \( L_i = 1 \ \text{mH/km}, \ C_i = 110 \ \text{nF/km} \))

Total cable length: 130 m

\[ 0.13 \quad 14.3 \]

Total inductances and capacitances: \( \sum \ L_i \) and \( \sum \ C_i \)

\[ 150.13 \quad 164.3 \]

Intrinsic safety is achieved if all conditions are fulfilled: \( U_0 \leq U_i \quad I_0 \leq I_i \quad P_0 \leq P_i \quad L_0 \geq \sum L_i \quad C_0 \geq \sum C_i \)
The manufacturer’s specifications must be observed for the cables. If these specifications are not available, the following values can be assumed (according to EN 60017-14, Part 12.2.2.2.): 200 pF/m and 1 mH/m or 30 μH/Ω.

If the value \( P_0 \) of the associated equipment is not stated, a linear characteristic must be present. From this \( P_0 \) can be calculated by

\[
P_0 = \frac{1}{4} \times I_0 \times U_0.
\]

The connection of proximity switches to isolating switching amplifiers, two-wire transmitters to isolating transducers or solenoid valves to valve control modules can be regarded as examples of simple circuits. The conformance certificate and the EC type examination certificate contain different indices for the limit values. In this description only the indices according to EN 60079-14 are used. The index 0 here stands for maximum limit data that can be output and I for the maximum limit data that can supplied.

Standardized documents should be used for the intrinsic safety verification in order to ensure greater clarity. Besides the date and the name of the issuer, the document should also contain the circuit designation or number.

### Interconnection/assembly of several devices

The second case considers the interconnection of several active associated apparatus. The electrical limit values of the EC type examination certificate must not in this case be used as proof of intrinsic safety. This procedure is fundamentally different to the first case. This considers a new assembly based on the interconnection of the individual associated apparatus into a single assembly with new limit values. This kind of interconnected assembly is then always assigned to category “ib”, even if all the individual apparatus are assigned to category “ia”. The use of such an assembly for zone 0 is therefore not permitted. A detailed description of the interconnection and assembly of several devices is beyond the scope of this introduction. The related calculation methods and an example are contained in annexes A and B of EN 60079-14. The ignition curves of IEC 60079-11 are also required for this. These ignition curves are also contained in EN 50020.

A special procedure must be observed when interconnecting associated equipment that does not have linear characteristics throughout. This is described in detail in EN 60079-25.

### Applicability of approvals

#### Scope of approvals/national approvals

Equipment that conforms to the ATEX Directive can be freely traded, installed and operated in the member states of the European Union.

ATEX approval is recognized in Switzerland although this country is not a member of the EU. An approval by the SEV is no longer required if the customer is provided with the necessary documentation. This includes the operating instructions of the device, the type examination certificate, the CE declaration and the certificate of the manufacturer’s Ex audit.

Many states worldwide require their own national approval of the equipment. TURCK devices are therefore often provided with approvals for different states. National approvals are required, for example, in the USA, Canada, China, Japan, Australia or the CIS countries. Other countries accept the issued approvals of other states. For this reason, knowledge of national regulations is essential.

In many countries, approvals are only issued for a limited period. When purchasing a device it should therefore be ensured that the time limit for the approval was renewed. Further operation is accepted in many countries if an approval elapses after the installation.

The ATEX approval and the approvals in the USA and Canada are not time limited.

#### Approvals available on the internet

#### Current overview of approvals

The approvals of all TURCK devices are available on the Internet and can be downloaded directly from the TURCK website: www.turck.com
Terms and explanations

Active metal part
Active metal parts are conductors or conductive components that carry an electrical voltage during operation.

Actuator
An actuator, such as a control valve for example, is a device that converts electrical control signals into mechanical motion.

Address
The address is on a network, a numerical identification that is needed to identify the participants, e.g., the hardware address of a field bus (MAC address) or the IP address of a host (PC).

Addressing
Addressing describes the assignment and setting of an address, e.g., for a station in a network.

Alarm output
A detected error resulted in the shutdown of the corresponding output. The alarm output remains on as long as the input circuit monitoring does not detect any faults. If a fault occurs in a circuit, the alarm output switches off (see also ‘Common alarm output’).

Alarm output (interface technology)
Electrical output that is set to LOW in the event of an error.

Analog
Representation of a signal with continuous, interruption-free history.

Analog output
The analog output signal of the device is used for the continuous output of a measured variable. The format of an analog signal is for example 0/4 … 20 mA or 0/2 … 10 V.

Analog signal
An analog signal is an electrical signal that can continuously take on any infinitely variable value between a minimum and maximum value (see also ‘Digital signal’). For analog signals, the value x of the physical size (such as a voltage) is also mapped as physical size. Thus there is an analogous correlation between the physical unit and the value representing it.

Application area (Ex devices)
The application areas for Ex devices are:
- The areas in the explosion hazardous zones themselves
- The areas outside of the explosion hazardous zones

ARP
ARP (Address Resolution Protocol) is used to assign hardware addresses (MAC IDs) worldwide to the IP address of the network stations. The assignments are managed in internal tables (AR tables).

ATEX
The abbreviation for “Atmosphère explosible” stands for the EC Framework Directive 94/9/EC, which refers to the “single European Act” under Article 100a of the EU. The corresponding national regulations for explosion protection were adopted from the ATEX 100a.

Attenuating element
Attenuating elements consist of a special material and serve for the damping of sensors.

Backplane
A backplane is a mounting plate which provides slots for taking module cards.

Baud
Baud is a unit for the transmission speed. One baud corresponds to the transfer of one step/signal change per second. If one bit is transferred per step, the baud rate is identical to the transfer rate in bits per second, if a step is transferred in 0.2 s, the baud rate is 5.

Baud rate
See Baud

Bidirectional
Bidirectional means that the data and signals are transmitted at the same time from point to point in both directions.

Burden
The burden defines the maximum value of the resistance on an analog output. This value consists of the load of the connected device and the cable resistance.
**Bus**

A bus collects and transmits data and control information between different components such as CPU, memory and I/O level following a defined protocol. A bus can be composed of a number of parallel cables for data transfer, addressing, control and power supply.

**Bus cycle time**

The bus cycle time is the time required by a master to serve all stations of a bus system once, i.e. to write the corresponding outputs and read the inputs.

**Bus system**

A bus system describes the totality of all units that communicate with one another via a bus. Serial bus systems transfer the information serially via a common line; parallel bus systems consist of several parallel lines on which data, address or control information is transferred in parallel.

**Cable compensation**

With temperature measurements a so-called cable compensation may be required, depending on the measuring process (e.g. Pt100 in 2-wire circuits). With resistance thermometers, the resistance value of the incoming cable must be taken into account with 2-wire circuits; this resistance value is determined with cable compensation and can thus be compensated. Otherwise unwanted corruptions of the measuring result may occur.

**Cable resistance**

The cable resistance is the resistance value of a complete cable (feed and return cables).

**Capacitive coupling**

A capacitive (electrical) coupling occurs between conductors located on different potentials. This can cause interference. Possible causes of a capacitive coupling are signal cables, contactors routed in parallel and static discharges.

**Coding element**

A coding element is an element consisting of two sections, which is used for the unique assignment of the electronic and base module in the TURCK BL20 and BL67 I/O systems.

**Cold junction compensation**

A thermocouple consists of two wires of different metals, connected at one end to a measuring point. On the two open ends of the thermocouple (= cold junction) a voltage can be measured which is determined by the different electron density of the wires, as well as by the temperature difference between the measuring point and cold junction. Thus, a thermocouple measures not absolute temperature at the measuring point, but the differential temperature between the measuring point and the cold junction. Since the voltage is usually measured at ambient temperature, the measured voltage value is too low by the amount which corresponds to the voltage of the ambient temperature. Therefore, the so-called “cold junction compensation” is carried out to determine the value for the absolute temperature at the measuring point. To do so, temperature at the cold junction must either be kept constant - as in the past by an ice bath with constant 0 °C (“cold junction”) - or the temperature of the cold junction must additionally be measured as a reference point.

**Common alarm output**

A detected error resulted in the shutdown of the corresponding output. As long as the error monitoring detects no errors, the alarm output is switched on. When an error occurs in a circuit, the alarm output switches off (see also alarm output).

**Common potential**

Common potential means that the reference potential of control and working circuit (input and output circuit) are electrically connected.

**Configure**

Is the systematic arrangement of the modules of a station.

**Current consumption**

The current consumption defines the current that is used for the power supply of the device. For sensors with switching output the power consumption is indicated without load.

**DeviceNet™**

DeviceNet™ is a standard open bus system based on CAN (Controller Area Network) and is standardized in EN 50325. It is widely used in the USA and Asia.

**DHCP**

Dynamic Host Configuration Protocol - DHCP is a client-server protocol for the allocation of IP addresses and other parameters. It is used for the dynamic and automatic configuration of terminal devices.

**Digital**

Representation of a value by a series of characters that are assigned to the value to be represented (e.g. a voltage) according to a
Glossary
Terms and explanations

Digital output
A digital output provides on/off signals depending on the values that are determined during a continuous measuring process. Digital outputs are normally implemented with PNP or NPN transistors or with an electromechanical relay.

Digital signals
For digital signals, the value of the physical quantity x of a voltage for example, is not represented as a physical size, but encoded in characters of any kind, such as in binary digit combinations. There is thus no analogous correlation between the physical unit and the output value. Basis of the digital process is the collection and analysis of abstract strings corresponding to a physical value such as a voltage.

DIN
DIN is the mark for the collective work of the Deutsches Institut für Normung e. V., a central body for normative and standardization work in Germany.

Drop-off time
The drop-off time defines the time required for a signal to change its signal level from 90% to 10% (see also 'Rise time').

DTM
DTM stands for Device Type Manager and defines the application-independent driver for computer-programmable and communication devices within a defined FDT frame application such as PACTware™. The DTM includes among others:
- User interface for the device
- Device logic and parameterization

EC Declaration of Conformity
With the EC Declaration of Conformity the manufacturer of a device certifies legally binding, that the device complies with the relevant European Directives. The manufacturer must ensure this by appropriate manufacturing and testing.

EC type examination certificate
The EC type examination certificate is issued by a certified testing laboratory and contains the technical data of a device or values at which the device may be operated. The EC type examination certificate also states any "special conditions" for the use of the device as well as the basic safety and health regulations.

Efficiency
The efficiency is generally the ratio between output power (effective power) and input power.

ExelV - Ordinance for electrical installations in hazardous rooms (old) / areas (new)
ExelV is applicable in Germany and is aimed at those responsible for the technological causes of the formation of explosive mixtures. The former ExelV of 1980 related to European regulations on explosion protection of industrial electrical equipment. This "old" version constituted the legal basis for almost the entire field of explosion protection of electrical equipment. By defining explosion hazardous areas and especially by dividing these into specific zones, ExelV gained major importance as a virtual standard for explosion protection measures. Since the introduction of the ATEX Directive in 1996 a lot has changed. Definitions relating to the non-electrical aspects of new electrical equipment are now covered by the new "Explosion Protection Ordinance" (ExVO). The "new" 1996 version of the ExelV refers only to those parts which have not yet been transposed into national regulations.

EMC
By electromagnetic compatibility (EMC) is meant the ability of an electrical device to operate satisfactorily in an electromagnetic environment without adversely affecting or being adversely affected by other electrical equipment.

EN
Abbreviation for "European Norm"

Equipment, electrical
Electrical equipment is an object that is used for the generation, conversion, transfer, distribution or application of electrical energy, such as sensors, cables, machines, control devices.

ESD
Electrostatic Discharge – ESD is the abbreviation for electrostatic discharge, and describes the balancing of electrical charge between two differently charged materials.

EtherCAT™
EtherCAT™ is an Ethernet-based standard bus system with a master/slave architecture for fast applications and time-sensitive industrial applications, and is standardized in compliance with IEC 61158, IEC 61784 and ISO 15745-4. It offers the cyclical transmission of I/O data and acyclical transmission of requested data such as parameters, diagnostics and device identification data.

EtherNet/IP™
EtherNet/IP™ is an open Ethernet standard for industrial networks standardized to IEC 61158. It is mainly used in America and offers the connection to server-based office functions such as email clients or web servers.

External inductance
By external inductance is meant those inductances that have an effect outside of an Ex device, such as in a cable.

ExVO
Explosion Protection Regulation

Fault current
Output current in the event of a wire break or short-circuit in the input circuit, selectable between 0 mA or > 21.5 mA

FDT
FDT stands for Field Device Tool and describes the interface definition between the specific device DTM used and the frame application (such as PACTware™). The FDT includes:
- A standard user environment for all DTMs
User management
Management of the used DTMs
Network configuration

Field device
In automation, devices that are installed outside of the control cabinet, e.g. a NAMUR sensor, are called field devices.

Field supply
Power supply for the field devices and the signal voltage

FM (Approval)
Factory Mutual - certification and test lab for North American approvals for the Ex and non-Ex area (see also UL)

Force mode
The Force mode of a software makes it possible to “force” specific variables on input and output modules in order to create specific plant states.

Frequency
The frequency f is the number of vibrations per second and can be calculated as the reciprocal of the period (T = 1/f). The SI unit of frequency is the Hertz (1/s). Often, as well other units are used such as 1/min.

Function code
The function codes are used in the Modbus fieldbus to control the type and method of access to the devices. The function codes are incorporated and contained in the Modbus data telegram, including commands for reading and writing input and output data.

Galvanic isolation
Electric circuits are separated by means of a transformer such as an optocoupler.

GND
GND – Abbreviation for “Ground” (see Mass)

HART®
HART® stands for “Highway Addressable Remote Transducer” and consists of digital communication via a common data bus. The data transfer is implemented according to the Bell 202 standard by means Frequency Shift Keying (FSK). The low-frequency analog signal is superimposed with a high frequency oscillation (± 0.5 mA). A digital “1” is represented with a frequency of 1.2 kHz (1200 Hz) and a “0” with the frequency 2.2 kHz (2200 Hz).

Hexadecimal
Number system with the base 16. The sequence begins with 0 to 9 and continues with the letters A, B, C, D, E and F.

Hysteresis
The hysteresis is the difference between the switch-on and the switch-off point.

Hysteresis (limit value monitoring)
With switching outputs: Difference between switch-on and switch-off point. To avoid fluttering of an output, the two switching points can be set to different values. If the switch-off point is higher than the switch-on point, the exceedance of a limit value is monitored. If the switch-on point is higher than the switch-off point, the undercutting of a limit value monitored. The difference between the values is application-specific and should take into account the regular fluctuations in the measured value.

I/O
Abbreviation for “Input/ Output”

I/P converter
An I/P converter converts a current signal on the input side (0/4…20 mA) to a pressure on (e.g. 0.5…4 bar) on the output side.

IECEx

Ignition category
The EN 60079 (IEC 60079) standard stipulates general requirements for the design and testing of electrical equipment required for the hazardous area:
- Oil immersion “o” (EN / IEC 60079-6)
- Pressurized enclosure “p” (EN / IEC 60079-2)
- Powder filling “q” (EN / IEC 60079-5)
- Flameproof enclosure “d” (EN / IEC 60079-1)
- Increased safety “e” (EN / IEC 60079-7)
- Intrinsic safety “i” (EN / IEC 60079-11)
- Non-sparking equipment “nA” (EN / IEC 60079-15)
- Sparking equipment “nC” , “nR” (EN / IEC 60079-15)
- Encapsulation “m” (EN / IEC 60079-18)
- Optical radiation “o” (EN / IEC 60079-28)
- Intrinsically safe electrical systems “i-SYST” (EN / IEC 60079-25) (see also the section ‘Basics of explosion protection’)

Impedance
The impedance (also: apparent resistance) is the resistance, which a device or a circuit of several devices has for an alternating current of a specific frequency. The size of the impedance is therefore not constant in relation to the different frequency values. This is due to the fact that the impedance also consists of a reactive resistance as well as the pure ohmic resistance (active resistance).

Inductance
The inductance is an electrical property of a current-carrying conductor or other component, to build a magnetic field due to a change in the electrical current, which counteracts the power change.

Inductive coupling
Inductive (magnetic) coupling occurs between two current carrying conductors. The magnetic field caused by the currents induces a voltage that can cause interference. Transformers, motors, power supply cables routed in parallel and HF signal cables are typical sources of interference.
**Input circuit monitoring**

The input circuit monitoring monitors the connected loop. For analog signals, usually the 4…20 mA signal is used (example: wire breakage I < 3.6 mA; Short circuits I > 21.5 mA). The NAMUR working group makes recommendations on the threshold. NAMUR sensors offer line monitoring for digital signals. Sensors compliant with EN 60947-5-6 (NAMUR) have an impedance of < 400 Ω in a non-operational state and otherwise have a maximum impedance that ensures a minimum current of > 0.05 mA. These limit values can be used for detecting wire breaks and/or short-circuits in the control circuit of switching amplifiers.

**Input delay**

The input delay specifies the time required by a device (e.g. a valve control module) to provide the output signal after a signal is present at the input.

**Input frequency**

The input frequency is the maximum rate that must be applied to the input of the unit or that can be measured.

**Input lock time**

During the input lock-out time pulses at the sensor input of the interface device are suppressed for the set time.

**Input resistance**

The input resistance is present at the input of a device and loads the voltage source present at the input.

**Insulation resistance**

By insulation resistance is meant the ohmic resistance between electrical conductors or to ground potential.

**Internal inductance**

The value of the internal inductance must be taken into account when verifying intrinsic safety. The internal inductance of associated equipment reduces the connectable value. The internal inductance of an intrinsically safe apparatus reduces the usable cable length. The 50% rule should be applied if the intrinsically safe equipment also has an internal capacitance in addition to the internal inductance. This rule is applicable as soon as both reactances are more than 1 % of the connectible reactances. If this is the case, the connectible reactances are reduced by 50 %, i.e. the usable cable length is reduced.

**Intrinsic safety**

“Intrinsic safety i” is a protection type for the hazardous area that is described by the EN 60079-11 standard. The electrical energy of a device here is limited so that it cannot cause ignition in a potentially explosive atmosphere (see also the section “Basics of explosion protection”).

**IP protocol**

IP protocol (Internet protocol) – a network protocol wide-spread in computer networks and used in the context of the TCP/IP protocol family to communicate data packets. The protocol aims to assemble data packages (formatting and fragmentation) to units, to address the data packages (addressing), and to convey (routing) in a connectionless packet-oriented network.

**Limit frequency**

The limit or cutoff frequency defines the maximum or minimum value of the frequency that can or should be processed. To ensure interference immunity, an upstream filter is installed in the pulse inputs of rotational speed monitors. Input frequencies that are above the limit frequency of this filter can no longer be processed by the speed monitoring device.

**Line monitoring**

TURCK interface devices with cable monitoring are used to monitor the input circuit for short-circuits and wire breaks (see also ‘Input circuit monitoring’).

**Linearity deviation**

Indicated by sensors with an analog output. Permitted deviation of the output signal from an ideal linear output characteristic as a % of the full scale value of the output signal.

**Load resistance**

The load resistance is the electrical resistance, by which a power and signal source is loaded.

**Loop-powered**

Loop-powered devices are fed from the signal and do not require a separate power supply.

**LSB**

LSB stands for Least Significant Bit; and represents the lowest value of a digital bit string.

**MAC ID**

The MAC ID (Media Access Control Identification) is the unchangeable, globally unique physical address of a network component. The MAC address is used for communication in Ethernet networks.

**Mass**

Mass is a common reference potential for conductive components.

**Measurement deviation**

Is the deviation of a value according to DIN 1319-1:1995 obtained from the measurements of the true value of the measurand.

**Measuring accuracy**

The closeness of the measured value to the nominal value (see also Measurement deviation).

**Measuring range**

Indicated by sensors with analog output. It is the size of the range in which the output signal is changed.

**Millivolt signals**

One thousandth of a volt
Modbus TCP

Modbus TCP is an open Ethernet standard with a client/server architecture for industrial automation that is standardized in IEC 61158. Modbus communication is implemented with function codes that are incorporated in the data telegram. For data transmission in Ethernet-TCP/IP networks, Modbus TCP uses the Transport Control protocol (TCP) for the transfer of the Modbus application protocol.

Module bus (TURCK BL stations and modules)

The internal bus of a BL20 or BL67 station is called the module bus. The module bus is independent of the fieldbus. The BL20 and BL67 modules communicate via the module bus with the gateway.

MSB

MSB stands for „Most significant bit“; in a digital signal of a specific length, the bit that represents the highest value.

Multiprotocol ethernet

The Ethernet multiprotocol describes a special function of I/O modules that enables the modules to be used in any of the three Ethernet systems PROFINET, Modbus TCP or EtherNet/IP™. The Ethernet multiprotocol modules detect the protocol used automatically by listening to the communication traffic during the startup phase.

NAMUR

International Association of automation technology users of the process industry.

Ni100

Temperature-dependent resistor to DIN 43760, consisting of nickel; less expensive than Pt100 resistors. The temperature coefficient of a nickel resistance thermometer is virtually 2 × greater than that of a platinum resistance thermometer.

No-load voltage

The open circuit voltage is the voltage on the output side if no load is connected.

Nominal voltage

The nominal or rated voltage specified by the manufacturer for the normal operation of a device.

Normally closed operation

Normally closed operation is present when the output (e.g. of an isolating switching amplifier) is active when the contact is open or with an activated NAMUR sensor.

Normally open operation

Normally open operation is present when the output (such as of an isolating switching amplifier) is active when the contact is closed or with a non-activated inductive NAMUR sensor.

On signal (1 signal)

The On signal defines the signal level (e.g. in Volts) required by a device to detect the input pulse (e.g. 5…30 V – see also ‘Zero signal’).

Operational safety ordinance (BetrSichV)

The Operational Safety Ordinance (BetrSichV) is the German implementation of the work equipment directive 89/655/EEC [1], later replaced by Directive 2009/104/EC [2], and regulates in Germany the provision of work equipment by the employer, the use of work equipment by workers at work, as well as the monitoring of systems within the meaning of the occupational health and safety.

Output current

The output current is the current that a device can provide at the output circuit.

Output function (see also „Electrical designs“)

Typical output functions are: NAMUR: Normalized output signal in accordance with EN 60947-5-6 NO contact (NO): The output is open when the sensor is non-activated and closed when the sensor is activated. Normally closed (NC): The output is closed when the sensor is non-activated and open when the sensor is activated. Complementary/Antivalent (two-way contact): One of the two outputs is closed in the non-activated state and the other output is closed in the activated state. Analog output: The output supplies a normalized output signal (0/4…20 mA or 0/2…10 V).

Output power

The output power is the power that a device can provide at the output circuit, such as a valve control module for the associated valve controlled (see also ‘Switching capacity’).

Output voltage

The output voltage is the voltage that a device can provide at the output circuit.

Overhead

In data communication, overhead stands for all information additional to the user data that has to be transferred or stored. This includes headers in the data packets, routing data or a check code that a receiver has sent back to the transmitter, in order to confirm correct data transmission.

PACTware™

PACTware™ stands for “Process Automation Configuration Tool” and is an open and manufacturer-independent operator interface for the plant-wide operation of devices, systems and communication components. The connection between the PACTware™ operator interface and the specific device DTM is implemented via an FDT interface. PACTware™ enables the devices of an installation to be configured and operated simply, quickly and efficiently, as well as diagnosed if required.
Parameterization

Parameterization denotes the setting of parameters to specific values, e.g. the device type, format and length data, as well as the number of inputs and outputs in the configuration software of a fieldbus master.

Passive metal part

Passive metal parts are conductive elements that are not energized during (normal) operation, but may become energized in the event of a fault.

Period duration measuring process

With the rotational speed monitors, the time between two successive input pulses is measured directly and compared with the internally defined reference time. This measuring principle also enables acceptable reaction times in applications with relatively large pulse intervals.

Ping

PING - acronym for “Packet INternet Gopher”; A command, with which the accessibility of target stations in networks can be tested. For this, a PING signal is sent to the destination station and checked whether and in what period of time the expected “echo” comes back.

PLC

A programmable logic controller is a device for the digital control and regulation of machinery or equipment. The program sequences are edited cyclicly or acyclicly in the PLC in event-oriented manner.

Potential equalization

Potential equalization consists of all measures taken to equalize differences in electrical potential between the chassis of electrical equipment, the ground and external conductive components.

Potential-free

The reference potentials of control and power circuits (input and output circuit) are said to be potential-free when they are galvani-cally isolated from each other.

Power consumption

The power consumption defines the value that the device itself converts.

PROFIBUS-DP

PROFIBUS-DP (Process Field Bus for Decentralized Peripherals) is one of the most widely used standard bus systems in automation technology, standardized according to EN 50170. It is used for the fast, serial control of remote field devices by the central controller with cyclic data exchange.

PROFINET

PROFINET is an open Ethernet standard based on PROFIBUS and standardized in IEC 61158 and IEC 61784 for the connection of decentralized devices to a controller. It offers cyclical and acyclical data exchange based on a provider - consumer model.

Protection rating

Protection class according to IEC/EN 60529 and DIN 40050-9, defines the protection of the enclosure against contact with and ingress of foreign matters and humidity. The customary protection classes of TURCK products are:
- IP20: Protection against solid foreign objects with Ø > 50 mm; no protection against water (use only in the control cabinet)
- IP65: Full protection against dust and hose water
- IP67: Full protection against dust and short submersion in water
- IP69K: Full protection against dust and high-pressure/steam-jet cleaning

Protective conductor

A protective conductor is primarily used to offer protection against fatal shock currents and must discharge a fault current for at least a short time. Protective earth/ground conductors are represented by the abbreviation PE/PG (protective earth/ground). The PE/PG for insulated conductors and cables must have a yellow-green marking over the entire length.

Pt100

Pt100 resistors are used for the industrial temperature measurement. In the IEC 751, the basic values can be found for platinum resistors. The measuring range is from -200 °C to +850 °C; common is the range -100 °C to +600 °C for standard resistors. A Pt100 can be connected in 2, 3 or 4-wire technology to a transmitter.

Pulse

Pulses are voltages or currents that exist over a “short” period. For monitoring rotational speed, the signals of a NAMUR sensor are used as input pulses for the rotational speed monitor.

Pulse output

The pulse output (transistor output) provides the input pulse signal (e.g. with a rotational speed monitor) for other processing units.

Pulse time

The pulse time is the period in which a pulse is present.

Rated voltage

The rated voltage is the highest permissible supply voltage of a device (in normal operation).

Reference ground

The reference ground is the potential of the ground in the vicinity of the grounding equipment. Unlike the ground, which always has a potential of zero, the reference ground can have a different potential than zero.

Reference potential

The reference potential is the potential from which the voltages of all connected circuits are considered and/or measured.
Repeater
A repeater is a device that is used in data cables to electrically amplify and refresh the signals to be transferred. This enables data to be transported over large distances.

Response time
A bus system response time is the time interval between sending a read request and the receipt of a reply. The reaction time in relation to an input module is the time between the occurrence of a signal change at the module input and the output of the signal change to the bus system.

Ring memory
A ring memory stores data continuously in a certain period of time, and overrides the data after a given amount of time to reclaim the space for new data. This process is inevitably best illustrated graphically in a ring form, thus the name of this technology.

Ripple
Irregularities in the DC voltage may occur after the VAC mains voltage is rectified to a VDC voltage (due to the original sinusoidal wave of the mains voltage). The remaining wave troughs can be compensated (“smoothed”) by means of a capacitor connected in parallel to the load or a coil connected in series to the load. The remaining AC component after smoothing is called the ripple or hum voltage. A 10 % ripple (peak-peak) of the supply voltage is normally tolerated.

Rise time
The rise time defines the time required for a signal to change its signal level from 10% to 90 % (see also ‘Drop-off time’).

RS485
RS485 (EIA-485) is a serial (bus) interface according to EIA standard for fast, wired data transmission at high data rates.

RS485-IS
Standard RS485 with reduced, adapted intrinsically safe IS signal levels

Segment coupler
The segment coupler is used to adapt the standard RS485 signal to an intrinsically safe RS485-IS signal. The signal is transferred via copper cables. The repeater functionality of the segment coupler ensures that the amplitude and phase of the signal are regenerated; thus preventing any losses in signal strength and quality.

Serial
With serial data transmission, digital data is transmitted sequentially – bit by bit – via a cable. Standardized serial interfaces are available for the serial transfer of digital data.

Shield
A shield is the term given to the electrically conductive covering of cables, housings and cabinets that prevents the formation of electrical or magnetic fields in order to ensure the proper functioning of an electrical system and improve electromagnetic compatibility (see also “Shielding”).

Shielding
Shielding describes the entirety of all measures to protect sensitive electronic components or lines against interference through magnetic or electrical fields (see also „Shield”).

Short circuit proof
A short circuit proof apparatus resists the thermal and dynamic stresses that can occur at its place of installation due to a short circuit.

Short-circuit
A short circuit is a conductive connection between two or several points in a circuit that are normally energized. The fault current circuit has no effective resistance.

Short-circuit current
The short-circuit current defines the value of the current present in the event of a short-circuit.

Short-circuit detection
Several TURCK interface devices, such as isolating switching amplifiers, are provided with short-circuit monitoring in the input circuit (see also ‘Input circuit monitoring’ and ‘Short-circuit threshold’).

Short-circuit threshold
The short-circuit threshold is the value at which a device, such as an isolating switching amplifier, detects a short-circuit in the input circuit.

SIL
SIL stands for Safety Integrity Level. The IEC 62061, IEC 61508 and IEC 61511 standards offer methods of making probabilistic risk assessments of safety circuits. These standards define four safety levels (SIL level) which describe the measures required for the mitigation of risk in installation sections.

Simultaneity factor
The simultaneity factor indicates how many channels can be operated simultaneously with nominal load.

Start-up time delay
Adjustable time for bridging the startup phase, e.g. of a drive in which the alarms are switched off.

Station
A station is a functional unit or assembly, which consists of several components.
Supply voltage
The supply voltage is the voltage that a device requires for trouble-
free operation.

Supply voltage range
The supply voltage range is the range between the minimum and
maximum value that a device requires to ensure a power supply.

Switch-off delay
Adjustable time by which the switching of the output can be de-
layed (see also ‘Switch-on delay’).

Switch-off threshold/Switch-off point
A switch-off point is exceeded or falls below a set value.

Switch-on threshold
The switch-on threshold defines the signal level at which a switch-
on is initiated, e.g. by means of a limit value relay.

Switching capacity
The switching capacity is the power that an electrical device can
switch safely.

Switching current
The switching current is the current that an electrical device can
safely switch.

Switching frequency (interface devices)
The switching frequency indicates the number of status changes
per second.

Switching frequency (max.)
The max. switching frequency of a device indicates how many
changes of the switching state are possible within a second.

Switching voltage
The switching voltage is the voltage that an electrical device can
safely switch.

TCP
TCP (Transmission Control Protocol) is a connection-oriented
transport protocol that ensures secure and fault-free data trans-
pot based on the Internet protocol and a special fault detection
mechanism (e.g. acknowledgment of telegrams, time monitoring
of telegrams).

Temperature classes
Equipment for the hazardous area is classified into temperature
classes. This specifies the maximum permissible surface tempera-
ture of an apparatus. The explosion protected apparatus can also
be approved for several temperature classes – depending on tech-
nical and financial considerations.

Terminal cross-section
The cross-section of the connection cables of a device

Terminating resistor
A terminating resistor (terminator) is used in a network at the be-
ingning and the end of a bus line in order to prevent disturbing
signal reflections.

Test voltage
The test voltage is the voltage used for testing the insulation resis-
tance (see also ‘Insulation resistance’).

Thermocouples
Thermocouples are used for industrial temperature measuring.
The most common types are type B, E, J, K, L, N, R, S and T thermo-
couples. Depending on type, thermocouples can be used for tem-
perature ranges from -270…1800 °C.

Topology
In networks, the topology denotes the arrangement and connec-
tion of network components (stations, nodes). Network compo-
nents can be connected in different ways Point-to-point connec-
tions (such as star, ring and hybrid topology) as well as point to
multipoint connections (bus and cell topology).

Transmitter
Transmitters are devices that convert signals into a different, most-
ly normalized signal (e.g. transducer).

Trigger event
A trigger event is normally the triggering of an event, such as the
exceeding of a limit value, on account of which, for example, the
write process to a ring memory is stopped.

UDP
UDP (User Datagram Protocol) is a connectionless, unsecured
transport protocol for exchanging data between different partici-
pants in a network.

UL
Underwriters Laboratories – certification and test lab for North
American approvals for the Ex and non-Ex area (see also FM)

Unidirectional
Unidirectional means that the data and signals are transmitted
from point to point in one direction only.

Voltage drop
In electrical engineering, the voltage drop is a potential difference
which exists between two terminal points of a resistor through
which current flows, for example, the voltage across a switched
output of a device.

Window function
The power-good range is set with the window function. The user
defines the switch range by means of an upper and lower window
limit.
**Wire-break**

A wire break occurs when a cable is interrupted in a closed electrical circuit (see also ‘Input circuit monitoring’).

**Wire-break threshold**

Sensors according to EN 60947-5-6 ensure a minimum flow of 0.05 mA. This current is used for detecting wire breaks and represents the wire-break threshold.

**Zero signal (0 signal)**

A “zero signal” is the signal level (e.g. in Volts) that a device requires to detect the input pulse as a zero signal (e.g. 0…3 V) (see also ‘On signal’).
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