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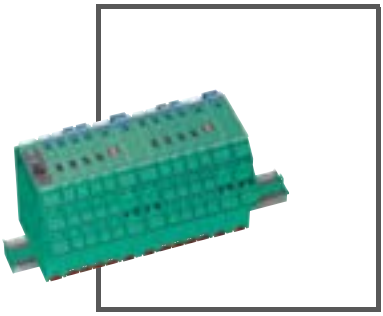
# SYSTEM DESCRIPTION

## K-System
### Isolated Barriers



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**1 Safety ..... 4**
**1.1** Validity ..... 4
**1.2** Target Group / Personnel ..... 4
**1.3** Reference to further documentation ..... 4
**1.4** Marking ..... 4
**1.5** Intended Use ..... 5
**1.6** Improper Use ..... 5
**1.7** Mounting/Installation ..... 5
**1.8** Operation, Maintenance, Repair ..... 6
**1.9** Delivery, Transport, Disposal ..... 6

**2 Product Specifications ..... 7**
**2.1** Function ..... 7
**2.2** Housing Styles ..... 8
**2.3** Terminals ..... 10
**2.4** Color Identification ..... 15
**2.5** Status Indicators with LEDs ..... 16
**2.6** Label Carrier ..... 17

**3 Installation ..... 18**
**3.1** DIN Mounting Rail ..... 18
**3.2** Power Rail ..... 18
**3.3** Mounting ..... 19
**3.4** Connection ..... 21
**3.5** Device Configuration ..... 26

**4 Operation ..... 28**
**4.1** Fault Monitoring ..... 28
**4.2** Fault Output ..... 28
**4.3** Current and Voltage Standard Signals ..... 32

**5 Technical Specifications ..... 33**
**5.1** Technical Data ..... 33
**5.2** Model Number Description ..... 36
**5.3** Dimensions ..... 38

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# 1 Safety

## 1.1 Validity

The chapter “Safety” is valid as instruction manual.

Specific processes and instructions in this document require special precautions to guarantee the safety of the operating personnel.

## 1.2 Target Group / Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the system operator.

Mounting, installation, commissioning, operation, maintenance and disassembly of any devices may only be carried out by trained, qualified personnel. The instruction manual must be read and understood.

## 1.3 Reference to further documentation

Laws, standards, or directives applicable to the intended use must be observed. In relation to hazardous areas, Directive 1999/92/EC must be observed.

The corresponding data sheets, declarations of conformity, EC-type-examination certificates, certificates and Control Drawings if applicable (see data sheet) are an integral part of this document. You can find this information under www.pepperl-fuchs.com.

Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version, which can be found under www.pepperl-fuchs.com.

## 1.4 Marking

| Device identification |
|---|
| Pepperl+Fuchs GmbH |
| Lilienthalstrasse 200, 68307 Mannheim, Germany |
| Model number |
| ATEX approval |
| Group, category, type of protection, temperature classification |
| Statement of conformity (where appropriate) |
| Group, category, type of protection (where appropriate) |

The exact designation of the device can be found on the name plate on the device side.



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## 1.5 Intended Use

The devices are only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

The device must only be operated in the ambient temperature range and at the relative humidity (non-condensing) specified.

The devices are used in C&I technology for the galvanic isolation of C&I signals such as 20 mA and 10 V standard signals or alternatively for adapting or standardizing signals. Devices that incorporate intrinsically safe circuit are used for operating intrinsically safe field devices in hazardous areas.

## 1.6 Improper Use

Protection of the operating personnel and the overall system is not ensured if the product is not being used according to its intended purpose.

The equipment is not suitable for isolating signals in high current applications unless this is noted separately in the corresponding datasheet.

## 1.7 Mounting/Installation

Prior to mounting, installation, and commissioning of the device you should make yourself familiar with the device and carefully read the instruction manual.

The device must not be installed at locations where corrosive vapors may be present.

The devices fulfill a degree of protection IP 20 according to IEC/EN 60529.

The devices are designed for use in pollution degree 2 and overvoltage category II as per IEC/EN 60664-1.

If used in areas with higher pollution degree, the devices need to be protected accordingly.

Only use power supplies that provide protection against direct contact (e. g. SELV or PELV) for the connection to power feed modules.

Observe the tightening torque of the terminal screws.

The installation instructions in accordance with IEC/EN 60079-14 must be observed.

Intrinsically safe circuits of associated apparatus (installed in safe areas) can be led into hazardous areas, whereby special attention must be paid to maintain separation distances to all non-intrinsically safe circuits according to the requirements in IEC/EN 60079-14.

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All separation distances between two adjacent intrinsically safe circuits need to be observed in accordance with IEC/EN 60079-14.

If "Ex i" protected circuits (intrinsically safe) were operated with non-intrinsically safe circuits, they must no longer be used as "Ex i" protected circuits.

The respective peak values of the field device and the associated apparatus with regard to explosion protection should be considered when connecting intrinsically safe field devices with intrinsically safe circuits of associated apparatus (verification of intrinsic safety). Make sure to observe IEC/EN 60079-14 and IEC/EN 60079-25.

If more channels of one device are connected in parallel, make sure the parallel connection is made directly at the terminals of the device. When verifying the intrinsic safety, the maximum values for the parallel connection must be considered.

## 1.8 Operation, Maintenance, Repair

The devices must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device.

## 1.9 Delivery, Transport, Disposal

Check the packaging and contents for damage.

Check if you have received every item and if the items received are the ones you ordered.

Keep the original packaging. Always store and transport the device in the original packaging.

Store the device in a clean and dry environment. The permitted ambient conditions (see data sheet) must be considered.

Disposing of devices, packaging material, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.



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# 2 Product Specifications

## 2.1 Function

Isolated barriers are used for protection of intrinsically safe circuits in hazardous areas. They have the necessary current and voltage limitation and additionally electrical isolation between field circuit and control.

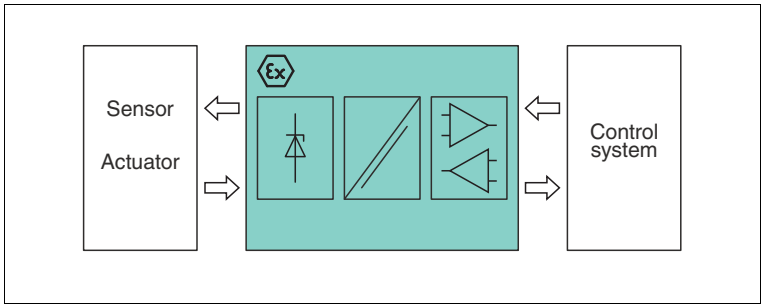


Figure 2.1 Function – isolating, amplifying and transforming signals

The K-System consists of wide range of isolated barriers suitable for mounting on 35 mm DIN mounting rail. K-System is easy to specify, integrate and expand. Our extensive line of intrinsic safe isolators for hazardous location applications contains over 150 different models, each containing industry leading features and benefits.

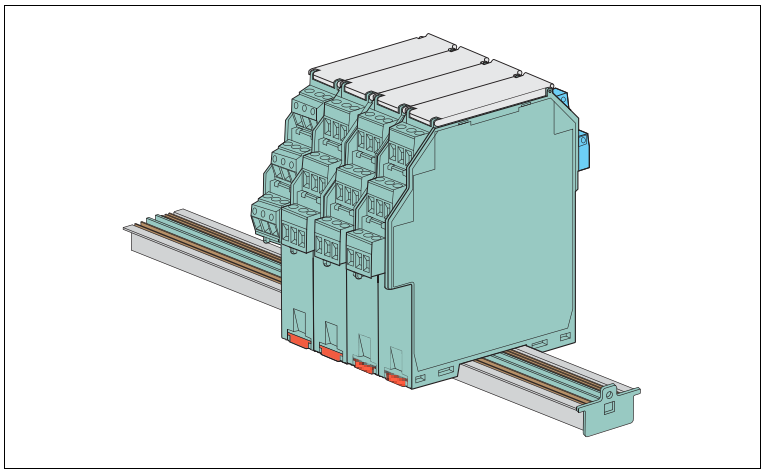

Figure 2.2 K-System on Power Rail



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## 2.2 Housing Styles

Depending on the functionality and application, K-System devices have three different housing widths:

- KC devices with 12.5 mm width
- KF devices with 20 mm width
- KF devices with 40 mm width

The three housing widths versions have the same system characteristics. All devices from the K-System can be combined on the Power Rail.

**KC Device Housing**

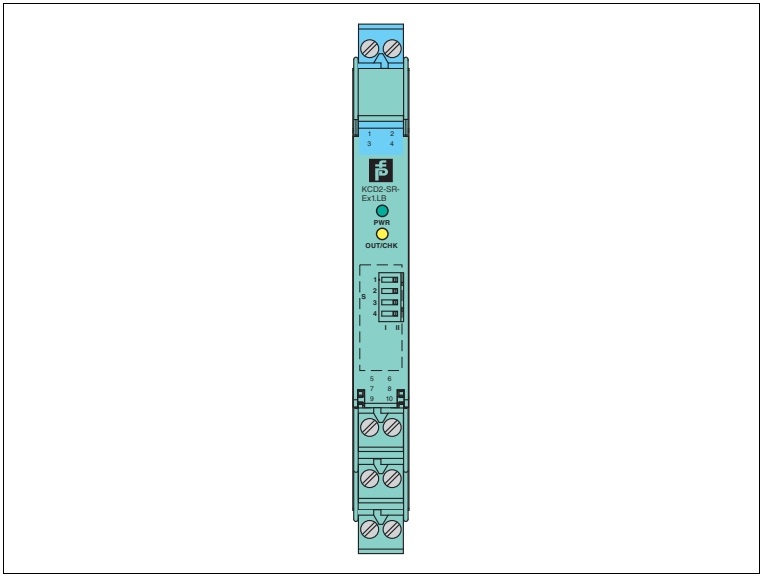


Figure 2.3 KC device housing (12.5 mm)

Used for high signal integrity

- Compact 12.5 mm housing
- Maximum packing density with single loop integrity
- Power loss only 0.8 W per device


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### KF Device Housing

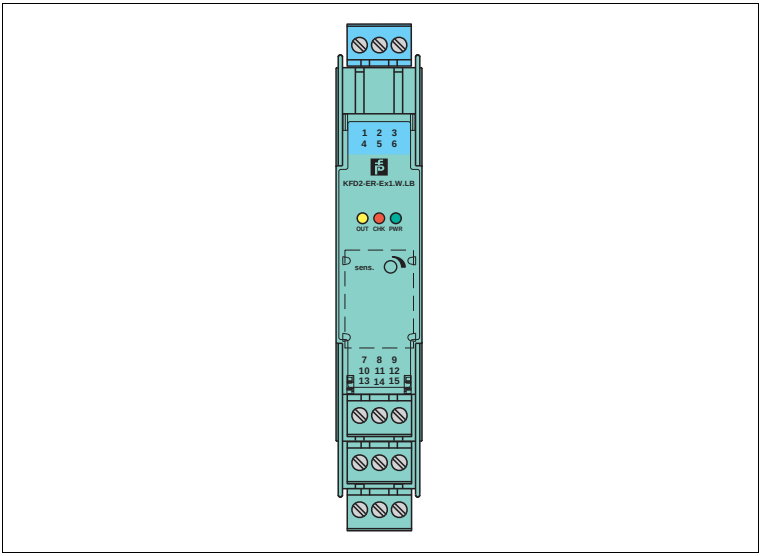


Figure 2.4 KF device housing (20 mm)

Used for high channel density

- Compact 20 mm housing
- Highest packing density on the market
- Requires only 5 mm per channel


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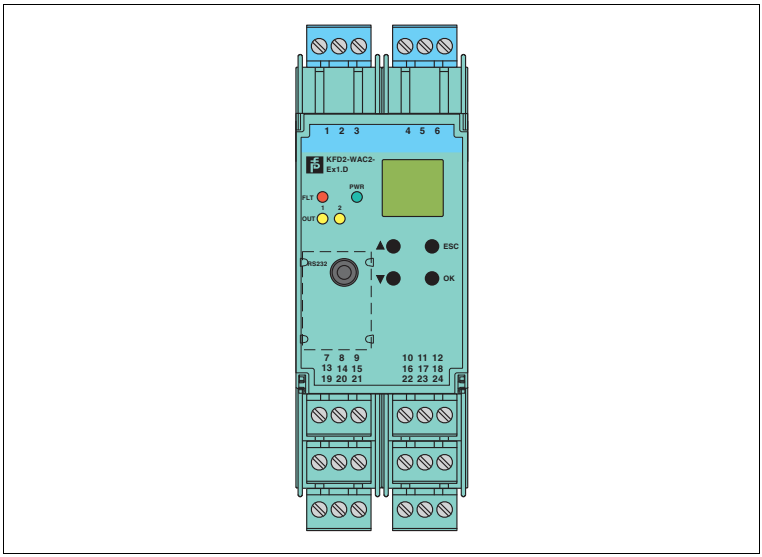


Figure 2.5 KF device housing (40 mm)

Used for applications with high functionality

- Digital devices monitor speed, direction of rotation, slip, flow rates and time.
- Analog devices monitor transmitter signals, temperature signals and load cells.
- Configured using **PACTware™** or keypad
- AC/DC wide range supply available

## 2.3 Terminals

### 2.3.1 Removable Terminal Blocks

The removable terminal blocks simplify connection and control cabinet construction significantly. These terminal blocks offer adequate space for the connection of leads with core cross-sections of up to 2.5 mm$^2$ (14 AWG). The terminal blocks are coded with red coding pins so misconnection of terminal blocks are eliminated.

Observe the tightening torque of the terminal screws. The tightening torque is 0.5 Nm to 0.6 Nm.

The 20 mm and 40 mm wide KF devices are factory-equipped with screw terminals. The KC devices are available with screw terminals or spring terminals. The type code of the versions of the KC-devices with spring terminals has the extension ".SP".

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As an alternative to the factory-equipped terminal blocks the devices can be used with other terminal blocks:

- Terminal blocks with screw terminals
- Terminal blocks with screw terminals and test sockets
- Terminal blocks with spring terminals and test sockets

These terminal blocks are available as accessories. The terminal blocks can be easily coded with KF-CP coding pins (available separately).

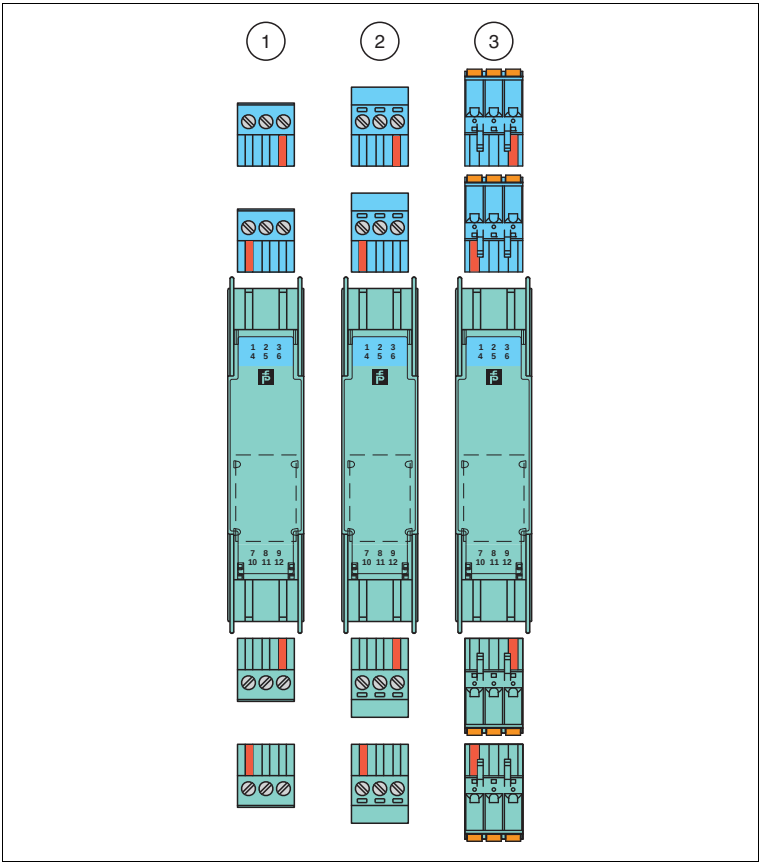


Figure 2.6 K-System removable terminal blocks

**1** Terminal blocks with screw terminals
**2** Terminal blocks with screw terminals and test sockets
**3** Terminal blocks with spring terminals and test sockets


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**Protection against direct contact**

The removable terminal blocks have different heights:

- Height 15 mm (1), (2), (3): These terminal blocks are used in applications that have rated voltages lower than 50 V AC. The insulation of the removable terminal blocks provides protection against direct contact. The insulation corresponds to a reinforced insulation according to EN 50178 for a rated insulation voltage of 50 V AC.
- Height 15.5 mm (4), (5): These terminal blocks are used in applications that have rated voltages higher than 50 V AC. The insulation of the removable terminal blocks provides protection against direct contact. The insulation corresponds to a basic insulation according to EN 50178 for a rated insulation voltage of 300 V AC. The higher terminals are marked (X).

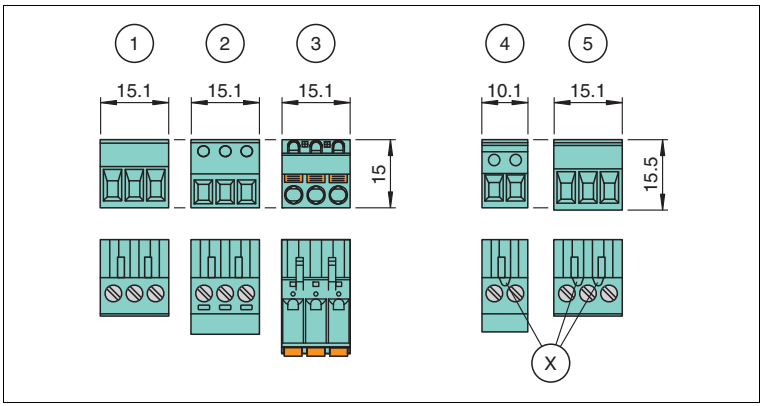


Figure 2.7 Removable terminal blocks with different heights

**1** Terminal block with screw terminals, height 15 mm
**2** Terminal block with screw terminals and test sockets, height 15 mm
**3** Terminal block with spring terminals and test sockets, height 15 mm
**4** Terminal block with screw terminals and test sockets, height 15.5 mm
**5** Terminal block with screw terminals, height 15.5 mm
**X** Marking

***Note!***

For more information see the corresponding data sheets.

## 2.3.2 Terminal Designation

Please reference appropriate device for precise terminal designation.



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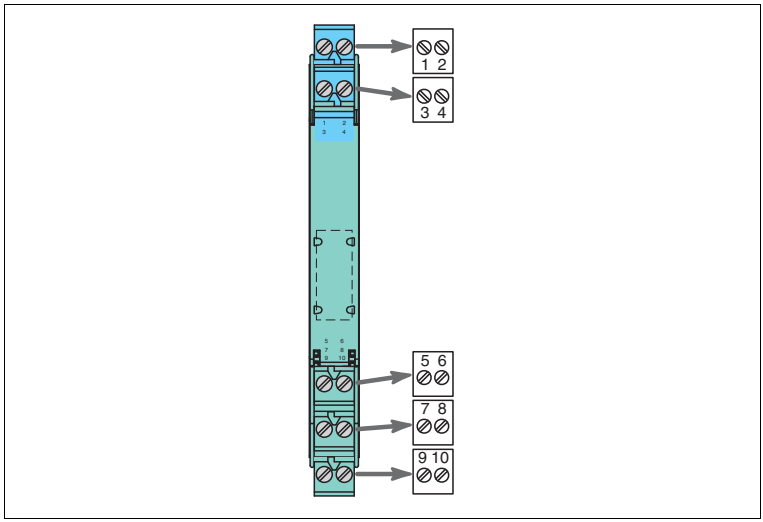


Figure 2.8 KC device housing (12.5 mm)

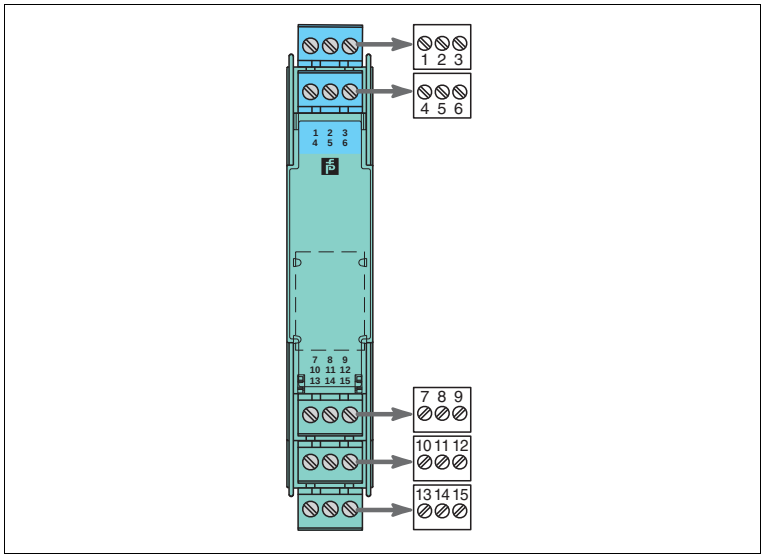


Figure 2.9 KF device housing (20 mm)


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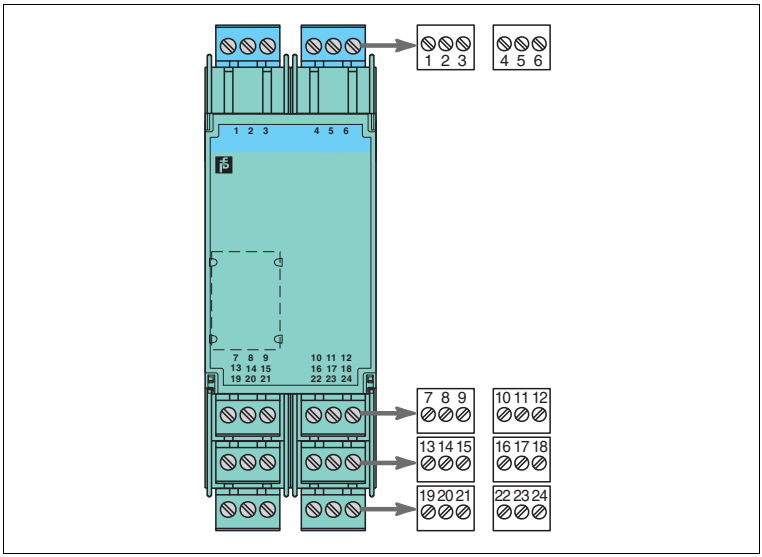


Figure 2.10 KF device housing (40 mm)


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## 2.4 Color Identification

The color identification of the devices has the following meaning:

- Green (1) indicates devices with DC power supply.
- Black (2) indicates devices with AC power supply.
- Gray (3) indicates devices with AC/DC wide range supply of
  - 20 V DC to 90 V DC or
  - 48 V AC to 253 V AC
- Blue (4) indicates devices that process signals from the hazardous area

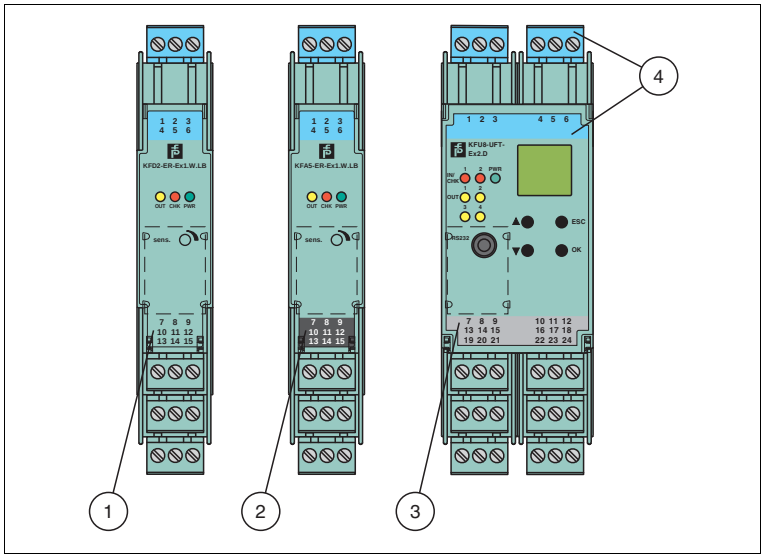


Figure 2.11 Color identification of devices

**1** green
**2** black
**3** gray
**4** blue


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## 2.5 Status Indicators with LEDs

LEDs are often used on isolators to indicate different statuses (e. g. for power supply, device failure, status messages, binary switching states). Standard LED colors are assigned to the status display according to NAMUR NE44.

| LED | Display function | Display | Meaning |
|---|---|---|---|
| Green LED | Power supply | On | Power supply OK |
| | | Off | Power failure or insufficient power supply – device faulty |
| Red LED | Device fault, device failure | On | Internal fault signal, failure signal – fault/failure display of causes detected inside the device, device needs replacing |
| | Line fault | Flashing | External fault signal, failure signal – fault/failure display of causes detected outside the device, inspection and elimination of fault required |
| | No fault | Off | No malfunction, device is operating properly |
| Yellow LED | Switching states of binary inputs and outputs | On | Possible causes of the output:<br>■ The relay is energized.<br>■ The NO contact (also a change-over contact) is actively closed.<br>■ The open collector is switched through.<br>■ The switching voltage generated inside the device is applied.<br>Possible causes of the input:<br>■ An external contact is closed.<br>■ A NAMUR sensor is undamped (OK range according to closed-circuit current principle).<br>■ A switching signal is actively applied. |
| | | Off | Possible causes of the output:<br>■ The relay is de-energized.<br>■ The NO contact (also a change-over contact) is actively opened.<br>■ The open collector is not switched through.<br>■ The switching voltage generated inside the device is not applied.<br>Possible causes of the input:<br>■ An external contact is opened.<br>■ A NAMUR sensor is damped (fault range according to closed-circuit current principle).<br>■ A switching signal is not applied. |

Table 2.1 Meaning of status indicators



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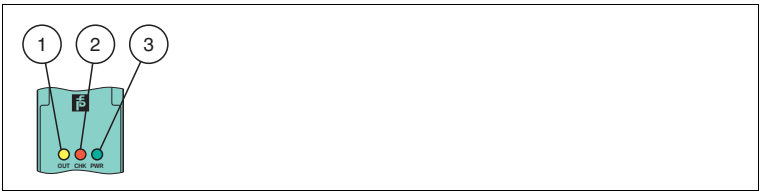


Figure 2.12 Example status indicators

**1** Yellow LED "OUT"
Switching state of the output

**2** Red LED "CHK"
Lead breakage and short circuit status indicator

**3** Green LED "PWR"
Power supply status indicator

## 2.6 Label Carrier

A label carrier for individually labeling the devices is provided in the factory.

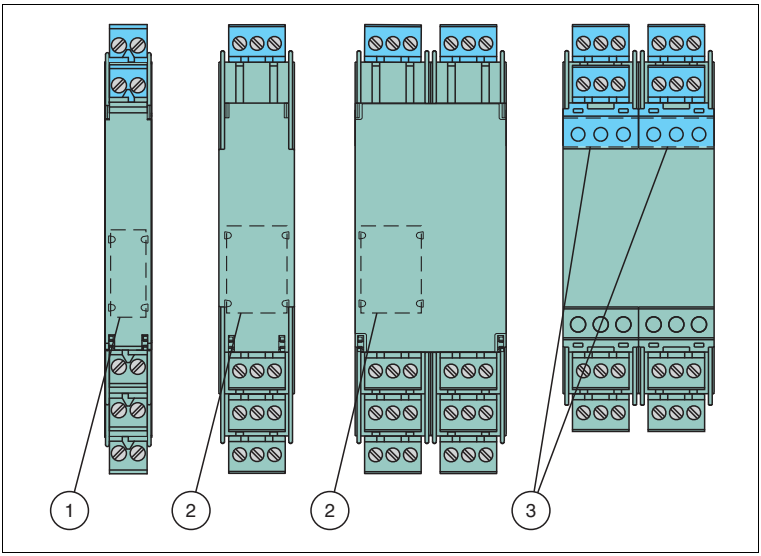


Figure 2.13 Label carrier on the front

**1** Label carrier on KC devices for 22 mm x 9 mm labels

**2** Label carrier on KF devices for 22 mm x 16.5 mm labels

**3** Label carrier on KF devices (old version) for 18 mm x 8 mm labels



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# 3 Installation

## 3.1 DIN Mounting Rail

The devices are mounted on a 35 mm DIN mounting rail according to EN 60715.

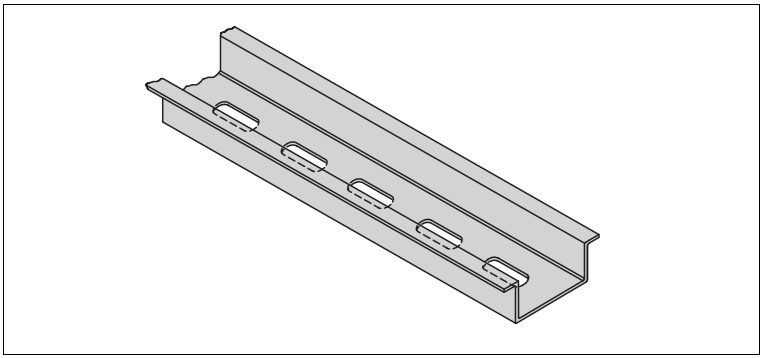

Figure 3.1 Example: DIN mounting rail UPR-MR (35 mm x 15 mm)

## 3.2 Power Rail

To reduce wiring and installation costs, Power Rail is the optimum solution. The Power Rail is a DIN mounting rail with plastic insert, that delivers power to the devices (24 V DC) and transfers bus signals and a collective error message.

The Power Rail is factory-equipped with cover and end caps. These parts cover empty and open segments of the Power Rail. Thus, the Power Rail is protected from contamination. Additionally the cover and end caps prevent that electrically conductive parts come in contact with the Power Rail.

Power Rail is available in two versions:

- **Power Rail UPR-03**
  Version with three leads:
  - two conductors for power
  - one conductor for collective error messaging
- **Power Rail UPR-05 (only for KFD2-WAC2-(Ex)1.D)**
  Version with five leads:
  - two conductors for power
  - one conductor for collective error messaging
  - two conductors for serial data exchange



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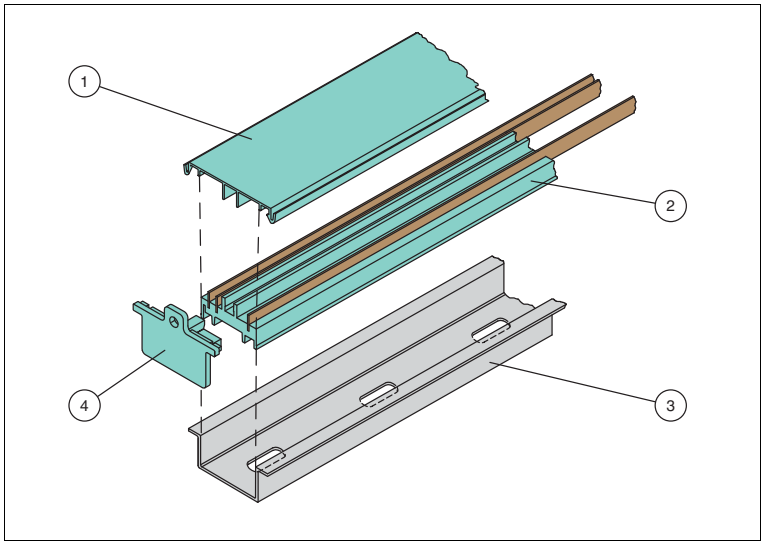


Figure 3.2 Example: Power Rail UPR-03

**1** Cover UPR-COVER
**2** Insert UPR-INS-03
**3** DIN mounting rail UPR-MR (35 mm x 15 mm)
**4** End cap UPR-E

## 3.3 Mounting

Mounting the Isolated Barrier

Snap the device onto the DIN mounting rail in a **vertical downward** movement. See figure below.



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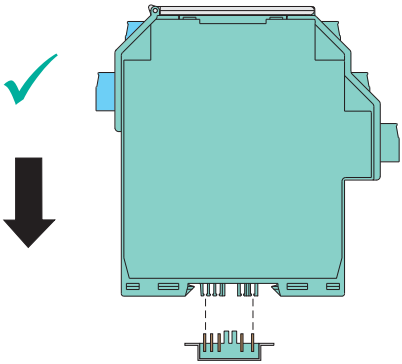
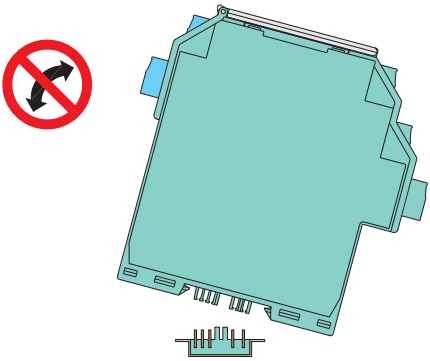


**CORRECT: Device snapped on vertically.**

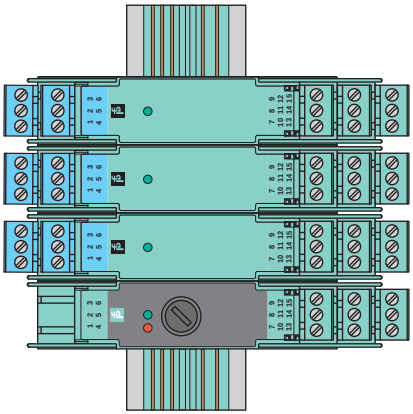


**INCORRECT: Device snapped on from the side.**
Can damage the contacts and cause the device to fail.

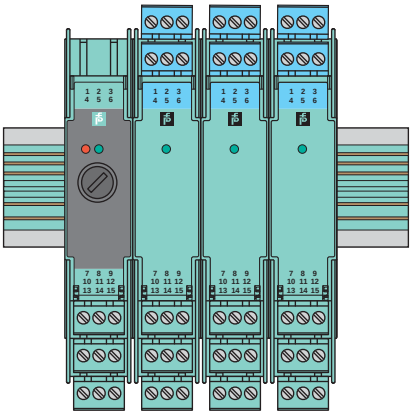
Figure 3.3

### Vertical and horizontal mounting

Low heat dissipation allows vertical or horizontal mounting without spacing. Operation is guaranteed over the full temperature range of the system in any mounting direction and without restriction.



Vertical mounting



Horizontal mounting

Figure 3.4

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Mounting the Terminal Blocks

The insulation of the removable terminal blocks protect against direct contact. If you replace the terminal blocks, observe the rated insulation voltage. See chapter 2.3.1. If the rated voltage greater than 50 V AC, proceed as follows:

1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

## 3.4 Connection

K-System devices are available with different supply voltages.

- 24 V DC power supply
- 115 V AC or 230 V AC power supply for applications where direct current is not available
- AC/DC wide range supply with 20 V DC to 90 V DC or 48 V AC to 230 V AC

The supported supply voltage for each device is identified on the side plate.

***Note!***

For more information see the corresponding data sheets.



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### 3.4.1 Power Supply without Power Rail

If devices with AC or universal power supplies are used, the advantages of Power Rail are not available.

Conventional power supplies create complicated and expensive wiring systems. After all isolated barriers are connected, there is a significant amount of wiring and more wiring must be added for extra functions such as line fault detection.

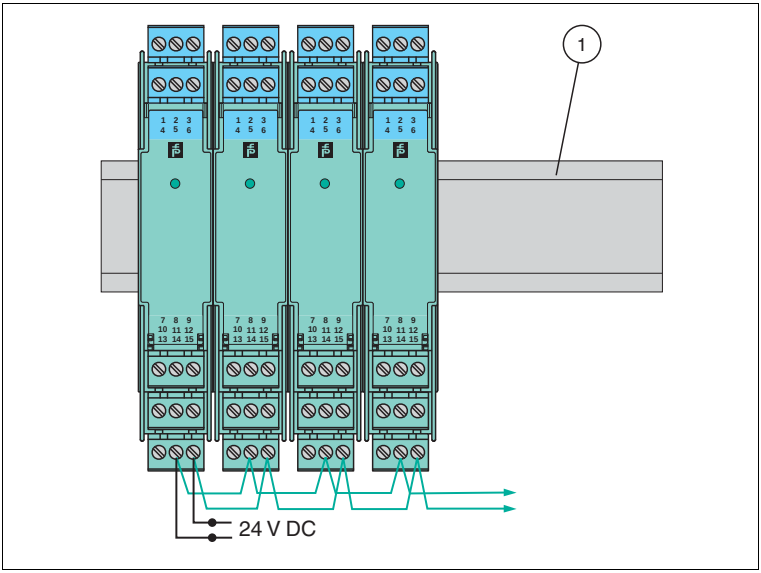


Figure 3.5 Conventional installation

**1** DIN mounting rail

### 3.4.2 Power Supply with Power Rail

For devices with a 24 V DC supply voltage, use of the Power Rail reduces wiring and installation costs. The Power Rail almost completely eliminates the risk of wiring faults and facilitates expansion.

Power is supplied to the Power Rail via a power feed module which provides a voltage of 24 V DC (max. 4 A) to a maximum of 80 devices.

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The power feed module features a replaceable 5 A fuse at the front. This fuse ensures that the Power Rail and connecting contacts are protected. It prevents damage caused by reverse supply voltage or by installing too many isolators. The isolators on the Power Rail feature integrated device fuses. Any faults in the isolator or in the signal leads do not affect the Power Rail supply system. The 5 A fuse permits a rated current of up to 4 A across the entire temperature range.

The power feed module also has the task of outputting a collective error message or power failure of the isolators via a separate relay output.

Alternatively, supply of the Power Rail can be provided using the power supply KFA6-STR-1.24.*. In this case, no collective error message is possible.

**Non-Redundant Supply with Power Feed Modules**

The power feed module mounts on the Power Rail for easy and reliable distribution of power to all connected isolators. This method eliminates the wiring loops (daisy chain) necessary on a conventional installation without Power Rail.

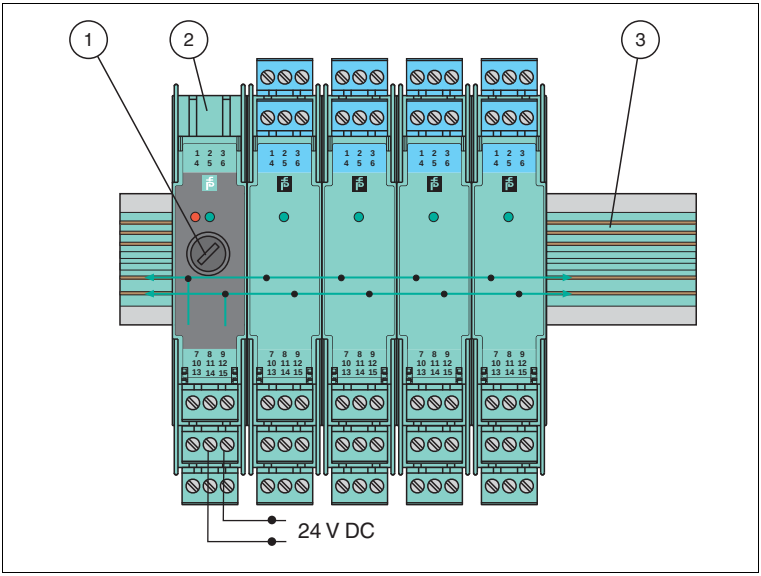


Figure 3.6 Power Rail installation

**1** Replaceable fuse
**2** Power feed module
**3** Power Rail


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### Redundant Supply with Power Feed Modules

Two power supplies or a redundant power supply with two power feed modules offer a high degree of availability. If a power supply or the fuse in a power feed module fails, the redundant supply continues to energize the isolators through their Power Rail connection.

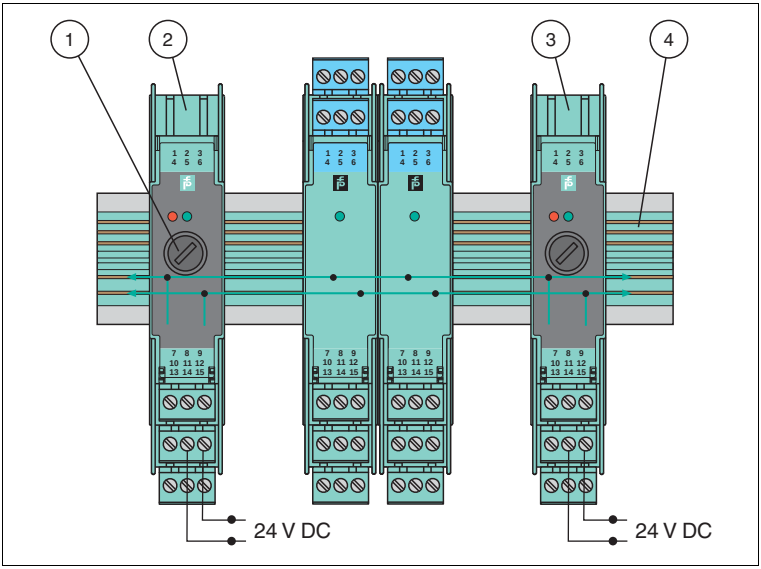


Figure 3.7 Redundant power connections

1 Replaceable fuse
2 Power feed module 1
3 Power feed module 2
4 Power Rail

### Direct Supply with Power Supplies

A complete power solution for a K-System installation is possible by using the following power supplies:

- KFA6-STR-1.24.4 from 115/230 V AC to 24 V DC/4 A or
- KFA6-STR-1.24.500 from 115/230 V AC to 24 V DC/500 mA

The power supplies snap on the Power Rail to easily and efficiently distribute power to the isolated barriers.


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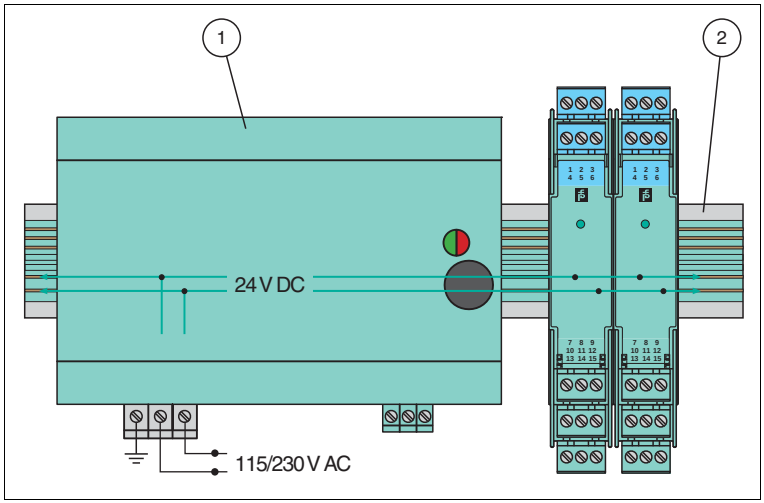


Figure 3.8 Integrated power supply (4 A)

**1** Power supply
**2** Power Rail

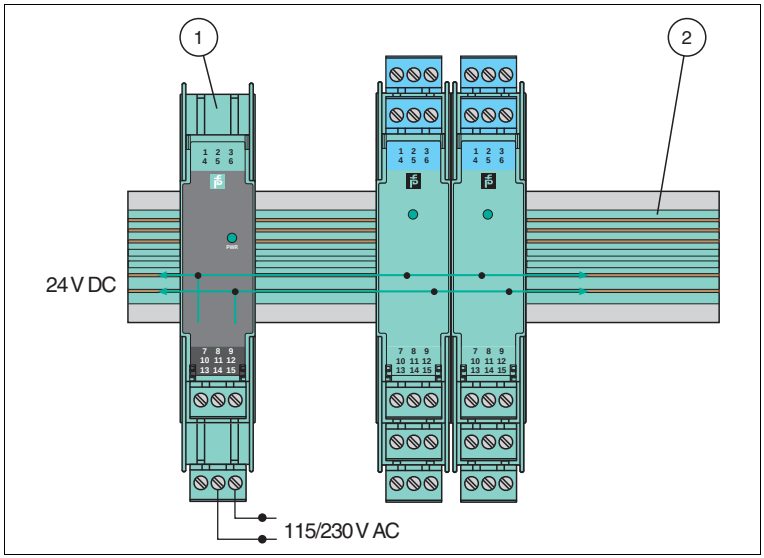


Figure 3.9 Integrated power supply (500 mA)

**1** Power supply
**2** Power Rail


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## 3.5 Device Configuration

Many devices of the K-System can be adapted to different applications. Depending on the device different controls are available for this configuration.

These controls are:

**DIP switches**

Via DIP switches you can configure the basic functions of the device.

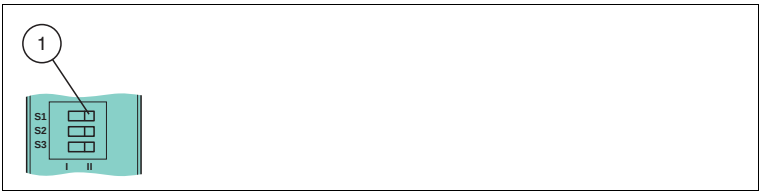


Figure 3.10

**1** DIP switch

**Rotary switches**

Via rotary switches you can configure the basic functions of the device.

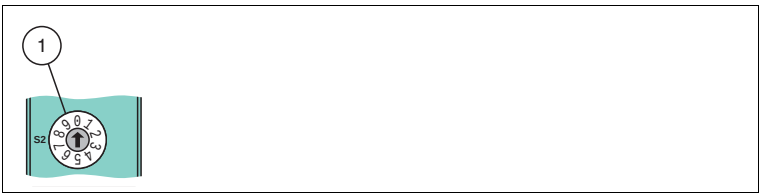


Figure 3.11

**1** Rotary switch

**Potentiometers**

Via potentiometers you can configure the calibration of input and output characteristics.

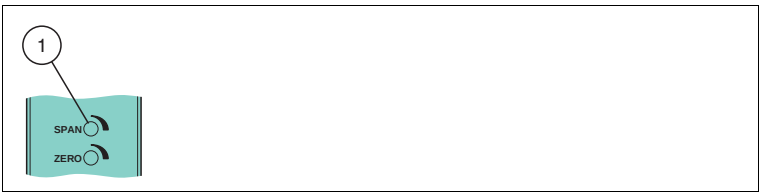


Figure 3.12

**1** Potentiometer

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### Keypad and LC display

Via keypad you can configure the settings of the device parameters. Measured values, fault signals and configuration settings are displayed on the LC display.

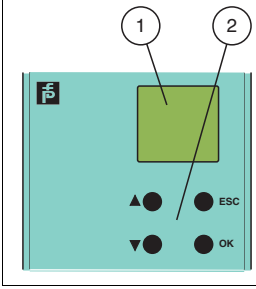


Figure 3.13

**1** LC display
**2** Keypad

### Programming sockets for the connection of a PC with parameterization software PACTware™

Via parameterization software PACTware™ you can configure the device easily. The configuration data can be edited and saved. The parameterization software helps users for maintenance, diagnostics and troubleshooting.

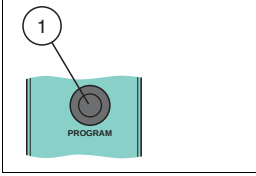


Figure 3.14

**1** Programming socket

Device configuration

Set the particular controls as described in section "Configuration" of the data sheet.

***Note!***

For more information see the corresponding data sheets.



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# 4 Operation

## 4.1 Fault Monitoring

Numerous faults can occur between measurement of the process variable and evaluation in the control system. This can lead to undesirable process statuses under certain circumstances. These process statuses may result in plant downtime or quality problems or even present a hazard to persons and the environment. Depending on the device version, the isolators enable monitoring of the following faults:

- Line faults
  Here, the connection cables between the isolator and field device are monitored for lead breakages or short circuits. If a fault is detected, it is output at the fault message output or collective fault message. The relevant switching outputs are then switched to a de-energized state. The red fault indication LEDs signal the fault.
- Device faults
  The isolators are designed so that internal faults are detected and reported. In the case of a power failure, the outputs are switched to a de-energized state.

## 4.2 Fault Output

Numerous K-System isolators monitor the field cables for lead breakages and short circuits so that faults in the plant can be detected immediately. Line faults are prevented from being interpreted as signals. Depending on the configuration of the devices, these faults are transmitted to the outputs at the control side and in separate fault indication outputs as additional information.

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### Fault Indication Output

Line and device faults are transmitted if the device has a fault indication output (FAULT). The fault indication output is active in a normal state and inactive in a fault state (closed-circuit principle). Is it impossible to reverse the detection direction of the fault indication output.

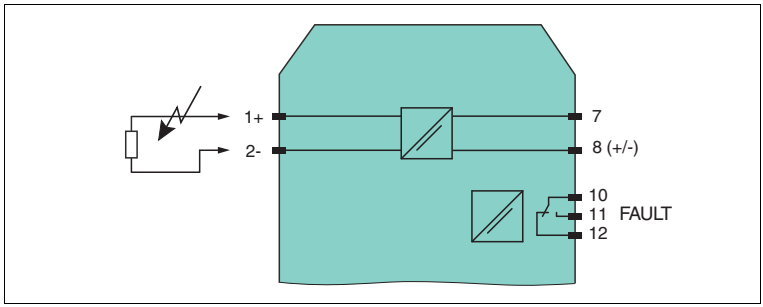


Figure 4.1

### Line Fault Transparency (LFT)

If the device has a signal output with line fault transparency, the fault message can also be transferred to the signal line, saving additional wiring and enabling the transfer of channel selective fault messages. A resistive passive transistor output is used for digital signals. The signals 0 and 1 are transmitted using two resistance values at the output. The output switches to high impedance in the event of a fault. Corresponding input cards are required in the controller for this line fault transparency function.

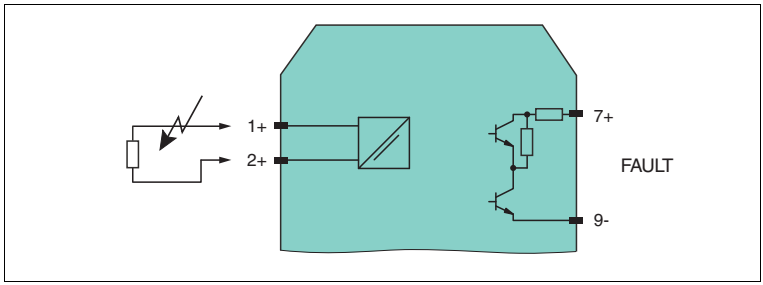


Figure 4.2 Example of line fault transparency with digital input


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### Collective Error Message on Power Rail

In addition to the output of fault messages at a separate fault indication output or using line fault transparency, the fault is also output at the Power Rail (FAULT) as a collective error message.

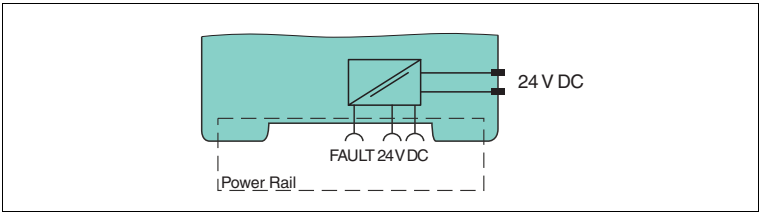


Figure 4.3

The collective error message enables line fault detection of many isolators without requiring additional wiring. In the event of a fault, a fault message signal is transmitted to the Power Rail from an isolator. The power feed module evaluates the signal and transmits the fault message signal to the controller by means of a potential-free contact.

The potential-free contact simultaneously reports the device power failure or failure of individual devices.



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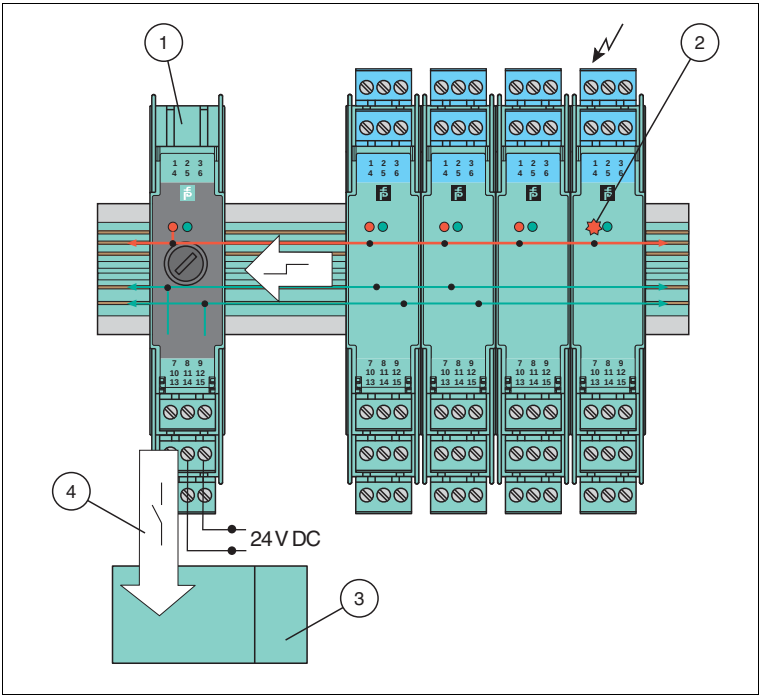


Figure 4.4 Collective error message via power feed module

**1** Power feed module
**2** Fault indication on one of the devices (red LED flashes)
**3** Process control system
**4** Fault indication output


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## 4.3 Current and Voltage Standard Signals

The following signals have established themselves as the standard:

- the 0/4 mA to 20 mA current signal
- the 0/2 V to 10 V voltage signal

The 0/1 V to 5 V voltage signal is also occasionally encountered in addition to the 0/2 V to 10 V voltage signal.

Analog sensor signals and digital frequency signals are converted into one of the two standard signals for processing in a wide variety of measurement, regulatory and control tasks. This offers the measurement and control technician an easy-to-measure standard signal common to all manufacturers. Sensor signals are converted into standard signals via signal converters.

For more diagnostic options, the NAMUR organization published NAMUR recommendation NE43, dividing the value range of the signal (e. g. current signal) into several areas. Valid, defined measurement value information is transferred within the range from 3.8 mA to 20.5 mA. Failure information is available when the signal current is < 3.6 mA or > 21 mA i. e. outside of the range for measured value information. The same applies to the voltage signal.

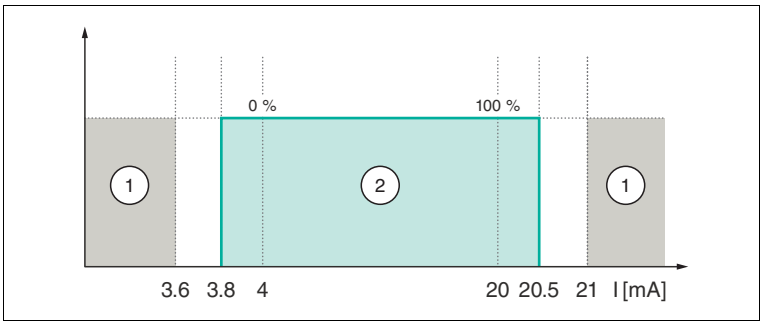


Figure 4.5 Signal ranges according to NAMUR NE43 (e. g. current signal)

**1** Failure information
**2** Measuring information

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# 5 Technical Specifications

## 5.1 Technical Data

**Electrical Data**

**Safe Area Signals or Control Circuit Signals**

- 0/4 mA to 20 mA signal level according to NE43
- 0/2 V to 10 V signal level according to NE43
- 0/1 V to 5 V signal level according to NE43
- Current output HART compatible
- Current input HART compatible
- Digital output: active or passive electronic output 100 mA/30 V, short-circuit protected
- Relay output 2 A, minimum load 1 mA/24 V
- Logic level 24 V according to IEC 60946
- Functional isolation or safe isolation according to IEC 61140 and NAMUR NE23

**Ex Signals or Field Circuit Signals**

- Transmitter power supply up to 17 V DC
- Current output HART compatible
- Pt100, 2-, 3-, (4)-wire technology
- Resistor 0 Ω to 400 Ω with freely definable characteristic
- Potentiometer
- Thermocouples of all types, internal cold junction, external reference
- Current output HART compatible
- Digital input according to NAMUR EN 60947-5-6
- Digital output for Ex-i valves, short-circuit protected

**Conformity**

**General**

- Isolators with and without explosion protection, mostly with Ex ia IIC/Class I Div. 1, international approvals
- EMV according to
  - EN 61326-1
  - EN 61326-3-2, only for devices with SIL rating, where the data sheet mentions this standard.
    If you operate the device with a DC supply voltage, you must ensure that the bridging of the 20 ms voltage interruption is realized by the power supply.
  - NAMUR NE21
    If you operate the device with a DC supply voltage, you must ensure that the bridging of the 20 ms voltage interruption is realized by the power supply.


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- LEDs according to NAMUR NE44
- Software according to NAMUR NE53
- Switch-on pulse suppression
- K*D2 devices:
  - Supply voltage 20 V DC to 30 V DC via Power Rail or supply terminals
  - Collective error message via Power Rail
- K*A and K*U devices:
  - Supply voltage 115 V/230 V AC ±10 %
- Safety devices according to VDE 0660, part 209, AK according to DIN 19250

**Digital Inputs and Outputs according to NAMUR**

The standards references for this interface have changed many times:

- German standard (old): **DIN 19234**: Electrical distance sensors – DC interface for distance sensors and switch amplifiers; 1990-06
- European standard (old): **EN 50227**: Low voltage switch gear and control gear – control devices and switching elements – proximity switches, DC interface for proximity sensors and switch amplifiers (NAMUR), 1996-10
- German version (old): **DIN EN 50227**: Low voltage switch gear – control devices and switching elements – proximity switches, DC interface for proximity sensors and switch amplifiers (NAMUR), 1997
- **Current designation: EN 60947-5-6**: Low voltage switch gear – control devices and switching elements – proximity switches, DC interface for proximity sensors and switch amplifiers (NAMUR), 2000
- **Current IEC designation: IEC 60947-5-6**: Low voltage switch gear and control gear – part 5-6: Control devices and switching elements – DC interface for proximity sensors and switch amplifiers (NAMUR), 1999

**Ambient Conditions**

**Ambient Temperature**

- -20 °C to 60 °C (-4 °F to 140 °F), exceptions see data sheets

**Storage Temperature**

- -40 °C to 90 °C (-40 °F to 194 °F), exceptions see data sheets

**Reference Conditions for Adjustment**

- 20 °C (68 °F)

**Relative Humidity**

- max. 95 % without moisture condensation

**Vibration Resistance**

- according to EN 60068-2-6, 10 Hz to 150 Hz, 1 g, high crossover frequency

**Shock Resistance**

- according to EN 60068-2-27, 15 g, 11 ms, half-sine

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### Labeling

Place for labeling on the front side, label:

- KC devices (12.5 mm): 22 mm x 9 mm
- KF devices (20 mm and 40 mm): 22 mm x 16.5 mm
- KF devices (old version): 18 mm x 8 mm

### Mechanical Specifications

### Mounting

- Snap-on 35 mm DIN mounting rail according to EN 60715. Can be mounted horizontally or vertically, side by side.
- Panel mount: The lugs on the base of the isolator must be extended and used for mounting purposes with 3 mm screws.
- K-MS mounting base for screw attachment

### Housing Material

- Polycarbonate (PC)

### Dimensions

- Dimension drawings please refer to chapter Dimensions.

### Protection Degree

- IP20 according to EN 60529

### Connection

- KH* devices: self-opening terminals for max. core diameter of 1 x 2.5 $mm^2$ (14 AWG)
- KF* and KC* devices: removable connector with integrated self opening terminals for leads of up to a max. of 1 x 2.5 $mm^2$ (14 AWG)
- Observe the tightening torque of the terminal screws. The tightening torque is 0.5 Nm to 0.6 Nm.

### Fire Protection Class

- Housing: V2 according to UL 94 standard. Unless stated otherwise all details relate to the reference conditions.

***Note!***

For more information see the corresponding data sheets.



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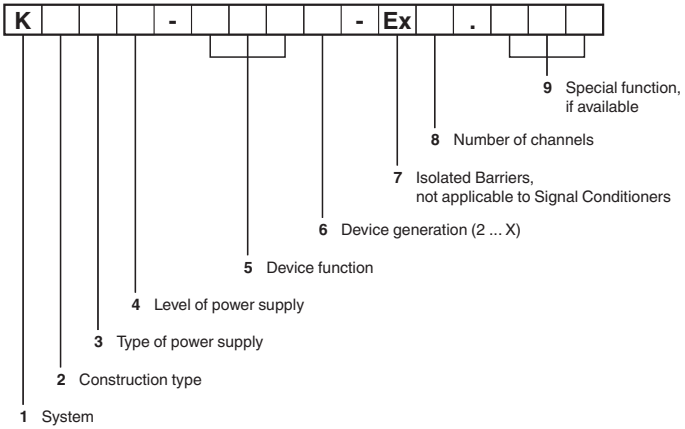
## 5.2 Model Number Description




| | | |
|---|---|---|
| **Position 1** | K | K-System |
| **Position 2** | C | Version with removable terminal blocks, 12.5 mm width |
| | F | Version with removable terminal blocks, 20 mm or 40 mm width |
| | H | Version without removable terminal blocks, 20 mm or 40 mm width |
| **Position 3** | D | DC power supply |
| | A | AC power supply |
| | U | AC/DC power supply |
| **Position 4** | 0 | without power supply |
| | 2 | 24 V |
| | 4 | 100 V |
| | 5 | 115 V |
| | 6 | 230 V |
| | 8 | 20 V DC to 90 V DC, 48 V AC to 253 V AC |
| **Position 5** | CC | Converter for current/voltage |
| | CD | Active current driver |
| | CR | Transmitter power supply, current output |
| | CRG | Transmitter power supply with trip value |
| | CS | Passive current driver |
| | DU | Switch amplifier, time relay |
| | DWB | Overspeed/underspeed monitor, logic control unit |
| | EB | Power feed module |
| | ELD | Ground fault detection |
| | ER | Conductivity switch amplifier |
| | FF | RS 232 repeater |
| | GS | Trip amplifier for current/voltage |
| | GU | Universal trip amplifier |

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| | | |
|---|---|---|
| **Position 5** | GUT | Temperature converter with trip value |
| | HLC | HART Loop Converter |
| | HMM | HART Multiplexer Master |
| | HMS | HART Multiplexer Slave |
| | PT | Potentiometer converter |
| | RC | Converter for resistors |
| | RCI | Solenoid driver |
| | RO | Relay module |
| | RR | Thermometer resistance repeater |
| | RSH | Relay module in fail-safe technology |
| | SCD | SMART current driver |
| | SCS | SMART current driver/repeater |
| | SD | Solenoid driver |
| | SH | Switch amplifier in fail-safe technology |
| | SL | Solenoid driver with logic input |
| | SOT | Switch amplifier with passive, potential free transistor output |
| | SR | Switch amplifier with relay output |
| | SRA | Switch amplifier with relay output, 2:1 operation mode |
| | SRT | Switch amplifier with active transistor and relay output |
| | ST | Switch amplifier with active transistor output |
| | STC | SMART transmitter power supply with current output |
| | STR | Power supply |
| | STV | SMART transmitter power supply with voltage output |
| | TR | RTD converter |
| | TT | Converter for thermocouple/mV signal |
| | UFC | Universal frequency converter |
| | UFT | Frequency converter with direction and synchronization monitoring |
| | USC | Universal signal converter with trip value |
| | UT | Universal temperature converter |
| | VC | Converter for current/voltage |
| | VCR | Transmitter power supply, repeater for current/voltage |
| | VD | Solenoid driver |
| | VM | Solenoid driver |
| | VR | Voltage repeater |
| | WAC | Strain gauge converter |



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## 5.3 Dimensions

### 5.3.1 Housing Types Isolated Barriers K-System

Housing Type A2

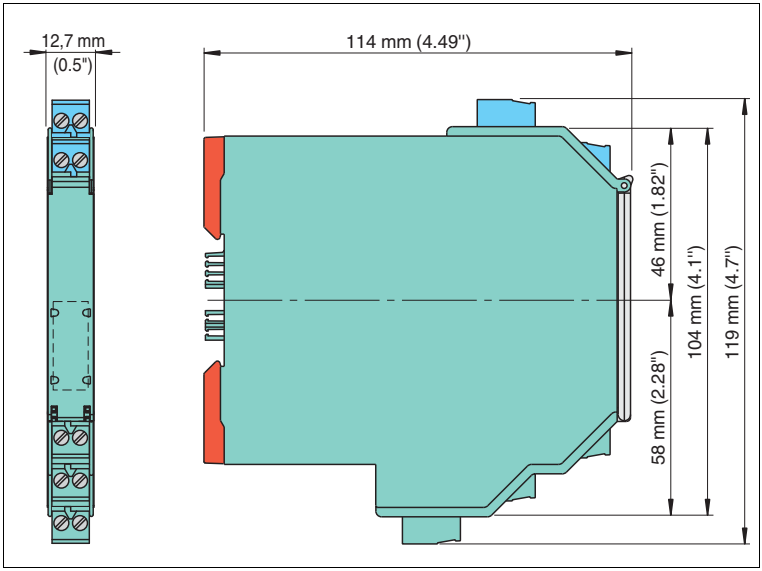


Figure 5.1

Number of terminal blocks max. 5

- Dimension drawing with screw terminals
- When using screw terminals with test sockets the device is 124 mm (4.9 in) in height.
- When using spring terminals the device is 131 mm (5.16 in) in height.



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Housing Type B1

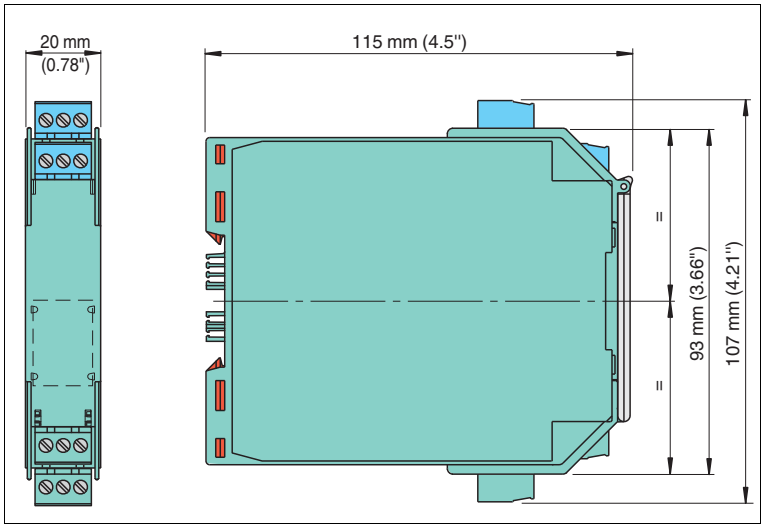


Figure 5.2

Number of terminal blocks max. 4

- Dimension drawing with screw terminals
- When using screw terminals with test sockets the device is 115 mm (4.6 in) in height.
- When using spring terminals the device is 122 mm (4.8 in) in height.



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Housing Type B2

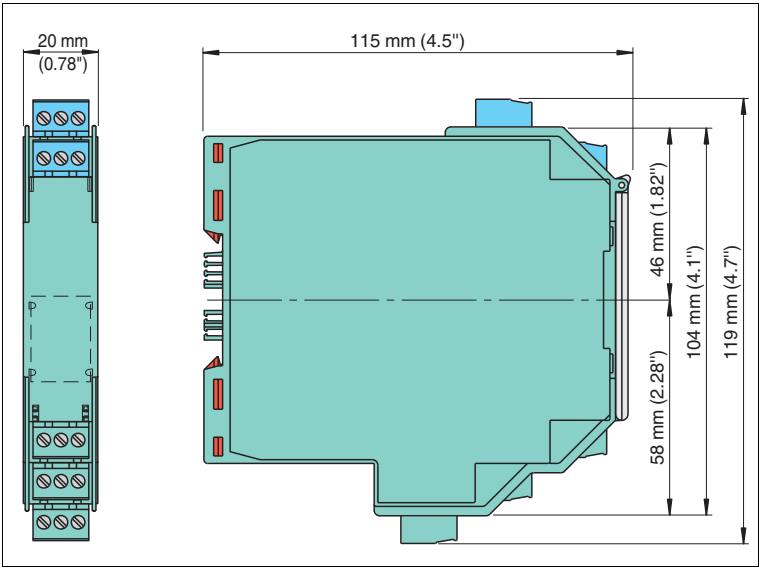


Figure 5.3

Number of terminal blocks max. 5

- Dimension drawing with screw terminals
- When using screw terminals with test sockets the device is 124 mm (4.9 in) in height.
- When using spring terminals the device is 131 mm (5.16 in) in height.



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Housing Type C1

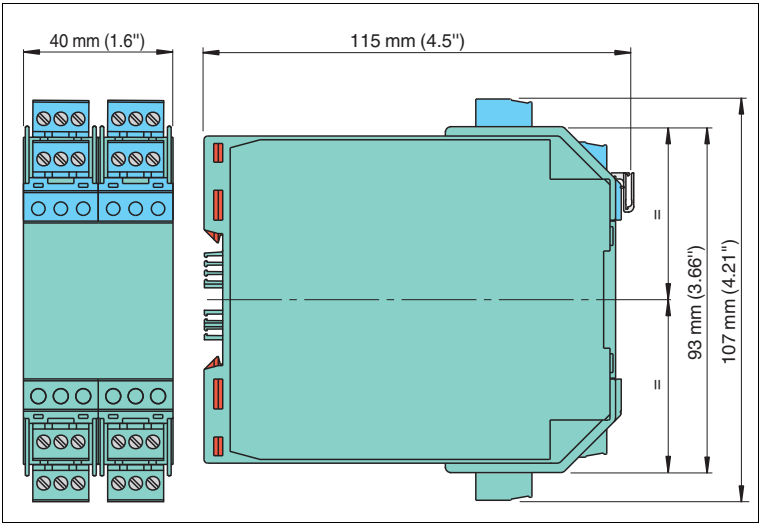


Figure 5.4

Number of terminal blocks max. 8

- Dimension drawing with screw terminals
- When using screw terminals with test sockets the device is 115 mm (4.6 in) in height.
- When using spring terminals the device is 122 mm (4.8 in) in height.



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Housing Type C2

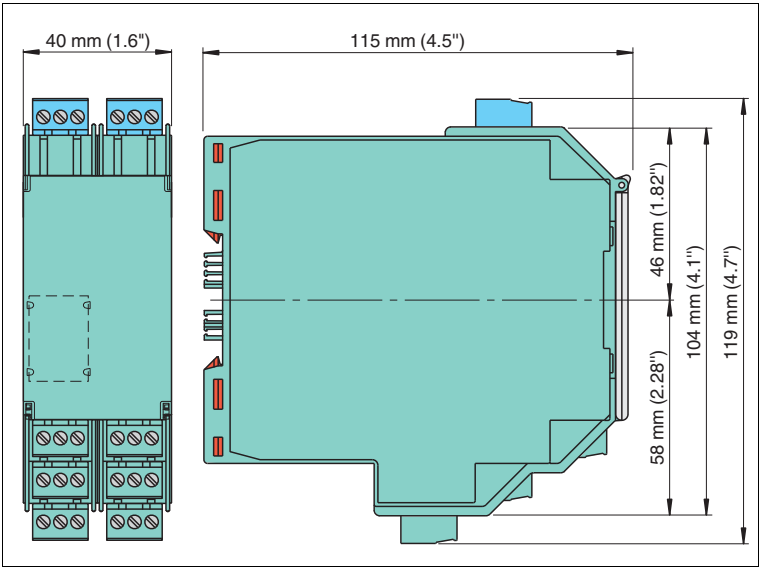


Figure 5.5

Number of terminal blocks max. 10

- Dimension drawing with screw terminals
- When using screw terminals with test sockets the device is 124 mm (4.9 in) in height.
- When using spring terminals the device is 131 mm (5.16 in) in height.



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Housing Type D2

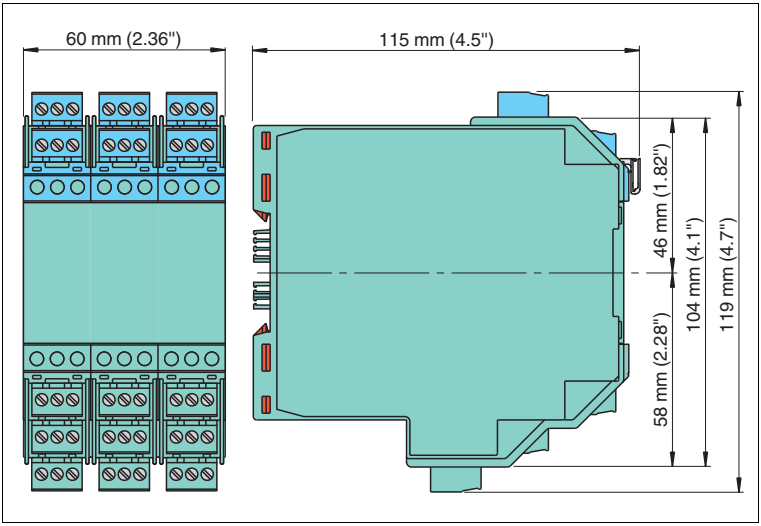


Figure 5.6

Number of terminal blocks max. 15

- Dimension drawing with screw terminals
- When using screw terminals with test sockets the device is 124 mm (4.9 in) in height.
- When using spring terminals the device is 131 mm (5.16 in) in height.

Housing Type E

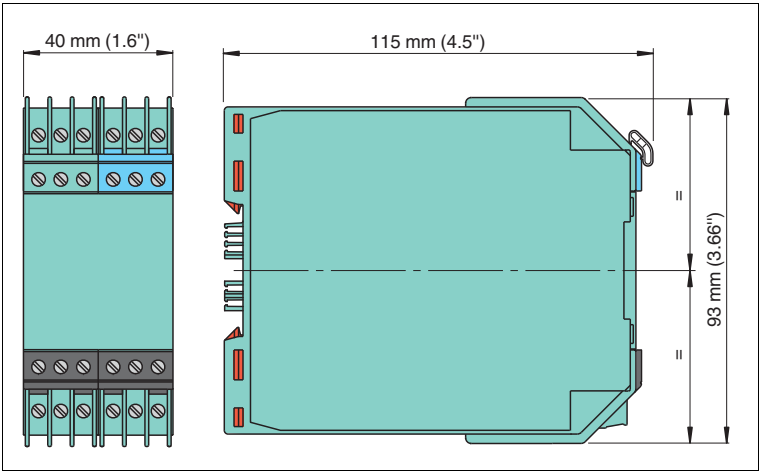


Figure 5.7

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Housing Power Supply 4 A

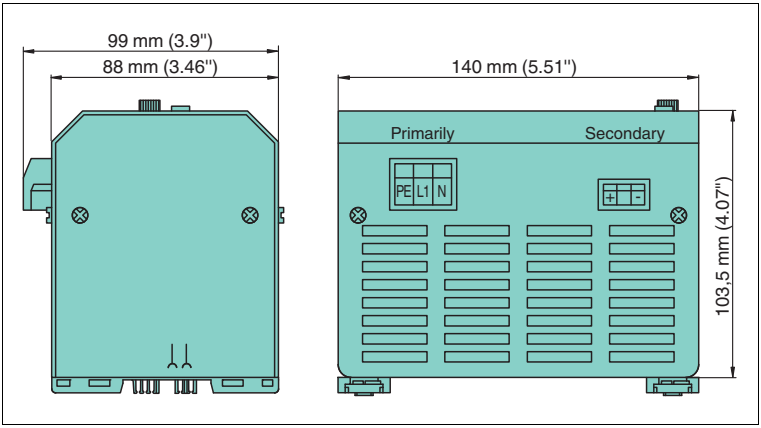


Figure 5.8

SMART Transmitter Power Supply Housing DN421

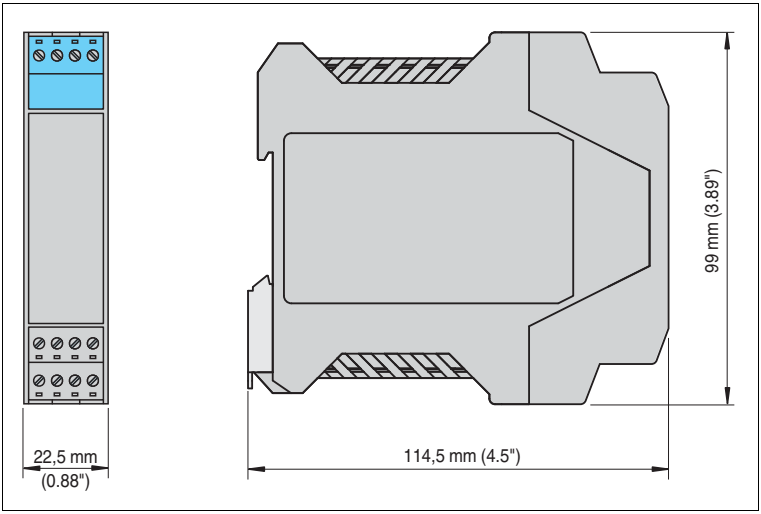


Figure 5.9


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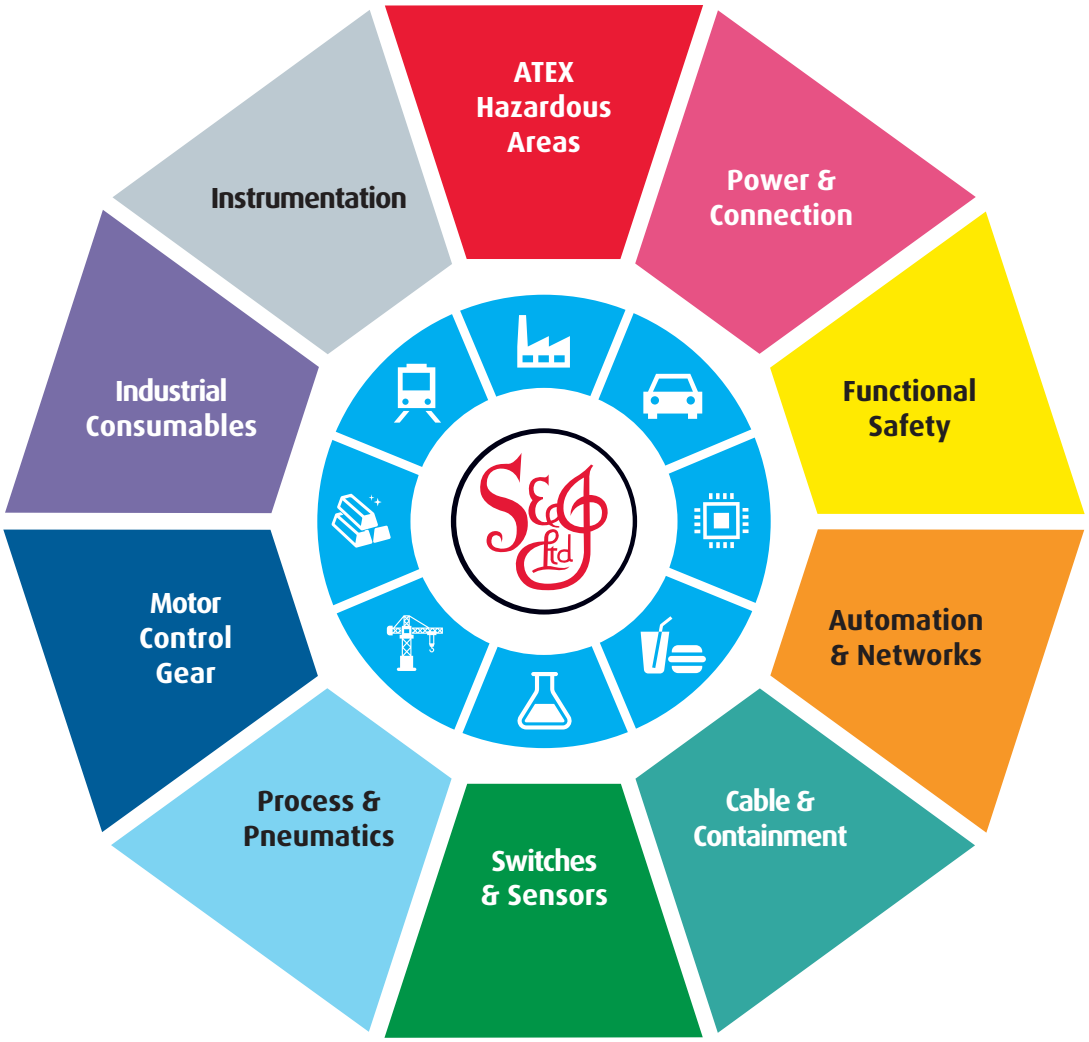


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