



# I/P signal converter TEIP11, TEIP11-PS

## Operating Instruction

42/18-46-EN

06.2009

Rev. H

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## **1 Safety**

### **1.1 General information and notes for the reader**

Read these instructions carefully prior to installing and commissioning the device.

These instructions are an important part of the product and must be kept for later use.

These instructions are intended as an overview and do not contain detailed information on all designs for this product or every possible aspect of installation, operation and maintenance.

For additional information or in case specific problems occur that are not discussed in these instructions, contact the manufacturer.

The content of these instructions is neither part of any previous or existing agreement, promise or legal relationship nor is it intended to change the same.

This product is built based on state-of-the-art technology and is operationally safe. It has been tested and left the factory in a safe, maintenance-free state. The information in the manual must be observed and followed in order to maintain this state throughout the period of operation.

Modifications and repairs to the product may only be performed if expressly permitted by these instructions.

Only by observing all of the safety information and all safety/warning symbols in these instructions can optimum protection of both personnel and the environment, as well as safe and fault-free operation of the device, be ensured.

Information and symbols directly on the product must be observed. They may not be removed and must be fully legible at all times.

### **1.2 Intended use**

The TEIP11, TEIP11-PS is used to control pneumatic actuators or pneumatic positioners for positioning valves. It also converts input current proportionally into a compressed air signal. The TEIP11, TEIP11-PS may be used in accordance with the "Ex relevant specifications" section, page 24 and the "Specifications" section, page 25. All other use is improper use.

**1.3 Target groups and qualifications**

Installation, commissioning, and maintenance of the product may only be performed by trained specialist personnel who have been authorized by the plant operator to do so. The specialist personnel must have read and understood the manual and comply with its instructions.

Prior to using corrosive and abrasive materials for measurement purposes, the operator must check the level of resistance of all parts coming into contact with the materials to be measured. ABB Automation Products GmbH will gladly support you in selecting the materials, but cannot accept any liability in doing so.

The operators must strictly observe the applicable national regulations with regards to installation, function tests, repairs, and maintenance of electrical products.

**1.4 Warranty provisions**

Using the device in a manner that does not fall within the scope of its intended use, disregarding this instruction, using underqualified personnel, or making unauthorized alterations releases the manufacturer from liability for any resulting damage. This renders the manufacturer's warranty null and void.

**1.5 Plates and symbols**

**1.5.1 Safety/warning symbols, note symbols**



**DANGER – <Serious damage to health / risk to life>**

This symbol in conjunction with the signal word "Danger" indicates an imminent danger. Failure to observe this safety information will result in death or severe injury.



**DANGER – <Serious damage to health / risk to life>**

This symbol in conjunction with the signal word "Danger" indicates an imminent electrical hazard. Failure to observe this safety information will result in death or severe injury.



**WARNING – <Bodily injury>**

This symbol in conjunction with the signal word "Warning" indicates a possibly dangerous situation. Failure to observe this safety information may result in death or severe injury.



**WARNING – <Bodily injury>**

This symbol in conjunction with the signal word "Warning" indicates a potential electrical hazard. Failure to observe this safety information may result in death or severe injury.



**CAUTION – <Minor injury>**

This symbol in conjunction with the signal word "Caution" indicates a possibly dangerous situation. Failure to observe this safety information may result in minor or moderate injury. This may also be used for property damage warnings.



**ATTENTION – <Property damage>!**

The symbol indicates a potentially damaging situation.

Failure to observe this safety information may result in damage to or destruction of the product and/or other system components.



**IMPORTANT (NOTICE)**

This symbol indicates operator tips, particularly useful information, or important information about the product or its further uses. It does not indicate a dangerous or damaging situation.

1.5.2 Name plate

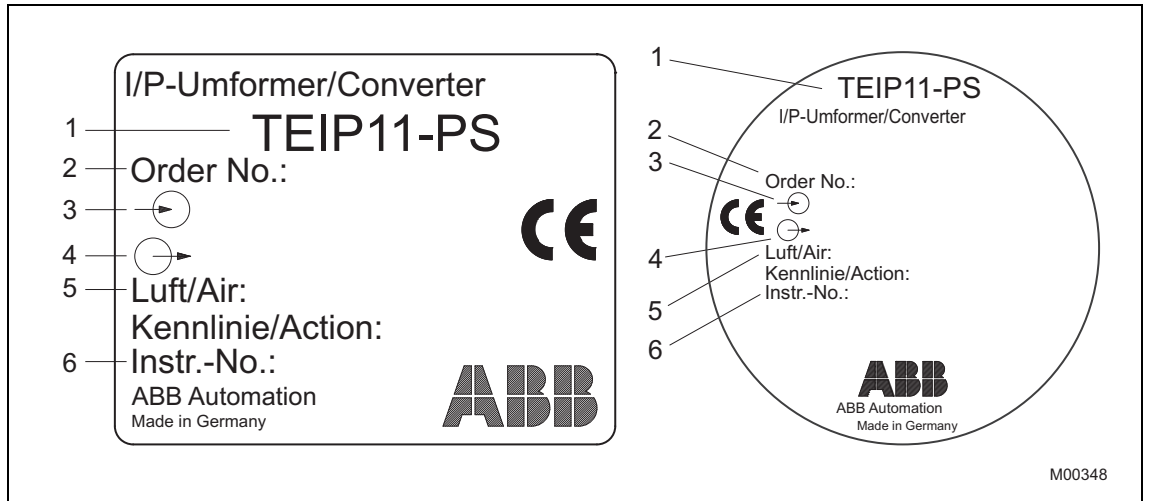


Fig. 1

- |                      |                   |
|----------------------|-------------------|
| 1 Full name of model | 4 Output signal   |
| 2 Order code         | 5 Supply pressure |
| 3 Input signal       | 6 Serial number   |

1.6 Transport safety information

Check the devices for possible damage that may have occurred during transport. Damages in transit must be recorded on the transport documents. All claims for damages must be claimed without delay against the shipper and before the installation.



## 1.7 Safety information for electrical installation

The electrical connections may only be performed by authorized specialist personnel according to the electrical plans.

Comply with electrical connection information in the instruction. Otherwise, the electrical protection class can be affected.

The secure separation of contact-dangerous electrical circuits is only ensured when the connected devices fulfill the requirements of the DIN EN 61140 (VDE 0140 Part 1) (basic requirements for secure separation).

For secure separation, run the supply lines separated from contact-dangerous electrical circuits or additionally insulate them.

## 1.8 Operating safety information

Before switching on the unit make sure that your installation complies with the environmental conditions listed in the chapter "Technical data" or in the data sheet.

If there is a chance that safe operation is no longer possible, take the unit out of operation and secure against unintended startup.

When mounting the unit in areas that may be accessed by unauthorized persons, take the required protective measures.

Check the devices for possible damage that may have occurred from improper transport. Damages in transit must be recorded on the transport documents. All claims for damages must be submitted to the shipper without delay and before installation.

## 1.9 Returning devices

Use the original packaging or suitably secure shipping containers if you need to return the device for repair or recalibration purposes. Fill out the return form (see the Appendix) and include this with the device.

According to EC guidelines for hazardous materials, the owner of hazardous waste is responsible for its disposal or must observe the following regulations for shipping purposes:

All devices delivered to ABB Automation Products GmbH must be free from any hazardous materials (acids, alkalis, solvents, etc.).

## 1.10 Disposal

ABB Automation Products GmbH actively promotes environmental awareness and has an operational management system that meets the requirements of DIN EN ISO 9001:2000, EN ISO 14001:2004, and OHSAS 18001. Our products and solutions are intended to have minimum impact on the environment and persons during manufacturing, storage, transport, use, and disposal.

This includes the environmentally friendly use of natural resources. ABB conducts an open dialog with the public through its publications.

This product/solution is manufactured from materials that can be reused by specialist recycling companies.

### 1.10.1 Information on WEEE Directive 2002/96/EC (Waste Electrical and Electronic Equipment)

This product/solution is not subject to the WEEE directive 2002/96/EC and relevant national laws (e. g., ElektroG in Germany).

The product/solution must be disposed of at a specialized recycling facility. Do not use municipal garbage collection points. According to the WEEE Directive 2002/96/EC, only products used in private applications may be disposed of at municipal garbage facilities. Proper disposal prevents negative effects on people and the environment, and supports the reuse of valuable raw materials.

If it is not possible to dispose of old equipment properly, ABB Service can accept and dispose of returns for a fee.

### 1.10.2 RoHS directive 2002/95/EC

With the Electrical and Electronic Equipment Act (ElektroG) in Germany, the European directives 2002/96/EC (WEEE) and 2002/95/EC (RoHS) are translated to national law. ElektroG defines the products that are subject to regulated collection and disposal or reuse in the event of disposal or at the end of their service life. ElektroG also prohibits the marketing of electrical and electronic equipment that contains a specific amount of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) (also known as hazardous substances with restricted uses).

The products provided to you by ABB Automation Products GmbH do not fall within the current scope of the directive on waste from electrical and electronic equipment according to ElektroG. If the necessary components are available on the market, these substances will no longer be used in new product development.

## 2 Ex relevant safety instructions

### Requirements/Conditions for safe use of I/P signal converters in a hazardous area design (type doc. 900771)



#### Important

Prior to mounting, check to ensure that the I/P signal converter meets the measurement and safety requirements that apply at the measuring point.

- When making the electrical connections, observe the data in the "Specifications" section and the information on the explosion protection certificate.
- The unit must be supplied with instrument air that is free of oil, water, and dust. Do not use flammable gas, oxygen, or oxygen-enriched gas.
- Do not open the unit immediately after switch-off: Wait for at least four minutes.



#### Notice - Potential damage to parts!

Handle the cover with care. Otherwise, the thread may become damaged, thus negating the "Ex d" explosion protection.



#### Important

Use only cable glands with full "Ex d" approval for "EEx d" operation.

- Secure the cable and wire entries against turning and loosening by using a medium-strength securing adhesive.
- If the I/P signal converter is used at an ambient temperature above 60 °C (140 °F) or below -20 °C (-4 °F), use cable entries and cables suitable for an operating temperature of up to the maximum ambient temperature plus 10 K or down to the minimum ambient temperature.



#### Notice - Potential damage to parts!

Units that comply with the "Ex ia" and "Ex d" protection classes when new should not be used in intrinsically safe "Ex ia" applications once they have been commissioned and used in an environment with "Ex d" protection, since the electronics may have been damaged.

This is why the units must be permanently marked (e.g., cross out or paste over "Ex i").

### 3 Design and function

The TEIP11, TEIP11-PS signal converters transform electrical signals into pneumatic standard signals, e.g., 4 ... 20 mA into 0.2 ... 1 bar (3 ... 15 psi). They represent, therefore, a connecting link between electrical/electronic and pneumatic systems. The patented signal conversion principle is based on the force balance method.

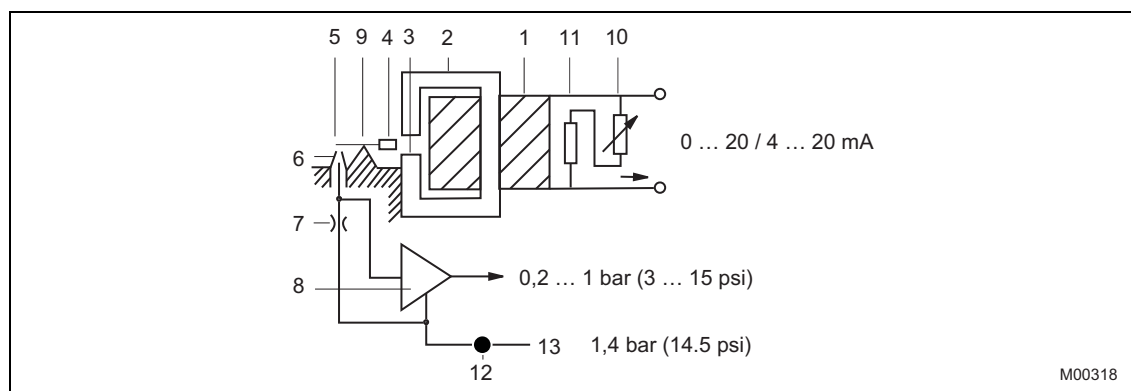


Fig. 2

- |            |                   |
|------------|-------------------|
| 1 Coil     | 8 Converter stage |
| 2 Yoke     | 9 Lever arm       |
| 3 Air gap  | 10 Potentiometer  |
| 4 Magnet   | 11 Resistor       |
| 5 Flapper  | 12 Filter         |
| 6 Nozzle   | 13 Air supply     |
| 7 Throttle |                   |

#### Functionality

Force balancing takes place at the lever arm, which is pivoted with a tension band at (9). The coil (1) and yoke (2) generate a magnetic field in the air gap (3), which applies a force to the magnet (4) on the lever arm. The force changes in proportion to the current (input signal) flowing through the coil (1).

A counterforce is applied on the other side of the lever arm, through the dynamic air pressure present at the nozzle (6) and the flapper (5). The force is controlled in such a way that a balance of the two torques is achieved. If a torque imbalance occurs, the lever arm rotates. This rotation changes the air gap between the nozzle (6) and the flapper (5) and, thus, the dynamic air pressure. Air is permanently supplied to the nozzle (6) through the throttle (7). The converter stage (8) converts the dynamic air pressure into a 0.2 ... 1 bar or 3 ... 15 psi output signal.

**Supply air**

During operation the pneumatic unit needs a steady supply of air (13) according to unit specifications. Zero position adjustment can be performed by turning the tension band suspension (9), and range adjustment via the potentiometer (10).

**Special features**

Special features of the TEIP11, TEIP11-PS signal converter are its relatively small dimensions and outstanding operational stability when subject to shock and vibration. The stability is due to the light weight (only around 100 mg) of the moving system, which consists of the lever arm with the magnet (4) and the flapper (5) with balancing weight.

**Filter**

The filter (12) prevents malfunctions caused by polluted air. Note that the filter capacity is only sufficient for collecting dirt that occurs occasionally (e.g., residual dirt in the air pipes at first commissioning). It is no substitute for proper air conditioning.

**Deliverables**

For details on the deliverable signal converter models and their accessories, please refer to the appropriate data sheet, which also includes the order numbers of the individual items.

## Mounting

### 4 Mounting

#### 4.1 Operating conditions at installation site



##### Important

Prior to mounting, check to ensure that the TEIP11, TEIP11-PS signal converter meets the measurement and safety requirements that apply at the installation location.

See the "Specifications" section, page 25.

#### 4.2 Delivery scope

- Check the delivery for completeness, signs of damage, model, and scope immediately upon arrival.
- Check whether the delivery is in accordance with your order.

##### Accessories

The following loose accessories are delivered with the unit as extra items:

- Mounting bracket for the aluminum or stainless steel field housing unit (for wall or 2" pipe mounting)
- Cable entry for signal converter with "EEx d" type of protection

#### 4.3 TEIP11/TEIP11-PS

##### 4.3.1 Mounting the control room housing unit for rail mounting

This design is snap-mounted onto a DIN top-hat rail.

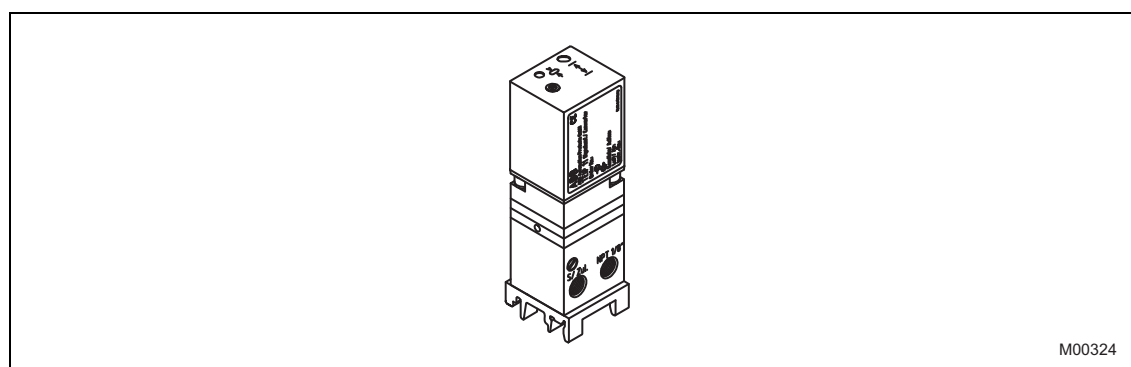


Fig. 3: Control room housing unit for rail mounting

The TEIP11, TEIP11-PS signal converter has a special mounting base. Due to its universal design, it is suitable for mounting onto EN 50022 - 35 x 7.5, EN 50045 - 15 x 5, and EN 50035 - G32 top-hat rails.

##### Top-hat rail mounted in a vertical position

For top-hat rails that are mounted in a vertical position, the electrical connection for the unit should preferably be on the left.

##### Top-hat rail mounted in a horizontal position

For top-hat rails that are mounted in a horizontal position, the electrical connection for the unit should preferably be facing up.

### 4.3.2 Mounting the aluminum/stainless steel field housing unit

The sturdy housing unit can be installed outdoors without protection.

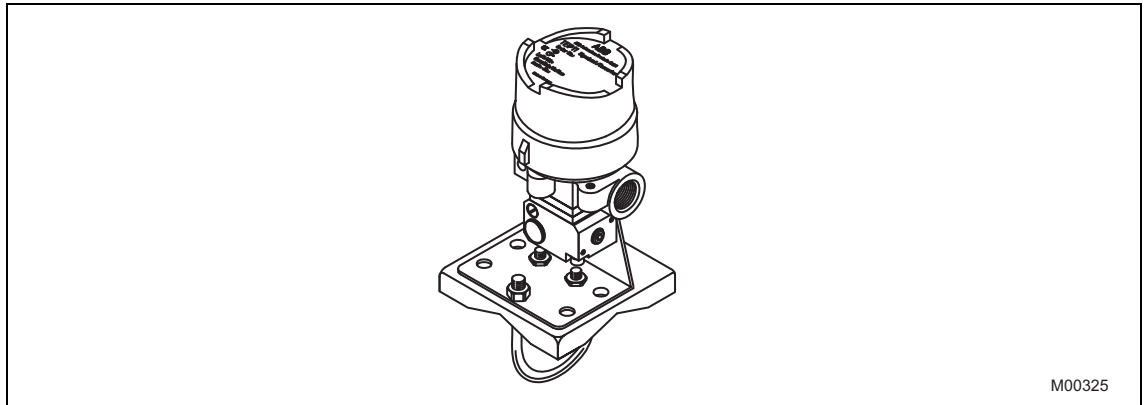


Fig. 4: Aluminum / stainless steel field housing unit

#### Mounting

Position the housing unit so that the cable gland is facing downwards or sideways, to prevent moisture from penetrating the unit.

#### Accessories

A stainless steel mounting bracket is provided as an accessory for installation. The mounting bracket is available in two versions:

- For wall mounting only
- Universal for wall or 2" pipe mounting

### 4.4 TEIP11

#### 4.4.1 Mounting the field housing unit as a mounting module for OEM applications

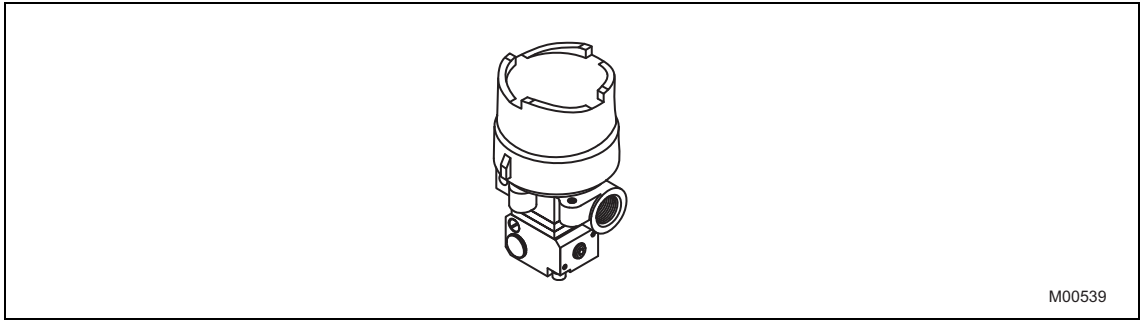


Fig. 5: Aluminum / stainless steel field housing unit

#### Mounting

Position the housing unit so that the cable gland is facing downwards or sideways, to prevent moisture from penetrating the unit.

#### Accessories

A stainless steel mounting bracket is provided as an accessory for installation. The mounting bracket is available in two versions:

- For wall mounting only
- Universal for wall or 2" pipe mounting



## 4.5 TEIP11-PS

### 4.5.1 Mounting the control room housing unit for block mounting

For this design, a special connection block is used to mount the unit.

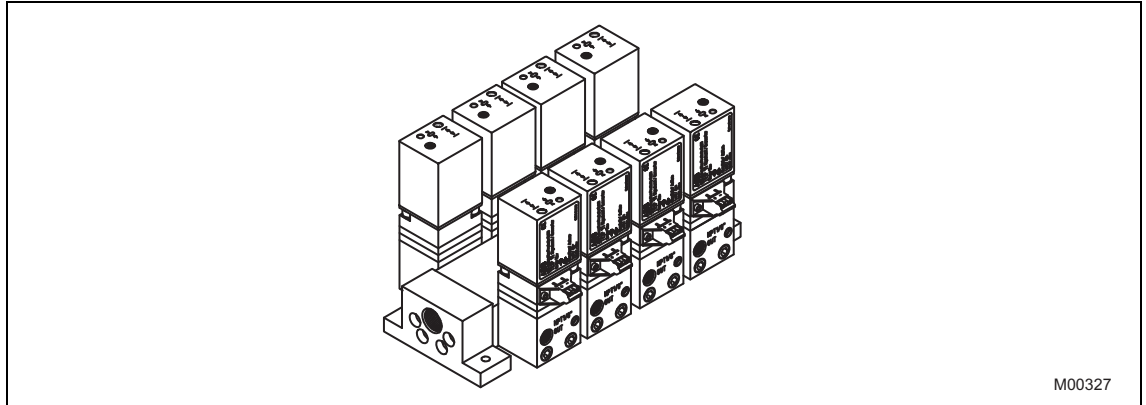


Fig. 6: Control room housing unit for block mounting

#### Design

The connection block is designed for mounting a maximum of 4 I/P signal converters. The connection blocks can be expanded to units of 2, 3, or 4 blocks to create block units with 4, 8, 12, or 16 I/P signal converters.

#### Mounting

The material for forming the block units is delivered separately for self-installation; in addition to the connection blocks, it includes the necessary screws and gaskets (O-rings).

#### Air supply

The air supply for the connected units is provided via a central connection block. The connection block's air connector features a non-return coupling for every single I/P signal converter. This allows connection sites to remain unused, and individual I/P signal converters to be dismantled or mounted during operation.

4.5.2 Mounting the plastic field housing unit

The plastic housing unit is suitable for mounting on-site.

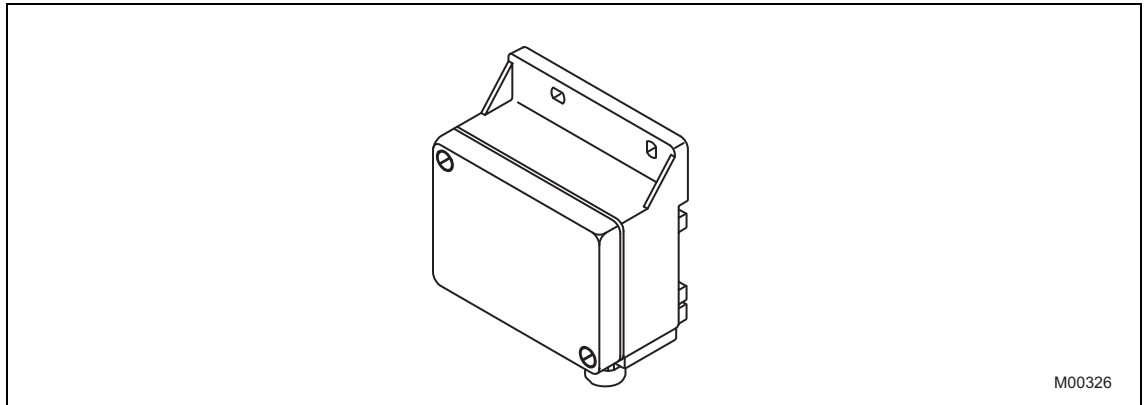


Fig. 7: Plastic field housing unit

**Mounting types**

Units can be mounted on walls or vertically on a 2" pipe.

The connections for the input and output signals should face downwards, to prevent moisture from penetrating the unit.



**Risk of explosion!**  
 For versions that are operated with flammable gas, installation must be performed outdoors or in a well-ventilated building.  
 When installing the unit in buildings, the exhaust must be routed outdoors.

## 5 Electrical connection



### Important

For electrical installation, the following standards, data, and documents must be observed:

- The relevant regulations and safety standards pertaining to the installation and operation of electrical systems
- The additional regulations, standards, and directives pertaining to the installation and operation of explosion-proof systems, if explosion-proof units are used
- The values for the electrical connection in the "Specifications" section, page 25
- For explosion-proof devices, also observe the information on the explosion protection certificate

### 5.1 Signal cables

Do not run signal cables close to power lines.



### Important

Power lines may produce interference in their immediate vicinity, which impairs the measured values transmitted on the signal cable.

### 5.2 Cable glands

The field housing units feature a Pg 11 cable entry.

#### Aluminum or stainless steel field housing unit

- Standard/EEEx ia                      1/2" NPT cable gland
- EEx d                                      Tap hole M20 x 1.5
- FM/CSA "Intrinsically              NPT 1/2" tap hole  
Safe"/"Explosion Proof"



### Important

Use only cable glands with full "Ex d" approval for "EEEx d" operation (partly approved cable glands labeled "U" are NOT sufficient).

Fix the screwed-in "Ex d" cable gland with glue to secure it against loosening. Loctite 242/243 or similar glues are suitable.

### 5.3 Position of the terminals

The electrical connection is provided by 2-pole screw terminals for cables with a max. cross-sectional area of 2.5 mm<sup>2</sup> (14 AWG).

#### **Control room housing unit for rail and block mounting**

The terminals are located on the side of the housing unit.

#### **Plastic, aluminum, or stainless steel field housing unit**

The terminals are located inside the housing unit. Therefore, the field housing unit must be opened in order to connect the cable.

### 5.4 Connection

Do not reverse polarity when connecting the cable.

## 6 Pneumatic connection



### Important

The TEIP11, TEIP11-PS signal converter must be supplied with instrument air that is free of oil, water, and dust.

The purity and oil content should meet the requirements of Class 3 according to DIN / ISO 8573-1.

The pressure dew point should be 10 K below the lowest operating temperature.

For versions with a plastic housing unit and when operating units with flammable gas, an additional line must be added to route the gas to a safe site.

1/8, 1/4, and 3/8 NPT tap holes are provided to connect the air pipes (supply and output); see the information contained in the "Specifications" section, page 25.

The connections for air supply and output are marked accordingly.



### Notice - Potential damage to parts!

Dust, splinters, and any other particles must be blown off the pipe before it is connected. Such particles could block the unit.

The supply pressure for the unit has to be set as follows:

**For output 0.2 ... 1 bar (3 ... 15 psi)**

1.4 ± 0.1 bar (20 ± 1.5 psi)

The maximum allowable overload limit for the supply pressure is 4 bar (60 psi).



### Notice - Potential damage to parts!

Provisions should be made to ensure that in the event of an error the pressure does not rise above 4 bar (60 psi). This could result in mechanical damage to the unit.

## 7 Commissioning

The signal converter is ready for operation immediately after installation and connection. No further adjustment is required.

## 8 Maintenance



### Important

Note that the supplied instrument air must be free of oil, water and dust according to DIN/ISO 8573-1 to ensure trouble-free operation.

It is recommended to regularly check the built-in textile filter (if present) for the degree of pollution and the signal conversion to see if the values are still within the tolerance.

### 8.1 Replacing the filter element

If the supply air for the positioner has not been conditioned properly (for data relating to supplied air quality, see the "Specifications" section, page 25), the built-in textile filter protects the sensitive air nozzles and throttles from being obstructed with dirt; fluids are held back.

The filter capacity means that it can only collect dirt that occurs occasionally. More persistent dirt will block the filter.

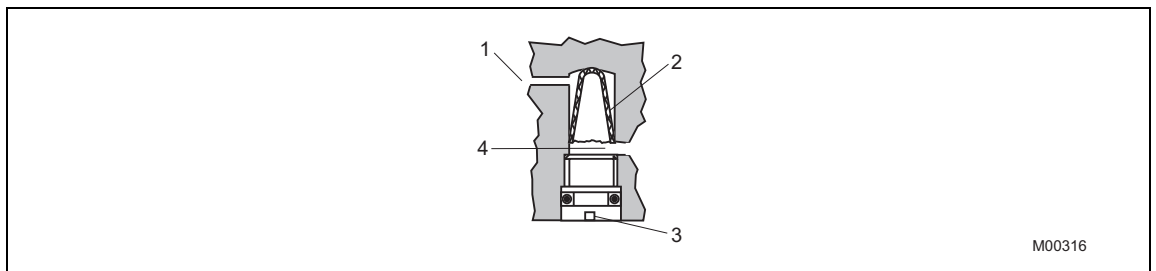


Fig. 8: Air filter (sectional drawing)

- |                  |              |
|------------------|--------------|
| 1 Air intake     | 3 Screw plug |
| 2 Filter element | 4 Air outlet |



### Important

Switch off the air supply before replacing the filter element.

1. Switch off the air supply.
2. Remove the screw plug and pull out the filter element using tweezers (see Fig. 8).

Spare filter elements can be ordered from ABB Service.

3. Insert the new filter element and tighten the screw plug.

The signal converter is ready to operate immediately after the filter element has been replaced. No further measures (e.g., readjustment) are required.

4. Switch on the air supply.



### Important

The signal converter with plastic housing unit is not equipped with a filter element due to its design.

**8.2 Readjusting the signal conversion**

The signal converters are delivered in an adjusted condition. After longer operating periods, however, the tolerance limits may be exceeded due to aging or drift. This can be eliminated by readjustment.

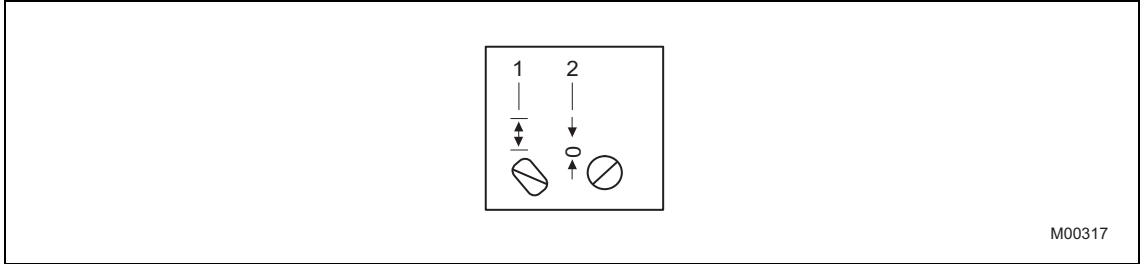


Fig. 9: Adjustment screws



**Important**

When using a field housing unit first remove the cover to access the screws.

The signal converter can be readjusted with 2 adjustment screws (see Fig. 9).

Designation	Description
1	Setting of range
2	Setting of zero point

## Ex relevant specifications

### 9 Ex relevant specifications

#### 9.1 TEIP11/TEIP11-PS

##### Explosion protection

ATEX / GOST Russia / GOST Ukraine,  
intrinsically safe (all designs)  
2G EEx ia IIC /T4/T5/T6 TÜV 1487x  
(for the control room housing unit and the field-mount housing)  
ATEX / GOST Russia / GOST Ukraine,  
flameproof (only with metal field-mount housing) EEx d IIC  
T4/T5/T6

##### 9.1.1 Intrinsic Safety ATEX

###### Explosion protection

Approved for use in Zone 0.

###### Designation

II 2 G EEx ia IIC T6

##### 9.1.2 Safety specifications for intrinsic safety ATEX

###### Temperature table

Temperature class	Input current	Ambient temperature range
T6	50 mA	-55 ... 60 °C
T6	60 mA	-55 ... 55 °C
T5	60 mA	-55 ... 70 °C
T4	60 mA	-55 ... 85 °C
T5	100 mA	-55 ... 55 °C
T4	100 mA	-55 ... 85 °C
T5	120 mA	-55 ... 45 °C
T4	120 mA	-55 ... 80 °C
T4	150 mA	-55 ... 70 °C

###### Explosion ratings

$I_i$	$U_i$	$P_i$
50 mA	42.5 V	2.125 W
60 mA	38.8 V	2.328 W
100 mA	30 V	3.0 W
120 mA	28 V	3.36 W
150 mA	25.5 V	3.825 W

##### 9.1.3

##### Intrinsically safe FM

FM "intrinsically safe" (not for metal field housing units)  
I.S.: CL I / Div 1 / Grp A B C D

FM "intrinsically safe" (for field housing units only)  
I.S.: CL I-II-II / Div 1 / Grp A B C D E F G  
S.: CL II / Div 2 / Grp G  
S.: CL III / Div 2

##### 9.1.4 Non-incendive FM

N.I.: CL I / Div 2 / Grp A B C D (not for metal field housing units)  
N.I.: CL I / Div 2 / Grp A B C (not for metal field housing units)

##### 9.1.5 Intrinsically safe CSA

CSA "intrinsically safe" (not for metal field housing units)  
I.S.: CL I / Div 1 / Grp A B C D  
CL I / Div 2 / Grp A B C D

CSA "intrinsically safe" (for metal field housing units only)  
I.S.: CL I / Div 1 / Grp A B C D  
CL II / Div 1 / Grp E F G  
CL III  
CL I / Div 2 / Grp A B C D  
CL II / Div 2 / Grp E F G

##### 9.1.6 Non-incendive CSA

FM "explosion proof" (for metal field housing units only)  
X.P.: CL I / Div 1 / Grp B C D  
D.I.P.: CL II III / Div 2 / Grp E F G

CSA "explosion proof" (for metal field housing units only)  
X.P.: CL I / Div 1 / Grp B C D



## 10 Specifications

### 10.1 TEIP11/TEIP11-PS

#### 10.1.1 Input

##### Signal range

0 ... 20 mA or 4 ... 20 mA  
 0 ... 10 mA or 10 ... 20 mA  
 4 ... 12 mA or 12 ... 20 mA  
 (additional ranges available upon request)

##### Input resistance

$R_i = 260 \Omega$  at 20 °C (68 °F),  $T_k + 0.4 \% / K$

##### Overload limit

30 mA (for explosion-proof units, see the information contained in the "Ex relevant specifications" section, page 24)

##### Capacitance/Inductance

Negligible

#### 10.1.2 Environmental capabilities

##### Climate class

GPF or PPF acc. to DIN 40040  
 Temperature:  
 -55 ... 85 °C (-67 ... 185 °F)  
 -45 ... 85 °C (-49 ... 185 °F)  
 Relative humidity for operation, storage, or transport:  
 75 % mean, 95 % short-term,  
 no condensation

#### 10.1.3 Design for rail mounting

##### Material/Ingress protection

IP 20 aluminum housing unit, with plastic cover

##### Mounting

Rail mounting:  
 EN 50022 - 35 x 7.5  
 EN 50035 - G 32  
 EN 50045 - 15 x 5

##### Electrical connection

2-pole screw terminal for 2.5 mm<sup>2</sup> (14 AWG)

##### Pneumatic connection

1/8 NPT tap hole for air supply and output

##### Weight

0.25 kg (0.55 lb)

##### Dimensions

See Section 0, "Fehler! Ungültiger Eigenverweis auf Textmarke."

#### 10.1.4 Design for field housing unit (aluminum/stainless steel)

##### Material/Ingress protection

IP 65 aluminum or stainless steel housing unit

##### Surface

Aluminum housing,  
 painted with dual component coating,  
 lower section, black, RAL 9005,  
 screw-on cover, Pantone 420,  
 stainless steel housing unit,  
 electrolytically polished

##### Mounting

Wall or 2" pipe mounting  
 With stainless steel mounting bracket (accessory)

##### Electrical connection

2-pole screw terminal for 2.5 mm<sup>2</sup> (14 AWG) in housing unit,  
 NPT 1/2" cable gland for cable entry  
 For ATEX "intrinsically safe":  
 M20 x 1.5 tap hole for cable entry  
 For ATEX "EEx d":  
 (Cable gland with Ex d approval available as an accessory on request)  
 NPT 1/2" tap hole for cable entry with FM/CSA

##### Pneumatic connection

1/4" NPT tap hole for air supply and output

##### Weight

0.62 kg (1.37 lb) with aluminum housing unit  
 1.20 kg (2.65 lb) with stainless steel housing unit

##### Dimensions

See Section 0, "Fehler! Ungültiger Eigenverweis auf Textmarke."

## Specifications

### 10.2 TEIP11

#### 10.2.1 Output (pneumatic)

##### Signal range

0.2 ... 1 bar (3 ... 15 psi)

##### Air capacity

At supply air pressure	kg/h	Nm <sup>3</sup> /h	scfm
1.4 bar (20 psi)	0,05	0,041	0,024
2.0 bar (30 psi)	0,07	0,057	0,033
4.0 bar (60 psi)	0,10	0,082	0,048
6.0 bar (90 psi)	0,16	0,130	0,076
10.0 bar (150 psi)	0,25	0,205	0,120

#### 10.2.2 Power supply (pneumatic)

##### Instrument air

Free of oil, water, and dust acc. to DIN / ISO 8573-1  
Pollution and oil content according to Class 3  
Pressure dew point 10 K below operating temperature

##### Supply pressure

1.4 ... 10 bar (20 ... 150 psi)

##### Air consumption

Equivalent to air capacity

#### 10.2.3 Transmission data and influences

##### Characteristic

Linear, direct, or reverse action

##### Deviation

≤ 1 %

##### Hysteresis

≤ 0.3 %

##### Dead band

≤ 0.1 %

##### Temperature

≤ 0.1 % / 10 K within -20 ... 85 °C (-4 ... 185 °F)  
≤ 0.2 % / 10 K within -55 ... -20 °C (-67 ... -4 °F)

##### Influence of supply air pressure

≤ 0.8 % at 1.4 ... 2 bar (20 ... 30 psi)  
≤ 0.8 % at 2 ... 3 bar (30 ... 45 psi)  
≤ 0.5 % at 3 ... 10 bar (45 ... 150 psi for every 1 bar (15 psi))

##### Mechanical vibration

≤ 1 % up to 10 g and 20 ... 80 Hz

##### Seismic vibration

Meets the requirements of DIN IEC 68-3-3 Class III for strong and strongest earthquakes.

##### Mounting orientation

Zero point ≤ 0.5 % at 90° change of position

##### EMC

Meets the requirements of EMC Directive 89/336/EEC of May 1989 (increased interference immunity as per EN 50082-2 PR of 11/93).

##### CE Marking

Complies with the EC directive for CE conformity

### 10.3 TEIP11-PS

#### 10.3.1 Output (pneumatic)

##### Signal range

0.2 ... 1 bar (3 ... 15 psi)

##### Air capacity

≥ 5 kg/h = 4.1 Nm<sup>3</sup>/h = 2.4 scfm

##### Load power acc. to VDE / VDI 3520

≥ 0.95 kg/h = 0.9 Nm<sup>3</sup>/h = 0.5 scfm

#### 10.3.2 Power supply (pneumatic)

##### Instrument air

free of oil, water and dust acc. to DIN / ISO 8573-1  
pollution and oil content according to Class 3  
Pressure dew point 10 K below operating temperature

##### Supply pressure

1.4 ± 0.1 bar (20 ± 1.5 psi) (with output 1 bar (15 psi))

##### Air consumption

≤ 0.2 kg/h = 0.16 Nm<sup>3</sup>/h = 0.1 scfm

#### 10.3.3 Transmission data and influences

##### Characteristic

Linear, direct, or reverse action

##### Deviation

≤ 0.5 %

##### Hysteresis

≤ 0.3 %

##### Dead band

≤ 0.1 %

##### Temperature

≤ 1 % / 10 K within -20 ... 85 °C (-4 ... 185 °F)  
≤ 2 % / 10 K within -55 ... -20 °C (-67 ... -4 °F)

##### Power supply

≤ 0.3 % / 0.1 bar (1.5 psi) change in pressure

##### Mechanical vibration

≤ 1 % up to 10 g and 20 ... 80 Hz

##### Seismic vibration

Meets the requirements of DIN IEC 68-3-3 Class III for strong and strongest earthquakes.

##### Mounting orientation

Zero point ≤ 0.4 % at 90° change of position

##### Step response

10 ... 90 % and 90 ... 10 % 0.6 s  
5 ... 15 % and 15 ... 5 % 0.25 s  
45 ... 55 % and 55 ... 45 % 0.2 s  
85 ... 95 % and 95 ... 85 % 0.15 s

##### EMC

Meets the requirements of EMC Directive 89/336/EEC of May 1989 (increased interference immunity as per EN 50082-2 PR of 11/93).

##### CE Marking

Complies with the EC directive for CE conformity

### 10.3.4 Operating conditions at installation site

#### Ambient temperature

Depending on the ordered model:

-40 ... 85 °C (-40 ... 185 °F)

-55 ... 85 °C (-67 ... 185 °F)

For Ex d:

-40 ... 85 °C (-40 ... 185 °F)

#### Required protection

IP 20 for control room housing unit for rail or block mounting,

IP 54 for plastic housing unit,

IP 65 for aluminum or stainless steel field housing unit

#### Installation position

Any

### 10.3.5 Design for block mounting

#### Material/Ingress protection

IP 20 aluminum housing unit, with plastic cover

#### Mounting

In block format with special connection block (accessory),

max. 4 connection blocks each with 4 signal converters

#### Electrical connection

2-pole screw terminal for 2.5 mm<sup>2</sup> (14 AWG)

#### Pneumatic connection

3/8 NPT tap hole for air supply

(main connection to connection block)

1/8 NPT tap hole for output

(on each individual signal converter)

#### Installation position

Any

#### Weight

0.3 kg (0.66 lb)

#### Dimensions

See Section 0, "Fehler! Ungültiger Eigenverweis auf Textmarke."

### 10.3.6 Design for field housing unit (plastic)

#### Material/Ingress protection

Polyester housing unit, black, IP 54

#### Mounting

Wall or 2" pipe mounting

(2" pipe mounting for vertical pipes only)

#### Electrical connection

2-pole screw terminal for 2.5 mm<sup>2</sup> (14 AWG) in housing unit,

Pg 11 cable gland for cable entry

#### Pneumatic connection

1/8 NPT tap hole for air supply and output

#### Air outlet

For gas exhaust with 6 mm (0.24 inch) cut or crimp connection

#### Installation position

Any

#### Weight

1.0 kg (2.20 lb)

#### Dimensions

See Section 0, "Fehler! Ungültiger Eigenverweis auf Textmarke."

### 10.3.7 Accessories

#### "Ex d" cable gland

Brass, with M20 x 1.5 thread

#### Stainless steel mounting bracket for wall or 2" pipe mounting

For aluminum or stainless steel field housing unit

#### Material for block mounting

Connection block for 4 signal converters,

panel with central air connector 3/8 NPT,

dummy panel

### 10.3.8 Spare parts

Except for the textile filter, the signal converter is wear free and does not require maintenance.

## Dimensions

### 11 Dimensions

#### 11.1 TEIP11/TEIP11-PS

##### 11.1.1 Design for control room housing unit for rail mounting

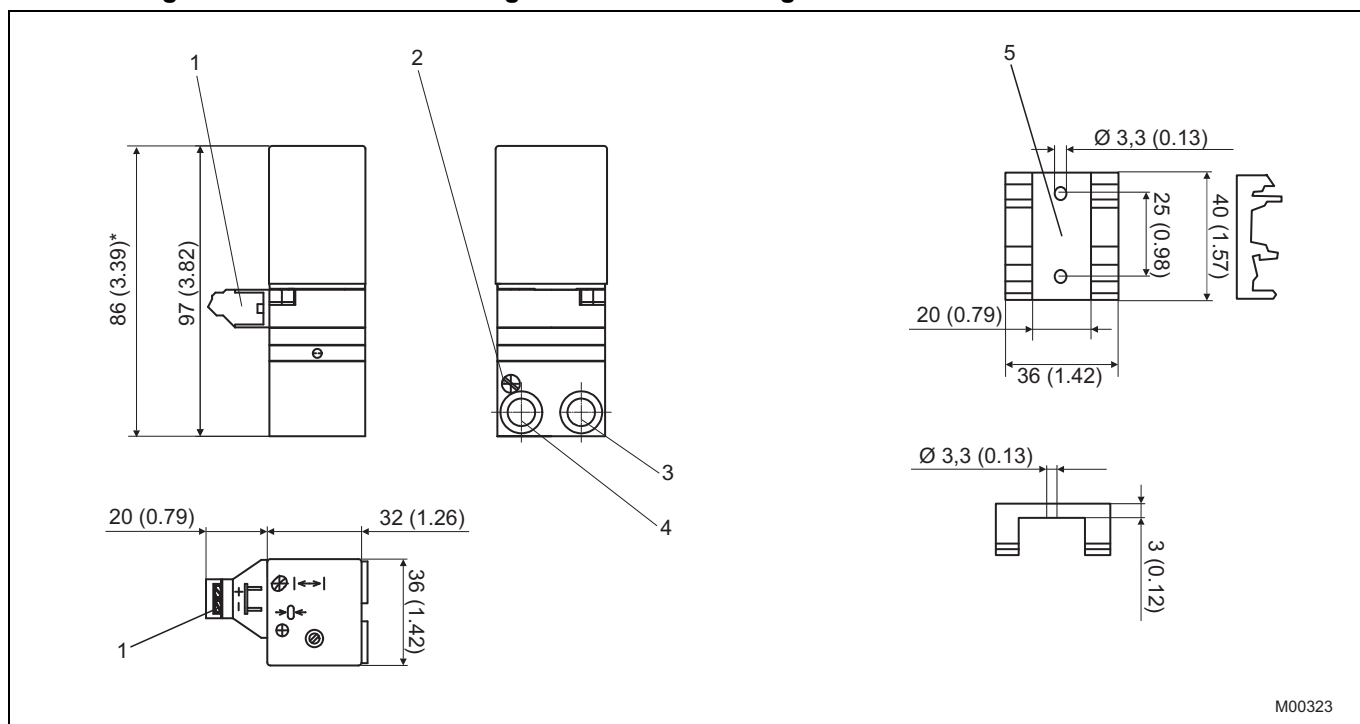


Fig. 10: Dimensions in mm (inch)

- 1 Electrical connections
- 2 Filter
- 3 Output

- 4 Supply air
- 5 Mounting bracket for DIN rail mounting

\*TEIP11 only

**11.1.2 Design for aluminum or stainless steel field housing unit**

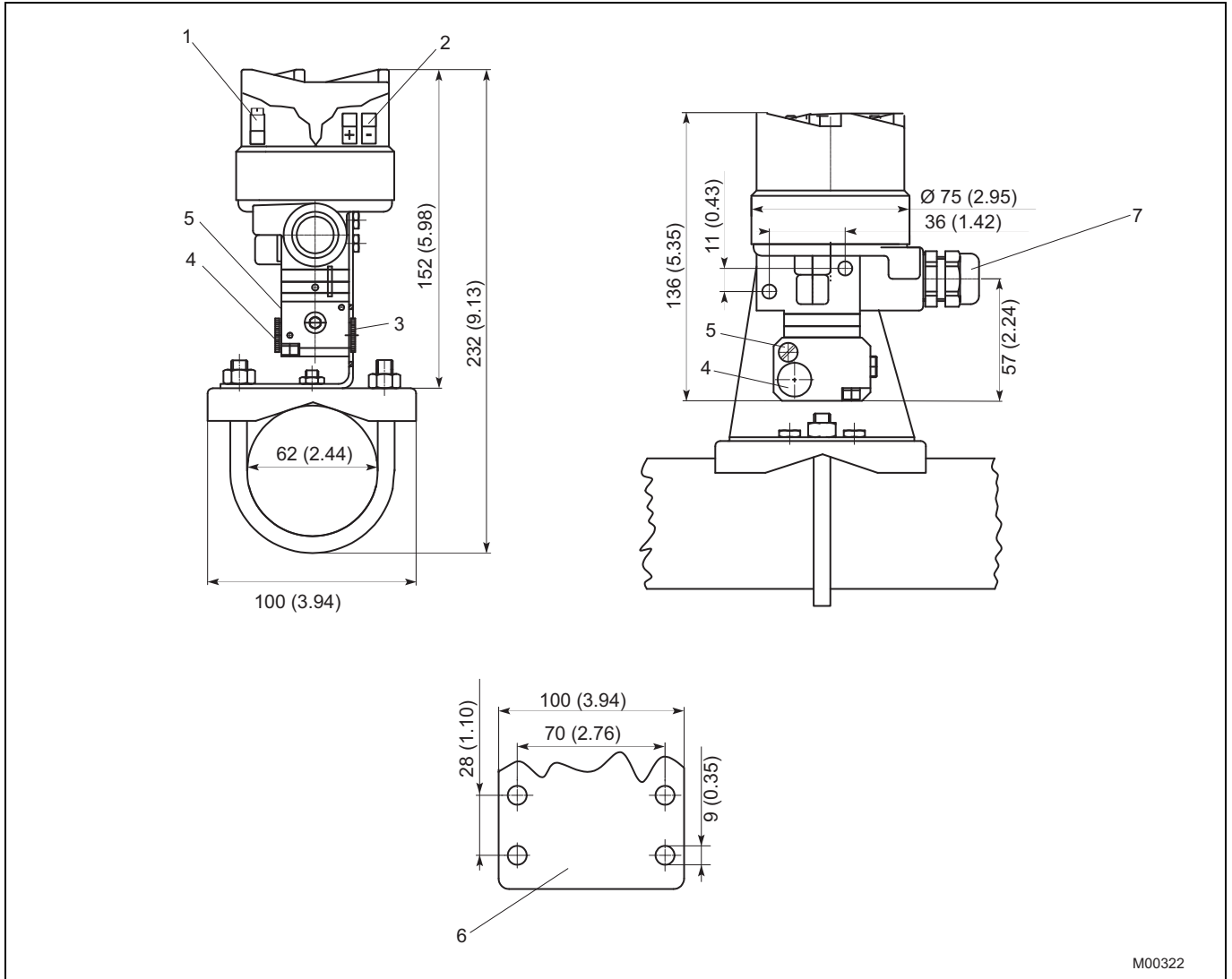


Fig. 11: Dimensions in mm (inch)

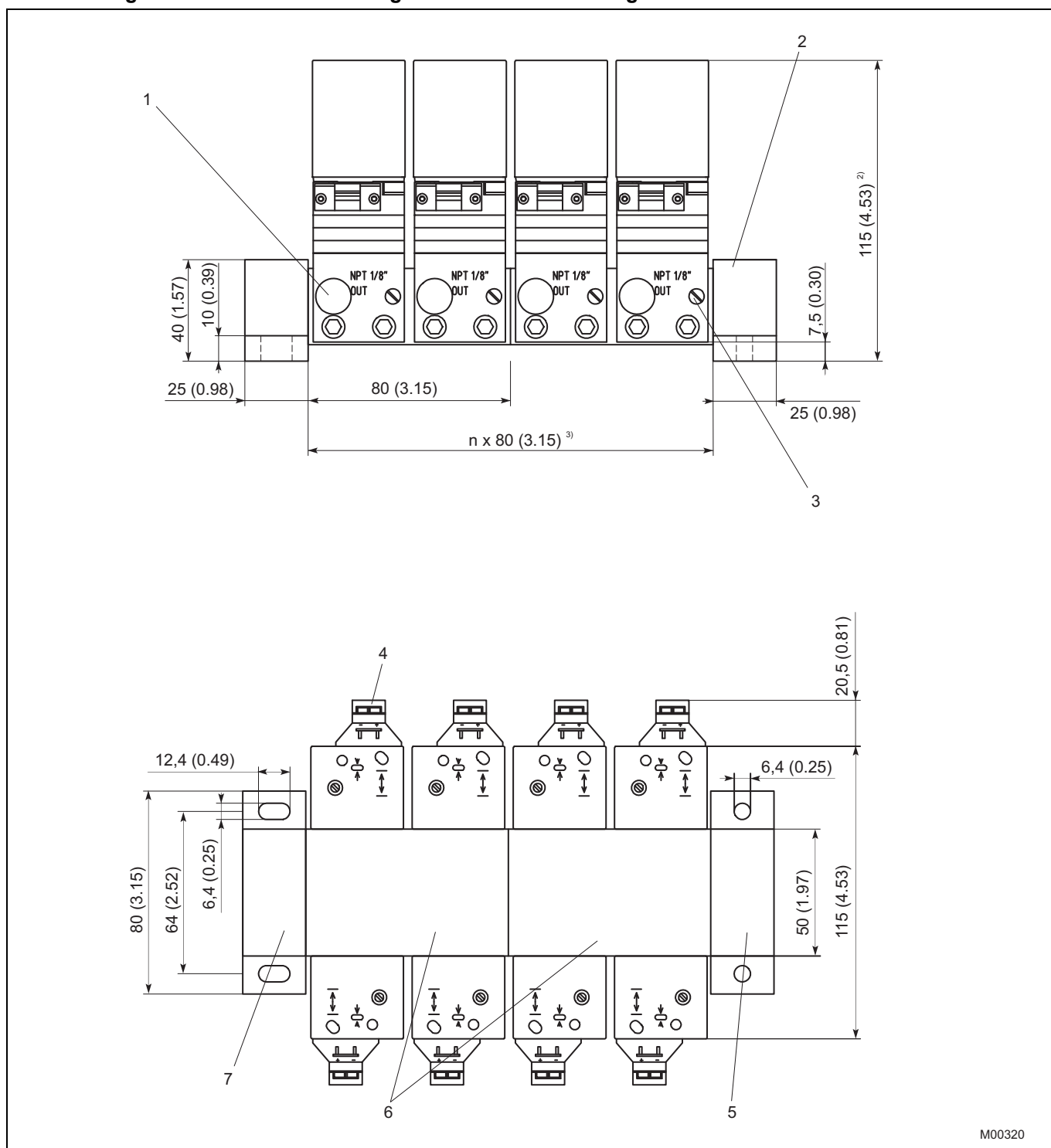
- |                          |                                    |
|--------------------------|------------------------------------|
| 1 Ground terminal        | 4 Supply air                       |
| 2 Electrical connections | 5 Filter                           |
| 3 Output                 | 6 Profiled sheet for wall mounting |
|                          | 7 Cable gland                      |

M00322

# Dimensions

## 11.2 TEIP11-PS

### 11.2.1 Design for control room housing unit for block mounting



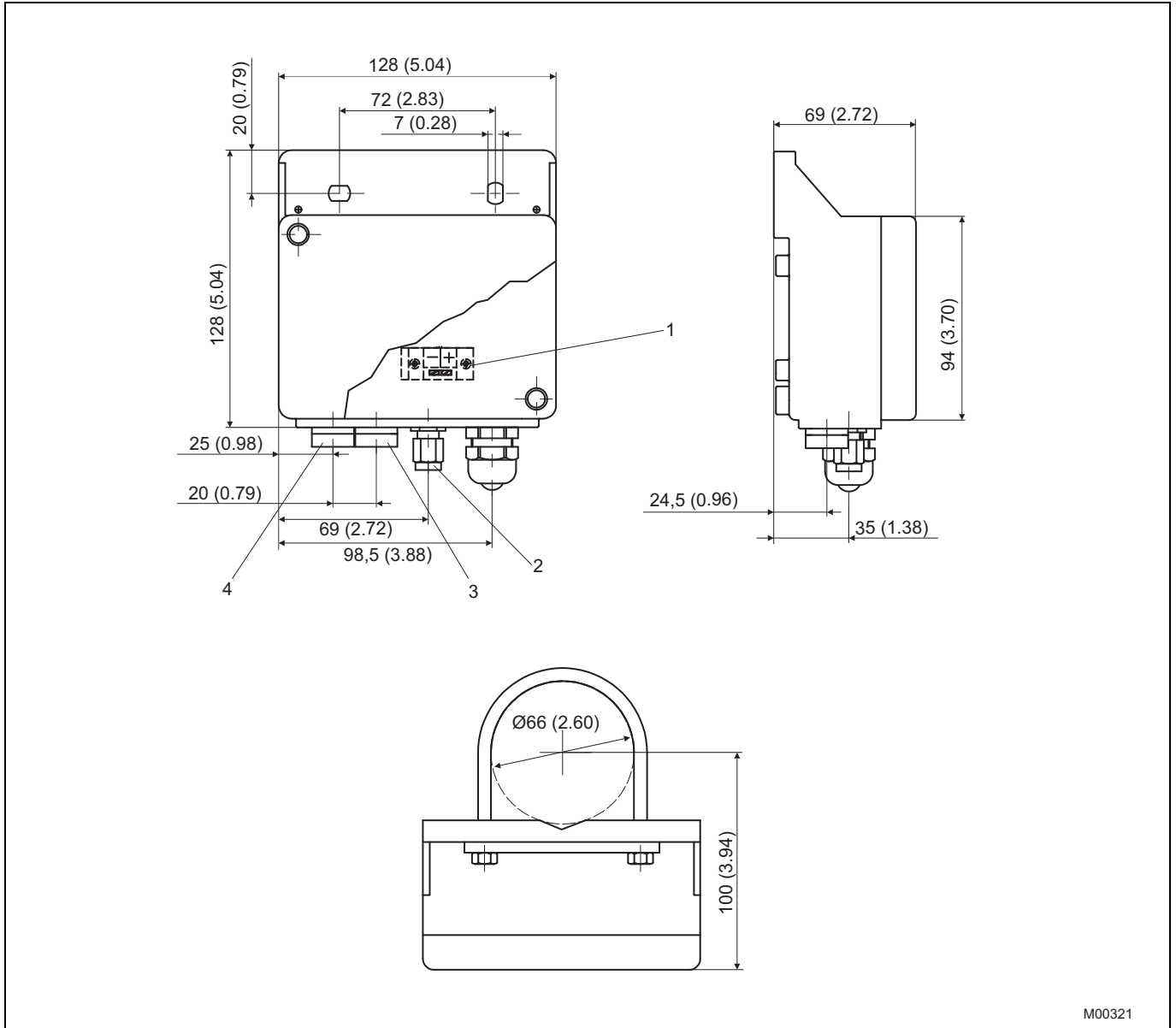
M00320

Fig. 12: Dimensions in mm (inch)

- |                          |                                    |
|--------------------------|------------------------------------|
| 1 Output                 | 5 Panel with central air connector |
| 2 Supply air             | 6 Connection blocks                |
| 3 Filter                 | 7 Dummy panel                      |
| 4 Electrical connections |                                    |

1) 0.2 ... 1 bar (2.90 ... 14.50 psi) version  
 2) 0.4 ... 1 bar (5.80 ... 14.50 psi) version  
 3) Length 80 mm (3.15 inch) for each connection block

11.2.2 Design for plastic field housing unit



M00321

Fig. 13: Dimensions in mm (inch)

- |   |                          |
|---|--------------------------|
| 1 Electrical connections  | 3 Supply air             |
| 2 Connection only with version for operation with flammable gas for diverting the escaping gas / 6 mm (0.24) screw terminal | 4 Output                 |
|   | 5 Cable gland connection |

**Dimensions**

**11.3 TEIP11**

**11.3.1 Design for field housing unit as a mounting module for OEM applications**

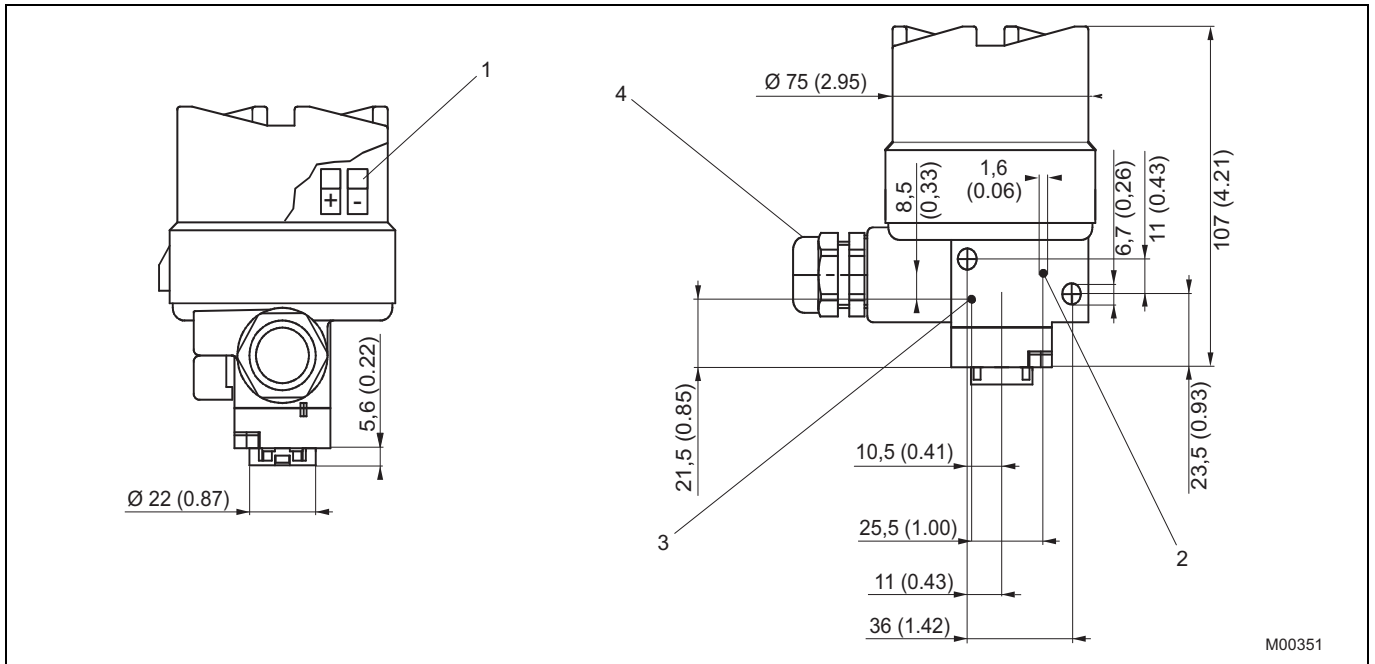


Fig. 14: Dimensions in mm (inch)

- 1 Electrical connections
- 2 Output
- 3 Supply air
- 4 Cable gland







**12 Appendix**

**12.1 Additional documents**

- Data sheet TEIP11 (10/18-0.11)
- Data sheet TEIP11-PS (10/18-0.10)

**12.2 Approvals and certifications**

CE mark		<p>The version of the meter in your possession meets the requirements of the following European directives:</p> <ul style="list-style-type: none"> <li>- EMC directive 89/336/EEC</li> <li>- ATEX directive 94/9/EC</li> </ul>
Explosion Protection	  	<p>Identification for intended use in potentially explosive atmospheres according to:</p> <ul style="list-style-type: none"> <li>- ATEX directive</li> <li>- FM Approvals (US)</li> <li>- CSA International (Canada)</li> </ul>



**Important**

All documentation, declarations of conformity, and certificates are available in ABB's download area.

[www.abb.com/instrumentation](http://www.abb.com/instrumentation)



## EG-KONFORMITÄTSERKLÄRUNG

EC DECLARATION OF CONFORMITY  
ATTESTATION DE CONFORMITE CE

**Hersteller:** ABB Automation Products GmbH  
*Manufacturer / Fabricant:* Minden

**Anschrift:** Schillerstraße 72  
*Address / Adresse:* D-32425 Minden

**Produktbezeichnung:** I/P Signalumformer TEIP11 / TEIP11-PS  
*Product name:* I/P Signal Converter TEIP11 / TEIP11-PS  
*Désignation du produit:* Transducteur I/P TEIP11/ TEIP11-PS

### Das Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein:

*This product meets the requirements of the following European directives:  
Les produits répondent aux exigences des Directives C.E. suivantes:*

**89/336/EWG - 92/31/EWG - 93/68/EWG**  
89/336/EEC - 92/31/EEC - 93/68/EEC  
89/336/CEE - 92/31/CEE - 93/68/CEE

**EMV-Richtlinie \***  
*Electromagnetic Compatibility Directive \**  
*Directives concernant la compatibilité électromagnétique \**

### Für Geräte in Ex-Ausführung gemäß Kennzeichnung auf Typschild gilt zusätzlich:

*For products in Ex design according to identification on nameplate the following is additionally applicable:  
Pour des produits en exécution Ex selon marque sur plaque signalétique le suivant est aussi applicable:*



**94/9/EG** **ATEX-Richtlinie**  
94/9/EEC *ATEX Directive*  
94/9/CEE *ATEX Directive*

### \* einschließlich Änderungen und deutscher Umsetzung durch das EMVG und Gerätesicherheitsgesetz

*\* including alterations and German realization by the EMC law and the instruments safety law*

*\* y compris les modifications et la réalisation allemande par la loi concernant la compatibilité électromagnétique et la sécurité d'appareils*

### Die Übereinstimmung mit den Vorschriften dieser Richtlinien wird nachgewiesen durch die vollständige Einhaltung folgender Normen:

*Conformity with the requirements of these Directives is proven by complete adherence to the following standards:  
La conformité avec les exigences de ces directives est prouvée par l'observation complète des normes suivantes:*

**EN 61000-6-2 / EN 61000-6-3 / EN 61000-6-4**  
**Ex: EN 50 014 / EN 50 284 / EN 50 018 / EN 50 020**

03.04.2008

**Datum**  
*Date*  
*Date*

**Dr. Wolfgang Scholz**  
**Leiter R&D**  
Head of R&D  
Responsable R&D

**Manfred Klüppel**  
**Leiter Qualitätssicherung**  
Head of Quality Assurance  
Responsable Assurance de la Qualité

**Statement on the contamination of devices and components**

Repair and/or maintenance work will only be performed on devices and components if a statement form has been completed and submitted.

Otherwise, the device/component returned may be rejected. This statement form may only be completed and signed by authorized specialist personnel employed by the operator.

**Customer details:**

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Contact person: \_\_\_\_\_

Telephone: \_\_\_\_\_

Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

**Device details:**

Type: \_\_\_\_\_

Serial no.: \_\_\_\_\_

Reason for the return/description of the defect: \_\_\_\_\_

**Was this device used in conjunction with substances which pose a threat or risk to health?** Yes       No

If yes, which type of contamination (please place an X next to the applicable items)?

Biological            Corrosive/irritating            Combustible (highly/extremely combustible)      Toxic            Explosive            Other toxic substances      Radioactive      

Which substances have come into contact with the device?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

We hereby state that the devices/components shipped have been cleaned and are free from any dangerous or poisonous substances.

\_\_\_\_\_  
Town/city, date\_\_\_\_\_  
Signature and company stamp

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Printed in the Fed. Rep. of Germany (06.2009)

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3KXE311001R4201



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