

# Electro-Pneumatic Positioner TZIDC-200, TZIDC-210, TZIDC-220

for 4 ... 20 mA two-wire technology,  
HART, PROFIBUS PA,  
FOUNDATION fieldbus



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# Electro-Pneumatic Positioner TZIDC-200, TZIDC-210, TZIDC-220

## Commissioning Instruction

CI/TZIDC-200/210/220-EN

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Rev. A

Translation of the original instruction

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## 1 Safety

### 1.1 General information and notes for the reader

You must 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 future reference.

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 if 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 perfect working order from a safety perspective. 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 instructions 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

TZIDC-200, TZIDC-210, TZIDC-220 positioners are electro-pneumatic positioning devices for use with pneumatically controlled actuators.

The device may only be used for the applications listed in these operating instructions and in the data sheet.

- The maximum operating temperature must not be exceeded.
- The permissible operating temperature must not be exceeded.
- The housing protection type must be observed during operation.

### **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.



**NOTICE – <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 (NOTE)**

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**

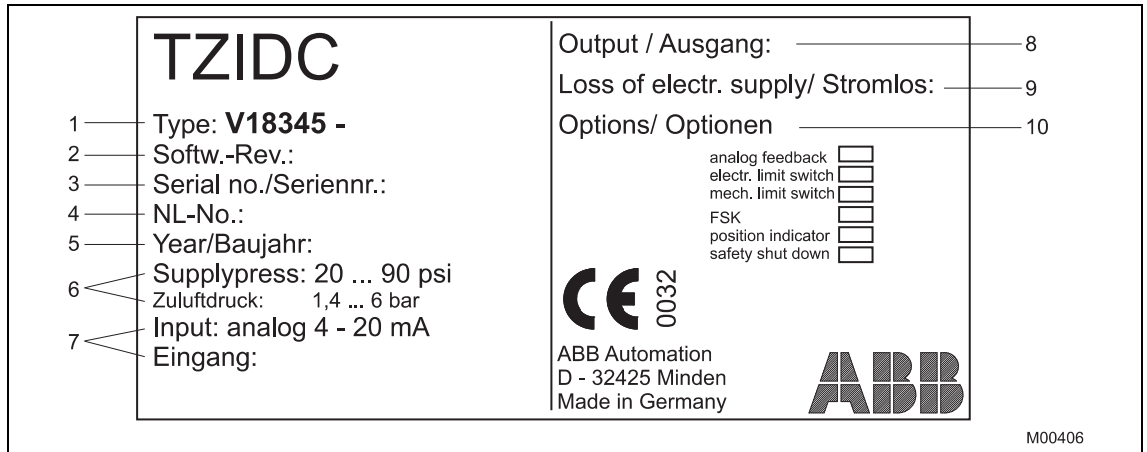


Fig. 1: Name plate

- |                       |                   |
|-----------------------|-------------------|
| 1 Complete model name | 6 Supply pressure |
| 2 Software version    | 7 Input           |
| 3 Serial number       | 8 Output          |
| 4 NL number           | 9 Dead            |
| 5 Year                | 10 Options        |

**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 Storage conditions**

The unit must be stored in dry and dust-free conditions. The unit is also protected by a dessicant in the packaging.

The storage temperature should be between -40 ... 85 °C (-40 ... 185 °F).

The storage time is basically indefinite. However, the warranty conditions stipulated in the order confirmation of the supplier are valid.

## 1.8 Installation safety information



### CAUTION - Risk of injury!

Incorrect parameter values can cause the valve to move unexpectedly. This can lead to process failures and result in injuries.

Before recommissioning a TZIDC-200, TZIDC-210, TZIDC-220 positioner that was used at another location, the device must always be reset to factory settings. Never start Autoadjust before restoring factory settings.

- Only qualified specialists who have been trained for these tasks are authorized to mount and adjust the unit, and to make the electrical connection.
- When working on the unit always observe the locally valid accident prevention regulations and the regulations concerning the construction of technical installations.

## 1.9 Safety information for electrical installation

- The electrical connection may only be made by authorized specialist personnel and in accordance with the electrical circuit diagrams.
- The electrical connection information in the manual must be observed; otherwise, the type of electrical protection may be adversely affected.
- Safe isolation of electrical circuits which are dangerous if touched is only guaranteed if the connected devices satisfy the requirements of DIN EN 61140 (VDE 0140 Part 1) (basic requirements for safe isolation).
- To ensure safe isolation, install supply lines so that they are separate from electrical circuits which are dangerous if touched, or implement additional isolation measures for them.

## 1.10 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.

Prior to installation, check the devices for any damage that may have occurred as a result of improper transport. Details of any damage that has occurred in transit must be recorded on the transport documents. All claims for damages must be submitted to the shipper without delay and before installation.

### 1.11 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.).

Please contact Customer Center Service acc. to page 2 for nearest service location.

### 1.12 Integrated management system

ABB Automation Products GmbH operates an integrated management system, consisting of:

- Quality management system to ISO 9001:2008
- Environmental management system to ISO 14001:2004
- Occupational health and safety management system to BS OHSAS 18001:2007 and
- Data and information protection management system

Environmental awareness is an important part of our company policy.

Our products and solutions are intended to have a minimal impact on the environment and on people during manufacturing, storage, transport, use, and disposal.

This includes the environmentally-friendly use of natural resources. We conduct an open dialog with the public through our publications.

## 1.13 Disposal

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

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

This product is not subject to WEEE Directive 2002/96/EC or relevant national laws (e.g., ElektroG in Germany).

The product must be disposed of at a specialist 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.

### 1.13.2 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 into 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 certain amounts 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 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 at the right time, in the future these substances will no longer be used in new product development.

## 2 Ex relevant safety instructions

Depending on the type of explosion protection, an Ex label is attached to the left of the positioner beside the main name plate. It shows the explosion protection and the unit's relevant EX certificate.

### Requirements / preconditions for safe operation of positioners:



#### **IMPORTANT (NOTE)**

Observe the units' relevant technical data and special conditions in accordance with the applicable certificate.

- Manipulation of the devices by users is not permitted. Modifications to the units may only be performed by the manufacturer or an explosion-protection specialist.
- The splash guard cap must be screwed in place to achieve IP 65 / NEMA 4x protection class. Operating the units without the splash guard cap is prohibited.
- 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.



#### **IMPORTANT (NOTE) – Use in areas with combustible dust**

- To prevent loss of its ignition-proof classification, the housing may not be opened.
- Use only cable glands that conform to protection type  $\geq$  IP 65.
- Avoid hazardous sliding brush discharges.

### 3 Mounting



**CAUTION - Risk of injury!**

Incorrect parameter values can cause the valve to move unexpectedly. This can lead to process failures and result in injuries.

Before recommissioning a TZIDC-200, TZIDC-210, TZIDC-220 positioner that was used at another location, the device must always be reset to factory settings. Never start Autoadjust before restoring factory settings.

#### 3.1 Operating conditions at installation site



**IMPORTANT (NOTE)**

Before installation, check whether the TZIDC-200, TZIDC-210, TZIDC-220 positioner meets the control and safety requirements for the installation location (actuator or valve). See the „Specifications“ chapter in the operating instructions or on the data sheet.

#### 3.2 Mechanical mount

##### 3.2.1 General

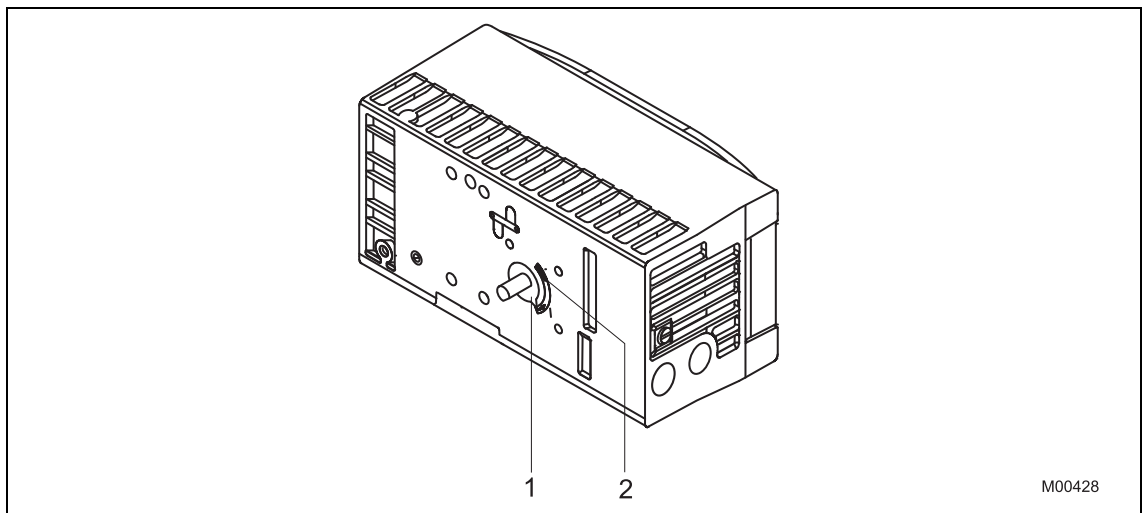


Fig. 2: Operating range

The arrow (1) on the positioner feedback shaft (and the lever) must move through the area marked by the arrows (2).

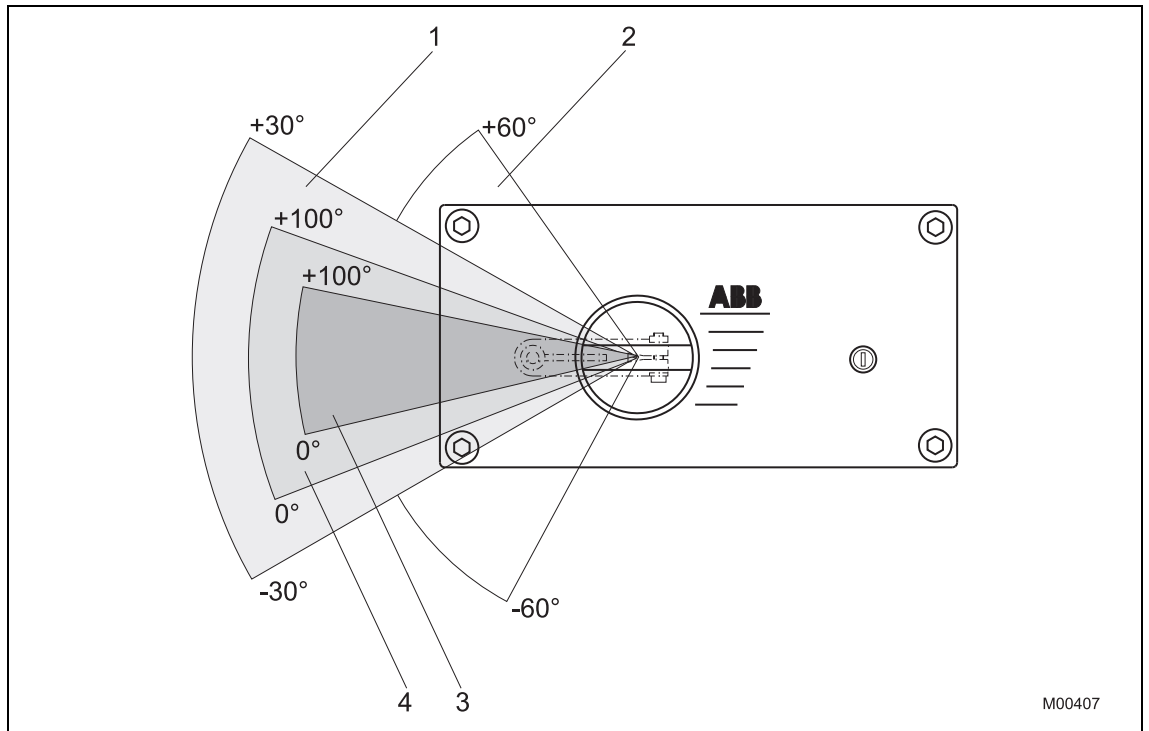


Fig. 3: Positioner range

- 1 Sensor range for linear actuators
- 2 Sensor range for rotary actuators
- 3 Operating range for linear actuators
- 4 Operating range for rotary actuators

**i**

**IMPORTANT (NOTE)**

During installation make sure that the actuator travel or rotation angle for position feedback is implemented correctly.

The maximum rotation angle for position feedback is 60° when installed on linear actuators and 120° on rotary actuators. The minimum angle is always 25°.

## 3.2.2 Mounting on linear actuators

For mounting on a linear actuator in accordance with DIN / IEC 534 (lateral mount per NAMUR) a complete mounting kit is available, and consists of the items in the following table:

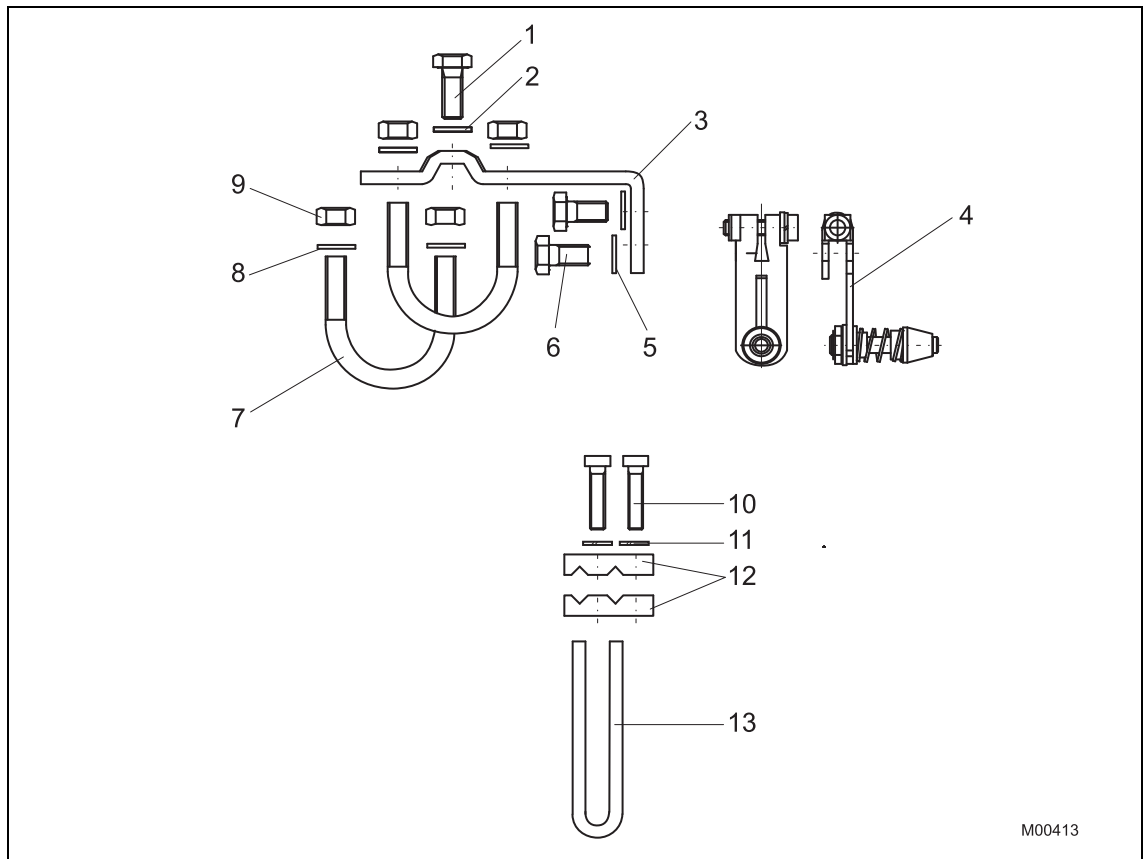


Fig. 4: Mounting kit for linear actuators

- Lever (4) with follower pin, for stroke adjustment 10 ... 35 mm (0.39 ... 1.38 inch) or 20 ... 100 mm (0.79 ... 3.94 inch).
- Follower guide (13) with two screws (10), spring washers (11), and clamp plates (12).
- Mount bracket (3) with two screws (6) and two shims (5).
- Screw (1) and shim (2) for mounting on cast iron yoke.
- Two U-bolts (7) each with two shims (8) and two nuts (9) for mounting on columnar yoke.

Required tools:

- Wrench, size 10 / 13
- Allen key, size 4

Procedure:

1. Attaching follower guide to actuator

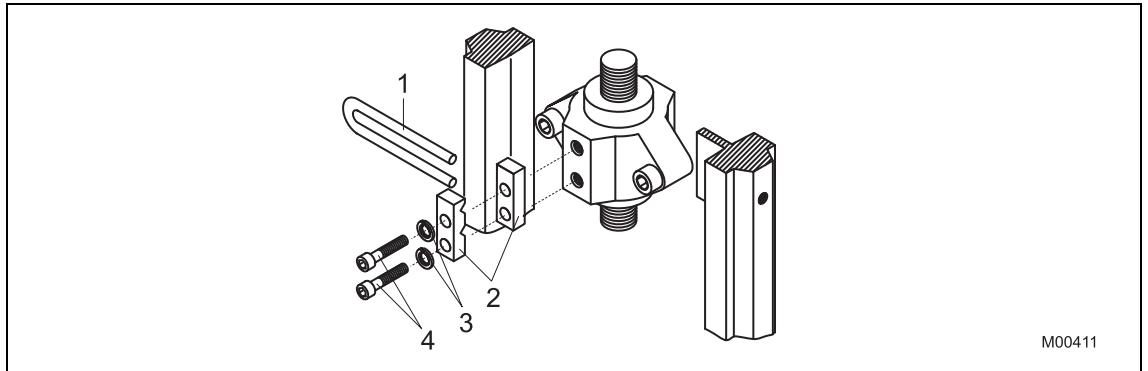


Fig. 5



**IMPORTANT (NOTE)**

Hand tighten the screws.

- Attach the follower guide (1) and clamp plates (2) with screws (4) and spring washers (3) to the actuator stem.

2. Assemble the lever (unless preassembled)

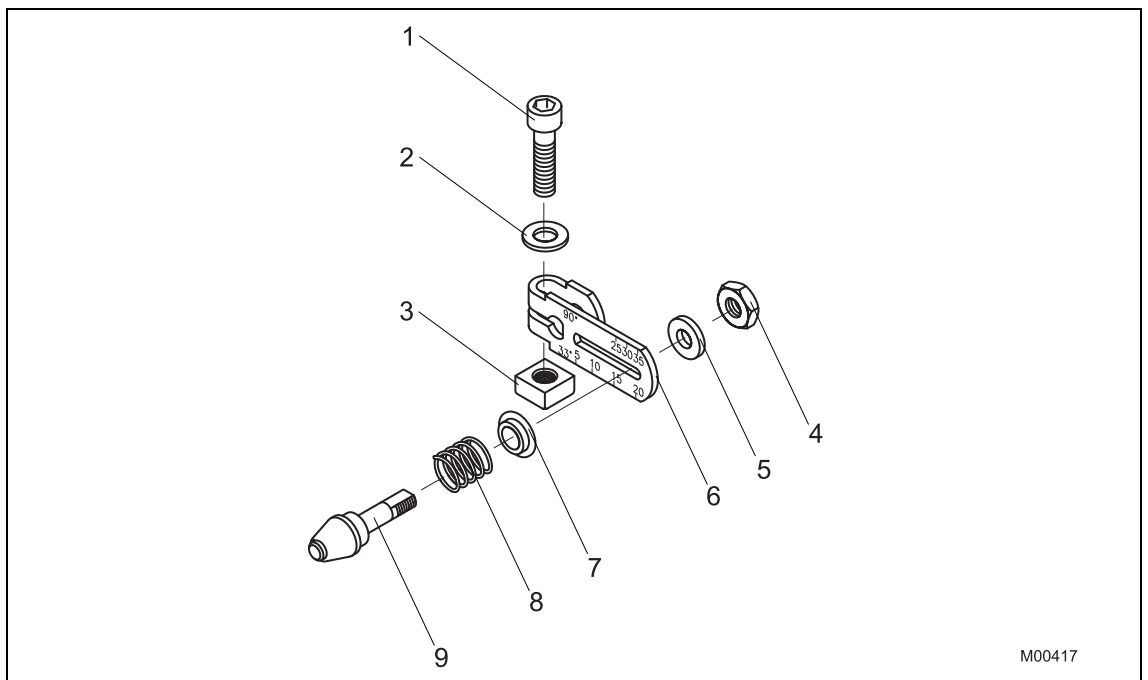


Fig. 6

- Insert spring (8) on bolt with follower pin (9).
- Slip the plastic washer (7) onto the bolt and compress the spring with it.
- Insert the bolt with compressed spring into the oblong hole in the lever (6) and fasten it in the desired position using the plain washer (5) and nut (4) at the lever. The scale on the lever indicates the link point for the stroke range.
- Place the washer (2) on the screw (1). Insert the screw in the lever and lock with the nut (3).

### 3. Mounting lever and bracket on positioner

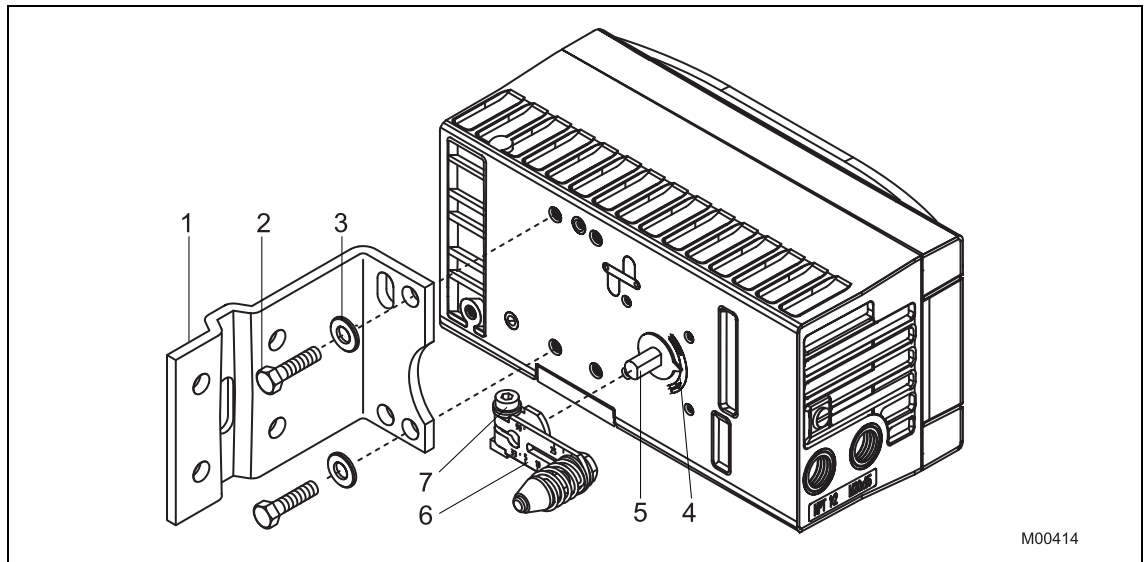


Fig. 7

- Attach the lever (6) to the feedback shaft (5) of the positioner (can only be mounted in one position due to the flat on the side of the shaft).
- Using the arrow marks (4) check whether the lever moves within the operating range (between the arrows).
- Hand-tighten the screw (7) on the lever.
- Hold the prepared positioner with loose mount bracket (1) to the actuator so that the follower pin for the lever enters the follower guide to determine which holes on the positioner must be used for the mount bracket.
- Attach the mount bracket (1) with screws (2) and shims (3) to the proper holes on the positioner housing. Tighten the screws as evenly as possible to ensure subsequent linearity. Align the mount bracket in the oblong hole to ensure that the operating range is symmetrical (lever moves between the arrows (4)).

**4.a Mounting on cast iron yoke**

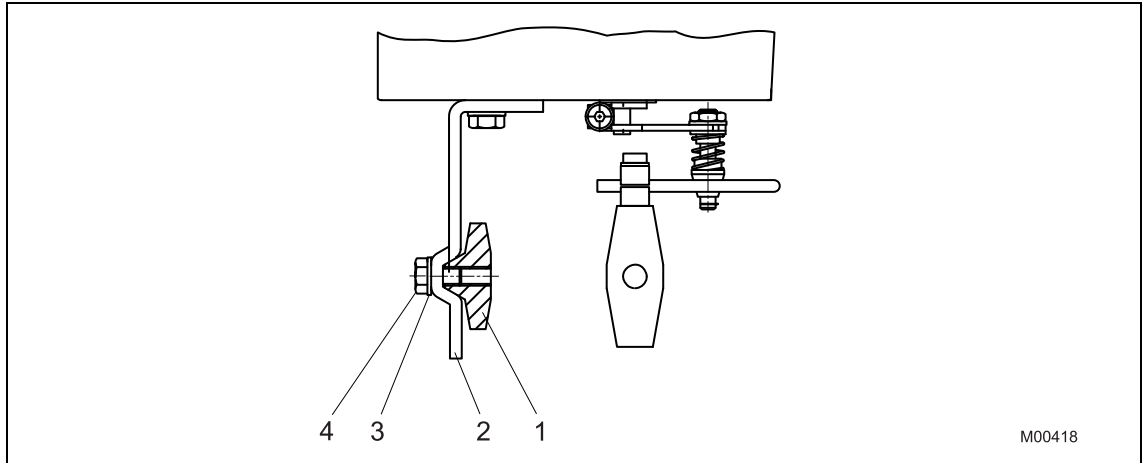


Fig. 8

- Attach the mount bracket (2) with screw (4) and shim (3) to the cast iron yoke (1)

or

**4.a Mounting on columnar yoke**

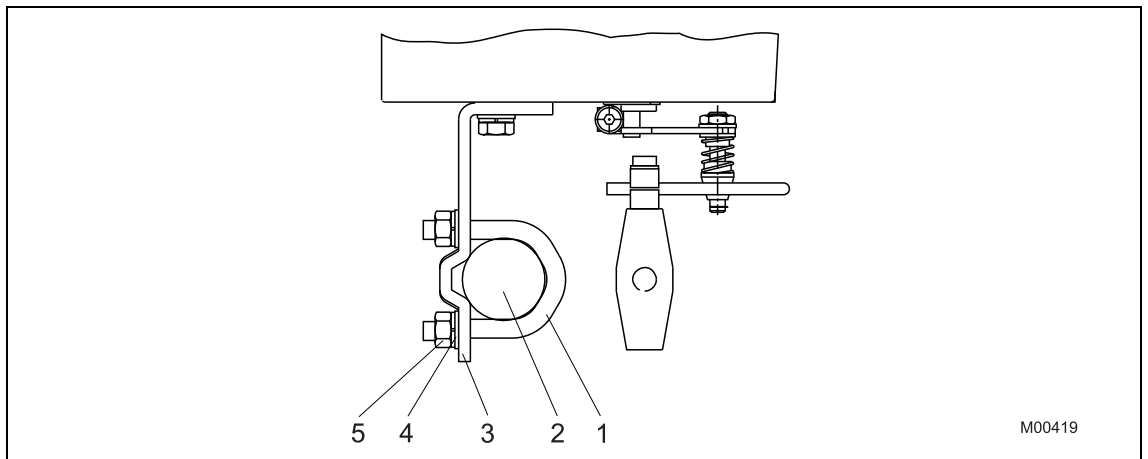


Fig. 9

- Hold the mount bracket (3) in the proper position on the columnar yoke (3).
- Insert the U-bolts (2) from the inside of the columnar yoke (3) through the holes for the mount bracket.
- Add the washers (5) and nuts (6). Hand tighten the nuts.



**IMPORTANT (NOTE)**

Adjust the height of the positioner on the cast iron yoke or columnar yoke until the lever is horizontal (based on visual check) at half stroke of the valve.



**3.2.3 Mounting on part-turn actuator**

For mounting on part-turn actuators in accordance with VDI / VDE 3845, the following mounting kit is available:

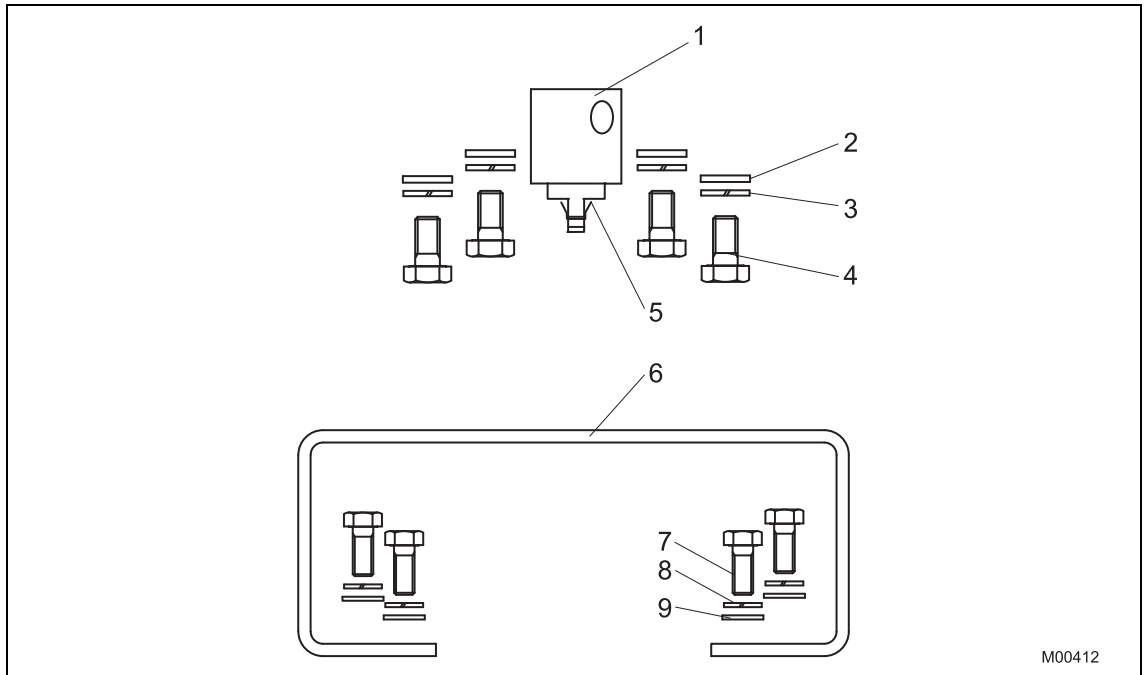


Fig. 11

- Adapter (1) with spring (5).
- Four screws M6 (4), four spring washers (3), and four shims (2) for attaching the mounting bracket (6) to the positioner.
- Four screws M5 (7), four spring washers (8), and four shims (9) for attaching the mounting bracket to the actuator.

Required tools:

- Wrench, size 10 / 13
- Allen key, size 3

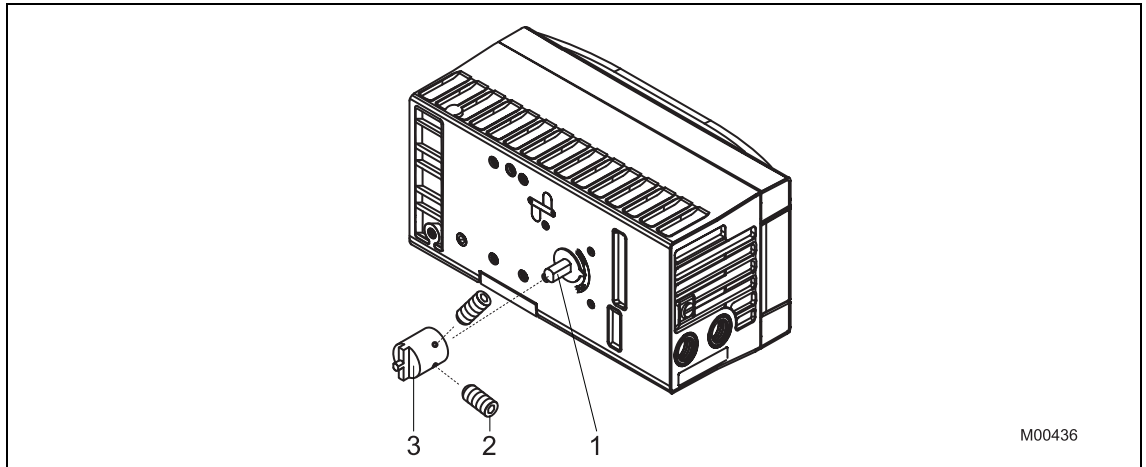
**Procedure:****1. Mounting the adapter on the positioner**

Fig. 12

- Determine the mounting position (parallel to actuator or at 90° angle)
- Calculate the rotational direction of the actuator (right or left).
- Move the part-turn actuator into home position.
- Based on the mounting position as well as the home position and rotational direction of the actuator, determine in which position the feedback shaft (1) for the positioner must be pre-adjusted and in which position the adapter (2) must be placed to enable the positioner to travel within the proper range (the arrow on the rear of the device must travel within the admissible range, see Fig. 2).
- Pre-adjust feedback shaft.
- Place the adapter in the proper position on the feedback shaft and fasten with set screws (3). One of the set screws must be locked in place on the flat side of the feedback shaft.

**2. Screwing mounting bracket on to positioner**

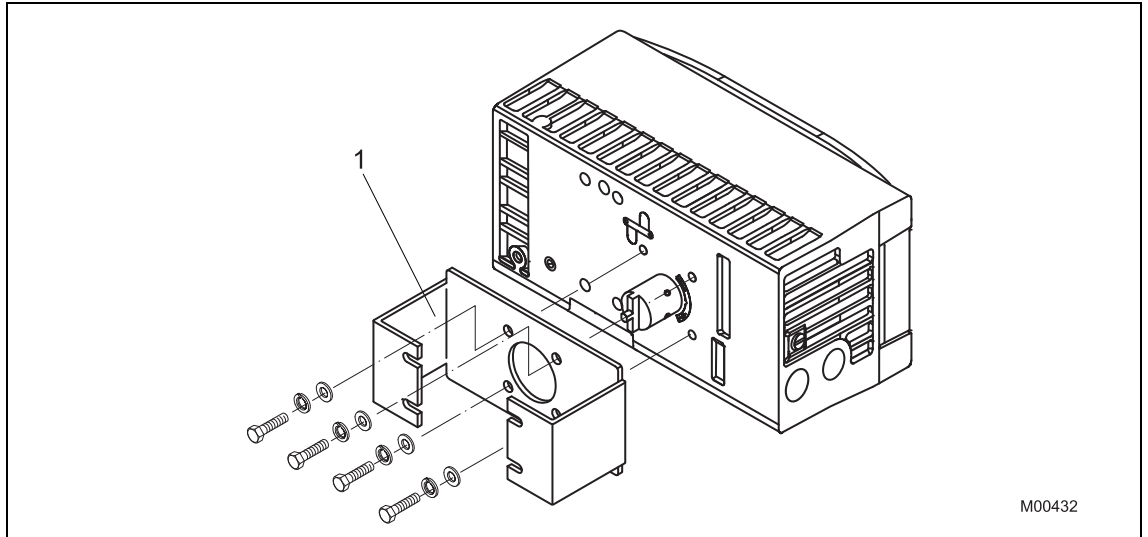


Fig. 13

1 Mounting bracket

**3. Screwing positioner on to actuator**

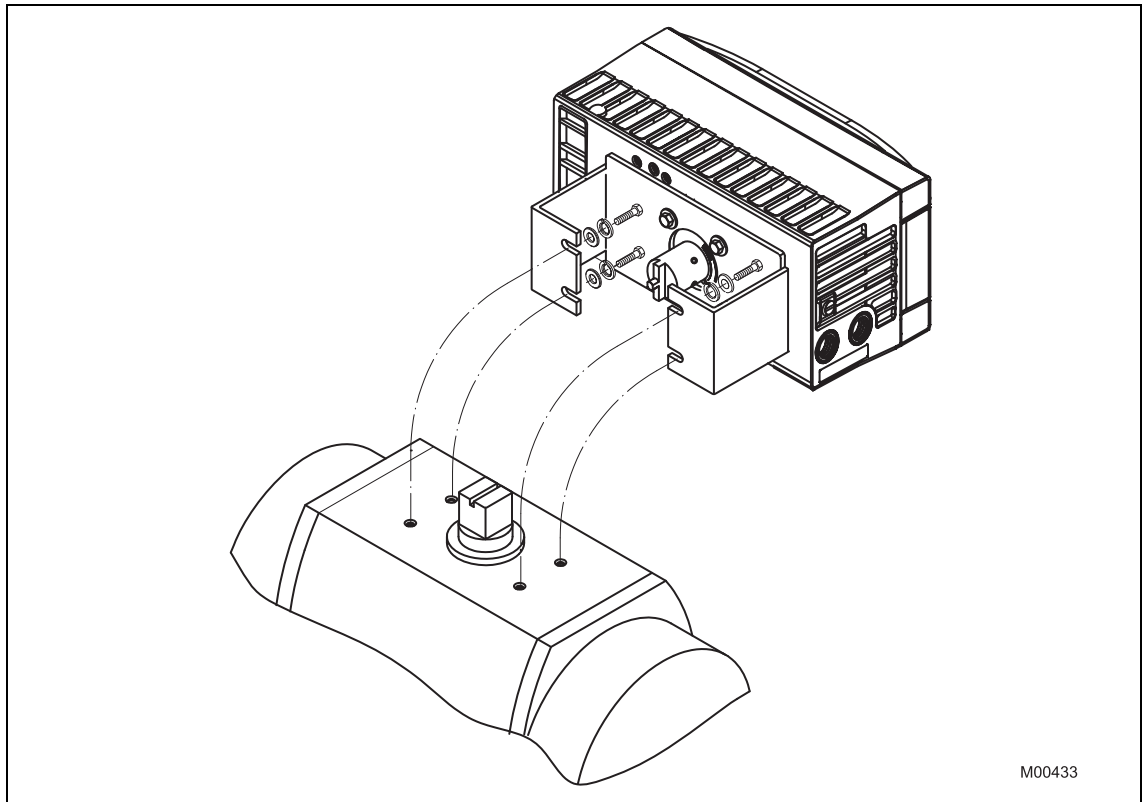


Fig. 14



**IMPORTANT (NOTE)**

After mounting, check whether the working range for the actuator matches the sensor range for the positioner.

4 Electrical connections



**DANGER – Risk of explosion (TZIDC-200 only)**

It is prohibited to use the integrated communication interface (LKS) in an Ex area.

Never use the integrated communication interface (LKS) on the main board with a positioner that is being used in an explosion risk area.

1. Strip the wire by approx. 8 mm (0.32 inch).
2. To connect the signal lines, the emergency shutdown module and the proximity switches or microswitches, insert the wire ends from the left into the respective screw terminals and hand-tighten the screws (access from above). To connect a plug-in module, insert the wire ends from above in the appropriate screw terminals and hand-tighten the screws (access from the side).

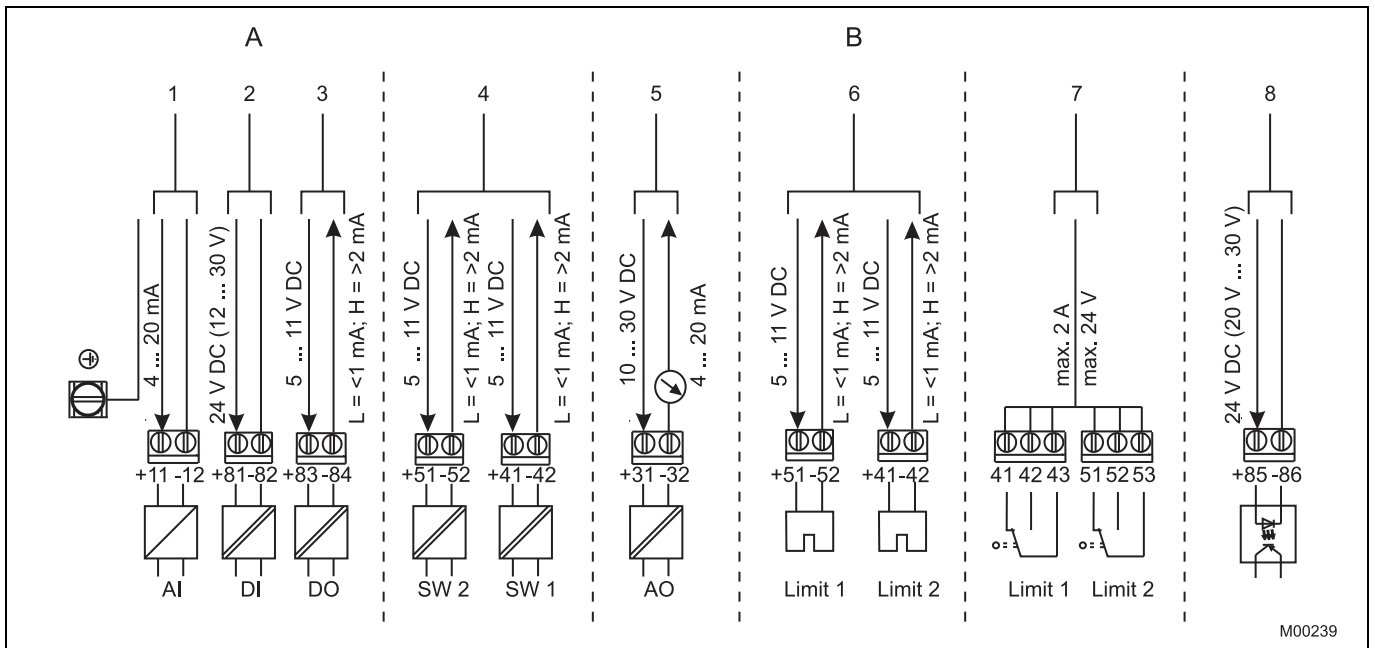


Fig. 15: Electrical connection

- A Basic model
- B Options

- 1 Analog input / Bus connector
- 2 Digital input <sup>1)</sup>
- 3 Digital output <sup>1)</sup>
- 4 Digital feedback <sup>1)</sup>
- 5 Analog feedback <sup>1)</sup>
- 6 Proximity switches
- 7 Microswitches
- 8 Emergency shutdown module

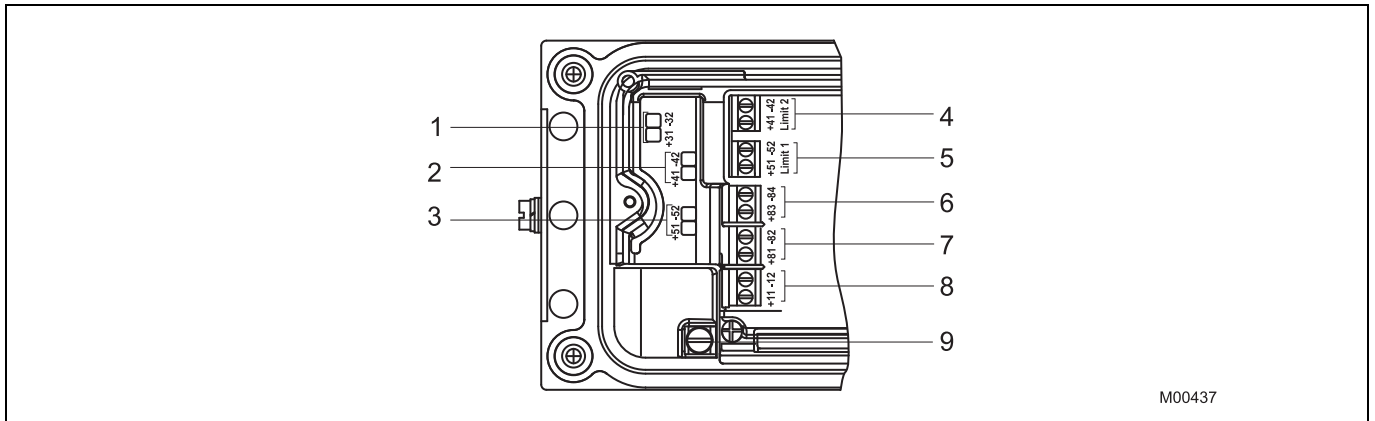
1) TZIDC-200 only



**IMPORTANT (NOTE)**

Keep cable shields as short as possible and connect on both sides.

**4.1 Screw terminal assignments**



M00437

Fig. 16

- |                                                                                                   |                                   |
|---------------------------------------------------------------------------------------------------|-----------------------------------|
| 1 Module for analog position feedback <sup>1)</sup>                                               | 6 Digital output DO <sup>1)</sup> |
| 2 Module for digital feedback <sup>1)</sup> or service switch of emergency shutdown module        | 7 Digital input DI <sup>1)</sup>  |
| 3 Module for digital position feedback <sup>1)</sup> or terminals of the shutdown module          | 8 Signal 4 ... 20 mA              |
| 4 Installation kit for digital position feedback, either proximity switches or 24 V microswitches | 9 Grounding screw                 |
| 5 Same as 4                                                                                       |                                   |

1) TZIDC-200 only

## 4.2 Cable entry

**IMPORTANT (NOTE)**

The cable terminals are delivered closed and must be unscrewed before inserting the cable.

For the cable entry into the housing, on the left-hand side of the housing there are two tap holes in four thread combinations to accommodate the cable entry and pneumatic connection.

- Cable: thread 1/2-14NPT, air pipe: thread 1/4-18 NPT
- Cable: thread M20 x 1,5, air pipe: thread 1/4-18 NPT
- Cable: thread M20 x 1,5, air pipe: thread G 1/4
- Cable: thread G 1/2, air pipe: thread Rc 1/4

As an option, one thread can be fitted with a cable gland and the other with a pipe plug if necessary.

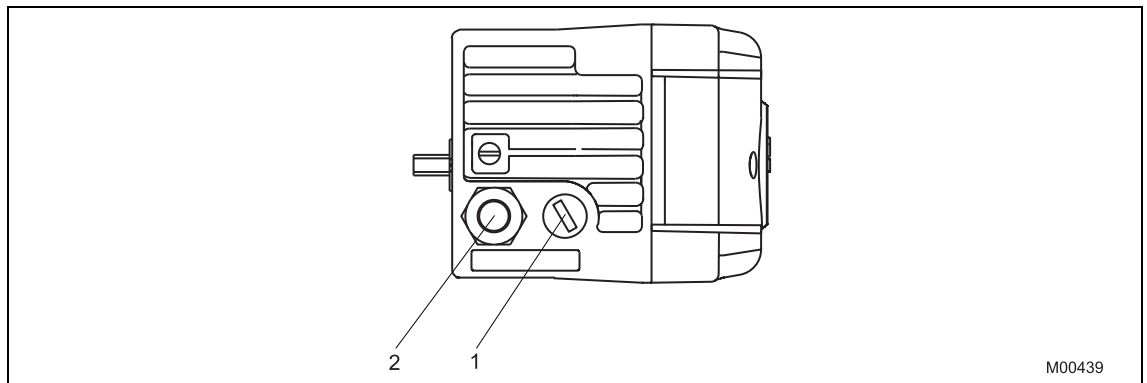


Fig. 17: Cable entry

- 1 Pipe plug
- 2 Cable gland

**5 Pneumatic connection**



**IMPORTANT (NOTE)**

The TZIDC-200, TZIDC-210, TZIDC-220 positioners 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.



**NOTICE - Potential damage to parts!**

Impurities on the pipe and positioner can damage components.

Dust, splinters, and any other particles of dirt must be blown off the pipe before it is connected.

To connect the air pipes, G1/4 or 1/4-18 NPT tap holes are provided. We recommend that you use a line with dimensions of 6 x 1 mm.



**NOTICE - Potential damage to parts!**

Pressure above 6 bar (90 psi) can damage positioners or actuators.

Provisions should be made to ensure that, in the event of an error, the pressure does not rise above 6 bar (90 psi).

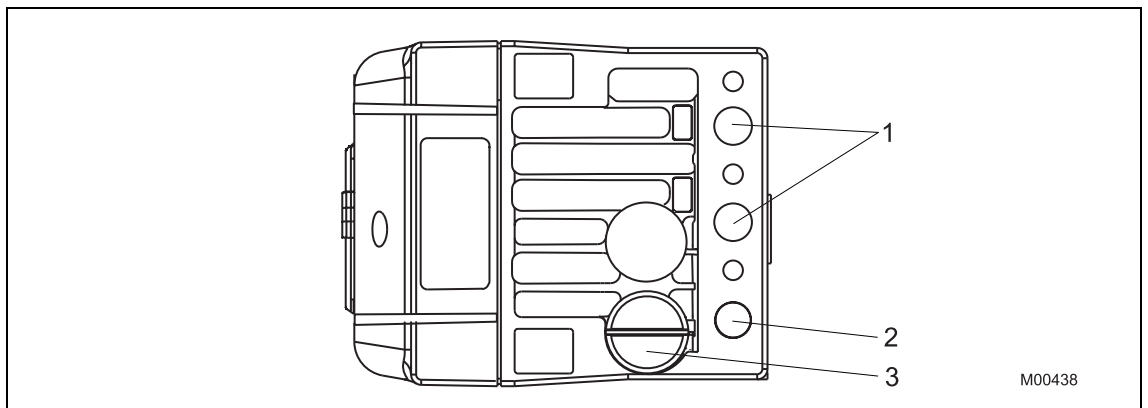


Fig. 18: Pneumatic connections

- 1 Pneumatic outputs
- 2 Supply air
- 3 Filter screw

All pneumatic piping connections are located on the right side of the positioner. To connect the pneumatic pipes, G1/4 or 1/4-18 NPT tap holes are provided. The positioner is labeled according to the tap holes available. The corresponding pipe connections must be included.

The level of supply pressure must be adjusted to the output pressure in the actuator required to provide increased actuating force. The operating range for the positioner is between 1.4 ... 6 bar (20 ... 90 psi).

Arrange the connections according to their marks:

Designation	Pipe connection
-	Air supply, pressure 1.4 ... 6 bar (20 ... 90 psi)
OUT1	Output pressure for actuator
OUT2	Output pressure for actuator (2nd connection with double-acting actuator)

## 6 Commissioning

### 6.1 TZIDC-200

1. Feed in pneumatic auxiliary power.
2. Feed in electrical supply power.
  - Feed in setpoint current 4 ... 20 mA (terminals +11 / -12)
3. Check mount:
  - Press and hold **MODE**, and press **▲** or **▼** until operating mode 1.3 (manual adjustment within the sensor range) is displayed. Release **MODE**.
  - Press **▲** or **▼** to move the actuator into the mechanical end position; check the end positions; rotation angle is displayed in degrees; for high-speed mode, press **▲** and **▼** simultaneously.  
  
Recommended range:
    - between -28 ... 28° for linear actuators
    - between -57 ... 57° for part-turn actuatorsMinimum angle: 25°
4. Run Autoadjust.

#### For linear actuators <sup>1)</sup>:

- Press and hold **MODE** until **ADJ\_LIN** is displayed; release the control button.
- Press **MODE** again and hold down until the countdown ends.
- Release **MODE**; this starts Autoadjust.

#### For part-turn actuators <sup>1)</sup>:

- Press and hold **ENTER** until **ADJ\_ROT** is displayed; release the control button.
- Press **ENTER** again and hold it down until the countdown ends.
- Release **ENTER**; this starts Autoadjust.

If Autoadjust is successful, the parameters will be stored automatically and the positioner will revert to operating mode 1.1.

If an error occurs during Autoadjust, the process will be terminated with an error message. If this happens, press and hold down **▲** or **▼** for approximately three seconds. The unit will switch to the operating level, mode 1.3 (manual adjustment within the sensor range). The mount is checked and corrected if necessary. Autoadjust then runs again.



#### IMPORTANT (NOTE)

Autoadjust does not always result in optimum control conditions.

1) The zero position is determined automatically and saved during Autoadjust (counter-clockwise (CTCLOCKW) for linear actuators and clockwise (CLOCKW) for part-turn actuators).

## 6.1.1 Operating modes

Selection from the operating level:

- Press and hold down **MODE**.
- Press and release **▲** rapidly as often as required. The selected operating mode is displayed.
- Release **MODE**.
- The position is displayed in % or as a rotation angle.

Operating mode	Mode indicator	Position indicator
1.0 Control mode <sup>1)</sup> with adaptation (the control parameter)		
1.1 Control mode <sup>1)</sup> without adaptation (the control parameter)		
1.2 Manual adjustment <sup>2)</sup> in the operating range. Adjust with <b>▲</b> or <b>▼</b> <sup>3)</sup>		
1.3 Manual adjustment <sup>2)</sup> in the sensor range. Adjust with <b>▲</b> or <b>▼</b> <sup>3)</sup>		

1) Since self-optimization in operating mode 1.0 is subject to several factors during control operation with adaptation, incorrect adjustments could be made over an extended period.

2) Position not active

3) For high-speed mode: Press **▲** and **▼** simultaneously

6.2 TZIDC-210 / TZIDC-220

1. Feed in pneumatic supply power
2. Connect the bus to the bus terminals with any polarity (or supply power 9 ... 32 V DC)



3. Check mount:
  - Press and hold down **MODE** and **ENTER**; once the countdown has gone from 3 to 0, release **MODE** and **ENTER**; the unit switches to the operating level, mode 1.x
  - Press and hold down **MODE** and **ENTER**.
  - Additionally, press **▲** or **▼** until operating mode 1.3 (manual adjustment within the sensor range) is displayed. Release **MODE**
  - Press **▲** or **▼** to move the actuator into the mechanical end position; check the end positions; rotation angle is displayed in degrees (for high-speed mode, press **▲** and **▼** simultaneously)

Recommended range:

- between -28 ... 28° for linear actuators
- between -57 ... 57° for rotary actuators

Minimum angle: 25°

4. Go back to the bus level:

- Press and hold down **MODE** and **ENTER**; once the countdown has gone from 3 to 0, release **MODE** and **ENTER**



5. Run Autoadjust
  - Check that the unit is on the bus level ("REMOTE")

**For linear actuators <sup>1)</sup>:**

- Press and hold down **MODE** until **ADJ\_LIN** is displayed. Release the control button
- Press **MODE** again and hold down until the countdown ends
- Release **MODE**; this starts Autoadjust

**For rotary actuators <sup>1)</sup>:**

- Press and hold down **ENTER** until **ADJ\_ROT** is displayed. Release the control button
- Press **ENTER** again and hold down until the countdown ends
- Release **ENTER**; this starts Autoadjust

If Autoadjust is successful, the parameters will be stored automatically and the positioner will revert to operating mode 1.1.

If an error occurs during Autoadjust, the process will be terminated with an error message. If this happens, press and hold down  $\blacktriangle$  or  $\blacktriangledown$  for approximately three seconds. The unit will switch to the operating level, mode 1.3 (manual adjustment within the sensor range). The mount is checked and corrected if necessary. Autoadjust then runs again.

### 6. Set potential dead band and tolerance band

This step is only required for critical (e.g., very small) actuators. It is not necessary under normal circumstances.

- 1) The zero position is determined automatically and saved during Autoadjust (counter-clockwise (CTCLOCKW) for linear actuators and clockwise (CLOCKW) for rotary actuators).

**6.2.1 Setting the bus address**

1. Switch to the configuration level:
  - Press and hold down **↑** and **↓** simultaneously.
  - Press and release **ENTER**.
  - Wait for the countdown to go from 3 to 0.
  - Release **↑** and **↓**;



is displayed.

2. Switch to parameter group 1.5:
  - Press and hold down **MODE** and **ENTER** simultaneously.
  - Press **↑** or **↓**;



is displayed.

- Release **MODE**;



is displayed.

3. Setting the bus address
  - Press **↑** or **↓** to set the correct value.
  - Press and hold down **ENTER**.
  - Wait for the countdown to go from 3 to 0.
  - Release **ENTER**.

The new bus address is saved.

4. Switch to parameter 1.6 (Return to operating level) and save the new setting:
  - Press and hold down **MODE**.
  - Press and release **↑** twice;



is displayed.

- Release **MODE**.
- Press and release **↑** to select **NV\_SAVE**.
- Press and hold down **ENTER** for the countdown to go from 3 to 0.

The new parameter setting is saved and the positioner automatically returns to the working level, continuing to run on the operating level that was active prior to the configuration level being called up.

6.2.2 Request information

When the unit is in bus operation, a variety of information can be called up. Press the following control buttons to access this information:

Control buttons		Action
		<b>Cyclic communication:</b> Displays the setpoint in % and the setpoint status. <b>Acyclic communication:</b> Displays the communication status.
		Displays the bus address and operating mode.
ENTER		Displays the software revision.

6.2.3 Operating modes

Selection from the operating level:

- Press and hold down **MODE**
- Press and release as often as required to display the selected operating mode
- Release **MODE**
- The position is displayed in % or as a rotation angle

Operating mode	Mode indicator	Position indicator
1.1 Positioning with fixed setpoint Use  or  to adjust the setpoint		
1.2 Manual adjustment <sup>1)</sup> in the operating range Adjust with  or <sup>2)</sup>		
1.3 Manual adjustment <sup>1)</sup> in the sensor range Adjust with  or <sup>2)</sup>		

1) Positioning not active.

2) for high-speed mode: Press and simultaneously.

**7 Ex relevant specifications**

**7.1 TZIDC-200**

**FM Approval HLC 8/02 3010829**

Explosionproof; enclosure 4X; T5, max. 82 °C  
CL I; Div 1; Grp. C-D

Intrinsic Safety; enclosure 4X; T5, max. 82 °C  
CL I, II, III; Div 1; Grp. A-B-C-D-E-F-G

Non-Incendive; enclosure 4X; T4, max. 85 °C  
CL I; Div 2; Grp. A-B-C-D  
CL II, III; Div 2; Grp. F-G

Dust-Ignitionproof; enclosure 4X; T5, max. 82 °C  
CL II, III; Div 1; Grp. E-F-G

**CSA Certification 1393920**

Explosionproof; enclosure 4X; T5, max. 85 °C  
CL I; Div 1; Grp. C-D  
CL II; Div 1; Grp. E-F-G  
CL III

Intrinsic Safety; enclosure 4X; T5, max. 82 °C  
CL I; Div 1; Grp. A-B-C-D  
CL II; Div 1; Grp. E-F-G  
CL III

**ATEX / GOST Russia / GOST Ukraine**

Type-Examination Test Certificate: DMT 02 ATEX E 029 X  
Type: **Flameproof enclosure**  
Device class: II 2G (Ex ib IIC)  
Temperature class: T4, T5, T6  
Permissible ambient temperature: T4: -40 °C < T<sub>amb</sub> < 85 °C  
T5: -40 °C < T<sub>amb</sub> < 80 °C  
T6: -40 °C < T<sub>amb</sub> < 65 °C

**ATEX**

Type-Examination Test Certificate: TÜV 98 ATEX 1370 X  
Type: **Intrinsically safe equipment**  
Device class: II 2G (Ex ib IIC)  
Temperature class: T4, T5, T6  
Permissible ambient temperature: T4: -40 °C < T<sub>amb</sub> < 85 °C  
T5: -40 °C < T<sub>amb</sub> < 50 °C  
T6: -40 °C < T<sub>amb</sub> < 35 °C

**IECEX**

Type-Examination Test Certificate: IECEX TUN 04.0015X, Issue no.: 4  
Type: **Intrinsic safety**  
Temperature class: T4, T5, T6  
Permissible ambient temperature: T4: -40 °C < T<sub>amb</sub> < 85 °C  
T5: -40 °C < T<sub>amb</sub> < 50 °C  
T6: -40 °C < T<sub>amb</sub> < 40 °C

**IECEX Ex d**

Type-Examination Test Certificate: IECEX BVS 07.0030X, Issue No.: 0  
Type: **Flameproof enclosures 'd'**  
Temperature class: T4, T5, T6  
Permissible ambient temperature: T4: -40 °C < T<sub>amb</sub> < 85 °C  
T5: -40 °C < T<sub>amb</sub> < 80 °C  
T6: -40 °C < T<sub>amb</sub> < 65 °C

## Ex relevant specifications

### 7.2 TZIDC-210

#### FM Approval

TZIDC-210 Positioner, Model V18349-a014b3cd3ef  
IS/I,II,III/1/ABCDEF/T6,T5,T4 Ta = 40 °C, 55 °C, 85 °C-901265  
Entity, FISCO

Entity and FISCO Parameters							
Terminals	Type	Groups	Parameters				
			Vmax	I <sub>max</sub>	P <sub>i</sub>	C <sub>i</sub>	L <sub>i</sub>
+11 / -12	Entity	A-G	24 V	250 mA	1.2 W	2.8 nF	7.2 uH
+11 / -12	FISCO	A-G	17.5 V	360 mA	2.52 W	2.8 nF	7.2 uH
+11 / -12	FISCO	C-G	17.5 V	380 mA	5.32 W	2.8 nF	7.2 uH
+51 / -52	Entity	A-G	16 V	20 mA	-	60 nF	100 uH
+41 / -42	Entity	A-G	16 V	20 mA	-	60 nF	100 uH
+85 / -86	Entity	A-G	30 V	-	-	3.7 nF	< 1 uH

NI/II/2/ABCD/T6,T5,T4 Ta = 40 °C, 55 °C, 85 °C  
S/II,III/2/EFG/T6,T5,T4 Ta = 40 °C, 55 °C, 85 °C  
Enclosure type 4x

- a = Case/mounting – 1, 2, 3, 4, 5 or 6
- b = Output/safe protection – 1, 2, 3 or 4
- c = Option modules (shutdown) – 0 or 5
- d = Optional mechanical kit for digital position feedback – 0, 1 or 2
- e = Design (varnish/coding) – 1 or 2
- f = Device identification label – 0, 1 or 2

TZIDC-210 Positioner, Model V18349-a012b3cd3ef  
XP/II/2/CD/T6, T5, T4 TA = 82 °C  
DIP/II, III/2/FG/T6, T5, T4 Ta = 82 °C  
Enclosure type 4x

- a = Case/mounting – 1, 2, 3, 4, 5 or 6
- b = Output/safe protection – 1, 2, 3 or 4
- c = Option modules (shutdown) – 0 or 5
- d = Optional mechanical kit for digital position feedback – 0, 1 or 2
- e = Design (varnish/coding) – 1 or 2
- f = Device identification label – 0, 1 or 2

CSA Certification 1555690  
Explosion proof; enclosure 4X  
Temperature range: -40 ... 85 °C  
T5, max. 85 °C ; T6, max. 70 °C  
CL I; Div 1; Grp. C-D  
CL II; Div 1; Grp. E-F-G  
CL III

#### ATEX / GOST Ukraine

Type-Examination Test Certificate:

Type:

Device class:

Temperature class:

Permissible ambient temperature:

#### II 2G Ex d II C T4/T5/T6

DMT 02 ATEX E 029 X

Flameproof enclosure

II 2G (Ex ib IIC)

T4, T5, T6

T4: -40 °C < T<sub>amb</sub> < 85 °C

T5: -40 °C < T<sub>amb</sub> < 80 °C

T6: -40 °C < T<sub>amb</sub> < 65 °C

#### ATEX

Type-Examination Test Certificate:

Type:

Device class:

Temperature class:

Permissible ambient temperature:

#### II 2G Ex ia II C T6

TÜV 02 ATEX 1831 X

Intrinsically safe equipment

II 2G (Ex ia IIC)

T4, T5, T6

T4: -40 °C < T<sub>amb</sub> < 85 °C

T5: -40 °C < T<sub>amb</sub> < 55 °C

T6: -40 °C < T<sub>amb</sub> < 40 °C

#### IECEx

Type-Examination Test Certificate:

Type:

Temperature class:

Permissible ambient temperature:

#### Ex ia IIC T6

IECEx TUN 04.0015X,  
Issue no.: 0

Intrinsically safe

T4, T5, T6

T4: -40 °C < T<sub>amb</sub> < 85 °C

T5: -40 °C < T<sub>amb</sub> < 55 °C

T6: -40 °C < T<sub>amb</sub> < 40 °C

Signal circuit for PROFIBUS PA only for connecting to a certified intrinsically-safe circuit (e.g., FISCO power supply unit or barriers) with max. values acc. to:

	FISCO power supply ia/ib for Grp. IIB/IIC	FISCO power supply ia/ib for Grp. IIB/IIC	Barriers or power supply ia/ib for Grp. IIB/IIC
Voltage	U <sub>i</sub> = 17.5 V	U <sub>i</sub> = 17.5 V	U <sub>i</sub> = 24 V
Current	I <sub>i</sub> = 380 mA	I <sub>i</sub> = 360 mA	I <sub>i</sub> = 250 mA
Power	P <sub>i</sub> = 5.32 W	P <sub>i</sub> = 2.52 W	P <sub>i</sub> = 1.2 W
Characteristic curve	rectangular	trapezoidal	Linear

**7.3 TZIDC-220**

**FM Approval**

TZIDC-220 Positioner, Model V18350-a014b3cd4ef  
 IS/I,II,III/1/ABCDEF/T6,T5,T4 Ta = 40 °C, 55 °C, 85 °C-901265  
 Entity, FISCO

Entity and FISCO Parameters							
Terminals	Type	Groups	Parameters				
			Vmax	I <sub>max</sub>	P <sub>i</sub>	C <sub>i</sub>	L <sub>i</sub>
+11 / -12	Entity	A-G	24 V	250 mA	1.2 W	2.8 nF	7.2 uH
+11 / -12	FISCO	A-G	17.5 V	360 mA	2.52 W	2.8 nF	7.2 uH
+11 / -12	FISCO	C-G	17.5 V	380 mA	5.32 W	2.8 nF	7.2 uH
+51 / -52	Entity	A-G	16 V	20 mA	-	60 nF	100 uH
+41 / -42	Entity	A-G	16 V	20 mA	-	60 nF	100 uH
+85 / -86	Entity	A-G	30 V	-	-	3.7 nF	< 1 uH

NI/II/2/ABCD/T6,T5,T4 Ta = 40 °C, 55 °C, 85 °C  
 S/II,III/2/EFG/T6,T5,T4 Ta = 40 °C, 55 °C, 85 °C  
 Enclosure type 4x

- a = Case/mounting – 1, 2, 3, 4, 5 or 6
- b = Output/safe protection – 1, 2, 3 or 4
- c = Option modules (shutdown) – 0 or 5
- d = Optional mechanical kit for digital position feedback – 0, 1 or 2
- e = Design (varnish/coding) – 1 or 2
- f = Device identification label – 0, 1 or 2

TZIDC-220 Positioner, Model V18350-a012b3cd4ef  
 XP/II/2/CD/T6, T5, T4 TA = 82 °C  
 DIP/II, III/2/FG/T6, T5, T4 Ta = 82 °C  
 Enclosure type 4x

- a = Case/mounting – 1, 2, 3, 4, 5 or 6
- b = Output/safe protection – 1, 2, 3 or 4
- c = Option modules (shutdown) – 0 or 5
- d = Optional mechanical kit for digital position feedback – 0, 1 or 2
- e = Design (varnish/coding) – 1 or 2
- f = Device identification label – 0, 1 or 2

**CSA Certification 1555690**

Explosion proof; enclosure 4X  
 Temperature range: -40 ... 85 °C  
 T5, max. 85 °C ; T6, max. 70 °C  
 CL I; Div 1; Grp. C-D  
 CL II; Div 1; Grp. E-F-G  
 CL III

**ATEX / GOST Ukraine**

Type-Examination Test Certificate:

Type:

Device class:

Temperature class:

Permissible ambient temperature:

**II 2G Ex d II C T4/T5/T6**

DMT 02 ATEX E 029 X

Flameproof enclosure for equipment

II 2G (Ex ib IIC)

T4, T5, T6

T4: -40 °C < T<sub>amb</sub> < 85 °C

T5: -40 °C < T<sub>amb</sub> < 80 °C

T6: -40 °C < T<sub>amb</sub> < 65 °C

**ATEX**

Prototype test certificate:

Type:

Device class:

Temperature class:

Permissible ambient temperature:

**II 2G Ex ia II C T6**

TÜV 02 ATEX 1831 X

Intrinsically safe equipment

II 2G (Ex ia IIC)

T4, T5, T6

T4: -40 °C < T<sub>amb</sub> < 85 °C

T5: -40 °C < T<sub>amb</sub> < 55 °C

T6: -40 °C < T<sub>amb</sub> < 40 °C

**IECEX**

Prototype test certificate:

Type:

Temperature class:

Permissible ambient temperature:

**Ex ia IIC T6**

IECEX TUN 04.0015X, Issue no.: 0

Intrinsically safe

T4, T5, T6

T4: -40 °C < T<sub>amb</sub> < 85 °C

T5: -40 °C < T<sub>amb</sub> < 55 °C

T6: -40 °C < T<sub>amb</sub> < 40 °C

Signal circuit for FOUNDATION fieldbus only for connecting a certified intrinsically safe circuit (e.g., FISCO power supply or barriers) with max. values acc. to:






	FISCO power supply ia/ib for Grp. IIB/IIC	FISCO power supply ia/ib for Grp. IIB/IIC	Barriers or power supply ia/ib for Grp. IIB/IIC
Voltage	U <sub>i</sub> = 17.5 V	U <sub>i</sub> = 17.5 V	U <sub>i</sub> = 24 V
Current	I <sub>i</sub> = 380 mA	I <sub>i</sub> = 360 mA	I <sub>i</sub> = 250 mA
Power	P <sub>i</sub> = 5.32 W	P <sub>i</sub> = 2.52 W	P <sub>i</sub> = 1.2 W
Characteristic curve	rectangular	trapezoidal	Linear

## 8 Appendix

### 8.1 Other applicable documents

- Operating instruction TZIDC-200, TZIDC-210, TZIDC-220 (42/18-85)
- Configuration-, parameterization instruction TZIDC, TZIDC-1x0, TZIDC-2x0 (45/18-79)
- TZIDC-200 data sheet (10/18-0.32)
- TZIDC-210 data sheet (10/18-0.33)
- TZIDC-220 data sheet (10/18-0.34)

### 8.2 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 2004/108/EC</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 (marking in addition to CE marking)</li> <li>- IEC standards</li> <li>- FM Approvals (US)</li> <li>- CSA International (Canada)</li> </ul>



#### IMPORTANT (NOTE)

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 C.E.

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

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

**Produktbezeichnung:** Elektropneumatische Stellungsregler - TZIDC, TZIDC-110, TZIDC-120, TZIDC-200, TZIDC-210, TZIDC-220

*Product name:* Electro-Pneumatic Positioners – TZIDC, TZIDC-110, TZIDC-120, TZIDC-200, TZIDC-210, TZIDC-220

*Désignation du produit:* Positionneur Electro-Pneumatique – TZIDC, TZIDC-110, TZIDC-120, TZIDC-200, TZIDC-210, TZIDC-220

**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:*

**2004/108/EG**                      **EMV-Richtlinie \***  
 2004/108/EC                      *Electromagnetic Compatibility Directive \**  
 2004/108/CE                      *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/C.E.E.                              *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 cocemant 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 61 000-6-1 / EN 61 000-6-2 / EN 61 000-6-3 / EN 61 000-6-4**

**Ex: Es gelten die Normen der entsprechenden EG-Baumusterprüfbescheinigungen**

*The standards of the relevant type-examination certificates shall apply  
 Il convient d'appliquer les normes des certificats d'homologation CE*

02.07.2009

**Datum**  
*Date*  
*Date*

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

**Bernhard Kruse**  
**Leiter Qualitätsmanagement**  
 Head of Quality Management  
 Responsable Management de la Qualité

EG-Konformität-TZIDC\_07.2009.doc

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

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