ABB MEASUREMENT & ANLYTICS | DATA SHEET

TZIDC-200
Digital Positioner
Compact, well-proven, and flexible

HART® protocol

For 4 to 20 mA two-wire technology, Flameproof (Enclosure)

Low operating cost

Compact design

Well-proven technology and intelligence

Robust and environmentally ruggedized

Wide operating temperature range
• −40 to 85 °C (−40 to 185 °F)

Easy to commission, ‘single pushbutton’ operating philosophy

Mechanical position indicator

ATEX, FM, CSA, GOST and IECEx approvals

For SIL2 safety loops
1 Description

The TZIDC-200 is an electronically configurable positioner with communication capabilities, mounting to pneumatic linear or rotary actuators. It features a small and compact design, a modular construction, and an excellent cost-performance ratio. Fully automatic determination of the control parameters and adaptation to the final control element yield considerable time savings and an optimal control behavior.

1.1 Pneumatics

An I/P module with subsequent pneumatic amplifier is used to control the pneumatic actuator. The well-proven I/P module proportionally converts the permanent electrical positioning signal from the CPU into a pneumatic signal used to adjust a 3/3-way valve. The air flow for pressurizing or depressurizing the actuator is continuously adjusted. As a result, excellent control is achieved. When reaching the set point, the 3/3-way valve is closed in center position to minimize the air consumption.

Four different pneumatics versions are available: for single-acting or double-acting actuators, each with "fail-safe" or "fail-freeze" function.

1.1.1 “Fail-safe” function

If the electrical power supply fails, the positioner output 1 is depressurized, and the pneumatic actuator’s return spring moves the valve to the defined safe position. In case of a double-acting actuator the second output 2 is additionally pressurized.

1.1.2 “Fail-freeze” function

If the electrical power supply should fail, the positioner output 1 (and 2, if applicable) is closed and the pneumatic actuator stops ("freezes") the valve in the current position. If compressed air supply should fail, the positioner depressurizes the actuator.

1.2 Operation

The positioner has a built-in operating panel providing a 2-line LCD and 4 pushbuttons for optimal local configuration, commissioning and operational monitoring.

Alternatively, the appropriate configuration program and the available communication option can be used.

1.3 Communication

The standard TZIDC-200 model has a local communication interface (LKS connector). Additionally, a “HART communication” option for communication via the 20 mA signal is available. Both communications are based on the HART Protocol.

1.4 Inputs and outputs

In addition to its input for the analog position set point the TZIDC-200 positioner is equipped with a digital input which can be used to activate various protective functions in the device via the process control system. A digital output allows you to output collective alarms or fault messages.

1.5 Modular design

The TZIDC-200 basic model can be enhanced at any time by retrofitting optional equipment. Option modules for analog or digital position feedback can be installed. Additionally, a mechanical position indicator, proximity switches or 24 V microswitches are available for indicating the position independently of the mother board function.
Electro-Pneumatic Positioner TZIDC-200
for 4 … 20 mA two-wire technology, Flameproof (Enclosure)

Fig. 1: TZIDC-200 schematic diagram

**Basic model**
1. LKS plug
2. Positioning signal 4 … 20 mA
3. Digital input
4. Digital output DO
5. Supply, 1.4 … 6 bar (20 … 90 psi)
6. Exhaust
7. I/P module with 3/3-way valve
8. Position sensor (optional up to 270° rotation angle)

**Optional upgrades**
9. Plug module for analog feedback (4 … 20 mA)
10. Plug module for digital feedback
11. Installation kit for mechanical position indicator
12. Installation kit for digital feedback with proximity switches
13. Installation kit for digital feedback with 24 V microswitches

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**Important**

With optional upgrades either the "Installation kit for digital feedback with proximity switches" (12) or the "Installation kit for digital feedback with microswitches 24 V" (13) can be used.
2 Mounting versions

2.1 To linear actuators in accordance with the standard
Lateral attachment is in accordance with DIN / IEC 534 (lateral attachment to NAMUR). The required attachment kit is a complete set of attachment material, but does not include the screwed pipe connections and air pipes.

2.2 To rotary actuators in accordance with the standard
This attachment is designed for mounting according to the standard VDI / VDE 3845. The attachment kit consists of a console with mounting screws for mounting on a rotary actuator. The adapter for coupling the positioner feedback shaft to the actuator shaft has to be ordered separately. Screwed pipe connections and air pipes have to be provided on site.

2.3 Integral mounting to control valves
The TZIDC-200 positioner featuring standard pneumatic action is available as an option for integral mounting. The required holes are found at the back of the device. The benefit of this design is that the point for mechanical stroke measurement is protected and that the positioner and actuator are linked internally. No external tubing is required.

2.4 Special actuator-specific mounting
In addition to the mounting methods described above, there are special actuator-specific attachments. Please contact us for details.
Fig. 2: Mounting options

1 Mounting to linear actuators acc. to DIN / IEC 534
2 Mounting to rotary actuators to VDI / VDE 3845
3 Integral mounting to control valves
4 Integral mounting to control valves by using an adapter panel
3 Operation

3.1 General

Microprocessor-based position control in the TZIDC-200 provides for optimal results. The positioner features high-precision control functions and high operational reliability. Due to their elaborate structure and easy accessibility, the device parameters can be quickly adapted to the respective application.

The total range of parameters includes:
- Operating parameters
- Adjustment parameters
- Monitoring parameters
- Diagnosis parameters
- Maintenance parameters

3.1.1 Operating parameters

The following operating parameters can be set manually if required:

Setpoint Signal
Signal min. 4 mA, max. signal 20 mA (0 ... 100 %)
freely selectable for split-range operation
min. range 20 % (3.2 mA)
recommended range > 50 % (8.0 mA)

Action (setpoint signal)
Increasing: Setpoint Signal 4 ... 20 mA = position 0 ... 100 %
Decreasing: Setpoint Signal 20 ... 4 mA = position 0 ... 100 %

Characteristic curve (travel = f(setpoint signal))
Linear, equal percentage 1:25 or 1:50 or 25:1 or 50:1 or freely configurable with 20 reference points.

Travel limit
The positioning travel, i.e. the stroke or angle of rotation, can be reduced as required within the full range of 0 ... 100 %, provided that a minimum value of 20 % is observed.

Shut-off function
This parameter can be set separately for each end position. When the respective configured limit value is exceeded, the shut-off function causes immediate travel of the actuator until reaching the set end position.

When the shut-off value is set to “0”, the position is further controlled, even in the respective end position.

Travel time prolongation
This function can be used to increase the max. travel time for full travel. This time parameter can be set separately for each direction.

IMPORTANT (NOTE)
This function can only be used with the pneumatics with the safety function “fail-safe”.

Switching points for the position
This parameter allows you to define two position limits for signaling (see option “Module for digital position feedback”).

Digital output
The alarms generated in the TZIDC-200 positioner can be polled via the digital output as a collective alarm.

The desired information can be selected via the operator panel or remotely via the configuration program.

The output can be set to “active high” or “active low”, as required.

Digital input
For the digital input, one of the following safety options can be selected. You may use the operator’s panel or configuration program to select an option.
- No function (default)
- Move to 0 % position
- Move to 100 % position
- Hold previous position
- disable local configuration
- Disable local configuration and operation
- Disable any access (no local or remote access via a PC)

The selected function is activated once the 24 V DC signal is no longer applied (< 11 V DC).

3.1.2 Adjustment parameters

The TZIDC-200 positioner has a special function for automatic adjustment of the parameters.

Additionally, the control parameters can be set automatically (in adaptive control mode) or manually to optimally adapt them to the process requirements.

Tolerance band
Upon reaching the tolerance band, the position is slowly re-adjusted until the dead band has been reached.

Dead band (sensitivity)
When reaching the dead band, the position is held. The factory setting for this parameter is 0,1 %.

Actuator spring action
Selection of the sensor shaft rotating sense (looking into the open case), if the valve is moved to the safe position by the actuator spring (actuator is depressurized via Y1 / OUT1).

For double-acting actuators the actuator spring action corresponds to pressurizing the pneumatic output (OUT2).

Display 0 ... 100 %
Adjusting the display (0 ... 100%) according to the direction of action for opening or closing the valve.

3.1.3 Monitoring parameters

Various functions for permanent operational monitoring are implemented in the TZIDC-200 operating program. The following states will be detected and indicated, e.g.:
- 4 ... 20 mA setpoint signal out of range
- position out of the adjusted range
- positioning time-out (adjustable time parameter)
- position controller inactive
- counter limits (settable in the diagnosis phase) exceeded

While automatic commissioning is in progress, the current state is continuously indicated on the integrated LCD.

During operation, the LCD shows the most important process variables:
- current position (in %),
- malfunctions, alarms, messages (as code)

Access to extended monitoring parameters is possible via HART communication and the DTM.
3.1.4 Diagnosis parameters

The diagnosis parameters of the TZIDC-200 program inform the operator about the operating conditions of the valve. From this information the operator can derive which maintenance works are required, and when. Additionally, limit values can be defined for these parameters. When they are exceeded, an alarm is reported. The following values are e.g. determined:
- Number of movements performed by the valve
- Total travel

The diagnosis parameters and limit values can be called up, set, and reset via HART communication, using the configuration program.

3.2 Operator panel

The TZIDC-200 positioner’s operator panel with four pushbuttons allows for:
- operational monitoring
- manual control
- configuration
- fully automatic commissioning

The operator panel is protected by a hinged cover which can be opened during operation even in hazardous areas, i.e. the positioner can be locally operated any time as required.

3.2.1 Single-button commissioning

Commissioning the TZIDC-200 positioner is especially easy. The standard Autoadjust function for automatic adaptation of the device parameters can be started by simply pressing a single front panel button, and without knowing parameterization details. Depending on the selected actuator type (linear or rotary), the displayed zero position is automatically adapted:
- for linear actuators counter-clockwise (CTCLOCKW)
- for rotary actuators clockwise (CLOCKW).

Besides this standard function, a customized “Autoadjust” function is available. The function is launched either via the operator’s panel or HART communication.

3.2.2 Display

The information indicated by the 2-line LC display is permanently updated and adapted during operation, to inform the operator in an optimal way. During control operation (control with or without adaptation) the following TZIDC-200 data can be called up by pressing the pushbuttons briefly:
- Up button: Current setpoint (mA)
- Down button: Temperature in device
- Up + Down buttons: Current control deviation

Fig. 3: TZIDC-200 with removed cover, view of the operator panel

Fig. 4: TZIDC-200 operating elements and display
4 Communication

4.1 DTM

The DTM (Device Type Manager) for TZIDC-200 is based on the FDT / DTM technology (FDT 1.2) and can be integrated in a process control system or loaded in a PC with the DSV401 (SMART VISION) program. This allows you to work with the same user interface in the commissioning phase, during operation, and for service tasks for monitoring the device, setting parameters, and uploading data. Communication is based on the HART protocol. It occurs via a local interface connection (LKS) or in frequency-modulated mode using an FSK-modem connected at any chosen point of the 20 mA signal line. Communication has no effect on operation. Newly set parameters are saved in the non-volatile memory directly upon the download into the device, and become active immediately.

4.2 LKS adapter (RS-232 interface converter)

You can easily connect your TZIDC-200 positioner to a PC, e.g., in the workshop or in the commissioning phase, by using the positioner’s LKS adapter (LKS = local communication interface). An RS-232 interface converter adapts the signals on the serial PC port to the level of the positioner’s LKS.

4.3 FSK Modem

The FSK modem establishes a digital frequency-modulated communication (Frequency Shift Keying) with the TZIDC-200 positioner. Tapping is possible at any chosen point of the 20 mA signal line. We recommend that you use an electrically isolated FSK modem. It is bus-compatible when used with isolating amplifiers. Even connecting explosion-protected field devices is possible, on condition that the FSK modem is run outside the hazardous area.
5 Specifications

5.1 Input

Setpoint signal (two-wire technology)
Nominal range  4 ... 20 mA
Split range configuration between  20 ... 100 % of the nominal range
Max.  50 mA
Min.  3.6 mA
Starting at  3.8 mA
Load voltage at 20 mA  9.7 V
Impedance at 20 mA  485 Ω

Digital input
Control voltage
- 0 ... 5 V DC
  logical switching state "0"
- 11 ... 30 V DC
  logical switching state "1"
Current  max. 4 mA

5.2 Output

Compressed air output
Range  0 ... 6 bar (0 ... 90 psi)
Air capacity  5.0 kg/h = 3.9 Nm³/h = 2.3 scfm
  at 1.4 bar (20 psi) supply pressure
  13 kg/h = 10 Nm³/h = 6.0 scfm
  at 6 bar (90 psi) supply pressure
Output function
For single or double-acting actuators, air is vented from actuator or actuator is blocked in case of (electrical) power failure
Shut-off values
End position 0 % = 0 ... 45 %
End position 100 % = 55 ... 100 %

Digital output (control circuit to DIN 19234 / NAMUR)
Supply voltage  5 ... 11 V DC
Current > 0.35 mA ... < 1.2 mA
Switching state logical "0"
Current > 2.1 mA
Switching state logical "1"
Effective direction (configurable)
normally logical "0" or logical "1"

5.3 Travel

Rotation angle
Used range  25 ... 120° (rotary actuators, optional 270°)
  25 ... 60 ° (linear actuators)
Travel limit
Min. and max. limits, freely configurable between 0 ... 100 % of total travel (min. range > 20 %)
Travel time prolongation
Range of 0 ... 200 s, separately for each direction
Dead band time limit
Setting range 0 ... 200 s (monitoring parameter for control until the deviation reaches the dead band)

5.4 Air supply

Instrument air
free of oil, water and dust acc. to DIN / ISO 8573-1
pollution and oil content according to
Class 3 (purity: max. particle size:
5 μm, max. particle density:
5 mg / m³; oil content: max.
concentration: 1 mg / m³; pressure
dew point: 10 K below operating
temperature
Supply pressure
1.4 ... 6 bar (20 ... 90 psi)

IMPORTANT (NOTE)
Do not exceed the maximum operating pressure of the actuator!

Air consumption  < 0.1 kg/h / 0.05 scfm (independent of supply pressure)

5.5 Transmission data and influences

Output Y1
Increasing
Increasing setpoint signal 0 ... 100 %
Increasing pressure at output
Decreasing
Increasing setpoint signal 0 ... 100 %
Decreasing pressure at output

Action (setpoint signal)
Increasing
Signal 4 ... 20 mA = Position 0 ... 100 %
Decreasing
Signal 20 ... 4 mA = Position 0 ... 100 %

Characteristic curve (travel = f (setpoint signal))
Linear, equal percentage 1:25 or 1:50 or 25:1 or 50:1 and freely configurable with 20 reference points
Deviation  ≤ 0.5 %
Tolerance band  0.3 ... 10%, adjustable
Dead band  0.1 ... 10%, adjustable
Resolution (A/D conversion)  > 16,000 steps
Sample rate  20 ms
Influence of ambient temperature  ≤ 0.5% per 10 K
Reference temperature  20 °C
Influence of vibration  ≤ 1 % to 10 g and 80 Hz

Seismic vibration
Meets requirements of DIN/IEC 68-3-3 Class III for strong and strongest earthquakes

Influence of mounting orientation
Not measurable

Complies with the following directives
- EMC directive 2004/108/EC from December 2004
- EC Directive for CE conformity marking

Communication
- HART protocol 5.9
- Local connector for LKS (not in explosion protection area)
- HART communication via 20 mA signal line with (optional) FSK modem
5.6 Environmental capabilities

Ambient temperature
For operation, storage and transport: -40 ... 85 °C (-40 ... 185 °F)

Relative humidity
Operational (with closed housing and air supply switched on): 95 % (annual average), condensation permissible
Transport and storage: 75 % (annual average), non-condensing

5.7 Housing

Material / IP rating
Aluminum with ≤ 0.1 % copper
IP rating IP 65 (optional IP 66) / NEMA 4X

Surface / color
Electrostatic dip painting with epoxy resin; stove-hardened. Housing painted black, RAL 9005, matte; housing cover Pantone 420.

Electrical connections
Screw terminals: Max. 1.0 mm² (AWG 17) for options
Max. 2.5 mm² (AWG 14) for 4 ... 20 mA input signal

IMPORTANT (NOTE)
Do not expose the terminals to mechanical strain.

Four thread combinations for 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
(Additional: With cable gland(s) and blind plugs as necessary)

Weight
3.0 kg (1.36 lb)

Mounting orientation
Any

Dimensions
See "Dimensions"

5.8 Safety Integrity Level

IMPORTANT (NOTE)
Applies to applications with single-acting and depressurizing pneumatics.

The positioner TZIDC / TZIDC-200 meets the requirements regarding:
- functional safety acc. to IEC 61508
- explosion protection (depending on the model)
- electromagnetic compatibility in accordance with EN 61000

Without the input signal, the pneumatic module in the positioner vents the drive and the installed spring in it moves the valve in a predetermined end position (OPEN or CLOSED).

SIL specific safety-related characteristics:

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<th>Device</th>
<th>SFF</th>
<th>PFDav</th>
<th>λdd + λs</th>
<th>λdu</th>
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<td>TZIDC / TZIDC-200 with supply current 0 mA</td>
<td>94 %</td>
<td>1.76 * 10^-4</td>
<td>651 FIT</td>
<td>40 FIT</td>
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For details refer to the Management Summary in the SIL-Safety Instructions 37/18-79XA.

5.9 Options

Module for analog position feedback
Signal range 4 ... 20 mA (configurable split ranges)
Supply, 2-wire circuitry 24 V DC (10 ... 30 V DC)
Characteristic curve Increasing or decreasing (configurable)
Deviation < 1 %

IMPORTANT (NOTE)
Without a signal from the positioner (e.g., "no energy" or "initializing") the module sets the output to > 20 mA (alarm level).

Module for digital position feedback
Two switches for digital position feedback (position adjustable within the range of 0 ... 100%, ranges cannot overlap)
Current circuits acc. to DIN 19234 / NAMUR
Supply voltage 5 ... 11 V DC
Signal current < 1.2 mA Switching state logical "0"
Signal current > 2.1 mA Switching state logical "1"
Direction of action normally logical "0" or logical "1" (configurable)
Digital position feedback with proximity switches
Two proximity switches for independent position signaling. Switching points adjustable between 0 ... 100%
Current circuits acc. to DIN 19234 / NAMUR
Supply voltage 5 ... 11 V DC
Signal current < 1.2 mA Switching state logical "0"
Signal current > 2.1 mA Switching state logical "1"

Direction of action (logical state)

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<th>Proximity switch</th>
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<td>SJ2-SN (NC)</td>
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Digital position feedback with 24 V microswitches

**IMPORTANT (NOTE)**
Only approved for Ex d version!

Two microswitches for independent position signaling. Switching points adjustable between 0 ... 100%.
Voltage max. 24 V AC / DC
Load rating max. 2 A
Contact surface 10 µm Gold (AU)

Mechanical position indicator
Indicator disk in enclosure cover, linked with positioner feedback shaft through magnetic coupling.

**IMPORTANT (NOTE)**
These options are also available for retrofitting by Service.

5.10 Accessories
Mounting material
Attachment kit for linear actuators to DIN / IEC 534 / NAMUR
Attachment kit for part-turn actuators to VDI / VDE 3845
Attachment kit for integral mounting to control valves
Attachment kit for actuator-specific attachment upon request

Ex d cable entry
Cable gland and pipe plug approved for Ex d, securing adhesive

Pressure gauge block
With pressure gauges for supply and output pressure. Pressure gauges with housing ø 28 mm (1.10 inch), with connection block in aluminum, black with installation material for mounting on positioner

Filter regulator
All metal version in brass, varnished black, bronze filter element, 40 µm, with condensate drain.
Max. pre-pressure 16 bar (232 psi), output adjustable to 1.4 ... 6 bar (20.31 ... 87.02 psi)

PC adapter for communication
LKS adapter f. plug conn. to positioner
FSK modem for HART communication
(see data sheet 63_6.71)

PC software for remote configuration and operation
DSV401 (SMART VISION) with DTM for TZIDC / TZIDC-200 available on CD ROM (see data sheet 63_1.20)
6 Ex relevant specifications

6.1 ATEX

6.1.1 ATEX / GOST Russia / GOST Ukraine

6.1.1.1 Flameproof enclosure

Designation: II 2 G Ex d IIC T4/T5/T6 Gb
Type examination certificate: DMT 02 ATEX E 029 X
Type: TZIDC-200/210/220 Doc. 901132
Device class: II 2G
Standards:
- EN 60079-0: 2009 General requirements
- EN 60079-1: 2007 Flameproof enclosure “d”

Special conditions for ATEX, flameproof enclosure

- Hot parts inside the housing pose a risk of explosion. Never open the device immediately after switch-off. Always wait at least four minutes before opening the device.
- Prior to final installation, the operator must decide how the device is to be used, either:
  A) as a device featuring the "Ex i" type of protection; or
  B) as a device with the "Ex d" type of protection.
  The type of use that was not selected must be permanently covered on the name plate. Specific conditions of the surrounding environment, such as chemical corrosion, must be taken into account when affixing the permanent mark. Only the manufacturer may change the selected type of use following a re-examination.
- Variants that, according to declarations, also meet the requirements for the "intrinsically safe" type of protection may no longer be used as "intrinsically safe" if they have been previously used as a flameproof type of protection.
- Manipulation of the device in any form by the user is not permitted. Only the manufacturer or an explosion protection specialist may modify the device.
- The IP 65 / NEMA 4x IP rating is only achieved if the splash guard is screwed in place. Devices must never be operated without the splash guard.
- The device may only be operated using instrument air that is free from oil, water and dust. Flammable gases, oxygen or oxygen-enriched gases must not be used.
- Medium strength adhesive must be used to secure the cable entries and line entries and stop them from twisting and self-loosening.
- In the event of high torsional forces resulting from wear to the shaft for the position pickoff (significant control deviation), the bearing sleeves must be replaced.
- If the positioner is operated at an ambient temperature of above 60 °C (140 °F) or below -20 °C (-4 °F), ensure that the cable entries and lines in use are suitable for an operating temperature that corresponds to the maximum ambient temperature increased by 10 K, or the minimum ambient temperature.
- The dimensions of the ignition penetration-proof seam of this equipment partly exceed the minimum values required by EN 60079-1:2007 and IEC 60079-1:2007 and also partly fall below the maximum required values therein. All inquiries relating to dimensions must be directed to the manufacturer.
- Screws that comply with the minimum requirements of the A2-70, A2-80 or 10.12 quality grades must be used to close the flameproof enclosure.
- NOTICE – damage to parts.
  If the sealing surface is damaged, "Ex d" explosion protection is no longer guaranteed. Handle the housing cover carefully. Place the housing cover only on a smooth and clean surface.
- DANGER – risk of explosion (only applies to TZIDC-200)
  Operating the local communication interface (LKS) in a potentially explosive atmosphere is prohibited. Never use the local communication interface (LKS) on the main board within a potentially explosive atmosphere.
6.1.2 IECEx

6.1.2.1 Flameproof enclosure

Designation: Ex d IIC T4/T5/T6 Gb
Type examination certificate: IECEx BVS 07.0030X, Issue No.: 0
Type: TZIDC-200/210/220
Temperature class: T4, T5, T6
Standards: IEC 60079-0: 2011
General requirements
IEC 60079-1: 2007
Flameproof enclosure "d"

Electrical data
Voltage: ≤ 30 V AC/DC
Amperage: ≤ 20 mA

Pneumatic data
Supply pressure: ≤ 6 bar

Thermal data
T4: -40 °C < T_{amb} < 85 °C
T5: -40 °C < T_{amb} < 80 °C
T6: -40 °C < T_{amb} < 65 °C

Special conditions for IECEx, flameproof enclosure
- The positioner is designed for a maximum permissible ambient temperature range of -40 … 85 °C
- If the positioner is operated at an ambient temperature of above 60 °C or below -20 °C, ensure that the cable entries and lines in use are suitable for an operating temperature that corresponds to the maximum ambient temperature increased by 10 K, or the minimum ambient temperature
- Variants that, according to declarations, also meet the requirements for the "intrinsically safe" type of protection may no longer be used as "intrinsically safe" if they have been previously used as a flameproof type of protection.

6.1.3 FM / CSA

FM Approval HLC 8/02 3010829
Explosion Proof; 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-Ignition Proof; enclosure 4X; T5, max. 82 °C
CL II, III; Div 1; Grp. E-F-G

CSA Certification 1393920
Explosion Proof; 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
### Electrical connections

**Fig. 7: Screw terminals, overview**

1. Module for analog position feedback
2. Module for digital feedback
3. Module for digital feedback
4. Digital position feedback, either proximity switches or 24 V microswitches
5. Digital position feedback, either proximity switches or 24 V microswitches
6. Digital output DO
7. Digital input
8. Signal 4 ... 20 mA
9. Grounding screw

**Fig. 8: Pin configuration**

**A Basic model**

1. Analog input
2. Digital input
3. Digital output DO
4. Digital feedback
5. Analog feedback
6. Proximity switches
7. Microswitches
8 Dimensions

All dimensions in mm (inch)

Fig. 9: Top view
A Tap hole M8 (10 mm (0.39 inch) low)
B Tap hole M6 (8 mm (0.32 inch) low)
C Tap hole M5 x 0.5 (air connections in version for integral mounting)
D Sensor shaft (larger than scale)

Fig. 10: Left and right side view
A NPT ½" or M20 x 1.5
B Pneumatic connections, NPT ¼" -18 or G1/4"
Electro-Pneumatic Positioner TZIDC-200
for 4 … 20 mA two-wire technology, Flameproof (Enclosure)

Fig. 11: Bottom view
A Pneumatic connections, NPT 1/4"-18 or G1/4"

Fig. 12: Mounting drawings
Mounting to linear actuators to DIN / IEC 534
Mounting to rotary actuators to VDI / VDE 3845
*) Dimensions A and B are dependent on the rotary actuator
Electro-Pneumatic Positioner TZIDC-200
for 4 ... 20 mA two-wire technology, Flameproof (Enclosure)

Fig. 13: Positioner TZIDC-200 with pressure gauge block and filter regulator
### 9 Ordering information

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<th>Main Code</th>
<th>Add. Code</th>
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<tbody>
<tr>
<td>Case made of aluminium, varnished, for mounting to linear actuators acc. DIN / IEC 534 / NAMUR or to rotary actuators acc. VDI / VDE 3845</td>
<td>1 0</td>
</tr>
<tr>
<td>Case made of aluminium, varnished, with mechanical position indicator, for integral mounting to control valves (see dimensional drawing)</td>
<td>3 0</td>
</tr>
<tr>
<td>Case made of aluminium, varnished, with mechanical position indicator, for integral mounting to control valves (see dimensional drawing)</td>
<td>4 0</td>
</tr>
<tr>
<td>Case made of aluminium, varnished, for mounting to rotary actuators acc. VDI / VDE 3845 with extended rotation angle up to 270°</td>
<td>5 0</td>
</tr>
<tr>
<td>Case made of aluminium, varnished, with mechanical position indicator, for mounting to rotary actuators acc. VDI / VDE 3845 with extended rotation angle up to 270°</td>
<td>6 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>With operator panel and display integrated in the enclosure cover</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Explosion Protection</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>ATEX Ex d II C T4/T5/T6 Gb</td>
<td>1</td>
</tr>
<tr>
<td>FM / CSA Class 1, Div. 1, Group C-D (explosion-proof)</td>
<td>2</td>
</tr>
<tr>
<td>ATEX II 2 G Ex ib IIC T6 resp. T4 Gb + Ex d</td>
<td>3</td>
</tr>
<tr>
<td>FM / CSA Intrinsic Safety and Explosion-proof</td>
<td>4</td>
</tr>
<tr>
<td>IECEx Ex ib IIC T6 Gb</td>
<td>5</td>
</tr>
<tr>
<td>IECEx Ex d II C T4/T5/T6 Gb</td>
<td>6</td>
</tr>
<tr>
<td>ATEX II 2 G Ex ia IIC T6 resp. T4</td>
<td>7</td>
</tr>
<tr>
<td>GOST Russia - Ex d IIC T4 / T5 / T6</td>
<td>D</td>
</tr>
<tr>
<td>IECEx ia IIC T6 resp. T4 Gb</td>
<td>K</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output / Safe Position (in case of an electrical power failure)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single acting, fail safe</td>
<td>1</td>
</tr>
<tr>
<td>Single acting, fail freeze</td>
<td>2</td>
</tr>
<tr>
<td>Double acting, fail safe</td>
<td>3</td>
</tr>
<tr>
<td>Double acting, fail freeze</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connections</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable: Thread M20 x 1.5, air pipe: Thread G 1/4</td>
<td>1</td>
</tr>
<tr>
<td>Cable: Thread M20 x 1.5, air pipe: Thread 1/4-18 NPT</td>
<td>2</td>
</tr>
<tr>
<td>Cable: Thread 1/2-14 NPT, air pipe: Thread 1/4-18 NPT</td>
<td>3</td>
</tr>
<tr>
<td>Cable: Thread G 1/2, air pipe: Thread Rc 1/4</td>
<td>7</td>
</tr>
</tbody>
</table>

1) Only with cable connection NPT thread

Continued on next page
### Electro-Pneumatic Positioner TZIDC-200

**for 4 … 20 mA two-wire technology, Flameproof (Enclosure)**

<table>
<thead>
<tr>
<th>Main Code</th>
<th>Add. Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZIDC-200 Electro-Pneumatic Positioner, with flameproof enclosure, intelligent, software-configurable with Local Communication Interface (LKS) and HART communication</td>
<td>V18348 X X X X X X X X X X XXX</td>
</tr>
</tbody>
</table>

**Option Modules for Analog or Digital Position Feedback**

<table>
<thead>
<tr>
<th>Variant</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>Without</td>
</tr>
<tr>
<td>1</td>
<td>Plug-in module for analog position feedback, signal range 4 ... 20 mA, two-wire</td>
</tr>
<tr>
<td>3</td>
<td>Plug-in module for digital position feedback</td>
</tr>
<tr>
<td>4</td>
<td>Plug-in module for analog position feedback, signal range 4 ... 20 mA, two-wire, and digital position feedback</td>
</tr>
</tbody>
</table>

**Optional Mechanical Kit for Digital Position Feedback**

<table>
<thead>
<tr>
<th>Variant</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Without</td>
</tr>
<tr>
<td>1</td>
<td>Mechanical kit for digital position feedback with proximity switches SJ2-SN (NC or logical 1)</td>
</tr>
<tr>
<td>2</td>
<td>Mechanical kit for digital position feedback with 24 V AC / DC microswitches (change-over contacts)</td>
</tr>
</tbody>
</table>

**Parameter Setting / Bus Address**

<table>
<thead>
<tr>
<th>Variant</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Factory setting for HART devices</td>
</tr>
<tr>
<td>2</td>
<td>Customer-specific parameter settings for HART devices</td>
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</tbody>
</table>

**Design (Varnish / Coding)**

<table>
<thead>
<tr>
<th>Variant</th>
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<tr>
<td>1</td>
<td>Standard</td>
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<td>2</td>
<td>Others</td>
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**Device Identification Label**

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<td>1</td>
<td>Label</td>
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<td>2</td>
<td>Label including text, with separate stainless steel label 11.5 x 60 mm (0.45 x 2.36 in.)</td>
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</table>

**Documentation Language**

<table>
<thead>
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<th>Language</th>
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<tr>
<td>German</td>
<td>M1</td>
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<tr>
<td>Italian</td>
<td>M2</td>
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<tr>
<td>Spanish</td>
<td>M3</td>
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<tr>
<td>French</td>
<td>M4</td>
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<td>English</td>
<td>M5</td>
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<td>Swedish</td>
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<td>Finnish</td>
<td>M8</td>
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<tr>
<td>Polish</td>
<td>M9</td>
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<tr>
<td>Portuguese</td>
<td>MA</td>
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<tr>
<td>Russian</td>
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<td>Czech</td>
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<td>MM</td>
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<td>Estonian</td>
<td>MO</td>
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<td>Bulgarian</td>
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<td>MR</td>
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<tr>
<td>Slovak</td>
<td>MS</td>
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<tr>
<td>Lithuanian</td>
<td>MU</td>
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<tr>
<td>Slovakian</td>
<td>MV</td>
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</tbody>
</table>

---

2) No IECEx
3) Only for Ex d version
4) Plain text, max. 16 letters

Continued on next page
**Electro-Pneumatic Positioner TZIDC-200**

For 4 … 20 mA two-wire technology, Flameproof (Enclosure)

<table>
<thead>
<tr>
<th>Add. Code</th>
<th>Main Code</th>
<th>Variant</th>
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<tbody>
<tr>
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<td></td>
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<td>17</td>
</tr>
</tbody>
</table>

TZIDC-200 Electro-Pneumatic Positioner, with flameproof enclosure, intelligent, software-configurable with Local Communication Interface (LKS) and HART communication

SIL2 - Declaration of Conformity

Certificate of Compliance

Inspection Certificate

5) With single acting, fail safe pneumatic only
## 9.2 Accessories

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mounting bracket</strong></td>
<td></td>
</tr>
<tr>
<td>EDP300 / TZIDC Mounting bracket for rotary actuators (mounting to VDI / VDE 3845), dimension A/B = 80/20 mm</td>
<td>319603</td>
</tr>
<tr>
<td>EDP300 / TZIDC Mounting bracket for rotary actuators (mounting to VDI / VDE 3845), dimension A/B = 80/30 mm</td>
<td>319604</td>
</tr>
<tr>
<td>EDP300 / TZIDC Mounting bracket for rotary actuators (mounting to VDI / VDE 3845), dimension A/B = 130/30 mm</td>
<td>319605</td>
</tr>
<tr>
<td>EDP300 / TZIDC Mounting bracket for rotary actuators (mounting to VDI / VDE 3845), dimension A/B = 130/50 mm</td>
<td>319606</td>
</tr>
<tr>
<td><strong>Lever</strong></td>
<td></td>
</tr>
<tr>
<td>EDP300 / TZIDC Lever 30 mm</td>
<td>7959151</td>
</tr>
<tr>
<td>EDP300 / TZIDC Lever 100 mm</td>
<td>7959152</td>
</tr>
<tr>
<td><strong>Adapter</strong></td>
<td></td>
</tr>
<tr>
<td>EDP300 / TZIDC Adapter (shaft coupler) for rotary actuators (mounting to VDI / VDE 3845)</td>
<td>7959110</td>
</tr>
<tr>
<td>EDP300 / TZIDC Form - locking shaft adapter</td>
<td>7959371</td>
</tr>
<tr>
<td><strong>Pressure gauge block</strong></td>
<td></td>
</tr>
<tr>
<td>TZIDC Pressure gauge block, 0.6 MPa, single acting, G 1/4 connection</td>
<td>7959364</td>
</tr>
<tr>
<td>TZIDC Pressure gauge block, 0.6 MPa, single acting, Rc 1/4 connection</td>
<td>7959358</td>
</tr>
<tr>
<td>TZIDC Pressure gauge block, 0.6 MPa, double acting, G 1/4 connection</td>
<td>7959360</td>
</tr>
<tr>
<td>TZIDC Pressure gauge block, 0.6 MPa, double acting, Rc 1/4 connection</td>
<td>7959359</td>
</tr>
<tr>
<td><strong>Filter regulator</strong></td>
<td></td>
</tr>
<tr>
<td>TZIDC Filter regulator, brass, connections thread G 1/4, incl. material for mounting to pressure gauge block</td>
<td>7959119</td>
</tr>
<tr>
<td>TZIDC Filter regulator, brass, connections thread 1/4-18 NPT, incl. material for mounting to pressure gauge block</td>
<td>7959120</td>
</tr>
<tr>
<td><strong>Attachment kit</strong></td>
<td></td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for linear actuators, stroke 10 ... 35 mm</td>
<td>7959125</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for linear actuators, stroke 20 ... 100 mm</td>
<td>7959126</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for remote sensor control unit (for wall or pipe mounting)</td>
<td>7959381</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for Fisher 1051-30, 1052-30</td>
<td>7959214</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for Fisher 1061 size 130</td>
<td>7959206</td>
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<tr>
<td>EDP300 / TZIDC Attachment kit for Fisher 471</td>
<td>7959195</td>
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<tr>
<td>EDP300 / TZIDC Attachment kit for Fisher 657 / 667 Size 10 ... 90 mm</td>
<td>7959177</td>
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<tr>
<td>EDP300 / TZIDC Attachment kit for Fisher Guide 32/34</td>
<td>7959344</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for Guilde DK</td>
<td>7959161</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for Keystone 79U/E-002(S) ... 79U/E-181(S)</td>
<td>7959147</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for Masonelain CAMFLEX II, VARIMAX, MINITORK II</td>
<td>7959144</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for Masonelain VanPak 28000 series</td>
<td>7959163</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for MaxFlo MaxFlo</td>
<td>7959140</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for NAF 791290</td>
<td>7959207</td>
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<tr>
<td>EDP300 / TZIDC Attachment kit for NAMUR stroke 100 ... 170 mm</td>
<td>7959339</td>
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<tr>
<td>EDP300 / TZIDC Attachment kit for NELES BC6-20, B1C6-20, B1J8-20, B1J8-20</td>
<td>7959146</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for pressure gauge block, 0.6 MPa, single acting, G 1/4 connection</td>
<td>7959146</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for Samson 241, 271, 3271</td>
<td>7959145</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for Samson 3277</td>
<td>7959136</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for Schubert &amp; Salzer GS 8020 / 8021 / 8023</td>
<td>7959200</td>
</tr>
<tr>
<td>EDP300 / TZIDC Attachment kit for SED SED stroke 100 mm</td>
<td>7959141</td>
</tr>
<tr>
<td>EDP300 / TZIDC Mounting Kit Uhde Type 4 Stroke 400 mm cropped</td>
<td>7959500</td>
</tr>
<tr>
<td><strong>Cable gland</strong></td>
<td></td>
</tr>
<tr>
<td>TZIDC-2xx 1 x Ex d cable gland M20 x 1.5, 1 pipe plug M20 x 1.5, securing adhesive</td>
<td>7959244</td>
</tr>
<tr>
<td>TZIDC-2xx 2 x Ex d cable glands M20 x 1.5, securing adhesive</td>
<td>7959245</td>
</tr>
<tr>
<td>TZIDC-2xx 1 x Ex d cable gland 1/2 in., 1 pipe plug 1/2 in., NPT, securing adhesive</td>
<td>7959246</td>
</tr>
<tr>
<td>TZIDC-2xx 2 x Ex d cable glands 1/2 in. NPT, securing adhesive</td>
<td>7959247</td>
</tr>
</tbody>
</table>