

ABB TZIDC-200 Electro-Pneumatic Positioner datasheet

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The TZIDC-200 is an electronically configurable positioner with communication capabilities designed for 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.

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TZIDC-200 Electro-Pneumatic Positioner

Measurement made easy

Compact, well-proven, and flexible



HART protocol

For 4 ... 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 ... 85 °C (-40 ... 185 °F)

Easy to commission, “single pushbutton” operating philosophy

Mechanical position indicator

ATEX, FM, CSA, GOST and IECEx approvals

For SIL2 safety loops

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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 or a shutdown-module 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.

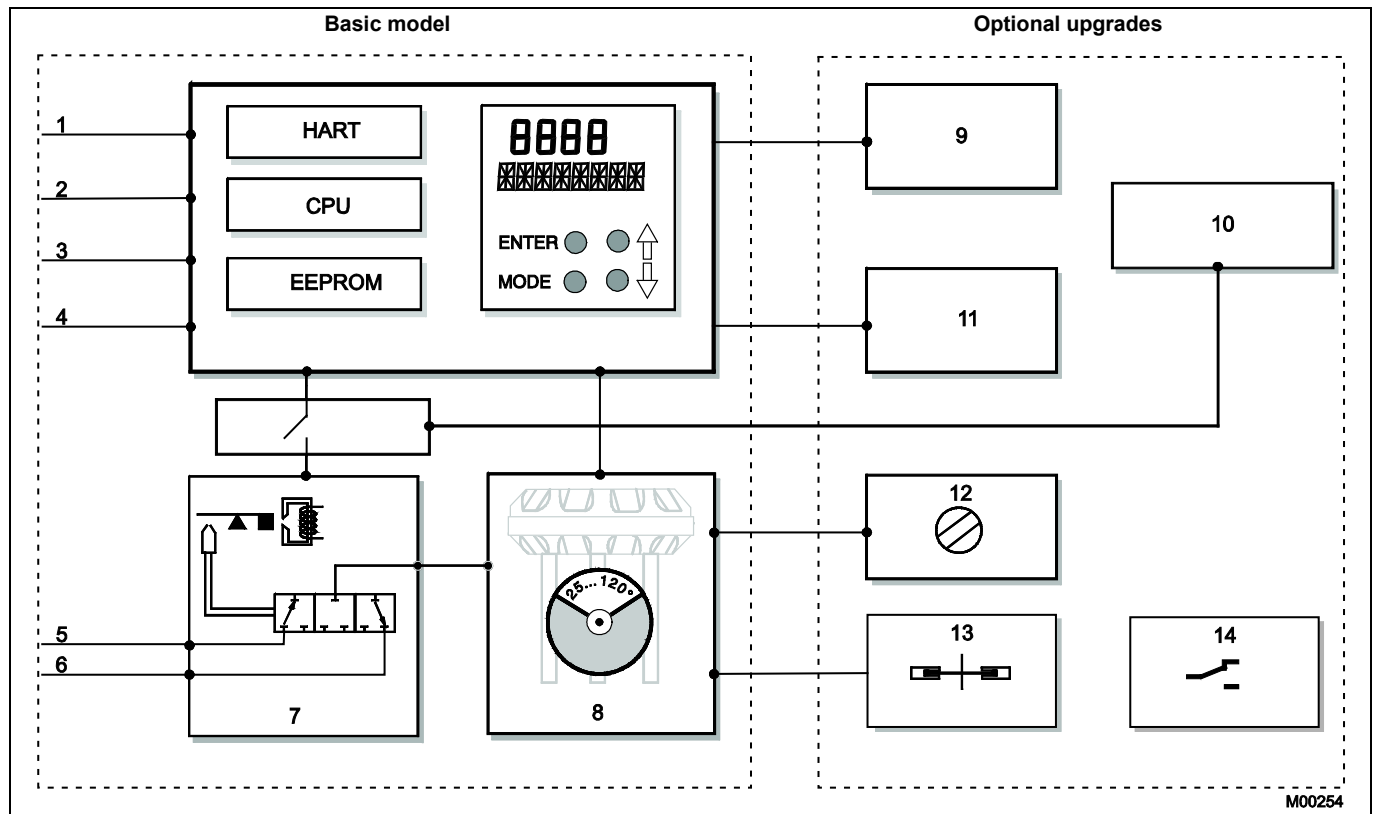


Fig. 1: TZIDC-200 schematic diagram

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-in module for safety shutdown (forced depressurization)
- 11 Plug module for digital feedback
- 12 Installation kit for mechanical position indicator
- 13 Installation kit for digital feedback with proximity switches
- 14 Installation kit for digital feedback with 24 V microswitches



Important

With optional upgrades either the "Installation kit for digital feedback with proximity switches" (13) or the "Installation kit for digital feedback with microswitches 24 V" (14) 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.

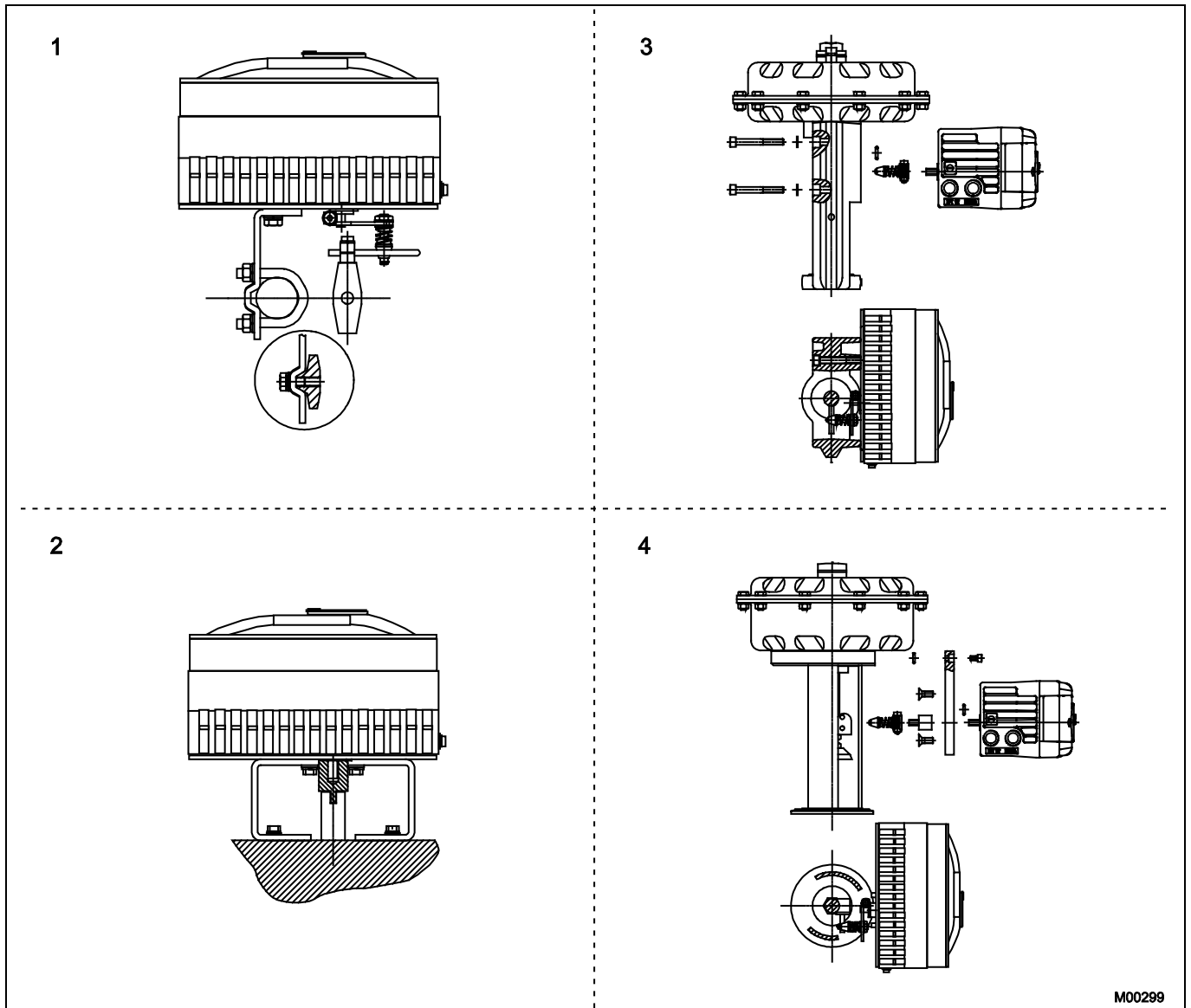


Fig. 2: Mounting options

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

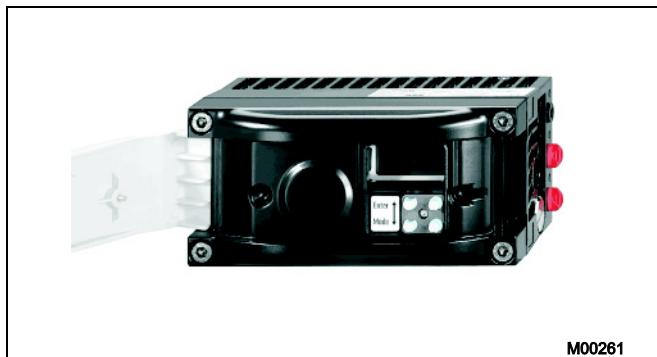


Fig. 3: TZIDC-200 with removed cover, view of the operator panel

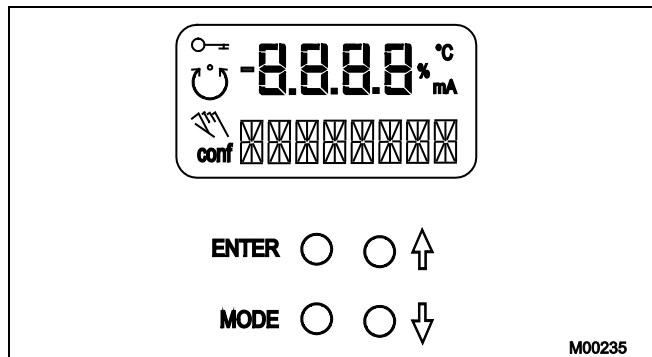


Fig. 4: TZIDC-200 operating elements and display

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.

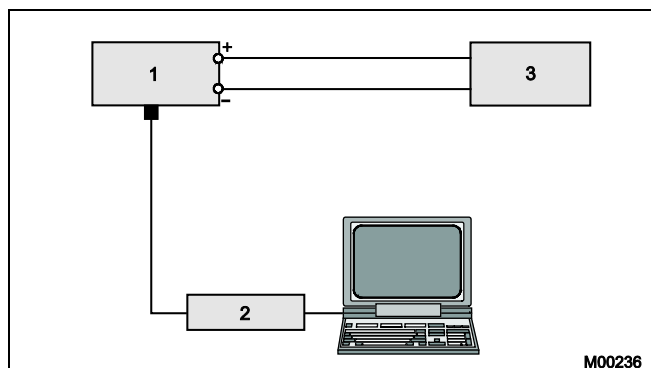


Fig. 5: Local communication via LKS adapter
1 TZIDC-200 3 Controller
2 LKS adapter

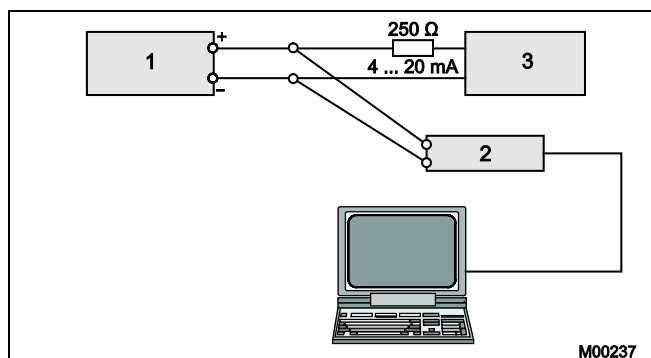


Fig. 6: HART communication with FSK modem via 20 mA signal line
1 TZIDC-200 3 Controller
2 FSK modem

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 Nm ³ /h = 2.3 sfc at 1.4 bar (20 psi) supply pressure 13 kg/h = 10 Nm ³ /h = 6.0 sfc 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 / m ³ ; oil content: max. concentration: 1 mg / m ³ ; pressure dew point: 10 K below operating temperature)
Supply pressure	1.4 ... 6 bar (20 ... 90 psi)

i 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)
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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)

When using proximity switches SJ2-S1N (NO): -25 ... 85 °C (-13 ... 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
- (Optional: 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 and the emergency shutdown module for meet 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:

Device	SFF	PFDav	$\lambda_{dd} + \lambda_s$	λ_{du}
TZIDC / TZIDC-200 as shutdown module	94 %	$1.76 \cdot 10^{-4}$	718 FIT	40 FIT
TZIDC / TZIDC-200 with supply current 0 mA	94 %	$1.76 \cdot 10^{-4}$	651 FIT	40 FIT

For details refer to the Management Summary in the SIL-Safety Instructions 37/18-79XA.

5.9 Options

Module for analog position feedback¹⁾

Signal range	4 ... 20 mA (configurable split ranges)
Supply, 2-wire circuitry	24 V DC (10 ... 30 V DC) 48 V DC (20 ... 48 V DC, no ignition protection)
Characteristic curve (configurable)	Increasing or decreasing
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 feedback¹⁾

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)

Module for the emergency shutdown function²⁾

Supply voltage	24 V DC (20 ... 30 V DC) (electrically isolated from input signal)
Safe position is activated when	Voltage < 5 V
Explosion protection	see certificate (operating instructions)
SIL	See "Safety Integrity Level"

A separate 24 V DC signal is normally applied to the emergency shutdown module, which connects through the signal from the microprocessor to the I/P module.

When the 24 V DC signal is interrupted, the pneumatic module executes the respective safety function, depending on the mechanical construction:

The positioner output 1 is depressurized, and the valve is moved to the safe position. In case of a double-acting actuator the second output 2 is additionally pressurized.

i IMPORTANT (NOTE)
The emergency shutdown module can only be used with pneumatics with the safe position "fail-safe".

The emergency shutdown module works independently of the mother board, i.e., all information from the final control element is available in the supervisory process control system at any time.

- 1) The module for analog position feedback and the module for digital position feedback plug in separate slots and can be used together.
- 2) The module for the emergency shutdown function uses the same space as the module for analog feedback and the module for analog or digital feedback and cannot be plugged in and run together with any of them.

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)

Proximity switch	Position			
	< Lim. 1	> Lim. 1	< Lim. 2	> Lim. 2
SJ2-SN (NC)	0	1	1	0
SJ2-S1N (NO)	1	0	0	1

i IMPORTANT (NOTE)
When using proximity switch SJ2_S1N (NO), the positioner may only be used at an ambient temperature range of -25 ... 85 °C (-13 ... 185 °F).

Digital position feedback with 24 V microswitches

i 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.

i 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: $-40\text{ °C} < T_{amb} < 85\text{ °C}$

T5: $-40\text{ °C} < T_{amb} < 80\text{ °C}$

T6: $-40\text{ °C} < T_{amb} < 65\text{ °C}$

Special conditions for IECEx, flameproof enclosure

- The positioner is designed for a maximum permissible ambient temperature range of $-40\text{ ... }85\text{ °C}$
- 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

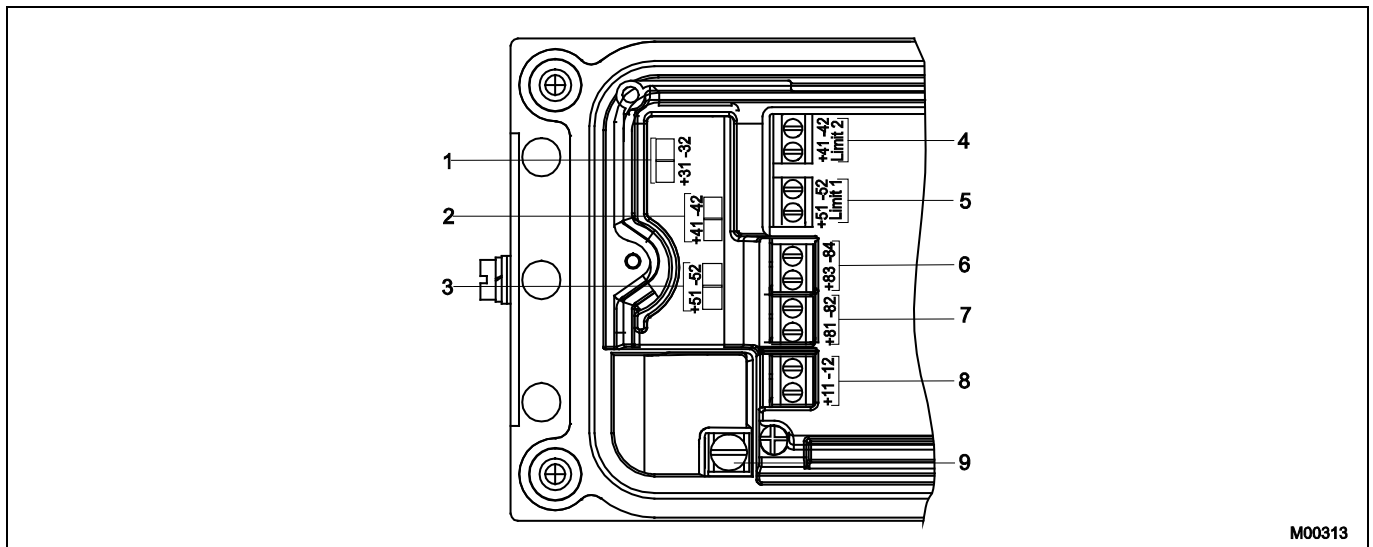
Intrinsic Safety; enclosure 4X; T5, max. 82 °C

CL I; Div 1; Grp. A-B-C-D

CL II; Div 1; Grp. E-F-G

CL III

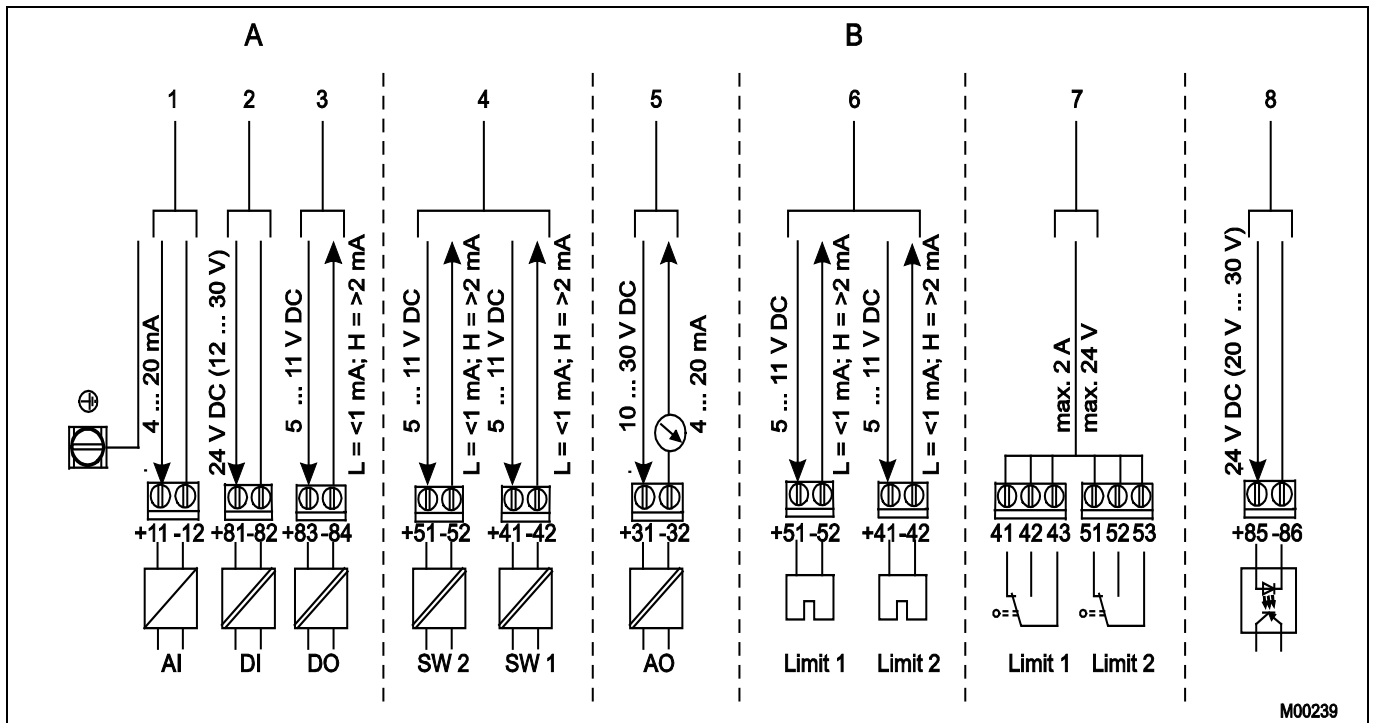
7 Electrical connections



M00313

Fig. 7: Screw terminals, overview

- | | |
|--|--|
| 1 Module for analog position feedback | 5 Digital position feedback, either proximity switches or 24 V microswitches |
| 2 Module for digital feedback or service switch of emergency shutdown module | 6 Digital output DO |
| 3 Module for digital feedback or terminals for emergency shutdown module | 7 Digital input |
| 4 Digital position feedback, either proximity switches or 24 V microswitches | 8 Signal 4 ... 20 mA |
| | 9 Grounding screw |



M00239

Fig. 8: Pin configuration

- | | |
|---------------|-----------------------------|
| A Basic model | 1 Analog input |
| B Options | 2 Digital input |
| | 3 Digital output DO |
| | 4 Digital feedback |
| | 5 Analog feedback |
| | 6 Proximity switches |
| | 7 Microswitches |
| | 8 Emergency shutdown module |

8 Dimensions

All dimensions in mm (inch)

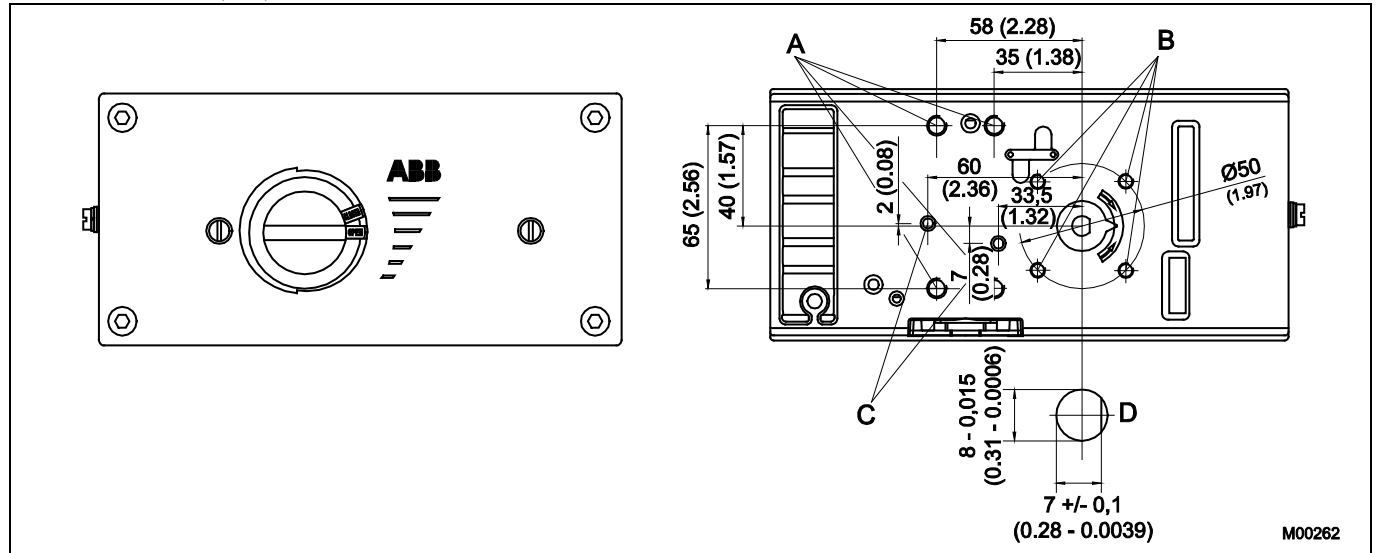


Fig. 9: Top view
 A Tap hole M8 (10 mm (0.39 inch) low)
 B Tap hole M6 (8 mm (0.32 inch) low)
 C Tap hole M5 x 0.5 (air connections in version for integral mounting)
 D Sensor shaft (larger than scale)

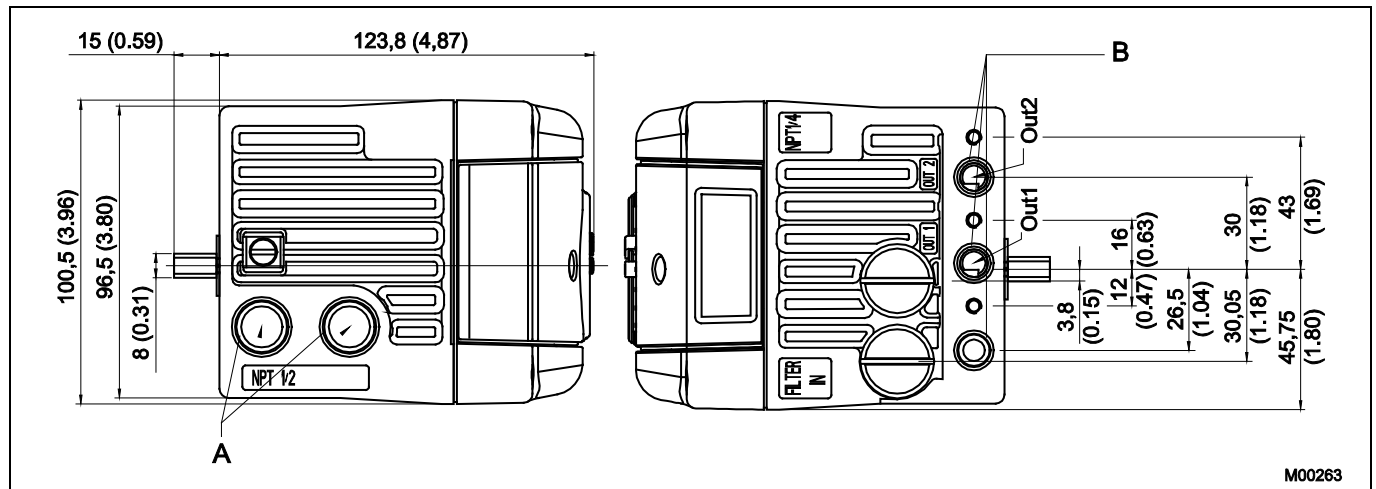


Fig. 10: Left and right side view
 A NPT 1/2" or M20 x 1.5
 B Pneumatic connections, NPT 1/4" -18 or G1/4"

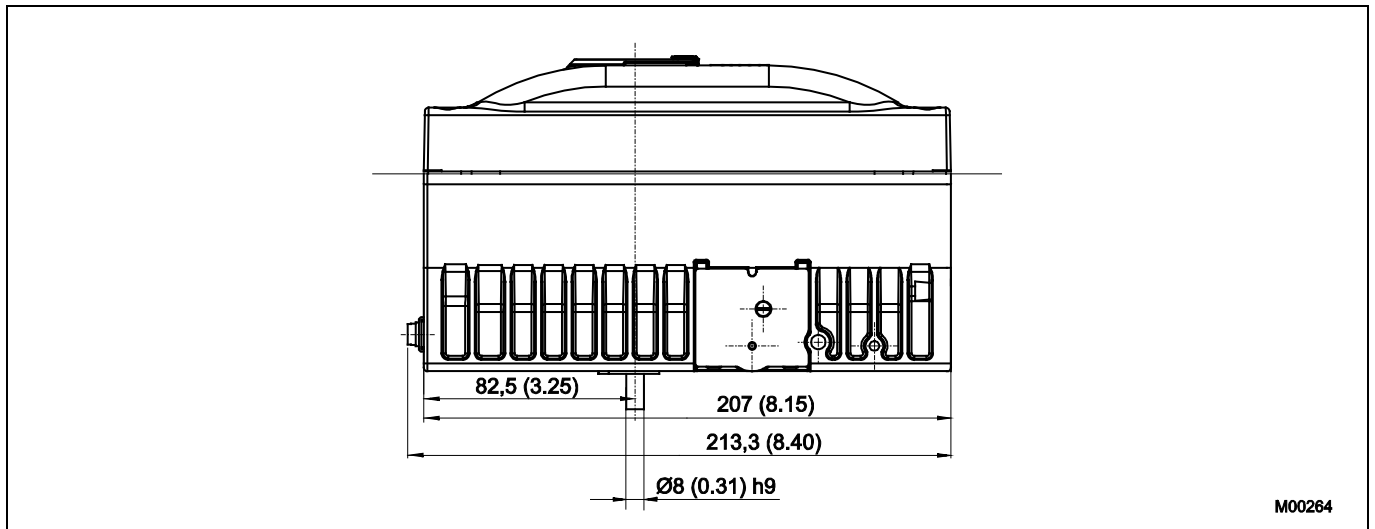


Fig. 11: Bottom view

A Pneumatic connections, NPT 1/4"-18 or G1/4"

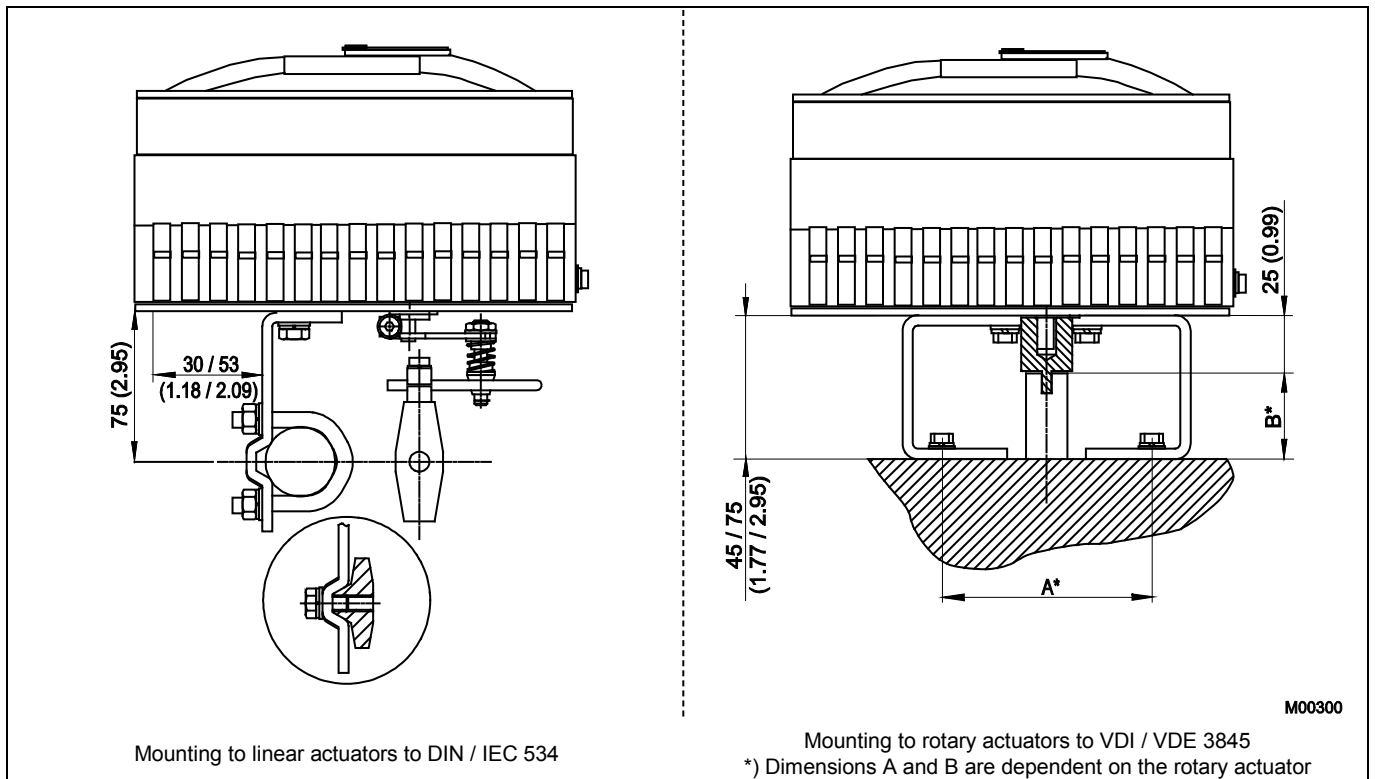


Fig. 12: Mounting drawings

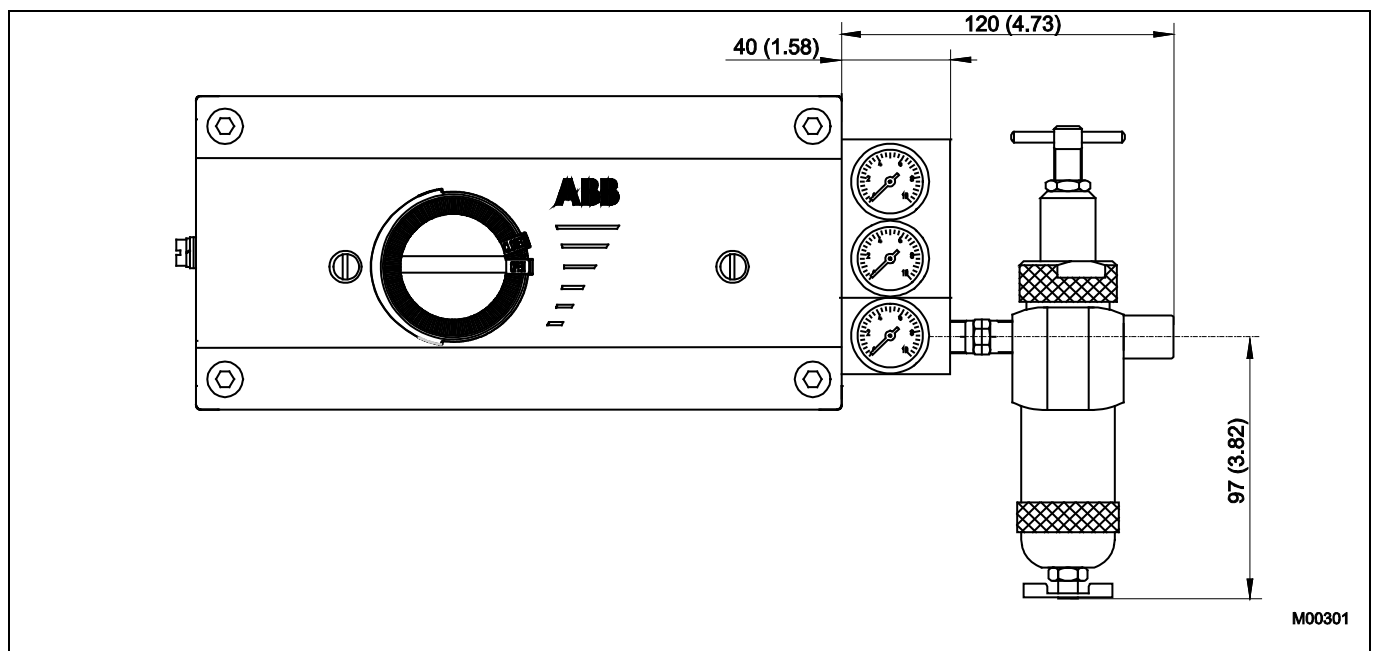


Fig. 13: Positioner TZIDC-200 with pressure gauge block and filter regulator

9 Ordering information

	Variant	Main Code															Add. Code
		1 – 6	7	8	9	10	11	12	13	14	15	16	17				
TZIDC-200 Electro-Pneumatic Positioner, with flameproof enclosure, intelligent, software-configurable with Local Communication Interface (LKS) and HART communication	V18348		X	X	X	X	X	X	X	X	X	X	X	X	X	X	XXX
Case / Mounting																	
Case made of aluminium, varnished, for mounting to linear actuators acc. DIN / IEC 534 / NAMUR or to rotary actuators acc. VDI / VDE 3845			1	0													
Case made of aluminium, varnished, with mechanical position indicator, for mounting to linear actuators acc. DIN / IEC 534 / NAMUR or to rotary actuators acc. VDI / VDE 3845			2	0													
Case made of aluminium, varnished, for integral mounting to control valves (see dimensional drawing)			3	0													
Case made of aluminium, varnished, with mechanical position indicator, for integral mounting to control valves (see dimensional drawing)			4	0													
Case made of aluminium, varnished, for mounting to rotary actuators acc. VDI / VDE 3845 with extended rotation angle up to 270°			5	0													
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°			6	0													
Operation																	
With operator panel and display integrated in the enclosure cover																	1
Explosion Protection																	
ATEX Ex d II C T4/T5/T6 Gb																	1
FM / CSA Class 1, Div. 1, Group C-D (explosion-proof)																	1) 2
ATEX II 2 G Ex ib IIC T6 resp. T4 Gb + Ex d																	3
FM / CSA Intrinsically Safe and Explosion-proof																	1) 4
IECEX Ex ib IIC T6 Gb																	5
IECEX Ex d II C T4/T5/T6 Gb																	6
ATEX II 2 G Ex ia IIC T6 resp. T4																	7
GOST Russia - Ex d IIC T4 / T5 / T6																	D
IECEX ia IIC T6 resp. T4 Gb																	K
Output / Safe Position (in case of an electrical power failure)																	
Single acting, fail safe																	1
Single acting, fail freeze																	2
Double acting, fail safe																	3
Double acting, fail freeze																	4
Connections																	
Cable: Thread M20 x 1.5, air pipe: Thread G 1/4																	1
Cable: Thread M20 x 1.5, air pipe: Thread 1/4-18 NPT																	2
Cable: Thread 1/2-14 NPT, air pipe: Thread 1/4-18 NPT																	3
Cable: Thread G 1/2, air pipe: Thread Rc 1/4																	7

Continued on next page

1) Only with cable connection NPT thread

Main Code														Add. Code
Variant	1 – 6	7	8	9	10	11	12	13	14	15	16	17		XXX
TZIDC-200 Electro-Pneumatic Positioner, with flameproof enclosure, intelligent, software-configurable with Local Communication Interface (LKS) and HART communication		V18348	X	X	X	X	X	X	X	X	X	X	X	XXX
Option Modules for Analog or Digital Position Feedback														
Without														
Plug-in module for analog position feedback, signal range 4 ... 20 mA, two-wire														
Plug-in module for digital position feedback														
Plug-in module for analog position feedback, signal range 4 ... 20 mA, two-wire, and digital position feedback														
Plug-in module for shutdown function														
Analog feedback and shut-down														
Optional Mechanical Kit for Digital Position Feedback														
Without														
Mechanical kit for digital position feedback with proximity switches SJ2-SN (NC or logical 1)														
Mechanical kit for digital position feedback with proximity switches SJ2-S1N (NO or logical 0)														
Mechanical kit for digital position feedback with 24 V AC / DC microswitches (change-over contacts)														
Parameter Setting / Bus Address														
Factory setting for HART devices														
Customer-specific parameter settings for HART devices														
Design (Varnish / Coding)														
Standard														
Others														
Device Identification Label														
Without														
Label														
Label including text, with separate stainless steel label 11.5 x 60 mm (0.45 x 2.36 in.)														
Documentation Language														
German														
Italian														
Spanish														
French														
English														
Swedish														
Finnish														
Polish														
Portuguese														
Russian														
Czech														
Dutch														
Danish														
Greek														
Latvian														
Hungarian														
Estonian														
Bulgarian														
Romanian														
Slovak														
Lithuanian														
Slovenian														
M1														
M2														
M3														
M4														
M5														
M7														
M8														
M9														
MA														
MB														
MC														
MD														
MF														
MG														
ML														
MM														
MO														
MP														
MR														
MS														
MU														
MV														

Continued on next page

- 2) Only for fail safe pneumatic. Not for FM / CSA Version
- 3) No IECEx
- 4) Only for ambient temperature range -25 ... 85 °C, no IECEx
- 5) Only for Ex d version
- 6) Plain text, max. 16 letters

Main Code														Add. Code	
Variant	1 – 6	7	8	9	10	11	12	13	14	15	16	17			
TZIDC-200 Electro-Pneumatic Positioner, with flameproof enclosure, intelligent, software-configurable with Local Communication Interface (LKS) and HART communication														xxx	
V18348														XXX	
SIL2 - Declaration of Conformity SIL2 - Declaration of Conformity														7)	CS2
Certificate of Compliance Certificate of compliance with the order acc. EN 10204-2.1 (DIN 50049-2.1) with item description Test report 2.2 acc. EN 10204 (DIN 50049-2.2)															CF2 CF3
Inspection Certificate Inspection certificate 3.1 acc. EN 10204															CBA

7) With single acting, fail safe pneumatic only

9.2 Accessories

Accessories	Order number
Mounting bracket	
EDP300 / TZIDC Mounting bracket for rotary actuators (mounting to VDI / VDE 3845), dimension A/B = 80/20 mm	319603
EDP300 / TZIDC Mounting bracket for rotary actuators (mounting to VDI / VDE 3845), dimension A/B = 80/30 mm	319604
EDP300 / TZIDC Mounting bracket for rotary actuators (mounting to VDI / VDE 3845), dimension A/B = 130/30 mm	319605
EDP300 / TZIDC Mounting bracket for rotary actuators (mounting to VDI / VDE 3845), dimension A/B = 130/50 mm	319606
Lever	
EDP300 / TZIDC Lever 30 mm	7959151
EDP300 / TZIDC Lever 100 mm	7959152
Adapter	
EDP300 / TZIDC Adapter (shaft coupler) for rotary actuators (mounting to VDI / VDE 3845)	7959110
EDP300 / TZIDC Form - locking shaft adapter	7959371
Pressure gauge block	
TZIDC Pressure gauge block, 0.6 MPa, single acting, G 1/4 connection	7959364
TZIDC Pressure gauge block, 0.6 MPa, single acting, Rc 1/4 connection	7959358
TZIDC Pressure gauge block, 0.6 MPa, single acting, NPT 1/4 connection	7959360
TZIDC Pressure gauge block, 0.6 MPa, double acting, G 1/4 connection	7959365
TZIDC Pressure gauge block, 0.6 MPa, double acting, Rc 1/4 connection	7959359
TZIDC Pressure gauge block, 0.6 MPa, double acting, NPT 1/4 connection	7959361
Filter regulator	
TZIDC Filter regulator, brass, connections thread G 1/4, incl. material for mounting to pressure gauge block	7959119
TZIDC Filter regulator, brass, connections thread 1/4-18 NPT, incl. material for mounting to pressure gauge block	7959120
Attachment kit	
EDP300 / TZIDC Attachment kit for linear actuators, stroke 10 ... 35 mm	7959125
EDP300 / TZIDC Attachment kit for linear actuators, stroke 20 ... 100 mm	7959126
EDP300 / TZIDC Attachment for remote sensor control unit (for wall or pipe mounting)	7959381
EDP300 / TZIDC Attachment kit for Fisher 1051-30, 1052-30	7959214
EDP300 / TZIDC Attachment kit for Fisher 1061 size 130	7959206
EDP300 / TZIDC Attachment kit for Fisher 471	7959195
EDP300 / TZIDC Attachment kit for Fisher 657 / 667 Size 10 ... 90 mm	7959177
EDP300 / TZIDC Attachment kit for Fisher Gulde 32/34	7959344
EDP300 / TZIDC Attachment kit for Gulde DK	7959161
EDP300 / TZIDC Attachment kit for Keystone 79U/E-002(S) ... 79U/E-181(S)	7959147
EDP300 / TZIDC Attachment kit for Masoneilan CAMFLEX II, VARIMAX, MINITORK II	7959144
EDP300 / TZIDC Attachment kit for Masoneilan VariPak 28000 series	7959163
EDP300 / TZIDC Attachment kit for MaxFlo MaxFlo	7959140
EDP300 / TZIDC Attachment kit for NAF 791290	7959207
EDP300 / TZIDC Attachment kit for NAMUR stroke 100 ... 170 mm	7959339
EDP300 / TZIDC Attachment kit for NELES BC6-20, B1C6-20, BJ8-20, B1J8-20	7959146
EDP300 / TZIDC Attachment kite, lever for linear stroke, length 150 ... 250 mm	7959210
EDP300 / TZIDC Attachment kit for Samson 241, 271, 3271	7959145
EDP300 / TZIDC Attachment kit for Samson 3277	7959136
EDP300 / TZIDC Attachment kit for Schubert&Salzer GS 8020 / 8021 / 8023	7959200
EDP300 / TZIDC Attachment kit for SED SED stroke 100 mm	7959141
EDP300 / TZIDC Mounting Kit Uhde Type 4 Stroke 400 mm cropped	7959500
Cable gland	
TZIDC-2xx 1 x Ex d cable gland M20 x 1.5, 1 pipe plug M20 x 1.5, securing adhesive	7959244
TZIDC-2xx 2 x Ex d cable glands M20 x 1.5, securing adhesive	7959245
TZIDC-2xx 1 x Ex d cable gland 1/2 in. NPT, 1 pipe plug 1/2 in. NPT, securing adhesive	7959246
TZIDC-2xx 2 x Ex d cable glands 1/2 in. NPT, securing adhesive	7959247

Notes

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