Electro-Pneumatic Positioner
TZIDC-200

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
  - flameproof enclosure
  - intrinsically safe
- For SIL2 safety loops

Compact, well-proven, and flexible
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.
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
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.

In both cases, the "mechanical position indicator" (8) must be installed.
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:

**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 (positioning signal)**
Increasing: Signal 4 ... 20 mA = position 0 ... 100 %
Increasing: Signal 20 ... 4 mA = position 0 ... 100 %

**Characteristic curve (travel = f(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**
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**
When reaching the tolerance band the position is considered as corrected. From this point on, the position is further slowly re-adjusted until the dead band is reached. The factory setting for this parameter is 0.3 %.

**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 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  Technical data

5.1  Input

Output signal (two-wire-technology)
Nominal range 4 ... 20 mA
Split range configuration between 20 ... 100 %
of the nominal range
Max. 25 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 seconds, separately for each direction

Dead band time limit Range 0 ... 200 seconds (monitoring parameter for
control until the deviation reaches the tolerance 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)

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

5.5  Transmission data and influences

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

Action (positioning signal)
Increasing Signal 4 ... 20 mA =
actuator position 0 ... 100 %
Decreasing Signal 20 ... 4 mA =
actuator position 0 ... 100 %

Characteristic curve (travel = f (signal))
Linear, equal percentage 1:25 or 1:50 or 25:1 or 50:1 and freely
configurable with 20 reference points.
Characteristic deviation ≤ 0.5 %
Tolerance band 0.3 ... 10 %, adjustable
Dead band 0.1 ... 10 %, adjustable
Resolution (A/D conversion) > 4000 steps
Sample rate 20 ms
Influence of ambient temperature ≤ 0.5 % per 10 K
Influence of vibration ≤ ± 1 % to 10 g and 80 Hz

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

Influence of mounting orientation
Not measurable.

Meets the requirements of the following directives
- EMC Directive 89 / 336 / EWG as of May 1989
- EC Directive for CE conformity marking

Communication
- HART Protocol 5.1
- Local connector for LKS (local communication interface) adapter
- HART communication via 20 mA signal line with (optional) FSK modem

5  Technical data

5.1  Input

Output signal (two-wire-technology)
Nominal range 4 ... 20 mA
Split range configuration between 20 ... 100 %
of the nominal range
Max. 25 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"
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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
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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 seconds, separately for each direction

Dead band time limit Range 0 ... 200 seconds (monitoring parameter for
control until the deviation reaches the tolerance band)
5.6 Environmental capabilities

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>-40 ... 85 °C (-40 ... 185 °F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For operation, storage and transport</td>
<td></td>
</tr>
<tr>
<td>When using proximity switches SJ2-S1N (NO):</td>
<td>-25 ... 85 °C (-13 ... 185 °F)</td>
</tr>
</tbody>
</table>

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/Protections
Aluminum, protection class IP 65 / NEMA 4X

Surface/color
Electrostatic dipping varnish with epoxy resin, stove-hardened. Case varnished black, RAL 9005, matte, housing cover Pantone 420.

Electrical connections
Screw terminals: Max. 1.0 mm² for options, Max. 2.5 mm² for analog signal.
Note: Do not expose the terminals to strain.
Cable entry: 2 tap holes 1/2-14 NPT or M20 x 1.5 (cable gland or pipe plug must be ordered separately)

Pneumatic connections
Threads G 1/4 or 1/4-18 NPT

Weight
3.0 kg

Mounting orientation
any orientation allowed

Dimensions
see dimensional drawings

5.8 Safety Integrity Level

Important
Applies to applications with single-acting and depressurizing pneumatics.

The positioner TZIDC-200 and the emergency shutdown module for TZIDC-200 meet the requirements regarding:
- functional safety in accordance with IEC 61508 / IEC 61511-1
- explosion protection (depending on the model)
- electromagnetic compatibility in accordance with EN 61000

In case of a failure of electrical power or compressed air supply or when a positioner malfunction occurs, the actuator is depressurized by the positioner, and the return spring in the actuator moves the valve to a pre-defined, safe end position (either OPEN or CLOSED).

SIL specific safety-related characteristics:

<table>
<thead>
<tr>
<th></th>
<th>TZIDC-200</th>
<th>Emergency shutdown module for TZIDC-200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>SIL2</td>
<td>SIL2</td>
</tr>
<tr>
<td>SFF</td>
<td>85 %</td>
<td>94 %</td>
</tr>
<tr>
<td>PFDav</td>
<td>6.89 x 10⁻⁴</td>
<td>1.76 x 10⁻⁴</td>
</tr>
<tr>
<td>λ₁₁ + λ₅₅</td>
<td>925 FIT</td>
<td>718 FIT</td>
</tr>
<tr>
<td>λ₁₂</td>
<td>157 FIT</td>
<td>40 FIT</td>
</tr>
</tbody>
</table>

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

Important

The values indicated here are taken from the respective approval certificates.
Always observe the specifications and supplements in the certificates.
(see operating instructions).

FM Approval HLC B/02 3010829
Explosion proof; enclosure 4X; T5, max. 82 °C
CL I; Div 1; Grp. C-D
Intrinsically safe; enclosure 4X; T5, max. 82 °C
CL I, II, III; Div 1; Grp. A-B-C-D-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 I; 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
Intrinsically safe; 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
Prototype test certificate: DMT 02 ATEX E 029 X
Type: II 2G EEEx d II C T4/T5/T6
Flameproof enclosure
Device class: II 2G (EEEx ib IIC)
Temperature class: T4, T5, T6
Permissible ambient temperature:
T4: -40 °C < T_{amb} < 85 °C
T5: -40 °C < T_{amb} < 80 °C
T6: -40 °C < T_{amb} < 65 °C

ATEX
Prototype test certificate: TÜV 98 ATEX 1370 X
Type: II 2G (EEEx ib IIC)
Device class: II 2G (EEEx ib IIC)
Temperature class: T4, T5, T6
Permissible ambient temperature:
T4: -40 °C < T_{amb} < 85 °C
T5: -40 °C < T_{amb} < 50 °C
T6: -40 °C < T_{amb} < 35 °C

5.10 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)
48 V DC (20 ... 48 V DC, no ignition protection)
Characteristic curve (configurable)
Rising or falling
Characteristic deviation < 1 %

Important
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 < 1.0 mA Switching state logical "0"
Signal current > 2.0 mA Switching state logical "1"
Direction of action normally logical "0" or logical "1" (configurable)

Module for the emergency shutdown function

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

Important
The emergency shutdown module can only be used with pneumatics with the safe position “fail-safe”.

IECEx
Prototype test certificate: IECEx TUN 04.0015X, issue no.: 0
Type: Intrinsically safe
Temperature class: T4, T5, T6
Permissible ambient temperature:
T4: -40 °C < T_{amb} < 85 °C
T5: -40 °C < T_{amb} < 50 °C
T6: -40 °C < T_{amb} < 35 °C
Electro-Pneumatic Positioner TZIDC-200
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The emergency shutdown module works independently of the motherboard, 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 < 1.0 mA Switching state logical "0"
Signal current > 2.0 mA Switching state logical "1"

Direction of action (logical state)

<table>
<thead>
<tr>
<th>Proximity switch</th>
<th>&lt; Lim. 1</th>
<th>&gt; Lim. 1</th>
<th>&lt; Lim. 2</th>
<th>&gt; Lim. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJ2-S1N (NC)</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>SJ2-S1N (NO)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Important
When using SJ2_S1N (NO), the TZIDC-200 positioner may only be used at an ambient temperature range from -25 … 85 °C (-13 … 185 °F).

Digital position feedback with 24 V microswitches

Important
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
These options are also available for retrofitting by Service.

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

EEEx d cable glands
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., with connection block in aluminum, black with installation material for mounting to TZIDC-200.

Filter regulator
All metal version in brass, varnished black, bronze filter element, 40 µm, with condensate drain.
max. pre-pressure 16 bar, output adjustable to 1.4 … 6 bar

PC adapter for communication
LKS adapter f. plug conn. to TZIDC-200
FSK modem for HART communication
(see data sheet 63_6.71 DE)

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 EN)
6 Electrical connection

Fig. 7: Screw terminals, overview

1 Module for analog position feedback
2 Module for digital feedback or service switch of emergency shutdown module
3 Module for digital feedback or terminals for emergency shutdown module
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
Electro-Pneumatic Positioner TZIDC-200
for 4 ... 20 mA two-wire technology, flameproof enclosure

Fig. 8: Pin configuration
A Basic model
B Options

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

All dimensions in mm (inch)

![Diagram of Electro-Pneumatic Positioner TZIDC-200](image)

**Fig. 9: Top view**
- A Tap hole M8 (10 mm low)
- B Tap hole M6 (8 mm 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 ½”-18 or G1/4”
Fig. 11: Bottom view

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

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

<table>
<thead>
<tr>
<th>Electro-Pneumatic Positioner</th>
<th>Variant digit No.</th>
<th>1</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>Code</th>
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<tbody>
<tr>
<td>TZIDC-200 with Flameproof Enclosure</td>
<td>Catalog No.</td>
<td>V18348-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>intelligent, software-configurable with local communication interface (LKS) and HART communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Case / Mounting

| Case made of aluminium, varnished, protection IP 65 (NEMA 4X) |          |    |    |    |    |    |    |    |    |    |      |
| for mounting to linear actuators acc. to DIN/IEC 534 / NAMUR |          |    |    |    |    |    |    |    |    |    |      |
| or to rotary actuators acc. to VDI/VDE 3845 |          |    |    |    |    |    |    |    |    |    |      |
| as above, but with mechanical position indicator |          |    |    |    |    |    |    |    |    |    |      |
| for integral mounting to control valves |          |    |    |    |    |    |    |    |    |    |      |
| as above, but with mechanical position indicator |          |    |    |    |    |    |    |    |    |    |      |
| for mounting to rotary actuators acc. to VDI/VDE 3845 |          |    |    |    |    |    |    |    |    |    |      |
| with extended rotation angle up to 270° |          |    |    |    |    |    |    |    |    |    |      |
| as above, but with mechanical position indicator |          |    |    |    |    |    |    |    |    |    |      |

See Options/Accessories for customer-specific mounting

Please specify the actuator type and type of mounting

Note:

Special mounting material is required (see "Accessories")

Operation

- with operator panel and display integrated in the enclosure cover | 1 |    |    |    |    |    |    |    |    |    |      |

Explosion protection

- ATEX Ex II 2 G EEx d IIC T4, T5, T6 | 1 |    |    |    |    |    |    |    |    |    |      |
- FM/CSA Class 1, Div. 1, Group C-D (explosion-proof) | 2 |    |    |    |    |    |    |    |    |    |      |
- ATEX EEx ib and EEx d IIC T6 | 3 |    |    |    |    |    |    |    |    |    |      |
- FM/CSA intrinsically safe and explosion-proof | 4 |    |    |    |    |    |    |    |    |    |      |
- IECEx Ex ib IIG T6 | 5 |    |    |    |    |    |    |    |    |    |      |
- GOST Russia Ex d IIC T4/T5/T6 | D |    |    |    |    |    |    |    |    |    |      |
- other explosion protection certificates upon request |          |    |    |    |    |    |    |    |    |    |      |

Output / safe position (in case of an electrical power failure)

- Single acting, | 1 |    |    |    |    |    |    |    |    |    |      |
  - fail safe |    |    |    |    |    |    |    |    |    |    |      |
  - fail freeze |    |    |    |    |    |    |    |    |    |    |      |
- Double acting, | 2 |    |    |    |    |    |    |    |    |    |      |
  - fail safe |    |    |    |    |    |    |    |    |    |    |      |
  - fail freeze |    |    |    |    |    |    |    |    |    |    |      |

Connections

- Cable: Thread M20 x 1.5 | 1 |    |    |    |    |    |    |    |    |    |      |
  - Air pipe: Thread G 1/4 |    |    |    |    |    |    |    |    |    |    |      |
- Cable: Thread M20 x 1.5 | 2 |    |    |    |    |    |    |    |    |    |      |
  - Air pipe: Thread 1/4-18 NPT |    |    |    |    |    |    |    |    |    |    |      |
- Cable: Thread 1/2-14 NPT | 3 |    |    |    |    |    |    |    |    |    |      |
  - Air pipe: Thread 1/4-18 NPT |    |    |    |    |    |    |    |    |    |    |      |

Option modules for analog or digital position feedback

- without | 0 |    |    |    |    |    |    |    |    |    |      |
- Plug-in module analog position feedback, sign. range 4...20 mA, |    |    |    |    |    |    |    |    |    |    |      |
  - two-wire | 1 |    |    |    |    |    |    |    |    |    |      |
  - digital position feedback |    |    |    |    |    |    |    |    |    |    |      |
  - analog position feedback, sign. range 4...20 mA, |    |    |    |    |    |    |    |    |    |    |      |
  - two-wire, and digital position feedback | 3 |    |    |    |    |    |    |    |    |    |      |
  - shutdown module | 4 |    |    |    |    |    |    |    |    |    |      |

Continued on next page

1) only with cable connection NPT thread
2) EEx d cable glands see accessories
3) only for fail safe pneumatic
8.1 Ordering information (continued)

<table>
<thead>
<tr>
<th>Electro-Pneumatic Positioner</th>
<th>Variant digit No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Code</th>
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<tbody>
<tr>
<td>TZIDC-200 with Flameproof Enclosure</td>
<td>Catalog No.</td>
<td>V18348-</td>
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<tr>
<td>with Flameproof Enclosure</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

Optional mechanical kit for digital position feedback
- without 0
- Mechanical kit for digital position feedback with proximity switches SJ2-SN (NC or logical 1) 1
- with proximity switches SJ2-S1N (NO or logical 0) 4) 2
- with 24 V DC/AC microswitches (change-over contacts) 5) 3

Parameter setting / bus address
- Factory setting for HART devices 1
- Customized parameter setting for HART devices 2

Design (varnish / coding)
- Standard 1
- As specified (on request) 2

Device identification label
- (provide list, if available) 0
- without label including text (plain text, max. 16 letters) 1
- with separate sticker 1
- with separate stainless steel label 18.5 x 65 mm 2

8.2 Additional ordering information

<table>
<thead>
<tr>
<th>Certificates</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>SIL2 - Declaration of conformity 6)</td>
<td>CS2</td>
</tr>
<tr>
<td>Certificate of compliance with the order acc. to EN 10204-2.1 (DIN 50049-2.1)</td>
<td>CF1</td>
</tr>
<tr>
<td>Certificate of compliance with the order acc. to EN 10204-2.1 (DIN 50049-2.1) with item description</td>
<td>CF2</td>
</tr>
<tr>
<td>Test Report acc. to EN 10204-2.2 (DIN 50049-2.2)</td>
<td>CF3</td>
</tr>
<tr>
<td>Inspection certificate 3.1 acc. to EN 10204 with max. deviation</td>
<td>CBA</td>
</tr>
</tbody>
</table>

4) only for ambient temperature range -25...+85 °C
5) only for Ex d version
6) only for single acting and fail safe pneumatic
8.3 Order information, accessories 1

<table>
<thead>
<tr>
<th>Mounting material and cost</th>
<th>Catalog No.</th>
</tr>
</thead>
</table>
| Attachment kit for linear actuators  
(lateral attachment to DIN/IEC 534 / NAMUR) stroke 10 ... 35 mm | 7959125 |
| Attachment kit for linear actuators  
(stroke 20 ... 100 mm) | 7959126 |
| Attachment kit for rotary actuators (mounting to VDI/VDE 3845)  
consisting of:  
a) Adapter (shaft coupler) | 7959110 |
| b) Mounting bracket dimension A/B = 80/20 mm | 319603 |
| dimension A/B = 80/30 mm | 319604 |
| dimension A/B = 130/30 mm | 319605 |
| dimension A/B = 130/50 mm | 319606 |

<table>
<thead>
<tr>
<th>Pressure gauge block</th>
<th></th>
</tr>
</thead>
</table>
| for single acting TZIDC-200 with 2 pressure gauges Ø 28 mm  
(1 x for air supply and 1 x for output pressure)  
G 1/4 connections  
Supply pressure range 0...10 bar/0...140 psi  
Output pressure range 0...4 bar/0...60 psi  
0...10 bar/0...140 psi | 7959111 |
| 1/4-18 NPT connections  
Supply pressure range 0...10 bar/0...140 psi  
Output pressure range 0...4 bar/0...60 psi  
0...10 bar/0...140 psi | 7959112 |
| for double acting TZIDC-200 with 3 pressure gauges Ø 28 mm  
(1 x for air supply and 2 x for output pressure)  
G 1/4 connections  
Supply pressure range 0...10 bar/0...140 psi  
Output pressure range 0...4 bar/0...60 psi  
0...10 bar/0...140 psi | 7959113 |
| 1/4-18 NPT connections  
Supply pressure range 0...10 bar/0...140 psi  
Output pressure range 0...4 bar/0...60 psi  
0...10 bar/0...140 psi | 7959114 |

(Pressure gauge blocks are delivered as separate units  
for mounting by the customer)

<table>
<thead>
<tr>
<th>Filter regulator, brass</th>
<th></th>
</tr>
</thead>
</table>
| incl. material for mounting to pressure gauge block  
connections thread G 1/4  
thread 1/4-18 NPT | 7959119 |
| (Filter regulators are delivered as separate units  
for mounting by the customer) | 7959120 |

<table>
<thead>
<tr>
<th>Adapter and operating program for digital communication</th>
<th></th>
</tr>
</thead>
</table>
| LKS adapter see Data Sheet 10/63-6.71 EN  
FSK modem see Data Sheet 10/63-6.71 EN  
DSV401 (SMART VISION) on CD-ROM see Data Sheet 10/63-1.20 EN | |

<table>
<thead>
<tr>
<th>EEx d cable glands</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x EEx d cable gland M20 x 1.5, 1 pipe plug M20 x 1.5, securing adhesive</td>
<td>7959244</td>
</tr>
<tr>
<td>2 x EEx d cable glands M20 x 1.5, securing adhesive</td>
<td>7959245</td>
</tr>
<tr>
<td>1 x EEx d cable gland 1/2&quot; NPT, 1 pipe plug 1/2&quot; NPT, securing adhesive</td>
<td>7959246</td>
</tr>
<tr>
<td>2 x EEx d cable glands 1/2&quot; NPT, securing adhesive</td>
<td>7959247</td>
</tr>
</tbody>
</table>

7) for cable diameter 7.2...11.7 mm
## 8.4 Order information, accessories 2

<table>
<thead>
<tr>
<th>TZIDC, TZIDC-110, TZIDC-120, TZIDC-200, TZIDC-210, TZIDC-220</th>
<th>Catalog No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment kit for</td>
<td>Manufacturer / Type</td>
</tr>
<tr>
<td>Air Torque</td>
<td>SC 30</td>
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<tr>
<td>Air Torque</td>
<td>SC-P-60-4</td>
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<tr>
<td>Air Torque</td>
<td>SR 30</td>
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<tr>
<td>ARI</td>
<td>DP32, DP33, DP34</td>
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<tr>
<td>AMG</td>
<td>SAD 010 ... SAF 040</td>
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<tr>
<td>AMG</td>
<td>SAD 040 ... SAF 050</td>
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<tr>
<td>ARCA</td>
<td>812 stroke 30 mm</td>
</tr>
<tr>
<td>ARCA</td>
<td>812 stroke 60 mm</td>
</tr>
<tr>
<td>ARCA</td>
<td>813 stroke 30 mm</td>
</tr>
<tr>
<td>ARCA</td>
<td>813 stroke 60 mm</td>
</tr>
<tr>
<td>Autmax</td>
<td>DA 85 ... DA150</td>
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<tr>
<td>Badger Meter</td>
<td>ATC 754/755</td>
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<tr>
<td>bar</td>
<td>GTE / GTD 045 ... 127</td>
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<td>bar</td>
<td>GTE / GTD 143 ... 254</td>
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<tr>
<td>Bray</td>
<td>92 / 93 series</td>
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<tr>
<td>Conovalve</td>
<td>Series 740.000 / 750.000 / 770.000 / 795.000</td>
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<td>El-O-Matic</td>
<td>ED / ED / PE / PD 500 ... 4004</td>
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<td>El-O-Matic</td>
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<td>FESTO</td>
<td>DRD-4-F05 ... DRD-50-F10</td>
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<td>FESTO</td>
<td>DRD-77-F10 ... DRD-255-F14</td>
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<td>Fisher</td>
<td>1051-30, 1052-30</td>
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<td>Fisher</td>
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<td>Fisher</td>
<td>471</td>
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<td>Fisher</td>
<td>585 C</td>
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<td>Fisher</td>
<td>657 / 667 Size 10 ... 30 mm</td>
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<tr>
<td>Flow Serve</td>
<td>DA 85 ... 150</td>
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<td>Flow Serve</td>
<td>867 / 868 size 05 ... 30</td>
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<tr>
<td>Foxboro</td>
<td>FoxPak IP127 / V725</td>
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<tr>
<td>Foxboro</td>
<td>V713 stroke 10 ... 35 mm</td>
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<td>Foxboro</td>
<td>V713 stroke 25 ... 90 mm</td>
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<tr>
<td>GEFA</td>
<td>AC 020 ... AC 1750</td>
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<td>MC 063 FA</td>
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<tr>
<td>GEMU</td>
<td>690/25 and 50</td>
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<td>GEMU</td>
<td>CleanStar</td>
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<td>Gulde</td>
<td>DK</td>
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9) need additional Adapter (Shaft Coupler), Catalog No. 7959110
## 8.5 Order information, accessories 3

<table>
<thead>
<tr>
<th>Attachment kit for Manufacturer / Type</th>
<th>Catalog No.</th>
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<tbody>
<tr>
<td>Honeywell 600-11, 600-15</td>
<td>7959126</td>
</tr>
<tr>
<td>Hytork XL26 ... XL680</td>
<td>319603</td>
</tr>
<tr>
<td>Hytork XL1125, XL1370, XL2585, XL4580</td>
<td>319605</td>
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<tr>
<td>Keystone 79U/E-002(S) ... 79U/E-181(S)</td>
<td>7959147</td>
</tr>
<tr>
<td>Mapag A/F 30 ... A/F 500</td>
<td>319603</td>
</tr>
<tr>
<td>Masoneilan CAMFLEX II, VARIMAX, MINITORK II</td>
<td>7959144</td>
</tr>
<tr>
<td>Masoneilan VanPak 28000 series</td>
<td>7959163</td>
</tr>
<tr>
<td>MaxFlo</td>
<td>7959140</td>
</tr>
<tr>
<td>NAF 791290</td>
<td>7959207</td>
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<tr>
<td>NAMUR stroke 10 ... 35 mm</td>
<td>7959125</td>
</tr>
<tr>
<td>NAMUR stroke 25 ... 90 mm</td>
<td>7959126</td>
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<tr>
<td>NAMUR stroke 100 ... 170 mm</td>
<td>7959339</td>
</tr>
<tr>
<td>NELES B1JU8, B1J8U, B1CU9/20E, B1CU17/55, B1CU13-32,</td>
<td>319603</td>
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<tr>
<td>NELES B1C6U-20U, 1JAU10/20, BC6U-20U</td>
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<tr>
<td>NELES BC6-20, B1C6-20, B1J8-20</td>
<td>7959146</td>
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<tr>
<td>Norbro 10AR40, 20BR40, 20AR40, 20ARDA40, 15AR40, 15BR40</td>
<td>319603</td>
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<td>Norbro 25AR40, 25BR40, 35AR40, 35BR40, 33-40, 30AR40</td>
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<tr>
<td>Norbro 45BR40, 45AR40</td>
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<tr>
<td>Prisma PP10, PP20</td>
<td>319604</td>
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<tr>
<td>Prisma PPW</td>
<td>319603</td>
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<tr>
<td>Remote Control RCD 05-DA/SR ... RCD 60-DA/SR</td>
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<tr>
<td>Revo FD/FS 12, 25, 50</td>
<td>319603</td>
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<td>Revo FD/FS 90, 130, 180, 205, 306</td>
<td>319605</td>
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<tr>
<td>Richter RA-1/2 046 ... RA-1/2 127</td>
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<td>Richter RA-1/2 185 ... RA-1/2 300</td>
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<td>Samson 241, 271, 3271</td>
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<td>Samson 3277</td>
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<td>Schubert&amp;Salzer GS 8020 / 8021 / 8023</td>
<td>7959200</td>
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<td>SED SED stroke 100 mm</td>
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<tr>
<td>VDI / VDE 3845 130 / 50 mm</td>
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</tbody>
</table>

9) need additional Adapter (Shaft Coupler), Catalog No. 7959110
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www.abb.com/instrumentation

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