

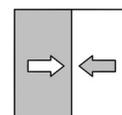


Operating manual

DA01 VUW

Differential pressure measuring device
Pressure levels PN250/PN400

Standard version



Masthead

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Subject to technical amendments.



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Version history

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1 Sicherheitshinweise

1.1 General



WARNING

This operating manual contains instructions fundamental to the installation, operation and maintenance of the device that must be observed unconditionally. It must be read by the assembler, operator and the specialized personnel in charge of the instrument before it is installed and put into operation.

This operating manual is an integral part of the product and therefore needs to be kept close to the instrument in a place that is accessible at all times to the responsible personnel.

The following sections, in particular instructions about the assembly, commissioning and maintenance, contain important information, non-observance of which could pose a threat to humans, animals, the environment and property.

The instrument described in these operating instructions is designed and manufactured in line with the state of the art and good engineering practice.

1.2 Personnel Qualification

The instrument may only be installed and commissioned by specialized personnel familiar with the installation, commissioning and operation of this product.

Specialized personnel are persons who can assess the work they have been assigned and recognize potential dangers by virtue of their specialized training, their skills and experience and their knowledge of the pertinent standards.

1.3 Risks due to Non-Observance of Safety Instructions

Non-observance of these safety instructions, the intended use of the device or the limit values given in the technical specifications can be hazardous or cause harm to persons, the environment or the plant itself.

The supplier of the equipment will not be liable for damage claims if this should happen.

1.4 Safety Instructions for the Operating Company and the Operator

The safety instructions governing correct operation of the instrument must be observed. The operating company must make them available to the installation, maintenance, inspection and operating personnel.

Dangers arising from electrical components, energy discharged by the medium, escaping medium and incorrect installation of the device must be eliminated. See the information in the applicable national and international regulations.

Please observe the information about certification and approvals in the Technical Data section.

1.5 Unauthorised Modification

Modifications of or other technical alterations to the instrument by the customer are not permitted. This also applies to replacement parts. Only the manufacturer is authorised to make any modifications or changes.

1.6 Inadmissible Modes of Operation

The operational safety of this instrument can only be guaranteed if it is used as intended. The instrument model must be suitable for the medium used in the system. The limit values given in the technical data may not be exceeded.

The manufacturer is not liable for damage resulting from improper or incorrect use.

1.7 Safe working practices for maintenance and installation work

The safety instructions given in this operating manual, any nationally applicable regulations on accident prevention and any of the operating company's internal work, operating and safety guidelines must be observed.

The operating company is responsible for ensuring that all required maintenance, inspection and installation work is carried out by qualified specialized personnel.

1.8 Pictogram explanation



DANGER

Type and source of danger

This indicates a **direct** dangerous situation that could lead to death or **serious injury** (highest danger level).

- a) Avoid danger by observing the valid safety regulations.



WARNING

Type and source of danger

This indicates a **potentially** dangerous situation that could lead to death or **serious injury** (medium danger level).

- a) Avoid danger by observing the valid safety regulations.



CAUTION

Type and source of danger

This indicates a **potentially** dangerous situation that could lead to slight or serious injury, damage or **environmental pollution** (low danger level).

- a) Avoid danger by observing the valid safety regulations.



NOTICE

Note / advice

This indicates useful information of advice for efficient and smooth operation.

2 Product and functional description

2.1 Delivery scope

- Differential pressure measuring device DA01
- Operating Manual

2.2 Equipment versions

The following illustrations depict typical combinations of the measuring cell, measured value display and contact elements. However, these can be freely combined according to the order code. Wherever this is not possible, this is clearly stated.

For instance, a small measuring cell with an NG160 display and a contact element is also available.



Large measuring cell Ø130
(mbar ranges)

Small measuring cell Ø75
(bar ranges)

Fig. 1: Device overview

2.2.1 Process connection

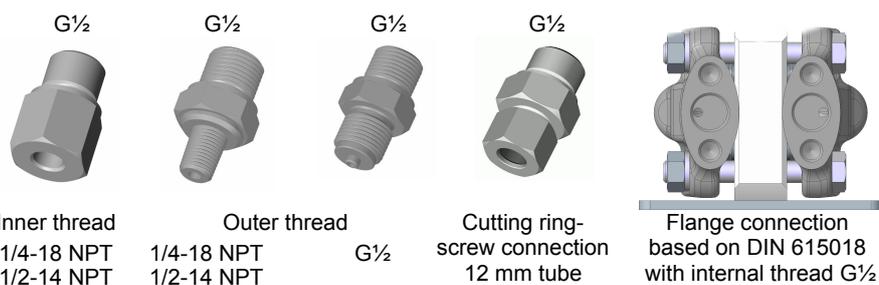


Fig. 2: Options for the process connection

2.2.2 Nameplate

2.2.3 Contact elements



Limit switch in accordance with data sheet KE##	Rotation angle encoder in accordance with data sheet KE09
for standard devices	
<ul style="list-style-type: none"> • Low-action contacts • Snap-actiocontacts • Inductive contacts 	<ul style="list-style-type: none"> • KINAX 3W2 708-226D0 • KINAX 3W2 708-226E0
for ATEX devices	
<ul style="list-style-type: none"> • Snap-action contacts • Inductive contacts 	<ul style="list-style-type: none"> • KINAX 3W2 708-226D0 • KINAX 3W2 708-226E0

Fig. 3: Contact elements

2.2.4 Special functions



- Marker needle
- Trailing needle

Fluid fillings
<ul style="list-style-type: none"> • Unit without contacts <i>Paraffin oil, glycerine, silicon oil</i>
<ul style="list-style-type: none"> • Unit with low-action contacts <i>Paraffin oil, silicon oil</i>
<ul style="list-style-type: none"> • Units with magnetic spring contacts <i>Silicon oil</i>
<ul style="list-style-type: none"> • Unit with inductive contacts <i>Paraffin oil, silicon oil</i>

Fig. 4: Special functions

2.2.5 Assembly

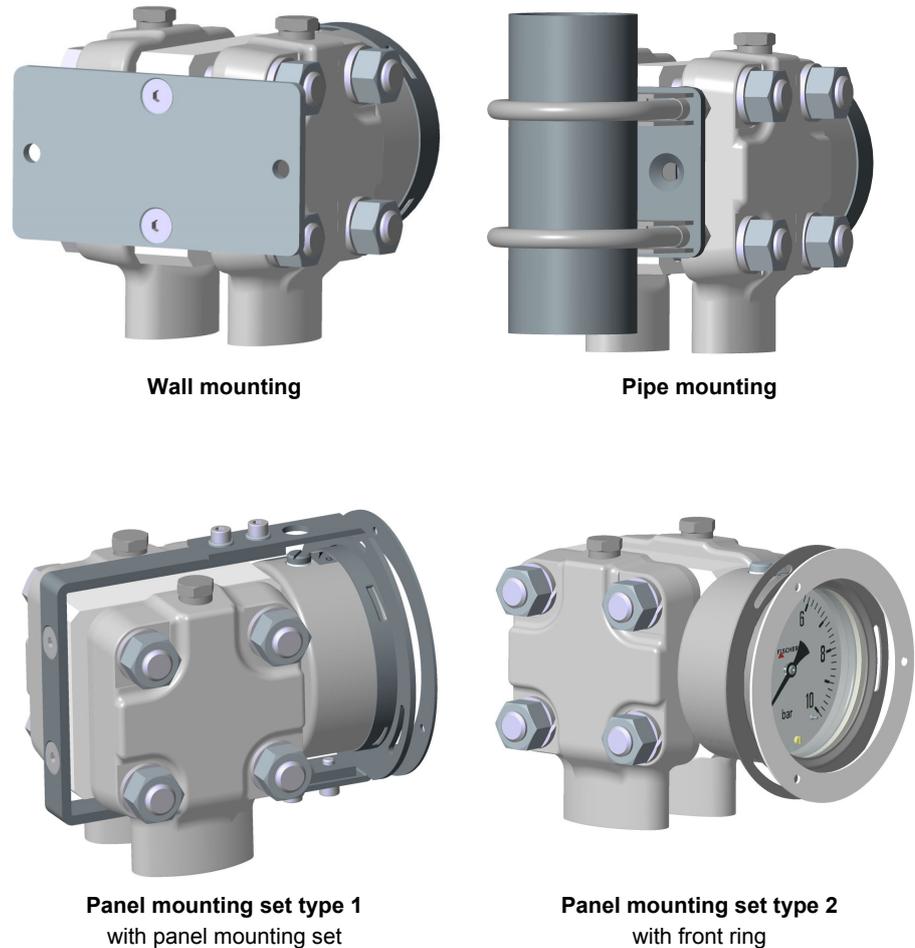


Fig. 5: Assembly

The panel installation fittings can only be used in devices with a small measuring cell ($\varnothing 75$) and a display in the NG100 bayonet ring casing.



⚠ WARNING

Panel mounting set

Due to the heavy weight, the operator needs to install a support construction for installation of the front panel.

2.2.6 Equipment features (overview)

The following shows the configuration possibilities of the DA01 depending on the measuring cell used and the pressure level.

Key

- available
- on request

Small measuring cell Ø75

Measuring range	Measured value display Ø100	Low-action contacts			Snap-action contacts			Inductive contacts		Rotation angle transducer	Trailing needle	Marker needle	Remote seal	Pressure level
		1	2	3	1	2	3	1	2					
0 ... 0.6 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	PN250/PN400
0 ... 1 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 1.6 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 2.5 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 4.0 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 6bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 10 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 16 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 25 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
-1 ... 0.6 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
-1 ... 1.5 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
-1 ... 3 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
-1 ... 5 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	

Fig. 6: Small measuring cell Ø75 Measured value display Ø100

Measuring range	Measured value display Ø160	Low-action contacts			Snap-action contacts			Inductive contacts		Rotation angle transducer	Trailing needle	Marker needle	Remote seal	Pressure level
		1	2	3	1	2	3	1	2					
0 ... 0.6 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●		<input type="checkbox"/>	●	●	PN250/PN400
0 ... 1 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 1.6 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 2.5 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 4.0 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 6bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 10 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 16 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
0 ... 25 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
-1 ... 0.6 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
-1 ... 1.5 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
-1 ... 3 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	
-1 ... 5 bar	●				<input type="checkbox"/>	<input type="checkbox"/>		●	●	●	<input type="checkbox"/>	●	●	

Fig. 7: Small measuring cell Ø75 Measured value display Ø160

Large measuring cell Ø130

Measuring range	Measured value display Ø100	Low-action contacts			Snap-action contacts			Inductive contacts		Rotation angle transducer	Trailing needle	Marker needle	Remote seal	Pressure level
		1	2	3	1	2	3	1	2					
0 ... 40 mbar	●											●		PN250
0 ... 60 mbar	●							□				●		
0 ... 100 mbar	●				□	□		●	●	●	□	●	●	
0 ... 160 mbar	●				□	□		●	●	●	□	●	●	
0 ... 250 mbar	●				□	□		●	●	●	□	●	●	
0 ... 400 mbar	●				□	□		●	●	●	□	●	●	
-40 ... +60 mbar	●				□	□		●	●	●	□	●	●	
-60 ... +100 mbar	●				□	□		●	●	●	□	●	●	
-100 ... +150 mbar	●				□	□		●	●	●	□	●	●	
-100 ... +250 mbar	●				□	□		●	●	●	□	●	●	

Fig. 8: Large measuring cell Ø130 Measured value display Ø100

Measuring range	Measured value display Ø160	Low-action contacts			Snap-action contacts			Inductive contacts		Rotation angle transducer	Trailing needle	Marker needle	Remote seal	Pressure level
		1	2	3	1	2	3	1	2					
0 ... 40 mbar	●											●		PN250
0 ... 60 mbar	●											●		
0 ... 100 mbar	●				□	□		●	□	●	□	●	●	
0 ... 160 mbar	●				□	□		●	●	●	□	●	●	
0 ... 250 mbar	●				□	□		●	●	●	□	●	●	
0 ... 400 mbar	●				□	□		●	●	●	□	●	●	
-40 ... +60 mbar	●				□	□		●	●	●	□	●	●	
-60 ... +100 mbar	●				□	□		●	●	●	□	●	●	
-100 ... +150 mbar	●				□	□		●	●	●	□	●	●	
-100 ... +250 mbar	●				□	□		●	●	●	□	●	●	

Fig. 9: Large measuring cell Ø130 Measured value display Ø160

2.3 Function diagram

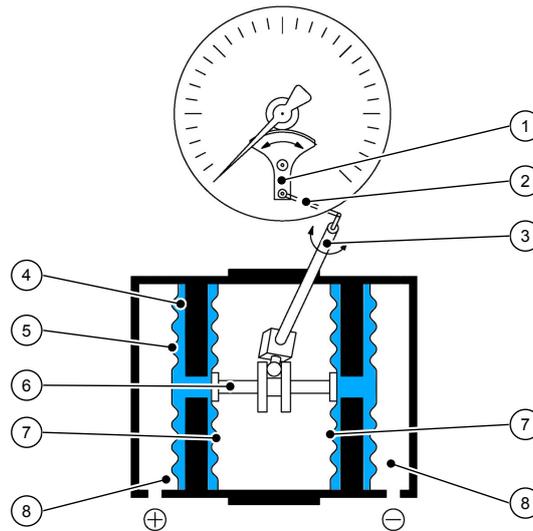


Fig. 10: Function diagram

1	Motion train	2	Transfer lever
3	Measuring shaft	4	Pressure transfer fluid
5	Separating membrane	6	Connecting rod
7	Measuring diaphragm	8	Pressure chamber

2.4 Design and mode of operation

The pressures in the pressure chambers that are to be compared are each exerted onto a measuring membrane that can be rigidly connected using a connection rod. To compensate the static pressure, the space between the separating and measuring membrane is filled with a pressure transfer fluid.

During pressure equalisation, the two measuring membranes are in an idle position. In case of pressure difference, the force acting on the membranes causes it to be moved towards the side of the lower pressure.

The connecting rod transfers the deflection of the measuring membranes onto the transfer lever mounted to the measuring shaft. Proportional to the current differential pressure, the measurement shaft makes a rotational movement that the indicator translates into a rotation angle between 0 and 270°.

In the case of one-sided pressure by the measuring system above and beyond the measuring range, the over-pressure guard will be activated which supports the overloaded membrane.

3 Assembly

3.1 General information

The device can be mounted in one of the following ways (see Assembly):

1. **Wall mounting**

The device is designed for installation onto flat assembly plates. The unit is equipped with a wall mounting plate for this mounting type.

2. **Pipe assembly**

The device is equipped with a special pipe assembly set and is suitable for mounting to a 2" pipe (DN50).

3. **Panel mounting**

Panel mounting is available in two installation models.

– **Panel mounting fittings** (Type 1)

This variant is only suitable for models with a small measuring system (Ø75) and a bayonet ring casing NG100.

– **Panel installation with front ring** (Type 2)

All models are suitable for this variant. A suitable steel construction must be used to ensure that the front plate can bear the weight of the DA03. This is possible e.g. by means of a combination with the wall or pipe assembly.

At the factory, the device is calibrated for vertical installation, but the installation position is arbitrary. For any installation positions that are not vertical, the zero-point signal can be corrected via the installed offset correction.

To ensure safety during installation and maintenance, we recommend installing a suitable shut-off valve on the system (see accessories).

3.2 Process connection

- By authorized and qualified specialized personnel only.
- The pipes need to be depressurized when the instrument is being connected.
- Appropriate steps must be taken to protect the device from pressure surges.
- Check that the device is suitable for the medium being measured.
- Maximum pressures must be observed (cf. Tech. data)

All supply lines are arranged so that there are no mechanical forces acting on the device.

The pressure lines must be kept as short as possible and installed without any tight bends to avoid delays.

The pressure lines must be installed at an inclination so that when fluids are measured no air pockets are created or when measuring gases, no water pockets are created. If the required inclination is not reached, water or air filters must be installed at suitable places.

The pressure lines need to be vented for fluid measuring media. [► 15].

If water is used as a measuring medium, the unit must be protected against frost.

If the pressure sensing lines are already pressurised at the time of commissioning, zero-point control and adjustment cannot be performed. In such cases, the device should be only connected to the mains without the pressure sensing lines.

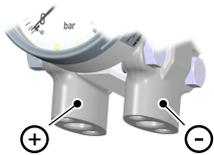


Fig. 11: Process connection

The process connections are marked with (+) and (-) symbols on the device. The pressure lines must be mounted according to these symbols.

Differential pressure

- ⊕ Higher pressure
- ⊖ lower pressure

3.3 Electrical connections

- By authorized and qualified specialized personnel only.
- When connecting the unit, the national and international electro-technical regulations must be observed.
- Disconnect the system from the mains, before electrically connecting the device.
- Install the consumer-adapted fuses.
- Do not connect the connector if strained.

Only devices with contact elements are connected to the electrical supply. To this end there is a cable socket on the side of the device, or a HAN plug in the power plant version.

3.3.1 Cable socket / HAN plug

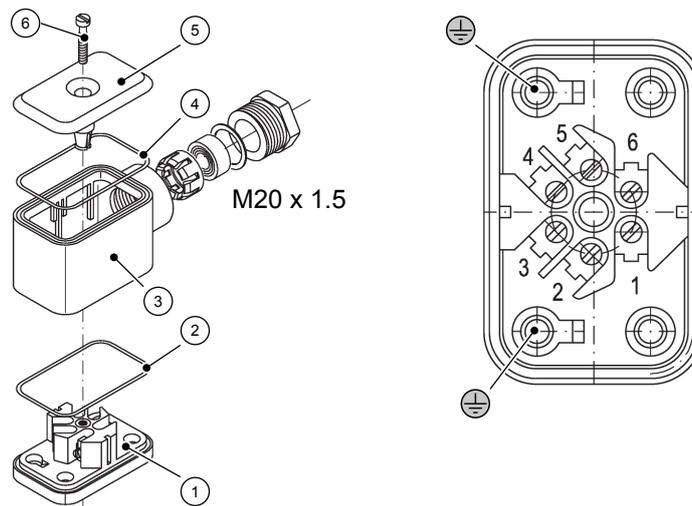


Fig. 12: Cable socket

1	Lower part	2	Sealing ring EPDM
3	Middle part	4	Sealing ring EPDM
5	Lid	6	Lid screw

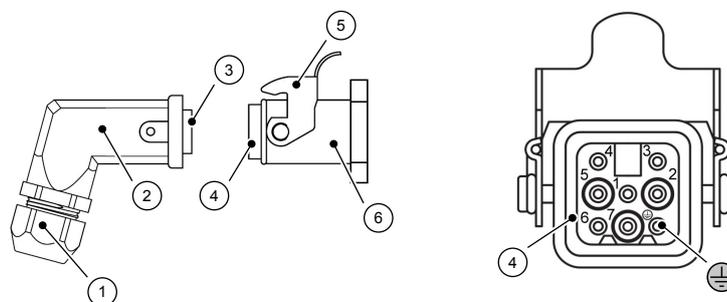


Fig. 13: HAN connector

1	Cable screw connection M20 x 1.5	2	Sleeve housing Han 3A
3	Socket insert Han 7D	4	Pin insert Han 7D
5	Safety clip	6	Attachment casing Han 3D

3.3.2 Contact elements

Contact elements are supplied in accordance with [data sheet KE](#). This illustrates all variants, their pin assignment and the technical data.

Creep and magnetic spring contacts

The terminal numbers always correspond to the contact number and are assigned to the target indicators from left to right. Up to three contacts can be used. There are assigned to the target indicators as follows:

1. For 2 contacts
 Contact 1: left target indicator
 Contact 2:right target indicator
2. For 3 contacts
 Contact 1: left target
 Contact 2: middle target
 Contact 3: right target

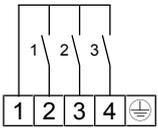
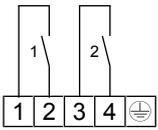


Fig. 14: Contacts

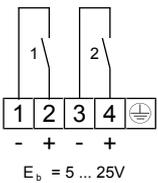


Fig. 15: Inductive contacts

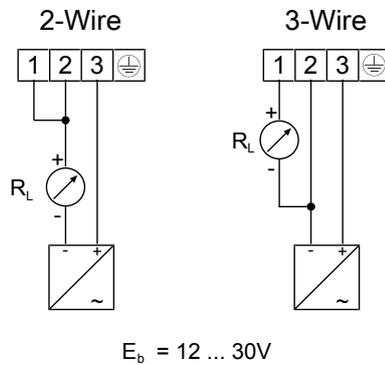
Inductive contacts

In the case of inductive contacts, the switch function is not only determined by the slot type initiator but also by the switch amplifier. Up to max two contacts can be used. There are assigned to the target indicators as follows:

- Contact 1: left target indicator
- Contact 2:right target indicator.

3.3.3 Rotation angle transducers KINAX 3W2

The rotation angle encoder serves to record angular positions, to prepare and provide the measured values as electrical output signals 0/4 ... 20 mA for the following device. Rotation angle encoder is supplied in accordance with [data sheet KE09](#). This contains further information about the pin assignment and the technical data.



$E_b = 12 \dots 30V$

Fig. 16: Rotation angle transducers connection

4 Commissioning

4.1 General

All electrical supply, operating and measuring lines, and the pressure connections must have been correctly installed before commissioning. All supply lines are arranged so that there are no mechanical forces acting on the device.

Check that all pressure connections are free of leaks before commissioning.

In models filled with fluid, the venting valve on the upper side of the bayonet casing must be opened before commissioning! To do this, turn the venting screw anticlockwise as far as it will go.

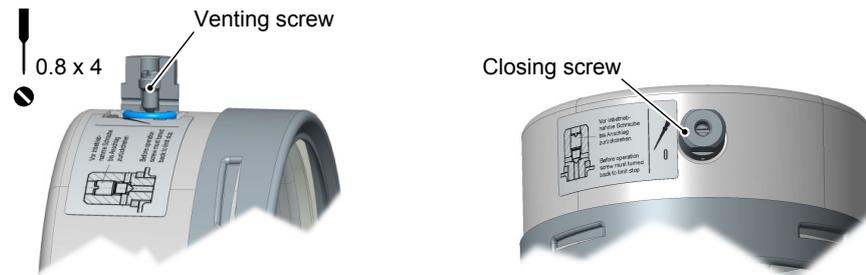


Fig. 17: Venting valve

4.2 Venting of the pressure lines



WARNING

Risk connected to pressure

Never remove the venting screw if the unit is still pressurised! Close the shut-off valves of the flanged fittings or depressurize the system.

The pressure lines need to be vented for before commissioning on devices that work with fluid media. Proceed as follows:

- Remove the venting screws of the two pressure chambers.
- Carefully increase the system pressure until the fluid level is 5 mm below the sealing surface of the threaded borehole.
- Close the device with the venting screws

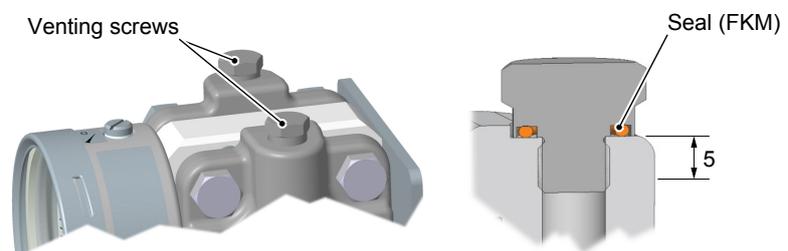


Fig. 18: Venting with fluid media

4.3 Zero point correction

The differential pressure measuring units are set in the factory before delivery so that they do not usually need to be adjusted at the assembly site. If this is still necessary, proceed as follows:

- Depressurize the measuring chamber (+) and (-) side or only exert the existing static system pressure.
- Remove the closing screw The zero point correction screw is located behind.
- Set the measurement value pointer to the scale zero point using the zero point correction screw.
- Mount the closing screw

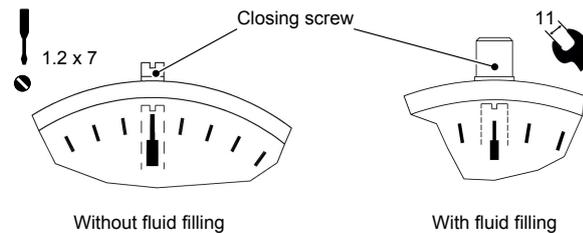


Fig. 19: Zero point correction screw

4.4 Switch point setting

There is an adjustment lock attached to the front pane of the measuring unit on units with contact elements. This means that the contacts attached to the target indicators can be set to any point along the scale.

To facilitate switching precision and the service life of the mechanical measuring system, the switching points should lie between 10% and 90% of the measuring range.

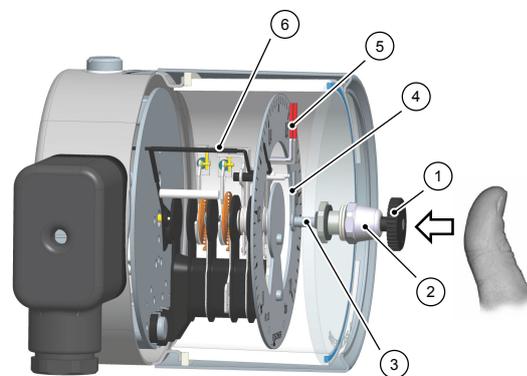


Fig. 20: Switch point setting

1	Adjustment key	2	Adjusting lock
3	Axle	4	Drive arm
5	Set-point display	6	Actual value display

Adjustment sequence:

- Press the axle inwards until the drive arm reaches behind the setting pin of the target value indicator.
- Set the target value indicator to the required switch point by turning the setting key.
- Relieve the axle.
- The switch-point setting can be secured against unintentional adjustment by removing the attachment screw and the adjustment key.

5 Servicing

5.1 Maintenance

The instrument is maintenance-free. We recommend the following regular inspection to guarantee reliable operation and a long service life:

- Check the function in combination with downstream components.
- Check the leak-tightness of the pressure connection lines.
- Check the electrical connections.

The exact test cycles need to be adapted to the operating and environmental conditions. In combination with other devices, the operating instructions for the other devices also need to be observed.

5.2 Transport

The measuring device must be protected against impacts. It should be transported in the original packaging or a suitable transport container.

5.3 Service

All defective or faulty devices should be sent directly to our repair department. Please coordinate all shipments with our sales department.



WARNING

Process media residues

Process media residues in and on dismantled devices can be a hazard to people, animals and the environment. Take adequate preventive measures. If required, the devices must be cleaned thoroughly.

Return the device in the original packaging or a suitable transport container.

5.4 Disposal



WARNING

Incorrect disposal may pose a risk to the environment.

Please help to protect the environment by always disposing of the work pieces and packaging materials in compliance with the valid national waste and recycling guidelines or reuse them.

6 Technical Data

6.1 Allgemeines

EXECUTION	Nominal pressure	Measuring cell	Application information
DA01 V ...	PN250	Ø75	<p>Measuring ranges: 0...0.6 bar to 0...25 bar</p> <p>Remote seals: It is possible to attach remote seals for all measuring ranges. The remote seals need to be designed for the displacement volume, the length of the cable and the application temperature.</p>
DA01 U ...	PN400	Ø75	<p>Measuring ranges: 0...0.6 bar to 0...25 bar</p> <p>Remote seals: It is possible to attach remote seals for all measuring ranges. The remote seals need to be designed for the displacement volume, the length of the cable and the application temperature.</p>
DA01 W ...	PN250	Ø130	<p>Measuring ranges: 0...40 mbar to 0...400 bar</p> <p>Limitations: Drag indicator measuring ranges ≥ 60 mbar Contacts / Transmitter measuring ranges ≥ 100 mbar</p> <p>Remote seals: It is possible to attach remote seals for measuring ranges ≥ 160 mbar. The remote seals need to be designed for the displacement volume, the length of the cable and the application temperature.</p>

6.2 Input variables

Measuring variable

Differential pressure in gaseous and fluid aggressive media.

General

Rated pressure of the measuring system	Max. static operating pressure
Durability	One-sided over-pressure-proof up to the rated pressure of the measuring system resistance to under-pressure on the (+) and (-) side
Measurement accuracy	±1.6 % of the measuring range
Temperature sensor	0.3 % / 10 °C
Zero-point adjustment	±25 % of the measuring range

Measuring ranges

Small measuring cell Ø75

Measuring range	Device model		
	V	U	W
0 ... 0.6 bar	•	•	
0 ... 1 bar	•	•	
0 ... 1.6 bar	•	•	
0 ... 2.5bar	•	•	
0 ... 4.0 bar	•	•	
0 ... 6 bar	•	•	
0 ... 10 bar	•	•	
0 ... 16 bar	•	•	
0 ... 25 bar	•	•	
-1 ... 0.6 bar	•	•	
-1 ... 1.5 bar	•	•	
-1 ... 3 bar	•	•	
-1 ... 5 bar	•	•	

Large measuring cell Ø130

Measuring range	Device model		
	V	U	W
0 ... 40 mbar			•
0 ... 60 mbar			•
0 ... 100 mbar			•
0 ... 160 mbar			•
0 ... 250 mbar			•
0 ... 400 mbar			•
0 ... 600 mbar			•

6.3 Operating conditions

Permissible ambient temperature	-20 ... +80 °C
Admissible storage temperature	-40 ... +80 °C
Admissible media temperature	Max. 100 °C
Type of protection:	IP 65 acc. to EN 60529

6.4 Construction design

Materials

Measured value display	Material	Material no.	
		EU	AISI
Bayonet ring housing NG100, NG160	CrNi steel	1.4301	304
Process connection (all models)	CrNi steel	1.4404	316L
Intermediate plate	AlMgSiPb	HARD-COAT®	
Seals (O-rings)	FKM		
Motion train	CrNi steel		
Dial face and needle	Aluminium, painted, printed		
Inspection disk	Safety laminated glass		

MB = Measurement range

Materials (media-contacting)

Design of the measuring system (R)	Material	Material no.	
		EU	AISI
Pressure caps	CrNi steel	1.4404	316L
Separation membranes	CrNi steel	1.4571	361Ti

Design of the measuring system (G)	Material	Material no.	
		EU	AISI
Pressure caps	CrNi steel	1.4404	316L
Separation membranes	Hastelloy® C276		

Process connection	Material	Material no.	
		EU	AISI
Connecting piece and port	CrNi steel	1.4404	316L
Cutting ring screw connections	CrNi steel	1.4571	

Assembly

Wall mounting	Flanged assembly plate
Pipe mounting	Flanged assembly plate and attachment bracket
Panel mounting set type 1	Panel installation fittings for units with a small measuring cell (Ø75) and NG100 bayonet ring casing.
Panel mounting set type 2	Front ring and support construction

6.4.1 Additional Attachments

6.4.1.1 Contact elements

Limit signal transmitters (contacts) and capacitive rotation angle transducers with an output signal proportional to the angular position can be fitted into a housing augmented by a corresponding bayonet ring connector.

A certain minimum pressure level is required to operate this kind of contact element, which is why there is a lower limit for the mbar measuring ranges. This limit depends on the model type and is stated in the section 'General'.

The measuring deviation increases by $\pm 0.5\%$ per contact when the contacts are driven and switched.

For more information and the order key, please refer to the data sheet:

- for limit switch in [data sheet KE](#)
- for rotation angle converter in the [data sheet KE09](#)

6.4.1.2 Fluid charging

Under aggravated operating conditions, such as vibrations and extreme pressure fluctuations, or in order to avoid condensation forming if used outdoors, the casing can be filled with the following fluids depending in the type of contacts installed:

without contacts	Glycerine, silicon oil
Low-action contacts	Silicon oil
Magnetic spring contacts	Silicon oil
Inductive contacts	Paraffin oil
Rotation angle transducer	no filling possible

6.4.1.3 Marker needle

A settable red marker can be attached to the scale to clearly show a certain pressure (limit value).

6.4.1.4 Trailing needle

The trailing needle is 'dragged' with the measured value indicator. As there is no fixed connection between the two needles, one-off maximum values are stored. The trailing needle can be reset using an adjusting dial in the window. Trailing needles cannot be used in conjunction with contacts. A certain minimum pressure level is required to move the drag indicator, which is why there is a lower limit for the mbar measuring ranges. This limit depends on the model type and is stated in the section 'General'.

6.4.1.5 Shut-off fitting

3-spindle valve block PN 100, DN 5, can be directly flanged

- Type DZ3600SV2700
- Material 1.4571
- Functions: Shut-off, pressure compensation

6.4.2 Electrical connection

In the case of devices with additional electronic equipment, the connection is realised using a cable socket attached to the side and/or with a Han 7D connector on the power plant models. The pin assignment depends on the ordered mode and is stated in the data sheet KE or KE09.

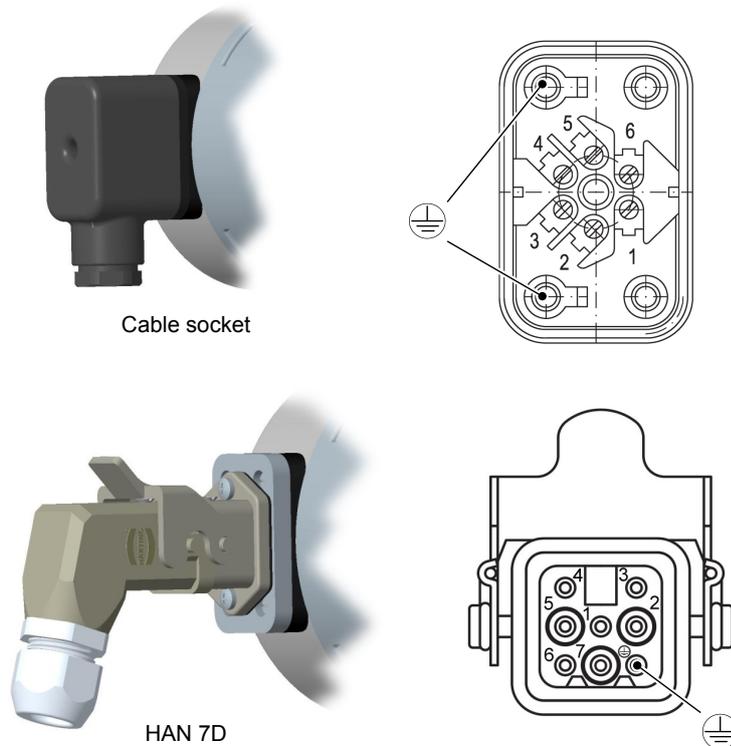


Fig. 21: Cable socket

Cable socket

Number of screw terminals	6 + 2PE
Rated current	See data sheet KE
Rated voltage	250 V
Cable diameter	up to 1.5 mm ² with wire protection
Cable screw connection	M20 x 1.5, terminal range 7 ... 13 mm

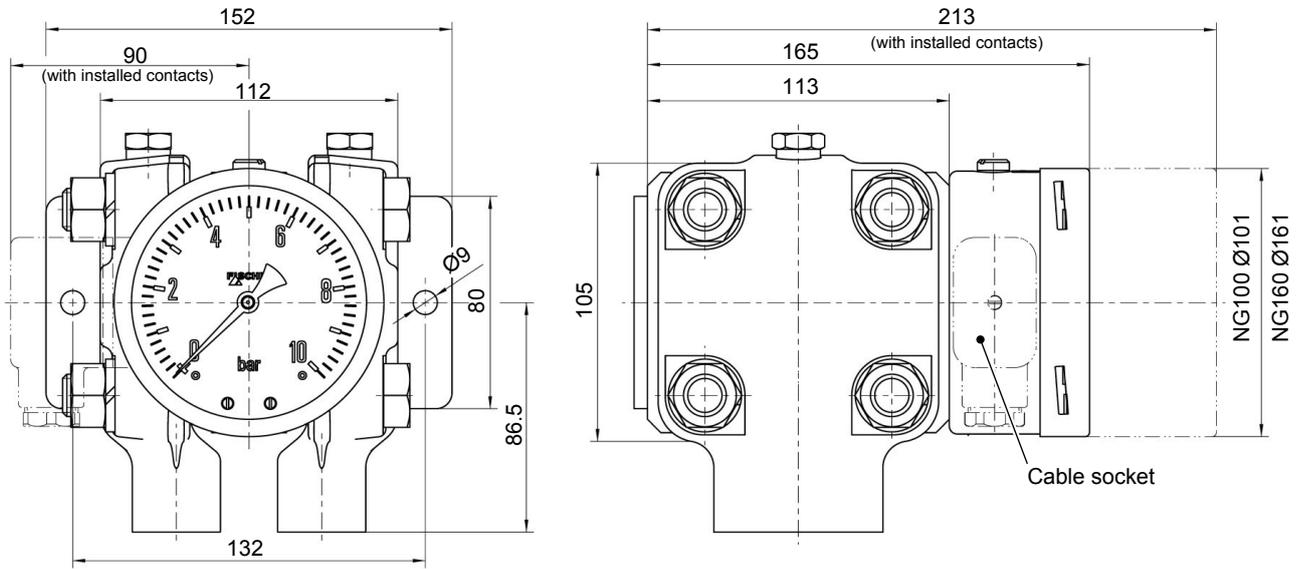
HAN 7D

No. of crimp contacts	7 + PE
Rated current	See data sheet KE
Rated voltage	50 V
Cable diameter	1 mm ²
Cable screw connection	M20 x 1.5, terminal range 7 ... 13 mm

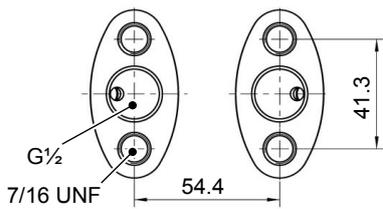
6.4.3 Dimensional drawings

All dimensions in mm unless otherwise stated

Small measuring system (Ø75)



Flange based on DIN EN 61518



Wall mounting plate

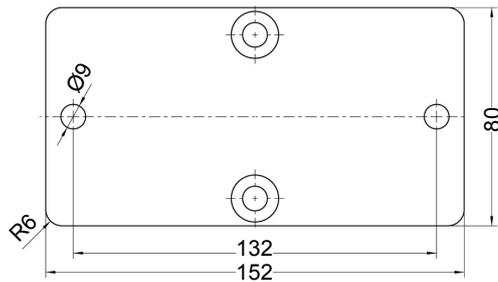


Fig. 22: Dimensional drawing (Small measuring system Ø75)

2" pipe mounting (possible for all models)

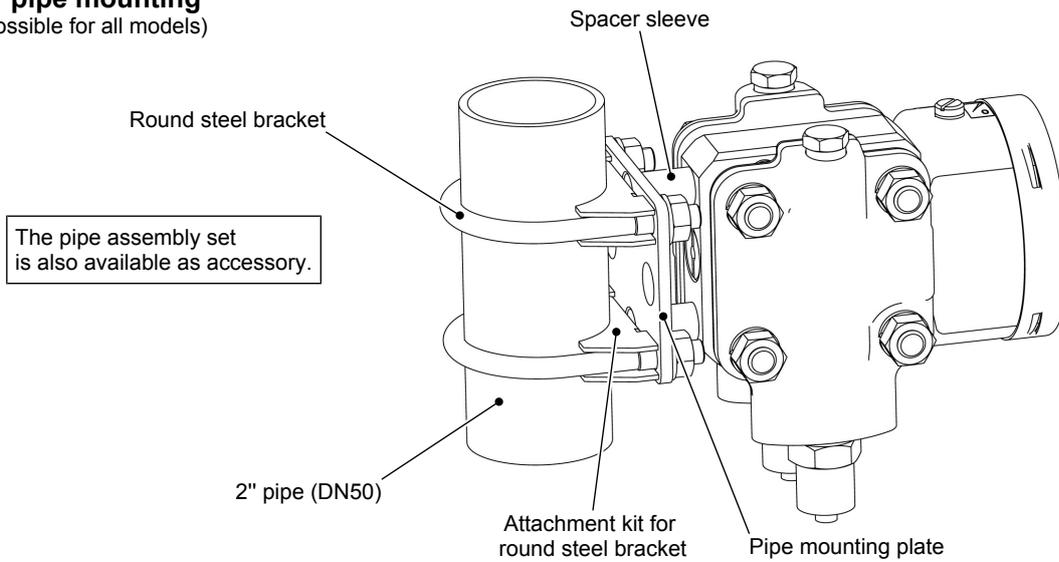
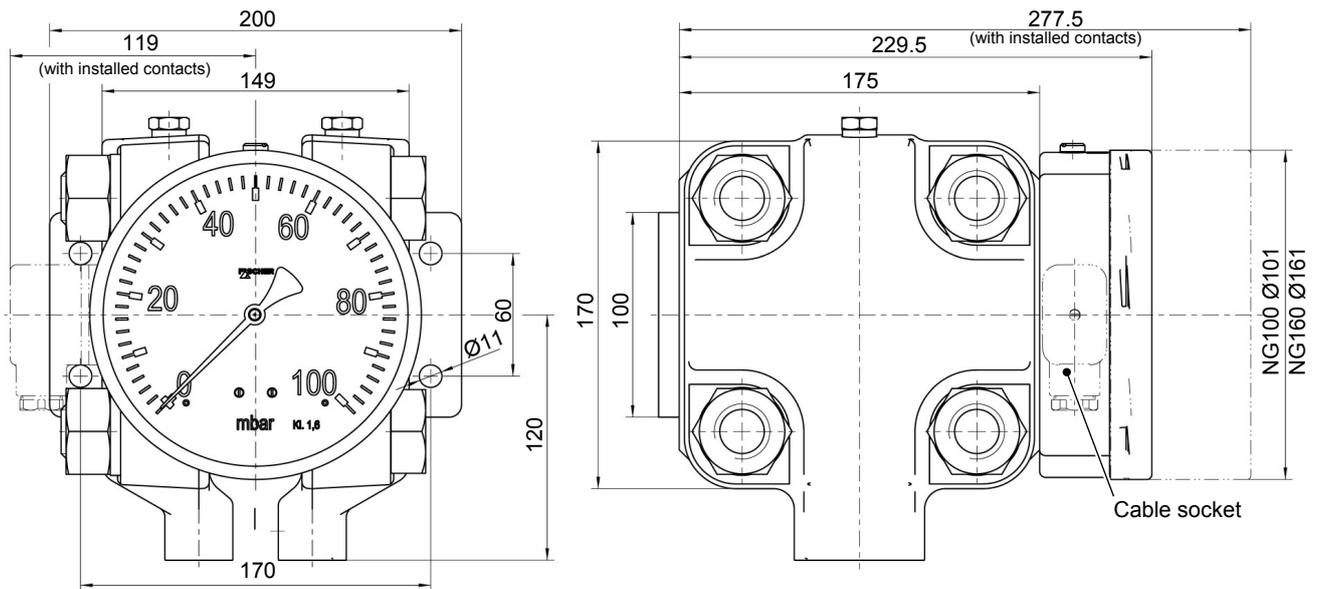
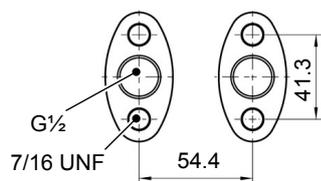


Fig. 23: Pipe mounting

Large measuring system (Ø130)



Flange based on DIN EN 61518



Wall mounting plate

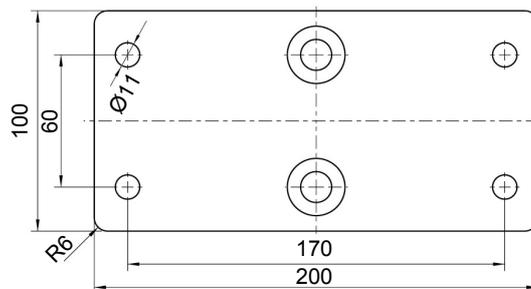
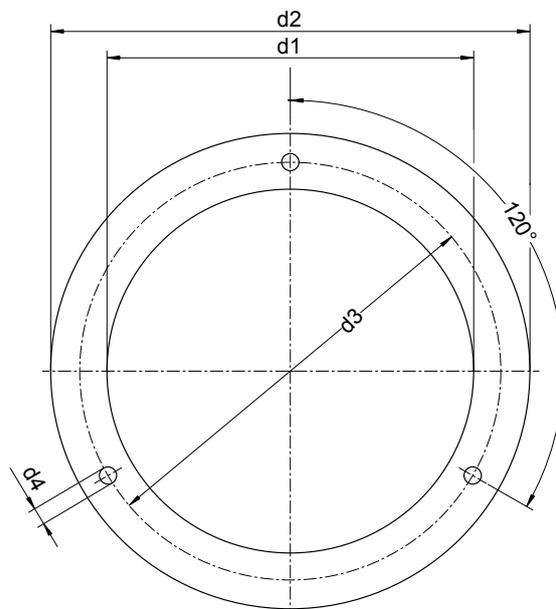
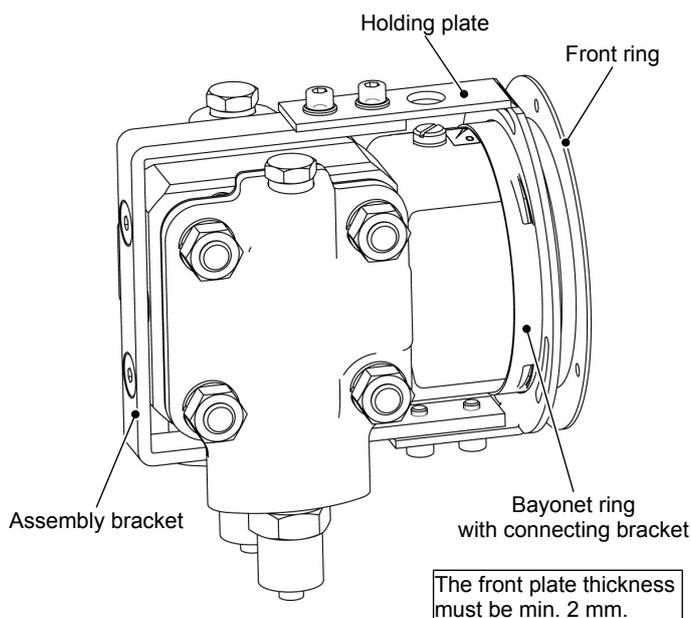


Fig. 24: Dimensional drawing (Large measuring system Ø130)

Installation of front panel type 1

(only small measuring system Ø75 and NG100 display)

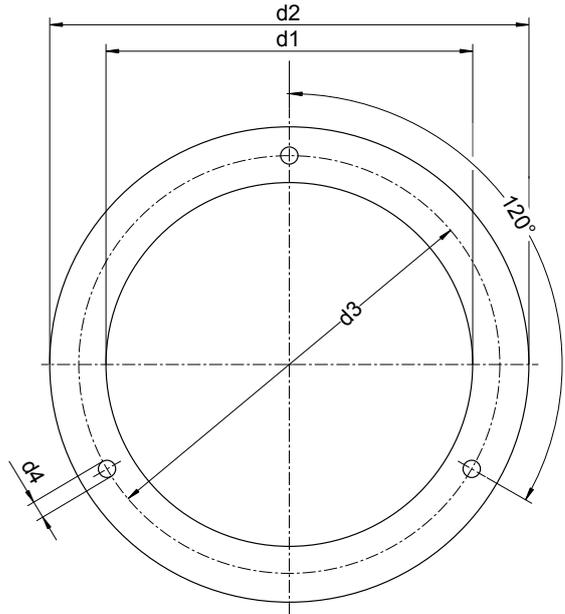
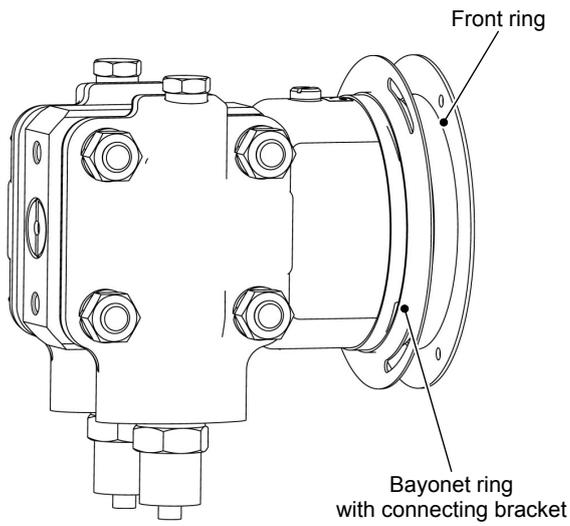


	d1	d2	d3	d4
NG100	101	132	116	4.8

Fig. 25: Installation of front panel with panel fittings

Installation of front panel type 2

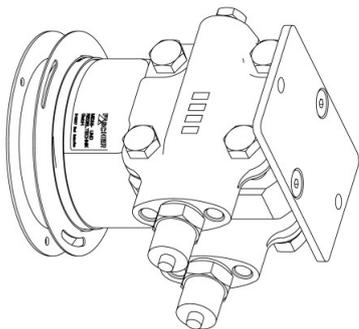
The front plate thickness must be min. 2 mm.



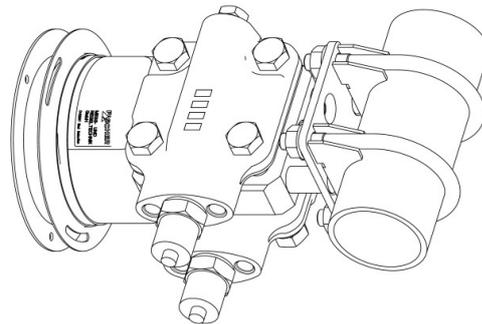
	d1	d2	d3	d4
NG100	101	132	116	4.8
NG160	161	196	178	5.8

A suitable steel construction must be used to ensure that the front plate can bear the weight of the DA03.

Examples:



Assembly on a mounting plate



Mounting to a 2" pipe

Fig. 26: Installation of front panel with front ring

Contact elements

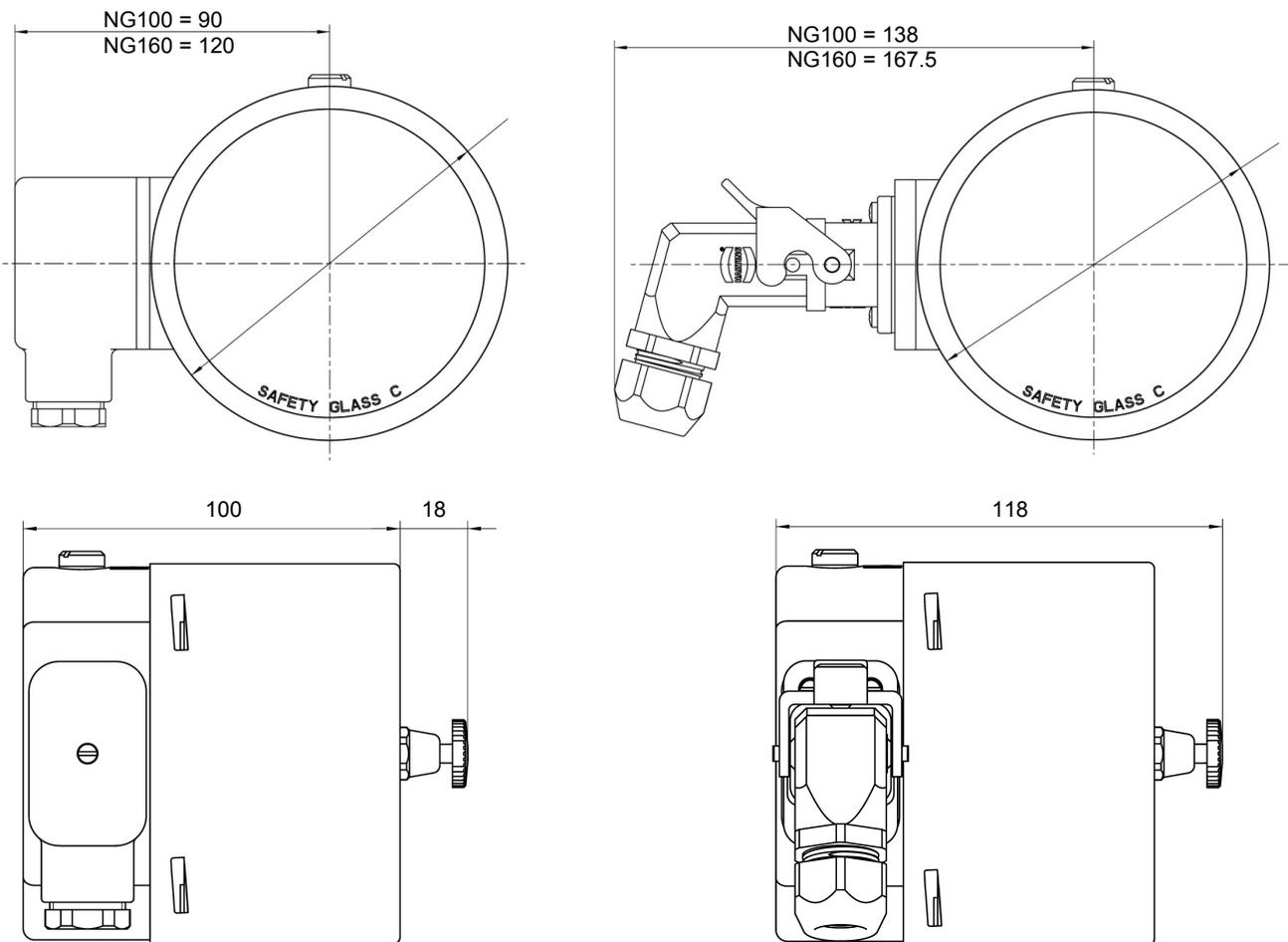


Fig. 27: Dimensional drawing contact devices

Shut-off fitting
with inner spindle thread

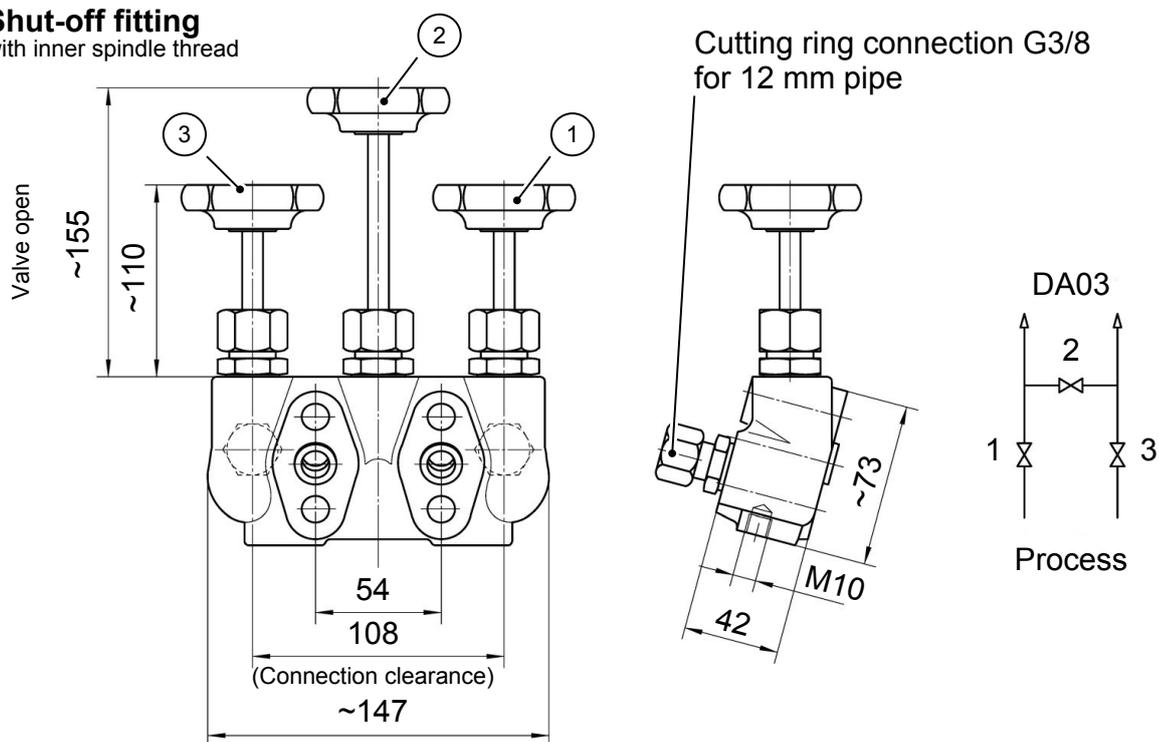
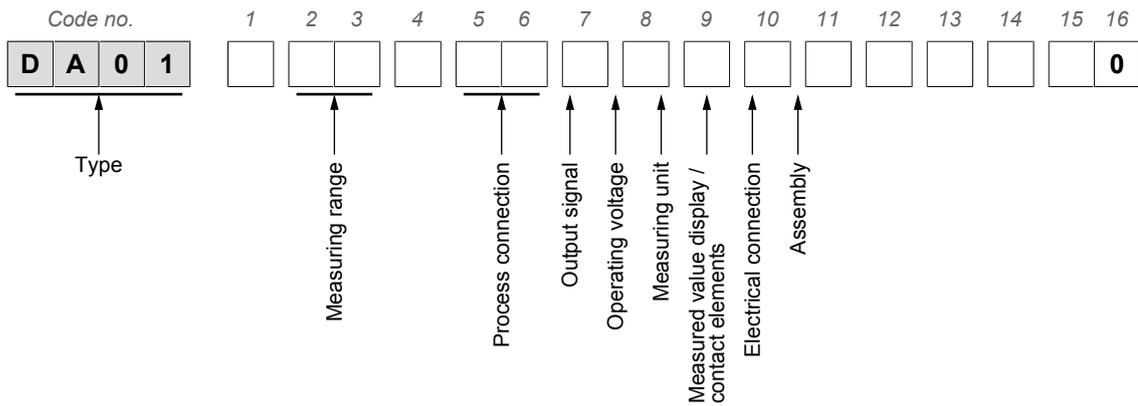


Fig. 28: Shutoff valve DZ3600SV2700

7 Order Codes



Device model:

[1]	Pressure level	Measuring cell
V	PN250	Ø75
U	PN400	Ø75
W	PN250	Ø130

Measuring range:

Small measuring system
Ø75

[2.3]	Measuring range	Device model		
		V	U	W
01	0 ... 0.6 bar	•	•	
02	0 ... 1 bar	•	•	
03	0 ... 1.6 bar	•	•	
04	0 ... 2.5bar	•	•	
05	0 ... 4.0 bar	•	•	
06	0 ... 6 bar	•	•	
07	0 ... 10 bar	•	•	
08	0 ... 16 bar	•	•	
09	0 ... 25 bar	•	•	
32	-1 ... 0.6 bar	•	•	
33	-1 ... 1.5 bar	•	•	
34	-1 ... 3 bar	•	•	
35	-1 ... 5 bar	•	•	

**Large measuring system
Ø130**

[2.3]	Measuring range	Device model		
		V	U	W
57	0 ... 40 mbar			•
58	0 ... 60 mbar			•
59	0 ... 100 mbar			•
60	0 ... 160 mbar			•
82	0 ... 250 mbar			•
83	0 ... 400 mbar			•
C1	0 ... 600 mbar			•
70	-40 ... +60 mbar			•
72	-60 ... +100 mbar			•
74	-100 ... +150 mbar			•
76	-100 ... +250 mbar			•

Design of the measuring system:

[4]	
R	Pressure chamber CrNi steel 1.4404 (AISI 316L) Measuring membrane standard
G	Pressure chamber CrNi steel 1.4404 (AISI 316L) Measuring membrane Hastelloy C276

Process connection:

[5.6]	
03	Flange connection based on DIN EN 61518 with internal thread G½
04	Connecting piece G½ with inside thread 1/4 -18 NPT
05	Connecting piece G½ with inside thread 1/2 -14 NPT
13	Connection shanks G½ with external thread G½
14	Connecting port G½ with outer thread 1/4-18 NPT
15	Connecting port G½ with outer thread 1/2-14 NPT
27	Cutting ring connection in brass for 12 mm pipe

Measured value display:

[7]	
L	Bayonet ring housing NG100
M	Bayonet ring housing NG160

Assembly:

[8]	
W	Wall mounting
R	Pipe mounting
T	Panel installation fittings (only a small measuring system Ø75, NG100 measured value display without contact elements)
G	Front ring for panel mounting

Fluid filling:

[9]	
0	Without fluid filling
1	Glycerine
4	Paraffin oil
5	Silicon oil

Special functions:

[10]	
0	Without special function
1	Adjustable marker needle
2	Resettable drag needle

Contacts/transmitters:

[11]	
0	No contacts/transmitters
1	Built-in contacts as per data sheet KE
2	Installed capacitive rotation angle encoder in accordance with data sheet KE09
5	Built-in contacts with plug connector (power plant model)

[12]	
0	Standard version

Limitations

A minimum operating pressure, which not all measuring ranges achieve, is required to activate a contact element or a drag indicator. Please also note the information about the equipment features [► 8].

7.1 accessories

Order no.	Planned measures	Material
DZ3600SV2700	Triple valve block DN5 PN420 <ul style="list-style-type: none"> • Flange connection acc. to DIN EN 61518 • Cutting ring screw connections 12 mm pipe • Including assembly set 	1.4571

Order no.	Planned measures	Type
05003065	Isolating unit amplifier 1-channel 24 V DC	TS500Ex-ia-1R-5
05003066	Isolating unit amplifier 2-channel 24 V DC	TS500Ex-ia-2R-5
05003083	Isolating unit amplifier 1-channel 230 V AC	TS500Ex-ia-1R-0
05003084	Isolating unit amplifier 2-channel 230 V AC	TS500Ex-ia-2R-0
05003070	Universal supplier isolator	ST500Ex-10-5
05003086	Universal supplier isolator	ST500Ex-10-0

8 EU Declarations of conformity



(Translation)

EU Declaration of Conformity

For the product described as follows

Product designation **Differential Pressure Gauge**
(with contact desvice KE ## S/M ##### H2)

Type designation **DA01 ... 10**

it is hereby declared that it corresponds with the basic requirements specified in the following designated directives:

2014/35/EU

Low Voltage Directive

2011/65/EU

RoHS Directive

The products were tested in compliance with the following standards.

Low Voltage Directive (LVD)

DIN EN 61010-1:2011-07
EN 61010-1:2010

Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

RoHS Directive (RoHS 2)

DIN EN 50581:2013-02
EN 50581:2012

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Also they were subjected to the conformity assessment procedure „Internal production control“.

The object of the declaration described above is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Sole responsibility for the issue of this declaration of conformity in relation to fulfilment of the fundamental requirements and the production of the technical documents is with the manufacturer.

Manufacturer **FISCHER Mess- und Regeltechnik GmbH**
Bielefelder Str. 37a
32107 Bad Salzufen, Germany
Tel. +49 (0)5222 974 0

Documentation representative Mr. Torsten Malischewski
B.Sc.
Development department

The devices bear the following marking:



Bad Salzufen
27 March 2018

p.p. M. Reichler
General sales manager





(Translation)

EU Declaration of Conformity

For the product described as follows

Product designation **Differential Pressure Gauge**
(with transmitter for angular position KE0905#9)

Type designation **DA01 ... 20**

it is hereby declared that it corresponds with the basic requirements specified in the following designated directives:

2014/30/EU *EMC Directive*
2011/65/EU *RoHS Directive*

The products were tested in compliance with the following standards.

Electromagnetic compatibility (EMC)

DIN EN 61000-6-2:2006-03 *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments*
EN 61000-6-2:2005
DIN EN 61000-6-2 Corrigendum:2011-06 *Corrigendum to DIN EN 61000-6-2*
DIN EN 61000-6-3:2011-09 *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments*
EN 61000-6-3:2007 + A1:2011
DIN EN 61000-6-3 Corrigendum 1:2012-11 *Corrigendum to DIN EN 61000-6-3*

RoHS Directive (RoHS 2)

DIN EN 50581:2013-02 *Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances*
EN 50581:2012

Also they were subjected to the conformity assessment procedure „**Internal production control**“.

The object of the declaration described above is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Sole responsibility for the issue of this declaration of conformity in relation to fulfilment of the fundamental requirements and the production of the technical documents is with the manufacturer.

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Development department

The devices bear the following marking:



Bad Salzuflen
27 March 2018

p.p. M. Reichler
General sales manager



Fig. 30: CE_EN_DA01_20

9 EAC Declaration



ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ ДЕКЛАРАЦИЯ О СООТВЕТСТВИИ

Заявитель Общество с ограниченной ответственностью «МАТИС-М». Место нахождения: 117261, город Москва, улица Вавилова, дом 70, корпус 3, комната правления, Российская Федерация. Адрес места осуществления деятельности: 109029, город Москва, город, Сибирский проезд, дом 2, корпус 12, Российская Федерация, Основной государственный регистрационный номер: 1037739575125, телефон: +7 495 725-23-09, адрес электронной почты: info@matis-m.ru

в лице Генерального директора Шарова Александра Анатольевича

заявляет, что Прибор - манометр для измерения дифференциального давления, тип DA01, DA03, DA08, DA09, DA10, DA12

Продукция изготовлена в соответствии с директивой 2014/30/EU

Изготовитель "FISCHER Mess- und Regeltechnik GmbH"

Место нахождения: Bielefelder Straße 37a, D-32107 Bad Salzuflen, Германия. Филиал завода-изготовителя: "FISCHER Mess- und Regeltechnik GmbH" место нахождения: Bielefelder Straße 37a, D-32107 Bad Salzuflen, Германия.

Код ТН ВЭД ЕАЭС 9026 20 400 0, серийный выпуск

Соответствует требованиям Технического регламента Таможенного союза ТР ТС 020/2011 "Электромагнитная совместимость технических средств"

Декларация о соответствии принята на основании протокола № 01228-02/2017-06 от 14.06.2017 года. Испытательной лаборатории (центра) продукции народного потребления "Отдел 101" Общества с ограниченной ответственностью "Межрегиональный центр исследований и испытаний", регистрационный номер аттестата аккредитации № RA.RU.21AO47 Схема декларирования: 3д

Дополнительная информация ГОСТ 30804.3.2-2013 Совместимость технических средств электромагнитная. Эмиссия гармонических составляющих тока техническими средствами с потребляемым током не более 16 А (в одной фазе). Нормы и методы испытаний

ГОСТ 30804.3.3-2013 Совместимость технических средств электромагнитная. Ограничение изменений напряжения, колебаний напряжения и фликера в низковольтных системах электроснабжения общего назначения. Технические средства с потребляемым током не более 16 А (в одной фазе), подключаемые к электрической сети при несоблюдении определенных условий подключения. Нормы и методы испытаний

Условия хранения продукции в соответствии с ГОСТ 15150-69. Срок хранения (службы, годности) указан в прилагаемой к продукции товаросопроводительной и/или эксплуатационной документации.

Декларация о соответствии действительна с даты регистрации по 14.06.2022 включительно

 М.П. Шаров Александр Анатольевич
(подпись) (Ф. И. О. заявителя)

Регистрационный номер декларации о соответствии: ЕАЭС N RU Д-ДЕ.АЛ16.В.77754

Дата регистрации декларации о соответствии: 15.06.2017

Fig. 31: ЕАЭС N RU Д-ДЕ.АЛ16.В.77754