

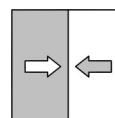


## Operation manual

### DA03 GK/HLP

Differential pressure measuring device  
Pressure levels PN40/PN100/PN160

Standard version



## Masthead

**Manufacturer:****FISCHER Mess- und Regeltechnik GmbH**

Bielefelderstr. 37a  
D-32107 Bad Salzuflen

Telephone: +49 5222 974 0  
Telefax: +49 5222 7170

eMail: [info@fischermesstechnik.de](mailto:info@fischermesstechnik.de)  
web: [www.fischermesstechnik.de](http://www.fischermesstechnik.de)

**Technical editorial team:**

Documentation representative: T. Malischewski  
Technical editor: R. Kleemann

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## Version history

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Rev. ST4-C 10/21	Version 3 (UKCA Declaration)
Rev. ST4-D 02/23	Version 4 (Liquid filling for inductive contacts)
Rev. ST4-E 07/23	Version 5 (Version T omitted)
Rev. ST4-F 02/24	Version 6 (Measuring cell Ø75 pressure caps changed)

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# 1 Safety guidelines

## 1.1 General

This operating manual contains basic instructions for the installation, operation and maintenance of the device that must be followed without fail. It must be read by the installer, the operator and the responsible specialist personnel before installing and commissioning the device.

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).

1. 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).

1. 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).

1. 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 DA03
- 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.

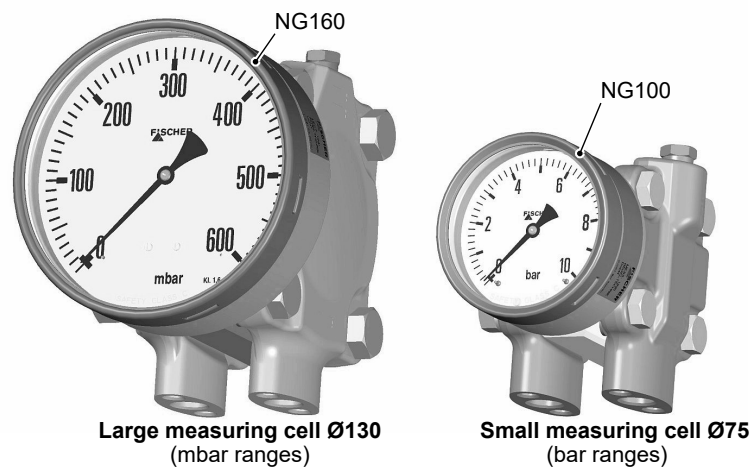


Fig. 1: Device overview

#### 2.2.1 Process connection

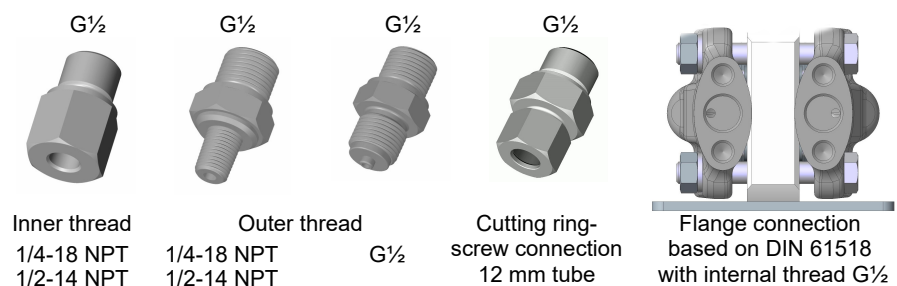


Fig. 2: Options for the process connection

#### 2.2.2 Nameplate

The presented type plates serve to show an example of the information shown. The data shown is purely fictive, but does correspond to the actual conditions. For more information, please see the order code at the end of these instructions.

Technical data	Order Codes	
Article no	DA0302LR03	 MESS- u. REGELTECHNIK GmbH D-32107 Bad Salzuffen
Measurement range	0...1 bar	
P stat. max.	100 bar	
Prod. - No	AB1509105.02.016	
	Made in Germany	

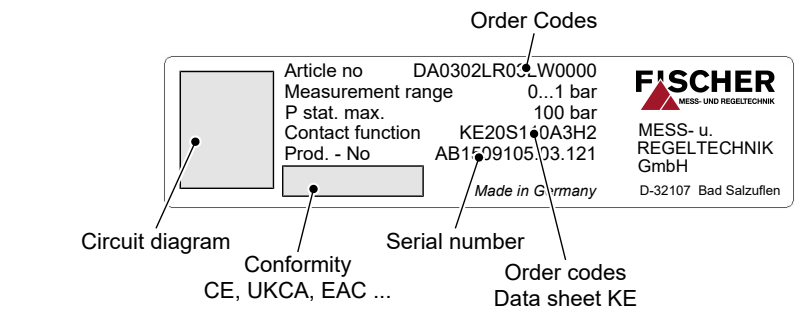
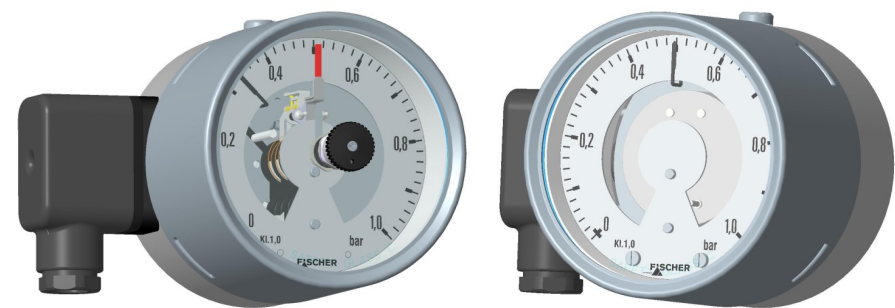


Fig. 3: Nameplate

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"><li>Low-action contacts</li><li>Snap-actiocontacts</li><li>Inductive contacts</li></ul>	<ul style="list-style-type: none"><li>KINAX 3W2 708-226D0</li><li>KINAX 3W2 708-226E0</li></ul>
for ATEX devices	
<ul style="list-style-type: none"><li>Snap-action contacts</li><li>Inductive contacts</li></ul>	<ul style="list-style-type: none"><li>KINAX 3W2 708-226D0</li><li>KINAX 3W2 708-226E0</li></ul>

Fig. 4: Contact elements

2.2.4 Special functions

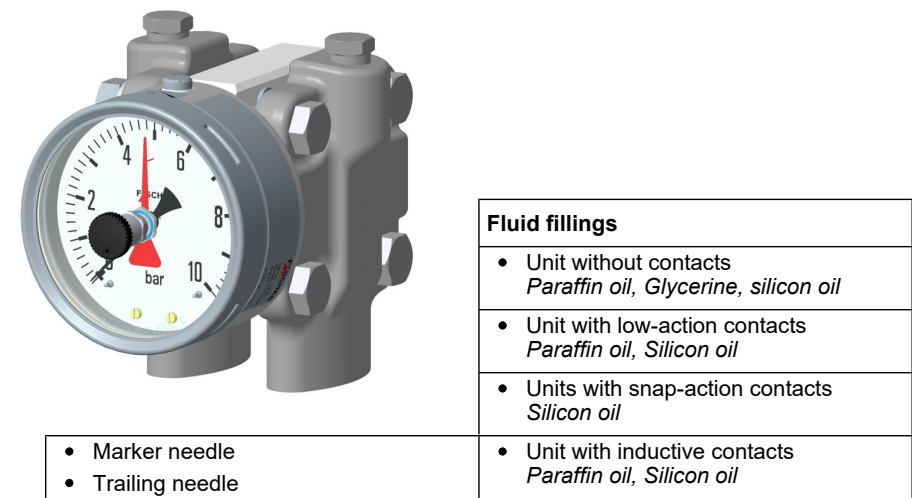
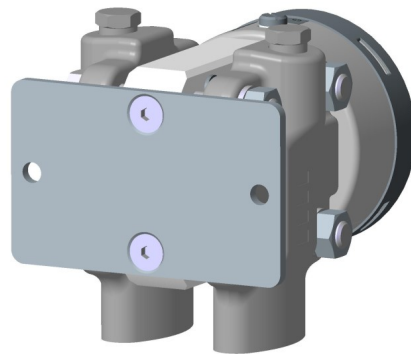
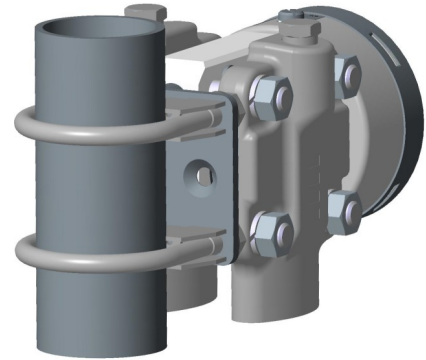


Fig. 5: Special functions

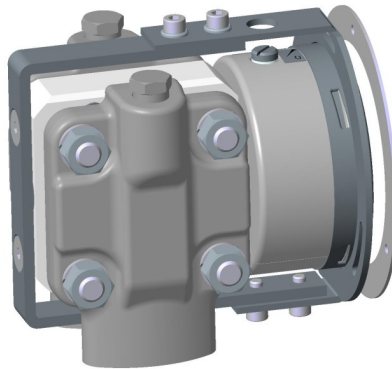
### 2.2.5 Assembly



Wall mounting



Pipe mounting



Panel mounting set type 1  
with panel mounting set



Panel mounting set type 2  
with front ring

Fig. 6: Assembly types

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 DA03 depending on the measuring cell used and the pressure level.

**NOTICE! All PN160 versions are only possible with one switching contact.**

#### **Key**

- available for PN40/PN100/PN160
- only available for PN40/PN100
- on request

**Small measuring cell Ø75**

Measurement range	Measurement display		Low-action contacts			Snap-action contacts			Inductive contacts		Rot. angle transducer	Trailing needle	Marker needle	Remote seal	Pressure level
	Ø100	Ø160	1	2	3	1	2	3	1	2					
0 ... 0.6 bar	○	○	○	○	○	○	○		○	○	○	○	○	○	PN40/PN100
0 ... 1 bar	○	○	○	○	○	○	○		○	○	○	○	○	○	
0 ... 1.6 bar	○	○	○	○	○	○	○		○	○	○	○	○	○	
0 ... 2.5 bar	○	○	○	○	○	○	○		○	○	○	○	○	○	
0 ... 4.0 bar	○	○	○	○	○	○	○		○	○	○	○	○	○	
0 ... 6bar	○	○	○	○	○	○	○		○	○	○	○	○	○	
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**

Measurement range	Measurement display		Low-action contacts			Snap-action contacts			Inductive contacts		Rot. angle transducer	Trailing needle	Marker needle	Remote seal	Pressure level
	Ø100	Ø160	1	2	3	1	2	3	1	2					
0 ... 40 mbar	○	○	□	□		□	□		□	□	○		○		PN40 PN100
0 ... 60 mbar	○	○	○	○		○	○		○	○	○	○	○		
0 ... 100 mbar	●	●	●	○		●	○		●	○	●	●	●	●	PN40/PN100/PN160
0 ... 160 mbar	●	●	●	○	○	●	○		●	○	●	●	●	●	
0 ... 250 mbar	●	●	●	○	○	●	○		●	○	●	●	●	●	
0 ... 400 mbar	●	●	●	○	○	●	○		●	○	●	●	●	●	
-40 ... +60 mbar	●	●	●	○	○	●	○		●	○	●	●	●	●	
-60 ... +100 mbar	●	●	●	○	○	●	○		●	○	●	●	●	●	
-100 ... +150 mbar	●	●	●	○	○	●	○		●	○	●	●	●	●	
-100 ... +250 mbar	●	●	●	○	○	●	○		●	○	●	●	●	●	

## 2.3 Intended use

The DA03 serves to display differential pressures in neutral gaseous and fluid media.

If used with aggressive media, the media compatibility with the materials used must be checked (see Techn. data).

The DA03 can be delivered with a contact element. If the set limit values are exceeded, the output power circuits are opened or closed, and/or a 0/4...20 mA output signal proportional to the displayed value is issued for a capacitive rotation angle encoder.

## 2.4 Function diagram

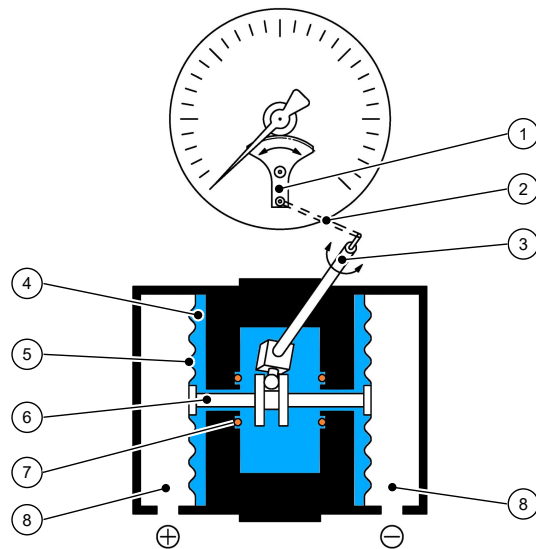


Fig. 7: Function diagram

1	Motion train	2	Transfer lever
3	Measuring shaft	4	Pressure transfer fluid
5	Measuring membranes	6	Connecting rod
7	O-ring (pressure relief valve)	8	Pressure chamber

## 2.5 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 measuring membranes 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. The over-pressure causes the overloaded membrane and its collar to be pressed against the inner O-ring. This creates two separate pressure spaces between the measuring membranes that need to be filled with fluid. In the adjacent pressure space, a corresponding over-pressure is created. The measuring membrane is supported by the contained transfer fluid. In this way the measuring membranes compensate the forces acting upon them.

## 3 Assembly

### 3.1 General information

The device can be mounted in one of the following ways (see Assembly [► 8]):

#### 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.

With liquid measuring media, the pressure lines must be vented [► 14].

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.

The process connections are marked on the unit with (+) and (-) symbols. The pressure lines are to be mounted according to this marking.

#### Differential pressure

- ⊕ Higher pressure
- ⊖ lower pressure

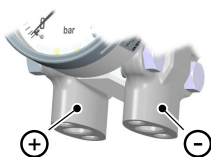


Fig. 8: Process connection

### 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

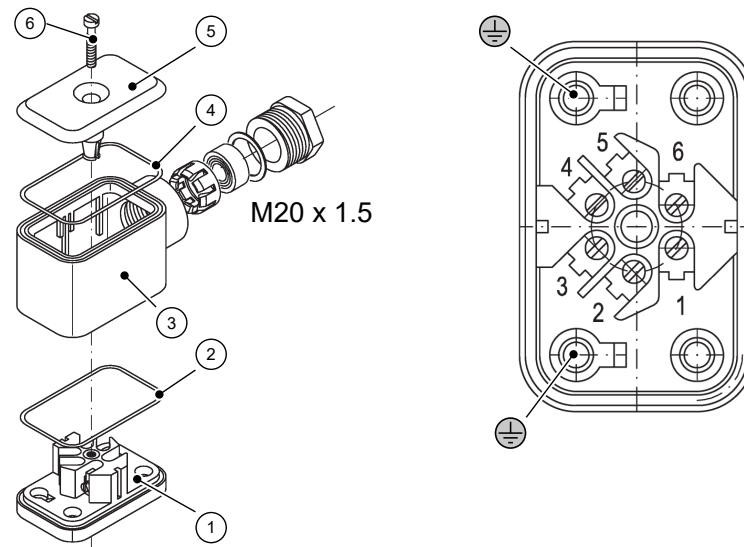


Fig. 9: Cable socket

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

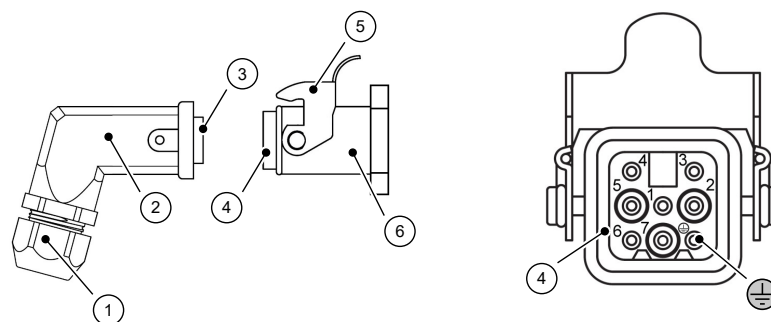


Fig. 10: HAN connector

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

#### 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.

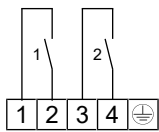
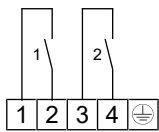
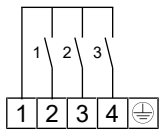


Fig. 11: Contacts

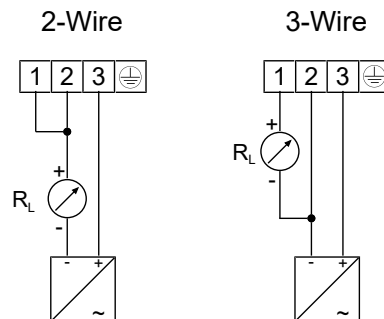


$E_b = 5 \dots 25V$

Fig. 12: Inductive contacts

### 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. 13: 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.

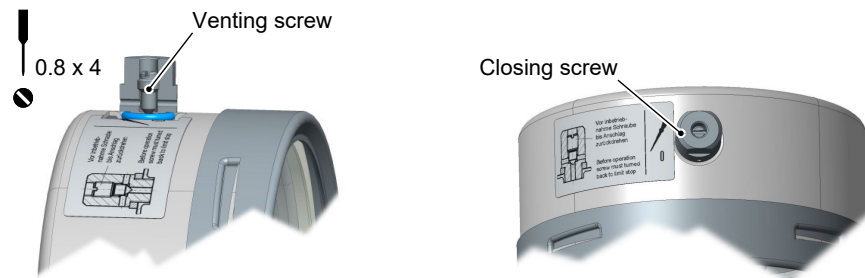


Fig. 14: Venting valve

### 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

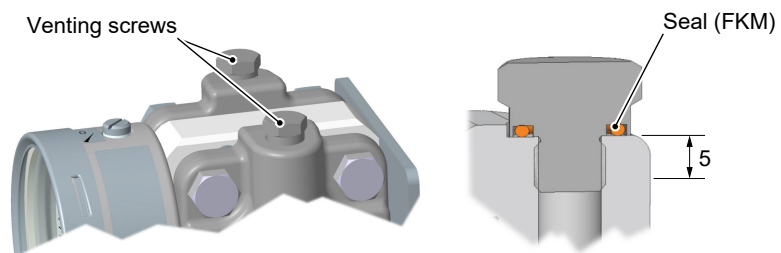


Fig. 15: Venting with fluid media

### 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

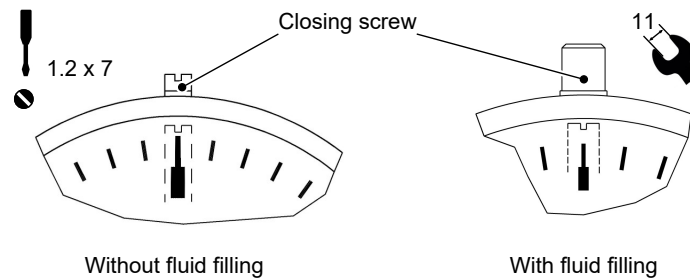


Fig. 16: Zero point correction screw

### 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.

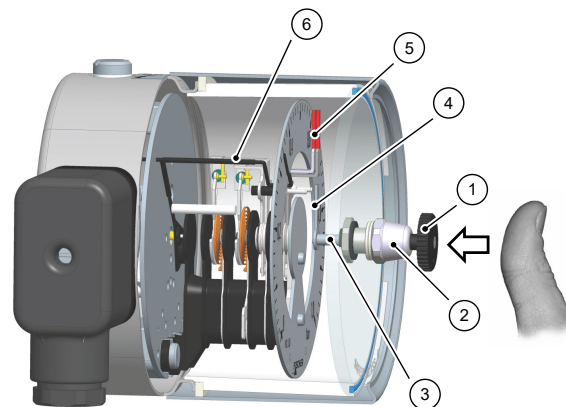


Fig. 17: Switch point setting

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

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 General information

EXECUTION	Nominal pressure	Measuring cell	Application information
<b>DA03 G ...</b>	PN40	Ø75	Measuring ranges: 0...0.6 bar to 0...25 bar Remote seals: <sup>(1)</sup> It is possible to attach remote seals for measuring ranges $\geq 0.6$ bar.
<b>DA03 K ...</b>	PN100	Ø75	Measuring ranges: 0...0.6 bar to 0...25 bar Remote seals: It is possible to attach remote seals for measuring ranges $\geq 0.6$ bar.
<b>DA03 H ...</b>	PN40	Ø130	Measuring ranges: 0...40 mbar to 0...400 bar Limitations: Drag indicator measuring ranges $\geq 60$ mbar Contacts / Transmitter measuring ranges $\geq 100$ mbar Remote seals: It is possible to attach remote seals for measuring ranges $\geq 160$ mbar..
<b>DA03 L ...</b>	PN100	Ø130	Measuring ranges: 0...40 mbar to 0...400 bar Limitations: Drag indicator measuring ranges $\geq 60$ mbar Contacts / Transmitter measuring ranges $\geq 100$ mbar Remote seals: It is possible to attach remote seals for measuring ranges $\geq 160$ mbar..
<b>DA03 P ...</b>	PN160	Ø130	Measuring ranges: 0...40 mbar to 0...400 bar Limitations: Drag indicator measuring ranges $\geq 60$ mbar Contacts / Transmitter measuring ranges $\geq 100$ mbar Remote seals: It is possible to attach remote seals for measuring ranges $\geq 0.6$ bar.

<sup>(1)</sup> The remote seals need to be designed for the displacement volume, the length of the cable and the application temperature

## 6.2 Input variables

### Measuring variable

Differential pressure in gaseous and fluid aggressive media.

### General information

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

Measurement range	Device model	
	H	K
0 ... 250 mbar		
0 ... 400 mbar		
-100 ... 150 mbar		
-150 ... 250 mbar		
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

Measurement range	Device model		
	H	L	P
0 ... 40 mbar	•	•	•
0 ... 60 mbar	•	•	•
0 ... 100 mbar	•	•	•
0 ... 160 mbar	•	•	•
0 ... 250 mbar	•	•	•
0 ... 400 mbar	•	•	•
0 ... 600 mbar	•	•	•
-40 ... +60 mbar	•	•	•
-60 ... +100 mbar	•	•	•
-100 ... +150 mbar	•	•	•
-100 ... +250 mbar	•	•	•

### 6.3 Operating conditions

Permissible ambient temperature	-20 ... +60 °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	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
Measuring membranes	MB ≤ 400 mbar	CrNi steel	1.4571	361Ti
	MB ≥ 0.6 bar	NiCrCo alloy	DURATHERM®	

Design of the measuring system (H)		Material
Pressure caps		Hastelloy® C276
Measuring membranes	MB ≤ 2.5 bar	Hastelloy® C276
	MB ≥ 4 bar	Standard membrane with separator film Hastelloy® C276 The model with the separator foil is not suitable for under-pressure

Design of the measuring system (G)		Material	Material no.	
			EU	AISI
Pressure caps		CrNi steel	1.4404	316L
Measuring membranes	MB ≤ 400 mbar	CrNi steel	1.4571	361Ti
	MB ≥ 0.6 bar	NiCrCo alloy	DURATHERM®	

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	Paraffin oil, Glycerine, silicon oil
Low-action contacts	Paraffin oil, Silicon oil
Magnetic spring contacts	Silicon oil
Inductive contacts	Paraffin oil, Silicon 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' [► 18]'.

#### 6.4.1.5 Shut-off fitting

3-spindle valve block PN 420, 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.

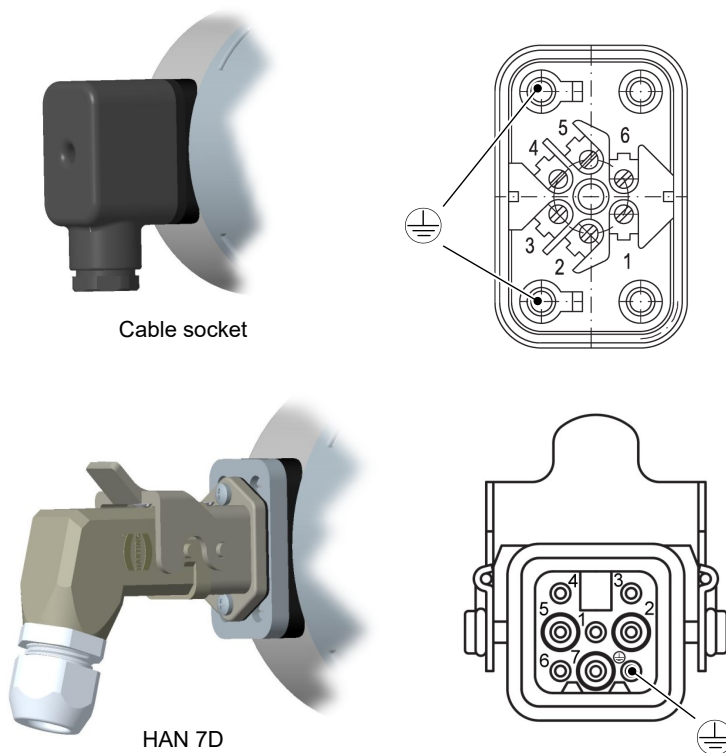


Fig. 18: Cable socket

#### Cable socket

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

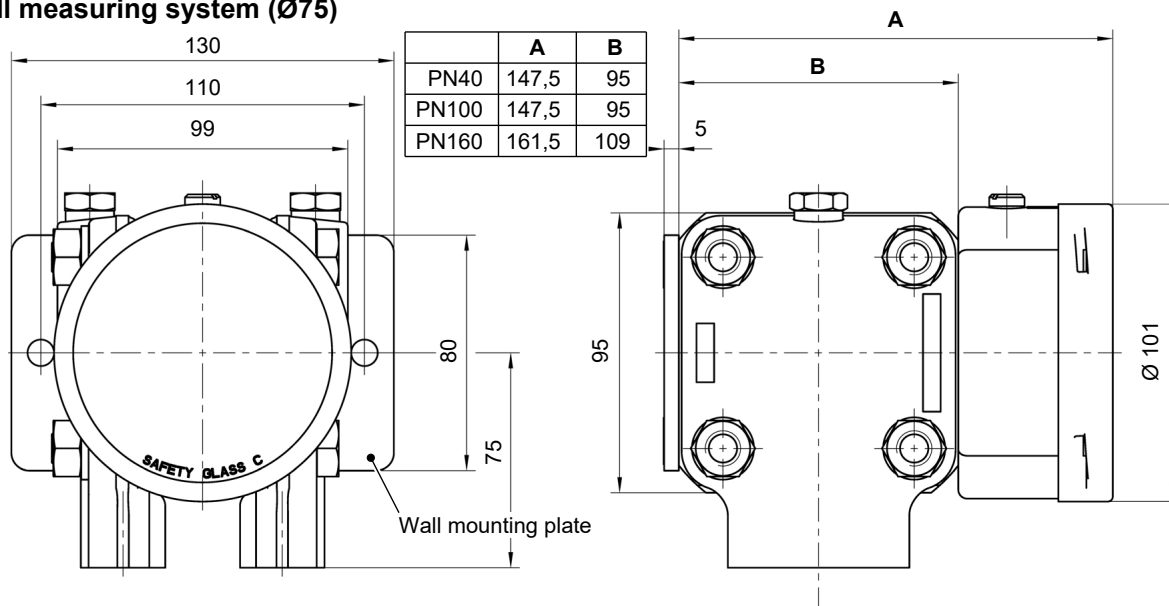
#### HAN 7D

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

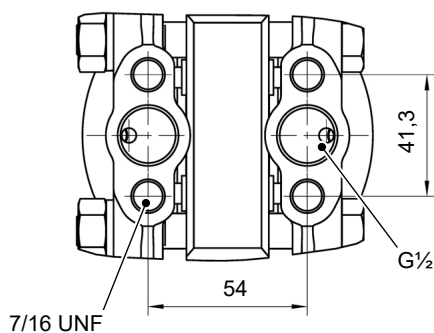
### 6.4.3 Dimensional drawings

All dimensions in mm unless otherwise stated

#### Small measuring system (Ø75)



#### Flange based on DIN EN 61518



#### Wall mounting plate

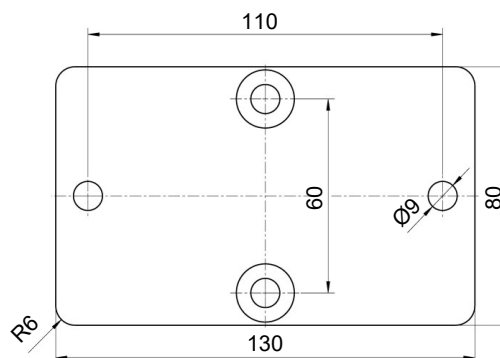


Fig. 19: Dimensional drawing (Small measuring system Ø75)

#### 2" pipe mounting

(possible for all models)

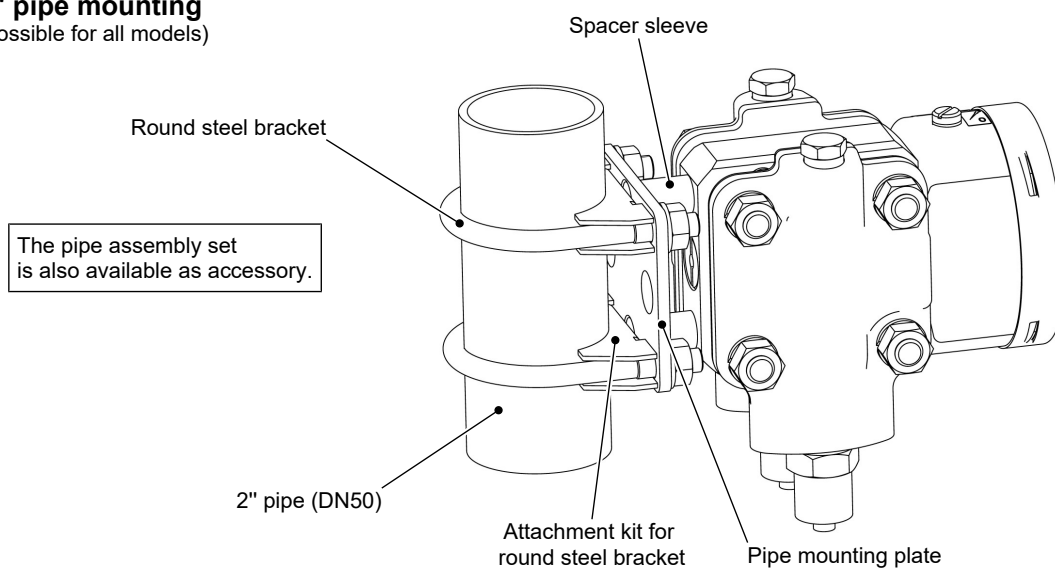


Fig. 20: Pipe mounting

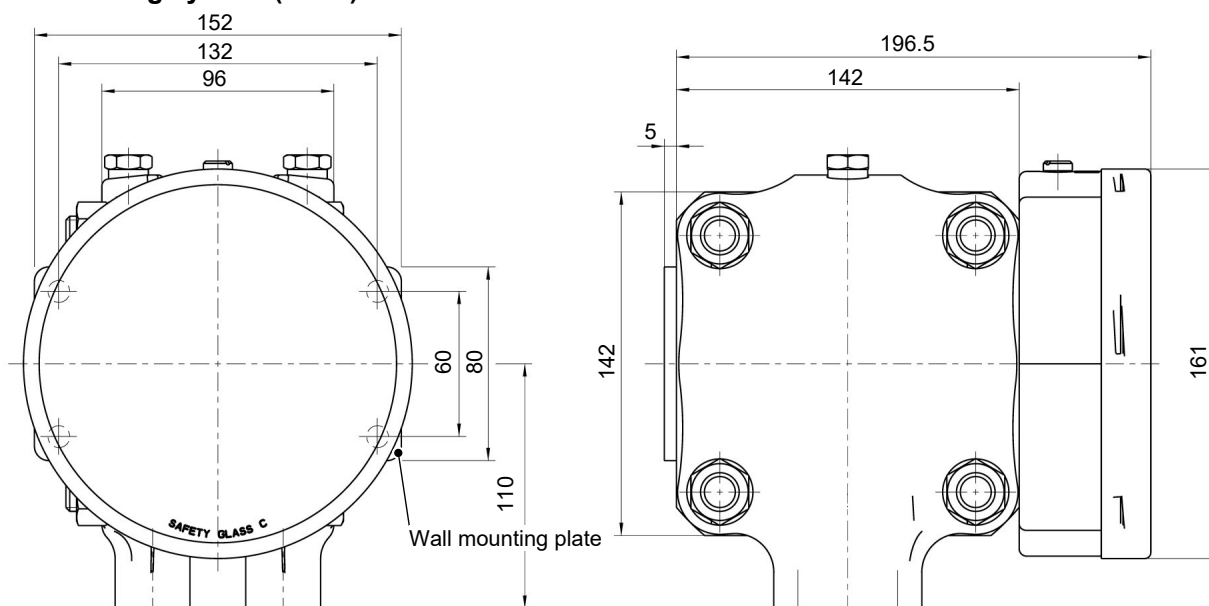
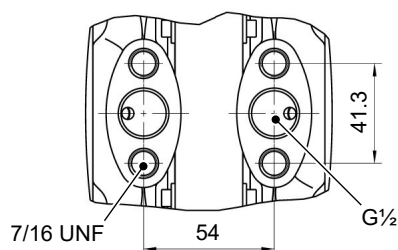
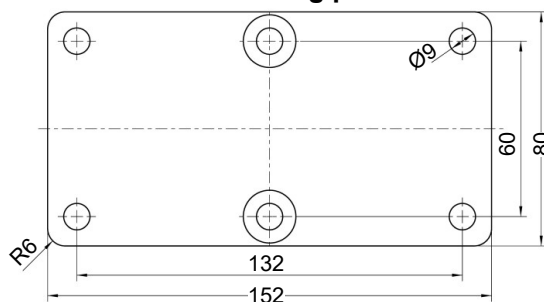
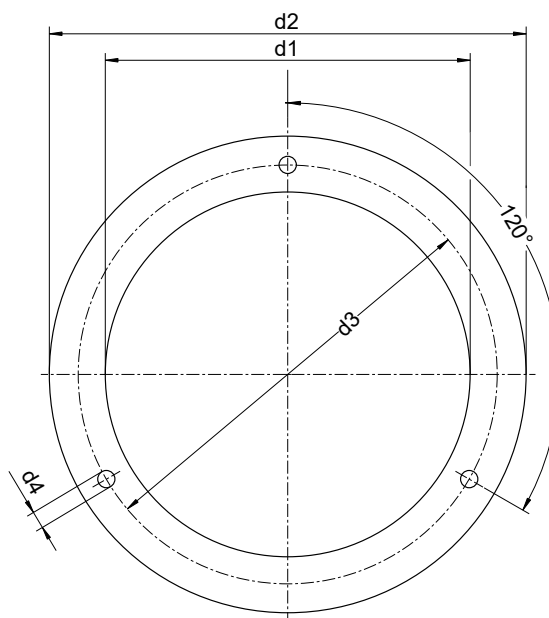
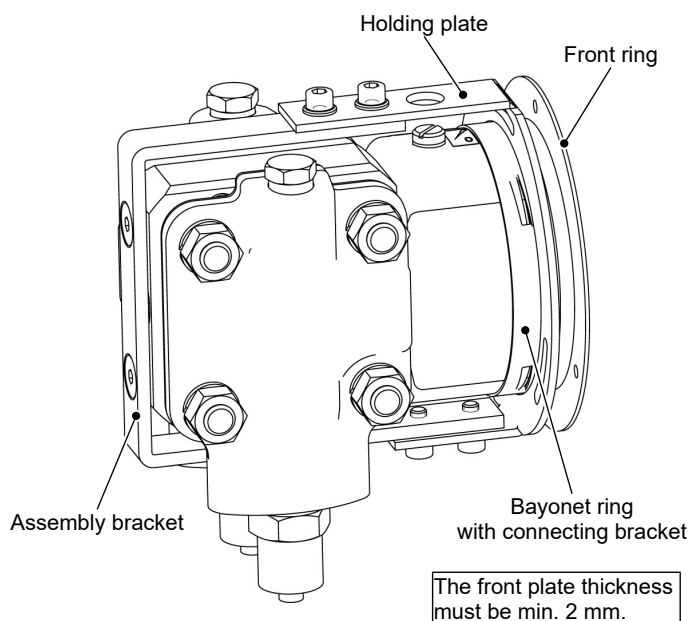
**Large measuring system (Ø130)****Flange based on DIN EN 61518****Wall mounting plate**

Fig. 21: Dimensional drawing (Large measuring system Ø130)

**Installation of front panel type 1**

(only small measuring system Ø75 and NG100 display)

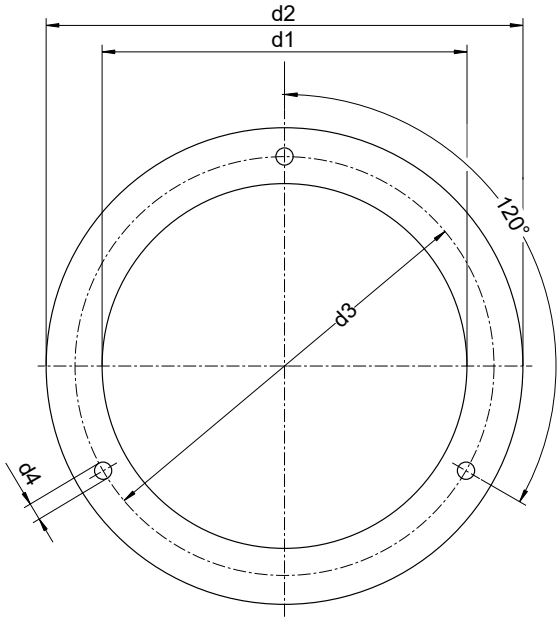
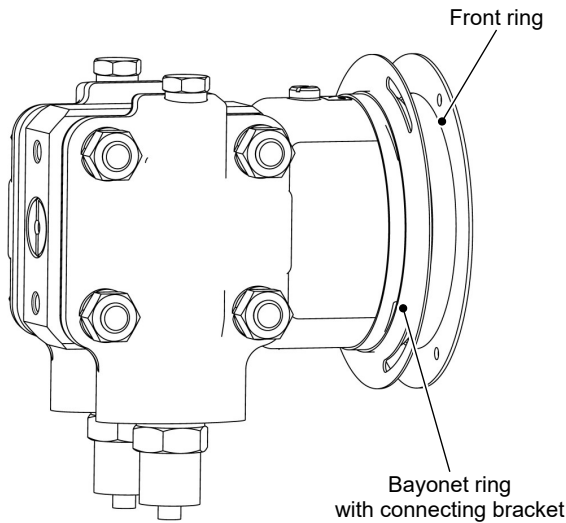


	d1	d2	d3	d4
NG100	101	132	116	4.8

Fig. 22: Installation of front panel with panel fittings

Installation of front panel type 2

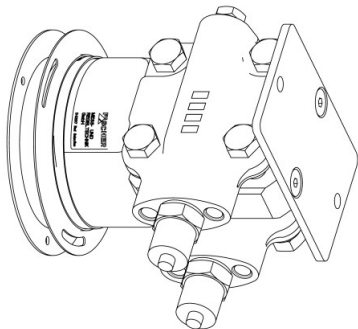
The front plate thickness must be min. 2 mm.



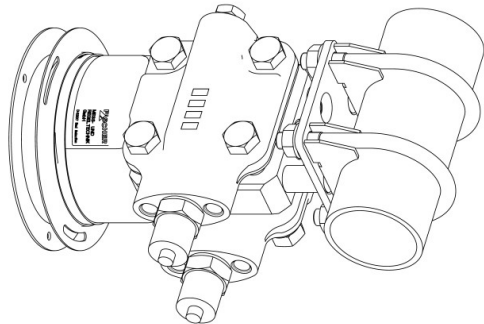
	d1	d2	d3	d4
NG100	101	132	116	4.8
NG160	161	196	178	5.8

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

Examples:



Assembly on a mounting plate



Mounting to a 2" pipe

Fig. 23: Installation of front panel with front ring

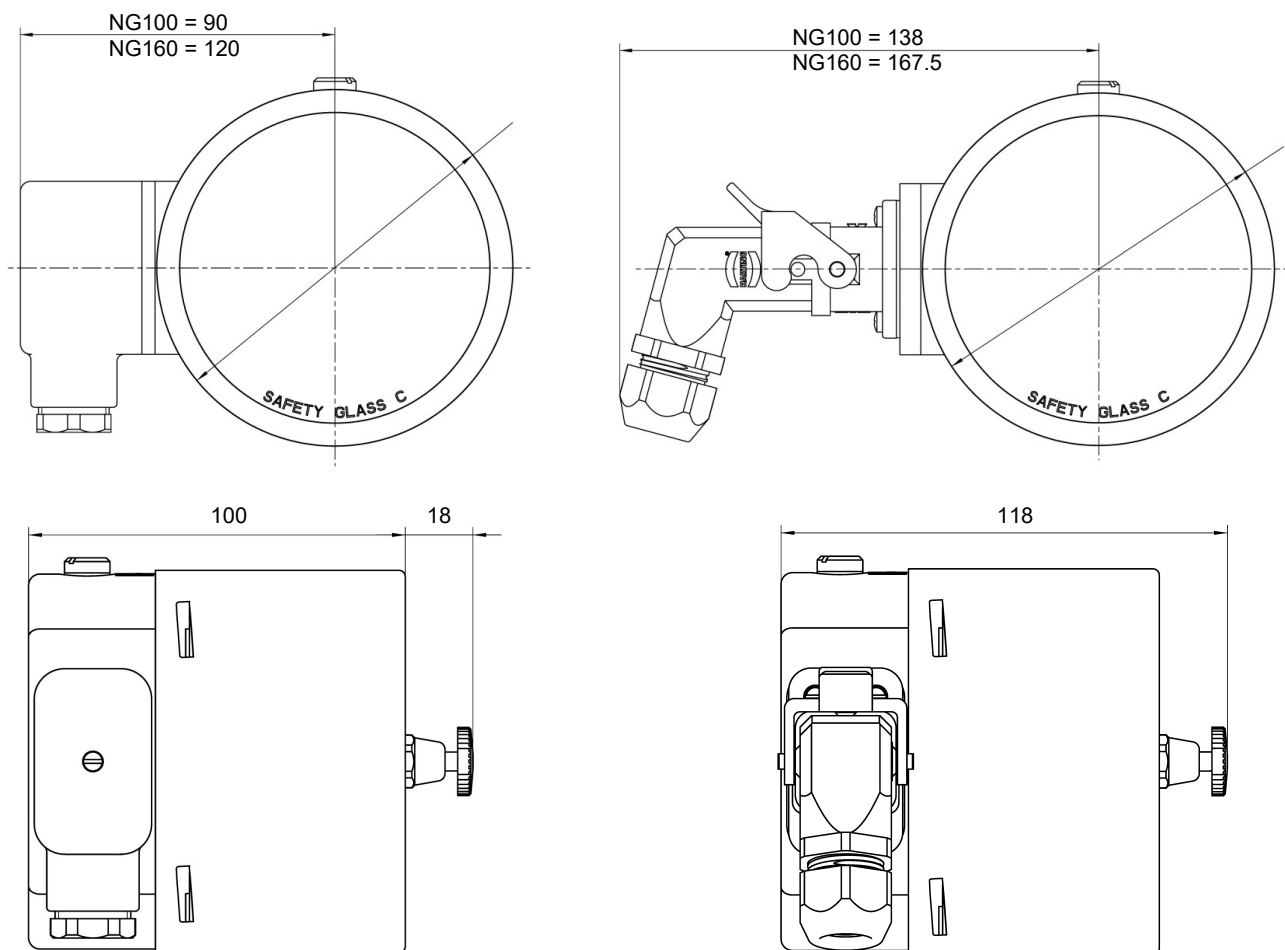
**Contact elements**

Fig. 24: Dimensional drawing contact devices

**Shut-off fitting**

with inner spindle thread

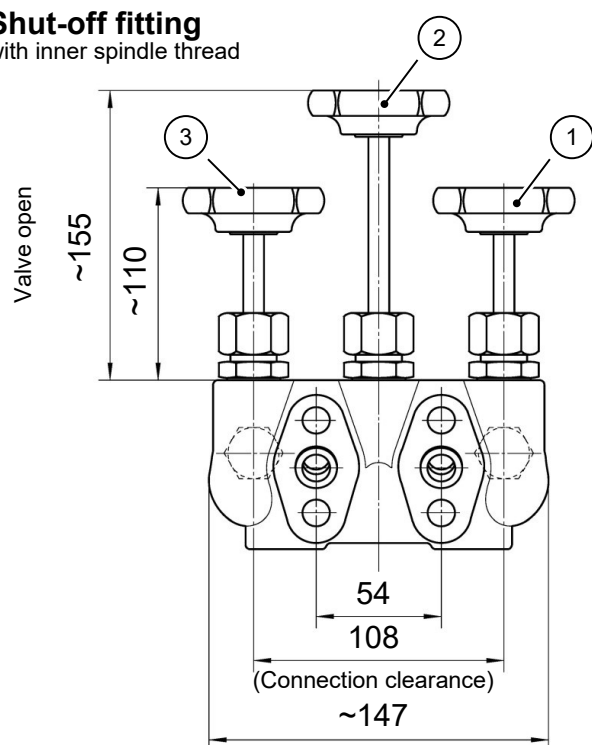
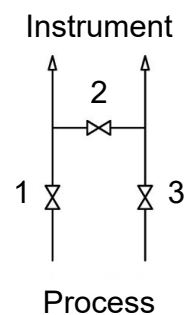
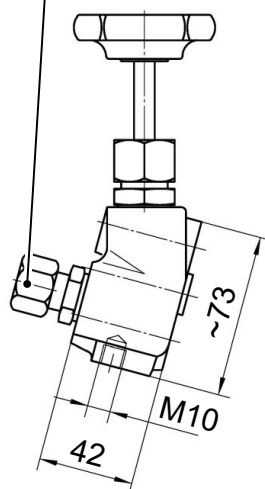
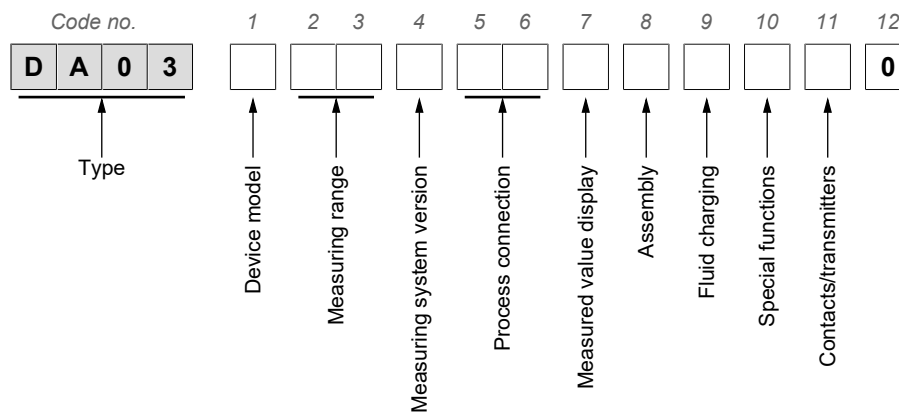
Cutting ring connection G3/8  
for 12 mm pipe

Fig. 25: Shutoff valve DZ3600SV2700

## 7 Order Codes



### Device model:

[1]	Pressure level	Measuring cell
G	PN40	Ø75
H	PN40	Ø130
K	PN100	Ø75
L	PN100	Ø130
P	PN160	Ø130

### Measuring range:

Small measuring system  
Ø75

[2.3]	Measurement range	Device model	
		G	K
82	0 ... 250 mbar		
83	0 ... 400 mbar		
74	-100 ... 150 mbar		
76	-150 ... 250 mbar		
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]	Measurement range	Device model		
		H	L	P
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
H	Pressure chamber Hastelloy C4 Measuring membrane Hastelloy C276
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 transducer 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
<b>DZ3600SV2700</b>	Triple valve block DN5 PN420 <ul style="list-style-type: none"> <li>• Flange connection acc. to DIN EN 61518</li> <li>• Cutting ring screw connections 12 mm pipe</li> <li>• Including assembly set</li> </ul>	1.4571

(Translation) **CE**

## 8 EU Declarations of conformity

### EU Declaration of Conformity

For the product described as follows

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

**Type designation** **DA03 ... 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 Salzufflen, Germany  
Tel. +49 (0)5222 974 0

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

The devices bear the following marking:



Bad Salzufflen  
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** **DA03 ... 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**  
EN 61000-6-2:2005

Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

**DIN EN 61000-6-2 Corrigendum:2011-06**

Corrigendum to DIN EN 61000-6-2

**DIN EN 61000-6-3:2011-09**

EN 61000-6-3:2007 + A1:2011

Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

**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**  
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

09010306 • CE\_EN\_DA03\_20 • Rev. ST4-A • 01/18



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Fig. 27: CE\_EN\_DA03...20

## 9 UKCA Declarations of Conformity



### UKCA Declaration of Conformity

For the product described as follows

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

**Type designation**                         **DA03 ... 10**  
   **DA03 ... 50**

is hereby declared to comply with the essential requirements, specified in the following UK regulations:

<b>Statutory regulation No.</b>	<b>Description</b>
2016 No. 1101	<i>The Electrical Equipment (Safety) Regulations 2016</i>
2022 No. 1647	<i>The Hazardous Substances and Packaging (Legislative Functions and Amendment) (EU Exit) Regulations 2020</i>
2021 No. 422	<i>The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (Amendment) Regulations 2021</i>

The products have been tested according to the following standards.

#### Low Voltage Directive (LVD):

<i>BS EN 61010-1+A1:2017-03-31</i>	<i>Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements</i>
------------------------------------	--

#### Restriction of Hazardous Substances (RoHS):

<i>BS EN IEC 63000:2018-12-10</i>	<i>Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances</i>
-----------------------------------	---

The sole responsibility for drawing up this declaration of conformity in relation to the fulfilment of the essential requirements and the preparation of the technical documentation lies with the manufacturer.

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

The devices bear the following marking:

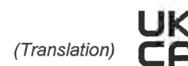


**Bad Salzufflen**  
**04 Okt 2021**

G. Gödde  
Managing director



Fig. 28: UKCA\_EN\_DA03\_10



## UKCA Declaration of Conformity

For the product described as follows

Product designation

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

Type designation

**DA03 ... 20**

is hereby declared to comply with the essential requirements, specified in the following UK regulations:

**Statutory regulation No.**

2016 No. 1091

2022 No. 1647

2021 No. 422

**Description**

*The Electromagnetic Compatibility Regulations 2016*

*The Hazardous Substances and Packaging (Legislative Functions and Amendment) (EU Exit) Regulations 2020*

*The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (Amendment) Regulations 2021*

The products have been tested according to the following standards.

**Electromagnetic compatibility (EMC):**

BS EN IEC 61000-6-2:2019-02-25

*Electromagnetic compatibility (EMC). Generic standards. Immunity standard for industrial environments*

BS EN IEC 61000-6-3:2021-03-30

*Electromagnetic compatibility (EMC). Generic standards. Emission standard for equipment in residential environments*

**Restriction of Hazardous Substances (RoHS):**

BS EN IEC 63000:2018-12-10

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

The sole responsibility for drawing up this declaration of conformity in relation to the fulfilment of the essential requirements and the preparation of the technical documentation lies with the manufacturer.

Manufacturer

**FISCHER Mess- und Regeltechnik GmbH**

Bielefelder Str. 37a

32107 Bad Salzuflen, Germany

Tel. +49 (0)5222 974 0

The devices bear the following marking:



Bad Salzuflen  
04 Okt 2021

G. Gödde  
Managing director

09010586 • UKCA\_EN\_DA03\_20 • Rev. ST4-A • 09/21



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Fig. 29: UKCA\_EN\_DA03\_20



## 10 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 StraBe 37a, D-32107 Bad Salzuflen, Германия. Филиал завода-изготовителя: "FISCHER Mess- und Regeltechnik GmbH" место нахождения: Bielefelder StraBe 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**

  
(подпись)

М.П.

Шаров Александр Анатольевич

(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

## Notes



**FISCHER Mess- und Regeltechnik GmbH**

Bielefelder Str. 37a  
D-32107 Bad Salzuflen

Tel. +49 5222 974-0

Fax +49 5222 7170

[www.fischermesstechnik.de](http://www.fischermesstechnik.de)

[info@fischermesstechnik.de](mailto:info@fischermesstechnik.de)