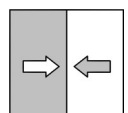


Operating manual

DA10 ... 0A (ATEX)

Differential pressure measuring device
for potentially explosive areas

Gas explosion protection Zone 1 and 2, gases and vapours
Dust explosion protection Zone 21 and 22, Dry dusts



Masthead

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Subject to technical amendments.



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Version history

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Table of Content

1	Safety guidelines	4
1.1	General	4
1.2	Personnel Qualification	4
1.3	Risks due to Non-Observance of Safety Instructions	4
1.4	Safety Instructions for the Operating Company and the Operator	5
1.5	Unauthorised Modification	5
1.6	Inadmissible Modes of Operation	5
1.7	Safe working practices for maintenance and installation work	5
1.8	Pictogram explanation	6
2	Product and functional description	7
2.1	Delivery scope	7
2.2	Intended use	7
2.3	Equipment versions	7
2.4	Function diagram	10
2.5	Design and mode of operation	10
3	Assembly	11
3.1	General information	11
3.2	Process connection	11
3.3	Use in areas at risk of explosion	12
4	Commissioning	13
4.1	General	13
4.2	Zero point correction	13
5	Servicing	14
5.1	Maintenance	14
5.2	Transport	14
5.3	Service	14
5.4	Disposal	14
6	Technical Data	15
6.1	General	15
6.2	Operating conditions	15
6.3	Input variables	15
6.4	Construction design	16
7	Order Codes	21
7.1	accessories	23
8	Attachments	24
8.1	EU Declaration of Conformity	24
8.2	EAC Declaration	25

1 Safety guidelines

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.



WARNING

For explosion-proof models the specialized personnel must have received special training or instruction or be authorized to work with explosion-proof instruments in explosion hazard areas.

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.

The instrument must be decommissioned and secured against inadvertent re-operation if a situation arises in which it must be assumed that safe operation is no longer possible. Reasons for this assumption could be:

- evident damage to the instrument
- failure of the electrical circuits
- longer storage outside the approved temperature range.
- considerable strain due to transport

Repairs may be carried out by the manufacturer only.

A professional single conformity inspection as per DIN EN 61010, section 1, must be carried out before the instrument can be re-commissioned. This inspection must be performed at the manufacturer's location. Correct transport and storage of the instrument are required.

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 DA10 ... 0A
- Operating Manual

2.2 Intended use

The differential pressure manometer DA10 ... 0A serves to measure and display differential pressures in gaseous, fluid and aggressive media. The unit is completely made of stainless steel and is suitable for use in aggressive environments. If used with aggressive media, the media compatibility with the materials used must be checked (see Techn. data).

The differential pressure manometer DA10 ... 0A is suitable for use in areas at risk of explosion.



DANGER

Installation regulations

The respective installation instructions must be observed for every application case. These should be listed in detail in the same-named section in chapter 'Assembly' for the 'use in explosive areas'.

2.3 Equipment versions

The appearance of the available models differs in terms of the mounting method. Wall mounting version is shown as an example. The measuring system differs because it uses CrNi steel and/or Hastelloy. For more information, please see the technical data.

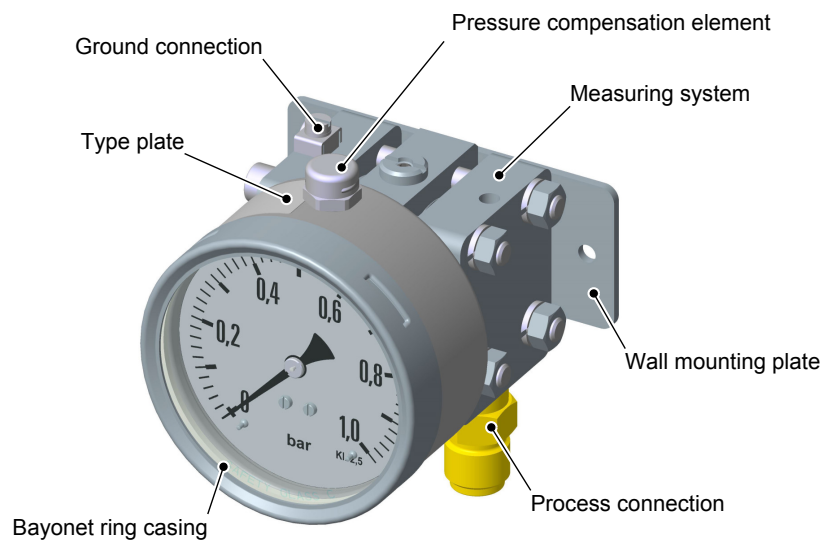


Fig. 1: Device overview

2.3.1 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.

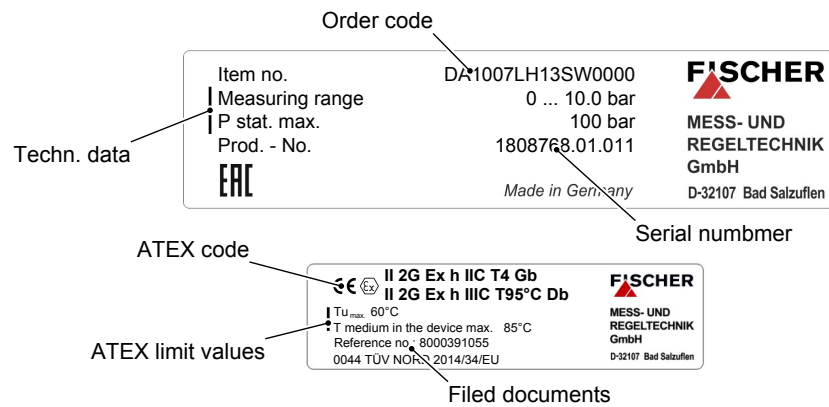


Fig. 2: Nameplate

2.3.2 Special functions

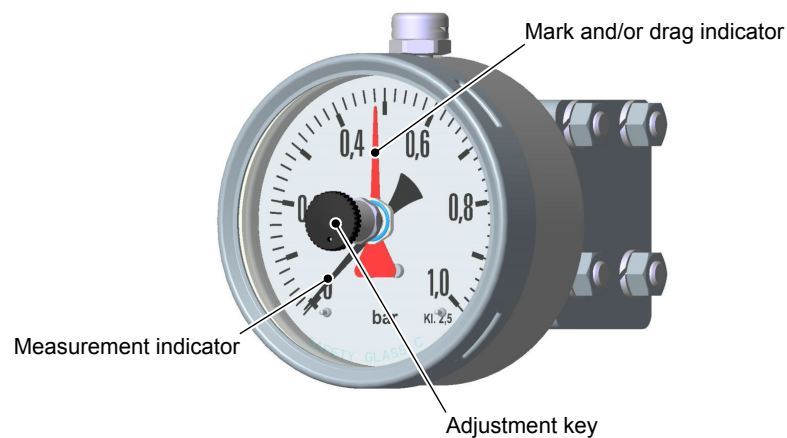


Fig. 3: Needle

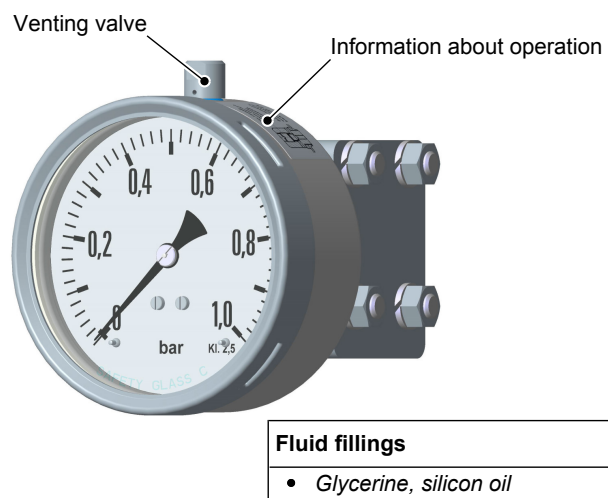


Fig. 4: Fluid charging

NOTICE! Fluid cannot be filled into models with a marker or drag indicator.

2.3.3 Process connection

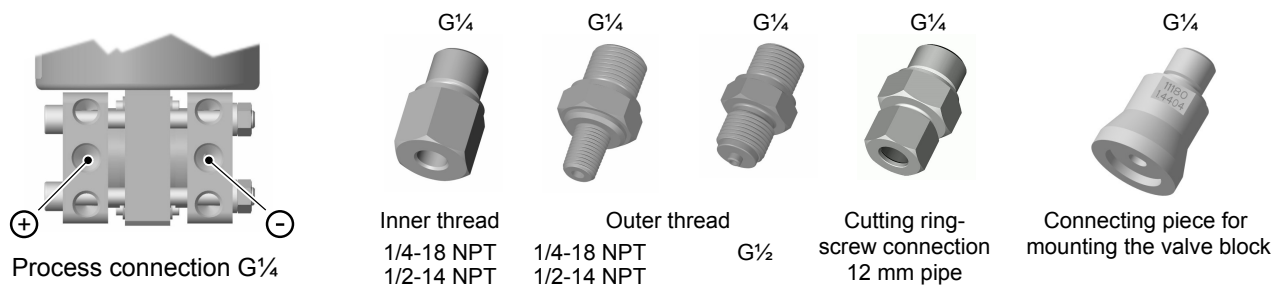


Fig. 5: Options for the process connection

2.3.4 Assembly types

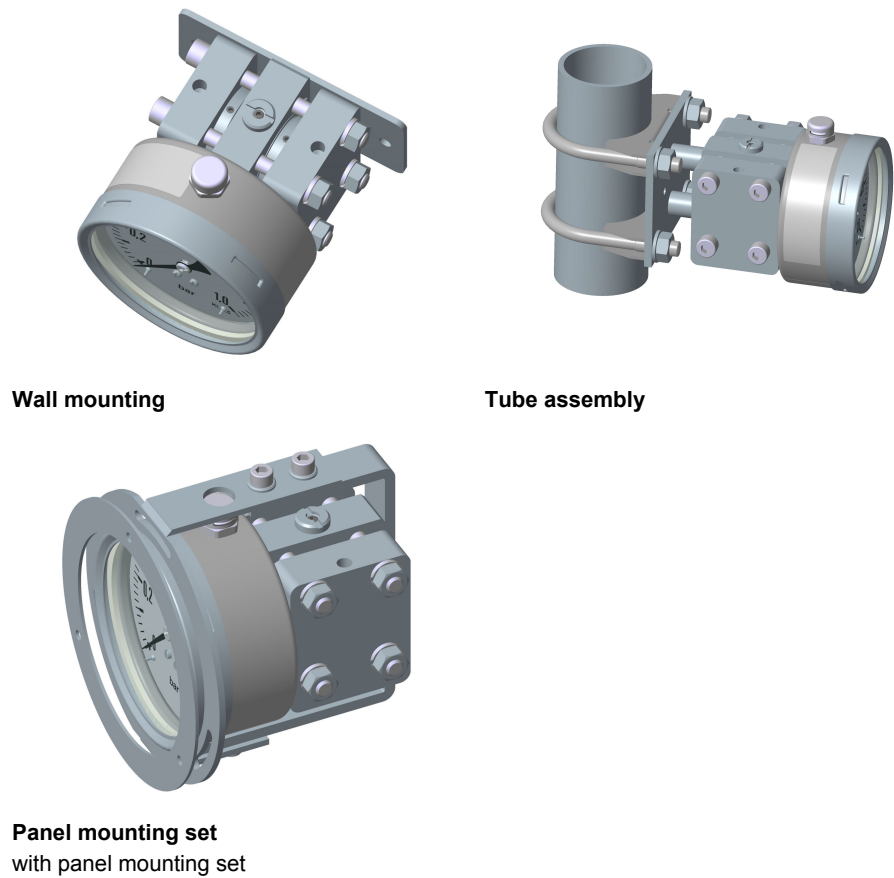


Fig. 6: Assembly types

2.4 Function diagram

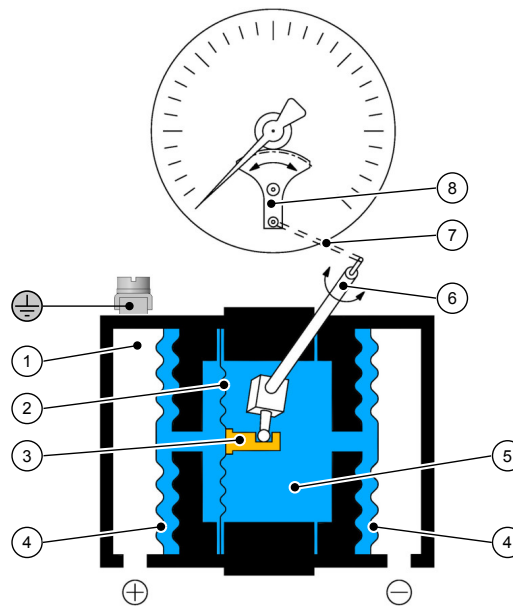


Fig. 7: Function diagram

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

2.5 Design and mode of operation

The differential pressure that is to be measured acts on the separating diaphragms and is transferred hydraulically onto the measuring diaphragm. When the pressure is equalised, this is in its idle state. In case of pressure difference, the force acting on the measuring membrane causes it to be moved towards the side of the lower pressure. The deflection is transferred to the display mechanism as a rotary movement via a torsion tube.

If the measuring system is loaded above the measuring range, the separating diaphragms are supported on parts of the system casing with the same contours. In this way, the measuring system is protected against overload.

3 Assembly

3.1 General information

The device can be mounted in one of the following ways:

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 fitting**

The device is equipped with a special front panel set and is suitable for mounting in front panels with a wall thickness of 2 to 3 mm.

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

The process connection may only be realised by authorised and qualified specialists that have undergone additional training or briefings or have a permit to work on explosion-protected units in potentially explosive systems.

Risks emanating from pressure on the instrument should be prevented by means of suitable action.

- 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..

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

Differential pressure

⊕ Higher pressure

⊖ lower pressure

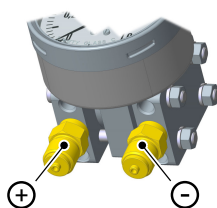


Fig. 8: Process connection

3.3 Use in areas at risk of explosion

DA10 ... 0A

Ⓔ II 2G Ex h IIC T4 Gb

Ⓔ II 2D Ex h IIC T95°C Db

Explosive areas Zone 1 and 2, and 21 and 22, risk from gases and dry dust.

Allowed temperatures:

- The maximum surface temperature 95 °C was determined under the following conditions without dust accumulation and safety factor.
- Allowed ambient temperature: -20°C to +60°C.
- Allowed medium temperature in the differential measurement unit < 85°C.



WARNING

Compression heat

With gaseous mediums, the instrument temperature can increase due to compression heat. In such cases, the pressure change speed must be limited or reduced to the allow measuring substance temperature.

NOTICE! For a differential pressure change between 10% and 90% of the measuring range and a pulse frequency < 0.06 Hz, the temperature increase is <10K.

To avoid additional heating, the instruments may not be exposed to direct sunlight during operation!

The standards EN60079-0, EN 60079-31, EN ISO 80079-36 and EN ISO 80079-37 apply for the non-electrical part of the devices in terms of explosion protection. The applicable requirements of these standards are satisfied.

The documents for the mechanical part were filed with notified office NB0044 (TÜV-Nord-Cert) under the file number 8000391055.

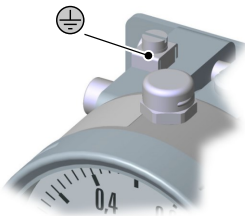
Ground connection



WARNING

Static electricity

The case must be equipped with an earth connection on the side to reduce the surface resistance.



The ground terminal is suitable for connecting fine-wire conductors up to 4 mm² or single-wire conductors up to 6 mm².

Fig. 9: Ground terminal

4 Commissioning

4.1 General

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



⚠ CAUTION

Leak test

The pressure lines need to be checked for leaks before commissioning.

4.2 Zero point correction

The devices are set in the factory before delivery so that adjustment at the assembly site is usually unnecessary. Nevertheless, a zero-point correction on site is possible and is carried out as follows:



⚠ CAUTION

Fluid charging

No zero-point correction is possible on devices filled with fluids because the device needs to be opened and the fluid would leak out.

- Depressurize the pressure measuring line or only exert the existing static system pressure.
- Open the front of the device by releasing the bayonet ring. You may need a belt key for this.
- Hold the indicator tight and adjust the indicator bushing with a screwdriver until the indicator (after release) is in the correct zero position.

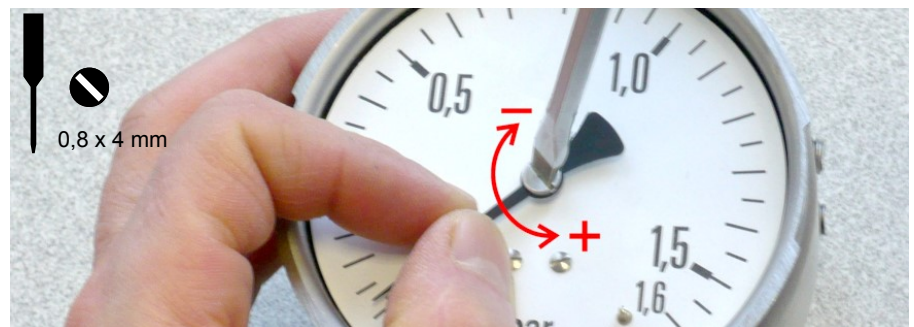


Fig. 10: Micro adjustment indicator

- Close the device again and ensure that the seal, gasket and bayonet ring are all in the correct position.

5 Servicing

5.1 Maintenance

To ensure reliable operation and a long service life, we recommend carrying out the following test on a regular basis:

- Check the reading.
- Checking the switch function in connection with the downstream components.
- Checking the pressure lines for leaks.
- Checking the electrical connections (terminal connection of the cable).

The precise test cycles and operating and ambient conditions need to be adjusted. If several components of the unit interact, all operating instructions of the other units also need to be observed.



WARNING

Dust deposits

The device must be cleaned with a damp cloth at regular intervals to prevent heat build-up. Cleaning intervals depend on the amount of local dust.

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 General

General information	
Type designation	DA10
Pressure type	Differential pressure
Measuring principle	Diaphragm measuring cell
Pressure transfer agent in the measuring cell	Silicon oil
Measuring medium	Neutral gaseous and fluid media; aggressive media according to the medium compatibility of the fitted materials.

6.2 Operating conditions

Ambient temperature range	-20 °C ... +60 °C
Storage temperature range	-40 °C ... +80 °C
Medium temperature range	Max. 85°C
Protection class IP	IP65 acc. to DIN EN 60529

6.3 Input variables

Rated pressure of the measuring system	PN100
Maximum static system pressure	100 bar
Durability	Over-pressure-proof on one side up to rated pressure of the measuring system, (+) and (-) sides, under-pressure-proof
Measurement accuracy	±2.5 % of the measuring range (±1.6 % FS on request)
Temperature sensor	0.3 % / 10 °C
Zero-point adjustment	±25 % of the measuring range

Measuring ranges

[bar]	[kPa]	[psi]
0 ... 1.0	0 ... 100	0 ... 15
0 ... 1.6	0 ... 160	0 ... 30
0 ... 2.5	0 ... 250	0 ... 60
0 ... 4.0	0 ... 400	0 ... 100
0 ... 6.0	0 ... 600	0 ... 160
0 ... 10.0	0 ... 1000	0 ... 200
0 ... 16.0	0 ... 1600	

6.4 Construction design

Materials

Measured value display	Material	Material no.	
		EU	AISI
Bayonet ring housing NG100	CrNi steel	1.4404	316L
Process connection (all models)	CrNi steel	1.4404	316L
Intermediate plate	AlMgSiPb	HARD-COAT®	
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 (H)	Material	Material no.	
		EU	AISI
Pressure caps	Hastelloy	C276	
Separating membrane	Hastelloy	C276	
Seal	FKM O-rings		

Design of the measuring system (R)	Material	Material no.	
		EU	AISI
Pressure caps	CrNi steel	1.4404	316L
Separating membrane	Hastelloy	C276	
Seal	FKM O-rings		

Design of the measuring system (P)	Material	Material no.	
		EU	AISI
Pressure caps	Hastelloy	C276	
Separating membrane	Hastelloy	C276	
Seal	FEP sheathed FKM O-rings		

Design of the measuring system (V)	Material	Material no.	
		EU	AISI
Pressure caps	CrNi steel	1.4404	316L
Separating membrane	Hastelloy	C274	
Seal	FEP sheathed FKM O-rings		

Assembly

Wall mounting	Flanged assembly plate
Pipe mounting	Flanged assembly plate and attachment bracket
Panel mounting set	Front panel fitting set

6.4.1 Dimensional drawings

All dimensions in mm unless otherwise stated

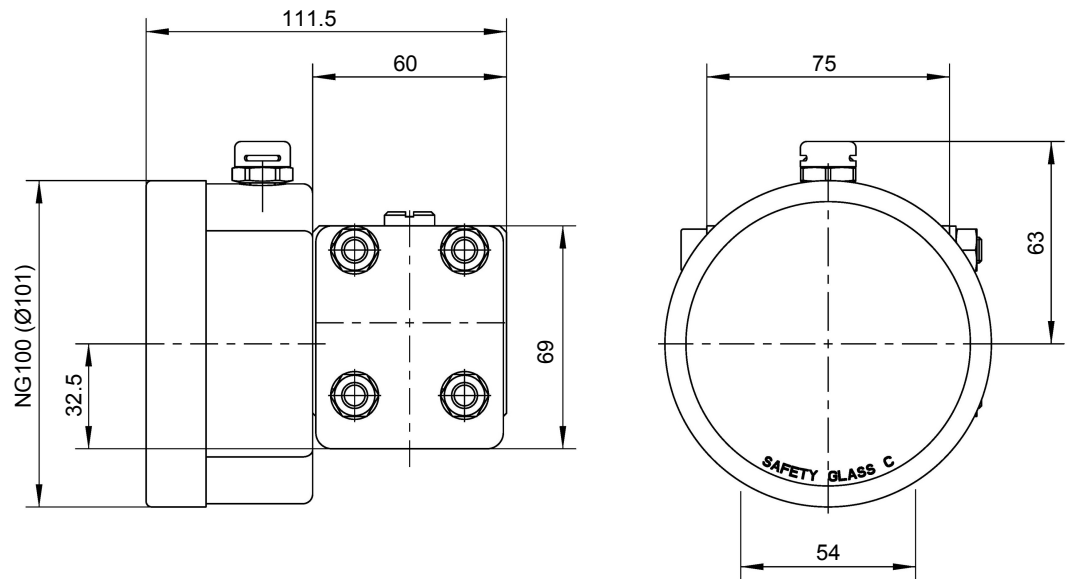


Fig. 11: Dimension drawing

6.4.1.1 Wall mounting

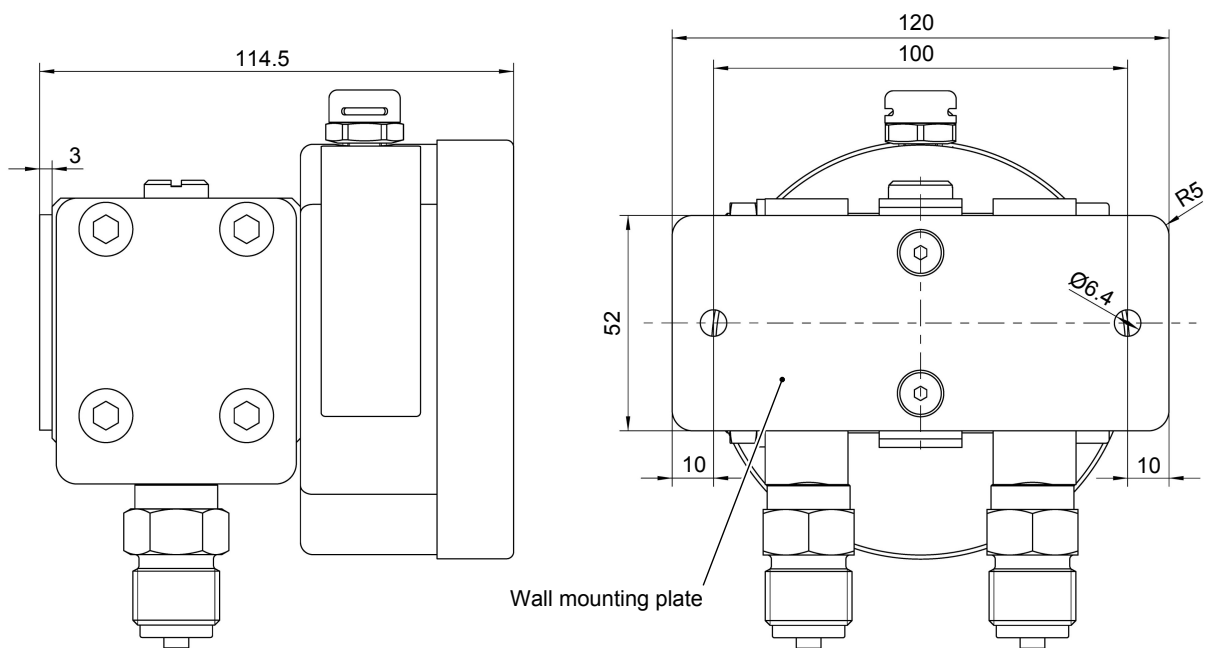


Fig. 12: Wall mounting

6.4.1.2 Pipe mounting

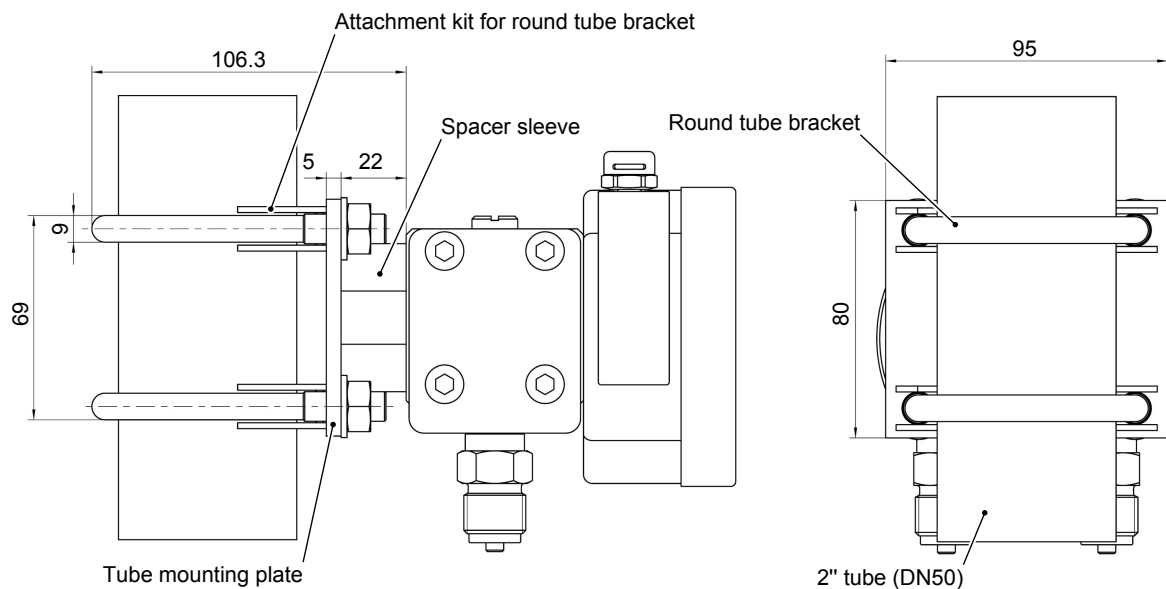


Fig. 13: Pipe mounting

6.4.1.3 Installation of front panel

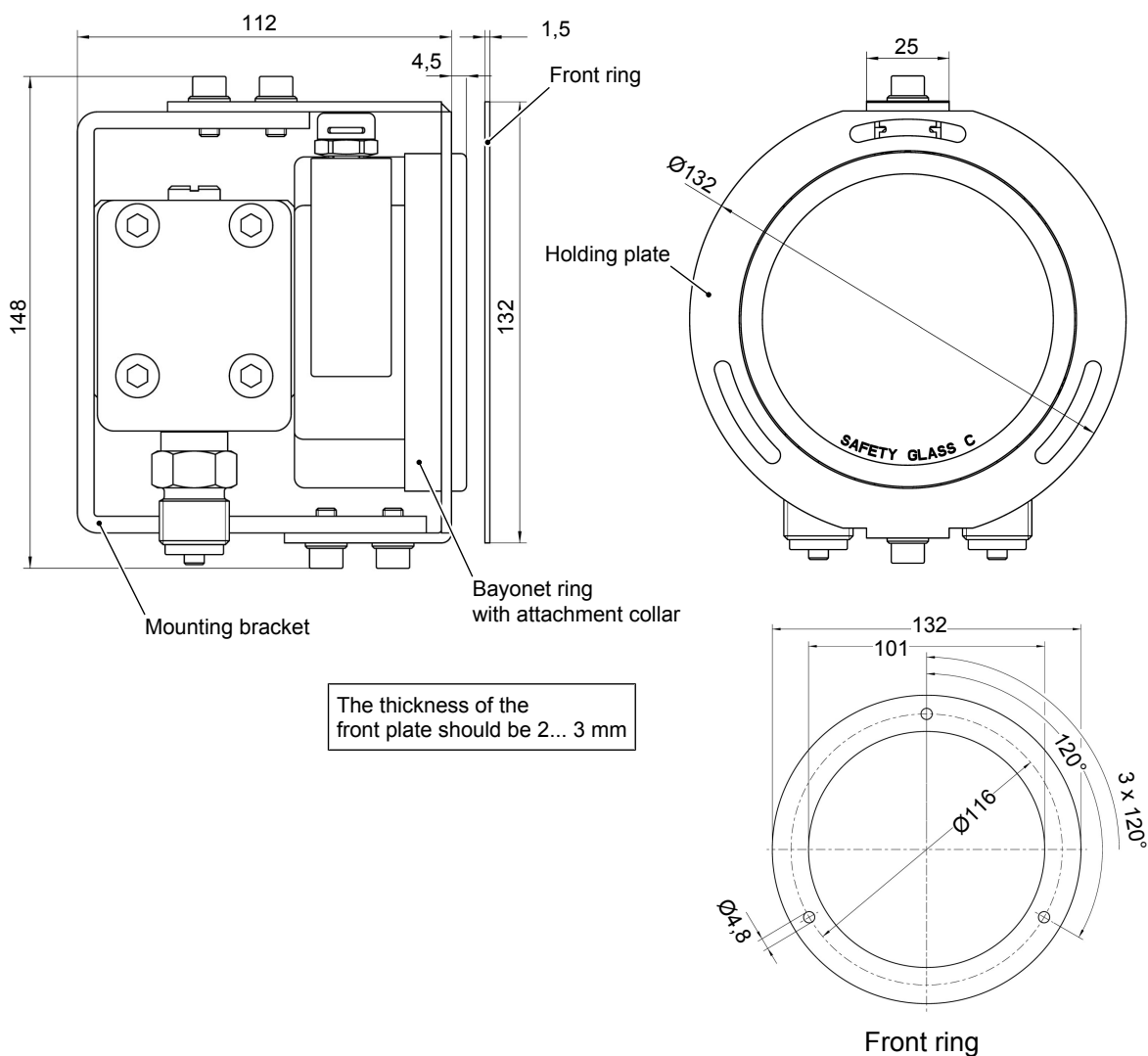


Fig. 14: Installation of front panel

6.4.1.4 Process connection

6.4.1.4.1 Connection port with cylindrical external thread

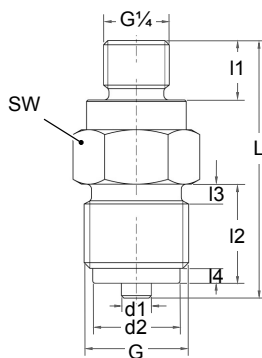


Fig. 15: Connecting port G

G	d1	d2	L	I1	I2	I3	I4	SW
Tol.	± 0.1	± 0.2	± 0.3	± 0.2	± 0.2	± 0.1	± 0.1	
G$\frac{1}{2}$	6	17.5	52	12	23	4	3	22
G$\frac{1}{4}$	5	9.5	39	12	15	3	2	19

SW:= Key width

6.4.1.4.2 Connection shanks with tapered external thread

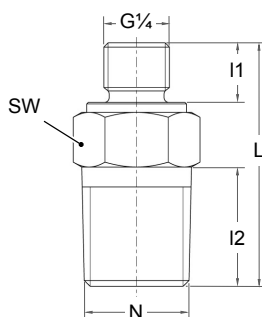


Fig. 16: Connecting port NPT

N	L	I1	I2	SW
Tol.	± 0.3	± 0.2	± 0.2	
$\frac{1}{2}$-14 NPT	49	12	24	22
$\frac{1}{4}$-18 NPT	42	12	18	19

SW:= Key width

6.4.1.4.3 Connecting port with inner thread

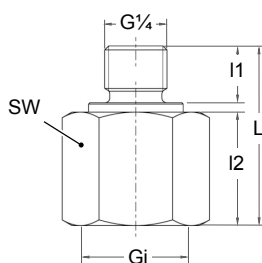


Fig. 17: Connecting port Gi

Gi	L	I1	I2	SW
Tol.	± 0.3	± 0.2	± 0.2	
G$\frac{1}{2}$	38	12	24	27
$\frac{1}{2}$-14 NPT	38	12	24	27
$\frac{1}{4}$-18 NPT	32	12	18	19

SW:= Key width

6.4.1.4.4 Screw-in connection

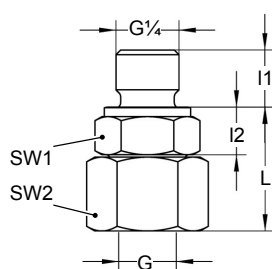


Fig. 18: Screw-in connection

g	L	I1	I2	SW1	SW2
Tol.		± 0.2	± 0.2		
12	26	12	12	19	22

SW:= Key width

6.4.1.4.5 Shut-off fitting (accessories)

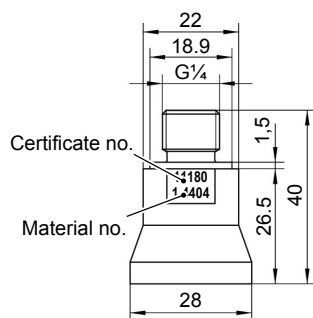


Fig. 19: Connecting piece

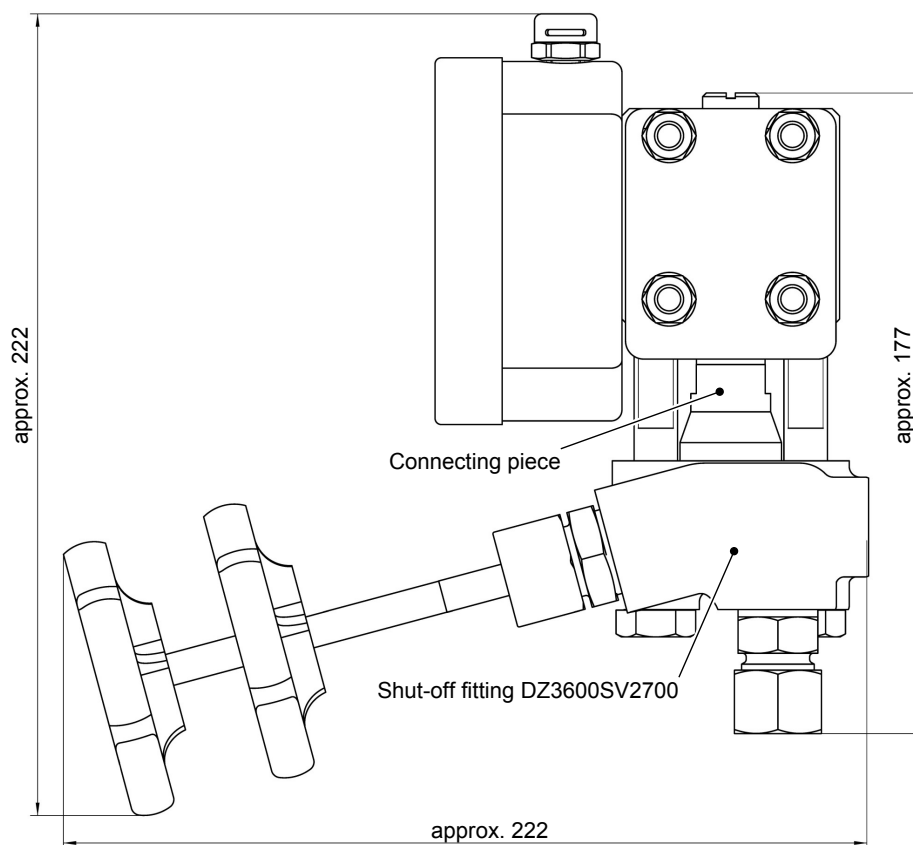


Fig. 20: DA10 with shut-off fitting

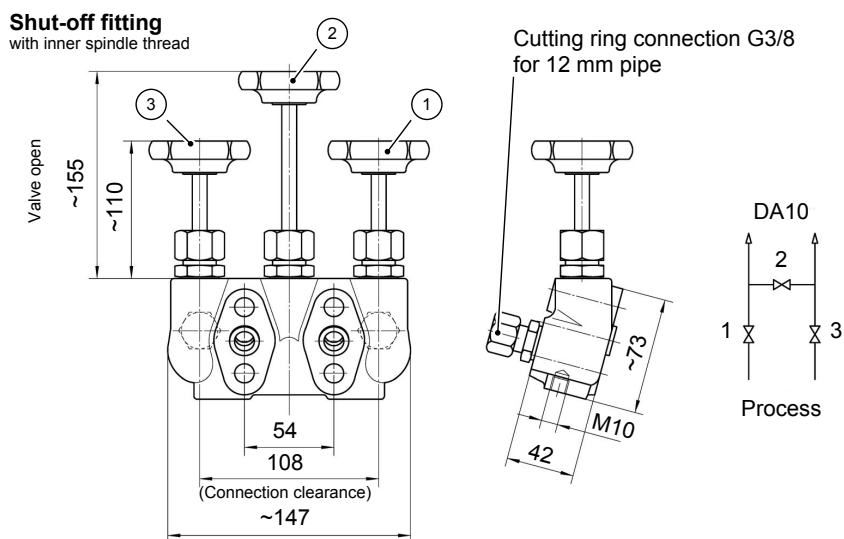
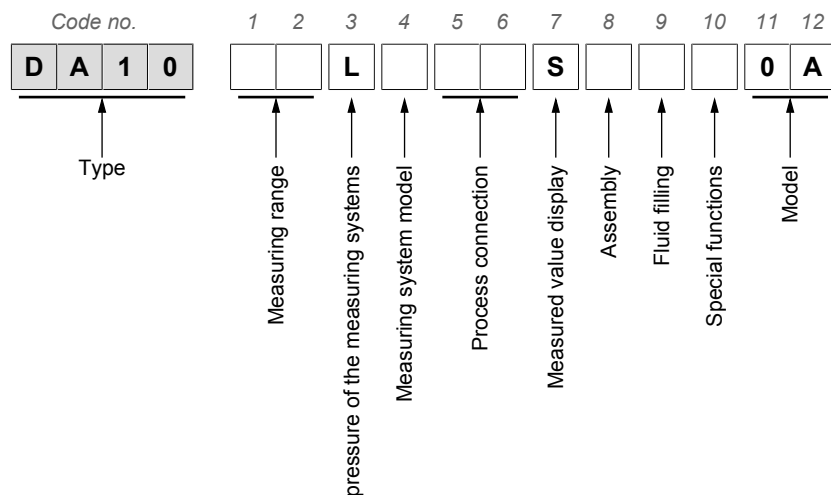


Fig. 21: Shut-off fitting DZ3600SV2700

7 Order Codes



Measuring range:

[1.2]	(Code no.)
02	0 ... 1.0 bar
03	0 ... 1.6 bar
04	0 ... 2.5 bar
05	0 ... 4.0 bar
06	0 ... 6.0 bar
07	0 ... 10.0 bar
09	0 ... 16.0 bar
F2	0 ... 100 kPa
F3	0 ... 160 kPa
F4	0 ... 250 kPa
F5	0 ... 400 kPa
F6	0 ... 600 kPa
F7	0 ... 1000 kPa
F8	0 ... 1600 kPa
H4	0 ... 15 psi
H5	0 ... 30 psi
H6	0 ... 60 psi
H7	0 ... 100 psi
H8	0 ... 200 psi
H9	0 ... 160 psi

Rated pressure of the measuring system

[3]	(Code no.)
L	PN100

Design of the measuring system:

[4]	(Code no.)	Material
H	Pressure caps	Hastelloy C276
	Separating membrane	Hastelloy C276
	Seal	FKM O-rings
R	Pressure caps	Stainless steel 1.4404
	Separating membrane	Hastelloy C276
	Seal	FKM O-rings
P	Pressure caps	Hastelloy C276
	Separating membrane	Hastelloy C276
	Seal	FKM O-rings
V	Pressure caps	Stainless steel 1.4404
	Separating membrane	Hastelloy C276
	Seal	FKM O-rings

Process connection:

[5.6]	(Code no.)
01	Inner thread G 1/4
04	Connecting piece G $\frac{1}{4}$ with inside thread 1/4 -18 NPT
05	Connecting piece G $\frac{1}{4}$ with inside thread 1/2 -14 NPT
13	Connection shanks G $\frac{1}{4}$ with external thread G $\frac{1}{2}$
14	Connecting port G $\frac{1}{4}$ with outer thread 1/4-18 NPT
15	Connecting port G $\frac{1}{4}$ with outer thread 1/2-14 NPT
27	Cutting ring connection in brass for 12 mm pipe
VM	Connecting piece for mounting the valve block

Measured value display:

[7]	(Code no.)
S	Bayonet ring housing NG100

Assembly:

[8]	(Code no.)
W	Wall mounting
R	Pipe mounting
D	Panel mounting set

Fluid filling:



[9]	(Code no.)
0	Without fluid filling
1	Glycerine
5	Silicon oil

Fluid cannot be filled into models with a marker or drag indicator.

Special function:

[10] (Code no.)	
0	Without special function
1	Adjustable marker needle
2	Resettable drag needle

Design:

[11.12] (Code no.)	
0A	Non-electrical unit (without switch contacts)
	 II 2G Ex h T4 Gb  II 2D Ex IIIC T95°C Db

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

8.2 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


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. 23: ЕАЭС N RU Д-ДЕ.АЛ16.В.77754

