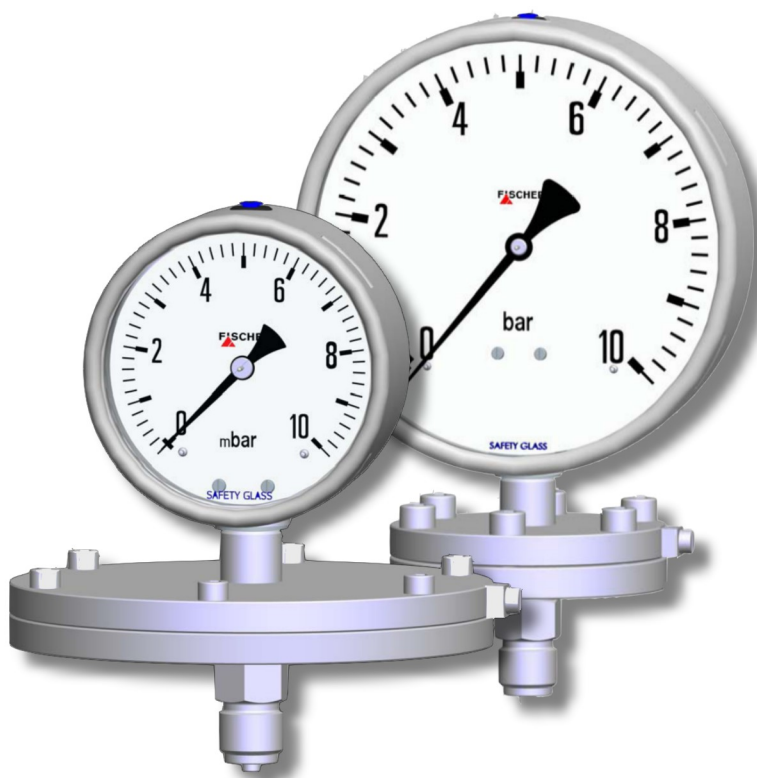




Ex II 2G Ex h IIC T4 Gb
Ex II 2D Ex h IIIC T95°C DB



RoHS II
COMPLIANT

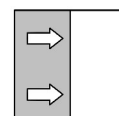


Operation manual

MA15F ... A/B/C/D

Diaphragm manometer
for 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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1 Safety information

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

- Diaphragm manometer MA15
- Operating Manual

2.2 Product summary

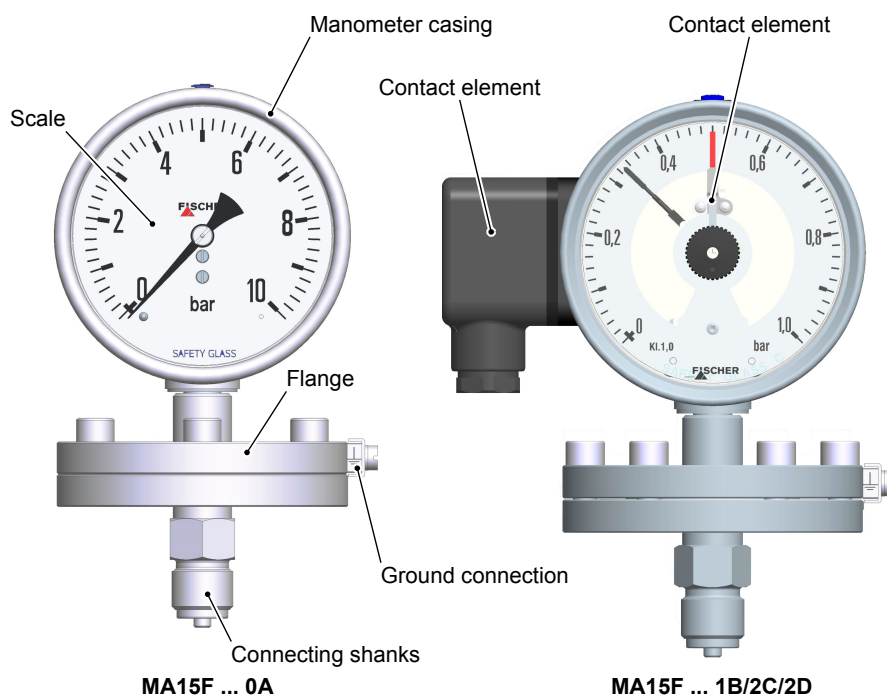


Fig. 1: Product summary

Manometer casing

The following options are available for the manometer casing:

- Bayonet ring housing NG100 or NG160
- Safety casing NG100 or NG160 with unbreakable rear wall and blow-out opening acc. to DIN EN 837

Process connection

Please see the order code for precise details about the process connection options (flange and connection pin).

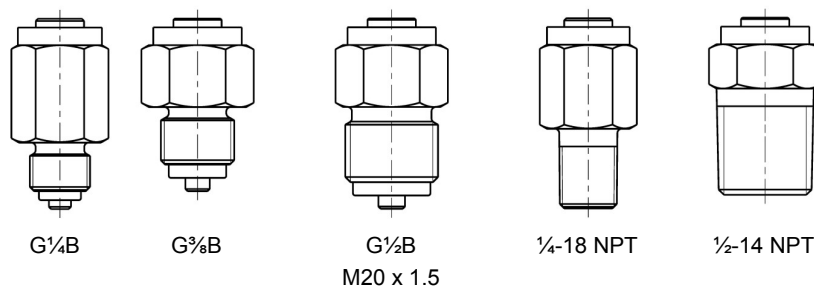


Fig. 2: Process connection

2.2.1 Type plate

This type plate serves as an example of the information that is stated. 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.

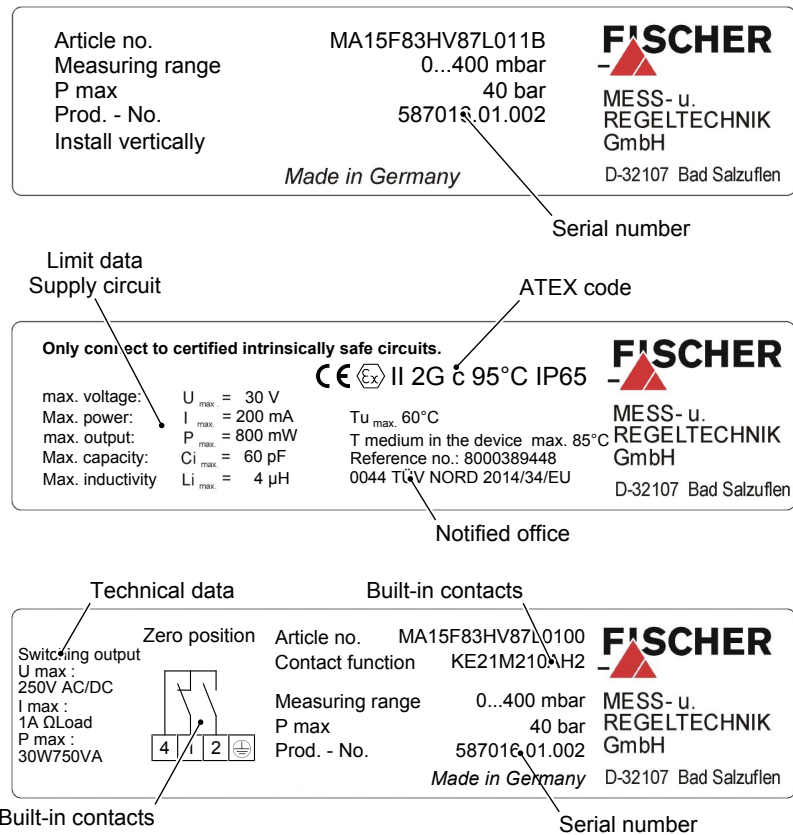


Fig. 3: Type plates with and without contacts

2.3 Intended use

The units may only be used for the purpose stipulated by the manufacturer.

The units serve to measure over-pressure and under-pressure in industrial applications in areas at risk of explosion acc. to directive 2014/34/EU.

The optional installed switch elements are low-action contacts, mechanical magnetic spring contacts, inductive proximity switches in a slotted design or capacitive rotation angle encoder.⁽¹⁾ If the set limit values are exceeded, the output power circuits are opened or closed.

The corresponding setup regulations are to be considered for each application case.

⁽¹⁾ Please see the information in the order code.

2.4 Function diagram

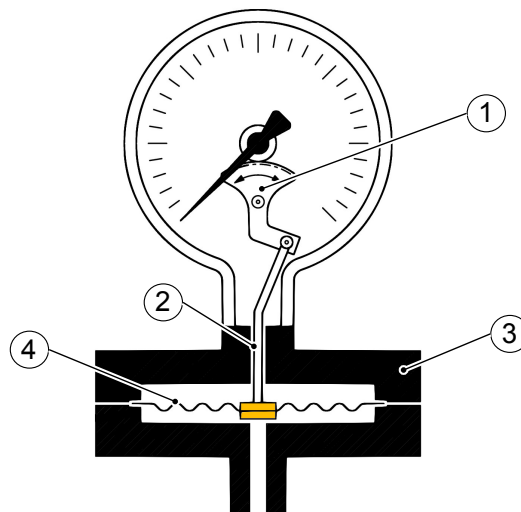


Fig. 4: Function diagram

1 Motion train	2 Connecting rod
3 Flange	4 Diaphragm

2.5 Design and mode of operation

The measuring element, the concentric corrugated diaphragm, is clamped between two flanges and the medium is applied on one side.

The diaphragm bulges elastically from its normal position as a result of the applied pressure. The linear movement is proportional to the applied pressure. A rod assembly on the side of the diaphragm that faces away from the medium captures the expansion movement and transfers it to the indicator.

The measurement display is shown on a 270 W° scale.

3 Assembly

3.1 Generalities

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

Mounting pressure transmitters

During assembly, observe the respective national and international guidelines and safety regulations.

Only mount the unit to systems that are depressurized. Only ever operate the unit within the permitted measuring range or below the maximum overload.

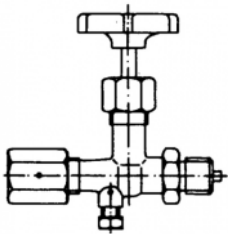


Fig. 5: Shutoff valve.

The device is set ex-works for vertical installation, however any installation position is possible.

To guarantee safe working conditions during installation and maintenance, suitable stop valves must be fitted in the system (see accessories). By means of the manometer shutoff, the unit

- Can be depressurized or taken out of operation.
- Be disconnected from the power supply within the applicable system for repairs or inspections.

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)



WARNING

Earth connection via the system earth

During assembly, ensure that the earth connection between the unit and the system earth is ensured. The connection to the system earth is realised via the process connection. Therefore, never use an insulated Teflon tape or similar. Design the process connection acc. to EN 837 and use a suitable flat seal.

3.2.1 Measuring lines that need to be connected

The following points need to be observed when connecting the pressure line:

- To ensure there is no influence on the measured values, severe bends and coils in the wire should be avoided.
- To prevent deposits, there should be a continuous incline or drop of at least 8%.
- When measuring steam pressure, a water bag-forming loop must be provided due to the temperature (see accessories).

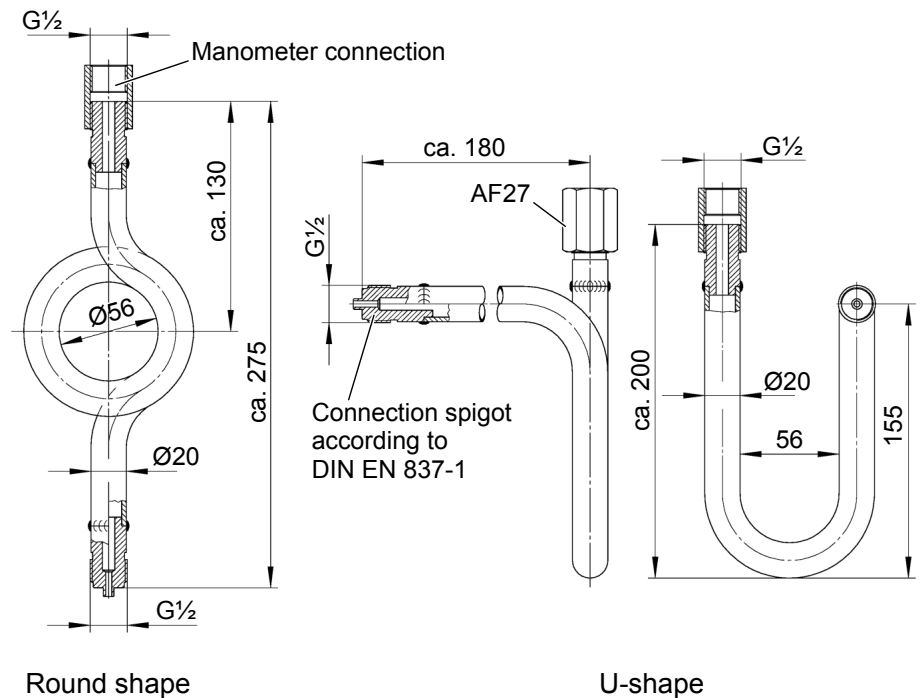


Fig. 6: Siphon MZ1###

- The transmitter must be positioned below the measuring point for liquid measurements. Vent the pressure line before commissioning.
- The transmitter must be positioned above the measuring point for gas measurements.

3.2.2 Pressure surge absorption

Pulsating pressure on the system side can lead to functional problems. We recommend installing a damping element in the pressure connection lines as a protective measure.

a) Capillary throttle

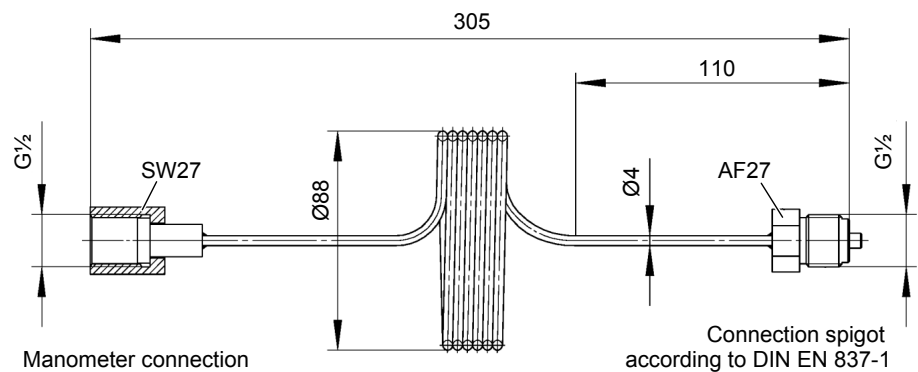


Fig. 7: Capillary throttle MZ400#

b) Settable damping reactor

In operating mode, the damping throttle must be set so that the output signal follows the pressure changes with a delay.

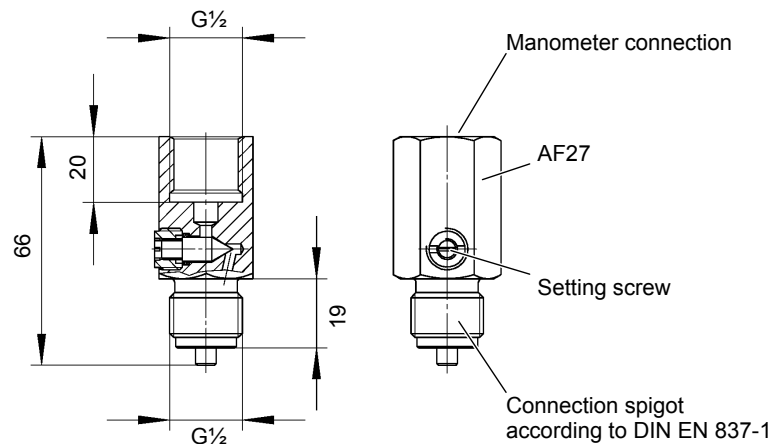


Fig. 8: Damping reactor MZ410#

3.3 Electrical connections

3.3.1 General information

Only units with installed contacts or a rotation angle transducer are connected to the power supply.

- By authorized and qualified specialized personnel only.
- When connecting the unit, the national and international electro-technical regulations must be observed.
- The electrical connection is usually realised via a cable socket mounted to the side.
- Disconnect the system from the mains, before electrically connecting the device.
- Please see the type plate for the connection assignment.



WARNING

Operation in areas at risk of explosion

If operated in explosive areas, the electrical data of the unit and the valid local regulations and guidelines for the installation and operation of electrical systems in explosive areas must be observed (e.g. DIN EN 60079-14)

Ground connection

The outer ground connection must always be connected to the protective potential equalisation or a similar local potential equalisation. The connection is suitable for connecting fine-wire conductors up to 4 mm² or single-wire conductors up to 6 mm².

3.3.2 Limit switch in accordance with data sheet KE

For more technical information about the contact types and connection options, please see the data sheet KE. You can request the data sheet on request or via our webserver www.fischermesstechnik.de.

3.3.3 Rotation angle transducer acc. to data sheet KE09

For more technical information about the rotation angle transducer, please see the data sheet KE09. You can request the data sheet on request or via our web-server www.fischermesstechnik.de.

3.4 Use in areas at risk of explosion

3.4.1 Differential pressure transmitter without contact element

MA15 ... 0A

Ex II 2G Ex h IIC T4 Gb

Ex II 2D Ex h IIIC 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 8000389448.

3.4.2 Differential pressure transmitter with magnetic spring contacts

MA15 ... 1B

Ⓔ II 2G Ex h IIC T4 Gb

Simple electric operating equipment acc. to EN60079-11 sec: 5.7 in explosive areas Zone 1 and 2.

Contact element: KE ## M ## 0B4H2

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 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.

As a simple electrical operating unit, the installed electrical switch contacts fulfil the requirements of the standard EN60079-14 Par. 3.5.2. The devices are not labelled with respect to the electrical part.

The documents for the mechanical part were filed with notified office NB0044 (TÜV-Nord-Cert) under the file number 8000389448.

Intrinsically safe power circuits

For use in areas at risk of explosion, instruments must be connected to certified, intrinsically safe electricity circuits.

Max. voltage	U_{\max}	30 V
Max. current	I_{\max}	200 mA
Max. power	P_{\max}	800 mW
Max. inner capacity	$C_{i \max}$	60 pF
Max. inner inductivity	$L_{i \max}$	4 μ H

Recommend circuit breakers see accessories

3.4.3 Differential pressure transmitter with inductive contacts

MA15 ... 1C

Ex II 2G Ex h IIC T4 Gb

Ex II 2D Ex h IIIC T95°C Db

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

Contact element: KE ## I ## 0C0H2

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 installed inductive proximity switches of the type SJ2-N (106575) are EC type-tested with the certificate PTB 99 ATEX 2219 X. The type of the installed proximity switch is stated on the type plate. The manufacturer is Pepperl+Fuchs GmbH. For more information about proximity switches, please visit the website <https://www.pepperl-fuchs.com>.

The documents for the mechanical part were filed with notified office NB0044 (TÜV-Nord-Cert) under the file number 8000389448.

Intrinsically safe power circuits

For use in areas at risk of explosion, instruments must be connected to certified, intrinsically safe electricity circuits.

Max. voltage	U_{\max}	16 V
Max. current	I_{\max}	25 mA
Max. power	P_{\max}	64 mW
Max. inner capacity	$C_{i \max}$	30 nF
Max. inner inductivity	$L_{i \max}$	100 µH

Recommend circuit breakers see accessories

3.4.4 Differential pressure transmitter with rotation angle transducer

MA15 ... 2D

Ⓔ II 2G Ex h IIC T4 Gb

Explosive areas Zone 1 and 2, risk from gases.

Rotation angle transducer: KE0905#9

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 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 installed capacitive rotation angle measuring transducer of the type KINAX 3W2 are EC type-tested with the certificate ZELM 10 ATEX 0427 X. The type of the installed rotation angle transducer is stated on the type plate. The manufacturer is Camille Bauer Metrawatt AG. For more information about the rotation angle transducer, please visit the website <http://www.camillebauer.com>.

The documents for the mechanical part were filed with notified office NB0044 (TÜV-Nord-Cert) under the file number 8000389448.

Intrinsically safe power circuits

For use in areas at risk of explosion, instruments must be connected to certified, intrinsically safe electricity circuits.

Max. voltage	U_{\max}	30 V
Max. current	I_{\max}	160 mA
Max. power	P_{\max}	1 mW
Max. inner capacity	$C_{i \max}$	10 nF
Max. inner inductivity	$L_{i \max}$	0 µH

Recommend circuit breakers see accessories

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 the pressure connections do not leak before commissioning.

4.2 Zero point correction

The pressure measuring units are set in the factory before delivery so that they do not usually need to be adjusted at the assembly site.

The zero-point may need to be corrected for some units on site (see order code).

Units with setting screw

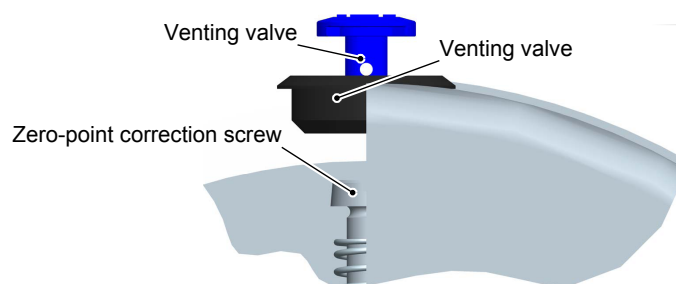


Fig. 9: Zero point correction

1. Depressurize the measuring line or only exert the existing static system pressure.
2. Open the venting valve as shown in the illustration and carefully remove the entire valve plug from the casing.
3. Adjust the measurement value pointer using zero point correction screw to the scale zero point.
4. Refit the valve plug into the casing.
5. Close the venting valve.

Unit with micro adjustment indicator

Micro adjustment indicators can only be used in units without a fluid filling.



Fig. 10: Micro adjustment indicator

1. Open the casing by releasing the bayonet ring.
2. Set the indicator to zero with a screwdriver.
3. Close the casing.

4.3 Switch point setting

There is an adjustment lock attached to the front pane of the measuring unit on units with installed limit signal encoders. Using the detachable adjustment key, 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.

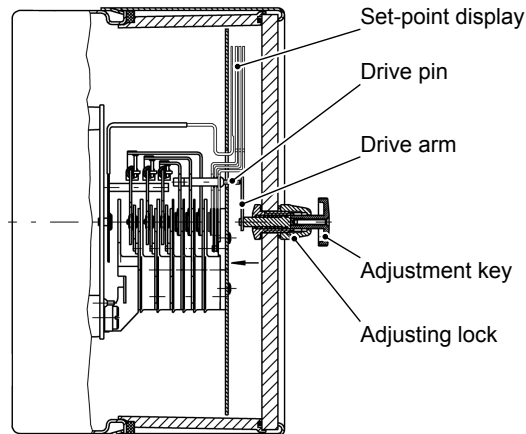


Fig. 11: Contact element

1. Place the adjustment key on the axle of the adjusting lock
2. Press axle inwards until the drive arm reaches behind the setting pin of the target value indicator.
3. Set the target value indicator to the required switch point by turning the key.
4. Relieve the axle, remove the adjustment key

Contact function

Function 1: Close contacts for increasing display in clockwise direction.

Function 2: Open contacts for increasing display in clockwise direction.

Contact assignment:

Up to three contacts are available depending on the unit version.

1. Contact left target indicator
2. Contact middle target indicator
3. Contact right target indicator

4.4 Units with a rotation angle transducer

The capacitive rotation angle transducer records the angle setting of the indicator in a contact-free manner and changes this into an measurement that is proportional to the AC current signal. The device is configured in the factory before delivery and cannot be reset on site.

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 accessories

- Siphons MZ1###
- Capillary throttle coil MZ400#
- Settable damping reactor MZ410#
- Manometer shutoff valves MZ5###, MZ6###

Please see here the data sheet MZ measuring devices accessories. Here you will find more detailed information about the technical data and the order codes of the accessory parts MZ.

You can request the data sheet on request or via our webserver www.fischer-messtechnik.de.

5.5 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 Standard version

The measuring variable is pressure and/or under-pressure in gaseous, liquid, aggressive, highly viscous or soiled media.

The diaphragm manometer fulfils the requirements of the standard EN 837-3.

Measuring range

0 ... 16 mbar to 0 ... 250 mbar	Flange diameter 160 mm
0 ... 400 mbar bar to 0 ... 25 bar	Flange diameter 100 mm
-1 ... 0 to -1 ... 24 bar	

Pressure load

Admissible overload	5x Scale upper value (max. 40 bar)	
Idle load	Scale upper value	
Alternating load	0.9 x Scale upper value	
Max. pressure (flange screw connection)	160 mm	10 bar
	100 mm	40 bar

Process connection

Connecting shanks	G $\frac{1}{2}$ B, G $\frac{1}{4}$ B, G $\frac{3}{8}$ B	
	$\frac{1}{4}$ -18 NPT, $\frac{1}{2}$ -14 NPT	
	M20 x 1.5	
Connection flange DIN EN	DN20, DN25, DN50 PN40	
Connection flange ANSI	1", 2", 3"	150 lbs, 300 lbs
open connection flange with loose collar flange *)	DN 50	PN40

*) only for measuring ranges ≥ 400 mbar

Accuracy class

1.6	
2.5	Units with coated / cladmed measuring system

Permissible temperature

Increase ambient temperature	-20 °C ... +60 °C
Media temperature	≤ 85 °C
Storage temperature	-40 °C ... +70 °C

Temperature influence

If there is a reference temperature difference of +20 °C on the measuring system:

$\leq \pm 0.8$ % / 10 K	of the respective scale upper value
-------------------------	-------------------------------------

Housing

Bayonet ring housing	\varnothing 100 or 160 mm
Safety housing	

Protection

IP66 acc. to EN 60529 / IEC 60529

Materials

Housing	CrNi Steel 1.4404
Motion train	CrNi steel 1.4301
Dial face and needle	Aluminium (painted)
Inspection disk	Safety laminated glass
Connecting port (contact with medium)	CrNi-steel 1.4404 (AISI 316L)
Connection flange (contact with medium)	CrNi-steel 1.4404 (AISI 316L)
Diaphragm (contact with medium)	
- Measuring range ≤ 250 mbar	CrNi steel 1.4571 (AISI 316T)
- Measuring ranges ≥ 400 mbarr	NiCrCo alloy (DURATHERM®)
Seals (contact with medium)	VITON®

6.2 Options

Additional electrical attachments

Limit signal transmitters of the type KE and capacitive rotation angle transducer of the type KE09 can be fitted into a housing enlarged by a corresponding bayonet ring. The electrical connection is usually realised via a cable connection socket mounted to the side of the casing.

Please refer to the data sheets KE and KE09 for technical data. You can receive the data sheet on request or download them from our webserver www.fischermesstechnik.de.

Fluid charging

The housing can be filled with glycerine if the casing is to operate under aggravated operating conditions such as vibrations and extreme pressure fluctuations, or in order to avoid condensate formation if used outdoors.

- Silicone oil is used in units with switch contacts.
- Paraffin oil is used in units with inductive proximity switches.
- Filling is not possible in units with a capacitive rotation angle transducer.

Needle

- **Marker indicator**

Settable indicator for marking the limit value in the disk.

- **Drag indicator**

The drag indicator is 'dragged' by 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.

Measuring system

- **O₂ applications 'Oil and grease'**

In compliance with the requirements of the Chemical Professional Association, all parts that come into contact with the medium are cleaned (see order code filling fluids)

- **PTFE cladding and/or PFA coating of the measuring system**

In the case of highly aggressive media, all parts that come into contact with the medium are coated with a protective sheath of PFA or PTFE. A FEP covered O-Ring made of FKM is used for the flange seal. A suitable seal needs to be used on the system side to seal the cladded units.

- **Material**

Optionally, the measuring system incl. the process connection is also made of Hastelloy C.

Zero point correction

- with a setting screw
- with a micro adjustment indicator

6.3 Dimensional drawings

All dimensions in mm unless otherwise stated

6.3.1 Model without contacts

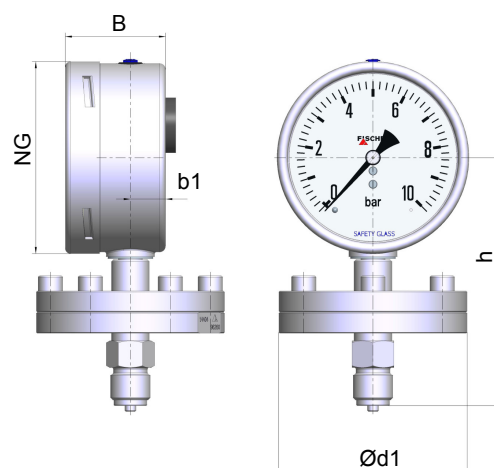


Fig. 12: Dimension drawing MA15F without contacts

Housing	NG	B	h	b1	Ød1
Bayonet ring housing	100	53	130	19	100
	160	53	160	19	157
Safety housing	100	63	130	26	100
	160	65	160	26	157

6.3.2 Model with contacts

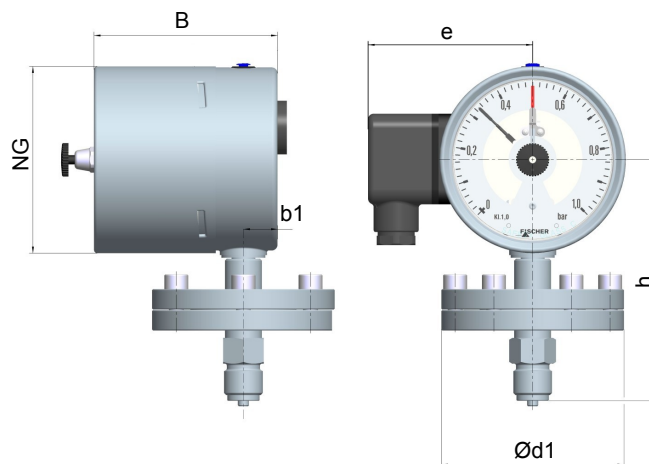


Fig. 13: Dimension drawing MA15F with contacts

Housing	NG	B	h	b1	Ød1	e
Bayonet ring housing	100	100	130	19	100	90
	160	100	160	19	157	120
Safety housing	100	109	130	26	100	90
	160	109	160	26	157	120

6.3.3 Process connection

6.3.3.1 Version with collar flange

The dimensions stated apply for all housing models NG100 and NG160.

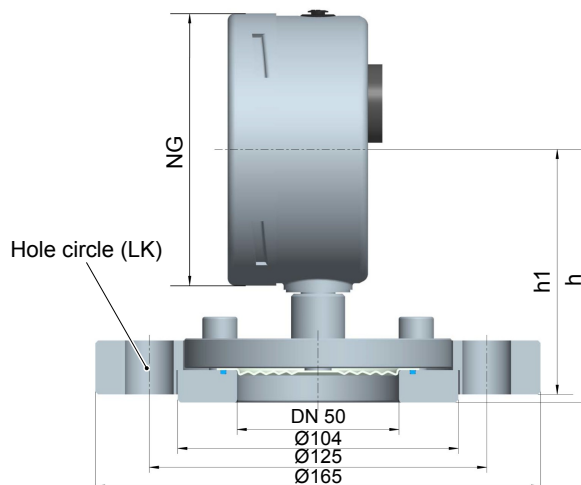


Fig. 14: Collar flange

Measuring range ≥ 400 mbar

DN	PN	NG	h	h1	LK	
					No.	Borehole
50	40	100	94	91	4	18
		160	124	121	4	18

6.3.3.2 Version with DIN connection flange

The dimensions stated apply for all housing models NG100 and NG160.

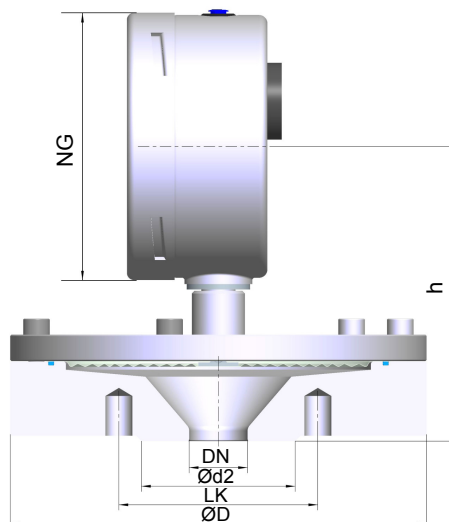


Fig. 15: Connection flange

Measuring range ≤ 400 mbar

DN	PN	ØD	Ød2	h	LK	No.	Thread
					Ø		
20	40	157	58	111	75	4	M12
25	40	157	68	110	85	4	M12
50	40	165	102	108	125	4	M16

Measuring range ≥ 0.6 bar

20	40	105	58	106	75	4	M12
25	40	115	68	103	85	4	M12
50	40	165	102	108	125	4	M16

6.3.3.3 Version with ANSI connection flange

Dimension drawing, see Version with DIN connection flange [► 25]. The dimensions stated apply for all housing models NG100 and NG160.

Measuring range ≤ 400 mbar

		ØD	Ød2	h	LK	No.	Thread
					Ø		
1"	150 lbs	157	50.8	118	79.2	4	1/2-13 UNC
1"	300 lbs	157	50.8	120	88.9	4	5/8-11 UNC
2"	150 lbs	157	91.9	123	120.7	4	5/8-11 UNC
3"	150 lbs	165	92.1	114	127	8	5/8-11 UNC

Measuring range ≥ 0.6 bar

1"	150 lbs	108	50.8	118	79.2	4	1/2-13 UNC
1"	300 lbs	123	50.8	124	88.9	4	5/8-11 UNC
2"	150 lbs	152	91.9	107	120.7	4	5/8-11 UNC
3"	150 lbs	190.5	127	119	152.4	4	Ø19.1

6.3.3.4 Connecting shanks

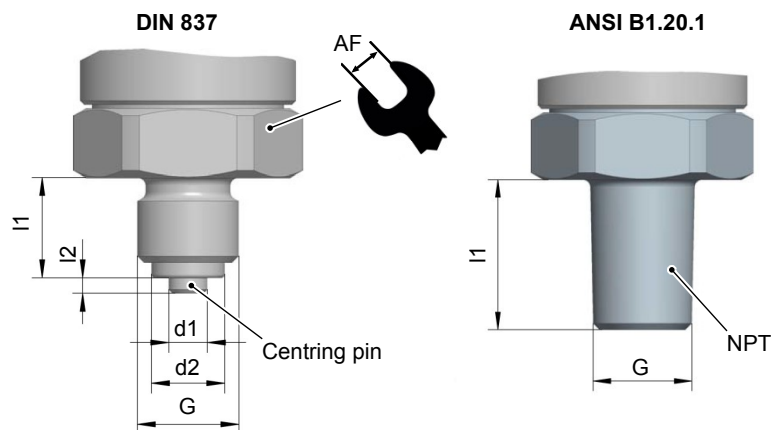
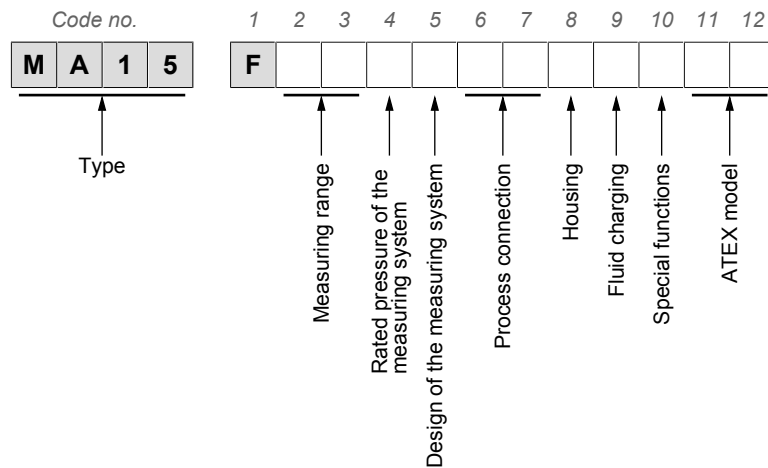


Fig. 16: Connecting shanks

G (Thread)	d1	d2	l1	l2	SW
G $\frac{1}{4}$ B	5	9.5	13	2	19
G $\frac{3}{8}$ B	5.5	13	16	3	22
G $\frac{1}{2}$ B	6	17.5	20	3	22
M20 x 1.5	6	17.5	20	3	22
$\frac{1}{4}$ -18 NPT			15		19
$\frac{1}{2}$ -14 NPT			19		22

7 Order Codes



[2.3] Measuring range

55	0 ... 16 mbar
56	0 ... 25 mbar
57	0 ... 40 mbar
58	0 ... 60 mbar
59	0 ... 100 mbar
60	0 ... 160 mbar
82	0 ... 250 mbar
83	0 ... 400 mbar
01	0 ... 0.6 bar
02	0 ... 1 bar
03	0 ... 1.6 bar
04	0 ... 2.5 bar
05	0 ... 4 bar
06	0 ... 6 bar
07	0 ... 10 bar
08	0 ... 16 bar
09	0 ... 25 bar
31	-1 ... 0 bar
32	-1 ... 0.6 bar
33	-1 ... 1.5 bar
34	-1 ... 3 bar
35	-1 ... 5 bar
36	-1 ... 9 bar
37	-1 ... 15 bar
28	-1 ... 24 bar

[4]	Rated pressure of the measuring system
E	10 bar (Measuring ranges ≤ 250 mbar)
H	40 bar (Measuring ranges ≥ 400 mbar)

[5]	Design of the measuring system
V	CrNi Steel 1.4404
S	CrNi steel 1.4404 with diaphragm in Hastelloy C
T	CrNi steel 1.4404 with PFA coating
P	CrNi steel 1.4404 with PTFE coating

[6.7]	Process connection
85	Connection shanks with external thread G $\frac{1}{4}$ B acc. to DIN EN 837
86	Connection shanks with external thread G $\frac{3}{8}$ B acc. to DIN EN 837
87	Connection shanks with external thread G $\frac{1}{2}$ B acc. to DIN EN 837
88	Connecting port G $\frac{1}{2}$ with outer thread $\frac{1}{4}$ -18 NPT
89	Connecting port G $\frac{1}{2}$ with outer thread $\frac{1}{2}$ -14 NPT
S2	Connection shanks with external thread M20 x 1.5 acc. to DIN EN 3852
FL	open flange with collar attachment flange DN50 PN40 ^{*)}
F1	Connection flange DN20, PN40
F2	Connection flange DN25, PN40
F5	Connection flange DN50, PN40
D3	ANSI flange 1" 150 lbs
D8	ANSI flange 1" 300 lbs
D6	ANSI flange 2" 150 lbs
D5	ANSI flange 3" 150 lbs

^{*)} only for measuring ranges from 400 mbar

[8]	Housing
L	Bayonet ring housing NG100
C	Bayonet ring housing NG160
0	Safety housing NG100
P	Safety housing NG160

[9]	Fluid charging
0	Without fluid filling
1	Glycerine Unit without contacts
4	Paraffin Unit with inductive contacts
5	Silicone oil

Please note that units can only be filled with fluid from a measuring range of 100 mbar. Units with an installed rotation angle transducer cannot be filled.

[10] Special functions		
1	Zero-point correction with setting screw	
2	Zero-point correction micro adjustment indicator	
3	Zero-point correction with setting screw	Adjustable marker needle
4	Zero-point correction with setting screw	Resettable drag needle ^{*)}
5	Zero-point correction micro adjustment indicator	Adjustable marker needle
6	Zero-point correction micro adjustment indicator	Resettable drag needle ^{*)}

^{*)} only for measuring ranges from 60 mbar

[11.12] ATEX		
0A	Non-electrical unit (without switch contacts)	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T95°C Db
1B	Unit with magnetic spring contacts KE##M##0B4H2 Simple electrical operating equipment acc. to DIN EN 60079-11	II 2G Ex h IIC T4 Gb
1C	Unit with inductive contacts KE##I##0C0H2	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T95°C Db
2D	Unit with capacitive rotation angle transducer KE0905#9	II 2G Ex h IIC T4 Gb

8 Attachments

8.1 EU Declarations of conformity



(Translation) **CE**

EU Declaration of Conformity

For the product described as follows

Product designation **Diaphragm pressure gauge**
(with snap action contacts KE ## M ## 0B4H2)

Type designation **MA15 ... 1B**

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

2014/35/EU	Low Voltage Directive
2014/34/EU	ATEX 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

Explosive atmospheres (ATEX)

DIN EN 60079-0:2014-06
EN 60079-0:2012 + A11:2013

Explosive atmospheres - Part 0: Equipment - General requirements

DIN EN ISO 80079-36:2016-12
EN ISO 80079-36:2016

Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements

DIN EN ISO 80079-37:2016-12
EN ISO 80079-37:2016

Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres - Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k"

The build-in contact device as an 'standard electrical equipment' meets the requirements of paragraph 3.5.2 of the following standard

DIN EN 60079-14:2014-10
EN 60079-14:2014

Explosive atmospheres - Part 14: Electrical installations design, selection and erection

DIN EN 60079-14 Corrigendum 1:2016-06
EN 60079-14:2014/AC:2016

Corrigendum to DIN EN 60079-14

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

The dossier is retained under file no. **8000389448** at the notified body **NB0044**:

TÜV NORD CERT GmbH
Langemarckstraße 20
D-45141 Essen, Germany

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.

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Fig. 17: CE_DE_MA15F_1B_Page1

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 Salzuflen, Germany
Tel. +49 (0)5222 974 0

Documentation representative

Mr. Torsten Malischewski
B.Sc.
Development department

The devices bear the following marking:

CE  II 2G Ex h IIC T4 Gb



Bad Salzuflen
14 Feb 2018

G. Gödde
Managing director



(Translation) **CE**

EU Declaration of Conformity

For the product described as follows

Product designation **Diaphragm pressure gauge**
(with inductive contacts KE ## I ## 0C0H2)

Type designation **MA15 ... 1C**

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

2014/34/EU	ATEX Directive
2011/65/EU	RoHS Directive

The products were tested in compliance with the following standards.

Explosive atmospheres (ATEX)

DIN EN 60079-0:2014-06
EN 60079-0:2012 + A11:2013

Explosive atmospheres - Part 0: Equipment - General requirements

DIN EN 60079-31:2014-12
EN 60079-31:2014

Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

DIN EN ISO 80079-36:2016-12
EN ISO 80079-36:2016

Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements

DIN EN ISO 80079-37:2016-12
EN ISO 80079-37:2016

Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres - Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k"

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

The dossier is retained under file no. **8000389448** at the notified body **NB0044**:

TÜV NORD CERT GmbH
Langemarckstraße 20
D-45141 Essen, Germany

The built-in inductive proximity switches are EC type certified: **PTB 99 ATEX 2219 X**

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 Salzuflen, Germany
Tel. +49 (0)5222 974 0

Documentation representative

Mr. Torsten Malischewski
B.Sc.
Development department

The devices bear the following marking:

Ex II 2G Ex h IIC T4 Gb
Ex II 2D Ex h IIC T95°C Db

Bad Salzuflen
14 Feb 2018

G. Gödde
Managing director



Fig. 20: CE_DE_MA15F_1C_Page2

(Translation) **CE**

EU Declaration of Conformity

For the product described as follows

Product designation **Diaphragm pressure gauge**
(with transmitter for angular position KE0905#9)

Type designation **MA15 ... 2D**

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

2014/30/EU	EMC Directive
2014/34/EU	ATEX 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

Explosive atmospheres (ATEX)

DIN EN 60079-0:2014-06 EN 60079-0:2012 + A11:2013	Explosive atmospheres - Part 0: Equipment - General requirements
DIN EN ISO 80079-36:2016-12 EN ISO 80079-36:2016	Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements
DIN EN ISO 80079-37:2016-12 EN ISO 80079-37:2016	Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres - Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k"

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
--	--

The dossier is retained under file no. **8000389448** at the notified body **NB0044**:

TÜV NORD CERT GmbH
Langemarckstraße 20
D-45141 Essen, Germany

The build-in transmitter for angular position is EC type certified: **ZELM 10 ATEX 0427 X**

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.

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Fig. 21: CE_DE_MA15F_2D_Page1

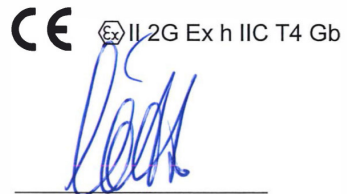
Sole responsibility for the issue of this declaration of conformity in relation to fulfilment of the fundamental requirements and the production of the technical documents is with the manufacturer.

Manufacturer**FISCHER Mess- und Regeltechnik GmbH**

Bielefelder Str. 37a
32107 Bad Salzuflen, Germany
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Documentation representative

Mr. Torsten Malischewski
B.Sc.
Development department

The devices bear the following marking:

Bad Salzuflen
14 Feb 2018

G. Gödde
Managing director



Fig. 22: CE_DE_MA15F_2D_Page2

(Translation) **CE**

EU Declaration of Conformity

For the product described as follows

Product designation **Diaphragm pressure gauge**
(without contact device)

Type designation **MA15 ... 0A**

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

2014/34/EU

ATEX Directive

The products were tested in compliance with the following standards.

Explosive atmospheres (ATEX)

DIN EN 60079-0:2014-06
EN 60079-0:2012 + A11:2013

Explosive atmospheres - Part 0: Equipment - General requirements

DIN EN 60079-31:2014-12
EN 60079-31:2014

Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

DIN EN ISO 80079-36:2016-12
EN ISO 80079-36:2016

Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements

DIN EN ISO 80079-37:2016-12
EN ISO 80079-37:2016

Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres - Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k"

Manufacturer



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Documentation representative

Mr. Torsten Malischewski
B.Sc.
Development department

The devices bear the following marking:

CE  II 2G Ex h IIC T4 Gb
 II 2D Ex h IIIC T95°C Db

Bad Salzufflen
13 March 2018

G. Götde
Managing director

09010225 • CE_EN_MA15F_0A • Rev. ST4-A • 03/18



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Fig. 23: CE_DE_MA15F_0A