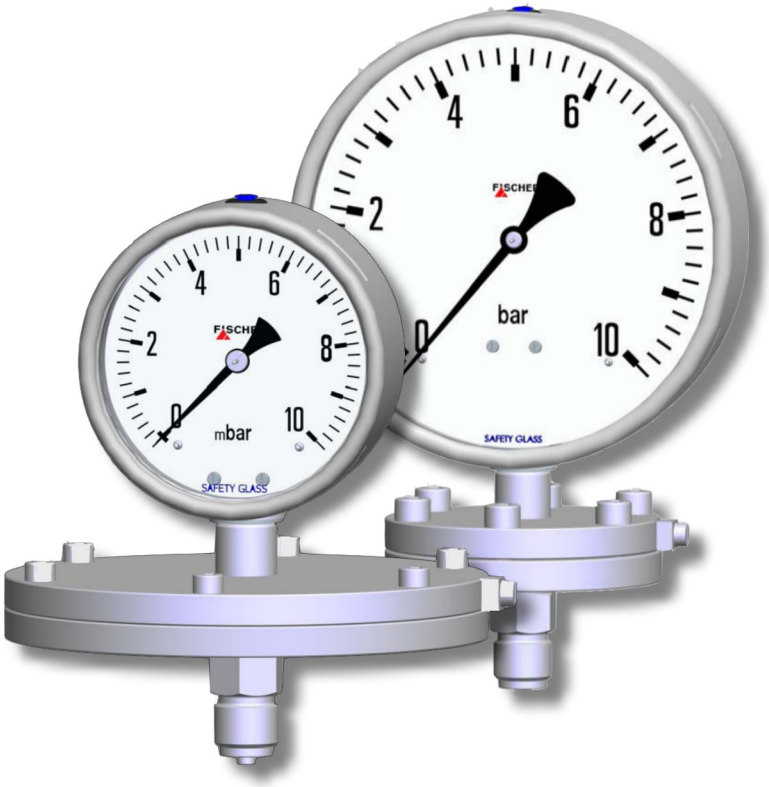
developing solutions

FISCHER
MESS- UND REGELTECHNIK

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

RoHS II COMPLIANT

UK CA



Data sheet

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

09015054 • DB_EN_MA15_ATEX • Rev. ST4-F • 10/21

1 Product and functional description

1.1 Performance characteristics

Important features

- Highly durable
- Corrosion-resistant casing made of CrNi steel
- Thread or flange connection
- Measuring range from 0…16 mbar
- Large selection of special models

Typical applications

- Measuring points with higher overload
- Gaseous, fluid and highly viscous media
- Aggressive or soiled media, also media containing solids
- Use in aggressive environments
- Use in areas at risk of explosion Zone 1 and 2 and also Zone 21 and 22

Areas of application

- Chemical and petrochemical industry
- Mining
- Power plants
- On-/Offshore
- Environment technology
- Mechanical and plant engineering

1.2 Product summary

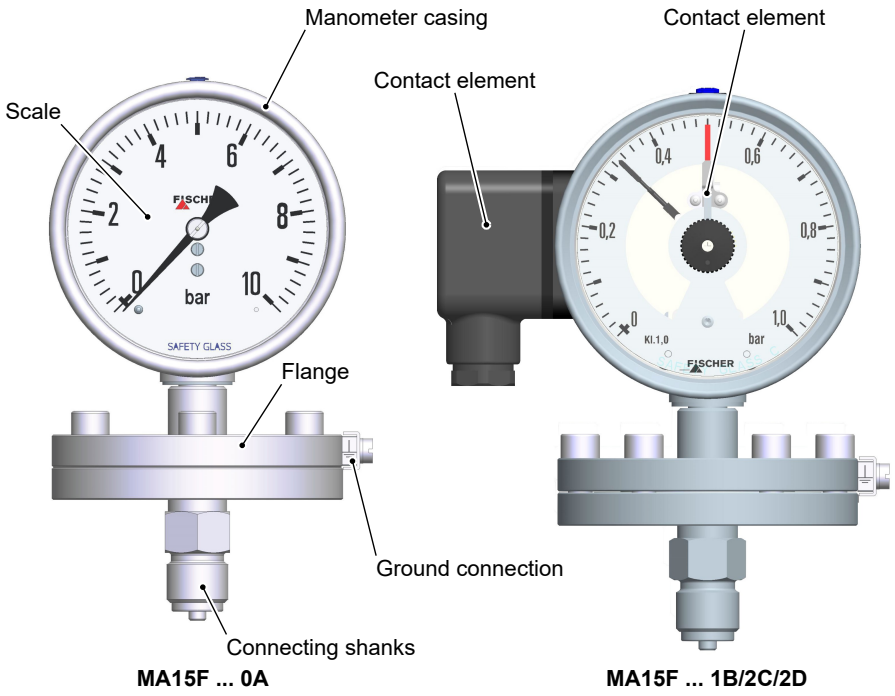


Fig. 1: Product summary

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).

1.3 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.

MA15F … 0A Diaphragm manometer without switch contacts


II 2G Ex h IIC T4 Gb


II 2D Ex IIIC T95°C Db

MA15F … 1B Diaphragm manometer with switch contacts


II 2G Ex h IIC T4 Gb

MA15F … 1C Diaphragm manometer with inductive proximity switches


II 2G Ex h IIC T4 Gb


II 2D Ex IIIC T95°C Db

MA15F … 2D Diaphragm manometer capacitive rotation angle transducer


II 2G Ex h IIC T4 Gb

[1] Please see the information in the order code.

1.4 Function diagram

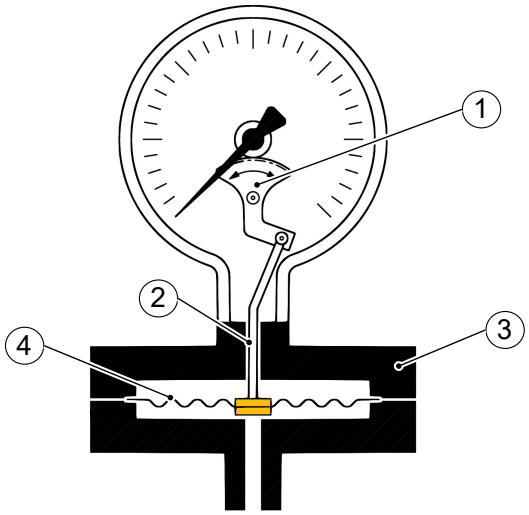


Fig. 2: Function diagram

1 Motion train	2 Connecting rod
3 Flange	4 Diaphragm

1.5 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.

2 Technical Data

2.1 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 … 250mbar	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	G½B, G¼B, G⅜B	
	¼-18 NPT, ½-14 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 collare flange *)	DN 50	PN40

*) only for measuring ranges ≥ 400 mbar

Accuracy class

1.6	
2.5	Units with coated / cladded 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:

≤ ±0.8 % /10 K	of the respective scale upper value

Housing

Bayonet ring housing	Ø 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 < 160 mbar	CrNi steel 1.4571 (AISI 316T)
- Measuring ranges ≥ 160 mbar	NiCrCo alloy (DURATHERM®)
Seals (contact with medium)	VITON®

2.2 Options

- Additional electrical attachments
  - Limit switch type KE
  - Capacitive rotation angle transducer type KE09
- Fluid charging
- Needle
  - Marker needle
  - Trailing needle
- Measuring system
  - O_2 applications
  - PTFE cladding / PFA coating of the measuring system
  - Model in Hastelloy C
- Zero-point adjustment
  - Setting screw
  - Micro adjustment indicator

2.3 Dimensional drawings

All dimensions in mm unless otherwise stated

2.3.1 Model without contacts

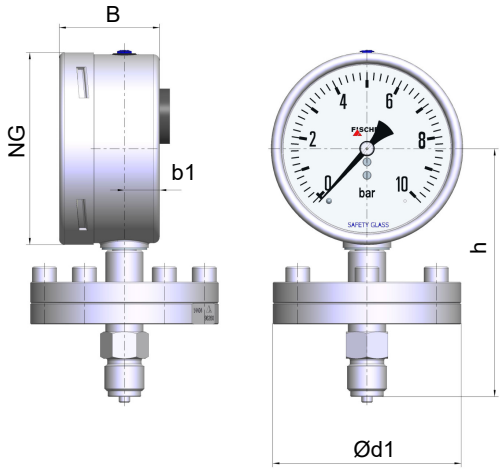


Fig. 3: Dimension drawing MA15F without contacts

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

2.3.2 Model with contacts

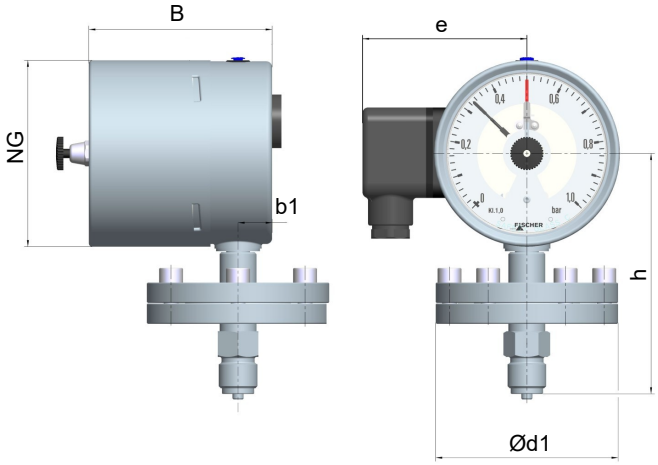


Fig. 4: Dimension drawing MA15F with contacts

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

Electrical connection

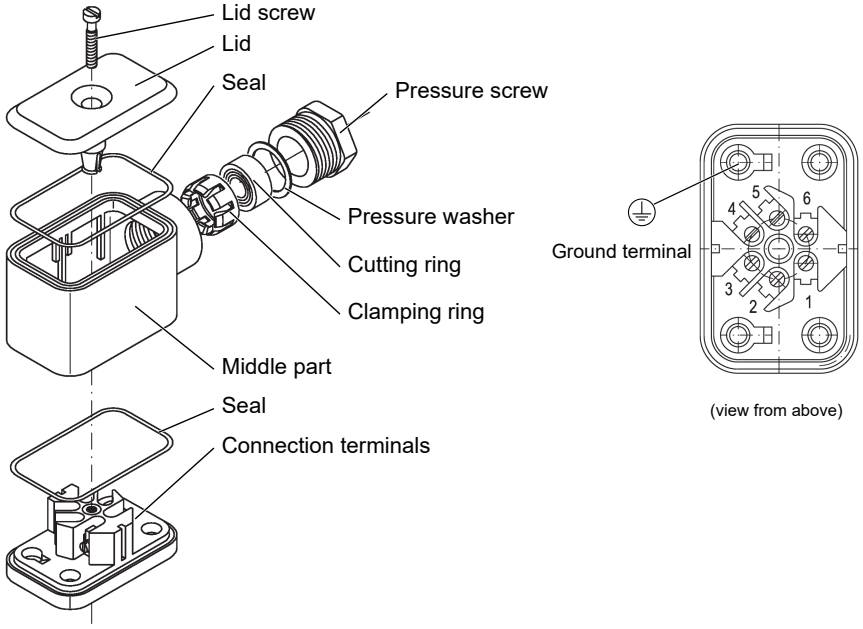


Fig. 5: Cable socket

Please see the type plate for the connection assignment.

2.3.3 Process connection

2.3.3.1 Version with collar flange

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

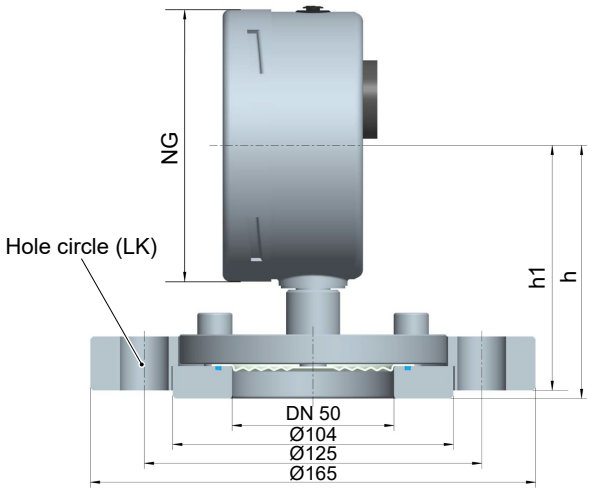


Fig. 6: Collar flange

Measuring range ≥ 400 mbar

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

2.3.3.2 Version with DIN connection flange

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

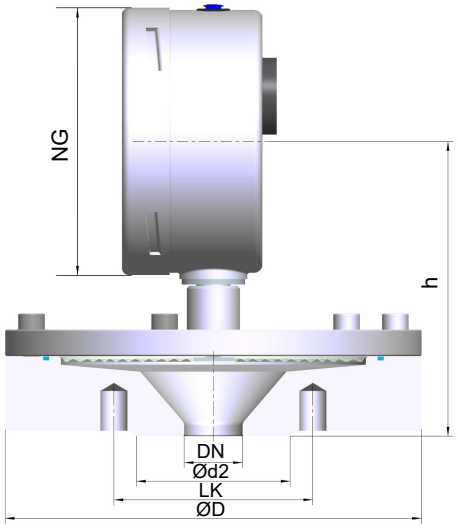


Fig. 7: Connection flange

Measuring range ≤ 400 mbar

DN	PN	ØD	Ød2	h	LK		
					Ø	No.	Thread
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

2.3.3.3 Version with ANSI connection flange

Dimension drawing, see Version with DIN connection flange [▶ 9]. The dimensions stated apply for all housing models NG100 and NG160.

Measuring range ≤ 400 mbar

		ØD	Ød2	h	LK		
					Ø	No.	Thread
1"	150 lbs	157	50.8	118	79.2	4	½-13 UNC
1"	300 lbs	157	50.8	120	88.9	4	⅝-11 UNC
2"	150 lbs	157	91.9	123	120.7	4	⅝-11 UNC
3"	150 lbs	165	92.1	114	127	8	⅝-11 UNC

Measuring range ≥ 0.6 bar

1"	150 lbs	108	50.8	118	79.2	4	½-13 UNC
1"	300 lbs	123	50.8	124	88.9	4	⅝-11 UNC
2"	150 lbs	152	91.9	107	120.7	4	⅝-11 UNC
3"	150 lbs	190.5	127	119	152.4	4	Ø19.1

2.3.3.4 Connecting shanks

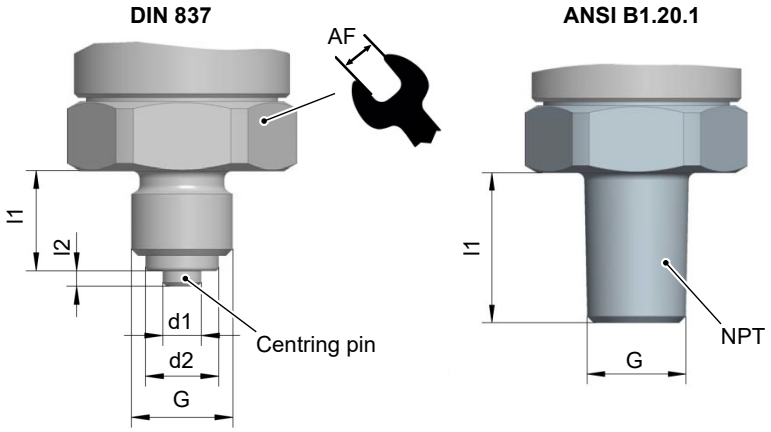
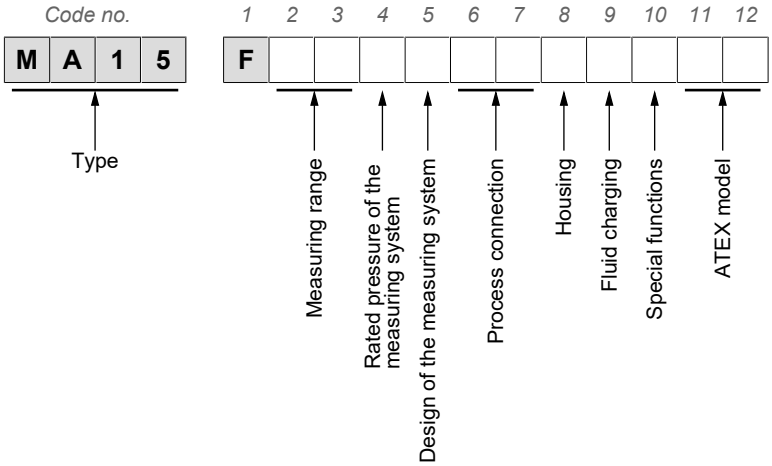


Fig. 8: Connecting shanks

G (Thread)	d1	d2	l1	l2	SW
G¼B	5	9.5	13	2	19
G⅜B	5.5	13	16	3	22
G½B	6	17.5	20	3	22
M20 x 1.5	6	17.5	20	3	22
¼-18 NPT			15		19
½-14 NPT			19		22

3 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 G¼B acc. to DIN EN 837
86	Connection shanks with external thread G⅜B acc. to DIN EN 837
87	Connection shanks with external thread G½B acc. to DIN EN 837
88	Connecting port G½ with outer thread ¼-18 NPT
89	Connecting port G½ with outer thread ½-14 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

3.1 Accessories

Measuring instrument accessories according to data sheet MZ.

Order no.	Designation
MZ1###	Siphons according to DIN 16282, PN100 on both sides G½
MZ400#	Capillary inductor 2 mm clear width, socket G1/2i, pin G1/2A
MZ5###	Pressure gauge Shut-off valve acc. to DIN 16270/16271 Journal/ socket G1/2
MZ6###	Pressure gauge double valve acc. to DIN 16272 Journal/socket G1/2

The data sheet is available on request or from our web server https://www.fisc-hermesstechnik.de/.

Order no.	Designation	Type
05003090	Galvanically isolated supply isolating amplifier for ATEX applications. • 24 V DC, 1 channel Input: 4 … 20 mA Output: 4 … 20 mA • The device can be mounted in Zone 2 / Cl.1, Div. 2 and can receive signals from Zones 0, 1 and 2, as well as 20, 21 and 22 including Mining / Class I/II/III, Div. 1, Size A-G. • SIL2/SIL3 according to IEC 61508	9106B1A
05003091	Pulse isolator for the transmission of signals from NAMUR sensors and mechanical switches from the ATEX area to the safe area. • 24 V DC, 1 channel Switching input (NAMUR) Relay output • The device can be used in safe areas and in zone 2 / div. 2 and can accept signals from zone 0, 1, 2, 20, 21, 22 as well as M1 / class I/II/III, div. 1, size A-G. • SIL2 according to IEC 61508	9202B2A
05003092	Pulse isolator for the transmission of signals from NAMUR sensors and mechanical switches from the ATEX area to the safe area. • 24 V DC, 2 channel Switching input(NAMUR) Relay output • The device can be used in safe areas and in zone 2 / div. 2 and can accept signals from zone 0, 1, 2, 20, 21, 22 as well as M1 / class I/II/III, div. 1, size A-G. • SIL2 according to IEC 61508	9202B2B

Order no.	Designation	Type
05003093	Display / Programming front Communication interface for setting the operating parameters for supply isolating amplifiers and pulse isolators. • The device may only be used in safe areas. • Allows saving the configuration of a device type and loading it into other devices of the same type. • Display for process data and status visualization.	4501

3.2 Information about the document

This document contains all technical data about the device. Great care was taken when compiling the texts and illustrations. nevertheless, errors cannot be ruled out.

Subject to technical amendments.

FISCHER Mess- und Regeltechnik GmbH
Bielefelder Str. 37a
D-32107 Bad Salzuflen

Tel. +49 5222 974-0
Fax +49 5222 7170
www.fischermesstechnik.de
info@fischermesstechnik.de