



Ex II1/2G Ex ia IIC T4 Ga/Gb
Ex II 2D Ex ia IIIC T80°C Db



RoHS II
COMPLIANT

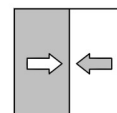


Datasheet

DE49 ## 0

Digital differential pressure transmitter

for explosive areas
Dust explosion protection zone 21 and 22, dry dusts
Gas explosion protection zone 1 and 2, gases and vapors



1 Product and functional description

1.1 Performance features

Important features

- ATEX type testing
 - Zone 21 and 22
 - Zone 1 and 2
- Robust, resistant to overpressure and maintenance-free
- LC Measured value display
- Foil keypad
- Can be configured
- Analogue output signal with
 - Characteristic curve spread inversion
 - with any offset within the measuring range
- Casing protection class IP65

Typical applications

- Ventilation equipment in areas at risk of explosion (painting systems, pharmacy, chemicals)

1.2 Intended use

The differential pressure transmitter DE49##0###BH00M# allows the measurement of under-pressure, over-pressure and differential pressure in dry neutral and gaseous media.

Fields of application include

- Air-conditioning technology
- Ventilation technology
- Environmental technology

Explosion hazard area classification

The differential pressure transmitter DE49##0###BH00M# is suitable as an electrical device for operation in potentially explosive areas.

- The device must be installed in Zone 1 or 2 or Zone 21 or 22.
- The pressure connections may be connected with Zone 0.
- The power circuit must satisfy the ignition protection category "Intrinsic safety" category "ia".
- Designation as per guideline 2014/34/EU.

Ⓔ II 1/2G Ex ia IIC T4 Ga/Gb

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$-10\text{ °C} \leq T_a \leq +60\text{ °C}$

1.3 Equipment versions

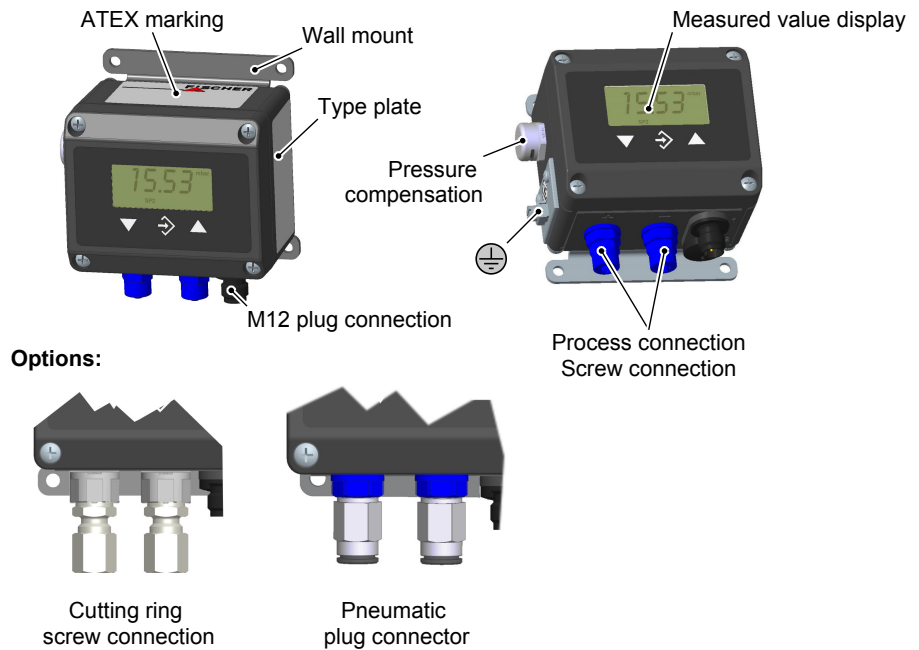


Fig. 1: Equipment versions DE49##0

1.4 Function diagram

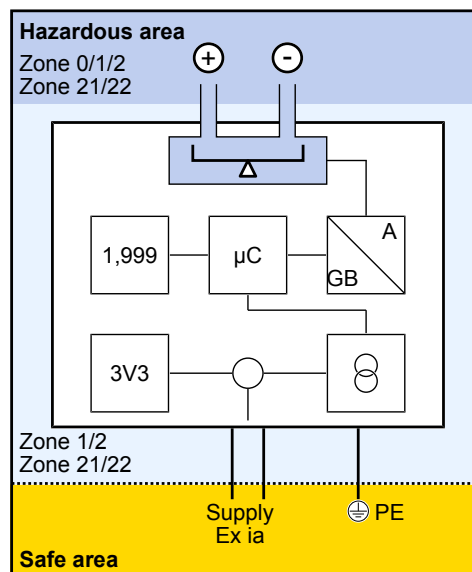


Fig. 2: Function diagram

1.5 Design and mode of operation

This switching device is based on a piezo-resistive sensor element that is suitable for measuring overpressure, underpressure and differential pressure.

The pressure acts on the silicone membrane of a semiconductor chip which in turn deforms. The specific material resistance changes proportionally to the deformation.

The electronics inside the pressure transmitter casing now convert this resistance change into an electrical output signal, calculate the pressure measurement and display this on the LC display.

The optional output signal can be dampened, spread and inverted.

2 Technical data

2.1 General

Please also observe the order code here.

2.2 Input variables

Measuring variable: Differential pressure for gaseous media

Measuring range			Static operation pressure	Bursting pressure
mbar	Pa	kPa	mbar	mbar
---	0...25	---	50	150
---	0...40	---	50	150
---	0...60	---	50	150
---	0...100	---	50	150
0...4	0...400	---	50	150
0...6	0...600	---	50	150
0...10	0...1000	0...1,0	100	300
0...16	0...1600	0...1,6	100	300
0...25	---	0...2,5	250	750
0...40	---	0...4,0	250	750
0...60	---	0...6,0	500	1500
0...100	---	0...10,0	500	1500
---	-20 ... +80	---	50	150
---	±25	---	50	150
---	±40	---	50	150
---	±60	---	50	150
---	±100	---	50	150
±2,5	±250	---	50	150
±4	---	---	50	150
±6	---	---	50	150
±10	---	±1,0	100	300
±16	---	±1,6	100	300
±25	---	±2,5	250	750
±40	---	±4,0	250	750
±60	---	±6,0	500	1500
±100	---	---	500	1500

2.3 Output parameters

Outlet	Signal range	Apparent ohmic resistance
4...20 mA,	3.5...22.5 mA	$R_L \leq (U_b - 4 \text{ V})/0.02 \text{ A}$

2.4 Measurement accuracy

Characteristic curve deviation

(Non-linearity and hysteresis)

Maximum: 1.0 % FS

Typical: 0.5 % FS

The information refers to a linear, non-spread characteristic curve at 25 °C and applies to all measuring ranges. FS (Full Scale) refers to the basic measuring range.

Temperature coefficient (TK)

Measuring range			TK zero-point [% FS/10K]		TK span [% FS/10K]	
mbar	Pa	kPa	typ.	max.	typ.	max.
---	0...25	---	0.2	1.0	0.3	1.0
---	0...40	---	0.2	1.0	0.3	1.0
---	0...60	---	0.2	1.0	0.3	1.0
---	0...100	---	0.2	1.0	0.3	1.0
0...4	0...400	---	0.2	1.0	0.3	1.0
0...6	0...600	---	0.2	1.0	0.3	1.0
0...10	0...1000	0...1.0	0.2	0.4	0.3	0.3
0...16	0...1600	0...1.6	0.2	0.4	0.3	0.3
0...25	---	0...2.5	0.2	0.4	0.3	0.3
0...40	---	0...4.0	0.2	0.4	0.3	0.3
0...60	---	0...6.0	0.2	0.4	0.3	0.3
0...100	---	0...10.0	0.2	0.4	0.3	0.3
0...160	0...400	---	0.2	0.4	0.3	0.3
0...250	0...600	---	0.2	0.4	0.3	0.3
---	-20 ... +80	---	0.2	1.0	0.3	1.0
---	±25	---	0.2	1.0	0.3	1.0
---	±40	---	0.2	1.0	0.3	1.0
---	±60	---	0.2	1.0	0.3	1.0
---	±100	---	0.2	1.0	0.3	1.0
±2.5	±250	---	0.2	1.0	0.3	1.0
±4	---	---	0.2	0.5	0.3	0.5
±6	---	---	0.2	0.4	0.3	0.3
±10	---	±1.0	0.2	0.4	0.3	0.3
±16	---	±1.6	0.2	0.4	0.3	0.3
±25	---	±2.5	0.2	0.4	0.3	0.3
±40	---	±4.0	0.2	0.4	0.3	0.3
±60	---	±6.0	0.2	0.4	0.3	0.3
±100	---	---	0.2	0.4	0.3	0.3

With reference to the basic measuring range (FS), Compensation range 0..60°C.

2.5 Display and control elements

Display

4-digit LC display stating the measuring unit

Keyboard

Foil keypad with 3 buttons

Programming

Damping	0.0 ... 100.0 s (jump response time 10 / 90 %) for signal input
Measuring range unit	mbar, bar, Pa, KPa, PSI and inWc
Start / end of measuring range	User-definable within the basic measuring range ⁽¹⁾
Output signal	Adjustable limit values within the signal range
Zero-point stabilising	Zero-point window max. $\frac{1}{3}$ of the basic measuring range ⁽²⁾
Zero point correction	$\pm\frac{1}{3}$ of the basic measuring range ⁽³⁾
Implementation of characteristic curve	Linear, rooted, max. 4:1 spread, inverted
Password	1 ... 999 (0 = no password protection)

(1) Max. effective spread 4:1

(2) measured values around zero are set to zero.

(3) Zero-point correction to compensate different installation positions.

2.6 Auxiliary energy

The unit power supply may only be an inherently safe power circuit of the ignition protection type 'Ex ia IIC'.

Rated Voltage	24v DC
Admissible operating voltage	12 ... 30 V
Current limitation	≤ 22.5 mA (can be programmed)

Supply and signal power circuit limit values

(Ignition protection type intrinsic safety Ex ia IIC)

	U_i	≤ 30 V
	I_i	≤ 100 mA
	P_i	≤ 750 mW
inner effective capacity	C_i	2.5 nF
effective inner inductivity	L_i	negligible

NOTICE! In contrast to the EMV-GND, the power connections have an inner capacity of max. 5 nF.

2.7 Application conditions

Increase ambient temperature	-10 ... +60 °C
Media temperature	-10 ... +60 °C
Storage temperature	-20 ... +70 °C
Enclosure protection class	IP65 as per EN 60529
EMC	EN 61326-1:2013 EN 61326-2-3:2013
RoHS	EN 50581:2012
ATEX	EN 60079-0:2012 + A11:2013 EN 60079-11:2012 EN 60079-26:2015

ATEX classification

Type testing	IBExU09ATEX1164
Zone 1 and 2	⊕ II 1/2G Ex ia IIC T4 Ga/Gb
Zone 21 and 22	⊕ II 2D Ex ia IIIC T80°C Db

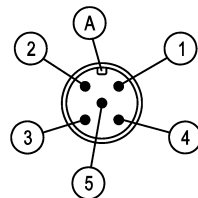
2.8 Construction design

Process connection

Aluminium hose screw connection for 6/4 or 8/6 mm hose
Cutting ring screw connection in brass for 6 or 8 mm pipe
Pneumatic plug connector for 6/4 or 8/6 mm hose

Electrical connection

M12 round plug connector (5-pin) for supply and analogue output signal



Pin	Signal name	Cable colour
1	Supply (+U _b) / output (+Sig)	brown
2	n.c.	
3	Supply (-U _b) / output (-Sig)	blue
4	n.c.	
5	Functional earth (⏏)	green/yellow
A	Coding Type A	

Fig. 3: Pin assignment

Materials

Housing	Polyamide (PA) 6.6 , electrically conductive
Media-contacting material	Silicon, Viton®, aluminium, brass

Assembly

Attachment boreholes on the rear side for attachment to mounting plates.

Wall mounting using wall mounting plate

Panel mounting set for installing the panel

Assembly of the mounting rails using an adapter

Dimensional drawings

All dimensions in mm unless otherwise stated

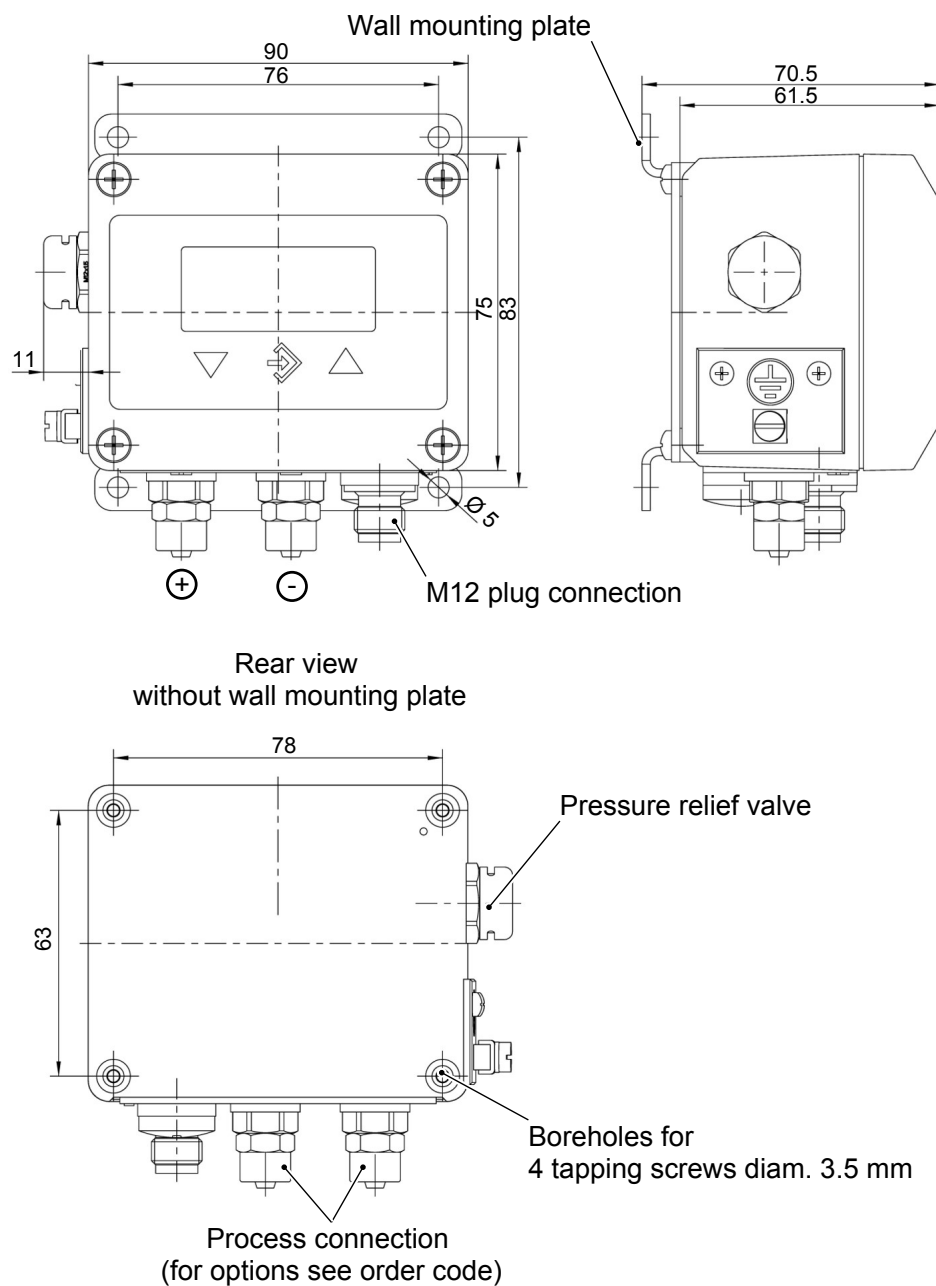


Fig. 4: Dimensional picture

Panel mounting set

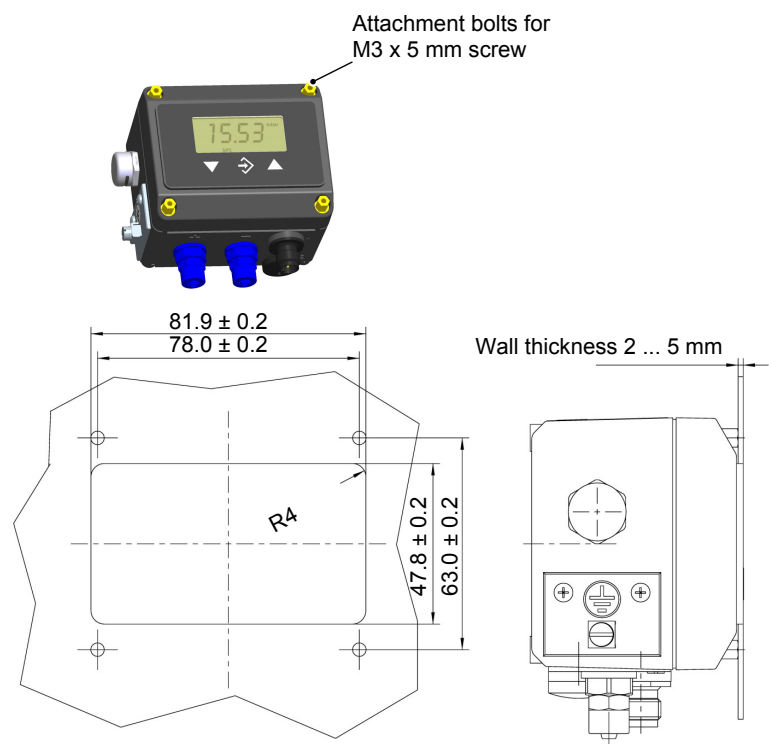


Fig. 5: Panel mounting set

Assembly of the mounting rails

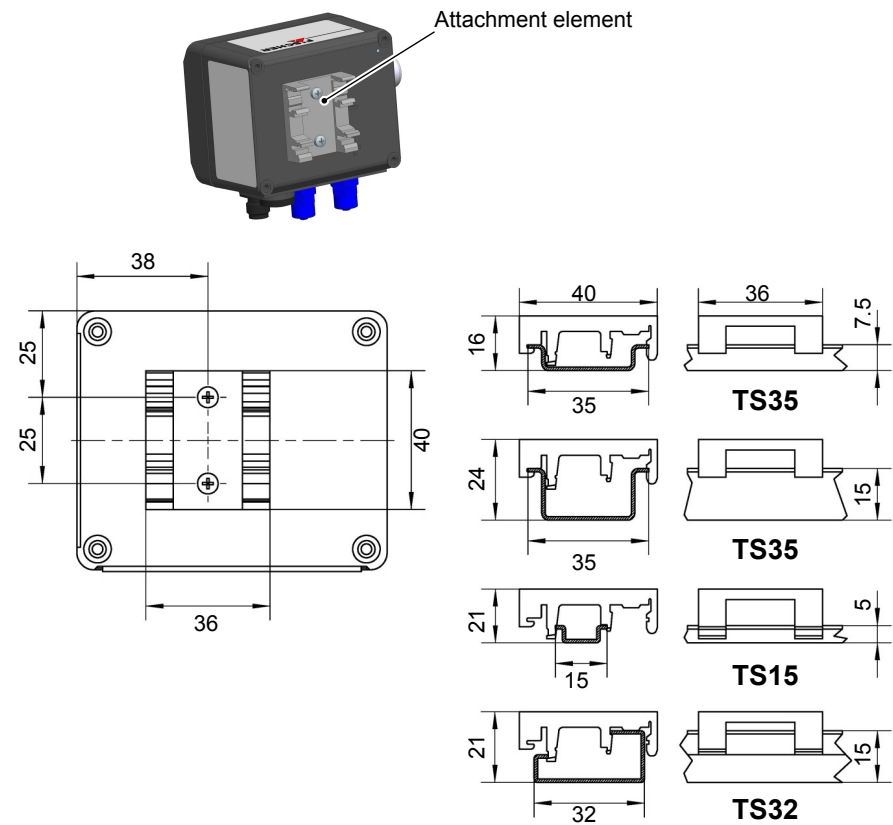
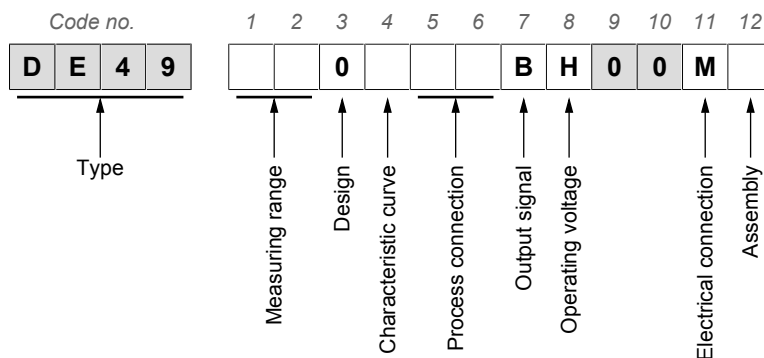


Fig. 6: Assembly of the mounting rails

3 Order Codes



[1,2]	Measuring range	Static operating pressure
52	0 ... 4 mbar	50 mbar
53	0 ... 6 mbar	50 mbar
54	0 ... 10 mbar	100 mbar
55	0 ... 16 mbar	100 mbar
56	0 ... 25 mbar	250 mbar
57	0 ... 40 mbar	250 mbar
58	0 ... 60 mbar	500 mbar
59	0 ... 100 mbar	500 mbar
A6	-2,5 ... +2,5 mbar	50 mbar
A7	-4 ... +4 mbar	50 mbar
A8	-6 ... +6 mbar	50 mbar
A9	-10 ... +10 mbar	100 mbar
B1	-16 ... +16 mbar	100 mbar
B2	-25 ... +25 mbar	250 mbar
C5	-40 ... +40 mbar	250 mbar
B3	-60 ... +60 mbar	500 mbar
B4	-100 ... 100 mbar	500 mbar
D1	0 ... 25 Pa	5 kPa
D2	0 ... 40 Pa	5 kPa
D3	0 ... 60 Pa	5 kPa
D4	0 ... 100 Pa	5 kPa
D7	0 ... 400 Pa	5 kPa
D8	0 ... 600 Pa	5 kPa
D9	0 ... 1000 Pa	10 kPa
E1	0 ... 1600 Pa	10 kPa

[1,2]	Measuring range	Static operating pressure
L5	-25 ... +25 Pa	5 kPa
R6	-40 ... +40 Pa	5 kPa
2L	-60 ... +60 Pa	5 kPa
L7	-100 ... +100 Pa	5 kPa
L6	-250 ... +250 Pa	5 kPa
L0	-20 ... +80 Pa	5 kPa
N1	0 ... 1 kPa	10 kPa
N2	0 ... 1,6 kPa	10 kPa
N3	0 ... 2,5 kPa	25 kPa
N4	0 ... 4 kPa	25 kPa
N5	0 ... 6 kPa	50 kPa
E5	0 ... 10 kPa	50 kPa
L8	-1 ... +1 kPa	10 kPa
L9	-1,6 ... +1,6 kPa	10 kPa
M6	-2,5 ... +2,5 kPa	25 kPa
M7	-4 ... +4 kPa	25 kPa
M8	-6 ... +6 kPa	50 kPa

[3]	Design
0	Standard version

[4]	Characteristic curve
0	linear rising (standard)
R	root extracted

[5,6]	Process connection
40	Aluminum screw connection for 6/4 mm hose
41	Aluminum screw connection for 8/6 mm hose
28	Cutting ring screw connection made of brass or 6 mm tube
29	Cutting ring screw connection made of brass for 8 mm tube
P6	Pneumatic plug connector for 6/4 mm hose
P8	Pneumatic plug connector for 8/6 mm hose

[7]	Output signal
B	4 ... 20 mA 2-wire connection

[8]	Operating voltage
H	24 V DC (12 ... 30 V DC)

[11]	Electrical connection
M	M12 plug connection

[12] Assembly	
0	Attachment boreholes on rear side (standard)
S	Assembly of the mounting rails
T	Board mounting set
W	Wall mounting

3.1 Accessories

Order no.	Designation	No. of Poles	length
06401685	Connection cable with M12 connector	5 pin	2 m
06401686	Connection cable with M12 connector	5 pin	5 m
06401687	Connection cable with M12 connector	5 pin	7 m
06401688	Connection cable with M12 connector	5 pin	15 m

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
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.



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