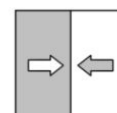




Datasheet

DE44

Digital 2-channel differential pressure switch/transmitter
with colour-change LCD



1 Product and functional description

1.1 Use as intended

The DE44 is a multi-functional switching unit with an optional transmitter output. It has two independent differential pressure inputs and is suitable for measuring overpressure, under-pressure and differential pressure in dry and neutral gaseous media. The device is to be exclusively used for the applications agreed between the manufacturer and the user.

1.2 Performance characteristics

Typical applications

- Air-conditioning technology
- Ventilation technology
- Environmental technology
- Monitoring of automatic roll filters, extraction systems etc.
- Tensile measurements on chimneys
- Flow and control pressure measurements
- Surface technology

Important features

- Long-term stable measurement of low pressure
- Robust, resistant to overpressure and maintenance-free
- two independent differential pressure sensors
- Two analogue outputs Sig1 and Sig2 with the option of spreading and reversing the characteristic line with any offset
- Square root extraction or characteristic line implementation via a table with max. 30 measuring points for both analogue outputs Sig1 and Sig2
- 4...6-digit LCD, full graphic, colour backlighting
- Switchable pressure units
- Menu-guided operation

a) Model with 2 switch points

- Two switch points SP1 and SP2; optionally with semiconductor switches or electromechanical relays

b) Model with 4 switch points

- Four switch points SP1 ... SP4 with semiconductor switches

1.3 Function diagram with 2 switching outputs

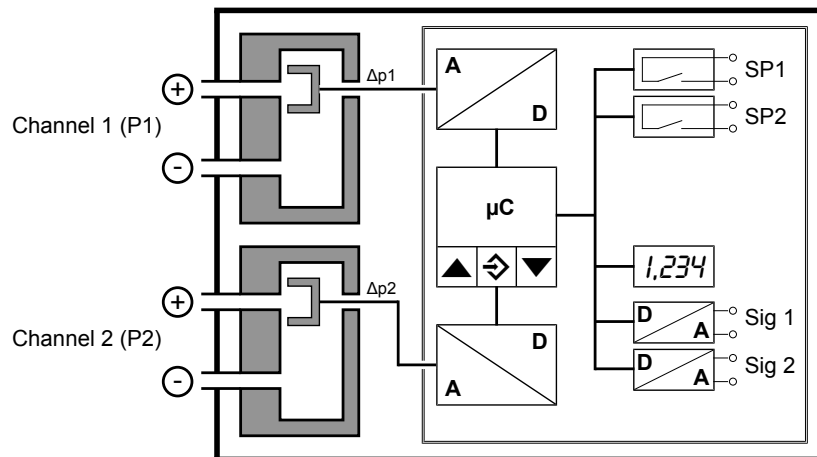


Fig. 1: Function diagram with 2 switching outputs

1.4 Function diagram with 4 switching outputs

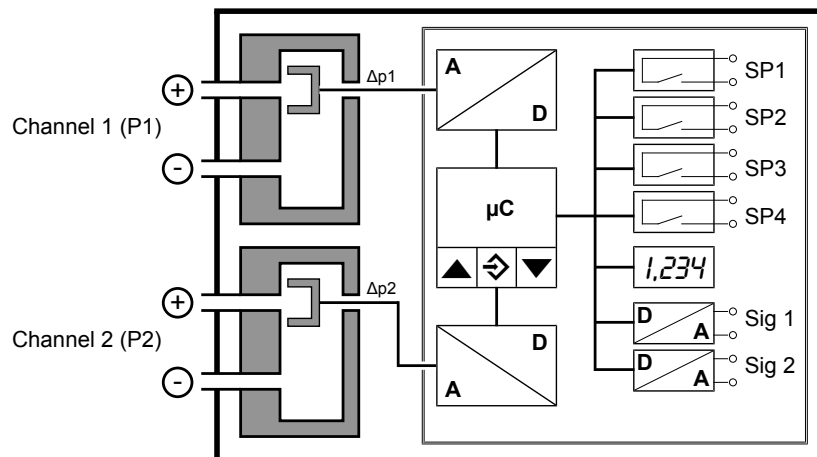


Fig. 2: Function diagram with 4 switching outputs

1.5 Design and mode of operation

This switch unit is based on two piezo-resistor sensor elements that are suitable for measuring over-pressure, under-pressure and differential pressure. The pressure that is to be measured acts upon a silicone membrane that is equipped with a resistor bridge.

This pressure-related movement of the diaphragm induces a change of resistance, which is evaluated by the device's electronics and transformed into signals for the display and two or four switch contacts. There are also (optional) two transmitter outputs available. The outputs are permanently assigned to the input channels.

- Channel 1 (P1) → Output 1 (Sig 1)
- Channel 2 (P2) → Output 2 (Sig 2)

An output signal between the uniform signals 0 ... 20 mA, 4 ... 20 mA and 0 ... 10 V can be selected. Both outputs can be dampened, spread and inverted. Both outputs can also be square-rooted and transformed via a table function even if it is non-linear.

In the case of flow measurements, larger values with 5 or 6 digits can be shown (see also Parameter decimal place measuring range).

a) Model with 2 switching outputs

The switching outputs can be assigned to the input channels by means of configuration:

- Channel 1 (P1) → SP1, SP2
- Channel 1 (P1) → SP1
Channel 2 (P2) → SP2
- Channel 2 (P2) → SP1, SP2

b) Model with 4 switching outputs

The switching outputs are permanently assigned to the input channels as follows:

- Channel 1 (P1) → SP1, SP2
- Channel 2 (P2) → SP3, SP4

1.6 Part designations

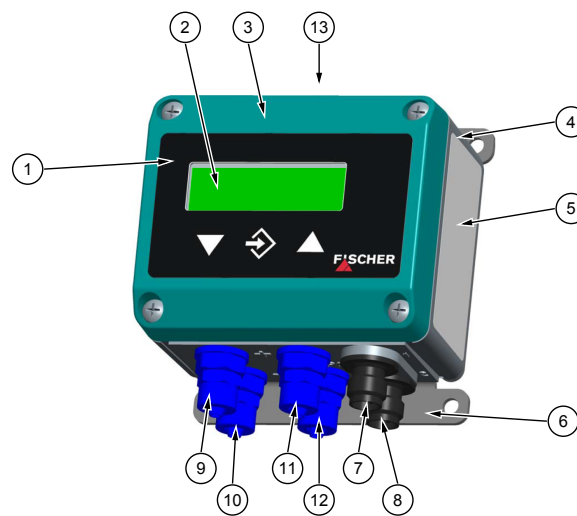


Fig. 3: DE44_LCD_Overview

1	Foil keypad	2	LC display
3	Casing lid	4	Lower part of casing
5	Circuit diagram	6	Wall bracket
7	M12 plug 1	8	M12 plug 2
9	Process connection P1 (+)	10	Process connection P1 (-)
11	Process connection P2 (+)	12	Process connection P2 (-)
13	Type plate		

2 Technical data

2.1 General

Please also observe the order code here.

2.2 Input variables

Measuring variable

2 x differential pressure for gas-like media

Measuring range

Measuring range			Stat. operating pressure max.	Bursting pressure
mbar	Pa	kPa	mbar	mbar
0...4	0...400	---	50	150
0...6	0...600	---	50	150
0...10	0...1000	0...1	100	300
0...16	0...1600	0...1.6	100	300
0...25	---	0...2.5	250	750
0...40	---	0...4	250	750
0...60	---	0...6	500	1500
0...100	---	0...10	500	1500
0...160	---	---	1500	3000
0...250	---	---	1500	3000
±2.5	±250	---	50	150
±4	±400	---	50	150
±6	±600	---	50	150
±10	±1000	±1	100	300
±16	±1600	±1.6	100	300
±25	---	±2.5	250	750
±40	---	±4	250	750
±60	---	±6	500	1500
±100	---	---	500	1500

Tab. 1: Measuring ranges

You can select a unit other than the unit of the basic measuring range with the parameter **Unit** (measuring menu level). The conversion is automatic. All measuring ranges listed in the table are listed in the order code and can be ordered.

2.3 Output parameters

Output signal

There are two output signals available that are permanently assigned to the respective input channels. The type of output signal (0/4...20 mA, 0...10V) must be stated on the order and cannot be changed. Signal range and load are identical for both outputs.

Output 1 (P1)	Output 2 (P2)	Signal range	Apparent ohmic resistance
0...20 mA	0...20 mA	0.0...21.0 mA	$U_b \leq 26 \text{ V} : R_L \leq (U_b - 4 \text{ V})/0.02 \text{ A}$ $U_b > 26 \text{ V} : R_L \leq 1100 \Omega$
4...20 mA,	4...20 mA,		
0...10 V	0...10 V	0.0...11.0 V	$R_L \geq 2 \text{ k}\Omega$

Tab. 2: Signal range and load

Switching outputs**a) Model with 2 switching outputs**

2 potential-free relay contacts		
2 potential-free semiconductor switches (MOSFET)		
	Relay	MOSFET
Progr. switching function	Open contact (NO) Break contact (NC)	One-pin activator (NO) One-pin deactivator (NC)
allowed Switching voltage	32 V AC/DC	12...32 V AC/DC
Max. switching current	2A	0.25A
Max. switching output	64 W / 64 VA	8 W / 8 VA $R_{ON} \leq 4 \Omega$

Tab. 3: Two switching outputs

b) Model with 4 switching outputs

4 potential-free semiconductor switches (MOSFET)	
	MOSFET
Progr. switching function	One-pin activator (NO) One-pin deactivator (NC)
Allowed switching voltage	12...32 V AC/DC
Max. switching current	0.25A
Max. switching output	8 W / 8 VA $R_{ON} \leq 4 \Omega$

Tab. 4: Four switching outputs

2.4 Measuring accuracy**Characteristic curve deviation**

(Non-linearity and hysteresis)

Maximum: 1.0 % FS
Typical: 0.5 % FS

Tab. 5: Characteristic curve deviation

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...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	0.2	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	0.2	0.4	0.3	0.3
0...60	---	0...6	0.2	0.4	0.3	0.3
0...100	---	0...10	0.2	0.4	0.3	0.3
0...160	---	---	0.2	0.4	0.3	0.3
0...250	---	---	0.2	0.4	0.3	0.3
±2.5	±250	---	0.2	1.0	0.3	1.0
±4	±400	---	0.2	0.5	0.3	0.5
±6	±600	---	0.2	0.4	0.3	0.3
±10	±1000	±1	0.2	0.4	0.3	0.3

Measuring range			TK zero-point [% FS/10K]		TK span [% FS/10K]	
mbar	Pa	kPa	typ.	max.	typ.	max.
±16	±1600	±1.6	0.2	0.4	0.3	0.3
±25	---	±2.5	0.2	0.4	0.3	0.3
±40	---	±4	0.2	0.4	0.3	0.3
±60	---	±6	0.2	0.4	0.3	0.3
±100	---	---	0.2	0.4	0.3	0.3

Tab. 6: Temperature coefficient

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

2.5 Auxiliary energy

Rated Voltage	24 V AC/DC
Admissible operating voltage	$U_b = 12...32$ V AC/DC
Power consumption	Typ. 2 W / Max. 3 W

Tab. 7: Auxiliary energy

Electrical connection

Connector 1

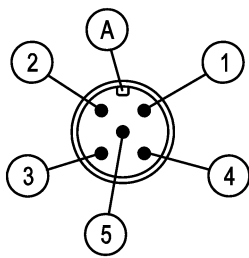


Fig. 4: M12 plug 5-pin

Connector 2

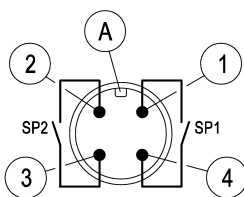


Fig. 5: M12 plug 4-pin

Pin	Signal name		Cable colour
1	Supply	+U _b	brown
2	Output 2	+Sig2	white
3	Supply	-U _b	blue
4	Output 1	+Sig1	Black
5	unused		green/yellow
A	Coding A		

Tab. 8: Supply and output signal

a) Model with 2 switching outputs

Pin	Signal name		Cable colour
1	Switching output 1	SP1	brown
2	Switching output 2	SP2	white
3	Switching output 2	SP2	blue
4	Switching output 1	SP1	Black
A	Coding A		

Tab. 9: Two switching outputs

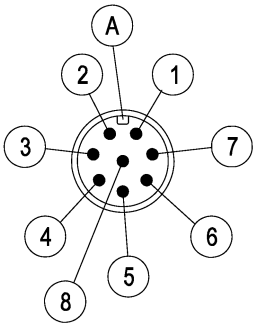
Connector 2

Fig. 6: M12 plug 8-pin

b) Model with 4 switching outputs

Pin	Signal name		Cable colour
1	Switching output 1	SP1	white
2	Switching output 1	SP1	brown
3	Switching output 2	SP2	green
4	Switching output 2	SP2	yellow
5	Switching output 3	SP3	grey
6	Switching output 3	SP3	pink
7	Switching output 4	SP4	blue
8	Switching output 4	SP4	red
A	Coding A		

Tab. 10: Four switching outputs

2.6 Application conditions**Ambient conditions**

Ambient temperature	-10 ... +70 °C
Media temperature	-10 ... +70 °C
Storage temperature	-20 ... +70 °C
Enclosure protection class	IP65 as per EN 60529
EMC	EN 61326-1:2013 EN 61326-2-3:2013

2.7 Construction design**Process connection**

4 x aluminium hose screw connection for 6/4 or 8/6 mm hose
4 x pneumatic plug connector for 6/4 or 8/6 mm hose

Materials

Housing	Polyamide (PA) 6.6
Media-contacting material	Silicon, Viton, brass nickel plate, aluminium anodised material

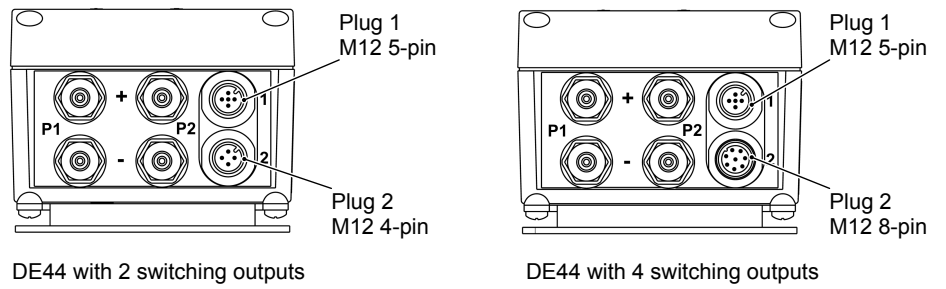
Assembly

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

Tab. 11: Important design features

Dimensional drawings All dimensions in mm unless otherwise stated

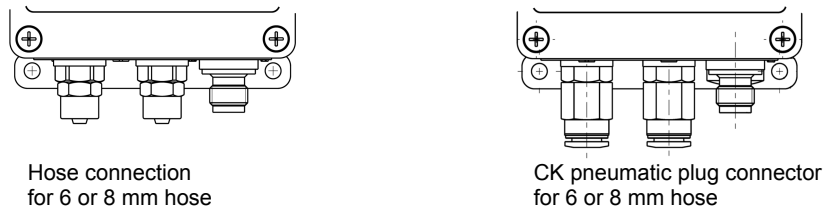
2.7.1 Process and electric connections



DE44 with 2 switching outputs

DE44 with 4 switching outputs

Options for the process connection



Hose connection for 6 or 8 mm hose

CK pneumatic plug connector for 6 or 8 mm hose

Fig. 7: Ports

2.7.2 Wall mounting

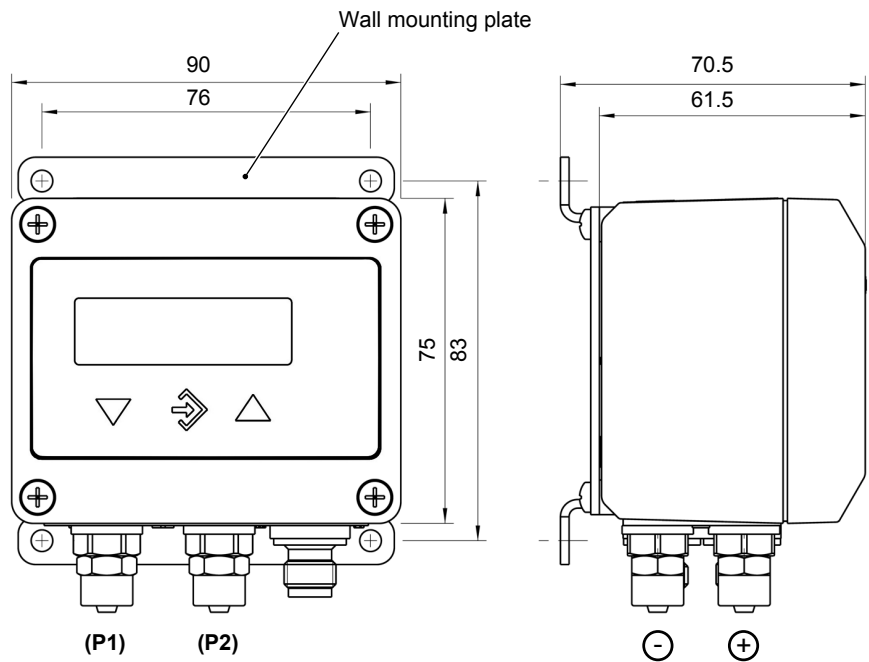


Fig. 8: Wall mounting dimension diagram

2.7.3 Assembly on an assembly plate

The standard model is not supplied with a wall mounting plate. It is attached to flat mounting plates using attachment boreholes on the rear side.

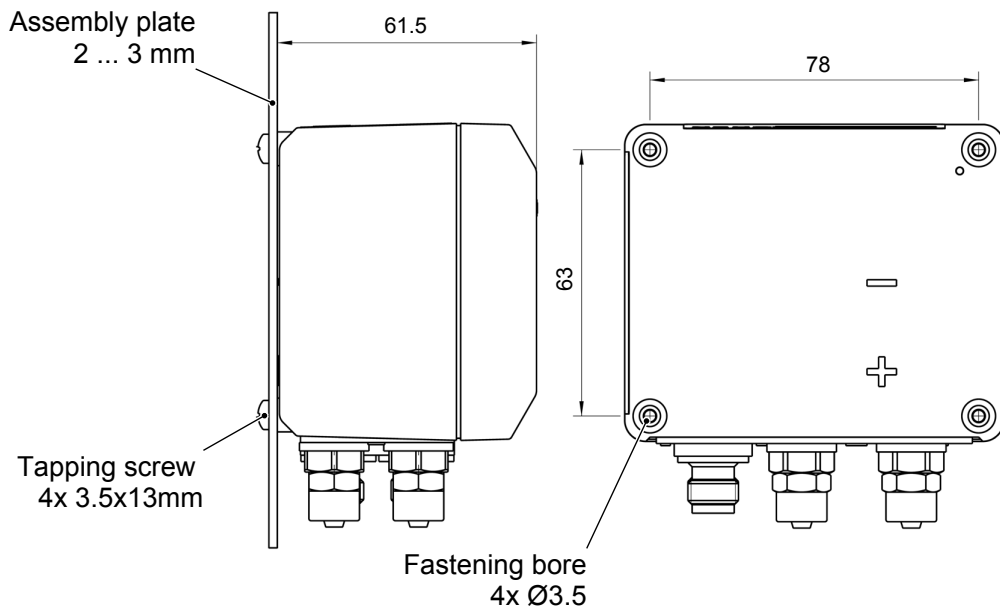
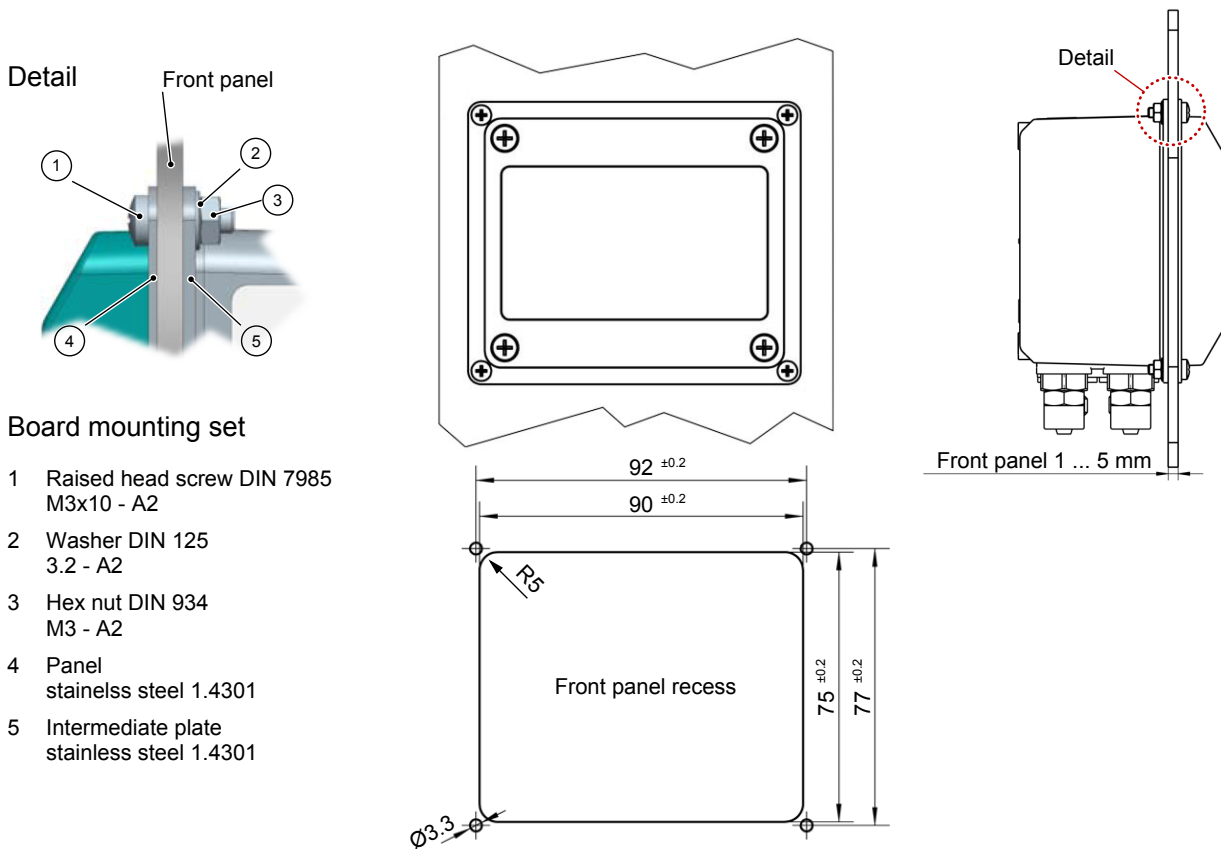


Fig. 9: Assembly on an assembly plate dimension diagram

2.7.4 Installation of front panel

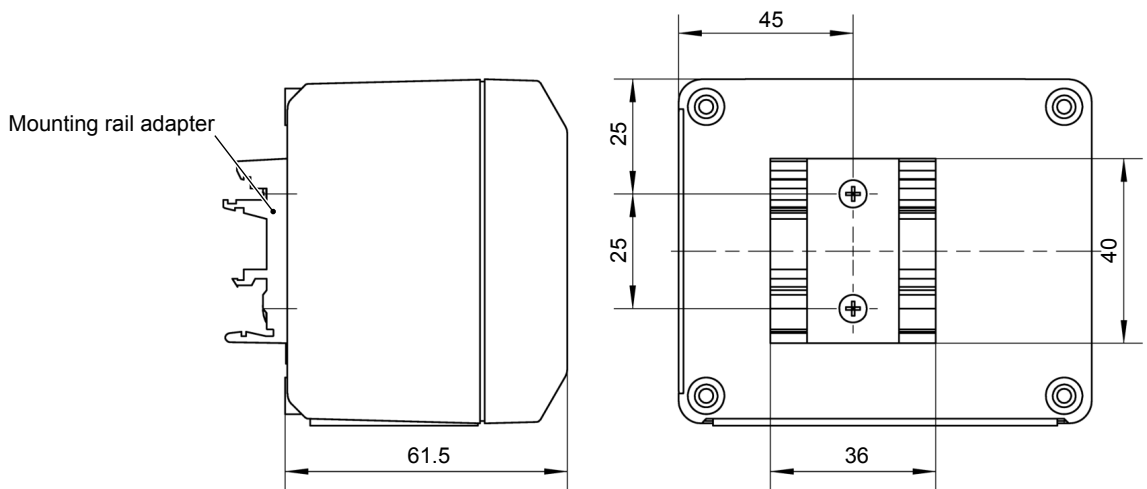


Board mounting set

- 1 Raised head screw DIN 7985 M3x10 - A2
- 2 Washer DIN 125 3.2 - A2
- 3 Hex nut DIN 934 M3 - A2
- 4 Panel stainless steel 1.4301
- 5 Intermediate plate stainless steel 1.4301

Fig. 10: Front panel dimensional diagram

2.7.5 Assembly of the mounting rails



The device can be mounted to the following mounting rails using the mounting rail adapter:

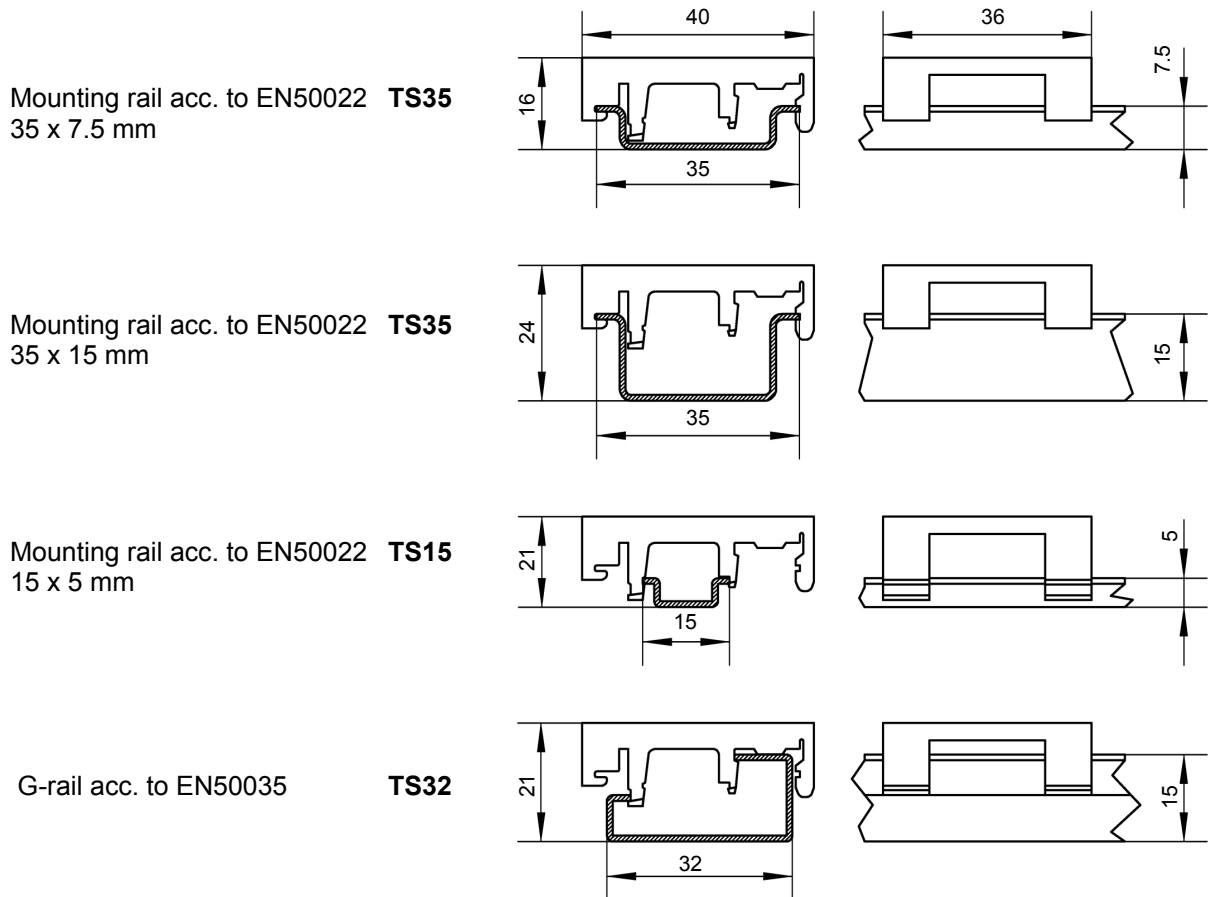


Fig. 11: Mounting rail dimensional diagram

2.8 Display and operating interface

Advertisement

4...6-digit LCD, full graphic, colour backlighting

Programming

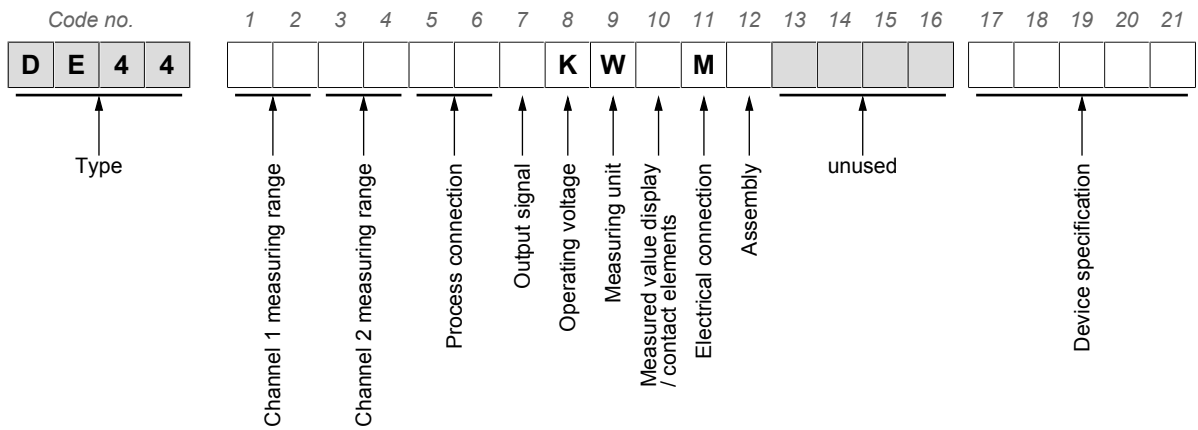
Attenuation	0.0...100.0s (jump response 10/90%)
Display assignment	P1 and P2 are shown at the same time
Switching output channel 1 and channel 2	Switch-off point, switch-on point, delay (0...1800s), function (NC / NO contact) <ul style="list-style-type: none"> • 2 switching outputs: assignment to the relay • 4 switching outputs: fixed assignment
Offset correction	$\pm\frac{1}{3}$ of the basic measuring range ⁽¹⁾
Zero-point window	Measured values around zero are set to zero within settable limits
Output signal	User-definable within the basic measuring range ⁽²⁾
Characteristic curve P1	linear, square rooted, table with 3...30 support points
Characteristic curve P2	linear, square rooted, table with 3...30 support points
Password	001 ... 999 (000 = no password protection)

Tab. 12: Important features of the user interface

(1) To compensate different installation positions.

(2) Max. effective spread 4:1

3 Order Codes



Measuring range:

Channel 1

[1.2]	(Code no.)
52	0 ... 4 mbar
53	0 ... 6 mbar
54	0 ... 10 mbar
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
A6	-2.5 ... +2.5 mbar
A7	-4 ... +4 mbar
A8	-6 ... +6 mbar
A9	-10 ... +10 mbar
B1	-16 ... +16 mbar
B2	-25 ... +25 mbar
C5	-40 ... +40 mbar
B3	-60 ... +60 mbar
B4	-100 ... +100 mbar
D7	0 ... 400 Pa
D8	0 ... 600 Pa
D9	0 ... 1000 Pa
E1	0 ... 1600 Pa
L6	-250 ... +250 Pa
N1	0 ... 1 kPa
N2	0 ... 1.6 kPa
N3	0 ... 2.5 kPa
N4	0 ... 4 kPa

[1.2]	(Code no.)
N5	0 ... 6 kPa
E5	0 ... 10 kPa
L8	-1 ... +1 kPa
L9	-1.6 ... +1.6 kPa
M6	-2.5 ... +2.5 kPa
M7	-4 ... +4 kPa
M8	-6 ... +6 kPa

Channel 2

[3.4]	(Code no.)
52	0 ... 4 mbar
53	0 ... 6 mbar
54	0 ... 10 mbar
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
A6	-2.5 ... +2.5 mbar
A7	-4 ... +4 mbar
A8	-6 ... +6 mbar
A9	-10 ... +10 mbar
B1	-16 ... +16 mbar
B2	-25 ... +25 mbar
C5	-40 ... +40 mbar
B3	-60 ... +60 mbar
B4	-100 ... +100 mbar
D7	0 ... 400 Pa
D8	0 ... 600 Pa
D9	0 ... 1000 Pa
E1	0 ... 1600 Pa
L6	-250 ... +250 Pa
N1	0 ... 1 kPa
N2	0 ... 1.6 kPa
N3	0 ... 2.5 kPa
N4	0 ... 4 kPa
N5	0 ... 6 kPa
E5	0 ... 10 kPa

	[3.4] (Code no.)
	L8 -1 ... +1 kPa
	L9 -1.6 ... +1.6 kPa
	M6 -2.5 ... +2.5 kPa
	M7 -4 ... +4 kPa
	M8 -6 ... +6 kPa
	[5.6] (Code no.)
Pressure connection:	40 Aluminium screw connection for 6 / 4 mm hose
	41 Aluminium screw connection for 8 / 6 mm hose
	P6 Pneumatic plug connector for 6/4 mm hose
	P8 Pneumatic plug connector for 8/6 mm hose
	[7] (Code no.)
Output signal:	0 without output signal
	4 0 ... 20 mA (3-wire) channel 1+2
	6 4 ... 20 mA (3-wire) channel 1+2
	5 0 ... 10 V (3-wire) channel 1+2
	[8] (Code no.)
Operating voltage	K 24 V AC/DC
	[9] (Code no.)
Measuring unit:	W Selectable pressure units
	[10] (Code no.)
Measured value display / contact elements:	C 4-digit colour change LCD / 2 relay contacts
	D 4-digit colour change LCD / 2 semiconductor switches
	G 4-digit colour change LCD / 4 semiconductor switches
	[11] (Code no.)
Electrical connection	M M12 plug connector (plastic)
	[12] (Code no.)
Assembly option:	0 Standard (attachment boreholes on rear side)
	S Assembly of the mounting rails
	T Panel mounting set
	W Wall mounting

3.1 Accessories

Order no.	Planned measures	No. of Poles	Length
06401993	Connection cable for switching outputs with M12 connector	4-pin	2 m
06401994	Connection cable for switching outputs with M12 connector	4-pin	5m
09011146	Connection cable for switching outputs with M12 connector	8-pin	5m
06401995	Connection cable for supply/signal with M12 connector	5-pin	2 m
06401996	Connection cable for supply/signal with M12 connector	5-pin	5 m
EU03F300	Transmitter PC Interface incl. PC software Casing: 107x54x30 mm		
EU050000	Transmitter PC Interface incl. PC software	without battery	
EU050001	Casing: 195x101x44 mm	With battery	
A data sheet about the EU03 ad EU 05 models is available on our website www.fischermess-technik.de or on request.			

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 Salzufen
Tel. +49 5222-974-0
Fax. +49 5222-7170

web : www.fischermesstechnik.de
eMail : info@fischermesstechnik.de