developing solutions

ELECTROPROJECT
AN EQUANS COMPANY

FISCHER
MESS- UND REGELTECHNIK

CE

RoHS II
COMPLIANT

EAC

Data sheet

DE38

Digital differential pressure transmitter / switch
with colour change LCD

09005549 • DB_EN_DE38_LCD • Rev. ST4-A • 01/19

1 Product and functional description

1.1 Performance characteristics

Typical applications

- Monitoring of filters, compressors, extraction systems etc.
- Differential pressure measurements between the supply and return on heating systems
- Flow, control pressure and filling level measurements

Important features

- Robust and resistant to overpressure
- Maintenance-free through wear-free inductive pickup
- Switchable pressure units
- Optional signal output with possibility of characteristic curve spread and reversal with any offset
- Characteristic curve implementation via table with max. 30 measuring points
- Limit overstepping can be signalised by a change of colour in the background
- Adjustment of all parameters and measuring point protocol through optional PC adaptor

1.2 Intended use

The DE38 is a differential pressure transmitter / switch with a diaphragm measuring device and is suitable for measuring over-pressure, under-pressure and differential pressure in neutral liquid and gaseous media.

Please contact the manufacturer before using this unit with dirty or aggressive media because the media compatibility of the unit needs to be checked.

The device may only be used for the purpose stipulated by the manufacturer. The manufacturer will not be liable for damage arising from incorrect or improper use.

1.3 Device model

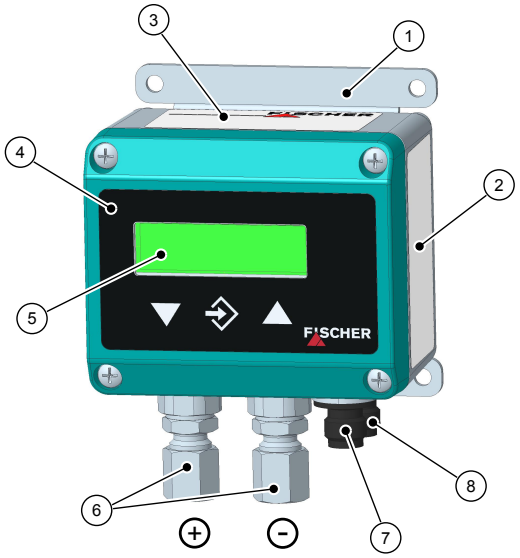


Fig. 1: Product summary

1	Wall mounting plate	2	Circuit diagram
3	Type plate	4	Foil keypad
5	LCD display with colour-change	6	Process connection
7	M12 connector 1 (auxiliary energy, analogue output)	8	M12 connector 2 (switching outputs)

1.4 Function diagram

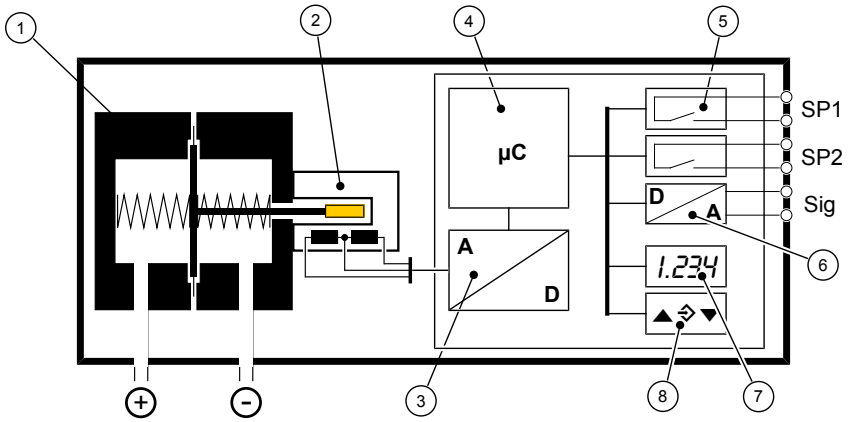


Fig. 2: Function diagram

1	Measuring cell	2	Inductive displacement transducer
3	Analogue/Digital converter	4	Micro-controller
5	Switching outputs	6	An. output
7	LC display	8	Foil keypad

1.5 Design and mode of operation

The switching device is based on a robust and durable diaphragm measuring unit. The pressures to be compared have an effect on a spring mounted measuring diaphragm that is in an idle state when the pressure is equalised.

In case of a pressure difference, a force acts on the measuring diaphragm. The force acting on the measuring diaphragm causes it to be moved towards the side of the lower pressure until the spring forces compensate this force.

The movement of the diaphragm is transferred via a tappet into the core of the inductive displacement sensor. The electronics integrated into the device evaluate this movement and transform it into signals on the display, switch contacts and optionally into an analogue output signal. The can be dampened, spread, inverted and transformed via a table function even if it is non-linear.

2 Technical data

2.1 General

Type designation	DE38
Pressure type	Differential pressure
Medium	Neutral gaseous and fluid media
Measurement principle	Inductive

2.2 Input variables

Measuring ranges			**0 …**	**400**	**6**	**1**	**1.6**	**2.5**	**4**	**6**
	Unit			**mbar**				**bar**		
Stat. operating pressure max.	bar			16				16		
Characteristic curve deviation[+)]	%FS	Max.		2.5				2.5		
	%FS	Type		0.8				0.8		
TK span [x)]	%FS/10K	Max.		0.8				0.4		
		Type		0.2				0.2		
Tk zero-point [x)]	%FS/10K	Max.		0.8				0.5		
		Type		0.2				0.2		

[+)] Characteristic curve deviation (non-linearity and hysteresis) at 25°C and rated voltage basic measuring range with linear characteristic curve, not spread

[x)] In relation to the input range with a linear, not spread, characteristic curve.

Compensation range 0...60°C

2.3 Output sizes

An. output

Output signal	0/4 … 20 mA		0 … 10 V	
Operating voltage U_b	≤ 26 V	> 26 V	< 15 V	≥ 15 V
Apparent ohmic resistance	$R_L \leq \frac{U_b - 4\ V}{0.02\ A}$	R_L>1100 Ω	R_L≥10 kΩ	R_L≥2 kΩ

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	2 A	0.25 A
Max. switching output	64 W / 64 VA	8 W / 8 VA R_{ON} ≤ 4 Ω

2.4 Auxiliary energy

nominal voltage	24 V AC/DC
Admissible operating voltage	12 … 32 V AC/DC
Absorbed current	2 W (2VA)

2.5 Operating conditions

Ambient temperature range	-10 … +70 °C
Storage temperature range	-20 … +70 °C
Medium temperature range	-10 … +70 °C
Protection class IP	IP65 as per DIN EN 60529
EMC	EN 61326-1:2013 EN 61326-2-3:2013
RoHS	EN 50581:2012

2.6 Display and operating interface

Display

4-digit LCD, full graphic, colour backlighting

Programming

Damping	0.0…100.0s (jump response 10/90%)
Switch output	Switch-off point, switch-on point, response time (0...1800s), function (NC / NO contact)
Measuring range unit	mbar / Pa / "free unit", starting value, end value and decimal point for "free unit"
Output signal	User-definable within the basic measuring range (1)
Zero-point stabilising	0…⅓ of the basic measuring range (2)
Zero point correction	±⅓ of the basic measuring range (3)
Implementation of characteristic curve	linear, square rooted, table with 3...30 support points
Password	001 ... 999 (000 = no password protection)
Language (can be switched)	DE, EN, FR, ES, IT, PT, and HU

(1) Max. effective spread 4:1
(2) measured values around zero are set to zero.
(3) To compensate different installation positions.

2.7 Construction design

Process connection	Inner thread G⅛, cutting ring screw connections for 6 or 8 mm pipes
Electrical connection	Flange connector M12 Connector 1: 5 pin, male Connector 2: 4 pin, male
Installation position	User-defined
Dimensions	90 x 120 x 71 mm
Weight	Max. 1 kg

2.7.1 Materials

The list of materials is issued for the standard version.

Materials of the parts that come into contact with the medium		
Process connection	Screw connection	Stainless steel 1.4305 Nickel-plated brass
	Sealant	FKM
Pressure chamber		Brass, stainless steel 1.4310, 1.4405, 1.4305
Diaphragm	Option 1	Brass, NBR
	Option 2	Brass, Viton

Materials of the parts that come into contact with the surroundings	
Housing	PA 66
Foil keypad	Polyester
Electrical connection	PA, CuZn gold-plated
Wall mounting plate	Aluminium

2.7.2 Dimensional drawings

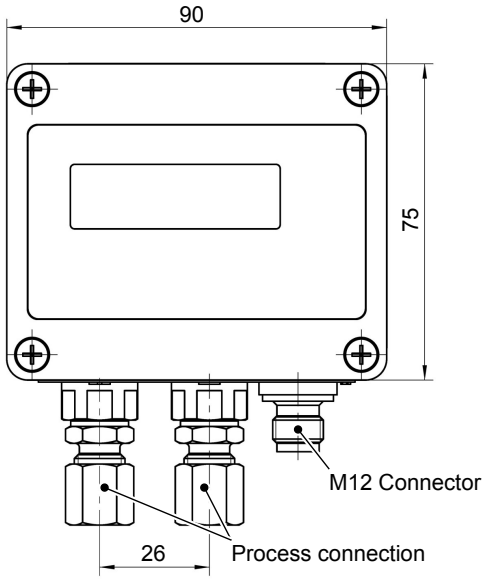


Fig. 3: Front view

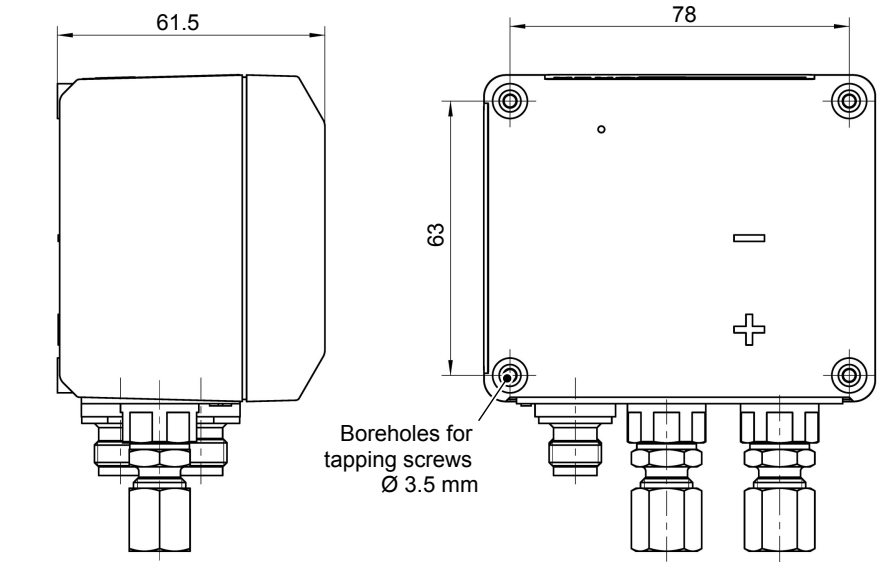


Fig. 4: Side and rear view

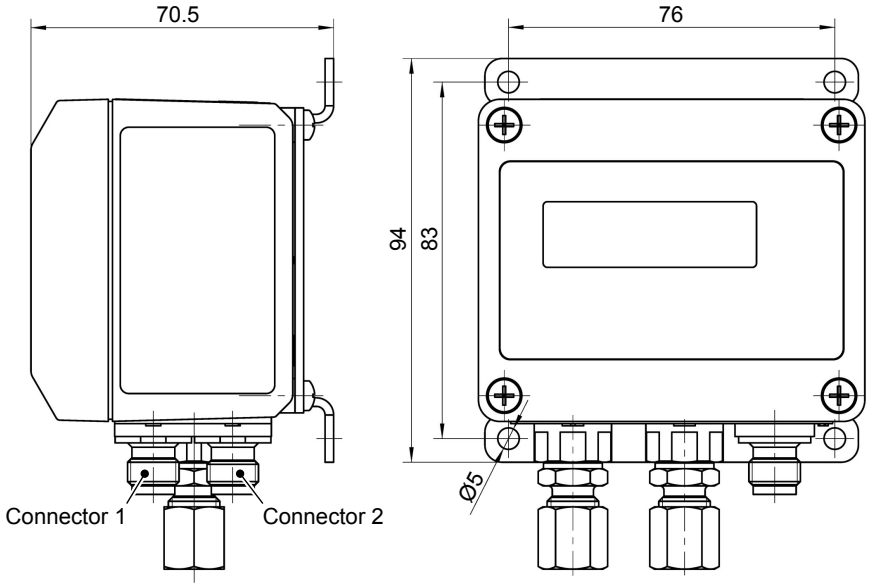
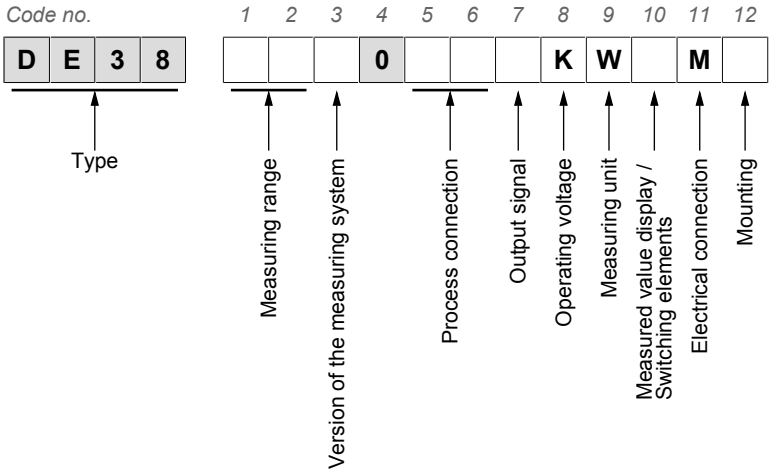


Fig. 5: Wall mounting

3 Order codes



Measurement range:

[1.2]	*(Code no.)*
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

Design of the measuring system:

[3]	*(Code no.)*
M	Pressure chamber, diaphragm, seals made of brass and NBR
N	Pressure chamber, diaphragm, seals made of brass and Viton

Process connection:

[5.6]	*(Code no.)*
00	Inner thread G ⅛
28	Cutting ring connection in brass, galvanised for 6 mm tube
29	Cutting ring connection in brass, galvanised for 8 mm tube

Output signal:

[7]	*(Code no.)*
0	without output signal
A	0 … 20 mA
P	4 … 20 mA
C	0 … 10 V

Operating voltage:

[8]	*(Code no.)*
K	24 V AC/DC

Measuring unit:

[9]	*(Code no.)*
W	Selectable pressure units

Measured value display / contact elements:

[10]	*(Code no.)*
C	4-digit LC display; 2 relay contacts
D	4-digit LC display; 2 semiconductor switches

Electrical connection:

[11]	*(Code no.)*
M	M12 plug connection

Assembly:

[11]	*(Code no.)*
0	Standard (attachment boreholes on rear side)
W	Wall mounting

3.1 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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3.2 Accessories

Order no.	Planned measures	No. of Poles	Length
06401993	M12 Connection cable for switching outputs	4-pin	2 m
06401994	M12 Connection cable for switching outputs	4-pin	5 m
06401563	M12 Connection cable for switching outputs	4-pin	7 m
06401572	M12 Connection cable for switching outputs	4-pin	10 m
06401995	M12 Connection cable for supply/signal	5-pin	2 m
06401996	M12 Connection cable for supply/signal	5-pin	5 m
06401564	M12 Connection cable for supply/signal	5-pin	7 m
06401573	M12 Connection cable for supply/signal	5-pin	10 m

Remote configuration

Order no.		
EU05 0000	Transmitter PC Interface incl. Software	without battery
EU05 0001	Transmitter PC Interface incl. Software	with battery