FISCHER MESS- UND REGELTECHNIK

Data sheet

DE39 Digital differential pressure transmitter with internal pressure sensors

Display and switching device for differential pressure of gaseous and fluid media.

Fields of application include:

- Filter monitoring
- Filling level measuring

Design and mode of operation

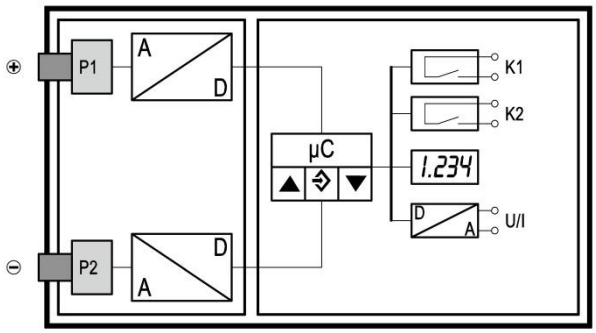
The device is based on an electronic evaluation circuit that analyses the measuring signals of two integrated ceramic pressure transmitters. The signals of the pressure transmitter can be displayed separately for checking purposes.

The integrated pressure sensors work with ceramic pressure measuring cells. The signals are digitalised and made available to the analysis unit for further processing.

The main task is to calculate the differential pressure that can be displayed and analysed. The analysis allows the configuration of two independent switching points and the provision of an output signal that is proportional to the differential pressure.

The rated pressures of the integrated sensors and the differential pressure measuring range are set permanently ex-works and shown on the type plate.

Functional Schematic



Important features

- Large bright LED display
- Switchable pressure units
- 2 independent switching points with lots of configuration options
- Zero-point correction, signal damping
- Optional signal output with possibility of characteristic curve spread and reversal with any offset
- Characteristic curve implementation via table with max. 30 measuring points
- Complete adjustment of all parameters and measuring point protocol possible through optional PC adaptor EU03
- Display of the individual pressure levels (primary, secondary) possible

Typical applications

- Differential pressure measurements in heavily soiled media
- Simple pump control systems
- Pump, compressor monitoring

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Technical data

Basic measuring range [1]	0…	bar	6	10	16	25	40
Static operating pressure	max.	bar	6	10	16	25	40
Bursting pressure		bar	25	25	50	100	100
Characteristic curve deviation°)	max.	%FS	< 2.5				
	typ.	%FS	< 1.0				
Tk range°°)	max.	%FS/10K	< 0.3				
	typ.	%FS/10K	< 0.1				
Tk zero-point °°)	max.	%FS/10K	< 0.4				
	typ.	%FS/10K	< 0.15				

°: Characteristic curve deviation (non-linearity and hysteresis) at 25°C and rated voltage
basic measuring range (linear characteristic curve, not spread)
○○) : in terms of the basic measuring range (characteristic line linear, not spread)

General points

Admissible ambient temperature	-10 … 70 °C
Admissible media temperature	-10 ... 80 °C
Admissible storage temperature	-20 … 70 °C
Enclosure protection class	IP 65 acc. to DIN EN 60529

Electrical data

Rated Voltage	24 V AC/DC	
Admissible operating voltage U_b	12 … 32 V AC/DC	
Power consumption	approx. 2 W (VA)	
Electrical connection type	Three-conductor	
Characteristic curve	linear, square rooted, flat cylindrical tank 3 … 30 support points	
Output signal	0/4…20 mA	0…10 V
Admissible apparent ohmic resistance	$U_b \leq 26$ V : $R_L \leq (U_b - 4\text{ V}) / 0{,}02$ A $U_b < 26$ V : $R_L \leq 1100\ \Omega$	$U_b < 15$ V : $R_L \geq 10$ kΩ $U_b \geq 15$ V : $R_L \geq$ 2 kΩ
Switch contacts	2 pot.-free relay contacts	2 pot.-free semiconductor switches (MOSFET)
Type	1-pin activation switch	1-pin activation switch
Function (can be programmed)	Open contact (NO) / break contact (NC)	Open contact (NO) / break contact (NC)
Switching voltage	32 V AC/DC	3…32 V AC/DC
Switching current	2 A	0.25 A
Switching output	64 W (VA)	8 W (VA)
Activation resistance	---	≤ 4 Ω
Display	3.5 character LED	

Ports

Process connection	Inner thread G 1/8, cutting ring screw connections for 6 or 8 mm pipes
electr. connection	2 x round plug connector M12 Connector 1 for supply and analogue output signal (5-pin, male) Connector 2 for switching contacts (4-pin, male)

Materials

Housing	Polyamide PA 6.6 (GL-version: Lexan Resin 940A)
Media-contacting material	Stainless steel 1.4404, FKM, ceramics (Al2O3, 96%) Stainless steel 1.4571 or brass

Assembly

Bore-holes on the reverse side for attachment of the assembly panels
or wall mounting by means of assembly plate
If the device is intended for outdoor use, we recommend permanently protecting the membrane keypad against UV radiation and using a suitable enclosure or at least the erection of a sufficiently dimensioned canopy as a protection measure against constant rain or snow.

Programming

Via membrane keypad with menu-controlled operation or transmitter PC Interface EU03 (accessories), can be locked with a password

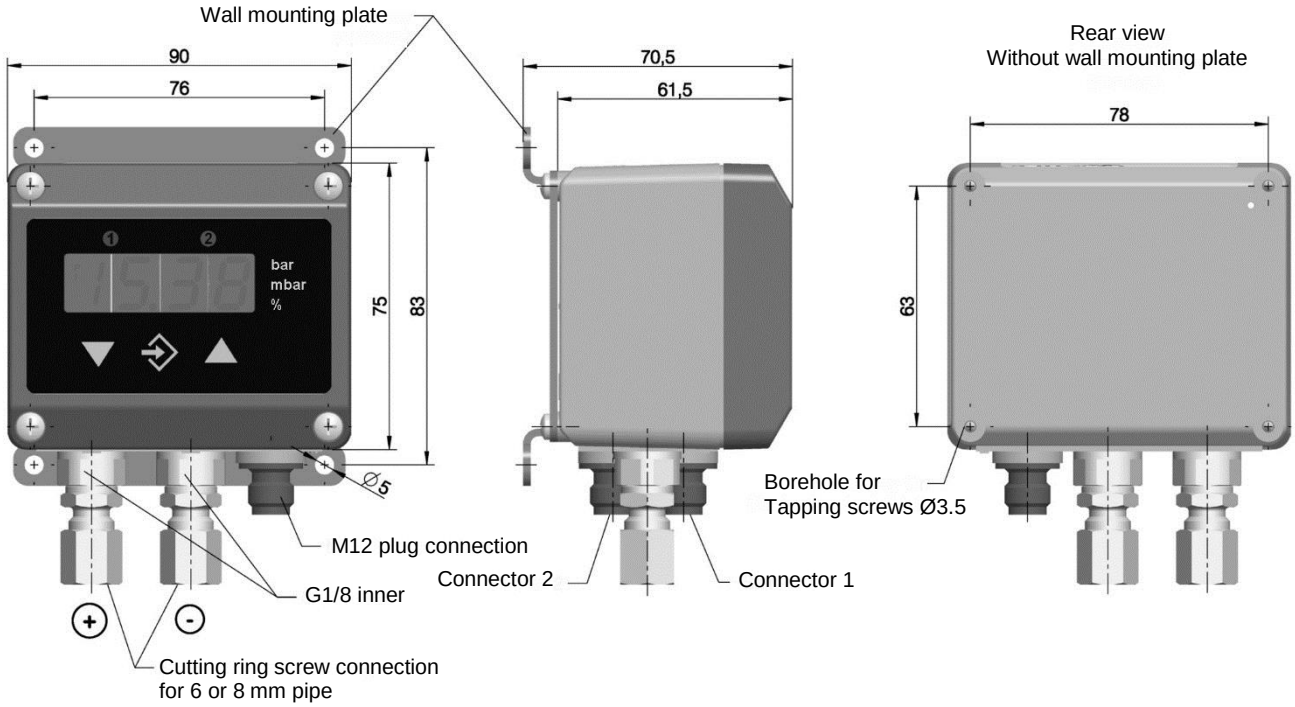
[1]The effective measuring range is the basic measuring range and the set spread (max. 10:1). Therefore, the smallest possible measuring range for the 6 bar basic measuring range is: 0 ...0.6 bar

	Setting parameters
Offset	Nulling of the input differential pressure
Pressure display	P1, P2, ΔP [1]
Attenuation	0.0 … 100.0 s (jump response time 10 / 90 %) for signal output; separately also for display
Switching output ❶ ❷	Switch-off point, switch-on point, response time (0...100s), function (NC / NO contact)
Measuring range unit	bar, mbar, % [2]
Start / end of measuring range	can be set anywhere within the basic measuring range [3]
Zero-point stabilising	0…⅓ basic measuring range[4]
Implementation of characteristic curve	linear, square rooted, flat cylindrical tank 3 … 30 support points
Password	001 ... 999 (000 = no password protection)

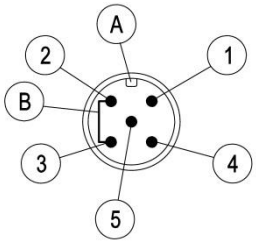
(1): Pressure display P1 and P2 only serve inspection purposes. All configuration parameters refer to ΔP.
(2): Other measuring range units are available on request.
(3): Maximum effective spread 10:1. The output signal, the display range % and the free unit are influenced.
(4): Measuring values (±⅓ basic measuring range around zero) are set to zero (e.g. to suppress creeping quantities).

Dimensional drawings

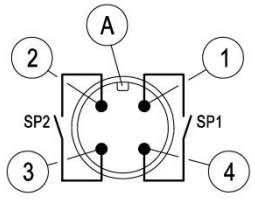
(All dimensions in mm unless otherwise specified)



Electrical connection



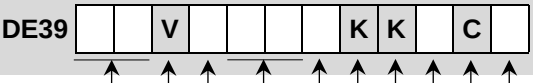
Pin	Signal name		Cable colour
1	Supply	$+U_b$	brown
2	Delivery	-Sig	white
3	Supply	$-U_b$	blue
4	Delivery	+Sig	black
5	n.c.		
A	Coding		
B	Bridge		



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

Order Codes

Digital differential pressure transmitter, with 3 ½-digit LED display



Measuring ranges
0… 6 bar ..... > **0 6**
0…10 bar ..... > **0 7**
0…16 bar ..... > **0 8**
0…25 bar ..... > **0 9**
0…40 bar ..... > **1 0**

Design of the measuring system
Chromium nickel steel 1.4404 ..... > **V**

Approval variants
Standard model ..... > **0**

Pressure connection
Inner thread G 1/8 ..... > **0 0**
Cutting ring screw connection made of 1.4571 for 6 mm pipe ..... > **2 4**
Cutting ring screw connection made of 1.4571 for 8 mm pipe ..... > **2 5**
Cutting ring screw connection in brass for 6 mm pipe ..... > **2 8**
Cutting ring screw connection in brass for 8 mm pipe ..... > **2 9**

Electrical output signal
without analogue electrical output signal ..... > **0**
0 - 20 mA 3-LINE ..... > **A**
0 - 10 V DC ..... 3-LINE. **C**
4 - 20 mA 3-LINE ..... > **P**

Operating voltage
24 V DC/AC (12 - 32 V DC/AC) ..... > **K**

Measuring unit
bar, mbar, % ..... > **K**

Measured value display / contact elements
3 1/2 digit LED measuring range display with two potential-free relay contacts ..... > **3**
3 1/2 digit LED measuring range display with two potential-free semiconductor switches .... > **6**

Electrical connection
M12 plug connection ..... > **C**

Assembly option
Standard (attachment boreholes on rear side) ..... > **0**
Wall mounting ..... > **W**

Accessories

Purchase order number	Designation	No. of Poles	Usage	Length
06401993	Connection cable with M12 connector	4-pole	for switching outputs	2 m
06401994	Connection cable with M12 connector	4-pole	for switching outputs	5 m
06401995	Connection cable with M12 connector	5-pole	for supply / signal	2 m
06401996	Connection cable with M12 connector	5-pole	for supply / signal	5 m
04005144	Wall mounting set			
EU03F300	Transmitter PC Interface incl. PC software			

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