FISCHER MESS- UND REGELTECHNIK

DE38 || Digital Differential Pressure Transmitter / Switch

The DE 38 is a multi-function field-mounted pressure instrument that combines a digital readout, transmitter and dual limit detection relays. It can be used for measurement and control of positive or negative gauge pressure, differential pressure, flow and level. It is compatible for use with relatively clean and non-corrosive gases or liquids.

Principles of Operation

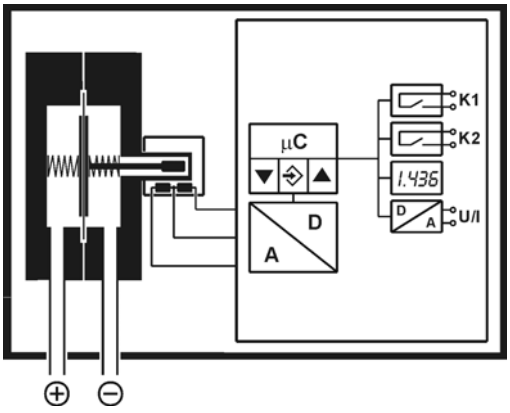
The instrument uses a tough, flexible sensing diaphragm embedded between stiffening plates and balanced by springs on either side. The diaphragm is at zero position when pressures on either side of the diaphragm are equal.

Inequality of pressures results in deflecting the diaphragm towards the lower pressure side until a new equilibrium determined by the changed balance of forces is reached.

Fastened to the center of the diaphragm is an axial rod, the other end of which forms the moving core of a precision LVDT displacement sensor element.

The linear displacement of the LVDT core is proportional to the pressure difference across the diaphragm. This displacement is converted by the transmitter's electronic module to a standard electrical signal output. An optional output signal can be slew rate limited, spreaded, inverted and transformed nonlinearly by means of a table function.

Schematic Diagram



Features

- Robust design; over-pressure protected
- Wear-free non-contact LVDT sensing element needs no maintenance
- Selectable pressure units
- Signal output with possibility of spreading and inverting characteristic curve with any offset (optional)
- Characteristic conversion of output via 3...30 entries table
- Complete set-up of all parameters and print out by using optional PC-programming interface EU03

Applications

- Monitoring of compressors, filters and vacuum systems
- Measurement of differential pressure between supply and return fuel lines in heating systems
- Flow, control-pressure and level measurement

Specifications

General

Measuring range	mbar	0-400	0-600	0-1000	0-1600			
	bar			0-1.000	0-1.600	0-2.50	0-4.00	0-6.00
max. static operating pressure	bar	16 bar						
straight line error (max.)°	%FS	2.5 %						
Straight line error (typ.)°	%FS	0.8 %						
Tc span (max.)°°	%FS 10K	0.8 %	0.4 %					
Tc span (typ.)°°	%FS 10K	0.2 %						
Tc zero point (max.)°°	%FS 10K	0.8 %	0.5 %					
Tc zero point (typ.)°°	%FS 10K	0.2 %						

°: Straight line error = non-linearity + hysteresis; at 25°C; pressure within specified range (characteristic linear, not spreaded)

°°: Pressure within specified range (characteristic linear, not spreaded); compensated temperature range 0 to 60°C

Operating temp. (ambient)	-10 … 70°C
Operating temp. (media)	-10 … 70°C
Storage temperature	-20 … 70°C
Protection class (housing)	IP 65 per DIN EN 60529

Electrical

Nominal supply voltage	24 V DC/AC
Operating supply voltage	12 … 32 V DC/AC
Output signal	0 … 20 mA, 4 … 20 mA, 0 … 10 V (3-wire)
Output signal load	For output current $R_L \leq (U_B - 4\ V) / 0.02\ A$ ($U_B \leq 26V$), else $R_L \leq 1100\ \Omega$ For output voltage $R_L \geq 2\ K\Omega$ ($U_B \geq 15\ V$), $R_L \geq 10\ K\Omega$ ($U_B = 12$ …15V)
Power consumption	Approx. 2 W/VA
Switching contacts	2 sets of programmable voltage free relay contacts: NO or NC $U_{max} = 32$ V DC/AC, $I_{max} = 2$ A, $P_{max} = 64$ W/VA Optional, instead of relay outputs: 2 programmable voltage free MOSFET switch outputs; NO/NC U = 3 … 32 V DC/AC, $I_{max} = 0.25$ A, $P_{max} = 8$ W/VA, $R_{ON} \leq 4\ \Omega$
Display	3½ digit LED

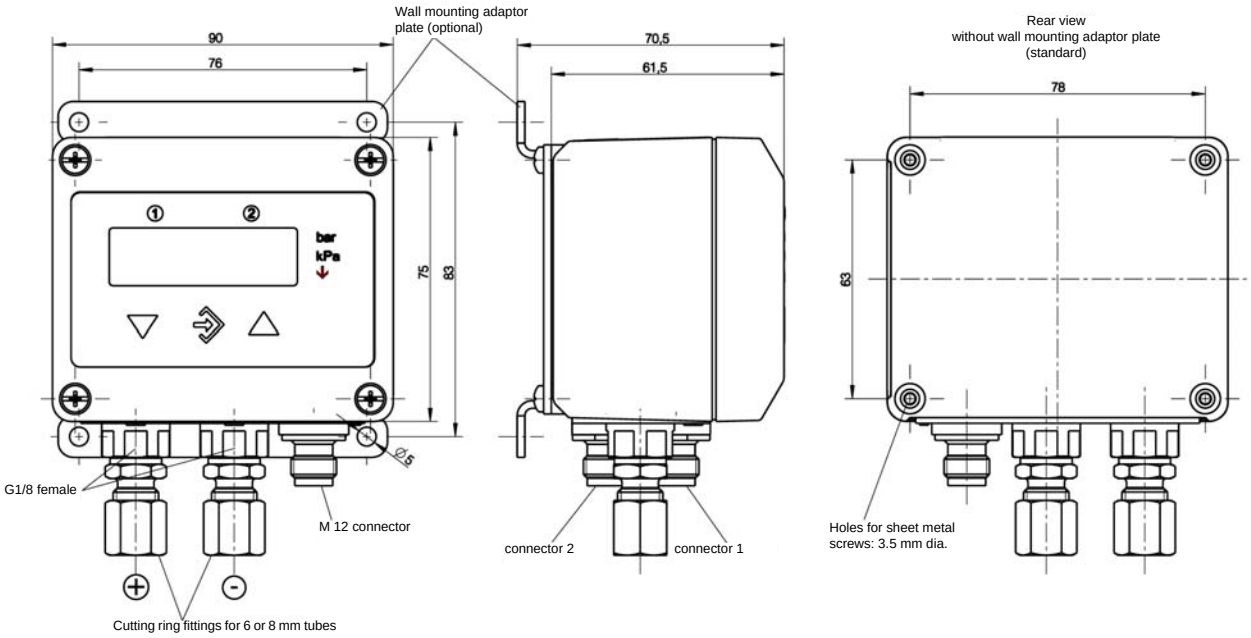
Connections

Electrical connections	Two round-shell multi-pin connector sockets (M12, male) Connector 1: 5-pin: power input and analog signal output Connector 2: 4-pin: relay contacts / solid-state switch outputs
Pressure connections	G 1/8 female threads with optional cutting ring fittings for 6 or 8 mm tube

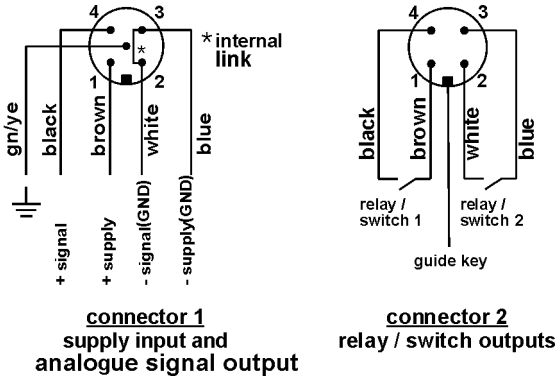
Materials, Mounting

Materials, housing	Polyamid PA 6.6
Materials, media contact	Brass, VITON®, NBR
Mounting	Rear mounting holes for panel mounting Wall mountable using adaptor plate IIf the instrument is intended for outdoor application, we highly recommend using an adequate protective housing (or at least a big enough shelter) as permanent protection against UV-radiation on the membrane keyboard and against exposure of the instrument to rain or snow.

Dimensions (all units in mm unless stated otherwise)



Electrical connection / Switching function



Programming

Via membrane key-switches or by using PC-programming interface (accessory), programming mode can be password protected.

	Settings:
Input filtering	0.0 ... 100.0 secs (10 / 90% step response time) for signal output, display seperated
Relay / switch 1 / 2	activation point, de-activation point, response time delay (0.0 ... 100.0 secs), logic (N/O or N/C)
Measurement unit selection	bar, kPa, „free unit“ start value, end value and decimal place for „free unit“
Zero suppression	0 ... 100 counts (1)
Output signal start / end value	can be set at any point of measuring range (2)
Zero pressure calibration	±100 counts (3)
Output characteristic	linear, square rooted, horizontal cylindr. tank, table (3...30 entries)
Password range	001 ... 999 (000 = password protection disabled)

Notes:
(1) Measured value deviations up to 100 counts symmetric about zero are set to zero. Used for zero drift suppression.
(2) Maximum effective turn-down ratio = 4:1. Only the output signal is affected. Transfer function is inverted if start value > end value.
(3) Zero calibration setting may change with mounting orientation.

Ordering Code

Digital Differential Pressure Transmitter / Switch **DE38**

			0				K	0		M	

Measuring range

0 . . 400 mbar	83
0 . . . . 0.6 bar	01
0 . . . . 1 bar	02
0 . . . . 1.6 bar	03
0 . . . . 2.5 bar	04
0 . . . . 4 bar	05
0 . . . . 6 bar	06

Sensor materials

Pressure chambers, diaphragm, gaskets: brass / NBR	M
Pressure chambers, diaphragm, gaskets: brass / Viton®	N

Pressure connections

G 1/8 female thread	00
Brass cutting ring fitting for 6 mm tube	28
Brass cutting ring fitting for 8 mm tube	29

Signal output

No signal output	0
Current output: 0 - 20 mA linear, 3-wire	A
Voltage output: 0 - 10 V DC linear, 3-wire	C
Current output: 4 - 20 mA linear, 3-wire	P

Supply voltage

24 V DC/AC (12-32 V DC/AC)	K

Display and limit switching points

3½ digit LED display; 2 sets of potential-free relay contacts	3
3½ digit LED display; 2 solid-state switch outputs	6

Electrical connections

M12 roundshell multi-pin connectors	M

Mounting

Rear fastening holes	0
Wall mounting	W

Accessories

Ordering code	Designation	Pins	Application	Length
06401993	cable with M12 connector	4-pin	for relay / switch	2 m
06401994	cable with M12 connector	4-pin	for relay / switch	5 m
06401995	cable with M12 connector	5-pin	for supply / signal	2 m
06401996	cable with M12 connector	5-pin	for supply / signal	5 m
04005144	wall mounting adapter set			
EU03.F300	PC-programming interface with SW			

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