

DE 45 || Digital Pressure Gauge / Transmitter / Switch

The DE 45 is a multi-function pressure instrument that combines a digital readout, dual limit detection relays, and optional transmitter output.

It can measure positive gauge, negative gauge, or differential pressure.

It is ideally suited for applications such as:

- Ventilation and air handling systems
- Climate control systems
- Environmental systems

Principles of Operation

The instrument is based on a piezo-resistive sensor element and can measure positive gauge, negative gauge (vacuum) or differential pressure. The pressure is measured directly by a piezo-resistive resistance bridge that is formed on the surface of an integral silicon diaphragm in each sensor.

Change of pressure results in change of resistance that is converted to a varying voltage and then digitized. The instrument's internal microcontroller transfers the measured value on the LED display, controls the two limit detection relays / switches, and transmits the measured value through an analog conversion stage as a voltage or current signal output.

An optional output signal can be slew rate limited, spreaded, inverted, and piecewise linear transformed by means of a table.



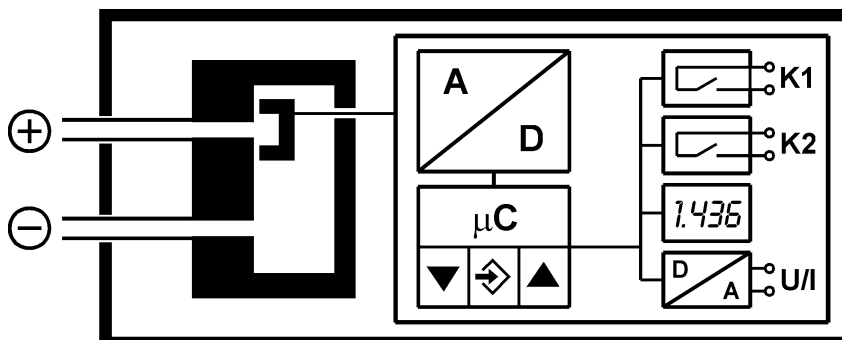
Features

- Robust design; over-pressure tolerant
- Maintenance-free
- Selectable pressure units
- Piecewise linear output transformation via 3...30 entries table

Applications

- Monitoring of roll-band filters, vacuum systems, etc.
- Chimney draught measurement
- Flow and control-pressure measurement
- Surface coating systems

Schematic diagram



Specifications DE 45

General

Measuring range	mbar	0-4	0-6	0-10	0-16	0-25	0-40	0-60	0-100	±2,5	±4	±6	±10	±16	±25	±40	±60
	Pa	0-400	0-600	0-1000	0-1600					±250	±400	±600	±1000	±1600			
	inWC	0-1.6	0-2.5	0-4	0-6.5	0-10	0-16	0-25	0-40	±1.0	±1.6	±2.5	±4	±6.5	±10	±16	±25
max. static operating pressure	mbar	50		100		250		500		50		100		250		500	
Max. safe pressure	mbar	150		300		750		1500		150		300		750		1500	
Straight line deviation (max.)°	%FS	1.0															
Straight line deviation (typ.)°	%FS	0.5															
TC span (max.)°	%FS 10K	1.0		0.3				1.0		0.5		0.3					
TC span (typ.)°	%FS 10K	0.3															
TC offset (max.)°	%FS 10K	1.0		0.4				1.0		0.5		0.4					
TC offset (typ.)°	%FS 10K	0.2															

° Straight line deviation = nonlinearity + 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 60529

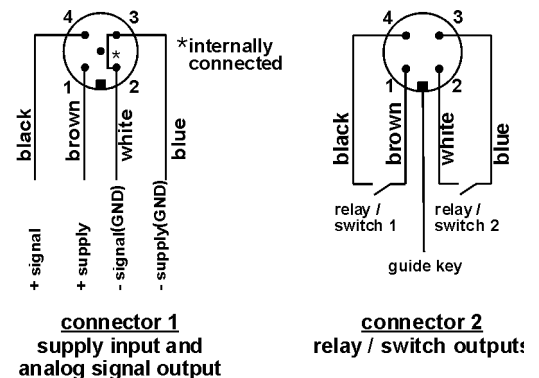
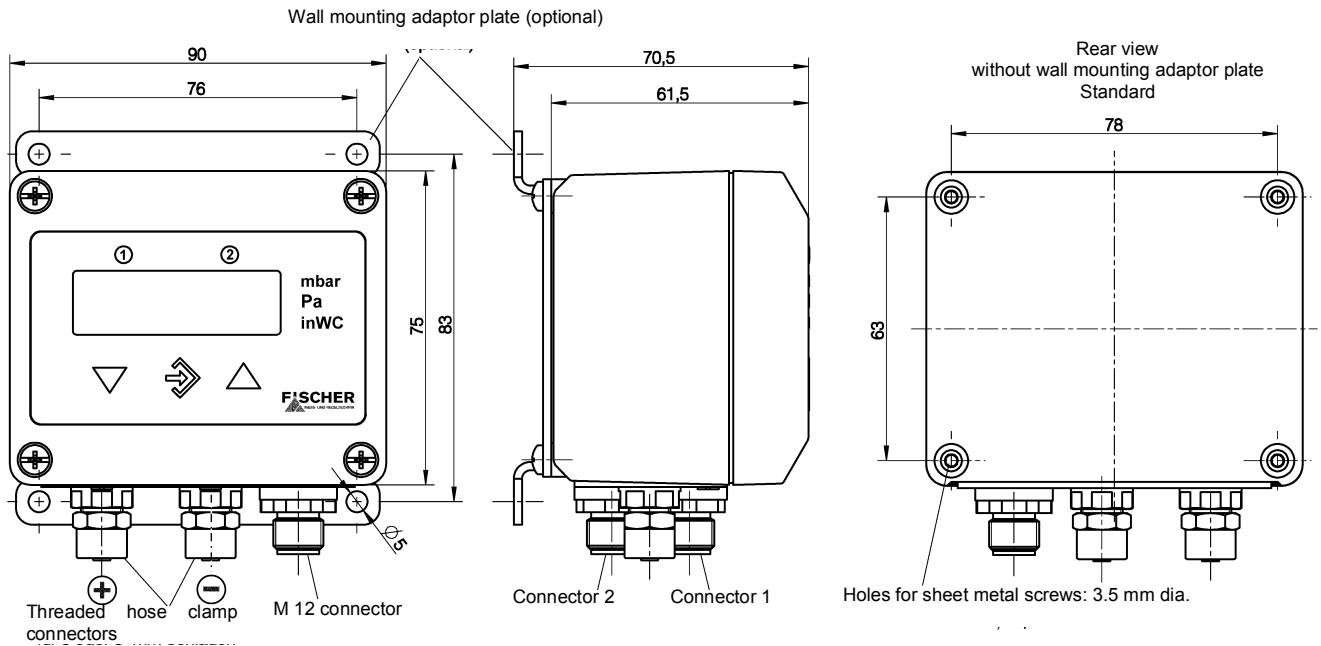
Electrical

Nominal supply voltage	24 V DC / AC
Operating supply voltage	12 ... 32 V DC / AC
Output signal	0 ... 20 mA, 4 ... 20 mA, or 0 ... 10 V DC (3-wire)
Output signal load	For current output: 600 Ω max. at 24 V DC supply voltage; or $R_L \leq (V_{\text{supply}} - 12 \text{ V}) / 0.02 \text{ A}$ For voltage output: $\geq 2 \text{ K}\Omega$ ($V_{\text{supply}} \geq 15 \text{ V DC}$) $\geq 10 \text{ K}\Omega$ ($V_{\text{supply}} = 12 \dots 15 \text{ V DC}$)
Power consumption	Approx. 2 W / VA
Relay contacts	2 sets of voltage free contacts: N/O or N/C (programmable) $V_{\text{max}} = 32 \text{ V DC / AC}$; $I_{\text{max}} = 2 \text{ A}$; $P_{\text{max}} = 64 \text{ W / VA}$
Solid-state switch outputs	Optional, instead of relay outputs: 2 voltage free MOSFET switch outputs; NO/NC (programmable), $U = 3 \dots 32 \text{ V DC/AC}$, $I_{\text{max}} = 0.6 \text{ A}$, $P_{\text{max}} = 20 \text{ W / VA}$, $R_{\text{ON}} \leq 2.5 \Omega$
Display	3½ digit LED

Connections, materials, mounting

Electrical connections	Two round-shell multi-pin connector sockets (M12) Connector 1: 5-pin: power input and analog signal output Connector 2: 4-pin: relay contacts / solid-state switch outputs
Pressure connections	Threaded hose clamp connectors (aluminum) for 8/6 or 6/4 mm hose
Materials, housing	Polyamide PAPA
Materials, media contact	Silicon, PVC, aluminum, brass
Mounting	Mounting holes at rear for panel mounting Wall mountable using adaptor plate

Dimensions DE 45



Programming

The instrument is programmed using its membrane key-switches. Programming mode is password protected.

	Settings:
Input filtering	0.0 ... 100.0 secs (10 / 90% step response time)
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	mbar / Pa / in H ₂ O
Zero suppression	0 ... 100 counts (1)
Output signal start / end value	can be set at any point from minimum to maximum of measuring range (2)
Zero pressure calibration	± 100 counts (3)
Output characteristic	linear, square rooted, horizontal cylindr. tank, table (3...30 entries)
Password range	000 ... 999 (000 = password protection disabled)

(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 DE 45

Digital Pressure Gauge / Transmitter / Switch

 DE 45

		0	0			K	0		M	
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Measuring range max. static operating pressure

0 ... 4 mbar	50 mbar	5	2
0 ... 6 mbar	50 mbar	5	3
0 ... 10 mbar	100 mbar	5	4
0 ... 16 mbar	100 mbar	5	5
0 ... 25 mbar	250 mbar	5	6
0 ... 40 mbar	250 mbar	5	7
0 ... 60 mbar	500 mbar	5	8
0 ... 100 mbar	500 mbar	5	9
- 2.5 ... 2.5 mbar	50 mbar	A	6
- 4 ... 4 mbar	50 mbar	A	7
- 6 ... 6 mbar	100 mbar	A	8
- 10 ... 10 mbar	100 mbar	A	9
- 16 ... 16 mbar	250 mbar	B	1
- 25 ... 25 mbar	250 mbar	B	2
- 40 ... 40 mbar	500 mbar	C	5
- 60 ... 60 mbar	500 mbar	B	3

Pressure connections

Threaded hose clamp connectors for 6 / 4 mm hose	4	0
Threaded hose clamp connectors for 8 / 6 mm hose	4	1

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 nominal (12-32 V DC/AC operating)	K
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Display and limit switching outputs

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

Electrical connections

M12 round-shell multi-pin connectors	M
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Mounting

Rear fastening holes (standard)	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			
EU 03	PC-programming interface with SW			