

DE46 || Digital Differential Pressure Switch / Transmitter

The DE46 is a multi-function differential pressure switch with an optional transmitter signal output. It is suitable for accurate measurement of low positive / negative gauge pressure or differential pressure of air and gases.

Examples of applications:

- Air conditioning and ventilation systems
- Environmental monitoring
- Clean rooms and laboratories

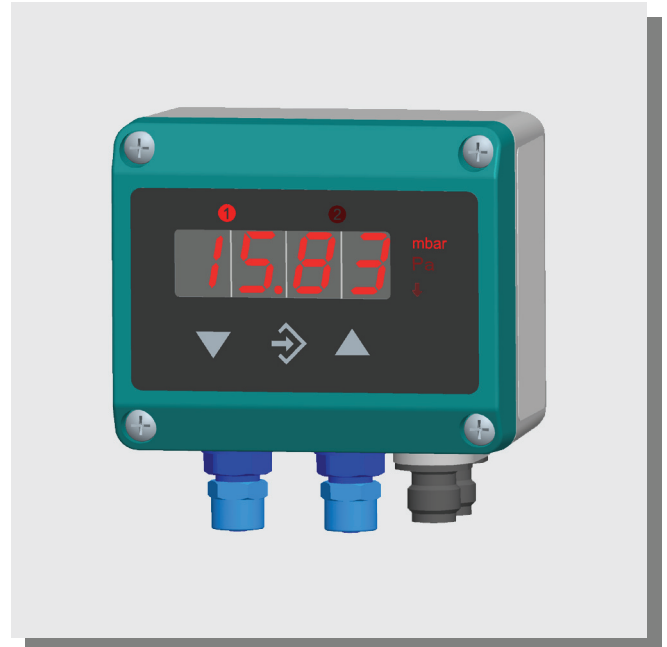
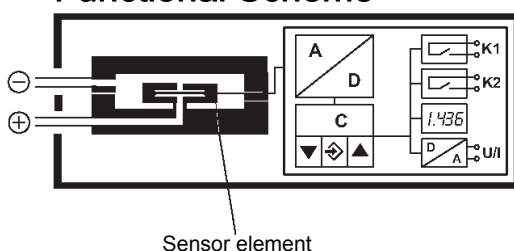
Principles of Operation

The instrument is based on a capacitance sensor element and can measure positive gauge, negative gauge or differential pressure.

The pressure is measured directly by a micromachined silicon-on-glass capacitance sensor element. The instrument's internal microcontroller transfers the measured value to its LED display and operates the two internal limit relays whose contacts are used for alarm and/or control functions. With the transmitter option, the measured value is transmitted as a voltage or current signal output after conversion by a D/A converter stage.

The output signal can be filtered, scaled and inverted accurately and easily by digital means.

Functional Scheme



Features

- Low pressures measurable without long-term drift
- Robust design; over-pressure protected; maintenance-free
- Optional transmitter signal output that can be accurately scaled, adjusted for zero offset anywhere in the specified pressure range, and inverted if needed
- Non-linear measurements can be linearized using a user-programmable look-up table of up to 30 points
- All settings / adjustments can be done from a PC using optional EU03 PC Adaptor

Typical Applications

- Condition monitoring of filters
- Precision air duct measurements
- Clean room pressure balance monitoring
- Burner air feed low pressure detection
- Oven air feed control



Specifications

General

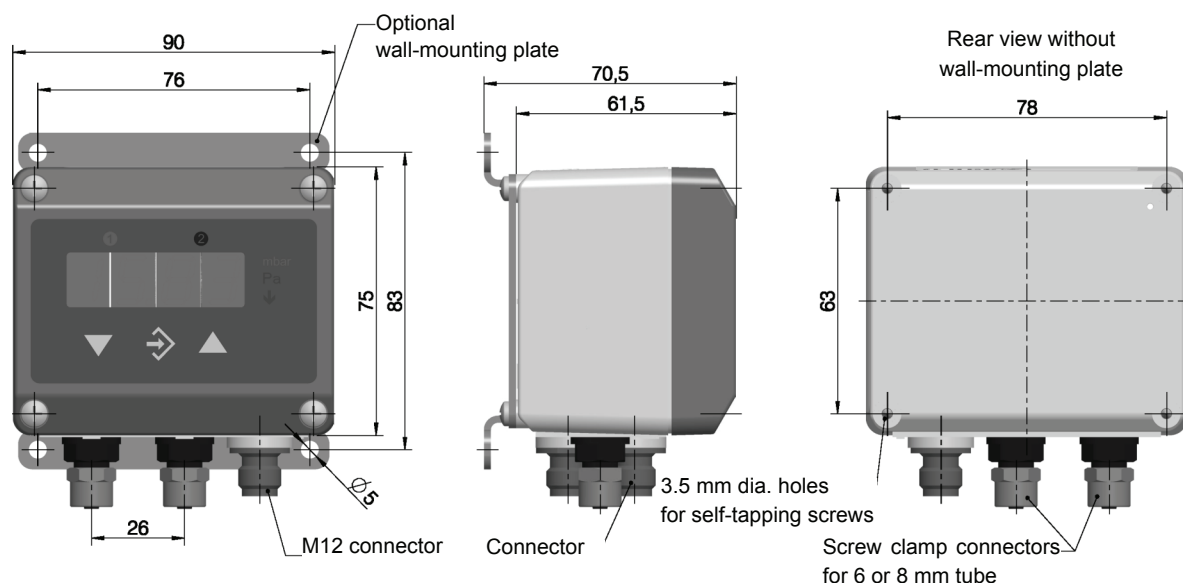
Base measuring range	Pa	0-25	0-50	0-100	0-250	0-500	0-1000	- 12.5...+ 12.5	- 25...+ 25	- 50...+ 50	- 100...+ 100
Max. static operating pressure	bar	1.0									
Max. safe pressure	bar	1.7									
Straight line error (max.)°	%FS	1.0									
Repeatability°	%FS	0.1									
TC span and offset max.°°	%FS 10K	0.6									

° Straight-line error = nonlinearity + hysteresis; at 25 °C; default output scaling (f.s. = pressure range end value); linear output.

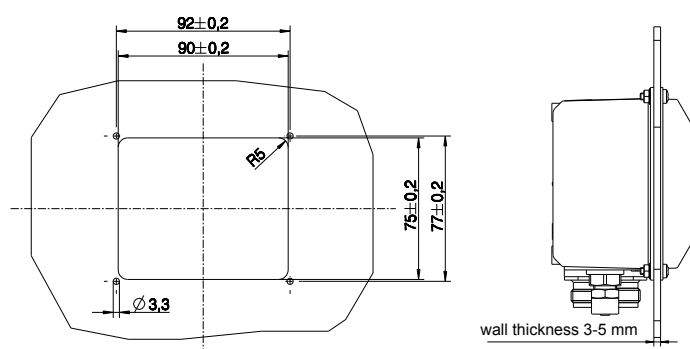
°° Pressure within specified range; compensated temperature range 4 to 50 °C

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	20 ... 32 V DC / AC
Output signal	0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V DC (3-wire)
Output signal load impedance	for current output $R_L \leq (U_B - 4 \text{ V}) / 0.02 \text{ A}$ ($U_B \leq 26\text{V}$), else $R_L \leq 1100 \Omega$ for voltage output $R_L \geq 2 \text{ K}\Omega$ ($U_B \geq 15 \text{ V}$), $R_L \geq 10 \text{ K}\Omega$ ($U_B = 12 \dots 15\text{V}$)
Power consumption	approx. 2 W / VA
Limit relay contact	2 relays, potential-free contacts, NO or NC (user setting) $U_{\max} = 32 \text{ V DC/AC}$; $I_{\max} = 2 \text{ A}$; $P_{\max} = 64 \text{ W/VA}$ Alternatively: 2 solid-state switch (MOSFET) outputs, SPST, N/O or N/C (user setting) $U = 3 \text{ to } 32 \text{ V DC/AC}$; $I_{\max} = 0.25 \text{ A}$; $P_{\max} = 8 \text{ W/VA}$; $R_{\text{ON}} \leq 4 \Omega$
Display	3½ digit LED display
Connections, Materials, Mounting	
Electrical connections	2 x M12 round-shell multi-pin connectors Connector 1: Signal output & supply input (5-pin male socket) Connector 2: Contact outputs (4-pin male socket)
Pressure connections	Screw clamp connectors (aluminum) for 6/4 mm or 8/6 mm tube
Materials housing	Polyamide PA 6,6
Materials, media contact	Silicon, PVC, aluminum, brass
Mounting	Rear mounting holes for back-panel mounting Wall mounted with mounting plate If the instrument is intended for outdoor application, we highly recommend using an adequate protective housing (or at least a big enough shelter) as protection against UV-radiation on the membrane keyboard and against exposure of the instrument to rain or snow.

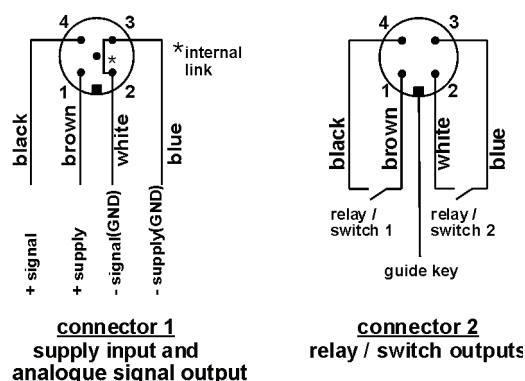
Dimensions (all units in mm unless stated otherwise)



Optional panel mounting kit



Electrical connections



Programming

The DE46 can be programmed either through its membrane keyboard and menu-assisted prompting, or from a PC using the EU03 PC adaptor (optional accessory). Password locking is possible..

	Settings:
Damping	0.0 to 100.0 sec (10 / 90 % step response time) for signal output, display seperated
Relays 1 & 2 functions	Normally energized or normally de-energized; switching delay (0 to 100 sec.); N/C or N/O
Unit of measurement	mbar / Pa / „free unit“ start value, end value and decimal place for „free unit“
Zero stabilization	0 to 100 counts of least significant digit (1)
Measuring range min. / max.	Basic measuring range min. / max. (2)
Zero adjustment	± 100 counts of least significant digit (3)
Output signal transformation	Linear, square root, horizontal tank volume, look-up table (3 to 30 points)
Password	001 to 999 (000 = password lock disabled)

Notes:

- (1) Measured values within ± 100 counts of zero are displayed as exactly zero (i.e., zero drift is suppressed).
- (2) Turndown ratio = 4:1 max. Only the output signal is affected. Downward sloping output signals are also possible when the starting value of the measuring range is greater than the ending value.
- (3) Zero adjustment may be needed for mounting orientation other than vertical.

Ordering Code

Digital Differential Pressure Switch / Transmitter

DE46 # # N # M

Measuring Range

0 25 Pa.....>	D	1
0 50 Pa.....>	J	6
0 . . . 100 Pa.....>	D	4
0 . . . 250 Pa.....>	D	6
0 . . . 500 Pa.....>	J	7
0 . . 1000 Pa.....>	D	9
- 25.0 . . . + 25.0 Pa.....>	L	5
- 50.0 . . . + 50.0 Pa.....>	L	2
- 100.0 . . . + 100.0 Pa.....>	L	7

Pressure Connection

Screw clamp connectors (aluminum) for 6 / 4 mm tube.....>	4	0
Screw clamp connectors (aluminum) for 8 / 6 mm tube.....>	4	1

Signal Output

Without analogue signal output.....>	0
0 - 20 mA linear, 3-wire.....>	A
0 - 10 V DC linear, 3-wire.....>	C
4 - 20 mA linear, 3-wire.....>	P

Power Supply Input

24 V DC/AC nominal (20-32 V DC/AC operating).....>	N
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Display / Switching Output

3½ digit LED display with 2 relays (potential-free contacts).....>	3
3½ digit LED display with 2 solid-state switch outputs.....>	6

Electrical Connection

M12 round-shell multi-pin connectors (sockets).....>	M
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Mounting

Standard: rear fastening holes for self-tapping screws.....>	0
Mounting rail.....>	S
Front panel mounting adaptor kit.....>	T
Wall mounting plate.....>	W

Accessories

Ordering Code	Description	Pins	Function	Length
06401993	M12 connector plug with cable	4	Switching outputs	2 m
06401994	M12 connector plug with cable	4	Switching outputs	5 m
06401995	M12 connector plug with cable	5	Supply + signal	2 m
06401996	M12 connector plug with cable	5	Supply + signal	5 m
04005144	Wall mounting plate			
EU03.F300	PC programming adaptor with software			