

Datasheet

DE45

Digital Differential Pressure Switch / Transmitter

The DE45 is a multi-function pressure instrument with an optional transmitter output.

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

Ideally suited for applications such as:

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

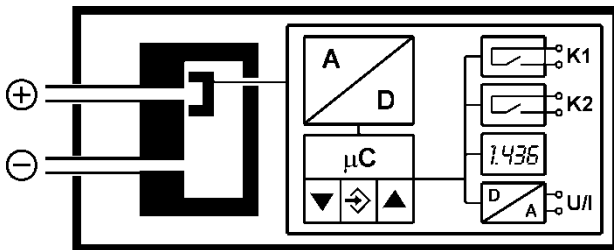
Principles of Operation

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.

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. The output signal can be slew rate limited, spreaded, inverted, and transformed nonlinearly by means of a table function.

Schematic diagram

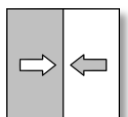


Features

- Robust design, over-pressure safe and maintenance-free
- Signal output as an option, with possibility of spreading and inverting characteristic curve with any offset
- 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 roll-band filters, vacuum systems, etc.
- Chimney draught measurement
- Flow and control-pressure measurement
- Surface coating systems



Specifications

Measuring range	Positive range (0...)											Plus over minus range (±)									
	mbar	4	6	10	16	25	40	60	100	160	250	2,5	4	6	10	16	25	40	60	100	
	Pa	400	600	1000	1600							250	400	600	1000	1600					
	kPa	0,4	0,6	1,0	1,6	2,5	4,0	6,0	10,0	16,0	25,0	0,25	0,4	0,6	1,0	1,6	2,5	4,0	6,0	10,0	
Static operation pressure	max.	mbar	50		100		250		500		1500		50		100		250		500		
Burst pressure		mbar	150		300		750		1500		3000		150		300		750		1500		
Straight line deviation ^{*)}	max.	%FS	1,0											1,0							
	typ.	%FS	0,5											0,5							
TC Span ^{**)}	max.	%FS/10K	1,0		0,3				0,4					1,0		0,5		0,3			
	typ.	%FS/10K	0,3											0,3							
TC Offset ^{**)}	max.	%FS/10K	1,0		0,4									1,0		0,5		0,4			
	typ.	%FS/10K	0,2											0,2							

^{*)} : Straight line deviation = nonlinearity + hysteresis; at 25 °C; pressure within specified range (characteristic linear, not spreaded)

^{**)} : Pressure within specified range (not spreaded); compensated temperature range 0 to 60 °C

General	
Operating temperature (ambient)	-10 ... 70°C
Operating temperature (medium)	-10 ... 70°C
Storage temperature	-20 ... 70°C
Protection class	IP65 according to DIN EN 60529
Electrical	
Nominal Voltage	24V AC/DC
Perm. Operating Voltage U_b	12 ... 32V AC/DC
Connection type	Three Wire Connection
Output signal	0 ... 20mA, 4 ... 20mA AC/DC
Perm. Load	$R_L \leq (U_b - 4 V) / 0,02A$ (if $U_b \leq 26V$) $R_L \leq 1100 \Omega$ (if $U_b > 26V$)
Power consumption	Approx. 2W / VA
Display Unit	3½ digit LED
	$0 \dots 10V DC$ $R_L \geq 2 K\Omega$ (if $U_b \geq 15V$), $R_L \geq 10 K\Omega$ (if $U_b = 12 \dots 15V$)
Switching Contacts	
EMR	2 sets of voltage free relay contacts; programmable n.o. or n.c. $U_{max} = 32V AC/DC$, $I_{max} = 2 A$, $P_{max} = 64 W/VA$
SSR	2 sets of voltage free semiconductor switch (MOSFET); programmable SPST-n.o. or n.c. $U = 3 \dots 32V AC/DC$, $I_{max} = 0,25A$, $P_{max} = 8 W/VA$, $R_{ON} \leq 4 \Omega$
Connections	
Pressure connections	threaded hose coupling (aluminum) for 6/4 mm or 8/6 mm hose
Electrical connections	2 x round shell male connector sockets M12 Connector 1 (5-pin): power supply and analog signal output Connector 2 (4-pin): relay contacts (alt. solid-state switch output)
Material	
Housing	Polyamide PA 6.6
Media contact	Silizium, PVC, aluminum, brass
Mounting	
	Rear mounting holes for panel mounting Panel mounting kit Wall mountable using adaptor plate
Outdoor application	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.

Programming

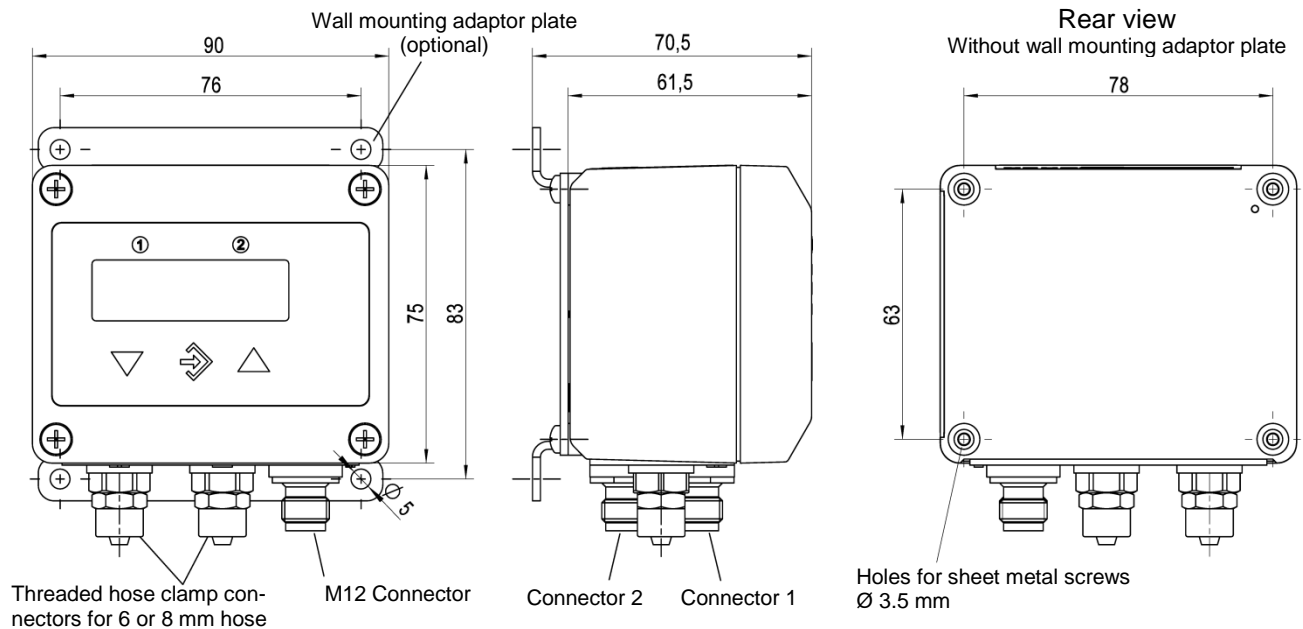
Via membrane key-switches, programming mode can be password protected.

	Settings
Input filtering	0 ... 100.0 secs (10 / 90% step response time) for signal output, display separated
Relay/switch 1 / 2	Activation point, de-activation point, response time delay (0.0 ... 100.0 secs), logic (n.o. /n.c.)
Measurement unit selection	mbar / Pa / „free unit“ start value, end value and decimal place for „free unit“
Zero suppression	0 ... 1/3 of the basic measuring range (1)
Output signal start/end value	Can be set at any point of the basic measuring range (2)
Zero pressure calibration	$\pm 1/3$ of the basic measuring range (3)
Output characteristic	Linear, square rooted, horizontal cylindr. tank, table (3...30 entries)
Password	001 ... 999 (000 = password protection disabled)

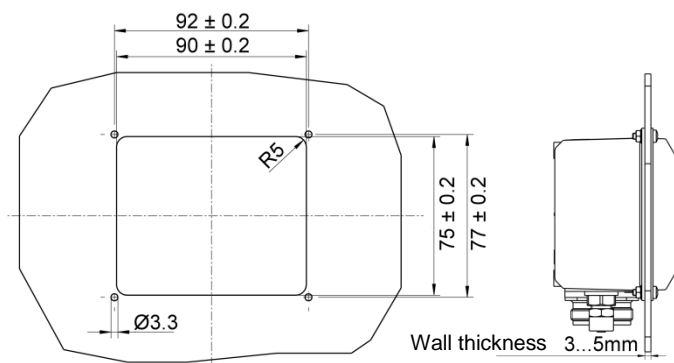
Notes:

- (1): Measured values (about zero) are set to zero (used for zero drift suppression); see rating plate for basic measuring range
- (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.

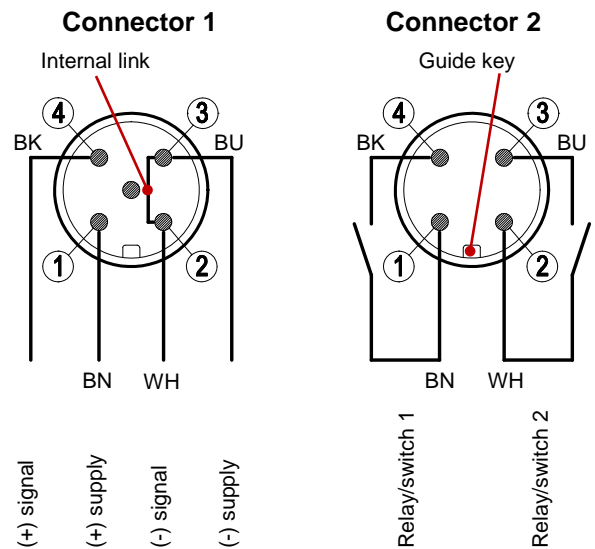
Dimensions (All units in mm unless stated otherwise)



Panel mounting



Electrical connection



Ordering code

**Digital Differential Pressure Switch / Transmitter,
with 3 1/2-digit LED display**

Type DE45

		0	0			K			M	
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Measuring range

0 ... 4 mbar.....>	5	2
0 ... 6 mbar.....>	5	3
0 ... 10 mbar.....>	5	4
0 ... 16 mbar.....>	5	5
0 ... 25 mbar.....>	5	6
0 ... 40 mbar.....>	5	7
0 ... 60 mbar.....>	5	8
0 ... 100 mbar.....>	5	9
0 ... 160 mbar.....>	6	0
0 ... 250 mbar.....>	8	2
-2,5 ... +2,5 mbar.....>	A	6
-4 ... +4 mbar.....>	A	7
-6 ... +6 mbar.....>	A	8
-10 ... +10 mbar.....>	A	9
-16 ... +16 mbar.....>	B	1
-25 ... +25 mbar.....>	B	2
-40 ... +40 mbar.....>	C	5
-60 ... +60 mbar.....>	B	3
-100 ... +100 mbar.....>	B	4
0 ... 400 Pa.....>	D	7
0 ... 500 Pa.....>	J	7
0 ... 600 Pa.....>	D	8
0 ... 1000 Pa.....>	D	9
0 ... 1600 Pa.....>	E	1
-250 ... +250 Pa.....>	L	6
0 ... 1 kPa.....>	N	1
0 ... 1,6 kPa.....>	N	2
0 ... 2,5 kPa.....>	N	3
0 ... 4 kPa.....>	N	4
0 ... 6 kPa.....>	N	5
0 ... 10 kPa.....>	E	5
0 ... 16 kPa.....>	E	6
0 ... 25 kPa.....>	E	7
-1 ... +1 kPa.....>	L	8
-1,6 ... +1,6 kPa.....>	L	9
-2,5 ... +2,5 kPa.....>	M	6
-4 ... +4 kPa.....>	M	7
-6 ... +6 kPa.....>	M	8

Pressure connection

Threaded hose clamp connector (aluminum) for 6 / 4 mm hose.....>	4	0
Threaded hose clamp connector (aluminum) for r 8 / 6 mm hose.....>	4	1

Signal output

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

Supply voltage

24 V DC/AC nominal (12 - 32 V DC/AC operating).....>	K
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Unit of measurement

Standard Units.....>	0
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Display and switching element

3 1/2-digit-LED – 2 sets of voltage free relay contacts.....>	3
3 1/2-digit-LED – 2 solid state switch output.....>	6

Electrical connections

M12 round shell connector.....>	M
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Mounting

Standard (rear fastening holes).....>	0
Top hat rail mounting.....>	S
Panel mounting kit.....>	T
Wall mounting.....>	W

Accessories

Ordering code	Designation	Pins	Application	Length
06401993	cable with M12 connector (female)	4-pins	for relay/switch	2 m
06401994	cable with M12 connector (female)	4-pins	for relay/switch	5 m
06401995	cable with M12 connector (female)	5-pins	for supply/output signal	2 m
06401996	cable with M12 connector (female)	5-pins	for supply/output signal	5 m
EU03.F300	PC-programming interface inclusive software			