

## DE 44 || Digital 2-Channel Differential Pressure Switch / Transmitter

The DE 44 is a dual-sensor 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 of two independent gas / air pressure sources.

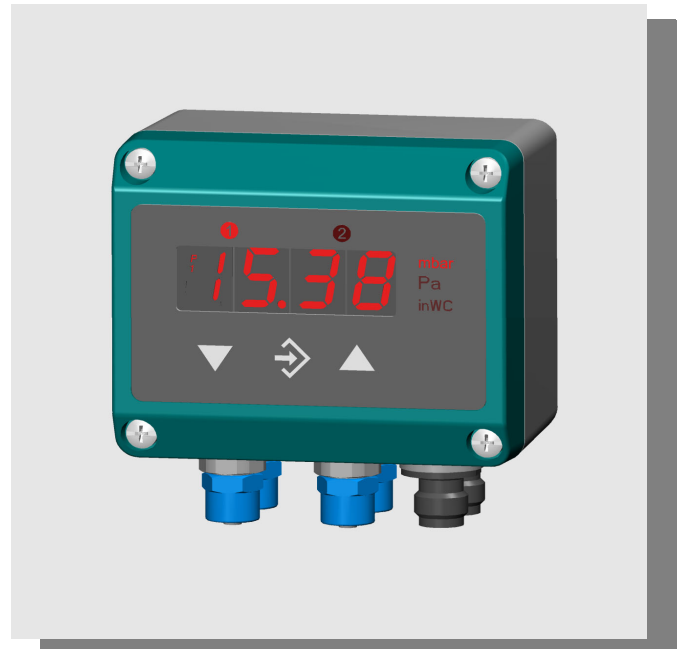
It is ideally suited for applications such as:

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

### Principles of Operation

The instrument is based on dual piezo-resistive sensor elements, each of which 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.

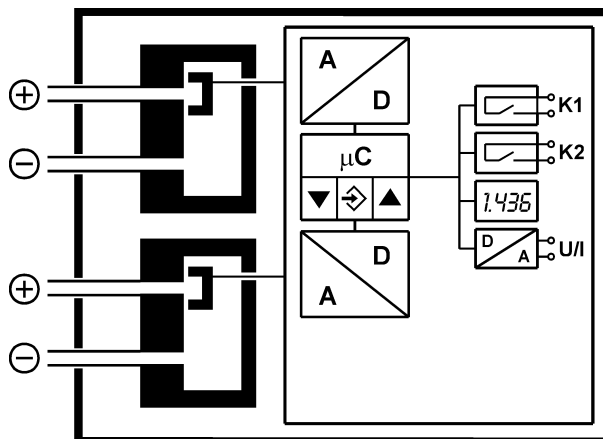


### Features

- Robust design; over-pressure tolerant
- Two independent differential pressure sensors
- Selectable pressure units
- Piecewise linear output transformation 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



Schematic diagram

## Specifications DE 44

### General

Two independent differential pressure sensors

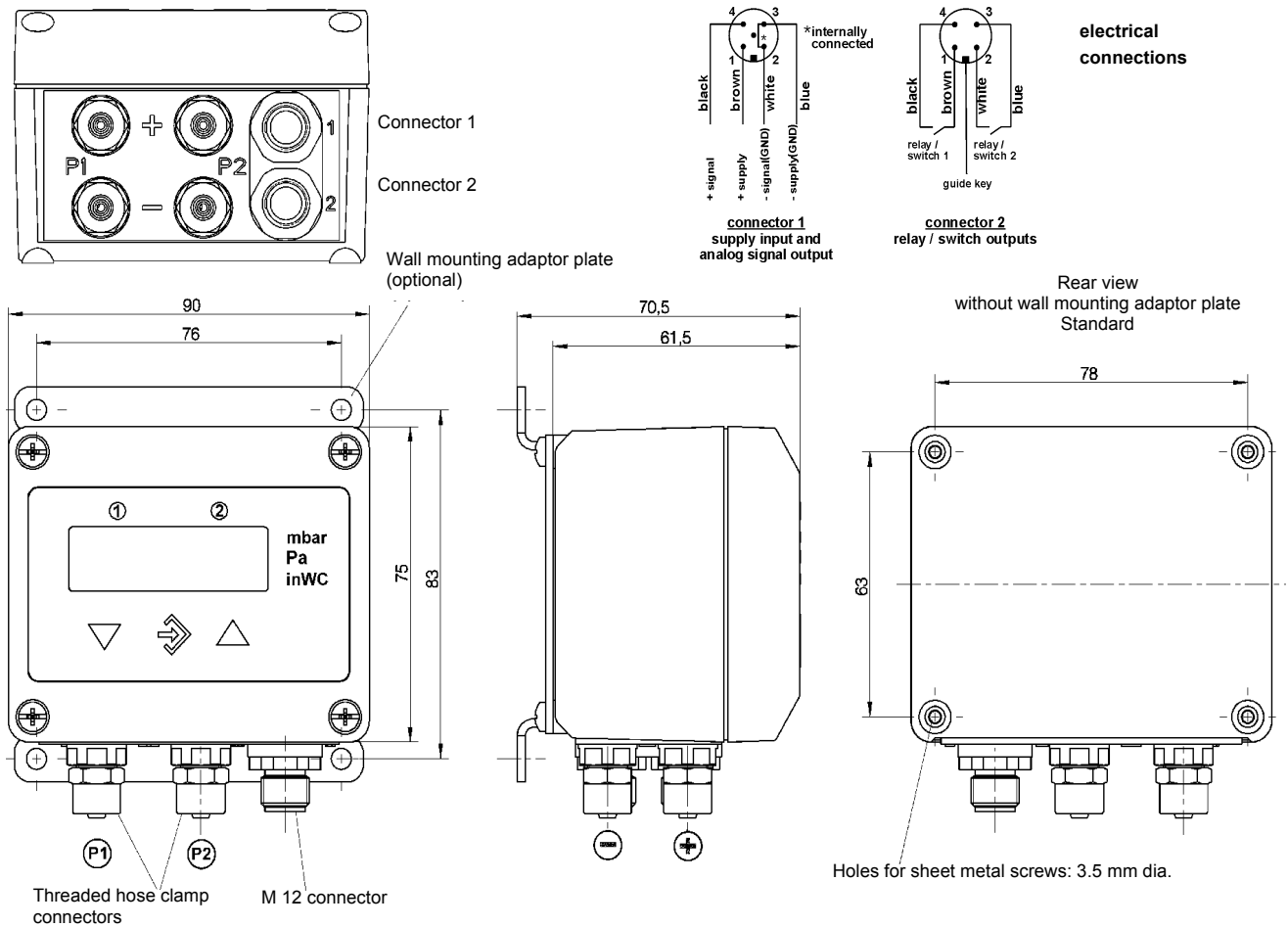
Measuring range	mbar	0-4	0-6	0-10	0-16	0-25	0-40	0-60	0-100	±2,5	±4	±6	±10	±16	±25	±40	±60
	Pa	0-400	0-600	0-1000	0-1600					±250	±400	±600	±1000	±1600			
	inWC	0-1.6	0-2.5	0-4	0-6.5	0-10	0-16	0-25	0-40	±1.0	±1.6	±2.5	±4	±6.5	±10	±16	±25
Max. static operating pressure	mbar	50		100		250		500		50		100		250		500	
Max. safe pressure	mbar	150		300		750		1500		150		300		750		1500	
Straight line error (max.)°	%FS	1.0															
Straight line error (typ.)°	%FS	0.5															
Tc span (max.)°°	%FS	1.0				0.3				1.0		0.5				0.3	
Tc span (typ.)°°	%FS	0,3															
Tc zero point (max.)°°	%FS	1.0				0.4				1.0		0.5				0.4	
Tc zero point (typ.)°°	%FS	0.2															

° Straight line error = 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 EN 60529
<b>Electrical</b>	
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 $R_L \leq (U_B - 4 V) / 0,02 A$ ( $U_B \leq 26V$ ), else $R_L \leq 1100 \Omega$ for voltage output $R_L \geq 2 K\Omega$ ( $U_B \geq 15 V$ ), $R_L \geq 10 K\Omega$ ( $U_B = 12 \dots 15V$ )
Power consumption	Approx. 2 W / VA
Relay contacts	2 sets of voltage free contacts: N/O or N/C (programmable) $V_{max} = 32 V DC / AC$ ; $I_{max} = 2 A$ ; $P_{max} = 64 W / VA$
Solid-state switch outputs	Optional, instead of relay outputs: 2 voltage free MOSFET switch outputs; NO/NC (programmable), $U = 3 \dots 32 V DC/AC$ , $I_{max} = 0,25 A$ , $P_{max} = 8 W/VA$ , $R_{ON} \leq 4 \Omega$
Display	3½ digit LED
<b>Connections, materials, mounting</b>	
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	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 44



## Programming

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

<b>Settings:</b>	
Input filtering	0.0 ... 100.0 secs (10 / 90% step response time)
Display function	0.0 = Pressure port 1 only. 0.1 = Pressure port 2 only. 0.2 ... 25.5 = Display alternating time (0)
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 <sub>2</sub> 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 - pressure port 1 / 2	±100 counts (3)
Output characteristic	linear, square rooted, horizontal cylindr. tank, table (3...30 entries)
Password range	000 ... 999 (000 = password protection disabled)

(0) The display alternates between pressure pressure ports 1 and 2 equally, each for the pre-set time

(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.

Note: 1. Relay/switch output 1 and output signal are for pressure port 1.

2. Relay/switch output 2 is for pressure port 2.

# Ordering Code DE 44

## Digital 2-Channel Differential Pressure Switch / Transmitter DE 44

										K		0		M			
<b>Pressure port I</b>		<b>max. static operating pressure</b>															
<b>Measuring range</b>																	
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														
<b>Pressure port II</b>		<b>max. static operating pressure</b>															
<b>Measuring range</b>																	
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														
<b>Pressure connections</b>																	
Threaded hose clamp connectors for 6 / 4 mm hose						4		0									
Threaded hose clamp connectors for 8 / 6 mm hose						4		1									
<b>Signal output (pressure port I only)</b>																	
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					
<b>Supply voltage</b>																	
24 V DC/AC nominal (12-32 V DC/AC operating)												K					
<b>Display and limit switching outputs</b>																	
3½ digit LED display; 2 sets of voltage free relay contacts														3			
3½ digit LED display; 2 solid-state switch outputs														6			
<b>Electrical connections</b>																	
M12 round-shell multi-pin connectors																M	
<b>Mounting</b>																	
Rear fastening holes (standard)																0	
Wall mounting																W	

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			