FISCHER MESS- UND REGELTECHNIK

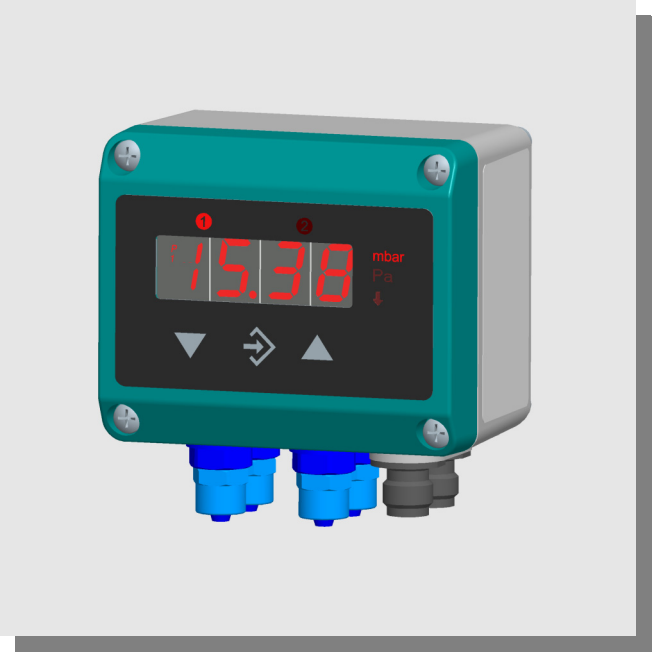
DE44 || Digital 2-Channel Differential Pressure Switch / Transmitter

The DE44 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

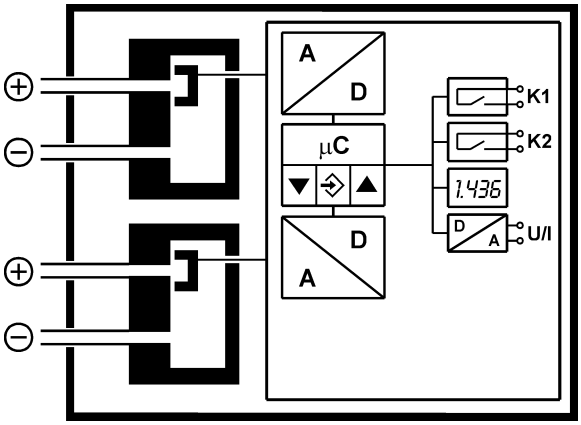


Principles of Operation

The instrument is based on dual piezo-resistive sensor elements. 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 transformed non-linearly by means of a table function.

Schematic Diagram



Features

- Robust design; over-pressure safe
- Maintenance-free
- Two independent differential pressure sensors
- Selectable pressure units
- Signal output with possibility of spreading and inverting characteristc 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 roll-band filters, vacuum systems, etc.
- Chimney draught measurement
- Flow and control-pressure measurement
- Surface coating systems

Specifications

General

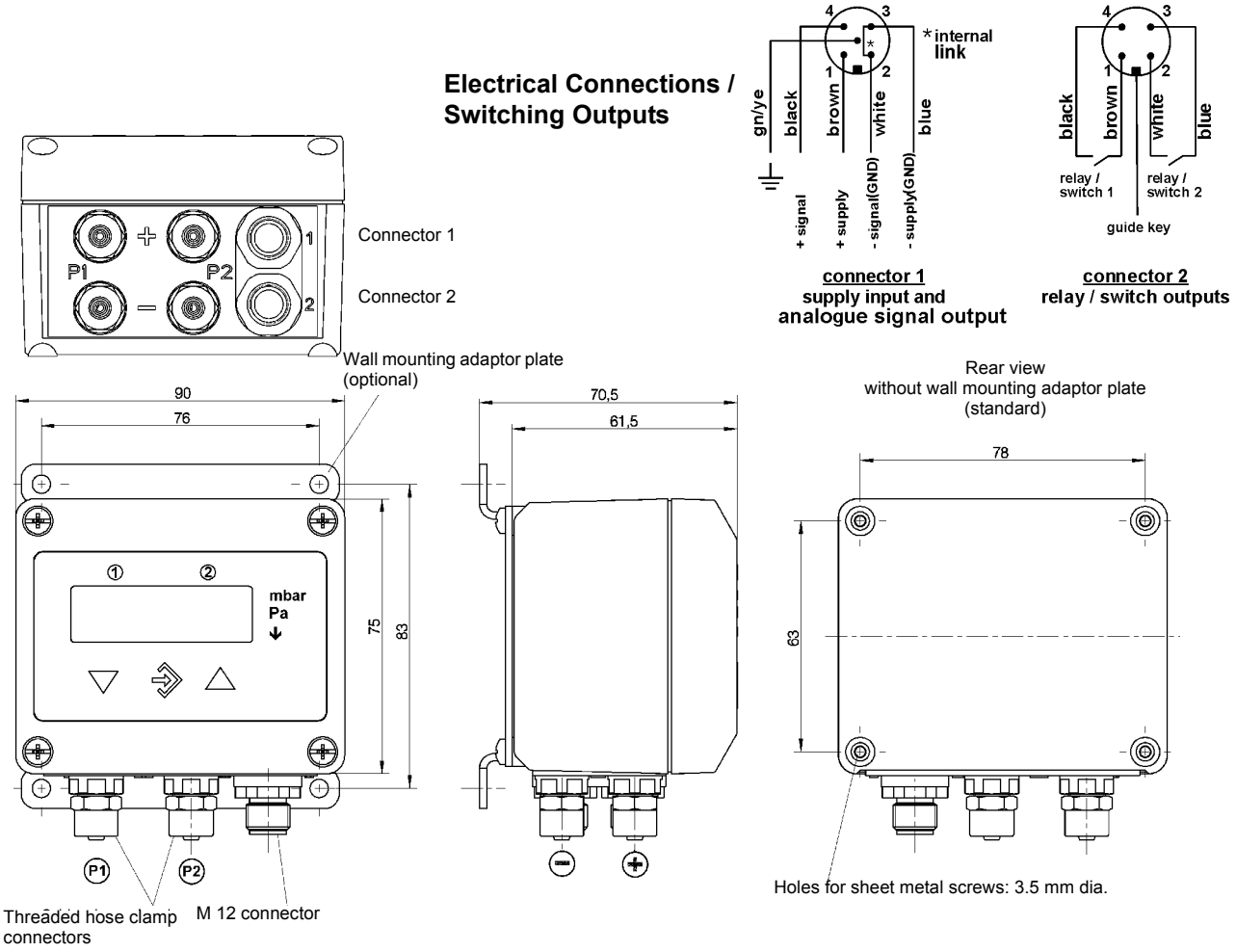
Two independent differential pressure sensors

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			
	kPa	0-0.4	0-0.6	0-1.0	0-1.6	0-2.5	0-4.0	0-6.0	0-10.0	±0.25	±0.4	±0.6	±1.0	±1.6	±2.5	±4.0	±6.0
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 10K	1.0		0.3						1.0	0.5	0.3					
Tc span (typ.)°°	%FS 10K	0,3															
Tc zero point (max.)°°	%FS 10K	1.0		0.4						1.0	0.5	0.4					
Tc zero point (typ.)°°	%FS 10K	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
	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 $R_L \leq (U_B - 4\ V) / 0.02\ A$ ($U_B \leq 26V$), else $R_L \leq 1100\ \Omega$ for voltage output $R_L \geq 2\ K\Omega$ ($U_B \geq 15\ V$), $R_L \geq 10\ K\Omega$ ($U_B = 12 \ldots 15V$)
Power consumption	Approx. 2 W / VA
Switching contacts	2 sets of programmable voltage free relay contacts: N/O or N/C 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
	Materials, mounting
Materials, housing	Polyamide PA 6,6
Materials, media contact	Silicon, PVC, aluminum, brass
Mounting	Rear mounting holes for panel mounting Wall mountable using adaptor 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)



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
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 / „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 - pressure port 1 / 2	±100 counts (3)
Output characteristic	linear, square rooted, horizontal cylindr. tank, table (3...30 entries)
Password range	001 ... 999 (000 = password protection disabled)

(0) The display alternates between 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

Digital 2-Channel Differential Pressure Switch / Transmitter DE44

							K	0		M		

Pressure Port I
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 Port II
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 (Pressure Port I only)

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

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

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.F300	PC-programming interface with SW			

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