

AIR DIFFERENTIAL PRESSURE SWITCHES & TRANSMITTERS

Features

- On/off output
- Electrical rating 250 Vac
- 6 different pressure ranges
- Switching pressure to be adjusted easy on a scaled adjustment knob
- Static, over, underpressure and vacuum
- IP54 protection

Technical data

Output	on/off
Max. operating pressure	10 kPa
Medium	Air, non-combustible and non-aggressive gases.
Temp. range	Medium and ambient temp. from -20°C to +85°C. Storage temperature from -40°C to +85°C.
Diaphragm material	Silicone, tempered at +200°C, free of gas emissions. Other materials available on request.
Pressure connections	2 plastic pipe connection pieces (P1 and P2), external diameter 6.0 mm: P1 for connection to higher pressure (marked +) P2 for connection to lower pressure (marked -)
Housing materials	Switch body made of PA 6.6. Cover made of PS.
Weight	150 g
Mechanical working life	Over 10.000.000 switching operations
Electrical rating	max. 1.0 A (0.4 A) / 250 Vac
Electrical con.	AMP flat plug 6.3 mmx 0.8 mm in accordance with DIN 46244 or push-on screw terminals. Cable conduit PG-11 or M20x1.5 with cable strain
Protection	IP 54
Approvals	CE marking according to EC Low Voltage Directive 73/23/EEC.



Can be delivered in 3 different alternatives
 1. Only the pressure switch
 2. The pressure switch separately packed and the duct fixing kit separately packed.
 3. The pressure switch and the duct fixing kit packed together in one small carton.

Ordering

Type no.	Adjustment range	Switching differential
Air differential pressure switch		
930.80 222111	20–200 Pa	10 Pa
930.84 222111	30– 400 Pa	15 Pa
930.83 222111	50– 500 Pa	20 Pa
930.85 222111	200–1.000 Pa	100 Pa
930.86 222111	500–2.500 Pa	150 Pa
930.87 222111	1000–4.000 Pa	250 Pa

DFK 200

Duct fixing kit

Air differential pressure switch with duct fixing kit (DFK 200), packed together into a carton.		
930.80 222134	20–200 Pa	10 Pa
930.84 222134	30– 400 Pa	15 Pa
930.83 222134	50– 500 Pa	20 Pa
930.85 222134	200–1.000 Pa	100 Pa
930.86 222134	500–2.500 Pa	150 Pa
930.87 222134	1000–4.000 Pa	250 Pa

Note:

930.81 with pressure range 40-100 Pa and 930.82 with pressure range 40-200 Pa are available until stock is sold out.

Description

The 930 differential pressure switch is suitable for low differential pressure switching applications in air-conditioning systems for providing indication of fan status or 'filter dirty'.

With this pressure switch the switching pressure can be adjusted manual by hand or with a screwdriver using a scaled adjustment knob located under the cover.

Tolerance for upper and lower switching pressure is +/-15%.

Switching pressure specifications apply to vertical installation which is also the recommended position with pressure-pipe connections pointing downwards.

If the switches are installed horizontally with AMP connection terminals uppermost, the switching values are approx. 20 Pa higher.

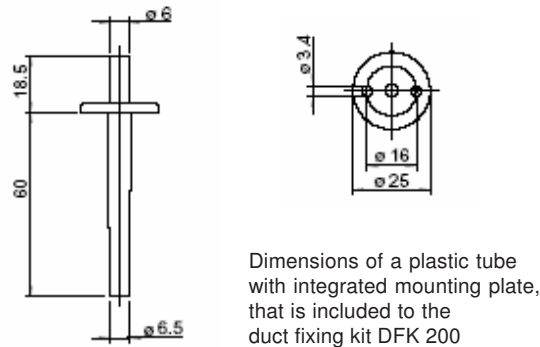
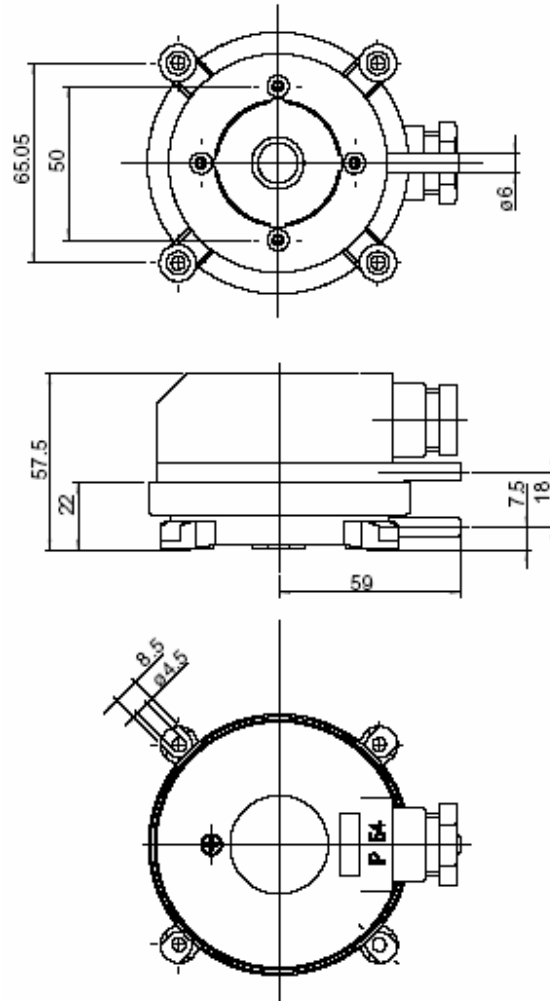
Applications

Adjustable differential pressure switch for monitoring overpressure, vacuum and differential pressure of air or other non-combustible, non-aggressive gases.

Possible fields of application include:

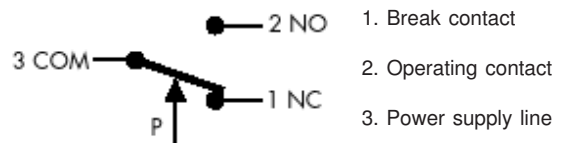
- Monitoring air filters and ventilators
- Monitoring industrial cooling-air circuits
- Overheating protection for fan heaters
- Monitoring flows in ventilation ducts
- Controlling air and fire-protection flaps
- Frost protection for heat exchangers

Dimensions (mm)



Duct fixing kit DFK 200 includes
2 plastic tubes with integrated mounting plate,
2 metres PVC hose and 4 screws

Electrical connection



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984M without LED display



984M with LED display

984M are supplied with duct fixing kit,
packed together in a carton

Technical data

Pressure medium	Air and non-aggressive gases
Linearity and hysteresis error	< ± 1 % of FS
Working temperature	0 to +50 °C
Storage temperature	-10 to +70 °C
Long-term stability, typ.	< ± 0.5 % to 2.5% of FS / year (depending on pressure range)
Repetition accuracy	< ± 0.2 % of FS
Position dependence	< ± 0.02 % of FS / g
Humidity	0 to 95 % rel, non-condensing
Response time	100 ms or 1 s (jumper selectable)
Maximum load	< 500 ohm
Process connection	6 mm hose pipe
Electrical connection	Screw terminal block for wire up to 1.5 mm ²
Mounting	Screw mounting with serrated screws
Housing material	Housing with process connection P2 made of ABS, mounting part with process connection P1 made of POM
Housing dimensions	approx. Ø 85 x 58 mm
Weight approx.	approx. 130 g
Protection category to EN60529	IP54
Cable conduit for protection cap	M20 x 1.5 made of Polyamide
Standards / Conformance	EN60770, EN61326
Display, optional	Red LED display, 3.5 digits (only on 984M.3x3314)

Features

- Selectable output via jumper
0-10 Vdc or 4-20 mA output, 3-wire
with power supply 24 Vac/dc
- 4-20 mA output, 2-wire
with power supply 24 Vdc
- LED display as option on the 3-wire version
- 2 adjoining pressure ranges in one unit,
pressure ranges selectable via jumper
- Pressure ranges
from 0-100 Pa up to 0-250 kPa
- Response time 100 ms and 1 s
selectable via jumper

Description

The differential pressure transmitters of the 984M series are used for measuring differential pressure, positive pressure and vacuum.

Selection of output signal

The output signal of the 3-wire version is configurable. The factory setting is for a 0-10 Volt output signal, but this can be changed to 4-20 mA by removing the jumper. The 2-wire version is only available with a 4-20 mA output signal.

Selection of pressure range

To adapt best for the application the transmitter can be selected between two adjoining pressure ranges. Factory setting is for the most sensitive range, by opening of a jumpered bridge the less sensitive range is activated.

Selection of response time

The response time of the output signal can be selected by a jumpered bridge. Factory setting is for a slow response time (1 s), which dampens short pressure peaks. To work with a fast response time (100ms) this bridge needs to be replaced.

Easy offset calibration

The output signal can be calibrated to zero by pressing the M key (pressure transmitter must be depressurised).

Switching output (only for the 3-wire version)

As well as an analogue output signal, the differential pressure transmitter contains an adjustable transistor switching output with a maximum switching capacity of 35 Vdc/100 mA.

Measuring method

Piezoresistive pressure transducer

Mounting position

They can be mounted in any position. Due to the selfcompensating piezoresistive pressure transducer any possible mounting error is eliminated.

Ordering

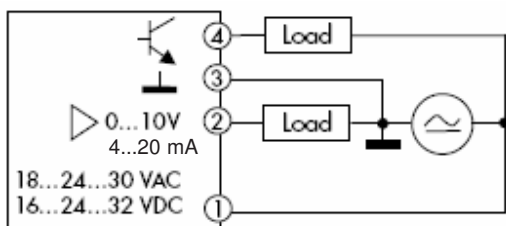
Air differential pressure transmitter

Type no.	Analogue output 1	Analogue output 2	Pressure range 1	Pressure range 2	Conn.	Power supply	LED display	Switch. output
984M.323104	0-10 Vdc	4-20 mA	0 to 100 Pa	0 to 250 Pa	3-wire	24 Vac/dc	no	yes
984M.333104	0-10 Vdc	4-20 mA	0 to 250 Pa	0 to 500 Pa	3-wire	24 Vac/dc	no	yes
984M.343104	0-10 Vdc	4-20 mA	0 to 500 Pa	0 to 1.000 Pa	3-wire	24 Vac/dc	no	yes
984M.353104	0-10 Vdc	4-20 mA	0 to 1 kPa	0 to 2.5 kPa	3-wire	24 Vac/dc	no	yes
984M.373104	0-10 Vdc	4-20 mA	0 to 5 kPa	0 to 10 kPa	3-wire	24 Vac/dc	no	yes
984M.393104	0-10 Vdc	4-20 mA	0 to 25 kPa	0 to 50 kPa	3-wire	24 Vac/dc	no	yes
984M.3B3104	0-10 Vdc	4-20 mA	0 to 100 kPa	0 to 250 kPa	3-wire	24 Vac/dc	no	yes
984M.323114	0-10 Vdc	4-20 mA	0 to 100 Pa	0 to 250 Pa	3-wire	24 Vac/dc	yes	yes
984M.333114	0-10 Vdc	4-20 mA	0 to 250 Pa	0 to 500 Pa	3-wire	24 Vac/dc	yes	yes
984M.343114	0-10 Vdc	4-20 mA	0 to 500 Pa	0 to 1.000 Pa	3-wire	24 Vac/dc	yes	yes
984M.353114	0-10 Vdc	4-20 mA	0 to 1 kPa	0 to 2.5 kPa	3-wire	24 Vac/dc	yes	yes
984M.373114	0-10 Vdc	4-20 mA	0 to 5 kPa	0 to 10 kPa	3-wire	24 Vac/dc	yes	yes
984M.393114	0-10 Vdc	4-20 mA	0 to 25 kPa	0 to 50 kPa	3-wire	24 Vac/dc	yes	yes
984M.3B3114	0-10 Vdc	4-20 mA	0 to 100 kPa	0 to 250 kPa	3-wire	24 Vac/dc	yes	yes
984M.323204	4-20 mA		0 to 100 Pa	0 to 250 Pa	2-wire	24 Vdc	no	no
984M.333204	4-20 mA		0 to 250 Pa	0 to 500 Pa	2-wire	24 Vdc	no	no
984M.343204	4-20 mA		0 to 500 Pa	0 to 1.000 Pa	2-wire	24 Vdc	no	no
984M.353204	4-20 mA		0 to 1 kPa	0 to 2.5 kPa	2-wire	24 Vdc	no	no
984M.373204	4-20 mA		0 to 5 kPa	0 to 10 kPa	2-wire	24 Vdc	no	no
984M.393204	4-20 mA		0 to 25 kPa	0 to 50 kPa	2-wire	24 Vdc	no	no
984M.3B3204	4-20 mA		0 to 100 kPa	0 to 250 kPa	2-wire	24 Vdc	no	no

Electrical connections

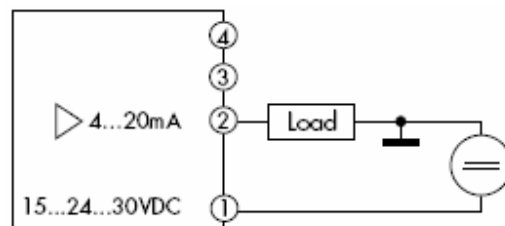
984M.3x3104 and 984M.3x3114, 0-10 Vdc / 4-20 mA output, 3-wire, with switching output

4	Switching output, npn
3	(GO) GND
2	(Y) Output 0-10 Vdc and 4-20 mA
1	(G) Power supply 24 Vac/dc

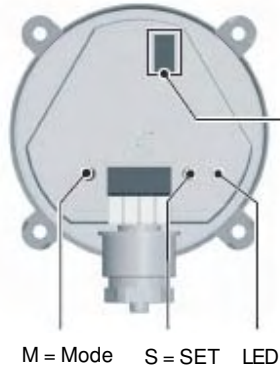


984.3x3204 4-20 mA output, 2-wire

4	(NC)	Do not use
3	(NC)	Do not use
2	(Y)	Output 4-20 mA
1	(G)	Power supply 24 Vdc



Switches and jumper settings



984M.3x3104, 0-10 Vdc/4-20 mA without LED display

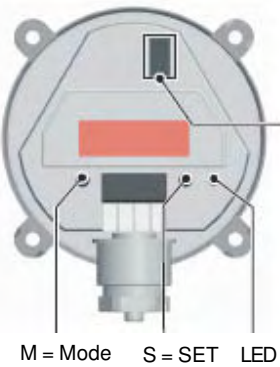
	switched	open
Pressure range	low	high
Response	slow	fast
Mode	linear	*square root
Output signal	0-10 Vdc	4-20 mA

Offset Calibration

This function can be used to correct the zero-point deviation (offset) of the output signal in depressurised state (example: to 0 V/4mA at zero Pa). Disconnect the unit from the pressure by opening both hose nozzles or removing the hoses. Then press the "M" button for 5 s.

Setting of Switching Output

This function is used to set the switching output to "switched through" for a pressure you have defined. Apply the pressure or pressure differential at which the switching output is to be connected. Then press the "S" button for 5 s until the LED flashes quickly (= value is saved). The LED lights up as soon as the defined pressure is reached or exceeded.



984M.3x3114, 0-10 Vdc/4-20 mA with LED display

	switched	open
Pressure range	low	high
Response	slow	fast
Mode	linear	*square root
Output signal	0-10 Vdc	4-20 mA

Offset Calibration

This function can be used to correct the zero-point deviation (offset) of the output signal in depressurised state (example: to 0 V/4mA at zero Pa). Disconnect the unit from the pressure by opening both hose nozzles or removing the hoses. Then follow the programming instructions on the next page.

Setting of Switching Output

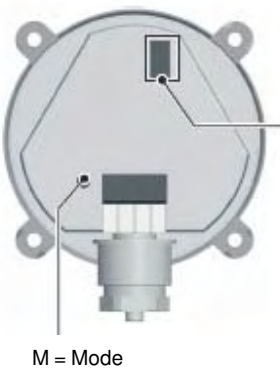
This function is used to set the switching output to "switched through" for a pressure you have defined. The LED lights up as soon as the defined pressure is reached or exceeded.

Peak Value

The shown low/high peak value is the value that was ever set at the sensor. A resetting of the peak value can take place only at the manufacturer.

Error messages

Er. SE	sensor defect
Er. Li	measurement exceeding



984M.3x3204, 4-20 mA

	switched	open
Pressure range	low	high
Response	slow	fast
Mode	linear	*square root

Offset Calibration

This function can be used to correct the zero-point deviation (offset) of the output signal in depressurised state (example: to 0 V/4mA at zero Pa). Disconnect the unit from the pressure by opening both hose nozzles or removing the hoses. Then press the "M" button for 5 s.

*Square root = 984M can be used for volume flow measurement, this product feature is at extra cost and have to be requested when ordering.



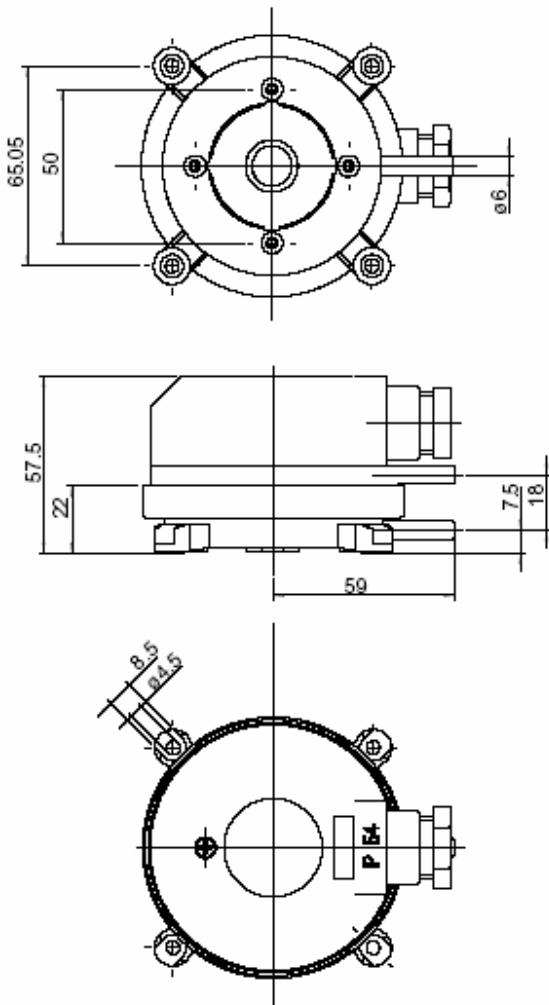
Programming of 984M.3x3114 (the LED display version)

Switch	Display	Step	Information
	250		Current measured value
Press >M<	OFFS		Offset calibration
		Press >S<	Show actual offset value
Press >M<	-3		Re-calibration of offset
		Press >S<(5 sec)	
	0		Store offset. Display blinking for confirmation
		Press >M<	
	OFFS		
			Setting switching level
Press >M<	5P		Show actual switching level
		Press >S<	
	112		Modify switching level
		Press >S<(5 sec)	
	112		Store switching level. Display blinking for confirmation
		Press >M<	
	5P		
			Peak value high
Press >M<	HI		Show peak value high
		Press >S<	
	240		Return
		Press >M<	
	HI		
			Peak value low
Press >M<	LO		Show peak value low
		Press >S<	
	-50		Return
		Press >M<	
	LO		
Press >M<			Current measured value
	250		

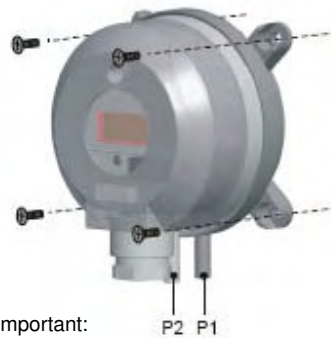
Pressure ranges

Type	Pressure range 1	Pressure range 2	Overload capacity	Bursting pressure	Temperature error
984M.323	0 to 100 Pa	0 to 250 Pa	20 kPa	40 kPa	< ± 5 % of FS
984M.333	0 to 250	0 to 500 Pa	20 kPa	40 kPa	< ± 5 % of FS
984M.343	0 to 500 Pa	0 to 1.000 Pa	20 kPa	40 kPa	< ± 2.5 % of FS
984M.353	0 to 1 kPa	0 to 2.5 kPa	40 kPa	70 kPa	< ± 1 % of FS
984M.373	0 to 5 kPa	0 to 10 kPa	60 kPa	120 kPa	< ± 1 % of FS
984M.393	0 to 25 kPa	0 to 50 kPa	300 kPa	500 kPa	< ± 1 % of FS
984M.3B3	0 to 100 kPa	0 to 250 kPa	1.2 MPa	2 MPa	< ± 1 % of FS

Dimensions (mm)



Mounting and hose connection



Important:
When connecting and laying the hoses, do not bend or damage them. Hoses and hose connections that are not airtight cause damage to the device or will give wrong measuring results.

Ø Inner < 5.5 mm for optimum clamping

Use hose clips from 25 kPa (250 mbar)

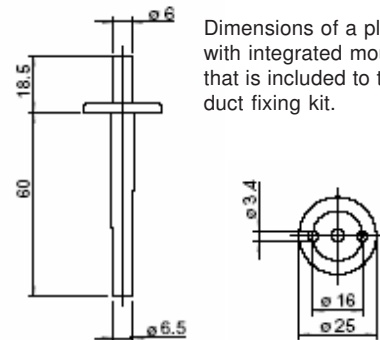
P1 = Positive pressure measurement

P2 = Vacuum measurement

P1 + P2 = Differential pressure measurement



Duct fixing kit includes:
2 plastic tubes with integrated mounting plate
2 metres PVC hose and 4 screws.



Dimensions of a plastic tube with integrated mounting plate, that is included to the duct fixing kit.

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