

616

Electronic
differential
pressure switch
0 to 25 bar



EDITION 05/2001

HUBA-REGISTERED TRADE MARK

 **Huba Control**

FOR FINE PRESSURE AND FLOW MEASUREMENT



Adjustment of switching points

The upper and lower switching point can be freely selected between 5 and 100 % fs. Recommended spacing between upper and lower switching points: > 2 % fs (factory-set at 5 and 100 % unless switching point is specified).

Electrical connection / Protection class

Cable 1.5 meters, IP 65.
Round plug connector DIN 41524, 3-pole, IP 65.
Connector DIN 43650-A, IP 65.

Operation / Switch status indication

N/C contact: When pressure is applied ($p_0 \rightarrow p_{max}$) the collector will disconnect the applied load as soon as the upper switching point is reached. As the pressure falls ($p_{max} \rightarrow p_0$) the collector will connect the load as soon as the lower switching point is reached.

N/O contact: When pressure is applied ($p_0 \rightarrow p_{max}$) the collector will connect the applied load as soon as the upper switching point is reached. With a fall in pressure ($p_{max} \rightarrow p_0$) the collector will disconnect the load as soon as the lower switching point is reached.

Switch status indication: LED in DIN connector (see accessories).

Example:

pfs 20 bar differential pressure
Upper switching point:
12 bar differential pressure
Lower switching point:
8 bar differential pressure

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Technical overview

The type 616 electronic differential pressure switches measure pressure by means of highly resistant ceramic elements. An open collector (transistor) output accommodates loads up to 100 mA. Either an N/C or N/O contact may be used, and the upper and lower switching point can be freely selected in the range 5 to 100 % fs. Various electrical and pressure connections are available to suit given applications.

Pressure types

See order code selection table.

Overload

See order code selection table.

System pressure

(P1 and P2 simultaneously)
25 bar to pressure range 6 bar
50 bar on pressure range 10/16 / 25 bar

Rupture pressure

1.5 x system pressure

Accuracy

Repeatability < +/- 0.5 % fs.
Accuracy of switching point adjustments < 1 % fs.

Materials of housing in contact with the medium

Ceramic/Inox 1.4305
Ceramic/PVDF
Sealing material: optionally FPM, EPDM, NBR, MVQ according to order code selection table.

The distinct advantages

- Ideal for frequent switching cycles
- Long service life and long-term stability due to lack of moving parts (unlike mechanical pressure switches)
- Very low susceptibility to temperature
- Modular system for easy implementation of individual applications

Temperature influences

Medium and ambient temperature -15 °C to +80 °C.
TC zero point see order code selection table
TC sensitivity (% fs/°C)
< +/- 0.015 at 2x nominal pressure
< +/- 0.022 at 3x nominal pressure
< +/- 0.037 at 5x nominal pressure

Load cycle

< 50 Hz

Mechanical rating

Resistant to vibration up to 15 g.

Dynamic response

Suitable for static and dynamic measurements.
Response time < 5 ms

Pressure connections

Pressure-tube tip, screw fitting for pipe or inside thread R 1/8"

Weight

aprox. 430 grams

Installation arrangement

Unrestricted. Venting required with liquid media.

Power supply

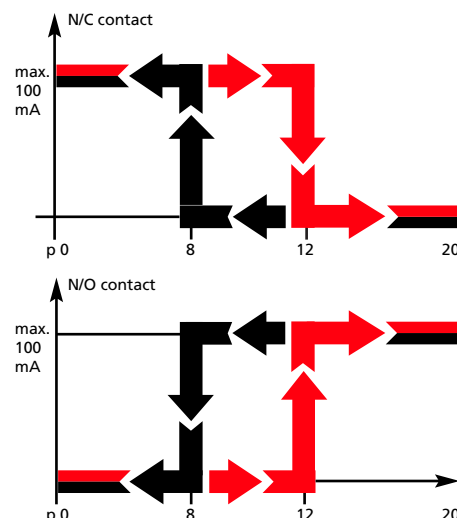
10 ... 33 VDC
24 VAC +/-15 %

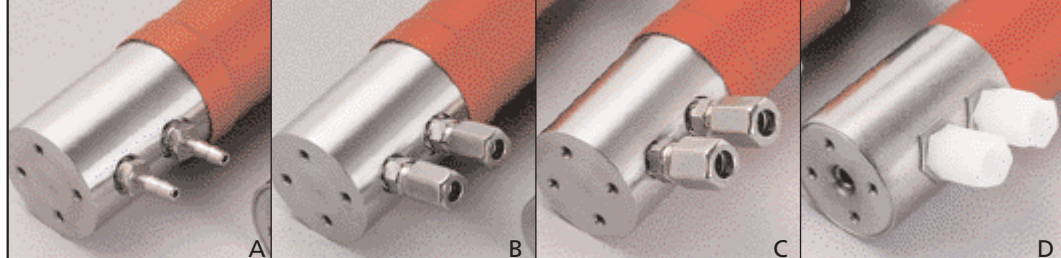
Output

Open collector switch output for max. 100 mA at maximum supply voltage.

Short circuit proof and protected against polarity reversal. Each connection against other with max. +/- supply voltage. NPN/PNP.

Electromagnetic compatibility: CE conformity to EC directive 89/336 EEC (EMC) by application of harmonized standards EN 50081-1, EN 50081-2 and EN 50082-2.





- A – Pressure tube for tube Ø 4 mm
- B – Screw fitting for pipe Ø 6 mm
- C – Screw fitting for pipe Ø 8 mm
- D – Screw fitting PVDF for pipe Ø 8 mm

Versions

Order code selection table

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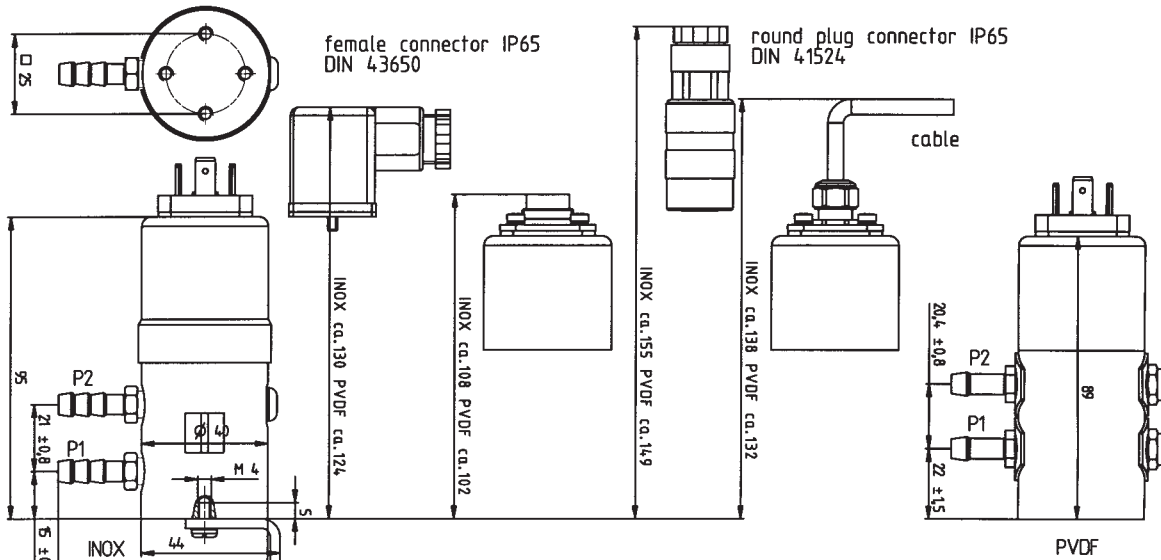
616

9 X X X X X X X X

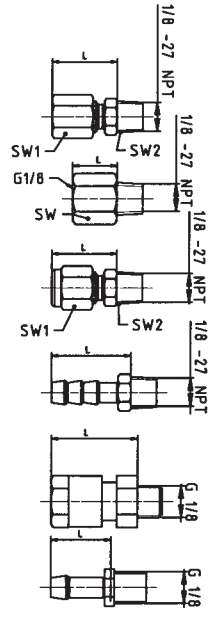
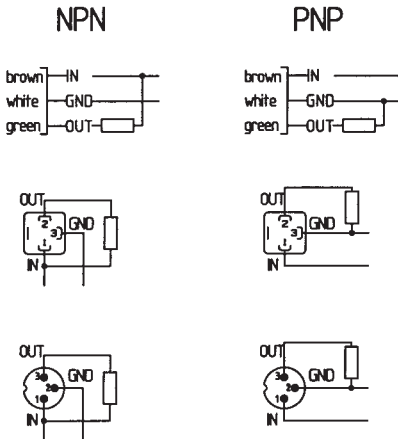
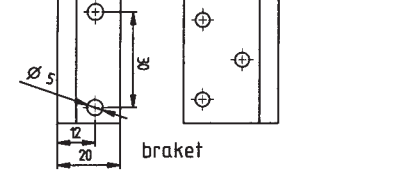
Pressure ranges ¹ (bar)		(bar)		(fs/°C)																	
0 ... +		P1	P2																		
0 ... + 0.1	Overload on one side max.	0.6	0.6	TCO < 0.12 %																	
0 ... + 0.2	Overload on one side max.	1.2	1.2	TCO < 0.12 %																	
0 ... + 0.2	Overload on one side max.	0.6	0.6	TCO < 0.06 %																	
0 ... + 0.25	Overload on one side max.	1.2	1.2	TCO < 0.1 %																	
0 ... + 0.25	Overload on one side max.	0.6	0.6	TCO < 0.05 %																	
0 ... + 0.3	Overload on one side max.	0.6	0.6	TCO < 0.04 %																	
0 ... + 0.4	Overload on one side max.	1.2	1.2	TCO < 0.06 %																	
0 ... + 0.4	Overload on one side max.	2	2	TCO < 0.1 %																	
0 ... + 0.5	Overload on one side max.	1.2	1.2	TCO < 0.05 %																	
0 ... + 0.5	Overload on one side max.	3	3	TCO < 0.12 %																	
0 ... + 0.6	Overload on one side max.	1.2	1.2	TCO < 0.04 %																	
0 ... + 0.6	Overload on one side max.	3	3	TCO < 0.1 %																	
0 ... + 1	Overload on one side max.	2	2	TCO < 0.04 %																	
0 ... + 1	Overload on one side max.	5	5	TCO < 0.1 %																	
0 ... + 1.6	Overload on one side max.	3.2	3.2	TCO < 0.04 %																	
0 ... + 1.6	Overload on one side max.	12	12	TCO < 0.15 %																	
0 ... + 2.5	Overload on one side max.	5	5	TCO < 0.04 %																	
0 ... + 2.5	Overload on one side max.	12	12	TCO < 0.1 %																	
0 ... + 4	Overload on one side max.	8	8	TCO < 0.04 %																	
0 ... + 4	Overload on one side max.	12	12	TCO < 0.06 %																	
0 ... + 6	Overload on one side max.	12	12	TCO < 0.04 %																	
0 ... + 10	Overload on one side max.	20	12	TCO < 0.04 %																	
0 ... + 16	Overload on one side max.	32	12	TCO < 0.04 %																	
0 ... + 25	Overload on one side max.	50	12	TCO < 0.04 %																	
Sealing materials		FPM	Fluoro-elastomer																		
		EPDM	Ethylene propylene																		
		NBR	Nitrile butadiene																		
		MVQ	Silicone polymer																		
Calibration		Factory-set																			
		Not factory-set (only IP 65)																			
Switch contact		Normally open	NPN non-floating																		
		Normally closed	NPN non-floating																		
		Normally open	PNP non-floating																		
		Normally closed	PNP non-floating																		
Electrical connections²		Cable, 1.5 meters, Pg 7	(protection class IP 65)																		
		Connector DIN 43650-A	(protection class IP 65)																		
		Round plug connector DIN 41524, 3-pole	(protection class IP 65)																		
Pressure connections		without connections (1/8 -27 NPT / PVDF G 1/8)																			
		(only adjustable version)																			
		Pressure-tube tip (CuZn nickel plated)	for tube Ø 4 mm																		
		Pressure-tube tip (CuZn nickel plated)	for tube Ø 6 mm																		
		Pressure-tube tip (PVDF)	for tube Ø 6 mm																		
		Screw fitting (CuZn nickel plated)	for pipe Ø 6 mm																		
		Screw fitting Inox 1.4305	for pipe Ø 6 mm																		
		Screw fitting (CuZn nickel plated)	for pipe Ø 8 mm																		
		Screw fitting Inox 1.4305	for pipe Ø 8 mm																		
		Screw tip (PVDF)	for pipe Ø 6 mm																		
		Screw tip (PVDF)	for pipe Ø 8 mm																		
		Outside thread 7/16-20 UNF (CuZnvn)																			
		Adapter G 1/8 inside	for pipe Ø 6 mm																		
		Adapter G 1/8 outside with union nut	for pipe Ø 6 mm																		
Case in contact with medium		Inox 1.4305 with pressure tip orifice																			
		PVDF (range and overload max. 10 bar)																			
		2 pressure tip orifice (only Inox)																			
Accessories		Female connector DIN 43650-A with seal (IP 65 when installed and screwed)																			
		Round plug connector (coupling socket) DIN 41524 (IP 65)																			
		Mounting bracket																			
		Test certificate																			

¹ Other pressure ranges on request.

² Without female connector.



P1 higher pressure, lower vacuum
P2 lower pressure, higher vacuum



measure X				
Inox	screw fitting for pipe on the outside Ø 6	SW1=10 SW2=12	L= ca. 20.5	L= ca. 61.5
	screw fitting for pipe on the outside Ø 8	SW1=12 SW2=14	L= ca. 22.5	L= ca. 63.5
Inox	adapter G1/8 inside thread	SW=14	L= ca. 14	L= ca. 55
CuZn	screw fitting for pipe on the outside Ø 6	SW1=10 SW2=12	L= ca. 20.5	L= ca. 61.5
	screw fitting for pipe on the outside Ø 8	SW1=12 SW2=14	L= ca. 22.5	L= ca. 63.5
CuZn Inox	pressure tube for tube Ø 4	SW=10	L= 20	L= ca. 61
	pressure tube for tube Ø 6	SW=10	L= 25	L= ca. 66
PVDF	pressure fitting for pipe on the outside Ø 6	SW=12	L= ca. 21.5	L= ca. 62.5
	pressure fitting for pipe on the outside Ø 8	SW=14	L= ca. 24.7	L= ca. 65.7
PVDF	pressure tube for tube Ø 6	SW=10	L= 20	L= ca. 63

Electromagnetic compatibility:

CE conformity to EC directive 89/336 EEC (EMC) by application of harmonized standards EN 50081-1, EN 50081-2 and EN 50082-2.

Type of interference/Interference susceptibility	Test standard	Effects
Electrostatic discharge ESD	IEC 1000-4-2 8 kV air discharge / 4 kV contact discharge	No failure (criterion B)
High-frequency electromagnetic radiation (HF)	ENV 50140 10 V/m / 80...1000 MHz	No effect (criterion A)
Conducted HF interference	ENV 50141 10 V/m / 0.15 ... 80 MHz	No effect (criterion A)
Fast transients (burst)	IEC 801-4 2 kV	No failure (criterion B)
Magnetic fields 50 Hz 30 A/m	EN 61000-4-8	No effect (criterion A)
Type of interference/Emitted interference	Test standard	Effects
Conducted interference	EN 55022 0.15...30 MHz	None
Radiation from housing	30...1000 MHz, 10 meters	None

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