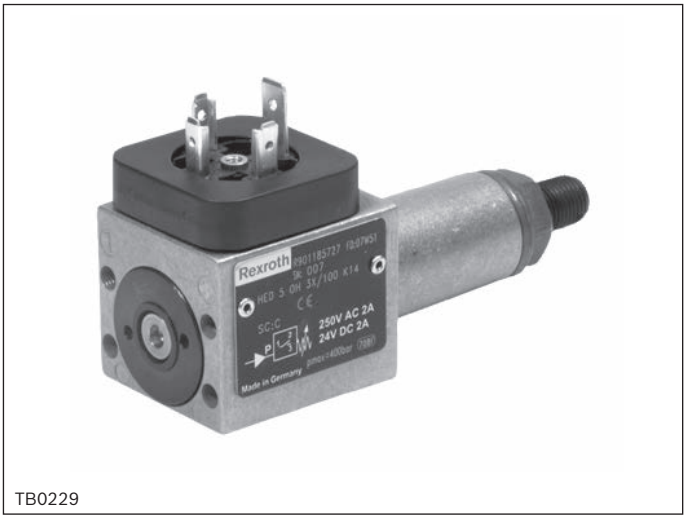
Hydro-electric pressure switch

Type HED 5

RE 50056
Edition: 2016-09
Replaces: 09.15



TB0229

- Component series 3X
- Maximum operating pressure 400 bar

Features

- 4 pressure ratings
- Electrical connection
  - with large cubic connector
- Micro switch with NC/NO contact function
- Potential-free switching of currents from 1 mA to 2 A
- UL approval
- CCC approval (except for MT version)

Contents

Ordering data

01	02		03		04	05	06	07
HED5	**OH**	**–**	**3X**	**/**		**K14**		*****

01	Piston type pressure switch	**HED5**
02	Flange connection	**OH**
03	Component series 30 ... 39 (30 ... 39: unchanged installation and connection dimensions)	**3X**
04	Max. pressure rating 50 bar	**50**
	Max. pressure rating 100 bar	**100**
	Max. pressure rating 200 bar	**200**
	Max. pressure rating 350 bar	**350**

Electrical connection

05	**Individual connection**	
	Without mating connector; connector DIN EN 175301-803	**K14** [1]

Seal material

07	NBR seals	**no code**
	FKM seals	**V**
	Low-temperature seal (max. 315 bar)	**MT**
	Observe compatibility of seals with hydraulic fluid used! (Other seals upon request)	
08	Further details in the plain text	

[1] Mating connectors, separate order, see accessories

Accessories

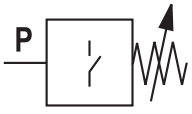
- Mating connectors for the electrical connection see Page 8.

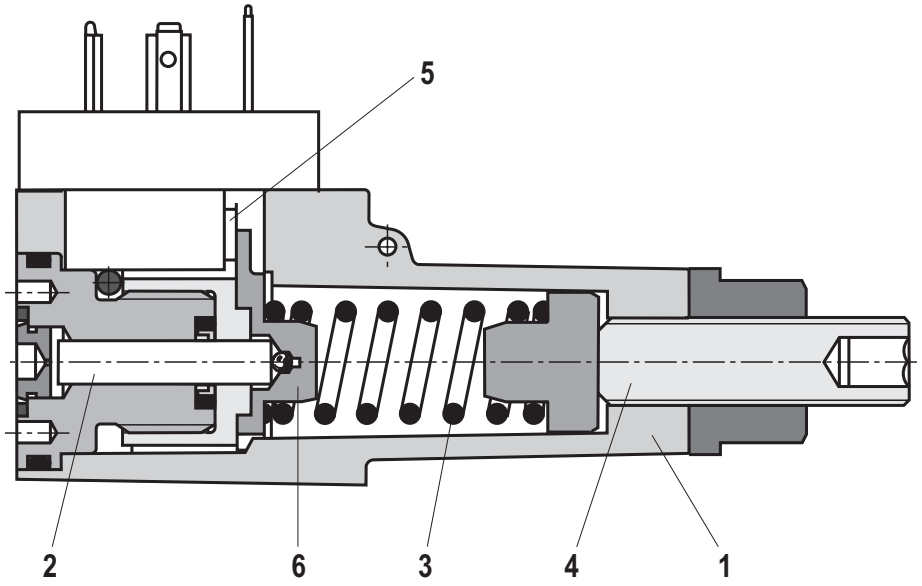
Function, section

Hydro-electric pressure switches of type HED 5 are piston type pressure switches.
They basically consist of housing (1), installation kit with piston (2), compression spring (3), adjustment element (4) and micro switch (5).
The pressure to be monitored acts on the piston (2). The latter is supported by the spring plate (6) and acts against the continuously adjustable force of the compression spring (3). The spring plate (6) transmits the movement of the piston (2) onto the micro switch (5). This switches the electric circuit on or off, depending on the circuit set-up.

☞ **Notes:**
In order to increase the life cycle, the pressure switch should be mounted with low vibrations and protected from hydraulic pressure surges.

Symbol





Technical data
(For applications outside these parameters, please consult us!)

General		
Mass	kg	0,2
Installation position		any
Ambient temperature range	°C	–30 to +50 (NBR seals) –20 to +50 (NBR seals) –40 to +50 (low-temperature seals)
Sine test according to DIN EN 60068-2-6:1996-05		10...2000 Hz, max. 10 g, 10 double cycles
Transport shock according to DIN EN 60068-2-27:1995 03		Half-sine 15 g / 11 ms, 3 x in positive direction, 3 x negative direction (a total of 6 single shocks per axis)
Noise test according to DIN EN 60068-2-64:1995-08		20...2000 Hz, 14 g_{RMS}, 24 h
Conformity ▶ CE		DIN EN 61058-1: 2002 / A2: 2008 DIN EN 60947-1: 2007 / A1: 2011 DIN EN 60947-5-1: 2004 / A1: 2009 DIN EN 60529: 1991 / A2: 2013
▶ UL		UL 508 17th edition File No E223220 (up to 350bar)
▶ CCC		GB 14048.5-2008

Hydraulic						
Pressure rating		bar	50	100	200	350
Max. operating pressure	▶ NBR/FKM seals	bar	350	350	350	400
	▶ MT version	bar	315	315	315	315
Pressure adjustment range (decreasing)		bar	5...50	10...100	15...200	25...350
Pressure differential per rotation [1]		bar	≈10	≈17	≈38	≈60
Hydraulic fluid [1]			see table below			
Hydraulic fluid temperature range (at the valve operating ports)		°C	–30 ... +80 (NBR seals) –20 ... +80 (FKM seals) –40 ... +80 (low-temperature seals)			
Viscosity range		mm^2/s	10 ... 800			
Maximum permissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)			Class 20/18/15 [2]			
Load cycles			≥ 4 million			

Hydraulic fluid		**Classification**	**Suitable sealing materials**	**Standards**	**Data sheet**
Bio-degradable		HL, HLP, HLPD, HVLP, HVLPD	NBR, FKM, low-temperature seals	DIN 51524	90220
Bio-degradable	▶ Insoluble in water	HETG	NBR, FKM	ISO 15380	90221
		HEES	FKM		
	▶ Soluble in water	HEPG	FKM	ISO 15380	
Schwerentflammbar	▶ Water-free	HFDU, HFDR	FKM	ISO 12922	90222
	▶ Containing water	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	NBR	ISO 12922	90223

☞ **Important information on hydraulic fluids:**

- For more information and data about the use of other hydraulic fluids, refer to data sheets above or contact us!
- There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- The flash point of the hydraulic fluid used must be 40 K higher than the maximum solenoid surface temperature.
- **Flame-resistant – contains water**:
  - Maximum pressure differential per control edge 50 bar
  - Pressure pre-loading at the tank port > 20% of the pressure differential, otherwise increased cavitation
  - Life cycle as compared to operation with mineral oil HL, HLP 50 to 100%
- **Bio-degradable and flame-resistant:** When using these hydraulic fluids that are simultaneously zinc-solving, zinc may accumulate (700 mg zinc per pole tube).

Technical data
(For applications outside these parameters, please consult us!)

Electrical				
Electrical connection			EN 175301-803, 3-pole + PE	
Maximum connection cross-section (mating connector)		mm^2	1,5	
Line entry (mating connector)			M16 x 1,5	
Protection class according to DIN EN 60529			IP 65 with mating connector fitted and screwed in place	
Maximum switching frequency		1/h	4800	
Switching accuracy (repetition accuracy)			< ± 1% of the set pressure	
Switches			according to VDE 0630-1/DIN EN 61058-1	
Transition resistance		mΩ	< 50	
Insulation coordination			Overvoltage category 3	
Contamination			Degree of contamination 3	
Bounce time	▶ ON	ms	< 5	
	▶ OFF	ms	< 5	
				Utility model according to IEC 60947
Minimum current		mA	1,0 with 24 V DC	DC-12
Maximum current		A	0,5 at 50 V DC, inductive	DC-22
			0,2 at 125 V DC, inductive	DC-22
			0,1 at 250 V DC, inductive	DC-22
			2,0 at 250 V AC	AC-12

Switching power			
Switching cycles	**Voltage *U* in V**	**Ohmic load max. in A**	**Inductive load, max. in A**
2 million	250, AC	2 A for 2 million circuits (AC-12)	0,5 A, cos. ϕ = 0,6 for 2 million circuits (DC-12)
2 million	24, DC	2 A for 2 million circuits (DC-12)	0,5 A for 2 million circuits [3]
5 million	24, DC	5,0 mA for 5 million circuits (DC-12)	–

[1] Direction of rotation:
– clockwise → set pressure increase
– anti-clockwise → set pressure decrease

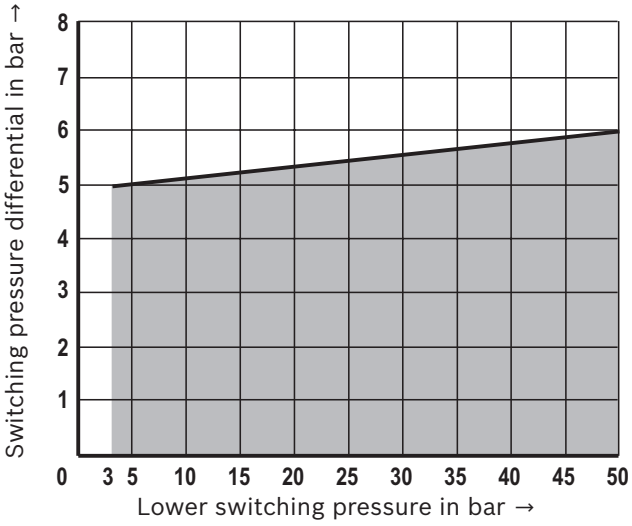
[2] The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the life cycle of the components.
For the selection of the filters see www.boschrexroth.com/filter.

[3] Value does not comply with any utility category according to IEC 60947

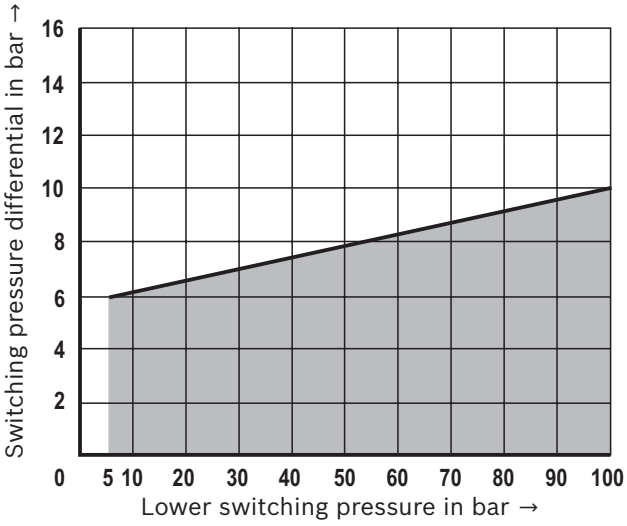
☞ **Notes:**
All variants can be unloaded to p_{min} = 0 bar.
(Observe the switching pressure differential!)

Characteristic curves: Switching pressure differential
(measured with HLP46, ϑ_{Oil} = 40 ± 5 °C)

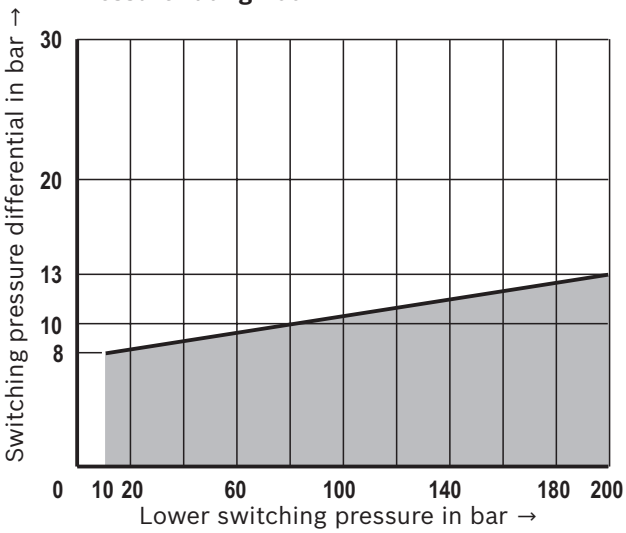
Pressure rating 50



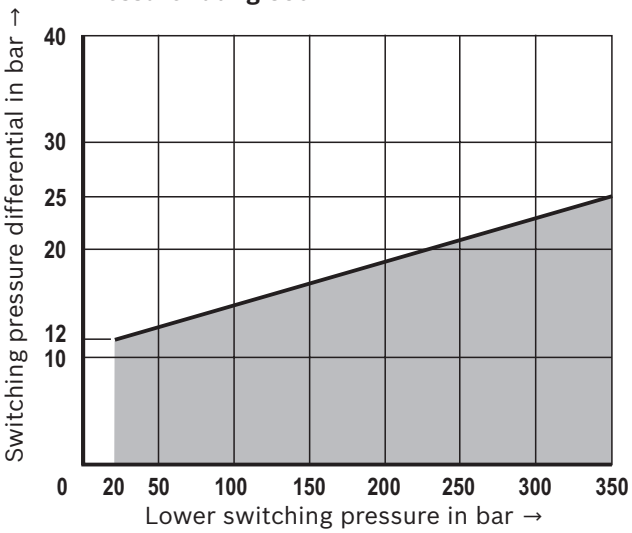
Pressure rating 100



Pressure rating 200

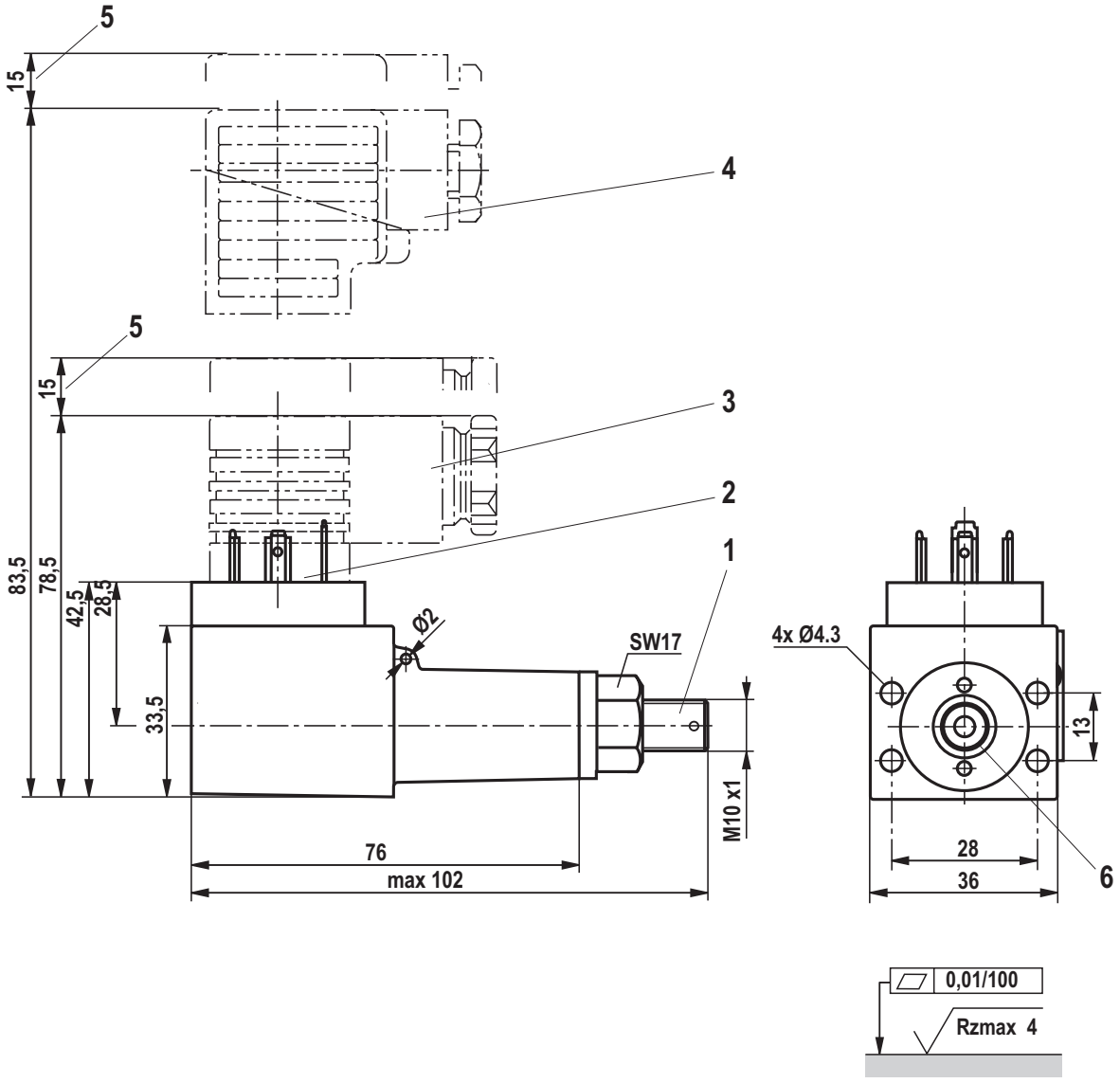


Pressure rating 350



☞ **Notes:**
The switching pressure differential may increase within the course of the life cycle due to the deterioration of the oil quality and the number of load cycles.

Dimensions: Type HED 5 ...**K14**
(dimensions in mm)

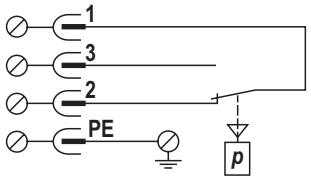
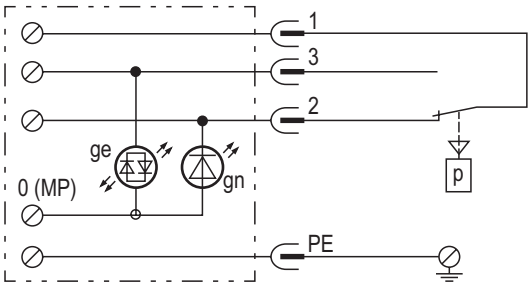


Required surface quality of the device contact surface

1 Adjustment element
2 Plug-in connection according to EN 175301-803 (connection „K14“)
3 Mating connector without circuitry (separate order, see page 8)
4 Mating connector with circuitry (separate order, see page 8)
5 Space required to remove the mating connector
6 Seal ring (connection bore of the counterpart: max. Ø6)

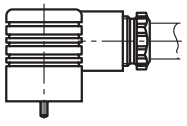
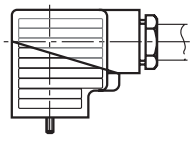
Valve mounting screws (separate order)
4 hexagon socket head cap screws
ISO 4762-M4X45-10.9-flZn-240h-L
(friction coefficient μ_{total} = 0.09 to 0.14)
Tightening torque $\boldsymbol{M}_A$ = 2 Nm ± 10 %
Material no. **R913000370**

Electrical connection according to DIN EN 175301-803

“K14” without indicator light	**“K14” with** indicator light
	Mating connectors 

Switching function
Terminals 1-2: Contact opens in case of pressure increase
Terminals 1-3: Contact closes in case of pressure increase

Mating connectors according to DIN EN 175301-803

For connection “K14”						
For details and more mating connectors see data sheet 08006						
	Material number					
	Without circuitry	With circuitry (indicator light) AC/DC, –20....+60 °C				
Color	240 V, –40...+125 °C	6 ... 14 V	16 ... 30 V	36 ... 60 V	90 ... 130 V	180 ... 240 V
black	**R901017012**	**R901017030**	**R901017048**	**R901017032**	**R901017035**	**R901017037**

Further information

☞ **Notes:**
For general notes on safety, assembly or commissioning, see operating instructions:

07600-B Hydraulic valves for industrial applications