

M.4

hex 27

0190 / 0191

Diaphragm / piston pressure switches up to 24 V with gold contacts

- Zinc-plated steel (CrVI-free), with spade terminal
- Snap action with gold contacts
- Overpressure safety up to 1,450 / 5,801 / 10,152 psi (100 / 400 / 700 bar)¹⁾
- Differential adjustable at factory



P _{max.} in psi (bar)	Adjustment range in psi (bar)	Tolerance in psi (bar) at room temperature	Male thread	Order number
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0190 Diaphragm pressure switches with spade terminal

1,450 psi ¹⁾ (100 bar) ¹⁾	4.35 - 21.75 psi (0.3 - 1.5 bar)	± 2.90 psi (± 0.2 bar)	M 10 x1 taper	0190 - 457 01 - X - 001
			M 12x1.5 cyl.	0190 - 457 02 - X - 002
			1/4" BSPP	0190 - 457 03 - X - 003
			1/4" NPT	0190 - 457 09 - X - 314
			1/8" NPT	0190 - 457 04 - X - 318
			7/16-20 UNF	0190 - 457 20 - X - 301
			9/16/18 UNF	0190 - 457 21 - X - 302

14.5 - 145 psi (1 - 10 bar)	± 7.25 psi (± 0.5 bar)	M 10 x1 taper	0190 - 458 01 - X - 040	
		M 12x1.5 cyl.	0190 - 458 01 - X - 041	
		1/4" BSPP	0190 - 458 03 - X - 042	
		1/4" NPT	0190 - 458 09 - X - 340	
		1/8" NPT	0190 - 458 04 - X - 343	
		7/16-20 UNF	0190 - 458 20 - X - 341	
			9/16/18 UNF	0190 - 458 21 - X - 342

5,801 psi ¹⁾ (400 bar) ¹⁾	145- 725 psi (10 - 50 bar)	± 43.5 psi (± 3.0 bar)	M 10 x1 taper	0190 - 459 01 - X - 007
			M 12x1.5 cyl.	0190 - 459 01 - X - 008
			1/4" BSPP	0190 - 459 03 - X - 009
			1/4" NPT	0190 - 459 09 - X - 316
			1/8" NPT	0190 - 459 04 - X - 320
			7/16-20 UNF	0190 - 459 20 - X - 305
			9/16/18 UNF	0190 - 459 21 - X - 306

145 - 1,450 psi (10 - 100 bar)	± 43.5 - 72.5 psi (± 3.0 - 5.0 bar)	M 10 x1 taper	0190 - 461 01 - X - 010	
		M 12x1.5 cyl.	0190 - 461 02 - X - 011	
		1/4" BSPP	0190 - 461 03 - X - 012	
		1/4" NPT	0190 - 461 09 - X - 317	
		1/8" NPT	0190 - 461 04 - X - 321	
		7/16-20 UNF	0190 - 461 20 - X - 307	
			9/16/18 UNF	0190 - 461 21 - X - 308

0191 Piston pressure switches with spade terminal

10,152 psi ¹⁾ (700 bar) ¹⁾	725 - 2,900 psi (50- 200 bar)	± 72.5 psi (± 5.0 bar)	M 10 x1 taper	0191 - 460 01 - X - 001
			M 12x1.5 cyl.	0191 - 460 02 - X - 002
			1/4" BSPP	0191 - 460 03 - X - 003
			1/4" NPT	0191 - 460 09 - X - 303
			7/16-20 UNF	0191 - 460 20 - X - 301
			9/16/18 UNF	0191 - 460 21 - X - 302

Seal material – Application areas

NBR (BunaN)	Hydraulic/machine oil, heating oil, air, nitrogen, etc.	1
EPDM	Brake fluid, hydrogen, oxygen, acetylene, etc.	2
FKM (Viton®)	Hydraulic fluids (HFA, HFB, HFD), petrol/gasoline, etc.	3
FFKM	Chemical acids, diluted alkalis, ketones, ester's, alcohols	6
HNBR	Hydraulic/machine oil, ester-based bio-oils	9

Refer to page 53 for the temperature range and application thresholds of sealing materials. ↓

Your order number:

019X - XXX XX - X - XXX

1) Static value. Dynamic value is 30-50 % lower. Values pertain to the hydraulic/pneumatic part of the pressure switch.
 2) Excluding the thread sizes G 1/8, R 1/8, NPT 1/8 and M 10x1 cylindrical/conical.
 3) HNBR diaphragm not available for pressure ranges between 0.3 - 1.5 bar.

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Technical details

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Temperature resistance of sealing materials	NBR - diaphragm pressure switches, $p_{max} = 4,352 / 5,800$ psi (300 / 400 bar)	-40 °F ... +212 °F (-40 °C ... +100 °C)
	NBR - diaphragm pressure switch, $p_{max} = 1,450$ psi (100 bar)	-22 °F ... +212 °F (-30 °C ... +100 °C)
	EPDM	-22 °F ... +248 °F (-30 °C ... +120 °C)
	EPDM-TW (in diaphragm pressure switch)	-4 °F ... +212 °F (-20 °C ... +100 °C)
	FKM (in diaphragm pressure switch)	+23 °F ... +248 °F (-5 °C ... +120 °C)
	FKM (in piston pressure switch)	+5 °F ... +248 °F (-15 °C ... +120 °C)
	FFKM	-4 °F ... +248 °F (-20 °C ... +120 °C)
	Silicone (in diaphragm pressure switch)	-40 °F ... +248 °F (-40 °C ... +120 °C)
	HNBR	-22 °F ... +248 °F (-30 °C ... +120 °C)
Burst pressure (diaphragm pressure switch, overpressure resistance 100 bar)	2,900 psi (200 bar)	
Burst pressure (diaphragm pressure switch, overpressure resistance 400 bar)	10,152 psi (700 bar) for threads M10, G 1/8, R 1/8, NPT 1/8 and type 0140 up to max. 600 bar)	
Burst pressure (Piston pressure switch)	14,500 psi (1,000 bar) for threads M10, G 1/8, R 1/8, NPT 1/8 and type 0140 up to max. 600 bar)	
Switching frequency	200/min	
Mechanical life expectancy	1,000,000 cycles (for diaphragm pressure switches, life expectancy value only applies for switching pressures to max. 50 bar)	
Pressure rise rate	≤ 14,500 psi/ms (≤ 1,000 bar/s)	
Hysteresis (only adjustable at factory)	Adjustable average value 10 ... 30 % depending on type Types 0140 and 0141 cannot be adjusted	
Vibration resistance	10 g; 5 ... 200 Hz sine wave; DIN EN 60068-2-6	
Shock resistance	294 m/s ² ; 14 ms half sine wave; DIN EN 60068-2-6, DIN EN 60068-2-29	
Protection class	IP65 with socket device, terminals IP00	
Weight	approx. 100 g	

Switching performance and materials overview

Type	0140	0141	0170	0171	0180	0181	0183	0186	0187	0190	0191	0196	0197
5 ... 24 V DC										•	•	•	•
10 ... 42 V AC/DC			•	•									
10 ... 250 V AC/DC	•	•			•	•	•	•	•				
3 ... 50 mA										•	•	•	•
10 mA ... 2 A	•	•											
10 mA ... 4 A			•	•	•	•	•	•	•				
Gold contacts										•	•	•	•
Silver contacts	•	•	•	•	•	•	•	•	•				
Adjustable hysteresis			•	•	•	•	•	•	•	•	•	•	•
Zinc-plated steel (CrVI-free)	•	•	•	•	•	•	•			•	•		
Stainless steel 1.4305								•	•			•	•



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Electrical values

0140 / 0141		
Rated working voltage U_N	Rated working current I_N	Usage category ¹⁾
250 VAC 50 / 60 Hz	2 A	AC12
24 VDC	2 / 1 A	DC12 / DC13
50 VDC	1 / 0.5 A	DC12 / DC13
75 VDC	0.5 / 0.25 A	DC12 / DC13
125 VDC	0.2 / 0.1 A	DC12 / DC13
250 VDC	0.15 / 0.1 A	DC12 / DC13
Rated insulation voltage U_i	300 V	
Rated impulse withstand voltage U_{imp}	4 kV	
Conventional thermal current I_{th}	5 A	
Switching overvoltage:	< 2.5 kV	
Rated frequency:	DC and 50 / 60 Hz	
Nominal current of short-circuit mechanism:	to 3.5 A	
Rated short-circuit current:	< 350 A	
IP class of protection according to DIN EN 60529:1991+A1:1999:	IP65 with connector	
Tightening torque of terminal screws:	< 0.35 Nm	
Connector cross-section:	0.5 - 1.5 mm ²	

0170 / 0171 / 0180 / 0181 / 0183 / 0186 / 0187 / 0190 / 0191 / 0196 / 0197		
Rated working voltage U_N	Rated working current I_N	Usage category ¹⁾
250 VAC 50 / 60 Hz	4 A	AC12
250 VAC 50 / 60 Hz	1 A	AC14
24 VDC	4 / 2 A	DC12 / DC13
50 VDC	2 / 1 A	DC12 / DC13
75 VDC	1 / 0.5 A	DC12 / DC13
125 VDC	0.3 / 0.2 A	DC12 / DC13
250 VDC	0.25 / 0.2 A	DC12 / DC13
Rated insulation voltage U_i	300 V	
Rated impulse withstand voltage U_{imp}	2.5 kV	
Conventional thermal current I_{th}	5 A	
Switching overvoltage:	< 2.5 kV	
Rated frequency:	DC and 50 / 60 Hz	
Nominal current of short-circuit mechanism:	to 5 A	
Rated short-circuit current:	< 350 A	
IP class of protection according to DIN EN 60529:1991+A1:1999:	IP65 with socket device, terminals IP00	

Socket devices and protective caps

- IP65 socket devices or IP54 rubber protective caps for increased protection
- Simple installation with plug-in socket devices

<p>Rubber protective cap</p> <p>With central cable feed-through for 1.5 - 5 mm cable diameter</p> <p>With rubber protective cap fitted: IP54</p> <p>Suitable for voltages up to 42 V</p>	<p>Rubber protective cap</p> <p>With two cable feed-throughs for 1.7 - 2,2 mm cable diameter</p> <p>With rubber protective cap fitted: IP54</p> <p>Suitable for voltages up to 42 V</p>	<p>Rubber protective cap</p> <p>With two cable feed-throughs for 1.7 - 2,3 mm cable diameter</p> <p>With rubber protective cap fitted: IP54</p> <p>Suitable for voltages up to 42 V</p>	<p>Socket device</p> <p>cCSAus approval Housing: Polyamide PG9 screw fitting (tightening range 6 - 9 mm)</p> <p>With socket device fitted: IP65</p> <p>Suitable for voltages up to 250 V</p>
<p>suitable for series 0151 / 0163 / 0164 / 0166 0167 / 0168 / 0169</p>	<p>suitable for series 0151 / 0163 / 0164 / 0166 0167 / 0168 / 0169</p>	<p>suitable for series 0170 / 0171 / 0180* / 0181* / 0183* / 0186* / 0187* 0190 / 0191 / 0196 / 0197 (*up to 42 V)</p>	<p>suitable for series 0170 / 0171 / 0180 / 0181 0183 / 0186 / 0187 0190 / 0191 / 0196 / 0197</p>
<p>Article number: 1-1-66-621-010</p>	<p>Article number: 1-1-66-621-003</p>	<p>Article number: 1-1-70-621-007</p>	<p>Article number: 1-1-80-652-002</p>

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Changeover with silver or gold contacts



- Switching point can be adjusted when fitted on site¹⁾
- Factory adjustable hysteresis (except types 0140 and 0141)
- High overpressure safety and long service life under harsh conditions
- Operating voltage up to 250 V
- Series 0140 / 0141 with protective insulation
- For ready-wired customized versions refer to chapter M.5, starting at page 62
- For pressure switches with integrated connectors refer to chapter M.2, starting at page 32

¹⁾ Pressure switches can also be supplied preset at factory.
Our preset switches are sealed with lacquer paint, set points are embossed on the housing.