

# 0166

## Diaphragm pressure switches up to 42 V with spade terminal

- Made of zinc-plated steel (CrVI-free)
- Spade terminal
- Overpressure safety up to 4,350 psi (300 bar), Burst pressure safety up to 5,800 psi (400 bar) <sup>1)</sup>

Adjustment range <small>tolerance at room temperature</small>	Male thread	Order number NO → :	Order number NC → :
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### 0166 Diaphragm pressure switches with spade terminal

1.45 - 14.5 ± 2.90 psi (0.1 - 1 ± 0.2 bar)	M 10x1 taper	0166 - 403 01 - X - 009	0166 - 404 01 - X - 013
	M 12x1.5 cyl.	0166 - 403 02 - X - 010	0166 - 404 02 - X - 014
	1/4" BSPP	0166 - 403 03 - X - 011	0166 - 404 03 - X - 015
	1/8" BSPP	0166 - 403 28 - X - 603	0166 - 404 28 - X - 604
	1/4" NPT	0166 - 403 09 - X - 345	0166 - 404 09 - X - 346
	1/8" NPT	0166 - 403 04 - X - 012	0166 - 404 04 - X - 016
	7/16-20 UNF	0166 - 403 20 - X - 305	0166 - 404 20 - X - 307
	9/16-18 UNF	0166 - 403 21 - X - 306	0166 - 404 21 - X - 308
7.25 - 43.5 ± 4.35 psi (0.5 - 3 ± 0.3 bar)	M 10x1 taper	0166 - 423 01 - X - 070	0166 - 424 01 - X - 070
	M 12x1.5 cyl.	0166 - 423 02 - X - 070	0166 - 424 02 - X - 070
	1/4" BSPP	0166 - 423 03 - X - 070	0166 - 424 03 - X - 070
	1/8" BSPP	0166 - 423 28 - X - 070	0166 - 424 28 - X - 070
	1/4" NPT	0166 - 423 09 - X - 070	0166 - 424 09 - X - 070
	1/8" NPT	0166 - 423 04 - X - 070	0166 - 424 04 - X - 070
	7/16-20 UNF	0166 - 423 20 - X - 070	0166 - 424 20 - X - 070
	9/16-18 UNF	0166 - 423 21 - X - 070	0166 - 424 21 - X - 070
14.5 - 145 ± 7.25 psi (1 - 10 ± 0.5 bar)	M 10x1 taper	0166 - 407 01 - X - 025	0166 - 408 01 - X - 029
	M 12x1.5 cyl.	0166 - 407 02 - X - 026	0166 - 408 02 - X - 030
	1/4" BSPP	0166 - 407 03 - X - 027	0166 - 408 03 - X - 031
	1/8" BSPP	0166 - 407 28 - X - 607	0166 - 408 28 - X - 608
	1/4" NPT	0166 - 407 09 - X - 349	0166 - 408 09 - X - 350
	1/8" NPT	0166 - 407 04 - X - 028	0166 - 408 04 - X - 032
	7/16-20 UNF	0166 - 407 20 - X - 313	0166 - 408 20 - X - 315
	9/16-18 UNF	0166 - 407 21 - X - 314	0166 - 408 21 - X - 316
145 - 290 ± 14.50 psi (10 - 20 ± 1.0 bar)	M 10x1 taper	0166 - 411 01 - X - 041	0166 - 412 01 - X - 045
	M 12x1.5 cyl.	0166 - 411 02 - X - 042	0166 - 412 02 - X - 046
	1/4" BSPP	0166 - 411 03 - X - 043	0166 - 412 03 - X - 047
	1/4" NPT	0166 - 411 09 - X - 353	0166 - 412 09 - X - 354
	1/8" NPT	0166 - 411 04 - X - 044	0166 - 412 04 - X - 048
	7/16-20 UNF	0166 - 411 20 - X - 321	0166 - 412 20 - X - 323
	9/16-18 UNF	0166 - 411 21 - X - 322	0166 - 412 21 - X - 324
	290 - 725 ± 29.0 psi (20 - 50 ± 2.0 bar)	M 10x1 taper	0166 - 415 01 - X - 057
M 12x1.5 cyl.		0166 - 415 02 - X - 058	0166 - 416 02 - X - 062
1/4" BSPP		0166 - 415 03 - X - 059	0166 - 416 03 - X - 063
1/8" BSPP		0166 - 415 28 - X - 615	0166 - 416 28 - X - 616
1/4" NPT		0166 - 415 09 - X - 357	0166 - 416 09 - X - 358
1/8" NPT		0166 - 415 04 - X - 060	0166 - 416 04 - X - 064
7/16-20 UNF		0166 - 415 20 - X - 329	0166 - 416 20 - X - 331
9/16-18 UNF		0166 - 415 21 - X - 330	0166 - 416 21 - X - 332

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	Hot water, chemical acids, diluted alkalis, ketones, esters, alcohols	6
HNBR	Hydraulic/machine oil, ester-based bio-oils	9

Your order number:

0166 - XXX XX - X - XXX

# M.3

hex 24



<sup>1)</sup> Static value. Dynamic value is 30-50 % lower. Values pertain to the hydraulic/pneumatic part of the pressure switch.



## 0166

Diaphragm pressure switches up to 42 V with M3 screw terminal

- Made of zinc-plated steel (CrVI-free)
- M3 screw terminal
- Overpressure safety up to 4,350 psi (300 bar)<sup>1)</sup> Burst pressure safety up to 5,800 psi (400 bar)<sup>1)</sup>

Adjustment range tolerance at room temperature	Male thread	Order number NO →  :	Order number NC → :
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### 0166 Diaphragm pressure switches with M3 screw terminal

1.45 - 14.5 ± 2.90 psi (0.1 - 1 ± 0.2 bar)	M 10x1 taper	0166 - 401 01 - X - 001	0166 - 402 01 - X - 005
	M 12x1.5 cyl.	0166 - 401 02 - X - 002	0166 - 402 02 - X - 006
	1/4" BSPP	0166 - 401 03 - X - 003	0166 - 402 03 - X - 007
	1/8" BSPP	0166 - 401 28 - X - 601	0166 - 402 28 - X - 602
	1/4" NPT	0166 - 401 09 - X - 343	0166 - 402 09 - X - 344
	1/8" NPT	0166 - 401 04 - X - 004	0166 - 402 04 - X - 008
	7/16-20 UNF	0166 - 401 20 - X - 301	0166 - 402 20 - X - 303
	9/16-18 UNF	0166 - 401 21 - X - 302	0166 - 402 21 - X - 304
7.25 - 43.5 ± 4.35 psi (0.5 - 3 ± 0.3 bar)	M 10x1 taper	0166 - 421 01 - X - 070	0166 - 422 01 - X - 070
	M 12x1.5 cyl.	0166 - 421 02 - X - 070	0166 - 422 02 - X - 070
	1/4" BSPP	0166 - 421 03 - X - 070	0166 - 422 03 - X - 070
	1/8" BSPP	0166 - 421 28 - X - 070	0166 - 422 28 - X - 070
	1/4" NPT	0166 - 421 09 - X - 070	0166 - 422 09 - X - 070
	1/8" NPT	0166 - 421 04 - X - 070	0166 - 422 04 - X - 070
	7/16-20 UNF	0166 - 421 20 - X - 070	0166 - 422 20 - X - 070
	9/16-18 UNF	0166 - 421 21 - X - 070	0166 - 422 21 - X - 070
14.5 - 145 ± 7.25 psi (1 - 10 ± 0.5 bar)	M 10x1 taper	0166 - 405 01 - X - 017	0166 - 406 01 - X - 021
	M 12x1.5 cyl.	0166 - 405 02 - X - 018	0166 - 406 02 - X - 022
	1/4" BSPP	0166 - 405 03 - X - 019	0166 - 406 03 - X - 023
	1/8" BSPP	0166 - 405 28 - X - 605	0166 - 406 28 - X - 606
	1/4" NPT	0166 - 405 09 - X - 347	0166 - 406 09 - X - 348
	1/8" NPT	0166 - 405 04 - X - 020	0166 - 406 04 - X - 024
	7/16-20 UNF	0166 - 405 20 - X - 309	0166 - 406 20 - X - 311
	9/16-18 UNF	0166 - 405 21 - X - 310	0166 - 406 21 - X - 312
145 - 290 ± 14.50 psi (10 - 20 ± 1.0 bar)	M 10x1 taper	0166 - 409 01 - X - 033	0166 - 410 01 - X - 037
	M 12x1.5 cyl.	0166 - 409 02 - X - 034	0166 - 410 02 - X - 038
	1/4" BSPP	0166 - 409 03 - X - 035	0166 - 410 03 - X - 039
	1/8" BSPP	0166 - 409 28 - X - 609	0166 - 410 28 - X - 610
	1/4" NPT	0166 - 409 09 - X - 351	0166 - 410 09 - X - 352
	1/8" NPT	0166 - 409 04 - X - 036	0166 - 410 04 - X - 040
	7/16-20 UNF	0166 - 409 20 - X - 317	0166 - 410 20 - X - 319
	9/16-18 UNF	0166 - 409 21 - X - 318	0166 - 410 21 - X - 320
290 - 725 ± 29.0 psi (20 - 50 ± 2.0 bar)	M 10x1 taper	0166 - 413 01 - X - 049	0166 - 414 01 - X - 053
	M 12x1.5 cyl.	0166 - 413 02 - X - 050	0166 - 414 02 - X - 054
	1/4" BSPP	0166 - 413 03 - X - 051	0166 - 414 03 - X - 055
	1/8" BSPP	0166 - 413 28 - X - 613	0166 - 414 28 - X - 614
	1/4" NPT	0166 - 413 09 - X - 355	0166 - 414 09 - X - 356
	1/8" NPT	0166 - 413 04 - X - 052	0166 - 414 04 - X - 056
	7/16-20 UNF	0166 - 413 20 - X - 325	0166 - 414 20 - X - 327
	9/16-18 UNF	0166 - 413 21 - X - 326	0166 - 414 21 - X - 328

#### 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	Hot water, chemical acids, diluted alkalis, ketones, esters, alcohols	6
HNBR	Hydraulic/machine oil, ester-based bio-oils	9

Refer to page 41 for the temperature range and application thresholds of sealing materials.

Article number:

0166 - XXX XX - X - XXX

<sup>1)</sup> Static value. Dynamic value is 30-50 % lower. Values pertain to the hydraulic/pneumatic part of the pressure switch.

# Pressure switches hex 24

## Technical data

# M.3

## hex 24



Rated working voltage:	10 ... 42 VAC/DC	
Rated current range (resistive load, DC12 / AC12):	10 mA ... 4 A	
Switching power DC12 / AC12:	100 W / 100 VA	
Temperature resistance of sealing materials:	NBR (BunaN)	-40 °F ... +212 °F (-40 °C ... +100 °C)
	NBR (in piston pressure switch)	-22 °F ... +212 °F (-30 °C ... +100 °C)
	EPDM	-22 °F ... +248 °F (-30 °C ... +120 °C)
	EPDM-W270, diaphragm	-4 °F ... +212 °F (-20 °C ... +100 °C)
	FKM (Viton®) (in diaphragm pressure switch)	+23 °F ... +248 °F (-5 °C ... +120 °C)
	FKM (Viton®) (in piston pressure switch)	+5 °F ... +248 °F (-15 °C ... +120 °C)
	FFKM	-4 °F ... +248 °F (-20 °C ... +120 °C)
	Silicone, diaphragm	-40 °F ... +248 °F (-40 °C ... +120 °C)
	HNBR	-22 °F ... +248 °F (-30 °C ... +120 °C)
Burst pressure (diaphragm pressure switch):	5,800 psi (400 bar)	
Burst pressure (piston pressure switch):	10,150 psi (700 bar) (for threads M10, G 1/8, R 1/8 and NPT 1/8 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. 725 psi / 50 bar)	
Pressure rise rate:	≤ 14.5 psi/ms (1 bar/ms)	
Differential:	Average value 5 – 30 % depending on type, not adjustable	
Vibration resistance	10 g; 5 – 200 Hz sine wave; DIN EN 60068-2-6	
Shock resistance:	294 m/s <sup>2</sup> ; 14 ms half sine wave; DIN EN 60068-2-27	
Protection class:	IP65 with socket device, terminals IP00	
Weight:	approx. 3.17 oz (90 g)	

Type:		0163	0164	0166	0167	0168	0169
Material:	Zinc-plated steel (CrVI-free)	●		●		●	●
	Stainless steel		●				
	Brass				●		
Overpressure safety up to:	35 bar				●		
	300 bar			●		●	
	600 bar	●	●				●



## Pressure switches hex 24

NC or NO, maximum voltage 42 V



- Most cost-effective solution for mechanical pressure monitoring
- Stable switching point even after long use and high load
- Switching point can be adjusted when fitted on site<sup>1)</sup>
- High pressure resistance, compact, small switches, available as normally closed (NC) or normally open (NO)
- For solutions with integrated connectors, please refer to chapter M.1, starting at page 22
- For customized and ready-wired pressure switches, please refer to chapter M.5

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