

New Snap Disk

Fixed setting pressure switches



- The new range of Eliwell electromechanical pressure switches with fixed setting are compact, lightweight and easy to install.
- Safe and reliable product, thanks to the soldering process for the stainless steel diaphragm which guarantees a perfect seal.
- Any pressure value between 1 and 55 bar can be set (up to 180 for CO₂).

APPLICATIONS

They are products designed to protect refrigeration systems against critical conditions by setting high or low pressure limits. The stainless steel control element is designed so as to ensure a better life of the product with high performance.

Thanks to the modern construction technology used, Eliwell pressure switches offer the best solutions for applications in refrigeration systems, residential and commercial air conditioning, automotive, ice machines, etc. They can also be used to control the pressure in hydraulic or steam systems, in air compressors and in industrial equipment.

APPROVALS



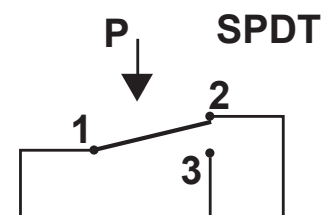
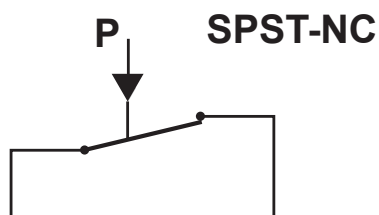
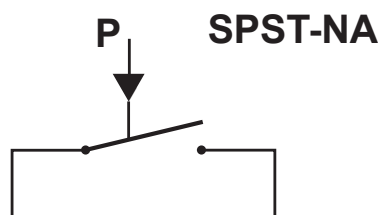
TECHNICAL SPECIFICATIONS

Compatible refrigerants		R22, R134a, R404A, R407A, R407C, R410A, R448A, R449A, R450A, R452A, R507A, R1234yf, R1234ze, R744, R290 (*) (#)
Ambient operating temperature		-30 ... 80°C (-22 ... 176°F)
Storage and transportation temperature		-60 ... 105°C (-76 ... 221°F)
Fluid temperature		-54 ... 135°C (-65.2 ... 275°F)
Contacts configuration		SPST-NO, SPST-NC, SPDT
Reset mode		Automatic, Manual
Pressure range	Automatic reset	-1 ... 55 bar (-14.5 ... 798 psi)
	Manual reset	10 ... 55 bar (145 ... 798 psi)
	CO ₂ applications	90 ... 180 bar (1305 ... 2611 psi)
Maximum system pressure	0 ... 1.5 bar (0 ... 22 psi)	28 bar (406 psi)
	1.5 ... 31 bar (22 ... 450 psi)	45 bar (653 psi)
	>31 bar (> 450 psi)	1,43 x Operating pressure
Maximum system temperature		120°C (248°F) [PED]
Standard electrical connection		Faston 6.35 mm / 0.25 in. Cable: 1.0 m (3.28 ft) UL1015 (0.82 mm ² / 18 AWG) Other types of electrical connection upon request (see "ORDERING METHOD" page 11)
Standard pressure fitting		7/16-20 UNF with depressor Other types of fitting upon request (see "ORDERING METHOD" page 11)
Contact resistance		< 50 mΩ
Dispersion current		< 0.75 mA
Resistance to flame		94V-0
Protection rating		IP67 (versions with cable)

(*) Models with automatic reset: Tested as a cut-off device in a closed room, in accordance with IEC/EN 60079-15:2010, clause 22.4, Group IIA for a resistive load of 6 A 250 Vac

(#) **NOTE:** For refrigerant gases which are not listed, please contact the Eliwell Sales Office.

CONTACTS CONFIGURATION



LOAD FEATURES					
Models	Reset	Load type	Voltage	Load	Piloting service [VA]
NSDHM	Manual Reset - SPST	Motor	120 / 240 Vac	6 FLA - 36 LRA	---
	Manual Reset - SPDT		120 Vac	6 FLA - 36 LRA	375
			240 Vac	3 FLA - 18 LRA	
NSDHA NSDHF NSDLA NSDCA	Automatic Reset - SPST	---	36 Vdc	3 A	---
		Motor	24 Vac	---	125
			120 Vac	6 FLA - 36 LRA	375
			240 Vac	6 FLA - 36 LRA	
		Resistive or inductive	250 Vac	6 A	---
NSDHA NSDLA	Automatic Reset - SPDT	---	36 Vdc	3 A	---
		Motor	24 Vac	---	125
			120 Vac	6 FLA - 36 LRA	375
			240 Vac	3 FLA - 18 LRA	
		Resistive or inductive	250 Vac	3 A	---

STANDARD CODES						
Codes (*)	Application	Reset	CUT-OUT [bar (psi)]	CUT-IN [bar (psi)]	Contact configuration	UL models family
NSDHA00B39101	High Pressure	automatic	18 (261)	13 (188)	SPST - NC	NSD03H
NSDHM00C39006		manual	18 (261)	13 (188)	SPST - NC	NSDM
NSDHA00B39107		automatic	24 (348)	18 (261)	SPST - NC	NSD03H
NSDHA00B39102		automatic	26 (377)	20 (290)	SPST - NC	NSD03H
NSDHA00B39103		automatic	28 (406)	21 (304)	SPST - NC	NSD03H
NSDHM00C39007		manual	28 (406)	21 (304)	SPST - NC	NSDM
NSDHA00B39104		automatic	42 (609)	33 (479)	SPST - NC	NSD03H
NSDHM00C39008		manual	42 (609)	33 (479)	SPST - NC	NSDM
NSDLA00A39112	Low Pressure	automatic	0.7 (10.15)	1.7 (24.66)	SPST - NO	NSD03L
NSDLA00A39100		automatic	1.7 (24.66)	2.7 (39.16)	SPST - NO	NSD03L
NSDLA00A39114		automatic	2.5 (36.25)	4.2 (60.91)	SPST - NO	NSD03L
NSDHF00A39103	Fan control	automatic	8.5 (123)	11 (159)	SPST - NO	NSD03H
NSDHF00A39104		automatic	13 (188)	16 (232)	SPST - NO	NSD03H
NSDCA11B32300	CO₂ high pressure	automatic	125 (1812)	90 (1305)	SPST - NC	/

(*) Standard codes with 1 m (3.28 ft) cable length, and ¼ SAE female connection with depressor.

STANDARD VALUES FOR PRESSURE, TOLERANCE AND DIFFERENTIAL (*)

Low pressure automatic reset

CUT-OUT		CUT-IN		Maximum differential [bar (psi)]	Minimum differential [bar (psi)]
Pressure range [bar (psi)]	Tolerance [bar (psi)]	Pressure range [bar (psi)]	Tolerance [bar (psi)]		
0.2 (2.90)	0.2 (2.90)	1 (14.5)	0.3 (4.35)	0.8 (11.60)	0.3 (4.35)
0.3 (4.35)	0.3 (4.35)	1 ... 1.5 (14.5 ... 21.75)	0.3 (4.35)	1.2 (17.40)	0.5 (7.25)
0.4 (5.80)	0.3 (4.35)	1 ... 1.5 (14.5 ... 21.75)	0.3 (4.35)	1.1 (15.95)	0.5 (7.25)
0.5 ... 1.5 (7.25 ... 21.75)	0.4 (5.80)	1.5 ... 3 (21.75 ... 43.51)	0.5 (7.25)	1.5 (21.75)	0.5 (7.25)
1.5 ... 3 (21.75 ... 43.51)	0.5 (7.25)	2 ... 5 (29 ... 72.52)	0.5 (7.25)	2 (29)	0.5 (7.25)
3 ... 6 (43.51 ... 87.02)	0.5 (7.25)	4 ... 8 (58.01 ... 116)	0.5 (7.25)	2 (29)	0.5 (7.25)
7 ... 8 (101 ... 116)	0.7 (10.15)	8 ... 12 (116 ... 174)	0.8 (11.60)	3 (43.51)	0.5 (7.25)
9 ... 10 (130 ... 145)	0.8 (11.60)	10 ... 14 (145 ... 203)	0.8 (11.60)	4 (58.01)	0.5 (7.25)

High pressure automatic reset

CUT-OUT		CUT-IN		Maximum differential [bar (psi)]	Minimum differential [bar (psi)]
Pressure range [bar (psi)]	Tolerance [bar (psi)]	Pressure range [bar (psi)]	Tolerance [bar (psi)]		
11 ... 13 (159 ... 188)	1 (14.5)	6 ... 8 (87.02 ... 116)	0.5 (7.25)	5 (72.52)	2 (29)
14 ... 16 (203 ... 232)	1 (14.5)	9 ... 11 (130 ... 159)	0.8 (11.60)	5 (72.52)	2 (29)
17 ... 25 (246 ... 362)	1 (14.5)	15 ... 20 (217 ... 290)	1 (14.5)	5 (72.52)	2 (29)
26 ... 30 (377 ... 435)	1 (14.5)	20 ... 24 (290 ... 348)	1 (14.5)	6 (87.02)	2 (29)
32 ... 35 (464 ... 507)	1 (14.5)	26 ... 30 (377 ... 435)	1 (14.5)	6 (87.02)	2 (29)
36 ... 39 (522 ... 565)	1.5 (21.75)	27 ... 29 (391 ... 420)	1 (14.5)	9 (130)	2 (29)
40 ... 55 (580 ... 797)	1.5 (21.75)	30 ... 50 (435 ... 725)	1.5 (21.75)	10 (145)	2 (29)

(*) For non-standard features, or features which are not listed, please contact the Eliwell Sales Office.

STANDARD VALUES FOR PRESSURE, TOLERANCE AND DIFFERENTIAL (*)
High pressure manual reset

CUT-OUT		CUT-IN		Maximum differential [bar (psi)]	Minimum differential [bar (psi)]
Pressure range [bar (psi)]	Tolerance [bar (psi)]	Pressure range [bar (psi)]	Tolerance [bar (psi)]		
15 ... 35 (217 ... 507)	1 (14.5)	10 ... 24 (145 ... 348)	2 (29)	10 (145)	6 (87.02)
36 ... 39 (522 ... 565)	1.5 (21.75)	30 ... 31 (435 ... 449)	2 (29)	10 (145)	7 (101)
40 ... 55 (580 ... 797)	1.5 (21.75)	30 ... 50 (435 ... 725)	2 (29)	15 (217)	10 (145)

CO₂ automatic reset

CUT-OUT		CUT-IN		Maximum differential [bar (psi)]	Minimum differential [bar (psi)]
Pressure range [bar (psi)]	Tolerance [bar (psi)]	Pressure range [bar (psi)]	Tolerance [bar (psi)]		
100 ... 120 (1450 ... 1740)	15 (217)	70 ... 90 (1015 ... 1305)	20 (290)	40 (580)	30 (435)
130 ... 150 (1885 ... 2175)	15 (217)	90 ... 100 (1305 ... 1450)	20 (290)	50 (725)	40 (580)
160 ... 180 (2320 ... 2610)	20 (290)	100 ... 120 (1450 ... 1740)	20 (290)	60 (870)	50 (725)

(*) For non-standard features, or features which are not listed, please contact the Eliwell Sales Office.

OPERATING PRINCIPLES



	SPST automatic reset NSDHA – NSDLA - NSDHF	SPST manual reset NSDHM
Operating principle	<p>The stainless steel diaphragm expands and contracts when subjected to the effects of pressure.</p> <p>Movement of the diaphragm triggers a piston which opens or closes the electrical contact.</p> <p>The switch is reset automatically when the pressure increases or decreases to reach the nominal value.</p>	<p>When the system pressure rises above the nominal value, the diaphragm expands, pushing the safety disc to the block position while cutting off electrical contact.</p> <p>When the pressure drops, the membrane contracts while the disc remains in its safety block position; this block is removed manually, using the reset button.</p> <p>The button also resets the electrical contact at the same time.</p>
Typical application	<p>Protection from high and low pressure in refrigeration and air conditioning systems, ice machines, etc.</p> <p>It can also be used to control the pressure in hydraulic or steam systems, air compressors and industrial equipment.</p>	<p>All air conditioning and refrigeration systems requiring protection from particularly high pressure values and where operator intervention is required in order to restore operating conditions.</p> <p>Can be installed directly on the piping or on the control panel.</p>

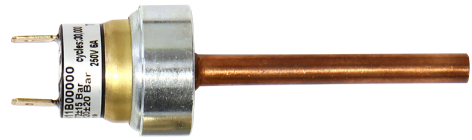
Test pressure at operating pressure		
<10 bar (<145 psi)	17 bar (246 psi)	/
10...27.5 bar (145...399 psi)	41 bar (595 psi)	41 bar (595 psi)
>27.5 bar (>399 psi)	55 bar (798 psi)	55 bar (798 psi)

Pressure range	-1 ... 55 bar (-14 ... 798 psi)	10 ... 55 bar (145 ... 798 psi)
Burst Pressure	345 bar (5004 psi)	345 bar (5004 psi)
Contact capacity	250 Vac 6 A (inductive); 36 Vdc 3 A; 24 Vac 125 VA; 120 Vac 375 VA; 240 Vac 375 VA (PILOT DUTY) - 50/60 Hz	250 Vac 3 A (inductive); 24 Vac 125 VA; 120 Vac 375 VA; 240 Vac 375 VA (PILOT DUTY) - 50/60 Hz SPDT: 24 Vac 125 VA; 120/240 Vac 375 VA
Lifetime cycles (*)	100,000	10,000
Approvals	CE0035 - PED CAT IV – VDE - UL	CE0035 - PED CAT IV - UL

Electrical contact	<p>A diagram showing two terminals, C and H, connected by a solid line. A dashed line indicates the contact is normally closed.</p>	<p>A diagram showing two terminals, C and H, with a gap between them. A dashed line indicates the contact is normally open.</p>	<p>A diagram showing two terminals, C and H, connected by a solid line. A dashed line indicates the contact is normally closed.</p>
	Normally closed	Normally open	Normally closed

(*) For information regarding models with a different number of cycles, contact the Eliwell Sales Office.

OPERATING PRINCIPLES



	SPDT NSDHA - NSDLA - NSDHM	SPST for CO₂ NSDCA
Operating principle	The stainless steel diaphragm expands and contracts when subjected to the effects of pressure. When the pressure rises, contact (H) opens while contact (L) closes. When the pressure drops, contact (L) opens while contact (H) closes.	The stainless steel diaphragm expands and contracts when subjected to the effects of pressure. Movement of the membrane triggers a piston which opens or closes the electrical contact. The switch is reset automatically when the pressure decreases to reach the nominal value.
Typical application	Mainly used in refrigeration and air conditioning systems.	Designed and created specifically for equipment which uses CO ₂ and equipment with pressure levels over 55 bar.

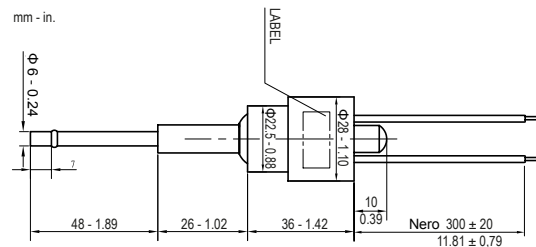
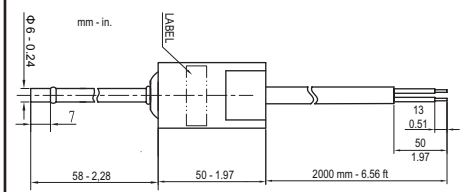
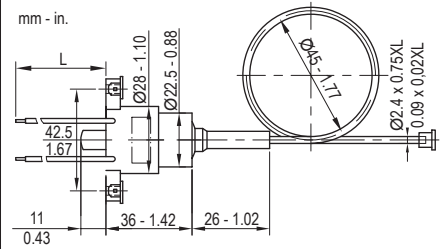
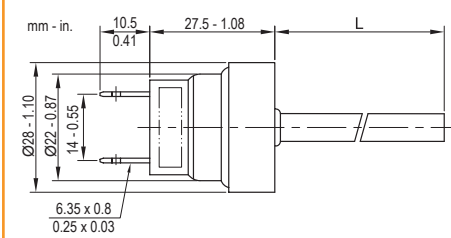
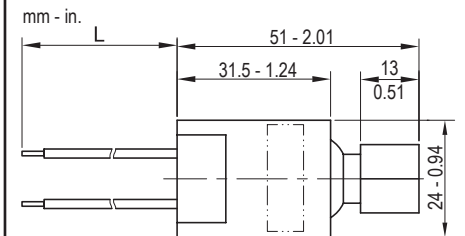
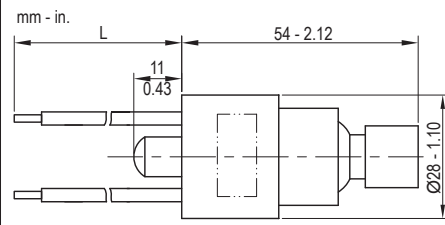
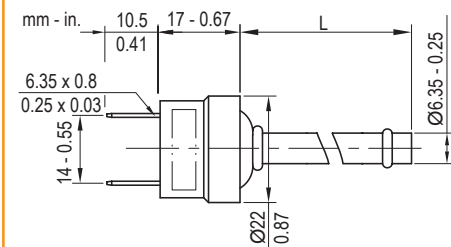
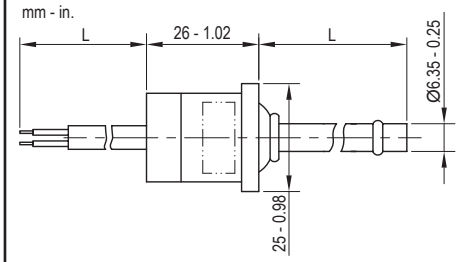
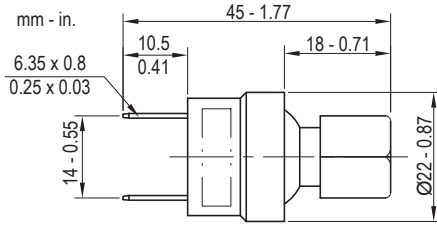
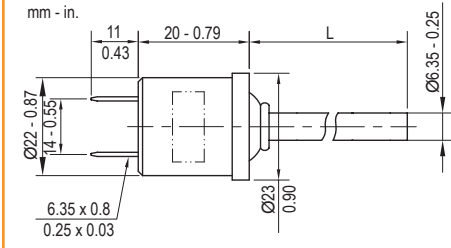
Test pressure at operating pressure		
<10 bar (<145 psi)	17 bar (246 psi)	180 bar (2611 psi)
10...27.5 bar (145...399 psi)	41 bar (595 psi)	/
>27.5 bar (>399 psi)	55 bar (798 psi)	/

Pressure range	-1 ... 55 bar (-14 ... 798 psi)	90 ... 180 bar (1305 ... 2611 psi)
Burst Pressure	345 bar (5004 psi)	720 bar (10443 psi)
Contact capacity	24 Vac 125 VA; 240 Vac 375 VA	24 Vac 125 VA; 240 Vac 375 VA
Lifetime cycles (*)	100,000 WITH AUTOMATIC RESET / 10,000 WITH MANUAL RESET	30,000
Approvals	CE0035 - PED CAT IV	CE0035 - PED CAT IV

Electrical contact	<p style="text-align: center;">SPDT</p>	<p style="text-align: center;">Normally closed</p>
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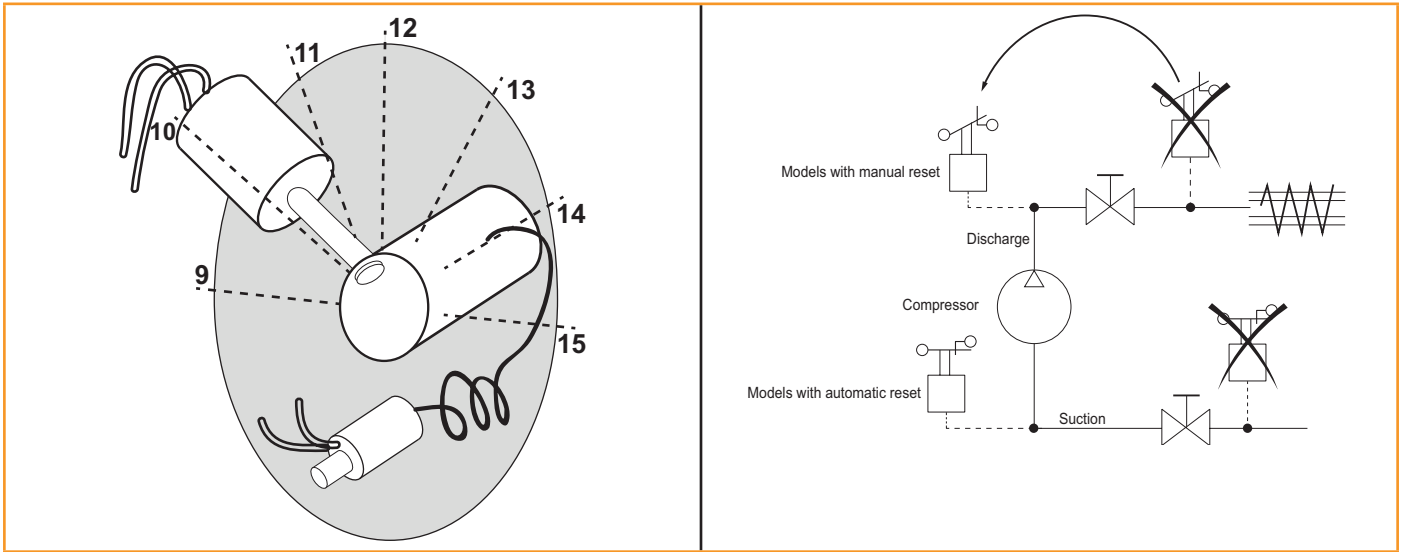
(*) For information regarding models with a different number of cycles, contact the Eliwell Sales Office.

TYPICAL DIMENSION DIAGRAMS



INSTALLATION INSTRUCTIONS

The pressure control device must always be positioned on the upper side of the refrigerant line. The control device pressure head must be tilted to an angle between the 10 o'clock and 2 o'clock positions, as indicated in the figure. This reduces the likelihood of oil being deposited inside the sensitive element, which could cause the controller to malfunction.



Avoid strong pulses on the high pressure side connections. Install the pressure controllers away from the compressor delivery point, so as to minimise the effects of the pulses produced by alternative compressors.

Fixing torque

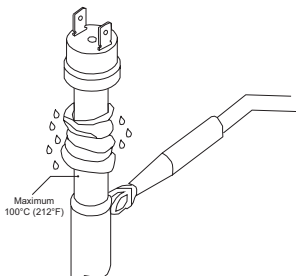
To avoid damaging the controls, the following instructions must be observed:

- The fixing torque permitted for brass fittings and for flare fittings is between 13.5 and 15 Nm (119.48 and 132.76 lb-in.).
- Do not tighten the flare nut on the pressure fittings too much: excessive tightening may damage the threads on the nuts or fittings, leading to refrigerant leakage.
- Use one or two keys (depending on the type of connector) to apply the tightening torque. Do not use the pressure switch body as a tightening application point.
- Make sure the soldering areas are free from oxidised material.
- Install the pressure controllers well away from the compressor delivery point.

Installation / soldering of control devices with copper pipes

To ensure soldering is carried out correctly, we recommend observing the following instructions:

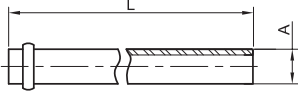
- Do not direct the soldering iron towards the plastic body of the control device.
- In models for soldering, protect the device pipe with a damp cloth and/or cooling gel.
- Soldering must take no longer than 15 seconds (with a damp cloth and/or cooling gel).
- Do not exceed 100°C (212°F) when soldering the areas adjacent to the pressure switch body.
- Do not reduce the length of the copper pipe to less than 35 mm (1.38 in.).
- The tip of the soldering iron must be kept well away from the surface of the part.
- Keep the soldering iron moving during manual soldering.
- Use a multi-tip soldering iron.
- Use a pressure reducer when testing and operating pressure switches with an operating pressure under 10 bar (145 psi); avoid sudden pressure peaks over 86.2 bar (250 psi).
- Use a pressure reducer when testing and operating pressure switches with an operating pressure between 10 and 55.1 bar (145 and 800 psi); avoid sudden pressure peaks over 55.1 bar (800 psi).



NOTE: When soldering copper alloys there is no need to use flux. Overheating will cause the internal switch to become faulty.

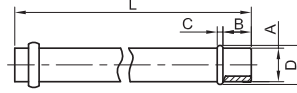
PRESSURE FITTINGS

Pipe



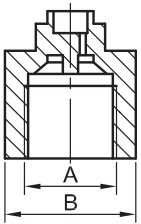
Ref. (*)	Dimensions	Applicable pressure value
A	∅ 6 mm (0.24 in.) ∅ 6.35 mm (0.25 in.)	0...180 bar (0...2611 psi)
L	30...150 mm (1.18...5.90 in.)	

Pipe



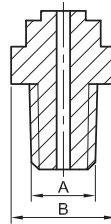
Ref. (*)	Dimensions	Applicable pressure value
A	∅ 6 mm (0.24 in.) ∅ 6.35 mm (0.25 in.)	0...55 bar (0...798 psi)
L	30...150 mm (1.18...5.90 in.)	
B	3...12 mm (0.12...0.47 in.)	
C	2...4 mm (0.8...0.16 in.)	
D	∅ 6.35...9 mm (0.25...0.35 in.)	

Threaded female



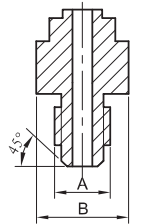
Ref. (*)	Dimensions	Applicable pressure value
A	NPT1/4	0...55 bar (0...798 psi)
	7/16-20-UNF	
	1/2-20-UNF	
B	S14	
	S17	

Threaded male



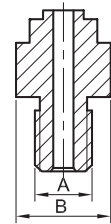
Ref. (*)	Dimensions	Applicable pressure value
A	NPT1/4	0...55 bar (0...798 psi)
	7/16-20-UNF	
	1/2-20-UNF	
B	S14	
	S17	

Threaded male



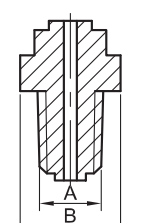
Ref. (*)	Dimensions	Applicable pressure value
A	7/16-20-UNF	0...55 bar (0...798 psi)
B	S14	

Threaded male



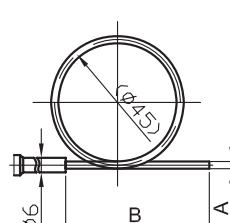
Ref. (*)	Dimensions	Applicable pressure value
A	3/8-24-UNF	0...55 bar (0...798 psi)
	M10x1	
	7/16-20-UNF	
	M12x1.5	
	M12x1.25	
B	S14	
	S16	
	S17	

Threaded male



Ref. (*)	Dimensions	Applicable pressure value
A	NPT1/8	0...55 bar (0...798 psi)
B	S14	

Capillary



Ref. (*)	Dimensions	Applicable pressure value
A	∅ 2.4 x 0.75 mm (0.09 x 0.03 in.)	0...55 bar (0...798 psi)
	∅ 3 x 0.75 mm (0.12 x 0.03 in.)	
B	350...1500 mm (13.77... 59.05 in.)	

(*) Ref. = Reference.

ORDERING METHOD

		NSD	HA	00	B	39	001
NSD series	NSD						
Product type	HA High pressure Automatic reset HM High pressure Manual reset HF High pressure Automatic reset - Fans LA Low pressure Automatic reset CA CO ₂ Automatic reset						
Pressure fitting	00 1/4" SAE female with depressor 01 1/8" threading male 02 1/4" threading male 03 3/8" male O-ring fitting 04 1/4" for soldering (6.35x5.75) 05 1/4" SAE Male 06 1/4" for soldering (5x53) 07 3/32" capillary copper pipe (2.4x915) 08 1/4" for soldering (6.35x71) 10 6X58.4 copper pipe with holding ring H0 6X58.4 copper pipe with holding ring PPS SHELL 11 6X50.5 straight copper pipe H1 6X50.5 straight copper pipe PPS SHELL 12 6.35 copper pipe with holding ring H2 6.35 copper pipe with holding ring PPS SHELL 13 1/2" SAE female without faucet valve (stainless steel) M2 M12 x 1.5 (O-ring seat diameter 9.5 mm and height 3 mm) 14 6.35X59 straight copper pipe H4 6.35X59 straight copper pipe PPS SHELL XX On request						
Contact system	A NO - Silver-plated contacts B NC - Silver-plated contacts D SPDT - Silver-plated contacts C NC - for HM only (manual reset) E NO - Gold-plated contacts F NC - Gold-plated contacts G SPDT - Gold-plated contacts						
Electrical connections	00 1/4" FAST-ON connector 1/4" (6.3 mm) 01 3/16" FAST-ON connector 3/16" (4.8 mm) 39 39" (990 mm) 60 60" wires (1520 mm) 79 79" (2006 mm) 99 99" (2515 mm) 3A 119" wires (3022 mm) 3B 138" (3505 mm) 4A 158" (4013 mm) 5A 197" (5004 mm) PF 24 V AMP connector xxxxxxxx FEMALE SPST PM 24 V AMP connector 282101-1 MALE SPST RF 24 V AMP connector 282087-1 FEMALE SPDT RM 24 V AMP connector 282105-1 MALE SPDT DF 24 V AMP connector 282080-1 FEMALE SPST UL2733 cable (with rubber gasket) DM 24 V AMP connector 282104-1 MALE SPST UL2733 cable (with rubber gasket) VF 230 V AMP connector 1745096-1 FEMALE SPST UL2733 cable (with rubber gasket) VM 230 V AMP connector 1745099-1 MALE SPST UL2733 cable (with rubber gasket) MF 39" cable (990 mm) + MINI-FIT JR 39-01-302 connector & MINI-FIT female socket 39-00-0038 (both MOLEX) LH S : SPST UL2733 cable; x : Different number depending on the length of the cable (automatic reset only) RF 100 mm & AMP connector 282087-1 FEMALE SPDT						
Incremental suffix	000 incremental suffix 10,000 cycles 100 incremental suffix 100,000 cycles 250 incremental suffix 250,000 cycles 300 incremental suffix 30,000 cycles 600 incremental suffix 150,000 cycles						

Life Is On



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