Life Is On

eliwell by Schneider Electric

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 0.2 and 55 bar can be set (up to 175 for CO_2).

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

CE 0035 cULus VDE

TECHNICAL SPECIFICATIONS

The product complies with the following harmonized Standards			EN 60730-1 / EN 60730-2-6 / EN 12263	
Construction of control			Incorporated control	
Purpose of control			Pressure operating control (VDE) Pressure protective control (UL)	
Type of action			Manual reset: 2.C (UL) - 1.B (VDE) Automatic reset: 2.B (UL) - 1.B (VDE)	
Contacts configuration			SPST-NO, SPST-NC, SPDT	
Degree of protection by enclosure			IP67 (versions with cable)	
Pollution degree			3 (UL) 2 (VDE)	
Overvoltage category			II	
Rated impulse voltage			4'000 V (UL) 2'500 V (VDE)	
Refrigerants			see List of compatible refrigerants	
Ambient operating conditions			0…80 °C (32 ... 176 °F) (UL) 0…85 °C (32 ... 185 °F) (VDE)	
Transportation and storage conditions			-40 ... 60 °C (-40 ... 140 °F) (UL) -25 ... 60 °C (-13 ... 140 °F)	
Temperature system Ts (Fluid temperature)			-54 ... 135 °C (-65.2 ... 275 °F) -54 ... 150 °C (-65.2 ... 302 °F)	within the range: < 1.5 bar (22 psi) 1.5 ... 55 bar (22 ... 798 psi) 120...175 bar (1740...2538 psi)
Reset mode			Automatic or manual	
Momentary pressure surge (**Pmax**)			1.1 x **PS**	
Pressure range	-	Auto Reset	0.2 ... 55 bar (2.9 ... 798 psi)	
		Manual Reset	10 ... 55 bar (145 ... 798 psi)	
		CO_2 Applications	120 ... 175 bar (1740 ... 2538 psi)	
Maximum pressure system **PS**	CUT OUT Pressure	< 1.5 bar (< 22 psi)	28 bar (406 psi)	
		1.5 .... ≤ 43 bar (22 ... ≤ 623 psi)	50 bar (725 psi)	
		> 43 ... 55 bar (> 623 ... 798 psi)	1.1 x (CUT OUT + 2 bar)	
		120 … 175 bar (1740 ... 2538 psi)	1.1 x (CUT OUT + 2 bar)	
Burst pressure test	Working range	0.2 … 55 bar (2.9 ... 798 psi)	345 bar (5000 psi)	
		120 … 175 bar (1740 ... 2538 psi)	**Pmax** x 4	
Standard electrical connection [1]			Faston 6.35 mm / 0.25 in. Cable: 1.0 m (3.28 ft) UL1015 (0.82 mm² / 18 AWG) Other types of electrical connection upon request (see "**ORDERING METHOD**" page 13)	
Standard pressure fitting			7/16-20 UNF with depressor Other types of fitting upon request (see "**ORDERING METHOD**" page 13)	
Approvals			UL - VDE - PED category IV	
			CO2 models: PED category IV	
Vibration Resistance			8 g's at 50 to 2000 Hz	

[1] *refer to the technical drawing of the dedicated p/n.*

COMPATIBLE REFRIGERANTS					
Refrigerant	**Safety Group**	**Refrigerant**	**Safety Group**	**Refrigerant**	**Safety Group**
R1224yd(Z)	A1	R456A	A1	R446A	A2L
R1233zd	A1	R458A	A1	R447A	A2L
R1234zd	A1	R460A	A1	R447B	A2L
R1336mzz(E)	A1	R460B	A1	R451A	A2L
R1336mzz(Z)	A1	R460C	A1	R451B	A2L
R13I1	A1	R461A	A1	R452B	A2L
R134a	A1	R463A	A1	R454B	A2L
R404A	A1	R464A	A1	R454C	A2L
R407C	A1	R507	A1	R455A	A2L
R407F	A1	R513A	A1	R457A	A2L
R407G	A1	R513B	A1	R459A	A2L
R407H	A1	R515A	A1	R459B	A2L
R407I	A1	R515B	A1	R467A	A2L
R410A	A1	R1132a	A2	R468A	A2L
R417B	A1	R419B	A2	R516A	A2L
R417C	A1	R439A	A2	R290	A3
R422E	A1	R440A	A2	R436C	A3
R442A	A1	R462A	A2	R441A	A3
R448A	A1	R465A	A2	R443A	A3
R449A	A1	R512A	A2	R511A	A3
R449B	A1	R1234yf	A2L	R600a	A3
R449C	A1	R1234ze	A2L	R1150	A3
R450A	A1	R32	A2L	R170	A3
R452A	A1	R123	A2L	R514A	B1
R452C	A1	R444A	A2L	R1130(E)	B1
R453A	A1	R444B	A2L	R744	A1
R454A	A1	R445A	A2L		

Automatic reset models SPST with quick connector: tested as enclosed-break-device according to IEC/EN 60079-15:2010, Clause 22.4, Group IIA for a resistive load of 6 A.
Manual reset models / Automatic Reset models with lead wire: Tested as sealed device according to IEC 60079-0:2017, Clause 26.5 and IEC 60079-15:2017, Clause 9 and 12.

STANDARD CODES						
Codes (*)	**Application**	**Reset**	**CUT-OUT [bar (psi)]**	**CUT-IN [bar (psi)]**	**Contact configuration**	**UL Model**
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	**CO_2 high pressure**	automatic	125 (1812)	90 (1305)	SPST - NC	NSDCA

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

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)

CO_2 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.

TECHNICAL FEATURES

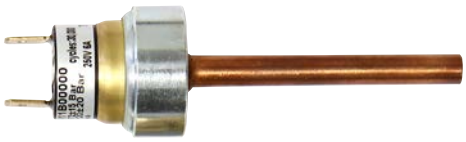
	SPST automatic reset	SPST manual reset
	Models NSD01H NSD03H NSD01L NSD03L	**Model NSDM**
Operating principle	The stainless steel diaphragm expands and contracts when subjected to the effects of pressure. Movement of the diaphragm triggers a piston which opens or closes the electrical contact. The switch is reset automatically when the pressure increases or decreases to reach the nominal value.	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. 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. The button also resets the electrical contact at the same time.
Typical application	Protection from high and low pressure in refrigeration and air conditioning systems, ice machines, etc. It can also be used to control the pressure in hydraulic or steam systems, air compressors and industrial equipment.	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. Can be installed directly on the piping or on the control panel.

Pressure range	0.2 ... 55 bar (2.9 ... 798 psi)		10 ... 55 bar (145 ... 798 psi)	
Burst Pressure	345 bar (5000 psi)		345 bar (5000 psi)	
Contact capacity	Pressure protective control 6A inductive 250 Vac 3A resistive 36 Vdc 125 VA 24 Vac pilot duty 375 VA 120/240 Vac pilot duty 6FLA 36LRA 120/250 Vac	Pressure operating control 6 A resistive 250 Vac	Pressure protective control 6FLA 36LRA 120/240 Vac Pressure operating control 3A inductive 250Vac 125VA 24 Vac pilot duty 375VA 120/240Vac pilot duty	Pressure operating control 6 A resistive 125/250 Vac
Lifetime cycles (*)	100’000	30’000	10’000	
Approvals	CE0035 - PED CAT IV – VDE - UL		CE0035 - PED CAT IV – VDE - UL	

Electrical contact	**SPST-NC** **PRESSURE RISING**	**SPST-NO** **PRESSURE RISING**	**SPST-NC** **PRESSURE RISING**

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

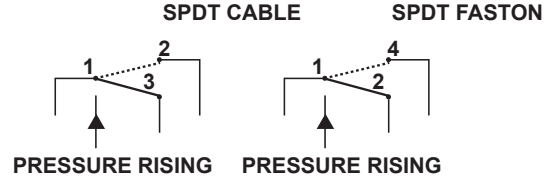
TECHNICAL FEATURES

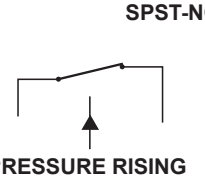


	SPDT automatic reset		SPDT manual reset	SPST for CO_2
	Models	**NSD01H2 NSD03H2 NSD01L2 NSD03L2**	**Model NSDM2**	**Models NSD01CA NSD03CA**
Operating principle	The stainless steel diaphragm expands and contracts when subjected to the effects of pressure. When the pressure rises, contact (H) opens while contact (L) closes. As the pressure increases, the contact 1-3 or (1-2) opens and simultaneously contact 1-2 or (1-4) closes. As the pressure decreases, contact 1-2 or (1-4) opens and simultaneously contact 1-3 or (1-2) closes.		When the system pressure rises above the nominal value, the diaphragm expands, pushing the safety disc to the block position. Contact 1-3 or (1-2) opens and at the same time contact 1-2 or (1-4) closes. When the pressure decreases the diaphragm contracts, while the When the pressure decreases, the diaphragm contracts and the disc remains in the safety lock position; it is unlocked manually by pressing the reset button. The button simultaneously resets the electrical contact; contact 1-2 or (1-4) opens and contact 1-3 or (1-2) 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.		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. Can be installed directly on the piping or on the control panel.	Designed and created specifically for equipment which uses CO_2 and equipment with pressure range over 120 bar.

Pressure range	0,2 ... 55 bar (2,9 ... 798 psi)		10 ... 55 bar (145 ... 798 psi)		120 ... 175 bar (1740 ... 2538 psi)	
Burst Pressure	345 bar (5000 psi)		345 bar (5000 psi)		Pmax X 4	
	UL	**VDE**	**UL**	**VDE**	**UL**	**VDE**
Contact capacity	Pressure protective control NC: 6A resistive 120/250 Vac NO: 3A resistive 120/250 Vac NC: 6FLA 36LRA 120/250 Vac NO: 3FLA 18LRA 120/250 Vac	Pressure operating control NC: 6 A resistive 125/250 Vac NO: 3 A resistive 125/250 Vac	Pressure protective control Protective control NC: 6FLA 36LRA 250 Vac NO: 3FLA 18LRA 250 Vac	Pressure operating control NC: 6A resistive 125/250 Vac NO: 3A resistive 125/250 Vac	Pressure operating control 6A inductive 250 Vac	/
Lifetime cycles (*)	100,000	30,000	10,000		30,000	
Approvals	CE0035 - PED CAT IV – VDE - UL		CE0035 - PED CAT IV – VDE - UL		CE0035 - PED CAT IV – UL	

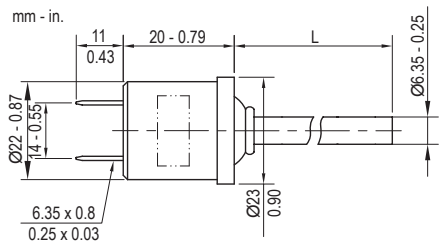
Electrical contact

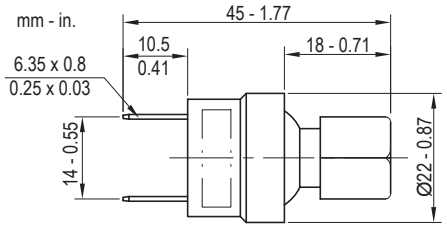


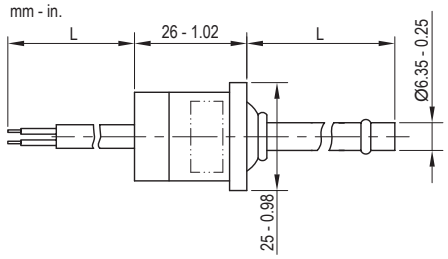


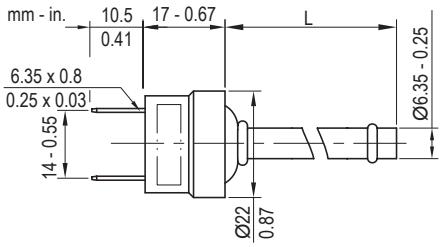
(*) For information regarding models with a different number of cycles, contact the Eliwell Sales Office.

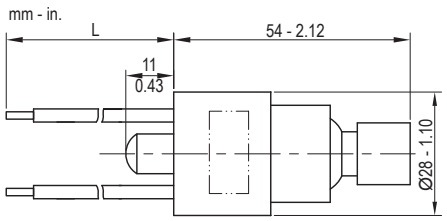
TYPICAL DIMENSION DIAGRAMS

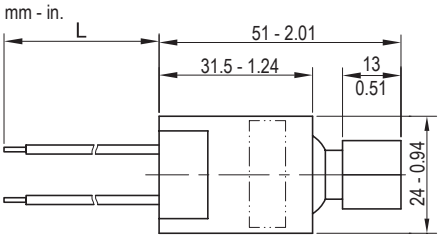


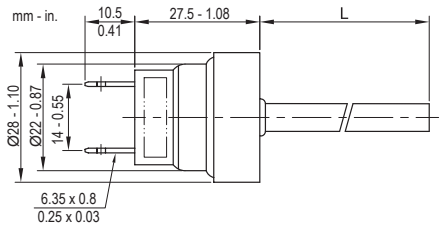


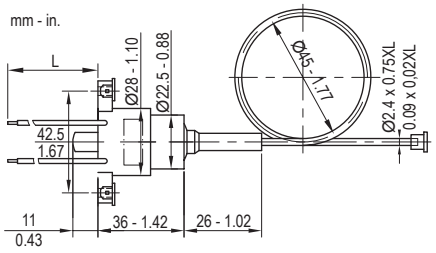


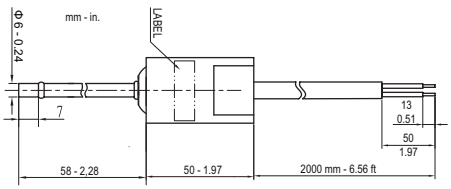






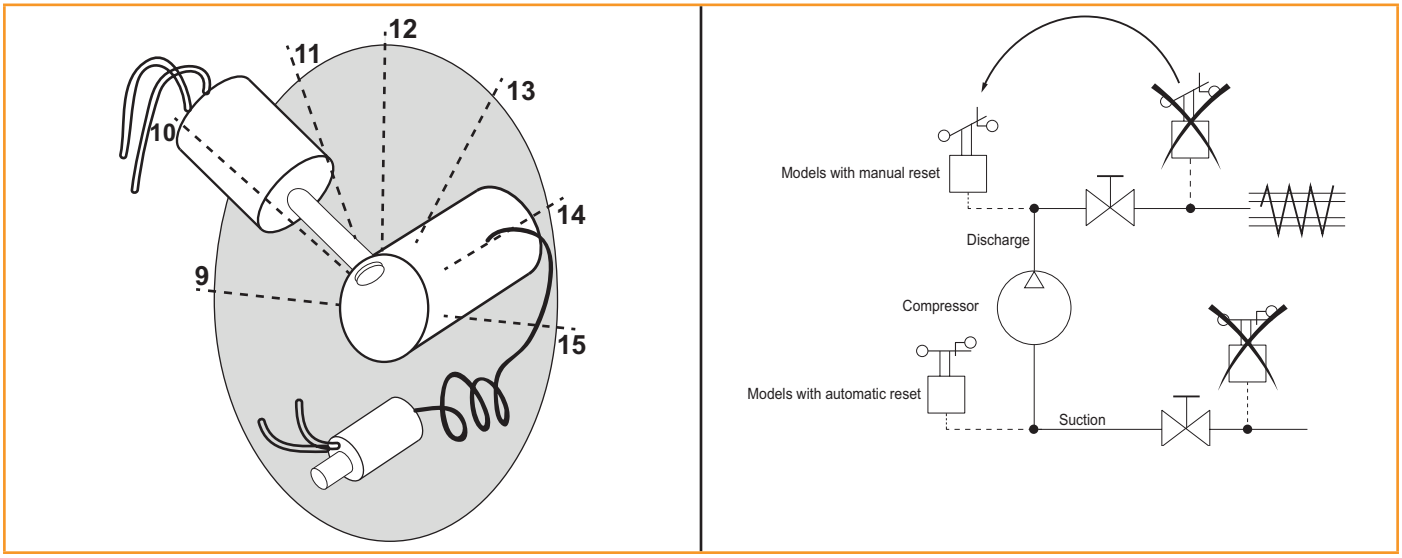






INSTALLATION INSTRUCTIONS

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 14 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.

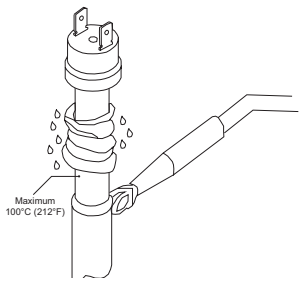
Fixing torque

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 N•m (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

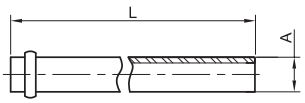
To ensure soldering is carried out correctly, we recommend observing the following instructions:



- 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 17.2 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).

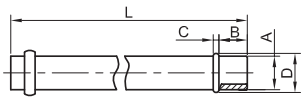
NOTE: When soldering copper alloys there is no need to use flux.
Overheating will cause the internal switch to become faulty.

Pipe



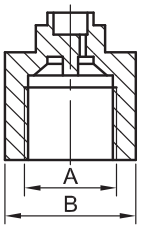
Ref. (*)	Dimensions	Applicable pressure value
A	Ø 6 mm (0.24 in.) Ø 6.35 mm (0.25 in.)	0...180 bar (0...2611 psi)
L	30...150 mm (1.18...5.90 in.)	

Pipe



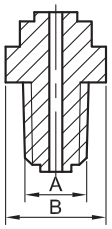
Ref. (*)	Dimensions	Applicable pressure value
A	Ø 6 mm (0.24 in.) Ø 6.35 mm (0.25 in.)	0...55 bar (0...798 psi)
L	30...150 mm (1.18...5.90 in.)	
B	3...12 mm (0.12...0.47 in.)	
C	2...4 mm (0.8...0.16 in.)	
D	Ø 6.35...9 mm (0.25...0.35 in.)	

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	NPT1/8	0...55 bar (0...798 psi)
B	S14	

(*) Ref. = Reference.

HOW TO ORDER

	NSD	HA	00	B	39	0xx

NSD series

NSD	

Product type

HA	High pressure Automatic reset
HM	High pressure Manual reset
HF	High pressure Automatic reset - FAN
LA	Low pressure Automatic reset
CA	CO_2 Automatic reset

Pressure fitting

00	1/4" SAE female with valve opener
01	1/8" threading male
10	6X58 copper pipe with holding ring
11	6X52 straight copper tube
12	6.35X59 copper tube with holding ring 7 mm deep
14	6.35X59 straight copper tube 7 mm deep
M2	M12 x 1.5
H5	6X59 straight copper pipe 4mm deep
C5	6X62,5 straight copper tube for CO_2

Contact system

A	NO – Silver contacts
B	NC – Silver contacts
D	SPDT – Silver contacts
C	NC – Silver-plated contacts (manual reset)
M	SPDT – Silver contacts (manual reset)
E	NO – Gold-plated contacts
F	NC – Gold-plated contacts
G	SPDT – Gold-plated contacts

Electrical connections

00	1/4" Quick connector (6.3 mm)
39	1 m wire UL1015 18 AWG
79	2 m wire UL1015 AWG 118
3A	3 m wire UL1015 18 AWG
4A	4 m wire UL1015 18 AWG
5A	5 m wire UL1015 18 AWG
PF	0.1 m wire UL1015 18 AWG + connector AMP 24 V 282080-1 female SPST
PM	0.1 m wire UL1015 18 AWG + connector AMP 24 V 282104-1 male SPST
RF	0.1 m wire UL1015 18 AWG + Connector AMP 24 V 282087-1 female SPDT

Incremental suffix

0xx	Incremental suffix 10,000 cycles
1xx	Incremental suffix 100,000 cycles
3xx	Incremental suffix 30,000 cycles CO_2 models

CUSTOM APPLICATIONS

Eliwell pressure switches are available with a wide range of pressure fittings and electrical connections.
For your applications, whether standard or custom, our range of options can be designed for any system configuration.

Life Is On

eliwell by Schneider Electric

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Eliwell has been developing and producing control systems and services for commercial and industrial refrigeration since 1980. It embodies the success story of an Italian company that has been bringing Italian-made technological development to the world for 40 years. Schneider Electric has been part of the group since 2014 and represents its centre of excellence for HVACR applications. Today Eliwell, together with Schneider Electric, is the global partner providing efficient and sustainable solutions and services for food storage and distribution systems, and for systems dedicated to ambient comfort, for the integrated control of resources.