

New Snap Disk

Fixed setting pressure switches

Compatible Refrigerants

R22, R134a, R401A, R402A, R404A, R407C, R410A and their lubricating oils, CO2 and R290



Our new range of electromechanical pressure switches with fixed setting are compact, light and easy to install.

Features

- Adopting standard thread, 7/16-20 UNF female with valve opener or brass copper tube 6.0/6.35 mm diameter, easy to install and no special requirement for mounting and fixing.
- Several mechanical fittings available on request.
- Fast-on or wiring connection available according to customers' needs.
- SPST switch, normally open or normally closed.
- SPDT switch, also available.
- Any pressure value between -1~55 bar (up to 180 for CO₂) can be made.
- Factory set according to customers' specification.
- Safe and reliable product thanks to welding process of the stainless steel diaphragm able to grant a perfect seal.



Applications

Our new range of electromechanical pressure switches with fixed setting are compact, light and easy to install.

They are typically designed to protect refrigeration systems against critical conditions by setting high or low pressure limits. The stainless-steel control element is designed to grant an enhanced product life-cycle, with high performance.

Thanks to its advanced manufacturing technology, Ranco pressure switches offer the best solutions for applications in refrigeration systems, residential and commercial air conditioning systems, automotive systems, ice maker, etc.

They can also be used to control pressure in hydraulic and steam systems, air compressors and industrial equipments.

Approvals



Table 1: Technical Data

Compatible Refrigerants	R100, R400 and R500 types such as R22, 134A, 401A, 402A, 404A, 407C, 410A and their lubricating oils, CO2, R290
Contact Configuration	SPST-NO, SPST-NC, SPDT
Reset	Automatic, Manual
Standard Electrical connection	1/4" Fast-on terminals (6,35 mm) 1,0m Wire lead UL1015 18AWG Other electrical connection upon request (see How To Order)
Standard Pressure fitting	7/16-20 UNF with valve opener Other fittings upon request (see How To Order)
Contact resistance	< 50mΩ
Leakage current	< 0,75mA
Flame resistance	94V-0
Protection degree	IP67 (wired version)
Working ambient temperature	-30°C...+80°C
Fluid Temperature	-50°C...+135°C

Table 2: Certifications Available

UL for AUTOMATIC RESET					
Models	NSDHA, NSDHF, NSDLA				
Voltage	250 Vac	36 Vdc	24 Vac	120 Vac	240 Vac
Current	6A	3A	125 VA	375 VA	375 VA
Load Type	Inductive	-	Pilot Duty		
Frequency	50 / 60 Hz	-	50 / 60 Hz		
Endurance Cycles	100'000				

UL for MANUAL RESET					
Models	NSDHM				
Voltage	250 Vac			150 Vac	
Current	6A			3A	
Load Type	Resistive			Resistive	
Endurance Cycles	10'000				

UL for MANUAL RESET					
Models	NSDHM				
Voltage	250 Vac	24 Vac	120 Vac	240 Vac	
Current	3A	125 VA	375 VA	375 VA	
Load Type	Inductive	Pilot Duty			
Frequency	50 / 60 Hz	50 / 60 Hz			
Endurance Cycles	10'000				

Table 3: Standard Part Numbers

Application	Part number	Reset	Cut out [bar]	Cut in [bar]	Contact configuration	UL model family
High pressure cut out	NSDHA00B39101	automatic	18	13	SPST - NC	NSD03H
	NSDHM00C39006	manual	18	13	SPST - NC	NSDM
	NSDHA00B39107	automatic	24	18	SPST - NC	NSD03H
	NSDHA00B39102	automatic	26	20	SPST - NC	NSD03H
	NSDHA00B39103	automatic	28	21	SPST - NC	NSD03H
	NSDHM00C39007	manual	28	21	SPST - NC	NSDM
	NSDHA00B39104	automatic	42	33	SPST - NC	NSD03H
Low pressure cut out	NSDLA00A39112	automatic	0,7	1,7	SPST - NO	NSD03L
	NSDLA00A39100	automatic	1,7	2,7	SPST - NO	NSD03L
	NSDLA00A39114	automatic	2,5	4,2	SPST - NO	NSD03L
Fan	NSDHF00A39103	automatic	8,5	11	SPST - NO	NSD03H
	NSDHF00A39104	automatic	13	16	SPST - NO	NSD03H

Table 4: Standard Performance

Low Pressure Auto Reset					
Cut-out		Cut-in		Max. Differential (bar)	Min. Differential (bar)
Pressure Range (bar)	Tolerance (bar)	Pressure Range (bar)	Tolerance (bar)		
0,2	0,2	1	0,3	0,8	0,3
0,3	0,3	1~1,5	0,3	1,2	0,5
0,4	0,3	1~1,5	0,3	1,1	0,5
0,5~1,5	0,4	1,5~3	0,5	1,5	0,5
1,5~3	0,5	2~5	0,5	2,0	0,5
3~6	0,5	4~8	0,5	2,0	0,5
7~8	0,7	8~12	0,8	3,0	0,5
9~10	0,8	10~14	0,8	4,0	0,5

High Pressure Auto Reset					
Cut-out		Cut-in		Max. Differential (bar)	Min. Differential (bar)
Pressure Range (bar)	Tolerance (bar)	Pressure Range (bar)	Tolerance (bar)		
11~13	1	6~8	0,5	5	2
14~16	1	9~11	0,8	5	2
17~25	1	15~20	1	5	2
26~30	1	20~24	1	6	2
32~35	1	26~30	1	6	2
36~39	1,5	27~29	1	9	2
40~55	1,5	30~50	1,5	10	2

High Pressure Manual Reset					
Cut-out		Cut-in		Max. Differential (bar)	Min. Differential (bar)
Pressure Range (bar)	Tolerance (bar)	Pressure Range (bar)	Tolerance (bar)		
15~35	1	10~24	2	10	6
36~39	1,5	30~31	2	10	7
40~55	1,5	30~50	2	15	10

CO ₂ Auto Reset					
Cut-out		Cut-in		Max. Differential (bar)	Min. Differential (bar)
Pressure Range (bar)	Tolerance (bar)	Pressure Range (bar)	Tolerance (bar)		
100~120	15	70~90	20	40	30
130~150	15	90~100	20	50	40
160~180	20	100~120	20	60	50



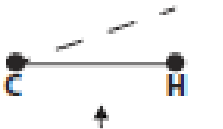
Operating Principles

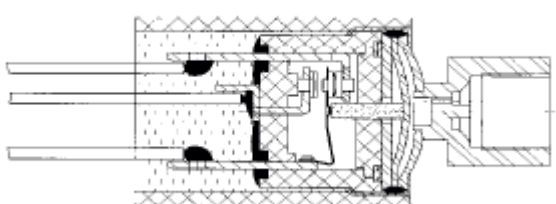
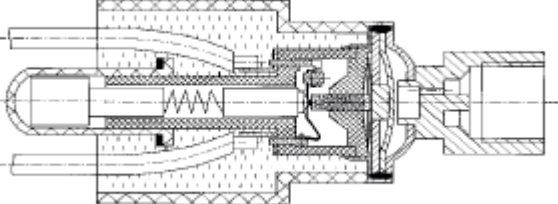
	SPST auto reset	SPST manual reset
	NSDHA – NSDLA - NSDHF	NSDHM
Operating principle	<p>Stainless steel diaphragm expands and contracts itself under the effect of pressure.</p> <p>The movement of the diaphragm actuates a plunger, which operates the opening or the closing of the electrical contact.</p> <p>The switch automatically resets when pressure reaches, by increasing or decreasing, the nominal value.</p>	<p>When system pressure increases higher than nominal, diaphragm expands itself, pushing the safety disc in blocking position, and simultaneously, interrupting the electric contact.</p> <p>When pressure decreases, diaphragm contracts itself, while the disc remains in the safety locked position; unlocking step takes place manually, through reset button.</p> <p>The button simultaneously operates the reset of the electrical contact.</p>
Typical Application	<p>High and low pressure protection of refrigeration, air-conditioning systems, ice maker etc.</p> <p>It can also be used to control pressure in hydraulic and steam systems, air compressors and industrial equipments.</p>	<p>All air conditioning and refrigeration systems that require protection from particularly High Pressure, and where the operator intervention is necessary to restore operating conditions.</p> <p>They can be directly installed on the pipeline or on the control panel.</p>

Proof pressure at working pressure

<10 bar	17 bar	/
10...27,5 bar	41 bar	41 bar
>27,5 bar	55 bar	55 bar

Pressure range	-1 ~ 55 bar	10 ~ 55 bar
Burst Pressure	345 bar	345 bar
Contact rating	250Vac 6A (inductive); 36Vdc 3A; 24Vac 125VA; 1 20Vac 375VA; 240Vac 375VA (pilot duty) - 50/60Hz	250Vac 3A (inductive); 24Vac 125VA; 120Vac 375VA; 240Vac 375VA (pilot duty) - 50/60Hz SPDT: 24Vac 125VA; 120/240Vac 375VA
Cycles life	100.000	10.000
Approvals	CE0035 - PED CAT IV – VDE - UL	CE0035 - PED CAT IV - UL

Electric Drawing			
	Normal Close	Normal Open	Normal Close

Structure Drawing		
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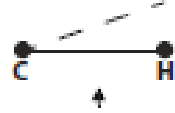
Operating Principles

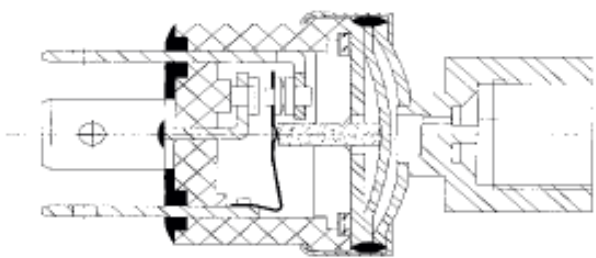
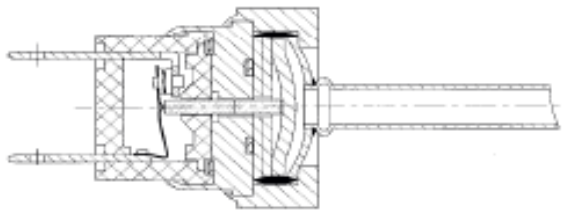
	SPDT	SPST for CO2
	NSDHA - NSDLA - NSDHM	NSDCA
Operating principle	Stainless steel diaphragm expands and contracts itself under the effect of pressure. Increasing pressure contact (H) opens, and contact (L) simultaneously closes. Decreasing pressure contact (L) opens and contact (H) simultaneously closes.	Stainless steel diaphragm flexes and contracts itself under the effect of pressure. the movement of the diaphragm actuates a plunger, which operates the opening or the closing of the electrical contact. The switch automatically resets when pressure reaches, by decreasing the nominal value.
Typical Application	Mainly used in refrigeration and air-conditioning systems.	Specially designed and manufactured for refrigeration systems using CO2 and equipments with high pressures over 55 bar.

Pressure range	-1 ~ 55 bar	90 ~ 180 bar
Burst Pressure	345 bar	720 bar
Contact rating	24Vac 125VA; 240Vac 375VA	24Vac 125VA; 240Vac 375VA
Cycles life	100.000 AUTOMATIC RESET / 10.000 MANUAL RESET	30.000
Approvals	CE0035 - PED CAT IV	CE0035 - PED CAT IV

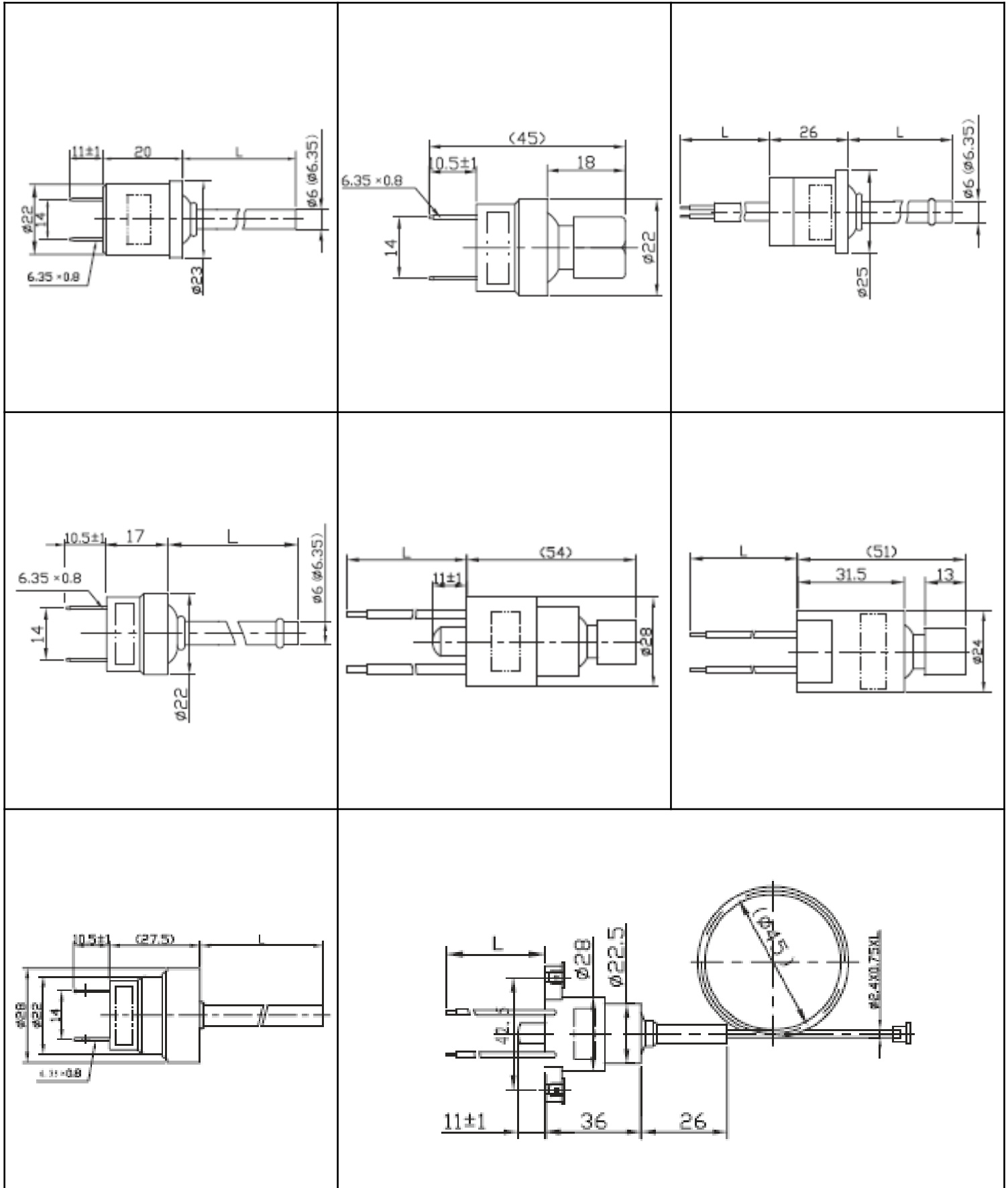
Proof pressure at working pressure

<10 bar	17 bar	180 bar
10...27,5 bar	41 bar	/
>27,5 bar	55 bar	/

Electric Drawing		
	SPDT	Normal Close

Structure Drawing		
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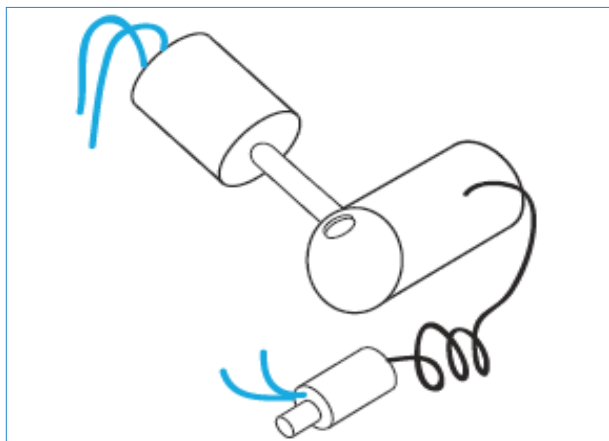
Typical Outline Drawing



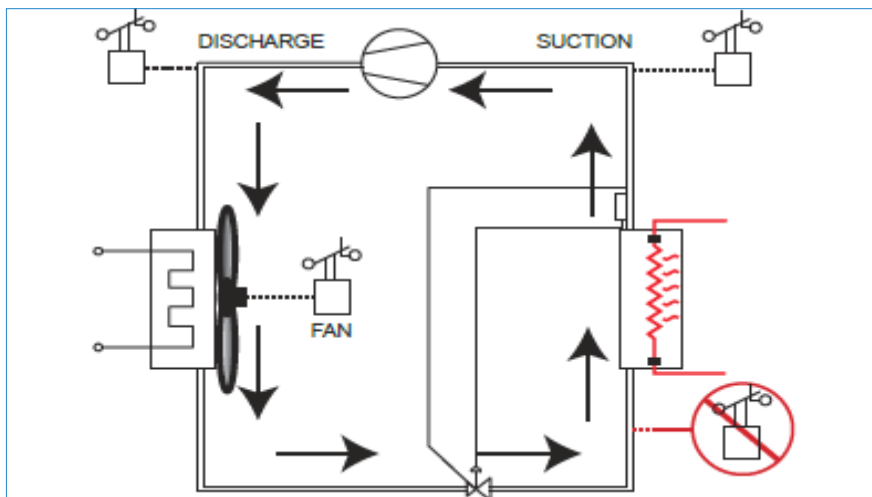
Installation Instructions

Pressure connection of the control must always be located on the top side of the refrigerant line or within 10 to 2 o'clock as shown in picture below.

This reduces the possibility of sediment collecting inside the pressure sensing element which could cause the control to malfunction.



In addition, the location of the tap point shall always be as indicated below, so that the safety function of the control is not defeated.



Avoid Severe Pressure Pulsation on High-Side Pressure Connections.

Install controls pressure away from the compressor discharge, to minimize the effects of pressure pulsation generated by reciprocating compressors.

Fastening Torque

To avoid any damage to the controls, the below instructions must be carefully followed:

- The allowable fastening torque for copper or brass flare connections shall be within 13,5 to 15Nm
- Do Not Over-Tighten Flare Nuts on Pressure Connection Fittings: over tightening flare connections may damage the threads on the flare nuts or flare connectors, and result in refrigerant leaks
- Use two wrenches to apply the torque. Do not use control's body for installation Control's calibration may permanently change if excessive side loads have been applied to control's body.

Installing / Brazing Controls with Copper Tubes

To assure a proper brazing, is recommended to follow the following instructions:



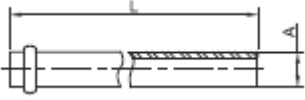
- the connection areas shall be reasonably free from heavy oxides
- during brazing do not aim torch toward the plastic body of the control
- protect the tube with- a wet cloth to reduce the overheating during brazing process
- recommended maximum soldering time: 15 seconds (using wet cloth)
- max temperature allowed to the bottom of the tube (near the body): 100°C
- do not shorten the length of the copper tube less than 35 mm: shorter tubes cause loss of calibration due to excess heat reaching the pressure sensing element
- to prevent overheating, the torch tip should be held away from the surface of the work so that the inner cone of the flame is not in contact with the work piece. In manual torch brazing, the torch should be kept in motion to avoid localized overheating and should be kept on the more massive part. A multiple torch is recommended as it will heat faster and more uniformly than a single flame.

Note: Flux is not ordinarily needed when brazing copper alloys.

Note: overheating will cause the internal switch to fail.

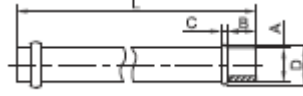
Pressure Fitting

Pipe



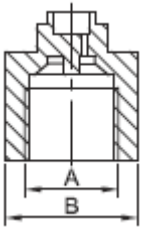
Code	Dimension	Apply Pressure Value
A	Ø6 Ø6.35	0...180 bar
L	30-150	

Pipe



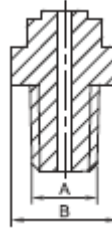
Code	Dimension	Apply Pressure Value
A	Ø6 Ø6.35	0...55 bar
L	30-150	
B	3-12	
C	2-4	
D	Ø6.35-Ø9	

Female Flare Type



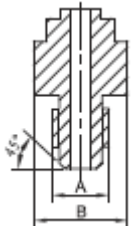
Code	dimension	Apply Pressure Value
A	NPT1/4	0...55 bar
	7/16-20-UNF	
	1/2-20-UNF	
B	S14	
	S17	

Male Flare Type



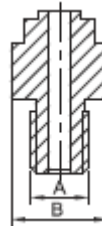
Code	dimension	Apply Pressure Value
A	NPT1/4	0...55 bar
	7/16-20-UNF	
	1/2-20-UNF	
B	S14	
	S17	

Male Flare Type



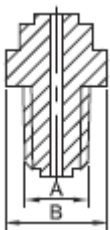
Code	dimension	Apply Pressure Value
A	7/16-20-UNF	0...55 bar
B	S14	

Male Flare Type



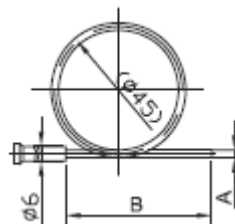
Code	dimension	Apply Pressure Value
A	3/8-24-UNF	0...55 bar
	M10x1	
	7/16-20-UNF	
	M12x1.5	
	M12x1.25	
B	M14x1.5	
	S14	
	S16	
	S17	

Male Flare Type



Code	dimension	Apply Pressure Value
A	NPT1/8	0...55 bar
B	S14	

Capillary



Code	dimension	Apply Pressure Value
A	Ø2.4 x 0.75	0...55 bar
	Ø3 x 0.75	
B	350-1500	

How To Order

NSD Series	NSD	HA	00	B	39	001
Product Type	HA High pressure Automatic reset HM High pressure Manual reset HF High pressure Automatic reset - FAN LA Low pressure Auto reset					
Pressure Fitting	CA CO2 Auto reset 00 1/4 SAE female, with valve opener 01 1/8" male pipe thread 02 1/4" male pipe thread 03 3/8" male O-ring fitting 04 1/4" solder (6,35x5,75) 05 1/4" SAE flare Male 06 1/4" solder (5x53) 07 3/32" copper capillary tube (2,4x915) 08 1/4" solder (6,35x71) 10 6X58,4 bulge Cu tube 11 6X50,5 straight Cu tube					
Contact System	xx Upon request A NO - Silver Alloy Contacts B NC - Silver Alloy Contacts C NC - for HM only (manual reset) D SPDT - Silver Alloy E NO - Gold Plated Alloy Contacts F NC - Gold Plated Alloy Contacts G SPDT - Gold Plated Alloy Contacts					
Electrical Connection	00 1/4" Quick Connector (6,3 mm) 01 3/16" Quick Connector (4,8 mm) 39 39" (990mm) UL1015 18AWG Wire Leads 60 60" (1520mm) UL1015 18AWG Wire Leads 79 79" (2006mm) UL1015 18AWG Wire Leads 99 99" (2515mm) UL1015 18AWG Wire Leads 3A 119" (3022mm) UL1015 18AWG Wire Leads 3B 138" (3505mm) UL1015 18AWG Wire Leads 4A 158" (4013mm) UL1015 18AWG Wire Leads PF Plug connector AMP 282080-1 FEMALE PM Plug connector AMP 282101-1 MALE					
Incremental Suffix	000 incremental suffix number 10.000 cycles life manual reset 100 incremental suffix number 100.000 cycles life automatic reset 300 incremental suffix number 30.000 cycles life CO ₂					