

General information:

For application in refrigeration systems and heat pumps.

The device has a potential ignition source and has not been qualified according to ATEX standards. Installation into a 'non-explosive location'.

Safety instructions:

- Read operating instructions thoroughly. Failure to comply can result in device failure, system damage or personal injury.
- This product is intended for use by qualified personnel having the appropriate knowledge and skills like trained according to EN 13313 or a specific training for flammable refrigerants.
- Flammable refrigerants require special handling and care due to its flammability. Sufficient ventilation is required during service of the system.
- Contact with rapidly expanding gases can cause frostbite and eye damage. Proper protective equipment (gloves, eye protection, etc.) must be used.
- Ensure that the system is correctly labeled with applied refrigerant type and a warning for explosion risk.
- In a severely contaminated system, avoid breathing acid vapors and avoid contact with skin from contaminated refrigerant / lubricants. Failure to do so could result in injury.
- Before opening any system make sure pressure in system is brought to and remains at atmospheric pressure.
- Do not release any refrigerant into the atmosphere!
- Do not exceed the specified maximum ratings for pressure, temperature, voltage and current.
- Ensure that the system piping is grounded.
- Before installation or service disconnect all voltages from system and device.
- Observe and avoid mechanical damage of housing in order to maintain protection class.
- Do not use any other fluid media without prior approval of EMERSON. Use of fluids not listed could result in:
 - Change of hazard category of product and consequently change of conformity assessment requirement for product in accordance with European Pressure Equipment Directive 2014/68/EU.
- Ensure that design, installation and operation comply with European and national standards/regulations.
- For flammable refrigerants only use valves and accessories approved for it!

Function:

Fig. 1a: automatic reset function:

- PS1/PS2 Pressure switches are equipped with SPDT snap action contacts switching from 1-2 to 1-4 on rising and from 1-4 to 1-2 on falling pressure.

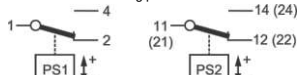


Fig. 1a

Fig. 1b: manual reset function for low pressure reset / Fig. 1c: manual reset function for high pressure reset:

- PS1/PS2 with manual reset (high pressure/low pressure reset): Reaching the preset switching point contact 1-4 switches to 1-2 (low pressure switch) or from 1-2 to 1-4 (high pressure switch) and locks in this position. After the pressure rises or drops by a fixed differential the switch can be reset by pushing the reset button.

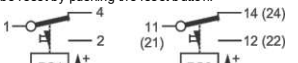


Fig. 1b

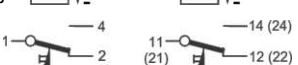


Fig. 1c

Mounting location:

Any direction except upside down

Installation: (Fig. 2)

- PS1/PS2 controls may be installed by using a mounting plate or as a wall-mounted device against a flat surface.
- Use universal thread M4 or UNC8-32 mounting holes for installation via mounting plate.
- Use the standard mounting holes at the backside for wall mounting.
- Use mounting screws supplied with control.
- Mounting screws must not penetrate control backside by more than 3mm to ensure proper operation.
- Do not use PS1/PS2 in pulsating operating condition!
- To achieve protection class IP44, the following instructions must be observed:
 - Cover must be closed, and cover screw fastened
 - Control must be mounted against a flat surface so that all openings on the housing backside are fully covered

Pressure connection: (Fig. 3)

- Connection of the pressure side depends on the exact model / pressure connector.
- When connecting PS1/PS2 to the hot gas line of a refrigeration system, a pipe, capillary or flexible tube of at least 80 mm shall be used to allow sufficient temperature drop between refrigeration line and pressure switch below.

Threaded connection:

- Connectors A & C: Do not apply torsional load to pressure connector; use second spanner to counter-balance torque when tightening pressure connection.
 - K-type connectors: use copper gasket supplied with control.
- Brazing connection:**
- Perform the brazing joint as per EN 14324.
 - Before and after brazing clean tubing and brazing joints.
 - Minimize vibrations in the piping lines by appropriate solutions.
 - Do not exceed the max. surface temperature of 70 °C!

Pressure Test:

- After completion of installation, a pressure test must be carried out as follows:
 - according to EN 378 for systems which must comply with European pressure equipment directive 2014/68/EU.
 - to a maximum working pressure of system for other applications.

Tightness Test:

- Conduct a tightness test according to EN 378-2 with appropriate equipment and method to identify leakages from joints and products. The allowable leakage rate must be according system manufacturer's specification.

WARNING:

- Failure to pressure test or tightness test as described could result in loss of refrigerant, damage to property and/or personal injury.
- The tests must be conducted by skilled personnel with due respect regarding the danger related to pressure.

Electrical connection: (Fig. 4)

- Range spindle (1)
- Lockplate (2)
- Differential spindle (3)
- Electrical terminals (4)
- Check-out lever (5)
- Cable entry grommet (6)
- Pressure Connection (7)
- Entire electrical connections have to comply with local regulations.
- Wire size must match the electrical load connected to the switch contacts.
- Ensure that the cables are mounted without tension; always leave the cable a bit loose.
- Ensure that cables are not mounted near sharp edges.
- Do not bend or mechanically stress the cable outlet, maintain a clearance of 20 mm to neighboring parts.
- Feed cables through rubber grommet at switch bottom.
- Optionally, the rubber grommet may be replaced by a standard PG 13.5 cable gland.
- Connect wires to terminals by considering switch functions as shown in Fig. 1a to Fig. 1c.
- Fasten terminal screws with torque 1.2 Nm max.
- For electronic applications with low electrical loads (voltage < 24 V and current < 50 mA) gold plated contacts are recommended.

Setpoint adjustment: (Fig. 5)

- PS1/PS2 pressure switches come with individually adjustable range and differential depending on the exact model.
- Manual reset switches always have a fixed differential.
- Use a flat screwdriver or a 1/4" refrigeration (square) wrench to adjust setpoints as described below.
- Adjust upper setpoint using the range spindle.
- Adjust lower setpoint by tuning the differential spindle.

Upper setpoint - Differential = Lower setpoint

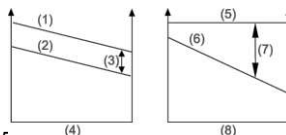


Fig. 5

- Upper setpoint (1)
- Lower setpoint (2)
- Differential = constant (3)
- Turning range spindle (4)
- Upper setpoint (5)
- Lower setpoint (6)
- Differential = variable (7)
- Turning differential spindle (8)

- A separate gauge must be used for exact adjustment of the setpoints. The integrated display scale can only be used for obtaining approximate settings.
- When changing the upper setpoint the lower setpoint must be re-checked.
- Refer to the Emerson catalogue or Technical Information for standard factory settings.

Manual reset / Universal reset: (Fig. 6a-c)

- Manual reset (external): press the reset button (1) as indicated by Fig. 6a.
- Manual reset (internal): remove the housing cover and press the reset button (2) as indicated by Fig. 6b.
- Note that the reset is 'trip-free', i.e. reset is only possible if the pressure has reached its reset threshold.
- Universal reset: remove the cover and change the universal toggle to the desired position (manual (3) or auto reset (4), Fig. 6c)

Check-out lever: ((5) Fig. 4 & Fig. 7)

- Use the check-out lever to manually override the electrical contact position for testing out the system.
- Use the check-out lever on low pressure switches to manually override the electrical contact position for evacuating the refrigeration system.

Service / Maintenance:

- Disconnect electrical power before service.
- In case of repair work or replacing the control always use a new gasket. (K-Types)
- According to EN 378-4 during each periodic maintenance, tightness tests shall be carried out at the relevant part of the refrigerating system. This shall apply where appropriate following any repair.



Pressure Controls Series PS1 / PS2



Technical Data:

Medium compatibility	Fluid Group II (A1) R448A, R449A, R513A, R450A, R134a, R452A, R23, R410A, R407C, R404A, R507, R124, R1234ze (A2L)	Fluid Group I (A2L) R32, R452B, R454B, R454A, R454 C, R455A, R1234yf
Electrical rating	Resistive load (AC1) 24 A / 230 VAC Inductive load (AC15) 10 A / 230 VAC Inductive load (DC13) 0.1 A / 230 VDC 3 A / 24 VDC 6 A / 12 VDC Start-up (AC3) 144 A / 120 VAC / 230 VAC Motor rating (FLA) 24 A / 120 VAC / 240 VAC Locked rotor (LRA) 144 A / 120 VAC / 240 VAC	Resistive load (AC1) 10 A / 230 VAC* Inductive load (AC15) 1 A / 230 VAC* Inductive load (DC13) 0.1 A / 230 VDC* 3 A / 24 VDC* 6 A / 12 VDC* Start-up (AC3) - Motor rating (FLA) - Locked rotor (LRA) - *) Acc. IEC 60335-2-40 max. electrical load = 2.5 kVA
Protection class (IEC 529/EN 60529)	IP44	
Temperature range TS Storage / Transport / Ambient / Medium	-50 °C...+70 °C	
Max. allowable pressure PS/ Test pressure PT	See Type code table	
Vibration resistance (acc. EN 12263)	4 g (10...1000 Hz)	
Standards	- EN 12263 - PED 2014/68/EU, Category IV for all devices with TÜV approval under EN12263	- LVD 2014/35/EU, - EN 60947-1, EN 60947-5-1
Marking	CE 0035 for devices under PED CE for devices under LVD	UK CA pending EAC all types
Dimensions	See Fig. 2	

Type Code:

PS 1 - A 7 A

Product Name

- PS1 Single standard version
- PSA Customer specific version PS1

Function

- A Pressure control, automatic reset
- B Pressure cut out, external manual reset EN 12263
- R Pressure control, external manual reset
- S Safety pressure cut-out, internal manual reset EN 12263
- U Convertible from R to A
- W Pressure limiter, automatic, DIN / EN 12263
- X Pressure control, automatic with extended adjustment spindles

Pressure Connector

- A 7/16"-20 UNF male
- C R 1/4" male, stainless steel with steel bellows
- J 1 m capillary with 6 mm-ODM solder tube
- K 1 m capillary with 7/16"-20 UNF flare nut and schrader valve opener
- L 1 m capillary with 1/4"-ODM solder tube
- R R 1/4" male, brass
- U 6 mm ODF solder, 80 mm length
- X 1/4"-ODF solder, 80 mm length

Pressure Range (bar)

	PS	PT		PS	PT
1	-0.75...3	11 13	4	1...20	20 23
2	-0.8...1.5	11 13	5	6...31	31 35
3	-0.5...7	22 24			

NOTE: Function types B, R or S in combination with pressure range 1, 2 or 3 have a low-pressure manual reset function and latch with falling pressure. Function types B, R, S in combination with Pressure Range 4 or 5 have a high-pressure manual reset function and latch with rising pressure.

PS 2 - A 7 A

Product Name

- PS2 Dual Standard version
- PSB Customer specific version PS2

Function

- A both sides: Pressure control, automatic reset
- B both sides: Pressure cut-out, external manual reset EN 12263
- C left: Pressure limiter, automatic right: Pressure cut out, external manual reset, EN 12263
- G left: Pressure cut out, external manual reset, right: Safety pressure cut-out, internal manual reset EN 12263
- L left: Pressure control, automatic reset, right: Pressure control external manual reset
- M left: Pressure control, automatic reset, right: Convertible from R to A
- N left: Pressure control, automatic reset, right: Convertible from R to A, EN 12263
- R both sides: Pressure control, external manual reset
- S both sides: Safety pressure cut-out, internal manual reset EN 12263
- T left: Pressure limiter, automatic right: Safety pressure cut-out, internal manual reset EN 12263
- U both sides: Convertible from R to A
- W both sides: Pressure limiter, automatic, DIN / EN 12263
- X both sides: Pressure control, automatic with extended adjustment spindles
- Y left: Pressure control, automatic reset right: Convertible from R to A, extended adjustment spindles
- Z both sides: Convertible from R to A, extended adjustment spindles

Pressure Connector

- A 7/16"-20 UNF male
- C R 1/4" male, stainless steel with steel bellows
- J 1 m capillary with 6 mm-ODM solder tube
- K 1 m capillary with 7/16"-20 UNF flare nut and schrader valve opener
- L 1 m capillary with 1/4"-ODM solder tube
- U 6 mm ODF solder, 80 mm length
- X 1/4"-ODF solder, 80 mm length

Pressure Range (bar)

	left	PS	PT	right	PS	PT
7	-0.5...7	22 24		6...31	31 35	
8	6...31	31 35		6...31	31 35	
9	-0.75...3	11 13		6...31	31 35	

Fig. 2

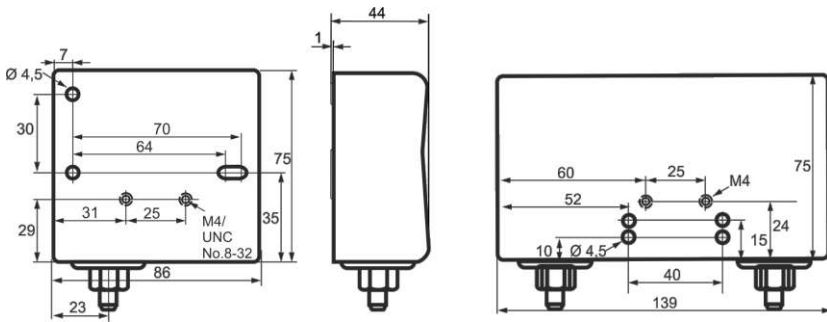


Fig. 3

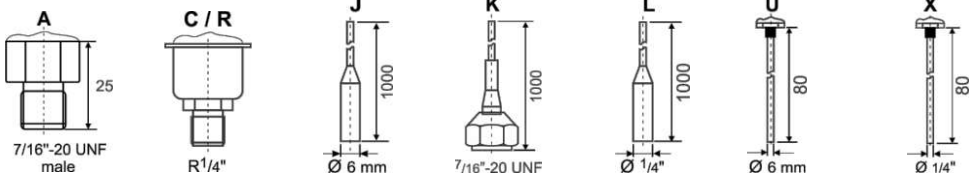


Fig. 4

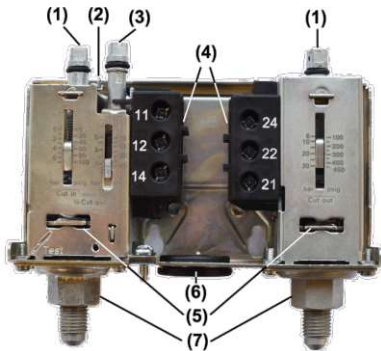


Fig. 7:



Fig. 6a

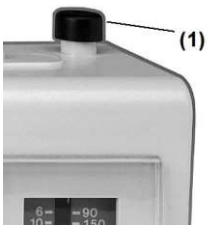


Fig. 6b

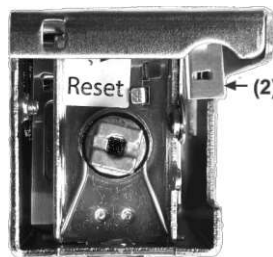


Fig. 6c

