INSTALLATION BULLETIN

P100 Series Encapsulated Pressure Controls

Application

The P100 Series Encapsulated Pressure Controls are compact, economical, direct-mount, snap-action, On/Off pressure controls, available in a wide variety of factory-calibrated, non-adjustable pressure setpoints.

The P100 controls are designed primarily for direct or pilot duty control of motors and other refrigeration or air conditioning application loads requiring precise, repeatable pressure control over a wide range of ambient conditions.

Standard P100 models come with 1/4 in. SAE female flare fitting with integral Schrader valve depressor and 48 in., No. 18 American Wire Gauge (AWG) insulated, stranded-copper wire leads. See Figures 2 and 3.

The standard P100 models are UL Recognized as **refrigerant pressure limiting devices**.

A high pressure manual reset lockout is available on some models. See Figures 1 and 2 for standard models available from your Johnson Controls/PENN sales representative.

Additional pressure connection styles, pressure setpoints, and electrical ratings are available on non-standard models, in quantity orders only. Contact your Johnson Controls/PENN sales representative or distributor, or Refrigeration Application Engineering at (800) 275-5676 to order non-standard P100 pressure controls.

Operation

A bowed, stainless steel, snap-acting disc reverses its curvature when pressurized to the specified actuation setpoint. When the disc snaps, it drives a set of electrical contacts open or closed, depending on the control's switch action.

When the applied pressure returns to the specified deactuation setpoint on **automatic reset controls**, the snap-acting disc and electrical contacts return to their original position.

On high pressure **manual reset controls**, the disc remains in the reversed position and the electrical contacts remain open until **both** the deactuation pressure is reached **and** the manual reset button is pushed. After deactuation pressure is reached, push the manual reset button to return the contacts to the closed position.

A "trip free" internal latching mechanism on manual reset controls does not allow the control to be reset until the system pressure reaches the specified deactuation setpoint, even if the reset button is held fully depressed.

Dimensions

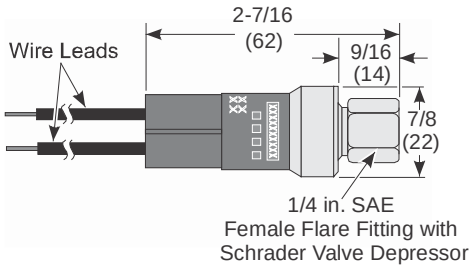

Figure 1: Dimensions of Standard P100AP, CP Type Pressure Controls, in. (mm)

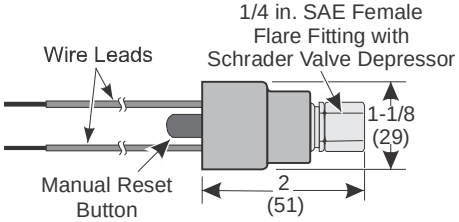

Figure 2: Dimensions of Standard P100DA, Type Pressure Control, in. (mm)

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*M*ounting

The compact size and lightweight construction of the P100 series controls allows mounting the control directly to the refrigeration piping or almost any other convenient pressure tap point on the system. Observe the following guidelines when installing the P100 controls.

IMPORTANT:	If these controls are installed on equipment containing hazardous or regulated materials, such as refrigerants or lubricants, the installer and user should observe all regulations governing the handling and containment of those materials.

IMPORTANT:	Pressure tap points should be located on the top side of the refrigerant lines. This reduces the possibility of sediment accumulating in the control.

Do Not Overtighten Flare Nuts on Pressure Connection Fittings. Overtightening flare connections may damage the threads on the flare nuts or flare connectors and result in refrigerant leaks. Do not exceed 9 lb·ft (12 N·m) of torque when tightening brass flare connections.

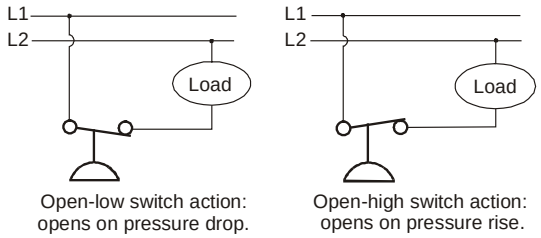
Avoid Severe Pressure Pulsation on High-Side Pressure Connections. Install P100 controls on pressure tap points away from the compressor discharge to minimize the effects of pressure pulsation from reciprocating compressors.

*W*iring

WARNING:	**Risk of Electrical Shock.** Disconnect the power supply before making electrical connections. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.
AVERTISSEMENT:	**Risque de décharge électrique.** Débrancher l'alimentation avant de réaliser tout branchement électrique. Tout contact avec des composants conducteurs de tensions dangereuses risque d'entraîner une décharge électrique et de provoquer des blessures graves, voire mortelles.

IMPORTANT:	Make all wiring connections in accordance with the National Electrical Code and all local regulations. Use copper conductors only. Do not exceed the control's electrical rating.

Standard P100 Encapsulated Pressure Controls are available with several switch options. Check the label on the control body for model number. Refer to the following guidelines, diagrams, and the electrical ratings in Table 1 and Table 2 when wiring the standard P100 controls.



Open-low switch action: opens on pressure drop.

Open-high switch action: opens on pressure rise.

Figure 3: Wiring Diagrams for P100 Control Models with an SPST Switch

IMPORTANT:	After mounting and wiring control, attach a reliable set of gauges to the controlled equipment and operate the equipment at least three cycles at the pressures necessary to verify control setpoints and proper operation. Do not exceed manufacturers' recommended pressure ratings for the controlled equipment or any of its components when operating the controlled equipment.

Repairs and Replacement

Field repairs to the P100 pressure controls must not be made. For a replacement control, contact an authorized Johnson Controls/PENN Sales Representative or Distributor, or Refrigeration Application Engineering at (800) 275-5676.

Ordering Information

Standard P100 control model features are available in single and quantity orders through your Johnson Controls/PENN Sales Representative or Distributor.

Non-standard P100 controls, built to customer specifications, are also available (with quantity orders only). Contact your Johnson Controls/PENN Sales Representative or Distributor, or Refrigeration Application Engineering at (800) 275-5676 for ordering non-standard P100 pressure controls.

Table 1: Standard Duty Electrical Contact Ratings

Switch Action—Model Numbers	SPST—P100AA, AC, AG, AJ, CA, CC, CG, CJ, DA, and DC		SPST—P100AP, CP	
Motor Ratings	**120V**	**240V**	**120V**	**240V**
AC Full Load Ampere	5.8	2.9	6.0	6.0
AC Locked Rotor Ampere	34.8	15.0	36.0	36.0
Non-Inductive Ampere	-	-	-	-
Inductive Ampere	-	-	-	-
Pilot Duty	375 VA		375 VA	

Table 2: Heavy Duty Electrical Contact Ratings

Switch Action—Model Numbers	SPST—P100AE and CE				SPDT—P100EE			
Motor Ratings	**120V**		**240V**		**120V**		**240V**	
Contact Type	**N.O.**	**N.C.**	**N.O.**	**N.C.**	**N.O.**	**N.C.**	**N.O.**	**N.C.**
AC Full Load Ampere	13.0	13.0	10.0	10.0	5.8	13.0	2.9	10.0
AC Locked Rotor Ampere	65.0	60.0	45.0	45.0	34.8	60.0	17.4	45.0
Non-Inductive Ampere	13.0	25.0	10.0	25.0	10.0	25.0	5.0	25.0
Inductive Ampere	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Pilot Duty	278 VA	125 VA	278 VA	125 VA	278 VA	125 VA	278 VA	125 VA

Specifications

Product	P100 Encapsulated Pressure Controls
Electrical Ratings	120 and 240 VAC at 50/60 Hz (See Table 1 and Table 2 for ampere ratings.)
Burst Pressure	3,500 psi (24,130 kPa)
Maximum Overpressure	250 psi (1,724 kPa) overpressure rating for P100 controls with 5 to 100 psi (34 to 690 kPa) working pressure 600 psi (4,137 kPa) overpressure rating for P100 controls with 100 to 500 psi (690 to 3,447 kPa) working pressure 800 psi (5,516 kPa) overpressure rating for P100 controls with 500 to 700 psi (3,447 to 4,826 kPa) working pressure
Refrigerant Temperature	-65 to 275°F (-54 to 135°C)
Ambient Temperature	Operating: -20 to 150°F (-29 to 66°C) Shipping: -40 to 185°F (-40 to 85°C)
Dielectric Strength	750 Vrms across open contacts 1,550 Vrms (minimum) Terminals to Fitting
Agency Listings	UL Recognition (US): File SA516, CCN SDFY2 UL Recognition (Canada): File SA516, CCN SDFY8

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, contact Johnson Controls/PENN Refrigeration Application Engineering at (800) 275-5676. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

Johnson Controls

Controls Group
507 E. Michigan Street
P.O. Box 423
Milwaukee, WI 53201

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www.johnsoncontrols.com