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P70, P72, and P170 Series

Controls for Low Pressure Applications

Description

The P70, P72, and P170 controls for low pressure applications are designed primarily for low pressure cut-out control, pump-down control, and capacity control on commercial refrigeration and air conditioning applications.

These controls are available in several pressure ranges and are compatible with most common refrigerants. They may also be used on other non-corrosive fluid applications. Ammonia-compatible models are also available.

Controls also are available in several different electrical ratings and switch configurations. The P72 models provide direct control of 208-240 volt single-phase motors up to 3 horsepower, and 208-220 volt 3-phase motors up to 5 horsepower.

Features

- all-steel case and cover built to provide long lasting, rugged protection for internal components
- "Sight-Set" calibrated pressure adjustment displays a visible pressure scale, fully adjustable through the range without removing the cover (on NEMA 1 enclosure models)
- MICRO-SET™ differential option allows for precise control on critical low pressure applications
- manual reset lockout option provides "trip-free" low pressure lockout that cannot be overridden or reset until pressure returns to specified level
- limited knob adjustment option restricts control adjustment ranges and deters tampering and over-adjustment

Applications

NEMA 1 enclosures are standard on most models.

- **P70A and P170A models** with Single-Pole Single-Throw (SPST) Open-low switch action are the most popular models, and are typically used for low pressure cut-out and pump-down control.
- **P70 and P170 models** are also available with SPST Open-high switch action, and are typically used for capacity control. Models with Single-Pole Double-Throw (SPDT) or 4-wire, 2-circuit switch action allow users to install alarm devices or other control circuits.



P70AB-12 MICRO-SET™ Low Pressure Control

- **P72 models** have a Double-Pole Single-Throw (DPST) switch with load-carrying contacts that can provide direct control of 208-240 V single-phase motors up to 3 horsepower, and 208-220 V 3-phase motors up to 5 horsepower. Refer to DPST Electrical Ratings (P72A, B, C, and D Models) on page 3.

Selection Chart for Standard P70, P72, and P170 Controls for Low Pressure Applications

Code Number	Switch Action	Range psig (kPa)	Differential psi (kPa)	Pressure Connection	Max. Overpressure	Max. Working Pressure	Limited Knob Adjustment
MICRO-SET Controls (For Non-Corrosive Refrigerants)							
P70AB-12C	SPST Open Low	12 in. Hg to 80 (-41 to 551)	Minimum 5 (34) Maximum 35 (241)	36 in. Cap. with 1/4 in. Flare Nut	525 psig (3617 kPa)	80 psig (551 kPa)	Supplied, but not assembled
P170AB-12C				1/4 in. Male Flare Connector			
P70EA-14C	SPDT 1 to 3 Open Low 1 to 2 Close Low			36 in. Cap. with 1/4 in. Flare Nut			None
P170EA-14C				1/4 in. Male Flare Connector			
ALL-RANGE Controls (For Non-Corrosive Refrigerants)							
P70AB-1C	SPST Open Low	20 in. Hg to 100 (-68 to 690)	Minimum 7 (48) Maximum 50 (345)	1/4 in. Male Flare Connector	325 psig (2239 kPa)	100 psig (690 kPa)	Supplied, but not assembled
P70AB-2C				36 in. Cap. with 1/4 in. Flare Nut			
P70BA-1C			Manual Reset Lockout				None
P70BA-10C				1/4 in. Male Flare Connector			
P70EA-10C	SPDT 1 to 3 Open Low 1 to 2 Close Low		5 (34) Fixed				
P72AA-1C	DPST Open Low		Minimum 7 (48) Maximum 50 (345)	36 in. Cap. with 1/4 in. Flare Nut			Mounted on Differential Screw
P72AB-1C							
P170AB-2C	SPST Open Low			1/4 in. Male Flare Connector			
P70CA-1C	SPST Open High			36 in. Cap. with 1/4 in. Flare Nut			None
P170CA-1C				1/4 in. Male Flare Connector			
ALL-RANGE Controls (Ammonia-Compatible)							
P70AA-5C	SPST Open Low	20 in. Hg to 100 (-68 to 690)	Minimum 7 (48) Maximum 50 (345)	1/4 in. SS Female NPT	325 psig (2239 kPa)	100 psig (690 kPa)	None
P70CA-4C	SPST Open High						
P70GA-11C	4-wire, 2-circuit Line M1 Close Low Line M2 Open Low						
P70HA-3C			Manual Reset Lockout				

Note: To order models not listed in the selection chart, please contact Johnson Controls/Penn Refrigeration Application Engineering at 1-800-275-5676.

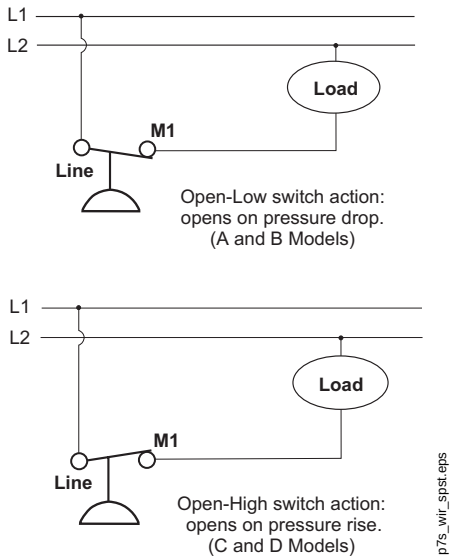
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Controls for Low Pressure Applications (Continued)

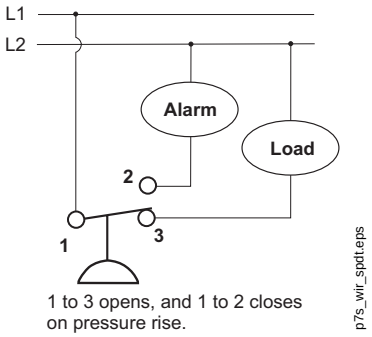
Technical Specifications

Single Pressure Controls Switch Action, Low Event, High Event, and Models

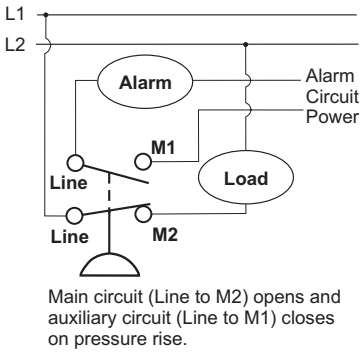
Switch and Action	Low Event	High Event	Models
Single-Pole Single-Throw (SPST) Open-low	Cut Out (Opens Line to M1)	Cut In (Closes Line to M1)	P70A, P70B, P170A
Single-Pole Single-Throw (SPST) Open-high	Cut In (Closes Line to M1)	Cut Out (Opens Line to M1)	P70C, P70D, P170C, P170D
Single-Pole Double-Throw (SPDT)	Opens 1 to 2 and closes 1 to 3	Closes 1 to 2 and Opens 1 to 3	P70E, P70F
4-wire, 2-circuits, 1 N.O., 1 N.C. Open-low	Cut Out (Opens M2 to Line and Closes M1 to Line)	Cut In (Closes M2 to Line and Opens M1 to Line)	P70G, P70H
4-wire, 2-circuits, 1 N.O., 1 N.C. Open-high	Cut In (Closes M2 to Line and Opens M1 to Line)	Cut Out (Opens M2 to Line and Closes M1 to Line)	P70J, P70K, P170K
Double-Pole Single-Throw (DPST) Open-low	Cut Out (Opens M1 to Line and M2 to Line)	Cut In (Closes M1 to Line and M2 to Line)	P72A, P72B
Double-Pole Single-Throw (DPST) Open-high	Cut In (Closes M1 to Line and M2 to Line)	Cut Out (Opens M1 to Line and M2 to Line)	P72C, P72D



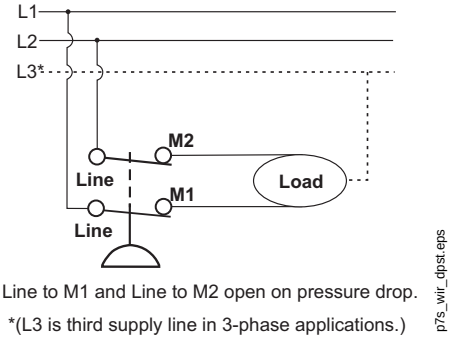
Typical Wiring for SPST Open-Low Switch and Open-High Switch (P70A, B, C, D, and P170A, C, D, Models)



Typical Wiring for SPDT Switch (P70E, F Models)



Typical Wiring for 4-wire 2-circuit Switch (P70G and H Models)

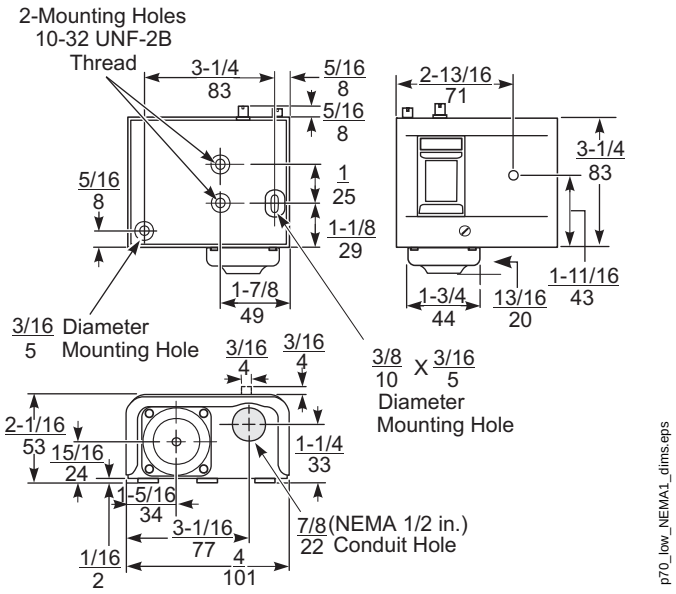


Typical Wiring for DPST Switch (P72A and B Models)

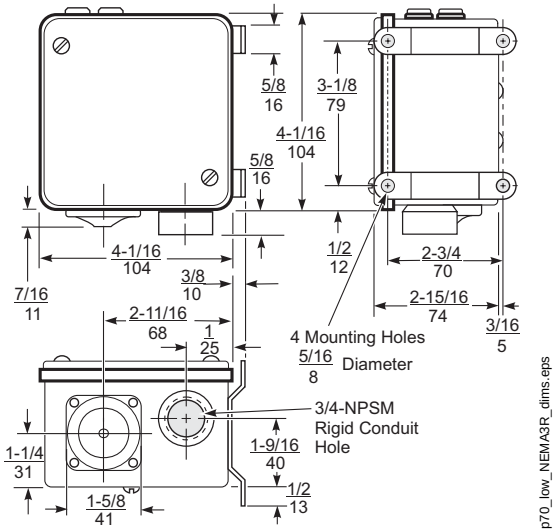
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Controls for Low Pressure Applications (Continued)

Technical Specifications (Continued)



Dimensions for Low Pressure Controls with NEMA 1 Enclosure, in. (mm)*



Dimensions for Low Pressure Controls with NEMA 3R Enclosure, in. (mm)*

*** These dimensions are nominal and are subject to accepted manufacturing tolerances and application variables.**

SPST Electrical Ratings (P70A, B, C, and D, and P170A, C, and D Models)

	Single-Phase Ratings			
	Standard			Hermetic Compressor
	120 VAC	208 VAC	240 VAC	208/240 VAC
Motor Horsepower	2	3	3	--
Motor Full-Load A	24	18.7	17	20
Motor Locked-Rotor A	144	112.2	102	120
Non-Inductive A	22	22	22	--
Pilot Duty - 125 VA at 120 to 600 VAC; 57.5 VA at 120 to 300 VDC				

SPDT Electrical Ratings 1hp Switch (P70E Models)

	Standard Single-Phase Ratings			
	120 VAC	208 VAC	240 VAC	277 VAC [1]
Motor Full Load A	16.0	9.2	8.0	7.0
Motor Locked Rotor A	96.0	55.2	48.0	42.0
Non-Inductive A	16.0	9.2	8.0	-
Pilot Duty	125 VA at 120 to 600 VAC			125 VA at 24 to 600 VAC

1. Rating for P70EC models only

SPDT Electrical Ratings1/4 hp Switch (P70F Models)

	Standard Single-Phase Ratings		
	120 VAC	208 VAC	240 VAC
Motor Full Load A	6.0	3.3	3.0
Motor Locked Rotor A	36.0	19.8	18.0
Non-Inductive A	6.0	6.0	6.0
Pilot Duty	125 VA at 24 to 240 VAC		

4-wire, 2-circuit Electrical Ratings (P70G, H, J, and K, and P170K Models)

	Standard Single-Phase Ratings							
	Line-M2 (Main Contacts)				Line-M1 (Auxiliary Contacts)			
	120 VAC	208 VAC	240 VAC	277 VAC	120 VAC	208 VAC	240 VAC	277 VAC
Motor Full Load A	16.0	9.2	8.0	--	6.0	3.3	3.0	--
Motor Locked Rotor A	96.0	55.2	48.0	--	36.0	19.8	18.0	--
Non-Inductive A	16.0	9.2	8.0	7.2	6.0	6.0	6.0	6.0
Pilot Duty for both sets of contacts	125 VA at 24 to 600 VAC; 57.5 VA at 120 to 300 VDC							

DPST Electrical Ratings (P72A, B, C, and D Models)

	Standard Ratings					Hermetic Compressor Ratings	
	120 VAC, 1Ø	208 VAC, 1Ø	240 VAC, 1Ø	208 VAC, 3Ø	220 VAC, 3Ø	208 VAC, 1Ø	240 VAC, 1Ø
Motor Horsepower	2	3	3	5	5	--	--
Motor Full-Load A	24	18.7	17	15.9	15	24	24
Motor Locked-Rotor A	144	112.2	102	95.4	90	144	144
AC Non-Inductive A	24	24	24	24	24	--	--
DC Non-Inductive A	3	0.5	0.5	0.5	0.5	--	--
Pilot Duty	125 VA at 120 to 600 VAC; 57.5 VA at 120 to 300 VDC						

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