

## P70, P72, and P170 Series Controls for Low Pressure Applications Catalog Page

### 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 to 240 volt single-phase motors up to 3 horsepower, and 208 to 220 volt three-phase motors up to 5 horsepower.

Refer to the *P70, P72, and P170 Series Controls for Low Pressure Applications Product Bulletin (Part No. 24-7664-2608)* for important product application information.

### 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 four-wire, two-circuit switch action allow users to install alarm devices or other control circuits.
- **P72 models** have a double-pole, single-throw (DPST) switch with load-carrying contacts that can provide direct control of 208 to 240 V single-phase motors up to 3 horsepower, and 208 to 220 V 3-phase motors up to 5 horsepower. See the DPST Electrical Ratings (P72A, B, C, and D Models) that follow.



**P70AB-12 MICRO-SET  
Low Pressure Control**

### Repair Information

If the P70, P72, and P170 Series Controls for Low Pressure Applications fail to operate within their specifications, replace the units. For a replacement control, contact the nearest Johnson Controls® representative.



## P70, P72, and P170 Series Controls for Low Pressure Applications Catalog Page (Continued)

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

| Product Code Number  | Switch Action  | Range psi (kPa)               | Differential psi (kPa)             | Pressure Connection                     | Max. Overpressure    | Max. Working Pressure | Limited Knob Adjustment                 |   |                               |
|--|--|-------------------------------|------------------------------------|---|----------------------|-----------------------|---|---|-------------------------------|
| <b>MICRO-SET Controls (For Non-Corrosive Refrigerants)</b> |  |                               |                                    |   |                      |                       |   |   |                               |
| P70AB-12C  | SPST open low  | 12 in. Hg to 80 (-41 to 551)  | Minimum 5 (34)<br>Maximum 35 (241) | 36 in. capillary with 1/4 in. flare nut | 525 psig (3,617 kPa) | 80 psig (551 kPa)     | Supplied, but not assembled             |   |                               |
| P170AB-12C   |  |                               |                                    | 1/4 in. external flare connector        |                      |                       |   |   |                               |
| P70EA-14C  | SPDT   |                               |                                    | 36 in. capillary with 1/4 in. flare nut |                      |                       |   |   |                               |
| P170EA-14C   | 1 to 3 open low<br>1 to 2 close low                  |                               |                                    | 1/4 in. external flare connector        |                      |                       | None                                    |   |                               |
| <b>All-Range Controls (For Non-Corrosive Refrigerants)</b> |  |                               |                                    |   |                      |                       |   |   |                               |
| P70AB-1C   | SPST open low  | 20 in. Hg to 100 (-68 to 690) | Minimum 7 (48)<br>Maximum 50 (345) | 1/4 in. external flare connector        | 325 psig (2,239 kPa) | 100 psig (690 kPa)    | Supplied, but not assembled             |   |                               |
| P70AB-2C   |  |                               |                                    | 36 in. capillary with 1/4 in. flare nut |                      |                       |   |   |                               |
| P70BA-1C   |  |                               |                                    | Manual reset<br>lockout                 |                      |                       | 1/4 in. external flare connector        |   |                               |
| P70BA-10C  |  |                               |                                    |   |                      |                       |   |   |                               |
| P70EA-10C  | SPDT<br>1 to 3 open low<br>1 to 2 close low          |                               |                                    | 5 (34)<br>fixed                         |                      |                       |   |   |                               |
| P72AA-1C   | DPST open low  |                               |                                    | Minimum 7 (48)<br>Maximum 50 (345)      |                      |                       | 36 in. capillary with 1/4 in. flare nut | 1/4 in. external flare connector        | Mounted on differential screw |
| P72AB-1C   |  |                               |                                    |   |                      |                       |   |   |                               |
| P170AB-2C  | SPST open low  |                               |                                    |   |                      |                       | 1/4 in. external flare connector        | 36 in. capillary with 1/4 in. flare nut | None                          |
| P70CA-1C   | SPST open high                                       |                               |                                    |   |                      |                       |   |   |                               |
| P170CA-1C  |  |                               |                                    |   |                      |                       | 1/4 in. external flare connector        |   |                               |
| <b>All-Range Controls (Ammonia-Compatible)</b>             |  |                               |                                    |   |                      |                       |   |   |                               |
| P70AA-5C   | SPST open low  | 20 in. Hg to 100 (-68 to 690) | Minimum 7 (48)<br>Maximum 50 (345) | 1/4 in. SS Internal NPT                 | 325 psig (2,239 kPa) | 100 psig (690 kPa)    | None                                    |   |                               |
| P70CA-4C   | SPST open high                                       |                               |                                    |   |                      |                       |   |   |                               |
| P70GA-11C  | Four-wire,   |                               |                                    |   |                      |                       |   |   |                               |
| P70HA-3C   | Two-circuit<br>Line M1 close low<br>Line M2 open low |                               |                                    |   |                      |                       |   | Manual reset<br>lockout                 |                               |

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

### Technical Specifications

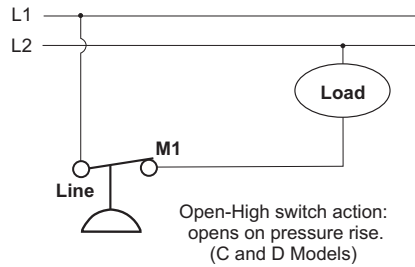
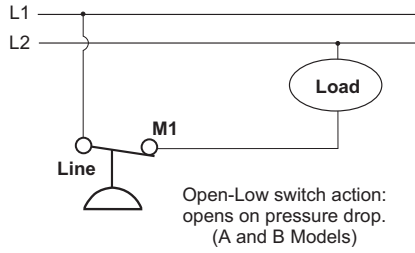
#### Single Pressure Controls Switch Action, Low Event, High Event, and Models

| Switch and Action                                 | Low Event   | High Event  | Models                   |
|---|---|---|--------------------------|
| SPST Open Low                                     | Cut-Out<br>(Opens Line to M1)                       | Cut-In<br>(Closes Line to M1)                       | P70A, P70B, P170A        |
| SPST Open High                                    | Cut-In<br>(Closes Line to M1)                       | Cut-Out<br>(Opens Line to M1)                       | P70C, P70D, P170C, P170D |
| SPDT  | Opens 1 to 2 and<br>closes 1 to 3                   | Closes 1 to 2 and<br>Opens 1 to 3                   | P70E, P70F               |
| Four-Wire, Two-Circuits, 1 N.O., 1 N.C. Open Low  | Cut-Out<br>(Opens M2 to Line and Closes M1 to Line) | Cut-In<br>(Closes M2 to Line and Opens M1 to Line)  | P70G, P70H               |
| Four-Wire, Two-Circuits, 1 N.O., 1 N.C. Open High | Cut-In<br>(Closes M2 to Line and Opens M1 to Line)  | Cut-Out<br>(Opens M2 to Line and Closes M1 to Line) | P70J, P70K, P170K        |
| DPST Open Low                                     | Cut-Out<br>(Opens M1 to Line and M2 to Line)        | Cut-In<br>(Closes M1 to Line and M2 to Line)        | P72A, P72B               |
| DPST Open High                                    | Cut-In<br>(Closes M1 to Line and M2 to Line)        | Cut-Out<br>(Opens M1 to Line and M2 to Line)        | P72C, P72D               |

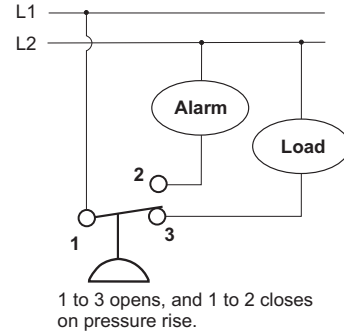


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## Technical Specifications (Continued)



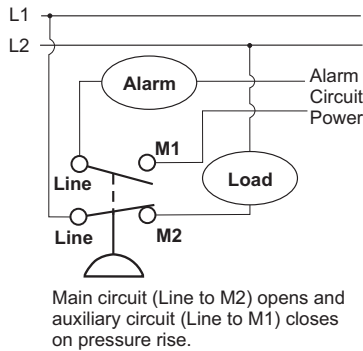
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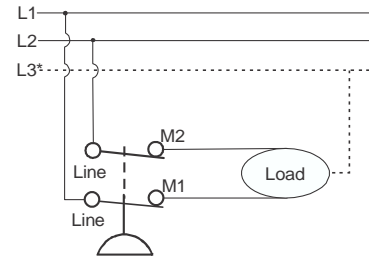
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**Wiring for SPST Open Low Switch and Open High Switch (P70A, B, C, D, and P170A, C, D, Models)**

**Typical Wiring for SPDT Switch (P70E, F Models)**



**Typical Wiring for Four-Wire Two-Circuit Switch (P70G and H Models)**



\*(L3 is third supply line in three-phase applications.)

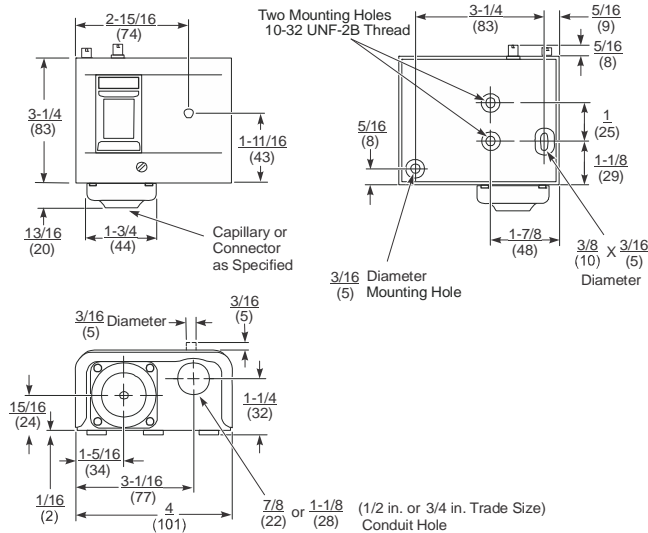
**Typical Wiring for DPST Switch (P72A and B Models)**

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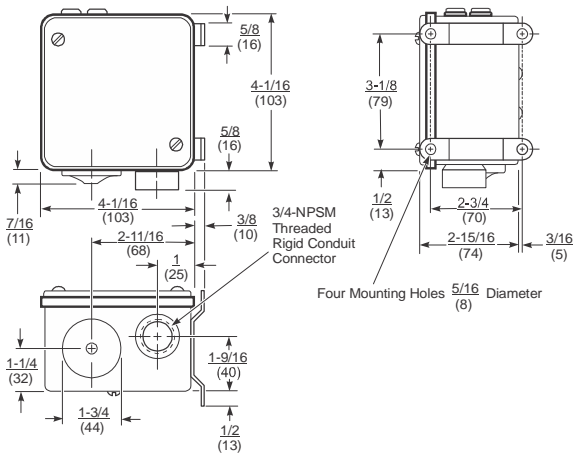


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## Technical Specifications (Continued)



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, 120 to 600 VA; 57.5 VA, 120 to 300 VDC |         |         |                     |

### SPDT Electrical Ratings 1hp Switch (P70E Models)

|                      | Standard Single-Phase Ratings |         |         |                         |
|----------------------|-------------------------------|---------|---------|-------------------------|
|                      | 120 VAC                       | 208 VAC | 240 VAC | 277 VAC <sup>1</sup>    |
| 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 Ratings 1/4 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       |         |         |

### Four-Wire, Two-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, Single-Phase                               | 208 VAC, Single-Phase | 240 VAC, Single-Phase | 208 VAC, Three-Phase | 220 VAC, Three-Phase | 208 VAC, Single-Phase       | 240 VAC, Single-Phase |
| 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 |                       |                       |                      |                      |                             |                       |

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2018 Johnson Controls. [www.johnsoncontrols.com](http://www.johnsoncontrols.com)