



## Description

**Figure 1: P70MA-1 Dual Pressure Control**



P70, P72, and P170 Series dual pressure controls are designed primarily for use as combination high and low pressure controls on commercial refrigeration and air conditioning applications.

These controls are available in several pressure ranges and are compatible with most common refrigerants. Ammonia compatible models are also available.

These controls respond directly to system pressure changes on both high and low sides, and can provide single-device control of the compressor.

Controls are available in several different electrical ratings and switch configurations, including independent high and low pressure switches on P70S and P170S models. P72 models provide direct control of 208 V to 240 V, single-phase motors of up to 3 hp, and 208 V to 220 V, three-phase motors up to 5 hp.

Refer to the *P70, P72, and P170 Series Controls for Dual Pressure Applications Product Bulletin (LIT-125455)* for important product application information.

## Features

### All-steel case and cover

Long lasting, rugged protection for internal components

### Sight-set calibrated pressure adjustment

Visible pressure scale on NEMA 1 enclosure models, fully adjustable through the range without removing the cover

### MICRO-SET™ differential option

Precise control on low pressure applications

## Additional P70S and P170S features

The following P70S and P170S features make the control more versatile and reduce inventory:

### Independent high and low pressure switches

Meets a variety of dual pressure application wiring requirements

### Convertible automatic or manual reset lockout for high pressure

Adaptable to several dual pressure applications in the field

## Applications

NEMA 1 enclosures are standard on most models. NEMA 3R enclosures are also available.

### P70S and P170S models

P70S and P170S controls feature independently operated high and low pressure single-pole, double-throw (SPDT) switches that you can wire to satisfy a variety of control requirements. These adaptable controls also come with a high pressure manual reset lockout mechanism that you can convert to automatic reset.

### P70L, P70M, P70N, and P170L, P170M, P170N models

These controls feature a single-pole, single-throw (SPST) switch. Models are available with automatic or manual reset lockout options. Models with manual reset are available with either high-side-only manual reset, or low-side and high-side manual

reset. P70L and P70M ammonia-compatible models are also available.

### P72 models

P72 controls feature a double-pole, single-throw (DPST) switch with load-carrying contacts that can provide direct control of 208 VAC to 240 VAC, single-phase motors up to 3 hp, and 208 to 220 VAC, three-phase motors up to 5 hp. See [Electrical ratings](#).

Some models are available with limited knob adjustment, which restricts adjustment of the

pressure settings and deters over-adjustment or tampering.

## Repair information

If a P70, P72, or P170 series control fails to operate within its specifications, replace the unit. For a replacement control, contact the nearest Johnson Controls® representative.

## Selection charts

### Note:

- In each of the following tables, if the high pressure side is UL listed, the high pressure side only is UL Listed as a Refrigeration Pressure Limiting Control.
- The high side differential is not adjustable.

**Table 1: Selection chart for MICRO-SET controls for non-corrosive refrigerants**

| Product code number | Switch action        | Low pressure side, psi (kPa)     |                                    | High pressure side, psi (kPa) |   | Pressure connector                      | Limited knob adjustment | High pressure side UL listed |
|---------------------|----------------------|----------------------------------|------------------------------------|-------------------------------|---|---|-------------------------|------------------------------|
|                     |                      | Range                            | Differential                       | Range                         | Differential  |   |                         |                              |
| P70LB-6C            | SPST                 | 12 in. Hg to 80 psi (-41 to 552) | Minimum 5 (34)<br>Maximum 35 (241) | 100 to 500 (690 to 3,447)     | Fixed, approximately 65 (448)   | 36 in. capillary with 1/4 in. flare nut | Low cutout              | Yes                          |
| P70SA-1C            | Two independent SPDT |                                  |                                    |                               | Lockout fixed at 65 (448), you can set the reset to automatic or manual |   | None                    |                              |
| P170LB-6C           | SPST                 |                                  |                                    |                               | Fixed, approximately 65 (448)   | 1/4 in. external flare connector        | Low cutout              |                              |
| P170MA-18C          |                      |                                  |                                    |                               | Lockout requires manual reset   |   | None                    |                              |
| P170SA-1C           | Two independent SPDT |                                  |                                    |                               | Fixed at 65 (448) or lockout requires manual reset                      |   |                         |                              |

**Table 2: Selection chart for all-range controls for non-corrosive refrigerants**

| Product code number | Switch action | Low pressure side, psi (kPa)      |                      | High pressure side, psi (kPa) |                               | Pressure connector                      | Limited knob adjustment | High pressure side UL listed |
|---------------------|---------------|-----------------------------------|----------------------|-------------------------------|-------------------------------|---|-------------------------|------------------------------|
|                     |               | Range                             | Differential         | Range                         | Differential                  |   |                         |                              |
| P70LB-1C            | SPST          | 20 in. Hg to 100 psi (-68 to 690) | Minimum 7 (48)       | 100 to 500 (690 to 3,447)     | Fixed, approximately 65 (448) | 36 in. capillary with 1/4 in. flare nut | Low cutout              | Yes                          |
| P70MA-1C            |               |                                   | Maximum 50 (345)     |                               | Lockout requires manual reset |   | None                    |                              |
| P70NA-1C            |               |                                   | Fixed (manual reset) |                               |                               |   | No                      |                              |
| P72LA-1C            | DPST          |                                   | Minimum 7 (48)       |                               | Fixed, approximately 65 (448) |   | Low cutout              | Yes                          |
| P72LB-1C            |               |                                   | Maximum 50 (345)     |                               | Lockout requires manual reset |   | None                    |                              |
| P72MA-1C            |               |                                   | Fixed (manual reset) |                               |                               |   |                         |                              |
| P72NA-1C            |               |                                   |                      |                               |                               |   |                         |                              |
| P170LB-1C           | SPST          |                                   | Minimum 7 (48)       |                               | Fixed, approximately 65 (448) | 1/4 in. external flare connector        | Low cutout              |                              |
| P170MA-1C           |               |                                   | Maximum 50 (345)     |                               | Lockout requires manual reset |   | None                    |                              |
| P170NA-1C           |               |                                   | Fixed (manual reset) |                               |                               |   | No                      |                              |

**Table 3: Selection chart for all-range ammonia compatible controls**

| Product code number | Switch action | Low pressure side, psi (kPa)      |                  | High pressure side, psi (kPa) |                               | Pressure connector             | Limited knob adjustment | High pressure side UL listed |
|---------------------|---------------|-----------------------------------|------------------|-------------------------------|-------------------------------|--------------------------------|-------------------------|------------------------------|
|                     |               | Range                             | Differential     | Range                         | Differential                  |                                |                         |                              |
| P70LA-2C            | SPST          | 20 in. Hg to 100 psi (-68 to 690) | Minimum 7 (48)   | 100 to 500 (690 to 3,447)     | Fixed, approximately 65 (448) | 1/4 in. internal NPT connector | None                    | Yes                          |
| P70MA-2C            |               |                                   | Maximum 50 (345) |                               | Lockout requires manual reset |                                |                         |                              |

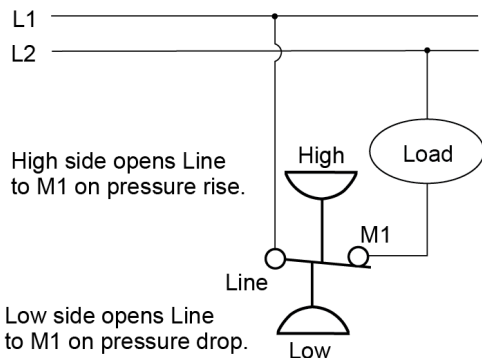
ⓘ **Note:** For information about models not listed, contact Johnson Controls/PENN® Refrigeration Application Engineering at 1-800-275-5676.

## Technical specifications

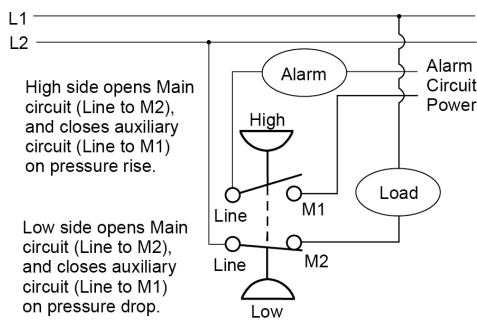
**Table 4: Maximum pressures**

| Pressure                 | Low side            |                     | High side           |
|--------------------------|---------------------|---------------------|---------------------|
|                          | All range           | MICRO-SET           |                     |
| Maximum working pressure | 100 psi (552 kPa)   | 80 psi (690 kPa)    | 500 psi (3,447 kPa) |
| Maximum overpressure     | 325 psi (2,241 kPa) | 525 psi (3,620 kPa) | 525 psi (3,620 kPa) |

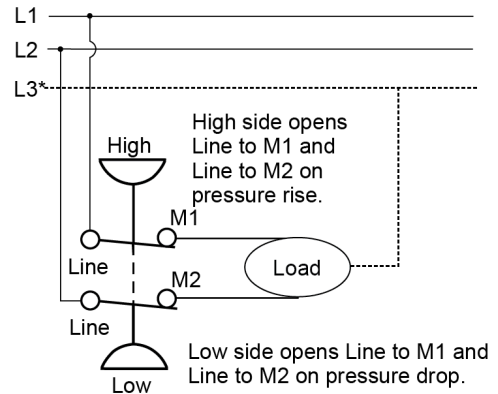
**Figure 2: Standard wiring for an SPST switch**



**Figure 3: Standard wiring for a P70P four-wire, two-circuit switch model**



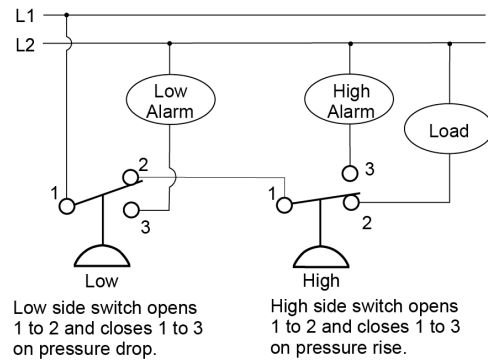
**Figure 4: Standard wiring for a DPST switch**



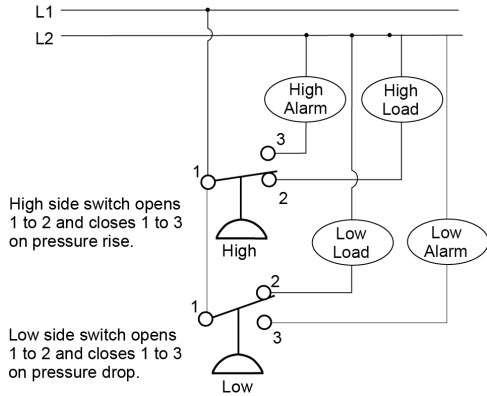
\*(L3 is third supply line in 3-phase applications.)

Figure 5 and Figure 6 illustrate two P70S or P170S SPDT switches wired in various control configurations that switch loads with an optional high side alarm and low side alarm.

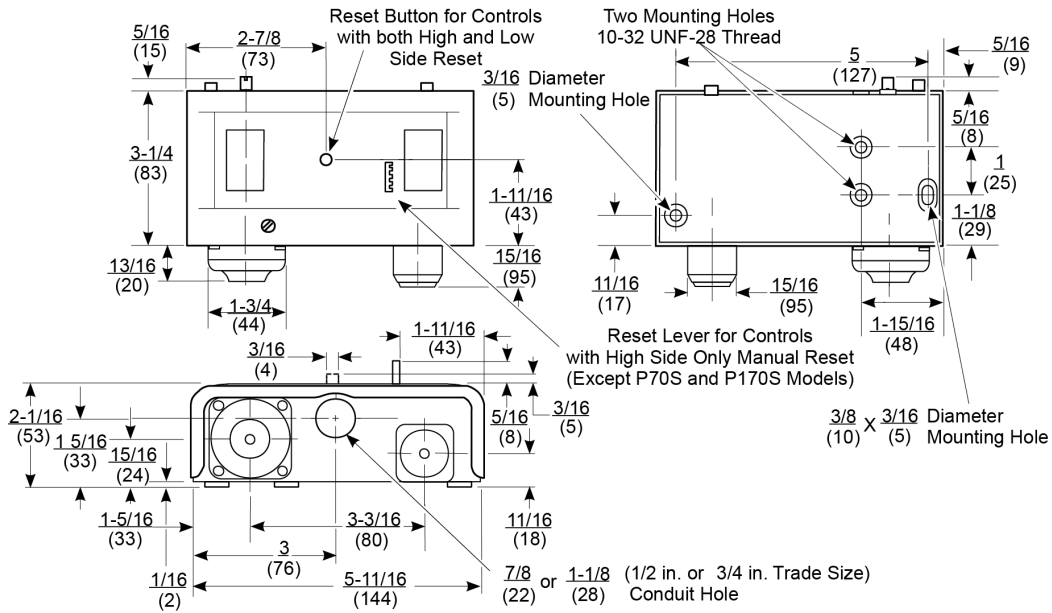
**Figure 5: Two SPDT switches wired as a dual pressure control**



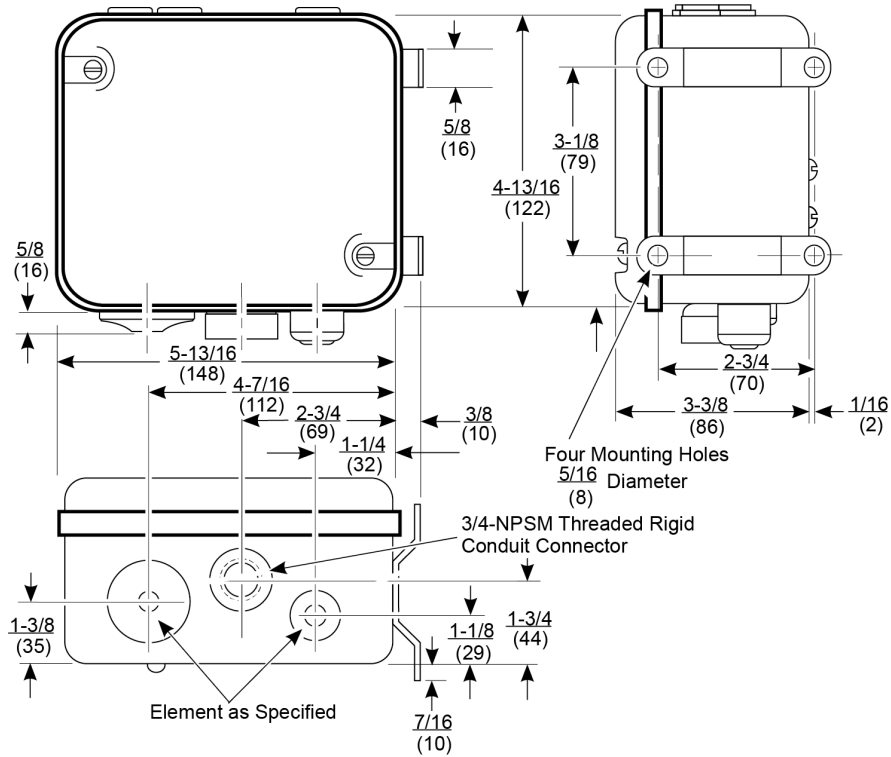
**Figure 6: Two SPDT switches wired to control two different loads**



**Figure 7: Dimensions for P70, P72, and P170 dual pressure controls with NEMA 1 enclosure, in. (mm)**



**Figure 8: Dimensions for P70, P72, and P170 dual pressure control with NEMA 3R enclosure, in. (mm)**



① **Note:** These dimensions are nominal and are subject to accepted manufacturing tolerances and application variables.

## Electrical ratings

**Table 5: DPST electrical ratings for P72L, P72M, and P72N**

| Description             | Standard single-phase 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 amps    | 24  | 18.7                  | 17                    | 15.9                 | 15                   | 24                          | 24                    |
| Motor locked-rotor amps | 144   | 112.2                 | 102                   | 95.4                 | 90                   | 144                         | 144                   |
| AC non-inductive amps   | 24  | 24                    | 24                    | 24                   | 24                   | —                           | —                     |
| DC non-inductive amps   | 3   | 0.5                   | 0.5                   | 0.5                  | 0.5                  | —                           | —                     |
| Pilot duty              | 125 VA at 120 VAC to 600 VAC<br>57.5 VA at 120 VDC to 300 VDC |                       |                       |                      |                      |                             |                       |

**Table 6: SPST electrical ratings for P70L, P70M, P70N, and P170L, P170M, P170N**

| Description             | Single-phase ratings  |         |         |                             |
|-------------------------|---|---------|---------|-----------------------------|
|                         | Standard single-phase ratings                                 |         |         | Hermetic compressor ratings |
|                         | 120 VAC   | 208 VAC | 240 VAC | 208/240 VAC                 |
| Motor horsepower        | 2   | 3       | 3       | —                           |
| Motor full-load amps    | 24  | 18.7    | 17      | 24                          |
| Motor locked-rotor amps | 144   | 112.2   | 102     | 144                         |
| Non-inductive amps      | 22  | 22      | 22      | —                           |
| Pilot duty              | 125 VA at 120 VAC to 600 VAC<br>57.5 VA at 120 VDC to 300 VDC |         |         |                             |

**Table 7: SPDT electrical ratings for P70S and P170S**

| Description             | Standard single-phase ratings                  |         |         |         |
|-------------------------|--|---------|---------|---------|
|                         | 120 VAC  | 208 VAC | 240 VAC | 277 VAC |
| Motor full-load amps    | 16.0   | 9.2     | 8.0     | 7.0     |
| Motor locked-rotor amps | 96.0   | 55.2    | 48.0    | 42.0    |
| Non-inductive amps      | 16.0   | 9.2     | 8.0     | —       |
| Pilot duty              | 125 VA at 24 VAC, 720 VA at 120 VAC to 277 VAC |         |         |         |

**Table 8: Four-wire, two-circuit electrical ratings for P70P**

| Description             | Standard single-phase ratings                                 |         |         |         |                                |         |         |         |
|-------------------------|---|---------|---------|---------|--------------------------------|---------|---------|---------|
|                         | Line-M2 for main contacts                                     |         |         |         | Line-M1 for auxiliary contacts |         |         |         |
|                         | 120 VAC   | 208 VAC | 240 VAC | 277 VAC | 120 VAC                        | 208 VAC | 240 VAC | 277 VAC |
| Motor full-load amps    | 16.0  | 9.2     | 8.0     | —       | 6.0                            | 3.3     | 3.0     | —       |
| Motor locked-rotor amps | 96  | 55.2    | 48      | —       | 36                             | 19.8    | 18.0    | —       |
| Non-inductive amps      | 16.0  | 9.2     | 8.0     | 7.2     | 6.0                            | 6.0     | 6.0     | 6.0     |
| Pilot duty              | 125 VA at 120 VAC to 600 VAC<br>57.5 VA at 120 VDC to 300 VDC |         |         |         |                                |         |         |         |

## Product warranty

This product is covered by a limited warranty, details of which can be found at [www.johnsoncontrols.com/buildingswarranty](http://www.johnsoncontrols.com/buildingswarranty).

## Single point of contact

| APAC   | EU  | UK   | NA/SA   |
|--|---|--|---|
| JOHNSON CONTROLS<br>C/O CONTROLS<br>PRODUCT MANAGEMENT<br>NO. 32 CHANGJIANG RD<br>NEW DISTRICT<br>WUXI JIANGSU PROVINCE<br>214028<br>CHINA | JOHNSON<br>CONTROLS<br>VOLTAWEG 20<br>6101 XK ECHT<br>THE NETHERLANDS | JOHNSON<br>CONTROLS<br>TYCO PARK<br>GRIMSHAW LANE<br>MANCHESTER<br>M40 2WL<br>UNITED KINGDOM | JOHNSON<br>CONTROLS<br>5757 N GREEN BAY<br>AVE.<br>GLENDALE, WI<br>53209<br>USA |

## Contact information

Contact your local Johnson Controls representative:  
[www.johnsoncontrols.com/locations](http://www.johnsoncontrols.com/locations)

Contact Johnson Controls:  
[www.johnsoncontrols.com/contact-us](http://www.johnsoncontrols.com/contact-us)