P70, P72, and P170 Series Controls for Dual Pressure Applications Installation Guide

Part No. 24-8607-0 Rev. K

2026-04-28

Applications

The P70, P72, and P170 Controls for Dual Pressure Applications provide combined high and low pressure control of compressors on commercial refrigeration and air conditioning applications.

Important: Except for the models listed as refrigeration pressure cut out controls, use this P70, P72, and P170 Series Control only as an operating control. Where failure or malfunction of the P70, P72, or P170 Pressure Control could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or cut out controls, intended to warn of or protect against failure or malfunction of the P70, P72, or P170 Pressure Control.

P70S and P170S models have 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 have a high pressure manual reset lockout mechanism that is convertible to automatic reset. See Table 1.

P70L, M, N, and P170L, M, N models have a single-pole, single-throw (SPST) switch.

P70L, M, N, and P170L, M, N 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. See Table 1 and Table 3.

P70L and P70M ammonia compatible models are available. See Table 2.

P72 models have a double-pole, single-throw (DPST) switch with load-carrying contacts that can provide direct control of 120/600 VAC, single-phase motors and 208/240 VAC, 3-phase motors. See Table 3.

The controls are available in several pressure ranges and are compatible with most common refrigerants.

The MICRO-SET® option provides fine adjustment of the differential setting for precision pressure control of low pressure applications.

Some models feature limited knob adjustment, which restricts adjustment of the pressure settings and deters over-adjustment or tampering. See Adjusting the low pressure limit knob.

A manual reset lockout option prevents the pressure control from resetting automatically after the control reaches the cut out setpoint, and provides shutdown capability for unmonitored equipment. See Performing a manual reset.

All currently available models come with Type 1(NEMA) enclosures.

Table 1 and Table 2 list the standard models and features of P70, P72, and P170 controls for dual pressure applications. These standard models are available through most authorized Johnson Controls/PENN distributors.

Selection chart

Note: The high pressure side, and not the low pressure side, of the models in the following table are UL Listed as refrigeration pressure cut out controls.

© 2026 Johnson Controls. All rights reserved.

Table 1: Standard MICRO-SET P70, P72, and P170 dual pressure controls for non-corrosive refrigerants

Model Code Number	Switch Action	Low Pressure, psig (kPa)		High Pressure Side, psig (kPa)		Pressure Connector	Limited Knob Adjustment
		Range	Differential	Range	Differential (Non-Adjustable)		
P70LB-6C	SPST	12 in. Hg to 80 psig (-41 to 552)	Min 5 (34) Max 35 (241)	100 to 500 (690 to 3,447)	Fixed Approximately 65 (448)	36 in. Capillary with 1/4 in. Flare Nut	Low cut out
P70MA-18C					Lock out Requires Manual Reset		None
P70SA-1C	Two Independent SPDT				Fixed at 65 (448) or Lock out Requires Manual Reset		None
P170LB-6C	SPST				Fixed Approximately 65 (448)	1/4 in. Male Flare Connector	Low cut out
P170MA-18C					Lock out Requires Manual Reset		None
P170SA-1C	Two Independent SPDT				Fixed at 65 (448) or Lock out Requires Manual Reset		None

Note: The high pressure side, and not the low pressure side, of the models in the following table are UL Listed as refrigeration pressure cut out controls.

Table 2: Standard all-range P70, P72, and P170 dual pressure controls for ammonia

Model Code Number	Switch Action	Low Pressure, psig (kPa)		High Pressure Side, psig (kPa)		Pressure Connector	Limited Knob Adjustment
		Range	Differential	Range	Differential (Non-Adjustable)		
P70MA-2C	SPST	20 in. Hg to 100 psig (-68 to 690)	Min 7 (48) Max 50 (345)	100 to 500 (690 to 3,447)	Lock out Requires Manual Reset	1/4 in. Female NPT Connector	None

Note: Except for the P70NA-1 and the P170NA-1 models, the high pressure side, and not the low pressure side, of the models in the following table are UL Listed as refrigeration pressure cut out controls.

© 2026 Johnson Controls. All rights reserved.

Table 3: Standard all-range P70, P72, and P170 dual pressure controls for non-corrosive refrigerants

Model Code Number	Switch Action	Low Pressure, psig (kPa)		High Pressure Side, psig (kPa)		Pressure Connector	Limited Knob Adjustment
		Range	Differential	Range	Differential (Non-Adjustable)		
P70LB-1C	SPST	20 in. Hg to 100 psig (-68 to 690)	Min 6 (41) Max 50 (345)	100 to 500 (690 to 3,447)	Fixed Approximately 65 (448)	36 in. Capillary with 1/4 in. Flare Nut	Low cut out
P70MA-1C					Lock out Requires Manual Reset		
P70NA-1C			Fixed (Manual Reset)				None
P72MA-1C	DPST		Min 7 (48) Max 50 (345)		Lock out Requires Manual Reset		None
P170LB-1C	SPST		Min 7 (48) Max 50 (345)		Fixed Approximately 65 (448)	1/4 in. Male Flare Connector	Low cut out
P170MA-1C					Lock out Requires Manual Reset		None
P170NA-1C			Fixed (Manual Reset)				

Functionality

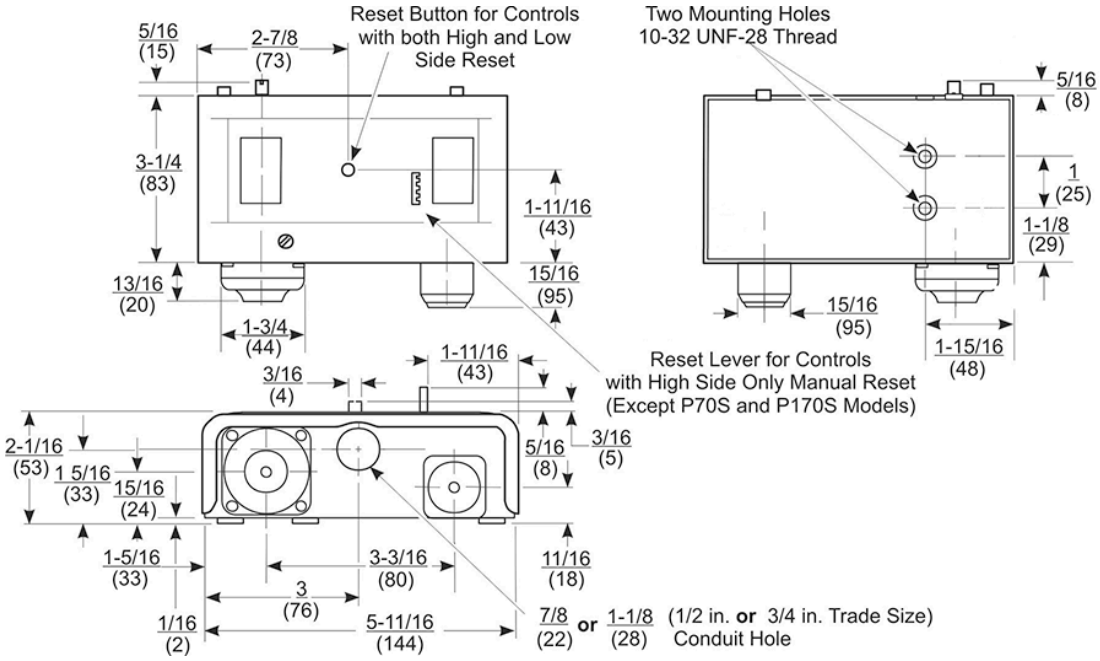
Table 4: Functionality

Model	Function	Setpoint – Adjustable / Fixed	Contact configuration – Reset Action (Manual/Auto)	Action Type Description
P70SA, P170SA	Operating	Adjustable ⓘ **Note:** The high pressure cut out trip value is factory-set	SPDT – auto	2.B.L
	Cut-out		SPDT – auto	
	Operating		SPDT – manual	2.B.L.D.H
	Cut-out		SPDT – manual	
P70L, P170L / P72L dual pressure control	Operating	Adjustable ⓘ **Note:** Use the high pressure cut out only at the factory-set trip value	SPST / DPST N.C. contacts open High or Low Pressure – Auto reset	2.B.L for all ratings other than 600 V; 2.C.L for 600 V
P70M, P170M / P72M dual pressure control	Operating		SPST / DPST N.C. contacts open High Pressure – Manual reset	2.B.L.D.J for all ratings other than 600 V; 2.C.L.D.J for 600 V
			SPST / DPST N.C. contacts open Low Pressure – Auto reset	2.B.L for all ratings other than 600 V; 2.C.L for 600 V
P70N, P170N / P72N dual pressure control	Operating		SPST / DPST N.C. contacts open High or Low Pressure – Manual reset	2.B.L.D.J for all ratings other than 600 V; 2.C.L.D.J for 600 V

© 2026 Johnson Controls. All rights reserved.

Dimensions

Figure 1: Dimensions for P70, P72, and P170 Dual Pressure Controls with NEMA 1 Enclosure, in. (mm)



Mounting

CAUTION

Risk of Property Damage

Mount the pressure control separately from the electrical cabinet and seal all electrical piping to prevent ammonia from migrating to electrical components. Where there may be exposure to ammonia, use only ammonia-compatible control modules and pressure connections. System shutdown due to improper adjustment may cause property damage.

CAUTION

Risk of Property Damage

Mount the P70, P72, or P170 Pressure Control according to the instructions and guidelines included with the control. These instructions and guidelines are intended to reduce the risk of malfunction of the product and resulting property damage. Failure to follow these instructions and guidelines could cause the control to malfunction, resulting in property damage.

Important: Use only the mounting screws supplied with the mounting bracket to avoid damaging internal components. Be careful not to distort or bend the control case when mounting the control to an uneven surface. Using other screws or bending the control case will void the warranty.

© 2026 Johnson Controls. All rights reserved.

When you install the control, adhere to the following guidelines:

- Mount the control in an accessible position, where the control and pressure-connection lines are not subject to damage.
- Mount the pressure control upright and level.
- Position the pressure-connection lines to allow drainage away from the control bellows.
- Position the pressure-tap points on the top side of the refrigerant lines to reduce the possibility of oil, liquids, or sediment accumulating in the bellows, which could cause the control to malfunction.
- Mount controls with Type 1 (NEMA) enclosures on horizontal or vertical flat surfaces.
- Use the two supplied screws with the threaded holes at the back of the control to mount the control to the appropriate bracket for your surface.

Figure 2: Mounting a control on a horizontal surface with BKT38A-6xxR

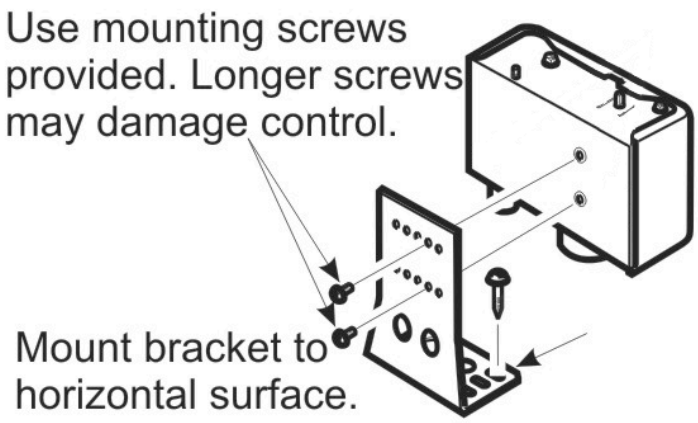
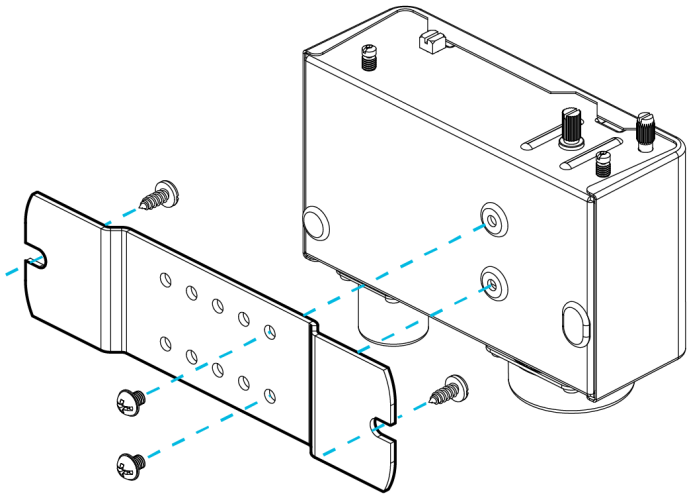


Figure 3: Mounting a control on a vertical surface with BKT40A-6xxR



© 2026 Johnson Controls. All rights reserved.

Wiring

WARNING

Risk of Electric Shock

Disconnect or isolate all power supplies before making electrical connections. More than one disconnect or isolation may be required to completely de-energize equipment. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

- **Important:** Use copper conductors only. Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the P70, P72, or P170 Pressure Control electrical ratings.
- **Important:** Use the included terminal screws in the switch block. If you use other terminal screws, you void the warranty and could damage the switch.

P70, P72, and P170 controls for dual pressure applications are available with several switch options and electrical ratings. Check the label inside the control cover for the model number, switch action, and electrical rating. Check the wiring terminal designations on the control switch block, and see the following guidelines and applicable wiring diagrams, when wiring the control. For switch actions and models, see Technical specifications.

Figure 4: Standard wiring for an SPST switch

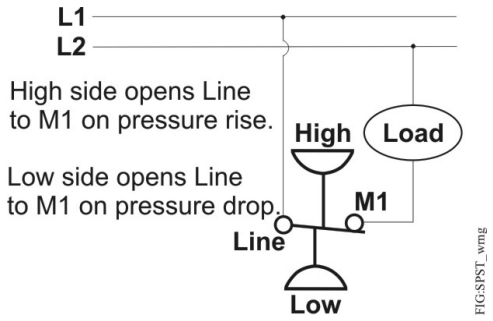
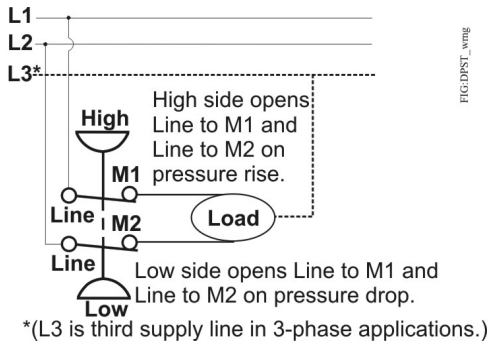


Figure 5: Standard wiring for a DPST switch



© 2026 Johnson Controls. All rights reserved.

Figure 6: Standard wiring for two SPDT switches

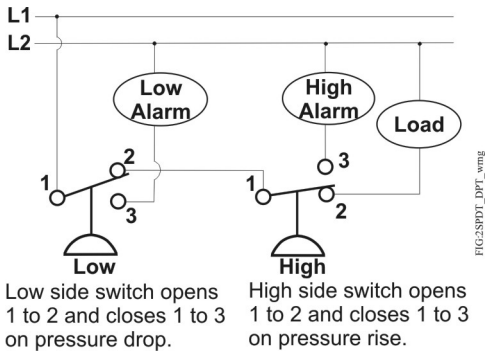
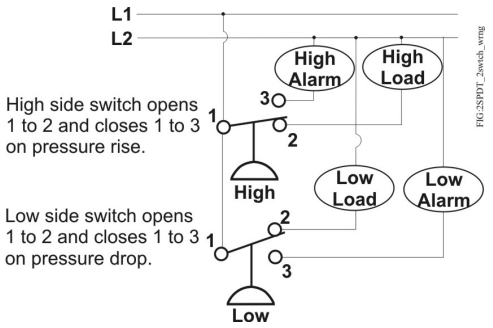


Figure 7: Standard wiring for two SPDT switches with different loads



Piping

CAUTION

Risk of Environmental and Property Damage

Avoid sharp bends in the capillary tubes. Sharp bends can weaken or kink capillary tubes, which may result in refrigerant leaks or restrictions of flow.

CAUTION

Risk of Environmental and Property Damage

Coil and secure excess capillary tubing away from contact with sharp or abrasive objects or surfaces. Vibration or sharp or abrasive objects in contact with capillary tubes can cause damage that may result in refrigerant leaks or loss of element charge, which may result in damage to the environment or property.

- **Important:** If the control is installed on equipment that contains hazardous or regulated materials such as certain refrigerants or lubricants, you must comply with all standards and regulations governing the containment and handling of those materials.
- **Important:** Do not apply more than 9 ft·lb (12 N·m) of torque to the flare nuts on pressure connection line fittings. Overtightening or applying more than 9 ft·lb (12 N·m) of torque could cause seal failure and voids your warranty.

© 2026 Johnson Controls. All rights reserved.

P70, P72, and P170 dual pressure controls are typically connected to the controlled equipment by a capillary, except ammonia compatible models. These controls are available with a variety of pressure connection styles.

Avoid severe pressure pulsation at high side pressure connections. Install the pressure connection to pressure-tap points away from the compressor, to minimize the effects of pressure pulsation from reciprocating compressors.

- **Important:** After you install the control, evacuate pneumatic and pressure connection lines to remove air, moisture, and other contaminants in a manner consistent with applicable environmental regulations and standards.

Setup and adjustments

⚠ CAUTION

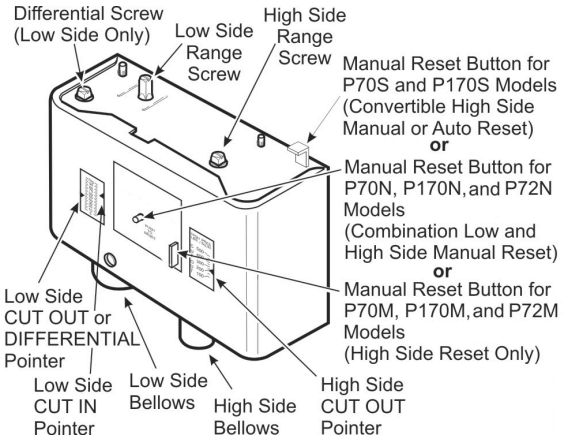
Risk of Property Damage

Obtain and use the compressor manufacturer's net oil bearing pressure specifications. If necessary, reset the cut out pressure difference to the manufacturer's specifications. Using improper pressure settings may damage the control, compressor, or other controlled equipment.

- **Important:** Use the pressure control settings recommended by the manufacturer of the controlled equipment. Do not exceed the pressure ratings of the controlled equipment or any of its components when checking pressure control operation or operating the controlled equipment.
- **Important:** After you mount, wire, and evacuate the control, attach a reliable set of gauges to the controlled equipment, and operate the equipment for at least three cycles at the pressures necessary to verify the control setpoints and correct equipment operation.

Adjustment procedures for the P70, P72, and P170 dual pressure controls vary depending on the model. To adjust the controls, complete the procedures in the following sections. Refer to the product label inside the control cover for the model number and switch action. Check the front of the control cover to determine if the control is an all-range or MICRO-SET model. For control adjustment components, see the following figure.

Figure 8: Dual pressure control adjustment components



© 2026 Johnson Controls. All rights reserved.

Setting up all-range controls

Set up only the low side of an all-range control. The low side of all-range controls displays the cut in and cut out setpoints.

1. To adjust the cut in and cut out setpoints up or down simultaneously, turn the range screw. The adjustment maintains the set differential value.
2. To adjust the cut out setpoint and change the differential value, turn the differential screw.

Setting up MICRO-SET controls

Set up only the low side of a MICRO-SET control. The low side of MICRO-SET controls features a scale plate that displays the cut in setpoint on the right and the differential setting on the left.

1. To adjust the cut in setpoint, turn the range screw.
2. To adjust the cut out pressure and change the differential setting, turn the differential screw.

Setting up dual pressure controls

Set up only the high side of a dual pressure control. The high side scale plate of the P70, P72, and P170 dual pressure controls displays only the cut out setpoint. Turn the range screw to adjust the cut out setpoint.

Note: The high side differential is fixed at approximately 65 psi.

Important: Do not adjust the pointers beyond the highest or lowest indicator marks on the control's pressure scale. If you adjust the pointers beyond the indicator marks, you could damage screw threads or cause inaccurate control operation, and you void the warranty.

To adjust the dual pressure controls, complete the following steps:

1. To set the low side cut in setpoint, turn the low side range screw.
   - All-range controls: Turn the screw clockwise to raise the cut in setpoint.
   - MICRO-SET controls: Turn the screw clockwise to lower the cut in setpoint.
2. To adjust the differential, turn the differential screw.
   - All-range controls: Turn the screw clockwise to raise the cut out setpoint.
   - MICRO-SET controls: Turn the screw clockwise to increase the differential value.
3. Set the high side cut out setpoint. To raise the setpoint, turn the high side range screw clockwise. To lower the setpoint, turn the high side range screw counterclockwise.
4. On P70S and P170S models, set the reset operation for high side automatic reset or manual reset lockout. See Performing a manual reset, or for P70S and P170S models, see Configuring a P70S or P170S control as automatic or manual reset.

Performing a manual reset

Pressure controls with the manual reset option lock out when they reach the cut out pressure setpoint. You must manually reset the control to restart the controlled equipment. The manual reset mechanism is trip-free and the user cannot override it by blocking or tying down the reset button.

1. Before you reset locked-out equipment, determine and remedy the cause of the lockout.
2. Wait for the sensed pressure to return to the appropriate value:
   - When a lockout is caused by the control's low side cut out, wait for the sensed pressure to rise to the cut in setpoint.
   - When a lockout is caused by the control's high side cut out, wait for the sensed pressure to drop at least 70 psig below the cut out setpoint.

© 2026 Johnson Controls. All rights reserved.

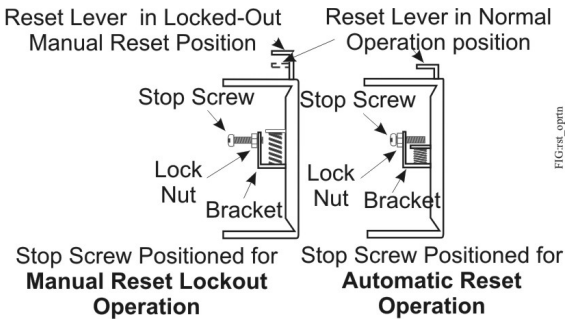
3. Press and release the manual reset button to restore operation of the controlled equipment.

Configuring a P70S or P170S control as automatic or manual reset

The P70S and P170S controls have a convertible high side pressure reset. A cut out occurs if the pressure drops to the cut out value minus the differential. Set the control to be reset manually or to reset automatically after a cut out. To perform a manual reset, you press down the reset lever.

1. Disconnect all power sources to the pressure control and remove the control cover.
2. Choose the reset operation and adjust the stop screw.
   - **For Manual Reset Operation:** Loosen the lock nut, and unscrew the stop screw, being careful to not remove the screw completely from the bracket.
   - **For Automatic Reset Operation:** Loosen the lock nut, push the reset lever down, and screw in the stop screw fully.
3. Tighten the lock nut to hold the stop screw in place, and replace the control cover.
4. Restore all power sources and cycle the equipment to check the control operation.

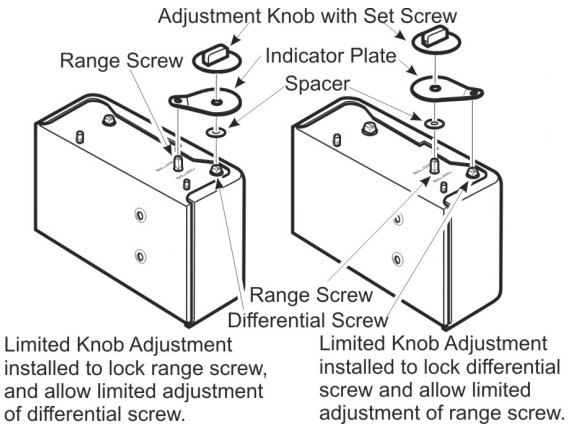
Figure 9: High pressure reset mechanism for P70S and P170S controls



Adjusting the low pressure limit knob

Some models of control include a limited knob adjustment kit which is for only the low pressure side of the control. The knob restricts the adjustment of the low-side range and differential screws, and deters over-adjustment or tampering with the control. A stop on the knob limits adjustments to less than one turn.

Figure 10: Limited knob adjustment kit



© 2026 Johnson Controls. All rights reserved.

To install the limited knob adjustment kit, complete the following steps:

1. Determine which screw you want to adjust and install the knob accordingly:
   - To lock the differential adjustment screw and allow limited adjustment of the range screw, install the knob on the range screw.
   - To lock the range screw and allow limited adjustment of the differential screw, install the knob on the differential screw.
2. Adjust the control pointers, to the high event and low event setpoints that you want on all-range controls, or to the differential setting on MICRO-SET controls.
3. Place the spacer on the adjustment screw that you want.
   - All-range controls with limited knob adjustment kits have round and knurled adjustment screws. Place the spacer on the range screw.
   - MICRO-SET controls have square adjustment screws. Place the spacer on the same adjustment screw as the knob.
4. Align the large end of the indicator plate over the adjustment screw with the spacer.
5. Align the small end of the indicator plate over the adjustment screw to be locked.
6. Align the knob over the large end of the indicator plate.
7. Attach the knob to the adjustment screw, and tighten the set screw.

ⓘ **Note:** The limited knob adjustment kit is for exclusively an all-range control or exclusively a MICRO-SET control. You cannot interchange.

Electrical ratings

Table 5: SPST electrical ratings

cULus standard single-phase ratings					
VAC at 60 Hz	**120 VAC**	**208 VAC**	**240 VAC**	**480 VAC**	**600 VAC**
Full load amps	24	24	24	5	4.8
Locked rotor amps	144	144	144	30	28.8
Resistive amps	24	24	24	—	—
Pilot duty	125 VA at 120 VAC to 600 VAC. 20 VA at 120 VDC to 300 VDC.				

Table 6: SPDT electrical ratings

cULus				
VAC at 60 Hz	**120 VAC**	**208 VAC**	**240 VAC**	**277 VAC**
Full load amps	16	9.2	8	7
Locked rotor amps	96	55.2	48	42
Resistive amps	16	9.2	8	7
Pilot duty	125 VA at 24 VAC. 720 VA at 120 VDC to 277 VDC.			

© 2026 Johnson Controls. All rights reserved.

Table 7: DPST electrical ratings

Single-phase ratings, for each set of contacts						Three-phase ratings, for two-pole	
VAC at 60 Hz	**120 VAC**	**208 VAC**	**240 VAC**	**480 VAC**	**600 VAC**	**208 VAC**	**240 VAC**
Full load amps	24	24	24	5	4.8	15.9	15
Locked rotor amps	144	144	144	30	28.8	95.4	90
Resistive amps	24	24	24	—	—	—	—
Two-pole DC resistive amps	0.33	0.17	0.17	—	—	—	—
Pilot duty	125 VA at 120 VAC to 600 VAC. 20 VA at 120 VDC to 300 VDC.						

Technical specifications

Table 8: Technical specifications

Specification	Details
Switch Action	P70, P170: SPST or 4-Wire, 2-Circuit P70S, P170S: Two independent SPDT PENN switches P72: DPST
Pressure Connection	P70, P72 Standard Models: various connections available (Styles 5, 13, 15, 34, 37) P170 Standard Models: 1/4 in. male flare hose connection (Style 5) P70LA-2, P70MA-2 Ammonia-Compatible Models: 1/4 in. female NPT connection (Style 15)
Maximum Overpressure (non-recurring)	Low Side All-Range: 325 psig (2,241 kPa) Low Side MICRO-SET: 525 psig (3,620 kPa) High Side (All-Range and MICRO-SET): 525 psig (3,620 kPa)
Maximum Working Pressure	Low Side All-Range: 100 psig (690 kPa) Low Side MICRO-SET: 89.9 psig (552 kPa) High Side (All-Range and MICRO-SET): 500 psig (3,447 kPa)
Ambient Conditions	-40 to 140°F (-40 to 60°C)
Case and Cover	Type 1 (NEMA) enclosures: Galvanized steel case, plated and painted steel cover
Dimensions (H × W × D)	With Type 1 (NEMA) enclosure: 3-1/4 × 5-11/16 × 2-1/16 in. (83 × 144 × 53 mm)
Approximate Shipping Weight	With Type 1 (NEMA) enclosures: Individual: 3.5 lb (1.6 kg) Bulk pack (10 controls): 35 lb (15.9 kg)
Agency listings	North America: cULus Listed; UL 60730 United States: Controllers, Refrigeration - SDFY.SA516 Canada: Controllers, Refrigeration - SDFY7.SA516 LZGH2/8: Flame Arrest Protected A2L Refrigerants - UL E533907

© 2026 Johnson Controls. All rights reserved.

Table 9: Accessories

Type of bracket	5 per box	10 per box
L-shaped horizontal surface mounting bracket	BKT38A-600R	BKT38A-610R
Vertical surface mounting bracket	BKT40A-600R	BKT40A-610R

Conformity declaration

Table 10: SPDT switch models

Information	Description
Purpose of control	Pressure operating control Pressure operating or Pressure cut out for models P70SA and P170SA
Method of mounting control	Surface mounted - permanently attached through usage of a mounting bracket
Method of earthing of control	Wiring binding screw terminal
Type 2 action	Type 2.B.L (Micro-disconnection) for all model ratings other than 600 V. Type 2.C.L (Micro-interruption) for all models at 600 V rating. Additional suffixes D and H for the high pressure switch side of models P70SA and P170SA.
External pollution situation	Pollution degree 3
Rated impulse voltage	6,000 V
Deviation and drift	The deviation does not exceed 105% of the set point. The drift does not exceed 5%.

Table 11: SPDT switch models pressure table

Operating pressure	Operating differential pressure	Maximum working pressure (over pressure)
12 in. Hg to 80 psi	5 psi to 35 psi	525 psi
20 in. Hg to 100 psi	7 psi to 50 psi	325 psi
100 psi to 500 psi	55 psi to 95 psi	525 psi

Table 12: SPST and DPST models

Information	Description
Purpose of control	Pressure operating or pressure cut out control, depending on the model. See Functionality.
Method of mounting control	Surface mounted - permanently attached through usage of a mounting bracket
Method of earthing of control	Wiring binding screw terminal
Type 1 or Type 2 action	See Functionality.
External pollution situation	Pollution degree 3

© 2026 Johnson Controls. All rights reserved.

Table 12: SPST and DPST models

Information	Description
Rated impulse voltage	6,000 V
Deviation and drift	The deviation does not exceed 105% of the set point. The drift does not exceed 5%.

Table 13: SPST and DPST models pressure table

Operating pressure	Operating differential pressure	Maximum working pressure (over pressure)
12 in. Hg to 80 psi	5 psi to 35 psi	525 psi
20 in. Hg to 100 psi	7 psi to 50 psi	325 psi
100 psi to 500 psi	60 psi to 150 psi	525 psi

Contact information

Contact your local Johnson Controls representative: www.johnsoncontrols.com/locations

Contact Johnson Controls: www.johnsoncontrols.com/contact-us

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Single point of contact

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

All specifications and other information shown were current as of document revision and are subject to change without notice.

© 2026 Johnson Controls. All rights reserved.