

## P45 Series Oil Pressure Cutout Controls With Built-In Time Delay Relay

### Application

The P45 controls provide dependable economical low lube oil pressure cutout for pressure lubricated refrigeration compressors. The factory set pressure adjustment provides operation to the compressor manufacturer's specification.

The P45 control measures the net oil pressure available to circulate oil through the lubrication system. (Net oil pressure is the difference between the oil gage pressure and the refrigerant pressure in the crankcase.)

A built-in time delay relay, compensated for ambient temperature, allows for pressure pickup on start and avoids nuisance shutdowns on short duration pressure losses during the running cycle.

All Series P45 controls are designed for use *only* as operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add devices (safety, limit controls) or systems (alarm, supervisory systems) that protect against, or warn of, control failure.

### Features

- The P45 is interchangeable in mounting and wiring with most Penn P28 controls.
- Proven reliable pressure sensing elements -- several million in use.
- Time delay relay incorporates trip-free manual reset.



**Fig. 1 -- Exterior of Series P45. Power element connection with 1/4 in. flare nut (Style 13) is standard.**

- Ambient compensation gives uniform time delay regardless of temperature variations at control location.
- Enclosed pressure actuated contacts are protected against wiring interference.
- Single unit mounting and wiring -- saves installation time and materials.

### Specifications

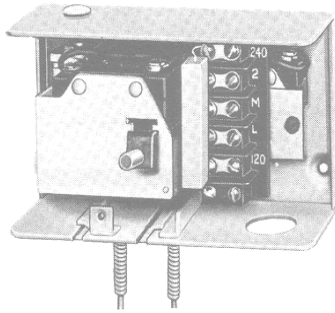
<b>Type Number</b>	<b>P45NAA</b>	Manual Reset, 24 VAC or DC
	<b>P45NCA</b>	Manual Reset, 120/240 VAC
	<b>P45NCB</b>	Manual Reset, 120/240 VAC 30" (762 mm) Wire Lead on Alarm
<b>Range</b>	7/60 PSI (50/400 kPa) Time Delay Shutdown Range (Pressure Difference)*	
<b>Refrigerant</b>	Non-Corrosive, All-Range	
<b>Maximum Allowable Overrun Pressure</b>	425 PSIG (2930 kPa)	
<b>Electrical Rating (Pilot Duty)</b>	<b>Time Delay Heater Circuit</b>	120/240 VAC 24 VAC or DC
	<b>Pilot Circuit</b>	750 VA, 120/240 VAC
		120 VA, 24 VAC 57.5 VA, 24 VDC
<b>Switch Finish</b>	Enclosed Dust Protected Pennswitch Gray Baked Enamel	
<b>Material</b>	<b>Case</b>	.062" (1.6 mm) Cold Rolled Steel
	<b>Cover</b>	.025" (0.6 mm) Cold Rolled Steel
<b>Shipping Weight</b>	<b>Individual Pack</b>	3 lb (1.4 kg)
	<b>Overpack 50 Units</b>	62 lb (28.0 kg)
	<b>Bulk Pack 10 Units Less Bracket</b>	25 lb (11.3 kg)
	<b>Bulk Pack 10 Units With Bracket</b>	32 lb (14.5 kg)

\*NOTE: Time delay heater de-energized at 3 PSI (21 kPa) pressure difference above setting.

### Optional Constructions

#### Pressure Connectors

Standard controls supplied with 36 in. (914 mm) capillary tubing with 1/4 in. flare nut (Style 13). Controls with 1/4 in. SAE male connector (Style 5) or 36 in. (914 mm) capillary and 1/4 in. sweat connection (Style 34) may be supplied on quantity orders, when specified. (See Pressure Sensing Element Styles.)



**Fig. 2 -- P45 Control with cover removed. Note convenience of terminals for easy wiring.**

### Time Delay Heater Circuit

For voltage applications other than listed in Specification table, consult Customer Service.

### Mounting Bracket

Universal mounting bracket, Part 271-51, supplied when specified.

### Outdoor Enclosure

Available on quantity orders, when specified.

### Time Delay Relay

The time delay relay is a "trip-free", thermal expansion device. Manual reset models are available with factory set and sealed time delays of 30, 45, 60, 90 or 120 seconds.

The time delay relay is compensated to minimize the effect of ambient temperature variations. Timing is affected by voltage variations.

For applications using a 208 volt control circuit, it is suggested that one leg of the 208 volt circuit and a neutral or ground wire be used to power the 120 volt circuit of the time delay heater.

When a P45 control is installed on a 440 or 550 VAC system, use an external step-down transformer to provide either 120 or 240 volts to the pilot and time delay relay circuits. The transformer must be of sufficient volt-ampere capacity to operate the motor starter and the P45's time delay relay.

### Electrical Power Required for Time Delay Relay

Timing in Seconds	Voltage	
	12, 24 or 120	240*
30, 45, 60, 90 or 120	15 VA	30 VA

\*Includes dropping resistor wattage.

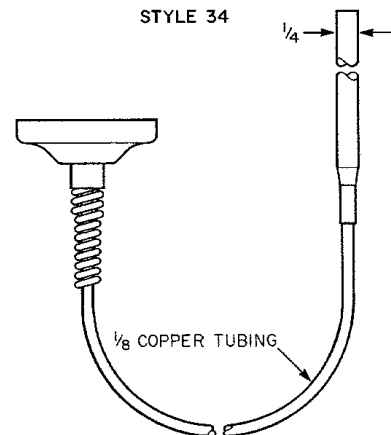
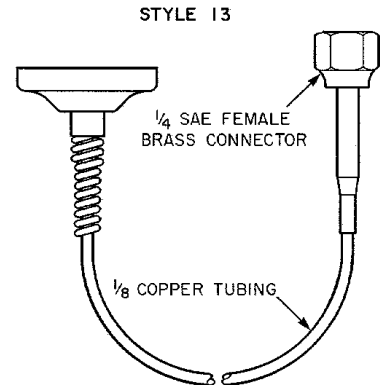
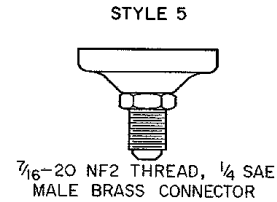
### Repairs and Replacement

Field repairs must not be made. For a replacement control contact the nearest Johnson Controls wholesaler.

### Ordering Information

To order, specify:

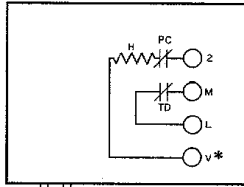
1. Quantity required.
2. Factory setting -- pressure differential below which time delay circuit is energized.
3. Complete Product Number if available.
4. If Product Number is not available, specify the Type Number and the following:
  - a. Connector Style 5, Style 13 or Style 34. See Fig. 3.



**Fig. 3 -- Pressure sensing element styles available for the P45. Style 13 is standard.**

- b. Timing in seconds (30, 45, 60, 90, 120).
- c. Time delay heater circuit voltage.
  - 1) 120/240 dual voltage.
  - 2) 24 VAC or DC

**P45NAA**



OIL LOW  
 \*V: 120, 208, 240 VAC  
 OR 24 VAC OR DC  
 SINGLE VOLTAGE MODELS

PC PRESSURE ACTUATED CONTACTS OPEN ON INCREASE IN PRESSURE DIFFERENCE BETWEEN OIL AND LOW PRESSURE CONNECTORS. MAKES AND BREAKS TIME DELAY HEATER CIRCUIT.

TD HEATER ACTUATED TIME DELAY CONTACTS OPEN AFTER FACTORY SET TIME DELAY INTERVAL IF:

1. PRESSURE ACTUATED CONTACTS CLOSE WHEN DIFFERENTIAL PRESSURE DROPS BELOW SET POINT, OR
2. DIFFERENTIAL PRESSURE FAILS TO INCREASE TO 3 PSI (21 kPa) ABOVE SET POINT AFTER MACHINE STARTS.

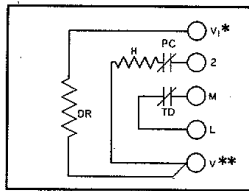
DR VOLTAGE DROPPING RESISTOR USED IN DUAL VOLTAGE MODELS.

H HEATER FOR TIME DELAY RELAY.

CONNECT L AND M TERMINALS IN CONTROL CIRCUIT AS SINGLE-POLE SWITCH.

CONNECT 2 AND V1 TERMINALS SO THAT CIRCUIT IS ENERGIZED ONLY WHEN MOTOR STARTER IS CLOSED.

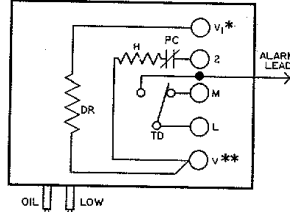
**P45NCA, P45PCA**



OIL LOW  
 \*V1: 240 VOLTS  
 \*\*V: 120 VOLTS  
 DUAL VOLTAGE MODELS

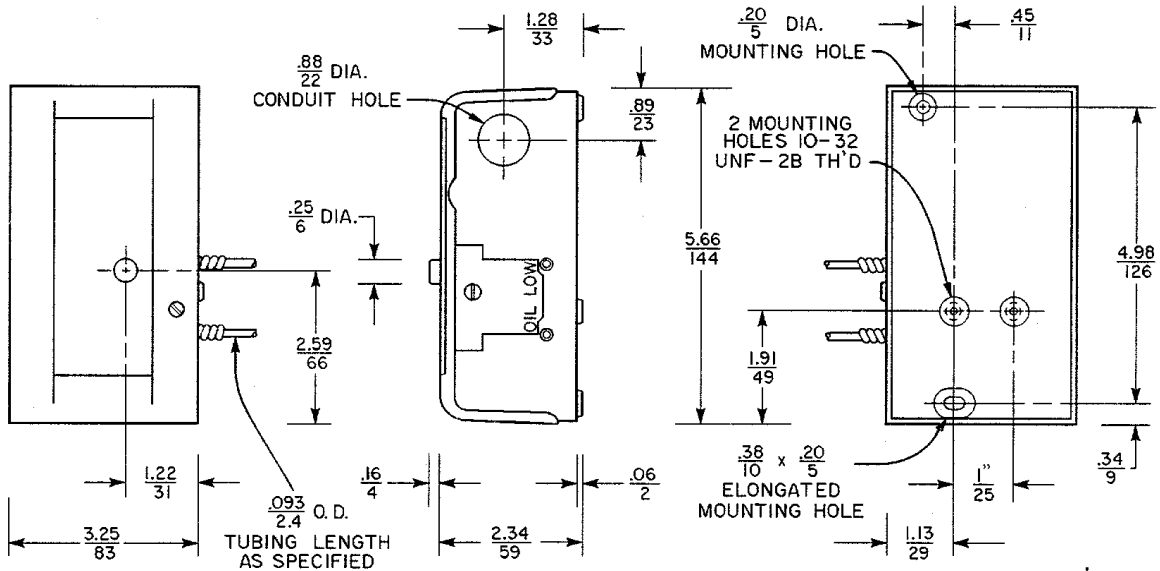
**TYPICAL EXTERNAL WIRING DIAGRAMS (FORM 3646) AVAILABLE UPON REQUEST.**

**P45NCB**

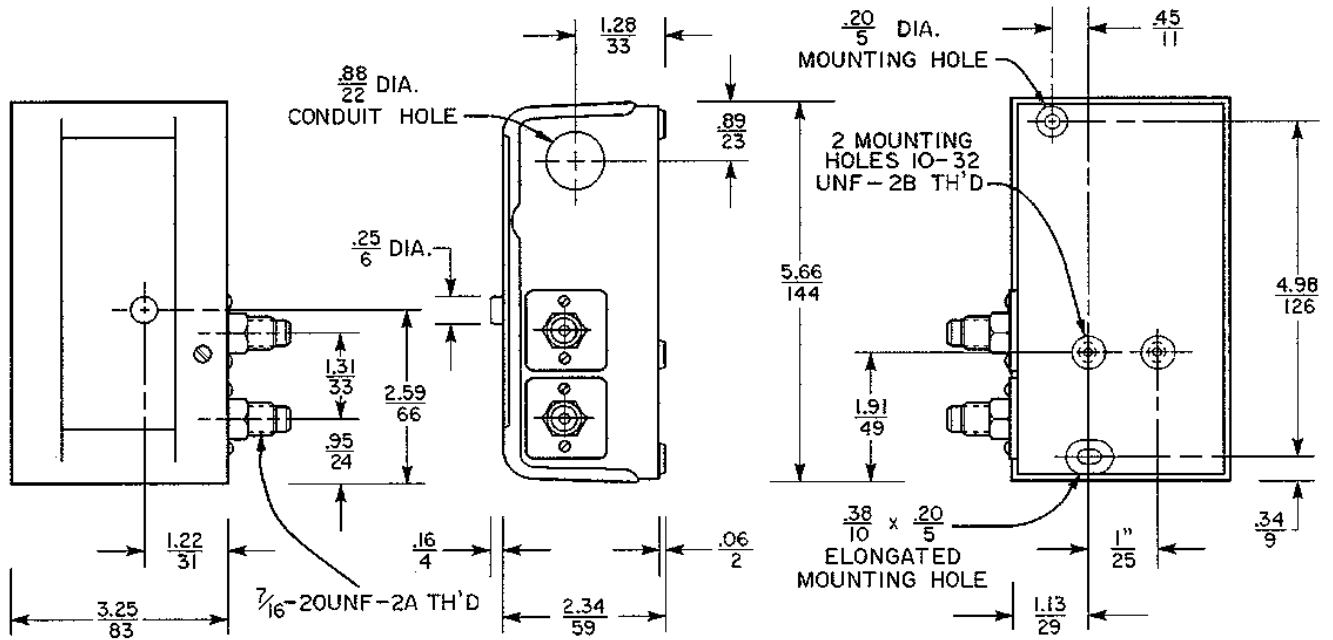


IN THE P45 CONTROLS WITH ALARM LEAD THE TD SWITCH IS SPDT. THE CONTACTS BETWEEN TERMINALS L AND M OPERATE AS THE TD OUTLINED ABOVE. WHEN THESE CONTACTS ARE OPEN, THE CONTACTS BETWEEN L AND THE ALARM LEAD WIRE ARE CLOSED.

OIL LOW  
 \*V1: 240 VOLTS  
 \*\*V: 120 VOLTS  
 DUAL VOLTAGE MODELS WITH ALARM CIRCUIT



**P45 Dimensions in mm (Style 13 and 34 Elements)**



**P45 Dimensions  $\frac{\text{in}}{\text{mm}}$   
(Style 5 Elements)**

*Performance specifications appearing herein are nominal and are subject to accepted manufacturing tolerances and application variables.*

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**JOHNSON  
CONTROLS**

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