



P28 Series Lube Oil Pressure Cutout Control with Time Delay

Description

The P28 series provides dependable lube oil protection on pressure of lubricated refrigeration compressors by sensing low lube oil pressure. A built-in time delay switch, accurately compensated for ambient temperature, allows for pressure pick up on start and avoids nuisance shutdowns on pressure drops of short duration during the running cycle.

Refer to the *P28 and P128 Series Lube Oil Controls with Built-in Time Delay Relay Product Bulletin (LIT-125420)* for important product application information.

Features

- direct-reading scale indication
- adjustable setpoint
- trip-free manual reset
- replacement timing relays available
- dust-protected switch

Applications

- semi-hermetic compressors
- P28 Control measures pressure available to circulate oil through the lubrication system (Net oil pressure is the difference between oil gauge and crankcase pressure.)

Accessories

- all models listed on this page include a universal mounting bracket
- replacement timing relays— refer to *Replacement Timing Relays for P28 and P29 Lube Oil Controls Catalog Page (LIT-1927395)*

Repair Information

If the P28 Series Lube Oil Pressure Cutout Control with Time Delay fails to operate within its specifications, replace the unit. For a replacement control, contact the nearest Johnson Controls® representative.



P28AA Lube Oil Pressure Cutout Control

Selection Chart

Product Code Number	Time Delay	Time Delay Heater Circuit VAC	Type of Reset	Range ¹ psi (kPa)	Refrigerant (R)	Pressure Connection
P28AA-1C ²	90 seconds	120/240	Manual	8 to 70 (55 to 483)	Non-corrosive ³	36 in. capillary with 1/4 in. flare nut
P28AA-2C ⁴	60 seconds					
P28AA-17C ⁵	120 seconds					
P28AA-18C	45 seconds					
P28AN-1C	90 seconds	120/240	Manual	8 to 70 (55 to 483)	Ammonia	1/4 in. internal NPT
P28DN-1C	90 seconds	120/240	Manual	8 to 70 (55 to 483)	Non-corrosive ³	36 in. capillary with 1/4 in. flare nut
P28DA-1C	With Runlight and Alarm Terminals					
P28GA-2C	90 seconds					
P28NA-5C	120 seconds	24 VAC or VDC	Manual			

1. Switch differential approximately 5 psig (34 kPa). Time delay relay energizes at 9 psig (61 kPa) pressure difference, de-energized at 14 psig (97 kPa) difference
2. Replaces Ranco® P30-3701
3. Non-corrosive refrigerants include R-12, R-22, R-134A, R-500, R-502 (R)
4. Replaces Ranco P30-3601
5. Replaces Ranco P30-3801

Technical Specifications

The maximum bellows pressure is 180 psig (2,241 kPa).

Electrical Ratings - Pilot Duty

Time Delay Heater Circuit	Pilot Circuit	Alarm Circuit (must be same voltage as pilot circuit)	P28DA-1 Contact Rating 2 to 1: 2 to 3 (must be same voltage as time delay circuit)	
			Crankcase Heater: Term 2 to 1	Runlight: Term 2 to 3
120/240 VAC	750 VA, 120/240 VAC	125 VA, 120/240 VAC	10 A 120 VAC, 5 A 240 VAC	10 W
24 VAC or VDC	125 VA, 24 VAC 57.5 VA, 24 VDC	125 VA, 24 VAC 57.5 VA, 24 VDC	---	

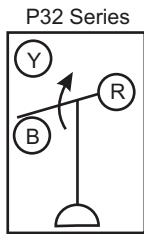


P32 Series Sensitive Pressure Switch

Description

This differential pressure switch is used to sense pressure/air flow in ducts.

Refer to the *P32 Series Sensitive Differential Pressure Switch Product Bulletin (LIT-125435)* for important product application information.



Action on Increase of Pressure

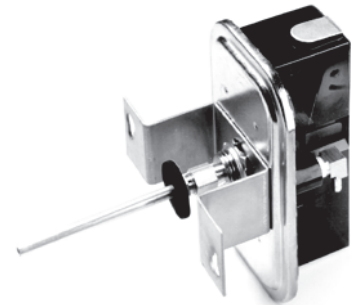
P28 Action Diagram

Features

- easy-to-read setpoint scale
- versatile mounting options

Applications

- pressure/air flow proving with electric duct heaters, humidifiers, and other equipment
- maximum pressure/air flow control for variable volume systems
- reheat duct powered systems
- clogged filter detection
- detection of icing of air conditioning coils and initiation of defrost cycle
- sensitive pressure settings
- dust-tight snap switch



P32 Sensitive Pressure Switch

Repair Information

If the P32 Series Sensitive Pressure Switch fails to operate within its specifications, replace the unit. For a replacement switch, contact the nearest Johnson Controls® representative.

Selection Chart

Product Code Number	Ambient Temperature Min./Max.	Connector	Maximum Over-pressure psig (kPa) ¹	Contact Action	Range in. WC (kPa)	Sensitivity at Min. Setpoint in. WC (kPa)	Setpoint	Scale Plate	Mounting Bracket (Included)
P32AC-1C	-40°F (-40°C) min. 167°F (75°C) max.	High Pressure connectors are metal 1/8 in. internal NPT inside, 1/2 in. NPSM outside for mounting Low pressure connectors are molded, 1/8 in. internal NPT	1 (6.895)	SPDT	0.15 to 12 (0.037 to 2.99)	0.07 (0.017)	Adjustable	Yes	L BKT182-1
P32AC-2C ²									U BKT229-1
P32AF-1C					0.05 to 5 (0.012 to 1.24)	0.025 (0.006)			L BKT182-1
P32AF-2C ²					U BKT229-1				

1. Maximum overpressure at either connection
2. Supplied with 1/4 in. compression fitting, 4 in. extension tube, two mounting screws, and O-gasket (angle barbed fitting installed)

Accessories

The switch can be mounted directly or with the supplied mounting bracket.

Product Code Number	Description
FTG18A-600R	Remote Mounting Kit: 4 in. flanged sensing tube, two barbed fittings, two No. 10 screws, and a gasket

Technical Specifications

Electrical Ratings

Motor Ratings VAC	120	208	240
Type P32AC (Standard Differential, 1/2 hp)			
AC Full Load A	9.8	5.65	4.9
AC Locked Rotor A	58.8	33.9	29.4
Non-Inductive or Resistive Load	15 A, 24 to 277 VAC		
Pilot Duty	125 VA, 24 VAC; 360 VA, 120 to 277 VAC		
Type P32AF (Close Differential, 1/4 hp)			
AC Full Load A	5.8	3.3	2.9
AC Locked Rotor A	34.8	19.8	17.4
Non-Inductive or Resistive Load	10 A, 24 to 277 VAC		
Pilot Duty	125 VA, 24 VAC; 360 VA, 120 to 277 VAC		

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P45 Series Lube Oil Pressure Cutout Control with Time Delay

Description

The P45 Control provides dependable, low lube oil pressure protection for refrigeration compressors. The low-adjustable factory-set pressure setting provides operation to the compressor manufacturer's specification. A built-in time delay relay, compensated for ambient temperature, allows for pressure pick-up on start and avoids nuisance shutdowns on short duration pressure losses during the running cycle.

Refer to the *P45 Series Oil Pressure Cutout Controls with Built-in Time Delay Relay Product Bulletin (LIT-125445)* for important product application information.

Features

- universal mounting
- trip-free manual reset
- ambient compensated time delay

Accessories

These controls are supplied without mounting brackets. If brackets are required, order kit number **BKT38A-600R**, which contains five **271-51** Angle Mounting Brackets with screws.

Applications

The P45 control is used on semi-hermetic compressors. It measures net oil pressure available to circulate oil through the compressor's lubrication system. (Net oil pressure is the difference between oil pump pressure and the crank case pressure.)

Repair Information

If the P45 Series Lube Oil Pressure Cutout Control with Time Delay fails to operate within its specifications, replace the unit. For a replacement control, contact the nearest Johnson Controls® representative.



P45NCA Lube Oil Pressure Cutout Control

Technical Specifications

For all non-corrosive refrigerants.

Electrical Rating – Pilot Duty

Time Delay Heat Circuit	Pilot Duty
120/240 VAC	750 VA, 120/240 VAC
24 VAC	125 VA, 24 VAC

Selection Chart

Product Code Number	Time Delay ¹	Heater Circuit VAC	Type of Reset	Maximum Bellows Pressure, psig (kPa)	Factory Setting, psi (kPa) Fixed	Pressure Connection
Copeland® Compressors						
P45NAA-5C	120 seconds	24	Manual	425 (2,390)	9 (62) ²	36 in. capillary with 1/4 in. flare nut
P45NAA-10C	90 seconds					48 in. capillary with 1/4 in. flare nut
P45NCA-12C ³	120 seconds	120/240				36 in. capillary with 1/4 in. flare nut
P145NCA-12C ⁴						1/4 in. external flare (Style 5)
P145NCB-12C ⁵						
Carlyle® Compressors						
P45NCA-82C ⁶	45 seconds	120/240	Manual	425 (2,390)	6.5 (45) ⁷	36 in. capillary with 1/4 in. flare nut
P145NCA-82C ⁸						1/4 in. external flare (Style 5)
P145NCB-82C ⁹						

1. Relay is not field-replaceable
2. Switch differential is approximately 5 psi (34 kPa). Time delay relay energizes at 9 psi (61 kPa) pressure difference, de-energizes at 14 psi (97 kPa) difference.
3. Replaces Ranco® P30-5826
4. Replaces Ranco P30-5827
5. Replaces Ranco P30-5827 (Includes alarm wire)
6. Replaces Carlyle/Carrier® Code No. HKCA-500, 6342050
7. Switch differential is approximately 4.5 psi (34 kPa). Time delay relay energizes at 6.5 psi (45 kPa) pressure difference, de-energizes at 11 psi (76 kPa) difference.
8. Replaces Carlyle/Carrier Part No. HKCA-500, 6342050 with 36" SEC99A UltraCap®
9. Replaces Carlyle/Carrier Part No. HKCA-500, 6342050 with 36" SEC99A UltraCap (Includes alarm wire)



P74 Series Differential Pressure Control

Description

Series P74 measures the pressure difference between two sources: supply lines and return lines. A change in differential pressure will reposition the switching mechanism to cause corrective action of the supplementary control equipment.

Refer to the *P47 Series Steam Pressure Controls Product Bulletin (LIT-125450)* for important product application information.

Features

- field-proven Penn switch with a completely enclosed contact mechanism
- pressure differential setting is easily changed without removing the cover

Applications

- differential pressure sensing on chillers or water-cooled condensers
- lube oil failure cutout for refrigeration compressors (same as the P28, but does not incorporate time delay)
- positioning M100 Series motor-actuated valves (P74JA-2)
- to prove pump operation

Accessories

All models on this page include a universal mounting bracket.

Repair Information

If the P74 Series Differential Pressure Control fails to operate within its specifications, replace the unit. For a replacement control, contact the nearest Johnson Controls® representative.



P74EA-8 Differential Pressure Control

Selection Chart

Product Code Number	Switch Action	Range Pressure Differential psig (kPa) ¹	Switch Differential	Pressure Connections	Bellows Material	
For All Non-Corrosive Liquids						
P74AA-1C	Single-Pole, Single-Throw (SPST) closes on decreases in pressure difference	8 to 70 Adjustable (55 to 483)	8 to 30 Adjustable	36 in. capillary with 1/4 in. flare nut	Stainless steel	
P74BA-1C	SPST opens on decrease in pressure difference					
P74EA-8C	Single-Pole, Double-Throw (SPDT) (snap-acting)	2 to 26 Adjustable (14 to 207)	3.5 Fixed	36 in. capillary with 1/4 in. flare nut	Brass	
P74EA-10C				1/4 in. external flare		
P74FA-1C		8 to 60 Adjustable (55 to 414)	1.5 Fixed	1/4 in. FNPT		
P74FA-5C						
P74FA-10C		2 to 26 Adjustable (14 to 207)				36 in. capillary with 1/4 in. flare nut
P74JA-2C	SPDT (floating)	8 to 60 Adjustable (55 to 414)	2.5 Fixed	1/4 in. external flare		

1. Maximum continuous pressure to low pressure bellows - 180 psig (1,241 kPa)

Technical Specifications

Electrical Ratings

Motor Ratings	120 V	208 V	240 V	277 V
P74AA, P74BA - 1 Phase				
AC Full Load A	20.0	18.7	17.0	—
AC Locked Rotor A	120.0	112.2	102.0	—
AC Non-Inductive A	22.0	22.0	22.0	—
Pilot Duty	125 VA, 120 to 600 VAC; 57.5 VA, 120 to 300 VDC			
P74EA				
AC Full Load A	16.0	9.2	8.0	—
AC Locked Rotor A	96.0	55.2	48.0	—
AC Non-Inductive A	16.0	16.0	16.0	16.0
Pilot Duty	125 VA, 120 to 600 VAC			
P74FA				
AC Full Load A	6.0	3.4	3.0	—
AC Locked Rotor A	36.0	20.4	18.0	—
AC Non-Inductive A	10.0	10.0	10.0	10.0
Pilot Duty	125 VA, 120 to 277 VAC			
P74JA				
1 A; 24 VAC Class 2; 50/60 Hz				

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P128 and P145 Series Lube Oil Pressure Controls

Description

The P128 and P145 Series Controls provide dependable low pressure lube oil cut-out for pressure lubricated refrigeration compressors. The P128 Series offer adjustable range settings.

The P128 and P145 controls feature a 1/4 in. external flare pressure connection which may be used with a refrigerant hose or cap tube such as SEC99 UltraCap.

Refer to the *P28 and P128 Series Lube Oil Control with Built-in Time Delay Relay Product Bulletin (LIT-125420)* for important product application information.

Features

- ambient compensated time delay relay
- trip-free manual reset
- industry standard
- P128 is fully adjustable throughout its range
- P145 is factory set to compressor manufacturer's specifications

Applications

Use these controls for lube oil cutout on hermetic and semi-hermetic compressors used in commercial air-conditioning and commercial and industrial refrigeration systems.



P128AA Lube Oil Pressure Control



P145NCA Lube Oil Pressure Control

Technical Specifications

Pressure controls P128 and P145 are designed to be used with SEC99 UltraCap. Product specifications for P128 are the same as P28 model. Refer to *P28 Series Lube Oil Pressure Cutout Control (With Time Delay) (LIT-1927185)*. Product specifications for P145 are the same as P45 model. Refer to *P45 Series Lube Oil Pressure Cutout Control (With Time Delay) (LIT-1927185)*. Also note the selection chart below.

Accessories

Some controls are supplied less mounting brackets. If brackets are required, order kit number **BKT38A-600**, which contains five **271-51** angle mounting brackets with screws; or **BKT38A-601** which contains one mounting bracket with screws.

Repair Information

If the P128 and the P145 Series Lube Oil Pressure Control fails to operate within its specifications, replace the unit. For a replacement control, contact the nearest Johnson Controls® representative.

Selection Chart

Product Code Number	Time Delay	Heater Circuit VAC	Type of Reset	Range psig (kPa)		Refrigerant	Pressure Connection	
				Adjustable	Non-Adjustable			
P128AA-1C ¹	90 seconds	120/240	Manual	8 to 70 (55 to 483)	---	Non-corrosive	1/4 in. external flared connection	
P128AA-2C ²	60 seconds							
P128AA-17C ³	120 seconds							
P145NCA-12C ⁴	45 seconds			---	Factory Set 9 (62)	Non-corrosive		
P145NCA-82C ⁵								Factory Set 6.5 (45)
P145NCB-12C ⁶								Factory Set 9 (62)
P145NCB-82C ⁷								Factory Set 6.5 (45)

1. Replacement for P28AA-1*. Replaces Ranco® P30-3701.
2. Replacement for P28AA-2*. Replaces Ranco P30-3601.
3. Replacement for P28AA-17*. Replaces Ranco P30-3801.
4. Replacement for P45NCA-12*. (Copeland Model) Replaces Ranco P30-5826.
5. Replacement for P45NCA-82*. (Carlyle Model).
6. Copeland model with alarm circuit
7. Carlyle model with alarm circuit

* SEC99 UltraCap Hose must be ordered separately.



P12 Series Differential Pressure Controls

Description

The P12 Series Differential Pressure Controls are suitable for use with oil and/or non-corrosive refrigerants. The switch is actuated by a difference in pressure between the two sensing elements. The control is factory-set to open the switch (COM to 1) at a differential pressure of 18 psi (124 kPa) and close the switch (COM to 1) at a differential pressure of 12 psi (83 kPa). The control is not field-adjustable.

This control may be connected to a P28 Lube Oil Control, with time delay, to give complete monitoring of lubrication on two refrigeration compressors driven by one motor.

Refer to the *P12 Series Differential Pressure Control Product Bulletin (LIT-997452)* for important product application information.

Repair Information

If the P12 Series Differential Pressure Control fails to operate within its specifications, replace the unit. For a replacement control, contact the nearest Johnson Controls® representative.



P12AA
Differential Pressure Control

Selection Chart

Product Code Number	Differential Pressure		Maximum Overpressure, psi (kPa)	Enclosure	Fitting
	COM to 1 OPENS	COM to 1 CLOSES			
P12AA-3C	18 psi (124 kPa)	12 psi (83 kPa)	500 (3,447)	NEMA1 Enclosure	1/4 in. external SAE flare fitting