

## Series P28 Oil Protection Controls

### Introduction

*These oil protection controls are designed to give protection against low net lube oil pressure on pressure lubricated refrigeration compressors. The controls measure the pressure differential between the pressure generated by the oil pump and the refrigerant pressure at the crankcase. A built-in time delay switch allows for pressure-pick up on start and avoids nuisance shutdowns on pressure drops of short duration during the running cycle.*

### Description

When the compressor is started, the time delay switch is energised. If the net oil pressure does not build up within the required time limit, the time delay switch trips to stop the compressor. If the net oil pressure rises within the required time after the compressor starts, the time delay switch is automatically de-energised and the compressor continues to operate normally. If the net oil pressure should drop below setting (scale pointer) during the running cycle, the time delay switch is energised and, unless the net oil pressure returns to cut-in point within the time delay period, the compressor will be shut down, and have to be manual reset. The compressor can never run longer than the predetermined time on low oil pressure. Controls are available only for manual reset after cut-out.



**P28DP Oil Protection Control**  
 (P) Setpoint adjusting cam

#### Feature and Benefits

<input type="checkbox"/> <b>Heavy duty pressure elements</b>	Withstand high overrun pressure
<input type="checkbox"/> <b>Safety lock-out with trip-free manual reset</b>	Override is not possible in the control function
<input type="checkbox"/> <b>Ambient compensated timing</b>	Stable delay time during all ambient conditions
<input type="checkbox"/> <b>Dust-tight Penn switch</b>	Prevents pollution of the contacts by electrostatic influences

## Note

These controls are designed for use only as operating controls. Where an operating control failure would result in personal injury or loss of property it is the responsibility of the installer to add devices or systems that protect against, or warn of, control failure.

## Time delay switch

Timings of 30, 50, 90 or 120 seconds are available for all models. The 230 VAC time delay circuit requires 30 VA for timing of 120 seconds and 50 VA for timing of 30 seconds. The time delay unit is compensated to assure uniform timing for 0 to +55°C ambient temperature. Timing is affected only by voltage variations. After a lock-out has occurred the control can be manual reset after the time delay switch has cooled down for minimum 15 minutes.

## Time delay heater circuits

Standard controls are equipped with time delay circuit for 230 VAC. Special models can be supplied at extra cost for 12 V AC/DC, 24 V AC/DC or 115/230 V AC. Quantity orders only.

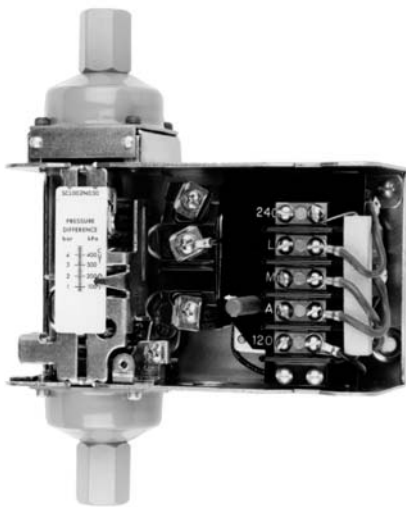


Fig. 1  
P28DA Control, Cover removed

## Repair and replacement

The timer and terminal board assembly may be replaced as a complete unit. Other repairs are not recommended. When contacting the supplier for a replacement you should state the type/modelnumber of the control. This number can be found on the data plate or cover label.

## Typical wiring diagrams

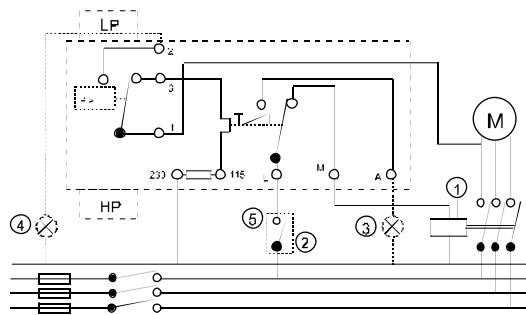


Fig. 2  
P28DA

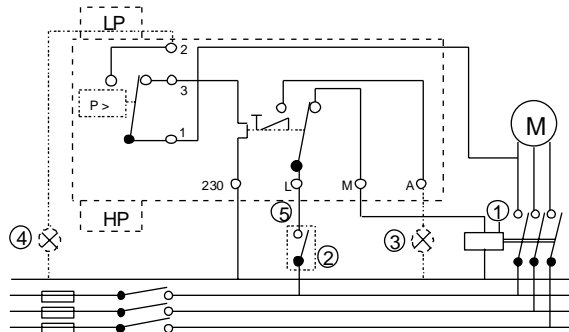


Fig. 3  
P28DP/DJ

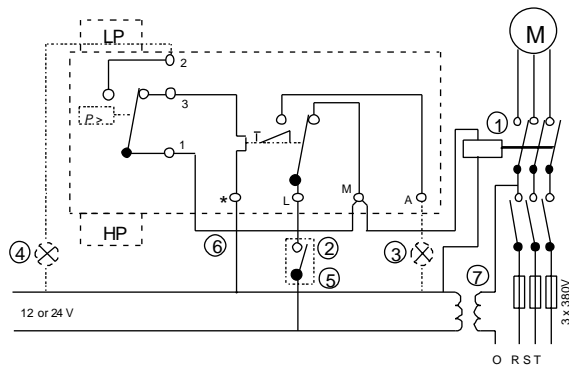


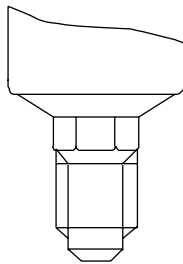
Fig. 4  
12 or 24 VAC or VDC

- Electro-magnetic switch
- Operating control
- Alarm light
- Safe light
- Additional controls only in this line
- Jumper
- Transformer (12 or 24 V)  
"Lp" = LP bellows  
"Hp" = HP bellows

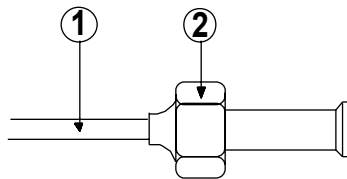
## T Type number selection table

Order number	Pressure connection	Timing (s)	Voltage	Refrigerant	Remarks
P28DA-9341	5	50	115/230	non-corrosive	incl.PG 13.5 nipple
P28DA-9660	13	90	115/230	non-corrosive	
P28DJ-9360	5	90	230	non-corrosive	
P28DJ-9861	15	90	230	NH3	
P28DP-9300	5	-	230	non-corrosive	without time delay
P28DP-9340	5	50	230	non-corrosive	
P28DP-9360	5	90	230	non-corrosive	
P28DP-9380	5	120	230	non-corrosive	
P28DP-9640	13	50	230	non-corrosive	
P28DP-9660	13	90	230	non-corrosive	
P28DP-9680	13	120	230	non-corrosive	
P28DP-9840	15	50	230	NH3	
P28DP-9860	15	90	230	NH3	

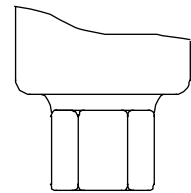
## P Pressure connections



**Fig. 5**  
**Style 5**  
**Male connection**  
7/16"-20 UNF for  
1/4" /6 mm flare nut

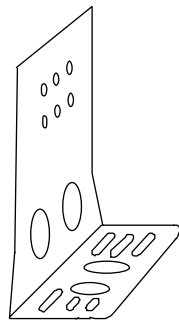


**Fig. 6**  
**Style 13**  
1. 90 cm capillary  
2. 7/16"-20 UNF nut for  
1/4" SAE flare tube

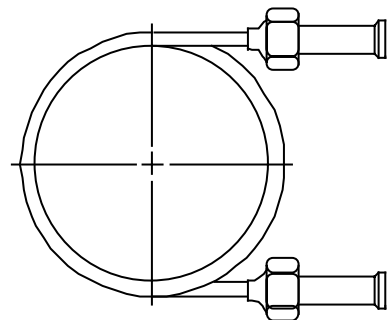


**Fig. 7**  
**Style 15**  
1/4"-18 NPT (female)

## A Accessories

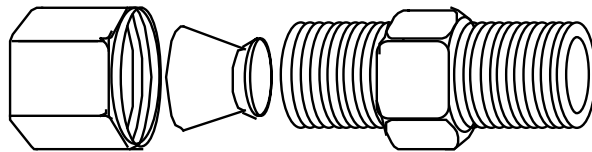


**Fig. 8**  
**Mounting Bracket**  
order number 271-51L



**Fig. 9**  
**90 cm Capillary with (2) flare nuts**  
order number SEC002N600

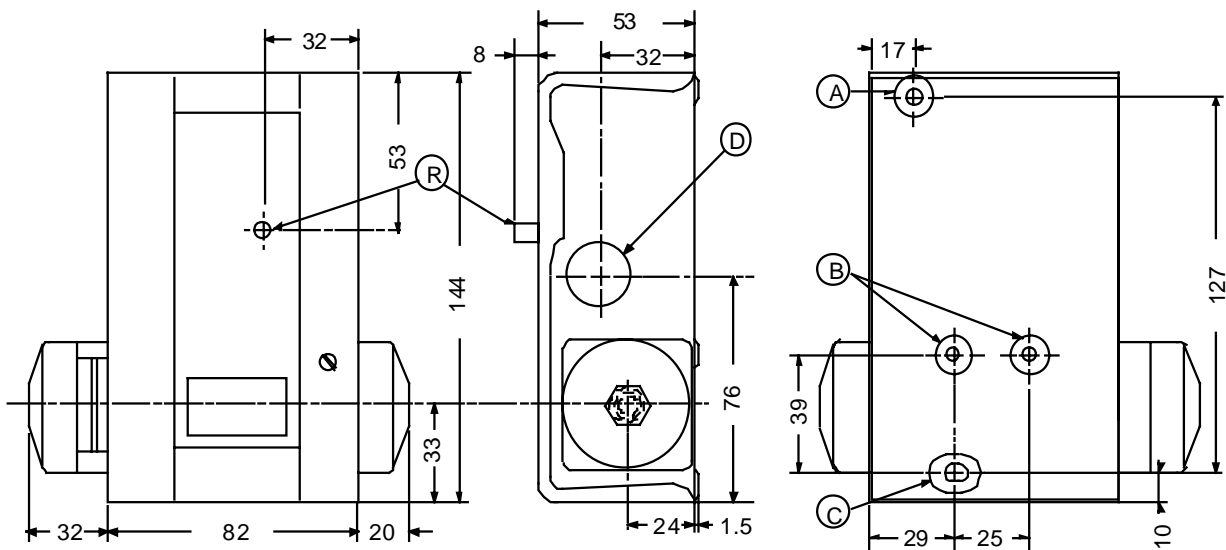
## Accessories



**Fig. 10**  
**Compression Coupling**

Description	Application	Code number
Fits into style 15 pressure connectors	For 6 mm copper or steel tubing	<b>CNR003N001R</b>
	For 8 mm copper or steel tubing	<b>CNR003N002R</b>

## Dimensions (mm)

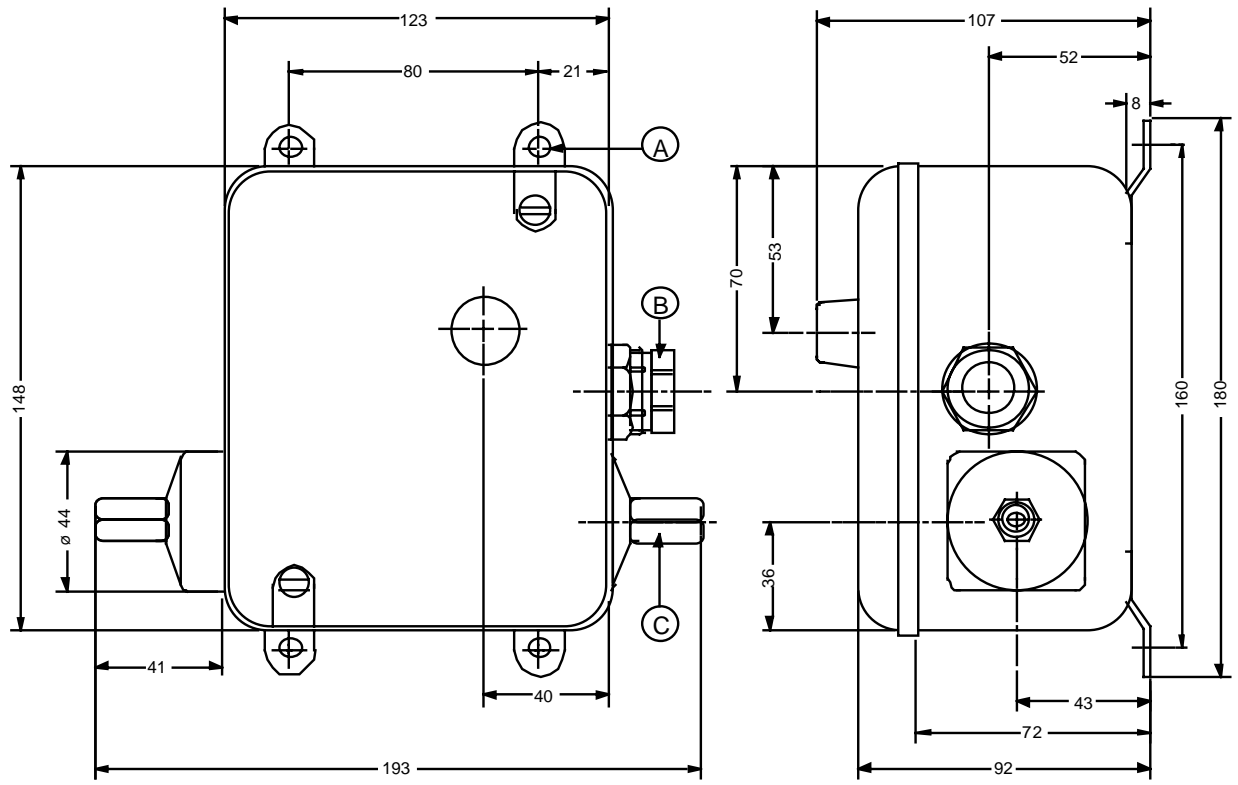


### Type P28DA/DP

- A. Mounting hole, 5 mm dia.
- B. (2) mounting bracket holes, 10-32 UNF
- C. Mounting slot
- D. Cable inlet hole, 22.3 mm dia.
- R. Reset button

**Fig. 11**

## Dimensions (mm)



### Type P28DJ

- A. (4) MTG holes, 7 mm dia.
- B. Connector, PG-16
- C. 1/4"-18 NPT (2x)

Fig. 12

# Notes

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# Notes

## Specifications

<b>Product series</b>	<b>P28DJ/DP</b>	single voltage	230 V
	<b>P28DA</b>	dual voltage	115/230 V
<b>Application</b>	Oil protection control on refrigeration compressors		
<b>Pressure connectors</b>	Style 5, 15, 13 (see drawings)		
<b>Operating range*</b>	0.6 to 4.8 bar Operating at pressures greater than 17 bar may lead to bellows failure and catastrophic refrigerant loss		
<b>Maximum allowable overrun pressure</b>	23 bar		
<b>Range adjustment</b>	Turn range cam to reach set point desired		
<b>Material</b>	Case 1.5 mm cold-rolled steel, zinc plated Cover 0.8 mm cold-rolled steel, blue enamel finish		
<b>Enclosure</b>	<b>Type P28DA/DP</b>	IP30	
	<b>Type P28DJ</b>	IP66	
<b>Electrical ratings</b>	15(8) A, 230 Vac		
<b>Shipping weight</b>	<b>P28DA/DP</b>	Individual pack	1.5 kg
		Overpack (10 pcs)	15 kg
	<b>P28DJ</b>	Individual pack	3 kg
		Overpack (4 pcs)	12 kg
<b>Accessories</b>	<b>Mounting bracket</b>	order number	<b>271-51L</b>
(order separately)	<b>Compression coupling</b>	(6mm) order number	<b>CNR003N001R</b>
		(8mm)	<b>CNR003N002R</b>
	<b>90 cm capillary with two flare nuts</b>	order number	<b>SEC002N600</b>

\* Time delay de-energised at 0.21 to 0.34 bar pressure difference above setting  
100 kPa = 0.1 MPa = 1 bar ≈ 1.02 kp/cm<sup>2</sup> = 1.02 at ≈ 14.5 psi

*The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office or representative. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.*

**JOHNSON  
CONTROLS**

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