

Series P315PR

Direct Mount Pressure Actuated Condenser Fan Speed Controllers for Electronically Commutated Motors

Introduction

The Series P315PR direct mount pressure actuated condenser fan speed controllers are designed for speed control of electronically commutated (EC) condenser fan motors. Condenser pressure control of a refrigeration system, via speed control of the fans on an air-cooled condenser, results in optimum performance throughout the year. The Series P315PR controllers are designed for non-corrosive refrigerant systems.

A pressure actuated control provides the most direct and fastest response to pressure changes in a refrigerant system. The controller varies the supply voltage to the motor from 5% to at least 95% over the proportional band.



**Figure 1: Series P315PR
Direct Mount Pressure Actuated
Condenser Fan Speed Controller**

Feature	Benefit
Condenser Fan Speed Directly Controlled by Condenser Pressure	Provides optimum condenser pressure control year round; reduces short-cycling during low temperatures; and increases condenser fan motor efficiency, which saves energy.
Can Be Mounted Directly to Pressure Connections on Condenser Outlets	Enables easy installation and provides direct and fast response to condenser pressure changes.
Easy Access Setpoint Adjustment Screw on Top of Controller	Provides easy and precise setpoint adjustment to meet your application needs.
IP65 Enclosure	Enables you to mount the controller outdoors.
Compact Design	Fits into small spaces and provides a small turning radius for screwing the controller onto the condenser fitting.
Quick Connector Electrical Plug	Enables easy wiring and quick installation.
Compatible with 1 ~ or 3 ~ EC Motors	Provides inexpensive and efficient fan speed control for low and high horsepower motors.

IMPORTANT: Use this Series P315PR Condenser Fan Speed Controller only as an operating control. Where failure or malfunction of the P315PR Controller 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 limit controls, intended to warn of or protect against failure or malfunction of the P315PR Controller.

Installation

The controller must be mounted in upright position on the refrigerant line, preferably at the condenser outlet side, to reduce pressure pulsation as much as possible.

Mount the controller within a 45° angle on both sides of the top of the high pressure line to avoid accumulation of oil inside the controller bellows and maintain the class IP65 rating. See Figure 2.

If you are using a pump-down system, the controller connection must be made at the high-pressure side of the system and upstream from the solenoid valve to avoid low pressure during pump-down.

The controller (IP65) can be mounted outdoors. When mounted inside a cabinet, holes for air circulation must be provided.

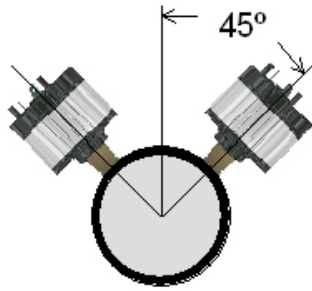


Figure 2: Mounting Position Range

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.



CAUTION: Risk of Property Damage.

Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

Wire the P315PR Series controller according to the details shown in Figure 3.

The rubber gasket must be placed between the quick connector plug and the controller terminals to maintain the IP65 protection class. The O-ring must be placed on the screw. Tighten screw securely. The screw fastens the connector plug to the controller terminals. The gasket, grommet, and O-ring keep the IP65 protection class for the controller.

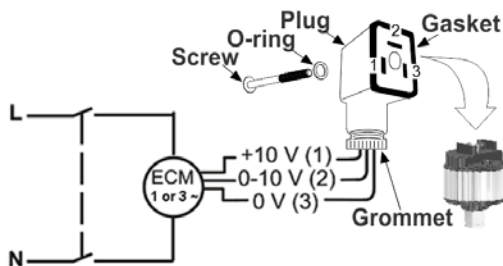
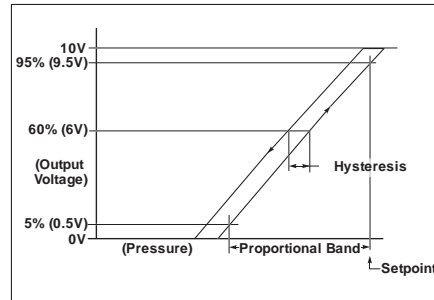


Figure 3: Wiring Details

Control Characteristic



Range	360°
5-15	-1.7 bar
8-25	-2.5 bar
22-42	-3.7 bar

Figure 4: Control Versus Pressure*

* Controller voltage output (measured across wires 2 and 3) with supply voltage at + 10 VDC (measured across wires 1 and 3).

The controller's proportional band is fixed and defined as the difference between the two pressure values at which the output voltage values are 5% and 95% (+0.5 and +9.5 VDC) of the supply voltage from the EC motor. The proportional band is typically 4 bar (58 psi) for the 5 to 15 and 8 to 25 bar ranges and typically 5 bar (72.5 psi) for the 22 to 42 bar range.

Setpoint Adjustment Screw



Figure 5: Setpoint Adjustment Screw Location

Setpoint Adjustment

The setpoint is defined at 95% output value. The pressure setpoint at which your equipment operates can be adjusted by using the setpoint adjustment screw.

The controller ships with the following factory-default setpoints:

- P315PR-9203: 6 bar (87 psi)
- P315PR-9202: 19 bar (276 psi)
- P315PR-9200: 26 bar (377 psi)

Repair Information

If a Series P315PR Condenser Fan Speed Controller fails to operate within its specifications, replace the unit. For a replacement Series P315PR, contact the nearest Johnson Controls® representative. Provide the model number of the control when ordering a replacement. This number is found on the data plate.

Table 1: Product Selection Chart

Product Code Number	Range (bar)*	Element Style	Setting (bar)	Prop. Band (bar)	Controller Mode**	Minimum Shipping Qty	Additional Features
P315PR-9200C	8 to 25	47	19	4	N/A	1	--
P315PR-9200D	8 to 25	47	19	4	N/A	25	Bulk Pack
P315PR-9202C	22 to 42	47	26	5	N/A	1	--
P315PR-9203C	5 to 15	47	6	4	N/A	1	--
P315PR-9203D	5 to 15	47	6	4	N/A	25	Bulk Pack

*1 bar = 100 kPa ≈ 14.5 psi

**Minimum speed.



**Figure 6: Pressure Connection: Style 47
(Dimensions in mm)**

Technical Specifications

Product Type	P315PR Pressure Control	
Pressure Range	P315PR-9200C and P315PR-9200D 8 to 25 bar (116 to 363 psi) P315PR-9202C 22 to 42 bar (319 to 609 psi) P315PR-9203C and P315PR-9203D 5 to 15 bar (72.5 to 218 psi)	
Maximum Overrun Pressure	P315PR-9200C and P315PR-9200D 40 bar P315PR-9202C 48 bar P315PR-9203C and P315PR-9203D 25 bar	
Pressure Connection	Style 47 (7/16-20 UNF female including valve depressor)	
Control Action	Direct	
Operating Ambient Temperature	-20 to 55°C	
Main Supply Voltage	Excitation Voltage from EC Motor (+10 V maximum 1,1 mA)	
Proportional Band	P315PR-9200C, P315PR-9203C, and P315PR-9203D 4 bar typical P315PR-9202C 5 bar typical	
Storage Ambient Humidity	10 to 98% Relative Humidity (RH)	
Storage Ambient Temperature	-40 to 85°C	
Enclosure	IP65	
Material	Top/Bottom	Polycarbonate (glass filled)
	Heat Sink	Aluminium
	Pressure Connection	Brass
Shipping Weight	0.2 kg (Individual Pack)	
Wiring Connections	Screw Terminals 1-1/2 mm ² maximum Quick Connector Plug PG9 (6 up to 8 mm cable)	

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.



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