

Series P215PR

Direct Mount Pressure Actuated Condenser Fan Speed Controllers For Single Phase Motors (incl. built-in RFI suppression filter)

Introduction

These Direct Mount pressure actuated condenser fan speed controllers are designed for speed variation of single-phase motors.

Head pressure control of a refrigeration system, through speed variation of the fan on an air-cooled condenser, results in optimum performance throughout the year.

A pressure actuated device, gives the most direct and fastest response to pressure variations in the refrigerant system. The controller varies the supply voltage to the motor from 30 % to at least 95 % over the proportional band using the phase cutting principle.

This provides speed variation of permanent split capacitor or shaded pole motors that do not draw more than 3 A (rms) full load current.

Cut-off models (fan stops at low pressure) as well as minimum speed models (fan keeps running at 30%) are available.

The controllers can be used in non-corrosive refrigerant systems.

The motor manufacturer should have approved his product for this speed control principle.



P215PR
Direct Mount Pressure Actuated
Condenser Fan Speed Controller

It is recommended to confirm with the electric motor manufacturer, that the motor can be used with a controller, using the phase cutting principle for speed variation. You can also provide a copy of this product data sheet to the motor manufacturer/supplier for review.

Feature and Benefits

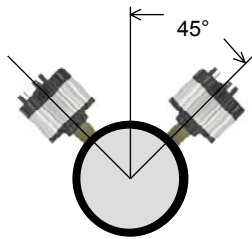
<input type="checkbox"/> Condenser pressure control by fan speed variation.	Optimum condenser pressure control all the year round. Less noise during colder (night) period.
<input type="checkbox"/> Pressure input.	Direct and fast response to pressure variations.
<input type="checkbox"/> Direct mount.	Easy to install.
<input type="checkbox"/> Setpoint screw on top.	Easy setpoint adjustment after installation.
<input type="checkbox"/> Built-in suppression filter.	The controller meets the electro-magnetic compatibility requirements of the 89/336/EEC directive.
<input type="checkbox"/> IP65	Can be mounted outdoors
<input type="checkbox"/> Compact design	Small turn-around circle. Fits in small units.
<input type="checkbox"/> Attractive styling	Upgrades your equipment
<input type="checkbox"/> Quick connector plug included	For easy wiring and quick replacement

! Caution

The P215PR is intended to control equipment under normal operating conditions. Where failure or malfunction of the P215PR could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory systems) intended to warn of or protect against failure or malfunction of the P215PR must be incorporated into and maintained as part of the control system.

Installation

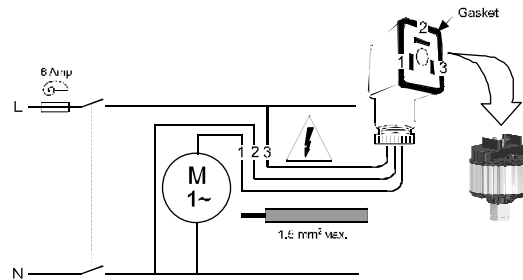
The controller must be mounted in upright position on the refrigerant line and preferable at the condenser outlet side (to prevent pulsation as much as possible). If a pump-down system is used the pressure connection must be made at the high-pressure side of the system and before the solenoid valve (to avoid low pressures during pump-down). An angle of 45° is allowed to both sides. This to avoid the accumulation of oil inside the bellows and to fulfil class IP65.



The controller (IP65) can be mounted outdoors. When mounted inside a cabinet, holes for air circulation should be provided. About 4 Watt heat will be generated at the maximum load of 3 A.

Wiring

The built-in EMC filter is designed for a maximum distance of two meters between the controller and the motor. Non-shielded cable must be used. The rubber gasket must be placed between the quick connector plug and the controller terminals to keep the IP65 protection class.



EMC

The controller has a built-in suppression filter and meets all required EC directives. Please note that when two or more EMC compliant components are built together the total system may not be compliant. To make the total system compliant is the responsibility of the producer.

Note

More motors can be wired in parallel, provided that the total current will not exceed the maximum limit.

! Caution

The enclosed quick connector plug is especially designed (special terminal numbering) for this control and should not be used for other purposes.

Measuring

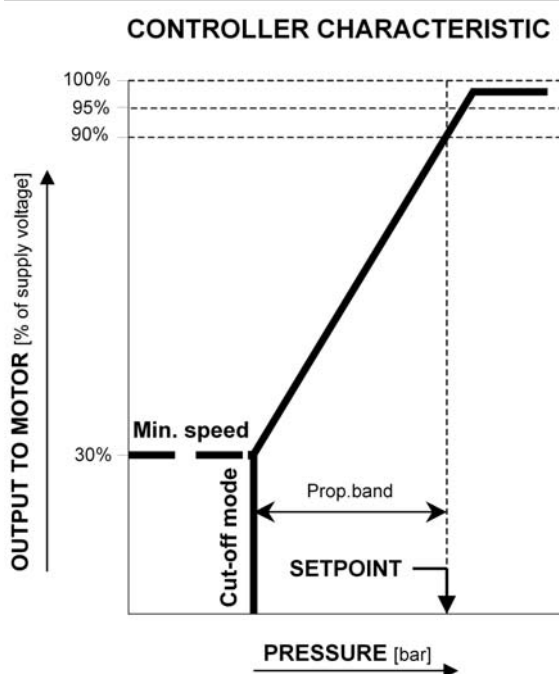
For measuring amps or volts values a true rms meter should be used.

! Caution

The P215PR is not equipped with a power switch. Therefore an additional switch to isolate the device should be used in the power supply wiring to the P215PR. Also the P215PR should be externally fused against miswiring or short circuits. Use a thermal/current overload relay with a current rating according to the motor (max. 6 A/slow).

Adjustments

The setpoint is defined at 90% output value. The fixed min. speed or cut-off value is 30% of the supplied voltage. Please note that the load and the supply voltage can affect the controller characteristic.



The proportional band is fixed and defined as the pressure difference between the points where the output values are 30% and 90% of the supply voltage.

	Range (bar)	
	10 to 25	22 to 42
Prop. band	4.5 ± 1	5.5 ± 1.5

There is a built-in (fixed) hysteresis. This is not indicated in the control characteristic. The hysteresis is included in the prop. band.

Note

The values indicated are at 50Hz power supply. At 60 Hz the cutt-off and proportional band values decrease with 20 %.



Setpoint

The pressure setpoint at which your equipment has to work can be adjusted by above setpoint adjusting screw.

The setpoint is factory set at:

range 10 to 25 bar	19 bar
range 22 to 42 bar	26 bar

Repair and replacement

Repair is not possible. In case of an improperly functioning control, please check with your nearest supplier. When contacting the supplier for a replacement you should state the type-model number of the control. This number can be found on the data plate.

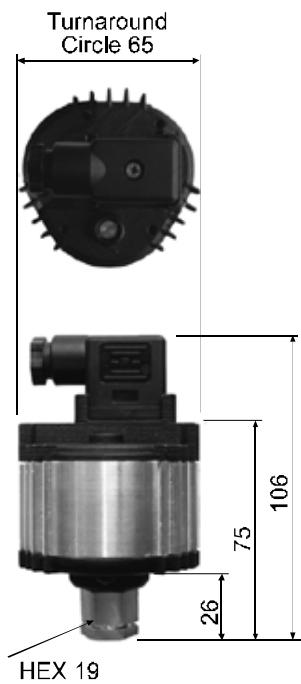
Type number selection table

Order nr.	Range (bar)	Element style	Setting (bar)	Prop. band (bar)	Controller Mode
P215PR-9200	10 to 25	47	19	4.5	Cut-off
P215PR-9202	22 to 42	47	26	5.5	Cut-off
P215PR-9800	10 to 25	28	19	4.5	Cut-off

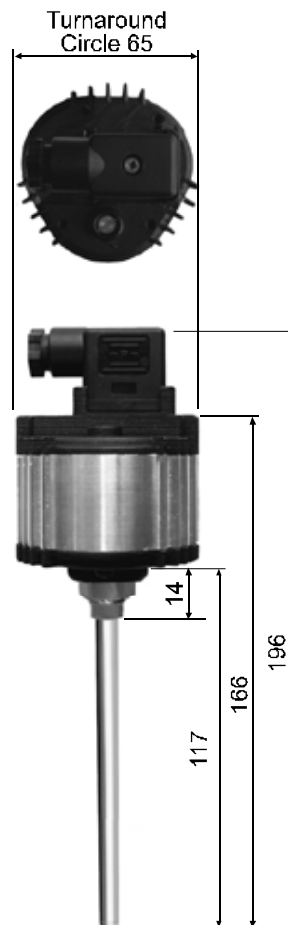
Note: 1 bar = 100 kPa ≈ 14.5 psi

Pressure connections and Dimensions (mm)

There are two types of pressure connections available.



**Style 47 Direct mount
7/16 -20 UNF female
(incl. valve depressor)**



Style 28 Braze connection 6 mm ODM

Note

Specifications

Product type	P215PR
Pressure range	10 to 25 bar 22 to 42 bar
Maximum overrun pressure	22 to 42 bar = 48 bar 10 to 25 bar = 40 bar
Pressure connection	style 47 (7/16-20UNF female incl. valve depressor) style 28 (with 100 mm tube 6 mm ODM)
Control action	direct
Maximum output voltage	≥ 95 % of supply voltage
Maximum current	3 A rms (at maximum voltage output) Special models up to 4 A are possible. Please contact your supplier.
Minimum current	≥ 100 mA
Power factor (cosφ) motor	≥ 0.6
Mains supply voltage	230 Vac +10 % / -15 %
Mains supply frequency	50/60 Hz
Operating ambient temperature	-20 to +55 °C
Storage ambient humidity.	10 to 98 % R.H.
Storage ambient Temp.	-40 to 85 °C
Cut-off point /Minimum speed	30 % of supply voltage
Prop. band range	22 to 42 bar = 5.5 ± 1.5 bar
range range	10 to 25 bar = 4.5 ± 1 bar
Enclosure	IP65
Material	top/bottom Polycarbonate (glass filled) heatsink aluminium press. connection Brass bellows Phosphor bronze
Shipping weight	individual pack 0,3 kg
Residual current motor	in cut-off mode ≤ 25 mA
Wiring connections	screw terminals 1½ mm ² max. 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.

**Johnson Controls International, Inc.**

Headquarters: Milwaukee, WI, USA
 European Headquarters: Westendhof 8, 45143 Essen, Germany
 European Factories: Lomagna (Italy), Leeuwarden (The Netherlands) and Essen (Germany)
 Branch Offices: Principal European Cities.

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