



VFD68 Variable Frequency Drives

Description

The VFD68 Variable Frequency Drive provides three-phase motor speed control in a variety of HVAC/R applications. The VFD68 drive is designed primarily for condenser fan speed control on HVAC and refrigeration condensing units, but can also be set up to control a variety of pumps, blowers, and fans.

The VFD68 drive accepts an input signal from P499 Electronic Pressure Transducer, or other devices that provide a 0 to 5 VDC, 0 to 10 VDC, or 4 to 20 mA signal.

The application-specific design of the VFD68 drive provides a simple interface, which makes the drive easy to understand and operate.

You can quickly and easily reconfigure the VFD68 drive to control variable speed pumps in cooling and heating applications, or to control variable speed supply fans in VAV applications.

The VFD68 drive is an RS485, RTU-compliant ModBus® slave device and can be integrated into a ModBus network.

Refer to the *VFD68 Variable Frequency Drives Product Bulletin (LIT-12012068)* for important product application information.

Features

- Selectable input types allows use with 0 to 5 VDC (ratiometric), 0 to 10 VDC, or 4 to 20 mA input signals from transducers, sensors, and controllers.
- High input signal selection of two similar inputs (230 or 460 volt models only) provides fan speed control of dual circuit condensing units, based on the highest pressure circuit.
- Compact design provides for easy and flexible installation.
- Three-phase, 230, 460, or 575 VAC models can control a wide variety of three-phase motors ranging up to 10hp.
- Simple and advanced end-user settings provide quick and simple application setup and operation, as well as advanced setup parameters for custom applications.

Applications

The VFD68 drive accepts input signals from a variety of pressure transducers, temperature sensors, and low-voltage controllers to provide continuous response to changing condenser load conditions.

The VFD68 drive allows the system to:

- maintain optimum condenser head pressure
- operate in low ambient temperature conditions down to -40°C (-40°F)
- reduce short-cycling, which occurs when using
- use On/Off fan controls
- maintain a more stable evaporator temperature
- operate more efficiently, reducing electricity cost.

The VFD68 drive can also:

- help optimize compressor operation, reduce wear, and extend compressor life by stabilizing the condenser head pressures
- reduce motor repair and replacement costs by eliminating the condenser fan short-cycling
- extend refrigerated product life and provide more consistent comfort cooling by stabilizing evaporator temperatures

Selecting a Motor

IMPORTANT: When selecting the motor, do not exceed the maximum output current rating of the VFD68 drive

Motors used with the VFD68 drive must:

- be AC induction three-phase motors that are UL Recognized and CSA Certified, or equivalent
- be rated for: 230 VAC at 50/60 Hz; 460 VAC at 50/60 Hz; or 575 VAC at 60 Hz
- have an Inverter Rating (460 VAC motors)
- have Insulation Class F or better

The VFD68 drive is intended for use with variable speed motors that are rated for 40:1 operation.



VFD68BBB Variable Frequency Drive

A VFD68 drive can control multiple motors wired in parallel; however, the sum of the Full Load Amperes (FLA) ratings for the motors must not exceed the maximum output current rating of the VFD68 drive, including any de-rating due to altitude, temperature, or a combination of both.

IMPORTANT: Do not control both single-phase and three-phase motors with the same VFD68 drive.

Repair Information

If the VFD68 Variable Frequency Drive fails to operate within its specifications, replace the unit. For a replacement VFD68 Drive, contact the nearest Johnson Controls® representative.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products. © 2015 Johnson Controls, Inc.



VFD68 Variable Frequency Drives (Continued)

Selection Charts

230 VAC ±10% Production Models

Product Code Number	Description
VFD68BBB-2C	VFD68 Drive; 0.1 kw (1/8 hp); 128 x 68 x 81 mm (5 x 2-11/16 x 3-3/16 in.)
VFD68BCB-2C	VFD68 Drive; 0.2 kw (1/4 hp); 128 x 68 x 81 mm (5 x 2-11/16 x 3-3/16 in.)
VFD68BDC-2C	VFD68 Drive; 0.4 kw (1/2 hp); 128 x 68 x 113 mm (5 x 2-11/16 x 4-7/16 in.)
VFD68BFD-2C	VFD68 Drive; 0.75 kw (1 hp); 128 x 68 x 133 mm (5 x 2-11/16 x 5-1/4 in.)
VFD68BGG-2C	VFD68 Drive; 0.5 kw (2 hp); 128 x 108 x 136 mm (5 x 4-1/4 x 5-5/16 in.)
VFD68BHG-2C	VFD68 Drive; 2.2 kw (3 hp); 128 x 108 x 136 mm (5 x 4-1/4 x 5-5/16 in.)
VFD68BJK-2C	VFD68 Drive; 3.7 kw (5 hp); 128 x 170 x 142 mm (5 x 6-11/16 x 5-5/8 in.)
VFD68BKL-2C	VFD68 Drive; 5.5 kw (7-1/2 hp); 150 x 220 x 155 mm (5-15/16 x 8-11/16 x 6-1/8 in.)
VFD68BLL-2C	VFD68 Drive; 7.5 kw (10 hp); 150 x 220 x 155 mm (5-15/16 x 8-11/16 x 6-1/8 in.)
VFD68BMP-2C	VFD68 Drive; 11 kw (15 hp); 260 x 220 x 190 (10-1/4 x 8-11/16 x 7-1/2)
VFD68BNP-2C	VFD68 Drive; 15 kw (20 hp); 260 x 220 x 190 (10-1/4 x 8-11/16 x 7-1/2)

460 VAC ±10% Production Models

Product Code Number	Description
VFD68CDF-2C	VFD68 Drive; 0.4 kw (1/2 hp); 128 x 108 x 130 mm (5 x 4-1/4 x 5-1/8 in.)
VFD68CFF-2C	VFD68 Drive; 0.75 kw (1 hp); 128 x 108 x 130 mm (5 x 4-1/4 x 5-1/8 in.)
VFD68CGG-2C	VFD68 Drive; 1.5 kw (2 hp); 128 x 108 x 136 mm (5 x 4-1/4 x 5-5/16 in.)
VFD68CHH-2C	VFD68 Drive; 2.2 kw (3 hp); 128 x 108 x 156 mm (5 x 4-1/4 x 6-1/8 in.)
VFD68CJJ-2C	VFD68 Drive; 3.7 kw (5 hp); 128 x 108 x 166 mm (5 x 4-1/4 x 6-1/2 in.)
VFD68CKL-2C	VFD68 Drive; 5.5 kw (7-1/2 hp); 150 x 220 x 155 mm (5-15/16 x 8-11/16 x 6-1/8 in.)
VFD68CLL-2C	VFD68 Drive; 7.5 kw (10 hp); 150 x 220 x 155 mm (5-15/16 x 8-11/16 x 6-1/8 in.)
VFD68CMP-2C	VFD68 Drive; 11 kw (15 hp); 260 x 220 x 190 (10-1/4 x 8-11/16 x 7-1/2)
VFD68CNP-2C	VFD68 Drive; 15 kw (20 hp); 260 x 220 x 190 (10-1/4 x 8-11/16 x 7-1/2)

575 VAC +5/-10% Production Models

Product Code Number	Description
VFD68DFM-2C	VFD68 Drive; 0.75 kw (1 hp); 150 x 140 x 136 mm (5-15/16 x 5-1/2 x 5-5/16 in.)
VFD68DGM-2C	VFD68 Drive; 1.5 kw (2 hp); 150 x 140 x 136 mm (5-15/16 x 5-1/2 x 5-5/16 in.)
VFD68DHM-2C	VFD68 Drive; 2.2 kw (3 hp); 150 x 140 x 136 mm (5-15/16 x 5-1/2 x 5-5/16 in.)
VFD68DJN-2C	VFD68 Drive; 3.7 kw (5 hp); 150 x 220 x 148 mm (5-15/16 x 8-11/16 x 5-13/16 in.)
VFD68DKN-2C	VFD68 Drive; 5.5 kw (7-1/2 hp); 150 x 220 x 148 mm (5-15/16 x 8-11/16 x 5-13/16 in.)
VFD68DLN-2C	VFD68 Drive; 7.5 kw (10 hp); 150 x 220 x 148 mm (5-15/16 x 8-11/16 x 5-13/16 in.)

Accessories

Product Code Number	Description	Accessory Information
P499RAPS100K P499RCPS100K	Electronic Pressure Transducer (-10 to 100 psis [sealed for wet and freeze/thaw applications] Range) and WHA-PKD3-200C Wire Harness	<ul style="list-style-type: none"> Product code numbers ending in K are P499 kit models that include one P499 Pressure Transducer model and a WHA-PKD3-200C (6-1/2 ft [2 m]) Wire Harness. To order a single P499 Pressure Transducer model (without a WHA-PKD3-200C Wire Harness), replace the K with a C at the end of the P499 product code number. P499RxP type models are 0.5 to 4.5 VDC ratiometric pressure transducers with Packard style electrical connections. P499RAP type models have a 1/8 in. 27 NPT external thread (Style 49) pressure connection. P499RCP type models have a 1/4 in. SAE 45° flare internal thread (7/16-20 UNF) with depressor (Style 47) pressure connection. Refer to the <i>P499 Series Electronic Pressure Transducers Product/Technical Bulletin (LIT-12011190)</i> for more information on P499 Pressure Transducer models and the associated wire harnesses.
P499RAPS102K P499RCPS102K	Electronic Pressure Transducer (0 to 200 psis [sealed for wet and freeze/thaw applications] Range) and one WHA-PKD3-200C Wire Harness	
P499RAP-101K P499RCP-101K	Electronic Pressure Transducer (0 to 100 psig Range) and WHA-PKD3-200C Wire Harness	
P499RAP-102C	Electronic Pressure Transducer (0 to 200 psig Range)	
P499RAP-105K P499RCP-105K	Electronic Pressure Transducer (0 to 500 psig Range) and WHA-PKD3-200C Wire Harness	
P499RAP-107K P499RCP-107K	Electronic Pressure Transducer (0 to 750 psig Range) and WHA-PKD3-200C Wire Harness	
WHA-PKD3-200C	Wire Harness with Pigtail Leads, 6-1/2 ft (2 m)	
WHA-PKD3-400C	Wire Harness with Pigtail Leads, 13 ft (4 m)	
WHA-PKD3-400C	Wire Harness with Pigtail Leads, 19-5/8 ft (6 m)	

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VFD68 Variable Frequency Drives (Continued)

Technical Specifications

VFD68 Variable Frequency Drive	
Input Power Voltage/Frequency	230 VAC, 50 HZ (208/230 VAC, 60 Hz); 400 VAC, 50 Hz (460 VAC, 60 Hz); 575 VAC, 50 Hz; Continuous Duty
Output Voltage/Frequency	230 VAC, 50 HZ (208/230 VAC, 60 Hz); 400 VAC, 50 Hz (460 VAC, 60 Hz); 575 VAC, 50 Hz; Continuous Duty
Input Devices	Johnson Controls/PENN® P499 Electronic Pressure Transducers
PWM Carrier Frequency	Adjustable 0.7 to 15 kHz
Motor Requirements	Three-phase NEMA Design B motors required; Inverter-rated motors recommended
Overload Capacity	150% of ampere rating for 1 minute
Start/Stop	Use STF input to start or stop the motor
Ambient Conditions	Storage: -40 to 65°C (-40 to 149°F), 0 to 95% RH noncondensing Operating: -40 to 50°C (-40 to 122°F), 0 to 95% RH noncondensing Altitude: 1,000 m (3,300 ft) maximum without derating
Enclosures	UL Type 1 (NEMA) fan cooled (230 VAC 1 hp and lower models do not have a fan)
Maximum High Voltage Wire Length	Up to 100 m (328 ft) between the VFD68 drive and the motor (using the appropriate wire gauge)
Compliance	North America: cULus Listed, UL 508C, CSA-C22.2 No. 14, File E244421; Industry Canada (IC) Compliant to Canadian ICES-003, Class B limits Europe: CE Mark- Johnson Controls Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive. Australia: Regulatory Compliance Mark (RCM)
Dimensions (H x W x D)	Minimum: 128 x 68 x 81 mm (5 x 2-11/16 x 3-3/16 in.) Maximum: 260 x 220 x 190 mm (10-1/4 x 8-11/16 x 7-1/2 in.)
Shipping Weight	0.5 to 3.8 kg (1.1 to 8.38 lb)

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