

# Honeywell

# SmartVFD Three Contactor and Three Contactor Auto-Bypass Assemblies

## INSTALLATION INSTRUCTIONS

### APPLICATION

#### Three Contactor Bypass

The Smart VFD Three Contactor Bypass Assemblies channel electrical power either through or around the variable frequency drive (VFD).

### INSTALLATION

#### When Installing This Product

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions, Honeywell SmartVFD manual's and on the product to make sure the product is suitable for your application.
3. Verify bypass model is correct; no damage has been incurred; no screws, connections, terminations are loose.
4. Installer must be a trained, experienced service Technician, with VFD operation experience.
5. After installation is complete, check out product operation as provided in these instructions.



### WARNING

**Can Cause Serious Injury or Death**

1. Installation requires work with voltages that may cause serious injury or death.
2. This instruction manual is intended as a guide only. End user is responsible for proper application of this assembly, insuring proper conformance, directives, intended use and maintaining all safety practices as described in Honeywell SmartVFD manual, local codes, and local safety authorities.
3. Disconnect power supply before installation, and before any servicing.



### CAUTION

**Equipment Damage Hazard.  
Can short equipment circuitry.  
Disconnect power supply before installation**

#### Location and Mounting

Locate the device in a clean, dry, well-ventilated area with an ambient temperature below 104°F (40C).

Refer to SmartVFD user manual for free air space requirements above and to the sides of SmartVFD's.

Insure proper branch/short circuit protection is provided.

### WIRING

#### IMPORTANT

*All wiring must agree with applicable codes, ordinances and regulations.*

*Variable frequency drive can store energy. Refer to VFD manual for safe work practices and appropriate wait times before servicing after equipment power has been de-energized. All safety, warning and caution information located in Honeywell SmartVFD manuals must be read, understood and followed.*

1. Ensure that bypass panel voltage corresponds with that of the power supply.
2. To access the bypass panel wiring compartment:
  - a. Ensure the main disconnect handle is in the *OFF* position.
  - b. Open the cover.
  - c. Test for power.
3. Refer to SmartVFD user manual "Power Cabling" and "Control Unit" for proper power and control wire sizing information.
4. Terminate input three phase power wiring to line side of main fused disconnect. Refer to bypass panel schematic.
5. Terminate three phase motor wiring to motor terminals "T1", "T2", "T3". Refer to bypass panel schematic.
6. Terminate VFD control wiring to proper terminal in bypass panel. Refer to bypass panel schematic.
7. If equipped with Auto bypass, leave jumper J2 on bypass panel terminals 4 & 5 for auto bypass operation. Remove jumper J2 for manual bypass operation.
8. Leave jumper J1 on bypass panel terminals 1 & 3 if fire/smoke/safety shutdown not used. If this shutdown is used, remove jumper J1 and terminate fire/smoke/safety shutdown to bypass panel terminals 1 & 3.

Refer to schematic for typical wiring.

#### IMPORTANT

*Use only copper wire with 167°F (75°C) minimum.*



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## OPERATION

1. Make sure bypass panel and motor are properly grounded.
2. Make sure all connection points are tight, including all bypass panel connection points.
3. Make sure all safeties (customer's option) are connected and in working order.
4. Double-check correct voltage is being applied and power and motor wiring are terminated in the correct place.
5. Verify motor FLA does not exceed VFD output amp rating and bypass starter overload relay setting dial.
6. Set bypass starter overload relay adjustment dial to motor FLA.
7. Verify building automation system is ready for start, stop, speed command; and all wires are terminated in the correct location.

**Before applying power, make sure all personnel, debris, etc. are clear. Verify main input disconnect handle is in the "OFF" position; "Bypass/Off/Test/VFD" selector switch is in the "OFF" position.**

1. Apply input power, check three phase voltage on line side of main disconnect switch.
2. Turn main disconnect handle to "ON" position.
3. Turn "Bypass/Off/Test/VFD" selector switch to "Test" position. Enter all appropriate parameters in "SetUp Wizard" and all motor nameplate data. See SmartVFD manuals.
4. Turn "Bypass/Off/Test/VFD" selector switch to "VFD" position. Press "Loc/Rem" button and program correct parameters for local (keypad) control. See SmartVFD manuals. Check motor rotation.
  - a. If motor is rotating backwards in VFD mode, shut down power, lock out power source, wait until VFD stored energy has dissipated, switch incoming motor wires on the "T1" and "T2" terminals in the bypass panel, or motor wires "T1" and "T2" in the motor junction box. Re-energize power and check rotation again.
5. Turn "Bypass/Off/Test/VFD" selector switch to "Off" position. Wait for motor to stop. Turn selector switch to "Bypass" position then back to "Off" position. Do not leave the motor running in "Bypass" position. Check motor rotation.
  - a. If motor is rotating backwards in Bypass mode, shut down power, lock out power source, test incoming voltage on incoming line power wiring to line side of main disconnect switch. Once it is established that power is shut down, swap incoming wires on "L1" and "L2" of main disconnect switch. Re-energize power and check rotation again.

**Bypass panel "Bypass/Off/Test/VFD" selector switch has four operating positions:**

1. **VFD:** Device directs power to VFD first, then to the motor. VFD controls the motor as it would without the bypass panel.
2. **OFF:** Device stops power. Power reaches neither the motor nor the VFD.
3. **TEST:** Device directs power to VFD only. This allows for VFD calibration, adjustments, and diagnostics.
4. **BYPASS:** Device directs power to motor only. No power reaches the VFD. The motor operates at full speed with full power.

## Auto Bypass Equipped

An Auto-Bypass model number will end with G131/U, G231/U, G331/U.

1. **AUTO BYPASS CONTROL:** Bypass panel will automatically switch motor over to bypass starter if VFD faults. Bypass can also be selected remotely via contact closure on bypass panel terminals 6 & 7. Jumper J2 on bypass panel terminals 4 & 5 must remain in place for auto bypass operation. Removing jumper J2 sets bypass panel to: "Manual Bypass" – will not automatically switch to bypass upon a VFD fault. Bypass would need to be selected by turning "Bypass/Off/Test/VFD" selector switch to "Bypass" position.
2. VFD is pre-programmed at bypass manufacturing facility for "Auto Bypass" operation.

Effective 6/5/12 VFD digital input for "VFD Enable" on all models equipped with the AUTO BYPASS CONTROL option has changed from "DIN2" to "DIN4". Changes reflected on "HONEYWELL SMARTVFD, 3 CONTACTOR BYPASS PANEL, WITH AUTO BYPASS" schematic, page 4.

### IMPORTANT:

*If you have had a need to perform a factory reset of Smart VFD HVAC parameters, then you also need to perform the following steps.*

- a. Go to Parameter: M3.5.1.16 (Preset Frequency Selection 0). Change DigiN SlotA.4 to be "DigiN Slot 0.1". The Preset Speed will be turned off and DigiN4 will be used as Run Enable.
- b. Go to Parameter M.3.5.1.10 (Run Enable). Change DigiN Slot0.2 to be "DigiN Slot A.4".

## Operation Using the VFD (TEST Position)

To set bypass panel to power the VFD without powering the motor:

1. Stop the motor.
2. Wait five seconds.
3. Rotate switch to TEST.
4. Start the VFD (see VFD instructions for details).

## Operation Using the VFD (VFD Position)

To set bypass panel to use VFD to control the motor as it would without the bypass panel:

1. Stop the motor.
2. Wait five seconds.
3. Rotate switch to VFD.
4. Start the VFD (see VFD instructions for details).

## VFD Bypass

To set bypass panel to direct power only to motor:

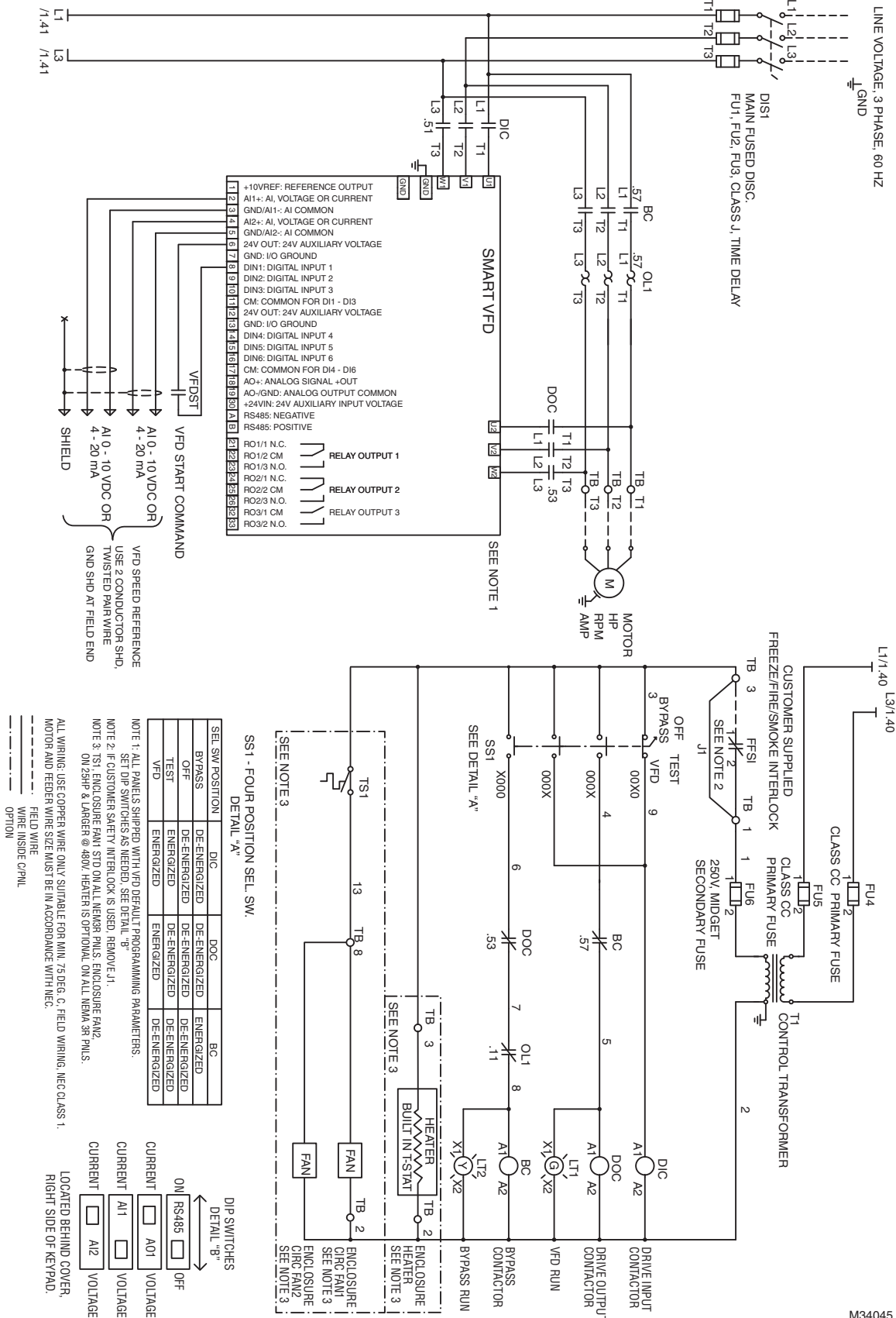
1. Rotate switch from VFD to OFF.
2. Wait five seconds.

### IMPORTANT

*Switching the bypass panel to BYPASS can immediately turn the motor on.*

3. Rotate switch to BYPASS.

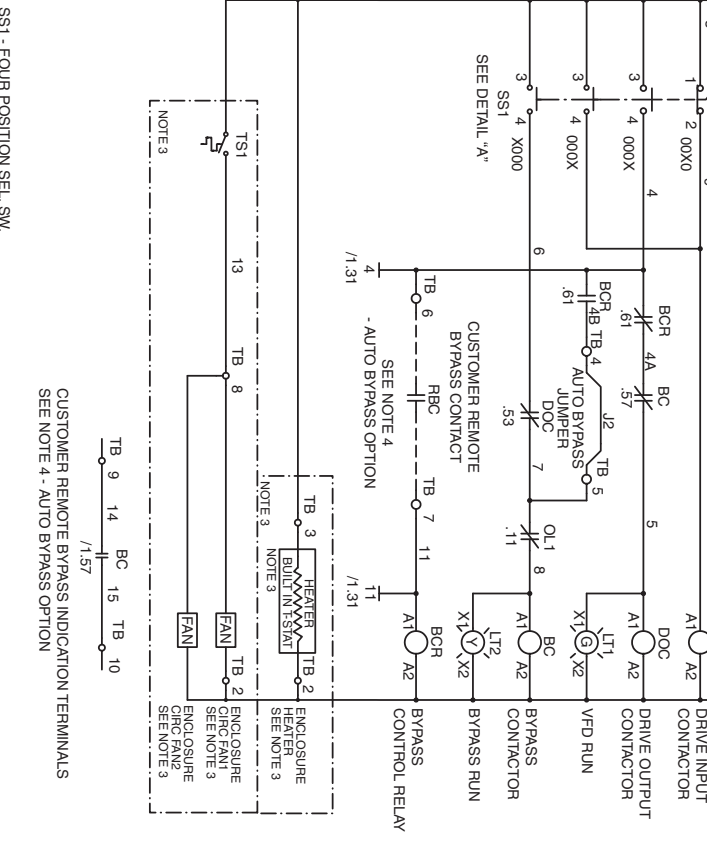
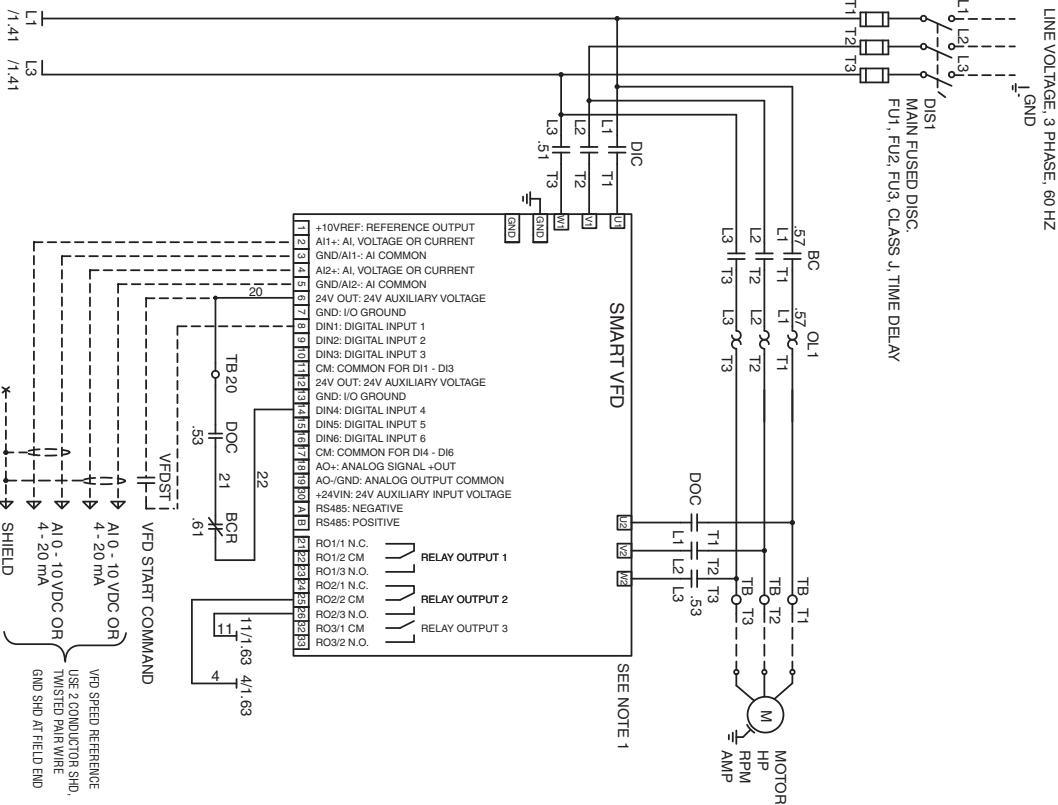
SMARTVFD THREE CONTACTOR AND THREE CONTACTOR AUTO-BYPASS ASSEMBLIES



M34045

Fig. 1. 3 Contactor Wiring Diagram

# SMARTVFD THREE CONTACTOR AND THREE CONTACTOR AUTO-BYPASS ASSEMBLIES



**SS1 - FOUR POSITION SEL. SW. DETAIL "A"**

SEL. SW POSITION	DDC	DOC	BC
BYPASS	DE-ENERGIZED	DE-ENERGIZED	ENERGIZED
OFF	DE-ENERGIZED	DE-ENERGIZED	DE-ENERGIZED
TEST	DE-ENERGIZED	DE-ENERGIZED	DE-ENERGIZED
VFD	ENERGIZED	ENERGIZED	DE-ENERGIZED

NOTE 1: ALL PANELS SHIPPED WITH VFD DEFAULT PROGRAMMING PARAMETERS AS FACTORY DEFAULT EXCEPT PARAMETERS M3.3.1.6, WHICH IS SET TO SLOT 0.1, AND M3.3.1.7 WHICH IS SET TO SLOT A.4. THESE CHANGES ARE FOR VFD ENABLE FOR AUTO BYPASS CONTROL. SET DIP SWITCHES SHOWN IN DETAIL "B" AS REQUIRED.  
 NOTE 2: IF CUSTOMER SAFETY INTERLOCK IS USED, REMOVE J1.  
 NOTE 3: TS1 ENCLOSURE FAN1 STD ON ALL NEWER PANELS. ENCLOSURE FAN2.  
 NOTE 4: ON 30, 40 & 100HP @ 480V HEATER IS OPTIONAL ON ALL NEWER 3R PANELS.  
 NOTE 5: FULL CAGE, BEYOND 100HP, IS NOT AVAILABLE. SEE NOTE 3.  
 NOTE 6: MANUAL BYPASS OPTION - REMOVE JUMPER J2.  
 NOTE 7: 151 ENCLOSURE OPTION - REMOVE JUMPER J2.

ALL WIRING: USE COPPER WIRE ONLY. SUITABLE FOR MIN. 75 DEG. C. FIELD WIRING, NEC CLASS 1. MOTOR AND FEEDER WIRE SIZE MUST BE IN ACCORDANCE WITH NEC.  
 FIELD WIRE: WIRE INSIDE OF PANEL  
 OPTION: WIRE INSIDE OF PANEL



**Fig. 2. 3 Contactor Auto-bypass Wiring Diagram**

**Table 1. SmartVFD 3 Contactor and 3 Contactor Auto-Bypass.**

Voltage				NEMA1		NEMA12		NEMA3R	
	HP	Amps	Frame	NEMA1 3 Contactor Bypass	NEMA1 3 Contactor Auto Bypass	NEMA12 3 Contactor Bypass	NEMA12 3 Contactor Auto Bypass	NEMA3R 3 Contactor Bypass	NEMA3R Contactor Auto Bypass
460	1.5	3.4	4	HVFDSB3C0015G130	HVFDSB3C0015G131	HVFDSB3C0015G230	HVFDSB3C0015G231	HVFDSB3C0015G330	HVFDSB3C0015G331
	2	4.8	4	HVFDSB3C0020G130	HVFDSB3C0020G131	HVFDSB3C0020G230	HVFDSB3C0020G231	HVFDSB3C0020G330	HVFDSB3C0020G331
	3	5.6	4	HVFDSB3C0030G130	HVFDSB3C0030G131	HVFDSB3C0030G230	HVFDSB3C0030G231	HVFDSB3C0030G330	HVFDSB3C0030G331
	4	8	4	HVFDSB3C0040G130	HVFDSB3C0040G131	HVFDSB3C0040G230	HVFDSB3C0040G231	HVFDSB3C0040G330	HVFDSB3C0040G331
	5	9.6	4	HVFDSB3C0050G130	HVFDSB3C0050G131	HVFDSB3C0050G230	HVFDSB3C0050G231	HVFDSB3C0050G330	HVFDSB3C0050G331
	7.5	12	4	HVFDSB3C0075G130	HVFDSB3C0075G131	HVFDSB3C0075G230	HVFDSB3C0075G231	HVFDSB3C0075G330	HVFDSB3C0075G331
	10	16	5	HVFDSB3C0100G130	HVFDSB3C0100G131	HVFDSB3C0100G230	HVFDSB3C0100G231	HVFDSB3C0100G330	HVFDSB3C0100G331
	15	23	5	HVFDSB3C0150G130	HVFDSB3C0150G131	HVFDSB3C0150G230	HVFDSB3C0150G231	HVFDSB3C0150G330	HVFDSB3C0150G331
	20	31	5	HVFDSB3C0200G130	HVFDSB3C0200G131	HVFDSB3C0200G230	HVFDSB3C0200G231	HVFDSB3C0200G330	HVFDSB3C0200G331
	25	38	6	HVFDSB3C0250G130	HVFDSB3C0250G131	HVFDSB3C0250G230	HVFDSB3C0250G231	HVFDSB3C0250G330	HVFDSB3C0250G331
	30	46	6	HVFDSB3C0300G130	HVFDSB3C0300G131	HVFDSB3C0300G230	HVFDSB3C0300G231	HVFDSB3C0300G330	HVFDSB3C0300G331
	40	61	6	HVFDSB3C0400G130	HVFDSB3C0400G131	HVFDSB3C0400G230	HVFDSB3C0400G231	HVFDSB3C0400G330	HVFDSB3C0400G331
	50	72	7	HVFDSB3C0500G130	HVFDSB3C0500G131	HVFDSB3C0500G230	HVFDSB3C0500G231	HVFDSB3C0500G330	HVFDSB3C0500G331
	60	87	7	HVFDSB3C0600G130	HVFDSB3C0600G131	HVFDSB3C0600G230	HVFDSB3C0600G231	HVFDSB3C0600G330	HVFDSB3C0600G331
	75	105	7	HVFDSB3C0750G130	HVFDSB3C0750G131	HVFDSB3C0750G230	HVFDSB3C0750G231	HVFDSB3C0750G330	HVFDSB3C0750G331
100	140	8	HVFDSB3C1000G130	HVFDSB3C1000G131	HVFDSB3C1000G230	HVFDSB3C1000G231	HVFDSB3C1000G330	HVFDSB3C1000G331	
120	170	8	HVFDSB3C1250G130	HVFDSB3C1250G131	HVFDSB3C1250G230	HVFDSB3C1250G231	HVFDSB3C1250G330	HVFDSB3C1250G331	
150	205	8	HVFDSB3C1500G130	HVFDSB3C1500G131	HVFDSB3C1500G230	HVFDSB3C1500G231	HVFDSB3C1500G330	HVFDSB3C1500G331	
208	0.75	3.7	4	HVFDSB3A0007G130	HVFDSB3A0007G131	HVFDSB3A0007G230	HVFDSB3A0007G231	HVFDSB3A0007G330	HVFDSB3A0007G331
	1	4.8	4	HVFDSB3A0010G130	HVFDSB3A0010G131	HVFDSB3A0010G230	HVFDSB3A0010G231	HVFDSB3A0010G330	HVFDSB3A0010G331
	1.5	6.6	4	HVFDSB3A0015G130	HVFDSB3A0015G131	HVFDSB3A0015G230	HVFDSB3A0015G231	HVFDSB3A0015G330	HVFDSB3A0015G331
	2	8	4	HVFDSB3A0020G130	HVFDSB3A0020G131	HVFDSB3A0020G230	HVFDSB3A0020G231	HVFDSB3A0020G330	HVFDSB3A0020G331
	3	11	4	HVFDSB3A0030G130	HVFDSB3A0030G131	HVFDSB3A0030G230	HVFDSB3A0030G231	HVFDSB3A0030G330	HVFDSB3A0030G331
	5	18	5	HVFDSB3A0050G130	HVFDSB3A0050G131	HVFDSB3A0050G230	HVFDSB3A0050G231	HVFDSB3A0050G330	HVFDSB3A0050G331
	7.5	24	5	HVFDSB3A0075G130	HVFDSB3A0075G131	HVFDSB3A0075G230	HVFDSB3A0075G231	HVFDSB3A0075G330	HVFDSB3A0075G331
	10	31	5	HVFDSB3A0100G130	HVFDSB3A0100G131	HVFDSB3A0100G230	HVFDSB3A0100G231	HVFDSB3A0100G330	HVFDSB3A0100G331
	15	48	6	HVFDSB3A0150G130	HVFDSB3A0150G131	HVFDSB3A0150G230	HVFDSB3A0150G231	HVFDSB3A0150G330	HVFDSB3A0150G331
	20	62	6	HVFDSB3A0200G130	HVFDSB3A0200G131	HVFDSB3A0200G230	HVFDSB3A0200G231	HVFDSB3A0200G330	HVFDSB3A0200G331
	25	75	6	HVFDSB3A0250G130	HVFDSB3A0250G131	HVFDSB3A0250G230	HVFDSB3A0250G231	HVFDSB3A0250G330	HVFDSB3A0250G331
	30	88	7	HVFDSB3A0300G130	HVFDSB3A0300G131	HVFDSB3A0300G230	HVFDSB3A0300G231	HVFDSB3A0300G330	HVFDSB3A0300G331
	40	105	7	HVFDSB3A0400G130	HVFDSB3A0400G131	HVFDSB3A0400G230	HVFDSB3A0400G231	HVFDSB3A0400G330	HVFDSB3A0400G331
	50	140	8	HVFDSB3A0500G130	HVFDSB3A0500G131	HVFDSB3A0500G230	HVFDSB3A0500G231	HVFDSB3A0500G330	HVFDSB3A0500G331
	60	170	8	HVFDSB3A0600G130	HVFDSB3A0600G131	HVFDSB3A0600G230	HVFDSB3A0600G231	HVFDSB3A0600G330	HVFDSB3A0600G331
75	205	8	HVFDSB3A0750G130	HVFDSB3A0750G131	HVFDSB3A0750G230	HVFDSB3A0750G231	HVFDSB3A0750G330	HVFDSB3A0750G331	

**Table 1. SmartVFD 3 Contactor and 3 Contactor Auto-Bypass. (Continued)**

				NEMA1		NEMA12		NEMA3R	
Voltage	HP	Amps	Frame	NEMA1 3 Contactor Bypass	NEMA1 3 Contactor Auto Bypass	NEMA12 3 Contactor Bypass	NEMA12 3 Contactor Auto Bypass	NEMA3R 3 Contactor Bypass	NEMA3R Contactor Auto Bypass
230	0.75	3.7	4	HVFDSB3B0007G130	HVFDSB3B0007G131	HVFDSB3B0007G230	HVFDSB3B0007G231	HVFDSB3B0007G330	HVFDSB3B0007G331
	1	4.8	4	HVFDSB3B0010G130	HVFDSB3B0010G131	HVFDSB3B0010G230	HVFDSB3B0010G231	HVFDSB3B0010G330	HVFDSB3B0010G331
	1.5	6.6	4	HVFDSB3B0015G130	HVFDSB3B0015G131	HVFDSB3B0015G230	HVFDSB3B0015G231	HVFDSB3B0015G330	HVFDSB3B0015G331
	2	8	4	HVFDSB3B0020G130	HVFDSB3B0020G131	HVFDSB3B0020G230	HVFDSB3B0020G231	HVFDSB3B0020G330	HVFDSB3B0020G331
	3	11	4	HVFDSB3B0030G130	HVFDSB3B0030G131	HVFDSB3B0030G230	HVFDSB3B0030G231	HVFDSB3B0030G330	HVFDSB3B0030G331
	5	18	5	HVFDSB3B0050G130	HVFDSB3B0050G131	HVFDSB3B0050G230	HVFDSB3B0050G231	HVFDSB3B0050G330	HVFDSB3B0050G331
	7.5	24	5	HVFDSB3B0075G130	HVFDSB3B0075G131	HVFDSB3B0075G230	HVFDSB3B0075G231	HVFDSB3B0075G330	HVFDSB3B0075G331
	10	31	5	HVFDSB3B0100G130	HVFDSB3B0100G131	HVFDSB3B0100G230	HVFDSB3B0100G231	HVFDSB3B0100G330	HVFDSB3B0100G331
	15	48	6	HVFDSB3B0150G130	HVFDSB3B0150G131	HVFDSB3B0150G230	HVFDSB3B0150G231	HVFDSB3B0150G330	HVFDSB3B0150G331
	20	62	6	HVFDSB3B0200G130	HVFDSB3B0200G131	HVFDSB3B0200G230	HVFDSB3B0200G231	HVFDSB3B0200G330	HVFDSB3B0200G331
	25	75	6	HVFDSB3B0250G130	HVFDSB3B0250G131	HVFDSB3B0250G230	HVFDSB3B0250G231	HVFDSB3B0250G330	HVFDSB3B0250G331
	30	88	7	HVFDSB3B0300G130	HVFDSB3B0300G131	HVFDSB3B0300G230	HVFDSB3B0300G231	HVFDSB3B0300G330	HVFDSB3B0300G331
	40	105	7	HVFDSB3B0400G130	HVFDSB3B0400G131	HVFDSB3B0400G230	HVFDSB3B0400G231	HVFDSB3B0400G330	HVFDSB3B0400G331
	50	140	8	HVFDSB3B0500G130	HVFDSB3B0500G131	HVFDSB3B0500G230	HVFDSB3B0500G231	HVFDSB3B0500G330	HVFDSB3B0500G331
	60	170	8	HVFDSB3B0600G130	HVFDSB3B0600G131	HVFDSB3B0600G230	HVFDSB3B0600G231	HVFDSB3B0600G330	HVFDSB3B0600G331
	75	205	8	HVFDSB3B0750G130	HVFDSB3B0750G131	HVFDSB3B0750G230	HVFDSB3B0750G231	HVFDSB3B0750G330	HVFDSB3B0750G331



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