

# VSD Series II Variable Speed Open Drives

## Product Bulletin

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The Johnson Controls® VSD Series II Variable Speed Open Drives, powered by Eaton® technology, are specifically engineered for HVAC, pump, and fluid control applications. The ultra-efficient DC capacitor and power structure allows the drives to consume less energy, lowering greenhouse gases.

The I/O configuration is designed with wiring ergonomics in mind by including removable terminal blocks. The main, easily removable, control board used for all drive frames with six digital IN, two analog IN, one analog OUT, three relay OUT, and two expansion slots for I/O or communication boards. In addition, the control board has built-in RS-485 and Ethernet communication.

These drives continue the tradition of robust performance and raise the bar on features and functionality, ensuring the best solution at the right price.

VSD Series II Variable Speed Open Drives are selected using VSD Series II code numbers and standard Johnson Controls order entry tools.



Figure 1: VSD Series II Open Drive

Table 1: VSD Series II Open Drive Features and Benefits

Features	Benefits
<b>Patented Active Energy Control Algorithm</b>	Achieves an additional 2% to 8% energy savings when compared to competitive products.
<b>HAND/OFF/AUTO and DRIVE/BYPASS Selector on Keypad</b>	Simplifies control.
<b>Copy/Paste Function</b>	Allows the transfer of parameter settings from one drive to the next.
<b>Versatile Keypad</b>	Displays up to nine monitored parameters simultaneously.
<b>EMI/RFI Filters Standard on All Drives (Frame 4 through Frame 9)</b>	Meet EMC Category 2 requirements.
<b>Motor Overload, Underload, and Stall Protections</b>	Protect against premature motor failure.
<b>BACnet® MS/TP, BACnet IP, Modbus®, and N2 Network Protocols</b>	Provide a wide variety of communication protocols to meet the needs of many applications.

## Additional VSD Series II Open Drive Features

- Integrated DC link choke standard on drives from frame 4 through frame 9
- Anti-trip DC bus regulation
- Input surge protection against voltage spikes varistor input
- Additional I/O and communication cards provide plug-and-play functionality
- Remote mount keypad kit available
- NEMA Type 1 and NEMA Type 12 available
- Real-time clock with PLC functionality
- Two independent PID functions
- On-screen troubleshooting diagnostics with embedded manual assistance
- Onboard RS-485 (BACnet, N2, Modbus)
- Onboard Ethernet-based communications (BACnet/IP, Modbus/TCP)
- Standard NEMA Type 12 keypad on all drives
- Quickstart wizard built into programming of drive ensures a smooth startup
- I/O connections with simple quick connection terminals
- Control logic can be powered from an external 24V power supply to simulate internal drive functions and fieldbus, if necessary, used for testing and software downloads
- Standard I/O, 6DI, 2AI, 1AO 2 Form C RO (NO/NC), 1 Form A RO (NO)
- Hard-wired external/damper interlock

**IMPORTANT:** Use this VSD Series II Variable Speed Open Drive only as an operating control. Where failure or malfunction of the series II open drive 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 series II open drive.

## Onboard Network Communication

### **Metasys® System**

Each VSD Series II Variable Speed Open Drive provides communication between the drive and a Johnson Controls Metasys N2 network. With this connection, the drives can be controlled, monitored and programmed from the Metasys system. N2 can be selected and programmed by the drive keypad.

### **BACnet**

The VSD Series II Variable Speed Open Drives provide communication to BACnet® networks. Data transfer is master-slave/token passing (MS/TP) RS-485.

### **BACnet IP**

100 base T interface

### **Modbus TCP**

Ethernet-based protocol

### **Modbus RTU**

Each VSD Series II Variable Speed Open Drives provide communication to Modbus RTU RS-485 as a slave on a Modbus network. Other communication parameters include an address range from 1 – 247; a parity of None, Odd or Even; and the stop bit is 1.

**Table 2: VSD Series II Open Drives Selection Chart**

	Code Number	V	S				0	0	A	—	0	0	0	0	0
<b>Base Product</b>	VS = Series II Variable Speed Open Drive prefix														
<b>Amps/hp/kW</b>	3D4 = 3.4 A, 1.5 hp, 1.1 kW <sup>1</sup> 3D7 = 3.7 A, 3/4 hp, 0.55 kW <sup>2</sup> 4D8 = 4.8 A, 1 hp, 1.1 kW <sup>1</sup> 4D8 = 4.8 A, 2 hp, 1.5 kW <sup>2</sup> 5D6 = 5.6 A, 3 hp, 2.2 kW <sup>2</sup> 6D6 = 6.6 A, 1.5 hp, 1.1 kW <sup>1</sup> 8D0 = 8 A, 2 hp, 1.5 kW <sup>1</sup> 8D0 = 8 A, 4 hp, 3 kW <sup>2</sup> 011 = 11 A, 3 hp, 2.2 kW <sup>1</sup> 012 = 12 A, 4 hp, 3 kW <sup>1</sup> 012 = 12 A, 7.5 hp, 5.5 kW <sup>2</sup> 016 = 16 A, 10 hp, 7.5 kW <sup>2</sup> 018 = 18 A, 5 hp, 4 kW <sup>1</sup> 023 = 23 A, 15 hp, 11 kW <sup>2</sup> 024 = 24 A, 7.5 hp, 5.5 kW <sup>1</sup> 031 = 31 A, 10 hp, 7.5 kW <sup>1</sup> 031 = 31 A, 20 hp, 15 kW <sup>2</sup> 038 = 38 A, 25 hp, 18.5 kW <sup>2</sup> 046 = 46 A, 30 hp, 22 kW <sup>2</sup> 048 = 48 A, 15 hp, 11 kW <sup>1</sup> 061 = 61 A, 40 hp, 30 kW <sup>2</sup> 062 = 62 A, 20 hp, 15 kW <sup>1</sup> 072 = 72 A, 50 hp, 37 kW <sup>2</sup> 075 = 75 A, 25 hp, 18.5 kW <sup>1</sup> 087 = 87 A, 60 hp, 45 kW <sup>2</sup> 088 = 88 A, 30 hp, 22 kW <sup>1</sup> 105 = 105 A, 40 hp, 30 kW <sup>1</sup> 105 = 105 A, 75 hp, 55 kW <sup>2</sup> 140 = 140 A, 50 hp, 37 kW <sup>1</sup> 140 = 140 A, 100 hp, 75 kW <sup>2</sup> 170 = 170 A, 60 hp, 45 kW <sup>1</sup> 170 = 170 A, 125 hp, 90 kW <sup>2</sup> 205 = 205 A, 75 hp, 55 kW <sup>1</sup> 205 = 205 A, 150 hp, 110 kW <sup>2</sup> 261 = 261 A, 100 hp, 75 kW <sup>1</sup> 261 = 261 A, 200 hp, 132 kW <sup>2</sup> 310 = 310 A, 125 hp, 90 kW <sup>1</sup> 310 = 310 A, 250 hp, 160 kW <sup>2</sup>														
<b>Voltage</b>	2 = 230 V 4 = 480 V														
<b>Enclosure Rating</b>	1 = NEMA Type 1 (IP21) 2 = NEMA Type 12 (IP54)														
<b>Drive Style</b>	0 = None (Open Drive)														
<b>Revision #</b>	B = Rev. 2 (Americas) D = Rev. 2 (Canada)														
<b>Separator (—)</b>															
<b>Communications</b>	0 = STD (BACnet/Legacy N2/Modbus) S = SA Bus, CS Card (added to JC-VSD) L = LONWORKS® Network, C4 Card (added) <sup>3</sup>														
<b>Options</b>	00 = None														

1. 208 – 240 Volts 3-phase.
2. 380 – 480 Volts 3-phase.
3. Contact your local Johnson Controls representative for product availability.

**Table 3: VSD Series II 208/230 V Open Drives - Frame 4**

<b>Code number</b>	<b>Description<sup>1</sup></b>	<b>Current (A)<sup>1</sup></b>
VS3D7210B-00000	VSD Series II, 3/4 hp (0.55 kW), 208 – 230 VAC, Type 1	3.7
VS3D7210B-S0000	VSD Series II, 3/4 hp (0.55 kW), 208 – 230 VAC, Type 1, SA Bus	3.7
VS3D7210B-L0000	VSD Series II, 3/4 hp (0.55 kW), 208 – 230 VAC, Type 1, LON	3.7
VS3D7220B-00000	VSD Series II, 3/4 hp (0.55 kW), 208 – 230 VAC, Type 12	3.7
VS3D7220B-S0000	VSD Series II, 3/4 hp (0.55 kW), 208 – 230 VAC, Type 12, SA Bus	3.7
VS3D7220B-L0000	VSD Series II, 3/4 hp (0.55 kW), 208 – 230 VAC, Type 12, LON	3.7
VS4D8210B-00000	VSD Series II, 1 hp (1.1 kW), 208 – 230 VAC, Type 1	4.8
VS4D8210B-S0000	VSD Series II, 1 hp (1.1 kW), 208 – 230 VAC, Type 1, SA Bus	4.8
VS4D8210B-L0000	VSD Series II, 1 hp (1.1 kW), 208 – 230 VAC, Type 1, LON	4.8
VS4D8220B-00000	VSD Series II, 1 hp (1.1 kW), 208 – 230 VAC, Type 12	4.8
VS4D8220B-S0000	VSD Series II, 1 hp (1.1 kW), 208 – 230 VAC, Type 12, SA Bus	4.8
VS4D8220B-L0000	VSD Series II, 1 hp (1.1 kW), 208 – 230 VAC, Type 12, LON	4.8
VS6D6210B-00000	VSD Series II, 1.5 hp (1.1 kW), 208 – 230 VAC, Type 1	6.6
VS6D6210B-S0000	VSD Series II, 1.5 hp (1.1 kW), 208 – 230 VAC, Type 1, SA Bus	6.6
VS6D6210B-L0000	VSD Series II, 1.5 hp (1.1 kW), 208 – 230 VAC, Type 1, LON	6.6
VS6D6220B-00000	VSD Series II, 1.5 hp (1.1 kW), 208 – 230 VAC, Type 12	6.6
VS6D6220B-S0000	VSD Series II, 1.5 hp (1.1 kW), 208 – 230 VAC, Type 12, SA Bus	6.6
VS6D6220B-L0000	VSD Series II, 1.5 hp (1.1 kW), 208 – 230 VAC, Type 12, LON	6.6
VS8D0210B-00000	VSD Series II, 2 hp (1.5 kW), 208 – 230 VAC, Type 1	8
VS8D0210B-S0000	VSD Series II, 2 hp (1.5 kW), 208 – 230 VAC, Type 1, SA Bus	8
VS8D0210B-L0000	VSD Series II, 2 hp (1.5 kW), 208 – 230 VAC, Type 1, LON	8
VS8D0220B-00000	VSD Series II, 2 hp (1.5 kW), 208 – 230 VAC, Type 12	8
VS8D0220B-S0000	VSD Series II, 2 hp (1.5 kW), 208 – 230 VAC, Type 12, SA Bus	8
VS8D0220B-L0000	VSD Series II, 2 hp (1.5 kW), 208 – 230 VAC, Type 12, LON	8
VS011210B-00000	VSD Series II, 3 hp (2.2 kW), 208 – 230 VAC, Type 1	11
VS011210B-S0000	VSD Series II, 3 hp (2.2 kW), 208 – 230 VAC, Type 1, SA Bus	11
VS011210B-L0000	VSD Series II, 3 hp (2.2 kW), 208 – 230 VAC, Type 1, LON	11
VS011220B-00000	VSD Series II, 3 hp (2.2 kW), 208 – 230 VAC, Type 12	11
VS011220B-S0000	VSD Series II, 3 hp (2.2 kW), 208 – 230 VAC, Type 12, SA Bus	11
VS011220B-L0000	VSD Series II, 3 hp (2.2 kW), 208 – 230 VAC, Type 12, LON	11
VS012210B-00000	VSD Series II, 4 hp (3 kW), 208 – 230 VAC, Type 1	12
VS012210B-S0000	VSD Series II, 4 hp (3 kW), 208 – 230 VAC, Type 1, SA Bus	12
VS012210B-L0000	VSD Series II, 4 hp (3 kW), 208 – 230 VAC, Type 1, LON	12
VS012220B-00000	VSD Series II, 4 hp (3 kW), 208 – 230 VAC, Type 12	12
VS012220B-S0000	VSD Series II, 4 hp (3 kW), 208 – 230 VAC, Type 12, SA Bus	12
VS012220B-L0000	VSD Series II, 4 hp (3 kW), 208 – 230 VAC, Type 12, LON	12

1. All horsepower and current ratings are Variable Torque (VT).

**Table 4: VSD Series II 208/230 V Open Drives - Frame 5**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS018210B-00000	VSD Series II, 5 hp (4 kW), 208 – 230 VAC, Type 1	18
VS018210B-S0000	VSD Series II, 5 hp (4 kW), 208 – 230 VAC, Type 1, SA Bus	18
VS018210B-L0000	VSD Series II, 5 hp (4 kW), 208 – 230 VAC, Type 1, LON	18
VS018220B-00000	VSD Series II, 5 hp (4 kW), 208 – 230 VAC, Type 12	18
VS018220B-S0000	VSD Series II, 5 hp (4 kW), 208 – 230 VAC, Type 12, SA Bus	18
VS018220B-L0000	VSD Series II, 5 hp (4 kW), 208 – 230 VAC, Type 12, LON	18
VS024210B-00000	VSD Series II, 7.5 hp (5.5 kW), 208 – 230 VAC, Type 1	24
VS024210B-S0000	VSD Series II, 7.5 hp (5.5 kW), 208 – 230 VAC, Type 1, SA Bus	24
VS024210B-L0000	VSD Series II, 7.5 hp (5.5 kW), 208 – 230 VAC, Type 1, LON	24
VS024220B-00000	VSD Series II, 7.5 hp (5.5 kW), 208 – 230 VAC, Type 12	24
VS024220B-S0000	VSD Series II, 7.5 hp (5.5 kW), 208 – 230 VAC, Type 12, SA Bus	24
VS024220B-L0000	VSD Series II, 7.5 hp (5.5 kW), 208 – 230 VAC, Type 12, LON	24
VS031210B-00000	VSD Series II, 10 hp (7.5 kW), 208 – 230 VAC, Type 1	31
VS031210B-S0000	VSD Series II, 10 hp (7.5 kW), 208 – 230 VAC, Type 1, SA Bus	31
VS031210B-L0000	VSD Series II, 10 hp (7.5 kW), 208 – 230 VAC, Type 1, LON	31
VS031220B-00000	VSD Series II, 10 hp (7.5 kW), 208 – 230 VAC, Type 12	31
VS031220B-S0000	VSD Series II, 10 hp (7.5 kW), 208 – 230 VAC, Type 12, SA Bus	31
VS031220B-L0000	VSD Series II, 10 hp (7.5 kW), 208 – 230 VAC, Type 12, LON	31

1. All horsepower and current ratings are Variable Torque (VT).

**Table 5: VSD Series II 208/230 V Open Drives - Frame 6**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS048210B-00000	VSD Series II, 15 hp (11 kW), 208 – 230 VAC, Type 1	48
VS048210B-S0000	VSD Series II, 15 hp (11 kW), 208 – 230 VAC, Type 1, SA Bus	48
VS048210B-L0000	VSD Series II, 15 hp (11 kW), 208 – 230 VAC, Type 1, LON	48
VS048220B-00000	VSD Series II, 15 hp (11 kW), 208 – 230 VAC, Type 12	48
VS048220B-S0000	VSD Series II, 15 hp (11 kW), 208 – 230 VAC, Type 12, SA Bus	48
VS048220B-L0000	VSD Series II, 15 hp (11 kW), 208 – 230 VAC, Type 12, LON	48
VS062210B-00000	VSD Series II, 20 hp (15 kW), 208 – 230 VAC, Type 1	62
VS062210B-S0000	VSD Series II, 20 hp (15 kW), 208 – 230 VAC, Type 1, SA Bus	62
VS062210B-L0000	VSD Series II, 20 hp (15 kW), 208 – 230 VAC, Type 1, LON	62
VS062220B-00000	VSD Series II, 20 hp (15 kW), 208 – 230 VAC, Type 12	62
VS062220B-S0000	VSD Series II, 20 hp (15 kW), 208 – 230 VAC, Type 12, SA Bus	62
VS062220B-L0000	VSD Series II, 20 hp (15 kW), 208 – 230 VAC, Type 12, LON	62

1. All horsepower and current ratings are Variable Torque (VT).

**Table 6: VSD Series II 208/230 V Open Drives - Frame 7**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS075210B-00000	VSD Series II, 25 hp (18.5 kW), 208 – 230 VAC, Type 1	75
VS075210B-S0000	VSD Series II, 25 hp (18.5 kW), 208 – 230 VAC, Type 1, SA Bus	75
VS075210B-L0000	VSD Series II, 25 hp (18.5 kW), 208 – 230 VAC, Type 1, LON	75
VS075220B-00000	VSD Series II, 25 hp (18.5 kW), 208 – 230 VAC, Type 12	75
VS075220B-S0000	VSD Series II, 25 hp (18.5 kW), 208 – 230 VAC, Type 12, SA Bus	75
VS075220B-L0000	VSD Series II, 25 hp (18.5 kW), 208 – 230 VAC, Type 12, LON	75
VS088210B-00000	VSD Series II, 30 hp (22 kW), 208 – 230 VAC, Type 1	88
VS088210B-S0000	VSD Series II, 30 hp (22 kW), 208 – 230 VAC, Type 1, SA Bus	88
VS088210B-L0000	VSD Series II, 30 hp (22 kW), 208 – 230 VAC, Type 1, LON	88
VS088220B-00000	VSD Series II, 30 hp (22 kW), 208 – 230 VAC, Type 12	88
VS088220B-S0000	VSD Series II, 30 hp (22 kW), 208 – 230 VAC, Type 12, SA Bus	88
VS088220B-L0000	VSD Series II, 30 hp (22 kW), 208 – 230 VAC, Type 12, LON	88
VS105210B-00000	VSD Series II, 40 hp (30 kW), 208 – 230 VAC, Type 1	105
VS105210B-S0000	VSD Series II, 40 hp (30 kW), 208 – 230 VAC, Type 1, SA Bus	105
VS105210B-L0000	VSD Series II, 40 hp (30 kW), 208 – 230 VAC, Type 1, LON	105
VS105220B-00000	VSD Series II, 40 hp (30 kW), 208 – 230 VAC, Type 12	105
VS105220B-S0000	VSD Series II, 40 hp (30 kW), 208 – 230 VAC, Type 12, SA Bus	105
VS105220B-L0000	VSD Series II, 40 hp (30 kW), 208 – 230 VAC, Type 12, LON	105

1. All horsepower and current ratings are Variable Torque (VT).

**Table 7: VSD Series II 208/230 V Open Drives - Frame 8 (Part 1 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS140210B-00000	VSD Series II, 50 hp (37 kW), 208 – 230 VAC, Type 1	140
VS140210B-S0000	VSD Series II, 50 hp (37 kW), 208 – 230 VAC, Type 1, SA Bus	140
VS140210B-L0000	VSD Series II, 50 hp (37 kW), 208 – 230 VAC, Type 1, LON	140
VS140220B-00000	VSD Series II, 50 hp (37 kW), 208 – 230 VAC, Type 12	140
VS140220B-S0000	VSD Series II, 50 hp (37 kW), 208 – 230 VAC, Type 12, SA Bus	140
VS140220B-L0000	VSD Series II, 50 hp (37 kW), 208 – 230 VAC, Type 12, LON	140
VS170210B-00000	VSD Series II, 60 hp (45 kW), 208 – 230 VAC, Type 1	170
VS170210B-S0000	VSD Series II, 60 hp (45 kW), 208 – 230 VAC, Type 1, SA Bus	170
VS170210B-L0000	VSD Series II, 60 hp (45 kW), 208 – 230 VAC, Type 1, LON	170
VS170220B-00000	VSD Series II, 60 hp (45 kW), 208 – 230 VAC, Type 12	170
VS170220B-S0000	VSD Series II, 60 hp (45 kW), 208 – 230 VAC, Type 12, SA Bus	170
VS170220B-L0000	VSD Series II, 60 hp (45 kW), 208 – 230 VAC, Type 12, LON	170
VS205210B-00000	VSD Series II, 75 hp (55 kW), 208 – 230 VAC, Type 1	205

**Table 7: VSD Series II 208/230 V Open Drives - Frame 8 (Part 2 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS205210B-S0000	VSD Series II, 75 hp (55 kW), 208 – 230 VAC, Type 1, SA Bus	205
VS205210B-L0000	VSD Series II, 75 hp (55 kW), 208 – 230 VAC, Type 1, LON	205
VS205220B-00000	VSD Series II, 75 hp (55 kW), 208 – 230 VAC, Type 12	205
VS205220B-S0000	VSD Series II, 75 hp (55 kW), 208 – 230 VAC, Type 12, SA Bus	205
VS205220B-L0000	VSD Series II, 75 hp (55 kW), 208 – 230 VAC, Type 12, LON	205

1. All horsepower and current ratings are Variable Torque (VT).

**Table 8: VSD Series II 208/230 V Open Drives - Frame 9**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS261210B-00000	VSD Series II, 100 hp (75 kW), 208 – 230 VAC, Type 1	261
VS261210B-S0000	VSD Series II, 100 hp (75 kW), 208 – 230 VAC, Type 1, SA Bus	261
VS261210B-L0000	VSD Series II, 100 hp (75 kW), 208 – 230 VAC, Type 1, LON	261
VS261220B-00000	VSD Series II, 100 hp (75 kW), 208 – 230 VAC, Type 12	261
VS261220B-S0000	VSD Series II, 100 hp (75 kW), 208 – 230 VAC, Type 12, SA Bus	261
VS261220B-L0000	VSD Series II, 100 hp (75 kW), 208 – 230 VAC, Type 12, LON	261
VS310210B-00000	VSD Series II, 125 hp (90 kW), 208 – 230 VAC, Type 1	301
VS310210B-S0000	VSD Series II, 125 hp (90 kW), 208 – 230 VAC, Type 1, SA Bus	301
VS310210B-L0000	VSD Series II, 125 hp (90 kW), 208 – 230 VAC, Type 1, LON	301
VS310220B-00000	VSD Series II, 125 hp (90 kW), 208 – 230 VAC, Type 12	301
VS310220B-S0000	VSD Series II, 125 hp (90 kW), 208 – 230 VAC, Type 12, SA Bus	301
VS310220B-L0000	VSD Series II, 125 hp (90 kW), 208 – 230 VAC, Type 12, LON	301

1. All horsepower and current ratings are Variable Torque (VT).

**Table 9: VSD Series II 480 V Open Drives - Frame 4 (Part 1 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS3D4410B-00000	VSD Series II, 1.5 hp (1.1 kW), 480 VAC, Type 1	3.4
VS3D4410B-S0000	VSD Series II, 1.5 hp (1.1 kW), 480 VAC, Type 1, SA Bus	3.4
VS3D4410B-L0000	VSD Series II, 1.5 hp (1.1 kW), 480 VAC, Type 1, LON	3.4
VS3D4420B-00000	VSD Series II, 1.5 hp (1.1 kW), 480 VAC, Type 12	3.4
VS3D4420B-S0000	VSD Series II, 1.5 hp (1.1 kW), 480 VAC, Type 12, SA Bus	3.4
VS3D4420B-L0000	VSD Series II, 1.5 hp (1.1 kW), 480 VAC, Type 12, LON	3.4
VS4D8410B-00000	VSD Series II, 2 hp (1.5 kW), 480 VAC, Type 1	4.8
VS4D8410B-S0000	VSD Series II, 2 hp (1.5 kW), 480 VAC, Type 1, SA Bus	4.8
VS4D8410B-L0000	VSD Series II, 2 hp (1.5 kW), 480 VAC, Type 1, LON	4.8
VS4D8420B-00000	VSD Series II, 2 hp (1.5 kW), 480 VAC, Type 12	4.8
VS4D8420B-S0000	VSD Series II, 2 hp (1.5 kW), 480 VAC, Type 12, SA Bus	4.8
VS4D8420B-L0000	VSD Series II, 2 hp (1.5 kW), 480 VAC, Type 12, LON	4.8
VS5D6410B-00000	VSD Series II, 3 hp (2.2 kW), 480 VAC, Type 1	5.6

**Table 9: VSD Series II 480 V Open Drives - Frame 4 (Part 2 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS5D6410B-S0000	VSD Series II, 3 hp (2.2 kW), 480 VAC, Type 1, SA Bus	5.6
VS5D6410B-L0000	VSD Series II, 3 hp (2.2 kW), 480 VAC, Type 1, LON	5.6
VS5D6420B-00000	VSD Series II, 3 hp (2.2 kW), 480 VAC, Type 12	5.6
VS5D6420B-S0000	VSD Series II, 3 hp (2.2 kW), 480 VAC, Type 12, SA Bus	5.6
VS5D6420B-L0000	VSD Series II, 3 hp (2.2 kW), 480 VAC, Type 12, LON	5.6
VS8D0410B-00000	VSD Series II, 4 hp (3 kW), 480 VAC, Type 1	8
VS8D0410B-S0000	VSD Series II, 4 hp (3 kW), 480 VAC, Type 1, SA Bus	8
VS8D0410B-L0000	VSD Series II, 4 hp (3 kW), 480 VAC, Type 1, LON	8
VS8D0420B-00000	VSD Series II, 4 hp (3 kW), 480 VAC, Type 12	8
VS8D0420B-S0000	VSD Series II, 4 hp (3 kW), 480 VAC, Type 12, SA Bus	8
VS8D0420B-L0000	VSD Series II, 4 hp (3 kW), 480 VAC, Type 12, LON	8
VS9D6410B-00000	VSD Series II, 5 hp (4 kW), 480 VAC, Type 1	9.6
VS9D6410B-S0000	VSD Series II, 5 hp (4 kW), 480 VAC, Type 1, SA Bus	9.6
VS9D6410B-L0000	VSD Series II, 5 hp (4 kW), 480 VAC, Type 1, LON	9.6
VS9D6420B-00000	VSD Series II, 5 hp (4 kW), 480 VAC, Type 12	9.6
VS9D6420B-S0000	VSD Series II, 5 hp (4 kW), 480 VAC, Type 12, SA Bus	9.6
VS9D6420B-L0000	VSD Series II, 5 hp (4 kW), 480 VAC, Type 12, LON	9.6
VS012410B-00000	VSD Series II, 7.5 hp (5.5 kW), 480 VAC, Type 1	12
VS012410B-S0000	VSD Series II, 7.5 hp (5.5 kW), 480 VAC, Type 1, SA Bus	12
VS012410B-L0000	VSD Series II, 7.5 hp (5.5 kW), 480 VAC, Type 1, LON	12
VS012420B-00000	VSD Series II, 7.5 hp (5.5 kW), 480 VAC, Type 12	12
VS012420B-S0000	VSD Series II, 7.5 hp (5.5 kW), 480 VAC, Type 12, SA Bus	12
VS012420B-L0000	VSD Series II, 7.5 hp (5.5 kW), 480 VAC, Type 12, LON	12

1. All horsepower and current ratings are Variable Torque (VT).

**Table 10: VSD Series II 480 V Open Drives - Frame 5 (Part 1 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS016410B-00000	VSD Series II, 10 hp (7.5 kW), 480 VAC, Type 1	16
VS016410B-S0000	VSD Series II, 10 hp (7.5 kW), 480 VAC, Type 1, SA Bus	16
VS016410B-L0000	VSD Series II, 10 hp (7.5 kW), 480 VAC, Type 1, LON	16
VS016420B-00000	VSD Series II, 10 hp (7.5 kW), 480 VAC, Type 12	16
VS016420B-S0000	VSD Series II, 10 hp (7.5 kW), 480 VAC, Type 12, SA Bus	16
VS016420B-L0000	VSD Series II, 10 hp (7.5 kW), 480 VAC, Type 12, LON	16
VS023410B-00000	VSD Series II, 15 hp (11 kW), 480 VAC, Type 1	23
VS023410B-S0000	VSD Series II, 15 hp (11 kW), 480 VAC, Type 1, SA Bus	23
VS023410B-L0000	VSD Series II, 15 hp (11 kW), 480 VAC, Type 1, LON	23
VS023420B-00000	VSD Series II, 15 hp (11 kW), 480 VAC, Type 12	23
VS023420B-S0000	VSD Series II, 15 hp (11 kW), 480 VAC, Type 12, SA Bus	23
VS023420B-L0000	VSD Series II, 15 hp (11 kW), 480 VAC, Type 12, LON	23



**Table 10: VSD Series II 480 V Open Drives - Frame 5 (Part 2 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS031410B-00000	VSD Series II, 20 hp (15 kW), 480 VAC, Type 1	31
VS031410B-S0000	VSD Series II, 20 hp (15 kW), 480 VAC, Type 1, SA Bus	31
VS031410B-L0000	VSD Series II, 20 hp (15 kW), 480 VAC, Type 1, LON	31
VS031420B-00000	VSD Series II, 20 hp (15 kW), 480 VAC, Type 12	31
VS031420B-S0000	VSD Series II, 20 hp (15 kW), 480 VAC, Type 12, SA Bus	31
VS031420B-L0000	VSD Series II, 20 hp (15 kW), 480 VAC, Type 12, LON	31

1. All horsepower and current ratings are Variable Torque (VT).

**Table 11: VSD Series II 480 V Open Drives - Frame 6**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS038410B-00000	VSD Series II, 25 hp (18.5 kW), 480 VAC, Type 1	38
VS038410B-S0000	VSD Series II, 25 hp (18.5 kW), 480 VAC, Type 1, SA Bus	38
VS038410B-L0000	VSD Series II, 25 hp (18.5 kW), 480 VAC, Type 1, LON	38
VS038420B-00000	VSD Series II, 25 hp (18.5 kW), 480 VAC, Type 12	38
VS038420B-S0000	VSD Series II, 25 hp (18.5 kW), 480 VAC, Type 12, SA Bus	38
VS038420B-L0000	VSD Series II, 25 hp (18.5 kW), 480 VAC, Type 12, LON	38
VS046410B-00000	VSD Series II, 30 hp (22 kW), 480 VAC, Type 1	46
VS046410B-S0000	VSD Series II, 30 hp (22 kW), 480 VAC, Type 1, SA Bus	46
VS046410B-L0000	VSD Series II, 30 hp (22 kW), 480 VAC, Type 1, LON	46
VS046420B-00000	VSD Series II, 30 hp (22 kW), 480 VAC, Type 12	46
VS046420B-S0000	VSD Series II, 30 hp (22 kW), 480 VAC, Type 12, SA Bus	46
VS046420B-L0000	VSD Series II, 30 hp (22 kW), 480 VAC, Type 12, LON	46
VS061410B-00000	VSD Series II, 40 hp (30 kW), 480 VAC, Type 1	61
VS061410B-S0000	VSD Series II, 40 hp (30 kW), 480 VAC, Type 1, SA Bus	61
VS061410B-L0000	VSD Series II, 40 hp (30 kW), 480 VAC, Type 1, LON	61
VS061420B-00000	VSD Series II, 40 hp (30 kW), 480 VAC, Type 12	61
VS061420B-S0000	VSD Series II, 40 hp (30 kW), 480 VAC, Type 12, SA Bus	61
VS061420B-L0000	VSD Series II, 40 hp (30 kW), 480 VAC, Type 12, LON	61

1. All horsepower and current ratings are Variable Torque (VT).

**Table 12: VSD Series II 480 V Open Drives - Frame 7**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS072410B-00000	VSD Series II, 50 hp (37 kW), 480 VAC, Type 1	72
VS072410B-S0000	VSD Series II, 50 hp (37 kW), 480 VAC, Type 1, SA Bus	72
VS072410B-L0000	VSD Series II, 50 hp (37 kW), 480 VAC, Type 1, LON	72
VS072420B-00000	VSD Series II, 50 hp (37 kW), 480 VAC, Type 12	72
VS072420B-S0000	VSD Series II, 50 hp (37 kW), 480 VAC, Type 12, SA Bus	72
VS072420B-L0000	VSD Series II, 50 hp (37 kW), 480 VAC, Type 12, LON	72

**Table 12: VSD Series II 480 V Open Drives - Frame 7**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS087410B-00000	VSD Series II, 60 hp (45 kW), 480 VAC, Type 1	87
VS087410B-S0000	VSD Series II, 60 hp (45 kW), 480 VAC, Type 1, SA Bus	87
VS087410B-L0000	VSD Series II, 60 hp (45 kW), 480 VAC, Type 1, LON	87
VS087420B-00000	VSD Series II, 60 hp (45 kW), 480 VAC, Type 12	87
VS087420B-S0000	VSD Series II, 60 hp (45 kW), 480 VAC, Type 12, SA Bus	87
VS087420B-L0000	VSD Series II, 60 hp (45 kW), 480 VAC, Type 12, LON	87
VS105410B-00000	VSD Series II, 75 hp (55 kW), 480 VAC, Type 1	105
VS105410B-S0000	VSD Series II, 75 hp (55 kW), 480 VAC, Type 1, SA Bus	105
VS105410B-L0000	VSD Series II, 75 hp (55 kW), 480 VAC, Type 1, LON	105
VS105420B-00000	VSD Series II, 75 hp (55 kW), 480 VAC, Type 12	105
VS105420B-S0000	VSD Series II, 75 hp (55 kW), 480 VAC, Type 12, SA Bus	105
VS105420B-L0000	VSD Series II, 75 hp (55 kW), 480 VAC, Type 12, LON	105

1. All horsepower and current ratings are Variable Torque (VT).

**Table 13: VSD Series II 480 V Open Drives - Frame 8**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS140410B-00000	VSD Series II, 100 hp (75 kW), 480 VAC, Type 1	140
VS140410B-S0000	VSD Series II, 100 hp (75 kW), 480 VAC, Type 1, SA Bus	140
VS140410B-L0000	VSD Series II, 100 hp (75 kW), 480 VAC, Type 1, LON	140
VS140420B-00000	VSD Series II, 100 hp (75 kW), 480 VAC, Type 12	140
VS140420B-S0000	VSD Series II, 100 hp (75 kW), 480 VAC, Type 12, SA Bus	140
VS140420B-L0000	VSD Series II, 100 hp (75 kW), 480 VAC, Type 12, LON	140
VS170410B-00000	VSD Series II, 125 hp (90 kW), 480 VAC, Type 1	170
VS170410B-S0000	VSD Series II, 125 hp (90 kW), 480 VAC, Type 1, SA Bus	170
VS170410B-L0000	VSD Series II, 125 hp (90 kW), 480 VAC, Type 1, LON	170
VS170420B-00000	VSD Series II, 125 hp (90 kW), 480 VAC, Type 12	170
VS170420B-S0000	VSD Series II, 125 hp (90 kW), 480 VAC, Type 12, SA Bus	170
VS170420B-L0000	VSD Series II, 125 hp (90 kW), 480 VAC, Type 12, LON	170
VS205410B-00000	VSD Series II, 150 hp (110 kW), 480 VAC, Type 1	205
VS205410B-S0000	VSD Series II, 150 hp (110 kW), 480 VAC, Type 1, SA Bus	205
VS205410B-L0000	VSD Series II, 150 hp (110 kW), 480 VAC, Type 1, LON	205
VS205420B-00000	VSD Series II, 150 hp (110 kW), 480 VAC, Type 12	205
VS205420B-S0000	VSD Series II, 150 hp (110 kW), 480 VAC, Type 12, SA Bus	205
VS205420B-L0000	VSD Series II, 150 hp (110 kW), 480 VAC, Type 12, LON	205

1. All horsepower and current ratings are Variable Torque (VT).

**Table 14: VSD Series II 480 V Open Drives - Frame 9**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS261410B-00000	VSD Series II, 200 hp (132 kW), 480 VAC, Type 1	261
VS261410B-S0000	VSD Series II, 200 hp (132 kW), 480 VAC, Type 1, SA Bus	261
VS261410B-L0000	VSD Series II, 200 hp (132 kW), 480 VAC, Type 1, LON	261
VS261420B-00000	VSD Series II, 200 hp (132 kW), 480 VAC, Type 12	261
VS261420B-S0000	VSD Series II, 200 hp (132 kW), 480 VAC, Type 12, SA Bus	261
VS261420B-L0000	VSD Series II, 200 hp (132 kW), 480 VAC, Type 12, LON	261
VS310410B-00000	VSD Series II, 250 hp (160 kW), 480 VAC, Type 1	310
VS310410B-S0000	VSD Series II, 250 hp (160 kW), 480 VAC, Type 1, SA Bus	310
VS310410B-L0000	VSD Series II, 250 hp (160 kW), 480 VAC, Type 1, LON	310
VS310420B-00000	VSD Series II, 250 hp (160 kW), 480 VAC, Type 12	310
VS310420B-S0000	VSD Series II, 250 hp (160 kW), 480 VAC, Type 12, SA Bus	310
VS310420B-L0000	VSD Series II, 250 hp (160 kW), 480 VAC, Type 12, LON	310

1. All horsepower and current ratings are Variable Torque (VT).

## VSD Series II Accessories and Replacement Parts

**Table 15: Conversion Kits for VSD Series II Variable Speed Open Drives**

Code Number	Description
VS-FS4-N12KIT	Frame 4 Type 1 to Type 12 Conversion Kit – N12/IP54 Cover with Gasket, Plastic Plugs
VS-FS5-N12KIT	Frame 5 Type 1 to Type 12 Conversion Kit – N12/IP54 Cover with Gasket, Plastic Plugs
VS-FS6- N12KIT	Frame 6 Type 1 to Type 12 Conversion Kit – N12/IP54 Cover with Gasket, Plastic Plugs

**Table 16: Demonstration Kits for VSD Series II Variable Speed Open Drives**

Code Number	Description
VS-DEMO2	VSD Series II Bypass Demo
VSM2-DEMO	VSD Micro Series II Bypass Demo

**Table 17: Power Supplies and Keypads for VSD Series II Variable Speed Open Drives**

Code Number	Description
VS-KEYPAD-SER2	VSDII, Graphic HOA Keypad
VS-RMT-KEYPAD2	VSDII, Remote Keypad Kit
VS-REM-USB-LOAD	Remote Download USB to RJ-485 Cable with Software Driver Disk

**Table 18: Fans for VSD Series II Variable Speed Open Drives**

Code Number	Description
VS-FS4-FAN	Frame 4 Main Fan
VS-FS4-INT-FAN	Frame 4 Internal Fan
VS-FS5-FAN	Frame 5 Main Fan
VS-FS5-INT-FAN	Frame 5 Internal Fan
VS-FS6-FAN	Frame 6 Main Fan
VS-FS6-INT-FAN	Frame 6 Internal Fan
VS-FS7-FAN	Frame 7 Main Fan
VS-FS7-INT-FAN	Frame 7 Internal Fan

**Table 19: Flange Kits for VSD Series II Variable Speed Open Drives**

Code Number	Description
VS-FS4-N12FLKIT	Frame 4-N12/IP54 Flange Kit
VS-FS5-N12FLKIT	Frame 5-N12/IP54 Flange Kit
VS-FS6-N12FLKIT	Frame 6-N12/IP54 Flange Kit
VS-FS7-N12FLKIT	Frame 7-N12/IP54 Flange Kit

**Table 20: Communication Cards, Auxiliary Contacts, and I/O Cards for VSD Series II Variable Speed Open Drives**

Code Number	Description
VS-XXM-B1	I/O Expander Card, 6 DI/DO, Slot D/E
VS-XXM-B2	I/O Expander Card, 2 X RO and Thermistor, Slot D/E
VS-XXM-B4	I/O Expander Card, 1 X AI, 2 X AO (Isolated), Slot D/E
VS-XXM-B5	I/O Expander Card, 3 X RO, Slot D/E
VS-XXM-B9	I/O Expander Card, 1 X RO, 5 X DI (42 to 240 VAC), Slot D/E
VS-XXM-BF	I/O Expander Card, 1 X AO, 1 X DO, 1 X RO, Slot D/E
VS-XXM-C4	LONWORKS® Communications Card, Slot D/E
VS-XXM-CS	SA Bus Communications Card
VS-XXM-F1	I/O Expander Card, 3 RO, Slot B
VS-XXM-F2	I/O Expander Card, 2 RO and Thermistor Input, Slot B
VS-XXM-K9-FS4-5	Auxiliary Contact Kit for IPASS Sizes B, C (Output and Bypass)
VS-XXM-K9-FS6-9	Auxiliary Contact Kit for IPASS Sizes D, F, G (Output and Bypass)

**Table 21: Micro Drives for VSD Series II Variable Speed Open Drives**

Code Number	Description
VSM2-IP21-FS1	VSM II Type 1 / IP21 Kit – FS1
VSM2-IP21-FS2	VSM II Type 1 / IP21 Kit – FS2
VSM2-IP21-FS3	VSM II Type 1 / IP21 Kit – FS3
VSM2-KEYADAPTER	VSM II Remote Mounting Kit – Bezel and Cable
VSM2-PCADAPTER	VSM II PC Connection Module
VSM2-RJADAPTER	VSM II RJ45 Adapter Module
VSM2-TEXTKEYPAD	VSM II Keypad

## VSD Series II Option Boards

The VSD Series II Drives can accommodate a wide selection of expander and adapter option boards to customize the drive for your application needs. The drive's control unit is designed to accept a total of five option boards.

The VSD Series II factory installed standard board configuration includes an A9 I/O board and an A2 relay output board, which are installed in slots A and B.

**Table 22: Option Boards**

Description		Allowed Slot Locations <sup>1</sup>	Option Number
I/O Cards	3 Relay (Qty 2 Form C relay, qty 1 Form A Relay) (replacement only - included with Variable Speed Series II Drive)	B	VS-XXM-F1
	2 Relay and 1 Thermistor (Not available with L3 and L4 pilot light option.) (replaces standard slot B relay board.)	B	VS-XXM-F2
Extended I/O Cards	6 Digital Outputs (DI), 6 Digital Outputs (DO), 1 ext +24 VDC/EXT +24 VDC Programmable	D, E	VS-XXM-B1
	1 Relay Out (RO) Normally Closed/Normally Open (N.C./N.O.), 1 RO (N.O.), 1 Thermistor	D, E	VS-XXM-B2
	1 Analog Input (AI) (mA isolated), 2 Analog Output (AO) (mA isolated)	D, E	VS-XXM-B4
	Card - 3 Relay Dry Contact	D, E	VS-XXM-B5
	1 RO (N.O.), 5 DI (42 – 240 VAC Input)	D, E	VS-XXM-B9
	Expander IO - 1 AO, 1 DO, 1 RO	D, E	VS-XXM-BF
	SA Bus (JC-VSD Only)	D, E	VS-XXM-CS
	LONWORKS Network	D, E	VS-XXM-C4

1. The option card must be installed in one of the slots listed for that card.

## Dimensions

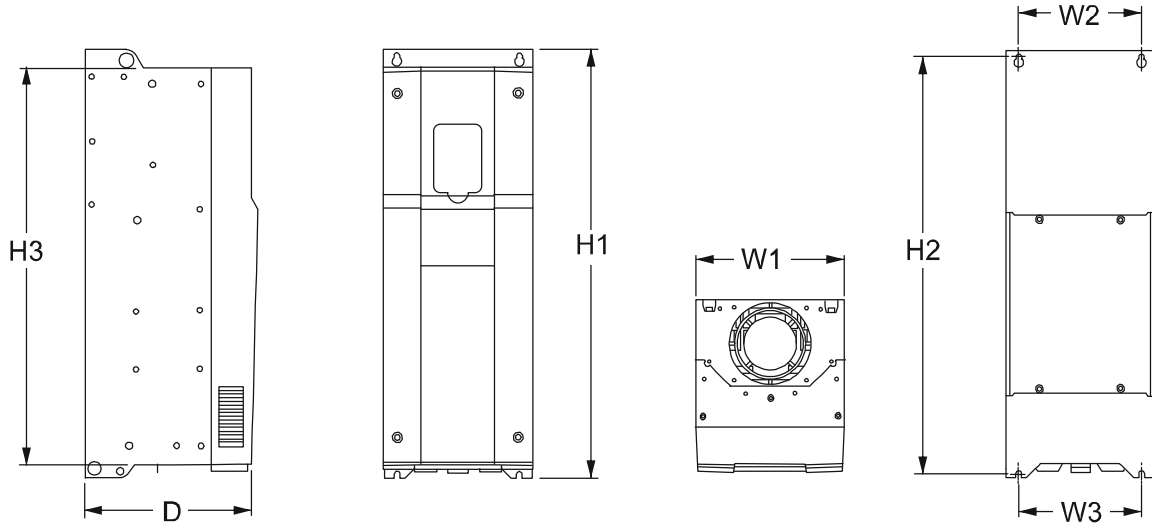


FIG:Frame 4\_7

Figure 2: VSD Series II Open Drives Frame 4 – Frame 7

Table 23: VSD Series II Open Drives Frame 4 – Frame 7

Frame Size	Dimensions in. (mm), approximate						
	H1	H2	H3	D	W1	W2	W3
FR4	12.89 (327.5)	12.32 (313)	11.22 (285)	7.77 (197.3)	5.04 (128)	3.94 (100)	3.94 (100)
FR5	16.50 (419)	15.98 (406)	15.04 (382)	8.73 (221.6)	5.67 (144)	4.53 (115)	3.94 (100)
FR6	21.93 (557)	21.28 (540.5)	20.24 (514)	9.29 (236)	7.68 (195)	5.83 (148)	5.83 (148)
FR7	25.98 (660)	25.39 (645)	24.29 (617)	10.49 (266.5)	9.06 (230)	7.48 (190)	7.48 (190)

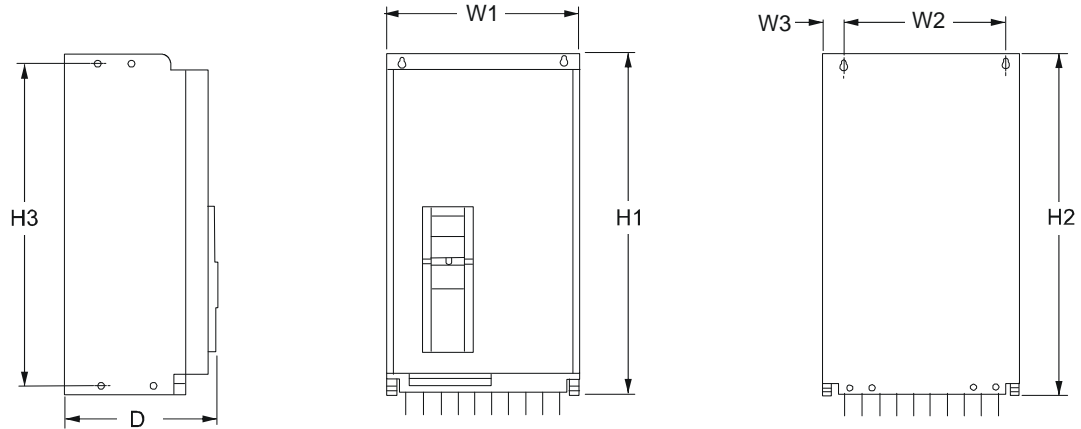


FIG.Frame 8\_9

Figure 3: VSD Series II Open Drives Frames 8 and 9

Table 24: VSD Series II Open Drives Frames 8 and 9

Frame Size	Dimensions in. (mm), approximate						
	H1	H2	H3	D	W1	W2	W3
FR8	38.02 (965.7)	37.26 (946.4)	37.26 (946.4)	13.76 (349.6)	11.42 (290.1)	9.29 (236)	1.42 (36)
FR9	33.09 (890.4)	31.89 (810)	31.89 (810)	14.63 (371.6)	18.90 (480)	15.75 (400)	1.57 (40)

# Wiring Diagram

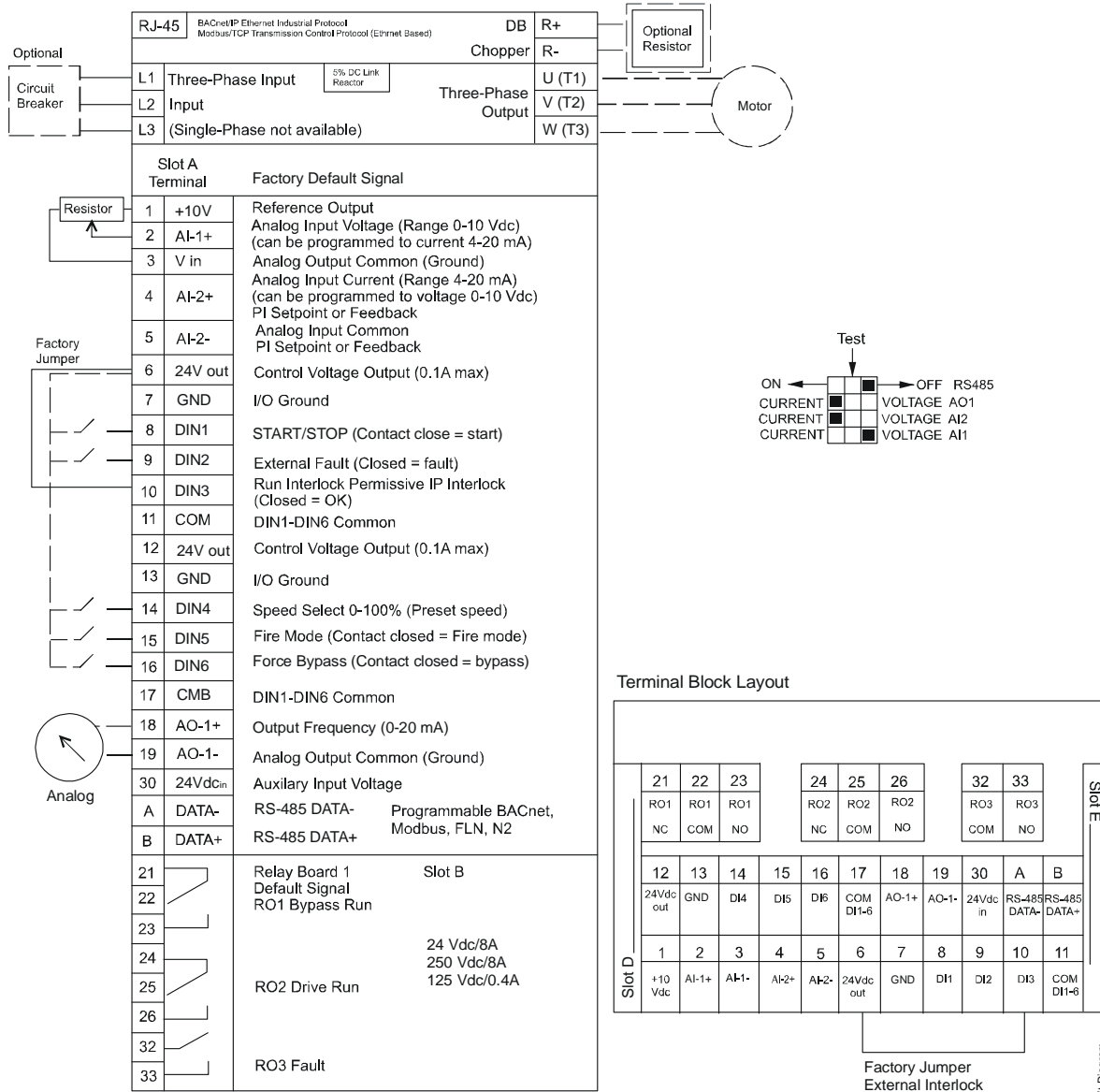


Figure 4: VSD Series II Open Drives Circuit Diagram




## Technical Specifications

### VSD Series II Variable Speed Open Drives (Part 1 of 3)

<b>Input Voltage (<math>V_{in}</math>)</b>	200 – 240 VAC, 380 – 480 VAC, -10%/+10%
<b>Input Frequency (<math>f_{in}</math>)</b>	50/60 Hz (Variation Up to 47-66 Hz)
<b>Connection to Power</b>	Once Per Minute or Less (Typical Operation)
<b>Current Withstand Rating</b>	100 kAIC
<b>Output Voltage</b>	0 to $V_{in}$ Line Voltage In
<b>Continuous Output Current</b>	Ambient Temperature Maximum 104°F (40°C), Overload 1.1 x $I_L$ (1 min./10 min.)
<b>Overload Current</b>	110% (1 min./10 min.)
<b>Initial Output Current</b>	150% for 2 Seconds
<b>Output Frequency</b>	0 to 320 Hz
<b>Frequency Resolution</b>	0.01 Hz
<b>Control Method</b>	Frequency Control (V/f) Open Loop Sensorless Vector Control
<b>Switching Frequency</b>	1 – 310 A Frame 4 – 9: default 6 kHz
<b>Frequency Reference</b>	Analog Input: Resolution 0.1% (10 bit), Accuracy +/-1% Panel Reference: Resolution 0.01 Hz
<b>Field Weakening Point</b>	8 to 320 Hz
<b>Acceleration Time</b>	0.1 to 3,000 s
<b>Deceleration Time</b>	0.1 to 3,000 s
<b>Braking Torque</b>	DC Brake: 30% x $T_n$ (without Brake Option)
<b>Ambient Operating Temperature</b>	14 (No Frost) to 104°F (-10 to 40°C)
<b>Storage Temperature</b>	-40 to 158°F (-40 to 70°C)
<b>Relative Humidity</b>	0 to 95% RH, Noncondensing, Noncorrosive, No Dripping Water
<b>Air Quality</b>	Chemical Vapors: IEC 60721-3-3, Unit In Operation, Class 3C2; Mechanical Particles: IEC 60721-3-3, Unit In Operation, Class 3S2
<b>Altitude</b>	100% Load Capacity (No Derating) Up to 3,280 ft (1,000 m); 1% Derating for Each 328 ft (100 m) Above 3,280 ft (1,000 m); Maximum 9,842 ft (3,000 m)
<b>Vibration</b>	Frame 4 – 9, EN 61800-5-1, EN 60068-2-6; 5 to 150 Hz, Displacement Amplitude 1 mm (Peak) at 5 to 15.8 Hz, Max. Acceleration Amplitude 1 G at 15.8 to 150 Hz
<b>Shock</b>	EN 61800-5-1, EN 60068-2-27 United Parcel Service® (UPS) Drop Test (for Applicable UPS Weights) Storage and Shipping: max. 15 G, 11 ms (in package)
<b>Enclosure Class</b>	NEMA Type 1/IP21 or NEMA Type 12/IP54
<b>EMC (at default settings)</b>	Immunity: Fulfills all Electromagnetic Compatibility (EMC) Immunity Requirements; Emissions: EN 61800-3 (2004), LEVEL H
<b>Emissions</b>	EMC Level Dependent: +EMC 2: EN 61800-3 (2004) Category C2, Delivered with Class C2 EMC Filtering as Default
<b>Analog Input Voltage</b>	0 to 10 V, R = 200 kOhms Differential Resolution 0.1%; Accuracy ±1%, Dip Switch Selection (Voltage/Current)
<b>Analog Input Current</b>	0 (4) to 20 mA; $R_i$ - 250 Ohms Differential

### VSD Series II Variable Speed Open Drives (Part 2 of 3)

<b>Digital Inputs (6)</b>	Positive or Negative Logic; 18 to 30 VDC
<b>Auxiliary Voltage</b>	24 V $\pm$ 10%, Maximum 250 mA
<b>Output Reference Voltage</b>	10 V +3%, Maximum Load 10 mA
<b>Analog Output</b>	0 to 10 V, 0 (4) to 20 mA; $R_L$ max. 500 Ohms; Resolution 10 bit; Accuracy $\pm$ 2%, Dip Switch Selection (Voltage/Current)
<b>Relay Outputs</b>	3 Programmable, 2 Form C, 1 Form A Relay Outputs Switching Capacity: 24 VDC/8 A, 250 VAC/8 A, 125 VDC/0.4 A
<b>Hard Wire Jumper</b>	Between Terminal 6 and 10 (Factory Default)
<b>Dip Switch Setting Default</b>	RS485 = Off A01 = Current A12 = Current A11 = Voltage
<b>Overcurrent Protection</b>	Yes
<b>Overvoltage Protection</b>	Yes
<b>DC Bus Regulation Anti-trip</b>	Yes (Accelerates or Decelerates the Load)
<b>Undervoltage Protection</b>	Yes
<b>Earth Fault Protection</b>	Yes, in case of earth fault in motor or motor cable, only the frequency converter is protected.
<b>Input Phase Supervision</b>	Yes, trips if any of the input phases are missing
<b>Motor Phase Supervision</b>	Yes, trips if any of the output phases are missing
<b>Overtemperature Protection</b>	Yes
<b>Motor Overload Protection</b>	Yes
<b>Motor Stall Protection</b>	Yes
<b>Motor Underload Protection</b>	Yes
<b>Short Circuit Protection</b>	Yes (of the 24 V and 10 V Reference Voltages)
<b>Surge Protection</b>	Yes (Varistor Input)
<b>OHSPD Special Seismic Certification Pre-Approval</b>	Yes
<b>Compliance</b>  	UL Listed File No 508C; cUL Listed
	Safety – EN 61800-5-1 (2007)
	CE Mark – Johnson Controls, Inc., declares that the VSD Series II Variable Speed Open Drives are in compliance with the essential requirements and other relevant provisions of EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.
<b>Warranty</b>	2 Years Standard Terms; 3 Years with Certified Startup
<b>Reliability</b>	500,000 Hours Mean Time Between Failures (MTBF)
<b>Line Voltage (VAC)</b>	230 V (208 to 240 V) 480 V (380 to 500 V) 575 V (525 to 690 V)

### VSD Series II Variable Speed Open Drives (Part 3 of 3)

<b>Weight</b>	FR4	13.2 lb (6 kg)
	FR5	22 lb (10 kg)
	FR6	44 lb (20 kg)
	FR7	83 lb (37.5 kg)
	FR8	154.3 lb (70 kg)
	FR9	238 lb (108 kg)
<b>Voltage/Horsepower/Amperes</b>	FR4	230 V, 0.75 to 4 hp, 0.55 to 3 kW, 3.7 to 12 A
		480 V, 1.5 to 7.5 hp, 1.1 to 5.5 kW, 3.4 to 12 A
	FR5	230 V, 5 to 10 hp, 4 to 7.5 kW, 18 to 31 A
		480 V, 10 to 20 hp, 7.5 to 15 kW, 16 to 31 A
	FR6	230 V, 15 to 20 hp, 11 to 15 kW, 48 to 62 A
		480 V, 25 to 40 hp, 18.5 to 30 kW, 38 to 61 A
	FR7	230 V, 25 to 40 hp, 18.5 to 30 kW, 38 to 61 A
		480 V, 50 to 75 hp, 37 to 55 kW, 75 to 105 A
	FR8	230 V, 50 to 75 hp, 37 to 55 kW, 140 to 205 A
		480 V, 100 to 150 hp, 75 to 110 kW, 140 to 205 A
	FR9	230 V, 100 to 120 hp, 75 to 90 kW, 261 to 310 A
		480 V, 100 to 125 hp, 132 to 160 kW, 261 to 310 A

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



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