

# VSD Series Variable Speed Open and MicroDrives

## Product Bulletin

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The Johnson Controls® VSD Series Variable Speed Open Drives, powered by Cutler-Hammer® technology from Eaton's electrical business, are specifically engineered for HVAC, pump, and fluid control applications. The power circuit makes use of the most sophisticated semiconductor technology and a highly modular construction that is adaptable to the customer's needs.

The open drive input and output configuration (I/O) is designed with modularity in mind. The I/O is comprised of option cards, each with its own input and output configuration. The control module is designed to accept a total of five of these cards.

VSD Series MicroDrives are a cost-effective solution for mid-market and low-horsepower applications. Available in 115 V, 230 V, 480 V, and 575 V models, MicroDrives are designed to provide variable speed control for three-phase motor applications up to 10 horsepower.

VSD Series MicroDrives are standard Eaton® Cutler-Hammer MicroDrives, orderable using VSD Series code numbers and standard Johnson Controls tools.



**Figure 1: VSD Series Open Drive**

**Table 1: VSD Series Open Drive Features and Benefits**

Features	Benefits
<b>True Full Network Connectivity for Both Drive and Bypass N2, XT, SA Bus, LON, and BACnet® Protocol</b>	Provides for compatibility with current and future Johnson Controls network architecture.
<b>Software Parameters that Utilize Engineering Units Common to the HVAC Industry</b>	Allow for quick and easy startup using the onboard startup wizard with engineering units transmitted over a communications bus.
<b>Johnson Controls Support that Includes Ordering, Estimating, and Project Management Tools: Advanced Order Management System (AOMS), Advanced Installation Management (AIM) Tools - QuickLIT, Catalog, PRESTO, and STORE</b>	Provides for easy product identification and ordering.
<b>Closed-Loop Control Programmed with Engineering Units for Specific HVAC Applications: Duct Static, Building Static, Pressure Control, and Temperature Control</b>	Enables software parameters to use engineering units common to HVAC industry.
<b>Standard TYPE 12 Keypad on all Drives with Copy and Paste Function; Capable of Monitoring Three Parameters Simultaneously</b>	Allows easy transfer of parameter settings from one drive to another drive.
<b>Drive Programming Capability Using Auxiliary 24 V Power Supply (VS-AUX24V)</b>	Allows for programming the variable speed drive (including network communication validation) prior to wiring three-phase power to the drive.

## Additional VSD Series Open Drive Features

- Run permissive damper control in drive mode
- Up to six user-defined skip frequencies
- Selectable Analog Input (AI) Min/Max/Averaging feature
- Digital inputs can be defined for normally open (N.O.) or normally closed (N.C.) operation
- Automatic fault display captures 16 drive operating parameters at time of fault
- HAND/OFF/AUTO selector on keypad simplifies control
- Plenum rated
- Standard 3% line reactors for enhanced transient and harmonic distortion protection
- EMI/RFI Filters standard on all drives
- Standard drive current rating of 100 kAIC
- I/O and communication cards provide plug-and-play functionality

## VSD MicroDrive Features

- 115 V, 230 V, 480 V, and 575 V models
- user-friendly keypad with four-character LED display
- seven status-indicating LEDs and six function keys
- two analog inputs, six programmable intelligent digital inputs, one programmable digital output, one programmable relay

- speed potentiometer
- Underwriters Laboratories Inc.® (UL) Listed
- built-in dynamic braking chopper
- RS-485 serial communication port for MODBUS® protocol
- MicroDrive with IP-20 chassis for installation in HVAC equipment or separate enclosure
- National Electrical Manufacturers' Association (NEMA) Type 1 skin-tight enclosures available  
VS-MVXENCS used with 115 V 0.25 –1 hp, 230 V 0.5 – 2 hp, 480 V/575 V 1 – 3 hp  
VS-MVXENCL used with 230 V 3 – 7.5 hp and 480/575 V 5 – 10 hp
- NEMA Type 1 enclosures available in Canada  
VS-MVX ENCS-C = 575 V 1, 2, 3 hp  
VS-MVENCL-C = 575 V 5, 7.5, 10 hp  
(for VSDs shipped from Canada)



Figure 2: VSD Series MicroDrive

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

Code Number		V	S				0	A	—					
<b>Base Product</b>	VS = Variable Speed Drive prefix													
<b>Horsepower (VT)<sup>1</sup></b>	001 = 1.0 hp to 250 = 250 hp <sup>2</sup>													
<b>Voltage<sup>3</sup></b>	2 = 208/230 V 4 = 480 V 5 = 575 V <sup>4</sup>													
<b>Enclosure Rating</b>	1 = TYPE 1 2 = TYPE 12													
<b>Enclosure Style</b>	0 = None (Open Drive)													
<b>Revision #</b>	A = Rev. 1 (Americas) C = Rev. 1 (Canada)													
<b>Separator (—)</b>														
<b>Communications<sup>5</sup></b>	0 = None B = MS/TP BACnet Communication N = N2/XT/SA Bus Communication (N2 by default) L = LONWORKS® Network													
<b>Option 1</b>	00 = None													
<b>Option 2</b>	00 = None													

1. All horsepower ratings are Variable Torque (VT).
2. 1 to 100 hp at 230 V; 1.5 to 250 hp at 480 V; 3 to 200 hp at 575 V.
3. Voltage Ratings: 230 V = 208 - 240 V; 480 V = 380-500 V; 575 V = 525-690 V.
4. Can only be ordered as Revision C.
5. N2/XT/SA Bus, MS/TP BACnet, or LONWORKS Communications selectable on drive keypad.

**Table 3: VSD Series MicroDrives Selection Chart**

Code Number		V	S	M			0	0	A	—	0	0	0	0	0
<b>Base Product</b>	VSM = Variable Speed MicroDrive prefix														
<b>Horsepower (VT/CT)<sup>1</sup></b>	F2 = 25 <sup>2</sup> F5 = 0.5 hp <sup>2,3</sup> 01 = 1.0 hp <sup>2,3,4</sup> 02 = 2.0 hp <sup>3,4</sup> 03 = 3.0 hp <sup>3,4</sup> 05 = 5.0 hp <sup>3,4</sup> 07 = 7.5 hp <sup>3,4</sup> 10 = 10 hp <sup>4</sup>														
<b>Voltage<sup>5</sup></b>	1 = 115 V 2 = 230 V 4 = 480 V 5 = 575 V <sup>6</sup>														
<b>Enclosure Rating</b>	0 = IP20														
<b>Enclosure Style</b>	0 = None ([Open Drive] IP-20 enclosure)														
<b>Revision #</b>	A = Rev. 1 (Americas) C = Rev. 1 (Canada)														
<b>Separator (—)</b>															
<b>Communications</b>	0 = None														
<b>Options</b>	0000 = None														

1. All horsepower ratings are dual rated for Variable Torque (VT) and Constant Torque (CT).
2. 115 V only.
3. 230 V.
4. 480 V only.
5. Voltage Ratings: 230 V = 180 - 264 V; 480 V = 342 - 528 V; 575 V = 500 - 600 V.
6. Can only be ordered as Revision C.

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

<b>code number</b>	<b>Description<sup>1</sup></b>	<b>Current (A)<sup>1</sup></b>
VS001210A-00000	VSD 1 hp 230 V, TYPE 1	4.8
VS001210A-L0000	VSD 1 hp 230 V, TYPE 1, LON	4.8
VS001210A-N0000	VSD 1 hp 230 V, TYPE 1, N2/XT/SA Bus	4.8
VS001210A-B0000	VSD 1 hp 230 V, TYPE 1, MS/TP BACnet	4.8
VS001220A-00000	VSD 1 hp 230 V, TYPE 12	4.8
VS001220A-L0000	VSD 1 hp 230 V, TYPE 12, LON	4.8
VS001220A-N0000	VSD 1 hp 230 V, TYPE 12, N2/XT/SA Bus	4.8
VS001220A-B0000	VSD 1 hp 230 V, TYPE 1, MS/TP BACnet	4.8
VSF15210A-00000	VSD 1-1/2 hp 230 V, TYPE 1	6.6
VSF15210A-L0000	VSD 1-1/2 hp 230 V, TYPE 1, LON	6.6
VSF15210A-N0000	VSD 1-1/2 hp 230 V, TYPE 1, N2/XT/SA Bus	6.6
VSF15210A-B0000	VSD 1-1/2 hp 230 V, TYPE 1, MS/TP BACnet	6.6
VSF15220A-00000	VSD 1-1/2 hp 230 V, TYPE 12	6.6
VSF15220A-L0000	VSD 1-1/2 hp 230 V, TYPE 12, LON	6.6
VSF15220A-N0000	VSD 1-1/2 hp 230 V, TYPE 12, N2/XT/SA Bus	6.6
VSF15220A-B0000	VSD 1-1/2 hp 230 V, TYPE 12, MS/TP BACnet	6.6
VS002210A-00000	VSD 2 hp 230 V, TYPE 1	7.8
VS002210A-L0000	VSD 2 hp 230 V TYPE 1, LON	7.8
VS002210A-N0000	VSD 2 hp 230 V, TYPE 1, N2/XT/SA Bus	7.8
VS002210A-B0000	VSD 2 hp 230 V, TYPE 1, MS/TP BACnet	7.8
VS002220A-00000	VSD 2 hp 230 V, TYPE 12	7.8
VS002220A-L0000	VSD 2 hp 230 V, TYPE 12, LON	7.8
VS002220A-N0000	VSD 2 hp 230 V, TYPE 12, N2/XT/SA Bus	7.8
VS002220A-B0000	VSD 2 hp 230 V, TYPE 12, MS/TP BACnet	7.8
VS003210A-00000	VSD 3 hp 230 V, TYPE 1	11
VS003210A-L0000	VSD 3 hp 230 V, TYPE 1, LON	11
VS003210A-N0000	VSD 3 hp 230 V, TYPE 1, N2/XT/SA Bus	11
VS003210A-B0000	VSD 3 hp 230 V, TYPE 1, MS/TP BACnet	11
VS003220A-00000	VSD 3 hp 230 V, TYPE 12	11
VS003220A-L0000	VSD 3 hp 230 V TYPE 12, LON	11
VS003220A-N0000	VSD 3 hp 230 V, TYPE 12, N2/XT/SA Bus	11
VS003220A-B0000	VSD 3 hp 230 V, TYPE 12, MS/TP BACnet	11

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

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

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS005210A-00000	VSD 5 hp 230 V, TYPE 1	17.5
VS005210A-L0000	VSD 5 hp 230 V, TYPE 1, LON	17.5
VS005210A-N0000	VSD 5 hp 230 V, TYPE 1, N2/XT/SA Bus	17.5
VS005210A-B0000	VSD 5 hp 230 V, TYPE 1, MS/TP BACnet	17.5
VS005220A-00000	VSD 5 hp 230 V, TYPE 12	17.5
VS005220A-L0000	VSD 5 hp 230 V, TYPE 12, LON	17.5
VS005220A-N0000	VSD 5 hp 230 V, TYPE 12, N2/XT/SA Bus	17.5
VS005220A-B0000	VSD 5 hp 230 V, TYPE 12, MS/TP BACnet	17.5
VS007210A-00000	VSD 7-1/2 hp 230 V, TYPE 1	25
VS007210A-L0000	VSD 7-1/2 hp 230 V, TYPE 1, LON	25
VS007210A-N0000	VSD 7-1/2 hp 230 V, TYPE 1, N2/XT/SA Bus	25
VS007210A-B0000	VSD 7-1/2 hp 230 V, TYPE 1, MS/TP BACnet	25
VS007220A-00000	VSD 7-1/2 hp 230 V, TYPE 12	25
VS007220A-L0000	VSD 7-1/2 hp 230 V, TYPE 12, LON	25
VS007220A-N0000	VSD 7-1/2 hp 230 V, TYPE 12, N2/XT/SA Bus	25
VS007220A-B0000	VSD 7-1/2 hp 230 V, TYPE 12, MS/TP BACnet	25
VS010210A-00000	VSD 10 hp 230 V, TYPE 1	31
VS010210A-L0000	VSD 10 hp 230 V, TYPE 1, LON	31
VS010210A-N0000	VSD 10 hp 230 V, TYPE 1, N2/XT/SA Bus	31
VS010210A-B0000	VSD 10 hp 230 V, TYPE 1, MS/TP BACnet	31
VS010220A-00000	VSD 10 hp 230 V, TYPE 12	31
VS010220A-L0000	VSD 10 hp 230 V, TYPE 12, LON	31
VS010220A-N0000	VSD 10 hp 230 V, TYPE 12, N2/XT/SA Bus	31
VS010220A-B0000	VSD 10 hp 230 V, TYPE 12, MS/TP BACnet	31

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

**Table 6: VSD Series 208/230 V Open Drives - Frame 6 (Part 1 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS015210A-00000	VSD 15 hp 230 V, TYPE 1	48
VS015210A-L0000	VSD 15 hp 230 V, TYPE 1, LON	48
VS015210A-N0000	VSD 15 hp 230 V, TYPE 1, N2/XT/SA Bus	48
VS015210A-B0000	VSD 15 hp 230 V, TYPE 1, MS/TP BACnet	48
VS015220A-00000	VSD 15 hp 230 V, TYPE 12	48
VS015220A-L0000	VSD 15 hp 230 V, TYPE 12, LON	48
VS015220A-N0000	VSD 15 hp 230 V, TYPE 12, N2/XT/SA Bus	48
VS015220A-B0000	VSD 15 hp 230 V, TYPE 12, MS/TP BACnet	48
VS020210A-00000	VSD 20 hp 230 V, TYPE 1	61
VS020210A-L0000	VSD 20 hp 230 V, TYPE 1, LON	61

**Table 6: VSD Series 208/230 V Open Drives - Frame 6 (Part 2 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS020210A-N0000	VSD 20 hp 230 V, TYPE 1, N2	61
VS020210A-N0000	VSD 20 hp 230 V, TYPE 1, N2/XT/SA Bus	61
VS020210A-B0000	VSD 20 hp 230 V, TYPE 1, MS/TP BACnet	61
VS020220A-00000	VSD 20 hp 230 V, TYPE 12	61
VS020220A-L0000	VSD 20 hp 230 V, TYPE 12, LON	61
VS020220A-N0000	VSD 20 hp 230 V, TYPE 12, N2/XT/SA Bus	61
VS020220A-B0000	VSD 20 hp 230 V, TYPE 12, MS/TP BACnet	61

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

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

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS025210A-00000	VSD 25 hp 230 V, TYPE 1	75
VS025210A-L0000	VSD 25 hp 230 V, TYPE 1, LON	75
VS025210A-N0000	VSD 25 hp 230 V, TYPE 1, N2/XT/SA Bus	75
VS025210A-B0000	VSD 25 hp 230 V, TYPE 1, MS/TP BACnet	75
VS025200A-00000	VSD 25 hp 230 V, TYPE 12	75
VS025200A-L0000	VSD 25 hp 230 V, TYPE 12, LON	75
VS025200A-N0000	VSD 25 hp 230 V, TYPE 12, N2/XT/SA Bus	75
VS025200A-B0000	VSD 25 hp 230 V, TYPE 12, MS/TP BACnet	75
VS030210A-00000	VSD 30 hp 230 V, TYPE 1	88
VS030210A-L0000	VSD 30 hp 230 V, TYPE 1, LON	88
VS030210A-N0000	VSD 30 hp 230 V, TYPE 1, N2	88
VS030210A-N0000	VSD 30 hp 230 V, TYPE 1, N2/XT/SA Bus	88
VS030210A-B0000	VSD 30 hp 230 V, TYPE 1, MS/TP BACnet	88
VS030220A-00000	VSD 30 hp 230 V, TYPE 12	88
VS030220A-L0000	VSD 30 hp 230 V, TYPE 12, LON	88
VS030220A-N0000	VSD 30 hp 230 V, TYPE 12, N2/XT/SA Bus	88
VS030220A-B0000	VSD 30 hp 230 V, TYPE 12, MS/TP BACnet	88
VS040210A-00000	VSD 40 hp 230 V, TYPE 1	114
VS040210A-L0000	VSD 40 hp 230 V, TYPE 1, LON	114
VS040210A-N0000	VSD 40 hp 230 V, TYPE 1, N2/XT/SA Bus	114
VS040210A-B0000	VSD 40 hp 230 V, TYPE 1, MS/TP BACnet	114
VS040220A-00000	VSD 40 hp 230 V, TYPE 12	114
VS040220A-L0000	VSD 40 hp 230 V, TYPE 12, LON	114
VS040220A-N0000	VSD 40 hp 230 V, TYPE 12, N2/XT/SA Bus	114
VS040220A-B0000	VSD 40 hp 230 V, TYPE 12, MS/TP BACnet	114

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

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

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS050210A-00000	VSD 50 hp 208 - 230 V, TYPE 1	140
VS050210A-L0000	VSD 50 hp 208 - 230 V, TYPE 1, LON	140
VS050210A-N0000	VSD 50 hp 208 - 230 V, TYPE 1, N2/XT/SA Bus	140
VS050210A-B0000	VSD 50 hp 208 - 230 V, TYPE 1, MS/TP BACnet	140
VS050220A-00000	VSD 50 hp 208 - 230 V, TYPE 12	140
VS050220A-L0000	VSD 50 hp 208 - 230 V, TYPE 12, LON	140
VS050220A-N0000	VSD 50 hp 208 - 230 V, TYPE 12, N2/XT/SA Bus	140
VS050220A-B0000	VSD 50 hp 208 - 230 V, TYPE 12, MS/TP BACnet	140
VS060210A-00000	VSD 60 hp 208 - 230 V, TYPE 1	170
VS060210A-L0000	VSD 60 hp 208 - 230 V, TYPE 1, LON	170
VS060210A-N0000	VSD 60 hp 208 - 230 V, TYPE 1, N2/XT/SA Bus	170
VS060210A-B0000	VSD 60 hp 208 - 230 V, TYPE 1, MS/TP BACnet	170
VS060220A-00000	VSD 60 hp 208 - 230 V, TYPE 12	170
VS060220A-L0000	VSD 60 hp 208 - 230 V, TYPE 12, LON	170
VS060220A-N0000	VSD 60 hp 208 - 230 V, TYPE 12, N2/XT/SA Bus	170
VS060220A-B0000	VSD 60 hp 208 - 230 V, TYPE 12, MS/TP BACnet	170
VS075210A-00000	VSD 75 hp 208 - 230 V, TYPE 1	205
VS075210A-L0000	VSD 75 hp 208 - 230 V, TYPE 1, LON	205
VS075210A-N0000	VSD 75 hp 208 - 230 V, TYPE 1, N2/XT/SA Bus	205
VS075210A-B0000	VSD 75 hp 208 - 230 V, TYPE 1, MS/TP BACnet	205
VS075220A-00000	VSD 75 hp 208 - 230 V, TYPE 12	205
VS075220A-L0000	VSD 75 hp 208 - 230 V, TYPE 12, LON	205
VS075220A-N0000	VSD 75 hp 208 - 230 V, TYPE 12, N2/XT/SA Bus	205
VS075220A-B0000	VSD 75 hp 208 - 230 V, TYPE 12, MS/TP BACnet	205

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

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

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VSF15410A-00000	VSD 1-1/2 hp 480 V, TYPE 1	3.3
VSF15410A-L0000	VSD 1-1/2 hp 480 V, TYPE 1, LON	3.3
VSF15410A-N0000	VSD 1-1/2 hp 480 V, TYPE 1, N2/XT/SA Bus	3.3
VSF15410A-B0000	VSD 1-1/2 hp 480 V, TYPE 1, MS/TP BACnet	3.3
VSF15420A-00000	VSD 1-1/2 hp 480 V, TYPE 12	3.3
VSF15420A-L0000	VSD 1-1/2 hp 480 V, TYPE 12, LON	3.3
VSF15420A-N0000	VSD 1-1/2 hp 480 V, TYPE 12, N2/XT/SA Bus	3.3
VSF15420A-B0000	VSD 1-1/2 hp 480 V, TYPE 12, MS/TP BACnet	3.3
VS002410A-00000	VSD 2 hp 480 V, TYPE 1	4.3
VS002410A-L0000	VSD 2 hp 480 V, TYPE 1, LON	4.3

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

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS002410A-N0000	VSD 2 hp 480 V, TYPE 1, N2/XT/SA Bus	4.3
VS002410A-B0000	VSD 2 hp 480 V, TYPE 1, MS/TP BACnet	4.3
VS002420A-00000	VSD 2 hp 480 V, TYPE 12	4.3
VS002420A-L0000	VSD 2 hp 480 V, TYPE 12, LON	4.3
VS002420A-N0000	VSD 2 hp 480 V, TYPE 12, N2/XT/SA Bus	4.3
VS002420A-B0000	VSD 2 hp 480 V, TYPE 12, MS/TP BACnet	4.3
VS003410A-00000	VSD 3 hp 480 V, TYPE 1	5.6
VS003410A-L0000	VSD 3 hp 480 V, TYPE 1, LON	5.6
VS003410A-N0000	VSD 3 hp 480 V, TYPE 1, N2/XT/SA Bus	5.6
VS003410A-B0000	VSD 3 hp 480 V, TYPE 1, MS/TP BACnet	5.6
VS003420A-00000	VSD 3 hp 480 V, TYPE 12	5.6
VS003420A-L0000	VSD 3 hp 480 V, TYPE 12, LON	5.6
VS003420A-N0000	VSD 3 hp 480 V, TYPE 12, N2/XT/SA Bus	5.6
VS003420A-B0000	VSD 3 hp 480 V, TYPE 12, MS/TP BACnet	5.6
VS005410A-00000	VSD 5 hp 480 V, TYPE 1	7.6
VS005410A-L0000	VSD 5 hp 480 V, TYPE 1, LON	7.6
VS005410A-N0000	VSD 5 hp 480 V, TYPE 1, N2/XT/SA Bus	7.6
VS005410A-B0000	VSD 5 hp 480 V, TYPE 1, MS/TP BACnet	7.6
VS005420A-00000	VSD 5 hp 480 V, TYPE 12	7.6
VS005420A-L0000	VSD 5 hp 480 V, TYPE 12, LON	7.6
VS005420A-N0000	VSD 5 hp 480 V, TYPE 12, N2/XT/SA Bus	7.6
VS005420A-B0000	VSD 5 hp 480 V, TYPE 12, MS/TP BACnet	7.6
VS007410A-00000	VSD 7-1/2 hp 480 V, TYPE 1	12
VS007410A-L0000	VSD 7-1/2 hp 480 V, TYPE 1, LON	12
VS007410A-N0000	VSD 7-1/2 hp 480 V, TYPE 1, N2/XT/SA Bus	12
VS007410A-B0000	VSD 7-1/2 hp 480 V, TYPE 1, MS/TP BACnet	12
VS007420A-00000	VSD 7-1/2 hp 480 V, TYPE 12	12
VS007420A-L0000	VSD 7-1/2 hp 480 V, TYPE 12, LON	12
VS007420A-N0000	VSD 7-1/2 hp 480 V, TYPE 12, N2/XT/SA Bus	12
VS007420A-B0000	VSD 7-1/2 hp 480 V, TYPE 12, MS/TP BACnet	12

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

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

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS010410A-00000	VSD 10 hp 480 V, TYPE 1	16
VS010410A-L0000	VSD 10 hp 480 V, TYPE 1, LON	16
VS010410A-N0000	VSD 10 hp 480 V, TYPE 1, N2/XT/SA Bus	16
VS010410A-B0000	VSD 10 hp 480 V, TYPE 1, MS/TP BACnet	16
VS010420A-00000	VSD 10 hp 480 V, TYPE 12	16



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

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS010420A-L0000	VSD 10 hp 480 V, TYPE 12, LON	16
VS010420A-N0000	VSD 10 hp 480 V, TYPE 12, N2/XT/SA Bus	16
VS010420A-B0000	VSD 10 hp 480 V, TYPE 12, MS/TP BACnet	16
VS015410A-00000	VSD 15 hp 480 V, TYPE 1	23
VS015410A-L0000	VSD 15 hp 480 V, TYPE 1, LON	23
VS015410A-N0000	VSD 15 hp 480 V, TYPE 1, N2/XT/SA Bus	23
VS015410A-B0000	VSD 15 hp 480 V, TYPE 1, MS/TP BACnet	23
VS015420A-00000	VSD 15 hp 480 V, TYPE 12	23
VS015420A-L0000	VSD 15 hp 480 V, TYPE 12, LON	23
VS015420A-N0000	VSD 15 hp 480 V, TYPE 12, N2/XT/SA Bus	23
VS015420A-B0000	VSD 15 hp 480 V, TYPE 12, MS/TP BACnet	23
VS020410A-00000	VSD 20 hp 480 V, TYPE 1	31
VS020410A-L0000	VSD 20 hp 480 V, TYPE 1, LON	31
VS020410A-N0000	VSD 20 hp 480 V, TYPE 1, N2/XT/SA Bus	31
VS020410A-B0000	VSD 20 hp 480 V, TYPE 1, MS/TP BACnet	31
VS020420A-00000	VSD 20 hp 480 V, TYPE 12	31
VS020420A-L0000	VSD 20 hp 480 V, TYPE 12, LON	31
VS020420A-N0000	VSD 20 hp 480 V, TYPE 12, N2/XT/SA Bus	31
VS020420A-B0000	VSD 20 hp 480 V, TYPE 12, MS/TP BACnet	31

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

**Table 11: VSD Series 480 V Open Drives - Frame 6 (Part 1 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS025410A-00000	VSD 25 hp 480 V, TYPE 1	38
VS025410A-L0000	VSD 25 hp 480 V, TYPE 1, LON	38
VS025410A-N0000	VSD 25 hp 480 V, TYPE 1, N2/XT/SA Bus	38
VS025410A-B0000	VSD 25 hp 480 V, TYPE 1, MS/TP BACnet	38
VS025420A-00000	VSD 25 hp 480 V, TYPE 12	38
VS025420A-L0000	VSD 25 hp 480 V, TYPE 12, LON	38
VS025420A-N0000	VSD 25 hp 480 V, TYPE 12, N2/XT/SA Bus	38
VS025420A-B0000	VSD 25 hp 480 V, TYPE 12, MS/TP BACnet	38
VS030410A-00000	VSD 30 hp 480 V, TYPE 1	46
VS030410A-L0000	VSD 30 hp 480 V, TYPE 1, LON	46
VS030410A-N0000	VSD 30 hp 480 V, TYPE 1, N2/XT/SA Bus	46
VS030410A-B0000	VSD 30 hp 480 V, TYPE 1, MS/TP BACnet	46
VS030420A-00000	VSD 30 hp 480 V, TYPE 12	46
VS030420A-L0000	VSD 30 hp 480 V, TYPE 12, LON	46
VS030420A-N0000	VSD 30 hp 480 V, TYPE 12, N2/XT/SA Bus	46
VS030420A-B0000	VSD 30 hp 480 V, TYPE 12, MS/TP BACnet	46

**Table 11: VSD Series 480 V Open Drives - Frame 6 (Part 2 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS040410A-00000	VSD 40 hp 480 V, TYPE 1	61
VS040410A-L0000	VSD 40 hp 480 V, TYPE 1, LON	61
VS040410A-N0000	VSD 40 hp 480 V, TYPE 1, N2/XT/SA Bus	61
VS040410A-B0000	VSD 40 hp 480 V, TYPE 1, MS/TP BACnet	61
VS040420A-00000	VSD 40 hp 480 V, TYPE 12	61
VS040420A-L0000	VSD 40 hp 480 V, TYPE 12, LON	61
VS040420A-N0000	VSD 40 hp 480 V, TYPE 12, N2/XT/SA Bus	61
VS040420A-B0000	VSD 40 hp 480 V, TYPE 12, MS/TP BACnet	61

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

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

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS050410A-00000	VSD 50 hp 480 V, TYPE 1	72
VS050410A-L0000	VSD 50 hp 480 V, TYPE 1, LON	72
VS050410A-N0000	VSD 50 hp 480 V, TYPE 1, N2/XT/SA Bus	72
VS050410A-B0000	VSD 50 hp 480 V, TYPE 1, MS/TP BACnet	72
VS050420A-00000	VSD 50 hp 480 V, TYPE 12	72
VS050420A-L0000	VSD 50 hp 480 V, TYPE 12, LON	72
VS050420A-N0000	VSD 50 hp 480 V, TYPE 12, N2/XT/SA Bus	72
VS050420A-B0000	VSD 50 hp 480 V, TYPE 12, MS/TP BACnet	72
VS060410A-00000	VSD 60 hp 480 V, TYPE 1	87
VS060410A-L0000	VSD 60 hp 480 V, TYPE 1, LON	87
VS060410A-N0000	VSD 60 hp 480 V, TYPE 1, N2/XT/SA Bus	87
VS060410A-B0000	VSD 60 hp 480 V, TYPE 1, MS/TP BACnet	87
VS060420A-00000	VSD 60 hp 480 V, TYPE 12	87
VS060420A-L0000	VSD 60 hp 480 V, TYPE 12, LON	87
VS060420A-N0000	VSD 60 hp 480 V, TYPE 12, N2/XT/SA Bus	87
VS060420A-B0000	VSD 60 hp 480 V, TYPE 12, MS/TP BACnet	87
VS075410A-00000	VSD 75 hp 480 V, TYPE 1	105
VS075410A-L0000	VSD 75 hp 480 V, TYPE 1, LON	105
VS075410A-N0000	VSD 75 hp 480 V, TYPE 1, N2/XT/SA Bus	105
VS075410A-B0000	VSD 75 hp 480 V, TYPE 1, MS/TP BACnet	105
VS075420A-00000	VSD 75 hp 480 V, TYPE 12	105
VS075420A-L0000	VSD 75 hp 480 V, TYPE 12, LON	105
VS075420A-N0000	VSD 75 hp 480 V, TYPE 12, N2/XT/SA Bus	105
VS075420A-B0000	VSD 75 hp 480 V, TYPE 12, MS/TP BACnet	105

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

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

<b>Code Number</b>	<b>Description<sup>1</sup></b>	<b>Current (A)<sup>1</sup></b>
VS100410A-00000	VSD 100 hp 480 V, TYPE 1	140
VS100410A-L0000	VSD 100 hp 480 V, TYPE 1, LON	140
VS100410A-N0000	VSD 100 hp 480 V, TYPE 1, N2/XT/SA Bus	140
VS100410A-B0000	VSD 100 hp 480 V, TYPE 1, MS/TP BACnet	140
VS100420A-00000	VSD 100 hp 480 V, TYPE 12	140
VS100420A-L0000	VSD 100 hp 480 V, TYPE 12, LON	140
VS100420A-N0000	VSD 100 hp 480 V, TYPE 12, N2/XT/SA Bus	140
VS100420A-B0000	VSD 100 hp 480 V, TYPE 12, MS/TP BACnet	140
VS125410A-00000	VSD 125 hp 480 V, TYPE 1	170
VS125410A-L0000	VSD 125 hp 480 V, TYPE 1, LON	170
VS125410A-N0000	VSD 125 hp 480 V, TYPE 1, N2/XT/SA Bus	170
VS125410A-B0000	VSD 125 hp 480 V, TYPE 1, MS/TP BACnet	170
VS125420A-00000	VSD 125 hp 480 V, TYPE 12	170
VS125420A-L0000	VSD 125 hp 480 V, TYPE 12, LON	170
VS125420A-N0000	VSD 125 hp 480 V, TYPE 12, N2/XT/SA Bus	170
VS125420A-B0000	VSD 125 hp 480 V, TYPE 12, MS/TP BACnet	170
VS150410A-00000	VSD 150 hp 480 V, TYPE 1	205
VS150410A-L0000	VSD 150 hp 480 V, TYPE 1, LON	205
VS150410A-N0000	VSD 150 hp 480 V, TYPE 1, N2/XT/SA Bus	205
VS150410A-B0000	VSD 150 hp 480 V, TYPE 1, MS/TP BACnet	205
VS150420A-00000	VSD 150 hp 480 V, TYPE 12	205
VS150420A-L0000	VSD 150 hp 480 V, TYPE 12, LON	205
VS150420A-N0000	VSD 150 hp 480 V, TYPE 12, N2/XT/SA Bus	205
VS150420A-B0000	VSD 150 hp 480 V, TYPE 12, MS/TP BACnet	205

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

**Table 14: VSD Series 480 V Open Drives - Frame 9 (Part 1 of 2)**

<b>Code Number</b>	<b>Description<sup>1</sup></b>	<b>Current (A)<sup>1</sup></b>
VS200410A-00000	VSD 200 hp 480 V, TYPE 1	261
VS200410A-L0000	VSD 200 hp 480 V, TYPE 1, LON	261
VS200410A-N0000	VSD 200 hp 480 V, TYPE 1, N2/XT/SA Bus	261
VS200410A-B0000	VSD 200 hp 480 V, TYPE 1, MS/TP BACnet	261
VS200420A-00000	VSD 200 hp 480 V, TYPE 12	261
VS200420A-L0000	VSD 200 hp 480 V, TYPE 12, LON	261
VS200420A-N0000	VSD 200 hp 480 V, TYPE 12, N2/XT/SA Bus	261
VS200420A-B0000	VSD 200 hp 480 V, TYPE 12, MS/TP BACnet	261
VS250410A-00000	VSD 250 hp 480 V, TYPE 1	300
VS250410A-L0000	VSD 250 hp 480 V, TYPE 1, LON	300

**Table 14: VSD Series 480 V Open Drives - Frame 9 (Part 2 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS250410A-N0000	VSD 250 hp 480 V, TYPE 1, N2/XT/SA Bus	300
VS250410A-B0000	VSD 250 hp 480 V, TYPE 1, MS/TP BACnet	300
VS250420A-00000	VSD 250 hp 480 V, TYPE 12	300
VS250420A-L0000	VSD 250 hp 480 V, TYPE 12, LON	300
VS250420A-N0000	VSD 250 hp 480 V, TYPE 12, N2/XT/SA Bus	300
VS250420A-B0000	VSD 250 hp 480 V, TYPE 12, MS/TP BACnet	300

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

**Table 15: VSD Series 575 V Open Drives (Canadian) - Frame 6 (Part 1 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS003510C-00000	VSD 3 hp 575 V, TYPE 1	4.5
VS003510C-L0000	VSD 3 hp 575 V, TYPE 1, LON	4.5
VS003510C-N0000	VSD 3 hp 575 V, TYPE 1, N2/XT/SA Bus	4.5
VS003510C-B0000	VSD 3 hp 575 V, TYPE 1, MS/TP BACnet	4.5
VS003520C-00000	VSD 3 hp 575 V, TYPE 12	4.5
VS003520C-L0000	VSD 3 hp 575 V, TYPE 12, LON	4.5
VS003520C-N0000	VSD 3 hp 575 V, TYPE 12, N2/XT/SA Bus	4.5
VS003520C-B0000	VSD 3 hp 575 V, TYPE 12, MS/TP BACnet	4.5
VS005510C-00000	VSD 5 hp 575 V, TYPE 1	7.5
VS005510C-L0000	VSD 5 hp 575 V, TYPE 1, LON	7.5
VS005510C-N0000	VSD 5 hp 575 V, TYPE 1, N2/XT/SA Bus	7.5
VS005510C-B0000	VSD 5 hp 575 V, TYPE 1, MS/TP BACnet	7.5
VS005520C-00000	VSD 5 hp 575 V, TYPE 12	7.5
VS005520C-L0000	VSD 5 hp 575 V, TYPE 12, LON	7.5
VS005520C-N0000	VSD 5 hp 575 V, TYPE 12, N2/XT/SA Bus	7.5
VS005520C-B0000	VSD 5 hp 575 V, TYPE 12, MS/TP BACnet	7.5
VS007510C-00000	VSD 7-1/2 hp 575 V, TYPE 1	10
VS007510C-L0000	VSD 7-1/2 hp 575 V, TYPE 1, LON	10
VS007510C-N0000	VSD 7-1/2 hp 575 V, TYPE 1, N2/XT/SA Bus	10
VS007510C-B0000	VSD 7-1/2 hp 575 V, TYPE 1, MS/TP BACnet	10
VS007520C-00000	VSD 7-1/2 hp 575 V, TYPE 12	10
VS007520C-L0000	VSD 7-1/2 hp 575 V, TYPE 12, LON	10
VS007520C-N0000	VSD 7-1/2 hp 575 V, TYPE 12, N2/XT/SA Bus	10
VS007520C-B0000	VSD 7-1/2 hp 575 V, TYPE 12, MS/TP BACnet	10
VS010510C-00000	VSD 10 hp 575 V, TYPE 1	13.5
VS010510C-L0000	VSD 10 hp 575 V, TYPE 1, LON	13.5
VS010510C-N0000	VSD 10 hp 575 V, TYPE 1, N2/XT/SA Bus	13.5
VS010510C-B0000	VSD 10 hp 575 V, TYPE 1, MS/TP BACnet	13.5
VS010520C-00000	VSD 10 hp 575 V, TYPE 12	13.5

**Table 15: VSD Series 575 V Open Drives (Canadian) - Frame 6 (Part 2 of 2)**

<b>Code Number</b>	<b>Description<sup>1</sup></b>	<b>Current (A)<sup>1</sup></b>
VS010520C-L0000	VSD 10 hp 575 V, TYPE 12, LON	13.5
VS010520C-N0000	VSD 10 hp 575 V, TYPE 12, N2/XT/SA Bus	13.5
VS010520C-B0000	VSD 10 hp 575 V, TYPE 12, MS/TP BACnet	13.5
VS015510C-00000	VSD 15 hp 575 V, TYPE 1	18
VS015510C-L0000	VSD 15 hp 575 V, TYPE 1, LON	18
VS015510C-N0000	VSD 15 hp 575 V, TYPE 1, N2/XT/SA Bus	18
VS015510C-B0000	VSD 15 hp 575 V, TYPE 1, MS/TP BACnet	18
VS015520C-00000	VSD 15 hp 575 V, TYPE 12	18
VS015520C-L0000	VSD 15 hp 575 V, TYPE 12, LON	18
VS015520C-N0000	VSD 15 hp 575 V, TYPE 12, N2/XT/SA Bus	18
VS015520C-B0000	VSD 15 hp 575 V, TYPE 12, MS/TP BACnet	18
VS020510C-00000	VSD 20 hp 575 V, TYPE 1	22
VS020510C-L0000	VSD 20 hp 575 V, TYPE 1, LON	22
VS020510C-N0000	VSD 20 hp 575 V, TYPE 1, N2/XT/SA Bus	22
VS020510C-B0000	VSD 20 hp 575 V, TYPE 1, MS/TP BACnet	22
VS020520C-00000	VSD 20 hp 575 V, TYPE 12	22
VS020520C-L0000	VSD 20 hp 575 V, TYPE 12, LON	22
VS020520C-N0000	VSD 20 hp 575 V, TYPE 12, N2/XT/SA Bus	22
VS020520C-B0000	VSD 20 hp 575 V, TYPE 12, MS/TP BACnet	22
VS025510C-00000	VSD 25 hp 575 V, TYPE 1	27
VS025510C-L0000	VSD 25 hp 575 V, TYPE 1, LON	27
VS025510C-N0000	VSD 25 hp 575 V, TYPE 1, N2/XT/SA Bus	27
VS025510C-B0000	VSD 25 hp 575 V, TYPE 1, MS/TP BACnet	27
VS025520C-00000	VSD 25 hp 575 V, TYPE 12	27
VS025520C-L0000	VSD 25 hp 575 V, TYPE 12, LON	27
VS025520C-N0000	VSD 25 hp 575 V, TYPE 12, N2/XT/SA Bus	27
VS025520C-B0000	VSD 25 hp 575 V, TYPE 12, MS/TP BACnet	27
VS030510C-00000	VSD 30 hp 575 V, TYPE 1	34
VS030510C-L0000	VSD 30 hp 575 V, TYPE 1, LON	34
VS030510C-N0000	VSD 30 hp 575 V, TYPE 1, N2/XT/SA Bus	34
VS030510C-B0000	VSD 30 hp 575 V, TYPE 1, MS/TP BACnet	34
VS030520C-00000	VSD 30 hp 575 V, TYPE 12	34
VS030520C-L0000	VSD 30 hp 575 V, TYPE 12, LON	34
VS030520C-N0000	VSD 30 hp 575 V, TYPE 12, N2/XT/SA Bus	34
VS030520C-B0000	VSD 30 hp 575 V, TYPE 12, MS/TP BACnet	34

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

**Table 16: VSD Series 575 V Open Drives (Canadian) - Frame 7**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS040510C-00000	VSD 40 hp 575 V, TYPE 1	41
VS040510C-L0000	VSD 40 hp 575 V, TYPE 1, LON	41
VS040510C-N0000	VSD 40 hp 575 V, TYPE 1, N2/XT/SA Bus	41
VS040510C-B0000	VSD 40 hp 575 V, TYPE 1, MS/TP BACnet	41
VS040520C-00000	VSD 40 hp 575 V, TYPE 12	41
VS040520C-L0000	VSD 40 hp 575 V, TYPE 12, LON	41
VS040520C-N0000	VSD 40 hp 575 V, TYPE 12, N2/XT/SA Bus	41
VS040520C-B0000	VSD 40 hp 575 V, TYPE 12, MS/TP BACnet	41
VS050510C-00000	VSD 50 hp 575 V, TYPE 1	52
VS050510C-L0000	VSD 50 hp 575 V, TYPE 1, LON	52
VS050510C-N0000	VSD 50 hp 575 V, TYPE 1, N2/XT/SA Bus	52
VS050510C-B0000	VSD 50 hp 575 V, TYPE 1, MS/TP BACnet	52
VS050520C-00000	VSD 50 hp 575 V, TYPE 12	52
VS050520C-L0000	VSD 50 hp 575 V, TYPE 12, LON	52
VS050520C-N0000	VSD 50 hp 575 V, TYPE 12, N2/XT/SA Bus	52
VS050520C-B0000	VSD 50 hp 575 V, TYPE 12, MS/TP BACnet	52

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

**Table 17: VSD Series 575 V Open Drives (Canadian) - Frame 8 (Part 1 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS060510C-00000	VSD 60 hp 575 V, TYPE 1	62
VS060510C-L0000	VSD 60 hp 575 V, TYPE 1, LON	62
VS060510C-N0000	VSD 60 hp 575 V, TYPE 1, N2/XT/SA Bus	62
VS060510C-B0000	VSD 60 hp 575 V, TYPE 1, MS/TP BACnet	62
VS060520C-00000	VSD 60 hp 575 V, TYPE 12	62
VS060520C-L0000	VSD 60 hp 575 V, TYPE 12, LON	62
VS060520C-N0000	VSD 60 hp 575 V, TYPE 12, N2/XT/SA Bus	62
VS060520C-B0000	VSD 60 hp 575 V, TYPE 12, MS/TP BACnet	62
VS075510C-00000	VSD 75 hp 575 V, TYPE 1	80
VS075510C-L0000	VSD 75 hp 575 V, TYPE 1, LON	80
VS075510C-N0000	VSD 75 hp 575 V, TYPE 1, N2/XT/SA Bus	80
VS075510C-B0000	VSD 75 hp 575 V, TYPE 1, MS/TP BACnet	80
VS075520C-00000	VSD 75 hp 575 V, TYPE 12	80
VS075520C-L0000	VSD 75 hp 575 V, TYPE 12, LON	80
VS075520C-N0000	VSD 75 hp 575 V, TYPE 12, N2/XT/SA Bus	80
VS075520C-B0000	VSD 75 hp 575 V, TYPE 12, MS/TP BACnet	80
VS100510C-00000	VSD 100 hp 575 V, TYPE 1	100
VS100510C-L0000	VSD 100 hp 575 V, TYPE 1, LON	100

**Table 17: VSD Series 575 V Open Drives (Canadian) - Frame 8 (Part 2 of 2)**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS100510C-N0000	VSD 100 hp 575 V, TYPE 1, N2/XT/SA Bus	100
VS100510C-B0000	VSD 100 hp 575 V, TYPE 1, MS/TP BACnet	100
VS100520C-00000	VSD 100 hp 575 V, TYPE 12	100
VS100520C-L0000	VSD 100 hp 575 V, TYPE 12, LON	100
VS100520C-N0000	VSD 100 hp 575 V, TYPE 12, N2/XT/SA Bus	100
VS100520C-B0000	VSD 100 hp 575 V, TYPE 12, MS/TP BACnet	100

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

**Table 18: VSD Series 575 V Open Drives (Canadian) - Frame 9**

Code Number	Description <sup>1</sup>	Current (A) <sup>1</sup>
VS125510C-00000	VSD 125 hp 575 V, TYPE 1	125
VS125510C-L0000	VSD 125 hp 575 V, TYPE 1, LON	125
VS125510C-N0000	VSD 125 hp 575 V, TYPE 1, N2/XT/SA Bus	125
VS125510C-B0000	VSD 125 hp 575 V, TYPE 1, MS/TP BACnet	125
VS125520C-00000	VSD 125 hp 575 V, TYPE 12	125
VS125520C-L0000	VSD 125 hp 575 V, TYPE 12, LON	125
VS125520C-N0000	VSD 125 hp 575 V, TYPE 12, N2/XT/SA Bus	125
VS125520C-B0000	VSD 60 hp 575 V, TYPE 12, MS/TP BACnet	125
VS150510C-00000	VSD 150 hp 575 V, TYPE 1	144
VS150510C-L0000	VSD 150 hp 575 V, TYPE 1, LON	144
VS150510C-N0000	VSD 150 hp 575 V, TYPE 1, N2/XT/SA Bus	144
VS150510C-B0000	VSD 150 hp 575 V, TYPE 1, MS/TP BACnet	144
VS150520C-00000	VSD 150 hp 575 V, TYPE 12	144
VS150520C-L0000	VSD 150 hp 575 V, TYPE 12, LON	144
VS150520C-N0000	VSD 150 hp 575 V, TYPE 12, N2/XT/SA Bus	144
VS150520C-B0000	VSD 150 hp 575 V, TYPE 12, MS/TP BACnet	144
VS200510C-00000	VSD 200 hp 575 V, TYPE 1	208
VS200510C-L0000	VSD 200 hp 575 V, TYPE 1, LON	208
VS200510C-N0000	VSD 200 hp 575 V, TYPE 1, N2/XT/SA Bus	208
VS200510C-B0000	VSD 200 hp 575 V, TYPE 1, MS/TP BACnet	208
VS200520C-00000	VSD 200 hp 575 V, TYPE 12	208
VS200520C-L0000	VSD 200 hp 575 V, TYPE 12, LON	208
VS200520C-N0000	VSD 200 hp 575 V, TYPE 12, N2/XT/SA Bus	208
VS200520C-B0000	VSD 200 hp 575 V, TYPE 12, MS/TP BACnet	208

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

**Table 19: VSD Series 115/230/480/575 V MicroDrives**

<b>Code Number</b>	<b>Description</b>	<b>Continuous Output Ampere Rating</b>
VSMF2000A-00000	MicroDrive 1/4 hp 115 V, IP20 Enclosure, 1-phase <sup>1</sup>	1.6
VSMF5000A-00000	MicroDrive 1/2 hp 115 V, IP20 Enclosure, 1-phase <sup>1</sup>	2.5
VSM01000A-00000	MicroDrive 1 hp 115 V, IP20 Enclosure, 1-phase <sup>1</sup>	4.2
VSMF5200A-00000	MicroDrive 1/2 hp 230 V, IP20 Enclosure, 1-phase <sup>1</sup> /3-phase	2.5
VSM01200A-00000	MicroDrive 1 hp 230 V, IP20 Enclosure, 1-phase <sup>1</sup> /3-phase	5.0
VSM02200A-00000	MicroDrive 2 hp 230 V, IP20 Enclosure, 1-phase <sup>1</sup> /3-phase	7.0
VSM03200A-00000	MicroDrive 3 hp 230 V, IP20 Enclosure, 1-phase <sup>1</sup> /3-phase	10
VSM05200A-00000	MicroDrive 5 hp 230 V, IP20 Enclosure	17
VSM07200A-00000	MicroDrive 7-1/2 hp 230 V, IP20 Enclosure	25
VSM01400A-00000	MicroDrive 1 hp 480 V, IP20 Enclosure	3.0
VSM02400A-00000	MicroDrive 2 hp 480 V, IP20 Enclosure	4.0
VSM03400A-00000	MicroDrive 3 hp 480 V, IP20 Enclosure	5.0
VSM05400A-00000	MicroDrive 5 hp 480 V, IP20 Enclosure	8.2
VSM07400A-00000	MicroDrive 7-1/2 hp 480 V, IP20 Enclosure	13
VSM10400A-00000	MicroDrive 10 hp 480 V, IP20 Enclosure	18
VSM01500C-00000 <sup>2</sup>	MicroDrive 1 hp 575 V, IP20 Enclosure	1.7
VSM02500C-00000 <sup>2</sup>	MicroDrive 2 hp 575 V, IP20 Enclosure	3.0
VSM03500C-00000 <sup>2</sup>	MicroDrive 3 hp 575 V, IP20 Enclosure	4.2
VSMC5500C-00000 <sup>2</sup>	MicroDrive 5 hp 575 V, IP20 Enclosure	6.6
VSM07500C-00000 <sup>2</sup>	MicroDrive 7-1/2 hp 575 V, IP20 Enclosure	9.9
VSM10500C-00000 <sup>2</sup>	MicroDrive 10 hp 575 V, IP20 Enclosure	12.2

1. Input current is higher due to the single-phase input to the drive.

2. This is a Canadian model.



## VSD Series Spare Parts

Table 20: VSD Series Spare Parts (Part 1 of 4)

Code Number	Description
VS-OPTA2	I/O Card, 2 Relay
VS-OPTA9	I/O Card, 6DI 1DO, 2AI, 1AO
VS-OPTB4	I/O Card, 1DI, 2AO
VS-OPTB5	I/O Card, 3 Relay
VS-OPTNX	N2/XT/SA Bus Comm Card
VS-OPTC4	LonWorks Comm Card
VS-OPTCJ	MS/TP BACnet Comm Card
VS-OPTD3	RS-232 Comm Card
VS-KEYPAD	Hand/Off/Auto Keypad
VS-AUX24V	24 V Aux Power Supply
VS-DEMO	VS Drive Demo <sup>1</sup>
VS-RMTKEYPAD	Remote Keypad Kit
VS-DRIVECABLE	RS-232 Download Cable (6 ft)
VS-KEYPADCABLE	RS-232 Remote Keypad Cable (6 ft)
VS-RIBBONCABLE	IntelliPass Ribbon Cable
VS-TRAINING	3-Day Start-Up Training
VS-PP01060	Fan Assembly FR4
VS-PP01061	Fan Assembly FR5/6
VS-PP01062	Fan Assembly FR6
VS-PP01063	Fan Assembly FR7
VS-PP01123	Fan Assembly FR8
VS-PP01080	Fan Assembly FR9, 10
VS-PP09051	Fan Transformer for PP01080
VS-VB00308	Power Board 1 - 1-1/2 to 2 hp, 230 V
VS-VB00310	Power Board 3 hp, 230 V
VS-VB00313	Power Board 5, 7-1/2, 10 hp, 230 V
VS-VB00316	Power Board 15, 20 hp, 230 V
VS-VB00319	Power Board 25, 30, 40 hp, 230 V
VS-PP01000	Electrolytic Capacitors 5 to 15 hp, 230 to 480 V
VS-PP01001	Electrolytic Capacitors 5 to 7-1/2 hp, 230 to 480 V
VS-PP01002	Electrolytic Capacitors 5 to 15 hp, 230 to 480 V

Table 20: VSD Series Spare Parts (Part 2 of 4)

Code Number	Description
VS-PP01003	Electrolytic Capacitors 10 to 20 hp, 230 to 480 V
VS-PP01004	Electrolytic Capacitors 15 to 40 hp, 230 to 480 V
VS-PP01005	Electrolytic Capacitors 25 to 250 hp, 230 to 480 V
VS-CP01304	IGBT Module 1 to 3 hp, 230 to 480 V
VS-CP01305	IGBT Module 2 to 5 hp, 230 to 480 V
VS-CP01306	IGBT Module 3 to 10 hp, 230 to 480 V
VS-CP01307	IGBT Module 7-1/2 to 15 hp, 230 to 480 V
VS-CP01308	IGBT Module 10 to 20 hp, 230 to 480 V
VS-PP01022	IGBT Module 15 to 30 hp, 230 to 480 V
VS-PP01023	IGBT Module 20 to 40 hp, 230 to 480 V
VS-PP01024	IGBT Module 25 to 50 hp, 230 to 480 V
VS-PP01025	IGBT Module 30 to 60 hp, 230 to 480 V
VS-PP01029	IGBT Module 40 to 75 hp, 230 to 480 V
VS-VB00242	Rectifying Board 25 to 75 hp, 230 to 480 V
VS-CP01367	Chopper/Rectifier 15 to 30 hp, 230 to 480 V
VS-CP01368	Chopper/Rectifier 20 to 40 hp, 230 to 480 V
VS-PP01035	Diode/Thyristor Module 25 to 75 hp, 230 to 480 V
VS-VB00252	Control Board Assembly 230 V, 480 V, 575 V <sup>2</sup>
VS-VB00205	Power Board 1-1/2 hp, 480 V
VS-VB00206	Power Board 2 hp, 480 V
VS-VB00207	Power Board 3 hp, 480 V
VS-VB00208	Power Board 5 hp, 480 V
VS-VB00210	Power Board 7-1/2 hp, 480 V
VS-VB00211	Power Board 10 hp, 480 V
VS-VB00212	Power Board 15 hp, 480 V
VS-VB00213	Power Board 20 hp, 480 V
VS-VB00214	Power Board 25 hp, 480 V

**Table 20: VSD Series Spare Parts (Part 3 of 4)**

Code Number	Description
VS-VB00215	Power Board 30 hp, 480 V
VS-VB00216	Power Board 40 hp, 480 V
VS-VB00217	Power Board 50 hp, 480 V
VS-VB00218	Power Board 60 hp, 480 V
VS-VB00219	Power Board 75 hp, 480 V
VS-VB00220	Power Board 100 hp, 480 V
VS-VB00221	Power Board 125 hp, 480 V
VS-VB00236	Power Board 150 hp, 480 V
VS-PP01020	IGBT Module 25 hp, 480 V
VS-PP01026	IGBT Module 100 hp, 480 V
VS-PP01027	IGBT Module 125 to 150 hp, 480 V
VS-VB00227	Rectifying Board 100 to 150 hp, 480 V
VS-VB00459	Rectifying Board 200 to 250 hp, 480 V
VS-CP01268	Diode/Thyristor Module 100 to 150 hp, 480 V
VS-PP01037	Diode/Thyristor Module 200 to 250 hp, 480 V
VS-FR09810	Rectifying Module 200 to 250 hp, 480 V
VS-FR09800	Power Module 200 hp, 480 V
VS-FR09801	Power Module 250 hp, 480 V
VS-VB00404	Power Board 3 to 30 hp, 575 V
VS-VB00419	Power Board 40 to 50 hp, 575 V
VS-VB00422	Power Board 60, 75, 100 hp, 575 V
VS-VB00425	Power Board 125 to 200 hp, 575 V
VS-PP01093	Electrolytic Capacitors 3 to 30 hp, 575 V
VS-PP01041	Electrolytic Capacitors 40 to 200 hp, 575 V
VS-PP01140	Electrolytic Capacitors 100 hp, 575 V

**Table 20: VSD Series Spare Parts (Part 4 of 4)**

Code Number	Description
VS-PP01091	IGBT Module 3 to 30 hp, 575 V
VS-PP01089	IGBT Module 40 to 50 hp, 575 V
VS-PP01127	IGBT Module 60, 75, 100 hp, 575 V
VS-VB00442	Rectifying Board 40 to 50 hp, 575 V
VS-VB00427	Rectifying Board 60, 75, 100 hp, 575 V
VS-VB00460	Rectifying Board 125 to 200 hp, 575 V
VS-PP01092	Diode Module 3 to 30 hp, 575 V
VS-PP01071	Diode/Thyristor Module 40 to 50 hp, 575 V
VS-CP01373	Diode/Thyristor Module 60, 75, 100 hp, 575 V
VS-PP01072	Diode/Thyristor Module 125 to 100 hp, 575 V
VS-FR09812	Rectifying Module 125 to 200 hp, 575 V
VS-FR09802	Power Module 125 hp, 575 V
VS-FR09803	Power Module 150 hp, 575 V
VS-FR09804	Power Module 200 hp, 575 V

1. Includes an RS-232 Comm Card and an N2/XT Bus Comm Card (VS-OPTNX) as standard. Order a VS-OPTB5 (I/O Card 3 Relay) to simulate bypass and a VS-OPTCJ card if MS/TP BACnet is required.
2. Control module is mounted in blue box (no I/O cards included).

### VSD Series Option Boards

The VSD Series 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. See Figure 3.

The VSD Series 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.

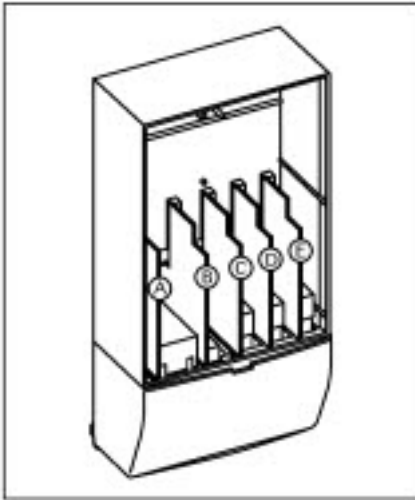


Figure 3: VSD Series Option Boards

Table 21: Option Boards

Description		Allowed Slot Locations <sup>1</sup>	Option Number	Factory Installed
				Suffix Number
Basic I/O Cards	2 Relay Output (RO), Normally Closed/Normally Open (N.C./N.O.),	B	VS-OPTA2	Standard
	6 Digital Outputs (DI), 1 Digital Output (DO), 2 Analog Inputs (AI), 1 Analog Output (AO) Small Terminal Block, 1 +10 V DC ref, 2 ext +24 VDC/EXT +24 VDC	A	VS-OPTA9	Standard
Extended I/O Cards	1 AI (mA isolated), 2 AO (mA isolated), 1 ext +24 VDC/ EXT +24 VDC	C, D <sup>2</sup>	VS-OPTB4	B4
	3 RO (NO)	C, D <sup>2</sup>	VS-OPTB5	B5
Communication Cards <sup>3</sup>	Johnson Controls N2/XT/SA Bus Com	D, E <sup>2</sup>	VS-OPTNX	N
	Johnson Controls MS/TP BACnet Com	D, E <sup>2</sup>	VS-OPTCJ	B
	LONWORKS Network	D, E <sup>2</sup>	VS-OPTC4	L

1. The option card must be installed in one of the slots listed for that card.
2. This is the preferred slot for option board card placement.
3. Only one communication card can be installed.

## VSD Series Replacement Part Selection

Table 22: VSD 230 V Open Drives, Frames 4 – 7 (208 – 240 V Rating)

Frame	4				5			6		7			Code Number <sup>1</sup>
	1	1-1/2	2	3	5	7-1/2	10	15	20	25	30	40	
Power Board	1	1	1										VS-VB00308
				1									VS-VB00310
					1	1	1						VS-VB00313
								1	1				VS-VB00316
										1	1	1	VS-VB00319
Electrolytic Capacitors	2	2	2										VS-PP01000
				2									VS-PP01001
					2	2							VS-PP01002
							2						VS-PP01003
								2	2				VS-PP01004
IGBT Module	1	1											VS-CP01304
			1										VS-CP01305
				1	1								VS-CP01306
						1							VS-CP01307
							1						VS-CP01308
								1					VS-PP01022
									1				VS-PP01023
										1			VS-PP01024
											1		VS-PP01025
Rectifying Board										1	1	1	VS-VB00242
Chopper/Rectifier								1					VS-CP01367
									1				VS-PP01368
Diode/Thyristor Module										3	3	3	VS-PP01035
Control Board	1	1	1	1	1	1	1	1	1	1	1	1	VS-VB00252
Cooling Fans													
Fan Assembly FR4	1	1	1	1									VS-PP01060
Fan Assembly FR5					1	1	1						VS-PP01061
Fan Assembly FR6								1	1				VS-PP01062
Fan Assembly FR7										1	1	1	VS-PP01063

1. Each code number is a quantity of one. Order the quantity specified for replacement.

**Table 23: VSD 480 V Open Drives, Frames 4 and 5 (380 – 500 V Rating)**

Frame	4					5			Code Number <sup>1</sup>
	1-1/2	2	3	5	7-1/2	10	15	20	
<b>Power Board</b>	1								VS-VB00205
		1							VS-VB00206
			1						VS-VB00207
				1					VS-VB00208
					1				VS-VB00210
						1			VS-VB00211
							1		VS-VB00212
								1	VS-VB00213
<b>Electrolytic Capacitors</b>	2	2	2	2					VS-PP01000
					2				VS-PP01001
						2	2		VS-PP01002
								2	VS-PP01003
<b>IGBT Module</b>	1	1	1						VS-CP01304
				1					VS-CP01305
					1	1			VS-CP01306
							1		VS-CP01307
								1	VS-CP01308
<b>Control Board</b>	1	1	1	1	1	1	1	1	VS-VB00252
<b>Fans</b>									
Fan Assembly 80 mm FR4	1	1	1	1	1				VS-PP01060
Fan Assembly 120 mm FR5						1	1	1	VS-PP01061

1. Each code number is a quantity of one. Order the quantity specified for replacement.

Table 24: VSD 480 V Open Drives, Frames 6 – 9 (380 – 500 Rating)

Frame	6			7			8			9		Code Number <sup>1</sup>
	25	30	40	50	60	75	100	125	150	200	250	
Power Board	1											VS-VB00214
		1										VS-VB00215
			1									VS-VB00216
				1								VS-VB00217
					1							VS-VB00218
						1					1	VS-VB00219
							1					VS-VB00220
								1				VS-VB00221
									1			VS-VB00236
Electrolytic Capacitors	2	2	2									VS-PP01004
				2	2	2	4	4	4	8	8	VS-PP01005
IGBT Module	1											VS-PP01020
		1										VS-PP01022
			1									VS-PP01023
				1								VS-PP01024
					1							VS-PP01025
						1						VS-PP01029
							1					VS-PP01026
								1	1			VS-PP01027
Rectifying Board				1	1	1						VS-VB00242
							1	1	1			VS-VB00227
										1	1	VS-VB00459
Chopper/Recruiter	1	1										VS-CP01367
			1									VS-CP01368
Diode/Thyristor				3	3	3						VS-PP01035
							3	3	3			VS-CP01268
										3	3	VS-PP01037
Rectifying Module Sub-Assembly										1	1	VS-FR09810
Power Module Sub-Assembly										1		VS-FR09800
											1	VS-FR09801
Control Board	1	1	1	1	1	1	1	1	1	1	1	VS-VB00252
Fans												
Fan Assembly 150 mm FR6	1	1	1									VS-PP01062
Fan Assembly 150 mm FR7				1	1	1						VS-PP01063
Main Fan 165 W FR8							1	1	1			VS-PP01123
Fan 230 W FR9 -FR10										1	1	VS-PP01080
Fan Transformer for PP01080										1	1	VS-PP09051

1. Each code number is a quantity of one. Order the quantity specified for replacement.

**Table 25: VSD 575 V Open Drives, Frame 6 (525 – 690 V Rating)**

Frame	6								Code Number <sup>1</sup>
	3	5	7-1/2	10	15	20	25	30	
Power Board	1	1	1	1	1	1	1	1	VS-VB00404
Electrolytic Capacitors	2	2	2	2	2	2	2	2	VS-PP01093
IGBT Module	3	3	3	3	3	3	3	3	VS-PP01091
Diode Module	1	1	1	1	1	1	1	1	VS-PP01092
Control Board	1	1	1	1	1	1	1	1	VS-VB00252
Fans									
FR6 up to 13 A	1	1	1	1					VS-PP01061
FR6 greater than 13 A					1	1	1	1	VS-PP01062

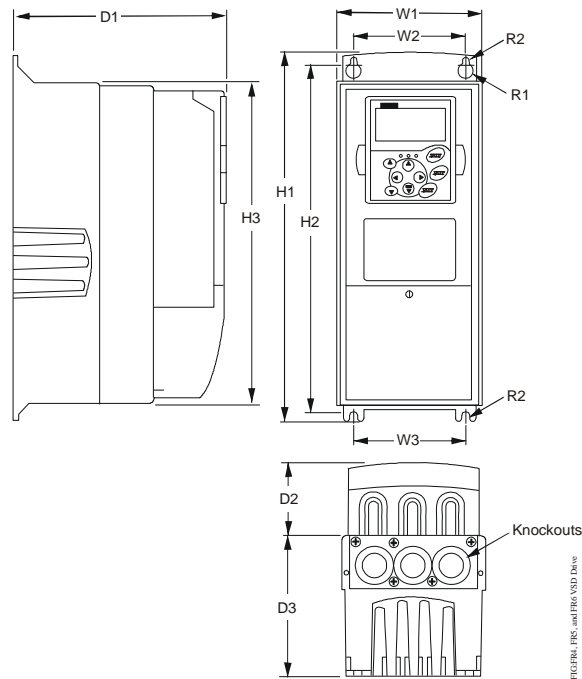
1. Each code number is a quantity of one. Order the quantity specified for replacement.

**Table 26: VSD 575 V Open Drives, Frames 7 – 9 (525 – 690 Rating)**

Frame	7		8			9			Code Number <sup>1</sup>
	40	50	60	75	100	125	150	200	
Power Board	1	1							VS-VB00419
			1	1	1				VS-VB00422
						1	1	1	VS-VB00425
Electrolytic Capacitors	2	2	4	4		8	8	8	VS-PP01041
					4				VS-PP01141
IGBT Module	1	1							VS-PP01089
			1	1	1				VS-PP01127
Rectifying Board	1	1							VS-VB00442
			1	1	1				VS-VB00427
						1	1	1	VS-VB00460
Diode/Thyristor	3	3							VS-PP01071
			3	3	3				VS-CP01373
						3	3	3	VS-PP01072
Rectifying Module Sub-Assembly						1	1	1	VS-FR09812
Power Module Sub-Assembly						1			VS-FR09802
							1		VS-FR09803
								1	VS-FR09804
Control Board	1	1	1	1	1	1	1	1	VS-VB00252
Fans									
FR7	1	1							VS-PP01063
FR8			1	1	1				VS-PP01123
FR9						1	1	1	VS-PP01080
Fan Transformer for PP01080						1	1	1	VS-PP09051

1. Each code number is a quantity of one. Order the quantity specified for replacement.

## Dimensions



**Figure 4: TYPE 1 and TYPE 12 VSD Series Open Drive Dimensions (Frames FR4, FR5, and FR6)**

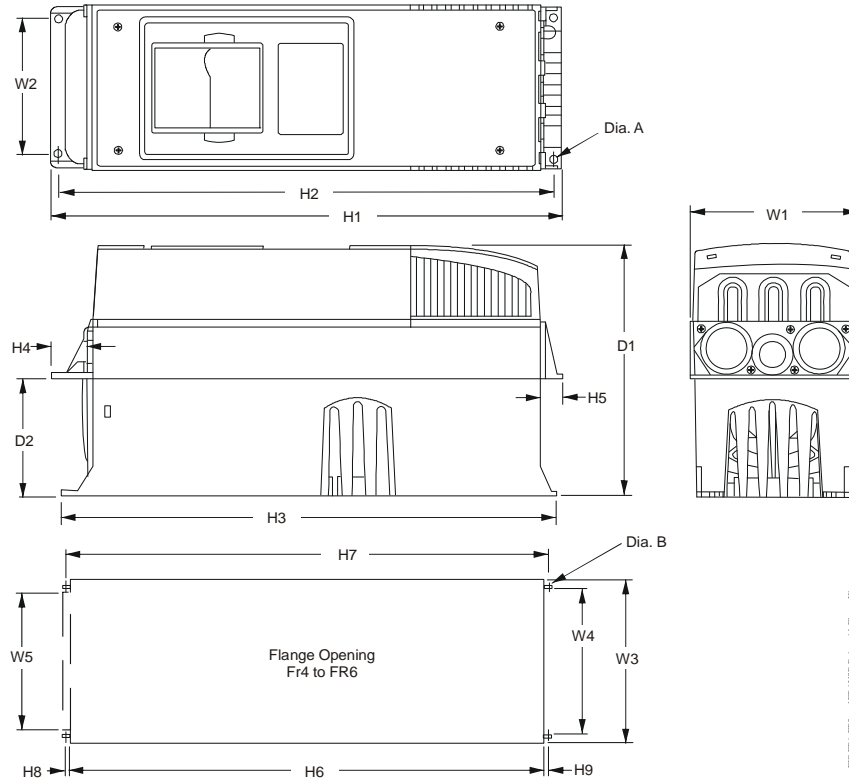
**Table 27: Type 1 and Type 12 VSD Series Open Drive Dimensions (Frames FR4, FR5, FR6, FR7, FR8, and FR9)**

Frame Size	Dimensions in. (mm), approximate										
	H1	H2	H3	D1	D2	D3	W1	W2	W3	R1 (Dia.)	R2 (Dia.)
<b>FR4</b>	12-7/8 (327)	12-11/32 (313)	11-1/2 (292)	7-1/2 (190)	2-17/32 (64)	4-31/32 (126)	5-1/16 (128)	3-15/16 (100)	—	1/2 (0.5)	9/32 (0.3)
<b>FR5</b>	16-1/2 (419)	16 (406)	15-13/32 (391)	8-7/16 (214)	2-11/16 (68)	5-27/32 (148)	5-11/16 (144)	3-15/16 (100)	—	1/2 (0.5)	9/32 (0.3)
<b>FR6</b>	21-3/32 (558)	21-5/16 (541)	20-7/16 (519)	9-11/32 (237)	2-11/16 (68)	6-3/4 (171)	7-11/16 (195)	5-27/32 (148)	—	23/32 (18)	3/8 (9)
<b>FR7</b>	24-13/16 (630)	24-3/16 (614)	23-1/4 (591)	10-1/8 (257)	2-11/16 (68)	7-15/32 (189)	9-11/32 (237)	7-1/2 (190)	—	23/32 (18)	3/8 (9)
<b>FR8</b>	29-3/4 (755)	28-27/32 (732)	28-13/32 (721)	11-11/32 (288)	1-11/32 (288)	1 (279)	11-1/4 (285)	10-1/16 (255)	—	23/32 (18)	3/8 (9)
<b>FR9</b>	45-9/32 (1150)	44-1/8 (1120)	—	14-9/32 (362)	5-31/32 (137)	8-27/32 (224)	18-29/32 (480)	15-3/4 (400)	—	23/32 (18)	3/8 (9)



**Table 28: Type 1 and Type 12 VSD Series Open Drive Knockout Dimensions (Frames FR4, FR5, FR6, FR7, FR8, and FR9)**

<b>Frame Size</b>	<b>Knockouts and in. (mm)</b>
	<b>N1 (O.D.)</b>
<b>FR4</b>	3 at 1-1/8 (28)
<b>FR5</b>	2 at 1-15/32 (37) 1 at 1-1/8 (28)
<b>FR6</b>	3 at 1-15/32 (37)
<b>FR7</b>	3 at 1-7/8 (47)
<b>FR8</b>	3 at 1-1/8 (28) 2 at 2-11/32 (59)
<b>FR9</b>	4 at 2-11/32 (59)



**Figure 5: TYPE 1 and TYPE 12 VSD Series Open Drive with Flange Kit Dimensions (Frames FR4, FR5, and FR6)**

**Table 29: Type 1 and Type 12 VSD Series Open Drive Dimensions (Frames FR4, FR5, and FR6 with Flange Kit)**

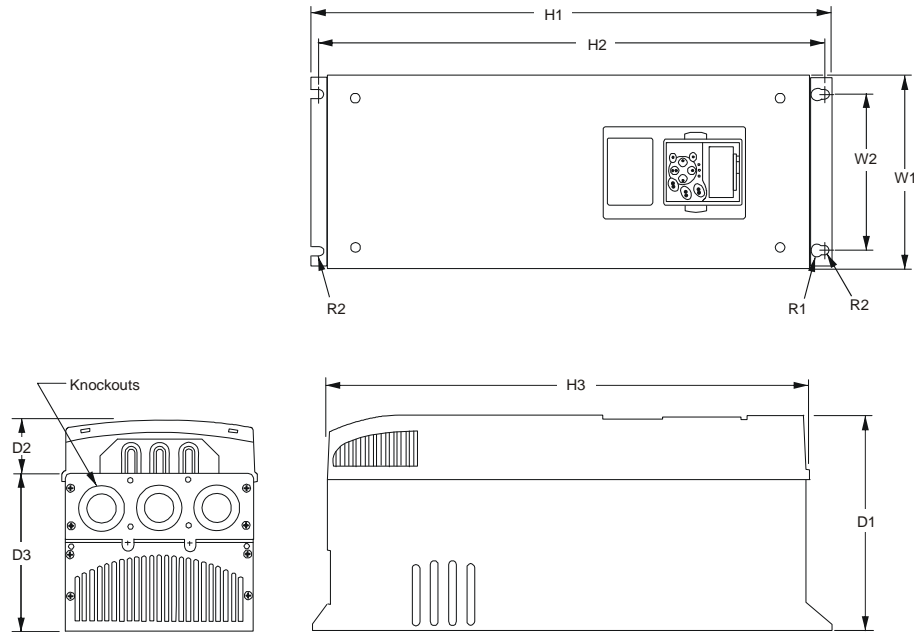
Frame Size	Dimensions in. (mm), approximate									
	W1	W2	H1	H2	H3	H4	H5	D1	D2	Dia. A
FR4	5-1/16 (128)	4-15/32 (113)	13-9/32 (337)	12-13/16 (325)	12-7/8 (327)	1-3/16 (30)	7/8 (22)	7-1/2 (190)	3-1/16 (77)	9/32 (7)
FR5	5-11/16 (144)	4-3/4 (120)	17-3/32 (434)	16-9/16 (420)	16-1/2 (419)	1-7/16 (36)	23/32 (18)	8-7/16 (214)	3-15/16 (100)	9/32 (7)
FR6	7-11/16 (195)	6-25/32 (170)	21-31/32 (560)	21-5/8 (549)	21-31/32 (558)	1-3/16 (30)	13/16 (20)	9-11/32 (237)	4-3/16 (106)	9/32 (7)

**Table 30: Flange Opening Dimensions (Frames FR4, FR5, and FR6) (Part 1 of 2)**

Frame Size	Dimensions in. (mm), approximate							
	W3	W4	W5	H6	H7	H8	H9	Dia. B
FR4	4-27/32 (123)	4-15/32 (113)	—	12-13/32 (315)	12-13/16 (325)	—	7/32 (5)	9/32 (7)

**Table 30: Flange Opening Dimensions (Frames FR4, FR5, and FR6) (Part 2 of 2)**

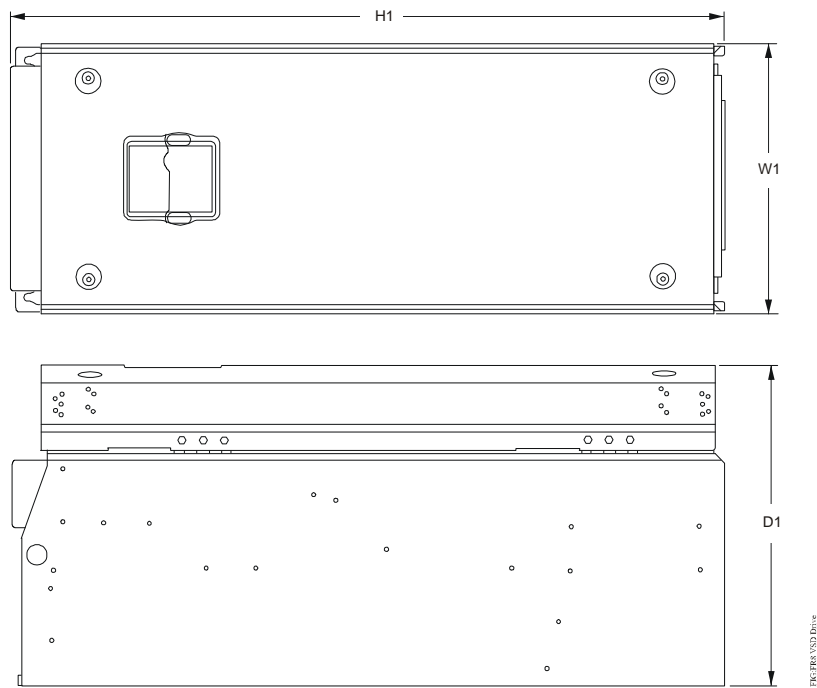
Frame Size	Dimensions in. (mm), approximate							
	W3	W4	W5	H6	H7	H8	H9	Dia. B
FR5	5-11/32 (135)	4-3/4 (120)	—	16-5/32 (410)	16-9/16 (420)	—	7/32 (5)	9/32 (7)
FR6	7-5/16 (185)	6-23/32 (170)	6-3/16 (157)	21-1/4 (539)	21-5/8 (549)	9/32 (7)	7/32 (5)	9/32 (7)



**Figure 6: TYPE 1 and TYPE 12 VSD Series Open Drive Dimensions (Frame FR7)**

**Table 31: Type 1 and Type 12 VSD Series Open Drive Dimensions (Frame FR7)**

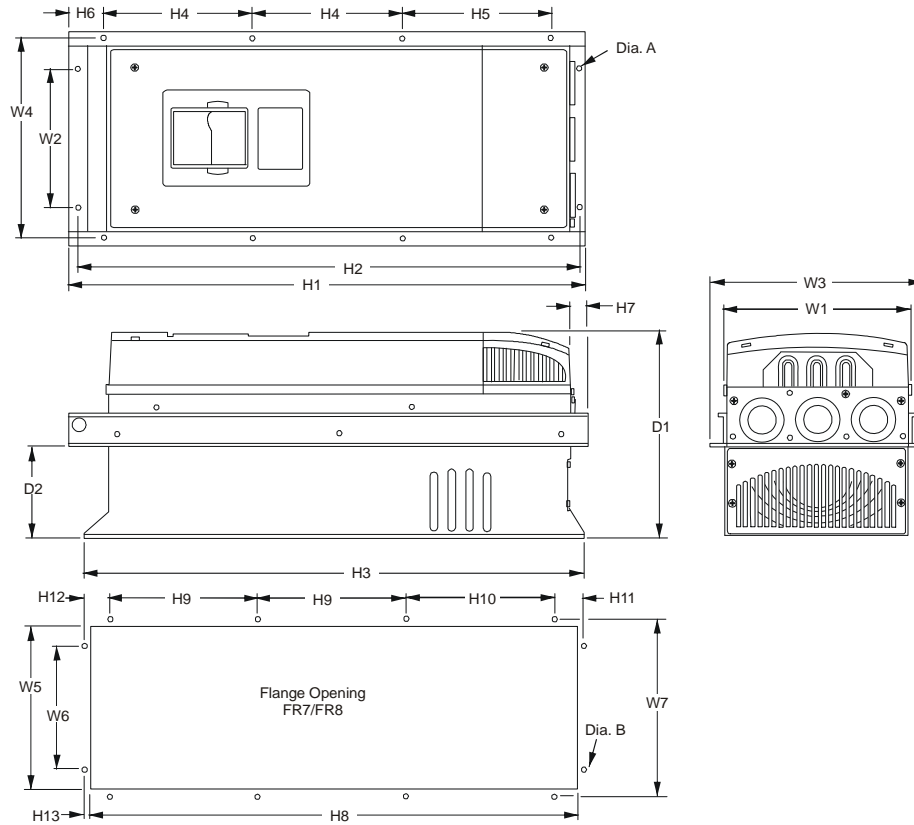
Frame Size	Dimensions in. (mm), approximate										Knockouts and in. (mm)
	H1	H2	H3	D1	D2	D3	W1	W2	R1 (Dia.)	R2 (Dia.)	N1 (O.D.)
FR7	24-13/16 (630)	24-3/16 (614)	23-1/4 (591)	10-1/8 (257)	2-11/16 (68)	7-1/2 (190)	9-11/32 (237)	7-1/2 (190)	23/32 (18)	3/8 (9)	3 at 1-15/32 (37)



**Figure 7: TYPE 1 and TYPE 12 VSD Series  
Open Drive Dimensions (Frame FR8)**

**Table 32: Type 1 and Type 12 VSD Series Open  
Drive Dimensions (Frame FR8)**

Frame Size	Dimensions in. (mm), approximate		
	D1	H1	W1
FR8	3-9/16 (344)	30-3/32 (764)	11-13/32 (289)



**Figure 8: TYPE 1 and TYPE 12 VSD Series Open Drive with Flange Kit Dimensions (Frames FR7 and FR8)**

**Table 33: Type 1 and Type 12 VSD Series Open Drive Dimensions (Frames FR7 and FR8 with Flange Kit)**

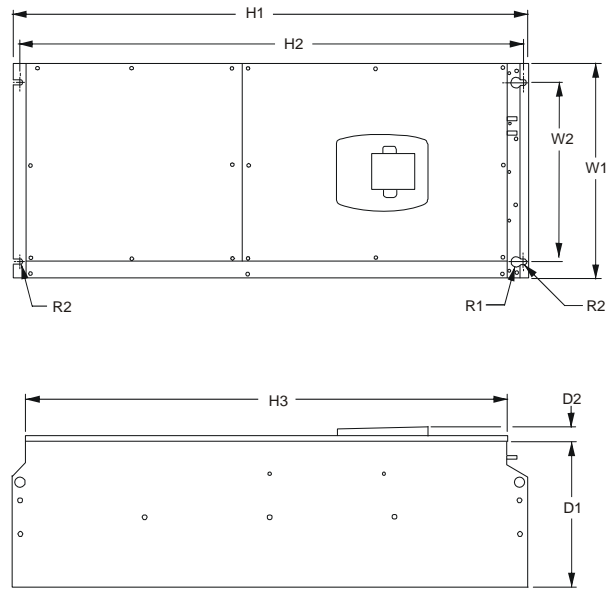
Frame Size	Dimensions in. (mm), approximate										
	W1	W2	W3	W4	H1	H2	H3	H4	H5	H6	H7
FR7	9-11/32 (237)	6-29/32 (175)	10-21/32 (270)	9-31/32 (253)	25-11/16 (652)	24-29/32 (632)	24-13/16 (630)	7-15/32 (189)	7-15/32 (189)	29/32 (23)	13/16 (20)
FR8	11-1/4 (285)	—	1 (355)	1 (330)	32-25/32 (832)	—	29-11/32 (745)	10-13/16 (258)	10-7/16 (265)	1-23/32 (43)	2-1/4 (57)

**Table 34: Type 1 and Type 12 VSD Series Open Drive Dimensions (Frames FR7 and FR8 with Flange Kit)**

Frame Size	Dimensions in. (mm), approximate		
	D1	D2	Dia. A
FR7	10-1/8 (257)	4-5/8 (117)	1/4 (6)
FR8	13-9/16 (344)	4-11/32 (110)	3/8 (9)

**Table 35: Flange Opening Dimensions (Frames FR7 and FR8)**

Frame Size	Dimensions in. (mm), approximate									
	W5	W6	W7	H8	H9	H10	H11	H12	H13	Dia. B
FR7	9-3/16 (233)	6-29/32 (175)	9-31/32 (253)	24-3/8 (619)	7-15/32 (189)	7-15/32 (189)	1-13/32 (35)	1-9/32 (32)	9/32 (7)	1/4 (6)
FR8	11-7/8 (301)	—	1	31-29/32 (810)	10-3/16 (258)	10-7/16 (265)	—	—	—	3/8 (9)



**Figure 9: TYPE 1 and TYPE 12 VSD Series Open Drive Dimensions (Frame FR9)**

**Table 36: Type 1 and Type 12 VSD Series Open Drive Dimensions (Frame FR9)**

Frame Size	Dimensions in. (mm), approximate								
	H1	H2	H3	D1	D2	W1	W2	R1 Dia.	R2 Dia.
FR9	45-3/8 (1,152)	44-3/16 (1,122)	42-3/8 (1,076)	12-7/8 (327)	1-13/21 (35)	18-19/32 (480)	15-3/4 (400)	13/16 (20)	3/8 (9)

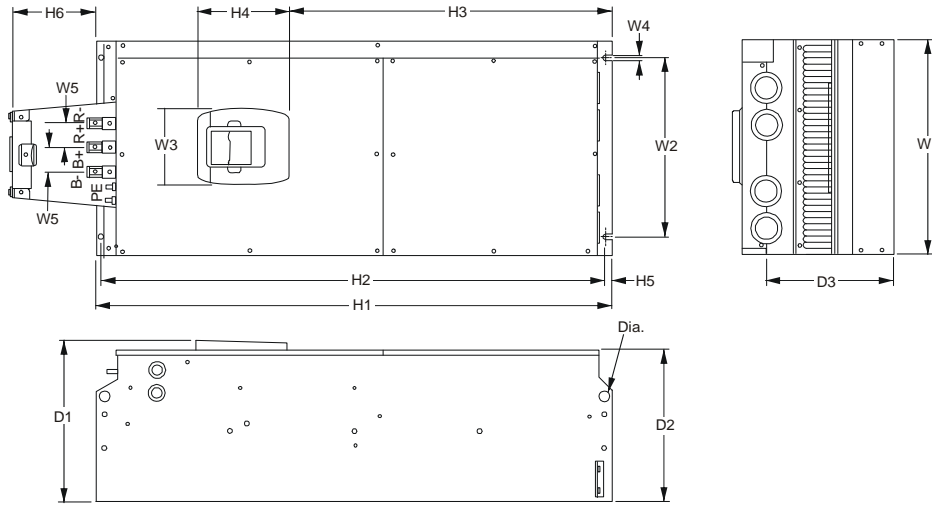


FIG FR9\_2 VSD.DWG

**Figure 10: TYPE 1 and TYPE 12 VSD Series Open Drive Dimensions (Frame FR9)**

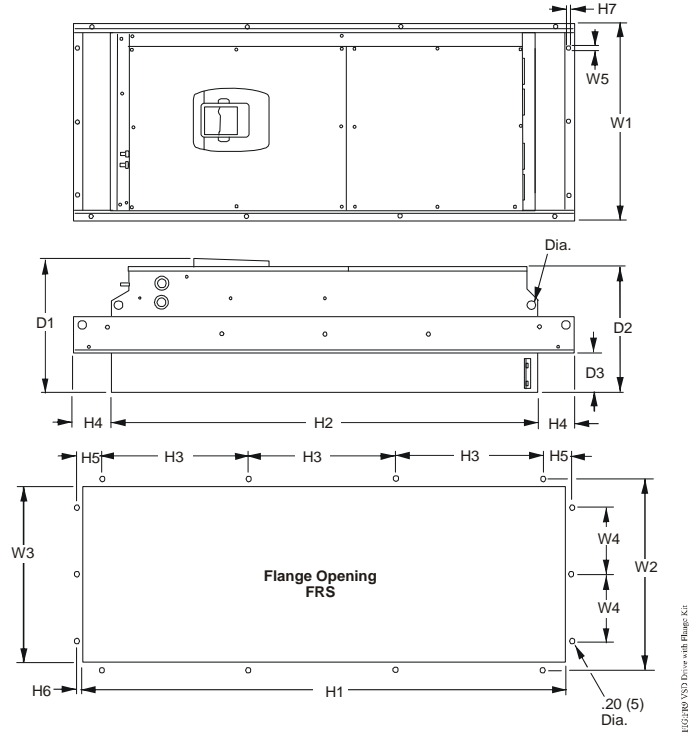
**Table 37: Type 1 and Type 12 VSD Series Open Drive Dimensions (Frame FR9)**

Frame Size	Dimensions in. (mm), approximate											
	W1	W2	W3	W4	W5	H1	H2	H3	H4	H5	H6 <sup>1</sup>	D1
FR9	18-29/32 (480)	15-3/4 (400)	6-1/2 (165)	3/8 (9)	2-5/32 (54)	45-3/8 (1,152)	44-3/16 (1,122)	28-13/32 (721)	8-3/32 (205)	21/32 (16)	7-13/32 (188)	14-9/32 (362)

1. The brake resistor terminal box (H6) is included when the brake chopper is ordered.

**Table 38: Type 1 and Type 12 VSD Series Open Drive Dimensions (Frame FR9)**

Frame Size	Dimensions in. (mm), approximate		
	D2	D3	Dia.
FR9	12-7/8 (327)	11-1/4 (285)	27/32 (21)



**Figure 11: TYPE 1 and TYPE 12 VSD Series Open Drive with Flange Kit Dimensions (Frame FR9)**

**Table 39: Flange Opening Dimensions (Frame FR9)**

Frame Size	Dimensions in. (mm), approximate										
	W1	W2	W3	W4	W5	H1	H2	H3	H4	H5	H6
FR9	20-7/8 (530)	20-3/32 (510)	19-1/8 (485)	7-7/8 (200)	1/4 (6)	51-21/32 (1,312)	45-9/32 (1,150)	16-9/16 (420)	3-15/16 (100)	1-13/32 (35)	3/8 (9)

**Table 40: Flange Opening Dimensions (Frame FR9)**

Frame Size	Dimensions in. (mm), approximate				
	H7	D1	D2	D3	Dia.
FR9	3/32 (2)	14-9/32 (362)	13-13/32 (340)	4-5/16 (109)	27/32 (21)



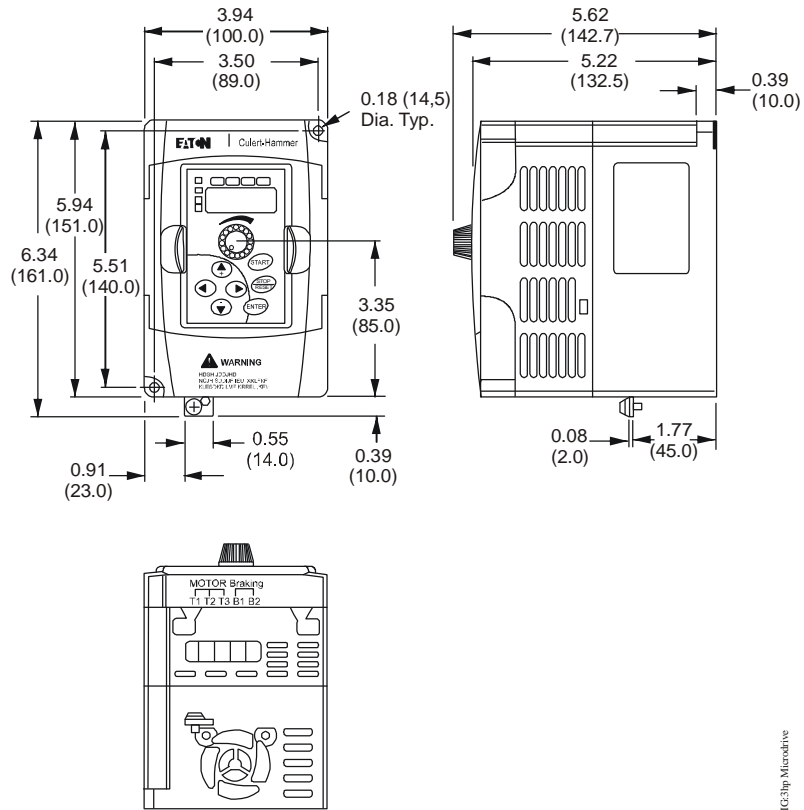


FIG. 3hp Microdrive

Figure 12: 1/4 to 3 hp MicroDrive Dimensions, in. (mm)

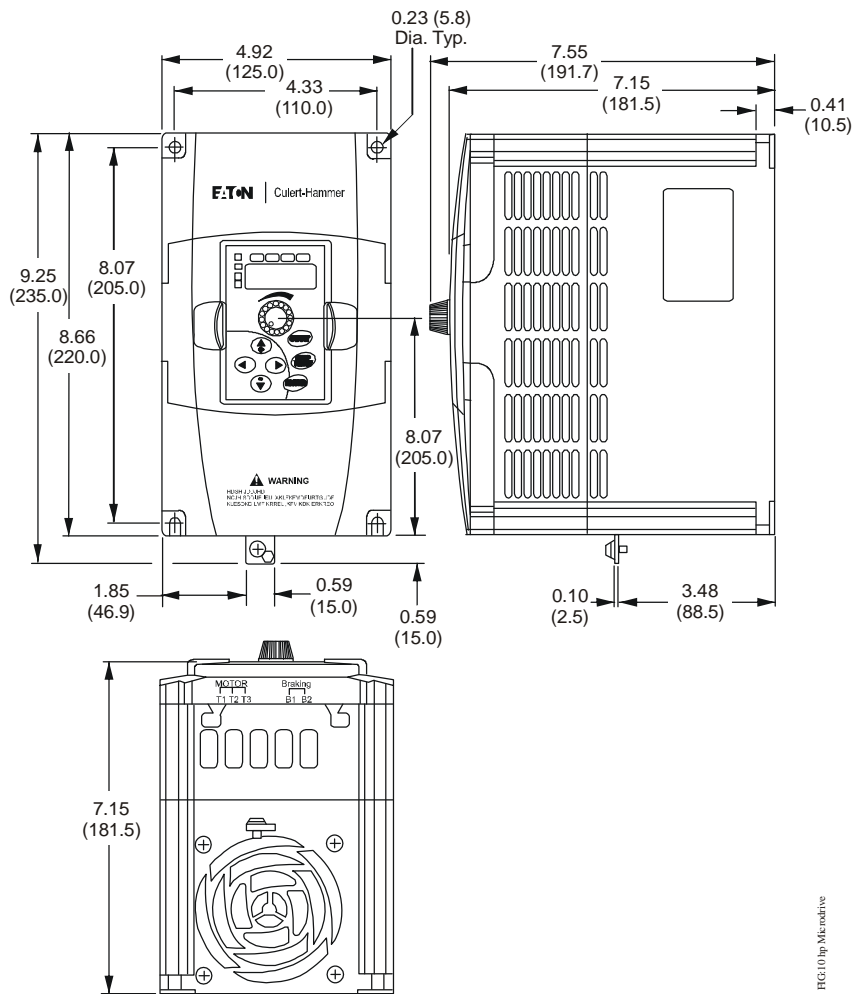
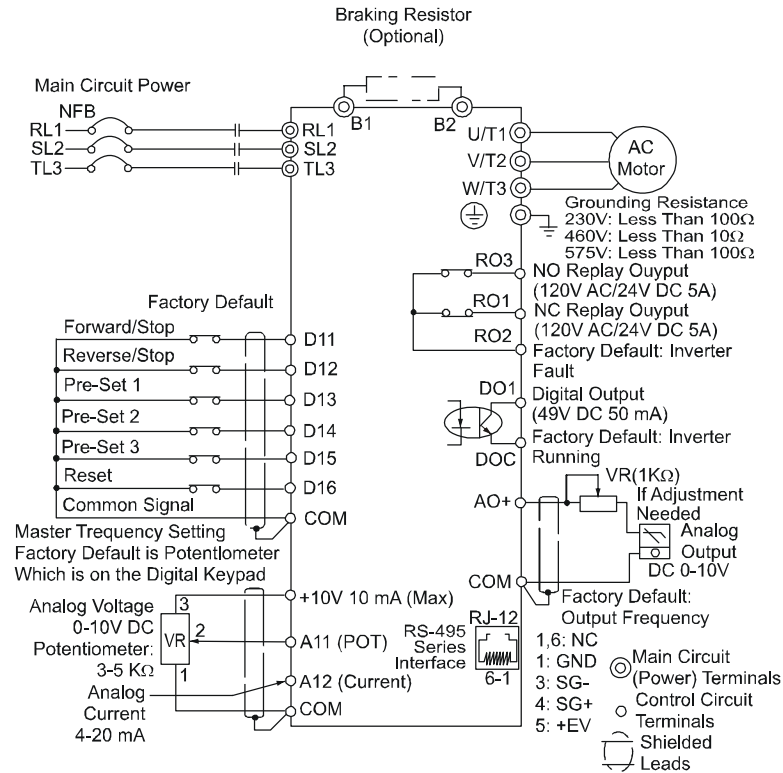


FIG.10 hp Microdrive

Figure 13: 3 to 10 hp MicroDrive Dimensions, in. (mm)

## Wiring



NOTE: Do not plug a modem or telephone line to the RS-495 communication port, permanent damage may result. Terminals 2 & 5 are the power sources for the optional copy keypad and should not be used while using RS-495 communications.

- 1/2-3 hp 230V VSD Series MicroDrives are both single - and three phase input ready. For single-phase input models, select any two input power terminals, For three-phase input, use all three power input terminals.

FIG. MicroDrive Circuit Diagram

Figure 14: Microdrives Circuit Diagram

## Technical Specifications

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

Input Voltage ( $V_{in}$ )	10%/-15%
Input Frequency ( $f_{in}$ )	50/60 Hz (Variation Up to 45 to 66 Hz)
Connection to Power	Once Per Minute or Less (Typical Operation)
Current Withstand Rating	100 kAIC
Output Voltage	0 to $V_{in}$
Continuous Output Current	Ambient Temperature Maximum 104°F (40°C), Overload 1.1 x $I_L$ (1 min./10 min.)
Overload Current	110%
Output Frequency	0 to 320 Hz
Frequency Resolution	0.01 Hz
Control Method	Frequency Control (V/f) Open Loop Sensorless Vector Control

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

<b>Switching Frequency</b>	Adjustable with Parameters 2.6.9 1 to 40 hp: 1 to 16 kHz; Default 10 kHz 50 to 75 hp: 1 to 10 kHz; Default 3.6 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>	30 to 320 Hz
<b>Acceleration Time</b>	0 to 3,000 s
<b>Deceleration Time</b>	0 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 721-3-3, Unit In Operation, Class 3C2; Mechanical Particles: IEC 721-3-3, 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>	EN 50178, EN 60068-2-6; 5 to 50 Hz, Displacement Amplitude 1 mm (Peak) at 3 to 15.8 Hz, Max. Acceleration Amplitude 1 G at 15.8 to 150 Hz
<b>Shock</b>	EN 50178, EN 6068-2-27 United Parcel Service® (UPS) Drop Test (for Applicable UPS Weights) Storage and Shipping: max. 15 G, 11 ms (in package)
<b>Enclosure Class</b>	TYPE 1/IP21 or TYPE 12/IP54
<b>Product</b>	IEC 61800-2
<b>Safety</b>	UL 508C; CSA C22.2 No. 14
<b>EMC (at default settings)</b>	Immunity: Fulfills all Electromagnetic Compatibility (EMC) Immunity Requirements; Emissions: EN 61800-3, LEVEL H
<b>Air Quality Chemical Vapors</b>	IEC721-3-3; Unit In Operation; Class 3C2
<b>Mechanical Particles</b>	IEC721-3-3, Unit In Operation Class 3S2
<b>Analog Input Voltage</b>	0 to 10 V, R = 200 Ohms Differential (-10 to 10 V Joystick Control) Resolution 0.1%; Accuracy ±1%
<b>Analog Input Current</b>	0 (4) to 20 mA; $R_i$ - 250 Ohms Differential
<b>Digital Inputs (6)</b>	Positive or Negative Logic; 18 to 24 VDC
<b>Auxiliary Voltage</b>	24 V ±15%, Maximum 250 mA
<b>Output Reference Voltage</b>	10 V 3%, Maximum Load 10 mA
<b>Analog Output</b>	0 (4) to 20 mA; $R_L$ max. 500 Ohms; Resolution 10 bit; Accuracy ± 2%
<b>Digital Outputs</b>	Open Collector Output, 50 mA/48 V
<b>Relay Outputs</b>	2 Programmable Form C Relay Outputs Switching Capacity: 24 VDC/8 A, 250 VAC/8 A, 125 VDC/0.4 A
<b>Overcurrent Protection</b>	Trip Limit 4.0 x $I_H$ Instantaneously
<b>Overvoltage Protection</b>	Yes
<b>Undervoltage Protection</b>	Yes
<b>Earth Fault Protection</b>	In case of earth fault in motor or motor cable, only the frequency converter is protected.

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

<b>Input Phase Supervision</b>	Trips if any of the input phases are missing.		
<b>Motor Phase Supervision</b>	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>Ratings</b>	UL Listed File No. E244421; cUL Listed		
<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)		
<b>Weight</b>	FR4	11 lb (5 kg)	
	FR5	17.9 lb (8 kg)	
	FR6	40.8 lb (19 kg)	
	FR7	77.2 lb (35 kg)	
	FR8	127.8 lb (58 kg)	
	FR9	321.9 lb (59 kg)	
<b>Voltage/Horsepower</b>	FR4	230 V/1 to 3 VT	
		480 V/1-1/2 to 7-1/2 VT	
	FR5	230 V/5 to 10 VT	
		480 V/10 to 20 VT	
	FR6	230 V/15 to 20 VT	
		480 V/25 to 40 VT	
		575 V/3 to 30 VT	
	FR7	230 V/25 to 40 VT	
		480 V/50 to 75 VT	
		575 V/40 to 50 VT	
	FR8	230 V/50 to 75 VT	
		480 V/100 to 150 VT	
		575 V/60 to 100 VT	
	FR9	480 V/200 to 250 VT	
		575 V/125 to 200 VT	

### VSD Series MicroDrives - 115 V (Part 1 of 3)

<b>Voltage Class</b>	<b>115 V Series</b>		
<b>Model Number VSM_ _ _00A-00000</b>	F21	F51	011
<b>Maximum Applicable Motor Output (kW)</b>	0.2	0.4	0.75
<b>Maximum Applicable Motor Output (hp)</b>	0.25	0.5	1

### VSD Series MicroDrives - 115 V (Part 2 of 3)

Voltage Class		115 V Series		
<b>Output Rating</b>	Rated Output Capacity (kVA)	0.6	1.0	1.6
	Rated Output Current (A)	1.6	2.5	4.2
	Maximum Output Voltage (V)	Proportional to twice the Input Voltage		
	Rated Frequency (Hz)	0.1 to 400 Hz		
<b>Input Rating</b>	Rated Voltage	90 to 132 VAC		
	Frequency Tolerance	± 5% (50/60 Hz)		
	1-Phase Rated Input Current	6	9	16
<b>Control Characteristics</b>	Control System	Sinusoidal Pulse Width Modulation (SPWM)		
	Output Frequency Resolution	0.1 Hz		
	Overload Endurance	150% of Rated Current for 1 Minute		
	Acceleration/Deceleration Time	0.01 to 600.00 Seconds		
	Torque Characteristics	Including the auto-torque, auto-slip compensation; starting torque can be 150% at 1 Hz in vector, 3 Hz in V/F.		
	V/F Pattern	Adjustable V/F Pattern or Sensorless Vector		
	Stall Prevention Level	Set to Percentage of Rated Current		
<b>Operating Characteristics</b>	Frequency Setting	Keypad	Set by UP, DOWN Keys or Potentiometer	
		External Signal	Potentiometer – 5 kW/0.5 W, 0 to +10 VDC or 0 to +5 V (Input Impedance 47 kW), RS-485 Interface, 4 to 20 mA (Input impedance 250 ohms) 1 to 7 Step Speeds, Proportional plus Integral plus Derivative (PID) Feedback	
	Operation Setting Signal	Keypad	Set by START, STOP, RIGHT, and LEFT Keys	
		External Signal	FWD/STOP, REV/STOP (RUN/STOP, FWD/REV), 3-Wire Control, Serial Communication	
	Digital Input Signal	Multi-step Selections 1 to 7, Jog, Acceleration/Deceleration Inhibit, First/Second Acceleration/Deceleration Switch, Counter, External BB (Pause), PLC Operation. Terminals have 5 V potential and must be brought to DC common to enable (Sinking)		
	Digital Output Indication	Operating, Up to Frequency, Desired Frequency, Non-Zero External Pause Function (bb), Abnormal Indication, Local/Remote Indication, Programmable Logic Controller (PLC) Low Voltage		
	Analog Output Signal	Analog Frequency/Current Signal Output		
<b>Other Functions</b>		Auto Voltage Regulation (AVR), S-Curve, Over-Voltage, Over-Current Stall Prevention, Fault Records Checking, Carrier Frequency Adjustable, DC Injection Braking, Momentary Power Loss Restart, Frequency Limit Setting, Parameter Lock/Reset, Frequency Input Operation Method Selection, Reverse Run Inhibit, and Others		
<b>Protection</b>		Self-testing, Over-Voltage, Over-Current, Under-Voltage, Overload, Overheating, External Fault, Ground Fault, I <sup>2</sup> t.		
<b>Cooling Systems</b>		Forced Air-Cooling		

### VSD Series MicroDrives - 115 V (Part 3 of 3)

Voltage Class		115 V Series
Environment	Installation Location	Altitude 3,280 ft (1,000 m) or Lower, Keep from Corrosive Gasses, Liquid, and Dust
	Pollution Degree	2
	Ambient Temperature	14 to 122°F (-10 to 50°C) (Noncondensing and Not Frozen) 14 to 104°F (-10 to 40°C) for the Models of 5.5 kW and Higher
	Storage Temperature	-4 to 140°F (-20 to 60°C)
	Ambient Humidity	Below 90% RH (Noncondensing)
	Vibration	9.80665 m/s <sup>2</sup> (1G) Less Than 20 Hz, 5.88 m/s <sup>2</sup> (0.6G) at 20 to 50 Hz

### VSD Series MicroDrives - 230 V (Part 1 of 2)

Voltage Class		230 V Series					
Model Number VSM_ _ 00A-00000		F52	012	022	032	052	072
Maximum Applicable Motor Output (kW)		0.4	0.75	1.5	2.2	3.7	5.5
Maximum Applicable Motor Output (hp)		0.5	1.0	2.0	3.0	5.0	7.5
Output Rating	Rated Output Capacity (kVA)	1.0	1.9	2.7	3.8	6.5	9.5
	Rated Output Current (A)	2.5	5.0	7.0	10.0	17.0	25.0
	Maximum Output Voltage (V)	Proportional to Input Voltage					
	Rated Frequency (Hz)	0.1 to 400 Hz					
Input Rating	Rated Voltage	180 to 264 VAC					
	Frequency Tolerance	± 5% (50/60 Hz)					
	1-Phase/3-Phase Rated Input Current	6.3/3.2	11.5/6.3	15.7/9	27/15	19.6	28
Control Characteristics	Control System	Sinusoidal Pulse Width Modulation (SPWM)					
	Output Frequency Resolution	0.1 Hz					
	Overload Endurance	150% of Rated Current for 1 Minute					
	Acceleration/Deceleration Time	0.01 to 600.00 Seconds					
	Torque Characteristics	Including the auto-torque, auto-slip compensation; starting torque can be 150% at 1 Hz in vector, 3 Hz in V/F.					
	V/F Pattern	Adjustable V/F Pattern or Sensorless Vector					
Stall Prevention Level	Set to Percentage of Rated Current						

### VSD Series MicroDrives - 230 V (Part 2 of 2)

Voltage Class		230 V Series	
Operating Characteristics	Frequency Setting	Keypad	Set by UP, DOWN Keys or Potentiometer
		External Signal	Potentiometer – 5 kW/0.5 W, 0 to +10 VDC or 0 to +5 V (Input Impedance 47 kW), RS-485 Interface, 4 to 20 mA (Input impedance 250 ohms) 1 to 7 Step Speeds, Proportional plus Integral plus Derivative (PID) Feedback
	Operation Setting Signal	Keypad	Set by START, STOP, RIGHT, and LEFT Keys
		External Signal	FWD/STOP, REV/STOP (RUN/STOP, FWD/REV), 3-Wire Control, Serial Communication
	Digital Input Signal		Multi-step Selections 1 to 7, Jog, Acceleration/Deceleration Inhibit, First/Second Acceleration/Deceleration Switch, Counter, External BB (Pause), PLC Operation. Terminals have 5 V potential and must be brought to DC common to enable (Sinking).
	Digital Output Indication		Operating, Up to Frequency, Desired Frequency, Non-zero External Pause Function (bb), Abnormal Indication, Local/Remote Indication, PLC, Low Voltage
Analog Output Signal		Analog Frequency/Current Signal Output	
Other Functions		Auto Voltage Regulation (AVR), S-Curve, Over-Voltage, Over-Current Stall Prevention, Fault Records Checking, Carrier Frequency Adjustable, DC Injection Braking, Momentary Power Loss Restart, Frequency Limit Setting, Parameter Lock/Reset, Frequency Input Operation Method Selection, Reverse Run Inhibit, and Others.	
Protection		Self-testing, Over-Voltage, Over-Current, Under-Voltage, Overload, Overheating, External Fault, Ground Fault, I <sup>2</sup> t.	
Cooling Systems		Forced Air-Cooling	
Environment	Installation Location		Altitude 3,280 ft (1,000 m) or Lower, Keep from Corrosive Gasses, Liquid, and Dust
	Pollution Degree		2
	Ambient Temperature		14 to 122°F (-10 to 50°C) (Noncondensing and Not Frozen) 14 to 104°F (-10 to 40°C) for the Models of 5.5 kW and Higher
	Storage Temperature		-4 to 140°F (-20 to 60°C)
	Ambient Humidity		Below 90% RH (Noncondensing)
	Vibration		9.80665 m/s <sup>2</sup> (1 G) Less than 20 Hz, 5.88 m/s <sup>2</sup> (0.6 G) at 20 to 50 Hz

### VSD Series MicroDrives - 480 V (Part 1 of 2)

Voltage Class		480 V Series					
Model Number VSM__ _00A-00000		014	024	034	054	074	104
Maximum Applicable Motor Output (kW)		0.75	1.5	2.2	3.7	5.5	7.5
Maximum Applicable Motor Output (hp)		1.0	2.0	3.0	5.0	7.5	10
Output Rating	Rated Output Capacity (kVA)	2.3	3.1	3.8	6.2	9.9	13.7
	Rated Output Current (A)	3.0	4.0	5.0	8.2	13.0	18.0
	Maximum Output Voltage (V)	Proportional to Input Voltage					
	Rated Frequency (Hz)	0.1 to 400 Hz					



## VSD Series MicroDrives - 480 V (Part 2 of 2)

<b>Voltage Class</b>		<b>480 V Series</b>					
<b>Input Rating</b>	Rated Voltage		342 to 528 VAC				
	Frequency Tolerance		± 5% (50/60 Hz)				
	3-Phase Rated Input Current		4.2	5.7	6.0	8.5	14.0
<b>Control Characteristics</b>	Control System		Sinusoidal Pulse Width Modulation (SPWM)				
	Output Frequency Resolution		0.1 Hz				
	Overload Endurance		150% of Rated Current for 1 Minute				
	Acceleration/Deceleration Time		0.01 to 600.00 Seconds				
	Torque Characteristics		Including the auto-torque, auto-slip compensation; starting torque can be 150% at 1 Hz in vector, 3 Hz in V/F.				
	V/F Pattern		Adjustable V/F Pattern or Sensorless Vector				
	Stall Prevention Level		Set to Percentage of Rated Current				
<b>Operating Characteristics</b>	Frequency Setting	Keypad	Set by UP, DOWN Keys or Potentiometer				
		External Signal	Potentiometer – 5 kW/0.5 W, 0 to +10 VDC or 0 to 5 V (Input Impedance 47 kW), RS-485 Interface, 4 to 20 mA (Input impedance 250 ohms), 1 to 7 Step Speeds, PID Feedback				
	Operation Setting Signal	Keypad	Set by START, STOP, RIGHT, and LEFT Keys				
		External Signal	FWD/STOP, REV/STOP (RUN/STOP, FWD/REV), 3-Wire Control, Serial Communication				
	Digital Input Signal		Multi-step Selections 1 to 7, Jog, Acceleration/Deceleration Inhibit, First/Second Acceleration/Deceleration Switch, Counter, External BB (Pause), PLC Operation. Terminals have 5 V potential and must be brought to DC common to enable (Sinking).				
	Digital Output Indication		Operating, Up to Frequency, Desired Frequency, Non-Zero bb, Abnormal Indication, Local/Remote Indication, PLC, Low Voltage				
	Analog Output Signal		Analog Frequency/Current Signal Output				
<b>Other Functions</b>		AVR, S-Curve, Over-Voltage, Over-Current Stall Prevention, Fault Records Checking, Carrier Frequency Adjustable, DC Injection Braking, Momentary Power Loss Restart, Frequency Limit Setting, Parameter Lock/Reset, Frequency Input Operation Method Selection, Reverse Run Inhibit, and Others.					
<b>Protection</b>		Self-testing, Over-Voltage, Over-Current, Under-Voltage, Overload, Overheating, External Fault, Ground Fault, I <sup>2</sup> t.					
<b>Cooling Systems</b>		Forced Air-Cooling					
<b>Environment</b>	Installation Location		Altitude 3,280 ft (1,000 m) or Lower, Keep from Corrosive Gasses, Liquid, and Dust				
	Pollution Degree		2				
	Ambient Temperature		14 to 122°F (-10 to 50°C) (Noncondensing and Not Frozen) 14 to 104°F (-10 to 40°C) for the Models of 5.5 kW and Higher				
	Storage Temperature		-4 to 140°F (-20 to 60°C)				
	Ambient Humidity		Below 90% RH (Noncondensing)				
	Vibration		9.80665 m/s <sup>2</sup> (1 G) Less than 20 Hz, 5.88 m/s <sup>2</sup> (0.6 G) at 20 to 50 Hz				

## VSD Series MicroDrives - 575 V

Voltage Class		575 V Series <sup>1</sup>					
Model Number VSM__ _00C-00000		015	025	035	055	075	105
Maximum Applicable Motor Output (kW)		0.75	1.5	2.2	3.7	5.5	7.5
Maximum Applicable Motor Output (hp)		1	2	3	5	7-1/2	10
Output Rating	Rated Output Capacity (kVA)	1.7	3.0	4.2	6.6	9.9	12.2
	Rated Output Current (A)	1.7	3.0	4.2	6.6	9.9	12.2
	Maximum Output Voltage (V)	3-Phase Proportional to Input Voltage					
	Rated Frequency (Hz)	0.1 to 400 Hz					
	Carrier Frequency (kHz)	1 to 10					
Input Rating	Rated Input Current	3-Phase					
		2.4	4.2	5.9	7.0	10.5	12.9
	Rated Voltage	3-Phase 500 to 600 VAC					
	Voltage Tolerance	-15% to 10% (425 to 660 V)					
Frequency Tolerance		± 5% (47 to 63 Hz)					
Cooling Method		Fan-Cooled					
Weight in lb (kg)		3.3 (1.5)	3.3 (1.5)	4.4 (2.0)	7.0 (3.2)	7.0 (3.2)	7.5 (3.3)
Environment	Installation Location	Altitude 3,280 ft (1,000 m) or Lower, Keep from Corrosive Gasses, Liquid, and Dust					
	Pollution Degree	2					
	Ambient Temperature	14 to 122°F (-10 to 50°C) (Noncondensing and Not Frozen) 14 to 104°F (-10 to 40°C) for the Models of 5.5 kW and Higher					
	Storage Temperature	-4 to 140°F (-20 to 60°C)					
	Ambient Humidity	Below 90% RH (Noncondensing)					
	Vibration	9.80665 m/s <sup>2</sup> (1 G) Less than 20 Hz, 5.88 m/s <sup>2</sup> (0.6 G) at 20 to 50 Hz					

1. Only available as a Revision C (Canadian) version only.



**Building Efficiency**

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