

VS1MX NEMA 4X/12 AC DRIVES



Available as NEMA 4X (IP66) Washdown and NEMA 12 (IP55) Dust Tight micro drives that are compact, cost effective, and provide powerful control functions. The VS1MX can be started by adjusting just a few basic parameters.

The VS1MX is a feature rich V/Hz product targeted at both the equipment manufacturing and end user markets. Combining performance with an intuitive operator interface, the VS1MX can handle the most demanding applications. Available as a switch version with a built in input disconnect, on/off switch and speed potentiometer, it is ideal for stand alone applications.

Features

- Single Phase Input Voltage / Power Ratings
 - 115 VAC: 0.5 to 1.5 hp (0.37 to 1.1 kW)
 - 240 VAC: 0.5 to 3 hp (0.37 to 2.2 kW)
- Three Phase Input Voltage / Power Ratings
 - 240 VAC: 0.5 to 5 hp (0.37 to 4 kW)
 - 480 VAC: 1.0 to 10 hp (0.75 to 7.5 kW)
- NEMA 4X (IP66)
 - IP66 Washdown Rating
 - Heatsink coated for harsh environments
- NEMA 12 (IP55)
 - Harsh Duty Rating
- Enhanced V/Hz Control (Fan/Pump, Linear, Custom)
- Operator Interface
 - User friendly control; basic start/stop, forward/reverse and speed control
 - LED Display; six character
 - Basic parameter list for quick start up
 - Remote keypad option
 - Program loader (upload/download capable)
- Operation Functions
 - Power – Off E-Stop
 - DC injection braking
 - Power line dip ride through
 - Skip frequency
 - Software parameter lock
 - Display speed scaling for custom units
 - PI control
 - Auto restart
 - Slip compensation
 - Brake transistor (frames B & C)
 - Start into a rotating load
- Modbus-RTU Standard (built-in)

Specifications

- Digital Inputs 1 & 2
 - Fully configurable
 - Factory set to common defaults
 - 24 VDC sink / source
- Digital Input 3 / Analog Input 2:
 - Configurable for motor thermistor input
 - Programmable as Analog Input 2
 - 0-10V or 4-20mA
 - 12 bit resolution
- Analog Input 1 / Digital Input 4:
 - 0-10V or 4-20mA
 - 12 bit resolution
 - Programmable as Digital Input 4
- Relay Output: Normally Open Contact
- Analog Output: 0-10V / Digital Output
 - Proportional to Motor Speed, Motor Current, Drive Enable or Motor at Speed
 - Programmable as Digital Output
- Preset Speeds (4)
- Fault Memory
 - Last (4) fault history
- Environmental
 - 0 to 40° C
 - 3300 feet (1000m)
 - 10 to 95% Humidity, non-condensing
- Electrical
 - 115 VAC (99-126 VAC) @ 48-62 Hz
 - 240 VAC (198-264 VAC) @ 48-62 Hz
 - 480 VAC (342-528 VAC) @ 48-62 Hz
 - 97% efficiency @ full load and frequency
- Output Ratings
 - 150% for 1 minute, 175% for 2 seconds
 - 0 to 500 Hz Output Frequency
 - 4 to 32 kHz switching frequency

VS1MX NEMA 4X/12 AC DRIVES

VS1MX Catalog Number Definition

VS1	MX	2	OP5	-	4	TDF
Options						
T	Transistor Output					
D	Disconnect Switch					
F	EMC Filter					
Enclosure						
2	NEMA 12					
4	NEMA 4X					
HP/kW (1, 2 or 3 Characters)						
OP5	1/2 hp					
1	1 hp					
2	2 hp					
3	3 hp					
5	5 hp					
7	7.5 hp					
10	10 hp					
Voltage						
1	115V 1-Phase					
2	230V 3-Phase					
4	460V 3-Phase					
8	230V 1-Phase					
Series						
MX	Micro Drive					

Agency Certifications/ Listings:

- UL
- cUL
- CE

Optional Equipment and Accessories*

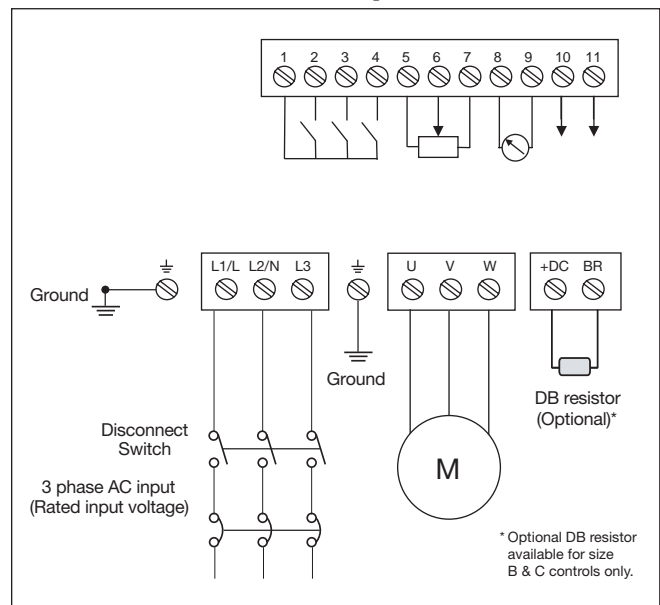
- Remote Keypad VS1ST-RKEY3
- CopyCat Loader VS1ST-CCL
- 2nd Relay Output Card VS1ST-2ROUT
- HVAC Output Card VS1ST-HVAC
(Fault & Drive Run)
- 100 or 230V Control Input Card VS1ST-LOGHV-11 or 23
- DB Resistor Kit VS1MX-R50W200
- Serial Network Cables:
 - Splitter Cable VS1ST-J45SP
 - 0.5, 1 or 3M Cable VS1ST-CBL0P3, CBL1 or CBL3
- Communication Network Gateway Interface:
 - Profibus Gateway VS1ST-PBUS
 - DeviceNet Gateway VS1ST-DNET
 - Ethernet Gateway VS1ST-ENET

*Note: The VS1MX shares many of the same option kits as the VS1ST.

VS1MX Connections

Control Terminal	Signal	Description
1	+24 Volts	+24V, 100mA
2	Digital Input 1	0 = 0-4 VDC; 1 = 8-30 VDC
3	Digital Input 2	0 = 0-4 VDC; 1 = 8-30 VDC
4	Digital Input 3	0 = 0-4 VDC; 1 = 8-30 VDC
	Analog Input 2	Analog: 0 to 10V, 0 to 20mA or 4 to 0mA
5	+10 Volts	10mA, (1kOhm min) potentiometer
6	Analog Input 1	Analog: 0 to 10V, 0 to 20 or 4 to 20mA
	Digital Input 4	0 = 0-4 VDC; 1 = 8-30 VDC
7	0 Volts	User ground, connected to terminal 9
8	Analog Output	Analog: 0 to 10V, 20mA maximum
	Digital Output	Digital: 0 to 24V
9	0 Volts	User ground, connected to terminal 7
10	Relay Common	
11	Relay N/O	250V AC 6A / 30V DC 5A
Power Terminal	Signal	Description
L1/L, L2/N, L3	AC Line Input	Input power to drive
U, V, W	Drive output	Output terminals to motor (3-Phase)
+DC, BR	Brake control	DB Resistor Connection only available for B and C frames
⊥	Ground	Chassis Ground

Terminal Description Chart



* Optional DB resistor available for size B & C controls only.

Switch Version Controls

The VS1MX is available with or without analog controls. Devices provided as standard on the switched version are active in the terminal control mode.

Speed Potentiometer: Adjust operating speed.

Start/Stop/Direction: Forward enables the drive and allows the drive to run. Reverse changes direction and zero center stops the drive.

Disconnect Switch: Used to disconnect power to the drive.

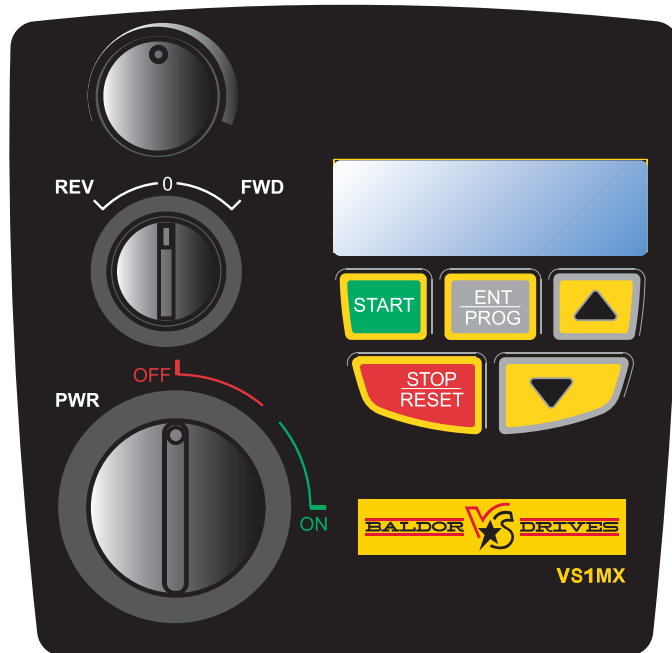
Operation – Using the Keypad

Up/Down: In operation mode, up/down arrows increase or decrease the speed reference. Used to navigate between parameters in edit mode.

Ent/Prog: Press momentarily to cycle through display screens. Access the parameters menu by holding the Ent/Prog key for >1 second. Used to display a parameter and store a new value into memory.

Stop: Stop the drive.

Start: Run the drive in keypad operation mode. Changes motor direction if pressed while running.



NEMA 4X (IP66) KEYPAD

Programming Parameters

Keypad Display	Parameter Name
P-00	Read-only Parameters
P-01	Motor Rated Voltage
P-02	Motor Rated Current
P-03	Motor Rated Frequency
P-04	Motor Rated Speed
P-05	Minimum Speed
P-06	Maximum Speed
P-07	Start/Stop Source
P-08	Operating Mode
P-09	Stop Mode
P-10	Accel Time
P-11	Decel Time
P-12	Preset Speed 1
P-13	Preset Speed 2
P-14	Preset Speed 3
P-15	Preset Speed 4
P-16	Analog Input Scaling
P-17	Analog In 1
P-18	Voltage Boost
P-19	Energy Savings Enable
P-20	Trip Log
P-21	PWM Frequency
P-22	Relay Output

Keypad Display	Parameter Name
P-23	Display Speed Scaling
P-24	Analog Output Function
P-25	Digital & Relay Output Limits
P-26	Skip Frequency
P-27	Skip Frequency Band
P-28	Restart Mode
P-29	Restart Attempts
P-30	Analog Input Offset
P-31	Brake After Stop
P-32	Brake Before Start
P-33	Decel 2 Fast Stop
P-34	Brake Chopper Enable
P-35	Communication Node Address
P-36	V/Hz Frequency
P-37	V/Hz Voltage
P-38	PI Proportional Gain
P-39	PI Integral Time Constant
P-40	PI Operating Mode
P-41	PI Reference Select
P-42	PI Digital Reference
P-43	PI Feedback Select
P-44	Analog In 2 Format
P-45	Parameter Access Lock

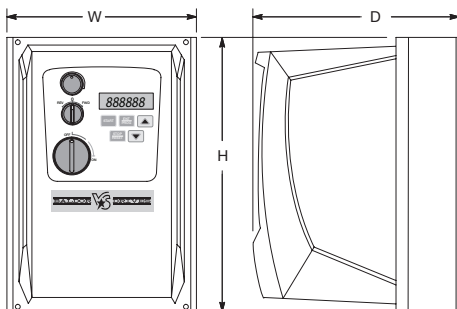
VS1MX NEMA 4X/12 AC DRIVES

Ratings and Dimensions:

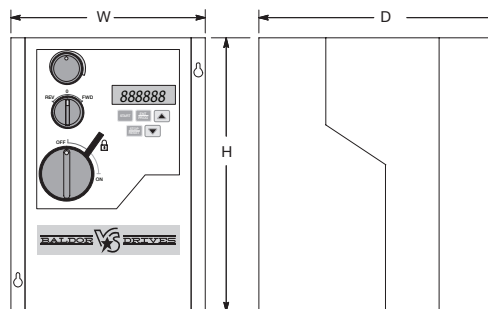
Model Number*				Hp	kW	Input Current (Amps)	Output Current (Amps)	Frame
Switched	Non-Switched	Switched	Non-Switched					
NEMA 4X	NEMA 4X	NEMA 12	NEMA 12					
115V 50/60Hz 1-Phase Input, 230V 3-Phase Output								
VS1MX10P5-4D	VS1MX10P5-4	VS1MX10P5-2D	VS1MX10P5-2	0.5	0.37	6.7	2.3	A
VS1MX11-4D	VS1MX11-4	VS1MX11-2D	VS1MX11-2	1	0.75	12.5	4.3	A
VS1MX11P5-4TD	VS1MX11P5-4T	VS1MX11P5-2TD	VS1MX11P5-2T	1.5	1.1	16.8	5.8	B
230V 50/60Hz 1-Phase Input, 3-Phase Output								
VS1MX80P5-4D	VS1MX80P5-4	VS1MX80P5-2D	VS1MX80P5-2	0.5	0.37	6.7	2.3	A
VS1MX81-4D	VS1MX81-4	VS1MX81-2D	VS1MX81-2	1	0.75	12.5	4.3	A
VS1MX82-4D	VS1MX82-4	VS1MX82-2D	VS1MX82-2	2	1.5	19.3	7	A
VS1MX82-4TD	VS1MX82-4T	VS1MX82-2TD	VS1MX82-2T	2	1.5	19.3	7	B
VS1MX83-4TD	VS1MX83-4T	VS1MX83-2TD	VS1MX83-2T	3	2.2	28.8	10.5	B
230V 50/60Hz 3-Phase Input/Output								
VS1MX20P5-4D	VS1MX20P5-4	VS1MX20P5-2D	VS1MX20P5-2	0.5	0.37	3	2.3	A
VS1MX21-4D	VS1MX21-4	VS1MX21-2D	VS1MX21-2	1	0.75	5.8	4.3	A
VS1MX22-4D	VS1MX22-4	VS1MX22-2D	VS1MX22-2	2	1.5	9.2	7	A
VS1MX22-4TD	VS1MX22-4T	VS1MX22-2TD	VS1MX22-2T	2	1.5	9.2	7	B
VS1MX23-4TD	VS1MX23-4T	VS1MX23-2TD	VS1MX23-2T	3	2.2	13.7	10.5	B
VS1MX25-4TD	VS1MX25-4T	VS1MX25-2TD	VS1MX25-2T	5	4	20.7	18	C
460V 50/60Hz 3-Phase Input/Output								
VS1MX41-4D	VS1MX41-4	VS1MX41-2D	VS1MX41-2	1	0.75	2.9	2.2	A
VS1MX42-4D	VS1MX42-4	VS1MX42-2D	VS1MX42-2	2	1.5	5.4	4.1	A
VS1MX42-4TD	VS1MX42-4T	VS1MX42-2TD	VS1MX42-2T	2	1.5	5.4	4.1	B
VS1MX43-4TD	VS1MX43-4T	VS1MX43-2TD	VS1MX43-2T	3	2.2	7.6	5.8	B
VS1MX45-4TD	VS1MX45-4T	VS1MX45-2TD	VS1MX45-2T	5	4	12.4	9.5	B
VS1MX47-4TD	VS1MX47-4T	VS1MX47-2TD	VS1MX47-2T	7.5	5.5	16.1	14	C
VS1MX410-4TD	VS1MX410-4T	VS1MX410-2TD	VS1MX410-2T	10	7.5	17.3	18	C

*Note: Ratings also apply to all EMC Filter models as indicated by an F at the end of the model number.

NEMA 4X (IP66)



NEMA 12 (IP55)



Dimensions – inches (mm)

Frame	H	W	D
IP66 (NEMA 4X)			
A	9.13 (232)	6.34 (161)	6.89 (175)
B	10.12 (257)	7.4 (188)	7.3 (185.5)
C	12 (305)	8.29 (210.5)	8.97 (227.5)
IP55 (NEMA 12)			
A	7.87 (200)	5.51 (140)	6.38 (162)
B	12.20 (310)	6.46 (164)	6.93 (176)
C	12.20 (310)	8.29 (210.5)	9.56 (242.8)
Weight – lbs (Kg)			
Frame	A	B	C
	5.07 (2.3)	9.92 (4.5)	19.84 (9.0)



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