

VS1ST AC DRIVES



Starter replacement drive that is compact, cost effective, and provides powerful control functions. The VS1ST can be started by adjusting just a few basic parameters.

The VS1ST is a feature rich V/Hz product targeted at the equipment manufacturing markets. Combining performance with an intuitive operator interface, the VS1ST can handle the most demanding applications.

Features

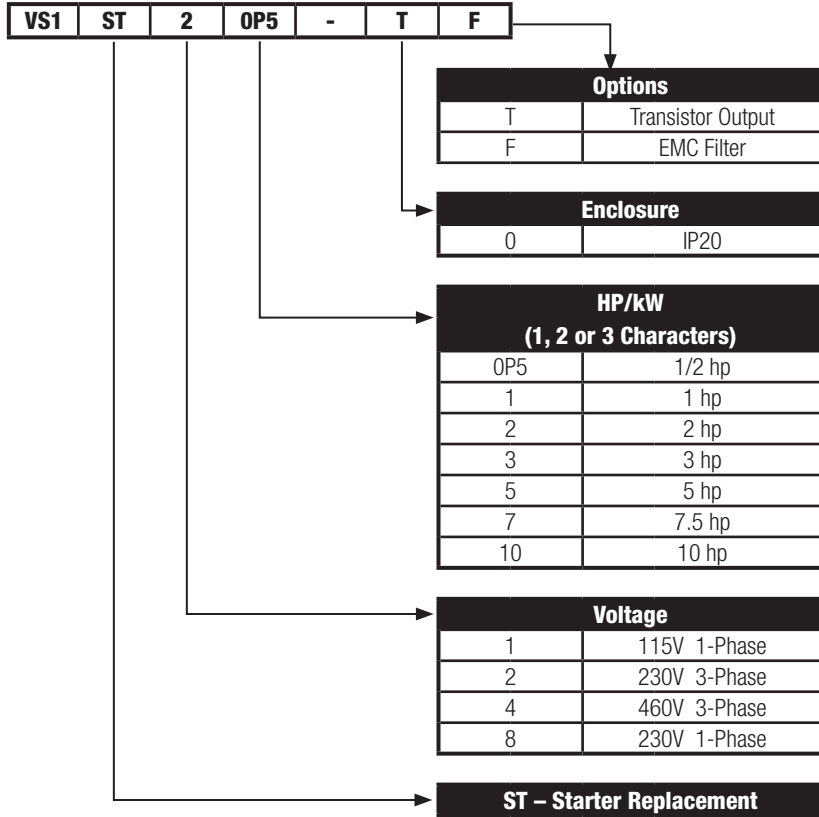
- Single Phase Input Voltage / Power Ratings
 - 115 VAC: 0.5 to 1.5 hp (0.37 to 1.1 kW)
 - 240 VAC: 0.5 to 3 hp (0.37 to 2.2 kW)
- Three Phase Input Voltage / Power Ratings
 - 240 VAC: 0.5 to 5 hp (0.37 to 4 kW)
 - 480 VAC: 1.0 to 10 hp (0.75 to 7.5 kW)
- IP20 Enclosure
 - DIN rail mounting
 - Pluggable I/O terminal strip
 - Easy access power terminals
- 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 50° 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 500Hz Output Frequency
 - 4 to 32 kHz switching frequency

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VS1ST Catalog Number Definition



Agency Certifications/ Listings:

- UL
- cUL
- CE

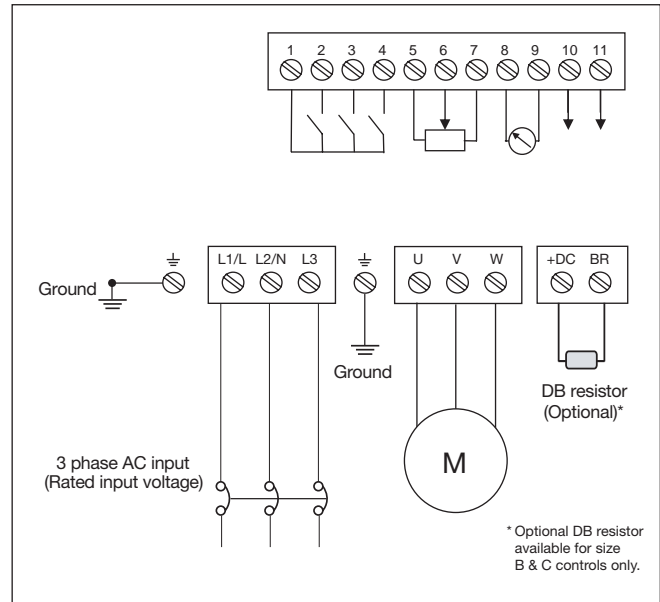
Optional Equipment and Accessories

- Remote Keypad VS1ST-RKEY3
- CopyCat Loader VS1ST-CCL
- 2nd Relay Output Card VS1ST-2ROUT
- HVAC Output Card VS1ST-HVAC
(Fault & Drive Run)
- 110 or 230V Control Input Card VS1ST-LOGHV-11 or 23
- DB Resistor Kit VS1ST-R100W200
- 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

VS1ST 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
5	Analog Input 2	Analog: 0 to 10V, 0 to 20mA or 4 to 20mA
6	+10 Volts	10mA, (1kOhm min) potentiometer
7	Analog Input 1	Analog: 0 to 10V, 0 to 20 or 4 to 20mA
8	Digital Input 4	0 = 0-4 VDC; 1 = 8-30 VDC
9	0 Volts	User ground, connected to terminal 9
10	Analog Output	Analog: 0 to 10V, 20mA maximum
11	Digital Output	Digital: 0 to 24V
	0 Volts	User ground, connected to terminal 7
	Relay Common	
	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



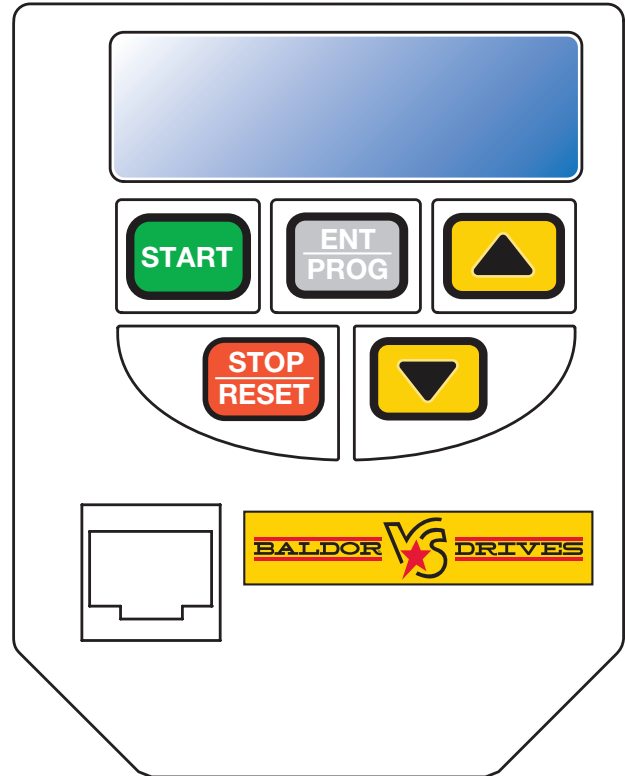
Operation – Using the Keypad

Increase/Decrease: In operation mode, increase/decrease 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.



Programming Parameters

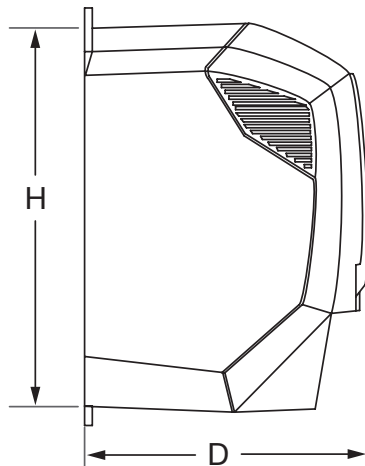
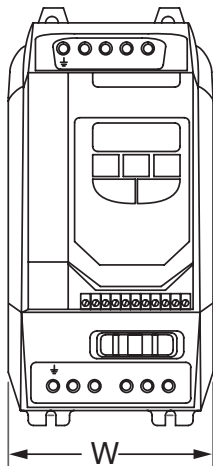
Keypad Display	Parameter Name
P-00	Read-only Parameters
P-01	Motor Rated Voltage
P-02	Motor Rated Current
P-03	Motor Rated Frequency
P-04	Motor Rated Speed
P-05	Minimum Speed
P-06	Maximum Speed
P-07	Start/Stop Source
P-08	Operating Mode
P-09	Stop Mode
P-10	Accel Time
P-11	Decel Time
P-12	Preset Speed 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

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Ratings and Dimensions:

Model Number		Transistor Output	Hp	kW	Input Current (Amps)	Output Current (Amps)	Frame
Standard	w/ EMC Filter						
115V 50/60Hz 1-Phase Input, 230V 3-Phase Output							
VS1ST10P5-0	N/A	No	0.5	0.37	6.7	2.3	A
VS1ST11-0	N/A	No	1	0.75	12.5	4.3	A
VS1ST11P5-0T	N/A	Yes	1.5	1.1	16.8	5.8	B
230V 50/60Hz 1-Phase Input, 3-Phase Output							
VS1ST80P5-0	VS1ST80P5-0F	No	0.5	0.37	6.7	2.3	A
VS1ST81-0	VS1ST81-0F	No	1	0.75	12.5	4.3	A
VS1ST82-0	VS1ST82-0F	No	2	1.5	19.3	7	A
VS1ST82-0T	VS1ST82-0TF	Yes	2	1.5	19.3	7	B
VS1ST83-0T	VS1ST83-0TF	Yes	3	2.2	28.8	10.5	B
230V 50/60Hz 3-Phase Input/Output							
VS1ST20P5-0	N/A	No	0.5	0.37	3	2.3	A
VS1ST21-0	N/A	No	1	0.75	5.8	4.3	A
VS1ST22-0	N/A	No	2	1.5	9.2	7	A
VS1ST22-0T	VS1ST22-0TF	Yes	2	1.5	9.2	7	B
VS1ST23-0T	VS1ST23-0TF	Yes	3	2.2	13.7	10.5	B
VS1ST25-0T	VS1ST25-0TF	Yes	5	4	20.7	18	C
460V 50/60Hz 3-Phase Input/Output							
VS1ST41-0	VS1ST41-0F	No	1	0.75	2.9	2.2	A
VS1ST42-0	VS1ST42-0F	No	2	1.5	5.4	4.1	A
VS1ST42-0T	VS1ST42-0TF	Yes	2	1.5	5.4	4.1	B
VS1ST43-0T	VS1ST43-0TF	Yes	3	2.2	7.6	5.8	B
VS1ST45-0T	VS1ST45-0TF	Yes	5	4	12.4	9.5	B
VS1ST47-0T	VS1ST47-0TF	Yes	7.5	5.5	16.1	14	C
VS1ST410-0T	VS1ST410-0TF	Yes	10	7.5	17.3	18	C



Dimensions – inches (mm)			
Size	H	W	D
VS1ST Micro Drive			
A	6.81 (173)	3.23 (82)	4.84 (123)
B	8.70 (221)	4.29 (109)	5.91 (150)
C	10.28 (261)	5.16 (131)	6.89 (175)
Weight – lbs (Kg)			
Frame	A	B	C
	2.42 (1.1)	5.73 (2.6)	6.61 (3)



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