

# VS1SP

## AC DRIVES

The versatile drive designed to handle your most complex sensorless vector applications in an easy to configure product

Built on the popular H2 inverter technology, the Baldor V\*S Drives VS1SP is a product designed to tackle difficult and demanding applications while providing an interface to the user that is simple and intuitive. The VS1SP is a sensorless vector product that controls motor speed and torque with the precision and the responsiveness needed to accomplish most applications where open loop vector control is desirable. Additionally, it provides the same interface as the Baldor V\*S Drives closed loop vector products so that commonality is maintained within your facility for both closed loop and open loop applications.



- ✓ Aggregate/Cement
- ✓ Food/Beverage
- ✓ Mining
- ✓ Paper/Forest Products
- ✓ Petroleum/Chemicals
- ✓ Unit/Baggage Handling
- ✓ Air Handling
- ✓ Power Generation
- ✓ Pump/Fluid Handling

### Features

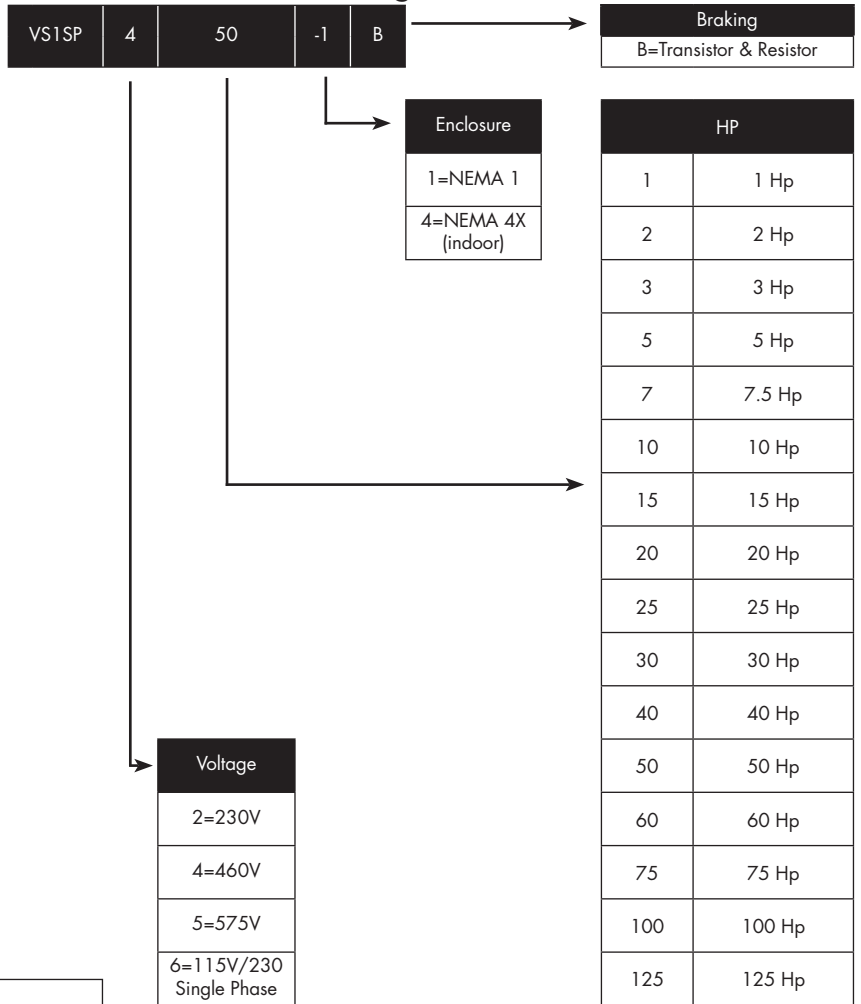
- Input Voltages / Power Ratings
  - 120/240 Vac 1-phase/ 1 ~ 3 Hp
  - 200-240 Vac 3-phase/ 1 ~ 60 Hp
  - 380-480 Vac 3-phase/ 1 ~ 125 Hp
  - 575-600 Vac 3-phase/ 1 ~ 125 Hp
- Enclosures / Mounting
  - NEMA 1 (1 ~ 125 Hp)
  - NEMA 4X / IP65 (1 ~ 10 Hp)
- Control Modes
  - V/Hz (Pump/Fan, Linear, Custom)
  - Sensorless Vector
- User-friendly keypad with full-graphics backlit LCD display and adjustable font sizes
  - Parameter upload/download capability
  - Multiple (6) English-text status screens
  - Help text available for all screens
  - Remote mountable up to 200 feet away
- PID Control Loop with 2 or 3 inputs
- Profile run for repetitive processes
- PLC functionality for intelligent operation
- Same expansion boards as VS1GV products
- Normal duty and heavy duty ratings
- USB interface standard for PC-based tools
- Pull-apart terminal blocks

### Specifications

- Digital Inputs (9), automatic mode setup, 24 Vdc sink/source, internal/external power source
- Relay Outputs (2) N.O./N.C. (Form C)
- Digital Outputs (2) Opto-isolated (24Vdc)
- Analog Inputs (2)
  - (1) Unipolar 0 ~ 10Vdc
  - (1)  $\pm 10V/0 \sim 10V/4 \sim 20mA$
- Analog Outputs (2)
  - (1) Unipolar 0 ~ 10Vdc or 4 ~ 20mA
  - (1) Bipolar  $\pm 10Vdc$
- Environmental
  - -10 ~ 45°C (higher available w/derate)
  - 1000m Altitude w/o derate
  - 10 ~ 90% Humidity, non-condensing NEMA 1 models/  
10 ~ 100% Humidity NEMA 4X models
- Electrical
  - Input voltage  $\pm 10\%$  of nominal, 48 ~ 63 Hz
  - Operational on single-phase input with derate
- Output Ratings
  - 0 ~ 500Hz Output Frequency
  - 1 ~ 16KHz Switching Frequency
  - 115% Overload Normal Duty Ratings
  - 150% Overload Heavy Duty Ratings
  - 175% Overload 3 Second Capability

- RS485 Modbus RTU Standard (Built-in)
  - Provides ability for multi-drop control from PLC without need for expansion board

### VS1SP Catalog Number Definition



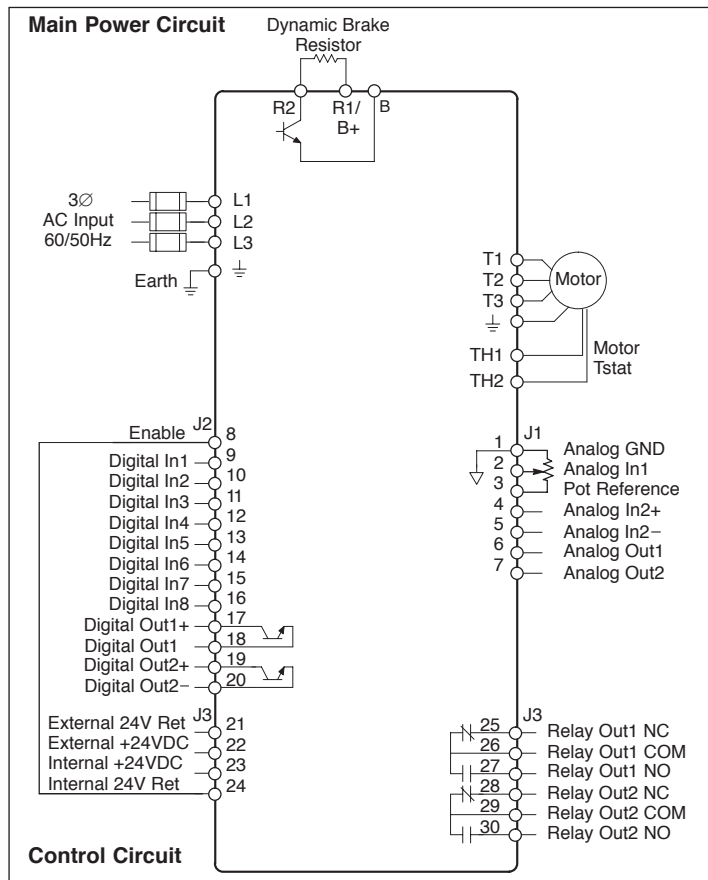
### Agency Certifications / Listings:

- UL
- cUL
- CE

### Instruction Manuals:

- Drive: MN764
- Ethernet Server Expansion Board: MN751
- Mini® Expansion Board: MN752
- Isolated Input Expansion Board: MN753
- High Resolution Analog Input/Output Expansion Board: MN754
- Master Pulse Reference/Isolated Pulse Follower Expansion Board: MN755
- DeviceNet / EtherNet/IP Expansion Board: MN756
- PROFIBUS-DP Expansion Board: MN758
- Lonworks Expansion Board: MN759

### VS1SP Connections



# RATINGS

Catalog Number	Enclosure Type	Frame	Heavy Duty HP	Heavy Duty kW	Continuous Heavy Duty Amps	Normal Duty HP	Normal Duty kW	Continuous Normal Duty Amps
<b>115Vac / 230Vac Single-Phase Input</b>								
VS1SP61-1B	NEMA 1	AA	1	0.75	4.2	2	1.5	6.8
VS1SP61-4B	NEMA 4X	AA	1	0.75	4.2	2	1.5	6.8
VS1SP62-1B	NEMA 1	AA	2	1.5	6.8	3	2.25	9.6
VS1SP62-4B	NEMA 4X	AA	2	1.5	6.8	3	2.25	9.6
VS1SP63-1B	NEMA 1	AA	3	2.25	9.6	3	2.25	9.6
VS1SP63-4B	NEMA 4X	AA	3	2.25	9.6	3	2.25	9.6
<b>230Vac Three-Phase Input</b>								
VS1SP21-1B	NEMA 1	AA	1	0.75	4.2	2	1.5	6.8
VS1SP21-4B	NEMA 4X	AA	1	0.75	4.2	2	1.5	6.8
VS1SP22-1B	NEMA 1	AA	2	1.5	6.8	3	2.25	9.6
VS1SP22-4B	NEMA 4X	AA	2	1.5	6.8	3	2.25	9.6
VS1SP23-1B	NEMA 1	AA	3	2.25	9.6	5	3.73	15.2
VS1SP23-4B	NEMA 4X	AA	3	2.25	9.6	5	3.73	15.2
VS1SP25-1B	NEMA 1	AA	5	3.73	15.2	7.5	5.6	22.0
VS1SP25-4B	NEMA 4X	AA	5	3.73	15.2	7.5	5.6	22.0
VS1SP27-1B	NEMA 1	AA	7.5	5.6	22.0	7.5	5.6	22.0
VS1SP27-4B	NEMA 4X	AA	7.5	5.6	22.0	7.5	5.6	22.0
VS1SP210-1B	NEMA 1	B	10	7.5	28.0	15	11.2	42.0
VS1SP215-1B	NEMA 1	B	15	11.2	42.0	20	14.9	54.0
VS1SP220-1B	NEMA 1	B	20	14.9	55.0	20	14.9	54.0
VS1SP225-1B	NEMA 1	C	25	18.7	68.0	30	22.4	80.0
VS1SP230-1B	NEMA 1	C	30	22.4	80.0	40	29.8	104.0
VS1SP240-1B	NEMA 1	C	40	29.8	104.0	40	29.8	104.0
VS1SP250-1B	NEMA 1	D	50	37.3	130.0	50	37.3	154.0
VS1SP260-1B	NEMA 1	D	60	44.8	154.0	60	44.8	192.0
<b>460Vac Three-Phase Input</b>								
VS1SP41-1B	NEMA 1	AA	1	0.75	2.1	2	1.5	3.4
VS1SP41-4B	NEMA 4X	AA	1	0.75	2.1	2	1.5	3.4
VS1SP42-1B	NEMA 1	AA	2	1.5	3.4	3	2.25	4.8
VS1SP42-4B	NEMA 4X	AA	2	1.5	3.4	3	2.25	4.8
VS1SP43-1B	NEMA 1	AA	3	2.25	4.8	5	3.73	7.6
VS1SP43-4B	NEMA 4X	AA	3	2.25	4.8	5	3.73	7.6
VS1SP45-1B	NEMA 1	AA	5	3.73	7.6	7.5	5.6	11.0
VS1SP45-4B	NEMA 4X	AA	5	3.73	7.6	7.5	5.6	11.0
VS1SP47-1B	NEMA 1	AA	7.5	5.6	11.0	10	7.5	14.0
VS1SP47-4B	NEMA 4X	AA	7.5	5.6	11.0	10	7.5	14.0
VS1SP410-1B	NEMA 1	AA	10	7.5	14.0	10	7.5	14.0
VS1SP410-4B	NEMA 4X	AA	10	7.5	14.0	10	7.5	14.0
VS1SP415-1B	NEMA 1	B	15	11.2	21.0	20	14.9	27.0
VS1SP420-1B	NEMA 1	B	20	14.9	27.0	25	18.7	34.0
VS1SP425-1B	NEMA 1	B	25	18.7	34.0	30	22.4	40.0
VS1SP430-1B	NEMA 1	C	30	22.4	40.0	40	29.8	52.0
VS1SP440-1B	NEMA 1	C	40	29.8	52.0	50	37.3	65.0
VS1SP450-1B	NEMA 1	C	50	37.3	65.0	60	44.8	77.0
VS1SP460-1B	NEMA 1	D	60	44.8	77.0	75	55.6	96.0
VS1SP475-1B	NEMA 1	D	75	55.6	96.0	100	75	124.0
VS1SP4100-1B	NEMA 1	D	100	75	124.0	125	93.3	156.0
VS1SP4125-1B	NEMA 1	D	125	93.3	156.0	150	112	180.0
<b>575Vac Three-Phase Input</b>								
VS1SP51-1B	NEMA 1	AA	1	0.75	1.7	2	1.5	2.7
VS1SP51-4B	NEMA 4X	AA	1	0.75	1.7	2	1.5	2.7
VS1SP52-1B	NEMA 1	AA	2	1.5	2.7	3	2.25	3.9
VS1SP52-4B	NEMA 4X	AA	2	1.5	2.7	3	2.25	3.9
VS1SP53-1B	NEMA 1	AA	3	2.25	3.9	5	3.73	6.1
VS1SP53-4B	NEMA 4X	AA	3	2.25	3.9	5	3.73	6.1
VS1SP55-1B	NEMA 1	AA	5	3.73	6.1	7.5	5.6	9.0
VS1SP55-4B	NEMA 4X	AA	5	3.73	6.1	7.5	5.6	9.0
VS1SP57-1B	NEMA 1	AA	7.5	5.6	9.0	10	7.5	11.0
VS1SP57-4B	NEMA 4X	AA	7.5	5.6	9.0	10	7.5	11.0
VS1SP510-1B	NEMA 1	AA	10	7.5	11.0	10	7.5	11.0
VS1SP510-4B	NEMA 4X	AA	10	7.5	11.0	10	7.5	11.0
VS1SP515-1B	NEMA 1	B	15	11.2	17.0	20	14.9	22.0
VS1SP520-1B	NEMA 1	B	20	14.9	22.0	25	18.7	27.0
VS1SP525-1B	NEMA 1	B	25	18.7	27.0	25	22.4	32.0
VS1SP530-1B	NEMA 1	C	30	22.4	32.0	40	29.8	41.0
VS1SP540-1B	NEMA 1	C	40	29.8	41.0	50	37.3	52.0
VS1SP550-1B	NEMA 1	C	50	37.3	52.0	60	44.8	62.0
VS1SP560-1B	NEMA 1	D	60	44.8	62.0	75	55.6	77.0
VS1SP575-1B	NEMA 1	D	75	55.6	77.0	100	75	99.0
VS1SP5100-1B	NEMA 1	D	100	75	99.0	125	93.3	125.0
VS1SP5125-1B	NEMA 1	D	125	93.3	125.0	150	112	144.0

## DIMENSIONS

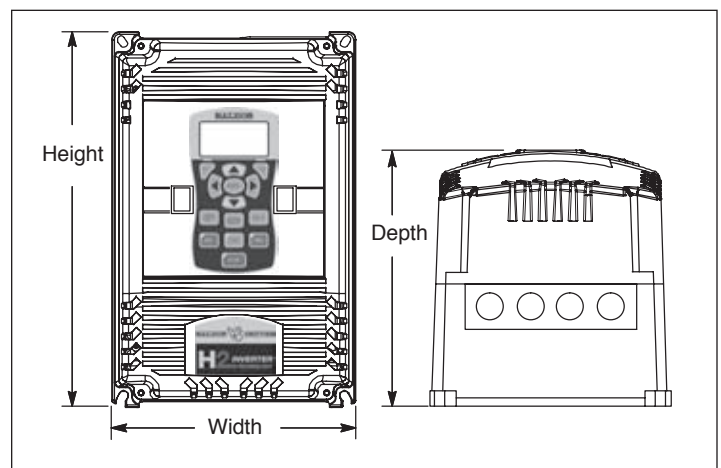
Size	Dimensions inches (mm)					Weight (ap'x) lbs (kg)
	Outside			Mounting		
	Height (A)	Width (B)	Depth (C)	Height (A1)	Width (B1)	
<b>AA</b>	12.27 (312)	7.97 (202)	8.21 (209)	11.75 (298)	7.38 (187)	20 (9.1)
<b>B</b>	18.00 (457)	9.10 (231)	9.77 (248)	17.25 (438)	7.00 (178)	30 (13.6)
<b>C</b>	22.00 (559)	9.10 (231)	9.77 (248)	21.25 (540)	7.00 (178)	60 (27.2)
<b>D</b>	28.00 (711)	11.50 (292)	13.00 (330)	27.25 (692)	9.50 (241)	120 (54.4)

## Additional Features

- USB 2.0 and RS485 ports standard on every drive
- Workbench PC Configuration and control software provided at no charge (download from web site)
  - Connects to drive via USB 2.0 or RS485 port
  - Commissioning Wizard
  - Parameter view/modify
  - Oscilloscope function
  - Drive cloning capability
  - Firmware update capability
- Real time clock for logging events in drive memory
- Fault trace capability to determine several key operating conditions captured at the time of fault
- Quick Setup Display
  - Control type (V/Hz / Sensorless Vector)
  - Motor rated volts
  - Motor rated amps
  - Motor magnetizing amps (no load current)
  - Motor rated base speed
  - Motor rated frequency
  - Calculate motor model
  - Analog offset trim
  - One-step tuning
  - Operating mode (keypad, terminals, network)
  - Acceleration time
  - Deceleration time
  - Minimum speed
  - Maximum speed

## Optional Equipment and Accessories

- Remote NEMA 4X/12 Keypad
  - Keypad: KP0029A01 SP
  - Keypad cables available up to 200 ft (61 meters)
- Communications Options
  - Ethernet Server: EXBHH001A01
  - DeviceNet / EtherNet/IP: EXBHH013A01
  - PROFIBUS: EXBHH014A01
  - Lonworks: EXBHH016A01
- Expansion Options
  - Isolated Input (115Vac): EXBHH003A01
  - High Resolution Analog: EXBHH005A01
  - Master Pulse Reference/Follower: EXBHH007A01
  - Mini<sup>®</sup> Expansion Board: EXBHH002A01
- Dynamic Braking Resistors
  - See dynamic braking resistor selection table in catalog
- Line Reactors
  - See accessories and options section of catalog
- Line (CE) Filters
  - See accessories and options section of catalog



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