

SV Series



Single- and Multi-Axis CE-Marked Digital Brushless Servo Systems

Features

Performance

- Fully EMC and LVD compliant when installed with recommended filters
- Direct operation from voltages up to 460VAC
- Velocity or torque mode operation
- Three power ranges of single- and multi-axis drives
- Accepts industry standard $\pm 10V$ torque or velocity command input
- Integrated power supply in single-axis units
- Separate power module allows shared supply in multi-axis systems
- Resolver feedback provides sinusoidal commutation for smooth, cog-free operation
- AC brushless servo motors provide torque up to 531 in/lbs continuous and 1,328 in/lbs peak
- No drive tuning necessary when used in torque mode with 6K or 6000 Series controller
- Fully opto-isolated I/O circuits using PLC-compatible 24V signal levels
- Provides incremental encoder output for analog servo controller

Protection

- Over-temperature and over-voltage protected
- Fully short circuit protected IGBT power stage
- Completely enclosed metal casing for total electromagnetic shielding
- Motors include over-temperature sensor
- Power supply module includes power dump resistors to dissipate regenerated power from motor

Physical

- 460VAC 3-phase power input (+10%, -15%) (230VAC on SV2500S)
- Three push buttons and 3-digit display for configuration and diagnostics
- Ready and Error LEDs on power module and drive
- Removable connectors on all signals for easy installation
- IP20 enclosure with VDE0160 isolation rating

CE (EMC and LVD)

SV2500S, SV4500S and SV8500S (Single Axis) and SV200M, SV500M and SV1500M (Multi Axis)

The SV Series servo drive from Parker brings the benefits of microprocessor control to the classic analog servo amplifier. Combining the automated tuning and programmability of digital technology with the speed and response of analog circuitry, the SV series offers a cost-effective solution to a wide range of brushless servo applications.

The SV Series is offered with 8 brushless servo motors to cover the power requirements of a majority of applications. The drives can also be configured to run with most three-phase, brushless motors currently available utilizing resolver feedback. With speeds up to 5,000 rpm and a wide range of available shaft power, the SV is well suited to meet the demands of today's customers.

The SV Series consists of three single-axis drives (SV2500S, SV4500S and SV8500S) and three multi-axis drives (SV200M, SV500M and SV1500M).

Easy and reliable installation is accomplished by utilizing removable screw terminals and "D" shell connectors for all connection points. The drives are housed in a rugged, fully enclosed metal casing, providing a high degree of protection as well as effective electromagnetic shielding.

All SV Series drives are easily configured to operate in either torque or velocity mode and, when matched with a Parker controller, form a powerful and flexible system for solving a variety of motion control applications.

SV Single-Axis Specifications

	Parameter	Value		
Performance	Resolver Accuracy Resolution	±10 arc min 2,048 or 4,096 post quadrature counts per rev		
Output Power		SV2500S	SV4500S	SV8500S
	Voltage Frequency Current • Cont. (max rms per phase) • Peak (max rms per phase) Power Dissipation	325VDC 10 kHz 6.3A 12.6A 80 W	650VDC 10 kHz 6.5A 13.0A 140 W	650VDC 10 kHz 12.5A 25.0A 250 W
Input Power	Voltage—AC Supply Frequency AC Supply Tolerance Voltage (Control) Fuses Input—AC Supply	230VAC, 1- or 3-Phase 50/60 Hz +10%, -15% +24VDC ±10%, ripple <1V p-p 10 amp	460VAC, 3-Phase 50/60 Hz +10%, -15% (+24V supply included) 10 amp	460VAC, 3-Phase 50/60 Hz +10%, -15% (+24V supply included) 16 amp
	Protection	Short Circuit Brownout Overvoltage Overtemperature I ² t Safety Isolation	Phase to phase, Phase to earth Below 80VDC Will shut down when power dump capacity is exceeded Motor 170°C (330°F); Drive 85°C (185°F) Error generated if peak current >3 seconds VDE0160	
Inputs	Command Programmable • Enable, Brake, Auto Offset, • Mode Select, Limit ±15V Reference	±10V 20K ohms input impedance 24V nom. @ 10 mA high = 14-32V, low <7.5V Internal clamp w/ zener diode @ 6.8V, fully optically isolated, sink or source Available		
Outputs Digital	Encoder Programmable: Fault, Error Ready Contact Output	5V line driver (RS485) output, TTL compatible, source 60 mA max, requires external +5VDC supply @ 100 mA User selectable 2,048 or 4,096 ppr PNP type, sourcing only, rated for 24V @ 100 mA fully optically isolated, short circuit protected 125V, 500 mA, 30W maximums		
	Outputs Analog	Velocity (X8, pin 10) • (X8, pin 11) Motor Voltage (X8, pin 12) Current Monitor	Absolute: 8V = 6,000 rpm Normalized: +10V = max speed 0.7-10V = 70-1000VDC 1V = 1.2 A for SV2500S, SV4500S; 1V = 2.4 A for SV8500S	
Physical	Connections Drive-to-Servo Controller • Inputs/Outputs • RS232 • Encoder Output • Test Points • Fan • Drive-to-Motor • Resolver-to-Drive • Power	16 pin screw terminal, removable 16 pin screw terminal, removable 9 pin "D" type 15 pin screw terminal, removable 7 pin screw terminal, removable 2 pin screw terminal, removable 8 pin screw terminal 15 pin "D" type 4 pin screw terminal		
Environment	Drive temperature ambient Maximum heat sink temp Motor temperature ambient Maximum motor case temp Humidity Storage	0-45° C (32-113° F) 85° C (185° F) 0-40° C (32-104° F) 125° C (257° F) 0-95% non-condensing -30-85° C (-22-185° F)		
Tuning	Torque Mode Velocity Mode	Two bandwidth selections Offset, stiffness, damping, torque limit, bandwidth selection, frequency compensation		
Diagnostics	LEDs	Ready and Error LEDs 3 digit, 7 segment LED display will indicate 23 error conditions and 31 status messages		

Drives & Drive/Controllers

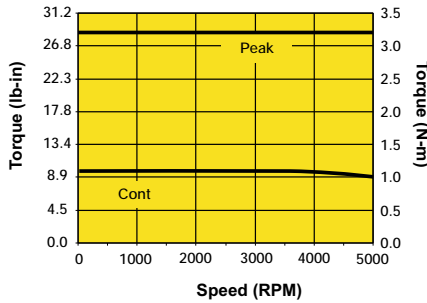
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SV Single-Axis Speed/Torque Curves

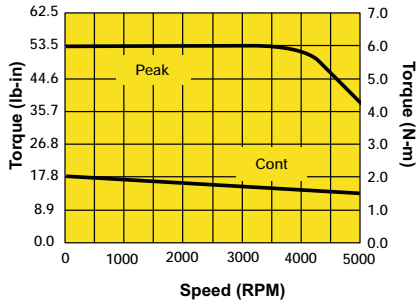
All SV speed/torque data assume the following conditions:

- 40°C ambient temperature
- nominal K_T of motor

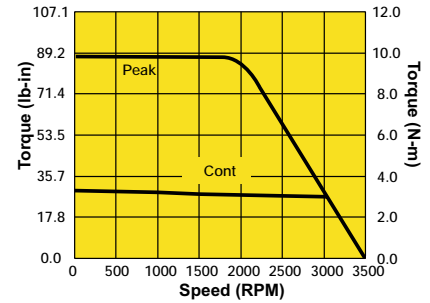
HDY70C4-44S w/SV2500S (230 VAC)



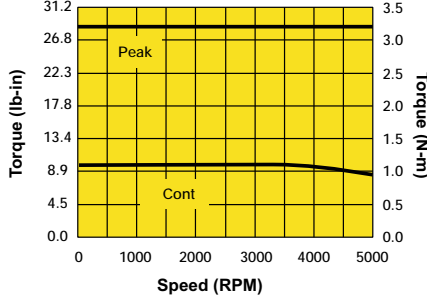
HDY92E4-44S w/SV2500S (230VAC)



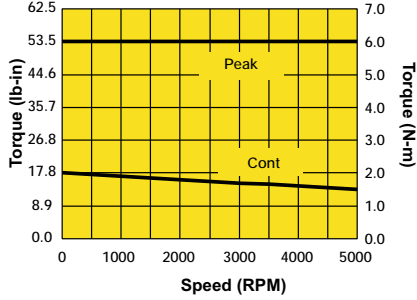
HDY115A6-88S w/SV2500S (230VAC)



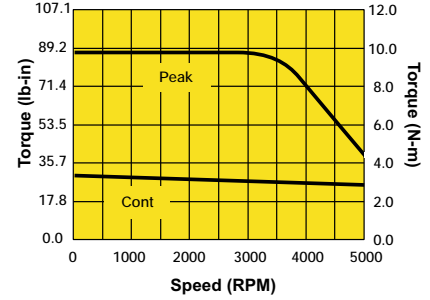
HDY70C4-44S w/SV4500S (460VAC)



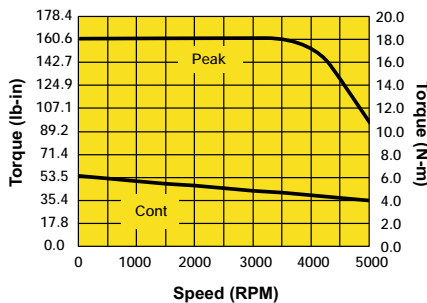
HDY92E4-44S w/SV4500S (460VAC)



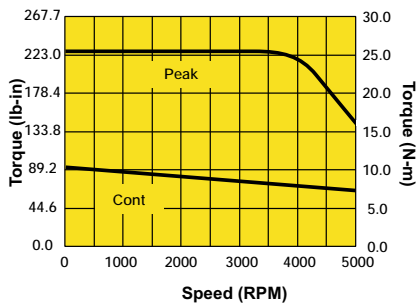
HDY115A6-88S w/SV4500S (460VAC)



HDY115C6-88S w/SV8500S (460VAC)



HDY142C6-88S w/SV8500S (460VAC)



For drawings and specifications of the recommended motor packages, please refer to the COMPAX section.

Drives & Drive/Controllers

SV Multi-Axis Specifications

	Parameter	Value																		
Performance	Resolver Accuracy Resolution	±10 arc min 2,048 or 4,096 post quadrature counts per rev																		
Output Power	Voltage Frequency Current Continuous (max rms per phase) Peak (max rms per phase) Power Dissipation	<table border="1"> <thead> <tr> <th>SV200M</th> <th>SV500M</th> <th>SV1500M</th> </tr> </thead> <tbody> <tr> <td colspan="3">650VDC from power supply module; see module specs for additional info</td> </tr> <tr> <td>10 kHz</td> <td>10 kHz</td> <td>5 kHz</td> </tr> <tr> <td>6.5A</td> <td>11.5A</td> <td>25A</td> </tr> <tr> <td>8.5A</td> <td>17A</td> <td>50A</td> </tr> <tr> <td>140 W</td> <td>250 W</td> <td>250 W</td> </tr> </tbody> </table>	SV200M	SV500M	SV1500M	650VDC from power supply module; see module specs for additional info			10 kHz	10 kHz	5 kHz	6.5A	11.5A	25A	8.5A	17A	50A	140 W	250 W	250 W
SV200M	SV500M	SV1500M																		
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Power Supply Module	Voltage • Input—AC Supply • Input—Control • Output Frequency Power (max continuous) Power (peak <3 seconds) Fuses • Input—AC Supply • Output	<table border="1"> <thead> <tr> <th>NMD10</th> <th>NMD20</th> </tr> </thead> <tbody> <tr> <td colspan="2">100-460VAC 3 Phase +10%, -15% +24VDC ±10%, ripple <1V p-p; 1 amp max per drive, 1 amp max per brake</td> </tr> <tr> <td colspan="2">160-680VDC</td> </tr> <tr> <td>50/60 Hz</td> <td>50/60 Hz</td> </tr> <tr> <td>10 kW</td> <td>20 kW</td> </tr> <tr> <td>20 kW</td> <td>40 kW</td> </tr> <tr> <td>16 amp</td> <td>35 amp</td> </tr> <tr> <td>30 amp</td> <td>50 amp</td> </tr> </tbody> </table>	NMD10	NMD20	100-460VAC 3 Phase +10%, -15% +24VDC ±10%, ripple <1V p-p; 1 amp max per drive, 1 amp max per brake		160-680VDC		50/60 Hz	50/60 Hz	10 kW	20 kW	20 kW	40 kW	16 amp	35 amp	30 amp	50 amp		
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Inputs	Command Programmable • Enable, Brake, Auto Offset, • Mode Select, Limit ±15V Reference	±10V 20K ohms input impedance 24V nom. @ 10 mA high = 14-32V, low <7.5V Internal clamp w/ zener diode @ 6.8V, fully optically isolated, sink or source 8 mA available																		
Outputs Digital	Encoder Programmable: Fault, Error	5V line driver (RS485) output, TTL compatible, source 60 mA max, requires external +5VDC supply @ 100 mA User selectable 2,048 or 4,096 ppr PNP type, sourcing only, rated for 24V @ 100 mA fully optically isolated, short circuit protected																		
Outputs Analog	Ready Contact Output Velocity (X8, pin 10) • (X8, pin 11) Motor Voltage (X8, pin 12) Current Monitor	125V, 500 mA, 30W maximums Absolute: 8V = 6,000 rpm Normalized: +10V = max speed 0.7-10V = 70-1000VDC 1V = 1.2 A for SV200; 1V = 2.4 A for SV500; 1V = 7.0 A for SV1500																		
Physical	Connections Drive-to-Servo Controller • Inputs/Outputs • RS232 • Encoder Output • Test Points • Fan • Drive-to-Motor • Resolver-to-Drive • Power	16 pin screw terminal, removable 16 pin screw terminal, removable 9 pin "D" type 15 pin screw terminal, removable 7 pin screw terminal, removable 2 pin screw terminal, removable 7 pin screw terminal 15 pin "D" type 6 pin screw terminal																		
Environment	Drive temperature ambient Maximum heat sink temp Motor temperature ambient Maximum motor case temp Humidity Storage	0-45° C (32-113° F) 85° C (185° F) 0-40° C (32-104° F) 125° C (257° F) 0-95% non-condensing -30-85° C (-22-185° F)																		
Tuning	Torque Mode Velocity Mode	Two bandwidth selections Offset, stiffness, damping, torque limit, bandwidth selection, frequency compensation																		
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Drives & Drive/Controllers

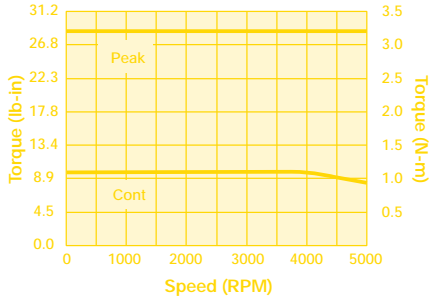
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SV Multi-Axis Speed/Torque Curves

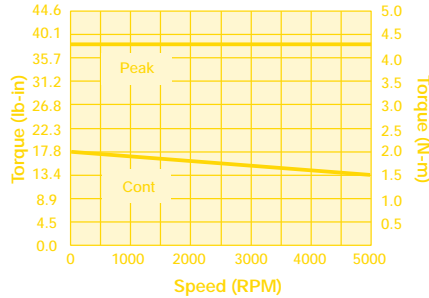
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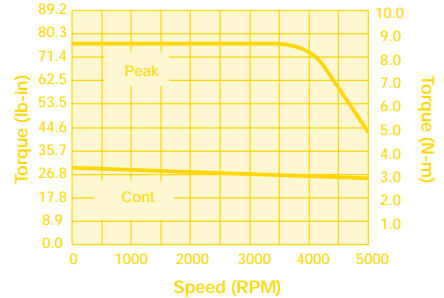
HDY70C4-44S w/SV200M (460VAC)



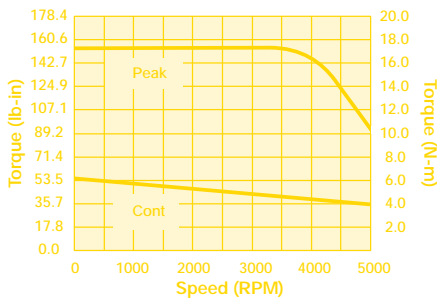
HDY92E4-44S w/SV200M (460VAC)



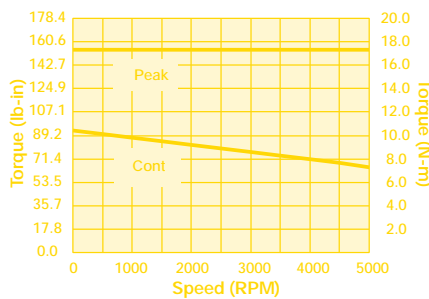
HDY115A6-88S w/SV200M (460VAC)



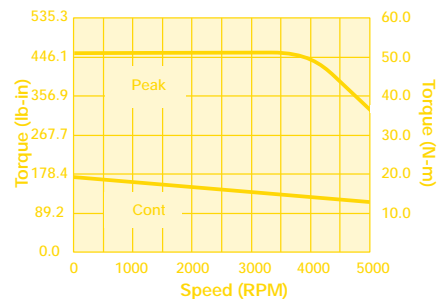
HDY115C6-88S w/SV500M (460VAC)



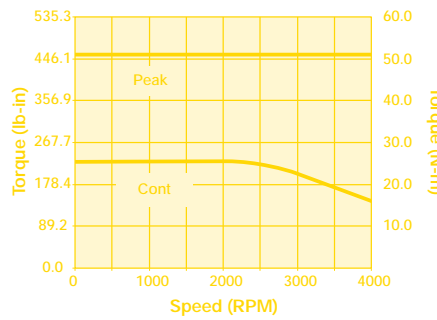
HDY142C6-88S w/SV500M (460VAC)



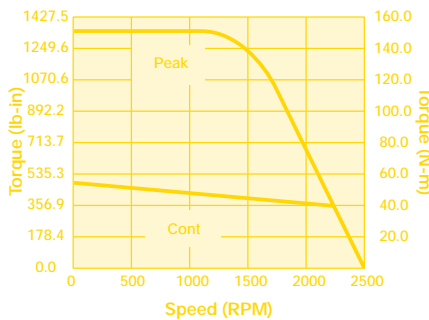
HDY142G6-88S w/SV1500M (460VAC)



HBMR190E6-88S w/SV1500M (460VAC)



HBMR190J6-260S w/SV1500M (460VAC)

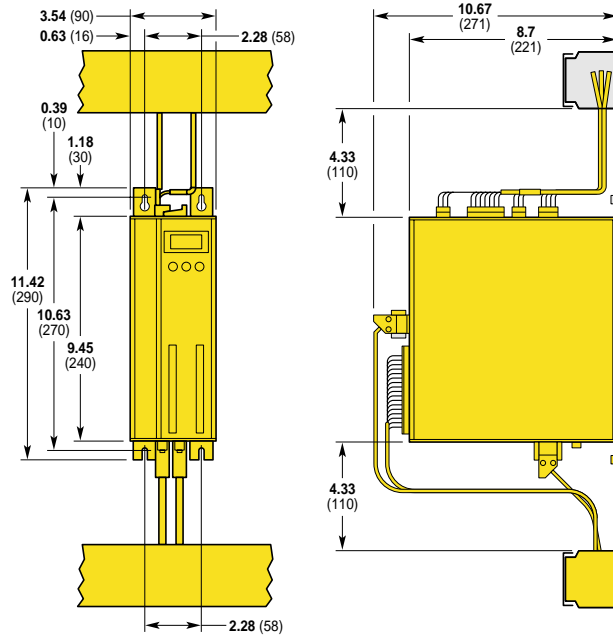


For drawings and specifications of the recommended motor packages, please refer to the COMPAX section.

SV Dimensional Drawings

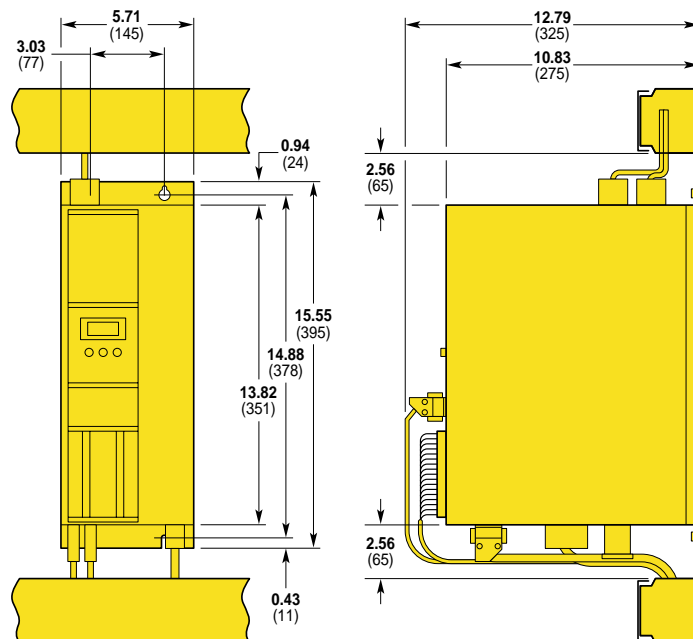
Dimensions and mounting details for direct panel mounting for SV2500S

Dimensions in inches (mm)



Dimensions and mounting details for direct panel mounting for SV4500S and SV8500S

Dimensions in inches (mm)



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SV2500S, SV4500S and SV8500S Connections

X13-Encoder Connections - 15-Pin D Connector

Pin No.	Type	Signal
1	Ground	Shield
2	Output	Channel Z+
3	Output	Channel B+
4	Output	Channel A+
5	Input	Logic Ground
6	Reserved	Reserved
7	No Connection	
8	No Connection	
9	Output	Channel Z-
10	Output	Channel B-
11	Output	Channel A-
12	No Connection	
13	Input	+5VDC
14	No Connection	
15	No Connection	

X12-Resolver Connections - 15-Pin D Connector

Pin No.	Type	Signal
1	Ground	Shield
2	No Connection	
3	No Connection	
4	Output	Rotor 2
5	Input	Stator 1
6	No Connection	
7	No Connection	
8	No Connection	
9	Input	Motor Temp. +
10	Input	Motor Temp. -
11	Input	Stator 4
12	Input	Stator 3
13	Input	Stator 2
14	Output	Rotor 1
15	No Connection	

X6-RS232 Connections - 9-Pin D Connector

Pin No.	Signal
1	No Connection
2	Rx
3	Tx
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	+5VDC

X1-Motor Power Connector - 8-Pin Removable Connector

Pin No.	Signal	Pin No.	Signal
1	Phase U	5	Brake +
2	Phase V	6	Brake -
3	Phase W	7	Brake Enable
4	Motor Earth	8	Brake Enable

X9-Analog References - 7-Pin Removable Connector

Pin No.	Type	Signal
1	Reference 1	Ref point monitor of first input
2	Reference 2	Ref point monitor of second input
3	Current U	Current monitor, Phase U
4	Current V	Current monitor, Phase V
5	Conductance U	Conductivity, Phase U
6	Conductance V	Conductivity, Phase V
7	Shield	Housing Shield

X8-Control Connections - 16-Pin Removable Connector

Pin No.	Type	Signal
1	Input	Command 1+
2	Input	Command 1-
3	Input	Command 2+
4	Input	Command 2-
5	No Connection	
6	No Connection	
7	GND	Analog GND
8	GND	Analog GND
9	Output	Current Monitor
10	Output	Tach - Absolute
11	Output	Tach - Normalized
12	Output	Supply Voltage Value
13	Output	+15VDC
14	Output	-15VDC
15	GND	Analog GND
16	GND	Analog GND

X10-Control Connections 16-Pin Removable Connector

Pin No.	Type	Signal
1	Input	Input 1 (Enable)
2	Input	Input 2 (Brake)
3	Input	Input 3
4	Input	Input 4
5	No Connection	
6	GND	I/O GND
7	GND	I/O GND
8	GND	I/O GND
9	Output	+24VDC (<500 mA)
10	GND	Logic GND for +24V
11	No Connection	
12	No Connection	
13	No Connection	
14	Input	Programmable Output Pull Up
15	Output	Programmable Output
16	GND	Programmable Output GND

X2-Main Input (Removable) Connector

Pin No.	Signal
1	Line 1
2	Line 2
3	Line 3
4	Earth

X3-External Logic Supply (Removable) Connector

Pin No.	Type	Signal
1	24V GND	0V return for 24V supply
2	24V Input	+24V input @ 5A to maintain logic

Drives & Drive/Controllers

Ordering Information
CE (EMC and LVD)

Drives	Part No.	Description
	SV2500S	6.3 A Continuous, 230V Drive
	SV4500S	6.5 A Continuous, 460V Drive
	SV8500S	12.5 A Continuous, 460V Drive

Motors	Part No.	Description
	HDY70C4-44S	70 mm Brushless motor w/resolver
	HDY92E4-44S	92 mm Brushless motor w/resolver
	HDY115A6-88S	115 mm Brushless motor w/resolver
	HDY115C6-88S	115 mm Brushless motor w/resolver
	HDY142C6-88S	142 mm Brushless motor w/resolver

Motor-to-Drive cables	Part No.	Description
	MOK42	Motor cable for HDY70 through HDY 115
	MOK43	Motor cable for HDY142

Resolver-to-Drive cables	Part No.	Description
	REK32	Resolver cable for HDY70 through HDY142

Drives	Part No.	Description
	SV200M	6.5A Continuous Drive
	SV500M	11.5A Continuous Drive
	SV1500M	25A Continuous Drive

Power Module	Part No.	Description
	NMD10	10 kW Power Supply Module
	NMD20	20 kW Power Supply Module

Motors	Part No.	Description
	HDY70C4-44S	70 mm Brushless motor w/resolver
	HDY92E4-44S	92 mm Brushless motor w/resolver
	HDY115A6-88S	115 mm Brushless motor w/resolver
	HDY115C6-88S	115 mm Brushless motor w/resolver
	HDY142C6-88S	142 mm Brushless motor w/resolver
	HBMR190E6-88S	190 mm Brushless motor w/resolver
	HBMR190J6-260S	190 mm Brushless motor w/resolver

Motor-to-drive cables	Part No.	Description
	MOK42	Motor cable for HDY70 through HDY 115
	MOK43	Motor cable for HDY142
	MOK21	Motor cable for HBMR190

Resolver-to-drive cables	Part No.	Description
	REK32	Resolver cable for HDY70 through HDY142
	REK14	Resolver cable for HBMR190

Standard lengths available from 2.5 meters to 50 meters.

Please call factory for additional ordering information.

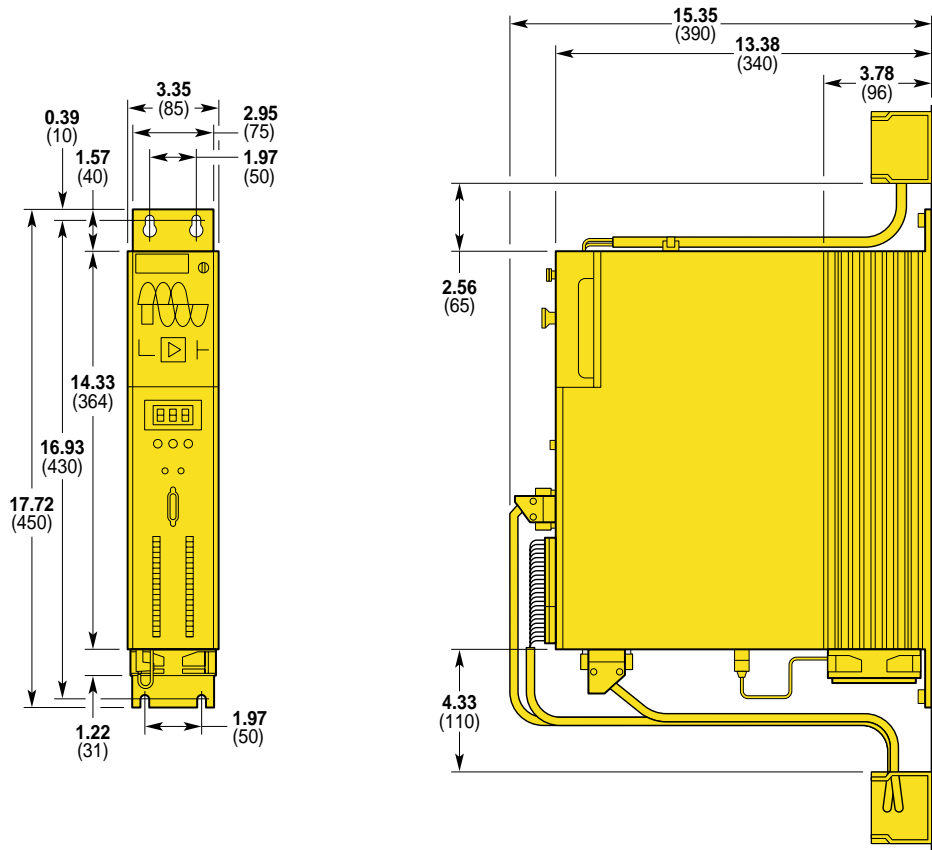
Drives & Drive/Controllers

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SV Dimensional Drawing

Dimensions and mounting details for direct panel mounting for SV200M, SV500M and SV1500M

Dimensions in inches (mm)



Drives & Drive/Controllers

SV200M, SV500M and SV1500M Connections

X6-RS232 Connections 9-Pin D Connector	
Pin No.	Signal
1	No Connection
2	Rx
3	Tx
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	+5VDC

X1-Motor Connections 7-Pin Connector		
Pin No.	Type	Signal
1	Input	Phase B
2	Input	Phase C
3	Input	Phase A
4	Ground	Earth Ground
5	Ground	Earth Ground
6	Input	Brake+
7	Input	Brake-

X13-Encoder Connections 15-Pin D Connector					
Pin No.	Type	Signal	Pin No.	Type	Signal
1	Ground	Shield	9	Output	Channel Z-
2	Output	Channel Z+	10	Output	Channel B-
3	Output	Channel B+	11	Output	Channel A-
4	Output	Channel A+	12	No Connection	
5	Input	Logic Ground	13	Input	+5VDC
6	Reserved	Reserved	14	No Connection	
7	No Connection		15	No Connection	
8	No Connection				

X12-Resolver Connections - 15-Pin D Connector					
Pin No.	Type	Signal	Pin No.	Type	Signal
1	Ground	Shield	9	Input	Motor Temp. +
2	No Connection		10	Input	Motor Temp. -
3	No Connection		11	Input	Stator 4
4	Output	Rotor 2	12	Input	Stator 3
5	Input	Stator 1	13	Input	Stator 2
6	No Connection		14	Output	Rotor 1
7	No Connection		15	No Connection	
8	No Connection				

X10-Control Connections - 16-Pin Removable Connector		
Pin No.	Type	Signal
1	Input	Input 1 (Enable)
2	Input	Input 2 (Brake)
3	Input	Input 3
4	Input	Input 4
5	No Connection	
6	GND	I/O GND
7	GND	I/O GND
8	GND	I/O GND
9	Output	+24VDC (<500 mA)
10	GND	Logic GND for +24V
11	No Connection	
12	No Connection	
13	No Connection	
14	Input	Programmable Output Pull Up
15	Output	Programmable Output
16	GND	Programmable Output GND

X8-Control Connections - 16-Pin Removable Connector		
Pin No.	Type	Signal
1	Input	Command 1+
2	Input	Command 1-
3	Input	Command 2+
4	Input	Command 2-
5	No Connection	
6	No Connection	
7	Ground	Analog Ground
8	Ground	Analog Ground
9	Output	Current Monitor
10	Output	Tach - Absolute
11	Output	Tach - Normalized
12	Output	Supply Voltage Value
13	Output	+15VDC
14	Output	-15VDC
15	Ground	Analog Ground
16	Ground	Analog Ground

X3-Power Connections - 4-Pin Screw Terminal Connector		
Pin No.	Type	Signal
1	Input	+24VDC
2	Ground	Logic Ground

NMD10 & NMD20 Power Module Connections

X1,2 & 3-Power Connections - 7-Pin Connector		
Pin No.	Type	Signal
1	Input	Line 1
2	Input	Line 2
3	Input	Line 3
4	Input	Earth Ground
5	Input	+24VDC
6	Input	Logic Ground

Control Connections - X8 - 7-Pin Connector		
Pin No.	Type	Signal
1	Output	+24VDC
2	Output	Ground
3	Output	Ready Contact
4	Output	Ready Contact
5	Input	Emergency Stop
6	Input	Emergency Stop
7	Ground	Shield

X2-Power Connections - 6-Pin Screw Terminal Connector		
Pin No.	Type	Signal
1	Ground	Earth Ground
2	Input	+HV
3	Input	-HV

Integrate Brushless Digital Servo Systems into Your Application. Call 1-800-358-9070 Today.