Servo Products



- Three drive series to cover a wide range of motors
- Common features and control options
- Common software tools for configuration and programming
- Multiple communication options, including: Ethernet, EtherNet/IP, RS-232/485 and CANopen
- Easy system commissioning and tuning using preconfigured setup files
- Point-and-click programming with Si Programmer[™]
- Complex motion, multi-tasking, and thirdparty HMI support with Q Programmer[™]
- Motors with NEMA and Metric frame sizes
- Torques from 0.84 to 64 in-lb

Servo Drives

- SV7
- SVAC3
- BLuAC5

Servo Motors

- M Series
- V Series



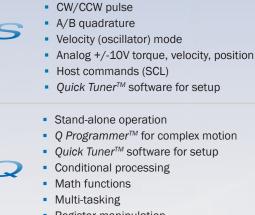


- Operates from 120 or 220 VAC
- Digital PID servo control
- Velocity and acceleration feedforward minimize position error throughout every move
- Digital DQ current loop provides wide bandwidth, precise current control
- Sine commutation for smooth, quiet motion
- PID output filter + derivative filter eliminate system resonances
- Jerk filter provides jerk free "S curve" motion
- Built-in regeneration (power dump) circuit
- 100 Mbit Ethernet
- Flexible control options

Pulse & direction

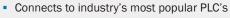
• Q Programmable[™] version

Control Options*



- Register manipulation
- Encoder following
- Third-party HMI compatibility

EtherNet/IP



Same functions as Q model

*See back page for complete list of available model numbers.



For more information, visit: www.applied-motion.com/SVAC3

Communications

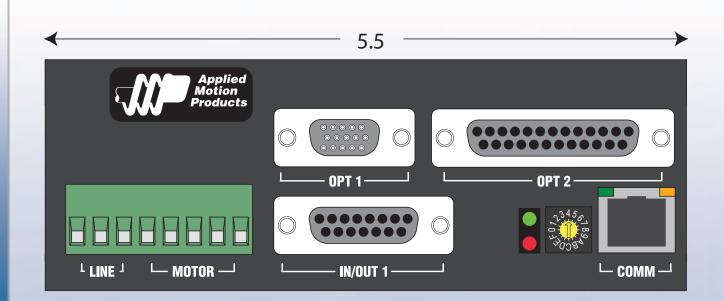
Ethernet Port

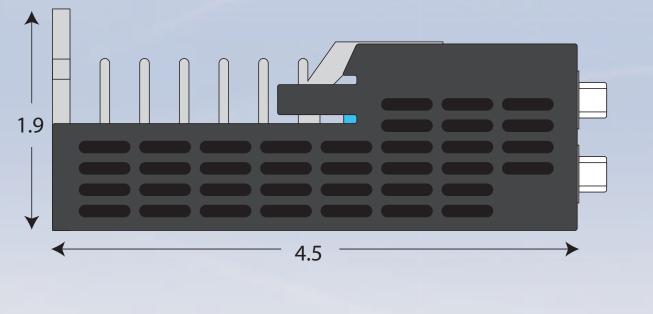
 The Ethernet port on all SVAC3 drives is used for configuration, programming, and streaming SCL and Q commands to one or more drives across 100 Mbit Ethernet networks (TCP and UDP).

EtherNet/IP option: SV7-IP-EE

Allows drives to be commanded and queried over EtherNet/IP industrial networks.

SVAC3 Dimensions





Dimensions in inches Not to scale

Inputs and Outputs



4 digital inputs 2 digital outputs 1 analog input

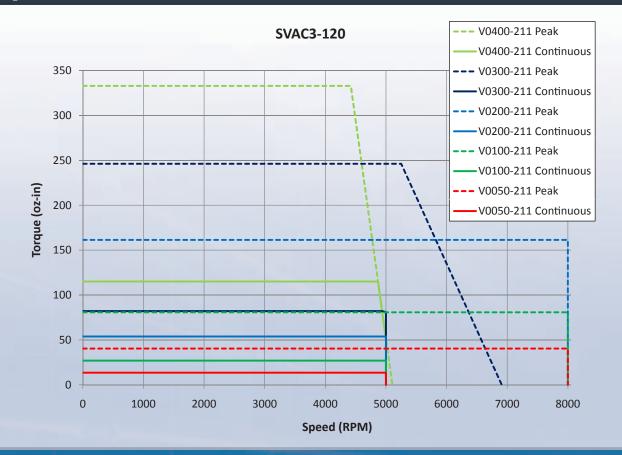


12 digital inputs 6 digital outputs 1 analog input

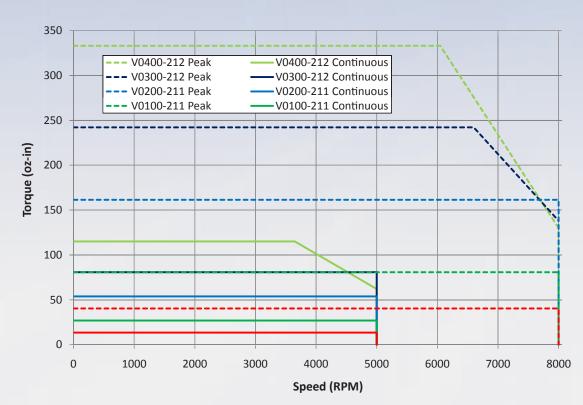


12 digital inputs 6 digital outputs 1 analog input

Torque Curves for 120 Volt SVAC3



Torque Curves for 220 Volt SVAC3



SVAC3-220

SVAC3 Technical Specifications

POWER AMPLIFIER:

AMPLIFIER TYPE	Digital MOSFET 16 kHz PWM					
CURRENT CONTROL	4 quadrant d-q method					
OUTPUT CURRENT	SVAC3-120: 0.5 to 3.5 A rms continuous, 0.5 to 7.4 A rms peak (2 seconds max, I2t limiting)					
	SVAC3-220: 0.5 to 1.8 A rms continuous, 0.5 to 5.4 A rms peak (2 seconds max, I2t limiting)					
INPUT POWER	SVAC3-120: 108-132 VAC, 50-60 Hz					
	SVAC3-220: 108-242 VAC, 50-60 Hz"					
PROTECTION	Over-voltage, under-voltage, over-temp, motor/wiring shorts (phase-to-phase, phase-to-ground)					
REGENERATION	Built-in regeneration circuit, 10 watts max					
AMBIENT TEMPERATURE	0 to 40 °C (32 to 104 °F), must be mounted to suitable heatsink with adequate ventilation					
HUMIDITY	90% max, non-condensing					
WEIGHT	22.4 oz					
CONTROLLER:						
NON-VOLATILE STORAGE	Drive configuration and Q program stored in non-volatile memory					
INPUTS/OUTPUTS: S	X1, X2 inputs: Optically isolated, differential, 5-24 VDC, minimum pulse width = 250 ns, maximum pulse					

NUN-VULATILE STURAGE	Drive configuration and Q program stored in non-volatile memory						
INPUTS/OUTPUTS: S	X1, X2 inputs: Optically isolated, differential, 5-24 VDC, minimum pulse width = 250 ns, maximum pulse						
models	frequency = 2 MHz. Function: step & direction, CW/CCW step, A/B quadrature encoder						
	X3 input: Optically isolated, differential, 5-24 VDC. Function: motor enable						
	X4 input: Optically isolated, differential, 5-24 VDC. Function: alarm reset						
	Note: any input that is not assigned to a dedicated function can be used for a home or registration sensor or for program branching						
	Y1 output: Optical Darlington, sinking or sourcing, 30 VDC max, 100 mA max. Function: brake relay						
	Y2 output: Optical Darlington, sinking or sourcing, 30 VDC max, 100 mA max. Function: fault, motion or tach						
	Note: any output that is not assigned to a dedicated funtion is general purpose programmable						
	Analog input: Single-ended. Range (resolution) is software selectable 0-5 VDC (10 bits), +/-5 or 0-10 VDC						
	(11 bits), or +/-10 VDC (12 bits). Software configurable offset, deadband and filtering.						
INPUTS/OUTPUTS: Q and	X1, X2 inputs: Optically isolated, differential, 5-24 VDC, minimum pulse width = 250 ns, maximum pulse						
IP models	frequency = 2 MHz. Function: step & direction, CW/CCW step, A/B quadrature encoder						
	X3 input: Optically isolated, differential, 5-24 VDC. Function: motor enable						
	X4 input: Optically isolated, differential, 5-24 VDC. Function: alarm reset						
	IN1, IN2 inputs: Optically isolated, differential, 5-24 VDC. Function: jogging						
	IN3-IN6 inputs: Optically isolated, sinking w/ shared common, 12-24 VDC						
	IN7 , IN8 inputs: Optically isolated, differential, 5-24 VDC. Function: CW and CCW limits						
	Note: any input that is not assigned to a dedicated function can be used for a home or registration sensor or for program branching.						
	Y1 output: Optical Darlington, sinking or sourcing, 30 VDC max, 100 mA max. Function: brake relay						
	Y2 output: Optical Darlington, sinking or sourcing, 30 VDC max, 100 mA max. Function: fault						
	OUT1 output: Optical Darlington, sinking, 30 VDC max, 100 mA max. Function: motion or tach						
	OUT2, OUT3 outputs: Optical Darlington, sinking, 30 VDC max, 100 mA max						
	OUT4 output: Optical Darlington, sinking or sourcing, 30 VDC max, 100 mA max						
	Note: any output that is not assigned to a dedicated funtion is general purpose programmable						
	Analog input: Single-ended. Range (resolution) is software selectable 0-5 VDC (10 bits), +/-5 or 0-10 VDC						
	(11 bits), or +/-10 VDC (12 bits). Software configurable offset, deadband and filtering.						
COMMUNICATION	All models: Ethernet 100BASE-T, supports TCP and UDP						
INTERFACE	IP models only: EtherNet/IP industrial networking						
ENCODER INTERFACE	Differential line receivers for incremental encoder (A/B quadrature) feedback, up to 2 MHz. 400 cpr min						
ENCODER INTERFACE	to 32,768 cpr max (1600 quadrature counts min to 131,072 quadrature counts max)						
AGENCY APPROVALS	RoHS CE EN61800-3:2004, EN61800-5-1:2003 UL 508C						

BLUAC5 1000W AC Powered Servo Drive

- Operates from 100 to 240 VAC, 1 or 3
 phase
- Digital PID servo control
- Velocity and acceleration feedforward minimize position error throughout every move
- Digital DQ current loop provides wide bandwidth, precise current control
- Sine commutation for smooth, quiet motion
- PID output filter + derivative filter eliminate system resonances
- Built-in regeneration (power dump) circuit
- Dynamic braking
- RS-232, RS-485
- Flexible control options
- Si and Q Programmable[™] versions

Control Options*

- Pulse & direction
- CW/CCW pulse
- A/B quadrature
- Velocity (oscillator) mode
- Analog +/-10V torque, velocity, position
- Host commands (SCL)
- SiNet hub compatible
- Quick Tuner[™] software for setup
- Stand-alone operation
- *Q Programmer[™]* for complex motion
- Quick Tuner[™] software for setup
- Conditional processing
- Math functions
- Multi-tasking
- Register manipulation
- Encoder following
- Third-party HMI compatibility
- QE adds additional I/O
- Si Programmer[™] point-and-click indexer software with built-in Quick Tuner[™]
- User-friendly GUI
- I/O and motion programming
- Operator interface available (MMI-01 or MMI-02)

*See back page for complete list of available model numbers.



For more information, visit: www.applied-motion.com

Communications

RS-232 port

Standard on all drives

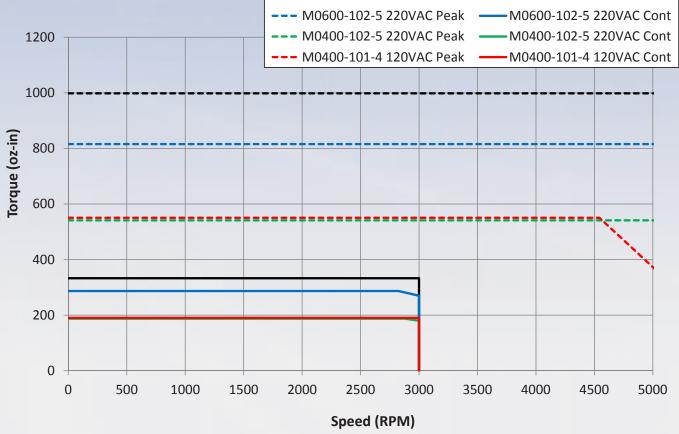
• The RS-232 port is used for configuration, programming, and sending SCL and Q commands to a single drive.

RS-485 port

Standard on all drives

 The RS-485 port can be used to stream SCL and Q commands to one or more drives across a serial network.

BLuAC5 Dimensions **Inputs and Outputs** 2.70 4.85 --1.32-7 digital inputs 7 digital inputs 3 digital outputs 3 digital outputs 2 analog inputs 2 analog inputs η Ø b τU 15 digital inputs 15 digital inputs 7.8 7 digital outputs 7 digital outputs 7.4 3 analog inputs 0 0 0 **Dimensions in Inches** Not to scale **Torque Curves for BLuAC5** --- M0750-102-5 220VAC Peak •M0750-102-5 220VAC Cont --- M0600-102-5 220VAC Peak -M0600-102-5 220VAC Cont



BLuAC5 Technical Specifications

POWER AMPLIFIER:

AMPLIFIER TYPE	3-phase sinusoidal PWM switching at 16 kHz					
CURRENT CONTROL	4 quadrant d-q method					
OUTPUT CURRENT	Up to 5 A rms continuous, up to 15 A rms peak (2 seconds max, I2t limiting)					
INPUT POWER	90-260 VAC, 50/60 Hz, 1-phase or 3-phase					
PROTECTION	Over-voltage (400 VDC on DC bus), under-voltage (100 VDC on DC bus), over-temp (75 °C), motor/wiring shorts (phase-to-phase, phase-to-ground), regeneration error (based on regeneration values input by user), encoder failure (differential encoders only), Hall sensor failure					
REGENERATION	50 Watt internal shunt resistor, connector for external high-power shunt resistor					
AMBIENT TEMPERATURE	0 to 40 °C (32 to 104 °F), must be mounted to suitable heatsink with adequate ventilation					
HUMIDITY	90% max, non-condensing					
WEIGHT	S and Q models: 35.1 oz QE and Si models: 44 oz					

CONTROLLER:

NON-VOLATILE STORAGE	Drive configuration and programs stored in non-volatile memory					
INPUTS/OUTPUTS: S and Q models	 X1, X2 inputs: Optically isolated, differential, 5 VDC X3-X7 inputs: Optically isolated, single-ended w/ shared common, 12-24 VDC Y1-Y3 outputs: Optical Darlington, sinking w/ shared common, 30 VDC max, 100 mA max Analog inputs: Two single-ended inputs can be wired together as one differential input. Range is software selectable 0-5 VDC, +/-5, 0-10 VDC, or +/-10 VDC. Software configurable offset, deadband and filtering on differential input only 					
INPUTS/OUTPUTS: QE and Si models	 X1, X2 inputs: Optically isolated, differential, 5 VDC X3-X7 inputs: Optically isolated, single-ended w/ shared common, 12-24 VDC IN1-IN6 inputs: Optically isolated, single-ended w/ shared common, 12-24 VDC IN7, IN8 inputs: Optically isolated, differential, 12-24 VDC Y1-Y3 outputs: Optical Darlington, sinking w/ shared common, 30 VDC max, 100 mA max OUT1-OUT4 outputs: Optical Darlington, sinking or sourcing, 30 VDC max, 100 mA max Analog inputs: Two single-ended inputs can be wired together as one differential input. Range is software selectable 0-5 VDC, +/-5, 0-10 VDC, or +/-10 VDC. Software configurable offset, deadband and filtering on differential input only. Note: Si Programming does not support the analog input(s). 					
COMMUNICATION INTERFACE	RS-232 for configuration, programming and serial communications to a single drive RS-485 for serial communications to one or more drives on a serial network					
ENCODER INTERFACE	Differential line receivers for incremental encoder (A/B quadrature) feedback, up to 2 MHz. 50 cpr min to 8192 cpr max (200 quadrature counts min to 32,768 quadrature counts max)					
AGENCY APPROVALS	RoHS CE					

SV7 300W DC Powered Servo Drive

- Operates from 24 to 80 VDC
- Digital PID servo control
- Velocity and acceleration feedforward minimize position error throughout every move
- Digital DQ current loop provides wide bandwidth, precise current control
- Sine commutation for smooth, quiet motion
- PID output filter + derivative filter eliminate system resonances
- Jerk filter provides jerk free "S curve" motion
- RS-232, RS-485, CANopen, Ethernet
- Flexible control options
- Si and Q Programmable[™] versions

Control Options*

- Pulse & direction
- CW/CCW pulse
- A/B quadrature
- Velocity (oscillator) mode
- Analog +/-10V torque, velocity, position
- Host commands (SCL)
- SiNet Hub compatible
- Quick Tuner[™] software for setup
- Stand-alone operation
- *Q Programmer[™]* for complex motion
- Quick Tuner[™] software for setup
- Conditional processing
- Math functions
- Multi-tasking
- Register manipulation
- Encoder following
- Third-party HMI compatibility
- Si Programmer[™] with built-in Quick Tuner[™]
- Point-and-click indexing software
- User-friendly GUI
 - I/O and motion programming
 - Operator interface available (MMI-01 or MMI-02)
 - CANopen protocols DS301 and DSP402
 - Profile Position, Profile Velocity, and
 - Homing modes
 - Up to 127 axes per channel
 - Execute stored Q programs
 - EtherNet/IP
 - Connects to industry's most popular PLC's
 - Same functions as Q model

*See back page for complete list of available model numbers.

For more information go to www.applied-motion.com/SV

Communications

Ethernet option: SV7-Q-EE

 The Ethernet option board allows the SV7-Q-EE to be commanded and queried over standard 100Mbit Ethernet using the SCL and Q languages.

CANopen option: SV7-C-CE

 The CANopen option board used with the SV7-C-CE allows the drive to be connected to a CANopen network along with other CANopen drives. Drives can be controlled and interrogated over the network.

RS-485 option: SV7-Q-RE, SV7-S-RE

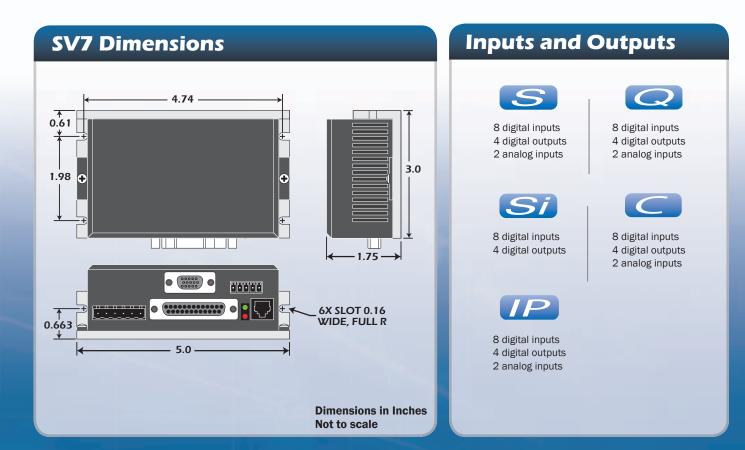
• The RS-485 option board adds the ability to stream SCL and Q commands to one or more drives on a serial network.

RS-232 port: standard on all but Ethernet drives Example: SV7-S-AF

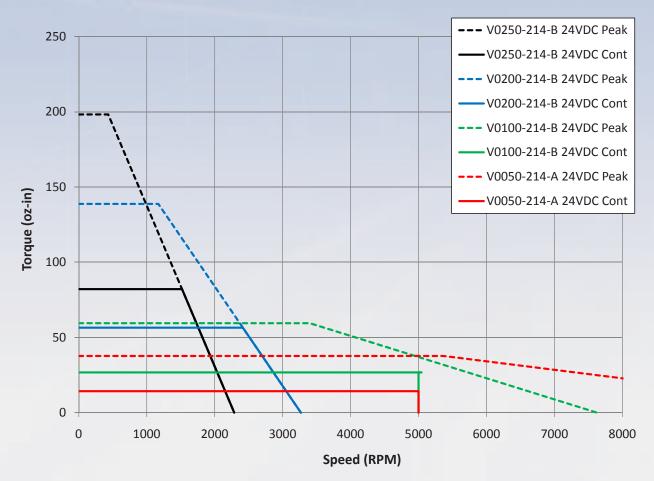
• The RS-232 port is used for configuration, programming, and serial communications with a single drive.

EtherNet/IP option: SV7-IP-EE

Allows drives to be commanded and queried over EtherNet/IP industrial networks.

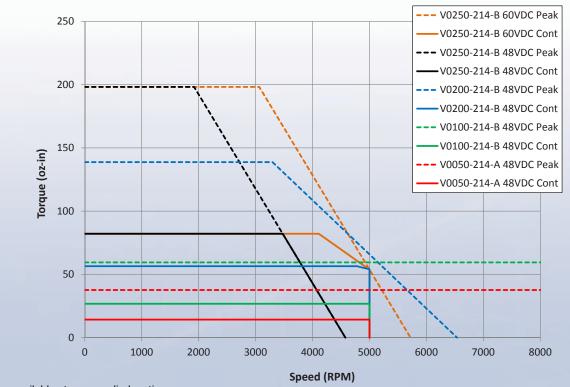


Torque Curves for SV7 at 24 VDC



More curves available at www.applied-motion.com

Torque Curves for SV7 at 48 VDC



More curves available at www.applied-motion.com

SV7 Technical Specifications

POWER AMPLIFIER: All Models

AMPLIFIER TYPE	Digital MOSFET 16 kHz PWM					
CURRENT CONTROL	4 quadrant d-q method					
OUTPUT CURRENT	0.5 to 7.0 A rms continuous, 0.5 to 14 A rms peak (2 seconds max, I2t limiting)					
INPUT POWER	24-80 VDC (external power supply required)					
PROTECTION	Over-voltage, under-voltage, over-temp, motor/wiring shorts (phase-to-phase, phase-to-ground)					
REGENERATION No internal regeneration circuit. RC-050 external regeneration clamp may be required for with high load inertia and/or rapid deceleration						
AMBIENT TEMPERATURE	0 to 40 °C (32 to 104 °F), must be mounted to suitable heatsink with adequate ventilation					
HUMIDITY	90% max, non-condensing					
WEIGHT	10 oz					

CONTROLLER: All Models

NON-VOLATILE STORAGE	Drive configuration and Q program stored in non-volatile memory				
INPUTS/OUTPUTS	X1, X2 inputs: Optically isolated, differential, 5 VDC, minimum pulse width = 250 ns, maximum pulse frequency = 2 MHz. Function: step & direction, CW/CCW step, A/B quadrature encoder X3 input: Optically isolated, sinking or sourcing, 12-24 VDC. Function: motor enable				
	 X4 input: Optically isolated, sinking or sourcing, 12-24 VDC. Function: alarm reset X5, X6 inputs: Optically isolated, sinking or sourcing, 12-24 VDC. Function: CW and CCW jog inputs Note: inputs X3-X6 have a shared common. X7, X8 inputs: Optically isolated, differential, 12-24 VDC. Function: CW and CCW limits 				
	Note: any input that is not assigned to a dedicated function can be used for a home or registration sensor or for program branching.				

Continued on page 12

SV7 Technical Specifications (Continued)

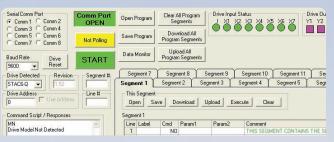
CONTROLLER (CONT): AI	I Models
INPUTS/OUTPUTS (CONT)	 Y1 output: Optical Darlington, NPN/sinking, 30 VDC max, 100 mA max. Function: brake relay Y2 output: Optical Darlington, NPN/sinking, 30 VDC max, 100 mA max. Function: motion or tach Y3 output: Optical Darlington, NPN/sinking, 30 VDC max, 100 mA max. Function: fault Note: outputs Y1-Y3 have a shared common. Y4 output: Optical Darlington, sinking or sourcing, 30 VDC max, 100 mA max Note: any output that is not assigned to a dedicated function is general purpose programmable. Analog input: Single-ended. Range (resolution) is software selectable 0-5 VDC (10 bits), +/-5 or 0-10 VDC (11 bits), or +/-10 VDC (12 bits). Software configurable offset, deadband and filtering.
COMMUNICATION INTER- FACE	 SV7-x-Ax: RS-232 for programming and serial communications SV7-x-RE: RS-232 for programming and serial communications, RS-485 for serial communications SV7-Q-EE: Ethernet for programming and serial communications SV7-C-CE: RS-232 for programming, CANopen for communications SV7-IP-EE: Ethernet for programming, EtherNet/IP for network communications"
ENCODER INTERFACE	Differential line receivers for incremental encoder (A/B quadrature) feedback, up to 2 MHz. 400 cp min to 32,768 cpr max (1600 quadrature counts min to 131,072 quadrature counts max)
AGENCY APPROVALS	RoHS CE EN61800-3:2004, EN61800-5-1:2003"

Software for All Drives



Quick Tuner™

Used for setup and configuration of the drive. For more information about *Quick Tuner*TM, visit the Applied Motion Products website.



Q Programmer™

Q Programmer[™] is used to create and edit stand-alone programs for Q version drives. These programs can include multi-tasking, math, register manipulation, encoder following, and more.



Si Programmer™

Intended for use in stand-alone applications, Si Programmer[™] provides a user friendly, point-and-click, graphical interface that doesn't require any previous programming experience. Currently available on SV7 and BLuAC5 servo drives only.

Servo Motor Data



 Economical package NEMA frame sizes

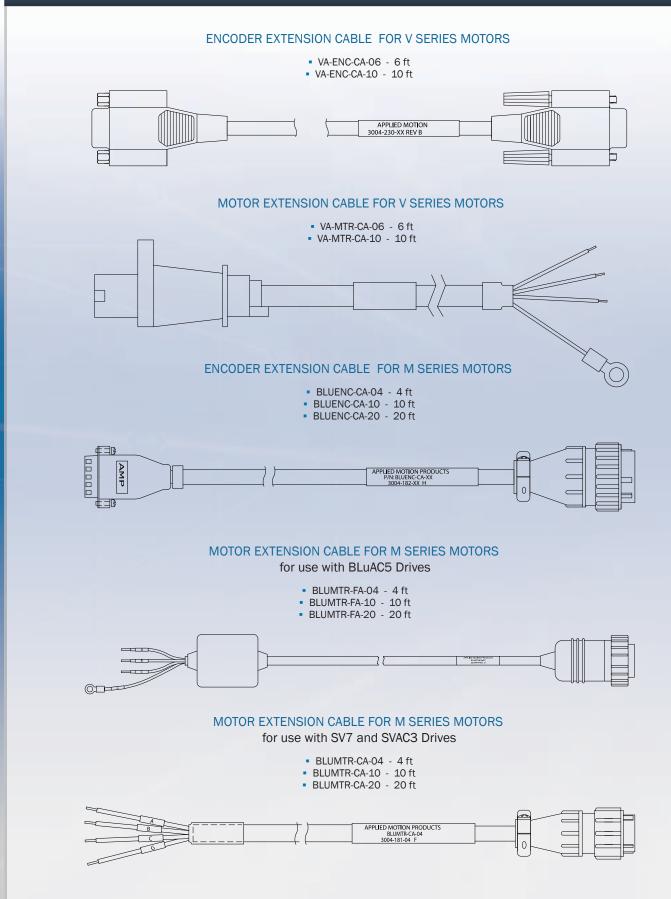
encoder

• 2048 line (8192 count) incremental

- M Series Motors:
- High torque density
- Metric frame sizes
- 2000 line (8000 count)incremental encoder

Part #	Supply Voltage	Frame Size	Rated Power (Watts)	Cont.l Peak Torque (in-lb)	Rated Peak Speed (rpm)	Torque Constant (in-Ib/A)	Voltage Constant (V/krpm)	Rotor Inertia (oz-in-sec ⁻²)
M0100-103-3-000	24 VDC	40 mm	100	2.8 8.4	3000 5000	0.4	4.8	4.25E-04
M0100-103-4-000	24 VDC	60 mm	100	2.8 8.4	3000 5000	0.39	4.6	1.27E-03
V0050-214-A-000	48 VDC	NEMA 17	50	0.84 2.6	5000 8000	0.168	2.0	4.11E-04
V0100-214-B-000	48 VDC	NEMA 23	100	1.68 5.0	5000 8000	0.266	3.5	1.32E-03
V0200-214-B-000	48 VDC	NEMA 23	200	3.36 10	5000 5900	0.62	7.4	2.58E-03
V0250-214-B-000	48 VDC	NEMA 23	200	5.0 15	3350 4000	0.885	10.7	3.82E-03
M0200-104-4-000	48 VDC	60 mm	200	5.7 17	3000 5000	0.93	11	2.55E-03
M0400-105-4-000	60 VDC	60 mm	400	11 34	3000 5000	1.41	16.8	4.81E-03
V0050-211-A-000	120 VAC	NEMA 17	50	0.84 2.6	5000 8000	0.053	5.54	4.11E-04
V0100-211-B-000	120 VAC	NEMA 23	100	1.68 5.0	5000 8000	1.04	12.2	1.32E-03
M0100-101-3-000	120 VAC	40 mm	100	2.8 8.4	3000 5000	2.8	19.3	4.25E-04
M0100-101-4-000	120 VAC	60 mm	100	2.8 8.4	3000 5000	1.68	19.9	1.27E-03
V0200-211-B-000	120 VAC	NEMA 23	200	3.36 10	5000 8000	1.93	22.8	2.58E-03
V0300-211-B-000	120 VAC	NEMA 23	300	5.0 15	4860 6800	1.86	22.4	3.82E-03
M0200-101-4-000	120 VAC	60 mm	200	5.7 17	3000 5000	1.77	20.5	2.55E-03
V0400-211-C-000	120 VAC	NEMA 34	400	6.7 20	5000 8000	2.5	29	1.44E-02
M0400-101-4-000	120 VAC	60 mm	400	11 34	3000 5000	2.12	24.8	4.81E-03
V0000 040 D 000	0001/00		000	50145	5000 1 0000	0.00	00.7	0.005.00
V0300-212-B-000	220 VAC	NEMA 23	300	5.0 15	5000 8000	2.83	33.7	3.82E-03
M0200-102-4-000	220 VAC	60 mm	200	5.7 17	3000 5000	3.45	41	2.55E-03
V0400-212-C-000	220 VAC	NEMA 34	400	6.7 20	5000 8000	4.04	45.6	1.44E-02
M0400-102-5-000	220 VAC	80 mm	400	11 34	3000 5000	4.3	50.8	7.93E-03
M0750-102-5-000	220 VAC	80 mm	750	21 64	3000 5000	4.4	52.2	1.53E-02

Servo Motor Extension Cables



Accessories

Power Supplies

Applied Motion offers two matched power supplies for use with the SV7 drives. A 24VDC 150W (part number: PS150A24) and a 48VDC 320W version (part number: PS320A48). These power supplies have current over load capability making them ideal for use with servo drives.



Break Out Boards: BOB-1 and BOB-2

BOB-1 is for use with all drives and expands the DB25F connector to screw terminals. BOB-2 is for use with the DB25M connector on the BLuAC5-Si and -QE. A 3 foot cable included with both models.



RC-050 Regeneration

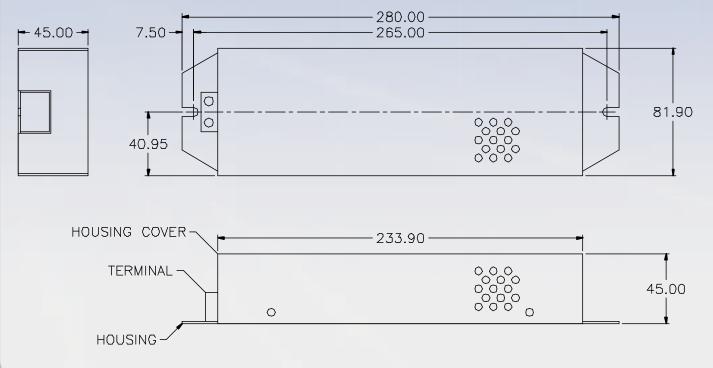
Clamp (for SV7) The RC-050 regeneration clamp is for use where regeneration from the motor may be excessive for the power supply. In these cases, the RC-050 is connected between the



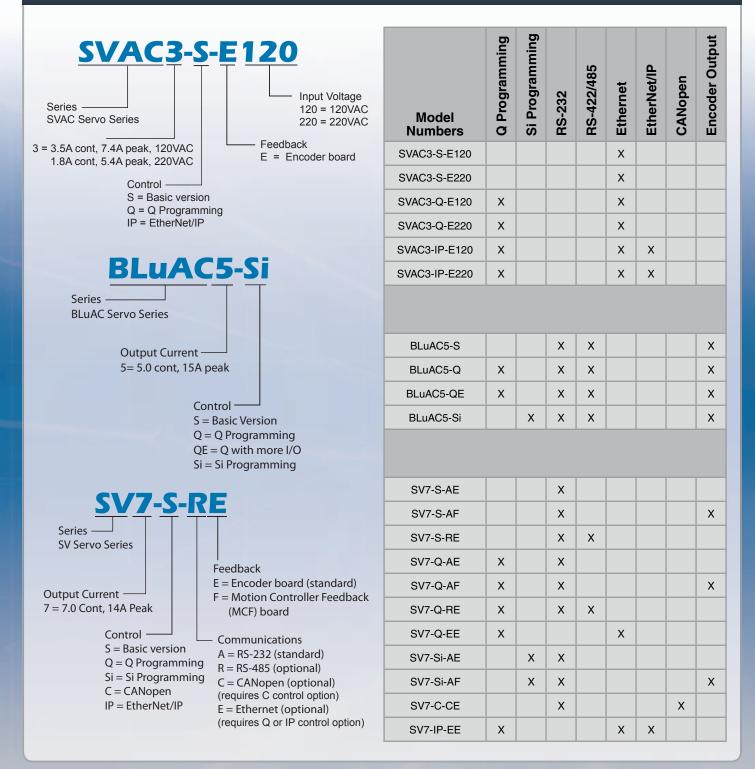
drive and power supply and absorbs regenerated energy.

Braking resistor assembly - RA-100

For use with BLuAC5 dynamic braking and regeneration circuits.



Servo Drive Model Numbers





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