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





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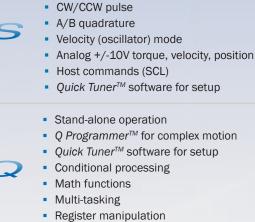


- Operates from 120 or 220 VAC
- Digital PID servo control
- Velocity and acceleration feedforward minimize position error throughout every move
- Digital DQ current loop provides wide bandwidth, precise current control
- Sine commutation for smooth, quiet motion
- PID output filter + derivative filter 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

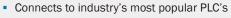
• Q Programmable[™] version

Control Options*



- 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

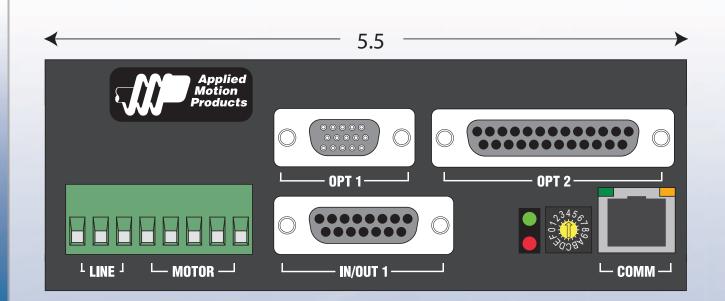
 The Ethernet port on all SVAC3 drives is used for configuration, programming, and streaming SCL and Q commands to one or more drives across 100 Mbit Ethernet networks (TCP and UDP).

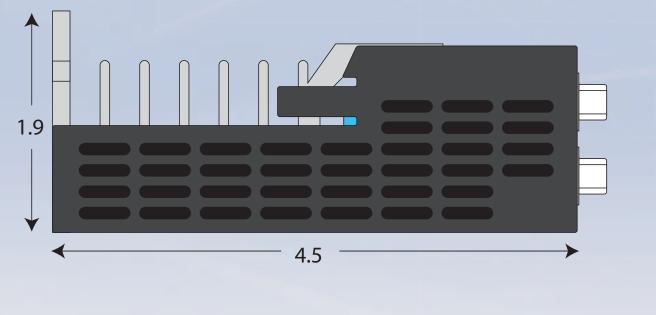
EtherNet/IP option: SV7-IP-EE

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

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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

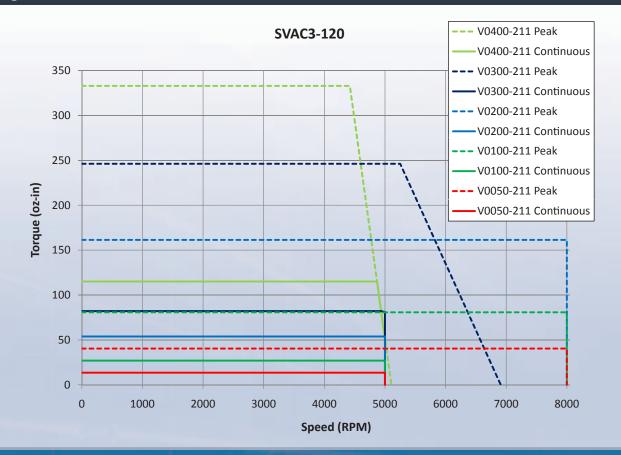


12 digital inputs 6 digital outputs 1 analog input



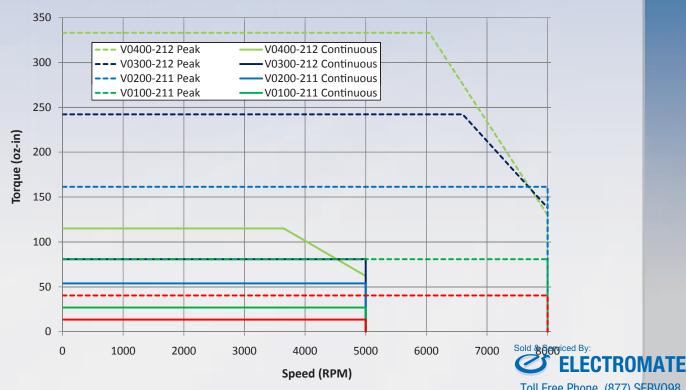
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Torque Curves for 120 Volt SVAC3



SVAC3-220

Torque Curves for 220 Volt SVAC3



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4

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

NON-VOLATILE STORAGE	Drive configuration and Q program stored in non-volatile memory
INPUTS/OUTPUTS: S models	X1, X2 inputs: Optically isolated, differential, 5-24 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, 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 IP models	X1, X2 inputs: Optically isolated, differential, 5-24 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, 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 INTERFACE	All models: Ethernet 100BASE-T, supports TCP and UDP 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 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 Sold & Serviced By:



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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

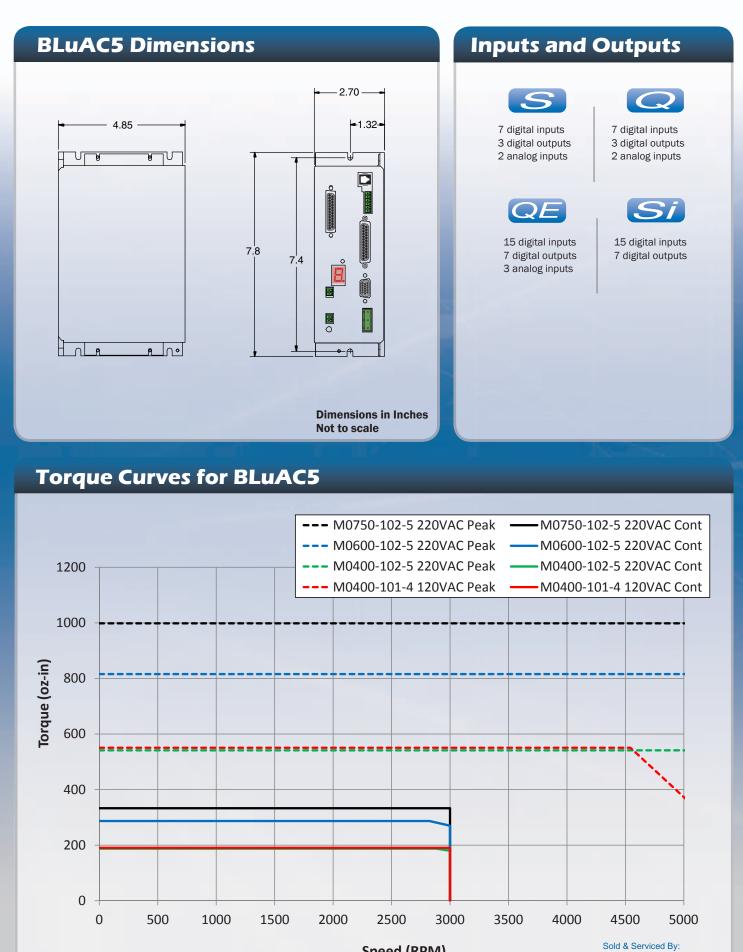
• The RS-232 port is used for configuration, programming, and sending SCL and Q commands to a single drive.

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.





Speed (RPM)

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BLuAC5 Technical Specifications

POWER AMPLIFIER:

AMPLIFIER TYPE	3-phase sinusoidal PWM switching at 16 kHz					
CURRENT CONTROL	l quadrant d-q method					
OUTPUT CURRENT	Jp 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: Optical y 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



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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

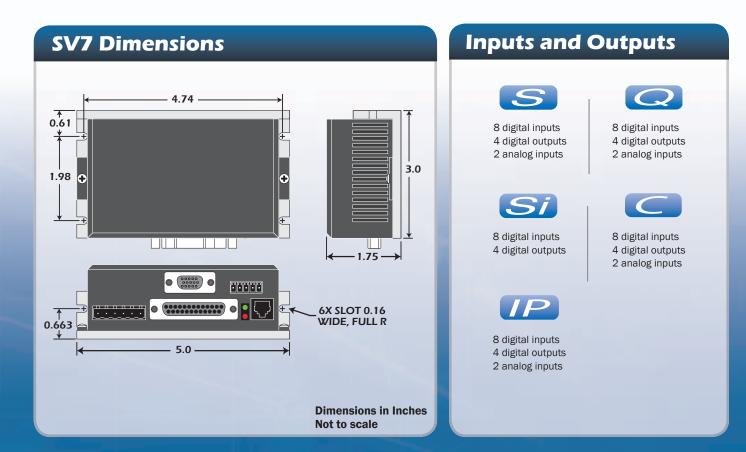
• The RS-232 port is used for configuration, programming, and serial communications with a single drive.

EtherNet/IP option: SV7-IP-EE

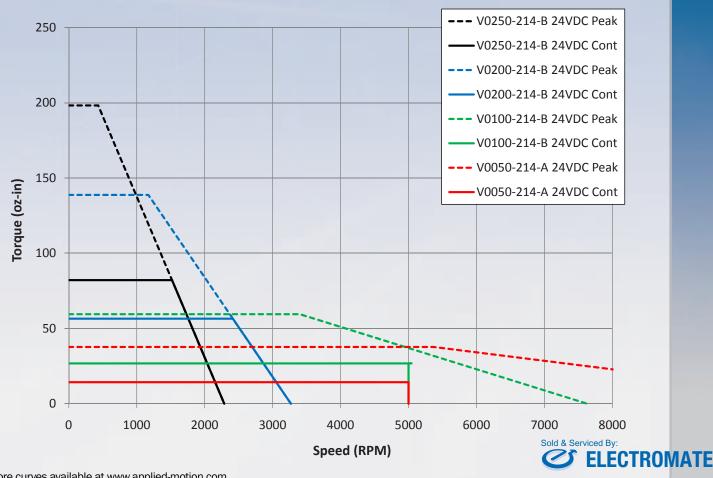
Allows drives to be commanded and queedove Life OTROMATE industrial networks.

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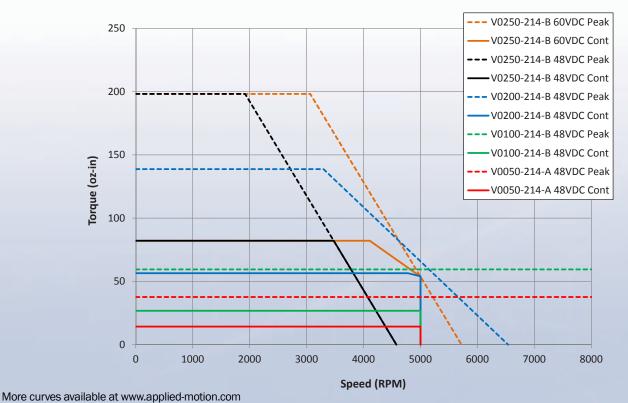
Torque Curves for SV7 at 24 VDC



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More curves available at www.applied-motion.com

Torque Curves for SV7 at 48 VDC



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 applications 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

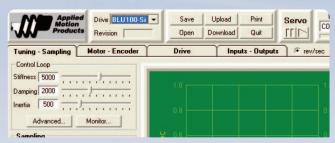
NON-VOLATILE STORAGE	Drive configuration and Q program stored in non-volatile memory				
INPUTS/OUTPUTS	X1, X2 inputs: Optically isolated, differential, 5 VDC, minimum pulse width = 250 ns, maximum pulse				
	frequency = 2 MHz. Function: step & direction, CW/CCW step, A/B quadrature encoder				
	X3 input: 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.				
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SV7 Technical Specifications (Continued)

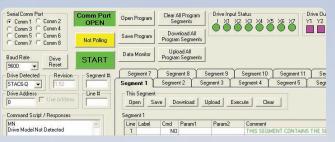
CONTROLLER (CONT): AI	I Models
INPUTS/OUTPUTS (CONT)	 Y1 output: Optical Darlington, NPN/sinking, 30 VDC max, 100 mA max. Function: brake relay Y2 output: Optical Darlington, NPN/sinking, 30 VDC max, 100 mA max. Function: motion or tach Y3 output: Optical Darlington, NPN/sinking, 30 VDC max, 100 mA max. 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.

Motion		Help	Line		Description C
W Products	Drive 2.21B		→1		MMI(wait for enter): "Press left or i
A A	Download		2		MMI: "JOGGING COMPLETE"
	Upload		3	\odot	Wait 1 seconds
Motor Encoder	Execute		_4	4	Go to line 1
			5	♦	<u></u>
	Save		6	♦	
Alarms Regen	Open		7	₩	
20000 Steps/rev	Print		8	¥	

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.



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All software applications run on Windows 7, Windows Vista, XP, 2000, NT, ME, 98.

Servo Motor Data



Economical packageNEMA frame sizes

encoder

• 2048 line (8192 count) incremental

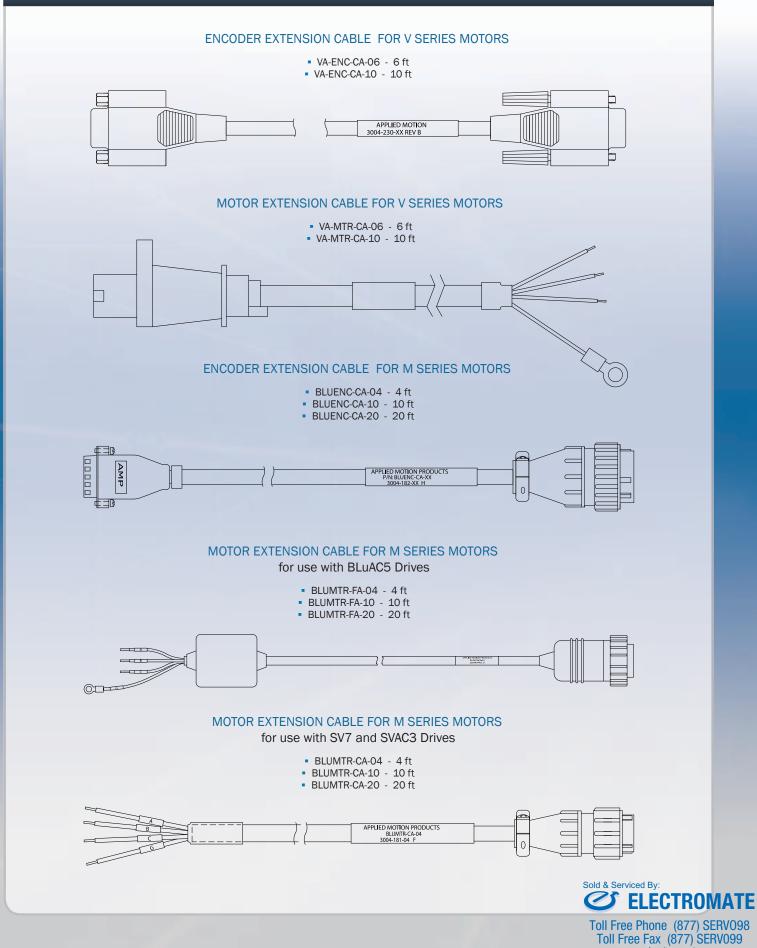
- M Series Motors:
- High torque density
- Metric frame sizes
- 2000 line (8000 count)incremental encoder

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
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



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Servo Motor Extension Cables



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14

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

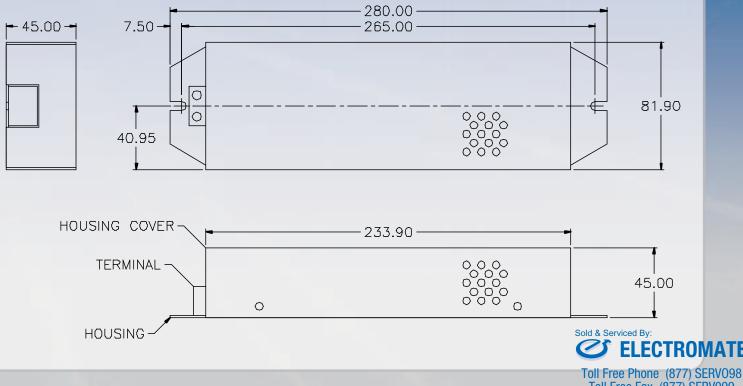
Clamp (for SV7) The RC-050 regeneration clamp is for use where regeneration from the motor may be excessive for the power supply. In these cases, the RC-050 is connected between the



drive and power supply and absorbs regenerated energy.

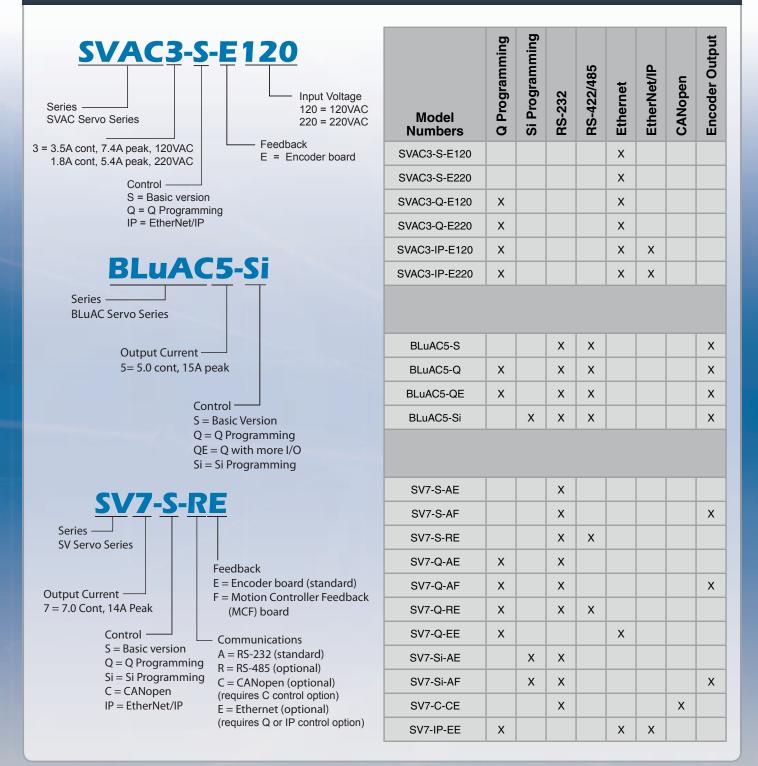
Braking resistor assembly - RA-100

For use with BLuAC5 dynamic braking and regeneration circuits.



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Servo Drive Model Numbers







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