

Sold by Servo Systems Co. 115 Main Road, P.O. Box 97, Montville, NJ 07045-0097  
 Toll Free: (800) 922-1103 Phone: (973) 335-1007 Fax: (973) 335-1661 www.servosystems.com

## MaxPlus® Servo Amplifiers.

A complete family that's  
 completely reliable.

The MaxPlus® Series of high performance servo amplifiers delivers rugged efficiency to match the broad scope of your applications and power range needs. Choose from a broad current range of 3 to 100 amps at 80 to 260 Vac (230 Series) and from 5 to 100 amps at 200 to 520 Vac (460 Series), all at 45 to 65 Hz.

### A legend of performance that lasts.

We didn't just design MaxPlus servo amps to work, we designed them to work hard, in the toughest conditions. So we built in advantages such as electrical transient protection on AC inputs and all I/O lines. We included a resolver for position and velocity feedback to keep things running smoothly, even when the motor heats up. To further minimize heat, we put in switch mode logic supplies. IGBT modules perform the high power switching.

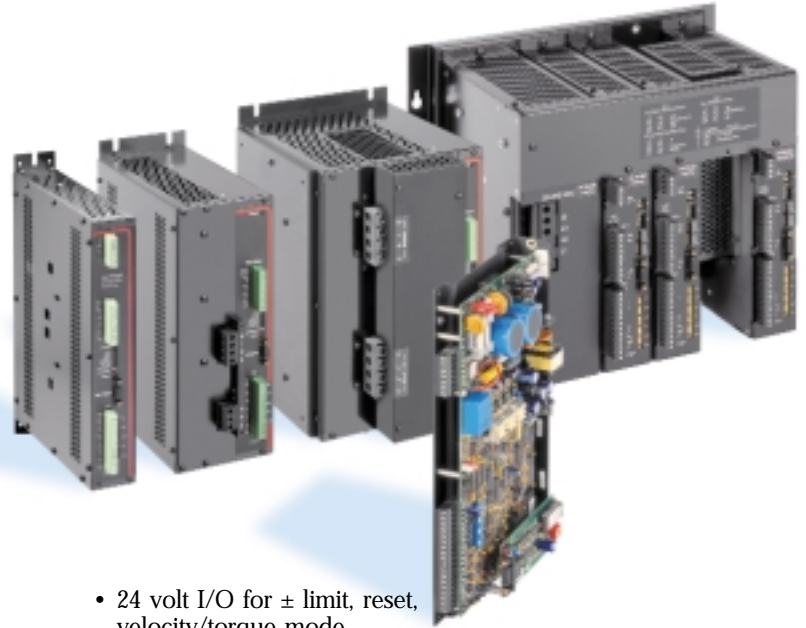
### Keeping costs and complications down.

You get advanced, self-contained, space-saving workhorses known the world over for dependability. You can depend on them for simple operation, too, with easy-to-read LED diagnostic indicators and simple one-turn visual adjustments.

### Design features that make sense. Because people like you helped design them.

We've worked with numerous customers to determine the most desirable features in a high performance servo amp. We've brought the best ideas together in the MaxPlus family. That means you also get:

- Efficient power conversion
- High frequency switching
- $\pm 10$  volts for maximum velocity or torque



- 24 volt I/O for  $\pm$  limit, reset, velocity/torque mode
- 2 differential analog channels (command and auxiliary)
- Motor and amplifier thermal protection
- Simple screw terminal interface
- Single or three-phase operation

### Making sure you're in the right place at the right time

For efficient control, we provide external position information to the motion-controller through simulated encoder and index outputs. AC line in-rush current protection allows the normal turn-on that's critical to first class multi-axis performance. Internal shunt regulators dissipate regenerative energy.

### Technology advances that produce results.

We are working with new and emerging technologies to improve our product offering. It is the mission of the MTS Automation Division to continually improve the quality, reliability and cost effectiveness of our products, while achieving higher levels of performance.

### Putting it all into a complete package

You can configure complete, matched systems with MaxPlus servo amps and high-quality MaxPlus servo motors, or you can use MaxPlus amps with other manufacturers' motors, whichever combination is best for you.

## Features

- Efficient Power Conversion
- High Frequency Switching
- Resolver Feedback
- Simulated Encoder Signals
- $\pm 10$  Volt output for Velocity and Torque Monitoring
- 12-24 Volt I/O for  $\pm$ Limit, Reset, Velocity/Torque Mode
- 2 Differential Analog Input Channels (Command and Auxiliary)
- LED Diagnostic Indicators
- Motor and Amplifier Thermal Protection
- AC, I/O and Bridge Transient Suppression
- Totally Self-Contained Design
- Phoenix™ Terminal Interface
- AC In-Rush Protection
- Single or Three Phase Operation
- Simple One-Turn Visual Adjustments
- Analog Tachometer Option
- No Isolation Transformer Required
- Quasi Trapezoid with Torque Linearization: (Torque Ripple 5% Maximum)
- Common Cabling

## Specifications

### Environmental Characteristics:

Operating Temperature:

- 0-45°C Maximum Ambient (32-113°F)

### Relative Humidity:

- 0-95%, Non-condensing

### Encoder Simulation:

- TTL Differential Output Plus Index (Line Driver Output)
- Phase Quadrature
- Line Count (select with jumper): Standard 1024,512,256, and 128 lines available  
“-14” Option-4096 lines available
- Accuracy:
 

Resolver Cable Length	Maximum Error
25 foot	$\pm 20$ minutes
50 foot	$\pm 30$ minutes
100 foot	$\pm 40$ minutes

### Fault Protection:

- Shorts
- Amplifier Temperature
- Motor Temperature
- Continuous Current
- High BUS (Excess Regeneration)
- Resolver Feedback

## Input/Output Interface Analog Signals

- Velocity Command Input: Differential Input 0 to  $\pm 10$  Vdc (15 Vdc Maximum)
- Auxiliary Input: Differential Input 0 to  $\pm 10$  Vdc (15 Vdc Maximum)
- Velocity Output: (Switch Selectable)  
1.3 Volts Per 1000 rpm (MPA-03/06/09)  
2.8 Volts Per 1000 rpm (MPA-05/09/15/25/35/50/75/100)  
With the “-14” option (14-bit mode) the tach gradient is 2.1 Volts Per 1000 rpm
- Current Output:  $\pm 10$  Volts =  $\pm$ Peak Current

## Input/Output Interface 24 Volt Logic:

### Inputs

- RES (Reset/Enable)
- +LIM (+Limit)
- -LIM (-Limit)
- V/T (Velocity/Torque) Select

### Outputs

- Fault/Ready

## Jumper/Switch Configurations

- Pole Setting
- Tach Gradient
- I/O Logic
- Encoder Line Count
- Filtering

## Adjustments

- BAL (Balance)
- CUR (0-Peak Current Limit)
- RESP (Response)
- SIG (Signal)
- LEAD (Lead)

## Options

- External Shunts
- Brushless Tachometer Input
- Separate Logic Supply
- Common DC bus
- 14 Bit Mode

## Controller Options

- Indexer
- Clamp
- Pulse and Direction



MTS Systems Corporation  
Automation Division

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[www.mtsautomation.com](http://www.mtsautomation.com)

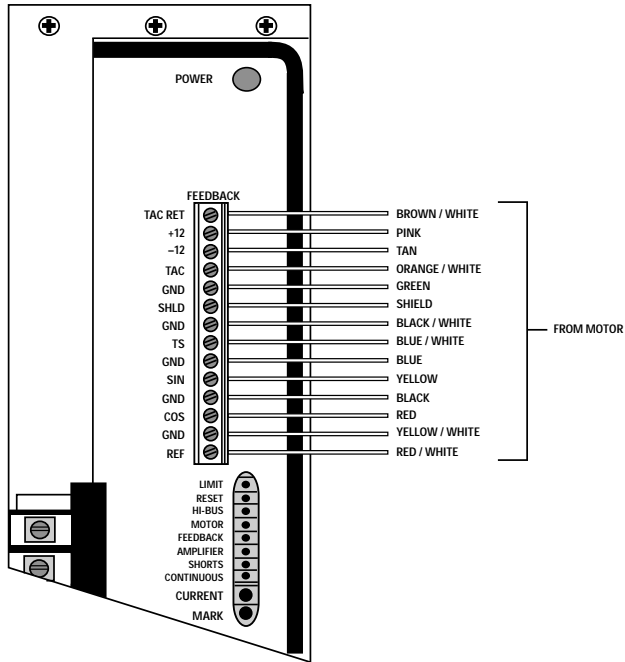
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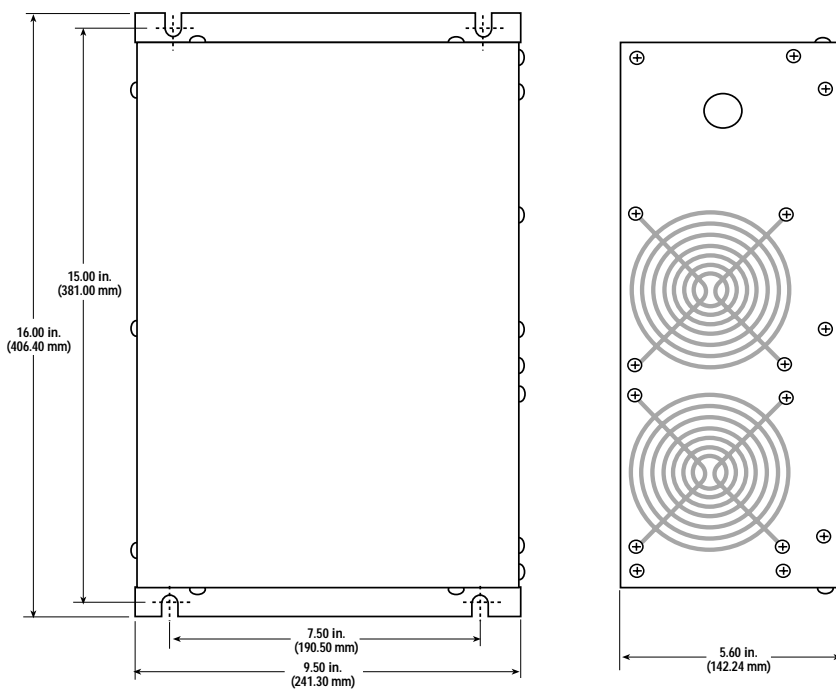
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**Brushless Tachometer**



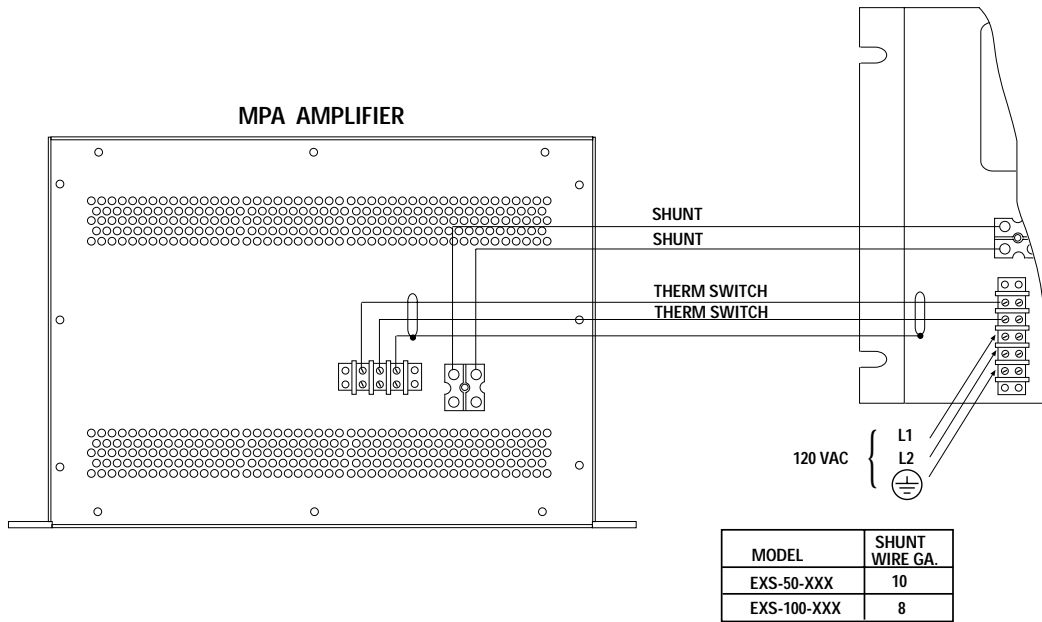
When the Brushless Tachometer option is required, the feedback wiring is extended to facilitate the additional signals.

**External Shunt Mechanical Footprint**



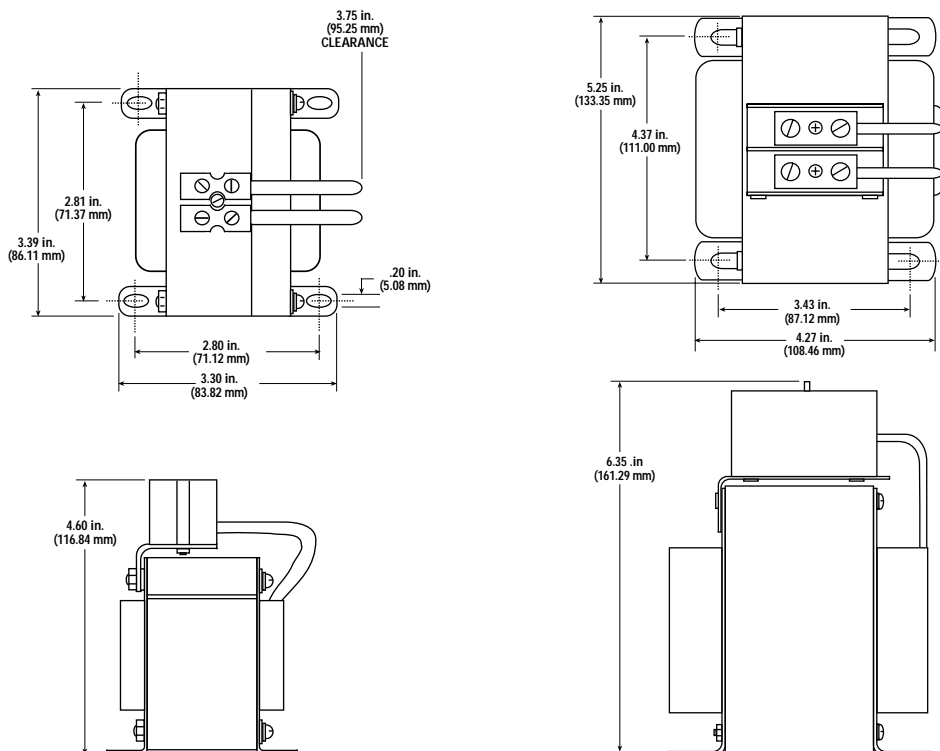
There are two external shunt loads available for the 230 and 460 series: EXS-50-XXX and EXS-100-XXX where the "XXX" designates the series.

**Amplifier/External Shunt Connection**



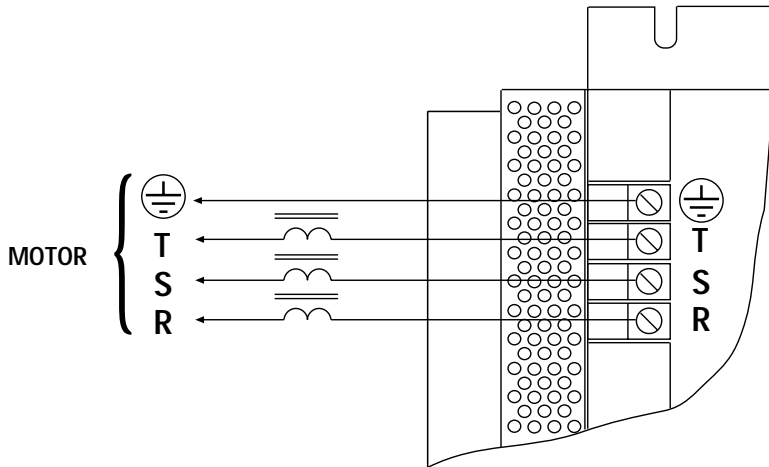
The shunt load should be mounted external to the amplifier enclosure but within four feet. The wiring can be accessed through a 3/4" seal tight connection with an optional cover or it can be wired directly.

**External Inductors Mechanical Footprints**



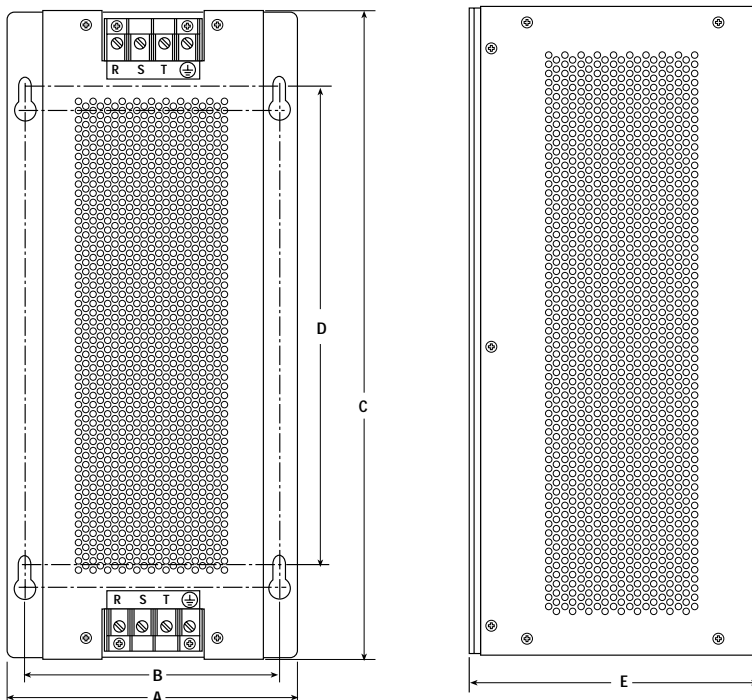
There are two external inductors available, IND-50-1 mH and IND-100-5mH.

External Inductor Connection



External inductors can be placed in the R, S, and T leads of the amplifier to insure that the minimum inductance specification is met. Since the inductors can become very hot, it is recommended that they be wired external to the amplifier enclosure.

Inductor Box Mechanical Footprints



In applications where there is a requirement to reduce the effects of radiated noise, the inductors are available in an enclosure. There are two inductor boxes available; IBX-50-1mH and IBX-100-.5mH.

Inductor Box Dimensions

Model	A in.[mm]	B in.[mm]	C in.[mm]	D in.[mm]	E in.[mm]
IBX-50-1mH	7.25[184.15]	6.35[161.29]	12.00[304.80]	8.50[215.90]	5.90[149.86]
IBX-100-.5mH	8.00[203.20]	7.00[177.80]	17.85[453.39]	13.26[336.80]	7.75[198.85]

MPA	06	230	Options											
			-T	-EXS	-14	-S	-S	-HT	-EDC	-RC	-RT	-12P	-CB	-ANF3
MAX PLUS AMPLIFIERS	AMPS	LINE VOLTAGE	TACH	EXS	14 BIT.	110 VOLT SEPARATE SUPPLY	24 VOLT SEPARATE SUPPLY	HIGH TURN POTENTIOMETER	EDC	REVERSE CONNECTORS	RIGHT ANGLE CONNECTORS	12 POLES	COMMON BUS	ANF3
	03	230	*	N/A	STD.	*	N/A	*	*	*	*	N/A	N/A	N/A
	06	230	*	N/A	STD.	*	N/A	*	*	*	*	N/A	N/A	N/A
	09	230	*	N/A	STD.	*	N/A	*	*	*	*	N/A	N/A	N/A
	05	230	*	N/A	*	*	N/A	*	*	*	*	N/A	N/A	*
		460	*	N/A	*	*	N/A	*	*	*	*	N/A	N/A	*
	07	230	*	N/A	*	*	*	*	*	*	*	N/A	N/A	*
		460	*	N/A	*	*	N/A	*	*	*	*	N/A	N/A	*
	09	230	*	N/A	*	*	N/A	*	*	*	*	N/A	N/A	*
		460	*	N/A	*	*	N/A	*	*	*	*	N/A	N/A	*
	10	230	*	N/A	*	*	*	*	*	*	*	N/A	N/A	*
		460	*	N/A	*	*	N/A	*	*	*	*	N/A	N/A	*
	15	230	*	N/A	*	*	*	*	*	*	*	N/A	N/A	*
		460	*	N/A	*	*	N/A	*	*	*	*	N/A	N/A	*
	25	230	*	*	*	*	N/A	*	*	*	*	*	*	*
		460	*	*	*	*	N/A	*	*	*	*	*	*	*
	35	230	*	*	*	*	N/A	*	*	*	*	*	*	*
		460	*	*	*	*	N/A	*	*	*	*	*	*	*
	50	230	*	*	*	*	N/A	*	*	*	*	*	*	*
		460	*	*	*	*	N/A	*	*	*	*	*	*	*
	75	230	*	*	*	*	N/A	*	*	*	*	*	*	*
		460	*	*	*	*	N/A	*	*	*	*	*	*	*
	100	230	*	*	*	*	N/A	*	*	*	*	*	*	*
		460	*	*	*	*	N/A	*	*	*	*	*	*	*

**MPA Options** \* = Available N/A = Not available (not all available options can be combined, please consult factory)

**Tach** = Brushless Tachometer. Allows an analog tachometer feedback to be used with the drive. The input is fed directly into the velocity feedback loop for better performance.

**EXS** = External Shunt. This option with an external shunt box can dissipate more regenerative energy than the internal shunt capability.

**14 bit** = 14 bit resolution. Allows the amplifier to output 4096 encoder lines or 16384 counts per revolution of the motor.

**S** = Separate Supply. This option keeps the logic supply powered to retain current position.

**HT** = High Turn Potentiometer. BAL, CUR, RESP, SIG, LEAD user adjustment pots are 25 turn potentiometer instead of a single turn.

**EDC** = EDC Controller. The drive has preconfigured jumpers and switches to connect to MTS Automation EDC Controller.

**RC** = Reverse Connectors. Feedback and I/O Phoenix connectors where the wires attach to the left rather than to the right side of connector.

**RT** = Right Angle Connectors. Feedback and I/O Phoenix connectors where the wires attach to the front rather than to the right side of connector.

**12P** = 12 Pole EPROM installed which allows commutation of a twelve pole motor.

**CB** = Common Bus. Allows the DC bus of multiple amplifiers to be connected together to allow the bus capacity to be shared.

**ANF3** = This amplifier has the same specifications as the MPA 230/460 drives with the following exceptions:

- 1) The 14 bit option is switch selectable.
- 2) Over-speed fault adjustment.
- 3) Controller Card options can be installed.



## MTS Systems Corporation Automation Division

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