

## FEATURES

- Updated version of our Series 58 Digital Servo Amplifier – with more powerful processor for enhanced monitoring and configuration capabilities.
- High performance DSP based servo controls motor force or torque. Control of velocity or position using the motor's Hall or encoder signals is an option.
- Controls brush-type, brushless-trapezoidal and brushless-sinusoidal motors.
- User inputs motor parameters, voltage, peak and continuous current limit, using HyperTerminal. Setup software automatically computes the algorithm for a 2kHz current loop bandwidth.
- Proprietary PWM software controlled switching scheme yields ultra-low ripple at low current levels, zero crossover distortion, and minimizes EMI in noise sensitive applications
- Differential amplifiers accept a single  $\pm 10V$  analog current command for trapezoidal brushless and brush type motors.
- Optional inputs allow digital commands through the RS-232 or Serial Peripheral Interface.
- 3 output current ranges and scale factors available.
- Optically isolated digital inputs for Enable/Reset, Brake, and  $\pm$ Travel Limits.
- Motor Current monitor output, and optically isolated digital output provides controller Fault indication.
- Fault protection makes this drive virtually indestructible.
- Operates from one low cost 24 - 160 VDC regulated or unregulated power supply or battery.



## PRODUCT DESCRIPTION

This Digital Servo Amplifier provides DSP based digital closed loop four-quadrant PWM control of force or torque of permanent magnet, linear or rotary, brush or brushless DC motors. Our PWM current control algorithm, current sensing method, and advanced switching scheme yields performance comparable to a linear servo amplifier.

An update to our Series 58 Digital Servo Amplifier, the Series 560 provides the same wide range of output power options, but with a more powerful on-board processor. The powerful DSP in the Series 560 enables additional flexibility for enhanced monitoring and custom configurations.

This Digital Drive will reduce expensive motor drive stocking requirements because it will control brush-type, Brushless-trapezoidal and Brushless-sinusoidal motors.

Setup is easy. The operating configuration – motor type, motor parameters, operating voltage, peak and continuous current limits, and system parameters for velocity or position control are all input by the user to a PC based setup program which automatically downloads the information, with the computed algorithm, into the flash memory of the drive via an RS-232 port. The drive can be reconfigured at any time by running the setup program.

**LOW VOLTAGE MODELS  
GENERAL SPECIFICATIONS**

<b>MODEL</b>	<b>560B-3-2-48</b>	<b>560C-3-4-48</b>	<b>560D-3-6-48</b>
INPUT POWER BUS <sup>(3)</sup>	24 to 48 VDC	24 to 48 VDC	24 to 48 VDC
CONT. OUTPUT POWER (Max.)	450 watts <sup>(1)</sup>	675 watts <sup>(1)</sup>	1350 watts <sup>(1)</sup>
CONT. OUTPUT CURRENT	10 amps <sup>(1)</sup>	15 amps <sup>(1)</sup>	30 amps <sup>(1)</sup>
PEAK OUTPUT CURRENT	20 amps <sup>(1)</sup> (1 sec typ.)	30 amps <sup>(1)</sup> (1 sec typ.)	60 amps <sup>(1)</sup> (1 sec typ.)
SCALE FACTOR ( A / V )	2	4	6
OUTPUT VOLTAGE @ CONT. OUTPUT CURRENT	Input Bus Voltage - 3 Volts Typical	Input Bus Voltage - 3 Volts Typical	Input Bus Voltage - 3 Volts Typical
MAX HEAT SINK TEMPERATURE	Faults if > 70 °C	Faults if > 70 °C	Faults if > 70 °C
CURRENT LOOP BANDWIDTH	2 kHz Typical	2 kHz Typical	2 kHz Typical
SWITCHING FREQUENCY	20kHz Symmetric PWM <sup>(2)</sup>	20kHz Symmetric PWM <sup>(2)</sup>	20kHz Symmetric PWM <sup>(2)</sup>
MINIMUM LOAD INDUCTANCE	120 UH	120 UH	120 UH
WEIGHT	1.6 lbs	1.6 lbs	1.6 lbs

**HIGH VOLTAGE MODELS  
GENERAL SPECIFICATIONS**

<b>MODEL</b>	<b>560E-3-1-160</b>	<b>560F-3-2-160</b>	<b>560G-3-3-160</b>
INPUT POWER BUS <sup>(3)</sup>	24 to 160 VDC	24 to 160 VDC	24 to 160 VDC
CONT. OUTPUT POWER (Max.)	1570 watts <sup>(1)</sup>	1570 watts <sup>(1)</sup>	1570 watts <sup>(1)</sup>
CONT. OUTPUT CURRENT	10 amps <sup>(1)</sup>	10 amps <sup>(1)</sup>	10 amps <sup>(1)</sup>
PEAK OUTPUT CURRENT	10 amps <sup>(1)</sup> (1 sec typ.)	20 amps <sup>(1)</sup> (1 sec typ.)	30 amps <sup>(1)</sup> (1 sec typ.)
SCALE FACTOR ( A / V )	1	2	3
OUTPUT VOLTAGE @ CONT. OUTPUT CURRENT	Input Bus Voltage - 3 Volts Typical	Input Bus Voltage - 3 Volts Typical	Input Bus Voltage - 3 Volts Typical
MAX HEAT SINK TEMPERATURE	Faults if > 70 °C	Faults if > 70 °C	Faults if > 70 °C
CURRENT LOOP BANDWIDTH	2 kHz Typical	2 kHz Typical	2 kHz Typical
SWITCHING FREQUENCY	20kHz Symmetric PWM <sup>(2)</sup>	20kHz Symmetric PWM <sup>(2)</sup>	20kHz Symmetric PWM <sup>(2)</sup>
MINIMUM LOAD INDUCTANCE	400 UH	400 UH	400 UH
WEIGHT	1.6 lbs	1.6 lbs	1.6 lbs

### OPERATING CONTROL SIGNALS and INDICATORS

Input analog control signal	+_ 10 Volts
Digital Input Commands	Rs-232, SPI
Peak Current limit	Software adjustable
Continuous Current limit	Software adjustable
Drive Enable/Reset	5V logic, optically isolated
(+) Travel Limit	5V logic, optically isolated
(-) Travel Limit	5V logic, optically isolated
Brake	5V logic, optically isolated
Fault and/or Brake status	5V logic, optically isolated
Drive Enabled indicator	Green LED
Brake indicator	Red LED
Fault indicator	Red LED
Digital Hall Effect Sensors	3 channels,+5 Volts,Gnd

### AUXILIARY OUTPUTS

Motor (bus) current monitor	2.5v = 0 amps, 5v = +full scale, 0v = -full scale
Detailed Operation/Fault Status	RS-232 Port Returns current operating status and event history. History cleared when drive re-enabled after fault condition.
Logic supply	5VDC with 25 ma max available for external use.

### FAULT PROTECTION CIRCUITS

Controller over-temperature	Under-voltage
Current overload ( $\pm 25\% >$ Peak Amps)	Over-speed
Short Circuit (Ph-Ph, Ph-Gnd)	Motor stall
Over-voltage	Illegal Hall sensor states

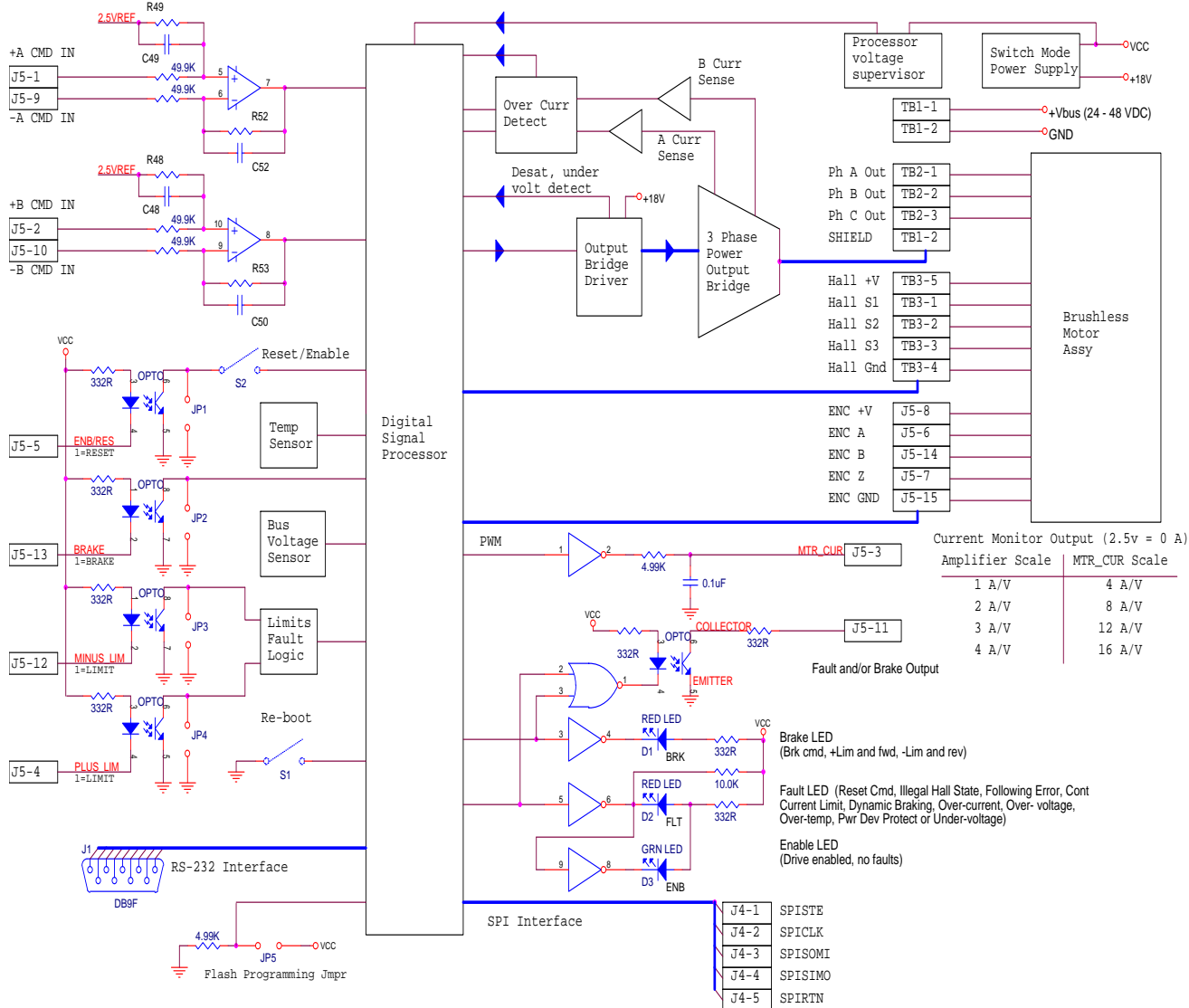
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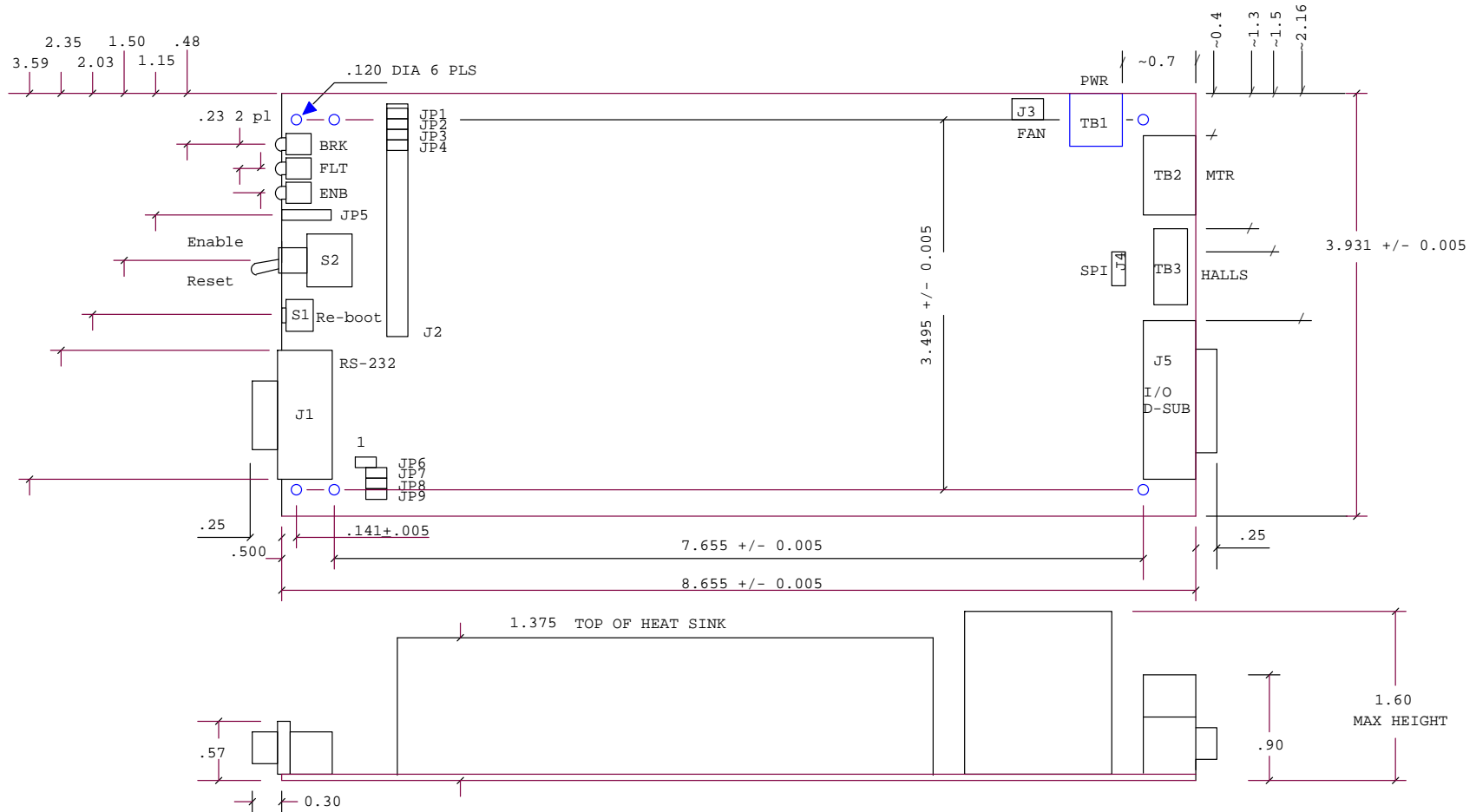
1. Depends on ambient operating temperature and heat sink.

For the >10 amperes continuous output, we recommend forced convection cooling with a minimum airflow of 100 CFM. Consult factory for assistance.

2. Equivalent to 40 KHz asymmetric PWM. The algorithm sampling update rate is 20 KHz.

3. The user should protect the Amplifier and any external circuits from a catastrophic failure by fusing the input power connections to the amplifier. See Application Note Supplementary Fuse Protection (which can be viewed at [www.peakservo.com](http://www.peakservo.com)).





NOTES:1. ALL DIMENSIONS SPECIFIED IN INCHES