DSPautomation

Bus Voltage Input

- 17 - 135 VAC
- 180 – 260 VAC

Control Modes

- Gearing
- Position
- Velocity
- Torque

Command Interface

- Step/Direction
- ± 10V Velocity or Torque Command
- Master encoder (gearing)
- Network (EtherCAT, CANopen)
- Descrete I/O

Communication

- USB
- Network

Servomotor Feedback

- Incremental quadrature A/B encoder
- Resolver
- Serial Encoder (BiSS, EnDAT 2.2)
- Digital Halls

Description

The M Series servo drive is for powering brushless or brush servomotors. Logic control power is internally generated from the VDC bus. An option is available for 24 VDC isolated control power supplied externally by the end user. The small package design outputs up to 3.6 kW continuous power.

The M Series all digital servo drive utilizes a 32 bit digital signal processor (DSP) and 16 bit A/D's and D/A's for control loops and servomotor feedback inputs to provide ultimate high performance. The drive controls the failsafe brake and thermal sensing from the servomotor. Servomotor feedback is a determining factor in performance of a servo system. The M Series comes standard with BiSS and EnDAT 2.2 serial encoder or SSI interface.

The M Series supports EtherCAT, www.ethercat.org and CANopen, www.canopen.org. Other networks are available on request.

Setup and Commissioning

A USB port on the servo drive is used for communication between the servo drive and PC (personal computer). DSP Automation provides easy to us Window ™ software for setup and commission.

Setup requires setting the parameters for the ***servo drive*** and the ***servomotor***. These parameters are easily set by the user or DSP Automation will preset for the customer if requested.

Commissioning the system for optimum performance is a challenge for most users. DSP Automation provides standard and advanced control adjustments for the optimum performance required for the application. An integrated two channel oscilloscope provides instantaneous feedback for visually viewing the dynamic performance of the system.

DSP Automation does not leave the task of commissioning the servo system to the experience of our customers. We provide full support to guarantee success. To qualified customers, a DSP Automation engineer will be at the customer's location for commissioning and training for the first system.

Technical Specifications

M Series (120 VAC, 1 Ø)								
Input Voltage	17 - 135 VAC, 1 Ø, 50/60 Hz							
Output Current	Continuous current @ 40° C (A rms)	1	2	4	6	8	12	15
	Peak (A rms)	3	6	12	18	24	30	30
	Peak Current Time (sec.)	3						

M Series (240 VAC, 1/3 Ø)								
Input Voltage	180 VAC - 260 VAC, 1/3 Ø, 50/60 Hz							
Output Current	Continuous current @ 40° C (A rms)	1	2	4	6	8	12	15
	Peak (A rms)	3	6	12	18	24	30	30
	Peak Current Time (sec.)	3						

Performance Specifications

Control Logic Voltage	Internal DC/DC converter	
Current Loop BW	3.0kHz	
Velocity Loop BW	600Hz	
PWM Frequency	20kHz	
Emulated Encoder Max Output Frequency	2.5 MHz	
Commissioning/ Diagnostics	Software (USB port), LEDs	
Encoder Feedback	Incremental Encoder / Halls Absolute Serial: Single / Multiturn, 17-25bit, BiSS / EnDAT 2.2 / SSI Tachometer: (+/-50V max.) 16-bit A/D Resolution	
Operating Modes	Torque, Velocity, Pulse & Direction, Encoder Follower, Sensorless (Brushed only)	
Motor Temperature Sensor	NTC, PTC, Thermostat	
Motor Current Waveform	Sinusoidal	
Analog Input	+/-10V, 16-bit A/D Resolution, software scalable	
Analog Output	+/-10V, Software Selectable/scalable	
Digital Inputs	3 Inputs, 5-28VDC control voltage	
Digital Outputs	2 Software Selectable Outputs, 5-28VDC, 100mA max.	
Servomotor Brake Control	Software Selectable Output, 24-28VDC, 3A max. (user supplied power)	
Operating Ambient Temperature	0 °C to 50 °C	
Relative Humidity	5 - 95% non-condensing	
Regen Capability	Internal Resistor 30W cont., 1kW peak	External Resistor Up to 100% of Drive Capacity

SERVO DRIVE MODEL NUMBER

M - 240 - 2 - RS - NEC - 24 - Cxxx

M Family
(AC Power Input)

Voltage Rating
70: 17-70 VDC
120: 80-135 VDC
240: 140-260 VDC

Current Rating (RMS)
1: 1A
2: 2A
4: 4A
6: 6A
8: 8A
12: 12A
15: 15A

Motor Feedback Option
N/A: Standard
RS: Resolver
BS: BiSS
ED: EnDAT 2.2
EN: EnDAT 2.1
SC: Sine/Cosine
HP: Hiperface
SS: SSI

CUSTOM:
C000 - C999
N/A:
STANDARD

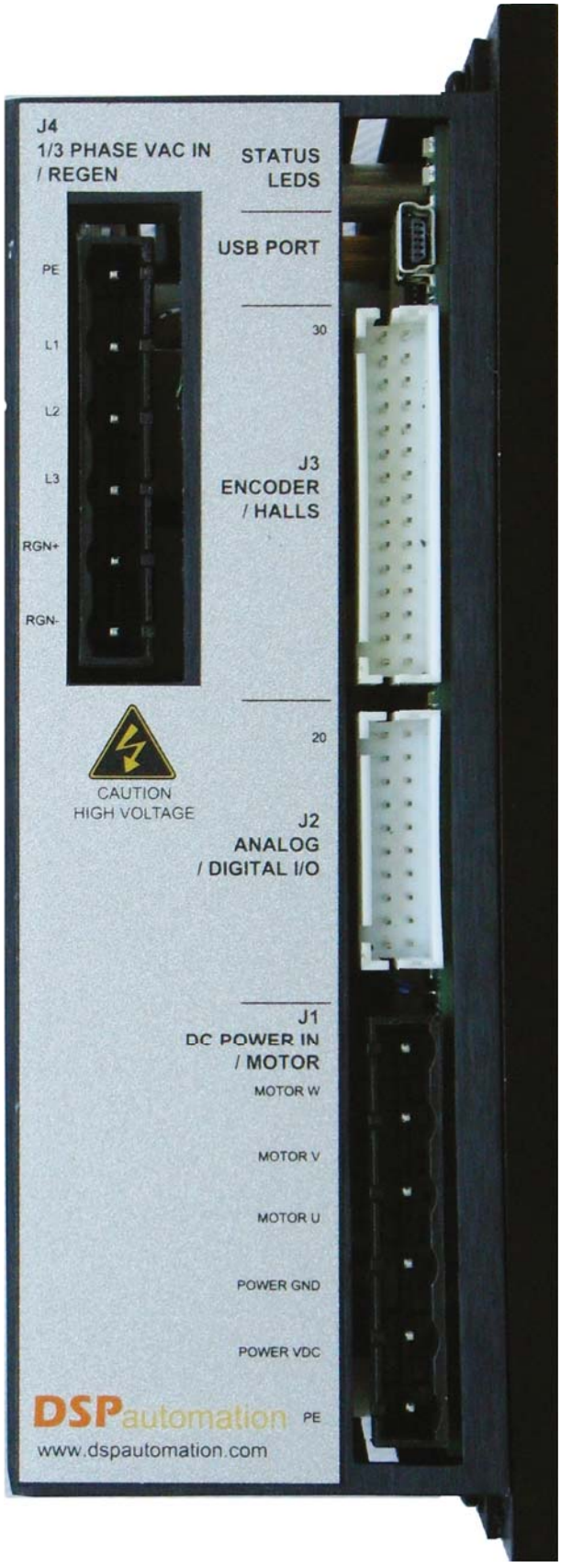
N/A: DC Bus Powered
24: 24 VDC PS Option

Network / Com Options
N/A: No network /Com
NEC: Ethercat
NEP: Ethernet Powerlink
NSE: SERCOS III
NPB: Profibus
NCO: CanOpen
NDN: DeviceNet
NIP: EtherNet/IP
RS2: RS-232
RS4: RS-485
DIO: IO Extension Module

M Series Model Number

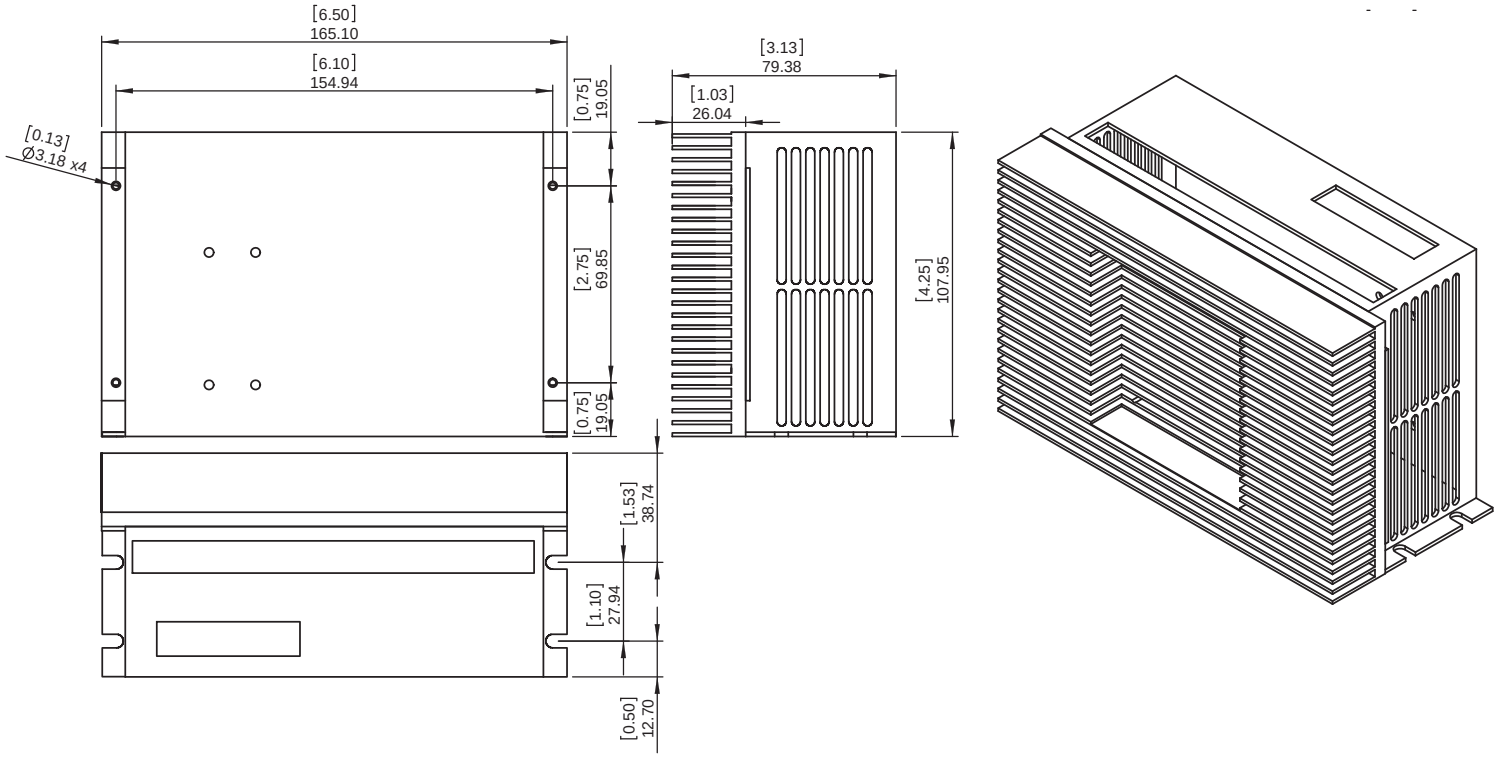
Examples:

- 45 VAC bus, 8 amps continuous with standard incremental encoder input _ **M-120-8**
- 220 VAC bus, 1 or 3 Ø, 4 amps continuous with standard incremental encoder input _ **M-240-4**
- 120 VAC bus, 6 amps continuous with resolver _ **M-120-6-RS**
- 240 VAC bus, 1 or 3 Ø, 12 amps continuous with BiSS serial encoder and EtherCAT _ **M-240-12-BS-NEC**


J4
1/3 PHASE VAC IN
/ REGEN
STATUS
LEDS
USB PORT
30
PE
L1
L2
L3
RGN+
RGN-
J3
ENCODER
/ HALLS
20
CAUTION
HIGH VOLTAGE
J2
ANALOG
/ DIGITAL I/O
J1
DC POWER IN
/ MOTOR
MOTOR W
MOTOR V
MOTOR U
POWER GND
POWER VDC
DSPautomation
PE
www.dspautomation.com

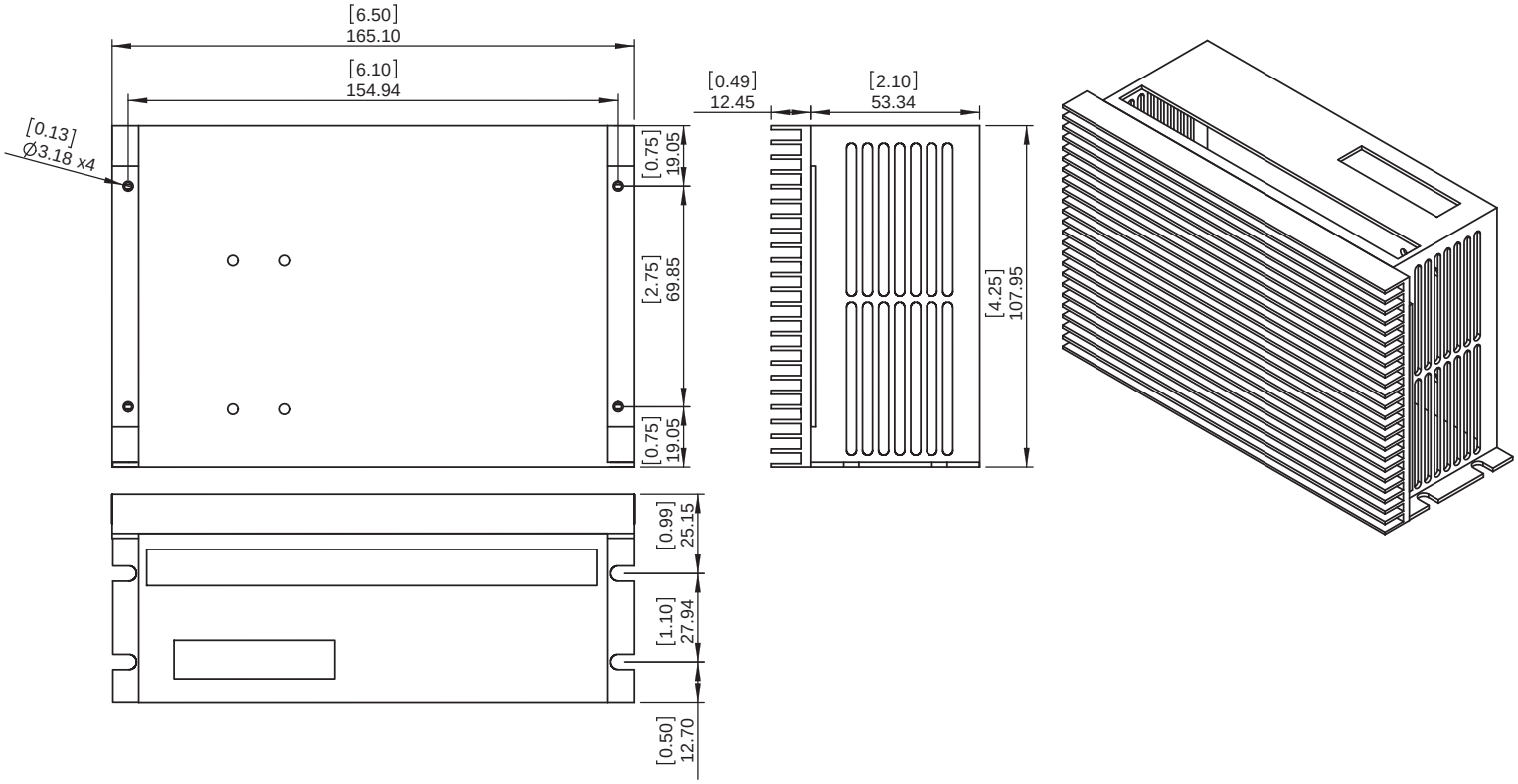
M SERIES (8-15 amps cont.)

MOUNTING DRAWING, UNITS: MM (INCH)



M SERIES (1-6 amps cont.)

MOUNTING DRAWING, UNITS: MM (INCH)



Bus Voltage Input

- 20 - 100 VDC
- 100 – 365 VDC

Control Modes

- Gearing
- Position
- Velocity
- Torque

Command Interface

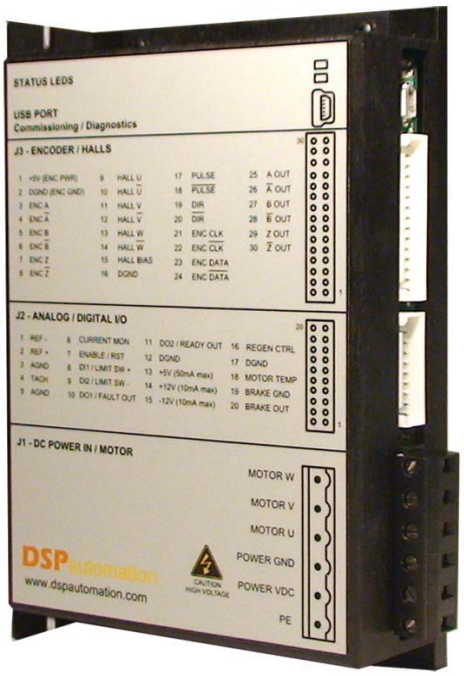
- Step/Direction
- ± 10V Velocity or Torque Command
- Master encoder (gearing)
- Network (EtherCAT, CANopen)
- Descrete I/O

Communication

- USB
- Network

Servomotor Feedback

- Incremental quadrature A/B encoder
- Resolver
- Serial Encoder (BiSS, EnDAT 2.2)
- Digital Halls



The X Series servo drive is for powering brushless or brush servomotors. The VDC input bus allows for lower cost multi-axis solutions and space saving. Logic control power is internally generated from the dc bus. An option is available for 24 VDC isolated control power supplied externally by the end user. The small package design outputs up to 3.6 kW continuous power.

The X Series all digital servo drive utilizes a 32 bit digital signal processor (DSP) and 16 bit A/D's and D/A's for control loops and servomotor feedback inputs to provide ultimate high performance. The drive controls the failsafe brake and thermal sensing from the servomotor. Servomotor feedback is a determining factor in performance of a servo system. The X Series comes standard with BiSS and EnDAT 2.2 serial encoder or SSI interface.

The X Series supports EtherCAT, www.ethercat.org and CANopen, www.canopen.org. Other networks are available on request.

Setup and Commissioning

A USB port on the servo drive is used for communication between the servo drive and PC (personal computer). DSP Automation provides easy to us Window ™ software for setup and commission.

Setup requires setting the parameters for the ***servo drive*** and the ***servomotor***. These parameters are easily set by the user or DSP Automation will preset for the customer if requested.

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Technical Specifications **X Series** (VDC)

Input Voltage	20 – 100 VDC **or** 100 - 365 VDC							
Output Current	Continuous current @ 40° C (A rms)	1	2	4	6	8	12	15
	Peak (A rms)	3	6	12	18	24	30	30
	Peak Current Time (sec.)	3						

Performance Specifications

Control Logic Voltage	Internal DC/DC converter			
Current Loop BW	3.0kHz			
Velocity Loop BW	600Hz			
PWM Frequency	20kHz			
Emulated Encoder Max Output Frequency	2.5 MHz			
Commissioning/ Diagnostics	Software (USB port), LEDs			
Encoder Feedback	Incremental Encoder / Halls Absolute Serial: Single / Multiturn, 17-25bit, BiSS / EnDAT 2.2 / SSI Tachometer: (+/-50V max.) 16-bit A/D Resolution			
Operating Modes	Torque, Velocity, Pulse & Direction, Encoder Follower, Sensorless (Brushed only)			
Motor Temperature Sensor	NTC, PTC, Thermostat			
Motor Current Waveform	Sinusoidal			
Analog Input	+/-10V, 16-bit A/D Resolution, software scalable			
Analog Output	+/-10V, Software Selectable/scalable			
Digital Inputs	3 Inputs, 5-28VDC control voltage			
Digital Outputs	2 Software Selectable Outputs, 5-28VDC, 100mA max.			
Servomotor Brake Control	Software Selectable Output, 24-28VDC, 3A max. (user supplied power)			
Operating Ambient Temperature	0 °C to 50 °C			
Relative Humidity	5 - 95% non-condensing			
Regen Capability	Internal Resistor	30W cont., 1kW peak	External Resistor	Up to 100% of Drive Capacity

SERVO DRIVE MODEL NUMBER

X - 365 - 2 - RS - NEC - 24 - Cxxx

X Family
(DC Power Input)

Voltage Rating
100: 20-100 VDC
165: 100-180 VDC
365: 200-365 VDC

Current Rating (RMS)
1: 1A
2: 2A
4: 4A
6: 6A
8: 8A
12: 12A
15: 15A

Motor Feedback Option
N/A: Standard
RS: Resolver
BS: BiSS
ED: EnDAT 2.2
EN: EnDAT 2.1
SC: Sine/Cosine
HP: Hiperface
SS: SSI

CUSTOM:
C000 - C999
N/A:
STANDARD

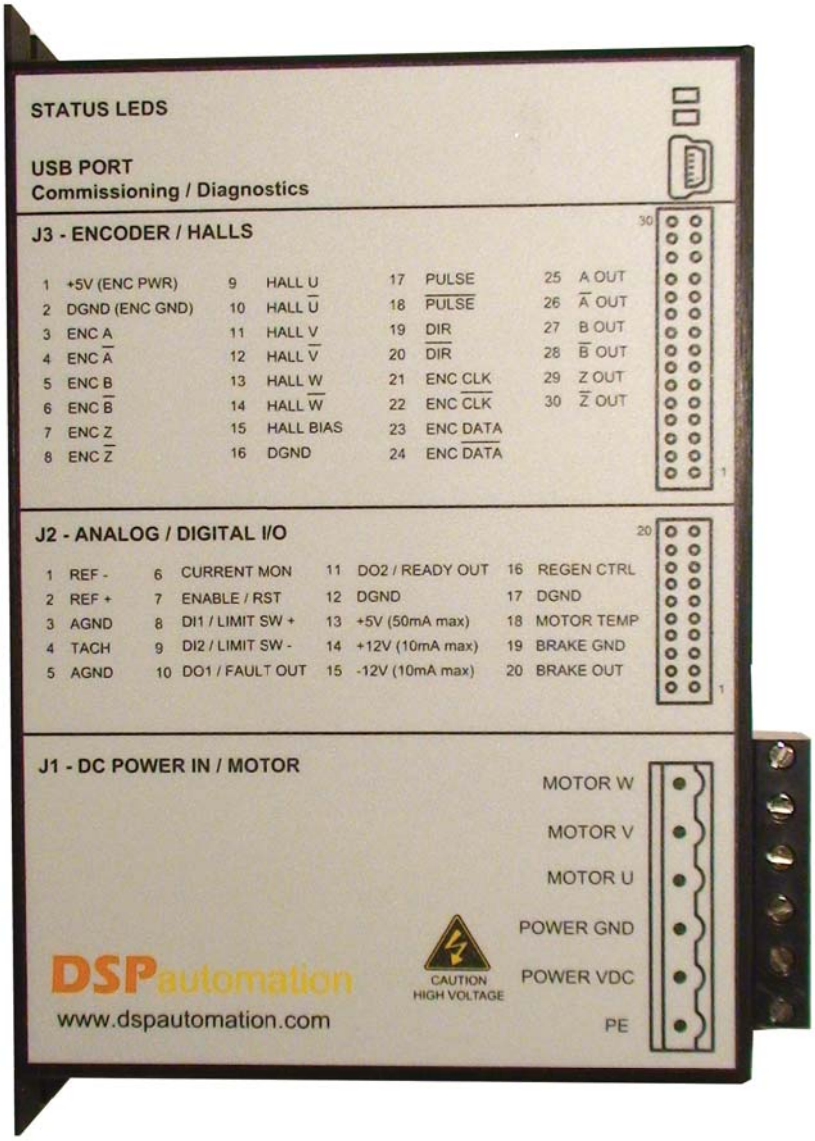
N/A: DC Bus Powered
24: 24 VDC PS Option

Network / Com Options
N/A: No network /Com
NEC: Ethercat
NEP: Ethernet Powerlink
NSE: SERCOS III
NPB: Profibus
NCO: CanOpen
NDN: DeviceNet
NIP: EtherNet/IP
RS2: RS-232
RS4: RS-485
DIO: IO Extension Module

X Series Model Number

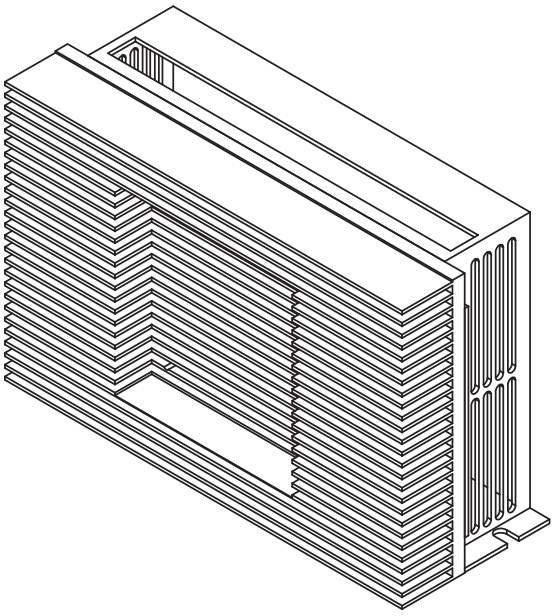
Examples:

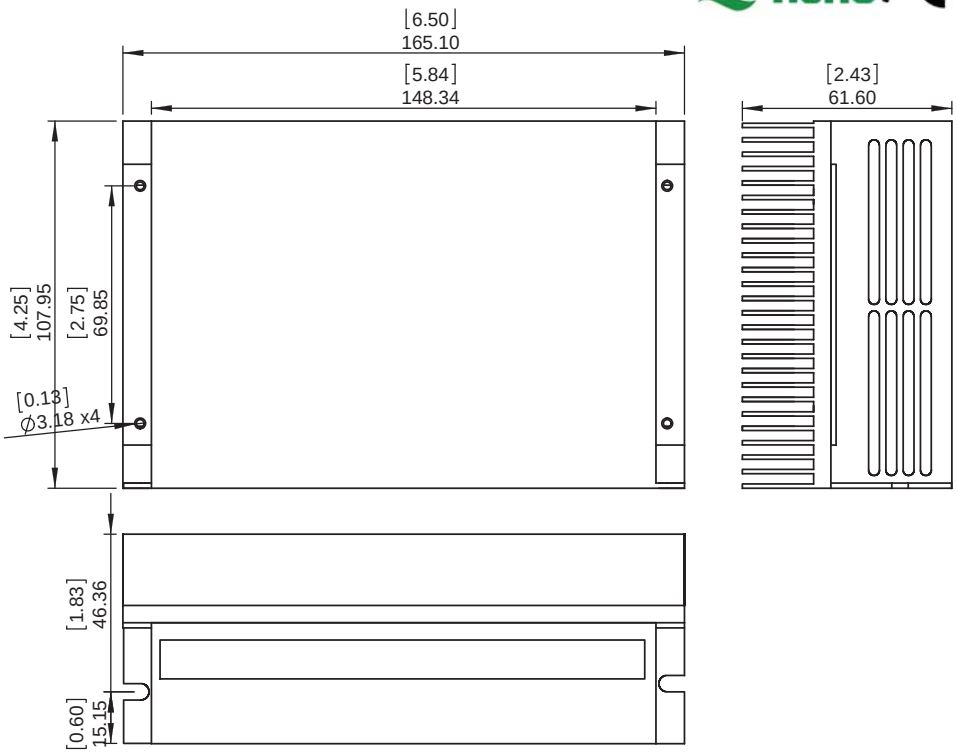
- 45 VDC bus, 8 amps continuous with standard incremental encoder input _ **X-100-8**
- 300 VDC bus, 4 amps continuous with standard incremental encoder input _ **X-365-4**
- 160 VDC bus, 6 amps continuous with resolver _ **X-365-6-RS**
- 300 VDC bus, 2 amps continuous with BiSS serial encoder and CANopen network _ **X-365-2-BS-NCO**


STATUS LEDS
USB PORT
Commissioning / Diagnostics
J3 - ENCODER / HALLS
30
1
1 +5V (ENC PWR)
2 DGND (ENC GND)
3 ENC A
4 ENC Ā
5 ENC B
6 ENC B̄
7 ENC Z
8 ENC Z̄
9 HALL U
10 HALL Ū
11 HALL V
12 HALL V̄
13 HALL W
14 HALL W̄
15 HALL BIAS
16 DGND
17 PULSE
18 PULSE
19 DIR
20 DIR
21 ENC CLK
22 ENC CLK
23 ENC DATA
24 ENC DATA
25 A OUT
26 Ā OUT
27 B OUT
28 B̄ OUT
29 Z OUT
30 Z̄ OUT
J2 - ANALOG / DIGITAL I/O
20
1
1 REF -
2 REF +
3 AGND
4 TACH
5 AGND
6 CURRENT MON
7 ENABLE / RST
8 DI1 / LIMIT SW +
9 DI2 / LIMIT SW -
10 DO1 / FAULT OUT
11 DO2 / READY OUT
12 DGND
13 +5V (50mA max)
14 +12V (10mA max)
15 -12V (10mA max)
16 REGEN CTRL
17 DGND
18 MOTOR TEMP
19 BRAKE GND
20 BRAKE OUT
J1 - DC POWER IN / MOTOR
MOTOR W
MOTOR V
MOTOR U
POWER GND
POWER VDC
PE
CAUTION
HIGH VOLTAGE
DSPautomation
www.dspautomation.com

X SERIES (8-15 amps cont.)

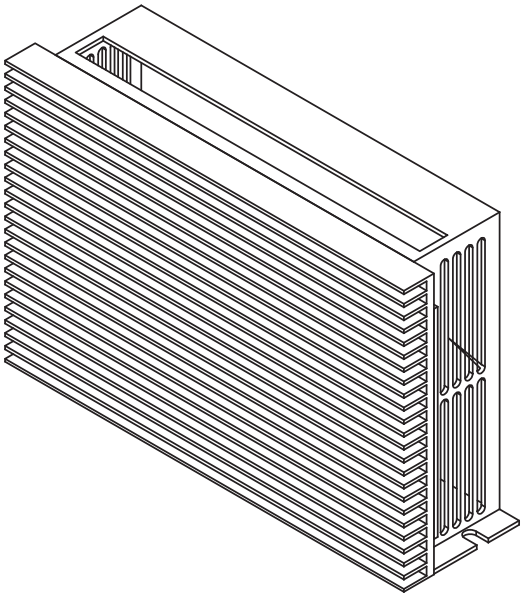
MOUNTING DRAWING, UNITS: MM (INCH)

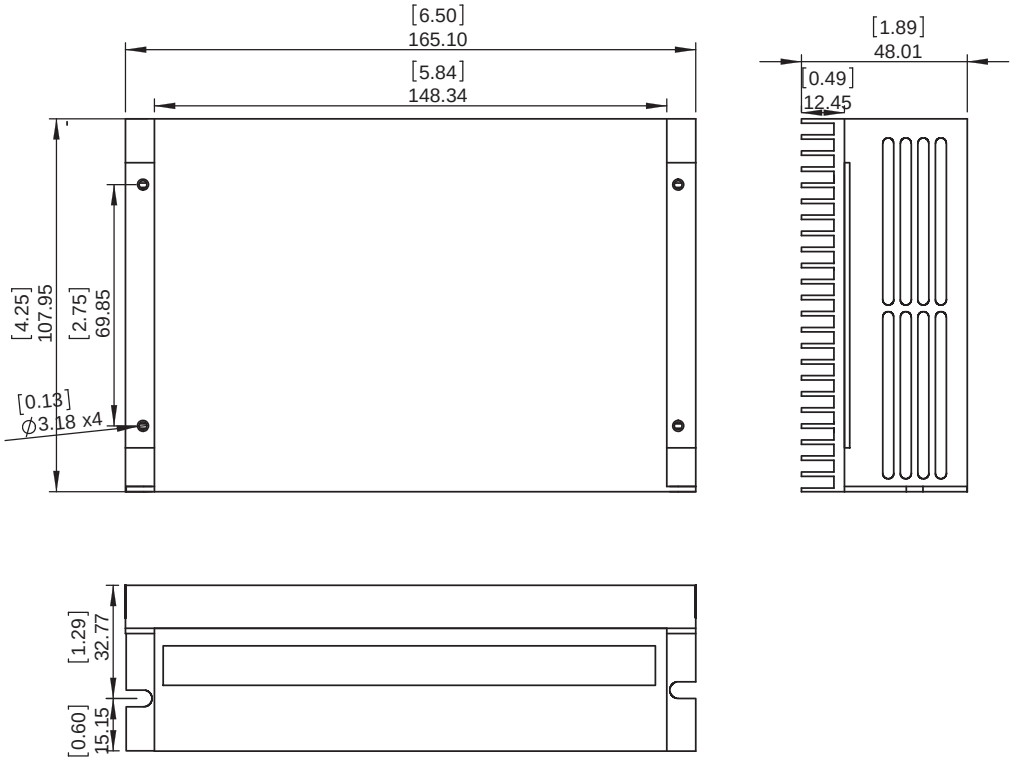




X SERIES (1-6 amps cont.)

MOUNTING DRAWING, UNITS: MM (INCH)





Bus Voltage Input

- 24 – 180 VDC

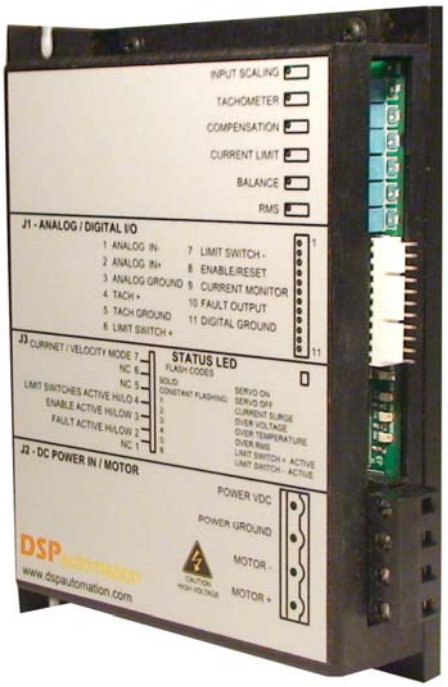
Continuous Current Rating

- 2 – 15 amps

Description

The A-Series servo drive is a high performance cost effective solution for powering brush servomotors with an analog tachometer feedback. The packaging is small for producing over 2 kW. An LED indicates drive status for easy trouble shooting.

The A-Series is designed and manufactured to UL standards.



Technical Specifications

A Series (VDC)						
Input Voltage	24 VDC - 180 VDC					
Output Current	Continuous current @ 40° C (A rms)	2	4	8	12	15
	Peak (A rms)	6	12	24	24	30
	Peak Current Time (sec.)	3				

Performance Specifications

Control Logic Voltage	Internal DC/DC converter
Current Loop BW	2.5kHz
Velocity Loop BW	400Hz
PWM Frequency	16kHz
Analog Input	+/-10V, Differential
Input Impedance	40 kOhm
Feedback	Tachometer: (+/-50V max.)
Analog Output	+/-10V, Current monitor
Digital Inputs	3 Inputs, 5-28VDC control voltage, 1x Enable/Reset, 2x Limit Switches
Digital Outputs	Fault Output, 5-28VDC, 100mA max., Open Collector or 0~12V
Commissioning/ Diagnostics	Jumpers, LEDs
Operating Modes	Torque, Velocity
Operating Ambient Temperature	0 °C to 50 °C (Shutdown 80 °C heatsink temperature)
Relative Humidity	5 - 95% non-condensing
Weight	1.0lbs (0.45kgr)

Adjustments

Peak Current	Potentiometer, 0 to (6/12/24/30)
RMS Current	Potentiometer, 0 to (2/4/8/12/15)
Signal Command	Potentiometer, Input Scaling
Balance	Potentiometer, Zero velocity offset
Compensation	Potentiometer, System response
Tachometer	Potentiometer, Input Scaling
Operating Mode	Jumper Select: Velocity, Torque
Enable/Reset Input Logic	Jumper Select: Active Hi / Active Lo
Limit Switch Input Logic	Jumper Select: Active Hi / Active Lo
Fault Output Input Logic	Jumper Select: Active Hi / Active Lo

Status LED Flash Codes

Constant Flashing	Servo Off
Solid	Servo On
1 Flash	Current Surge
2 Flashes	Over Voltage
3 Flashes	Over Temperature
4 Flashes	Over RMS current
5 Flashes	Limit Switch + Active
6 Flashes	Limit Switch - Active

SERVO DRIVE MODEL NUMBER

A - 180 - 8 - Cxxx

A Family
(Analog, DC Input)

Voltage Rating
80: 15-80 VDC
180: 50-180 VDC

CUSTOM:
C000 - C999
N/A:
STANDARD

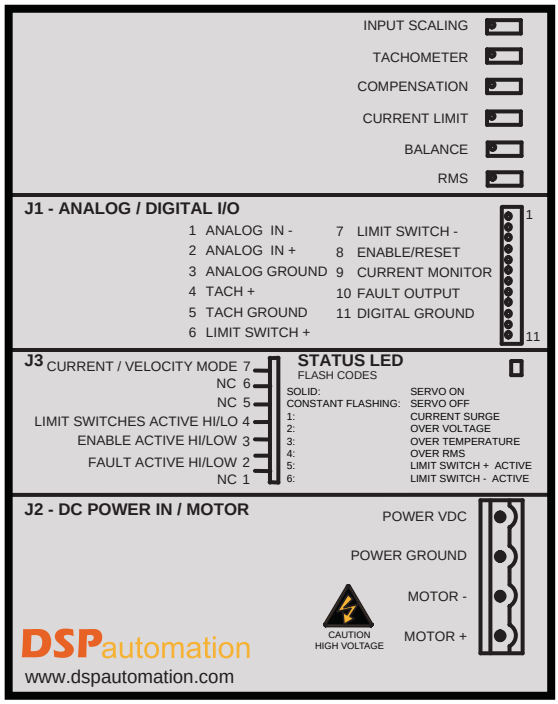
Current Rating (RMS)
2: 2A 12: 12A
4: 4A 15: 15A
8: 8A

Note:

1. Selecting 48 VDC is for 24 – 48 VDC bus
2. Selecting 180 VDC is for 48 – 180 VDC bus

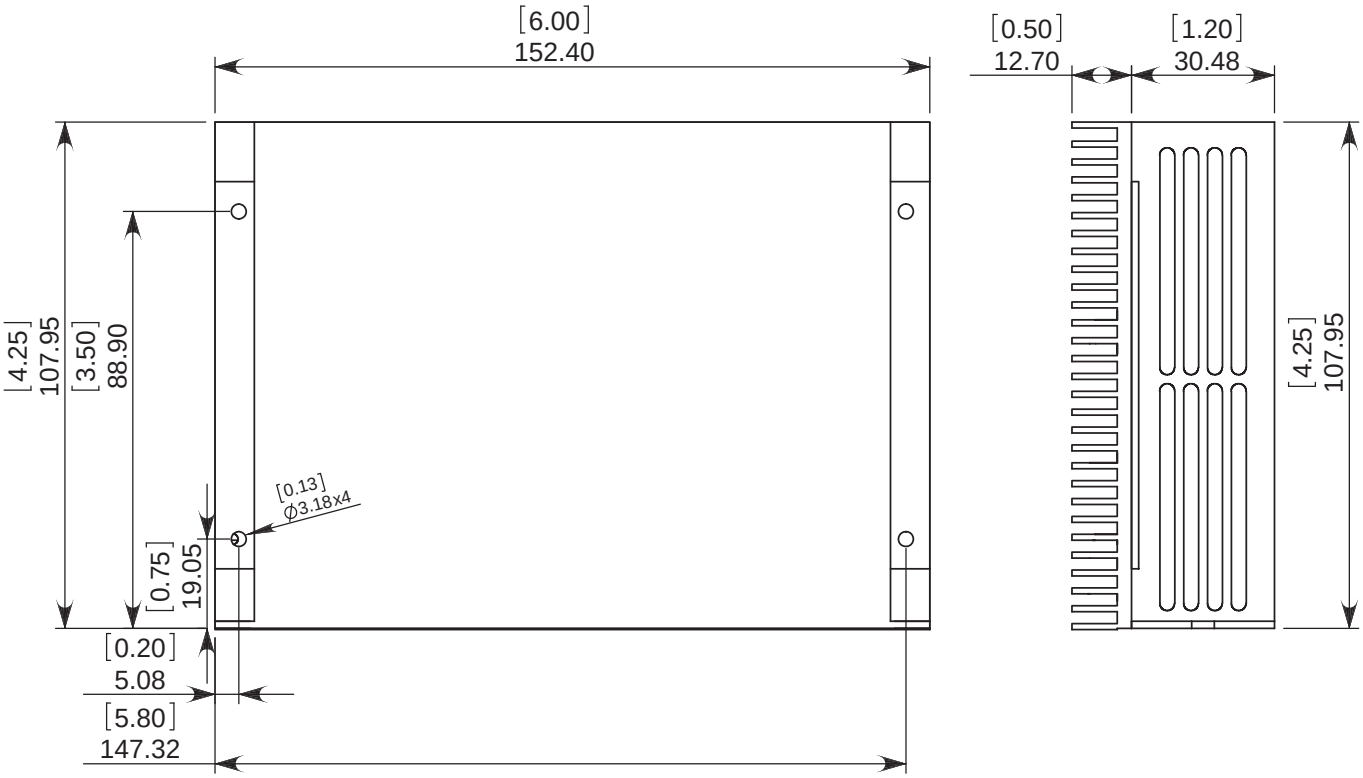
Examples:

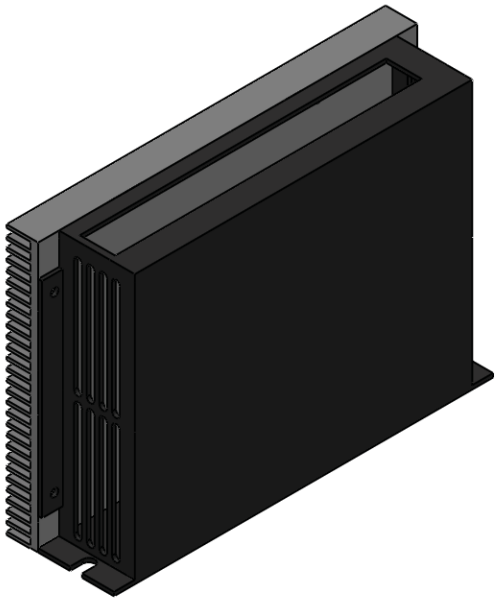
A-48-15
A-180-4
A-180-15



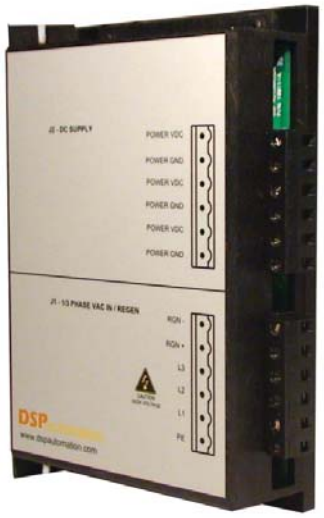
A SERIES SERVO DRIVE

MOUNTING DRAWING, UNITS: MM (INCH)





XPM Power Module (VAC to VDC converter)



- XPM-120 (120 VAC bus input and below)
- XPM-220 (180 VAC – 240 VAC, 1 Ø bus input)
- XPM- 240 (200 VAC – 260 VAC, 3 Ø bus input)

The XPM power modules are capacitance optimized for global power line bus voltages. The XPM provides 100% regen protection to the X Series servo drives.

XPM Power Modules		XPM-120-15	XPM-240-15	XPM-120-30	XPM-240-30
Input Voltage	VAC	17 - 130 VAC 1 Ø, 50/60 Hz	130 - 260 VAC 1 or 3 Ø, 50/60 Hz	17 - 120 VAC 1 Ø, 50/60 Hz	180 - 260 VAC 1 or 3 Ø, 50/60 Hz
Output Voltage	VDC	24-185 VDC	185 – 365 VDC	24-185 VDC	185 – 365 VDC
Output Current	Continuous current (A Rms)	15	15	30	30

POWER MODULE MODEL NUMBER

XPM - 240 - 15 - 3 - E - D - Cxxx

XPM Family
AC Power Supply

Voltage Rating
70: 17-70 VDC
120: 80-135 VDC
240: 140-260 VDC

Current Rating (RMS)
15: 15A
30: 30A

CUSTOM:
C000 - C999
N/A:
STANDARD

N/A: STANDARD
D: Voltage Doubler

E: External Region Control
I: Internal Region Control

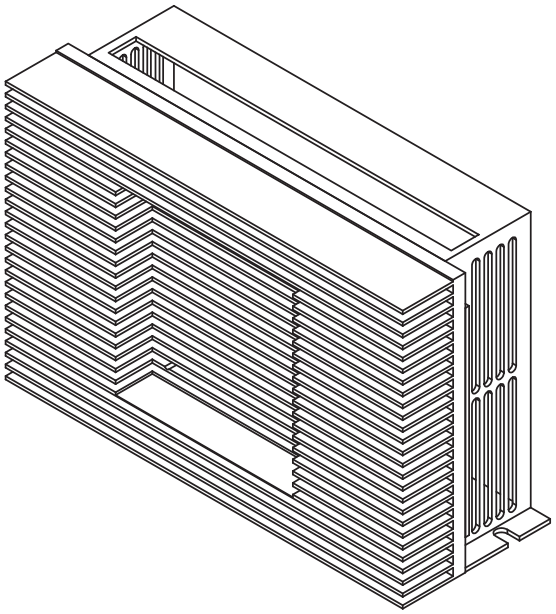
1: Single Phase
3: Three Phase

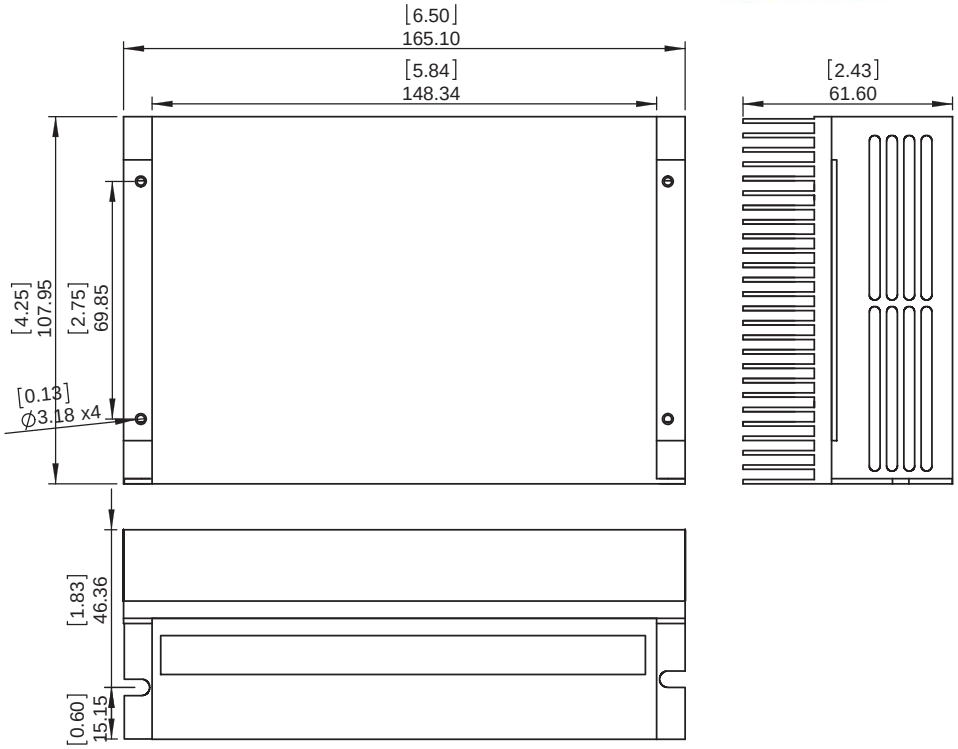
Examples:

32 VAC bus input _ XPM-120-30_ aprox. 45 VDC and 30 amps continuous output
120 VAC bus input _ XPM-120-30 or XPM-240-30_ approx. 168 VDC and 30 amps continuous output
240 VAC bus input _ XPM-240-15_ approx. 336 VDC and 15 amps continuous

XPM SERIES (Type 1)

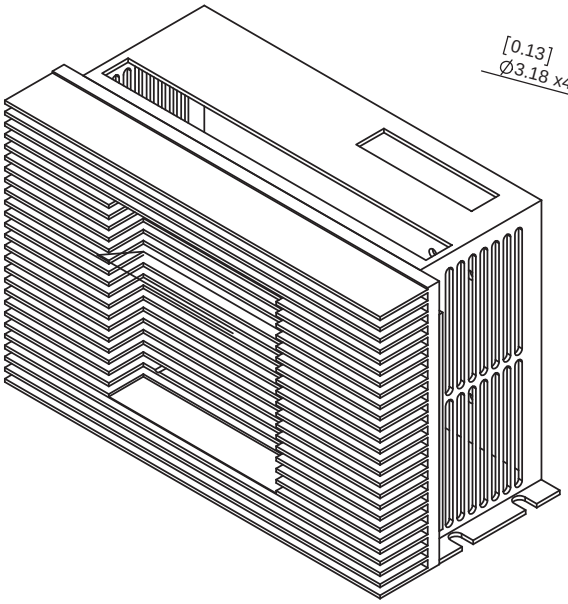
MOUNTING DRAWING, UNITS: MM (INCH)

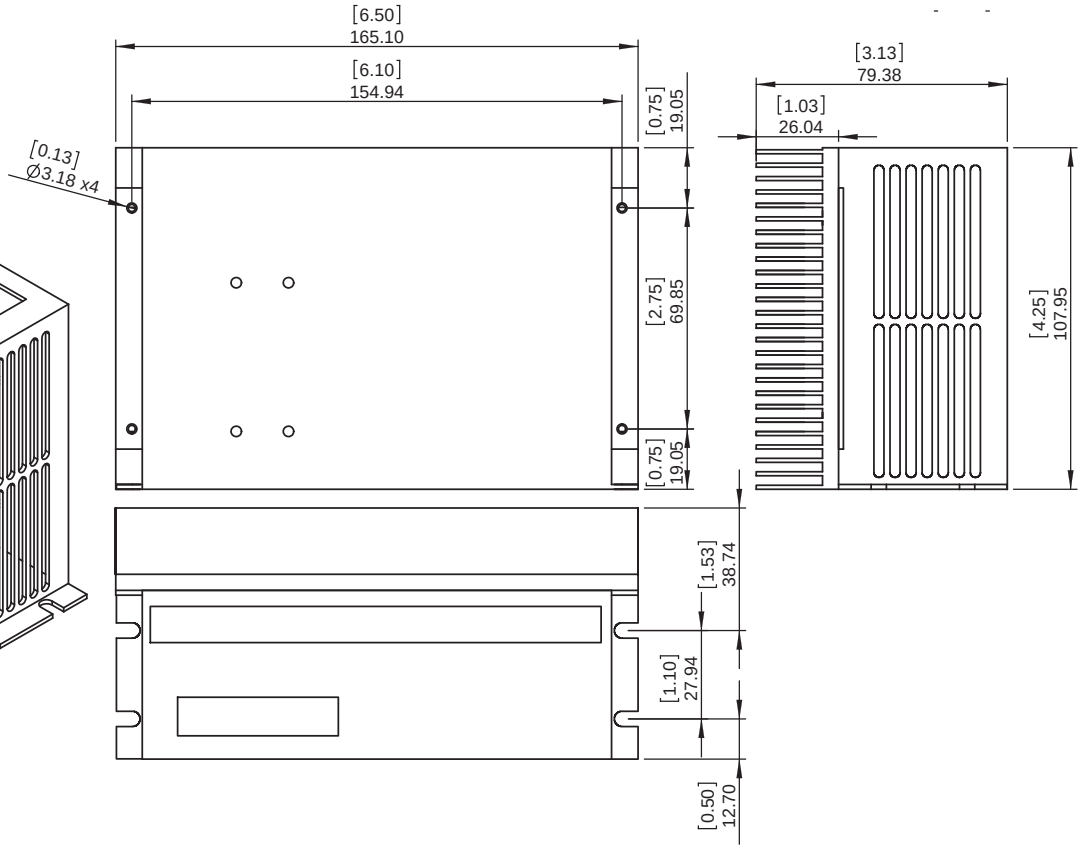




XPM SERIES (Type 2)

MOUNTING DRAWING, UNITS: MM (INCH)





DSP Automation offers servomotors matched with our servo drives. The companies we work with are leading companies in the design and manufacturing of servomotors. We provide rotary or linear in brush or brushless (AC servomotors), low or high inertia, metric or NEMA mounting, and low or high performance. Contact us with your requirements for the most cost effective solution and performance.

Head Office

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