| SW-2 | Description | Setting | |
|---|---|---|---|
| | | On | Off |
| 2-1 | Mode Selection. See Mode Selection Table below for full description of mode switch settings. | Current Mode | Velocity Modes |
| 2-2 | Hall Velocity feedback. This connects the internally generated velocity signal from the Hall sensors. | Hall sensor velocity feedback enabled. | Hall sensor velocity feedback disabled. |
| 2-3 | Encoder Velocity feedback. This connects the internally generated velocity signal from the encoder. | Encoder velocity feedback enabled. | Encoder velocity feedback disabled. |
| 2-4 | Velocity Feedback Polarity | Toggles the polarity of the velocity feedback signal (Encoder or Hall velocity mode only). | |
| 2-5 | Duty Cycle feedback. This connects the internally generated velocity signal from the output stage. | Duty cycle feedback enabled. | Duty cycle feedback disabled. |
| 2-6 | Voltage Mode. | Voltage feedback enabled. | Voltage feedback disabled. |
| 2-7 | IR Compensation Mode. | IR Comp enabled. | IR Comp disabled. |
| 2-8<br>2-9<br>2-10 | Velocity Loop Integrator Capacitor Switches. These adjust the value of the integrator capacitor in the velocity mode. | See Velocity Loop Integrator Capacitance Table below. | |
| *Important Note: Drive will not operate properly with more than one of these switches ON due to multiple feedback signals. | | | |

*Mode Selection Table*

Operating modes can be selected by setting SW2 DIP switches according to the following table.

| | SW2-1 | SW2-2 | SW2-3 | SW2-4 | SW2-5 | SW2-6 | SW2-7 |
|---|---|---|---|---|---|---|---|
| CURRENT | ON | OFF | OFF | X | OFF | X | OFF |
| DUTY CYCLE | OFF | OFF | OFF | X | ON | X | OFF |
| VOLTAGE | OFF | OFF | OFF | X | OFF | ON | OFF |
| IR COMP | OFF | OFF | OFF | X | OFF | ON | ON |
| HALL VELOCITY | OFF | ON | OFF | X | OFF | ON | OFF |
| ENCODER VELOCITY | OFF | OFF | ON | X | OFF | X | OFF |
| TACHOMETER | OFF | OFF | OFF | X | OFF | X | OFF |

X = does not affect mode

*Velocity Loop Integrator Capacitance Table*

Set the Velocity Loop Integrator Capacitance value according to the following table. Decreasing the capacitance increases the integrator gain.

| µF | SW2-8 | SW2-9 | SW2-10 |
|---|---|---|---|
| **0.5** | OFF | OFF | OFF |
| **1.0** | ON | OFF | OFF |
| **1.5** | OFF | ON | OFF |
| **2.0** | ON | ON | OFF |
| **2.5** | OFF | OFF | ON |
| **3.0** | ON | OFF | ON |
| **3.5** | OFF | ON | ON |
| **4.0** | ON | ON | ON |


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*Current Loop Tuning Values*

SW3 DIP switches add additional resistance and capacitance to the current loop tuning circuitry. SW3 switches 1-5 add additional parallel capacitance to the current loop integrator capacitor, and SW3 switches 6-10 add additional series resistance to the current loop gain resistor (see Block Diagram). Capacitance and resistance values are given in the tables below along with the appropriate DIP switch settings.

| SW3 | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch | Additional Current Loop Integrator Capacitance (µF) – (decreasing the capacitance increases the integrator gain) | | | | | | | | | | | | | | | | |
| | SHORT | .082 | .077 | .072 | .067 | .062 | .057 | .052 | .047 | .035 | .030 | .025 | .020 | .015 | .010 | .005 | OPEN |
| 1 | ON | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF |
| 2 | ON | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF |
| 3 | ON | ON | ON | ON | ON | OFF | OFF | OFF | OFF | ON | ON | ON | ON | OFF | OFF | OFF | OFF |
| 4 | ON | ON | ON | ON | ON | ON | ON | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 5 | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |

| SW3 | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch | Additional Current Loop Gain Resistance (kΩ) – (increasing the resistance increases the proportional gain) | | | | | | | | | | | | | | | |
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 |
| 6 | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF |
| 7 | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF |
| 8 | ON | ON | ON | ON | OFF | OFF | OFF | OFF | ON | ON | ON | ON | OFF | OFF | OFF | OFF |
| 9 | ON | ON | ON | ON | ON | ON | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 10 | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| **Switch (continued)** | **160** | **170** | **180** | **190** | **200** | **210** | **220** | **230** | **240** | **250** | **260** | **270** | **280** | **290** | **300** | **310** |
| 6 | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF |
| 7 | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF |
| 8 | ON | ON | ON | ON | OFF | OFF | OFF | OFF | ON | ON | ON | ON | OFF | OFF | OFF | OFF |
| 9 | ON | ON | ON | ON | ON | ON | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 10 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |

**Potentiometer Functions**

| Potentiometer | Description | Turning CW |
|---|---|---|
| Pot 1 | Loop gain adjustment in open loop and velocity modes. Turn this pot fully CCW in current mode. | Increases loop gain |
| Pot 2 | Current limit. Adjusts both the continuous and peak current limit while maintaining the continuous/peak ratio set by the DIP Switches. | Increases current limit |
| Pot 3 | Reference in gain. This potentiometer adjusts the ratio between input signal and output variables (voltage, current, and velocity). | Increases reference input gain |
| Pot 4 | Test/Offset. Used to adjust any imbalance in the input signal or in the drive. When SW1-1 (DIP switch) is ON, the sensitivity of this pot is greatly increased allowing it to be used as an on-board signal source for testing purposes. | Zero speed setting is at the midpoint of this 14-turn pot. |
| Pot 5 | Ramp Time. Sets the ramp time for the command input signal. | Increases ramp time (slower Accel or Decel) |
| Note: Potentiometers are approximately linear and have 12 active turns with 1 inactive turn on each end. | | |

*Ramping Command (Pot 5):*

The built-in ramp circuit allows the command input to be ramped linearly. This feature is activated by setting SW1-8 = ON. The ramp time can be set for up to 30 seconds in reaching the max command by adjusting Pot 5 fully clockwise. Ramping rates are linear with respect to time and apply to both directions of motion. For example, if the single-ended command input is only 2.5 Volts, the time to ramp to this voltage would be half the time to ramp to 5 Volts.


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**Through-hole Components†**

| Location | Description |
|---|---|
| RF1 | IR Compensation Scaling. Through-hole resistor that can be added to configure the amplifier for IR Compensation mode. See section below on IR Compensation Notes for more details. |

*IR Compensation Notes*

For applications that will use IR Compensation mode, a resistor can be added to the location named in the table above. The combination of the added resistor and correct DIP switch settings will configure the amplifier for IR Compensation mode. While in IR Compensation mode, the amplifier will adjust the duty cycle to compensate for changes in the output current. Consult the amplifier's functional block diagram and the manufacturer's website for more information.

**†NOTE: DAMAGE DONE TO THE DRIVE WHILE PERFORMING THESE MODIFICATIONS WILL VOID THE WARRANTY.**


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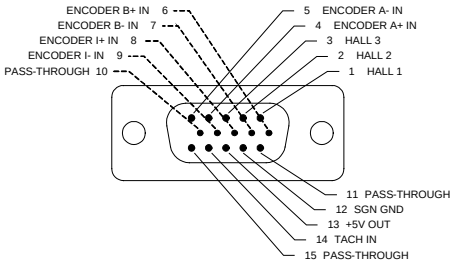
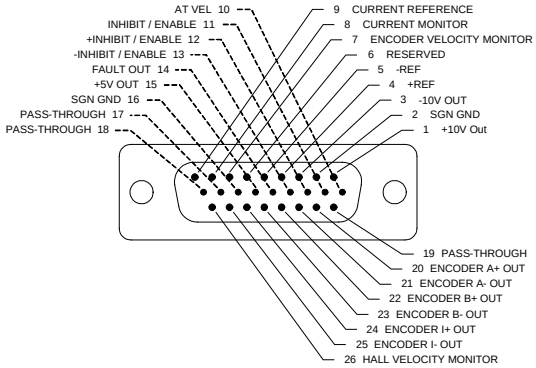
## MECHANICAL INFORMATION

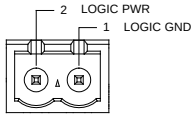
| Feedback Connector | | |
|---|---|---|
| Connector Information | | 15-pin, high-density, female D-sub |
| Mating Connector | Details | TYCO: Plug P/N 748364-1; Housing P/N 5748677-1; Terminals P/N 1658670-2 (loose) or 1658670-1 (strip) |
| | Included with Drive | No |



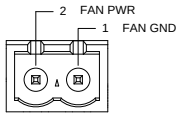

| I/O Signal Connector | | |
|---|---|---|
| Connector Information | | 26-pin, high-density, female D-sub |
| Mating Connector | Details | TYCO: Plug P/N 1658671-1; Housing P/N 5748677-2; Terminals P/N 1658670-2 (loose) or 1658670-1 (strip) |
| | Included with Drive | No |



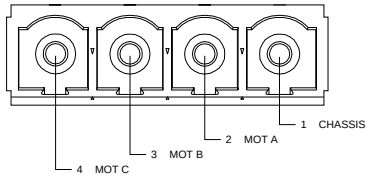

| Logic Power Connector | | |
|---|---|---|
| Connector Information | | 2-pin, 5.08 mm spaced, enclosed, friction lock header |
| Mating Connector | Details | Phoenix Contact: P/N 1757019 |
| | Included with Drive | Yes |



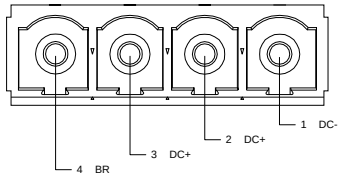
| Fan Power Connector | | |
|---|---|---|
| Connector Information | | 2-port, 5.08 mm spaced, enclosed, friction lock header |
| Mating Connector | Details | Phoenix Contact: P/N 1757019 |
| | Included with Drive | Yes |



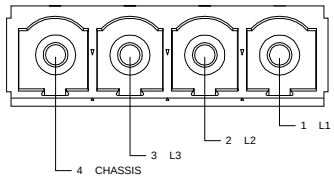

| Motor Power Connector | | |
|---|---|---|
| Connector Information | | 4-pin, 10.16 mm spaced, enclosed, friction lock header |
| Mating Connector | Details | Phoenix Contact: P/N 1913523 |
| | Included with Drive | Yes |




| DC Power Connector | | |
|---|---|---|
| Connector Information | | 4-pin, 10.16 mm spaced, enclosed, friction lock header |
| Mating Connector | Details | Phoenix Contact: P/N 1913523 |
| | Included with Drive | Yes |




| AC Power Connector | | |
|---|---|---|
| Connector Information | | 4-pin, 10.16 mm spaced, enclosed, friction lock header |
| Mating Connector | Details | Phoenix Contact: P/N 1913523 |
| | Included with Drive | Yes |





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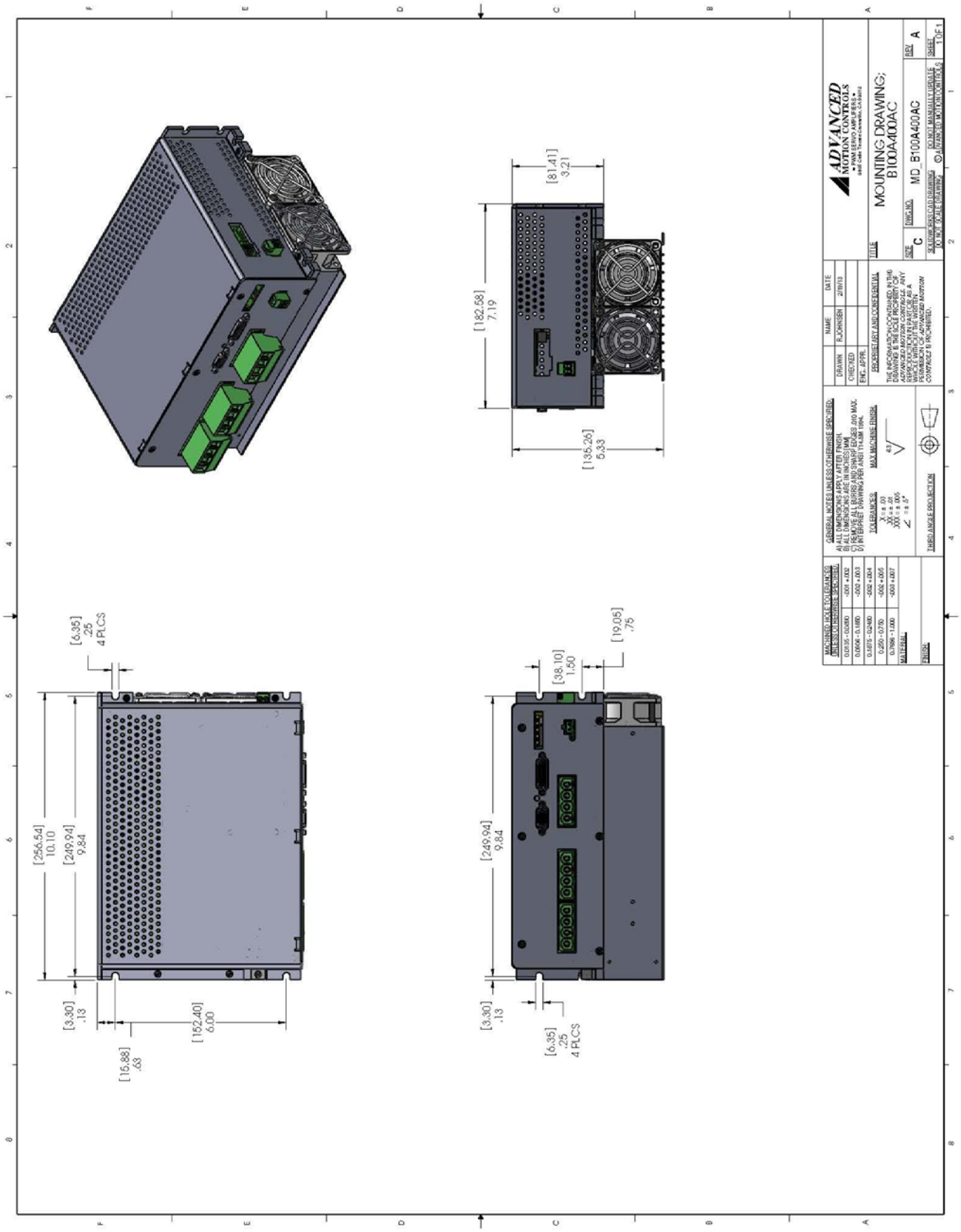
## MOUNTING DIMENSIONS



## PART NUMBERING INFORMATION

B 100 A 400 AC -

**Drive Type**
B or BX: Brushless drive.
BE: Encoder Velocity Mode Available
BD: PWM Command
BDC: PWM Command, Closed Current Loop
S or SX: Commutated Sine Command

**Peak Current**
Maximum peak current rating in Amps.

**Peak Voltage**
Peak voltage rating in Volts. If 2 numbers used, scaled 1:10.

**Additional Options***
ANP: Analog Position Loop
FBP: Flat Baseplate

**Power Supply**
: DC Power Supply
AC: AC Power Supply
FAC: AC Power Connecter Relocated to the Front

**Isolation Option****
I: Optical Isolation

* Options available for orders with sufficient volume. Contact *ADVANCED* Motion Controls for more information.
** Isolation comes standard on all AC supply drives and most DC supply drives 200V and above. Consult selection tables of the website or drive datasheet block diagram to see if isolation is included.

DigiFlex® Performance™ series of products are available in many configurations. Note that not all possible part number combinations are offered as standard drives. All models listed in the selection tables of the website are readily available, standard product offerings.

*ADVANCED* Motion Controls also has the capability to promptly develop and deliver specified products for OEMs with volume requests. Our Applications and Engineering Departments will work closely with your design team through all stages of development in order to provide the best servo drive solution for your system. Equipped with on-site manufacturing for quick-turn customs capabilities, *ADVANCED* Motion Controls utilizes our years of engineering and manufacturing expertise to decrease your costs and time-to-market while increasing system quality and reliability. Feel free to contact Applications Engineering for further information and details.

### Examples of Customized Products

- Optimized Footprint
- Private Label Software
- OEM Specified Connectors
- No Outer Case
- Increased Current Resolution
- Increased Temperature Range
- Custom Control Interface
- Integrated System I/O
- Tailored Project File
- Silkscreen Branding
- Optimized Base Plate
- Increased Current Limits
- Increased Voltage Range
- Conformal Coating
- Multi-Axis Configurations
- Reduced Profile Size and Weight

### Available Accessories

*ADVANCED* Motion Controls offers a variety of accessories designed to facilitate drive integration into a servo system. Visit www.a-m-c.com to see which accessories will assist with your application design and implementation.


Power Supplies


Shunt Regulators


Drive(s)


Filter Cards

To Motor

All specifications in this document are subject to change without written notice. Actual product may differ from pictures provided in this document.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