Golden Ding Series Analog Servo Drives

Power Range	
Peak Current	8A
Continuous Current	4A
Supply Voltage	10 - 80 VDC

Description

The CAB8A80X PWM servo drive is designed to drive brushless and brushed DC motors at a high switching frequency. The CAB8A80X is fully protected against over-voltage, under-voltage, over-current, over-heating, invalid commutation, and short-circuits. A single digital output indicates operating status. The drive interfaces with digital controllers that have analog ±10V output.

The CAB8A80X conforms to the following specifications and is designed to the Environmental Engineering Considerations as defined in MIL-STD-810F.

Extended Environment Performance	
Ambient Temperature	-40°C to +85°C (-40°F to +185°F)
Storage Temperature	-50°C to +100°C (-58°F to +212°F)
Thermal Shock	-40°C to +85°C (-40°F to +185°F) in 2 min.
Relative Humidity	0 to 95% Non-Condensing
Vibration	30 Grms for 5 min. in 3 axes

See Part Numbering Information on last page of datasheet for additional ordering options.

Features

- Four Quadrant Regenerative Operation
- Built-in regenerative and shunt regulator
- Lightweight
- High Switching Frequency
- Wide Temperature Range
- High Performance Thermal Dissipation
- Differential Input Command
- Digital Fault Output Monitor
- 12VDC Operation
- Current Monitor Output
- Compact Size
- High Power Density

HARDWARE PROTECTION

- Over-Voltage
- Under-Voltage
- Over-Current
- Over-Temperature
- Short-circuit (phase-phase)
- Short-circuit (phase-ground)

INPUTS/OUTPUTS

- Digital Fault Output
- Digital Inhibit Input
- Analog Current Monitor
- Analog Command Input
- Analog Current Reference

FEEDBACK SUPPORTED

- Hall Sensor

MODES OF OPERATION

- Current

COMMUTATION

- Trapezoidal

MOTORS SUPPORTED

- Three Phase (Brushless)
- Single Phase (Brushed, Voice Coil, Inductive Load)

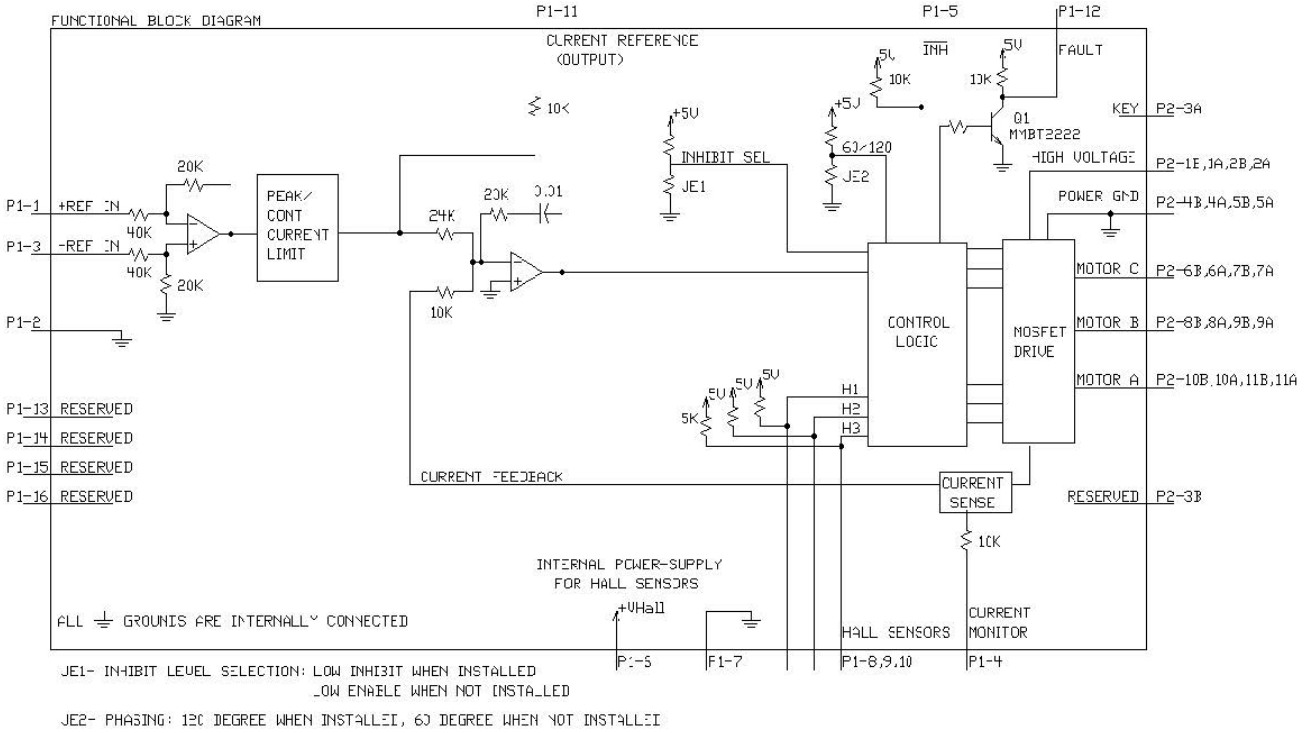
COMMAND SOURCE

- ±10 V Analog

COMPLIANCE CONSIDERATIONS

- MIL-STD-810F (as stated)
- MIL-STD-1275D (optional)
- MIL-STD-461E (optional)
- MIL-STD-704F (optional)
- MIL-HDBK-217 (optional)

BLOCK DIAGRAM



Information on Approvals and Compliances	
MIL-STD-810F	Environmental Engineering Considerations and Laboratory Tests - (as stated)
MIL-STD-1275D	Characteristics of 28 Volt DC Electrical Systems in Military Vehicles - (optional)
MIL-STD-461E	Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment - (optional)
MIL-STD-704F	Aircraft Electric Power Characteristics - (optional)
MIL-HDBK-217	Reliability Prediction of Electronic Equipment (MTBF) - (optional)

HARDWARE SETTINGS

Jumper Settings

Jumpers are SMT, 0 ohm resistors located on the underside of the drive PCB. By default, the drive is configured with the jumpers installed. Typical drive operation will not require the jumpers to be removed. Please contact the factory before jumper removal.

Jumpe	Description	Configuration	
	SMT Jumper(0Ω Resustor)	Not Installed	Installed
JE1	Inhibit logic. Sets the logic level of inhibit pins. Labeled JE1 on the PCB of the drive.	Low Enable	Low Inhibit
JE2	Hall sensor phasing. Selects 120 or 60 degree commutation phasing. Labeled JE2 on the PCB of the drive.	60 degree	120 degree

Notes:

Any damage done to the drive while performing these modifications will void the product warranty.It is recommended to contact AMC China's technical staff before setting of JPE1 and JPE2.

SPECIFICATIONS

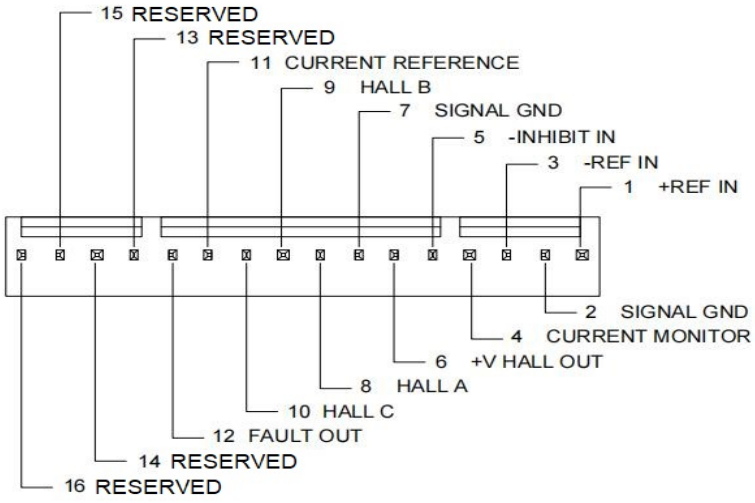
Description	Power Specifications Units	Value
DC Supply Voltage Range	VDC	10 - 80
DC Bus Over Voltage Limit	VDC	88
DC Bus Under Voltage Limit	VDC	9
Maximum Peak Output Current[1]	A	8
Maximum Continuous Output Current	A	4
Maximum Continuous Output Power	W	304
Maximum Power Dissipation at Continuous Current	W	16
Minimum Load Inductance (Line-To-Line)[2]	µH	100
Internal Bus Capacitance[3]	µF	320
Low Voltage Supply Outputs	-	+6 VDC (30 mA)
Switching Frequency	kHz	31
Description	**Control Specifications** Units	Value
Command Sources	-	±10 V Analog
Feedback Supported	-	Halls
Commutation Methods	-	Trapezoidal
Modes of Operation	-	Current
Motors Supported	-	Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless)
Hardware Protection	-	Invalid Commutation Feedback, Over Current, Over Temperature, Over Voltage, Under Voltage, Short Circuit (Phase-Phase & Phase-Ground)
Description	**Mechanical Specifications** Units	Value
Agency Approvals	-	MIL-STD-810F (as stated), MIL-STD-1275D (optional), MIL-STD-461E (optional), MIL-STD-704F (optional), MIL-HDBK-217 (optional)
Size (H x W x D)	mm	127 x 77.5 x 44.5
Baseplate Operating Temperature Range	°C (°F)	-40 - 105 (-40 - 221)
Ambient Temperature Range	°C (°F)	-40 - 85 (-40 - 185)
Storage Temperature Range	°C (°F)	-50 - 100 (-58 - 212)
Thermal Shock	°C (°F)	-40 - 85 (-40 - 185) in 2 minutes
Vibration	Grms	30 for 5 minutes in 3 axes
Relative Humidity	-	0 - 95% Non-Condensing
P1 Connector	-	16 Pin, pitch 2.54 mm connector
P2 Connector	-	8Pin pitch 5.08 mm Pluggable terminal block

Notes

1. Maximum duration of peak current is ~2 seconds. Peak RMS value must not exceed continuous current rating of the drive.
2. Lower inductance is acceptable for bus voltages well below maximum. If the motor inductance is lower than the minimum inductance, please contact the factory for customized modification.

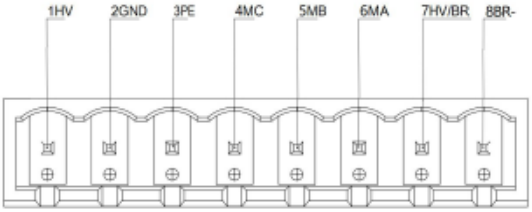
PIN FUNCTIONS

P1 Signal Interface Definitions		
Connector information		16 Pin, pitch 2.54 mm connector
Matching Connector	Part No.	Molex: P/N 22-01-3167 (Housings) and P/N 08-50-0114 (CRIMP TERMINAL)
	Remark	Connectors need to be ordered separately
Pin	Signal	Description
1	+REF IN	Differential Reference Input (±10 V Operating Range, ±15 V Maximum Input)
2	SIGNAL GND	Signal Ground
3	-REF IN	Differential Reference Input (±10 V Operating Range, ±15 V Maximum Input)
4	CURRENT MONITOR	Current Monitor. Analog output signal proportional to the actual current output. Polarity is reversed from command voltage. Scaling is 2.7 A/V. Measure relative to signal ground.
5	INHIBIT IN	TTL level (+5 V) inhibit/enable input. Leave open to enable drive. Pull to ground to inhibit drive. Inhibit turns off all power devices.
6	+V HALL OUT	Low Power Supply For Hall Sensors (+6 V @ 30 mA). Referenced to signal ground. Short circuit protected.
7	SIGNAL GND	Signal Ground
8	HALL 1	Single-ended Hall/Commutation Sensor Inputs (+5 V logic level)
9	HALL 2 [1]	
10	HALL 3	
11	CURRENT REFERENCE	Measures the command signal to the internal current-loop. This pin has a maximum output of ±7.3 V when the drive outputs maximum peak current. Measure relative to signal ground.
12	FAULT OUT	TTL level (+5 V) output becomes high when power devices are disabled due to at least one of the following conditions: inhibit, invalid Hall state, output short circuit, over voltage, over temperature, power-up reset.
13	RESERVED	RESERVED
14	RESERVED	
15	RESERVED	
16	RESERVED	

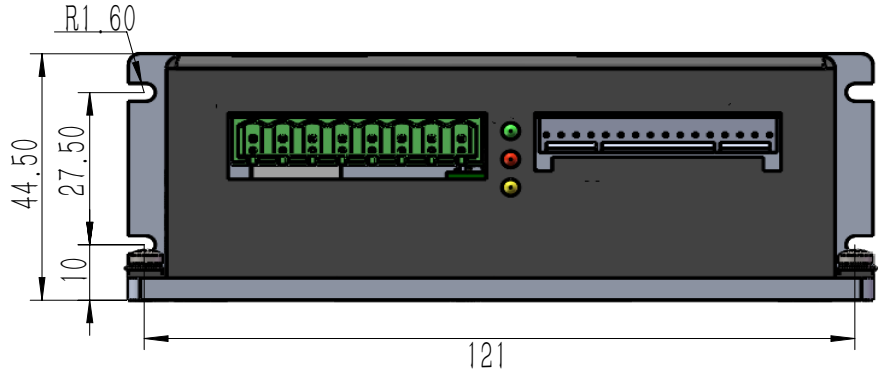


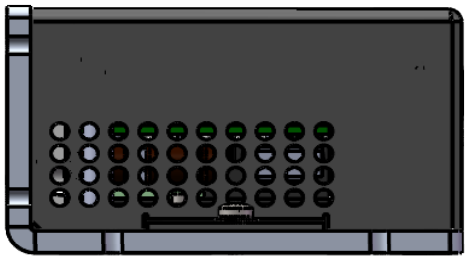
1. For use with Single Phase (Brushed) motors, ground Hall 2 and only connect motor leads to Motor A and Motor B.

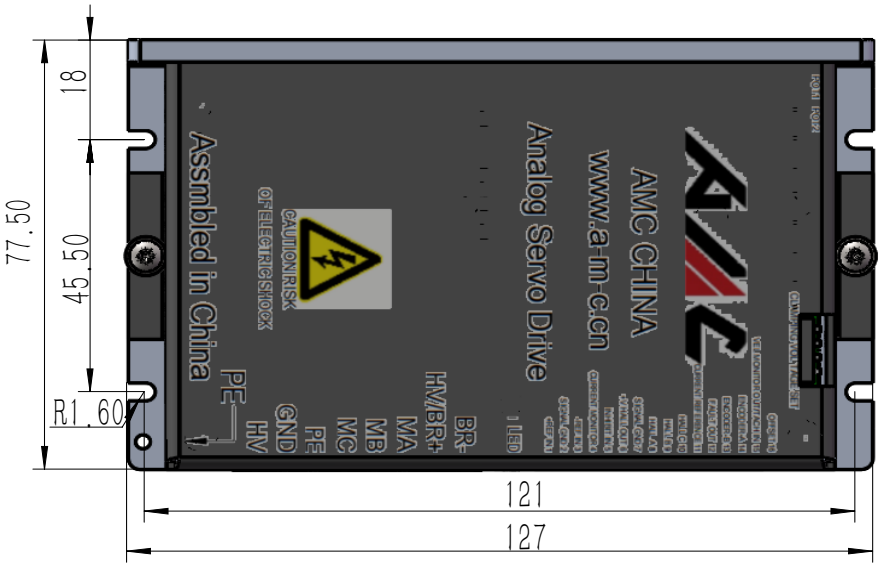
P2 Power Interface Definitions		
Connector information		8Pin pitch 5.08 mm Pluggable terminal block
Matching Connector	Part No.	KF2EDGK5.08
	Remark	Connectors need to be ordered separately
Pin	Signal	Description
1	HV	DC+ Power Input
2	GND	Power Ground (Common With Signal Ground).
3	PE	Protective ground (Connect motor cable shield)
4	MC	Motor Phase W
5	MB	Motor Phase V
6	MA	Motor Phase U
7	HV/BR+	External braking resistor connection. Connect a resistor between BR+ and BR-.
8	BR-	

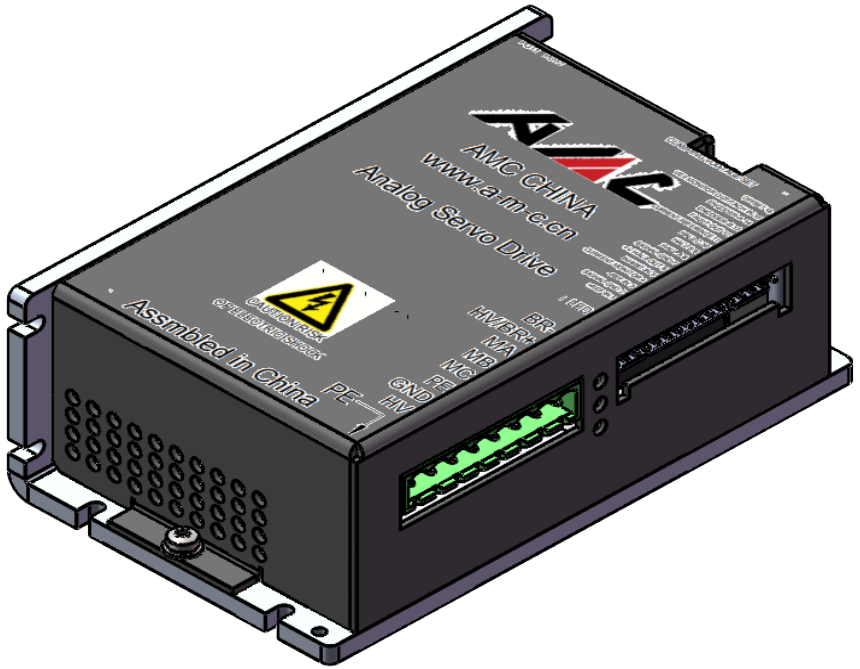


DIMENSIONS (mm)









PART NUMBERING INFORMATION

CA B __ 8 A 80 X

CA: Golden Ding Series Analog Drives

Drive Type

B: ± 10V Analog
BDC: PWM Command

Feedback

Blank: Hall Sensor
H: Hall Sensor & Tachometer
E: Hall Sensor & Incremental Encoder &Tachometer

Peak Current (Amps)

6: 6A Peak Current, 3A Continuous Current
8: 8A Peak Current, 4A Continuous Current
10: 10A Peak Current, 5A Continuous Current
12: 12A Peak Current, 6A Continuous Current
15: 15A Peak Current, 7.5A Continuous Current
16: 16A Peak Current, 8A Continuous Current
20: 20A Peak Current, 10A Continuous Current
25: 25A Peak Current, 12.5A Continuous Current
40: 40A Peak Current, 20A Continuous Current
60: 60A Peak Current, 30A Continuous Current

Max DC Bus Voltage

36: 36VDC
80: 80VDC
175: 175VDC

Operating Temperature

Blank: -25-75℃
X: -40-75℃