

FEATURES

- **Power Supply:** 110VAC Double Input, or 220VAC Input
- **Current:** Peak 16A, Cont. 8A
- **Motor:** BLDC Motor
- **Command Inputs:** Analog + Direction, RS232 communication
- **Functions:** Enable, Direction, Speed Output, Fault Output
- **Feedback Specification:** Hall sensor
- **Modes of Operation:** Velocity Mode, Amplifier Mode
- **Protection:** Over Current, Over Voltage, Under Voltage
- Isolation between Drive Circuits and Control Circuits
- Isolation between Control Circuits and Command interfaces.
- **Ambient Temperature:** -10~70°C, -40~85°C for Industrial Level.
- **Dimensions:** 202 x 143 x 73 mm

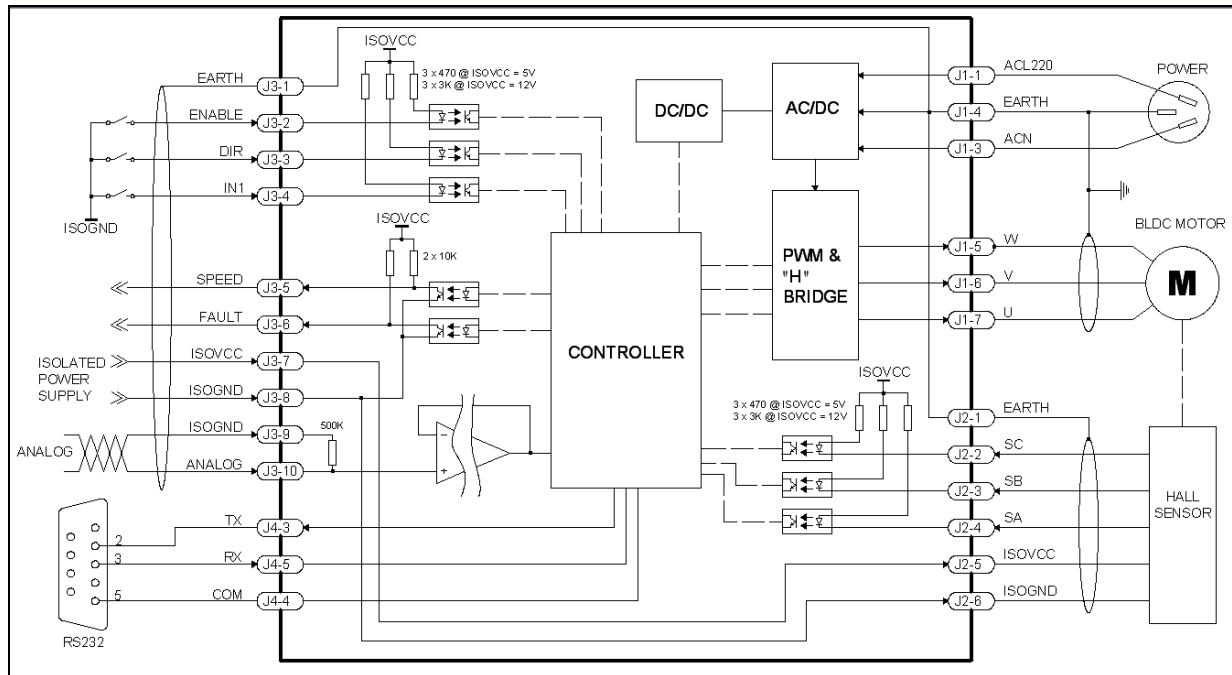


DISCRIPTION


MLABL08 is a BLDC motor drive with direct or doubled AC power-supply. AC 220V power supplied through **Pin J1-1** is converted to DC power directly for BLDC motor. AC110V or lower power connected to **Pin J1-2** and **Pin J1-1** is doubled firstly before converted to DC power. By using voltage doubling circuit, low voltage power supply of AC110V is transformed to DC310V to supply to motor.

⚠ DANGER! DO NOT open drive to avoid injured by high voltage!

DIAGRAM




⚠ CAUTION 1: The above diagram shows Direct AC power connection for 220VAC. When using doubled AC power supply for AC110 or lower, it is important to connect the live line of power supply to **PIN J1-2**, and short **PIN J1-1** and **J1-2**

 Notice 1: Built-in ISOVCC is optional.

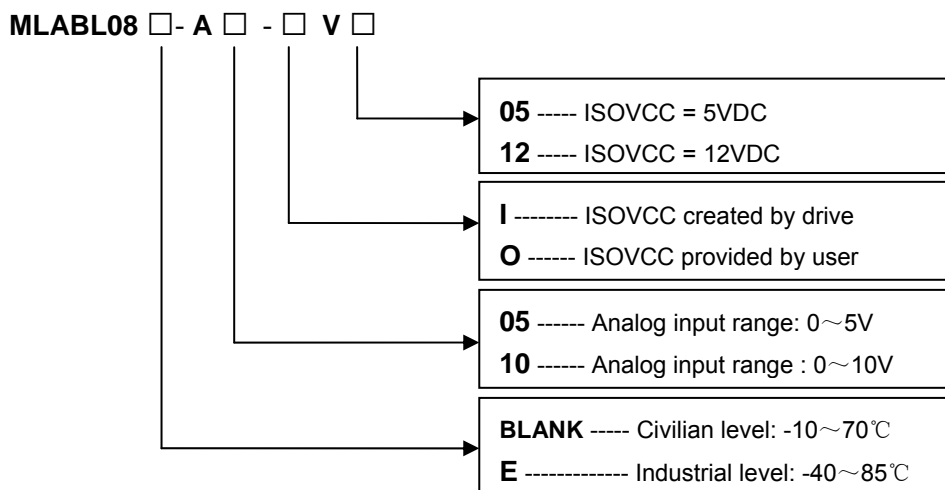
POWER SUPPLY

	DOUBLED AC POWER SUPPLY	DIRECT AC POWER SUPPLY
Power Input	<i>J1-1</i> short to <i>J1-2</i> <i>J1-2</i> to LIVE line <i>J1-3</i> to NULL line <i>J1-4</i> to EARTH line	<i>J1-1</i> to LIVE line <i>J1-3</i> to NULL line <i>J1-4</i> to EARTH line
Input Range (VAC)	45~120	90~240
Output Range (VDC)	2.828 x VAC _{input}	1.414 x VAC _{input}

 Warning 1: DO NOT apply 120VAC or higher voltage to **Pin J1-2** to avoid drive damage.

 Warning 2: Always connect **Pin J1-4** and heatsink to EARTH.

ORDER NUMBER

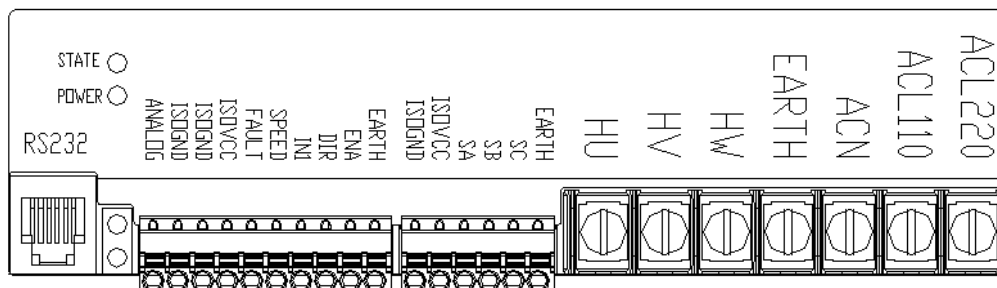


ELECTRICAL CHARACTERISTIC

ITEMS	LABELS	PARAMETERS	UNITS
Power Supply	U_{ac}	<i>J1-1</i> : 90~240 <i>J1-2</i> : 45~120	VAC
Continuous Current	$I_{continuous}$	8	A
Peak Current	I_{peak}	16	A
PWM Frequency	f_{pwm}	25	KHz
Digital Input	DIR, ENABLE, IN1	On Current: 3~7	mA
Analog Input	Impedance	500	KΩ
	Range	-A05: 0~5 -A10: 0~10	VDC
Communications	RS232	9600 (19200)	bps
Speed Range		400~80000 (2 poles)	RPM
		100~20000 (8 poles)	

Under Voltage	Vu	J1-1: 90	J1-2: 45	VAC
Over Voltage	Vo	J1-1: 240	J1-2: 120	VAC

INTERFACES



J1 Power Supply and Motor

J1-1	ACL220	AC220V Live line	Power Supply
J1-2	ACL110	AC110V Live line	
J1-3	ACN	Null line	
J1-4	EARTH	Earth line	Motor
J1-5	HW	Motor winding W (T)	
J1-6	HV	Motor winding V (S)	
J1-7	HU	Motor winding U (R)	

J2 Hall Sensor

J2-1	EARTH	Earth
J2-2	SC	Hall C
J2-3	SB	Hall B
J2-4	SA	Hall A
J2-5	ISOVCC	Hall power supply
J2-6	ISOVCC	Hall power GND

J3 Command Interfaces

J3-1	EARTH	Earth
J3-2	ENA	Enable or Disable input. Unconnected or high signal at J3-2 ENABLES drive's control to motor. Low signal at J3-2 DISABLES drive's control.
J3-3	DIR	Direction input. Motor rotates CW when J3-3 is at high signal or disconnected. Motor rotates CCW when J3-3 is at low signal. Pin is invalid in RS232 command mode.
J3-4	IN1	Reserved.
J3-5	SPEED	Motor speed output. One pulse output for one pair poles per cycle.
J3-6	FAULT	Error output. Low signal output for error. This pin is OC and pulled up to ISOVCC inner by a 10K resistance.
J3-7	ISOVCC	Input 5VDC or 12VDC when use external ISOVCC.
J3-8	ISOVCC	Isolated power GND.
J3-9	ISOVCC	Isolated power GND.
J3-10	ANALOG	Analog command input. Input from 0 to 5V or from 0 to 10V depending

on drive version.

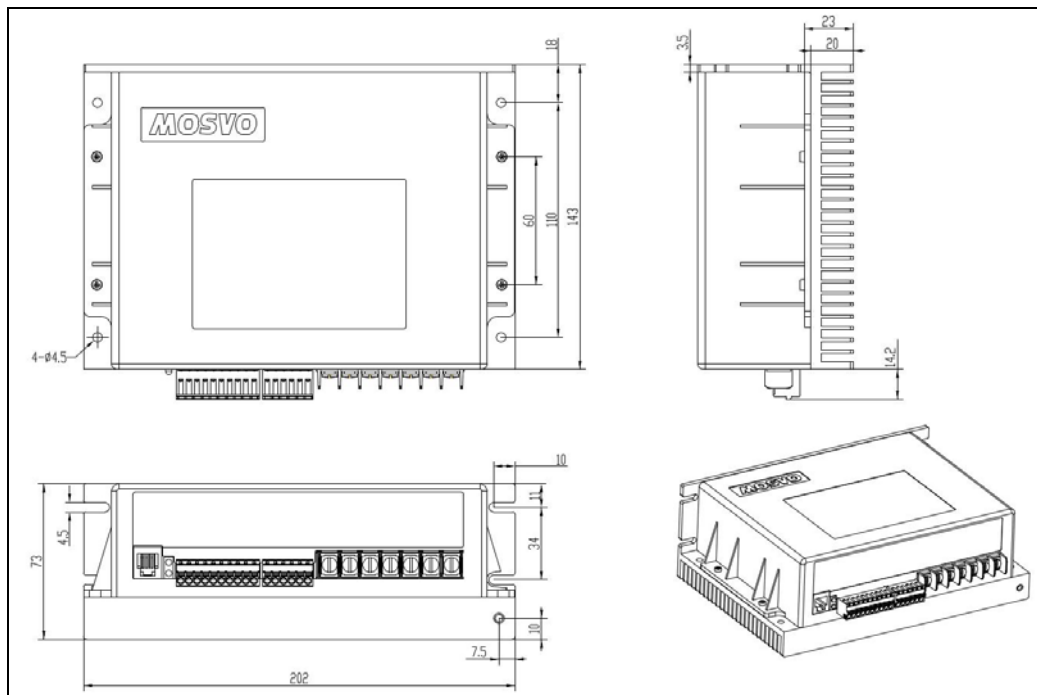
J4 RS232 Communications

J4-3	TX	RS232 TXD
J4-4	COM	RS232 GND
J4-5	RX	RS232 RXD

INDICATOR LIGHT

INDICATOR LIGHT	STATE	MEANING
POWER	Green On	Power Supplied
	Off	No Power
STATE	Green Flashes	Disable
	Green On	Enable
	Red On	Error

DIMENSIONS (unit: mm)



PARAMETERS SETUP

1. Default Parameters

ITEMS	PARAMETERS
ENA	Enable
SMOD1	Analog command, Velocity mode
BAUD9600	RS-232 baud rate: 9600bps
SPC16000	Peak current: 16A
SCC8000	Continuous Current: 8A
A50	Acceleration: 50
P1000	Velocity Loop Proportion Parameter: 1000

I200	Velocity Loop Integral Parameter: 200
D0	Velocity Loop Differential Parameter: 0
SSP5000	Maxim Velocity: 5000RPM
SMAV200	Dead Voltage: 200Mv
SNP4	Pair poles: 4
SPT1000	Protection Delay: 1000mS

2. Parameters Setup

User can configure the drive parameters according to the motor and load. Power-off will lose user's parameters configuration in the drive. To avoid that, use command "ESA" to save drive configuration to EEPROM memory.

CONTROL MODE

1. Communication command (RS232), Velocity Mode (SMOD0)

Command: V + Parameter

Example: V1000

For motor operate in velocity of 1000RPM

2. Analog Command, Velocity Mode (SMOD1)

Command: SSP (Maxim Velocity), SMAV (Dead Voltage)

- Maxim Velocity: SSP + parameter

Example: SSP5000.

Setup motor velocity range: -5000~5000 RPM

- Dead Voltage: SMAV + parameter

Example: SMAV200.

Motor will not respond to analog input ranges from -200mV to 200mV,

Analog to Velocity Command (Figure 1):

Target Velocity = $SSP \times \text{Analog}_{input} \div \text{Analog}_{maxim}$

3. Communication Command (RS232), Amplifier Mode (SMOD768)

Command: AM + Parameter

Example: AM20, $V_{out} = UDC \times 20/100$;

Example: AM-20, $V_{out} = UDC \times (-20) \div 100$;

4. Analog Command, Amplifier Mode (SMOD769)

Analog to UDC_{out} Command (Figure 2)

Target UDC_{out} = $UDC_{maxim} \times \text{Analog}_{input} \div \text{Analog}_{maxim}$

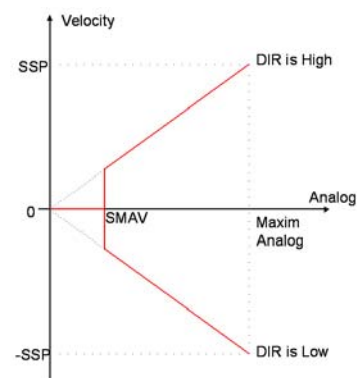


Figure 1

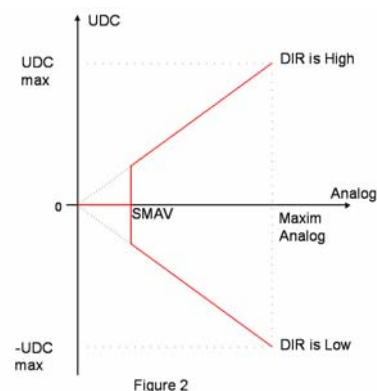


Figure 2

PROTECTION and RESET

Drive shuts down for error. To reset the protective state, use command 'DIS' or apply low signal to J3-2. To restart the drive, use command 'ENA' or apply high voltage to J3-2 pin