Feature

- Wide supply voltage (20 ~ 70 VDC).
- Dual or single channel control for BLDC motors.
  Output channels can be paralleled to drive a single motor up to 50Arms.
- Built-in electromagnetic brake control.
- RS485 (Trumman Multi-drive ModBus protocol) or CANopen control.
- Seamless operation in speed and position mode (encoder model only).
- Programmable I/O and operation parameters.
- Built-in regenerative shunt circuit (external resistor required).

Product Number Code

DEV C - F 050 C E

① ② ③ ④ ⑤ ⑥

①	Series	**DEVC** : **DEV** (I04) series dual channel BLDC motor drive.
②	Communication	**R:** RS485 **C**: RS485/CANBUS
③	Power Supply Voltage	**F** : 20~70VDC
④	Max Output Current	**050** : 50A
⑤	Reserved	-
⑥	Feature	**E** : Encoder

General Specifications

Model	DEVC-F050CE
Power Supply Voltage	24VDC ~ 70VDC
Regenerative active voltage	73 VDC (programmable), External resistor specification depends on the power system and the load.
Over Voltage Limit	85 VDC
Under Voltage Limit	18 VDC
Rated Continuous Output Current	25 A (per channel)
Peak Output Current	50 A (per channel)
Motor Feedback Supported	Incremental encoder, Hall
Cooling	Natural convection
Operating Temperature	-20 ~ 45 degC
Storage Temperature	-20 ~ 70 degC
Dimension (mm)	(190) * (120 + 30) * (40)

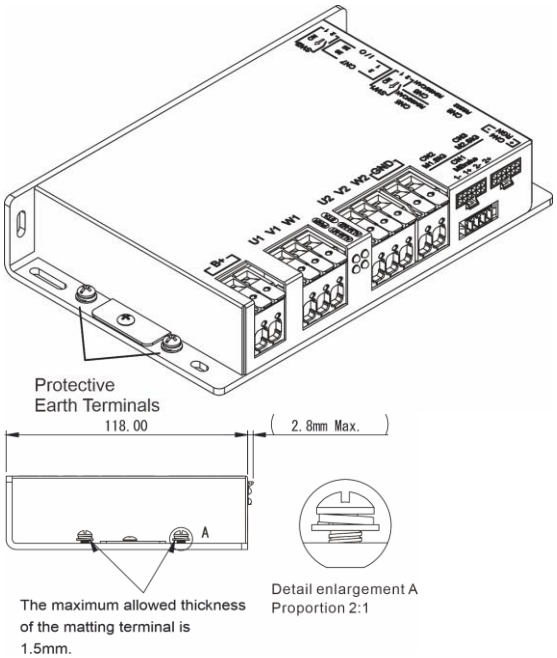
Control Specifications

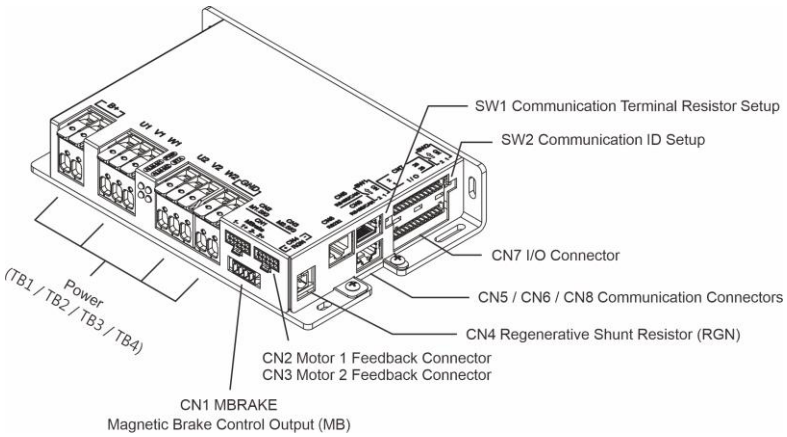
Inputs Specifications	2 SINK logic digital inputs (X0,X1) Internal Power Supply: 5VDC (on voltage <= 0.5VDC) | External Power Supply: 15~30VDC 25mA (through COMI) Low active of high active programmable.
	4 differential digital inputs (XH0+/-, XH1+/-, XH2+/-, XH3+/-) Support 5V differential / Internal 5V SINK / External 15~30VDC 25mA (external resistor 2.4K required). Low active of high active programmable.
Input Functions	Can be set to the following functions: S/S(FWD)、DIR(REV)、FREE、STOP-MODE、EBRAKE/ALM-RST、ALM-RST、D0、D1、EBRAKE/RUN、SERVO-ON、STOP、EXT-ERROR、CW-LIMIT、CCW-LIMIT
Outputs Specifications	2 SINK logic digital inputs (Y0, Y1) | 4 SINK logic high speed digital outputs (YH0 to YH3). Internal 5VDC 3mA | External 5 to 60VDC 25mA (on voltage <0.5VDC).
Electromagnetic Brake Output	2 sets 1A (Main power with PWM)
Output Functions	Can be set to the following functions: SPD-OUT、ALM-OUT、BUSY-OUT、VA-OUT、EN-OUT、ALM-PULSE、BUSY-ALM-PULSE、RUN-OUT、DIR-OUT、VA-OUT2、VA-EN-OUT
Analog Inputs	2 sets 0 to 5 VDC (speed control)
RS232	115200 bps. Can be connected to a PC with A_HMI software to program the drive. Modbus RTU/ASCII , Support speed/position control.
RS485 or CAN BUS* (one at a time)	RS485: 115200 bps, Modbus RTU/ASCII, (Multi-drive / Multi-drive Lite), Support speed/position control.
	CAN BUS: 1Mps, CANopen, Support speed/position control.

Protect Functions	Over-current, Over-load, Over-voltage, Under-voltage, Main circuit overheat, Feedback sensor error, Over-speed, EEPROM error, communication error.
Operation functions	Open-loop duty, speed mode, position mode, torque limit, slight position keeping (hall model), regenerative energy release (external resistor required).

* CANBUS model only.

Interface





Power (TB1/TB2/TB3/TB4)

Pin	Description	Pin	Description
B+	Main Power In (TB1)	B-	Main Power GND (TB4)
U1	Motor 1 Output U (TB2)	U2	Motor 2 Output U (TB3)
V1	Motor 1 Output V (TB2)	V2	Motor 2 Output V (TB3)
W1	Motor 1 Output W (TB2)	W2	Motor 2 Output W (TB3)

CN1 MBRAKE (Magnetic Brake Control Output) (MB)

Pin	Description
MB1-	Motor 1 MB control output
MB1+	Motor 1 MB Power
MB2-	Motor 2 MB control output
MB2+	Motor 2 MB Power

pitch 3.50mm
Matting connector: Included

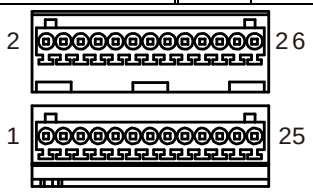
CN4 Regenerative Resistor (RGN)

Pin	Description
R+	Connect to a resistor more than 5 ohm, 40W (actual required resistor power rating may be larger depends on the load inertia).
R-	

pitch 5.08mm
Matting connector: Included

CN7 I/O Connector

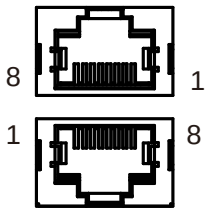
Pin	Name	Description	Default Function	Pin	Name	Description	Default Function
1	X0	Digital input X0	M1 START/STOP	2	Y0_P	Digital output Y0+	M1 ALM-OUT
3	X1	Digital input X1	M2 START/STOP	4	Y0_N	Digital output Y0-	
5	COMI	Digital input external 24 COM input.	-	6	Y1_P	Digital output Y1+	M2 ALM-OUT
7	A0X	Analog input 0	M1 speed control	8	Y1_N	Digital output Y1-	
9	A1X	Analog input1	M2 speed control	10	YH0	High speed digital output YH0	Reserved
11	GND	Signal ground	-	12	YH1	High speed digital output YH1	M1 SPD-OUT
13	5V	5V (For I/O)	-	14	YH2	High speed digital output YH2	Reserved
15	CTRL+	Control supply input (20~70VDC)	-	16	YH3	High speed digital output YH3	M2 SPD-OUT
17	XH0+	Differential input XH0. Connect to XH0- when use SINK connection.	M1 CCW/CW	18	XH2+	Differential input XH2. Connect to XH2- when use SINK connection.	M2 CCW/CW
19	XH0-			20	XH2-		
21	XH1+	Differential input XH1. Connect to XH1- when use SINK connection.	Reserved	22	XH3+	Differential input XH3. Connect to XH3- when use SINK connection.	ALM-RST
23	XH1-		Reserved	24	XH3-		
25	STO1	Reserved	-	26	STO2	Reserved	-



pitch 2.50mm
Matting connector: Included

CN5 / CN6 Communication Connectors

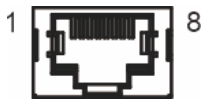
Pin	Name	Description
1	RS232_RX	Drive side RS232 RX
2	RS232_TX	Drive side RS232 TX
3	GND	Signal ground
4	RS485_A	RS485 A (Cannot be used with CAN at the same time)
5	RS485_B	RS485 B (Cannot be used with CAN at the same time)
6	GND	Signal ground
7	CAN_L	CANBUS L (Cannot be used with RS485 at the same time)
8	CAN_H	CANBUS H (Cannot be used with RS485 at the same time)



RJ45
Matting connector: optional

CN8 Communication Connectors

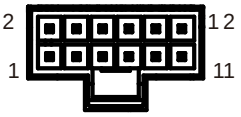
Pin	Name	Description
1	RS232_RX	Drive side RS232 RX
2	RS232_TX	Drive side RS232 TX
3	GND	Signal ground
4	VCC_5V	5V supply for communication (20mAmx).
5	NC	Do not use.
6	NC	Do not use.
7	CAN_L	CANBUS L (Cannot be used with RS485 at the same time)
8	CAN_H	CANBUS H (Cannot be used with RS485 at the same time)



RJ45
Matting connector: optional

CN2 Motor 1 Feedback Connector
CN3 Motor 2 Feedback Connector

Pin	CN2 Name	CN3 Name	Description
1	5V		5V for motor feedback sensor.
2	GND		Signal ground.
3	M1A-	M2A-	Encoder A- / Hall U
4	M1A+	M2A+	Encoder A+
5	M1B-	M2B-	Encoder B- / Hall V
6	M1B+	M2B+	Encoder B+
7	M1C-	M2C-	Encoder C- / Hall W
8	M1C+	M2C+	Encoder C+
9	M1S0	M2S0	HU for encoder + hall type sensor
10	M1S2	M2S2	HW for encoder + hall type sensor
11	M1S1	M2S1	HV for encoder + hall type sensor
12	NC	NC	NC



pitch 2.50mm
Matting connector: optional

LED Functions

LED Function	Description
PWR-LED (Green)	ON：Normal (logic power on) OFF：logic power off
STA-LED (Orange)	ON：RS-485/CANBUS normal Blink：RS-485/CANBUS signal received but cannot identify the message (baud-rate or protocol error). OFF：RS-485/CANBUS no signal (not connected).
ALM-M1 (Red) ALM-M2 (Red)	ALM-M1 indicates the alarm status of motor1, ALM-M2 indicates the alarm status of motor2. ON：Drive in WAIT status (SERVO-OFF). Slow Blink：Alarm occurs. The type of alarm can be confirmed by the blink count. Super-Fast Blink (30ms)： STO OFF (STO power not connected). OFF：Normal.

SW1 Communication Terminal Resistor Setup

SW1-1	SW1-2
ON = CANBUS with internal terminal resistor 120R. OFF = CANBUS without internal terminal resistor.	ON = RS485 with internal terminal resistor 120R. OFF = RS485 without internal terminal resistor.

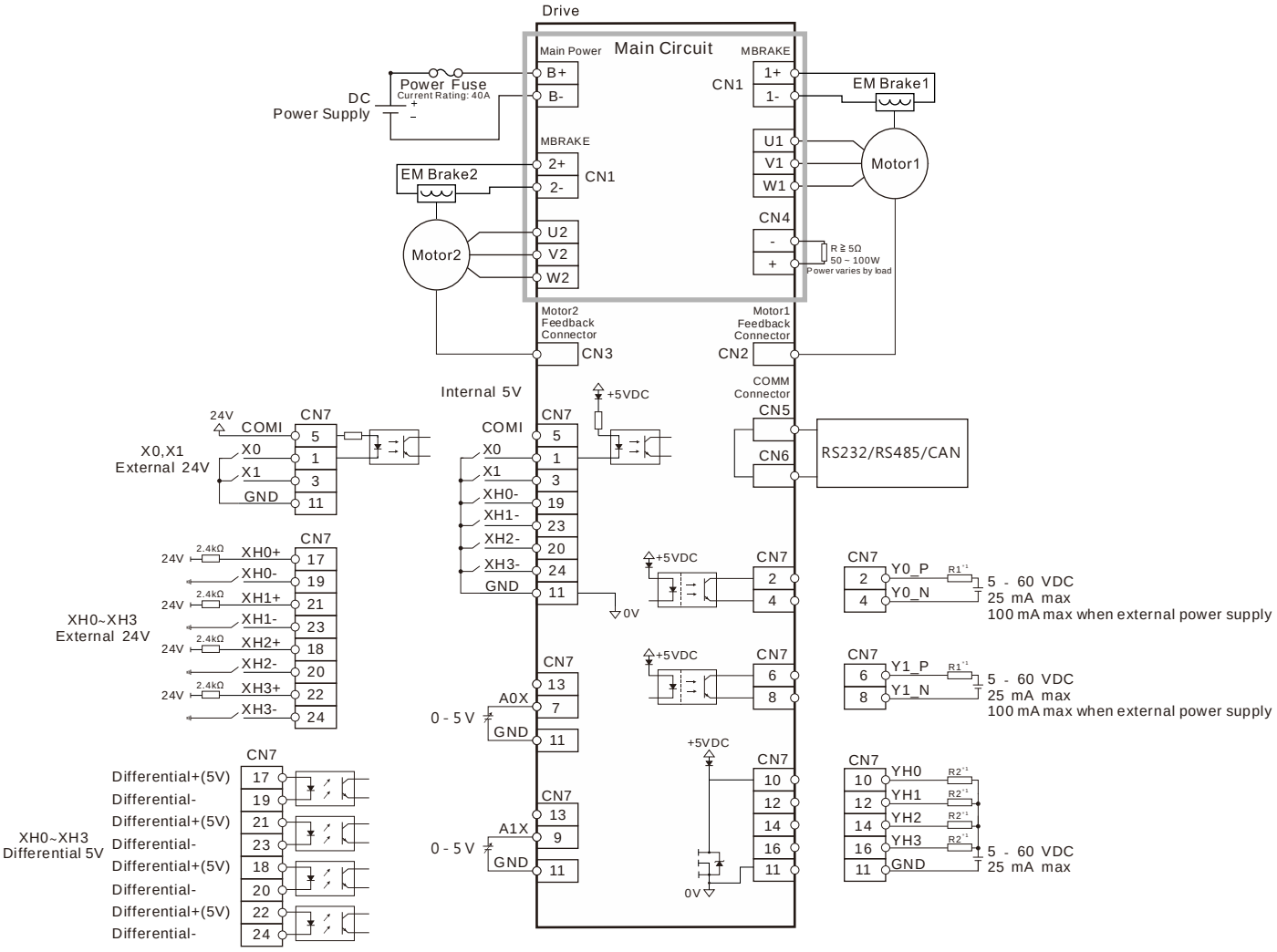
SW2 Communication ID Setup (After Rev D)

M1 ID	M2 ID	SW2-1	SW2-2
1	2	0	0
3	4	1	0
5	6	0	1
7	8	1	1

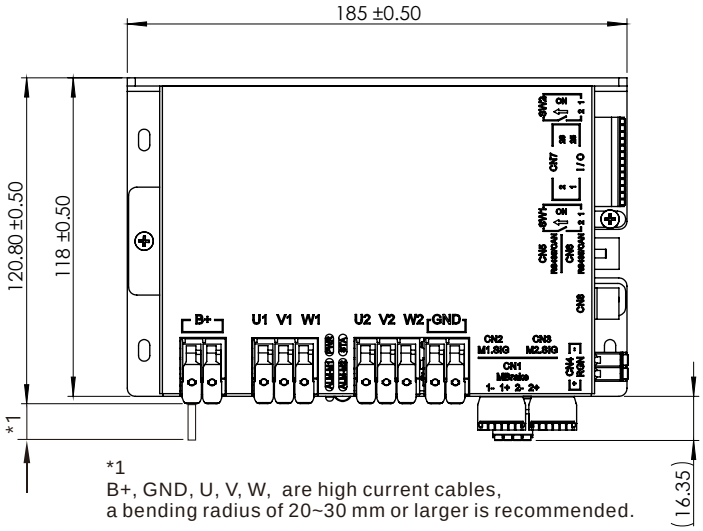
SW2 Communication ID Setup (Before Rev C)

M1 ID	M2 ID	SW2-1	SW2-2
1	2	0	0
3	4	0	1
5	6	1	0
7	8	1	1

Connection

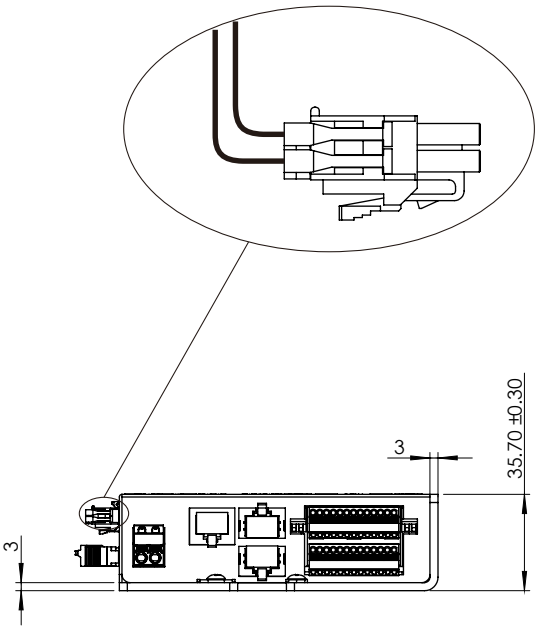

Drive
Main Power
Main Circuit
MBRAKE
B+
B-
CN1
1+
1-
EM Brake1
DC
Power Supply
Power Fuse
Current Rating: 40A
MBRAKE
2+
2-
CN1
EM Brake2
U1
V1
W1
Motor1
CN4
-
+
R ≧ 5Ω
50 ~ 100W
Power varies by load
Motor2
U2
V2
W2
Motor2
Feedback
Connector
CN3
Motor1
Feedback
Connector
CN2
COMM
Connector
CN5
CN6
RS232/RS485/CAN
Internal 5V
+5VDC
24V
COMI
CN7
5
X0,X1
External 24V
X0
1
X1
3
GND
11
XH0-
19
XH1-
23
XH2-
20
XH3-
24
XH0~XH3
External 24V
2.4kΩ
XH0+
17
XH1+
21
XH2+
18
XH3+
22
XH3-
24
XH0~XH3
Differential 5V
Differential+(5V)
Differential-
0 - 5 V
A0X
A1X
GND
13
7
9
11
2
4
6
8
10
12
14
16
0V
Y0_P
Y0_N
Y1_P
Y1_N
YH0
YH1
YH2
YH3
R1
R2
5 - 60 VDC
25 mA max
100 mA max when external power supply

Dimension (Unit: mm)

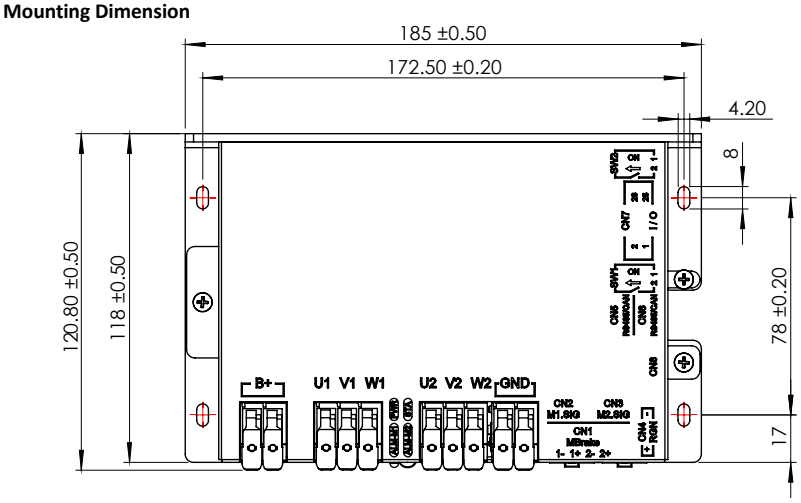


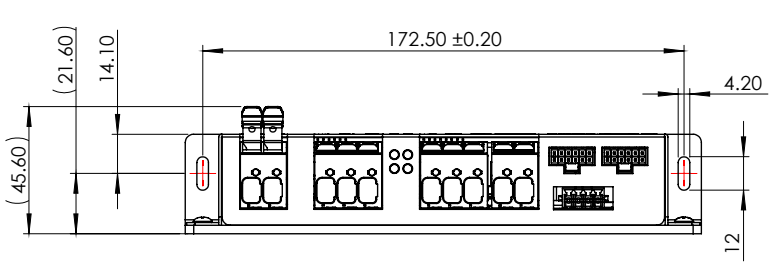
*1
B+, GND, U, V, W, are high current cables,
a bending radius of 20~30 mm or larger is recommended.

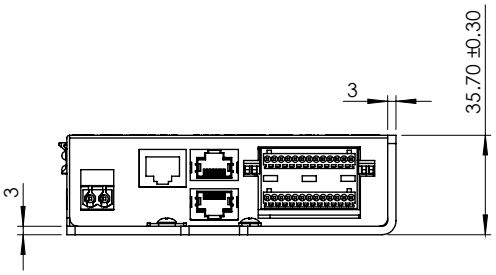
Recommended bending directionfor the motor feedback signal wire



Mounting Dimension







Protect Function (Alarm)

When an alarm occurs, the motor coasts to stop, the ALM-OUT outputs ON and the ALM-LED blinks.
Before resetting an alarm, always remove the cause of the alarm and ensure safety then perform one of the reset operations specified below.

- Set the ALM-RST input "OFF" for more than 0.5 sec then set it to "ON" for more than 0.5 sec then set it to "OFF".
- Cycle the power. When cycling the power please turn the power off for at least 30sec or till the PWR LED off then turn the power on again.

NOTE Some alarm can only be rest by cycling the power.
NOTE The alarm cannot be reset if the drive operation command is "ON" (e.g. START/STOP input is ON). Please set all the operation command/signal to "OFF" before rest the alarm.

- **Alarm status register**

Channel	Monitor data register
M1	0003h
M2	0013h

- **ALM LED**

ALM LED blinks in a cycle when an alarm occurs. The blink time in each cycle is corresponding to the alarm error code.

LED Blinks/ Alarm Code	Protect Function	Description
1	Over-current	Excessive current has flown through the drive. Could be motor power short, motor stall ,or drive power is not enough.
2	Over-load	The load exceeds the rated value has applied to the motor for more than 5 sec. The load exceeds the torque limit value has applied to the motor for more than x sec (x can be set by parameter).
3	Motor feedback fault	Hall or encoder signal bad or not connected.
4	Over-voltage	The input power supply voltage has exceeded the maximum limit. Or the inertia of the load is too large.
5	Under-voltage	The input power supply voltage is under the low limit. Or bad power connection.
6	Drive main circuit overheat	The drive's heat sink temperature is over maximum limit.
7	Motor startup failed	Error in EEPROM data (Can NOT be reset by ALM-RST).
8	EEP data error	The motor temperature is too high. Or parameter 01-06 setting incorrect.
10	Motor overheat	Motor operation speed is over the parameter 05-03 setting.
12	Over-speed	(1) Encoder not connected (Can NOT be reset by ALM-RST). (2) Encoder position overflow. Reset the position with CS command before ALM-RST.
13	Encoder error	Error in EEPROM data (Can NOT be reset by ALM-RST).
14	Power On Inhibit	A run command is ON during power on.
15	External stop	EXT-ERROR input is ON. When cross-channel alarm is set to on, alarm of one channel will trigger the EXT-ERROR alarm of the other channel.
20	Hall sequence fault	The hall sequences no matching the drive's setting.
21	Communication error	The parameter setup value exceeds its limit, or the communication command was not supported. RS232 or RS485 timeout.
22	Parameter error	Parameter setup value was incorrect.

Revision History

REV	Date	Remark
1.0	20211126	1st Release.
1.1	20221207	IO function name M0, M1 modified to D0, D1. LED and SW function added. Interface and several minor content updated.