

# QuickStart Guide

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## EVO 6000/6800



# Welcome to the Liteon VFD QuickStart Guide.

This Quick Start guide tells you how to set up your EVO unit and use its basic features.  
Please refer to the User Manual for the full specification and features.

## Installation Direction

Install the AC drive upright for better cooling.

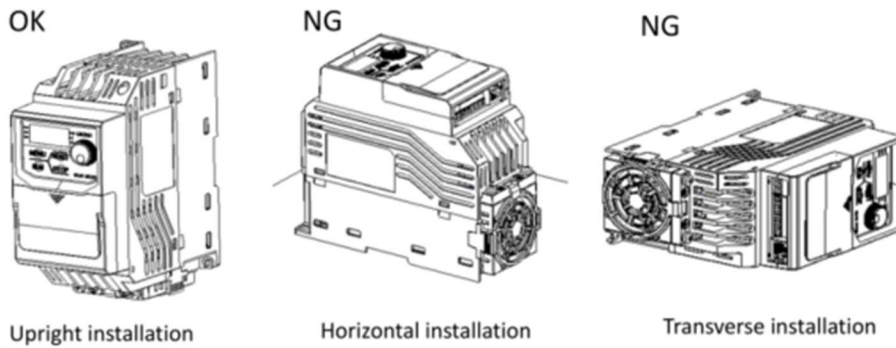


Figure 3.1 Installation Direction

### 3.2.2 Installation Spacing

Install the AC drive as illustrated below to ensure the required space for airflow and wiring.

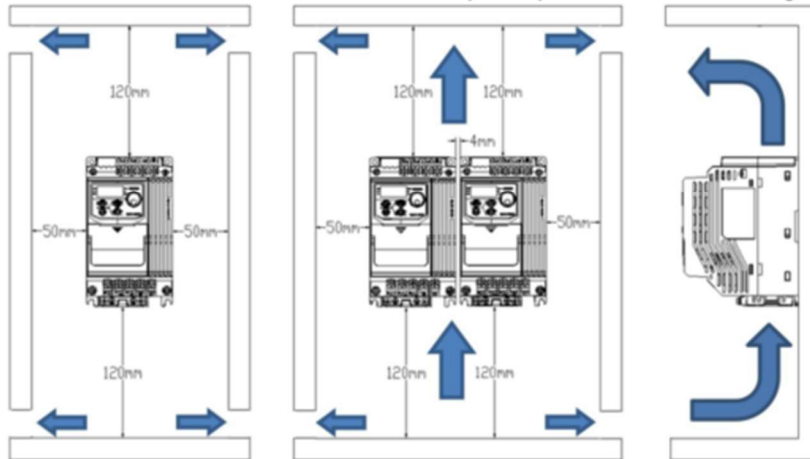
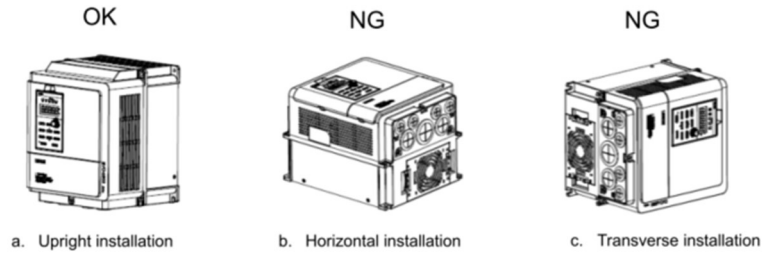


Figure 3.2 Installation Spacing Single

Note: When installing drives of different sizes, align the tops of the drives for easier cooling fan replacement.

Install the AC drive upright for better cooling.

Figure 3.1 Installation Direction



### 3.2.2 Installation Spacing

#### 3.2.2.1 Single Drive Installation

Install the AC drive as illustrated below to ensure the required space for airflow and wiring.

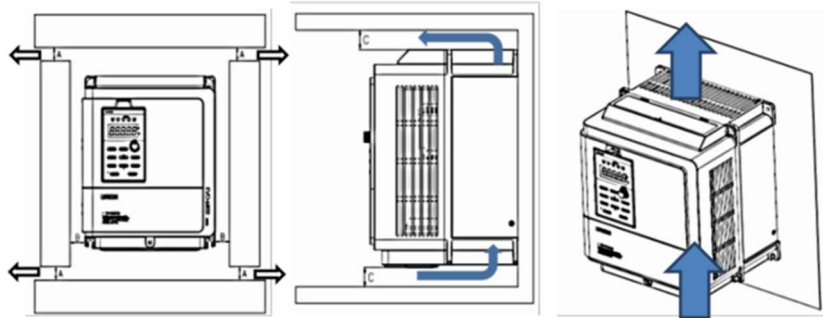
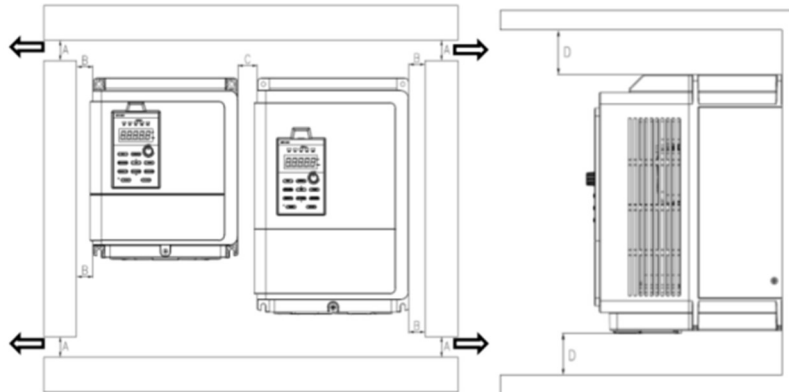


Figure 3.2 Installation Spacing for Single Drive

Note: Same amount of space is required for IP00 and NEMA 1 enclosure.

Install the AC drives as illustrated below to ensure the required space for airflow and wiring.



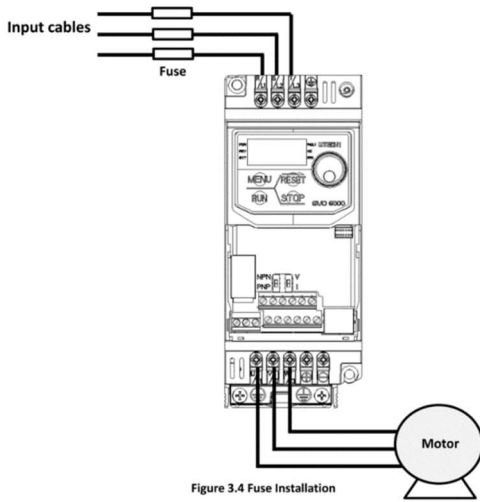
A – Minimum 50 mm B - Minimum 30 mm C - Minimum 10 mm D - Minimum 150 mm

Figure 3.3 Installation Space for Side-by-Side Installation

Note: When installing drives of different sizes, align the tops of the drives for easier cooling fan replacement.

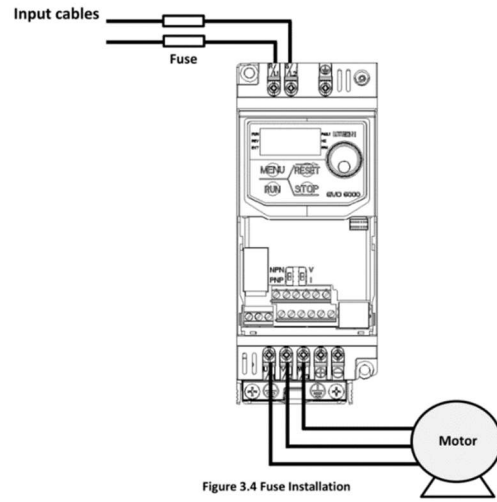
**EVO 6800**

# Basic Wiring

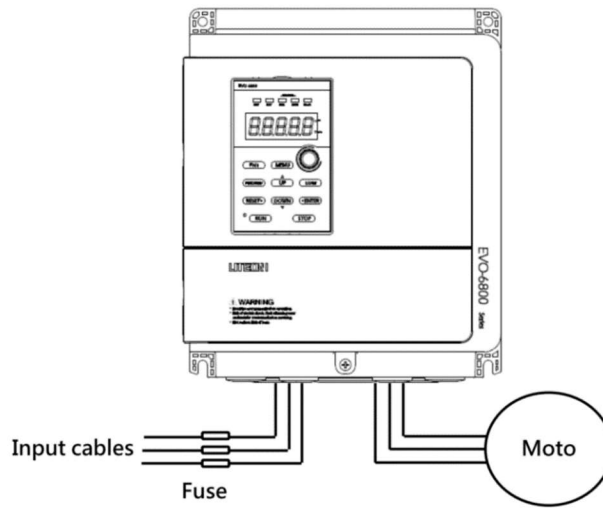


Three Phase Input

EVO6000



Single Phase Input


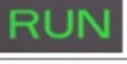





EVO6800

# Keypad

Table 5.1.2.1 LED Display

Number /Letter	LED Display	Number /Letter	LED Display	Number /Letter	LED Display	Number /Letter	LED Display
0	0	9	9	i	,	r	⌈
1	1	A	A	J	]	S	S
2	2	b	b	K	Nil	t	t
3	3	c	C	L	L	U	U
4	4	d	d	M	Nil	v	v
5	5	E	E	n	n	W	Nil
6	6	F	F	o	o	X	Nil
7	7	G	G	P	P	y	Nil
8	8	H	H	q	Nil	Z	Nil

	MENU Key	<ul style="list-style-type: none"> <li>■ Enters or exits the parameter group</li> <li>■ Switches the displayed menu</li> </ul>
	RUN Key	Forward/reverse selection
	STOP Key	Stops the drive. Refer to Table 5.1.2.2
	RESET Key	<ul style="list-style-type: none"> <li>■ Moves the cursor to the right</li> <li>Resets the drive to clear a fault situation</li> </ul>
	Non-Slip Setting Dial	Press it as "ENTER" key: <ul style="list-style-type: none"> <li>■ Enters parameter value, parameter and setting</li> <li>■ Enters parameter setting menu.</li> <li>■ Confirms the frequency set by the dial</li> </ul> Press it as "Dial" key: <ul style="list-style-type: none"> <li>Increases or decreases parameter numbers, setting value and frequency</li> </ul>

Ex. To change RPM, press the "MENU" button to cycle between the RPM Display, Parameters Menu, and the Monitor Display. Once on the RPM Display, turn the Dial to desired speed and press in on the Dial to set the speed.

# Factory Reset

Make sure A1-01 is set to 2 (default) to give full access to all Parameters.

Ex. For 60Hz 460V Set A1-03 to 2646 or 2623 for 60Hz 230V (if uncertain use 2-wire seq.)

Group A, Initialization			
A1: Basic Settings			
A1-01 <4>	Access Level Selection	Selects access level ( edit /view) 0: View Only Access to only parameter A1-01. 1: User-Defined Parameter Access Access to only parameter A1-01 and A2-00 to A2-15. 2: All Parameter Access All parameters can be edited and viewed	Default: 2 Min.: 0 Max.: 2
A1-02	Control Method Selection	0: Open-Loop V/F Control 1: Sensorless Voltage Vector Control (SVVC) (Open-Loop)	Default: 0 Range: 0, 1
A1-03	Reset	0: No initialization 2520: Resets 2-Wire Sequence / 50Hz / 200V 2522: Resets 2-Wire Sequence / 50Hz / 220V 2523: Resets 2-Wire Sequence / 50Hz / 230V 2620: Resets 2-Wire Sequence / 60Hz / 200V 2622: Resets 2-Wire Sequence / 60Hz / 220V 2623: Resets 2-Wire Sequence / 60Hz / 230V 3520: Resets 3-Wire Sequence / 50Hz / 200V 3522: Resets 3-Wire Sequence / 50Hz / 220V 3523: Resets 3-Wire Sequence / 50Hz / 230V 3620: Resets 3-Wire Sequence / 60Hz / 200V 3622: Resets 3-Wire Sequence / 60Hz / 220V 3623: Resets 3-Wire Sequence / 60Hz / 230V 2538: Resets 2-Wire Sequence / 50Hz / 380V 2541: Resets 2-Wire Sequence / 50Hz / 415V 2544: Resets 2-Wire Sequence / 50Hz / 440V 2546: Resets 2-Wire Sequence / 50Hz / 460V 2638: Resets 2-Wire Sequence / 60Hz / 380V 2641: Resets 2-Wire Sequence / 60Hz / 415V 2644: Resets 2-Wire Sequence / 60Hz / 440V 2646: Resets 2-Wire Sequence / 60Hz / 460V 3538: Resets 3-Wire Sequence / 50Hz / 380V 3541: Resets 3-Wire Sequence / 50Hz / 415V	Default: 0 Range: 0~9999

# Auto tuning

Set T1-01 (0 for rotational, 1 or stationary, 0 is default)

Change T1-12 to 1 and it will enter Autotune mode, press “Run” to start the auto tune. Display will show “End” when Autotune is complete.

## Entering Initial Settings Manually

d1: V/F Characteristics			
d1-00	Input Voltage Setting	Sets the input voltage of the drive. Always set the input voltage of the drive (not	Default : 400 Min.: 155 V
d1-02	Maximum Output Frequency	When d1-01 $\leq$ E, parameters d1-02 to d1-11 can be used to monitor the V/F pattern. When d1-01 = F, parameters d1-02 to d1-11 can be used to create a V/F pattern.	Default: <1> Min.: 25.0 Hz Max.: 400.0 Hz
d1-03	Maximum Voltage		Default: <1> Min.: 0.0 V Max.: 255.0 V <3>
d1-04	Base Frequency		Default: <1> Min.: 0.0 Hz Max.: Defined by d1-02
d1-05	Base Voltage		Default: <1> Min.: 0.0 V Max.: 255.0 V <3>
d1-06	Middle Output Frequency		Default: <1> Min.: 0.0 Hz
d2-00	Motor Rated Current		Sets the motor rated current. This will be set automatically during Auto-Tuning.
d2-01	Motor Rated Speed	Sets the motor rated speed. This will be set automatically during Auto-Tuning.	Default: o2-03 Min.: 0.00 Hz Max.: 20.00 Hz
d2-02	Motor No-Load Current	Sets the motor no-load current. This will be set automatically during Auto-Tuning.	Default: o2-03 Min.: 0 A Max.: d2-00
d2-03	Number of Motor Poles	Sets the number of motor poles. This will be set automatically during Auto-Tuning.	Default: 4 Min.: 2 Max.: 48
d2-04	Motor Line-to-Line Resistance	Sets the line-to-line resistance. This will be set automatically during Auto-Tuning.	Default: o2-03 Min.: 0.000 $\Omega$ MMax.:65.00 $\Omega$
d2-05	Motor Leakage Inductance	Sets the voltage drop caused by the motor leakage inductance relative to the motor	Default: o2-03 Min.: 0.00 mH
	Inductance	rated frequency and current. This will be set automatically during Auto-Tuning.	Max.:650.0 mH
d2-06	Motor Rotor Resistance	Sets the motor rotor resistance. This will be set automatically during Auto-Tuning.	Default: o2-03 Min.: 0.000 $\Omega$ Max.:65.00 $\Omega$
d2-07	Motor Mutual Inductance	Sets the motor mutual inductance. This will be set automatically during Auto-Tuning.	Default: o2-03 Min.: 0.0 mH Max.:6500 mH
d2-10	Motor Rated Capacity	Sets the motor rated capacity. This will be set automatically during Auto-Tuning. (1HP = 0.746 kW)	Default: o2-03 Min.: 0.00 kW Max.: 650.0kW

# Terminal Setup

**Operation Mode must be set to “Terminal” before terminal switches can be used.  
Frequency Command must be set to “1: Analog Input” before Pot can be used.**

b1: Operation Mode Selection			
b1-00	Frequency Command Selection 1	0: Keypad 1: Control Circuit Terminal (Analog Input) 2: Terminal Up/Down 3: Modbus Communication	Default: 0 Min.: 0 Max.: 3
b1-01	Run Command Selection 1	0: Keypad 1: Control Circuit Terminal (Sequence Control Input) 2: Modbus Communication	Default: 0 Min.: 0 Max.: 2

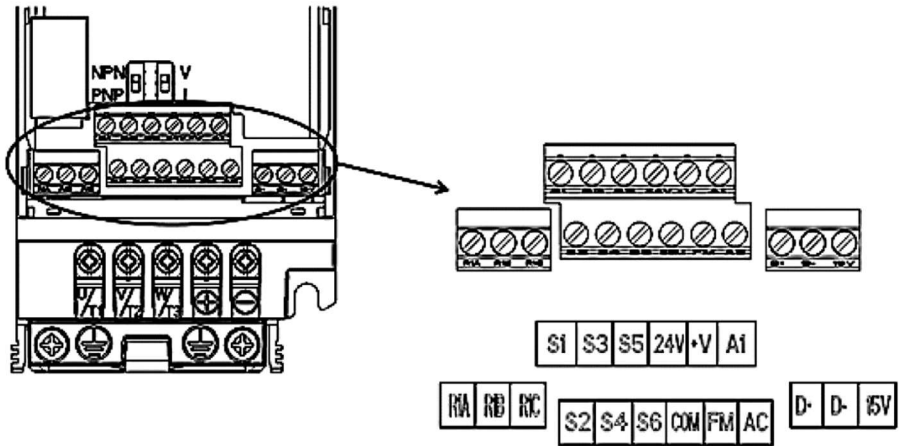
## Terminal Descriptions

### 4.3.1.1 Input Terminals

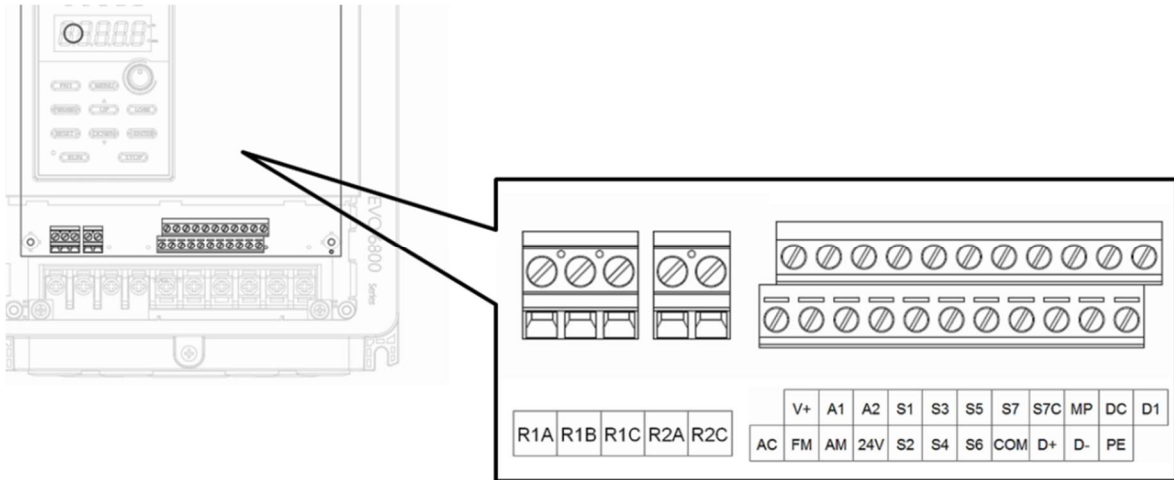
Table 4.3.1.1 Control Circuit Input Terminal

Terminal Type	Terminal Code	Terminal Name	Terminal Description
Multi-Function Digital Inputs	S1	Digital input terminal 1 (forward/stop)	Photocoupler, 24 V, 8 mA. Use NPN/PNP switch to select multi-function digital input type. The default is NPN mode.
	S2	Digital input terminal 2 (reverse/stop)	
	S3	Digital input terminal 3 (external fault 1)	
	S4	Digital input terminal 4 (fault reset)	
	S5	Digital input terminal 5 (Jog)	
	S6	Digital input terminal 6 (Baseblock)	
	24V	+24V auxiliary power terminal for analog input	+24V 25mA
	COM	Digital input common terminal for NPN/PNP mode switch. Select the mode correctly when connecting.	
Multi-Function Analog Inputs	+V	Auxiliary power terminal +10V	Analog input power+10V
	A1	Analog input terminal 1 (main frequency command)	Voltage input: 0 to 5V or 0 to 10V Impedance value: 32KΩ Current input: 0 or 4 to 20mA Impedance value: 250Ω
	PE	Ground terminal	The ground terminal for control signals to avoid interference. Use shielded cables only.
	AC	Common terminal for analog signals	

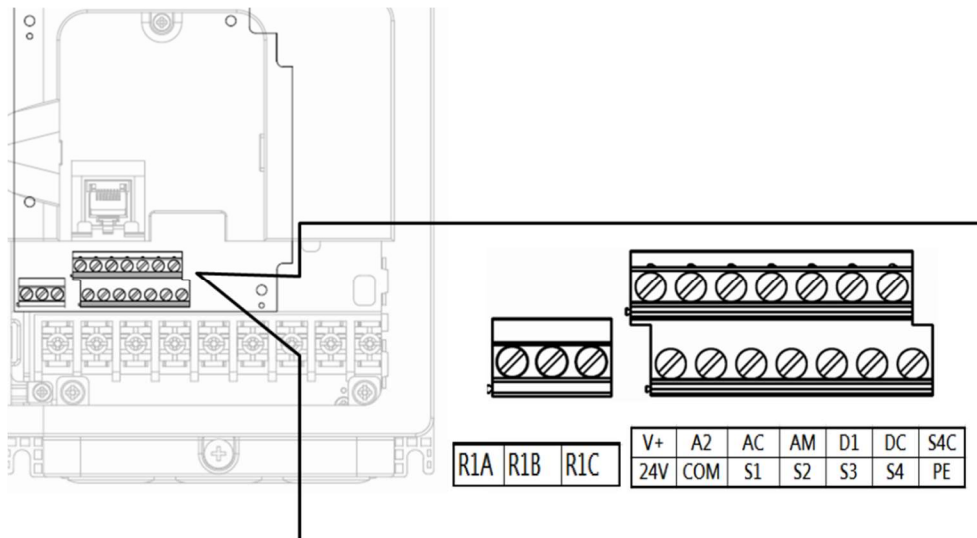
**EVO6000**



**EVO6800 >7.5kW**



**EVO6800 <5.5kW**



### Terminals Functions.

E1-00	Terminal S1 Function Selection	0 : 2-Wire Sequence Control (Forward/Stop) / 3-Wire Sequence Control (Stop) 1 : 2-Wire Sequence Control (Reverse/Stop) / 3-Wire Sequence Control (Stop)	Default : 0 Min.: 0 Max.: 0~73/100~173
E1-01	Terminal S2 Function Selection	2 : 3-Wire Sequence 3 : Local/Remote Selection	Default : 1 Min.: 0 Max.: 0~73/100~173
E1-02	Terminal S3 Function Selection	5 to 8: Multi-Step Speed Command 1 to 4 9 : Jog Frequency 10 : Up Command	Default : 23 Min.: 0 Max.: 0~73/100~173
E1-03	Terminal S4 Function Selection	11: Down Command 12: Up 2 Command 13: Down 2 Command	Default : 39 Min.: 0 Max.: 0~73/100~173
E1-04	Terminal S5 Function Selection	14, 15: FJOG/RJOG Command 16: Acc./Dec. Time Selection 1 18: Acc./Dec. Ramp Hold	Default : 9 Min.: 0 Max.: 0~73/100~173
E1-05	Terminal S6 Function Selection	19: Baseblock Command (Normal Open) 20: Retain 21: Fast Stop (Normal Open) 22: Fast Stop 23 to 38 : External Fault 39: Fault Reset 40 : oH2 (AC drive Overheat Alarm) 45: Communication Mode 46: PID Disable 47: PID Integral Reset	Default : 19 Min.: 0 Max.: 0~73/100~173
		48: PID Integral Hold 49: PID Soft-Start On/Off 50: PID Input Characteristics Switch 52: Timer Input 53, 54, 55: Offset Frequency 1/ 2/ 3 58/59: Retain 60: Program Lockout 61: Analog Frequency Command Hold 62: Retain 65: DC Braking 69 : Drive Enabled (Note) 0xx/1xx are anti-logic	
E1-08	2/3-wire control switch	0:2/3 line control mode 1 1:2/3 line control mode 2	Default: 0 Min.: 0 Max.: 1
E1-09	DI terminal delay time	Used to set the delay time of the inverter for the change when the status of the DI terminal changes.	Default: 0 ms Min.: 0 Max.: 500 ms

## Analog Input can be changed using the parameters below

E3-00	Terminal A1 Signal Level Selection	0: 0 to 20 mA 1: 4 to 20 mV 2: 0 to 10 V 3: 0 to 5 V	Default: 2 Range: 0 to 3
E3-01	Terminal A1 Function Selection	0 : Main Frequency Command 2 : Output Frequency Lower Limit 3 : Auxiliary Frequency Command 4 : Output Voltage Bias 5 : Acc./Dec. Time Gain (Decrease Only) 6 : DC Braking (DB) Current 7 : Stall Prevention Level During Run 8 : PID Feedback 9 : PID Target 11 : Overtorque/ Undertorque Detection 18: Communication Mode 1 19 : Communication Mode 2 21 : Retain<7>	Default: 0 Range: 0 to 21
E3-02 <4>	Terminal A1 Input Gain	Sets the terminal A1 input gain as a percentage when inputting 10V	Default: 100.0 % Min.: -999 % Max.: 999.9 %
E3-03 <4>	Terminal A1 Input Voltage Bias	Sets the terminal A1 input voltage bias as a percentage when inputting 0V	Default: 0.0 % Min.: -999 % Max.: 999.9 %
E3-04	Terminal A1 (4-	0 : no disconnection selection	Default: 0

## Stopping and Accelerating Modes

b1-02	Stopping Method Selection	0: Ramp to Stop 1: Coast to Stop 2: DC Braking to Stop 3: Coast to Stop with Timer	Default: 0 Min.: 0 Max.: 3
C1-00 <4>	Acceleration Time 1	Sets the time that the drive accelerates from 0Hz to the maximum output.	Default: 10.0 s Min.: 0.0 s Max.: 3600 s
C1-01 <4>	Deceleration Time 1	Sets the time that the drive decelerates from the maximum output to 0Hz.	
C1-02 <4>	Acceleration Time 2	Sets the time that the drive accelerates from 0Hz to the maximum output.	
C1-03 <4>	Deceleration Time 2	Sets the time that the drive decelerates from the maximum output to 0Hz.	
C1-08	Fast Stop Time	Sets the time to stop the drive faster.	
C1-11	Jog Acc. Time	Sets the time to accelerate from 0 Hz to Jog Frequency Command (L1-16).	Default: 10.0 s Min.: 0.0 s Max.: 3600 s
C1-12	Jog Dec. Time	Sets the time to decelerate from Jog Frequency Command (L1-16) to 0 Hz.	Default: 10.0 s Min.: 0.0 s Max.: 3600 s

# Relays

**Table 4.3.1.2 Control Circuit Output Terminals**

Terminal Type	Terminal Code	Terminal Name	Terminal Description
Multi-Function Relay Output	R1A	Relay 1 normal open	Relay output: DC 30 V, 1 A AC 250 V, 5 A
	R1B	Relay 1 normal closed	
	R1C	Relay 1 common	
Multi-Function Analog Output	FM	Programmable analog output terminal (output frequency)	Voltage Output: 0 to 10V Impedance value: 20K $\Omega$
	AC	Analog common terminal	

<1> Do not assign frequent switching functions such as ON/OFF to terminals R, which may shorten the relay terminal life.

**Relays can be programmed to trigger under the condition listed below.**

E2-00	Relay 1 Function Selection	0 : During Run 1 : Zero Speed Holding 2 : Frequency (Speed) Agree 3 : User-Defined Frequency (Speed ) Agree 4 : Drive Ready 5 : Uv (Undervoltage) Detection 6 : During Baseblock 8 : Frequency Command Source 9 : Frequency Command Loss 10: Run Command Source 11 : Fault 12 : Communication Mode 13 : Alarm 14 : Fault Restart 15 : Timer Outpu 16 : Frequency (FOUT) Detection 1 17 : Frequency (FOUT) Detection 2 18: Overvoltage/ Undervoltage Detection 1 (normal open) 22 : During Reverse 24: During Regeneration	Default: 11 Range: 0 to 49 / 100 to 149
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## FAQ

### **Does the EVO have Closed Loop Torque Control capability?**

ONLY EVO 8000 series can do Closed Loop Control, EVO 6000 and 6800 only supports SVVC and V/F

### **Does the EVO have PM Motor Control capability?**

PM motors require very precise timing and filters to operate without damaging motor. Only 8000 series have PM mode

### **What is the recommended Fuse or Breaker size?**

It is recommended that a fast-acting current limiting Fuse is used because breakers may react too slow and damage the drive. Rules in the NEC specific to VFDs call for the breaker to be 125% of the INPUT current of the VFD (use rated current on the nameplate depending on the Duty Cycle) (for single phase input current, \* 1.5 is the fuse size).

### **What is the EVO's voltage tolerance?**

EVO Voltage tolerances are +/- 15%

### **Do we need Brake Kits AND a Braking Resistor?**

6000 needs kit and brake resistor to dissipate heat

6800 just needs resistors, we have size recommendation if customer needs them

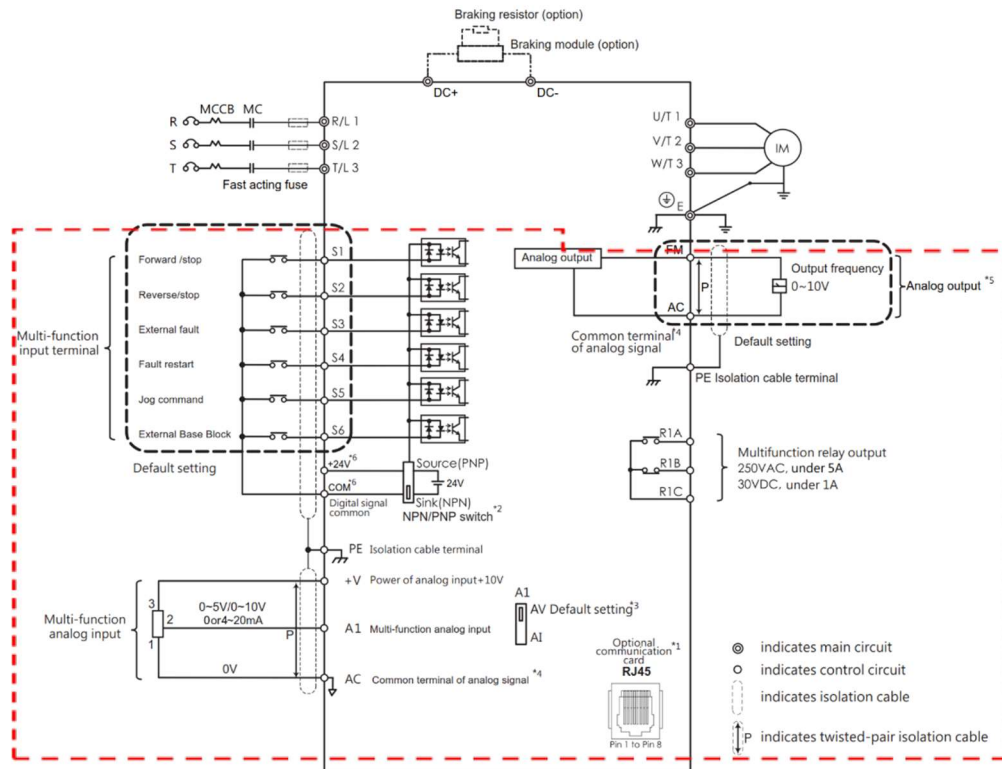
### **What is the Maximum Overload Capacity (for dynamic Braking)?**

150% for 1 minute every 10 minutes.

### **Can we disable Input Phase Loss Protection?**

Yes, set P7-00 to 0 (default is 1)

# Main Circuit



- RJ45 port can be connected to the built-in RS-485 communication or option communication cards (options cards are under development)
- Multi-function analog input S1 to S6 can be switched between Sink (NPN) mode and Source (PNP) mode. The default setting is NPN mode.
- DIP switch A1 is used to set the analog input type as voltage or current.
- AC (Analog Common) is the common terminal of analog signal.
- Analog output is used to connect a frequency meter, current meter, voltage meter and power meter.
- +V is the input terminal for auxiliary power.