CR700 Quick Start Guide Rev 1 (07-02-23)

The following procedure is a supplement to other documentation available with this equipment and will guide the user in properly wiring the CR700 and motor. It will also show the user how to configure the CR700 in either Traverse or Hoist function for a basic crane application. Please refer to the CR700 technical manual, for full details and detailed operation.

DANGER! Improper wiring can and will cause bodily harm as well as damage to the equipment.

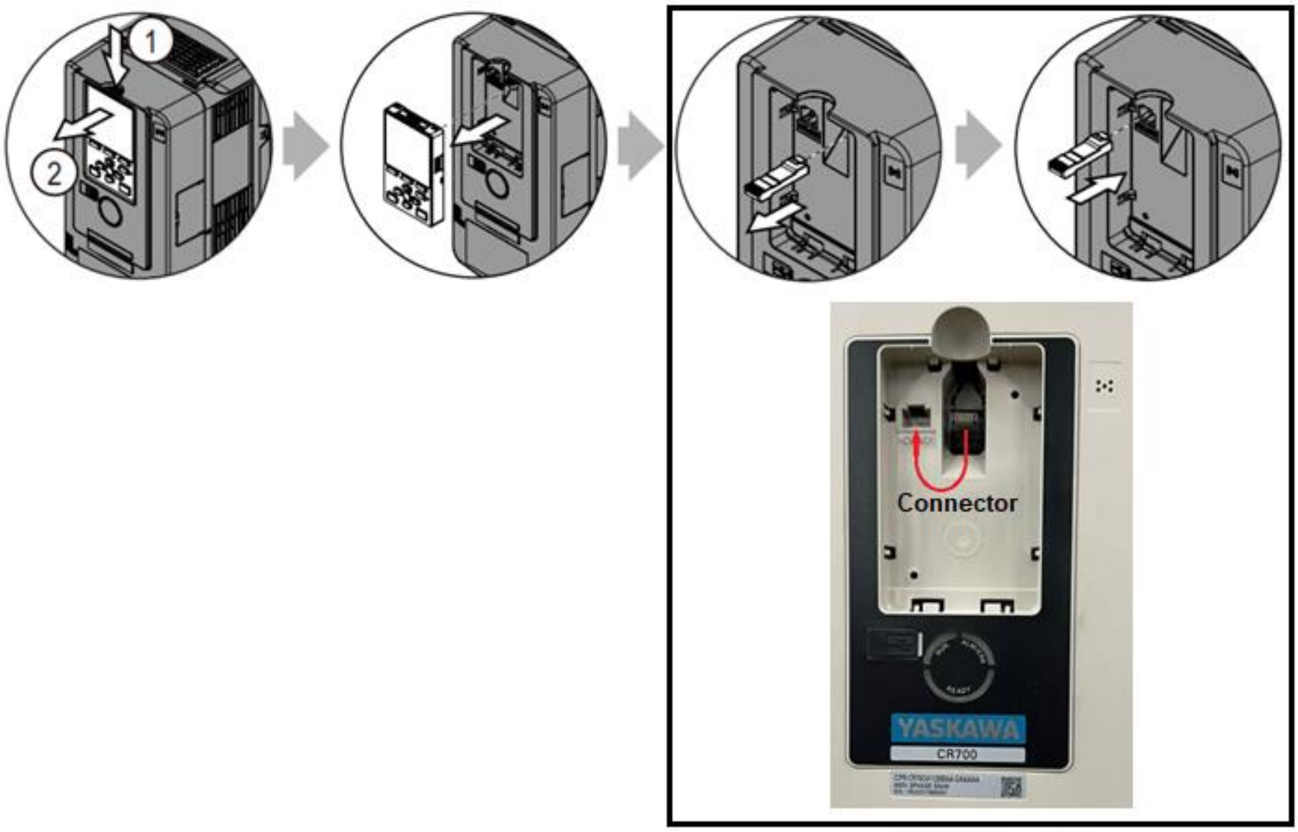
When installing the system, be sure to follow good wiring practices and all applicable codes. Ensure that the mounting of components is secure and that the environment, such as extreme dampness, poor ventilation, etc., will not cause system degradation.

The CR700 manuals are available at the following link, or for direct access to the CR700 Technical Manual, please scan the QR Code.

https://www.yaskawa.eu.com/manuals/cr700

CR700
Technical Manual

Step 1: **IMPORTANT –** On Models 4002 to 4150, please remove the keypad and connector before removing the front cover or attaching the drive front cover.



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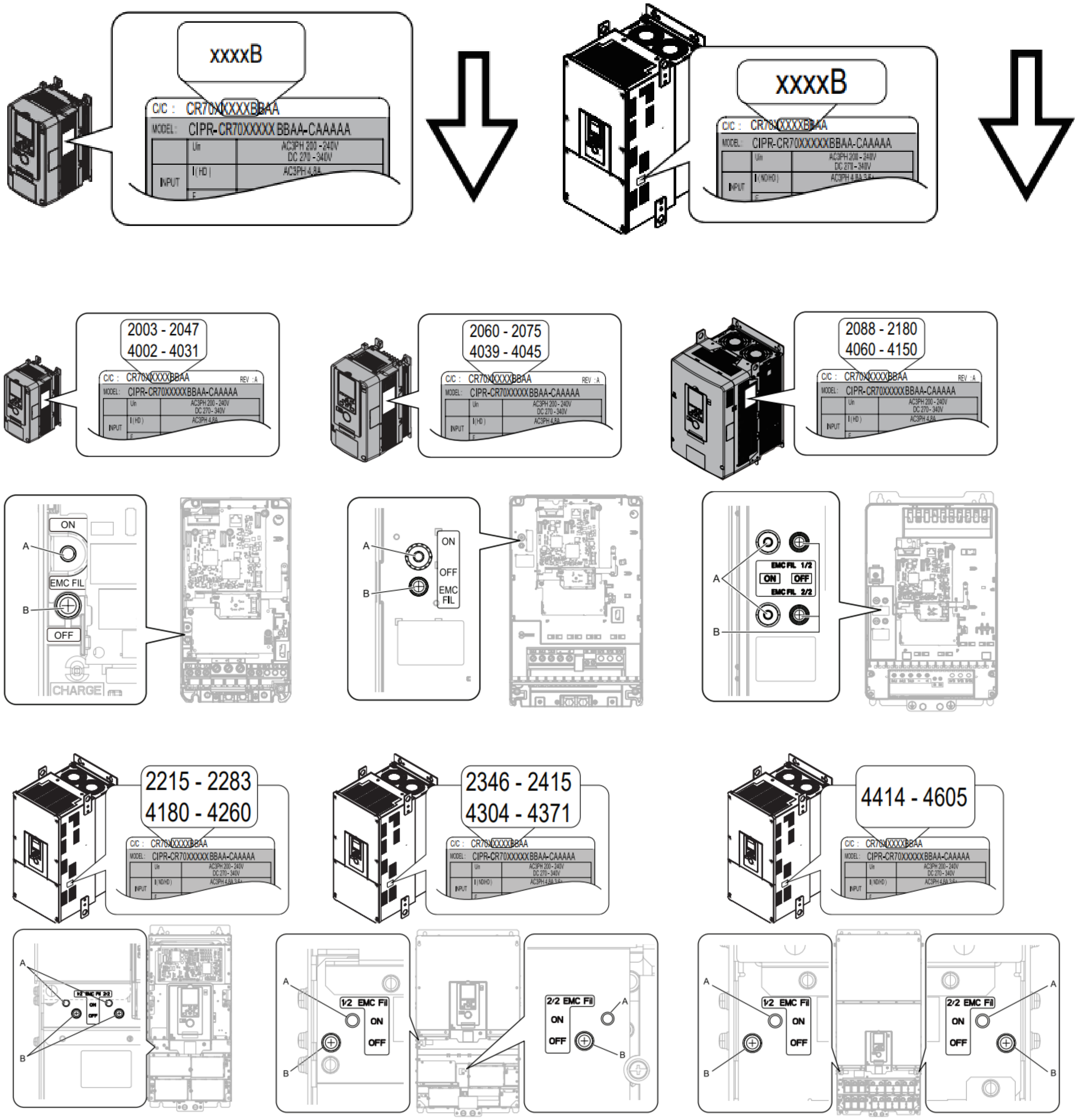
Step 2: How to turn on the built-in EMC Filter.

DANGER! Ensure the power is off to the drive and that the Charge LED is off before you attempt this step.



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Step 3: Connect Motor and Line Power

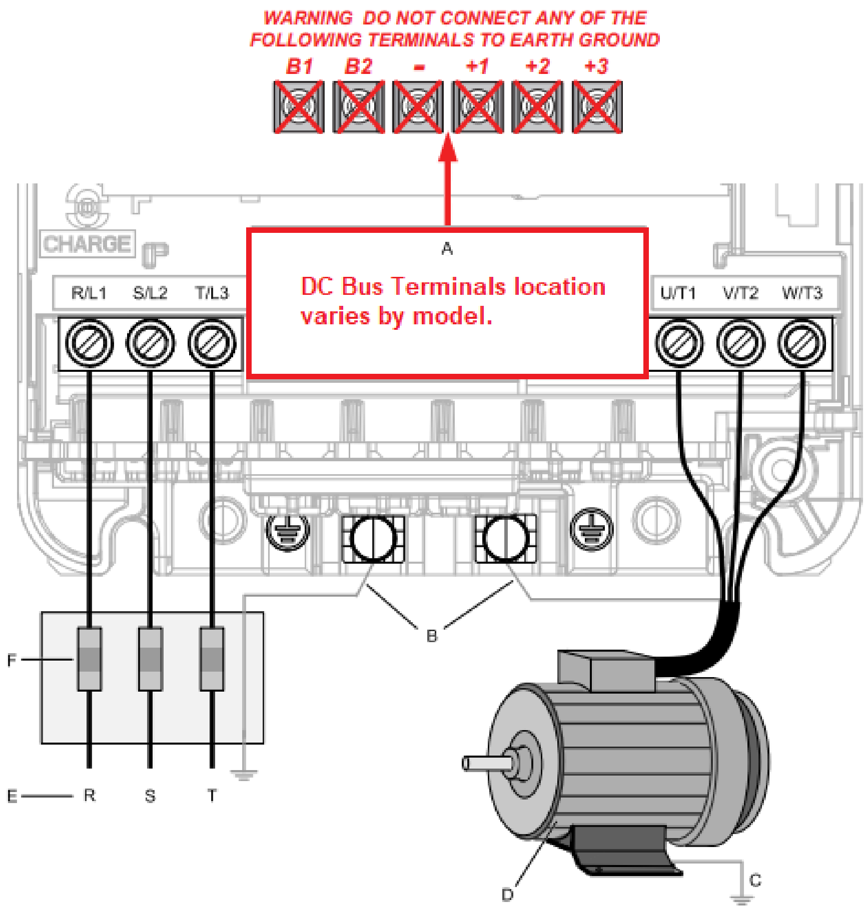
The figure below shows an example of the electrical connections for the input power and motor terminals.

WITH POWER OFF, make the appropriate connections. Make sure to follow good wiring practices and all applicable codes. Ensure that the equipment is grounded properly as shown below.

DANGER! Improper wiring can and will cause bodily harm as well as damage to the equipment.

DANGER! LETHAL VOLTAGES ARE PRESENT. Before applying power to the CR700, ensure that the terminal cover is fastened, and all wiring connections are secure. After the power has been turned off, wait at least five minutes until the charge indicator extinguishes completely before touching any wiring, circuit boards or components.

Electrical Shock Hazard. Do not connect terminals R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, +3, B1, or B2 to the ground terminal. If you connect these terminals to earth ground, it can cause damage to the drive or serious injury or death.



Note:
The location of terminals are different for different drive models.

A - DC bus terminal
B - Connect to the drive ground terminal.
C - Ground the motor case.
D - Three-Phase Motor
E - Use R, S, T for input power supply.
F - Input Protection (Fuses or Circuit Breakers)

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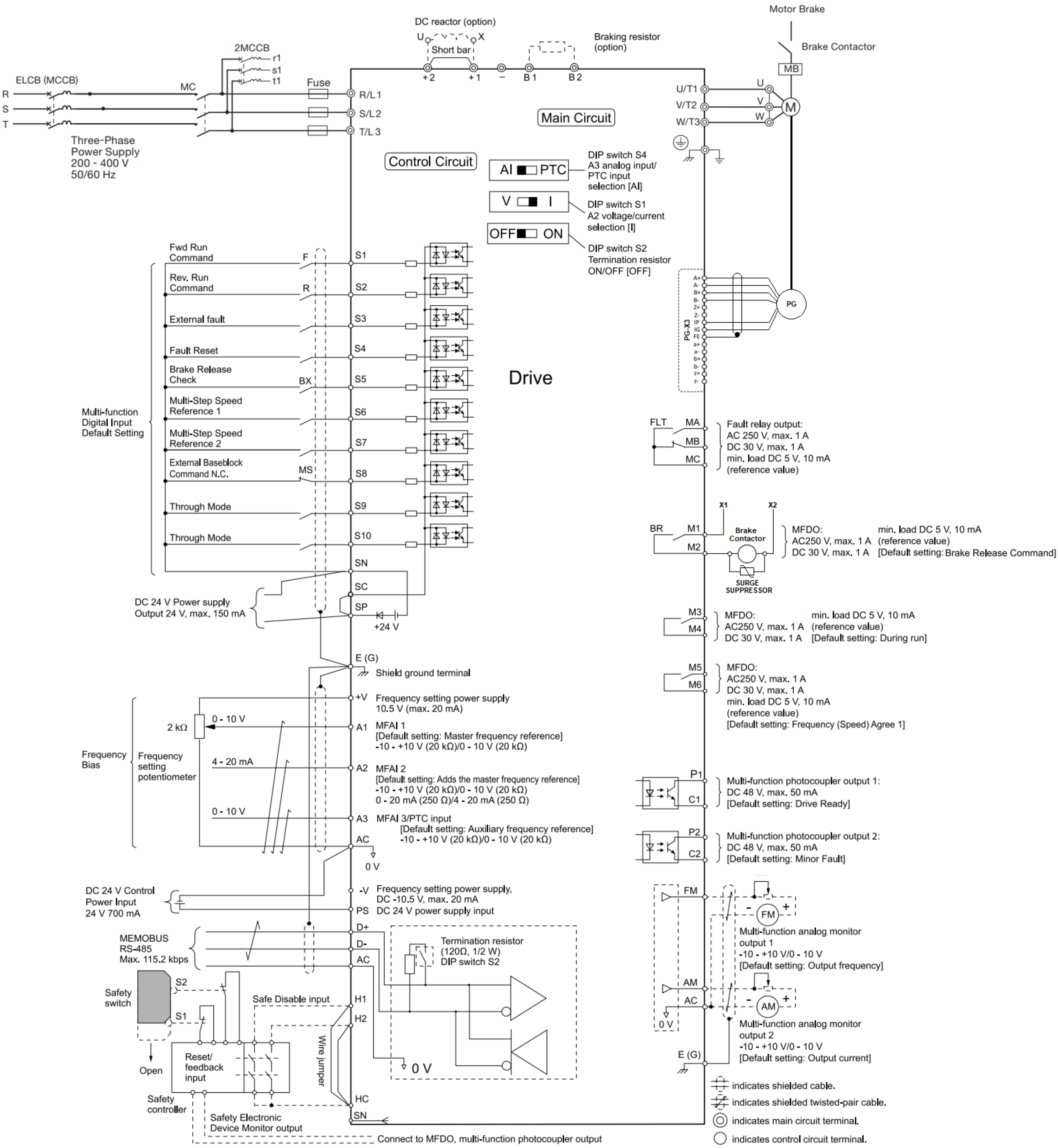
Step 4: Typical connection diagram. This step shows a typical wiring diagram and connection points for the CR700. Wiring connections should only be made by trained and authorized personnel when power to the drive is turned off.



Control Circuit Terminal Block Functions

Type	Terminal	Name (Default)	Functional (Signal Level)
Digital Inputs	S1	Multi-function input selection 1 (ON: Forward run OFF: Stop)	• Photocoupler • 24 V, 6 mA **Note:** Install the wire jumpers between terminals SC-SP and SC-SN to set the MFDI power supply. • SINK Mode: Install jumper between terminals SC and SP. jumper between terminals SC and SP. **Do not short circuit terminals SC and SN. Failure to obey will cause damage to the drive.** • SOURCE Mode: Install a jumper between terminals SC and SN. **Do not short circuit terminals SC and SP. Failure to obey will cause damage to the drive.** • External power supply: No jumper necessary between terminals SC-SN and terminals SC-SP.
	S2	Multi-function input selection 2 (ON: Reverse run OFF: Stop)	
	S3	Multi-function input selection 3 (External fault (N.O.))	
	S4	Multi-function input selection 4 (Fault reset)	
	S5	Multi-function input selection 5 Brake Release Check	
	S6	Multi-function input selection 6 (Multi-step speed reference 1)	
	S7	Multi-function input selection 7 (Multi-step speed reference 2)	
	S8	Multi-function input selection 8 Baseblock Command (N.C.)	
	S9	Multi-function input selection 9 (Through Mode)	
	S10	Multi-function input selection 10 (Through Mode)	
	SN	Multi-function input power supply 0 V	MFDI power supply and sensor power supply, 24 Vdc (max. 150 mA) **Note:** Do not short circuit terminals SP and SN. Failure to obey will cause damage to the drive
	SC	Multi-function input selection common	
	SP	Multi-function input power supply +24 Vdc	
Safe Disable Input	H1	Safe Disable input 1	Remove the jumper between terminals H1-HC and H2-HC when using the Safe Disable input. • 24 V, 6 mA • ON: Normal operation • OFF: Coasting motor • Internal impedance 4.7 kΩ • OFF time of at least 2 ms
	H2	Safe Disable input 2	
	HC	Safe Disable function common	
Master Frequency Reference	+V	Power supply for frequency setting	10.5 Vdc (allowable current 20 mA max.)
	-V	Power supply for frequency setting	-10.5 Vdc (allowable current 20 mA max.)
	A1	Multi-function analog input 1 (Master frequency reference)	Voltage input Select the signal level with H3-01 [Terminal A1 Signal Level Select]. • -10 V to +10 V/-100% to +100% (input impedance: 20 kΩ) • 0 V to 10 V/100% (input impedance: 20 kΩ)
	A2	Multi-function analog input 2 (Combined to terminal A1)	Voltage input or current input Select the signal level with DIP switch S1 and H3-09 [Terminal A2 Signal Level Select]. • -10 V to +10 V/-100% to +100% (input impedance: 20 kΩ) • 0 V to 10 V/100% (input impedance: 20 kΩ) • 4 mA to 20 mA/100%, 0 mA to 20 mA/100% (input impedance: 250 Ω)
	A3	Multi-function analog input 3/PTC input (Auxiliary frequency reference)	Voltage input Select the signal level with H3-05 [Terminal A3 Signal Level Select]. • -10 V to +10 V/-100% to +100% (input impedance: 20 kΩ) • 0 V to 10 V/100% (input impedance: 20 kΩ) PTC input (Motor Overheat Protection) Set DIP switch S4 to “PTC” to set terminal A3 for PTC input.
	AC	Frequency reference common	0V
	E (G)	Shielded cable	-
Fault Relay Output	MA	N.O. output (Fault)	• Relay output • DC30 V, 10 mA to 1 A • AC250 V, 10 mA to 1 A • Minimum load: 5 V, 10 mA (Reference value)
	MB	N.C. output (Fault)	
	MC	Digital output common	

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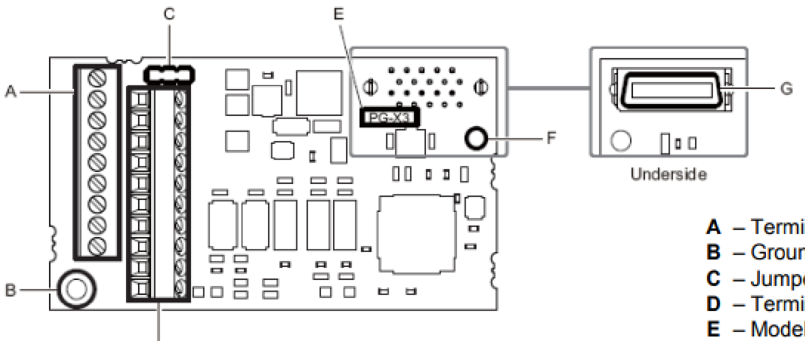
Control Circuit Terminal Block Functions Continued….

Type	Terminal	Name (Default)	Functional (Signal Level)
Digital Outputs	M1	Digital Outputs (Brake Release Command)	• Relay output • DC30 V, 10 mA to 1 A • AC250 V, 10 mA to 1 A • Minimum load: 5 V, 10 mA (Reference value) **Note:** Switching life is estimated at 8,000,000 times (assumes 30 mA, inductive load) or 200,000 times (assumes 1 A, resistive load). When switching inductive load such as relay coils, surge absorbing element in parallel against the load for effective protection of relay contact.
	M2		
	M3	Digital Outputs (During run)	
	M4		
	M5	Digital Outputs (Speed agree 1)	
	M6		
Multi-Functional Photocoupler Output	P1	Multi-function photocoupler output (Drive operation ready (READY))	Photocoupler output • 48 V, 2 mA to 50 mA **Note:** Connect a flywheel diode as shown in Figure 9.17 when driving a reactive load such as a relay coil. Ensure the diode rating is greater than the circuit voltage
	C1		
	P2	Multi-function photocoupler output (Minor Fault)	
	C2		
Monitor Output	FM	Analog monitor output 1 (Output frequency)	Voltage output • 0 V to +10 V/0% to 100% • -10 V to +10 V/-100% to +100% **Note:** Select with H4-07 [MFAO Term FM Signal Level Select] or H4-08 [MFAO Term AM Signal Level Select].
	AM	Analog monitor output 2 (Output current)	
	AC	Monitor common	0V

Step 5: Closed loop operation. **WITH POWER OFF,** the PG-X3 encoder feedback card (not supplied as standard) can be inserted into the either the CN5-B or CN5-C connectors located on the drive's control board. If only one option card is connected to the drive, use the CN5-C connector. If two option cards are connected, use both CN5-B and CN5-C. See the drive manual for directions on removing the front cover.

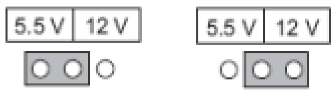


PG-X3 Option Card

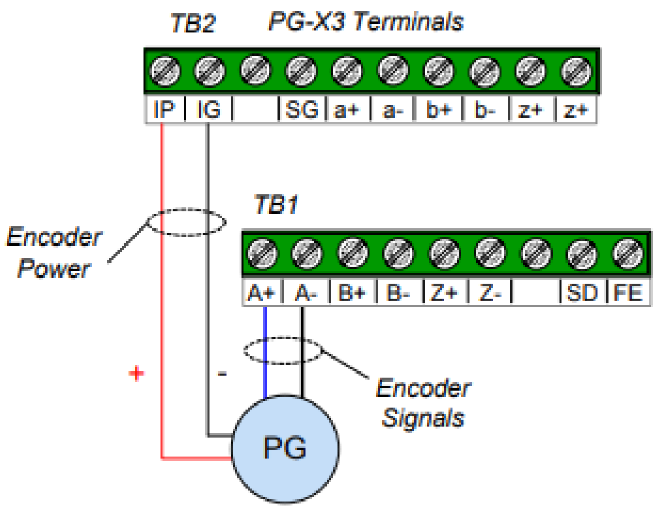
A – Terminal block TB1
B – Ground terminal (installation hole)
C – Jumper for PG power supply voltage (CN3)
D – Terminal block TB2
E – Model number
F – Installation hole
G – Connector (CN5)

IMPORTANT: Verify Encoder Power Supply Rating.

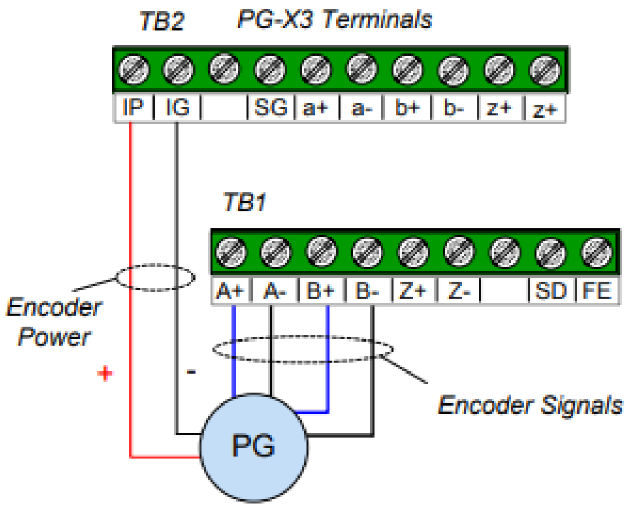
Encoder Power Supply (Max 200mA) Select Encoder Power Supply (IP + IG TB2) with Jumper CN3.



A single channel encoder can only be used in V/f + PG control mode (A1-02 = 1). It is required to use a quadrature encoder in Flux Vector control mode (A1-02 = 3). Connect Encoder (PG) signals to TB1 terminals of the PG-X3 card as shown below. Connect power supply from the PG-X3 card (TB1 – Terminals IP and IG) to the Encoder (PG).



Single Channel Feedback (A Only)
Set F1-21 = 0 (default)



Quadrature / Dual Channel Feedback (A & B)
Set F1-21 = 1

Step 6: Setup Wizard.

- Energize the drive to show the initial setup screen. Note: If the keypad does not show the Initial Setup screen, push [Menu] to show the Menu screen then push to select [Initial Setup].

- **Select [Set Date/Time]** to set the date and time. Note: Open the clock battery cover to put in a battery to use the clock functions. Use a Hitachi Maxell "CR2016 Lithium Manganese Dioxide Lithium Battery" or an equivalent battery.

- **Use A1-06 [Application Preset].** The drive software contains the application presets shown below. Set A1-06 [Application Selection] to align with the application to let the drive automatically set the best parameter settings for the selected application. Set application preset as necessary. The device changes the related parameters based on A1-06 as shown in the Application Preset (A1-06 Setting) Table further below.

  Note: Before you set A1-06, make sure that you set A1-03 = 2220 [Initialize Parameters = 2-Wire Initialization] to initialize parameters.
  It is not possible to change the A1-06 value. To set an application preset, set A1-03 = 2220 to initialize parameters, then set this parameter. If initializing all parameters will cause a problem, do not change the settings.

Application	A1-06	Description
Crane (Hoist)	1	The drive automatically sets the parameters for a hoist application. **Note:** Make sure that you do Auto-Tuning after you set A1-06 for Hoist application
Crane (Travelling)	2	The drive automatically sets the parameters for a Travelling application.
Closed Loop Crane (Hoist)	3	The drive automatically sets the parameters for a Closed Loop Crane (Hoist) application. **Note:** After you set A1-06 for a Closed Loop Crane (Hoist) application, make sure that you do Auto-Tuning

Application Preset (A1-06 Setting) Table

No	Name	Application Preset (A1-06 Setting)		
		Crane (Hoist) (1)	Crane (Travelling) (2)	Closed Loop Crane (Hoist) (3)
A1-02	Control Method Selection	2: Open Loop Vector	0: V/f Control	3: Closed Loop Vector Control
B1-01	Frequency Reference Selection 1	0: Keypad	0: Keypad	0: Keypad
C1-01	Acceleration Time 1	3.0 s	3.0 s	3.0 s
C1-02	Deceleration Time 1	3.0 s	3.0 s	3.0 s
C1-09	Fast Stop Time	2.0 s	2.0 s	2.0 s
D1-01	Reference 1	5.0 Hz	5.0 Hz	5.0 Hz
D1-02	Reference 2	25.0 Hz	25.0 Hz	25.0 Hz
D1-03	Reference 3	50.0 Hz	50.0 Hz	50.0 Hz
E1-03	V/f Pattern Selection	F: Custom	-	F: Custom
F1-05	Encoder 1 Rotation Selection	-	-	1: Pulse B leads in FWD Direction

No	Name	Application Preset (A1-06 Setting)		
		Crane (Hoist) (1)	Crane (Travelling) (2)	Closed Loop Crane (Hoist) (3)
H1-05	Terminal S5 Function Selection	-	3: Multi-Step Speed Reference 1	-
H1-06	Terminal S6 Function Selection	-	4: Multi-Step Speed Reference 2	-
H1-07	Terminal S7 Function Selection	-	6: Jog Reference Selection	-
H2-01	Term M1-M2 Function Selection	21: Brake Release Command	0: During Run	21: Brake Release Command
H2-02	Term M3-M4 Function Selection	1: Zero Speed	37: During Frequency Output	1: Zero Speed
H3-06	Terminal A3 Function Selection	F: Not Used	F: Not Used	F: Not Used
L2-03	Minimum Baseblock Time	0.1 s	-	0.1 s
L3-04	Stall Prevention during Decel	0: Disabled	0: Disabled	0: Disabled
L4-01	Speed Agree Detection Level	0.0 Hz	-	-
L4-02	Speed Agree Detection Width	0.0 Hz	-	-
L8-05	Input Phase Loss Protection Sel	1: Enabled	1: Enabled	1: Enabled
L8-07	Output Phase Loss Protection Sel	1: Enabled	1: Enabled	1: Enabled
L8-38	Carrier Frequency Reduction	1: Enabled below 6 Hz	1: Enabled below 6 Hz	1: Enabled below 6 Hz
L8-41	High Current Alarm Selection	1: Enabled	1: Enabled	1: Enabled
S1-01	Brake Release Frequency (FWD)	2.0 Hz	0.0 Hz	0.0 Hz
S1-02	Brake Release Frequency (REV)	2.0 Hz	0.0 Hz	0.0 Hz
S1-03	Brake Delay Frequency	3.0 Hz	0.0 Hz	0.0 Hz
S1-04	Brake Delay Time	0.30 s	0.00 s	0.00 s
S1-09	Torque Compensation (FWD)	50%	-	0%
S1-12	Brake Hold Frequency (FWD)	3.0 Hz	0.0 Hz	3.0 Hz
S1-13	Brake Hold Frequency (REV)	3.0 Hz	0.0 Hz	3.0 Hz
S1-14	Slip Prevention Frequency	3.0 Hz	0.0 Hz	0.0 Hz
S1-15	Slip Prevention Time	0.30 s	0.00 s	0.00 s
S1-16	Sequence Fault SE1 Detect Time	0.30 s	0.00 s	0.30 s
S1-17	Sequence Fault SE2 Detect Time	1.00 s	0.00 s	1.00 s
S1-18	Sequence Fault SE3 Detect Time	0.50 s	0.00 s	0.50 s
S1-19	Sequence Fault SE4 Detect Time	0.50 s	0.00 s	0.50 s
S1-54	Brake Sequence Selection	1: Enabled	0: Disabled	1: Enabled

Note:

When A1-06 [Application Preset] ≠ 0, the drive shows different parameters on the keypad for different application presets. Set A1-13 [All Function Parameter Display] = 0 to show all available parameters.

- **A1-02 [Control Method Selection]**. Select the applicable control method for the application different to the default set via the Application Preset (A1-06).

No. (Hex)	Name	Description
A1-02 (0102)	Control Method Selection	Sets the Control Method for the drive application and the motor. 0: V/f Control, 1: V/f Control with Encoder, 2: Open Loop Vector, 3: Closed Loop Vector, 4: Advanced Open Loop Vector.

Parameter Settings for Operation Without the Brake Sequence

If you operate the drive without the brake sequence, set S1-54 = 0 [Brake Sequence Selection = Disabled].

Setting the Direction of Motor Rotation

For hoist applications, wire the drive so that the Forward Run command hoists the load, and the Reverse Run command lowers the load. If the machine does not move this way, crane software functions and performance will be reversed, making it impossible to take full advantage of the drive performance and capabilities. Follow the procedure below to confirm the direction of motor rotation.

• Check the order of the U, V, and W phase output from the drive by checking the voltage (looking at the motor from the load side, most motors will rotate clockwise as the forward direction). Check the direction of motor rotation as it corresponds to the U, V, and W phase order.

• Check if b1-14 = 0 [Phase Order Selection = Standard] when operating the motor to hoist the load with the phase order U, V, and W.

If the phase order is U, V, and W when operating the motor to lower the load, then check if b1-14 = 1 [Switch Phase Order]. **Note:** First set the direction of motor rotation before setting the direction of rotation for the encoder.

Setting the Encoder (Pulse Generator)

■ Setting the Number of Pulses

Set the number of pulses for the encoder (pulse generator) in F1-01 [Encoder 1 Pulse Count (PPR)].

■ Setting the Direction of Motor Rotation

Use the drive to confirm that the rotation direction of the PG or encoder is correctly set by the following steps.
When Encoder Signal is Available

1. Check if the output signal from the PG and encoder leads with the A phase or the B phase when the Forward run command is input.
2. 2. If the output signal leads with the A phase (the A pulse leads at 90° from the B phase when the motor rotates forward), then set F1-05 = 0 [Encoder 1 Rotation Selection = Pulse A leads in FWD Direction].
3. 3. If the output signal leads with the B phase (the B pulse leads at 90° from the A phase when the motor rotates forward), then set F1-05 = 1 [Pulse B leads in FWD Direction].

When Encoder Signal is Not Available

1. Manually rotate the motor in the forward direction for the crane (hoisting) and verify the changes in U1-05 [Motor Speed].
2. If the value display in U1-05 is positive, then the PG and encoder are rotating in the correct direction.
3. If the value display in U1-05 is negative, change the setting to F1-05 = 1 if it is set to 0, and change the setting to F1-05 = 0 if it is set to 1. Note: First set the direction of motor rotation before setting the direction of rotation for the encoder.

Step 7: Auto-Tuning

!WARNING Injury to Personnel. Rotational Auto-Tuning rotates the motor at 50% or more of the motor rated frequency. Make sure that there are no issues related to safety in the area around the drive and motor. Increased motor frequency can cause serious injury or death.

!WARNING Sudden Movement Hazard. Before you do Rotational Auto-Tuning, disconnect the load from the motor. The load can move suddenly and cause serious injury or death.

Auto-Tuning automatically sets parameters on the drive connected to the motor. You must input some parameters individually during Auto-Tuning.

- Select [Auto-Tuning] from the main menu to select the Auto-Tuning Mode.
- Use the information in Table below to set T1-01 [Auto-Tuning Mode Selection].
- Push RUN to start Auto-Tuning. Refer to the Technical Manual for more information about Auto-Tuning.

Method	Parameter Setting	Application Conditions and Benefits	Applicable Control Method (A1-02)	
			V/f (0)	OLV (2)
Rotational Auto-Tuning	T1-01 = 0	• When you can decouple the motor and load the motor can rotate freely while Auto-Tuning. • When operating motors that have fixed output characteristics. • When it is necessary to use motors that have high-precision control. Yaskawa recommends that you do a Rotational Auto-Tune to enable the most accurate motor control. • When you cannot decouple the motor and load, but the motor load is less than 30%.	-	X
Stationary Auto-Tuning	T1-01 = 1	• When you cannot decouple the motor and load, but the load is more than 30%. • When the information from the motor test report or motor nameplate is not available. With Stationary Auto-Tuning, the energized drive stays stopped for approximately 1 minute. During this time, the drive automatically measures the necessary motor parameters. • When you operate the motor with less than 30% load after Auto-Tuning. Set T1-12 = 1 [*Test Mode Selection = Yes*] to do a test run after Auto-Tuning.	-	X
Stationary Line-Line Resistance	T1-01 = 2	• After Auto-Tuning, the wiring distance between the drive and motor changed by 50 m or more. • When the wiring distance is 50 m or more in the V/f Control mode. • When the motor output and drive capacity are different.	X	X

Input data for Auto-Tuning

Input Data	Value
Motor Rated Power	kW
Motor Rated Voltage	V
Motor Rated Current (FLA)	A
Motor Base Frequency	Hz
Motor Maximum Frequency	Hz
Number of Motor Poles	-
Motor Base Speed	min -1
Number of Encoder Pulses **1*	PPR
Motor No-Load Current **2*	A
Motor Rated Slip Frequency **2*	Hz

**1* Input this value when A1-02 = 3 [Control Method Selection = Closed Loop Vector].

**2* Input this value when you do stationary Auto-Tuning. Prepare motor data from the motor test report. If the motor test report is not available, do not change this parameter.

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Step 8: Drive Parameters. This section shows the most common parameters for applications. Refer to this table If you need to adjust the parameters.

No. (HEX) RUN	Name	Description
A1-00 (0100) RUN	Language Selection	Sets the language for the LCD keypad. 0: English, 1: Japanese, 7: Chinese
A1-02 (0102)	Control Method Selection	Sets the control method for the drive application and the motor. 0: V/f Control, 1: V/f Control with Encoder, 2: Open Loop Vector, 3: Closed Loop Vector, 4: Advanced Open Loop Vector
A1-03 (0103)	Initialize Parameters	Sets parameters to default values. 0: No Initialization, 1110: User Initialization, 2220: 2-Wire Initialization
A1-06 (0127)	Application Preset	Sets the drive to operate in selected application conditions. 0: General-purpose, 1: Crane (Hoist), 2: Crane (Traveling), 3: Closed Loop Crane (Hoist)
B1-01 (0180)	Frequency Reference Selection 1	Sets the input method for the frequency reference. 0: Keypad, 1: Analog Input, 2: Memobus/Modbus Communications, 3: Option PCB
B1-02 (0181)	Run Command Selection 1	Sets the input method for the Run command. 0: Keypad, 1: Analog Input, 2: Memobus/Modbus Communications, 3: Option PCB
B1-03 (0182)	Stopping Method Selection	Sets the method to stop the motor after removing a Run command or entering a Stop command. 0: Ramp to Stop, 1: Coast to Stop, 2: DC Injection Braking to Stop, 3: Coast to Stop with Timer
B1-04 (0183)	Reverse Operation Selection	Sets the reverse operation function. 0: Reverse Enabled, 1: Reverse Disabled
C1-01 (0200) RUN	Acceleration Time 1	Sets the length of time to accelerate from zero to maximum output frequency.
C1-02 (0201) RUN	Deceleration Time 1	Sets the length of time to decelerate from maximum output frequency to zero.
C2-01 (020B)	S-Curve Time @ Start of Accel	Sets the S-curve acceleration time at start.
C2-02 (020C)	S-Curve Time @ End of Accel	Sets the S-curve acceleration time at completion.
C2-03 (020D)	S-Curve Time @ Start of Decel	Sets the S-curve deceleration time at start.
C2-04 (020E)	S-Curve Time @ End of Decel	Sets the S-curve deceleration time at completion.
C6-02 (0224)	Carrier Frequency Selection	Sets the switching frequency (carrier frequency) for the transistors in the drive. 1: 2.0 kHz, 2: 5.0 kHz, 3: 8.0 kHz, 4: 10.0 kHz, 5: 12.5 kHz, 6: 15.0 kHz, F: User Defined (C6-03 to C6-05)
D1-01 - Dd1-15 (0280 - 0290) RUN	Reference 1 to 15	Sets the frequency reference in the units from o1-03 [Frequency Display Unit Selection.
D1-17 RUN (0292)	Jog Reference	Sets the frequency reference in the units from o1-03 [Frequency Display Unit Selection]. Set H1-xx = 6 [MFDI Function Select = Jog Reference Selection] to use the Jog frequency reference.
D2-01 (0289)	Frequency Reference Upper Limit	Sets maximum limit for all frequency references. The maximum output frequency is 100%.
D2-02 (028A)	Frequency Reference Lower Limit	Sets minimum limit for all frequency references. The maximum output frequency is 100%.

No. (HEX) RUN	Name	Description
E1-01 (0300)	Input AC Supply Voltage	Sets the drive input voltage.
E1-04 (0303)	Maximum Output Frequency	Sets the maximum output frequency for the V/f pattern
E1-05 (0304)	Maximum Output Voltage	Sets the maximum output voltage for the V/f pattern.
E1-06 (0305)	Base Frequency	Sets the base frequency for the V/f pattern.
E1-09 (0308)	Minimum Output Frequency	Sets the minimum output frequency for the V/f pattern.
E2-01 (030E)	Motor Rated Current (FLA)	Sets the motor rated current in amps.
E2-11 (0318)	Motor Rated Power	Sets the motor rated power in 0.01 kW increments. (1 HP = 0.746 kW)
H1-01 - H1-10 (0438, 0439, 0400 - 0407)	Terminal Sx Function Select	Sets the functions for MFDI terminals S1 to S10.
H2-01 (040B)	Term M1-M2 Function Selection	Sets the function for MFDO terminal M1-M2.
H2-02 (040C)	Term M3-M4 Function Selection	Sets the function for MFDO terminal M3-M4.
H2-03 (040D)	Term M5-M6 Function Selection	Sets the function for MFDO terminal M5-M6.
H2-04 (040E)	Term P1-C1 Function Selection	Sets the function for MFDO terminal P1-C1.
H2-05 (040F)	Term P2-C2 Function Selection	Sets the function for MFDO terminal P2-C2.
H3-01 (0410)	Terminal A1 Signal Level Select	Sets the input signal level for MFAI terminal A1. 0: 0-10V (Lower Limit at 0), 1: -10 to +10V (Bipolar Reference)
H3-02 (0434)	Terminal A1 Function Selection	Sets the function for MFAI terminal A1
H3-03 (0411) RUN	Terminal A1 Gain Setting	Sets the gain of the analog signal input to MFAI terminal A1.
H3-04 (0412) RUN	Terminal A1 Bias Setting	Sets the bias of the analog signal input to MFAI terminal A1.
H3-05 (0413)	Terminal A3 Signal Level Select	Sets the input signal level for MFAI terminal A3. 0: 0-10V (Lower Limit at 0), 1: -10 to +10V (Bipolar Reference)
H3-06 (0414)	Terminal A3 Function Selection	Sets the function for MFAI terminal A3.
H3-07 (0415) RUN	Terminal A3 Gain Setting	Sets the gain of the analog signal input to MFAI terminal A3.
H3-08 (0416) RUN	Terminal A3 Bias Setting	Sets the bias of the analog signal input to MFAI terminal A3.
H3-09 (0417)	Terminal A2 Signal Level Select	Sets the input signal level for MFAI terminal A2. 0: 0-10V (Lower Limit at 0), 1: -10 to +10V (Bipolar Reference), 2: 4 to 20 mA, 3: 0 to 20 mA
H3-10 (0418)	Terminal A2 Function Selection	Sets the function for MFAI terminal A2.

No. (HEX) RUN	Name	Description
H3-11 (0419) RUN	Terminal A2 Gain Setting	Sets the gain of the analog signal input to MFAI terminal A2.
H3-12 (041A) RUN	Terminal A2 Bias Setting	Sets the bias of the analog signal input to MFAI terminal A2.
H3-13 (041B)	Analog Input FilterTime Constant	Sets the time constant for primary delay filters on MFAI terminals.
H3-14 (041C)	Analog Input Terminal Enable Sel	Sets the enabled terminal or terminals when H1-xx = C [MFDI Function Select = Analog Terminal Enable Selection] is ON. 1: Terminal A1 only, 2: Terminal A2 only, 3: Terminals A1 and A2, 4: Terminal A3 only, 5: Terminals A1 and A3, 6: Terminals A2 and A3, 7: Terminals A1, A2, and A3
H4-01 (041D)	Terminal FM Analog Output Select	Sets the monitor number to send from MFAO terminal FM.
H4-02 (041E) RUN	Terminal FM Analog Output Gain	Sets the gain of the Ux-xx monitor signal set in H4-01 [terminals FM Monitor Selection].
H4-03 (041F) RUN	Terminal FM Analog Output Bias	Sets the bias of the Ux-xx monitor signal set in H4-01 [Terminal FM Analog Output Select].
H4-04 (0420)	Terminal AM Analog Output Select	Sets the monitoring number to be output from the MFAO terminal AM.
H4-05 (0421) RUN	Terminal AM Analog Output Gain	Sets the gain of the Ux-xx monitor signal set in H4-04 [terminals AM Monitor Selection].
H4-06 (0422) RUN	Terminal AM Analog Output Bias	Sets the bias of the Ux-xx monitor signal set in H4-04 [terminals AM Monitor Selection].
H4-07 (0423)	Terminal FM Signal Level Select	Sets the MFAO terminal FM output signal level. 0: 0-10V (Lower Limit at 0), 1: -10 to +10V (Bipolar Reference)
H4-08 (0424)	Terminal AM Signal Level Select	Sets the MFAO terminal AM output signal level. 0: 0-10V (Lower Limit at 0), 1: -10 to +10V (Bipolar Reference)
L1-01 (0480)	Motor Overload (oL1) Protection	Sets the motor overload protection with electronic thermal protectors. 0: Disable, 1: Variable Torque, 2: Constant Torque 10:1 Speed Range, 3: Constant Torque 100:1 SpeedRange, 6: Variable Torque (50Hz)
L1-02 (0481)	Motor Overload Protection Time	Sets the operation time for the electronic thermal protector of the drive to prevent damage to the motor. Usually it is not necessary to change this setting.
L3-04 (0492)	Stall Prevention during Decel	Sets the method that the drive will use to prevent overvoltage faults when it decelerates. 0: Disable, 1: General Purpose, 2: Intelligent (Ignore Accel Ramp), 3: General Purpose w/ DB resistor, 4: Overexcitation/High Flux 1, 5: Overexcitation/High Flux 2
S1-54 (06FD)	Brake Sequence Selection	Enables and disables operation toward a brake sequence. 0: Disable, 1: Enabled