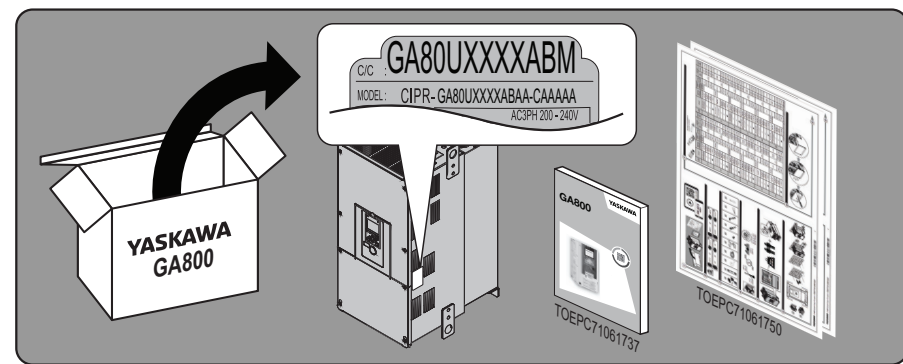
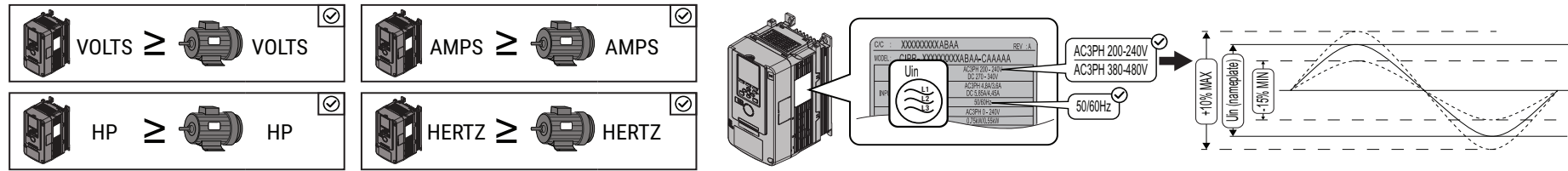


**1 Procedure for Installation and Primary Operation for Models GA80U2257 to 2415 and 4208 to 4720**

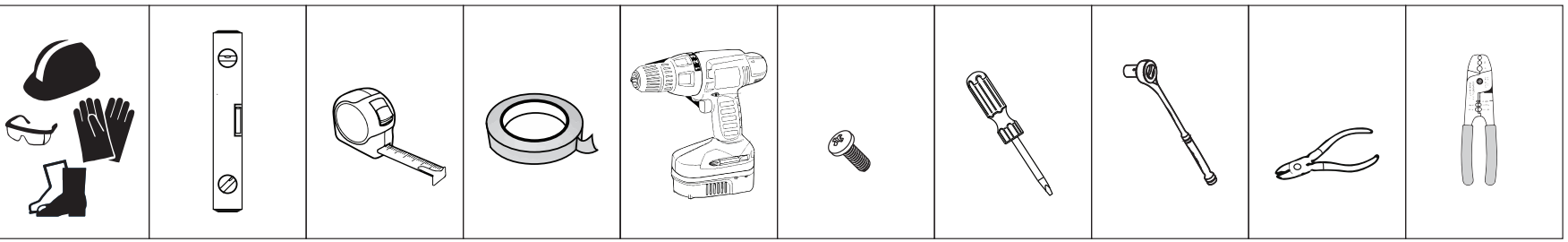


Read and follow the safety and installation procedures in the Installation & Primary Operation (TOEPC71061737) manual packaged with the drive.

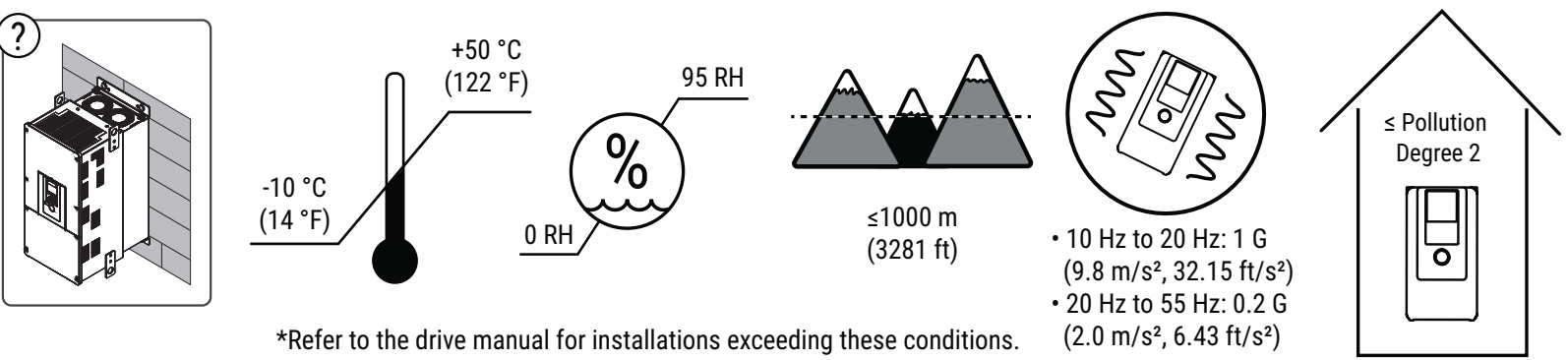
**2 Confirm the Drive and Motor Specifications**



**3 Collect the Required Tools and Equipment**

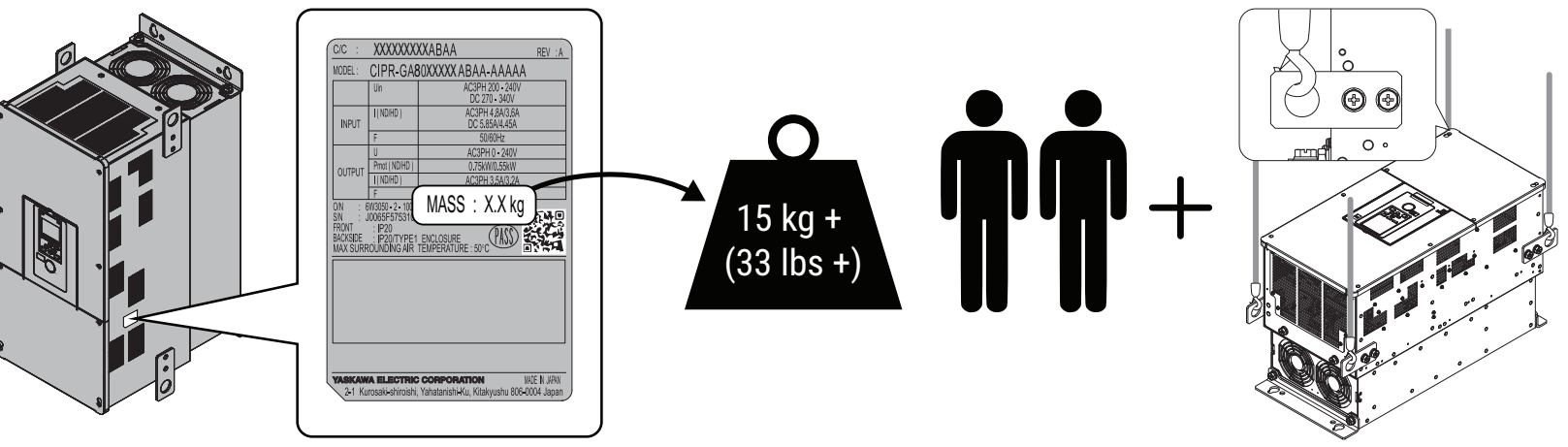


**4 Confirm the Correct Drive Installation Environment**

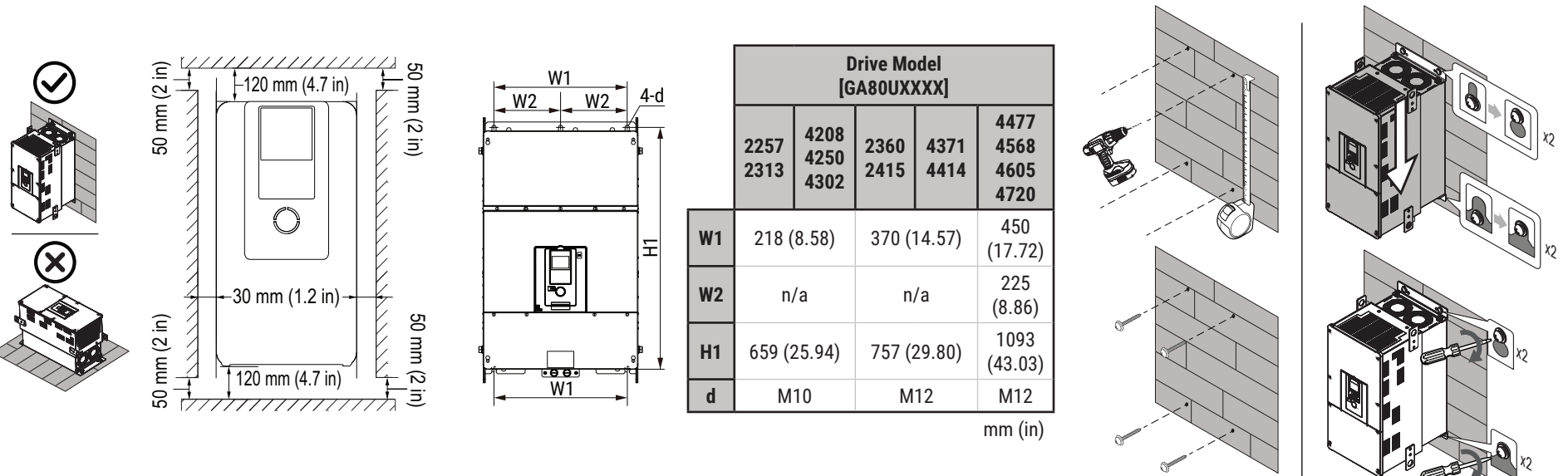


\*Refer to the drive manual for installations exceeding these conditions.

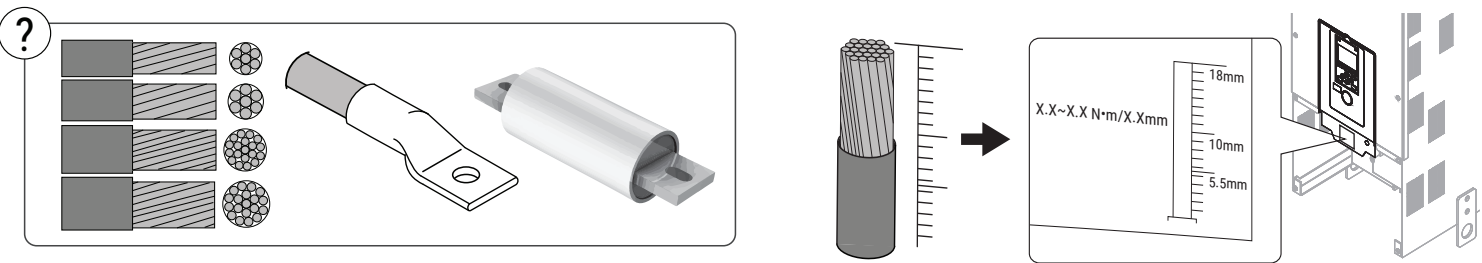
**5 Correctly Lift the Drive**



**6 Mount the Drive Vertically**



**7 Select the Wires, Wire Strip Length, Crimp Terminals, and Fuses**



**Factory-Recommended Wires and Crimp Terminals**  
 Use UL-Listed, vinyl-coated insulated copper wires for operation with a continuous maximum permitted temperature of 75 °C at 600 V.  
 Use UL-Listed closed-loop crimp terminals to maintain compliance with UL 508C.  
 Use the tools recommend by Panduit Corp. to crimp the closed-loop crimp terminals.  
 To comply with UL standards, use only insulated crimp terminals or crimp terminals with heat-shrinkable tubing.

Drive Model [GA80UXXXX]	Terminal	Wire Range AWG, kcmil (Recommended)	Panduit Crimp Terminal Part Number <sup>1</sup>	Drive Model [GA80UXXXX]	Terminal	Wire Range AWG, kcmil (Recommended)	Panduit Crimp Terminal Part Number <sup>1</sup>	Drive Model [GA80UXXXX]	Terminal	Wire Range AWG, kcmil (Recommended)	Panduit Crimp Terminal Part Number <sup>1</sup>
2257	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3	2/0 - 4/0 x 2P (2/0 x 2P)	S2/0-38R	4208	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3	2/0 - 4/0 x 2P (1/0 x 2P)	S1/0-38R	4414	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3	250 - 300 x 2P (300 x 2P)	LCA300-12 LCAX300-12
	-, +1	4/0 - 250 x 2P (4/0 x 2P)	S4/0-38R		-, +1	4/0 - 250 x 2P (3/0 x 2P)	S3/0-38R		300 - 400 x 2P (400 x 2P)	LCA400-12	
	+3	1/0 x 2P (1/0 x 2P)	S1/0-38R		+3	1/0 x 2P (1/0 x 2P)	S1/0-38R		1 - 4/0 x 2P (4/0 x 2P)	S4/0-12R	
	⊕	3 - 350 (3)	S2-38R		⊕	4 - 350 (4)	S4-38R P4-38R		1 - 350 (1)	S2-12R	
2313	R/L1, S/L2, T/L3	2/0 - 4/0 x 2P (4/0 x 2P)	S4/0-38R	4250	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3	2/0 - 4/0 x 2P (2/0 x 2P)	S2/0-38R	4477	R/L1, S/L2, T/L3	250 - 300 x 4P (250 x 4P)	S250-12R
	U/T1, V/T2, W/T3	2/0 - 4/0 x 2P (3/0 x 2P)	S3/0-38R		U/T1, V/T2, W/T3	250 - 300 x 4P (4/0 x 4P)	S4/0-12R				
	-, +1	4/0 - 250 x 2P (250 x 2P)	S250-38R		-, +1	4/0 - 250 x 2P (3/0 x 2P)	S3/0-38R		300 - 400 x 4P (4/0 x 4P)	S4/0-12R	
	+3	1/0 x 2P (1/0 x 2P)	S1/0-38R		+3	1/0 x 2P (1/0 x 2P)	S1/0-38R		4/0 x 4P (3/0 x 4P)	S3/0-12R	
⊕	2 - 350 (2)	S2-38R	⊕	2 - 350 (2)	S2-38R P2-38R	1/0 - 300 (1/0)	S1/0-12R				
2360	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3	250 - 300 x 2P (250 x 2P)	S250-12R	4302	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3	2/0 - 4/0 x 2P (3/0 x 2P)	S3/0-38R	4568	R/L1, S/L2, T/L3	250 - 300 x 4P (250 x 4P)	S250-12R
	-, +1	300 - 400 x 2P (350 x 2P)	LCA350-12 LCAX350-12		-, +1	4/0 - 250 x 2P (4/0 x 2P)	S4/0-38R		250 - 300 x 4P (4/0 x 4P)	S4/0-12R	
	+3	1/0 - 4/0 x 2P (3/0 x 2P)	S3/0-12R		+3	1/0 x 2P (1/0 x 2P)	S1/0-38R		300 - 400 x 4P (300 x 4P)	LCA300-12 LCAX300-12	
	⊕	1 - 350 (1)	S2-12R		⊕	2 - 350 (2)	S2-38R P2-38R		4/0 x 4P (3/0 x 4P)	S3/0-12R	
2415	R/L1, S/L2, T/L3	250 - 300 x 2P (250 x 2P)	S250-12R	4371	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3	250 - 300 x 2P (250 x 2P)	S250-12R	4605 4720	R/L1, S/L2, T/L3 U/T1, V/T2, W/T3	250 - 300 x 4P (300 x 4P)	LCA300-12 LCAX300-12
	U/T1, V/T2, W/T3	250 - 300 x 2P (300 x 2P)	LCA300-12 LCAX300-12		U/T1, V/T2, W/T3	250 - 300 x 2P (250 x 2P)	S250-12R				
	-, +1	300 - 400 x 2P (350 x 2P)	LCA350-12 LCAX350-12		-, +1	300 - 400 x 2P (350 x 2P)	LCA350-12 LCAX350-12		300 - 400 x 4P (400 x 4P)	LCA400-12	
	+3	1/0 - 4/0 x 2P (3/0 x 2P)	S3/0-12R		+3	1 - 4/0 x 2P (3/0 x 2P)	S3/0-12R		4/0 x 4P (4/0 x 4P)	S4/0-12R	
⊕	1 - 350 (1)	S2-12R	⊕	1 - 350 (1)	S2-12R	2/0 - 300 (2/0)	S2/0-12R				

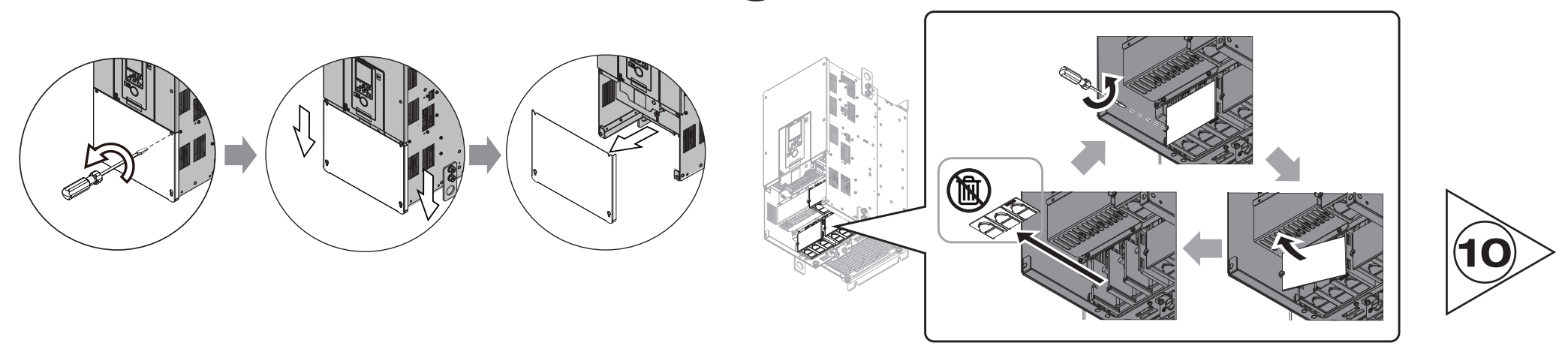
<sup>1</sup>For use with PANDUIT Corp. heat-shrinkable tubing HSTT series or an equivalent UL-recognized-heat shrinkable tubing rated 600 V minimum.

**Factory-Recommended Fuses**  
 Yaskawa recommends installing one of the following types of branch circuit protection to maintain compliance with UL 508C.  
 Semiconductor protective type fuses are preferred. Alternate branch circuit protection devices are also listed.  
 Maximum Time Delay fuse is 175% of drive full load output amps (FLA). This covers any Class CC, J, or T class fuse.

	2257	2313	2360	2415	4208	4250	4302	4371	4414	4477	4568	4605	4720
<b>Bussmann Semiconductor<sup>1</sup></b>	FWH-600A	FWH-800A	FWH-1000A	FWH-1000A	FWH-500A	FWH-600A	FWH-700A	FWH-800A	FWH-1000A	FWH-1200A	FWH-1200A	FWH-1400A	FWH-1400A
<b>Alternate Time-Delay (Class CC, J, or T)<sup>2</sup></b>	Max. Rating (A) <sup>3</sup>	400	500	600 <sup>4</sup>	800 <sup>4</sup>	350	400	500	n/a <sup>5</sup>	n/a <sup>5</sup>	n/a <sup>5</sup>	n/a <sup>5</sup>	n/a <sup>5</sup>
	Max. SCCR (kA)	100	100	100	100	100	100	100	n/a <sup>5</sup>	n/a <sup>5</sup>	n/a <sup>5</sup>	n/a <sup>5</sup>	n/a <sup>5</sup>

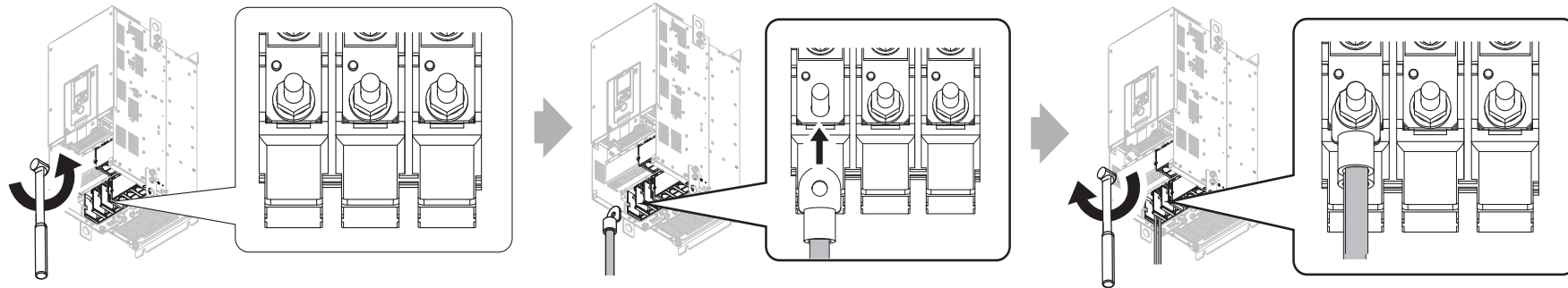
<sup>1</sup>Recommended Eaton/Bussmann Semiconductor fuse model.  
<sup>2</sup>Class T fuses are fast-acting (non-time delay only).  
<sup>3</sup>Maximum fuse ratings are based on ND1 or ND2 ratings, whichever is larger.  
<sup>4</sup>For fuses rated 601 - 800 amps, Class T fuses must be used.  
<sup>5</sup>Contact Yaskawa for alternate fuses.

**8 Remove the Terminal Cover**      **9 Remove the Terminal Block Cover and Wiring Cover**

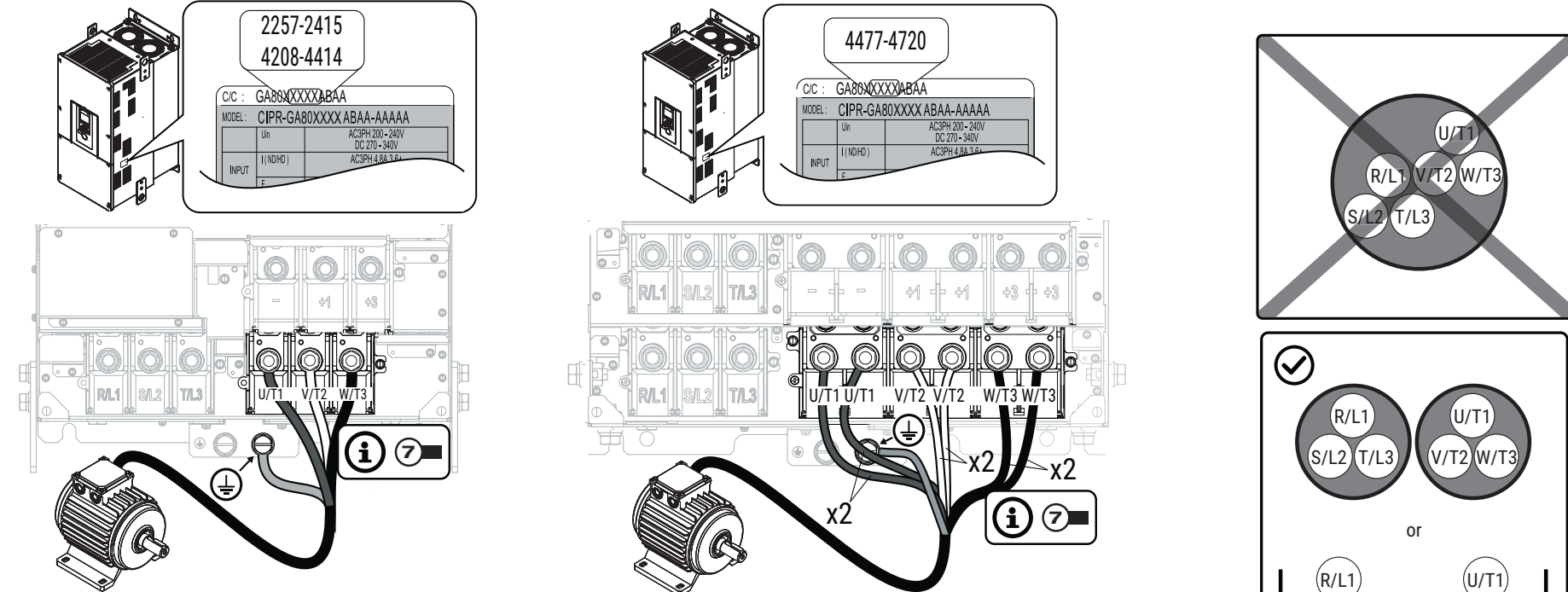




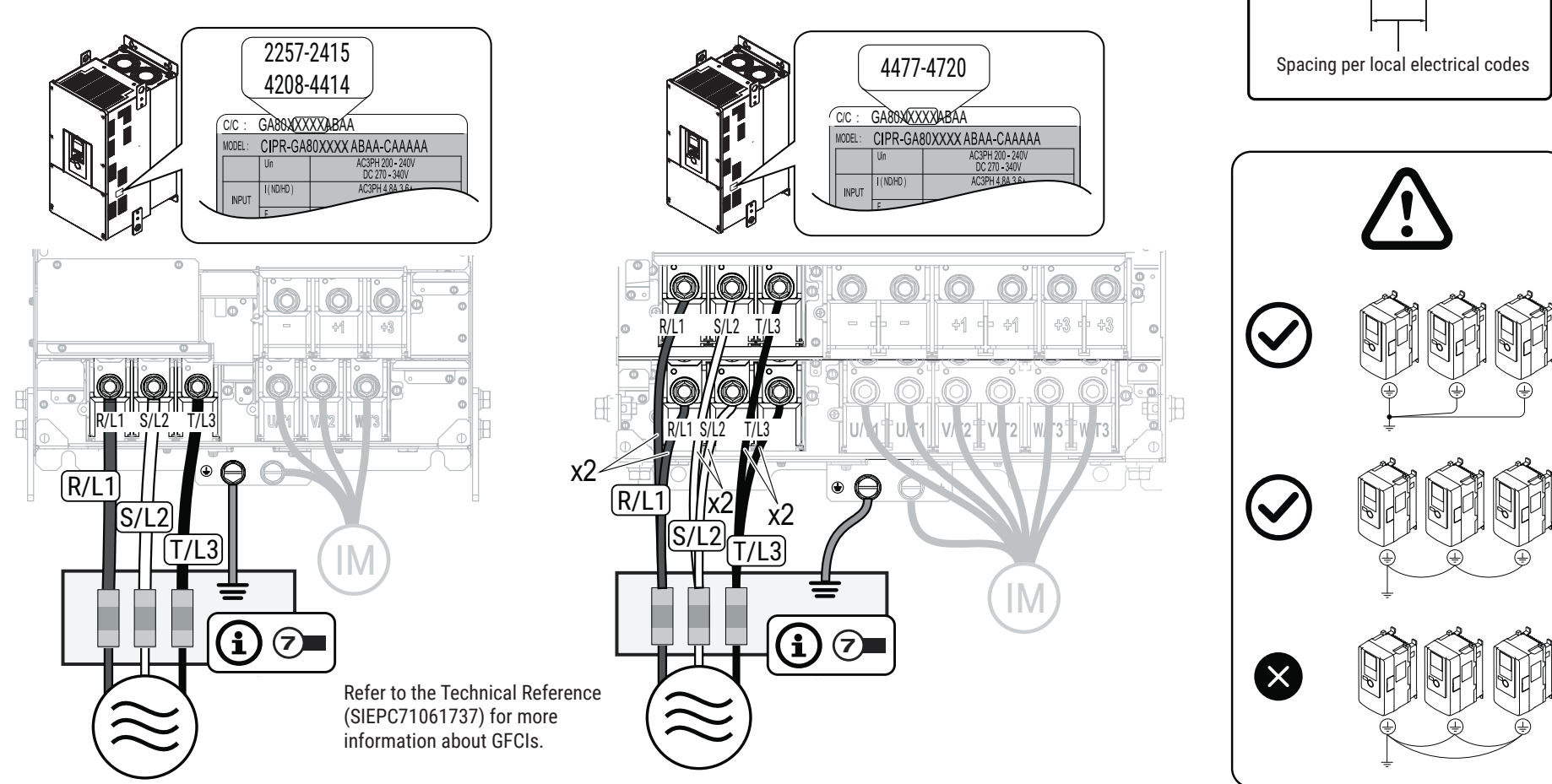
**10 Remove Terminal Block Nut to Attach Crimp Terminals**



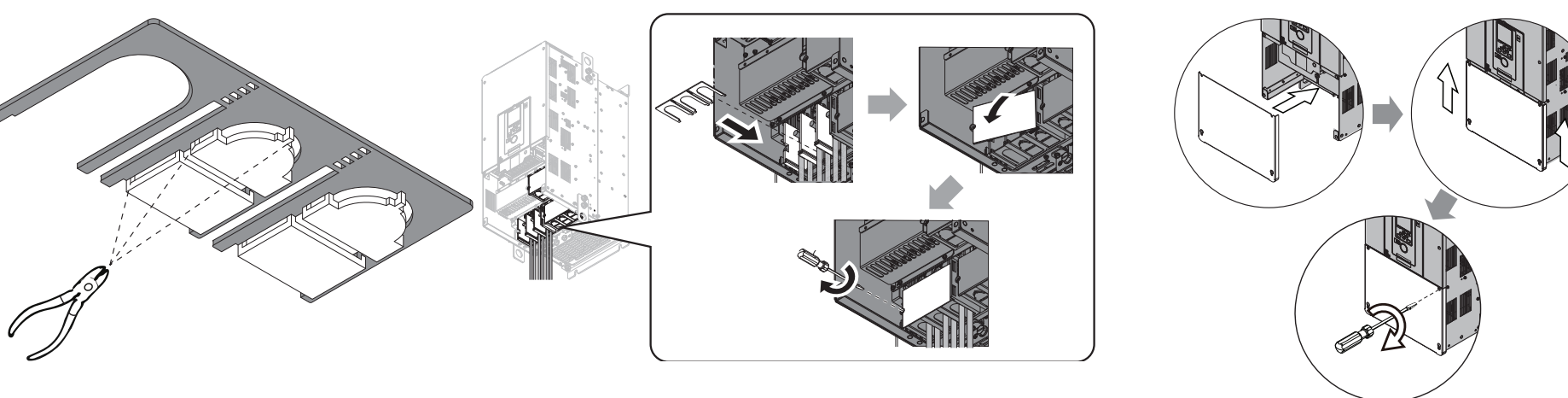
**11 Install the Motor Wiring**



**12 Install the Power Wiring**



**13 Remove the Tabs and Install the Wiring Cover, Terminal Block Cover, and Terminal Cover**



**14 Determine the Correct Auto-Tuning Method**

Motor Connection and Load Condition	
Use Stationary Auto-Tuning T1-01 = 1	Use Rotational Auto-Tuning T1-01 = 0

**15 Collect and Record Auto-Tuning Data from Motor Nameplate**

**3 PHASE INVERTER DUTY AC INDUCTION MOTOR NAMEPLATE EXAMPLE**

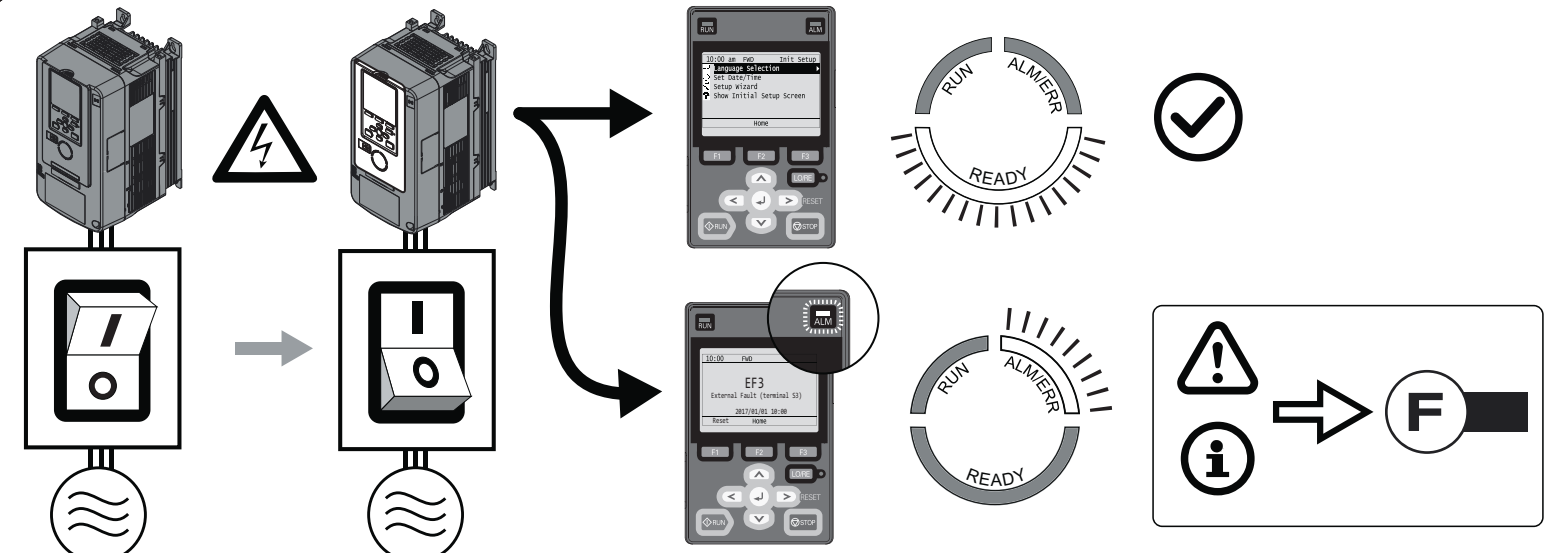
MODEL XX	123AAA123XX-X0	X	FRAME 123AX
POLES X	ENC XXX	CODE X	DES A
VOLTS XXX	FL RPM XXXX	FL AMPS XX/XX	TYPE ABC INS X0
SF 1.0	DUTY CONT	MAX AMB °C XX	TEMP SENSORS T-STATS
SERIAL		N.L. AMPS XX.X/X.X	
MAX RPM 4200	S.E. BRG. 309	U.S.E. BRG. XXX	ROTOR WK? X.X
HZ 1	HP 0	TORQUE (LB FT) XX.X	VOLTS (HIGH CONN) XXX
60	XX	AMPS (HIGH CONN) XX.X	
T20	XX	XX.X	XX.X
OHMS PH. R1: .XXX	R2: .XXX	X1: X.XX	X2: X.XX
			XM: XX.X

P/N XXXXXXX

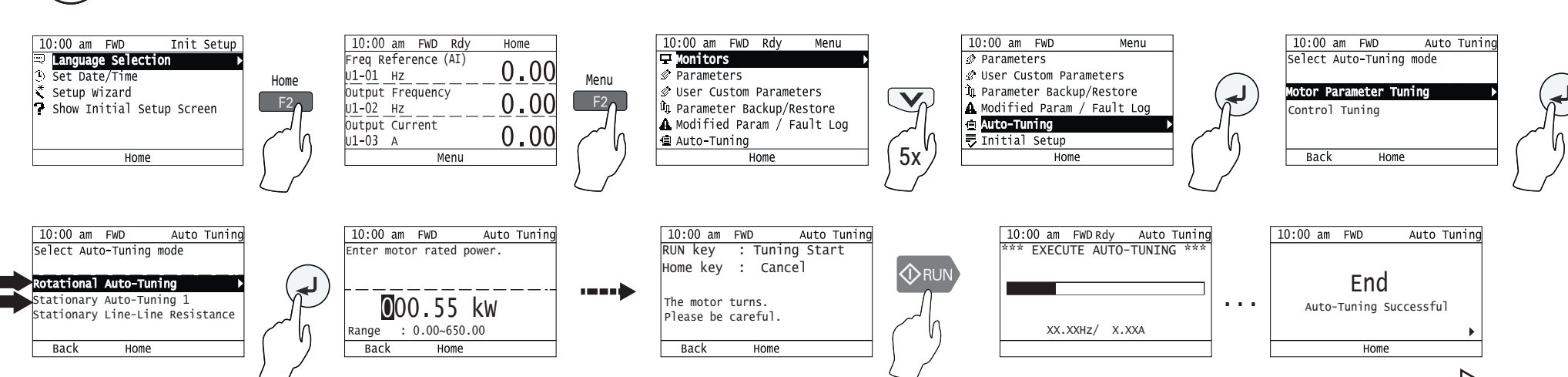
Reference	Motor Nameplate Data	Motor Nameplate Value	T1-xx Parameter (Ex-xx Parameter <sup>1</sup> )
A	Motor Rated Power	(HP x 0.746) kW	T1-02 (E2-11)
B	Motor Rated Voltage	V	T1-03 (E1-05)
C	Motor Rated Current (FLA)	A	T1-04 (E2-01)
D	Motor Rated Frequency (Base Frequency)	Hz	T1-05 (E1-04/E1-06)
E	Motor Pole Count	-	T1-06 (E2-04)
F	Motor Rated RPM	RPM	T1-07
G	Motor No-Load Current <sup>2</sup>	A	T1-09 (E2-03)
-	Motor Rated Slip <sup>2</sup>	0.000 Hz	T1-10 (E2-02)
-	Test Mode Selection <sup>2</sup>	-	T1-12
-	Motor No-Load Voltage	V	T1-13

<sup>1</sup>Auto-Tuning will automatically set the E1-xx and E2-xx parameters. You can manually adjust Ex-xx parameters after Auto-Tuning.  
<sup>2</sup>These values are only necessary for Stationary Auto-Tuning (T1-01 = 1).  
<sup>3</sup>If you do not know this value, leave at the default value of 0.000.

**16 Energize the Drive and Confirm It Is Ready**

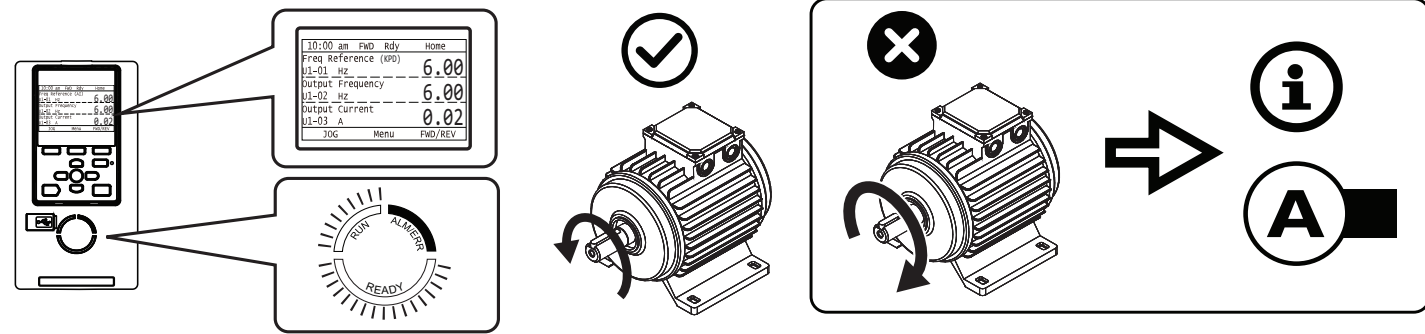
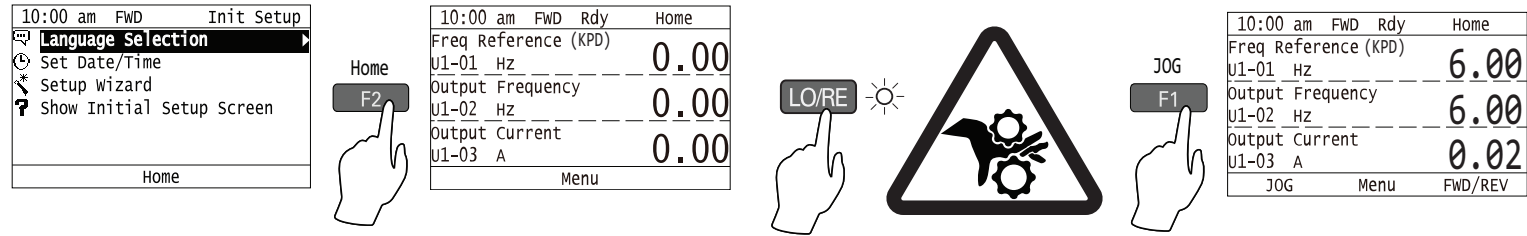


**17 Use Auto-Tuning Data from Motor Nameplate to Set Parameters and Auto-Tune the Drive**

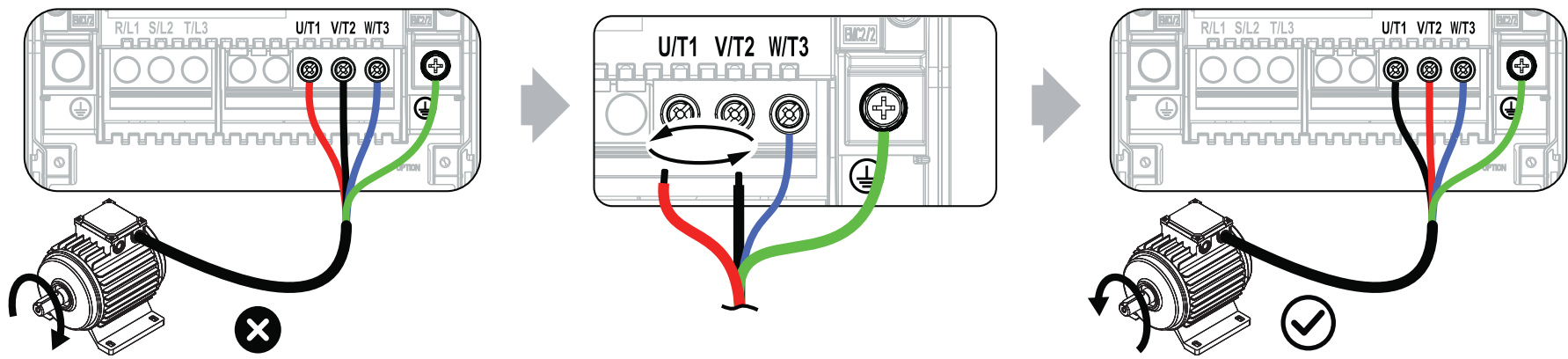




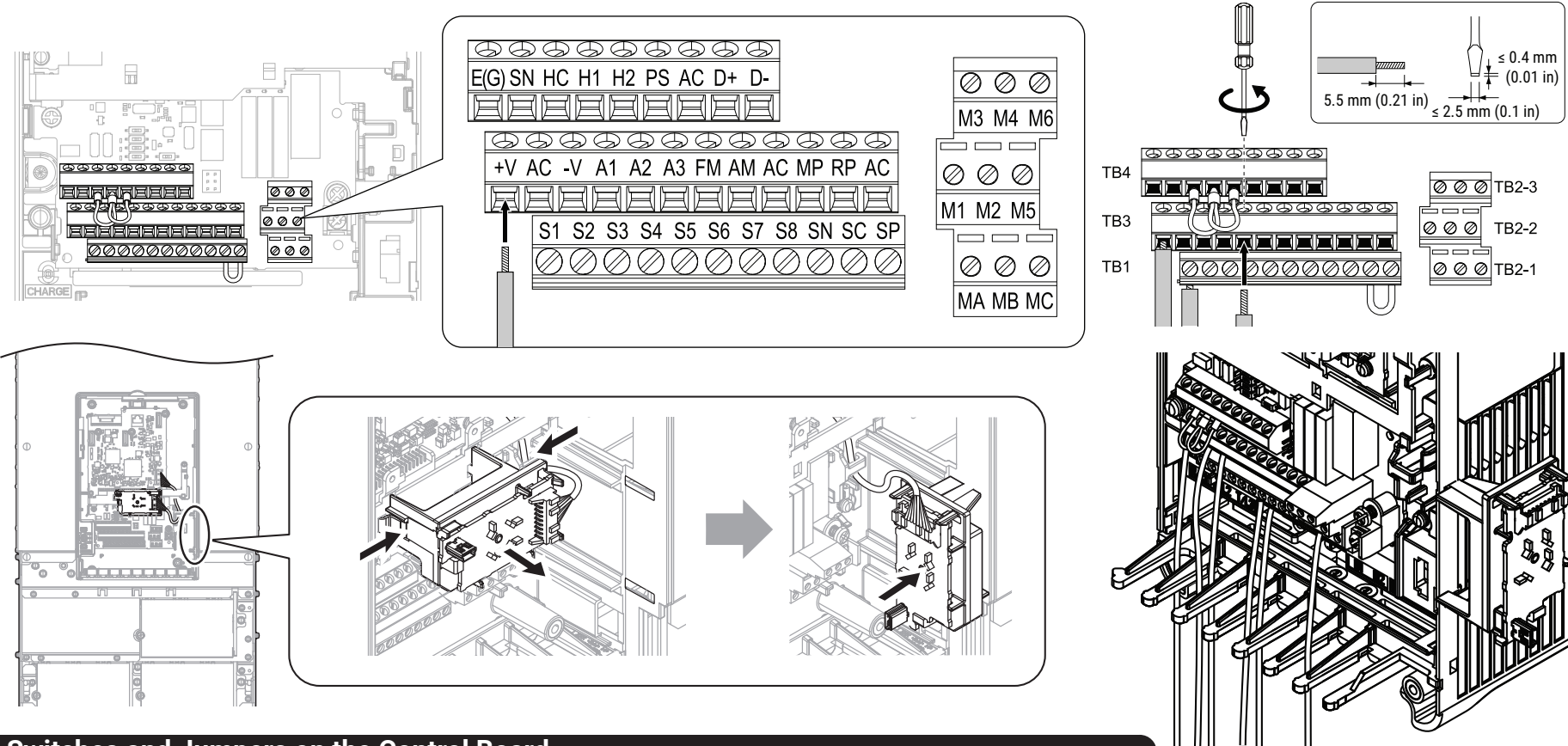
### 18 Set the Drive for LOCAL Control and Check the Motor Rotation Direction



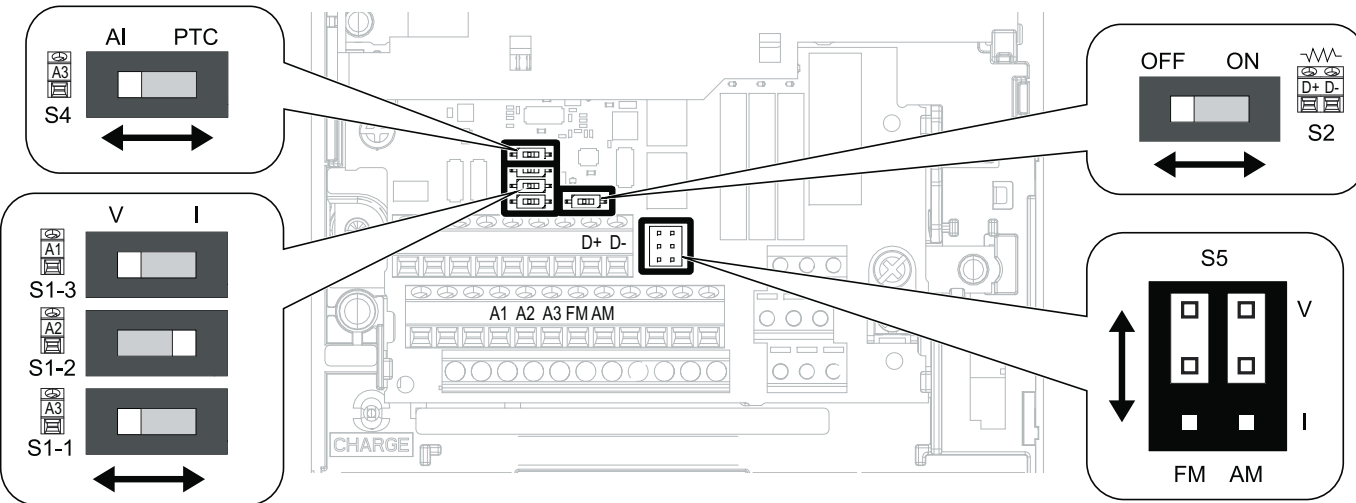
### A If the Motor Does Not Rotate in the Correct Direction



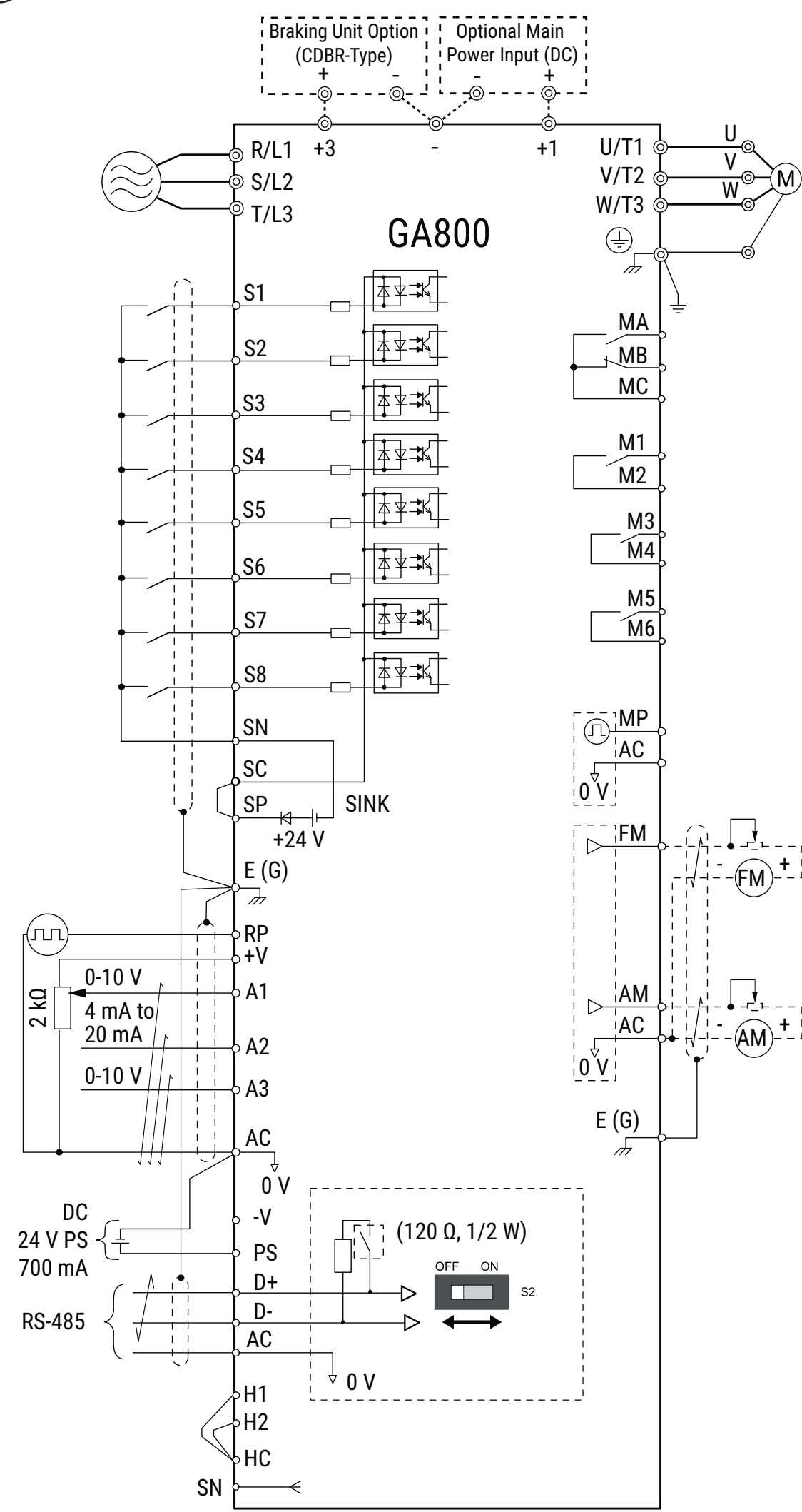
### B Control Circuit Configuration and Accessibility



### C Switches and Jumpers on the Control Board

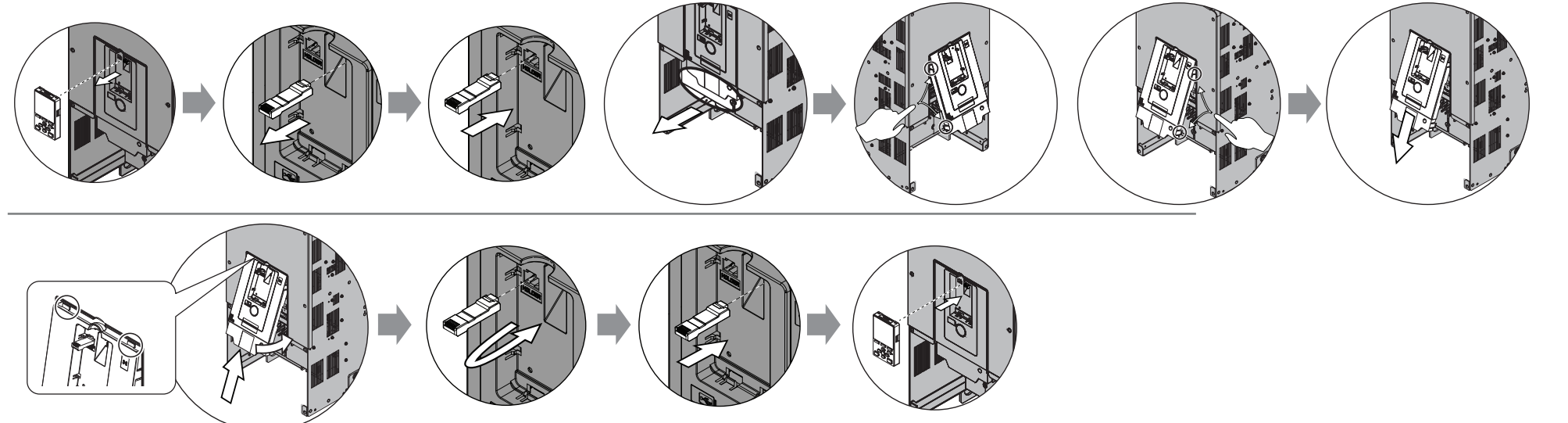


### D Connection Diagram and Terminal Functions



Terminal	Type	Signal Level	Default
S1	MFDI 1	Photocoupler 24 V, 6 mA	Forward run/Stop
S2	MFDI 2		Reverse run/Stop
S3	MFDI 3		External fault
S4	MFDI 4		Fault reset
S5	MFDI 5		Multi-step speed 1
S6	MFDI 6		Multi-step speed 2
S7	MFDI 7		Jog command
S8	MFDI 8		Baseblock command
SN	MFDI power 0 V	24 V, 150 mA maximum	-
SC	MFDI common		-
SP	MFDI power + 24 VDC	-	-
H1	Safe disable input 1	24 V, 6 mA Internal impedance: 4.7 kΩ Minimum OFF time: 2 ms	-
H2	Safe disable input 2		-
HC	Safe disable common		-
RP	Master frequency reference pulse train input	Response frequency: 0 ~ 32 kHz H level duty: 30 ~ 70% H level voltage: 3.5 ~ 13.2 V L level voltage: 0.0 ~ 0.8 V Input impedance: 3 kΩ	-
+V	Frequency setting power supply	10.5 V (20 mA maximum)	-
-V	Frequency setting power supply	-10.5 V (20 mA maximum)	-
A1	MFAI 1	-10 V ~ +10 V/-100% ~ +100% 0 V ~ 10 V/100% (input impedance 20 kΩ) 4 mA ~ 20 mA/100% (input impedance 250 Ω)	Master frequency reference
A2	MFAI 2	-10 V ~ +10 V/-100% ~ +100% 0 V ~ 10 V/100% (input impedance 20 kΩ) 4 mA ~ 20 mA/100% (input impedance 250 Ω)	Combined w/A1
A3	MFAI 3/PTC input	-10 V ~ +10 V/-100% ~ +100% 0 V ~ 10 V/100% (input impedance 20 kΩ) 4 mA ~ 20 mA/100% (input impedance 250 Ω) PTC input	Auxiliary frequency reference
AC	Common	0 V	-
E(G)	Connect shielded cable	-	-
MA	Fault relay out	30 VDC, 10 mA ~ 1 A 250 VAC, 10 mA ~ 1 A Minimum load: 5 V, 10 mA	Fault
MB	Fault relay out	-	Fault
MC	Common	-	-
M1	MFDO	30 VDC, 10 mA ~ 1 A 250 VAC, 10 mA ~ 1 A Minimum load: 5 V, 10 mA	During run
M2	MFDO		Zero speed
M3	MFDO		Speed agree 1
M4	MFDO	-	-
M5	MFDO	-	-
M6	MFDO	-	-
MP	Pulse train out	32 kHz maximum	Output frequency
FM	MFAO 1	0 V ~ +10 V/0% ~ 100% -10 V ~ +10 V/-100% ~ +100% 4 mA ~ 20 mA	Output frequency
AM	MFAO 2	-	Output current
AC	Common	0 V	-
PS	External 24 V PS input	21.6 VDC ~ 26.4 VDC, 700 mA	-
AC	External 24 V PS ground	0V	-
D+	Communication +	MEMOBUS/Modbus, RS-485	-
D-	Communication -	115.2 kbps maximum	-
AC	Common	0 V	-

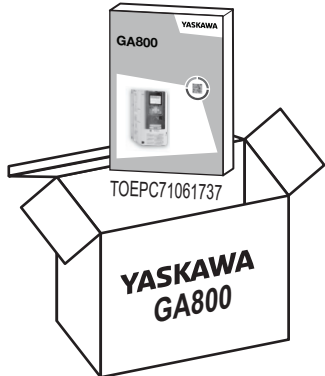

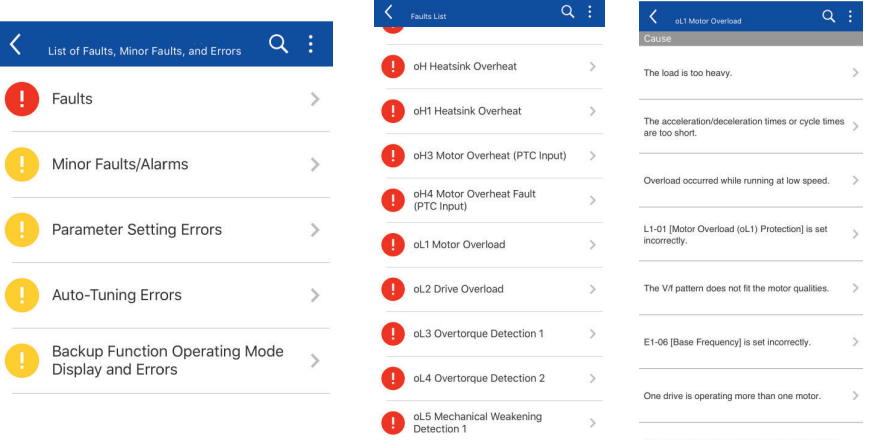



### E How to Remove the Drive Front Cover





## F Troubleshooting Resources for Drive Faults and Alarms



Resource	Choose This When:	URL	QR Code
Installation & Primary Operation	You have access to the paper copy of the manual that was packaged with the drive. This manual lists all drive faults and alarms, and offers a selection of causes and solutions. 	<a href="https://www.yaskawa.com/TOEPC71061737">https://www.yaskawa.com/TOEPC71061737</a>	 PDF download
DriveWizard Mobile App	You want to use your smartphone or tablet and use the embedded help to look up the full complement of causes and solutions to all drive faults and alarms. 	<a href="https://www.yaskawa.com/dwm">https://www.yaskawa.com/dwm</a>	 App download
Maintenance & Troubleshooting Manual	You want to download a PDF of the manual to your smartphone or tablet. This manual lists the full complement of causes and solutions to all drive faults and alarms and also includes detailed information about drive maintenance, wiring, and programming. 	<a href="https://www.yaskawa.com/TOEPAIGA8001">https://www.yaskawa.com/TOEPAIGA8001</a>	 PDF download

## G Additional Resources

## H Customer Feedback




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 •Manuals App  
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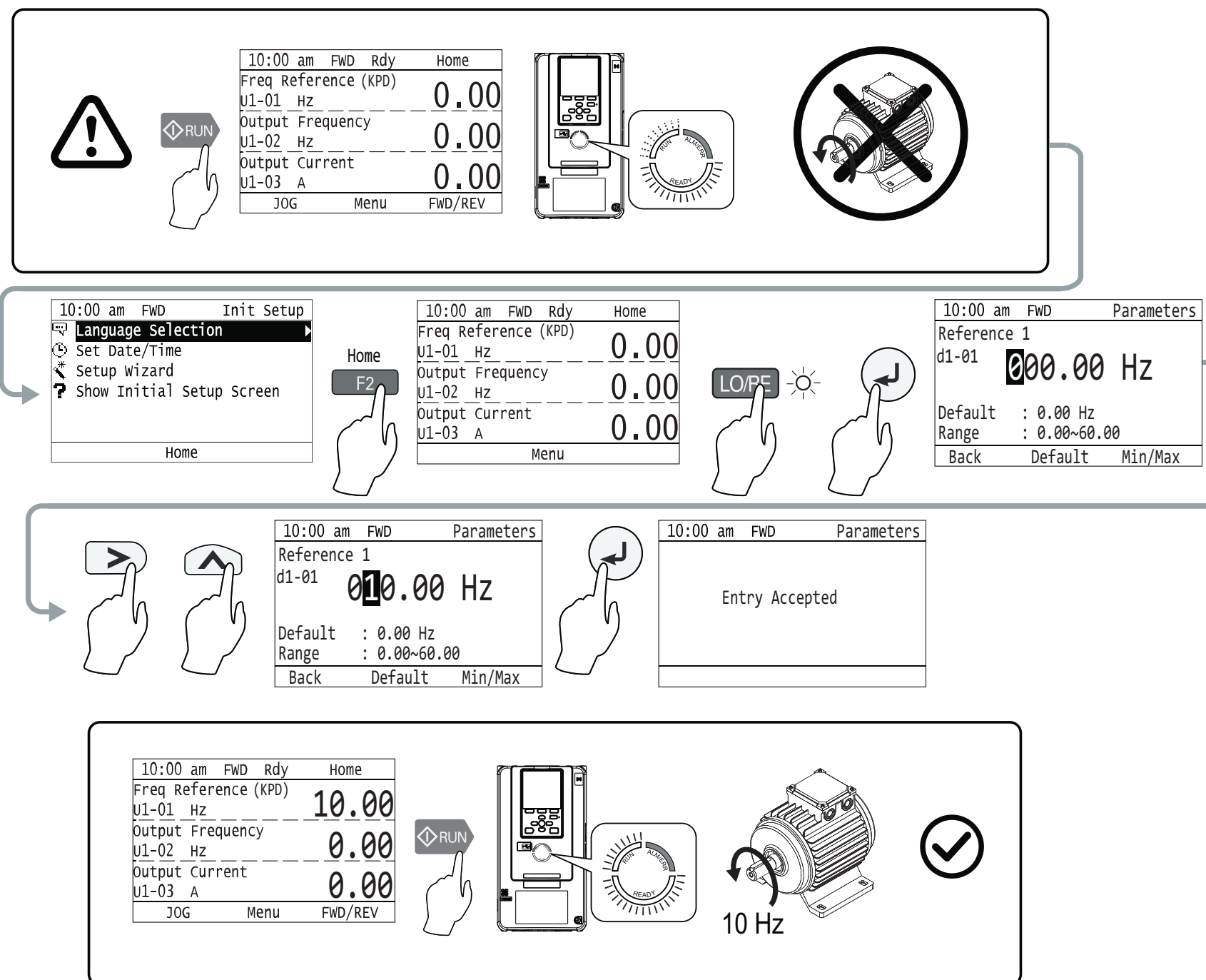
 [www.youtube.com/yaskawayea](https://www.youtube.com/yaskawayea)  
 [www.linkedin.com/company/18822](https://www.linkedin.com/company/18822)  
 [www.twitter.com/yaskawa](https://www.twitter.com/yaskawa)

**Headquarters Address:**  
**YASKAWA AMERICA, INC.**  
 2121 Norman Drive South  
 Waukegan, IL 60085  
 USA

## I Parameter Groups

A: Initialization	d: Reference Settings	F: Options	L: Protection Functions	o: Keypad-Related Settings
A1 Initialization	d1 Frequency Reference	F1 PG Option Setup (Encoder)	L1 Motor Protection	o1 Keypad Display
A2 User Parameters	d2 Reference Limits	F2 Analog Input Option	L2 Power Loss Ride Through	o2 Keypad Operation
<b>b: Application</b>				
b1 Operation Mode Selection	d3 Jump Frequency	F3 Digital Input Option	L3 Stall Prevention	o3 Copy Keypad Function
b2 DC Injection Braking and Short Circuit Braking	d4 Freq. Ref. Up/Down & Hold	F4 Analog Output Option	L4 Speed Detection	o4 Maintenance Monitors
b3 Speed Search	d5 Torque Control	F5 Digital Output Option	L5 Fault Restart	o5 Log Function
b4 Timer Function	d6 Field Weakening/Forcing	F6 Communication Option	L6 Torque Detection	<b>q: DriveWorksEZ Parameters</b>
b5 PID Control	d7 Offset Frequency	F7 Ethernet Options	L7 Torque Limit	<b>r: DriveWorksEZ Connections</b>
b6 Dwell Function	<b>E: Motor</b>		L8 Drive Protection	<b>T: Motor Tuning</b>
b7 Droop Control	E1 V/f Pattern for Motor 1	<b>H: Terminal Functions</b>		<b>U: Monitors</b>
b8 Energy Saving	E2 Motor 1 Parameters	H1 Digital Inputs	L9 Drive Protection 2	U1 Operation Status Monitors
b9 Zero Servo	E3 V/f Pattern for Motor 2	H2 Digital Outputs	<b>n: Special Adjustment</b>	
<b>C: Tuning</b>				
C1 Accel & Decel Time	E4 Motor 2 Parameters	H3 Analog Inputs	n1 Hunting Prevention	U2 Fault Trace
C2 S-Curve Characteristics	E5 PM Motor Settings	H4 Analog Outputs	n2 Auto Freq. Regulator (AFR)	U3 Fault History
C3 Slip Compensation	E6 Motor Setting	H5 Modbus Communication	n3 High Slip/Overexcite Braking	U4 Maintenance Monitors
C4 Torque Compensation	<b>C6 Duty &amp; Carrier Frequency</b>		n4 AOLV Tuning	U5 PID Monitors
C5 Auto Speed Regulator (CSR)			n5 Feed Forward Control	U6 Operation Status Monitors
C6 Duty & Carrier Frequency			n6 Online Tuning	U8 DriveWorksEZ Monitors
		H6 Pulse Train Input/Output	n7 EZ Drive	
		H7 Virtual Inputs/Outputs	n8 PM Motor Control Tuning	

## J If You Push the Run Button but the Motor Does Not Spin



10:00 am Fwd Rdy Home  
 Freq Reference (KPD)  
 U1-01 Hz 0.00  
 Output Frequency  
 U1-02 Hz 0.00  
 Output Current  
 U1-03 A 0.00  
 JOG Menu FWD/REV

Home F2

10:00 am Fwd Rdy Home  
 Reference 1  
 d1-01 000.00 Hz  
 Default : 0.00 Hz  
 Range : 0.00-60.00  
 Back Default Min/Max

Home F2

10:00 am Fwd Rdy Home  
 Parameters  
 Reference 1  
 d1-01 10.00 Hz  
 Default : 0.00 Hz  
 Range : 0.00-60.00  
 Back Default Min/Max

Entry Accepted

10:00 am Fwd Rdy Home  
 Freq Reference (KPD)  
 U1-01 Hz 10.00  
 Output Frequency  
 U1-02 Hz 0.00  
 Output Current  
 U1-03 A 0.00  
 JOG Menu FWD/REV

10 Hz