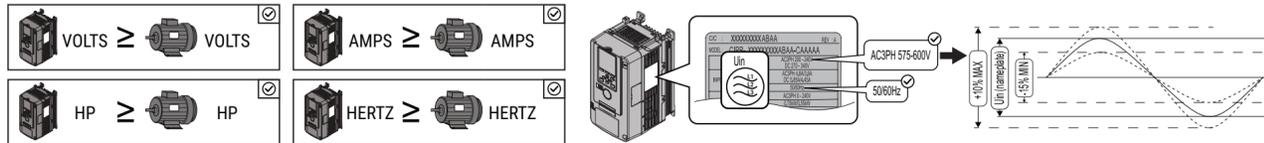
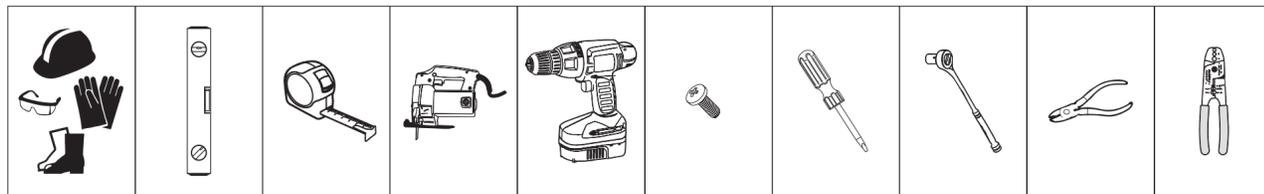


Read and follow the safety and installation procedures in the Installation & Primary Operation (TOEPC7106170V) manual packaged with the drive.

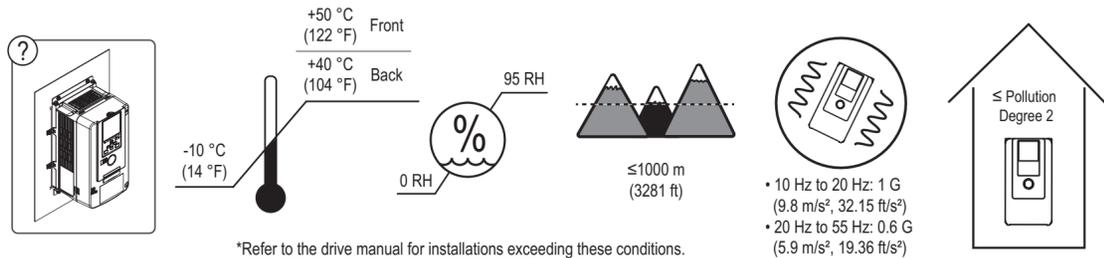
**1 Confirm the Drive and Motor Specifications**



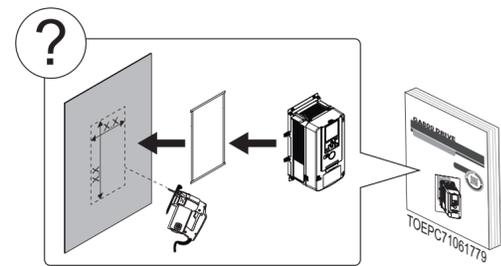
**2 Collect the Required Tools and Equipment**



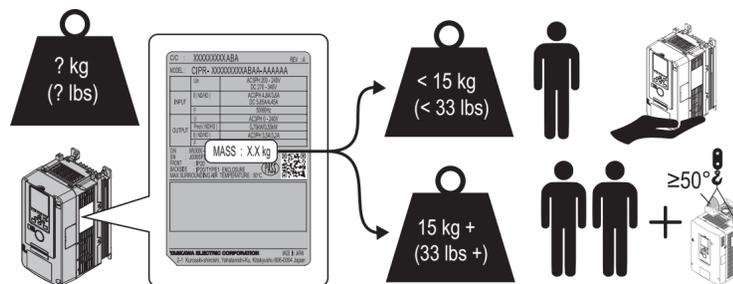
**3 Confirm the Correct Drive Installation Environment \***



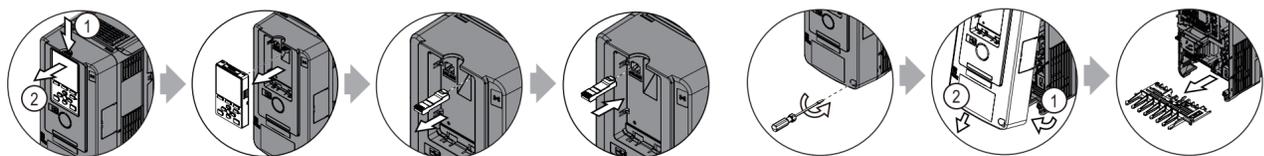
**4 Cut an Opening and Install the Drive**



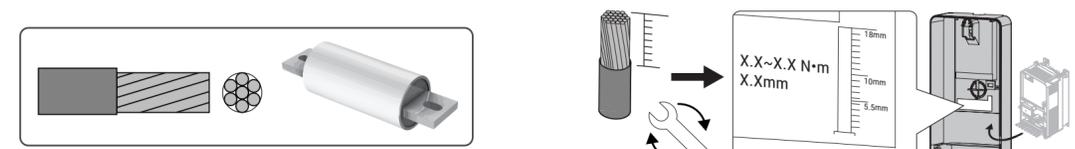
**5 Correctly Lift the Drive**



**6 Remove the Keypad, Front Cover, and Wiring Cover**



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



**UL Compliance:** Install one of these types of short circuit protection devices to comply with UL 508C. Semiconductor protective type fuses are recommended, but the table also shows alternative short circuit protection devices. When you use MCCBs, RK1, or RK5 fuses as UL listed drive protection devices, you must mount the drive in a ventilated enclosure according to the minimum enclosure volume specified in this document.

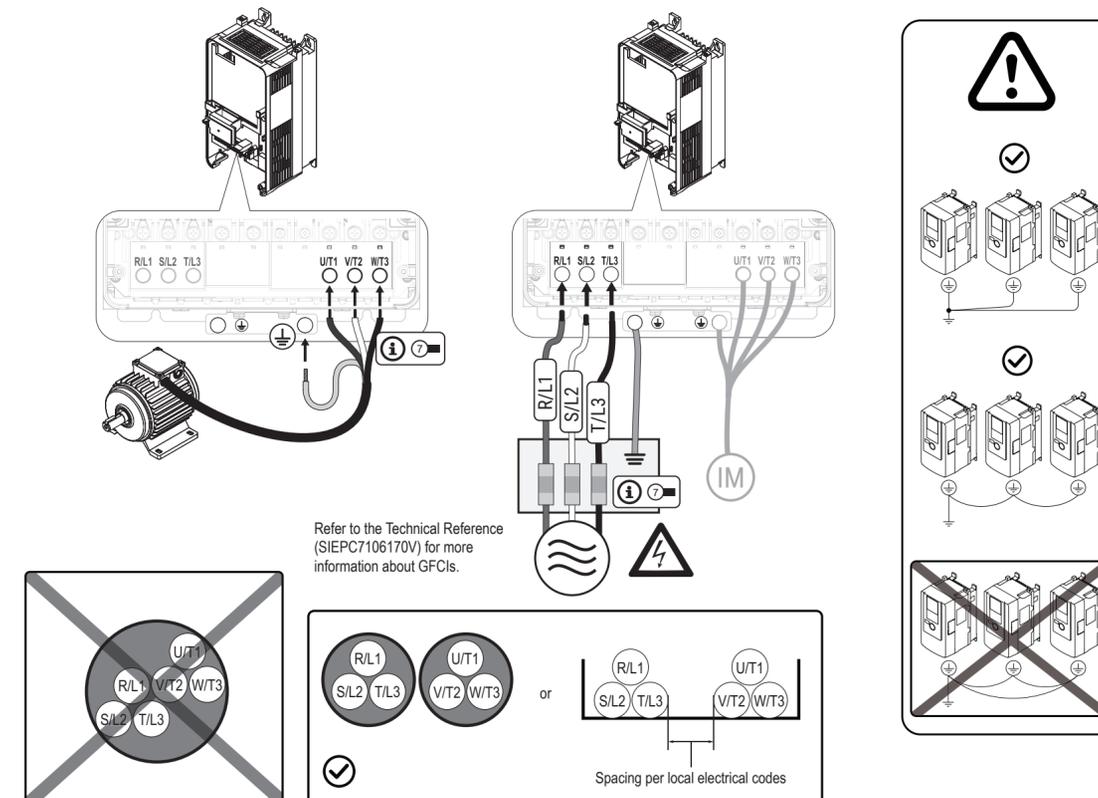
**Molded Case Circuit Breaker (MCCB) and Non-Semiconductor Fuse Ratings:** Maximum MCCB rating is 200% of the Normal-Duty drive full load output amp (FLA) rating. Maximum CC, J, T, RK1, or RK5 fuse rating is 175% of the Normal-Duty drive full load output amp (FLA) rating. You can substitute an alternate UL listed current limiting type MCCB where the peak let-through current and I<sup>2</sup>t of the alternate MCCB is not greater than the specified MCCB in this table.

**Short Circuit Current Rating (SCCR):** The maximum SCCR provided by drive and fuse, or drive and MCCB combinations in this document, is 100,000 RMS symmetrical amps. Use the protection specified in this document to prepare the drive for use on a circuit capable of delivering not more than 100,000 RMS symmetrical amps and not more than 600 Vac when there is a short circuit in the power supply.

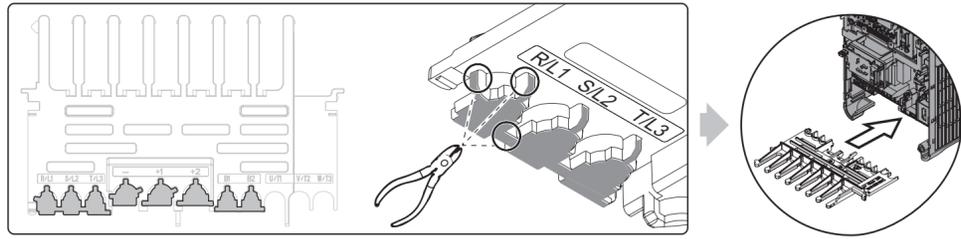
Model	IP20 Applicable Gauge AWG (Recommended Value in Parentheses)					Semiconductor Fuse Manufacturer: Eaton/Bussmann Part Number **
	R/L1, S/L2, T/L3	U/T1, V/T2, W/T3	-	+1	B1, B2	
Three-Phase 600 V Class						
5002 - 5011	14 - 6 (14)	14 - 6 (14)	14 - 3 (14)	14 - 10 (14)	n/a (10)	FWP-70B
5017	8 - 3 (10)	10 - 4 (10)	8 - 1 (8)	14 - 8 (14)	n/a (8)	FWP-100B
5022	8 - 3 (8)	10 - 4 (10)	8 - 1 (8)	14 - 8 (12)	n/a (8)	FWP-100B
5027 - 5032	10 - 4 (8)	10 - 6 (8)	10 - 3 (6)	14 - 8 (10)	n/a (6)	FWP-125A
5041 - 5052	12 - 3 (6)	12 - 3 (6)	10 - 2 (4)	14 - 6 (8)	n/a (6)	FWP-150A
5062	2/0 - 250 (2)	3/0 - 300 (2)	1/0 - 2/0 (2)	1 - 2/0 (4)	n/a (4)	FWP-150A
5077	2/0 - 250 (2)	3/0 - 300 (2)	1/0 - 2/0 (1)	1 - 2/0 (4)	n/a (4)	FWP-150A
5099	2/0 - 250 (1)	3/0 - 300 (1)	1/0 - 2/0 (2/0)	1 - 2/0 (3)	n/a (4)	FWP-150A

\*\* Install the specified semiconductor fuses in UL Type 1 Kit UUX002314, which attaches to the drive. Alternatively, both the drive and the fuses may be installed in a supplemental enclosure.

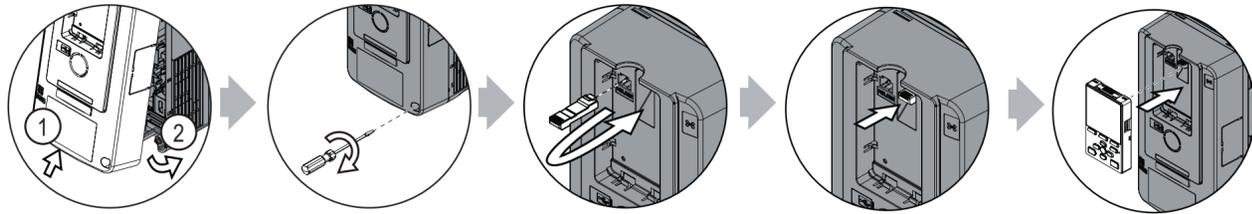
**8 Install the Motor Wiring and Power Wiring**



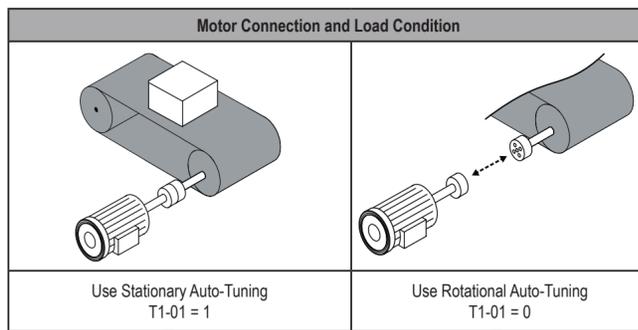
**9 Remove the Tabs and Install the Wiring Cover**



**10 Install the Front Cover and Keypad**



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



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

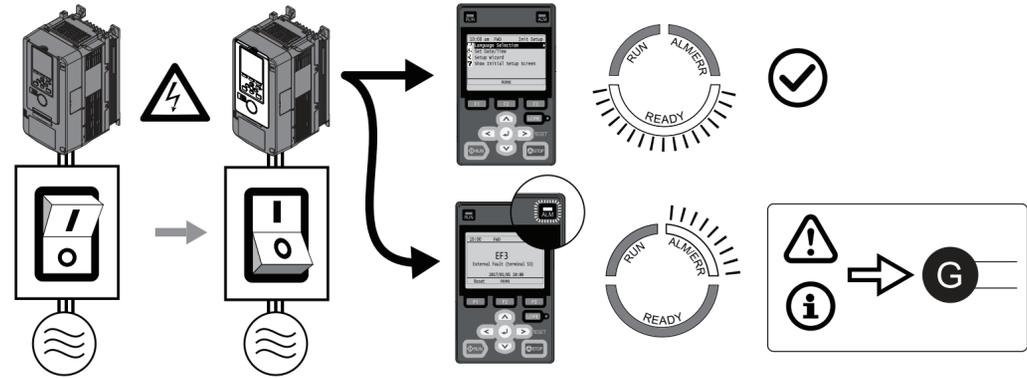
**3 PHASE INVERTER DUTY AC INDUCTION MOTOR NAMEPLATE EXAMPLE**

MODEL XX	123AAA123XX-X0	X FRAME 123AX
POLES X	ENC XXX	CODE X
VOLTS XXX	FL RPM XXXX	FL AMPS XX/XX
SF 1.0	DUTY CONT	MAX AMB °C XX
SERIAL	N.L. AMPS XX.X/XX.X	TEMP. SENSORS T-STATS
MAX RPM 4200	S.E. BRG. 309	O.S.E. BRG. XXX
		ROTOR WK² XX
HZ	HP	RPM
		TORQUE (LB FT)
		VOLTS (HIGH CONN)
		AMPS (HIGH CONN)
1	0	XXX.X
60	XX	XXX.X
120	XX	XXX.X
OHMS PH.	R1: .XXX	R2: .XXX
	X1: X.XX	X2: X.XX
		XM: XX.X
P/N XXXXXXX		

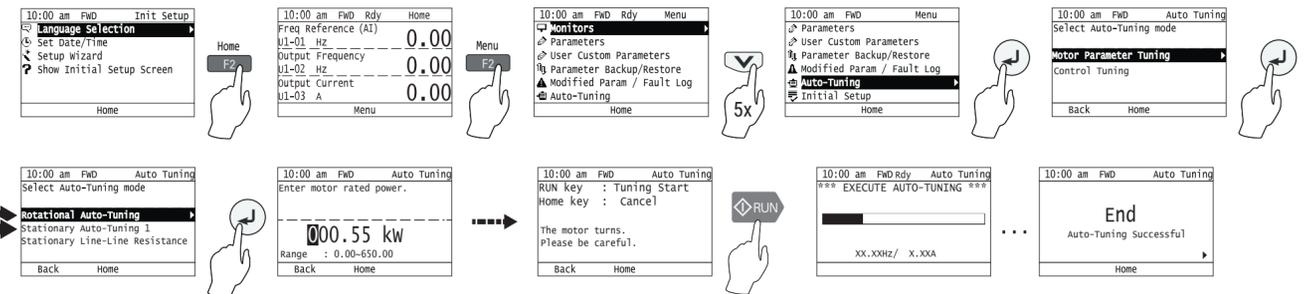
Reference	Motor Nameplate Data	Motor Nameplate Value	T1-xx Parameter (Ex-xx Parameter *)
A	Motor Rated Power	(HP x 0.746)	kW
B	Motor Rated Voltage		V
C	Motor Rated Current (FLA)		A
D	Motor Rated Frequency (Base Frequency)		Hz
E	Motor Pole Count		-
F	Motor Rated RPM		RPM
G	Motor No-Load Current **		A
-	Motor Rated Slip **	0.000	Hz
-	Test Mode Selection **		-
-	Motor No-Load Voltage		V

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

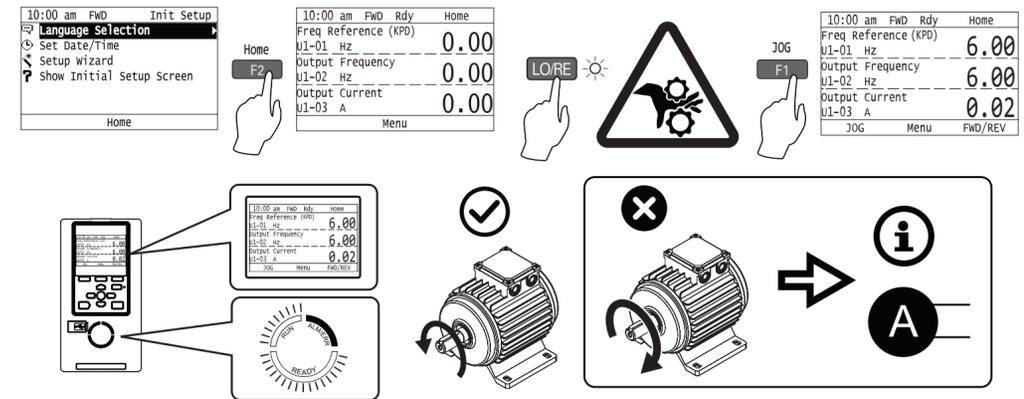
**13 Energize the Drive and Confirm It Is Ready**



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

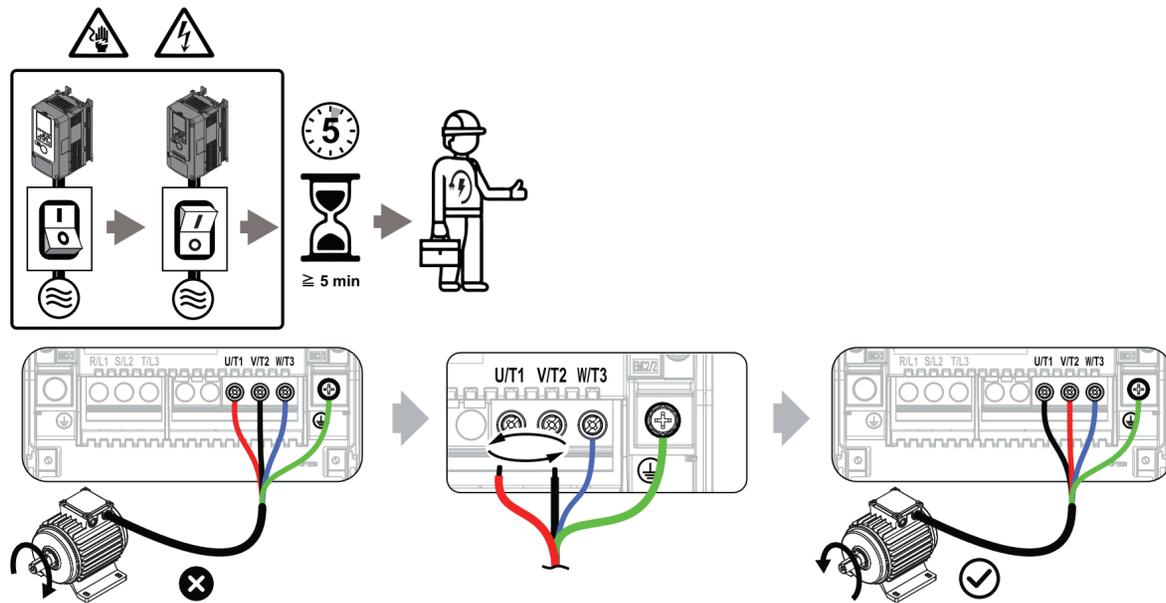


**15 Set the Drive for LOCAL Control and Check the Motor Rotation Direction**

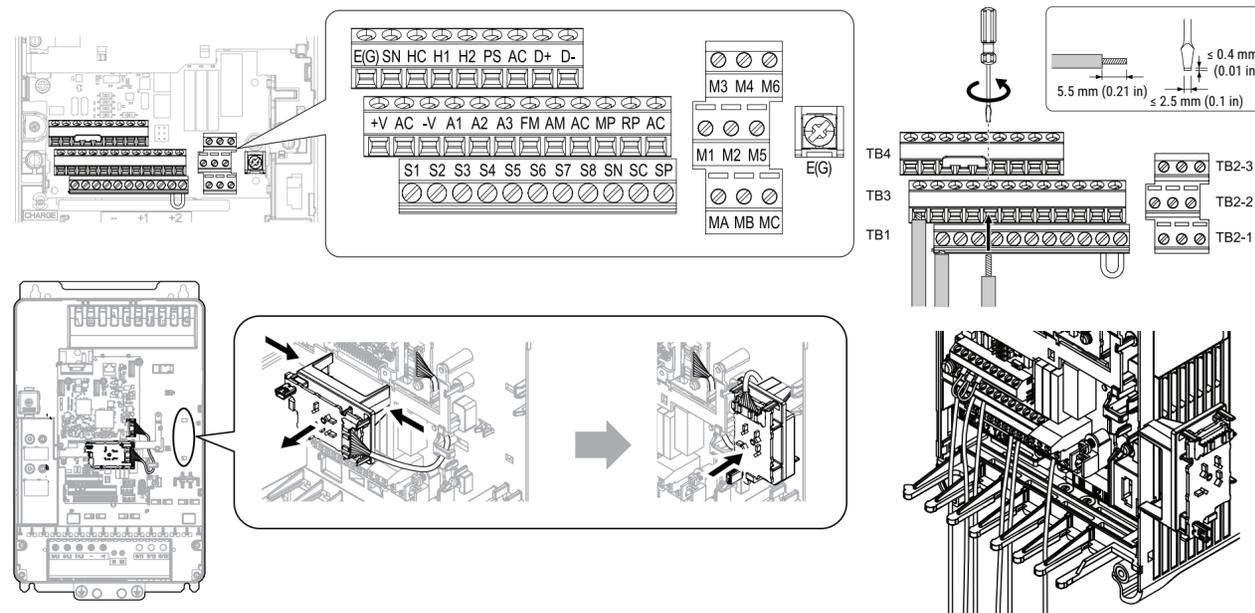


## Additional Information for Installation and Primary Operation

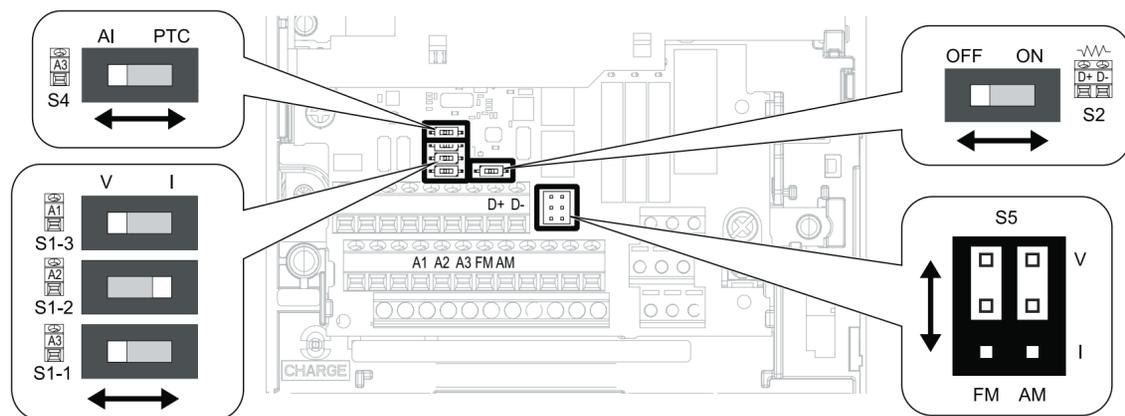
### A If the Motor Does Not Rotate in the Correct Direction



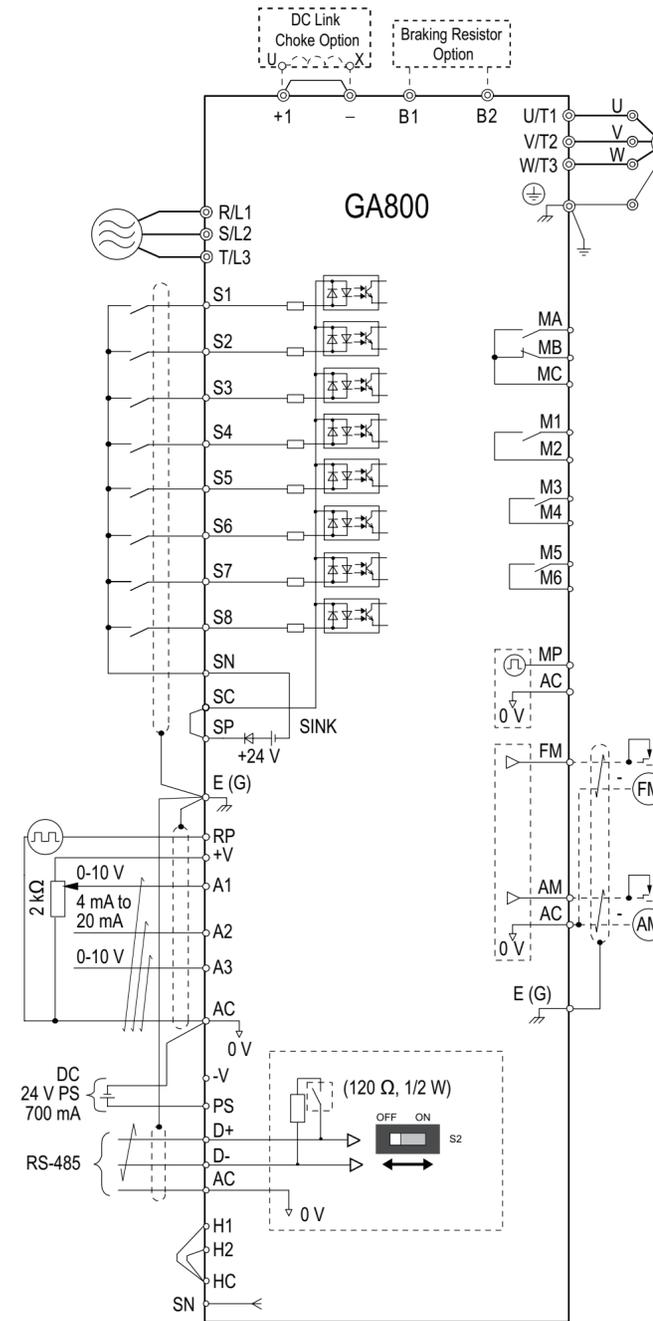
### B Control Circuit Configuration and Accessibility



### C Switches and Jumpers on the Control Board



## D Connection Diagram and Terminal Functions



Terminal	Type	Signal Level	Default
S1	MFDI selection 1	Photocoupler 24 V, 6 mA	Forward run/Stop
S2	MFDI selection 2		Reverse run/Stop
S3	MFDI selection 3		External fault (N.O.)
S4	MFDI selection 4		Fault reset
S5	MFDI selection 5		Multi-step speed reference 1
S6	MFDI selection 6		Multi-step speed reference 2
S7	MFDI selection 7		Jog command
S8	MFDI selection 8		Baseblock command (N.O.)
SN	MFDI power supply 0 V		-
SC	MFDI selection common	24 V, 150 mA maximum	-
SP	MFDI power supply +24 Vdc		-
H1	Safe Disable input 1	24 V, 6 mA Internal impedance: 4.7 k $\Omega$	-
H2	Safe Disable input 2	24 V, 6 mA Internal impedance: 4.7 k $\Omega$ Minimum OFF time: 2 ms	-
HC	Safe Disable function common		-
RP	Master frequency reference pulse train input	Response frequency: 0 Hz ~ 32 kHz H level duty: 30% ~ 70% H level voltage: 3.5 V ~ 13.2 V L level voltage: 0.0 V ~ 0.8 V Input impedance: 3 k $\Omega$	Master frequency reference
+V	Power supply for frequency setting	10.5 V (20 mA maximum)	-
-V		-10.5 V (20 mA maximum)	-
A1	MFAI 1	-10 V ~ +10 V/-100% ~ +100% 0 V ~ 10 V/100% (input impedance 20 k $\Omega$ ) 4 mA ~ 20 mA/100% 0 mA ~ 20 mA/100% (input impedance 250 $\Omega$ )	Master frequency reference
A2	MFAI 2		Combined to terminal A1
A3	MFAI 3/PTC input	-10 V ~ +10 V/-100% ~ +100% 0 V ~ 10 V/100% (input impedance 20 k $\Omega$ ) 4 mA ~ 20 mA/100% 0 mA ~ 20 mA/100% (input impedance 250 $\Omega$ ) PTC input	Auxiliary frequency reference
AC	Frequency reference common	0 V	-
E(G)	Cable shielding connection		-
MA	N.O. output	30 Vdc, 10 mA ~ 1 A 250 Vac, 10 mA ~ 1 A Minimum load: 5 V, 10 mA	Fault
MB	N.C. output		Fault
MC	MA/MB common		-
M1	MFDO		During Run
M2	MFDO		Zero Speed
M3	MFDO	30 Vdc, 10 mA ~ 1 A 250 Vac, 10 mA ~ 1 A Minimum load: 5 V, 10 mA	Speed Agree 1
M4	MFDO		
M5	MFDO		
M6	MFDO		
MP	Pulse train output	32 kHz maximum	Output frequency
FM	Analog monitor output 1	0 V ~ +10 V/0% ~ 100% -10 V ~ +10 V/-100% ~ +100% 4 mA ~ 20 mA	Output frequency
AM	Analog monitor output 2		Output current
AC	Monitor common	0 V	-
PS	External 24 V power supply input	21.6 Vdc ~ 26.4 Vdc, 700 mA	-
AC	External 24 V power supply ground	0 V	-
D+	Communication input/output (+)	MEMOBUS/Modbus, RS-485 115.2 kbps maximum	-
D-	Communication output (-)		-
AC	Signal ground	0 V	-

MFDI: Multi-function Digital Input MFDO: Multi-function Digital Output  
MFAI: Multi-function Analog Input

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

The diagram illustrates the steps to take if the motor does not spin after pressing the Run button. It shows the drive's keypad menu with parameters like Freq Reference (KPD), Output Frequency, and Output Current. A hand is shown pressing the RUN button. A 'LO/PE' indicator is shown, and a motor is shown with a checkmark, indicating successful operation.

### F Parameter Groups

A: Initialization	d: Reference Settings	F: Options	L: Protection Functions	o: Keypad-Related Settings
A1 Initialization	d1 Frequency Reference	F1 Encoder Option Setup	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 Frequency 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: DWEZ Connection 1-20</b>
b6 Dwell Function	<b>E: Motor Parameters</b>		L8 Drive Protection	<b>U: Monitors</b>
b7 Droop Control	E1 V/f Pattern for Motor 1	<b>H: Terminal Functions</b>		U1 Operation Status Monitors
b8 Energy Saving	E2 Motor 1 Parameters	H1 Digital Inputs	<b>n: Special Adjustment</b>	
b9 Zero Servo	E3 V/f Pattern for Motor 2	H2 Digital Outputs	n1 Hunting Prevention	U2 Fault Trace
<b>C: Tuning</b>				
C1 Accel & Decel Time	E4 Motor 2 Parameters	H3 Analog Inputs	n2 Auto Freq Regulator (AFR)	U3 Fault History
C2 S-Curve Characteristics		H4 Analog Outputs	n3 High Slip/Overexcite Braking	U4 Maintenance Monitors
C3 Slip Compensation		H5 Modbus Communication	n4 Adv Open Loop Vector Tune	U5 PID Monitors
C4 Torque Compensation		H6 Pulse Train Input/Output	n5 Feed Forward Control	U6 Operation Status Monitors
C5 Auto Speed Regulator (ASR)		H7 Virtual MFIO selection	n6 Online Tuning	U8 DriveWorksEZ Monitors
C6 Duty & Carrier Frequency				

### G 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/toepc7106170v">https://www.yaskawa.com/toepc7106170v</a>	
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>	
Technical Reference	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/siepc7106170v">https://www.yaskawa.com/siepc7106170v</a>	

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