1 — Procedure for Installation and Primary Operation for Models GA80U2004 to 2211 and 4002 to 4168

ON-SITE VIDEO
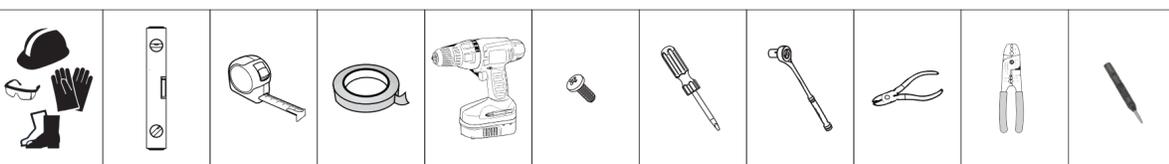
https://www.yaskawa.com/ga800qsp1
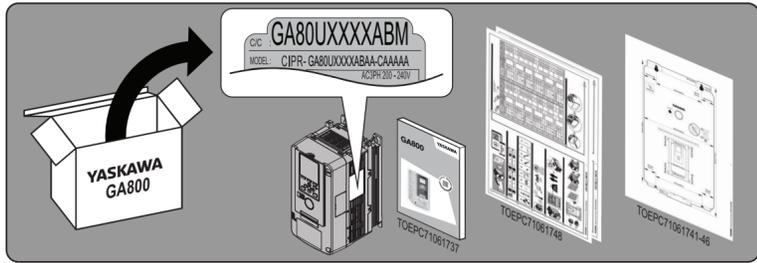
Read and follow the safety and installation procedures in the Installation & Primary Operation (TOEPC71061737) manual packaged with the drive.
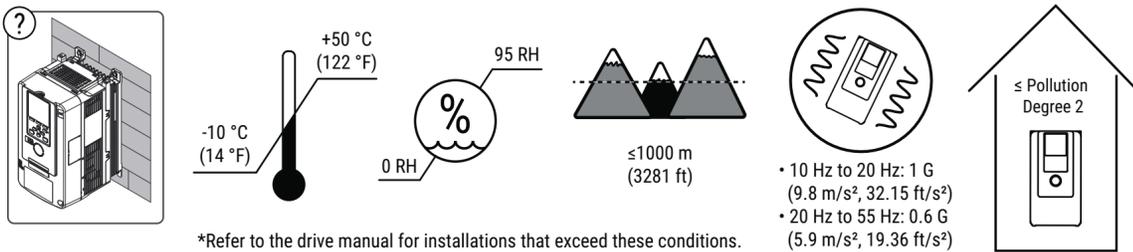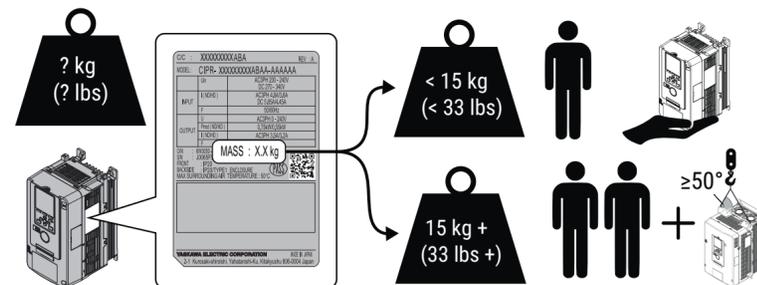
2 — Confirm the Drive and Motor Specifications

VOLTS ≥ VOLTS AMPS ≥ AMPS HP ≥ HP HERTZ ≥ HERTZ
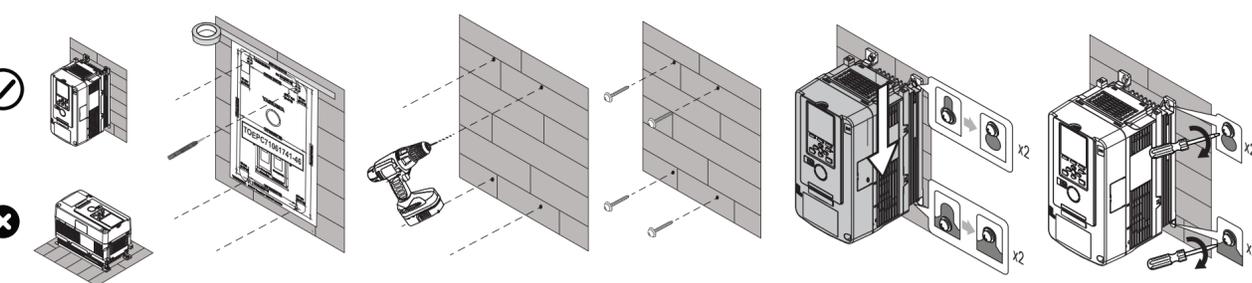
AC3PH 200-240V AC3PH 380-480V 50/60Hz
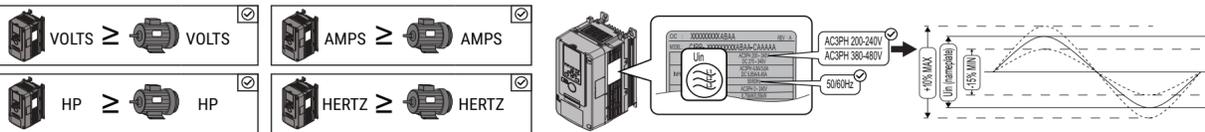
3 — Collect the Required Tools and Equipment

4 — Confirm the Correct Drive Installation Environment*

+50 °C (122 °F)   -10 °C (14 °F)   95 RH   0 RH   ≤1000 m (3281 ft)   ≤ Pollution Degree 2

- 10 Hz to 20 Hz: 1 G (9.8 m/s², 32.15 ft/s²)
- 20 Hz to 55 Hz: 0.6 G (5.9 m/s², 19.36 ft/s²)

*Refer to the drive manual for installations that exceed these conditions.

5 — Correctly Lift the Drive

? kg (? lbs)   < 15 kg (< 33 lbs)   15 kg + (33 lbs +)   ≥50°   MASS : X.X kg
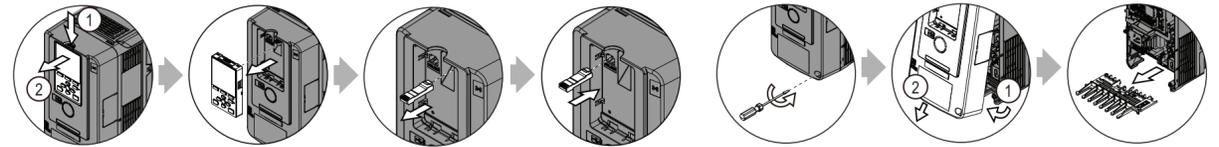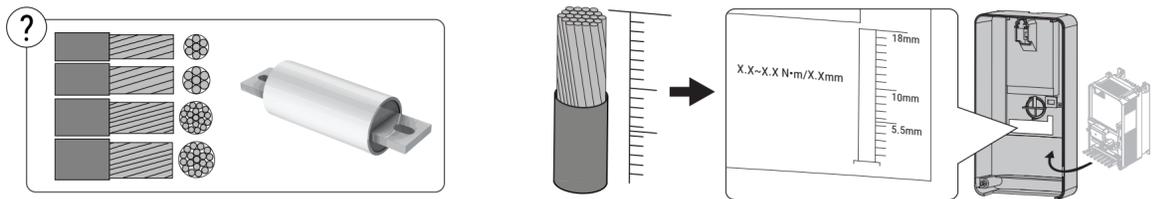
6 — Mount the Drive Vertically

7 — Remove the Keypad, Front Cover, and Wiring Cover

8 — Select the Correct Fuses, Wires, and Wire Strip Length

X.X–X.X N·m/X.Xmm   18mm   10mm   5.5mm

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.

200 V Class Wire Gauge Range and Branch Circuit Protection by Drive Model [GA80UXXXX] (*Recommended*)

Terminal			2004 2006 2008	2010	2012	2018	2021	2030	2042	2056	2070	2082	2110	2138	2169	2211
R/L1 S/L2 T/L3			14-6 (14)	14-6 (12)	14-6 (10)	14-6 (10)	14-6 (8)	14-6 (6)	14-6 (6)	8-3 (3)	6-1 (1)	6-1/0 (1/0)	6-1/0 (1/0)	2-2/0 (2/0)	2/0-250 (4/0)	2/0-250 (250)
U/T1 V/T2 W/T3				14-6 (14)	14-6 (12)		14-6 (10)	14-6 (8)		10-4 (4)	6-3 (3)	6-2 (2)			3/0-300 (4/0)	3/0-300 (300)
− +1 +2	− +1	− +1 +1	14-3 (14)	14-3 (12)	14-3 (10)	14-3 (8)	14-3 (8)	14-3 (6)	14-3 (3)	8-1 (1)	4-1/0 (1/0)	4-2/0 (2/0)	2-2/0 (2/0)	2-4/0 (4/0)	1/0-2/0 (1)	1/0-2/0 (2/0)
B1 B2	B1 B2	+3	14-10 (14)	14-10 (14)	14-10 (14)	14-10 (14)	14-10 (14)	14-10 (12)	14-10 (10)	14-8 (8)	14-8 (8)	14-6 (6)	10-4 (4)	10-3 (3)	1-2/0 (1)	1-2/0 (2/0)
⏚			14-8 (10)	14-8 (10)	14-8 (10)	14-8 (10)	12-8 (10)	10-8 (8)	10-8 (8)	8-6 (6)	6-4 (6)	6-4 (6)	6-4 (6)	4 (4)	4-1/0 (4)	4-1/0 (4)
Bussmann Semiconductor[1]			FWH-45B	FWH-45B	FWH-50B	FWH-80B	FWH-80B	FWH-125B	FWH-200B	FWH-225A	FWH-250A	FWH-225A	FWH-225A	FWH-275A	FWH-275A	FWH-325A
Alternate Time-Delay (Class CC, J, or T)[2]	Max. Rating (A)[3]		6 / 10 / 12	15	20	30	35	50	70	90	110	125	175	225	250	350
	Max. SCCR (kA)		65	65	65	65	65	100	100	100	100	100	100	100	100	100

[1] Recommended EATON/Bussmann Semiconductor fuse model.
[2] Class T fuses are fast-acting (non-time delay only).
[3] Maximum fuse ratings are based on ND1 or ND2 ratings, whichever is larger.

400 V Class Wire Gauge Range and Branch Circuit Protection by Drive Model [GA80UXXXX] (*Recommended*)

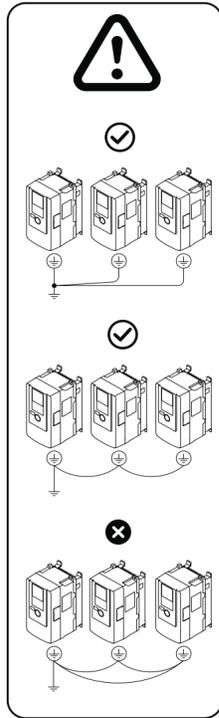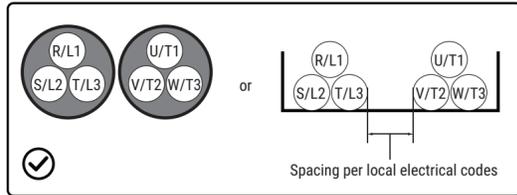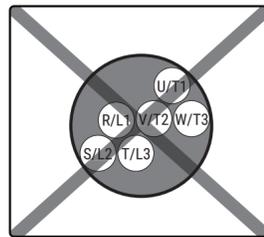| Terminal			4002 4004	4005 4007	4009	4012	4018	4023	4031	4038	4044	4060	4075	4089	4103	4140	4168
R/L1 S/L2 T/L3			14-6 (14)	14-6 (14)	14-6 (14)	14-6 (12)	14-6 (10)	14-6 (8)	8-3 (6)	8-3 (6)	10-4 (4)	10-4 (4)	12-3 (3)	10-2 (2)	2-2/0 (1/0)	2/0-250 (3/0)	2/0-250 (4/0)
U/T1 V/T2 W/T3						14-6 (14)		14-6 (10)	14-6 (8)	10-4 (8)	10-6 (6)				2-2/0 (1)	3/0-300 (2/0)	3/0-300 (4/0)
− +1 +2	− +1	− +1 +1	14-3 (14)	14-3 (14)	14-3 (12)	14-3 (10)	14-3 (8)	14-3 (8)	8-1 (6)	8-1 (4)	10-3 (3)	10-3 (3)	10-2 (2)	6-1/0 (1/0)	2-4/0 (2/0)	1/0-2/0 (2)	1/0-2/0 (1/0)
B1 B2	B1 B2	+3	14-10 (14)	14-10 (14)	14-10 (14)	14-10 (14)	14-10 (14)	14-10 (12)	14-8 (10)	14-8 (10)	14-8 (8)	14-8 (8)	14-6 (6)	14-6 (6)	10-3 (3)	1-2/0 (1)	1-2/0 (1/0)
⏚			14-8 (12)	14-8 (10)	14-8 (10)	14-8 (10)	14-8 (10)	12-8 (10)	10-6 (8)	10-6 (8)	8-4 (6)	8-4 (6)	6-4 (4)	6-4 (4)	6-4 (4)	4-1/0 (4)	4-1/0 (4)
Bussmann Semiconductor[1]			FWH-50B	FWH-50B FWH-60B	FWH-60B	FWH-60B	FWH-80B	FWH-90B	FWH-150B	FWH-200B	FWH-200B	FWH-225A	FWH-250A	FWH-275A	FWH-275A	FWH-300A	FWH-325A
Alternate Time-Delay (Class CC, J, or T)[2]	Max. Rating (A)[3]		3.5 / 7	9 / 12	15	20	30	40	50	60	70	100	125	150	175	225	250
	Max. SCCR (kA)		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

[1] Recommended EATON/Bussmann Semiconductor fuse model.
[2] Class T fuses are fast-acting (non-time delay only).
[3] Maximum fuse ratings are based on ND1 or ND2 ratings, whichever is larger.
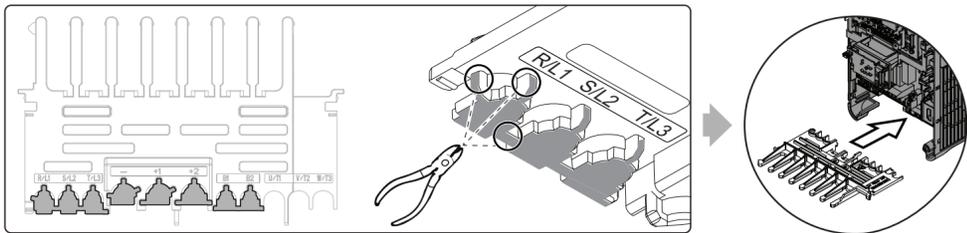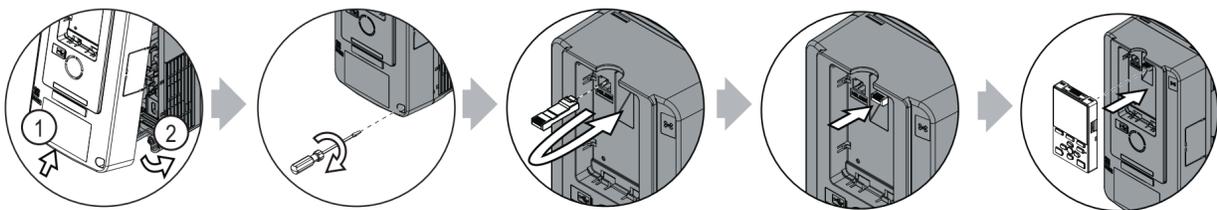
9 Install the Motor Wiring and Power Wiring

R/L1 S/L2 T/L3   U/T1 V/T2 W/T3

R/L1 S/L2 T/L3   U/T1 V/T2 W/T3
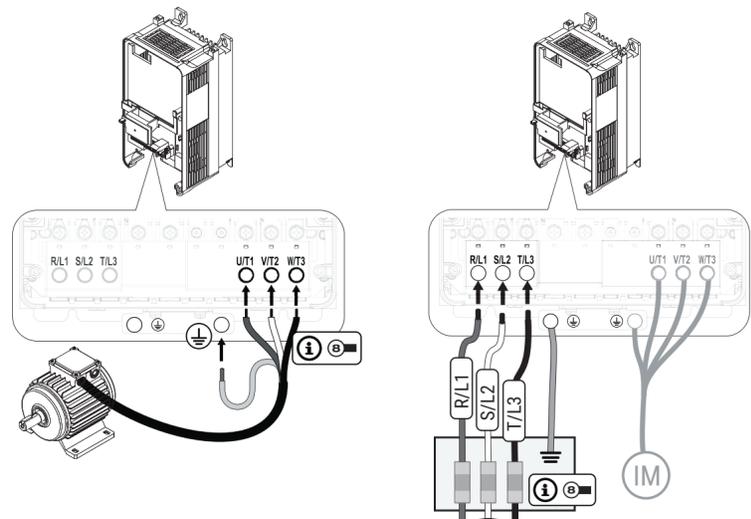
Refer to the Technical Reference (SIEPC71061737) for more information about GFCIs.

| R/L1 | U/T1 |
| S/L2 T/L3 | V/T2 W/T3 |

or

| R/L1 | U/T1 |
| S/L2 T/L3 | V/T2 W/T3 |

Spacing per local electrical codes

10 Remove the Tabs and Install the Wiring Cover

11 Install the Front Cover and Keypad

12 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 |

13 Collect and Record Auto-Tuning Data from Motor Nameplate

3 PHASE INVERTER DUTY AC INDUCTION MOTOR NAMEPLATE EXAMPLE

MODEL XX	123AAAA123XX-X0	X FRAME 123AX
POLES X	ENC XXX CODE X	DES A TYPE ABC INS X0
VOLTS XXX	FL RPM XXXX	FL AMPS XX/XX
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	O.S.E. BRG. XXX ROTOR WK² X.X

HZ	HP	RPM	TORQUE (LB FT)	VOLTS (HIGH CONN)	AMPS (HIGH CONN)
1	-	0	XX.X	-	XX.X
60	XX	XXXX	XX.X	XXX	XX.X
120	XX	XXXX	XX.X	XXX	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[1])
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[2]		A	T1-09 (E2-03)
-	Motor Rated Slip[2][3]	0.000	Hz	T1-10 (E2-02)
-	Test Mode Selection[2]		-	T1-12
-	Motor No-Load Voltage		V	T1-13

[1]Auto-Tuning will automatically set the E1-xx and E2-xx parameters. You can manually adjust Ex-xx parameters after Auto-Tuning.
[2]These values are only necessary for Stationary Auto-Tuning (T1-01 = 1).
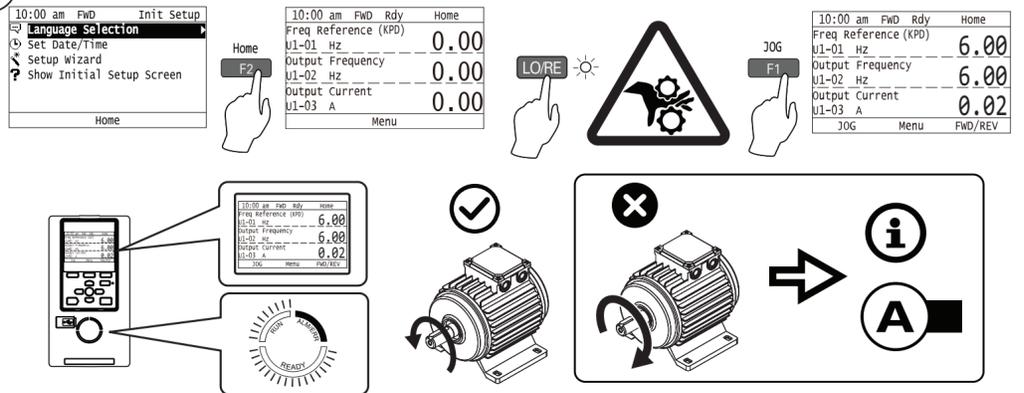[3]If you do not know this value, leave at the default value of 0.000.
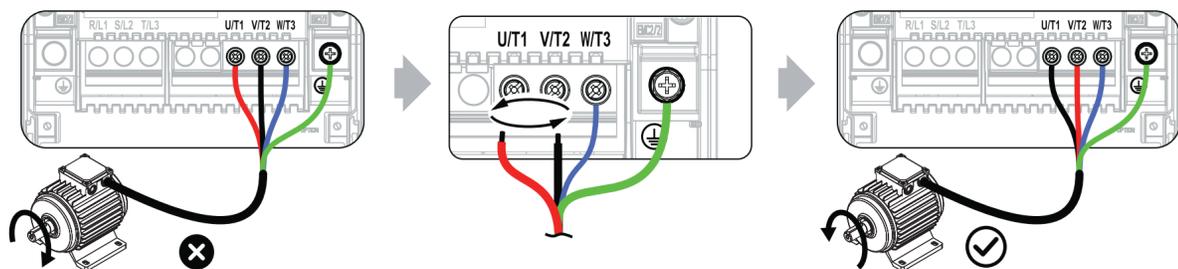
14 Energize the Drive and Confirm It Is Ready
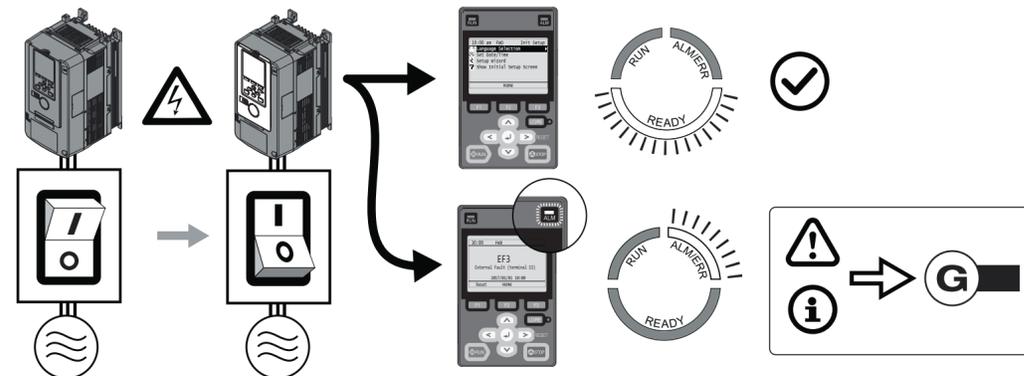
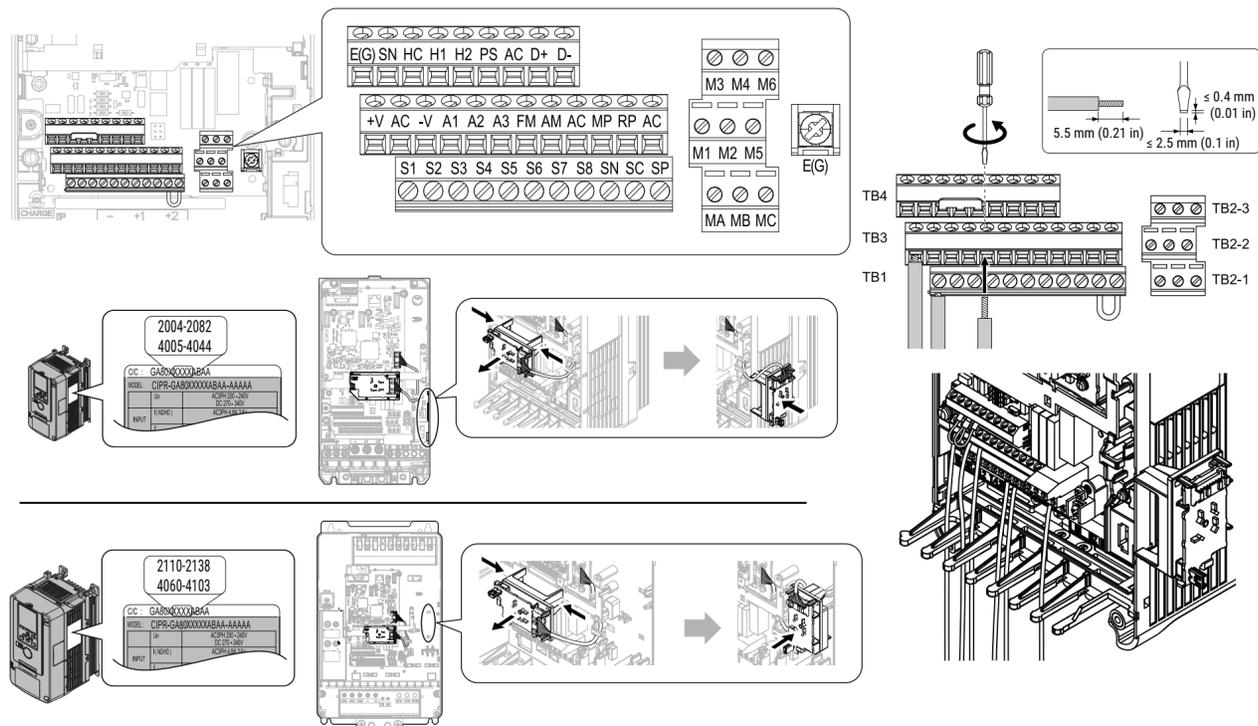## 15 Use Auto-Tuning Data from Motor Nameplate to Set Parameters and Auto-Tune the Drive
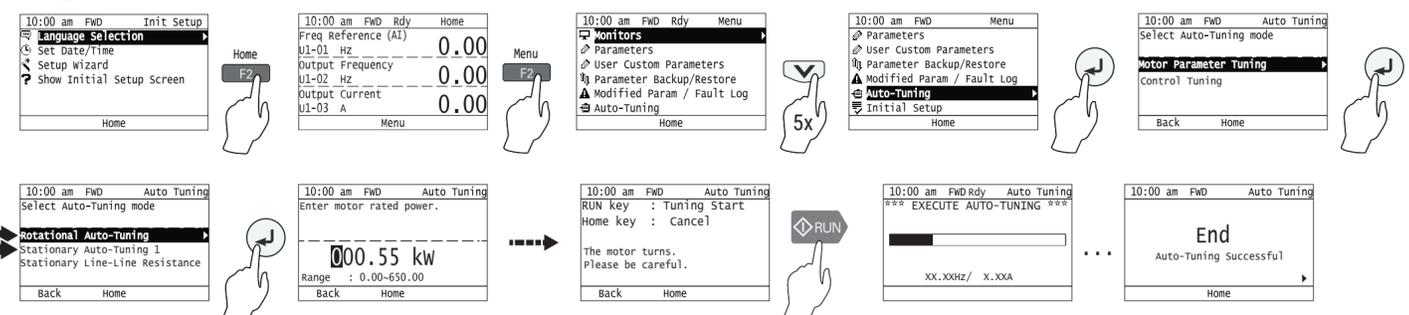
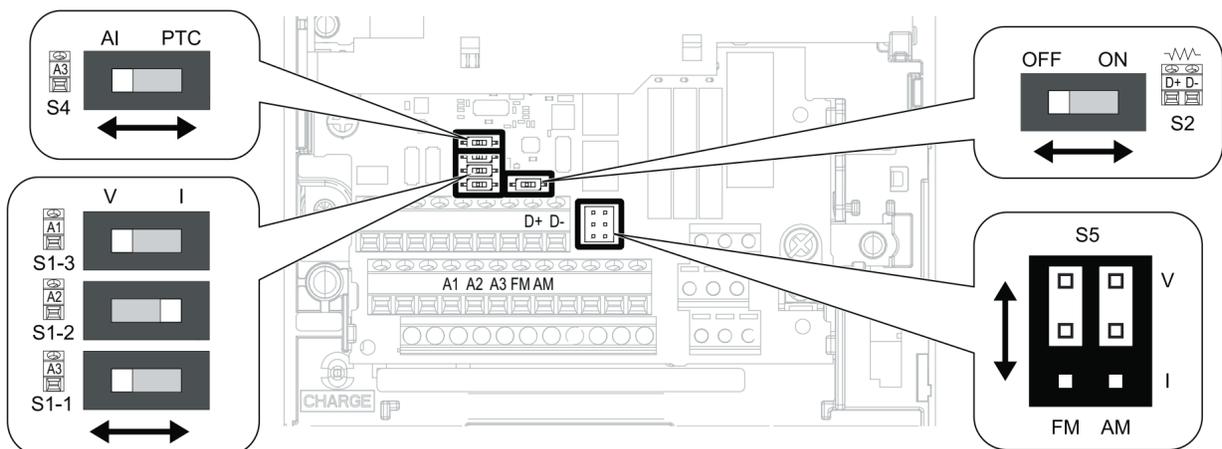## 16 Set the Drive for LOCAL Control and Check the Motor Rotation Direction

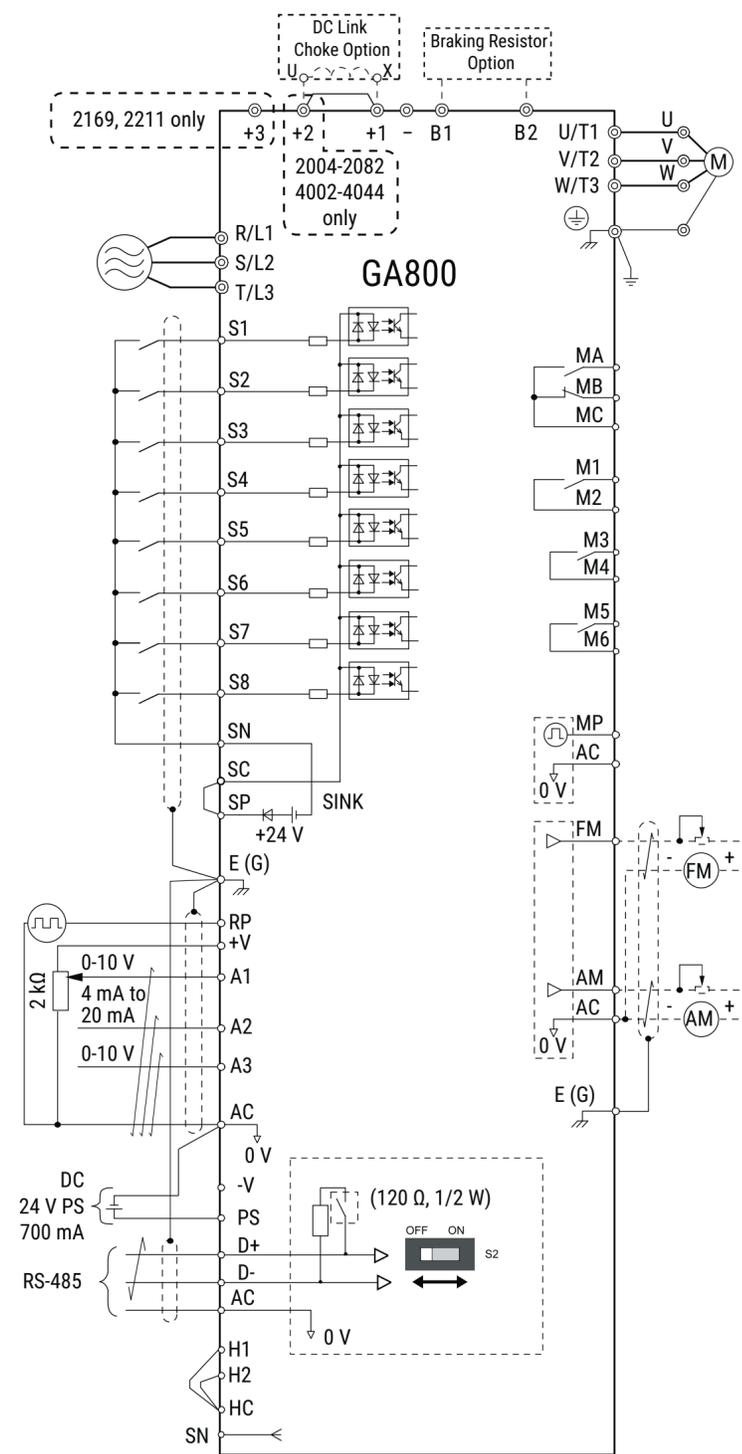## A — If the Motor Does Not Rotate in the Correct Direction

B — Control Circuit Configuration and Accessiblity

≤ 0.4 mm (0.01 in)
5.5 mm (0.21 in)
≤ 2.5 mm (0.1 in)

C — Switches and Jumpers on the Control Board

D — Connection Diagram and Terminal Functions

Terminal	Type	Signal Level	Default
S1	MFDI 1		Forward run/Stop
S2	MFDI 2		Reverse run/Stop
S3	MFDI 3		External fault
S4	MFDI 4	Photocoupler 24 V, 6 mA	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		-
SC	MFDI common	24 V, 150 mA maximum	
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		-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% 0 mA ~ 20 mA/100% (input impedance 250 Ω)	Master frequency reference
A2	MFAI 2		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% 0 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
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			
M3	MFDO		Zero speed
M4			
M5	MFDO		Speed agree 1
M6			
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-485 115.2 kbps maximum	-
D-	Communication -		-
AC	Common	0 V	-

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.	https://www.yaskawa.com/toepc71061737	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.	https://www.yaskawa.com/dwm	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.	https://www.yaskawa.com/toepyaiga8001	PDF download

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F   Parameter Groups

A: Initialization		d: Reference Settings		H: Terminal Functions		n: Special Adjustment		q: DriveWorksEZ Parameters	
A1	Initialization	d1	Frequency Reference	H1	Digital Inputs	n1	Hunting Prevention	r: DriveWorksEZ Connections	
A2	User Parameters	d2	Reference Limits	H2	Digital Outputs	n2	Auto Freq. Regulator (AFR)	T: Motor Tuning	
b: Application		d3	Jump Frequency	H3	Analog Inputs	n3	High Slip/Overexcite Braking	U: Monitors	
b1	Operation Mode Selection	d4	Freq. Ref. Up/Down & Hold	H4	Analog Outputs	n4	AOLV Tuning	U1	Operation Status Monitors
b2	DC Injection Braking and Short Circuit Braking	d5	Torque Control	H5	Modbus Communication	n5	Feed Forward Control	U2	Fault Trace
b3	Speed Search	d6	Field Weakening/Forcing	H6	Pulse Train Input/Output	n6	Online Tuning	U3	Fault History
b4	Timer Function	d7	Offset Frequency	H7	Virtual Inputs/Outputs	n7	EZ Drive	U4	Maintenance Monitors
b5	PID Control	E: Motor		L: Protection Functions		n8	PM Motor Control Tuning	U5	PID Monitors
b6	Dwell Function	E1	V/f Pattern for Motor 1	L1	Motor Protection	o: Keypad-Related Settings		U6	Operation Status Monitors
b7	Droop Control	E2	Motor 1 Parameters	L2	Power Loss Ride Through	o1	Keypad Display	U8	DriveWorksEZ Monitors
b8	Energy Saving	E3	V/f Pattern for Motor 2	L3	Stall Prevention	o2	Keypad Operation		
b9	Zero Servo	E4	Motor 2 Parameters	L4	Speed Detection	o3	Copy Keypad Function		
C: Tuning		E5	PM Motor Settings	L5	Fault Restart	o4	Maintenance Monitors		
C1	Accel & Decel Time	E9	Motor Setting	L6	Torque Detection	o5	Log Function		
C2	S-Curve Characteristics	F: Options		L7	Torque Limit				
C3	Slip Compensation	F1	PG Option Setup (Encoder)	L8	Drive Protection				
C4	Torque Compensation	F2	Analog Input Option	L9	Drive Protection 2				
C5	Auto Speed Regulator (CSR)	F3	Digital Input Option						
C6	Duty & Carrier Frequency	F4	Analog Output Option						
		F5	Digital Output Option						
		F6	Communication Option						
		F7	Ethernet Options						

H   Additional Resources

Mobile App

DriveWizard® Mobile
Commissioning Smartphone App
https://www.yaskawa.com/dwm

Product Manuals

•PDFs
•Online HTML5-Searchable
•Manuals App
https://www.yaskawa.com/ga800manuals

I   Customer Feedback

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