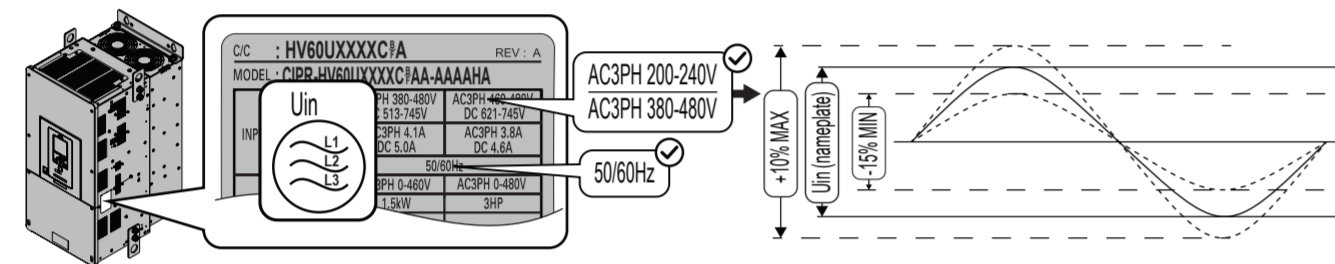
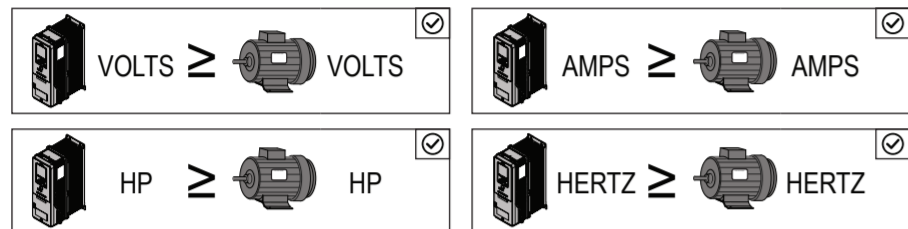


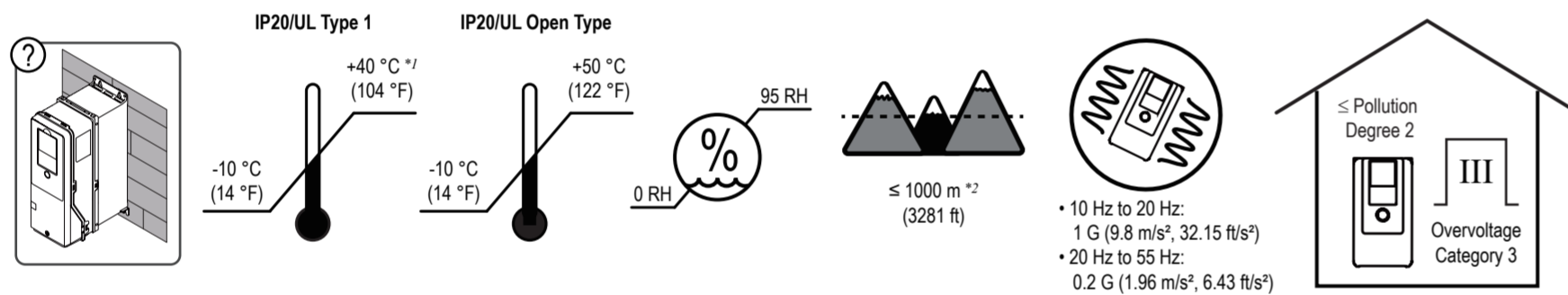
Read and follow the safety and installation procedures in the Installation & Primary Operation (TOEPC71061732) manual packaged with the drive.



1 Confirm the Drive and Motor Specifications

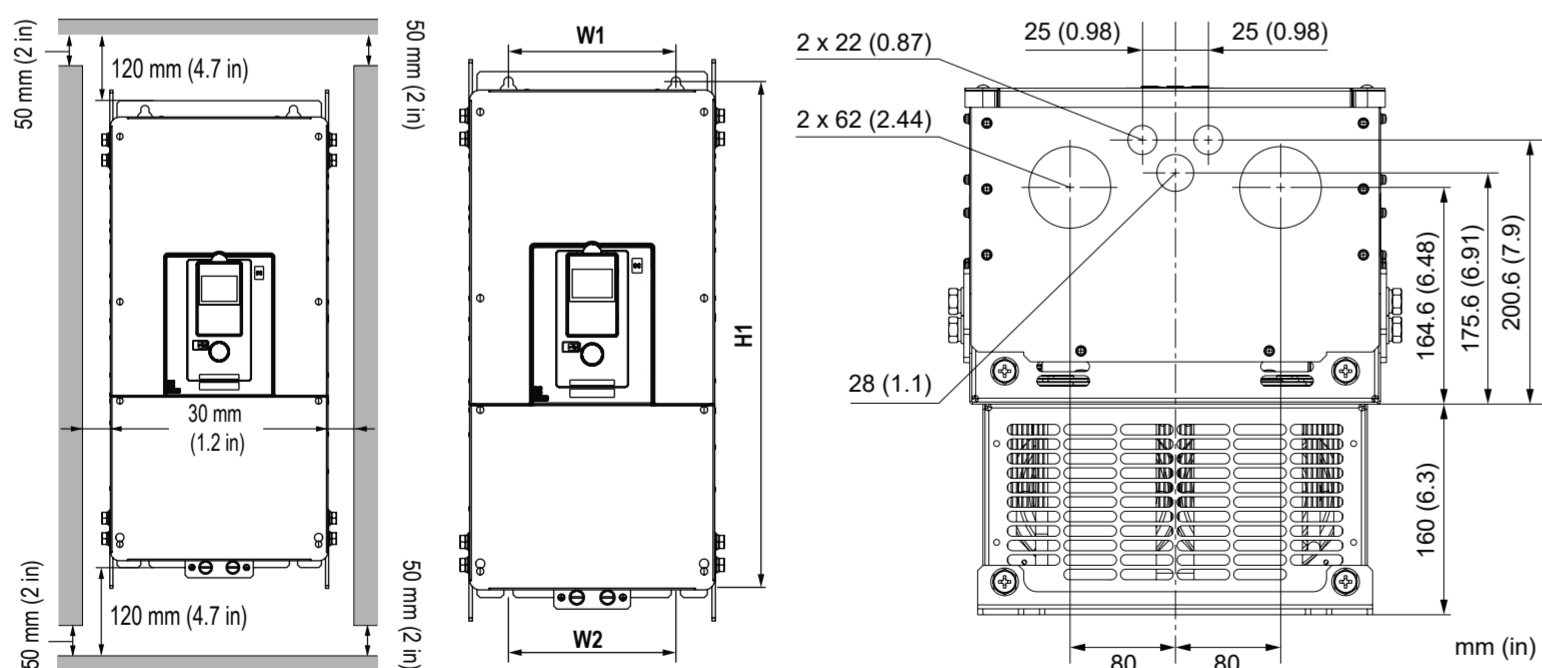


2 Confirm the Correct Drive Installation Environment



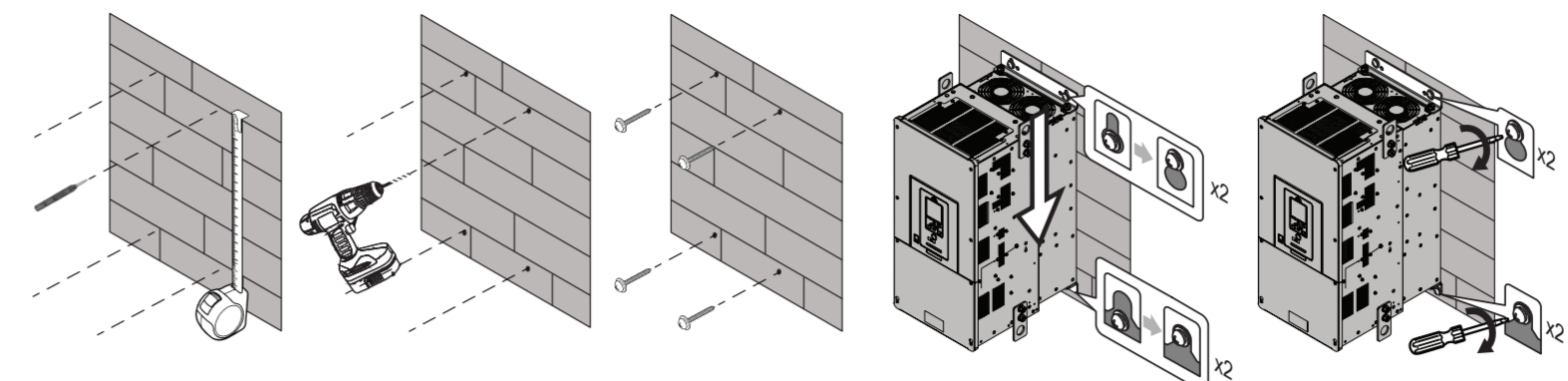
*1 You can use the drive at a maximum of 60 °C (140 °F) when you derate the output current.
 *2 Derate the output current by 1% for each 100 m (328 ft) to install the drive in altitudes between 1000 m to 4000 m (3281 ft to 13123 ft). Refer to the Technical Reference (SIEPC71061732) for derating information.

3 Select the Correct Mounting Location and Position



	Drive Model [HV60UXXXX]		
	2143, 2169	2211, 2273	4156, 4180, 4240
W1	218 (8.58)	218 (8.58)	370 (14.57)
W2	218 (8.58)	218 (8.58)	370 (14.57)
H1	733 (28.86)	659 (25.94)	757 (29.8)
d	M10 (3/8-16)	M10 (3/8-16)	M12 (1/2-13)

4 Mount the Drive Vertically



When you use non-metric hardware to install the drive, use Type B narrow washers or equivalent and make sure that the size of the screw head and washer are applicable for your drive before installation.

5 Select the Motor and Power Wires, Crimp Terminals, and Branch Circuit Protection

240 V Wires and Crimp Terminals

Drive Model [HV60UXXXX]	Terminal	Wire Range AWG, kcmil (Recommended)	Panduit Crimp Terminal Part Number ^{*1, *2}	Drive Model [HV60UXXXX]	Terminal	Wire Range AWG, kcmil (Recommended)	Panduit Crimp Terminal Part Number ^{*1, *2}
2143	R/L1, S/L2, T/L3	6 - 4/0 (2/0)	LCA2/0-56-X	2211	R/L1, S/L2, T/L3	3 - 4/0 × 2P (1/0 × 2)	LCA1/0-12-X
	U/T1, V/T2, W/T3	6 - 4/0 (3/0)	LCA3/0-56-X		U/T1, V/T2, W/T3	2 - 250 × 2P (1/0 × 2)	LCA1/0-12-X
	-, +1	6 - 4/0 (3/0)	LCA3/0-56-X		-, +1	4 - 350 (3 or 2)	LCA4-12-L/LCA2-12-Q
	⊕	6 - 4/0 (4)	LCA4-56-L		⊕		
2169	R/L1, S/L2, T/L3	6 - 4/0 (3/0)	LCA3/0-56-X	2273	R/L1, S/L2, T/L3	3 - 4/0 × 2P (2/0 × 2)	LCA2/0-12-X
	U/T1, V/T2, W/T3	6 - 4/0 (4/0)	LCA4/0-56-X		U/T1, V/T2, W/T3	2 - 250 × 2P (3/0 × 2)	LCA3/0-12-X
	-, +1	6 - 4/0 (1/0 × 2)	LCA1/0-56-X		-, +1	4 - 350 (2)	LCA2-12-Q
	⊕	6 - 4/0 (4)	LCA4-56-L		⊕		

480 V Wires and Crimp Terminals

Drive Model [HV60UXXXX]	Terminal	Wire Range AWG, kcmil (Recommended)	Panduit Crimp Terminal Part Number ^{*1, *2}	Drive Model [HV60UXXXX]	Terminal	Wire Range AWG, kcmil (Recommended)	Panduit Crimp Terminal Part Number ^{*1, *2}
4156	R/L1, S/L2, T/L3	6 - 4/0 (2/0)	LCA2/0-56-X	4240	R/L1, S/L2, T/L3	3 - 4/0 × 2P (1/0 × 2)	LCA1/0-12-X
	U/T1, V/T2, W/T3	6 - 4/0 (3/0)	LCA3/0-56-X		U/T1, V/T2, W/T3	2 - 250 × 2P (2/0 × 2)	LCA2/0-12-X
	-, +1	6 - 4/0 (4/0)	LCA4/0-56-X		-, +1	4 - 350 (2)	LCA2-12-Q
	⊕	6 - 4/0 (4)	LCA4-56-L		⊕		
4180	R/L1, S/L2, T/L3	3 - 4/0 × 2P (1/0 × 2)	LCA1/0-12-X	4302	R/L1, S/L2, T/L3	2/0 - 300 × 2P (3/0 × 2)	LCA3/0-12-X
	U/T1, V/T2, W/T3	2 - 250 × 2P (1/0 × 2)	LCA1/0-12-X		U/T1, V/T2, W/T3	4/0 - 400 × 2P (4/0 × 2)	LCA4/0-12-X
	-, +1	4 - 350 (3 or 2)	LCA4-12-L/LCA2-12-Q		-, +1	1 - 350 (1/0)	LCA1/0-12-X
	⊕				⊕		

*1 For use with Panduit Corp. heat-shrinkable tubing HSTT series or an equivalent UL-recognized-heat shrinkable tubing rated 600 V minimum.
 *2 Refer to the Installation & Primary Operation (TOEPC71061732) for possible Panduit Type P and Type S crimp terminal alternatives.

Required Short Circuit Protection

Install one of the types of short circuit protection devices listed here to comply with UL 508C. Semiconductor protective type fuses are recommended, but the tables also show alternative short circuit protection devices.

Required Short Circuit Protection for HV600 AC Drives (Three-Phase 240 V)

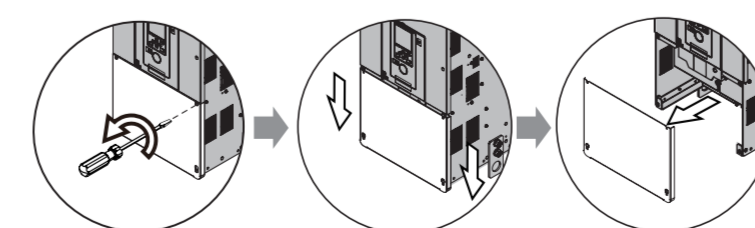
Protected Enclosure	Eaton/Bussman Semiconductor Fuse Part Number	2143	2169	2211	2273
Not Required	Class CC, J, or T Fuse ² Maximum Amps	FWH-250A	FWH-275A	FWH-600A	FWH-800A
Ventilated Protected Enclosure Required	MCCB Maximum Amps	250	250	350	450
	Schneider MCP Part Number	350	400	500	600
	Enclosure Volume Minimum (in ³)	JLL36250M75	JLL36250M75	LLL36400M37X	LLL36400M37X

Required Short Circuit Protection for HV600 AC Drives (Three-Phase 480 V)

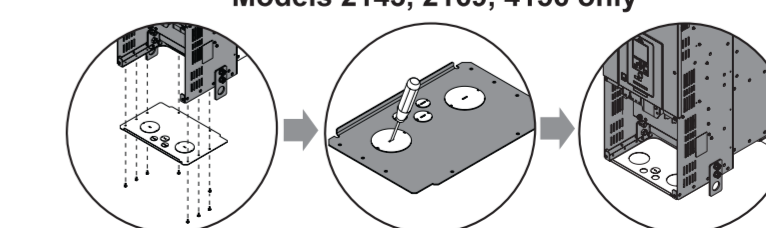
Protected Enclosure	Eaton/Bussman Semiconductor Fuse Part Number	4156	4180	4240	4302
Not Required	Class CC, J, or T Fuse ² Maximum Amps	FWH-325A	FWH-500A	FWH-600A	FWH-700A
Ventilated Protected Enclosure Required	MCCB Maximum Amps	250	300	400	500
	Schneider MCP Part Number	350	450	600	700
	Enclosure Volume Minimum (in ³)	JLL36250M75	JLL36250M75	LLL36400M37X	LLL36400M37X
	External Heatsink	21582	52800 ^{*2}	52800 ^{*2}	52800 ^{*2}
	Internal Heatsink	14657	14657	14657	52800

*1 Class T fuses are fast-acting (non-time-delay) only. You can substitute a Class J time-delay fuse for a Class J non-time-delay fuse.
 *2 External heatsink installations on models 4180, 4240, and 4302 require a heatsink shroud and filter.

6 Remove the Terminal Cover



7 Remove the Conduit Bracket and Knock-Outs, Reinstall Bracket

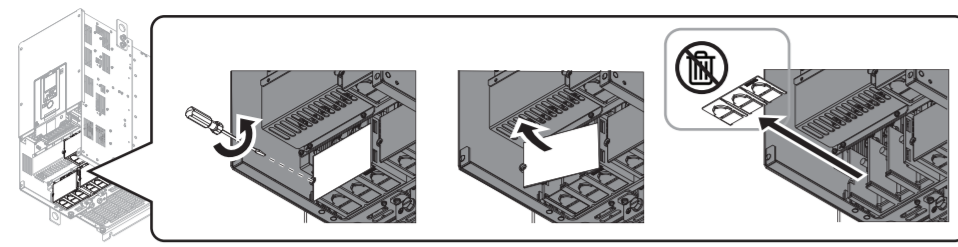


Models 2143, 2169, 4156 only

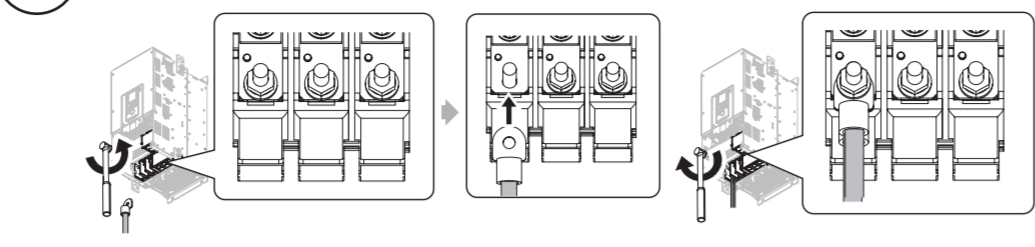
Flip Over for Steps

8 to 14

8 Remove the Terminal Block Cover and Wiring Cover **9 Remove Terminal Block Nut to Attach Crimp Terminals**



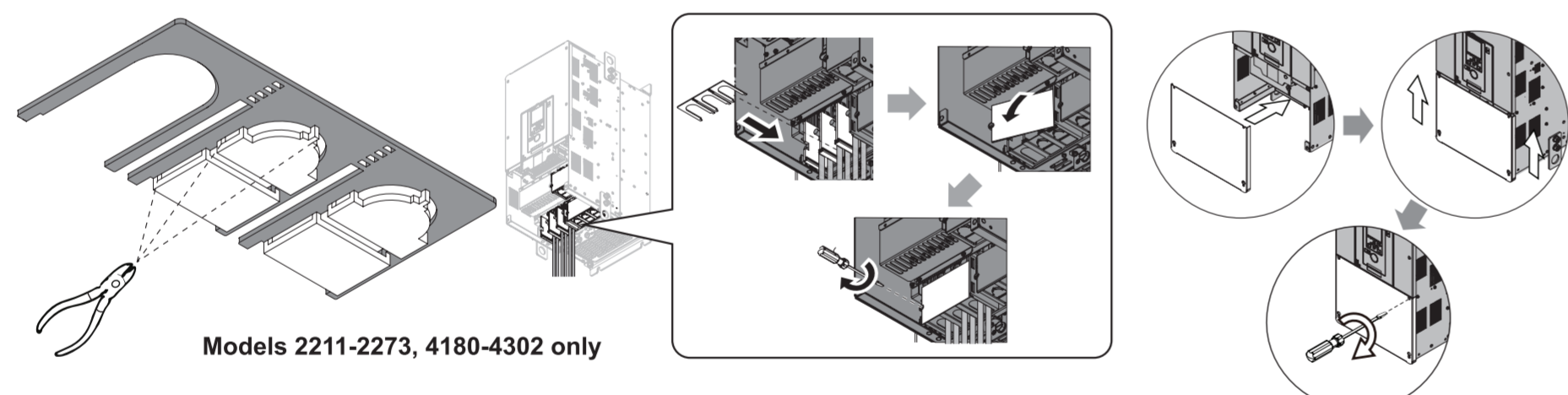
Models 2169-2273, 4180-4302 only



10 Install the Motor Wiring and Power Wiring

Refer to the Technical Reference (SIEPC71061732) for information about GFCIs.

11 Remove the Tabs and Install the Wiring Cover, Terminal Block Cover, and Terminal Cover



Models 2211-2273, 4180-4302 only

12 Energize the Drive and Confirm It Is Ready

13 Set the Motor Rated Current (FLA) from the Motor Nameplate in E2-01

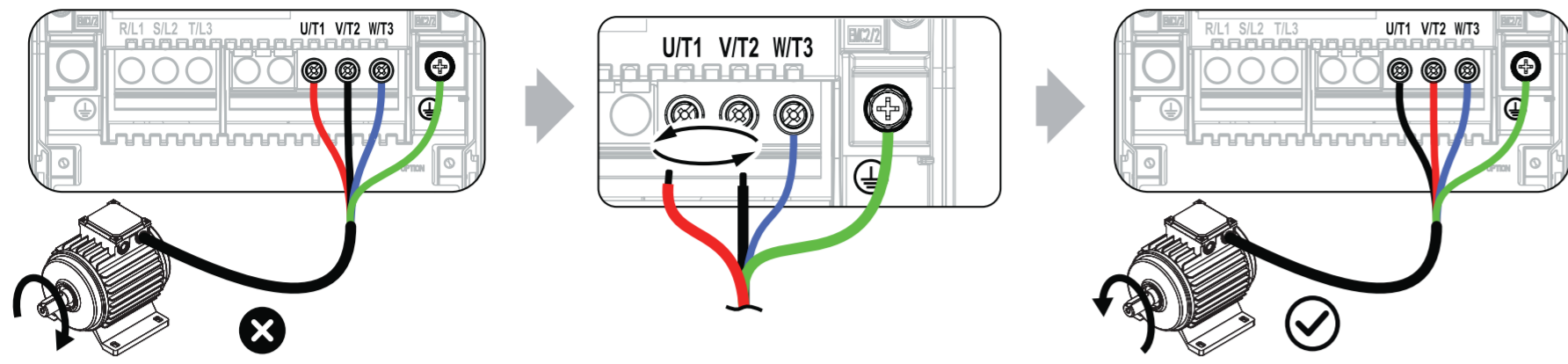
3 PHASE INVERTER DUTY AC INDUCTION MOTOR NAMEPLATE EXAMPLE										
MODEL	XX	123AAAA123XX-X0			X	FRAME 123AX				
POLES	X	ENC XXX	CODE X		DES A	TYPE ABC INS X0				
VOLTS	XXX	FL	RPM	XXXX						
SF 1.0	DUTY CONT	MAX	AMB °C	XX						
					FL	AMPS	XX/XX			
					TEMP	SENSORS	T-STATS			
SERIAL		N.L. AMPS		XX.X/X.X						
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 XXXXXXXX										

14 Set the Drive for HAND Operation and Check the Motor Rotation Direction

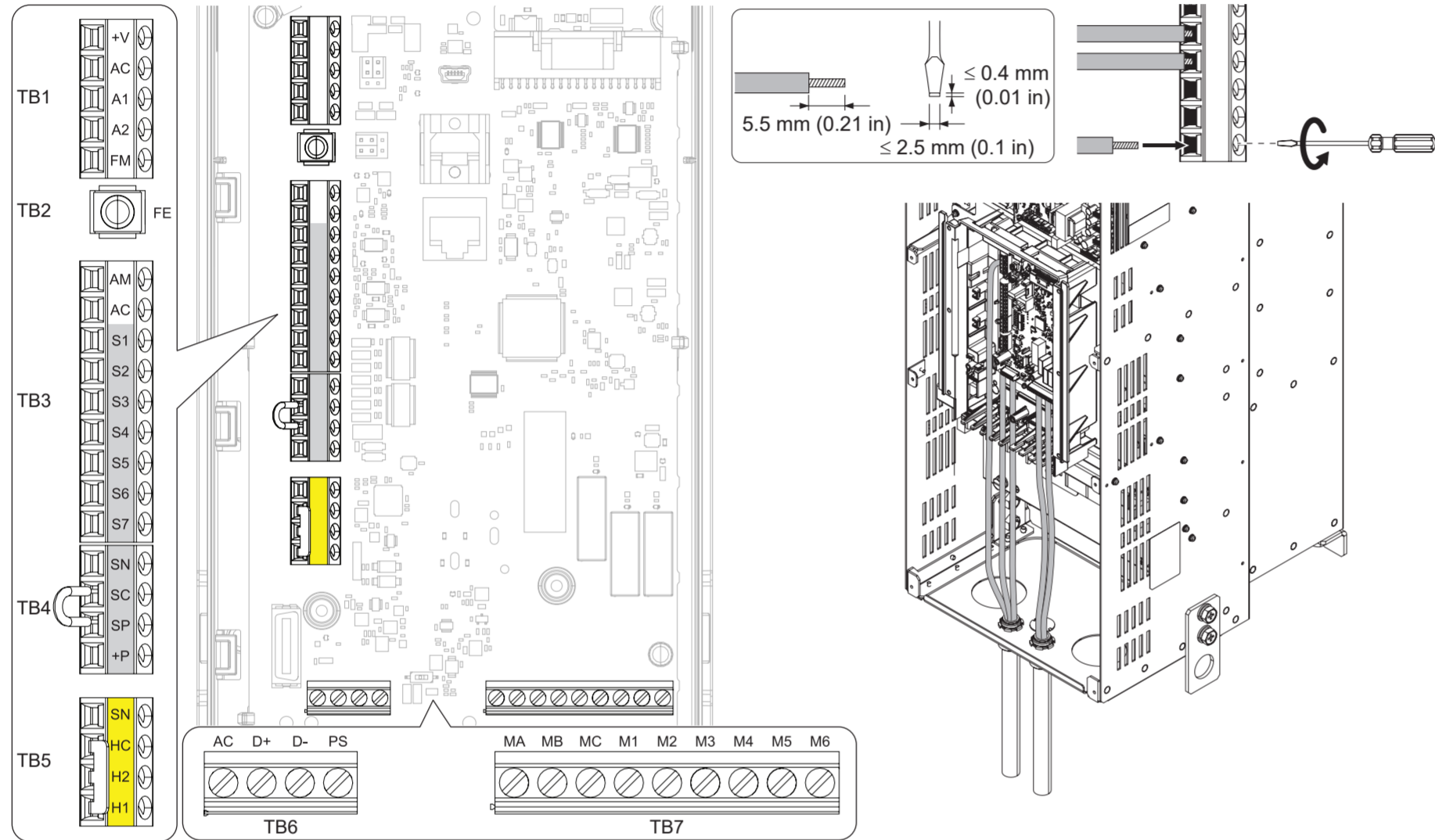
Additional Information for Installation and Primary Operation

A How to Set Up the Drive for Monitoring via BACnet MS/TP

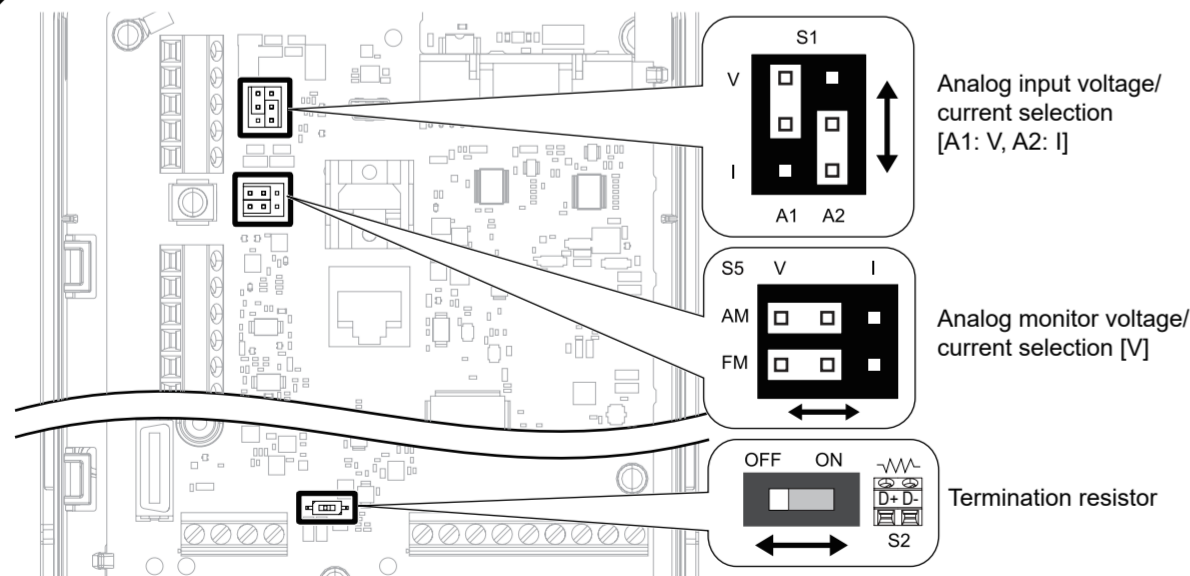
B If the Motor Does Not Rotate in the Correct Direction



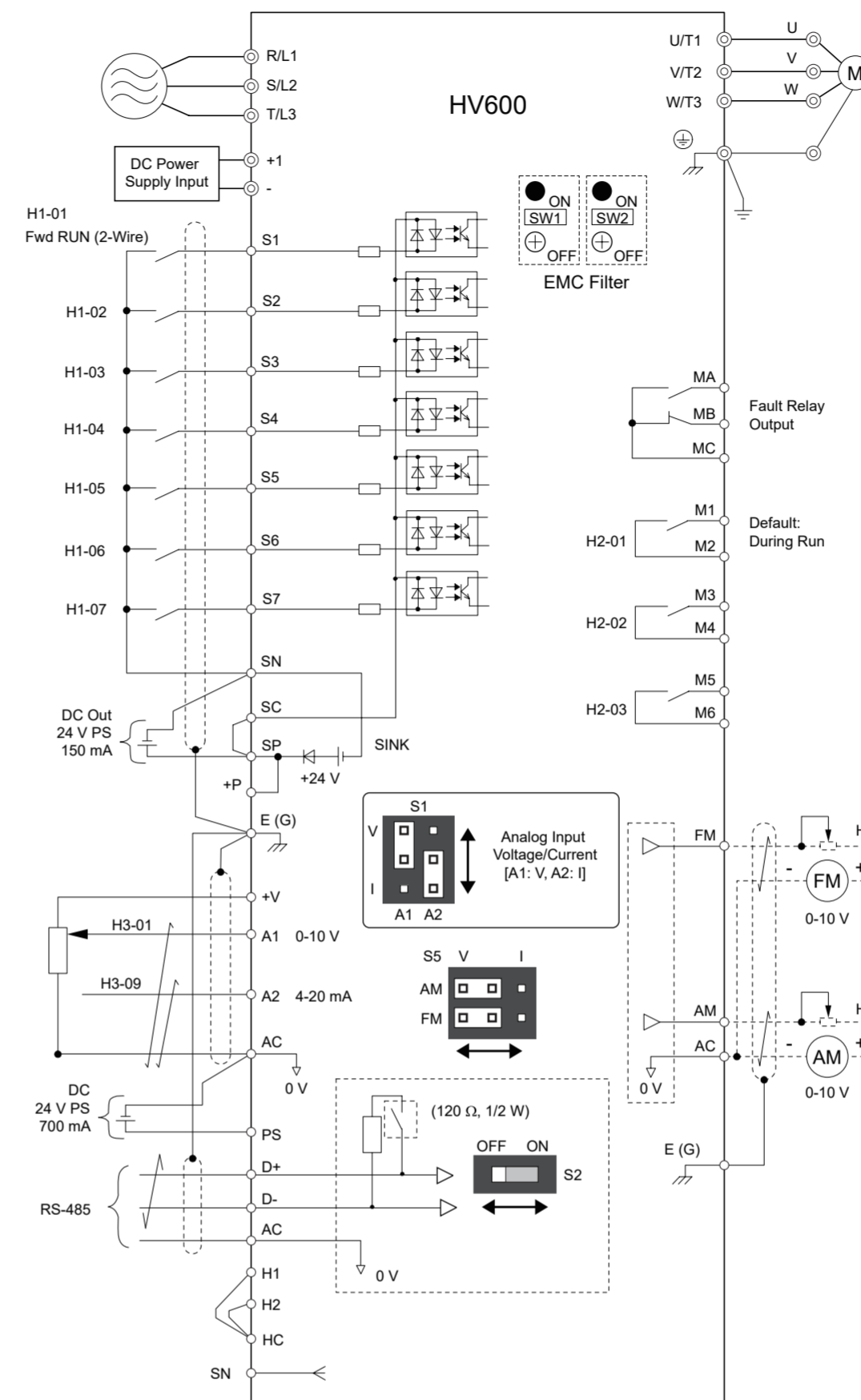
C Control Circuit Configuration



D Switches and Jumpers on the Control Board

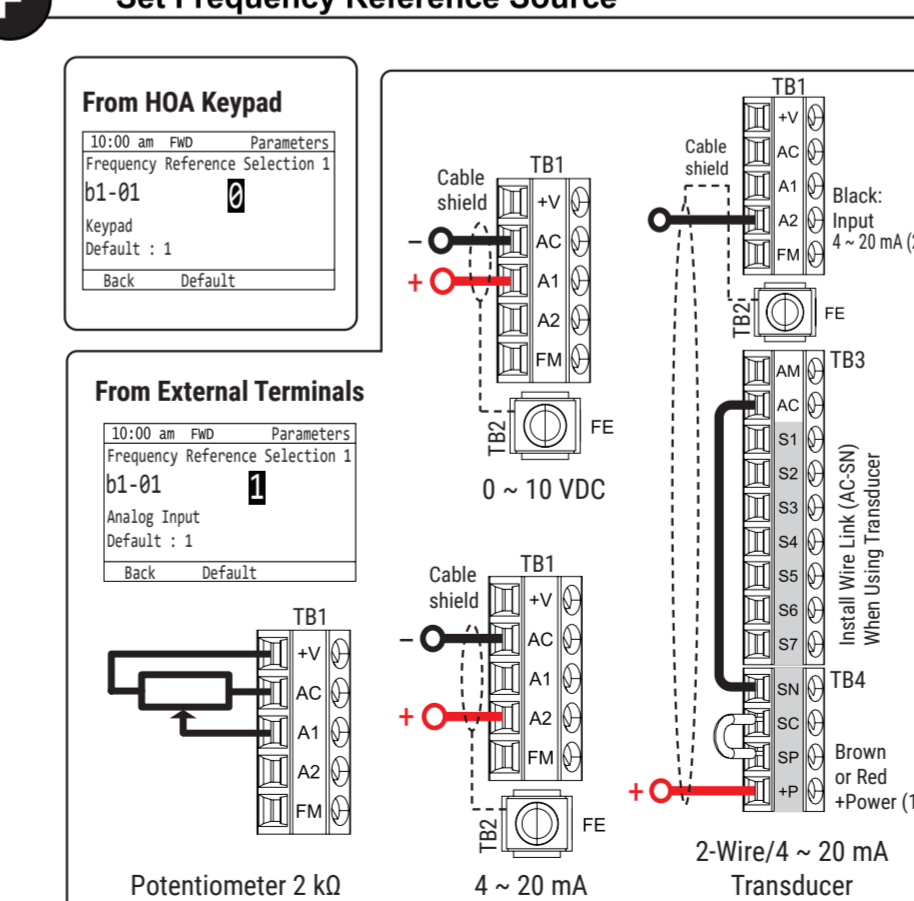


E Connection Diagram and Terminal Functions

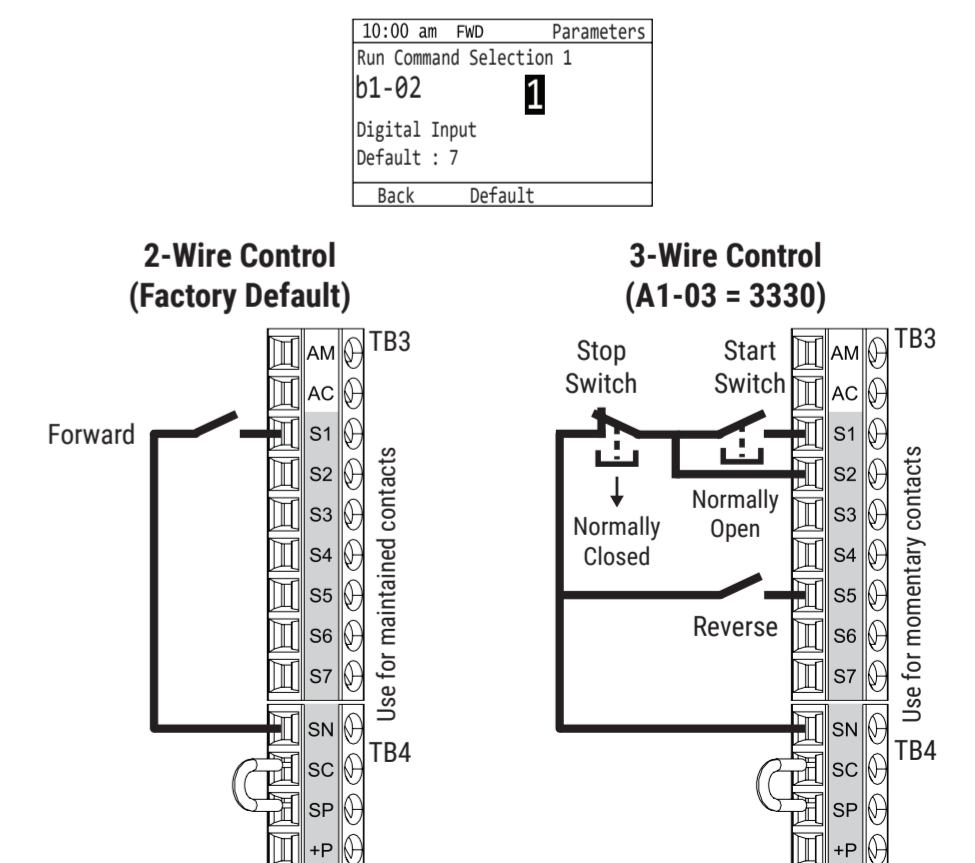


Terminal	Type	Signal Level	Default	Parameter Default
S1	MFDI 1	Photocoupler 24 V, 6 mA Internal impedance: 4.7 kΩ	Forward RUN (2-Wire)	H1-01 40
S2	MFDI 2		Not Used	H1-02 F
S3	MFDI 3		External Fault (NO-Always-Coast)	H1-03 24
S4	MFDI 4		Fault Reset	H1-04 14
S5	MFDI 5		Multi-Step Speed Reference 1	H1-05 3
S6	MFDI 6		Multi-Step Speed Reference 2	H1-06 4
S7	MFDI 7		Jog Reference Selection	H1-07 6
SN	MFDI power 0 V		-	-
SC	MFDI common	24 V, 150 mA maximum	-	-
SP	MFDI power + 24 VDC		-	-
H1	Safe disable input 1	Photocoupler 24 V, 6 mA Internal impedance: 4.7 kΩ	-	-
H2	Safe disable input 2		-	-
HC	Safe disable common		-	-
+V	Frequency setting power supply	10.5 V (20 mA maximum)	-	-
A1	MFAI 1	0 V ~ 10 V/100% (input impedance 20 kΩ) 4 mA ~ 20 mA/100%	Frequency Reference	H3-01 0
A2	MFAI 2	0 mA ~ 20 mA/100% (input impedance 250 Ω)	Frequency Reference	H3-09 2
AC	Common	0 V	-	-
E (G)	Connect shielded cable		-	-
MA	Fault relay output	30 VDC, 10 mA ~ 2 A 250 VAC, 10 mA ~ 2 A Minimum load: 5 V, 10 mA	Fault (N.O)	Fault
MB	Common		Fault (N.C)	Fault
MC	Common		-	-
M1	MFDO		During Run	H2-01 0
M2	MFDO	30 VDC, 10 mA ~ 2 A 250 VAC, 10 mA ~ 2 A Minimum load: 5 V, 10 mA	Zero Speed	H2-02 1
M3	MFDO		Speed Agree 1	H2-03 2
M4	MFDO			
M5	MFDO			
M6	MFDO			
FM	MFAO 1	0 V ~ 10 V/0% ~ 100% 4 mA ~ 20 mA	Output Frequency	H4-01 102
AM	MFAO 2		Output Current	H4-04 103
AC	Common	0 V	-	-
+P	External power supply	24 V (150 mA maximum)	-	-
PS	External 24 V PS input	21.6 VDC ~ 26.4 VDC, 700 mA	-	-
AC	External 24 V PS ground	0 V	-	-
D+	Communication +	APOGEE FLN, BACnet, MEMOBUS/Modbus, Metasys N2	-	-
D-	Communication -	RS-485 115.2 kbps maximum	-	-
AC	Common	0 V	-	-

F Set Frequency Reference Source



G Set Start/Stop Control Method from External Terminals



H If You Push the HAND Button but the Motor Does Not Spin

The diagram illustrates the troubleshooting process for a motor that does not spin after pressing the HAND button. It shows the following steps:

- Initial state: The keypad shows '10:00 am FWD Rdy Home' and 'HAND' is selected. The menu displays 'Freq Reference (KPD) 0.00', 'U1-01 Hz 0.00', and 'Output Frequency 0.00'.
- Pressing the HAND button leads to a warning icon and a 'No Motor' icon.
- Pressing the Home button (F2) leads to the 'Init Setup' screen with options: 'Language Selection', 'Set Date/Time', and 'Show Initial Setup Screen'.
- Pressing the Home button (F2) again leads to the 'Parameters' screen showing 'HAND Frequency Reference S5-05 000.00 Hz'.
- Pressing the Home button (F2) leads to the 'Parameters' screen showing 'HAND Frequency Reference S5-05 010.00 Hz'.
- Pressing the Home button (F2) leads to the 'Parameters' screen showing 'HAND Frequency Reference S5-05 10.00 Hz'.
- The final state shows the motor spinning at '10 Hz'.

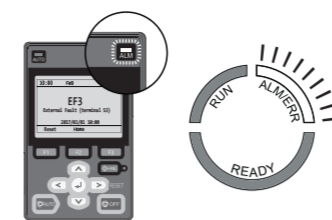
I Parameter Groups

A: Initialization	d: Reference Settings	H: Terminal Functions	n: Special Adjustment	T: Auto-Tuning
A1 Initialization	d1 Frequency Reference	H1 Digital Inputs	n1 Hunting Prevention	T0 Tuning Mode Selection
A2 User Parameters	d2 Reference Limits	H2 Digital Outputs	n3 High Slip/Overexcite Braking	T1 InductionMotor Auto-Tuning
b: Application	d3 Jump Frequency	H3 Analog Inputs	n7 EZ Drive	T2 PM Motor Auto-Tuning
b1 Operation Mode Selection	d4 Freq. Ref. Up/Down & Hold	H4 Analog Outputs	n8 PM Motor Control Tuning	T4 EZ Tuning
b2 DC Injection Braking and Short Circuit Braking	d6 Field Weakening	H5 Serial Communication	o: Keypad-Related Settings	Y: Application Features
b3 Speed Search	d7 Offset Frequency	H7 Virtual Inputs/Outputs	o1 Keypad Display	Y1 Application Basics
b4 Timer Function	E: Motor	L: Protection Functions	o2 Keypad Operation	Y2 PID Sleep and Protection
b5 PID Control	E1 V/f Pattern for Motor 1	L1 Motor Protection	o3 Copy Keypad Function	Y4 Application Advanced
b8 Energy Saving	E2 Motor 1 Parameters	L2 Power Loss Ride Through	o4 Maintenance Monitors	Y9 Network Multiplex Options
C: Tuning	E3 V/f Pattern for Motor 2	L3 Stall Prevention	o5 Log Function	YA Preset Setpoint
C1 Accel & Decel Time	E4 Motor 2 Parameters	L4 Speed Detection	q: DriveWorksEZ Parameters	YC Feedback Features
C2 S-Curve Characteristics	E5 PM Motor Settings	L5 Fault Restart	r: DriveWorksEZ Connections	YF PI Auxiliary Control
C3 Slip Compensation	E9 Motor Setting	L6 Torque Detection	S: Special Applications	
C4 Torque Compensation	F: Options	L7 Torque Limit	S1 Dynamic Noise Control	
C5 Auto Speed Regulator (CSR)	F6 Communication Option	L8 Drive Protection	S2 Sequence Run Timers	
C6 Carrier Frequency	F7 Ethernet Options	L9 Drive Protection 2	S3 PI2 Control	
			S5 HAND/OFF/AUTO Operation Protection	
			S6 Protection	

Frequently Used Parameters

Parameter Number Name	Default Description	Parameter Number Name	Default Description	Parameter Number Name	Default Description
A1-06 Application Preset	0 No Preset Selected	b3-24 Speed Search Method Selection	2 Current Detection 2	E1-01 Input AC Supply Voltage	- User-Defined
b1-01 Frequency Reference Selection 1	1 Analog Input	C1-01 Acceleration Time 1	30.0 s	E2-01 Motor Rated Current (FLA)	- User-Defined
b1-02 Run Command Selection 1	7 AUTO Command + Term Run	C1-02 Deceleration Time 1	30.0 s	L5-01 Number of Auto-Restart Attempts	0 No Restart Attempts
b1-03 Stopping Method Selection	1 Coast to Stop	d2-01 Frequency Reference Upper Limit	100.0%	L5-04 Interval Method Restart Time	10.0 s
b3-01 Speed Search at Start Selection	0 Disabled	d2-02 Frequency Reference Lower Limit	0.0%	S1-01 Dynamic Noise Control	1 Enabled

J 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.	https://www.yaskawa.com/toepc71061732	 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/toeypaihv6001	 PDF download

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Headquarters Address:

YASKAWA AMERICA, INC.
2121 Norman Drive South
Waukegan, IL 60085
USA
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