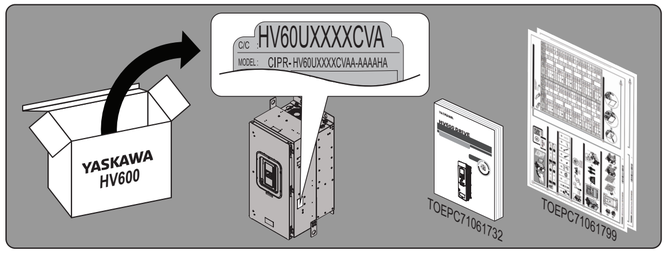
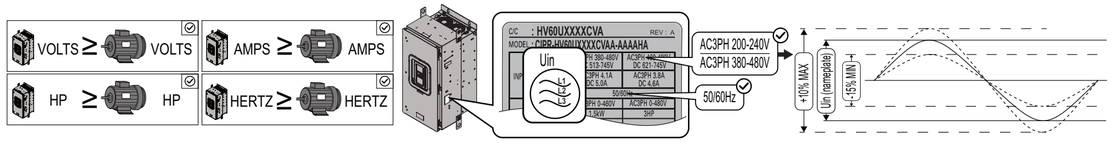
HV600 Quick Setup Procedure for IP55/UL Type 12 Models HV60U2143, 2169, and 4156

TOEPC71061799

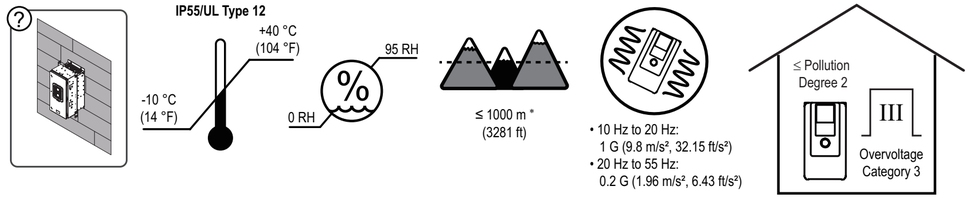


Read and follow the safety and installation procedures in the Installation & Primary Operation (TOEPC71061732) manual packaged with the drive.

1 Confirm the Drive and Motor Specifications

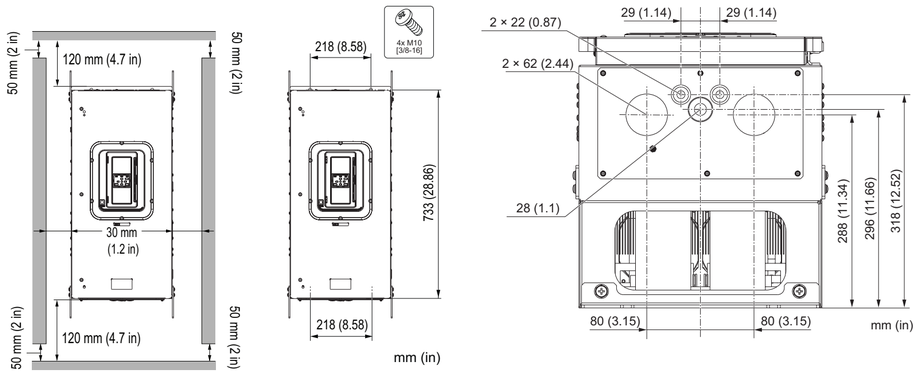


2 Confirm the Correct Drive Installation Environment

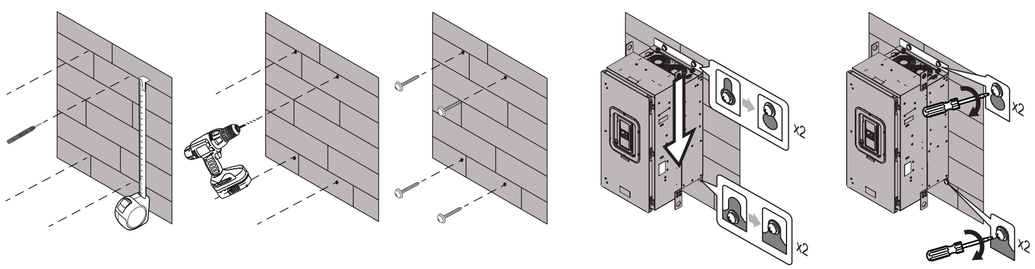


* Derate the output current by 1% for each 100 m (328 ft) to install the drive in altitudes between 1000 m to 4000 m (3281 ft to 13123 ft). Refer to the Technical Reference (SIEPC71061732) for derating information.

3 Select the Correct Mounting Location and Position



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 (*mm²*)*1	Recommended Wire Gauge AWG/kcmil	PANDUIT Crimp Terminal Part Number*2 *3
2143	R/L1, S/L2, T/L3	6 - 4/0 (***16 - 95***)	2/0	LCA2/0-56-X
	U/T1, V/T2, W/T3	6 - 4/0 (***16 - 95***)	3/0	LCA3/0-56-X
	-, +1	6 - 4/0 (***16 - 95***)	3/0	LCA3/0-56-X
	⏚	6 - 4/0 (***16 - 95***)	4	LCA4-56-L

Drive Model [HV60UXXXX]	Terminal	Wire Range AWG/kcmil (*mm²*)*1	Recommended Wire Gauge AWG/kcmil	PANDUIT Crimp Terminal Part Number*2 *3
2169	R/L1, S/L2, T/L3	6 - 4/0 (***16 - 95***)	3/0	LCA3/0-56-X
	U/T1, V/T2, W/T3	6 - 4/0 (***16 - 95***)	4/0	LCA4/0-56-X
	-, +1	6 - 4/0 (***16 - 95***)	1/0 × 2	LCA1/0-56-X
	⏚	6 - 4/0 (***16 - 95***)	4	LCA4-56-L

480 V Wires and Crimp Terminals

Drive Model [HV60UXXXX]	Terminal	Wire Range AWG/kcmil (*mm²*)*1	Recommended Wire Gauge AWG/kcmil	PANDUIT Crimp Terminal Part Number*2 *3
4156	R/L1, S/L2, T/L3	6 - 4/0 (***16 - 95***)	2/0	LCA2/0-56-X
	U/T1, V/T2, W/T3	6 - 4/0 (***16 - 95***)	3/0	LCA3/0-56-X
	-, +1	6 - 4/0 (***16 - 95***)	4/0	LCA4/0-56-X
	⏚	6 - 4/0 (***16 - 95***)	4	LCA4-56-L

*1 The metric wire gauge values are provided as reference information from equivalent AWG sizes and not exactly the same sizes as the AWG/kcmil value. Obey local safety regulations for wire sizes and make sure that the ferrule or crimp terminals are correct for your size.
*2 For use with PANDUIT Corp. heat-shrinkable tubing HSTT series or an equivalent UL-recognized-heat shrinkable tubing rated 600 V minimum.
*3 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 61800-5-1.

240 V Required Short Circuit Protection

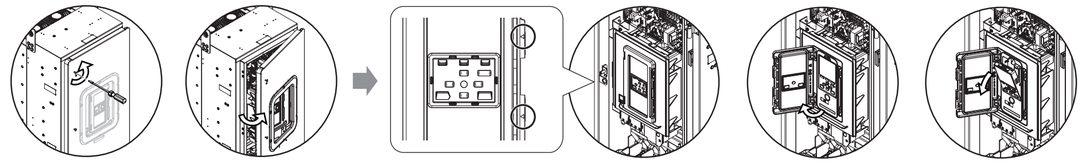
	Drive Model [HV60UXXXX]	
	2143	2169
Class J or T Fuse*1*2 Maximum Amps	250	250

480 V Required Short Circuit Protection

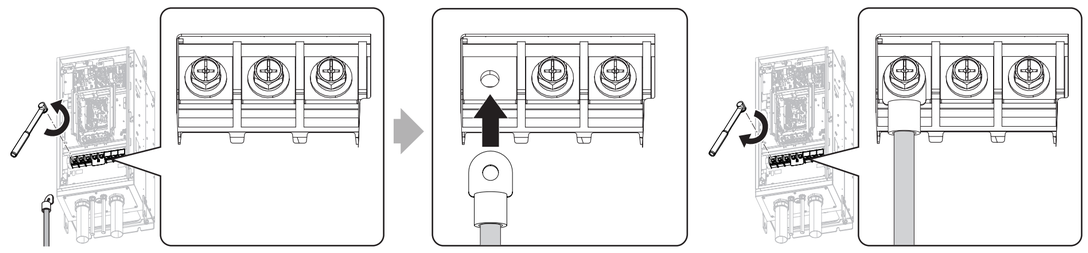
	Drive Model [HV60UXXXX]
	4156
Class J or T Fuse*1*2 Maximum Amps	250

*1 Class T fuses are fast-acting (non-time-delay) only. Class J can be either time-delay or non-time-delay.
*2 Protection device and drive permitted in same or separate enclosure.

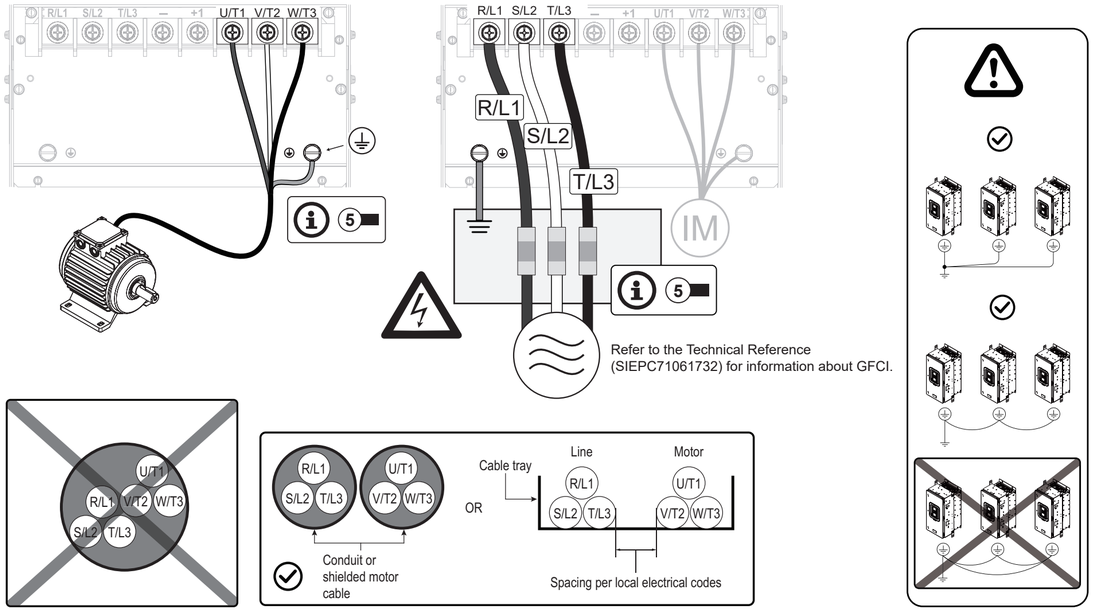
6 Open the Front Door and Remove the Keypad



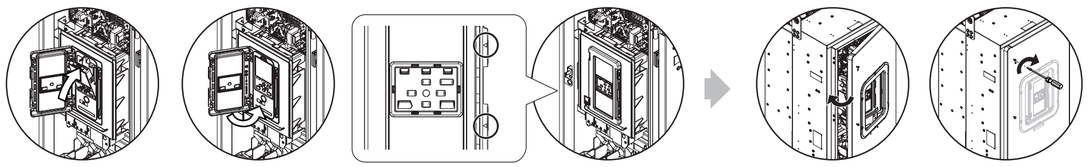
7 Remove Terminal Block Bolt to Attach Crimp Terminals



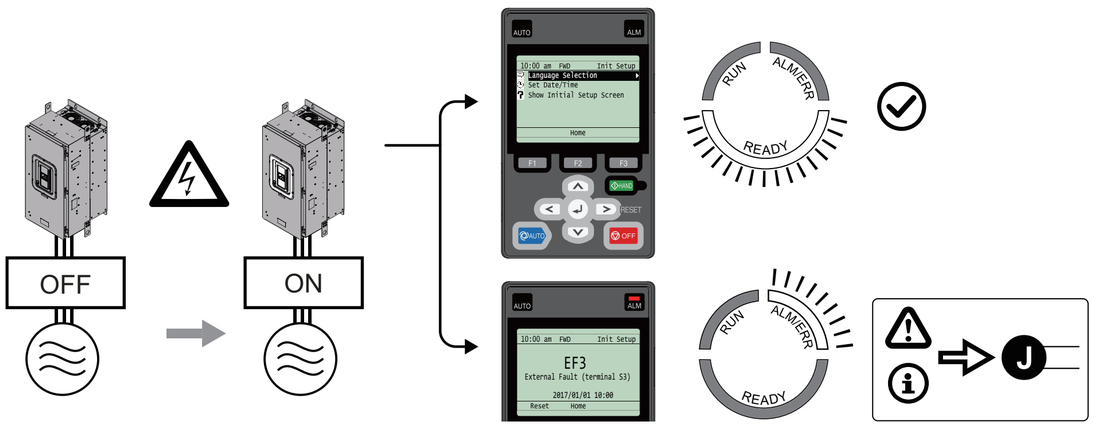
8 Install the Motor Wiring and Power Wiring



9 Install the Keypad and the Front Cover

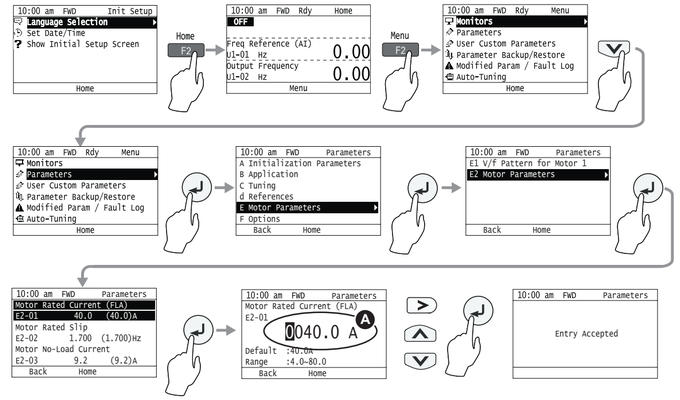


10 Energize the Drive and Confirm It Is Ready

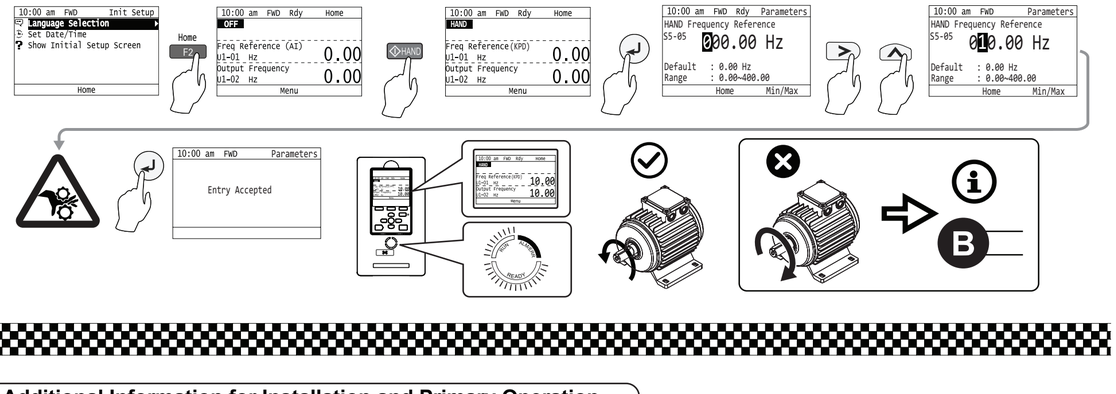


11 Set the Motor Rated Current (FLA) from the Motor Nameplate in E2-01

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		FL AMPS XX/XX (A)	
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					

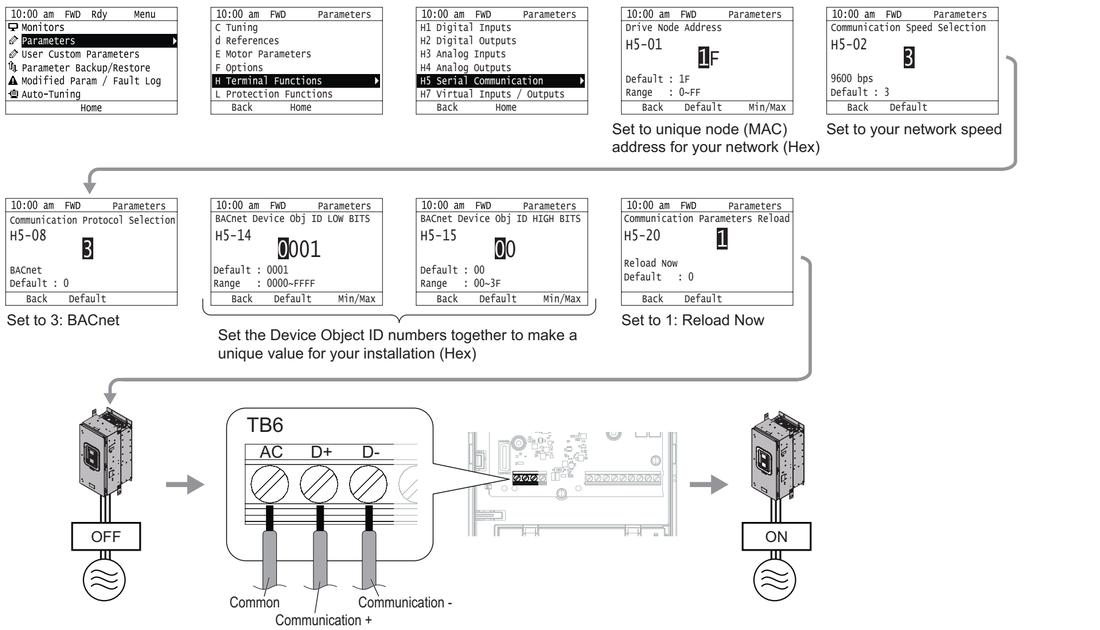


12 Set the Drive for HAND Operation and Check the Motor Rotation Direction

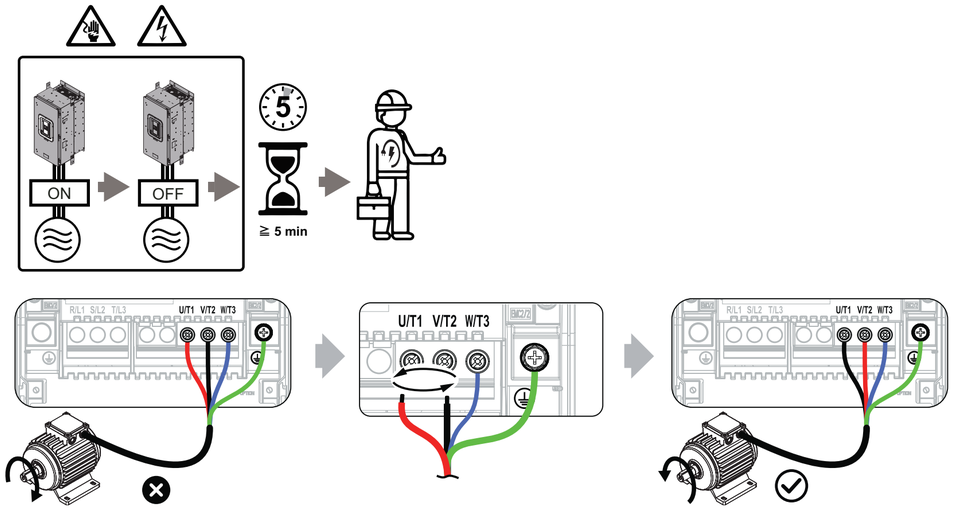


Additional Information for Installation and Primary Operation

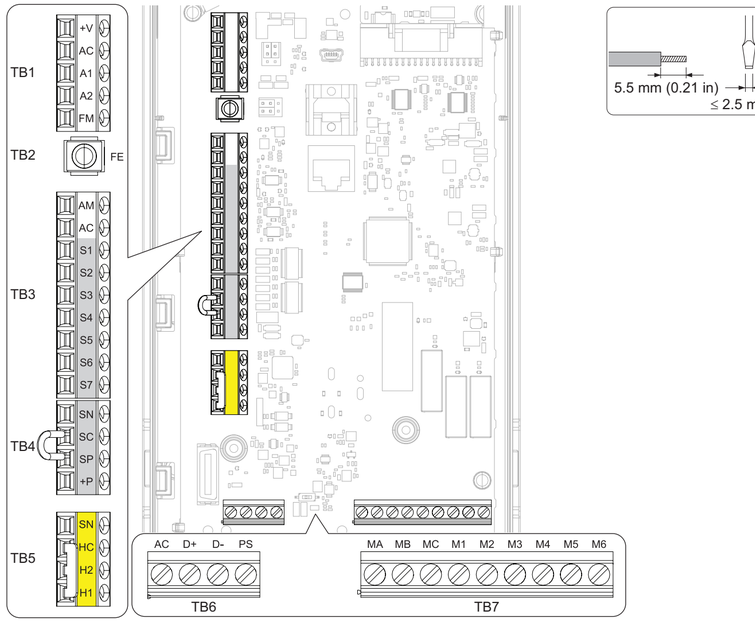
A How to Set Up the Drive for Monitoring via BACnet MS/TP

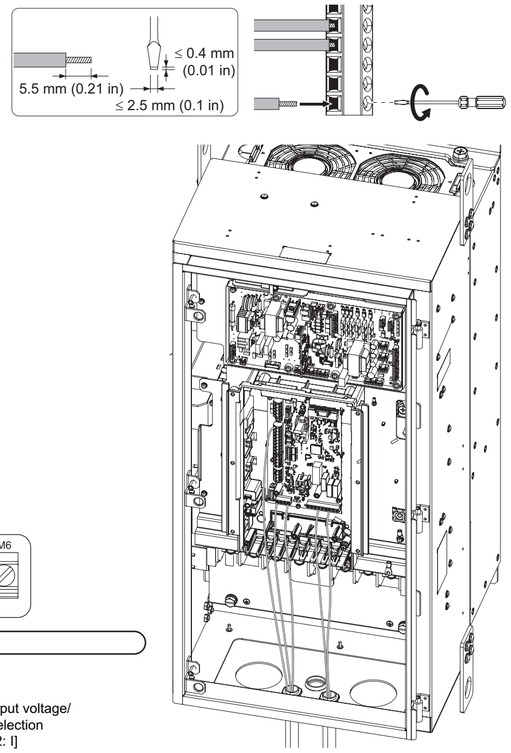


B If the Motor Does Not Rotate in the Correct Direction

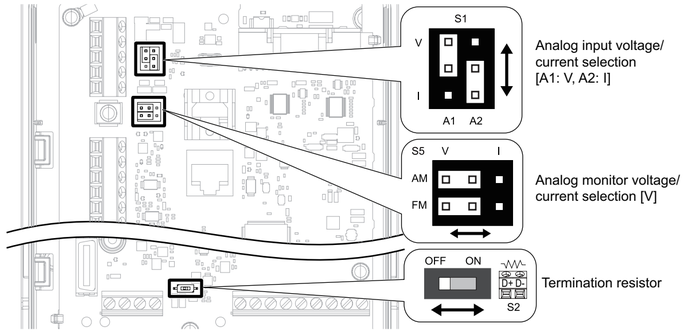


C Control Circuit Configuration and Accessiblity

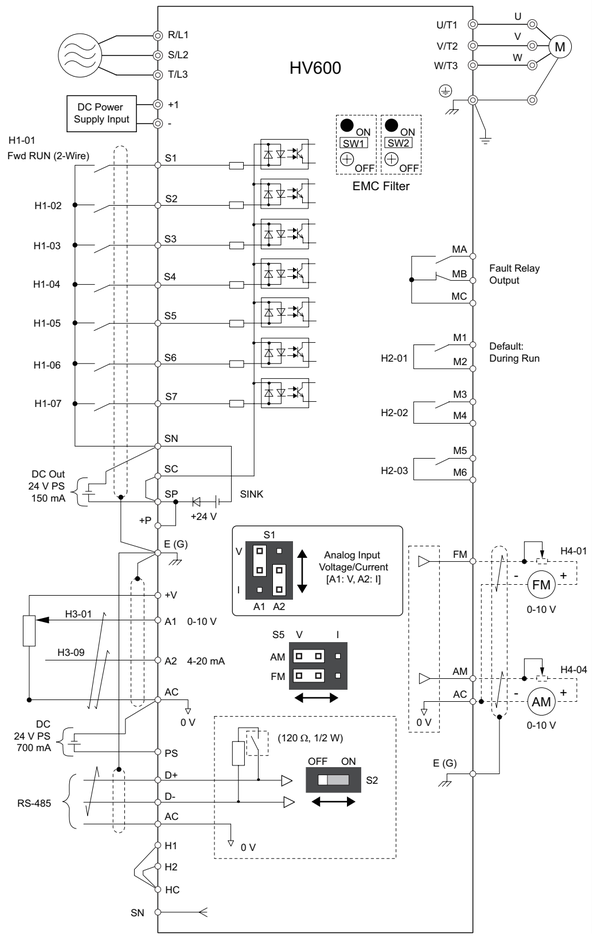




D Switches and Jumpers on the Control Board



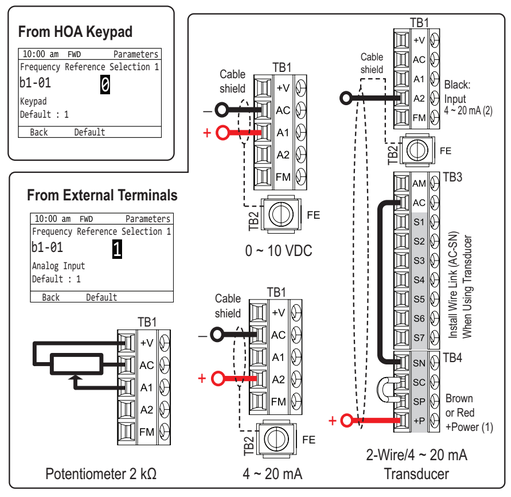
E Connection Diagram and Terminal Functions



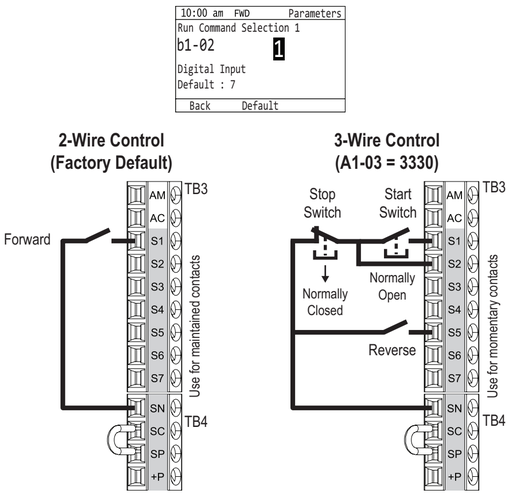
Terminal	Type	Signal Level	Default	Parameter | Default
S1	MFDI 1	Photocoupler 24 V, 6 mA Internal impedance: 4.7 kΩ	Forward RUN (2-Wire)	H1-01 | 40
S2	MFDI 2		Not Used	H1-02 | F
S3	MFDI 3		External Fault (NO-Always-Coast)	H1-03 | 24
S4	MFDI 4		Fault Reset	H1-04 | 14
S5	MFDI 5		Multi-Step Speed Reference 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	24 V, 150 mA maximum	-	-
SC	MFDI common		-	-
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% 0 mA ~ 20 mA/100% (input impedance 250 Ω)	Frequency Reference	H3-01 | 0
A2	MFAI 2		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			Fault (N.C)	Fault
MC	Common		-	-
M1	MFDO	30 Vdc, 10 mA ~ 2 A 250 Vac, 10 mA ~ 2 A Minimum load: 5 V, 10 mA	During Run	H2-01 | 0
M2				
M3	MFDO		Zero Speed	H2-02 | 1
M4				
M5	MFDO		Speed Agree 1	H2-03 | 2
M6				
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 RS-485 115.2 kbps maximum	-	-
D-	Communication -		-	-
AC	Common	0 V	-	-

MFDI: Multi-Function Digital Input
MFAI: Muti-Function Analog Input
MFDO: Multi-Function Digital Output
MFAO: Muti-Function Analog Output

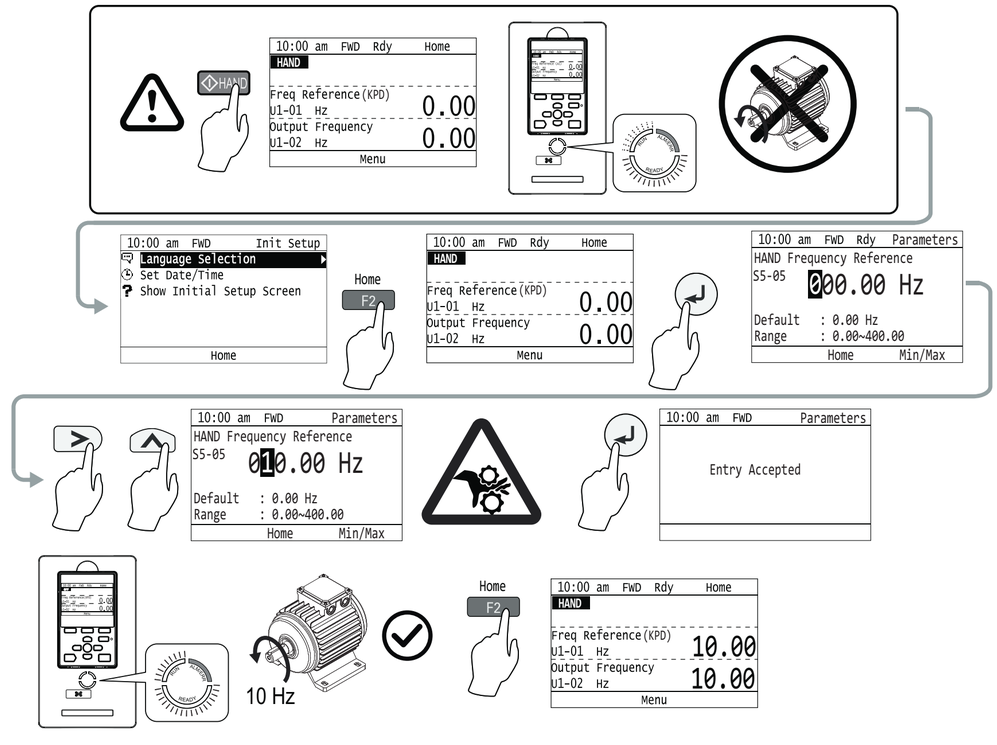
F Set Frequency Reference Source



G Set Start/Stop Control Method from External Terminals



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



I Parameter Groups

A: Initialization Parameters	
A1	Initialization
A2	User Parameters
b: Application	
b1	Operation Mode Selection
b2	DC Injection Braking and Short Circuit Braking
b3	Speed Search
b4	Timer Function
b5	PID Control
b8	Energy Saving
C: Tuning	
C1	Accel & Decel Time
C2	S-Curve Characteristics
C3	Slip Compensation
C4	Torque Compensation
C5	Auto Speed Regulator (ASR)
C6	Carrier Frequency

d: Reference Settings	
d1	Frequency Reference
d2	Reference Limits
d3	Jump Frequency
d4	Frequency Ref Up/Down & Hold
d6	Field Weakening
d7	Offset Frequency
E: Motor Parameters	
E1	V/f Pattern for Motor 1
E2	Motor Parameters
E3	V/f Pattern for Motor 2
E4	Motor 2 Parameters
E5	PM Motor Settings
E9	Motor Setting
F: Options	
F6	Communication Options
F7	Ethernet Options

H: Terminal Functions	
H1	Digital Inputs
H2	Digital Outputs
H3	Analog Inputs
H4	Analog Outputs
H5	Serial Communication
H7	Virtual Inputs/Outputs
L: Protection Functions	
L1	Motor Protection
L2	Power Loss Ride Through
L3	Stall Prevention
L4	Speed Detection
L5	Fault Restart
L6	Torque Detection
L7	Torque Limit
L8	Drive Protection
L9	Drive Protection 2
n: Special Adjustment	
n1	Hunting Prevention
n3	High Slip/Overexcite Braking
n7	EZ Drive
n8	PM Motor Control Tuning

o: Keypad-Related Settings	
o1	Keypad Display
o2	Keypad Operation
o3	Copy Keypad Function
o4	Maintenance Monitors
o5	Log Function
q: DriveWorksEZ Parameters	
r: DWEZ Connection 1-20	
S: Special Applications	
S1	Dynamic Noise Control
S2	Sequence Run Timers
S3	PI2 Control
S5	Hand/Off/Auto Operation
S6	Protection

U: Monitors	
U1	Operation Status Monitors
U2	Fault Trace
U3	Fault History
U4	Maintenance Monitors
U5	PID Monitors
U6	Operation Status Monitors
U8	DriveWorksEZ Monitors
UA	Network Multiplexing
UC	BACnet Diagnostic Monitors
Y: Application Features	
Y1	Application Basics
Y2	PID Sleep and Protection
Y4	Application Advanced
Y9	Network Multiplex Options
YA	Preset Setpoint
YC	Foldback Features
YF	PI Auxiliary Control

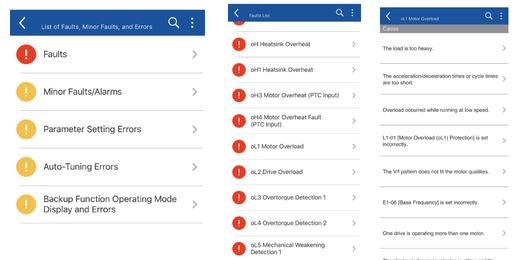
Frequently Used Parameters

Parameter Number | Name	Default | Description
A1-06 | Application Preset	0 | No Preset Selected
b1-01 | Frequency Reference Selection 1	1 | Analog Input
b1-02 | Run Command Selection 1	7 | AUTO Command + Term Run
b1-03 | Stopping Method Selection	1 | Coast to Stop
b3-01 | Speed Search at Start Selection	0 | Disabled

Parameter Number | Name	Default | Description
b3-24 | Speed Search Method Selection	2 | Current Detection 2
C1-01 | Acceleration Time 1	30.0 s
C1-02 | Deceleration Time 1	30.0 s
d2-01 | Frequency Reference Upper Limit	100.0%
d2-02 | Frequency Reference Lower Limit	0.0%

Parameter Number | Name	Default | Description
E1-01 | Input AC Supply Voltage	- | User-Defined
E2-01 | Motor Rated Current (FLA)	- | User-Defined
L5-01 | Number of Auto-Restart Attempts	0 | No Restart Attempts
L5-04 | Interval Method Restart Time	10.0 s
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	Download on the App Store GET IT ON Google Play App download
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Headquarters Address:

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

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