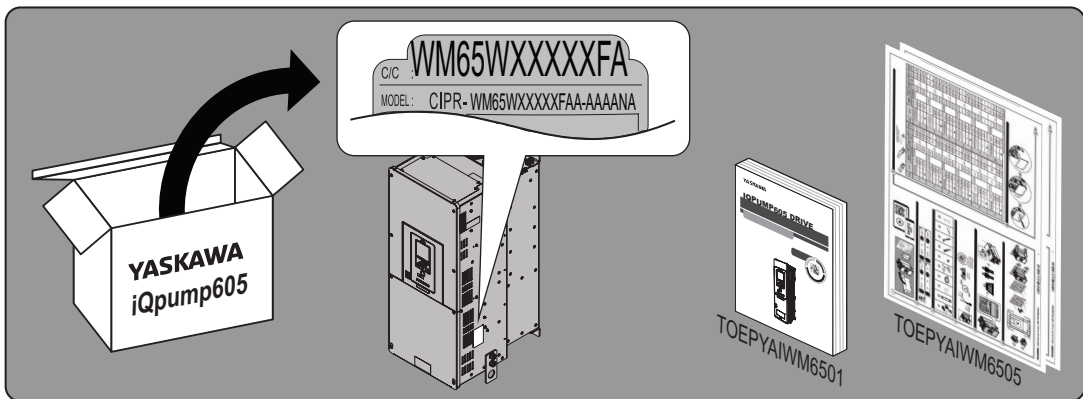


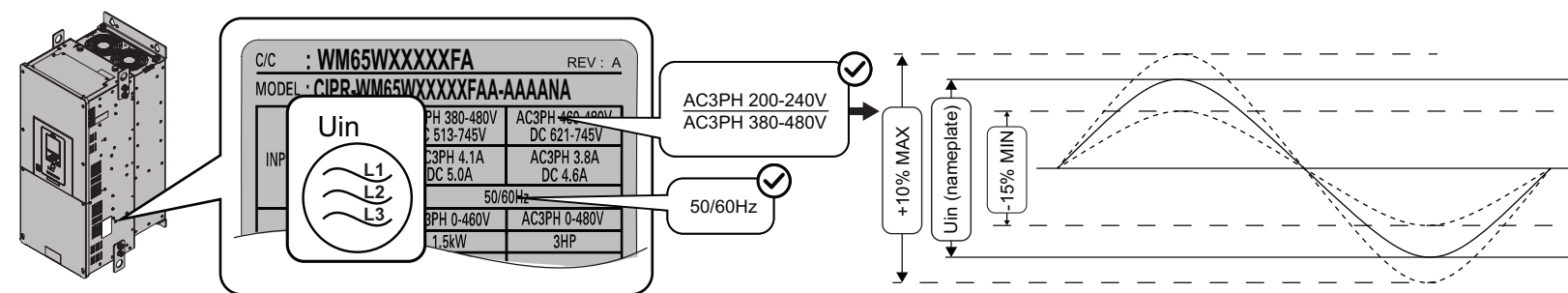
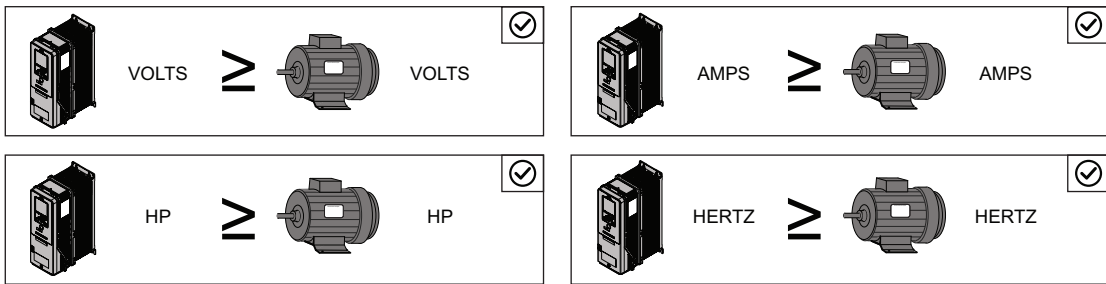
TOEPYAIWM6505



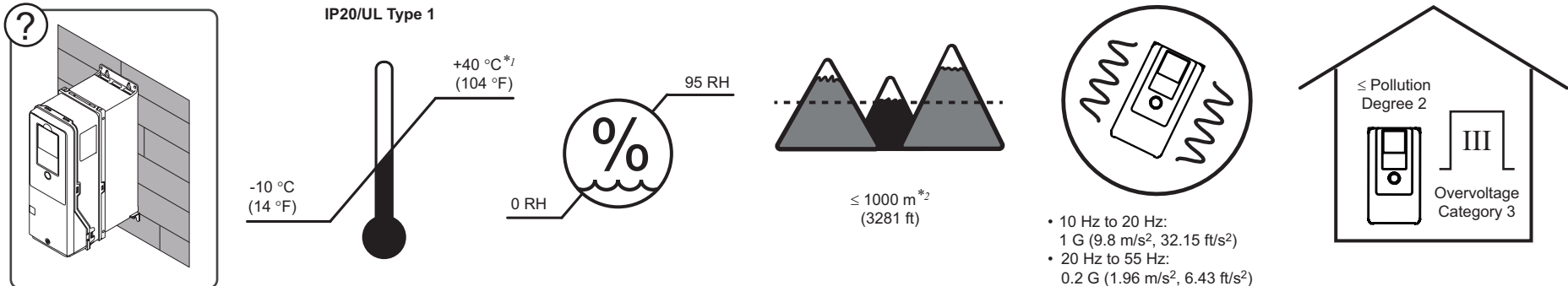
Read and follow the safety and installation procedures in the Installation & Primary Operation (TOEPYAIWM6501) manual packaged with the drive.



1 Confirm the Drive and Motor Specifications

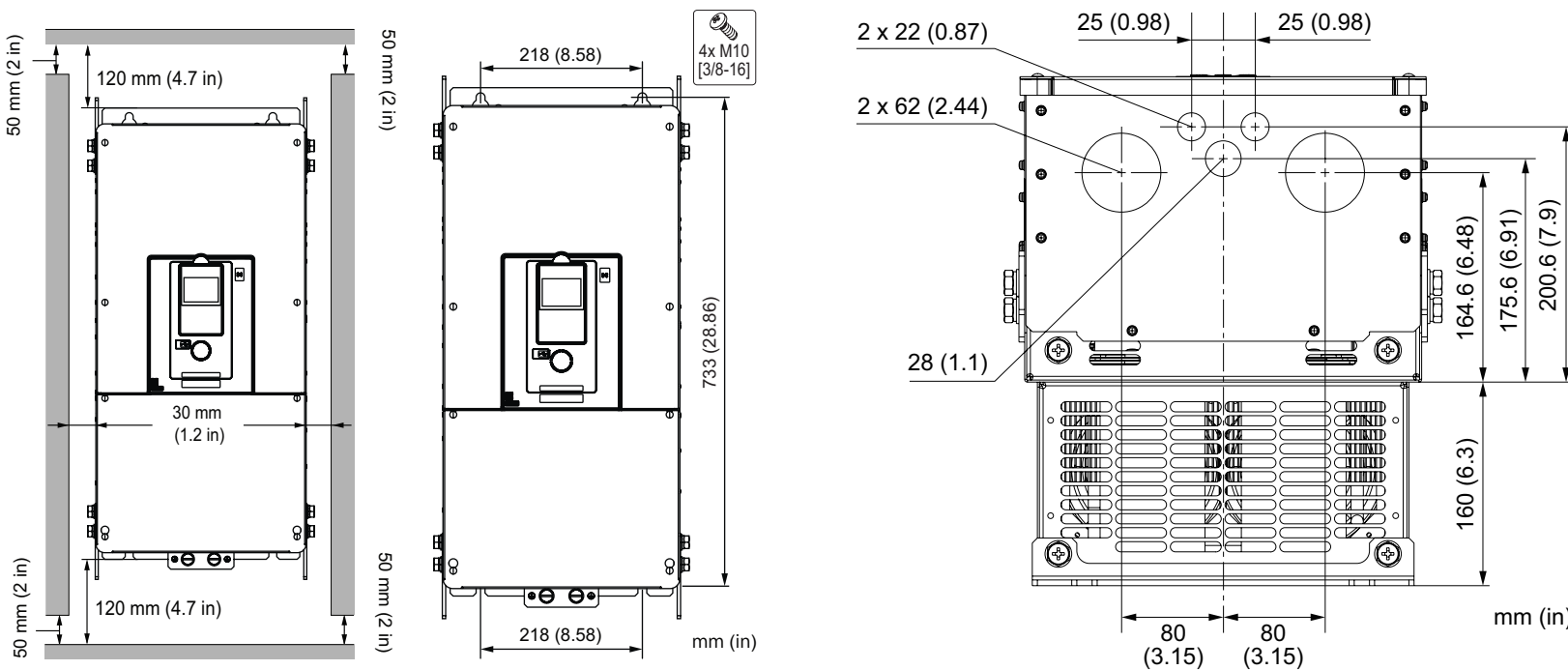


2 Confirm the Correct Drive Installation Environment

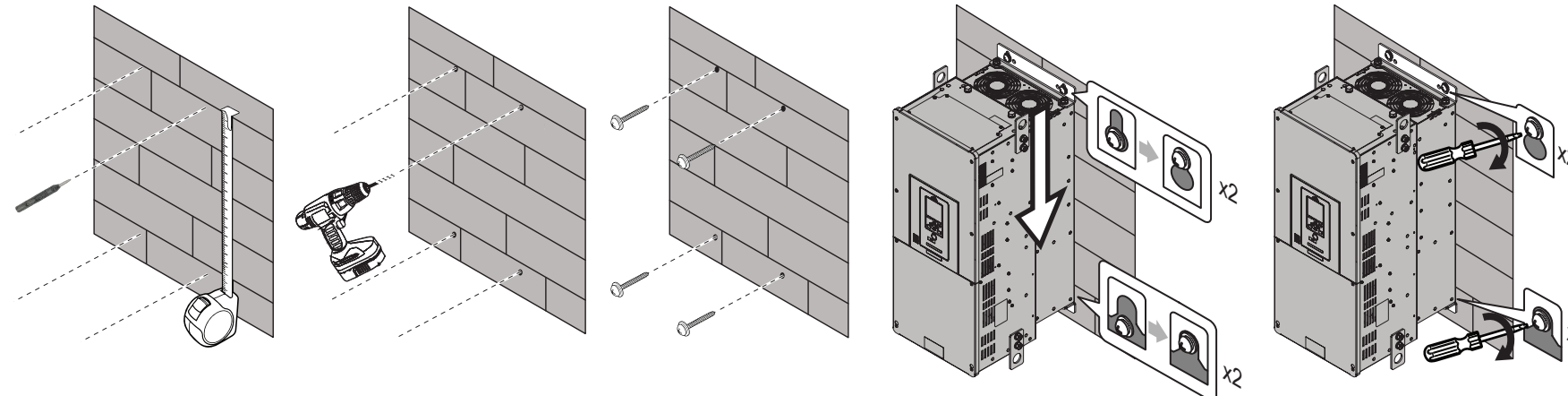


\*1 You can use the drive at a maximum of 60 °C (140 °F) when you derate the output current.  
\*2 Derate the output current by 1% for each 100 m (328 ft) to install the drive in altitudes between 1000 m to 4000 m (3281 ft to 13123 ft). Refer to the Technical Reference (SIEPYAIWM6501) for derating information.

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 [WM65WXXXX] | Terminal         | Wire Range AWG/kcmil (mm <sup>2</sup> ) <sup>*1</sup> | Recommended Wire Gauge AWG/kcmil | Panduit Crimp Terminal Part Number <sup>*2,*3</sup> | Drive Model [WM65WXXXX] | Terminal         | Wire Range AWG/kcmil (mm <sup>2</sup> ) <sup>*1</sup> | Recommended Wire Gauge AWG/kcmil | Panduit Crimp Terminal Part Number <sup>*2,*3</sup> |
|-------------------------|------------------|-------------------------------------------------------|----------------------------------|-----------------------------------------------------|-------------------------|------------------|-------------------------------------------------------|----------------------------------|-----------------------------------------------------|
| 2143                    | R/L1, S/L2, T/L3 | 6 - 4/0 (16 - 95)                                     | 2/0                              | LCA2/0-56-X                                         | 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)                                     | 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)                                     | 3/0                              | LCA3/0-56-X                                         |                         | -, +1            | 6 - 4/0 (16 - 95)                                     | 1/0 × 2                          | LCA1/0-56-X                                         |
|                         | ⊕                | 6 - 4/0 (16 - 95)                                     | 4                                | LCA4-56-L                                           |                         | ⊕                | 6 - 4/0 (16 - 95)                                     | 4                                | LCA4-56-L                                           |

480 V Wires and Crimp Terminals

| Drive Model [WM65WXXXX] | Terminal         | Wire Range AWG/kcmil (mm <sup>2</sup> ) <sup>*1</sup> | Recommended Wire Gauge AWG/kcmil | Panduit Crimp Terminal Part Number <sup>*2,*3</sup> |
|-------------------------|------------------|-------------------------------------------------------|----------------------------------|-----------------------------------------------------|
| 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 (TOEPYAIWM6501) for possible Panduit Type P and Type S crimp terminal alternatives.

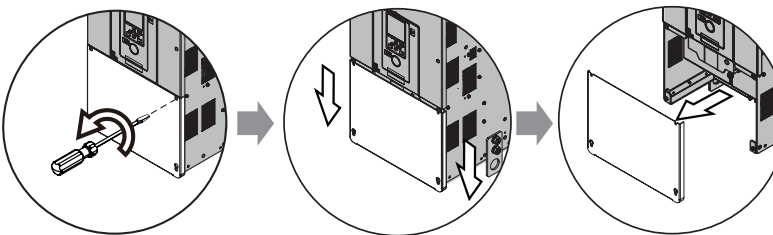
Required Short Circuit Protection for iQpump605 AC Drives

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.

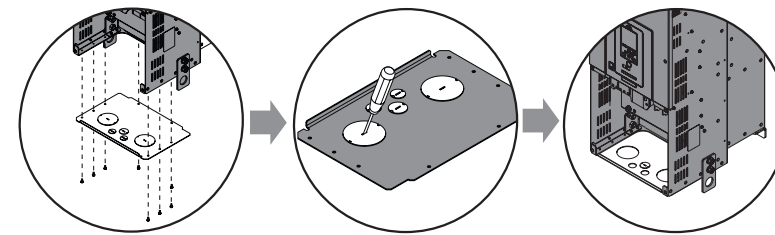
|                                                                 |                                                                                            | Three-Phase 240 V                                                                |             | Three-Phase 480 V |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------|-------------------|
|                                                                 |                                                                                            | 2143                                                                             | 2169        | 4156              |
| Drive Mounted without Supplemental Enclosure (Using Type 1 Kit) | Eaton/Bussmann Semiconductor Fuse <sup>*1</sup> Part Number (Permitted Only in Type 1 Kit) | Not allowed. Does not support internal fuses for these drive models.             |             |                   |
|                                                                 | Class CC, J, or T Fuse <sup>*2</sup> Maximum Amps                                          | 250                                                                              | 250         | 250               |
| Drive Mounted in Supplemental Enclosure                         | Any Size Protected Enclosure (Ventilated or Non-Ventilated)                                | FWH-250A                                                                         | FWH-275A    | FWH-325A          |
|                                                                 | Eaton/Bussmann Semiconductor Fuse <sup>*1</sup> Part Number                                |                                                                                  |             |                   |
|                                                                 | Class CC, J, or T Fuse <sup>*2,*3</sup> Maximum Amps                                       | 250                                                                              | 250         | 250               |
|                                                                 | Class CC, J, or T Fuse <sup>*2,*3</sup> Maximum Amps                                       | Enclosure volume not restricted. Refer to the values in the row above for fuses. |             |                   |
|                                                                 | MCCB <sup>*2</sup> Maximum Amps                                                            | 350                                                                              | 400         | 350               |
|                                                                 | Schneider MCP <sup>*2</sup> Part Number                                                    | JLL36250M75                                                                      | JLL36250M75 | JLL36250M75       |
|                                                                 | Enclosure Volume Minimum (in <sup>3</sup> )                                                | 21582                                                                            | 21582       | 21582             |
|                                                                 | External Heatsink Internal Heatsink                                                        | 14657                                                                            | 14657       | 14657             |

\*1 Protection device must be in the same enclosure as the drive.  
\*2 Class T fuses are fast-acting (non-time-delay) only. Classes CC and J can be either time-delay or non-time-delay.  
\*3 Protection device and drive permitted in same or separate enclosure.

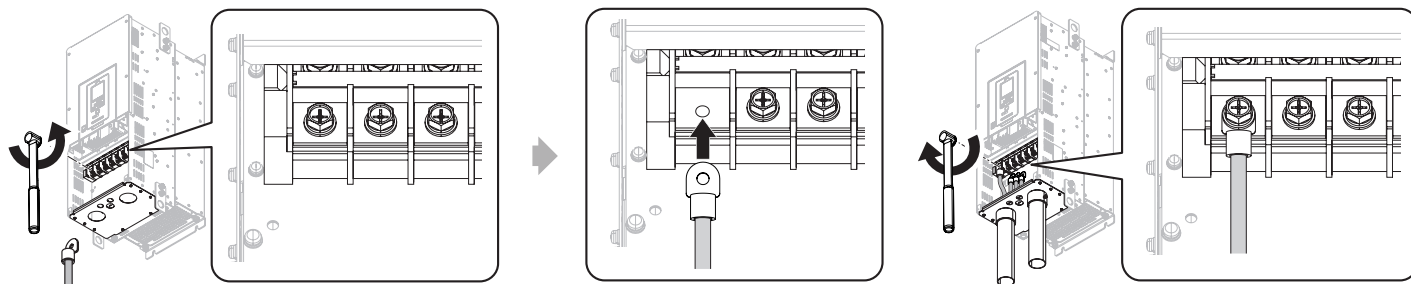
6 Remove the Terminal Cover



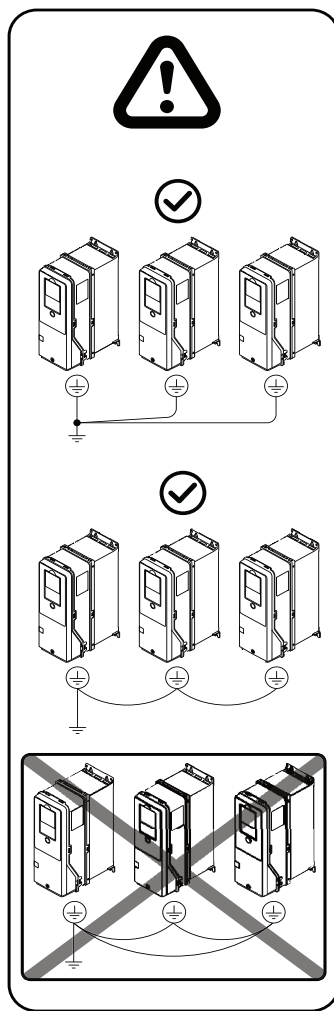
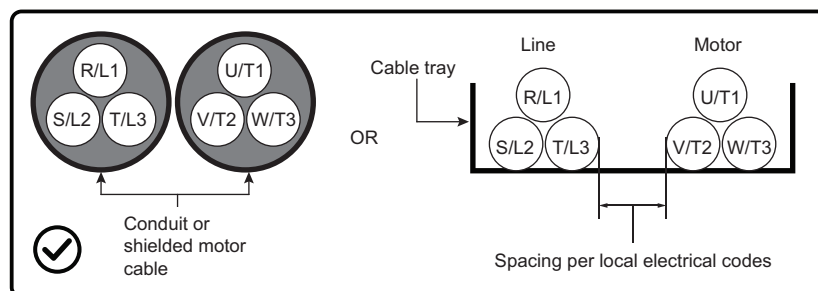
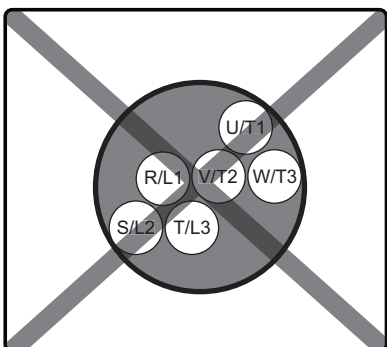
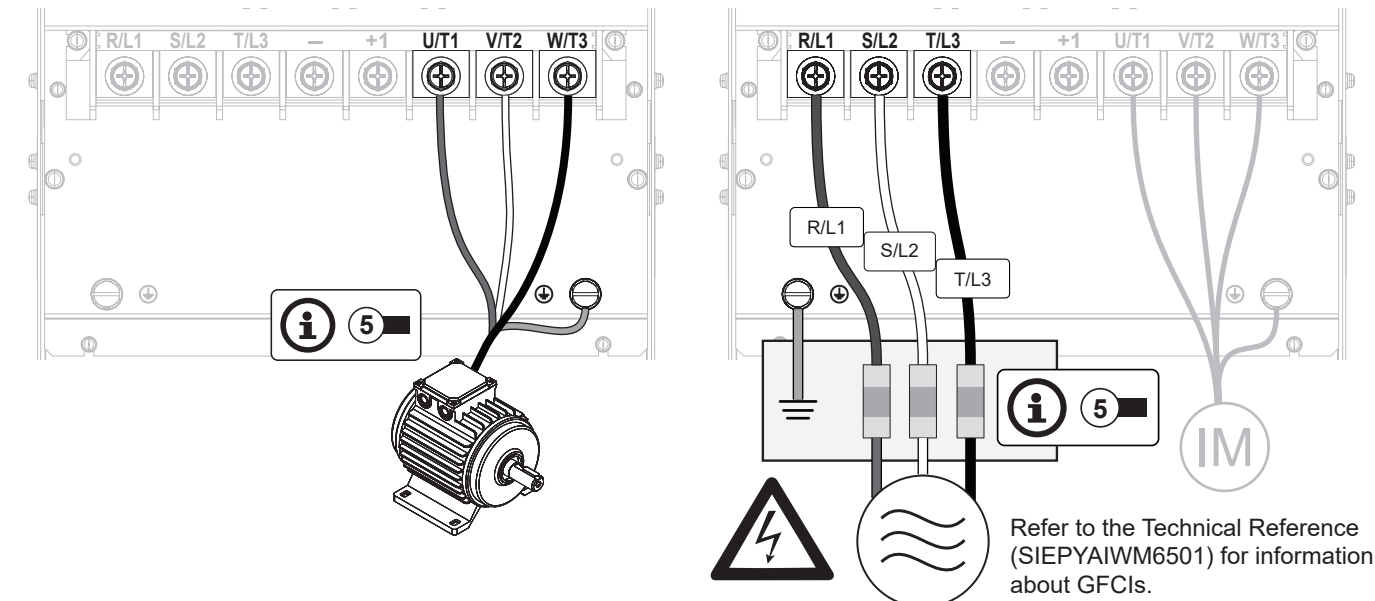
7 Remove the Conduit Bracket and Knock-Outs, Reinstall Bracket



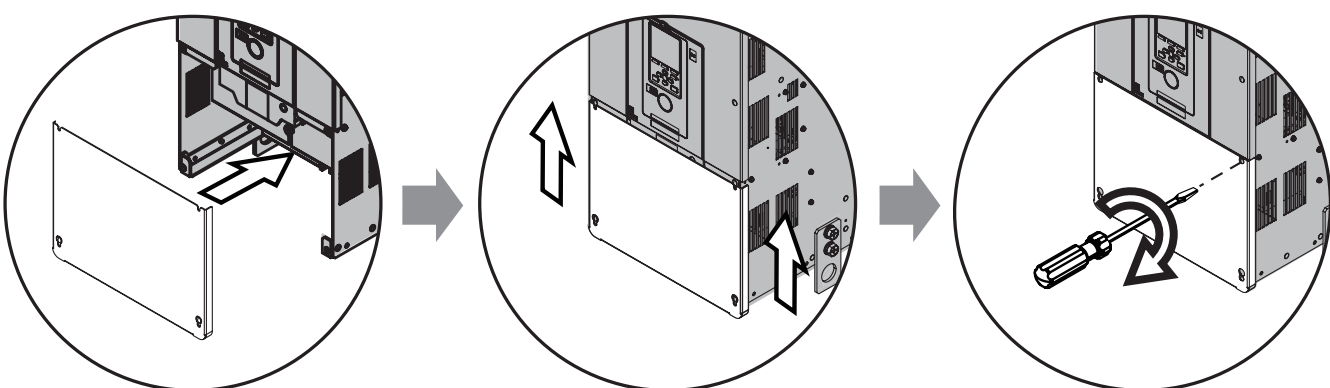
## 8 Remove the Terminal Block Bolt to Attach Crimp Terminals



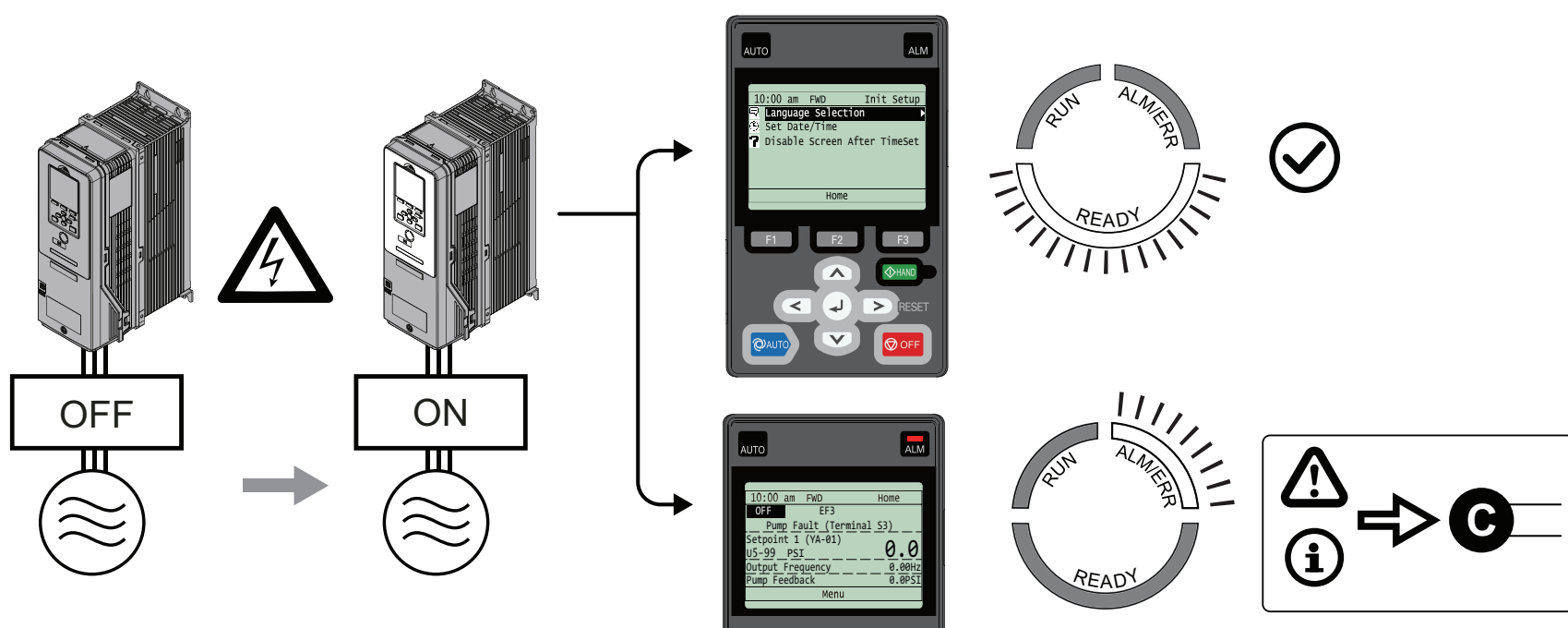
## 9 Install the Motor Wiring and Power Wiring



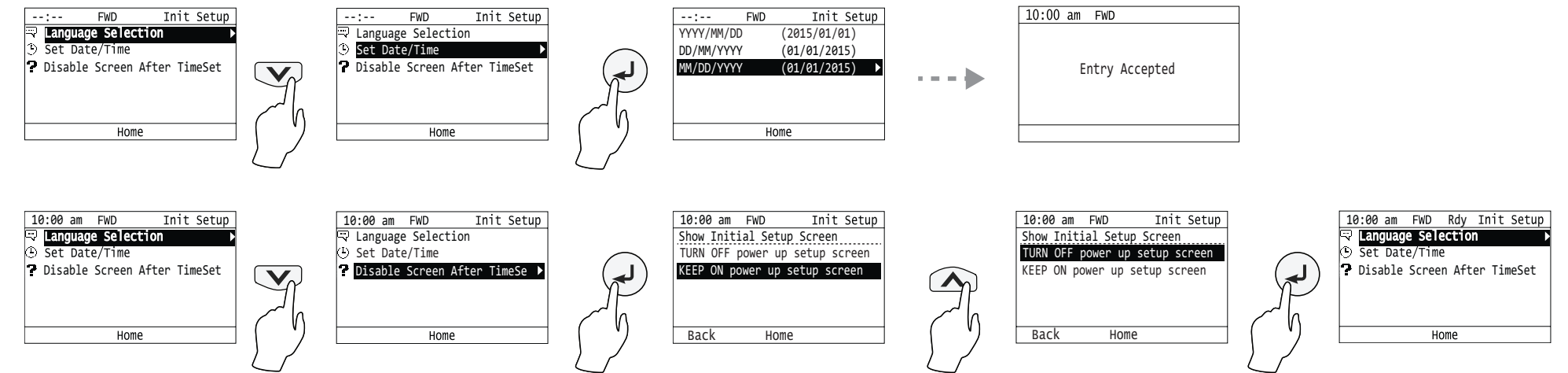
## 10 Install the Terminal Cover



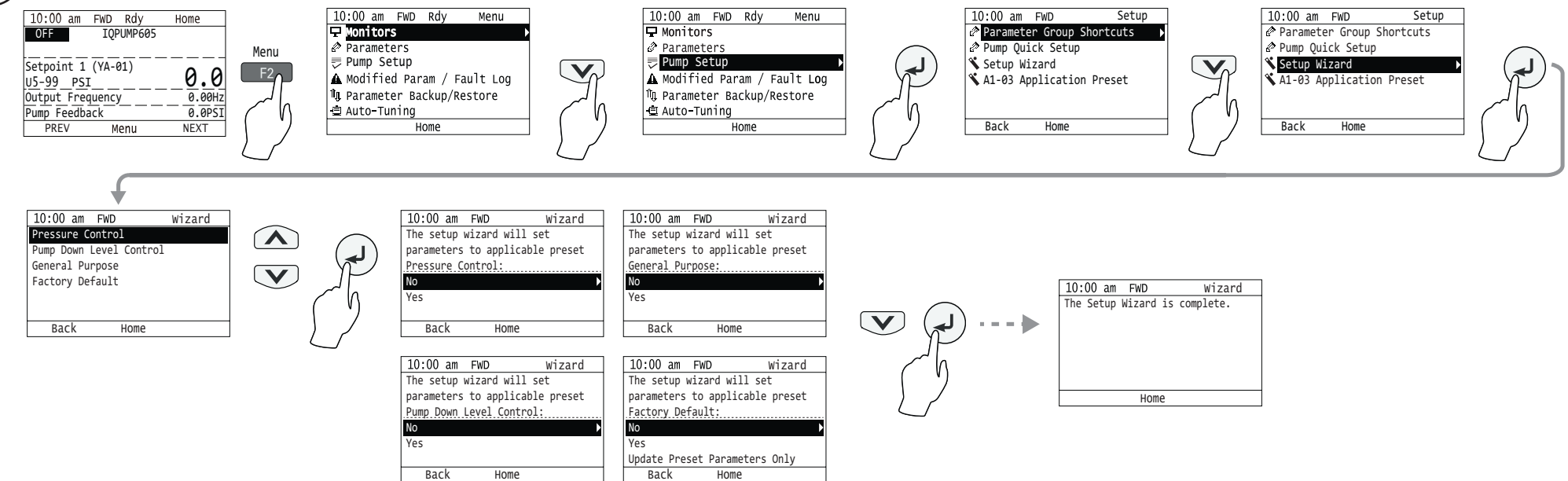
## 11 Energize the Drive and Confirm It Is Ready



## 12 Set the Real-Time Clock and Disable the Initial Setup Screen

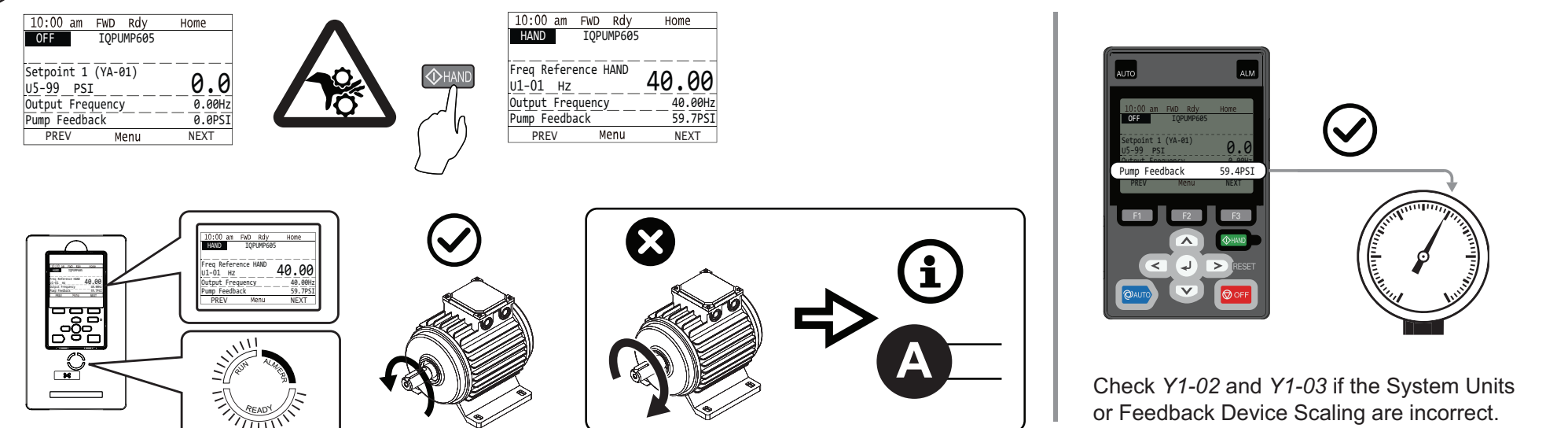


## 13 Run the Setup Wizard



If you will not use one of the Setup Wizard applications, refer to **B** Application Presets and Pump Quick Setup

## 14 Use HAND Operation to Check the Motor Rotation Direction and Check the Feedback Signal



## Additional Resources



Mobile App



DriveWizard® Mobile Commissioning Smartphone App

<https://www.yaskawa.com/dwm>



Product Manuals



PDFs

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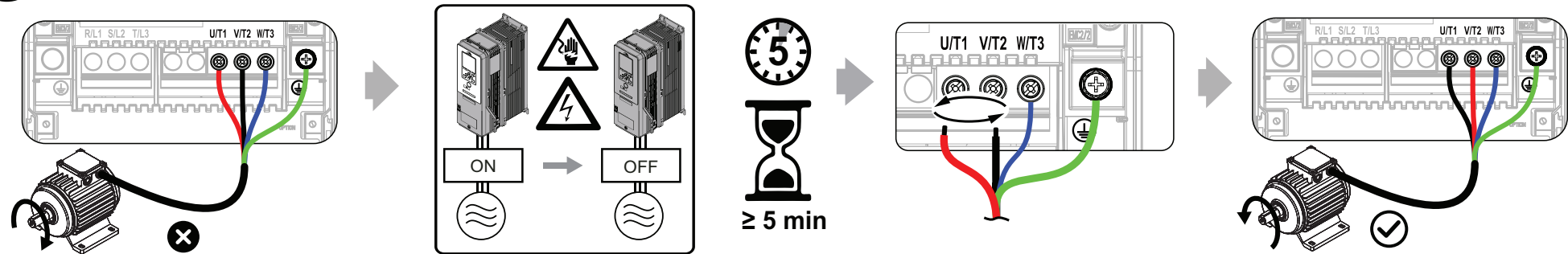
**in** [www.linkedin.com/company/18822](http://www.linkedin.com/company/18822)

Headquarters Address:

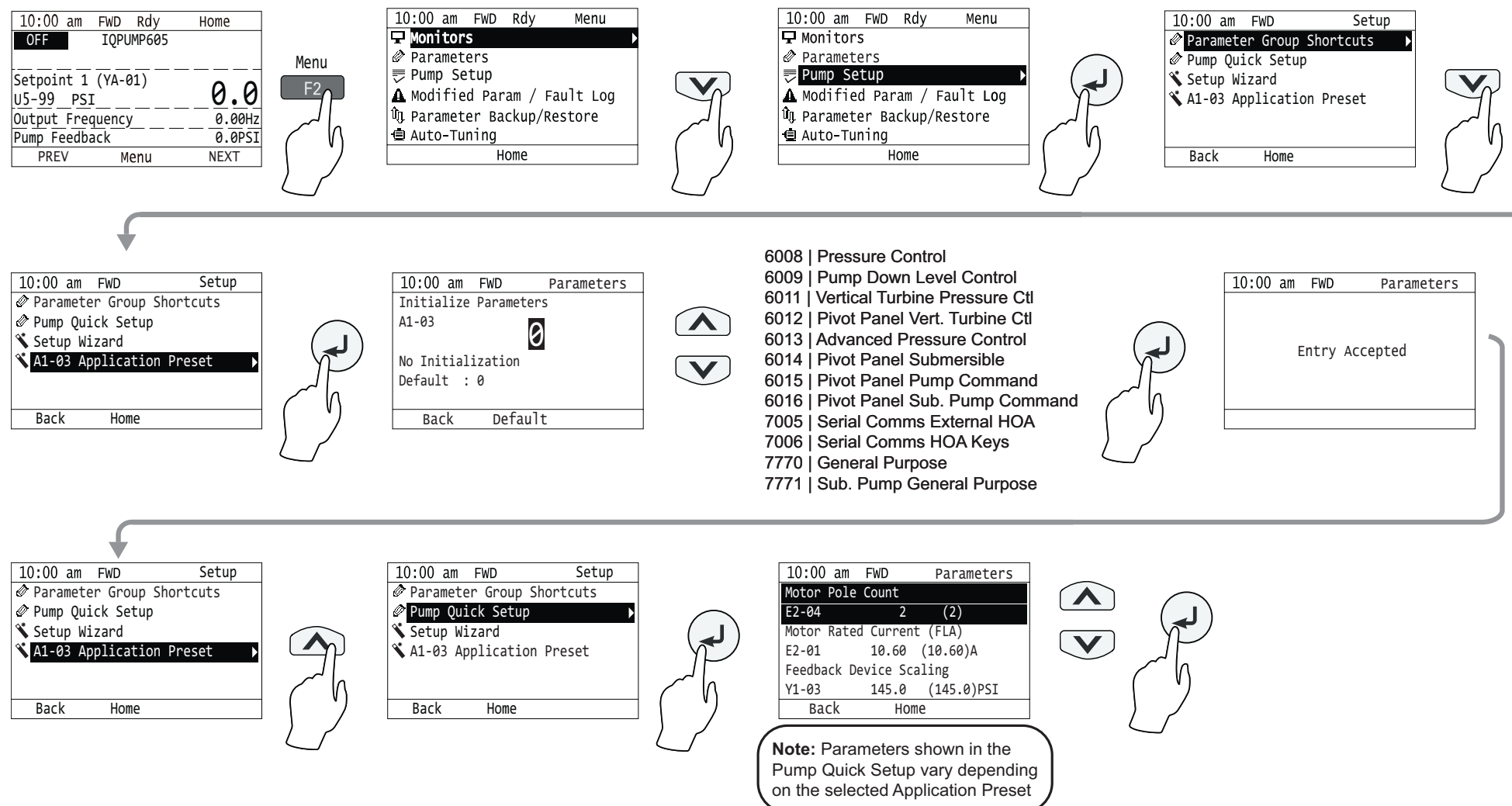
**YASKAWA AMERICA, INC.**  
2121 Norman Drive South  
Waukegan, IL 60085  
USA

Additional Information for Installation and Primary Operation

A If the Motor Does Not Rotate in the Correct Direction



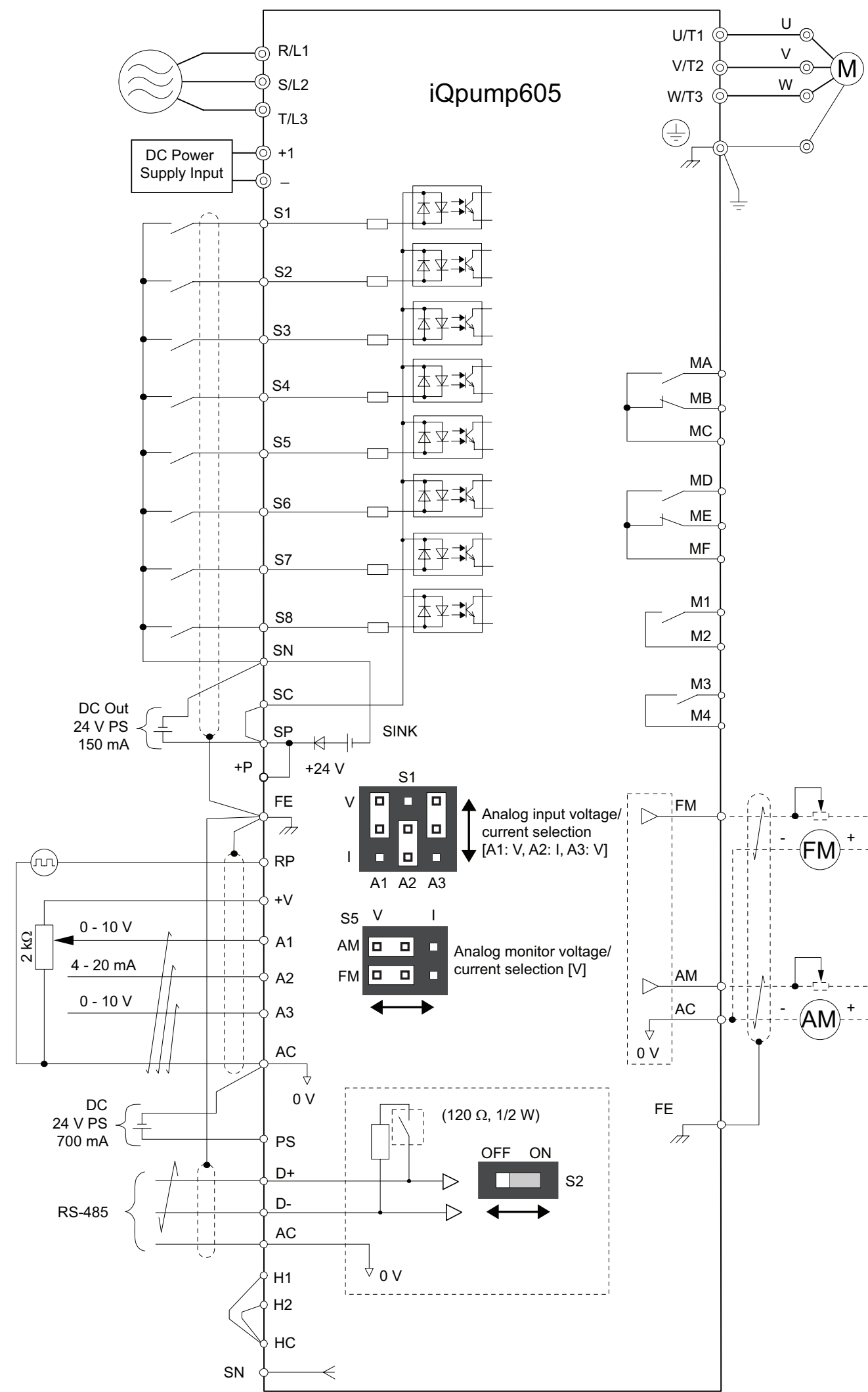
B Application Presets and Pump Quick Setup



C Troubleshooting Resources for Drive Faults and Alarms

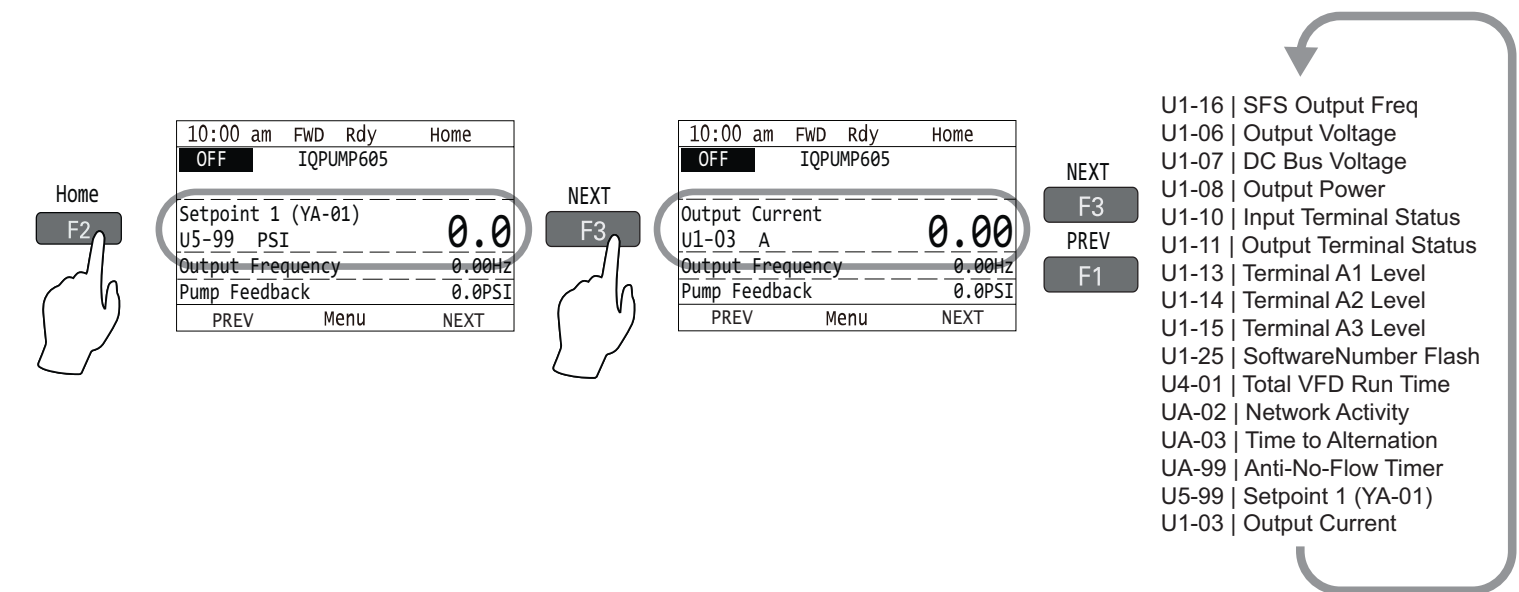
| Resource                             | Choose This When:                                                                                                                                                                                                                                            | URL                                                                                       | 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/toepyaiwm6501">https://www.yaskawa.com/toepyaiwm6501</a> | <br>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>                     | <br><br>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/toepyaiwm6503">https://www.yaskawa.com/toepyaiwm6503</a> | <br>PDF download     |

D Connection Diagram and Terminal Functions

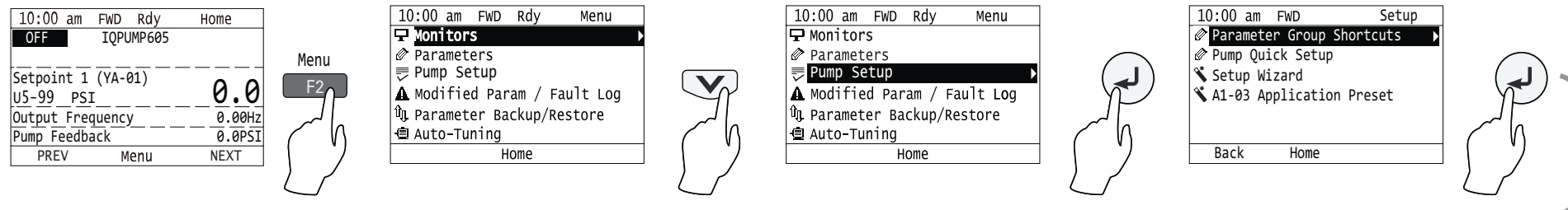


| Terminal | Type                             | Signal Level                                                                                                                                                        | Default                             |
|----------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| S1       | MFDI 1                           | Photocoupler<br>24 V, 6 mA<br>Internal impedance: 4.7 kΩ                                                                                                            | Forward RUN (2-Wire)                |
| S2       | MFDI 2                           |                                                                                                                                                                     | Not Used                            |
| S3       | MFDI 3                           |                                                                                                                                                                     | External Pump Fault (NO-@Run-Coast) |
| S4       | MFDI 4                           |                                                                                                                                                                     | Fault Reset                         |
| S5       | MFDI 5                           |                                                                                                                                                                     | PID Setpoint Selection 1            |
| S6       | MFDI 6                           |                                                                                                                                                                     | HAND Mode                           |
| S7       | MFDI 7                           |                                                                                                                                                                     | HAND Mode 2                         |
| S8       | MFDI 8                           |                                                                                                                                                                     | Not Used                            |
| SN       | MFDI power 0 V                   | 24 V, 150 mA maximum                                                                                                                                                | -                                   |
| SC       | MFDI common                      |                                                                                                                                                                     | -                                   |
| SP       | MFDI power +24 VDC               | -                                                                                                                                                                   | -                                   |
| H1       | Safe disable input 1             | Photocoupler<br>24 V, 6 mA<br>Internal impedance: 4.7 kΩ                                                                                                            | -                                   |
| H2       | Safe disable input 2             |                                                                                                                                                                     | -                                   |
| HC       | Safe disable common              |                                                                                                                                                                     | -                                   |
| RP       | Multi-function pulse train input | • Response frequency: 0 Hz ~ 32 Hz<br>• H level duty: 30% ~ 70%<br>• H level voltage: 3.5 V ~ 13.2 V<br>• L level voltage: 0.0 V ~ 0.8 V<br>• Input impedance: 3 kΩ | -                                   |
| +V       | Frequency setting power supply   | 10.5 V (20 mA maximum)                                                                                                                                              | -                                   |
| A1       | MFAI 1                           | 0 V ~ 10 V/100% (input impedance 20 kΩ)                                                                                                                             | Frequency Reference                 |
| A2       | MFAI 2                           | 4 mA ~ 20 mA/100% (input impedance 250 Ω)                                                                                                                           | PID Feedback                        |
| A3       | MFAI 3                           | 0 mA ~ 20 mA/100% (input impedance 250 Ω)                                                                                                                           | HAND Frequency Reference            |
| AC       | Common                           | 0 V                                                                                                                                                                 | -                                   |
| FE       | Connect shielded cable           | -                                                                                                                                                                   | -                                   |
| MA       | Fault relay out                  | 30 VDC, 10 mA ~ 2 A<br>250 VAC, 10 mA ~ 2 A<br>Minimum load: 5 V, 10 mA                                                                                             | Fault                               |
| MB       | Common                           | -                                                                                                                                                                   | Inverse Fault                       |
| MC       | Common                           | -                                                                                                                                                                   | -                                   |
| MD       | MFO                              | 30 VDC, 10 mA ~ 2 A<br>250 VAC, 10 mA ~ 2 A<br>Minimum load: 5 V, 10 mA                                                                                             | Fault                               |
| ME       | MFO                              | -                                                                                                                                                                   | -                                   |
| MF       | Common                           | -                                                                                                                                                                   | -                                   |
| M1       | MFO                              | 30 VDC, 10 mA ~ 2 A<br>250 VAC, 10 mA ~ 2 A<br>Minimum load: 5 V, 10 mA                                                                                             | During Frequency Output             |
| M2       | MFO                              | -                                                                                                                                                                   | -                                   |
| M3       | MFO                              | -                                                                                                                                                                   | Pressure Reached                    |
| M4       | MFO                              | -                                                                                                                                                                   | -                                   |
| FM       | MFAO 1                           | 0 V ~ +10 V/0% ~ 100%<br>4 mA ~ 20 mA                                                                                                                               | Output Frequency                    |
| AM       | MFAO 2                           | -                                                                                                                                                                   | Output Current                      |
| 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          | 0V                                                                                                                                                                  | -                                   |
| D+       | Communication +                  | MEMOBUS/Modbus<br>115.2 kbps maximum                                                                                                                                | -                                   |
| D-       | Communication -                  | -                                                                                                                                                                   | -                                   |
| AC       | Common                           | 0 V                                                                                                                                                                 | -                                   |

E Quick Monitor View



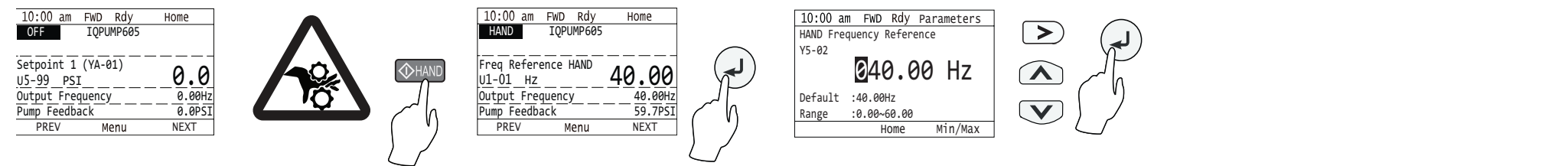
## F Parameter Group Shortcuts



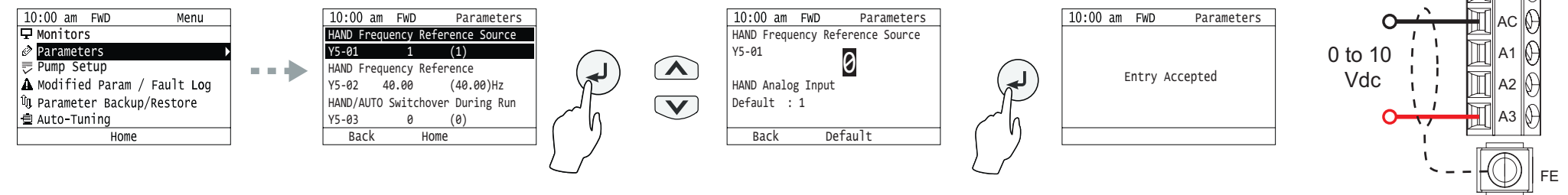
| Parameter Group Shortcut   | Parameter Number   Name                  | Default   Description             |
|----------------------------|------------------------------------------|-----------------------------------|
| Pump HAND Mode Selection   | Y5-01   HAND Frequency Reference Source  | 1   HAND Reference 1 (Y5-02)      |
|                            | Y5-02   HAND Frequency Reference         | 40.00 Hz                          |
|                            | Y5-03   HAND/AUTO Switchover During Run  | 0   Disabled                      |
|                            | Y5-04   Operation HAND Key               | 1   Enabled                       |
|                            | Y5-05   HAND Frequency Reference 2       | 0.00 Hz                           |
|                            | Y5-06   HAND Reference Prime Loss Level  | 0.0 A                             |
|                            | Y5-07   HAND Reference Prime Loss Level2 | 0.0 A                             |
|                            | Y5-09   HAND MOP Selection               | 0   ENTER Key Required            |
|                            | Y4-10   AUTO Key Memory at Power Down    | 0   Disabled                      |
| Run/Stop Control Operation | b1-01   Frequency Reference Selection 1  | 0   Keypad                        |
|                            | b1-02   Run Command Selection 1          | 0   Keypad                        |
|                            | b1-03   Stopping Method Selection        | 1   Coast to Stop                 |
|                            | b1-04   Reverse Operation Selection      | 1   Reverse Disabled              |
|                            | b1-11   Run Delay @ Stop (Backspin)      | 0   Disabled                      |
|                            | b1-14   Phase Order Selection            | 0   Standard                      |
|                            | Y4-10   AUTO Key Memory at Power Down    | 0   Disabled                      |
| Pump (PID) Tuning          | Y4-17   Utility Start Delay              | 0.2 min                           |
|                            | b5-01   PID Mode Setting                 | 1   Standard                      |
|                            | b5-02   Proportional Gain (P)            | 2.00                              |
| Accel/Decel/Thrust         | b5-03   Integral Time (I)                | 3.0 sec                           |
|                            | b5-09   PID Output Level Selection       | 0   Normal Output (Direct Acting) |
|                            | C1-01   Acceleration Time 1              | 20.0 sec                          |
| Start & Sleep Level        | C1-02   Deceleration Time 1              | 10.0 sec                          |
|                            | Y4-11   Thrust Acceleration Time         | 1.0 sec                           |
|                            | Y4-12   Thrust Frequency                 | 30.0 Hz                           |
|                            | Y4-13   Thrust Deceleration Time         | 2.5 sec                           |
|                            | Y1-04   Sleep Wake-Up Level              | 0.0 PSI                           |
|                            | Y1-05   Sleep Wake-up Level Delay Time   | 1.0 sec                           |
|                            | Y1-06   Minimum Speed                    | 40.0 Hz                           |
| Low Feedback               | Y2-03   Sleep Delay Time                 | 5 sec                             |
|                            | Y2-05   Sleep Boost Level                | 0.0 PSI                           |
|                            | Y2-06   Sleep Boost Hold Time            | 5.0 sec                           |
|                            | Y2-07   Sleep Boost Max Time             | 20.0 sec                          |
|                            | Y1-08   Low Feedback Level               | 0.0 PSI                           |
|                            | Y1-09   Low Feedback Lvl Fault Dly Time  | 10 sec                            |
|                            | Y1-10   Low Feedback Selection           | 0   Fault (and Digital Output)    |
| High Feedback              | L5-40   Low Feedback Flt Retry Selection | 0   No Retry                      |
|                            | L5-43   LowFeedback Fault Retry Attempts | 3                                 |
|                            | L5-46   Low Feedback Fault Restart Time  | 20.0 sec                          |
|                            | Y1-11   High Feedback Level              | 0.0 PSI                           |
|                            | Y1-12   High Feedback Lvl Fault Dly Time | 5 sec                             |
|                            | Y1-13   High Feedback Selection          | 0   Fault (and Digital Output)    |
|                            | L5-41   Hi Feedback Flt Retry Selection  | 0   No Retry                      |
|                            | L5-44   Hi Feedback Fault Retry Attempts | 3                                 |
|                            | L5-47   Hi Feedback Fault Restart Time   | 20.0 sec                          |

| Parameter Group Shortcut | Parameter Number   Name                  | Default   Description          |
|--------------------------|------------------------------------------|--------------------------------|
| Setpoint Not Met         | Y1-15   Maximum Setpoint Difference      | 0.0 PSI                        |
|                          | Y1-16   Not Maintaining Setpoint Time    | 60 sec                         |
|                          | Y1-17   Not Maintaining Setpoint Sel     | 0   Fault (and Digital Output) |
|                          | L5-50   Setpoint Not Met Fault Retry Sel | 0   No Retry                   |
|                          | L5-54   Setpoint Not Met Retry Attempts  | 3                              |
| Dry Run/Loss of Prime    | L5-58   Setpoint Not Met Restart Time    | 20.0 sec                       |
|                          | Y1-18   Prime Loss Detection Method      | 0   Current (A)                |
|                          | Y1-19   Prime Loss Level                 | 0.0 A                          |
|                          | Y1-20   Prime Loss Time                  | 20 sec                         |
|                          | Y1-22   Prime Loss Selection             | 0   Fault (and Digital Output) |
| Pre-Charge               | Y1-23   Prime Loss Max Restart Time      | 0.2 min                        |
|                          | L5-51   Loss of Prime Fault Retry Select | 0   No Retry                   |
|                          | L5-55   Loss of Prime Flt Retry Attempts | 3                              |
|                          | Y4-01   Pre-Charge Level                 | 0.0 PSI                        |
|                          | Y4-02   Pre-Charge Frequency             | 0.0 Hz                         |
| Output Current Limit     | Y4-03   Pre-Charge Time                  | 0.0 min                        |
|                          | Y4-05   Pre-Charge Loss of Prime Level   | 0.0 A                          |
|                          | Y4-06   Pre-Charge Frequency 2           | 0.0 Hz                         |
|                          | Y4-07   Pre-Charge Time 2                | 0.0 min                        |
|                          | Y4-08   Pre-Charge Loss of Prime Level 2 | 0.0 A                          |
| Pump Over Cycle          | YC-01   Output Current Limit Select      | 0   Disabled                   |
|                          | YC-02   Current Limit                    | 0.0 A                          |
|                          | Y2-10   Max Cycling Protection Allowed   | 0                              |
|                          | Y2-11   Cycling Count Decrement Time     | 300 sec                        |
|                          | Y2-12   Over Cycle Mode                  | 0   Disabled                   |
| Auto-Restart             | L5-52   Over Cycle Fault Retry Selection | 0   No Retry                   |
|                          | L5-56   Over Cycle Fault Retry Attempts  | 3                              |
|                          | L5-59   Over Cycle Fault Restart Time    | 20.0 sec                       |
|                          | L5-01   Number of Auto-Restart Attempts  | 5                              |
|                          | L5-04   Interval Method Restart Time     | 20.0 sec                       |
| Single Phase Foldback    | YC-10   Single Phase Foldback Sel        | 1   Enabled                    |
|                          | YC-11   Ripple Regulator Setpoint        | 95.0%                          |
| Multiple Setpoints       | YA-01   Setpoint 1                       | 0.0 PSI                        |
|                          | YA-02   Setpoint 2                       | 0.0 PSI                        |
|                          | YA-03   Setpoint 3                       | 0.0 PSI                        |
|                          | YA-04   Setpoint 4                       | 0.0 PSI                        |
| Edit Default Drive Name  | o1-83   Drive Name                       | 1   IQPUMP605                  |
|                          | o1-84   Drive Name Unit Number           | 0                              |

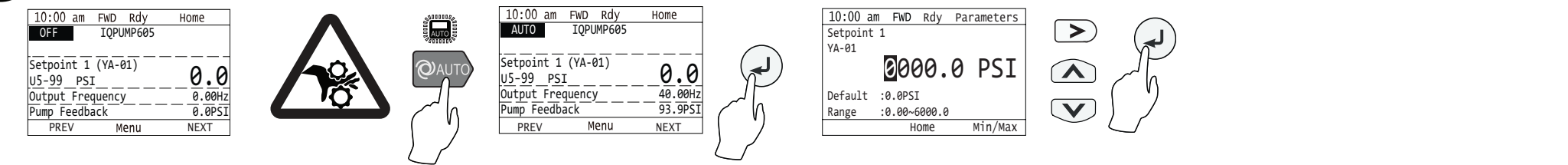
## G HAND Mode Operation



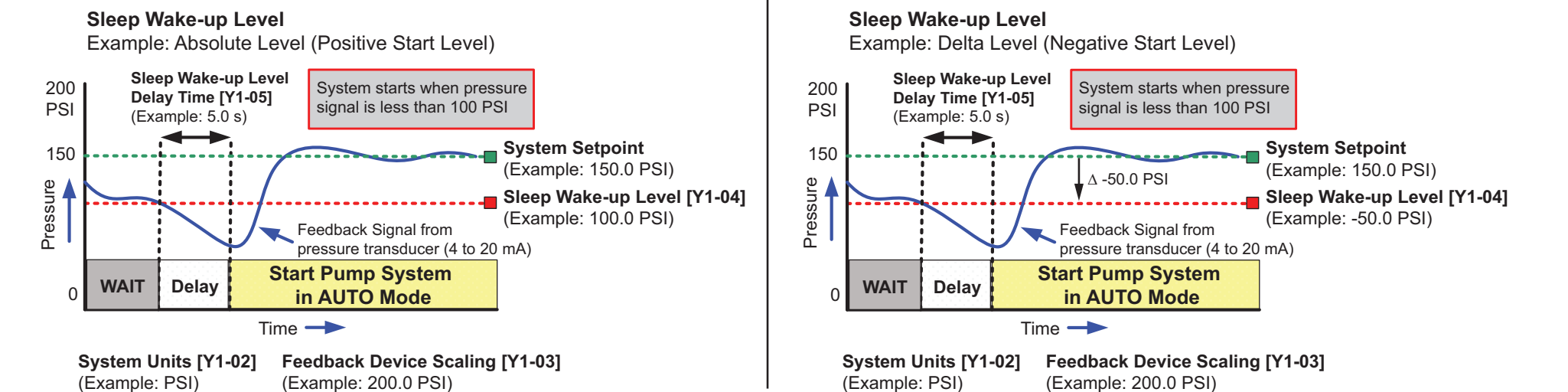
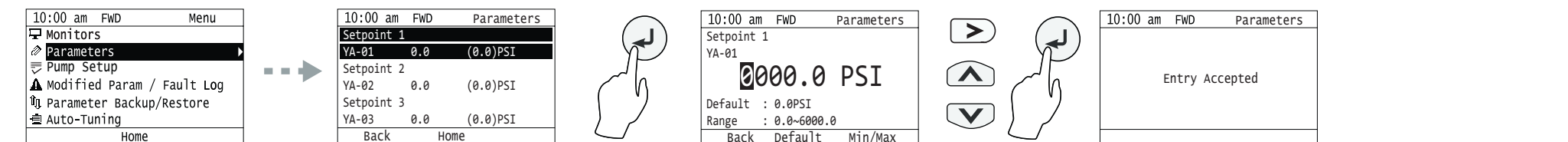
### HAND Speed from Analog Input (0 to 10 V)



## H AUTO Mode Operation



### Set System Setpoint



## I Select Start/Stop Control Method and Wire Feedback Signal

