MA7200 PLUS INVERTER SERIES

PUMP Quick Start Manual

1 to 2 HP

Models- MA7200-2001/2-N1 (230V)
&
MA7200-4001/2-N1 (460V)
Quick Start Guide for Pump Applications

This guide is to simplify the start up of the **MA7200 PLUS Inverter series, 1 to 2 HP**, for pump applications. It is not intended to replace the MA7200 PLUS Installation and Operation Manual, and the user is urged review this manual. There are three methods of control or combinations thereof that that may be selected; Keypad, Analog Signal (external terminal), or Serial Communication. Only Keypad and analog signal control will be covered as serial communication is beyond the scope of this manual. For serial communication control or special external control, the user is referred to the MA7200 PLUS Installation and Operating Manual.

**SAFETY FIRST!**

**Step 1 - Before Starting the Inverter**

- Referring to the MA7200 PLUS Instruction Manual, please review and verify that the correct inverter size for the associated motor was received free of damage. To ensure personnel safety and to avoid equipment damage, follow the precautions and the installation procedures for mounting, wiring, and operating environment.

  **CAUTION - To avoid damage to the inverter when removing the inverter cover and/or LCD Operator, refer to Appendix B for the proper procedure.**

- In accordance with applicable codes, make electrical connections to the motor and input power terminals. (Refer to the block diagram, Fig. 4). No other external connections should be made at this time, as the initial control will be from the keypad.

**Step 2 - Apply Power to the Drive**

- Apply AC power to the Inverter and observe the LCD Display Line 1; it should read “Freq. Cmd 000.00Hz”. Line 2 should read “TECO”. The red LED on the STOP key should be on. The DRIVE and FWD LED’s should be on. (See Fig. 1 below)

**Step 3 - Set Drive to Run Mode**

- If the red DRIVE LED is not on with AC power up, press the PGRM / DRIVE key until the red Drive LED is on. The Inverter is now in the RUN mode.

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**Fig. 1 MA7200 PLUS Keypad**
Step 4 - Check Pump Motor Operation

- Enter 10.00Hz for the frequency reference and set parameter Sn-08 = 1 to disable Reverse Direction operation. **Note:** The output from the inverter is displayed in Hz as factory default. If desired, the output may be displayed in per cent (%) of full speed. *(see appendix)*

### To set the output frequency to 10.00 Hz:

<table>
<thead>
<tr>
<th>Keypad Steps</th>
<th>Resulting Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Press the key twice</td>
<td>Freq. Cmd 010.00Hz TECO (Flashing)</td>
</tr>
<tr>
<td>2 - Press the key</td>
<td>Freq. Cmd 010.00Hz TECO (Flashing)</td>
</tr>
<tr>
<td>3 - Press the key to save.</td>
<td>Entry Accepted 2 Seconds</td>
</tr>
</tbody>
</table>

### To set the parameter Sn-08 = 1; (Inhibit reverse operation)

<table>
<thead>
<tr>
<th>Keypad Steps</th>
<th>Resulting Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Press the key</td>
<td>An – 01 - Freq. Cmd. 1</td>
</tr>
<tr>
<td>2 - Press the key twice</td>
<td>Sn – 01 - Inverter Capacity</td>
</tr>
<tr>
<td>3 - Press the key until display shows</td>
<td>Sn – 08 - Reverse Operate (Flashing)</td>
</tr>
<tr>
<td>4 - Press the key</td>
<td>Sn – 08 = 0 - Allow Reverse (Flashing)</td>
</tr>
<tr>
<td>5 - Press the key</td>
<td>Sn – 08 = 1 - Inhibit Reverse (Flashing)</td>
</tr>
<tr>
<td>6 - Press the key to save</td>
<td>Entry Accepted 2 Seconds</td>
</tr>
<tr>
<td>7 - Press the Key to return to the main display</td>
<td>PRGM DRIVE Key</td>
</tr>
</tbody>
</table>
• Press the **RUN** key, and check the pump direction of rotation. If the direction is not correct, press the **STOP** key and wait until the motor has come to a complete **STOP**. Next, **power down the inverter**.

**Danger**

*After the power has been turned OFF, wait at least 5 minutes until the charge indicator extinguishes completely before touching any wiring, circuit boards or components.*

• Reverse any two of the pump motor connections at the inverter (U(T1), V(T2), or W(T3)). Next, following **STEP 2**, power-up the inverter; the motor direction should now be correct.

**Step 5 – Select Method of Control**

• Before selecting the method of control, verify that the inverter is in the **STOP** mode.

• There are two methods of control or combinations thereof that may be selected; **Keypad**, and **Analog Signal**.

  **RUN / STOP Command** - Can be provided from the keypad or from an external contact (see Fig. 2a).

  **Speed Reference** – Can be from the keypad or from an external analog signal (0 – 10 VDC or 4 – 20 mA). see Fig’s 3a, 3b, and 3c.

• The **RUN/STOP** method of control is set by parameter **Sn – 04** and the **Speed Reference** is set by parameter **Sn – 05**. The following Table shows the values to be set when selecting.

<table>
<thead>
<tr>
<th>Value</th>
<th>Start / Stop Sn – 04</th>
<th>Speed Reference Sn – 05</th>
</tr>
</thead>
<tbody>
<tr>
<td>*0</td>
<td>Keypad</td>
<td>Keypad</td>
</tr>
<tr>
<td>1</td>
<td>External Contact</td>
<td>External Analog</td>
</tr>
</tbody>
</table>

**NOTE**

The factory default for Sn – 04 and Sn – 05 is set to 0; Digital Operator (Keypad) No further parameter changes are necessary if this is the desired method of control. If **External Contact** set to Sn – 04 or **External Analog** set to Sn – 05 is desired then proceed as follows.
To set the parameter Sn-04 = 1
(Run Source Select)

**Keypad Steps**  

1 - Press the **PRGM DRIVE** key

2 - Press the **DSPL** key twice

3 - Press the **key until display shows**

4 - Press the **EDIT ENTER** key

5 - Press the **key**

6 - Press the **EDIT ENTER** key to save.

7 - Press the **PRGM DRIVE** key to return to the main display.

**Resulting Display**

- An – 01 - Freq. Cmd. 1
- Sn – 01 - Inverter Capacity
- Sn – 04 Run Source Select
- Sn – 04 = 0 – Run Source Select
- Sn – 04 = 1 – Run Source Select
- Entry Accepted
- Sn – 04 = 1 – Run Source Select (Flash)
After the method of control has been selected, if external control wiring is required, (e.g. external analog) power down the inverter before removing any covers or making any connections. In the following pages are wiring examples for Start / Stop, E-Stop, Restart, and Analog Connections.

**Danger**

*After the power has been turned OFF, wait at least 5 minutes until the charge indicator extinguishes completely before touching any wiring, circuit boards, or components.*
**DIGITAL INPUT / OUTPUT** terminal connections (1 – 2 HP)

Fig’s 2a, 2b, and 2c below show the control terminal connections for input control functions. The connections shown are typical and the user is referred to the *MA7200 Manual* if additional information is required. Fig. 2d shows an example for the use of the **Fault Output Relay**.

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**Fig. 2a Start/Stop Switch Connection**

- SC 1 3 5
- E 2 4 6
- Connect shield to terminal E

**Note:**
This external Start/Stop switch is required when "External Contact" is selected in parameter Sin04. (See Step 9)

**START/STOP SWITCH**

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**Fig. 2b External Fault Contact Connection**

- SC 1 3 5
- E 2 4 6
- Connect shield to terminal E

**Note:**
This external Fault input is optional. It may be provided from any external isolated dry contact source that is required to shut the inverter down.

**EXTERNAL FAULT CONTACT**

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**Fig. 2c Fault Reset Switch Connection**

- SC 1 3 5
- E 2 4 6
- Connect shield to terminal E

**Fault Reset Switch**

**Note:**
This external Fault Reset input is optional. The Fault may be also reset from the keypad.

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**Fig. 2d Fault Output Contacts**

- Relay contacts are rated @ 250VAC, 30VDC, 2A or less

**Note:**
Relay contacts are used to shut down equipment etc.

**Power Source**

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ANALOG INPUT  terminal connections (1 – 2 HP)

Fig’s 3a, 3b, and 3c show the various analog input schemes that can be used to control the output frequency and thus the speed of the pump motor when External Analog is selected by Sn-05 in Step 5. Only one method may be used as the input source with Fig. 3a Potentiometer Input being most common.

**Fig. 3a** Speed Control Potentiometer Input

**Fig. 3b** 0 – +10 VDC Analog Input

**Fig. 3c** 4 – 20 mA Analog Input
**MA7200 PLUS BLOCK DIAGRAM**

Fig. 4 is an overall basic electrical connection diagram for MA7200 PLUS inverters rated 1 to 2 HP. It is used in conjunction with the other sections of this guide to give the user the ability to successfully start up a Pump application. More detailed information is available in the MA7200 PLUS Manual to which the user is referred if further information is required.

![Block Diagram Image]

Fig. 4 MA7200 PLUS 1 to 2 HP Pump Application Diagram
Appendix A-
Changing display to read output speed in percent (%) of full speed.

The display is factory defaulted to show the inverter output frequency in Hz. If desired, the display can be changed to show the output frequency as a percentage of full speed. To do this parameter Cn-28 must be changed from (00000) to (00001) as follows:

<table>
<thead>
<tr>
<th>Keypad Steps</th>
<th>Resulting Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Press the PRGM key</td>
<td>An – 01 - Freq. Cmd. 1</td>
</tr>
<tr>
<td>2 - Press the DSPL key 3 times</td>
<td>Cn – 01 - Input Voltage</td>
</tr>
<tr>
<td>3 - Press the key until display shows</td>
<td>Cn-28 - Operator DSPL Unit</td>
</tr>
<tr>
<td>4 - Press the EDIT key</td>
<td>Cn-28 = 00000 Operator DSPL Unit</td>
</tr>
<tr>
<td>5 - Press the key</td>
<td>Cn-28 = 00001 Operator DSPL Unit</td>
</tr>
<tr>
<td>6 - Press the EDIT key to save</td>
<td>Entry Accepted 2 Seconds</td>
</tr>
</tbody>
</table>

7 - Press the PRGM key to return to the main display.
Appendix B -
Removing the LCD Digital Operator and Inverter Cover(s)

STEP 1 - Remove the (2) screws

STEP 2 – Gently Lift UP the LCD Operator and remove the connecting cable (RJ1) by unplugging it from the back of the LCD Operator.

STEP 3 – Gently remove the cover(s).