

MA7200 SERIES

Bypass Quick Start Guide



TECO   **Westinghouse**

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This Quick Start Guide is used in conjunction with other documentation supplied with this equipment and will help you with the setup and wiring of the MA7200 bypass panel and motor.

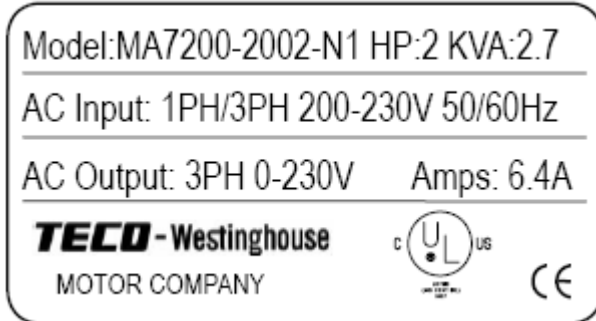


Warning / Danger: Improper wiring can and will cause bodily harm as well as damage to the equipment

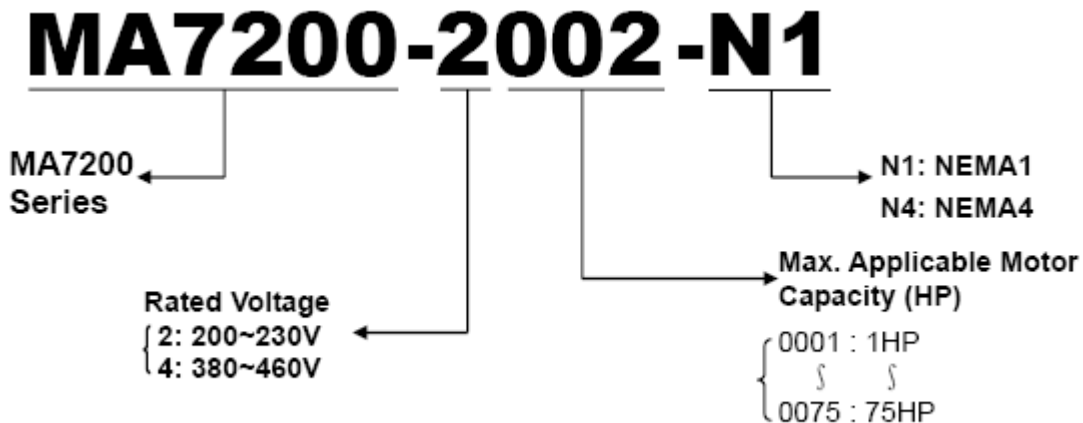
When installing the system be sure to follow good wiring practices and all applicable codes. Ensure that the mounting of the MA7200 bypass panel is secure and that the environment, such as extreme dampness, poor ventilation etc. will not cause system degradation.

Please read this quick start guide in conjunction with the MA7200 Installation Manual provided with the MA7200 thoroughly before attempting any installation.

It is essential to verify the MA7200 drive nameplate data and make sure that the MA7200 has the correct rating so it can be used with your motor. An example of the MA7200 nameplate is shown below.



- Check that the input voltage range meets the **input power** requirements.
- Ensure that the **Amperes and Output Voltage** rating for the MA7200 meets the motor nameplate requirements



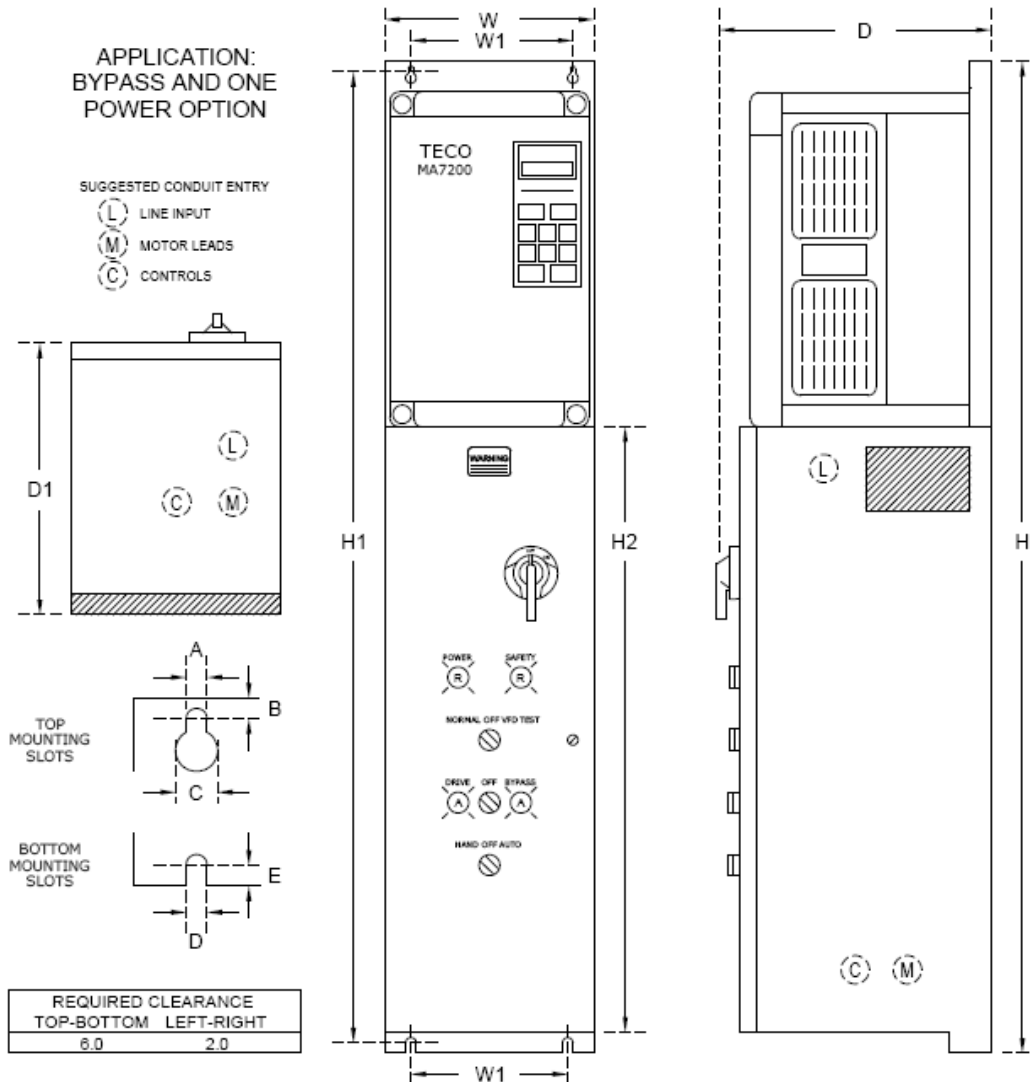
1.2 Mounting

Mounting of the MA7200 bypass panel is extremely important for accessibility as well as for the environment. Various MA7200 bypass panels are available and the mounting dimensions (footprint) may be different. Because the mounting procedure is fairly extensive, it is beyond the scope of this document. The user is referred to the installation documents received with the MA7200 bypass panel. In the case where your system has more than one MA7200 bypass panel, refer to the proper clearances required for adequate ventilation.

Please pay particular attention to:

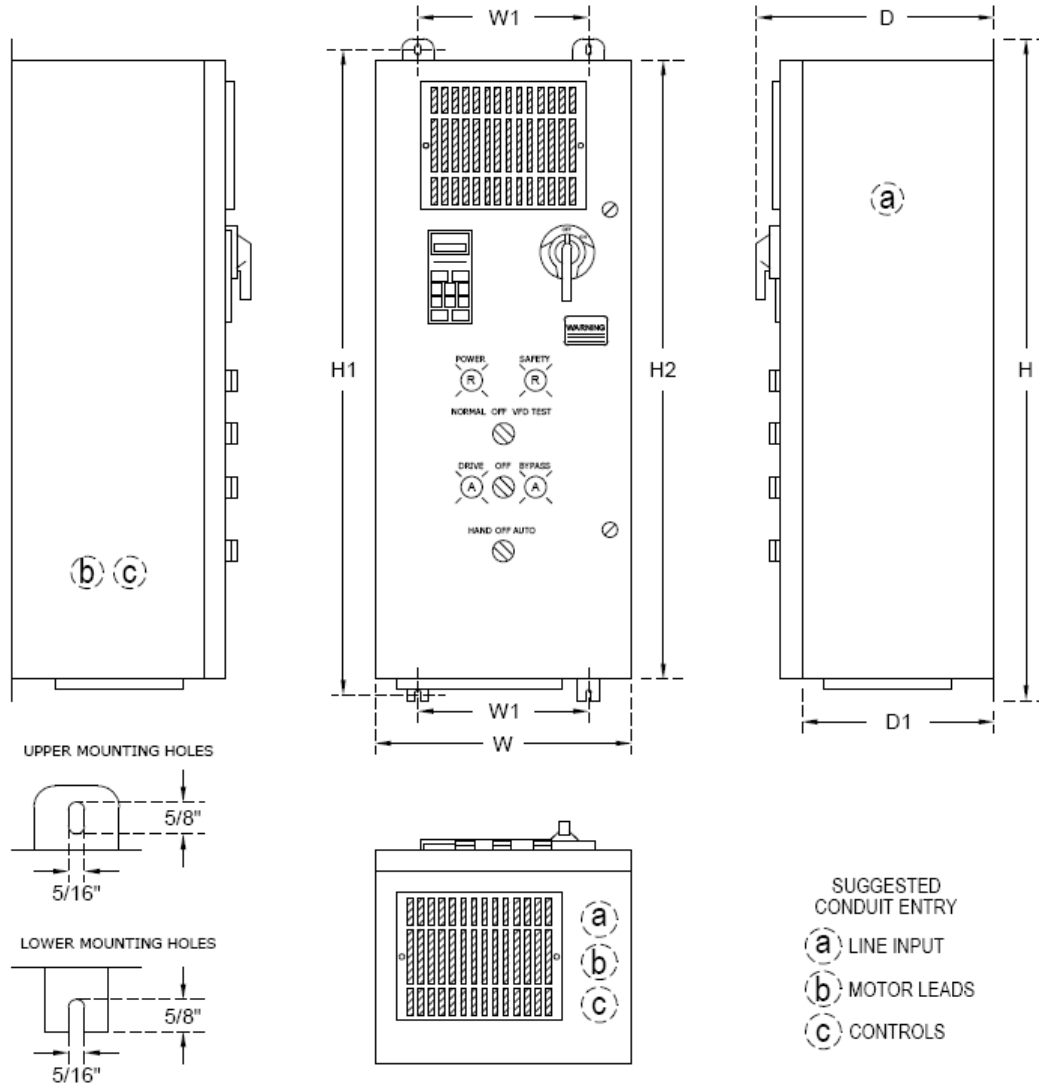
- The clearances to be maintained around the enclosure for adequate ventilation.
- The environmental specifications such as avoiding excessive dampness, extreme temperatures, chemical exposure, corrosive areas etc. to avoid damage to the equipment and to maintain safety.

The next pages show the drawings of the MA7200 enclosure types including the dimensions and weights.



HORSEPOWER - VT			ENCL FRAME	ALL DIMENSIONS ARE IN INCHES							MOUNTING SLOTS					SHIP WT EST
460V	230V	208V		H	W	D	H1	H2	W1	D1	A	B	C	D	E	
1-2	1-2	1-1.5	T2E1V21	51.0	6.5	10.7	50.00	37.2	4.50	8.2	3/8	3/8	7/8	3/8	1/2	85 LBS
3-7.5	3-7.5	2-5	T2E1V22	51.0	6.5	10.7	50.00	37.2	4.50	8.2	3/8	3/8	7/8	3/8	1/2	90 LBS
10-15	10	7.5-10	T2S1V43	43.0	11.1	11.9	42.00	26.7	9.00	9.4	3/8	3/8	7/8	3/8	5/8	150 LBS
20	-	-	T2S1V44	43.0	11.1	11.9	42.00	26.7	9.00	9.4	3/8	3/8	7/8	3/8	5/8	170 LBS
25-30	15-30	15-25	T2S1V64	54.1	15.1	15.8	53.00	36.4	12.50	13.3	1/2	1/2	1	1/2	9/16	235 LBS
40-80	-	-	T2S1V65	64.9	15.1	15.8	63.00	36.4	12.50	13.3	1/2	1/2	1	1/2	9/16	275 LBS
-	40-50	30-40	T2S1V75	78.0	18.7	18.0	76.50	41.8	15.00	13.5	1/2	3/4	1	1/2	3/4	395 LBS
75-100	-	-	T2S1V76	78.0	18.7	18.0	76.50	41.8	15.00	13.5	1/2	3/4	1	1/2	3/4	425 LBS

Fig.1a MA7200 NEMA 1 - Bypass Package



HORSEPOWER - VT			ENCL FRAME	ALL DIMENSIONS ARE IN INCHES							REQUIRED CLEARANCE				SHIP WT ESTIMATE
460V	230V	208V		H	W	D	H1	H2	W1	D1	TOP	BTM	LFT	RGT	
1-7.5	1-3	1-3	CP12-110	28.5	16.0	14.5	27.0	26.0	10.0	11.0	6.0	6.0	2.0	2.0	130 LBS
10-15	5-7.5	5-7.5	CP12-215	35.5	19.0	15.5	34.0	33.0	13.0	12.0	6.0	6.0	2.0	2.0	155 LBS
20-30	10-15	10	CP12-330	38.5	22.0	16.5	37.0	36.0	16.0	13.0	6.0	6.0	2.0	2.0	210 LBS
40-50	20-25	15-20	CP12-335	42.5	22.0	17.5	41.0	40.0	16.0	14.0	6.0	6.0	2.0	2.0	275 LBS
60	30	25	CP12-550	50.5	26.0	17.5	49.0	48.0	20.0	14.0	6.0	6.0	2.0	2.0	340 LBS
75-100	40-50	30-40	CP12-565	51.5	30.0	18.5	50.0	49.0	24.0	15.0	6.0	6.0	2.0	2.0	450 LBS

Fig.1b MA7200 NEMA 12 - Bypass Package

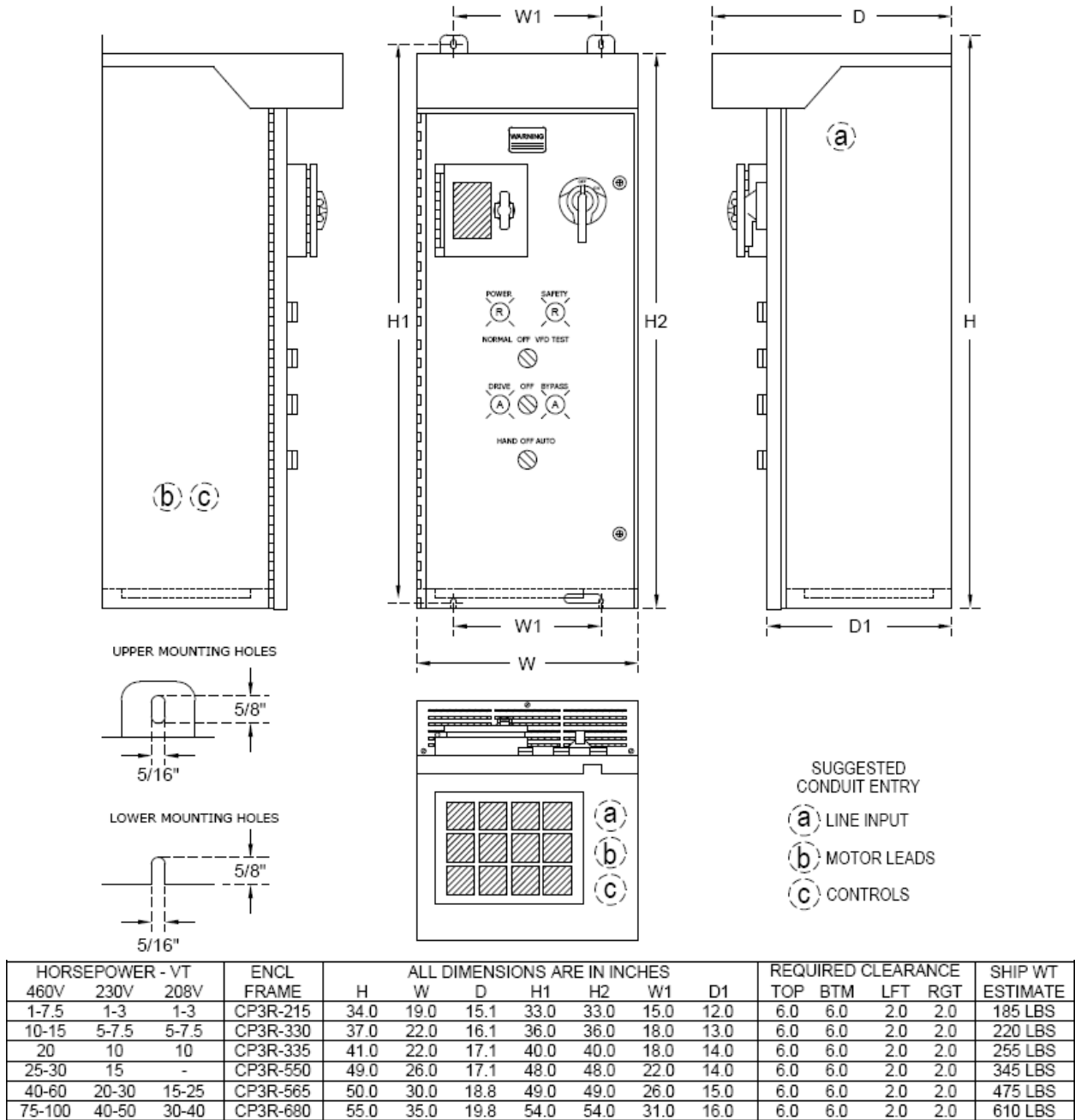


Fig.1c MA7200 NEMA 3R - Bypass Package

The following section pertains to the MA7200 NEMA 1 - Bypass Package

Removing the digital operator (For 230V: 1-2HP, 460V: 1-2HP)

Remove screws “a” and “b” on the front cover. Next remove the front cover and then remove screws “c” and “d”. Disconnect the RS-232 cable connector from the LCD digital operator.

Attaching the Cover (For 230V: 1-2HP, 460V: 1-2HP)

Reconnect the RS-232 cable connector to the back of the LCD digital operator and attach the digital operator using the screws c and d. Insert the tabs of the upper part of front cover into the groove of the inverter and screws a and b.

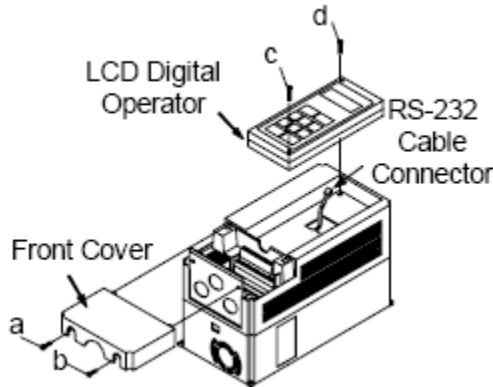


Fig. 2 MA7200 Removing / Attaching Cover (For 230V: 1-2HP, 460V: 1-2HP)

Removing the digital operator (For 230V: 3-10HP, 460V: 3-10HP)

Remove screws a. and b. Press the lever on the side of the digital operator in the direction of arrow 1 to unlock the digital operator. Disconnect the RS-232 cable connector on the back of the LCD digital operator and Lift the digital operator in the direction of arrow 2.

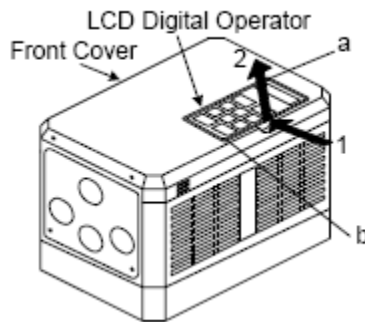


Fig. 3 MA7200 Removing Digital Operator (For 230V: 3-10HP, 460V: 3-10HP)

Removing the Cover (For 230V: 3-10HP, 460V: 3-10HP)

Press the left and right sides of the front cover in the directions of arrow 1 and lift the bottom of the cover in the direction of arrow 2 to remove the front cover.

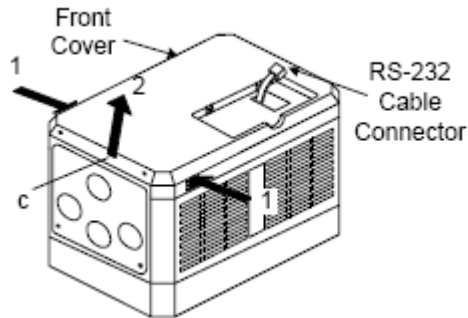


Fig. 4 MA7200 Removing the Cover (For 230V: 3-10HP, 460V: 3-10HP)

Attaching the Cover and Digital Operator (For 230V: 3-10HP, 460V: 3-10HP)

Insert the tab of the upper part of the front cover into the groove of the MA7200 and press the lower part of the front cover onto the inverter until the front cover snaps in place.

Insert the cable connector from the MA7200 into the back of the LCD digital operator and hook the digital operator on the front cover in the direction of arrow 1.

Press the digital operator in the direction of arrow 2 until it snaps into place “b” and then tighten “a” and “b”.

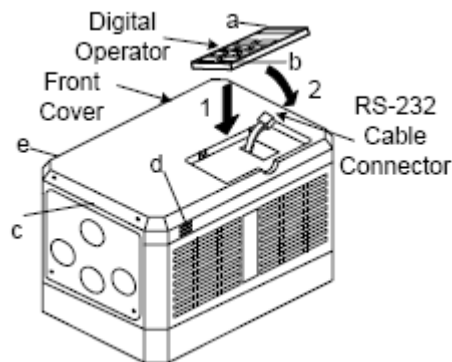


Fig. 5 MA7200 Attaching the Cover and Operator (For 230V: 3-10HP, 460V: 3-10HP)

Removing the digital operator (For 230V: 15, 20HP, 460V: 15, 20HP)

Remove the screws a. and b. Disconnect the RS-232 cable connector on the back side of the LCD digital operator and then lift the digital operator upwards.

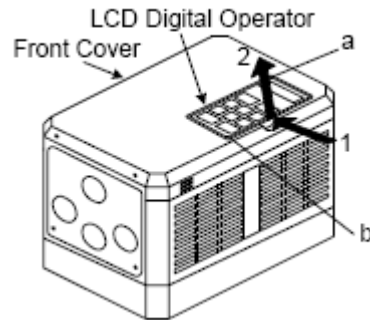


Fig. 6 MA7200 Removing the digital operator (For 230V: 15, 20HP, 460V: 15, 20HP)

Removing the Cover (For 230V: 15, 20HP, 460V: 15, 20HP)

Loosen the two screws c. and d. holding the front cover in the place and lift the bottom of the front.

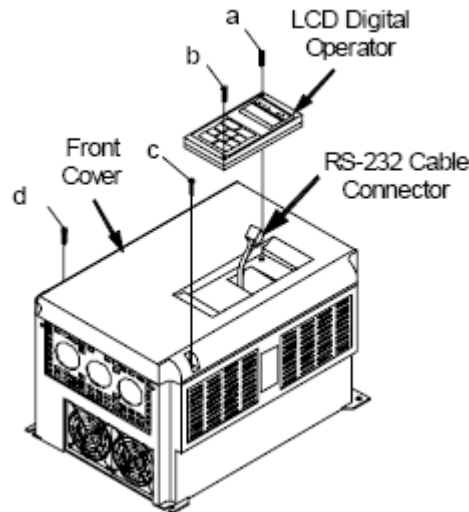


Fig. 7 MA7200 Removing the cover (For 230V: 15, 20HP, 460V: 15, 20HP)

Attaching the Cover and Digital Operator (For 230V: 15, 20HP, 460V: 15, 20HP)

Insert the tab of the upper part of front cover into the groove of the inverter and tighten screws c and d. Connect the RS-232 cable connector on the back of the LCD digital operator. Attach the digital operator and then tighten the screws a and b.

Removing the Cover (For 230V: 30 - 40HP, 460V: 30 – 75HP)

Loosen the two screws a and b of the front cover and loosen the two screws c and d. Lift the front cover upwards to remove. (Do not remove the digital operator.)

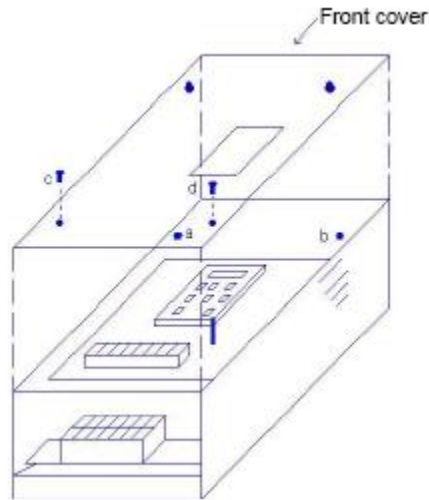


Fig. 8 MA7200 Removing the cover (For 230V: 30 - 40HP, 460V: 30 - 75HP)

Mounting the Cover (For 230V: 30 - 40HP, 460V: 30 – 75HP)

Set the front cover in place and tighten the screws a, b, c and d.

2. Input Power and Motor Connections

Fig.6 below shows the electrical connections for the input power and motor terminals for various MA7200 models. Verify the input power and motor terminals of the model you are installing. **WITH POWER OFF**, make the appropriate connections.

Make sure to follow good wiring practices and all applicable codes and ensure that the equipment is grounded properly as shown.

DANGER, LETHAL VOLTAGES ARE PRESENT- Before applying power to the MA7200 Drive, ensure that the panel cover is in place and all wiring connections are secure. After the power has been turned OFF, wait at least five minutes until the charge indicator extinguishes completely before touching any wiring, circuit boards or components.

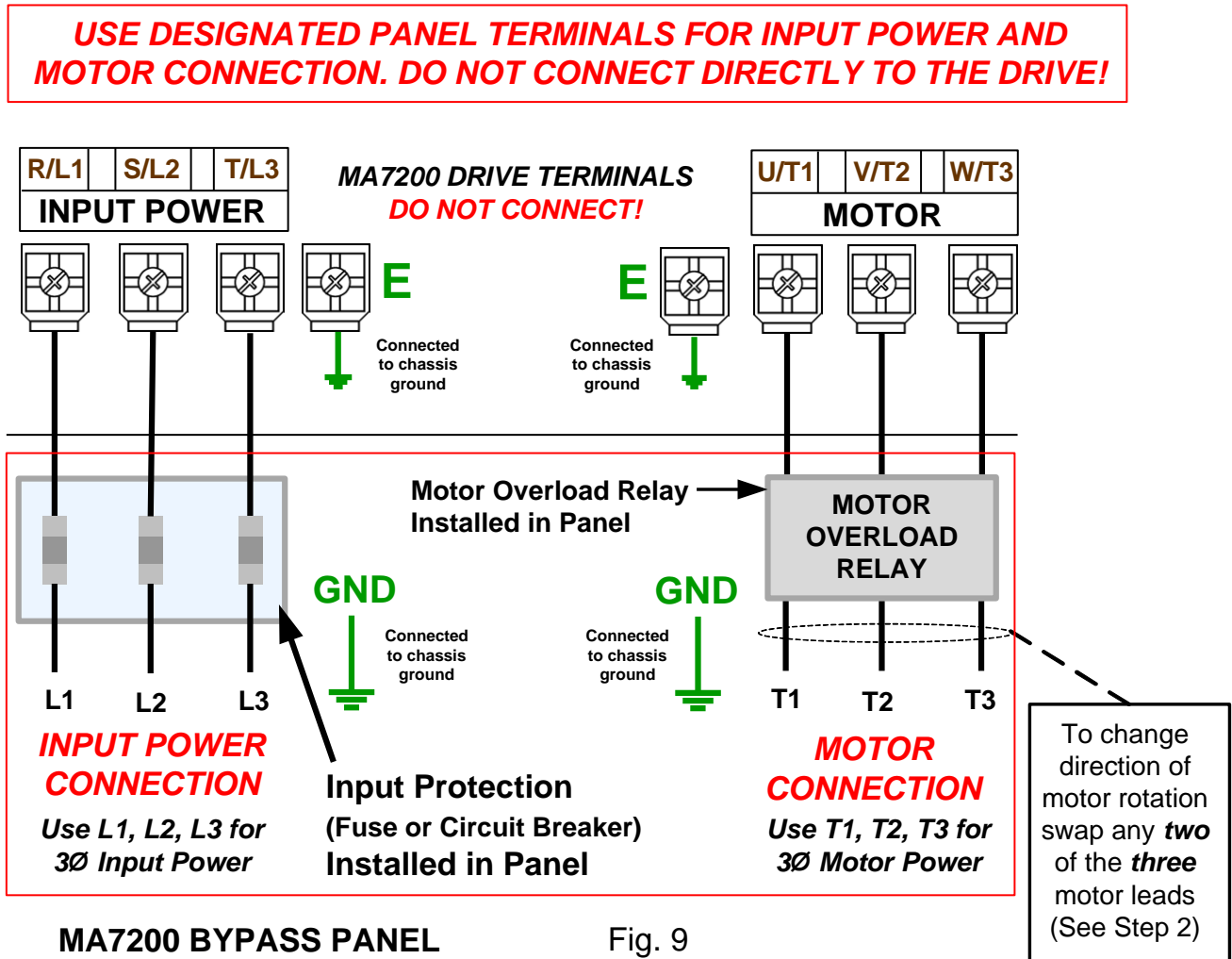


Fig. 9

3. Check Motor Rotation and Direction

This test is to be performed solely from the MA7200 keypad. Apply power to the MA7200 Bypass Panel after all the electrical connections have been made, protective covers have been re-attached and panel door has been closed. At this point, **DO NOT RUN THE MOTOR**, the display of the digital operator should display as shown below in **Fig. 10**.

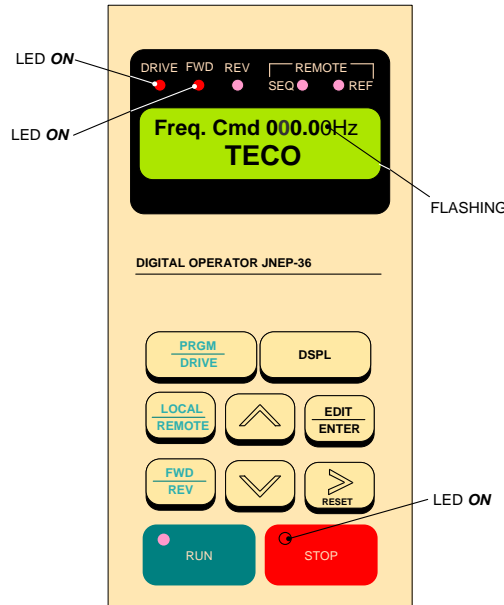


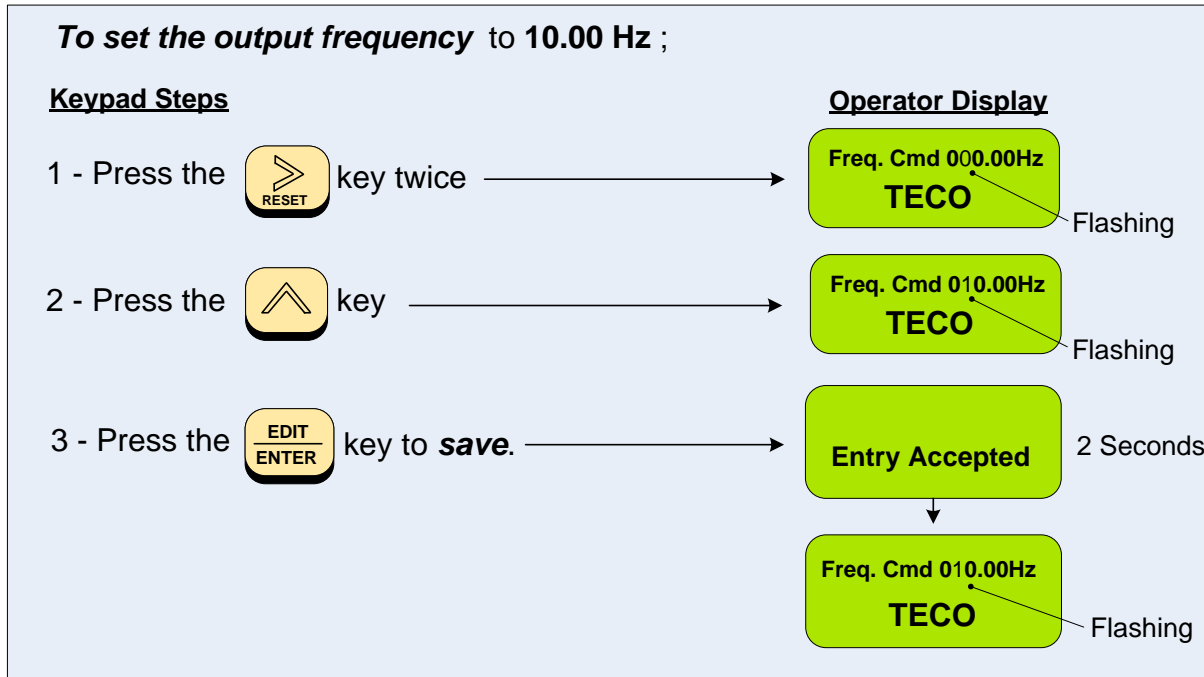
Fig. 10 MA7200 Keypad

Set the MA7200 Drive to Local Run Mode


First put the MA7200 into drive mode by pressing the **PGRM / DRIVE** key until the red **Drive** LED is *on*. Next press the **LOCAL/REMOTE** button to select LOCAL Operation. The speed reference (**0.00**) should now be blinking, the LED on the **Stop** Key should be on and the **DRIVE** and **FWD** LED should be on.

Check 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 other **units** such as (%) of full speed, PSI etc. (see **Step 9**)



The motor should now be operating at low speed running in forward (clockwise) direction.

Next press  on the keypad to stop the motor.

When the motor has come to a complete stop press the **LOCAL/REMOTE** button to select **REMOTE** Operation.

If the motor direction is incorrect, power down the MA7200 drive.

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

Using Safety precaution, and referring to **Fig.9**, swap any **two** of the **three** output leads to the motor (U/T1, V/T2 and W/T3). After the wiring change, repeat **Step 3** and recheck motor direction.

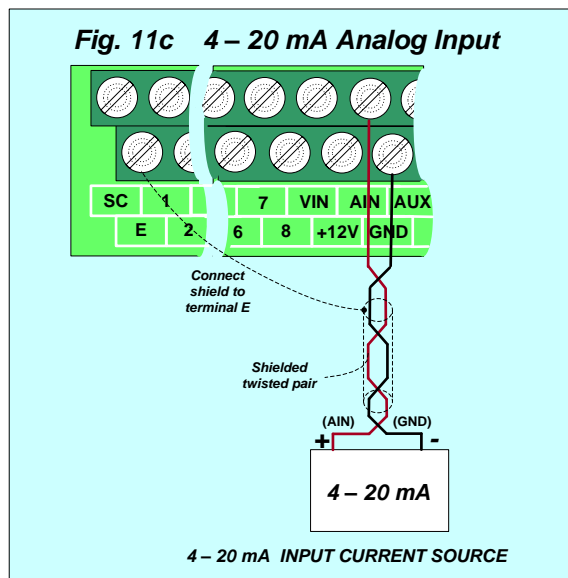
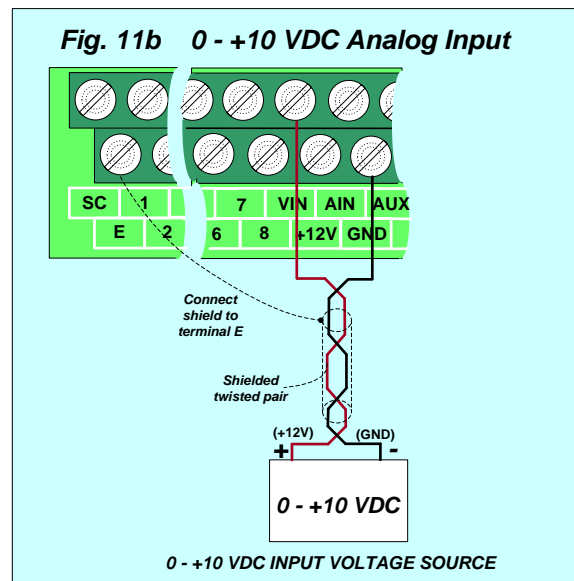
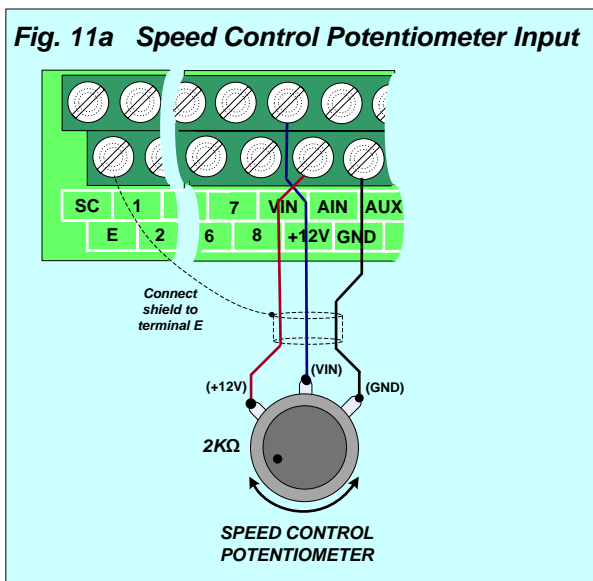
4. Speed Reference Configuration

The MA7200 offers users several choices to set the speed reference from different sources.

Parameter **Sn-05** is used to select the speed reference command.

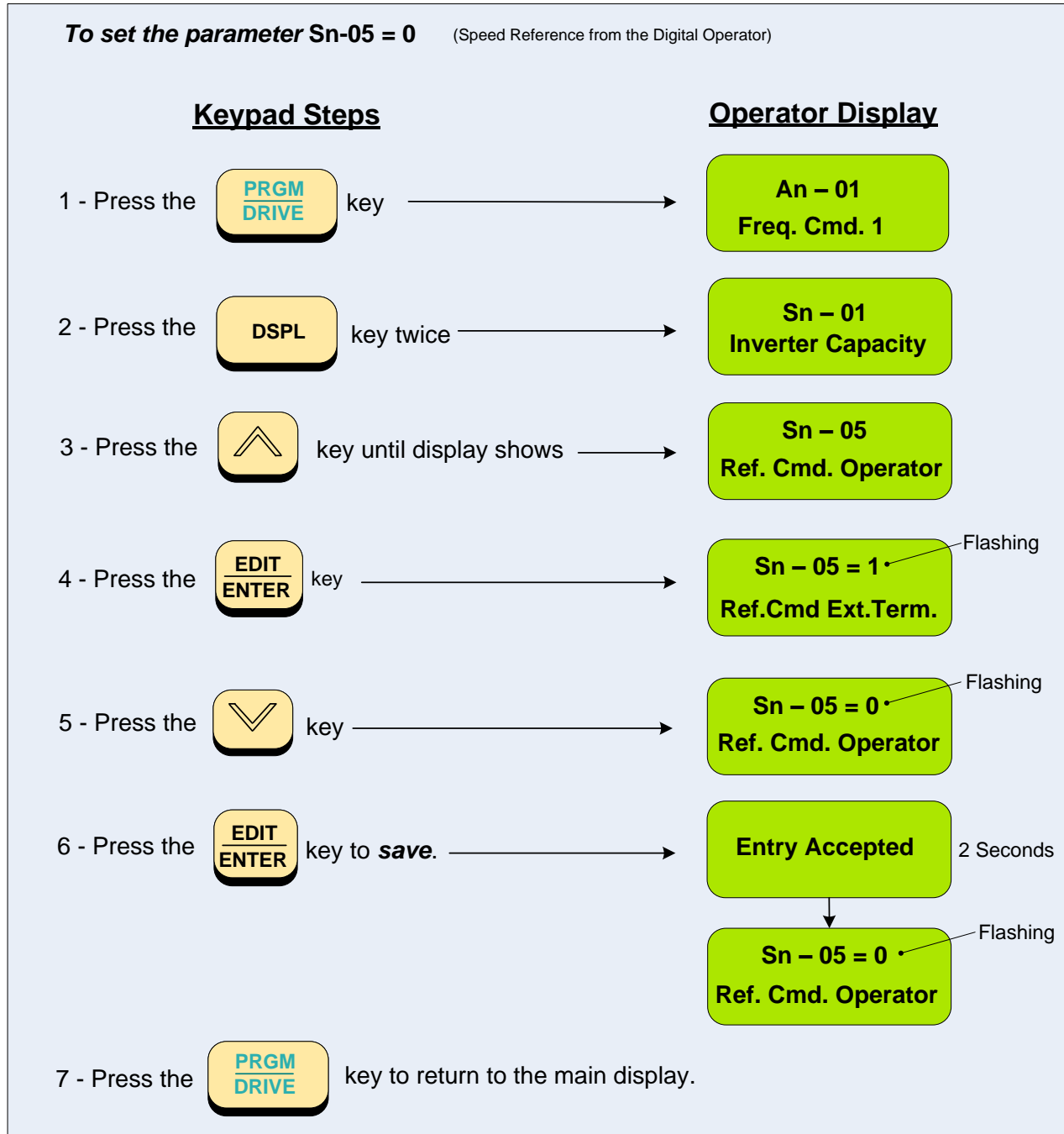
4.1 Reference from External Analog Signal (Default Setting, Sn-05 = 1)

The frequency reference command is selected with parameter Sn-05 and the default setting for the MA7200 bypass is external analog speed reference command (Sn-05 = 1). See below for various analog input solutions.



4.2 Reference from Digital Operator (Sn-05 = 0)

To enter a speed reference on the digital operator parameter Sn-05 has to be programmed to 0.



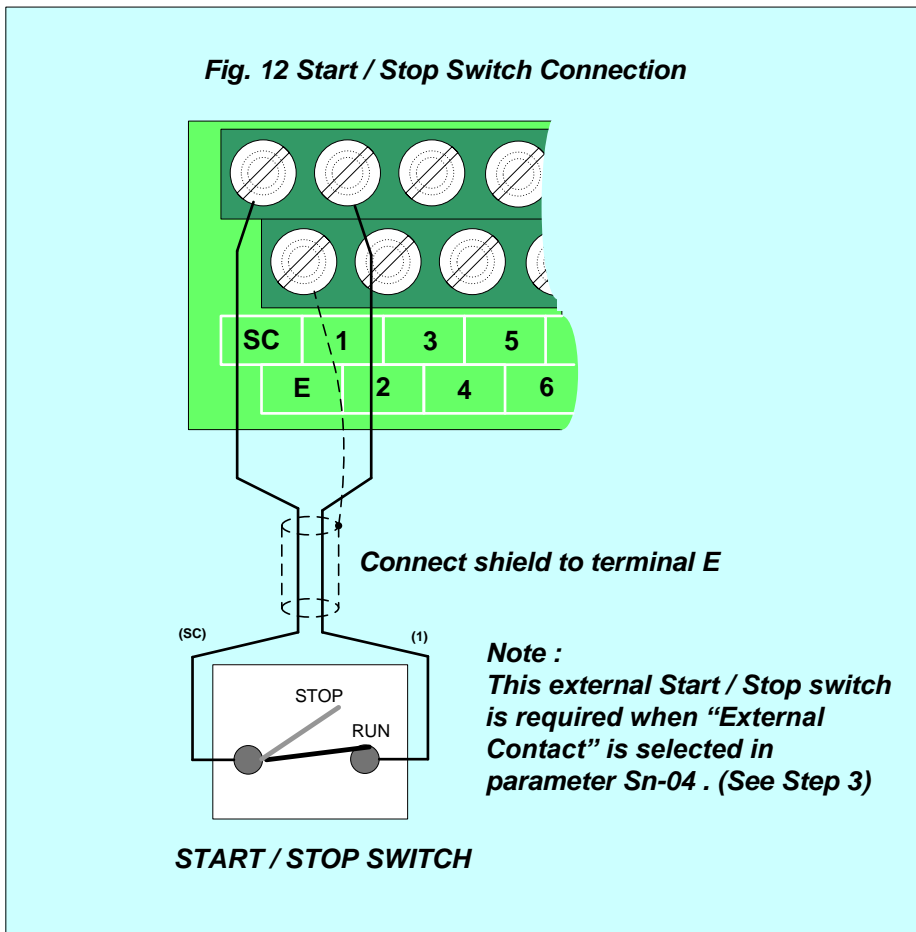
5. Run / Stop Configuration

The MA7200 offers users several choices to run and stop the drive from different sources. The most commonly used methods are described in the next sections.

Parameter **Sn-04** is used to select the start/stop command.

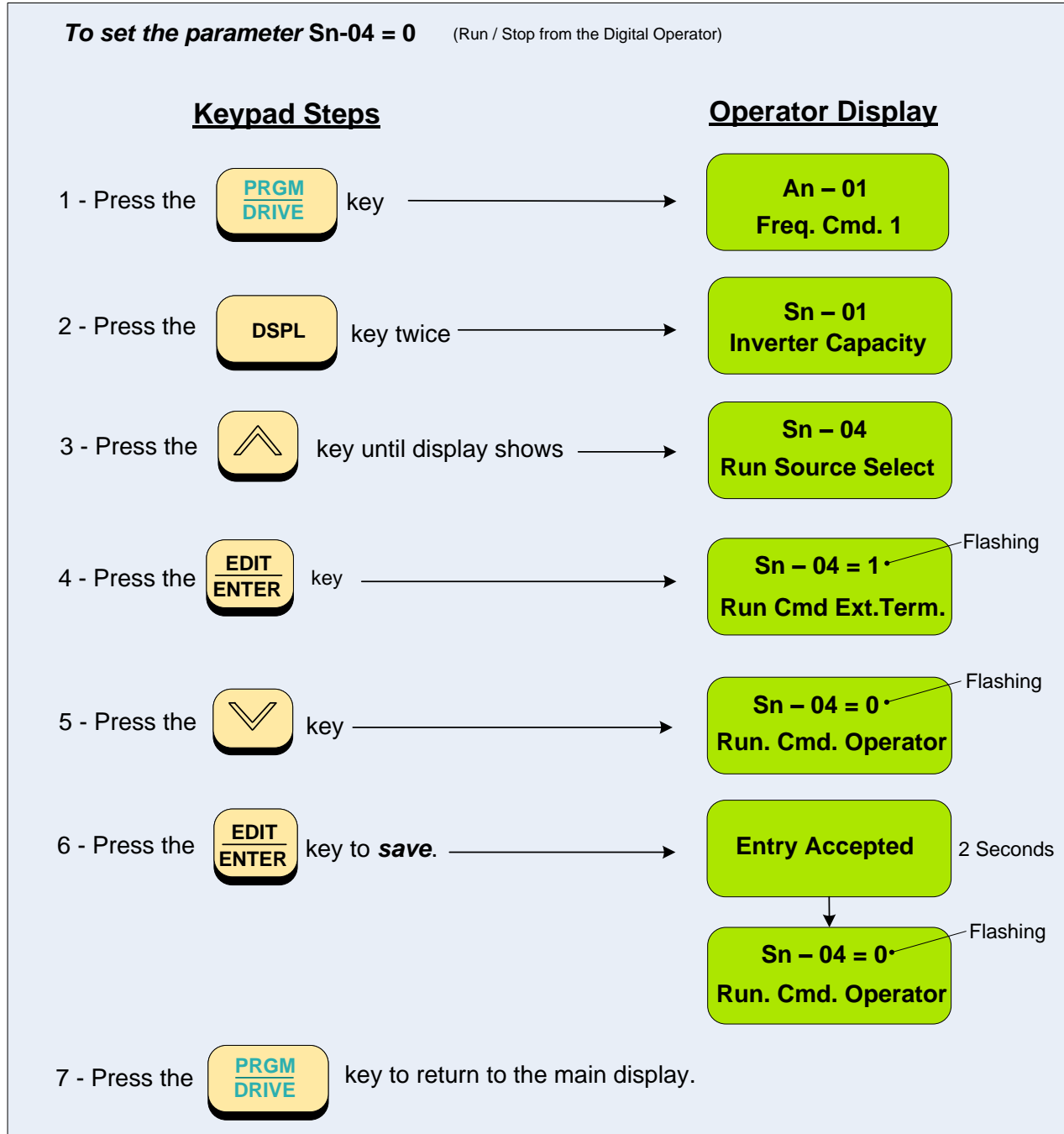
5.1 Run/Stop from External Switch / Contact (Default Setting, Sn-04 = 1)

Wiring diagram Run / Stop Switch



5.2 Run / Stop Command from the Digital Operator (Sn-04 = 0)

To run / stop the MA7200 from the digital operator, parameter Sn-04 has to be programmed to 0.



6. External Fault / Fault Reset / Output Fault Contact

A contact can be used to stop drive operation due to an external fault (default input terminal 3 and SC). Refer to multi-function input parameters Sn-25 to Sn-28 for additional digital input signal functions.

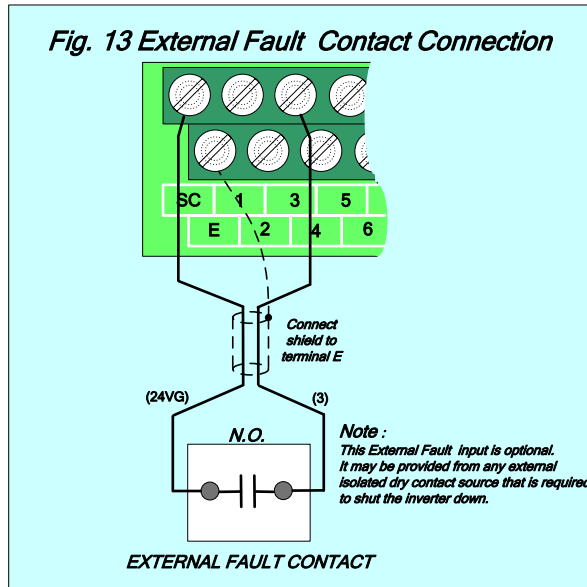
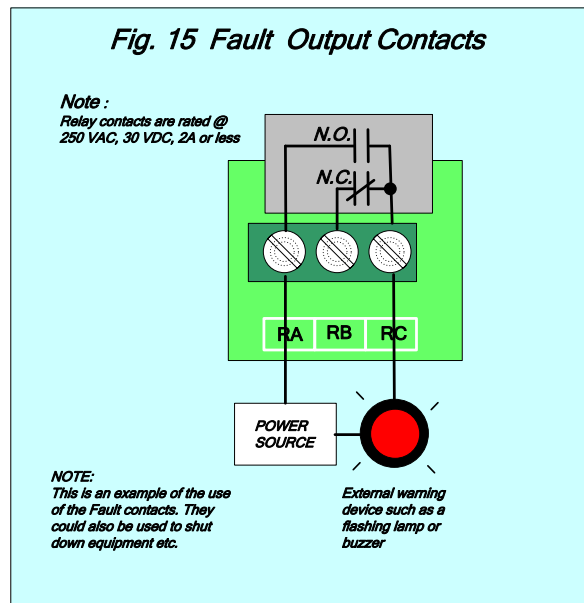
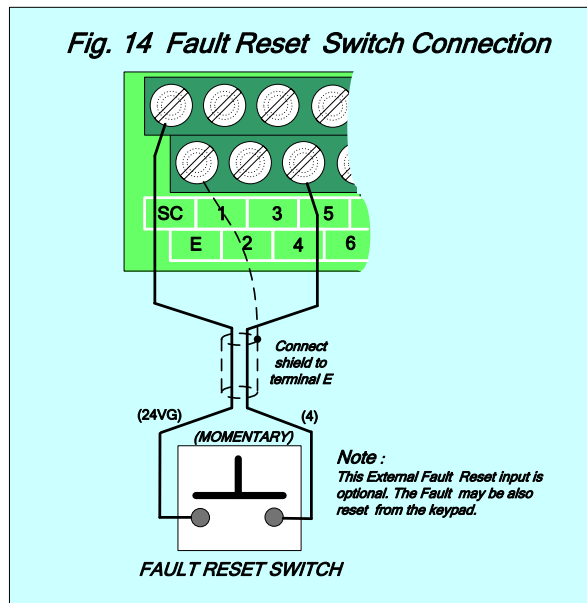


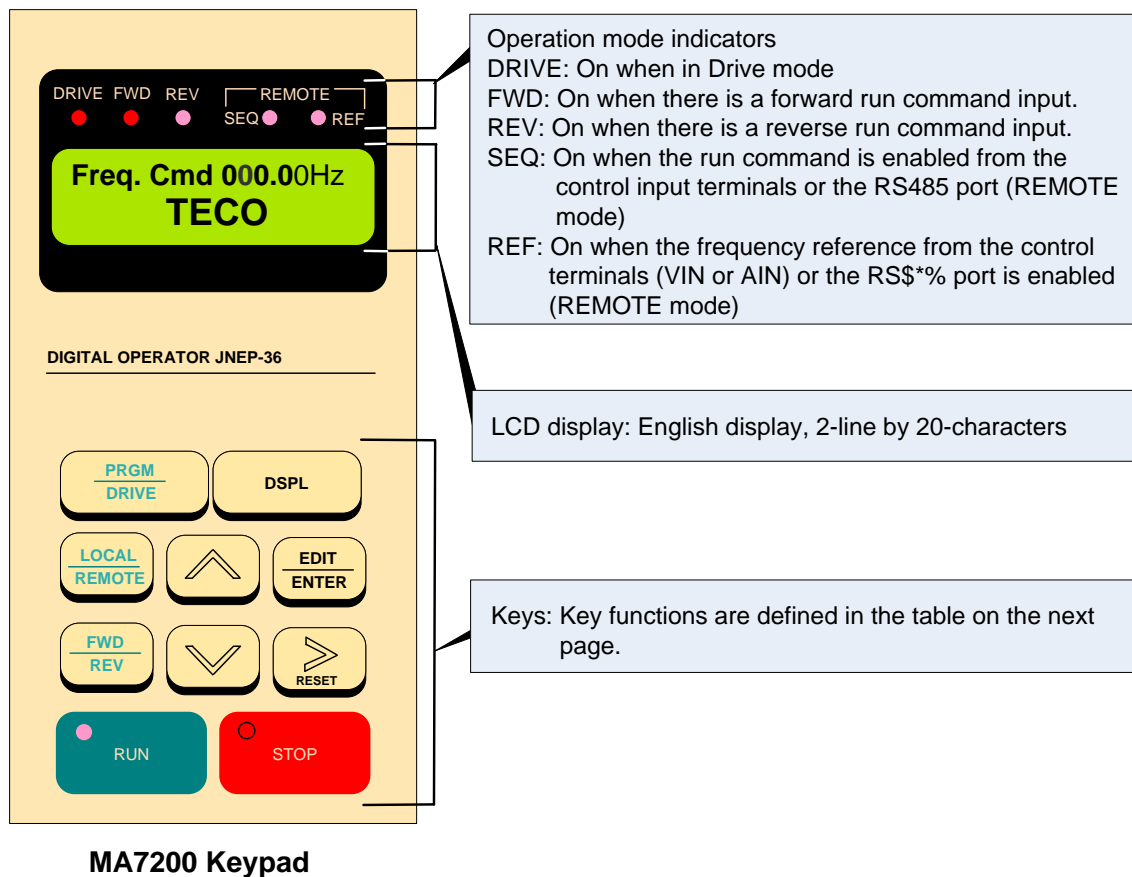
Fig. 14 shows how to connect an external contact to reset the drive after a fault has occurred (default input terminal 4 and SC) and fig. 15 shows how connect an external warning device using the multi-function digital output contracts.



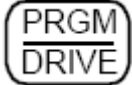








7. Digital Operator Panel

The Digital Operator has various functions for inputting, controlling, and displaying operations such as frequency setting, run/stop command, confirming and changing function data, confirming status, and copying. Please review and become familiar with each function before attempting to operate the drive. The Digital Operator can be removed or inserted during inverter operation, however, if it is removed during a keypad operation (e.g., run/stop, frequency setting), the inverter will stop and initiate an alarm.

7.1 Overview and Navigation

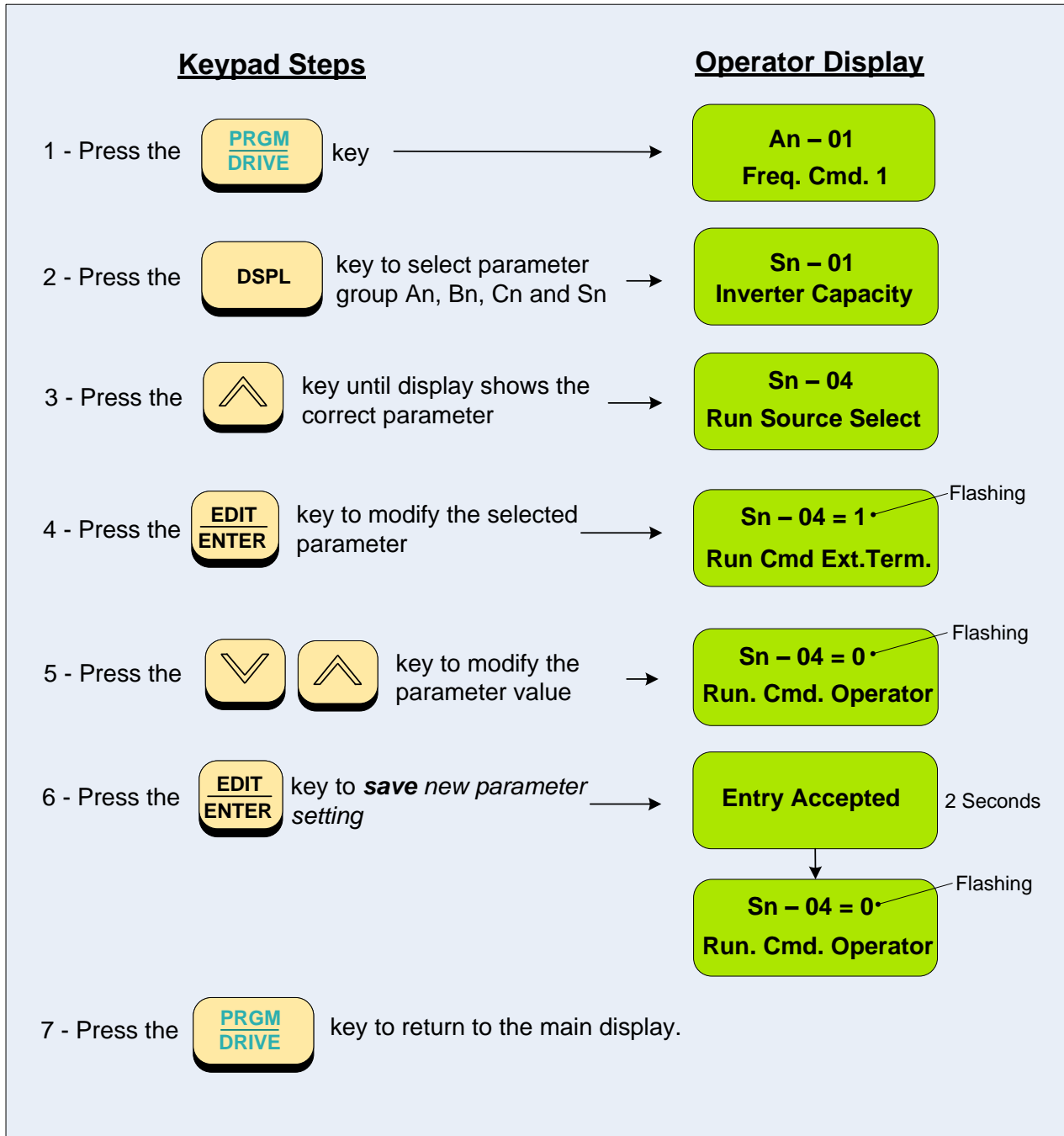


Functions of Operation Keys

Key	Name	Function
	PRGM / DRIVE key	Switches between program mode (PRGM) and drive mode (DRIVE).
	DSPL key	Display operation status
	Jog Key	Activate jog operation when pushed
	INC/DEC key	Used to change data, move the cursor up or down, or scroll the display screen.
	RESET key	Used to move the cursor horizontally when changing data or Reset the MA7200 when a fault has occurred.
	FWD/REV key	Select the motor rotation direction from the digital operator.
	EDIT/ENTER key	Select menu items, groups, functions, and user constants name, and set values (EDIT). Press the ENTER key to confirm selection.
	RUN key	Start MA7200 operation in (DRIVE) mode when parameter Sn-04 is set to '0' or when the MA7200 is operated in local mode.
	STOP key	Stop the MA7200 operation from the digital operator. The STOP key can be enabled or disabled by setting parameter Sn-07 when operating from external run/stop terminals.

7.2 Programming Parameters

On the program menu screen, push the **PRGM / DRIVE** key. The parameter select screen appears. Select the desired parameter and set value as follows.

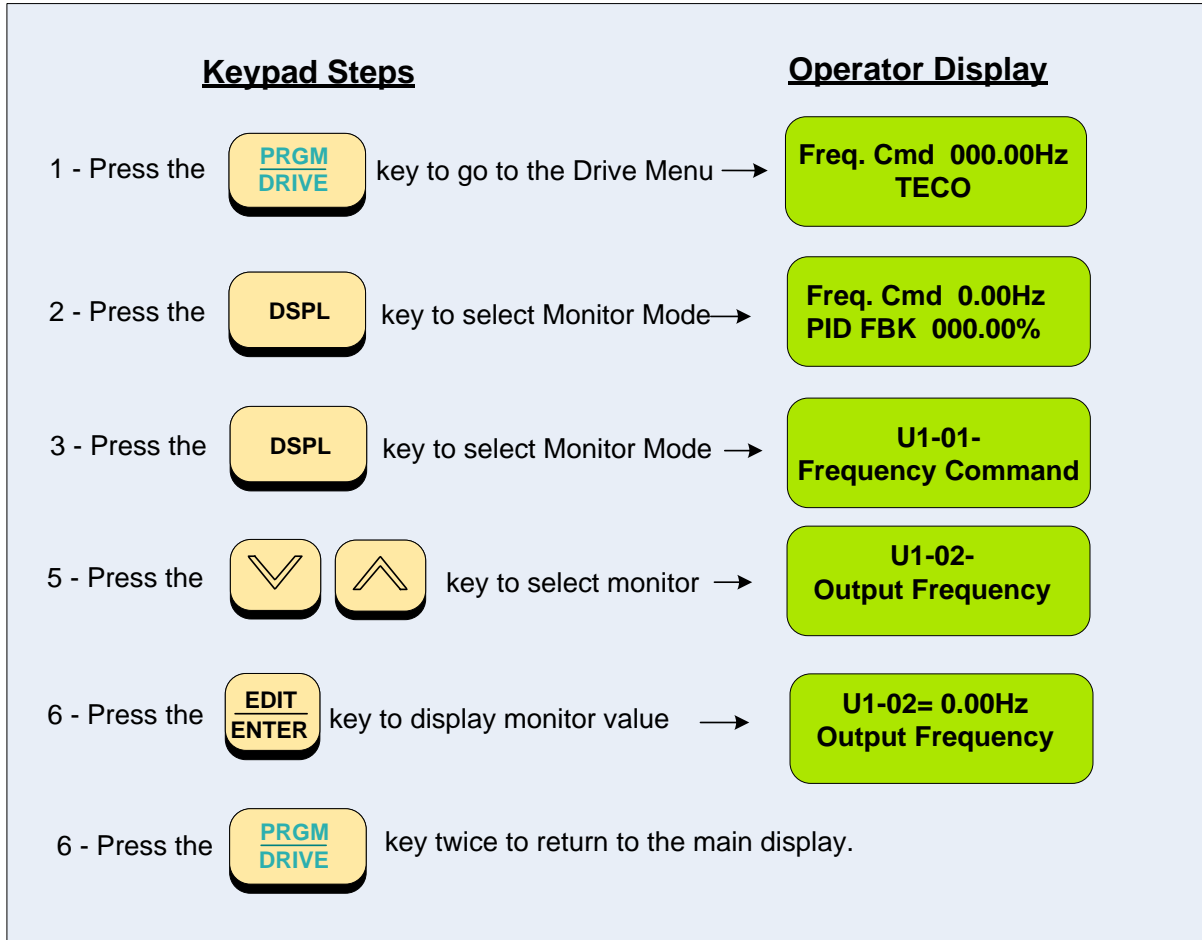


The parameter designations (function codes) consist of alphanumeric characters with unique alphabetical letters assigned to each parameter group (see table on the next page).

Parameter Designations and Corresponding Groups

Parameter	Group name	Remarks
An	Frequency command parameter group	Can be changed while the drive is running
Bn	Application parameter group	Can be changed while the drive is running
Sn	System parameter group	Can only be changed when drive is stopped
Cn	Control parameter groups	Can only be changed when drive is stopped
P	Fan/Pump Application parameter groups	Only specific parameters can be changed when drive is running, refer to the user manual for more information.

7.3 Monitoring Signals and Status



8. Motor and Application Specific Settings

It is essential that before running the motor, the motor nameplate data matches the motor data stored in the MA7200.

8.1 Maximum Rated Motor Current (Cn-09)

The motor rated current is set at the factory based on the drive size. Please verify that the motor FLA on the motor nameplate matches the motor rated current shown in parameter Cn-09.

Setting range: 0.00 to Maximum Rated Motor Current depends on drive size

8.2 Motor Overload Protection Selection (Sn-23)

Parameter Sn-23 is used to select the motor overload protection.

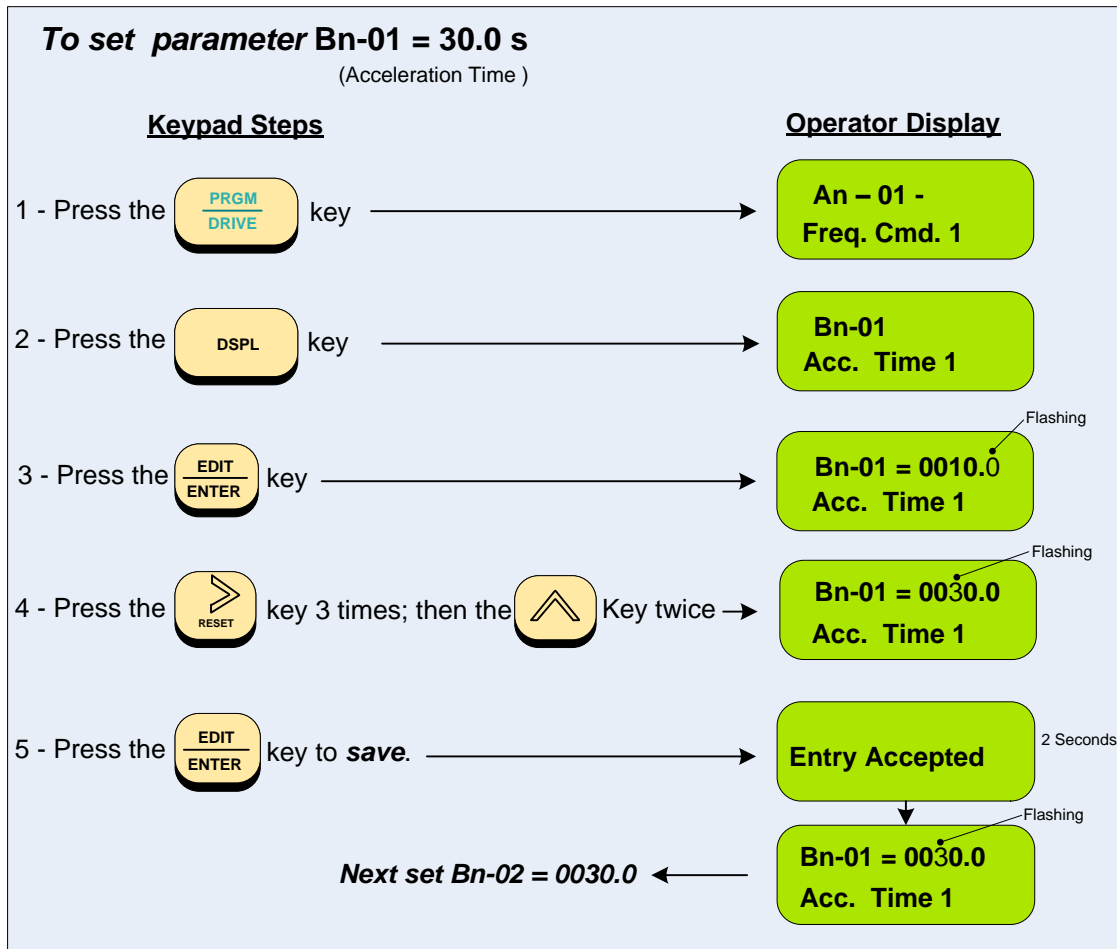
- 0: Electronically motor overload protection disabled
- 1: Standard motor cold start overload protection characteristics **(factory default)**
- 2: Standard motor hot start overload protection characteristics
- 3: Special motor cold start overload protection characteristics
- 4: Special motor hot start overload protection characteristics

8.3 Acceleration and Deceleration Time (Bn-01 / Bn-08)

Acceleration and Deceleration times as well as the PID control [(P) Proportional Gain and/or the (I) Integral Time (see STEP 11) directly control the system dynamic response. The longer the acceleration and deceleration time, the slower the system response, and the shorter time, the faster the response. An excessive amount of time can result in sluggish system performance while too short of a time may result in system instability.

The starting values suggested by this guide normally result in good system performance for the majority of fan and pump applications. If the values need to be adjusted, caution should be exercised, and the changes should be in small increments to avoid system instability.

Parameters **Bn-01** (Acceleration) and **Bn-02** (Deceleration) are **both** set at the factory for **10.0 seconds**. For fan and pump applications, the recommended starting values are **30 seconds**. To change these parameters, follow the keypad navigation procedure as shown next.



9. Using PID Control for Constant Flow / Pressure Applications

9.1 What is PID Control?

The PID function in the MA7200 drive can be used to regulate a process variable such as pressure, flow, temperature by regulating the output frequency (motor speed). A **feedback device** (transducer) signal is used to compare the actual process variable to a specified **set-point**. The difference between the set-point and feedback signal is called the error signal. The PID control tries to minimize this error to by automatically adjusting the output frequency and thus the motor speed.

The amplitude of the error can be adjusted with the **Proportional Gain** parameter **Bn-17** and is directly related to the output of the PID controller, so the larger gain the larger the output correction.

Example 1:

Gain = 1.0

Set-Point = 80%

Feedback = 78%

Error = Set-point - Feedback = 2%

Control Error = Gain x Error = 2%

Example 2:

Gain = 2.0

Set-Point = 80%

Feedback = 78%

Error = Set-point - Feedback = 2%

Control Error = Gain x Error = 4%

Please note that an excessive gain can make the system unstable and oscillation may occur.

The response time of the system can be adjusted with the **Integral Gain** set by parameter **Bn-18**. Increasing the **Integral Gain Time** will make the system less responsive while decreasing the **Integral Gain Time** will increase response but may result in instability of the total system.

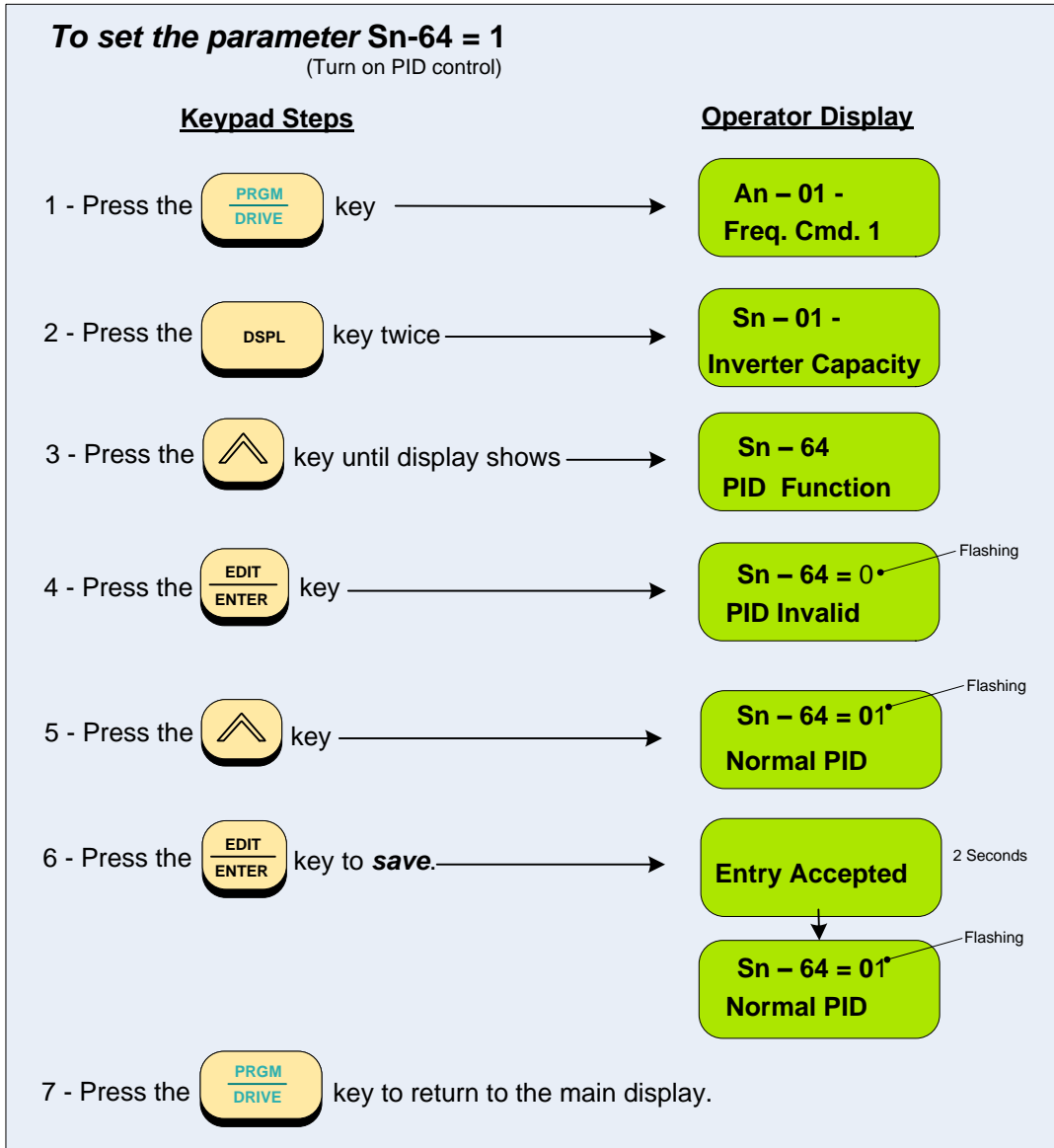
Slowing the system down response time too much may be unsatisfactory for the process. The end result is that these two parameters in conjunction with the acceleration (**F07**) and deceleration (**F08**) times (see **chapter 7.2**) are adjusted to achieve optimum performance for a particular application.

For typical fan and pump applications a Proportional Gain (Bn-17) of 2.0 and an Integral Gain Time (Bn-18) of 5.0 sec is recommended.

Enable PID control (Sn-64), and Feedback input (Sn – 24)

Before selecting the parameter(s), **ensure the inverter is in the STOP mode.**

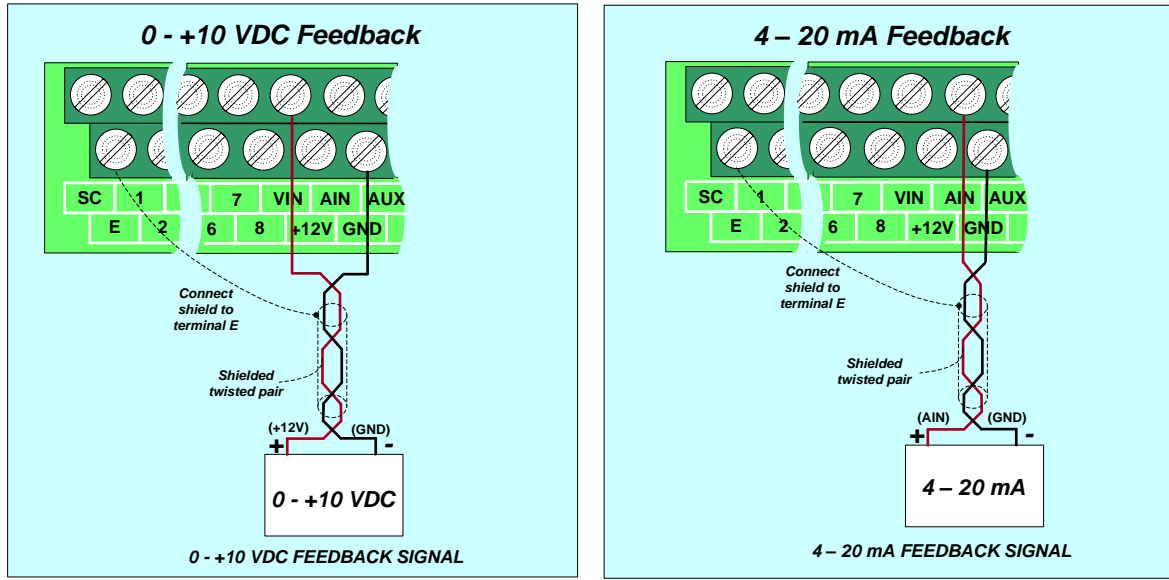
- To activate PID control parameter (**Sn-64**) must be set to =1.
- To set the parameter(s), follow the navigation procedure as shown next.
-



9.2 Connect Feedback Signal (Sn-24)

Depending on the type of feedback transducer used the MA7200 drive can be setup for either 0-10V or a 4-20mA feedback transducer using parameter Sn-24.

Sn-24 is set to = 1 (**AIN, 4-20 mA**), as factory default. To select (**VIN, 0-10 Vdc**), (**Sn-24**) must be set to 0.



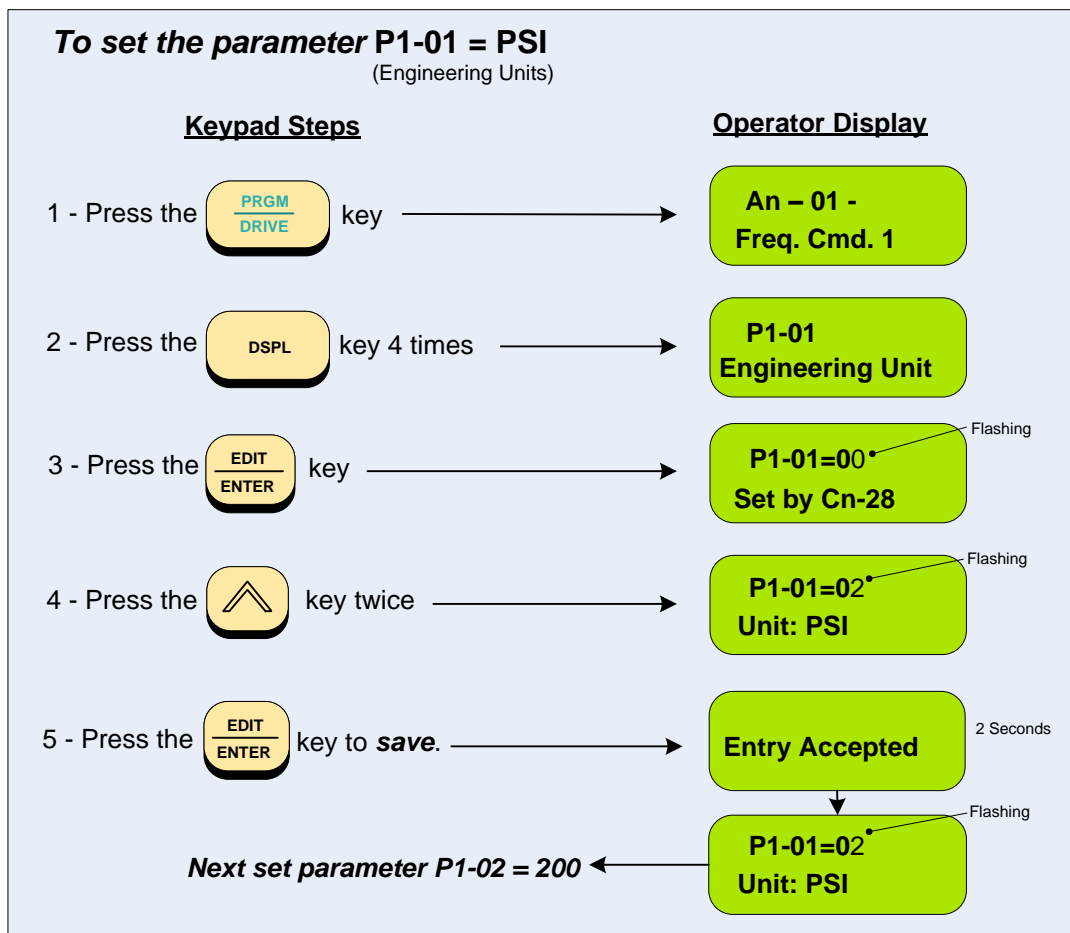
9.3 Set-Point Scaling / Transducer Feedback Scaling (P1-01 / P1-02)

Initially the display will read *output frequency* in (Hz) as the *factory default* and is set by parameter (**Cn-28=0**). If (**Cn-28**) is changed to (**=1**), then the display will read out in (%). The setting of (**Cn-28**) is only *valid* if (**P1-01=0**), which is the *factory default*. Other engineering units may be selected by parameter setting (**P1-01**) as described below.

In this step, the feedback engineering units that the system is controlling such as *CPM* in fan applications or *PSI* in the case of pumps can be selected by parameter (**P1-01**). (See **Appendix A** for additional selections). The *maximum* value that the engineering units will be in any given application is set by parameter (**P1-02**). These selections will now be displayed on the digital operator.

Example:

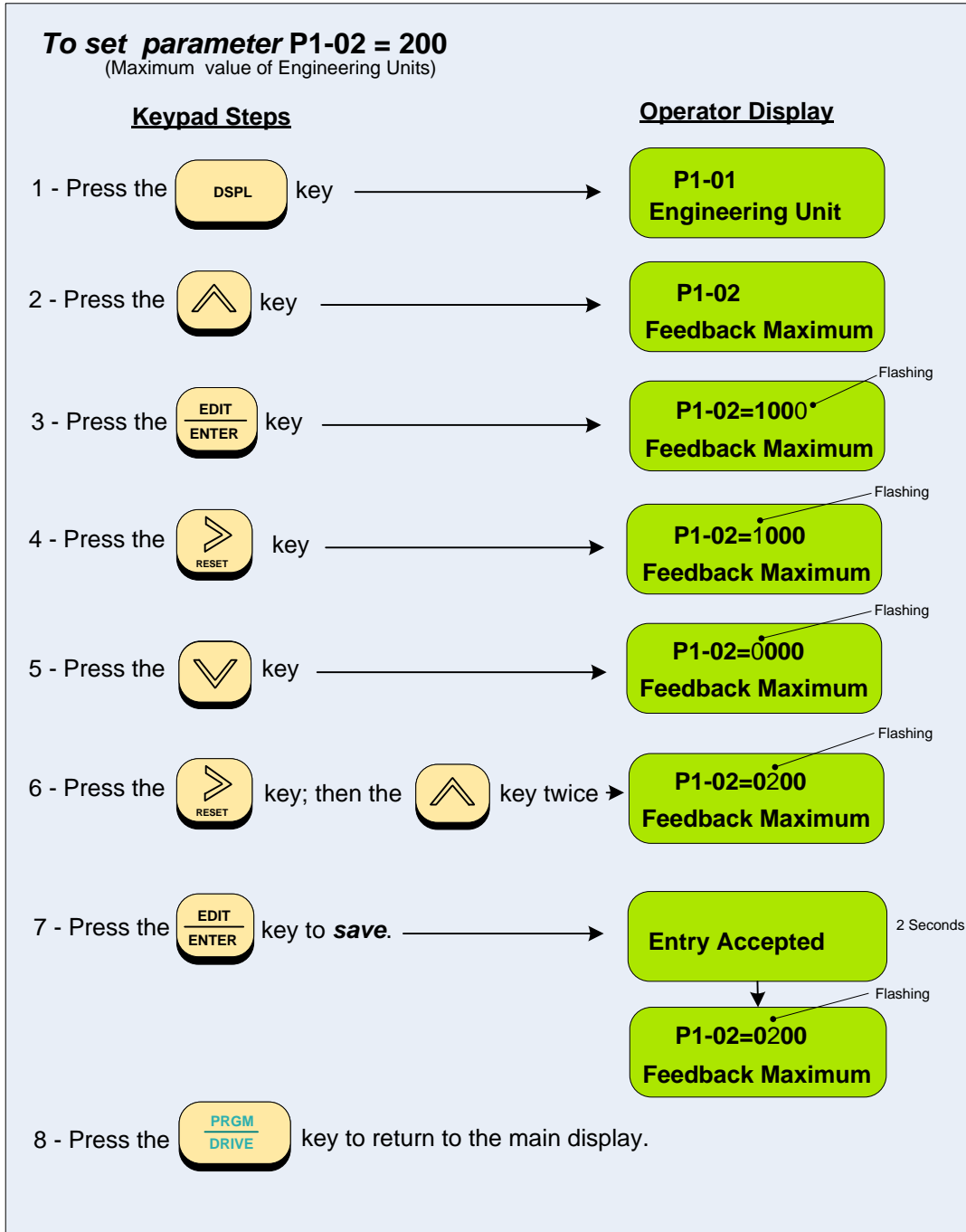
A pump application that has a feedback transducer with a maximum value of 200 PSI i.e 200 PSI = 20mA or 10 Vdc, can be set as shown next.



Note: Once P1-01 is set to a non-zero value, then Cn-28 is no longer valid.

Important Note:

In order to enter the set-point from the digital operator Reference selection Sn-05 has to be programmed to 0, see section 4.2 Reference from Digital Operator.



Appendix A – Startup Sheet – Standard Application – Useful Parameters

MA7200 Plus Parameter Reference Standard Application (Non PID)		
User Information		
Date:		
Project Name:		
Started up by:		
Drive Type:	V	HP
Parameter List	Parameter Setting	User Setting
[GROUP: Sn System Parameters]		
Sn-02 V/F Curve Selection	06-60Hz Variable Torque (Fan) 07-60Hz Variable Torque (Pump)	
Sn-03 Operator Display	00-An,Bn,Cn,Sn Read/Write Enabled	
Sn-04 Run Source Selection	00-Operator 01-Terminals 02-Serial Communications	
Sn-05 Frequency Source Selection	00-Operator 01-Terminals 02-Serial Communications	
Sn-06 Stop Method Selection	00-Deceleration to stop 01- Coast to Stop	
Sn-07 Priority of Stopping	00-Operator STOP key effective	
Sn-08 Prohibition of REV Run	00-Reverse run enabled 01-Reverse run Disabled	
Sn-18 Operation Selection at Powerloss	00-Stop running 01-Powerloss Ride Thru	
Sn-23 Motor Overload Protection Selection	01-Standard motor cold start	
Sn-24 Frequency Command Characteristics Selection	00-Voltage signal 0-10V (VIN) 01-Current signal 4-20mA (AIN)	
Sn-61 Applied Torque Mode	01-Variable Torque	

Parameter List	Parameter Setting	User Setting
[GROUP: Bn Basic Parameters]		
Bn-01 Acceleration Time 1	30.0 sec.	
Bn-02 Deceleration Time 1	45.0 sec.	
Bn-05 Voltage Analog Input Gain (VIN)	100.0 %	
Bn-06 Voltage Analog Input Bias (VIN)	0.0 %	
Bn-07 Current Analog Input Gain (AIN)	100.0 %	
Bn-08 Current Analog Input Bias (AIN)	0.0 %	
Bn-09 Multi Function Analog Input Gain (AUX)	100.0 %	
Bn-11 Auto Torque Boost Gain	0.5	
Bn-12 Monitor 1 (If used)	02- Output Frequency	
Bn-13 Monitor 2	03- Output Current	
[GROUP: Cn Control Parameters]		
Cn-09 Motor Rated Current	Motor FLA	
Cn-18 Frequency Cmd Upper Limit	100 %	
Cn-19 Frequency Cmd Lower Limit	0 %	
Cn-24 Number of Auto Restart Attempt	5	
Cn-34 Carrier Frequency Setting	Refer to Pg 3-24 of manual	
Cn-46 Pole no. of Motor	2 Pole(s) (3600 RPM) 4 Pole(s) (1800 RPM) 6 Pole(s) (1200 RPM)	
Sn-63 - Parameter Copy	2 – Copies drive parameters to keypad. Saves parameters in the keypad as well as in the drive. In case of drive failure, backup can be used to reload all the parameters into the new drive.	
For reference only. For Installation Instructions, additional controls or special system programming, consult the MA7200 Plus Instruction Manual supplied with the drive.		

Appendix B – Startup Sheet – PID Application – Useful Parameters

MA7200 Plus Parameter Reference Standard Application with PID		
User Information		
Date:		
Project Name:		
Started up by:		
Drive Type:	V	HP
Parameter List	Parameter Setting	User Setting
[GROUP: Sn System Parameters]		
Sn-02 V/F Curve Selection	06-60Hz Variable Torque (Fan) 07-60Hz Variable Torque (Pump)	
Sn-03 Operator Display	00-An,Bn,Cn,Sn Read/Write Enabled	
Sn-04 Run Source Selection	00-Operator 01-Terminals 02-Serial Communications	
Sn-05 Frequency Source Selection	00-Operator 01-Terminals 02-Serial Communications	
Sn-06 Stop Method Selection	00-Deceleration to stop 01- Coast to Stop	
Sn-07 Priority of Stopping	00-Operator STOP key effective	
Sn-08 Prohibition of REV Run	00-Reverse run enabled 01-Reverse run Disabled	
Sn-12 Torque Detection Mode	6 - Undertorque selected. Stop operation after detection	
Sn-18 Operation Selection at Powerloss	00-Stop running 01-Powerloss Ride Thru	
Sn-23 Motor Overload Protection Selection	01-Standard motor cold start	
Sn-24 Frequency Command Characteristics Selection	00-Voltage signal 0-10V (VIN) 01-Current signal 4-20mA (AIN)	
Sn-61 Applied Torque Mode	01-Variable Torque	
Sn-64 PID Function	1 - PID Turned On	

Parameter List	Parameter Setting	User Setting
[GROUP: Bn Basic Parameters]		
Bn-01 Acceleration Time 1	30.0 sec.	
Bn-02 Deceleration Time 1	45.0 sec.	
Bn-05 Voltage Analog Input Gain (VIN)	100.0 %	
Bn-06 Voltage Analog Input Bias (VIN)	0.0 %	
Bn-07 Current Analog Input Gain (AIN)	100.0 %	
Bn-08 Current Analog Input Bias (AIN)	0.0 %	
Bn-09 Multi Function Analog Input Gain AUX)	100.0 %	
[GROUP: Bn Basic Parameters]		
Bn-11 Auto Torque Boost Gain	0.5	
Bn-12 Monitor 1 (If used)	02- Output Frequency	
Bn-13 Monitor 2	03- Output Current	
Bn-16 PID Detection Gain	Adjust if signal and feedback from external sensor do not match. Use only is required.	
Bn-17- PID Proportional Gain	(1.0) Increase by 0.1. Decrease when system becomes unstable.	
Bn-18 PID Integral Time	(1.0) Decrease by 0.1. Increase when system becomes unstable.	
Bn-19 PID Differential Time	(0.0) Do Not Use	
[GROUP: Cn Control Parameters]		
Cn-09 Motor Rated Current	Motor FLA	
Cn-18 Frequency Cmd Upper Limit	100 %	
Cn-19 Frequency Cmd Lower Limit	0 %	
Cn-24 Number of Auto Restart Attempt	5	
Cn-32 Torque Detection Level 1	Set to percentage you want for undertorque level. Based on 0-109% of motor torque.	
Cn-33 - Torque Detection Time	5-10 seconds before shutdown	
Cn-34 Carrier Frequency Setting	Refer to Pg 3-24 of manual	
Cn-46 Pole no. of Motor	2 Pole(s) (3600 RPM) 4 Pole(s) (1800 RPM) 6 Pole(s) (1200 RPM)	
Sn-63 - Parameter Copy	2 – Copies drive parameters to keypad. Saves parameters in the keypad as well as in the drive. In case of drive failure, backup can be used to reload all the parameters into the new drive.	
For reference only. For Installation Instructions, additional controls or special system programming, consult the MA7200 Plus Instruction Manual supplied with the drive.		

[GROUP: P Fan / Pump Application Parameters]		
Parameter List	Parameter Setting	User Setting
P1-01 Engineering Unit	00 - 25	
P1-02 Feedback Maximum	10 - 9999 (Eng. Units set by P1-01)	
P1-03 Local/Remote Key	0: Enabled 1: Disabled (Jog)	
P1-04 PID Sleep Function	0: PID Sleep Invalid 1: PID Sleep Valid	
P1-05 PID Wakeup Direction	0: Feedback above 1: Feedback below	
P2-01 Sleep Start Level	000.00 - 100.00%	
P2-02 Sleep Start Delay	000.1 - 600.0 s	
P2-03 Sleep Wakeup Level	000.00 - 099.99%	
P2-04 Sleep Wakeup Delay	000.1 - 600.0 s	

Appendix C – Parameter Setting List

Customer:				MA7200 PLUS Model No.					
Site:									
Equipment:									
An		Bn						Cn	
Para	Setting	Para	Setting	Para	Setting	Para	Setting	Para	Setting
An-01		Bn-01		Bn-17		Bn-41		Cn-01	
An-02		Bn-02		Bn-18		Bn-42		Cn-02	
An-03		Bn-03		Bn-19		Bn-43		Cn-03	
An-04		Bn-04		Bn-20		Bn-44		Cn-04	
An-05		Bn-05		Bn-15		Bn-45		Cn-05	
An-06		Bn-06		Bn-16		Bn-46		Cn-06	
An-07		Bn-07		Bn-17				Cn-07	
An-08		Bn-08		Bn-18				Cn-08	
An-09		Bn-09		Bn-19				Cn-09	
An-10		Bn-10		Bn-20				Cn-10	
An-11		Bn-11		Bn-15				Cn-11	
An-12		Bn-12		Bn-16				Cn-12	
An-13		Bn-13		Bn-17				Cn-13	
An-14		Bn-14		Bn-18				Cn-14	
An-15		Bn-15		Bn-19				Cn-15	
An-16		Bn-16		Bn-20				Cn-16	
An-17		Bn-17		Bn-21				Cn-17	
		Bn-18		Bn-22				Cn-18	
		Bn-19		Bn-23				Cn-19	
		Bn-20		Bn-24				Cn-20	
		Bn-01		Bn-25				Cn-21	
		Bn-02		Bn-26				Cn-22	
		Bn-03		Bn-27				Cn-23	
		Bn-04		Bn-28				Cn-24	
		Bn-05		Bn-29				Cn-25	
		Bn-06		Bn-30				Cn-26	
		Bn-07		Bn-31				Cn-27	
		Bn-08		Bn-32				Cn-28	
		Bn-09		Bn-33				Cn-29	
		Bn-10		Bn-34				Cn-30	
		Bn-11		Bn-35				Cn-31	
		Bn-12		Bn-36				Cn-32	
		Bn-13		Bn-37				Cn-33	
		Bn-14		Bn-38				Cn-34	
		Bn-15		Bn-39				Cn-35	
		Bn-16		Bn-40				Cn-36	

Cn		Sn				P		Un	
Para	Setting	Para	Setting	Para	Setting	Para	Setting	Monitor	Setting
Cn-37		Sn-03		Sn-39		P1-01		Un-01	
Cn-38		Sn-04		Sn-40		P1-02		Un-02	
Cn-39		Sn-05		Sn-41		P1-03		Un-03	
Cn-40		Sn-06		Sn-42		P1-04		Un-04	
Cn-41		Sn-07		Sn-43		P1-05		Un-05	
Cn-42		Sn-08		Sn-44		P1-06		Un-06	
Cn-43		Sn-09		Sn-45		P1-07		Un-07	
Cn-44		Sn-10		Sn-46		P1-08		Un-08	
Cn-45		Sn-11		Sn-47		P1-09		Un-09	
Cn-46		Sn-12		Sn-48		P1-10		Un-10	
Cn-47		Sn-13		Sn-49		P2-01		Un-11	
Cn-48		Sn-14		Sn-50		P2-02		Un-12	
Cn-49		Sn-15		Sn-51		P2-03		Un-13	
Cn-50		Sn-10		Sn-52		P2-04		Un-14	
Cn-51		Sn-11		Sn-53		P2-05		Un-15	
Cn-52		Sn-12		Sn-54		P2-06		Un-16	
Cn-53		Sn-13		Sn-55		P2-07		Un-17	
Cn-54		Sn-14		Sn-56		P2-08		Un-18	
Cn-55		Sn-15		Sn-57		P2-09		Un-19	
Cn-56		Sn-16		Sn-58		P2-10		Un-20	
Cn-57		Sn-17		Sn-59		P3-01		Un-21	
Cn-58		Sn-18		Sn-60		P3-02		Un-22	
Cn-59		Sn-19		Sn-61		P3-03		Un-23	
Cn-60		Sn-20		Sn-62		P3-04		Un-24	
Cn-61		Sn-21		Sn-63		P3-05		Un-25	
Cn-62		Sn-22		Sn-64		P3-06		Un-26	
Cn-63		Sn-23		Sn-65		P3-07		Un-27	
Cn-64		Sn-24		Sn-66		P3-08		Un-28	
Cn-65		Sn-25		Sn-67		P3-09		Un-29	
		Sn-26		Sn-68		P3-10		Un-30	
		Sn-27		Sn-69		P3-11		Un-31	
		Sn-28		Sn-70		P3-12		Un-32	
		Sn-29				P3-13		Un-33	
		Sn-30				P3-14		Un-34	
		Sn-31				P3-15			
		Sn-32				P3-16			
		Sn-33				P4-01			
		Sn-34				P4-02			
		Sn-35				P4-03			
		Sn-36				P4-04			
		Sn-37				P4-05			
		Sn-38				P5-01			
						P5-02			



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