$25.00

BALDOR®
MOTORS AND DRIVES

BDI 1100
Frequency Inverter

Installation and Operating Manual

12/96 **MN71100**

Table of Contents

Section 1
General Information

Introduction

The Baldor Series 1100 controls represent the latest technology in microprocessor based motor controls. This control provides digital motion control in a small, low cost package. All motor protection features are automatic with only the most important features accessible to the user. Simplicity in operation is the hallmark of the Series 1100 Inverter.

Even the input power requirements are simple. Just connect to 230VAC single phase power and you're ready to operate a 230VAC three phase motor. The built in keypad only has seven keys for simplicity of use. Product features of the Series 1100 are:

- $^1/_3$ to 1 Horsepower
- Input voltage rating of 230VAC single phase
- 4 character LED display (for setup & monitoring)
- IGBT power transistors for quiet motor operation
- Adjustable Volts/Hz ratio for conveyors, pumps and fans
- 4 preset speeds
- Selectable independent Accel and Decel adjustments for multiple speed and varying load applications
- Built-in DC injection braking for quick motor deceleration
- Optional external dynamic brake resistor is required (Minimum resistance is 30 ohms)

Limited Warranty

For a period of two (2) years from the date of original purchase, BALDOR will repair or replace without charge controls which our examination proves to be defective in material or workmanship. This warranty is valid if the unit has not been tampered with by unauthorized persons, misused, abused, or improperly installed and has been used in accordance with the instructions and/or ratings supplied. This warranty is in lieu of any other warranty or guarantee expressed or implied. BALDOR shall not be held responsible for any expense (including installation and removal), inconvenience, or consequential damage, including injury to any person or property caused by items of our manufacture or sale. (Some states do not allow exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply.) In any event, BALDOR's total liability, under all circumstances, shall not exceed the full purchase price of the control. Claims for purchase price refunds, repairs, or replacements must be referred to BALDOR with all pertinent data as to the defect, the date purchased, the task performed by the control, and the problem encountered. No liability is assumed for expendable items such as fuses.

Goods may be returned only with written notification including a BALDOR Return Authorization Number and any return shipments must be prepaid.

Safety Notice

This equipment contains voltages that may be as great as 500 volts! Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the start-up procedure or troubleshoot this equipment.

This equipment may be connected to other machines that have rotating parts or parts that are driven by this equipment. Improper use can cause serious or fatal injury. Only qualified personnel should attempt the start-up procedure or troubleshoot this equipment.

PRECAUTIONS

⚠ **WARNING: Do not touch any circuit board, power device or electrical connection before you first ensure that power has been disconnected and there is no high voltage present from this equipment or other equipment to which it is connected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the start-up procedure or troubleshoot this equipment.**

⚠ **WARNING: Be sure that you are completely familiar with the safe operation of this equipment. This equipment may be connected to other machines that have rotating parts or parts that are controlled by this equipment. Improper use can cause serious or fatal injury. Only qualified personnel should attempt the start-up procedure or troubleshoot this equipment.**

⚠ **WARNING: Be sure the system is properly grounded before applying power. Do not apply AC power before you ensure that all grounding instructions have been followed. Electrical shock can cause serious or fatal injury.**

⚠ **WARNING: Do not remove cover for at least five (5) minutes after AC power is disconnected to allow capacitors to discharge. Dangerous voltages are present inside the equipment. Electrical shock can cause serious or fatal injury.**

⚠ **WARNING: Improper operation of control may cause violent motion of the motor shaft and driven equipment. Be certain that unexpected motor shaft movement will not cause injury to personnel or damage to equipment. Peak torque of several times the rated motor torque can occur during control failure.**

⚠ **WARNING: Motor circuit may have high voltage present whenever AC power is applied, even when motor is not rotating. Electrical shock can cause serious or fatal injury.**

⚠ **WARNING: This unit has an automatic restart feature that will start the motor whenever input power is applied and a RUN (FWD or REV) command is issued and maintained. If an automatic restart of the motor could cause injury to personnel, the automatic restart feature should be disabled by changing the AUTORESTART parameter (P23) to ZERO.**

⚠ WARNING: Dynamic brake resistors may generate enough heat to ignite combustible materials. Keep all combustible materials and flammable vapors away from brake resistors.

⚠ Caution: To prevent equipment damage, be certain that the electrical service is not capable of delivering more than the maximum line short circuit current amperes at 230 VAC control rating.

⚠ Caution: Failure to properly size the Dynamic Brake resistor may result in overvoltage trips, excessive motor current and control failure.

Section 2
Installation

Receiving & Inspection

The Series BDI 1100 Control is thoroughly tested at the factory and carefully packaged for shipment. When you receive your control, there are several things you should do immediately.

1.. Observe the condition of the shipping container and report any damage immediately to the commercial carrier that delivered your control.

2.. Verify that the part number of the control you received is the same as the part number listed on your purchase order.

3.. If the control is to be stored for several weeks before use, be sure that it is stored in a location that conforms to published storage specifications. (Refer to Section 5 of this manual).

Physical Location

The location of the control is important. It should be installed in an area that is protected from direct sunlight, corrosives, harmful gases or liquids, dust, metallic particles, and vibration. Exposure to these can reduce the operating life and degrade performance of the control.

Several other factors should be carefully evaluated when selecting a location for installation:

1.. For effective cooling and maintenance, the control should be mounted on a smooth, non-flammable vertical surface. Table 2-1 lists the Watts Loss ratings for enclosure sizing.

Heatsink temperature may reach 80°C during operation.

2.. At least four inches (10cm) clearance must be provided on all sides for air flow.

3.. Front access must be provided to allow the control cover to be opened or removed for service and to allow viewing of the Keypad Display.

4.. **Altitude derating**. Above 3300 feet, derate the continuous and peak output current by 2% for each 1000 feet above 3300 feet.

5.. **Temperature derating**. Up to 40°C no derating required. Above 40°C, derate the continuous and peak output current by 2% per °C above 40°C. Maximum ambient is 55°C.

Table 2-1 Series 1100 Watts Loss Ratings

Constant Torque HP Rating	230 VAC	
	2.5KHz PWM	8.0KHz PWM
1/3	6 Watts/ Amp	8 Watts/ Amp
1/2	6 Watts/ Amp	8 Watts/ Amp
3/4	5 Watts/ Amp	7 Watts/ Amp
1	5 Watts/ Amp	7 Watts/ Amp

Optional Dynamic Brake Hardware

⚠ **WARNING: Dynamic Brake Resistor produces heat and may ignite flammable materials. To avoid fire hazard, keep all combustible materials and flammable vapors away from brake resistor.**

Physical Installation

Dynamic Brake (DB) resistor must be installed on a flat, vertical non-flammable surface. A power resistor with a value of 30 ohms minimum is recommended. Mount the resistor to the vertical surface.

AC Main Circuit

Line Impedance

The control requires a minimum line impedance of 3% (voltage drop across the reactor is 3% when the control draws rated input current). If the incoming power line has less than 3% impedance, a line reactor can be used to provide the needed impedance in most cases. Line reactors are optional and are available from Baldor.

Protection Devices

Be sure a suitable input power protection device is installed. Use the recommended circuit breaker or fuses listed in Table 2-2 (Wire Size and Protection Devices). Input and output wire size is based on the use of copper conductor wire rated at 75 °C.

Power Disconnect Device

A power disconnect should be installed between the input power service and the control for a fail safe method to disconnect power. The control will remain in a powered-up condition until all input power is removed from the control and the internal bus voltage is depleted.

Table 2-2 Wire Size and Protection Devices - 230 VAC

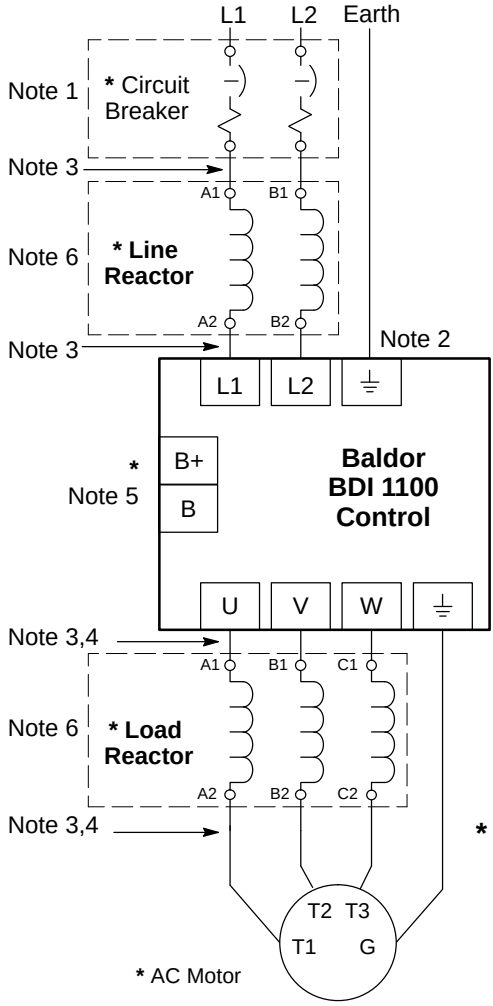
Rated HP	Wire Gauge AWG	Input Breaker	Input Fuse Fast Acting	Input Fuse Time Delay
1/3	14	15A (240V)	10A (250V)	5A (250V)
1/2	14	15A (240V)	10A (250V)	5A (250V)
3/4	14	15A (240V)	15A (250V)	10A (250V)
1	14	15A (240V)	15A (250V)	10A (250V)

Power & Motor Connections

The AC power & motor connections are shown in Figure 2-1.

1.. Disconnect all power sources from the control.
2.. Remove the terminal access cover located below the keypad. Connect Line 1 and Line 2 to terminals L1 and L2.
3.. Connect plant “Earth” ground to the ground screw located on the bottom left of the opening (on heatsink).
4.. Connect the Motor leads to terminals U, V, and W (phase sequence is not important).
5.. Connect the Motor ground to the ground screw located on the bottom right of the opening (on heatsink).
6.. Connect the Dynamic Brake resistor leads to terminals B+ and B. Use wire size specified in Table 2-2.
7.. Install the terminal access cover.

Figure 2-1 AC Power and Motor Connections



Notes:

1. See Protection Devices description.
2. Connect panel or ground terminal of control to “Earth Ground”.
3. Shield wires inside a metal conduit.
4. Metal conduit should be used to shield output wires (from U, V, W of control to T1, T2, T3 of motor.) Connect conduits so the use of Load Reactor or RC Device does not interrupt EMI/RFI shielding.
5. “DB Resistor * ” connection.
6. See Line/Load Reactors description.

***** Optional components not provided.

Control Circuit Connections

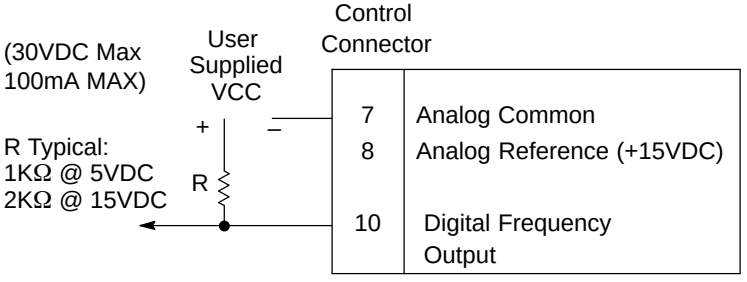
Five operating modes are available in the Series 1100 control. These operating modes define the basic motor control setup and the operation of the input and output terminals. The operating modes are:

- Keypad Control (P25=0)
- JOG Control (P25=1)
- 4 Speed, 2-Wire Control (P25=2)
- Analog Pot Speed Control (P25=3)
- Standard Run, 2-Wire Control with Speed Pot (P25=4)

Refer to the operating mode description for your application and connect the control connector terminal wiring as shown in the diagram. Use the program information to correctly program the control as described in the Power-Up Procedure in this section of the manual.

Digital Frequency Output Connection

Figure 2-2 Outputs Description



Note: If the Analog Speed Pot is not used, the internal +15VDC reference may be used. Connect terminals 8 and 10. The signal at terminal 10 is the output frequency. An external supply (Figure 2-2) must be used if the Analog Speed Pot is used.

Keypad Control Mode

In the Keypad mode:

1.. All analog inputs and outputs are active. No connections are necessary (to Control Connector terminals 1 to12).

2.. Press FWD key to operate motor in forward direction.

3.. Press REV key to operate motor in reverse direction.

4.. Press STOP key to brake or coast to stop.

Note: To clear a Fault condition, press the STOP/RESET key.

Programming Information:
P25=0

JOG Control Mode

In the JOG mode:

1.. All analog inputs and outputs are active. No connections are necessary (to Control Connector terminals 1 to12).

2.. Press and hold FWD key to operate motor in forward direction.

3.. Press and hold REV key to operate motor in reverse direction.

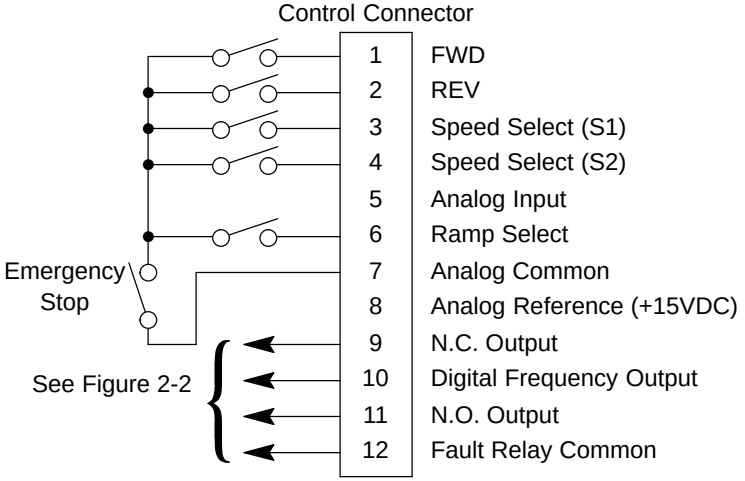
4.. Release the FWD or REV key to brake or coast to stop.

Note: To clear a Fault condition, press the STOP/RESET key.

Programming Information:
P25=1

4 Speed, 2-Wire Control Mode

Figure 2-3 4 Speed, 2-Wire Connection Diagram



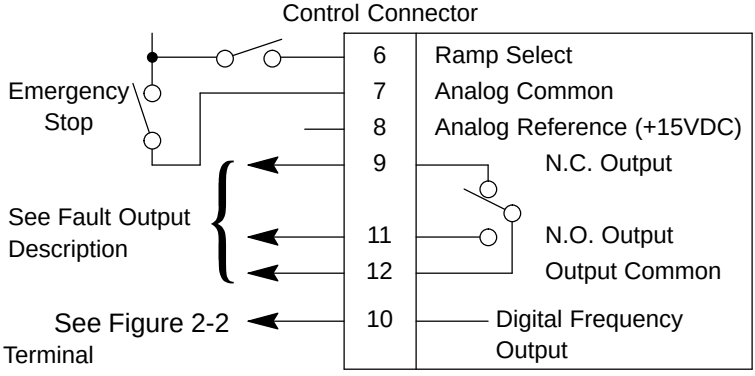
Programming Information:
P25=2

Table 2-3 Preset Frequency Select

S1	S2	Function
OPEN	OPEN	Preset Frequency 1
CLOSED	OPEN	Preset Frequency 2
OPEN	CLOSED	Preset Frequency 3
CLOSED	CLOSED	Preset Frequency 4

4 Speed, 2-Wire Control Mode Continued

Figure 2-4 Outputs Description



1 OPEN to stop forward motor rotation.
CLOSED to run motor in forward direction.

2 OPEN to stop reverse motor rotation.
CLOSED to run motor in reverse direction.

3 See Table 2-3.

4 See Table 2-3.

6 Ramp Select input (6) OPEN, selects Accel/Decel group 1.
Ramp Select input (6) CLOSED, selects Accel/Decel group 2.
Group 1= Parameters P8 & P9.
Group 2= Parameters P10 & P11.

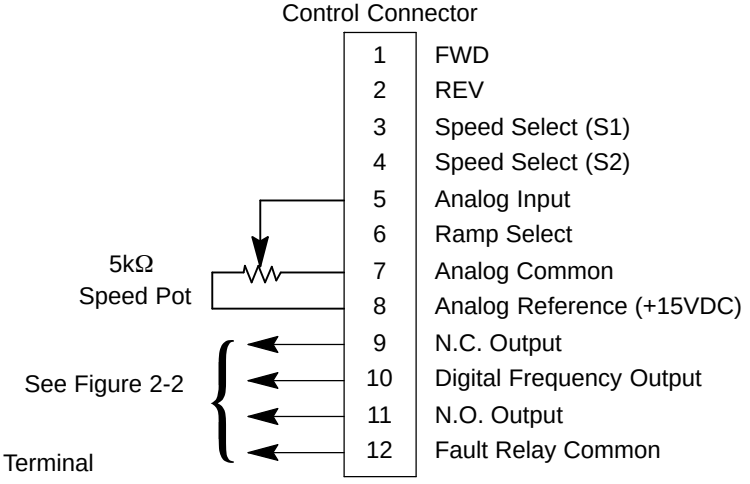
10 Digital frequency output can be used by an optional frequency meter connected between terminals 10 and 7. Square wave output with 50% duty cycle, frequency is same as motor.

9, 11 & 12 If no control fault is present, terminals 9 and 12 contact is closed. If a fault occurs, terminals 11 and 12 contact is closed. (Contacts rated 30VDC @ 1A, 120VAC @0.5A).

Note: Emergency Stop switch removes analog common from all inputs. This stops the motor.

Analog Pot Speed Control Mode

Figure 2-5 Speed Pot Connection Diagram



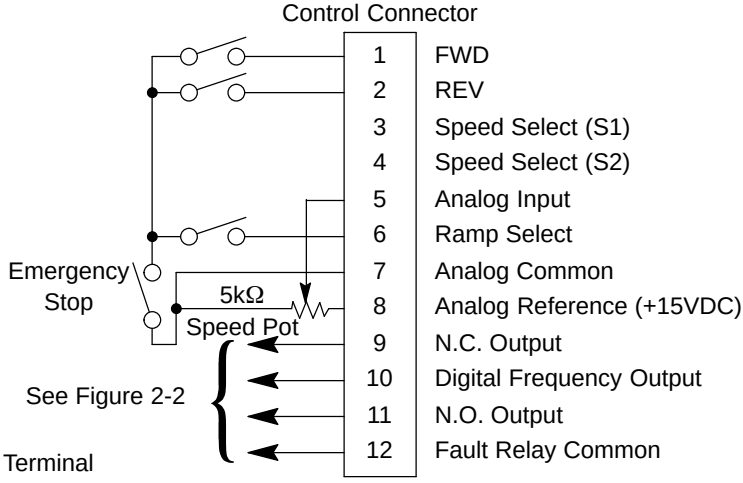
10 Digital frequency output can be used by an optional frequency meter connected between terminals 10 and 7.

9, 11 & 12 If no control fault is present, terminals 9 and 12 contact is closed. If a fault occurs, terminals 11 and 12 contact is closed.

Programming Information:
P25=3

Standard Run 2 Wire Control Mode with Speed Pot

Figure 2-6 Standard Run 2-Wire Connection Diagram



1 OPEN to stop forward motor rotation.
CLOSED to run motor in forward direction.

2 OPEN to stop reverse motor rotation.
CLOSED to run motor in reverse direction.

6 Ramp Select input (6) OPEN, selects Accel/Decel group 1.
Ramp Select input (6) CLOSED, selects Accel/Decel group 2.
Group 1= Parameters P8 & P9.
Group 2= Parameters P10 & P11.

10 Digital frequency output can be used by an optional frequency meter connected between terminals 10 and 7.

9, 11 & 12 If no control fault is present, terminals 9 and 12 contact is closed. If a fault occurs, terminals 11 and 12 contact is closed.

Programming Information:
P25=4

Power-Up Procedure

Initial Conditions

Be sure the Control (physical & AC power), Motor and DB Resistor are wired according to the procedures in this section. Become familiar with the keypad programming and keypad operation of the control as described in Section 3 of this manual.

1.. Turn power on. Be sure the LED display is ON and no errors are displayed. The preset operating frequency should be displayed.

Note: If a fault condition occurred during a previous operation and power was removed, the fault will continue to appear when power is again applied. To clear a Fault condition, press the STOP/RESET key. If Auto Restart is enabled, the control will automatically attempt to restart if in modes 2 or 4 only (P25=2 or 4).

2.. Perform the steps for the Operating mode for your application.

Keypad Control Mode

1.. Press Mode and set parameter 25 to the value 0.

2.. Press FWD. The ▲ LED should be ON and the motor should run in the forward direction.

3.. Press STOP. Motor should Brake or Coast to a stop.

4.. Press REV. The ▼ LED should be ON and the motor should run in the reverse direction.

5.. Press STOP. Motor should Brake or Coast to a stop.

JOG Control Mode

1.. Press Mode and set parameter 25 to the value 1.

2.. Press and Hold FWD. The ▲ LED should be ON and the motor should run in the forward direction.

3.. Release the FWD key. Motor should Brake or Coast to a stop.

4.. Release the REV key. The ▼ LED should be ON and the motor should run in the reverse direction.

5.. Press STOP. Motor should Brake or Coast to a stop.

Analog Speed Pot Control Mode

1.. Press Mode and set parameter 25 to the value 3.

2.. Press Mode again (Frequency Display mode).

3.. Adjust the Speed Pot to obtain the desired motor frequency.

4.. Press FWD or REV to run the motor in the correct direction.

5.. Press STOP. Motor should Brake or Coast to a stop.

4 Speed, 2-Wire Control Mode

1.. Press Mode and set parameter 25 to the value 2.

2.. Press Mode again (Frequency Display mode).

3.. Open all input switches.

4.. Close the Emergency Stop switch.

5.. Set S1 and S2 to select the desired speed preset value.
Parameter 4=Preset Frequency 1 value.
Parameter 5=Preset Frequency 2 value.
Parameter 6=Preset Frequency 3 value.
Parameter 7=Preset Frequency 4 value.
(These values can be changed using the keypad.
See Section 3).

6.. Open or Close Ramp Select to choose the appropriate Acceleration/Deceleration group time.
Group 1= Parameters P8 & P9.
Group 2= Parameters P10 & P11.

7.. Close FWD switch to run the motor forward or Close REV switch to run motor in the reverse direction.

8.. Press STOP. Motor should Brake or Coast to a stop.

Note: If motor runs in the wrong direction, reverse any two of the motor leads to obtain the desired rotation.

Standard Run, 2-Wire Control Mode with Speed Pot

1.. Press Mode and set parameter 25 to the value 4.

2.. Press Mode again (Frequency Display mode).

3.. Adjust the Speed Pot to obtain the desired motor frequency.

4.. Close connector terminal 1 (FWD) or terminal 2 (REV) to run the motor in the correct direction.

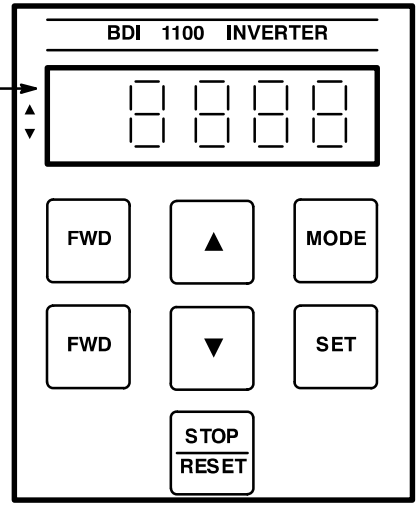
5.. Press STOP. Motor should Brake or Coast to a stop.

Section 3
Parameter Descriptions

Keypad Description

The Series BDI 1100 keypad is shown in Figure 3-1.

Figure 3-1 Series 1100 Keypad



The 4 character LED display is used to monitor the operating frequency of the motor. It is also used to display parameter values during the programming operation. (See Figure 3-2) The ▲ LED indicates the motor is running in the forward direction and the ▼ LED indicates the motor is running in the reverse direction.

FWD Causes motor to run in the forward direction.

REV Causes motor to run in the forward direction.

▲ Increases the parameter value being displayed.

▼ Decreases the parameter value being displayed.

MODE Changes between “view running frequency” and “view parameter values”.

SET Press to save a new parameter value after change.

STOP/ Stop motor rotation or

RESET Reset the control after a fault condition.

Figure 3-2 LED Display Functions

The LED Display is used for the following:

Display preset frequency or POT frequency. (Displayed on Power Up)

F	X	X	X

Display the operating motor frequency.

d	X	X	X

Display the operating motor RPM.
"d 0" if stopped or 4 digit RPM if running.

X	X	X	X

Display the parameter number

P		X	X

Display a parameter value (Press set while parameter number is displayed).

X	X	X	X

View Parameters

To view the parameters, apply power to the control and perform the following actions:

Action	Description	Display	Comment
Press STOP	Be sure motor is stopped	F60.0	Preset = 60.0Hz
Press MODE	Display actual frequency	d 0.0	Motor actual = 0.0Hz
Press MODE	Display actual Motor RPM	d 0	0 RPM
Press MODE	Display parameter number	P1	Parameter = P1
Press ▲ or ▼	Scroll through parameter list	PXXX	
Press MODE	Exit the programming mode	F60.0	
Press MODE	Press mode again	d 0.0	Display actual frequency
Press MODE	Press mode again	d 0	Display actual RPM
Press FWD	Run motor in forward direction	▲	Accel to 1725 RPM
Press STOP	Be sure motor is stopped	d 0	Decel to 0 RPM

Parameter Table

No.	Name	Factory Setting	Range	User Setting
P1	Starting Frequency	2.0Hz	0-15Hz	
P2	Minimum operating frequency	2.0Hz	0-400Hz	
P3	Maximum operating frequency	60.0Hz	15-400Hz	
P4	Preset frequency 1	60.0Hz	0-400Hz	
P5	Preset frequency 2	60.0Hz	0-400Hz	
P6	Preset frequency 3	60.0Hz	0-400Hz	
P7	Preset frequency 4	60.0Hz	0-400Hz	
P8	Acceleration Time 1	10.0sec	0.1-600sec	
P9	Deceleration Time 1	10.0sec	0.1-600sec	
P10	Acceleration Time 2	10.0sec	0.1-600sec	
P11	Deceleration Time 2	10.0sec	0.1-600sec	
P12	Jog Frequency	20.0Hz	0-400Hz	
P13	DC Brake Time	0.0sec	0-15sec	
P14	DC Brake Voltage	0%	0-30%	
P15	V/Hz Low Point Voltage	0%	0-35%	
P16	V/Hz Mid Point Frequency	60.0Hz	10-400Hz	
P17	V/Hz Mid Point Voltage	100%	0-100%	
P18	V/Hz Base Frequency	60.0Hz	10-400Hz	
P19	V/Hz Base Voltage	100%	0-100%	
P20	Switching Frequency	2.4KHz	2.4-9.6KHz	
P21	Motor Rated RPM	1725	0-9999	
P22	Motor Rated Frequency	60.0	1-400	
P23	Number of Auto Restarts 0(Disabled)	0	0-10	
P24	Delay before Auto Restart	0	0-60 sec	
P25	0 Keypad Mode 1 Enable JOG Mode 2 Enable PLC Control Terminals 3 Enable Speed POT 4 Enable both 2 & 3.	0	0-4	

Note: 3/4 & 1HP only, if the Switching Frequency is increased from factory setting, derate the continuous output current by 0.1A for each 1KHz above factory setting.

Parameter Table Continued

No.	Name	Factory Setting	Range	User Setting
P26	Restore Factory Settings	0	0 or 1	
P27	Software Version	1.01	N/A	N/A
P40	1 1/3 Horsepower 2 1/2 Horsepower 3 3/4 Horsepower 4 1 Horsepower	Factory Set	1-4	N/A

Change a Parameter Value

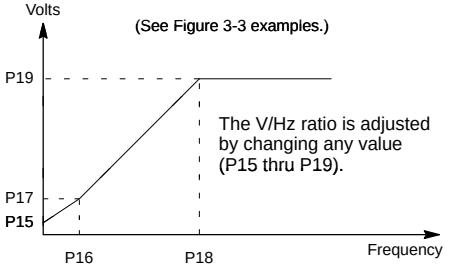
To view a parameter and change its value, apply power to the control and perform the following actions: (This example will change the Preset Frequency from 60.0Hz to 50.0Hz).

Action	Description	Display	Comment
Press STOP	Be sure motor is stopped	F60.0	Preset = 60Hz
Press MODE	Display actual frequency	d 0.0	Motor actual = 0Hz
Press MODE	Press mode again	d 0	Motor actual = 0 RPM
Press MODE	Display parameter number	P1	Parameter = P1
Press ▲ or ▼	Scroll to parameter P4	P4	
Press Set	Select Preset 1	60.0	Show its' value
Press ▼	Change the value to 50.0	50.0	Decrease preset to 50.0
Press Set	Save the new JOG freq. value	P12	Save and exit
Press MODE	Exit the programming mode	F50.0	
Press MODE	Display motor actual frequency	d 0.0	
Press FWD	Run motor in forward direction	▲ d50.0	Accel to 60.0Hz
Press STOP	Be sure motor is stopped	d 0.0	Decel to 0 Hz

Parameter Descriptions

No.	Name	Description
P1	Starting Frequency	When FWD or REV is pressed, the motor frequency starts at this value and accelerates to the preset value (P4) at the rate set by P8. When STOP is pressed, the motor frequency is reduced to this value at the rate set by P9.
P2	Minimum operating frequency	The operating frequency is not allowed to go below the Minimum output frequency P2 or above the Maximum output frequency P3. These parameters affect all P25 modes. The P2 can not be set less than the Starting Frequency P1.
P3	Maximum operating frequency	
P4	Preset frequency 1	P4 is the preset frequency for keypad control. P4 through P7 are Preset Frequencies that are initiated by hardware command at the control terminal strip (terminals 3 & 4, – switched inputs S1 and S2).
P5	Preset frequency 2	
P6	Preset frequency 3	
P7	Preset frequency 4	
P8	Acceleration Time 1	Sets the time in seconds for the output frequency of the inverter to linearly increase to the P3 Maximum frequency (or decrease from P3 frequency to 0 Hz). The additional accel/decel P10 & P11 are used when external control signals are in operation. This provides alternative accel/decel times (terminal 6).
P9	Deceleration Time 1	
P10	Acceleration Time 2	
P11	Deceleration Time 2	
P12	Jog Frequency	When P25 =1, the inverter will operate at this Jog frequency. The Jog accel/decel time are specified by P8 and P9.
P13	DC Brake Time	Sets the time that the DC injection brake signal is applied during DECEL.
P14	DC Brake Voltage	Sets the amount of DC Voltage applied to the motor windings to cause the motor to stop. Increasing the DC Brake Voltage setting will cause the motor to have more braking torque available for stopping. Be cautious when adjusting P14 since DC Injection Braking will cause additional heating if used in frequent start/stop applications.

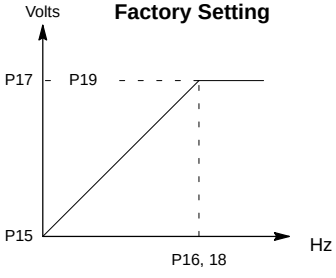
Parameter Descriptions Continued

No.	Name	Description
P15	V/Hz Low Point Voltage (also known as Torque Boost)	P15 thru P19 set the Voltage/Frequency relationship. This relationship is shown in the following graph. 
P16	V/Hz Mid Point Frequency	
P17	V/Hz Mid Point Voltage	
P18	V/Hz Base Frequency	
P19	V/Hz Base Voltage	
P20	Switching Frequency	Sets the switching rate (PWM frequency) of the output transistors. The PWM frequency can be increased to minimize audible noise that may be emitted from the motor. In general the PWM frequency should be set as low as possible to minimize the stress on the output transistors and motor windings.
P21	Motor Rated RPM	The rated speed of the motor (stated on nameplate).
P22	Motor Rated Freq	The rated frequency of the motor (stated on nameplate).
P23	Number of Auto Restarts	Maximum number of auto restarts attempts before requiring a manual restart. Auto Restart only works if P25=2 or 4.
P24	Delay before Auto Restart	The number of seconds allowed after a fault before an auto restart will be attempted (if fault is cleared).

Parameter Descriptions Continued

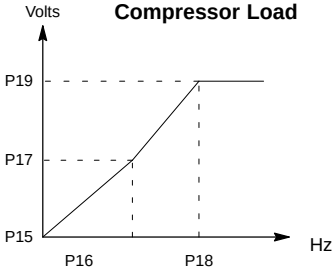
No.	Name	Description
P25	0 Keypad Mode	Allows motor control using the Keypad only.
	1 Enable JOG Mode	If set, the output frequency is the P12 value. The "JOG" function is not on the keypad. The operator must access this parameter to turn ON/OFF the Jog function.
	2 Enable Control Terminals	If P25 = 2, the output frequency, acceleration time, deceleration time, forward run, reverse run commands are controlled by the signals applied to the control terminal strip.
	3 Enable Speed POT	If P25 = 03, the output frequency is controlled by the Speed POT Input voltage at the control terminal strip terminal 5.
	4 Enable both 2 & 3	If P25 = 04, the output frequency is controlled by the Speed POT Input voltage, and the acceleration time, deceleration time, forward run, reverse run functions are controlled by the signals applied to the control terminal strip.
P26	Restore Factory Settings	If P26 = 01, all the parameter values will be restored to the factory settings.
P27	Software Version	Displays the revision of the software that is installed in the control.
P40	Horsepower rating of control	1 = $^1/_3$ Horsepower 2 = $^1/_2$ Horsepower 3 = $^3/_4$ Horsepower 4 = 1 Horsepower

Figure 3-3 V/Hz Profile Examples

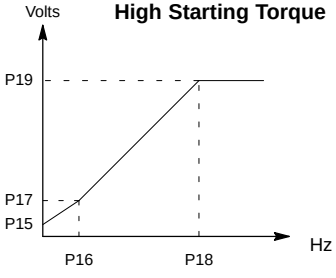


P15 0
P16 60
P17 100
P18 60
P19 100

Note:
P15= Torque Boost
P16= Mid Point Frequency
P17= Mid Point Voltage
P18= Base Frequency
P19= MAX Voltage



P15 0
P16 30
P17 30
P18 60
P19 100



P15 5
P16 3
P17 10
P18 60
P19 100

Section 4
Troubleshooting

Error Messages

If a fault occurs, a message will be displayed on the Keypad Display. Use the information in Table 4-1 to determine problem.

Table 4-1 Fault Codes

Fault	Indication	Possible Cause	Corrective Action
Oc	Over Current	1. Acceleration/ Deceleration Time is too short.	Increase Time value.
		2. P15 set too high.	Reduce P15 (torque boost value).
		3. Motor overloaded.	Check motor load. Check couplings for binding. Verify motor and control size.
Ou	Over Voltage	1. Input voltage too high.	Check input voltage. Use Step Down transformer. Use line reactor to minimize voltage spikes.
		2. Deceleration time too short. (P9, P11)	Increase Deceleration time. Add REGEN Resistor.
Uu	Under Voltage	1. Acceleration rate too short. (P8, P10)	Increase Acceleration time.
		2. Input voltage too low.	Check input voltage. Use Step Up transformer. Check power disturbances due to startup of other equipment.
OH	Over Temperature	1. Motor overloaded.	Correct motor loading.
		2. Ambient temperature too high.	Reduce ambient temperature.
Sc	Short Circuit	Phase to Phase short.	Check connections to motor. Test motor and control for failure.
Err1-Err5	EEPROM Failure	1. Excessive EMI or other interference. 2. Circuit failure.	Turn power OFF. Wait 5 minutes and power up to clear fault. Contact Baldor service facility.

First try to clear the fault. After the cause of failure has been corrected, Press the “STOP/RESET” key to clear the error message.

Note: If power is turned OFF while a fault message is displayed, the message will continue to be displayed after power is again turned ON.

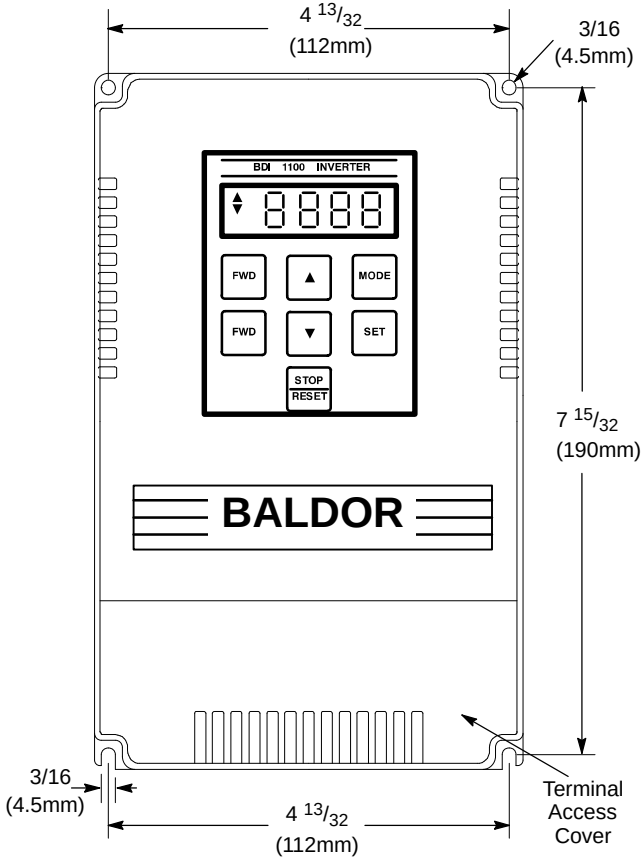
Fault Indications

Table 4-1 Fault Codes

Indication	Possible Cause	Corrective Action
Motor does not stop	1. Starting frequency value too high	Reduce the minimum frequency limit.
	2. Speed POT failure	Replace POT.
Unstable speed	1. Oscillating motor load.	Correct motor loading.
	2. Unstable input power.	Correct input power.
Motor runs rough at low speeds	1. Torque boost value too high. 2. V/F Midpoint too high.	Reduce torque boost value. Reduce midpoint frequency and midpoint voltage values.
	2. Misalignment of motor and load	Check coupling alignment.
	3. Motor failure.	Replace motor.
Motor Runs in Wrong Direction	Wrong Motor Phasing	Reverse any two motor leads (U, V or W) to obtain the correct rotation.
External Trip	1. Insufficient motor ventilation.	Clean the motor air intake and exhaust areas. Check ambient temperature.
	2. Excessive motor current.	Check motor for overloading. Verify motor and control ratings are correct.
	3. V/Hz ratio misadjusted.	Adjust P15, torque boost value. Adjust P16, Mid point Frequency. Adjust P17, Mid point Voltage. Adjust P18, Base frequency. Adjust P19, Maximum output voltage. If acceleration or deceleration is too quick, motor current may be excessive. Adjust Accel/Decel parameters P8 to P11. Adjust P8 or P10 for a longer ramp up and/or P9 and P11 for a longer ramp down time.

Dimensions

Figure 5-1 Control Mounting Hole Locations



Specifications

Table 5-1 Series 1100 Specifications

Horse Power	1/3, 1/2, 3/4 and 1 HP @ 230VAC
Input Line Impedance	3% minimum
Input Voltage	200 to 240 VAC Single Phase
Input Frequency	50/60Hz
Output Voltage	0 to Maximum Voltage
Output Frequency	0 to 400 Hz
Overload Capacity	150% for 60 seconds; 200% for 3 seconds
Control Method	Sinusoidal PWM
PWM Frequency	2.4 KHz to 9.6 KHz
Torque Boost	Adjustable 3 Point Volts/Hz pattern
DC Injection Braking	0 - 30% maximum voltage
DB (Dynamic Braking)	12 AMPS maximum peak current, recommend using a 30 ohm resistor minimum (Optional).
Fault Relay Output	Contacts rated 30VDC @ 1 A; 120VAC @0.5A. MAX Switching Voltage= 125V MAX Switching Current = 1A MAX Switching Power = 30Watts (60VA)
Ambient Operating Temperature	–10°C to 40°C, NEMA 1

Catalog No.	HP	Maximum Continuous Current
ID1102F33-MR	1/3	1.6A
ID1102F50-MR	1/2	2.2A
ID1102F75-MR	3/4	3.2A
ID110201-MR	1	4.2A

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