

DZB100H USER MANUAL

High velocity AC Motor Drives



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Preface

Thank you for choosing **DZB100** Series high-performance AC Motor Drives. **DZB100** Series are manufactured by adopting high-quality components, material and incorporating the latest microprocessor technology available.

Getting Started

This manual will be helpful in the installation, parameter setting, troubleshooting, and daily maintenance of the AC motor drives. To guarantee safe operation of the equipment, read the following safety guidelines before connecting power to the AC drives. Keep this operating manual handy and distribute to all users for reference.

WARNING

ATTENTION: Always read this manual thoroughly before using **DZB100** series AC Motor Drives.

DANGER! AC input power must be disconnected before any maintenance.

WARNING! Do not connect or disconnect wires and connectors while power is applied to the circuit.
Maintenance must be performed by qualified technicians.

WARNING! To avoid personal injury, do not remove the cover of the AC motor drive until all of the digital keypad "DISPLAY LED" lamps are off. The DC-link capacitor remains charged with a hazardous voltage even after input power is removed.

ATTENTION: Grounding the DZB100B drive is done by **connecting the Earth Ground to the drive ground terminal**.

CAUTION: There are highly sensitive components on the printed circuit boards. These components are especially sensitive to ESD (electrostatic discharge). **To avoid damage to the drive**, do not touch components or the circuit boards until static control precautions have been taken.

CAUTION: Never connect the main circuit output terminals U, V, and W directly to the AC main circuit power supply as **this will damage the drive**.

CAUTION: Do not apply the antirust to screws for fastening drives; Please clean the drives and screws with dry cloth or alcohol, not with synthetic cleaner. Fasten the screws with washers and rated torque lest the enclosure corners of drives be distorted.

This manual is for DZB100H Series AC Motor Drive.

Chapter 1 Introduction

The purpose of this chapter is to provide specific, yet simple information to **unpack, install** the AC drive. This chapter contains information on the following:

1.1 Receiving, Transportation, and Storage

1.2 Nameplate Information

1.1 Receiving, Storage and Transportation

The AC motor drive has gone through rigorous quality control tests at the factory before shipment. After receiving the AC drive, check for the following.

● Receiving

1. Check to make sure that the package includes an AC drive, the User Manual, dust covers and rubber bushings.
2. Inspect the unit to insure it was not damaged during shipment.
3. Make sure that the part number indicated on the nameplate corresponds with the part number of your order.

● Storage

The AC Drive should be kept in the shipping carton before installation. In order to retain the warranty coverage, the AC drive should be stored properly when it is not to be used for an extended period of time. Some storage suggestions are:

1. Store in a clean, dry location.
2. Store within an ambient temperature range of -20°C to $+65^{\circ}\text{C}$.
3. If possible, store in an air-conditioned environment where the relative humidity is less than 95%, non-condensing.
4. Do not store the AC drive in places where it could be exposed to corrosive gases.
5. Do not store the AC drive on a shelf or on an unstable surface.

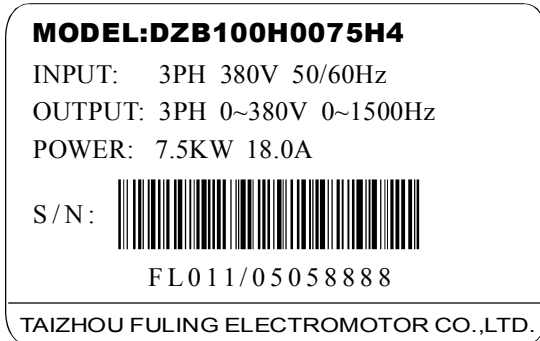
● Transportation

Temperature: -25°C to $+70^{\circ}\text{C}$; R.H.: 0% to 95%;

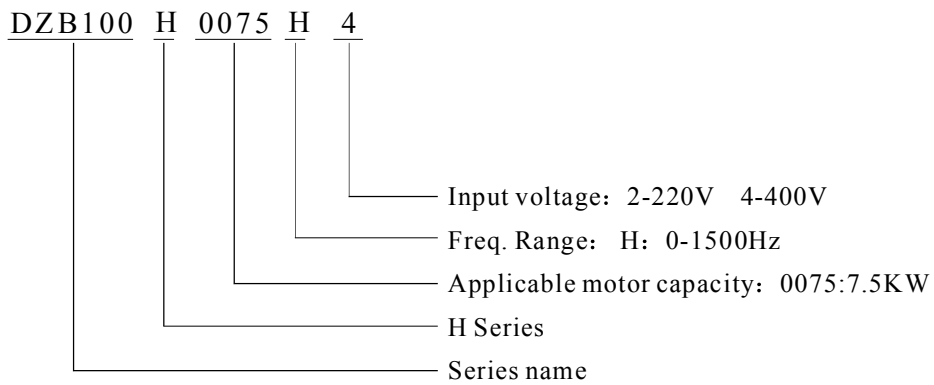
Air Pressure: 70kPa to 106kPa.

1.2 Nameplate Information

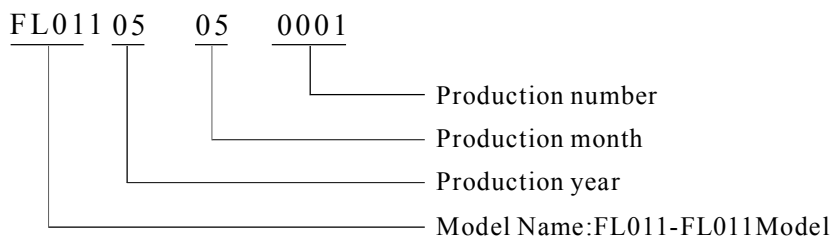
- **Example:**



- **Description of AC Motor Drive Model:**



- **Description of Serial Number:**



● **Description of Serial Name:**

Series Code	Explanation	Applicable Motor
H Series	Specific AC Motor Drives For High-Speed Motor	2.2~30KW
B Series	High-Performance General-Purpose AC Motor Drives	0.75~630KW
P Series	Specific AC Motor Drives For Fan&Pump	7.5~400KW
S Series	Specific AC Motor Drives For Plastic Molding Machinery	7.5~280KW
T Series	Specific AC Motor Drives For The Gating Of Elevator	0.55~2.2KW
L Series	Specific AC Motor Drives For Bobbin Machinery	0.55~75KW
D Series	Specific AC Motor Drives For Variable Power	3~800KVA
PP Series	Specific AC Motor Drives For Isobarically Water Supply	7.5~400KW
M Series	High-Performance Micro-Type AC Motor Drives	0.55~2.2KW
J Series	Compact Low-Cost Easy-to-Use General-Purpose AC Motor Drives	0.55~1.5KW

Chapter 2 Installation and Wiring

Chapter 2 provides the information needed to properly **install** and **wire** the AC drive. Make sure that the AC drive is wired according to the instructions contained in this chapter. The instructions should be read and understood before the actual installation begins.

2.1 Installation Requirements

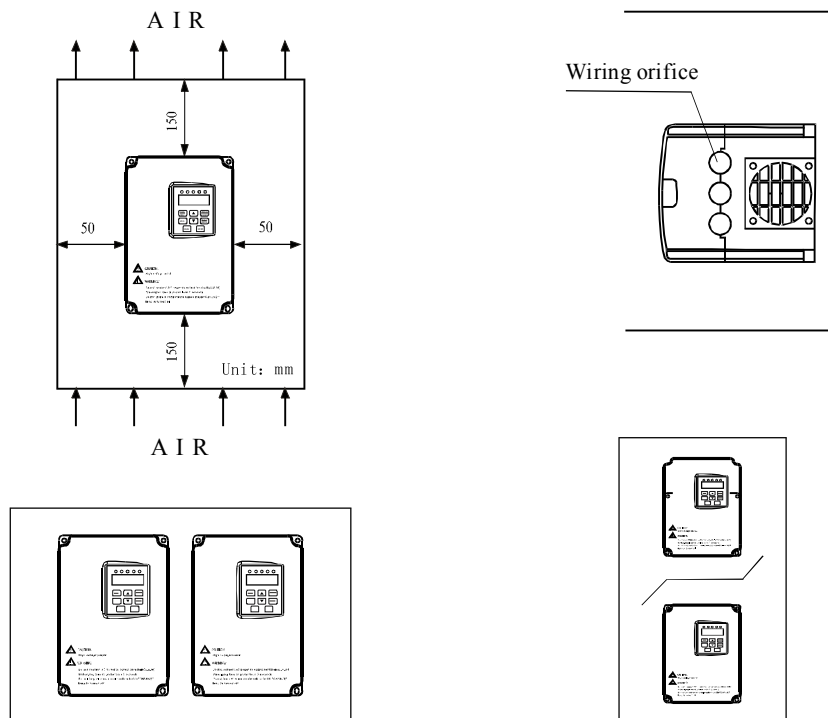
2.2 Wiring

2.3 Basic Wiring Diagram

2.1 Installation Requirements

Install the AC drive vertically to provide proper ventilation. Adequate space is required between the drive and a wall or other equipment. The figure below shows the minimum space needed.

All enclosures must provide adequate ventilation and the internal ambient temperature must be kept at 40 °C or below.



Caution: The AC drive should be installed in an environment that is:

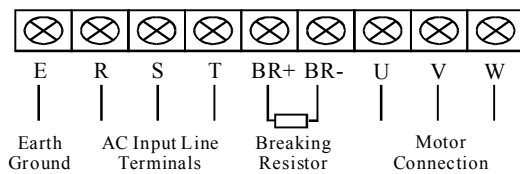
1. protected from rain or moisture;
2. protected from direct sunlight;
3. protected from corrosive gases or liquids;
4. free from airborne dust or metallic particles;
5. free from vibration;
6. free from magnetic noise
7. temperature: -10° C to +40° C; R.H.: 0% to 90%; air pressure: 86kPa to 106 kPa

2.2 Wiring


- **Main Circuit Wiring**

(1) Power terminal block designations

Power input and output may be connected via a nine or ten position terminal block. The pin assignments are as follows:

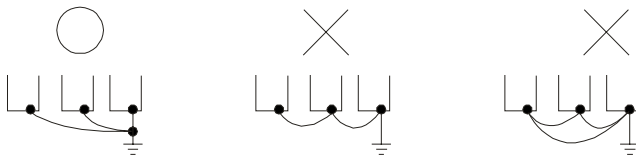


(2) Power block terminal designations

Terminals	Description
R, S, T(L, N)	AC input line terminals
U, V, W	Motor connection
BR+, BR-	Connection for the regenerative resistor (option)
 E	Ground

(3) Attention:

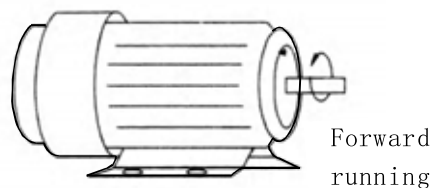
1. The user must provide a circuit breaker or disconnect switch and fuses in accordance with all applicable electrical codes.
2. Make sure that the leads are connected correctly and the AC drive is properly grounded.
(Ground leads should be at least the same size wire as the input leads R, S, and T.)
3. Use ground leads that comply with AWG standards. Make the length of these ground leads as short as possible.
4. Should several AC drive units be installed side by side, all the units should be grounded directly to the ground poles. Do not form a loop with the ground leads.



5. Make sure that the power source supplies the correct voltage and is capable of supplying the required current to the AC drive. Refer to specification for **Rated AC Input Power**. Motor Voltage should match the line voltage.
6. For single phase applications, the AC input line can be connected to any two of the three input terminals R, S, T. A single phase DZB100B drive can be powered from three phase as well as single phase.

Note: This drive is not intended for use with single-phase motors.

7. When the AC drive output terminals U, V, and W are connected to the motor terminals U, V, and W, respectively, the motor will rotate counter-clockwise (viewed from the shaft of the motor as shown below) if a forward operation command is entered (FWD lamp is ON).



8. To reverse the direction of rotation, interchange any two connections of the three motor leads.
9. The control lines and power lines (R,S,T;U,V,W;P,N,BR+,BR-) should be separated and avoid parallel wiring lest it should generate noise and cause mis-operation.

Caution: Do not attach or remove wiring or connectors when power is applied to the AC drive.

Caution: Do not monitor the signals at any point on the circuit board while the AC drive is in operation.

Caution: Do not connect the AC input to any of the U, V, W terminals, as this will damage the AC drive.

● Control Circuit Wiring

(1) Control terminal block designations

The control leads must be routed separately from the power supply and motor leads.
 They must not be fed through the same cable conduit.

Terminal Symbol

A	B	C		10V	VI	CI	FM	ACM	MO ₁	MO ₂	MCM	EV
FWD	REV	DCM	MI ₁	MI ₂	MI ₃	RST	EF	TRG	DCM	DFM	SG+	SG-

A	B	C	FWD	REV	DCM	MI ₁	MI ₂	MI ₃	RST	EF	TRG	DFM	DCM	MO ₁	MO ₂	MCM	10V	VI	CI	FM	ACM	EV	SG+	SG-
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(2) Control terminal block descriptions

Close Contacts Terminals	Terminals Use	Function
A-B	Multi-function indication output contact	Refer to Chapter 5, F1-57
B-C	Multi-function indication output contact	
REV-DCM	Reverse / Stop	"Open"→stop, "Close" → Reverse
FWD-DCM	Forward / Stop	"Open"→stop, "Close"→ Forward
MI ₁ -DCM	Multi-function input 1	Refer to Chapter 5, F1-39, 40, 41, 42
MI ₂ -DCM	Multi-function input 2	
MI ₃ -DCM	Multi-function input 3	
MI ₄ (EF)-DCM	Multi-function input 4	
RST-DCM	Reset	"Close"→ Reset
DFM-DCM	Digital frequency meter	Digital frequency output (0, +10 V)
TRG-DCM	Counter trigger input	"Open"→"Close":(counter value)+1
MO ₁ -MCM	Multi-function PHC output 1	Refer to F1-45, 46 (open collector output)
MO ₂ -MCM	Multi-function PHC output 2	
10V-ACM	Power supply for speed setting	+10 V (20 mA max. output current)
VI-ACM	Analog voltage input	0~10 V (Max. output freq.) input
CI-ACM	Analog current input	4~20 mA (Max. output freq.) input
FM-ACM	Analog frequency/current meter	0 ~10 V (Max. output freq.) output
SG+-SG-	Serial communication interface	RS-485 serial port
EV-DCM	Auxiliary control power source	DC 20V ~ 24V (50mA Max.)

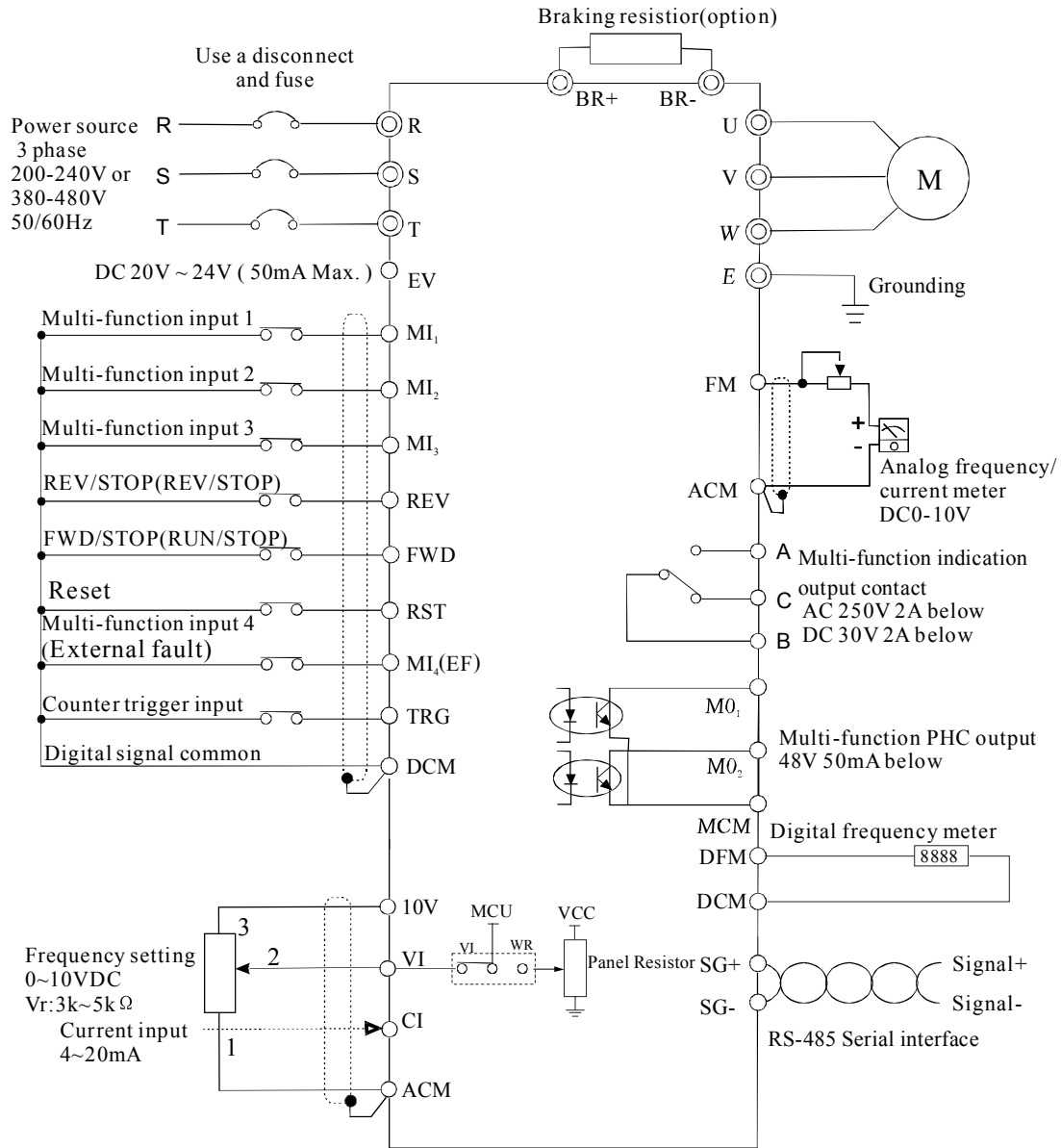
Note: Use twisted-shielded or twisted-pair shielded-lead wires for the control signal.

It is recommended to run signal wiring in a separate steel conduit.

The shield wire should only be connected at the drive.

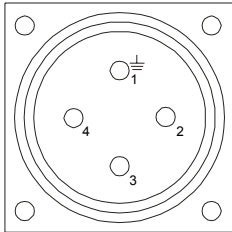
● 2.3 Basic Wiring Diagram

Users must connect wires according to the following circuit diagram shown below.

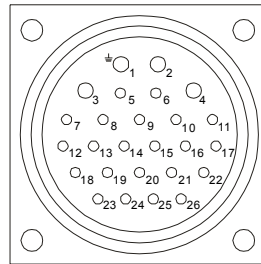


◎ shows main circuit ○ shows control circuit

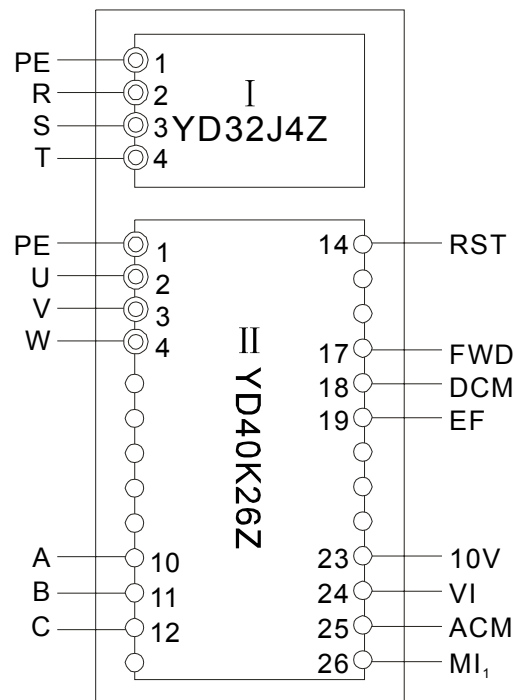
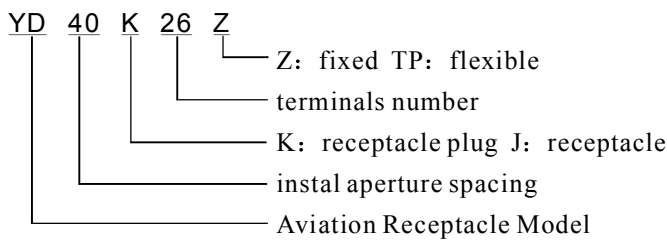
● Aviation Receptacle Wiring Diagram



I YD32J4Z



II YD40K26Z



⊙ shows main circuit ○ shows control circuit

Chapter 3 Digital Keypad Operation

Chapter 3 describes the various controls and indicators found on the digital keypad of the DZB100 AC drive. The information in this chapter should be read and understood before performing the start-up procedures described in Chapter 4.

3.1 Description of the Digital Keypad

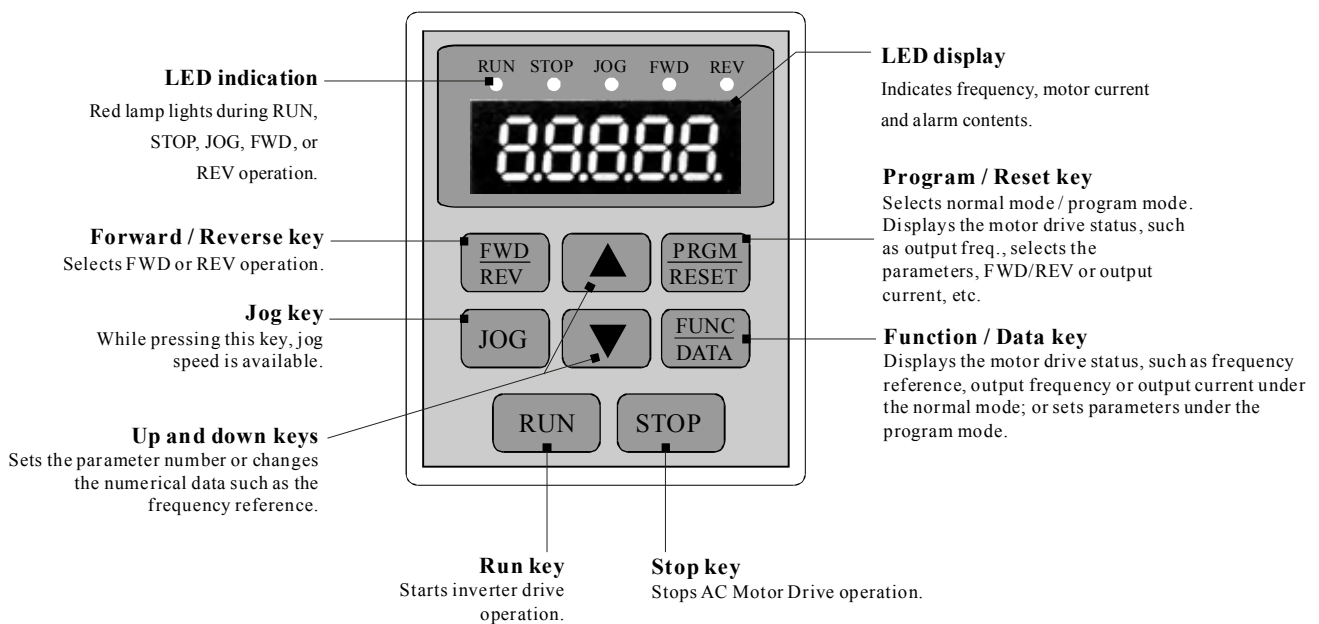
3.2 Explanation of Screen Display







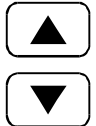
3.3 Digital Keypad Operating Modes & Programming steps

3.1 Description of the Digital Keypad

● Digital Keypad Parts and Functions

This digital keypad module includes two parts: display panel and a keypad. The display panel allows the user to program the AC drive, as well as view the different operating parameters. The keypad is the user interface to the AC motor drive. Refer to the following figure for a description of the different parts.









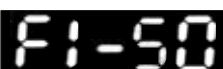



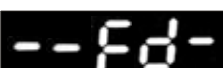





Key	Description
	<p>Program / Reset Used to select the Normal mode of operation or to program the AC drive when either the drive is running or has stopped. Switch to the PRGM mode to select a parameter or change the setting of a parameter. If the AC drive has stopped due to a fault, press this button to reset the drive.</p>
	<p>Function / Data Displays information on the AC drive status such as the reference frequency, output frequency, or output current in the normal mode. While the drive is in the Program Mode, press this key once to display the current parameters. After changing the parameters, press this key again to store the new parameters.</p>
	<p>Forward / Reverse Used to toggle between forward and reverse operation. Pressing this key will cause the motor to ramp down to 0 Hz and then ramp up to the preset speed in the opposite direction. By default, the digital keypad controls the AC drive forward/reverse operation. To control the forward/reverse operation via the control terminal block, change the F1-01 parameter to “0001” or “0002” .</p>
	<p>Jog Used to start the AC drive, then run at the jog frequency as set by the parameter specified under F1-12 [Jog Frequency].</p>
	<p>Run Used to start the AC drive operation. This key has no effect when the drive is set to terminal run.</p>
	<p>Stop Used to stop the AC drive operation.</p>
	<p>Up / Down Press the "Up" or "Down" button to change parameter settings. These keys may also be used to scroll through different operating values or parameters.</p>

Note: Pressing the "Up" or "Down" button momentarily changes the parameter settings in increments. Press and hold down either of these keys to rapidly run through the possible settings.

3.2 Explanation of Screen Display

● Explanation of Displayed Messages

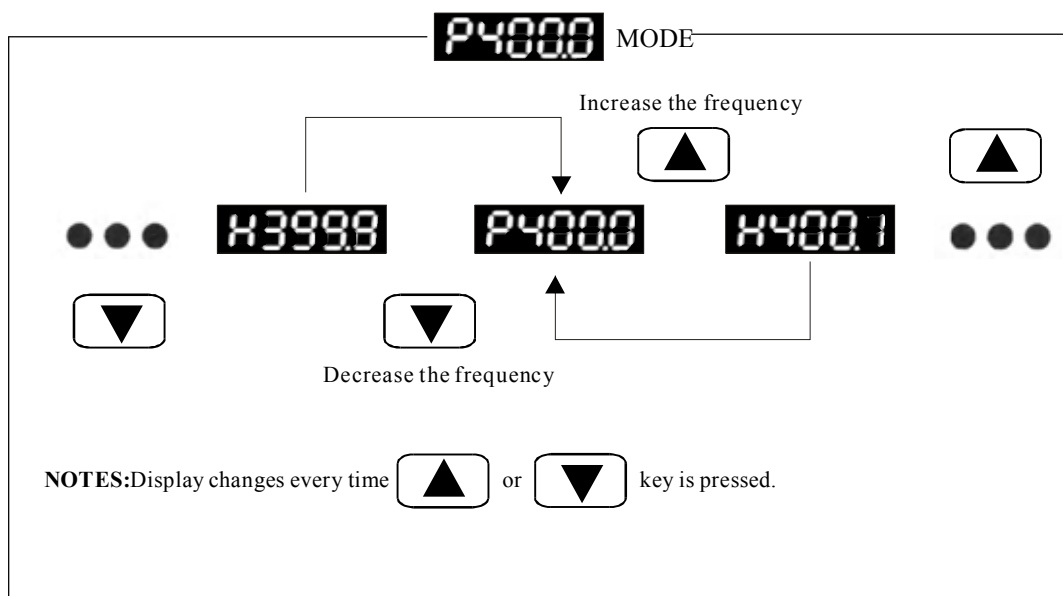
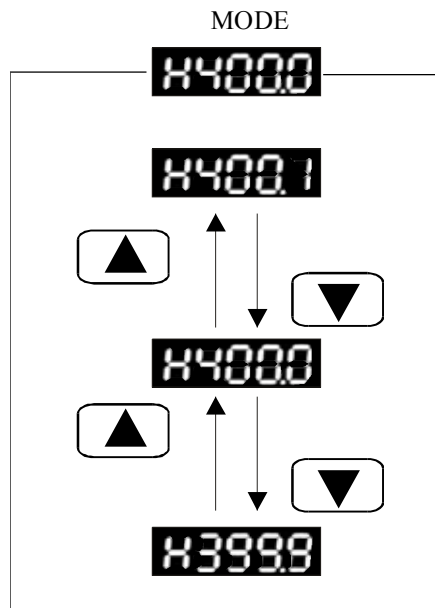
Displayed Message	Description
	Displays the AC drive output frequency controlled by the Maximum Output Frequency (F1- 03), Jog Frequency (F1- 16), or by the Multi-Function Input Terminals (F1-39-41). If the frequency source originates from the Digital keypad, the user can use either the  or  key to set the frequency.
	Displays the output frequency present at terminals U, V, and W.
	Displays the input voltage.
	Displays the custom unit (n), where $n = P * F1-.65$.
	Displays the internal counter value (r). Note: Refer to Chapter 5, F1-45, 46, 63 - 66 for a detailed description of the above.
	Displays the output current present at terminals U, V, and W
	Displays the specified parameter number. The actual parameter value may be displayed by pressing the  key.
	Displays actual value stored within the specified parameter. Press the  key to store the value of the specified parameter.
	The display will read “Fd” (as shown) for approximately 1 second if the input has been accepted. After a parameter value has been set, the new value is automatically stored in memory. To modify an entry, use  or  key. Then press the  key.

3.3 Digital Keypad Operating Modes & Programming steps

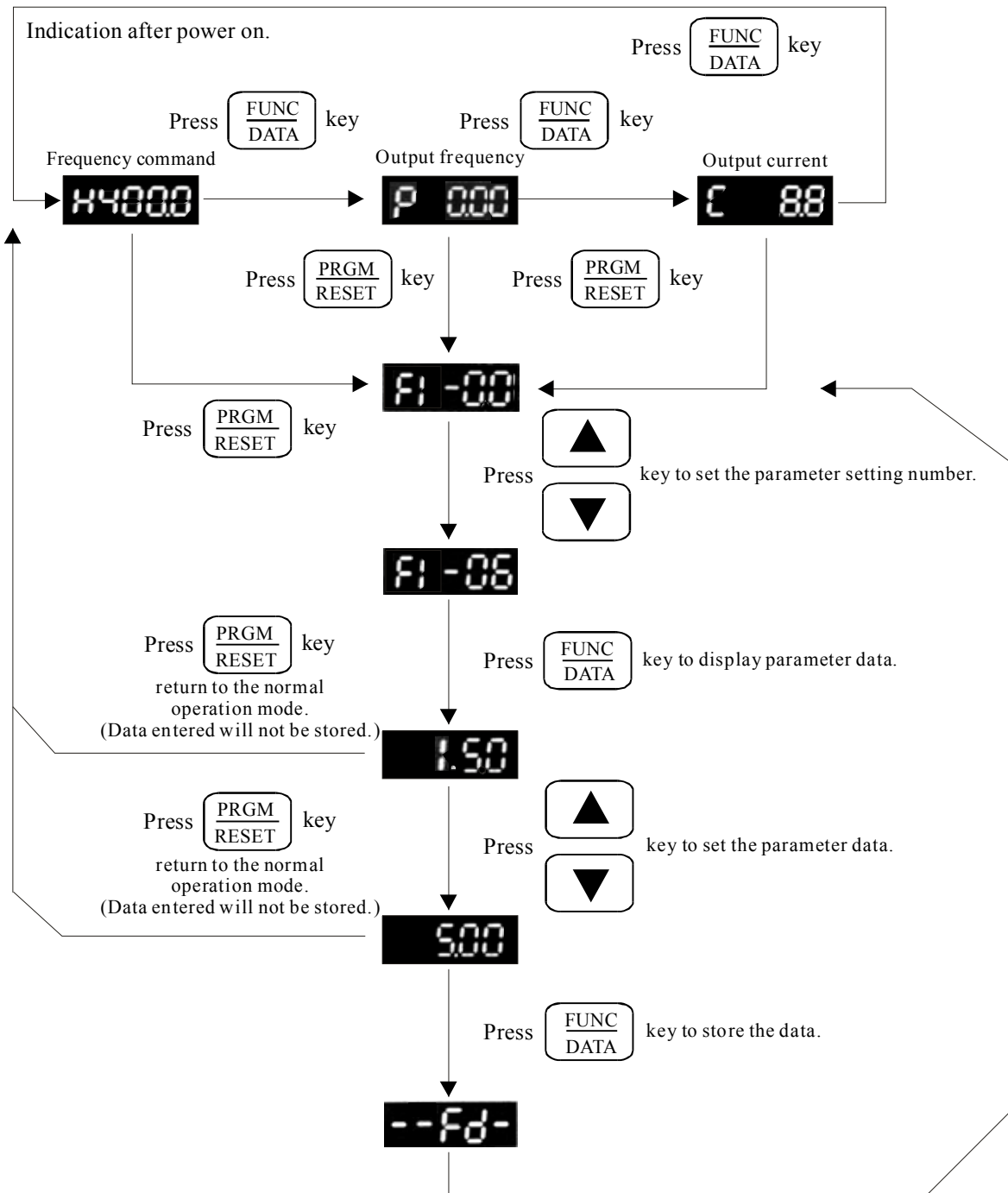
Pressing the (RUN) key after power on will cause the AC drive to operate at 60 Hz, which is the factory default setting. Use the (STOP) key to halt operation. Refer to the Basic Wiring Diagram in Chapter 2 for information on the wiring connection.

To change the operating frequency, proceed as follows:

The operating frequency may be changed in either the “STOP” or “RUN” mode.



Setting parameters:



Chapter 4 Start Up

This chapter describes the steps needed to start the AC drive and typical adjustment and verification procedures to ensure a simple and efficient start-up. The following start-up procedures describe the most common parameter settings and system configurations.

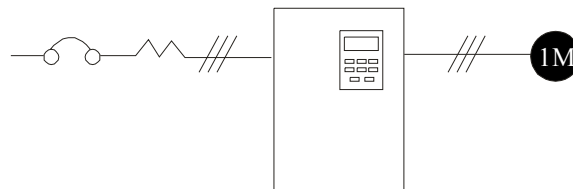
4.1 Initial Operation - Motor Disconnected

- ◆ Verify that the AC power line, at the disconnect device, is within the rated power of the AC drive.
- ◆ Connect the AC drive to the power line.
- ◆ Proceed as follows to select a mode of operation.

1. Operating frequency determined by the digital keypad.

Digital keypad enabled to control AC drive operation.

(F1-00=0000, F1-13=0000) (Factory default setting)

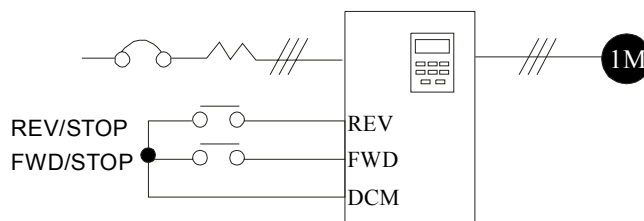


2. Operating frequency determined by the digital keypad.

Control terminals enabled to control AC drive operation; "Stop" key on digital keypad is enabled.

Two wire "REV/STOP" and "FWD/STOP" remote control enabled.

(F1-00=0000, F1-13=0001, F1-38=0000)

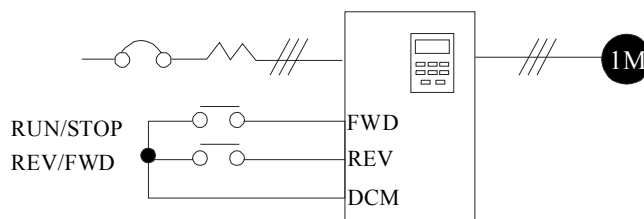


3. Operating frequency determined by the digital keypad;

Control terminals enabled to control AC Drive operation; "Stop" key on digital keypad is enabled.

Two wire "REV/FWD" and "RUN/STOP" remote control enabled.

(F1-00=0000, F1-13=0001, F1-38=0001)

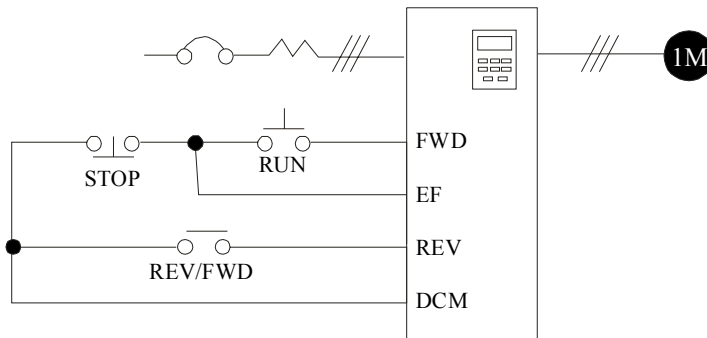


4. Operating frequency determined by the digital keypad;

Control terminals enabled to control AC Drive operation; "Stop" key on digital keypad is enabled.

Three wire sequence remote control is enabled.

(F1-00=0000, F1-13=0001, F1-14=0002)



Note: Descriptions of the close / open function are as follows:

Example: ■ To select Rev and Stop operations:

Rev / Fwd Contact "close" = reverse operation

Stop Contact "open" = stop

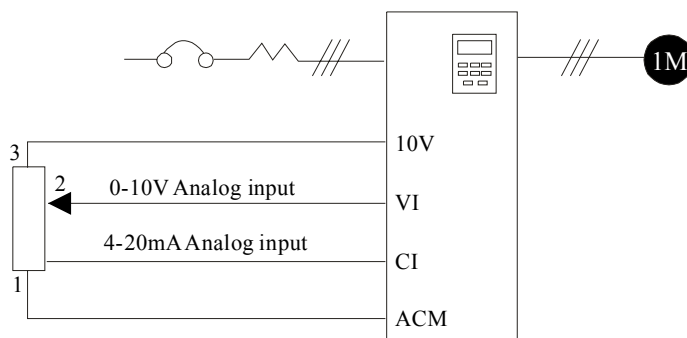
■  Momentary input

■  Maintained input

5. Operating frequency determined by analog input; (DC 0 to +10 V) + (DC 4 to 20 mA)

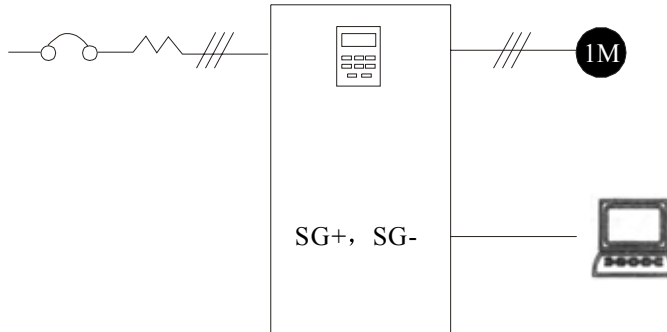
Digital keypad enabled to control AC Drive operation.

(F1-00=0001, F1-13=0000)



6. Operating frequency determined by remote control via the RS-485 serial interface;
RS-485 interface enabled to control AC Drive operation.

"Stop" key on digital keypad is enabled.(F1-00=0002, F1-13=0003)



This completes the operation mode selection. Verify your operation mode works correctly, then proceed to the next section for motor connection and initial operation.

4.2 Initial Operation - Setting Parameters and connecting the Motor.

- ◆ Verify Minimum and Maximum Output Frequency Settings (F1-08 and 04) are correct for your application.
- ◆ Verify the Motor Stop Method (F1-15) is correct for your application. If set to "Ramp to Stop", then verify the Accel/Decel Time Settings (F1-10 and 11) are correct for your application.
- ◆ Connect the motor to the terminals U, V, and W
- ◆ Check for correct motor shaft rotation (counter clockwise when viewed from the shaft).
- ◆ Verify the Stop command is functioning by pressing the Stop Key on the Digital Keypad or using your Control Terminal Stop method.

This completes the basic start-up. Depending on the application, some parameter values may need to be modified. Refer to Chapter 5 for parameter settings.

Chapter 5 Summary of Parameter Settings

NO.	Parameter Name	Parameter Value	Factory Setting
00	Command frequency source select	0000: Command frequency input determined by the digital control panel	0000
		0001: Command frequency input determined by the analog signal (0~+10v)+(4~20mA)	
		0002: Command frequency input determined by remote control via the RS-485 serial interface	
01	Max. voltage frequency	20.0~F1-04	600.0
02	Max. output voltage	0.0~400.0V	250.0
03	Over-torque detection	0~200%	150%
04	Max. operating	F1-01~1500.0Hz	800.0
05	User-defined frequency setting	F1-08~F1-04	400.0
06	Mid-point frequency	F1-08~F1-01	20.0
07	Mid-point voltage	0.0~400.0V	10.0
08	Min. output frequency	0.0~200.0Hz	20.0
09	Min. output voltage	0.0~100.0V	10.0
10	Acceleration time 1	0.1~999.9sec	10.0
11	Deceleration time 2	0.1~999.9sec	10.0
12	Jog frequency select	1.0~F1-04	50.0
13	Operation command source select	0000: Operating instructions determined by the digital control panel	0000
		0001: Operating instructions determined by the external terminal connections, keypad STOP key effective	
		0002: Operating instructions determined by the external terminal connections, keypad STOP key not effective	
		0003: Operating instructions determined by the RS-485 serial interface, keypad STOP key effective	
		0004: Operating instructions determined by the RS-485 serial interface, keypad STOP key not effective	

NO.	Parameter Name	Parameter Value	Factory Setting
14	External control terminal setting	0000: FWD / STOP, REV / STOP	0000
		0001: FWD / REV, RUN / STOP	
		0002: 3-WIRE operation control mode 1	
		0003: 3-WIRE operation control mode 2	
15	Motor stop method	0000: RAMP stop	0001
		0001: Coasting to stop	
16	REV run setting	0000: REV run enable	0001
		0001: REV run disable	
17	Over-torque detection mode select	0000: Over-torque detection not enabled	0001
		0001: Over-torque detection during constant speed operation, operation halted after over-torque detection	
		0002: Over-torque detection during constant speed operation, operation continues after over-torque detection	
		0003: Over-torque detection during operation, operation halted after over-torque detection	
		0004: Over-torque detection during operation, operation continues after over-torque detection	
18	Keypad lockout/reset	0000: All parameters can always be set and read	0000
		0001: All parameters are read-only	
		0002~0009: Reserved	
		0010: Resets all parameters to the factory defaults	
19	Multi-step speed setting 1	0.0~F1-03	0.0
20	Multi-step speed setting 2	0.0~F1-03	0.0
21	Multi-step speed setting 3	0.0~F1-03	0.0
22	Multi-step speed setting 4	0.0~F1-03	0.0
23	Multi-step speed setting 5	0.0~F1-03	0.0
24	Multi-step speed setting 6	0.0~F1-03	0.0
25	Multi-step speed setting 7	0.0~F1-03	0.0

Chapter 6 Parameter Settings

F1-00 Operating Frequency Source Select

F1- 00


Parameter Name Master Frequency source select

Factory Setting 0000

Settings 0000 Master Frequency determined by the digital keypad

0001 Master Frequency determined by the analog input signal
(0~+10V)+(4~20mA)

0002 Master Frequency determined by the RS-485 Interface.

 This parameter is used to determine the AC drive command frequency source.

F1-01 Maximum voltage frequency (Base frequency)


F1- 01

Parameter Name Maximum voltage frequency (Base frequency)

Factory Setting 600.0Hz

Unit 0.1Hz

Settings 20.0~F1-04

 This value should be set according to rated frequency of the motor as indicated on the motor nameplate.

F1-02 Maximum output voltage


F1- 02

Parameter Name Maximum output voltage

Factory Setting 250.0V

Unit 0.1V

Settings 0.0~400.0V

 This parameter determines the Maximum Output Voltage of the AC drive. The maximum output voltage setting must be smaller than or equal to the rated voltage of the motor as indicated on the motor nameplate.

F1-03 Over-torque detection level

F1-□□ 03

Parameter Name Over-torque detection level

Factory Setting 150%

Unit 1%

Settings 0~200%

☞ This parameter sets the over-torque detection level at 1% increments. The AC drive rated current is regarded as 100%.

F1-04 Maximum output frequency

F1-□□ 04

Parameter Name Maximum output frequency

Factory Setting 800.0Hz

Unit 0.1Hz

Settings F1-01~1500.0Hz

☞ This parameter determines the AC drive's maximum output frequency. All the AC drive analog inputs (0 - 10V, 4 - 20mA) are scaled to correspond to the output frequency range.

F1-05 User-difined Frequency Setting

F1-□□ 05

Parameter Name User-difined frequency setting

Factory Setting 400.0Hz

Unit 0.1Hz

Settings F1-08~F1-04

F1-06 Mid-point frequency

F1-□□ 06

Parameter Name Mid-point frequency

Factory Setting 20.0Hz

Unit 0.1Hz

Settings F1-08~F1-01

☞ This parameter sets the Mid-point frequency on the V/F curve. It may be used to determine the V/F ratio between the Minimum frequency and the Mid-point frequency.

F1-07 Mid-point voltage

F1-□□ 07

Parameter Name Mid-point voltage

Factory Setting 10.0V

Unit 0.1V

Settings 0.0~400.0V

☞ This parameter sets the Mid-point voltage on the V/F curve. It may be used to determine the V/F ratio between the Minimum frequency and the Mid-point frequency.

F1-08 Minimum output frequency

F1-□□ 08

Parameter Name Minimum output frequency

Factory Setting 20.0Hz

Unit 0.1Hz

Settings 0.0~ 200.0Hz

☞ This parameter sets the minimum output frequency of the AC Drive.

F1-09 Minimum output voltage

F1-□□ 09

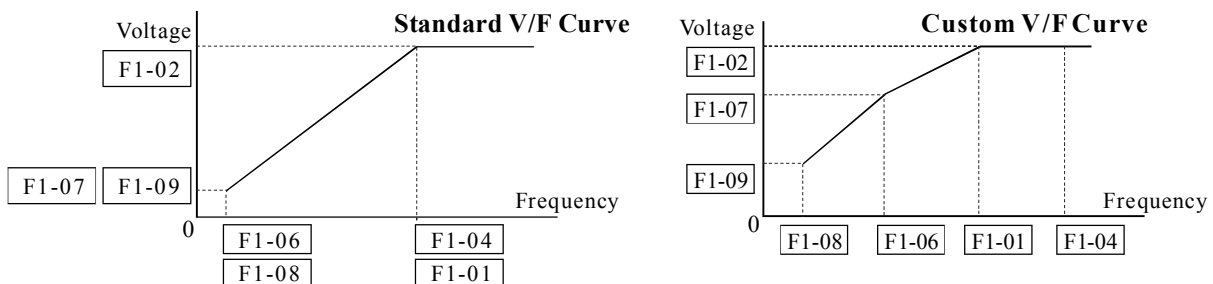
Parameter Name Minimum output voltage

Factory Setting 10.0V

Unit 0.1V

Settings 0.0~100.0V

☞ This parameter sets the minimum output voltage of the AC Drive.



F1-10 **F1-11** **Accel / Decel Time Setting**

F1- 10

Parameter Name Acceleration time 1

Factory Setting 10.0sec

Unit 0.1sec

Settings 0.1~999.9sec

- ☞ This parameter can be programmed while the drive is running.
- ☞ This parameter is used to determine the time required for the AC drive to ramp from 0 Hz to its Maximum operating frequency(F1-04) . The rate is linear unless S Curve is "Enabled".

F1- 11

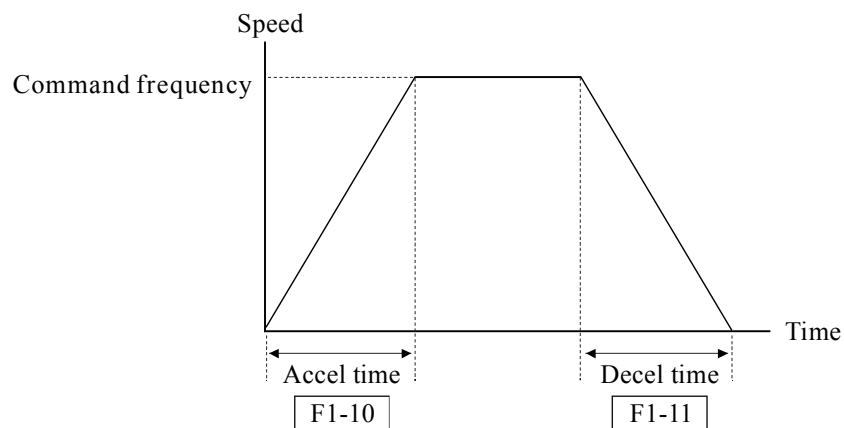
Parameter Name Deceleration time 1

Factory Setting 10.0sec

Unit 0.1sec

Settings 0.1~999.9sec

- ☞ This parameter can be programmed while the drive is running.
- ☞ This parameter is used to determine the time required for the AC drive to decelerate from the Maximum operating frequency (F1-04) down to 0 Hz. The rate is linear unless S Curve is "Enabled".



F1-12 Jog frequency

F1-□□ 12

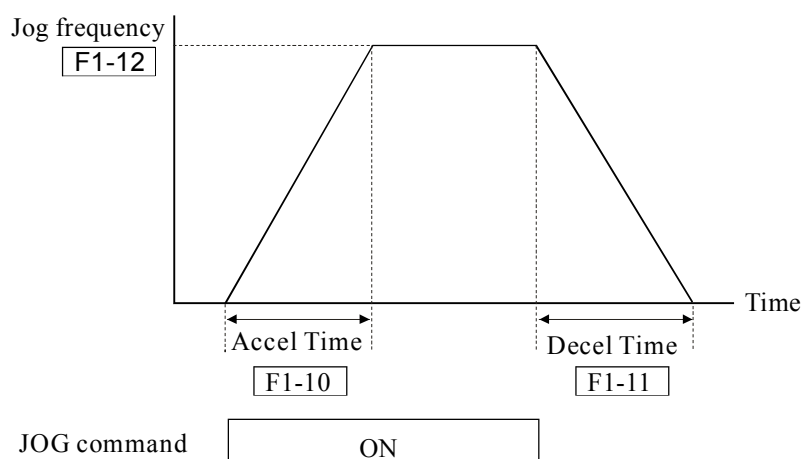
Parameter Name Jog frequency select

Factory Setting 50.0Hz

Unit 0.1Hz

Settings 0.0~F1-04

- ☞ This parameter can be programmed while the drive is running.
- ☞ This parameter is used to set the AC drive jog frequency. Upon receipt of a jog command the drive will ramp to the jog frequency.



F1-13 Operation Command Source Select

F1-□□ 13

Parameter Name Operation instructions source select

Factory Setting 0000

Settings 0000 Operating instructions determined by the digital keypad

0001 Operating instructions determined by the external terminal connections,
Keypad STOP key is enabled

0002 Operating instructions determined by the external terminal connections,
Keypad STOP key is not enabled

0003 Operating instructions determined by the RS-485 interface,
Keypad STOP key is enabled

0004 Operating instructions determined by the RS-485 interface,
Keypad STOP key is not enabled

- ☞ This parameter is used to determine the source of the AC Drive operating instructions.

F1-14 External Control Terminal Configuration

F1- □□ 14

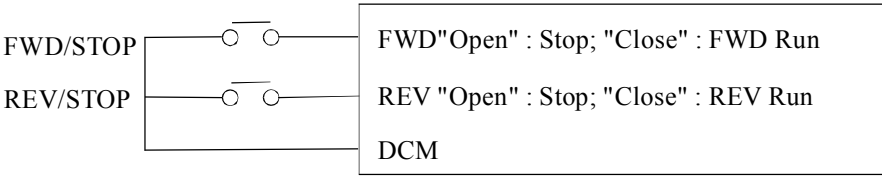
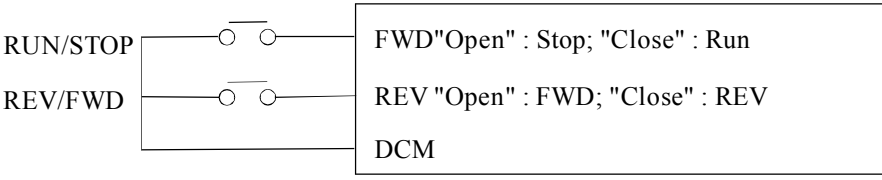
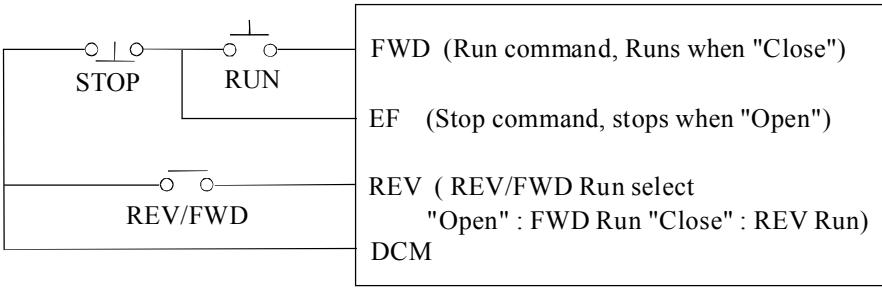
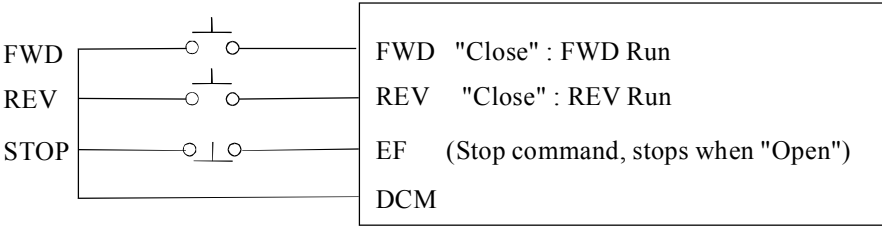
Parameter Name 2-wire / 3-wire operation control selection

Factory Setting 0000

- Settings** 0000 FWD / STOP, REV / STOP
 0001 FWD / REV, RUN / STOP
 0002 3-WIRE operation control mode 1
 0003 3-WIRE operation control mode 2

☞ This parameter determines the control functions and operating modes available through the external control terminals.

The following configurations are available:

F1-14	Control terminal wiring diagram
<p>0000 Two wire FWD / STOP REV / STOP</p>	
<p>0001 Two wire REV / FWD RUN / STOP</p>	
<p>0002 Three wire operation control mode 1</p>	
<p>0003 Three wire operation control mode 2</p>	

F1-15 Motor Stop Method Select

F1- 15

Parameter Name Motor stop method

Factory Setting 0000

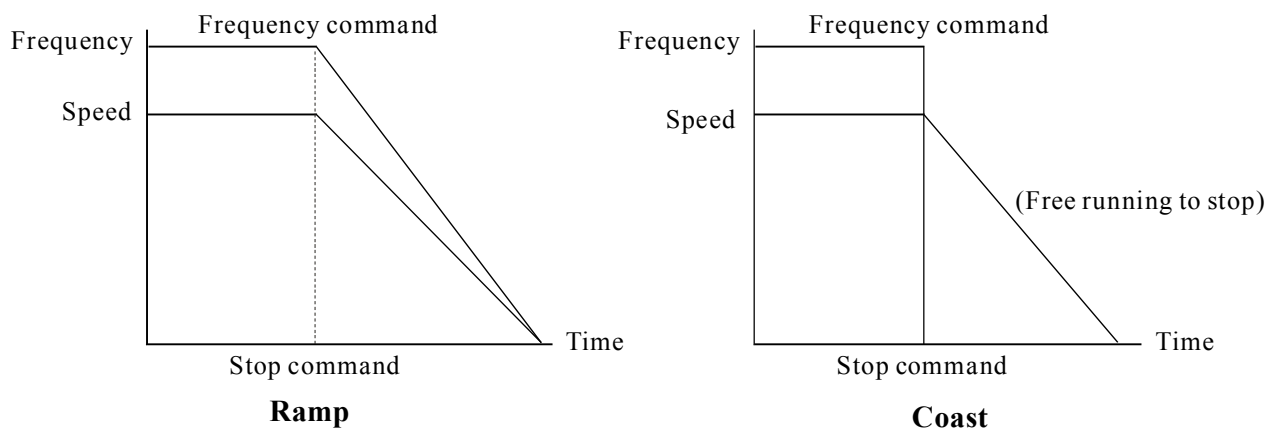
Settings 0000 Ramp stop

0001 Coast to stop

☞ This parameter determines how the motor is stopped when the AC Drive receives a valid stop command.

■ **Ramp** The AC drive output frequency decelerates in the time specified by F1-11, down to the frequency specified by (F1-08) and then the drive output turns off.

■ **Coast** The AC drive is turned off immediately while the motor free runs until it comes to a complete stop.



F1-16 REV Run Setting

F1- 16

Parameter Name REV Run

Factory Setting 0000

Settings 0000 REV run enabled

0001 REV run disabled

☞ This parameter determines whether the AC Drive can operate in the reverse direction.

F1-17 Over-torque detection mode select

F1-□□ 17

Parameter Name Over-torque detection mode select

Factory Setting 0001

Settings 0000 Over-torque detection not enabled
0001 Over-torque detection during constant speed operation,
operation halted after over-torque detection
0002 Over-torque detection during constant speed operation,
operation continues after over-torque detection
0003 Over-torque detection during operation,
operation halted after over-torque detection
0004 Over-torque detection during operation,
operation continues after over-torque detection

☞ This parameter determines the AC drive operation after an over-torque is detected.

F1-19 **F1-20** **F1-21** **F1-22** **F1-23** **F1-24** **F1-25** Multi-speed Operation

F1-□□ 19, 20, 21, 22, 23, 24, 25

Parameter Name Multi-step speed setting 1, 2, 3, 4, 5, 6, 7

Factory Setting 0.0Hz

Unit 0.1Hz

Settings 0.0~ 800.00Hz

☞ These parameters can be programmed while the drive is running.

☞ The multi-function input terminals are used to select one of eight AC drive Multi-Speed output frequencies. The frequency is determined by F1-19 to 25.

Chapter 7 Troubleshooting and Fault information

The AC drive has a comprehensive fault diagnosis system. Once a fault is detected, the corresponding protective functions will be activated to turn off the AC drive output.

During any failure, the AC drive switches off and an error message will appear in the display. The three most recent faults are stored in the AC drive non-volatile memory and may be read through the digital keypad, or through the RS-485 interface on the control board.

Note: Pressing the Reset button will not restore the AC drive to its normal operating conditions unless the fault is corrected.

Fault Name	Fault Descriptions	Corrective Actions
E001	The AC drive detects that the DC bus voltage has fallen below its minimum value.	Check whether the input voltage falls within the rated AC drive's input voltage.
E004	Over-current during acceleration: 1. Short-circuit at motor output. 2. Torque boost too high. 3. Acceleration time too short. 4. AC drive output capacity too small.	Check for possible poor insulation at the output line. Decrease the torque boost setting . Increase the acceleration time. Replace with an AC drive with higher output capacity.
E005	Over-current during steady state operation: 1. Short-circuit at motor output. 2. Sudden increase in motor loading. 3. AC drive output capacity too small.	Check for possible poor insulation at the output line. Check for possible motor stall. Replace with an AC drive with higher output capacity.
E006	Over-current during deceleration: 1. Short-circuit at motor output. 2. Deceleration time too short. 3. AC drive output capacity too small.	Check for possible poor insulation at the output line. Increase the deceleration time. Replace with an AC drive with higher output capacity.

Fault Name	Fault Descriptions	Corrective Actions
E008	<p>1.The AC drive detects excessive drive output current.</p> <p>2.The AC drive can withstand up to 150% of the rated current for a maximum of 60 seconds.</p>	<p>Check whether the motor is overloaded.</p> <p>Reduce the torque compensation setting as set.</p> <p>Increase the AC drive's output capacity.</p>
E009	<p>The over-current hardware trip circuit detects an abnormal increase in current.</p>	<p>Check whether the motor output power corresponds to the AC drive output power.</p> <p>Check the wiring connections between the AC drive and motor for possible short circuits.</p> <p>Increase the Acceleration time .</p> <p>Check for possible excessive loading conditions at the motor.</p> <p>After short-circuit being removed, if there is any abnormal conditions when operating the AC Motor Drive, it should be sent back to the agency or manufacturer.</p>
E00A	<p>The AC drive detects that the DC bus voltage has exceeded its maximum allowable value.</p>	<p>Check whether the input voltage falls within the rated AC drive input voltage. Check for possible voltage transients.</p> <p>Bus over-voltage may also be caused by motor regeneration. Either increase the Decel time or add an optional braking resistor. Check whether the required braking power is within the specified limits.</p>
E00d	<p>The external terminal EF-DCM goes from ON to OFF.</p>	<p>External fault.</p>
E00E	<p>The AC drive temperature sensor detects excessive heat.</p>	<p>Ensure that the ambient temperature falls within the specified temperature range.</p> <p>Make sure that the ventilation holes are not obstructed.</p> <p>Remove any foreign objects on the heatsinks and check for possible dirty heatsink fins.</p> <p>Provide enough spacing for adequate ventilation.</p>

Fault Name	Fault Descriptions	Corrective Actions
E00F	AC drive E2PROM contains invalid data or can not be programmed.	Check the connections between the main control board and the power board. Reset drive to factory defaults.
E011	Realy contact don't work (Start-up warning)	Check whether the internal Realay is damaged.
E013	Motor overload. Check the parameter settings F1-60, 62.)	Reduce the motor load. Adjust the over-torque detection setting to an appropriate setting.
E014	Protection circuitry of hardware detected abnormal operation.	Remove power from the AC drive and then restore power. If H.P.F. fault appears again, the AC drive should be returned for service.
E015	Drive's internal circuitry abnormal.	Switch off power supply. Check whether the input voltage falls within the rated AC drive input voltage. Switch on the AC drive.
E016 (bb)	External baseblock. AC drive output is turned off.	When the multi-function input 1 (2, 3)-DCM terminal goes from OFF to ON, the AC drive output will be turned off.
E017	Ground fault or fuse failure: 1. Ground fault : The AC drive output is abnormal. When the output terminal is grounded (short circuit current is 50% more than the AC drive rated current), the AC drive power module may be damaged. The short circuit protection is provided for the AC drive protection, not user protection. 2. Fuse failure: The fuse failure information will be displayed by the LED located on the power board.	Ground fault : 1. Check whether the IGBT power module is damaged. 2. Check for possible poor insulation at the output line. Fuse failure: 1. Replace Fuse. 2. Check whether the IGBT power module is damaged. 3. Check for possible poor insulation at the output line.

Chapter 8 Quality Guarantee

Quality guarantees of our products is transacted as the following rules and regulations:

8.1 Responsibility of manufacturer:

A: Interior

- ★ One month goods exchanging ,maintenance, and return after delivery
- ★ Three months goods exchanging ,maintenance after delivery
- ★ Twelve months goods maintenance after delivery

B:Abroad

- ★ Three months goods maintenance after delivery

8.2 Whenever and wherever use our product, users have the rights to take our service with payment.

All distributors, manufacturers and agents in the whole country can provide the service.

Our company has the right to entrust maintenance to others.

8.3 Responsibility immunity:

- ★ Abuse producing or inducing failure is out of our responsibility
- ★ The damage or referred,secondary damage caused by the fault of the equipment will not be compensated.

8.4 The equipment is guaranteed for twelve months from the date of exporting.

8.5 However the remedy of faults caused by the following reasons will be at user's cost, even though it happens during the guarantee period.

- ★ Improper operation, unauthorized repair or modification;
- ★ Operation beyond the standard specifications;
- ★ Falling down , barbarous transport;
- ★ Device ageing and failure caused by unsuitable environment;
- ★ Damage caused by earthquake, fire, windstorm, flood, lightning ,abnormal voltage and other natural disaster, or effect hereof.

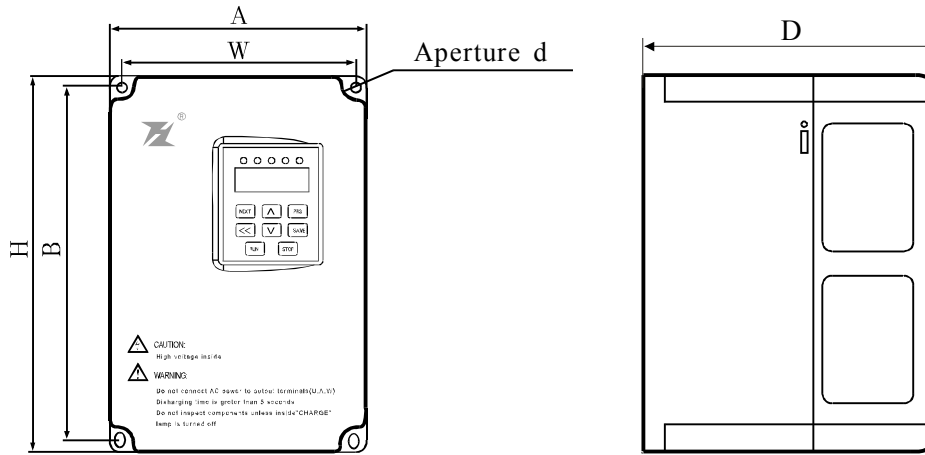
Appendix A: Standard Specifications

Item		Description
Input	Rated Voltage	220V Class:220V ± 20% 50/60Hz ± 5Hz
	Frequency	380V Class:380V ± 20% 50/60Hz ± 5Hz
Output	Maximum Output Voltage	Proportional to Input Voltage
	Output Frequency	0.01Hz-1500.0Hz (The frequency can be reached to 1500Hz by 100H Series AC Motor Drives.)
	Overload Endurance	150% of rated current for 1 minute
Control Characteristics	Control system	SPWM (Sinusoidal Pulse Width Modulation, carrier frequency 1-15kHz)
	V / F pattern	V/F pattern, Adjustable V/F pattern
	Frequency setting precision	0.1Hz
	Frequency resolving capability	Digital setting:0.1Hz Analog setting:Maximum frequency × 0.1%
	Slip compensation	Auto slip compensation, range:0.0-10.0
	Torque compensation	Manual/auto torque compensation, range:0%-10%
	Accel/decel time	Two curve:linear and s-curve; Two accel/decel curve, range:1.0-999.9
	Multi-step operation	Internal PLC operation; Multi-function terminal input
	Internal Counter	Realize product-line automatic count control
Operating Characteristics	Operation Setting Signal	Digital operation (Setting by RUN, STOP, FWD / REV); External signal (FWD, REV, EF can be combined for 2 or 3-wire operation, RS-485 serial interface.)
	Frequency setting	Digital operation (Setting by up/down or JOG key); External signal (Multi-function 1~4, JOG, Multi-step speed, Up / Down, 0 to 10 VDC, 4~20mA, RS-485 serial port)
	Input signal	Multi-step selection 1~7, Jogging, Accel. / Decel. Prohibit, First / Second Accel. / Decel. Switching command, External BB (NC, NO selection), etc.
	Output signal	During running, Up to frequency setting, Up to desired frequency setting Count out detection, Non zero-speed, Over-torque detection, etc.
	Analog / Digital Output	Analog frequency / current signal output, digital frequency signal output
	Other function	Automatic Voltage Regulation (AVR), S-Curve, over voltage, over-current stall prevention, abnormal records checking, Frequency limit, Carrier-frequency adjustable, DC braking, DB starting frequency setting, Momentary power failure restart, over-voltage stall prevention, etc.
Display	Display	Displays:pre-set frequency; operate frequency; output current; moto speed; internal count value; fault information, etc
	Protective function	Over-current, over voltage, under voltage, overheat ground fault, overload limit, over voltage supply, etc.
Environments	Installation site	Indoor (no straight sunshine, keep from corrosive gasses, liquid and dust)
	Altitude	1,000m or lower
	Ambient temperature	-10°C ~ +40°C
	Ambient Humidity	Below 90% RH (non-condensing)
	Vibration	1.0G less than 20Hz, 0.6G at 20~50Hz
	Storage temperature	-20°C - 60°C
Frame	Defend grade	IP20
	Cooling Method	Forced air-cooling

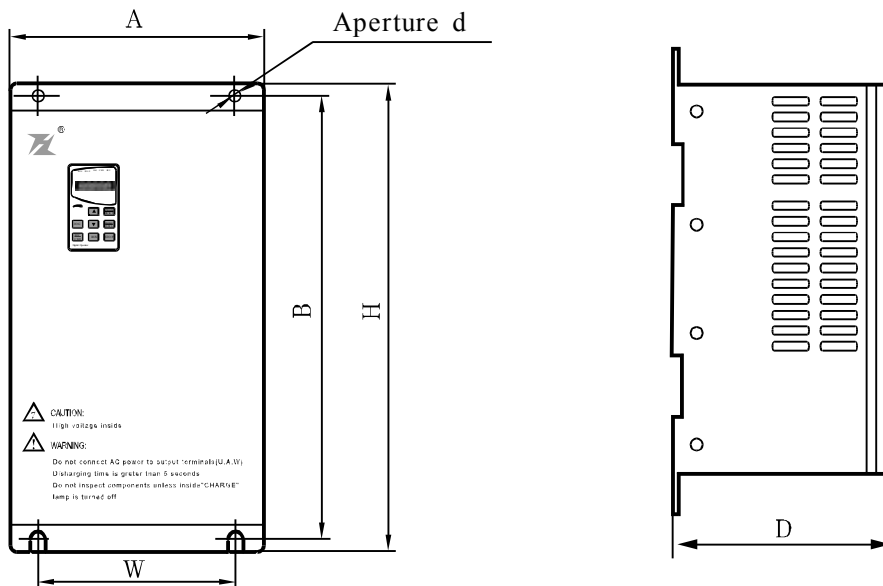
◆ AC380V Series Rating:

Voltage classification(380V)		0007	0015	0022	0037	0055	0075	0110	0150	0185	0220	0300
Input Rating	3 Phase motor rating(KW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30
	Inverter output(KVA)	1.0	2.0	3.0	5.0	7.5	10	15	20	25	30	40
	Output current(A)	2.5	3.7	5.0	8.5	13	18	24	30	39	46	58
	Output voltage(V)	Adjustable from 0 to input voltage										
Output Rating	Input Current(A)	3.2	4.8	6.5	11	16	23	31	39	50	58	75
	Operational range (V)	3 phase 380V \pm 20%, 47~63Hz										

Appendix B Dimensions



Type 1: Plastic Frame



Type 2: Steel Frame (Hanging)

Dimension form:

Model	AC Drives Model	Applicable Motor(KW)	Dimensions (mm)					
			A	B	H	W	D	d
FL0037	DZB100B0022H4	2.2	170	300	320	125	186	7
	DZB100B0037H4	3.7						
	DZB100B0055H4	5.5						
FL011	DZB100B0075H4	7.5	210	358	378	160	205	10
	DZB100B0110H4	11						
	DZB100B0150H4	15						
FL030	DZB100B0185H4	18.5	285	457	475	195	240	9
	DZB100B0220H4	22						
	DZB100B0300H4	30						