WENBIXIA 320 Series

WENBIXIA VFD 320 Series Variable Frequency Drive User Manual

Model: 320 Series

1. Product Overview

The WENBIXIA 320 series inverter is a versatile variable frequency drive (VFD) designed for precise control of three-phase motor speed. It features low noise operation, voltage vector and V/F control, quick response, and accurate torque management. This VFD supports automatic tuning of motor parameters, online switching between automatic and torque control, and includes a simple PLC function with 17 types of fault protection.
Key features include:

- Dual analog input for flexible control.
- Comprehensive protection against overcurrent, overvoltage, overload, phase loss, and short circuits.
- Simple PLC function for automated tasks.
- Output voltage regulation (AVR) function.
- Multiple speed setting methods and rich I/O terminals.

Figure 1: Front view of the WENBIXIA VFD 320 Series, showing the control panel, display, and key specifications like input/output phases, power ratings (0.75KW to 7.5KW), and frequency range (0-400Hz).

2. Installation and Wiring

Proper installation and wiring are crucial for the safe and efficient operation of the VFD. Ensure all connections are secure and follow local electrical codes.

2.1 Mounting

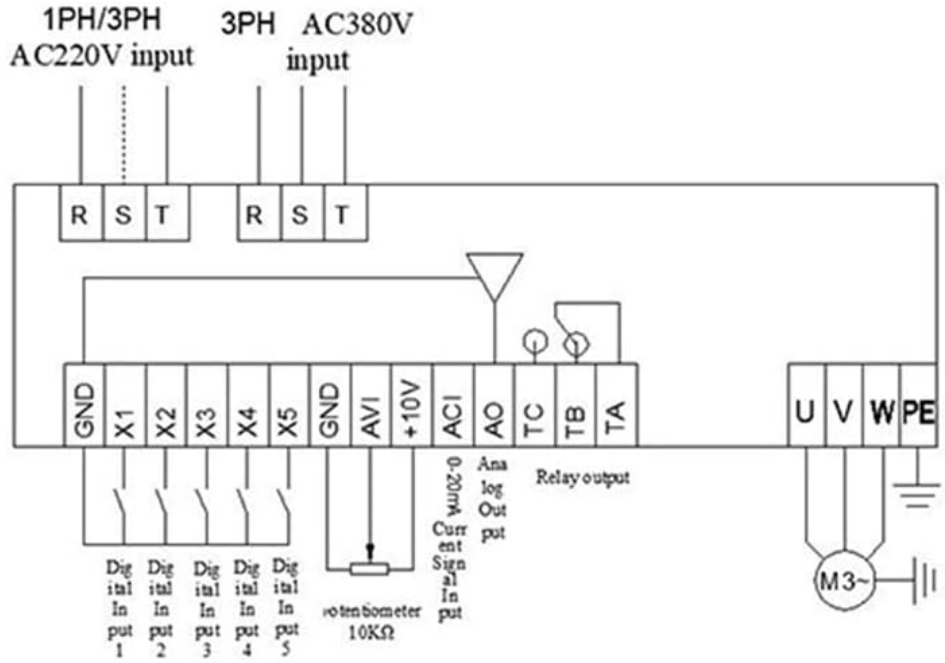
The VFD casing is designed with multiple ventilation holes to ensure adequate cooling and extend service life. Mount the unit in a location that allows for proper airflow and prevents overheating.

Figure 2: Angled view of the VFD, highlighting the cooling fins and ventilation design for optimal heat dissipation.

Figure 3: Rear view of the VFD, illustrating the mounting points and internal capacitor components.

2.2 Electrical Connections

Refer to the wiring diagram and terminal descriptions below for correct electrical connections. Always disconnect power before wiring.



Description of Terminal Function		
Terminal	**Function**	**Setting and Description**
R, S, T	Power supply of AC Drive: 380V model, connect to R, S, T terminals 220V model, connect to R, S or R, T terminals (determined by the label on the terminal)	Air switch should be used as the overcurrent protection device in the front of the AC drive input power supply. If a LCDI is provided, to prevent its malfunction, please choose a LCDI whose sensitivity level is above 200mA and action time is more than 100ms.
U, V, W	AC drive output, connected to the motor	To reduce the leakage current, the motor connecting cable should not exceed 50m wherever possible.
PE	Grounding	The AC drive should be well grounded.
X1	Digital input X1	Set via parameter F5.02, the factory default is FWD
X2	Digital input X2	Set via parameter F5.03, the factory default is REV
X3	Digital input X3	Set via parameter F5.04, the factory default is set to Multi-speed Step 1
X4	Digital input X4	Set via parameter F5.05, the factory default is set to Multi-speed Step 2
X5	Digital input X5	Set via parameter F5.06, the factory default is set to external reset signal
GND	Common port of signal	Zero potential of input/output signal
AVI	0-10V signal input	0-10V
10V	Frequency set potentiometer power supply	+10V, max. 10mA
ACI	4-20mA analog input	4-20mA
A0	Analog output signal	Set via parameter F6.10
TA, TB, TC	Relay output	Set via parameter F5.07 Contact capacity: AC 250V/3A DC 24V/2A

Figure 4: Detailed wiring diagram for the VFD, showing connections for power input (R, S, T), motor output (U, V, W), grounding (PE), and control terminals (X1-X5, GND, AVI, 10V, ACI, A0, TA, TB, TC). Below the diagram is a table describing each terminal's function and default settings.

Terminal Descriptions:

Terminal	Function	Setting and Description
R, S, T	Power supply of AC Drive	For 380V models, connect to R, S, T terminals. An overcurrent protection device should be used at the input.
U, V, W	AC drive output, connected to the motor	To reduce leakage current, the motor connecting cable should not exceed 50m.
PE	Grounding	The AC drive must be well grounded.
X1	Digital input X1	Set via parameter F5.02, default is FWD.
X2	Digital input X2	Set via parameter F5.03, default is REV.
X3	Digital input X3	Set via parameter F5.04, default is set to Multi-speed Step 1.
X4	Digital input X4	Set via parameter F5.05, default is set to Multi-speed Step 2.
X5	Digital input X5	Set via parameter F5.06, default is set to external reset signal.
GND	Common port of signal	Zero potential of input/output signal.
AVI	0-10V signal input	0-10V.
10V	Frequency set potentiometer power supply	+10V, max. 10mA.
ACI	4-20mA analog input	4-20mA.
A0	Analog output signal	Set via parameter F6.10.
TA, TB, TC	Relay output	Set via parameter F5.07. Contact capacity: AC 250V/3A, DC 24V/2A.

The terminal block is easily accessible by removing screws. Ensure all wires are connected firmly.

Figure 5: Front view of the VFD with the terminal block cover open, showing the screw terminals for electrical connections.

3. Operation

The WENBIXIA VFD 320 Series features a user-friendly control panel for easy operation and parameter adjustment.

3.1 Control Panel Overview

The control panel includes a digital display, function buttons, and a rotary encoder for setting parameters.

- **Display:** Shows current frequency, output voltage, current, and fault codes.
- **PRG/SET Button:** Enters/exits parameter setting mode and confirms selections.
- **JOG/ESC Button:** Initiates jog operation and cancels current operation or exits menus.
- **Up/Down Arrows:** Navigate through menus and adjust parameter values.
- **RUN Button:** Starts the motor.
- **STOP/RES Button:** Stops the motor and resets fault conditions.
- **Rotary Encoder:** Used for fine-tuning frequency and parameter values.

3.2 Basic Operation Steps

1. **Power On:** Ensure all wiring is correct and secure, then apply power to the VFD.
2. **Parameter Setting (if needed):**
    - Press the **PRG/SET** button to enter parameter setting mode.
    - Use the **Up/Down Arrows** or **Rotary Encoder** to navigate to the desired parameter (e.g., motor parameters, frequency settings).
    - Press **PRG/SET** again to select the parameter.
    - Adjust the value using the **Up/Down Arrows** or **Rotary Encoder**.
    - Press **PRG/SET** to save the new value.
    - Press **JOG/ESC** to exit parameter setting mode.
3. **Start Motor:** Press the **RUN** button to start the motor. The display will show the operating frequency.
4. **Adjust Speed:** Use the **Rotary Encoder** to adjust the output frequency and thus the motor speed during operation.
5. **Stop Motor:** Press the **STOP/RES** button to stop the motor.

For advanced functions like simple PLC, torque control, or external control via I/O terminals, refer to the detailed parameter manual (not included here) for specific parameter settings.

4. Maintenance

Regular maintenance ensures the longevity and reliable performance of your WENBIXIA VFD.

- **Cleaning:** Keep the VFD clean and free from dust and debris. Use a soft, dry cloth for cleaning. Do not use liquid cleaners.
- **Ventilation:** Ensure that the ventilation openings are not blocked. Periodically check and clean the cooling fan if accessible, to prevent overheating.
- **Connections:** Periodically check all electrical connections for tightness. Loose connections can cause overheating or intermittent operation.
- **Environment:** Operate the VFD within its specified environmental conditions (temperature, humidity, dust level) to prevent damage.
- **Inspection:** Visually inspect the VFD for any signs of damage, discoloration, or unusual odors.

5. Troubleshooting

This section provides basic troubleshooting steps for common issues. For complex problems or persistent faults, contact technical support.

Problem	Possible Cause	Solution
VFD does not power on	No input power; Incorrect wiring; Blown fuse.	Check power supply; Verify input wiring (R, S, T); Check fuses.
Motor does not run	Incorrect motor wiring (U, V, W); Fault condition; Parameter settings incorrect.	Verify motor connections; Check for fault codes on display and reset; Review motor parameters.
Overcurrent fault	Motor overload; Short circuit in motor or wiring; Acceleration time too short.	Reduce motor load; Check motor and wiring for shorts; Increase acceleration time parameter.
Overvoltage fault	Input voltage too high; Deceleration time too short; Regenerative load.	Check input voltage; Increase deceleration time parameter; Consider braking resistor for regenerative loads.
Overload fault	Motor or VFD overloaded; Motor parameters incorrect.	Reduce load; Check motor current and VFD capacity; Verify motor parameters (e.g., F0.03, F0.04).

The VFD provides 17 kinds of fault protection. When a fault occurs, a corresponding fault code will be displayed. Refer to the full product manual for a complete list of fault codes and their specific remedies.

6. Specifications

Below are the general specifications for the WENBIXIA 320 Series VFD. Specific power ratings vary by model variant.

- **Input Voltage:** 3-phase 380V (for this model variant)
- **Output Voltage:** 3-phase 0-380V
- **Power Range:** 0.75KW, 1.5KW, 2.2KW, 3KW, 4KW, 5.5KW, 7.5KW (model dependent)
- **Frequency Range:** 0-400Hz
- **Control Mode:** Voltage Vector & V/F Control
- **Protection:** Overcurrent, Overvoltage, Overload, Phase Loss, Short Circuit
- **Analog Input:** Dual analog input (0-10V, 4-20mA)
- **Digital Inputs:** Multiple configurable digital inputs
- **Relay Output:** Yes (AC 250V/3A, DC 24V/2A)
- **Item Weight:** Approximately 2.2 pounds (for 2.2KW model)
- **Package Dimensions:** Approximately 1.18 x 0.79 x 0.39 inches