Shenzhen VEIKONG Electric Co., Ltd.

Service Address: Block E01, first industrial park, Lingbei 5 road, Phoenix Community, Fuyong Street, Bao'an District, Shenzhen, China

Technical Support Hotline: +86-0755-89587650
Web Site: www.veikong-electric.com

VFD500 series high performance AC drive

Innovation/Technology/High Quality
Shenzhen Veikong Electric CO., Ltd. is a high-tech enterprise which has been specializing in researching, manufacturing and trading high, medium and low voltage inverters, providing our clients with integrated system solutions. We have a professional R&D and devoted management team with more than 20 years' experience of theoretical research, product development and quality management. Veikong also is one of the first independent AC drives company in China. We adopt SPWM, sensorless vector control and vector and torque control technology in our VFD series inverters, which has reached the international advanced standard. The products can directly replace and be equivalent of Europe and the United States, Japan and other brands, providing customers with a powerful technical support. We have achieved popularity and qualification in VFD industry. Quality is the life of enterprise.

Veikong drives keeps following ISO9001 standard to manage and supervise quality. Our products have passed CE certification and other technical approval. To better meet customer requirements and market needs, Veikong drives keeps on upgrading new technologies and new products.

The customer is the source of enterprise. We are honored to put top priority on customers’ requirements as well as achieving their requirements. Our products have been widely used in petroleum, chemical, melting, hoisting, electric power, building materials, water supply, plastics, textiles, printing, packing and other industries to create value for customers.

PCBA Production Line and Test

Burn-in

Lacquer

Assemble

Automatic DT test platform

Automatic PCBA ATE test platform

Automatic FLASH test platform
Company Profile

Strong R&D Power

- Board design: ECAD design platform-Mentor Network design constraint Netclass/net network width and distance

- Schematic diagram interdesign with PCB to a perfect extent with complete serious checking function

Power module design platform-heat model design

- Power Electronics design-IGBT Pulse Test

- Software design: powerful function: Simulink-MotorControl simulation platform

Strong develop ability

Advanced Instruments and Equipments

- Thermal imaging system
- Programming integrated testing system
- PM3000 power analyzer
- Programming temperature box
- Programming high voltage insulator
- Signal generator
- Signal analyzer
- AC source Surge Noise coupler EFT
- ESD tester
- Safety Instruments
VEIKONG VFD500 inverters

Drive design & features

Even more compact

- VEIKONG continues to make applications even smaller by combining the compact designed drive with the light, efficient design of a synchronous motor.
- Use Side-by-Side installation for an even more compact setup.
- Finless models available*.
  * Coming soon

Independent duct design

- Independent air duct design, effectively preventing dust entering inverter, causing short-circuit and other faults and improving reliability
- Use bigger air volume and long life cooling fan effectively reduces the internal temperature rise of the inverter and ensures reliable and stable operation of inverter.

Perfect protection system

- Designed for 10 years of maintenance-free operation.
- Cooling fan, capacitors, relays, and IGBTs have been carefully selected and designed for a life expectancy up to ten years.
  * Assumes the drive is running continuously for 24 hours a day at 80% load with an ambient temperature of 40°C.

High speed accuracy and wide speed range

- High speed accuracy and wide speed range
  Steady speed accuracy: ±0.5% (SVC), ±0.02% (VC)
  Speed range: 1:200 (SVC), 1:1000 (VC)
  Heavy load overload capability:
  - 110% rated current for long-term stable operation
  - 150% rated current for 1 minute
  - 180% rated current 10s

High torque in low speed, fast response

- High torque in low speed, fast response
  Load capacity in low speed:
  - VF: 180%@0.50Hz
  - SVC: 180%@0.25Hz
  - VC: 200%@0.00Hz

Rapid response to impact loads

- When it meets with sudden load change, inverter can quickly restore the speed, reduce the speed fluctuation, and ensure the production stability and high quality finished products.

Optimized SVC algorithm, stable operation in power generation

- At present, most of the inverters can not work stably under the SVC control mode (especially in the case of being reversed).
- VFD500 can run very well, and it achieves great convenience in some special applications (such as tension control in rewinding and winding).

Example: 380V 90KW

Example shows a 220V 3.7KW motor

44.6% smaller
67% smaller

Example: 380V 90KW

Example shows a 220V 3.7KW motor

44.6% smaller
67% smaller
VEIKONG VFD500 inverters

Advanced motor control

Advanced drive technology

- Capable of driving different types of motors. VFD500 series runs not only induction motors, but also synchronous motors like IPM*1 and SPM*2 motors with high performance open and closed loop vector control.

- Minimize equipment needed for your business by using the same drive to run induction and synchronous motors.

Positioning Capability without External Devices

- Use an IPM motor to perform position control – without motor feedback. Electrical saliency in IPM motors makes it possible to detect speed, direction and rotor position without the use of external feedback devices.

- Positioning functionality without a PLC. Visual programming in DriveWorcsEZ eliminates the need for external controllers by giving the user the power to create customized functions such as position control.

New Auto-tuning features

- Auto-Tuning features optimize drive parameters for operation with induction motors as well as synchronous motors to achieve the highest performance levels possible.

- Optimizing not only the drive and motor performance, but also automatically adjusts settings relative to the connected machinery.

- New Auto-Tuning methods. VFD500 continuously analyzes changes in motor characteristics during operation for highly precise speed control.

Powerful Torque Characteristics

- Powerful torque at 0 Hz, without sensors or feedback devices. Until recently, sensorless control has been out of reach for synchronous motors.

- VFD500 series provides powerful starting torque algorithm without relying on pole sensors or motor feedback.

- High-performance current vector control achieves powerful starting torque with an induction motor.
Stable and reliable

Deceleration over excitation function
- Accurate thermal simulation platform software ensures the reliability of thermal simulation.
- Each VFD500 inverter has undergone thermal simulation testing, and only the physical prototype is developed within the scope of the thermal simulation safety design requirements. After the actual test, the thermal simulation results are very close to the physical test results. In the limit test state, the thermal simulation can replace the actual load simulation and an additional layer of scientific thermal test.

Rigorous temperature rise test
- The whole machine temperature rise test uses the most severe cyclic overload test to meet the long-term reliable operation under extreme load conditions.
- Cyclic overload test: 1.5 times overload current for 1 minute, ambient current for 4 minutes, and 1.5 times operation for 1 minute at ambient temperature of 40°.
- This continuous cycle operation, 1 cycle for 5 minutes, until the system reaches the thermal equilibrium state, the whole machine is within the thermal design safety range.

Complete protection
- The whole series has output to ground short circuit protection, over current protection, drive overload protection, motor overload protection, drive over temperature protection, optional PT100/PT1000 motor over temperature protection.
- According to the type of fault, it can be set as fault free stop, fault deceleration stop, fault continue to run, and facilitate the on-site handling of emergency situations.
- Adopting multiple high-quality three-proof paint to enhance the environmental adaptability of the product. The three-proof paint adopts the automatic spraying process to ensure the uniformity of the thickness of the coating and the consistency of the batch.

Powerful internal logic
1. Built-in up to 6 sets of delay functions, a wide variety of input sources, the output can be used as a variety of other built-in module inputs.
2. Built-in up to 4 sets of comparator units, any input, multiple comparison functions, the output can be used as a variety of other built-in module inputs.
3. Built-in up to 4 sets of logic units, arbitrary inputs, multiple logic operations, and outputs can be used as inputs for various other built-in modules.
4. The above modules can be used alone or in combination to achieve complex internal logic functions to meet various applications, saving peripheral equipment and wiring.

Rich expansion function
- Standard ModbusRTU communication function, support for fieldbus such as Profibus-DP, CanOpen, etc.
- Supports incremental encoders and resolvers, where incremental encoders are compatible with differential encoders and open collector encoders.
- Support for IO expansion

Powerful debugging software
- Support online oscilloscope function
- Support parameter backup and download
- Support function parameter modification
- Support inverter software online upgrade
Multifunctional and user friendly

Deceleration over excitation function

- In many applications, the over-excitation function is set, the deceleration time is shortened by adjusting the motor output frequency and current, and the peripheral braking resistor and other accessories are reduced when the requirements for fast shutdown are met.

Undervoltage stall function

- When the system is powered off instantaneously, the motor is controlled by the regenerative energy during deceleration to maintain the inverter running for a short period of time and reduce the risk of idling under the instability of the grid.

Excellent speed tracking

- Non-impact smooth start for motors that do not stop rotating

Energy saving function

(1) It has excellent automatic energy saving function, only need to set the maximum energy saving target, as long as the operation meets the energy saving condition, it can enter the automatic skill state.

(2) By setting the VF function, it can realize the application of 1 drag and long distance control to meet the application of the transformation occasion.

User-friendly operation

(1) 4 Keyboard modes: standard mode (-bSC-), user-defined mode (-USr-), check mode (-vrF-) and wizard mode (-GdE-), easy to switch.

(2) Optional powerful LCD operator with parameter setting, parameter macro, monitoring, parameter copying, mobile phone Bluetooth, inverter program upgrade and other functions.
**VEIKONG VFD500 inverters**

### General Technical Data

**Designation Rules**

- **VFD500 - 4R0G/5R5P T4B**
  - B means breaking units
  - Voltage Class (2-220V, 4-380V, 6-690V)
  - Phase (T-Three Phase, S-Single Phase)
  - Model Type and power rating (G-General Type, P-Fan and pump Type)

### Appearance and Mounting Hole Dimension

<table>
<thead>
<tr>
<th>SIZE</th>
<th>Appearance and installation dimension (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>0.75KW-4KW</td>
<td>87</td>
</tr>
<tr>
<td>5.5KW-7.5KW</td>
<td>114</td>
</tr>
<tr>
<td>11KW-15KW</td>
<td>159</td>
</tr>
<tr>
<td>18.5KW-22KW</td>
<td>168</td>
</tr>
<tr>
<td>30KW-37KW</td>
<td>170</td>
</tr>
<tr>
<td>45KW-55KW</td>
<td>250</td>
</tr>
<tr>
<td>75KW-90KW</td>
<td>280</td>
</tr>
<tr>
<td>110KW</td>
<td>200</td>
</tr>
<tr>
<td>132KW-160KW</td>
<td>200</td>
</tr>
<tr>
<td>185KW-200KW</td>
<td>360</td>
</tr>
<tr>
<td>220KW-250KW</td>
<td>360</td>
</tr>
</tbody>
</table>

*450KW-710KW under development now*
## General Technical Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input</strong></td>
<td></td>
</tr>
<tr>
<td>Input Voltage</td>
<td>1-phase/3-phase 220V: 200V<del>240V 3-phase 380V</del>480V</td>
</tr>
<tr>
<td>Allowed Voltage fluctuation range</td>
<td>-15% ~ 10%</td>
</tr>
<tr>
<td>Input frequency</td>
<td>50Hz/60Hz, fluctuation less than 5%</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td></td>
</tr>
<tr>
<td>Output Voltage</td>
<td>3-phase: 0~input voltage</td>
</tr>
<tr>
<td>Overload capacity</td>
<td>General purpose application: 60S for 150% of the rated current  Light load application: 60S for 120% of the rated current</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
</tr>
<tr>
<td>Control mode</td>
<td>V/F control: Sensorless flux vector control without PG card (SVC) Sensor speed flux vector control with PG card (VC)</td>
</tr>
<tr>
<td>Operating mode</td>
<td>Speed control, Torque control (SVC and VC)</td>
</tr>
<tr>
<td>Speed range</td>
<td>1:100 (V/F) 1:200 (SVC) 1:1000 (VC)</td>
</tr>
<tr>
<td>Speed control accuracy</td>
<td>±0.5% (V/F) ±0.2% (SVC) ±0.02% (VC)</td>
</tr>
<tr>
<td>Speed response</td>
<td>5Hz(V/F) 20Hz(SVC) 50Hz(VC)</td>
</tr>
<tr>
<td>frequency range</td>
<td>0.00<del>600.00Hz(V/F) 0.00</del>200.00Hz(SVC) 0.00~400.00Hz(VC)</td>
</tr>
<tr>
<td>Input frequency resolution</td>
<td>Digital setting: 0.01Hz Analog setting: maximum frequency x 0.1%</td>
</tr>
<tr>
<td>Startup torque</td>
<td>150%/0.5Hz(V/F) 180%/0.25Hz 180%/0Hz(VC)</td>
</tr>
<tr>
<td>Torque control accuracy</td>
<td>SVC: within 5Hz10%. above 5Hz25% VC:3.0%</td>
</tr>
<tr>
<td>V/F curve</td>
<td>V/F curve type: straight line, multipoint, power function, V/f separation; Torque boost support: Automatic torque boost (factory setting), manual torque boost</td>
</tr>
<tr>
<td>Frequency giving ramp</td>
<td>Support linear and S curve acceleration and deceleration; 4 groups of acceleration and deceleration time, setting range 0.00s~60000s</td>
</tr>
<tr>
<td>DC bus voltage control</td>
<td>VdcMax control: Limit the amount of power generated by the motor by adjusting the output frequency to avoid over-voltage trip; VdcMin control: Control the power consumption of the motor by adjusting the output frequency, to avoid jump undervoltage fault</td>
</tr>
<tr>
<td>Carrier frequency</td>
<td>1kHz~12kHz (Varies depending on the type)</td>
</tr>
<tr>
<td>Startup method</td>
<td>Direct start (can be superimposed DC brake); speed tracking start</td>
</tr>
<tr>
<td>Stop method</td>
<td>Deceleration stop (can be superimposed DC braking); free to stop</td>
</tr>
</tbody>
</table>

## General Technical Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main control function</strong></td>
<td>Jog control, droop control, up to 16-speed operation, dangerous speed avoidance, swing frequency operation, acceleration and deceleration time switching, VF separation, over excitation braking, process PID control, sleep and wake-up function, built-in simple PLC logic, virtual Input and output terminals, built-in delay relay, built-in comparison unit and logic unit, parameter backup and recovery, perfect fault record, fault reset, two groups of motor parameters freely switch, software swap output wiring, terminals UP / DOWN</td>
</tr>
<tr>
<td><strong>Keypad</strong></td>
<td>LED Digital keyboard and LCD keypad(option)</td>
</tr>
<tr>
<td><strong>communication</strong></td>
<td>Standard: MODBUS communication Option:Profibus-DP and CAN OPEN</td>
</tr>
<tr>
<td><strong>PG card</strong></td>
<td>Incremental Encoder Interface Card (Differential Output and Open Collector), Rotary transformer Card</td>
</tr>
<tr>
<td><strong>Input terminal</strong></td>
<td>standard: 5 digital input terminals, one of which supports high speed pulse input up to 50kHz; 2 analog input terminals, support 0 ~ 10V voltage input or 0 ~ 20mA current input; Option card: 4 digital input terminals 2 analog input terminals.support-10V+10V voltage input</td>
</tr>
<tr>
<td><strong>Output terminal</strong></td>
<td>standard: 1 digital output terminal; 1 high-speed pulse output terminal (open collector type), support 0 ~ 50kHz square wave signal output; 2 relay output terminals, support 0 ~ 20mA current output or 0 ~ 10V voltage output; Option card: 4 digital output terminals</td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td>Refer to Chapter 6 &quot;Troubleshooting and Countermeasures&quot; for the protection function</td>
</tr>
<tr>
<td><strong>Installation location</strong></td>
<td>Indoor, no direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapor, drip or salt.</td>
</tr>
<tr>
<td><strong>Altitude</strong></td>
<td>Lower than 1000 m</td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>-10°C~+40°C (derated if the ambient temperature is between 40°C and 50°C)</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>Less than 95%RH, without condensing</td>
</tr>
<tr>
<td><strong>Vibration</strong></td>
<td>Less than 5.9 m/s² (0.6 g)</td>
</tr>
<tr>
<td><strong>Storage temperature</strong></td>
<td>-20°C ~ +60°C</td>
</tr>
<tr>
<td><strong>Installation</strong></td>
<td>Wall-mounted, floor-controlled cabinet, transmural</td>
</tr>
<tr>
<td><strong>Protection level</strong></td>
<td>IP20</td>
</tr>
<tr>
<td><strong>cooling method</strong></td>
<td>Forced air cooling</td>
</tr>
</tbody>
</table>

---

VEIKONG VFD500 inverters

Industrial control solution provider
### General Technical Data

<table>
<thead>
<tr>
<th>Type</th>
<th>Symbol</th>
<th>Terminal Name</th>
<th>Terminal function description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>+10V</strong></td>
<td><strong>Input voltage</strong></td>
<td></td>
<td><strong>10.10V±1%</strong> Maximum output current = 10mA. It provides power supply to external potentiometer with resistance range of 1KΩ~51KΩ</td>
</tr>
<tr>
<td><strong>GND</strong></td>
<td><strong>Analog ground</strong></td>
<td></td>
<td>Internal isolation from COM</td>
</tr>
<tr>
<td><strong>AI1</strong></td>
<td><strong>Analog input1</strong></td>
<td></td>
<td><strong>Input voltage</strong>: 0<del>10V; <strong>Impedance</strong>: 22KΩ <strong>Input current</strong>: 0</del>20mA; <strong>Impedance</strong>: 500KΩ Maximum input current: Through the jumper switch, the factory default voltage input.</td>
</tr>
<tr>
<td><strong>AI2</strong></td>
<td><strong>Analog input2</strong></td>
<td></td>
<td><strong>Input voltage</strong>: 0<del>10V; <strong>Impedance</strong>: 22KΩ <strong>Input current</strong>: 0</del>20mA; <strong>Impedance</strong>: 500KΩ Maximum input current: Through the jumper switch AI1 0<del>10V and 0</del>20mA analog input switch, the factory default voltage input.</td>
</tr>
<tr>
<td><strong>AO1</strong></td>
<td><strong>Analog output1</strong></td>
<td></td>
<td><strong>Output voltage</strong>: 0<del>10V; <strong>Impedance</strong>: ≥10KΩ <strong>Output current</strong>: 0</del>20mA; <strong>Impedance</strong>: 2000<del>500Ω Maximum output current: Through the jumper switch AO1 0</del>10V and 0~20mA analog output switching, the factory default voltage output.</td>
</tr>
<tr>
<td><strong>AO2</strong></td>
<td><strong>Analog output2</strong></td>
<td></td>
<td><strong>Output voltage</strong>: 0<del>10V; <strong>Impedance</strong>: ≥10KΩ <strong>Output current</strong>: 0</del>20mA; <strong>Impedance</strong>: 2000<del>500Ω Maximum output current: Through the jumper switch AO1 0</del>10V and 0~20mA analog output switching, the factory default voltage output.</td>
</tr>
<tr>
<td><strong>GND</strong></td>
<td><strong>Analog ground</strong></td>
<td></td>
<td>Internal isolation from COM</td>
</tr>
<tr>
<td><strong>+24V</strong></td>
<td><strong>+24V current</strong></td>
<td></td>
<td><strong>24V±10%</strong>: Internal isolation from GND <strong>Maximum output current</strong>: 200mA To provide 24V power supply, generally used as a digital input and output terminal power supply and external sensor power</td>
</tr>
<tr>
<td><strong>PLC</strong></td>
<td><strong>Digital input terminal common</strong></td>
<td></td>
<td>The factory default setting is connected PLC with <strong>+24V</strong> Terminal for on-off input high and level switch When using the external signal to drive DI1~DI4, it will disconnect the connector slip of PLC with the <strong>+24V</strong></td>
</tr>
<tr>
<td><strong>COM</strong></td>
<td><strong>24V ground</strong></td>
<td></td>
<td>Internal isolation from GND</td>
</tr>
<tr>
<td><strong>D11~D14</strong></td>
<td><strong>Digital input terminal 1~4</strong></td>
<td></td>
<td>Optocoupler isolation, compatible with bipolar input <strong>Frequency range</strong>: 0<del>200Hz <strong>Voltage range</strong>: 10V</del>30V</td>
</tr>
<tr>
<td><strong>HDI</strong></td>
<td><strong>Digital input terminal /High-speed pulse input</strong></td>
<td></td>
<td>Digital input terminal: same as D11<del>D14 <strong>Pulse input frequency input</strong>: 0</del>50KHz <strong>Voltage range</strong>: 10V~30V</td>
</tr>
</tbody>
</table>

### Switch output

<table>
<thead>
<tr>
<th>Type</th>
<th>Symbol</th>
<th>Terminal Name</th>
<th>Terminal function description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Switch output</strong></td>
<td><strong>DO1</strong></td>
<td>Open collector output</td>
<td><strong>Optocoupler isolation</strong> <strong>Voltage range</strong>: 0V<del>24V <strong>Current range</strong>: 0mA</del>50mA</td>
</tr>
<tr>
<td></td>
<td><strong>HDO</strong></td>
<td>Open collector output /High-speed pulse output</td>
<td><strong>High-speed pulse output</strong>: 0~50KHz</td>
</tr>
</tbody>
</table>

### Relay output 1/2 (optional)

<table>
<thead>
<tr>
<th>Type</th>
<th>Symbol</th>
<th>Terminal Name</th>
<th>Terminal function description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relay output 1</strong></td>
<td><strong>T1A/T1B/T1C</strong></td>
<td>Relay output</td>
<td><strong>T1A-T1B</strong>: normal open <strong>T1A-T1C</strong>: normal close</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Contact rating</strong>: AC 250V. 3A: DC 30V. 1A</td>
</tr>
<tr>
<td></td>
<td><strong>T2A/T2B/T2C</strong></td>
<td>Relay output</td>
<td><strong>Contact rating</strong>: AC 250V. 3A: DC 30V. 1A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Contact rating</strong>: AC 250V. 3A: DC 30V. 1A</td>
</tr>
</tbody>
</table>

#### 485 port

<table>
<thead>
<tr>
<th>Type</th>
<th>Symbol</th>
<th>Terminal Name</th>
<th>Terminal function description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>485+</strong></td>
<td></td>
<td>485 Positive differential signal</td>
<td><strong>Baud rate</strong>: 1200/2400/4800/9600/19200/38400/57600/115200bps</td>
</tr>
<tr>
<td><strong>485-</strong></td>
<td></td>
<td>485 Negative differential signal</td>
<td></td>
</tr>
</tbody>
</table>

### VFD500 Option Parts

- **IO extension card**: 4 DI terminal 4 DO terminal 2 analog input **Communication extension card**: Canopen Profibus-DP
- **IO board**: 7 DI terminals, 2 AI, 2 AO, 2 Relay
- **Communication extension card**: LCD keypad
- **IO extension card**: tripple Incremental PG card/open collector PG card/differential PG card/Rotary PG card **Open collector output**: same as DO1 **High-speed pulse output**: 0~50KHz
- **Optocoupler isolation**: 0mA~50mA **High-speed pulse output**: 0~50KHz
- **Baud rate**: 1200/2400/4800/9600/19200/38400/57600/115200bps
- **Contact rating**: AC 250V. 3A: DC 30V. 1A
- **Contact rating**: AC 250V. 3A: DC 30V. 1A
- **Baud rate**: 1200/2400/4800/9600/19200/38400/57600/115200bps
VEIKONG VFD500 application projects