



VD520 Series Inverters

VD520 Series Inverter Solutions



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About Vicruns

Vicruns Electric Technology Co., Ltd. is a company committed to the inverter, servo drives, mining equipment and construction machinery and other industries special drive and control system for R & D, production, sales and service. In a variety of harsh and special environment for the user to provide lasting and reliable standardized and personalized solutions.

The company is a national high-tech enterprises, software companies. With rich standard drives, motor control and industry special series products, all products have independent intellectual property rights, master of the high performance vector control, torque control, servo technique of permanent magnet synchronous motor technology core platform technology.

The company has more than 20 sales branches and 10 stock centers, products are widely used in electric power, mining, metallurgy, petroleum, chemical industry, building materials, lifting, machine tools, textile, paper making, packaging, light industrial, municipal and factory automation and other industries.

We target is to reduce the customer's use and maintenance cost, with the wisdom of science and technology to meet expectations, create new value, enhance customer competitiveness.

Qualification Honor



Intelligence and Innovation

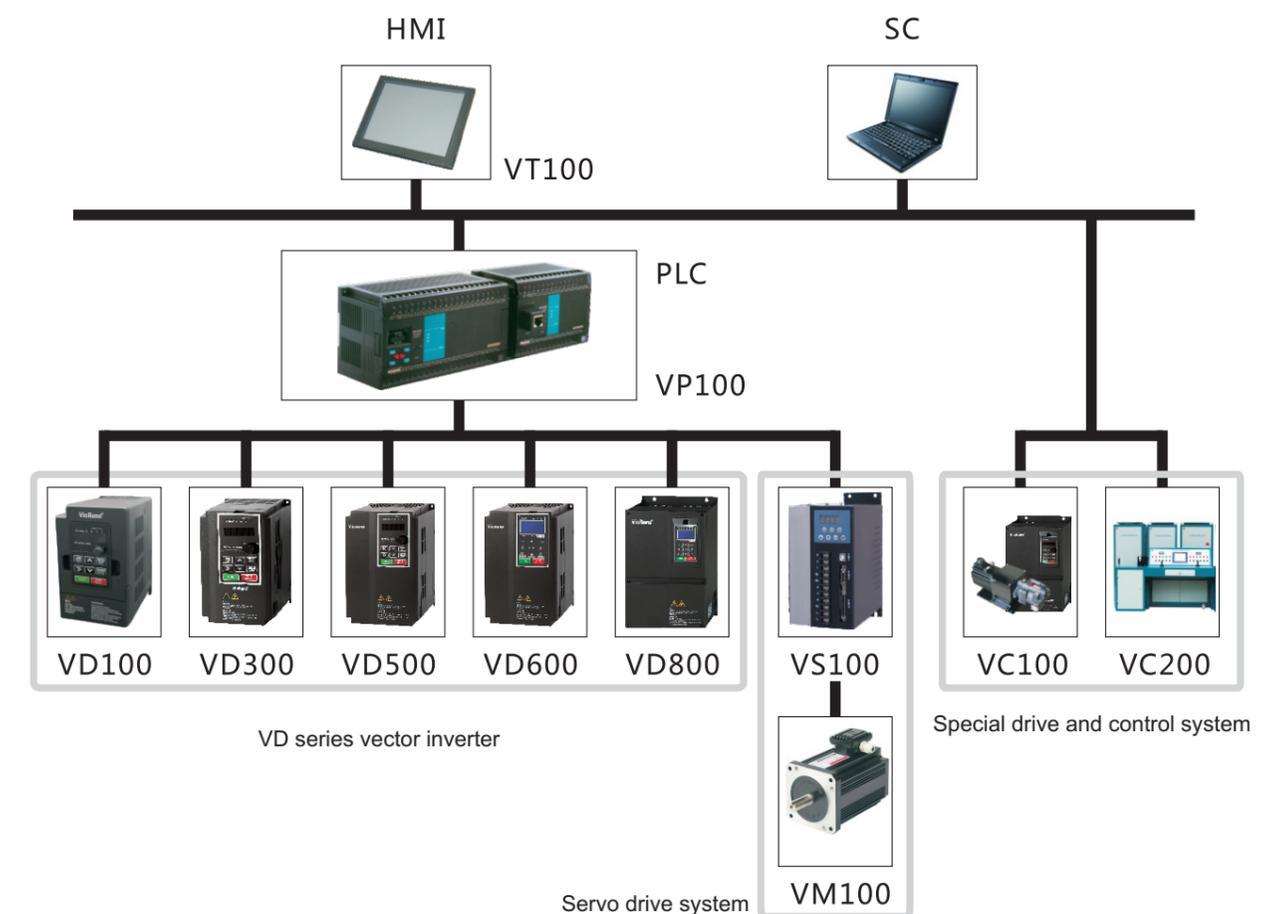
Vicruns product such as frequency inverter, servo drive, integration of drive and control system are the characteristics of parallel development on professional technology platform. So, the delvelopment of each parts can be carried out in parallel, also reduced the time to enter the market at the same time, to ensure customers have always been able to enjoy the latest function.

The developers in Vicruns company used the modular principle in the process of development, design, manufacture and configuration. Through it's own function, hardware, software, power module, printed circuit boards and function selection of options, development and production, we can guarantee the customer get reliable products.

Specialization is the faith always insist by the developers of Vicruns, The professional technical personnel in Vicruns will always face the motor drive and control field of all kinds of professional challenge. We can built a variety of functions in the standard products, to avoid increase additional cost and installation space.

We'll continue to share the latest apply experience and technical information with customers at anytime.

Drive and Control Product Solutions





1 Leading Control Technology

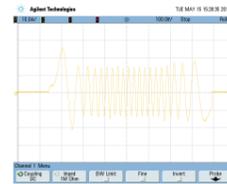
Start and stop quickly

Can realized the start and stop quickly through the special optimization of current and voltage control technology. When motor switchover sides around zero speed, can inhibition possible overvoltage and overcurrent, also can provide fast and reliable braking ability under the condition of no energy consumption braking deceleration. Especially suitable for CNC machine、 fountain equipment, bag making machine, Knitter, jacquard, printing machinery, ceramic secondary material such occasion as start and stop quickly, forward/reverse switchover quickly.

Rated load



0.1s Acceleration, deceleration



Fast dynamic response

Must be fully control the tension of winding material in the winding operation. To keep the tension of tangential from the influence of production line speed and drum diameter, VD series inverter also can tracking a wide range of torque reference value dynamically. Especially suitable for winding equipment, multipoint synchronous linkage equipment, rolling mill, packaging equipment.



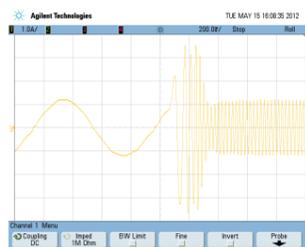
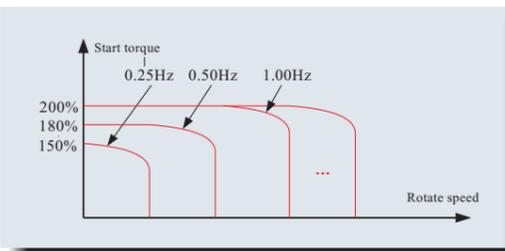
Control mode	Dynamic response
Open loop vector	< 20ms

Speed tracking quickly

The inverter can finished the motor speed, direction and the identification of phase angle within 0.2s, to realize a smooth starting for free rotation motor. Especially suitable for fan, pump, centrifugal mixing machinery such as large inertia load, track running after the instantaneous power failure recovery, in the occasions may produced reversal when starting or motor no-stop from power frequency to variable frequency switching applications.

Low frequency and high starting torque

It's truly realized the asynchronous motor 0.25Hz 150% starting torque, through the flux current and decoupling control of torque current and low frequency torque automatic update technology. Especially suitable for CNC lathe、 centrifugal mixing machinery, plastic machinery, cable machinery, metallurgical equipment, hoisting equipment etc.

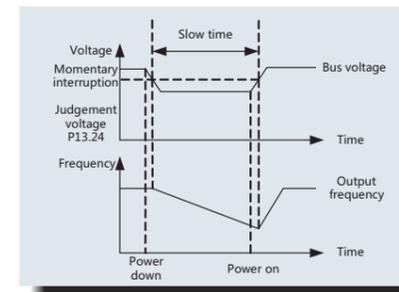


High precision rotate speed , wide range of speed control

Leading automatic slip vector control technology, to ensure the rotating speed precision can be controlled within 0.5% in the condition of open loop. Speed range to 1:100. Especially suitable for CNC machine, printing machinery, wood-working machinery, running machine such as have higher request for the length of the control in open loop conditions.

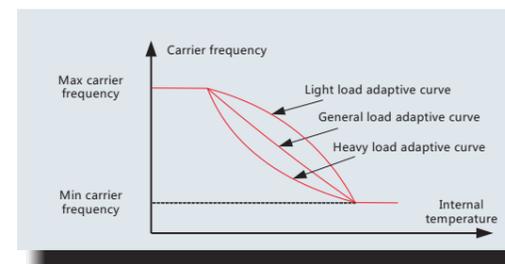
Energy reserve, instantaneous power down without stopping

Can through the motor feedback energy maintaining inverter to continue running in short-term when grid instantaneous power or voltage during suddenly drops. The inverter can be set up for a long time power failure to run automatically. Especially suitable for chemical fiber and textile production line, multipoint synchronous linkage equipment and such occasion that have higher request for the continuity of operation.



Adjust the carrier frequency automatically

Can adjust the carrier frequency automatically according to the temperature of environment, running frequency, motor power etc characters, reduce the noise of the motor under the condition of the motor temperature rise minimum. The function of adjust the carrier frequency automatically can be optimized control curve, to improve the control characteristics, and protect the inverter and motor effectively.



Optimized V/F control

V/F control curve of VD series frequency inverter have carried on effective optimization, better torque characteristic, acceleration/deceleration time can be set up shorter, for the frequent start to stop and short work period situation, the rapid startup performance significantly superior to similar products will get fully embody.

Torque limit

Under the torque control mode, can by limit torque on the machine within the maximum torque can withstand the maximize mechanical efficiency under the promise of protection equipment operation safety and service life.



Multiple motor switchover control can be realized

Have two groups of motor parameters which can realize motor switchover control. It's satisfied to share a frequency inverter with different motors and convenient for electric drive systems control, and effectively reduce the customer equipment investment.



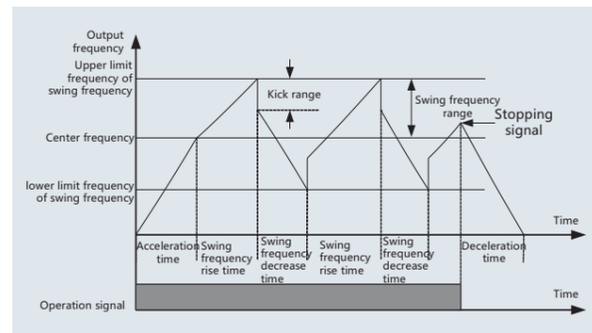
2 Comprehensive Function, the Perfect Embodiment of Professional and Universal Combinat

Built-in swing frequency functionion

If the groove drum run at constant speed reciprocating, the yarn often cross in the same place every time, make the yarn winding loose on top, undertighten. The swing frequency function of VD series inverter can slove the above defects.

Can use the terminal to realize start, stop, reset, switchover.

Suitable for textile, chemical fiber etc occasions that need swing frequency control.

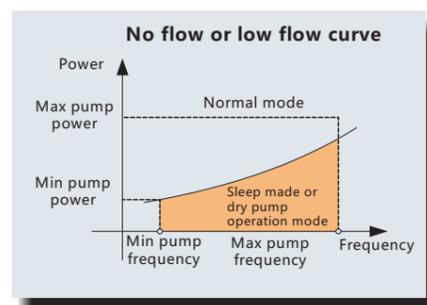


Pulse input and output functions

Input/output functions of pulse frequency, higher control precision, convenient for more than one inverter's synchronous control at the same time, especially suitable for paper machinery, printing machinery, packing machinery, textile production line etc multi-station synchronous linkage operation occasion.

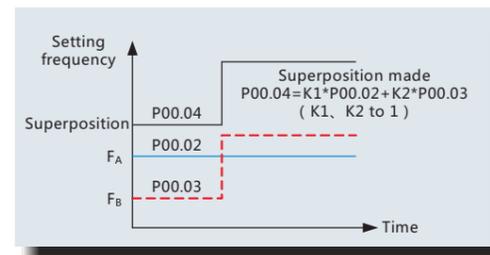
Enhanced sleep mode

Powerful PID closed-loop functions, can be directly and timely display the current pressure、 flow or tempreture etc parameters, can be set dormancy/awakening frequency, dormancy/awakening thresholds, dormancy/awakening waiting time, break line detection, overrun detection etc parameters, to realize the best energy-saving operation.



Frequency superposition

Multi-channel analog input/output terminals, -5~5V/-10~10V/4~20mA/0~20mA is optional, can realize the diversification of frequency inverter and synchronous linkage control combined with advocate complementary given、 frequency superposition function.



Droop control

When multiple frequency inverter drive one loads, due to the different speeds cause load distribute uneven, make the greater speeds inverter bear the heavier load. Adopt droop control can make the load distribute evenly with the increase of load make the droop speed changed.

Fixed length control

According to the input pulse counting, calculating the length of the workpiece walk through, stop to set value, have a fixed length, full of yarn, broken yarn such as input and output terminals cooperate at the same time. Can display set length, physical length, linear speed etc.

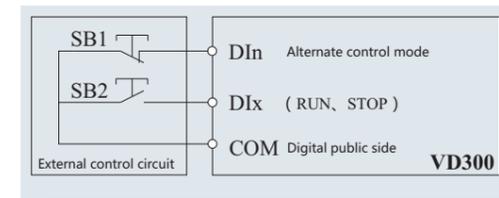
5V, 10V, 24V power supply on the control panel

Three power output terminal 5V, 10V, 24V on the control panel, and the 5V terminal especially suitable for using resistive far eastone the ordinary water supply occasion of pressure gauge.

485+	485-	5/10V	AI2	AO1	HDI1	DI2	DI4	OPEN+24V	COM	
PE	GND	AI1	GND	AO2	DI1	DI3	DI5	COM	HDO1	DO1

Alternate control

Can realized the start, stop control of the inverter with a button or foot switch.



16 segments speed, built-in simple PLC function

Multi-function digital quantity input terminal group can realized 16 segments sped, also can through built-in simple PLC function make the inverter run according to the setting time and speed automatically, can modify speed and running time on line, can single cycle, multicycle circulation run.

Counting accurate parking

After receiving the start signal, VD series inverter begin to run, until the terminal received a series of pulse complied by a user, a parking signal have produced soon, inverter start counting parking to slow down. The pulse input can deal with the 24V push-pull type encoder pulse, maximum 1024ppr, maximum pulse input frequency 100.00kHz.

User password

Can be password protection for the user to set parameters, to prevent no authorized personnel changes.

Time order protection

Can be set a single power-on time and running time, accumulative power-on and running time, facilitate technology needs or the equipment maintenance. Also optional date clock module, according to set a date time down, facilitate users business operation.

3 Reliability Design, Excellent Quality Assurance

Electrolytic capacitor is the points where malfunction happens easier of the frequency inverter, the full series capacitor of the VD series inverter set duct type design, observably improve the product reliability and service life.

Adopting the forced convection cooling method, air duct is easy to clean, no need to contact with the electronic components. In addition, the fan with terminal connection between internal circuit, the fan can be moved to the outside of tank's free space for cleaning after disassembled it, it's convenient and energy saving.

Adopting the international standards of circuit board coating protect the inverter to cope with the reliable operation in all kinds of industrial applications and harsh environment, and prolong service life.

Introduction of advanced thermal simulation technology, VD series have been accurate thermal design and passed more than 200 test points of temperature rise test fully, the overall high temperature of the machine is well-balanced, the heat-resistant ability and product reliability get a good guarantee while product shrinkage.

Perfect short circuit protection.

User password function can protect the parameters set by the user, to prevent unauthorized personnel changes.

4 Energy-saving design, energy saving and environmental protection

The efficiency of VD series inverter can be as high as 98%, the power factor is 0.95 above, heat loss less than similar products, system efficiency is better.

- Low standby power consumption

Fan can be set stop running in standby, control circuit with low power design, make the VD series inverter power consumption is lower in standby mode.

- Variable speed and energy saving

During the process of fan or pump throttling operation, the traditional adjusting device has waste energy and generate heat and noise at the same time. VD series inverter can control the fan or pump variable speed control, the optimized design of parabolic curve can ensure a smooth dynamic characteristics and good energy saving effect.

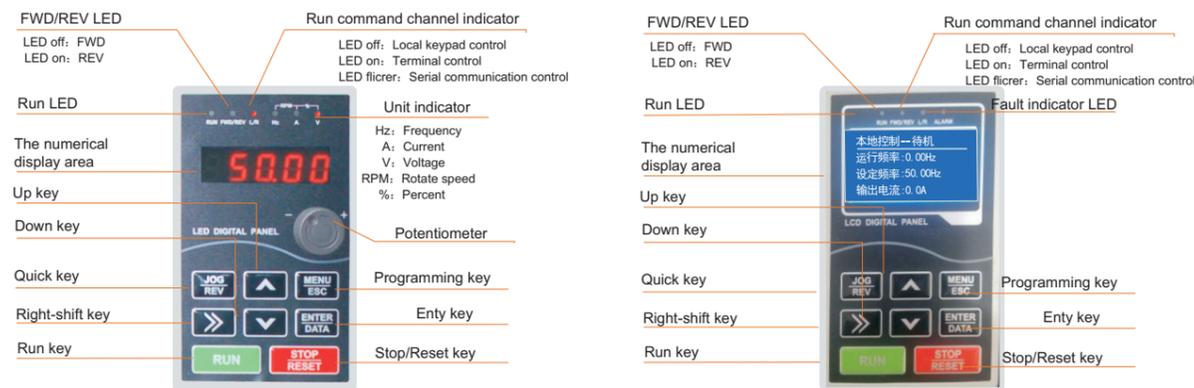
- Automatic energy optimization

The automatic energy optimization function of VD series inverter can provide additional current when the motor running at low speed. Inverter can adapt to the change of the load automatically, achieve the best energy-saving operation, additional energy saving up to 5%.

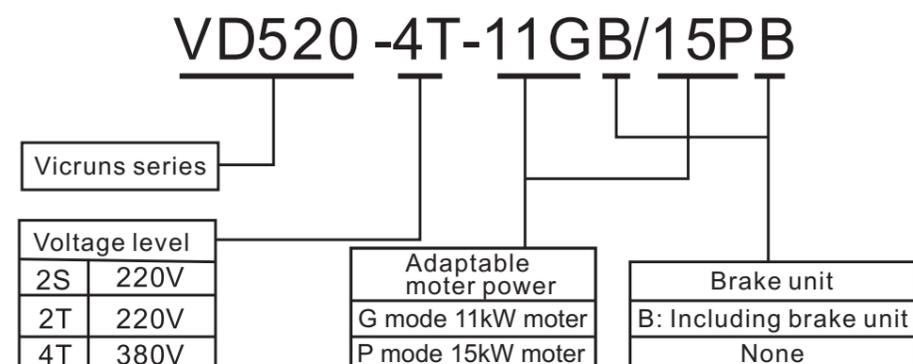
- Common DC bus

For multi-axis and long cycle braking applications, many sets of VD series inverter adopt common DC bus can be energy saving operation and reduce the cost of installation and operation significantly. More than one inverter DC shared between the DC bus means the renewable energy during the motor deceleration process can be used to control the other motor running.

5 Operation and Display Interface



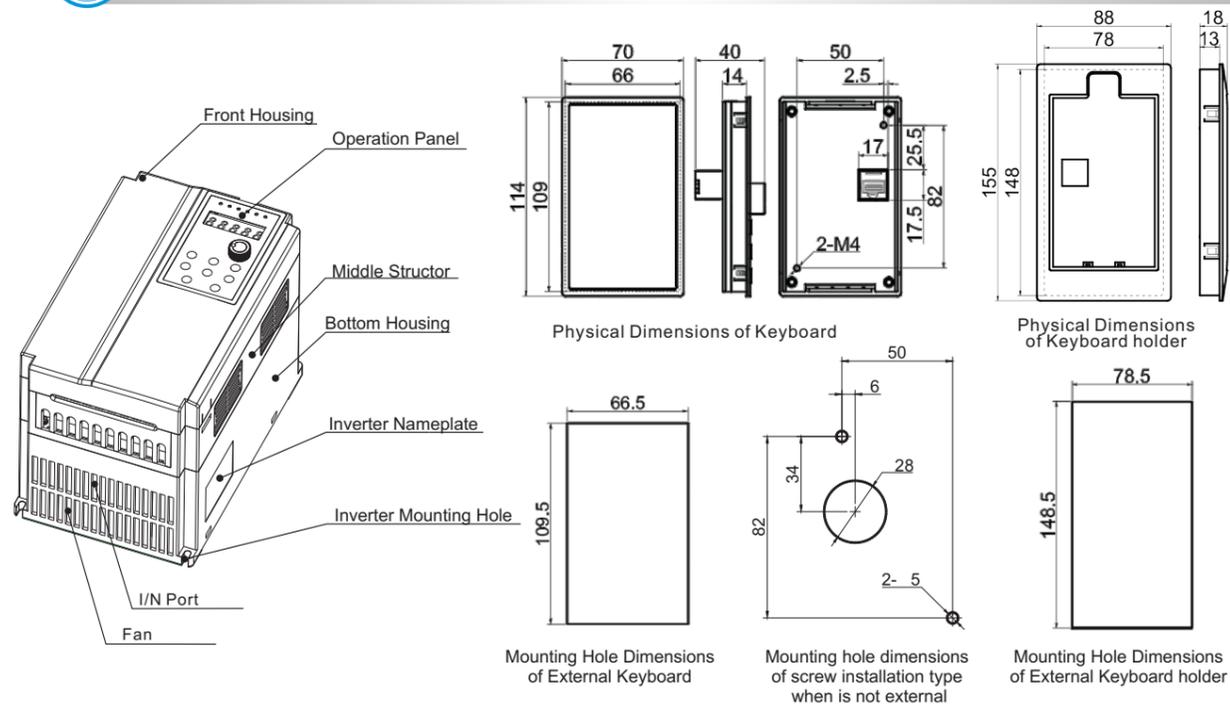
6 Nominate Scheme



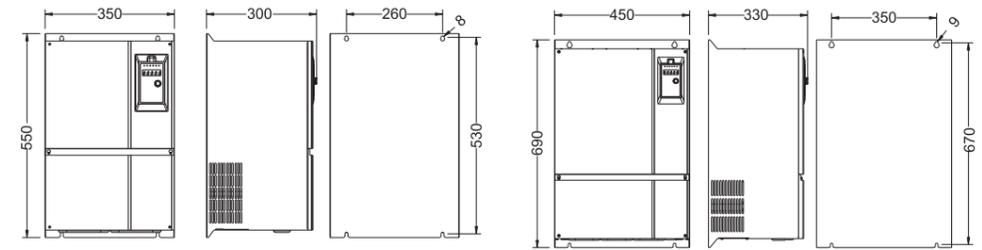
7 Product Specifications and Technical Data

Model No.	Power capacity (KVA)	Rated input current (A)	Rated output current (A)	Adaptable Motor		Structure Diagram
				(kW)	(HP)	
Single-phase:220V , 50/60Hz						
VD520-2S-0.7GB	1.5	8.2	4	0.75	1	1
VD520-2S-1.5GB	3	14	7	1.5	2	1
VD520-2S-2.2GB	4	23	9.6	2.2	3	1
VD520-2S-3.7GB	5.9	35	17	3.7	5	2
VD520-2S-5.5GB	8.9	50	25	5.5	7.5	2
Three-phase:380V , 50/60Hz						
VD520-4T-0.7GB	1.5	3.4	2.5	0.75	1	1
VD520-4T-1.5GB	3	5	3.8	1.5	2	1
VD520-4T-2.2GB	4	5.8	5.1	2.2	3	1
VD520-4T-3.7GB	5.9	10.5	9	3.7	5	1
VD520-4T-5.5GB	8.9	14.6	13	5.5	7.5	2
VD520-4T-7.5GB	11	20.5	17	7.5	10	2
VD520-4T-11GB	17	26	25	11	15	3
VD520-4T-15GB	21	35	32	15	20	3
VD520-4T-18.5GB	24	38.5	37	18.5	25	3
VD520-4T-22G	30	46.5	45	22	30	4
VD520-4T-30G	40	62	60	30	40	4
VD520-4T-37G	50	76	75	37	50	4
VD520-4T-45G	60	92	91	45	60	5
VD520-4T-55G	72	113	112	55	70	5
VD520-4T-75G	100	157	150	75	100	5
VD520-4T-90G	116	180	176	90	110	6
VD520-4T-110G	138	214	210	110	150	6
VD520-4T-132G	167	256	253	132	175	7
VD520-4T-160G	200	307	304	160	210	7
VD520-4T-185G	231	350	326	185	240	8
VD520-4T-200G	250	385	377	200	260	8
VD520-4T-220G	280	430	426	220	300	8
VD520-4T-250G	315	468	465	250	350	9
VD520-4T-280G	355	525	520	280	370	9
VD520-4T-315G	396	590	585	315	500	9
VD520-4T-355G	445	665	650	355	420	10
VD520-4T-400G	520	785	725	400	530	10
VD520-4T-450G	565	883	820	450	600	10
VD520-4T-500G	630	890	860	500	660	10
VD520-4T-560G	700	990	950	560	750	10
VD520-4T-630G	780	1120	1080	630	840	10

8 Physical Appearance

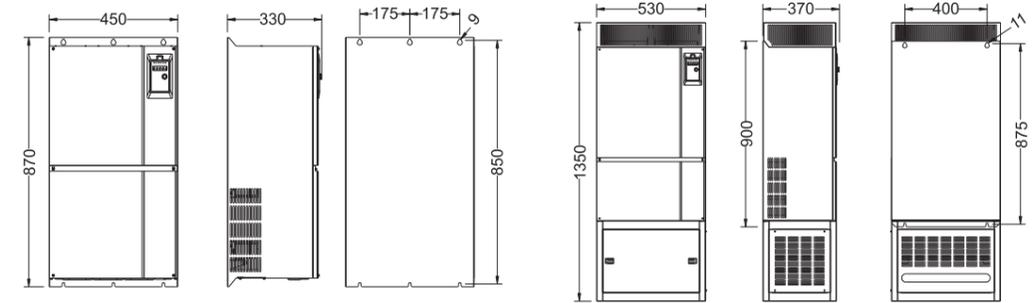


Remark: This keyboard can be directly introducing, no need purchase introducing tray, convenient installation, reduce the cost



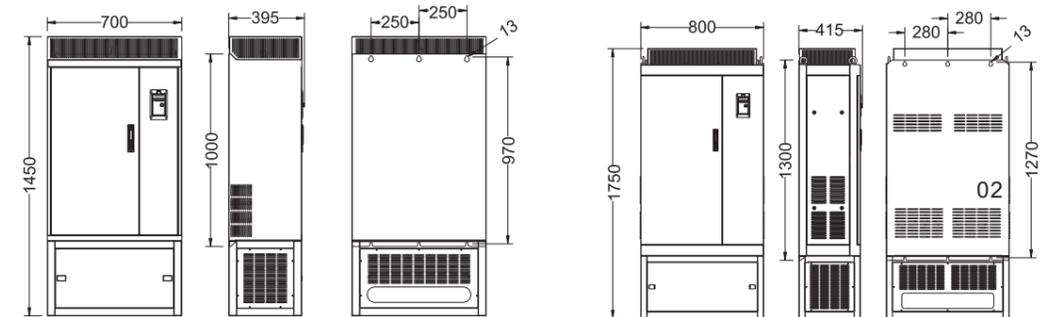
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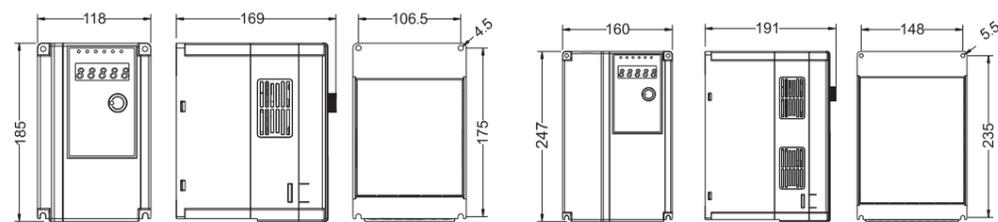
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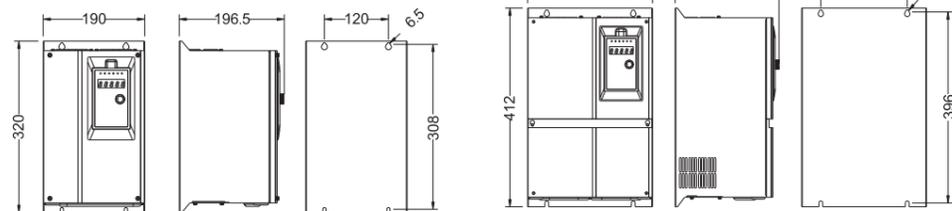
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9 Apparent and Mounting Dimensions



NO.1

NO.2



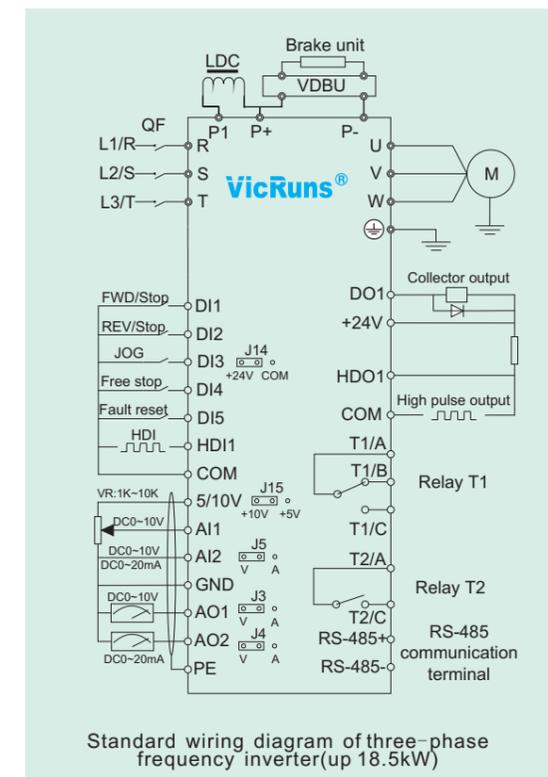
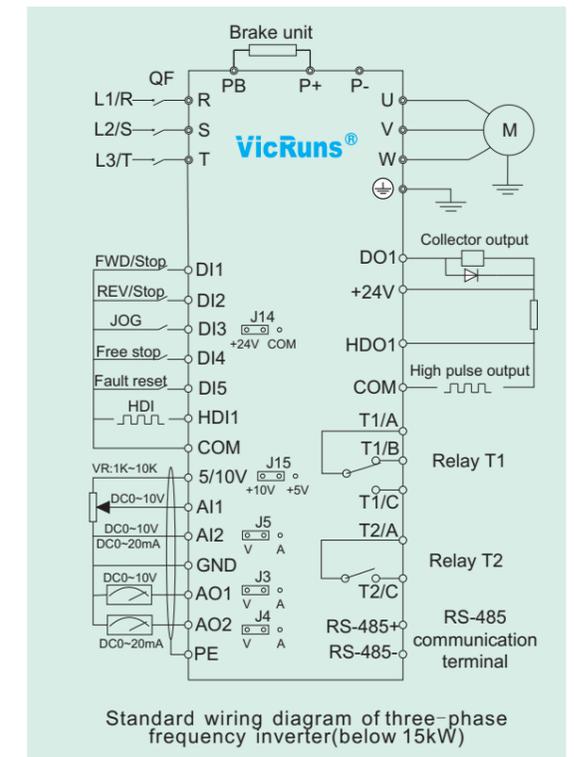
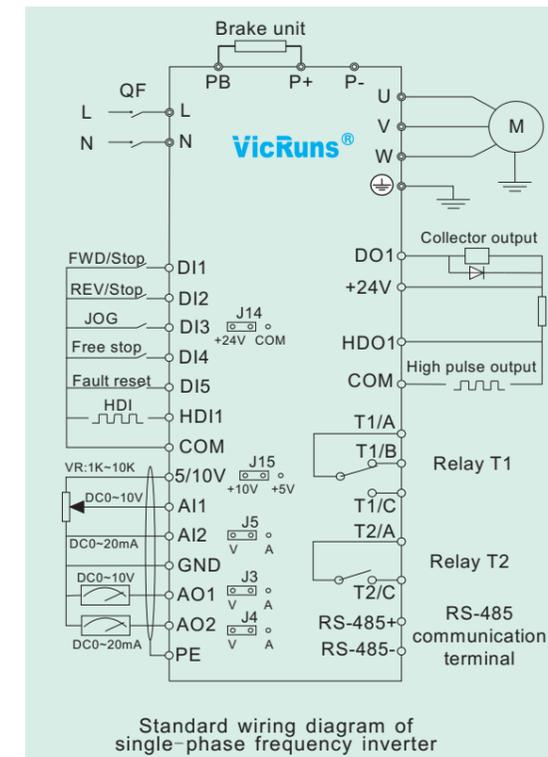
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NO.4

10 Technical Specifications

Item	Specifications		
Power input	Rated input voltage	Grade of rated voltage is 220V or 380V; voltage continued fluctuation±10%, brief fluctuation:-15~+10%, voltage imbalance rated<3%, aberration rate meet IEC61800-2 requirements.	
	Rated input current	Refer to the model and technical data sheet	
	Rated frequency	50/60Hz, fluctuation range ±5%	
Power output	Standard adaptive motor	Refer to the model and technical data sheet	
	Rated capacity	Refer to the model and technical data sheet	
	Rated current	Refer to the model and technical data sheet	
	Output voltage	Output three-phase under the rated input condition, 0V~rated input voltage, error is less than±3%.	
Main Control Functions	Highest frequency	50.00Hz~600.00Hz	
	Carrier frequency	0.5kHz~16.0kHz, auto-adjust carrier frequency.	
	Input frequency resolution	0.01Hz(digit setup mode)	
	Control mode	Open vector, V/F control	
	Start torque	0.25Hz/150%(vector control)	
	Motor type	asynchronous motor	
	Speed range	1:100	
	Speed control accuracy	±0.2%	
	Torque control accuracy	5%	
	Overload capacity	G type motor:	150% rated current for 60sec; 200% rated current for 1sec.
		P type motor:	120% rated current for 60sec; 150% rated current for 5sec.
	Torque boost	Auto torque boost, manual torque boost by 0.1%~10.0%.	
	Acceleration/deceleration curve	Linear or S curve acceleration/down mode, 4 types of acceleration/down time, range 0.0s~6500.0s.	
	DC braking	DC braking frequency: .000Hz~max output frequency, braking time: 0.0s~100.0s, braking current: 0.0%~100.0%.	
	Main Control Functions	Jogging control	Jogging frequency range: 0.00Hz~max output frequency, jog Acceleration/down time 0.0s~3600.0s.
Easy PLC, multi-stage speed run		Via built-in PLC or control terminal can realize max 16 stage speed run.	
Built-in PID		Can realize process control conveniently.	
Auto-adjustment of the voltage		Can keep the output voltage constant automatically when the grid voltage changed.	
Dynamic over voltage suppression		Auto suppress energy feedback value while run frequency changes, prevent bus over current tripping off.	
Oscillation suppression		Optimize V/F oscillation arithmetic, realize V/F steady operation.	
Individual Function	Power dip ride through	It ensures that the AC drive continues to run for a short time when an instantaneous power failure or sudden voltage reduction occurs.	
	Timing control	Timing control function: setting time range: 0min~65535min.	
	Multi-motor switchover	Two motors can be switched over via two groups of motor parameters.	
Operation	Support extension	Support multi-function I/O extension card	
	Running command source	Operation panel, control terminals, serial communication port, you can perform switchover between these sources in various ways.	
	Frequency source	There are a total of 11 frequency sources, such as digital setting, analog voltage setting, analog current setting, pulse setting and serial communication port setting, panel potentiometer setting, you can perform switchover between these sources in various ways.	
	Auxiliary frequency source	There are 11 auxiliary frequency sources, it can implement fine tuning of auxiliary frequency and frequency synthesis.	
	Input terminal		6 digit terminal input, 1 terminal support rapid pulse input on max 100kHz.
			2 analog input terminals; with optional 0/4mA to 20mA current input or 0V to 10V voltage input.
			Extension capacity: 3 digital input terminals and 1 analog input terminals.
Output terminal		2 analog output terminals; with optional 0/4mA to 20mA current output or -10V to 10V voltage output.	
		2 digit output terminals; one supporting 0.01kHz~100kHz square signal rapid pulse output.	
		2 relay output terminal Extension capacity: 1 digit output terminal.	
Display and Key pad Operation	LED display	Can display 5 parameters	
	Protection function	Motor short-circuit detection at power-on, input/output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection and overload protection etc.	

11 Standard Wiring Diagram



- Terminal® refers to Main circuit terminal, Terminal ○ refers to control circuit terminal ;
- B which is followed the product model represents Self-braking unit ;
- Braking resistor's selection is based on the user demand.
- Signal lines and power line must be separated alignments, if you want to control cables and power cable cross, let them cross by 90 degree angle.
- Analog signals suggest choose shielded twisted-pair cable, and single side grounding.

12 Selection guide of brake components

The following table as a guidance data, user can choose different resistance values and power according to the actual situation (but resistance must not be less than the recommended value in the table, power can be big). The selection of braking resistance need according to the practical application of the power of motor power to determine in the system, and have connected with the system inertia, deceleration time, the energy of the potential energy load and so on, need customers choose according to actual situation. The greater inertia of system is, the shorter deceleration time need, the more frequent braking, the greater the braking resistor need to choose the power, the resistance is smaller.

The selection of resistance value

When braking, almost all renewable energy of motor consumption on the braking resistor. According to the formula: $U \cdot U/R = P_b$

*U mean braking resistor (different systems are also different, generally take DC700V for AC380V system)

*Pb mean braking resistor

The power selection of braking resistor

Automatic resistance power is consistent with braking power in theory, but considering the derating 70%, according to the formula: $0.7 \cdot P_r = P_b \cdot D$

*Pr mean resistor power

*D mean braking frequency (The regeneration process accounts for the proportion of the whole process)

Elevator--20%~30%

Uncoiling and coiling--20%~30%

Centrifugal--50%~60%

Accidental braking load--5%

Generally by 10%

VD Series Inverter Braking Components Selection Table

Model	Recommend Power Braking Resistor	Recommend Resistance Braking Resistor	Braking Unit	Remarks
Single-phase 220V 50/60Hz				
VD520-2S-0.7GB	80W	≥150Ω	Internal	No special instructions
VD520-2S-1.5GB	100W	≥100Ω		
VD520-2S-2.2GB	100W	≥70Ω		
VD520-2S-3.7GB	200W	≥40Ω		
VD520-2S-5.5GB	300W	≥25Ω		
Three-phase 380V 50/60Hz				
VD520-4T-0.7GB	150W	≥300Ω	Internal	No special instructions
VD520-4T-1.5GB	150W	≥220Ω		
VD520-4T-2.2GB	250W	≥200Ω		
VD520-4T-3.7GB/5.5PB	300W	≥130Ω		
VD520-4T-5.5GB/7.5PB	400W	≥90Ω		
VD520-4T-7.5GB/11PB	500W	≥65Ω		
VD520-4T-11GB/15PB	800W	≥43Ω		
VD520-4T-15GB/18.5PB	1000W	≥32Ω		
VD520-4T-18.5G/22P	1300W	≥25Ω		
VD520-4T-22G/30P	4.4kW	≥26.5Ω		
VD520-4T-30G/37P	6kW	≥19.4Ω		
VD520-4T-37G/45P	7.4kW	≥15.8Ω		
VD520-4T-45G/55P	9kW	≥13Ω	External	VDBU-4T-110G
VD520-4T-55G/75P	11kW	≥10.6Ω		
VD520-4T-75G/90P	15kW	≥7.8Ω		
VD520-4T-90G/110P	18kW	≥6.5Ω	External	VDBU-4T-160G
VD520-4T-110G/132P	22kW	≥5.3Ω		
VD520-4T-132G/160P	26.4kW	≥4.4Ω		
VD520-4T-160G/185P	32kW	≥3.6Ω	External	VDBU-4T-250G
VD520-4T-185G/200P	37kW	≥3.2Ω		
VD520-4T-200G/220P	40kW	≥2.9Ω		
VD520-4T-220G/250P	44kW	≥2.7Ω	External	VDBU-4T-330G
VD520-4T-250G/280P	50kW	≥2.3Ω		
VD520-4T-280G/315P	56kW	≥2.1Ω		
VD520-4T-315G/355P	63kW	≥1.9Ω	External	VDBU-4T-600G
VD520-4T-355G/400P	70kW	≥1.7Ω		
VD520-4T-400G/450P	80kW	≥1.5Ω		
VD520-4T-450G/500P	90kW	≥1.3Ω	External	VDBU-4T-800G
VD520-4T-500G/560P	100kW	≥1.2Ω		

13 Industry Applications



Machine Tool Industry

VD series inverter provide high performance frequency conversion drive and the solution for CNC lathe, large vertical lathe, high speed milling machine, high speed punching machine, precision grinder, stone cutting, rotary cutting machine and other fields.



Textile Industry

VD series inverter for roving frame, spinning frame, high speed winding head, warp knitting machine, jacquard machine, water jet loom and other equipment to provide high performance frequency conversion drive. The pendulum frequency function, fixed-length control satisfies the requirement of the high performance of textile machine, reduce end breakage rate and realize the automatic control, improve production efficiency.



Plastics Industry

VD series inverter and VS series induction motor and synchronous servo system for plastic extrusion machine, injection molding machine, manipulator, bag making machine, blown film machine, film production line, plastic wire drawing machine and so on to provide high performance drive and control.



Petrochemical Industry

VD series inverter for oil kowtow machine, screw pump, plunger pump, injection pump, draining pump, air compressor, centrifugal mixing, the main fan and so on to provide energy saving and automatic control, help reduce energy consumption to improve production efficiency.



Metallurgy, Electric Power Industry

VD series inverter for the steel metallurgy and electric power plant industry mill, wire drawing machine, flying shears transmission system, air compressor, fan, pump and other equipment to improve the transmission efficiency and reduce electricity costs.



Coal Mine Industry

VD series inverter for belt conveyor, hoist, mine locomotive, winch, air compressor, fan, emulsion pump, water pump, etc to provide mining equipment and energy saving control system solutions.



Lifting Industry

VD series inverter is dedicated to travelling crane, lift, calabash type, bridge type, door type, tower crane, belt conveyor such as high-end fields to provide high performance products and solutions.



Municipal Environmental Industry

VD series inverter for urban water supply, sewage treatment, heating, central air conditioning, air compressor, elevators, large music fountain, renewable resources recycling equipment, ceramic building materials such fields to provide high performance energy saving products and control system.