

# 500 series

High-performance vector control inverter

Create professional quality and innovation to lead the future

Create professional quality and innovation to lead



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## INDVS COMPANY INTRODUCTION

Shenzhen INDVS Technology Co., Ltd., is a high-tech enterprise focuses on R&D, manufacture and sales of industrial automation control products, The main products are low-voltage Inverters. For the motor drive core control technology, we have equivalent level with the international advanced level, own speed sensorless vector control technology and speed sensor vector control technology. Through constant technological innovation, fully grasp the core technology, also have a complete industrial design and production capacity, have abundant general products and industry specific product lines. The products' voltages range covers 100Vac-480Vac, power range covers 0.4KW-500KW, can meet the needs of high-end applications in many industries. The Inverters have been applied in air compressors, machine tools, printing and packaging, metallurgy, petrochemical, metal processing, stone processing, wood processing, ceramics, plastics, washing machines, water supply, air-conditioning, municipal engineering textile and many industries of National economy.

## Create professional quality and innovation to lead the future

Indvs makes every effort to provide more value than the price of products and services. Our mission is to let customers be more competitive by excellent quality and innovative future. To let customers be successful, pursue excellence, faithful and trustful, unity and cooperation. Continuously improving quality, innovating products and outstanding service to meet customers' needs of accurate, efficient, energy saving, environmental protection and cost control.

Technical Specifications

- ⊙ Power Range:0.4KW/220V-200KW/220V 0.75KW/380V-500KW/380V/440V
- ⊙ Output Frequency:0Hz-500Hz
- ⊙ Control method: V/F Control SVC Vector Control
- ⊙ Torque characteristics: 1Hz Rated Output Torque 150%
- ⊙ Overload: 150% 1min., 180% 1sec., 200% instant protection
- ⊙ Protective functions: Overcurrent protection, Overvoltage , Undervoltage protection, Overheating protection, Overload
- ⊙ Basic Interface: Reversible instruction,5 Programmable digital inputs,2 Analog signal inputs,2 Analog signal outputs,2 Programmable open collector outputs,2 Programmable relay outputs.
- ⊙ Communication Interface : Standard RS485 communication interface.

Features of Product

- ⊙ Compact size and structure,Stable performance
- ⊙ Built-in PID, Auto Sleep/Wake-up function,Multi-speed operation
- ⊙ Designs are adapted to a wide range of wide-voltage changes, especially adapted to domestic low-voltage special occasions
- ⊙ Built-in brake unit, convenient interfaces braking resistor, users can choose braking resistor refer to manual
- ⊙ Panel mount assembly to facilitate the formation of a remote control, Panel potentiometer easy to use and operate
- ⊙ Perfect protection, Efficient radiating design
- ⊙ Any acceleration and deceleration curve settings, V/F curves are available.
- ⊙ Three anti-optimization
- ⊙ Programmable relay output, Output signal reaches 16 states



Comprehensive protection measures

- ⊙ Protection can be achieved against Overvoltage, Undervoltage protection, Input phase,Overload, Overheating,External terminal fault,Communication breakdown,Current detection error,Motor tuning fault,nearly 20 kinds of faults,with higher reliability.
- ⊙ 0.4KW~18.5KW,all specifications can be built-in brake unit. Other power machines for fast stop,can choose breaking unit and connect
- ⊙ Built-in automatic torque compensation function ; Built-in slip compensation and efficient operation ; Built-in PID controller.
- ⊙ Speed tracking restart function,to achieve the smooth start of rotating motor without the impact.A variety of parameters on-line
- ⊙ Rich and flexible input and output interface and control methods,can link many peripheral equipment such as PLC, IPC or instrument to operation
- ⊙ Optional LED, LCD operator panel,to achieve convenient

Application Fields

Products are widely used in mechanicals,Textile Machinery,Packaging Machinery,Plastic robot,Rubber Machinery,Printing machinery,Construction Machinery,Logistics and warehousing,Motor Machine,Metallurgy, Car,Electronic,Building Materials,Papermaking,Mining,Water Industry, Security,Petrifaction,Electricity,Wind power,Solar,Railway,Track Traffic, and other Industrial Automation industry.

## Indvs 500series open loop

### 500series open loop vector inverter

Have good EMC performance, reliable quality assurance, new concept design, with a new design platform, provides excellent motor drive performance, it's a high-performance general-purpose vector inverter in market.

### 500series Hardware advantages

Optimization of IGBT drive circuit, adopt double gate resistor configuration. Optimization of IGBT drive control circuit wiring optimization, effectively reduce IGBT drive control circuit wiring inductance overshoot suppression drive signal switch, ensure reliable operation of IGBT protection class solutions. Adapt to harsh environment, it can provide a higher degree of protection solutions, and thus have a stronger environmental adaptability.

### 500series Structural

#### Optimize power

Advanced thermal imaging detection and related technologies, rational distribution of positions of power devices, to make the Power devices' thermal field distribution is more balanced and reasonable, effectively

#### Improve primary filter capacitor

Main filter capacitor is placed in the duct to make the electrolytic capacitors' heat dissipation timely and effectively, can suppressed capacitance warming work effectively, thus prolonging the life.

#### Optimization of the main

Using laminated bus architecture with low resistance and high and smaller wiring inductance, effectively inhibit the dv/dt rate of change in the DC circuit, to ensure reliable operation of IGBT. Strong reliability and security, better heat dissipation, to ensure long-running in a particular environment, reduce system noise and electromagnetic interference / radio frequency interference. Simple and compact design, save internal space, install easily, good maintenance. Symmetry structure design to ensure that the distribution parameters of each device in parallel between consistency, improve the flow characteristics of parallel devices.



**Focus on craft & quality**



Quality Assurance

Three anti-paint coating equipment

Coated range according to the plate and customer requirements, through the plate surface and three defenses, reinforcing plate's tolerance in humid environment, oil, dust, conductive particles, corrosive gases, enhance the whole device's ability to adapt to the environment.

Strict electrostatic protection

Composite to be strict static protection. At the same time strict electrostatic protection check and inspection system, to ensure that every aspect of manufacturing the ESD protection can be effectively control.

100% Drag the full load factory testing

The whole machine has been full load status tested out of the factory, actual load verify the effectiveness of protection.

Automated Board Test System

Board PCB test fixture with automated tester for testing, Test for Online impedance board member, Signal amplitude logic state, and a dead time of the drive signal for testing, and simulate various states of protection functions to be confirmed. Automatic Test System with BARCODE encoding test data plate member is automatically recorded to ensure the integrity of the data plate.

Quality Assurance System

- Improve the thermal simulation and design optimization of the air duct, ensuring the power distribution parts heat more evenly, duct drag more reasonable. Based on the highest carrier full load temperature rise test, to ensure that products meet serious harsh industrial environment.
- Advanced Motor Test System, can proceed strictly test for Low frequency torque Variable Frequency Drive System, Speed Stability, Current waveform, Voltage waveform, within 1000 current harmonic component, etc. Ensure that products meet GB / IEC specifications.
- Products have been rigorously tested for overcurrent, overload, overvoltage, overheating, short-circuiting the output phase loss protection function, Guarantee perfect product protection and reliability. By temperature cycling salt spray test, Vibration testing means, ensure that the drive with a certain environmental tolerance.



Application in Air Compressor

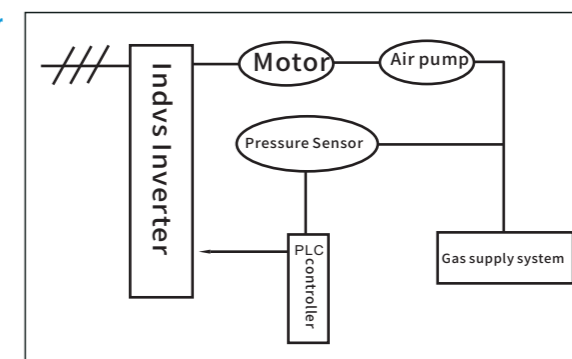
Example of Single screw compressor:

Original system conditions Problems :

1. While the main motor Star - delta decompression start, still large current at startup.
2. The main motor no-load operation often, is a non-economy, energy waste.
3. Main motor frequency operation causes a lot of noise when the compressor is running.
4. The main motor start frequency of the impact of large equipment, motor bearing wear large.

The advantage of using the Inverter on the Compressor

1. Energy saving
2. Lower operating costs
3. Improve the accuracy of pressure control
4. Extend the life of the compressor
5. Reducing compressor noise

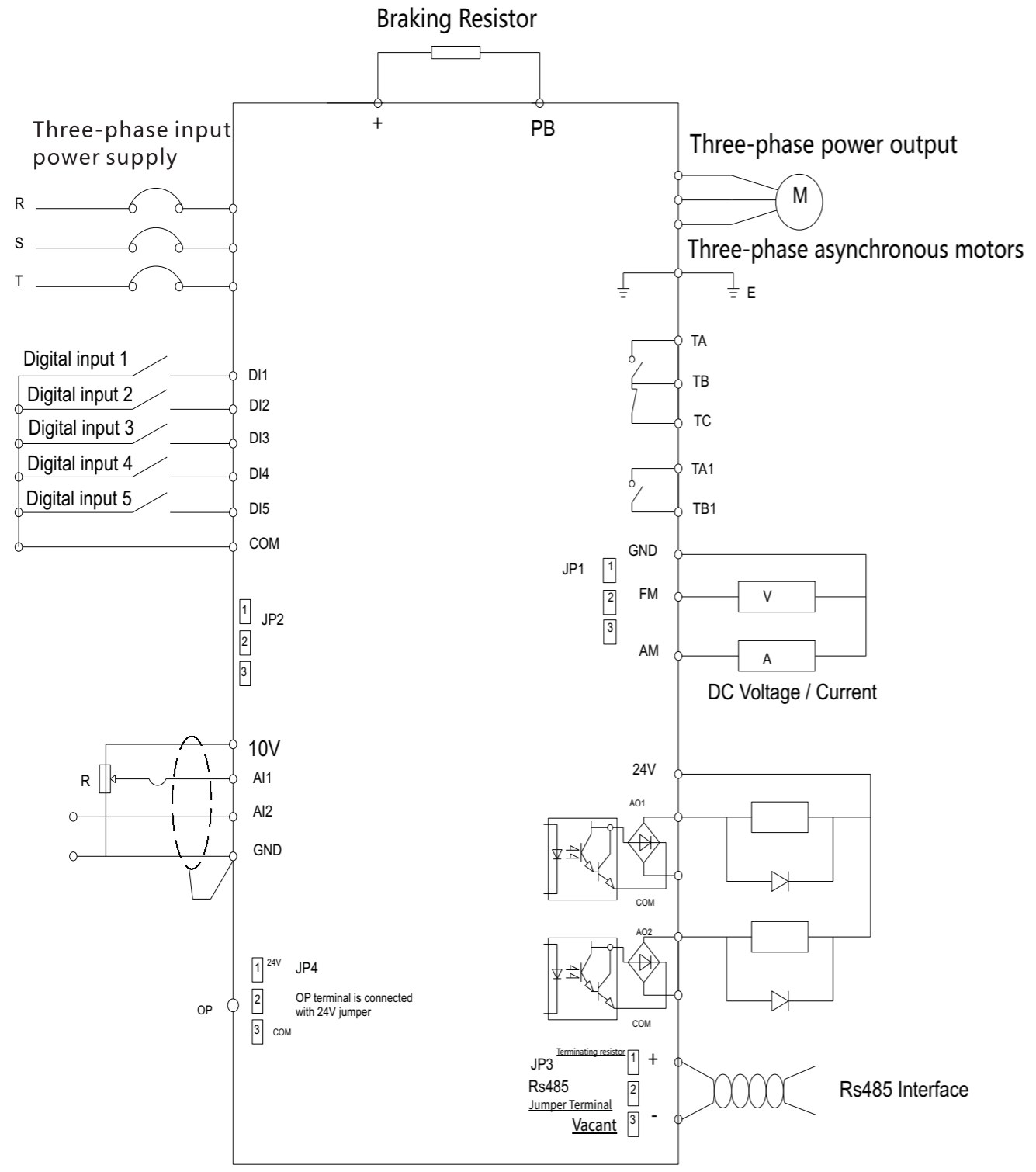


A case of a single air compressor 37KW unit workshop actual transformation:

- The electricity used per month before the transformation:  
 $Power\ Frequency = 3U \cdot I \cdot \cos\phi = 1.732 \cdot 380 \cdot 60 \cdot 0.9 = 35.54kW$   
 ( $\cos\phi = 0.9$   $U = 380V$   $I = 60A$ )
- Inverter compressor power test:  
 $Frequency\ Conversion = 3U \cdot I \cdot \cos\phi = 1.732 \cdot 380 \cdot 40 \cdot 0.9 = 23.7kW$   
 $\cos\phi = 0.9$   $U = 380V$   $I = 40A$  upper limiting frequency 42Hz
- Electricity per year by Industrial frequency:  
 $35.54kW \cdot 24 \cdot 30 \cdot 10 = 255888kW \cdot h$  Electricity per year by Frequency converter :  $23.7kW \cdot 24 \cdot 30 \cdot 10 = 170640kW \cdot h$  Annual electricity saving:  $255888kW \cdot h - 170640kW \cdot h = 85248kW \cdot h$  Saving rate:  $(35.54 \cdot 23.7) / 35.54 = 33.3\%$   
 Annual saving electricity cost:  $85248kW \cdot h \cdot 0.8RMB/kW \cdot h = 68198.4RMB$



Basic wiring diagram



Indvs 500 series

Item Explanation

The main control functions	Automatic Voltage Regulator	When the grid voltage changes, adjust the PWM output voltage constant (AVR function)
	Automatic energy-saving operation	Depending on the load, automatic optimization of V / F curve, energy-saving operation
	Automatic current limit	During the running current is automatically limited to prevent frequent overcurrent fault trip
No sense of vector control	Torque characteristics	When 1Hz, output 150% of rated torque, Speed stability and accuracy 0.1%
	Identification of motor parameters	Identification can be done from the motor parameters at motor perfectly still, so as to obtain the optimum control results
Run function	Run command channel	Operation panel setting ; Control terminal setting; Serial port setting, can be switched in three ways.
	Frequency setting	Keypad analog potentiometer setting, Keyboard arrow keys setting, Function code numbers setting, setting serial port terminal UP / DOWN setting, Analog voltage reference, Analog current setting, Combination setting.
	Switch input channel	Reversible instruction, 5 Programmable switching input, can set up 30 kinds of functions.
	Analog output channels	2 analog inputs, 0-10V, 4-20MA optional
	Analog output	Analog output 0-10V, 0-20MA optional, enabling set frequency, output frequency and other physical quantities output
Switch output channel	2 programmable open collector output; 2-way set relay output, enabling a variety of physical output	
	Switch output channel	2 programmable open collector output; 2-way set relay output, enabling a variety of physical output
Operation panel	LED Digital display	It can display setting frequency, output voltage, output current and other parameters
	External meter display	Output frequency, output current, output voltage of the main display physical display
Protective function		Overvoltage protection, overcurrent, undervoltage protection, thermal protection, overload protection.
Choose accessories		Braking resistor member; remote control panel, remote cable, keyboard install base etc.
Environment	Using places	Indoors, away from direct sunlight, dust, corrosive gas, oil mist, water vapor, etc.
	Altitude	Less than 1000 meters (higher than 1000m with derating)
	Ambient temperature	-10°C~+40°C
	Humidity	Less than 90% RH, No frost
	Vibration	Less than 5.9 m / s
Storage temperature	-20°C~+60°C	
Structure	Protection class	IP20 (Be using state or the keyboard display state)
	Cooling method	Forced air cooling
Installation way		Wall-mounted, cabinet installation

## U8000 series Product Features

8000 SERIES

U8000 SERIES backpack Frequency conversion water pressure regulator special for Pump: Indvs independent research and development regulator special for pump. Products casings are dustproof and waterproof. The Frequency conversion water pressure regulator can be installed in pump motor junction box of various brands, it can be adapted to a variety of sensor signals. Simple operation and high reliability system, low noise, superior price – performance. The Frequency conversion water pressure regulators can achieve collaboration by mutual communication.

### Specialized water supply motor fault protection

- There are multiple protections, such as lacking phase, overload, undervoltage etc. for Pump motor.
- Intelligent anti freezing, and anti rust protection.
- Water shortage automatic shutdown to protect water pump.
- High voltage automatic shutdown to protect pipe network.



### Piggyback installation

Directly mounted on the motor, no need control cabinet.

### Abundant water supply function design

- Variable frequency automatic constant pressure design for controlling water pressure precisely.
- One-button pressure setting, operating is easy and convenient
- Single pump constant pressure, main and auxiliary pump networking, automatic control.
- High protection IP54 Level, all-round waterproof and dustproof.

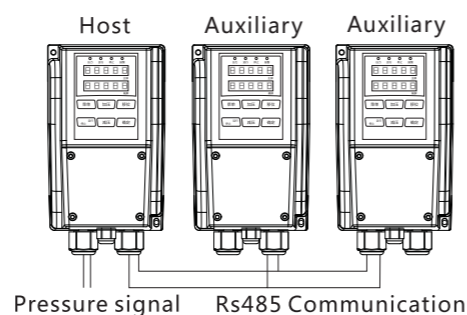
## Multi Pumps Networking Features

The host and auxiliary communicate by RS485, 4pcs auxiliaries at most.

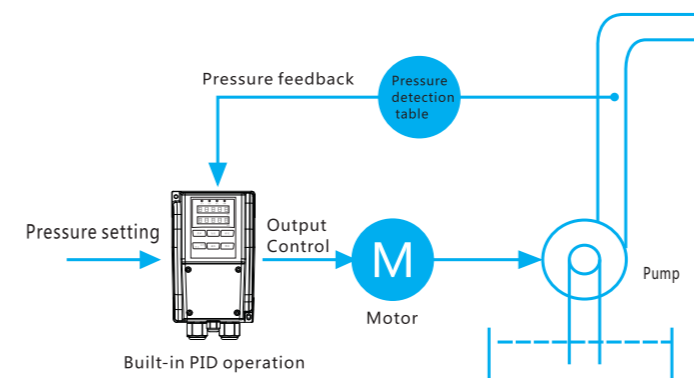
Through the host detection pipe network pressure and send to the auxiliary, at the same time automatic control of auxiliary operation according to the pressure, stop and PID status.

The host detects the auxiliary status real-time, when the auxiliary fault occurs, automatically skip the auxiliary and start next auxiliary, when a fault occurs, the system stops running.

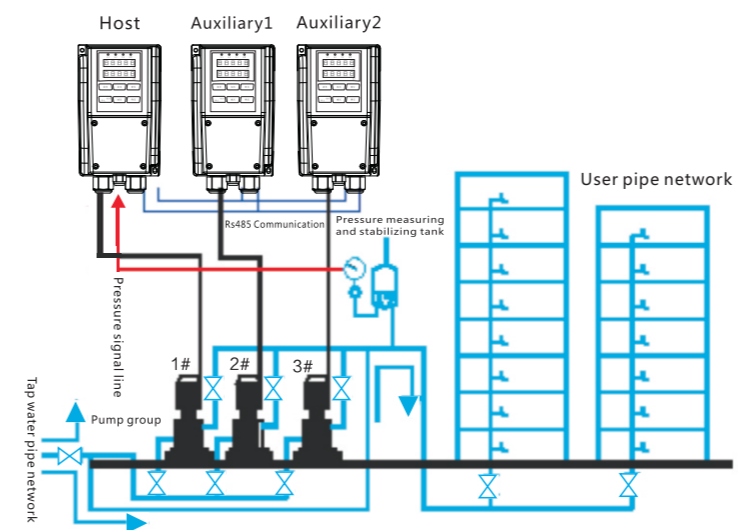
The main and auxiliary sequential alternate operation, to achieve uniform use of pumps, and extend pump life.



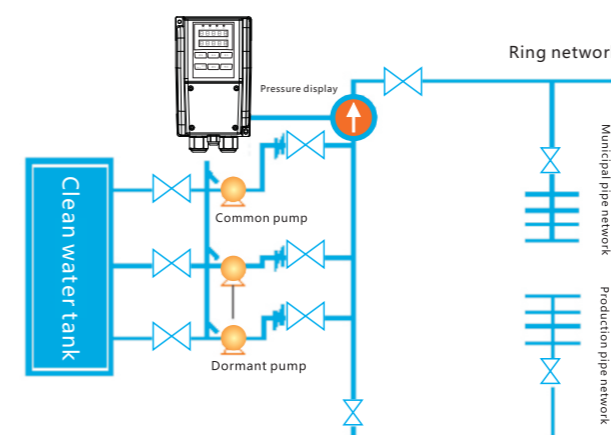
## One pump system



## Host and auxiliary multi-pump simple networking system

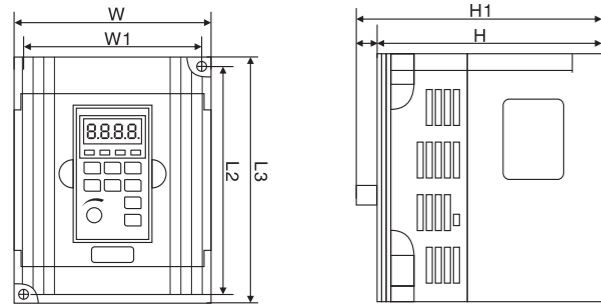


## A multi variable frequency pump + power frequency pump water supply system

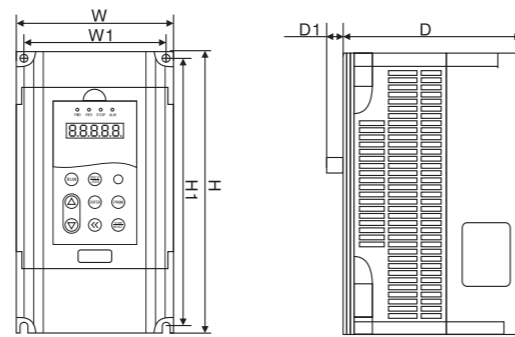


**Product Size**

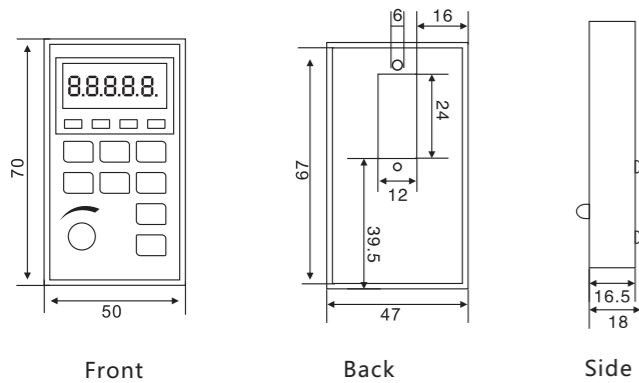
Plastic Shell (0.75KW-2.2KW)



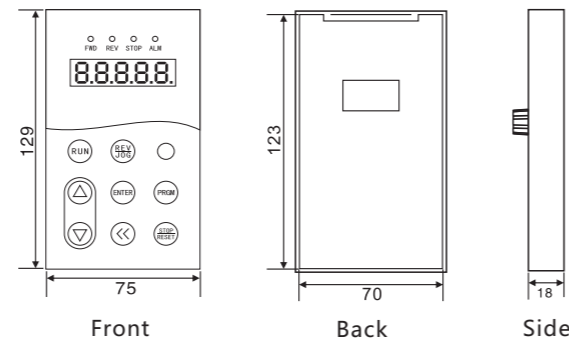
Plastic Shell (4.0KW-7.5KW)



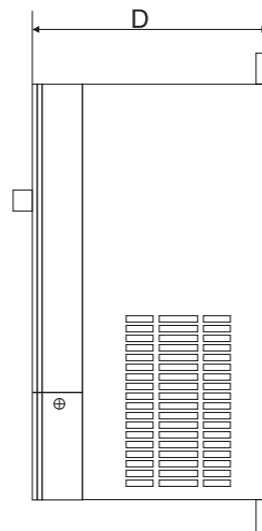
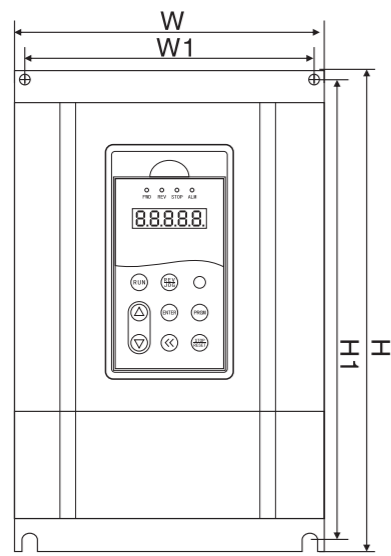
Keyboard



Keyboard



Steel Shell(11-400KW) Series



**Model Size**

Applicable models:500series 0.4-2.2KW

Model		W	W1	L3	L2	H	H1
Simple Model	0.4KW/220V	85.5	74	141.5	132	113	123
	0.75KW/220V						
	1.5KW/220V						
General Model	0.75KW/220V	100	92.0	152.0	143	116.5	127
	1.5KW/220V						
	2.2KW/220V						
General Model	0.75KW/380V	100	92.0	152.0	143	116.5	127
	1.5KW/380V						
	2.2KW/380V						

Applicable models:500series 4-7.5KW

Model	W	W1	H	H1	D	D1
4.0KW/380V	130	115	264	244	153	9.0
5.5KW/380V						
7.5KW/380V						

Applicable models:500series 11-400KW

Model	H	W	D	H	W	R1
11KW	397.1	212.0	190.9	378.2	156.5	7
15KW 18.5KW						
22KW	463.0	285.0	217.0	447.0	235.0	7
30KW 37KW						
45KW 55KW	600.1	385.4	267.0	580.0	260.0	9
75KW 93KW	700.0	473.0	311.0	678.0	343.0	10
110KW	849.0	480.0	389.0	822.1	369.0	10
132KW 160KW						
185KW 200KW	1060	650	381	1030	420	12
220KW 250KW						
285KW 315KW	1361	800	392.5	1300	520	12
350KW 400KW						