

Goodrive 300-16 Series

Special VFD for HVAC Applications

Your Trusted Industry Automation Solution Provider



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- Industrial Automation:**
- Variable-Frequency Drive
 - Servo & Motion Control
 - Motor & Electric Spindle
 - PLC
 - HMI
 - Intelligent Elevator Control System
 - Traction Drive
 - SVG
 - Solar Pump Controller
 - UPS
 - Online Energy Management System
 - New Energy Vehicle Electric Control System

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GD300-16 Series Special VFDs for HVAC Applications Product Introduction

GD300-16 is a powerful for HVAC industry application characteristics and control requirements for specialized research and development of HVAC industry special VFD, can be widely used in heating and water supply occasions.

The GD300-16 series are available in a wide power range designed for applications An advanced drive built on HVAC dedication ,which have a vast number of functions developed to meet the diverse needs of the HVAC business.

It can perfectly match for pumps, fans and compressors of installed in modern architecture, and gives additional solutions, and makes the building control intelligent. It has a very obvious energy saving effect.



Product Features

Rich Control Functions

It has smart logic controller, manual, soft start function, support 2xPID's, and Integrated fan, pump and compressor functionality.

HVAC Special Functions

Support fire override mode, timed circulation control function, multi motor combination control, sleep and wake up function and so on multiple special functions of HVAC applications.

Multiple Communications Modes

MODBUS communication supported and Scalable BACnet, PROFIBUS DP, CANopen and Devicenet communication cards.

Strong Adaptability, Energy Saving

The product can adapt to the harsh power grid, dust, temperature, humidity, with high reliability; and with 32 bit DSP processor for TI of U.S and powerful vector control technology, it can obviously improve the efficiency and save energy in applications of fans, pumps and compressors.

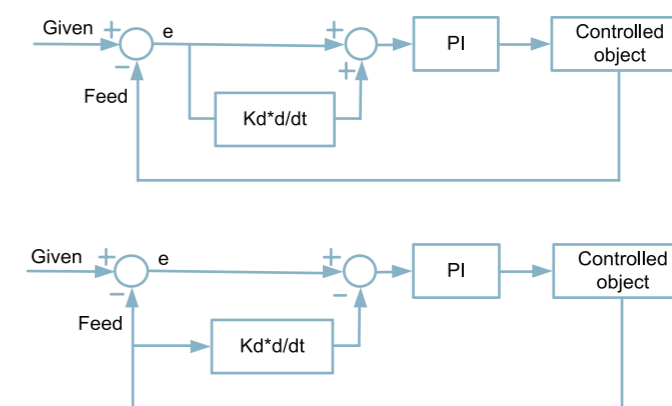
Highlights

Feature	Benefit
Smart Logic Controller	Often makes PLC unnecessary
2 × PID's	No extra PID controller needed
Real Time Clock and Timing Control	Can observe the current time and date, and can set the timer function, control the VFD automatically starting and stopping
Integrated fan, pump and compressor functionality	Saves external control and conversion equipment
Fire Override Mode	According to the preset speed operation, ignore the control signal, and the reliable running time can be prolonged in the emergency.
Manual, soft start function	Test motor normal operation
HVAC status view	Can real-time view of the motor running state
Sleep and wake up function	Can set the frequency of sleep and wake, the maximum savings of energy
Timed circulation control function	Extend the service life of pump
Multi motor combination control (up to 4 variable frequency pumps)	Can flexible consist of different motor system according to field application and configuration
Internal C3 EMC filter	Excellent EMC performance
Support LCD and LED keyboard	Friendly Operation
MODBUS communication supported (Scalable BACnet, PROFIBUS DP, CANopen and Devicenet communication cards)	Easy to use PC software tools(INVT studio)

Special Functions

1 Optimized PID function

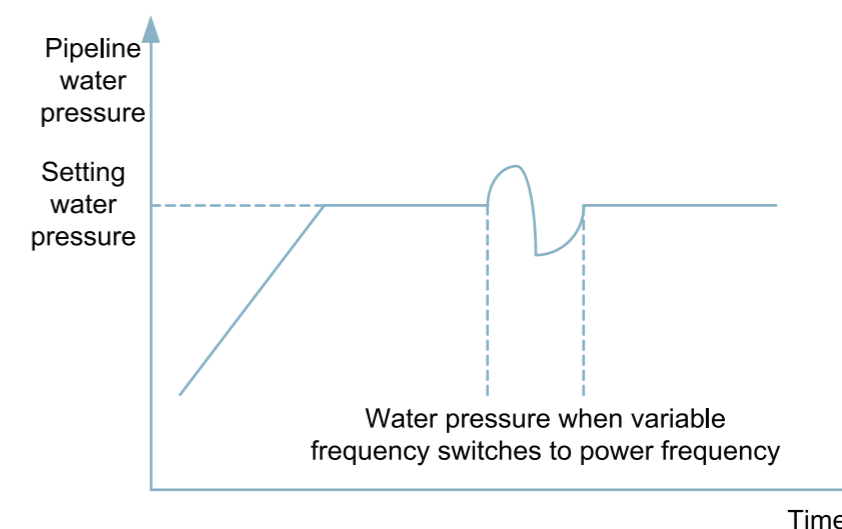
- The product has two sets of built-in PID controllers, among which P09 group is the default PID controller function in HVAC close loop process, with available combination control of two feedback channels, powerful functions, quick adjustment and response speed. According to the PID adjustment principle, the product provides two types of PID combination control modes through P09.34 selection, as shown below:



- P19 group is the 2nd set of PID controller, which can select to trigger PID2 start-up and stop according to switch signals and can also start or stop PID2 automatically according to the detection value of current actual control variable. PID2 adjustment output can be used for control processing of other functions of other masters via analog or communication output.

2 Smooth pump shifting

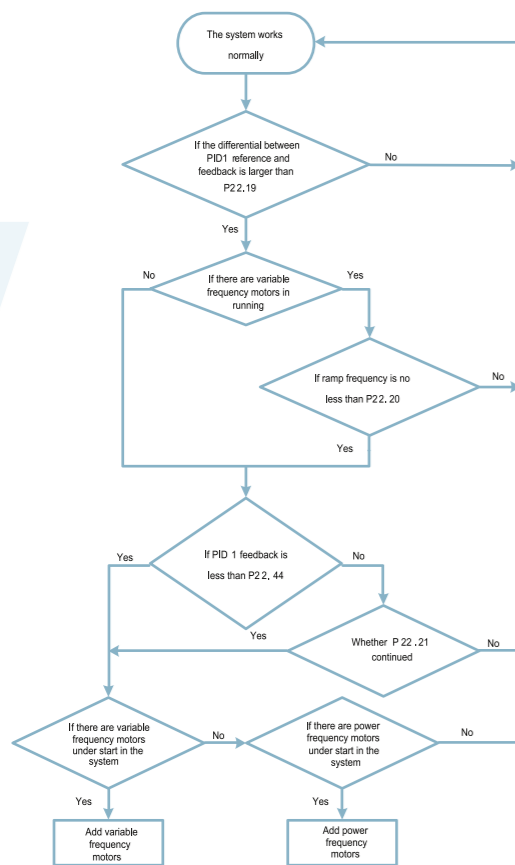
- In the application of water supply, when the variable frequency pump shifts to the power frequency pump, set the switching frequency of the variable frequency motor, make the VFD switch to run in power frequency after reaching higher switching frequency, avoid water pressure drops too fast and ensure the water pressure of the pipeline stabilizes quickly.



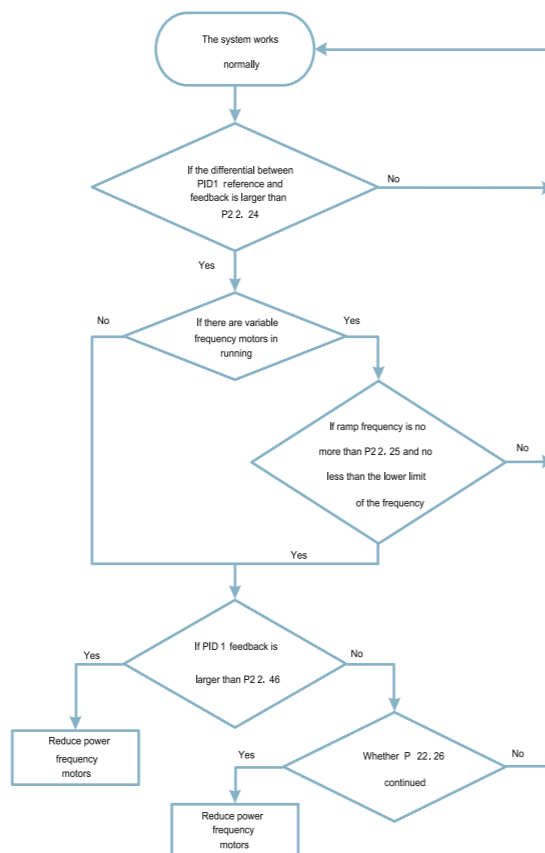
3 Flexible logic of adding and reducing motors

• Adding motors control:

In the case when multiple motors are needed for process control, after the running motors reach the upper limit of frequency, the process control variables such as pressure and flow cannot reach the setting target values, consider adding circulating variable frequency motors at first. If there are circulating variable frequency motors under start in the system, the VFD will control the system to add variable frequency motors; if no, add power frequency motors till the process control variables reach the setting target values.



Logic of adding motors



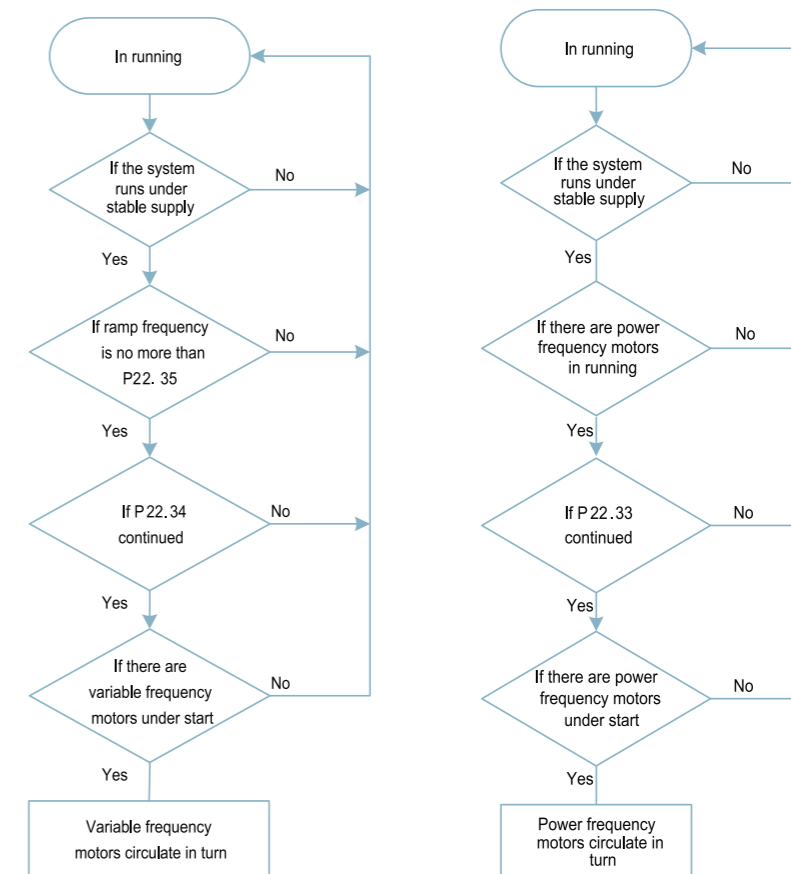
Logic of reducing motors

• Reducing motors control:

In process control when multiple motors are running at the same time, the variable frequency motors will decelerate continuously to the lower limit of the frequency when the user demand on the actual process value decreases. At the time, if the actual process value exceeds the setting value greatly, indicate the total motor output power is too large in the system and need to reduce power frequency motors one by one till maintaining the actual process value at the setting value and stabilizing providing the controlled variable.

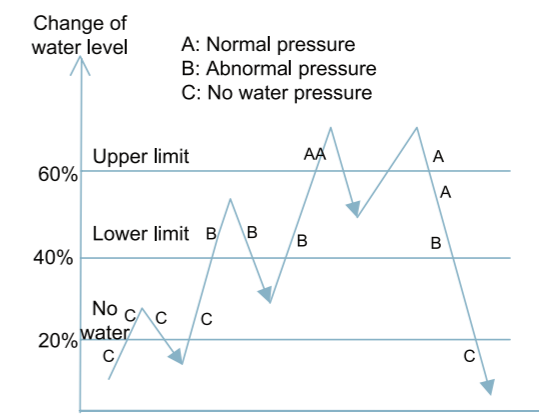
4 Timing circulation function

To avoid one motor runs for a long time while other valid motors ready for start do not run, and prolong the service life of motors, in the condition of stable and small controllable process variable supply, make all the motors under start run in turn according to the setting circulating period.

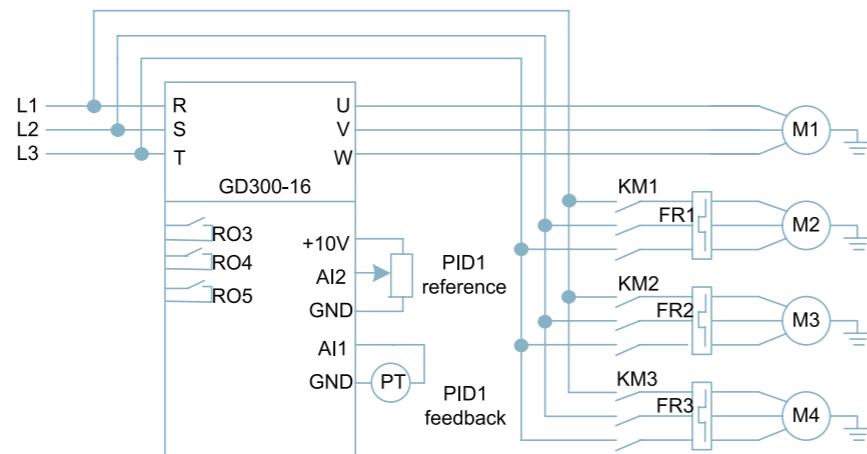


5 Water level detection of inlet water tank

The inlet water tank has two water level input modes of analog input and digital input: when the water level is below the lower limit and above the level of no water, the system will run under abnormal standby pressure; when the water level is below the level of no water, the system will stop running. The figure is shown as follows:

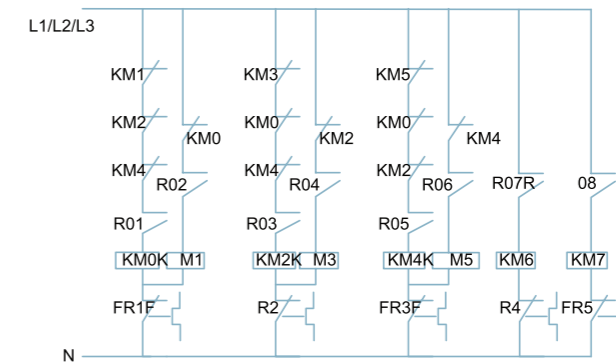
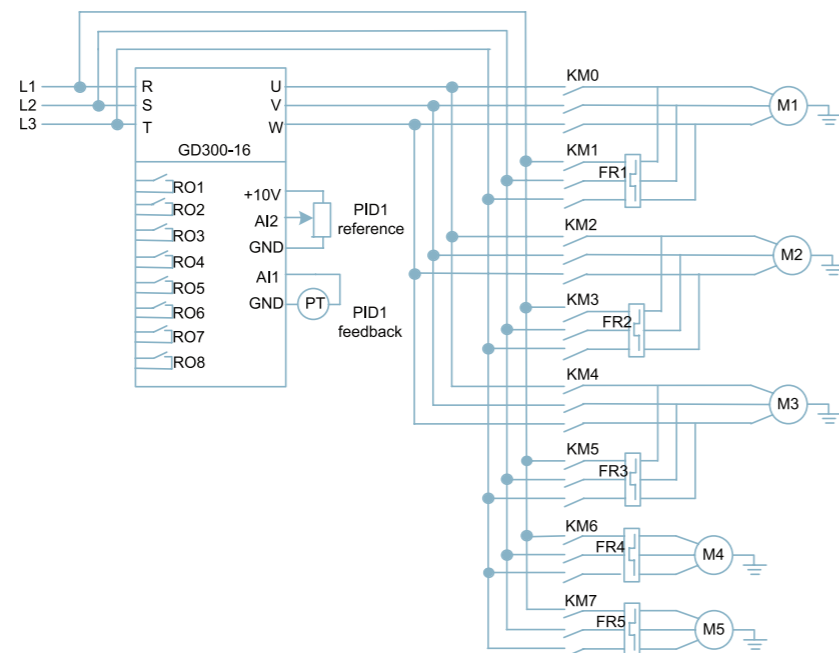


6 Single fixed variable frequency motor + multiple power frequency motors (need to configure the extended relay output card)



Note: The wiring diagram is the system of 1 fixed variable frequency motor + 3 power frequency motors and the system can also be connected without power frequency motors. There are 1 fixed variable frequency motor + 8 power frequency motors at most for GD300-16 VFD.

7 Multiple circulating variable frequency motors + multiple power frequency motors (need to configure the extended relay output card)



Note: The wiring diagram is the system of 3 circulating variable frequency motors + 2 power frequency motors and the system can also be connected without power frequency motors. There are 4 circulating variable frequency motors at most for GD300-16 VFD.

Main Applications

Mainly applies to constant pressure water supply of the high-rise building and the home of multi-storey buildings, and the city concentrated water supply, gas supply, the water treatment, and the water supply pump station. It has obvious energy saving effect.



• The city concentrated gas supply



• The city concentrated water supply



• the water supply pump station



• the water treatment



• The constant pressure water supply of the high-rise building and the multi-storey buildings

Model Instruction

GD300-16 - **5R5G** - **4-1** - **HVAC**
 ① ② ③ ④ ⑤

Key	No.	Detailed description	Detailed content
Abbreviation	①	Product abbreviation	GD300-16:Special VFD for HVAC
Rated power	②	Power range + Load type	5R5-5.5kW G—Constant torque load P—Variable torque load
Voltage degree	③	Voltage degree	S2: AC 1PH 220V(-15%)~240V(+10%) 2: AC 3PH 220V(-15%)~240V(+10%) 4: AC :3PH380V(-15%)~440V(+10%) 6: AC 3PH 520V(-15%)~660V(+10%)
Management number	④	IP code	Protection level (standard product protection level can be default): 0—IP00 1—IP20 2—IP21 5—IP54 6—IP65
	⑤	Market management number	HVAC: Heating ventilation and air conditioning ,can be default.

Product Specifications

Function	Specification		
Power input	Input voltage (V)	AC 3PH 380V(-15%)~440V(+10%)	
	Input current (A)	Refer to the rated value	
	Input frequency (Hz)	50Hz or 60Hz Allowed range: 47~63Hz	
Power output	Output voltage (V)	0~input voltage	
	Output frequency (Hz)	0~400Hz	
Technical control feature	Control mode	SVPWM, sensorless vector control	
	MAX Output frequency	400Hz	
	Adjustable-speed ratio	Open-loop vector 1: 100	
	Speed control accuracy	±0.2% (sensorless vector control)	
	Speed fluctuation	± 0.3%(sensorless vector control)	
	Torque response	<20ms(sensorless vector control)	
	Starting torque	0.3Hz/150%(sensorless vector control)	
	Overload capability	G type : 150% of rated current: 1 minute 180% of rated current: 10 seconds 200% of rated current: 1 second P type: 120% of rated current 1minute;	
	Terminal	Analog input	3 (AI1, AI2) 0~10V/0~20mA, (A3) -10~+10V

Function	Specification	
interface	Analog output	2 (AO1, AO2) 0~10V /0~20mA
	Digital input	8 common inputs, the Max. frequency: 1KHz, (PNP or NPN) internal impedance: 3.3kΩ; 1 high speed input, the Max. frequency: 50KHz
	Digital output	1 high speed output, the Max. frequency: 50kHz; 1 Y programmable output, 50mA/30V, the Max. frequency: 1KHz
	Relay output	2 programmable relay outputs RO1A NO, RO1B NC, RO1C common terminal RO2A NO, RO2B NC, RO2C common terminal Contactor capability: 3A/AC250V,1A/DC30V
	Communication	The standard 485 interface, support RTU protocol
	Communication expansion card	Supports BACnet ,CANopen, PROFIBUS DP and DeviceNet
	Relay expansion card	6 programmable relay outputs, open
Others	Mountable method	Wall and flange mountable
	Running Environment Temperature	-10~50℃, derate above 40℃
	Average non-fault time (MTBF)	100000 hours (25℃ ambient temperature)
	Protective degree	IP20
	Regulatory	Meet CE standard
	Cooling method	Air cooling
	DC reactor	30kW (including) the following is not optional, 37KW optional
	EMC Filter	Built-in C3 filter: Meet C3 IEC61800-3 level requirements, Optional C2 filter, meet the C2 IEC61800-3 level requirements

Type selection

- Product Power Rating

Model	Rated output power(kW)	Rated input current (A)	Rated output current (A)
GD300-16-004G/5R5P-4	4/5.5	13.5/19.5	9.5/14
GD300-16-5R5G/7R5P-4	5.5/7.5	19.5/25	14/18.5
GD300-16-7R5G/011P-4	7.5/11	25/32	18.5/25
GD300-16-011G/015P-4	11/15	32/40	25/32
GD300-16-015G/018P-4	15/18.5	40/47	32/38
GD300-16-018G/022P-4	18.5/22	47/56	38/45
GD300-16-022G/030P-4	22/30	56/70	45/60
GD300-16-030G/037P-4	30/37	70/80	60/75
GD300-16-037G/045P-4	37/45	80/94	75/92
GD300-16-045G/055P-4	45/55	94/128	92/115
GD300-16-055G/075P-4	55/75	128/160	115/150
GD300-16-075G/090P-4	75/90	160/190	150/180
GD300-16-090G/110P-4	90/110	190/225	180/215
GD300-16-110G/132P-4	110/132	225/265	215/260
GD300-16-132G/160P-4	132/160	265/310	260/305

• Product Packaging And Weight

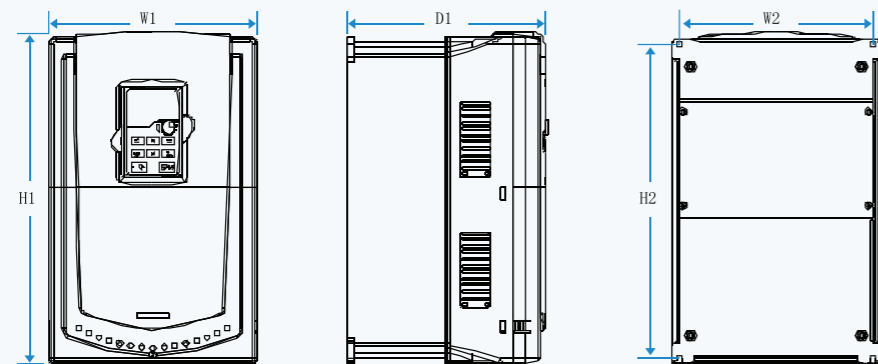
Power	Gross weight (kg)	Net weight (kg)	Packing material	Outer packing sizes (mm)
4-5.5kW	4kg	3.5kg	Carton box	343mmx230mmx270mm
7.5-15kW	6.5kg	6kg	Carton box	430mmx275mmx325mm
18.5kW	9kg	7.8kg	Carton box	460mmx340mmx330mm
22-30kW	11.5kg	9.5kg	Carton box	545mmx375mmx360mm
37-55kW	32kg	30kg	Carton box	695mmx410mmx470mm
75-110kW	57kg	47kg	Wooden box	760mmx445mmx580mm
132kW	110kg	85kg	Wooden box	971mmx631mmx565mm

• Installation Dimensions Table (unit:mm)

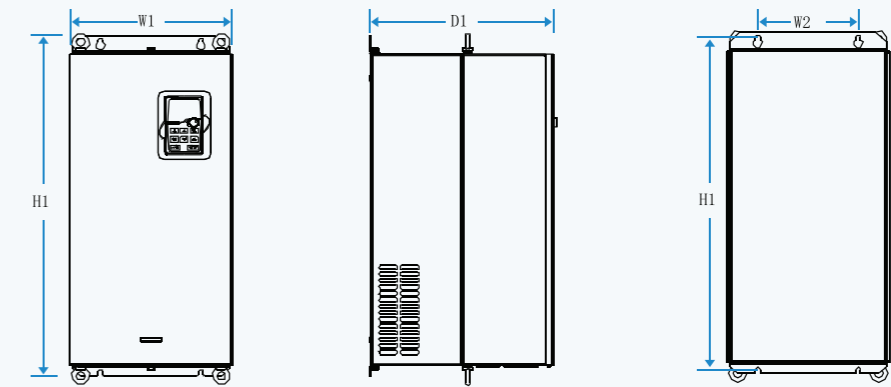
Model	W1	W2	H1	H2	D1	Installation hole
4kW-5.5kW	146	131	263	243.5	181	6
7.5kW-15kW	170	151	331.5	303.5	216	6
18.5kW	230	210	342	311	216	6
22kW-30kW	255	237	407	384	245	7
37kW-55kW	270	130	555	540	325	7
75kW-110kW	325	200	680	661	365	9.5
132kW	500	180	870	850	360	11

• Installation diagrams

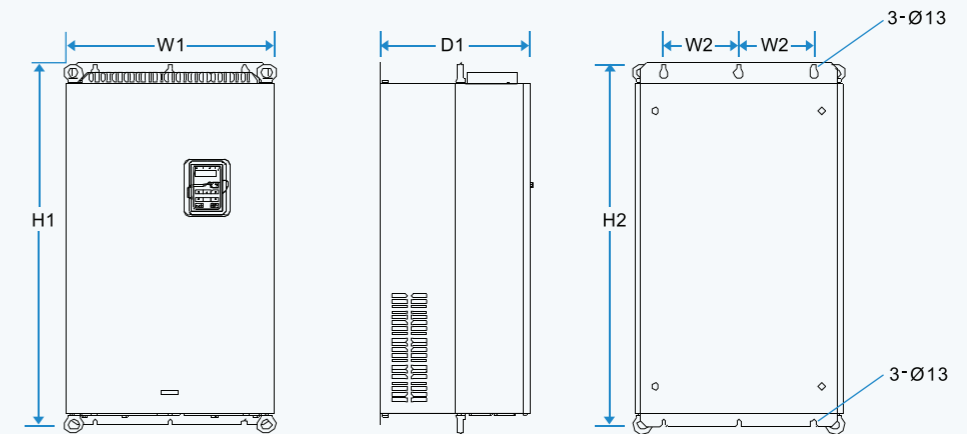
4~30kW



37~110kW



132kW



• Optional Parts

Optional name	Model	Note
English LCD liquid crystal keyboard	PRD_LCD300-16_ZY	
Expansion board of Relay	EC-RL-106	6 normally open output
PROFIBUS+Ethernet communication card	EC-TX-103	
CANopen communication card	EC-TX-105	
Devicenet communication card	EC-TX-106	
BACnet communication card	EC-TX-107	

Sales Network



- ★ INVT Headquarters
- INVT Sales & Service in 13 countries
- Sales and Service Partners in 63 countries

