Low Voltage Frequency Inverter

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Contents

Product Profile

HPVFE
Miniature Frequency Inverter

HPVFE Miniature inverter with high stability, high reliability.use V/F control mode, provide excellent speed control and high levels of torque control in the whole speed range , even if the dramatic increase in load, also can improve the speed regulation effect.An built-in EMC filter is an optional part.

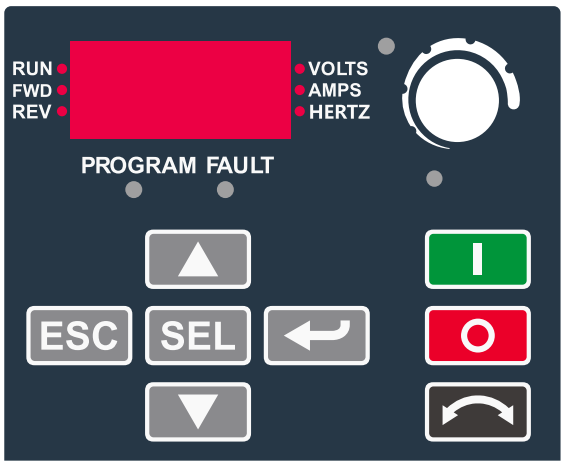
- Integrated panel provide local potentiometer and control key operation
- Integration of RS485 communication can be used for computer programming

specification	rated voltage: single phase AC 200~240V	rated power: 0.75-2.2KW
	rated voltage: three-phase AC 200~240V	rated power: 0.75-7.5KW
	rated voltage: three-phase AC 380~480V	rated power: 0.75-11KW

Start, Programming and Operation

Feature

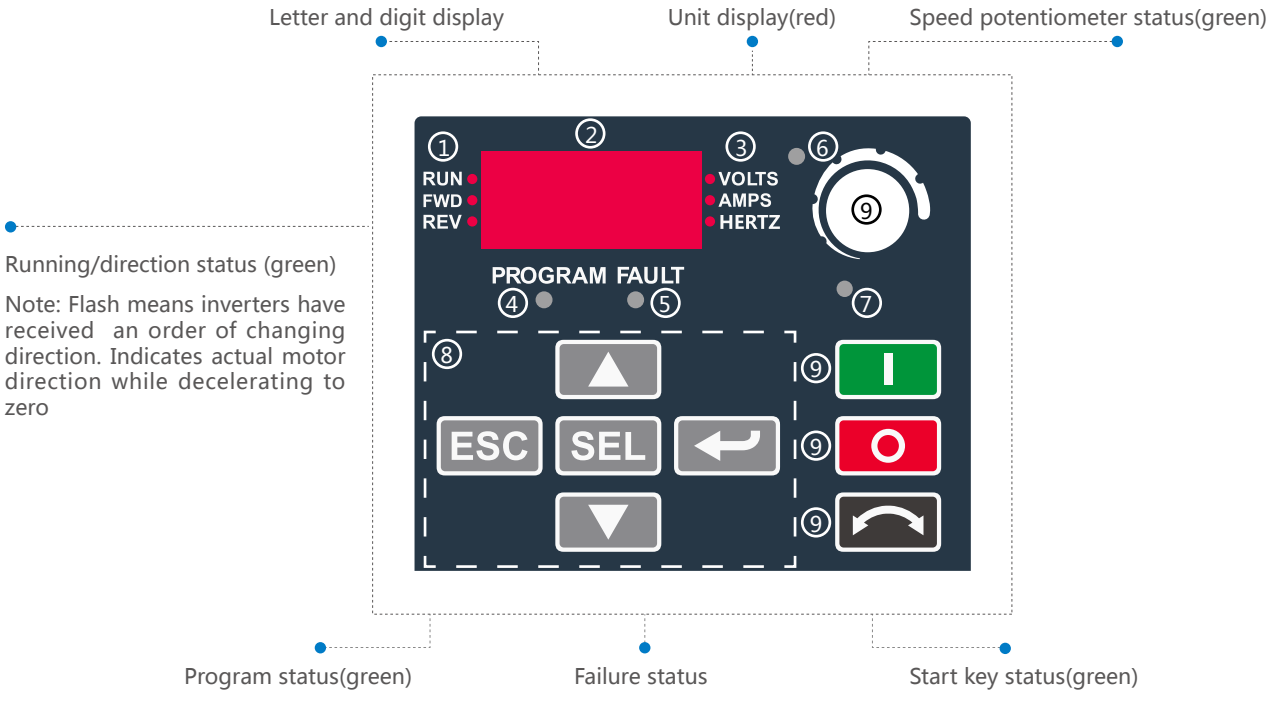
A basic programming group includes the most common 12 application parameters which make programming quicker and more convenient.



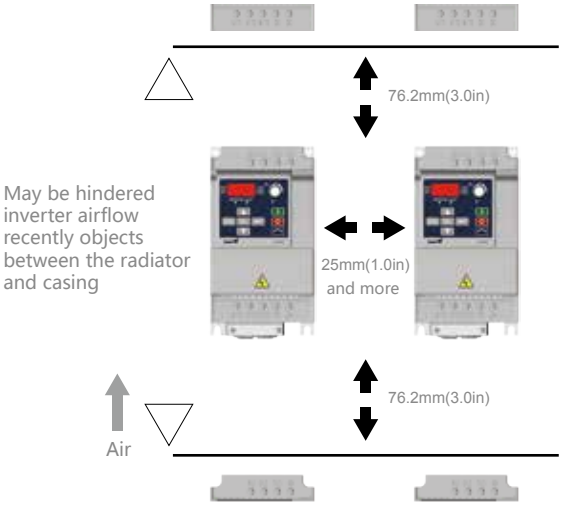
P101	Motor nameplate voltage
P102	Motor nameplate frequency inverter
P103	Motor overload current
P104	Min frequency
P105	Max frequency
P106	Start source
P107	Stop mode
P108	Speed reference
P109	Accel time
P110	Decel time
P111	Motor overload retention
P112	Reset to defaults

Feature

4 digits display and 12 additional LED indications display the status and data of inverter



Packaging and Mounting



- The control circuit terminal cover can be removed simply
- Type A and B can use the guide rail type installation
- All the single 220 v and 380 v three-phase inverter built-in EMC filter
- Zero clearance installation allows ambient temperature as high as 40 degrees, and save the precious installation space.Under the condition of the guarantee minimum frequency converter installation clearance, ambient temperature can reach 50 degrees.

Optimized Performance

- Control method: V/F control
- Operate simply,powerful
- Inverter automatic compensation and slip compensation for IR
- The PWM frequency can be adjusted to 10 KHZ guarantees the quiet operation
- Using the MODBUS communication protocol, RS485 interface
- Built-in EMI filter(optional)
- The external display
- 150% for 60 s,200% for 3 s

Product Structure

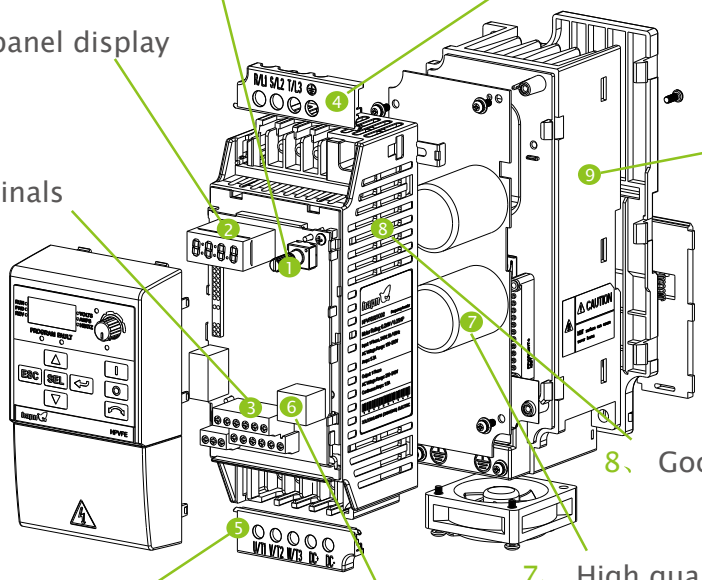
1、Potentiometer

2、The local control panel display

3、Input / Output terminals

4、Input power terminal

9、Heatsink



8、Good IP20 protection shell

7、High quality capacitors

5、output power terminal

6、RS485 interface

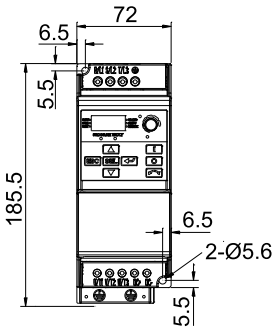
Product Selection

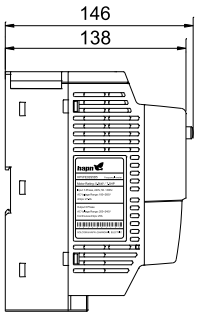
HP	VF	E	□□	□	□□□	□□
Enterprise code	Type	Series code	Voltage range 02 200 Vac ~240 Vac 04 380 Vac ~460 Vac	Phase Number T triple phase S single phase	Power rating	Function 01 Built-in EMC filter

Voltage	Model	Power (kW)	Horse Power (HP)	Rated Current (A)	CInverter Specification	Inverter Dimension	Weight (kg)
200~ 240Vac ±10% 50/60Hz Single	HPVFE02S0D75	0.75	1	4.2	A	72×185.5×146	1.3
	HPVFE02S1D5	1.5	2	8	B	100×174×146.5	1.8
	HPVFE02S2D2	2.2	3	11			
200~240Vac ±10% 50/60Hz Built-in EMC filter Single	HPVFE02S0D7501	0.75	1	4.2	A	72×185.5×146	1.3
	HPVFE02S1D501	1.5	2	8	B	100×174×146.5	1.8
	HPVFE02S2D201	2.2	3	11			
200~240Vac ±10% 50/60Hz Triple	HPVFE02T0D75	0.75	1	4.2	A	72×185.5×146	1.3
	HPVFE02T1D5	1.5	2	8	B	100×174×146.5	1.8
	HPVFE02T2D2	2.2	3	12			
	HPVFE02T3D7	3.7	5	17.5			
	HPVFE02T5D5	5.5	7.5	25	C	130×258×189.8	4
	HPVFE02T7D5	7.5	10	33			
380~480Vac ±10% 50/60Hz Triple	HPVFE04T0D75	0.75	1	2.5	A	72×185.5×146	1.3
	HPVFE04T1D5	1.5	2	4.2			
	HPVFE04T2D2	2.2	3	6	B	100×174×146.5	1.8
	HPVFE04T3D7	3.7	5	8.7			
	HPVFE04T5D5	5.5	7.5	13	C	130×258×189.8	4
	HPVFE04T7D5	7.5	10	18			
	HPVFE04T11	11	15	24			
380~480Vac 10% 50/60Hz Triple Built-in EMC filter	HPVFE04T0D7501	0.75	1	2.5	A	72×185.5×146	1.3
	HPVFE04T1D501	1.5	2	4.2			
	HPVFE04T2D201	2.2	3	6	B	100×174×146.5	1.8
	HPVFE04T3D701	3.7	5	8.7			
	HPVFE04T5D501	5.5	7.5	13	C	130×258×189.8	4
	HPVFE04T7D501	7.5	10	18			
	HPVFE04T1101	11	15	24			

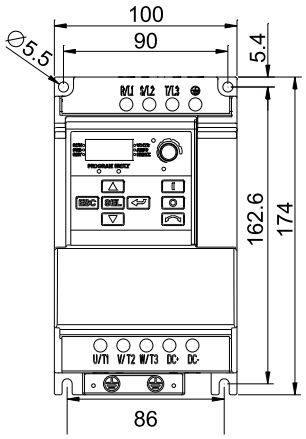
Product Dimension

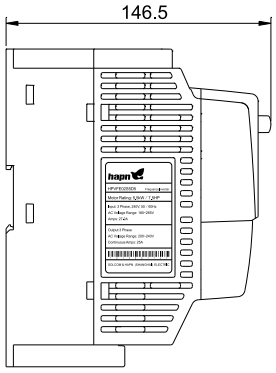
A



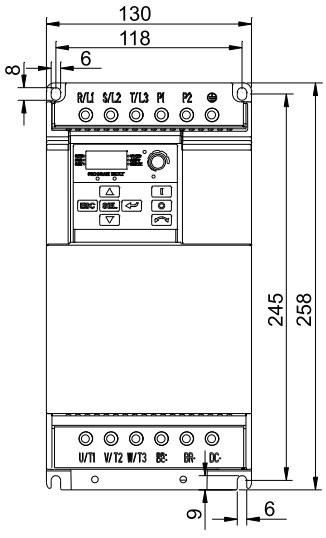


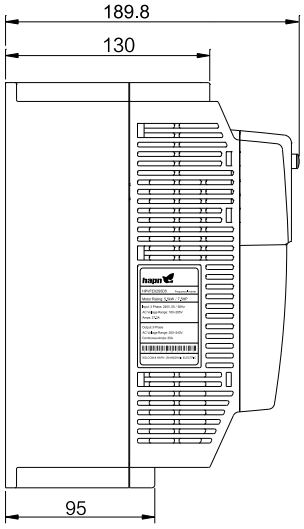
B



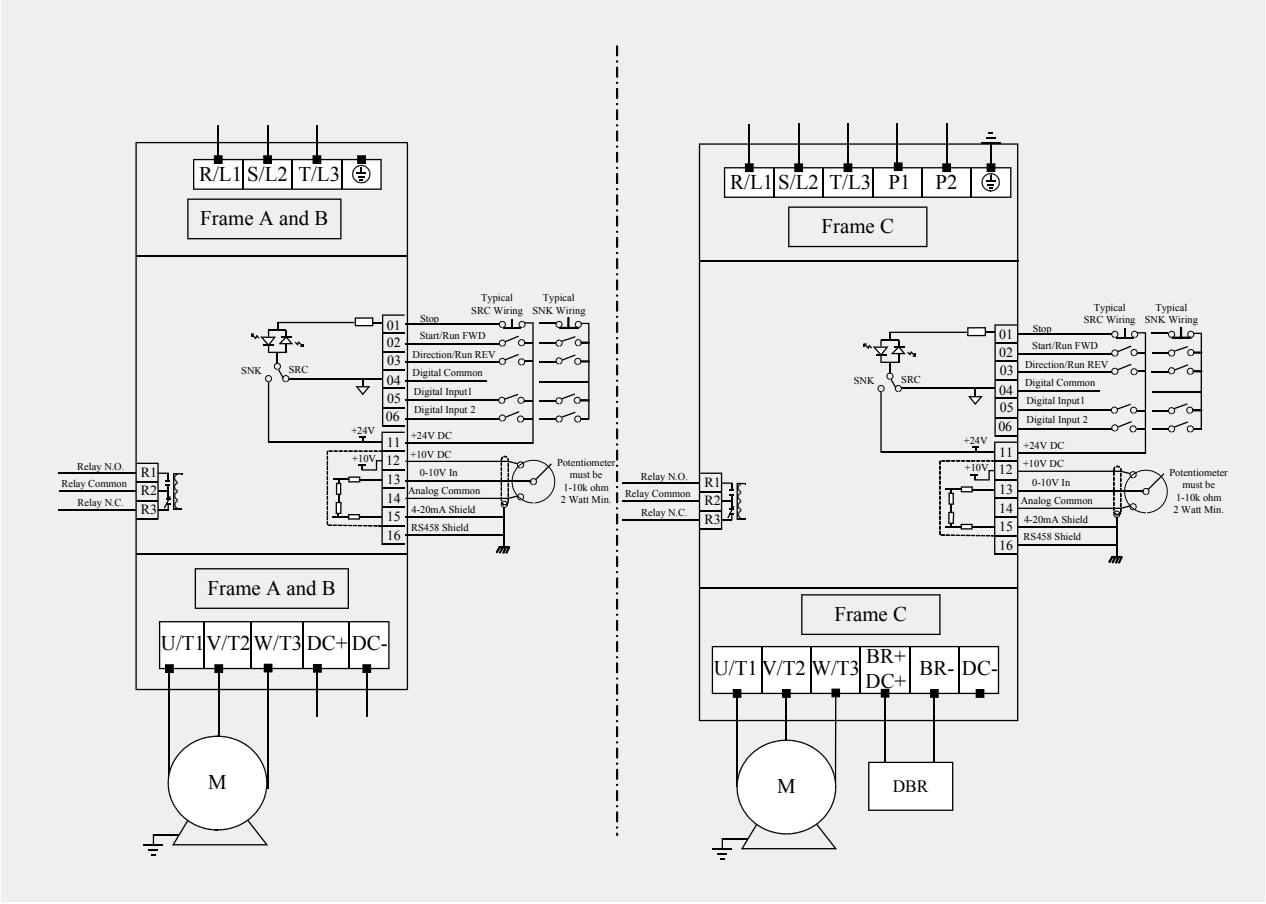


C





Wiring Diagram



Terminals		
R/L1 , S/L2	Single phase input	
R/L1 , S/L2 , T/L3	Three phase input	
P1[(2)] , P2[(2)]	The Frame C drive is shipped with a jumper between Terminals P1and P2. Remove this jumper only when a DC Bus Inductor will be connected. Drive will not power up without a jumper or inductor connected.	
U/T1	To motor terminals U/T1	exchange the motor connector to convert the rotation direction
V/T2	To motor terminals V/T2	
W/T3	To motor terminals W/T3	
DC+[(2)] , DC-[(2)]	DC bus line terminals	
BR+[(2)] , BR-[(2)]	Brake resistor terminals	
⏚	Earthing terminals	

Inverter Technology Data

Specification		
Input/Output Ratings	Output frequency: 0~400Hz(programmable)	
	Efficiency: 97.5% (typical)	
Digital Control Inputs (Input Current =6mA)	SRC (Source) Mode:	18-24V = on
		0-6V = off
	SNK (Sink) Mode:	0-6V = on
		18-24V = off
Analog Control Inputs	4-20mA Analog:	250 ohm input impedance
	0-10V DC Analog:	100k ohm input impedance
	External Pot	1-10k ohms, 2 Watt minimum
Control Output (Programmable Output, form C relay)	Resistive Rating	3.0A at 30V DC, 125vAC and 240vAC
	Inductive Rating	0.5A at 30V DC, 125vAC,and 240vAC
Protective Features	I^2t overload protection - 150% for 60 Secs, 200% for 3 Secs (Provides Class 10 protection)	
Over Volatge	200-240vAC input	200-240V AC Input Trip occurs at 405V DC bus voltage (equivalent to 290V AC incoming line)
	380-460vAC input	380-460V AC Input Trip occurs at 810V DC bus voltage (equivalent to 575V AC incoming line)
Under Volatge	200-240vAC input Input	Trip occurs at 210V DC bus voltage (equivalent to 150V AC incoming line)
	380-480 vA C input	Tri p occur s a t 390 V D C bu s voltag e (equivalen t t o 275 V A C incomin g line)
Control Ride Through		
Dynamic braking	Faultless Power Ride Through: 100 milliseconds	
	3-phase 220v, 5.5kw 7.5kw inverter and 3-phase 380v 5.5kw 7.5kw 11kw inverter have built-in brake unit in IGBT.	

Inverter Technology Data

Specification			
Environment	Allowed max sea level		1000m(3300feet), no need for derating use
	Allowed max environment temperature		IP20 open install
			IP20 compact install
	Cooling method	Without fan	220V three phase 0.75kw
			380V three phase 0.75kw
		With fan	All other power range except 0.75kw
	Storage temperature		-40℃ -85℃
	Working condition		The inverter may not be installed in explosive, corrosive, steam or dusty working condition.
	Relative humidity		0~95%, No condensation
	Impact (operation)		15G peak value for 11ms(0.1ms)
	Vibration (operation)		1G peak value 5~2000Hz
Control	Carrier Frequency		2-10kHz . Driver rating based on 4 kHz
	Frequency accuracy	Digital Input	Within ±0.05% of set output frequency
		Analog Input	Within 0.5% of maximum output frequency
	Speed Regulation -Open Loopwith Slip Compensation		±2% of base speed across a 40:1 speed range
	Stop Modes		Multiple programmable stop modes including -Ramp, Coast, DC-Brake,
			Ramp-to-Hold and S Curve
	Acceleration/Deceleration		Two independently programmable acceleration and deceleration times
			Each time may be programmed from 0~600 seconds in 0.1 second increments
	Intermittent Overload		150% Overload capability for up to 1 minute , 200% Overload capability for up to 3 seconds
	Electrical overload protection		Level 10, quick response and overload holding protection.
Electric	Voltage range		200-240V ±10%
			380-460V ±10%
	Frequency range		50/60Hz
	Input		For 3-phase, the input supports full rated current.
			For 1-phase, input supports 35% rated current.

Product Profile

HPVFV
Universal Vector Frequency Inverter

HPVFV inverter is specifically designed for accurate speed adjustment, with excellent performance, stable and reliable. The goal is high-power output, convenient use, high security. This inverter possesses auto tuning, PID control, multi-speed control and multifunctional input/output control etc.

Ordering Information

HP VF V – □□ □□□ □□

- HP: Enterprise code
- VF: Type
- V: Series code
- □□ Voltage range
  - 02 200-230Vac
  - 04 380-460Vac
  - 06 660-690Vac
  - 12 1140Vac
- □□□ Power rating
- □□ Function
  - 01 Braking control unit (30kW~200kW)
  - 02 Incremental Photo-electricity Encoder
  - 03 Communications RS-485 MODBUS
  - 04 Communications RS-485 PROFIBUS
  - 05 Synchronization card
  - 06 Analogue output card

Power rating

Code	Power rating
05D5	5.5kW
07D5	7.5kW
11	11kW
15	15kW
18D5	18.5kW
22	22kW
30	30kW
37	37kW
45	45kW
55	55kW
75	75kW

Code	Power rating
90	90kW
110	110kW
132	132kW
160	160kW
200	200kW
250	250kW
315	315kW
400	400kW
500	500kW
560	560kW
630	630kW

Parameters

1. Input rated voltage 400V (660V、1140V option) , Rated power 5.5~400kW
2. Input frequency 50/60Hz
3. Speed adjustment error less than 1%
4. Maximum line unbalanced level of three-phase input voltage is 3%
5. Overload 150% for 60s, 175% for 2s
6. Starting torque
   - Sensorless vector control 150%(0.5 Hz)
   - Sensor vector control 200% (0Hz)
7. Output frequency/speed:
   - Sensorless:0.0~300.0Hz (without encoder); 0.0~3000.0Hz (with encoder)
   - Sensor: 0~8000[rpm]
8. Frequency reference
   - Analog Input: resolution 10bit, accuracy+0.1%
   - Keypad: Resolution 0.01Hz / 0.1Hz
9. Acceleration time:
   - Sensorless & Sensored vector control : -0.00~3000.00[sec]
10. Deceleration time:
    - Sensorless & Sensored vector control : -0.00~3000.00[sec]

Product Selection

Model Selection

Voltage 380~460VAC Selection Table

Model	Rated power	Rated current	Type	Dimension	Weight
HPVFV0405D5	5.5	12	A1	195x370x188	8
HPVFV0407D5	7.5	16			
HPVFV04011	11	23.5			
HPVFV04015	15	31	B1	195x460x301	18.5
HPVFV0418D5	18.5	38			
HPVFV04022	22	45			
HPVFV04030	30	61	C1	283x490x319	34
HPVFV04037	37	72			
HPVFV04045	45	88			
HPVFV04055	55	107	D1	252x787x353	61
HPVFV04075	75	146			
HPVFV04090	90	174			
HPVFV04110	110	212			
HPVFV04132	132	252	E1	496x860x436	111
HPVFV04160	160	305			
HPVFV04200	200	382			
HPVFV04250	250	478	F1	555x1050x454	188
HPVFV04315	315	598			
HPVFV04400	400	759			

Note:
1. "D" represents"." in the model, for example,5D5 expresses as5.5. 2. Special customization please explain in advance.
3. 5.5~22kW, brake control unit (standard) 30~200kW, brake control unit (optional)

Voltage 660~690VAC Selection Table

Model	Rated power	Rated current	Type	Dimension	Weight
HPVFV-06030	30	35	A21	284×490×306	24
HPVFV-06037	37	42	A2	250×650×336	29
HPVFV-06045	45	50			
HPVFV-06055	55	61			
HPVFV-06075	75	84	B2	250×850×341	*
HPVFV-06090	90	100			
HPVFV-06110	110	122			
HPVFV-06132	132	145	C2	527×1000×446	*
HPVFV-06160	160	175			
HPVFV-06200	200	220			
HPVFV-06250	250	275			
HPVFV-06315	315	343	D2	730×1400×470	*
HPVFV-06400	400	435			
HPVFV-06500	500	544			

Voltage 1140VAC Selection Table

Model	Rated power	Rated current	Type	Dimension	Weight
HPVFV-12110	110	73	A3	366x906x442	*
HPVFV-12132	132	82			
HPVFV-12160	160	103	B3	575x1000x418	*
HPVFV-12200	200	128			
HPVFV-12250	250	160			
HPVFV-12315	315	202	C3	650x1500x469	*
HPVFV-12400	400	255			
HPVFV-12560	560	320			
HPVFV-12630	630	403	D3	820x1350x505	*

Note: * ask manufacturer.

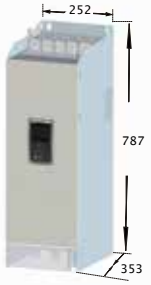
Product Dimensions

Specifications and Dimension

(A1)

(B1)

(C1)



(D1)

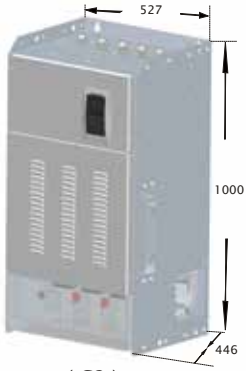
(E1)

(F1)

(A21)

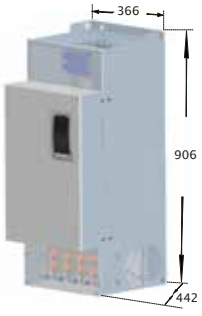
(A2)

(B2)



(C2)

(D2)



(A3)

(B3)

(C3)

(D3)

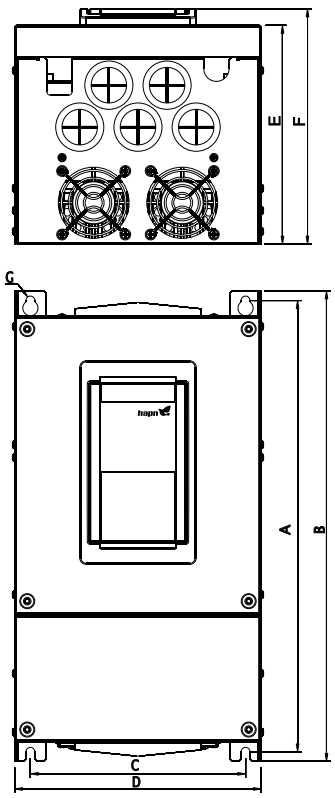
Note：The merchandise color will subject to actual color.

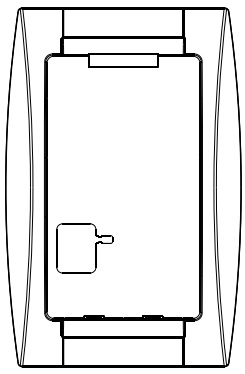
Product Selection

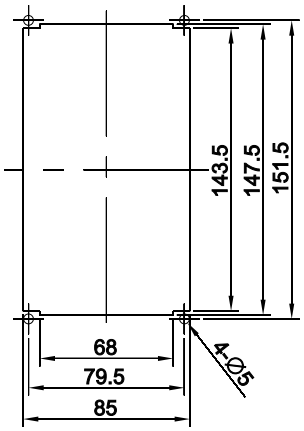
Dimension and screw size

Product size	A	B	C	D	E	F	G
Ⅰ	355	370	170	195	172	188	Φ7
Ⅱ	445	460	150	195	290	301	Φ7
Ⅲ	475	490	240	283	303	319	Φ7
Ⅳ	764	787	210	252	337	353	Φ9
Ⅴ	830	860	400	496	420	436	Φ13
Ⅵ	1018	1050	470	555	438	454	Φ13

note: for remoted control panel, the length of signal cable is <=5m with matched shelf.







Function

Protection Function		
Fault		Over voltage,under voltage,over current,over temperature,
		open-phase protection over load protection
		speed order losing
Warning		stop,over load ,temperature sensor abnormal
Instant power failure		≤8.3ms continue to run 8.3ms> restart
Panel	Run information	Output frequency, output current, output voltage,frequency reference,
		speed, DC voltage
	Fault information	"Display fault when protection function start.
		Display 9 history faults."
Parameters		
Operation		Keypad/terminals/communication
Frequency reference		Analog 0~10V/-10~+10V/0(4)~20mA
		Digital panel
Input signal	Direction	Forward Reverse
	Multi-step	16 steps reference
	Accel/Decel	0.00~3000.00s 4 selections per type
	Time selection	Accel/Decel output Linear,S-curve
	Emergency stop	Instant isolate output
	Jog	Jog run
Output signal	Restart	Remove error status when protection function starting
	Run status	Check Frequency, over load, over voltage, over temperature, RUN, STOP etc.
	Output	Digital output D01 D02 :AC 250V,5A DC 30V,5A
RUN function		DC-brake, frequency limit, slip compensation, in case of reverse, auto restart
		Auto tuning, PID control

Control Mode	
Control mode V/F	Filed orientation vector control, V/F control Sensorless Vector control
Frequency resolution	Digital 0.01Hz less than 100Hz 0.1Hz more than 100Hz
	Analog 0.01Hz/60Hz
Frequency degree	Digital Max.ouput frequency 0.01Hz
	Analog Max.ouput frequency 0.01Hz
V/F	Linear, S-Curve
Over load built_in	110% 2min 120% 1min
Torque setup	manual Torque setup 0~15% Auto Torque setup

Terminal Description

NO	Terminal	Dsecription	NO	Terminal	Dsecription
1	Vref.COM	Voltage reference group	14	DI.07	Mult-step 1
2	Vref.+10V	10Vdc supply terminal	15	DI.08	Mult-step 2
3	AI 1.P	Analog input 1 terminal	16	DI.COM	Digital input group
4	AI 1.N	0~10V use as volt. Ref.	17	AO1.N/DI.COM	Analog output 0(4)~20mA
5	AI 2.P	Analog input 2 terminal	18	AO.P	
6	AI 2.N	0(4)~20mA use as cur. Ref.	19	DO3.OC	Digital output 3-open collector
7	DI.01	Forword run	20	DO3.24V	Digital output +24V
8	DI.02	Reverse run	21	DO1.A	 Brake control
9	DI.03	Drive enable	22	DO1.B	
10	DI.04	External fault input	23	DO1.C	
11	DI.COM	Digital input group	24	DO2.A	 Fault output
12	DI.05	Fault reset	25	DO2.B	
13	DI.06	Mult-step 0	26	DO2.C	

Inverter Characteristics & Feature

Characteristics

HPVFV inverter, using high-performance digital signal processor and optimizing control algorithm, provides fans and pumps etc with high speed ,flexible, safety control.

Including V/F control, field orientation vector control , Sensorless Vector control (this control can effectively improve the problem speed along with the change of load). PID function and auto tuning function are more suitable for fans and pumps to realize better energy saving.

System startup or reaching set value, can realize smooth change of speed, also comply with the large inertia load control requirements.

Feature

Perfect protection function

- Over voltage, over current, low voltage, over temperature, over load,
- Zero-sequence current, out of control.

Torque control

- Quick torque response for the changable load(low speed with high torque)
- Starting output torque 150%
  i. Reversing deceleration control
  ii. Stop torque control
- No feedback device, correct torque control
- Synchronous run control

Double speed run control

PID control function

- PID control built_in, is mainly applied in process control to control flow rate, temperature, pressure etc. Use proportion, integral, differential realize variable closed-loop control. To add the PID processing controller outside the speed control loop. So the inverter, without PID controller and PLC, can realize many kind of function. PID compensation function can be used in control of the scroll tension.

Communication procedures

- Profibus、Modbus、RS485/232C、CAN
  - Monitoring function
  - Provide communication program (optional)
  - Fault Trace

Fault Trace

- Preservation current, voltage, frequency, torque, etc. in 1 second before trip.

Flying start

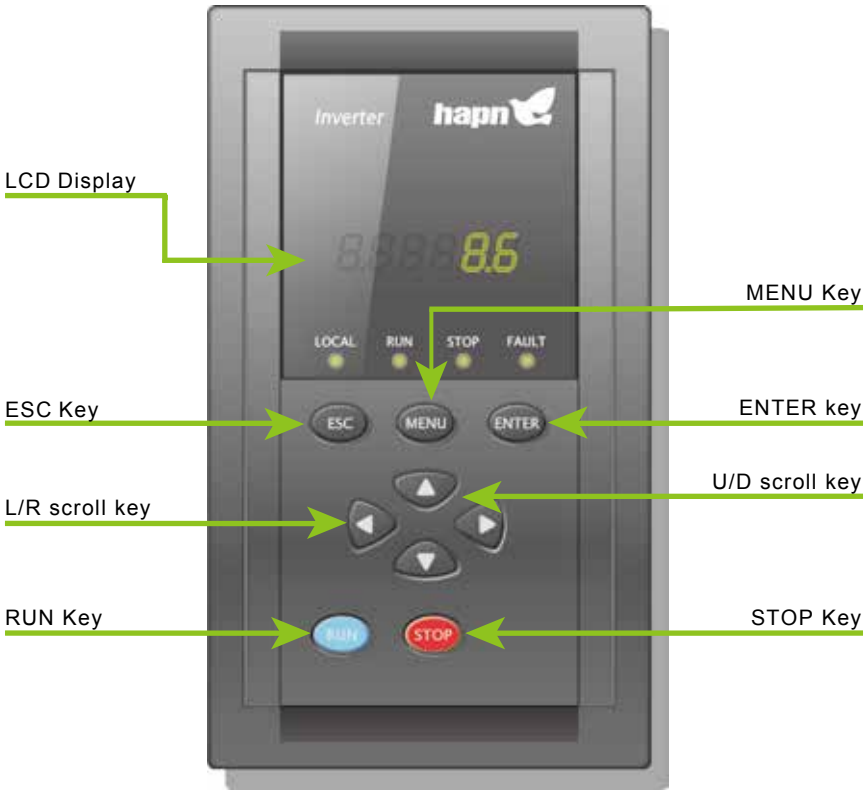
- Restart for deceleration load and instant power failure.

Auto tuning

- Automatic measurement motor parameters with simple operation, reflect the best control function

Keypad Description

The keypad of HPVFV inverter is composed with 9 keys, (ESC, ENTER, RUN, STOP, MENU, Left, Right, UP and Down scroll key). Users can set up parameters and monitor the operation status and start/ stop the motor with keypad, etc.



LCD Display :

If there are no work for certain time , the backlight will be off. And it will be automatically turned on when it starts working. The default value is 30 minutes.

ESC Key :

Move to upper menu. Reset when a Fault occurs.

MENU Key :

When a fault occurs, this is for moving to the last item, this moves to the inverter status monitor.(toggle button)

ENTER key :

When moving to the lower menu or Executing

U/D scroll key :

When moving to the Menu page, Monitor item and parameter items

L/R scroll key :

When users change parameters, these keys move the digits of parameter values.

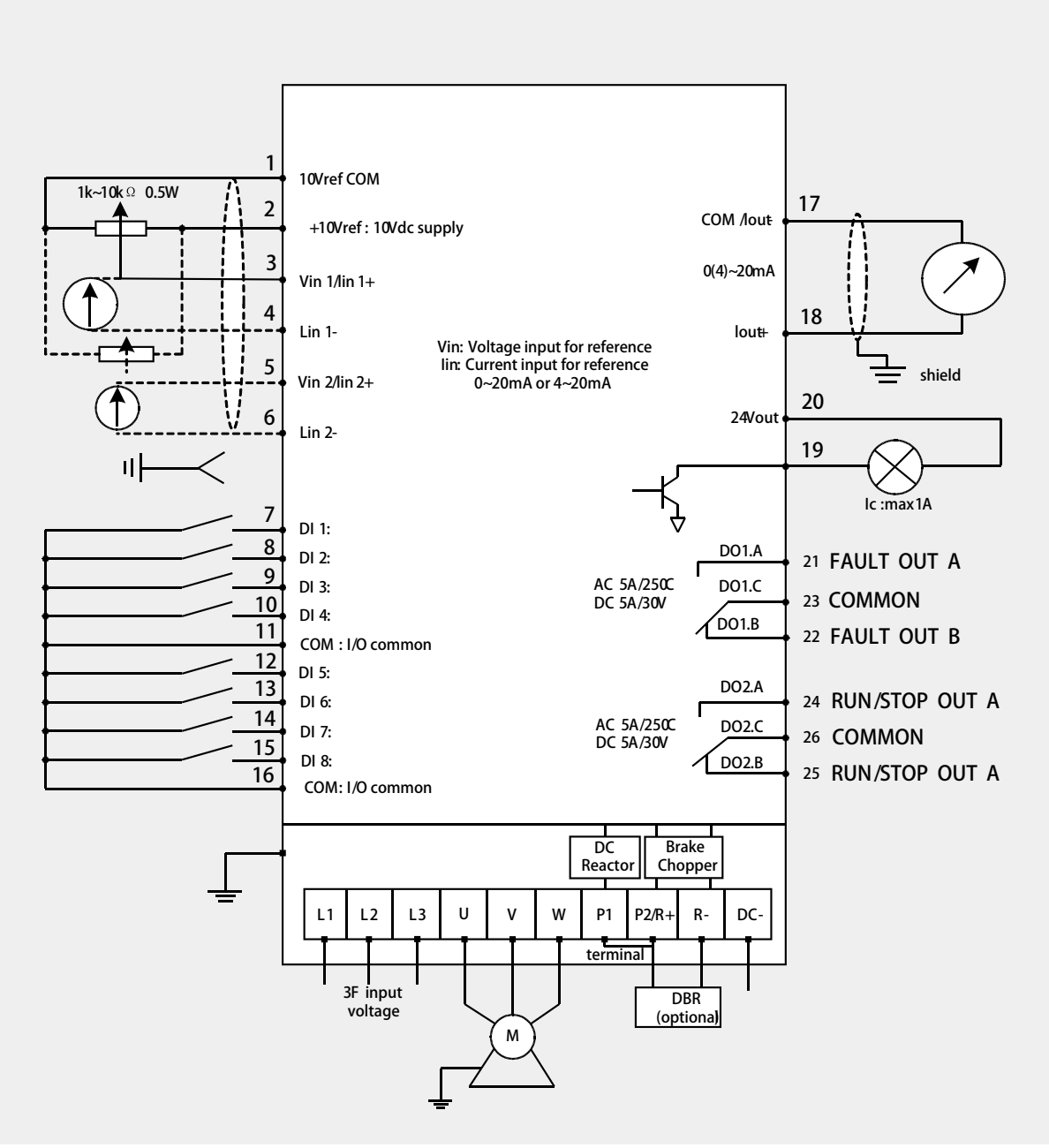
RUN Key :

When running the motor with keypad.

STOP Key :

When stopping the motor with Keypad

Wiring Diagram



Note:

1. AC Reator and RFI filter on the input lines(L1,L2,L3) are optional items.
2. Chokefilter on the output lines(U,V,W) is optional items.
3. Installing Fuse is recommended when breaking resistor be connected between terminal R+ and breaking resistor.

Applications

Application in cranes, hoists

HPVFV frequency inverter adpots sensorless vector control technology to meet the requirement of cranes with high starting torque, it means the frequency inverter can supply 150%torque when 0HZ.

Application in CNC lathe

The frequency inverter can detect the parameter of motor dynamic operation and adjust the parameter automatically, in this way, ensure the highest efficiency during the motor operation.

Application in escalator

For escalator, it will be waste when it operates with no passenger, if use energy saving technology of HPVFV frequency inverter, the escalator will operates when passenger on according to the sensor, the escalator also can decrease the speed or stop when passenger off according to the sensor.

Application in mixer

HPVFV frequency inverter adopts voltage /frequency control to start motor softly, in order to avoid the strike of electric net and motor itself and other equipments from motor starting with full voltage.

Application in extruding machine

- High torque output when 0HZ
- Automatic energy saving operation function can reduce the current accordeing to the torque changing, in this way, not only energy saving, but also guarantee the reliable and stable.

Application in pulping papermaking production line

- The frequency inverter with small volume and light weight, easy to install, simple testing, easy to operate, low noise without shaking.
- Speed adjustment with high precsion, the motor rotating speed without changed when the load and net voltage changed, so the frequency inverter has a good adaptability.
- The frequency inverter with complete protection function, high integrated level, so it is more reliable, easy to maintain due to self-diagnosis function.
- Good energy saving to save about 30% .
- To adjust the motor with infinitely variable speeds, low starting current, and without the strike of electric net and motor itself and other equipments.

Other Applications:

- pumps,fans,blowers,compressors,centrifugals,rollers,mine winches,mine conveyors,coal miners,...

Product Profile

HPVFQ
Four-Quadrant Inverter

HPVFQ series are Four Quadrant Frequency Inverter with vector control technique and energy regeneration technique, having the excellent motor control performance. Adopting the double PWM control technique to increase the power factor of system and realize the four quadrant running of the motor and meet the speed adjustment requirements of various loading,which can feed the regenerative power of the motor back to the electricity grid ,thus achieve the purpose of maximum saving energy. Moreover, it can reduce the harmonic pollution, the power factor is near to 1, it's a real green frequency inverter.

Function

Feature

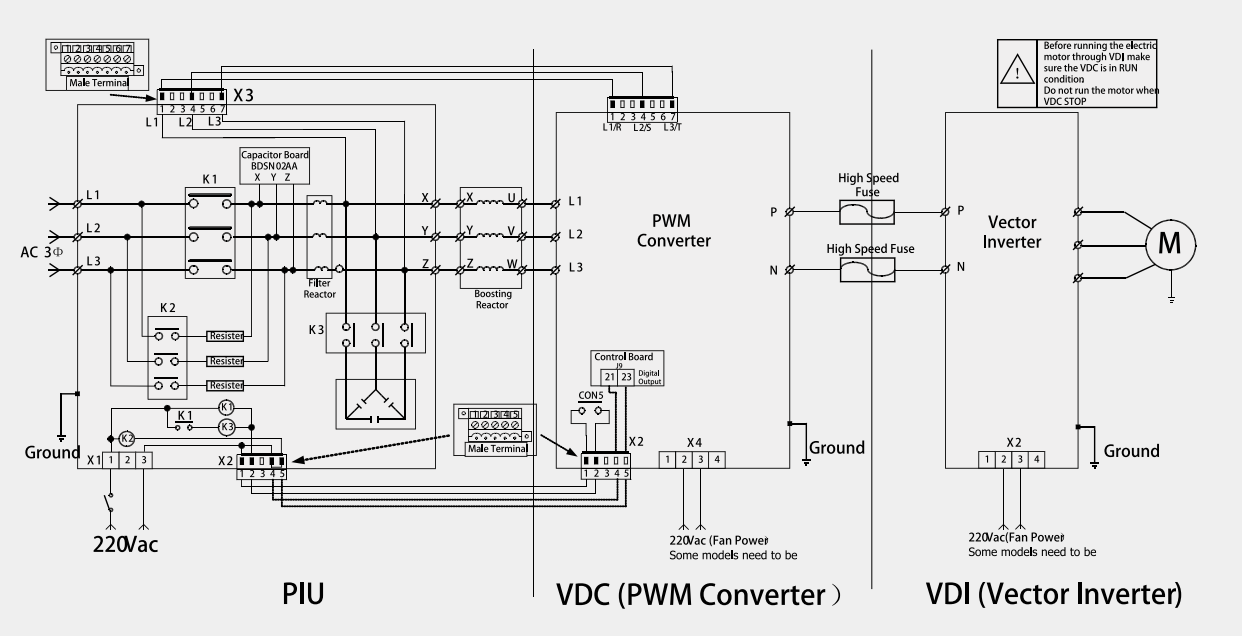
- Regenerative feedback(4-quadrant)
- Low harmonics, sine wave current
- No short-circuit current after disconnection
- Line voltage fluctuation compensation
- High precision and efficiency
- Power factor can be set(e.g.cosφ=1)
- Output voltage > Input voltage
- High starting torque
- High power factor
- Energy feedback
- Automatic load balancing
- Modular design
- Complete protection
- The corresponding special control function

Application

- DC power device
- Multi-motors applications
- Crane for lifting cargo,or high inertia application
- Tower cranes
- Port cranes
- Oilfield beam pumps
- Rollers
- Machine main spindle
- Mine winches,mine conveyors
- Gantry planers
- Cardboard crosscut machines
- Photovoltaic power system
- Windpower system
- Centrifugals,crushers in sugar mill
- Locomotive test system

Function

System constructive diagram



VDC PWM Rectifier (energy regenerative)

Features

- Regenerative feedback(4-quadrant)
- Low harmonics, sine wave current
- No short-circuit current after disconnection
- Line voltage fluctuation compensation
- High precision and efficiency
- Power factor can be set(e.g.cosφ=1)
- Output voltage > Input voltage

Communication methods

- RS485\232C Provide monitoring software
- PROFIBUS DP
- CAN

Highly efficient solution for trouble

- Varied parameters covering input voltage, current, frequency, input power and temperature in one second before failure can be preserved, refresh data function

VDI Vector Frequency Inverter

Features

- Perfect protection function: Protection for over current, over voltage, under voltage, over heat, over load, zero sequence current, abnormal operation
- Strong torque control: Quick torque response against sharp change of load(high torque output when low speed),
  - Reversedeceleration
  - Stop torque control
  - Start output torque of 150% without feedback device
- Built-in PID control: PID algorithm controls flow, temperature, pressure
- Support multiple communication applications:
  RS485/232C, Profibus-DP, Modbus
  - Monitoring
  - Communication application optional
  - Fault trace
- Fault trace: Varied parameters covering input voltage, current, frequency, torque in one second before failure alarm can be preserved
- Flying start: Restart for falling load, restart after instant disconnection
- Auto-tuning: Automatically identify parameters of motor

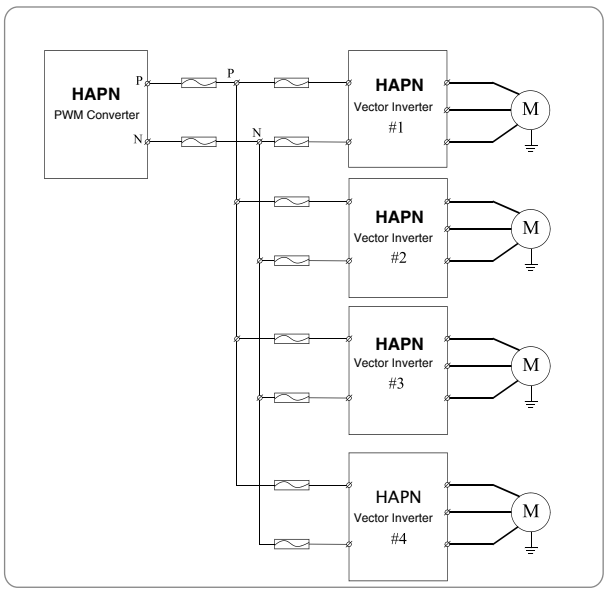
Ordering Information

HP VF Q – □□ □□□ □□

- HP: Enterprise code
- VF: Type
- Q: Series code
- □□ Voltage range
  - 04 380-460Vac
  - 06 660-690Vac
  - 12 1140Vac
- □□□ Power rating
- □□ Function
  - 02 Encoder
  - 03 Modbus Protocol
  - 04 Profibus Protocol
  - 05 Synchronous card
  - 06 Analogue output card

Parallel connection of vector freqency inverters

Make sure the power of PWM Converter is greater than the summation of all HPVFVs



Product Selection

Technical data

Main parameters	
Rated input voltage	400V (660V、1140Voptional) -20%~10%
Rated power	5.5~400kW
Input voltage frequency	50Hz/60Hz ±5%
Speed adjustment error range	＜ 1%
Three-phase input voltage imbalance range	Max 3% tolerance of 3ph input voltage is allowed
Overload running time	150% 60sec , 175%2sec
Starting torque	Sensorless vector control 150%　0.5Hz
	Vector control 200%　0Hz
Output frequency/speed	Sensorless：0.0~300.0 [Hz] (without encoder) ; 0.0~3000.0 [Hz] (with encoder)
	Sensor：0~8000 [rpm]
Acceleration time	V/F control：0.5~3000.0 [sec]
	Sensorless & Sensor vector control：0.00~3000.00 [sec]
Deceleration time	V/F control：0.5~3000.0 [sec]
	Sensorless & Sensor vector control：0.00~3000.00 [sec]

Model selection(Input voltage 380-460VAC, 50/60Hz HPVFQ series frequency inverter)

Model	Rated power (kW)	Rated current (A)	Type	Dimension (mm)	Weight (kg)
HPVFQ0405D5	5.5	12	Ⅰ	193×275×368*2	13*2
HPVFQ0407D5	7.5	16			
HPVFQ04011	11	23.5			
HPVFQ04015	15	31			
HPVFQ0418D5	18.5	38	Ⅱ	283×490×319*2	34*2
HPVFQ04022	22	45			
HPVFQ04030	30	61			
HPVFQ04037	37	72			
HPVFQ04045	45	88			
HPVFQ04055	55	107	Ⅲ	252×787×353*2	61*2
HPVFQ04075	75	146			
HPVFQ04090	90	174			
HPVFQ04110	110	212			
HPVFQ04132	132	252	Ⅳ	496×860×436*2	111*2
HPVFQ04160	160	305			
HPVFQ04200	200	382			
HPVFQ04250	250	478	Ⅴ	555×1050×454*2	188*2
HPVFQ04315	315	598			
HPVFQ04400	400	759			

Note:
1. "D" stands for "." in the model, for example,5D5 expresses as 5.5.
2. Consult with the manufacturer for 660V、1120V, frequency inverter's dimension and weight, please inform us the special customization in advance.
3. *2 in dimension stands for the dimension of a VDC and a VDI, their dimension is same.
4. Regular products range excludes fuse.

Product Profile

HPVFP

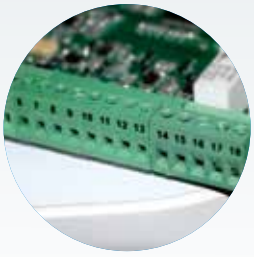
High Performance Full Function Vector Frequency Inverter

HPVFP series full function vector control frequency inverters feature high reliability,stability,flexibility and world leading motor control technology. With multifunction of protection for assuring safety running,compact structure,advanced process technology,it matches the requirements of multiple applications. The quick installation and commissioning offer the best solution for industry application.

Power: 0.75~160kW Input Voltage: 3 phases,380~480V

OLED display optional

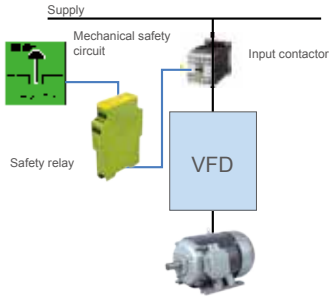

Built in EMC filter Optional


Pluggable Control Terminals


High Quality Long-life Fans

Performance of HPVFP Frequency Inverter

Safety Torque Function -STO

Safety Torque Off-STO (standard)	With	Without
HPVFP offer a safety torque off function to allow simple integration into machine critical safety circuits. ◆ Simple machine design reduces mounting time and cut down component cost,saves installation space. ◆ Faster shutdown and reset procedures save the maintenance time of system. ◆ Better safety standard than mechanical solution. ◆ Optimized motor connection. Single cable linking without contactor.		

Inverter Feature

Advanced motor control method

- Various control method: V/F control, V/F energy saving, sensorless vector speed control, sensorless vector torque control, close loop(encoder) speed control, close loop(encoder) torque control, open loop PM vector control.
- Various communication: Modbus, Profibus, CAN bus.
- Starting torque: 200% output torque at 0Hz.
- Multi-function: bluetooth function.
- More terminals: PLC.
- Adapt for various motors: PMSM, DC brushless motor, three phase AC asynchronous motor, SRM.
- Overload: 150% withstand 60s
- New protection: Safe torque off

Adapt for various motors

Three phase AC Permanent-Magnet synchronous motor | Three phase AC asynchronous motor | Synchronous reluctance motor | DC brushless motor

Inverter system running efficiency

With the raw material cost increasing, performance becomes an important factor of various of industry for transmission system. In many conditions, the final volume of performance will be effected by each components' performance, it does not means add each nominal performance simply. The real performance curve should take all system into consideration, which includes expected speed data and loading range.

Generally, the power factor of AC drive is 98%, it only representative the difference of input power and output power volume. Another factor, motor control scheme always been ignored which will highly effect the whole system performance.

Further more, HPVFP series frequency inverter was designed for various kinds of motors and make them in best performance condition.

- Blue curve means a scheme of advanced running of high performance induction motor, AC frequency inverter and high performance shift together.
- Red curve means AC drive controls PMSM. The running performance of AC drive increased the speed of motor and possibility of driving a loading. However, at low speed condition the performance was down, as well as the stability of speed.
- Green curve means HPVFP series frequency inverter controls a motor. The performance at full speed and full loading range.

Above all, HPVFP series frequency inverter has maximum output torque per kilowatt consumption at full speed and torque range.

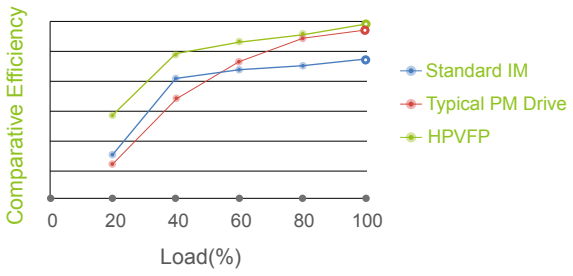
There are 2 factors in below chart:

- The whole performance of system running at different torque and loading is not a constant volume.
- The running performance of motor will influence the whole system performance.

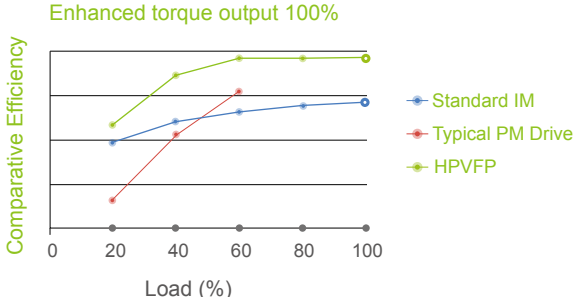
The chart displays the proportion of electricity grid and output torque power.

For example: 2.2kw motor

Enhanced torque output 100%



Enhanced torque output 100%



Product Application

Mining and quarry
fodder conveyor belt,
crusher, lift

Metal process
grind, cut, polish,
drill, whirl cut

Rubber, plastic
Extruding/forming/
mixing/rolling machine

Food and beverages
Conveyor belt, pump, mixing
machine, stacking machine

Applications in different industries

Lifting Cranes

Request:

- High torque while starting
- Exact and smooth moving while starting and stopping.
- Reliable braking
- Avoid gliding.
- Braking ability regenerate while going down.

HPVFP series frequency inverter provides features:

- Special algorithm for lifting device.
- Vector control and with out encoder condition, 200% torque at 0Hz and speed.
- Pre-set speed curves and variable speed control.
- Built-in braking IGBT and braking unit, only need a matched resistor.

Compressor

Request:

- Guarantee a synchronous speed.
- high torque while starting
- Always full load
- Safe operation, avoid any danger or injury.

HPVFP series frequency inverter provides features:

- In PMSM open loop condition, PMSM has maximum performance.
- Provide maximum torque while starting.
- In open loop condition, accuracy is better than 0.5%

Winding

Request:

- Provide exact motor torque control at a wide speed range.
- provide exact tension control in any condition
- The frequency inverter convert to open loop or close loop up to tension sensor or coil diameter
- Frequency inverter has electricity leakage protection.

HPVFP series frequency inverter provides features:

- PID closed loop tension information comes from pressure sensor or tension sensor.
- Optimized torque control in open loop condition.
- Encoder feedback function could provides wide motor speed range, even 0 rpm.
- Safe torque close function will provide emergency stop.

Product Option

Plug-in option modules

Extend the relay

Add 3 way relay output
Relay 3 - inverter display is normal
Relay 4, frequency converter fault occurs
Relay 5 - frequency converter operation instructions
This function can be programming/ adjustable

Extension I/O

add 3 way input
add the relay output

RJ45 extension port

PROFIBUS

The encoder feedback function

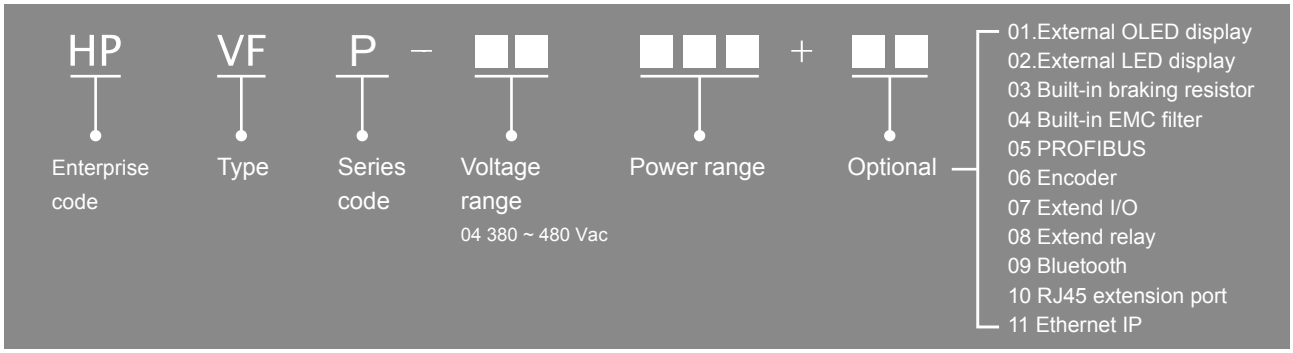
The encoder closed-loop feedback,
With incremental code
Compatible

Unique Function

- Built-in EMC filter, braking resistor, input and output filter, all conform to the requirements of the installation, fast communication
- Allows rapid replication between more than one frequency converter parameters
- Provide bluetooth wireless interface, can utilize the computer software to run a backup and storage of the inverter parameters

- Powerful PC software
- Inverter communication and parameter backup
- Parameters real-time editing functions
- Network communication function, frequency converter
- Simple, PLC programming function
- Parameter automatic updates, download, and storage capabilities

Product Selection

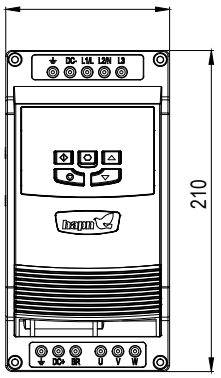


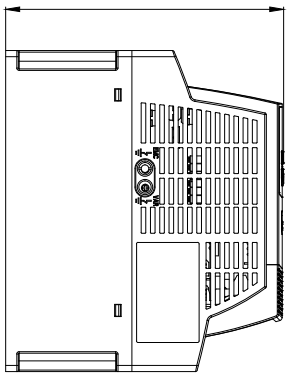
NOTE: 01、02、05、09、10 cannot be used at the same time;
06、07、08、11 cannot be used at the same time ,
For example,when select 05(profibus),modbus can not be used.For instance, if choose 10, then 01 and 05 , or 02 and 05,or 01 and 09,or 02 and 09 can be used at the same time.

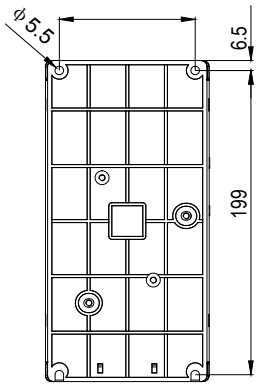
Voltage	Model	Power (kW)	Horse Power (HP)	Rated Current (A)	Inverter Frame	Inverter Dimension	Weight (kg)
380-480V ±10%	HPVFP-040D75	0.75	1	2.2	A	106×210×180	*
	HPVFP-041D5	1.5	2	4.1			
	HPVFP-042D2	2.2	3	5.8			
	HPVFP-0404	4	5	9.5			
	HPVFP-045D5	5.5	7.5	14	B	130×259×206	*
	HPVFP-047D5	7.5	10	18			
	HPVFP-04011	11	15	24			
	HPVFP-04015	15	20	30	C	190×450×215	*
	HPVFP-0418D5	18.5	25	39			
	HPVFP-04022	22	30	46			
	HPVFP-04030	30	40	61	D	255×525×239	*
	HPVFP-04037	37	50	72			
	HPVFP-04045	45	60	90	E	330×760×300	*
	HPVFP-04055	55	75	110			
	HPVFP-04075	75	120	150			
	HPVFP-04090	90	150	180			
	HPVFP-04110	110	175	202	F	336×1080×321	*
	HPVFP-04132	132	200	240			
	HPVFP-04160	160	250	302			

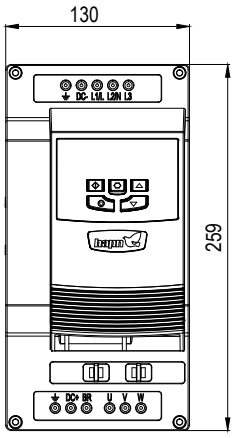
NOTE: "D "represents "."in the model,for example ,5D5 expresses as 5.5.
"*"pls consult factory

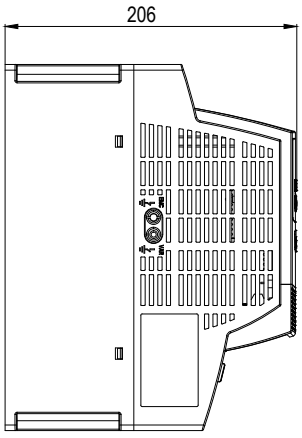
Product Dimension

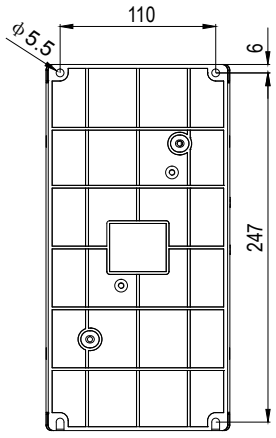


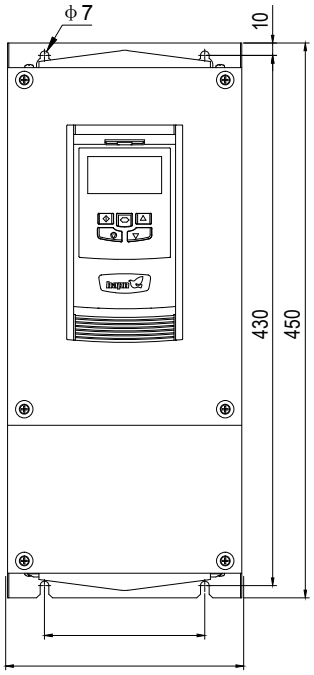


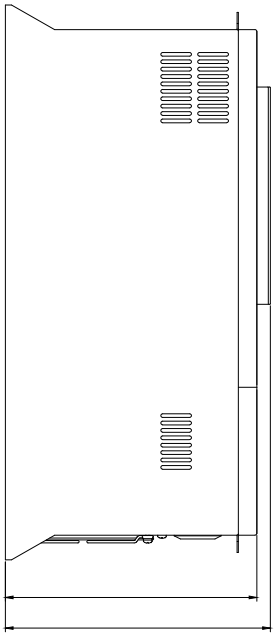








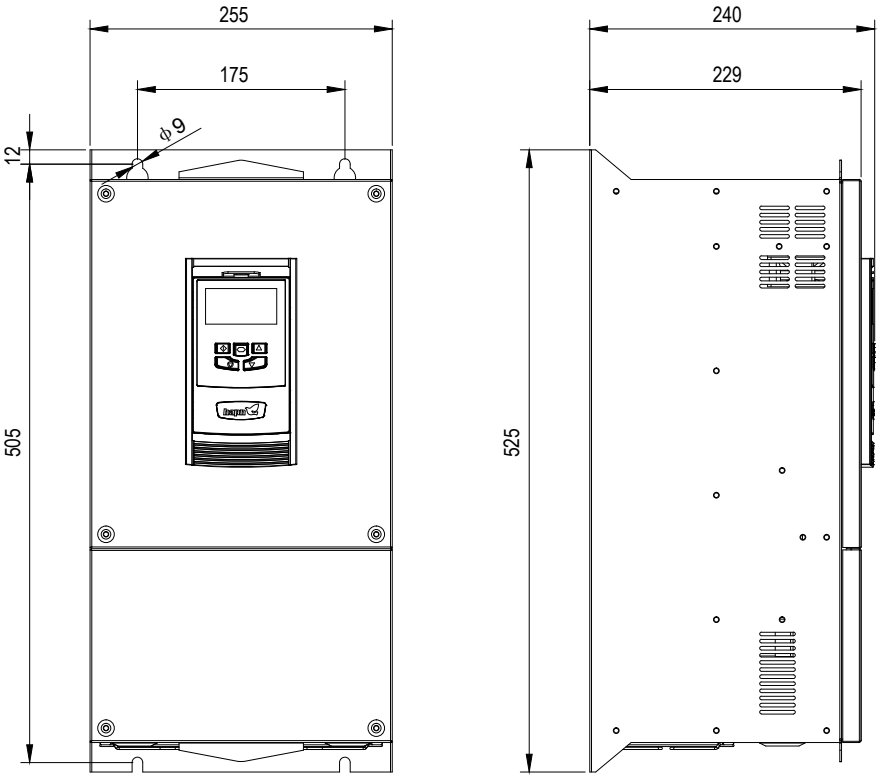




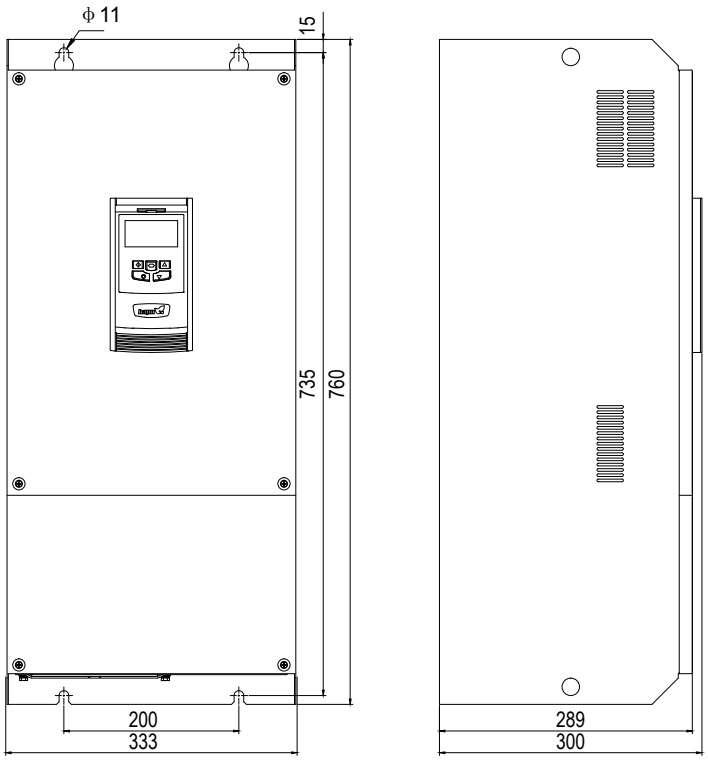
C

Product Dimension

D

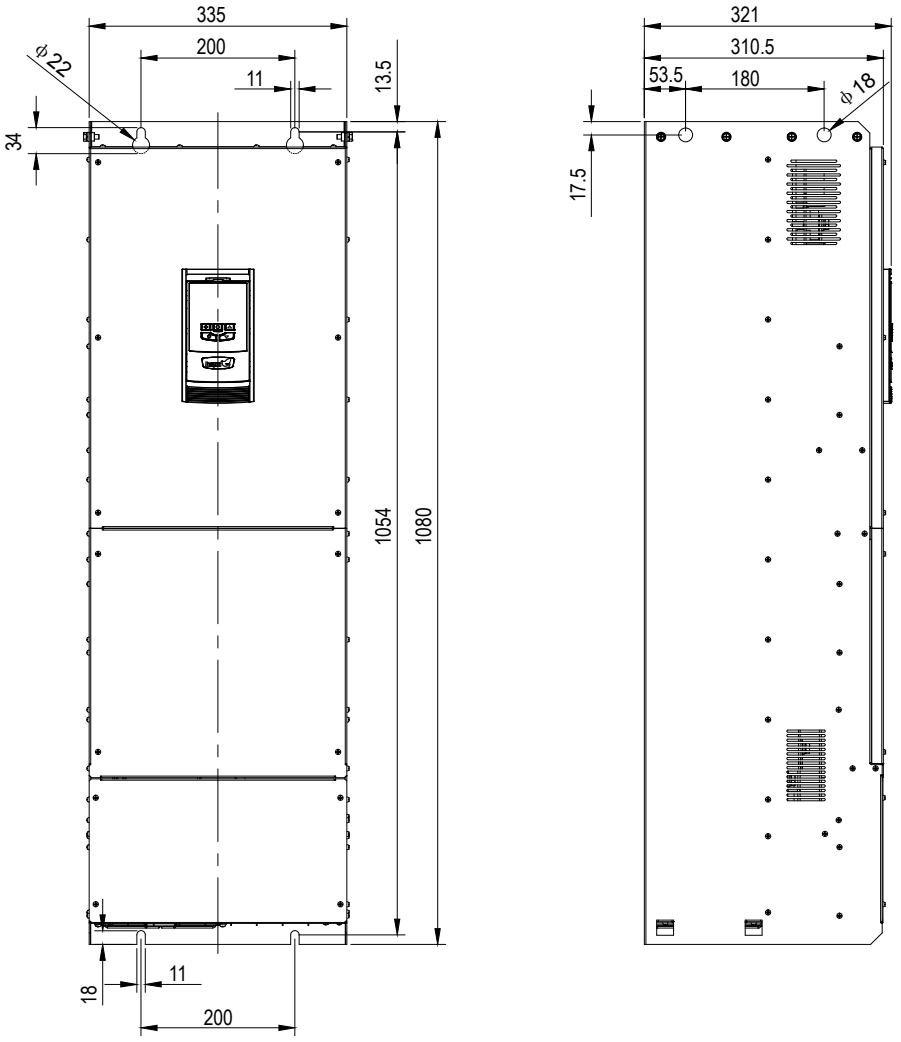


E



Product Dimension

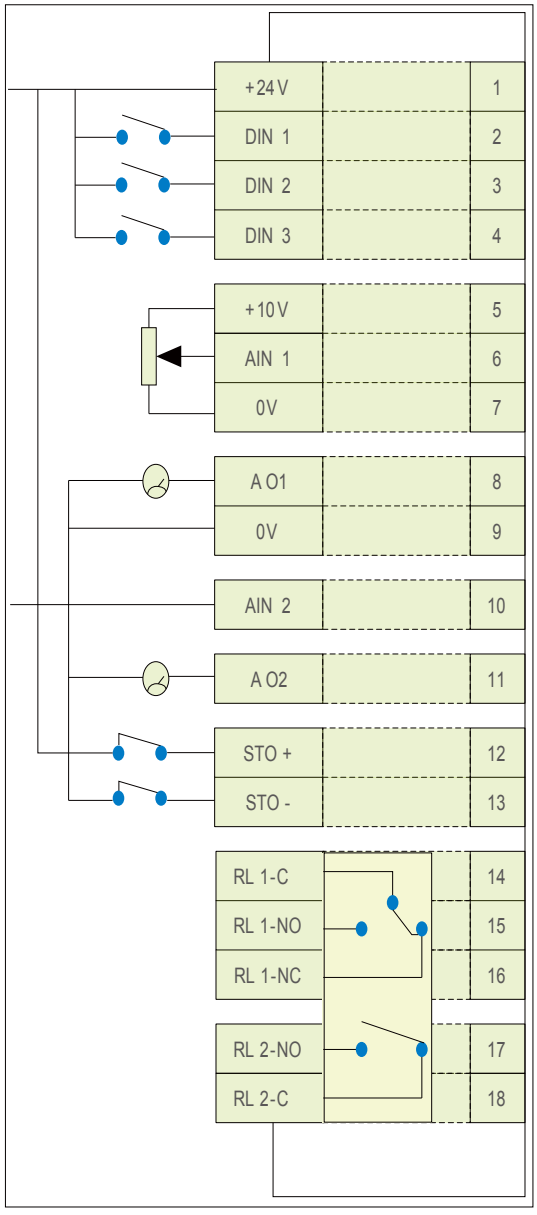
F



Inverter Technology Data

Specification			
Rated Input	Supply voltage	400V	380-480V ±10%
	Supply frequency	48-62Hz	
	Phase unbalance	Max 3%	
	Inrush current	Lower than rated current	
	Power period	120/hour,evenly distributed	
	The basic power factor	＞0.97	
Rated Output	Output power capacity	400V 3 phase power supply	0.75kW – 160kW
	Over capacity	150% / 60s	
		200% / 3s	
	Output frequency	0-500Hz	
Environmental Condition	Temperature	Storage	–40 - +60℃
		Work	–10 - +40℃
	Altitude	Max altitude 1000m, >1000m should reduce the nominal power, 1%/100m	
		Max 95% , non-condensing	
Shell	Humidity	Standard IP20	
Programmable	Display	Standard	7 LED
		Optional	OLED text display
	PC	PC adjust software	
Control Specification	Control method	V/F control	
		V/F energy-saving mode	
		Sensorless speed control	
		Sensorless torque control	
		Closed-loop speed control	
		Closed-loop torque control (with encoder)	
		Open loop PM vector control	
	PWM frequency	4~32kHz	
	Stop mode	Slope stopped, the user is adjustable 0.1-600s	
		Free stop	
	Braking	Magnetic flux brake of motor	
		Built-in brake thyristor (optional E,F)	
	Jump frequency	Single point, the user can adjust	
	Set value control	Analog signal	0~10V 10~0V、-10~10V、0~20mA、20~0mA、4~20mA、20~4mA
		Digital value	Digital potentiometer (panel)
		Optional	Profibus、Profinet、EtherNet/IP
I/O Specification	Supply voltage	Short-circuit protection	
		Potentiometer	
	Programmed input	Standard 5 way(additional 3 way)	
		3 way digital(additional 3 way)	
		2 way analog/Digital value optional	
	Digital input	Internal or external power supply, positive logic	
		Response time <4 ms	
	Analog input	Resolution	12 digits+sign
		Response time	<4ms
		Accuracy	When the full<+/- 2%, the scale and bias adjustable
	Programmable output	Total 4 way (additional 3 way)	
		2 way relay(additional 3 way)	
		2 way analog /digital value	
	Analog output	0-10V、0-20mA、4-20mA	
	Relay output	Max voltage	250VAC、30VDC
		On/off current	6A AC、5A DC
Control Feature	Lifting run	Special lifting mode	
	PID control	Internal PID control can be displayed through feedback	
Maintenance and Diagnostic	Fault record	Recently four fault code display	
	Data record	The data records of the frequency inverter be diagnosed as Purpose before the trip	
		Output current, temperature frequency converter, dc bus voltage	
	Maintenance indicator	The built-in user can modify maintenance interval of maintenance Instructions	
	Monitoring	In hours of running time timer , reset or not reset watt-hour meter	

Wiring Diagram



Function	Default setting
24VDC input(max 100mA) 、12VDC output	
digital input 1	inverter enabled
digital input 2	Forward/reverse
digital input 3	preset speed
+10V 5mA	
analog input 1	
0V	
analog input 1	motor speed
0V	
analog input 2	
analog output 2	motor current
Safety input torque off	
Safety input torque off	
relay output 1	inverter without fault /with fault
relay output 2	inverter run

Green Peace

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