Voltronic Power
Advancing Power

iMaster Solar Pump Inverter

0.75KW~37KW

Product Overview

- Built-in maximum power point tracking (MPPT) algorithm ensures that the solar power tracking efficiency can reach over 99% and maximize solar power conversion performance.
- Adapts to changes in weather conditions, effectively avoiding the system shutdown that occurs with traditional pumps during sudden cloudy weather.
- Strong anti-interference capabilities to reliably operate even at a well depth of 200 meters.
- Suitable for areas with inadequate power supply and various harsh environments.
- With an external switching kit, the inverter can automatically switch between PV input and grid input, thereby fulfilling the continuous water supply demand for 24 hours per day.
- Designed to control asynchronous AC induction motors
- V/F Control , Sensor-less Vector Control (SVC) and Feedback Vector Control (FVC) selectable
- Automatic torque boost and slip compensation
- Fast acceleration and deceleration performance
- 150% torque at 0.5Hz
- Provide precise speed control <0.5%
- Acceptable wide input voltage from 200V to 440V
- Conformal coating to withstand harsh environment
- Built-in RS-485 MODBUS communication
- Supports an external keypad

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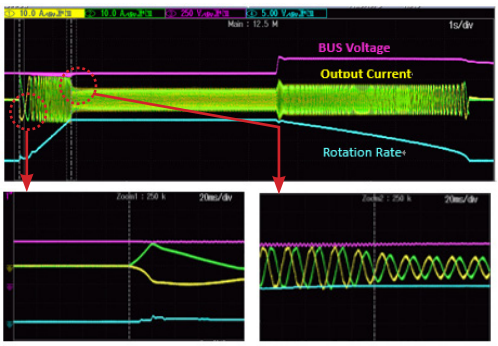
Outstanding Drive Performance

Unit with same rating and same setting (Acceleration 0.1 sec, deceleration 1 sec) Performance Comparison

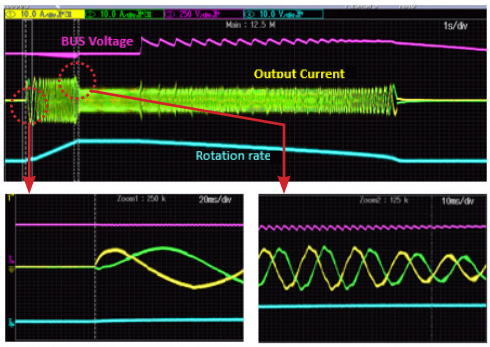
Acceleration Waveform

iMaster



Actual Acceleration 1.06s
Short acceleration time, precise current response

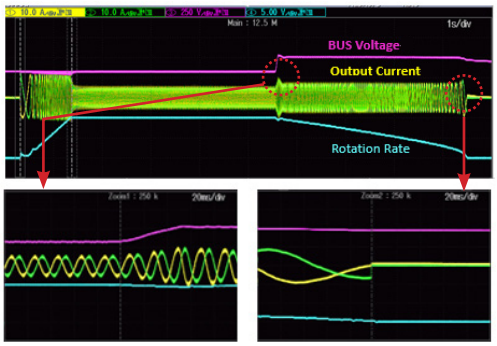
Other Brand



Actual Acceleration 1.21s
Long acceleration time, slow current response

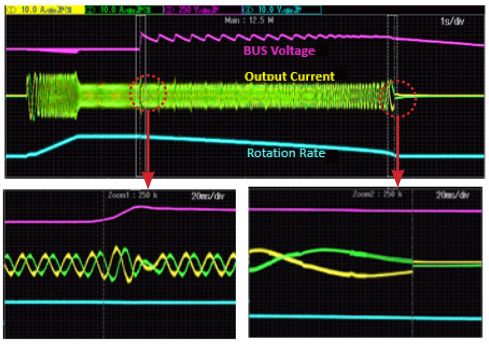
Deceleration Waveform

iMaster



Actual Deceleration 3.94s
BUS voltage stable & straight, waveform smooth

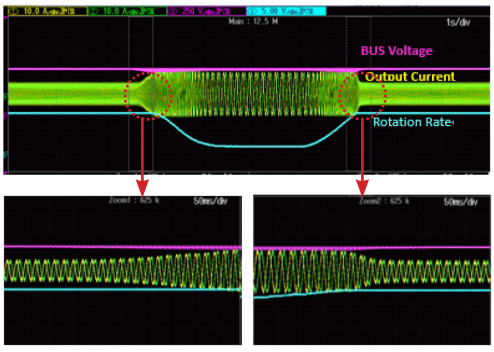
Other Brand



Actual Deceleration 5.25s
BUS voltage oscillates, current fluctuates, motor noise

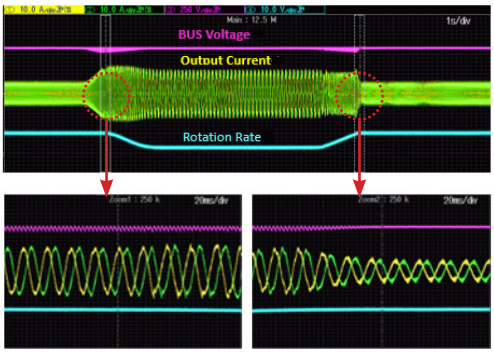
Waveform Performance for sudden loading and sudden unloading at 150% load

iMaster



Fast dynamic response, perfect current limiting

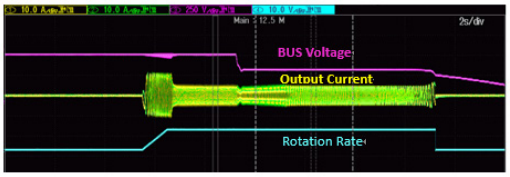
Other Brand



Slow dynamic response, oscillate waveform, current fluctuates

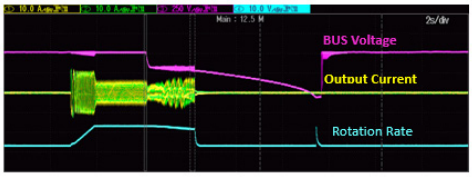
Waveform Performance while sudden power failure

iMaster



At power failure, unit runs for 10s, motor winds down

Other Brand



At power failure, unit runs for 3s, UV alarm motor stops freely

Flexible Installation

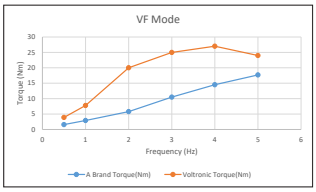
Provide high configuration flexibility and improve installation efficiency.

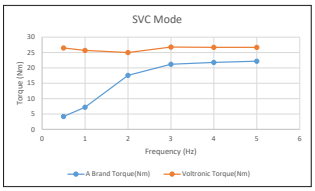
Wall mount

DIN Rail

High Starting Torque

150% starting torque with a low speed control of 0.5Hz provides outstanding machine stability, suitable for low loading applications.





Current Control for optimized lifecycle

After installing the VFD, startup current of the motor will not increase, which not only saves the cost, but also prolongs lifecycle.

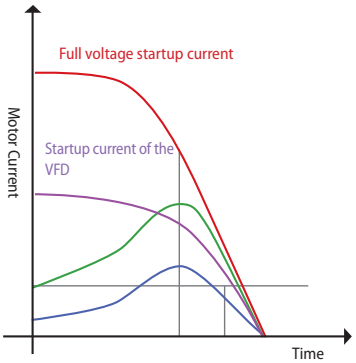
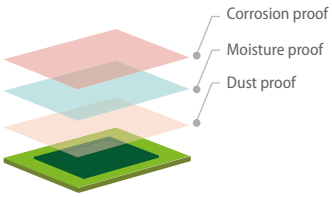


Diagram of changing current from startup to stop

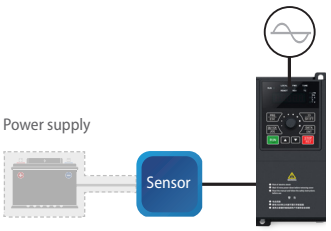
Conformal Coating

Ensures operation stability and safety in critical environment.



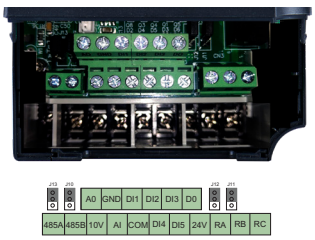
Built-in Power Supply for Sensor

Separate power supply not required because it's already built in 10Vdc and 24Vdc output for external sensors.



Multiple Programmable I/O Terminals

Astro provides multiple programmable digital and analog input and output terminals to meet diverse applications.



Seamless Installation

Support seamless side-by-side installation, saving installation space.

Detachable Operation Keypad

The keypad supports the one-click setting of industry parameters and can be pulled out for remote operation.

Product Quality Assurance

Professional R & D team

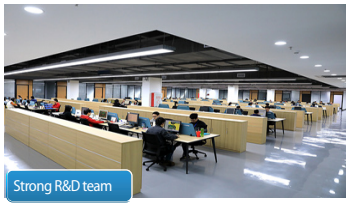
- Over 300 professional R&D engineers with rich experience in UPS and inverter industry
- Promote intellectual property, encourage patent application, and advocate and educate all employees about intellectual property
- Professional laboratory with strict production verification to ensure quality products.

Key components only use international well-known brands

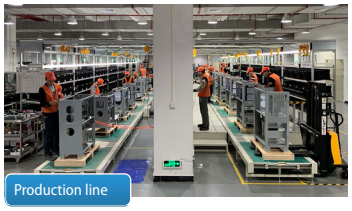
All important parts adopt international leading brands to ensure product quality and life cycle

Scalable and proficient manufacturing

- Four production sites: Shenzhen China, Zhongshan China, Vietnam and Taiwan with over 123,000 M²
- Economic scale by utilizing automation equipment, semi-automated production and highly vertical integration of in-house production

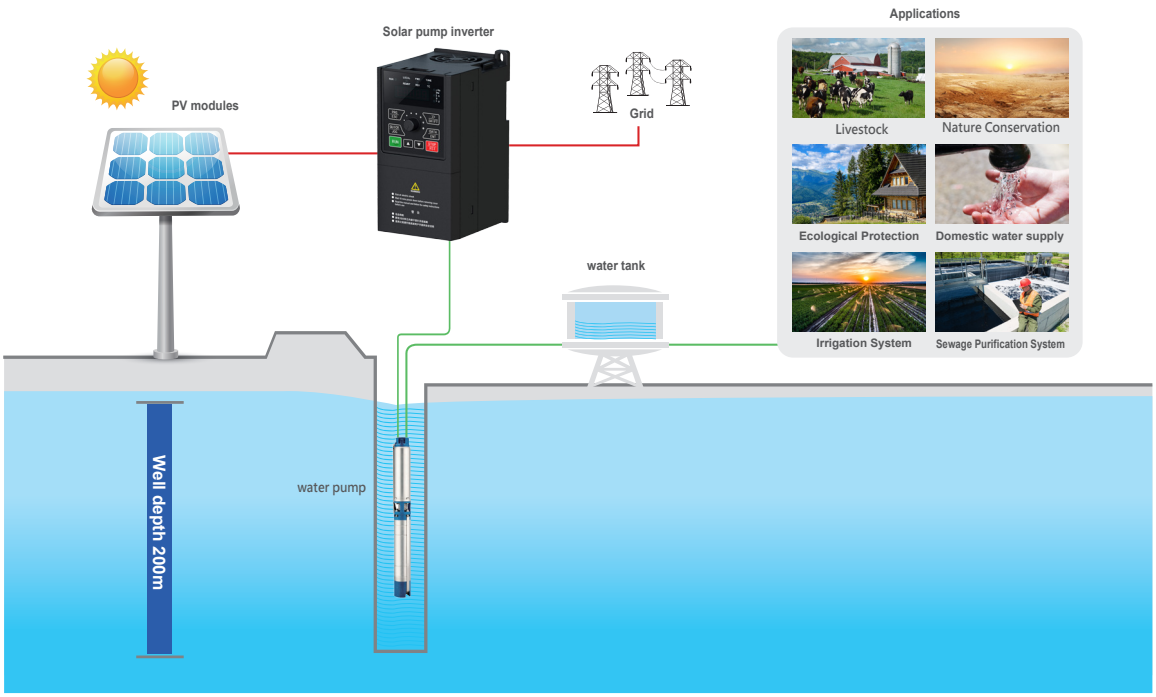

Strong R&D team


Accredited laboratory

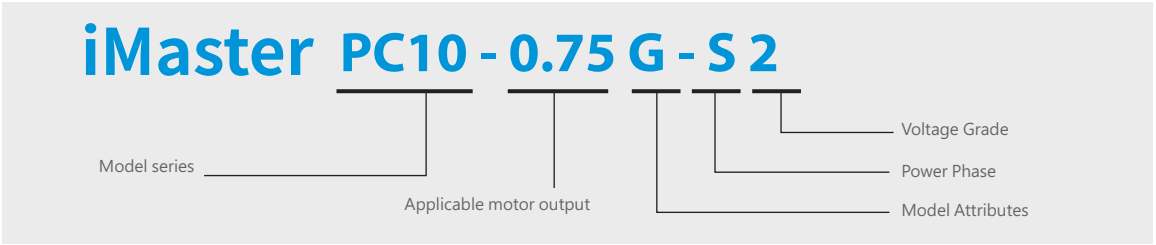

Production line

Automation & Smartization

Applications



Model Naming Rules



VFD Model Naming Rules	
Model series	PC or HC: water pump inverter
Applicable motor output	0.75kW-37kW
Model Attributes	**G:** G type model: 150% overload for 60s, 180% overload for 6s
	P: P type model : 120% overload for 60s, 150% overload for 6s
Power Phase	**S:** Single phase
	T: Three phase
Voltage grade	**2**：220VAC
	4：380VAC
Note:T4 Model with G/P type setting.	

Models Selection Guide

Rated Parameters					
Model	Nominal Capacity (KVA)	Nominal Input Current (A)	Nominal Output Current (A)	Applicable motor power (KW)	Applicable motor power(HP)
Single Phase 220V 50/60Hz					
PC10-0.75G-S2	1.5	8.2	4	0.75	1
PC10-1.5G-S2	3	14	7	1.5	2
PC10-2.2G-S2	4	23	9.6	2.2	3
PC10-4.0G-S2	5.9	32	17	4	5
PC10-5.5G-S2	11	45	25	5.5	7.5
Three-phase 380V 50/60Hz					
PC10-0.75G-T4	1.5	3.4	2.1	0.75	1
PC10-1.5G-T4	3	5	3.8	1.5	2
PC10-2.2G-T4	4	5.8	5.1	2.2	3
PC10-3.7G-T4	6	10.5	9	3.7	5
PC10-5.5G-T4	11	13.9	13	5.5	7.5
PC10-7.5G-T4	15	18.9	17	7.5	10
PC10-11G-T4	30	27.8	25	11	15
PC10-15G-T4	37	37.9	32	15	20
PC10-18.5G-T4	44	46.7	37	18.5	25
PC10-22G-T4	60	55.6	45	22	30
PC10-30G-T4	52	57	60	30	40
PC10-37G-T4	63	69	75	37	50

PV Module Specifications

Model	PC10-0.75G-S2 to PC10-5.5G-S2	PC10-0.75G-T4 to PC10-37G-T4
PV Input		
Maximum PV Array Open Circuit Voltage	450VDC	900 VDC
VOC Voltage Range	360 ~ 430VDC	550 ~ 750VDC
MPP Voltage Range	250 ~ 350VDC	450 ~ 600VDC
Start-up Voltage Range	160 ~ 450VDC（Adjustable）	300 ~ 900VDC（Adjustable）
Output		
Nominal AC Output Voltage	3PH /1PH 220V	3PH 380V
Output Frequency Range	0 ~ 500.00HZ	0 ~ 500.00HZ

Product Specification

Model	iMaster Single-phase (PC10-0.75G-S2 to PC10-5.5G-S2)	iMaster Three-phase (PC10-0.75G-T4 to PC10-37G-T4)
AC Input		
Input Voltage	AC,1PH,220V(-15%) ~ 240V(+10%)	AC,3PH,380V(-15%) ~ 440V(+10%)
Rated Frequency	50/60 Hz	
Frequency Range	±5% (47.5 ~ 63Hz)	
DC INPUT		
Input Dc voltage	450VDC	900VDC
Recommended VOC voltage range	360 ~ 430VDC	550~750VDC
Recommended MPPT	250 ~ 350VDC	450~600VDC
Voltage Range	160 ~ 450VDC (parameter adjustable)	300~900VDC (parameter adjustable)
OUTPUT		
Output Voltage	0- Input Voltage	
Maximum Output Frequency	0.1 ~ 500HZ	
Output Power	Please refer to Rated Parameter table	
Output Current	Please refer to Rated Parameter table	
BASIC PARAMETERS		
Highest frequency	Vector control: 0 ~ 500Hz	
	V/F control: 0 ~ 500Hz	
Carrier frequency	0.8KHz ~ 8KHz;Adjusted automatically according to the load characteristics Adjusted automatically according to the load characteristics.	
Input frequency resolution	Digital setting: 0.01Hz	
	Analog setting: Highest frequency×0.025%	
Control mode	Open-loop vector control (SVC) ; V/F control	
Starting torque	0.5Hz/150%（SVC）	
Adjustable speed ratio	1：100（SVC）	
Speed control accuracy	±0.5%（SVC）	
Overload capability	150% of rated current: 60 seconds ; 170% of rated current: 12 seconds ; 190% of rated current: 1.5 seconds	
Torque boost	Auto torque boost; Range of manual torque boost 0.1%~30.0%	
V/F curve	Three types: Linear, Multi-point, square curve	
	(1.2 power, 1.4 power, 1.6 power, 1.8 power, 2 power)	
V/F separation	Full separation, Half separation	
Acceleration and deceleration time	Linear and S-curve acceleration and deceleration modes available. The range of acceleration and deceleration time is 0.0~6500.0s.	
DC braking	DC braking frequency: 0.00Hz ~ Maximum frequency	
	Braking time: 0.0s~36.0s	
	Braking current value: 0.0%~100.0%	
JOG control	JOG frequency range: 0.00Hz ~ Maximum frequency (5Hz in default). JOG acceleration and deceleration time: 0.0s~6500.0s.	
Built-in PID	Simplify the establishment of a closed-loop control system	
Automatic voltage regulation (AVR)	Keep the output voltage in stable when the grid voltage fluctuates.	
Stall prevention from overvoltage and overcurrent	The current and voltage are limited automatically during operation to prevent frequent tripping due to over-current and over-voltage.	
Rapid current limit	Reduce the risk of over-current faults to keep VFD operated normally.	
Torque limit and control	Limit the torque automatically during operation to prevent frequent tripping due to over-current.	

Model	iMaster Single-phase (PC10-0.75G-S2 to PC10-5.5G-S2)	iMaster Three-phase (PC10-0.75G-T4 to PC10-37G-T4)
SPECIAL FEATURES		
Deceleration to stop	In case of power loss, the energy from load feedback is used to compensate and decelerate the motor until standstill, to prevent mechanical damage.	
Rapid current limit	Reduce the risk of over-current faults to keep VFD operated normally.	
Timer control	Setting range: 0.0Min ~ 6500.0Min	
Communication	Modbus	
MPP Tracking	Built-in intelligent maximum power point tracking technology	
Input Auto Switch	Suitable for solar pump application to auto switch between PV input and AC input	
INPUT/OUTPUT		
Command source	Operation panel, control terminal and serial communication port.	
Frequency source	Digital setting, Analog voltage setting, Analog current setting, Pulse setting and Serial port setting.	
Auxiliary frequency source	5 options to provide flexible auxiliary frequency fine-tuning and frequency synthesis.	
Input terminals	5 digital input terminals, one of which supports high-frequency pulse input up to 50kHz	
	1 analog input terminal supporting 0 ~ 10V voltage input or 0 ~ 20mA current input	
	1 rotary potentiometer analog input	
Output terminals	1 high-speed pulse output terminal supporting 50kHz step-wave signal output	
	1 relay output terminal	
	1 analog output terminal supporting 0~20mA current output or 0~10V voltage output	

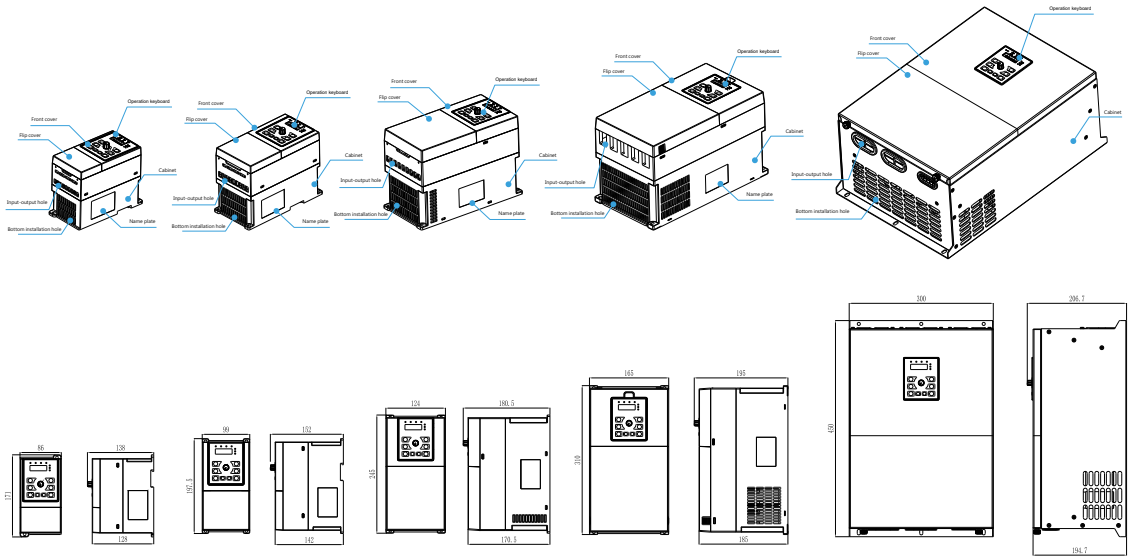
General Specifications

DISPLAY BUTTONS	
Keypad	Standard keypad
LED display	Display parameters
Key lock and function selections	It allows users to partially or fully lock the keys or define operated range for partial keys to prevent misoperation
Protective function	Power-on motor short circuit detection, output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, underload protection, weak light protection, etc.
ENVIRONMENT	
Storage temperature	-20°C ~ 60°C
Operation temperature	-10°C ~ 50°C (If temperarture is higher than 40°C, the output capacity will be derated 1% per 1°C increase)
Operation humidity	< 95% RH
Noise Level	50dBA max (0.75G-7.5G) / 65dBA max (11G-37G)
STANDARD	
Safety	IEC 61800-5-1
EMC	IEC 61800-3(C3)
INTERACE	
Communication Port	RS-485

Product specifications are subject to change without further notice

RoHS Compliant

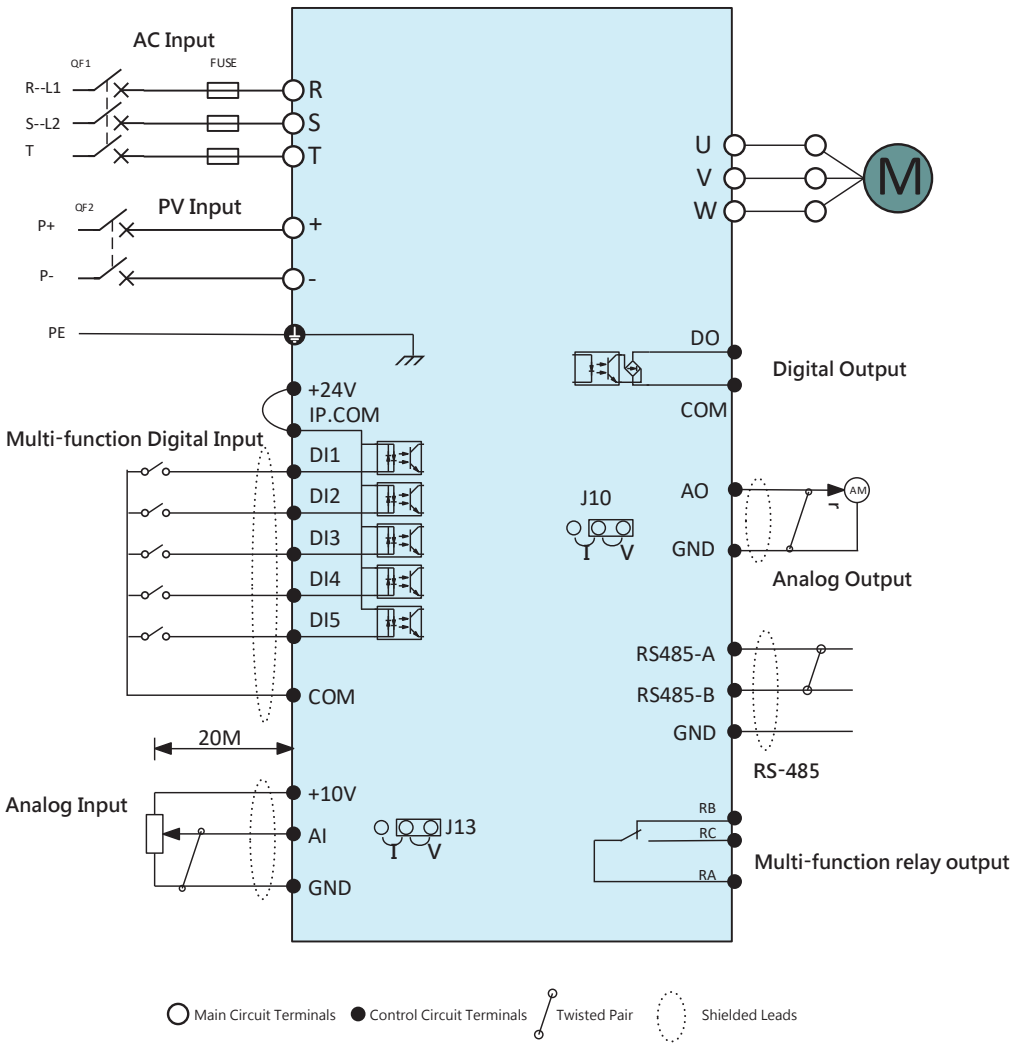
Dimensions (mm)



Installation Dimension

MODEL	Instillation Position(mm)		Overall Dimensions(mm)			Instillation Position (mm)	Weight (kg)
	A	B	H	W	D		
PC10-0.75G-S2	67.3	157.5	171	86	138	5.2	1
PC10-1.5G-S2							
PC10-0.75G-T4							
PC10-1.5G-T4							
PC10-2.2G-S2	85	184	197.5	99	152	5.2	1.5
PC10-2.2G-T4							
PC10-4.0G-T4							
PC10-4.0G-S2	106	233	245	124	180.5	5.2	3.5
PC10-5.5G-S2							
PC10-5.5G-T4							
PC10-7.5G-T4							
PC10-11G-T4	147	298	310	165	195	5.5	5.5
PC10-15G-T4							
PC10-18.5G-T4							
PC10-22G-T4							
PC10-30G-T4	260	433.5	450	300	206.7	6.5	15.5
PC10-37G-T4							

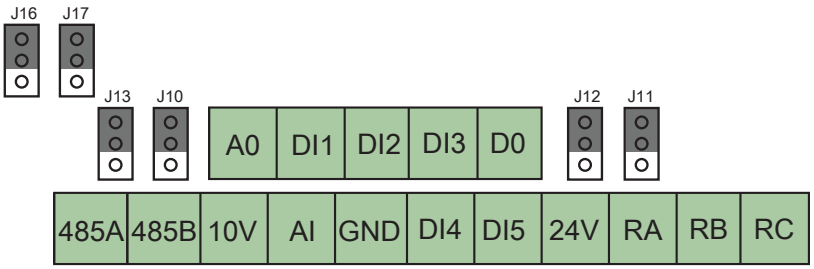
Wiring Diagram



Recommended Power Cable Selection Guide

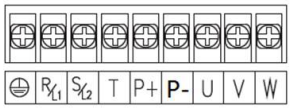
MODEL	Recommended cable size (mm^2)				Set Screws	
	RST / UVW	PE	P1 (+)	PB (+) / (-)	Screw spec	Torque (Nm)
PC10-0.75G-S2	2.5	2.5	2.5	2.5	M3	1.2 ~ 1.5
PC10-1.5G-S2	2.5	2.5	2.5	2.5	M3	1.2 ~ 1.5
PC10-2.2G-S2	4	4	4	4	M4	1.3~ 1.5
PC10-3.7G-S2	4	4	4	4	M4	1.3~ 1.5
PC10-5.5G-S2	4	4	4	4	M4	1.3~ 1.5
PC10-0.75G-T4	1.5	1.5	1.5	1.5	M3	1.2 ~ 1.5
PC10-1.5G-T4	1.5	1.5	1.5	1.5	M3	1.3~ 1.5
PC10-2.2G-T4	2.5	2.5	2.5	2.5	M4	1.3~ 1.5
PC10-3.7G-T4	2.5	2.5	2.5	2.5	M4	1.3~ 1.5
PC10-5.5G-T4	2.5	2.5	2.5	2.5	M4	1.3~ 1.5
PC10-7.5G-T4	4	4	4	4	M4	1.3~ 1.5
PC10-11G-T4	6	6	6	6	M5	2.0~2.5
PC10-15G-T4	10	10	10	10	M5	2.0~2.5
PC10-18.5G-T4	10	10	10	10	M5	2.0~2.5
PC10-22G-T4	10	10	10	10	M5	2.0~2.5
PC10-30G-T4	16	16	16	16	M6	2.5~3.0
PC10-37G-T4	16	16	16	16	M6	2.5~3.0

Control Terminal Location and Function Description

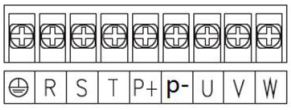


Category	Terminal label	Name	Description
Communication	RS485A	RS485 COM port	RS485 differential signal positive terminal
	RS485B		RS485 differential signal negative terminal
Analog input	AI1	Analog input terminal 1	Analog voltage/current input
Analog output	AO1	Analog output terminal 1	Analog voltage/current output
Digital input	DI1	Digital input terminal 1	Normal digital input
	DI2	Digital input terminal 2	Normal digital input
	DI3	Digital input terminal 3	Normal digital input
	DI4	Digital input terminal 4	Normal digital input
	DI5	Digital input terminal 5	Normal digital input/high frequency pulse input
Digital output	DO	Digital output terminal	Normal digital output/high frequency pulse output
Power supply	10V	+10V power supply	Provide +10V power supply
	GND	+10V power ground	
	24V	+24V power supply	Reference ground for analog signal and +24V power supply (HC10M: shared port for GND and COM)
	COM	+24V power ground	
Relay output	RA/RB	Relay output	Normally closed terminal
	RA/RC	External keyboard	Normally open terminal

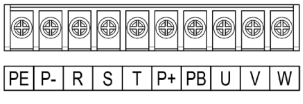
0.75KW~37KW Control Terminal Location and Function Description



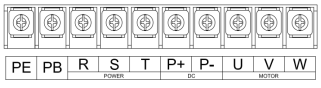
0.75-1.5KW



2.2-7.5KW



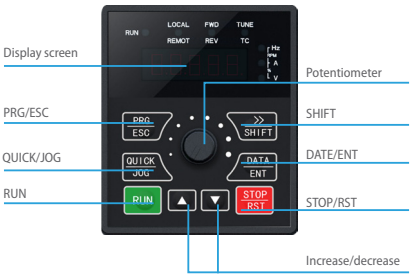
11-22KW

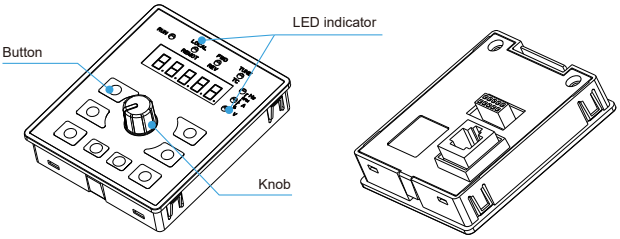


30-37KW

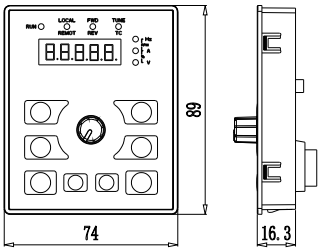
Terminal symbol	Terminal name and function description
PE、⏚	Ground terminal
R、S、T L1、L2	Three-phase AC input terminal Single-phase AC input terminal
P+、P-	PV input terminal
U、V、W	Three-phase AC output terminal

Keypad





Display	Function Description
PRG/ESC	To enter or exit setting mode.
DATE/ENT	To confirm the selection/value in setting mode.
Increase/ decrease	To increase/decrease the setting value.
SHIFT	In the shutdown display interface and operation display interface, the parameters to be displayed can be selected circularly; when modifying the parameters, the modification bit of the parameters can be selected.
RUN	In keyboard mode operation, used to run operation
STOP/RST	In the running state, pressing this key can be used to stop the running operation. When the fault alarm state is restricted by the function code P.04, all control modes can be used to reset the operation by this key.
Potentiometer	Adjust rate and frequency



Braking Resistor Selection Guide

MODEL	Open Circuit Voltage of PV Module			
	37V ±1V		45V ±1V	
	Power ±5WP	Number of batteries per series *Number of series	Power ±5WP	Number of batteries per series *Number of series
PC10-0.75G-S2	250	11*1	300	9*1
PC10-1.5G-S2	250	11*1	300	9*1
PC10-2.2G-S2	250	11*2	300	9*2
PC10-4.0G-S2	250	11*2	300	9*2
PC10-5.5G-S2	250	11*3	300	9*3
PC10-0.75G-T4	250	18*1	300	15*1
PC10-1.5G-T4	250	18*1	300	15*1
PC10-2.2G-T4	250	18*1	300	15*1
PC10-4.0G-T4	250	20*1	300	16*1
PC10-5.5G-T4	250	18*2	300	15*2
PC10-7.5G-T4	250	18*2	300	15*2
PC10-11G-T4	250	18*3	300	15*3
PC10-15G-T4	250	18*4	300	15*4
PC10-18.5G-T4	250	18*5	300	15*5
PC10-22G-T4	250	18*6	300	15*6
PC10-30G-T4	250	18*8	300	15*8
PC10-37G-T4	250	18*9	300	15*9