



SN160PV photovoltaic inverter for pump Selection manual

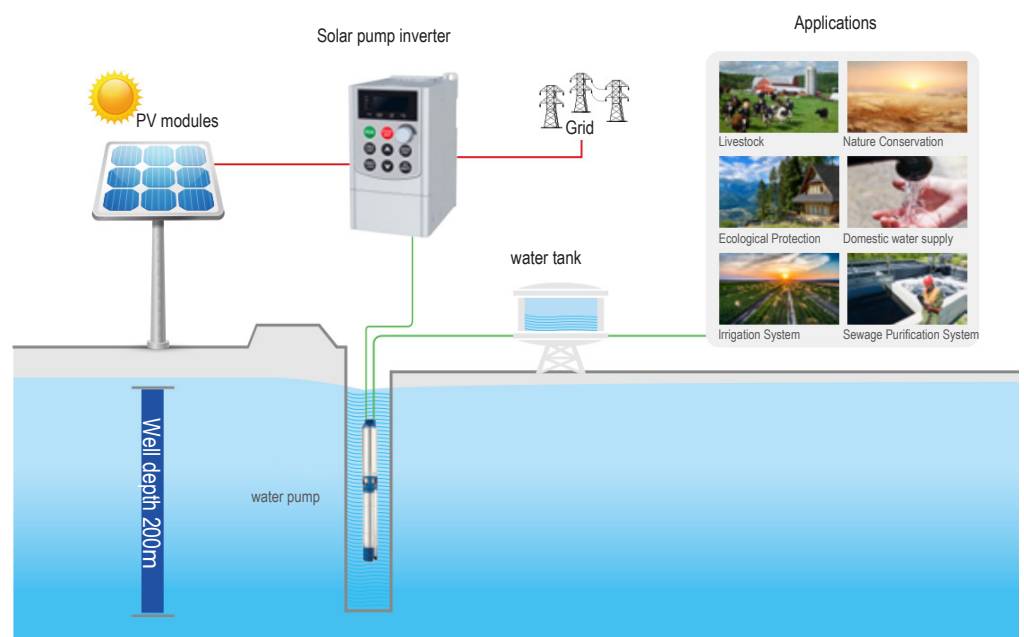




SN160PV Series Frequency Inverter

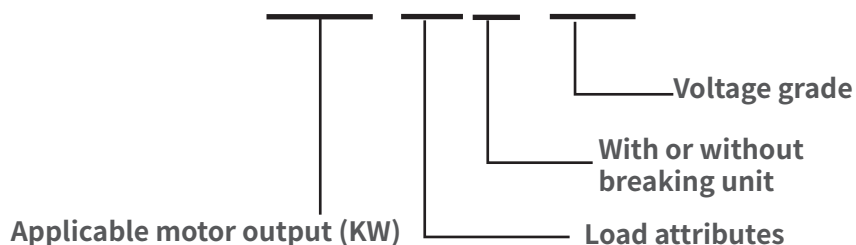
0.75KW~22 KW

- ▶ 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
- ▶ Built-in RS-485 MODBUS communication



Model Naming Rules

SN160PV-5.5 GC-4T



Applicable motor output	0.7KW~22KW
Load attributes	G : General purpose
With or without breaking unit	Empty: without breaking unit
	C :with breaking unit
Voltage grade	2s:Single 220V,range:-15%~20%
	4T :Three-phase 380V,range: -15%~20%

Models Selection Guide

Rated Parameters					
Model	Nominal Capacity (KVA)	Nominal input current (A)	Nominal Output Current (A)	Applicable motor power(kw)	Applicable motorpower(HP)
Single Phase 220v 50/60Hz					
SN160PV-0.75G-2S	1.5	8.2	4	0.75	1
SN160PV-1.5G-2S	3	14	7	1.5	2
SN160PV-2.2G-2S	4	23	9.6	2.2	3
Three-phase 380Vac 50/60Hz					
SN160PV-0.75G-4T	1.5	3.4	2.1	0.75	1
SN160PV-1.5G-4T	3	5	3.8	1.5	2
SN160PV-2.2G-4T	4	5.8	5.1	2.2	3
SN160PV-3.7G-4T	6	10.5	9	3.7	5
SN160PV-5.5G-4T	11	13.9	13	5.5	7.5
SN160PV-7.5G-4T	15	18.9	17	7.5	10
SN160PV-11G-4T	30	27.8	25	11	15
SN160PV-15G-4T	37	37.9	32	15	20
SN160PV-18.5G-4T	44	46.7	37	18.5	25
SN160PV-22G-4T	60	55.6	45	22	30

PV Module Specifications

Model	SN160PV-0.75G-2S,SN160PV-1.5G-2S ,SN160PV-2.2G-2S	SN160PV-0.75G-4T,SN160PV-1.5G-4T SN160PV-2.2G-4T, SN160PV-3.7G-4T,SN160PV-5.5G-4T,SN160PV-7.5G-4T, SN160PV-11G-4T,SN160PV-15G-4T,SN160PV-18.5G-4T,SN160PV-22G-4T
Pv input		
Maximum Pw Array OpenCircuit voltage	450VDC	800VDC
VOC Voltage Range	360 ~430VDC	550 ~750VDC
MPP Voltage Range	250 ~350VDC	450 ~600VDC
Start-up Voltage Range	160~450VDC(Adjustable)	300~800VDC(Adjustable)
Output		
Nominal Ac Output Voltage	3PH /1PH 220V	3PH 380V
Output Frequency Range	0~500.00HZ	0~500.00HZ

Model	0.75KW~22KW
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)
PV input	
Maximum PV Array Open Circuit Voltage	450VDC for 1PH 800VDC for 3PH
VOC Voltage Range	360~430VDC for 1PH 550~750VDC for 3PH
MPP Voltage Range	250~ 350VDC for 1PH 450-600DC for 3PH
Start-up Voltage Range	160~450DC(Adjustable)for 1PH 300~800VDC(Adjustable) for 3PH
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
Input frequency resolution	Digital setting: 0.01Hz Analog setting: Highest frequencyx0.025%
Control mode	Open-loop vector control (SvC) ; V/F control

Model	0.75KW~22KW
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 (AwR)	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.
orque limit and control	Limit the torque automatically during operation to prevent frequent tripping due to over-curent.
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.

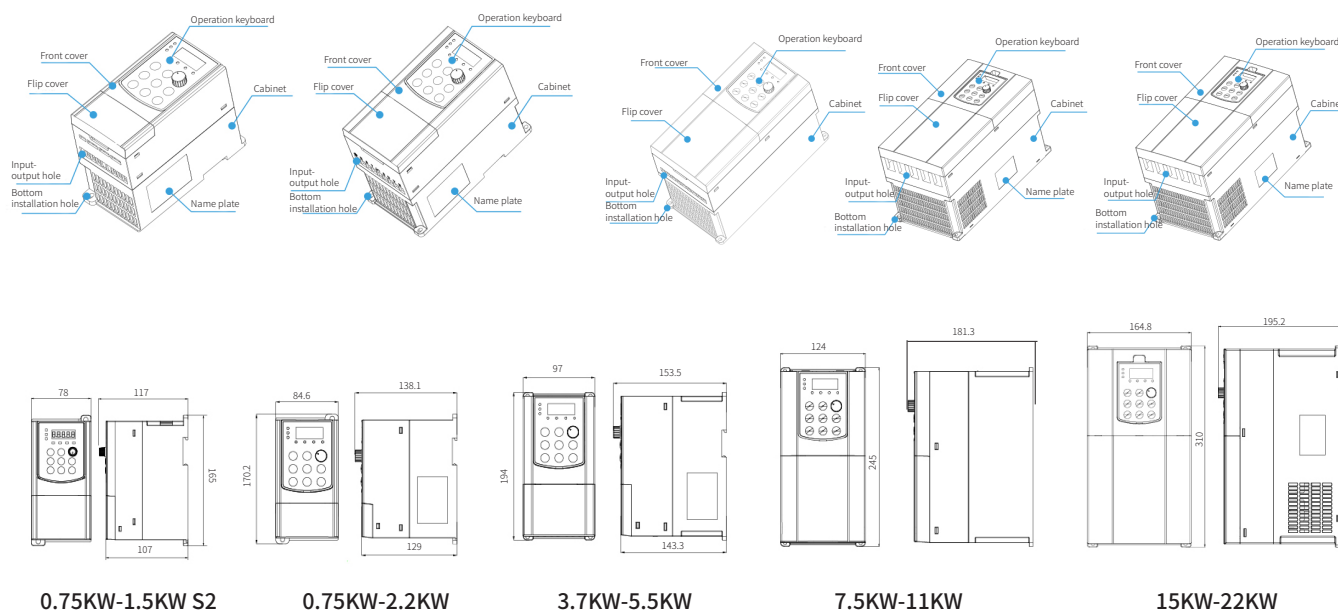
Model	0.75KW~22KW
INPUT/OUTPUT	
Input terminals	5 digital input terminals, one of which supports high-frequency pulse input up to 50kHz (only 4 digital input terminals available for MINI version)
	1 relay output terminal
	1 analog output terminal supporting 0~20mA current output or 0~10V voltage output

General Specifications

DISPLAY BUTTONS	0.75KW~22KW
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	Motor short-circuit detection at power-on, output phase loss protection, over-current protection, over-voltage protection, under-voltage protection, overheat protection, overload protection and etc.
ENVIRONMENT	
Storage temperature	-20° C ~ 60° C
Operation temperature	-10° C ~ 50° C (If temperature is higher than 40° C, the output capacity will be derated 1% per 1° C increase)
Storage humidity	< 95% RH
Operation humidity	< 95% RH
Noise Level	50dBA max.
STANDARD	
Safety	IEC 61800-5-1
INTERACE	
Communication Port	RS-485

Product specifications are subject to change without further notice

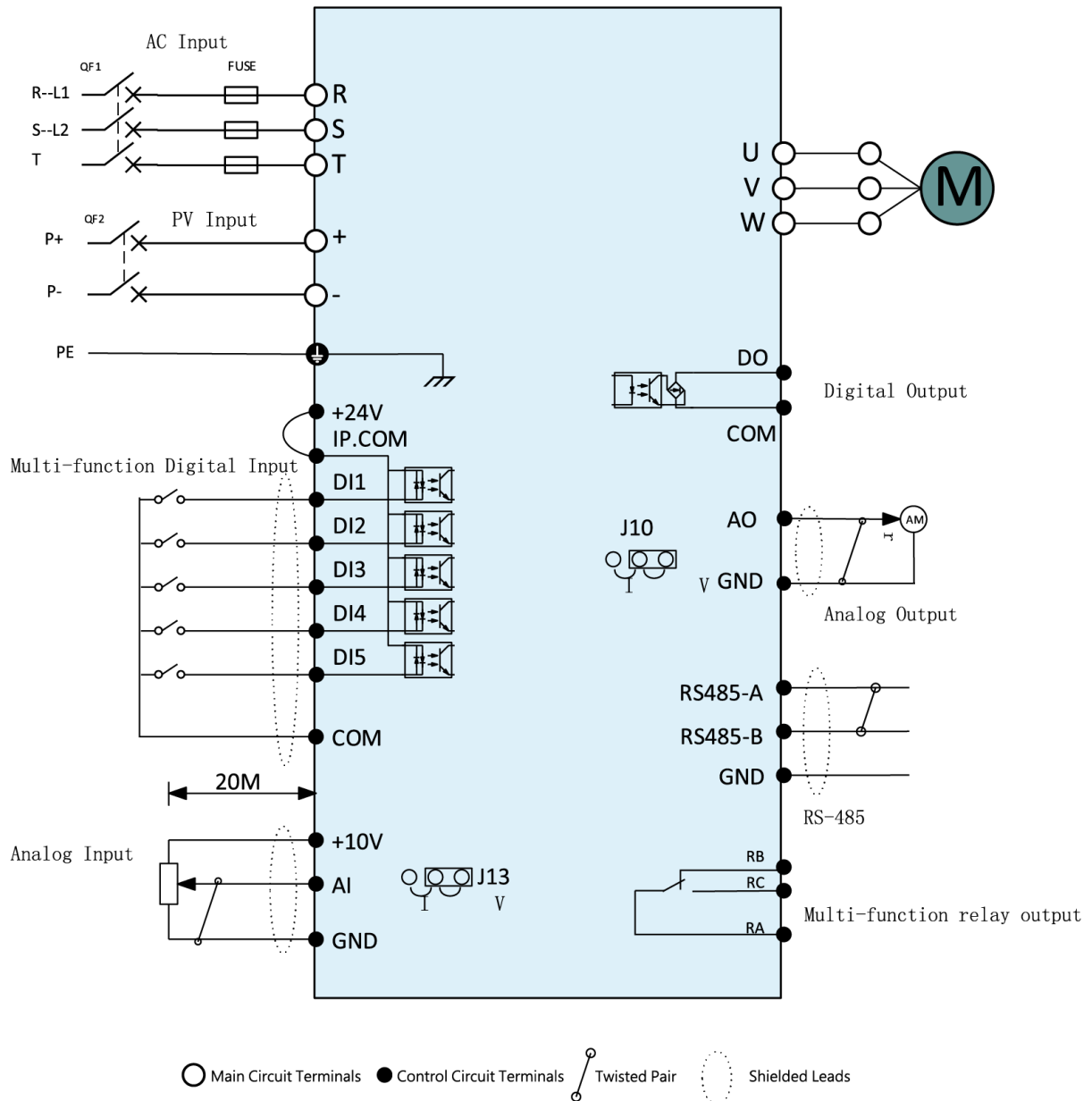
Dimensions (mm)



Installation Dimension

MODEL	Instillation Position(mm)		Overall Dimensions(mm)			Instillation Position (mm)	Weight (kg)
	A	B	H	W	D		
SN160PV-0.75G-2S	62	152	165	78	117	5.5	0.7
SN160PV-1.5G-2S							
SN160PV-2.2G-2S	67.3	157.5	170.2	84.6	138.1	5.2	1
SN160PV-0.75G-4T							
SN160PV-1.5G-4T							
SN160PV-2.2G-4T							
SN160PV-3.7G-4T	85	184	194	97	153.5	4.8	1.5
SN160PV-5.5G-4T							
SN160PV-7.5G-4T	106	233	245	124	181.3	5	2.5
SN160PV-11G-4T							
SN160PV-15G-4T	147	298	310	164.8	195.2	5.5	5.5
SN160PV-18.5G-4T							
SN160PV-22G-4T							

Wiring Diagram



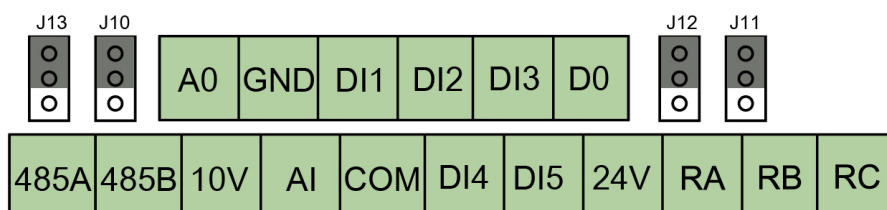
NOTE:

1. There is no DI5 for SN160PV 0.75~1.5 S2 version and DI4 is used for high-frequency pulse input.
2. There is no independent COM port available for SN160PV 0.75~1.5 S2 version, only shared port for COM and GND.

Recommended Power Cable Selection Guide

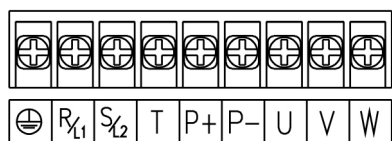
MODEL	Recommended cable size (mm ²)				Set Screws	
	RST	PE	P1 (+)	PB (+)	Screw spec	Torque (Nm)
	UVW			(-)		
SN160PV-0.75G-2S	2.5	2.5	2.5	2.5	M3	0.8
SN160PV-1.5G-2S	2.5	2.5	2.5	2.5	M3	0.8
SN160PV-2.2G-2S	4	4	4	4	M4	1.2~1.5
SN160PV-0.75G-4T	1.5	1.5	1.5	1.5	M4	1.2~1.5
SN160PV-1.5G-4T	1.5	1.5	1.5	1.5	M4	1.2~1.5
SN160PV-2.2G-4T	2.5	2.5	2.5	2.5	M4	1.2~1.5
SN160PV-3.7G-4T	2.5	2.5	2.5	2.5	M4	2~2.5
SN160PV-5.5G-4T	2.5	2.5	2.5	2.5	M4	1.3-1.5
SN160PV-7.5G-4T	4	4	4	4	M4	1.3-1.5
SN160PV-11G-4T	6	6	6	6	M4	1.3-1.5
SN160PV-15G-4T	10	10	10	10	M5	2.0-2.5
SN160PV-18.5G-4T	10	10	10	10	M5	2.0-2.5
SN160PV-22G-4T	10	10	10	10	M5	2.0-2.5

Control Terminal Location and Function Description

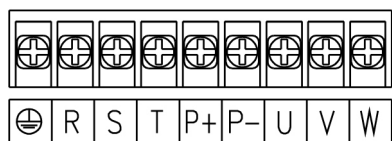


Category	Terminal label	Name	Description
Communication	RS485A	RS485 COM port	RS485 differential signal positive terminal
	RS485B		RS485 differential signal negative terminal
Analog input	AI1	Analog input terminal 1	Analog voltage/current input
Analog output	AO1	Analog output terminal 1	Analog voltage/current 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 (SN160PV:Normal digital output/high frequency pulse output)
	D15	Digital input terminal 5	Normal digital input/high frequency pulse input (SN160PV:Not available for SN160PV version)
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 (SN160PV: 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~22KW Control Terminal Location and Function Description



0.75KW-2.2KW



3.7KW-11KW

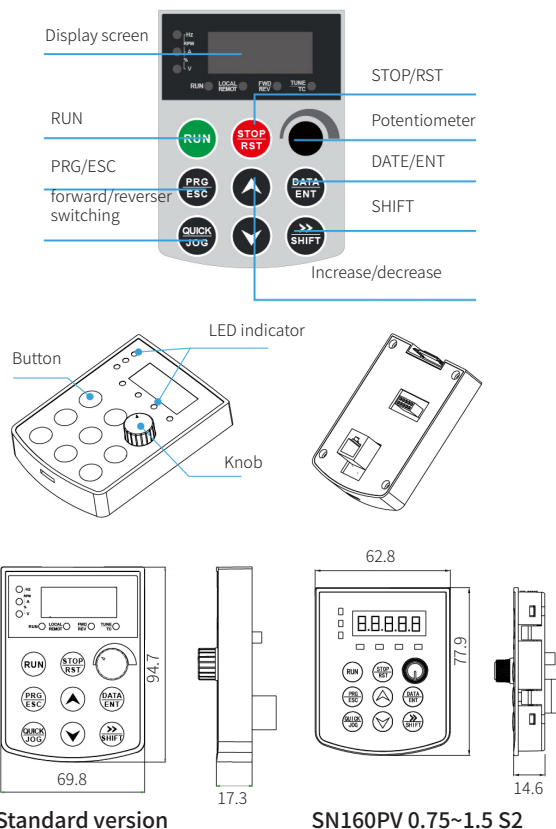


15KW-22KW

Terminal symbol	Terminal name and function description
	Ground terminal
R、S、T L1、L2	Three-phase AC input terminal Single-phase AC input terminal
P+、P-	External braking resistor 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 $\pm$ 1V		45V $\pm$ 1V	
	Power $\pm$ 5WP	Number of batteries per series *Number of series	Power $\pm$ 5WP	Number of batteries per series *Number of series
SN160PV-0.75G-2S	250	11*1	300	9*1
SN160PV-1.5G-2S	250	11*1	300	9*1
SN160PV-2.2G-2S	250	11*2	300	9*2
SN160PV-0.75G-4T	250	18*1	300	15*1
SN160PV-1.5G-4T	250	18*1	300	15*1
SN160PV-2.2G-4T	250	18*1	300	15*1
SN160PV-3.7G-4T	250	20*1	300	16*1
SN160PV-5.5G-4T	250	18*2	300	15*2
SN160PV-7.5G-4T	250	18*2	300	15*2
SN160PV-11G-4T	250	18*3	300	15*3
SN160PV-15G-4T	250	18*4	300	15*4
SN160PV-18.5G-4T	250	18*5	300	15*5
SN160PV-22G-4T	250	18*6	300	15*6

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