VEICHI

Solar Pump Inverter

VEICHI

Suzhou Veichi Electric Co., Ltd

No.1000 Songjia Road, Guoxiang street, Wuzhong Economic and Technological Development Zone, Suzhou

Tel：+86-512-6617 1988　　Fax：+86-512-6617 3610

Facebook: https://www.facebook.com/veichigroup

Whatsapp: +86- 138 2881 8903

Https://www.veichi.com/

Official Website

*Version: July，2023

About us

VEICHI Electric (stock code: 688698) has always been dedicated to the field of electrical drive and industrial control since its establishment, and now it is a high-tech enterprise engaged in R&D, production, and sales of industrial automation products in one. With R&D and production bases in Suzhou, Shenzhen and Xi'an, and a wholly-owned subsidiary in India, VEICHI now is capable of conducting its business to many countries and regions with competitive, safe and reliable products and services to customers all over the world.

Plentiful products cover AC drives, servo systems and control systems, which are widely used in heavy industry, light industry, high-end equipment and more to facilitate the intellectualized transformation of the manufacturing industry with solutions customized to different scenarios. In the meanwhile, along the development trend of the times, VEICHI is extending its place to the emerging fields such as robotics, new energy, and medical care, and has developed products such as coreless motors, frameless motors, photovoltaic AC drives, and surgical power systems, which have deeply empowered the impressively promising industries.

On long-term and persistent independent R&D and innovation, VEICHI has successfully cultivated a series of patented technologies with independent intellectual property rights, and has mastered the core technologies of motor control such as vector control of PMSM, high-frequency pulse injection control, field-weakening control for higher speed, scalar V/F control and vector control etc., and of silicon carbide application, motor parameter tuning and identification, motor control and protection, and motor speed tracking and start-up control. As of June 30, 2023, a total of 163 patents have been granted, including 43 patents for inventions.

VEICHI has been developing step by step over the past 18 years with abundant honorary awards and certificates from the state and competent authorities, including "the Third Batch of Special and Sophisticated 'Small Giant' Enterprises That Produce Novel and Unique Products" "High-tech Enterprises", "Jiangsu Provincial Engineering Technology Research Center", "Jiangsu Provincial Enterprise Technology Center", "Jiangsu Provincial Industrial Internet Development Demonstration Enterprise (Benchmarking Factory Category)" and others.

In the future, VEICHI Electric will continue to uphold the business philosophy of " guided by market demand and driven by technological innovation", strengthen the key core technology research and product iteration, and constantly expand its high-performance, high-quality, high-reliability applications, contributing to the development of electrical drive and industrial control with might and main.

2005
- Beginning of entrepreneurship in Shenzhen
- First-generation of AC drive successfully launched

2013
- Suzhou Veichi Electric Co., Ltd established
- First generation of servo system successfully developed

2014
- First stage of Suzhou Veichi project groundbreaking and put into construction

2016
- First stage of Suzhou Veichi project put into operation
- First generation of motion control system launched

2019
- Indian subsidiary established
- Restructure to a company limited by shares

2020
- A-share of science and technology innovation board landing
- Awarded as provincial Specialized and Sophisticated "Small Giant" Firms That Produce New and Unique Products

2021
- A Veichi controlled subsidiary established
- Awarded as the third patch of Specialized and Sophisticated "Small Giant" Firms That Produce New and Unique Products

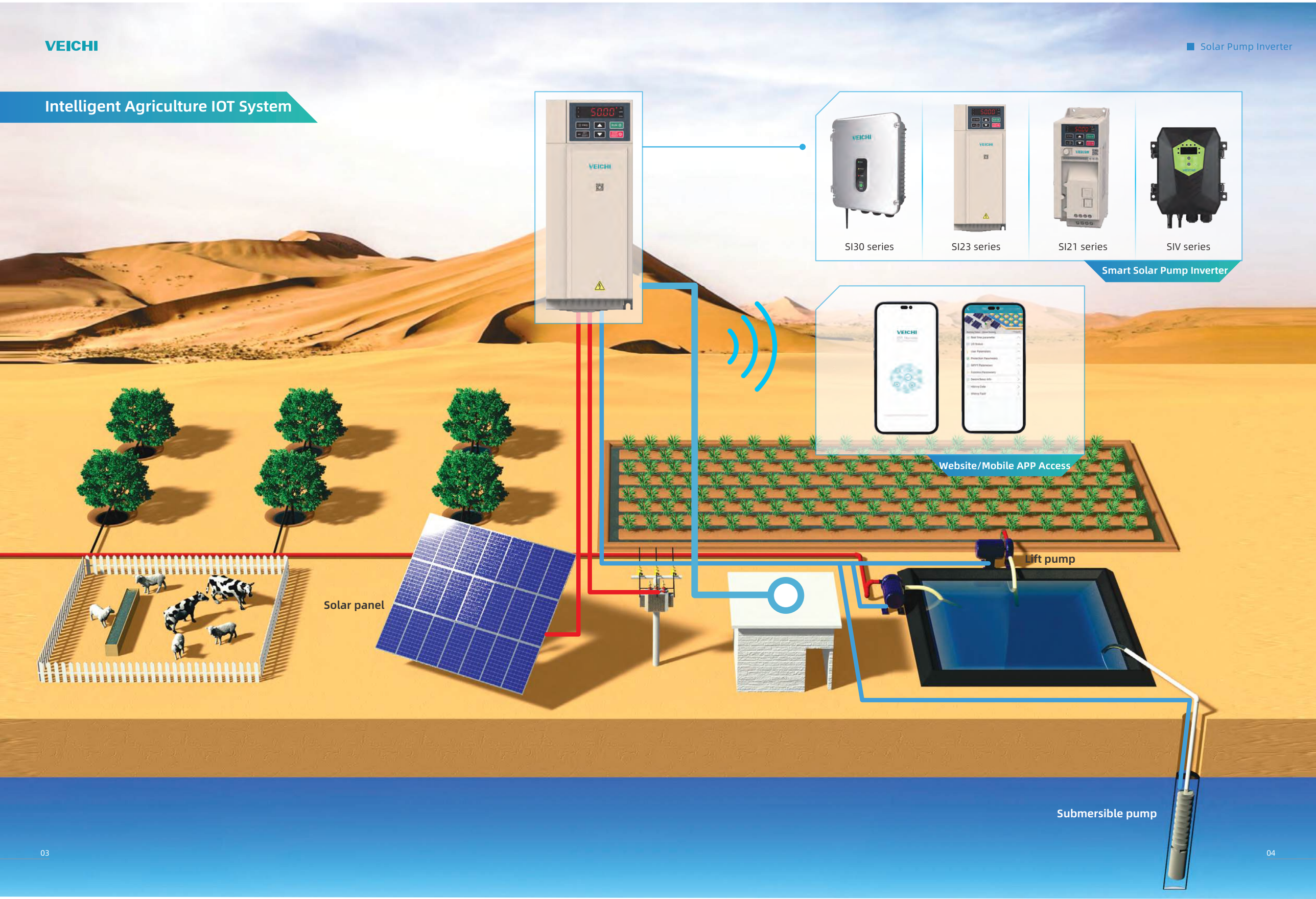
2022
- Xi'an R&D Center established
- Veichi Digital Energy subsidiary established

2023
- Suzhou Veichi Phase II project put into operation
- Suzhou Veichi Phase III Project put into construction
- Veichi Medical Equipment subsidiary established

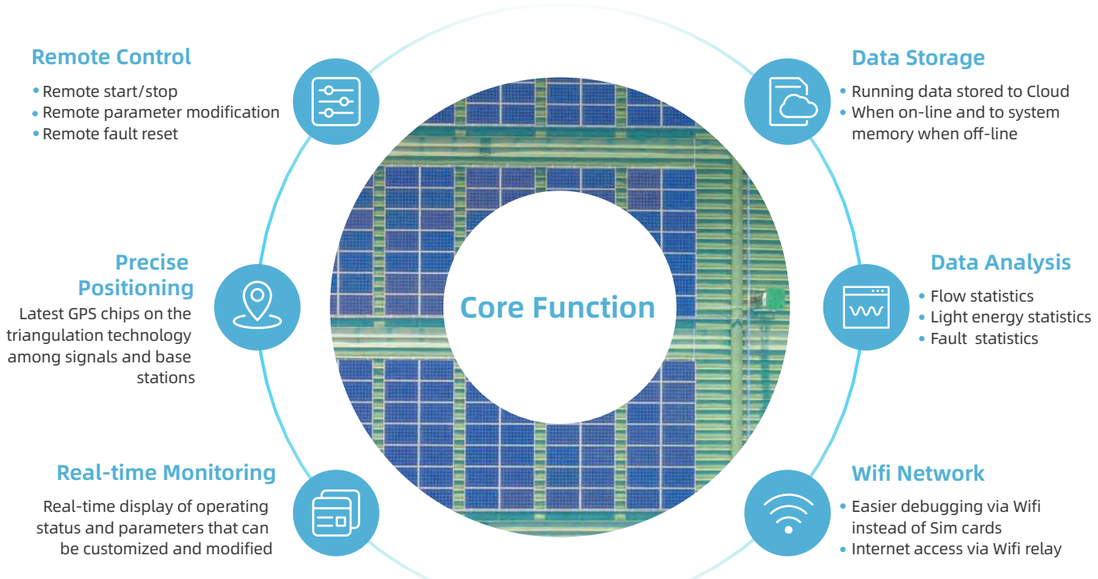
SOLAR PUMP INVERTER

In the context of intensifying world energy crisis, Veichi Electric launched the SI series of photovoltaic water pumps in line with new energy and sustainable development concepts, and they have gained a good reputation both at home and abroad so far. The SI series of photovoltaic water pumping systems are used to provide clean water resources in remote areas short of electric power facilities. The controller converts the DC power from the photovoltaic array into AC power and drives various water pumps so on sunny days, the SI series PV water pumping system can continuously pump water (the water source can be natural or special, such as rivers, lakes, wells or waterways, etc.).

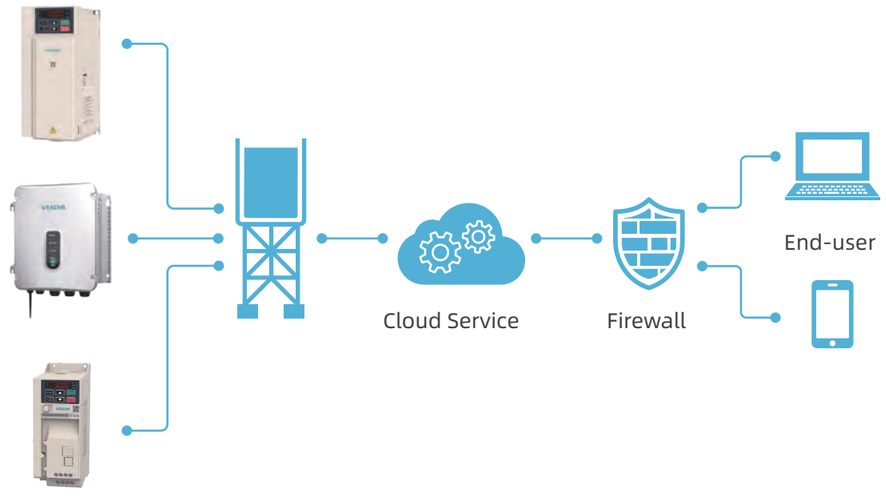
Intelligent Agriculture IOT System



Core Functions of IOT Products and System



Topological Graph of GPRS and Cloud Platform



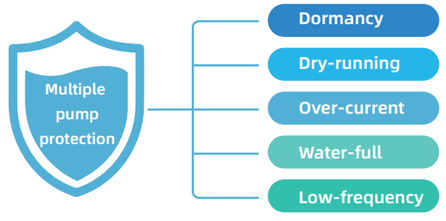
SI30 Series Solar Pump Inverter

IP65 High Protection | One Key Start/Stop | Smart IOT

Product Features

Multiple Pump Protections

- When the sunshine change, the solar panel output DC voltage is too low, the controller enters the dormant protection and alerts A.LPn .
- When running frequency too low, the controller will enter the low frequency protection and alert A.LFr; because the low frequency influence the pump cooling .
- When the inverter detects the output current is too low, the pump is prevented from running, automatically enters the dry-running and alerts A.LuT .
- When the running current is greater than the set threshold, the controller will automatically enter the overcurrent protection and alert the A.oLd .
- Through the terminal control and the liquid level sensor, the inverter can control the start and stop of the water pump according to the liquid level of the water tank .



Unattended, Automatic Operation, Remote Monitoring

- Unattended:After the system is installed, there is no need for personnel to be on duty.
- Automatic Operation:One key Start, inverter will automatically adjust the output frequency according to weather conditions, and upload fault alarm to IOT platform .
- Remote monitoring & control:Adjust operating parameters, handle and reset the fault remotely .

Adapt To Various Types Of Pumps

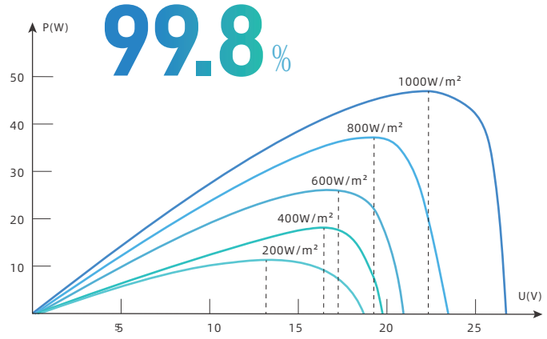
- AC Pumps：One key start/stop.
- PM synchronous pumps：Vector control, accurate Self -tuning of stator parameters .
- Single Phase: Single-phase/three-phase quick setting, simple operation .

Hige-efficient MPPT

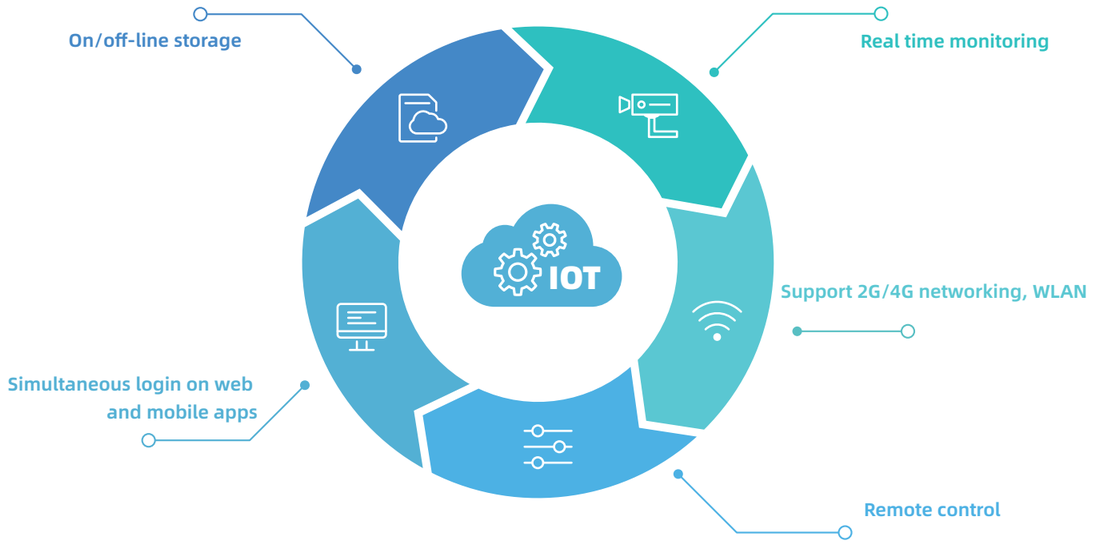
The software can quickly detect changes in bus voltage and then ensure the maximum output power of Solar panels when sunlight and temperature change .

MPPT efficiency up to:

99.8%



Smart IOT Platform

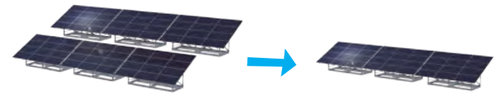


Comply With Multiple International Standards Certification

EN 61800/EN 61000/EN IEC 61000
IEC 61683/IEC 62109-1/IEC62109-2

Voltage boost function

The voltage boost function on SI30 series minimizes the number of PV panels.



IP65 High Protection Level

Integral aluminum shell,
up to:

25 years
of service life .

Overall protection:

IP65
waterproof display with one-key .
start and stop, safe and reliable waterproof connector .

SI30 Series Naming Rules

SI30 - D5 - 004G - R

Product Category
SI:stands for the solar pump inverter

Product Series
Different series are represented by different two-digit numbers

Voltage Class
D1:155VDC, for three-phase and single-phase 110V AC synchronous, asynchronous, single-phase and BLDC pumps.
D3:311V DC, for three-phase and single-phase 220V AC synchronous, asynchronous, single-phase and BLDC pumps.
D5:540VDC, for three-phase and single-phase 380~460V AC synchronous and asynchronous pumps.

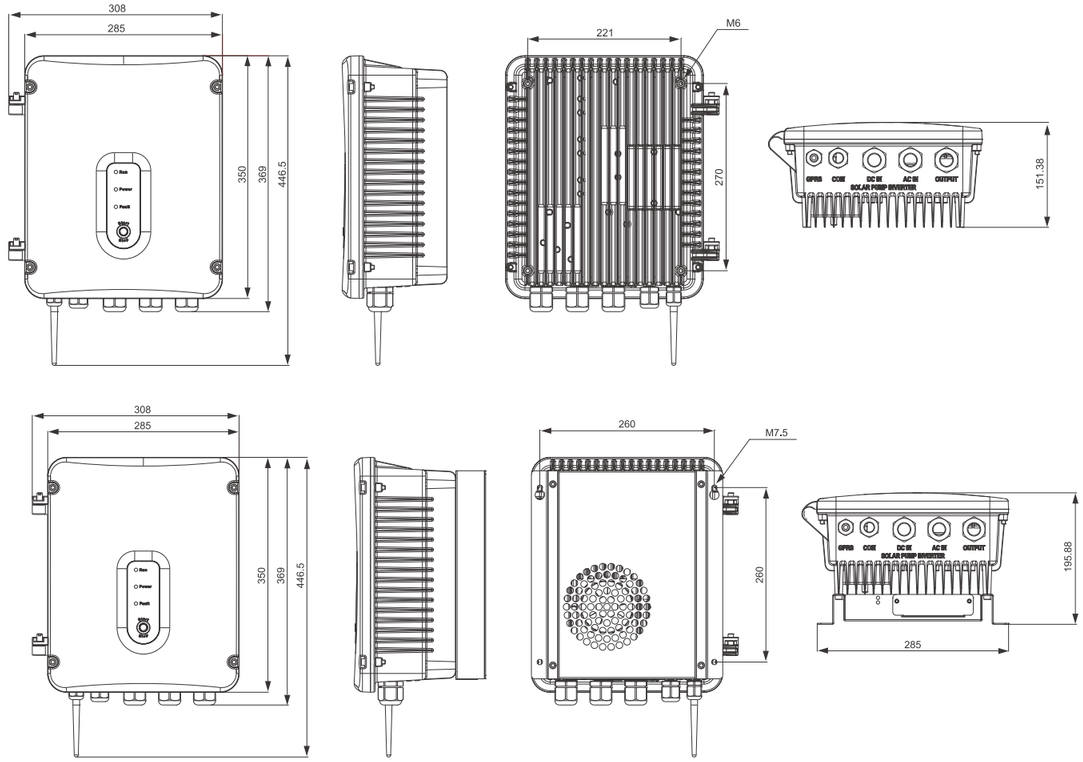
Rated Output Power
R75G=0.75KW
1R5G=1.5KW
004G=4KW
011G=11KW

Suffix
“R” stands for rectifier module
“I” stands for IOT module(optional)

Technical Specification

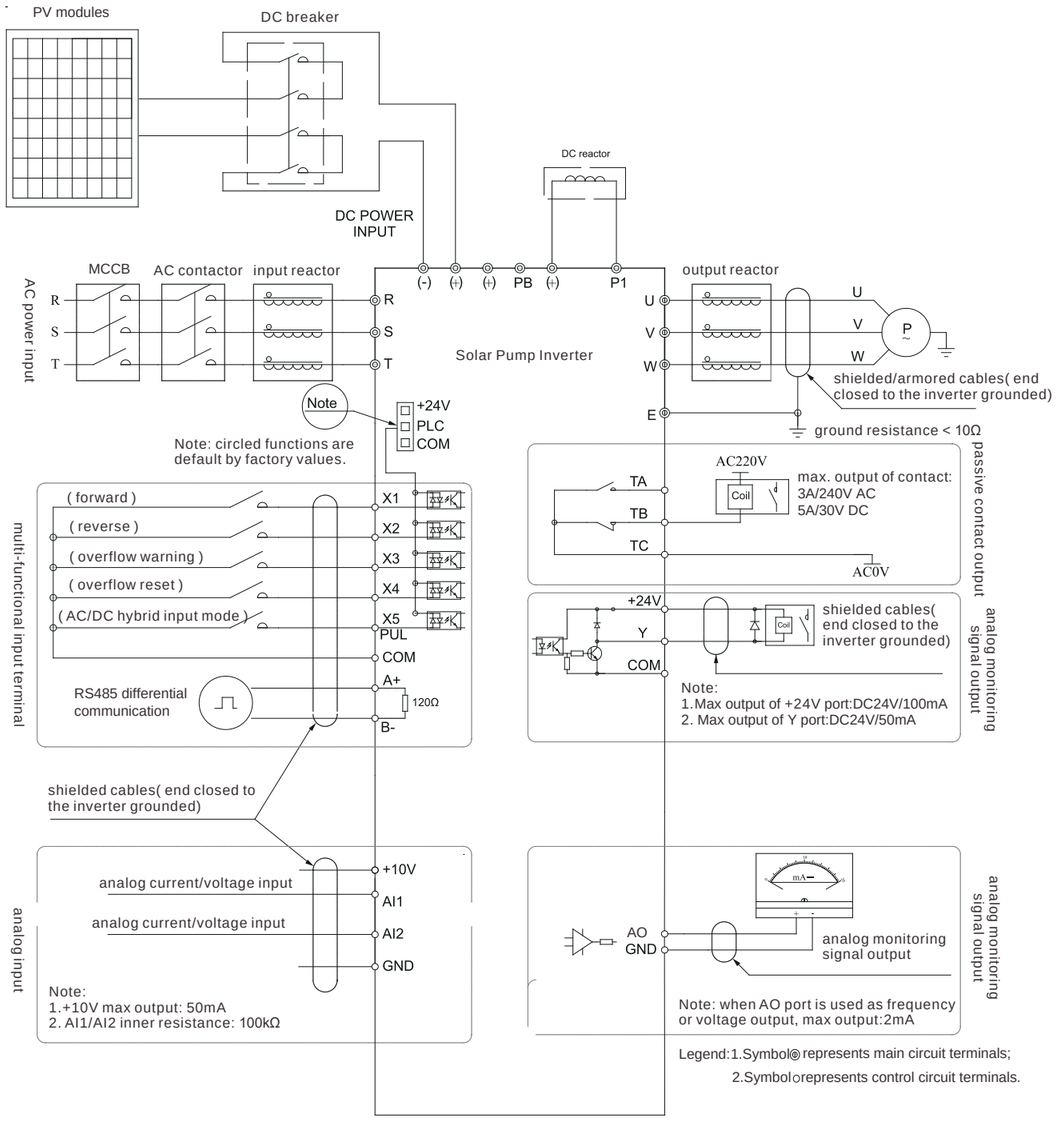
MODEL	D1	D3	D5
		PV Input	
Input voltage range	60~400V	150~450V	300~850V
Recommended Voc voltage	175~380V	360~430V	620~750V
Maximum MPPT efficiency	up to 99.8%	up to 99.8%	up to 99.8%
		AC Input	
Input voltage range	1PH 110V	1PH 220~240V	3PH 380~480V
Input voltage frequency	50/60Hz	50/60Hz	50/60Hz
		Output	
Output voltage range	110~230V	150~230V	230~460V
Output frequency range	0~600Hz	0~600Hz	0~600Hz
Output power range	0.75~1.5kW	0.75~2.2kW	0.75~11kW
Power	**Rated output current**		
0.75kW	7A	4A	2.5A
1.5kW	10A	7A	3.7A
2.2kW	-	10A	5A
4kW	-	-	10A
5.5kW	-	-	13A
7.5kW	-	-	17A
11kW	-	-	25A
		Control Performance	
Motor type	Asynchronous motor, permanent magnet synchronous motor, synchronous reluctance motor		
Control mode	V/F control, open-loop vector control, closed-loop vector control, voltage-frequency separated control		
Overload capacity	150% of rated load for 60s, 180% of overload capacity for 10s, 200% of overload capacity for 0.5s		
		System	
Installation	Hitch mounting		
Protection class	IP65		
Working temperature	-10~60℃		
Cooling method	Forced air cooling		
Humidity	20%~95%RH（condensation free）		
Installation environment	Altitude lower than 1000m. Derate 1% for each 100m rise when above 1000m.No condensation, icing, rain, snow, hail, etc., solar radiation below 700W/m2, air pressure 70kPa～106kPa		
		Protection	
Common potection	Undervoltage / overvoltage	√	√	√
	Input/output phase loss	√	√	√
	Overload	√	√	√
	Overcurrent	√	√	√
	Drive overheat	√	√	√
	Short circuit between phases and to ground	√	√	√
Specialized protection	Low frequency	√	√	√
	Pump overcurrent	√	√	√
	Dryout	√	√	√
	Min. power	√	√	√
	Overflow	√	√	√
	Sleep protection	√	√	√

SI30 Solar Pump Inverter Dimension



Inverter Model	Dimension(mm)			Installation dimension(mm)		Aperture Size
	W	H	D	W1	H1	
SI30-D1-R75G-R	308	446.5	151.38	221	270	M6
SI30-D1-1R5G-R						
SI30-D3-R75G-R						
SI30-D3-1R5G-R						
SI30-D3-2R2G-R						
SI30-D5-R75G-R						
SI30-D5-1R5G-R						
SI30-D5-2R2G-R						
SI30-D5-004G-R						
SI30-D5-5R5G-R	308	446.5	195.88	260	260	M7.5
SI30-D5-7R5G-R						
SI30-D5-011G-R						

SI30 Series Electric Wiring



Legend:1.Symbol◎represents main circuit terminals;
2.Symbol○represents control circuit terminals.

SI23 Series Solar Pump Inverter

New structure | High efficiency | Reliable Performance

Product Features

New look, narrow body

- Book-like narrow structure saves up 60% space max.
- New keyboard with simple design appearance simplifies operation .
- European terminals raises wiring efficiency.

Comply With Multiple International Standards Certification

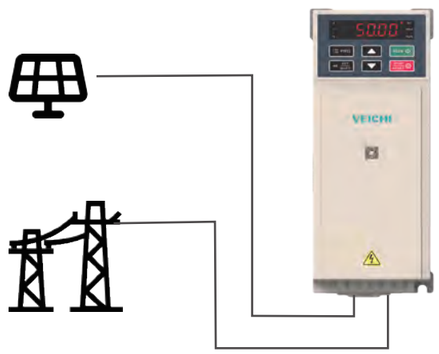
EN 61800/EN 61000/EN IEC 61000
IEC 61683/IEC 62109~1/IEC62109-2

Top algorithm

- Asynchronous, single-phase, permanent magnet synchronous, synchronous reluctance etc. pump motors applicable
- Internationally leading self-learning algorithm with accurate and consistent motion control
- High-bandwidth current vector with 12 times high-precision weak magnetic output

AC/DC hybrid input

When the solar panel power is lower than the set value, solar panel will be switched to the utility power to ensure the normal operation of the system until the solar panel power is restored to the set value, then the utility power will be switched back again to supply power .

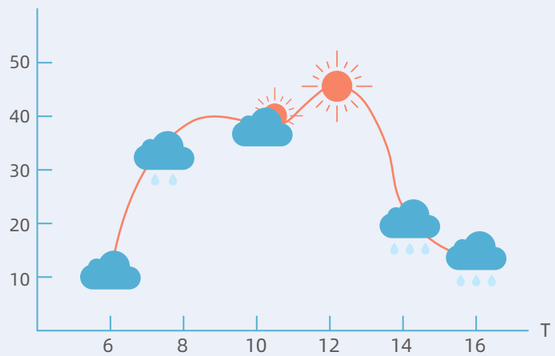


Smart IOT

- Support GPS positioning, WiFi data connection, offline data storage .
- Unattended, real-time, remote control .
- Big data analysis, calculation of cumulative power generation and flow .
- Auto identification of various APN remote data analysis devices and one-key Router connection.

Customized photovoltaic functions

- MPPT enables real-time adjustment of the optimal output frequency.
- Complete pump protections extend service life.
- Customized PQ curve offers users cumulative flow and power generation.
- AC/DC hybrid input, timing, and water pump cleaning etc. meet market demands.



Auto-Track at any daytime

SI23 Series Naming Rules

SI23 - D5 - 2R2G - A(H)

Product Category
SI:stands for the solar pump inverter

Product Series
Different series are represented by different two-digit numbers

Voltage Class
D1:155V DC, suitable for the 110V AC pumps 3PH
D3:311V DC, suitable for the 220V AC pumps 3PH
D5:540V DC, suitable for the 380V AC pumps 3PH
T3:540V DC, suitable for the 380V AC pumps 3PH
SS2: 311V DC, suitable for the 220V AC pumps 1PH

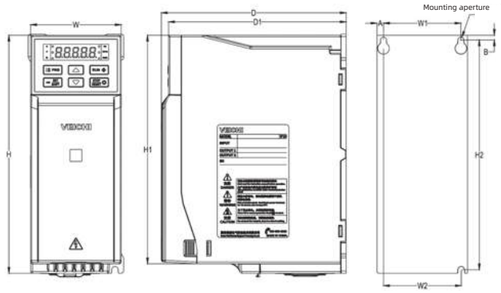
Rated Power
R75G=0.75KW
1R5G=1.5KW
004G=4KW
011G=11KW

Suffix
"A" for VEICHI
Non-A for neutral brand
" A(H)" Support up to 850V input
"I" IOT Module (optional)

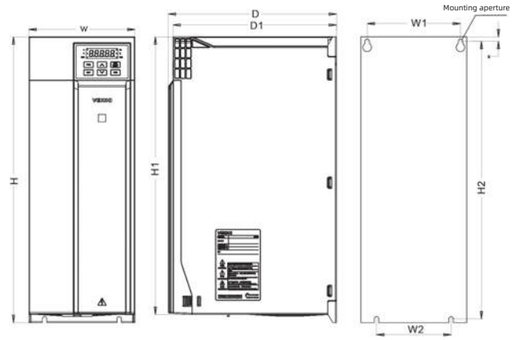
Technical Specification

MODEL	D1	D3	SS2	D5	T3
PV Input (D5 and T3 with suffix "H" support up to 850V input)					
Input voltage range	60~400V	150~450V	150~450V	250~780V	350~780V
Recommended Voc voltage	175~380V	360~430V	360~430V	620~750V	620~750V
Maximum MPPT efficiency	up to 99.8%	up to 99.8%	up to 99.8%	up to 99.8%	up to 99.8%
AC Input					
Input voltage range	1PH/3PH 110V	1PH/3PH 220V~240V	1PH/3PH 220V~240V	3PH 380~480V	3PH 380~480V
Input voltage frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Output					
Output voltage range	110~230V	150~230V	150~230V	230~460V	230~460V
Output frequency range	0~600Hz	0~600Hz	0~600Hz	0~600Hz	0~600Hz
Output power range	0.75~1.5kW	0.75~55kW	0.75~55kW	0.75~30kW	37~500kW
Power	**Rated output current**				
0.75kW	7A	4A	7A	3A	-
1.5kW	10A	7A	10A	4A	-
2.2kW	-	10A	16A	6A	-
4kW	-	16A	30A	10A	-
5.5kW	-	20A	42A	13A	-
7.5kW	-	30A	55A	17A	-
11kW	-	42A	-	25A	-
15kW	-	55A	-	32A	-
18.5kW	-	70A	-	38A	-
22kW	-	80A	-	45A	-
30kW	-	110A	-	60A	-
37kW	-	130A	-	-	75A
45kW	-	160A	-	-	90A
55kW	-	200A	-	-	110A
75kW	-	-	-	-	150A
90kW	-	-	-	-	180A
110kW	-	-	-	-	210A
132kW	-	-	-	-	250A
160kW	-	-	-	-	310A
185kW	-	-	-	-	340A
200kW	-	-	-	-	380A
Control Performance					
Motor type	Asynchronous motors Permanent magnet synchronous motor Synchronous reluctance motor	Asynchronous motors Permanent magnet synchronous motor Synchronous reluctance motor	Single phase motor	Asynchronous motors Permanent magnet synchronous motor Synchronous reluctance motor	Asynchronous motors Permanent magnet synchronous motor Synchronous reluctance motor
Control mode	V/F control, open-loop vector control, closed-loop vector control, voltage-frequency separated control				
Overload capacity	150% of rated load for 60s, 180% of overload capacity for 10s, 200% of overload capacity for 0.5s				
System					
Installation	Hitch mounting				
Protection class	IP20				
Working temperature	-10~60℃				
Cooling method	Forced air cooling				
Humidity	20%~95%RH（condensation free）				
Installation environment	Altitude lower than 1000m. Derate 1% for each 100m rise when above 1000m.No condensation, icing, rain, snow, hail, etc., solar radiation below 700W/m2, air pressure 70kPa ~ 106kPa				
Protection					
Common potection	Undervoltage / overvoltage	√	√	√	√	√
	Input/output phase loss	√	√	√	√	√
	Overload	√	√	√	√	√
	Overcurrent	√	√	√	√	√
	Drive overheat	√	√	√	√	√
	Short circuit between phases and to ground	√	√	√	√	√
Specialized protection	Low frequency	√	√	√	√	√
	Pump overcurrent	√	√	√	√	√
	Dryout	√	√	√	√	√
	Min. power	√	√	√	√	√
	Overflow	√	√	√	√	√
	Sleep protection	√	√	√	√	√

Plastic model

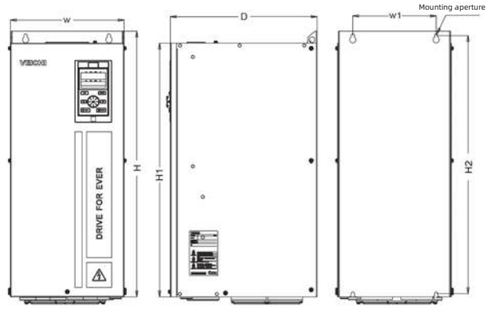


Model	Overall dimension(mm)					Installation dimension(mm)					Installation aperture
	W	H	H1	D	D1	W1	W2	H2	A	B	
SI23-D1-R75G-A	76	200	192	155	149	65	65	193	5.5	4	M4
SI23-D1-1R5G-A											
SI23-D3-R75G-A											
SI23-D3-1R5G-A											
SI23-SS2-R75G-A											
SI23-D5-R75G-A											
SI23-D5-1R5G-A											
SI23-D5-2R2G-A											
SI23-D3-2R2G-A	100	242	231	155	149	84	86.5	231.5	8	5.5	M4
SI23-D3-004G-A											
SI23-SS2-1R5G-A											
SI23-SS2-2R2G-A											
SI23-D5-004G-A											
SI23-D5-5R5G-A											
SI23-D3-5R5G-A	116	320	307.5	175	169	98	100	307.5	9	6	M5
SI23-SS2-004G-A											
SI23-SS2-5R5G-A											
SI23-D5-7R5G-A											
SI23-D5-011G-A											



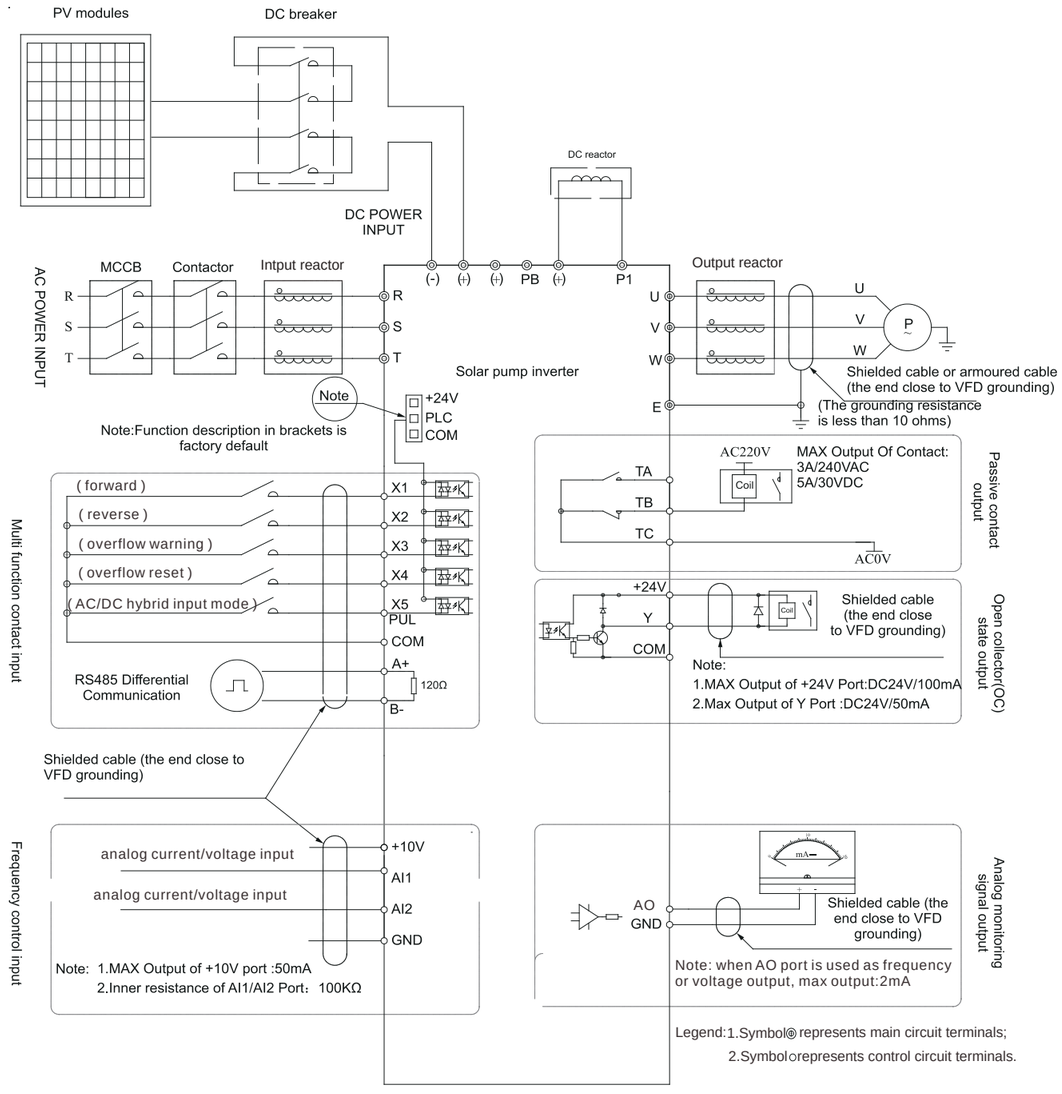
Model	Overall dimension(mm)					Installation dimension(mm)					Installation aperture
	W	H	H1	D	D1	W1	W2	H2	A	B	
SI23-D3-7R5G-A	142	383	372	225	219	125	100	372	6		M5
SI23-D3-011G-A											
SI23-SS2-7R5G-A											
SI23-D5-015G-A											
SI23-D5-018G-A											
SI23-D5-022G-A											
SI23-D3-015G-A	172	430	/	225	219	150	150	416.5	7.5		M5
SI23-D3-018G-A											
SI23-D3-022G-A											
SI23-D5-030G-A											
SI23-T3-037G-A											

Steel model



Model	Overall dimension (mm)				Installation dimension (mm)		Installation aperture
	W	H	H1	D	W1	H2	
SI23-D3-030G-A	240	560	535	310	176	544	M6
SI23-D3-037G-A							
SI23-D3-045G-A							
SI23-T3-045G-A							
SI23-T3-055G-A							
SI23-T3-075G-A							
SI23-D3-055G-A	270	638	580	350	195	615	M8
SI23-T3-090G-A							
SI23-T3-110G-A							
SI23-T3-132G-A	350	738	680	405	220	715	M8
SI23-T3-160G-A							
SI23-T3-185G-A	360	940	850	480	200	914	M16
SI23-T3-200G-A							

Standard Wiring Diagram



Note: When connect solar panel, both ACinput (R, T) and DCinput (+, -) is okay, ACinput is prefer.

SI21 Series
Solar Pump Inverter

Mini | Economic

Product Features

Flexible & Various Installation

- MINI & Various installation methods

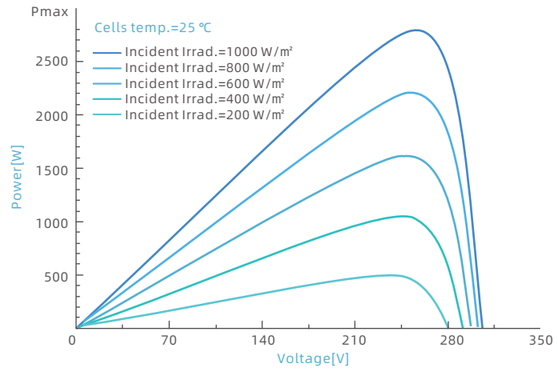
Side by side installation, no need to reserve clearance

Rail mounting, plug into it then use it

Side mounting, sideways installation if vertical space is not compatible

MPPT Technology

- Whole voltage range .
- Efficiency up to 99.8% .



Advanced Technology

- Suitable for asynchronous motors, permanent magnet synchronous motors, synchronous reluctance motors.
- Smooth operation, energy saving and high efficiency

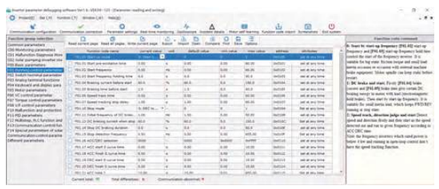
Synchronous reluctance motors

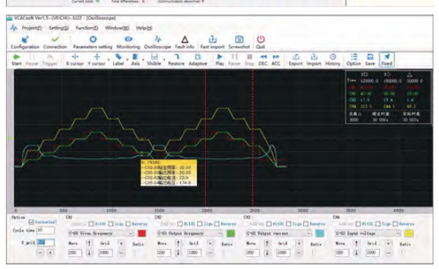
Permanent magnet synchronous motors

Asynchronous motors

Functional PC Monitor Software

- Parameters monitoring & Settings .
- Virtual oscilloscope .





Naming Rules of SI21 Series Model

SI21 - D1 - 1R5G - A

Product category
SI:stands for the solar pump inverter

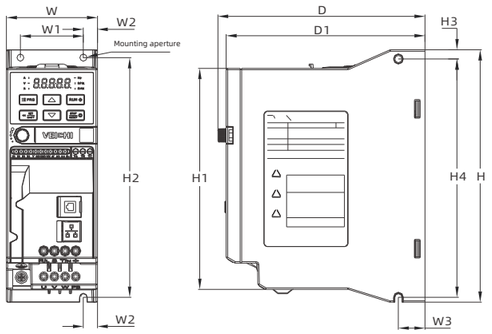
Product series
Different series are represented by different two-digit numbers

Voltage class
D1: 155V DC, Suitable for the 110V AC pumps 3PH
D3: 311V DC, Suitable for the 220V AC pumps 3PH
D5: 540V DC, Suitable for the 380V AC pumps 3PH

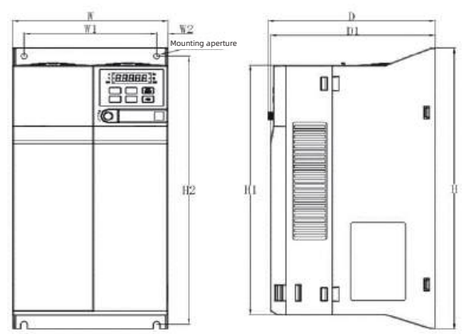
Suffix
"A" for VEICHI
Non-A for neutral brand

Rated output power
R75G=0.75KW
1R5G=1.5KW
004G=4KW

Dimension of SI21 Solar Pump Inverter



Model	Dimensions (mm)					Installation size (mm)						Mounting aperture
	W	H	H1	D	D1	W1	W2	H2	W3	H3	H4	
SI21-D1-R75G-A	65	177	155	148	142	45	10	168	19	6.5	167	3-M4
SI21-D3-R75G-A												
SI21-D3-1R5G-A												
SI21-D5-R75G-A												
SI21-D5-1R5G-A												
SI21-D5-2R2G-A												
SI21-D1-1R5G-A	75	202	180	163	157	55	10	193	19	6.5	192	3-M4
SI21-D3-2R2G-A												
SI21-D5-004G-A												
SI21-D5-5R5G-A												



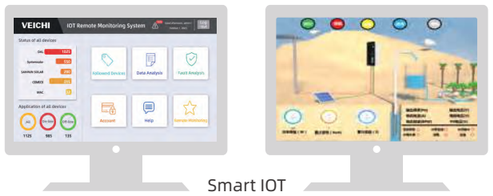
Model	Dimensions (mm)					Installation size (mm)						Mounting aperture
	W	H	H1	D	D1	W1	W2	H2	W3	H3	H4	
SI21-D5-7R5G-A	130	320	286	161	158	105	12.5	302	-	-	-	M5
SI21-D5-011G-A												
SI21-D5-015G-A	170	342.5	303.5	183	180	145	12.5	326.5	-	-	-	M5
SI21-D5-018G-A												
SI21-D5-022G-A												

Various Specific Functions

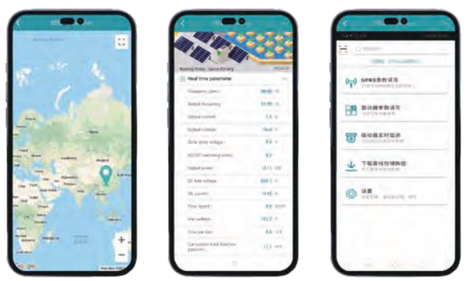
- One-key operation .
- Dormancy、dry run、low speed、minimum power、pump over current .
- Water fulfilled、output power limit、PQ curve、pump clean 、constant pressure control .

01. Dry Run	06. Dormancy
02. Low Speed	07. PQ Curve
03. Pump Over Current	08. Pump Clean
04. Minimum Power	09. Water Fulfilled
05. Constant Pressure Control	10. One-key Operation

Intelligent IOT



Smart IOT



Various Mobile Applications

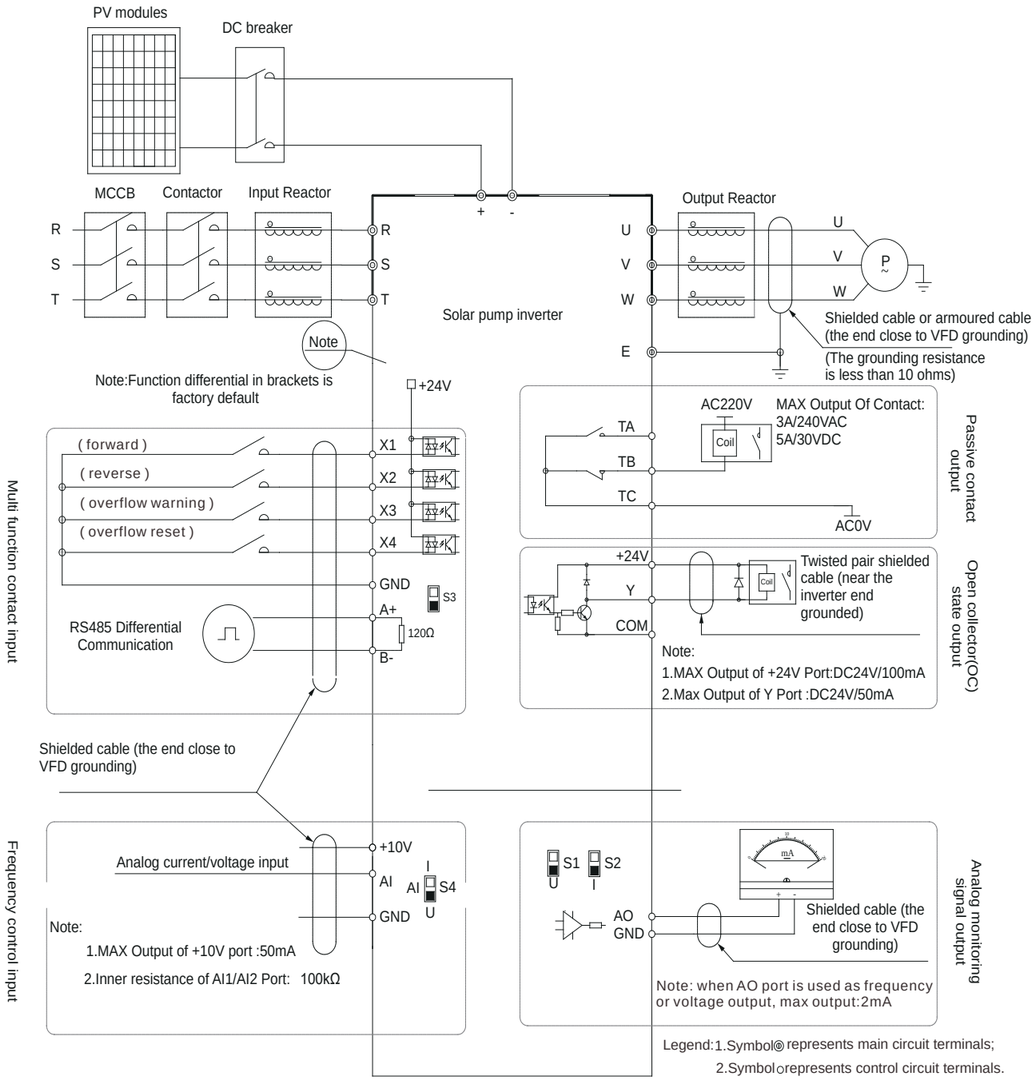
Technical Specification

MODEL	D1	D3	D5
		PV Input	
Input voltage range	60~400V	150~450V	250~780V
Recommended Voc voltage	175~380V	360~430V	620~750V
Maximum MPPT efficiency	up to 99.8%	up to 99.8%	up to 99.8%
		AC Input	
Input voltage range	1PH/3PH 110V	1PH/3PH 220~240V	3PH 380~480V
Input voltage frequency	50/60Hz	50/60Hz	50/60Hz
		Output	
Output voltage range	110~230V	150~230V	230~460V
Output frequency range	0~600Hz	0~600Hz	0~600Hz
Output power range	0.75~1.5kW	0.75~2.2kW	0.75~22kW
Power		**Rated output current**	
0.75kW	7A	4A	3A
1.5kW	10A	7A	4A
2.2kW	-	10A	5A
4kW	-	-	9.5A
5.5kW	-	-	13A
7.5kW	-	-	17A
11kW	-	-	25A
15kW	-	-	32A
18.5kW	-	-	38A
22kW	-	-	45A

	Control Performance	
Motor type	Asynchronous motor, permanent magnet synchronous motor, synchronous reluctance motor	
Control mode	V/F control, open-loop vector control, closed-loop vector control, voltage-frequency separated control	
Overload capacity	150% of rated load for 60s, 180% of overload capacity for 10s, 200% of overload capacity for 0.5s	
	System	
Installation	Hitch mounting	
Protection class	IP20	
Working temperature	-10~60℃	
Cooling method	Forced air cooling	
Humidity	20%~95%RH（condensation free）	
Installation environment	Altitude lower than 1000m. Derate 1% for each 100m rise when above 1000m.No condensation, icing, rain, snow, hail, etc., solar radiation below 700W/m2, air pressure 70kPa～106kPa	

		Protection		
Common potection	Undervoltage / overvoltage	√	√	√
	Input/output phase loss	√	√	√
	Overload	√	√	√
	Overcurrent	√	√	√
	Drive overheat	√	√	√
	Short circuit between phases and to ground	√	√	√
Specialized protection	Low frequency	√	√	√
	Pump overcurrent	√	√	√
	Dry run	√	√	√
	Min. power	√	√	√
	Overflow	√	√	√
	Sleep protection	√	√	√

Solar Pump Inverter Standard Wiring Diagram



BLDC pumping system

Photovoltaic pump specific | Plug and play | IP55

Product Features

Household PV Water Pump Inverter

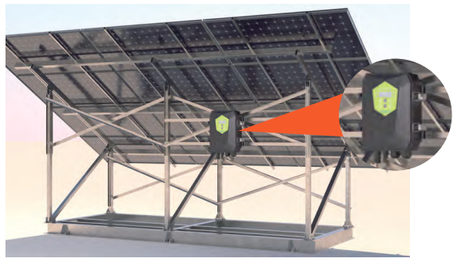
Designed for household use， and applied to screw pumps, plastic impeller pumps, stainless steel impeller pumps, ground pumps and more.

Plug and play, friendly interface

- Real-time working status, output power, output voltage, current, pump speed ect are displayed on the LED screen for full control;
- Simple installation with easy plug-and-play function saves complicated and cumbersome wiring.

Protection class：IP55

The SIV series has a high protection class and can be mounted on PV panel supports.



Cost Saving

The cost of the SIV series inverters and the pumps is approximately the same as the price of a conventional inverter.

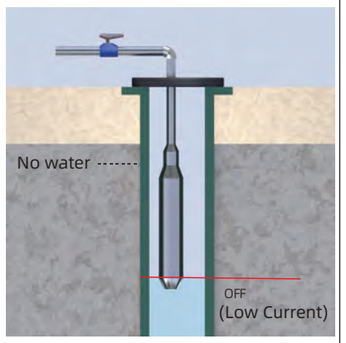
Technical Specification

Photovoltaic pump	Screw pump	Plastic impeller pump	Stainless steel impeller pump	Surface pump
Size(inch)	3	3/4	3/4/6	1/2(outlet)
Max.flow(m^2/h)	2.2	20	40	45
Max.range(m)	180	195	203	65
Voltage(V)	24/48/72	24/48/72/110	24/48/72/110	24/48/72/110
Power(W)	80~1100	200~1500	300~1500	210~1500

Exclusive Solutions For Water Pump Applications

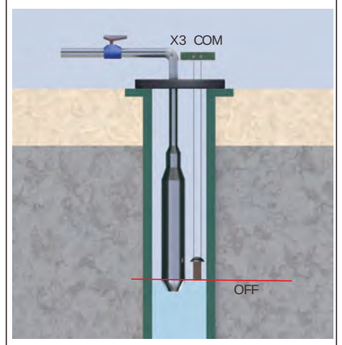
Dry running protection(No sensor)

When the well is empty, the output current will decrease, when the output current is lower than threshold value, dry running protection will be triggered



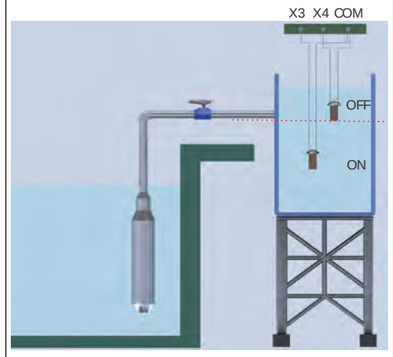
Dry running protection(One sensor)

When the downhole liquid level sensor detects water shortage, the frequency converter will enter into dry protection



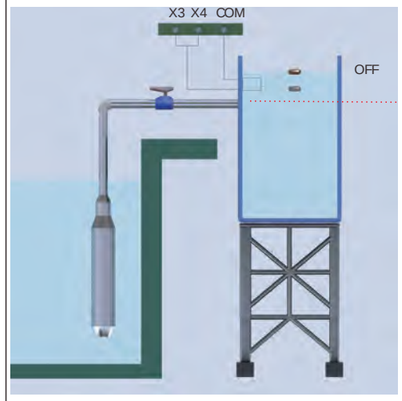
Water fulfil protection(Dual level sensor)

When the water level is higher than the high level sensor, it enters the water full protection. When the water level drops to the low level sensor, the inverter starts running



Water fulfil protection(Float switch)

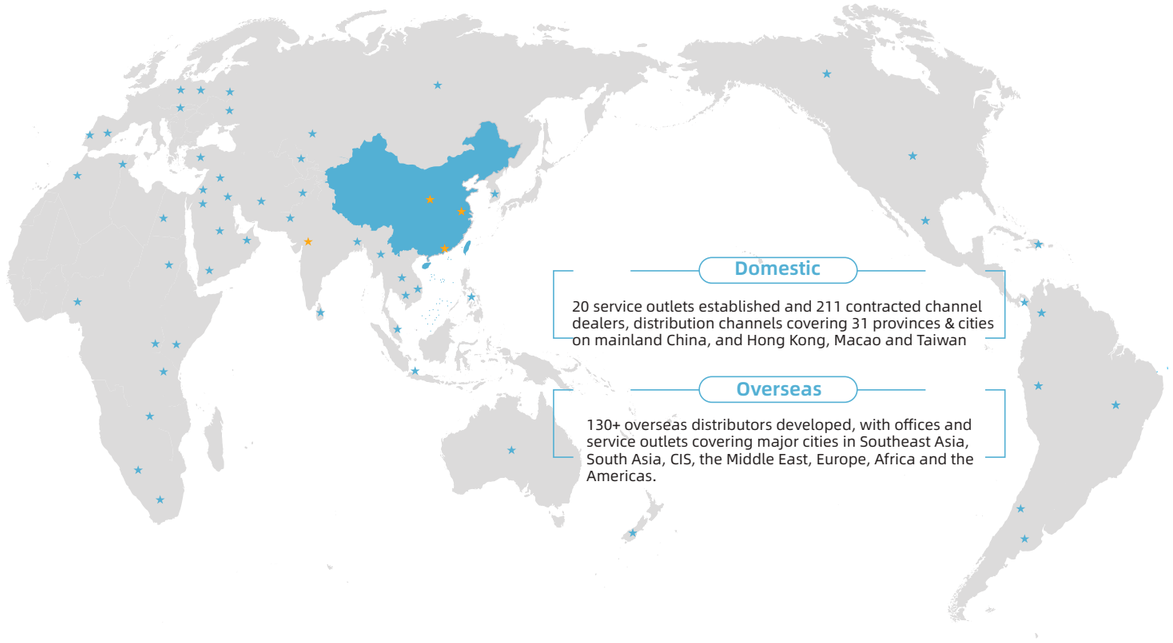
The float switch controls the start and stop according to the liquid level



Constant pressure irrigation solution

Built-in PID algorithm, according to the pressure gauge feedback data to adjust the running frequency, to achieve constant pressure water supply

Service and Support



01 Pre-sales

Technology promotion, site survey, proposal design, energy saving assessment

02 During-sales

Customization, design consultation, installation and commissioning, on-site training

03 After-sales

Regular return visits, regular maintenance, timelyrepairs, application instruction