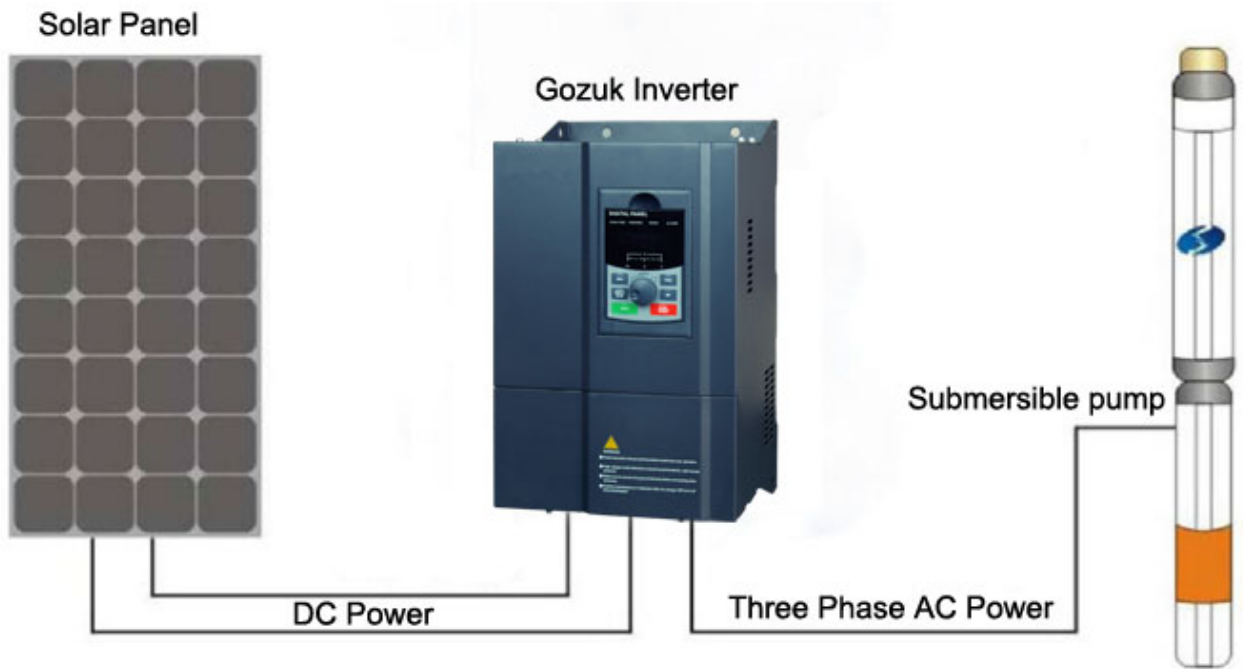# Gozuk Solar Pump Inverter

Introduction

Solar photovoltaic pumping system is a series-parallel absorb sunlight radiation energy through solar panels, and convert it into electricity for inverter driving centrifugal pump, axial flow pump, mixed-flow pump from deep well pump, deep well pump power supply, such as river, lake, pond water carry water. According to the change of intensity of sunlight, adjust output frequency in real time, output power close to the sun cell array maximum power.

Solar Pump Inverter: electrical energy from photovoltaic solar panels will drive water pumps.

- Internal with MPPT controller system, it can track maximum power of solar panels, and effective to increase the output power of the solar panels.
- Implement work throughout the day. It can work from sunrise to sunset, greatly improving the photovoltaic pump effective working hours a day.
- Automatically adapt to changes and cloudy weather. Effectively avoid the phenomenon of traditional pump system stop in sudden overcast.
- System has strong anti-jamming capability, in the depth of 200 meters, the system can still work stable.

Solar Pump Inverter Features

- Solar pump inverter built-in MPPT system, intelligent track maximum power point, fast response, high stability, efficiency is as high as 98%.
- Input voltage from 130VDC to 350VDC drive 220VAC pump, input voltage from 350VDC to 650VDC drive 380VAC pump.
- Protection for over current, over voltage, over load, anti-lightning etc.
- Smart operation, water level detection and operation panel to prevent overflow, dry pumping (optional).
- Infineon module IGBT last longer.
- Automatic running when power on.
- Low noisy, lower rate for maintenance.

Solar Pump Inverter Model List

Model	Current	Power	Input Voltage		Output Voltage	Weight	Dimension
	A	KW	VAC	VDC	3AC ±10%	KG	MM
GK200-R7D-1B	4.5	**0.75**	1AC 220V	130-350	220-240	2.4	189.5*167*120
GK200-1R5D-1B	7	**1.5**	1AC 220V	130-350	220-240		
GK200-2R2D-1B	10	**2.2**	1AC 220V	130-350	220-240		
GK200-004D-1B	16	**4**	1AC 220V	130-350	220-240	3.5	220*183.5*150
GK200-R7D-3B	2.5	**0.75**	3AC 380V	350-650	380-415	2.5	189.5*167*120
GK200-1R5D-3B	3.7	**1.5**	3AC 380V	350-650	380-415		
GK200-2R2D-3B	5	**2.2**	3AC 380V	350-650	380-415		
GK200-004D-3B	9	**4**	3AC 380V	350-650	380-415	4	220*183.5*150
GK200-5R5D-3B	13	**5.5**	3AC 380V	350-650	380-415		
GK200-7R5D-3B	17	**7.5**	3AC 380V	350-650	380-415	6	285*208.5*180
GK200-011D-3B	25	**11**	3AC 380V	350-650	380-415	11	345*230*203
GK200-015D-3B	32	**15**	3AC 380V	350-650	380-415		
GK200-018D-3B	37	**18**	3AC 380V	350-650	380-415	19	430*255*263
GK200-022D-3B	45	**22**	3AC 380V	350-650	380-415		
GK200-030D-3B	60	**30**	3AC 380V	350-650	380-415	30	490*274*310
GK200-037D-3B	75	**37**	3AC 380V	350-650	380-415		

General Specification

Item		Standard
Power supply	Input voltage, frequency	Single phase 200~240V, 50/60Hz Three phase 200~240V, 50/60Hz Three phase 380~420V, 50/60Hz
	Allowable fluctuation	Voltage :±15% frequency: ±5%
Control performance	Control system	Vector control base on DSP
	Output frequency	0.00~400.0Hz, The highest frequency can be set among 10.00~400.0Hz
	Control method	V/F control, vector control for flux with open loop 1, vector control for flux with open loop 2, vector control for PG.
	Lifting function of automatic torque	Torque control for low frequency (1Hz) and great output in the control method of V/F
	Control on accelerating and decelerating	Setting method for subsections of accelerating and decelerating S curve; the longest operation time 9600h
	Control on programme operation	Operation for speed program of 16 sections; the longest operation time 888.88h
	Image resolution of frequency setting	Figure: 0.01Hz (below 300Hz), 0.1Hz (above 300Hz) Simulation: 0.05Hz / 60Hz
	Frequency accuracy	Common difference of speed control 0.01% (25℃±10℃)
	V/F curve method	User defines V/F curve for linear and multiple power
	Overload capacity	150% rated current for 1 minute, 200% rated current for 0.1 second
	Slippage compensation	50~100%, compensation for automatic slippage
	Carrier frequency	0.5KHz~15KHz; carrier frequency can be adjusted based on the load characteristics
	Image resolution of	Figure setting: 0.01Hz simulation setting: the highest frequency × 0.1%

Item			Standard
	output frequency		
	Starting torque		0.5Hz/180%
	Speed range		1:200
	Accuracy of speed stabilizing (accuracy of speed control)		Vector control for flux with open loop: ≤±0.5% (rated synchronous speed)
	Stability of speed control		vector control for flux with open loop :≤±0.3% (rated synchronous speed)
	Torque response		≤40ms (vector control for flux with open loop)
	Torque boost		Automatic torque boost; manual torque boost 0.1% ~ 30.0%
	Acceleration and deceleration line		Acceleration and deceleration method for line; for acceleration and deceleration time; time scope for acceleration and deceleration 0.0s~3600.0s
	DC braking		DC braking frequency: 0.0Hz~maximum frequency, braking tine: 0.0~36.0 second, current value for braking movement: 0.0%~100.0%
	Electronic control		Range of jog frequency: 0.00Hz~maximum frequency; Acceleration and deceleration time of jog: 0.0s~3600.0s
	Operation on multi-sections		Realize the maximum operation of 16 sections via control terminals
	Build-in PID		Realize closed-loop control system with process control conveniently:
	Automatic voltage regulation (AVR)		Automatically make the output voltage constant when the network voltage changes
	Torque limitation and control		Excavator characteristics: automatic limitation on torque during the operation period and prevention for frequent over current trip; and vector model of close loop can realize the torque control
Personalized function	Self-checking for outside equipment safety of electrifying		Realize the security detection of electrifying on outside device like ground connection and short circuit
	Function of DC bus		Realize the function for many inverters to share DC bus
	MF key		Programmable key: function choice for positive and negative operation and jog operation
	Current-limiting function of the carrier		Built- in current-limiting algorithm of waveband reduces the probability for the solar pump inverter to report over current and improve the whole motor's ability on resisting disturbance
	Timing control		Timing control function: setting time scope 0h~65535h
	Standardization for extension cord of the keyboard		The customer can use the standard network cable to prolong the keyboard
Operation	Input signal	Operation method	Keyboard/terminal/communication
		Frequency setting	12 kinds of frequency setting method, including DC 0 ~ 10 v range can be adjusted, DC 0 ~ 20 ma range can be adjusted, panel potentiometer, etc.
		Starting signal	Forward, Reverse
		Speed of multiple sections	Speed for 16 sections can be set at most (using multifunction terminal or program execution)
		Acceleration of multiple sections	Acceleration 4 sections can be set at most (using multifunction terminal)
		Emergency stop	Interrupt controller output

Item			Standard
	LED/O LED show keypad	Operation of pendulous frequency	Operation of process control
		Jog	Operation with low speed
		Fault resetting	Automatically or manually reset the fault state when the protection function is at an effective state
		PID feedback signal	Including DC 0~10V, DC 1~5V, DC 0~20mA and DC 4~20mA
	Output signal	Operating condition	Motor situation showing stop, acceleration and deceleration, constant speed and state of programme operation
		Fault output	Output of sensitive point-AC 250V 5A, DC 30V 5A
		Analog output	Two analog outputs can choose 8 signals such as frequency, current, voltage and so on; and output signal scope can be set randomly among 0~10V/0~20mA.
		Output of digital quantity	Up to three output signals; every output signal has nine signals for choice
	Operation function		Limiting frequency, avoiding frequency, slippage compensation, invert protection, self-adjusting and PID control
	Braking of direct current		Built-in PID adjusts brake current and protects sufficient braking torque without over current
	Run command channel		Three channels: presetting of operation panel, control terminal and serial communication. The change via various methods
	Input terminal		Six digital input terminals can be compatible with active loudspeaker PNP or two input terminals of analog of NPN input method; among them, AI1 and AI2 can be input as voltage or current. (if it necessary to expand the function of input and output terminals, please use IO expansion cards)
	Output terminal		One digital output terminal (bipolar output), a relay output terminal, and an analog output terminal can respectively choose 0/4mA~20mA or 0/2V~10V and realize the output of physical quantities such as setting frequency, output frequency and rotate speed
Protection function	Inverter protection		Overvoltage protection, low-voltage protection, over current protection, overload protection, overheat protection, protection of over current and speed reduction, protection of overvoltage and speed reduction, protection of default phase (optional functions), external fault, communication error, abnormal feedback signal of PID and PG fault
	IGBT temperature display		Display current IGBT temperature
	Control cooling fan		Starting temperature of the fan can be set
	Instant power failure and then restarting		Less than 15 millisecond: Continuous operation More than 15 millisecond: automatically detect the motor speed and restart after instant power failure
	Tracking, method Of rotate speed		Automatically track motor speed at the start of the inverter
	Protection function of parameter		Protect the inverters parameter via setting supervisor password and decode
Display	LED/O LED show keypad	Operation information	18 monitoring objects of the operation in total: operation frequency, setting frequency, rated current of the motor, current percentage, DV bus voltage, output voltage, actual speed of the motor, accumulative operation time, IGBT temperature, PID given value, feedback value of PID, state of input terminal, state of output terminal, value of analog AI1, value of analog AI2A, current number for speed of multiple sections and setting value of torque
		Error	Keep five error messages at most and inquire fault type, voltage, current,

Item			Standard
		message	frequency and working condition when the fault occurs
		LED display	Display parameter
		OLED display	Options available; inverter in Chinese/English
		Parameter copy	Using special keyboard of parameter copy can realize the quick copy of the parameter (limited too OLED)
		Key lock and function choice	Realize partial or complete lock of the button; define the effect scope of partial buttons to prevent wrong operation
Communication		RS485/RS232	It can choose isolated RS485/RS232 communication module to realize the communication with the upper computer
Environment		Environment temperature	-10℃~40℃ (environment temperature is among 40℃~50℃; please use it with derating)
		Storage temperature	-20℃~65℃
		Environment humidity	Less than 90 % R.H, not exceeding 90% R.H
		Altitude, Vibration	Below 1000 m, below 5.9m/s² (=0.6g)
Cooling method			Forced cooling and natural air cooling

Gozuk Solar Pump Inverter System advantages

- Grid AC power Supply and solar panels power (collect batteries) DC power can switch. When power grid is not stable or power cut, you could change to solar energy for supply power. When the solar energy power cut, you could also use the grid power.
- Gozuk solar pump inverter can solve the problems of the traditional power instability or power can't reach area with water problems.
- Simple installation, intelligent operation.
- Investment cost, use cost and maintenance cost are very low.
- No need equipped with battery, cost savings, more environmental protection.
- Environmental protection, realize CO_2 zero carbon emissions.

Applications

Solar pump inverter mainly used in no power or power unstable region of the hill afforestation management lead Water project, supply water for river on both sides of the vegetation, soil and water loss prevention water supply project, the barren hills groves and other economy content of irrigation, natural ecological protection area desertification control water supply.

Supply water for lack of electricity remote mountain area, farm, school, hospital, factory and home. No electricity area or electricity Force unstable area covering the areas of animal husbandry and water, irrigate for farmland and greenhouse.

Widely used in the desert greening, desert governance, agricultural irrigation, water supply, urban life Water, pump systems, water purification, seawater desalination, etc.

Solar Pump Inverter Settings

Main Parameter Setting

P01.03=11 Setting MPPT function, input DC voltage control the frequency self-acting, protection for over current, over voltage, over load.
P02.11=1 Run command of the terminal is valid when it is electrified.
P09.15=10 Times for automatic reset of the fault-10 times.

220-240VAC solar pump:

PV solar panels output voltage: <130VDC, solar inverter stop (MPPT function P01.03=11)
PV solar panels output voltage: 130VDC~310VDC, solar pump work for 0-50Hz (insufficient sunlight)
PV solar panels output voltage: 310VDC~350VDC, solar pump works perfect (full Hz - 50/60Hz)
PV solar panels output voltage: >350VDC, solar inverter stop (MPPT function P01.03=11)

380-415VAC solar pump:

PV solar panels output voltage: <350VDC, solar inverter stop (MPPT function P01.03=11)
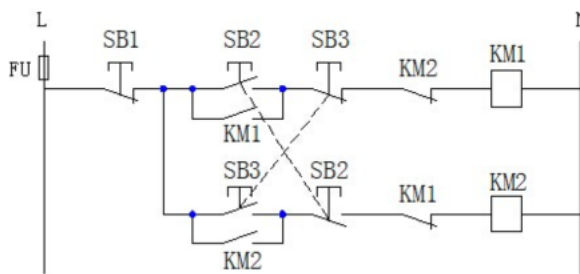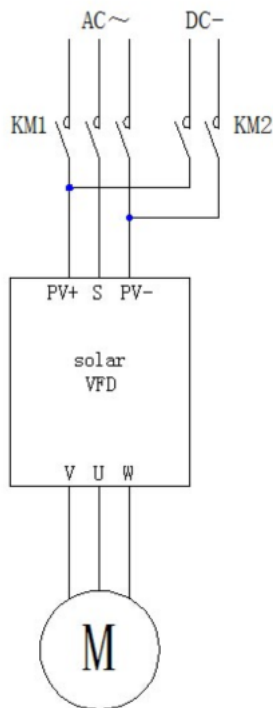PV solar panels output voltage: 350VDC~540VDC, solar pump work for 0-50Hz (insufficient sunlight)
PV solar panels output voltage: 540VDC~650VDC, solar pump works perfect (full Hz - 50/60Hz)
PV solar panels output voltage: >650VDC, solar inverter stop (MPPT function P01.03=11)

AC, DC input switching

When at night or sunlight is not strong enough, you also can use AC power supply.
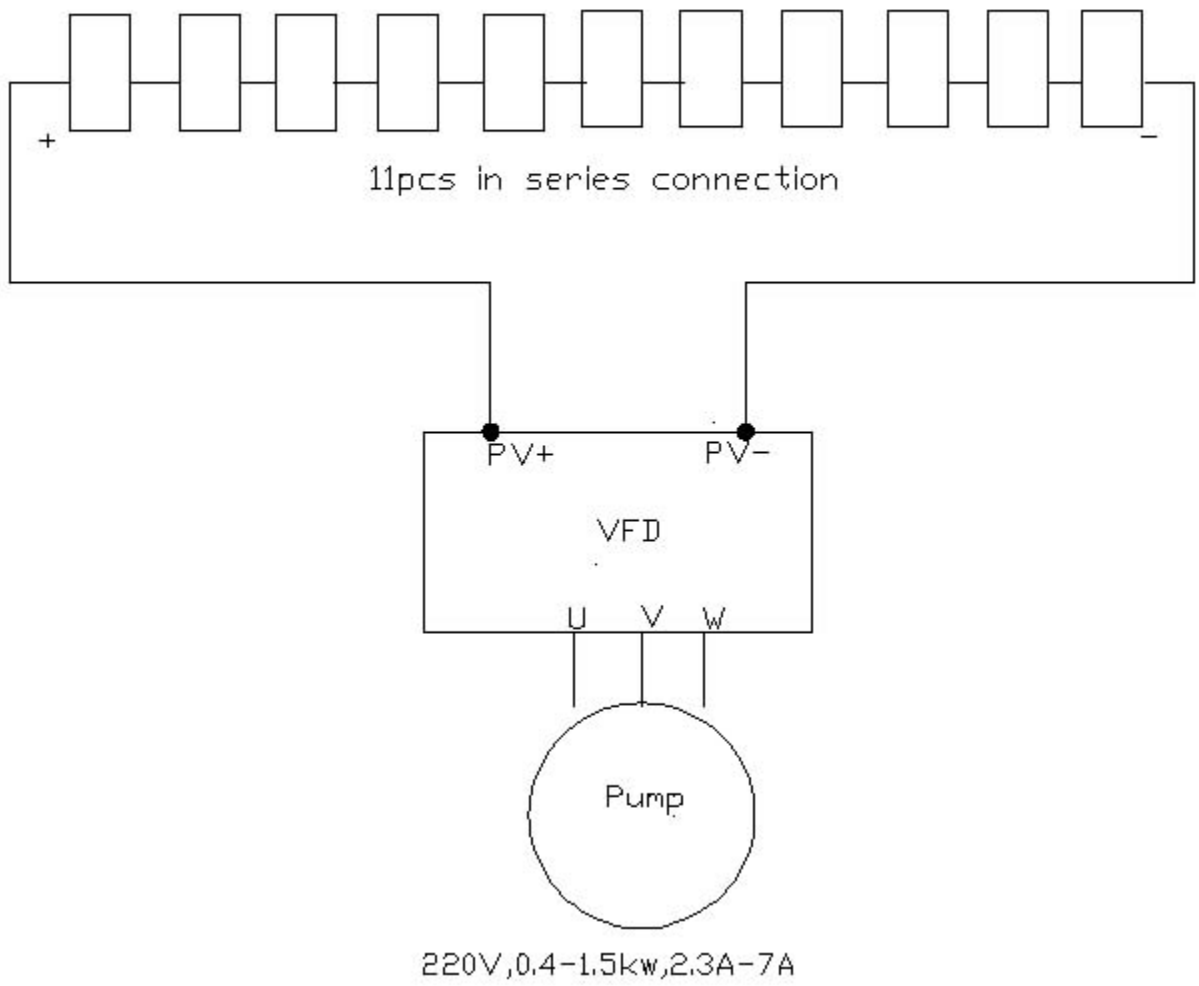

SB1: power stop button
SB2: AC power control button
SB3: DC power control button
KM1: AC power control MCCB
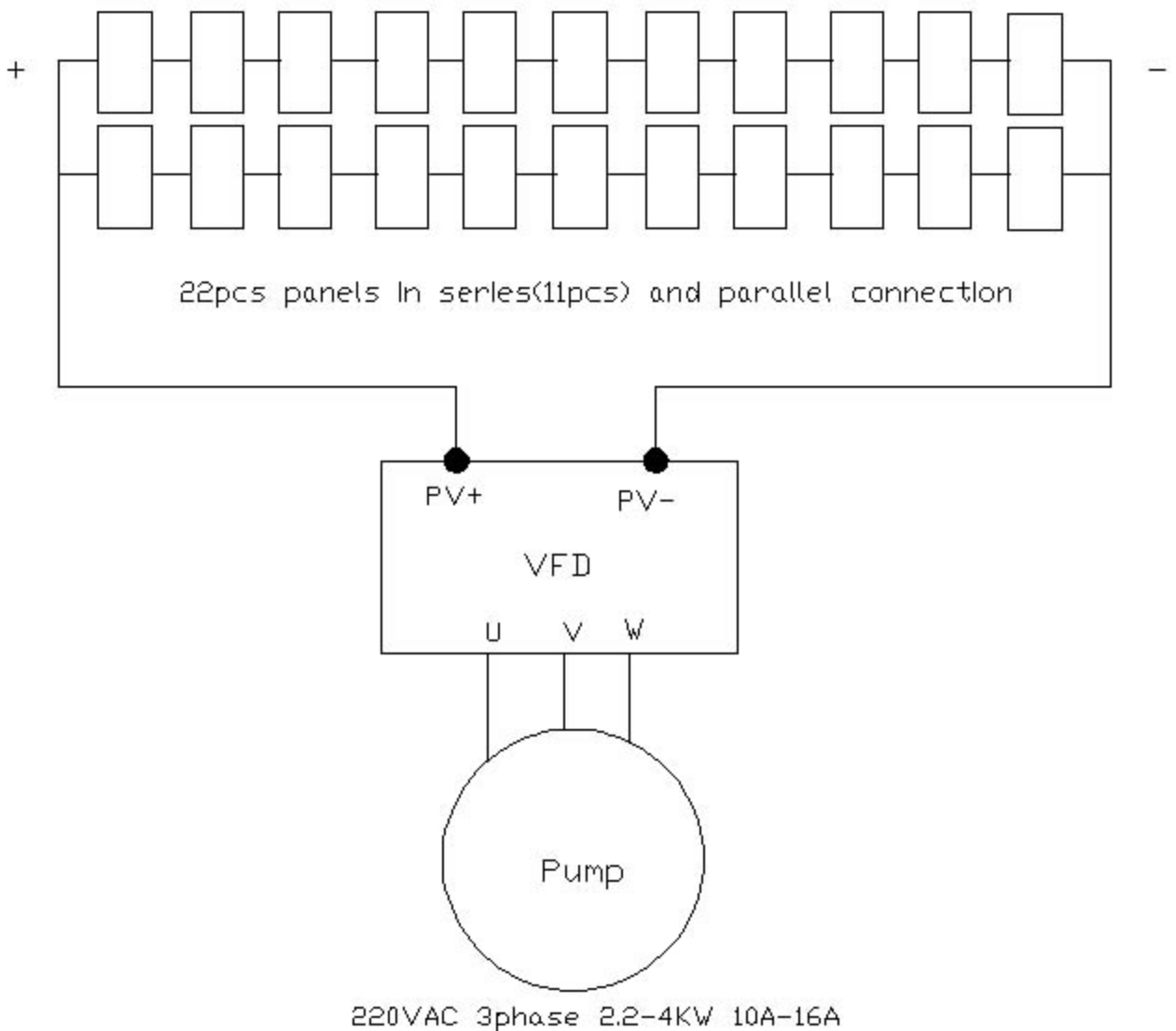KM2: DC power control MCCB

Tip: you also can use Batteries instead of PV solar panel.

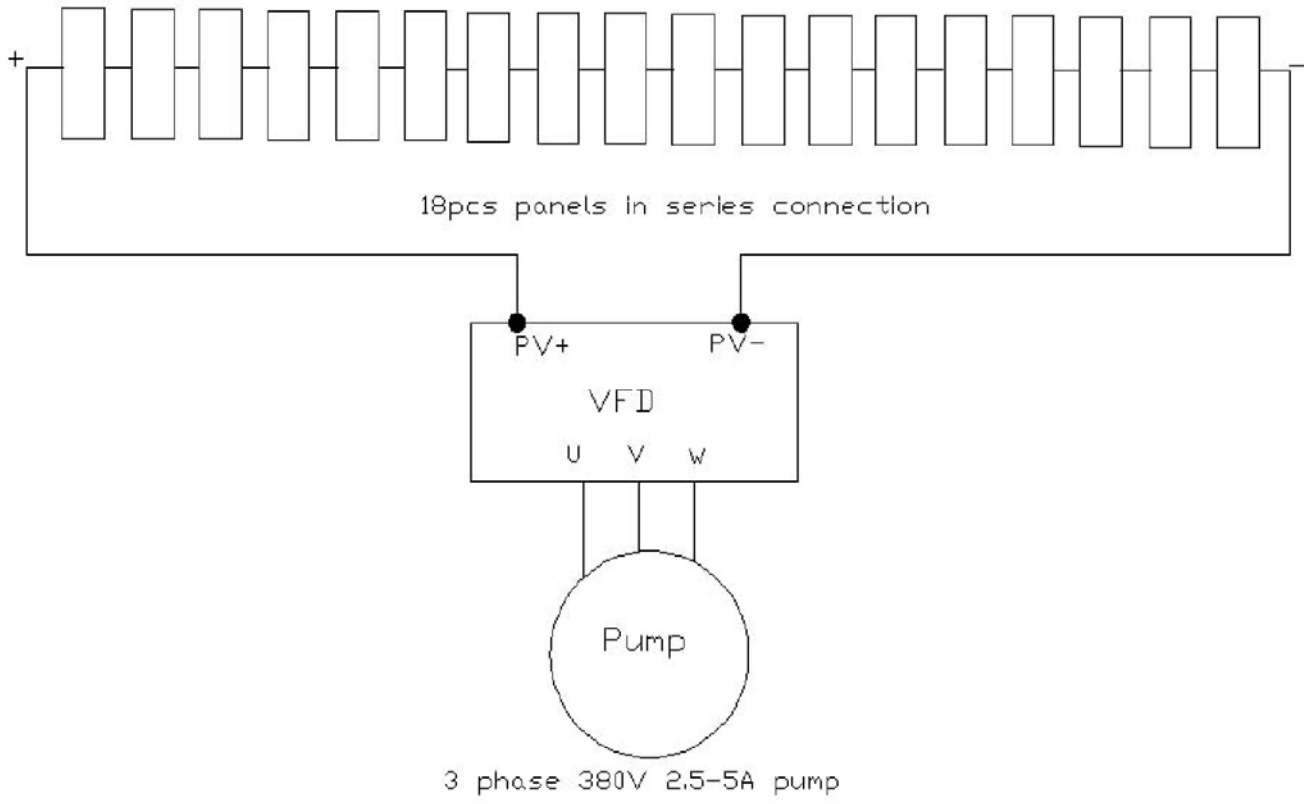# Solar panel array connected with solar pump inverter

36VDC Solar panels 240W 8A to
3phase 220VAC 0.4kw-1.5kw pump

11pcs in series connection

+   −

PV+   PV−

VFD

U   V   W

Pump

220V,0.4-1.5kw,2.3A-7A

36VDC Solar panels 240W 8A
to 3 phase 220VAC 2.2KW-4KW

+   −

22pcs panels In serIes(11pcs) and parallel connectIon

PV+   PV−

VFD

U   V   W

Pump

220VAC 3phase 2.2-4KW 10A-16A

36VDC 240W 8A solar panels to
3phase 380VAC 0.75-2.2KW pump

18pcs panels in series connection

PV+   PV-

VFD

U   V   W

Pump

3 phase 380V 2.5-5A pump

36VDC 240W 8A to 3phase 380VAC 4-5.5kw pump

36pcs panels in series(18pcs) and parallel connection

PV+   PV-

VFD

U   V   W

Pump

3phase 380VAC 4-5.5kw 9-13A pump