



Solar Pumping inverter



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Solar Pumping System overview

Solar pumping systems can be applied to all forms of daily use, water pumping for drinking water supply for remote villages and farms without connection to the water grid, for agricultural use such as livestock watering, agricultural irrigation, forestry irrigation, pond management, desert control, and industrial use such as wastewater treatment etc.

In recent years, with the promotion of the utilization of renewable energy resources, solar pumping systems are more and more used in municipal engineering, city centre squares, parks, tourist sites, resorts and hotels, and fountain systems in residential areas.

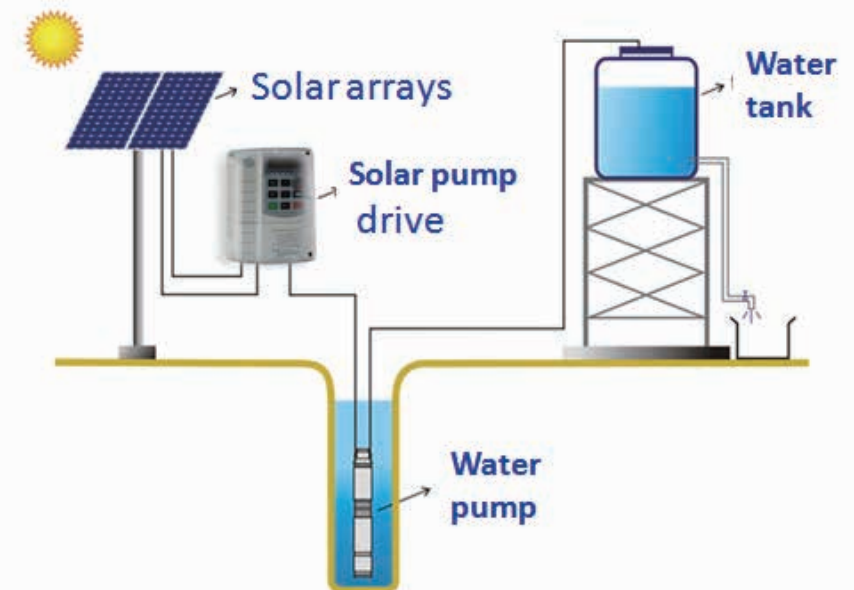
The system is composed of a PV generator, a pump and a solar pump drive. Based on the design philosophy that it is more efficient to store water rather than electricity, there is no energy storing device such as storage battery in the system. The system is prepared to be combined with an elevated water storage, e.g. water tower or an uphill tank installation.

The PV generator, an aggregation of PV modules connected in series and in parallel, absorbs solar irradiation and converts it into electrical energy, providing power for the whole system. The pump drive controls and adjusts the system operation and converts the DC produced by the PV module into AC to drive the pump, and adjusts the output frequency in real-time according to the variation of sunlight intensity to realize the maximum power point tracking (MPPT). The pump, driven by 3-phase AC motor, can draw water from deep wells, rivers and lakes and pour it into storage tanks or reservoirs, or be connected directly to the irrigation system, fountain system, etc.

According to the actual system demand and installation condition, different types of pumps such as centrifugal pump, axial flow pump, mixed flow pump or deep well pump can be used.

Solar pump system constitution

System wiring diagram



SOLAR PUMPS SYSTEM—SOLAR PANELS, SOLAR PUMP DRIVE, PUMPS

1. Main Features of solar pump system

- Low carbon economy
- In-built MPPT with high efficiency
- Pump specific protection
- Remote monitoring Best off grid solution

Applications

1. Ground water lowering,
2. Irrigation systems
3. Industrial Application
4. Drip irrigation & sprinkler
5. Tank/ cistern filling
6. Wildlife refuge
7. Rural water supply for ranches, cabins, and cottages



Solar panel



Solar Pump Drives



Pumps



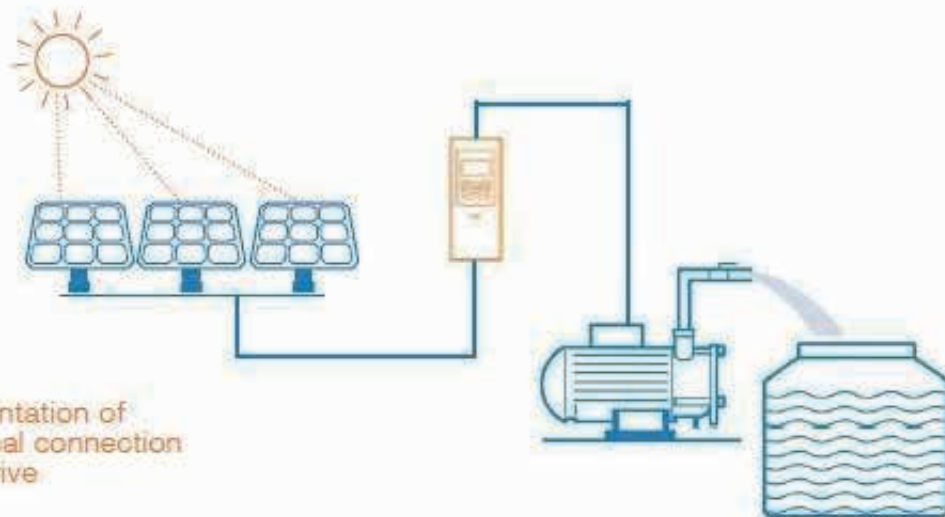
2. Solar pump system introduction

Solar Pumping system becomes more and more popular, it can be applied to daily (underground water), agriculture irrigation, forestry irrigation, desert control, pasture animal husbandry, water supply for islands, wastewater treatment engineering , and so on. In recent years, with the promotion of the utilization of new energy resources, solar pumping systems are more and more used in municipal engineering, city center squares, parks, tourist sites, resorts and hotels, the landscapes and fountain systems in the residential areas. This system is composed of a solar array, a pump and solar pumping inverter, or GPRS remote control model. Based on the design philosophy that it is better to store water than electricity, there is no energy storing device such as store battery in the system.

The solar array, an aggregation of many solar modules connected in series and parallel. Absorbs sunlight radiation and converts into electrical energy, providing dynamical water for the whole system. The pump inverter controls and adjusts the system operation and converts the DC produced by solar array into AC to drive the pump, and adjust the output frequency in real-time according to the variation of sunlight intensity to realize the maximum power point tracking(MPPT). The pump, drive by 3-phase AC motor, can draw water from the deep wells or rivers and lakes to pour into the storage tank or reservoir, or directly connect to the irrigation system, fountain system, etc. According to the actual system demand and installation conditions, different types of pump such as centrifugal pump, axial flow pump, mixed-flow pump or deep- well pump can be used.

Applications

1. Ground water lowering,
2. Irrigation systems
3. Industrial Application
4. Drip irrigation& sprinkler
5. Tank/ cistern filling
6. Wildlife refuge
7. Rural water supply for ranches, cabins, and cottages
9. Fountains.



Representation of the typical connection of the drive

3.Features of MULTIFIT Solar pump drive.

Built-in MPPT Maximum power point tracking functionality ensures that you get the most power output possible from your solar panel and maximizes the performance of your pump throughout the day

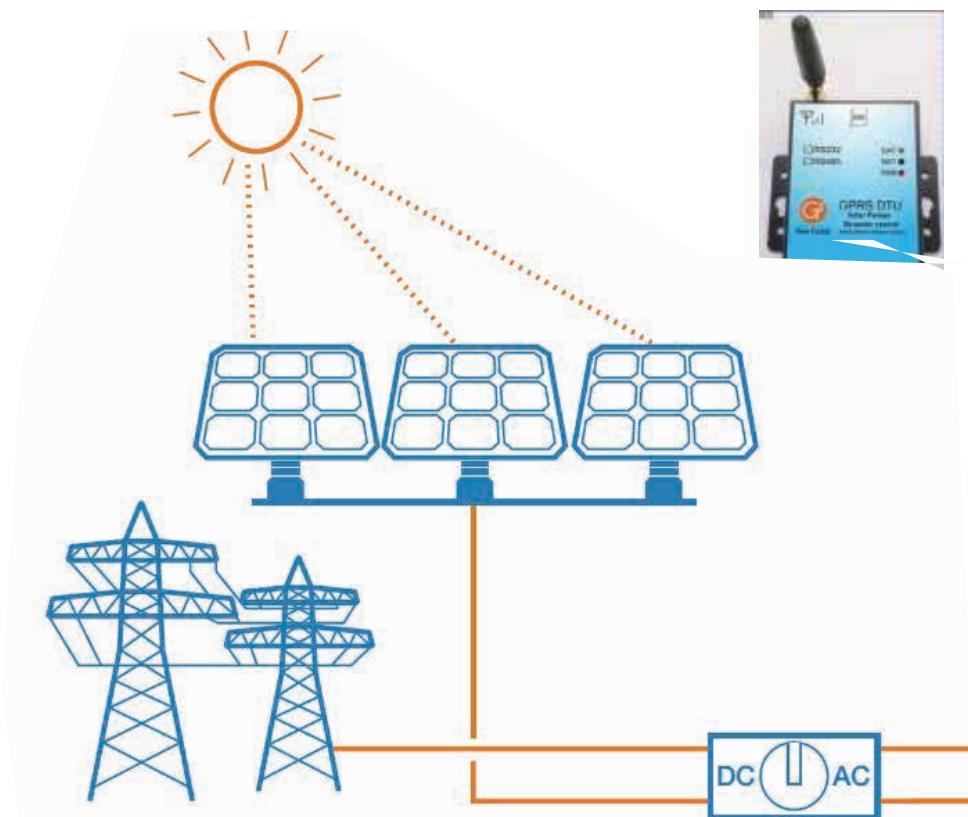
Built-in flow measurement and sensorless flow calculation.
And easy to get how much energy Generated by this system with Generated energy and calculating

Advanced function
automatic start and stop of the drive when there is enough power available.
(auto/manual)

Remote monitoring With the addition of optional GPRS modules you can monitor and configure drive and application parameters from anywhere via Modbus RTU

Best off-grid solution Where electricity is very erratic and unpredictable, farmers need not to depend on grid electricity for their agricultural requirements Low-carbon economy
With utilization of solar power, MULTIFIT drives help in reducing your carbon footprint

Multiple pump motors with a single drive control Standard asynchronous motors as well as more efficient permanent magnet syn. motors.
(PMSM)



Save in energy costs and maximize productivity

solar pump drives ensure reliable power supply throughout the day with on and off-grid compatibility

Reduce maintenance costs

The drives can be equipped with remote monitoring options, reducing maintenance trips to the site

Save environment

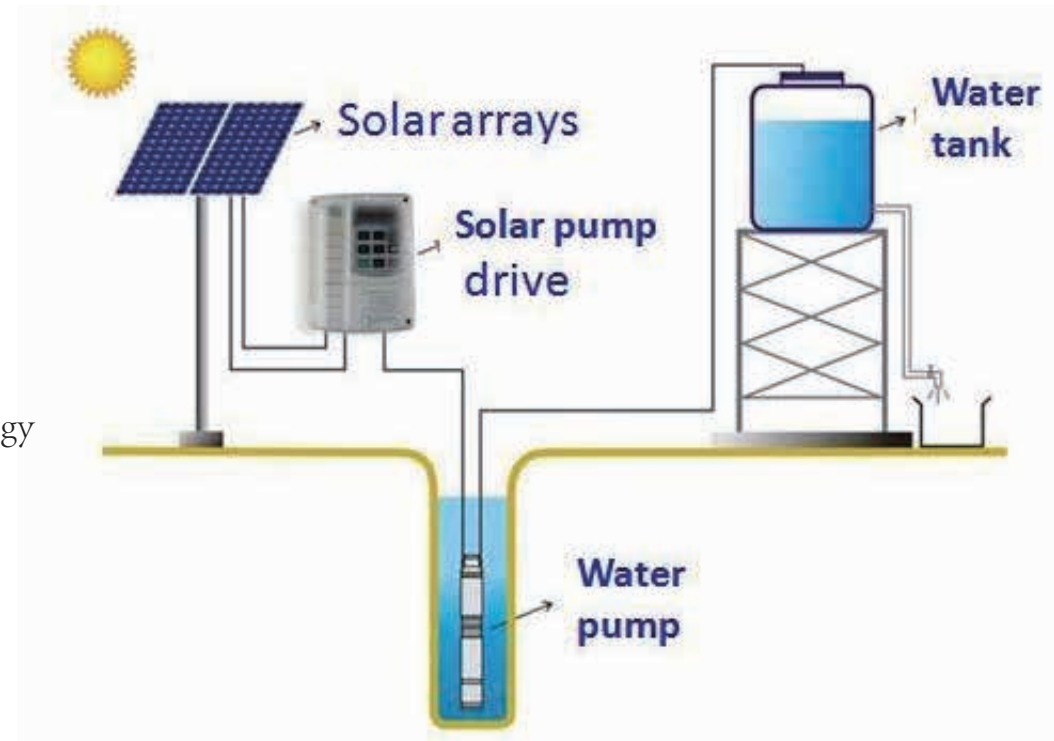
Harnessing the power of sun provides an environmentally friendly pumping without producing any CO₂ emissions

Easy install and operation

and little parameters configuring. End user, who never used drive before, can install and operate it very well.

Reduce operational risk

Embedded pump-specific features such as dry run detection,
Minimum power input protection Maximum current protection
Minimum frequency running protection Flow and generated energy showing



4. Technical Specification

Recommended MPPT voltage range-----90 ~350V DC input for 110V/160V/220V pumps, 0.75kw to 1.5kw 200~400VDC for 220VAC/240V pumps with 0.75 Kw to 4kw. 250~800VDC, for 380VAC pumps with 1.5kw to 45kw

Recommended input voltage-----170 Vmp DC for 110V AC pumps. 260Vmp DC for 160V AC pumps.
350Vmp DC for 220V AC pumps, 620Vmp DC for 220V AC pumps

Motor type-----Control for permanent magnet servo motor and asynchronous motor pumps.

Maximum DC power input-----400VDC for 220AC output /800VDC for 380V AC output

Rated output voltage-----3-phase , 110V/160V/220V. 3-phase, 220V/380V/480V

Output frequency range 0~50/60Hz

MPPT efficiency-----97%,

Ambient temperature range----- (G-type inverter with submersible pumps, and P type for general pumps.

Solar pump control special performance-----MPPT (maximum power point tracking), CVT (constant voltage tracking), auto/manual operation, dry run protection, low stop frequency protection, minimum power input, motor maximum current protection, flow calculating, energy generated calculating.

Protection function -----Phase loss protection, phase short circuit protection , ground to phase circuit protection , input and output short circuit protection. Stall protection

Protection -----IP20, Air force cooling

Running mode-----MPPT or CVT

Altitude-----Below 1000m; above 1000m, derated 1% for every additional 100m. Standard AC input backup circuit

CE, Design based on vector control drive MULS300 and MULS3200 series, more specification please refer to MUL S300 or MULS320 vector control drive operation manual

2.2. Solar pump drive features:

Save in energy costs and maximize productivity

Solar pump drives ensure reliable power supply throughout the day with on and off-grid compatibility.

Save environment

Harnessing the power of sun provides an environmentally friendly pumping without producing any CO2 emissions

Easy install and operation and little parameters Configuring.end user ,who never used drive before, can Install and operation it very well.

Reduce maintenance costs

The drives can be equipped with remote monitoring options, reducing maintenance trips to the site.

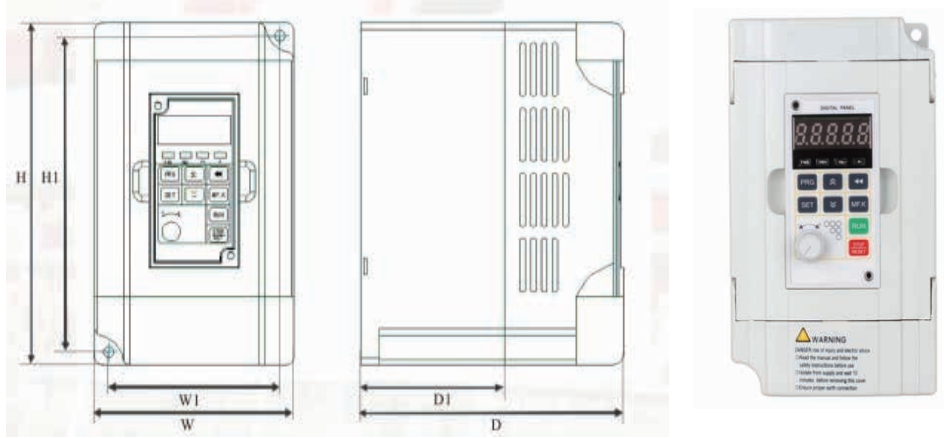
Reduce operational risk

Embedded pump-specific features such as dry run detection, minimum power input protection, maximum current protection, stop frequency running protection.

Models and specification

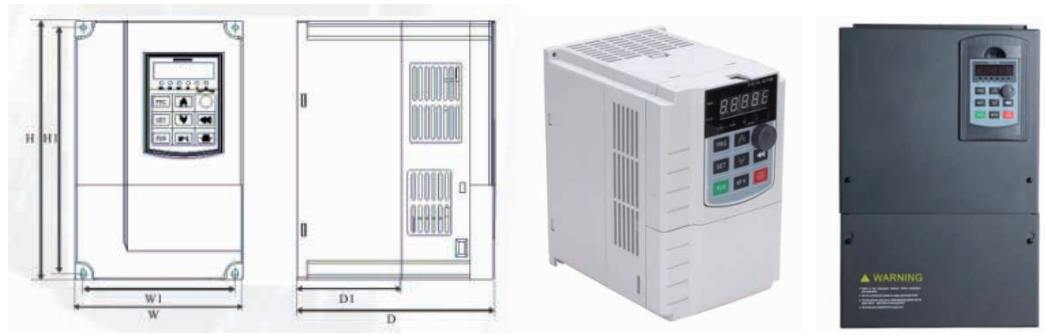
SN	Models	Rate current	DC input range (VDC)	Output voltage	Applicable for pumps	Installation size (mm)	MPPT voltage (V)	Fig
Mini type 2S series : 150 to 400 VDC or 200 to 240VAC								
1	MTLS-0K75KWP-2S-W	4A	150 to 400	220V/240V	0.75KW	170*110*70	220~400	Fig 1
2	MTLS-0K75KWP-2S-M	4A	150 to 400	220V/240V	0.75KW	143*86*114	220~400	Fig 1
3	MTLS-1K5KWP-2S-M	7A	150 to 400	220V/240V	1.5KW	143*86*114	220~400	Fig 1
Mini type 4T series : 250 to 800 VDC or 380 to 460 VAC								
4	MTLS-0K7KWP-4T-M	2.5A	250 to 800	380V-440V	0.75KW	143*86*114	480~560	Fig 1
5	MTLS-1K5KWP-4T-M	3.7A	250 to 800	380V-440V	1.5KW	143*86*114	480~560	Fig 1
6	MTLS-2K2KWP-4T-M	5A	250 to 800	380V-440V	2.2KW	143*86*114	480~560	Fig 1
General type 2S series : 150 to 400 V DC or 200 to 240 V AC								
7	MTLS-0K7KWP-2S	4A	150 to 400	220V/240V	0.75KW	185*125*159	220~400	Fig 2
8	MTLS-1K5KWP-2S	7A	150 to 400	220V/240V	1.5KW	185*125*159	220~400	Fig 2
9	MTLS-2K2KWP-2S	10A	150 to 400	220V/240V	2.2KW	185*125*159	220~400	Fig 2
10	MTLS-4K0KWP-2S	16A	150 to 400	220V/240V	4.0KW	245*150*177	220~400	Fig 2
General type 4T series : 250 to 800 VDC or 380 to 460VAC								
11	MTLS-0K7KWP-4T	2.5A	250 to 800	380V-440V	0.75KW	185*125*159	480~560	Fig 2
12	MTLS-1K5KWP-4T	3.7A	250 to 800	380V-440V	1.5KW	185*125*159	480~560	Fig 2
13	MTLS-2K2KWP-4T	5A	250 to 800	380V-440V	2.2KW	185*125*159	480~560	Fig 2
14	MTLS-4K0KWP-4T	10A	250 to 800	380V-440V	4.0KW	185*125*159	480~560	Fig 2
15	MTLS-5K5KWP-4T	13A	250 to 800	380V-440V	5.5KW	245*150*177	480~560	Fig 2
16	MTLS-7K5KWP-4T	17A	250 to 800	380V-440V	7.5KW	245*150*177	480~560	Fig 2
17	MTLS320-011KWP-4T	22A	250 to 800	380V-440V	11KW	247*160*178	480~560	Fig 2
18	MTLS320-015KWP-4T	30A	250 to 800	380V-440V	15KW	247*160*178	480~560	Fig 2
19	MTLS-018KWP-4T	37A	330 to 800	380V-440V	18KW	323*217*140	480~560	Fig 3
20	MTLS-022KWP-4T	45A	330 to 800	380V-440V	22KW	432*285*225	480~560	Fig 3
21	MTLS-030KWP-4T	60A	330 to 800	380V-440V	30KW	432*285*225	480~560	Fig 3
22	MTLS-037KWP-4T	75A	330 to 800	380V-440V	37KW	432*285*225	480~560	Fig 3
23	MTLS-045KWP-4T	90A	330 to 800	380V-440V	45KW	550*385*270	480~560	Fig 3
24	MTLS-055KWP-4T	110A	330 to 800	380V-440V	55KW	550*385*270	480~560	Fig 3
25	MTLS-075KWP-4T	150A	330 to 800	380V-440V	75KW	550*385*270	480~560	Fig 3
26	MTLS-090KWP-4T	180A	330 to 800	380V-440V	90KW	600*343*307	480~560	Fig 3
27	MTLS-110KWP-4T	220A	330 to 800	380V-440V	110KW	900*443*380	480~560	Fig 3
28	MTLS-132KWP-4T	260A	330 to 800	380V-440V	132KW	900*443*380	480~560	Fig 3

3.8. MTLs series solar pump drive dimensions



Mini type Fig 1

Power	H	H1	W	W1	D	D1	Hole
0.4~1.5KW	143	132	86	74	114	62.5	Ø4.5



General type Fig 2

Power (3 phase 380V output)	H	H1	W	W1	D	D1	hole
0.75~4KW	185	173	125	115	159	79	Ø5
5.5~7.5KW	244	232	150	136	176.5	93	Ø5
11kw -15kw	247	235	160	147	178	101	Ø5

Power (3 phase 380V output)	Inverter size				Install size/ hole		
	W	H	D	H2	W1	H1	D
MTLS-018KWP-4T	285	463	225	432	235	447	Φ8
MTLS-022KWP-4T							
MTLS-030KWP-4T							
MTLS-037KWP-4T	385	600	550	270	260	590	Φ9
MTLS-045KWP-4T							
MTLS-055KWP-4T							
MTLS-075KWP-4T	473	700	660	307	343	678	Φ10
MTLS-90KWP-4T							
MTLS-110KWP-4T							
MTLS-132KWP-4T	579	930	880	375	449	905	Φ10
MTLS-160KWP-4T							