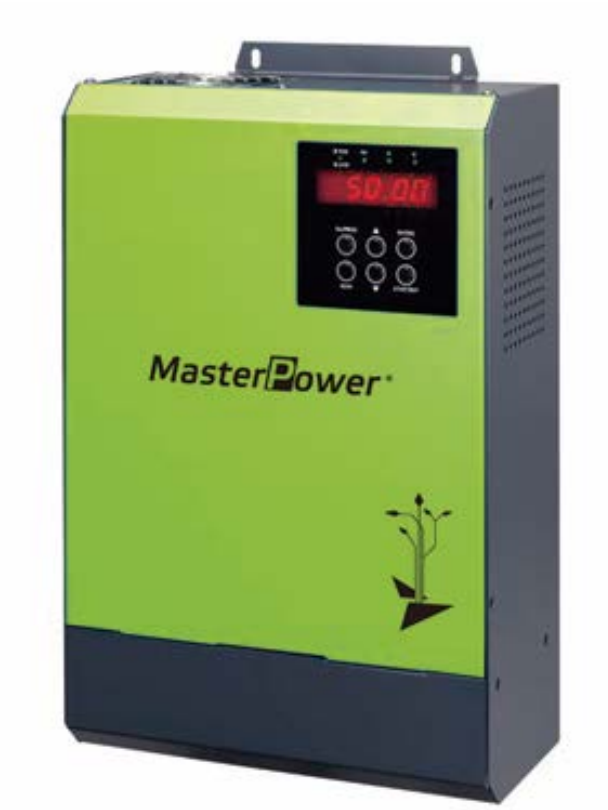
MasterPower®

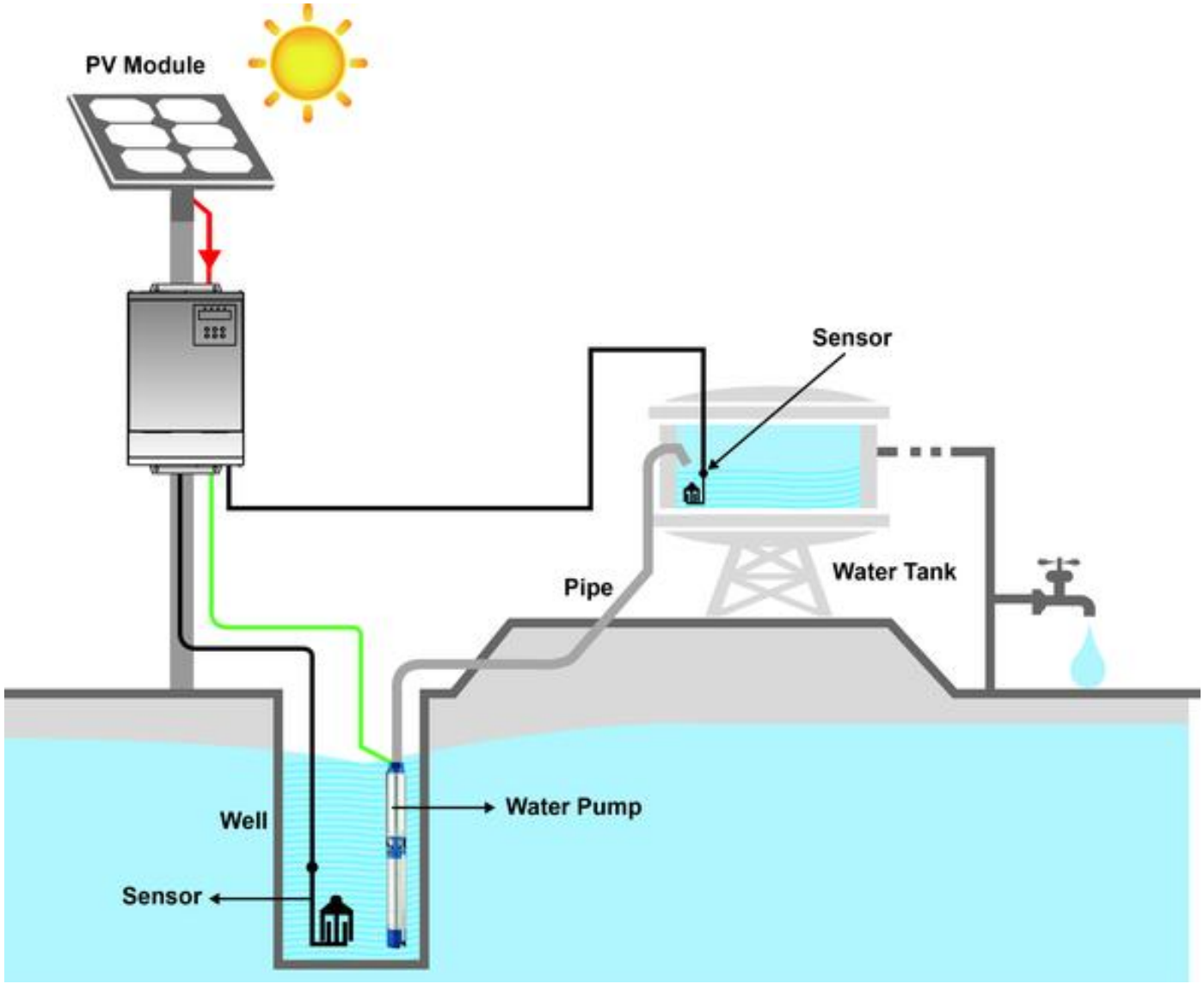
OMEGA

Solar Water Pump Inverter



Master Power Technology Corporation

Typical Application



Key Features

- Built-in MPPT solar charger
- Supports three-phase asynchronous motor
- Built-in full protection and self-diagnosis
- Soft stop function prevents water hammer effect and extends system lifecycle
- Comprehensive LEDs and display screen for real-time system status
- Remote monitoring through RS-485

Outstanding Features

- Water Pump Inverter sometimes is also called “Pump Driver” or “Pump Controller”. This inverter is used to manage the motors to make the water pump operation smoothly and extend the lifetime during the service.

- Aspire solar pump inverter would convert the PV power to drive the motor directly. There is no battery for energy storage on this inverter. The battery-less design would help to reduce the system maintenance cost and the inverter would work when sun raises and it will turn off automatically after sunset which is suitable for the remote sides.

- Inbuilt the MPPT SCC to maximize the PV energy for the connected loads.

- Supporting the soft start to reduce the starting surge current. Soft stop to avoid the “Water Hammer Effect” to extend the system service time.

- Inbuilt the real time protections for Dry Pumping, Phase Loses, Motor Locked, Short Circuit, Water Level Detection, Anti-Lightning, Over-Heating.

- LED/LCD display the real time system status and parameter setting

- The RS232/RS485 remote monitoring system will be ready in the near future.

What are the differences to PV Inverter and UPS

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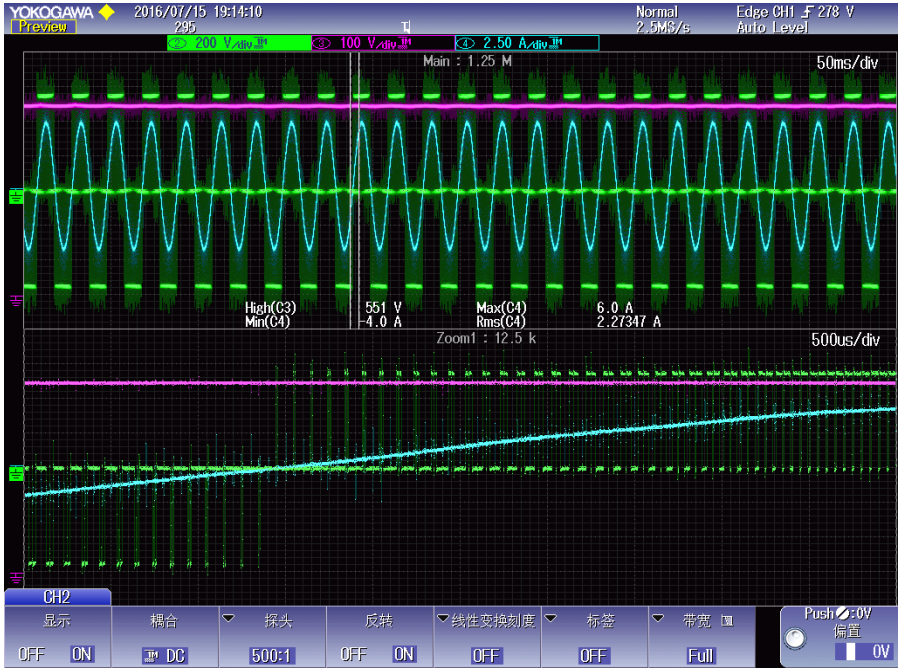
- The typical output of PV Inverter or UPS is Pure Sinewave of 380/220Vac with 50/60Hz. But the output of Aspire is High Frequency Impulse with Sinewave current waveform. The Sinewave current could make the motors running smoothly without bring the initial surge current.
- Aspire uses the fixed V/F ratio at V/F=380V/50Hz. We change the F to adjust the motor speed and the maximum F is less than 50Hz.



Comparison - General

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Input Type	PV Input		
Brand	**Aspire**	**Ixxx**	**Sxx**
Static Performance	**Good**	Worst	Worse
Dynamic Performance	**Good**	Good	Worse
MPPT Performance	**Good**	Worse	Worst
Speed Control	**Good**	Worse	Worst
Low PV Input	**Working**	Working	No Working
Constant Voltage Setting	**Yes**	Yes	No
Pump Noise	**Normal**	Normal	Big
Low Frequency Noise	**Normal**	Normal	Big
LCD Display	**Real Status**	Setting Only	Setting Only

Comparison – Soft Start

- During the Soft Start Period. Aspire offers smooth output current for the connected pump. Sxx brand Inverter has unstable output voltage and worst current. Ixxx brand Inverter has worst current and unstable output voltage which may set the inverter gets fault.

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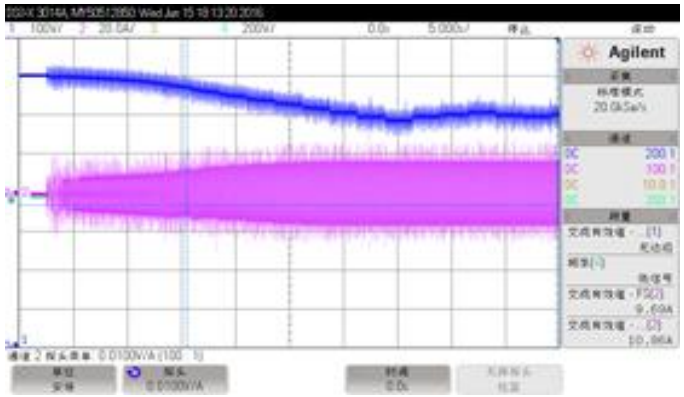
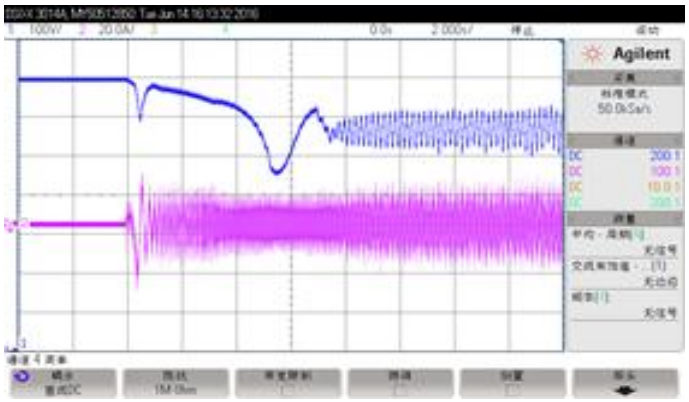
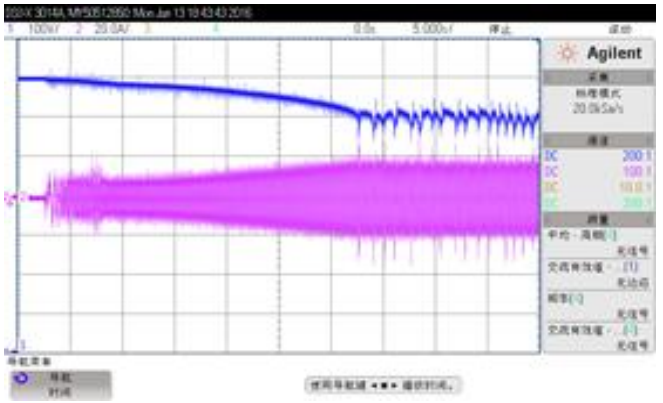




Ixxx Brand



Sxx Brand

Comparison – Sufficient PV Input

- From below waveform, Aspire provides the stable voltage and current output with best MPPT performance. But Sxx brand Inverter is worse and Ixxx brand Inverter is with worst performance.

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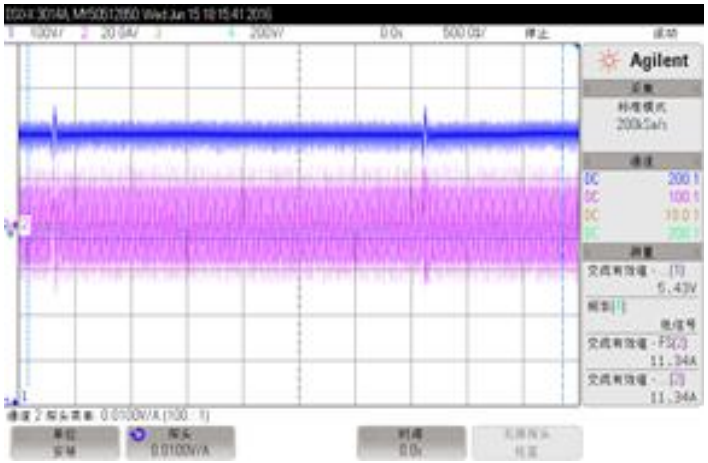
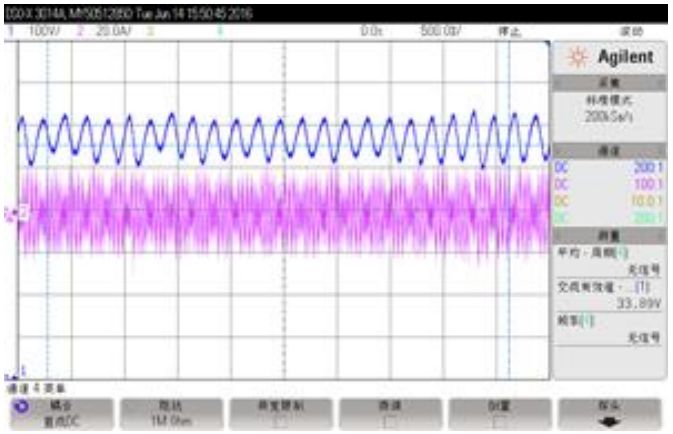
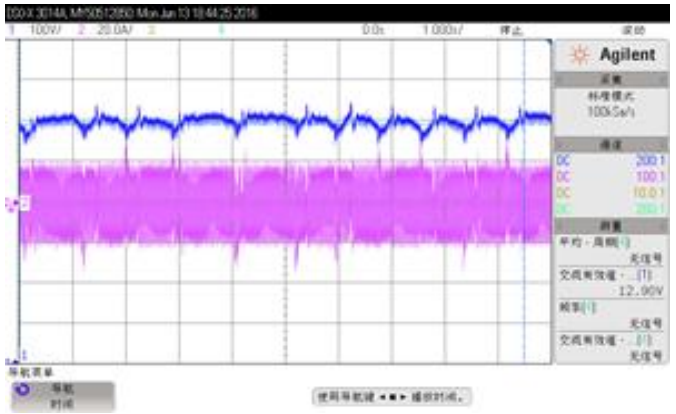




Ixxx Brand



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Comparison – PV Input is not stable

- Even with variable PV input, Aspire still could adjust the output to keep the system running stable. But Sxx & Ixxx brand inverter both switch to fault mode then turn off the output.

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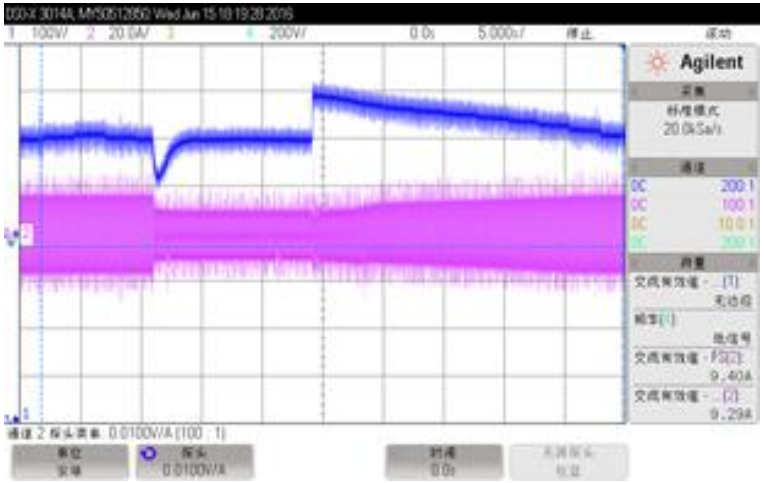
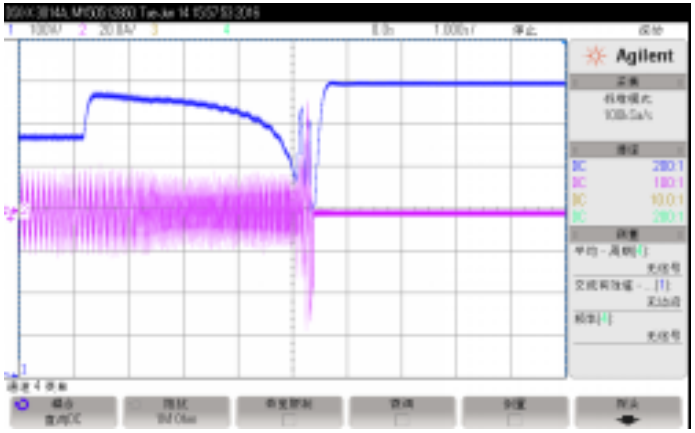
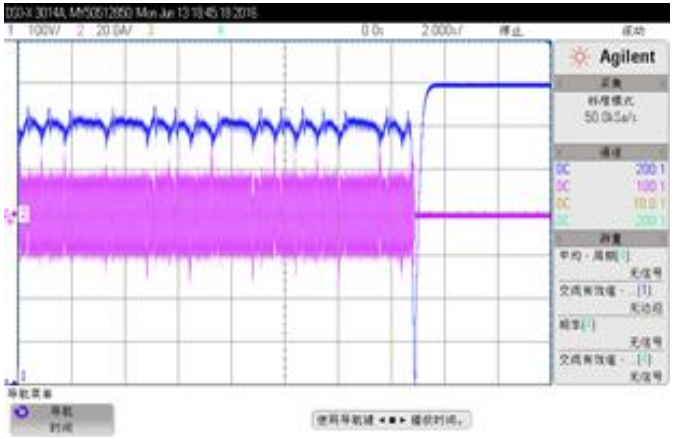




Ixxx Brand



Sxx Brand

Pump Selection and System Configuration

- The available power rating of Aspire is 2.2KW/7.5KW/11KW for 3 different models.
- Aspire only supports the 3-Phase AC motor for 380/400/415/4440Vac voltages.
- Aspire could not support the 1-Phase AC motor even the rating is smaller than 1-Phase Power of the Aspire.
- Aspire only could support the pump with less or equal rating. Aspire could not support the rating of pump higher than the Inverter rating.
- After the first time connecting the pump to Aspire, user needs to do the initial configuration according to the spec label of the pump on Rated Voltage/Rated Current/Rated Frequency and Rated capacity. This configuration is only needed for the 1st time after pump installation.

Panel Configuration

MODEL	OMEGA 2.2KW	OMEGA 7.5KW	OMEGA 11KW
Maximum DC Voltage	800 VDC		
MPPT Voltage Range	500 VDC ~ 600VDC		
Number of MPP Trackers	1		
Maximum Input Current	5.8 A	20.5 A	27 A

- We recommend the total PV Vmp is around 560Vdc to get the maximum MPPT output.

- Panel Types:

  A. 75-A: 75W, Vmp=17.46V, Imp=4.3A, Voc=21.96V

  B. 75-B: 75W, Vmp=13.3V, Imp=5.64A, Voc=16.94V

  C. 140-A: 140W, Vmp=17.9V, Imp=7.82A, Voc=22.0V

  D. 250-A: 250W, Vmp=30.64, Imp=8.16A, Voc=37.38V

MODEL	Aspire 2.2KW	Aspire 7.5KW	Aspire 11KW
PV Panel 75-A	32 in Series (2400W PV Panels)		
PV Panel 75-B	42 in Series (3150W PV Panels)		
PV Panel 140-A		32 in Series x 2 Strings (8960W PV Panels)	32 in Series x 3 Strings (13440W PV Panels)
PV Panel 250-A		19 in Series x 2 Strings (9500W PV Panels)	19 in Series x 3 Strings (14250W PV Panels)

Omega Spec

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MODEL	OMEGA 2.2KW	OMEGA 7.5KW	OMEGA 11KW
Maximum PV Array Power	3500 W	12000 W	17600 W
Rated Output Power	2200 W	7500 W	11000 W
PV INPUT (DC)			
Maximum DC Voltage	800 VDC		
Start-up Voltage	350 VDC		
MPPT Voltage Range	500 VDC ~ 600VDC		
Number of MPP Trackers	1		
OUTPUT			
Nominal Voltage	3 x 380/400/415/440 VAC		
Efficiency	> 97%		
Output Current	5.1 A	17 A	26 A
Motor Type	Three-phase asynchronous motor		
Frequency Precision	±0.2%		
PROTECTION			
Full Protection	Over-voltage, under-voltage, over-current, surge, over-temperature and short circuit protection		
PHYSICAL			
Dimension, D X W X H (mm)	110 x 230 x 342		
Net Weight (kgs)	5.5	6	6.5
Type of Mechanical Protection	IP20		
INTERACE			
Communication Port	RS-232/RS-485		
ENVIRONMENT			
Humidity	< 95% RH (No condensing)		
Operating Temperature	-20°C~45°C at 100% full load, 46°C~60°C power derating		