

# DriveE-Tech Solar



- 3.022 MP**
- 3.030 MP**
- 4.040 MP**
- 4.055 MP**
- 4.075 MP**
- 4.110 MP**
- 4.150 MP**



**DrivE-Tech Solar** inverters are designed to power traditional pumping systems using solar energy. This way it is possible to convert old systems into renewable energy installations or to use the same AC pumps to create independent, cost-saving and environmentally sustainable water systems.

The device is able to convert DC voltage coming from solar panels into AC voltage for powering any pump driven by a three-phase motor.

Pump speed is constantly adapted to available solar irradiation thus maximising the amount of pumped water and making possible operation even in conditions of low sunlight.

The device also offers complete pump protection against surges, overloads and dry running.



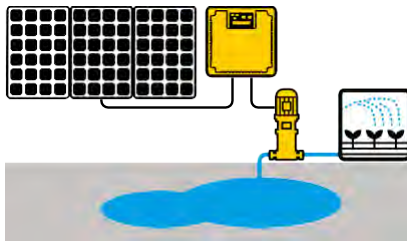
## Designed to resist

DrivE-Tech Solar is built entirely of Aluminium to ensure maximum cooling and durability. All other metal parts are made using AISI 304 stainless steel and therefore resistant to corrosion.

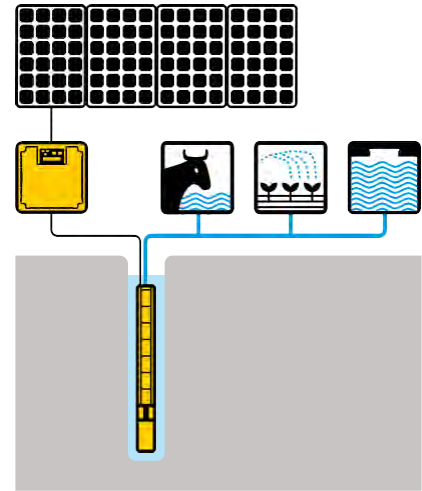
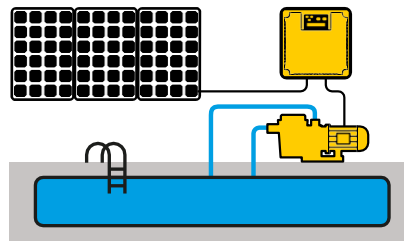
Two independent external fans and an internal fan provide perfect cooling. Their operation is adjusted according to actual thermal conditions, thus extending life.

DrivE-Tech Solar can be used with any type of traditional AC pump, thereby offering maximum flexibility in several areas of application.

When using surface pumps, device can be used for an irrigation system drawing water from a nearby water supply, or powering a pool pump at no cost.



When using submersible pumps, it is possible to fill tanks for watering livestock or simply irrigate lawns or crops.

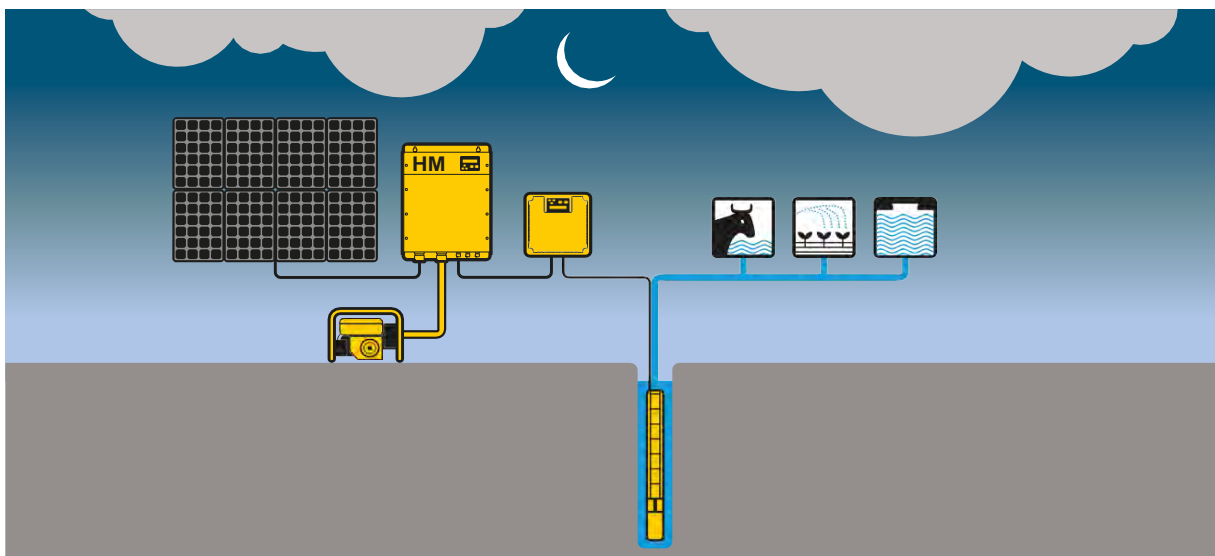


The inverter, in MP (MultiPower) version, can be powered in DC by solar panels or in AC by network or generator

to ensure the functioning of the pump at any hour of the day. This controls the peaks of water demand using AC input to avoid the oversizing of the photovoltaic system. HMA accessory,

used in combination with Solar MP models, manages independently the exchange from a source of energy to another on the basis of several options that can be select by the user:

- irradiance level
- hour of the day
- achievement of the requested daily range
- remote control trough digital command

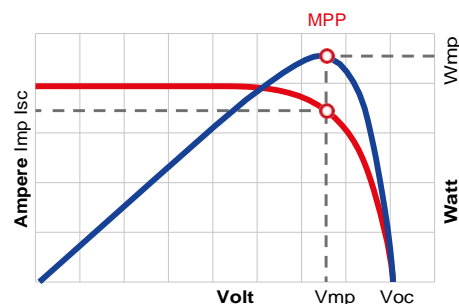


# MPPT: always the maximum power available

Based on the varying conditions of solar irradiation and temperature, MPPT (Maximum Power Point Tracking) maximises the electrical power drawn from the panels and therefore the amount of water pumped.

The greater the solar irradiation the faster the pump's rotation speed, and consequently water flow increases.

When solar irradiation decreases (due to clouds or the different times of day), the pump reduces frequency and therefore the flow, but it continues to provide water until the irradiation falls below a minimum level necessary to ensure operation.



## Monitoring parameters

The inverter is equipped with a backlit alphanumeric display and is designed to monitor key electrical parameters like input voltage, power, current and motor power factor.

It is also possible to connect a pressure or flow sensor to monitor performance levels.

In the diagnosis menu are recorded inverter and motor hours, operation statistics, and the last eight alarms occurred. The programming menus are password-protected to prevent unwanted tampering.

## Unmatched user experience

Thanks to the FE Connect DrivE-Tech app it is possible to communicate with all DrivE-Tech SMART Bluetooth® devices in order to:

- Monitor multiple operating parameters simultaneously on the wide, high definition colour screen of your smartphone or tablet.
- Get energy consumption statistics and check the alarm log.
- Develop programs, save them in the archive, copy them to other devices and share them among multiple users.
- Create reports with the possibility of adding notes and images, and email or store them in the digital archive.
- Remotely control a DrivE-Tech device via Wi-Fi or GSM by tethering to a nearby smartphone.





# Advanced connectivity

It is possible to connect:

- An alarm
- A motor run/stop signal
- A pressure sensor or a flow sensor for monitoring
- Up to four digital inputs for pump start and stop (float switch, level sensors, etc.)
- Modbus RTU



# Complete pump protection

The device is able to protect the pump against overload and dry running.

Dry running protection is performed by monitoring the motor's power factor and therefore probes are not required.

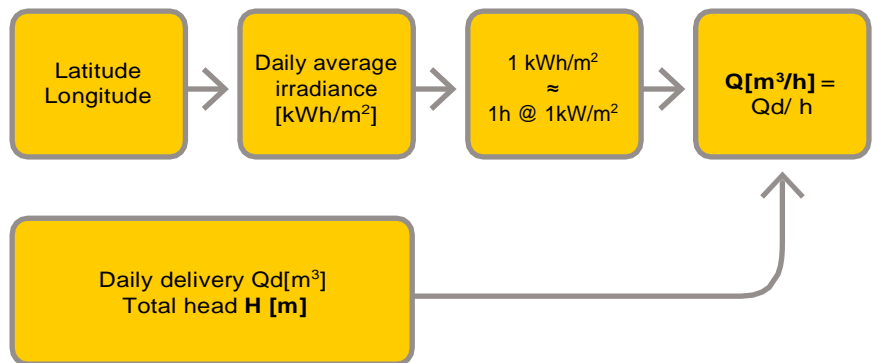
The device also protects itself against surges and overheating.



# PV system sizing

The pumping system must be designed taking into account the required daily flow rate, total head and the installation site.

In particular, the choice of the pump must be made considering the average daily solar irradiation.



Once the appropriate pump has been identified, it is necessary to know:

- Rated pump power (P2)
- Electrical motor power (P1). P1 can be derived by dividing P2 by motor efficiency.
- Rated motor current
- Rated motor voltage  
3 x 230 VAC or  
3 x 400 VAC

The inverter model to be used is determined by considering voltage and rated motor current.

To ensure maximum performance, the solar system consisting of one or more strings of solar panels connected in series - must provide:

**Electrical motor power (P1).** The photovoltaic power (Wp) must be at least equal to the electric motor power (P1). Typically, taking into account

the efficiency loss due to panel temperature, it is recommended to increase Wp by 15% with respect to P1.

### Rated motor voltage.

The rated voltage of each string of solar panels (Vmp) must be at least equal to the rated motor voltage multiplied by the factor 1.4.

**The open-circuit voltage** of each string (Voc) must be less than inverter's maximum operating voltage.

## Example

### Pump nameplate.

- Rated motor power:  
P2 = 3 kW
- Electric motor power:  
P1 = 4 kW
- Rated motor current:  
8.3 A
- Rated motor voltage:  
3 x 400 VAC

### Model selection.

The rated motor voltage being 400 VAC and the rated current 8.3 A, the most suitable model for the application is VS409.

### PV system sizing.

PV panels used:

- Wp = 240 W
- Vmp = 30 VDC
- Voc = 37 VDC
- Imp = 8 A

Since P1 = 4 kW the required electrical power is increased by 15% so Wp = 4.6 kW.

To develop 4.6 kW 19 panels of 240 W are needed.

Vmp = 19 x 30 = 570 VDC is greater than the rated motor voltage multiplied by 1.4 (400 x 1.4 = 560 VDC) and Voc = 19 x 37 = 703 VDC is less than the maximum voltage of VS409 (850 VDC).

For this reason, a single string of 19 panels can be installed.

# Technical specifications

Model	Vin DC VDC	Vin AC * VAC	Vin, P1 nom** VDC	Max Vout VAC	Max I out A	Typical motor P2***		Size
						VAC	kW	
3.022 MP	1 60 – 650	3x190-520	> 320	3 x 250	12	3 x 230	2,2	2
4.030 MP	320 – 850	3x190-520	> 560	3 x 460	9	3 x 400	3	2
4.040 MP	320 – 850	3x190-520	> 560	3 x 460	12	3 x 400	4	2
4.055 MP	320 – 850	3x190-520	> 560	3 x 460	15	3 x 400	5,5	2
4.075 MP	320 – 850	3x190-520	> 560	3 x 460	18	3 x 400	7,5	2
4.110 MP	320 – 850	3x190-520	> 560	3 x 460	25	3 x 400	11	2
4.150 MP	320 – 850	3x190-520	> 560	3 x 460	30	3 x 400	15	2

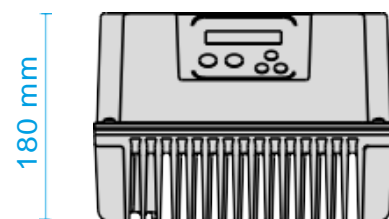
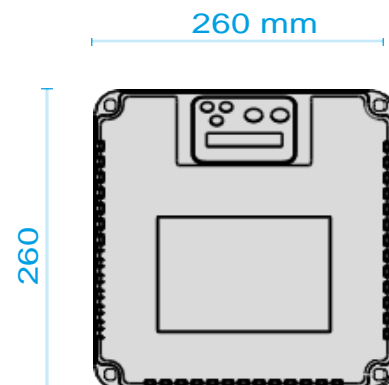
\* AC power available only for MP (MultiPower) models.

\*\* Input voltage necessary to obtain 100% of rated motor power.

\*\*\* Typical motor power. It is recommended to refer to the rated motor current when selecting the Drive-Tech Solar model.

## Electrical characteristics

- Rated ambient temperature: -10 to 50°C (14 to 122°F).
- Operating temperature: -10 to 60°C (14 to 140°F).
- Max altitude at rated current: 1000 m.
- Protection degree:  
IP66 (NEMA 4X) (Size 2), IP54 (NEMA 12) (Size 3, 4).
- Digital outputs configurable as N.O or N.C:
  1. Motor run signal
  2. Alarm signal
- Analog inputs, (10 or 15 VDC):
  1. 4-20 mA
  2. 4-20 mA
  3. 4-20 mA or 0-10 VDC
  4. 4-20 mA or 0-10 VDC
- 4 digital inputs, configurable as N.O or N.C, for motor start/stop
- MODBUS RTU RS485  
Bluetooth® SMART (4.0)



Size 2

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**1300 670 060**  
**franklinwater.com.au**

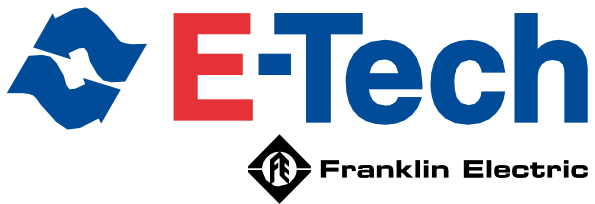


**Franklin Electric**



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# DrivE-Tech

## MINI-Solar



# Ideal for any kind of solar pumping application

## It ensures:

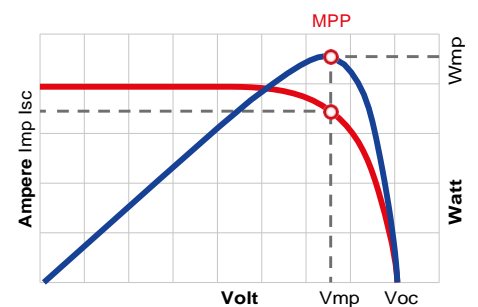
- New solar pumping systems creation.
- Conversion of existing systems into solar pumping systems.
- Control of both three-phase and single-phase pumps.
- Soft start and soft stop.
- Installation on humid and dusty environments made possible by IP66 (NEMA 4X) protection degree.
- Easy and fast commissioning thanks to initial configuration wizard.
- High thermal and mechanical performance thanks to aluminium case and independent ventilation.



## MPPT: always the maximum power available

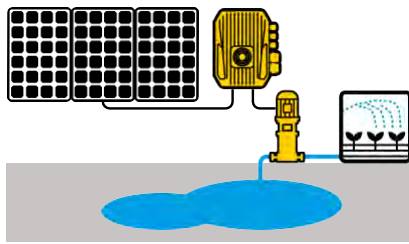
Based on the varying conditions of solar irradiation and temperature, MPPT (Maximum Power Point Tracking) maximises the electrical power drawn from the panels and therefore the amount of water pumped. The greater the solar irradiation the faster the pump's rotation speed, and consequently water flow increases.

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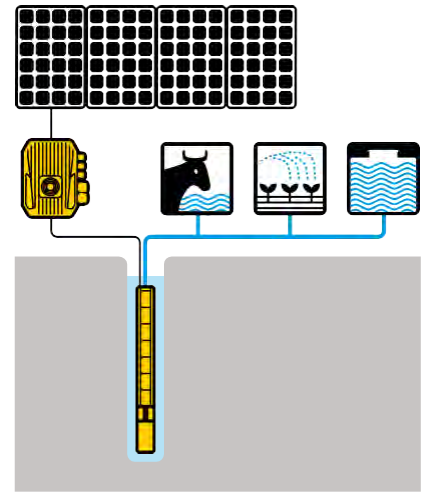
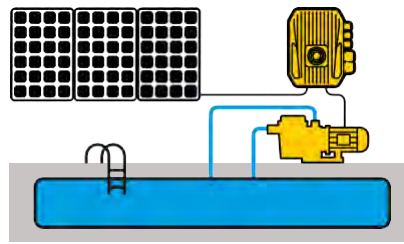


MIDA Solar can be used with any type of traditional AC pump, thereby offering maximum flexibility in several areas of application.

When using surface pumps, MIDA Solar can be used for an irrigation system drawing water from a nearby water supply, or powering a pool pump at no cost.



When using submersible pumps, MIDA Solar can fill tanks for watering livestock or simply irrigate lawns or crops.

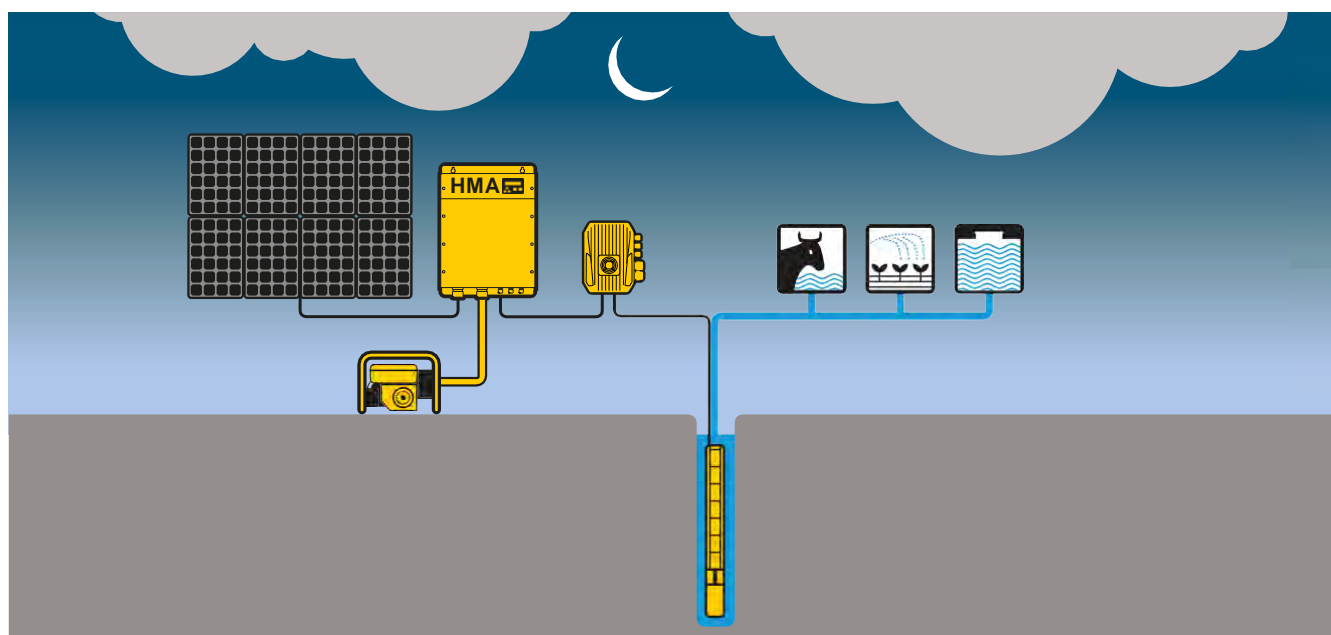


MIDA Solar, in MP (MultiPower) version, can be powered in DC by solar panels or in AC by network or generator

to ensure the functioning of the pump at any hour of the day. This controls the peaks of water demand using AC input to avoid the oversizing of the photovoltaic system. HMA accessory,

used in combination with MIDA Solar MP models, manages independently the exchange from a source of energy to another on the basis of several options that can be select by the user:

- irradiance level
- hour of the day
- achievement of the requested daily range
- remote control trough digital command.



# Automatic voltage adjustment

MIDA Solar is equipped with an internal “boost” circuit able to increase the voltage coming from solar panels. In this way the sizing of the photovoltaic system is independent of the pump’s nominal voltage and only proportional to its power. This implies a significant saving in the number of the solar panels, compared to systems without boost.

Example:

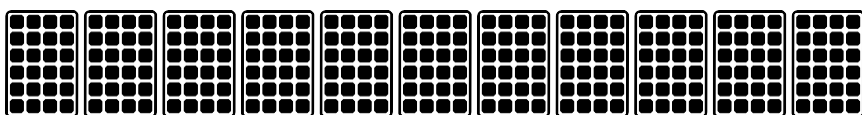
Pump power: 0,75 kW

Motor’s nominal voltage: 3x230 VAC

Recommended photovoltaic system power: 1250 W

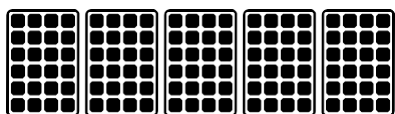
## Without boost

In order to allow the pump to reach the maximum frequency (maximum speed) it is necessary to guarantee at least 320 VDC input thus it is necessary to install 11 panels 250 Wp, totally 2750 Wp.



## With boost

Thanks to the voltage boost integrated in MIDA Solar, only 5 panels 250 Wp are needed, with a consequent saving of 6 panels.



\* The example considers panels 250 Wp, 30 Vmp, 37 Voc



## Built-in protections against:

- Overvoltage and undervoltage.
- Overcurrent and no load.
- Dry running.
- Overtemperature.

## Advanced motor controls:

- Control of single phase motors.
- Next generation control of asynchronous motors.
- Sensorless control of permanent magnet synchronous motors.

## EMC compatibility for residential environment:

- Integrated PFC (P.F. 1) to meet EN61000-3-2
- Integrated input filter for Category C1 (EN61800-3), Class B (EN55011)





# Unmatched user experience

Thanks to Nastec NOW App it's possible to communicate with all Nastec devices Bluetooth® SMART in order to:

- Monitor multiple operating parameters simultaneously on the wide, high definition, coloured screen of your smartphone or tablet.
- Get statistics of energy consumption and check alarms history.
- Make programs, save them in the archive, copy them to other devices and share them among multiple users.
- Perform reports with the possibility to insert notes, images and email them or keep them into the digital archive.
- Remotely control, via wi-fi or GSM, a Nastec device, using a smartphone nearby as a modem.



**Alarm details**

Title: UNDERVOLTAGE

Alarm: UNDERVOLTAGE

Description: Power supply voltage is lower than limit or not enough energy is available from power source. If input voltage is verified to be within limits and still UNDERVOLTAGE alarm comes-out, contact technical service.

**Test VS430 param8**

Parameter	Value
Control mode	Constant value 2 set
Max alarm value (°C)	10.0
Min alarm value (°C)	3.5
External air passing	<input type="checkbox"/>
Set value (°C)	-1.0
Compressor (°C)	-0.5
Set value (°C)	-2.0
Compressor set (°C)	-0.1
Value set supply (Hz)	5
Frequency max control (Hz)	50
Stop delay (sec)	5
Control ramp (sec)	40.0
Defrost (°C)	0.5

**Guide**

- UNDERVOLTAGE: Power supply voltage is lower than limit or not enough energy is available from power source.
- OVERVOLTAGE: Power supply voltage is higher than limit.
- DRY RUN COSPHI: Motor compressor is low from the dry run condition.
- OVERCURRENT MOTOR: Motor current is higher than the rated maximum.
- SENSOR FAULT: Sensor reading error.
- OVER TEMPERATURE INVERTER: Inverter over temperature.
- IGBT TRIP ALARM: The inverter driver by the load exceeds the capacity.
- NO COMMUNICATION: Communication between master and slave is broken.

**Remote**

STATE: Ready

**Allow to be controlled**  
Give the following ID to the operator, then confirm the request.  
YOUR ID: 548 003 081

**Control another device.**  
Insert here the ID provided by remote operator and send access request.

**CONTROL REMOTE DEVICE**



# Technical specifications

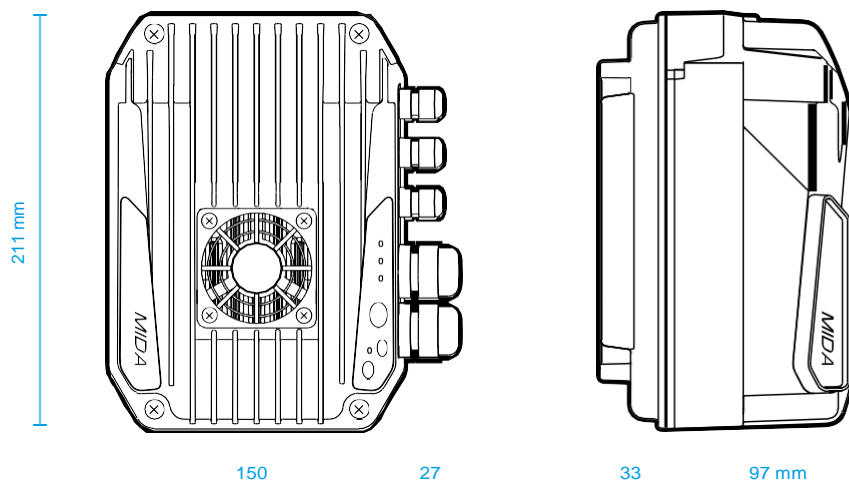
Model	V in DC	V in AC *	Max V out	Max I out	P2 motor power **		Size	Net Weight	Packing dimensions	Total weight
	VDC	VAC	VAC	A	VAC	kW				
MINI Solar 2.005MP	90 - 400	90 - 265	250	3,5	1 x 230 3 x 230	0,37 0,55	1	2,6	220x170x170	2,8
MINI Solar 2.011MP	90 - 400	90 - 265	250	5	1 x 230 3 x 230	0,55 1,1	1	2,6	220x170x170	2,8
MINI Solar 2.015MP	90 - 400	90 - 265	250	7,5	1 x 230 3 x 230	0,75 1,5	1	2,6	220x170x170	2,8

\* AC power available only for MIDA Solar MP models.

\*\* Typical motor power. It is recommended to refer to rated motor current when selecting the MIDA Solar model.

## General specifications

- Rated frequency: 50 - 60 Hz (+/- 2%)
- Ambient temperature: -10 - 50°C (14 - 122°F)
- Max. altitude at rated current: 1000 m
- Protection degree: IP66 (NEMA 4X)
- Settable digital outputs N.O. or N.C.:
  1. Motor run signal
  2. Alarm signal
- Analog inputs (10 or 15 VDC):
  1. 4-20 mA
  2. 4-20 mA
  3. 0 - 10 VDC
  4. 0 - 10 VDC
- 4 digital inputs, configurable N.O. or N.C. for motor run/stop
- RS485 MODBUS RTU, Bluetooth® SMART\* (4.0)



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