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YOU NO LONGER NEED TO REPLACE YOUR EXISTING PUMP OR MOTOR !

SAFETY & OTHER WARNINGS

1. WARNINGS

- a. Installation and maintenance work should be carried out by qualified personnel.
- b. Lethal, high voltages present in this unit.
This unit should only be installed or serviced by qualified professionals.
- c. Incorrect installation may cause permanent damage to the drive.
- d. The drives operate with AC and DC at HIGH VOLTAGES ! Caution !
- e. Adequate earthing is essential for safety and proper operation.

2. POSITIONING

- a. This drive is designed for operation in ambient temperatures up to 50 °C.
- b. Install the drive out of direct sunlight to prevent overheating and reduced performance. The ideal location is on the mounting pole of the PV Solar Array underneath the array for protection from the sun, heat, and weather elements.

3. MOUNTING

- a. Refer to section 14, on page 12 for mounting dimensions. Mount away from sunlight. Mount on flat surface or on a pole ranging from 50 to 200mm.
(Including 100 x 100mm wooden posts)
- b. Ensure ventilation all around is clear and free airflow all around.
Allow 500mm above and below the unit for ventilation.
For ideal operation, install in the shade.
- c. Ensure all cabling is clear from wildlife or other possible causes of damage.
- d. To guarantee IP65 protection, mount unit vertically, with cable and glands at the bottom. Plug all holes.

4. INSTALLATION

- a. Disconnect all AC and DC power sources, including solar panels
- b. Check all connection to and from the pump motor are sound and that there are no shorts to ground / earth.
- c. Use IP65 rated glands for all incoming and outgoing cables

5. PUMP MOTOR CONNECTIONS

- a. Connect the cables from the Pump/Motor Assembly to the Terminal Block labelled "MOTOR" and marked **U, V, W**. for 3 phase motors or...
- b. **Com, Main, Start** for single phase motors.
- c. Connect the ground / earth wire to the earth terminal screw.
- d. This should be an insulated wire, typically green or green/yellow

6. AC WIRING CONNECTIONS

- a. Make sure that all AC power DB boards are off or disconnected and confirm with a meter or AC detector, that power is off
- b. Connect Live, Neutral and Earth to the correct terminals in the drive
- c. The single phase supply should be 230Vac 15A max.
- d. If powered by a generator, ensure generator is not started under load and the supply is stable.

7. DC WIRING CONNECTIONS

- a. Make sure that the solar array is covered from any sun light or that the external DC power isolator is off or disconnected.
- b. Connect the cables from the array to the MC4 connectors of the drive observing the correct polarity.
- c. Plug-in the MC4 connectors and ensure they are locked properly.
- d. Mount the drive on the wall or pole
- e. Connect / ground the drive to earth using green or green-yellow wire
- f. Secure all wiring to prevent damage from animals or other.

Continues...

8. DC OPERATION

- a. Uncover solar panels or switch on the external solar power circuit.
- b. Once all covers have been replaced and it is safe to operate, turn on the drive.
- c. Ensure the auxiliary switch is in the ON position.
- d. The pump motor will startup after a brief period.
- e. The three diagnostics LEDs will now be on. Indicating a healthy situation.
- f. Check that the motor current is in the expected range, depending on the amount on sunlight on the panels.
- g. If this is a new installation, (new borehole) flush the system, until clear water comes out, to avoid clogging flow switches or flow meters with dirt or sediment.
- h. See next section for operation with dual supply (AC and or DC)

9. AC/DC SUPPLY OPERATION (AC / DC)

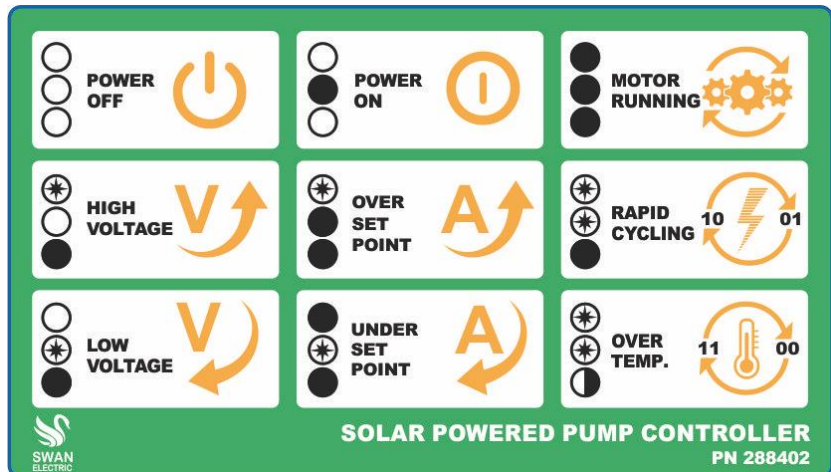
- a. PV ONLY (Solar Panels)
The DC / DC isolator is ON. And the AC (230Vac) isolator is OFF.
Water will flow according to amount of sun light on the panels.
- b. AC ONLY
The DC / DC isolator is OFF. And the AC (230Vac) isolator is ON.
Water will flow at a constant maximum rated capacity.
- c. PV and AC
Both the DC / DC and the AC (230Vac) isolator are ON.
Water will flow at a constant maximum rated capacity, if AC is available
or according to amount of sun light on the panels, if AC not available.

10. TROUBLESHOOTING

The drive will always operate the pump as efficiently as possible, and deliver as much water as possible, regardless of the power or voltages available, within specified limits. Including under low levels of sunlight.




If any parameter is outside the given limits, the drive will shut down, but will restart automatically, when condition return to normal specified limits.

An error code will be displayed on this LED panel shown below, when a fault condition exists. The drive will timeout for a certain time, depending on the nature of the fault.







For additional details, see following page.



11. DIAGNOSTICS - NORMAL OPERATION

STATUS INDICATION	REMEDY / ACTION
	<p style="text-align: center;">LOW OR NO SUNLIGHT</p> <p style="text-align: center;">Drive will start automatically as soon as sunlight is available</p>
	<p style="text-align: center;">ON / OFF</p> <p style="text-align: center;">If in manual mode, switch ON to start pump</p> <hr/> <p style="text-align: center;">If in automatic or pressure switch mode, the pump will start when pressure falls below set point of pressure switch</p>
	<p style="text-align: center;">ON / OFF</p> <p style="text-align: center;">If in manual mode, switch OFF to stop the pump. In this mode, the speed or rate of pumping will vary according to available sunlight</p> <hr/> <p style="text-align: center;">If in automatic mode, the pump will stop when the float or pressure switch is triggered or shut-off pressure is reached.</p>




12. DIAGNOSTICS – FAULT CONDITIONS

STATUS INDICATION	REMEDY / ACTION
	<p>Pump Motor does not switch on Loss of power to the controller</p> <p>Check DC supply voltage from solar array or the DC disconnect device is in the OFF position or DC fuses blown.</p> <p>Or Drive is faulty Return to supplier. No serviceable internal parts.</p>
	<p>Pump Motor does not switch on Damaged toggle switch - Contact supplier</p> <p>Series Float/Pressure switch Float/pressure switch is off. Check pressure or tank level. Pump will start when pressure or water level drops.</p> <p>Series Float/Pressure switch Float/pressure switch is on. Float/pressure switch faulty.</p>
	<p>Pump Motor does not switch off Damaged toggle switch Contact supplier.</p> <p>Or</p> <p>Drive is faulty Return to supplier. No serviceable internal parts.</p>
	<p>Pump Motor does not switch on</p> <p>Check DC voltage level Voc may exceed controller rating. Or ambient temperature may be too low.</p> <p>Drive will reset within 10 seconds after supply is rectified.</p> <p>If the condition persists, contact power company, supplier, or installer.</p>

Continues...

STATUS INDICATION	REMEDY/ACTION
	<p>Low voltage can be caused by : Low sunlight or Cloudy day, Shading of solar panel, incorrect mounting direction of solar panels or angle incorrect or bad DC connection.</p> <p>Sun light intensity may be too low : Wait for higher levels of light. Check for shadow caused by dirt or vegetation growth.</p> <p>The drive will reset within 10 seconds after supply returns. If the condition persists, contact power company, supplier or installer. Wait for clouds to dissipate.</p> <p>Remove cause of shadow. Vegetation growth may cause a functional system to deteriorate in performance as growth of vegetation takes place.</p> <p>Check the solar array mounting stability. Panels may have moved in the wind. Panels should face North in the Southern Hemisphere and South in the Northern Hemisphere and angled at the correct angle to the horizontal to make maximum use of available sunlight.</p> <p>Check DC connections and measure voltage under load to ensure no hot or loose connections are prevalent.</p>
	<p>Motor/pump keeps switching off or motor runs for only 10 seconds.</p> <p>Motor/Pump does not switch on within 5 minutes. Confirm that motor current setting matches motor nominal current. Pump shaft may be broken, or motor splines stripped. Check motor wiring for damage cable.</p> <p>Contact supplier. If drives continues not functioning correctly.</p>

Continues...

STATUS INDICATION	REMEDY/ACTION
	<p>Motor/Pump does not switch on and/or condition occurs all the time.</p> <p>The drive will reset in approximately 15 min.</p> <p>Pump locked up – debris may have entered the pump. Remove motor/pump from the borehole and clean.</p> <p>Cable damaged – drop cable may have been damaged. Remove pump and check cable for damage. If pumping does not restart in 20 min, or if the problem persists, contact installer or supplier.</p> <p>Unit operated correctly before – operating conditions may have changed. Use current clamp meter to confirm new working conditions.</p>
	<p>Motor/Pump does not switch on</p> <p>No user intervention will restart the pump/motor. Do not switch mains power supply on and off. The drive should will reset within 3 minutes.</p> <p>Motor/Pump is switching on too often or is running for very short periods : Continuous rapid cycling and excessive motor thermal cycling can be caused by a waterlogged tank, faulty contacts, faulty pressure switch, supply problem or a system fault. Check pressure tank charge level or bladder for damage. Check for faulty wiring. Check for intermittent mains supply.</p> <p>Switch power OFF for 5 minutes and try again. Contact installer or supplier not successful. No serviceable internal parts.</p>
	<p>Motor/Pump does not switch on or switches off unexpectedly.</p> <p>The drive encountered excessive internal temperature. Wait for controller to switch on when cooled down.</p> <p>If this happens during midday, controller location may be exposed to direct sunlight or cooling around controller may be too little. Allow at least 300mm clearance on all sides of controller.</p>

13. WIRING AND CONNECTING (models differ in design)

PLUG & PLAY MODELS : 3-PHASE 200 – 400V AC

PV / SOLAR INPUT : 30V MIN. 150V MAX. UP TO 750Wp



PUMP MOTOR TERMINALS

ON-OFF SWITCH
(CONNECT EXTERNAL SWITCH IN PARALLEL)

SOLAR PANEL NEGATIVE MC4 TERMINAL

SOLAR PANEL POSITIVE MC4 TERMINAL

PLUG & PLAY MODELS : 1-PHASE 230V AC

PV / SOLAR INPUT : 30V MIN. 150V MAX. UP TO 750Wp



PUMP MOTOR TERMINALS

COM, MAIN, RUN

ON-OFF SWITCH
(CONNECT EXTERNAL SWITCH IN PARALLEL)

SOLAR PANEL NEGATIVE MC4 TERMINAL

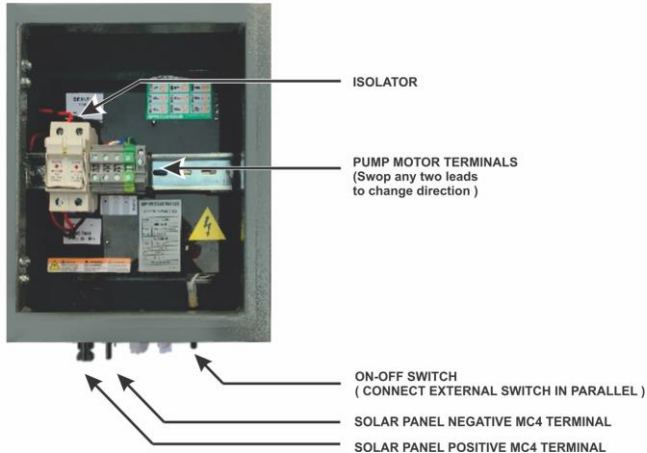
SOLAR PANEL POSITIVE MC4 TERMINAL

CONTINUES...

MINI and MIDI MODELS : 3-PHASE 200 – 400V AC

MINI MODEL PV / SOLAR INPUT : 30V MIN. 150V MAX. UP TO 1350Wp

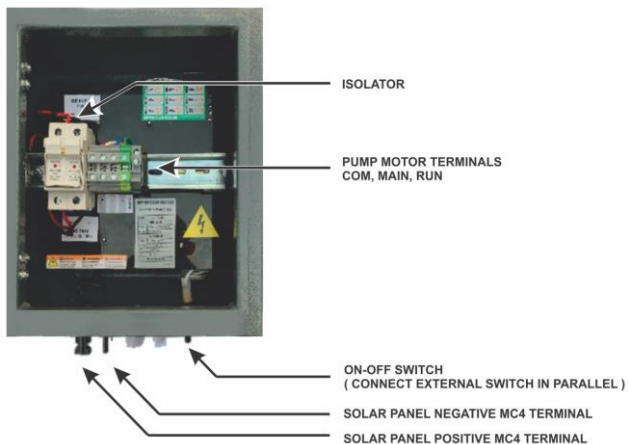
MIDI MODEL PV / SOLAR INPUT : 90V MIN. 450V MAX. UP TO 5000Wp



MINI and MIDI MODELS : 1-PHASE 230V AC

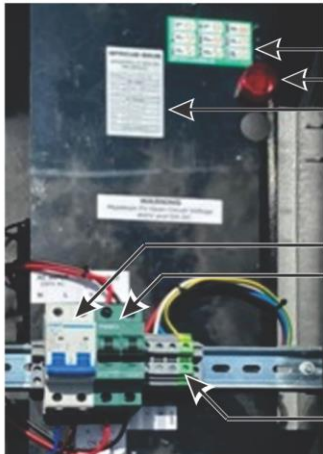
MINI PV / SOLAR INPUT : 30V MIN. 150V MAX. UP TO 1350Wp

MIDI PV / SOLAR INPUT : 90V MIN. 450V MAX. UP TO 5000Wp



MINI-A and MIDI-A MODELS : 3-PHASE 400V AC

PV / SOLAR INPUT : 90V MIN. 450V MAX. UP TO 5000Wp
 AC INPUT : 230VAC 15A MAX.



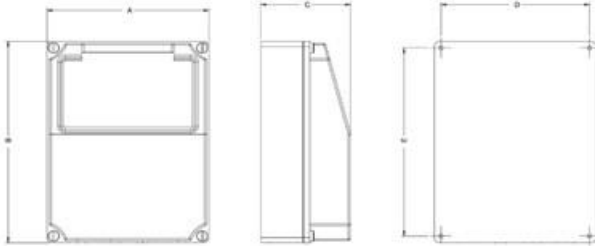
- DIAGNOSTICS / LED STATUS / FAULT INDICATORS
- AC VOLTAGE INDICATOR
- DRIVE NAME PLATE
- AC ISOLATOR SWITCH
- DC ISOLATOR
- PUMP MOTOR TERMINALS



- ON / OFF SWITCH
- GLAND FOR FLOAT OR LEVEL PROBES CABLE
- GLAND FOR POWER / MOTOR CABLES
- PV / SOLAR PANEL CONNECTORS
- GLAND FOR POWER / MOTOR CABLES

14. DIMENSIONS

PLUG & PLAY



A	B	C	D	E	WEIGHT
223mm	286mm	124mm	203mm	266mm	3200g



- Up to 750Wp input
- DC input voltage:
30 V to 150 V
- AC input not applicable

MINI



A	B	C	D	E	WEIGHT
250mm	300mm	225mm	230mm	322mm	9200g



- Up to 1350 WP input
- DC input voltage:
30 TO 150 Vmax
- AC input not applicable

CONTINUES...

MIDI



A	B	C	D	E	WEIGHT
300mm	400mm	225mm	280mm	422mm	13 000g



- Up to 5000Wp input
- DC input voltage:
90 TO 450 Vmax
- AC input not applicable

MINI-A



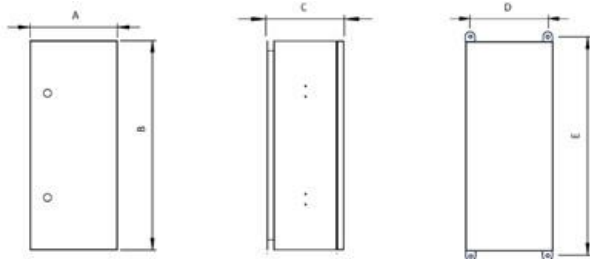
A	B	C	D	E	WEIGHT
250mm	600mm	225mm	230mm	622mm	13 000g



- Up to 5000Wp input
- DC input voltage:
90 TO 450 Vmax
- AC input voltage:
200 - 250VAC

CONTINUES...

MIDI - A



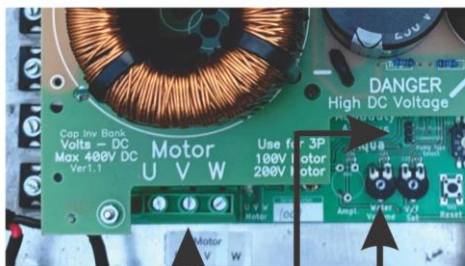
A	B	C	D	E	WEIGHT
300mm	600mm	225mm	280mm	622mm	17 000g



- Up to 5000Wp input
- DC input voltage:
90 TO 450 Vmax
- AC input voltage:
200 - 250VAC

MAX FLOW RATE SETTING FOR PLUG & PLAY MODELS ONLY !

(REMOVAL OF PROTECTIVE COVER I NECESSARY – BY QUALIFIED ELECTRICIAN)



MAX FLOW RATE
PUMP TYPE SELECT
CENTRIFUGAL
OR POSITIVE DISPLACEMENT
MOTOR LEAD TERMINALS

SET MAXIMUM FLOW RATE ONLY DURING MAXIMUM SOLAR INSOLATION
IN A CLEAR / CLOUDLESS MIDDAY CONDITION

15. PRODUCT SELECTION CHART

For additional technical details, please download technical data from www.swan-electric.co.za

P/N	MODEL	OUTPUT PHASES	POWER KW	OPTION AC IN	PV IN	BOX MATERIAL	IP RATE
283410	PLUG & PLAY	1	0.37	230V AC OPTIONAL	60 – 150V DC	PLASTIC	IP65
283411		1	0.55			PLASTIC	IP65
283440		3	0.37	400V AC		PLASTIC	IP65
283450		3	0.55	400V AC		PLASTIC	IP65
284410	MINI RANGE	1	0.37	230V AC	60 – 150V DC	METAL	IP54
284420		1	0.55	230V AC		METAL	IP54
284430		1	0.75	230V AC		METAL	IP54
284610		3	0.37	400V AC		METAL	IP54
284620		3	0.55	400V AC		METAL	IP54
284630		3	0.75	400V AC		METAL	IP54
284640		3	1.1	400V AC		METAL	IP54
284710	MIDI RANGE	1	0.37	230V AC	90 – 450V DC	METAL	IP54
284720		1	0.55	230V AC		METAL	IP54
284730		1	0.75	230V AC		METAL	IP54
284740		1	1.1	230V AC		METAL	IP54
284910		3	0.37	400V AC		METAL	IP54
284920		3	0.55	400V AC		METAL	IP54
284930		3	0.75	400V AC		METAL	IP54
284940		3	1.1	400V AC		METAL	IP54
284950		3	1.5	400V AC		METAL	IP54
284960		3	2.2	400V AC		METAL	IP54
284970		3	3.0	400V AC		700V DC MAC	METAL
284980		3	3.7	400V AC	METAL		IP54

16. GENERAL INFORMATION

WARRANTY

THE EQUIPMENT IS COVERED BY A ONE YEAR WARRANTY FROM THE DATE OF PURCHASE, ENSURING PROTECTION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP. PLEASE REFER TO THE WARRANTY DOCUMENTATION FOR TERMS AND CONDITIONS.

SERVICE INFORMATION

PLEASE CONTACT US - WWW.SWAN-ELECTRIC.CO.ZA

SEE QR CODE BELOW

REGULATORY COMPLIANCE

IP54
ROHS

DISPOSAL AND RECYCLING

THESE PRODUCTS MAY CONTAIN SUBSTANCES OR MATERIALS THAT ARE NOT ENVIRONMENTALLY FRIENDLY, AND SHOULD BE DISPOSED OF, IN A CONTROLLED AND SPECIFIC MANNER.

IF IN DOUBT, PLEASE RETURN THE PRODUCT TO US, FOR RECYCLING

CONTACT INFORMATION



www.swan-electric.co.za

sales@swan-electric.co.za