

Submittal Data

PROJECT:	UNIT TAG:	QUANTITY:
REPRESENTATIVE:	TYPE OF SERVICE: Solar Powered Irrigation	DATE:
ENGINEER:	SUBMITTED BY:	DATE:
CONTRACTOR:	APPROVED BY:	DATE:
	ORDER NO.:	DATE:

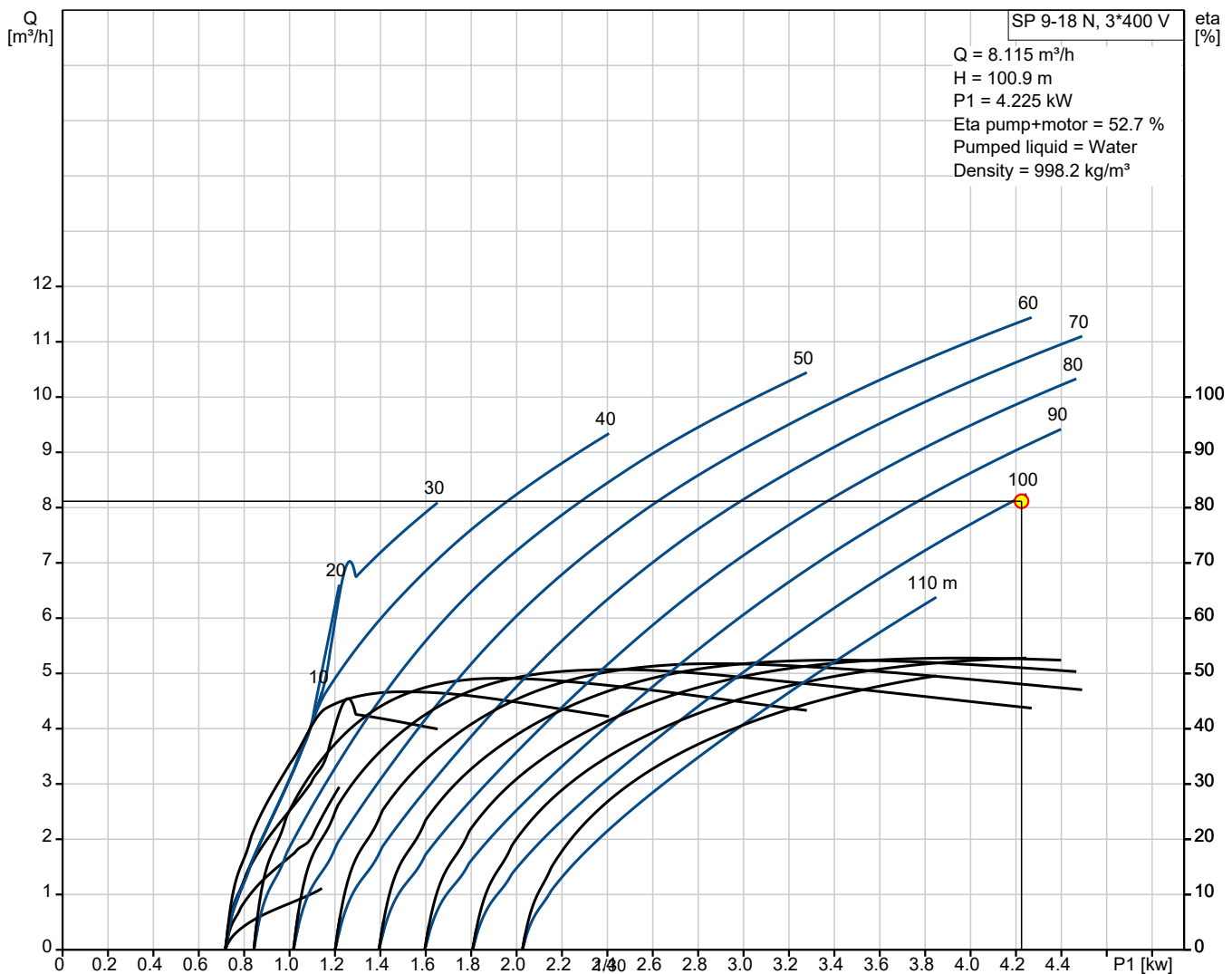


SP 9-18 N

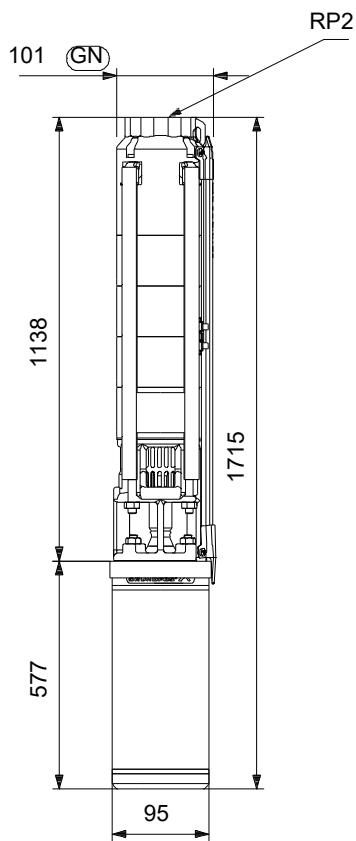
Grundfos SP are submersible borehole pumps, designed for pumping groundwater. Grundfos SP are all stainless-steel pumps, and they are available in 3 material grades. The pumps are suitable for boreholes in sizes ranging from 4" over 6" and 8" to 10". The motor sizes for the pumps are available in 0.37-250 kW.

Note! Product picture may differ from actual product

Conditions of Service	Pump Data	Motor Data
Liquid: Water	Liquid temperature range: -15 .. 40 °C Product number: 99604475	Mains frequency: 50 Hz Enclosure class: IP68



Submittal Data



Materials:



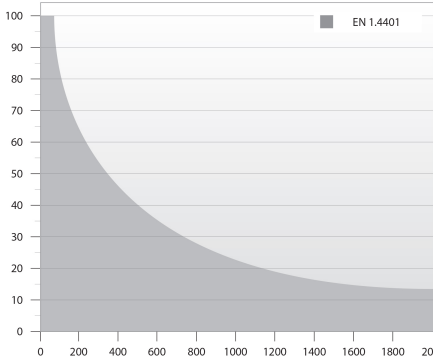
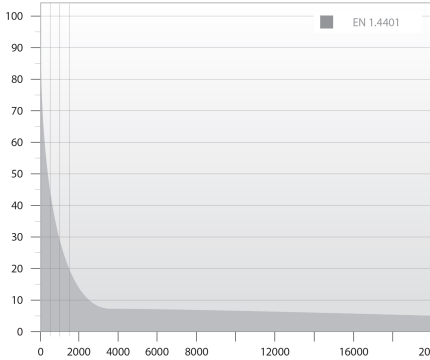
Impeller: Stainless steel

Impeller: AISI 316

Impeller: EN 1.4401

Project: REGWA (Dabak village)
Reference Number: Solar Powered Water Supply project

Client: MEDAIR International
Client Number:
Contact:

Qty.	Description
1	<p>SP 9-18 N</p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: 99604475</p> <p>Submersible borehole pump, suitable for pumping clean water. Can be installed vertically or horizontally. All steel components are made in stainless steel, EN 1.4401 (AISI 316), that ensures high corrosive resistance.</p> <p>Further product details</p> <p>The pump is suitable for applications similar to the following:</p> <ul style="list-style-type: none"> - raw-water supply - irrigation - groundwater lowering - pressure boosting - fountain applications - mining applications - off-shore applications. <p>The Grundfos SP pump is renowned for its high efficiency and already complies with the requirements of the Minimum Efficiency Index, and therefore Grundfos is amongst the best in class within submersible pumps.</p>  <p>Pump</p> <p>All pump surfaces that are in contact with pumped liquids are made in stainless steel which makes them corrosion- and wear-resistant. The corrosion diagram below shows the capabilities of the pump and motor in relation to the temperature in Celsius (y-axis) and the concentration of chloride in ppm (x-axis).</p> <div>   </div>

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Qty.	Description
1	<div> <p> The elastomer parts in the pump offer good wear resistance and long service intervals. The bearings are made of LSR (Liquid Silicone Rubber), sealing rings are made of TPU (Thermoplastic Poly-Urethane) and the non-return valve is made of NBR (Nitrile-Butadiene Rubber). The special elastomer material of the bearings offers increased resistance to sand and other abrasive particles (from 50 to 150 mg/l). In case the pump is used for pumping water with high content of hydrocarbons or solvents, Grundfos offers FKM rubber parts (Fluorocarbon) which are oil and temperature-resistant up to 90 °C. The pump is built with octagonal bearings with sand flush channels that minimise wear. As wear of the pump is inevitable, the pump design allows for easy replacement of all internal wear parts (bearings, impeller, wear rings and seal rings) to maintain high performance and a long lifetime. The suction interconnector is fitted with a strainer to prevent large particles from entering the pump. The suction interconnector is designed to comply with NEMA standards for motor mounting/dimensions. </p> <p>Motor</p> <p>The stator is hermetically encapsulated in stainless steel and the windings are embedded in polymer compound. This results in high mechanical stability, optimum cooling and reduces the risk of short circuits in the windings.</p> <p> Liquid: Pumped liquid: Water Liquid temperature range: -15 .. 40 °C </p> <p> Technical: Pump speed on which pump data are based: 2900 rpm Rated flow: 9 m³/h Rated head: 94.8 m Approvals: CE,EAC,UKCA,SEPRO,MOROCCO Approvals for motor: CE,EACMOROCCO,UKCA,SEPRO,RCM Curve tolerance: ISO9906:2012 3B Motor version: T40 Return valve: YES </p> <p> Materials: Pump: Stainless steel EN 1.4401 AISI 316 Impeller: Stainless steel EN 1.4401 AISI 316 Motor: Stainless steel EN 1.4539 Shaft seal: SiC/SiC </p> </div>



Company name: MEDAIR International
Created by: Basheer Ahmad Mukhlis
Phone: +93766591048
Email: basheer.basharmal786@gmail.com
Date: 10/10/2024


Project: REGWA (Dabak village)
Reference Number: Solar Powered Water Supply project

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Qty.	Description
1	<p>Installation:</p> <p>Maximum ambient pressure: 60 bar</p> <p>Maximum operating pressure: 60 bar</p> <p>Maximum outlet pressure: 11.9 bar</p> <p>Type of connection: Rp</p> <p>Size of connection: 2 inch</p> <p>Motor diameter: 4 inch</p> <p>Minimum borehole diameter: 105 mm</p> <p>Electrical data:</p> <p>Motor type: MS4000</p> <p>Motor flange design: NEMA</p> <p>Rated power - P2: 4 kW</p> <p>Power (P2) required by pump: 4 kW</p> <p>Mains frequency: 50 Hz</p> <p>Rated voltage: 3 x 380-400-415 V</p> <p>Rated current: 9.8-9.6-9.8 A</p> <p>Starting current: 440-480-490 %</p> <p>Cos phi - power factor: 0.85-0.8-0.77</p> <p>Rated speed: 2830-2860-2870 rpm</p> <p>Method of start: Direct-on-line (DOL)</p> <p>Enclosure class (IEC 34-5): IP68</p> <p>Insulation class (IEC 85): F</p> <p>Built-in motor protection: NONE</p> <p>Thermal protection: External</p> <p>Built-in temp. transmitter: No</p> <p>Length of cable: 1.7 m</p> <p>Power cable type: FLAT</p> <p>Motor No: 7C192710</p> <p>Windings: Enameled</p> <p>Others:</p> <p>Minimum efficiency index, MEI \geq: 0.70</p> <p>Net weight: 35.2 kg</p> <p>Gross weight: 40.8 kg</p> <p>Shipping volume: 0.068 m³</p> <p>Environmental approvals: WEEE</p>

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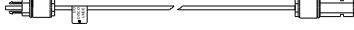
Qty.	Description
38	<p>GF 270</p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: 99299012</p> <p>The GF 270 is a polycrystalline solar module. The module is equipped with MC4 plugs for easy connection and comes as 30 pieces per pallet without individual packing. It must be mounted on a support structure, tilted at an angle ensuring optimum utilization of the solar energy.</p> <p>Liquid: Pumped liquid: Water</p> <p>Installation: Range of ambient temperature: -40 .. 85 °C</p> <p>Electrical data: Maximum power point voltage: 31.6 V Open circuit voltage: 38.4 V Max power point current: 8.76 A Module shortcut current: 9.11 A Maximum power output: 270 W Solar module type: POLYCRYSTALLINE</p> <p>Others: Brand: GRUNDFOS Net weight: 18.3 kg Shipping volume: 2 m³</p>



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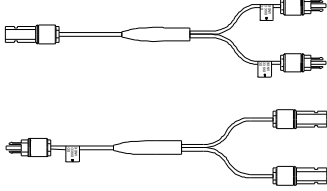
Qty.	Description
1	<p>Product name: Wire kit array to control box (MC4)</p> 
	<p>Note! Product picture may differ from actual product</p> <p>Product No.: 98257868</p> <p>Product No: 98257868</p> <p>EAN number: 5711492200964</p>



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Qty.	Description
1	<p>Product name: Wire kit array to array (MC4)</p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: 98257892 Product No: 98257892 EAN number: 5711492201152</p>

Project: REGWA (Dabak village)
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Qty.	Description
1	<p>RSI 3x380-440V IP66 4kW 9.6A</p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: 99044350</p> <p>Renewable Solar Inverter RSI is an off-grid solar inverter to enable end-user to use solar power for a wide range of water applications. RSI is customized specifically to be compatible with Grundfos pumps. With the built-in MPPT and various protection software, it delivers an efficient and reliable solar system solution.</p> <ul style="list-style-type: none"> • 3-phase 208V, 380V or 440V • Quick setup wizard • Preconfigured inputs • Build-in MPPT (Maximum power point tracking) • AC and DC power source compatible • Solar solution for up to 250kW <p>RSI offers the following inputs and output:</p> <ul style="list-style-type: none"> • RS-485 Modbus RTU/TCP • 6 Digital inputs, preconfigured for solar application • 2 Signal relays, RUN/FAULT <p>Liquid: Pumped liquid: Water</p> <p>Technical: Approvals and markings: CE</p> <p>Installation: Range of ambient temperature: -10 .. 60 °C Relative humidity: 100 %</p> <p>Electrical data: Rated power - P2: 4 kW Mains frequency: 50 / 60 Hz Rated voltage: 3 x 380 - 440 V Enclosure class (IEC 34-5): IP66 Rated voltage output AC: 380 V Voltage input DC: 800 V Rated current output AC: 10 A Udc: 400 V</p> <p>Others: Net weight: 8.8 kg Gross weight: 9.8 kg</p>

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Qty.	Description
1	<p>Water dispenser AQtap</p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: 98794194</p> <p>AQtap is an intelligent water dispenser that addresses some of the main challenges of providing a reliable and sustainable water supply in the developing world.</p> <p>The AQtap can be connected to existing water network or provided as part of a total Grundfos water supply solution. Through an integrated platform for revenue collection and online management of water points, AQtap supports the financial viability and accountability of water service operations.</p> <p>AQtap supports user friendly dispensing of drinking water to consumers through a simple and intuitive interface and system for credit transactions using smart cards.</p> <p>Consumers load credits directly at the AQtap onto their WaterCards, either through local water credit vendors or via mobile credit platforms.</p> <p>When tapping water, the water credits of the consumers' WaterCard are automatically deducted in a transparent way.</p> <p>The water dispenser has a robust construction, it operates precisely and with minimum wastage of water. The AQtap can be operated with grid and/or solar power. The internal battery is used as a backup power for approximately 12 hours of operation.</p> <p>User-friendly water dispensing</p> <p>Positive and transparent water tapping experience:</p> <ul style="list-style-type: none"> • simple and intuitive interface • closed system for credit transactions using smart cards • precise dispensing with minimum water wastage <p>Efficient revenue collection</p> <p>Consumers acquire water credits for their WaterCards via one of two methods:</p> <ol style="list-style-type: none"> 1) Water vending where credits are acquired on site 2) Mobile payment where credits are acquired through mobile banking platforms <p>Both methods enable:</p> <ul style="list-style-type: none"> • automatic collection of revenues • continuous revenue stream to cover running costs • financial transparency and sustainability <p>Intelligent water management</p> <p>Even large numbers of water points in distant locations can be monitored with the online Water Management System offering:</p> <ul style="list-style-type: none"> • remote access to system data and consumer data • streamlining of service processes and maintenance processes • reporting on financial transactions of water points <p>Liquid: Pumped liquid: Water Liquid temperature range: 0.1 .. 40 °C</p>



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Contact:

Qty.	Description
1	<p>Technical:</p> <p>Rated flow: 1 m³/h</p> <p>Maximum flow: 2 m³/h</p> <p>Installation:</p> <p>Range of ambient temperature: 1 .. 50 °C</p> <p>Relative humidity: 95 %</p> <p>Maximum operating pressure: 4 bar</p> <p>Type of inlet connection: BSP</p> <p>Type of outlet connection: BSP</p> <p>Size of inlet connection: 1/2 inch</p> <p>Size of outlet connection: 1/2 inch</p> <p>Mounting option: Vertical</p> <p>Electrical data:</p> <p>Power input P1: 45 W</p> <p>Mains frequency: 50 Hz</p> <p>Rated voltage: 1 x 110-240 V</p> <p>Enclosure class (IEC 34-5): IP55</p> <p>Others:</p> <p>Net weight: 23 kg</p> <p>Gross weight: 30 kg</p>

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Qty.	Description
1	<p>Sine-wave filter</p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: 96754974</p> <p>Sine wave filters have a high degree of filtering, resulting in a high reduction of the stress on the motor insulation system. At the same time, they reduce the acoustic noise from the motor.</p> <p>Motor losses are reduced due to the fact that a sine-wave filter converts the output pulses of the frequency converter into a sine-wave-shaped current. The result is a sine-wave-shaped current and reduced motor noise.</p> <p>Maximum cable length with sine-wave filter is 300 m.</p> <p>Output filters are used for reducing the voltage stress on the motor windings and the stress on the motor insulation system as well as for decreasing acoustic noise from a frequency-controlled motor.</p>

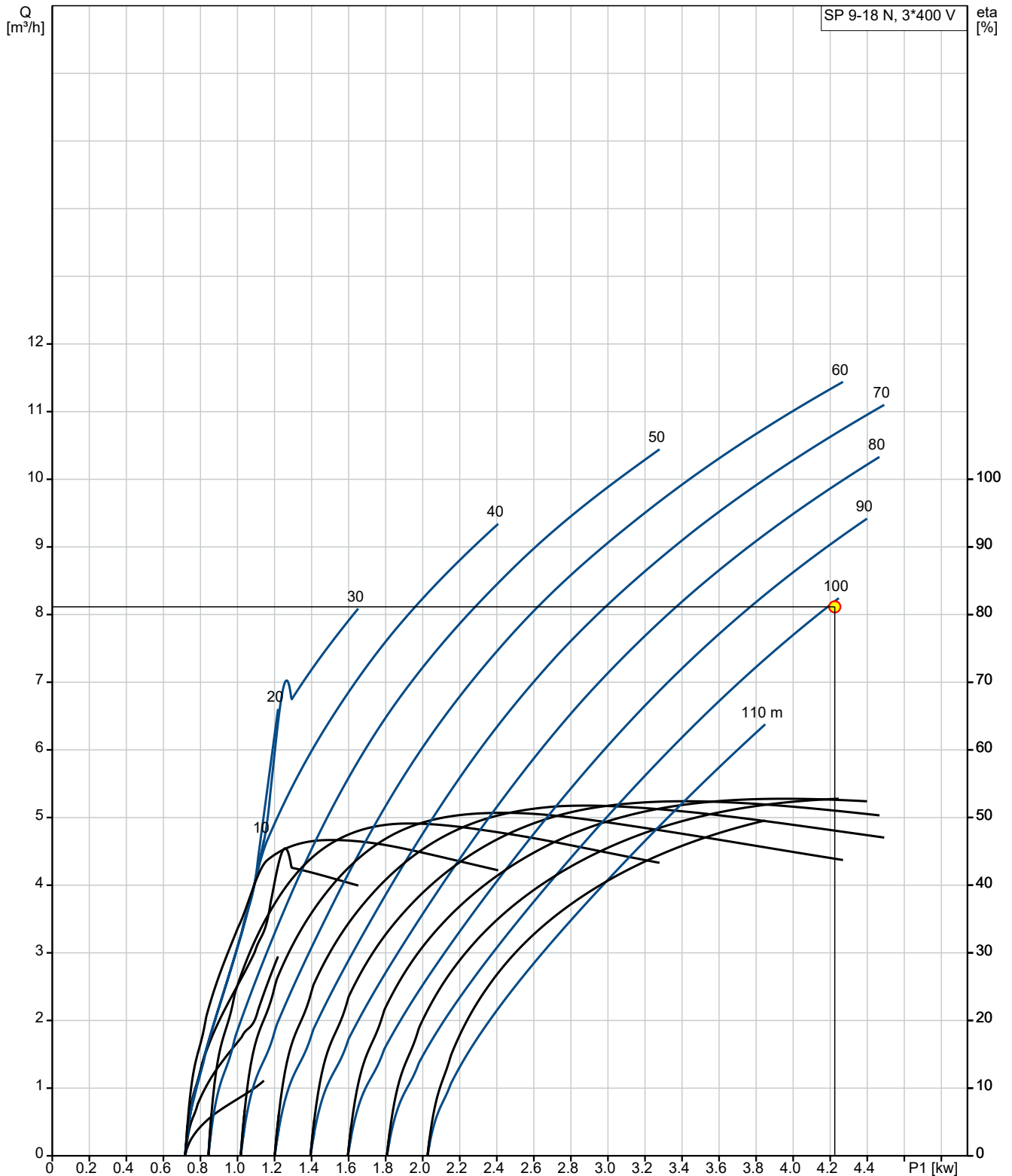


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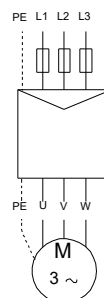
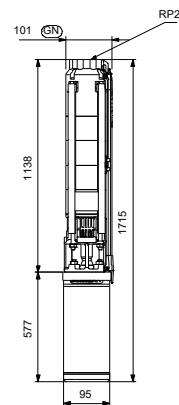
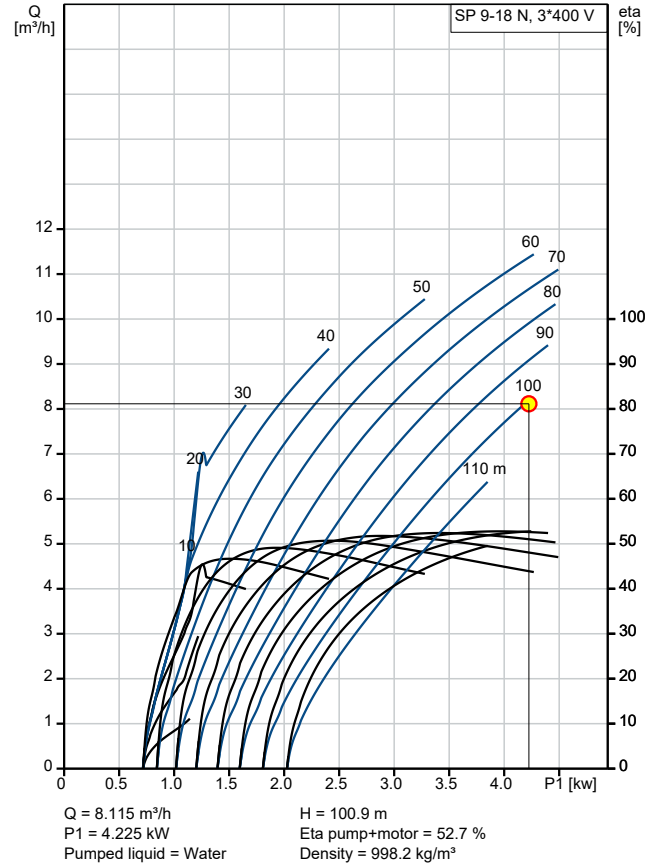
99604475 SP 9-18 N



Project: REGWA (Dabak village)
Reference Number: Solar Powered Water Supply project

Client: MEDAIR International
Client Number:
Contact:

Description	Value
General information:	
Product name:	SP 9-18 N
Product No:	99604475
EAN number:	5713831770985
Technical:	
Pump speed on which pump data are based:	2900 rpm
Rated flow:	9 m ³ /h
Rated head:	94.8 m
Stages:	18
Number of reduced-diameter impellers:	NONE
Approvals:	CE,EAC,UKCA,SEPRO,MOROCCO
Approvals for motor:	CE,EACMOROCCO,UKCA,SEPRO,RCM
Curve tolerance:	ISO9906:2012 3B
Model:	B
Motor version:	T40
Return valve:	YES
Materials:	
Pump:	Stainless steel
Pump:	EN 1.4401
Pump:	AISI 316
Impeller:	Stainless steel
Impeller:	EN 1.4401
Impeller:	AISI 316
Motor:	Stainless steel
Motor:	EN 1.4539
Shaft seal:	SiC/SiC
Installation:	
Maximum ambient pressure:	60 bar
Maximum operating pressure:	60 bar
Maximum outlet pressure:	11.9 bar
Type of connection:	Rp
Size of connection:	2 inch
Motor diameter:	4 inch
Minimum borehole diameter:	105 mm
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-15 .. 40 °C
Electrical data:	
Motor type:	MS4000
Motor flange design:	NEMA
Rated power - P2:	4 kW
Power (P2) required by pump:	4 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 380-400-415 V
Rated current:	9.8-9.6-9.8 A
Starting current:	440-480-490 %
Cos phi - power factor:	0.85-0.8-0.77
Rated speed:	2830-2860-2870 rpm
Method of start:	Direct-on-line (DOL)
Enclosure class (IEC 34-5):	IP68
Insulation class (IEC 85):	F
Built-in motor protection:	NONE





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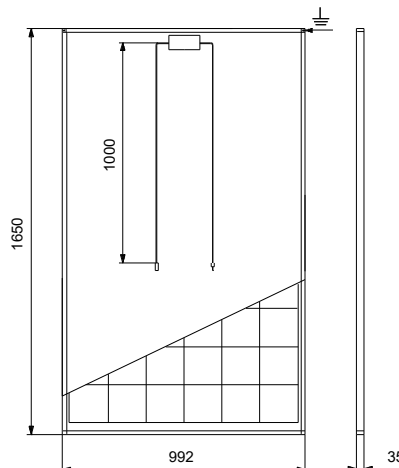
Client: MEDAIR International
Client Number:
Contact:

Description	Value
Thermal protection:	External
Built-in temp. transmitter:	No
Length of cable:	1.7 m
Power cable type:	FLAT
Motor No:	7C192710
Cable number:	99412529
Windings:	Enameled
Others:	
Minimum efficiency index, MEI \geq :	0.70
Net weight:	35.2 kg
Gross weight:	40.8 kg
Shipping volume:	0.068 m ³
Environmental approvals:	WEEE

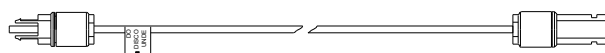
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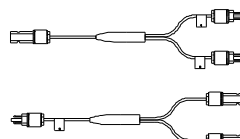
Description	Value
General information:	
Product name:	GF 270
Product No:	99299012
EAN number:	5713826826093
Installation:	
Range of ambient temperature:	-40 .. 85 °C
Liquid:	
Pumped liquid:	Water
Electrical data:	
Maximum power point voltage:	31.6 V
Open circuit voltage:	38.4 V
Max power point current:	8.76 A
Module shortcut current:	9.11 A
Maximum power output:	270 W
Solar module type:	POLYCRYSTALLINE
Others:	
Brand:	GRUNDFOS
Net weight:	18.3 kg
Shipping volume:	2 m³



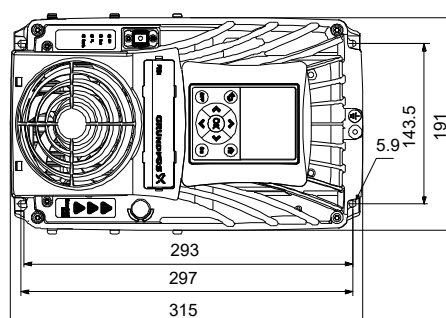
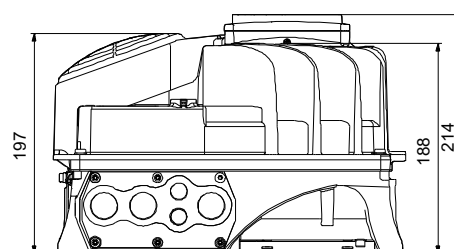
Description	Value
General information:	
Product name:	Wire kit array to control box (MC4)
Product No:	98257868
EAN number:	5711492200964



Description	Value
General information:	
Product name:	Wire kit array to array (MC4)
Product No:	98257892
EAN number:	5711492201152



Description	Value
General information:	
Product name:	RSI 3x380-440V IP66 4kW 9.6A
Product No:	99044350
EAN number:	5712605678656
Technical:	
Approvals and markings:	CE
Installation:	
Range of ambient temperature:	-10 .. 60 °C
Relative humidity:	100 %
Liquid:	
Pumped liquid:	Water
Electrical data:	
Rated power - P2:	4 kW
Mains frequency:	50 / 60 Hz
Rated voltage:	3 x 380 - 440 V
Enclosure class (IEC 34-5):	IP66
Rated voltage output AC:	380 V
Voltage input DC:	800 V
Rated current output AC:	10 A
Udc:	400 V
Others:	
Net weight:	8.8 kg
Gross weight:	9.8 kg



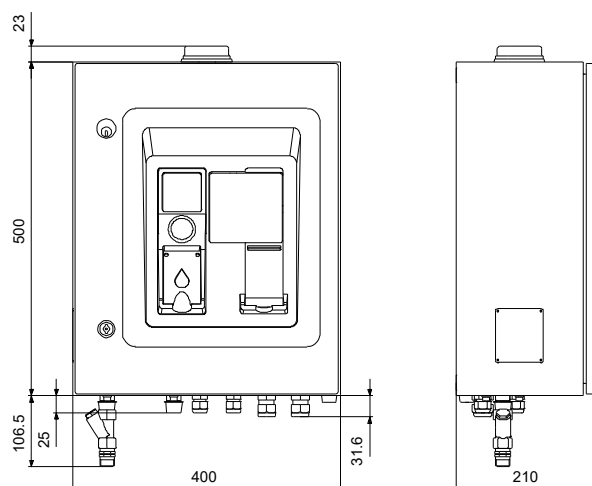
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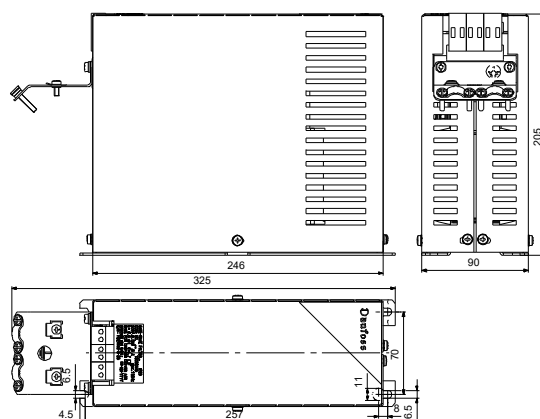
Description	Value
General information:	
Product name:	OTDCP16, Circuit Breaker, 16Amp
Product No:	98341686
EAN number:	5711493289296

Description	Value
General information:	
Product name:	OVR PV 40-1000 P, Surge Protection
Product No:	98341687
EAN number:	5711493289302

Description	Value
General information:	
Product name:	Water dispenser AQtap
Product No:	98794194
EAN number:	5712601456791
Technical:	
Rated flow:	1 m³/h
Maximum flow:	2 m³/h
Installation:	
Range of ambient temperature:	1 .. 50 °C
Relative humidity:	95 %
Maximum operating pressure:	4 bar
Type of inlet connection:	BSP
Type of outlet connection:	BSP
Size of inlet connection:	1/2 inch
Size of outlet connection:	1/2 inch
Mounting option:	Vertical
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	0.1 .. 40 °C
Electrical data:	
Power input P1:	45 W
Mains frequency:	50 Hz
Rated voltage:	1 x 110-240 V
Enclosure class (IEC 34-5):	IP55
Mount. design. acc. IEC 34-7:	Vertical
Others:	
Net weight:	23 kg
Gross weight:	30 kg



Description	Value
General information:	
Product name:	Sine-wave filter
Product No:	96754974
EAN number:	5710626352555
Installation:	
Mounted on:	Wall
Electrical data:	
Mains frequency:	50 Hz
Rated voltage:	x 200-500 V
Rated current:	10 A
Rated current at 100 Hz:	7.5 A
Enclosure class (IEC 34-5):	IP20
Cable size:	4 mm2
Inductor loss:	95 W





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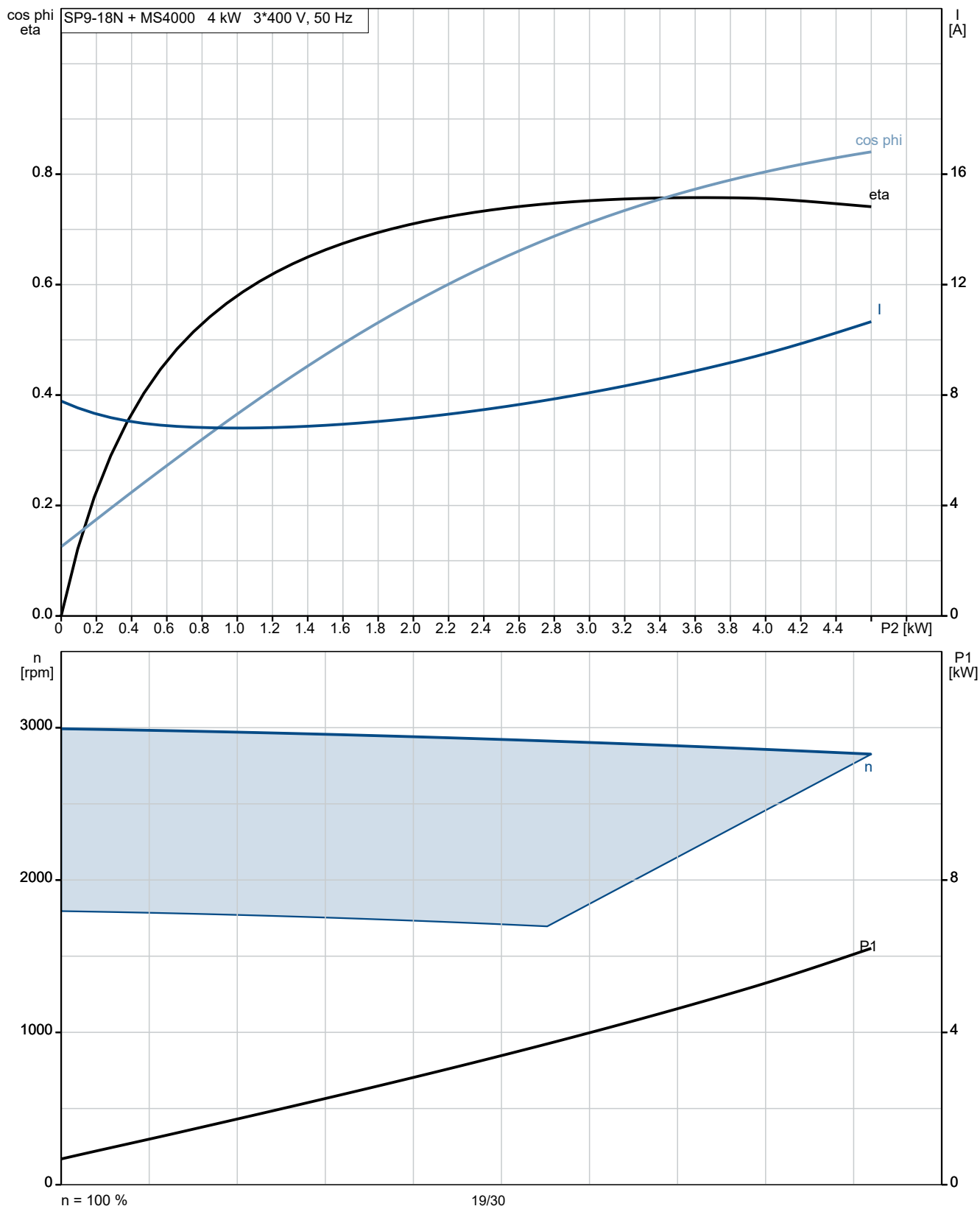
Client: MEDAIR International
Client Number:
Contact:

Description	Value
Others:	
Net weight:	7.1 kg
Danish VVS No.:	382997010
Finnish LVI No.:	9414025

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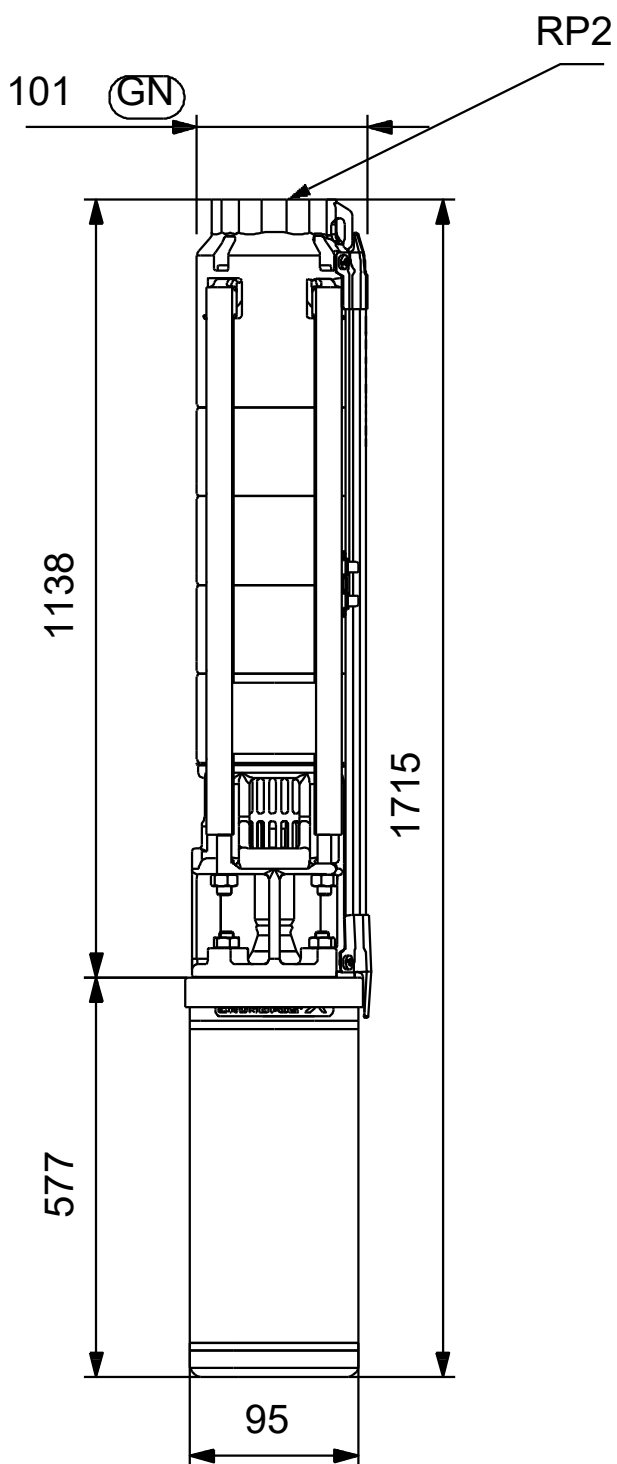
99604475 SP 9-18 N



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99604475 SP 9-18 N



Note! All units are in [mm] unless others are stated.
 Disclaimer: This simplified dimensional drawing does not show all details.

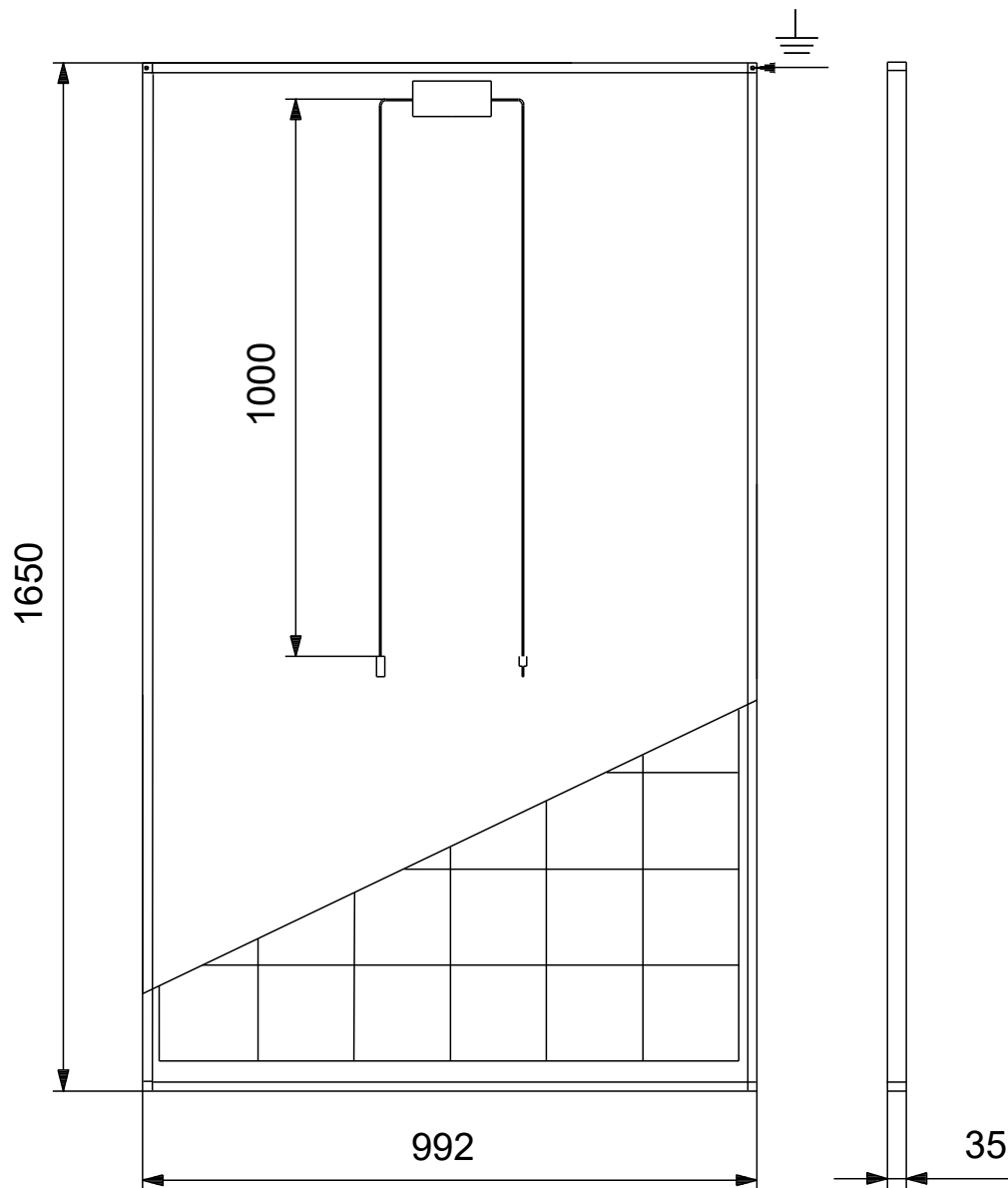


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99299012 GF 270



Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

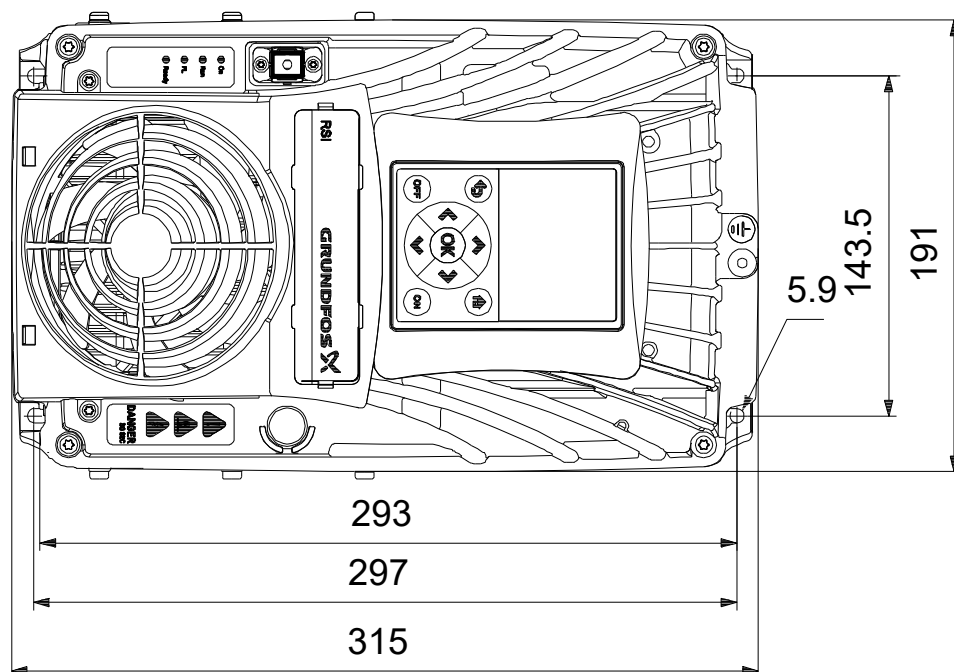
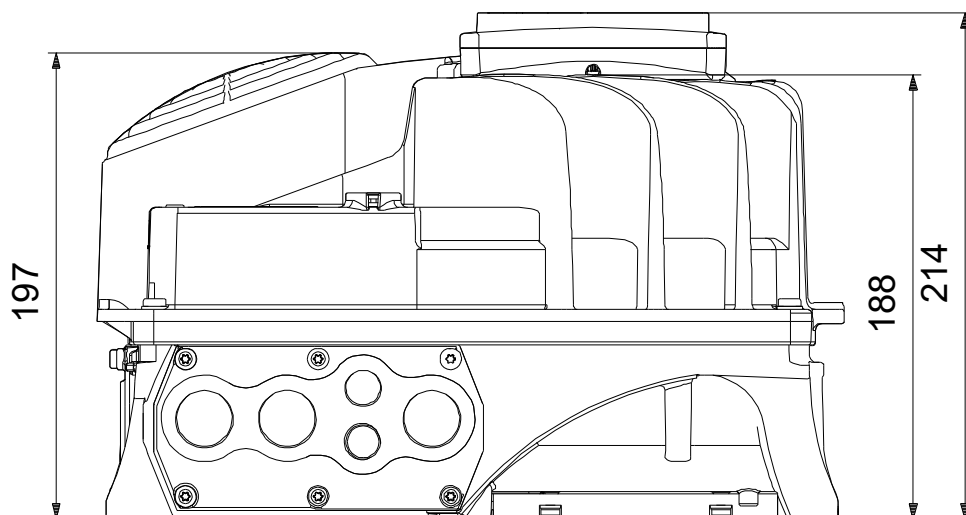


Company name: MEDAIR International
Created by: Basheer Ahmad Mukhlis
Phone: +93766591048
Email: basheer.basharmal786@gmail.com
Date: 10/10/2024

Project: REGWA (Dabak village)
Reference Number: Solar Powered Water Supply project

Client: MEDAIR International
Client Number:
Contact:

99044350 RSI 3x380-440V IP66 4kW 9.6A



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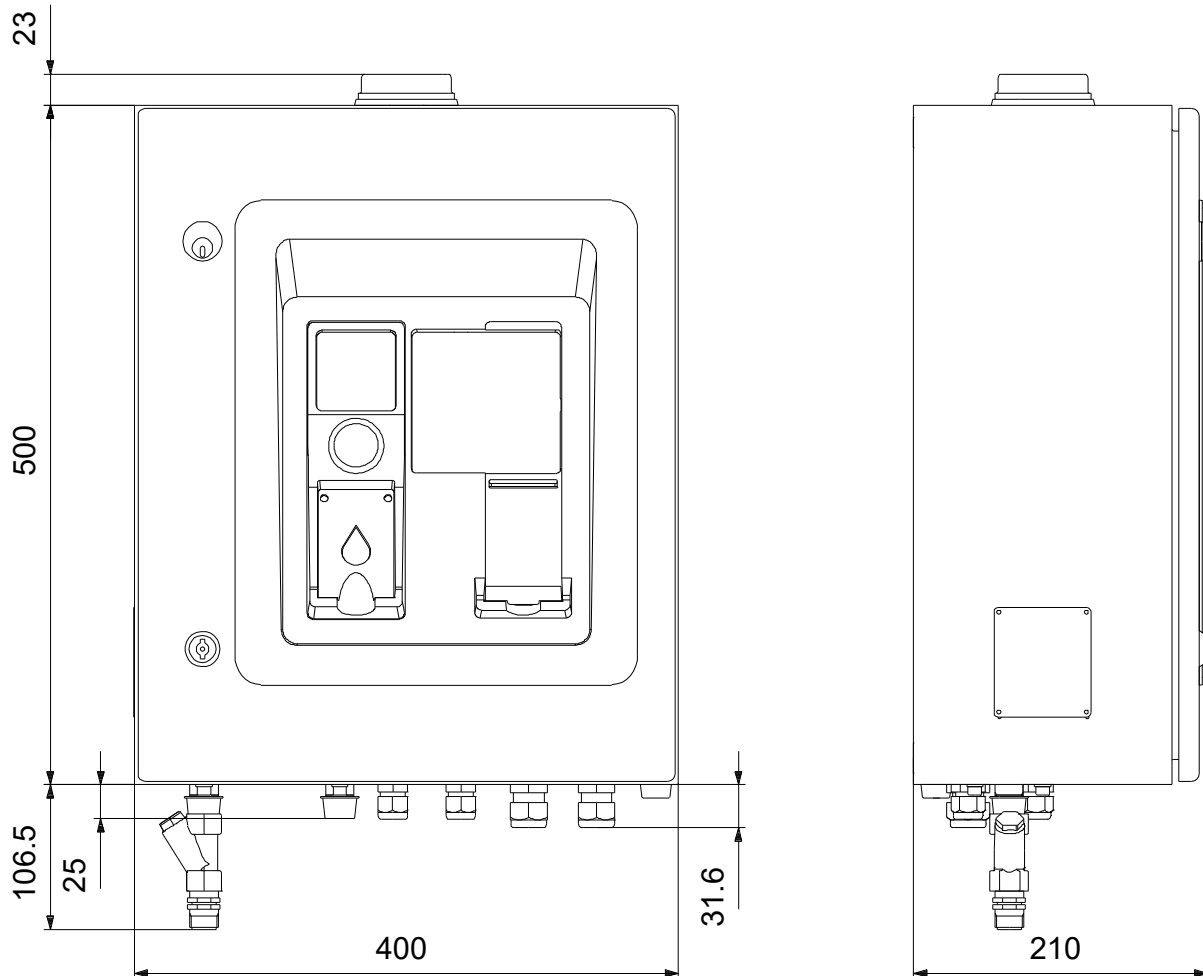


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98794194 Water dispenser AQtap



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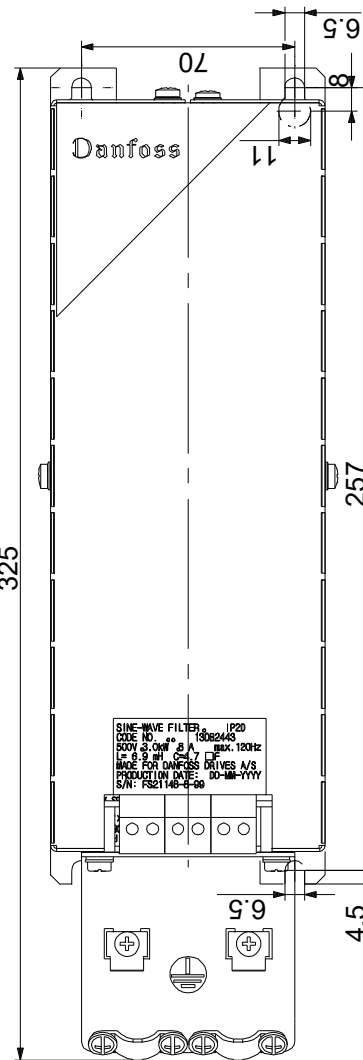
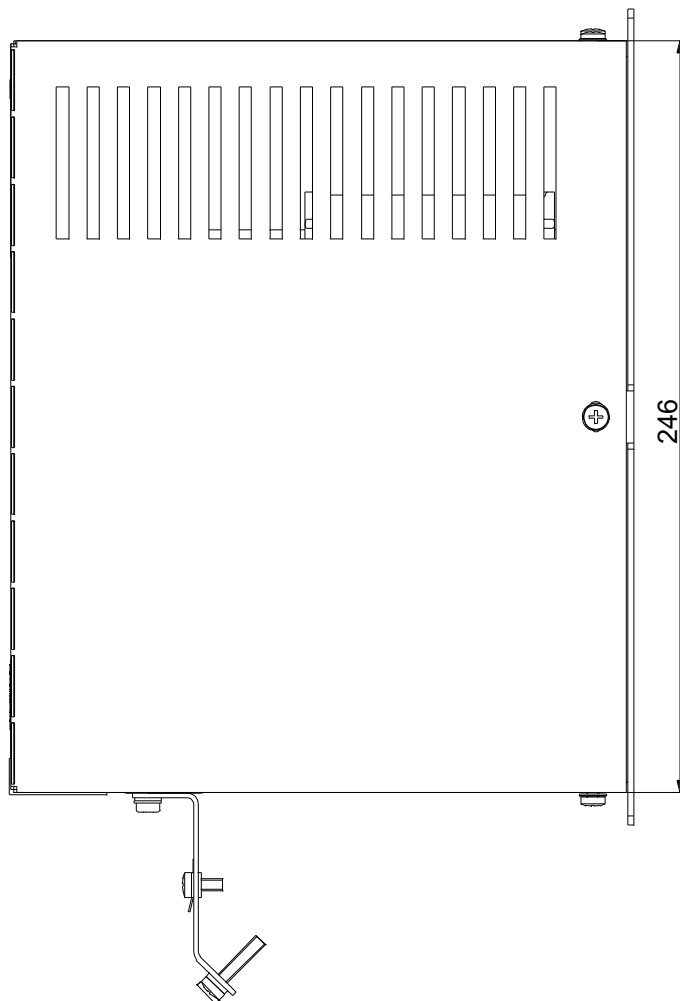
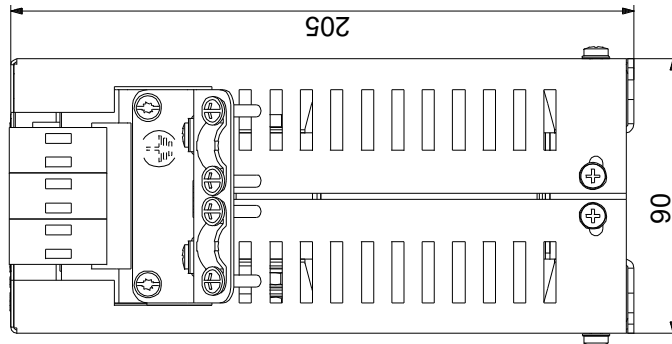


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96754974 Sine-wave filter

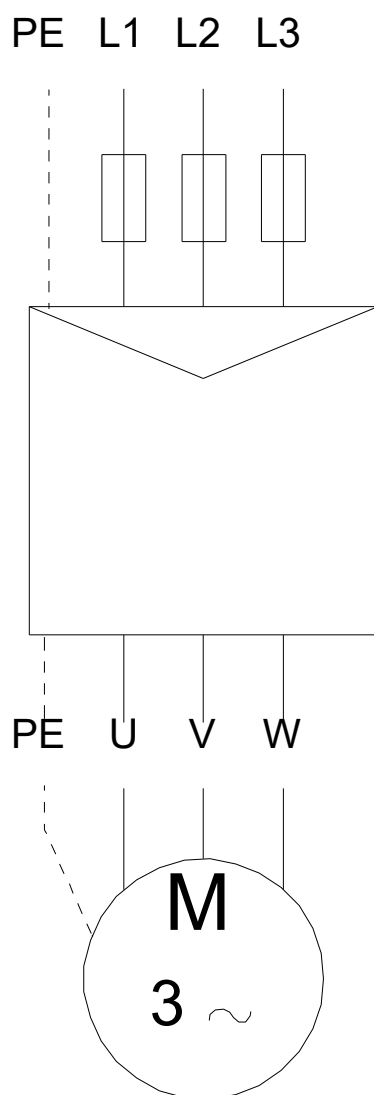


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Project: REGWA (Dabak village)
Reference Number: Solar Powered Water Supply project

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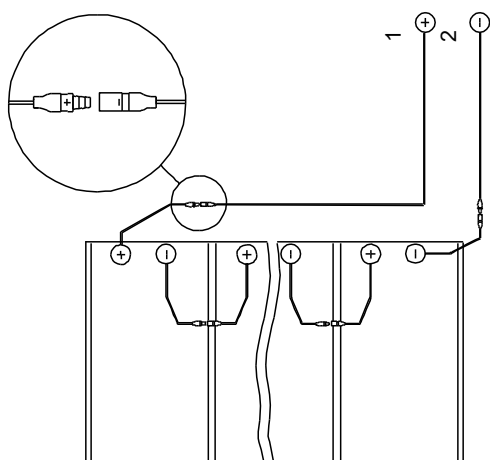
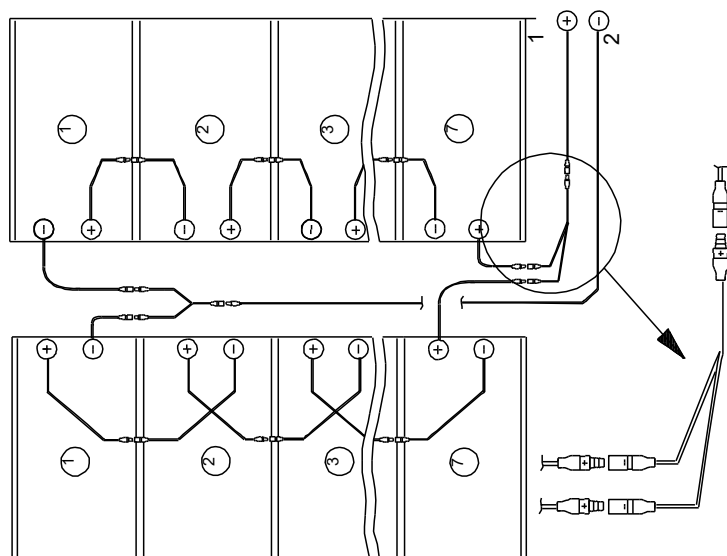
99604475 SP 9-18 N



Project: REGWA (Dabak village)
Reference Number: Solar Powered Water Supply project

Client: MEDAIR International
Client Number:
Contact:

99299012 GF 270





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Project: REGWA (Dabak village)
Reference Number: Solar Powered Water Supply project

Client: MEDAIR International
Client Number:
Contact:

99604475 SP 9-18 N

Input - summary

Water volume (max): 70 m³/day
Month for sizing: July
Static lift above ground: 15 m
Dynamic water level: 80 m
Sun tracking: No (fixed)
Location: Panjwayi District, Kandahar, Afghanistan
Latitude: 31.5462 DD, Longitude: 65.4583 DD

Products

Pump: SP 9-18 N, 1 x 99604475
Solar module: GF 270, 38 x 99299012
Wire kit, array to control box: 1 x 98257868
Wire kit, array to array: 1 x 98257892
Switch box / control unit: RSI 3x380-440V IP66 4kW 9.6A, 1 x 99044350
Switch box / control unit: OTDCP16, Circuit Breaker, 16Amp, 2 x 98341686
Switch box / control unit: OVR PV 40-1000 P, Surge Protection, 1 x 98341687
Others: Sine-wave filter, 1 x 96754974

Sizing results - summary

Water production, Peak flow and Price

Total water production per year: 26900 m³
Avg. water production per day: 73.6 m³/day
Average water production per watt per day: 7.2 l/Wp/day

Typical performance at solar radiation 800 W/m²

Flow: 8.1 m³/h
Total head: 100.9 m

Solar module configuration:

Number of solar modules in series: 19, in parallel: 2
Solar array rated power: 10.26 kW
Solar array rated volts: 600 V
Sun tracking: No (fixed)
Tilt angle: 31 deg.

Cables and pipes:

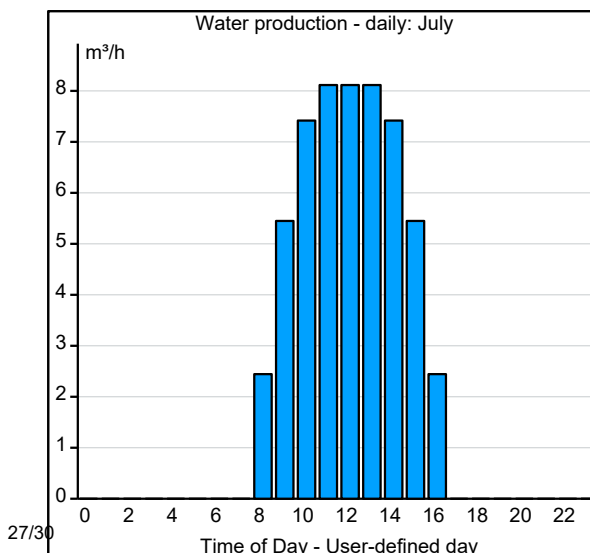
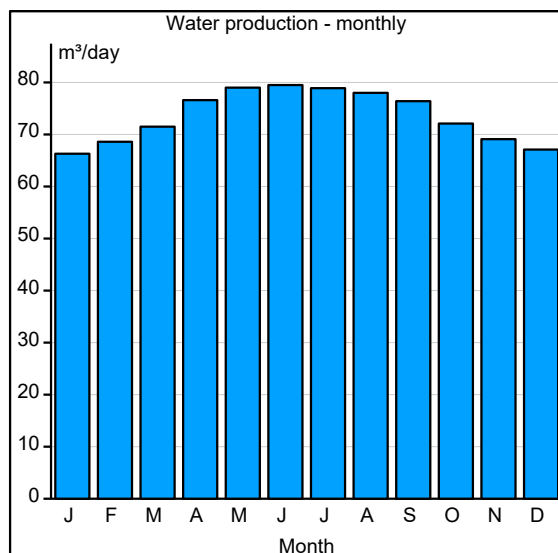
Pump cable length: 190 m
Pump cable size: 6 mm²
Total cable loss: 2.9 %

Material, riser pipe: PEH
Pipe length of riser pipe: 80 m
Friction losses: 5.888 m

System performance - monthly average

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	UDD
Water production [m ³ /day]	66.3	68.6	71.5	76.6	79	79.5	78.9	78	76.4	72.1	69.1	67.1	55
Energy production Solar [kWh/day]	56.6	60.7	67.3	68.0	68.6	68.9	66.5	68.5	72.5	71.5	64.0	57.4	34.6
Radiation horizontal [kWh/m ² day]	3.9	4.9	6.4	7.5	8.5	9.1	8.5	8.1	7.4	6.1	4.6	3.9	4
Radiation tilt [kWh/m ² day]	5.8	6.4	7.3	7.6	7.8	7.9	7.7	7.8	8.1	7.8	6.8	6.2	3.6
Avg. Temp. [°C]	5.8	9.2	14.9	21.3	26.2	28.8	29.7	27.4	22.0	16.1	10.9	7.2	10
UDD is a user-defined day in July.													

Data location: Latitude: 31 DD, Longitude: 65 DD





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99604475 SP 9-18 N

Location Map

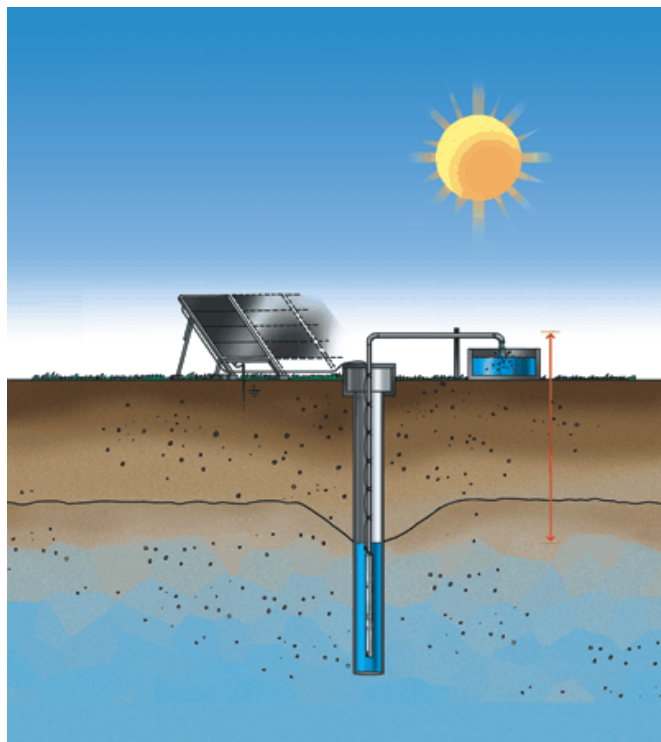


Location: Panjwayi District, Kandahar, Afghanistan
Latitude: 31.5462 DD, Longitude: 65.4583 DD

Project: REGWA (Dabak village)
Reference Number: Solar Powered Water Supply project

Client: MEDAIR International
Client Number:
Contact:

Installation and Input



Sizing Results

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Total water production per year: 26900 m³
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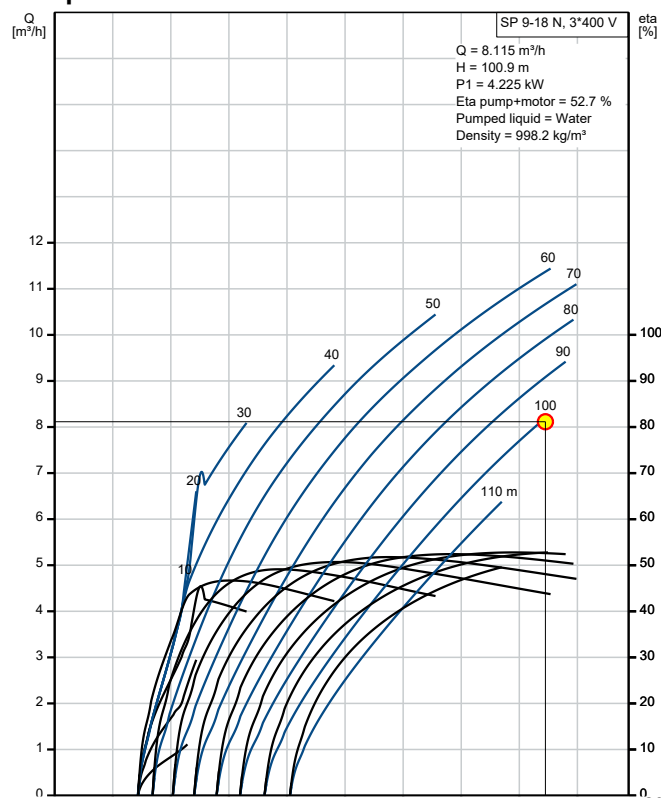
Cables and pipes:

Pump cable length: 190 m
 Pump cable size: 6 mm²
 Total cable loss: 2.9 %

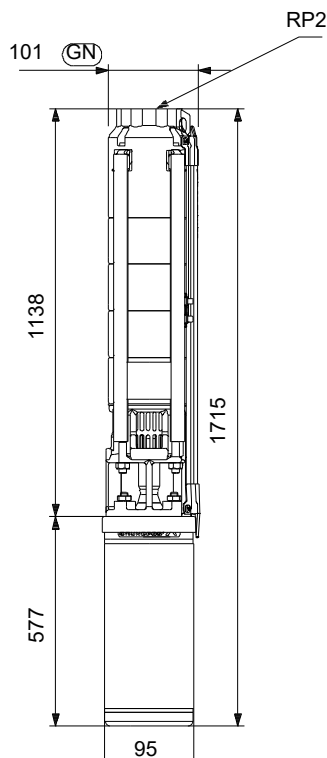
Material, riser pipe: PEH
 Pipe length of riser pipe: 80 m
 Friction losses: 5.888 m

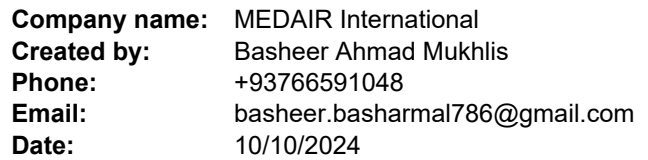
Location: Panjwayi District, Kandahar, Afghanistan
 Latitude: 31.5462 DD, Longitude: 65.4583 DD

Pump Curve



Dimensional Drawing





Client: MEDAIR International
Client Number:
Contact:

Position	Your pos.	Product name	Amount	Product No	Total
		SP 9-18 N	1	99604475	
		GF 270	38	99299012	
Wire_Kit ToControl		Wire kit array to control box (MC4)	1	98257868	
Wire_Kit Array_Arr ay		Wire kit array to array (MC4)	1	98257892	
box		RSI 3x380-440V IP66 4kW 9.6A	1	99044350	
Box		OTDCP16, Circuit Breaker, 16Amp	2	98341686	
Box		OVR PV 40-1000 P, Surge Protection	1	98341687	
		Water dispenser AQtap	1	98794194	
sine_wav e_filter		Sine-wave filter	1	96754974	

30/30