

SUBMERSIBLE PUMPSET DCSSP

DATA BOOKLET



SHAKTI

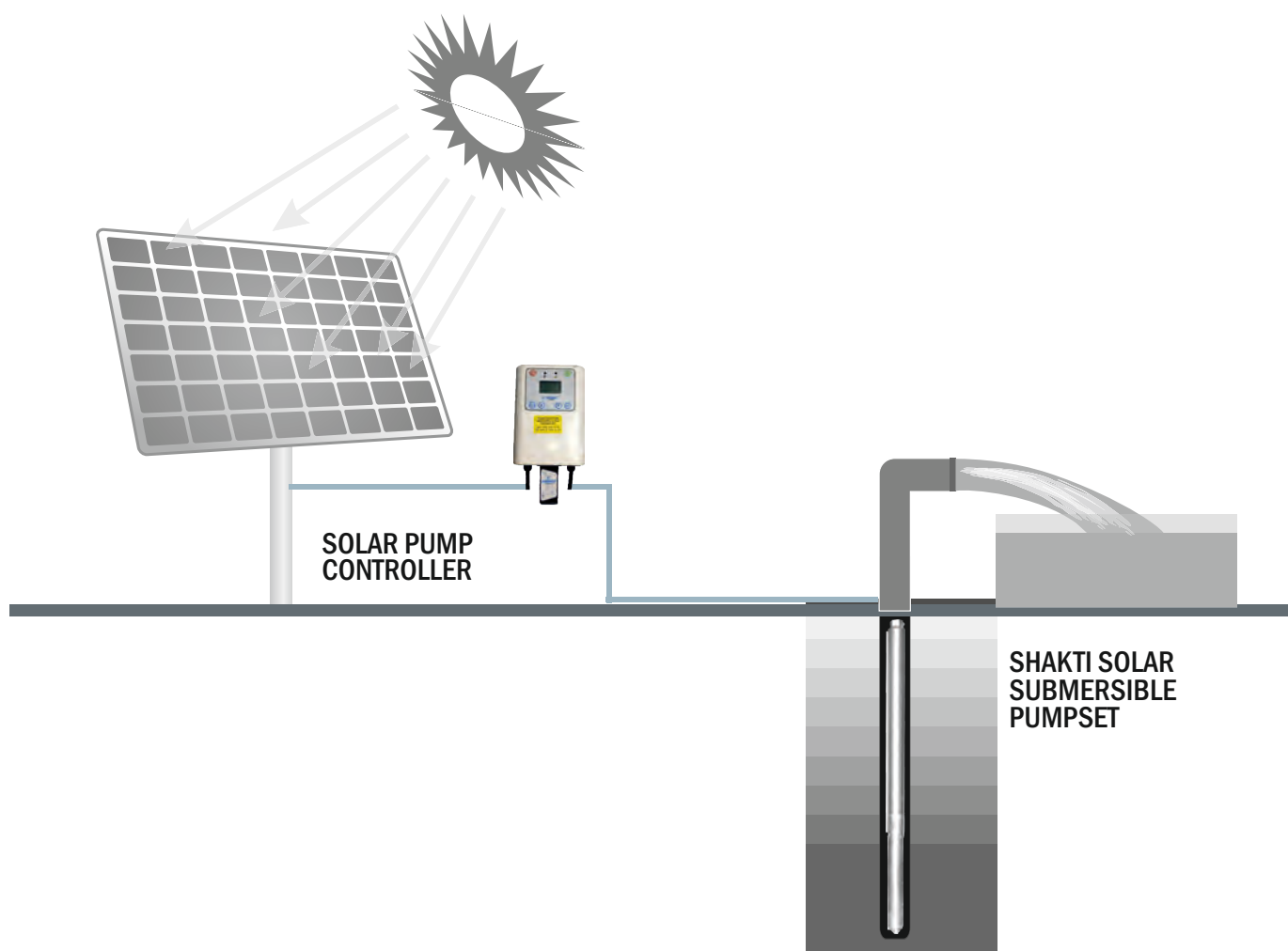
THE POWER OF INNOVATION, EFFICIENCY & TECHNOLOGY.

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INTRODUCTION

Now days Solar pumping system is becoming more and more popular, it is being applied to daily use (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 non conventional energy resources, solar pumping systems are being used more and more in municipal engineering, city centre 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 a pump controller. Based on the design philosophy that it is better to store water than electricity, there is no energy storing device such as battery in the system.



Structure of solar pumping system

The solar array, an aggregation of many solar modules connected in series and/ or parallel. This array absorbs radiation from sunlight and converts it into electrical energy thus helps in providing dynamical water as a whole system. The pump controller controls and adjusts the system operation, according to the variation of intensity of sunlight to realize the maximum power point tracking (MPPT). The pump is able to 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 may be used.

DCSSP

Applications

- Ground water lowering
- Irrigation systems
- Industrial Application
- Drip irrigation & sprinkler
- Tank / Cistern filling
- Wildlife refuge
- Rural water supply for ranches, cabins, and cottages
- Fountains

Features

- High flow system for faster tank fill and significant water output.
- Proven motor and pump technology for long-term reliability
- Clean and pollution free energy, Eco-friendly.
- Ideal for remote areas, where electricity is not available or availability is capital intensive.
- Suitable for day time irrigation, Continuous supply for 6-8 hours in a day.
- MPPT – Max Power Point Tracking for maximizing efficiency of input power
- Soft start feature prevents water hammer and increases system life Easy to operate.
- Simple installation and maintenance free.
- MNRE approved.

All-in-One Package

The Solar drive is used as a solution for specific pumping requirements of the solar pumping system. Using Shakti components, our technical expertise in groundwater pumping, and innovative thinking based on global market inputs, we have developed a rugged, high-output system which tackles the challenges of remote and harsh environments. No other system delivers the features, benefits, and reliability of solar drive in just one package!

The Solar water pumping system includes

- Shakti High Efficient Submersible motor
- Shakti Submersible pump
- Solar Panel and its mounting structure
- Solar Drive controller
- Cable
- Pipes
- Variety of flow rates available in: 20 to 100 LPM
- Motor and drive ratings available in: 1400 Watt - 3000 Watt

Identification

Type key for helical rotor pumps

	1.2	DCSSP	1400
Rated flow [M ³ /h]			
Solar Submersible Pump			
Power (Watts)			

*Note : 1. Input Power at Motor End.
2. Do not operate pump above its recommended duty head.

DCSSP

GENERAL DATA

The DCSSP system is a reliable water supply system based on renewable energy sources, such as solar. It incorporates a submersible pump. Very flexible as to its energy supply and performance, it can be combined and adapted to any need according to the conditions on the installation site. DCSSP pumps are high quality products designed for variety of high heads and small flows requirement. DCSSP pumps are suitable for both continuous and intermittent operation for a variety of applications.

Applications

DCSSP system especially suitable for water supply application, such as

- Villages, School, Hospitals, Single-family houses etc.
- Farms
 - Watering cattle
 - Irrigation of fields and greenhouses
- Game parks and game farms.
 - Watering applications

DCSSP pumps offer the following features:

- Dry-Run protection
- Highly efficient pump and motor
- Protection against up-thrust
- Over-voltage and under-voltage protection
- Overload protection

The DCSSP pump models incorporate an innovative motor design. With the use of permanent-magnet technology within the motor, the DCSSP pumps deliver unmatched performance. By combining permanent-magnet motors and SHAKTI'S own micro frequency converter, we are now able to control and communicate with the pump in ways never before possible. A few of the features that come out of this combination are Constant Pressure Control, and integrated Dry-Run protection. These are just a few of the many features that the DCSSP pumps can offer. The DCSSP pump models operate at a constant speed much like today's conventional pumps. The difference between it and traditional pumps is you get all the benefits of an electronically controlled permanent magnet motor that cannot be accomplished with a conventional induction motor.

Pumped liquids

Pumps are applicable in thin clean, non-aggressive, non-explosive liquids, not containing solid or long-fibered particles larger than sand grains.

PH value: 5 to 9

Liquid temperature: +32°F to +104°F (0°C to +40°C)

Sand content

Maximum allowable sand content: 50 ppm. A higher sand content will reduce the pump life considerably due to wear.

Salt content (chloride ions Cl-)

The table below shows the resistance of stainless steel to Cl-. The figures in the table are based on a pumped liquid with a pH value of 5 to 9.

Stainless steel AISI	Cl-content [ppm]	Liquid temperature [°F(°C)]
304	0-300	<104 (40)
	300-500	<86 (30)

CONTROLLER OVERVIEW

The controller starts the pumps slowly and adjust it's speed according to pumping load and power available from solar array.

Power output from the solar array is optimally matched to the load by maximum power point tracker(MPPT) through out all conditions.

The Shakti Solar drive is designed with the high standard of reliability expected of Shakti products. The controller attempts to drive the pump and motor to deliver water even under adverse conditions, reducing output as necessary to protect the system components from damage, and only shutting down in extreme cases.

Descriptions and Features

The Shakti Solar drives controller continuously monitors system performance and incorporates a number of features for pump system protection. In the event of a fault, the Shakti Solar drives will indicate the type of fault through the displays.

- Internal diagnostics will tolerate a lower input voltage.
- Whenever possible, the controller attempts to regulate the pump load in a manner that optimizes for maximum power transfer from the solar array.

An easy to use interface is provided to enhance configurability and enable remote system monitoring.

- A graphical display provides a detailed indication of system status.
- A small keypad offers flexibility for selection of user options.
- A continuous data connection for remote telemetry is made available

PROTECTION FEATURES

- Dry run Protection ➤ Overload Protection ➤ Open Circuit Protection ➤ Short Circuit Protection ➤ Over Heat

SOLAR PUMP DRIVE SPECIFICATION

CONTROLLER CODE	DESCRIPTION	VFD VOLTAGE RANGE (VDC)		VFD MAX OUTPUT CURRENT (AMP.)	MAX EFFICIENCY %	NET WEIGHT (KG)
		MIN (V)	MAX (V)			
9600000126	SIMHA UNIVERSAL DRIVE+3P 15A 450VDC	30	450	15	93	5.5



SHAKTI CONTROLLERS

PERFORMANCE CURVE

CURVE CONDITIONS

Specific performance charts

The specific performance charts in the Performance Curves section of this booklet are based on the following guidelines:

- All curves show mean values.
- The curves must not be used as guarantee curves.
- Typical deviation: $\pm 15\%$.
- The measurements have been made at a water temperature of $+68\text{ }^{\circ}\text{F}$ ($+20\text{ }^{\circ}\text{C}$).
- The curves apply to a kinematic viscosity of $1\text{ mm}^2/\text{s}$ (1 cSt). If the pump is used for liquids with a viscosity higher than that of water, this will reduce the head and increase the power consumption.

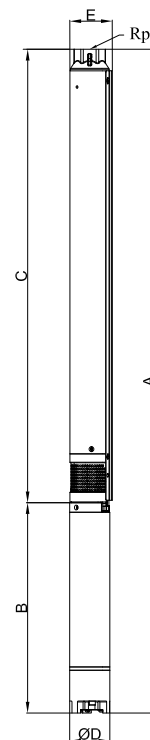
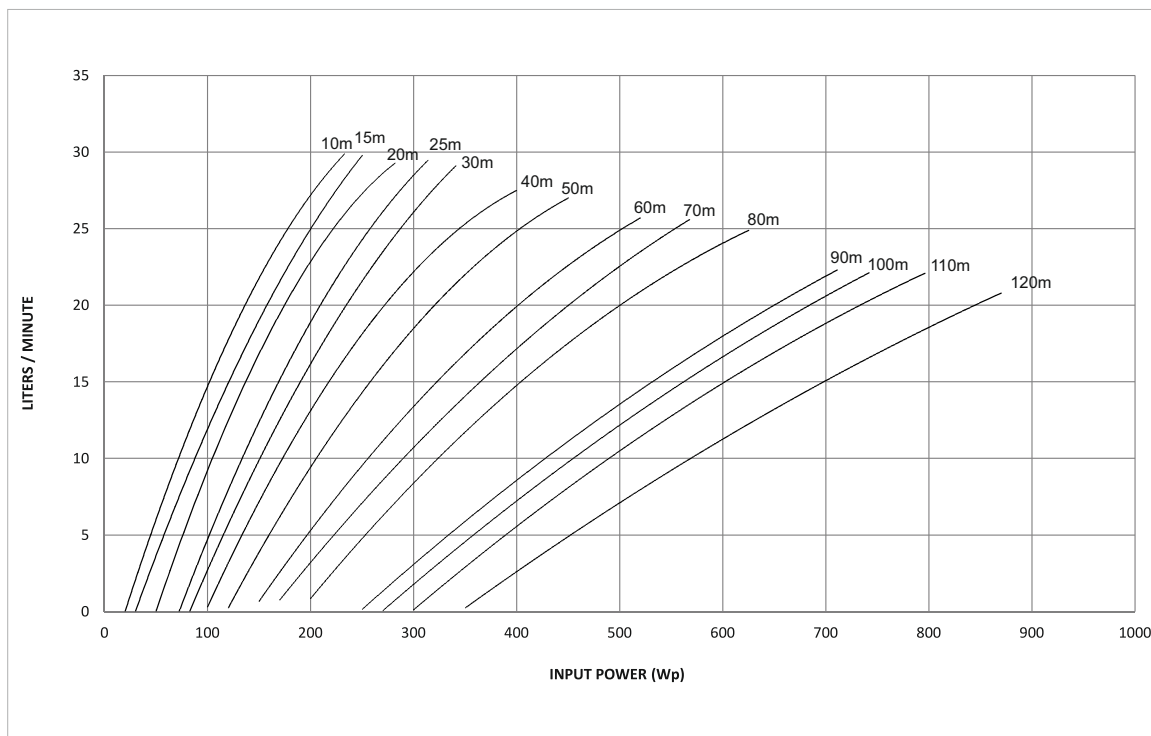
Pressure loss

The QH curves are inclusive of inlet and valve losses at actual speed.

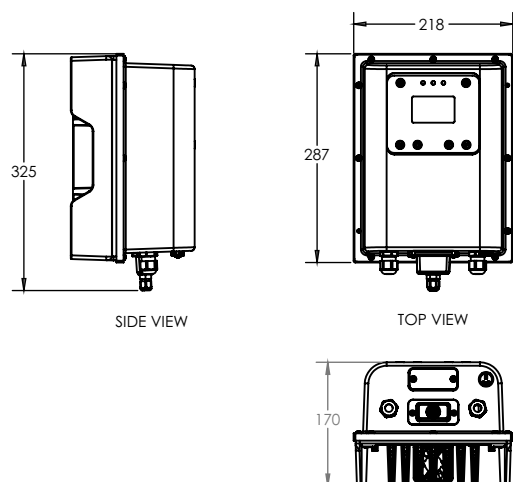
DCSSP

SOLAR 1.2 DCSSP 1400 Max (M)

BSP : 32 mm (4x4)
PUMPSET CODE : 9500002510
DISCHARGE (LPD) : 13720/10360/8400
DISCHARGE (LPW) : 9.8/7.4/6
DUTY HEAD : 60/90/120 METER
SOLAR PV ARRAY RATING : 1400 WATT



Controller Code : 9600000126



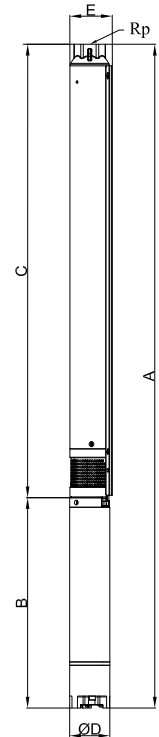
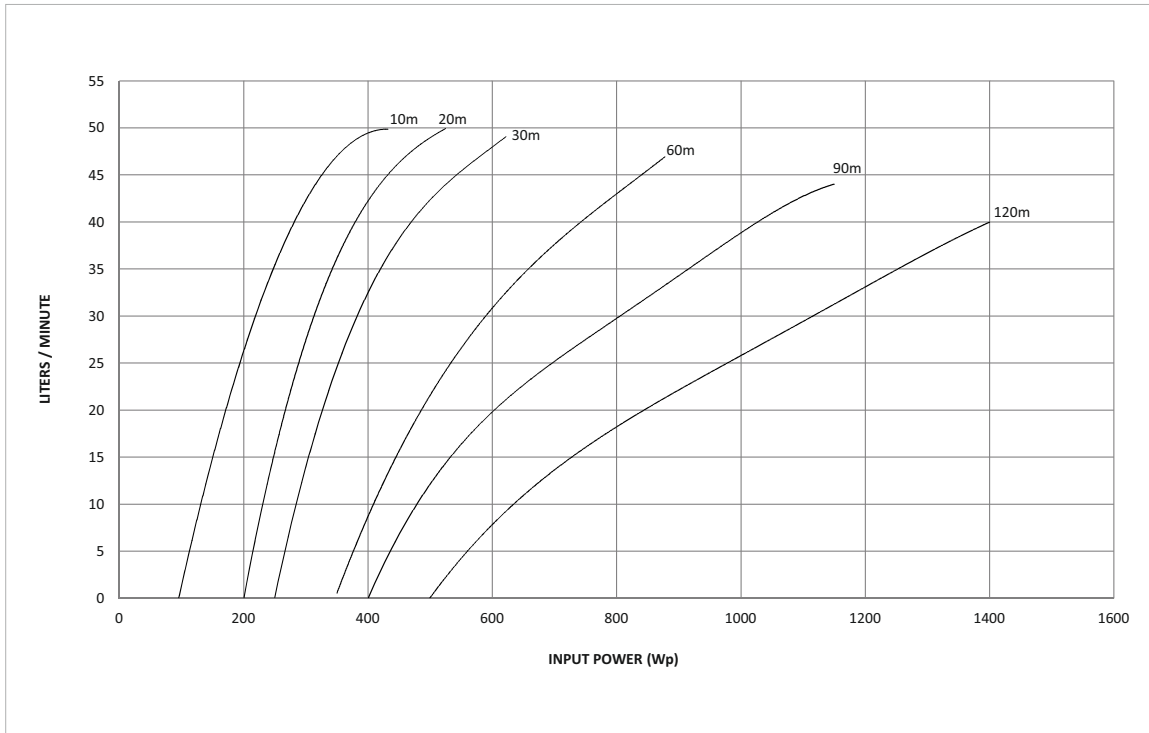
*NOTE :-

1. Subject to technical change without notice.
2. For dimensions refer technical data page.

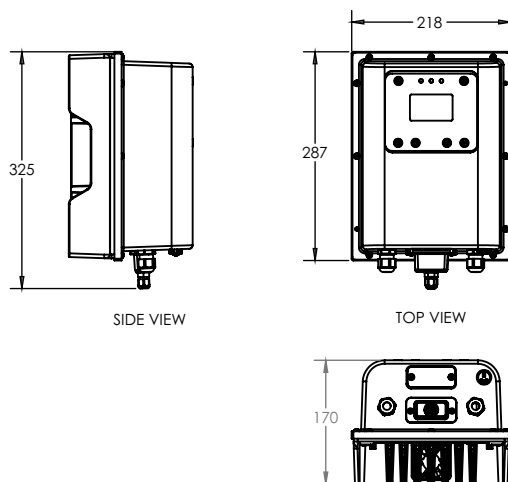
DCSSP

SOLAR 2.5 DCSSP 1400 Max (M)

BSP : 32 mm (4x4)
 PUMPSET CODE : 9500002599
 DISCHARGE (LPD) : 22100/18000/13600
 DISCHARGE (LPW) : 15.9/12.9/9.7
 DUTY HEAD : 60/90/120 METER
 SOLAR PV ARRAY RATING : 1400 WATT



Controller Code : 9600000126



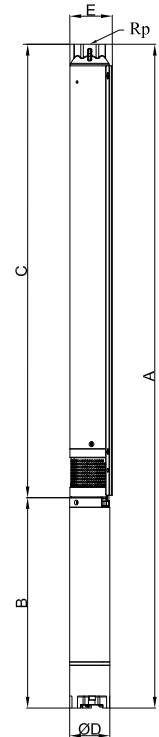
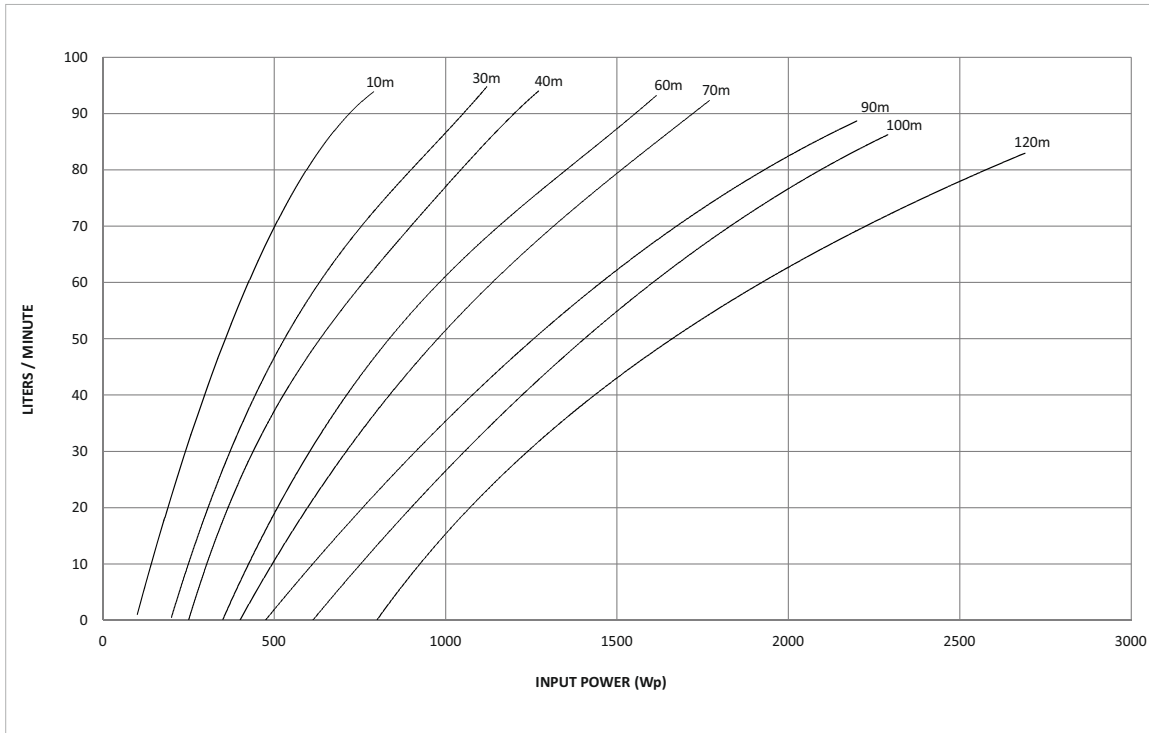
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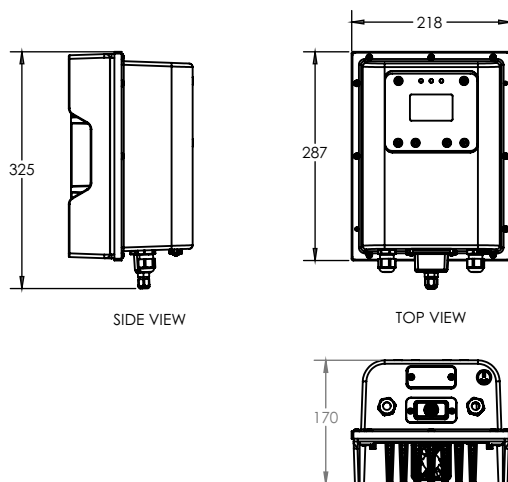
DCSSP

SOLAR 5 DCSSP 3000 Max (M)

BSP : 40 mm (4x4)
 PUMPSET CODE : 9500002641
 DISCHARGE (LPD) : 44640/37500
 DISCHARGE (LPW) : 14.9/12.5
 DUTY HEAD : 90/120 METER
 SOLAR PV ARRAY RATING : 3000 WATT



Controller Code : 9600000126



*NOTE :-

1. Subject to technical change without notice.
2. For dimensions refer technical data page.

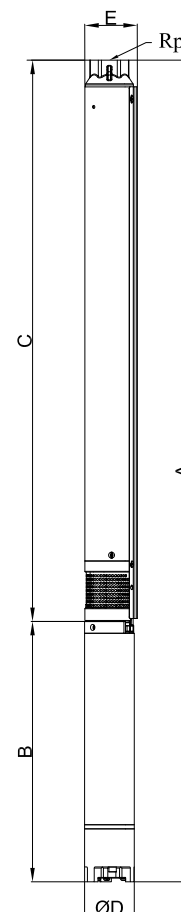
DCSSP

TECHNICAL DATA

Dimension and Weight

SR. NO.	SET CODE	DESCRIPTION	DIMENSION IN (mm)						NET WEIGHT * (Kg)
			A	B	C	ØD	E	Rp (BSP)	
1	9500002510	SOLAR 1.2 DCSSP 1400 MAX (M)	1128	319	809	95	94	32	17
2	9500002599	SOLAR 2.5 DCSSP 1400 MAX (M)	1188	379	809	95	94	32	18.5
3	9500002641	SOLAR 5 DCSSP 3000 MAX (M)	1304	414	890	95	94	40	23

Note :- * Pump + Motor Complete

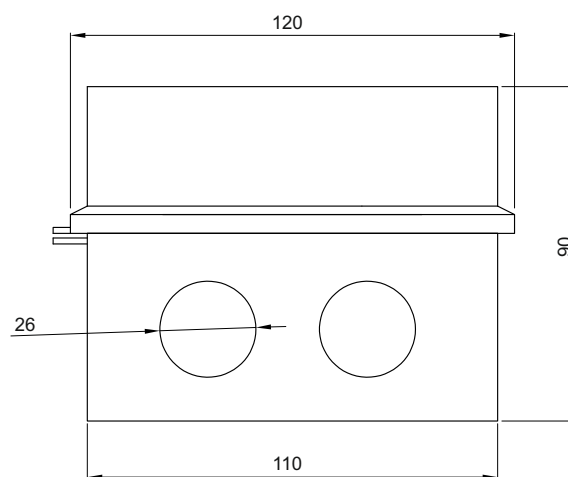
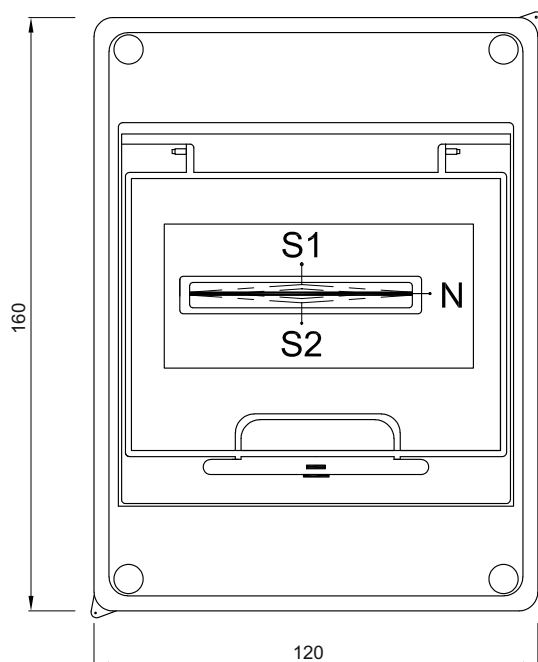


ACCESSORY

Change over switch

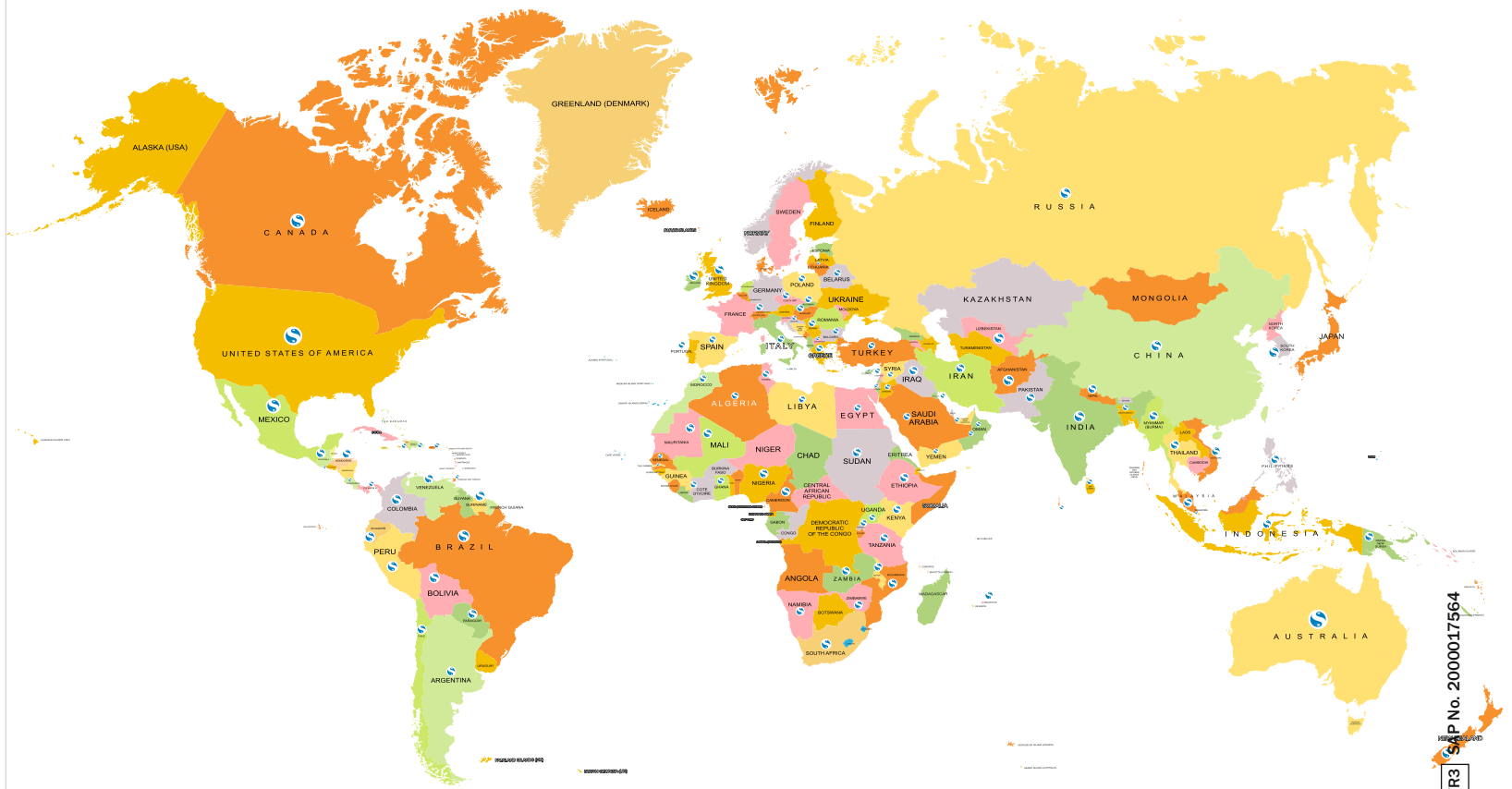
A change-over switch is a dual input single output device, which is used to change the input power source to the controller. It is generally used with controllers/drives which have options to run from solar as well as from grid. There are three operative positions in change-over switch corresponding to S1, S2, (Up and Down) & N (Middle). In case of S1 and S2 positions the corresponding sources are connected to output whereas and in N position none of the sources are connected to output. Conventionally the name of the sources is marked in S1 and S2 position for convenience of the user. These change-over switches are provided in a dust and rainproof boxes.

Note: It should be noted that while changing the power source through changeover the N position should be used until the display of the controller turns off. This intermediate use of N position avoids inrush currents through the changeover switch and improves its life.



CHANGE OVER SWITCH CODE - 3100000056

NOTE :- All dimensions in mm



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