

MONO PUMPS

A National Oilwell® Company

Sun-Downer

Solar Water Pumping Systems



Mono®


SUN-DOWNER

The Mono Sun-Downer systems are one of the original solar borehole pumping systems which were introduced to the market in 1985.

The Sun-Downer system utilises the robust Mono helical rotor lineshaft borehole pumps which are driven by standard DC motors via pulley drives.

A highly efficient Maximum Power Point Tracker (MPPT) called a power master, connects the motor to the solar array.

The Sun-Downer pump system is ideal for situations where bore conditions or customer preference preclude the use of submersible motors.

Flows & Heads

Flows to 140,000 lpd.
Heads up to 120m.

SUN-DOWNER FEATURES & BENEFITS

No ongoing fuel costs.	Minimal operating costs.
Connection to mains power is not required.	Ideal for remote, unattended locations. Reduced installation costs compared to AC systems.
Low pump speed.	Increased rotor and stator life in abrasive bores.
Uses standard Mono Pumps 1½" heavy duty column.	Can be installed in 3" or larger bores.
Mono Pumps helical rotor pump element.	Proven, efficient element to provide maximum water output. Suitable for bores containing silt or iron oxide.
Mono Pumps Maximum Power Point Tracker (MPPT) solar controller.	Maximises electrical power drawn from the solar array and overall system efficiency.
Standard DC motor used.	Motor can be directly connected to the solar array if necessary.
Standard drive head used.	Can be connected to a diesel motor via quarter twist belt drive
Supplied as complete package.	Simple installation, all parts required included
Requires only sunlight to run.	More consistent and reliable water supply than a windmill.
Provides greater daily output in summer months.	Provides more water when you need it most.

THE CONTROLLER - Power Master (MPPT)

The new generation solar controller is the electronic "brain" of the Sun-Downer solar water pumping system. Using the latest in microprocessor technology, the controller consists of an electronic PCB -

- Maximum Power Point Tracker (MPPT) controls the voltage of the array and the DC voltage to the motor controller.

The micro processor continuously changes the array voltage and monitors the input power level changes from the maximum power point of the array.

Status Indicator Lights (LED's) - Five multifunction system status lights designed to give the end user a simple identification on the systems operating status.

Plug & Socket Connections - For ease in installation and maintenance periods.

Float & Pressure Switch Facility - To allow connection of low voltage bore level probes or pressure switches ensuring automatic operation of the system when the tank is full or the bore level is low.

ON / OFF Switch - Allows instant startup or shutdown of system when required.

Com Port - Designed for simple connection to data interface with hand held diagnostic processing unit.

SOLAR WATER

1. Combined Discharge & Drive Head

Discharge heads are compact, sturdy and weatherproof. All feature grease lubricated pre-packed or sealed bearings.

2. Column

Column is available in 3 metre lengths manufactured from heavy duty galvanised pipe. Connection is by Mono's exclusive precision parallel threads producing a strong watertight joint.

3. Patented Bobbin or Spider Bearings

Simple, efficient and above all, long wearing, even under abrasive conditions. Short bobbin bearing shafts made of stainless steel run in bobbins to reduce wear on the main drive shaft.

4. Drive Shaft

Drive shaft is supplied in equivalent lengths with rolled threads for maximum thread strength and torque transmission. You have the option of carbon steel or stainless steel shafting depending on the quality of water.

5. Column Stabilizers

A unique Mono development. Supplied to support the discharge column in relation to the bore casing, thus reducing vibration and ensuring the discharge column is always centered within the bore casing.

6. Rotor / Stator Pumping Element

Perfected after many years of Mono worldwide development and research.

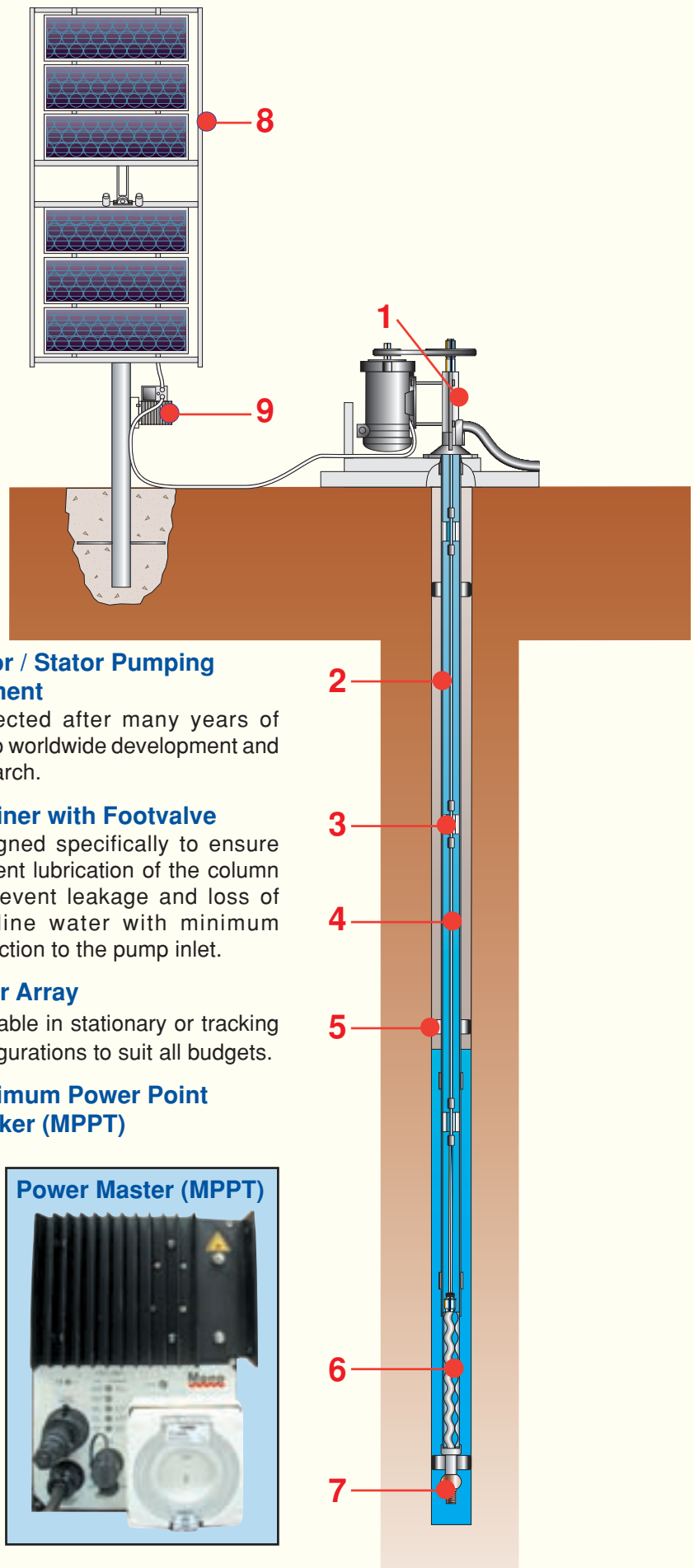
7. Strainer with Footvalve

Designed specifically to ensure efficient lubrication of the column to prevent leakage and loss of pipeline water with minimum restriction to the pump inlet.

8. Solar Array

Available in stationary or tracking configurations to suit all budgets.

9. Maximum Power Point Tracker (MPPT)



THE HAND HELD DISPLAY UNIT

As an accessory to the new generation controller, the hand held display unit is the latest development in user friendly trouble shooting and diagnostic parameter setting technology.

The unit allows the operator to extract data from the SMC and if applicable, change software settings.



Power Master (MPPT)



PUMPING SYSTEMS



GPS Tracking Array

The Mono GPS Tracker (patent applied for) will ensure that your solar modules are always facing the sun. The GPS Tracker overcomes the problems that are traditionally associated with refrigerant gas and light sensor trackers to ensure 100% tracking accuracy in all conditions.

A GPS (Global Positioning Satellite) sensor built into the controller provides precise latitude, longitude and time. This is all that the controller needs to calculate the exact position of the sun and correctly position the solar array.

Features

Benefits

Not dependent on light	Will track in overcast conditions, always ready for breaks in the cloud
Not dependent on heat	Will track in cold conditions, ready before the sun comes up
Fully rigid design	Not affected by wind
Built in GPS sensor	Simple installation, no calibration required
Automatic Calibration	No accumulated time error
No external sensors	No replacement of damaged sensors
Single button start	Simple to install, fully automatic
Designed to meet Australian Standards	Safe, fully engineered frame design
Excellent tracking accuracy	Maximise the power generated by the array
No refrigerant gas	Friendly to the environment
75° East / West tilt angle	More time pointing directly at the sun

Typical Performance - Tracking Array System

6.5kWh/m²day

System Size (Watts)	300	375	450	525	600	750	900	1050	1200	1350	1575
CAPACITY 1000's Litres per day (m³per day)											
Head (m)											
5	22.1	31.0	50.7	59.5	64.3	79.1	109.8	124.8	133.3	138.7	144.6
10	19.6	25.2	30.8	45.1	52.9	67.1	82.2	98.8	114.9	124.7	134.0
15	15.4	20.3	26.0	30.2	32.6	51.4	68.2	76.6	90.4	104.2	120.0
20	13.6	17.6	20.8	25.9	29.7	33.4	55.5	66.3	76.6	86.0	101.1
25	11.4	14.7	19.0	20.9	25.7	31.3	40.6	54.7	64.1	72.5	84.7
30	10.0	13.1	16.5	19.4	22.1	28.6	36.6	41.4	53.3	59.4	73.1
35	5.1	11.1	14.2	17.3	19.6	25.2	32.1	38.2	41.8	44.1	46.4
40	4.9	10.0	12.9	15.2	17.9	22.0	28.9	34.2	39.1	42.0	44.7
45	4.7	8.5	11.3	13.5	15.9	19.6	26.4	30.4	35.8	39.7	43.1
50	4.5	7.7	10.0	12.2	14.0	18.2	23.6	28.1	32.1	36.9	41.0
55	4.1	6.7	8.9	10.8	12.7	16.7	21.2	25.8	29.0	33.5	38.9
60	3.9	5.1	7.6	9.5	11.5	14.9	19.1	23.3	27.2	30.3	36.5
65		4.8	6.8	8.6	10.2	13.2	17.6	21.1	25.1	28.0	33.5
70		4.4	5.9	7.5	8.9	12.0	16.4	19.0	22.8	26.3	30.6
75		4.2	4.9	6.4	8.0	11.0	14.9	17.3	20.7	24.3	27.8
80		5.4	4.1	5.6	7.0	9.8	13.4	16.3	18.8	22.1	26.3
85				4.6	5.9	8.5	12.0	15.1	16.9	20.7	24.7
90				3.7	5.0	7.4	10.6	13.7	15.9	18.3	22.9
95				3.1	4.2	6.5	9.7	12.3	14.8	17.5	20.9
100				3.9	3.4	5.6	8.7	10.9	13.6	15.9	19.0
105						6.1	7.6	9.6	12.3	14.3	17.2
110						5.6	6.4	8.3	10.9	12.8	16.5
115						4.6	8.4	10.5	9.6	11.4	15.1
120						3.6	7.2	9.2	8.3	10.0	13.5

PUMPING SYSTEMS

CASS - COMPUTER AIDED SOLAR SELECTION

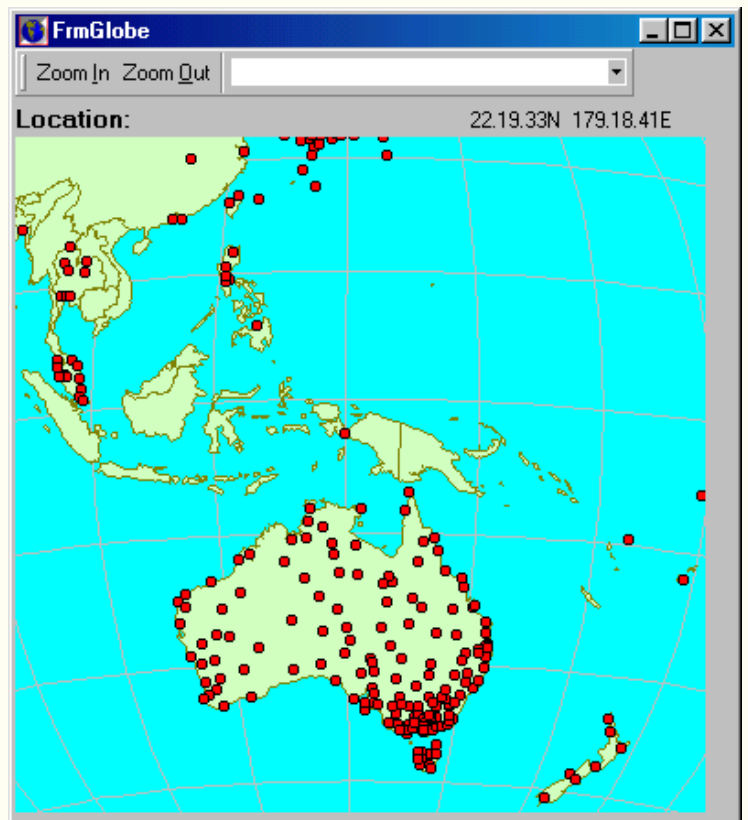
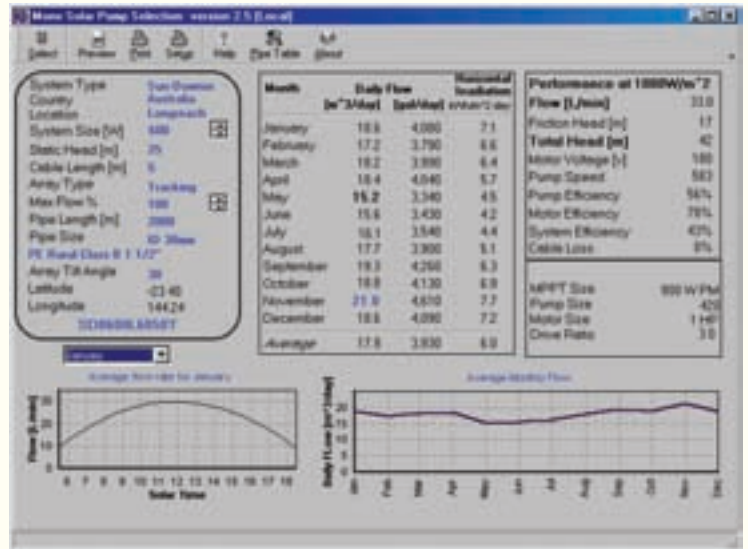
Mono Pumps can accurately predict the daily average flow you can expect from your solar pumping system for every month of the year for hundreds of locations.

Through the development of CASS (Computer Aided Solar Selection) the flow-rate of every system in the Mono Pumps solar range can be predicted for hundreds of locations around the world.

All that you need to do is enter your location, select the type of pumping system that you want to use, the size of solar array that you intend to use and the size and length of discharge pipework that you will be using. CASS will predict the flow-rate of your system, with your pipework, in your location.

CASS uses historical meteorological data and the results of extensive system testing to accurately model the installation and predict the system output.

It is easy to model a variety of systems to determine exactly which Mono Pumps solar pump will meet your flow requirements.



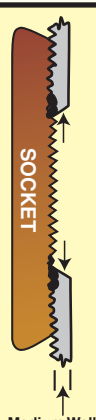
Mono Heavy Duty Column



Mono Heavy Duty Column is thick enough for parallel threads. We carefully machine the ends for a face to face connection. When you screw these faces together, you keep water out and have a much stronger connection than achieved via a tapered thread.



Ordinary column in medium weight pipe requires tapered threads. These may seal well when new, but vibration can cause water and corrosion to enter. If these few turns of thread give way, what happens to your pump?



Mono Pumps Around the World

Australasia



Mono Pumps (Australia) Pty Ltd
 338-348 Lower Dandenong Road
 Mordialloc Victoria 3195
 Australia
 Telephone: +61 (0) 3 9580 5211
 Facsimile: +61 (0) 3 9580 6659

Mono Pumps (New Zealand) Ltd
 PO Box 71-021
 35 - 41 Fremlin Place
 Avondale Auckland 7
 New Zealand
 Telephone: +64 (0) 9 829 0333
 Facsimile: +64 (0) 9 828 6480
 Email: info@mono-pumps.co.nz

	Telephone	Facsimile
Melbourne	03 9580 5211	03 9580 9036
Sydney	02 9521 5611	02 9542 3649
Brisbane	07 3350 4582	07 3350 3750
Adelaide	08 8447 8333	08 8447 8373
Perth	08 9479 0444	08 9479 0400
Darwin	08 8984 3099	08 8947 0540
Hobart	03 6249 8704	03 6249 8756
Kalgoorlie	08 9022 4880	08 9022 3660
Dunedin NZ	+64 3476 7264	+64 3476 2154



For total peace of mind ask about our scheduled maintenance contracts to suit your individual needs. We offer a complete package for all our product ranges including installation and commissioning if required.

Europe



Mono Pumps Limited
 Martin Street
 Audenshaw
 Manchester M34 5JA
 England
 Telephone: +44 (0) 161 339 9000
 Facsimile: +44 (0) 161 344 0727
 Email: info@mono-pumps.com
 Website: www.mono-pumps.com

Authorised Distributor:

Please contact the nearest Mono Office for details of your local authorised distributor.

Americas



Monoflo Incorporated
 16503 Park Row
 Houston
 Texas 77084
 U.S.A.
 Telephone: +1 281 599 4700
 Facsimile: +1 281 599 4733
 Email: inquire@monoflo.com
 Website: www.monoflo.com

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July 2003.

ART52/2

Mono Pumps (Australia) Pty Ltd

ABN 77004449478
 Telephone: +61 (0) 3 9580 5211
 Facsimile: +61 (0) 3 9580 6659
 E-mail: rural@mono-pumps.com
 Website: www.mono-pumps.com



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 A National Oilwell® Company