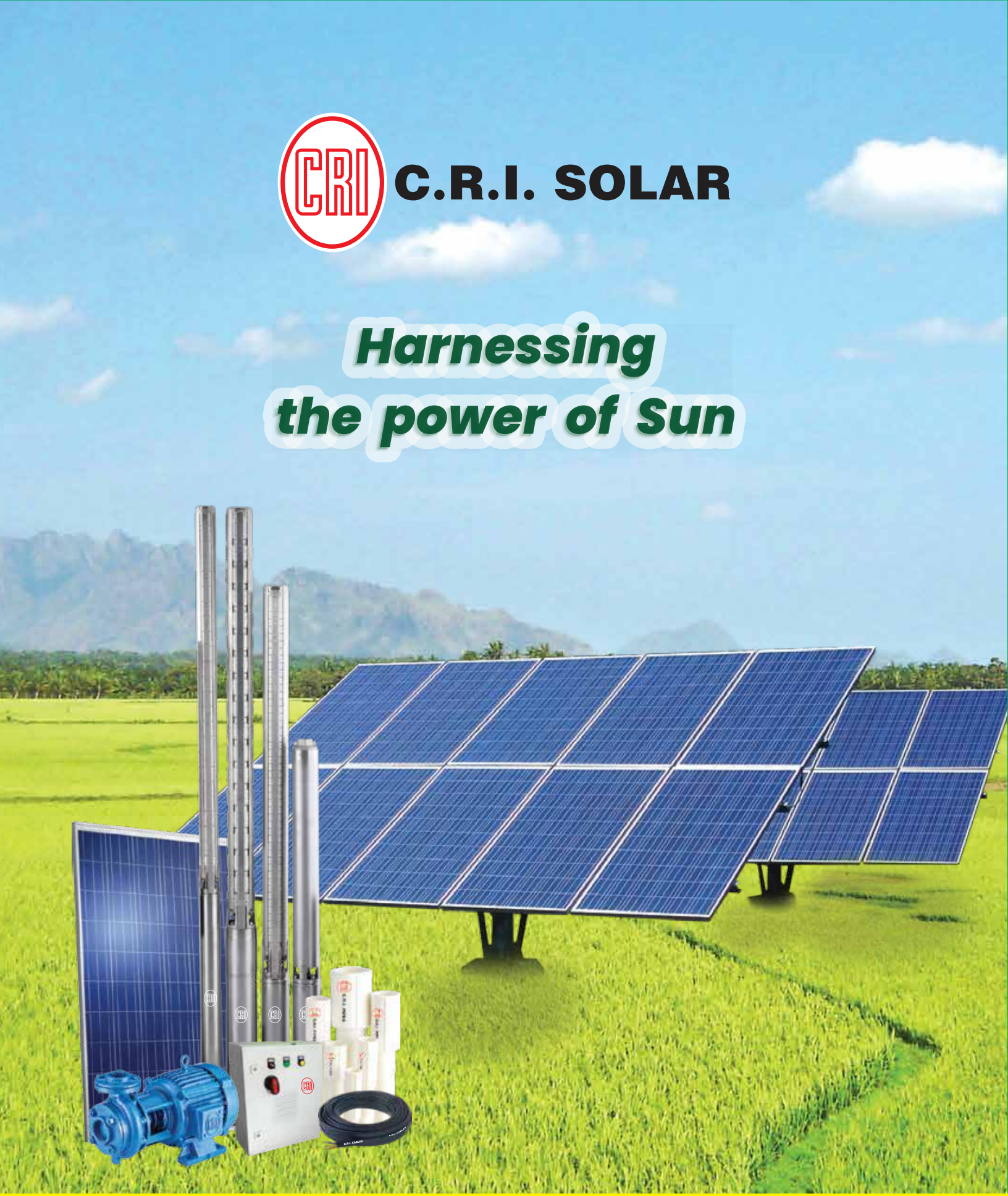
C.R.I. SOLAR

Harnessing the power of Sun



C.R.I. SOLAR PUMPING SYSTEM

VISION, MISSION & VALUES

To be the industry leader providing best-in-class fluid management solutions to individual and institutional customers and societies in our chosen markets.

We will achieve this through our dedicated efforts to enhance the welfare of all our stakeholders and by living by our values of **commitment, reliability** and **innovation.**

PROFILE

C.R.I. - the name itself encapsulates the company's ethos: "Commitment, Reliability, Innovation". Being a global player in the pump industry, C.R.I. has evolved as a leader in fluid management systems with strong presence in Pumps, Valves, Pipes, IoT Drives & Controls, Wires & cables, Solar Systems and Motors.

C.R.I. has over 6000 products catering to the flow management needs across various industries like Solar, Waste Water, Building, Pharma, Oil & Gas, Chemical, Power, Machine tool, Paper & Pulp, Mining, Process Industries, Agriculture, Residential, Community water supply, Food & Beverage applications.

The company has conquered the global market by extending to over 120 countries with 11 wholly owned subsidiaries. Today, C.R.I. is a brand that the world trusts when it comes to Fluid Management Solutions.

A GLIMPSE OF C.R.I. SOLAR PUMPING SYSTEM :

- Empanelled with Ministry of New and Renewable Energy (MNRE) for On- Grid and Off – Grid Projects.
- Highest grading, SP-1A by Credit Analysis & Research Ltd. (CARE) for Solar projects.
- Complete range of products from 1HP to 10HP AC Solar Pumpsets, as per MNRE specifications.
- Solar Pumpsets are tested through Array Simulator as per MNRE standards.
- Successfully Installed around 3 MW of Solar Pumping Systems.
- Supplied more than 10,000 MNRE Approved Solar pumpsets through System Integrators for their various projects across India.
- Having good service back-up in Pan-India

C.R.I. SOLAR PUMPING SYSTEMS

C.R.I. Solar pumping system's comprises of an array of Solar Photo Voltaic Modules, Pumpset, Solar Pump Controller, Module Mounting Structure , Lightning Arrester and Earthing Kit.

Solar Pump Controller converts DC Power supply generated by PV Modules to AC supply along with Variable Frequency Drive for optimize speed control of the pumpset . Function of MPPT (Maximum Power Point Tracking) maximises the system output efficiency.

Module Mounting structure is completely Hot Dip Galvanised, having Fixed Structures, Manual Tracking system with Dual Axis provision (Auto tracking is an Optional).

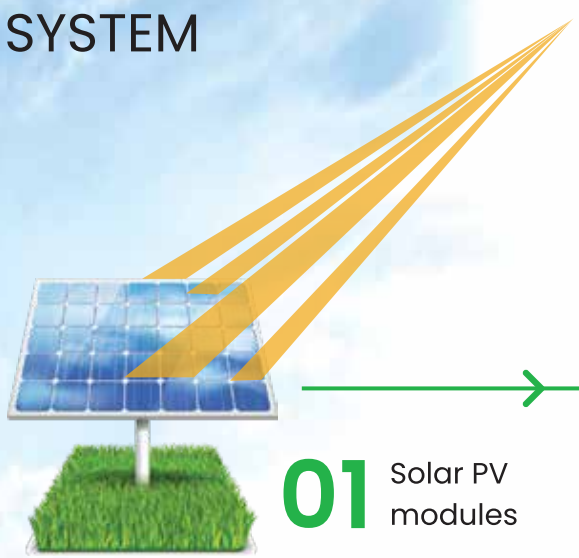
A lightning arrester is a device used on electrical power systems to protect the insulation and conductors of the system from the damaging effects of lightning.

Earthing kits are composed of two main components, a clamp and a cable. The clamp will be screwed on a coaxial cable and in case of lightning strokes in the installation, the voltage will be diverted over a ripple in the clamp with the combined cable and will be earthed / grounded by this way.

SALIENT FEATURES

- Eco-friendly
- Highly durable
- Universal – 50/60Hz pumps can be used
- Dry run protection with external feedback
- Extremely hardwearing water lubricated bearing
- High operating efficiency & low maintenance
- Operator Panel (optional Remote Monitoring System)
- Corrosion resistant Stainless Steel ensures longer life of Pumpset
- System having provision for operating through Solar & Electricity by power sharing Methodology

SCHEMATIC DIAGRAM OF SOLAR PUMPING SYSTEM



01 Solar PV modules

02 VFD Control panel

05 Remote monitoring

03 Pumpset

04 Water Supply

APPLICATIONS:

| Agricultural Irrigation | Farms municipal water supply | Rural water supply | Cattle feeding | Residential | Mining Application

C.R.I. STAINLESS STEEL

SUBMERSIBLE PUMPSETS

C.R.I. Stainless Steel Submersible pumpsets are made of corrosion resistant stainless steel with built in check valve. All vital components of these pump models are made of high quality **304/316 grade stainless steel.** The Optimal design of impellers and diffusers enables the best possible hydraulic efficiency.

These pumps are of multistage centrifugal type, which is powered by water filled/oil filled, rewindable submersible motor, suitable for continuous duty. Motor Stator is made up of low watt loss Silicon Steel Laminations and wound with high grade insulated copper windings wires which ensures high efficiency of the Motor.

SALIENT FEATURES

- Designed for wide voltage operations
- Laser welding for higher efficiency and longer durability
- Dynamically balanced rotating parts such as impeller and rotor
- High operating efficiency resulting in lower power consumption
- Balanced rigid construction
- Good suction lift attributes
- Easy to dismantle & repair

C.R.I. OPENWELL SUBMERSIBLE PUMPSETS

C.R.I. Openwell Submersible Pumpsets are ideally suitable for openwells or tanks where a wide fluctuation of water level occurs. The pumpsets works under water and rest at the bottom of the well. Prime mover is rewindable and water – cooled motor.

Specially designed water lubricated bearings are used to withstand the axial thrust loads with minimum wear and tear. The stator is wound with special waterproof synthetic film insulated copper winding wires and made up of low watt loss silicon steel laminations assembled under pressure and rigidly locked.

Motor sealing is made by polymers, 'O' rings, oil seals and sand guard to avoid ingress of well water/salt into the motor. Pressure equalizing rubber diaphragm is provided to guard the motor from pressure and volume variation of water as detailed in our operator's manual. Three phase motor requires an adequate motor protection control panel.

SALIENT FEATURES

- No suction and priming problem
- Extremely tough and hard wearing lubricated journal bearings are used
- Dynamically balanced rotating parts ensures minimum vibration and longer life
- Motor designed with higher cooling effect ensures longer life
- Motor body available in SS 304 & Cast Iron
- Designed for wide voltage operations
- High operating efficiency

C.R.I. CENTRIFUGAL MONOBLOCK PUMPSETS

C.R.I. Centrifugal Monoblock pumpsets volute chamber and impellers are designed to give the best possible hydraulic efficiency and good suction lift characteristics. Most modern and highly sophisticated machineries and technologies are engaged in manufacturing those pumpsets, using quality raw materials.

These pumpsets are powered by a totally enclosed fan cooled AC induction two pole motor or four pole motors, suitable for continuous duty. The motor stator is made with low watt loss silicon steel laminations, assembled under pressure and rigidly locked in the frame. The winding is of high-grade enameled copper wire and varnish impregnated.

Construction of motor frames and usage of quality materials results in high performance and low-temperature rise, thereby increasing the life cycle of the motor. These pumpsets require adequate motor protection control panel.

SALIENT FEATURES

- Designed with 3D HT technology
- Designed for wide voltage operations
- Single shaft for motor and pumpset ensure good mechanical strength
- Dynamically balanced rotating parts such as impeller and rotor
- High operating efficiency resulting in lower power consumption
- Good suction lift attributes
- Balanced rigid construction
- Graphite coated asbestos packing rope is used to increase the bush life
- Monoblock with extension shaft in specific models

PUMPSET PERFORMANCE CHART

	Model	Type of Submersible Pumpset	kW	HP	Stage	Outlet Size in mm	PV Array Capacity (Wp)	Head Range in Metres	Opearting Head in metres	Discharge (LPD)
BOREWELL SUBMERSIBLE	SOLB S4S-05/08	100mm(4")	0.75	1	8	32	900	30 - 45	30	35028
	SOLB S4S-02/18	100mm(4")	0.75	1	18	32	900	60 - 90	60	14000
	SOLB S4S-01/28	100mm(4")	0.75	1	28	32	900	90 -120	90	8000
	SOLB S4S-08/09	100mm(4")	1.5	2	9	50	1800	30 -45	30	58369
	SOLB S6S-14/05	150mm(6")	2.2	3	5	50	3000	30 - 45	30	25808
	SOLB S6S-12/08	150mm(6")	2.2	3	8	50	3000	50- 75	50	62859
	SOLB S4S-08/15	100mm(4")	2.2	3	15	50	3000	50- 75	50	60560
	SOLB S6S-48/03	150mm(6")	3.7	5	3	80	4800	20 -35	20	243000
	SOLB S6S-22/05	150mm(6")	3.7	5	5	80	4800	30 - 45	30	166270
	SOLB S6S-17/07	150mm(6")	3.7	5	7	65	4800	50-70	50	124400
	SOLB S6S-14/10	150mm(6")	3.7	5	10	50	4800	70-100	70	78230
	SOLB S6S-08/25	150/100mm	3.7	5	25	50	4800	100 -150	100	43520
	SOLB S6S-18/08	150mm(6")	5.5	7.5	8	65	6750	50-70	50	43520
	SOLB S6S-14/12	150mm(6")	5.5	7.5	12	65	6750	70-100	70	108400
	SOLB S4S-8/30	150/100mm	5.5	7.5	30	50	6750	100 -150	100	75600
	SOLB S6S-30/07	150mm(6")	7.5	10	7	80	9000	50-70	50	229450
	SOLB S6S-18/11	150mm(6")	7.5	10	11	65	9000	70-100	70	156700
	SOLB S6S-14/15	150mm(6")	7.5	10	15	65	9000	100 -150	100	107400

1HP – 5HP Pumpsets available in both Water filled and Oil filled motors

	Models	kW	HP	Outlet size in mm	PV Array Capacity (Wp)	Head Range in mtrs	Operating Head In Mts	Discharge (LPD)
OPENWELL SUBMERSIBLE	SOLO - 3	0.75	1	25	1200	8 - 26	20	51480
	SOLO CSM - 1	2.2	3	50	3000	16 - 24	20	126500
	SOLO CVH 3/3	2.2	3	50	3000	8 - 30	20	102960
	SOLO CSM - 2	3.7	5	65/80	4800	20 - 30	25	308880
	SOLO CV - 13	3.7	5	50	4800	20 - 40	30	334620
	SOLO CVH 5/4	3.7	5	50	4800	16 - 50	40	128700

	Models	kW	HP	Suction x Delivery in mm	PV Array Capacity (Wp)	Head Range in mtrs	Operating Head In Mts	Discharge (LPD)
CENTRIFUGAL MONOBLOCK	SOLM - ACM A11	0.75	1	50x40	900	10 - 12	10	82368
	SOLM - ACM 49	1.5	2	65X50	1800	10 - 15	10	182754
	SOLM 3 - H1	2.2	3	65X50	2700	10 - 15	10	256013
	SOLM 3 - H1	2.2	3	65X50	2700	20 - 25	20	124719
	SOLM BP - 5H5	3.7	5	100x75	4500	10 - 15	10	437515
	SOLM BPH 40.1	3.7	5	65X50	4500	20 - 30	20	219384

Wp - Watt Peak; LPD - Litre per day

C.R.I. SOLAR PUMP CONTROLLER

C.R.I. Solar Pump System comprises of an array of Solar Panel, VFD (Variable Frequency Drive) or Inverter for the conversion of D.C. supply generated from the solar panels into A.C. supply with variable frequency for optimal speed control of the pump.

With the function of MPPT (maximum power point tracking), it shall regulate the speed of the motor according to irradiation in real time to achieve the maximum power.

SALIENT FEATURES

| DC / AC Connection at the input side depending on drive ratings

| MPPT Algorithm when connected to PV Cells, while running on grid AC Power, MPPT feature shall be displaced automatically(Optional Operator Panel)

| Optional Remote Monitoring with GSM/GPRS

| Optional External Interlock (Thermistor etc.,)

OPERATING CONDITION

Ambient temperature	:	-10° C to +50° C
Relative Humidity	:	Maximum 95%
Climatic / Environmental conditions	:	Class 3K3, 3C2, according to EN 60721 -3-3
Compliance	:	CE, UL, CUL, CSA, C-Tick, GOST R

IN-BUILT PROTECTIONS

| Incoming DC fuses at the DC input supply | Incoming MCCB for AC input supply | In-built inverter protection function | Over current Fault | Short Circuit Fault | Earth Fault | Inbuilt VFD Having IP20, IP66 are excellent protections From High Dust , Moisture, solid objects. | VFD Enclosures Having high level of IP54 Protections against water splashed and Dust protection | Reverse Polarity like a diode provides only the reversal voltage protection. | Surge Protection (Optional) | Dry run protection

REMOTE MONITORING SYSTEMS

A remote monitoring unit is a device used to collect a wide variety of data from various sensors that transmit the data through wireless. A remote monitoring unit makes sorting and viewing of data easier across a large geographic range and many areas of interest.

The communication modes that are available in the systems are RS 485, RS 232, GSM and GPRS systems. Through these systems the critical electrical parameters (DC input voltage, input current & Frequency) and Pump parameters (Speed, Temperature & Flow) shall be controlled through appropriate control mechanisms. Thus it enhances the effectiveness of the solar pumping systems not only during its operation but also helps during after sales support.

C.R.I. uPVC COLUMN PIPES

These pipes are specially designed for submersible pumps, capable of handling both internal hydrostatic pressure as well as high tensile load caused by the pump weight & column water pressure and weight. These pipes are available in 33, 42, 48, 60, 75, 88, 113, and 140 mm sizes of outer diameter under Elite, ESPY, Medium, Standard, Heavy, and Super Heavy types. The Maximum Working Head f or Coupler type is upto 450 mtrs and for Bell Mouth upto 300 mtrs.

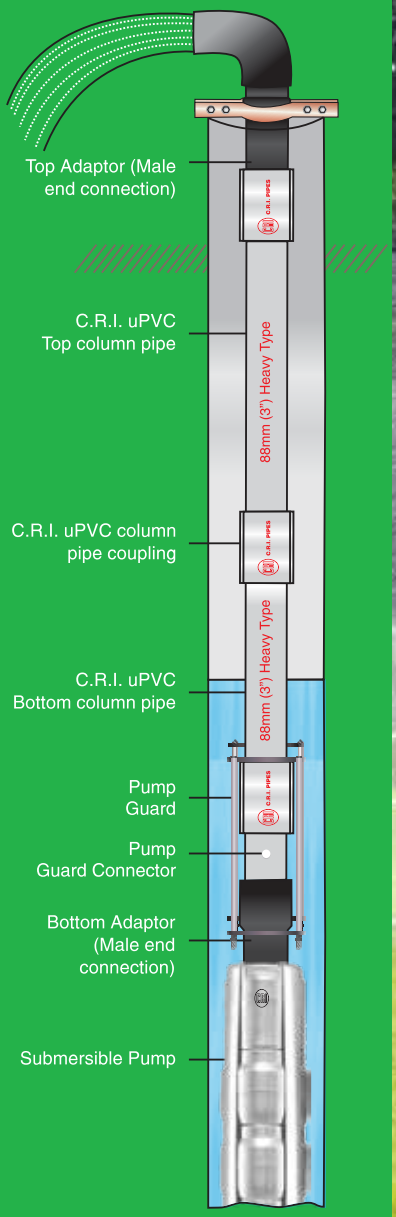
SALIENT FEATURES

- Rigid construction & longer life span of upto 25 years.
- Best alternate for G.I. Pipes and are corrosion free & cost effective
- Special care is taken while fixing couplers with pipes to avoid column slippage.
- Specially designed square threads are capable of withstanding heavy load.
- PBTS (Polymer Bonded Thread Sink) locking system enhances reliability.
- Special rubber seal is provided at the end of threads to ensure 100% leak proof even at high pressure.
- uPVC column pipes are resistant to chemical reactions when used in acidic or alkaline waters assuring long life.
- These pipes come in 3metre standard length and are of light weight ensuring easy handling and storage. Also supplied in 1.5metre length on request.

Available sizes : 33mm to 140mm

Max. Installation Depth : upto 450metre

Fields of Application : Borewells



ILLUSTRATION

PBTS™ ADVANCED LOCKING SYSTEM

C.R.I. HDPE PIPES

HDPE pipes are manufactured as per IS 4984:1995 standard available in 20mm to 1000mm sizes in different pressure classes are used to carry potable water in domestic, rural & agriculture pipe lines. These pipes are available in PN2.5 to PN16 pressure class in PE63, PE80, and PE100 grade and are manufactured according to Indian standards.

SALIENT FEATURES

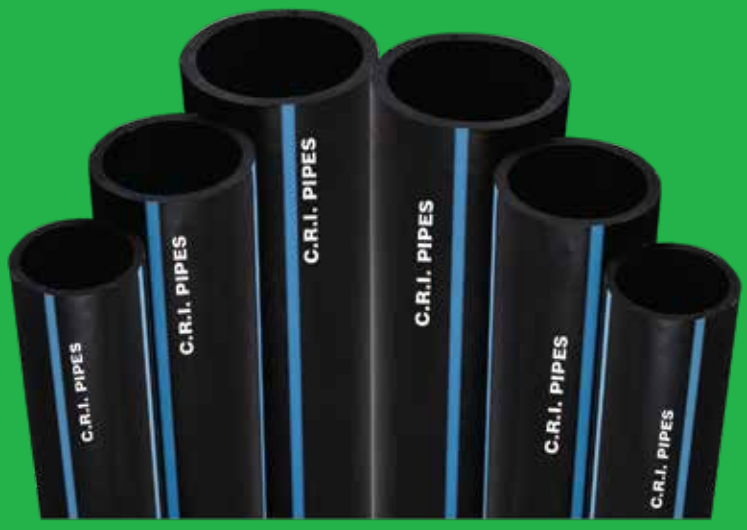
- Non-Toxic & Hygienic
- Corrosion resistance
- Maintenance free
- Strong, Flexible & Light weight
- Smooth surface

Available sizes : 20mm to 1000mm

Fields of Application : Potable Water Supply, Agriculture Pipe Lines, Sprinkler & Drip Irrigation

STANDARD LENGTH FOR VARIOUS SIZES

Sizes in mm (OD)	PN-Kgf/cm²	Length per roll
20, 25, 32, 40 & 50	6kg, 8kg, & 10kg	300mtr to 1000mtr
63 & 75	4kg, 6kg, 8kg & 10kg	200mtr to 500mtr
90	4kg, 6kg, 8kg & 10kg	100mtr to 200mtr
110	4kg, 6kg, 8kg & 10kg	6mtr & 100mtr



C.R.I. 3 CORE FLAT CABLES

C.R.I. Cables are manufactured as per Indian standards that generally conforms to IS 694. High conductivity, annealed and bunched flexible conductors are made from bright 99.97% EC grade copper.

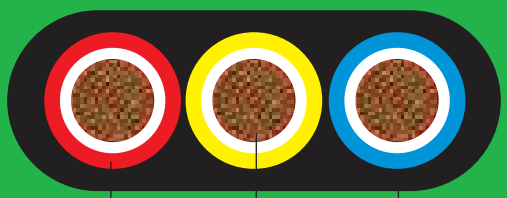
Conductors are twisted together and insulated with Double Layer PVC Protection. Insulation material is made up of special grade PVC compound which gives high insulation resistance.

Cables are sheathed with special grade of PVC compound which makes them impervious to water, grease, oil. This makes cables more durable with increased life and uncompromising performance at all the times irrespective of any fluctuations.

These cables are sequentially marked at one meter intervals for convenience.

SALIENT FEATURES

- High ageing property
- Low conductor resistance
- High insulation resistance
- Excellent weather resistant
- Resistant to oils, chemicals, ozone & solvents
- Cut, tear & abrasion resistant
- Flame resistant



PVC Insulation of Cores (Red, Yellow, Blue)

Flexible Copper Conductor

PVC Sheath (Black)

Available nominal sizes : 0.50mm² to 50.0 mm²

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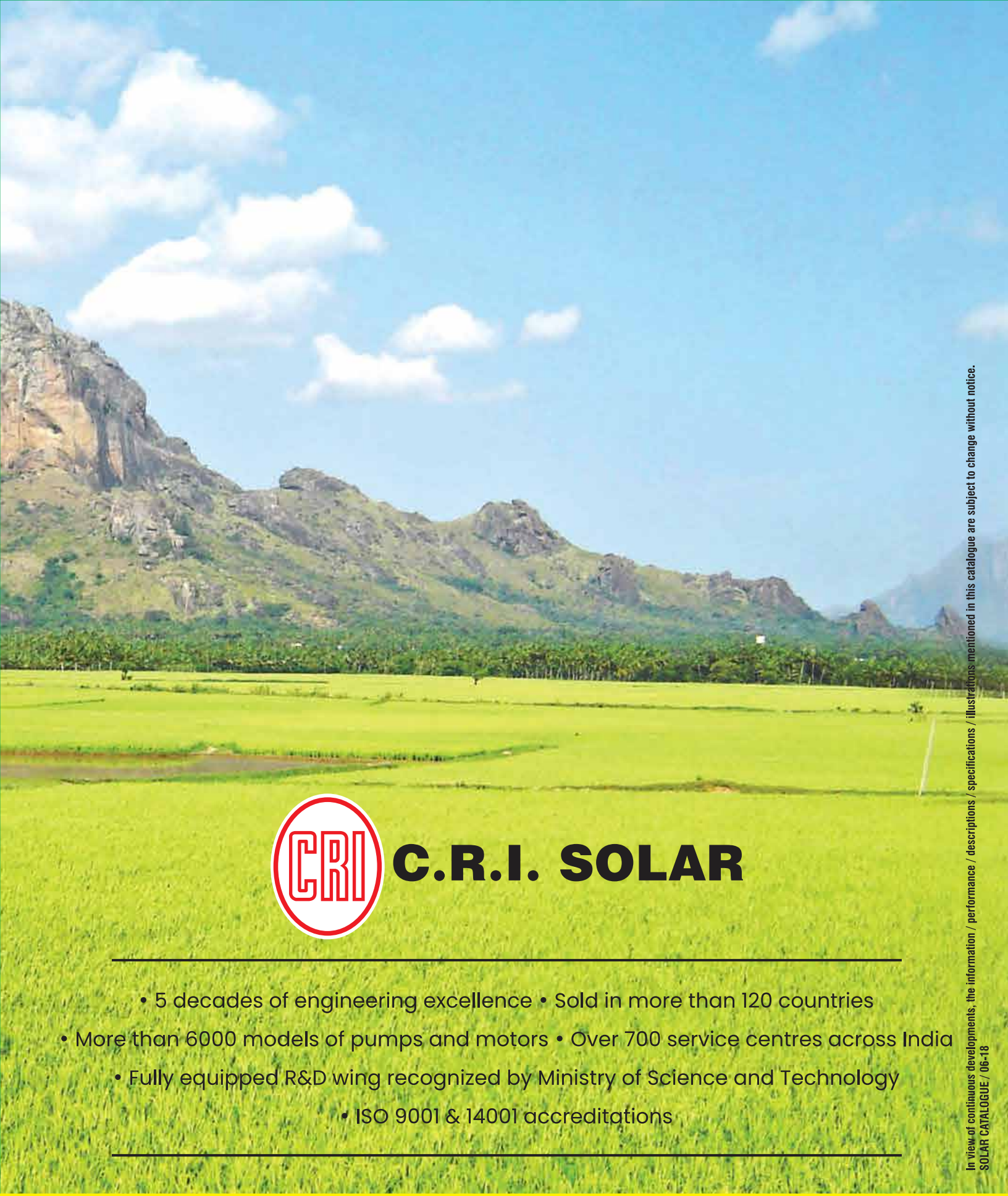

C.R.I. SOLAR

- 5 decades of engineering excellence • Sold in more than 120 countries
- More than 6000 models of pumps and motors • Over 700 service centres across India
- Fully equipped R&D wing recognized by Ministry of Science and Technology
- ISO 9001 & 14001 accreditations

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