HANDPUMP PRODUCT CATALOGUE

COMPREHENSIVE RANGE OF MANUAL WATER PUMPING SYSTEMS

MANUAL WATER SOLUTIONS ENGINEERED FOR RELIABILITY

SUMMARY

Water is the basic need of human being and all other living things for their survival on earth. As per history, human being explored and utilizes different sources of water such as ponds, rivers, lakes, surface walls, etc. however, safe water of consumption has been the major problem. To solve this problem, Handpumps are boon to mankind. They provide a cost-efficient water pumping solution to remote areas. As per extensive research done, it was found that water level in Asian and African countries is continuously going down. With the innovations, the solution in form of "Handpump", was worked for rural peoples which have been better options for many hours for searching water in pond/lakes and with no better options for drinking water.

Hand pumps are water-lifting devices that can be operated manually to withdraw water from surface water sources, groundwater sources and reservoirs, or to pump water into distribution systems. They are relatively easy to install, simple to operate and capable of lifting adequate amounts of water for a small community from depths up to 80 metres. There are many kinds of water hand pump in use and most of them have a similarity in design and principal. The essential component of hand pumps is Handle, the pump rod, Piston, Piston Valve, Raising main, suction lift and the water outlet. They are widely used in places where access to power sources is constrained, where financial resources for investment are limited, and where domestic water requirement is not excessive. However, operation and maintenance require community involvement, especially if the pumps are used heavily.

SALIENT FEATURES OF HANDPUMP

- The entire Pump Unit is Very Strong and Sturdy. Specially processed Nitrile Rubber Cup Washers ensure long life and durability.
- The entire pump is hot dipped Galvanized to make it corrosion resistant.
- Development of Sturdy and reliable community handpump at low cost.
- Hand Pumps are one of the most economical and simple solutions for providing a collective supply of drinking water in rural areas and suburban environments.
- Installation of the Pump in a Concrete Platform by using steel shuttering not only increases its operational life, but also prevents contamination of water thereby safe and potable drinking water.
- The handle is so designed that it balances that counter weight of the connecting rods and the ball bearings ensure frictionless and effortless operation. Long and heavy handle provides adequate mechanical advantage to reduce pumping efforts
- Low-cost options for most human-powered pump types available.
- Most simple hand pumps match VLOM pump standards and hence can be maintained by appropriately trained local caretakers (men or women)
- Easy availability of Spares Parts at Local market in the World
- Safety is increased (no direct access with buckets and ropes)
- Adequate discharge capacity to meet the domestic water requirements of families or small rural communities.

Span India Mark-II Hand pump has modular Construction. Mark-II Handpump is Manufactured as per **IS: 15500.** It consists of the following assemblies:

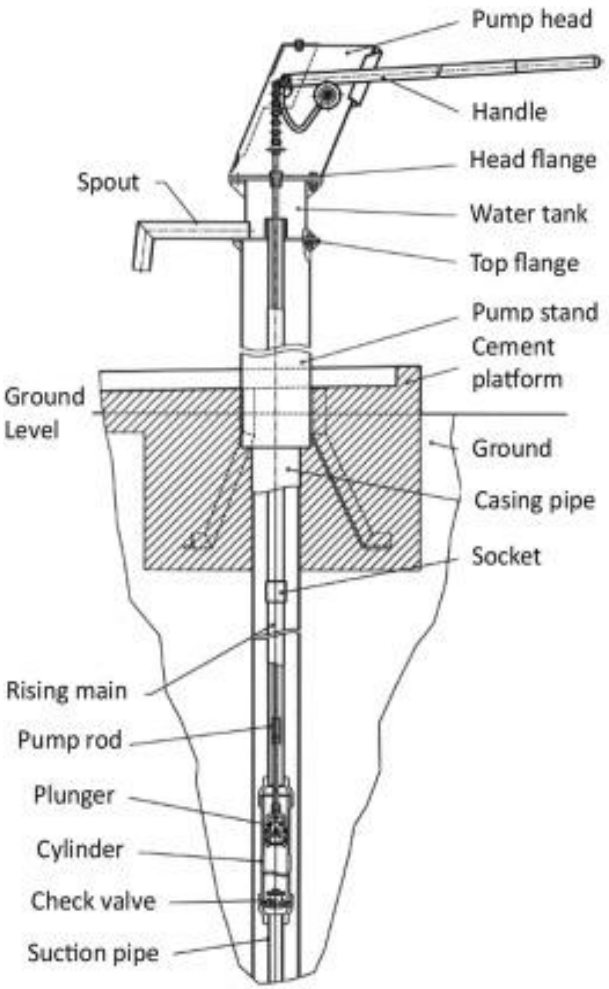
Pump Assembly- Comprising of the head with handle assembly. Water chamber assembly and the Stand assembly.

Cylinder Assembly- A cast iron cylinder body with Brass Liner inside and the lower and upper valve assemblies made from Gun Metal (Lead, Tin & Bronze)

Connecting Rod Assembly- A link between the Pump Assembly and the Cylinder Assembly made from 12mm diameter stainless steel or electroplated mild steel rods.

Riser Pipe Assembly- 32mm diameter G.I. Pipes supplied in three meters length with both ends threaded, one end fitted with coupler and another with thread protector cap.

Hand Pump India Mark-II	
Construction	Modular, comprising 6 assemblies
Pump Body	Fabricated MS, galvanized corrosion resistant
Cylinder	Direct action reciprocating (Stainless Steel)
Ideal speed	40 strokes per minute
Output	900 Litters per hour @ 40 strokes per minute
Operating depth	20 mtr to 40 mtr
Connecting Rods	12 mm diameter SS, electro-plated & welded coupler
Riser Pipes	32 mm diameter & Options- GI, uPVC and SS Pipes.



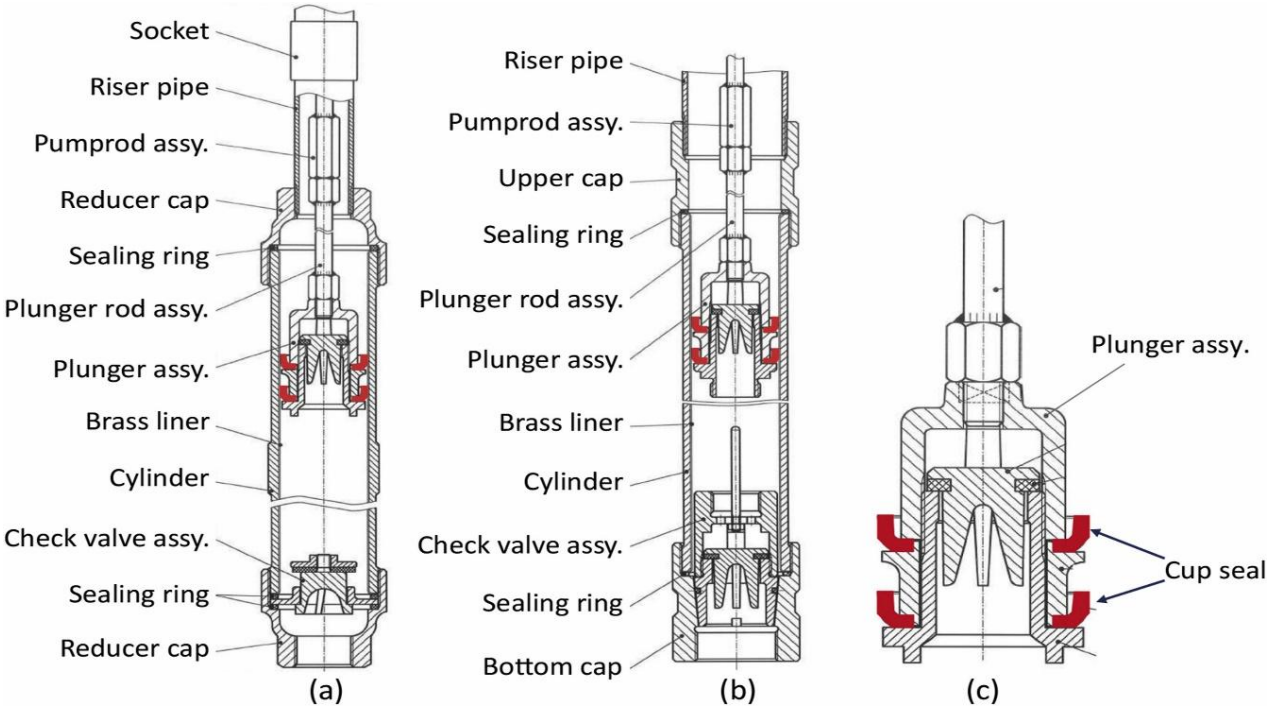


Fig. (a) Schematics of the India Mark II and (b) India Mark III pump cylinders, together with (c) the plunger assembly (cup seals highlighted).

Span India Mark-III Hand pump (65mm OTC) VLOM Deepwell Handpump manufactured as per IS: 13056:1991 is a modified version of India Mark-II Handpump.

The Basic difference in India Mark-III and India Mark-II Handpump is that the pump has Open Top Cylinder (OTC) which facilitates pulling out of Plunger assembly and check valve assembly from the cylinder without pulling out the cylinder / riser main.65mm diameter G.I. Pipes are used in this Pump. The main advantages of India Mark-III Handpumps are as follows:

- The repairs can be carried out by local mechanic. Hence it is also known as "Village Level Operation and Maintenance" (VLOM) Handpump
- Modification incorporated in this pump simplify maintenance procedure and reduce maintenance.
- Below ground level repairs could be carried out within a very short time without removing G.I. Pipes.
- It minimizes breakdown time.

Span India Mark-III Hand pump (50mm OTC) VLOM Deepwell Handpump is a modified version of India Mark-III VLOM (65mm OTC) pump, where in diameter G.I. / P.V.C. Pipes are use instead of 65mm Pipes. The design of the cylinder is simplified in this pump.

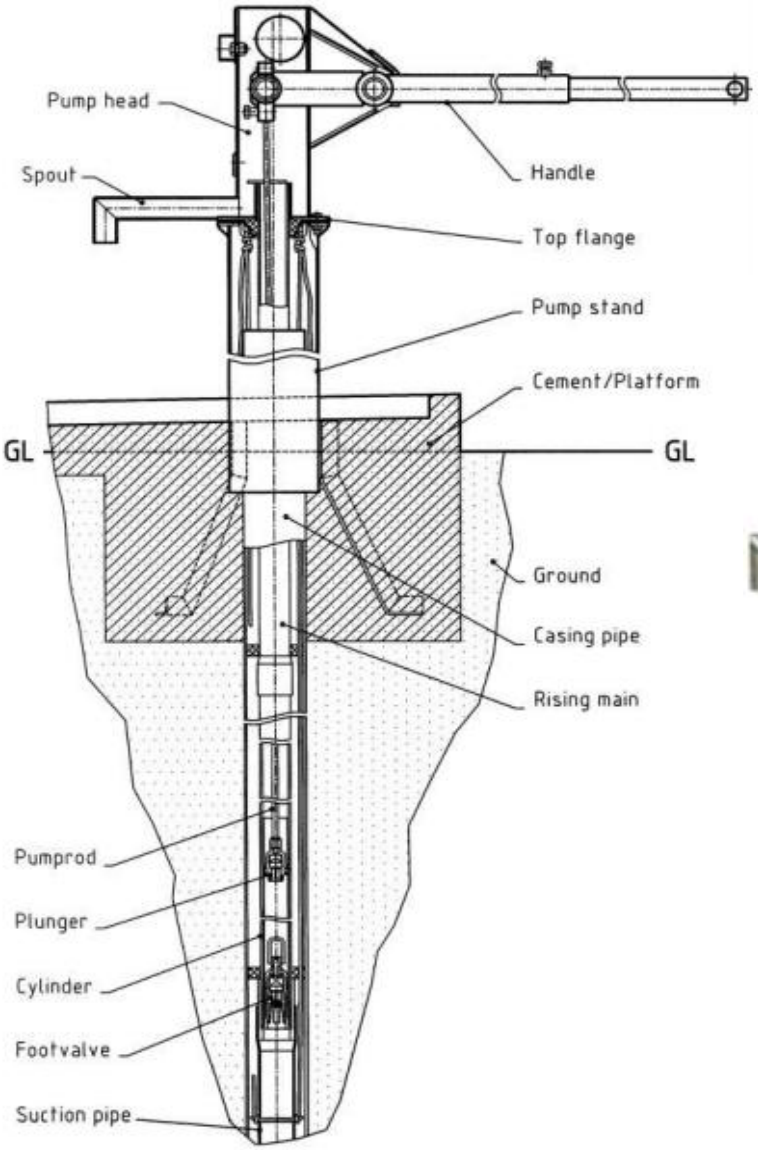
- Features and advantages of India Mark-III Hand pump (50mm OTC) VLOM

Features	Advantage
1. 50mm Riser Pipe	1. Lower Capital Cost
2. Interchangeable Nitrile Bobbin Valves	2. Suitable to use up to 60 Meter depth
3. 50mm Open Top Cylinder	3. Can be installed on 100mm borewells
4. Single Nitrile Cup Washer	4. PVC Riser Pipe option
5. Pipe Centraliser	5. Unlined wells can be used.
6. Monolithic Piston and Foot Valve assembly	6. Tools not required for servicing piston and foot valve

Span make Afridev Handpump has all the features of VLOM Handpump. Afridev Handpump has been designed to overcome the maintenance problem faced by the rural/unskilled operators. Afridev Handpump can be handled even by women / Childs easily.

The Afridev Handpumps are manufactured as per the latest SKAT Specification.

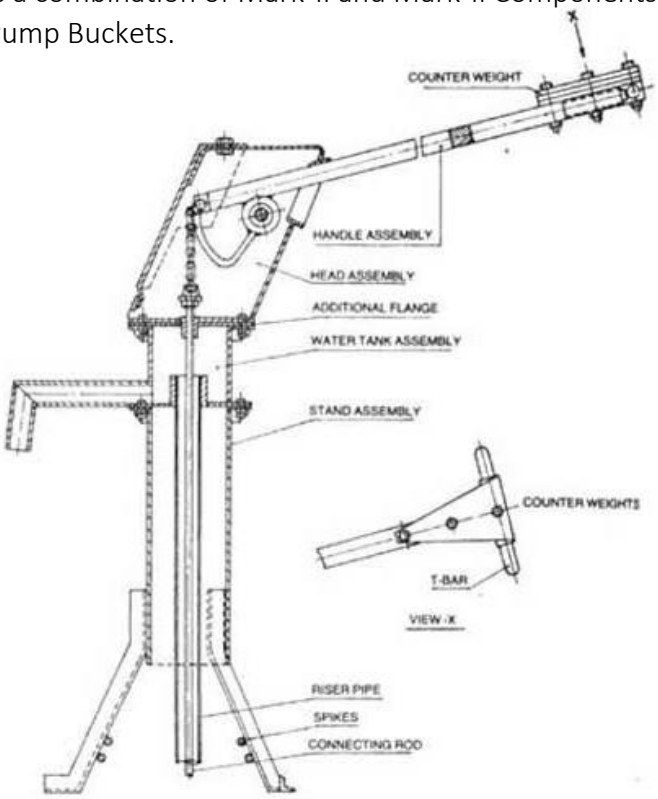
- Non-corrosive below ground components capable of working in corrosive water sources. This pump is fully corrosion resistant.
- uPVC Riser Pipe, Cylinder, Plunger and Foot Valves are light in weight and inexpensive.
- 12mm Dia. 3 Mtr Long Connecting rods with forged eye and hook at either side are quite useful for interlocking easily without any tools.
- Fulcrum and rod hanger pins are supported on special grade plastic bush bearings, easily replaceable.
- Adjustable Handle to suite installations in different bore depths.
- Rubber Centralisers are provided to each connecting rod to prevent internal damage to uPVC Pipes, due to abrasion.
- Rubber Centralisers are also provided to each uPVC Pipe to prevent external damage.
- The installation of the Afridev Pump is not difficult and does not need any lifting equipment.



Span Extra Deepwell Handpump are exclusively used for extracting water from greater depths. India Mark-II Handpump with minor modification is capable drawing water from operating depths up to 90 meters.

The Extra Deepwell Handpump, is to modified version of standard India Mark-II Handpump for drawing water from 45 to 90 meters depth and manufactured as per IS: 15500.

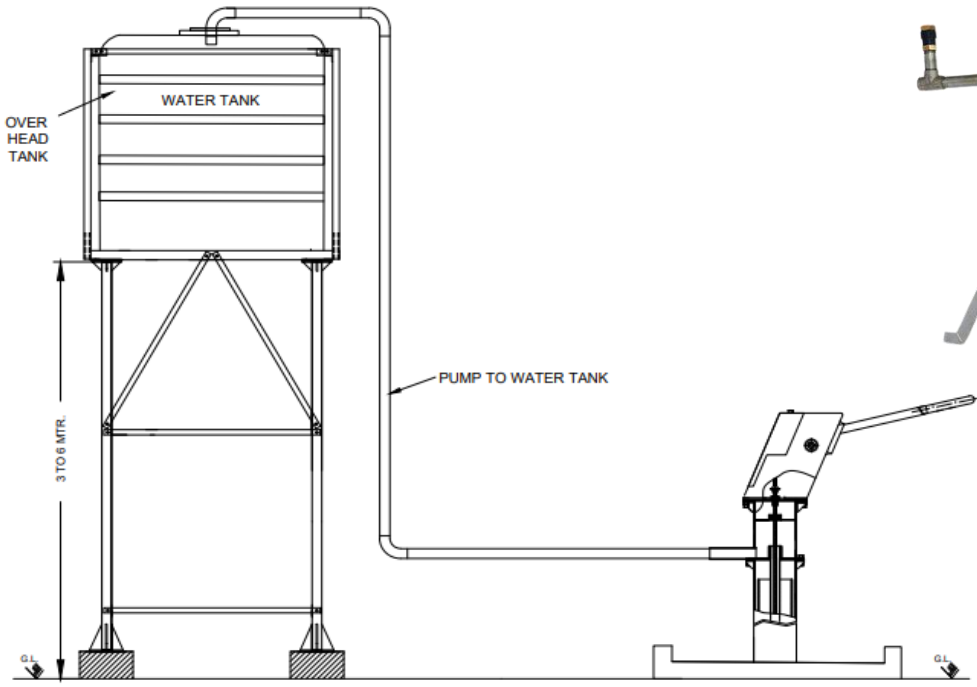
- Modified Heavier Handle with a T-type Handle and additional weights ensure reduced pumping efforts. The additional weights attached to the T-type Handle assist in the easy movement.
- Cylinder assembly is different and is a combination of Mark-II and Mark-II Components.
- Modified Cylinder Assembly has 3 Pump Buckets.
- Head assembly is slightly different



Span Force Lift Handpump Conventional India Mark II hand pump lift water from a bore well and deliver at ground level, however, the Force and Lift Hand Pump is designed to pump water from source to an overhead tank directly with almost same efforts.

- This pump is operated manually and is of great use to draw, store and distribute water through pipe line in areas where electrical supply is not available to lift water in an overhead tank.
- The Force Lift Handpumps are easy to operate and requires no additional efforts to lift water to overhead tanks and can be installed in bore wells of up to 100 mm diameter.
- They can efficiently and effortlessly lift water 6 mtr – 8 mtr above the ground level.
- The force and lift hand pump come in variant- India Mark II. The India Mark II variant has a stroke length of 125 mm, and discharges water up to 900 litres.
- The Force Lift Handpump comes with same design as India Mark II and India Mark III, as only design of water tank is modified to seal leakages around the connecting rod, during lifting stroke.
- They also solve the problem of lack of water supply due to absence of electricity, as the water drawn from these pumps can be stored in overhead tanks.

- As design of force lift and conventional India Mark II & III is same, no special spares are required for repairs. Design being same, existing technicians, working under hand pump repair scheme, can offer repairs and maintain force lift hand pump.
- Apart from that, this water can be filtered before supply, for drinking purposes of a small community, or can be used for public sanitation facilities.



Sl	Characteristics	India Mark-II Deepwell	India Mark-III (65mm) VLOM	India Mark-III (50mm) VLOM	India Mark-II Extra-Deepwell	India Mark-II / III Force Lift	Afridev Handpump
1	**Borewell Dia. (Min)**	100	100	100	125	150	100
2	**Maximum Stroke (mm)**	125	125	225	125	125	100
3	**Cylinder Diameter (mm)**	63	63	50	63	63	50
4	**Pumping Lift (Mtr)**	21 - 40	21 - 60	20 - 45	21 - 30	21 - 40	50 - 80
5	**Discharge / 40 Strokes (LPM)**	15	15	10	12	15	16.5
6	**Riser Main (a) Size (mm) (b) Material**	32 GI / SS / uPVC	65 GI	50 GI / uPVC	32 GI / SS / uPVC	32 GI / SS / uPVC	63 GI / uPVC
7	**Connecting Rod (a) Size (mm) (b) Material**	12 MS / SS / FRP	12 MS / SS / FRP	12 MS / SS / FRP	12 MS / SS / FRP	12 MS / SS / FRP	12 MS / SS / FRP
8	**National / International Standards**	IS: 15500	IS: 15500 & RUWATSAN I NIS-325	IS: 15500	IS: 13287	IS: 15500	SKAT / RUWATSAN II NIS-326

Major Components Technical Specifications of Handpumps

S.I.	Component	Feature / Characteristics
1	**Head Assembly**	Sturdy mild steel box containing the handle pivot.
		Heavy duty handle stops.
		Simple inspection cover secured by a single bolt.
		Flange mounts to water tank.
2	**Handle Assembly**	Solid bar handle to counter-balance connecting rods.
		Ball bearings.
		Chain linkage for gravity return of the piston.
		Quadrant and chain to ensure connecting rod alignment.
		Splash washer to help prevent wetting of chain.
3	**Water Tank Assembly**	Angled spout makes ingress of debris to water tank difficult.
		Heavy duty riser pipe holder raised above the spout to prevent ingress of debris to cylinder.
		Flange mounts to pedestal.
4	**Pedestal (Stand) Assembly**	150 mm N.B. pipe pedestal fits over borewell 125mm N.B. casing pipe.
		Angle iron legs to ensure firm bond to a concrete base.
		Sanitary seal created between OD of well casing and ID of pedestal to prevent infiltration of polluted water to well.
		Flange mounting provides for further head development or conversion to power pump.
5	**Connecting Rods**	Mild steel bright bar, electro-galvanised for surface protection.
		Threaded rods with hexagonal coupling and check nut.
		3 metre lengths for ease of handling.
6	**Cylinder Assembly**	Cast iron case for low cost and to protect brass liner.
		Brass liner with smooth finish to prolong leather bucket washer life.
		Rubber seated valve poppets for effective sealing.
7	**Rising Main Pipe**	32 mm NB medium grade galvanised pipe in 3-meter lengths to facilitate installation and repair using hand tools.

SPAN PUMPS

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