

Sun driven multi-purpose pump

cheap, maintenance free, mullti-purpose, long working, clean water pump driven by concentrated rays

PRACTICAL COMPACT DESIGN with Sub-PARTS + Rough Cost Analysis

Foldable Umbrella Type Collector

flexible sheet / cloth, lens & mirror, flexible reflective coated surface, tracking mech., hollow pipe for water circulation, manual push rod (opening/closing), Pre-heated water (IN), BASE, high torque motor, high conductive steam generation chamber, Super-heated steam (OUT), insulation.

Combined Unit of Pump & Steam Cylinder + Flywheel

low grade steel pipe of 150 mm length welded at faces (double acting reciprocating cylinder), water out, High grade plastic piston fitted with rubber bush, medium flywheel, water in, 120 mm Ø, hollow pipe for water circulation, steam in, 80 mm Ø, bearings, linkage, spring, steel piston with piston rings, steam out, 60 mm dia. steel pipe 150 mm length cutting; welded at both faces (cylinder).

Pre-heating & Pre-pressure mech.

(F) pressurizing chamber, (G) pre-heating steam chamber, flow regulating valve, can be formed one unit.

cost chart	
1) Alluminum reflective Foil (have 80% reflectivity)	= 400
2) Umbrella Frame (twice of normal umbrella & with parabolic shape)=	300
3) Radiater or high conductive steam chamber for steam generation	= 500
4) High Torque low RPM dc/stepper motor (used for robotics)	= 600
5) Lense, photo-diodes, wire, stand, normal electric components	= 200
6) Flexible mounting base (can be attached/detached as per Req.)	= 200
7) Inlet and outlet mounting, joints and others	= 300
Total (A) =	2500 Rs

Note: Reflextech mirror film are costly and have relectivity of 94%, so for cheaper version we have used aluminum foil or self adhesive aluminium tape

1) 60 mm dia. Steel pipe cutting (150mm length)=	200
2) welding faces on opposite size with holes	= 100
3) steel pipe welding for steam entry & exit	= 100
4) steel/Al piston fabrication with piston rings	= 500
5) 120 mm dia. high grade plastic cutting	= 100
6) joining its faces with plastic thik sheets & holes	= 100
7) different one way valves as per req. (4+3)	= 500
8) plastic piston with soft rubber bush (pump)	= 100
9) flywheel (Al)	= 400/kg
10) spring	= 50
Total (B) =	2150 Rs

1) flow knob	= 100
2) pre-pressure and pre-heating tank	= 500
3) syphon filling chamber	= 200
4) pipes for water suction	= 300
4) insulated pipes for steam	= 1000
Total (C) =	2100 Rs
Grand total =	6750 Rs ~ 7000 Rs
=	110 \$

Solution

The pump is driven by super-heated steam, generated by concentrating the sun rays through sun tracking collector. The working fanda is provided on the figures. Advantages includes cheap multipurpose pump which can also be used for generating power; providing clean water in rural areas; heating water which is done presently by killing trees; steam cooking if provided the villagers with designed steam containers and most importantly pumping the water using natural means.

working principle: water from the well (which is brought to the surface by siphon arrangement) is pressurized to get pumped through one-way valve, in the collector which is mounted inside the parabolic solar concentrator. Thus similar to lens we used during childhood days to focus the light

beam to burn the piece of paper, here water is super-heated with increment in pressure until it push

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Creative's profile



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