

**GLOBAL PRESS TENDER FOR VERTICAL TURBINE/
VERTICAL CENTRIFUGAL PUMP FOR RESITEMENT POL
DEPOT AT THINCHUPANGKHA , NEAR PARO , BHUTAN**

SPECIFICATION FOR VERTICAL TURBINE / VERTICAL CENTRIFUGAL PUMP

VERTICAL CENTRIFUGAL SUBMERSIBLE PUMP

EQUIPMENT : PUMP

MODIFIER : CENTRIFUGAL

TYPE : VERTICAL TURBINE / VERTICAL CENTRIFUGAL SUBMERSIBLE

CAPACITY : 50 KL/HR

SERVICE : PRODUCT PUMP

DETAILED SPECIFICATION -

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TYPE - VERTICAL CENTRIFUGAL SUBMERSIBLE PUMP

PUMP MODEL -

NO. OF STAGE - SINGLE

SP. GRAVITY = 0.82 (SKO) 0.84 (HSD) 0.73 (MS)

OPERATING TEMP. = -6 TO 28 DEG C

KINETIC VISCOSITY AT 38 DEG. C = 2 TO 7.5 CST.

CAPACITY = 50 KL / HR

SERVICE PRODUCT PUMP = MS,HSD & SKO

TOTAL DISCHARGE HEAD = 40 MLC AT DISCHARGE FLANGE ABOVE SUPPORT
PLATE

TOTAL HEAD (MWC) = 37 MTR

BKW PRODUCT = 5.68

RPM = 2900

BOWL EFFICIENCY = 69%

COL. PIPE SIZE = 100 MM

DISCHARGE PIPE SIZE = 80 MM

MOUNTING = VERTICAL

DIA OF TANK = 4 MTR + 150MM (MANHOLE COLLAR)

MANHOLE COVER DETAILS

OD 835 MM

ID 610 MM

PCD 773 MM

HOLE DIA FOR BOLT = 20MM

NO. OF BOLTS = 26 NO. (M-18 BOLT)

MINIMUM PROD LEVEL = 150 MM

SEAL TO BE PROVIDED = SEALOL / DURAMETALLIC / LEAK PROOF

MECHANICAL SLEEVE IMPELLER = SS 410 CF 8M

BOWL CASING = ASTM 216 WCB

IMPELLER SHAFT = SS ASTM 276ANLD

COLUMN PIPE ST PIPE = ERW IS 1239 HD

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LINE SHAFT COUPLING = SS ASTM 276ANLD
DISCHARGE CASE = ASTM 216 WCB
DISCHARGE PIPE ST PIPE = ERW IS 1239 HD
LUBRICATING PIPE ST PIPE = ERW IS 1239 HD
BEARING HOUSING = CAST IRON
BEARING HOUSING BUSH = 20% GFT

SPECIFICATION FOR MOTOR

HP (KW) = 9.3KW / 2 POLE
PHASE / VOLTAGE / FREQUENCY = 415V +/- 10%, 3-PHASE, 50HZ +/- 5%
ENCLOSURE = TEFC / SCIM
TYPE = FLP
INSULATION = CLASS B
MOUNTING & COUPLING = VERTICAL
SPEED = 3000 RPM
PROTECTION = AS PER IP 55
STARTER TYPE = STAR DELTA

OTHERS DATA BOLT = CONFIRMING TO IS 1367 GR. 4.6
FLANGE = SORF 150#, ASTM A 105
FLANGE DRILLING STUD = DIN ND 16 FF
GASKET NON ASPESTOS = FERROLITE NAM-37
PERFORMANCE TEST INCLUDING NPSH, INDICATING TOLERANCE ON Q, H,
BHP, NPSH (R) = AS PER IS 9137

Vendor shall furnish the following with the tender :-

1. Pump outline and sectional drawings .
2. Performance characteristic curves from zero flow to maximum.
3. Performance tests including NPSH , indicating tolerance on Q,H,BHP,NPSH(R) .
4. Recommended spares for two years of operation.

TEMPERATURE PROFILE AT PARO ::

Average Temperature:- (in degree celsius)

(Source: Meteorology Unit, Department of Power, Ministry of Trade & Industries, Thimphu)

PLACES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	Max Min	Max Min	Max Min	Max Min	Max Min	Max Min	Max Min	Max Min	Max Min	Max Min	Max Min	Max Min
PARO	9.4 (-)5.8	13.4 1.5	14.5 0.6	17.6 4.6	23.5 10.6	25.4 14.1	26.8 14.9	25.3 14.7	23.4 11.7	18.7 7.4	13.9 1.4	11.2 (-) 1.7

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SCOPE OF INSPECTION OF VERTICAL TURBINE PUMPS – IS 1710

The following tests shall be carried out at the manufacturer's works :

- a. Visual and dimensional checks
- b. Correlation of Material Test Certificates.
- c. Witness of Performance Test of bowl assembly with test motor and water .
- d. Hydrotesting of
 - i). Bowls
 - ii). Columns pipes
 - iii). Discharge head
- e. Mechanical Strip Test
- f. minimum submersible test .

Certificates of actual results of chemical analysis and mechanical properties of parts should be furnished to the Inspecting agencies for correlation and identification.

SCOPE OF INSPECTION FOR VERTICAL CENTRIFUGAL PUMPS :

Pumps shall be inspected by The TPIA (Third Party Inspection Agency) at your works as per the following procedures :

1. Performance test of the pump with lab motor in open circuit at manufacturer's works for flow rate , head and efficiency and verification of guarantee of duty point and performance curve as per IS 9137 standards / API 610 standards . Performance test will be carried out from 150% discharge to shut off ie zero flowrate .
2. Hydrostatic test of casing at relevant pressure .
3. mechanical strip test.
4. NPSH Testing in open circuit by throttling suction valve at constant flow rate as per clause no. 7.2 fig no. 9 of IS 9137 standard (graph to be plotted) .
5. Dynamic balancing of rotor and /or impeller as per ISO : 1940 Gr. 6.3
6. Dimension checks as per approved general arrangement drawing .
7. Manufacturer's material certificate for following parts used in the pump should be furnished for verification by TPIA .
 - i). Pump casing
 - ii). Impeller
 - iii). Wearing Ring
 - iv). Shaft and Shaft sleeve
8. The sampling for pumps will be done as per IS : 10572 – 1983 .
9. Motor test certificates will be furnished by vendor for verification .