VOLUME- II-D

VOLUME – IID, Technical Data Sheets Electro-Mechanical

DOCUMENT: DATA SHEET OF VERTICAL TURBINE CENTRIFUGAL PUMP (VT PUMP)

SR. NO.	PARTICULAR	DESCRIPTION	DATA TO FILL BY BIDDER	
1.0	LIQUID DATA			
1.1	Liquid handled	Treated Water / Raw water		
1.2	Specific gravity-kg/dm3	1.0		
1.3	Temperature-Drg.C	Ambient temp.		
1.4	Minimum Sump Level-m	Flooded		
1.5	Max. Permissible Turbidity - ppm	Please Furnish Detail		
2.0	PUMP DATA			
2.1	Make	Please Furnish Detail		
2.2	Pump type	Vertical Turbine		
2.3	Pump Model	Pl furnish		
2.4	Number of pumps - Nos.	As per BOQ		
2.5	Type of duty	Continuous		
2.6	Design capacity-m^3/hr.	As per BOQ		
2.7	Bowl Head–mlc	As per BOQ		
2.8	Frictional losses in Column pipe & Disc.	Pl furnish		
2.9	Total Bowl Head*- mlc	As per BOQ		
2.10	Guaranteed Bowl Efficiency at rated capacity- %	% Min. w/o -ve Tolerance Pl furnish		
2.11	Bowl input at Duty Point-kW	Pl. furnish		
2.12	No. of Transmission bearings	Pl. furnish		
2.13	Total Transmission Losses- kW	Pl furnish		
2.14	Total Pump input at Duty Point-kW	Pl furnish		
2.15	Rated Speed of pump set- RPM	Pl furnish		
2.16	Max. Bowl input @ Rated Impel.	Pl furnish		
2.17	Reco. Drive motor rating- KW	As per BOQ		
2.17.1	Min. efficiency of motor	As per Relevent IS Standard		
2.18	Minimum submergence required-m 1. For Solo operation	Pl. furnish		

2.19	Shut off head-m	Minimum 20 % Above Duty point head.		
2.20	Shut Off power-KW	Pl. furnish		
2.21	Max. Length of each Column pipe & Line Shaft-	2.5		
2.22	Max. Pump torque for rated Impeller-Nm	Pl. furnish		
2.23	Prime Mover	Ele. Motor		
2.24	Prime mover torque-Nm	Pl. furnish		
2.25	Location	Indoor		
3.0	CONSTRUCTIONAL FEATURE			
3.1	No. of stage	Pl furnish		
3.2	Casing	Diffuser Bowl Type		
3.3	Impeller	Enclosed		
3.4	Impeller dia. in mm	Max. / Rated / Min.		
3.5	Shaft / Drive Transmission	Direct Coupled		
3.6	Shaft sealing	Mechanical seal		
3.7	Gland packing Type & Size	Mechanical seal		
3.8	Mounting Orientation	Vertical		
3.9	Discharge Head Position	Above Pump Floor		
3.10	Type of Line shaft Bearing	Thordon		
3.11	Type of Line shaft lubrication	Self		
3.12	Type of Thrust Bearing	Heavy duty anti friction		
3.13	Type of Thrust Bearing lubrication	Oil		
3.14	Column Pipe Size & thk -mm	Pl furnish		
3.15	Nozzle orientation & size-			
	Bell Mouth / Opening	Size in mm / Bottom		
	Discharge Flange	Size in mm / Side		
3.16	Type of Starter / location	Pl furnish		
3.17	Flange drilling	As per IS 1538, FF with off center bolt		
3.18	Direction of rotation	CCW/CW when viewed from driving end		
4.0	MATERIAL OF CONSTRUCTION			
4.1	Bell Mouth / Pump Bowl/ Suction Cover / Impeller Guide Piece (M)	Cast Steel WCB		
4.2	Impeller (M)	SS CF8M		
4.3	Pump Shaft (M)	AISI 410		
4.4	Line Shaft (M)	AISI 410		
4.5	Head Shaft (M)	AISI 410		
4.6	Shaft Sleeve (M)	AISI 410		

4.7	Shaft Coupling (M)	SS, AISI 410		
4.8	Casing Wearing Ring (M)	SS CA-15		
4.9	Impeller Wearing Ring (M)	SS CF8M		
4.10	Gland Packing	Mechanical Seal Above 30 KW		
4.11	Column Pipes	MS ERW-min. 7 mm thick		
4.12	Gland	Mechanical Seal		
4.13	Motor Stool	M.S. IS 2062		
4.14	Sole Plates	M.S. IS 2062		
4.15	Hardware in contact with liquid / Non-wetted	In Liq. Contact: SS 304		
4.16	Strainer	Round bars of 3 mm dia. Of SS 304		
4.17	Painting	Pl furnish		
5.0	ACCESSORIES & SERVICES REQUIRED			
5.1	Pin Bush Type Coupling	YES		
5.2	Set of foundation bolts & Nuts	YES		
5.3	Sole Plates	YES		
5.4	Nonstandard / special maintenance	YES		
6.0	WEIGHT			
6.1	Weight of pump unit-kg	Pl furnish		
6.2	Weight of motor-kg	Pl furnish		
6.3	Reco. Crane capacity-Ton	Pl furnish		
7.0	DRAWINGS			
7.1	ISO efficiency Performance curve	Pl furnish		
7.2	GAD Drg. of Pump set	Pl furnish		
7.3	C/S drg. of pump with part list	Pl furnish		
7.4	Catalogue of products	Pl furnish		
7.5	QAP of products	Pl furnish		
7.6	Speed Torque curve	Pl furnish		
8.0	TESTING			
8.1	Hydrostatic test	Witness		
8.2	Performance test	100 % qty Witness with job motor		
8.3	Dynamic balancing test	TC verification required		
8.4	Strip test	TC verification required		
8.5	Visual inspection check	Witness		
8.6	ND Test	Not Required		

Note: 01. Manufacturer / supplier shall submit separate data sheet for each duty.
02. For components (marked-M) material certificates shall be furnished
03. Bidder shall refer electrical specifications for motor requirement and shall offer accordingly.
04.It is compulsory to submit backup guarantee from manufacturer of approved make-offered, valid for whole contract period.

SUBJECT : DATA SHEET FOR CAST IRON SLUICE/ GATE/SCOUR VALVE

SR. NO.	PARTICULARS	DESCRIPTION	DATA TO FILL UP BY CONTRACTOR
1.0	Make	Pl. furnish detail	
2.0	Manufacturing Std.	IS : 14846 – 2000 or latest	
3.0	Size range and Qty.	As per BOQ	
4.0	Fluid / Specific gravity	Water / 1.0	
5.0	Pressure Rating	PN : 1.6	
6.0	Stem	Rising Spindle	
7.0	Ends	Flanged, FF as per IS-1538 having off center bolt	
8.0	Bonnet	Bolte	
9.0	Disc.	Solid	
10.0	Operation	Electric Actuator operated	
11.0	Seat- Body & Disc	Renewabl	
12.0	Direction of Closing	Clockwise (marked on HW)	
13.0	Repacking /Back Seat Bush	Required (above 300 mm size)	
14.0	Channel & Shoe Arrangement	Required (600mm & above)	
15.0	Gear Box arrangement	Required (350 mm & above)	
	Material Of Construction		
17.0	Body / bonnet /Disc	C.I IS 210 GR.FG 260	
18.0	Stem	SS, AISI – 304 (M)	
19.0	Body & Disc seat	SS, AISI – 304 (M)	
20.0	Stem nut & Stuff. Box	Bronze IS 318 GR LTB2	
21.0	Stuffing box & Gland	DI, GR 500/7	
22.0	Channel & Shoe lining	S.S. BS 970 Gr 304 S16	
23.0	Gland Packing	Greasy Jute Packing	
24.0	Bolts, studs & nuts	CS IS 1367 Class 4.6/4	
25.0	Hand wheel /Cap	CI	
26.0	Details applicable require for Electrically Operated Valve		
26.1	Actuator make / model	Pl. furnish detail	
26.2	Actuator Torque capacity / RPM	Pl. furnish detail	
26.3	Power supply	3 Phase, 415 V, AC, 50 Hz.	
26.4	Valve opening/closing	Vendor to specify	
27.0	Electric Actuator Requirements	Fwd. & reverse integral starter for local & remote mode & cable up to actuator motor with all accessories as per	
28.0	Body/Shell test	24 Kg /	Required

29.0	Seat test	16Kg /	Required

NOTE: 01. Manufacturer / supplier shall submit separate data sheet for each duty.
02. For components (marked-M) material certificates shall be furnished
03. Actuator of MOV shall be as per specifications of Elect. Actuator attached separately

SUBJECT: DATA SHEET FOR DUAL PLATE CHECK VALVE (NON RETURN/REFLUX VALVES)

SR. NO.	PARTICULARS	DETAILS	PARTICULARS
1.0	Make	Pl. furnish detail	
2.0	Standard	API 594	
3.0	Size in mm / Qty	As per BOQ	
4.0	Fluid	Water	
5.0	Sp Gravity	1.0	
6.0	Pressure Rating	PN 1.6 / Class 300	
7.0	Ends	Flanged, flanges as per IS-1538 Table IV & VI	
8.0	MATERIAL OF CONSTRUCTION		
8.1	Body	CS, ASTM A 216 Gr WCB (M)	
8.2	Plates	CS, ASTM A 216 Gr WCB (M)	
8.3	Body Seat	SS to BS 970 Gr 304 S16(M)	
8.4	Plate Seat / Face	SS to BS 970 Gr 304 S16(M)	
8.5	Hinge Pin / Stop pin	SS, AISI 410 (M)	
8.6	Springs	S.S AISI –304 (M)	
8.7	Bolts, studs & nuts	Carbon Steel IS :1367 Class 4.6 / 4 hot dipped galvanised	
9.0	ACCESSORIES		
9.1	Drain Plug	Not Require	
9.2	Lifting Eye Bolts	Require	
9.3	Support foot	Not Require	
9.4	By Pass Arrangement	Not Require	
10.0	DRAWINGS		
10.1	General outline	Pl. furnish detail	
10.2	C.S. drawing with parts	Pl. furnish detail	
10.3	QA plan	Pl. furnish detail	
11.0	TESTING		
11.1	Shell test	To be witnessed	24 Kg /
11.2	Seat test	To be witnessed	16 Kg /

M – Denotes material test certificate require

DOCUMENT: TECHNICAL DATA SHEET FOR CI BUTTERFLY VALVE.

SR. NO.	PARTICULARS	DETAILS	DATA TO BE FILLED BY THE
1.0	CONSTRUCTIONAL FEATURES		
1.1	Make	Pl. furnish detail	
1.2	Standard	IS 13095 or BS EN 593	
1.3	Size in mm/Qty	As per BOQ	
1.4	Location	Indoor/Outdoor	
1.5	Fluid	RAW Water /Treated Water	
1.6	Sp Gravity	1.0	
1.7	Pressure Rating	PN1.6	
1.8	Ends	Flanged, flanges as per IS-1538 Table IV & VI	
1.9	Disc.	Duo eccentric	
1.9.1	Eccentricity-1 in mm	Pl. furnish detail	
1.9.2	Eccentricity-2 in mm	Pl. furnish detail	
1.10	Operation	Gear Box arrangement	
1.11	Other requirements	Valves shall be with HW	
2.0	MATERIAL OF CONSTRUCTION		
2.1	Body	C.I IS 210 GR.FG 260	
2.2	Disc	C.I IS 210 GR.FG 260	
2.3	Stem	S.S. AISI – 410 (M)	
2.4	Body seat	S.S. AISI – 410 (M)	
2.5	Disc seal	EPDM Rubber	
2.6	Clamping ring	S.S AISI –304	
2.7	Bolts, studs & nuts	CS, IS :1367 Class 4.6 / 4 hot dipped galvanised	
3.0	ACCESSORIES		
3.1	Gear Box	Required (150 mm above)	
3.2	By-Pass Arrangement	Not Required (600 mm above)	Not
3.3	Support foot	Required (900 mm above)	
4.0	DRAWINGS		
4.1	General outline	Pl. furnish detail	
4.2	C.S. drawing with parts	Pl. furnish detail	
4.3	QA plan	Pl. furnish detail	
5.0	TESTING		
5.1	Shell test	To be witnessed	24 Kg /
5.2	Seat test	To be witnessed	16 Kg /

M – Denotes material test certificate required

Actuator of MOV shall be as per specifications of Elect. Actuator attached separately

DOCUMENT: TECHNICAL DATA SHEET FOR METALLIC EXPANSION BELLOWS

SR. NO.	PARTICULARS	DESCRIPTION	BLANK DATA TO BE FILLED BY BIDDER
1.0	LIQUID DATA		
1.1	Fluid / Specific gravity	RAW Water/Treated Water	
1.2	Temperature	ambient	
2.0	EXPANSION BELLOWS DATA		
2.1	Make	Pl. furnish	
2.2	Manufacturing Standard	EJMA / ASME	
2.3	Size range and quantity	As per SOQ	
2.4	Overall length in mm	As per SOQ	
2.5	Pressure Rating	PN : 1.6	
2.6	Axial expansion in mm	5	
2.7	Axial compression in mm	15	
2.8	Mode of installation	Horizontal	
2.9	Ends	Flanged, FF as per IS-1538 having off center	
2.10	No of Convolution	Pl. furnish	
2.11	Thickness of Weld End	Pl. furnish	
2.12	Thickness of internal sleeve	Pl. furnish	
2.13	Qty. & Position of Rods	Min. 3 nos @ 120 Deg. interval	
3.0	MATERIAL OF CONSTRUCTION		
3.1	Bellows (M	SS 304	
3.2	Internal Sleeves (M	SS	
3.3	Flanges (M	CI / MS	
3.4	Lugs	CI / MS	
3.5	Rods	IS 1367 VI 1994 Cl 4.6	
3.6	Hardware	C.S IS 1367	
4.0	TESTING		
4.1	Hydrostatic Test pressure	24 kg / sq.cm	

M- Denotes material test required

DOCUMENT: DATA SHEET OF ELECTRICALLY OPERATED TRAVELING CRAN/HOIST

SR. NO.	PARTICULAR	DESCRIPTION	BLANK DATA TO BE
1.0	REQUIREMENT DATA		
1.1	Item	E.O.T. Crane with Electrical Hoist	
1.2	Location	Indoor in Pump House/Intakewell	
1.3	Quantity	as per price bid	
1.4	Capacity in TON	as per price bid	
1.5	IS Standard	IS - 807 & 3177	
2.0	CRANE DATA		
2.1	Make	Pl. furnish detail	
2.2	Model	Pl. Furnish detail	
2.3	Type	Single / Double Girder	
2.4	Class of Hoist	Medium Duty Cl – II as per IS 3177 with latest amendments	
2.5	Lift in m.*	as per site requirement	
2.6	Span in m*	as per site requirement	
2.7	Bay length in m.*	as per site requirement	
2.8	No. of Falls	Pl. Furnish	
2.9	Travel speed in mtr./min. • Longitudinal • Cross	Pl. Furnish detail	
2.10	Main Hoist speed-	Pl. Furnish	
2.11	Creep speed in m./min.	Pl. Furnish detail	
2.12	Fixed Girder Required	Pl. Furnish detail	
2.13	Type of Suspension	Hook	
2.14	Track	Pl. Furnish detail	
2.15	Brakes	Electromagnetic type	
2.16	Method of Operation	Pendant Push Button	
3.0	CONSTRUCTIONAL FEATURE		
3.1	End Carriage	Pl. Furnish detail	
3.2	Bridge	Box Type/Standard I beam Type	
3.3	End Stopper	Steel End Stopper on either side of the bridge.	
3.3.1	Wheel Base	Pl. Furnish detail	
3.4	Gear	Made of EN 24 / EN 9 - precision machined, teeth cutting by hobbing machine & duly hardened.	

3.5	Wire Rope	Pl. Furnish detail	
3.6	Hook	Forged steel single shank type – confirming to IS 15560 with thrust brgs., latch & anti-locking	
3.7	Rope Drum & Sheaves	MS Drum with grooving as per IS 3938	
3.8	Wheels	Made of Forged Steel confirming to IS 2707 GR- II duty/Steel cast EN – 9,	
SR. NO	PARTICULAR	DESCRIPTION	BLANK DATA TO BE FILLED
3.9	Shaft	High Tensile Steel	
3.10	Trolley	MS Frame with wheels of Forged steel / EN – 9	
3.12	Bearings	All moving parts be supported on SKF/FAG anti fric.Ball/Roller brgs.	
3.13	Maintenance Platform/ access walkway	Maintenance basket type Platform for One man seat Required	
3.14	Painting	Required. Furnish detail.	
4.0	ELECTRICAL DETAILS		
4.1	Supply Condition	415 V +/- 10 % variation 50 Hz +/- 5 % variation +/- 10 % Combined variation	
4.2	Motor Standard	IS	
4.3	Control Voltage	110 V	
4.4	Class of Insulation / Drg. of	F / IP 55	
4.5	Temperature	Ambient- 50 Drg. C	
4.6	Make	As per Tender specs.	
4.7	Type of Motor	Hoist	
4.8	Main Hoisting	Pl. Furnish detail	
4.9	L.T.	Pl. Furnish detail	
4.10	C.T.	Pl. Furnish detail	
4.11	Method of starting	Pl. Furnish detail	
4.12	Type of cooling	Pl. Furnish detail	
4.13	Total Connected Load-	Pl. Furnish detail	
5.0	ACCESSORIES & SERVICES REQUIRED		
5.1	Mech. Stopper for LT	YES	
5.2	Pendant with hanging	YES	

5.3	Limit Switches for • over hoisting • over lowering • over cross travel • over long travel	YES	
5.4	Trailing cable system	YES	
5.5	Control Panel	YES	
5.6	Isolation Switch for ele. Power	YES	
6.0	WEIGHT		
6.1	Weight of Hoist in kg	Please furnish	
6.2	Weight of Bridge in kg	Please furnish	
7.1	GA & Dimensional drg. of	Pl furnish	
7.2	Data as required by IS 3177-77, Appendix-B, clause 2.2	Pl furnish (In Separate Sheet)	
7.3	Complete Electrical circuit Diagram	Pl furnish	
7.4	Catalogue of products	Pl furnish	
7.5	QAP of products	Pl furnish	
8.0	TESTING		
8.1	Visual inspection and Dimensional Check	Witnessing	
8.2	Performance test	Witnessing	
8.3	Overload test at 125% load	Witnessing	
8.4	Deflection Test	Witnessing	
8.4	Material Test certificates	Required	

Note: 01. Manufacturer / supplier shall submit separate data sheet for each duty.
02. For components (marked-M) material certificates shall be furnished

03.(*) Contractor shall visit the site and obtain the data about span, lift, bay length, etc suitable for existing pump house and shall furnish in data sheet

TECHNICAL DATA SHEET FOR INDUCTION MOTOR:

SR. NO.	PARTICULAR	DESCRIPTION	TO BE FILED BY BIDDER
1.0	Make	Pl. Furnish	
2.0	Application	Pl. furnish as per applicable	
3.0	Type of motor	Squirrel cage induction	
4.0	Motor Ratings in KW	As per BOQ	
5.0	No. of units/Qty.-nos	As per BOQ	
6.0	Supply neutral	Solidly earthed	
7.0	Rated voltage	415 V	
8.0	No. of Phase &	3 Phase & 50 Hz.	
9.0	Full load Amp.-A	Pl. Furnish	
10.0	Supply condition	Pl. Furnish	
11.0	Synchronous	As per BOQ / Tender	
12.0	Duty condition as per IS	S1 suitable for continuous operations	
13.0	Method of starting	DOL / Star delta / Soft Starter /ATS etc. as applicable	
14.0	Guaranteed Motor Efficiency @ full load @3/4 load @ ½ load	Motor shall be as per IS:12615-2018, IE3 as per BOQ. Pl. furnish	
15.0	Power Factor @ full load @3/4 load @ ½ load	As per IE3 as per IS:12615-2018. Pl. furnish.SS	
16.0	Starting torque % of full load torque	Sufficient starting torque to start the maximum full load of driven equipment. Pl. furnish.	
17.0	Pull out torque % of full load torque	Sufficient to bring the motor to normal speed in minimum time. Pl. furnish.	
18.0	Starting time at specified minimum starting	Pl. furnish (As per Tender)	
19.0	Permissible running time at full load at	Pl. furnish (As per Tender)	

20.0	Locked rotor current withstand time (safe stall time) at 110%	Pl. furnish (As per Tender)	
20.1	At rated temp. (Hot)	Pl. furnish (As per Tender)	
20.2	When cold	Pl. furnish (As per Tender)	
21.0	Class of insulation &	Pl. furnish (As per Tender)	
22.0	Design temperature	50° C	
23.0	Location	As per Tender	
24.0	Hazardous area	As per Tender	
25.0	Atmosphere	As per Tender	
26.0	a) Type of Cooling	Pl. furnish.	
	b) Type of enclosure	Pl. furnish. For Motor & TB: min. IP 55:	
27.0	Terminal box	As per Mfg. Standard	
28.0	Earthing Terminals	Required as per IS. Min. 2 no.	
29.0	External cable	As per the SLD / Tender	
30.0	Shaft - Hollow /	Pl. furnish (As per Tender)	
31.0	Type of Couplings	Pl. furnish (as per Tender)	
32.0	Type of bearings	Pl. furnish (As per Tender)	
33.0	Colour shade of	Epoxy Grey shade 632 as per	
34.0	Space heater for motors	Confirm as per SLD / SOQ / Tender	
35.0	RTD / Thermistors	Confirm as per SLD / SOQ / Tender	
36.0	Winding	Pl. Furnish	
37.0	Standard to be followed	IS 12615, 325, 8225, 4889, 4772, 4029, 4691 and other relevant Indian Standard or	

Note: 1) Manufacturer / supplier shall submit separate data sheet for each duty / rating.
2) Other specifications not mentioned in datasheet, shall be considered as per tender specification / IS.

TECHNICAL DATA SHEET FOR ELECTROMEGNATIC FLOW METER

Sr. No	Description	Particulars
1	**General**	
1.1	Items	Electromagnetic flow Meter
1.2	Service	Water Flow Measurement and analysis
1.3	Fluid	Raw water /Treated water
1.4	Area Classification	Non Hazardous
1.5	Temperature	Ambient
2	**Flow Sensor**	
2.1	**MOC**	
a	Electrode / Sensor MOC	SS316/SS316L/SS304/SS304L/Hastellon/Titamium
b	Flow tube MOC	SS316/SS316L/SS304/SS304L/Metallic Alloy
c	Coil Housing MOC	SS316/SS316L/SS304/SS304L/Die cast alluminium/Carbon steel (cs)/Sheet steel
d	Earthing Ring/Electrod MOC	SS316/SS316L/SS304/SS304L/Hastellon/Titamium
e	Liner MOC	Neoprene
2.2	Process Connection	•Flanged
		•Reducer- Expander is accepted for ≥ 500 mm pipe diameter and shall be in contractor scope.
		•Contractor may allow to reduced flow meter size as per below.
		Pipe Dia / **Reduction alllowed** ≥500 mm to <1000 mm / 50 mm reduction of pipe line ≥ 1000 mm to <1500 mm / 100 mm reduction of pipe line ≥ 1500 mm / 150 mm reduction of pipe line
		•The Tapper flange degree of reducer and expander to the flow meter shall be same as flow meter flange dimensions
a	Flange MOC	Carbon steel (CS) / SS304/SS304L/SS316/SS316L
b	Flange Standard	IS 1538/AWWA/DIN/EN 1092/JIS/ANSI or equivelant
c	Counter Flange	Counter flange shall be in contractor scope and dimention of flange shall be same as flow meter flange dimension.

<table>
<tr><td>2.3</td><td>Housing Ingress of Protection(IP)</td><td colspan="3">IP 68 or NEMA 6P</td></tr>
<tr><td>2.4</td><td>Pressure Rating</td><td colspan="3">PN 16 (16 Kg/cm2)</td></tr>
<tr><td rowspan="2">2.5</td><td rowspan="2">Spool Piece</td><td colspan="3">Spool piece of each size of flow meter to be provided by contractor.</td></tr>
<tr><td colspan="3">Bidders are required to provide required Spool piece as per below table and it is to be kept at nearest GWIL ofice/ GWSSB Office? Nearest Head work or store.</td></tr>
<tr><td></td><td></td><td></td><td>Flow Meter Quantity (Nos)</td><td>Spool Piece Quantity(Nos)</td></tr>
<tr><td></td><td></td><td></td><td>1</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>≥ 2 to ≤ 5</td><td>2</td></tr>
<tr><td></td><td></td><td></td><td>> 5 to ≤ 20</td><td>5</td></tr>
<tr><td></td><td></td><td></td><td>> 20</td><td>10</td></tr>
<tr><td>3</td><td colspan="4">Flow Indicator and Transmitter</td></tr>
<tr><td>3.1</td><td>Type</td><td colspan="3">Microprocessor Based (Remote/ Integral Mounted)
•Remote mounted where Building available.
•Integral tpe where Building are not available/ Remote area</td></tr>
<tr><td rowspan="5">3.2</td><td rowspan="5">Power Supply</td><td colspan="3">•230 VAC type flow meters in case of Indoor/ Where Buildings is available</td></tr>
<tr><td colspan="3">•Contractor shall provide inbuilt battery-operated flow meters in case of outdoor/ remote area(min battery life 5year)</td></tr>
<tr><td colspan="3">•In case of battery operated flow meter, contractor must replace all batteries after completion 5th year without any additional cost to tenderer. Further 1% of capex cost will be released upon successful completion of this task</td></tr>
<tr><td colspan="3">•If battery fails during O and M period, contractor has to replace battery without any additional cost implication to client</td></tr>
<tr><td colspan="3">•In case of 230VAC flow meter, contractor has to supply and lay cable from the source of power supply to Flow meter, also installed UPS with inbuit stabilizer/ Constant voltage transformer to provide stabilized voltage to instruments. Contractor has to provide UPS with minimum of 2 hours battery back - up at full load.</td></tr>
<tr><td>3.3</td><td>Accuracy</td><td colspan="3">± 0.5 % at 0.3 to 4 m/s velocity of measured value</td></tr>
<tr><td rowspan="2">3.4</td><td rowspan="2">Transmitter Ingress of Protection</td><td colspan="3">•≥ IP 68 or equivalent for remote type display.</td></tr>
<tr><td colspan="3">•IP 68 or equivalent for integral type display.</td></tr>
<tr><td>3.5</td><td>Transmitter MOC</td><td colspan="3">Die-cast Aluminium/ Polycarbonate /SS316 with anticorrosive paint/PU finish with glass window enclouser</td></tr>
<tr><td>3.6</td><td>Output</td><td colspan="3">Digital Output-Modbus/ HART or equivalent</td></tr>
<tr><td>3.7</td><td>Communication</td><td colspan="3">Flow meter will communicate to PLC / Data Logger/ RTU through Digital output.</td></tr>
<tr><td rowspan="2">3.8</td><td rowspan="2">Display</td><td colspan="3">Min. 2 line LCD</td></tr>
<tr><td colspan="3">•Actual Flow rate/ Instantaneous Flow rate</td></tr>
</table>

		•Cumulative Flow/ Sum/ Totalizer
		•Alarm Indicator
		Actual Flow rate and Totalized reading can be display simultaneously
3.9	Display	Minimum 8 Digits
3.10	Data Logger/Local Storage (Internal/ External)	•Flow meter reading can be log/ store locally in data logger for every 15 minutes
		•Minimum 30 days storage required in Data logger.
3.11	Communication protocal	•Push - pull type where flow meter is 230 VAC flow meters
		•Push type where flow meter is inbuilt battery operated
		•Communication from the Flow Meter (Both ways) Remote Terminal Unit(RTU) to Centralized Monitoring Station(CMS) shall be through any cellular technology provided through reliable Telecom Service provider(TSP).
		•In case of GSM/ GPRS based communication system required SIM cards and its subscription; recurring charges shall be borne by Tenderer/bidder as per below. * SIM card and its subscription shall be bone by contractor for first 3 year of O and M * After succesful completion of 3rd year O and M (i.e 4th year to 8 th year O and M period) SIM card and its subscription change shall be borne by department
		•However bidder is responsible for performing variouse activitiese like coordinator activation and maintainance of the same.
		•In case of 230 VAC flow meter ,time stamped data shall be transfer from meter RTU to CMS at every 15 Minutes.
		•In case of battery operated flow meter ,time stamped data for every 15 minutes shall be shaved locally and after every 12 hour data will be transfered from flow meter RTU to CMS.
3.12	Zero and Span Adjustment	•Required
		•Zero and span adjustment can be done with the help of Password.
		•Protection of all parameters(calibration and revenue parameters) to be protected with thee help of factory set password.
		•Contractor shall share Password of flow meters to client at the end of every year. Further the release of subsequent quaterly O and M charges will only allowed upon successful confirmation of receiving of the same.
3.13	Facility for on line diagnosis (local indication as well as Central Monitoring Station	Required as following:
		Diagnostic
		•Continuous self test shall include(But not limited to):
		•Flow Meter On-Off
		•Circuit Break Alarm
		•Major error/ alarm like non-function of device, battery failure etc. will trigger immediately at central monitoring System

	Indication	
3.14	Cable Gland	Required
3.15	Cable length(sensor to transmitter	For remote type flow meter, cable to be supply as per site requirement along with 5-meter extra cable.16 Gauge copper cable is required
3.16	Data Protection	Stored parameter and measured flow data should not ger erased during power failure.

I) Remote Terminal Unit (RTU):

- It is bidder's responsibility to install new flow meter along with remote terminal unit for wireless communication with centralized monitoring system.
- It is bidder's responsibility to install remote terminal unit on existing flow meter for wireless communication with centralized monitoring system.

Sr. No.	Description	Particulars
1.1	• Panel-IP 54 in case of Indoor/Where Building is available • Panel- ≥ IP 65in case of outdoor/ remote area	To Mount Flow Meter Display, Data logger, GPRS Modem, 1 KVA voltage stabilizer with built in Surge protector device etc.
1.2	Data Logger (Internal/ External)	To Store Local Flow Data (every 15 minutes Data) and Alarm Data (Instantaneously) to be Log/ store for 30 Days
1.3	MODEM	Transmit Flow Data to Centralised Monitoring Station/ State Level Data Server
1.4	MOC	CRCA sheet
1.5	Thickness of Panel Wall	Minimum 1.5 mm
1.6	Thickness of Gland Plate	Minimum 2 mm
1.7	Panel Color	Paint Finish as per RAL- 7032 (follow 7 tank Process)

DOCUMENT: TECHNICAL DATA SHEET FOR H. T. VCB

Sr. No.	Particular	Details	Confirm / Data to be filled by the bidder
1.0	**General :**		
1.1	Make	As per Approved vendor list	
1.2	Model and Type no.	Pl. furnish	
1.3	Design Ambient	50°C	
1.4	Atmosphere	Corrosive, Humid, Dusty	
1.5	Location	Indoor / Outdoor	
1.6	Degree of Protection	IP-5X	
2.0	**Electrical Data :**		
2.1	Type of breaker	Vacuum Circuit Breaker	
2.2	Service	Continuous	
2.3	Voltage	11 kV ± 10%	
2.4	System Earthing	Solidly earthed	
2.5	Frequency	50 Hz. + 5% to - 5 %	
2.6	No. of phase	3	
2.7	System fault level	500 MVA	
2.8	Rated short time current	26.3 kA (1 sec.)	
2.9	Max. system voltage	12 kV	
2.10	Auxiliary supply : (Battery backup Power Pack required)	110V D.C derived from Power Pack connected on 110V AC P.T. supply.	
2.11	Making capacity	46 KA (peak)	
2.12	Bus bar material and current rating	Aluminum and As per BOQ.	
2.13	Cable entry	Bottom	
2.14	Cable size	Pl. Furnish	
2.15	Breaker particulars :		
	(a) Operating duty	Pl. furnish/ show catalogue / IS	
	(b) Operating mechanism	Motor charged spring / manual trip and close	
	(c) Spring charging motor	230 V AC, 200 W	

Sr. No.	Particular	Details	Confirm / Data to be filled by the bidder
	(d) Trip / Closing coil	110 V DC, 180 W	
	(e) Anti pumping feature/relay	Required.	
	(f) Latching requirement	Trip free	
	(g) Emergency trip push button	Required.	
	(h) Space heater and cubicle lamp	Required.	
2.16	**Constructiona l requirements**		
	(a) Thickness of sheet steel for frame, enclosure, doors, covers and partitions	CRCA sheet - 2 mm, hinge type door with neoprene rubber gasket	
	(b) Colour	Epoxy powder coating Light Gray RAL 7035 or Two coats epoxy primer and two coats of epoxy paint Shade 631 as per	
	(c) Earth bus size	50 x 6 mm GI Strip/ Cu	
	(d) Foundation frame	ISMC-100, Suitable for three breakers or as per BOQ, with necessary bed plate and foundations bolt.	
	(e) Over all dimension	Provide dimensions	
	(f) Over load of equipment	Provide as per tender	
	(g) Minimum clear space required (i) front side as well as (ii) rear side	Provide dimensions	
	Degree of Protection	IP 5 X	
2.17	Annunciation Provided	To be Provided as per tender	
2.18	Relays	As per Specifications	
	(a) Relay no. and detail	Shall be as per tender	
	(b) Type of relay	Shall be as per tender	
	(c) Make of relay	Shall be as per tender	
	(d) Model no of relay	Provide details	
2.19	Current Transformer		

Sr. No.	Particular	Details	Confirm / Data to be filled by the bidder
	(a) Type of CT	Cast Resin	
	(b) Accuracy class	Provide details as per tender	
	(c) VA burden	Provide details as per tender	
	(d) CT ratio	Provide details as per tender	
2.20	Potential Transformer		
	(a) Type of PT	Cast Resin	
	(b) Accuracy class	Provide details as per tender	
	(c) VA burden	Provide details as per tender	
	(d) PT ratio	Provide details as per tender	
2.21	**Panel Accessories**		
1	Toggle switch for space heater and socket	230 V A.C , 6 A	
2	(b) Socket	6 pin 5/15 A with DP MCB	
3	(c) MCB for spring charging motor circuit	6 A , DP MCB	
4	(d) MCB for ON / OFF	Double pole, 16 A, 110 V D.C for D.C ckt. Double pole, 16 A, 230 V A.C for A.C ckt.	
5	Local / Remote selector switch	4 ways, 2 positions, lockable in any position, angular movement, stay put, lever type handle.	
6	Trip – Neutral – Close (TNC) Switch.	6 ways, 3 position, spring return to neutral, angular movement, lockable pistol grip type handle.	
7	Space Heater	230 VA.C , 100 W (LT supply from LT Panel)	
8	Limit switch for test and service position.	Required	

DOCUMENT: TECHNICAL DATA SHEET FOR TRANSFORMER

SR. NO.	PARTICULAR	DETAILS	Confirm/Data To Be Filled By
1.0	GENERAL FEATURES		
1.1	Make	As per Vendor List	
1.2	Rating in kVA	As per BOQ	
1.3	Installation	Outdoor	
1.4	Service	Continuous	
1.5	Climate	Corrosive	
1.6	Type of cooling	ONAN (Oil natural Air Natural)	
1.7	Ambient temperature	Max. 50° C Avg. 35° C	
1.8	Allowable temperature rise	As per IS:1180(Part-1):2014 (or Latest Applicable IS)	
1.9	Painting	Epoxy, shade no. 631 as per IS : 5	
1.10	Oil type	Mineral oil	
1.11	Position	Plinth mounted	
2.0	ELECTRICAL DATA :		
2.1	Earthing: L.V. side	Solid	
2.2	No. of windings	Two	
2.3	Phase	3	
2.4	Frequency	50 Hz.	
2.5	Voltage ratio	11 / 0.433 kV	
2.6	Phase connection	Delta – Star	
2.7	Vector group	Dyn – 11	
2.8	Winding insulation class	"A"	
2.9 a) b)	Terminations : H.V. side L.V. side	As per BOQ	
3.0	TAP CHANGER :		
3.1	Tapping	H.V.	
3.2	Tap changer	As per BOQ	
3.3	Tapping range	as per IS-1180 (Part 1):2014 (or Latest Applicable IS)	
3.4	No. of steps	as per IS-1180 (Part 1):2014 (or Latest Applicable IS)	

SR. NO.	PARTICULAR	DETAILS	Confirm/Data To Be Filled By
4.0	Limit for transformer operation under over load condition as per IS	Pl. furnish	
5.0	ACCESSORIES AS UNDER :	Required	
_ _ _ _ _ _ _ _ _ _ _ _	Inspection cover. Buchholz relay with alarm and trip contacts Marshalling box Sampling valve with plug or cover plate. Magnetic oil level gauge and Plain oil level indicator with mini. Mark. Conservator and conservator drain valve Bidirectional rollers. Oil temp. indicator with alarm and trip contacts Bottom drain and Filter valve with plug or cover plate. Double diaphragm Explosion vent Silica-gel breather Air release plug / device. Separate neutral bushing Top oil filter valve Jacking pads Lifting lugs		
_ _ _ _ _ ---	Two Earthing terminals. Thermometer pocket for O.T.I. Winding temp. indicator with alarm and trip contacts Pressure relief valve Rating and diagram plate HV and LV gland Any other required as per IS:2026		
6.0	PERFORMANCE DATA :	Pl. furnish	

SR. NO.	PARTICULAR	DETAILS	Confirm/Data To Be Filled By
6.1. a)	Guaranteed Maximum Total losses without Positive tolerance (no-load + load losses at 75º C) at 100% of rated load.	IS:1180(Part-1):2014 / as per specifications / (or Latest Applicable IS)	
b)	Guaranteed Maximum Total losses without Positive tolerance (no-load + load losses at 75º C) at 50% of rated load.	IS:1180(Part-1):2014 / as per specifications / (or Latest Applicable IS)	
c)	Impedance (Percent) on principal tap	IS:1180(Part-1):2014 / as per specifications / (or Latest Applicable IS)	
6.2 a) b)	Rated current No load current at 100% voltage No load current at 112.5% voltage	As per IS-1180(Part 1):2014 (or Latest Applicable IS)	
6.3	Rated efficiency at 0.8 P.F.	As per IS-1180 (Part 1):2014 (or Latest Applicable IS)	
a) b) c)	At full load At 100% load At 50% load	Pl. furnish.	
6.4 a) b) c)	Rated regulation At 0.9 P.F. lag At 0.8 P.F. lag At unity P.F.	Pl. furnish	
6.5	Load at which max. efficiency occurs	Pl. furnish	
6.6	Maximum efficiency	Pl. furnish	
6.7	Permissible flux density and Over fluxing	Pl. furnish	

SR. NO.	PARTICULAR	DETAILS	Confirm/Data To Be Filled By
6.8	Current density	Pl. furnish	
7.0	**Mechanical Data:**	Pl. furnish	
7.1	Total Quantity of oil.	Pl. furnish	
7.2 a) b) c) d)	Total Trans. Weight (with oil) Trans. Weight without oil Copper weight core weight	Pl.furnish Pl.furnish Pl.furnish Pl.furnish	
7.3	Dimensions (mm.) including all accessories:	Pl. furnish	

DOCUMENT: TECHNICAL DATA SHEET FOR MEDIUM VOLTAGE PANEL BOARD (L.T PANEL).

SR. NO.	PARTICULAR	DETAILS	DATA TO BE FILLED BY THE BIDDER
1.0	SITE CONDITION		
1.1	Type / Make	Indoor / As per tender	
1.2	Mounting	Floor	
1.3	Ambient Temperature	50° C	
1.4	Atmosphere	Corrosive, Humid and Dusty	
2.0	CONSTRUCTION		
2.1	Housing	As per BOQ	
2.2	Protection Class	IP-5X	
2.3	Doors	As per BOQ	
2.4	Base channel	As per BOQ	
3.0	OPERATIVECONDITION		
3.1	Voltage	415 V ± 10%	
3.2	No. of phase	3	
3.3	System	3 phase, 4 wire	
3.4	Frequency	50 Hz, +5% / -5%	
3.5	Fault Current	25 kA/50kA as per SLD	
3.6	Neutral Grounding	Solid	
4.0	CONTROL SYSTEM		
4.1	Voltage		
	For Indication	230 V A.C.	
	For Metering	230 V A.C.	
	For Protection	230 V A.C.	
4.2	Control Supply Through	230 V A.C. for MCC and APFC	
4.3	Control Wiring	Pl. Furnish	
5.0	BUSBAR		

SR. NO.	PARTICULAR	DETAILS	DATA TO BE FILLED BY THE BIDDER
5.1	Neutral Bus bar Material	Same as Phase Bus bar.	
5.2	Earth Bus bar Material	As per SLD	
6.0	PLC Based System	As per SLD / BOQ.	
7.0	Electronic Motor Protection Relay (with RS-485 port)	Microprocessor based	
7.1	Type	As per tender	
7.2	Make	As per tender	
7.3	Protection	Pl. furnish	
	1) over current 2) single phasing 3) phase reverse 4) Current unbalance 5) under current (dry run) 6) stall (bearing broken) locked rotor 7) Restart Inhibition 8) Ground/Earth fault (CBCT)	Pl. furnish	
8.0	PAINTING		
8.1	Sheet should be 7 tank processed, Oven Baked at 310 °C with powder coating.	Required	
8.2	Colour	Pl. Furnish	
8.3	Shade : Exterior and Interior	Pl. Furnish	
9.0	PANEL TEMPERATURE		
9.1	Max. temperature rise	35 °C above ambient	
10.0	Control Wiring		
10.1	Wire Size	Pl. Furnish	
11.0	Hardware (Zinc Plated)	YES	

SR. NO.	PARTICULAR	DETAILS	DATA TO BE FILLED BY THE BIDDER
12.0	Space Heater	230 V A.C. with thermostat	
13.0	Pocket For Drg at door	YES	
14.0	Annunciator Window (Free standing to be mounted at convenient location with required cabling, required contacts should have separate terminal block in cable alley)	Indication for each Pump : a. Pump Trip (Red)- Through starter b. High level in sump c. Low and very low level in sump d. High and low discharge pressure e. Valve Motor Trip	
15.0	Instrumentation compartment	Separate compartment for energy meter, Hr meter, level controller, etc. with necessary internal wiring	
16.0	Panel Internal Lighting	Auto NO contact/switch with Panel door and CFL 18 W for Panel Internal Lighting	

Note: Other specifications not mentioned in datasheet shall be considered as per tender specifications

DATA SHEET (PRESSURE GAUGE)			
SR.No	Particulars	Dept.Requirement	Bidder's Data
1.0	GENERAL		
1.1	Make	As per vendor list	
1.2	Service	Individual Pump desch. and Common header	
1.3	Fluid	Raw water	
1.4	Area of Classification	Non-hazardous	
2.0	MATERIAL OF CONSTRUCTION		
2.1	Type	Bourden Type	
2.2	Sensor & other wet parts	SS 316	
2.3	Process connection	½" NPT (M)	
2.4	Dial size	150 MM	
2.5	Material of dial	Aluminum with white background & black numerals	
2.6	Glass	Shatter proof	
2.7	Housing material	Die cast aluminum with epoxy	
2.8	Accuracy	+ or – 1 %of full scale or better	
2.9	Over range protection	125 %of maximum pressure	
2.10	Gauge protection	IP 65	
2.11	Temperature	50 Degree Celsius Ambient	
2.12	Range	As per BOQ	
2.13	Accessories	Snubber ,3 way isolation valve, all other installation hardware	
2.14	Diaphram seal M.O.C	SS 316	
2.15	3 way isolation Valve	SS 316	
2.16	Impulse Tube Fitting M.O.C	SS 316	