APPLICABLE TO: ● PROPOSAL ○ PURCHASE ☐ AS BUILT — Rev

FOR: P.O.G.C — UNIT: 149

SITE: ASSALUYEH — SREVICE: SEA WATER PUMPS FROM WELLS

No. of Req'd: ---10--- Service · 10 / Stand by ----

NOTES : INFORMATION BELOW TO BE COMPLETED ○ BY PURCHASER ☐ BY MANUFACTURER ☐ BY MANUFACTURER OR PURCHASER

DATA SHEETS ● Rev.: 01

	ITEM NO.	ATTACHED	ITEM NO.	ATTACHED	ITEM NO.	ATTACHED
PUMP	149-P-106A~J	●				○
MOTOR	149-PM-106A~J	○				○
GEAR		○				○
TURBINE		○				○

REVISIONS

NO.	DATE	BY
0		
1		
2		
3		
4		

APPLICABLE OVERLAY STANDARD(S) :

OPERATING CONDITIONS (5.1.3)

FLOW, NORMAL 12 (m^3/h) RATED 20 (2) (m^3/h)

OTHER (m3/h)

SUCTION PRESSURE MIN / NORM 1 / 1.5(3) (barg)

MAX 2 (barg)

DISCHARGE PRESSURE 6 (18) (barg)

DIFFERENTIAL PRESSURE 5 (bar)

DIFF.HEAD 49.35 (1) (m) NPSHA >7 (20) (m)

PROCESS VARIATIONS (5.1.4)

STARTING CONDITIONS (5.1.4) DELIVERY VALVE : CLOSED

SERVICE: ● CONT ○ INTERMITTENT (STARTS/DAY)

● PARALLEL OPERATION REQ'D (5.1.13)

SITE DATA (5.1.3)

LOCATION: (5.1.30)

○ INDOOR ○ HEATED ● OUTDOOR ● UNHEATED

● ELECTRICAL AREA CLASSIFICATION (5.1.24 / 6.1.4) SAFE AREA

ZONE GR TC

○ WINTERIZATION REQ D. ● TROPICALIZATION REQ D.

SITE DATA (5.1.30)

● ALTITUDE 5 (m) BAROMETER 1.01 (bar)

● RANGE OF AMBIENT TEMPS:MIN,MAX. 2 / 48 (^oC)

● RELATIVE HUMIDITY: NORMAL/MAX. 65 / 100 (%)

UNUSUAL CONDITIONS: (5.1.30) ● DUST ● FUMES

● OTHER REFER TO SPEC. NO. :DB-2224-999-P332-204

DRIVER TYPE

● INDUCTION MOTOR ○ STEAM TURBINE ○ GEAR

○ OTHER

MOTOR DRIVER (6.1.1 / 6.1.4) (13)

☐ MANUFACTURER

☐ (kw) ☐ (r/min)

☐ FRAME ■ ENCLOSURE

HORIZONTAL ■ VERTICAL SERVICE FACTOR 1

☐ VOLTS / PHASE / HERTZ 400 / ☐ / 50

● TYPE SQUIRREL CAGE INDUCTION MOTORS

● MINIMUM STARTING VOLTAGE (6.1.5) 80%

■ INSULATION F ● TEMP. RISE B

☐ FULL LOAD AMPS

■ LOCKED ROTOR AMPS

■ STARTING METHOD D.O.L

☐ LUBE

BEARINGS (TYPE / NUMBER) :

☐ RADIAL /

☐ THRUST /

☐ VERTICAL THRUST CAPACITY

UP (N) DOWN (N)

LIQUID (5.1.3)

LIQUID TYPE OR NAME SEA WATER

○ HAZARDOUS ○ FLAMMABLE (5.1.5)

	MIN.	NORMAL	MAX.
PUMPING TEMP (^oC)	13	20 (4)	35
VAPOUR PRESS . (bara)			0.05
RELATIVE DENSITY (SG):			1.03
VISCOSITY (m Pa.s)	1.3	1.05	

SPECIFIC HEAT, C_P (kj/kg .k.)

○ CHLORIDE CONCENTRATION (6.5.2.4) (mg/kg)

○ H_2S CONCENTRATION WET (5.12.1.12c)

CORROSIVE / EROSIVE AGENT Yes/ NO (5.12.1.9)

MATERIALS (5.12.1.1)

● ANNEX H CLASS (5.12.1.1) D-2

○ MIN DESIGN METAL TEMP AT PRESSURE

○ REDUCED HARDNESS MATERIALS REQ D. (5.12.1.12)

☐ BARREL / CASE IMPELLER

☐ CASE / IMPELLER WEAR RINGS

☐ SHAFT

☐ DIFFUSERS

PERFORMANCE

PROPOSAL CURVE NO. (r/min)

☐ IMPELLER DIA RATED MAX. MIN. (mm)

☐ IMPELLER TYPE

☐ RATED POWER (kw) EFFICIENCY (%)

☐ MINIMUM CONTINUOUS FLOW :

THERMAL (m^3/h) STABLE (m^3/h)

☐ PREFERRED OPER. REGION TO (m^3/h)

☐ ALLOWABLE OPER. REGION TO (m^3/h)

☐ MAX. HEAD @ RATED IMPELLER (m)

☐ MAX. POWER @ RATED IMPELLER (kw)

☐ NPSHR AT RATED FLOW (m) (5.1.10)

■ MAX SUCTION SPECIFIC SPEED : 13000 (RPM,M3/HR,M) (5.1.11)

■ MAX . SOUND PRESS LEVEL REQ. D 85 @ 1m (dba) (5.1.16)

EST MAX. SOUND PRESS LEVEL (dba) (5.1.16)

○ EST MAX. SOUND POWER LEVEL (dba) (5.1.16)

UTILITY CONDITIONS (5.1.3)

ELECTRICITY	VOLTAGE	PHASE	HERTZ
DRIVERS (13)	400	3	50
HEATING (13)			

SYSTEM VOLTAGE DIP ● 80% ○ OTHER (6.1.5)

STEAM	MAX. PRESS.	MAX. TEMP	MIN. PRESS.	MIN. TEMP
DRIVERS				
HEATING				

COOLING WATER: (5.1.19) SOURCE

SUPPLY TEMP. (^oC) MAX. RETURN TEMP. (^oC)

NORM. PRESS. (barg) DESIGN PRESS.

MIN. RET. PRESS (barg) MAX. ALLOW. D.P. (bar)

CHLORIDE CONCENTRATION : (mg/kg)

CENTRIFUGAL PUMP DATA SHEET, SI UNIT

CONSTRUCTION

ROTATION (VIEWED FROM CPLG END) ☐ CW ☐ CCW

PUMP TYPE: (1.3) **Submersible (Manufacture standard)**

☐ VS1 ☐ VS2 ☐ VS3 ☐ VS4 ☐ VS5 ☐ VS6 ☐ VS7

CASING MOUNTING : ☐ SUMP COVER PLATE

☐ INLINE ☐ SEPARATE MOUNTING PLATE (8.3.8.3.1)

■ SEPARATE SOLE PLATE (8.3.8.3.3) **(8)**

CASING SPLIT :

☐ AXIAL ☐ RADIAL

CASING TYPE :

☐ SINGLE VOLUTE ☐ MULTIPLE VOLUTE ☐ DIFFUSER

CASE PRESSURE RATING :

☐ MAX. ALLOWABLE WORKING PRESSURE _____ (bar)

@ **85** (^{O}C)

■ HYDROTEST PRESSURE **1.5 * MAWP** (bar)

○ SUCTION PRESS. REGIONS MUST BE DESIGNED FOR MAWP(5.3.6)

☐ NOZZLE CONNECTIONS : (5.4.2) **(14)**

	SIZE (DN)	FLANGE RATING	FACING	POSITION
SUCTION	**Belltype**	**150#**		
DISCHARGE	**2"**	**150#**	**FF**	
BALANCE DRUM				

PRESSURE CASING AUX. CONNECTIONS : (5.4.3)

	NO.	SIZE (DN)	TYPE
■ DRAIN			
■ VENT			
☐ WARM-UP			
☐ BALANCE / LEAK-OFF			

☐ MACHINED AND STUDDED CONNECTIONS (5.4.3.8)

○ CYLINDRICALTHREADS REQUIRED (5.4.3.3)

● COMPONENT BALANCE TO ISO 1940 G 1.0 (5.9.4.4)

○ SHRINK FIT-LIMITED MOVEMENT IMPELLERS (8.2.2.3)

● MANUFACTURER _____ ☐ MODEL _____

☐ RATING (kw per100 r/min) _____

SPACER LENGTH _____ (mm) ■ SERVICE FACTOR **1.5 MIN**

RIGID

THROUGH COUPLINGS :

○ MANUFACTURER _____ ☐ MODEL _____

☐ RATING (kw per100 r/min) _____ ○ LUBE _____

☐ SPACER LENGTH _____ (mm) ☐ SERVICE FACTOR _____

☐ RIGID

DRIVER HALF COUPLING MOUNTED BY :

● PUMP MFR. ○ DRIVER MFR. ○ PURCHASER

● COUPLING BALANCED TO ISO 1940-1 **G.2.5** (6.2.3)

○ COUPLING PER ISO 14691 (6.2.4)

○ COUPLING PER ISO 10441 (6.2.4)

○ COUPLING PER API 671 (6.2.4)

● NON-SPARK COUPLING GUARD (6.2.14c)

○ COUPLING GUARD STANDARD PER (6.2.14a)

MECHANICAL SEAL : (5.8.1)

SEAL MANUFACTURER _____

☐ ● CATEGORY _____

● TYPE (SEAL CODE) _____

● ARRANGMENT _____

● SEAL/AUXILIARY PLAN **/**

SEAL CONSTRUCTION:

☐ SLEEVE MATERIAL _____

☐ GLAND MATERIAL _____

☐ AUX SEAL DEVICE (2.7.3.20) _____

☐ JACKET REQUIRED (2.7.3.17) _____

SEAL CHAMBER DATA: (2.1.6/2.1.7)

☐ TEMPERATURE _____

☐ PRESSURE _____

☐ FLOW _____

SURFACE PREPARATION AND PAINT

☐ MANUFACTURER'S STANDARD ○ OTHER (SEE BELOW)

● SPECIFICATION No. **RP-2224-999-6600-001**

● PUMP SURFACE PREPARATION

■ PRIMER _____

● FINISH COAT _____

BASEPLATE / COLUMN : (6.3.17)

○ BASEPLATE SURFACE PREPARATION _____

○ PRIMER _____

○ FINISH COAT _____

SHIPMENT : (7.4.1)

○ DOMESTIC ● EXPORT ● EXPORT BOXING REQUIRED

● OUTDOOR STORAGE MORE THAN **12** MONTHS

SPARE ROTOR ASSEMBLY PACKAGED FOR :

○ HORIZONTAL STORAGE ○ VERTICAL STORAGE

○ TYPE OF SHIPPING PREPARATION

HEATING AND COOLING

○ HEATING JACKET REQ'D (5.8.9) ☐ COOLING REQ'D

☐ COOLING WATER PIPING PLAN (6.5.3.1) _____

C.W. PIPING :

☐ PIPE ☐ TUBING: FITTINGS _____

C.W. PIPING MATERIALS :

☐ S.STEEL ☐ C.STEEL ☐ GALVANIZED

COOLING WATER REQUIREMENTS :

☐ BEARING HOUSING _____ m^3/h @ _____ (bar)

☐ HEAT EXCHANGER _____ m^3/h @ _____ (bar)

STEAM PIPING : ○ TUBING ○ PIPE

BEARINGS AND LUBRICATION

BEARING (TYPE / NUMBER) :

☐ RADIAL _____ /

☐ THRUST _____ /

LUBRICATION (5.11.3,5.11.4):

☐ GEARS ☐ FLOOD ○ PURGE OIL MIST

☐ SELF LUBRICATED ○ PURE OIL MIST

● CONSTANT LEVEL OILER PREFERENCE (5.10.2.2) : _____

☐ OIL VISC. ISO GRADE _____

○ REVIEW AND APPROVE THRUST BEARING SIZE

☐ OIL HEATER REQUIRED : ○ STEAM ○ ELECTRIC

INSTRUMENTATION (6.4.2)

○ ACCELEROMETER (6.4.2.1) _____

○ PROVISION FOR MOUNTING ONLY (5.10.2.11)

● FLAT SURFACE REQ'D (5.10.2.12)

○ PRESSURE GAUGE TYPE _____

REMARKS : _____

MASSES (Kg)

PUMP _____

DRIVER _____

GEAR _____

BASEPLATE _____

TOTAL _____

Rev.

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SPARE PARTS (TABLE 18)

- (●) START-UP (●) NORMAL MAINTENANCE
- (●) SPECIFY **2 YEARS OPERATION**

OTHER PURCHASER REQUIREMENTS

- (●) COORDINATION MEETING REQUIRED (9.1.3)
- (●) MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)
  - (●) MAX. RELATIVE DENSITY
  - (●) MAX. DIA. IMPELLERS AND / OR NO. OF STAGES
  - ( ) OPERATION TO TRIP SPEED
- ( ) CONNECTION DESIGN APPROVAL (5.12.3.4)
- ( ) TORSIONAL ANALYSIS REQUIRED (5.9.2.1)
- ( ) TORSIONAL ANALYSIS REPORT (5.9.2.6)
- (●) PROGRESS REPORTS (9.3.3)
- (●) OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)
- ( ) ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.2.1)
- MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)
  - [■] VENT [■] DRAIN [ ] COOLING WATER
- [ ] MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)
- [ ] FLANGES REQ'D IN PLACE OF SOCKET WELD UNIONS (6.5.2.8)
- CONNECTION BOLTING ( ) PTFE COATING (●) SS
  - ( ) PAINTED ( ) ASTM A153 GALVANIZED
- [ ] INSTALLATION LIST IN PROPOSAL (9.2.3L)

VERTICAL PUMPS

- [■] PUMP THRUST : (+)UP (-)DOWN
  - AT MIN. FLOW _____ (N) _____ (N)
  - AT RATED FLOW _____ (N) _____ (N)
  - MAX. THRUST _____ (N) _____ (N)
- [ ] SOLE PLATE REQ'D (8.3.8.3.3) _____ (m) X _____ (m)
- ( ) SEPARATE MOUNTING PLATE REQUIRED (8..8.3.1)
- [ ] SOLE PLATE THICKNESS _____ (mm)
- COLUMN PIPE : [ ] FLANGED [ ] THREADED
- [ ] DIAMETER _____ (mm) LENGTH _____ (m)
- GUIDE BUSHINGS [ ] [ ]
- [ ] NUMBER _____
- [ ] LINE SHAFT BEARING SPACING _____ (mm)
- GUIDE BUSHINGS LUBE :
  - [ ] WATER [ ] OIL
  - [ ] GREASE [ ] PUMPAGE
- LINE SHAFT : [ ] OPEN [ ] ENCLOSED
- [ ] LINE SHAFT DIAMETER : _____ (mm)
- [ ] TUBE DIAMETER : _____ (mm)
- LINE SHAFT COUPLING :
  - [ ] LINE SHAFT DIAMETER : [ ] SLEEVE & KEY [ ] THREADED
  - [ ] SUCTION CAN THICKNESS _____ (mm)
    - [ ] LENGTH _____ (m)
    - [ ] DIAMETER _____ (m)
- ( ) SUCTION STRAINER TYPE _____ **(21)**
- ( ) FLOAT & ROD ( ) FLOAT SWITCH
- ( ) IMPELLER COLLETS ACCEPTABLE (5.6.3)
- ( ) HARDENED SLEEVES UNDER BEARINGS (8.3.10.5)

VERTICAL PUMPS (CONT.)

- ( ) PUMP AND STRUCTURE DYNAMIC ANALYSIS (8.3.5)
- ( ) DRAIN PIPED TO SURFACE (8.3.13.5)

QA INSPECTION AND TESTING (11)

- (●) SHOP INSPECTION (7.1.4) (●) PERF. CURVE APPROVAL
- [ ] TEST WITH SUBSTITUTE SEAL (7.3.3.2b)

TEST	NON-WIT	WIT	OBSERVE
(●) HYDROSTATIC TEST OF BOWLS AND COLUMN (8.3.13.2)	( )	( )	( )
(●) HYDROSTATIC (7.3.2)	( )	(●)	( )
(●) PERFORMANCE (7.3.3)	( )	(●)	( )
(●) RETEST ON SEAL LKGE (7.3.3.2d)	( )	(●)	( )
(●) NPSH (7.3.4.2)	( )	(●)	( )
(●) COMPLETE UNIT TEST (7.3.4.3)	( )	(●)	( )
(●) SOUND LEVEL TEST (7.3.4.4)	( )	(●)	( )
(●) CLEANLINESS PRIOR TO FINAL ASSEMBLY (7.2.2.2)	(●)	( )	( )
( ) NOZZLE LOAD TEST (6.3.6)	( )	( )	( )
( ) 4 HR. MECH. RUN TEST (7.3.4.7.2)	( )	( )	( )
( ) MECHANICAL RUN UNTIL OIL TEMP. STABLE (7.3.4.7.1)	( )	( )	( )
(●) 4 HR. MECHANICAL RUN AFTER OIL TEMP. STABLE (7.3.4.7.3) **(12)**	( )	(●)	( )
( ) TRUE PEAK VELOCITY DATA (7.3.3.4d)	( )	( )	( )
( ) RESONANCE TEST (8.3.9.2)	( )	( )	( )
(●) AUXILIARY EQUIPMENT TEST (7.3.4.5)	(●)	( )	( )
[ ] IMPACT TESTING (5.12.4.3)	( )	( )	( )

  - ( ) PER EN 13445
  - ( ) PER ASME VIII
- (●) VENDOR KEEP REPAIR AND HT RECORDS (7.2.1.1c)
- (●) VENDOR SUBMIT TEST PROCEDURES (7.3.1.2 / 9.2.5)
- (●) VENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3e)
- (●) INCLUDE PLOTTED VIBRATION SPECTRA (5.9.3.3)
- (●) RECORD FINAL ASSEMBLY RUNNING CLEARANCES
- (●) COMPLETION OF INSPECTION CHECK LIST (7.1.6)
- (●) MATERIAL CERTIFICATION REQUIRED (5.12.1.8)
  - (●) CASING (●) IMPELLER (●) SHAFT
  - (●) OTHER **SHAFT SLEEVE, WEAR RINGS, MECHANICAL SEAL. STEEL PARTS**
- (●) CASTING REPAIR PROCEDURE APPROVAL REQ'D (5.12.2.5)
- [■] INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4)
  - [ ] MAG. PARTICLE [■] LIQUID PENETRANT (6)
  - [■] RADIOGRAPHIC [■] ULTRASONIC (7)
- INSPECTION REQUIRED FOR CASTINGS (7.2.1.3) (5.12.1.5)
  - [■] MAG. PARTICLE [■] LIQUID PENETRANT (6)
  - [■] RADIOGRAPHIC [■] ULTRASONIC (7)
- ( ) HARDNESS TEST REQUIRED (7.2.2.3)
- ( ) ADDITIONAL SUBSURFACE EXAMINATION (7.2.1.3)
  - FOR _____
  - METHOD _____

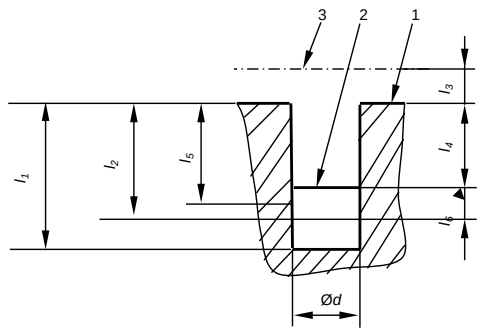
SUMP ARRANGEMENT

KEY

- **1** GRADE
- **2** LOW LIQUID LEVEL
- **3** CENTERLINE OF DISCHARGE
- l_1 SUMP DEPTH
- l_2 PUMP LENGTH
- l_3 CENTERLINE DISCHARGE HEIGHT
- l_4 HEIGHT OF GRADE ABOVE LOW LIQUID LEVEL
- l_5 DATUM ELEVATION ,FIRST-STAGE IMPELLER
- l_6 SUBMERGENCE REQUIRED
- Ød SUMP DIAMETER

REFER TO HYDRAULIC INSTITUTE STANDARDS FOR DEFINITIONS

- (●) l_1 **20** (m)
- (●) Ød _____ (m)
- (●) l_4 _____ (m)
- [■] l_2 _____ (m)
- [■] l_6 _____ (m)
- [■] l_3 _____ (m)
- [■] l_5 _____ (m)



						Rev
1	APPLICABLE TO: ● PROPOSALS ○ PURCHASE ◯ AS BUILT					
2	FOR	**P.O.G.C**	UNIT	**149**		
3	SITE	**ASSALUYEH**	SREVICE	**SEA WATER PUMP**		
4						
5	NOTES INFORMATION BELOW TO BE COMPLETE BY ○ PURCHASER ☐ BY MANUFACTURER ◯ BY MANUFACTURER OR PURCHASER					
6						
7	PRESSURE VESSEL DESIGN CODE REFERENCES.					
8	☐ THESE REFERENCES MUST BE LISTED BY THE MANUFACTURER					
9	CASTING FACTORS USED IN DESIGN (5.3.4) (TABLE 3)	☐				
10	SOURCE OF MATERIAL PROPERTIES	☐				
11						
12	WELDING AND REPAIRS (5.12.3)					
13	THESE REFERENCES MUST BE LISTED BY THE PURCHASER. DEFAULT TO TABLE 10 IF NO PURCHASER PREFERENCE IS STATED)					
14	○ ALTERNATIVE WELDING CODES AND STANDARDS (5.12.3.1)					
15	WELDING REQUIREMENT (APPLICABLE CODE OR STANDARD)			PURCHASER DEFINED	DEFAULT PER TABLE 10	
16	WELDER OPERATOR QUALIFICATION			○	●	
17	WELDING PROCEDURE QUALIFICATION			○	●	
18	NON-PRESSURE RETAINING STRUCTURAL WELDING SUCH AS BASEPLATES OR SUPPORTS			○	●	
19	MAGNETIC PARTICLE OR LIQUID PENETANT EXAMINATION OF THE PLATE EDGES			○	●	
20	POST WELD HEAT TREATMENT (IF REQUIRED)			○	●	
21	POST WELD HEAT TREATMENT OF CASING FABRICATION WELDS (IF REQUIRED)			○	●	
22						
23	MATERIAL INSPECTION (7.2.2.1)(7.2.1.3)					
24	THESE REFERENCES MUST BE LISTED BY THE PURCHASER. (DEFAULT TO TABLE 10 IF NO PURCHASER PREFERENCE IS STATED)					
25	○ ALTERNATIVE MATERIAL INSPECTIONS AND ACCEPTANCE CRITERIA (SEE TABLE 13)					
26	TYPE OF INSPECTION	METHODS		FOR FABRICATIONS	CASTINGS	
27	RADIOPRAPGY	○		○	○	
28	ULTRASONIC INSPECTION	○		○	○	
29	MAGNETIC PARTICLE INSPECTION	○		○	○	
30	LIQUID PENETRANT INSPECTION	○		○	○	
31	REMARKS					
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	REMARKS	Rev.
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2	**1) THE CHOICE OF A PUMP HAVING A MAX. HEAD MORE THAN 1.2 TIMES THE RATED HEAD SHALL BE SUBJECTED TO THE PURCHASER APPROVAL**	
3	**2) PUMP MINIMUM FLOW RATE: BY VENDOR**	
4	**3) PUMP SUCTION DESIGN PRESSURE :3.5 BARG**	
5	**4) PUMP DESIGN TEMPERATURE :85ºC**	
6	**5) THIS DOCUMENT IS BASED ON PROCESS DATASHEET NO.SPP 2224 149 P 106**	
7	**6) Where magnetic particle is not possible.**	
8	**7) Where Radiography is not possible.**	
9	**8) Head plate with through assembly.**	
10	**9) REFER TO PROCESS CENTRIFUGAL PUMPS SPECIFICATION NO.RP-2224-999-0910-001**	
11	**10) WELDED FLANGED VALVE**	
12	**11) FOR TEST AND INSPECTION REFER TO "ROTATING MACHINES-INSPECTION AND SHOP TEST" DOC No.RP-2224-999-1000-002**	
13	**12) PURCHASER / COMPANY SHALL HAVE THE RIGHT TO ORDER DISMANTLING THE PUMP AFTER MECHANICAL RUNNING TEST IF RECORDED TEST RESULT CAN NOT MEET REQUIREMENTS OF THIS DATASHEET**	
14	**13) REFER TO SQUIRREL CAGE INDUCTION MOTORS SPECIFICATION. DOC NO. RP-2224-999-1630-027**	
15	**14) ALLOWABLE NOZZLE LOAD SHALL BE 2 TIMES OF THE API 610**	
16	**15) CASING SHALL HAVE A CORROSION ALLOWANCE OF AT LEAST 3MM.**	
17	**16) ESTIMATED SHUT-OFF PRESSURE=8.05 barg**	
18	**17) For calculating the suction pressure, it is supposed that the sea water will be taken from wells (-20 m Max.).**	
19	**18) Discharge pressure will be finalized by vendor of Reverse Osmosis Package.**	
20	**19) Total dissolved solid (TDS)<20000 mg/l; pH = 8.2; CL = 6123 - 7514 ppm (CHLORINATION).**	
21	**20) Referenced at grade.**	
22	**21) Fluid intake design and specifying proper dimension shall be done by vendor**	
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	SCOPE OF SUPPLY	Rev.
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2	**1) SUBMERGED PUMP**	
3	**2) SUBMERGED ELECTRIC MOTOR**	
4	**3) HEAD PLATES WITH POWER JUNCTION BOX, WITH PIN, CABLE REEL AND HOLDER.**	
5	**4) CHECK VALVE FOR DISCHARGE LINE.(VENDOR TO ADVISE)**	
6	**5) POWER / EARTHING CABLES AND CABLE SUPPORTS**	
7	**6) FLOATER**	
8	**7) LIFTING CABLES**	
9	**8) INSPECTION AND TESTS**	
10	**9) PAINTING**	
11	**10) EXPORT BOXING**	
12	**11) DOCUMENTATION AND DRAWINGS**	
13	**12) SET OF ERECTION, START UP AND COMMISSIONING SPARE PARTS**	
14	**13) SET OF SPECIAL TOOLS**	
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TECHNICAL SPECIFICATION

Rev.

1 DESIGN

1.1 The rated capacity shall not exceed the capacity at the curve best efficiency point.

1.2 Axial thrust limitation shall be only allowed by internal balancing of impeller or opposed impeller arrangement.

1.3 Pump supplier shall specify power consumption at end of curve.

1.4 Pump shall have renewable wear rings

1.5 The first lateral critical speed shall be at least 10% over operating speed.

1.6 Discharge flange shall be : Up to 24" = ANSI B16.5, 26" and above = ANSI B 16.47 series A Bolts will be ANSI, also for calculated flanges. They shall be made of stainless steel.

2 ELECTRIC MOTOR

2.1 Electric motor power rating shall be at least 10 %above the rated pump power and will also be able to cover the whole pump curve

2.2 Motor design shall allow full voltage starting. Motor torque at 80% of rated voltage shall be capable of pump acceleration to full speed where discharge valve is open.

2.3 Rotor of pump and motor shall be designed to allow reverse rotation at 125% of normal speed without damage.

2.4 Power cable between motor and surface junction box shall be suitable for temperatur of fluide handled specified in data sheet.

2.5 Junction box shall be suitable for electric area classification specified in data sheet A double seal shall be provided in the connecting pipe between motor junction box and surface plate.

3 MISCELLANEOUS

3.1 Pump lifting cable shall be of AISI 304 stainless steel and non-twisting type.

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4 MATERIALS

4.1 Repair in pressure castings by plugging or impregnation is prohibited

4.2 Purchaser shall be informed prior necessity of repair.
All repair shall meet inspection requirement and acceptance of supplier standard.

5 SPECIAL TESTS

5.1 All accessible presssure- containing welds on head plate shall be 100% radiographied as per ASME code, SECTION VIII, Division 1.
For all other welds, dye-penetrant shall be used.

6 PERFORMANCE TEST

6.1 Each pump shall run continously for a periode of at least two hours at the rated point

6.2 This test shall include five points

6.3 This test shall be performed at the specified operating speed (tolerance + or - 5%) at specified voltage and frequency on data sheet.

6.4 If the impeller needs to be modified, the pump shall be retested.

6.5 Measurement of vibration on the motor housing adjacent to the upper bearing shall be recorded during this performance test.

6.6 A starting current test shall be performed on each motor.

7 NET POSITIVE SUCTION HEAD HEAD TEST

7.1 NPSHR shall be based on 3% head drop with a + or - 0% tolerance at the guarantee point.

8 PUMP DOWN TEST

8.1 All pumps shall be subject to this test.

8.2 The pump down test shall be performed after NPSHR test point has been completed with the liquid level equal to the NPSHR and with flow at guarantee point.

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9 **ELECTRIC MOTOR TEST**

Each motor shall be high-potential tested prior to functional testing as well as resistance and electric balance test. Acceptable resistance value as per Vendor Standard practice

10 **POWER CABLE BEND TEST**

Cable will be then submerged in salt water and high potential tested.
Each power cable shall be high-potential tested in air.

11 **LIFTING CABLE TEST**

A tensile test shall be performed at ambient temperature on a sample of each cable.

12 **CERTIFICATION OF MATERIAL TEST DATA**

Pump supplier shall provide certificates containing chemical and mechanical data of material(as per grade 3.1 of B.S.E.N.10204) used for:
Pressure casing PARTS, impellers, shafts, cover plate,.