ESS 027	:	Specification for electrical content of package unit.
ESS 016	:	Specification for control panels.
ESS 001	:	Specification for motor.

3.2 In case of any conflict between this specification and the document referred above, priority shal established in the following order.

(i) Equipment data sheets and drawings.
(ii) This specification.
(iii) JACOBS standard specification.
(iv) Codes and Standard.

4.0 BASIS OF DESIGN

4.1 Cycle water chillers shall be designed based on the following duty conditions.

Type	:	Vapour absorption (Single effect).
Process content	:	Process water.
Duty	:	Continuous.
Number of units	:	2 Nos. (both working)
Capacity	:	21,20,000 kcal/hr (700 TR).
Total process coolant flow	:	178 m^3/hr
Temperature of process coolant at chiller inlet	:	37 °C.
Temperature of process coolant at chiller outlet	:	25 °C
Inlet pressure of process coolant at chiller	:	9.0 kg/cm^2(g).
Refrigerant	:	Water.
Absorbent	:	Lithium bromide duly inhibited.
Design fouling factor for process coolant system	:	0.0003 hr-m^2-°C / kcal
Design fouling factor for cooling water system	:	0.0004 hr-m^2-°C / kcal.
Design fouling factor for steam	:	0.0002 hr- m^2-°C / kcal.
Maximum turndown required	:	10 – 100%
Driving media	:	Saturated process steam.
Steam pressure available @ before control valve	:	1 kg/cm^2 (g) @ 121°C
Steam analysis	:	Water : 99.98 mol.%. MEG : 0.02 mol.%.

For mechanical design following parameters shall be considered.

Design pressure on steam side : 5.0 kg/cm² (g).

Design temperature on steam side : 150°C.

Maximum steam consumption / unit : 5800 kg/hr.

COOLING WATER

Supply pressure : 4.5 kg/cm² (g).

Design pressure : 7.0 kg/cm²(g).

Supply temperature / Return temperature : 33°C / 43°C.

Allowable pressure drop : 1.0 kg/cm².

Analysis

		Normal	Maximum
pH	:	7.5 – 8.0	8.5
Turbidity / NTU		20-30	50
TDS, mg/l		800 –1200	2000
M-Alkalinity as Ca CO_3, mg/l		120-130	130
Calcium hardness as Ca CO_3, mg/l		280-320	250
Total hardness as Ca CO_3, mg/l		480-660	700
Chloride as Cl, mg/l		72-144	145
Suphate as SO_4, mg/l		460-710	750
Silica as SiO_2, mg/l		60-100	125
Organophosphonite HEDP as PO_4, mg/l		3-5	5
Inorganic polyphosphate as PO_4, mg/l		8-10	10
Orthophosphate as PO_4, mg/l		5	-
Polymeric dispersant, mg/l		5-10	10
Zinc as Zn, mg/l		1-2	2
Free Cl_2, mg/l		0.3-0.5	1
$KmnO_4$. values, mg/l		20-30	30

Based on this analysis, vendor shall select tube material. Vendor shall submit basis considered with offer.

INSTRUMENT AIR

Supply pressure : 6 kg/cm² (g).

Design pressure : 10.5 kg/cm² (g).

Supply temperature : Ambient.

Design temperature 65°C.

Following criteria shall be considered as minimum by vendor for determining design pressure and temperature for shell side.

Sr. no.	Item description	Design pressure (kg/cm²(g))	Design temperature (°C)
1.	Evaporator and generator	Greater of maximum operating pressure + 1.75 kg/cm²(g) or 1.1 x maximum operating pressure and full vacuum	Operating temperature + 30°C.