

MATERIAL CODE: EL8211800047

1800-01
Rev.00

PURCHASE SPECIFICATION FOR WATER CHILLER EQUIPMENT FOR XRF

ISSUE NO : 06

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General Description of the Equipment:

Water Chiller for S8 TIGER WDXRF System. Water chiller to cool all the processes that occurs in XRF machine with a short delivery time.

Product Details:

1. Chiller Capacity : **3TR (minimum) / 10.5 kW (minimum)**
2. Required Entry Media Temperature to Process: **Bidder to specify**
3. Required Flow Rate: **30 lpm (minimum)**
4. Required Pressure: **Bidder to specify**
5. Cooling Media Details: **Soft Water/ DM water (Bidder to specify any coolant to be added for better performance)**
6. Rated Operating Ambient Temperature : **35°C**
7. Maximum Operating Ambient temp. : **45°C**
8. Minimum Operating Ambient temp. : **5°C**
9. Indoor / Outdoor Installation : **Outdoor**
10. Ambient Air Quality : **Normal atmospheric condition in Bangalore**
11. No. of Compressor Circuits : **To be specified by bidder**
12. Refrigerant : **R134A**
13. Outlet Cooling Temperature from Chiller : **10°C to 15°C**
14. Process Flow rate & Pressure of cooling media delivered from chiller: **30 lpm & 3 bar**
15. No. of Process Pumps : **To be specified by bidder**
16. Type of Compressor : **Reciprocating**
17. Type of Controller : **Microprocessor**
18. Type of Condenser / MOC : **Air Cooled Condenser / Copper tubes with Aluminum fins**

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19. Type of Evaporator / MOC : Brazed Plate Heat Exchanger/ SS 316 Plates

**20. Reservoir Volume / MOC : 75 ltr (maximum)/ SS 304 (it should
hermetically sealed)**

21. Type of Pump / MOC : Centrifugal / SS 304 Impeller and casing

**22. MOC of the Wetted Parts : SS 304, Synthetic Elastomer, Textile braiding,
SS 304 clamping**

23. MOC of Chiller Frame : CRCA

24. Type of Surface Coating : Powder Coated

25. Color : AD Grey & RAL 7035

26. Power Supply : To be specified by bidder

27. Power Consumption : To be specified by bidder

**28. Chiller performance tolerance : +/-5% for full load and +/- 12% for
Part load**

29. Compressor

- a. Refrigerant :
- b. Unloading percentage: 0% / 100%
- c. Sealing: **Hermetic**
- d. Motor insulation type : **F class insulation**

30. Exhaust Fan

- a. Type : **Axial flow**
- b. MOC : **CRCA powder coated wings**
- c. Insulation class for motor: **F**
- d. Electrical protection: **IP 54**

31. Evaporator

- a. Type : **Brazed plate Heat exchanger**

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b. MOC : **SS 316**

c. Test Pressure : **40 bar**

32. Expansion Device: Thermostatic expansion valve

33. Current : To be specified by bidder

34. Hydraulic End Connection Size & Type : To be specified by bidder

35. Dimensions of Skid (s) : To be accommodate in 700mm W X 1500mm L

**36. Submission for Approval / Reference : Dimensional dwg, electrical
ckt drawing / layout**

37. Noise : 85 dBA (maximum) at 1 meter distance

38. PUMP

a. Type: **Centrifugal**

b. Mechanical Seal: **EPDM**

c. MOC: **SS 304** impeller and casing (inlet and outlet) chamber

d. Motor: **F class insulation, IP 55 protection**

39. Reservoir

a. Insulation: **Nitrile rubber or better**

b. Accessories : **Level indicator, level switch, temperature sensor**

40. Piping:

a. Flexible hose: **Synthetic elastomer, Textile braiding, SS clamping**

41. Pressure gauge : To be specified by bidder

42. Controller

a. Type: **Microprocessor**

b. Display: **LED**

c. Accuracy: **+/- 0.5°C, with 2 NTC probe (minimum)**

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d. Electrical protection: IP 54

43. Switch gears: Complying with IEC standards.

44. Accessories : Other electrical accessories include SPP, indicator, grommets, Cables, Wires, cable glands, terminal blocks, MCB channel, lugs etc.

45. Cabinet: Powder coated electrical cabinet with industrial lock. IP 54 protected for outdoor application

ENCLOSURE

1. MOC : CRCA

2. Surface coating: 7 tank degreasing process, powder coating.

SAFETY INTERLOCKS

- 1. HP trip : High pressure trip to the compressor from the pressure switch, Safeguarding the system from condition like blocked condenser, High ambient temperature or Overcharged system.**
- 2. LP trip : Low pressure trip to the compressor from the pressure switch, safeguarding the system from conditions like Gas leakage, system blockage, Evaporator freezing or undercharged system.**
- 3. WLL trip : Water level trip to the pump from the Float switch fixed inside the tank, safeguarding the pump from dry running.**

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4. SPP trip : **Single phase prevention trip to all the electrical components in the chiller providing safety from phase reversal or phase loss.**

5. OLR trip: **Overload relay trip to all the electrical components, securing system from Over load current.**

Additional interlocks :

Below mentioned material in the chiller to be sourced from reputed source like

1. GEAR BOX AND SPARES: **ELECON/ SHANTHI/ PREMIUM**
2. HIGH PRESSURE VALVE: **ADUCO/ KLINGER/ GEC**
3. HYDRAULIC PUMPS & VALVES: **DOWTY/ VICKERS/ REXROTH/ BEMCO/ YUKEN/ STANDAARD HYDRAULICS**
4. LOW PRESSURE VALVES: **AUDCO/ CANLE/ LEADER/ KLINGER**
5. PVC PIPES & FITTINGS: **ORIPLAST/ UNIPLAST**
6. STAINERS, HOSES & FITTINGS: **HYDROLINE/ HYDAC/ REXORTH/ YUKEN/ SAE HYDRAULICS**
7. LED LIGHT FITTINGS: **PHILLIPS/ OSRAM/ CROMPTON GREAVES/ WIPRO/ HAVELLS**
8. MOTORS: **NGEF/ SIEMENS/ KIRLOSKAR/ ABB/ CGL**

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A. Pre-Qualification Requirements:

1. The offer shall be for a new equipment currently available worldwide for sales. Used or refurbished equipment is not acceptable.
2. The bidder shall be a manufacturer of equipment and having adequate design and manufacturing capability for the range of equipment.
3. The bidder should have manufactured, supplied and successfully commissioned similar type of instruments minimum of 3 numbers in India in last 3 years. Details of user list along with model name and contact details of users to be submitted along with technical bid.
4. For imported equipment, the vendor shall have authorized local representative/office providing after sales service.
5. BHEL reserves the right for independent evaluation of the compliance to Pre-Qualification requirements.

B. General requirements for equipment:

1. The machine should be guaranteed for a period of 12 months from the date of commissioning or 18 months from date of supply, whichever is earlier.
2. During warranty period, if there is any repair to be carried out at the supplier's works, transportation cost of equipment/component besides repair / replacement charges, if any, should be borne by the supplier. All the related formalities should be borne and arranged by the supplier. Only manufacturers certified service engineers are allowed to provide warranty support, installation and training.
3. Product Catalogues and related technical information should be provided in the techno-commercial offer.
4. Two hard copies of all the operational manuals have to be provided along with the equipment
5. For all material related specification, vendor need to submit test certificate and for process related requirement, self-certification from vendor is necessary.

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6. Dimensions of equipment, weight and space requirements should be submitted in technical offer.
7. The bidders shall provide the details and make of bought out components / sub-systems. BHEL may suggest other makes of industry standard and preferably wherein after sales support is available in India. During Technical evaluation stage, BHEL reserves the right to indicate the specific make of the brought out component opted.
8. Training: Successful bidder shall arrange to provide on-site operational and application training for minimum 2 working days after installation and commissioning of the equipment.
9. Installation & Commissioning should be carried out at BHEL EPD. Pre-installation requirements should be furnished

C. Suitability of operating Condition

Ambient conditions:

1. Temperature: 20 to 45 degree Centigrade

(If the instrument requires specific environmental condition, bidder to indicate the requirements)

2. Relative humidity : Max 80%

Elevation of Bangalore: 920 meters from mean sea level

Vendor to confirm that the machine is suitable for the above and details of provisions on the machine for the same are to be furnished by the vendor.

D. Acceptance Criteria

BHEL reserve the right to carry out pre-dispatch inspection at manufacturer works. Manufacturer should inform BHEL 15 days prior to dispatch of the machine.

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