

ANNEXURE II - TECHNICAL SPECIFICATION & SCOPE OF SUPPLY				
Design, Supply, Installation & Commissioning of Water Chiller for Spiral Fin Welding Machines as per the following specification				
Sl.No	Description	Specification	Specified/To be confirmed by vendor	DEVIATIONS / REMARKS
1	Application:			
1.1	For cooling the Welding torch head & its accessories in the above mentioned equipment	Vendor to note down		
1.2	Water Chiller - Capacity - 34 TR or more (1,02,000 kcal/hr or more) , Qty - 1 No	Vendor to specify & confirm		
2	Parameters:			
2.1	Ambient Temperature : 45 deg.C	Vendor to note down		
3	Chiller Design:			
3.1	Cooling water temperature - Chiller Inlet : 12 deg.C and Chiller outlet: 7 deg.C	Vendor to confirm		
3.2	1 outlet & 1 inlet piping terminals to be brought out from the chiller unit . The terminals shall 3 or 4" flange connection with MS socket weld mating flange (PN16 pressure rating)	Vendor to confirm and specify the terminal size		
4	The Cooling circuit should have the following features mentioned	Vendor to confirm		
4.1	<i>Compressor : Hermetic scroll compressor (3 Phase, 415 V)</i>	Vendor to confirm		
4.1.a	No of compressors	Vendor to specify		
4.1.b	Tandem operation of compressors by micro processor controller during part load operation to improve energy efficiency	Vendor to specify		
4.1.c	Compressor make: Copeland / Danfoss	Vendor to confirm & specify the make		
4.2	Condenser Coil : Air cooled Top air throw.(V shape)	Vendor to confirm		
4.3	Evaporator should be made up of Copper coil only	Vendor to confirm		

4.5	Water Tank Details:			
4.5.a	Water tank shall be in scope of BHEL . Existing water tank is planned to be utilised	Vendor to confirm		
4.6	Water pump & Flow Rate:			
4.6.a	Water pump shall be in scope of BHEL .	Vendor to confirm		
4.6.b	Vendor to mention the required water flow (Min lpm and pressure) for evaporator coil	Vendor to specify		
4.6.c	Water Strainer assy for pump suction (size: 4" , flanged PN 16 pressure rating) shall be provided - 2 nos	Vendor to specify make and confirm		
4.7	Piping line connection between chiller and water tank (Existing pump delivery line size : 4 ")			
4.7 a	Supply of 50mm TF Quality thermocole pipe section with Japan Paint, Bitumen Paste, Plastic paper, chicken mesh covering, sand, and Cement Plastering work for 4" steel pipeline - 35 running metres including all bends and reducers (Approx - 8 bends , 2 reducers , 6 butterfly valves)	Vendor to confirm		
4.7 b	Supply of MS Reducers (4"-3"or 4 ") - 2 nos .Vendor to mention the size of reducer .	Vendor to confirm		
4.7c	Supply of flanged & butterfly type water bye pass valve - 4 "(PN 16 pressure rating) with MS socket weld mating flange (PN16 pressure rating) - Qty : 6 sets (Flanged Valves and mating flanges)	Vendor to specify make and confirm		
4.8	Refrigerant: R407C	Vendor to confirm & specify the refrigerant type		
4.9	Filter drier Make : Emerson/Danfoss/Sporlan	Vendor to confirm & specify the make		
4.10	Expansion device shall be Copper capillary tube or Thermostatic expansion device .	Vendor to confirm & specify the type		
4.11	Expansion valve to be provided. Expansion valve Make : Emerson/Danfoss/Sporlan	Vendor to confirm & specify the make		

4.12	Dimensions:	Vendor to confirm and specify the dimension		
4.12a	Available site area is 3000 x 2500 mm including the space for service clearance	Vendor to confirm		
5	Control Accessories to be provided:			
5.1	Hand Shut off valve (Both suction & Discharge end of the compressor (for refrigerant) for servicing purpose)	Vendor to confirm		
5.2	Hand Shut off valve (Both inlet & outlet end of condensor unit (for refrigerant) for servicing purpose)	Vendor to confirm		
5.3	Low Pressure / High Pressure Switch (with resetting provisions) Make : Danfoss/Saginomiya	Vendor to confirm & specify the make		
5.4	Digital Temperature Controller : Preferred make: Dixell / Sub - Zero / Carel	Vendor to confirm & specify the make		
5.5	The control circuit should be operated by Single phase 230 V AC, 50 HZ.	Vendor to confirm		
6	Safety Provisions:			
	The following safety provision should be provided:	Vendor to confirm		
6.1	Microcomputer Motor Protection Device (MPD) to protect chiller from phase unbalance/phase loss/phase reversal /overload/underload	Vendor to confirm		
6.2	Microcomputer Voltage Protection Device(VPD) to protect chiller from phase loss /phase reversal	Vendor to confirm		
6.3	AFT Anti freeze	Vendor to confirm		
6.4	High Pressure /Low Pressure protection	Vendor to confirm		
6.5	Chilled water pump shall interlocked with chiller	Vendor to confirm		
6.6	Interlock for Low water flow in chiller	Vendor to confirm		
6.7	Interlock for low chilled water temperature	Vendor to confirm		

6.8	Interlocks for sensor error	Vendor to confirm		
7	Electrical & Electronics			
7.1	Industrial Incoming Supply 3Ph, 415V AC, 50Hz will be provided to chiller by SSTP/BHEL.	Vendor to confirm		
7.2	Controller: Latest microprocessor based controller shall be provided	Vendor to confirm		
7.3	Mode of Operation: a) Local (through MMI), b) Remote (Through Digital IO control hard wired logic) and c) Communication Protocol (through modbus RTU or TCP/IP)	Vendor to confirm		
7.4	Safety Provisions: a) Motor Protection Device b) Voltage Protection Device c) Protection against Freezing, Low pressure, Anti Recycle, Low chilled water temperature, High Pressure, Sensor error, low water flow in chiller etc.,.	Vendor to confirm		
7.5	MMI Features: a) User friendly interface with graphic display b) Language: English (IN) c) Visual annunciation system d) Ingress Protection: IP55 or more	Vendor to confirm		
7.6	Diagnostic Features: a) Display of all digital input & output such as outlet water temperature for chiller, Current, Voltage & Compressor Run Hours, low water flow etc., b) Alarm history for the last 100 trips with date, time & cause of failure.	Vendor to confirm		
7.7	Controls & Interlocks: a) Chilled water pump shall be interlocked with compressor b) Safety controls shall be preset at factory and provision for field adjustment.	Vendor to confirm		
7.8	Compliance & Standards: Control panel shall be as per NEMA standard	Vendor to confirm		

8	Documentation:			
8.1	Water chiller shall be supplied with 3 set of manual. The Manual shall contain the details of a) Refrigeration Circuit diagrams b) Complete wiring diagram with Ferrule no. 4) Operation manual with Maintenance details.	Vendor to confirm		
9	NOTE:			
9.1	Fabrication and laying of MS pipeline with supplied valves , reducers will be under BHEL's scope . Supply and Laying of insulation over MS pipeline shall be under vendor scope	Vendor to confirm		
9.2	Erection and Commissioning of chiller unit shall be done by the supplier at BHEL Works and prove the performance. Material handling support , civil foundation , field wiring from existing control panel to chiller will be under BHEL's scope.	Vendor to confirm		
9.3	Initial charge of refrigerant shall be provided by the supplier.	Vendor to confirm		
9.4	The supplied items shall be guaranteed for trouble free performance for 18 months from the date of supply or 12 months from date of commissioning whichever is earlier .Incase of any failure or trouble reported , the supplier shall replace the items free of cost . Maintenance support for one year from date of commissioning shall be provided by vendor . In the above mentioned period of 12 months - i) preventive maintenance shall be carried out once in every three months as per OEM checklist (Checklist shall be submitted along with offer) . ii) breakdown maintenance if any shall be supported by the vendor .	Vendor to confirm		
9.5	All accessories shall be of reputed make. Suppliers shall quote the make of each item in their offer.	Vendor to confirm		
9.6	General arrangement diagram with detailed refrigeration system shall be supplied along with offer.	Vendor to confirm		
9.7	Point to point confirmation of technical data shall be offered by the supplier other wise the offer may be rejected.	Vendor to confirm		

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