



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 7653 Email : skaruna@bheltry.co.in , ajay@bheltry.co.in Web : www.bhel.com
NOTICE INVITING TENDER	

TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two Parts	2731700005	30.09.2017	25.10.2017

You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.

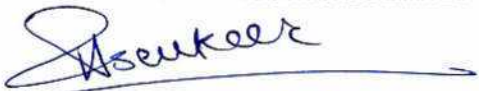
Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of tender opening.

Item	Description	Quantity
10	HVAC System as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1 No.

Important points to be taken care during submission of offer

1. Compliance Form No: TRY/ IND/ 06 to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
2. Delivery period required is 4 months from the date of P.O.
3. Commissioning and performance prove out shall be done at BHEL Trichy by the supplier
4. Time period required for commissioning and performance prove out shall be 2 months from the date of intimation by BHEL
5. EMD for this tender Rs.2,00,000/-
6. All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.

BHEL's General guidelines / instructions (refer MM/CE/GENL/001- EMD), compliance form and technical specification can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference.

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED  AJAY V. ASALKAR Sr. MANAGER MM / Capital Equipment BHEL, Tiruchirappalli - 620 014. Sr. Manager / Capital Equipment / MM
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PART- A
QUALIFYING CRITERIA

Sl.No.	REQUIREMENTS	BIDDER's RESPONSE
1	Only those Bidders, who have supplied and commissioned at least two numbers of Package type Air conditioning systems of minimum installed capacity of 165 TR capacity each or higher capacity in the past five years and such plant is presently working satisfactorily for a period of minimum one year (from the date of commissioning) should quote. (Air conditioning system refers to equipment involving Ductable Split ACs/Packaged air conditioner / Chiller units / VRF air conditioning systems.)	
	The Bidder should submit the following details for qualification purpose of their offer.	
1.1	Name and postal address of the customers or company where similar plants are installed.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the system	
1.5	Application for which the system is supplied	
1.6	Along with the Technical offer, the Bidder should submit a Performance certificate received from the customer for their supplied system (165 TR or more) for a minimum period of One Year from the date of Commissioning.	
1.7	Vender should submit IT return acknowledgement or balance sheet (profit & loss statement certified by a CA) for any two consecutive year during last four financial years (say 2012-13, 2013-14, 2014-15 and 2015-16).	
1.8	BHEL reserves the right to verify the information provided by Bidder. In case the information provided by Bidder is found to be false/ incorrect, the offer shall be rejected.	

BHEL Eng. No. 2731700005 : PART - B Specification for Supply, Installation, Testing, & Commissioning of HVAC facility		
SL.NO.	BHEL SPECIFICATION / REQUIREMENT	BIDDER'S RESPONSE
1.0	<u>Purpose:</u> Supply, Installation, Testing and Commissioning of HVAC (Heating Ventilation & Air Conditioning) facility in building number:-119, Unit-II of Bharat Heavy Electricals Limited (BHEL), Tiruchirappalli, Tamilnadu. The Building -119 consists of three Area A1, A2 &A3. Area A1: (21,750 (L) x 23,350 (B) x 3,200 (H)) existing concrete building, Area A2: (18,750 (L) x 24,000 (B) x 7,200 (H)) is under construction with Steel structure, galvalume sheet roof and RCC/Brick work boundary wall, are called as Cleanroom 1. Area A3: (23,600 (L) x 23,350 (B) x 3,200 (H)), on the western side of Area A1, is called as Cleanroom 2 (SKT-1 enclosed). Two Numbers of packaged air conditioning units are required, one for Cleanroom-1 and another for Cleanroom-2. Cleanroom 1 & 2 are to be maintained as a dust free and at Air conditioned environment. One No. of 3 Ton EOT crane and three Nos. of special purpose machines will be installed in Area A2. The entire area is to be used for manufacturing activities which is free from Dust & Chip generation. Proposed facility is for maintaining these clean rooms in dust free condition with controlled temperature & humidity.	Vendor to Note.

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	For accommodating the equipment pertaining to HVAC system, two Plant AC Rooms of each size 9000 mm (L) x 4000 mm x 4650 mm (H) with Concrete Roof will be constructed on both the sides, adjacent to the Cleanroom 1 (say Plant-1). Another two Plant AC Rooms of each size 6000 mm (L) x 4000 mm x 4650 mm (H) with Concrete Roof will be constructed on both the sides, adjacent to the Cleanroom 2(say Plant-2). (SKT -1 enclosed). Providing requisite openings in the walls for ducting / air passage in the building, concrete platforms and foundation concrete filling will be under BHEL's scope.	
2.0	<u>Scope of Supply:</u> 1. HVAC system – as specified vide Cl. 3.0 2. Insulated ducting as specified vide Cl. 4.0 3. Spares as specified vide Cl. 5.0	Vendor to Confirm.
3.0	<u>HVAC system:</u>	
3.1	<u>Scope of supply:</u> Design, manufacture, supply, erection, testing and commissioning of packaged air conditioning units with energy efficient multi scroll compressors, air-cooled condenser, microprocessor based programmable controlled Panel and other accessories for clean room-1 and clean room-2 separately. Evaporator and condenser tube coils material for both the plants should be of copper.	Vendor to Confirm.
3.2	<u>Design Parameters:</u> • Volume to be air-conditioned in the shop floor environment (Dimensions are in mm): • <u>Clean room 1</u> <u>Area A1</u> : 21750 (L) x 23,350 (B) x 3200 (H) <u>Area A2</u> : 18,750 (L) x 24,000 (B) x 7200 (H) • <u>Clean room 2</u> <u>Area A3</u> : 23600(L) x 23350(B) x 3200(H)	Vendor to Note.

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	• Temperature to be controlled inside the Cleanroom is 22 °C +/- 2 °C • Relative Humidity to be controlled inside the Cleanroom is 55+/- 5%. • Outside Ambient Design Conditions (For Tiruchirappalli, Tamilnadu) is 45 °C. • Permissible level of Relative humidity is 55 to 60 % (Approx.) • Total connected equipment electrical Load: Cleanroom 1:205 KW (Approx.) • Total connected Lighting electrical Load: Clean room-1: 7.5 KW (Approx.) • Number of occupancy Cleanroom-1: 15 Persons (Approx.) • Total connected equipment electrical Load: Cleanroom -2: 35 KW (Approx.) • Total connected Lighting electrical Load: Cleanroom- 2 ;3.7KW (Approx.) • Number of occupancy : Cleanroom 2: 10 Persons (Approx.) • Number of air changes per hour: Minimum 3 per hour • Number of Fresh air changes per hour : 1 No. per hour • Required Filtration level = 10 microns (minimum) • Refrigerant gas to be used in compressor = R-407C/R-410 A/ R-134A/R404A • Sound level inside clean room & Plant AC room = Less than 85 dB	
3.3.0	Packaged Air conditioners: Nominal capacity: <u>Plant 1:</u> (for Cleanroom -1) - 16.5 TR X 10 No. = 165 TR (Approx. Out of 165 TR - 80 % working and 20 % standby) or any equivalent numbers to be accommodated in both the service plant rooms. <u>Plant 2:</u> (for Cleanroom 2) - 16.5 TR X 6 No. = 99 TR (Approx. Out of 99 TR - 80 % working and 20 % standby) or any equivalent numbers to be accommodated in both the service plant rooms	Vendor to Confirm.
3.3.1	Capacity & Qty.:Plant-1 :Plant-2	Vendor to specify for each plant separately
3.3.2	Air Flow (in CMH)	Vendor to Specify

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SL.NO.	BHEL SPECIFICATION / REQUIREMENT	BIDDER'S RESPONSE
3.3.3	Make of the Packaged Air conditioner Units : Bluestar, Voltas, Carrier, LG, Trane (or) any other reputed makes acceptable to M/s BHEL	Vendor to Specify
3.3.4	Model no. of the Packaged Air conditioning units (vendor should enclosed catalogue)	Vendor to Specify
3.4.0	Electrical Power Supply	
3.4.1	Power Supply - 415 V , 3 Phase, 3 wire, 50 Hz, AC supply	Vendor to Confirm
3.4.2	Rated Current (in Amps)	Vendor to Specify
3.4.3	BHEL will provide necessary power supply with incoming isolators separately for AC units of Plant-1& Plant-2. All other interconnection cabling shall be in supplier's scope.	Vendor to Confirm
3.5.0	Indoor Unit for Packaged Air conditioners	
3.5.1	Overall Dimensions : Width X Depth X Height (in mm)	Vendor to Specify
3.6.0	Insulation	
3.6.1	Unit frame - To be provided with Fire retardant EPE.	Vendor to Confirm
3.6.2	Suction Line - To be provided with Sponge tube.	Vendor to Confirm
3.7.0	Compressor	
3.7.1	No. of compressors per Package unit - Qty. in nos.:Plant-1 :Plant-2	Vendor to specify for each plant separately
3.7.2	Type - Hermetically sealed Scroll type compressor	Vendor to Confirm
3.7.3	Make - Emerson Copeland / Danfoss only	Vendor to Confirm & Specify
3.7.4	Power Supply - 415 V , 3 Phase, 3 wire, 50 Hz, AC supply	Vendor to Confirm

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3.7.5	Refrigerant - Should be eco-friendly. R-407C/ R-410 A/ R-134A/R404 A	Vendor to Confirm & Specify
3.8.0	Blower	
3.8.1	Type - Centrifugal, Double inlet	Vendor to Confirm
3.8.2	Quantity - (in Nos.) : Plant-1 : Plant-2	Vendor to specify for each plant separately
3.9.0	Evaporator	
3.9.1	Tube Material - Inner grooved copper tubes	Vendor to Confirm
3.9.2	Fin Material - Hydrophobic aluminium	Vendor to Confirm
3.10.0	Expansion Valve	
3.10.1	Type - Thermostatic with external equaliser line	Vendor to Confirm
3.10.2	Make: Danfoss / Emerson only	Vendor to Confirm & Specify
3.11.0	Connections:	
3.11.1	Hard drawn copper piping for liquid and gas lines with necessary fittings, elbows, bends and supports etc. to be provided	Vendor to confirm
3.11.2	Liquid line valve - Required quantity	Vendor to Specify
3.11.3	Hand shut off valve - Required quantity	Vendor to Specify
3.11.4	Service Valve of suitable size to be provided	Vendor to confirm
3.12.0	Filter Drier:	
3.12.1	Make : Danfoss / Emerson only	Vendor to Specify
3.13.0	Air filter:	
3.13.1	Filtration capacity: up to 10 microns	Vendor to Specify

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3.13.2	Material : Non-woven polyester media enclosed by HDPE mesh	Vendor to Specify
3.14.0	Outdoor units for Packaged Air conditioners:	
3.14.1	Qty. per Package Unit - (in Nos.)	Vendor to Specify
3.14.2	Overall dimensions :Width X Depth X Height (in mm)	Vendor to Specify
3.14.3	Outdoor units are to be installed on the roof top of the Service room buildings	Vendor to confirm
3.15.0	Condenser Coil:	
3.15.1	Tube type/Material - Inner grooved copper tubes	Vendor to Specify
3.15.2	Fin Material - Hydrophobic aluminium	Vendor to Specify
3.16.0	Safety Devices	
3.16.1	Compressor Contactor, Blower motor contactor, Overload relay of reputed makes to be provided. The make of contactors, relays and control elements shall be Siemens/L&T/Telemecanique or other reputed makes acceptable to BHEL	Vendor to confirm
3.16.2	HP/LP Cut outs of Cartridge type with auto reset to be provided	Vendor to confirm
3.17.0	Controller Features:	
3.17.1	7 Segment LCD / LED display	Vendor to specify
3.17.2	Display of actual Run Temperature , LEDs for Fan & cool modes, LEDs for compressor operation, Reset key for resetting fault, ON / OFF provision	Vendor to confirm
3.17.3	Set temperature range : 19 deg.C to 32 deg.C	Vendor to confirm
3.17.4	NTC Thermistor bit sensor with 5M cable	Vendor to confirm
3.17.5	Fan & Cool modes	Vendor to specify
3.17.6	Time delays for compressor operation	Vendor to specify
3.17.7	Auto restart after power failure	Vendor to confirm

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3.17.8	Built in Single phase / Phase reverse protection	Vendor to confirm
3.17.9	Fault and Alarm display for : HP & LP / Temperature sensor / Indoor Fan overload	Vendor to confirm
4.0	Ducting:	Vendor to confirm
4.1	G.I ducting - Supply Air – 18 G / 20 G / 22 G / 24 G (Minimum 120 GSM) as per Requirement at site	Vendor to confirm
4.2	Acoustic insulation with 12 mm thick fibreglass with RP Tissue paper and 26 SWG. Al. perforated sheet & fastened with bolts & nuts for Supply air duct wherever required.	Vendor to confirm
4.3	Thermal Insulation for duct work: The insulation for duct work shall be have foil faced closed XLPE material in sheet form - shall be with minimum 13 mm thick for Supply Air Duct. Under Vendor's scope.	Vendor to confirm
4.4	Supply of air grilles/Diffusers made of Powder coated aluminium	Vendor to confirm
4.5	Vendor to provide the required Volume control dampers/ Fresh air dampers/ Collar dampers required at each supply air outlet points according to their design requirement. Return air openings will be provided by M/s BHEL. Return air grill with chicken mesh wire in the openings is under Vendor's scope	Vendor to confirm
4.6	Vendor to provide PVC drainage pipes (not less than 30 mm dia) with Nitrile rubber Insulations along with necessary fittings, elbows, bends and supports etc., for all the Outdoor units. The condensate water drainage line should be connected to the nearest drainage point	Vendor to confirm
4.7	Ribbed rubber pads to be provided wherever necessary	Vendor to confirm
4.8	Industrial Quality Fire Retardant Canvass connections to be provided for required quantity	Vendor to confirm
4.9	The envisaged ducting shall be distributed uniformly along the walls of the proposed facility around a height of about 3 m level. The height of the ducting with insulation to be restricted within 600 mm. Estimated length of the ducting to be laid – Clan Room	Vendor to confirm

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	1 - 180m (approximately) & Clean Room 2 - 150m (approximately). All the duct supporting items are under Vendor's scope.	
4.10	Heater coils are to be provided at the Supply air ducting Area for the purpose of maintaining humidity inside the conditioned area.	Vendor to Confirm & Specify
4.11	The envisaged ducting shall be distributed evenly to meet to the aesthetic look of the proposed area in the building.	Vendor to confirm
4.12	All the items required as above for both the plants are considered separately	
5.0	Spares:	
5.1	Itemized break-up of Mechanical, Electrical , Electronic and Spares used on the system in sufficient quantity as per recommendation of BIDDER for 2 years of trouble free operation of both the plants on three shifts continuous running basis should be offered by BIDDER.	Vendor to confirm
6.0	Electrical works:	
6.1	415V $\pm$ 10%, 50HZ , 3 Phase ,3 wire AC Power Supply (each capacity 100A, up to Isolator incoming) will be provided by BHEL at single location for each Plant AC Room (10 points - 5 in each room and another 6 points – 3 in each Room). All other interconnection cabling from the isolator outgoing for connecting different parts of the HVAC system is under supplier's scope. The interconnection cables shall be of copper and the size of the cables shall be selected (with appropriate factor of safety) by the supplier based on the power rating of the equipment's. Vendor to ensure necessary electrical safety devices in their control panel.	Vendor to confirm
6.2	All the electrical cabling between indoor and outdoor units with copper cables & G.I double earthing are under the scope of the supplier.	Vendor to confirm
6.3	All Electrical control wiring & termination is also under the supplier's scope	Vendor to confirm
6.4	Wiring: All electrical motors, limit switches etc., on the machine shall be wired using PVC sheathed cable running in conduits to common terminal block. All cables, wires shall be neatly routed and fixed with proper identification.	Vendor to confirm

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6.5	All the cable trays required for laying of cables should be included in the offer.	Vendor to confirm
7.0	Pre-Despatch Inspection: Equipment / items pre-despatch inspection will be identified and communicated to the supplier during approval stage. Supplier has to arrange for pre despatch inspection BHEL engineers at supplier's works.	Vendor to confirm
8.0	Supply & Installation Sequence: Detailed price break up for the following group of activities mentioned vide Cl. No. 8.1 to 8.2 shall be submitted along with the commercial Bid. - For each group of activities, 70% of Supply Payments will be made on completion of supply and 15% on completion of installation will be made. For activity specified vide Cl. 8.1, this 15% payment will be made after completion of activity vide Cl. 8.2 - Balance 15% for each activity will paid finally on completion of all the installation activities and successful commissioning. - Bidder has to submit a bar chart showing time schedule for these activities both for serial and as parallel activities.	Vendor to confirm & provide details
8.1	Supply of all the materials required for complete Installation of Ducting work in clean rooms and Plant AC rooms.	Vendor to confirm
8.2	Supply of all the materials required for HVAC system, Complete Installation & commissioning	Vendor to confirm
9.0	Painting: All non-working surfaces and control panels shall be given a primer coat & two coats of paint with SYNTHETIC ENAMEL GLOSSY FINISH APPLE GREEN PAINT AS PER IS 5/1994. Shade: (ISC) NO-281. All unpainted surfaces shall be protected from rust during transit.	Vendor to confirm
10.0	Commissioning:	
10.1	All the Welding, brazing, pressure testing, vacuuming, gas charging and commissioning are under the scope of the supplier.	Vendor to confirm

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10.2	Continuous run test: Simultaneous running of 10 units of Plant-1 & 6 units of Plant-2 continuously for 48 hours without interruption & faults shall be established during commissioning.	Vendor to confirm
10.3	Supplier has to supply all the commissioning spares & consumables required for commissioning	Vendor to confirm
11.0	<u>Guarantee:</u> Guarantee shall be 12 months from the date of commissioning and acceptance at BHEL works or 18 months from the date of supply whichever is earlier. Supplier should provide four quarterly free services for their equipment and spares including refrigerant gas charged in the systems. If any leakage of refrigerant after commissioning is identified, supplier should recharge the gas on free of cost during guarantee period.	Vendor to confirm
12.0	<u>Documentation:</u> To be submitted as mentioned vide Cl No. 12.1 to 12.3. All documents must be in English language only.	
12.1	<u>Documents to be submitted along with the offer:</u> 1. Completely filled Part-A and Part-B of this technical specification 2. Work order Copy for Supplied and commissioned at least two numbers of Package type Air conditioning systems of minimum installed capacity of 165 TR each or higher capacity in the past five years 3. Min. 1 No. of performance certificate in Customer's letter head as specified in Part-A of Technical specification. 4. Details of HVAC system with catalogue consisting of details like specification, make, model, weight of indoor & outdoor units, power rating, power consumption, input power supply requirement, dimensions and air flow etc., of AC units. 5. Itemised list of spares as specified vide Cl. 5.0	Vendor to confirm
12.2	<u>Documents to be submitted within a month after the placement of PO for approval before manufacture:</u>	Vendor to confirm

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	1. Detailed schedule of activities for supply, installation& commissioning 2. Ducting Design & layout 3. Details of HVAC system, their Make, Model No.& with detail catalogues 4. Layout of Package units, Control Panel, Outdoor units etc. 5. Wiring Diagram for Control Panel 6. Foundation drawing & requisite load details for equipment's need foundation / platform. BHEL will approve the same in 15 days.	
12.3	<u>Documents to be submitted at the time of commissioning of HVAC system:</u> <u>3 Sets of hard copies and 1 set as soft copy in CD of the following documents:</u> 1. As built condition – ducting layout 2. As Built- layout of Package units, Control Panel, Outdoor units etc., 3. As Built - System Wiring Diagram & Control Panel wiring diagram 4. O&M manuals of all the equipment's related to HVAC system 5. Details of spares & accessories as mentioned vide Cl. 5	Vendor to confirm
13.0	General:	
13.1	Before submitting the offer, Bidder may visit the site and have technical discussions with BHEL.	Vendor to confirm
13.2	Any civil work required for this work comes under the scope of BHEL. Supplier should give clearly the scope of civil work in their offer.	Vendor to confirm
13.3	All the tooling, fixtures, supporting structures, Instruments etc. required for installation and Commissioning shall be brought by the supplier on returnable basis	Vendor to confirm
13.4	Ribbed rubber pads to be provided wherever necessary	Vendor to confirm
13.5	BHEL will provide necessary power supply with incoming isolator for AC units. All other interconnection cabling (copper cables) shall be in supplier's scope	Vendor to confirm

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13.6	BHEL will provide necessary electrical power on free of cost during erection work (Supplier should give clearly the rating of supply point in their offer).	Vendor to confirm
13.7	The man power for the E&C activities is under vendor's scope. Supplier should adhere to necessary safety precautions while executing this job	Vendor to confirm
13.8	M/s BHEL shall provide assistance to material handling activities for loading & unloading of the units subjected to the availability of the facility. Any items which are not in their scope to be spelt out clearly in their offer.	Vendor to confirm
13.9	Annual Maintenance Contract: The supplier shall submit an offer for AMC of the offered Package units for two years after the completion of the warranty period.	Vendor to confirm

BUILDING 119 SKETCH 1

