

**INDIAN INSTITUTE OF TECHNOLOGY KANPUR  
CENTRAL STORE & PURCHASE  
SINGLE TENDER ENQUIRY**

**NIT No. IWD/S&P/AC/01**

**dated: 05.06.2018**

The Joint Registrar, (S&P), I.I.T., Kanpur on behalf of Board of Governors of IIT Kanpur invites single tender enquiry for the following works from M/s Trane India Limited (Original Equipment manufacturer) of 400 TR water cooled screw chiller:

Sl. No	Name of work and location	Estimated cost put to tender (In Rs.)	Period of Completion (in Month)	Last date & time of submission of tender	Time & date of opening of tender
1	Supply, installation, testing & commissioning of 400 TR screw chiller (Trane Make) & its integration with the existing central AC plant IWD IIT Kanpur	95,73,000/-	120 days	Upto 15:30 Hrs on 20.06.2018	At 16:00 Hrs on 20.06.2018

The tender notice is available on <https://eprocure.gov.in/cppp/latestactivetenders> websites. Last date & time of submission of tender is 20.06.2018 up to 15:30 Hrs in the o/o Joint Registrar (Store & Purchase) IIT, Kanpur. The tender shall be opened on 20.06.2018 at 16:00 Hrs in the office of DOIP.

**Joint Registrar (S&P)**

## GENERAL TERMS AND CONDITIONS

- 1 Unless otherwise provided in the Schedule of Quantities/Specifications, the rates tendered by the supplier shall be all inclusive and shall apply to all heights, lifts, leads and depths of the work and nothing extra shall be payable to him on account of the same.
- 2 Other agencies doing works related with this project may also simultaneously execute their works and the supplier shall afford necessary facilities for the same. The supplier shall leave such necessary holes, openings etc. for laying/burying in the work, pipes cables, conduits, clamps, boxes and hooks for fan clamps etc. as may be required for the other agencies. Nothing extra over the quoted rates shall be paid for doing these.
- 3 Some restrictions may be imposed by the security staff etc. on the working and for movement of labour, materials etc. The supplier shall be bound to follow all such restrictions/instructions and nothing extra shall be payable on account of the same.
- 4 The supplier shall fully comply with all legal orders and directions of the Public or local authorities or municipality and abide by their rules and regulations and pay all fees and charges for which he may be liable in this regard. Nothing extra shall be paid/reimbursed for the same.
- 5 The structural and architectural drawings shall at all times be properly co-related before executing any work. However, in case of any discrepancy in the item given in the schedule of quantities appended with the tender and Architectural drawings relating to the relevant item, the former shall prevail unless otherwise given in writing by the Engineer-in-charge.
- 9 The supplier shall take instructions from the Engineer-in-charge for stacking of materials.
- 10 It shall be ensured by the supplier that no electric live wire is left exposed or unattended to avoid any accidents in this regard.
- 11 The supplier shall maintain in perfect condition, all portions executed till completion of the entire work allotted to him. Where however phased delivery of work is contemplated these provisions shall apply separately to each phase.

## **SPECIAL TERMS & CONDITIONS**

1. *In the Contract (as hereinafter defined) the following definitions words and expressions shall have the meaning hereby assigned to them except where the context otherwise required.*

- i) Institute shall mean the Indian Institute of Technology (IIT), Kanpur
- ii) The President shall mean the Board of Governor, IIT Kanpur.
- iii) The Engineers In-charge, who shall administer the work, shall mean the Executive Engineer (Electrical& AC) for electrical and Air-conditioning works.
- iv) Government or Govt. of India shall mean the Indian Institute of Technology represented by its Director.
- v) The term Director General of Works shall mean the Chairman, Building & Works Committee of the Institute.
- vi) Accepting authority shall mean the Director, IIT Kanpur or his authorized representative.
- vii) Superintending Engineer shall mean the Superintending Engineer of the Institute, who as overall In-charge and head of the Institute Works Department shall direct the contract.
- viii) Site Engineers shall mean the Assistant Engineer & Jr. Engineer (AC/Electrical) for Electrical & Air-conditioning works, appointed by the Institute Works Department.

### 2. **Duties & Powers :**

i) **Site Engineers:**

The duties of the Site Engineer(s) are to watch and supervise the works and the workmanship employed in connection with the works, and to test and examine any materials to be used. He shall have no authority to relieve the supplier of any of his duties or obligations under the contract nor, except as expressly provided here under, to order any work involving delay or any extra payment by the Institute, nor to make any variation in the works.

The Engineer-in-charge, from time to time in writing, delegate to the Site Engineer (s) any of the powers and authorities vested in them. Any written instruction or written approval given by the Site Engineer (s) to the supplier within the terms of such delegation (but not otherwise) shall bind the supplier and the Institute as though it had been given by the Engineer-in-charge provided always as follows :

- a) Failure of the Site Engineer (s) to disapprove any work or materials shall not prejudice the power of the Engineer In-charge to subsequently disapprove such work or materials and to order the pulling down, removal or breaking up thereof.

- b) If the supplier is dissatisfied by reason of any decision of the Site Engineer (s), he shall be entitled to refer the matter to the Engineer-in-charge, who shall thereupon confirm reverse or vary such decision.

- 3. The scope of contract comprises the supply, installation ,testing & commissioning of 400 TR water cooled Screw Chiller and its integration with the existing ac plant with warranty of the chiller for **30 (thirty) months** after the commissioning. and the provision of all labour, materials, construction of plant equipment and transpiration, temporary works and everything, whether of temporary or permanent nature required in and for such construction, completion and maintenance so far as the necessity for providing the same is specified in or reasonably be inferred from the contract. The suppliers shall make his own arrangements for the store storage of materials, accommodation for his staff etc. and no claim for the temporary accommodation from the supplier shall be entertained.

The supplier shall carry out and complete the said work in every respect in accordance with this contract and as per the directions and to the satisfaction of the Engineer-in-charge. Issue of further drawings and /or written instructions, detailed directions and explanations which are hereinafter collectively referred to as instructions of the engineer-in-charge in regards to:-

- a. The variation or modification of the design, quality, or quantity of works or the addition or omission or substitution of any work.
- b. Any discrepancy in the drawings or between the schedule of quantities and /or drawings and/or specifications.
- c. The removal from the site of any materials brought thereon by the supplier and the substitution of any other material thereof.
- d. The dismissal from the works of any persons employed thereupon.
- e. The opening up for inspection of any work covered up.
- f. The amending /making good of any defects.

- 4. Water and electricity required for electrical & air-conditioning works shall be supplied free of charge.

- 5. Payment shall be regulated as under
  - a.) 100% payment through LC for supply part of imported item.
  - b.) 90% payment of Installation part shall be made after satisfactory installation, testing & commissioning of the chillers at site. Balance 10% of payment shall be made after made after 12 of successful operation and performance of the supplied chiller.

- 6. Completion drawings:  
On completion of works and before issuance of completion certificate, the supplier submit completion drawings in the form of four complete set of originals (reproducible), Technical literature, test certificates operation & maintenance manual and list of necessary spares.

- 7. Works Inspection and Testing of Equipment:
  - a.) Prior to dispatch of equipment the Institute reserves the right for pre-dispatch inspection the same at the manufacturer's works and the supplier shall provide and secure every reasonable

access and facility at the manufacturers works. Supplier shall give a reasonable notice of about 60 days for the purpose of test, and witness of all major equipments.

b.) Pre-commissioning test: All routine tests shall be carried out on the electrical & air-conditioning equipment. Protective & measuring devices should be checked for calibration of chiller unit should be checked for temperature.

8. **Rates:** 1. The rate for imported item i.e. 400 TR screw chiller (Trane make) shall be quoted in US Dollar (\$). The rates for installation, testing & commissioning of the chiller shall be quoted in Indian Rupees (INR). The quoted rate shall include for local works like custom clearance, transportation, loading & unloading at site, insulation, complete item of work and all charges for items contingent to the work, such as refrigerant, packing, forwarding, insurance, freight and delivery at site for the materials to be supplied by the contractor, watch and ward of all materials at the site, labour related expenses as per relevant labour laws, testing of materials/ samples etc excluding the GST. The GST shall be paid extra as per govt. norms.

2. M/s Trane will arrange for the pre-dispatch inspection of chiller at France factory. However, Any Travelling / Boarding / Lodging Is not Included in Commissioning & Local work: the cost of local works like custom clearance, transportation, loading & unloading at site insulation, installation, testing & commissioning shall be paid separately.

9. **Taxes & Duties:**

9.1 The custom duty shall be paid by the Institute directly to custom deptt.

9.2 No other tax is payable other than GST on installation, testing & commissioning of 400 TR machine. The GST shall be as applicable to IIT Kanpur as per Government rules.

10. **Warranty of the chiller:**

The 400 TR chiller shall be covered under comprehensive warrantee for **30 (thirty)** months from the date of commissioning of the chiller. The warrantee of the machine shall cover compressor, condenser, evaporator, expansion valves, LCD control panels and all associated inbuilt controls (controllers) of the chiller etc. except refrigerant.

## TECHINCAL SPECIFICATIONS

**SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF 1 x 400 TR CAPACITY TRANE MAKE WATER COOLED SERIES R ROTARY LIQUID CHILLER, WITH CLOSED TRANSITION STAR DELTA STARTER, REFRIGERANT - R134a,**

**400 TR WATER COOLED SCREW CHILLER**

**SOURCE: FRANCE/USA.**

**The Scope of supply for chiller includes:**

- **1 No. Direct drive Compressor** with motor 415 Volts, 3 phase, 50 Hz.
- Motor is **liquid refrigerant cooled**, hermetically sealed, two pole, squirrel cage induction.
- **1 # 150 psi, Evaporator** tubes externally finned, internally enhanced seamless copper tubes having 1 inch (25.4 mm) diameter. Evaporator shall have flanged pipe connections.
- **1 # 150 psi, Condenser** tubes externally finned internally enhanced seamless copper tubes having 0.75 inch (19.05 mm). Condenser shall have flanged pipe connections.
- Unit mounted **Closed Transition Star-Delta Starter. Enclosure type NEMA 1 for indoor covered application machines.**
- **Unit mounted CH530 microprocessor panel with LCD TOUCH SCREEN DISPLAY, Functions, and Safeties.**
- **PID (proportional integral derivative) control strategy ensures stable, efficient chilled water temperature control, maintaining +/- 1 deg F (0.56 Deg C) control.**
- **Trane's patented Adaptive Control to maintain chiller operation under adverse conditions.**

**Detailed Technical Specification:**

Make :- Trane	
Model No. :-	ERTHD E3G3G3
Cooling Capacity :-	400 TR
No. Of Compressor :-	1.00
Country of origin of machine :-	France/USA
Type of compressor :-	Direct Driven Semi Hermetic
Type of Motor :-	Hermetically sealed
Type of starter :-	Closed Transition Star Delta Starter
Actual capacity at full load :-	400 TR
Refrigerant gas R-134a :-	R-134a
Type of capacity control	Side valve, stepless control
Power consumption -1 KW /TON @ 100% load (As per AHRI certification) :-	0.65 KW/TR
Fouling Factor for condenser :-	0.001 FPS
Fouling Factor for evaporator :-	0.005FPS
Condenser IN/OUT Temp. (F) :-	90/97.5
Condenser water flow rate :-	1529 GPM
Pressure drop in condenser (Ft of H2O) :-	17ft. H2O
Chiller IN/OUT Temp. (F):-	55/45
Chilled water flow rate :-	969 GPM
Pressure drop in Chiller (Ft of H2O):-	17ft. H2O
Construction of condenser & evaporator:-	As per PED standard
Operating weight	9360 Kg
Length x Width x Height	4130 x 1800 x 2040MM

**BILL OF QUANTITY FOR 400 TR CHILLER (TRANE MAKE)**

**A. SUPPLY OF GOODS**

S.No.	Description of items	Qty/Unit	Technical Data	Rate (In USD)
1	<p><b>Water cooled screw chillers</b> Supply of Imported Eurovent Certified Water Cooled Screw Chillier Machine as per design parameters comprising the following complete specification as per norms &amp; conditionings and ARI/ Eurovent certification. The compressor should be of OEM make only.</p> <p>a) Make :- Model No. :- Cooling Capacity :- No. Of Compressor :- County of origin of machine :- Type of compressor :- Type of Motor :- Type of starter :- Actual capacity at full load :- Refrigerant gas R-134a :- Type of capacity control Power consumption -1 KW /TON @ 100% load (As per AHRI certification) :- Fouling Factor for condenser :- Fouling Factor for evaporator :- Condenser IN/OUT Temp. (F) :- Condenser water flow rate :- Pressure drop in condenser (Ft of H2O) :- Chiller IN/OUT Temp. (F):- Chilled water flow rate :- Pressure drop in Chiller (Ft of H2O):- Construction of condenser &amp; evaporator:- Operating weight Length x Width x Height</p> <p>b) 1 No. Screw compressors should be suitable for operation on R-134A refrigerant complete with safety shutdown and cycling shutdown as per specification</p> <p>c) Suitable horse power 2 pole continuous duly squirrel cage induction motor with class F insulation operating at 415 ± 6% volts, 3 phase 50Hz. AC supply and will have semi hermetic compressor with starter</p> <p>d) Suitable maching shell and tube flooded type evaporator and shell shall be fabricated from rolled carbon steel place with fusion welded seams and tube shall be high efficiency. Internally and externally enhanced type having plain copper land at all intermediate tube supports. The evaporator shall be PED certified.</p> <p>e) Suitable matching shell and tube type condenser with shell shall be fabricated from rolled carbon steel place with fusion welded seams. The condenser shall be PED certified.</p> <p>f) Frame work for mounting the above condenser, evaporator, compressor and motor etc.</p> <p>g) Refrigerant line accessories comprising of safety valve, angle valve and liquid line indicator etc.</p> <p>h) 1 No. microprocessor based control panel in locked enclosure, factory mounted, wired and tested with all safety and cycling shutdown provision and compressor motor starter as per specifications.</p> <p>i) The chiller shall be BMS compatible. The BMS interface unit should be able to communicate with existing Trane make chiller at site.</p> <p><b>400 TR machine (CIF Delhi port)</b></p>	01 No.	<p align="center">Trane ERTHD E3G3G3 400 TR 1.00 France Direct Driven Semi Hermetic Hermetically sealed Closed Transition Star Delta Starter 400 TR R-134a Side valve, stepless control 0.65 KW/TR</p> <p align="center">0.001 FPS 0.005FPS 90/97.5 1529 GPM 17ft. H2O 55/45 969 GPM 17ft. H2O As per PED standard 9360 Kg 4130 x 1800 x 2040MM</p>	
	<b>Total Part A</b>			

**(Custom duty is exempted for IIT Kanpur. Necessary documents shall be provided by institute)**



The 400 TR chiller shall be covered under comprehensive warrantee for 30 (thirty) months from the date of commissioning of the chiller. The warrantee of the machine shall cover compressor, condenser, evaporator, expansion valves, LCD control panels and all associated inbuilt controls (controllers) of the chiller etc. except refrigerant.

**INSTALLATION ,TESTING & COMMISSIONING OF 400 TR CHILLER**

**B.**

S.No.	Description of items	Qty/Unit	Rate (In INR)
	Installation, testing & commissioning of 400 TR screw chiller as per below specifications:		
a	Anti-sweat insulation on the collar, shell, flow chamber, tube cheets, suction connection and (as necessary) to the auxiliary tubing as per specification to suit the chilling machine	1 No.	
b	Flow switch at chiller and condenser		
c	Initial charges of R-134a refrigerant and oil.		
d	anti-vibration/ noise mounting as specified		
e	Victaulic coupling for chiller & condenser.		
f	RCC foundation for the chilling machine.		
g	Local clearance at port, local transportation to FOR IIT Kanpur transit and erection insurance.		
	<b>Total Part B</b>		