

## Technical Specification

<b>Basis Design of 45 TR Single circuits</b>	
Capacity (TR)	45 TR
Refrigerant	Refrigerant,R22/404
No. of compressors	1
<b>Temp application</b>	
Fluid In temp (Deg C)	+12
Fluid Out temp (Deg C)	+7
Media to be chilled	water
Area classification	NFLP
<b>Technical Specifications</b>	
<b>Compressor</b>	
Make	Bitzer
Type	Semi Sealed screw
Drive type	Not required
Check Valves	Suction and Discharge check valve of suitable sizes
<b>Evaporator</b>	
Construction	Shell MS
Type	(DX) Dry Expansion
HE Area (m2)	27 m2
Tube MOC	Copper
Tube specs	Weiland, Germany make Copper tubes internally grooved with 72TPI for additional heat transfer and turbulency.
Tube dia / Thickness	5/8" OD / <b>20G</b> thickness,
<b>Condenser 1</b>	
Construction	Shell MS
HE Area (m2)	23.5 m2
Tube/Plate MOC	Copper
Tube/ Plate specs	Externally finned Cooper tubes
Tube dia / Thickness	3/4" dia , 36 TPI, <b>17.5 G</b> thickness ,

<b>Electrical And Instrumentation</b>	
<b>Motor</b>	
Connected Load	38 Kw
Compressor Motor	internal special motor with high efficiency
No. of poles	2
<b>Controller microprocessor</b> 1 circuit	
Make	Magnum mcs Germany
Addl. control DI and DO	Control output for CHP,CNP,CTF, Feedback/ Overload relay I/P from starters of all Auxiliary motors.
<b>HMI display</b>	
Size	8"
Specifications and features	<ul style="list-style-type: none"> <li>&gt; Colour touchscreen with color scheme</li> <li>&gt; Inbuilt data logging in auditors format, alarm history, operation log, and other features</li> <li>&gt;. port to show VFD and Power data</li> <li>&gt; FDA CFR 21 part 11 compliant</li> <li>&gt; USB mouse/ keyboard/ pen drive</li> </ul>
<b>Sensors and Transducers</b>	
Temperatures	> Chiller In/Out, Condenser In/Out ,Oil cooler In/Out ,LPT, HPT, VFD Control, Oil out control,
Pressures	LP, HP, OP, FP
Flow parameters	Chiller flow switch Condenser Flow switch
Expansion valve	Parkar/denfoss made in USA electronic expansion valves with its T & P Sensors and driver

<b>Control Logic</b>	Sequential Start/ Stop for screw skid Stepless compressor loading on chiller temperature LP, HP, OP, FP, HPT, Oil Flow, Oil level, CH Flown flow, Overload trip and alarm Filter/ motor preventive maintenance schedule warnings Maintenance manual in built with photographs Check and remedies for each alarm in in-built operation manual
<b>Structure and Aesthetics</b>	
Frame	Rectangular Box section based firm and rigid frame structure for the skid Foundation/ Anchoring brackets provided Components arrangement done for easy and fast maintenance with enough working space
Refrigerant Piping	Seamless CS pipes for suction / discharge line & copper Piping brazed as per P & ID
Paint	We apply 2 coats of Epoxy base primer and 1 coat of paints to our skid after rust and dust removal using flap disc and chemical cleaning as required. All our piping and equipments are colour coded as per the temperature application and as depicted in the P&ID.
Operational space	In case of shell and tube Heat exchangers enough space from opening of dome and cleaning of tubes needs to be provided. For any other maintenance activity, minimum of 3ft clear distance must be maintained on all sides of the chiller.
Foundation/ Anchoring	RCC Foundation/ Anchoring points must be provided as per the approved GAD submitted to you.
<b>Exclusions</b>	
1	All civil works such as casting of foundations, grouting, breaking / making walls etc.
2	>All electrical work at site with its supply and installation. >This includes all isolation power panels with switch fuse units for main motors, isolation and power panels with required DOL and OLR , SFU / MCBs for chiller primary and secondary pumps, isolation SFU / MCCB panel to give input supply to ATS panels. >All field required armored cables including its supply and installation for main motors from panels , evaporative condenser fans, evaporative condenser pumps & earthing strips for main PLC panels , main motors , fans and pumps etc.
3	Refrigerant Oil and Gas One Time
4	Chiller primary and secondary pump , all water piping work along with required valves & fittings with insulations .
5	Logistic support for installation of chiller skid on site including lifting equipments and labour.
6	Any other items not specifically mentioned in our scope of supply.

* Electrical Power Requirements	3 Phase, 415 V, 50 Hz.
* Size of Chiller (Approx)	5 Ft (L) x 4 Ft (W) X 6 Ft (H)

## Scope of Work

Sr.No	Particular	Description of work
1	5KL PVC Chill Water Tank with cold insulation	In Buyer scope .
2	Water circulation pump primary and secondary, Balancing Valve/ gate valve, header at pump discharge	In Buyer scope .
3	Civil works for chiller foundation	In Buyer scope .
4	Main power supply cable to chiller panel: <b>Minimum 35 <u>sq.mm</u> × 4 core armored cable</b>	In Buyer scope .
5	Control cable: <b>2 core copper flexible, 1.0 <u>sq.mm</u>, 30 m length</b>	In Buyer scope .
6	Compressor oil and refrigerant for one-time commissioning as per YCSL specifications	In Buyer scope .
7	Weather shed for chiller system as per supplier requirements	In Buyer scope .
8	<b>Modbus RS485 communication</b> for SCADA/PLC interface (at additional actual cost)	Included in supplier scope
9	Electrical protections including: Compressor overload protection, Voltage monitoring relay, Single phasing preventer, OL / UV / OV protections	Included in supplier scope
10	Seamless internal piping with temperature insulation	Included in supplier scope
12	Control panel with <b>IP55 protection</b> , included in chiller scope	Included in supplier scope
13	Control panel electrical wiring drawings	Included in supplier scope
14	Design basis and calculation sheet for the 45 TR chiller (evaporator & condenser sizing)	Included in supplier scope

**QAP (Quality acceptance plan) :**

- Nitrogen pressure holding test
- Hydrostatic test for shell-and-tube heat exchangers
- Compressor ON/OFF functional testing
- Safety interlock testing
- Physical inspection
  - b) Warranty and test certificates for evaporator, condenser, and compressor
  - c) Complete **Operation & Maintenance (O&M) Manual** for the chiller system

The Chiller shall be manufacture & supply in Packaged Form, with all equipment mounted on Heavy Single base frame. The Electrical & Control Panel shall be mounted on front side of the Package Chiller for ease of operation. However the Chilling Plant shall be Assembled & Commissioned at your site.