Product Catalog

RTHG
Series R Helical Rotary Liquid Chiller
250-400 RT
50Hz

March 2013

RTHG-PRC001-EN

Introduction

To meet a wide range of applications in the 250 – 400 ton water-cooled market, Trane is proud to introduce the model RTHG helical-rotary liquid chiller. The introduction of this new chiller is an exciting step forward in reliability, high performance, life-cycle cost-effectiveness and simple, economical installation. The new RTHG chiller is designed to deliver proven Series R performance, plus all the benefits of an advanced heat transfer design and a low-speed, direct drive compressor.

The industrial-grade design of the Series R helical-rotary chiller is ideal for both industrial and commercial markets, in applications such as small & medium plants, recreational facilities, commercial and public buildings.

Public buildings

Transportation

Hotel

Industrial

Commercial

Features and Benefits

Reliability

- The Trane helical rotary compressor is a proven design resulting from years of research and thousands of test hours, including extensive testing under extraordinarily severe operating conditions.
- Trane is the world's largest manufacturer of large helical rotary compressors, with more than 240,000 compressors installed worldwide.
- Direct drive, low-speed compressors—a simple design with only three moving parts—provides maximum efficiency, high reliability, and low maintenance requirements.
- Suction gas-cooled motor stays at a uniformly low temperature for long motor life.
- Electronic expansion valve, with fewer moving parts than alternative valve designs, provides highly reliable operation.

High Performance

- Advanced design enables chilled water temperature control to ±0.5°F (0.28°C) for flow changes up to 10 percent per minute, plus handling of flow changes up to 30 percent per minute for variable flow applications.
- The superior low noise design means the chiller operates at the lowest noise level when compared to other product equivalents on the market.
- The electronic expansion valve with the Adaptive control TM logic can accurately adjust the flow of the refrigerant from 10% to 100%, based on loads.
- Optional LonTalk/Trace Summit or Modbus communications interface provides excellent, trouble-free inter operability.

Life Cycle Cost-Effectiveness

- The Series R semi-hermetic dual helical rotary compressor, based on Trane's global development platform, employs low-speed, direct-drive motors and hermetic structures. The motors are cooled by the refrigerant without being exposed to air, leading to an extended life.
- Precise compressor rotor tip clearance ensures optimal efficiency.
- Electronic expansion valve enables exceptionally tight temperature control, resulting in more efficient full-load and part-load operation than previously available.
- The compressor contains only 3 moving parts, meaning less mechanical losses and operational faults.
- The CH530 controller provides Feed Forward and Softloading functions, effectively eliminating the water temperature fluctuations and frequent start of the chiller, thus extending the chiller's life.

Simple, Economical Installation

- Due to its plug-and-play design, the chiller can be put into service immediately after the water pipes and power supply are connected at sites, greatly decreasing the construction period
- Full factory refrigerant and oil charges reduce required field labor, materials, and installation cost.
- Trane CH530 controls easily interface with Tracer Smmit ™, Modbus™ or LonTalk™ building automation systems through single twisted-pair wire.
- Trane has conducted extensive factory testing during manufacturing.

Options

300 psig Evaporator and Condenser Water Boxes

Water boxes are designed for 300 psig maximum waterside working pressure, and grooved pipe water connections are provided for ease of installation.

Refrigerant Isolation Valves

Factory-installed condenser inlet and outlet refrigerant valves allow isolation of the full refrigerant charge in the condenser while servicing the chiller.

Insulation

The evaporator and water boxes are covered with factory in installed 1.5 inch (38.1 mm) insulation. Factory installed foam insulation is used on the motor housing, suction line, liquid level sensor, and oil return system assembly (with its associated piping).

Circuit Breaker

A molded case standard interrupting capacity circuit breaker, factory pre-wired with terminal block power connections and equipped with a lockable external operator handle, is available to disconnect the chiller from main power.

Non-Fused Disconnect

A non-fused molded case disconnect switch, factory pre-wired with terminal block power connections and equipped with a lockable external operator handle, is available to disconnect the chiller from main power.

Communication

COMM4 (TRM4)
COMM5 (Lontalk)
BACnet
MODbus

Condenser regulation valve cont. & %RLA output

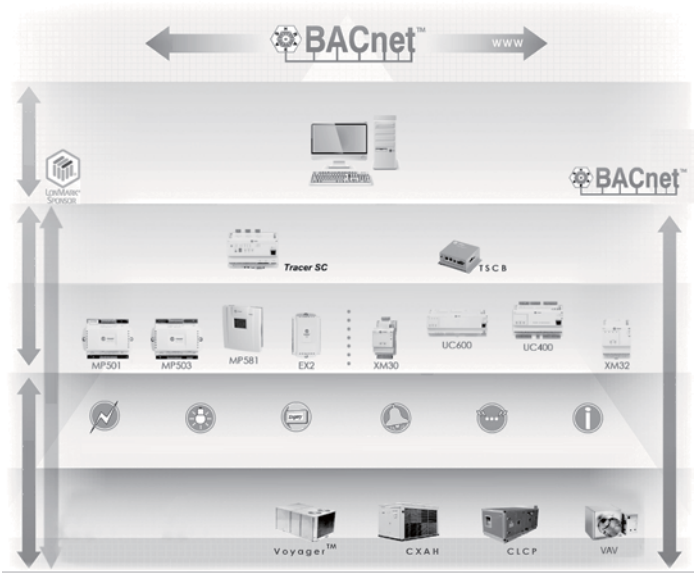
Cond. reg. valve cont. & %RLA (0-10Vdc)
Cond. press. (%HPC) & %RLA (0-10Vdc)
Chiller Diff. Press. & %RLA (0-10Vdc)

The Cutting-edge CH530 Controller

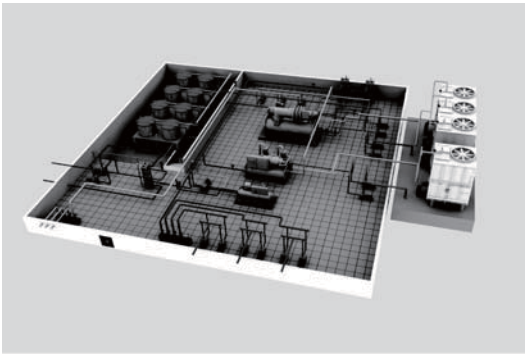
CH530 Controller

Microprocessor-based Trane CH530 controls monitor and maintain optimal operation of the chiller and its associated sensors, actuators, relays, and switches, all of which are factory assembled and extensively tested.

- Easy interface with computers hosting LonTalk/Trancer SummitTM or Modbus building automation/energy management systems allows the operator to efficiently optimize comfort system performance and minimize operating costs.
- Proportional Integral Derivative (PID) control strategy ensures stable, efficient chilled water temperature, maintaining ±1°F (0.56°C) by reacting to instantaneous load changes.
- Adaptive Control™ attempts to maintain chiller operation under adverse conditions, when many other chillers might simply shut down. This is accomplished by unloading the compressor due to high condensing pressure, low suction pressure and/or overcurrent.
- Easy-to-use operator interface displays all operating and safety messages, with complete diagnostics information, on a easily readable panel with a scrolling touch-screen display.
- Seamless integration with Trane's new generation of building automation systems -TRACER SC, featuring streamlined system architecture, a more instinctive user interface and user friendly operation offers users automated chiller plant services.



System Architecture Diagram



Equipment Room Diagram

Model Number Descriptions

R	T	H	G	4	0	0	B	A	X	A	A	X	X	X	X
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Digits 1-4 Product Family
RTHG - RTHG Family

Digits 5-7 Nominal Tons
250 = 250 nominal tons
300 = 300 nominal tons
350 = 350 nominal tons
400 = 400 nominal tons

Digit 8 Evap Water Box
A = Non Marine + 150psig + 2pass + LELE (option)
B = Non Marine + 150psig + 3pass + LERE
C = Non Marine + 300psig + 2pass + LELE (option)
D = Non Marine + 300psig + 3pass + LERE (option)
E = Non Marine + 150psig + 2pass + RERE (option)
F = Non Marine + 150psig + 3pass + RELE
G = Non Marine + 300psig + 2pass + RERE (option)
H = Non Marine + 300psig + 3pass + RELE (option)

Digits 9 Cond Water Box
A = Non Marine + 150psig + 2pass + LELE
B = Non Marine + 300psig + 2pass + LELE (option)
C = Non Marine + 150psig + 2pass + RERE
D = Non Marine + 300psig + 2pass + RERE (option)

Digits 10 Refrigeration Isolation Valve
X = Without
A = With (option)

Digits 11 Insulation
A = Standard Insulation
B = Thick Insulation (option)

Digit 12 Starter Type & Power Line Connection
A = YDEL Terminal block connection
B = YDEL Disconncet switch (option)
C = YDEL Circuit breaker (option)

Digit 13 Communication
X = No remote digital comm
4 = COMM4 (TRM4) (option)
5 = COMM5 (Lontalk) (option)
6 = BACnet (option)
7 = MODbus (option)

Digit 14 External Chilled Water & Current Limit Setpoint
X = None

Digit 15 External Base Loading (Minimum Unloading Setpoint)
X = None

Digit 16 Condenser Regulation Valve Cont. & %RLA Output
X = None
V = Cond. reg. valve cont. & %RLA (0-10Vdc) (option)
P = Cond. press. (%HPC) & %RLA (0-10Vdc) (option)
D = Chiller Diff. Press. & %RLA (0-10Vdc) (option)

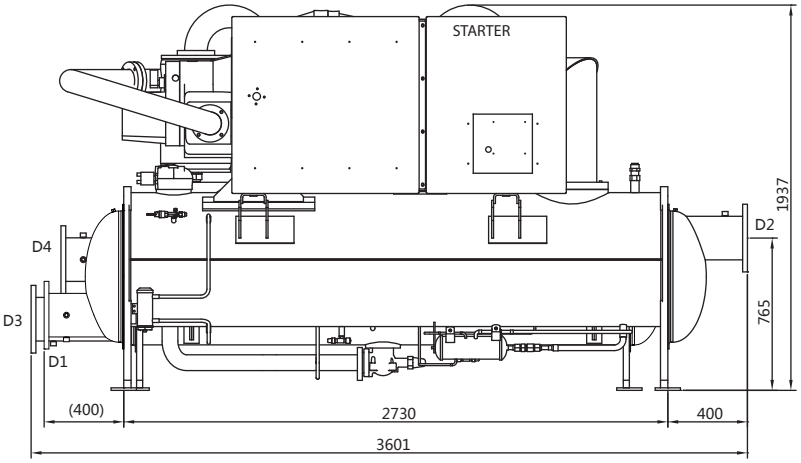
Technical Data

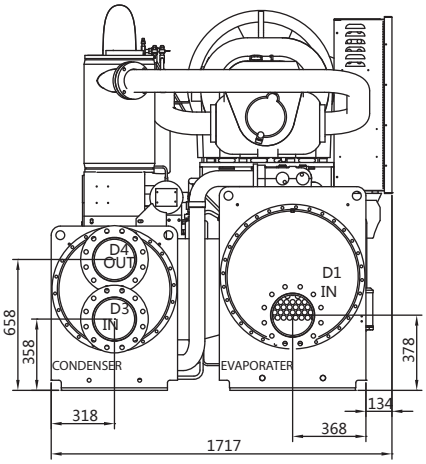
Model			250	300	350	400	250	300	350	400	250	300	350	400
Water Side Conditions			Evap. 7/12°C Cond. 30/35°C				Evap. 7/12°C Cond. 32/37°C				Evap. 6.7/12.2°C Cond. 30.5/36.1°C			
Power Supply			380V/3Ph/50Hz				380V/3Ph/50Hz				380V/3Ph/50Hz			
Cooling	Capacity	kW	885.3	1046.3	1214.7	1343.1	864.2	1020.7	1186.6	1313.9	866.6	1024.2	1189.4	1317.4
	Capacity	RT	251.8	297.6	345.5	382.0	245.8	290.3	337.5	373.7	246.5	291.3	338.3	374.7
	Power Input	kW	166.3	197.0	228.3	264.8	174.5	206.4	239.1	277.5	170.4	201.8	233.8	271.3
Running Current		A	270.0	310.0	360.0	430.0	270.0	310.0	360.0	430.0	270.0	310.0	360.0	430.0
Starting Current		A	456	711	711	711	456	711	711	711	456	711	711	711
Capacity Modulation		%	30%-100%				30%-100%				30%-100%			
Compressor	Charge		1				1				1			
	Starting Method		Y-Delta				Y-Delta				Y-Delta			
Oil	Charge	L	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
Refrigerant	Type		R134a				R134a				R134a			
	Charge	kg	222	215	215	200	222	215	215	198	222	215	215	198
Evaporator	Water Flow Rate	m^3/h	152.0	179.7	208.4	230.7	148.4	175.3	203.5	225.7	134.0	158.3	183.6	203.6
	Pressure Drop	kPa	77.4	79.8	84.9	66.9	74.1	76.2	81.3	64.3	61.6	63.4	67.5	53.5
	Water Conn. Size	mm	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200
Condenser	Water Flow Rate	m^3/h	179.2	211.7	245.7	273.2	177.2	209.2	243.0	270.7	159.2	188.0	218.2	243.1
	Pressure Drop	kPa	75.0	77.1	90.3	75.6	73.2	75.0	87.9	73.8	60.4	61.9	72.3	60.7
	Water Conn. Size	mm	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200
Net Weight		kg	5796	6453	6508	6704	5796	6453	6508	6704	5796	6453	6508	6704
Operating Weight		kg	6153	6923	7008	7151	6153	6923	7008	7151	6153	6923	7008	7151
Dimensions	Length	mm	3601	3601	3601	3601	3601	3601	3601	3601	3601	3601	3601	3601
	Width	mm	1717	1717	1717	1717	1717	1717	1717	1717	1717	1717	1717	1717
	Height	mm	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Language of Control Panel			English				English				English			

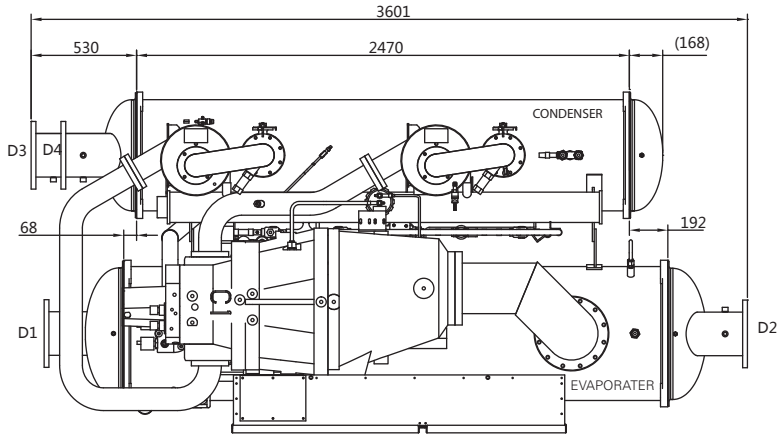
Note: FF (Evap) = 0.018 m^2 • °C/kW, FF (cond) = 0.044 m^2 • °C/kW
Based on Topss 150 version, please contact your local sales office for more information.

Dimensions

Unit: mm

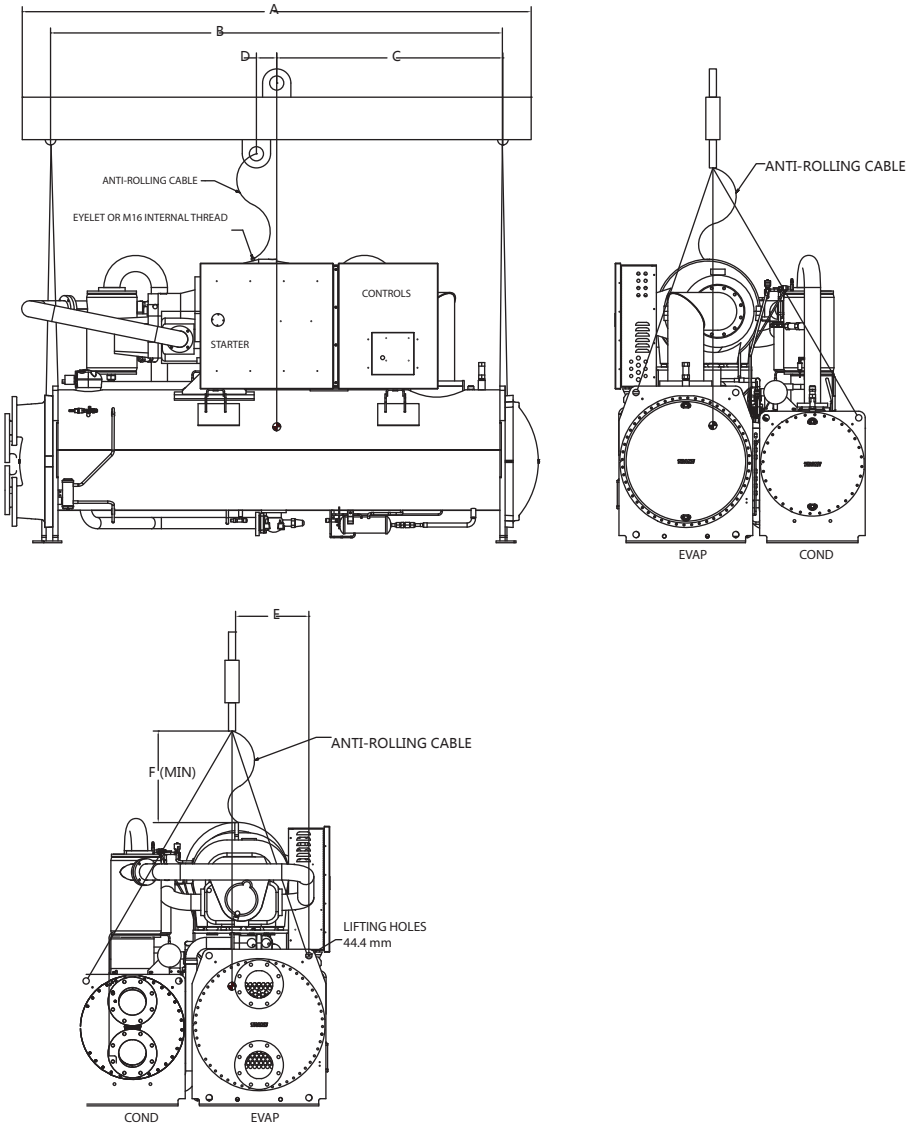






1. The evaporator is 3 pass
2. For the dimension of 2 pass evaporator please contact your local sales office.

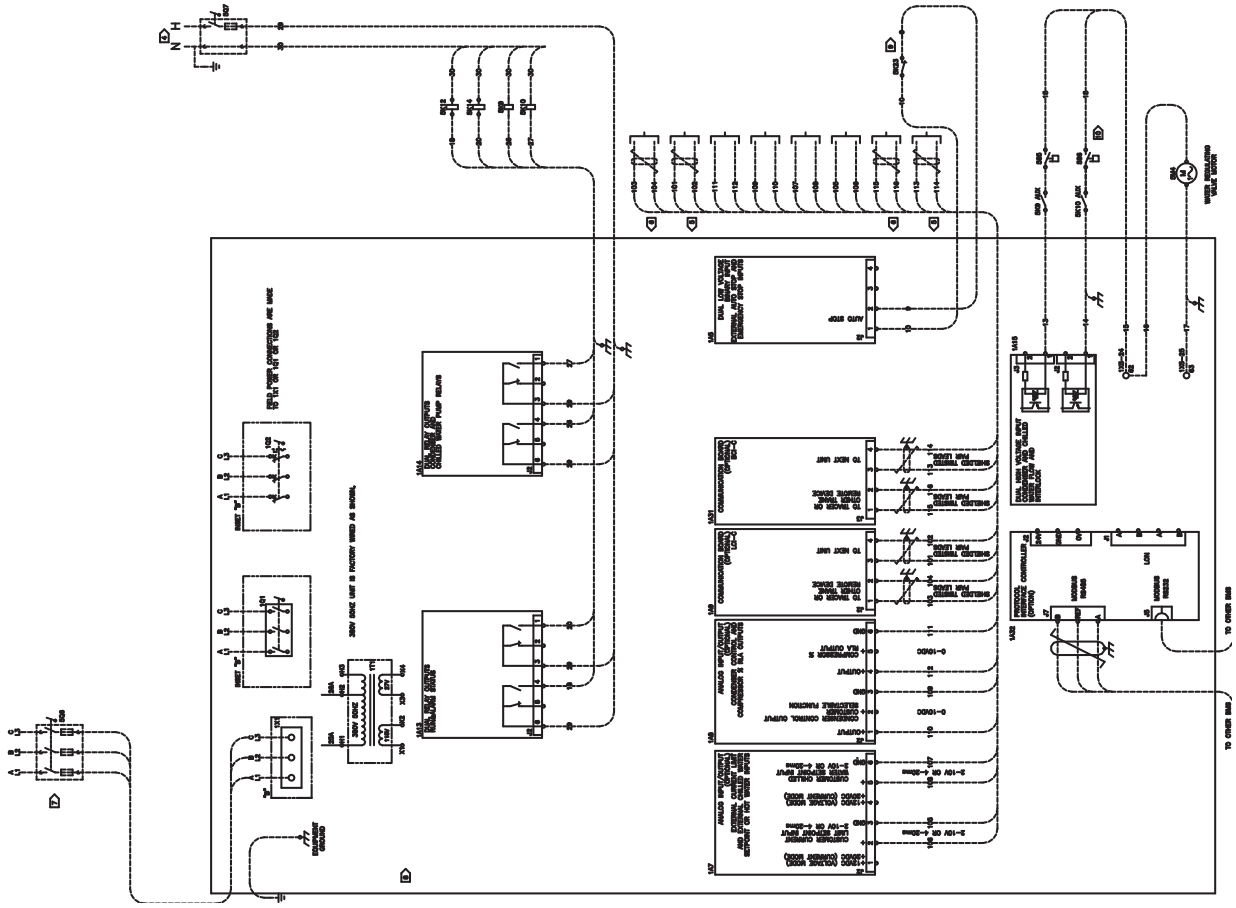
Rigging Diagram



Unit Lifting

Unit Model	Dimension (mm)					
	A	B	C	D	E	F
RTHG250	3048	2743	1523	219	584	610
RTHG300	3048	2743	1524	187	612	610
RTHG350	3048	2743	1523	188	614	610
RTHG400	3048	2743	1525	116	612	610

Electrical Connection



Trane optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments, Trane offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services, and parts.
For more information, visit www.Trane.com.

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.

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