TRANE®

Class A Systems

Using Trane water-cooled chillers

Ingersoll Rand

Top-class efficiencies backed by Eurovent

Eurovent

Trane participates in the Eurovent certification programmes where product performance and construction data are validated by independent laboratories. The added value to you is a guarantee of performance compliance and the peace of mind of knowing that Trane continuously strives to ensure we are meeting the needs of our customers.

Full-load or part-load operation (EER and ESEER)

Eurovent Certification classifies chillers according to the EER value (Energy Efficiency Ratio – efficiency in full-load operation) and ESEER value (European Seasonal Energy Efficiency Ratio – efficiency with part-load assessment).

The ESEER value takes into account the fact that a system in comfort air conditioning, chillers work in part-load mode during, on average and depending on the application, a good majority of the time.

The weighted efficiencies used to calculate ESEER correspond to a generic load profile of a typical comfort HVAC application.

Class A Certified

All Trane water-cooled chillers above 200 kW cooling capacity have earned the "class A" certification according to the Eurovent LCP program

The Eurovent LCP (Liquid Chilling Packages) program has independent laboratory testing capabilities for water-cooled chillers up to 1500 kW.

Here, the ESEER value is an important indicator for evaluating the energy consumption anticipated in comfort air conditioning.

If a system contains several chillers, almost no part-load operation under 50% occurs for the individual chillers, since the machines are switched on and off when the total load varies.

When is the part-load efficiency of chillers decisive for you?

Comfort air conditioning with chiller	Yes
Process cooling	No
Data centers	No
Applications with constant load profiles	No
Applications with several chillers	No

Trane – experts in system efficiency

An efficient chiller has optimum support only through an efficient overall system.

Trane's Tracer Summit™ Building Management System takes into account:

- The number and efficiency of the individual chillers in the system
- The technical components in the system
- Load conditions – usage requirement
- Annual use and load profile
- Environmental conditions
- Business – process – users
- Age and condition of systems
- Cleaning and condition of heat exchangers

Once all data has been evaluated, a control strategy is developed for the system, in cooperation with the user. The "Chiller Plant Manager" can operate with pre-programmed modules to access 30 years of Trane experience in the control of chillers.

Trane has the knowledge and resources to turn a Building Management System into a business advantage for you.

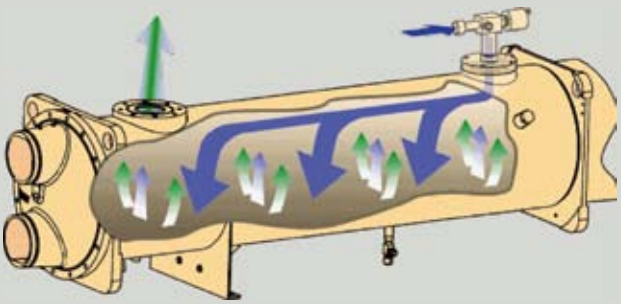
Reducing CO_2 impact

In compact chillers, the refrigerant circulates in a hermetically-sealed system. Trane takes all possible measures to prevent refrigerant from being released into the atmosphere. Production in line with the quality standards ISO 9001 and ISO 14001 forms the basis for high-quality products. An optimized refrigerant pipe system with minimal connection points and optimized components guarantees that the system will be hermetically sealed.

With the patented "Falling Film" evaporator, Trane reduces the overall refrigerant charge. The specific R134a charge, in kg/kW cooling capacity, used in Trane chillers are, on average, 0.23 kg/kW for screw and centrifugal compressor systems.

This innovative concept of evaporator technology can operate with refrigerant charges from 30 to 40% less than other technologies like direct expansion or flooded types. This also has a direct influence on the testing obligation of the operator in line with EN 378-1. If the system has leak points, this leads directly to a greater volume of refrigerant being released into the environment. If service is required, both indirect and direct costs increase.

Trane reduces indirect CO_2 impact with efficient systems and low primary energy consumption. Hermetically-sealed systems and low refrigerant filling quantities reduce the direct CO_2 impact from refrigerant emissions.



"Falling Film" evaporator

Preventive maintenance – a critical part o

Automatic tube cleaning is the key to keeping heat exchangers operating at peak efficiency

Keep your HVAC system's heat exchanger working permanently at maximum efficiency

Water-based cooling systems inevitably suffer from fouling of the heat exchanger surfaces, leading to a reduction in efficiency that leads to increased energy use and higher operating costs. Research shows that just a 0.6mm scale layer on condenser tubes reduces chiller heat transfer efficiency by 34% and increases energy consumption by 21%.

The Trane automatic tube cleaning system is a unique hydro-mechanical cleaning system that operates continuously to keep heat exchanger surfaces completely free from fouling. The result: operating capacity and efficiency are constantly maintained at peak levels, reducing overall energy consumption.

And there's absolutely no need for periodic shut-down of the HVAC system for costly and time-wasting chemical cleaning.

How the system works

The Trane automatic tube cleaning system features specially developed sponge balls, which are injected into the chiller condensing water flow to provide continuous tube cleaning while the chiller is in operation. The system is quick and easy to install – around 2 hours on a new installation and around 1 day on a pre-existing installation. It is delivered fully pre-programmed, with settings that can, where necessary, be simply and quickly changed to cater for varying water qualities.

Sponge cleaning balls

# of your maintenance plan

Through maintenance with laboratory oil analysis, Trane offers an effective option for inspecting your system. At the same time, the environmental impact from waste oil is reduced, since periodic oil change is no longer required.

Consistently high performance over the entire lifetime of the chiller

Oil in Trane chillers has lubricating, cooling and sealing functions. The volume required is extremely low and circulates due to the use of oil separators with a 99% degree of separation, above all in an internal oil circuit – for a RTHD chiller with 1300 kW, the oil volume is only 23 l.

In screw and centrifugal compressors, oil management and maintenance is critical to guarantee long term lifecycle and efficient operation of the chiller.

An oil analysis performed annually by the Trane Oil Laboratory enables the refrigeration system to be inspected with little time and cost outlay. The laboratory analysis provides information on the moisture, acidity and metal content of the entire system. Minor problems can be detected and rectified before they develop into major problems.

Main features of RTWD – RTHD – CVGF Chillers for indoor use

- ☑ Semi-hermetic Trane screw compressors with continuous direct-driven load control on RTWD and RTHD chillers
- ☑ Two-stage Trane centrifugal compressors with continuous load control via inlet guide vanes on CVGF chillers
- ☑ Simple and robust system design with few mechanically-moving parts, as well as the absence of highly-complex electronic components leads to a life expectancy of 20 years or more
- ☑ Maintenance-free compressor bearings, designed for 100,000 operating hours
- ☑ Refrigerant R134a for high capacities and low energy consumption
- ☑ Semi-hermetic compressors with suction refrigerant-cooled motors guarantee a hermetic refrigerant system
- ☑ Starter panel fitted at the factory, with a closed Star-Delta starter for low starting currents
- ☑ Tube evaporator with "Falling Film" technology for high coefficients of performance and to reduce refrigerant charges
- ☑ Extremely high efficiency in full-load operation, EER values up to 6.6
- ☑ Very high efficiency in part-load operation, ESEER values up to 7.25
- ☑ Trane controller to ensure all control and safety functions, integrating Adaptive Control logic, LCD display and various communication protocols

RTWD with screw compressor
Cooling capacity 236 – 841 kW

For more information about the Trane RTWD chiller, ask your local sales office for the brochure RLC-SLB020.

Unit size	Performance data*			Dimensions (mm)			Weight (kg)	
	Cooling capacity (kW)	Power input (kW)	EER	Length	Width	Height	Shipping weight	Operating weight
RTWD 60 HE	236	45	5.2	3210	890	1933	2588	2506
RTWD 70 HE	278	53	5.2	3210	890	1933	2596	2510
RTWD 80 HE	318	61	5.2	3210	890	1933	2673	2576
RTWD 90 HE	367	70	5.2	3225	890	1955	2866	2750
RTWD 100 HE	392	74	5.3	3225	890	1955	2908	2787
RTWD 110 HE	420	78	5.4	3225	890	1955	2946	2821
RTWD 120 HE	455	85	5.4	3225	890	1955	3136	3002
RTWD 130 HE	490	93	5.3	3360	1087	1920	3714	3560
RTWD 140 HE	534	100	5.3	3360	1087	1920	3745	3581
RTWD 160 PE	601	107	5.6	3755	1120	1950	4115	3890
RTWD 180 PE	662	118	5.6	3755	1120	1950	4345	4096
RTWD 200 PE	711	136	5.5	3456	1130	1955	4555	4287
RTWD 220 HE	769	146	5.3	3456	1130	1955	4435	4204
RTWD 250 HE	841	159	5.3	3456	1130	1955	4510	4256

* Evaporator entering/leaving water temperature 12/7°C and condenser entering/leaving water temperature 30/35°C. Evaporator fouling factor = 0.0176 m²K/kW. Condenser fouling factor = 0.044 m²K/kW.

RTHD with screw compressor
Cooling capacity 547 – 1466 kW

For more information about the Trane RTHD chiller, ask your local sales office for the brochure RLC-SLB012.

Unit size	Performance data*			Dimensions (mm)			Weight (kg)	
	Cooling capacity (kW)	Power input (kW)	EER	Length	Width	Height	Shipping weight	Operating weight
B1-B1-B1	547	96	5.7	3170	1602	1850	4215	4476
B1-C1-D1	564	95	6	3635	1602	1850	4462	4787
B2-B1-B1	597	105	5.7	3170	1602	1850	4215	4476
B2-C1-D1	616	103	6	3635	1602	1850	4462	4787
C1-D6-E5	773	142	5.5	3292	1600	1938	5797	6077
C1-D5-E4	782	139	5.6	3292	1600	1938	5884	6202
C1-D3-E3	800	137	5.9	3292	1600	1938	6351	6824
C2-D6-E5	892	166	5.4	3292	1600	1938	5797	6077
C2-D5-E4	901	162	5.6	3292	1600	1938	5884	6202
C2-E1-F1	941	154	6.1	3670	1600	1938	6639	7175
D1-D4-E4	1055	196	5.4	3292	1600	1938	5883	6201
D1-D3-E3	1077	191	5.7	3292	1600	1938	6351	6824
D1-G1-G1	1143	183	6.3	3762	1797	2034	8129	8943
D2-D1-E1	1160	210	5.5	3292	1600	1938	6551	6978
D2-F1-F2	1215	202	6	3686	1600	1938	7353	7955
D2-G2-G1	1247	198	6.3	3762	1797	2034	8516	9360
D3-D1-E1	1237	227	5.5	3292	1600	1938	6551	6978
D3-F1-F2	1300	217	6	3686	1600	1938	7353	7955
D3-G2-G2	1342	211	6.4	3762	1797	2034	8666	9555
E3-D2-E2	1349	264	5.1	3292	1600	2034	6676	7134
E3-F2-F3	1417	253	5.6	3686	1600	1938	6790	8326
E3-G3-G3	1466	246	6	3762	1797	2034	8913	9882

* Evaporator entering/leaving water temperature 12/7°C and condenser entering/leaving water temperature 30/35°C. Evaporator fouling factor = 0.0176 m²K/kW. Condenser fouling factor = 0.044 m²K/kW.

CVGF with two-stage centrifugal compressor
Cooling capacity 1200 – 3750 kW

For more information about the Trane CVGF chiller, ask your local sales office for the brochure CTV-PRC001.

Unit size	Performance data*			Dimensions (mm)			Weight (kg)	
	Cooling capacity (kW)	Power input (kW)	EER	Length	Width	Height	Shipping weight	Operating weight
400	1200-2000	220-340	5.8-6.6	4600	1980	2090	8800	10090
500	1250-2400	230-430	5.8-6.6	4600	1980	2090	8800	10090
650	1950-2800	280-480	5.8-6.6	4800	2080	2270	11000	12800
800	1950-3450	330-600	5.8-6.6	4950	2300	2520	14400	17100
1000	2300-3750	420-650	5.8-6.6	4950	2300	2520	15800	18500

* Considering the number of evaporator-condenser-compressor combinations available, only minimum and maximum values are given for each unit size. 12/7 °C entering/leaving chilled water temperature and 30/35 °C entering/leaving condenser water temperature. Evaporator and condenser fouling factor = 0.044 m²K/kW

How do you choose?

There are hundreds of possible system designs and chiller configurations, impacting chiller system efficiency levels. How do you possibly narrow the choices and definitively determine the right HVAC system design for your building?

Amazingly, it's quite easy… with Trane's help.

Our System Analyzer™ helps estimate building loads and performs preliminary energy and cost analyses of virtually any building, system, and equipment combination.

For LEED certification, TRACE™ 700 (Trane Air Conditioning Economics) software helps analyze the energy and economic effects of virtually any system configuration. It allows you to manipulate a wide range of variables to create a detailed energy usage profile for your specific building. Unlike overly simplified spreadsheet-based energy analyses, TRACE 700 software accurately compares the impact of building alternatives. You can test the effects and consequences of different architectural features, HVAC systems, and building utilization or scheduling scenarios. And you can see the different economic options for each scenario. This enables you to make genuine life-cycle, cost-based system decisions with absolute confidence.

Contact us – we're here to help

We can help you plan, install and manage your next HVAC system – so you can concentrate on your core business. Our experience and expertise in designing, commissioning and maintaining HVAC systems not only guarantees a solution that best answers your needs, it also gives you complete efficiency and peace of mind.

Call us, let's talk.

TRANE®

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 bvba, Lenneke Marelaan 6, 1932 Sint-Stevens-Woluwe, Belgium, ON 0888.048.262 - RPR Brussels

RLC-SLB021-E4, March 2010

Produced on recyclable paper, using environmentally friendly print practices that reduce waste.

IR Ingersoll Rand