



**TRANE®**

*Cooling and Heating  
Systems and Services*

# Indoor liquid chiller

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**CGWH Packaged Water-cooled  
liquid chiller**

**CCUH Condenserless liquid chiller**

**Sizes: 115 - 120 - 125 - 225 - 230 - 235 -  
240 - 250**



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**CG-PRC008-E4**



## Introduction

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The CGWH/CCUH chillers range equipped with Scroll compressors combines the latest technologies available to offer an optimum answer for today's air-conditioning and process cooling applications:

- Scroll compressor technology, with high performance, limited maintenance and longer life time design
- Latest generation of Trane controls, with user friendly graphical interface and integral auto-adaptive to guarantee maximum dependability
- High efficiency heat exchangers, allowing significant savings on operating cost
- Integrated hydraulic packages, to shorten installation and commissioning time.

## Features and benefits

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### Industry leading performance and flexibility for design engineers

#### The next generation: designed for You

The third generation of the successful indoor Scroll compressor product range has several benefits over the previous design. Your suggestions led to the improvements we have incorporated, including:

- Higher full-load energy efficiency for lower operating and life-cycle costs
- CH530 controls, with touch-screen display and LonTalk<sup>®</sup> capability
- Less sensitivity to condenser-water temperatures, alleviating concerns based on start-up temperatures
- Lighter weight for easier and less expensive handling and installation.

#### Applications: Operation and control advantages for any application

The Scroll compressor technology, with fewer moving parts, less rotating mass and less internal friction, associated with CH530 and Adaptive Controls<sup>™</sup>, allow the CGWH/CCUH range to be used in a wide variety of applications including:

- Comfort cooling: designed for reliability, energy efficiency, and system-design optimisation, whether the heat is rejected via an open cooling tower or a closed loop device (dry-cooler)
- Industrial process cooling: reliable operation with tight control of temperatures
- Ice/thermal storage
- Heat recovery
- Low-temperature process cooling.

#### System design and control: Greater application flexibility for increased savings

First-cost and operating cost minimising system-design concepts are catching on as their validity is proven through applications. These designs can provide lower equipment costs and lower operating costs than those possible with the traditional design methods and past chiller technologies. The concepts of the CGWH/CCUH range include:

- Heat exchangers with reduced water pressure drops and wider water flow/delta capability
- Thermal storage capability
- Variable primary (evaporator) chilled-water flow capability
- Series evaporator and/or condenser arrangements

The CGWH/CCUH range is designed for a wide range of applications and is especially suited for the dynamics of these system saving job designs. The dynamic benefits include:

- Efficient lift capability
- Tight temperature control.

CH530 controls mean that the CGWH/CCUH series chillers can maintain tight leaving-water temperature control in almost any application. These benefits fit especially well with the system design savings ideas listed above. As the compressor reaches the operating temperatures for the application, the controls, make sure you have total temperature control, even with chilled-water flow and/or load changes.

## Features and benefits

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### **Sound: Lower sound levels through compressor and chiller design**

Trane has a proven track record of continuously improving the sound levels of water chillers. With the CGWH/CCUH range Trane has designed a fully hermetic cabinet design which minimises sound radiation in the neighbourhood of the unit. The space around the chiller can be utilised without requirement of additional sound insulation. Only the sound produced by the remote condenser fans can be perceived in the surrounding of the installation, the sound of compressor is attenuated by the building structure.

### **Minimised job time for contractors through design and testing**

#### **Ease of installation**

- Footprint: Central to the design of any project is the operating envelope of the chiller. With this in mind, Trane builds the chillers to make the most efficient use of the available installation space. The compact CGWH/CCUH range chiller is an excellent choice for any retrofit or replacement job. It is smaller than most chillers it might replace, and easier to fit into existing buildings. All units fit through a standard single door.
- Weight: Furthermore, the decreased weight reduces the requirements for lifting, rigging, and installation. Installation time and effort are reduced when dealing with a significantly smaller and lighter unit.
- Commissioning: Water cooled units (CGWH) come from factory fully charged with refrigerant and oil, condenserless version (CCUH) with holding charge. Extensive factory testing helps ensure trouble-free start-up, resulting in lower installation costs and faster job completion.

### **The Integrated comfort system**

The water-cooled CGWH/CCUH chiller, with the CH530, makes a powerful combination with the Trane Tracer Summit Building Management System to become part of a Trane Integrated Comfort system (ICS). An Integrated Comfort system is a building comfort system composed of Trane HVAC equipment, integral unit controllers, and building management. It is all designed and commissioned with Trane application expertise to provide comfort, efficiency, and reliability, as well as single-source warranty and service. Whether you are replacing a chiller or adding one to any centrally controlled plant, the Tracer CH530 chiller controller offers a wide range of interface options. Its ability to communicate with other systems using industry-standard control signals allows you to upgrade the control of your chiller plant regardless of your current control system.

## Features and benefits

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### **Single-source responsibility**

A wide range of products designed for complete compatibility are available with the CGWH/CCUH scroll chillers. Your entire building comfort system can be completed using components from Trane.

### **The added value of applications expertise**

You get a quality chiller, properly selected and applied in a properly designed system. That means a comfort system that works, the first time!

### **Reduced total life cycle operating cost for building owner.**

#### **Energy efficiency: Reduced annual operating expenses**

The CGWH/CCUH chiller design has been optimized in order to achieve record efficiency levels. With the CH530 chiller control module, control over the chilled-water temperature is increased, simultaneously reducing annual operating costs. CGWH/CCUH chillers offer superior full-load performance and optimised part-load performance.

#### **Reduced maintenance: Less time and money every year**

The only recommended maintenance for a CGWH/CCUH chiller is an annual oil analysis. The hermetic design allows the compressor to be driven by a zero-maintenance motor. The installation of strainers upstream the evaporator and condenser (Option) eliminates the need for cleaning the heat exchangers tubes. The Adaptive Control™ microprocessor also helps reduce unnecessary maintenance by monitoring, protecting, and taking corrective action so that the chiller stays on-line when you need it the most. Service calls for nuisance trip-outs are virtually eliminated.

### **Reliability**

Trane has designed the CGWH/CCUH chiller range to be a leader in reliability for all applications:

- Simple design with 64 percent fewer parts than equal capacity reciprocating compressor.
- Advanced microelectronics protect both compressor and motor from typical electrical fault conditions.
- Scroll compressors have less than a third the torque variations of a reciprocating compressor.
- Years of laboratory testing have optimised compressor and chiller systems reliability.
- Water-cooled scroll chillers are factory tested.

#### **Comfort cooling: designed for reliability, energy efficiency, and system design optimisation**

Most comfort-cooling applications consider reliability and energy efficiency above all else in the design requirements. With proven reliability and high chiller efficiency, the CGWH/CCUH chillers are perfectly suited for these applications.

#### **Industrial process cooling / Low temperature process: Reliable operation with tight control of temperatures**

The Trane CGWH/CCUH chillers have the proven reliability required to keep the process running, eliminating concerns for chiller and resulting process downtime. The chiller matches system requirements and rapidly adjusts to match the changes seen by most processes.



## Features and benefits

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### **Ice / thermal storage**

The Trane CGWH/CCUH chillers can be used in partial or full thermal-storage applications because of their excellent compressor lift (operating temperature range) capability. High reliability and low maintenance means thermal storage applications are possible without a full-time operation/maintenance staff, and Trane Integrated Comfort System Controls can notify a computer or pager of any system issues.

### **Heat recovery**

The Trane CGWH chillers compressor lift capabilities also play well in heat recovery, or just high-temperature condenser applications. Building energy saving initiatives such as using condenser water for reheat (dehumidification), preheating boiler water, and providing domestic hot water are compatible with its temperature capabilities.

### **Easy serviceability**

Trane CGWH/CCUH chillers are designed with service personnel in mind. All major components are replaceable without complete unit disassembly. Plus, CH530 provides diagnostic capability to aid service personnel in analysing problems. Therefore, in case a problem does occur, the chiller can be up and running in a shorter period of time.

## Options description

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### **Hydraulic pump control:**

- Single or dual pump contactor.

### **Hot water control**

This option allows the control of the unit capacity based on the leaving condenser water temperature to provide heat recovery capability.

### **Phase protection device**

Inhibits operation of chiller in case of phase reversal

### **Setpoint and temperature offset and display card**

Allows to offset chilled water setpoint temperature based on either outside air, chilled water return or zone temperature and provides inlet/outlet condenser water temperature information.

### **High Efficiency Option**

This option provides oversized heat exchangers to allow the unit to be more energy efficient.

### **Ice Making**

The unit controls are factory set to handle ice making for thermal storage applications.

### **Communication Interface**

Permits bi-directional communication to the Trane Integrated Comfort™ system and provides the LonMark® chiller profile input/outputs for use with a generic BAS (Building Automation System)

### **Low Noise Version**

The unit is equipped with compressor sound jackets.

### **Pressure Gauges**

A set of two pressure gauges per refrigerant circuit, one for low pressure and one for high pressure.

## Applications consideration

Optimum performance of CGWH and CCUH units will be achieved only if proper application guidelines are followed.

Where the application varies from the guidelines presented, it should be reviewed with your local Trane sales engineer.

### Unit sizing

Unit capacities are listed in the "Performance Data" section.

Intentionally oversizing a unit to assure adequate capacity is not recommended. Erratic system operation and excessive compressor cycling are often a direct result of an oversized unit. In addition, an oversized unit is usually more expensive to purchase, install and operate. If oversizing is desired, consider using two units.

### Foundations

A special foundation is not required, provided the floor is flat, level and strong enough to support the unit's weight (see "General data" tables).

**Table 1 - Standard Operating Enveloppe - See performance data for specific informations.**

	<b>CGWH R407C</b>	<b>CCUH R407C</b>	
Min. leaving water temperature CDS	<b>+20°C</b>	<b>+30°C</b>	Min. Sat discharge temperature CDS (Dew point)
Max. leaving water temperature CDS	<b>+50°C</b>	<b>+55°C</b>	Max. Sat discharge temperature CDS (Dew point)
Min. leaving water temperature EVP	<b>-12°C</b>		
Max. leaving water temperature EVP	<b>+12°C</b>		

Limitation HP dans les tableaux = 24.5bar (Limitation Module 23 +/- 1 bar / Pressostat HP = 26 bar ).

Limitation température de refoulement dans les tableaux = 130°C



# Applications consideration

## Ground isolators

4 isolators are supplied as standard. They will protect the unit from any contact with the ground.

## Water drain

Ensure that near the unit is a large enough drain to evacuate the water when from the system emptying the unit for shutdown or repair.

## Water connection

Water connections are threaded ISO R7 type, location and diameter are indicated on the submittals available on request.

## Minimum water volume

The minimum recommended water volume depends on the type of application.

If necessary, provide a buffer tank. The control and safety devices are only certain to operate correctly if the system's water volume is sufficient.

## Water treatment

The use of untreated or improperly treated water in chillers may result in scaling, erosion, corrosion or algae. It is recommended that the services of a qualified water-treatment specialist be obtained to determine what water treatment, if any, is advisable. Trane assumes no responsibility for the results of untreated, or improperly treated water

## Flow rate limits

The minimum and maximum flow rates are indicated in the "Hydraulic data" charts section. Too low a flow rate may cause freezing of the evaporator. Too high a flow rate may cause erosion of the evaporator and very substantial pressure losses.

**Table 2 - Minimum water loop**

Sizes		115	120	125	225	230	235	240	250
CGWH Chillers Data	Cooling Capacity	51 kW	64 kW	77 kW	91 kW	103 kW	116 kW	127 kW	155 kW
	Biggest step	50%	60%	50%	42%	38%	34%	30%	25%
	Biggest step	26 kW	38 kW	39 kW	38 kW	39 kW	39 kW	38 kW	39 kW
	Minimum water loop for comfort	<b>244 l</b>	<b>368 l</b>	<b>368 l</b>	<b>365 l</b>	<b>375 l</b>	<b>377 l</b>	<b>365 l</b>	<b>371 l</b>

This table is estimated with  
 - Condenser : Water 30°/35°C  
 - Evaporator : Water 12°/7°C  
 - Dead Band of 3°C

Sizes		115	120	125	225	230	235	240	250
CCUH Chillers Data	Cooling Capacity	51 kW	64 kW	77 kW	90 kW	102 kW	115 kW	127 kW	153 kW
	Biggest step	50%	60%	50%	42%	38%	34%	30%	25%
	Biggest step	26 kW	38 kW	38 kW	38 kW	39 kW	39 kW	38 kW	38 kW
	Minimum water loop for comfort	<b>244 l</b>	<b>367 l</b>	<b>367 l</b>	<b>363 l</b>	<b>371 l</b>	<b>374 l</b>	<b>365 l</b>	<b>366 l</b>

This table is estimated with  
 - Condensing temp : 45°C with sub cooling 5°C  
 - Evaporator : Water 12°/7°C  
 - Dead Band of 3°C

# Performances

Table 10 - Selection table CGWH/R407C

		Leaving Water Temp. Condenser (°C) (Delta T° 5K)											
		25 °C		30 °C		35 °C		40 °C		45 °C		50 °C	
		Leaving water temp. Evaporator (°C)	Cooling cap (kW)	Power input (kW)	Cooling cap (kW)	Power input (kW)	Cooling cap (kW)	Power input (kW)	Cooling cap (kW)	Power input (kW)	Cooling cap (kW)	Power input (kW)	Cooling cap (kW)
CGWH 115 - STD / R407C	5.0	53.4	11.2	51.3	12.4	49.0	13.8	46.4	15.6	43.8	17.6	40.9	19.9
	7.0	56.7	11.3	54.5	12.5	52.1	13.9	49.5	15.7	46.6	17.8	43.6	20.1
	9.0	60.0	11.3	57.7	12.5	55.2	14.0	52.5	15.8	49.5	17.9	46.3	20.3
CGWH 120 - STD / R407C	5.0	66.9	14.1	64.2	15.7	61.4	17.5	58.3	19.7	55.0	22.2	51.5	25.0
	7.0	71.0	14.3	68.3	15.8	65.2	17.7	62.0	19.9	58.5	22.4	54.8	25.2
	9.0	75.2	14.4	72.3	15.9	69.2	17.8	65.7	20.0	62.1	22.6	58.2	25.4
CGWH 125 - STD / R407C	5.0	80.4	17.1	77.2	19.0	73.8	21.2	70.2	23.8	66.2	26.8	62.1	30.1
	7.0	85.2	17.2	81.9	19.1	78.4	21.4	74.5	24.0	70.4	27.1	66.0	30.4
	9.0	90.3	17.4	86.8	19.3	83.0	21.6	78.9	24.2	74.6	27.3	70.0	30.6
CGWH 225 - STD / R407C	5.0	94.9	19.6	91.2	21.7	87.1	24.2	82.7	27.3	78.0	30.8	73.0	34.7
	7.0	100.8	19.7	96.8	21.8	92.6	24.4	88.0	27.6	83.0	31.1	77.7	35.1
	9.0	106.8	19.9	102.6	22.0	98.1	24.6	93.3	27.8	88.1	31.4	82.5	35.4
CGWH 230 - STD / R407C	5.0	107.9	22.5	103.5	24.9	99.0	27.9	94.1	31.3	88.8	35.2	83.1	39.6
	7.0	114.4	22.6	110.0	25.1	105.1	28.1	99.9	31.6	94.3	35.5	88.4	39.9
	9.0	121.0	22.8	116.3	25.3	111.3	28.4	105.9	31.8	99.9	35.8	93.7	40.3
CGWH 235 - STD / R407C	5.0	121.1	25.2	116.4	28.0	111.3	31.2	105.8	35.0	99.9	39.3	93.7	44.2
	7.0	128.4	25.4	123.4	28.2	118.0	31.5	112.2	35.3	106.1	39.7	99.5	44.6
	9.0	135.7	25.6	130.4	28.5	124.8	31.8	118.7	35.7	112.2	40.0	105.4	45.1
CGWH 240 - STD / R407C	5.0	134.1	28.2	128.8	31.3	123.0	34.9	116.8	39.2	110.2	44.3	103.1	49.9
	7.0	142.0	28.4	136.4	31.5	130.4	35.2	123.8	39.6	116.9	44.7	109.5	50.3
	9.0	150.0	28.6	144.2	31.7	137.8	35.5	131.0	39.9	123.6	45.1	115.8	50.7
CGWH 250 - STD / R407C	5.0	162.8	33.8	156.3	37.4	149.4	41.7	141.9	46.9	134.0	52.6	125.7	59.1
	7.0	172.0	34.0	165.2	37.7	157.9	42.1	150.2	47.3	141.8	53.1	133.0	59.6
	9.0	181.0	34.3	174.0	38.0	166.4	42.4	158.2	47.7	149.5	53.6	140.3	60.1

# General data

**Table 12 - R407C Refrigerant**

		CGWH 115 R407C	CGWH 120 R407C	CGWH 125 R407C	CGWH 225 R407C	CGWH 230 R407C	CGWH 235 R407C	CGWH 240 R407C	CGWH 250 R407C
<b>Eurovent Performances (1)</b>									
Net Cooling Capacity	(kW)	52.1	65.4	78.5	92.5	105	118	130	158
Total Power input in cooling	(kW)	14.9	18.8	22.7	25.1	29.8	33.4	37.6	45.1
Evaporator water pressure drop	(kPa)	39	39	39	45	50	50	60	62
Condenser water pressure drop	(kPa)	62	63	64	71	79	78	94	95
Main Power supply	(V/Ph/Hz)	400/3/50							
Sound Power Level	(dB(A))	75	81	83	82	84	85	84	86
<b>Units Amps</b>									
Nominal (4)	(A)	35.4	44.3	53.2	62	70.9	79.8	88.6	106.4
Start-up Amps	(A)	137	192	201	209	218	227	236	254
Max supply cable size	(mm <sup>2</sup> )	16	35	35	35	50	50	95	95
<b>Compressor</b>									
Number		2	2	2	3	3	3	4	4
Type		Scroll							
Model		10T+10T	10T+15T	2x15T	2x10T+15T	10T+2x15T	3x15T	2x(10T+15T)	4x15T
Number of speeds		1	1	1	1	1	1	1	1
Number of motors		1	1	1	1	1	1	1	1
Rated Amps (2)(4)	(A)	30	42	50	55	65	75	84	101
Locked rotor Amps (2)	(A)	120	175	175	175	175	175	175	175
Motor RPM	(rpm)	2900	2900	2900	2900	2900	2900	2900	2900
Sump Heater	(W)	10T compressor = 100W; 15T compressor = 160W							
<b>Evaporator</b>									
Number		1	1	1	1	1	1	1	1
Type		Braze plate							
Water volume (total)	(l)	4.7	5.9	7.0	8.9	10.3	12.3	12.3	16.1
Antifreeze Heater	(W)	-	-	-	-	-	-	-	-
<b>Evaporator Water Connections</b>									
Type		ISO R7 - Male							
Diameter		1 1/2	1 1/2	1 1/2	2"	2"	2 1/2	2 1/2	2 1/2
<b>Condenser</b>									
Number		1	1	1	1	1	1	1	1
Type		Braze plate							
Water volume (total)	(l)	4.7	5.9	7.0	8.9	10.3	12.3	12.3	16.1
Antifreeze Heater	(W)	-	-	-	-	-	-	-	-
<b>Condenser Water Connections</b>									
Type ISO R7		Male							
Diameter		1 1/2	1 1/2	1 1/2	2"	2"	2"	2 1/2	2 1/2
<b>Dimensions</b>									
Height	(mm)	1545	1545	1545	1545	1545	1545	1545	1545
Length	(mm)	1001	1001	1001	2002	2002	2002	2002	2002
Width	(mm)	800	800	800	800	800	800	800	800
Weight uncrated	(kg)	389	416	443	626	655	689	757	815
Weight crated	(kg)	405	432	459	657	686	710	788	846
<b>System Data</b>									
Refrigerant circuit		1	1	1	2	2	2	2	2
<b>Refrigerant Charge (3)</b>									
Circuit A	(kg)	5	7	9	5	7	9	7	9
Circuit B	(kg)	-	-	5	5	5	7	9	-

(1) at Eurovent Conditions (Evap 12°C/7°C - Cond. 45°C - SC 5K)

(2) per motor

(3) per circuit

(4) 5°C sat suction temp. - 60°C sat discharge temp.

## Sound performances

**Table 14 - Sound spectrum**

CGWH & CCUH - Sound Data									
Size	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	dB(A)
115	81	63	58	74	67	70	59	49	75
120	85	62	64	77	73	72	67	57	79
125	87	62	67	79	76	73	69	59	81
225	92	68	67	77	75	74	69	60	80
230	94	68	70	79	77	75	71	62	82
235	95	67	71	80	78	76	73	64	83
240	95	63	68	77	78	75	69	59	82
<b>250</b>	<b>97</b>	<b>63</b>	<b>70</b>	<b>79</b>	<b>80</b>	<b>77</b>	<b>71</b>	<b>61</b>	<b>84</b>

**Notes on sound power levels:**

Sound power levels determined in accordance with ISO 3746-1996 for the overall sound power level in dBA.  
 The sound levels given by octave band are for information only.  
 - Reference source 1 pW.  
 - Sound power levels are valid under free field conditions only, on a reflecting surface (directivity = 2) on all sides of the unit, for + 35°C ambient maximum.  
 The compressor sound attenuating jackets permit to gain 3dBA.