



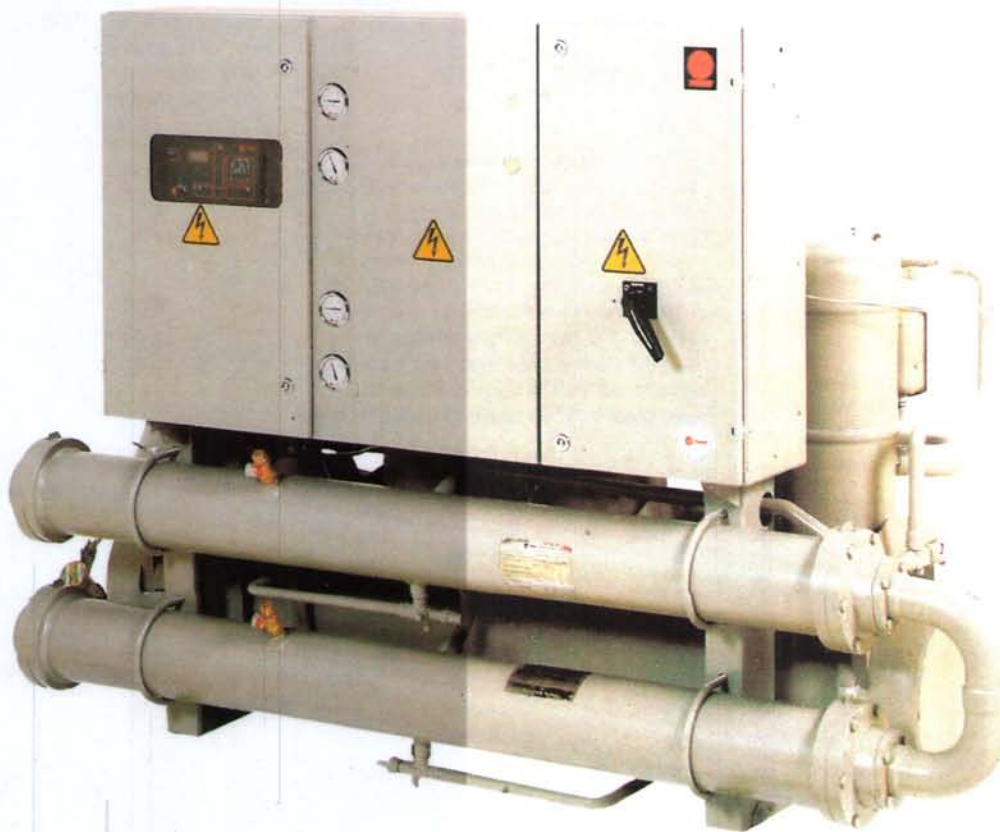
**TRANE™**

# CGWE CCUE

Liquid chillers, water cooled or water remote air cooled



- Nominal cooling capacities 55 to 165 kW, 6 sizes.
- With Trane 3-D scroll compressors.
- Microprocessor-based leaving chilled water PID-temperature control.
- Extensive remote control and communication capabilities.
- Model CGWE with built-in, water cooled condensers, model CCUE for use with a remote air cooled condenser.
- All water cooled models factory run tested.
- Designed and manufactured in accordance with the Trane Quality Management System approved to BS 5750, Part 1.



#### QUALITY ASSURANCE



APPROVALS  
B.S. 5750 Pt1  
ISO 9001  
NEN 2646

B10 CA 001 E

Scroll compressor liquid chillers, water cooled or remote air cooled.  
Series CGWE and CCUE - 55 to 165 kW (50 Hz)

# Trane 3-D scroll compressor :

The most advanced compressor technology available. Unmatched reliability through 64% fewer parts and 70% less torque variation than reciprocating compressors as well as an unsurpassed resistance to liquid slugging.

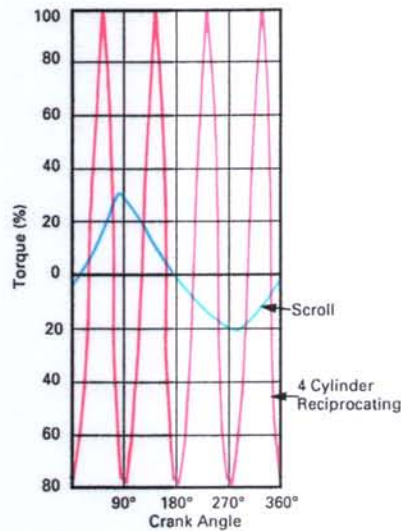
**Simple Design with 64% Fewer Parts**  
Fewer parts than an equal capacity reciprocating compressor means significant reliability and efficiency benefits. The single orbiting scroll eliminates the need for pistons, connecting rods, wrist pins and valves. Fewer moving parts, less rotating mass and less internal friction means greater efficiency than reciprocating compressors, too. And the scroll compressor has been proven reliable in one of the most rigorous test programs in the air conditioning industry.

**Low torque Variation**  
The 3-D scroll compressor has a very smooth compression cycle with torque variations only 30% of a reciprocating compressor. This means the scroll compressor imposes very little stress on the motor for greater reliability. Low torque variation results in less noise and vibration, too. Inherently smooth 3-D scroll compressor operation allows the use of industrial solid motor mounts rather than less reliable spring mounts required in many reciprocating compressors.

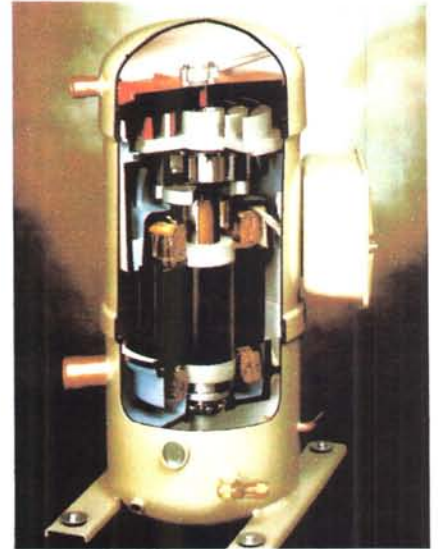
**Exclusive Electronic Protection**  
Advanced microelectronics protect the compressor motor. The protection system monitors compressor discharge temperature and motor temperature. Also protects against current overload.

**Suction Gas Cooled Motor**  
Compressor motor efficiency and reliability is further optimized with this

design. Cool suction gas keeps the motor cooler for longer life and better efficiency than compressors with the motor located in the hot gas discharge.

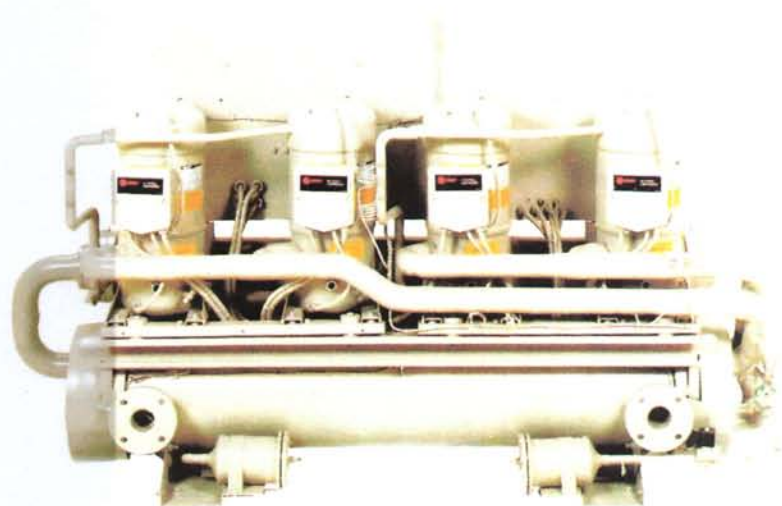


**Patented 3-D Scroll Compliance**  
Trane 3-D scroll compliance provides important reliability and efficiency benefits. 3-D compliance allows the orbiting scrolls to touch in all three dimensions, forming a completely enclosed compression chamber. In addition 3-D compliance means the orbiting scrolls only touch with enough force to create the seal so there is no wear between the scroll plates. Since the



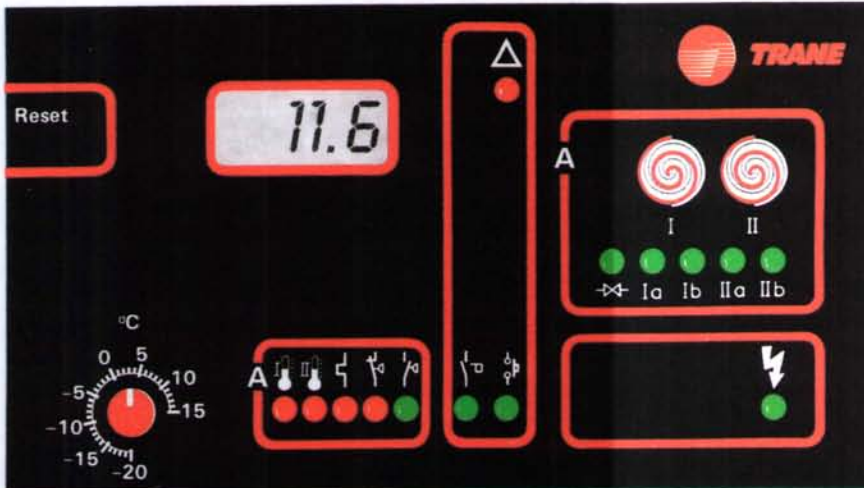
compression chamber is completely enclosed, the scroll compressor achieves high efficiencies.

The most outstanding feature of the scroll compressor 3-D compliance is that the compressor «gives» to allow liquid or dirt to pass through without damaging the compressor. In a reciprocating compressor, however, the liquid or dirt has no place to go and can cause serious damage.



## SCM Microprocessor control system :

Precise PID-type leaving chilled water temperature control, advanced operating mode control and system protection, extensive remote control and communication capabilities.



Central Control Module



Dual circuit Module  
(CGWE - CCUE 205 - 206 - 207)

### Microprocessor based chilled water control

The RCM controls from the leaving or supply water side of the chiller. With this temperature as a component of input, its programmed logic establishes the appropriate control response needed to produce a stable and accurate leaving water temperature condition. PID control produces accurate, responsive control action, eliminating steady state error from the chiller leaving water temperature.

### Operating mode control

Programmed, «intelligent» multi-parameter operating mode control assures safe and continuous operation even at marginal operating conditions.

Operating mode control includes :

- Anti-recycle timing between compressor starts, capacity steps and circuits.
- Low pressure start logic.
- Automatic restart after a power loss.
- Operating time balancing of compressors.

### System protection

All safety parameters are automatically checked before the chiller is allowed to start and also periodically during operation. The SCM system includes an auto-diagnostic routine which also covers the sensors.

The essential safety parameters are :

- Evaporator pressure
- Condensing pressure
- Discharge temperature
- Motor winding temperature
- Leaving chilled water temperature
- Motor current

### Communication

The SCM system offers as standard different possibilities and levels of communication and remote control thus providing complete status information and simplified fault diagnostic.

### Operator interface

A four-digit liquid crystal display on the front cover indicates the actual leaving chilled water temperature and the set point temperature. In case of an operational problem, 17 different fault diagnostic codes can be displayed indicating precisely the nature of the problem. The display further indicates operating hours and number of compressor starts.

LED indicating lights on the front cover provide detailed operating status information and the input status of the major safety devices.

### Parallel mode communication and remote control

The SCM accepts the following input from a remote location and

thus allows remote control of the chiller :

- On/off control by means of a volt-free contact,
- Remote reset of the chilled water temperature set point with a 0 to 10 Volt signal.

Optional relay cards -one per circuit- provide volt-free contacts for remote status and failure indication.

### Serial communication and remote control

The SCM is fitted as standard with a serial communication part which allows the chiller to communicate in the binary mode and to be integrated into a computerized Building Management system.

The SCM is a «slave system» controlled from a higher level system which can send the following commands via the serial link :

- Start/stop the chiller
- Change of chilled water set point.

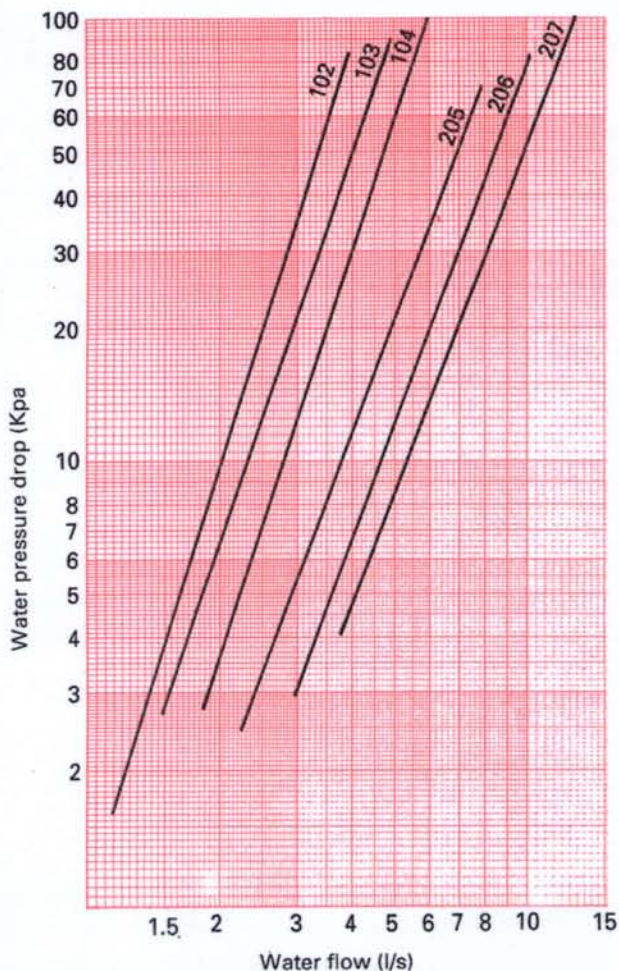
The higher level system can also extract from the SCM operating and status information as well as coded diagnostic and fault indication. The information obtained through the serial communication link can be displayed on the screen of a computer or monitor.

## Cooling capacity and power input (50 Hz)

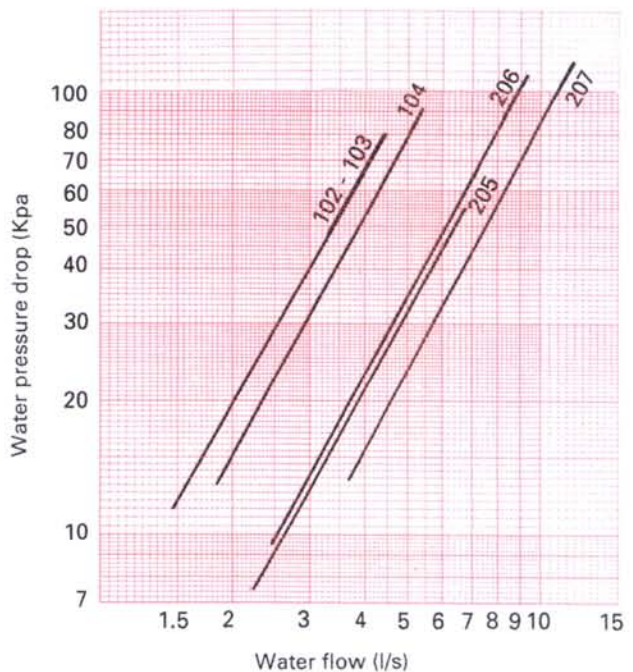
Model	Evap. leaving water temp. (°C)	Condenser leaving water temperature (°C)							
		30		35		40		45	
		Cooling (kW)	Input (kW)	Cooling (kW)	Input (kW)	Cooling (kW)	Input (kW)	Cooling (kW)	Input (kW)
102	5	55.5	11.9	53.1	13.0	50.7	14.4	50.7	15.9
	7	58.9	11.9	56.4	13.1	54.0	14.4	54.0	16.0
	9	62.4	12.0	59.8	13.1	57.3	14.5	57.3	16.1
103	5	66.7	15.2	64.3	16.8	61.6	18.4	61.6	20.3
	7	70.8	15.3	68.2	16.9	65.3	18.5	65.3	20.4
	9	75.0	15.4	72.2	17.0	69.2	18.6	69.2	20.5
104	5	82.3	18.8	79.3	20.6	76.0	22.6	76.0	25.0
	7	87.2	18.9	84.0	20.8	80.8	22.8	80.8	25.2
	9	92.4	19.1	89.1	21.0	85.5	23.0	85.5	25.3
205	5	105.7	23.6	101.5	26.0	96.9	28.6	96.9	31.6
	7	112.1	23.7	107.5	26.1	102.9	28.7	102.9	31.8
	9	118.6	23.8	113.9	26.2	109.1	28.9	109.1	31.9
206	5	133.6	30.5	128.4	33.4	123.1	36.8	123.1	40.5
	7	141.6	30.7	136.4	33.6	130.7	37.0	130.7	40.8
	9	150.0	30.9	144.4	33.8	138.5	37.2	138.5	41.1
207	5	164.6	37.6	158.5	41.3	152.1	45.4	152.1	49.9
	7	174.5	37.9	168.2	41.6	161.5	45.7	161.5	50.3
	9	184.8	38.1	178.2	41.8	171.1	46.1	171.1	50.7

(1) At 5°C ΔT and fouling factor 0.035 m<sup>2</sup> K/kW in evaporator and condenser.

### Condenser water side pressure drop



### Evaporator water side pressure drop



## Electrical and general data (50 Hz)

Model	CGWE	102	103	104	205	206	207
Nb of compressors/circuits (1)		2/1	2/1	2/1	4/2	4/2	4/2
Capacity steps	%	50	58 or 42	50	75-50-25	80-50-21 or 70-50-29	75-50-25
Full load amps (2)	A	41	52	63	83	104	126
Starting amps (3)	A	114	158	169	156	210	233
Evaporator water content	litres	45	45	40	62	66	95
Condenser water content	litres	8	10	12	18	22	26
R22 operating charge	kg	12	14	16	26	28	31
Unit operating weight (4)	kg	555	635	720	1170	1290	1360

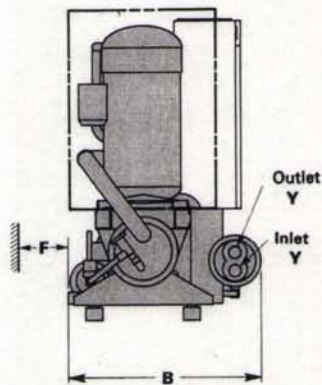
(1) One set of 2 manifolded compressors on sizes 102, 103, 104, 2 sets on sizes 205, 206, 207.

(2) At 415/3/50, 5 bar suction pressure, 25 bar discharge pressure.

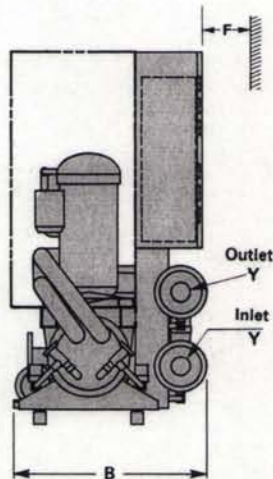
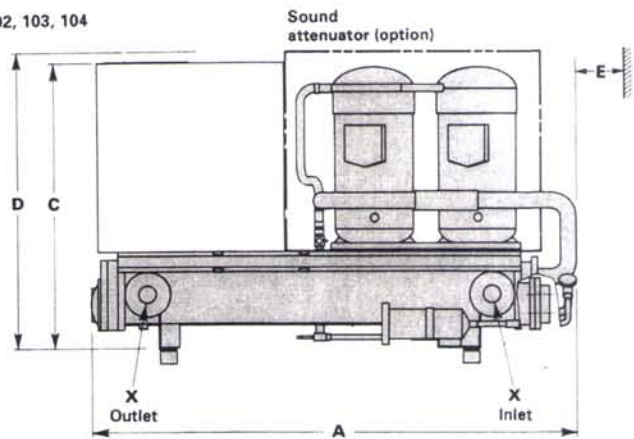
(3) One or three compressors running, the last one starting.

(4) All capacity and weight data apply to the series CGWE units (with built-in water cooled condenser), for series CCUE units (without condenser, for use with remote air cooled condenser) refer to your Trane sales office.

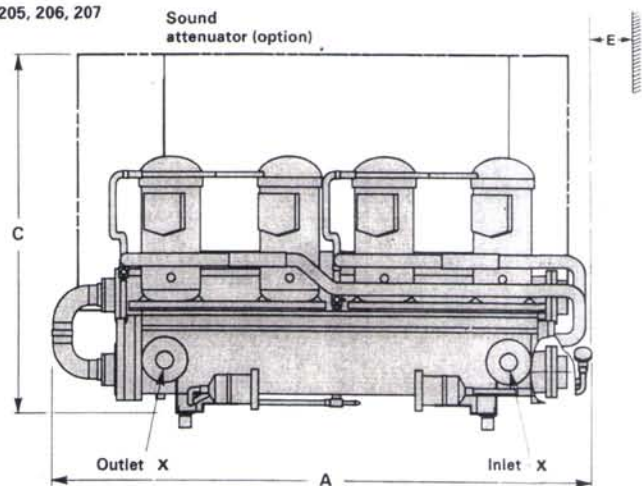
## Dimensions



CGWE 102, 103, 104



CGWE 205, 206, 207



Model	CGWE	102	103	104	205	206	207
Length	A (mm)	2000	2000	2000	2220	2220	2500
Width	B (mm)	800	800	800	800	800	800
Height	C (mm)	1160	1160	1160	1500	1500	1500
Height (3)	D (mm)	1200	1200	1200	—	—	—
Tube removal space	E (mm)	1700	1700	1700	1700	1700	2200
Clearance	F (mm)	600	600	600	600	600	600
Chilled water connection size (1)	X	2"	2"	65	65	65	80
Condenser water connection size (2)	Y	2"	2"	2"	3"	3"	3"

(1) Threaded connections ISO/R7 on sizes 102 and 103, flanged connections on all other sizes.

(2) Connections female pipe thread ISO/R7 on all sizes.

(3) With optional sound attenuating compressor enclosure.

(4) Drawings and dimensions approximate. Certified drawings on request.

# Mechanical specifications

Trane Scroll compressor liquid chiller units, factory assembled and wired, consisting of :

## Scroll compressors

Hermetic, welded shell Trane 3-D scroll compressors. Axial and radial compliance of mating compression chamber surfaces through tip seals and swing link mechanism connecting the orbiting scroll to the motor shaft.

Swing link design to eliminate effects of liquid and oil slugging.

Lubrication with centrifugal oil pump, oil heater and sight glass.

Two-pole motor, suction gas cooled with solid state protection against excess temperature, overload.

Two manifolded compressors on unit sizes 102 to 104, four compressors on two independent circuits on unit sizes 205 to 207.

## Water cooled condensers

(except series CCUE)

Shell-and-tube design. Steel shell welded to heavy tube sheets.

Seamless integrally finned copper tubes mechanically expanded into grooved tube sheets. Built-in liquid subcooler. Removable heads of closed grain cast iron. Water connections female pipe thread ISO R7.

Safety relief valve. Maximum operating pressure refrigerant side 2.8 MPa, water side 1.4 MPa.

One condenser on sizes 102 to 104, two condensers, factory piped in series, on sizes 205 to 207.

## Evaporator

Shell-and-tube design, one refrigerant circuit on sizes 102 to 104, two separate circuits on sizes 205 to 207.

Refrigerant inside the tubes and water circulating in the shell ; steel shell welded to heavy steel tube sheets. Removable refrigerant heads.

Water connections male pipe thread ISO R7 on sizes 102 and 103, flanged on all other sizes.

Thermal insulation of evaporator of flexible closed cell polyvinylchloride. Maximum operating pressure refrigerant side 1.6 MPa. Water side 1.4 MPa.

## Refrigerant circuit(s)

Each circuit including filter-dryer, sight glass, solenoid valve and thermostatic expansion valve. Compressor discharge service valve and liquid line shut-off solenoid valve.

Refrigerant circuit factory pressure and leak tested, dehydrated and charged with refrigerant charge.

## Control and starter panel

Panel with separate compartments for motor starter and controls.

Starter panel section includes :

- Compressor motor contactors
- Overload relays
- Terminal strips

The control panel includes :

SCM microprocessor-based control system, providing :

- PID leaving chilled water temperature control
- Programmed operating mode control and system protection
- Parallel and serial remote control and communication capabilities

The SCM system further provides :

- Liquid cristal display of chilled water temperature, set point and 17 fault diagnostic codes
- LED's for indication of operating status and safety inputs
- Digital readout of operating hours and compressor start count
- Remote reset of chilled water temperature with 0-10 V signal
- Volt-free contacts (optional) for remote status and fault indication
- Serial communication port (TTY link) for binary communication and remote control

The control section of the panel further includes :

- HP, LP pressostats
- Terminal strips

## Accessories and options

- Rubber-in-shear or spring type isolators
- Disconnect switch
- Factory-installed hot gas bypass
- Relay card for remote status and failure indication (one card per circuit)
- Sound attenuating compressor enclosure

## Factory run test

All series CGWE chillers are factory run tested under the contractual conditions before shipment. The control system is factory configured and all control and safety functions are checked.

## Shipment

CGWE ship on a wooden skid with the refrigerant and oil operating charges. CCUE compressor-chiller units ship on a wooden skid with oil operating charge and refrigerant holding charge.

## Quality Assurance

The Quality Management System applied by Trane has been subject to independent third party assessment and approval to BS 5750 Part 1, ISO 9001, NEN 2646 and ISO 900.

The products described in this catalogue are designed, manufactured, and tested in accordance with the approved system requirements as defined in the Trane Quality Manual.



Subject to Modifications.

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