



High Efficiency Two Stage Water Cooled Centrifugal Chiller

WTC/WCT

Cooling Capacity: 900-1500RT (WTC Single Comp.)
1600-3000RT (WCT Dual Comp.)



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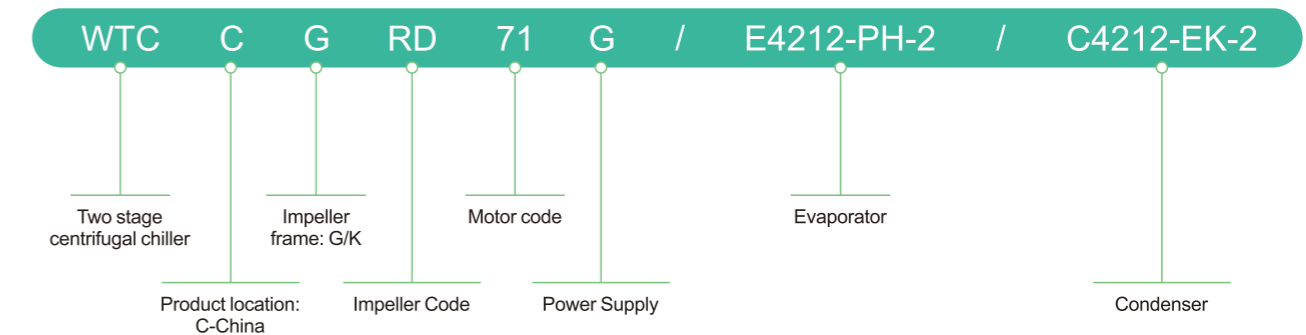
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01 Factory Introduction

► World-class Navigator of Air Conditioning

Daikin has been dedicating to develop innovative and industrial-leading performance products for over 100 years. Comprehensive lines of products meet variable requirements form different customers all over the world. Our customers can benefit from maximum energy savings, quiet operation, superior indoor air quality with utilizing of our products. Daikin will keep continuously pursuing cutting-edge technologies to bring customers unparalleled experience.

► Nomenclature



Note:

1. Power Supply: F-380V/ 50Hz, G-400V/ 50Hz, U-380V/ 60Hz, 9-6600V/50Hz

► Technical Data

Model	Cooling capacity		Power Consumption	Efficiency		Evap.		Cond.		Start Type	Rated Load Amps	Chiller Weight	Operation Weight
	ton _r	kW		kW/ton _r	COP	Flow Rate	Pressure Drop	Flow Rate	Pressure Drop				
						L/s	kPa	L/s	kPa	-	A	kg	kg
WTCCGAD58G/E3612PH-2/C3612EK-2	900	3165	476.7	0.5297	6.640	135.9	62.7	169.0	51.5	VFD	733	13458	14422
WTCCGAD58G/E3914QH-2/C3614FK-2	900	3165	467.6	0.5196	6.769	135.9	62.4	168.5	65.1	VFD	719	14538	15583
WTCCGRD58G/E4212PH-2/C4212EK-2	1000	3516	520.1	0.5202	6.760	150.9	43.0	187.2	32.3	VFD	799	16089	17465
WTCCGRD58G/E4214PH-2/C4214EK-2	1100	3868	573.0	0.5210	6.750	166.1	59.1	206.0	44.2	VFD	881	17333	18884
WTCCKBD87G/E4212QH-2/C4212EK-2	1200	4200	629.2	0.5268	6.675	180.3	66.3	224.2	43.7	VFD	967	16253	18512
WTCCKCD87G/E4214QH-2/C4214FK-2	1300	4572	673.4	0.5181	6.788	196.3	89.6	243.6	65.7	VFD	1035	18328	21087
WTCCKCD87G/E4514QH-2/C4214EK-2	1400	4924	726.1	0.5186	6.781	211.4	74.8	262.3	66.5	VFD	1116	21842	24601
WTCCKDD87G/E4814PH-2/C4814EK-2	1500	5275	773.5	0.5157	6.820	226.5	61.8	280.8	46.2	VFD	1189	26615	29750
WTCCKDD879/E4814PH-2/C4814EK-2	1500	5275	764.6	0.5097	6.899	226.5	61.8	281.6	46.4	Fixed Speed	77	26645	29780

Note:

1. Above chiller cooling capacity is based on AHRI standard 550/590(I-P):

ELWT: 6.67°C, EEWT: 12.22°C; CEWT: 29.44°C, CLWT: 34.61°C;

Evaporator/Condenser water side fouling factor: 0.0176/ 0.0440 °C.m²/kW;

2. Power Supply: G-400V/50Hz/3ph, 9-6600V/50Hz/3ph;

3. Above chiller is recommended, please contact local sales for other specific models;

4. Above selection based on WTC program 1.0.3.



02 Major Components



03 Technology Features

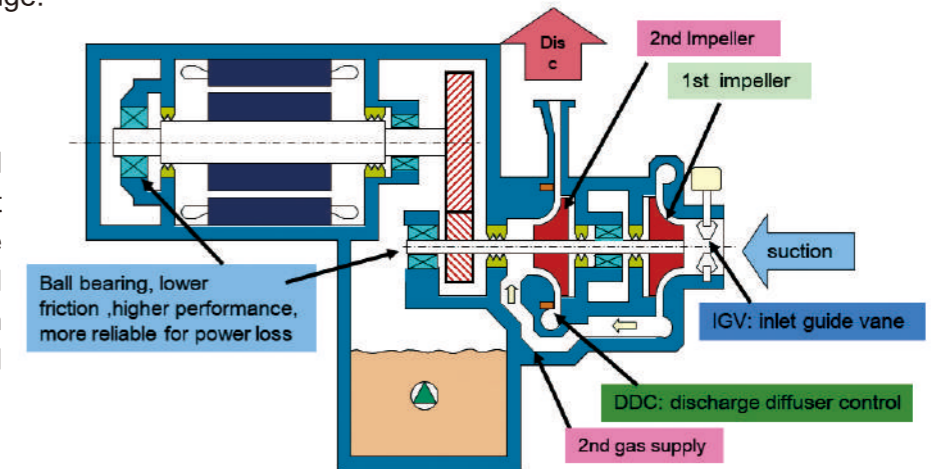


► Compressor

- Best-in-class two stage 3D impeller configuration eliminates axial impeller thrust and load on the shaft bearing.
- Patent IGV and DDC design equipped to intelligently control the cooling capacity and avoid the risk of surging. Moment-to-moment position adjustment for IGV and DDC base on continuous feedback signal, playing an important role in accurate operation under every condition.
- Gear driven design accurately delivers ultimate performance for specific customer condition.
- More reliable motor refrigerant cooling system to guarantee the motor temperature under acceptable operation range.

► Capacity Control

Reliable capacity control system integrates Inlet Guide Vane, Discharge Diffuser Control and VFD making contribution to smooth chiller unload and upload.



► Optimized Evaporator and Condensers

- Patent new distribution for evaporator allowing for more compact appearance, saving the refrigerant charge volume. In addition, a suction eliminator is located above the tube bundle to prevent liquid refrigerant carryover into the compressor, guaranteeing safety operation.
- Patent inclined condenser design significantly improves the heat transfer efficiency, minimizing the vessel size.
- Built-in sub-cooler at the bottom of the condenser further increase chiller efficiency.
- High performance tubes are typically internally and externally enhanced with special surfacing.

► Economizer

- WTC series employs a two stage refrigeration system integrating proprietary flash tank economizer to maximize chiller cooling capacity and efficiency.

► In-house VFD Starter

- Best-in-class technologies utilized in in-house VFD starter, delivering ultimate performance.
- Comprehensive protection and communication functions equipped to make sure dependable chiller operation.

04 Customer Benefits



Superior Performance

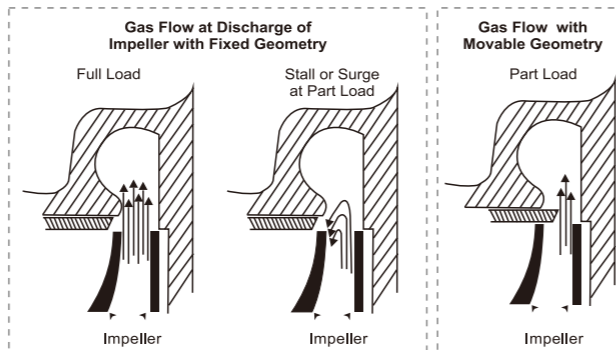
- Chiller's superior efficiency cannot be determined by any one component but thanks to a combination of compressor, motor, optimized vessels, economizer and VFD.
- WTC series' chiller COP can reach 6.9 under AHRI condition, much better than the traditional oiled bearing centrifugal chillers.

Reliable and Stable Operation

- Smart chiller control system bring customer fast, efficient and safe operation. Please refer to next page for more details.

Comprehensive protection measures for chillers:

- ▶ Surge protection
- ▶ Condenser high pressure protection
- ▶ High discharge temp protection
- ▶ Water Flow interlock
- ▶ Evaporator Low pressure protection
- ▶ Overvoltage or under-voltage...



- Built-in oil pump design reduces piping connection make the chiller's simplicity No piping connection means no oil leakage.
- With utilizing of jet pump, no need to worry about oil leakage to the refrigerate side.
- Electronic expansion valve instead of orifice in motor cooling line ensure the motor operate with acceptable temperature at all loads, further enhancing chiller's reliability and stability.
- Unique diffuser control(DDC) to avoid surging:
 - Without DDC:** Surge inevitably occurs under high lift but low load condition with centrifugal compressors, low refrigerant flow means low pressure can be transferred to which cannot overcome the high pressure in the condenser, thus refrigerant flows back into the impeller and causes surging.
 - With DDC:** Surge mitigated by reducing the discharge area of the diffuser, which in turn increases the gas velocity and raises pressure to overcome the pressure of the volute.

Fast Payback

- Superior efficiency means less power consumption for the customer.
- Reliable and stable operation effectively reduce maintenance times, thus cost for maintenance can be significantly decreased.

Quiet Operation

- Low rotation speed of compressor brings low vibration and low noise level.
- WTC series is suitable for sound and vibration sensitive situations such as library, theater, museum.

05 Smart Control



Comprehensive Monitoring and Display

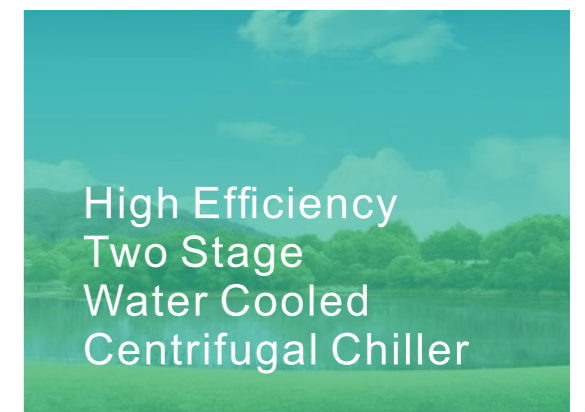
- State-of-art MicroTech controller incorporate microprocessor provides all monitor for chiller's efficient and safety operation.
- Real time running data display or graphic display brings customers a better sense of the chiller operation.

User-friendly Operation

- WTC provides an easy operator interface, with key operating parameters on the screen.
- Operation Simplicity allows you to change the set points easily by pressing set button from any screen.
- Multiple languages can be selected to fulfill different customer's requirements.

Alarm History for Easy Troubleshooting

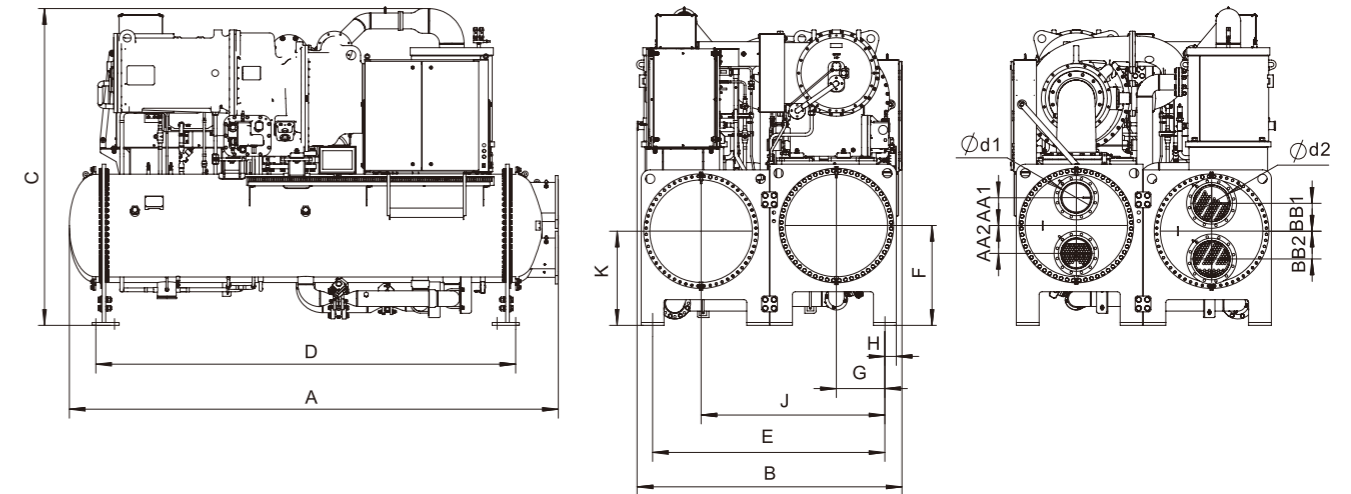
- Alarm history is easily accessed through intuitive touch-screen buttons.
- Operator can monitor all operating conditions by using the unit-mounted HMI.
- The occurred Alarms are retained in the controller's memory to aid in troubleshooting and fault analysis. Alarm history lists the alarms with the most current on top with date stamp, action taken and the cause of the alarm.
- You can download the chiller operating manual via USB.





Easy Communication with Building Automation System

- All MicroTechIII controllers offer simple and inexpensive flexibility to use the Building Automation System.
- The exclusive control feature provides seamless integration and comprehensive monitoring, control, and two-way data exchange with industry standard protocols such as LONWORKS, Modbus or BACnet.
- The BAS communication module can be ordered factory mounted with your chiller. It is easy to integrate into your building automation system, providing comprehensive data exchange and point list for system integration, equipment monitoring and alarm notification.



Model	Dimensions(mm)					Locating Size of Evaporator Connection(mm)					Locating Size of Condenser Connection(mm)				
	A	B	C	D	E	F	G	H	AA	d1	J	K	BB1	BB2	d2
WTCCG**/E3612**-2/C3612**-2	4372	2358	2840	3727	2068	888	433	102	248	273	1637	838	248	248	325
WTCCG**/E3914**-2/C3614**-2	5055	2513	2935	4376	2242	990	514	102	248	325	1811	838	248	248	325
WTCCG**/E4212**-2/C4212**-2	4556	2665	3049	3727	2394	990	514	102	273	356	1886	914	360	273	406
WTCCG**/E4214**-2/C4214**-2	5204	2665	3049	4376	2394	990	514	102	273	356	1886	914	360	273	406
WTCC**/E4212**-2/C4212**-2	4556	2665	3088	3727	2394	990	514	102	273	356	1886	914	360	273	406
WTCC**/E4214**-2/C4214**-2	5204	2665	3088	4376	2394	990	514	102	273	356	1886	914	360	273	406
WTCC**/E4514**-2/C4214**-2	5225	2743	3088	4376	2540	990	585	102	273	356	2033	914	360	273	406
WTCC**/E4814**-2/C4814**-2	5143	2888	3312	4376	2685	1057	578	102	273	356	2107	1057	318	318	457

Note:

1. A, B, C dimension deviation $\pm 13\text{mm}$;
2. Above dimension applies for unit mounted Daikin VFD of voltage below 460V, please contact your Daikin representative for other requirements.
3. The dimension include 20mm insulation for the evaporator.



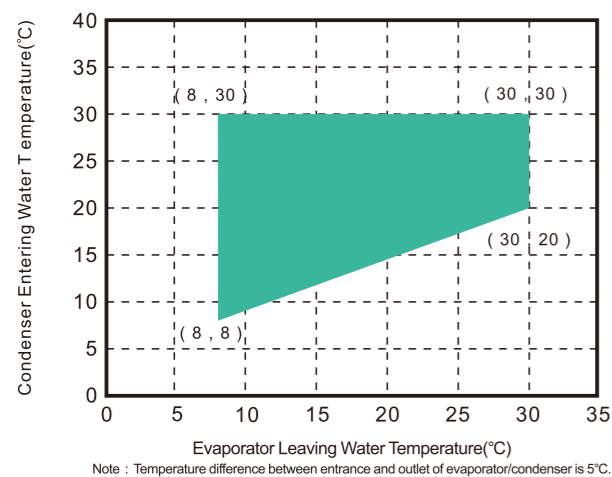
Items	Standard	Options
Vessel Code	GB	ASME
Water Connection	Victaulic Groove	ANSI Flange
Water Box	Compact Water Cover (1.0MPa)	Marine Water Box
Insulation	20mm Insulation on Evaporator and Cold Surface	40mm Insulation on Evaporator ^①
Flow Switch	Pressure Differential / Paddle Type	Thermal Flow Switch
Anti-vibration	Rubber Cushion	Spring Isolator
Warranty Extension	None	1 to 4 Year
Test	Factory Test ^②	1-4 Point Witness Test
Harmonic Distortion Filter	None	Active Power Filter / Passive Filter ^③
Rapid Restart	None	Option

NOTE

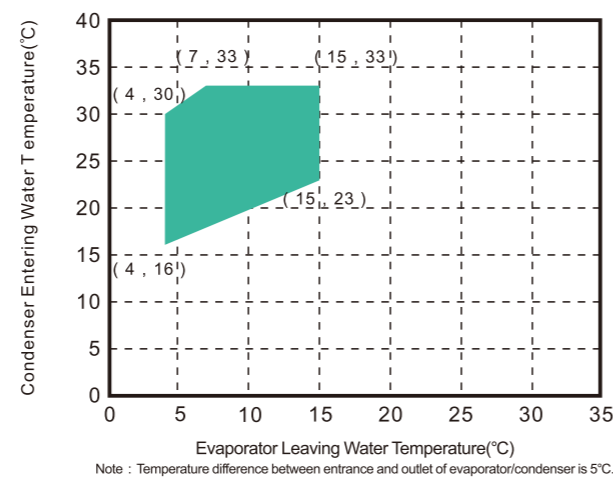
- Insulation:
 - Ambient temperature lower than 30°C. Humidity lower than 70%, use single layer insulation (20mm); humidity higher than 70%(include), use double layer insulation (40mm).
 - Ambient temperature higher than 30°C(include); Humidity lower than 65%, use single layer insulation (20mm); humidity higher than 65%(include), use double layer insulation (40mm).
 - Double layer of insulation (40mm) must be used when chiller leaving water temperature lower than 5°C(include).
 - 40mm Insulation on evaporator shell and 20mm on water head cap.
- Factory Testing: To ensure provide safe and reliable products to costumers, all Daikin applied chillers are factory tested before shipment. Operating and safety controls are checked for correct settings and operation. This testing helps reduce start-up issues and maintain critical construction schedules.
- Active power filter is unit mounted. Passive filter is free standing. The standard harmonic distortion of WTC/WCT chiller is less than 35%. Harmonic distortion filter is an optional solution to lower the total harmonic distortion imposed on power grid.



Startup Range



Operation Range



NOTE

The operation range above is for recommended. Chiller actual operation range should be subjected to the latest selection software.



The standard running condition of the water chiller is as follows:

Supply Voltage	Rated voltage ± 10%
Phase Unbalance Rate	≤2%
Frequency	Rated frequency ± 2%Hz
Operating Temperature	3~40°C
Relative Humidity	1. 20 mm thick insulation will normally prevent condensation in environments with relative humidifies up to 70% and dry bulb temperatures ranging from 10 to 32°C. 2. 40 mm thick is also available for relative humidifies up to 80% and dry bulb temperatures ranging from 10 to 32°C. 3. If relative humidifies or dry bulb temperatures exceed the above scope, please contact factory to confirm the insulation thick.
Explosion-proof Grade	None
Atmospheric Corrosive Gas Contents	Sulfur dioxide ≤ 10 mg/m ³ Hydrogen fluoride ≤ 5 mg/m ³ Hydrogen sulfide ≤ 5 mg/m ³ Nitrogen oxide ≤ 5 mg/m ³ Nitrogen ≤ 1 mg/m ³ Hydrogen chloride ≤ 5 mg/m ³
Installation	Indoor installation, no rain or direct sunlight(for installations of the outdoor, seaside, chemical plant, or place of high concentration of corrosive gas, please contact the local Daikin branch office and dealers)
Water Temperature Range of Water Chiller	Refer to IOMM
Water Capacity Range	Refer to IOMM
Heat Exchange Tube Waterside Pressure	Standard chiller 1.0MPa (may be designed follow the customer's requirements)

Water Quality Management

During the unit running, the water quality of the cooling and chilled water will directly affect the machine's performance and lifetime, so it is necessary to survey the water quality beforehand and conduct water quality control as the unit runs.

The following table contains some parameters of the water quality of open system:

Item	Unit	Reference Value	Item		
			Corrosion	Scaling	
Base Items	PH (25°C)	-	<6.5~8.0	O	O
	Electrical Conductivity (25°C)	μs/cm	<800	O	O
	Chloridion Cl ⁻	mg(Cl ⁻)/L	<200	O	
	Sulfateion SO ₄ ²⁻	mgSO ₄ ²⁻ /L	<200	O	
	Acid Consumption (PH=4.8)	mg(CaCO ₃)/L	<100		O
	Full Hardness	mg(CaCO ₃)/L	<200		O
Reference Items	Iron Fe	mg(Fe)/L	<1.0	O	O
	Sulphion S ²⁻	mg(S ²⁻)/L	Not Detected	O	
	Ammoniumion NH ₄ ⁺	mg(NH ₄ ⁺)/L	<1.0	O	
	Silicon Oxide SiO ₂	mg(SiO ₂)/L	<50		O

NOTE

- The "O" in the table indicates the relevant factors with corrosion or scaling.
- We recommend you add water process device and contact Daikin professional servicer to deal with it.