

TECHNICAL DETAILS

COMPRESSORS

Hermetic scroll type. They are built with oil, a crankcase heater, and are protected by a relay phase sequence control (to avoid reverse rotation). They are mounted on rubber shock absorbers. They offer a high level of energy efficiency (EER), reliability, low noise and low vibrations.

They are equipped with non-return valves, which protect against over-pressure resulting if the compressor is stopped. There is also an internal thermal protector, which protects them from electrical over-current or excessive running temperatures.

THE MULTI-COMPRESSOR CHOICE

The multi-compressor configuration for single refrigerant circuit is already used on model CWT025 and is the main feature of the CWT range. It gives the chiller important advantages when compared to units with equivalent cooling power and mounting a single compressor per refrigerant circuit. Machines with several compressors in the same circuit can achieve much better efficiency levels (EER) compared with machines with just one compressor per circuit:

- A. higher efficiency (EER) at partial loads.
- B. lower starting currents increases the average life of the compressors;
- C. Better adapt to the load required at any time.

FANS

Axial, directly coupled to a three-phase motors 4/6/8 poles and external rotor motors. All fans are equipped with internal thermal protection with automatic reset and class F insulation. The condensation control (standard) is run with a phase cutting controller. This solution makes the machine even more silent when the outside temperature is low or when it operates at partial load.

CONDENSER

The aluminum microchannel condensers guarantee a greater heat exchange surface than traditional copper tubes and also allow to minimize the refrigerant charge (from 30% to 35%

lower than the conventional condenser).

The total aluminum structure frees from galvanic corrosion risks. In all models, the condenser is protected by filters, easily removable and washable.

EVAPORATOR

It is made of AISI 316 stainless steel brazed plate, is compact and highly efficient. The exchanger completely separate and independent from the collection tank. All installed evaporators ensure high heat exchange efficiency between the refrigerant and fluid to be cooled and reduced pressure losses. They allow very low temperature approaches to optimise energy efficiency. The electronic controller antifreeze function monitors the water temperature from the evaporator outlet to prevent freezing. A differential pressure switch protects the heat exchanger from any lack of water flow, while a mechanical filter at the inlet (standard) protects the entire hydraulic circuit from dirt coming in from the process. In the models ranging from CWT075 to CWT130, the evaporators have double refrigerant circuit and single water circuits. This configuration is particularly efficient at partial loads, compared to solutions using independent evaporators (see also section "The multi-compressor choice").

ELECTRICAL PANEL

The panel is manufactured of galvanized steel with a polyester powder coated surface compliant to EN 60204 EC. It includes a main switch with door interlock (which prevents access to the panel when it is under voltage) and watertight door to access the electronic controls. It is equipped with an active ventilation system when the unit is running. It includes: thermo-magnetic motor protectors for compressors and pumps, remote control switches, autotransformer, compressor rotation control device. The cables inside the cabinet are numbered. For easy use, an ON / OFF switch on the electrical panel door is provided. It 'also available as option the heating resistance of the electrical panel for harsh climates.

OPTIONS:

Automatic water bypass	BA
P5 Pump	P5
Double P3 Pump	D3
Double P5 Pump	D5
Additional atmospheric water tank kit (glycol charge)	TA [1]
Non ferrous pressurized water circuit (stainless steel water tank)	TPI
Without tank	T0
Without pump	P0
Automatic Water Filling Kit	WF
Wind baffles kit	FWB
Remote Panel kit	ER
RS485 Serial Port kit	EMB
Wheels kit	FW
Rubber anti-vibration mountings kit (no tank units)	FA1 [2]
Rubber anti-vibration mountings kit (units with tank)	FA2 [2]
Wooden Crate	PWC

- [1] From CWT018 to CWT065 this kit increases the length of the unit of 315 mm
- [2] Antivibration mountings kit includes galvanized steel feet kit

SOME OTHER UNITS AVAILABLE FROM OUR PREMIUM LINE

QBE



LIQUID CHILLERS
FROM 2 TO 25 KW

DRYCOOLERS



LIQUID COOLERS
FROM 300 TO 1200 KW

CWE/HWE



LIQUID CHILLERS/HEAT PUMPS
FROM 13 TO 140 KW

CWB/CWB FC



LIQUID CHILLERS
FROM 80 TO 570 KW

FRIULAIR
Chillers

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FRIULAIR
Chillers



* Data referred to: water temp. in/out: 20/15°C - ambient air temp. 25°C

CWT

INDUSTRIAL LIQUID CHILLERS

FROM 18 TO 130 KW*

ERP
SEPR HT
READY 2021

INDUSTRY
Ready 4.0



DESCRIPTION

The CWT range was specifically designed to meet the application requirements of industry by offering precise control of refrigerated water temperature while operating over long time periods with varying load demands. The range includes 13 models with refrigerating power going from 18 to 130 kW (data referred to: water temp. in/out: 20/15°C - ambient air temp. 25°C) and was designed to be installed outdoors. All units are equipped with:

- Hermetic scroll compressors
- Plate evaporator
- Aluminium micro channel finned coils
- Fans with continuous speed control (phase cut)
- Microprocessor controller
- Ventilated electrical panel
- Integrated storage tank
- Hydraulic pump
- Condenser filters
- Filter and shut-off valves for water

STRUCTURE

The unit frame is made of galvanized steel with an additional polyester powder coat protection. This makes the range particularly resistant to external conditions and suitable for outdoor installation. The panels are easily removed, allowing access for maintenance and repair. The compressor compartment is independent from the condensing coil, so the user can access safely while the machine is in operation. The hydraulic system is also easily accessible, through the removal of steel filters.



REFRIGERANT CIRCUIT

This is manufactured of top quality materials by skilled personnel according to strict procedures of brazing, compliant with Directive 2014/68/EU. It is composed of:

- Scroll compressors designed for use with R410A
- Filter dryer
- Condenser assembled from micro channel aluminium
- Flow sight glass with moisture indicator
- External equalisation thermostatic expansion valve
- Unidirectional valves (only for multi-compressor units)
- High and low pressure gauge
- Pressure connections for checks and maintenance
- High pressure switch with manual reset and low pressure trasducer with semi automatic reset
- Evaporator assembled from AISI 316 L stainless steel brazed plate

HYDRAULIC CIRCUIT

This consists of an evaporator and interior piping to the machine, it also includes:

- A storage tank made of carbon steel and thermally insulated
- An electric stainless steel, thermally insulated pump
- Expansion vessel
- Safety valve
- Automatic vent valve
- Water differential pressure switch
- Stop ball valves
- Inlet unit water filter
- Water gauge
- Drain valve

The high litre/kW ratio (volume of the tank / refrigerating capacity) for refrigeration compressor allows it to be reduced to the minimum setting when starting up. It also helps to keep the outlet water temperature constant. The multi-compressor configuration allows for a smaller collection tank compared to the mono compressor and this means that the design temperature of the machine is rapidly attained. A storage tank is placed on the discharge pipe to further mitigate temperature variations. The collection tank is available on all models both pressurised and atmospheric (optional) version. All models are equipped with stainless steel centrifugal pumps with high efficiency (impeller AISI304) and a mechanical seal made from carbon/ceramic/EPDM. The available pressure head of the installed pumps can be P3 and P5. From CWT038 model onwards a double pump and rotation system for equalization of run times is available. All units in the range can be used with mixtures of ethylene glycol up to 30%.

		CWT018	CWT020	CWT025	CWT030	CWT038	CWT040	CWT045	CWT055	CWT065	CWT075	CWT090	CWT110	CWT130
PERFORMANCES [1]														
Cooling capacity	[kW]	13.71	16.56	19.33	20.14	27.36	33.09	32.38	40.84	49.48	54.81	69.23	81.88	99.37
Compressors power input	[kW]	4.08	5.48	7.64	7.55	8.77	11.26	11.12	13.92	17.59	16.53	21.85	26.35	34.09
Total power input	[kW]	4.72	6.12	8.28	8.19	10.05	12.54	12.40	15.24	18.91	20.73	26.05	30.47	38.21
Total absorbed current	[A]	8.84	10.90	11.96	14.60	18.76	22.33	22.48	27.97	33.17	36.59	44.41	54.25	65.35
Energy efficiency (pump excluded)	EER	2.90	2.71	2.33	2.46	2.72	2.64	2.61	2.68	2.62	2.64	2.66	2.69	2.60
Seasonal energy performance ratio [*]	SEPR HT	5.03	5.04	5.03	5.32	5.02	5.70	5.20	5.48	6.23	5.00	5.18	5.00	5.69
Water flow	[l/h]	2358	2848	3325	3465	4706	5691	5569	7025	8510	9427	11908	14084	17092
Evaporator pressure drop	[kPa]	377	368	348	366	387	378	392	363	341	279	271	356	418
ELECTRICAL DATA [2] [3]														
Maximum power input (total)	[kW]	6.65	7.81	10.21	10.21	13.29	15.61	15.64	19.34	22.82	28.22	32.87	40.15	47.12
Maximum absorbed current (total)	[A]	11.86	13.40	14.46	17.76	23.72	26.81	27.44	34.22	38.85	48.23	54.40	69.14	78.40
Starting current	[A]	71.60	91.60	47.03	62.68	83.47	105.01	72.36	93.96	117.05	107.97	132.60	128.88	156.60
Fan power	[kW]	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.66	0.66	0.66	2.1	2.1	2.06
Fan current	[A]	2.79	2.79	2.79	2.79	2.79	2.79	2.79	3	3	3	3.6	3.6	3.8
Number of fans	[#]	1	1	1	1	2	2	2	2	2	2	2	2	2
Standard pump type	[kW]	P3	P3	P3	P3	P3	P3	P3	P3	P3	P3	P3	P3	P3
Pump power input	[kW]	1.34	1.34	1.34	1.34	1.72	1.72	1.72	1.72	1.72	2.55	2.55	3.44	4.52
Pump absorbed current	[A]	2.5	2.5	2.5	2.5	3.8	3.8	3.8	3.8	3.8	4.7	4.7	6.4	8.7
Power supply	[V/Ph/Hz]	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
IP protection degree	---	IP44	IP44	IP44	IP44	IP44	IP44	IP44	IP44	IP44	IP44	IP44	IP44	IP44
TECHNICAL DATA														
N° of compressors	[#]	1	1	2	2	2	2	3	3	3	4	4	6	6
N° of refrigerant circuits	[#]	1	1	1	1	1	1	1	1	1	2	2	2	2
Air flow	[m³/h]	8.179	8.179	8.049	8.049	15.399	15.399	15.399	18.791	18.791	32.931	32.931	44.185	44.185
Sound pressure level at 10 m in free field [4]	[dB(A)]	50,0	50,0	50,0	50,0	53,0	53,0	53,0	49,5	49,5	58,5	58,5	52,0	52,0
Water connections size	[inch]	1"	1"	1"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	2"	2"	2"	2"
Tank capacity	[dm³]	95	95	95	95	135	135	135	135	135	205	205	205	205
Expansion vessel capacity	[dm³]	5	5	5	5	8	8	8	8	8	12	12	12	12
Width	[mm]	662	662	662	662	752	752	832	832	832	1.110	1.110	1.210	1.210
Depth	[mm]	1.305	1.305	1.305	1.305	1.635	1.635	1.850	1.850	1.850	2.025	2.025	2.230	2.230
Height	[mm]	1.425	1.425	1.425	1.425	1.535	1.535	1.700	1.700	1.700	1.900	1.900	2.255	2.255
Weight	[kg]	270	270	310	320	420	430	500	510	530	720	770	980	1.000

• [*] Data reported here are in accordance with European Regulation (EU) 2016/2281 for eco-design requirements of cooling products and high temperature process chillers.

• [1] Data referred to: water temp. in/out: 12/7°C - ambient air temp. 35°C

• [2] Data referred to unit without pump

• [3] Data related to most heavy condition allowed by safety devices

• [4] Referred at 10 m and at an height of 1,5 m in free field

MICROPROCESSOR CONTROLLER:

It allows to check at any time the operation parameters: condensing pressure, evaporating pressure, temperature of the inlet and outlet, and all digital inputs and outputs.

In case of partial or total block of the unit, you can see the alarm history to know which security device had been intervened. The controller is equipped with RS485 port.

As option it is possible to obtain the arrangement for LAN/Ethernet connection.



REFERENCE CONDITIONS

- Ambient temperature: 35°C
- Inlet water temperature: 12°C
- Outlet water temperature: 7°C

WORKING LIMITS

- Ambient temperature: -8°C / +45°C (min/max)
- Outlet water temperature: -10°C / +25°C (min/max)

ALARMS CONTROL

- High refrigerant pressure switch
- Low refrigerant pressure transducer
- Water differential pressure switch
- Incorrect phase sequence
- Compressors thermal protection
- Pump thermal protection
- Temperature failure probe
- Pressure failure probe
- High water temperature
- Anti-freeze

CHECKS AND TESTING

Each CWT unit has undergone testing at full load and the following checks were also performed

- Correct component assembly
- Pressurisation of the cooling circuit and leaks detection using a helium leak detector
- Pressurisation of the hydraulic circuit
- Electrical tests according to the EN60204 standard
- Check of correct protection and safety operation
- Check of correct electronic controller operation
- Performance and electrical data measurement

EASY MAINTENANCE

The CWT range has been designed and built to facilitate easy inspection and maintenance. The panels are easily removable, offering immediate access to all parts of the system. The clear arrangement of the components, the simple composition of the refrigerant and hydraulic circuit and the electrical system's cable numbering, aid the users normal control operations.

