TECHNICAL DETAILS

COMPRESSORS

Hermetic scroll type. They are build with oil, a crancake 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. The condenser of each unit is protected by filters easily removable and cleanable.

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 (only for CWT 038÷130)	D3
Double P5 pump (only for CWT 038÷090)	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 converter 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 (only for CWT 075÷130)	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 IN OUR PREMIUM LINE

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2 to 25kW
Air-cooled chillers
with rotary and scroll compressors

CWE/HWE

13 to 140kW
Air-cooled scroll compressor
chillers and heat pumps

CWB FC

80 to 240kW
Air-cooled chillers
with integrated freecooling

CDC

300 to 1200 kW
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also adiabatic system available

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FRIULAIR Chillers

CWT

AIR-COOLED SCROLL COMPRESSOR CHILLERS

from 18 to 130 kW

CWT

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 and was designed to be installed outdoor. 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.

REFRIGERATION 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
- Dehydrator filter
- Condenser assembled from microchannel 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
- Unit inlet water strainer
- 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 40%.

	CWT	018	020	025	030	038	040	045	055	065	075	090	110	130
PERFORMANCES 20/15@25 [1]														
Cooling capacity	[kW]	19.49	23.28	24.91	28.71	38.95	46.73	46.32	58.26	70.06	78.17	98.28	116.94	140.20
PERFORMANCES 12/7@35 [2][3]														
Cooling capacity	[kW]	13.71	16.56	17.71	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	5.78	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	6.42	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	11.44	14.60	18.76	22.33	22.48	27.97	33.17	36.59	44.41	54.25	65.35
Energy efficiency	EER	2.90	2.71	2.76	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]	2 358	2 848	3 046	3 465	4 706	5 691	5 569	7 025	8 510	9 427	11 908	14 084	17092
Evaporatore pressure drop	[kPa]	44.4	43.8	46.8	34.8	47.8	44.1	37.4	43.8	44.2	45.1	43.1	40.5	40.5
ELECTRICAL DATA [3][4]														
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	2.1	2.1	2.06	2.06
Fan current	[A]	2.79	2.79	2.79	2.79	2.79	2.79	2.79	3	3	3.6	3.6	3.8	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]	2.50	2.50	2.50	2.50	3.80	3.80	3.80	3.80	3.80	4.70	4.70	6.40	8.70
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	[5] [dbA]	50	50,0	50	50	53	53	53	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
Net weight - standard version	[kg]	270	270	310	320	420	430	500	510	530	720	770	980	1.000
OPTION														
P5 Pump power input	[kW]	1.77	1.77	1.77	1.77	2.55	2.55	2.55	2.55	2.55	4.52	4.52	4.52	4.52
P56 Pump absorbed current	[A]	3.30	3.30	3.30	3.30	4.70	4.70	4.70	4.70	4.70	8.70	8.70	8.70	8.70

- [*] Data in accordance with with European Regulation (EU) 2016/2281 for eco-design requirements
- [1] Data referred to: water temp. in/out: 20/15°C - ambient air temp. 25°C
- [2] Data referred to: water temp. in/out: 12/7°C - ambient air temp. 35°C
- [3] Data referred to unit without pump
- [4] Data related to most the heaviest condition allowed, without the intervention of the safety devices
- [5] Data referred to 10m and at an height of 1,5 m in open 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.

WORKING LIMITS

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

ALARM MANAGMENT

- 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
- Remote alarm and ON/OFF remote alarm available via clean contact in terminal block

CHECKS AND TESTING

Each CWT passes a test at full load ; the following checks are performed :

- Correct component assembly
- Pressurisation of the refrigeration circuit and leaks detection using a helium leak detector
- Pressurisation of the hydraulic circuit
- Electrical tests according to the EN60204 standard
- Check for a correct protection and safety operation
- Check for a 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.