OPTIONS:

Leaving water temperature stability (+/- 0,1 K) electronic hot gas by-pass valve (only for CWE036÷140)	VBE
Single P2/P3/P5 Pump	P2/P3/P5
Double P2/P3/P5 Pump	D2/D3/D5
Non ferrous water piping for single pump configuration	WP [1]
Non ferrous water piping for double pump configuration	WD [2]
Pressurized water tank	TP [3]
Non ferrous pressurized water circuit (stainless steel water tank)	TPI [3]
Pressurized water tank with double pump housing	TP2 [4]
Non ferrous pressurized water circuit for double pump housing (stainless steel water tank)	TPI2 [4]
Additional atmospheric water tank kit (glycol charge)	TA [5]
Non ferrous atmospheric water circuit (plastic water tank)	TANF
Disconnector tank with P2/ P3/ P5 Pump (pressurized carbon steel tank included)	X2/ X3/ X5
Water level switch	LSM [6]
Automatic water bypass valve	BA
Evaporator anti freeze heater	RA1
Evaporator and pump anti-freeze heaters	RA2
Evaporator, pump and tank anti-freeze heaters	RA3 [9]
Electrical switchboard anti-condensation heater	RS
Solenoid valve on liquid line (only for CWE013÷053; standard for CWE068÷140)	VL
Electronic thermostatic valve	VE
Continuous fan(s) speed control - phase cut type (minimum ambient temperature -8.0°C)	CA
Continuous fan(s) speed control - electronic fan(s) (minimum ambient temperature -10.0°C)	CE
Low ambient temperature kit (minimum ambient temperature -20°C)	CL [7]
Partial heat recovery (desuperheater)	HRP [10]
Full heat recovery	HRF [11]
Ductable axial electronic fan(s)	ZAP
Compressor(s) shut off valves	VSC
Single pump shut off valves (valid for both standard and non-ferrous versions)	VSP1
Double pump shut off valves (valid for both standard and non-ferrous versions)	VSP2
Water filter shut off valves (valid for both standard and non-ferrous versions)	VSF
Copper tubes&fins condenser	OCC
Condenser anti-corrosion treatment	OCT [8]
Double setpoint (from MODBUS and/or keyboard)	WE
Water heaters	RH [9]
Compressor (s) acoustic shield (s) (only for CWE026÷140)	AI1
Automatic water filling kit for units with atmospheric water tank	WFA
Brine kit: thermal insulation of hydraulic pipes fittings and pumps for low temperature units	BK
Wind baffles kit	FWB
Threaded water connections (GAS) (only for CWE075÷140; standard for CWE013÷068)	WC2
Stainless steel threaded water connections (GAS) (only for CWE075÷140)	WC2I
Automatic water filling kit	WF
Rubber anti-vibration mountings for no tank units	FA1
Rubber anti-vibration mountings for units with tank	FA2
Remote Panel	ER
Sequencer for modular units	EVG
RS485 Isolator	ISL
Water check valve and interlocked solenoid valve (only for CWE036÷140)	VCI [6]
Wheels kit	FW
Wooden base	PWB
Wooden crate	PWC

- [1] WP option provides EPDM piping and stainless steel water connections. Available only with any no tank configuration.
- [2] WD option provides EPDM piping and stainless steel water connections. Available only with no tank and only with double pump (D2, D3, D5) configurations only.
- [3] To be combined with P2, P3 ,P5 only.
- [4] To be combined with D2, D3, D5 only.
- [5] To be combined with TP, TPI, TP2, TPI2 only.
- [6] To be combined with TANF only.
- [7] Includes electronic fans, electrical switchboard anti-condensation heater and liquid receiver.
- [8] Catapharesis (black) or pre-painted aluminium fins (blue) or hydrophilic fins (blue) or spray pre-painted fins (grey).
- [9] To be combined with pressurized water tank (TP/TP2/TPI/TPI2) only. Contact our company.
- [10] Heating power recovered equal to approximately 20% of the cooling power produced.
- [11] Heating power recovered equal to approximately 100% of the cooling power produced.

MICROPROCESSOR CONTROLLER

It allows to check at any time the operation parameters: condensing pressure, evaporating pressure, inlet and outlet water temperature and all digital inputs and outputs.
In case of partial or total block of the unit, the alarm history shows which security has intervened.
The controller is standard equipped with RS485 port for modbus connections. As option the set up for Lane / Ethernet connection is available, by means of which it is possible to connect the unit to an internet gateway for remote supervision.
The controller's configuration is very easy by using a usb cable connected to client's laptop. This way any firmare update and mapping could be uploaded. No converter is required.

MAIN FUNCTIONS

- Pump on-off (optional)
- Fans operation
- Monitoring of the compressor switching cycles according to the outlet water temperature required
- Regulate pumps operating times (for models with optional double pump)
- Measure and display evaporator inlet and outlet water temperature
- Measure and display condensing and evaporating temperature pressure
- Antifreeze
- On-off remote control
- Alarm history

ALARM MANAGMENT

- Low/high refrigerant pressure transducer
- Water differential pressure switch
- Incorrect phase sequence
- Compressors thermal protection
- Temperature failure probe
- Pressure failure probe
- High water temperature
- Antifreeze
- High and low refrigerant pressure switch
- General alarm available via clean contact in terminal block

OPTION

HOT GAS BYPASS VALVE FOR PRECISE CONTROL OF WATER OUTLET TEMPERATURE

The CWE036÷140 range could be equipped as optional with a precise adjustment system for the outlet water temperature through a hot gas bypass valve.
This configuration provides a very precise control of thermal loads that are less than the minimum capacity of the compressor itself.
This system minimizes the fluctuations of the outlet water temperature with a high precision degree in the range of ± 0.1 K at standard working conditions.

Friulair markets its units in many configurations further than the ones listed in this document. Please contact our sales offices for more information: sales.chiller@friulair.com

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MADE IN ITALY

743000E998_CWE_ER_2022_Rev01

FRIULAIR Chillers

CWE

AIR-COOLED SCROLL COMPRESSOR CHILLERS

from 13 to 140 kW

ERP READY 2021

INDUSTRY 4.0 Ready

CWE

OZONE FRIENDLY R410A

DESCRIPTION

CWE water chillers are air-cooled with axial fans and consist of 14 basic models with cooling capacities from 13 to 140 kW. They are designed to specifically meet industrial application requirements and provide accurate control of chilled water temperatures with absolute reliability in terms of continuous operation. All units are equipped with:

- Hermetic scroll compressors
- Plate evaporator
- Micro-channel aluminium or finned tubes condensers
- Fans with step control
- Microprocessor controller
- Evaporator inlet water strainer

STRUCTURE AND MAINTENANCE

The unit frame is made of galvanized steel with an additional polyester powder coat protection. This makes the range particularly weather resistant and suitable for outdoor installation. All fasteners are made of stainless steel or electro-galvanized. The CWE series has been designed and built to facilitate inspection and maintenance. The canopy is easily removable and allows immediate access to the components inside.

FRIENDLY MAINTENANCE

The particular architecture of the aeraulic section (the fans are confined in a protected volume) allows safely access to the hydraulic section and to the compressor's housing.

The clear arrangement of the components, the simplicity of the refrigerant and hydraulic circuit and the identified cabled in the electrical system, assist the users normal operating schedule.

Control and/or maintenance operations could be carried out when the machine is operating and in total safety.

REFRIGERATION CIRCUIT AND EXPANSION VALVE

Manufactured of top quality materials by skilled personnel according to strict procedures of brazing, and conforms to Directive 2014/68/EU.

- Scroll compressors designed for R410A
- Evaporator made of stainless steel brazed plates
- Micro-channel aluminium plate condenser (013÷053)
- Copper tubes and aluminium fins condensers (068÷140)
- Dehydrator filter
- Flow sight glass with moisture indicator
- High pressure switch with manual reset
- LP alarm semi-automatic reset
- High and low pressure gauges
- Pressure connections for checks and maintenance

HYDRAULIC CIRCUIT

The hydraulic circuit consists of an internal evaporator and pipework. It features a differential pressure switch protecting the evaporator in case of water flow lack. All units can be equipped with an optional multistage centrifugal pump with steel impeller. All pump parts in contact with the fluid aire made from AISI 304 stainless steel compatible with up to 40% water ethylene glycol mixtures. The motor is a 2 poles ventilated asynchronous class F and is IP55 rated. Three different configurations of residual head pressure pumps are available (P2, P3 and P5), as well as double circulation pumps. Both atmospheric and pressurized tank versions are available, as well as non ferrous stainless steel one.

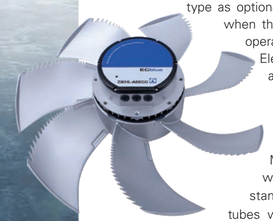
TECHNICAL DETAILS

COMPRESSORS

Scroll compressors hermetically sealed with oil sight glass. They are equipped with a crankcase heater and are protected by a relay phase sequence control (to avoid reverse rotation). They are mounted on rubber shock absorbers. The compressors are the most widely used in the refrigeration industry. They offer high-level EER energy efficiency and are reliable, low noise and boast an almost complete absence of vibrations. An internal thermal protector is installed for standard to prevent them from electrical over currents or excessive working temperatures and hot gas discharge high temperatures.

FANS

Axial fans are directly coupled to three-phase motors and to an external rotor. A safety fan guard is fitted on the air outlet. All fans are equippd with an internal protection with an automatic reset and are class F rated.
The condensation control is step type for standard or continuous speed type as optional. This makes the machine even quieter when the outside temperature is low or when it operates at a reduced load.
Electronic fans variable speed controlled are available with 0-10V signal directly sent from the electronic controller.



CONDENSER

Micro-channel aluminium condenser with protective polyester powder coating standard for CWE 013÷053. Plate copper tubes with aluminium fins condenser for CWE 068÷140. Each condenser is protected by air filters easily removable and cleanable. Various condenser anti corrosion treatments are available.

ELECTRICAL PANEL

The control panel is made from galvanized steel with a polyester powder coated surface, compliant with EN 60204 EC. It consists of a main switch with door-lock (which prevents access to the panel when it is under voltage) and watertight door to access the electronic controls. It includes: a thermo-magnetic motor protectors for compressors, pumps, remote control switches, autotransformer and rotation control device. The cables are identified.

EVAPORATOR

The evaporator is made of stainless steel brazed plates. It is compact and highly efficient.
All exchangers ensure high efficiency of heat exchange between the refrigerant and the fluid to be cooled. This reduces pressure losses. It allows 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 water strainer at the inlet protects the entire hydraulic circuit from dirt entering the machine.

ALTERNATIVE REFRIGERANT GAS

As an alternative to R410A, the CWE range is available with eco-friendly R454B refrigerant gas, with low environmental impact and GWP (global warming potential) of 466.

R454B LOW GWP

		CWE	013	021	026	036	041	046	053	068	075	085	100	110	125	140
PERFORMANCES	[1]															
Cooling capacity		[kW]	15.75	22.47	27.54	39.96	44.38	48.41	54.96	69.04	72.43	78.30	92.14	106.22	123.92	134.85
PERFORMANCES	[2]															
Cooling capacity		[kW]	11.04	15.98	19.76	28.93	32.07	35.06	39.89	50.64	52.83	57.28	67.30	77.75	91.14	99.32
Compressors power input		[kW]	3.23	5.50	6.36	7.28	8.45	9.72	12.09	18.16	17.18	19.87	21.96	25.62	29.71	34.97
Total power input		[kW]	3.61	5.88	6.98	8.82	9.99	11.26	13.63	19.70	18.42	21.11	23.20	27.50	31.59	36.85
Total absorbed current		[A]	6.50	10.15	13.02	15.16	17.19	19.25	23.47	32.29	30.03	34.61	38.12	45.94	52.19	60.13
Energy efficiency	[3]	EER	3.06	2.72	2.83	3.28	3.21	3.11	2.93	2.57	2.87	2.71	2.90	2.83	2.88	2.70
Seasonal energy performance ratio	[*]	SEPR HT	5.14	5.19	5.02	5.05	5.10	5.06	5.01	5.01	5.22	5.12	5.40	5.26	5.31	5.14
Water flow		[l/h]	1 898	2 748	3 398	4 976	5 515	6 030	6 861	8 710	9 086	9 852	11 575	13 373	15 676	17 083
Evaporator pressure drop		[kPa]	31.7	44.0	38.8	53.4	42.7	50.3	45.5	50.4	31.6	36.5	27.8	36.2	24.7	28.9
ELECTRICAL DATA	[3] [4]															
Maximum power input (total)		[kW]	5.16	7.49	9.65	12.95	14.37	15.87	18.15	24.36	24.06	26.90	29.91	35.11	40.67	46.24
Maximum absorbed current (total)		[A]	8.87	12.59	16.67	21.34	23.70	26.17	30.15	39.28	38.38	43.10	48.04	56.91	65.46	74.01
Starting current		[A]	53.80	90.80	99.40	126.40	141.40	148.40	175.40	144.34	143.44	160.80	170.27	202.15	245.43	249.70
Fan power		[kW]	0.19	0.19	0.31	0.77	0.77	0.77	0.77	0.77	0.62	0.62	0.62	0.94	0.94	0.94
Fan current		[A]	0.40	0.40	0.70	1.70	1.70	1.70	1.70	1.70	1.25	1.25	1.25	1.70	1.70	1.70
Fans quantity		[#]	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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	400/3/50
IP protection degree		---	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
TECHNICAL DATA																
Compressors quantity		[#]	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Refrigeration circuits quantity		[#]	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Air flow		[m³/h]	5 100	4 800	7 000	14 000	17 300	17 300	15 900	14 800	19 500	19 500	18 950	23 000	27 000	27 000
Sound pressure level	[5]	[dbA]	43.5	43.5	48.5	55.0	55.0	55.5	55.5	56.0	54.0	54.0	55.0	59.5	60.0	60.0
Water connections size (grooved)		[inch]	1"	1"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	2" VIC	2" VIC	2" VIC	2" VIC	2 1/2" VIC	2 1/2" VIC
Width		[mm]	680	680	680	925	925	925	925	925	1 380	1 380	1 380	1 380	1 380	1 380
Depth		[mm]	1 480	1 480	1 480	1 890	1 890	1 890	1 890	1 890	2 590	2 590	2 590	2 590	3 090	3 090
Height		[mm]	1 480	1 480	1 480	1 615	1 615	1 615	1 615	1 615	1 960	1 960	1 960	1 960	1 960	1 960
Net Weight - standard version		[kg]	230	240	260	360	380	390	410	420	710	710	740	780	920	940
OPTIONS																
Tank capacity TANF		[dm³]	90	90	90	255	255	255	255	255	500	500	500	500	500	500
Pump power input P2		[kW]	0.68	1.00	1.00	1.05	1.05	1.05	1.34	1.34	2.01	2.01	2.01	2.01	2.55	2.55
Pump absorbed current P2		[A]	1.40	2.00	2.00	1.90	1.90	1.90	2.50	2.50	4.10	4.10	4.10	4.10	4.70	4.70
Pump power input P3		[kW]	1.05	1.34	1.34	2.01	2.01	2.01	2.55	2.55	2.55	2.55	2.55	2.55	6.09	6.09
Pump absorbed current P3		[A]	1.90	2.50	2.50	4.10	4.10	4.10	4.70	4.70	4.70	4.70	4.70	4.70	10.60	10.60
Pump power input P5		[kW]	0.91	1.77	1.77	2.55	2.55	2.55	2.55	2.55	3.44	3.44	4.52	4.52	10.12	10.12
Pump absorbed current P5		[A]	1.70	3.30	3.30	4.70	4.70	4.70	4.70	4.70	6.40	6.40	8.70	8.70	17.20	17.20

- [*] Data in accordance 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 the unit without pump
- [4] Data related to most the heaviest condition allowed, without the intervention of the safety devices
- [5] Data referred at 10 m in free field and 1,5 m height

CHECKS AND TESTING

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

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

OPERATING LIMITS

Refer to the operating limits in the last release of the CWE technical manual. >> Contact the company.