

#### MAIN FUNCTIONS

- Pump on and off (optional);
- Fans operation;
- It controls the on and off cycles of compressors according to the water temperature required;
- Allocation of pumps operating times (for models with optional double pump);
- It measures and displays the evaporator water inlet and outlet temperatures;
- It measures and displays the condensing and evaporating pressure;
- NON-simultaneous compressors (manageable up to max. 4 compressors);
- Data rescue system in the event of a power failure;
- Antifreeze;
- On-off remote control;
- Alarm reset.



#### ALARM CONTROL

- low refrigerant pressure switch;
- water differential pressure switch;
- incorrect phase sequence;
- thermal compressors;
- heat pump;
- temperature failure probe;
- pressure failure probe;
- high water temperature;
- anti-freeze.



#### REFRIGERANT

The entire range is developed using R410A coolant which provides security for the high heat transfer coefficients leading to increased efficiency and energy savings.  
The use of such a coolant allows more compact exchangers and a reduction in the unit's size for the same installed power.

#### CHECKS AND TESTING

Each CWE/HWE has undergone testing at full load; 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 CWE/HWE range has been designed and built to facilitate inspection and maintenance.  
The hoods are easily removable, offering immediate access to the parts of the system. The clear arrangement of the components, the simple composition of the refrigerant and hydraulic circuits and the electrical system's cable numbering, assist the users normal control operations.

#### ACCESSORIES AND OPTIONS AVAILABLE

OPTIONS	INITIALS	OPTIONS	INITIALS
Pump P2	P2		
Pump P3	P3	Double water set point - single expansion valve	W1
Pump P5	P5	Double water set point - double expansion valve	W2
Double pump P2	D2	Wind proof protection	WB
Double pump P3	D3	Variable speed continuous fan (electronic control)	EC
Double pump P5	D5	[Room temperature = -10 °C]	
Pressurised tank (max 6 bar)	TP *	Variable speed continuous fan (phase-cut)	CA
Steel atmospheric tank (open cup)	TA *	[Room temperature = -10 °C]	
Non-metallic materials water circuit (steel)	NF *	Combined condensation control (EC+WB fans)	CC
PVC atmospheric tank (available with single pump only)	TANF *	[Room temperature = -20 °C]	
Automatic water filling (pressure circuit)	WF	Cataphoresis treatment for condensers	OEC
Manual bypass water valve	MB	Copper Condensers	OCC
Threaded water connection kit (CWE standard for 013 ÷ 068)	WC2	Remote electronic panel	ER
Anti-freeze evaporator resistors	RA1	Rubber shock absorbers	FA1
Anti-freeze evaporator and pump resistors	RA2	Rubber-type vibration dampers (with tank and pump)	FA2
Anti-freeze evaporator, pump and tank resistors	RA3	Wheels	FW
Electrical panel anti-condensation resistor	RS	Packaging wooden base	BS
Liquid refrigerant line solenoid valve (standard for CWE 075÷140)	VL	Wooden crate packaging	CR

\* to create an option between P2, P3, P5, D2, D3, D5

Remote control panel to be inserted remotely from the chiller, with the identical functions.  
LAN port Interface for control connection and centralised supervision systems.

#### Reference Conditions

Technical details for the HWE range (in heating mode) refer to the following operating conditions:

- Water inlet temperature 40 °C
- Water outlet temperature 45 °C
- Condenser air inlet temperature 7 °C

# FRIULAIR®

## Chillers



# CWE/HWE

AIR-COOLED WATER CHILLERS AND HEAT PUMPS,  
WHIT AXIAL FANS AND SCROLL COMPRESSORS  
FROM 13 KW TO 141 KW

# FRIULAIR®

## Chillers

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MADE IN ITALY

The new range of CWVE/ HWE water chillers and heat pumps are air-cooled with axial fans and consist of 19 basic models, with cooling capacities from 13 to 141 kW each designed for outdoor installation.

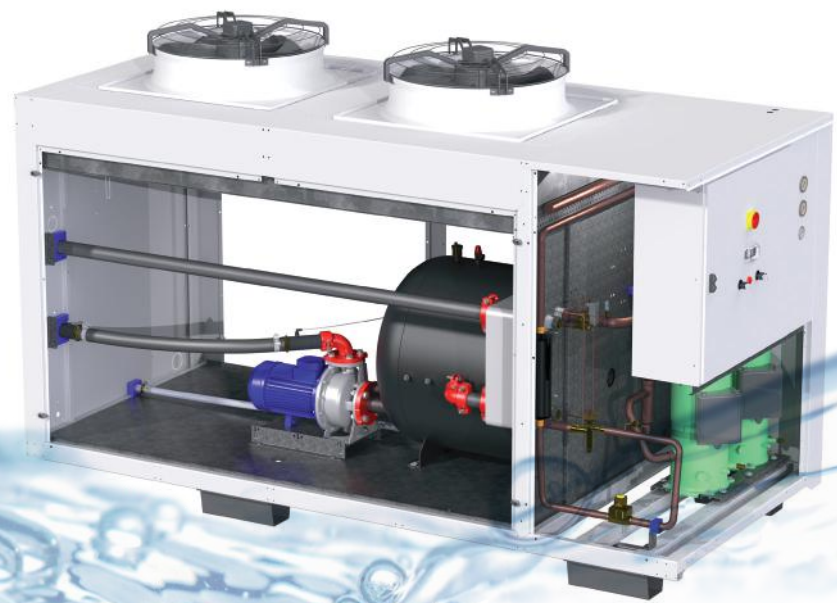
They are designed to specifically meet industry application requirements and provide accurate control of chilled and hot water temperatures with absolute reliability of continuous operation.

All units are equipped with:

- hermetic scroll compressors;
- ecological R410A refrigerant;
- Plate evaporator;
- finned tubes condensers;
- fans with step control;
- microprocessor controller;
- stainless steel filters for condensers;
- water inlet filter for the evaporator

**STRUCTURE**

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 stainless steel or electro-galvanized. The panels are easily removed, allowing access inside the unit for maintenance and repair. The front compressor compartment is independent from the condensing coil, so the operator can access them safely even while the machine is in operation. The hydraulic circuit is easily accessible for troubleshooting and maintenance.



**COOLING CIRCUIT AND EXPANSION VALVE**

Manufactured from top quality materials by skilled personnel according to strict procedures of brazing, and conforms to Directive 97/23. It comprises:

- Scroll compressors designed for R410A;
- Evaporator made from AISI 316 stainless steel brazed plate, copper and aluminium condensers;
- Filter dryer;
- Flow sight glass with moisture indicator;
- External equalisation thermostatic expansion valve which regulates the injection of liquid refrigerant into the evaporator. The injection is a response to the refrigerant overheating.

**HYDRAULIC CIRCUIT**

The hydraulic circuit consists of an internal evaporator and pipework. It features a differential pressure monostat that protects the evaporator in case of a no water flow. All units can be equipped with an optional multi stage centrifugal pump with steel impeller. All parts which are in contact with the fluid are AISI 304 stainless steel with mechanical seals in carbon/ceramic/EPDM (standard) which makes it possible to use water containing up to 30% ethylene glycol. The motor is asynchronous 2 poles ventilated with insulation class F, and IP55 protection. It is possible to select pumps with three different levels of pressure head (P2, P3 and P5). Double circulation pumps are also available. The water tank is available for all models in both atmospheric and pressurised versions and with the option of stainless steel.



**TECHNICAL DETAILS**

**COMPRESSORS**

Scroll compressors with hermetically sealed oil sight glass. These 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 air conditioning and refrigeration industry. They offer a high level of energy efficiency (EER), reliability, low noise and vibrations. They are internally equipped with non-return valves, which protect against over-pressure resulting from the refrigerating circuit if the compressor is stopped. There is also an internal thermal protector, which protects them from electrical over-current or excessive running temperatures and/ or from the flow of the hot gas.



**FANS**

Axial fans are directly coupled to three-phase 4 pole motors and to an external rotor. A safety fan guard is fitted on the air outlet. All the fans are equipped with internal thermal protection with automatic reset and are insulation class F. The condensation control is in stages (standard) or with continuous speed adjustment (optional). This makes the machine even quieter when the outside temperature is low or when it operates at a reduced load. Optionally available are EC type fans with a controlled variable speed which use a 0-10 V signal sent from the electronic controller.



**CONDENSER**

Manufactured from plated copper tubes with aluminium fins. All condensers are protected by stainless steel filters which are easily removable and washable. A cataporesis treatment to protect the condensing coils from corrosion is also available.

**TECHNICAL DATA CWVE**

Model		013	021	026	036	041	046	053	068	075	076	085	086	100	110	111	125	126	140	141
Cooling capacity <sup>(1)</sup>	[kW]	13,77	19,68	25,58	4,28	39,49	46,32	52,50	65,97	72,41	70,05	78,29	82,31	92,11	106,18	109,86	123,87	124,12	134,82	134,91
Compressors power input <sup>(1)</sup>	[kW]	3,48	5,01	7,12	0,86	10,05	10,34	12,70	17,22	16,05	15,49	18,65	21,68	20,71	23,89	26,62	27,98	29,10	33,21	33,68
Total power input <sup>(1)(2)</sup>	[kW]	3,75	5,28	7,74	1,36	11,99	12,28	14,64	19,16	17,29	16,73	19,89	22,92	21,95	25,77	28,50	29,86	30,98	35,09	35,56
Total absorbed current <sup>(1)(2)</sup>	[A]	6,74	9,77	15,18	7,22	20,09	20,73	24,98	31,85	28,37	27,98	32,84	36,93	36,30	43,49	46,47	49,70	52,83	57,57	58,66
EER (pump excluded) <sup>(1)</sup>	-	3,67	3,73	3,31	4,32	3,29	3,77	3,58	3,44	4,19	4,19	3,94	3,59	4,20	4,12	3,85	4,15	4,01	3,84	3,79
Water flow <sup>(1)</sup>	[l/ h]	2.368	3.385	4.400	736	6.792	7.968	9.030	11.346	12.454	12.049	13.466	14.157	15.843	18.263	18.896	21.306	21.348	23.189	23.204
Pressure drop <sup>(1)</sup>	[kPa]	47	64	62	248	62	84	75	84	55	52	64	70	49	64	68	43	43	50	50
Maximum power input (total) <sup>(2)(3)</sup>	[kW]	5,1	7,2	9,7	14,8	16,3	18,6	18,6	24,1	24,1	23,4	26,9	31,8	29,9	35,1	39,9	40,7	44,8	46,2	48,3
Maximum absorbed current (total) <sup>(2)(3)</sup>	[A]	9,0	12,7	17,7	24,2	26,6	30,7	30,7	39,2	38,4	37,8	43,1	50,6	48,1	57,0	64,3	65,5	73,7	74,1	78,9
Starting current <sup>(2)(3)</sup>	[A]	58,8	90,8	100,4	144,9	148,9	179,9	179,9	215,9	214,5	214,5	245,8	282,5	270,3	290,2	290,4	244,5	270,4	250,7	301,4
Fan power	[kW]	0,14	0,14	0,31	0,97	0,97	0,97	0,97	0,97	0,62	0,62	0,62	0,62	0,62	0,94	0,94	0,94	0,94	0,94	0,94
Fan current	[A]	0,38	0,38	1,20	1,93	1,93	1,93	1,93	1,93	1,25	1,25	1,25	1,25	1,25	1,70	1,70	1,70	1,70	1,70	1,70
Number of fans	[#]	2	2	2	2	2	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	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	IP44	IP44	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
Refrigerant	-	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Compressor type	-	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Evaporator type	-	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates	Brazed plates
Condenser type	-	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins	Tube&fins
N° of compressors	[#]	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	2	1	2	1
N° of refrigerant circuits	[#]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Air flow	[m³/h]	5.100	4.800	4.800	14.000	17.300	17.300	15.900	14.800	19.500	19.500	19.500	19.500	18.950	23.000	18.950	27.000	23.000	27.000	27.000
Sound pressure level <sup>(4)</sup>	[dB(A)]	43,5	43,5	43,5	55,0	55,0	55,5	55,5	56,0	54,0	53,0	54,0	51,5	55,0	59,5	59,0	60,0	59,0	60,0	59,5
Water connections diameter	[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" VIC	2" VIC	2" VIC	2" VIC	2" VIC	2" VIC	2" VIC
Width	[mm]	680	680	680	925	925	925	925	925	1380	1380	1380	1380	1380	1380	1380	1380	1380	1380	1380
Depth	[mm]	1550	1550	1550	1890	1890	1890	1890	1890	2590	2590	2590	2590	2590	2590	2590	3090	2590	3090	3090
Height	[mm]	1405	1405	1405	1580	1580	1580	1580	1580	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960
Weight	[kg]	250	270	270	380	380	400	420	420	650	650	670	670	700	730	730	820	820	850	850
Tank capacity - Option	[dm³]	110	110	110	200	200	200	200	200	400	400	400	400	400	400	400	400	400	400	400
Expansion vessel capacity - Option	[dm³]	8	8	8	12	12	12	12	12	18	18	18	18	18	18	18	18	18	18	18
P2 Pump power input - Option	[kW]	0,68	1,00	1,00	1,60	1,60	1,60	1,45	1,45	2,22	2,22	2,22	2,22	2,22	2,22	2,22	2,87	2,87	2,87	2,87
P2 Pump absorbed current - Option	[A]	1,40	2,00	2,00	1,90	1,90	1,90	2,60	2,60	4,30	4,30	4,30	4,30	4,30	4,30	4,30	5,00	5,00	5,00	5,00
P3 Pump power input - Option	[kW]	1,60	1,45	1,45	2,09	2,09	2,09	2,87	2,87	2,87	2,87	2,87	2,87	2,87	2,87	2,87	6,70	6,70	6,70	6,70
P3 Pump absorbed current - Option	[A]	1,90	2,60	2,60	4,00	4,00	4,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	11,80	11,80	11,80	11,80
P5 Pump power input - Option	[kW]	0,75	1,30	1,30	2,20	2,20	2,20	2,20	2,20	3,00	3,00	3,00	3,00	4,00	4,00	4,00	11,00	11,00	11,00	11,00
P5 Pump absorbed current - Option	[A]	2,50	3,50	3,50	4,60	4,60	4,60	4,60	4,60	6,30	6,30	6,30	6,30	8,10	8,10	8,10	18,80	18,80	18,80	18,80

(1) Data referred to: water temp. in/out: 20/15°C – Ambient air temp. 25°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. Friulair S.r.l. reserves the right to make technical changes without prior notice, errors and omissions excepted.

**EVAPORATOR**

The Evaporator is made from AISI 316 stainless steel brazed plate. It is compact and highly efficient.

All installed 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 filter at the inlet protects the entire hydraulic circuit from dirt entering the machine.



**ELECTRICAL PANEL**

The panel is manufactured from galvanized steel with a polyester powder coated surface, compliant with EN 60204 EC. It includes 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: thermo-magnetic motor protectors for compressors, pumps, remote control switches, autotransformer and rotation control device. The cables inside the cabinet are numbered. For easy use, an ON / OFF switch on the electrical panel door is provided.

There is an optional 0-10 V dimming signal for fan speed; panel heat resistance for harsh climates and ventilation (natural or forced by internal fans) for summer/ tropical climates.

**MICROPROCESSOR FOR AUTOMATIC CONTROL OF THE UNIT**

The entire range is equipped with a single type of electronic controller (to help the user manage their spare parts stock). It is one of the leading brands on the market. There are several customised options available. It allows the user to view the unit's status at any time, to control the water temperature settings and the effective water temperature and to indicate the alarms that were activated. If the unit is partially or totally blocked it indicates which safety switch has activated.

It is possible to read and set data from a customer's remote PC using the chiller's IP address. A standard RS485 port is installed and a connection via LAN/ Ethernet is optional.

