

### OPTIONS

P2 Pump	P2
P3 Pump	P3
Pressurized water tank	TP
Non ferrous pressurized water circuit (stainless steel water tank)	TPI [1]
Condensers anti-corrosion treatment Electrofin type	OEC
Compressors shut off valves	VSC
Condenser(s) air filter(s)	FP
Free cooling continuous fan(s) speed control - electronic fan(s)	FCE
Partial heat recovery (desuperheater)	HRP [2]
Electrical switchboard anti-condensation heater	RS
230V electric service socket (in the electric cabinet)	EBS
Gateway for remote communication	ENB
Compressors softstarters	SFS [3]
Electronic controller sun/rain protection	SRP
Compressors acoustic shields	AI1
Flanged water connections kit (EN1092-1)	WC1
Threaded water connections kit (GAS)	WC2
Stainless steel threaded water connections kit (GAS)	WC2I
Control panel roof kit	FPR
Rubber anti-vibration mountings for no tank units	FA1
Rubber anti-vibration mountings for units with tank	FA2
Remote panel kit	ER
Wooden base	PWB
Barrier bag	PBB

- [1] This option refers only to the stainless steel water tank. Other components (free cooling water manifolds, 3-way valve and pipes) are in cast iron and carbon steel.
- [2] Heating power recovered equal to approximately 20% of the cooling power produced.
- [3] Not available on all models. Contact our company.

### OTHER RANGES AVAILABLE IN OUR CATALOGUE



#### QBE

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

#### CWE/HWE

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

#### CFT

100 to 300kW  
Air-cooled chillers  
with scroll compressor

#### CDC

300 to 1200 kW  
Drycoolers  
also adiabatic system available



# CWB FC

AIR-COOLED CHILLERS from 80 to 240 kW  
with integrated free cooling

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](mailto:sales.chiller@friulair.com)

**FRIULAIR®**  
Chillers

via Cisis, 36 - 33052 Cervignano del Friuli (Ud) Italy  
Tel. +39 0431 939416 - Fax. +39 0431 939419  
[friulair@friulair.com](mailto:friulair@friulair.com) - [www.friulair.com](http://www.friulair.com)

MADE IN ITALY

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# CWB FC



## DESCRIPTION

The CWB FC series is designed specifically for industrial processes. Energy saving and reduced cooling costs are the key benefits of a free cooling integrated chiller. Chiller and free cooling hydraulic sections are completely separated: this allows to maximize the regulation of the two working modes. The range includes 8 models with cooling capacity from 80 kW to 240 kW and it is designed for outdoor installations.

## TECHNICAL DETAILS

### REFRIGERATION CIRCUIT

- Manufactured conforming to PED directive 2014/68/EU
- Electronic expansion valve
- Refrigerant solenoid valve
- Sight glass flow indicator
- High and low pressure switch
- High and low pressure gauges and plugs

### COMPRESSORS

- Scroll hermetic compressors
- Quiet operation and high efficiency
- Mounted on rubber anti-vibration blocks
- Crankcase heaters as standard
- Phase sequence protection device

### CONDENSERS

- Microchannel aluminium coils
- Low refrigerant charge
- Free from risk of galvanic corrosion

### FANS (CONDENSER SECTION)

- Axial fans with electronic speed regulation
- Equipped with protection grid and class F insulation

### EVAPORATOR

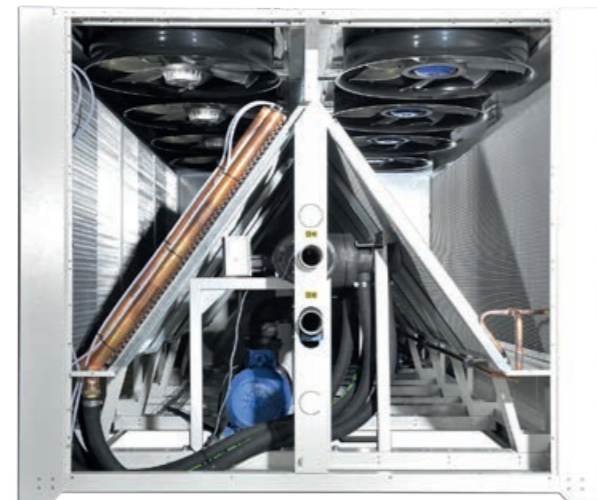
- Copper brazed stainless steel plates heat exchanger
- Compact size with high efficiency
- Antifreeze protection managed by the electronic controller
- Equipped with differential pressure switch

### HYDRAULIC CIRCUIT

- Standard models are equipped with a stainless steel brazed plates evaporator without tank and pump
- Three way valve and actuator to optimize the free cooling mode
- Low and medium head pressure pumps as optionals
- Temperature probes for setpoint control
- Suitable for up to 50% ethylene glycol mixtures

### FREE COOLING SECTION

- Copper tubes and aluminium fins water coils
- On / off axial fans



## FREE COOLING SYSTEM

The free cooling mode completely or partially supplies the cooling capacity performed by the refrigerating cycle.

When the ambient temperature is at least 5K less than the water return temperature, the free cooling coils can pre or fully cool the water.

The free cooling achieves more energy saving once the difference between the leaving water temperature and the ambient one increases.

### SUMMER MODE - FREE COOLING OFF

In summer and in general when the ambient temperature is higher than the return water temperature from the plant, the CWB FC units work like a traditional chiller.

### INTERMEDIATE MODE - FREE COOLING + CHILLER

When the ambient temperature is lower than the return water temperature, the CWB FC operates in partial free cooling. The return water from the system flows first through the free cooling condensers and then through the evaporator. If the cooling capacity provided from the free cooling is not compliant with the cooling capacity required, the electronic controller turns the compressors on.

### WINTER MODE - 100% FREE COOLING

During the cold seasons and when the ambient temperature

is lower than the temperature of the water returning from the plant, the CWB FC can work in free cooling mode up to 100%.

	CWB FC	100	135	150	160	190	225	255	285
<b>PERFORMANCES 15/10@30</b> [1]									
Cooling capacity	[kW]	86.06	109.26	119.67	134.71	158.66	194.13	228.94	244.54
<b>PERFORMANCES 12/7@35</b> [2][3]									
Cooling capacity	[kW]	76.83	97.60	106.85	119.98	141.24	173.23	203.43	217.52
Compressors power input	[kW]	17.79	26.84	31.50	40.02	38.94	55.52	56.48	69.14
Total power input	[kW]	21.69	30.74	35.40	43.92	44.79	61.37	64.28	76.94
Total absorbed current	[A]	35.72	51.02	58.01	70.35	71.90	99.04	109.10	125.95
Energy efficiency	EER	3.54	3.17	3.02	2.73	3.15	2.82	3.16	2.83
Seasonal energy performance ratio	SEPR HT	5.00	5.04	5.01	5.43	5.23	5.27	5.44	5.44
Water flow	[l/h]	13 214	16 788	18 378	20 637	24 294	29 795	34 990	37 414
Evaporator pressure drop	[kPa]	18	28	33	21	29	42	32	36

<b>ELECTRICAL DATA</b> [3][4]									
Maximum power input (total)	[kW]	32.57	42.69	48.26	58.47	64.71	81.46	89.93	100.50
Maximum absorbed current (total)	[A]	51.86	68.38	76.93	92.70	101.87	130.43	147.22	163.49
Starting current	[A]	174.09	248.35	252.62	259.51	265.67	356.96	346.93	386.07
Fan power (chiller side)	[kW]	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
Fan current (chiller side)	[A]	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16
Fans quantity (chiller side)	[#]	2	2	2	2	3	3	4	4
Fan power (free cooling side)	[kW]	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
Fan current (free cooling side)	[A]	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
Fans quantity (free cooling side)	[#]	2	2	2	2	3	3	4	4
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
IP protection degree	---	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54

<b>TECHNICAL DATA</b>									
Compressors quantity	[#]	2	2	2	2	2	2	2	2
Refrigerating circuits quantity	[#]	1	1	1	1	1	1	1	1
Air flow (chiller side)	[m³/h]	44 000	44 000	44 000	44 000	66 000	66 000	88 000	88 000
Air flow (Free cooling side)	[m³/h]	44 000	44 000	44 000	44 000	66 000	66 000	88 000	88 000
Sound pressure level	[5] [dBa]	60.5	60.5	59.5	61.5	61.5	61.5	61.5	61.5
Water connections diameter (Grooved)	[pollici]	3"	3"	3"	3"	3"	3"	3"	3"
Width	[mm]	2 204	2 204	2 204	2 204	2 204	2 204	2 204	2 204
Depth	[mm]	3 004	3 004	3 004	3 004	4 004	4 004	5 004	5 004
Height	[mm]	1 982	1 982	1 982	1 982	1 982	1 982	1 982	1 982
Net weight - standard version	[kg]	1 755	1 755	1 775	1 775	2 225	2 245	2 635	2 635

<b>FREE COOLING PERFORMANCES AT REQUESTED CONDITIONS</b>									
Cooling capacity	[6] [kW]	79.06	85.90	115.70	119.92	154.78	167.38	225.16	230.06
% of nominal cooling capacity	[1] ---	92	79	97	89	97	86	98	94

<b>FREE COOLING ON 100%</b>									
Cooling capacity	[7] [kW]	86.06	109.26	119.67	134.71	158.66	194.13	228.94	244.54
Total power input	[kW]	3.80	3.80	3.80	3.80	5.70	5.70	7.60	7.60
% reduction of total power input	[1] ---	-82	-87	-89	-91	-86	-90	-87	-89
Total FC ambient temperature	[°C]	-1.30	-4.00	-0.50	-1.70	-0.30	-2.10	-0.10	-0.70

• [\*] Data in accordance with European Regulation (EU) 2016/2281 for ecodesign requirements with free cooling mode off.

• [1] Data referred to: water temp. in/out: 15/10C - ambient air temp. 30°C - Ethylene Glycol 30%

• [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 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

• [6] Performance at: 0°C ambient temperature, 15°C inlet water temperature and 30% ethylene glycol

• [7] Performance at: 15°C inlet water temperature and 30% ethylene glycol

## FREE COOLING REFERENCE CONDITIONS

- Ambient temperature: 0°C
- Inlet water temperature: 15°C
- Ethylene glycol: 30%

## WORKING LIMITS

Refer to the operating limits in the last release of the CWB FC technical manual.

>> Contact the company.

