OPTIONS

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
Electronic thermostatic valve		VE
Compressor(s) shut-off valves on suction and discharge side		VSC
Evaporator anti-freeze heater		RA1
Evaporator and pump anti-freeze heaters		RA2
Evaporator, pump and tank anti-freeze heaters	[1]	RA3
Condenser anticorrosion treatment (cataphoresis type)	[2]	OCT
Compressor(s) acoustic shield(s)		AI1
Single P3 Pump		P3
Non ferrous atmospheric water circuit (plastic water tank)		TANF
Cold water tank configuration		TPC
No tank configuration		T0
No pump configuration		P0
Additional atmospheric water tank kit (glycol charge)		TA
Double atmospheric water tank kit (glycol charge)		2TA
Disconnector tank configuration with P2 pump (pressurized carbon steel tank included)		X2
Disconnector tank configuration with P3 pump (pressurized carbon steel tank included)		X3
Disconnector tank configuration with P2 pump (non ferrous atmospheric water tank included)		X2 TANF
Disconnector tank configuration with P3 pump (non ferrous atmospheric water tank included)		X3 TANF
Mechanical water level switch	[3]	LSM
Pump shut-off valves		VSP
Water strainer shut-off valves		VSF
P2 configuration for glycol up to 50%	[4]	SP2G
P3 configuration for glycol up to 50%	[4]	SP3G
Partial heat recovery (desuperheater)	[6]	HRP
Full heat recovery	[7]	HRF
Electrical switchboard anti-condensation heater		RS
Remote Panel Kit		ER
Threaded water connections kit (GAS)	[5]	WC2
Stainless steel threaded water connections kit (GAS)	[2]	WC2I
Rubber anti-vibration mountings kit (no tank units)		FA1
Rubber anti-vibration mountings kit (units with tank)		FA2
Wheels kit		FW
Wooden base		PWB
Wooden crate		PWC

- [1] Available only with pressurized tank
- [2] Option available for CEN 052÷096
- [3] To be combined with TANF only
- [4] Standard admissible propylene glycol mixture up to 40% with minimum outlet water temperature -10°C
- [5] Option available for CEN 052÷096 - Standard for CEN010÷046
- [6] Heating power recovered equal to approximately 20% of the cooling power produced.
- [7] Heating power recovered equal to approximately 100% of the cooling power produced.

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

7430DEP102_CEN_EN_2022_Rev01

OTHER RANGES AVAILABLE IN OUR CATALOGUE

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

CFT
100 to 300 kW
Air-cooled chillers
with scroll compressors

CWV
280 to 1200 kW
Air-cooled chillers
with screw compressors

CDC
300 to 1200 kW
Drycoolers
also adiabatic system available

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

MADE IN ITALY

FRIULAIR Chillers

CEN

AIR-COOLED SCROLL COMPRESSOR CHILLERS

from 10 to 96 kW

SEPR HT READY ERP 2021

for wineries and breweries

INDUSTRY Ready 4.0

CEN

OZONE FRIENDLY R410A

DESCRIPTION

The new CEN range is specifically designed to meet the application requirements of wineries by offering precise control of refrigerated water temperature while operating over long time periods with varying load demands.
The range includes 14 models with cooling capacities from 10 to 96 kW.
It is designed for outdoor installation, with specific standard components especially indicated at low temperatures.

FRAME AND STRUCTURE

All frame and cabinet cover material is made of galvanized steel that is then powder coated, making the CEN suitable for outdoor installation and for protection in harsh environments. The compressor cabinet is separate from the fan's section and is accessible on three sides to make control and maintenance easy. The hydraulic section is also easily accessible.

EASY MAINTENANCE

The CEN series has been designed and built to facilitate inspection and maintenance. The canopy is easily removable and allows immediate access to the components inside. 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.

FRIENDLY MAINTENANCE

REFRIGERATION CIRCUIT

It is manufactured from top quality materials and comply with the 2014/68/EU Directive. It includes dehydrator filter, liquid solenoid valve, liquid sight glass flow, thermostatic expansion valve sized to satisfy water setpoint 7°C / -8°C, high pressure safety switch with manual reset and low pressure transducer with semi-automatic reset, HP and LP refrigerant gauges, pressure plugs.

PERFORMANCES [1]			CEN010		CEN014		CEN019		CEN025		CEN027		CEN033		CEN038		CEN046		CEN052		CEN056		CEN063		CEN076		CEN088		CEN096	
Ambient temperature		[°C]	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Evaporator inlet water temperature		[°C]	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0	12.0	-5.0
Evaporator outlet water temperature		[°C]	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0	7.0	-8.0
Ethylene glycol percentage		---	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%	0%	40%
Cooling capacity		[kW]	11.04	6.37	15.98	9.01	19.76	11.53	28.93	16.65	32.07	18.58	35.06	20.38	39.89	23.47	49.88	29.39	51.81	30.33	55.90	32.80	62.66	36.46	74.57	43.03	88.21	50.87	95.74	55.60
Compressors power input		[kW]	3.23	2.89	5.50	4.61	6.36	5.29	7.28	6.51	8.45	7.50	9.72	8.57	12.09	10.55	18.16	15.95	17.08	15.26	19.72	17.55	21.51	19.21	25.31	22.53	29.44	26.26	34.59	30.73
Total power input		[kW]	4.09	3.75	6.61	5.72	7.71	6.64	9.71	8.94	10.88	9.93	12.15	11.00	14.64	13.10	21.04	18.83	19.80	17.98	22.44	20.27	24.23	21.93	29.21	26.43	33.75	30.57	38.90	35.04
Total absorbed current		[A]	7.50	6.99	11.55	10.30	14.42	13.38	16.76	15.65	18.79	17.43	20.85	19.18	25.47	23.30	34.79	31.53	32.58	29.92	37.09	33.97	40.16	36.82	49.10	45.22	56.59	52.07	64.36	58.78
Energy efficiency rating	[2]	EER	3.06	1.95	2.72	1.81	2.83	1.95	3.28	2.07	3.21	2.06	3.11	2.02	2.93	1.94	2.53	1.68	2.83	1.84	2.67	1.75	2.75	1.78	2.74	1.76	2.82	1.81	2.63	1.71
Seasonal energy efficiency rating	[*] [2]	SEPR HT	5.14	-	5.19	-	5.02	-	5.05	-	5.10	-	5.06	-	5.01	-	5.01	-	5.19	-	5.08	-	5.20	-	5.12	-	5.22	-	5.05	-
Water flow		[l/h]	1 899	2 083	2 748	2 943	3 399	3 769	4 977	5 440	5 516	6 072	6 031	6 662	6 861	7 670	8 579	9 603	8 912	9 913	9 614	10 720	10 778	11 915	12 825	14 062	15 172	16 623	16 468	18 171
Available pressure		[kPa]	154	133	194	166	165	124	186	147	180	139	154	104	185	110	181	140	217	172	195	142	156	93	140	106	218	182	197	152
ELECTRICAL DATA [3]																														
Maximum power input (total)		[kW]	5.64		8.22		10.38		13.84		15.26		16.76		19.16		25.70		25.54		28.38		31.39		37.13		43.10		48.67	
Maximum absorbed current (total)		[A]	9.87		13.99		18.07		22.94		25.30		27.77		32.15		41.78		41.08		45.80		50.74		60.51		70.26		78.81	
Starting current		[A]	54.80		92.20		100.80		128.00		143.00		150.00		177.40		146.84		146.14		163.50		172.97		205.75		250.23		254.50	
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	
Pump power input		[kW]	0.48		0.73		0.73		0.89		0.89		0.89		1.01		1.34		1.48		1.48		1.48		2.02		2.43		2.43	
Pump absorbed current		[A]	1		1.40		1.40		1.60		1.60		1.60		2.00		2.50		2.70		2.70		2.70		3.60		4.80		4.80	
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	
Sound pressure level	[4]	[dbA]	43.5		43.5		48.5		55		55		55.5		55.5		56		54		54		55		59.5		60		60	
Water connections diameter	[5]	[inch]	1"		1"		1"		1 1/2"		1 1/2"		1 1/2"		1 1/2"		1 1/2"		2"		2"		2"		2"		2"1/2		2"1/2	
Tank capacity		[dm3]	80		80		80		100		100		200		200		200		300		300		300		300		300		300	
Expansion vessel capacity		[dm3]	8		8		8		12		12		12		12		12		18		18		18		18		18		18	
Width		[mm]	685		685		685		925		925		925		925		925		1.380		1.380		1.380		1.380		1.380		1.380	
Depth		[mm]	1.455		1.455		1.455		1.890		1.890		1.890		1.890		1.890		2.590		2.590		2.590		2.590		3.090		3.090	
Height		[mm]	1.456		1.456		1.456		1.580		1.580		1.580		1.580		1.580		1.960		1.960		1.960		1.960		1.960		1.960	
Net Weight - standard version		[kg]	330		340		360		490		510		530		550		560		880		880		910		950		1 110		1 130	

NOTES

[*] Data in accordance with European Regulation (EU) 2016/2281 for eco-design requirements
* [1] Performances with pump P2 selection
* [2] Data referred to the unit without pump
* [3] Data related to the heaviest conditions allowed without the intervention of the safety devices
* [4] Data referred to 10m and at a height of 1,5 m in open field
* [5] For CEN 010 ÷ 046: threaded connections
CEN052 ÷ 096: grooved connections

OPERATING LIMITS

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

ALTERNATIVE REFRIGERANT GAS

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

R454B LOW GWP

CHECKS AND TEST

Each CEN is tested with full load. The following tests are also carried out:

- Correct components assembly
- Pressurization of the refrigeration circuit to test for leaks using helium leak–searcher;
- Hydraulic circuit pressing
- Electric tests in compliance with standard EN60204
- Protections and safety devices correctly working
- Electronic controller correctly working;
- Thermal performance and electric quantities measurement.

TECHNICAL DETAILS

HYDRAULIC CIRCUIT

All units are equipped with circulation pump, ferrous pressure tank of the "hot" type, safety valve, expansion vessel, water pressure gauge, recharging valve.
Thermal insulation for hydraulic pipes, fittings and pumps particularly suitable for low temperatures.
Centrifugal pump P2 type, with steel impeller, 2-pole, self-ventilated, class F insulation and IP55.

Suitable for working with propylene glycol up to 40% concentration and temperatures of -10 ° C. Other hydronic configurations are available in the options table.

COMPRESSOR

Of hermetic scroll type. They are all equipped with heating resistance, mounted on rubber anti-vibration blocks, protected by an electronic device controlling phase sequences to avoid any contrary rotation and complete with integrated ampere-thermic protector and filled with lubricant oil.

CONDENSER

Micro-channel aluminium condenser with protective polyester powder coating standard for CEN 010÷038.
Condenser manufactured of plated copper tubes with aluminium fins for CEN 046÷096. All units are equipped with condenser air filters with aluminum mesh and galvanized structure.
They can be easily removed for assistance and cleaning. Cataphoresis anti-corrosion treatment is available as an option on the entire range of condensers.

FANS

Fans with 4 pole, axial motors, with curved blades to improve rotation speed and decrease noise, with protective grid. Direct drive motor with internal thermal protector and IP 54.
Standard step condensation control; phase cut or electronic fan versions are available as an option.

EVAPORATOR

Stainlesteel brazed plate heat exchanger. Thermally insulated and protected by water filter connected at the inlet.
Sized for low water temperature operation.

CONTROL PANEL

Control panel complying with EN 60204 CE, with door lock disconnector (blocks access to the control panel when it is live) and watertight door to access the electronic control.
It includes circuit breaker protectors for compressors and pump, contactors, autotransformers, compressor rotation direction control devices; the cables are identified.

MICROPROCESSOR CONTROLLER

It allows to check at any time the operation parameters: condensing pressure, evaporating pressure, inlet and outlet temperatures and all digital inputs and outputs. In case of partial or total stop of the unit, the alarm history is available and allows to know which security device has tripped. 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. The controller's configuration is very easy by using a usb cable. 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
- Measure and display evaporator inlet and outlet water temperature
- Measure and display condensing and evaporating temperature pressure
- Antifreeze
- On-off remote control
- Alarm history
- General alarm remote control

ALARM MANAGMENT

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