

Uniflair BCEF - Integrated Free Cooling



Range

Cooling capacity: 400 ÷ 1100 kW

Available versions

- low noise

Refrigerant R-134a
"oil-free" centrifugal compressors with magnetic bearings

Standard Features

- Exclusive Uniflair free-cooling system completely managed by the microprocessor control
- Self-supporting frame in galvanized steel with panels finished in epoxy powders (colour RAL9022)
- Between one to three "oil free" centrifugal compressors with magnetic bearings equipped with:
 - internal thermal protection
 - protection and control of the rotation axis position
 - brushless synchronized DC motor
 - integrated control system
 - speed control with inverter
 - soft start start-up
 - phase sequence control
 - pre-rotation valve
 - temperature and pressure sensors
 - 2 centrifugal compression stages
 - anti-vibration kit
- Soundproofing enclosures for compressor/s
- Single refrigerant circuit conforming to EC standards (PED 97/23/ CE) with copper tubing including: filter dryer, liquid sight glass, electronic expansion valve controlled by a level sensor, discharge and suction taps on the compressor, pressure switches, high and low pressure transducers and gauges
- By-pass line for vacuum start-up with high pressure ratio
- Flooded evaporator featuring an integrated de-mister to prevent the formation of droplets: the exchanger is insulated with closed-cell expanded polyurethane
- Differential water pressure switch
- Air side exchange coil with aluminum fans and internally grooved copper tubes
- Acoustic-composite fans: Sickle-blade axial fans, statically and dynamically balanced, made from composite materials for high efficiency and low acoustic impact, with safety protection grilles
- **Modulating condensation control with continuous regulation of the fans speed**
- Electric panel conforming to EC standards (2006

/95 /EC and EMC 2004/108/EC directives) with EMC integrated filter for protection of the harmonics, maximum internal temperature control, absorbed current control auxiliary transformer, general auxiliary cut-off switch fuses on the compressors and remote control cut-off switches

- Line reactance for each compressor to stabilize the power supply
- Phase sequence control and minimum / maximum power supply and voltage
- **Free-cooling pump regulated by microprocessor control**
- Microprocessor control system including:
 - **continuous control of the cooling capacity by means of an inverter and IGV (Inlet Guide Vane)**
 - local user terminal with external display
 - **outlet chilled water temperature regulation by means of an exclusive PID algorithm**
 - **integrated LAN card for connecting more than one unit to the local area network**
 - acquisition and management of main electrical data
 - clock card
- Microprocessor control system in addition allows:
 - USB card for easy download of the operating parameters
 - management of double set-point from remote control
 - free-contact for general alarm and 2 for addressable alarms
 - remote ON-OFF switch
 - **integrated RS485 serial card for direct connection to external BMS**
 - **direct interface with serial BMSs with Modbus protocol**
 - interface with main BMS protocols, such as Bacnet, Lonworks, Trend, Metasys, SNMP/TCP-IP and KNX



TECHNICAL DATA								
BCEC MODEL		0301A	0401A	0532A	0632A	0752A	0903A	1103A
Power Supply	V/ph/Hz	400/3/50						
Compressor/s	nr x model	1 x oil free		2 x oil free			3 x oil free	
Cooling circuits	nr	1						
Evaporator	nr x model	1 x flooded						
Fans	nr x model	6	6	8	10	12	14	16
UNIT WITH ASYNCHRONOUS MOTOR FANS (AC)								
Cooling capacity (1)	kW	296	391	530	605	750	875	1100
Absorbed power (2)	kW	91,6	120,1	158,8	181,3	218,6	261,0	325,3
E.E.R. (2)		3,23	3,25	3,34	3,34	3,43	3,35	3,38
E.S.E.E.R. (3)		5,03	4,92	5,17	5,07	5,37	5,39	5,62
I.P.L.V. (4)		5,92	5,88	5,84	5,58	6,31	6,16	6,56
Noise pressure level (5)	dB(A)	52,1	52,5	53,5	54,0	55,0	55,0	55,5
Max. ambient temperature	°C	42						
UNIT WITH ELECTRONICALLY COMMUTED MOTOR FANS (EC)								
Cooling capacity (1)	kW	300	400	530	630	750	900	1100
Absorbed power (2)	kW	92,2	121,4	155,6	188,8	213,6	265,8	308,2
E.E.R. (2)		3,25	3,29	3,41	3,34	3,51	3,39	3,57
E.S.E.E.R. (3)		5,09	4,99	5,27	5,24	5,51	5,52	5,68
I.P.L.V. (4)		6,08	5,95	5,91	5,84	6,38	6,34	6,61
Noise pressure level (5)	dB(A)	52,1	52,5	53,5	54,0	55,0	55,0	55,5
Max. ambient temperature	°C	45						
DIMENSIONS								
Height	mm	2510	2510	2510	2510	2510	2510	2510
Length	mm	5000	5000	6430	7860	9290	10720	12150
Depth	mm	2200	2200	2200	2200	2200	2200	2200

1. Data refer to nominal conditions: Inlet / outlet water temperature: 12 / 7 °C; External air temperature 35 °C; glycol 0%
2. Data refer to total input power (compressors and fans)
3. European Seasonal Energy Efficiency Ratio
4. Integrated Partial Load Value
5. Measured in free-field conditions 10 mt from the unit, coil side (Q=2)

Construction Options

- Double power supply with automatic integrated management on the active line and integrated condenser for control
- Separate power supply for quick start procedure
- Double power supply with automatic integrated management on the active line and additional separate power supply for quick start procedure
- Power meter for a continuous measurement of the unit power consumption and communication to the BMS
- Acoustic-composite fans with electronic commutation motors (EC)
- Low external temperature option: unit can operate down to -20°C external temperature
- **Integrated hydronic system with 1 or 2 circulation pumps**
- **Integrated hydronic system with 1 or 2 inverter-driven circulation pumps and pressure transducers (1 + 1 stand-by)**
- Anti-freeze protection on evaporator and pump/s group
- Condensing coils equipped with metal safety grilles and filters
- Coil manifolds protection panels
- Condensing coil cataphoresis or pre-painting treatment (*)

Options

The units can be supplied with the following external accessories:

- Remote user terminal PDG (up to 200 meters with shielded cable) for:
 - entering of commands
 - display unit status of alarms
- Spring anti-vibration kit
- Flanged type hydraulic connection
- Lifting kit

Attracting perfection.

BCE units use "oil-free" revolutionary technology. In fact, the internal impellers of the compressor operate within a magnetic toroidal field, avoiding mechanical friction:

- Optimum efficiency at all load conditions
- Maximum reliability
- Minimum maintenance
- Reduced dimensions and weights
- Ultra silent operation



Top level performance.

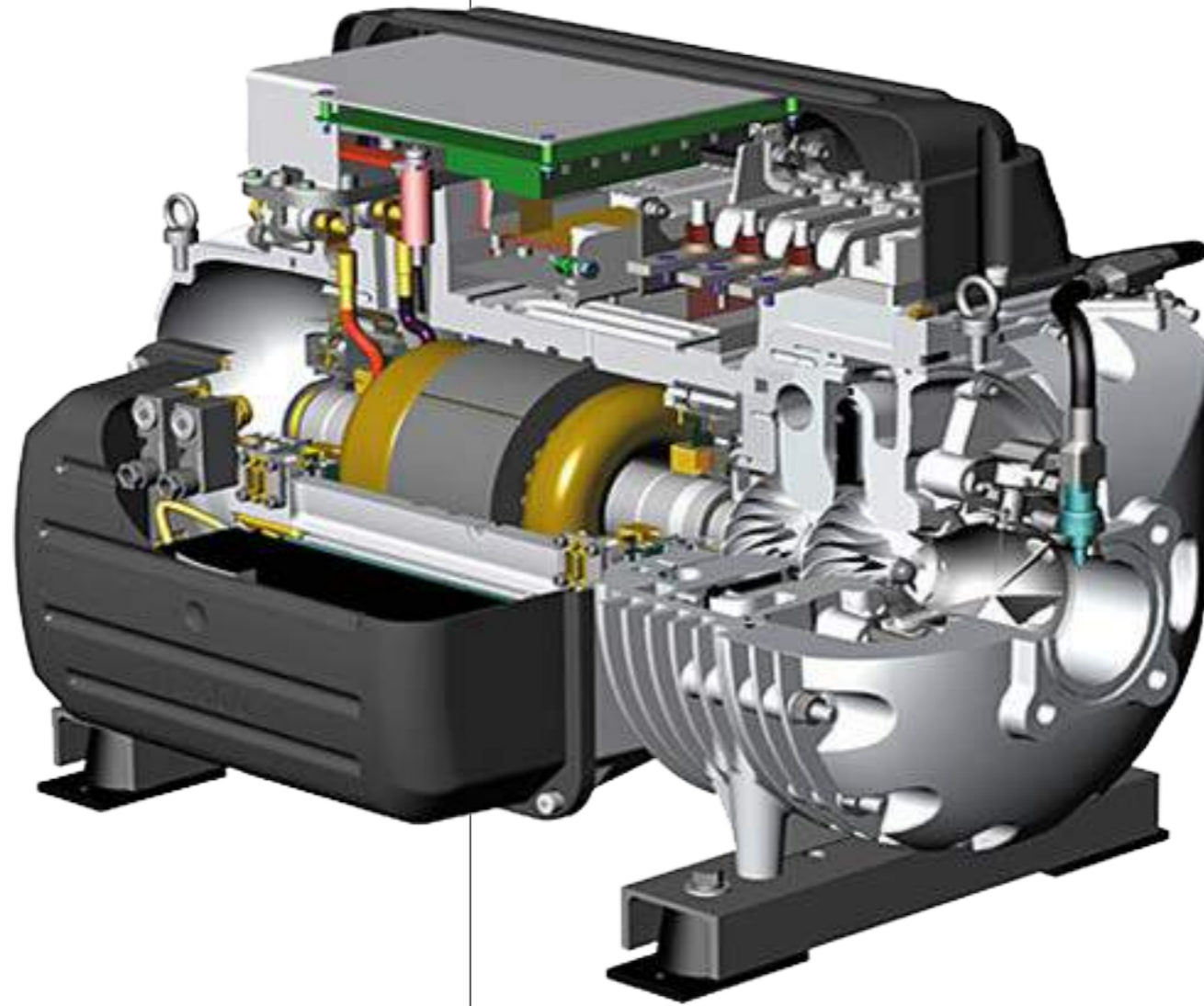
BCE units are able to adapt the cooling capacity of the compressor to the load extremely efficiently. Through analysis of the IPLV (Integrated Partial Load Value) and ESEER (Energetic Seasonal Energy Efficiency Ratio), it is clearly evident that the efficiency of the BCE unit is optimised in all operating conditions. The control software developed by Uniflair allows the unit to be programmed and adapted according to each demand placed on it.



Flooded Evaporator.

"Oil-free" operation means that it is possible to use flooded evaporator technology without limits, resulting in:

- Increased energy efficiency resulting from a higher exchange coefficient and a low ΔT between water and refrigerant
- Reduced energy losses due to the absence of superheating and decreased pressure drops
- Precise water temperature control thanks to the "accumulation" of refrigerant inside the evaporator



Cooling with style.

Avant-gard design is a distinguishing feature of BCE chillers. The use of magnetic bearings results in high reliability and increased energy savings. Since there is a lack of "physical" contact, wear and energy losses due to friction are eradicated.



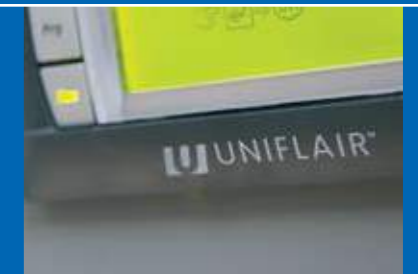
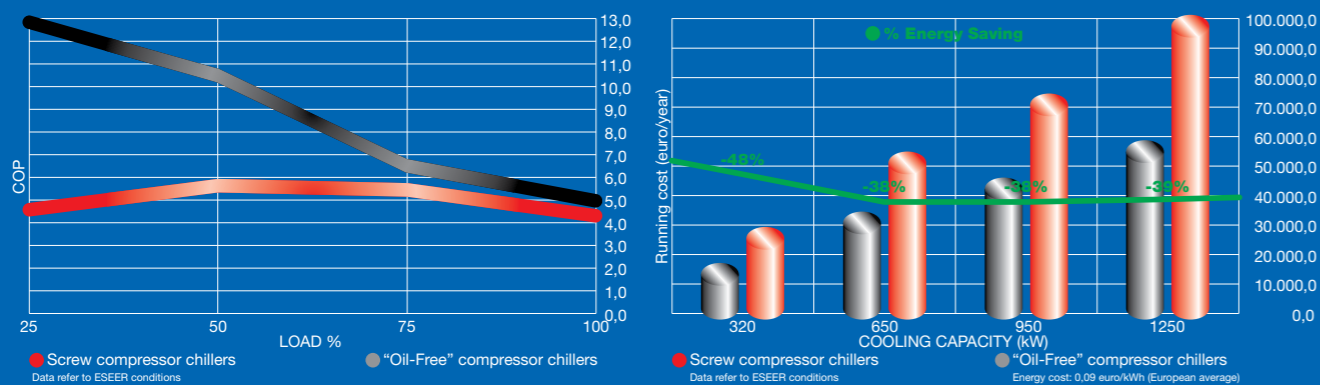
Reduced dimensions.

The BCE unit is lighter and more compact than any other compressor with the same capacity featuring traditional technology. The aesthetic impact is also reduced thanks to its elegant appearance.



Low noise.

The extremely low noise levels and the absence of vibrations inside the unit during all operating conditions reduce the acoustic impact of the BCE unit.



Uniflair BCEC



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 - protection and control of the rotation axis position
 - brushless synchronized DC motor
 - integrated control system
 - speed control with inverter
 - soft start start-up
 - phase sequence control
 - pre-rotation valve
 - temperature and pressure sensors
 - 2 centrifugal compression stages
 - anti-vibration kit
- Soundproofing enclosures for compressor/s
- Single refrigerant circuit conforming to EC standards (PED 97/23/ CE) with copper tubing including: filter dryer, liquid sight glass, electronic expansion valve controlled by a level sensor, discharge and suction taps on the compressor, pressure switches, high and low pressure transducers and gauges
- By-pass line for vacuum start-up with high pressure ratio
- Flooded evaporator featuring an integrated de-mister to prevent the formation of droplets: the exchanger is insulated with closed-cell expanded polyurethane
- Air side exchange coil with aluminium fins and internally grooved copper tubes
- Differential water pressure switch
- Acoustic-composite fans: Sickle-blade axial fans, statically and dynamically balanced, made from composite materials for high efficiency and low acoustic impact, with safety protection grilles
- **Modulating condensation control with continuous regulation of the fans speed**
- Electric panel conforming to EC standards (2006/95 /EC and EMC 2004/108/EC directives) with EMC integrated filter for protection of the harmonics, maximum internal

temperature control, absorbed current control auxiliary transformer, general auxiliary cut-off switch fuses on the compressors and remote control cut-off switches

- Line reactance for each compressor to stabilize the power supply
- Phase sequence control and minimum / maximum power supply and voltage
- Microprocessor control system including:
 - **continuous control of the cooling capacity by means of an inverter and IGV (Inlet Guide Vane)**
 - local user terminal with external display
 - **outlet chilled water temperature regulation by means of an exclusive PID algorithm**
 - **integrated LAN card for connecting more than one unit to the local area network**
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- Microprocessor control system in addition allows:
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 - **direct interface with serial BMSs with Modbus protocol**
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BCEF

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Compressor/s	nr x model	1 x oil free		2 x oil free			3 x oil free	
Cooling circuits	nr	1						
Evaporator	nr x model	1 x flooded						
Fans	nr x model	6	6	8	10	12	14	16
UNIT WITH ASYNCHRONOUS MOTOR FANS (AC)								
Cooling capacity (1)	kW	310	411	550	637	800	917	1213
Absorbed power (2)	kW	89,4	121,0	158,1	177,1	228,3	266,0	359,9
E.E.R. (2)		3,47	3,40	3,48	3,60	3,50	3,45	3,37
Free-cooling capacity (3)	kW	246	296	395	427	587	682	783
Absorbed power in free-cooling (3)(4)	kW	16,0	17,1	24,4	28,2	32,6	41,3	45,8
E.E.R. in free-cooling (3)(4)		15,37	17,27	16,18	15,16	18,01	16,51	17,08
Noise pressure level (5)	dB(A)	52,1	52,5	53,5	54,0	55,0	55,0	55,5
Max. ambient temperature	°C	40						
UNIT WITH ELECTRONICALLY COMMUTATED MOTOR FANS (EC)								
Cooling capacity (1)	kW	310	411	550	637	800	917	1213
Absorbed power (2)	kW	89,2	120,9	157,9	176,8	222,3	260,2	351,3
E.E.R. (2)		3,47	3,40	3,48	3,60	3,60	3,52	3,45
Free-cooling capacity (3)	kW	273	339	452	482	672	779	905
Absorbed power in free-cooling (3)(4)	kW	19,8	21,3	30,0	34,9	41,0	51,1	57,4
E.E.R. in free-cooling (3)(4)		13,74	15,90	15,09	13,83	16,39	15,26	15,76
Noise pressure level (5)	dB(A)	52,1	52,5	53,5	54,0	55,0	55,0	55,5
Max. ambient temperature	°C	43						
DIMENSIONS								
Height	mm	2510	2510	2510	2510	2510	2510	2510
Length	mm	5000	5000	6430	7860	9290	10720	12150
Depth	mm	2200	2200	2200	2200	2200	2200	2200

1. Data refer to nominal conditions: water temperature 10/15°C; external temperature 35°C; glycol 20%; refrigerant R134a
 2. Data refer to nominal conditions: inlet water temperature 15°C; external temperature 5°C; glycol 20%; refrigerant R134a
 3. Measured in free field conditions 10 m from the unit, coil side (Q = 2)

Construction Options

- Double power supply with automatic integrated management on the active line
- Separate power supply for quick start procedure
- Double power supply with automatic integrated management on the active line and additional separate power supply for quick start procedure
- Power meter for a continuous measurement of the unit power consumption and communication to the BMS
- Acoustic-composite fans with electronic commutation motors (EC)
- **Intelligent free-cooling**
- **Glycol free arrangement (*)**
- **Integrated hydronic system with 1 or 2 circulation pumps (1 + 1 stand-by)**
- **Integrated hydronic system with 1 or 2 inverter-driven circulation pumps and pressure transducers (1+1 stand-by)**
- Coils equipped with metal safety grilles and filters
- Coil manifolds protection panels
- Condensing coil cataphoresis or pre-painting treatment (*)

Options

- The units can be supplied with the following external accessories:
- Remote user terminal PDG (up to 200 meters with shielded cable) for:
 - entering of commands
 - display unit status of alarms
 - Spring anti-vibration kit
 - Flanged type hydraulic connection
 - Lifting kit