

ELFOEnergy Extended Inverter

AIR-COOLED INVERTER CHILLER FOR OUTDOOR INSTALLATION

WSAT-XIN 81-171 RANGE

PREMIUM Version

Nominal cooling capacity (A35/W7) from 15 to 30 kW

EXCELLENCE Version

Nominal cooling capacity (A35/W7) from 15 to 48 kW

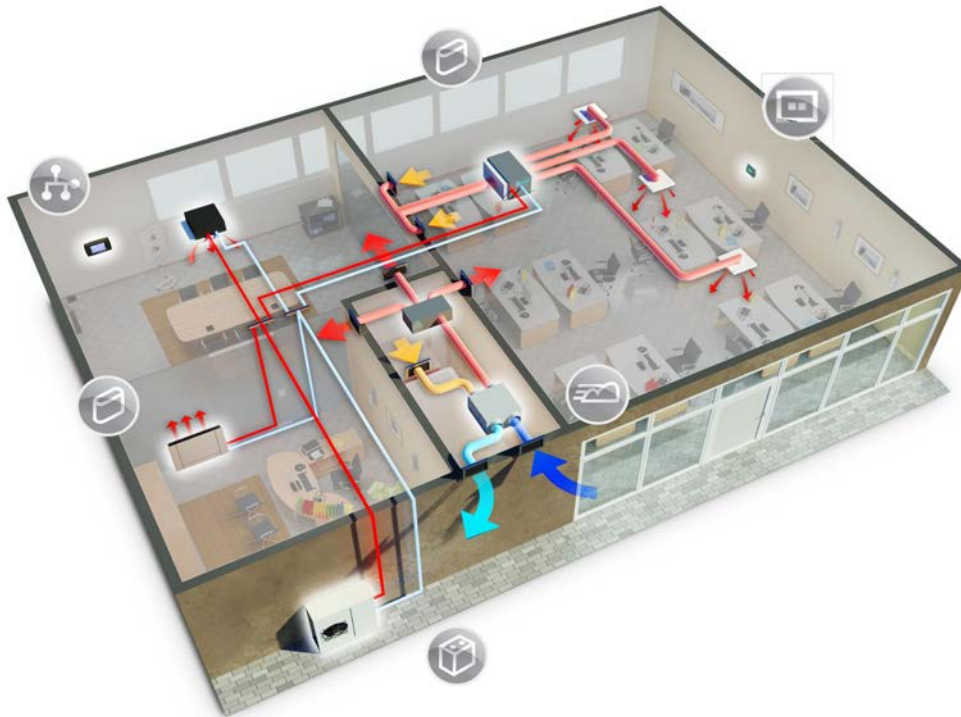
- ▶ HIGH SEASONAL EFFICIENCY
- ▶ INVERTER DC TECHNOLOGY
- ▶ 100% SILENT OPERATION
- ▶ COMPACT DIMENSIONS



Clivet is taking part in the EUROVENT certification programme up to 1.500 kW. The products concerned appear in the certified products list of the EUROVENT www.eurovent-certification.com site.

ELFOSystem OFFICE

ELFOEnergy Extended Inverter is the heart of ELFOSystem that Clivet has designed for light commercial



System values

Energy efficiency and Comfort

A single system that guarantees comfort all year round:

- high energy efficiency at partial load with inverter technology
- high room comfort levels with air renewal and purification
- use resources suited to the building's requirements;

Complete management of the system

Single control that interacts with all the components installed by checking the operating conditions of each device, thereby optimizing consumption to reach the desired comfort.

Simpler system

- industrialised solution for quick and expert installation
- Installation and adjustment errors exclusion
- Wirings and connections are clear and preconfigured
- Maintenance easiness

Application flexibility

Flexible system, since it can be adapted to systems with radiant panels, terminal units or mixed systems

A single smart system

A single, intelligent system with all the elements for year-round comfort

- ▶ Cooling
- ▶ Fresh air renewal and purification



System components



ELFOEnergy Extended Inverter

- Chiller at high seasonal efficiency
- Inverter technology
- 100% silent operation
- Compact dimensions



ELFOControl²

- Advanced control system to manage the operation of the whole flat
- Optimisation of performance and operation
- Simply to use and complete system management



ELFOFresh²

- Energy-recovery based room ventilation and purification
- Active thermodynamic recovery
- Electronic filtering
- Summer dehumidification
- FREE-COOLING



Fan coil units

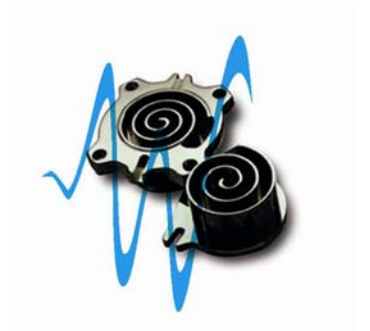
- Wide range of room terminals to adapt to any installation requirement, with temperature control per room
- Compact design and small size
- Continuous speed variation
- Homogenous temperature
- Reduced consumptions

Advanced technology and benefits

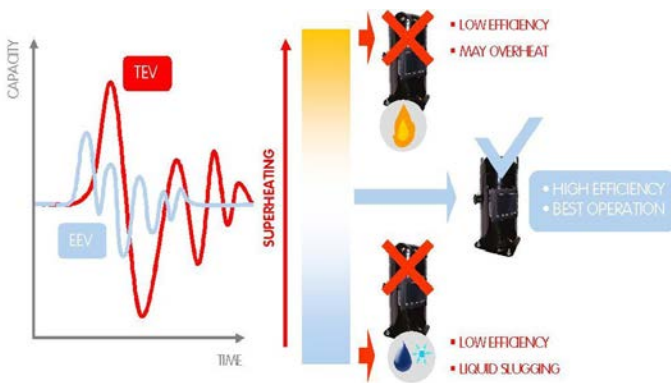
Inverter compressor

The inverter compressor can continuously modulate the cooling capacity from 40% to 100%.

This allows the delivered capacity to be set according to the demand on the system. Very high efficiency values can be achieved, especially under load staging conditions that coincide with most of the operating time.



Thermostatic electronics



The thermostatic electronic expansion valve (TEE) adapts quickly and precisely to the effective load required for use, permitting a stable and accurate adjustment and optimal operation of the compressor.

There is also an additional increase in efficiency in comparison to traditional thermostatic mechanical valves (TEM) and a longer compressor life.

Small size and simplified maintenance

For ideal operational flexibility

Positioning outdoor units is always a critical aspect when installing systems in terms of comfort.

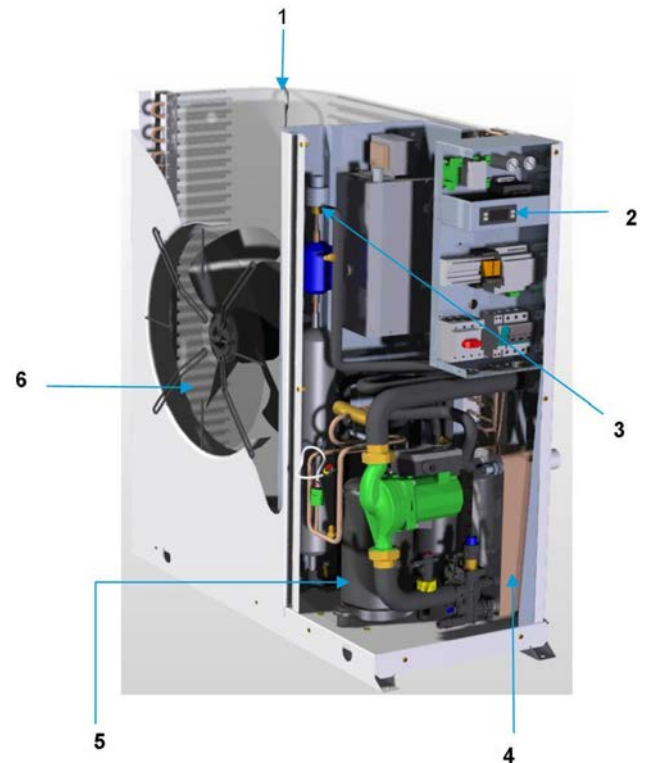
Units with a compact size are essential to contain their aesthetic impact and increase their adaptability.

ELFOEnergy Extended Inverter is a compact unit with a simple design and takes up very little space: it is specifically designed to adapt to the aesthetic features of any building while still allowing easy access to all its internal components, thereby simplifying maintenance.



Special design features

1. **The outdoor air probe:** allows setting the ideal climate in relation to environmental conditions
2. **The built-in display:** shows all the operating parameter settings
3. **The Electronic Thermostat:** Optimises the operation conditions of the refrigeration circuit
4. **The plate heat exchanger:** maximises the thermal efficiency thanks to large exchange surfaces
5. **The Inverter DC Compressor:** allows high seasonal efficiency thanks to the modulation
6. **The optimized fan profile:** guarantees extremely quiet operation in every operating mode. The fan varies its speed according to the conditions, increasing its quiet operation.



100% silent operation



For a superior comfort

Beyond increasing the efficiency of the unit, the special constructive features of ELFOEnergy Extended Inverter minimise the sound level making it particularly silent.

Thanks to the automatic modulation of the power capacity, the Inverter DC Compressor provides only the heat energy required by the system, therefore when the need decreases silence increases.

This advantage is greater during the night, when the energy requirement is minimal but silence is essential.

Thanks to the dynamic modulation of the speed in relation to the conditions, the fan reduces electric consumptions and optimises the operation of the refrigeration circuit in all use conditions, further increasing its silence.

Intelligent energy management

The Extended Inverter electronic control allows producing energy in the required quantity and in the most efficient and effective way in relation to the outdoor conditions and requirements of the building.

Everything IS UNDER CONTROL

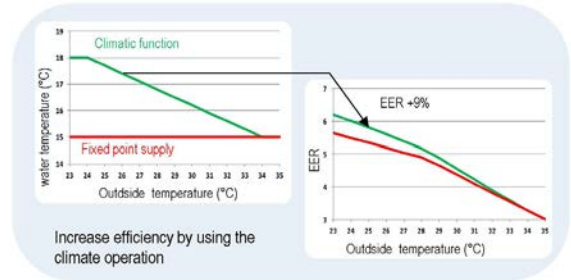


The electronic control with built-in display the unit allows defining the operation parameters with maximum simplicity. Once set, the control manages automatically the operation of the unit.

- setting the supply water set point
- climate compensation
- time schedule

Outdoor climatic compensation

The water temperature for the system is adjusted automatically in relation to the real requirements of the building and outdoor air temperature, increasing the seasonal energy efficiency.



Remote control

The RCTX remote control, equipped with an easy to read wide display, allows to program the plant supply temperature in a simple way, using only 4 buttons.

- The device can also:
 - control the unit's operation
 - activate the circulation of the system's water
 - set the unit set point water temperature according to time bands
- The RCTX also works in "remote control", making it even easier to configure and control the unit's operation. It can:
 - set the ON/OFF control
 - read the information detected by the device installed on board the unit, as the operation status, parameters and alarms.



PREMIUM and EXCELLENCE Version

Business oriented

All ELFOEnergy Extended Inverter models are featured by high energy performance at partial load and then by high seasonal efficiency.

With two versions available, the PREMIUM and the EXCELLENCE, the best solution can be selected, considering the initial investment cost and the system's entire life cycle.



PREMIUM Version

The PREMIUM Version provides excellent performance at partial load thanks to the modulation of the capacity supplied with the inverter technology applied to the compressor. This means it is economically competitive with heat pumps with ON/OFF technology.

It is mainly designed, therefore, for installations focusing on the initial investment.

PREMIUM Version Size 81-141: DC circulator (3-speed regulation).

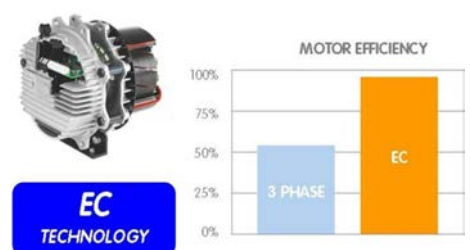
EXCELLENCE Version

The EXCELLENCE Version differs from the PREMIUM Version as it employs DC fans, thereby allowing for extremely high energy seasonal efficiency.

Fans are operated by EC motors, which automatically adjust their capacity as the system's load changes. This ensures optimal efficiency in every operating mode and saves up to 20% of the annual energy needs.

This allows for:

- -Maximum savings on running and maintenance costs.
- - Upgrade of the building's energy class and, therefore, increased value
- Effective use in applications with a highly variable power demand (offices, industrial and process applications).



EXCELLENCE Version Size 81-121: DC circulator + Ecobreeze fan

EXCELLENCE Version Size 131-171: ON/OFF pump + Ecobreeze fan

Standard unit technical specifications

Compressor

Size 81-171

Inverter controlled scroll-type hermetic compressor equipped with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on anti-vibration mounts and is equipped with oil charge.

An oil heater, which starts automatically, keeps the oil from being diluted by the refrigerant when the compressor stops.

Structure

Supporting structure realised in galvanised steel sheet able to supply excellent mechanical features and long-lasting resistance to corrosion.

Base made from galvanized steel plate painted with polyester powder paint, RAL 9001.

Panelling

Zinc-magnesium external panelling that ensures superior resistance to corrosion for outdoor installation and eliminates the need for periodical painting. The panels can be easily removed to fully access internal components and are lined with sound-proof material on the inside to contain the unit's sound levels.

Internal exchanger

Direct expansion heat exchanger with braze welded stainless steel INOX AISI 316 plates and complete with external thermal/anti-condensation insulation.

The exchanger is complete with:

- antifreeze heater to protect the water side exchanger, preventing the formation of frost if the water temperature falls below a set value.

External exchanger

Direct expansion finned coil exchanger made with copper pipes placed on staggered rows mechanically expanded to better adhere to the fin collar. The fins are made from aluminium a corrugated surface. They are appropriately distanced to ensure the maximum heat exchange efficiency.

The unit is fitted as standard with coil protection grills for PREMIUM Version, and EXCELLENCE Version Size 81-121.

Fan

PREMIUM Version Size 81-141:

propeller fans with aluminium pressure die-cast blades, directly driven by single-phase external rotor electric motor complying with VDE 0530/12.84, complete with thermal protection, IP 54 class according to DIN 40 050 norm. The impellers are housed in aerodynamically shaped nozzles to increase the efficiency and minimize the sound level, and protected by fan guards and supplied with variable speed electronic control (phase cutting)

EXCELLENCE Version Size 81-171:

Axial fans with sickle profile blades terminating with "Winglets", directly coupled to the electronic controlled motor (IP54), driven by the magnetic switching of the stator. The brushless technology and the special supply increase both the life expectancy and the efficiency. As a result the electric consumption is reduced up to 50%. Fans are housed in aerodynamically shaped structures to increase efficiency and reduce noise level. The assembly is protected by accident prevention guards. Supplied with variable speed control.

Hydronic assembly

PREMIUM Version Size 81-141:

Circulator with cast-iron body and impeller, equipped with direct current Brushless motor (3-speed regulation) with IP44-protection complete with thermoformed insulated casing. All connections are screwed.

EXCELLENCE Version Size 81-121:

Circulator with cast-iron body and impeller, equipped with direct current Brushless motor (regulated by 0-10V signal) with IP44-protection complete with thermoformed insulated casing. All connections are screwed.

EXCELLENCE Version Size 131-171:

Centrifuge electropump, with AISI-type 304 stainless steel body and impeller. The electropump is equipped with three-phase electric motor with IP55-protection and complete with thermoformed insulated casing. For size 131-141-151 the connections are screwed. For size 161-171 the connections are Victaulic type.

Refrigeration circuit

Refrigeration circuit with:

- electronic expansion valve
- filter dryer
- pressure probes
- low pressure safety
- high pressure safety

Electrical panel

The capacity section includes:

- fans and auxiliary circuit fuse
- compressor fuses
- isolating transformer for auxiliary circuit power supply

The control section includes:

- compressor overload protection and timer
- relay for remote cumulative fault signal
- condenser control
- Set point compensation with outdoor temperature
- double set-point management

The control keypad includes:

- Multifunction keys for ON/OFF control, cold and hot operation mode, display and alarm reset, daily or weekly schedule.
- Display

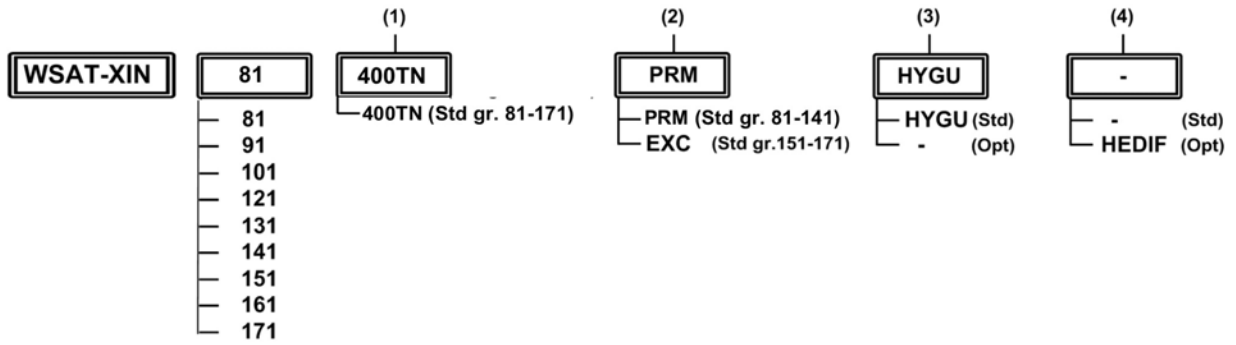
Water circuit

- water side safety valve
- drain valve
- Steel mesh strainer
- differential pressure switch (Size 81-171)

Accessories

- AMRX - Rubber antivibration mounts
- RCTX - Remote control
- CMSC2X - Serial communication module with RS485 serial converter kit
- KTFLX - Hose kit for connection to the chiller/heat pump
- KSAX - 100-litre circuit breaker
- KG4UP - Management kit up to 4 units in parallel
- PGFCX - Finned coil protection grill

Unit configuration



1) Power supply

Supply voltage 400/3/50+N (400TN)

From Size 81 to 171:

Standard

(2) Version

Version Premium (PRM)

From Size 81 to 141:

DC circulator (3-speed regulation) and fan with phase cutting

Version Excellence (EXC)

From Size 81 to 121:

DC circulator (regulated by 0-10V signal) and Ecobreeze fan

From Size 131 to 171:

ON/OFF pump and Ecobreeze fan

(3) User side hydronic assembly

User side hydronic assembly (HYGU)

Standard

User side hydronic assembly: not required (-)

4) Type of fans

Standard fan (-)

Diffuser for high efficiency axial fan (HEDIF)

From Size 131 to 171

Only for EXCELLENCE Version

PREMIUM VERSION

General technical data

Size		81	91	101	121	131	141	
Radiant panels								
Cooling								
Cooling capacity	1	kW	16,0	18,8	21,0	26,5	29,5	33,1
Total power input	2	kW	4,22	5,11	5,94	7,12	7,95	9,32
EER (EN 14511:2013)	3		3,78	3,67	3,53	3,72	3,71	3,55
Water flow-rate	1	l/s	0,76	0,90	1,00	1,27	1,41	1,58
Useful pump discharge head	1	kPa	76	71	66	68	61	51
ELFORoom and ELFOspace terminal units								
Cooling								
Cooling capacity	4	kW	15,5	17,5	19,6	25,3	27,8	30,6
Total power input	2	kW	5,53	6,53	8,03	9,57	10,8	12,8
EER (EN 14511:2013)	3		2,81	2,68	2,44	2,64	2,58	2,38
SEER	5		4,55	4,58	4,21	4,23	4,31	4,32
Water flow-rate	4	l/s	0,74	0,84	0,94	1,21	1,33	1,46
Useful pump discharge head	4	kPa	77	73	69	70	65	58
Compressor								
Type of compressors			Scroll Inverter DC					
Refrigerant			R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
No. of compressors		No	1	1	1	1	1	1
Oil charge		l	1,90	1,90	1,90	1,90	1,90	1,90
Refrigeration circuits		No	1	1	1	1	1	1
Refrigerant Charge		Kg	4,7	4,7	4,7	6,8	6,8	6,8
User side exchanger								
Type of internal exchanger	6		PHE	PHE	PHE	PHE	PHE	PHE
No. of exchangers		No	1	1	1	1	1	1
Water content		l	2,37	2,37	2,37	3,13	3,13	3,13
External Section Fans								
Type of fans	7		AX	AX	AX	AX	AX	AX
No. of fans		No	1	1	1	2	2	2
Standard airflow		l/s	2167	2389	2444	3333	3889	4167
Installed unit power		kW	0,45	0,41	0,39	0,50	0,47	0,44
Water circuit								
Maximum water side pressure		kPa	550	550	550	550	550	550
Safety valve calibration		kPa	600	600	600	600	600	600
Min. installation water contents		l	50	53	57	63	68	74
Power supply								
Standard power supply			400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign LOT21. Contains fluorinated greenhouse gases (GWP 2087,5)

1. Entering/leaving water temperature user side 23/18°C, external exchanger entering air 35°C
2. The overall power absorbed is calculated by adding the power absorbed by the compressor + the power absorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome pressure drop outside + the power absorbed by the auxiliary electrical circuit
3. EER (EN 14511:2013) cooling performance coefficient. Ratio between delivered cooling capacity and power input in compliance with EN 14511:2013
4. User side entering/leaving water temperature 12/7 °C, external exchanger entering air 35°C
5. Data calculated according to the EN 14825:2016 Regulation
6. PHE = plate exchanger
7. AX = axial fan

The heads are intended as available at the unit connections

The pressure drops of the steel mesh strainer, supplied with the unit, have been already taken into consideration

EXCELLENCE VERSION

General technical data

Size			81	91	101	121	131	141	151	161	171
Radiant panels											
Cooling											
Cooling capacity	1	kW	15,9	18,7	20,9	26,5	33,0	39,8	40,5	47,6	52,9
Total power input	2	kW	3,87	4,84	5,74	6,27	8,34	9,88	10,3	12,0	13,9
EER (EN 14511:2013)	3		4,12	3,86	3,65	4,23	3,96	4,03	3,92	3,97	3,80
Water flow-rate	1	l/s	0,76	0,89	1,00	1,27	1,58	1,90	1,94	2,27	2,53
Useful pump discharge head	1	kPa	64	59	55	69	100	103	101	84	67
ELFORoom and ELFOspace terminal units											
Cooling											
Cooling capacity	4	kW	15,5	17,4	19,6	25,3	26,8	32,4	36,4	43,2	48,1
Total power input	2	kW	5,18	6,26	7,83	8,69	8,56	10,2	12,2	14,4	16,4
EER (EN 14511:2013)	3		2,99	2,78	2,50	2,91	3,13	3,18	2,99	3,00	2,93
SEER	5		5,62	5,26	4,49	5,65	6,15	5,83	5,94	5,61	5,66
Water flow-rate	4	l/s	0,74	0,83	0,94	1,21	1,28	1,55	1,74	2,06	2,30
Useful pump discharge head	4	kPa	64	62	58	72	124	122	112	98	83
Compressor											
Type of compressors			Scroll Inverter DC								
Refrigerant			R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
No. of compressors			1	1	1	1	1	1	1	1	1
Oil charge			1,90	1,90	1,90	1,90	1,90	3,30	3,30	3,60	3,60
Refrigeration circuits			1	1	1	1	1	1	1	1	1
Refrigerant Charge			4,7	4,7	4,7	6,8	6,8	6,8	10	10	10
User side exchanger											
Type of internal exchanger	6		PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
No. of exchangers			1	1	1	1	1	1	1	1	1
Water content			2,37	2,37	2,37	3,13	3,13	3,13	3,13	4,27	4,27
External Section Fans											
Type of fans	7		EC	EC	EC	EC	EC	EC	EC	EC	EC
No. of fans			1	1	1	2	1	1	1	1	1
Standard airflow			2222	2306	2444	2778	4694	4694	5139	5649	5833
Installed unit power			0,19	0,23	0,27	0,20	0,63	0,63	1,03	1,02	1,36
Water circuit											
Maximum water side pressure			550	550	550	550	550	550	550	550	550
Safety valve calibration			600	600	600	600	600	600	600	600	600
Min. installation water contents			50	53	57	63	68	87	99	113	117
Power supply											
Standard power supply			400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign LOT21.
Contains fluorinated greenhouse gases (GWP 2087,5)

1. Entering/leaving water temperature user side 23/18°C, external exchanger entering air 35°C
2. The overall power absorbed is calculated by adding the power absorbed by the compressor + the power absorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome pressure drop outside + the power absorbed by the auxiliary electrical circuit
3. EER (EN 14511:2013) cooling performance coefficient. Ratio between delivered cooling capacity and power input in compliance with EN 14511:2013
4. User side entering/leaving water temperature 12/7 °C, external exchanger entering air 35°C
5. Data calculated according to the EN 14825:2016 Regulation
6. PHE = plate exchanger
7. EC = axial-flow fan + EC

The heads are intended as available at the unit connections

The pressure drops of the steel mesh strainer, supplied with the unit, have been already taken into consideration

PREMIUM VERSION

Electrical data

Supply voltage 400/3/50+N

Size			81	91	101	121	131	141
F.L.A. - Full load current at max admissible conditions								
F.L.A. - Pump		[A]	1,33	1,33	1,33	1,33	1,33	1,33
F.L.A. - Total		[A]	24,25	24,65	25,35	30,32	31,67	33,97
F.L.I. - Full load power input at max admissible conditions								
F.L.I. - Pump		[kW]	0,300	0,300	0,300	0,300	0,300	0,300
F.L.I. - Total		[kW]	7,28	8,18	9,68	12,46	14,06	16,26
M.I.C. - Maximum inrush current								
M.I.C. - Total		[A]	24,24	24,64	25,34	30,31	31,66	33,96

Power supply 400/3/50 (+ NEUTRAL) +/- 10%

Maximum Phase Unbalance: 2%

The pump is included in the total values calculation

for non standard voltage please contact Clivet technical office

The units are compliant with the provisions of European standards CEI EN 60204 and CEI EN 60335.

Sound levels

Size	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
81	83	77	69	61	63	67	60	61	56	72
91	84	79	70	62	64	67	60	61	56	72
101	86	81	72	62	65	67	60	61	57	73
121	81	73	67	61	63	67	61	61	55	71
131	85	76	70	61	64	67	61	61	56	72
141	86	79	72	63	65	68	61	62	57	73

Sound levels refer to units with full load under nominal test conditions.

The sound pressure level refers to a distance of 1m from the outer surface of the unit operating in an open field.

Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2)

Data referred to the following conditions:

- internal exchanger water = 12/7 °C

- Ambient temperature = 35 °C

EXCELLENCE VERSION

Electrical data

Supply voltage 400/3/50+N

Size		81	91	101	121	131	141	151	161	171
F.L.A. - Full load current at max admissible conditions										
F.L.A. - Pump	[A]	1,37	1,37	1,37	1,37	1,40	1,85	1,85	1,85	1,85
F.L.A. - Total	[A]	23,97	24,37	25,07	28,47	25,30	30,75	33,35	38,75	42,23
F.L.I. - Full load power input at max admissible conditions										
F.L.I. - Pump	[kW]	0,31	0,31	0,31	0,31	0,37	0,55	0,55	0,55	0,55
F.L.I. - Total	[kW]	7,71	8,61	9,61	12,07	11,53	18,61	20,56	23,56	26,11
M.I.C. - Maximum inrush current										
M.I.C. - Total	[A]	23,97	24,37	25,07	28,47	25,30	30,75	33,35	38,75	42,23

Power supply 400/3/50 (+ NEUTRAL) +/- 10%

Maximum Phase Unbalance: 2%

The pump is included in the total values calculation

for non standard voltage please contact Clivet technical office

The units are compliant with the provisions of European standards CEI EN 60204 and CEI EN 60335.

Sound levels

Size	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
81	83	77	69	61	63	67	60	61	56	72
91	84	79	70	62	64	67	60	61	56	72
101	86	81	72	62	65	67	60	61	57	73
121	81	73	67	61	63	67	61	61	55	71
131	85	83	75	70	78	69	63	64	63	80
141	85	83	80	79	83	75	72	61	69	85
151	88	86	81	80	84	75	72	61	70	86
161	93	91	85	85	87	78	75	65	73	89
171	94	84	85	85	87	78	75	65	73	90

Sound levels refer to units with full load under nominal test conditions.

The sound pressure level refers to a distance of 1m from the outer surface of the unit operating in an open field.

Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2)

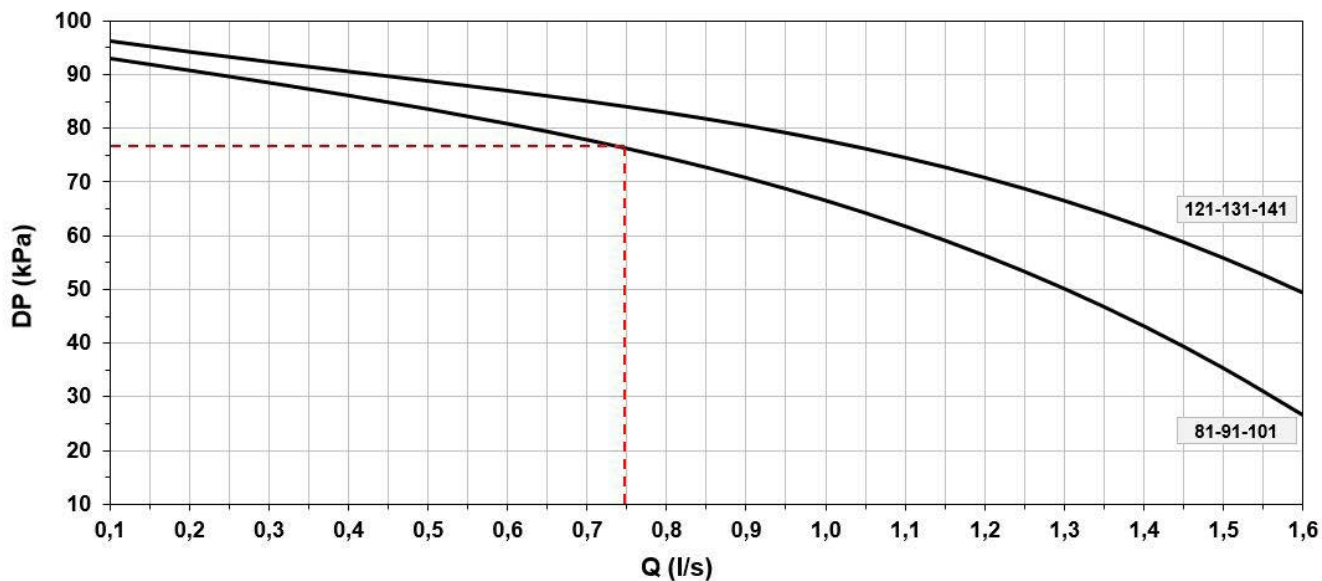
Data referred to the following conditions:

- internal exchanger water = 12/7 °C

- Ambient temperature = 35 °C

PREMIUM VERSION

Pump performance Size 81-141



Available pressure curves with hydronic assembly

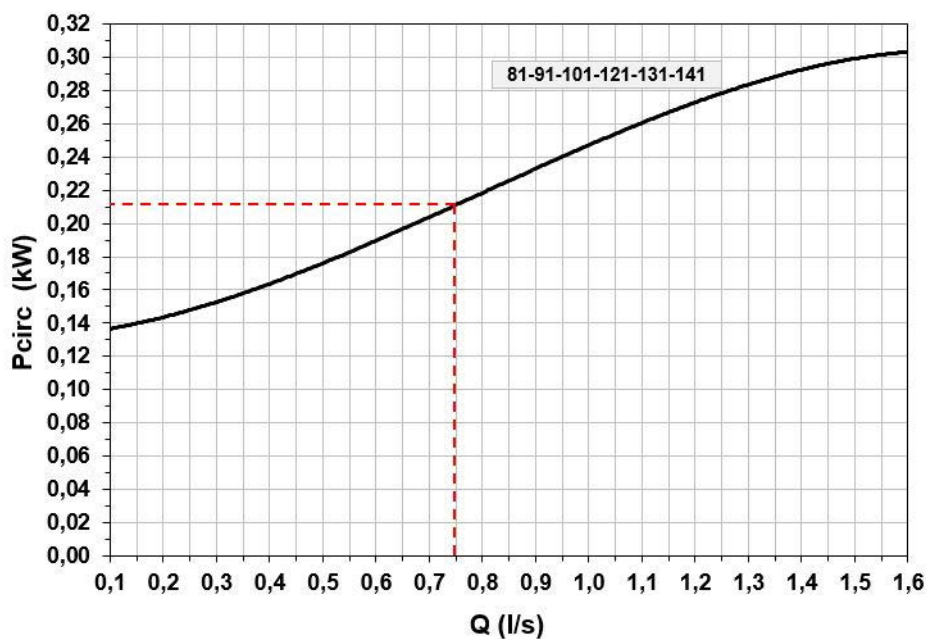
DP = Available pressure [kPa]

Q = Water flow-rate [l/s]

The heads are intended as available at the unit connections

The pressure drops of the steel mesh strainer, supplied with the unit, have been already taken into consideration

Pump absorption curves Size 81-141

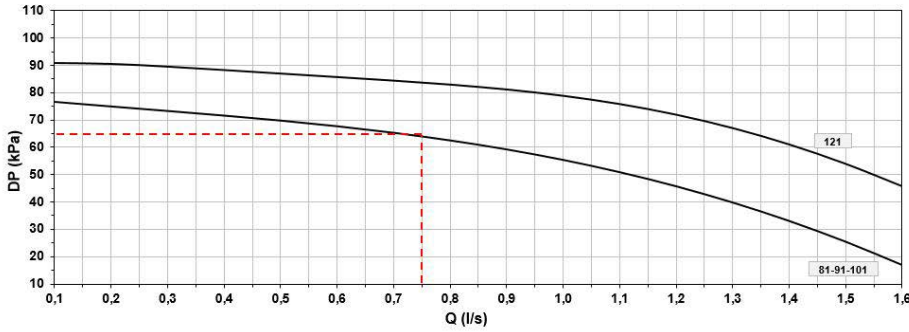


P_{circ} = Circulator absorbed power [kW]

Q = Water flow-rate [l/s]

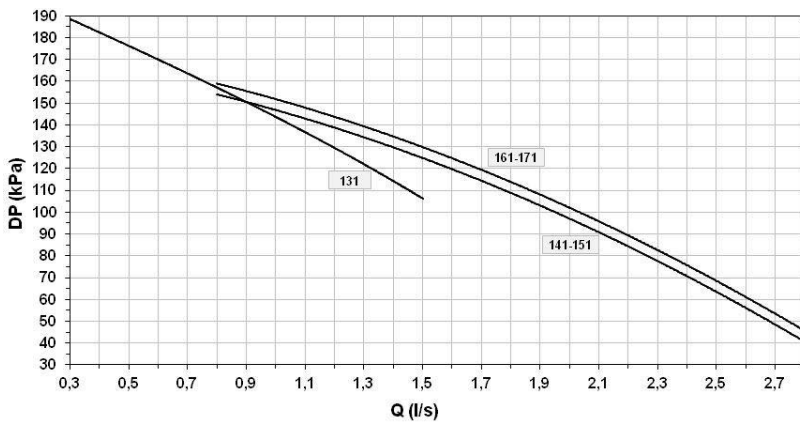
EXCELLENCE VERSION

Pump available pressure curves Size 81-121



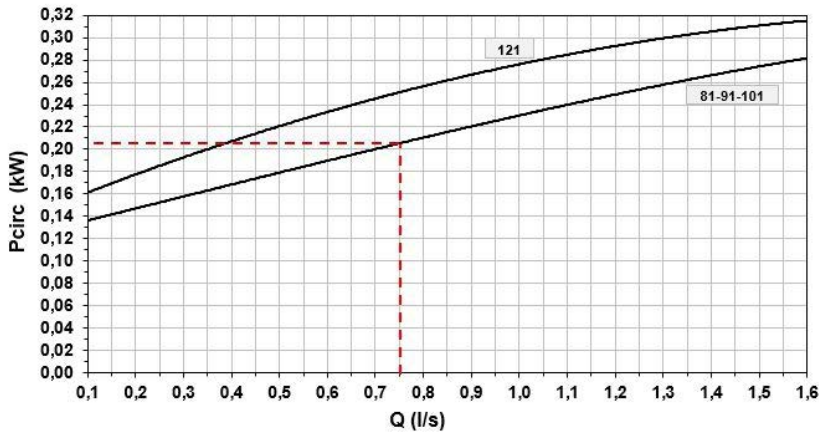
Available pressure curves with hydronic assembly
 DP = Available pressure [kPa]
 Q = Water flow-rate [l/s]
 The heads are intended as available at the unit connections
 The pressure drops of the steel mesh strainer, supplied with the unit, have been already taken into consideration

Pump available pressure curves Size 131-171



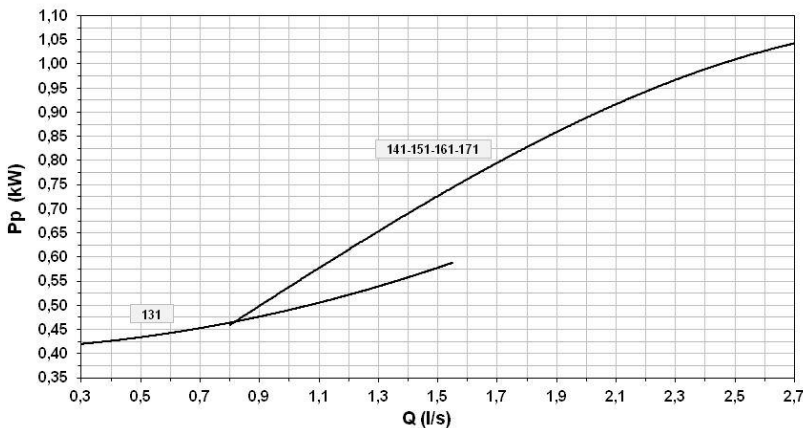
Available pressure curves with hydronic assembly
 DP = Available pressure [kPa]
 Q = Water flow-rate [l/s]
 The heads are intended as available at the unit connections
 The pressure drops of the steel mesh strainer, supplied with the unit, have been already taken into consideration

Pump absorption curves Size 81-121



Pcirc = circulator absorbed power [kW]
 Q = Water flow-rate [l/s]

Pump absorption curves Size 131-171

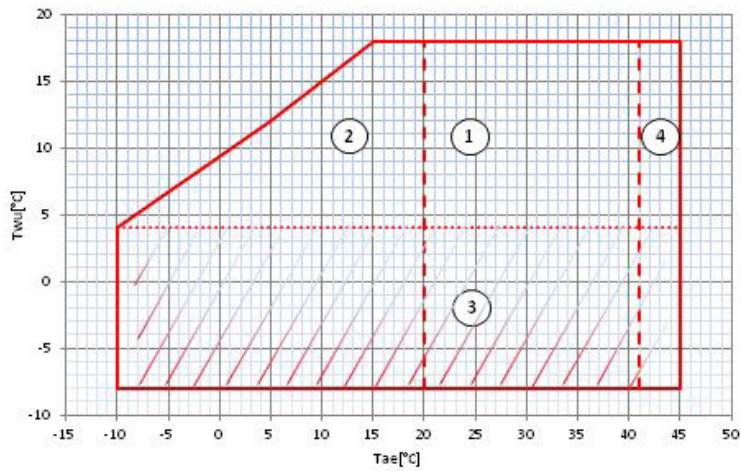


Pp = Electropump absorbed power [kW]
 Q = Water flow-rate [l/s]

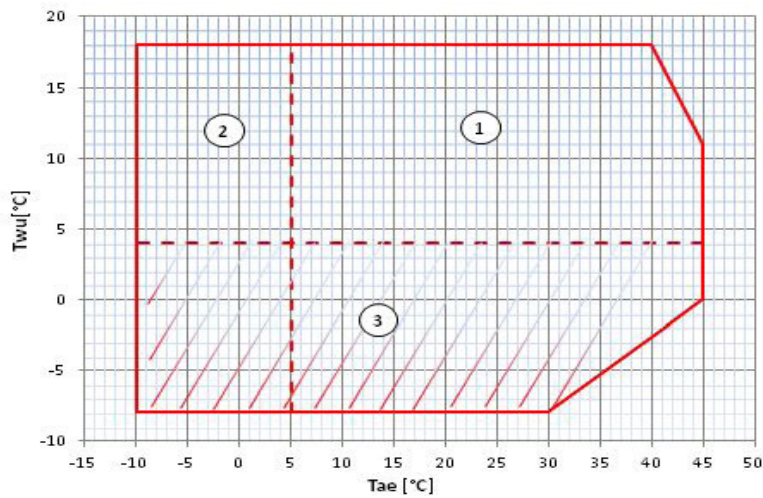
Operating range

Cooling

ELFOEnergy Extended Inverter 81-141 - PREMIUM, 81-131 EXCELLENCE



ELFOEnergy Extended Inverter 141-171 - EXCELLENCE



T_{wu} [°C] = leaving exchanger water temperature
 T_{ae} [°C]: external exchanger inlet air temperature

1. Normal operating range
2. Normal operating range with modulating fans
3. Operating range where the use of ethylene glycol is mandatory in relation to the temperature of the water at the outlet of the user side exchanger
4. Operating range with modulating compressor

Admissible water flow rates

Size		81	91	101	121	131	141	151	161	171
Minimum flow	[l/s]	0,35	0,35	0,35	0,42	0,42	0,42	0,42	0,48	0,48
Maximum flow-rate	[l/s]	1,95	1,95	1,95	2,70	2,70	2,70	2,70	2,70	2,70

Correction factors for glycol use

% ethylene glycol by weight		5%	10%	15%	20%	25%	30%	35%	40%
Freezing temperature	°C	-2,0	-3,9	-6,5	-8,9	-11,8	-16,6	-19,0	-23,4
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19
Cooling Capacity Factor	No	0,995	0,990	0,985	0,981	0,977	0,974	0,971	0,968
Compressor power input Factor	No	0,997	0,993	0,990	0,988	0,986	0,984	0,982	0,981
Internal exchanger glycol solution flow factor	No	1,003	1,010	1,020	1,033	1,050	1,072	1,095	1,124
Pressure drop Factor	No	1,029	1,060	1,090	1,118	1,149	1,182	1,211	1,243

The correction factors shown refer to water and glycol ethylene mixes used to prevent the formation of frost on the exchangers in the water circuit during inactivity in winter.

Fouling Correction Factors

m ² C/W	Internal exchanger	
	F1	FK1
0,44x10 ⁽⁻⁴⁾	1,00	1
0,44x10 ⁽⁻⁴⁾	0,97	0,99
0,44x10 ⁽⁻⁴⁾	0,94	0,98

The cooling performance values provided in the tables are based on the external exchanger having clean plates (fouling factor 1). For different fouling factor values, multiply the performance by the coefficients shown in the table.

F1 = Cooling capacity correction factors

FK1 = Compressor power input correction factor

Control

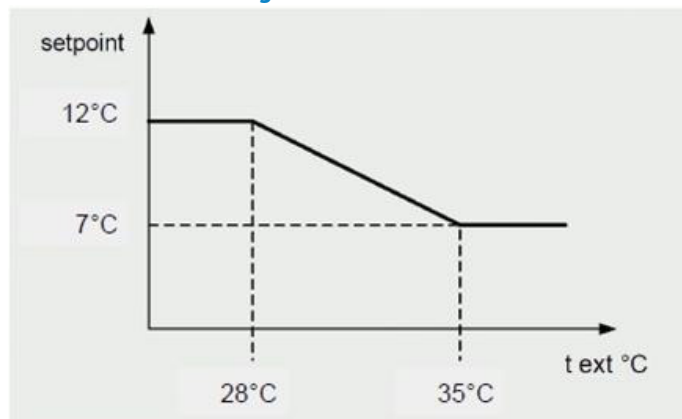
Climatic compensation with ambient temperature

The cooling capacity requirement of the building cooling decreases with the ambient temperature reduction

Power supply is not necessary for the terminal units always at the same temperature; for each kind of terminal unit it is better to have a water temperature that changes according with ambient temperature, with linear trend (what is commonly defined climatic control) for a high seasonal energy efficiency.

The following graph shows an example of climatic control on the water supply temperature.

Climatic curve in Cooling



With a decreasing ambient temperature, the climatic function increases the supply water set point

Set point = 7°C

Compensated set point = 12°C

PREMIUM

WSAT-XIN 81 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	75%	60%	50%	40%	100%	90%	75%	60%	50%	40%
7	20	18,46	16,80	14,35	11,96	10,45	8,94	4,33	4,57	4,97	5,43	5,78	6,32
	25	17,56	15,94	13,55	11,22	9,75	8,28	3,76	3,93	4,22	4,54	4,79	5,16
	30	16,66	15,10	12,82	10,58	9,18	7,77	3,28	3,40	3,60	3,83	4,00	4,24
	35	15,52	14,08	11,96	9,90	8,59	7,29	2,81	2,89	3,03	3,18	3,30	3,46
	40	14,27	12,98	11,08	9,23	8,07	6,90	2,38	2,44	2,54	2,65	2,72	2,83
	45	13,13	12,00	10,35	8,74	7,72	6,70	2,01	2,06	2,15	2,24	2,30	2,38
10	20	20,15	18,13	15,15	12,25	10,41	8,57	4,50	4,78	5,24	5,81	6,28	7,08
	25	19,10	17,14	14,26	11,45	9,67	7,89	3,89	4,09	4,42	4,82	5,15	5,69
	30	18,05	16,18	13,43	10,75	9,06	7,36	3,38	3,52	3,75	4,03	4,25	4,62
	35	16,78	15,05	12,51	10,03	8,46	6,90	2,88	2,98	3,14	3,33	3,48	3,71
	40	15,56	14,00	11,69	9,44	8,02	6,60	2,47	2,54	2,66	2,79	2,90	3,05
	45	14,42	13,03	10,99	9,01	7,75	6,50	2,11	2,17	2,27	2,38	2,46	2,57
12	20	21,30	19,25	16,24	13,30	11,44	9,58	4,77	5,07	5,57	6,17	6,65	7,44
	25	20,13	18,15	15,24	12,39	10,60	8,80	4,12	4,33	4,68	5,11	5,44	5,98
	30	18,96	17,08	14,31	11,60	9,90	8,19	3,57	3,72	3,97	4,26	4,49	4,85
	35	17,69	15,94	13,37	10,86	9,28	7,69	3,07	3,17	3,35	3,55	3,70	3,94
	40	16,36	14,78	12,46	10,19	8,76	7,33	2,61	2,68	2,81	2,95	3,06	3,22
	45	15,29	13,89	11,82	9,81	8,54	7,27	2,23	2,30	2,40	2,52	2,61	2,73
15	20	22,76	20,70	17,67	14,70	12,83	10,96	4,92	5,24	5,77	6,40	6,90	7,69
	25	21,58	19,58	16,63	13,75	11,93	10,11	4,26	4,49	4,87	5,31	5,66	6,21
	30	20,39	18,48	15,66	12,92	11,18	9,45	3,70	3,86	4,13	4,44	4,68	5,05
	35	18,97	17,20	14,60	12,05	10,45	8,85	3,16	3,27	3,46	3,68	3,84	4,08
	40	17,61	16,01	13,65	11,35	9,90	8,45	2,69	2,78	2,92	3,07	3,19	3,35
	45	16,60	15,17	13,06	11,01	9,71	8,42	2,34	2,42	2,54	2,67	2,76	2,89
18	20	24,75	22,60	19,42	16,32	14,36	12,40	5,34	5,72	6,35	7,10	7,67	8,56
	25	23,32	21,24	18,17	15,17	13,28	11,39	4,57	4,85	5,31	5,83	6,24	6,86
	30	21,89	19,92	17,00	14,16	12,37	10,57	3,93	4,13	4,46	4,83	5,11	5,54
	35	20,53	18,69	15,97	13,32	11,65	9,98	3,40	3,55	3,78	4,05	4,24	4,53
	40	19,06	17,39	14,93	12,54	11,03	9,52	2,91	3,02	3,20	3,39	3,53	3,73
	45	18,28	16,77	14,54	12,37	11,00	9,63	2,59	2,69	2,84	3,01	3,13	3,29

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

PREMIUM

WSAT-XIN 91 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	75%	60%	50%	40%	100%	90%	75%	60%	50%	40%
7	20	20,86	19,14	17,16	13,36	11,53	9,71	4,12	4,35	4,64	5,31	5,71	6,35
	25	19,80	18,16	16,24	12,55	10,77	9,00	3,58	3,75	3,96	4,43	4,71	5,15
	30	18,74	17,20	15,36	11,83	10,13	8,44	3,12	3,25	3,40	3,72	3,92	4,21
	35	17,48	16,05	14,35	11,07	9,50	7,92	2,68	2,77	2,87	3,10	3,23	3,43
	40	16,06	14,78	13,25	10,30	8,89	7,48	2,27	2,34	2,41	2,58	2,67	2,80
	45	14,92	13,77	12,41	9,81	8,56	7,31	1,93	2,00	2,06	2,20	2,28	2,38
10	20	22,85	20,89	18,50	13,89	11,68	9,47	4,37	4,64	4,98	5,77	6,27	7,15
	25	21,58	19,72	17,41	12,98	10,85	8,72	3,77	3,97	4,21	4,77	5,11	5,72
	30	20,30	18,55	16,37	12,16	10,14	8,12	3,26	3,41	3,58	3,97	4,21	4,61
	35	18,90	17,29	15,26	11,36	9,49	7,61	2,79	2,91	3,03	3,29	3,45	3,72
	40	17,42	15,96	14,13	10,60	8,91	7,22	2,37	2,46	2,54	2,74	2,85	3,03
	45	16,37	15,04	13,39	10,21	8,69	7,16	2,05	2,13	2,20	2,37	2,46	2,60
12	20	24,01	22,01	19,59	14,94	12,70	10,46	4,65	4,94	5,31	6,16	6,69	7,58
	25	22,72	20,82	18,49	13,99	11,83	9,66	4,01	4,23	4,50	5,09	5,46	6,08
	30	21,44	19,65	17,42	13,14	11,08	9,02	3,47	3,64	3,83	4,25	4,50	4,91
	35	19,93	18,28	16,22	12,26	10,35	8,45	2,96	3,09	3,22	3,51	3,68	3,95
	40	18,34	16,85	14,99	11,42	9,71	7,99	2,51	2,61	2,70	2,91	3,03	3,22
	45	17,42	16,05	14,37	11,12	9,56	8,01	2,23	2,31	2,40	2,58	2,68	2,83
15	20	25,66	23,62	21,17	16,45	14,18	11,91	4,70	5,02	5,41	6,31	6,87	7,78
	25	24,32	22,38	20,00	15,42	13,23	11,02	4,08	4,33	4,61	5,25	5,64	6,27
	30	22,98	21,15	18,88	14,51	12,41	10,31	3,56	3,74	3,95	4,40	4,67	5,09
	35	21,39	19,70	17,59	13,55	11,61	9,66	3,05	3,19	3,33	3,65	3,83	4,12
	40	19,82	18,29	16,38	12,71	10,96	9,19	2,60	2,71	2,81	3,04	3,18	3,37
	45	19,01	17,59	15,85	12,50	10,89	9,29	2,29	2,39	2,48	2,68	2,79	2,96
18	20	27,35	25,19	22,67	17,82	15,49	13,16	5,11	5,49	5,96	7,03	7,66	8,70
	25	25,85	23,80	21,36	16,66	14,41	12,15	4,44	4,72	5,07	5,84	6,29	7,01
	30	24,34	22,41	20,09	15,63	13,48	11,33	3,86	4,08	4,33	4,88	5,20	5,70
	35	22,68	20,91	18,75	14,61	12,62	10,63	3,32	3,49	3,67	4,06	4,28	4,63
	40	21,11	19,49	17,53	13,77	11,96	10,15	2,86	2,99	3,13	3,42	3,59	3,83
	45	20,64	19,11	17,29	13,80	12,12	10,44	2,57	2,69	2,81	3,07	3,21	3,42

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

PREMIUM

WSAT-XIN 101 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	75%	60%	50%	40%	100%	90%	75%	60%	50%	40%
7	20	23,97	21,99	18,97	15,51	13,36	11,20	3,83	4,04	4,42	4,98	5,39	5,89
	25	22,58	20,78	17,96	14,60	12,51	10,42	3,31	3,49	3,79	4,18	4,47	4,81
	30	21,20	19,55	16,93	13,73	11,74	9,76	2,87	3,02	3,25	3,53	3,73	3,96
	35	19,62	18,13	15,73	12,77	10,94	9,10	2,44	2,56	2,73	2,92	3,05	3,21
	40	18,18	16,82	14,63	11,95	10,29	8,62	2,09	2,20	2,34	2,48	2,58	2,69
	45	17,14	15,86	13,85	11,44	9,95	8,45	1,82	1,91	2,04	2,16	2,24	2,34
10	20	25,88	23,88	20,58	16,41	13,82	11,22	3,77	4,03	4,46	5,08	5,56	6,19
	25	24,43	22,61	19,52	15,48	12,97	10,46	3,29	3,50	3,85	4,29	4,63	5,06
	30	22,98	21,32	18,43	14,59	12,20	9,81	2,87	3,05	3,33	3,64	3,87	4,17
	35	21,31	19,80	17,16	13,59	11,38	9,17	2,45	2,61	2,82	3,04	3,20	3,40
	40	19,83	18,45	16,03	12,77	10,75	8,72	2,11	2,24	2,41	2,57	2,69	2,83
	45	19,00	17,69	15,42	12,42	10,57	8,70	1,86	1,97	2,12	2,26	2,36	2,48
12	20	27,28	25,21	21,82	17,58	14,95	12,30	3,97	4,27	4,76	5,43	5,95	6,60
	25	25,76	23,87	20,69	16,58	14,03	11,47	3,48	3,74	4,13	4,61	4,98	5,43
	30	24,24	22,51	19,54	15,63	13,19	10,75	3,06	3,28	3,59	3,93	4,19	4,50
	35	22,38	20,82	18,11	14,50	12,26	10,01	2,59	2,78	3,02	3,26	3,43	3,64
	40	20,94	19,51	17,02	13,70	11,64	9,57	2,25	2,40	2,60	2,78	2,91	3,06
	45	20,40	19,01	16,65	13,55	11,63	9,71	2,03	2,17	2,34	2,50	2,62	2,75
15	20	29,41	27,23	23,70	19,35	16,65	13,94	4,13	4,49	5,06	5,80	6,35	7,05
	25	27,60	25,62	22,33	18,14	15,53	12,91	3,55	3,84	4,28	4,81	5,20	5,68
	30	25,78	23,99	20,94	16,97	14,50	12,02	3,05	3,30	3,65	4,01	4,28	4,61
	35	23,94	22,31	19,52	15,83	13,54	11,25	2,62	2,83	3,11	3,36	3,55	3,78
	40	22,58	21,08	18,49	15,08	12,96	10,85	2,30	2,48	2,70	2,90	3,04	3,20
	45	23,15	21,62	19,03	15,70	13,64	11,57	2,13	2,30	2,51	2,69	2,82	2,97
18	20	31,61	29,16	25,36	20,88	18,09	15,30	4,52	4,91	5,56	6,45	7,11	7,91
	25	29,65	27,42	23,87	19,55	16,86	14,16	3,92	4,24	4,74	5,38	5,85	6,42
	30	27,67	25,65	22,36	18,27	15,72	13,17	3,39	3,66	4,05	4,51	4,84	5,24
	35	25,86	24,01	20,98	17,16	14,78	12,41	2,95	3,20	3,53	3,86	4,10	4,38
	40	24,56	22,83	20,00	16,45	14,25	12,04	2,59	2,79	3,05	3,31	3,49	3,70
	45	25,02	23,27	20,46	17,03	14,89	12,75	2,48	2,67	2,92	3,17	3,34	3,53

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

PREMIUM

WSAT-XIN 121 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	75%	60%	50%	40%	100%	90%	75%	60%	50%	40%
7	20	30,72	28,32	24,28	19,94	17,12	14,28	4,08	4,26	4,60	4,99	5,23	5,46
	25	29,06	26,86	23,03	18,82	16,07	13,32	3,55	3,71	3,96	4,24	4,40	4,56
	30	27,40	25,38	21,78	17,75	15,13	12,50	3,10	3,23	3,43	3,61	3,73	3,84
	35	25,26	23,44	20,15	16,45	14,03	11,61	2,64	2,74	2,88	3,01	3,08	3,15
	40	23,15	21,51	18,54	15,22	13,05	10,88	2,24	2,33	2,44	2,54	2,59	2,64
	45	21,04	19,55	16,94	14,06	12,19	10,31	1,88	1,96	2,06	2,14	2,19	2,24
10	20	33,59	31,12	26,51	21,23	17,78	14,34	4,42	4,64	5,03	5,45	5,71	5,95
	25	31,58	29,34	25,00	19,91	16,59	13,27	3,78	3,97	4,27	4,56	4,74	4,91
	30	29,57	27,53	23,48	18,66	15,52	12,37	3,25	3,41	3,64	3,84	3,96	4,08
	35	27,41	25,57	21,84	17,38	14,47	11,56	2,79	2,93	3,10	3,24	3,32	3,40
	40	25,16	23,50	20,13	16,11	13,49	10,87	2,36	2,48	2,62	2,72	2,78	2,83
	45	22,98	21,46	18,48	14,96	12,66	10,37	1,99	2,09	2,21	2,30	2,36	2,41
12	20	35,22	32,67	27,97	22,63	19,15	15,66	4,63	4,89	5,33	5,79	6,07	6,34
	25	33,18	30,87	26,43	21,27	17,91	14,54	4,00	4,22	4,56	4,88	5,09	5,27
	30	31,14	29,04	24,88	19,98	16,78	13,58	3,46	3,65	3,92	4,14	4,28	4,41
	35	28,87	26,96	23,15	18,61	15,65	12,69	2,95	3,11	3,32	3,47	3,56	3,65
	40	26,39	24,68	21,25	17,18	14,53	11,88	2,50	2,64	2,80	2,91	2,98	3,04
	45	24,30	22,73	19,67	16,08	13,75	11,41	2,12	2,24	2,38	2,48	2,55	2,60
15	20	37,90	35,21	30,35	24,89	21,32	17,75	4,80	5,11	5,62	6,14	6,48	6,81
	25	35,66	33,22	28,64	23,36	19,91	16,46	4,11	4,38	4,77	5,15	5,39	5,62
	30	33,41	31,20	26,92	21,90	18,64	15,36	3,54	3,77	4,07	4,33	4,50	4,66
	35	30,85	28,86	24,95	20,32	17,31	14,30	3,02	3,21	3,45	3,63	3,74	3,85
	40	28,19	26,40	22,89	18,75	16,06	13,36	2,55	2,71	2,89	3,03	3,11	3,19
	45	26,30	24,64	21,47	17,79	15,40	13,00	2,20	2,34	2,50	2,62	2,70	2,77
18	20	40,38	37,38	32,24	26,66	23,01	19,36	5,12	5,45	6,02	6,66	7,07	7,46
	25	37,99	35,27	30,42	25,01	21,49	17,96	4,39	4,66	5,11	5,57	5,86	6,15
	30	35,60	33,12	28,59	23,45	20,11	16,75	3,77	4,00	4,35	4,68	4,89	5,09
	35	32,83	30,60	26,46	21,74	18,66	15,57	3,22	3,44	3,72	3,95	4,10	4,24
	40	30,08	28,06	24,34	20,11	17,35	14,59	2,73	2,90	3,11	3,29	3,40	3,51
	45	28,34	26,45	23,06	19,27	16,80	14,33	2,38	2,53	2,72	2,88	2,98	3,08

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

PREMIUM

WSAT-XIN 131 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	75%	60%	50%	40%	100%	90%	75%	60%	50%	40%
7	20	33,86	31,06	26,94	22,18	18,91	15,62	4,05	4,25	4,55	4,98	5,27	5,55
	25	32,03	29,46	25,69	21,06	17,86	14,67	3,50	3,68	3,93	4,24	4,44	4,64
	30	30,20	27,84	24,37	19,94	16,89	13,82	3,04	3,19	3,41	3,63	3,77	3,90
	35	27,82	25,69	22,56	18,49	15,67	12,85	2,58	2,70	2,87	3,01	3,11	3,20
	40	25,49	23,57	20,74	17,08	14,55	12,01	2,18	2,29	2,45	2,56	2,63	2,69
	45	23,21	21,46	18,90	15,72	13,52	11,33	1,83	1,92	2,05	2,15	2,21	2,27
10	20	36,98	34,10	29,87	24,10	20,09	16,08	4,27	4,54	4,94	5,43	5,77	6,09
	25	34,78	32,16	28,32	22,74	18,87	15,00	3,66	3,89	4,23	4,58	4,82	5,05
	30	32,57	30,19	26,69	21,40	17,72	14,04	3,14	3,34	3,63	3,88	4,04	4,20
	35	30,26	28,09	24,91	20,00	16,58	13,16	2,69	2,86	3,11	3,28	3,39	3,50
	40	27,65	25,70	22,84	18,42	15,35	12,28	2,27	2,41	2,62	2,75	2,83	2,91
	45	25,36	23,58	20,97	17,08	14,37	11,67	1,92	2,04	2,21	2,33	2,40	2,47
12	20	38,80	35,83	31,45	25,60	21,54	17,47	4,49	4,81	5,28	5,82	6,19	6,55
	25	36,51	33,81	29,83	24,17	20,25	16,31	3,86	4,13	4,53	4,92	5,18	5,44
	30	34,22	31,76	28,14	22,76	19,02	15,28	3,32	3,56	3,90	4,18	4,36	4,53
	35	31,71	29,48	26,20	21,22	17,76	14,29	2,84	3,04	3,34	3,53	3,65	3,77
	40	29,11	27,09	24,12	19,63	16,51	13,38	2,41	2,58	2,83	2,97	3,06	3,15
	45	26,72	24,88	22,17	18,21	15,47	12,73	2,03	2,17	2,38	2,50	2,59	2,66
15	20	41,70	38,57	33,96	27,96	23,81	19,64	4,61	4,99	5,55	6,17	6,59	7,01
	25	39,25	36,40	32,21	26,40	22,38	18,34	3,96	4,28	4,76	5,21	5,51	5,81
	30	36,78	34,19	30,38	24,86	21,02	17,18	3,41	3,69	4,10	4,42	4,63	4,84
	35	33,82	31,49	28,07	22,99	19,47	15,93	2,88	3,12	3,46	3,68	3,83	3,97
	40	31,13	29,02	25,92	21,33	18,15	14,96	2,46	2,65	2,94	3,11	3,22	3,32
	45	28,97	27,01	24,14	20,07	17,24	14,42	2,11	2,28	2,53	2,68	2,77	2,87
18	20	44,11	40,66	35,57	29,48	25,28	21,07	4,91	5,29	5,87	6,60	7,11	7,60
	25	41,43	38,29	33,66	27,78	23,71	19,63	4,19	4,52	5,01	5,54	5,91	6,27
	30	38,73	35,87	31,67	26,09	22,22	18,35	3,59	3,87	4,28	4,67	4,93	5,19
	35	35,91	33,32	29,50	24,33	20,75	17,16	3,07	3,33	3,71	3,99	4,18	4,36
	40	32,89	30,54	27,10	22,46	19,24	16,03	2,60	2,80	3,09	3,31	3,45	3,58
	45	30,84	28,65	25,44	21,29	18,43	15,56	2,26	2,43	2,68	2,87	3,00	3,12

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

PREMIUM

WSAT-XIN 141 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	70%	60%	50%	40%	100%	90%	70%	60%	50%	40%
7	20	37,62	35,62	29,30	25,77	21,95	18,12	3,77	4,12	4,63	4,93	5,30	5,67
	25	35,34	33,45	27,69	24,37	20,68	16,97	3,24	3,55	3,98	4,22	4,47	4,73
	30	33,06	31,29	26,03	22,94	19,42	15,90	2,80	3,05	3,43	3,61	3,78	3,96
	35	30,56	28,92	24,15	21,32	18,07	14,82	2,38	2,60	2,89	3,02	3,14	3,26
	40	27,93	26,43	22,13	19,58	16,67	13,76	2,01	2,18	2,44	2,55	2,64	2,72
	45	25,47	24,10	20,19	17,94	15,41	12,87	1,69	1,81	2,02	2,11	2,19	2,27
10	20	40,69	38,52	32,07	28,13	23,51	18,88	3,88	4,25	4,90	5,27	5,68	6,11
	25	38,28	36,23	30,35	26,65	22,18	17,70	3,34	3,65	4,21	4,49	4,79	5,09
	30	35,86	33,94	28,58	25,12	20,87	16,61	2,87	3,14	3,62	3,84	4,04	4,25
	35	33,20	31,43	26,56	23,39	19,45	15,50	2,46	2,68	3,08	3,25	3,39	3,53
	40	30,28	28,66	24,27	21,42	17,89	14,36	2,06	2,23	2,56	2,70	2,80	2,90
	45	27,94	26,44	22,42	19,86	16,73	13,60	1,76	1,89	2,16	2,28	2,37	2,46
12	20	42,92	40,88	34,17	30,09	25,35	20,60	4,13	4,54	5,31	5,74	6,20	6,67
	25	40,21	38,30	32,20	28,38	23,81	19,23	3,53	3,88	4,53	4,86	5,19	5,52
	30	37,49	35,70	30,17	26,62	22,30	17,96	3,02	3,32	3,88	4,13	4,36	4,59
	35	34,77	33,10	28,08	24,82	20,81	16,78	2,60	2,84	3,31	3,51	3,67	3,83
	40	31,95	30,42	25,87	22,92	19,30	15,66	2,20	2,39	2,79	2,95	3,06	3,18
	45	29,48	28,07	23,89	21,24	18,04	14,83	1,87	2,01	2,34	2,47	2,58	2,68
15	20	46,06	44,23	37,16	32,90	28,01	23,09	4,19	4,64	5,55	6,04	6,58	7,12
	25	43,14	41,42	35,01	31,01	26,29	21,55	3,59	3,97	4,75	5,13	5,51	5,89
	30	40,20	38,59	32,78	29,07	24,60	20,11	3,08	3,40	4,06	4,36	4,62	4,89
	35	37,19	35,69	30,43	27,04	22,90	18,75	2,63	2,89	3,45	3,68	3,86	4,05
	40	34,21	32,83	28,06	24,99	21,26	17,51	2,24	2,45	2,92	3,10	3,24	3,38
	45	32,05	30,76	26,31	23,52	20,18	16,84	1,94	2,10	2,49	2,65	2,77	2,89
18	20	–	–	40,35	35,70	30,59	25,46	–	–	5,66	6,20	6,84	7,52
	25	46,58	45,31	38,11	33,74	28,79	23,82	3,64	4,06	4,85	5,28	5,74	6,22
	30	43,55	42,36	35,79	31,72	27,02	22,29	3,14	3,50	4,16	4,50	4,83	5,17
	35	40,08	38,99	33,06	29,35	25,02	20,67	2,67	2,95	3,55	3,82	4,05	4,30
	40	37,04	36,02	30,61	27,25	23,33	19,40	2,29	2,53	2,99	3,20	3,38	3,56
	45	35,34	34,37	29,24	26,12	22,56	18,99	2,02	2,21	2,60	2,79	2,95	3,11

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

EXCELLENCE

WSAT-XIN 81 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	80%	70%	50%	40%	100%	90%	80%	70%	50%	40%
7	20	18,4	16,8	14,3	11,9	10,4	8,91	4,71	5,05	5,65	6,45	7,15	8,37
	25	17,5	15,9	13,5	11,2	9,72	8,25	4,06	4,30	4,72	5,28	5,76	6,58
	30	16,6	15,1	12,8	10,5	9,14	7,74	3,51	3,69	3,99	4,37	4,70	5,23
	35	15,5	14,0	11,9	9,86	8,56	7,26	2,99	3,11	3,32	3,58	3,79	4,14
	40	14,2	12,9	11,0	9,20	8,03	6,87	2,52	2,60	2,75	2,93	3,08	3,30
	45	13,1	12,0	10,3	8,70	7,69	6,67	2,12	2,19	2,31	2,45	2,56	2,71
10	20	20,1	18,1	15,1	12,2	10,4	8,54	4,87	5,25	5,95	6,95	7,94	9,93
	25	19,1	17,1	14,2	11,4	9,63	7,86	4,18	4,45	4,95	5,64	6,31	7,60
	30	18,0	16,1	13,4	10,7	9,02	7,33	3,61	3,80	4,15	4,63	5,08	5,90
	35	16,7	15,0	12,5	9,99	8,43	6,86	3,06	3,19	3,43	3,75	4,05	4,57
	40	15,5	14,0	11,7	9,40	7,99	6,57	2,61	2,71	2,88	3,11	3,30	3,64
	45	14,4	13,0	11,0	8,97	7,72	6,47	2,22	2,30	2,44	2,61	2,75	2,98
12	20	21,3	19,2	16,2	13,3	11,4	9,54	5,16	5,57	6,32	7,35	8,34	10,20
	25	20,1	18,1	15,2	12,4	10,6	8,77	4,42	4,72	5,24	5,96	6,62	7,83
	30	18,9	17,0	14,3	11,6	9,86	8,16	3,81	4,02	4,38	4,87	5,32	6,10
	35	17,6	15,9	13,3	10,8	9,24	7,66	3,26	3,40	3,66	3,99	4,29	4,78
	40	16,3	14,7	12,4	10,2	8,73	7,30	2,75	2,86	3,04	3,28	3,48	3,79
	45	15,3	13,8	11,8	9,77	8,50	7,23	2,34	2,43	2,58	2,76	2,91	3,13
15	20	22,7	20,7	17,6	14,7	12,8	10,9	5,31	5,74	6,51	7,55	8,50	10,18
	25	21,5	19,5	16,6	13,7	11,9	10,1	4,56	4,87	5,41	6,14	6,78	7,89
	30	20,3	18,4	15,6	12,9	11,1	9,41	3,94	4,16	4,54	5,04	5,48	6,20
	35	18,9	17,2	14,6	12,0	10,4	8,81	3,34	3,50	3,77	4,11	4,40	4,85
	40	17,6	16,0	13,6	11,3	9,86	8,41	2,84	2,95	3,15	3,39	3,58	3,88
	45	16,6	15,1	13,0	11,0	9,68	8,38	2,46	2,56	2,72	2,91	3,06	3,27
18	20	24,7	22,6	19,4	16,3	14,3	12,4	5,75	6,26	7,16	8,36	9,43	11,29
	25	23,3	21,2	18,1	15,1	13,2	11,4	4,89	5,26	5,90	6,73	7,46	8,68
	30	21,9	19,9	17,0	14,1	12,3	10,5	4,18	4,45	4,90	5,48	5,97	6,76
	35	20,5	18,6	15,9	13,3	11,6	9,94	3,60	3,79	4,12	4,52	4,85	5,37
	40	19,0	17,3	14,9	12,5	11,0	9,48	3,07	3,21	3,45	3,74	3,97	4,31
	45	18,2	16,7	14,5	12,3	11,0	9,60	2,72	2,84	3,05	3,28	3,46	3,72

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

EXCELLENCE

WSAT-XIN 91 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	75%	60%	50%	40%	100%	90%	75%	60%	50%	40%
7	20	20,8	19,1	17,1	13,3	11,5	9,67	4,33	4,61	4,99	5,93	6,56	7,66
	25	19,8	18,1	16,2	12,5	10,7	8,96	3,75	3,95	4,22	4,88	5,31	6,05
	30	18,7	17,2	15,3	11,8	10,1	8,40	3,25	3,41	3,60	4,05	4,35	4,84
	35	17,4	16,0	14,3	11,0	9,46	7,89	2,78	2,90	3,03	3,34	3,54	3,86
	40	16,0	14,7	13,2	10,3	8,85	7,44	2,35	2,44	2,53	2,75	2,89	3,10
	45	14,9	13,7	12,4	9,77	8,52	7,28	2,00	2,07	2,15	2,33	2,44	2,60
10	20	22,8	20,8	18,5	13,9	11,6	9,43	4,59	4,91	5,35	6,47	7,29	8,92
	25	21,5	19,7	17,4	12,9	10,8	8,68	3,94	4,18	4,49	5,27	5,83	6,90
	30	20,3	18,5	16,3	12,1	10,1	8,08	3,40	3,58	3,80	4,33	4,71	5,41
	35	18,9	17,2	15,2	11,3	9,45	7,58	2,90	3,04	3,19	3,56	3,81	4,26
	40	17,4	15,9	14,1	10,6	8,87	7,18	2,45	2,56	2,67	2,93	3,10	3,40
12	20	24,0	22,0	19,5	14,9	12,7	10,4	4,88	5,24	5,71	6,91	7,76	9,37
	25	22,7	20,8	18,4	13,9	11,8	9,63	4,19	4,46	4,79	5,63	6,21	7,27
	30	21,4	19,6	17,4	13,1	11,0	8,99	3,62	3,82	4,06	4,63	5,03	5,72
	35	19,9	18,2	16,2	12,2	10,3	8,41	3,07	3,22	3,39	3,78	4,05	4,50
	40	18,3	16,8	15,0	11,4	9,67	7,96	2,60	2,71	2,83	3,11	3,30	3,59
	45	17,4	16,0	14,3	11,1	9,53	7,97	2,30	2,40	2,50	2,74	2,89	3,12
15	20	25,6	23,6	21,1	16,4	14,1	11,9	4,92	5,30	5,79	7,02	7,87	9,40
	25	24,3	22,3	20,0	15,4	13,2	11,0	4,26	4,55	4,90	5,76	6,35	7,37
	30	22,9	21,1	18,8	14,5	12,4	10,3	3,70	3,92	4,17	4,77	5,17	5,85
	35	21,3	19,7	17,6	13,5	11,6	9,63	3,16	3,32	3,50	3,92	4,19	4,63
	40	19,8	18,2	16,3	12,7	10,9	9,16	2,68	2,81	2,94	3,24	3,43	3,72
18	20	27,3	25,2	22,6	17,8	15,5	13,1	5,36	5,80	6,38	7,83	8,81	10,55
	25	25,8	23,8	21,3	16,6	14,4	12,1	4,63	4,97	5,39	6,42	7,10	8,27
	30	24,3	22,4	20,1	15,6	13,4	11,3	4,02	4,27	4,58	5,31	5,78	6,56
	35	22,6	20,9	18,7	14,6	12,6	10,6	3,44	3,64	3,86	4,38	4,70	5,22
	40	21,1	19,5	17,5	13,7	11,9	10,1	2,96	3,11	3,28	3,66	3,89	4,24
	45	20,6	19,1	17,3	13,8	12,1	10,4	2,65	2,78	2,93	3,26	3,45	3,73

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

EXCELLENCE

WSAT-XIN 101 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	75%	60%	50%	40%	100%	90%	75%	60%	50%	40%
7	20	23,9	21,9	18,9	15,5	13,3	11,2	3,95	4,19	4,64	5,33	5,87	6,59
	25	22,5	20,7	17,9	14,6	12,5	10,4	3,40	3,60	3,95	4,43	4,81	5,30
	30	21,2	19,5	16,9	13,7	11,7	9,72	2,94	3,11	3,38	3,72	3,98	4,31
	35	19,6	18,1	15,7	12,7	10,9	9,07	2,50	2,63	2,82	3,05	3,23	3,45
	40	18,1	16,8	14,6	11,9	10,2	8,59	2,14	2,25	2,42	2,58	2,71	2,87
	45	17,1	15,8	13,8	11,4	9,91	8,42	1,86	1,96	2,10	2,24	2,35	2,47
10	20	25,8	23,8	20,5	16,4	13,8	11,2	3,88	4,16	4,66	5,42	6,05	6,96
	25	24,4	22,6	19,5	15,4	12,9	10,4	3,37	3,61	4,00	4,54	4,98	5,61
	30	22,9	21,3	18,4	14,5	12,2	9,77	2,94	3,14	3,45	3,83	4,13	4,56
	35	21,3	19,8	17,1	13,6	11,3	9,13	2,50	2,67	2,91	3,18	3,39	3,67
	40	19,8	18,4	16,0	12,7	10,7	8,69	2,15	2,29	2,48	2,67	2,82	3,02
12	20	27,3	25,2	21,8	17,5	14,9	12,3	4,08	4,41	4,97	5,79	6,47	7,41
	25	25,7	23,8	20,6	16,5	14,0	11,4	3,57	3,85	4,29	4,88	5,36	6,01
	30	24,2	22,5	19,5	15,6	13,2	10,7	3,13	3,37	3,72	4,14	4,47	4,92
	35	22,3	20,8	18,1	14,5	12,2	9,97	2,65	2,85	3,12	3,41	3,63	3,93
	40	20,9	19,5	17,0	13,7	11,6	9,54	2,29	2,46	2,68	2,89	3,06	3,27
	45	20,4	19,0	16,6	13,5	11,6	9,67	2,07	2,21	2,41	2,60	2,73	2,91
15	20	29,4	27,2	23,7	19,3	16,6	13,9	4,25	4,63	5,27	6,16	6,88	7,85
	25	27,6	25,6	22,3	18,1	15,5	12,9	3,64	3,95	4,45	5,07	5,57	6,23
	30	25,7	24,0	20,9	16,9	14,5	12,0	3,12	3,38	3,77	4,21	4,55	5,00
	35	23,9	22,3	19,5	15,8	13,5	11,2	2,67	2,90	3,20	3,51	3,74	4,05
	40	22,5	21,0	18,4	15,0	12,9	10,8	2,34	2,53	2,78	3,01	3,19	3,40
18	20	31,6	29,1	25,3	20,8	18,1	15,3	4,66	5,07	5,80	6,86	7,71	8,84
	25	29,6	27,4	23,8	19,5	16,8	14,1	4,02	4,36	4,93	5,69	6,29	7,07
	30	27,6	25,6	22,3	18,2	15,7	13,1	3,47	3,76	4,20	4,74	5,16	5,69
	35	25,8	24,0	20,9	17,1	14,7	12,4	3,01	3,28	3,65	4,04	4,34	4,71
	40	24,5	22,8	20,0	16,4	14,2	12,0	2,64	2,85	3,15	3,45	3,67	3,94
	45	25,0	23,2	20,4	17,0	14,9	12,7	2,53	2,73	3,00	3,29	3,49	3,73

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

EXCELLENCE

WSAT-XIN 121 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	75%	60%	50%	40%	100%	90%	75%	60%	50%	40%
7	20	30,8	28,4	24,3	20,0	17,1	14,3	4,66	4,93	5,52	6,36	7,09	8,11
	25	29,1	26,9	23,1	18,8	16,1	13,3	4,00	4,23	4,67	5,26	5,76	6,46
	30	27,5	25,4	21,8	17,8	15,1	12,5	3,45	3,64	3,97	4,38	4,73	5,20
	35	25,3	23,5	20,2	16,5	14,0	11,6	2,91	3,06	3,29	3,57	3,80	4,11
	40	23,2	21,5	18,6	15,2	13,1	10,9	2,45	2,57	2,76	2,96	3,12	3,34
	45	21,1	19,6	17,0	14,1	12,2	10,3	2,04	2,15	2,30	2,46	2,59	2,75
10	20	33,6	31,1	26,5	21,3	17,8	14,4	4,95	5,30	6,00	7,00	7,91	9,31
	25	31,6	29,4	25,0	19,9	16,6	13,3	4,20	4,49	5,00	5,69	6,31	7,25
	30	29,6	27,6	23,5	18,7	15,5	12,4	3,58	3,82	4,20	4,68	5,10	5,73
	35	27,4	25,6	21,9	17,4	14,5	11,6	3,05	3,25	3,54	3,87	4,15	4,57
	40	25,2	23,5	20,2	16,1	13,5	10,9	2,57	2,73	2,95	3,19	3,39	3,67
	45	23,0	21,5	18,5	15,0	12,7	10,4	2,16	2,29	2,47	2,66	2,82	3,03
12	20	35,2	32,7	28,0	22,7	19,2	15,7	5,18	5,58	6,36	7,42	8,37	9,78
	25	33,2	30,9	26,5	21,3	17,9	14,6	4,44	4,77	5,35	6,09	6,75	7,71
	30	31,2	29,1	24,9	20,0	16,8	13,6	3,82	4,09	4,53	5,05	5,50	6,14
	35	28,9	27,0	23,2	18,6	15,7	12,7	3,23	3,46	3,78	4,14	4,45	4,87
	40	26,4	24,7	21,3	17,2	14,6	11,9	2,72	2,91	3,16	3,42	3,63	3,92
	45	24,3	22,8	19,7	16,1	13,8	11,4	2,30	2,45	2,66	2,87	3,04	3,26
15	20	37,8	35,2	30,4	24,9	21,4	17,8	5,31	5,79	6,66	7,80	8,79	10,20
	25	35,6	33,2	28,7	23,4	19,9	16,5	4,53	4,92	5,56	6,35	7,03	7,99
	30	33,4	31,2	27,0	21,9	18,7	15,4	3,88	4,19	4,68	5,23	5,69	6,33
	35	30,9	28,9	25,0	20,4	17,3	14,3	3,29	3,55	3,91	4,29	4,61	5,03
	40	28,2	26,4	22,9	18,8	16,1	13,4	2,76	2,97	3,25	3,52	3,74	4,03
	45	26,3	24,7	21,5	17,8	15,4	13,0	2,37	2,54	2,78	3,01	3,18	3,40
18	20	40,2	37,3	32,2	26,7	23,1	19,4	5,61	6,14	7,13	8,47	9,60	11,18
	25	37,9	35,2	30,4	25,0	21,5	18,0	4,81	5,22	5,95	6,89	7,67	8,74
	30	35,6	33,1	28,6	23,5	20,1	16,8	4,12	4,45	5,00	5,65	6,19	6,92
	35	32,8	30,6	26,5	21,8	18,7	15,6	3,51	3,80	4,23	4,69	5,07	5,56
	40	30,1	28,1	24,4	20,1	17,4	14,6	2,96	3,18	3,50	3,83	4,10	4,44
	45	28,4	26,5	23,1	19,3	16,8	14,4	2,57	2,75	3,03	3,31	3,53	3,79

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

EXCELLENCE

WSAT-XIN 131 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	70%	60%	50%	30%	100%	90%	70%	60%	50%	30%
7	20	31,3	28,7	23,7	20,9	18,1	11,3	4,89	4,90	5,34	5,57	8,72	9,81
	25	30,0	27,5	22,7	20,0	17,1	10,7	4,21	4,20	4,55	4,75	6,95	7,56
	30	28,5	26,2	21,7	19,0	16,2	10,1	3,64	3,62	3,92	4,03	5,63	6,04
	35	26,8	24,8	20,5	17,9	15,3	9,5	3,13	3,13	3,36	3,46	4,68	4,89
	40	24,6	22,9	19,0	16,7	14,2	8,7	2,64	2,64	2,85	2,94	3,85	3,87
	45	22,5	20,8	17,3	15,1	12,9	7,9	2,20	2,19	2,38	2,41	2,11	3,09
10	20	34,0	31,3	26,0	23,0	19,7	12,5	5,24	5,29	5,86	6,17	9,76	11,84
	25	32,5	29,9	24,9	21,9	18,7	11,8	4,50	4,52	4,98	5,21	7,69	8,71
	30	31,0	28,6	23,7	20,9	17,8	11,1	3,89	3,90	4,26	4,44	6,26	6,82
	35	29,2	26,9	22,4	19,7	16,8	10,5	3,35	3,36	3,66	3,80	5,15	5,48
	40	26,9	24,9	20,8	18,3	15,6	9,6	2,83	2,83	3,09	3,20	4,22	4,32
12	20	36,0	33,3	27,7	24,4	20,9	13,2	5,52	5,61	6,26	6,62	10,55	13,01
	25	34,5	31,8	26,5	23,3	19,9	12,5	4,75	4,78	5,30	5,57	8,30	9,53
	30	32,8	30,3	25,2	22,2	18,9	11,8	4,08	4,11	4,51	4,72	6,70	7,31
	35	30,9	28,5	23,8	20,9	17,8	11,1	3,50	3,52	3,87	4,02	5,48	5,86
	40	28,5	26,3	22,0	19,4	16,6	10,2	2,97	2,97	3,25	3,38	4,48	4,62
	45	26,0	24,0	20,0	17,6	15,0	9,2	2,47	2,47	2,69	2,79	2,43	3,62
15	20	39,2	36,1	30,1	26,5	22,6	14,3	5,94	6,05	6,83	7,25	11,77	15,14
	25	37,3	34,4	28,9	25,3	21,6	13,6	5,07	5,12	5,77	6,08	9,18	10,89
	30	35,5	32,8	27,3	24,1	20,6	12,9	4,35	4,40	4,87	5,13	7,33	8,33
	35	33,3	30,8	25,7	22,7	19,4	12,1	3,72	3,75	4,14	4,35	5,96	6,47
	40	30,8	28,6	23,9	21,0	18,0	11,2	3,15	3,17	3,49	3,63	4,84	5,16
	45	28,1	26,1	21,7	19,1	16,4	10,2	2,63	2,64	2,88	3,00	2,65	4,02
18	20	42,2	39,0	32,5	28,6	24,3	15,2	6,30	6,48	7,41	7,90	13,02	17,02
	25	40,3	37,2	31,1	27,3	23,3	14,5	5,39	5,48	6,22	6,56	10,01	12,01
	30	38,0	35,1	29,6	25,9	22,1	13,8	4,58	4,65	5,24	5,51	7,93	9,06
	35	35,7	33,0	27,7	24,4	20,9	13,0	3,91	3,96	4,42	4,66	6,44	7,08
	40	33,1	30,6	25,7	22,6	19,4	12,1	3,32	3,35	3,72	3,88	5,19	5,61
	45	30,1	28,0	23,5	20,6	17,5	10,9	2,77	2,79	3,09	3,21	2,81	4,34

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

EXCELLENCE

WSAT-XIN 141 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	70%	60%	50%	40%	100%	90%	70%	60%	50%	40%
7	20	36,8	33,5	26,8	23,3	19,6	15,9	4,43	4,63	5,05	5,28	7,61	8,48
	25	35,5	32,4	25,9	22,4	19,0	15,4	4,01	4,18	4,52	4,67	6,48	6,99
	30	34,0	31,0	24,9	21,6	18,3	14,8	3,60	3,73	4,01	4,14	5,49	5,79
	35	32,4	29,5	23,7	20,7	17,5	14,2	3,18	3,30	3,51	3,61	4,63	4,81
	40	30,3	27,8	22,4	19,4	16,5	13,3	2,76	2,86	3,04	3,09	3,85	3,88
	45	28,2	25,7	20,7	17,9	15,1	12,2	2,37	2,42	2,57	2,59	3,08	3,07
10	20	39,4	36,1	29,2	25,5	21,6	17,5	4,60	4,83	5,38	5,70	8,46	9,88
	25	38,1	34,9	28,3	24,7	20,9	16,9	4,19	4,37	4,83	5,07	7,13	7,95
	30	36,5	33,4	27,1	23,7	20,1	16,3	3,75	3,91	4,28	4,46	6,03	6,49
	35	34,7	31,8	25,9	22,6	19,2	15,6	3,32	3,46	3,77	3,90	5,07	5,29
	40	32,4	29,9	24,3	21,3	18,1	14,7	2,88	3,00	3,24	3,34	4,19	4,30
	45	30,0	27,7	22,5	19,7	16,8	13,4	2,47	2,56	2,74	2,81	3,40	3,36
12	20	41,8	38,3	30,9	27,0	22,9	18,6	4,77	5,01	5,61	5,98	9,05	10,93
	25	40,4	36,9	30,0	26,2	22,2	18,0	4,34	4,54	5,05	5,32	7,59	8,66
	30	38,6	35,4	28,7	25,1	21,4	17,4	3,89	4,06	4,47	4,68	6,40	6,99
	35	36,7	33,6	27,5	24,0	20,4	16,6	3,45	3,59	3,93	4,09	5,36	5,67
	40	34,2	31,6	25,7	22,6	19,2	15,6	3,00	3,13	3,39	3,51	4,42	4,57
	45	–	–	–	–	–	–	–	–	–	–	–	–
15	20	45,4	41,7	33,8	29,4	25,0	20,3	5,00	5,28	5,98	6,44	10,08	12,94
	25	43,8	40,2	32,7	28,6	24,2	19,6	4,56	4,79	5,37	5,72	8,35	9,90
	30	41,9	38,5	31,3	27,4	23,3	19,0	4,10	4,29	4,77	5,02	6,96	7,85
	35	39,7	36,5	29,8	26,2	22,3	18,1	3,64	3,80	4,19	4,39	5,82	6,29
	40	37,1	34,1	28,0	24,6	20,9	17,1	3,16	3,30	3,62	3,76	4,78	5,06
	45	–	–	–	–	–	–	–	–	–	–	–	–
18	20	49,4	45,4	36,5	31,9	27,0	21,8	5,23	5,55	6,32	6,89	11,12	15,25
	25	47,4	43,7	35,2	30,8	26,1	21,1	4,76	5,04	5,65	6,09	9,11	11,19
	30	45,2	41,9	33,9	29,7	25,2	20,4	4,28	4,51	5,04	5,38	7,52	8,63
	35	42,9	39,8	32,2	28,2	24,0	19,6	3,81	4,03	4,43	4,65	6,24	6,85
	40	40,0	37,2	30,2	26,5	22,5	18,4	3,33	3,50	3,83	3,99	5,10	5,47
	45	–	–	–	–	–	–	–	–	–	–	–	–

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

EXCELLENCE

WSAT-XIN 151 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	70%	60%	50%	30%	100%	90%	70%	60%	50%	30%
7	20	41,3	37,2	33,7	26,3	22,4	14,3	4,08	4,19	4,38	4,83	7,24	8,97
	25	39,9	36,0	32,6	25,4	21,6	13,8	3,72	3,82	3,98	4,34	6,21	7,26
	30	38,3	34,5	31,3	24,4	20,7	13,3	3,36	3,43	3,58	3,87	5,32	5,95
	35	36,4	32,8	29,8	23,3	19,8	12,7	2,99	3,05	3,17	3,40	4,52	4,89
	40	34,1	30,7	28,0	22,0	18,6	11,8	2,61	2,65	2,76	2,95	3,77	3,84
	45	31,5	28,5	26,0	20,3	17,2	10,8	2,23	2,27	2,36	2,48	3,08	2,99
10	20	44,2	40,6	36,8	28,8	24,6	15,7	4,22	4,43	4,64	5,20	7,95	10,84
	25	42,7	39,2	35,6	27,9	23,7	15,2	3,86	4,04	4,23	4,68	6,78	8,45
	30	41,2	37,7	34,2	26,8	22,8	14,7	3,51	3,65	3,81	4,17	5,81	6,76
	35	38,8	35,8	32,5	25,6	21,8	14,0	3,10	3,24	3,37	3,68	4,93	5,47
	40	36,4	33,4	30,6	24,1	20,5	13,1	2,72	2,82	2,95	3,18	4,13	4,29
	45	33,7	31,0	28,4	22,3	19,0	12,0	2,34	2,42	2,53	2,70	3,37	3,36
12	20	46,9	43,1	39,0	30,5	26,1	16,7	4,37	4,59	4,83	5,45	8,42	12,37
	25	45,3	41,6	37,7	29,5	25,1	16,1	4,01	4,20	4,40	4,90	7,17	9,35
	30	43,6	40,0	36,2	28,4	24,2	15,6	3,64	3,80	3,96	4,37	6,14	7,35
	35	41,1	37,9	34,4	27,1	23,1	14,9	3,22	3,37	3,52	3,85	5,20	5,88
	40	38,5	35,3	32,4	25,6	21,8	14,0	2,82	2,93	3,08	3,34	4,35	4,61
	45	-	-	-	-	-	-	-	-	-	-	-	-
15	20	51,1	46,8	42,6	33,3	28,4	18,2	4,59	4,83	5,10	5,83	9,19	15,93
	25	49,3	45,2	41,1	32,1	27,4	17,6	4,22	4,42	4,66	5,23	7,80	11,20
	30	47,1	43,3	39,4	30,9	26,4	17,0	3,82	4,00	4,19	4,67	6,63	8,46
	35	44,4	41,1	37,5	29,5	25,3	16,3	3,39	3,56	3,74	4,12	5,63	6,61
	40	41,7	38,3	35,0	27,8	23,8	15,3	2,99	3,11	3,25	3,57	4,68	5,14
	45	-	-	-	-	-	-	-	-	-	-	-	-
18	20	55,3	50,9	46,2	36,1	30,6	19,7	4,78	5,05	5,35	6,20	9,91	20,36
	25	53,3	49,1	44,4	34,9	29,6	19,0	4,40	4,64	4,88	5,57	8,40	13,12
	30	50,9	46,9	42,7	33,5	28,6	18,3	3,99	4,20	4,41	4,97	7,12	9,52
	35	48,1	44,4	40,5	31,9	27,3	17,6	3,56	3,75	3,92	4,37	6,00	7,27
	40	44,8	41,6	37,8	29,9	25,7	16,6	3,13	3,29	3,43	3,78	5,01	5,67
	45	-	-	-	-	-	-	-	-	-	-	-	-

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

EXCELLENCE

WSAT-XIN 161 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	70%	60%	50%	40%	100%	90%	70%	60%	50%	40%
7	20	49,3	44,7	40,0	31,4	26,8	21,8	4,19	4,32	4,55	4,99	7,27	8,07
	25	47,6	43,0	38,7	30,3	25,9	21,1	3,80	3,90	4,10	4,45	6,25	6,78
	30	45,7	41,4	37,1	29,2	24,9	20,4	3,41	3,50	3,67	3,95	5,35	5,66
	35	43,2	39,3	35,3	27,9	23,8	19,4	3,00	3,09	3,23	3,47	4,52	4,71
	40	40,2	36,8	33,2	26,2	22,4	18,3	2,61	2,68	2,81	2,99	3,77	3,91
	45	37,4	34,1	30,7	24,2	20,6	17,0	2,23	2,29	2,38	2,52	3,06	3,17
10	20	52,9	48,7	43,8	34,4	29,3	23,9	4,35	4,56	4,83	5,36	7,97	9,19
	25	51,1	47,0	42,2	33,1	28,3	23,2	3,95	4,14	4,35	4,77	6,80	7,55
	30	48,8	45,1	40,5	31,9	27,3	22,4	3,54	3,71	3,90	4,24	5,77	6,28
	35	46,2	42,8	38,5	30,4	26,0	21,4	3,13	3,28	3,44	3,72	4,89	5,19
	40	43,2	39,9	36,1	28,6	24,5	20,1	2,72	2,84	2,98	3,20	4,07	4,26
	45	40,1	37,1	33,5	26,5	22,7	18,6	2,35	2,44	2,55	2,71	3,32	3,40
12	20	56,0	51,6	46,4	36,4	31,1	25,4	4,48	4,72	5,00	5,61	8,46	10,03
	25	54,0	49,8	44,7	35,1	30,0	24,6	4,09	4,29	4,52	5,00	7,19	8,13
	30	51,7	47,6	42,9	33,8	28,9	23,8	3,67	3,84	4,05	4,44	6,08	6,70
	35	48,7	45,2	40,6	32,2	27,6	22,7	3,24	3,40	3,57	3,89	5,14	5,50
	40	45,5	42,1	38,2	30,3	26,0	21,4	2,83	2,95	3,10	3,35	4,28	4,53
	45	-	-	-	-	-	-	-	-	-	-	-	-
15	20	60,8	56,1	50,3	39,7	33,9	27,7	4,68	4,94	5,27	6,00	9,29	11,53
	25	58,6	53,9	48,5	38,3	32,7	26,9	4,27	4,48	4,76	5,34	7,81	9,20
	30	55,9	51,7	46,7	36,8	31,5	25,9	3,84	4,04	4,28	4,73	6,60	7,38
	35	52,7	48,9	44,2	35,0	30,1	24,7	3,40	3,58	3,77	4,14	5,56	5,99
	40	49,1	45,6	41,3	32,9	28,2	23,3	2,97	3,11	3,28	3,58	4,61	4,92
	45	-	-	-	-	-	-	-	-	-	-	-	-
18	20	65,8	60,6	54,6	42,9	36,6	29,9	4,86	5,13	5,51	6,38	10,13	13,13
	25	63,3	58,5	52,5	41,4	35,2	28,9	4,45	4,70	5,00	5,67	8,40	10,10
	30	60,1	55,8	50,3	39,7	33,9	27,8	3,99	4,22	4,48	5,02	7,06	8,03
	35	56,8	52,7	47,6	37,7	32,3	26,6	3,56	3,75	3,97	4,37	5,89	6,46
	40	52,8	49,2	44,4	35,3	30,3	25,0	3,11	3,27	3,44	3,78	4,88	5,24
	45	-	-	-	-	-	-	-	-	-	-	-	-

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling capacity and EER calculated according to EN 14511:2013

EXCELLENCE

WSAT-XIN 171 Performances in cooling

To	Tae	Cooling Capacity EN14511						EER EN14511					
		Percentage of compressor load						Percentage of compressor load					
°C	°C	100%	90%	70%	60%	50%	30%	100%	90%	70%	60%	50%	30%
7	20	54,7	49,0	44,4	34,7	29,7	21,9	4,01	4,10	4,29	4,72	7,05	8,23
	25	52,7	47,2	42,9	33,6	28,6	21,2	3,66	3,72	3,90	4,25	6,08	6,86
	30	50,6	45,3	41,2	32,4	27,5	20,4	3,30	3,35	3,50	3,80	5,22	5,72
	35	48,1	43,1	39,2	30,9	26,2	19,5	2,93	2,98	3,10	3,35	4,44	4,76
	40	44,7	40,3	36,9	29,0	24,7	18,4	2,55	2,59	2,71	2,90	3,75	3,91
	45	41,5	37,3	34,1	26,8	22,8	16,8	2,20	2,22	2,31	2,45	3,05	3,07
10	20	58,1	53,4	48,6	38,0	32,4	24,0	4,12	4,32	4,55	5,06	7,65	9,36
	25	56,1	51,5	46,9	36,8	31,2	23,3	3,77	3,95	4,13	4,56	6,57	7,69
	30	53,6	49,4	44,9	35,3	30,1	22,4	3,39	3,55	3,71	4,07	5,65	6,35
	35	50,8	46,9	42,6	33,7	28,7	21,5	3,02	3,15	3,29	3,59	4,81	5,27
	40	47,5	43,8	40,0	31,6	27,1	20,2	2,64	2,75	2,88	3,10	4,05	4,31
	45	44,0	40,6	37,1	29,2	25,0	18,5	2,28	2,37	2,47	2,63	3,31	3,39
12	20	61,5	56,5	51,3	40,2	34,3	25,5	4,25	4,46	4,70	5,28	8,05	10,25
	25	59,2	54,5	49,6	39,0	33,2	24,7	3,88	4,08	4,28	4,76	6,92	8,29
	30	56,7	52,2	47,4	37,4	31,9	23,8	3,51	3,66	3,85	4,25	5,94	6,79
	35	53,6	49,5	45,0	35,7	30,5	22,7	3,13	3,27	3,42	3,75	5,05	5,57
	40	50,0	46,2	42,3	33,4	28,7	21,5	2,73	2,86	2,99	3,24	4,26	4,59
	45	-	-	-	-	-	-	-	-	-	-	-	-
15	20	66,8	61,5	55,9	43,8	37,4	27,9	4,42	4,68	4,95	5,61	8,73	11,95
	25	64,1	59,1	53,9	42,4	36,1	27,0	4,06	4,28	4,52	5,06	7,46	9,34
	30	61,2	56,5	51,7	40,8	34,7	26,0	3,67	3,87	4,08	4,54	6,38	7,54
	35	58,1	53,5	49,0	38,8	33,2	24,8	3,29	3,44	3,62	4,00	5,43	6,13
	40	53,9	50,0	45,8	36,5	31,2	23,4	2,87	3,01	3,16	3,48	4,55	4,97
	45	-	-	-	-	-	-	-	-	-	-	-	-
18	20	72,1	66,5	60,6	47,6	40,6	30,1	4,56	4,85	5,16	5,96	9,41	13,64
	25	69,5	64,2	58,4	45,8	39,0	29,1	4,22	4,47	4,73	5,36	8,00	10,38
	30	66,4	61,2	55,8	44,0	37,5	28,0	3,84	4,04	4,28	4,79	6,80	8,27
	35	62,4	57,9	52,9	41,9	35,8	26,7	3,42	3,62	3,80	4,22	5,77	6,63
	40	58,2	53,8	49,4	39,2	33,6	25,1	3,02	3,16	3,33	3,67	4,84	5,34
	45	-	-	-	-	-	-	-	-	-	-	-	-

To = Leaving internal exchanger water temperature (°C)

Tae [°C] = External exchanger inlet air temperature

Performances in function of the inlet/outlet water temperature differential = 5°C

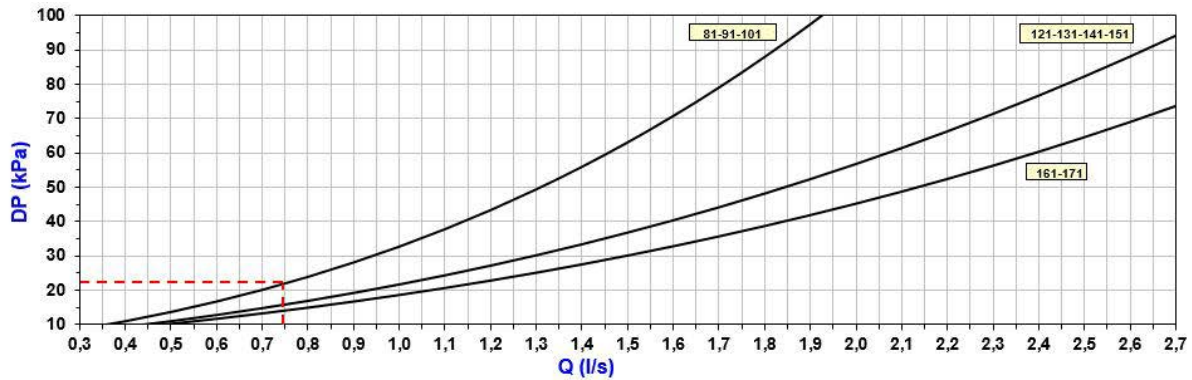
Cooling capacity and EER calculated according to EN 14511:2013

Configurations

User side hydronic assembly: not required (-)

The unit can be requested without the hydronic assembly, consisting solely of the circulation pump

Exchanger pressure drop curves + steel mesh filter



Exchanger pressure drop limit + filter
Caution: do not use beyond this limit.

Unit without hydronic system
Dp = pressure drop
Q = water flow

Exchanger pressure drop limit + filter. Caution: do not use below this limit

HEDIF - Diffuser for high efficiency axial fan

The new AxiTop diffuser creates an ideal air distribution: it aerodynamically decelerates the flow and transforms a big part of its kinetic energy in static pressure.

Obtaining:

- down to -3 dB of silence
- reduction of 3% of the absorbed energy

Since the fans are the unit's main noise source, the benefits are evident especially during the night hours, when the load is reduced but sensitivity to noise is enhanced.

The AxiTop diffuser is available only for EXCELLENCE Version from size 131 to 171.

Sound levels with HEDIF

Size	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
131	83	80	74	65	66	67	63	64	57	74
141	83	80	79	79	81	75	72	61	67	84
151	87	84	81	79	81	75	72	61	68	84
161	90	88	84	85	82	77	75	65	70	87
171	91	88	85	85	82	77	75	65	70	87

Sound levels refer to units with full load under nominal test conditions.

The sound pressure level refers to a distance of 1 meter from the outer surface of the unit operating in open field.

Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2)

Data referred to the following conditions:

entering / leaving exchanger water temperature user side 12/7°C

entering / leaving exchanger water temperature source side 30/35°C

Accessories separately supplied

Every accessory is marked with a configuration code, for instance CMMBX.

When the letter X is placed at the end, this means that the accessory is supplied separately. If there is no X in the code, the accessory is mounted in the factory.

AMRX - Rubber antivibration mounts

The rubber antivibration mounts reduce the vibrations of compressor during its operation and they are installed at the base toe.

RCTX - Remote control

The RCTX remote control, equipped with an easy to read wide display, allows to program the plant supply temperature in a simple way, using only 4 buttons.

- The device can also:

control the unit's operation

activate the circulation of the system's water

set the unit set point water temperature according to time bands

- The RCTX also works in "remote control", making it even easier to configure and control the unit's operation. It can:

set the ON/OFF control

read the information detected by the device installed on board the unit, as the operation status, parameters and alarms.

The unit is not activated if the room temperature set point has not been reached, but it is activated if the supply water temperature does not reach the set point programmed when setting the daily or weekly operating schedule.

The thermostat can be controlled at a maximum distance of 100 metres.



- 1.Clock
- 2.summer/winter/defrosting operating display
- 3.Ambient temperature
- 4.Alarm
- 5.UP + DOWN: operating time band setting
- 6.ON/OFF button
- 7.ESC +SET parameter programming
- 8.fan operating status (active)
- 9.compressor operating status (not active)
- 10.circulator operating status (active)

KG4UP - Management kit up to 4 units in parallel

Module that, by the remote activation of the first and second set-point, allows to manage the unit operating in cascade, up to 4 units, balancing the operating hours. Each unit must be connected to the module that enables its operating by a potential-free contact.

PGFCX - Finned coil protection grill

This accessory is used to protect the external coil from the accidental contact with external things or people.

Ideal for installation in places where persons can pass from, such as car parks, terraces, etc.

Accessory available only for Excellence version from size 131 to 171.

CMSC2X - Serial communication module with RS485 serial converter kit

It is a serial communication module (Modbus) designed to be connected to a supervisor with the standard Modbus protocol.

Up to 127 units can be connected to a single supervision system.

The serial communication module fitted with the supervisor (Modbus) is required if the unit is connected to ELFOControl.

Use an RS 485 BUS to connect it to a PC.

KTFLX - Hose kit for connection to the chiller/heat pump

The kit is made up of: no. 2 of flexible pipes, length 300 mm, necessary for the connection of the unit to the installation.

For size from 81 to 151 the diameter is 1"1/4.

For size from 161 to 171 the diameter is 1"1/2.



KSAX - 100-litre circuit breaker

Storage in Fe360b and anti-corrosion treatment with organic enamel, 50 mm-thick polyethylene and polyurethane external insulation and a maximum operating pressure of 6 bar.

Diameter 500 mm Height 900 mm 8 connections.

Suitable for all WSAT-XIN sizes.

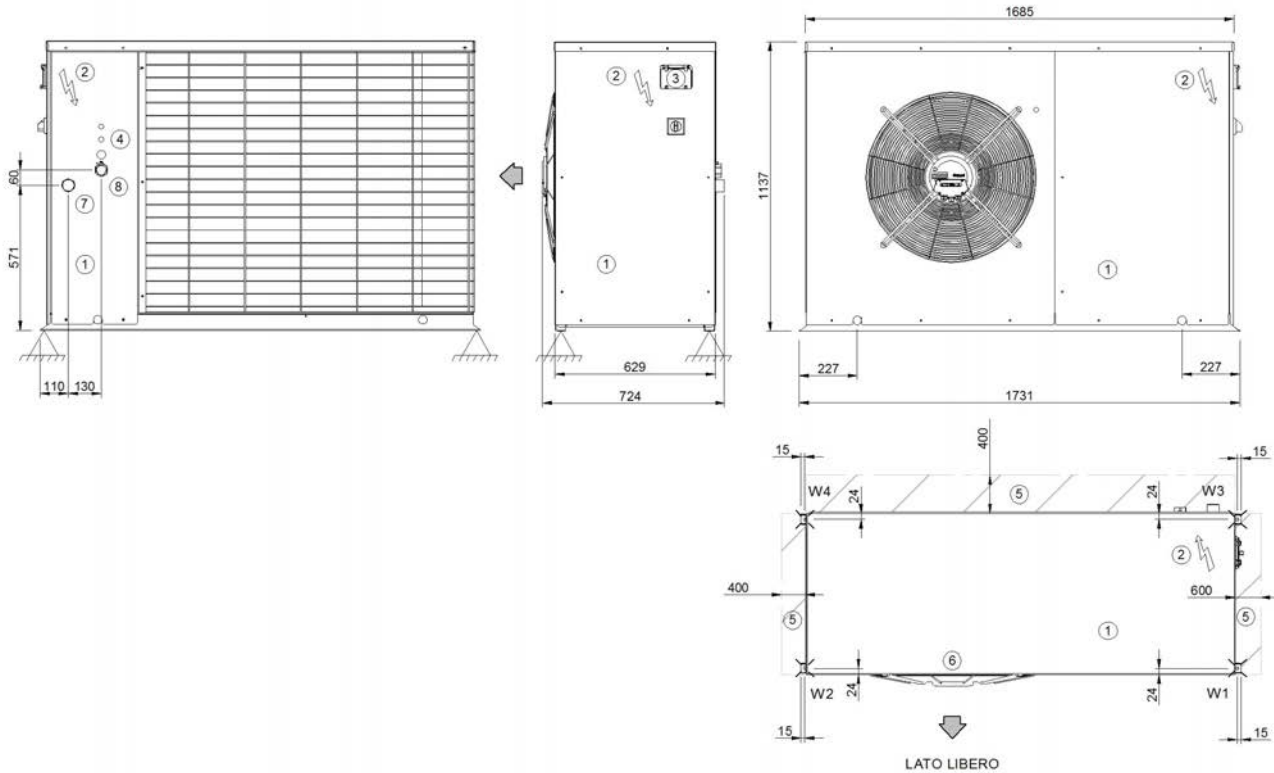
The presence of optional accessories may result in a substantial variation of the weights shown in the table.



Dimensional drawings - PREMIUM Version

ELFOEnergy Extended Inverter 81-91-101

DABQ981 REV00
24/11/2014



- 1. Compressor compartment
 - 2. Electrical panel
 - 3. Unit control keypad
 - 4. Power input
 - 5. Functional spaces
 - 6. Electric fan (supply - return)
 - 7. Internal exchanger water inlet (GAS F 1 1/4")
 - 8. Internal exchanger water outlet (GAS F 1 1/4")
- (M) Air supply

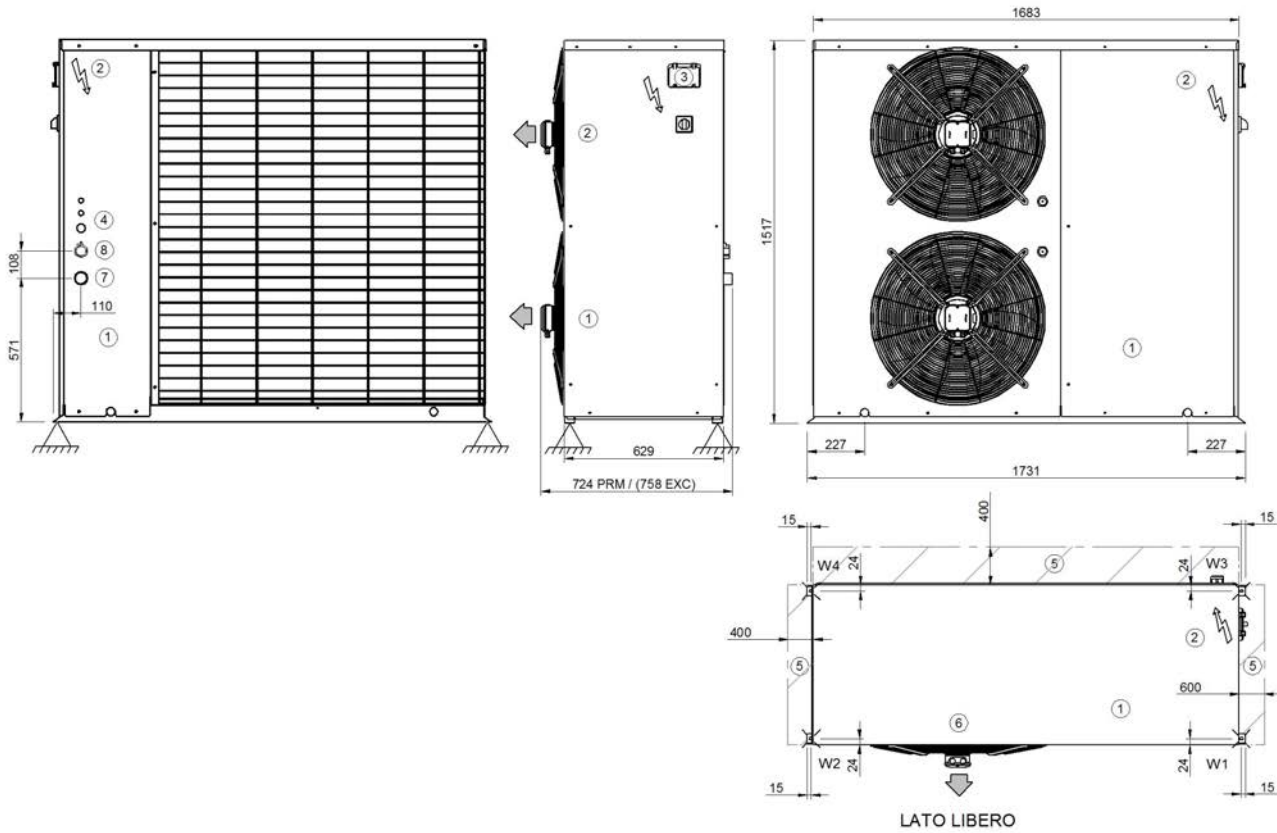
Size			81	91	101
Length		mm	1731	1731	1731
Depth		mm	724	724	724
Height		mm	1137	1137	1137
W1		kg	65	65	65
W2		kg	35	35	35
W3		kg	85	85	85
W4		kg	55	55	55
Operating weight		kg	240	240	240
Shipping weight		kg	250	250	250

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings - PREMIUM Version

ELFOEnergy Extended Inverter 121 - 131 - 141

DABQ921 REV00
24/11/2014



- 1. Compressor compartment
 - 2. Electrical panel
 - 3. Unit control keypad
 - 4. Power input
 - 5. Functional spaces
 - 6. Electric fan (supply - return)
 - 7. Internal exchanger water inlet (GAS F 1 1/4")
 - 8. Internal exchanger water outlet (GAS F 1 1/4")
- (M) Air supply

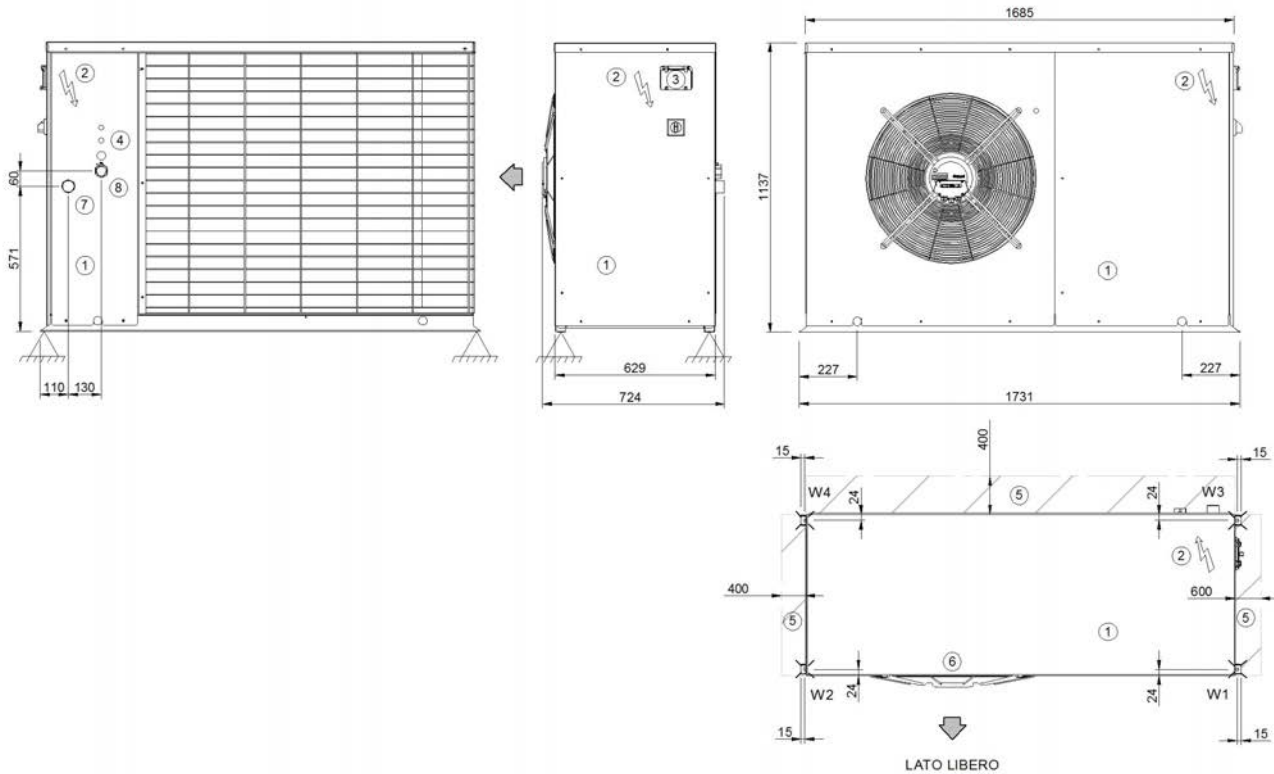
Size			121	131	141
Length		mm	1731	1731	1731
Depth		mm	724	724	724
Height		mm	1517	1517	1517
W1		kg	65	65	65
W2		kg	35	35	35
W3		kg	85	85	85
W4		kg	55	55	55
Operating weight		kg	240	240	240
Shipping weight		kg	250	250	250

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings - EXCELLENCE Version

ELFOEnergy Extended Inverter 81 - 91 - 101

DABQ981 REV00
24/11/2014



- 1. Compressor compartment
- 2. Electrical panel
- 3. Unit control keypad
- 4. Power input
- 5. Functional spaces
- 6. Electric fan (supply - return)
- 7. Internal exchanger water inlet (GAS F 1 1/4")
- 8. Internal exchanger water outlet (GAS F 1 1/4")
- (M) Air supply

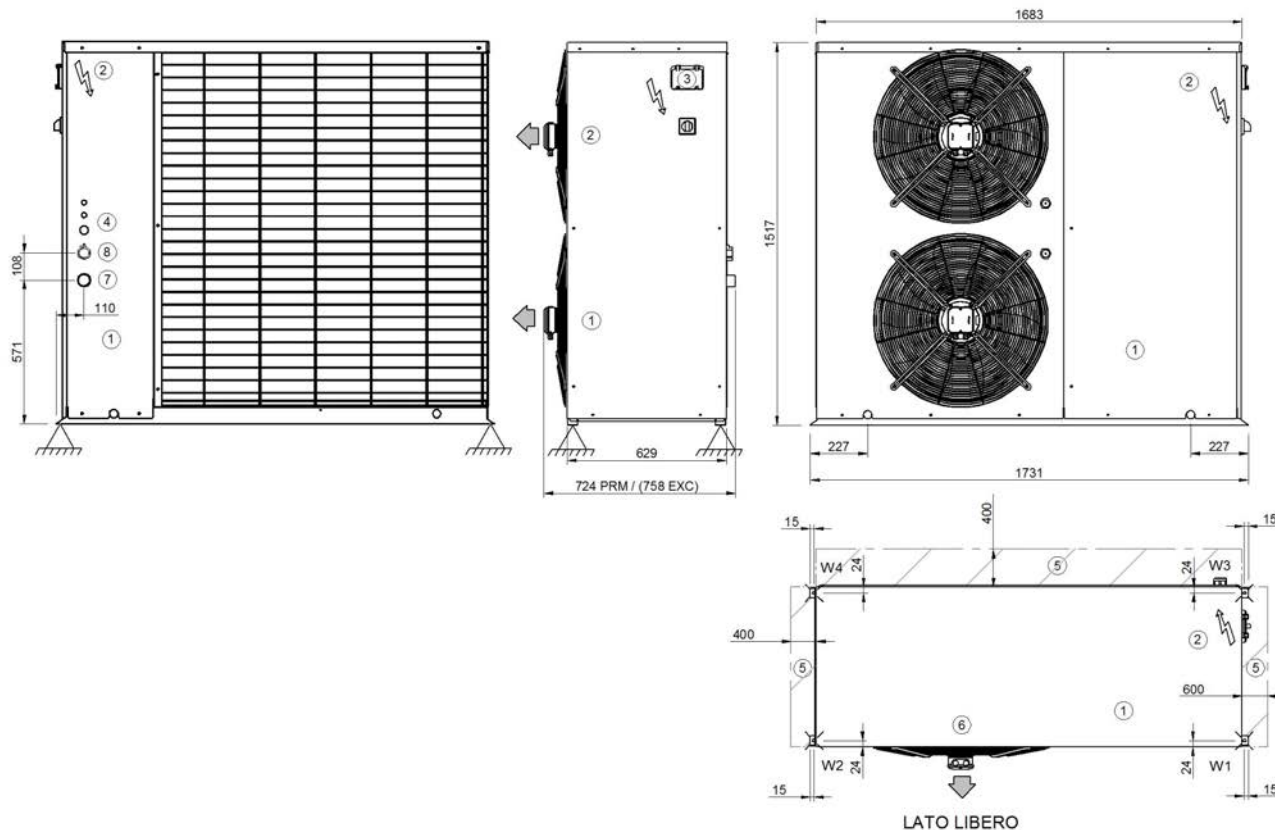
Size			81	91	101
Length		mm	1731	1731	1731
Depth		mm	724	724	724
Height		mm	1137	1137	1137
W1		kg	65	65	65
W2		kg	35	35	35
W3		kg	85	85	85
W4		kg	55	55	55
Operating weight		kg	240	240	240
Shipping weight		kg	250	250	250

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings - EXCELLENCE Version

ELFOEnergy Extended Inverter 121

DABQ9121 REV01
03/11/2015



- 1. Compressor compartment
 - 2. Electrical panel
 - 3. Unit control keypad
 - 4. Power input
 - 5. Functional spaces
 - 6. Electric fan (supply - return)
 - 7. Internal exchanger water inlet (GAS F 1 1/4")
 - 8. Internal exchanger water outlet (GAS F 1 1/4")
- (M) Air supply

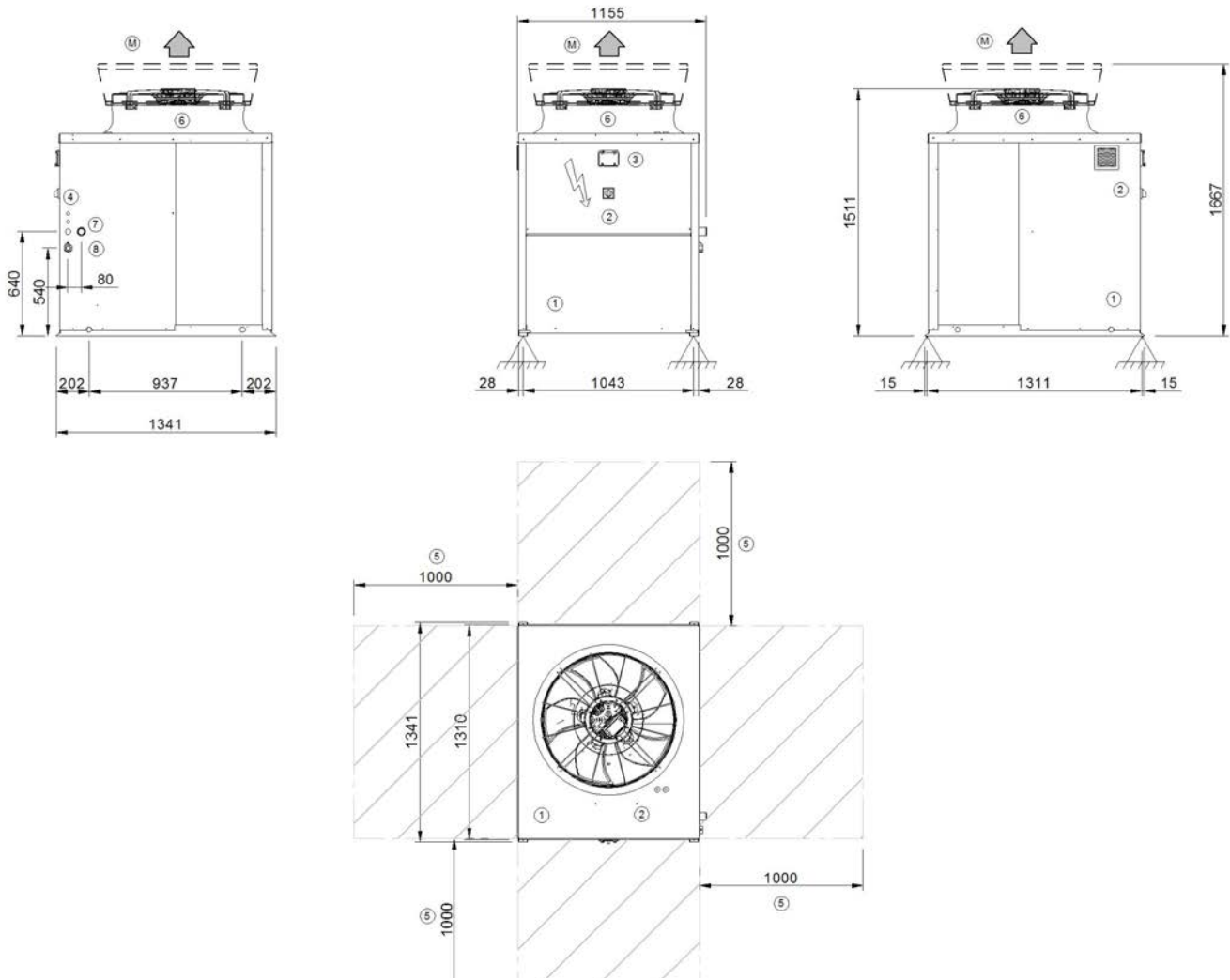
Size	121		
Length		mm	1731
Depth		mm	724
Height		mm	1517
W1		kg	70
W2		kg	55
W3		kg	110
W4		kg	75
Operating weight		kg	310
Shipping weight		kg	320

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings - EXCELLENCE Version

ELFOEnergy Extended Inverter 131 - 141 - 151

DABQ9131_151_1 REV01
21/10/2014



- 1. Compressor compartment
 - 2. Electrical panel
 - 3. Unit control keypad
 - 4. Power input
 - 5. Functional spaces
 - 6. Electric fan (supply - return)
 - 7. Internal exchanger water inlet (GAS F 1 1/4")
 - 8. Internal exchanger water outlet (GAS F 1 1/4")
- (M) Air supply

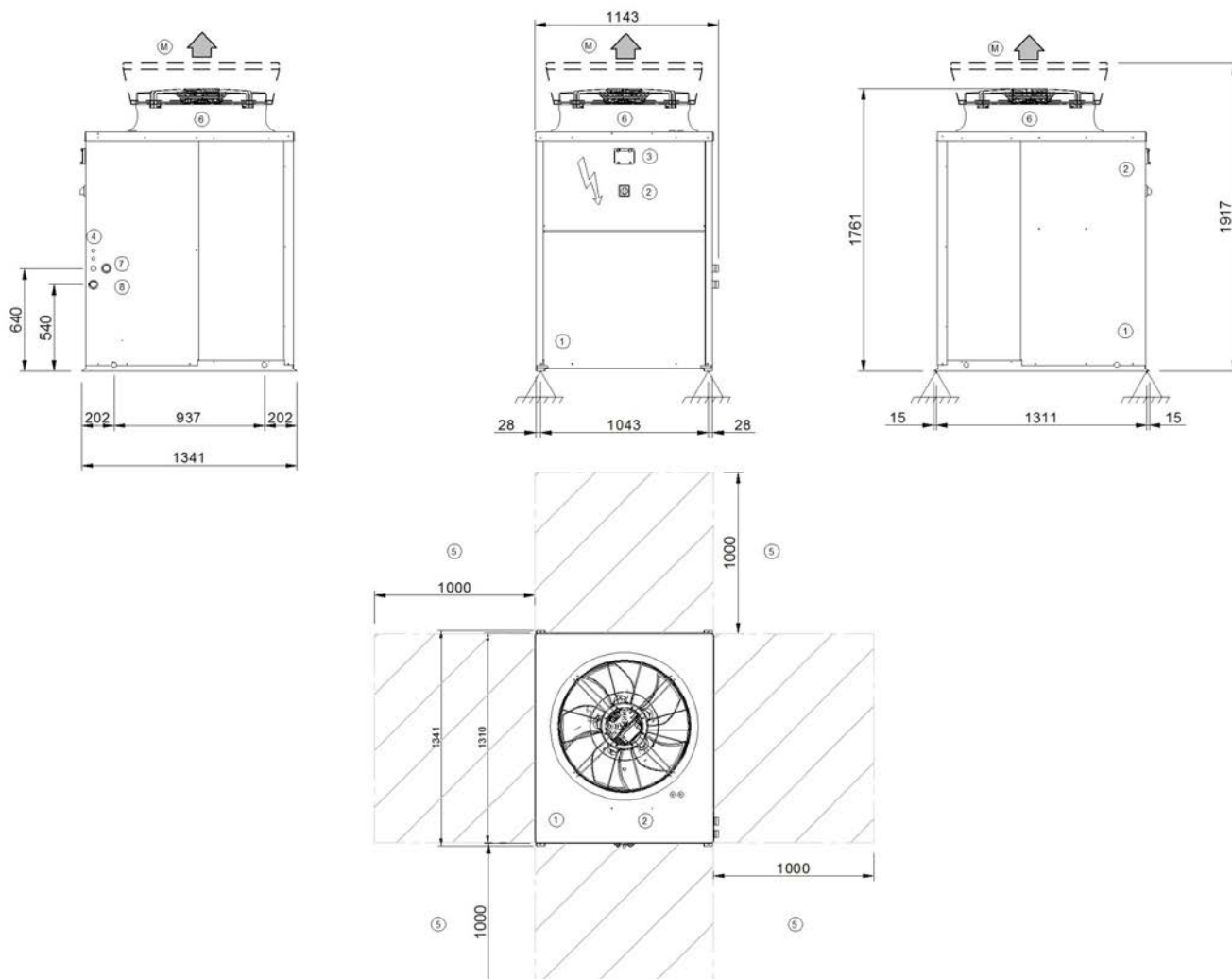
Size			131	141	151
Length		mm	1341	1341	1341
Depth		mm	1159	1159	1159
Height		mm	1520	1520	1520
Operating weight		kg	290	300	320
Shipping weight		kg	300	310	330

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings - EXCELLENCE Version

ELFOEnergy Extended Inverter 161 - 171

DABQ9161_171_1 REV01
Data: 21/10/2014



1. Compressor compartment
2. Electrical panel
3. Unit control keypad
4. Power input
5. Functional spaces
6. Electric fan (supply - return)
7. Internal exchanger water inlet (GAS Victaulic1" 1/2)
8. Internal exchanger water outlet (GAS Victaulic1" 1/2)

(M) Air supply

Size			161	171
Length		mm	1341	1341
Depth		mm	1146	1146
Height		mm	1770	1770
Operating weight		kg	390	390
Shipping weight		kg	400	400

The presence of optional accessories may result in a substantial variation of the weights shown in the table.



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