ELFO ENERGY LARGE

AIR-COOLED WATER CHILLER RATED FROM 78 TO 153 KW

✓ **Reduced energy consumption**

✓ **Optimised operation at partial loads**

✓ **Complete hydronic assembly supplied as standard**

WSAT-EE 322 - 602 (R-407C)	
Size	**Cooling [kW]**
322	78.5
362	92.5
402	101
452	109
502	126
552	140
602	153

SOSTITUISCE: BT03I001GB-00

The **ELFOENERGY** series chillers represent an important stage in the development of this type of unit. They feature the most up-to-date advances in technology, standing out for:

EFFICIENCY thanks to its special construction, the **ELFOENERGY** ensures high energy efficiency, in particular during operation at partial loads;

SELF-ADAPTING the evolved electronics implemented adapt the operating parameters of the chiller to the load conditions of the system it is installed in, optimising consumption, efficiency and the working life of the components;

EASE OF INSTALLATION each unit is supplied as standard with a complete hydronic assembly and is completely tested in the factory; installation is consequently quick and easy.

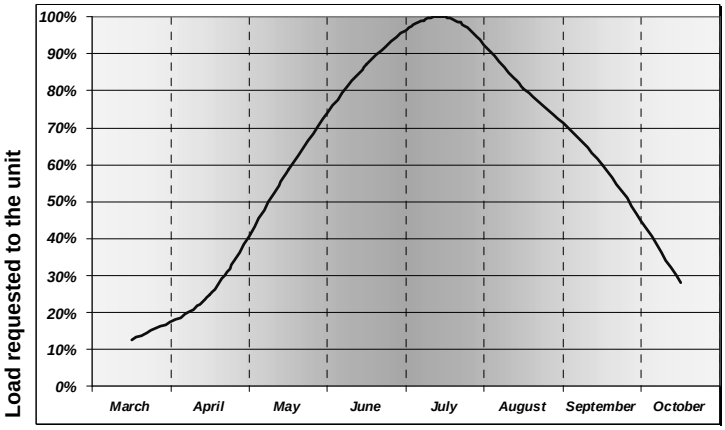
BT04I002GB-00

Clivet is partecipating in the EUROVENT Certification Programme.
Products are listed in the EUROVENT Directory of Certified Products
and in the site www.eurovent-certification.com.

CERTIFIED QUALITY SYSTEM ISO 9001 : 2000

Comfort is a human right. Care for the environment is a human duty.

SEASONAL THERMAL LOAD

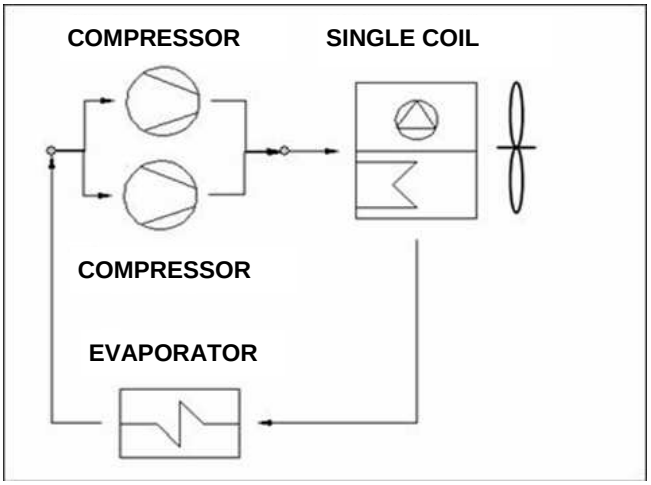


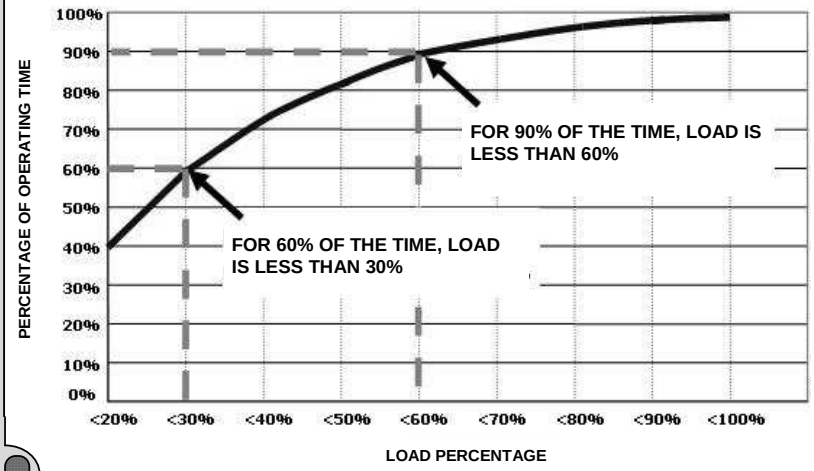
The **ELFOENERGY** is an appliance of new conception, designed especially to operate with increasing efficiency as thermal load reduces, yet able to handle the maximum load demand whenever necessary. Because of significant diurnal and seasonal variations in load, chillers must operate for prolonged periods under partial load conditions.

A ELFOENERGY unit always ensures conditions of maximum comfort coupled with ultra high efficiency for most of the system's working life, which means a big saving in electrical energy. This reflects the corporate policy of CLIVET, namely: offering fundamental and concrete solutions to help safeguard the well-being of people and their environment. By way of example, here is a seasonal thermal load graph relating to a multi-use building (shops, offices and apartments) located in the Milan area.

MULTIPLE HIGH EFFICIENCY SCROLL COMPRESSORS IN THE SAME COOLING CIRCUIT

A key aspect of the approach adopted in designing the **ELFOENERGY** is the notion of equipping a single cooling circuit with a battery of **SCROLL** compressors, rather than the conventional smaller number of bigger semi-hermetic compressors.
This enables the unit to adapt perfectly to the system load by switching the available compressors in and out of operation progressively in response to the demand.
The evolved control equipment used with **ELFOENERGY** units will optimize the activation sequence and balance the operating cycles of the compressors to maximum advantage.

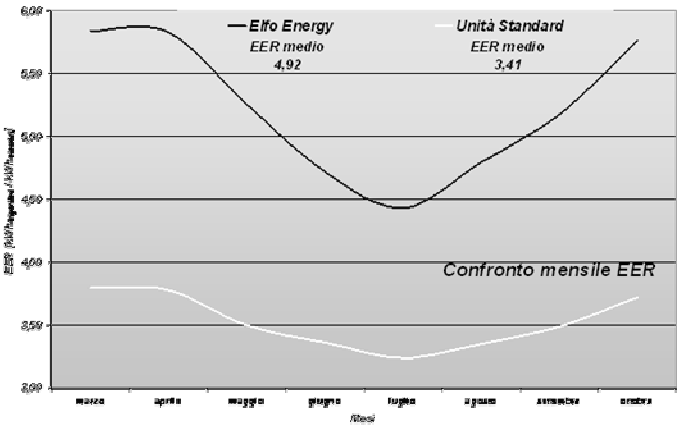


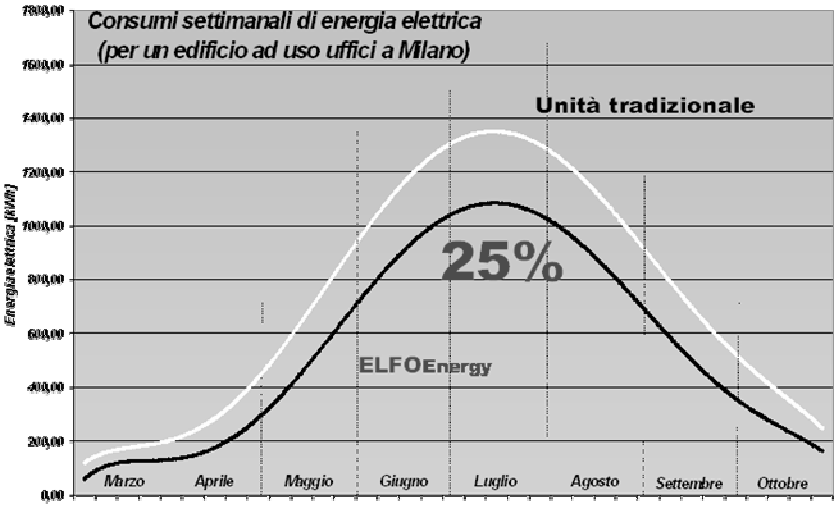


HIGH EFFICIENCY AT PARTIAL LOADS

The chiller in an air-conditioning system is selected on the basis of the maximum load the system is designed to handle.
In practice however, maximum load conditions account only for a small percentage of the overall operating time, **whereas the situation in which the chiller will operate most of the time is with the system under partial load.**
Simulation tests conducted in different buildings have shown that systems operate on average **for 90% of total operating time with thermal load registering at less than 60%**.
Accordingly, operating efficiency under partial load conditions is a key consideration when selecting a chiller.

The electronic controller and the specific constructional configuration highlight the thermodynamic efficiency of **ELFOENERGY.**
To achieve maximum efficiency, the electronic controller starts the compressors according to the most favourable ratio between the exchange surfaces, so that the condensing and evaporation temperature are always the most advantageous.
The diagram to the side shows the trend in efficiency **(EER)** of an **ELFOENERGY** unit and of a traditional unit on a typical summer day.
It is clear how the efficiency of the **ELFOENERGY** is practically always higher, **reaching values that are even more than twice as high at some times of the day**, when the load thermal is lower.

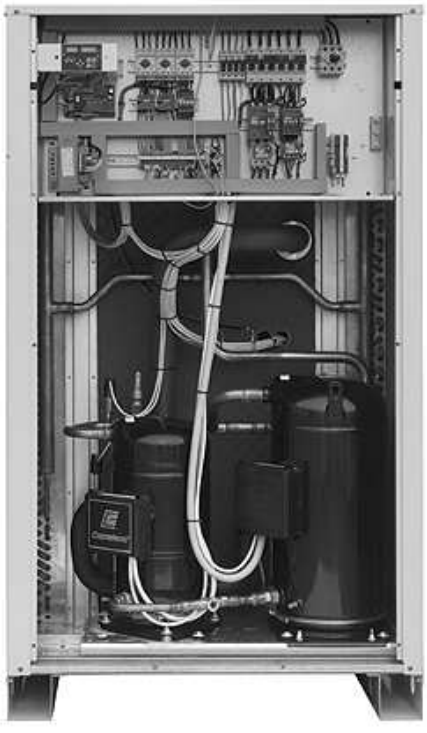




LOW RUNNING COSTS

Thanks to the characteristics described previously, **ELFOEnergy** ensures much higher efficiency than a traditional chiller for most of the operating time.
Comparing, in the same system, the power consumption of the **ELFOENERGY** against the power consumption of a traditional chiller with the same capacity, the seasonal savings can reach around 25%.
These data, combined with the intrinsic reliability of the unit, make the **ELFOENERGY** an essential option in both terms of **pay back time and peace of mind**.

In a system with a 80 kW unit installed, the annual energy saving obtained with a ELFOE-NERGY is in the region of 7.800 kW/h, which signifies a cost saving of € 1.100, and 1.300 kg less fuel to transport and burn.



ALL-IN-ONE PHILOSOPHY

ELFOEnergy is a unit "ready for use", including not only the components of the refrigerant circuit, but also a water circuit complete with pump (optional double pump), expansion vessel, safety valve, filling assembly and filter.
As a result, the only requirement is to connect the unit to the water inlet and outlet pipes; in this way, the commissioning times and the possible problems during installation are reduced to the minimum.

LOAD-DEPENDENT ON NOISE LEVELS TOO

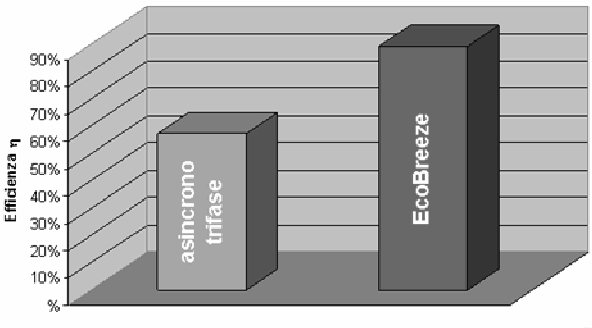
The condenser electronic controller, fitted as **standard on all the ELFOENERGY units, automatically adjusts the fan speed as the thermal load decreases.**
As the fans are the greatest source of noise for this type of unit, it is clear how this feature brings important benefits, **in particular at night, when the load is reduced but noise sensitivity is heightened.**

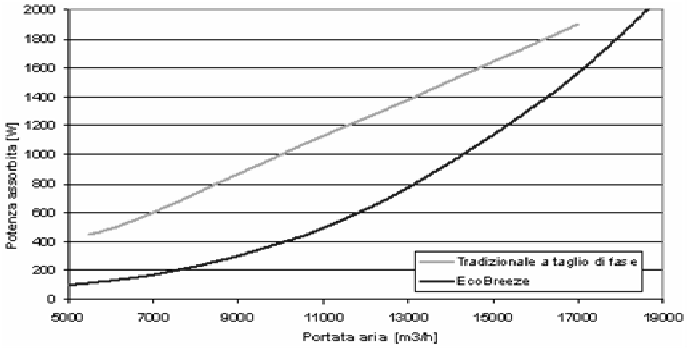
Accessory:ECOBreeze

Within the range of air condensation-based products, Clivet introduces an innovative technology based on the deployment of fans driven by Brushless motors, completely electronically-controlled, characterised by extremely high efficiency and which allow a very advanced adjustment of fan speeds.

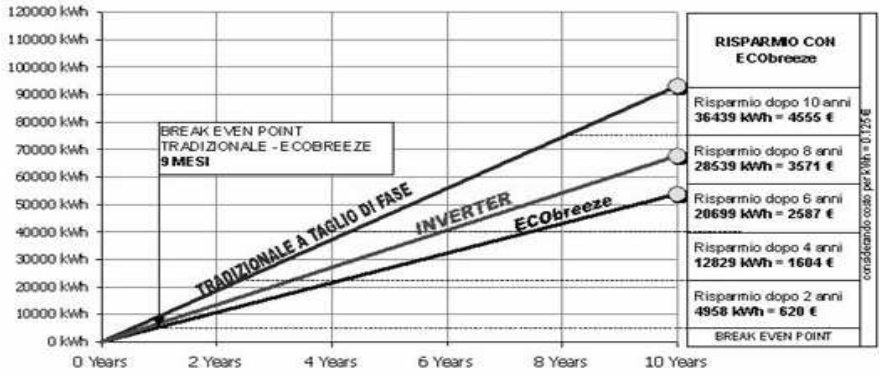
The ECOBreeze option envisages the utilisation of special fans driven by electrical Brushless motors. This technology envisages a permanent-magnets rotor, coupled with a very advanced magnetic field electronic switching control to the stator, directly integrated within the motor itself.
A veritable "feather in the cap" is the electronic switching device that manages the precise and effective modulation of the fan's rotation speed and, therefore, of the fan's capacity. The management of this device is entrusted to the unit's general control system, thus assuring complete integration with the other refrigerating unit's components; this also allows the attaining of an exceptional overall efficiency.
Furthermore, by integrating the control directly within the fan, one is guaranteed absolute suitability in the regulator/fan pair, differently from what is experienced in traditional systems. Finally, under particularly demanding or emergency conditions, for example should the environment temperature rise beyond the limits foreseen, before shutting the delivered power and/or setting the unit under alarm, the control device will detect the specific situation and will force the fans to a rotation speed beyond the nominal value, thus assuring an additional capacity of about 15% of the specified value. In this way, it is possible to assure the production of refrigerated water also when traditional units would be forced into alarm conditions.

Electric motor intrinsic efficency guarantees a consumption reduction in every operation conditions.





The final result confirms that in comparison to the traditional three-phase induction motors, also with frequency and/or voltage governing, the internal losses within the iron are reduced by 60%, those of the copper by 40%, whereas the intrinsic consumption is about half of that of a traditional modulator (inverter, phase adjuster).
The energy cutback, and therefore the money saved, under all operating conditions are truly remarkable and the initial investment is repaid in very few months. From that moment onwards the reduced operative costs turn directly into an economic gain for the user.

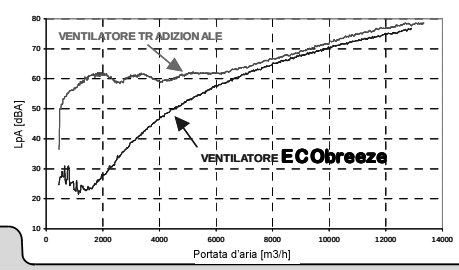


Il grafico fa riferimento ad una unità WSAT-EE 362 installata a Milano per 2000 h/anno di funzionamento

WSAT-EE		322	362	402	452	502	552	602
PAY-BACK	Months	16		26				
Saving after 10 Years	kWh	18950		17144				
	€ (0.125)	2369		2143				
Using rate	h/Year	2000						

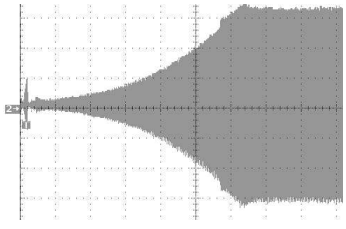
When fans turn at minimum necessary speed, noise emissions are reduced.

In addition to this, a generalised reduction in noise emission is obtained, due to the effect of both the rotation speed which is always modulated to the most suitable value, in keeping with the operation conditions, and the technology deployed in the governing which doesn't induce particular frequencies and vibrations in the rotation.



The start-up is progressive, without start absorption peaks.

The current damping at start-up (diagram below) due to the control typology, but also to the absence of brushing contacts for the power supply to the rotor, drastically reduce the harmful stresses for the lifetime of the component. In the final analysis, the fan's life can be considered as practically unlimited (greater than 80,000 hours).



STANDARD UNIT SPECIFICATIONS

COMPRESSOR
hermetic orbiting scroll compressor complete with motor over-temperature and over-current devices and protection against excessive gas discharge temperature. Fitted on rubber antivibration mounts and complete with oil charge
A oil heater is automatically switched on at the compressor shut-down to prevent oil dilution by the refrigerant.

STRUCTURE
structure made from "aluzink" plate, providing excellent mechanical characteristics and extensive corrosion strength

PANELLING
external panels in prepainted aluminium especially indicated in outdoor installation due to its superior resistance to corrosion avoiding periodic painting. Side panels are easily removable and allow complete access to unit components. Internal sound proof lining reduces sound pressure levels.

INTERNAL EXCHANGER
direct expansion heat exchanger, braze-welded AISI 316 stainless steel plates with large exchange surface and complete with external heat and anti-condensate insulation.
the exchanger comes complete with:
- differential pressure switch, water side
- antifreeze heater to protect the water side exchanger, preventing the formation of frost if the water temperature falls below a set value.

EXTERNAL EXCHANGER
heat exchange coil with aluminium fins and copper tubes in staggered rows. The coils are complete with integral subcooling circuit which assures the correct refrigerant feeding of the expansion valve. Available in different options as per optional list.

FAN
helical fans with die-cast aluminium blades, directly coupled to a three-phase electric motor with external rotor, with built-in thermal overload protection, IP 54 index of protection. Housed inside an aerodinamically shaped nozzles to increase efficiency and minimise noise levels; fitted with safety grills.

REFRIGERANT CIRCUIT
The circuit is complete with:
- liquid flow and moisture indicator
- high pressure switch
- low pressure switch
- compressor suction shut-off valve
- compressor discharge shut-off valve
- thermostatic expansion valve with equalizer
- high pressure safety
- liquid receiver
- replaceable antacid solid cartridge dehydrator filter
- pressure probes

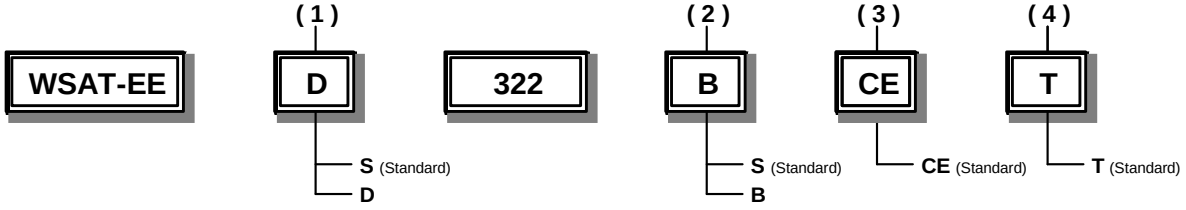
ELECTRICAL PANEL
the Power Section includes:
- isolating transformer for auxiliary circuit power supply
- main line isolator switch
- compressor fuses and thermal overload relay
- compressor and fan fuses
- compressor control contactor
- pump control contactor
- centrifugal pump motor protector
- phase cutting fan speed controller (pressure)
- Condensate control in cooling mode for units working with low ambient temperature

the control section includes:
- display of the set values and the error codes
- H2o antifreeze and high refrigerant gas pressure pre-alarm function that reduces cooling capacity to avoid unit shut-down
- compressor overload protection and timer
- antifreeze protection
- Compressor timer / operation signal LED
- possibility of communication with ZONE MASTER system (optional)
- proportional + integral water temperature control
- relay for remote cumulative fault signal
- self-diagnosis system with immediate display of the error code
- function and command buttons
- ON/OFF and alarm reset buttons
- UP and DOWN buttons to increase and decrease the values
- display of the set values, the error codes and the parameter index
- compressor operating hour display
- set point compensation with 4-20 mA signal
- remote ON/OFF control
- water pump control
- automatic compressor start rotation control (sizes 502÷602)

HYDRAULIC CIRCUIT
- Water fill assembly with pressure gauge
- drain valve
- water side safety valve
- diaphragm expansion vessel
- impurity trap with filter
- antifreeze heater protection to pumping station
- Closed couple pumps with high efficiency impellers. Maximum operating pressure 1000 kPa. Temperature range from -10 to +80°C. Maximum glycol concentration 40%. Motor: closed type. External ventilation. Protection IP55. Insulation class F. Clockwise rotation looking at the pump from the motor side.

ACCESSORIES
- copper / aluminium condenser coils with acrylic lining
- copper / aluminium condenser coils with Fin Guard (Silver) treatment
- copper / copper condenser coils
- stainless steel mesh mechanical filter (to be used, if required, with unit configured without hydronic group)
- finned coil protection grill.
- pump for useful heads other than standard
- double chilled water pump
- unit without hydraulic circuit components
- serial communication module to supervisor (MODBUS)
- daily and weekly programming clock
- set point compensation with outside temperature probe
- set point compensation according to the outside enthalpy
- phase monitor to check the presence and correct sequence of the power supply phases
- high and low pressure gauges
- control keypad for remote installation that repeats all the functions already present on the onboard microprocessor control.
- ECOBreeze
- spring antivibration mounts

CONFIGURATION CODE



(1) ENERGY RECOVERY
Partial Recovery (D)
made using plate exchangers to recover the desuperheating heat, up to 25% of the total heat of the unit.

(2) LOW TEMPERATURE
Not required (-)
Low water temperature (B)
this version permits units operation with glycol solution temperature from +5°C to -8°C.

(3) HEAT EXCHANGERS APPROVALS
CE = PED (European testing)

(4) ENERGY EFFICIENCY
Temperate Climate (T)

GENERAL TECHNICAL SPECIFICATIONS

Size			322	362	402	452	502	552	602
COOLING									
Cooling capacity	1	kW	78.5	92.5	100.8	108.8	125.8	139.8	152.7
Compressor power input	1	kW	28.3	34.3	36.2	40.4	44	48.7	55.6
Total power input	2	kW	30	36.2	38.4	42.6	47.8	52.4	59.5
EER	3	Nr	2.62	2.56	2.62	2.55	2.63	2.67	2.57
EER	4	Nr	4.01	3.9	4.03	4.06			
EER	5	Nr					4.38	4.62	4.42
EER	6	Nr	4.98	4.99	5.06	4.94			
COMPRESSOR									
Type of compressors			SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL
No. of Compressors		Nr	2	2	2	2	2	2	2
Std Capacity control steps		Nr	3	3	3	3	3	3	3
Refrigerant charge (C1)	7	kg	30	33	37	38	40	46	53
Refrigerant circuits		Nr	1	1	1	1	1	1	1
INTERNAL EXCHANGER									
Type of internal exchanger	8		PHE	PHE	PHE	PHE	PHE	PHE	PHE
No. of internal exchangers		Nr	1	1	1	1	1	1	1
Water flow-rate	1	l/s	3.8	4.4	4.8	5.2	6	6.7	7.3
Pressure drop	1	kPa	38	41	38	38	44	37	35
Useful pump discharge head	1	kPa	116	110	113	107	92	110	95
Water content		l	6.3	7.6	8	9	10.5	12.2	13.9
EXTERNAL SECTION FANS									
Type of fans	9		AX	AX	AX	AX	AX	AX	AX
Number of fans		Nr	2	2	2	2	2	2	2
Standard air flow		l/s	7517	7462	8797	8797	11821	13844	13844
Installed unit power		kW	1	1	1.3	1.3	2.1	2.1	2.1
HYDRAULIC CIRCUIT									
Max water side pressure		kPa	550	550	550	550	550	550	550
Safety valve calibration		kPa	600	600	600	600	600	600	600
EXPANSION VESSEL									
Expansion vessel capacity		l	5	5	5	5	5	5	5
No. of expansion vessels		Nr	1	1	1	1	1	1	1
POWER SUPPLY									
Standard power supply		V	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
NOISE LEVELS									
Sound pressure level (1 m)		dB(A)	64	65	68	68	69	70	70
DIMENSIONS									
Length		mm	2710	2710	2930	2930	2930	3370	3370
Depth		mm	1120	1120	1120	1120	1120	1120	1120
Height		mm	1905	1905	1905	1905	1905	1905	1905
STANDARD UNIT WEIGHTS									
Shipping weight		kg	810	857	946	995	1054	1180	1231
Operating weight		kg	820	870	960	1010	1070	1194	1244

(1) data referred to the following conditions :
internal exchanger water = 12/7°C
external exchanger air intake 35°C
(2) The total input is given by the compressor input + fans power input + pump power input - proportional part of the water pump to supply the available head to installation input
(3) 100% EER
internal exchanger water outlet temperature = 7°C
outside air temperature 35°C
(4) 66% EER
internal exchanger water outlet temperature = 10°C
room temperature = 28°C
(5) 50% EER
internal exchanger water outlet temperature = 10°C
room temperature = 28°C
(6) 33% EER
internal exchanger water outlet temperature = 13°C
room temperature = 25°C
(7) approximate values
(8) PHE = plates
(9) AX = axial-flow fan

BT04I002GB-00

Voltage: 400/3/50

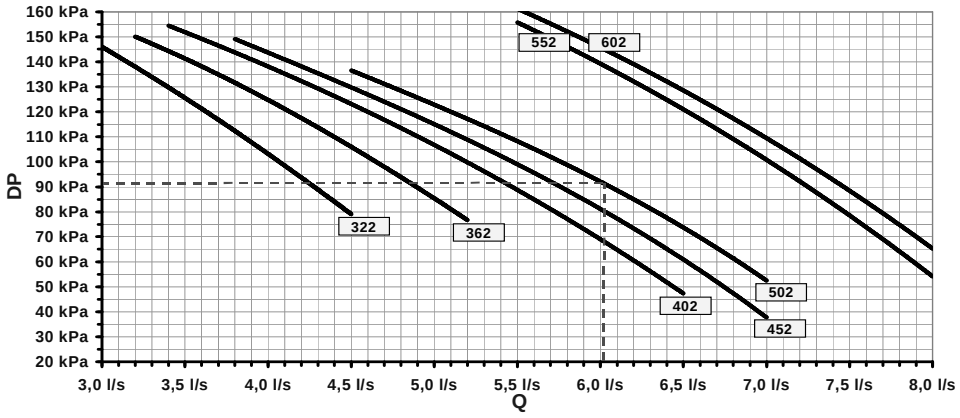
ELECTRICAL DATA

Size		322	362	402	452	502	552	602
F.L.A. - FULL LOAD CURRENT AT MAX ADMISSIBLE CONDITIONS								
F.L.A. - Total	A	66.5	76.5	81.7	90.2	100.9	114.5	126.5
F.L.I. FULL LOAD POWER INPUT AT MAX ADMISSIBLE CONDITION								
F.L.I. - Total	kW	40.7	46.3	49.5	55.5	61.4	68.9	75.5
M.I.C. MAXIMUM INRUSH CURRENT								
M.I.C. - Value	A	253.9	301.9	307.1	315.6	326.3	375.9	387.9

Maximum Phase Unbalance: 2%
power supply: 400/3/50 Hz +/-6%
for non standard voltage please contact Clivet technical office

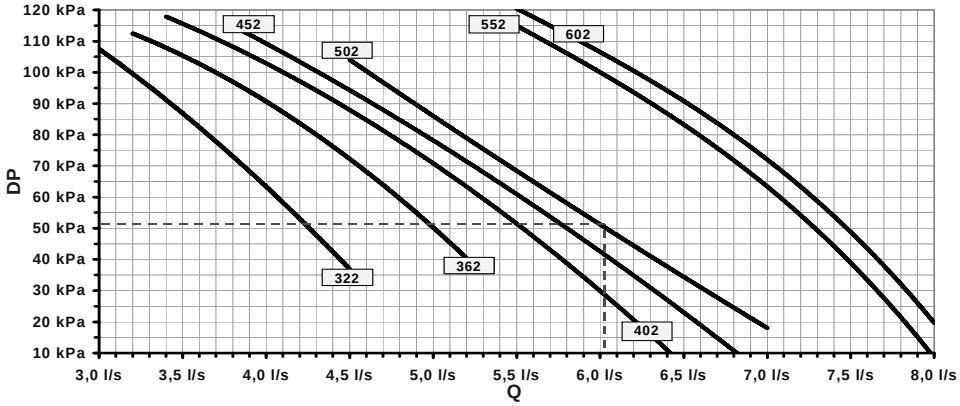
PUMP PERFORMANCE

CURVE OF DISCHARGE HEAD WITH STANDARD PUMP (PUMP + WATER FILTER)



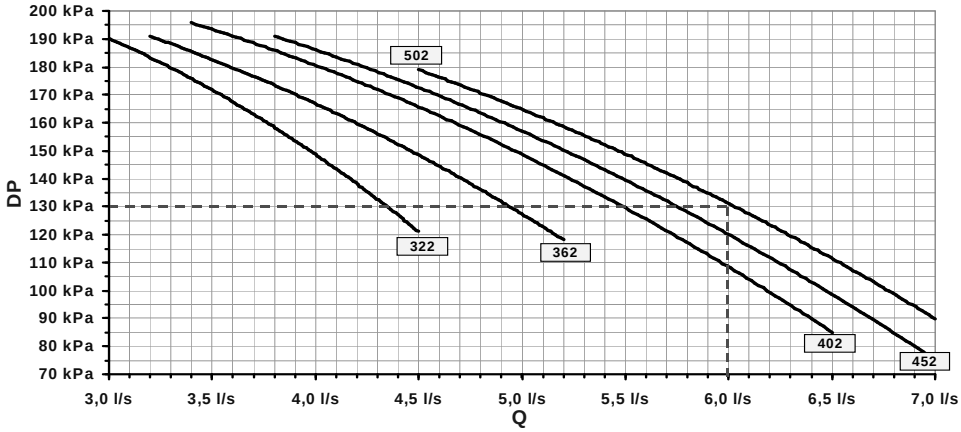
THE HEADS ARE INTENDED AS AVAILABLE AT THE UNIT CONNECTIONS
Q = WATER FLOW
DP = AVAILABLE HEAD

CURVE OF DISCHARGE HEAD WITH REDUCED PUMP (PUMP + WATER FILTER)



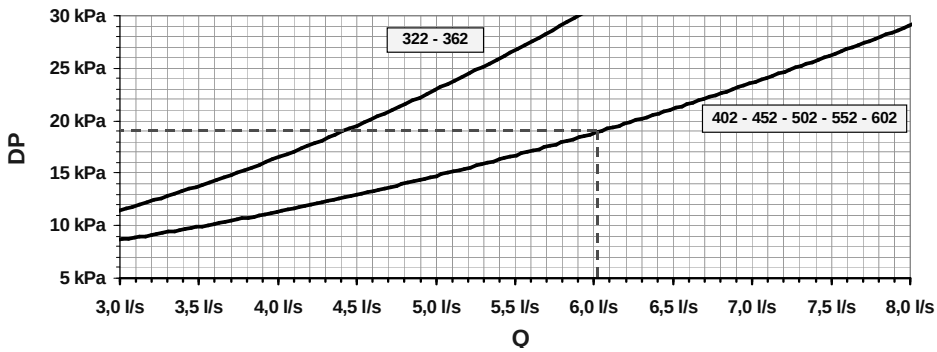
THE HEADS ARE INTENDED AS AVAILABLE AT THE UNIT CONNECTIONS
Q = WATER FLOW
DP = AVAILABLE HEAD

CURVE OF DISCHARGE HEAD WITH LARGER PUMP (PUMP + WATER FILTER)



THE HEADS ARE INTENDED AS AVAILABLE AT THE UNIT CONNECTIONS
Q = WATER FLOW
DP = AVAILABLE HEAD

PRESSURE DROP CURVES DOUBLE PUMP



PRESSURE DROP TO REMOVE IN THE ACCESSORY SELECTION: DOUBLE PUMP.

BOTH PUMPS CAN HAVE A STANDARD, REDUCED OR LARGER AVAILABLE HEAD. THE SECOND PUMP STARTS UP AUTOMATICALLY IN CASE OF THE FIRST PUMP FAILURE. THE UNIT CONTROL ALLOWS AN OPERATION ROTATION OF BOTH PUMPS. THE AVAILABLE HEAD, IN CASE OF THE DOUBLE PUMP USE, IS THE AVAILABLE HEAD OF THE SINGLE CHOOSEN PUMP (STANDARD, REDUCED OR LARGER) LESS THE PRESSURE DROPS AS YOU CAN SEE FROM THE GRAPH.

CORRECTION FACTOR FOR ANTIFREEZE SOLUTIONS

% 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	-15.6	-19.0	-23.4
Safety temperature		°C	3.0	1.0	-1.0	-4.0	-6.0	-10.0	-14.0	-19.0
Cooling Capacity Factor		Nr	0.995	0.990	0.985	0.981	0.977	0.974	0.971	0.968
Compressor input Factor		Nr	0.997	0.993	0.990	0.988	0.986	0.984	0.982	0.981
Internal exchanger Glycol solution flow Factor		Nr	1.003	1.010	1.020	1.033	1.050	1.072	1.095	1.124
Pressure drop Factor		Nr	1.029	1.060	1.090	1.118	1.149	1.182	1.211	1.243

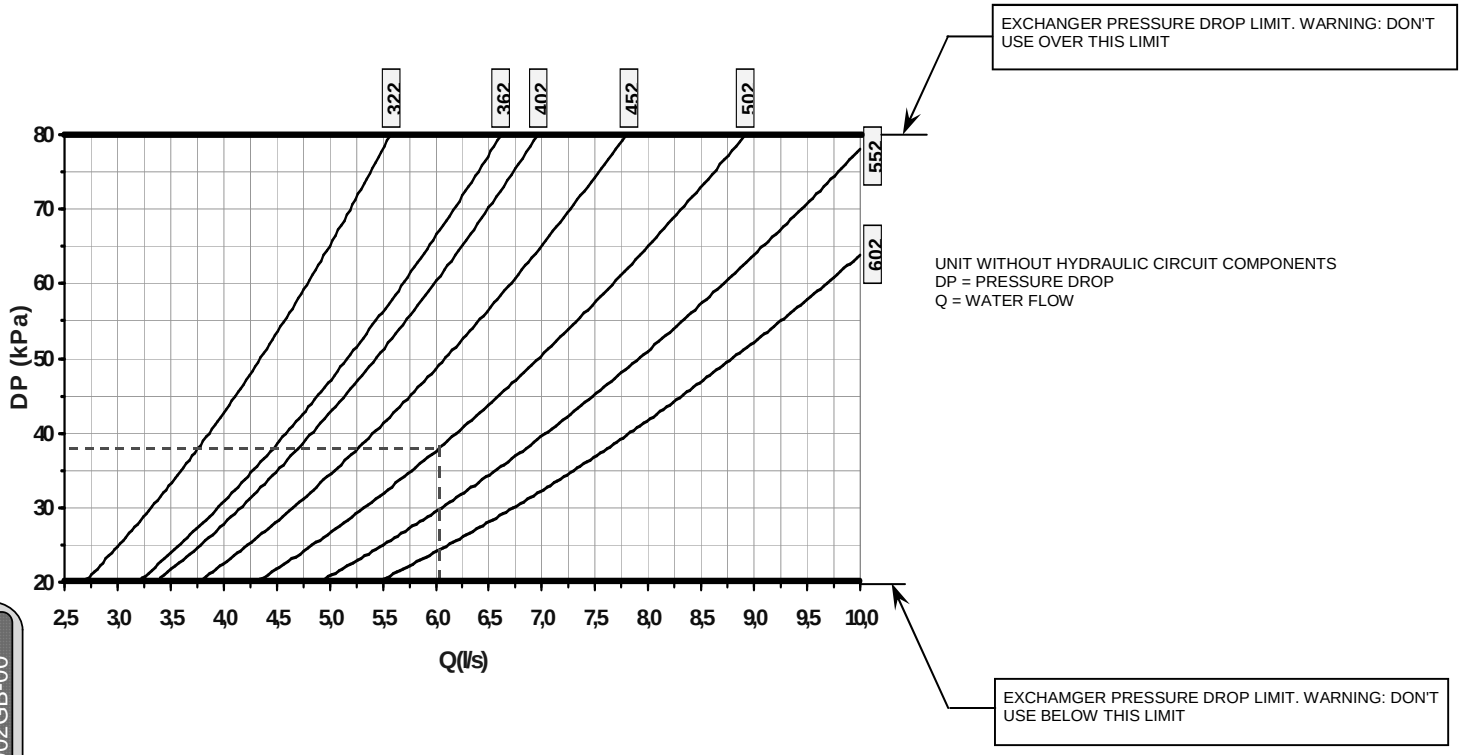
The correction factors shown refer to water and glycol ethylene mixes used to prevent the formation of frost on the exchangers in the water circuit during inactivity in winter.

FOULING CORRECTION FACTOR

	INTERNAL EXCHANGER	
m² °C/W	F1	FK1
0.44 x 10^(-4)	1.00	1.00
0.88 x 10^(-4)	0.97	0.99
1.76 x 10^(-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

EXCHANGER PRESSURE DROPS



GRANDEZZE		322	362	402	452	502	552	602
Portata minima	[l/s]	2,7	3,1	3,4	3,7	4,0	4,3	5,5
Portata massima	[l/s]	5,6	6,3	6,9	7,6	8,1	8,9	11,3

OPERATING LIMITS (COOLING)

Size			322	362	402	452	502	552	602
EXTERNAL EXCHANGER									
Max air intake temperature	1	°C	45	42.5	44	42	43.5	44.5	42.5
Max air intake temperature	2	°C	53	53	53	51.5	51	52	50.5
Min. air intake temperature	3	°C	-10	-10	-10	-10	-10	-10	-10
INTERNAL EXCHANGER									
Max water inlet temperature	4	°C	24	24	24	24	24	24	24
Min. water outlet temperature	5	°C	4	4	4	4	4	4	4

Water thermal head (min / max) are indicated in the section INTERNAL EXCHANGER PRESSURE DROP

(1) unit at full load: internal exchanger water 12/7°C
(2) internal exchanger water = 12/7°C
capacity-controlled unit (automatic capacity control)
(3) Min. air inlet temperature - still outside air
(4) this limit can be exceeded for brief and transitory periods with automatic capacity control of the unit: the maximum limit is 30°C.
capacity-controlled unit (automatic capacity control)
(5) antifreeze intervention

SOUND LEVELS

Size	Sound Power Level (dB)								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
322	80	82	84	82	74	72	69	66	64	82
362	78	80	83	84	74	73	69	64	65	83
402	90	82	86	86	79	74	69	64	68	86
452	90	82	86	86	79	75	70	64	68	86
502	82	87	88	87	80	77	73	68	69	87
552	82	89	89	88	81	78	74	69	70	88
602	83	88	88	89	80	79	75	68	70	88

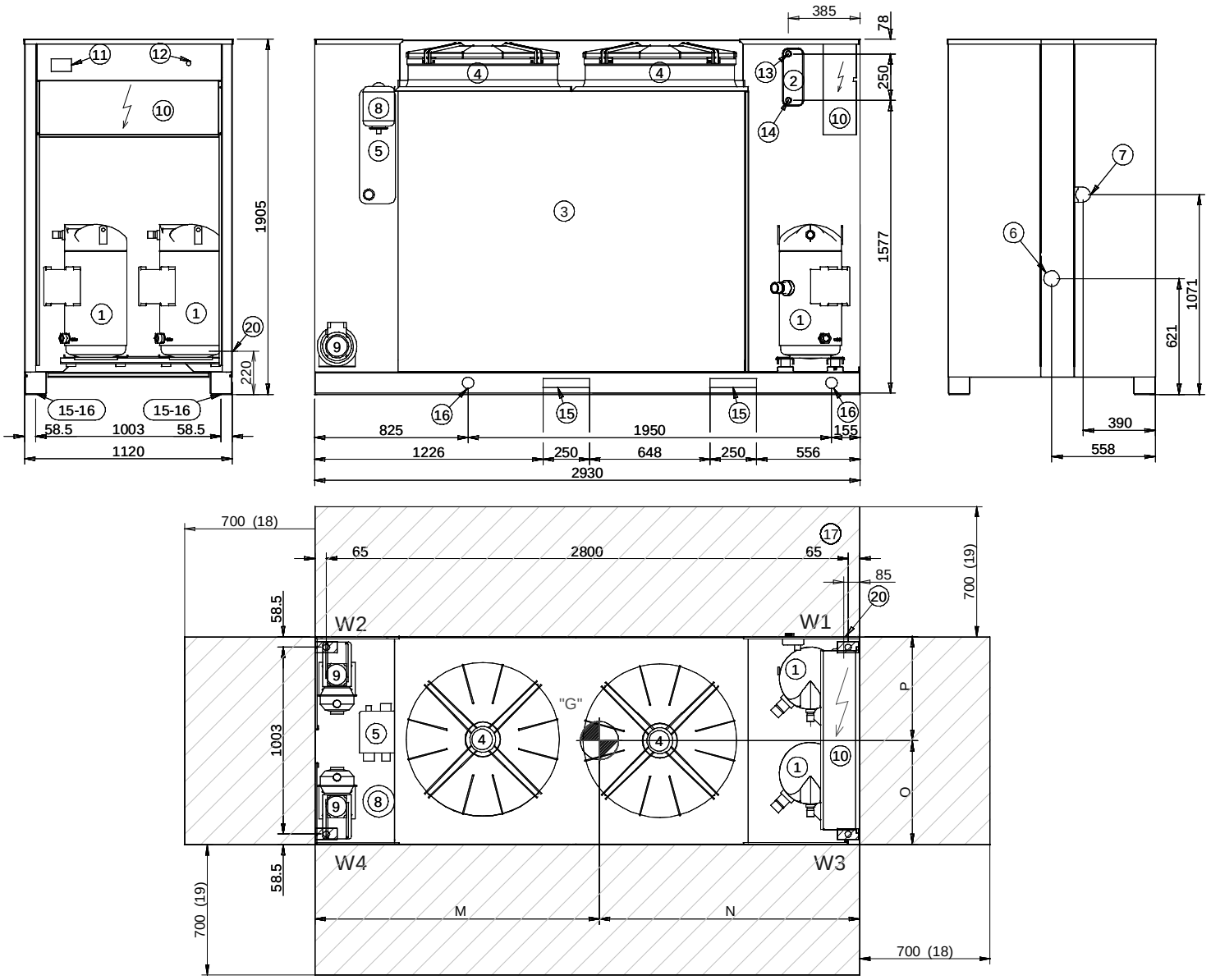
Measures according to ISO 3744 regulations, with respect to the EUROVENT 8/1 certification.
the sound levels refer to the unit at full load, in the rated test conditions.
The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field.
data referred to the following conditions :
internal exchanger water = 12/7°C

COOLING PERFORMANCE

Size	To (ºC)	EXTERNAL EXCHANGER AIR INTAKE TEMPERATURE (ºC)													
		25		30		32		35		40		43		46	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
322	6	85.4	23.0	81.1	25.4	79.3	26.5	76.5	28.1	71.7	31.0	68.7	32.9		
	7	87.7	23.2	83.2	25.7	81.4	26.7	78.5	28.3	73.6	31.2	70.5	33.1		
	8	90.3	23.4	85.7	25.9	83.8	26.9	80.9	28.6	75.8	31.5	72.6	33.3		
	9	93.1	23.7	88.4	26.1	86.5	27.2	83.5	28.8	78.4	31.7	75.2	33.6		
	10	96.2	24.0	91.4	26.4	89.5	27.5	86.5	29.1	81.3	32.0	78.1	33.8		
	11	99.5	24.2	94.7	26.7	92.8	27.8	89.8	29.4	84.6	32.3	81.4	34.2		
362	6	100.0	28.1	95.2	30.9	93.2	32.1	90.2	34.0	85.1	37.3				
	7	102.6	28.4	97.7	31.2	95.6	32.4	92.5	34.3	87.3	37.5				
	8	105.6	28.7	100.5	31.5	98.4	32.7	95.2	34.6	89.9	37.8				
	9	108.8	29.0	103.6	31.9	101.5	33.1	98.3	34.9	92.9	38.1				
	10	112.4	29.4	107.2	32.2	105.0	33.4	101.8	35.3	96.4	38.5				
	11	116.3	29.8	111.0	32.6	108.9	33.8	105.7	35.7	100.3	38.9				
402	6	108.2	29.6	103.2	32.6	101.2	33.9	98.1	35.9	92.9	39.4	89.8	41.6		
	7	111.2	29.8	106.1	32.9	104.0	34.2	100.8	36.2	95.4	39.6	92.1	41.8		
	8	114.5	30.1	109.2	33.2	107.1	34.5	103.8	36.4	98.3	39.9	94.9	42.1		
	9	118.1	30.4	112.7	33.5	110.5	34.8	107.2	36.7	101.6	40.2	98.1	42.4		
	10	121.9	30.8	116.5	33.8	114.3	35.1	110.9	37.1	105.3	40.5	101.8	42.7		
	11	126.0	31.1	120.6	34.2	118.4	35.5	115.0	37.4	109.4	40.9	105.9	43.0		
452	6	117.5	33.1	111.9	36.5	109.6	37.9	106.0	40.1	99.9	43.9				
	7	120.7	33.5	114.9	36.8	112.5	38.2	108.8	40.4	102.5	44.2				
	8	124.2	33.8	118.2	37.2	115.7	38.6	112.0	40.7	105.6	44.5				
	9	128.0	34.2	121.9	37.6	119.4	38.9	115.6	41.1	109.2	44.8				
	10	132.1	34.6	126.0	38.0	123.5	39.4	119.7	41.5	113.2	45.1				
	11	136.6	35.1	130.4	38.4	127.9	39.8	124.2	41.9	117.7	45.5				
502	6	132.4	36.0	126.3	39.7	123.8	41.2	120.1	43.5	113.8	47.6	110.0	50.2		
	7	138.2	36.6	132.1	40.2	129.6	41.7	125.8	44.0	119.4	48.1	115.6	50.6		
	8	143.5	37.1	137.2	40.7	134.7	42.2	130.9	44.5	124.4	48.5	120.4	51.0		
	9	148.3	37.5	141.8	41.2	139.2	42.6	135.3	44.9	128.6	48.9	124.6	51.3		
	10	152.4	38.0	145.7	41.6	143.1	43.1	139.0	45.3	132.2	49.2	128.1	51.6		
	11	156.0	38.3	149.1	41.9	146.3	43.4	142.1	45.7	135.1	49.5	130.9	51.9		
552	6	146.4	39.9	140.0	43.9	137.4	45.6	133.6	48.1	127.1	52.6	123.2	55.4		
	7	152.9	40.4	146.3	44.5	143.7	46.1	139.8	48.7	133.2	53.2	129.2	55.9		
	8	158.7	40.9	152.0	45.0	149.3	46.7	145.2	49.2	138.5	53.6	134.5	56.4		
	9	163.9	41.4	156.9	45.5	154.1	47.1	150.0	49.7	143.1	54.1	138.9	56.8		
	10	168.4	41.8	161.2	45.9	158.3	47.5	154.0	50.1	146.9	54.4	142.7	57.1		
	11	172.3	42.2	164.8	46.3	161.8	47.9	157.4	50.4	150.0	54.8	145.6	57.4		
602	6	159.7	45.7	152.9	50.2	150.2	52.1	146.1	55.0	139.3	60.0				
	7	166.6	46.4	159.6	50.9	156.8	52.8	152.7	55.6	145.8	60.6				
	8	172.8	47.0	165.5	51.5	162.7	53.4	158.4	56.2	151.4	61.1				
	9	178.2	47.5	170.7	52.1	167.8	53.9	163.4	56.8	156.2	61.7				
	10	182.8	48.0	175.2	52.6	172.1	54.4	167.6	57.3	160.1	62.1				
	11	186.8	48.5	178.8	53.0	175.7	54.9	171.0	57.7	163.3	62.5				

To = Internal exchanger water outlet temperature in° C
kWf = Cooling capacity in kW
kWe = Compressor power input in kW
Performances in function of the inlet/outlet water temperature differential = 5°C

DIMENSIONALES AND WEIGHT DISTRIBUTION WSAT-EE 402-452-502



(1) COMPRESSOR
(2) DESUPERHEATER (OPTIONAL)
(3) FINNED EXCHANGER
(4) HELICAL FANS
(5) PLATE EXCHANGER
(6) INTERNAL EXCHANGER WATER INLET Ø2 1/2" F GAS
(7) INTERNAL EXCHANGER WATER OUTLET Ø2 1/2" F GAS
(8) EXPANSION VESSEL
(9) CENTRIFUGAL PUMP
(10) ELECTRICAL PANEL
(11) MICROPROCESSOR KEYBOARD
(12) MAIN ISOLATOR SWITCH
(13) DESUPERHEATER WATER OUTLET 1" GAS
(14) DESUPERHEATER WATER INLET 1" GAS
(15) LIFTING LUGS
(16) LIFTING HOLES
(17) CLEARANCE ACCESS RECOMMENDED
(18) MINIMUM DIMENSION FOR A SAFE PASSAGE.
(19) MINIMUM DIMENSION FOR A PROPER AIR FLOW TO THE CONDENSER COIL.
(20) POWER INPUT
("G") BARYCENTRE

Size			402	452	502
M		mm	1760	1765	1800
N		mm	1170	1165	1130
O		mm	572	565	560
P		mm	548	555	560
Length		mm	2930	2930	2930
Depth		mm	1120	1120	1120
Height		mm	1905	1905	1905
W1		kg	296	320	325
W2		kg	192	200	215
W3		kg	288	298	320
W4		kg	184	192	210