



WSH-XSC 65D-180F

WATER COOLED CHILLERS OF 195 TO 560 kW.

SPINCHILLER represents the very latest step in the evolution of chiller units. Designed specifically to optimize efficiency at partial loads, units of the SPINCHILLER series offer lower energy consumption — under normal operating conditions — than any other chiller of similar rated capacity.



WSH-XSC 65D - 180F (R-410A)

Size	Cooling [kW]	Heating [kW]
65D	195	224
70D	207	237
75D	223	257
80D	234	269
85D	251	289
90D	286	327
100D	312	356
110D	334	383
115D	353	407
120D	371	428
135E	406	466
150F	440	506
165F	497	574
180F	560	646

The SPINCHILLER series signals a turning point in the development of this type of unit. It incorporates all the newest technology currently available, and is characterized by:

EFFICIENCY thanks to special features of construction, the SPINCHILLER guarantees high energy efficiency, especially when operating under partial load conditions;

SELF-ADAPT CAPABILITY evolved electronics ensure that the operating parameters of the chiller can be adapted to the load conditions of the overall system, optimizing power consumption, minimizing noise and extending the life of components;

RELIABILITY SCROLL compressors and newly designed electronic controllers combine to give levels of reliability unattainable hitherto with conventional units of similar rated capacity

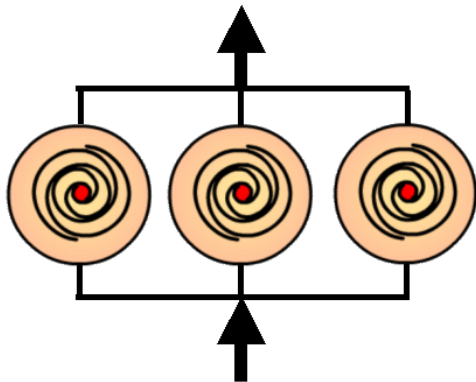
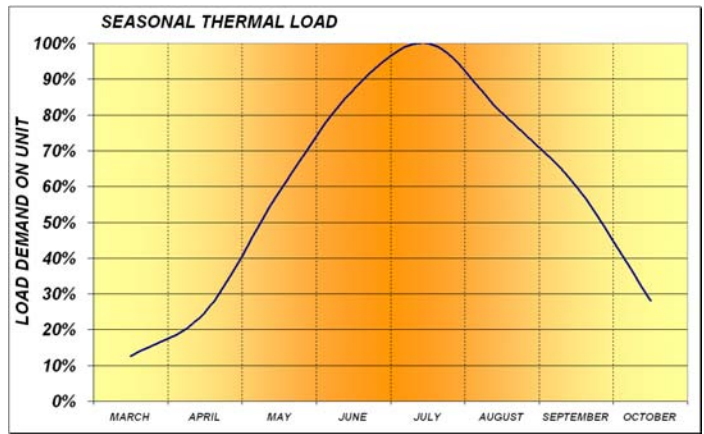
Clivet is participating in the EUROVENT Certification Programme "Liquid Chilling Packages".
Products are listed in the EUROVENT Directory of Certified Products and in the site www.eurovent-certification.com. Eurovent Chillers Certification Programme covers air cooled packaged chillers up to 600 kW and water cooled packaged chillers up to 1500 kW.



CERTIFIED QUALITY SYSTEM UNI EN ISO 9001:2008

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

The SPINCHILLER 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 SPINCHILLER 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.

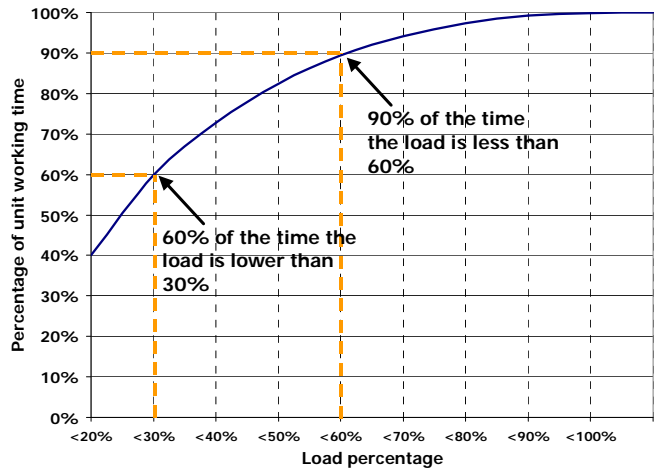


MULTIPLE HIGH EFFICIENCY SCROLL COMPRESSORS IN THE SAME COOLING CIRCUIT

A key aspect of the approach adopted in designing the SPINCHILLER 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 SPINCHILLER units will optimize the activation sequence and balance the operating cycles of the compressors to maximum advantage.

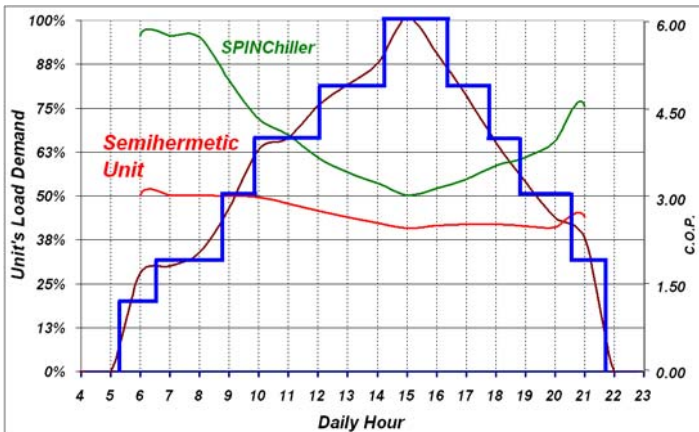
HIGH EFFICIENCY AT PARTIAL LOADS

The unit 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 partial load operation is the true condition in which the unit had to operate. Simulation tests conducted in different buildings have shown that systems operate on average for 90% of total operating time with thermal load lower than 60%. Accordingly, operating efficiency under partial load conditions is a key consideration when selecting a chiller.



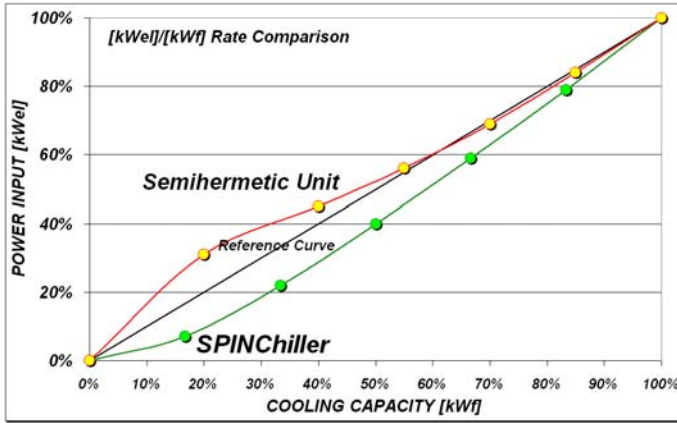
RESPONSE TO CHANGING LOAD

The higher efficiency of the SCROLL compressor and the special constructional features highlight the thermodynamic efficiency of the SPINChiller units. The graph to the side illustrates the extreme smoothness with which capacity delivered is adapted to the demand and shows how, even when not all the compressors are in operation, the efficiency of the SPINChiller remains higher than that of a conventional chiller, ACHIEVING EVEN DOUBLE THE EFFICIENCY WHEN OPERATING AT UNDER 50% LOAD. An advanced control system optimises the operating cycle and the rotation sequence of the compressors, significantly prolonging their service life. To obtain maximum efficiency, the electronic control activates the compressors according to the most favourable ratio between the heat exchange surfaces, so that the condensing and evaporation temperatures are always at the most beneficial values.



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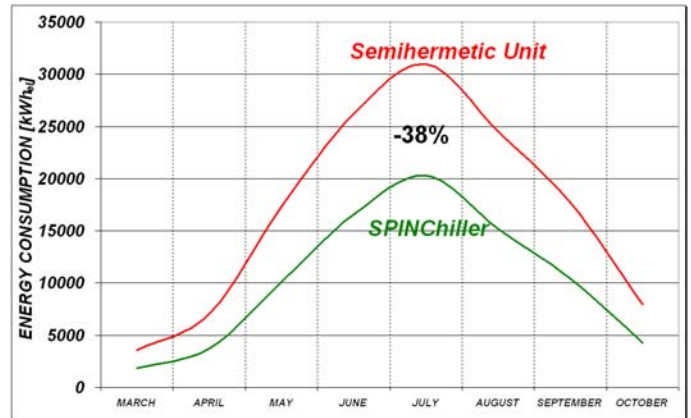
HIGHER EFFICIENCY GEARED TO OPTIMUM USE OF HEAT EXCHANGE SURFACES



In a traditional chiller operating at reduced load, the electrical power input is greater than the theoretical value (proportional to the cooling capacity delivered) due to friction and dispersion that affect the efficiency of the unit. The SPINCHILLER, on the other hand, consumes less power in percentage terms than the cooling capacity delivered thanks to the possibility of working with exchange surfaces that are oversized in all conditions when the maximum load is not required. This ensures extremely high EER values, higher than any other chiller in the same category.

LOW OPERATING COSTS

Thanks to the various advantages already mentioned, a unit of the SPINCHILLER series can count on levels of efficiency much higher than those of a conventional chiller almost all of the time when in operation. Comparing the electrical power consumption of a SPINCHILLER with that of a conventional chiller of similar rated capacity — operating in the same system — the SPINCHILLER delivers a saving of around 38% over the season. These performance values, and unparalleled intrinsic reliability, make the SPINCHILLER an unbeatable option in terms both of pay back and of troublefree operation.

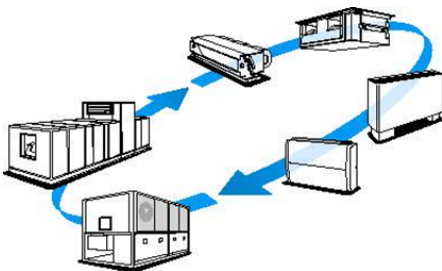


Modular structure benefits

Modularity of the refrigerant circuit: the required capacity is not delivered by one large compressor, but rather by a series of smaller capacity scroll compressors, in the same circuit; this allows better response to demand, the use of more reliable and economical standard components, standardisation of production and many other manufacturing and functional advantages. Modularity of the hydronic circuit: the flow-rate of fluid to the evaporator exchanger is controlled by operating a series of pumps in parallel (up to 3); as well as the advantages described above, this solution also allows a "reserve pump", which is less costly because it is smaller or can even be eliminated (a sufficient flow-rate can be temporarily guaranteed even with one pump out of service).



INTEGRATION INTO THE SYSTEM



The SPINchiller unit is able to communicate with other units of the CLIVETmaxi programme when installed and connected. All products of the CLIVETmaxi use the CLIVETtalk facility. This allows connected units to engage in a continuous exchange of information on ambient conditions, and on how to use the information. Each individual unit can control its own operating parameters natively, on the basis not only of the conditions impacting on it directly, but also of those affecting the entire installation. The result is an extremely high level of overall efficiency, as only a fully integrated system of components can deliver.

STANDARD UNIT SPECIFICATIONS

COMPRESSOR

Scroll compressor complete with: overload thermal protection, high refrigerant discharge temperature, rubber antivibration mounts, oil charge.
A oil heater is automatically switched on at the compressor shut-down to prevent oil dilution by the refrigerant.

STRUCTURE

The unit is made from a hot galvanised metal plate structure, painted with polyester powder coat RAL9001

INTERNAL EXCHANGER

Direct expansion heat exchanger, with 316 stainless steel braze-welded plates and large exchange surface, complete with external anti-condensate heat insulation. Two independent alternating water / freon refrigerant circuits, with cross flow to optimize heat exchange; complete with safety differential pressure switch on the water side and antifreeze heater to protect against the risk of freezing.

EXTERNAL EXCHANGER

Braze-plate external exchanger in AISI 316 stainless steel for increased surface exchange with external thermal/anticondensate insulation

REFRIGERANT CIRCUIT

The units are made with independent refrigerant circuits, each with:

- replaceable anti-acid solid cartridge dehydrator filter
- sight glass with moisture indicator
- electronic expansion valve (see details further on)
- high pressure switch
- low pressure switch
- low pressure safety valve
- high pressure safety valve
- compressor discharge shut-off valve

ELECTRICAL PANEL

The Power Section includes:

- main door lock isolator switch
- isolating transformer for auxiliary circuit power supply
- compressor circuit breaker
- compressor control contactor

The control section includes:

- proportional + integral water temperature control
- antifreeze protection
- compressor overload protection and timer
- self-diagnosis system with immediate display of the error code
- compressor operating hour display

- remote ON/OFF control
- automatic compressor start rotation control
- relay for remote cumulative fault signal
- input for demand limit (absorbed power limit according to an external signal 0-10V or 4-20mA)
- prealarm function for water anti-ice and high refrigerant gas pressure
- display of the set values, the error codes and the parameter index
- ON/OFF and alarm reset buttons
- interface terminal with graphic display
- electronic for Elfo Control system (optional)

ACCESSORIES

- Steel mesh strainer to be mounted at the exchanger inlet. Should the filter not be installed in the water system, Clivet declines all responsibility and the warranty on the equipment automatically expires .

- Compressor suction shut-off valve
- High and low pressure gauges
- Hydro Pack (see p.6)
- Anti-ice electric heaters utility side for hydronic group
- Phase monitor
- Power factor correction capacitors (cosfi > 0.9)
- Free contacts for compressor state
- Soft starter
- Pressure switch kit, to control the water flow at the external exchanger inlet.

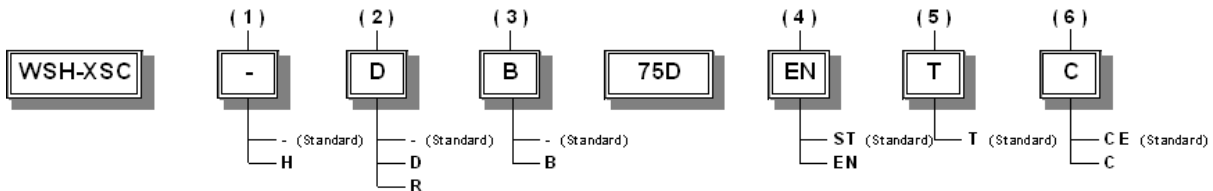
Standard calibration 3bar, other calibrations available upon request.

- Modulating two-ways motorized interception valve
- Microprocessor remote control module
- Set point compensation with 4-20 mA or 0-10 V signal
- Set point compensation with outside temperature probe
- Set point compensation according to the outside enthalpy
- Data logger (device for the acquisition of status and regulation values, as well as for recording the operation conditions in the surrounding of alarm events)
- Master-Slave function
- CAN/LON WORKS serial converter kit
- CAN/MODBUS serial converter kit
- CAN/BACnet serial converter kit
- Rubber antivibration mounts

TEST

All the units are factory-tested in specific steps, before shipping them. After the approval, the moisture contents present in all circuits are analyzed, in order to ensure the respect of the limits set by the manufacturers of the different components.

CONFIGURATION CODE



(1) OPERATION

Operation only cooling (OCO)

standard

Operation with reversal on water circuit (OHI)

Version which allows water-water heat pump operation with reversibility on water circuit. It is suitable for the production of civil and industrial hot water.

(2) ENERGY RECOVERY

Partial energy recovery(D)

Performed using braze-welded plate exchangers suitable for recovering the desuperheating heat, up to a maximum of 20% of the total heat of the unit.

Total energy recovery(R)

Performed using braze-welded plate exchangers suitable for recovering 100% of the condensing heat for the production of hot water
The heat exchangers also come with a water side protection differential switch

(3) LOW TEMPERATURE

Water low temperature(B)

This version allows unit operation in the range of water and glycol mix temperatures between +4 and -8°C.

Two Versions are available:

- Unit only for low temperatures
 - Unit with double set-point operating set-point
- (Please contact our Sales office for special conditions)

(4) ACOUSTIC CONFIGURATION

Standard acoustic configuration(ST)

See description "STANDARD UNIT SPECIFICATIONS"

Extremely low noise acoustic configuration (EN)

This configuration is obtained by inserting the compressors in a soundproof enclosure.

(5) APPLICATION

Tower water application (T)

(6) HEAT EXCHANGERS APPROVALS

Heat exchangers approvals CE = PED (European Testing)(PED)

Heat exchangers approvals C = CLIVET (Internal Testing)(CLV)

B109C006CB-03

COMPATIBILITY OF WSH-XSC OPTIONS

OPTIONS	DESCRIPTION	65D	70D	75D	80D	85D	90D	100D	110D	115D	120D	135E	150F	165F	180F
IO + ST	Outdoor installation, Standard acoustic configuration,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
IO + EN	Outdoor installation, Extremely low noise acoustic configuration,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
D + R	Partial energy recovery, Total energy recovery,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
D + 2PM	Partial energy recovery, Hydropack with 2 pumps,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
D + 3PM	Partial energy recovery, Hydropack with 3 pumps,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
D + 2PMS	Partial energy recovery, Hydropack source side with 2 pumps,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
D + 3PMS	Partial energy recovery, Hydropack source side with 3 pumps,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
R + 2PM	Total energy recovery, Hydropack with 2 pumps,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
R + 3PM	Total energy recovery, Hydropack with 3 pumps,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
R + 2PMS	Total energy recovery, Hydropack source side with 2 pumps,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
R + 3PMS	Total energy recovery, Hydropack source side with 3 pumps,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2PM + PUA2	Hydropack with 2 pumps, 2 poles type A pump,	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2PM + PUB2	Hydropack with 2 pumps, 2 poles type B pump,	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2PM + PUC2	Hydropack with 2 pumps, 2 poles type C pump,	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
2PM + PUD2	Hydropack with 2 pumps, 2 poles type D pump,	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
2PM + PUE2	Hydropack with 2 pumps, 2 poles type E pump,	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
2P1SB + PUA2	Hydropack with 2 pumps + 1 in stand-by, 2 poles type A pump,	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2P1SB + PUB2	Hydropack with 2 pumps + 1 in stand-by, 2 poles type B pump,	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2P1SB + PUC2	Hydropack with 2 pumps + 1 in stand-by, 2 poles type C pump,	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
2P1SB + PUD2	Hydropack with 2 pumps + 1 in stand-by, 2 poles type D pump,	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
2P1SB + PUE2	Hydropack with 2 pumps + 1 in stand-by, 2 poles type E pump,	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
3PM + PUA2	Hydropack with 3 pumps, 2 poles type A pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗
3PM + PUB2	Hydropack with 3 pumps, 2 poles type B pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊗
3PM + PUC2	Hydropack with 3 pumps, 2 poles type C pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊗
3PM + PUD2	Hydropack with 3 pumps, 2 poles type D pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3PM + PUE2	Hydropack with 3 pumps, 2 poles type E pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2PMS + PUA2	Hydropack source side with 2 pumps, 2 poles type A pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2PMS + PUB2	Hydropack source side with 2 pumps, 2 poles type B pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2PMS + PUC2	Hydropack source side with 2 pumps, 2 poles type C pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2PMS + PUD2	Hydropack source side with 2 pumps, 2 poles type D pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2PMS + PUE2	Hydropack source side with 2 pumps, 2 poles type E pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2P1SBS + PUA2	Hydropack source side with 2 pumps + 1 in stand-by, 2 poles type A pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2P1SBS + PUB2	Hydropack source side with 2 pumps + 1 in stand-by, 2 poles type B pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2P1SBS + PUC2	Hydropack source side with 2 pumps + 1 in stand-by, 2 poles type C pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2P1SBS + PUD2	Hydropack source side with 2 pumps + 1 in stand-by, 2 poles type D pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2P1SBS + PUE2	Hydropack source side with 2 pumps + 1 in stand-by, 2 poles type E pump,	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
3PMS + PUA2	Hydropack source side with 3 pumps, 2 poles type A pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗
3PMS + PUB2	Hydropack source side with 3 pumps, 2 poles type B pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗
3PMS + PUC2	Hydropack source side with 3 pumps, 2 poles type C pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗
3PMS + PUD2	Hydropack source side with 3 pumps, 2 poles type D pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3PMS + PUE2	Hydropack source side with 3 pumps, 2 poles type E pump,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2PM + CEHU	Hydropack with 2 pumps, Connection set exchanger with hydronic group (utility side),	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
2PMS + CEHU	Hydropack source side with 2 pumps, Connection set exchanger with hydronic group (utility side),	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
3PM + CEHU	Hydropack with 3 pumps, Connection set exchanger with hydronic group (utility side),	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2PMS + CEHS	Hydropack source side with 2 pumps, Connection set exchanger with hydronic group (source side),	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2P1SBS + CEHS	Hydropack source side with 2 pumps + 1 in stand-by, Connection set exchanger with hydronic group (source side),	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
3PMS + CEHS	Hydropack source side with 3 pumps, Connection set exchanger with hydronic group (source side),	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2PM + EHU	Hydropack with 2 pumps, Anti-ice electric heaters utility side for hydronic group,	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
2PMS + EHU	Hydropack source side with 2 pumps, Anti-ice electric heaters utility side for hydronic group,	✓	✓	✓	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗
3PM + EHU	Hydropack with 3 pumps, Anti-ice electric heaters utility side for hydronic group,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2PMS + EHS	Hydropack source side with 2 pumps, Anti-ice electric heaters source side for hydronic group,	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
2P1SBS + EHS	Hydropack source side with 2 pumps + 1 in stand-by, Anti-ice electric heaters source side for hydronic group,	✓	✓	✓	✓	✓	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
3PMS + EHS	Hydropack source side with 3 pumps, Anti-ice electric heaters source side for hydronic group,	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PFCP + SFSTR	Power factor correction capacitors (cosφ > 0.9), Soft Start,	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗

BT09C006CE-02

Accessory: Hydropack

New concept of pumping station and reserve pump.

By equipping the refrigerating units with the Hydropack accessory, the necessary flow capacity/head are provided in different versions according to the plant's potential.

1) HYDROPACK with 2 pumps;

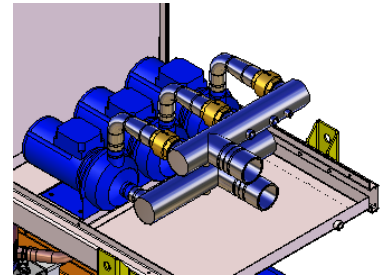
for the unit of lower power, the basic solution with 2 pumps can be selected. In case of blockage of a pump, the unit continues to operate normally up to about 60% of the load; this condition is in any case more reliable than the traditional solution with a single-pump of greater power.

2) HYDROPACK with 2 pumps + 1 stand-by;

a third back-up pump can be envisaged for total reliability. In this way, the stated water flow capacity is assured. (In fact, in case of faults the third pump comes automatically into operation and the unit's control device signals the blocking of the out-of-order pump).

3) HYDROPACK with 3 pumps,

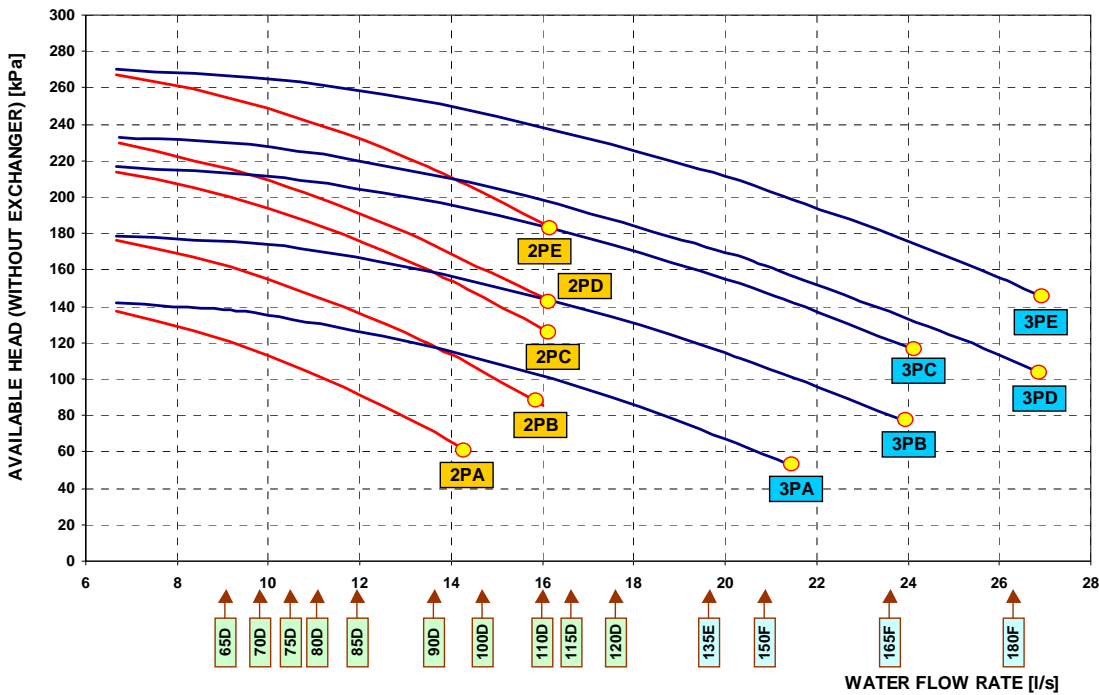
for units of greater power; with the 3 pumps for this solution always active; the possible blocking of one pump allows in any case the normal operation up to '80% of the load (always with blockage signalling). In this case, a back-up pump can be provided on request (not assembled); and the replacement can be carried out in a few minutes, thanks to the simplicity of the connections envisaged.



Self-adjustment: The modular pumping system makes it possible to automatically reduce the water flow rate if the temperature increases above the operating limit (excluding hydropack with 1 pump). The device is also very useful during start-ups, on weekends and after a long period of inactivity. When the temperature of water in the hydronic circuit is especially high, this prevents undesired shutdowns due to overload resulting in call-outs of service technicians to assist in restarting. The range of available pumps for these units can satisfy the most common system needs. For every size 65D÷180F it is possible to choose among 5 characteristics (A,B,C,D,E) of available head.

Varypack

The condenser Hydropack solution is also available with Varypack technology, which permits continuous modulation of the water flow in order to optimize functioning of the refrigeration unit and providing notable energy savings. For operations with partial capacities or medium temperatures, the Varypack self-adjusting algorithm modulates the water flow depending on minimum condensation, which is also made possible thanks to the use of standard electronic expansion valves integrated into the unit microprocessor control. The sophisticated ON/OFF system assisted by pumps also allows limiting pressure surges on the hydraulic line. Varypack also simplifies installation of the refrigeration unit, since expensive 3-way valves for modulating the water flow are not necessary.

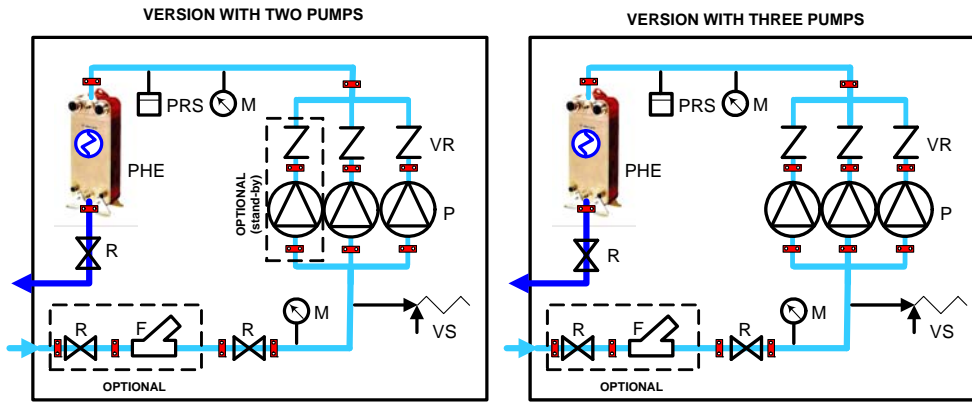


Technical Specifications		
Pump	Rated absorbed power [kW]	Rated absorbed current [A]
A	1.00	2.9
B	1.50	3.7
C	1.85	4.6
D	2.20	5.2
E	3.00	6.5
2PA	2.0	5.8
2PB	3.0	7.4
2PC	3.7	9.2
2PD	4.4	10.4
2PE	6.0	13.0
3PA	3.0	8.7
3PB	4.5	11.1
3PC	5.6	13.8
3PD	6.6	15.6
3PE	9.0	19.5

Attention: the evaporator pressure drops have to be taken from the heads represented in these diagrams in order to obtain the available head values.
Attention: in case of unit equipped with water filter accessory, the pressure drops of filter must be removed from pump discharge head curves.

Ready to start:

SpinChiller-units can be supplied with a pumping station on utility side. In this way connection activities are reduced to hydraulic pipe ones and to electric supply.



- Multi pump hydronic group including:
- R=shut-off valves,
 - F=steel mesh filter(optional),
 - M=gauges,
 - VS=safety valve(6 Bar),
 - P=high efficiency single-structure and single-rotor electric pumps,
 - VR=check valves,
 - PRS= safety pressure switch (avoids pumps operation in case of water absence)
 - PHE=evaporator
 - kit including two blind plugs needed in case of pump removal for maintenance operations.



More specifically, all main components (including the pre-setting of the connection to the system) are hydraulically connected through swift-latch connections instead of the traditional welding, flanging and threading, with obvious advantages for the user.

- They can be easily dismantled, affording an advantage in the inspection and maintenance operations.
- Work times are reduced by 90%.
- The deployment of specialised personnel is not necessary.
- The moving of single components is made very simple.
- Weight is reduced since at even piping dimensions the joints weigh half as much as the flanges.
- Utilisation of standard components that are available anywhere in the market..

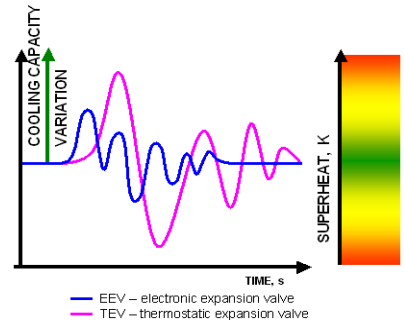
Standard electronic expansion valve

- Efficiency is in the standard scope of supply as a result of the electronic expansion valve. This element optimizes the superheating in any load condition thus offering a large number of advantages which can be summed up as follows:
- Fast and precise action due to the microprocessor based control with PID algorithms and to the step-motor.
 - High energetic efficiency in all conditions, thanks to the reduction of transients, in terms of amplitude and duration, following load variations.
 - Extended operating limits of the unit concerning minimum partial load and minimum air temperature at condenser.
 - Better operating conditions for the compressor, thanks to the lower discharge gas temperature and preventing liquid return and insufficient lubrication.
 - Easy unit set-up, even in special application seen the flexibility of the valve and its control parameters .
 - More responsible use of refrigerant as the overall quantity required is smaller.
 - Enhanced reliability of the operation of refrigerant circuit due to simplification of its components, to the control of the maximum operating pressure (MOP) and to the individual alarm condition indication.



Transient and effect on superheating

The instability of the superheating coming from the variation of the capacity supplied is reduced and is rapidly zeroed by the PID control and its fast reaction. This allows a steady operation, within the safety limits, around the most favorable value.



Seasonal efficiency=ESEER



ESEER: Guarantee in the performance means to be able to plan realistically the energy consumption and then the costs. The ESEER = European Seasonal Energy Efficiency Ratio, contrarily to the simple EER, is calculated as a combination of different operating conditions, which have been recently declared by Eurovent/CEN, in order to demonstrate the chiller efficiency while operating also in off-design conditions, normal in the mid-season.

	Conditions				
	Weight (%)	Load (%)	Condenser Inlet Water Temperature (°C)	Evaporator Outlet Water Temperature (°C)	
a	3	100	30	7	EERa = 4.67 x 0.03+
b	33	75	26	7	EERb = 5.64 x 0.33+
c	41	50	22	7	EERc = 6.64 x 0.41+
d	23	25	18	7	EERd = 6.76 x 0.23+
ESEER = 6.28					

- Example of calculation referred to unit WSH-XSC 150F ST.
- a,b,c,d, = partial load conditions and air temperature used for the ESEER calculation.
 - Weight % = space of time during which the unit works at the described conditions (used in the weighted sum).
 - Load % = partialization of the unit drop (referred to nominal capacity).
 - Air temperature = condensate coil intake air temperature.
 - Water temperature = evaporator water temperature.
 - EERa,b,c,d = EER calculated according to the partial load conditions

BT09C006CE-03

SOUND LEVELS

Acoustic configuration: Standard (ST)

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)
65D	81	62	75	90	84	86	80	74	73	91
70D	84	63	75	89	84	87	80	74	74	92
75D	87	62	74	91	85	86	80	74	74	92
80D	88	62	74	92	85	84	79	73	74	92
85D	90	63	74	93	86	85	79	73	74	93
90D	90	63	75	93	87	85	80	74	74	93
100D	89	67	78	91	87	92	84	78	76	95
110D	94	66	75	96	89	88	82	76	76	96
115D	94	66	75	96	89	88	82	76	76	96
120D	94	66	75	96	89	88	82	76	76	96
135E	94	65	75	95	89	87	81	75	76	95
150F	94	65	75	95	89	87	81	75	76	95
165F	95	66	76	96	90	88	82	76	77	96
180F	95	67	77	97	91	89	83	77	77	97

Measures according to UNI EN ISO 9614-2 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
- external exchanger water = 30/35°C

Acoustic configuration: Extremely low noise (EN)

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)
65D	71	53	70	83	73	74	69	64	64	82
70D	74	54	71	83	73	76	70	65	64	83
75D	77	54	70	84	74	75	69	65	65	83
80D	78	53	69	85	74	73	68	64	65	84
85D	80	54	70	86	75	74	69	64	66	85
90D	80	54	70	87	76	74	69	65	66	85
100D	79	58	74	84	76	80	73	69	67	85
110D	84	57	71	89	78	76	71	67	68	88
115D	84	57	71	89	78	76	71	67	68	88
120D	84	57	71	89	78	76	71	67	68	88
135E	84	57	71	89	78	76	71	66	68	87
150F	84	57	71	89	78	76	71	66	68	87
165F	84	57	72	90	79	77	71	67	68	88
180F	85	58	73	91	80	78	72	68	69	89

Acoustic configuration: Standard (ST)/Extremely low noise(EN)

GENERAL TECHNICAL SPECIFICATIONS

Size		65D	70D	75D	80D	85D	90D	100D	110D	115D	120D	135E	150F	165F	180F	
COOLING																
Cooling capacity	1	kW	195	207	223	234	251	286	312	334	353	371	406	440	497	560
Compressor power input	1	kW	41,2	44,2	47,3	50	53,4	59,5	65,1	70,2	75,4	79,3	86,1	93,7	106	119
Total power input	1	kW	41,5	44,5	47,6	50,3	53,7	59,8	65,4	70,5	75,7	79,6	86,6	94,2	106	120
Heating capacity total recovery	3	kW	224	237	257	269	289	327	356	383	407	428	466	506	574	646
Heating capacity partial recovery	3	kW	47	50	54	57	61	69	75	81	86	90	98	107	121	136
Cooling capacity (EN14511:2011)	2	kW	194	206	222	233	250	285	311	333	352	370	404	438	495	558
Total power input	2	kW	43,3	46,5	49,8	52,5	55,5	62,1	67,5	72,8	78,3	82,5	89,9	97,8	110	126
EER (EN 14511:2011)	2		4,48	4,43	4,46	4,44	4,51	4,59	4,61	4,57	4,49	4,48	4,5	4,48	4,5	4,44
ESEER	2		5,4	5,42	5,11	5,34	5,17	5,31	5,21	5,44	5,39	5,37	5,4	5,56	5,5	5,52

HEATING																
Heating capacity	4	kW	224	237	257	269	289	327	356	383	407	428	466	506	574	646
Compressor power input	4	kW	50,9	54,7	57,9	61,3	64,6	72,9	79,6	86,3	92,8	97,9	106	115	130	147
Total power input	4	kW	51,2	55	58,2	61,6	64,9	73,2	79,9	86,6	93,1	98,2	107	115	130	147
Heating capacity (EN14511:2011)	5	kW	224	237	257	269	289	327	356	383	407	428	466	506	574	646
Total power input (EN14511:2011)	5	kW	51,2	55	58,2	61,6	64,9	73,2	79,9	86,6	93,1	98,2	107	115	130	147
COP (EN 14511:2011)	5		4,38	4,31	4,42	4,37	4,45	4,47	4,46	4,42	4,37	4,36	4,36	4,4	4,42	4,39

COMPRESSOR																
Type of compressors			SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL
No. of compressors		Nr	4	4	4	4	4	4	4	4	4	4	5	6	6	6
Rated power (C1)		HP	30	35	35	40	40	45	50	55	55	60	60	75	75	90
Nominal Power (C2)		HP	35	35	40	40	45	45	50	55	60	60	75	75	90	90
Std Capacity control steps		Nr	4	4	4	4	4	4	4	4	4	4	5	6	6	6
Oil charge (C1)		l	7	8	8	10	10	9	10	10	12	11	11	20	20	17
Oil charge (C2)		l	8	8	10	10	9	9	10	12	11	11	20	20	17	17
Refrigerant circuits		Nr	2	2	2	2	2	2	2	2	2	2	2	2	2	2

INTERNAL EXCHANGER																
Type of internal exchanger	6		PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Water flow rate (Utility Side)		l/s	9,3	9,9	10,7	11,2	12	13,7	14,9	16	16,9	17,7	19,4	21	23,7	26,8
internal exchanger pressure drop		kPa	47	43	43	47	31	40	36	40	45	49	47	46	45	56
Water content		l	11	13	14	14	25	25	29	29	29	29	34	38	47	47

EXTERNAL EXCHANGER																
Type of external exchanger	6		PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Water flow rate (Source Side)		l/s	11,3	12	12,9	13,6	14,5	16,5	18	19,3	20,5	21,5	23,5	25,5	28,8	32,4
External exchanger pressure drop		kPa	46	51	52	51	32	40	33	37	36	39	46	49	52	65
Water content		l	14	14	16	18	29	29	38	38	43	43	47	56	56	

CONNECTIONS																
Water fittings	7		2" 1/2	2" 1/2	2" 1/2	2" 1/2	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"
Water fittings	8		2" 1/2	2" 1/2	2" 1/2	2" 1/2	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"

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	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50

(1) data referred to the following conditions : - internal exchanger water (evaporator) = 12 / 7 °C - external exchanger water (condenser) = 30/35°C
The data do not consider the pump share, required to overcome the pressure drop for the solution circulation inside the exchangers
(3) external exchanger water = 40/45°C
internal exchanger water = 12/7°C
(2) Data calculated according to EN 14511:2011 regulations referred to the following conditions :
(4) Data referred to unit in 'OHI - Operation with reversal on the water circuit' configuration data referred to the following conditions : - internal exchanger water (evaporator) = 12/7 °C - external exchanger water (condenser) = 40/45°C

The data do not consider the pump share, required to overcome the pressure drop for the solution circulation inside the exchangers
(5) Data referred to unit in 'OHI - Operation with reversal on the water circuit' configuration Data calculated according to EN 14511:2011 regulations referred to the following conditions :
- internal exchanger water (evaporator) = 12/7 °C
- external exchanger water (condenser) = 40/45°C
(6) PHE = plates
(7) internal exchanger inlet / outlet
(8) external exchanger inlet/outlet

ELECTRICAL DATA

Size		65D	70D	75D	80D	85D	90D	100D	110D	115D	120D	135E	150F	165F	180F	
F.L.A. - FULL LOAD CURRENT AT MAX ADMISSIBLE CONDITIONS																
F.L.A. - Total		A	132,4	141,7	153	164,3	170,9	177,5	196,3	218,9	225,5	232,1	270,2	308,3	328,1	347,9
F.L.I. FULL LOAD POWER INPUT AT MAX ADMISSIBLE CONDITION																
F.L.I. - Total		kW	79,3	85,7	90,8	95,9	102,2	108,5	121,3	131,5	137,9	144,2	167,5	178,2	197,2	216,2
M.I.C. MAXIMUM INRUSH CURRENT																
M.I.C. - Value		A	309,5	318	365	373,4	448	454,6	473,4	496	502,6	509,2	547,3	517	605,2	625

power supply: 400/3/50 Hz +/-6%
voltage unbalance: max 2 %
The F.L.A. data is to be considered in order to correctly size the supply line, whereas the M.I.C. data is used for

the sizing of the protection device up the line.
Certain accessories and operations may entail a significant variation in the absorptions illustrated here. Contact our technical department.

OPERATING LIMITS (COOLING)

Size		65D	70D	75D	80D	85D	90D	100D	110D	115D	120D	135E	150F	165F	180F	
EXTERNAL EXCHANGER																
Max water inlet temperature	1	°C	51	50	51	51	52	52	52	51	51	51	50	50	51	51
Max water inlet temperature	2	°C	52,5	51,5	52,5	52,5	53,5	53,5	53,5	52,5	52,5	52,5	51,5	52	53	53
Max water inlet temperature	3	°C	62	62	62	62	62	62	62	62	62	62	62	62	62	62
Min. water outlet temperature		°C	23	23	23	23	23	23	23	23	23	23	23	23	23	23
INTERNAL EXCHANGER																
Max water inlet temperature		°C	23	23	23	23	23	23	23	23	23	23	23	23	23	23
Min. water outlet temperature	4	°C	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Min. water outlet temperature	5	°C	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8

(1) unit at full load: internal exchanger water 12/7°C
(2) capacity-controlled unit (automatic capacity control)
(3) unit not operating

(4) Standard Version
(5) Low temperature version
Fluid with ethylene glycol of 40%

BT09C006CB-03

ACOUSTIC CONFIGURATION: STANDARD (ST)/EXTREMELY LOW NOISE(EN)

COOLING PERFORMANCE

Size	To (°C)	EXTERNAL EXCHANGER WATER OUTLET TEMPERATURE (°C)														
		30			35			40			45			50		
		kWf	kWe	kWt	kWf	kWe	kWt	kWf	kWe	kWt	kWf	kWe	kWt	kWf	kWe	kWt
65D	5	190,4	36,8	227,2	181,4	40,9	222,3	171,7	45,4	217,1	161,1	50,6	211,7	149,7	56,3	206,0
	6	197,6	37,0	234,6	188,4	41,0	229,4	178,4	45,6	224,0	167,5	50,8	218,3	155,9	56,5	212,4
	7	204,3	37,2	241,5	194,8	41,2	236,0	184,5	45,8	230,3	173,4	50,9	224,3	161,5	56,7	218,2
	8	210,4	37,3	247,7	200,7	41,3	242,0	190,1	45,9	236,0	178,8	51,1	229,9	166,6	56,8	223,4
	9	216,0	37,5	253,5	206,0	41,5	247,5	195,2	46,1	241,3	183,6	51,2	234,8	171,1	57,0	228,1
	10	221,1	37,6	258,7	210,8	41,6	252,4	199,8	46,2	246,0	187,8	51,3	239,1	175,1	57,1	232,2
70D	5	205,2	39,1	244,3	193,5	43,8	237,3	181,8	48,9	230,7	170,1	54,3	224,4	158,5	60,1	218,6
	6	212,4	39,3	251,7	200,3	44,0	244,3	188,2	49,1	237,3	176,2	54,5	230,7	164,3	60,3	224,6
	7	219,1	39,5	258,6	206,6	44,2	250,8	194,2	49,2	243,4	181,9	54,7	236,6	169,7	60,5	230,2
	8	225,5	39,6	265,1	212,6	44,3	256,9	199,9	49,4	249,3	187,3	54,8	242,1	174,9	60,7	235,6
	9	231,4	39,8	271,2	218,2	44,5	262,7	205,2	49,5	254,7	192,3	55,0	247,3	179,7	60,8	240,5
	10	236,9	39,9	276,8	223,4	44,6	268,0	210,1	49,7	259,8	197,0	55,1	252,1	184,3	61,0	245,3
75D	5	218,0	43,0	261,0	208,9	46,9	255,8	198,1	51,7	249,8	185,5	57,5	243,0	171,3	64,2	235,5
	6	225,2	43,2	268,4	215,8	47,1	262,9	204,7	51,9	256,6	191,8	57,7	249,5	177,2	64,4	241,6
	7	233,1	43,4	276,5	223,4	47,3	270,7	212,0	52,1	264,1	198,8	57,9	256,7	183,9	64,6	248,5
	8	241,7	43,6	285,3	231,7	47,5	279,2	220,0	52,3	272,3	206,5	58,1	264,6	191,3	64,9	256,2
	9	250,9	43,9	294,8	240,6	47,8	288,4	228,6	52,6	281,2	214,9	58,4	273,3	199,5	65,1	264,6
	10	260,9	44,1	305,0	250,3	48,0	298,3	238,0	52,9	290,9	224,1	58,7	282,8	208,4	65,4	273,8
80D	5	229,3	45,0	274,3	219,0	49,5	268,5	207,3	54,8	262,1	194,3	60,9	255,2	179,9	67,7	247,6
	6	236,8	45,2	282,0	226,1	49,7	275,8	214,1	55,0	269,1	200,7	61,1	261,8	186,1	67,9	254,0
	7	245,1	45,5	290,6	234,0	50,0	284,0	221,6	55,2	276,8	207,9	61,3	269,2	192,9	68,1	261,0
	8	254,0	45,7	299,7	242,6	50,2	292,8	229,9	55,5	285,4	215,9	61,5	277,4	200,6	68,3	268,9
	9	263,6	46,0	309,6	251,9	50,5	302,4	238,9	55,8	294,7	224,6	61,8	286,4	209,0	68,5	277,5
	10	273,8	46,3	320,1	261,9	50,8	312,7	248,6	56,0	304,6	234,0	62,1	296,1	218,1	68,8	286,9
85D	5	246,3	48,7	295,0	235,5	53,0	288,5	223,5	58,2	281,7	210,2	64,2	274,4	195,6	71,1	266,7
	6	254,7	48,9	303,6	243,6	53,2	296,8	231,1	58,4	289,5	217,4	64,4	281,8	202,3	71,3	273,6
	7	262,5	49,1	311,6	251,0	53,4	304,4	238,2	58,6	296,8	224,1	64,6	288,7	208,6	71,4	280,0
	8	269,7	49,3	319,0	257,9	53,6	311,5	244,7	58,8	303,5	230,2	64,8	295,0	214,4	71,6	286,0
	9	276,3	49,4	325,7	264,2	53,8	318,0	250,7	58,9	309,6	235,9	64,9	300,8	219,7	71,7	291,4
	10	282,4	49,6	332,0	269,9	53,9	323,8	256,1	59,1	315,2	241,0	65,1	306,1	224,5	71,8	296,3
90D	5	280,1	53,9	334,0	267,9	59,0	326,9	253,9	65,2	319,1	238,1	72,5	310,6	220,6	80,9	301,5
	6	289,7	54,2	343,9	277,0	59,2	336,2	262,6	65,4	328,0	246,3	72,7	319,0	228,3	81,1	309,4
	7	298,6	54,4	353,0	285,6	59,5	345,1	270,7	65,6	336,3	253,9	72,9	326,8	235,4	81,3	316,7
	8	306,8	54,6	361,4	293,4	59,7	353,1	278,1	65,8	343,9	260,9	73,1	334,0	241,9	81,5	323,4
	9	314,4	54,8	369,2	300,6	59,9	360,5	284,9	66,0	350,9	267,3	73,3	340,6	247,9	81,6	329,5
	10	321,2	55,0	376,2	307,1	60,0	367,1	291,0	66,2	357,2	273,1	73,4	346,5	253,3	81,7	335,0
100D	5	306,7	59,2	365,9	292,2	64,6	356,8	276,1	71,3	347,4	258,5	79,1	337,6	239,3	88,3	327,6
	6	317,5	59,5	377,0	302,5	64,9	367,4	285,9	71,5	357,4	267,7	79,4	347,1	247,9	88,5	336,4
	7	327,6	59,7	387,3	312,1	65,1	377,2	295,1	71,8	366,9	276,3	79,6	355,9	255,9	88,7	344,6
	8	337,0	60,0	397,0	321,1	65,4	386,5	303,5	72,0	375,5	284,3	79,9	364,2	263,4	88,9	352,3
	9	345,6	60,2	405,8	329,3	65,6	394,9	311,3	72,2	383,5	291,6	80,0	371,6	270,3	89,1	359,4
	10	353,6	60,4	414,0	336,8	65,8	402,6	318,4	72,4	390,8	298,4	80,2	378,6	276,6	89,2	365,8

To = Internal exchanger water outlet temperature in° C
 kWf = Cooling capacity in kW. The data do not consider the pump share, required to overcome the pressure drop for the solution circulation inside the exchangers.
 kWe = Compressor power input in kW
 kWt = Heating capacity (kW)
 Performances in function of the inlet/outlet water temperature differential = 5°C

E109C006GB-03

ACOUSTIC CONFIGURATION: STANDARD (ST)/EXTREMELY LOW NOISE(EN)

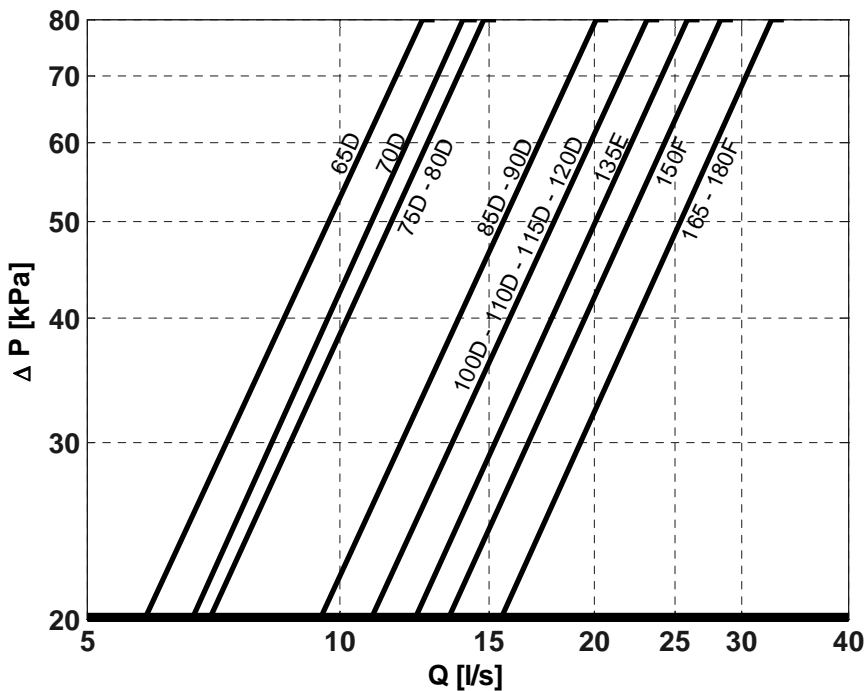
COOLING PERFORMANCE

Size	To (°C)	EXTERNAL EXCHANGER WATER OUTLET TEMPERATURE (°C)														
		30			35			40			45			50		
		kWf	kWe	kWt	kWf	kWe	kWt	kWf	kWe	kWt	kWf	kWe	kWt	kWf	kWe	kWt
110D	5	330,7	63,3	394,0	314,5	69,7	384,2	297,1	77,2	374,3	278,6	85,9	364,5	258,9	95,6	354,5
	6	340,2	63,5	403,7	323,6	70,0	393,6	305,9	77,5	383,4	287,0	86,1	373,1	266,9	95,8	362,7
	7	351,3	63,8	415,1	334,3	70,2	404,5	316,2	77,8	394,0	296,8	86,3	383,1	276,2	96,0	372,2
	8	364,1	64,1	428,2	346,6	70,6	417,2	327,9	78,1	406,0	308,0	86,6	394,6	286,7	96,2	382,9
	9	378,4	64,5	442,9	360,5	70,9	431,4	341,2	78,4	419,6	320,5	87,0	407,5	298,5	96,5	395,0
	10	394,4	64,9	459,3	375,9	71,4	447,3	355,9	78,8	434,7	334,4	87,3	421,7	311,5	96,8	408,3
115D	5	349,4	67,9	417,3	332,3	74,8	407,1	314,1	83,0	397,1	294,8	92,4	387,2	274,2	102,9	377,1
	6	359,4	68,1	427,5	342,0	75,1	417,1	323,4	83,2	406,6	303,6	92,6	396,2	282,6	103,1	385,7
	7	371,1	68,4	439,5	353,2	75,4	428,6	334,2	83,5	417,7	313,9	92,8	406,7	292,4	103,3	395,7
	8	384,5	68,8	453,3	366,2	75,7	441,9	346,6	83,8	430,4	325,7	93,1	418,8	303,6	103,6	407,2
	9	399,7	69,2	468,9	380,8	76,1	456,9	360,5	84,2	444,7	339,0	93,4	432,4	316,1	103,8	419,9
	10	416,6	69,6	486,2	397,0	76,6	473,6	376,1	84,6	460,7	353,8	93,8	447,6	330,1	104,0	434,1
120D	5	367,3	71,4	438,7	349,4	78,7	428,1	330,3	87,4	417,7	309,9	97,4	407,3	288,4	108,7	397,1
	6	377,8	71,6	449,4	359,5	79,0	438,5	339,9	87,7	427,6	319,1	97,7	416,8	297,1	109,0	406,1
	7	390,1	71,9	462,0	371,3	79,3	450,6	351,2	88,0	439,2	329,9	97,9	427,8	307,3	109,2	416,5
	8	404,1	72,3	476,4	384,8	79,7	464,5	364,2	88,3	452,5	342,3	98,2	440,5	319,0	109,4	428,4
	9	420,0	72,8	492,8	400,1	80,1	480,2	378,8	88,7	467,5	356,2	98,5	454,7	332,3	109,6	441,9
	10	437,7	73,3	511,0	417,1	80,6	497,7	395,1	89,1	484,2	371,8	98,9	470,7	347,1	109,8	456,9
135E	5	403,3	76,9	480,2	381,9	85,5	467,4	360,0	95,0	455,0	337,8	105,5	443,3	315,1	117,0	432,1
	6	414,7	77,2	491,9	392,9	85,7	478,6	370,6	95,3	465,9	347,9	105,7	453,6	324,8	117,2	442,0
	7	428,3	77,5	505,8	406,0	86,1	492,1	383,1	95,6	478,7	359,8	106,0	465,8	336,1	117,4	453,5
	8	444,0	77,9	521,9	421,0	86,5	507,5	397,5	96,0	493,5	373,5	106,4	479,9	349,1	117,7	466,8
	9	461,8	78,4	540,2	438,0	87,0	525,0	413,8	96,4	510,2	389,0	106,7	495,7	363,8	117,9	481,7
	10	481,6	79,0	560,6	457,0	87,5	544,5	431,9	96,9	528,8	406,3	107,2	513,5	380,2	118,2	498,4
150F	5	437,9	83,7	521,6	415,0	92,9	507,9	391,5	103,1	494,6	367,5	114,3	481,8	342,8	126,4	469,2
	6	449,5	84,0	533,5	426,3	93,3	519,6	402,5	103,5	506,0	378,1	114,6	492,7	353,1	126,6	479,7
	7	464,0	84,4	548,4	440,3	93,7	534,0	416,0	103,8	519,8	391,1	114,9	506,0	365,5	126,9	492,4
	8	481,4	84,9	566,3	457,0	94,1	551,1	432,0	104,3	536,3	406,3	115,3	521,6	380,0	127,2	507,2
	9	501,6	85,4	587,0	476,4	94,7	571,1	450,5	104,8	555,3	423,9	115,8	539,7	396,5	127,5	524,0
	10	524,6	86,0	610,6	498,5	95,3	593,8	471,6	105,4	577,0	443,8	116,3	560,1	415,2	127,9	543,1
165F	5	491,3	95,8	587,1	469,4	105,1	574,5	445,1	116,3	561,4	418,2	129,3	547,5	388,8	144,1	532,9
	6	503,8	96,1	599,9	481,8	105,4	587,2	457,1	116,6	573,7	429,8	129,6	559,4	399,9	144,4	544,3
	7	519,7	96,5	616,2	497,2	105,8	603,0	472,0	117,0	589,0	444,2	129,9	574,1	413,6	144,7	558,3
	8	538,8	97,0	635,8	515,7	106,3	622,0	489,8	117,4	607,2	461,2	130,3	591,5	429,8	145,1	574,9
	9	561,3	97,6	658,9	537,3	106,9	644,2	510,5	118,0	628,5	480,9	130,8	611,7	448,5	145,4	593,9
	10	587,1	98,4	685,5	562,0	107,7	669,7	534,0	118,7	652,7	503,3	131,4	634,7	469,7	145,9	615,6
180F	5	547,8	107,4	655,2	523,9	118,1	642,0	497,0	130,9	627,9	467,2	145,9	613,1	434,3	163,1	597,4
	6	566,2	107,9	674,1	541,3	118,6	659,9	513,5	131,4	644,9	482,7	146,3	629,0	449,1	163,5	612,6
	7	585,8	108,5	694,3	560,0	119,1	679,1	531,2	131,9	663,1	499,5	146,8	646,3	464,9	163,8	628,7
	8	606,6	109,0	715,6	579,9	119,6	699,5	550,2	132,4	682,6	517,5	147,2	664,7	481,9	164,2	646,1
	9	628,5	109,6	738,1	601,0	120,2	721,2	570,4	132,9	703,3	536,7	147,7	684,4	499,9	164,6	664,5
	10	651,7	110,3	762,0	623,4	120,8	744,2	591,9	133,5	725,4	557,1	148,2	705,3	519,1	165,0	684,1

To = Internal exchanger water outlet temperature in °C
 kWf = Cooling capacity in kW. The data do not consider the pump share, required to overcome the pressure drop for the solution circulation inside the exchangers.
 kWe = Compressor power input in kW
 kWt = Heating capacity (kW)
 Performances in function of the inlet/outlet water temperature differential = 5°C

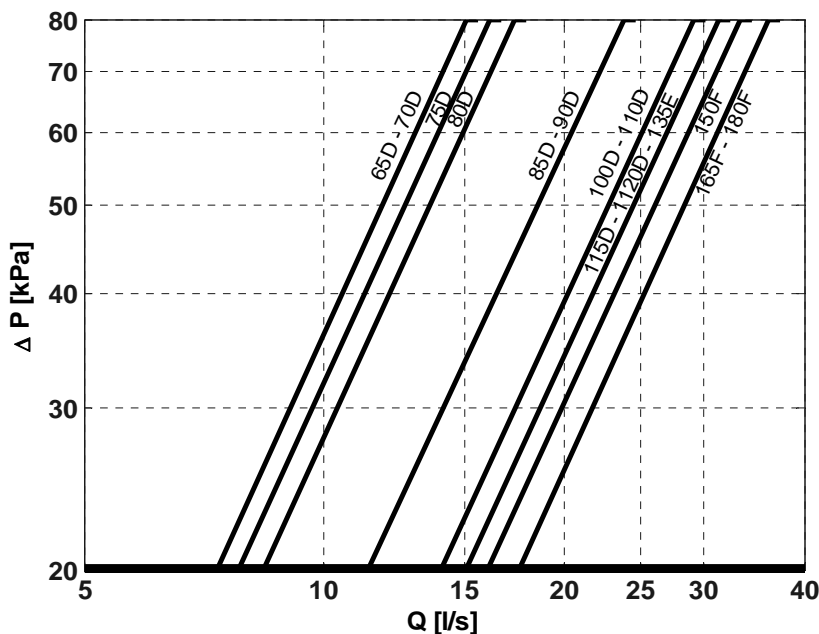
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EVAPORATOR PRESSURE LOAD: ST STANDARD - SC - EN



	Qmin [l/s]	Qmax [l/s]
65D	5.9	12.4
70D	6.6	13.9
75D	7.0	14.9
80D	7.0	14.9
85D	9.4	20.0
90D	9.4	20.0
100D	10.9	23.1
110D	10.9	23.1
115D	10.9	23.1
120D	10.9	23.1
135E	12.2	25.8
150F	13.4	28.3
165F	15.5	32.4
180F	15.5	32.4

EXTERNAL EXCHANGER PRESSURE DROP (CONDENSER): ST (STANDARD)- EN

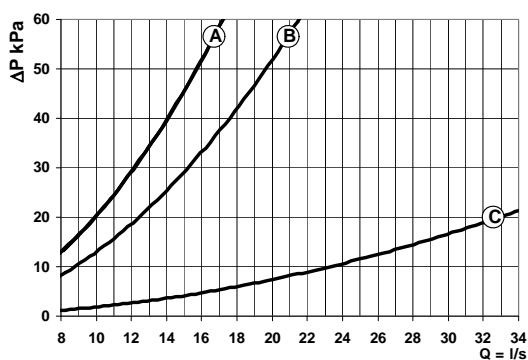


	Qmin [l/s]	Qmax [l/s]
65D	7.3	15.3
70D	7.3	15.3
75D	7.8	16.1
80D	8.4	17.2
85D	11.4	23.8
90D	11.4	23.8
100D	13.9	29.2
110D	13.9	29.2
115D	15.0	31.4
120D	15.0	31.4
135E	15.0	31.4
150F	15.9	33.2
165F	17.4	36.1
180F	17.4	36.1

ACCESSORIES

WATER FILTER

Pressure drop of the "water filter" accessory to be added to the pressure drop of the unit.

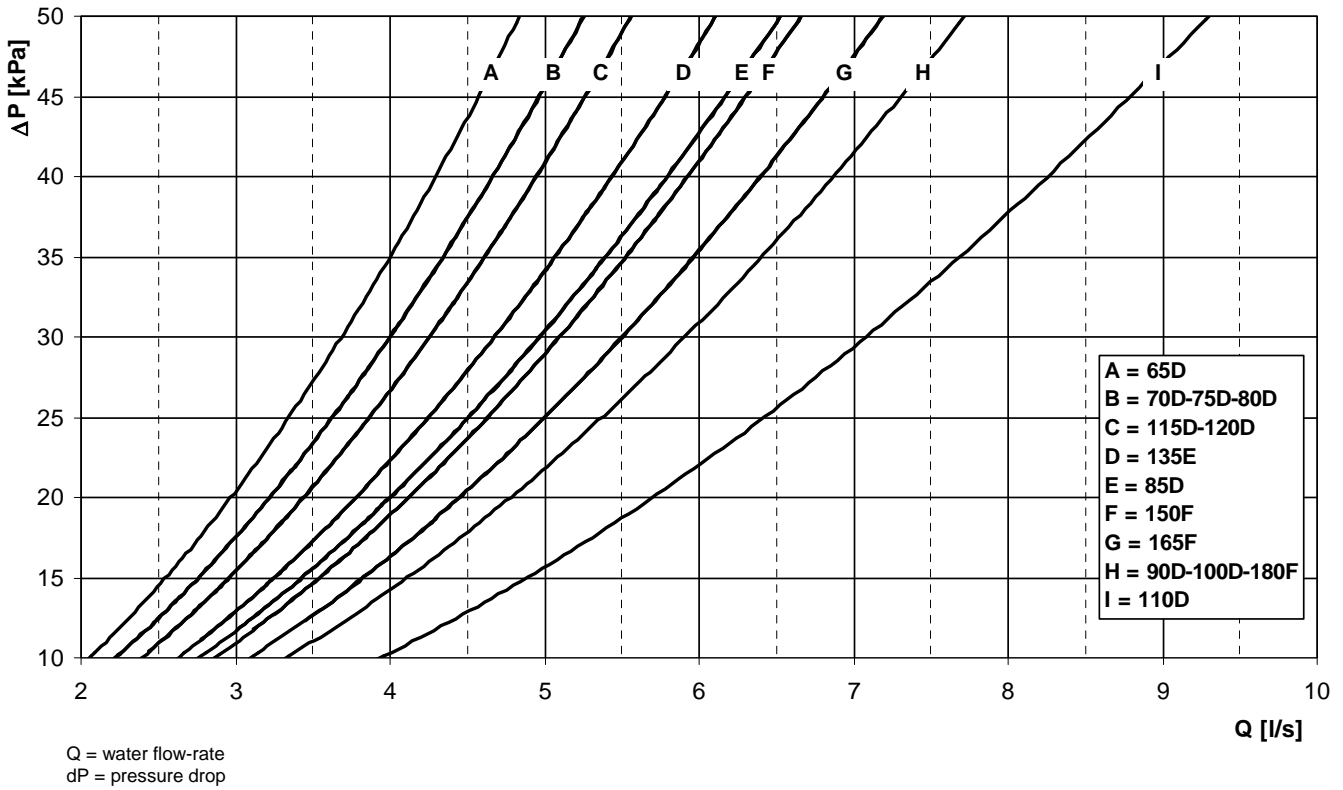


- Internal exchanger (evaporator)**
- (A) 65D-70D-75D-80D-85D
 - (B) 90D-100D-110D-115D-120D-135E-150F
 - (C) 165F-180F
- External exchanger (condenser)**
- (A) 65D-70D-75D-80D-85D
 - (B) 90D-100D-110D-115D-120D
 - (C) 135E-150F-165F-180F

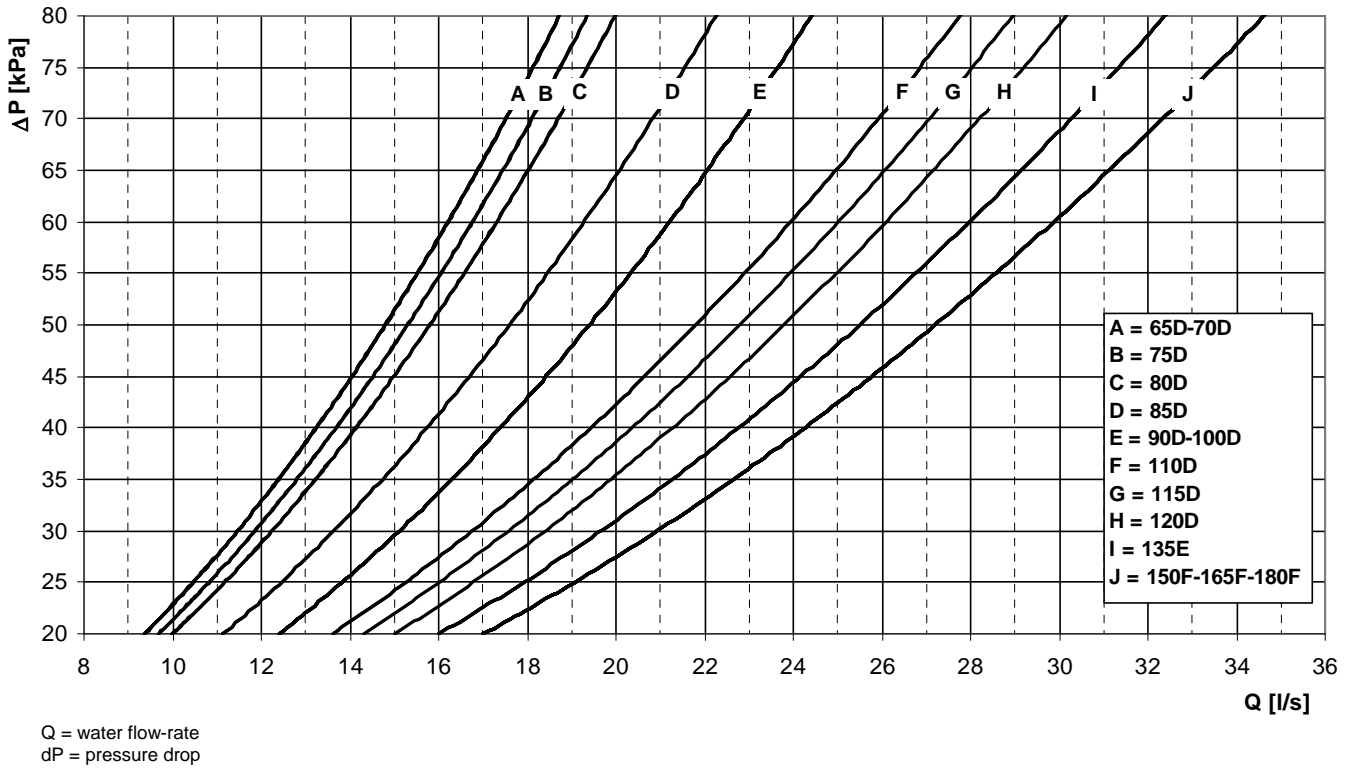
Q = water flow
dP = pressure drop

BT09C006CB-03

EXCHANGER PRESSURE DROP PARTIAL ENERGY RECOVERY



EXCHANGER PRESSURE DROP TOTAL ENERGY RECOVERY



BT09C006CE-03

CORRECTION FACTOR FOR ANTIFREEZE SOLUTIONS

Internal exchanger (evaporator)

% 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.

External exchanger (condenser)

% 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.

* MAX. REDUCTION EXTERNAL EXCHANGER INLET WATER TEMPERATURE

FOULING CORRECTION FACTOR

m ² °C/W	INTERNAL EXCHANGER		EXTERNAL EXCHANGER	
	F1	FK1	F2	FK2
0.44 x 10 ⁽⁻⁴⁾	1,00	1,00	1,00	1,00
0.88 x 10 ⁽⁻⁴⁾	0,97	0,99	0,97	1,08
1.76 x 10 ⁽⁻⁴⁾	0,94	0,98	0,92	1,05

F1 = Cooling capacity correction factors

FK1 = Compressor power input correction factor

EXCHANGER OPERATING LIMITS

	INTERNAL EXCHANGER		EXTERNAL EXCHANGER	
	DP _r	DP _w	DP _r	DP _w
	kPa	kPa	kPa	kPa
CLIVET (C)	4500	4500	1000	1000
PED (CE)	4500	4500	1000	1000

DP_r = Maximum operating pressure on refrigerant side

DP_w = Maximum operating pressure on water side

For different approvals contact our sales office

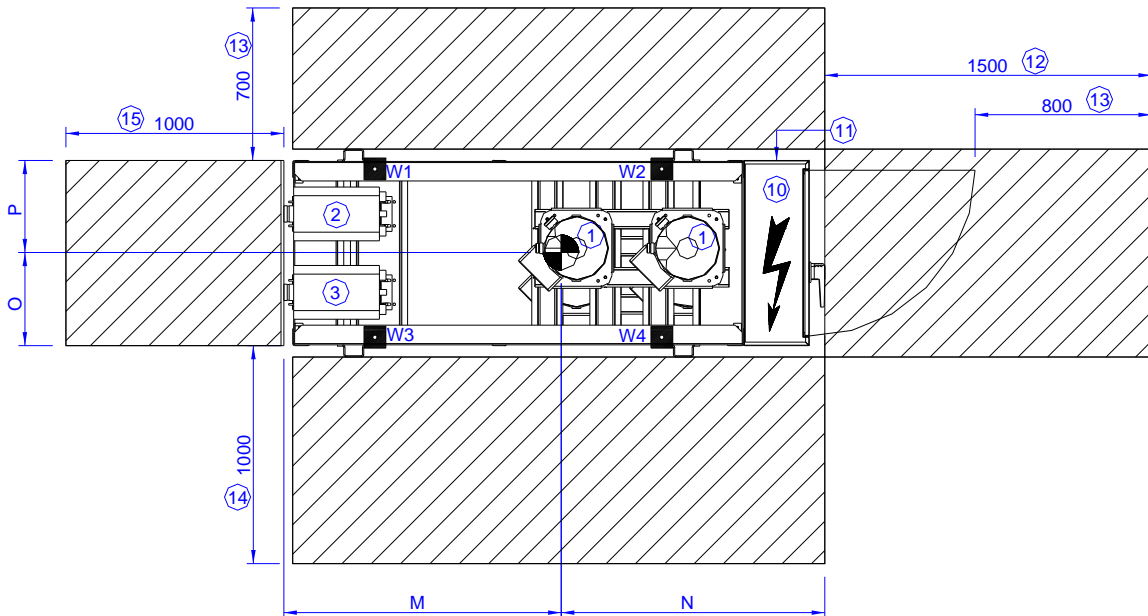
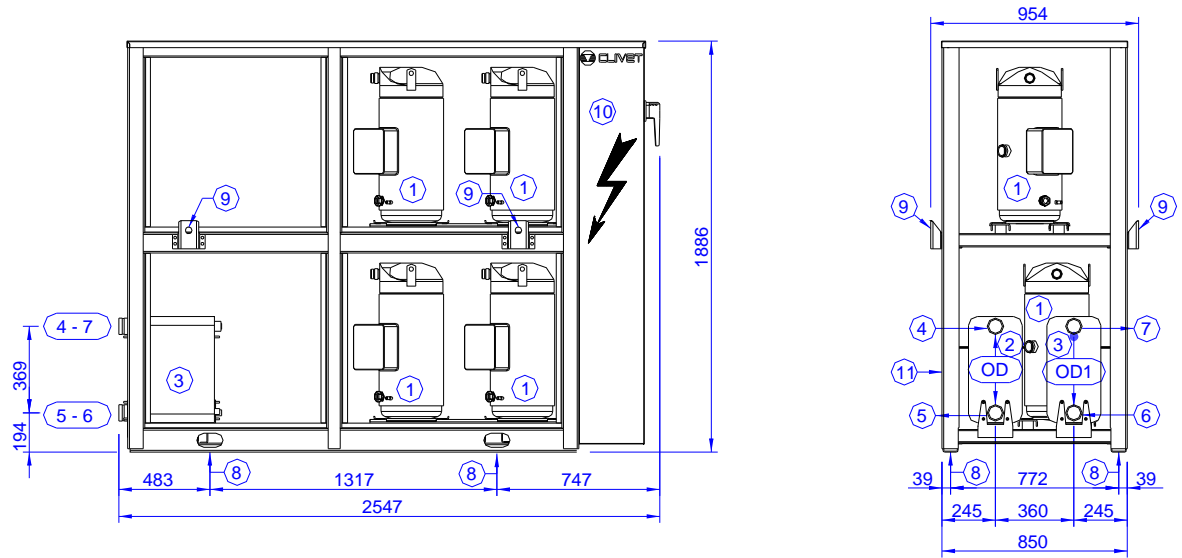
OVERLOAD AND CONTROL DEVICE CALIBRATION

		OPEN	CLOSED	VALUE
High pressure switch	kPa	4050	3300	-
Low pressure switch	kPa	450	600	-
Low pressure switch (Brine)	bar	200	350	-
Antifreeze protection	°C	3,00	5,50	-
High pressure safety valve	kPa	-	-	4500
Low pressure safety valve	kPa	-	-	3000
Max no. of compressor starts per hour	Nr	-	-	10,00
High compressor discharge temperature safety thermo-	°C	-	-	120

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DIMENSIONAL DRAWING

DIMENSIONS: WSH-XSC 65D-70D-75D-80D



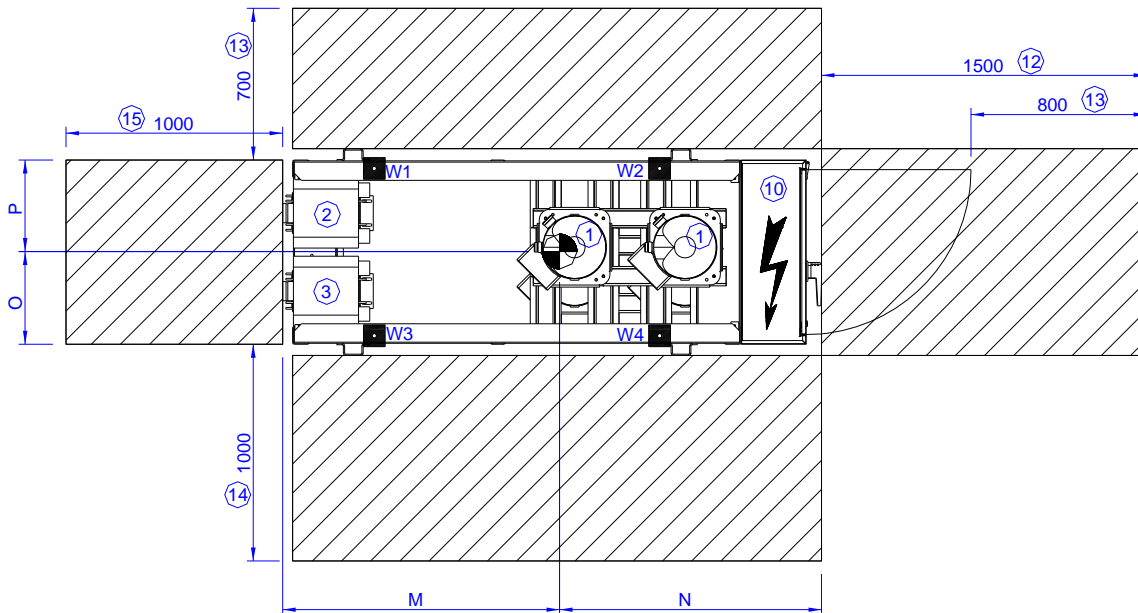
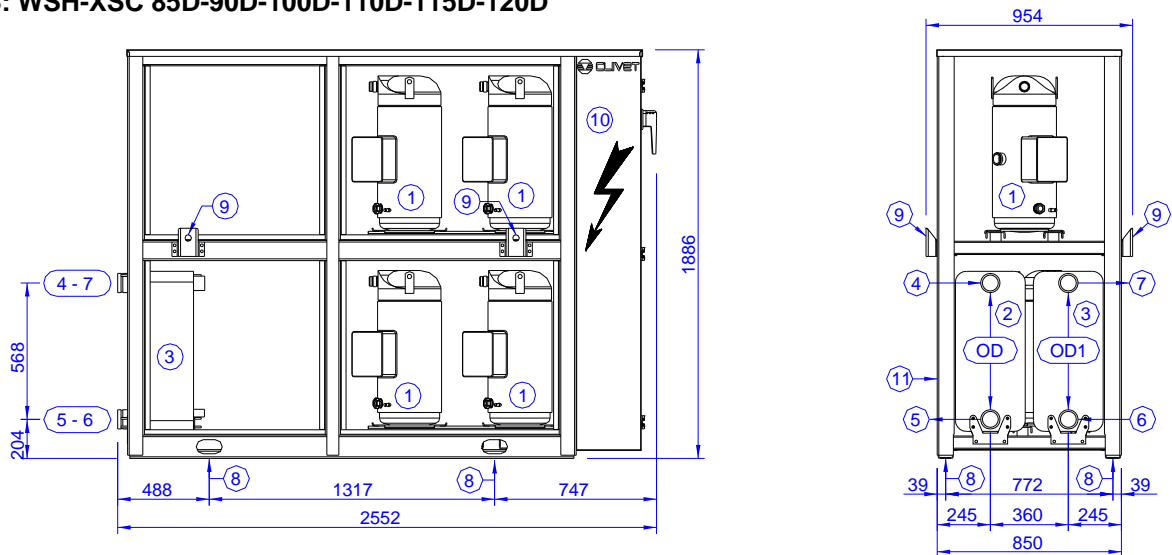
- (1) COMPRESSOR
- (2) INTERNAL EXCHANGER (EVAPORATOR)
- (3) EXTERNAL EXCHANGER (CONDENSER)
- (4) INTERNAL EXCHANGER WATER INLET
- (5) INTERNAL EXCHANGER WATER OUTLET
- (6) EXTERNAL EXCHANGER WATER INLET
- (7) EXTERNAL EXCHANGER WATER OUTLET
- (8) HOLE TO HANG UNIT
- (9) LIFTING BRACKETS
- (10) ELECTRICAL PANEL
- (11) POWER INPUT
- (12) MINIMUM DIMENSION ON THE ELECTRICAL SWITCHBOARD SIDE.
- (13) MINIMUM DIMENSION FOR A SAFE PASSAGE.
- (14) MINIMUM DIMENSION FOR MAINTENANCE.
- (15) MINIMUM DIMENSION FOR WATER CONNECTIONS.

Size	ST				EN				
	65D	70D	75D	80D	65D	70D	75D	80D	
M	mm	1314	1323	1289	1272	1271	1293	1264	1246
N	mm	1233	1224	1258	1275	1276	1254	1283	1301
O	mm	404	398	402	399	404	399	402	400
P	mm	446	452	448	451	446	451	448	450
OD	mm	76	76	76	76	76	76	76	76
OD1	mm	76	76	76	76	76	76	76	76
Length	mm	2547	2547	2547	2547	2547	2547	2547	2547
Depth	mm	850	850	850	850	850	850	850	850
Height	mm	1886	1886	1886	1886	1886	1886	1886	1886
W1	kg	187	192	216	229	223	222	246	260
W2	kg	398	422	423	423	410	440	442	440
W3	kg	208	221	244	262	248	254	277	296
W4	kg	444	485	477	484	457	504	498	501
Operating weight	kg	1238	1320	1360	1397	1337	1420	1464	1496
Shipping weight	kg	1212	1292	1329	1364	1311	1392	1433	1463

Particular accessories, executions or versions can bring about a great variation of the mass represented here. Please contact our Technical Department.

DIMENSIONAL DRAWING

DIMENSIONS: WSH-XSC 85D-90D-100D-110D-115D-120D



- (1) COMPRESSOR
- (2) INTERNAL EXCHANGER (EVAPORATOR)
- (3) EXTERNAL EXCHANGER (CONDENSER)
- (4) INTERNAL EXCHANGER WATER INLET
- (5) INTERNAL EXCHANGER WATER OUTLET
- (6) EXTERNAL EXCHANGER WATER INLET
- (7) EXTERNAL EXCHANGER WATER OUTLET
- (8) HOLE TO HANG UNIT
- (9) LIFTING BRACKETS
- (10) ELECTRICAL PANEL
- (11) POWER INPUT
- (12) MINIMUM DIMENSION ON THE ELECTRICAL SWITCHBOARD SIDE.
- (13) MINIMUM DIMENSION FOR A SAFE PASSAGE.
- (14) MINIMUM DIMENSION FOR MAINTENANCE.
- (15) MINIMUM DIMENSION FOR WATER CONNECTIONS.

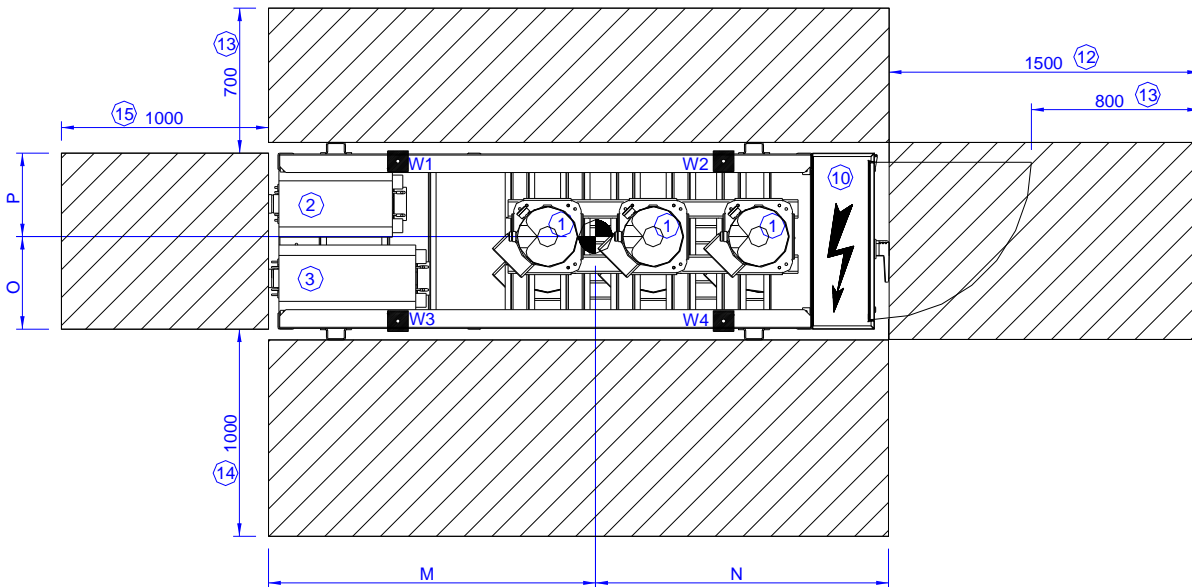
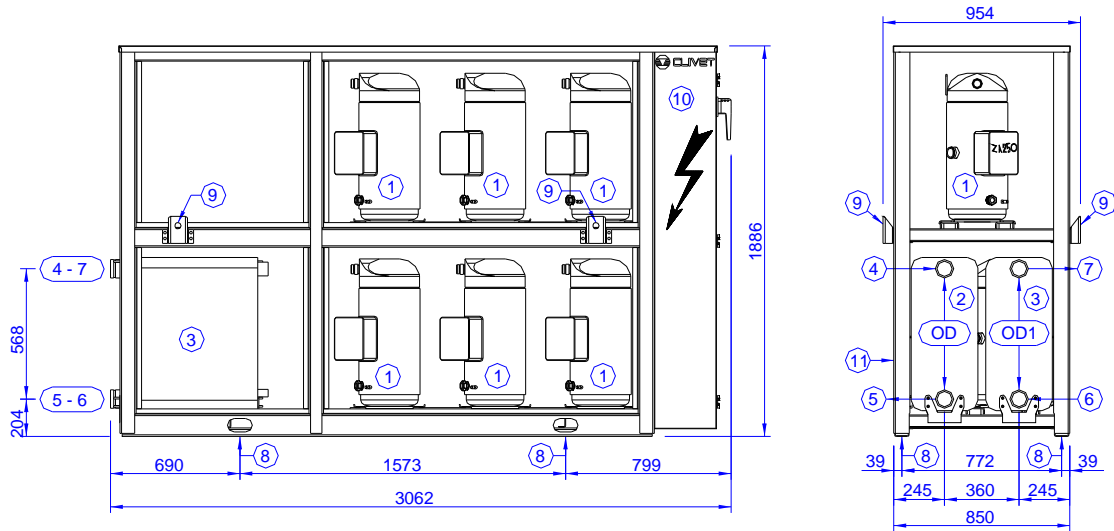
Size		ST						EN					
		85D	90D	100D	110D	115D	120D	85D	90D	100D	110D	115D	120D
M	mm	1233	1248	1217	1228	1221	1221	1211	1224	1197	1207	1202	1202
N	mm	1319	1304	1335	1324	1331	1331	1341	1328	1355	1345	1350	1350
O	mm	398	400	399	396	394	394	398	400	399	396	394	394
P	mm	452	450	451	454	456	456	452	450	451	454	456	456
OD	mm	89	89	89	89	89	89	89	89	89	89	89	89
OD1	mm	89	89	89	89	89	89	89	89	89	89	89	89
Length	mm	2552	2552	2552	2552	2552	2552	2552	2552	2552	2552	2552	2552
Depth	mm	850	850	850	850	850	850	850	850	850	850	850	850
Height	mm	1886	1886	1886	1886	1886	1886	1886	1886	1886	1886	1886	1886
W1	kg	266	260	297	304	312	313	297	291	327	335	342	344
W2	kg	426	437	451	479	480	482	442	452	467	494	496	498
W3	kg	306	296	340	354	367	368	341	331	375	390	402	404
W4	kg	490	497	516	557	564	567	509	515	534	574	583	585
Operating weight	kg	1489	1490	1604	1694	1723	1731	1589	1589	1703	1793	1823	1830
Shipping weight	kg	1435	1436	1537	1627	1651	1659	1535	1535	1636	1726	1751	1758

Particular accessories, executions or versions can bring about a great variation of the mass represented here. Please contact our Technical Department.

BT09C006CB-03

DIMENSIONAL DRAWING

DIMENSIONS: WSH-XSC 135E-150F-165F-180F



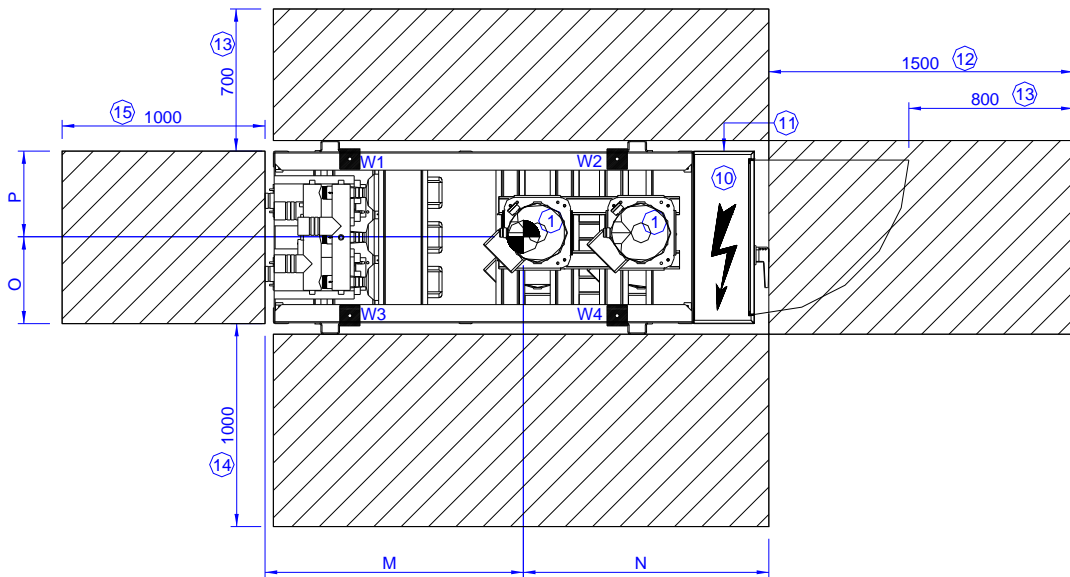
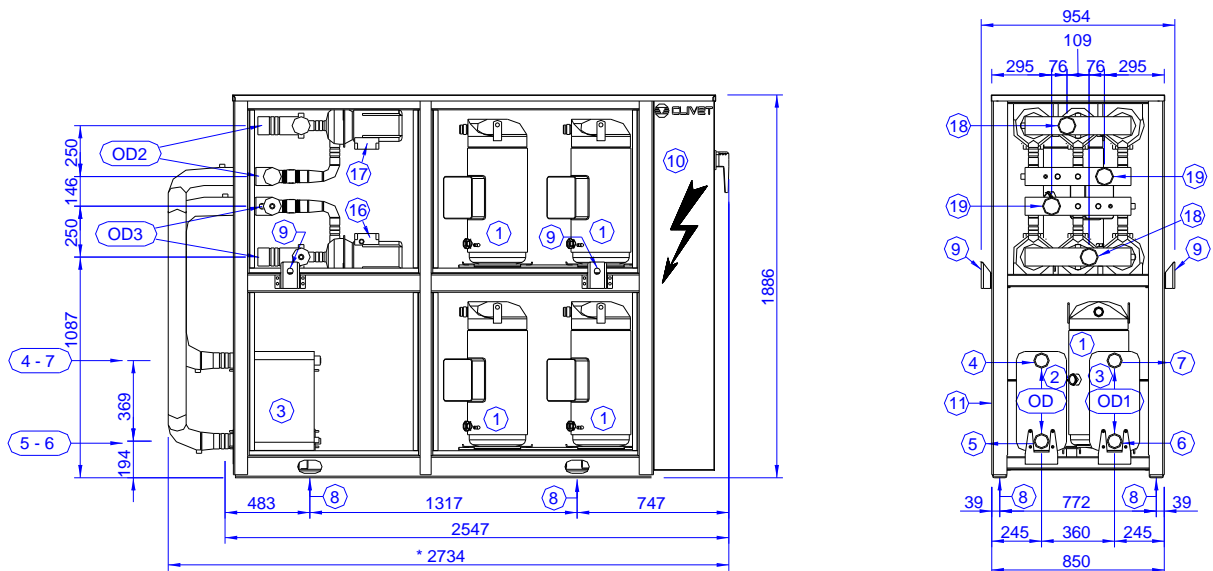
- (1) COMPRESSOR
- (2) INTERNAL EXCHANGER (EVAPORATOR)
- (3) EXTERNAL EXCHANGER (CONDENSER)
- (4) INTERNAL EXCHANGER WATER INLET
- (5) INTERNAL EXCHANGER WATER OUTLET
- (6) EXTERNAL EXCHANGER WATER INLET
- (7) EXTERNAL EXCHANGER WATER OUTLET
- (8) HOLE TO HANG UNIT
- (9) LIFTING BRACKETS
- (10) ELECTRICAL PANEL
- (11) POWER INPUT
- (12) MINIMUM DIMENSION ON THE ELECTRICAL SWITCHBOARD SIDE.
- (13) MINIMUM DIMENSION FOR A SAFE PASSAGE.
- (14) MINIMUM DIMENSION FOR MAINTENANCE.
- (15) MINIMUM DIMENSION FOR WATER CONNECTIONS.

Size	ST				EN				
	135E	150F	165F	180F	135E	150F	165F	180F	
M	mm	1509	1464	1470	1461	1493	1459	1459	1457
N	mm	1553	1598	1592	1601	1569	1603	1603	1605
O	mm	388	400	401	400	390	403	403	403
P	mm	462	450	449	450	460	447	447	447
OD	mm	89	89	89	89	89	89	89	89
OD1	mm	89	89	89	89	89	89	89	89
Length	mm	3062	3062	3062	3062	3062	3062	3062	3062
Depth	mm	850	850	850	850	850	850	850	850
Height	mm	1886	1886	1886	1886	1886	1886	1886	1886
W1	kg	398	496	523	527	434	536	560	567
W2	kg	511	567	607	598	534	605	632	636
W3	kg	483	564	592	600	520	601	628	635
W4	kg	620	645	687	681	640	678	708	713
Operating weight	kg	2012	2272	2409	2406	2128	2419	2528	2552
Shipping weight	kg	1935	2190	2325	2318	2051	2337	2444	2464

Particular accessories, executions or versions can bring about a great variation of the mass represented here. Please contact our Technical Department.

BT09C006CB-03

DIMENSIONS: WSH-XSC 65D-70D-75D-80D



- (1) COMPRESSOR
- (2) INTERNAL EXCHANGER (EVAPORATOR)
- (3) EXTERNAL EXCHANGER (CONDENSER)
- (4) INTERNAL EXCHANGER WATER INLET
- (5) INTERNAL EXCHANGER WATER OUTLET
- (6) EXTERNAL EXCHANGER WATER INLET
- (7) EXTERNAL EXCHANGER WATER OUTLET
- (8) HOLE TO HANG UNIT
- (9) LIFTING BRACKETS
- (10) ELECTRICAL PANEL
- (11) POWER INPUT

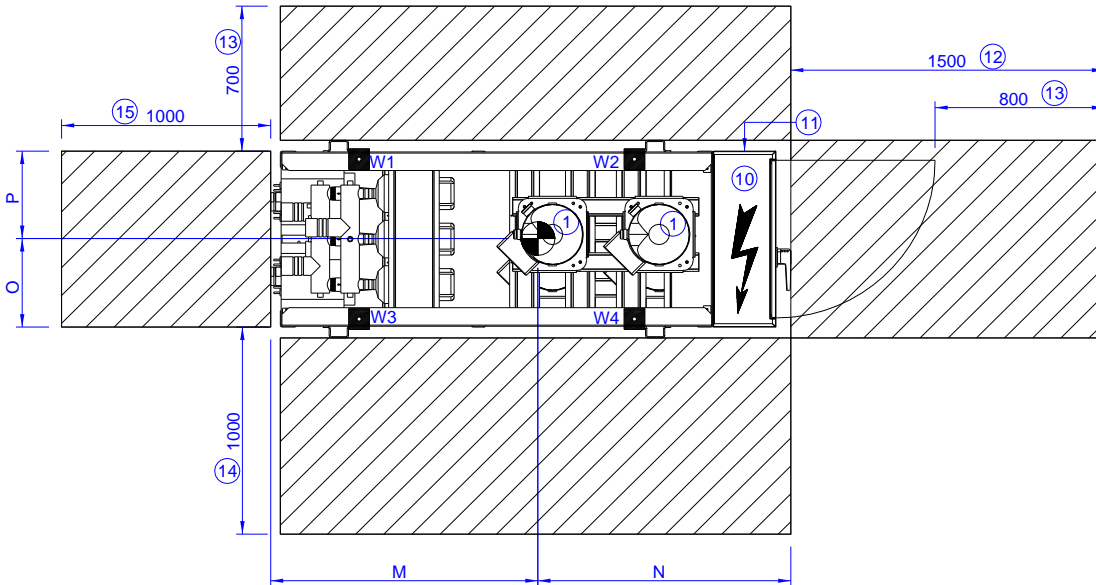
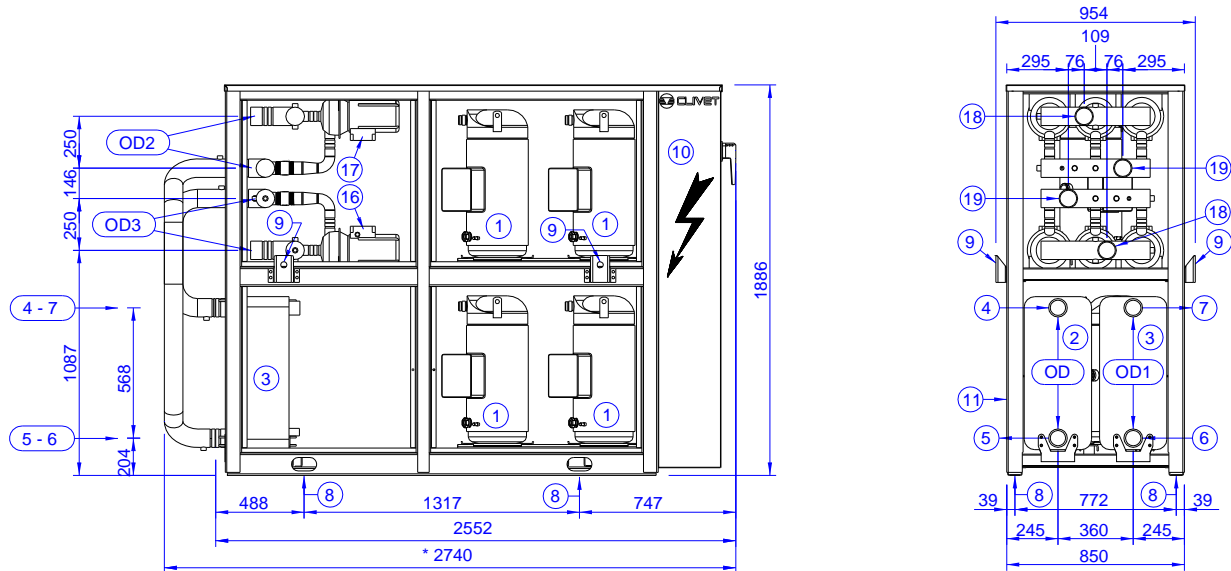
- (12) MINIMUM DIMENSION ON THE ELECTRICAL SWITCHBOARD SIDE.
- (13) MINIMUM DIMENSION FOR A SAFE PASSAGE.
- (14) MINIMUM DIMENSION FOR MAINTENANCE.
- (15) MINIMUM DIMENSION FOR WATER CONNECTIONS.
- (16) HYDROPACK UTILITY SIDE
- (17) HYDROPACK SOURCE SIDE
- (18) PUMPS SUCTION
- (19) PUMPS SUPPLY
- (*) UNIT LENGTH WITH ACCESSORIES CEHU / CEHS "EXCHANGER - HYDRONIC UNIT CONNECTION SET"

Size	ST				EN				
	65D	70D	75D	80D	65D	70D	75D	80D	
M	mm	1314	1323	1289	1272	1271	1293	1264	1246
N	mm	1233	1224	1258	1275	1276	1254	1283	1301
O	mm	404	398	402	399	404	399	402	400
P	mm	446	452	448	451	446	451	448	450
OD	mm	76	76	76	76	76	76	76	76
OD1	mm	76	76	76	76	76	76	76	76
OD2	mm	89	89	89	89	89	89	89	89
OD3	mm	89	89	89	89	89	89	89	89
Length	mm	2547	2547	2547	2547	2547	2547	2547	2547
Depth	mm	850	850	850	850	850	850	850	850
Height	mm	1886	1886	1886	1886	1886	1886	1886	1886
W1	kg	285	289	314	325	330	329	353	366
W2	kg	409	433	434	434	422	454	456	454
W3	kg	316	329	351	369	360	367	389	407
W4	kg	453	493	486	492	460	506	502	504
Operating weight	kg	1462	1544	1584	1621	1572	1655	1699	1731
Shipping weight	kg	1436	1516	1553	1588	1546	1627	1668	1698

Particular accessories, executions or versions can bring about a great variation of the mass represented here. Please contact our Technical Department.

DIMENSIONAL DRAWING

DIMENSIONS: WSH-XSC 85D-90D-100D-110D-115D-120D



- (1) COMPRESSOR
- (2) INTERNAL EXCHANGER (EVAPORATOR)
- (3) EXTERNAL EXCHANGER (CONDENSER)
- (4) INTERNAL EXCHANGER WATER INLET
- (5) INTERNAL EXCHANGER WATER OUTLET
- (6) EXTERNAL EXCHANGER WATER INLET
- (7) EXTERNAL EXCHANGER WATER OUTLET
- (8) HOLE TO HANG UNIT
- (9) LIFTING BRACKETS
- (10) ELECTRICAL PANEL
- (11) POWER INPUT
- (12) MINIMUM DIMENSION ON THE ELECTRICAL SWITCHBOARD SIDE.
- (13) MINIMUM DIMENSION FOR A SAFE PASSAGE.
- (14) MINIMUM DIMENSION FOR MAINTENANCE.
- (15) MINIMUM DIMENSION FOR WATER CONNECTIONS.
- (16) HYDROPACK UTILITY SIDE
- (17) HYDROPACK SOURCE SIDE
- (18) PUMPS SUCTION
- (19) PUMPS SUPPLY
- (*) UNIT LENGTH WITH ACCESSORIES CEHU / CEHS "EXCHANGER - HYDRONIC UNIT CONNECTION SET"

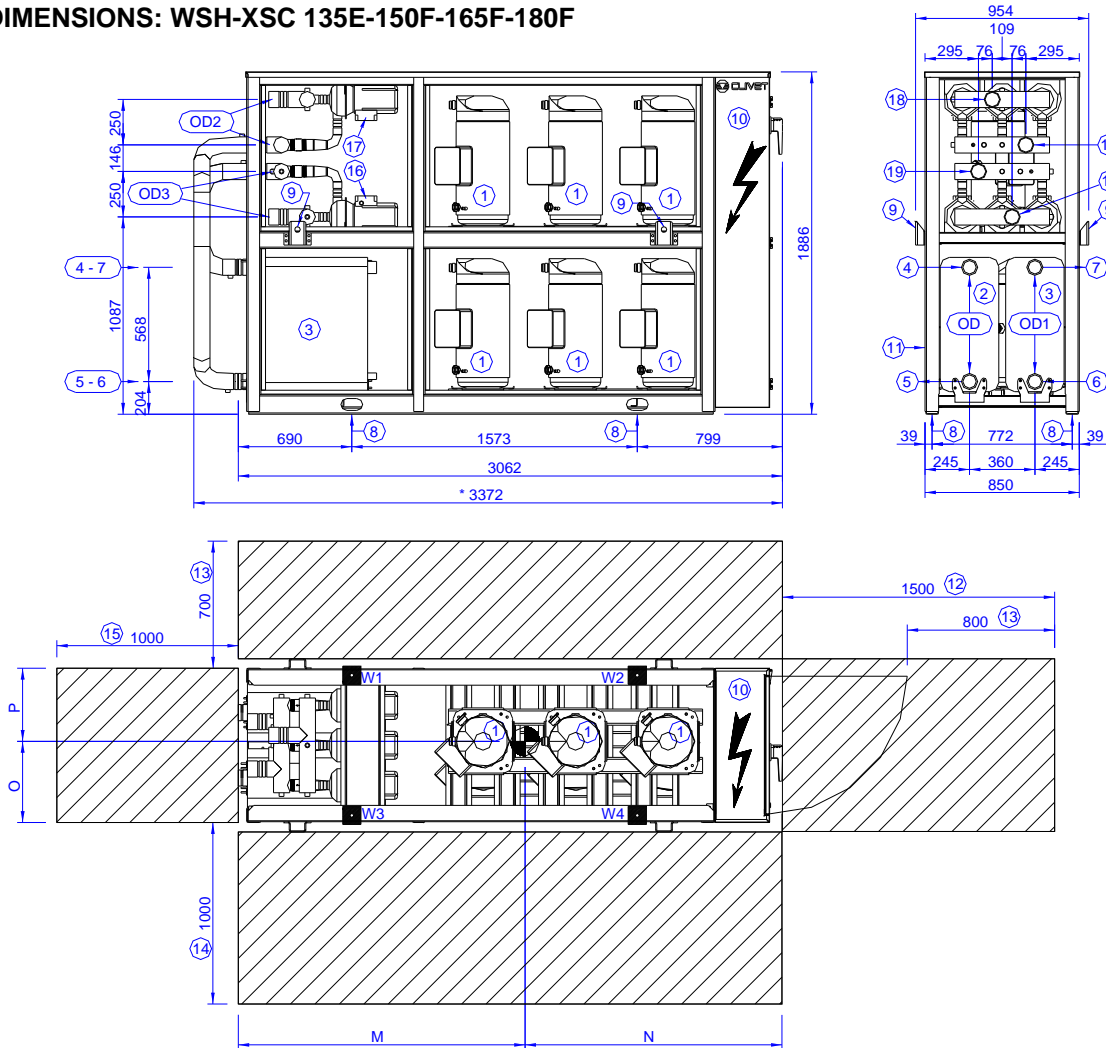
Size	ST						EN						
	85D	90D	100D	110D	115D	120D	85D	90D	100D	110D	115D	120D	
M	mm	1233	1248	1217	1228	1221	1221	1211	1224	1197	1207	1202	1202
N	mm	1319	1304	1335	1324	1331	1331	1341	1328	1355	1345	1350	1350
O	mm	398	400	399	396	394	394	398	400	399	396	394	394
P	mm	452	450	451	454	456	456	452	450	451	454	456	456
OD	mm	89	89	89	89	89	89	89	89	89	89	89	89
OD1	mm	89	89	89	89	89	89	89	89	89	89	89	89
OD2	mm	89	114	114	114	114	114	89	114	114	114	114	114
OD3	mm	89	114	114	114	114	114	89	114	114	114	114	114
Length	mm	2552	2552	2552	2552	2552	2552	2552	2552	2552	2552	2552	2552
Depth	mm	850	850	850	850	850	850	850	850	850	850	850	850
Height	mm	1886	1886	1886	1886	1886	1886	1886	1886	1886	1886	1886	1886
W1	kg	363	357	393	401	409	410	403	397	433	442	449	450
W2	kg	438	448	463	490	492	494	456	466	481	507	510	512
W3	kg	413	403	446	462	475	477	452	442	485	503	515	516
W4	kg	499	507	526	564	572	574	513	519	539	576	585	587
Operating weight	kg	1713	1714	1828	1918	1947	1955	1824	1824	1938	2028	2058	2065
Shipping weight	kg	1659	1660	1761	1851	1875	1891	1770	1770	1871	1961	1986	2001

Particular accessories, executions or versions can bring about a great variation of the mass represented here. Please contact our Technical Department.

E109C006CE-03

DIMENSIONAL DRAWING

DIMENSIONS: WSH-XSC 135E-150F-165F-180F



- (1) COMPRESSOR
- (2) INTERNAL EXCHANGER (EVAPORATOR)
- (3) EXTERNAL EXCHANGER (CONDENSER)
- (4) INTERNAL EXCHANGER WATER INLET
- (5) INTERNAL EXCHANGER WATER OUTLET
- (6) EXTERNAL EXCHANGER WATER INLET
- (7) EXTERNAL EXCHANGER WATER OUTLET
- (8) HOLE TO HANG UNIT
- (9) LIFTING BRACKETS
- (10) ELECTRICAL PANEL
- (11) POWER INPUT
- (12) MINIMUM DIMENSION ON THE ELECTRICAL SWITCHBOARD SIDE.
- (13) MINIMUM DIMENSION FOR A SAFE PASSAGE.
- (14) MINIMUM DIMENSION FOR MAINTENANCE.
- (15) MINIMUM DIMENSION FOR WATER CONNECTIONS.
- (16) HYDROPACK UTILITY SIDE
- (17) HYDROPACK SOURCE SIDE
- (18) PUMPS SUCTION
- (19) PUMPS SUPPLY
- (*) UNIT LENGTH WITH ACCESSORIES CEHU / CEHS "EXCHANGER - HYDRONIC UNIT CONNECTION SET"

Size	ST				EN			
	135E	150F	165F	180F	135E	150F	165F	180F
M	mm 1509	1464	1470	1461	1493	1459	1459	1457
N	mm 1553	1598	1592	1601	1569	1603	1603	1605
O	mm 388	400	401	400	390	403	403	403
P	mm 462	450	449	450	460	447	447	447
OD	mm 89	89	89	89	89	89	89	89
OD1	mm 89	89	89	89	89	89	89	89
OD2	mm 114	114	114	114	114	114	114	114
OD3	mm 114	114	114	114	114	114	114	114
Length	mm 3062	3062	3062	3062	3062	3062	3062	3062
Depth	mm 850	850	850	850	850	850	850	850
Height	mm 1886	1886	1886	1886	1886	1886	1886	1886
W1	kg 523	621	637	641	558	661	685	692
W2	kg 508	562	601	592	530	600	627	632
W3	kg 617	695	718	726	654	731	758	765
W4	kg 600	629	678	671	621	663	693	698
Operating weight	kg 2247	2507	2633	2630	2363	2654	2763	2787
Shipping weight	kg 2170	2425	2549	2542	2286	2572	2679	2699

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