

TETRIS W FC NG

40÷640 kW



General description

TETRIS W FC/NG is a free cooling chiller for indoor installation that integrates uncoupling exchanger, 3-way modulating valve, inverter-controlled pump on the source side and advanced software for management of the system and of the remote air exchanger.

Configurations

Basic: unit with TFT at -2°C

HE: unit with TFT at +1°C

Optional hydronic module

Strong points

- ▶ Plug and play indoor free cooling unit
- ▶ Hybrid free cooling: ability to operate in mixed free cooling/chiller mode in spring and autumn
- ▶ Fully integrated control for chiller, free cooling unit and remote air exchanger management
- ▶ High efficiency unit in "mechanical cooling" mode
- ▶ Very high efficiency in Free Cooling mode
- ▶ Free cooling with two levels of efficiency and payback time
- ▶ Installation made easier
- ▶ User circuit without glycol
- ▶ Wide capacity range
- ▶ Extremely compact



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"FREE COOLING" MANAGEMENT

When it is carried out, the Free Cooling condition allows chilled water to be obtained without needing to activate the compressors and therefore almost free of cost (in fact, activation of the circulation pumps and, for temperatures that are not extremely low, the dry cooler fans, cannot be disregarded).

However, this condition can be activated only if the external air temperature is low enough to satisfy the entire energy requirement of the users. Until this happens, for conventional units having the possibility of working in free cooling mode, generation of the power necessary to cover the energy requirement is carried out by mechanical cooling, and therefore by compressors, to then transfer the demand to free cooling in accordance with an ON-OFF logic that therefore guarantees an energy benefit that can be zero (if free cooling is not activated) or maximum (if free cooling is activated).

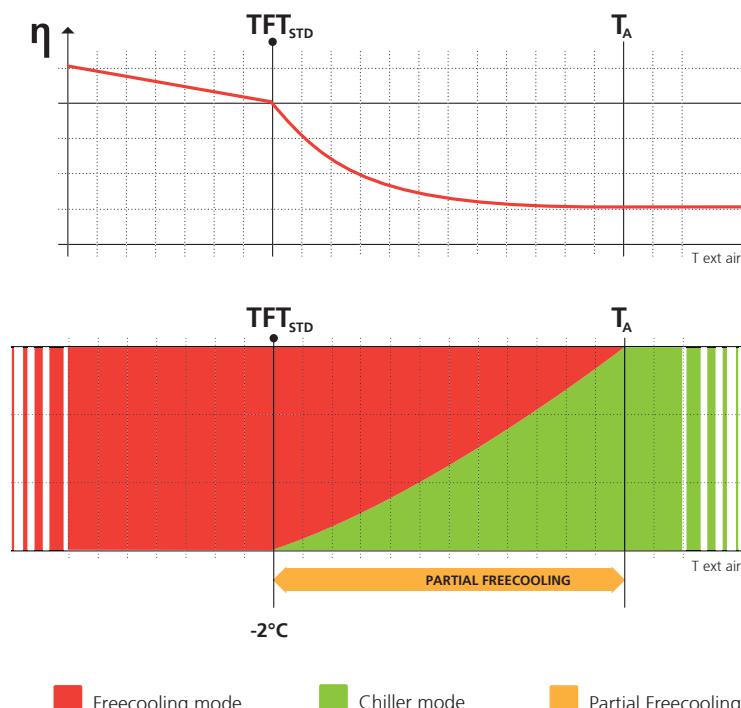
In reality, there are numerous conditions in which a partial benefit can be obtained from free cooling by having a partial coverage of demand with external air and the rest of it covered with mechanical production.

An activation temperature T_A can be defined, below which the partial free cooling mode begins. From this moment on, it is possible to introduce the concept of machine efficiency that no longer coincides with the known EER because the refrigeration capacity that the unit can deliver no longer totally depends on the power absorbed by the compressors, but instead benefits from the component coming from free cooling. The efficiency value of the unit as the external temperature changes is plotted below.

In the same way, we define Total Freecooling Temperature (TFT) as the external air temperature at which the capacity that can be obtained from free cooling is the same as that delivered by the refrigerant circuit under standard conditions. When the TFT is reached, the efficiency value is extremely high because the only power absorbed by the system in this condition is the power absorbed by the pumps and fans. So therefore the efficiency of the unit can easily reach values even higher than 15.

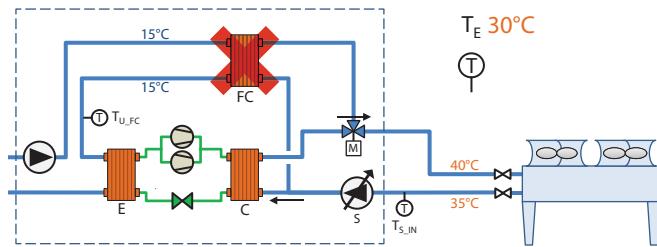
Thanks to the configuration of the hydronic circuit, having as standard a 3-way modulating valve dedicated to the source-side circuit, TETRIS W FC/NG has the possibility of working in "partial free cooling" mode and therefore guaranteeing very high efficiency values.

If we consider the case of a typical industrial installation in which chilled water production at the user side at a temperature of 10°C is required, then the TA will also be quantifiable at around 10°C. It follows that, in situations of this kind, even for latitudes corresponding to those of Frankfurt, partial Free Cooling mode is used for over half of the yearly hours of operation with enormous benefits in terms of reduction of the energy absorbed altogether over the year, especially for applications that provide for continuous operation without seasonal stops (industrial applications in which cooling is required over the whole year).



The three operating modes of the machine, depending on external air temperature, are therefore represented below:

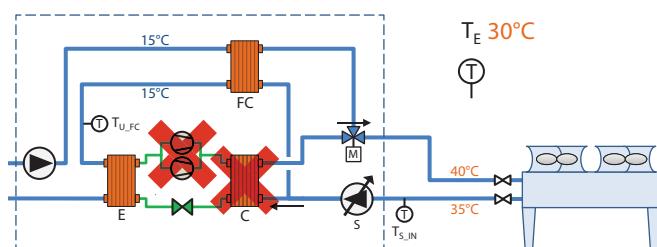
CHILLER



TETRIS W FC/NG

The free cooling exchanger is completely excluded by the 3-way valve and the refrigeration capacity is supplied entirely by the refrigerant circuit through activation of the compressors.

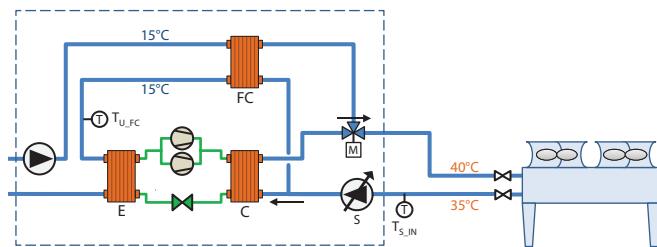
FREE COOLING



TETRIS W FC/NG

If the external air temperature is low enough to allow all the capacity necessary to cover the immediate requirement to be obtained through free cooling, then the compressors are excluded and the 3-way valve guarantees diversion of the glycol process fluid through the free cooling exchanger alone.

PARTIAL



TETRIS W FC/NG

If the external air temperature is not low enough to allow all the capacity necessary to cover the immediate requirement to be obtained through free cooling, but can in any case guarantee it will cover a part of it, then the three-way valve modulates so as to have process fluid flowing through the free cooling exchanger and through the refrigerant circuit condenser. This condition, which is called "partial free cooling", obviously occurs much more often than the total free cooling condition, and in any case guarantees a partial benefit compared to the "chiller" solution.

TWO DIFFERENT LEVELS OF EFFICIENCY FROM WHICH TO CHOOSE FOR THE ENTIRE RANGE

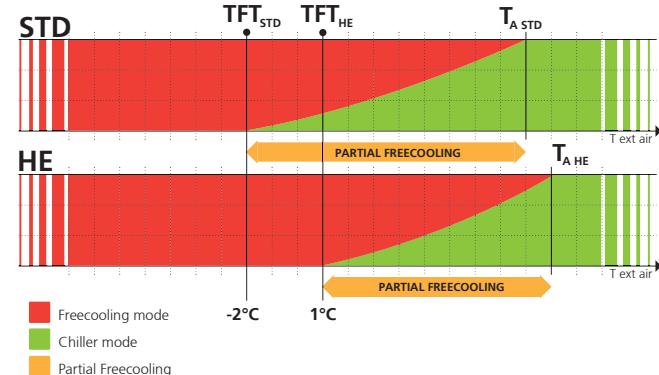
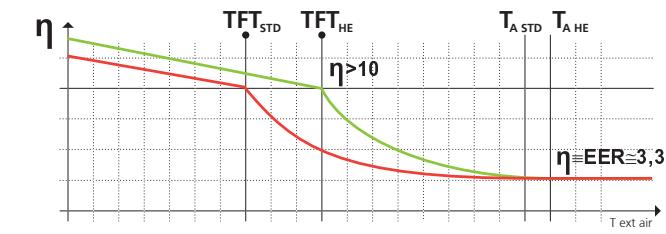
It is clear how, for the same external dry cooler performance, the aforementioned TFT depends on the sizing of the plate exchanger dedicated to free cooling and that the TFT can therefore be raised by using a more generous sizing of it.

By working on the size of the heat exchange parts, we have chosen to make two set-ups available on the entire range. These in turn lead to obtaining two TFT values:

- Standard TFT = -2°C
- Optional TFT = 1°C

In this way, the customer is allowed a choice between two distinct efficiency levels, a standard one and one called HE (High Efficiency).

The efficiency trend and the trend of the capacity obtained by Free Cooling for the two different values of TFT are plotted below.



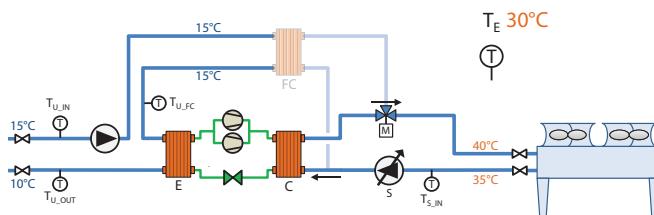
DIFFERENT OPERATING MODES BASED ON EXTERNAL CONDITIONS

The external air temperature is an essential parameter for establishing which operating mode regards TETRIS W FC/NG in terms of whether or not free cooling is activated and also of the procedure for condensation control and of the capacity generated by the machine.

Five operating scenarios, which are made for various external air temperatures T_E , are described in detail below.

FIRST SCENARIO

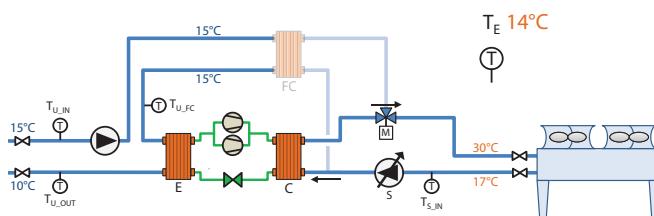
$T_E > T_{U_IN}$: OPERATION IN CHILLER MODE



- Free cooling: OFF
- Compressors: ON
- Pump S: works at maximum speed
- Three-way valve: fully closed to isolate the free cooling exchanger
- Dry cooler: the rotation speed of the fans is set to carry out a chiller condensation control

SECOND SCENARIO

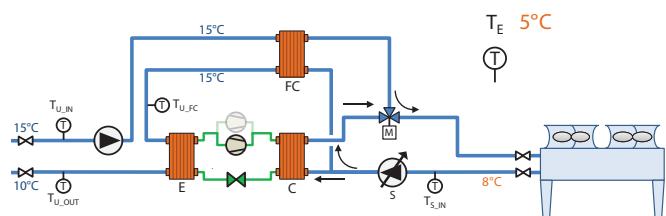
$T_A < T_{U_IN}$ but $T_{S_IN} > T_{U_IN}$: OPERATION IN CHILLER MODE



- Free cooling: OFF
- Compressors: ON
- Pump S: works at variable speed to control condensation
- Three-way valve: fully closed to isolate the free cooling exchanger
- Dry cooler: fans at maximum speed to obtain the lowest T_{S_IN} possible

THIRD SCENARIO

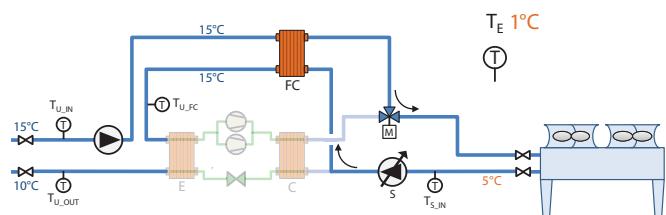
$T_{S_IN} + 3 < T_{U_IN}$: OPERATION IN PARTIAL FREE COOLING MODE



- Free cooling: ON
- Compressors: ON (at reduced capacity)
- Pump S: works at maximum speed
- Three-way valve: works in partial modulating mode to guarantee condensation control and feeding of the free cooling exchanger
- Dry cooler: fans at maximum speed to obtain the lowest T_{S_IN} possible

FOURTH SCENARIO

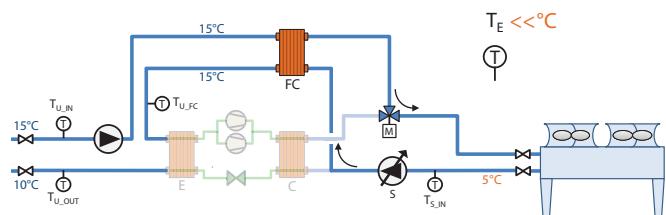
$T_{U_FC} = 10^\circ\text{C} = T_{U_OUT}$: OPERATION IN FREE COOLING MODE



- Free cooling: ON
- Compressors: OFF
- Pump S: works at maximum speed
- Three-way valve: fully open to the free cooling exchanger
- Dry cooler: fans modulating to control the T_{S_IN}

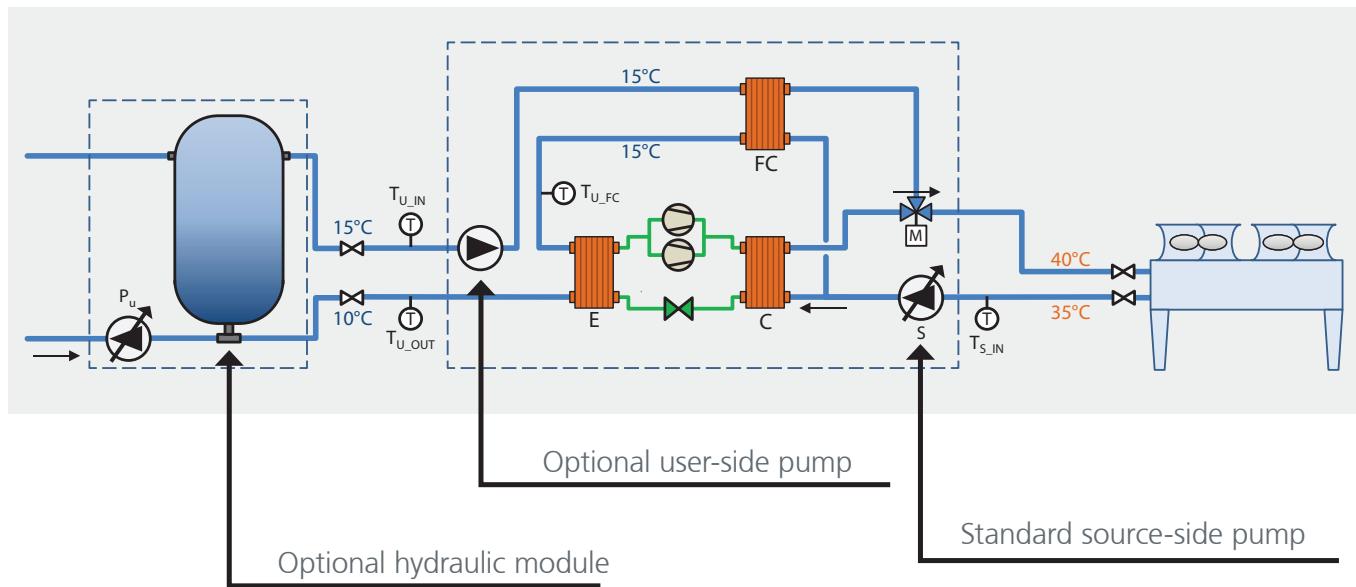
FIFTH SCENARIO

$T_A \ll 0$: OPERATION IN FREE COOLING MODE



- Free cooling: ON
- Compressors: OFF
- Pump S: works in speed modulating mode to guarantee control of the capacity of the refrigeration capacity of free cooling
- Three-way valve: fully open to the free cooling exchanger
- Dry cooler: OFF

HYDRAULIC CONFIGURATIONS



The configurability of the hydraulic circuit, as regards both the source side and the user side, allows requirements connected with different systems to be met and the energy performance of the machine to be optimized also in terms of the energy used for pumping.

SOURCE SIDE

Installed as standard is a variable-speed pump controlled by inverter that is also installed as standard. To work with high percentages of glycol up to 50%, there is a range of special pumps, which are in the catalogue.

The possible configurations as regards the source-side hydraulic circuit are therefore the following:

- 1SV: single pump with standard discharge head controlled by inverter (STANDARD)
- 2SV: double pump with standard discharge head controlled by inverter
- 1SVM: single pump with increased discharge head controlled by inverter
- 2SVM: double pump with increased discharge head controlled by inverter
- 1SGV: single pump with standard discharge head, suitable for working with glycol up to 50% and controlled by inverter
- 2SGV: double pump with standard discharge head, suitable for working with glycol up to 50% and controlled by inverter

Where there are 2 pumps, these always work in redundant mode, that is, with one on standby while the other is working.

The inverter is always included in the supply.

USER SIDE

The standard version does not have a pump on the user side but this is included as an accessory in the catalogue and can be selected from the following options:

- 1P: single pump for standard discharge head
- 2P: double pump for standard discharge head
- 1PM: single pump for increased discharge head
- 2PM: double pump for increased discharge head

Where there are 2 pumps, these always work in redundant mode, that is, with one on standby while the other is working.

USER-SIDE HYDRAULIC MODULE WITH TANK

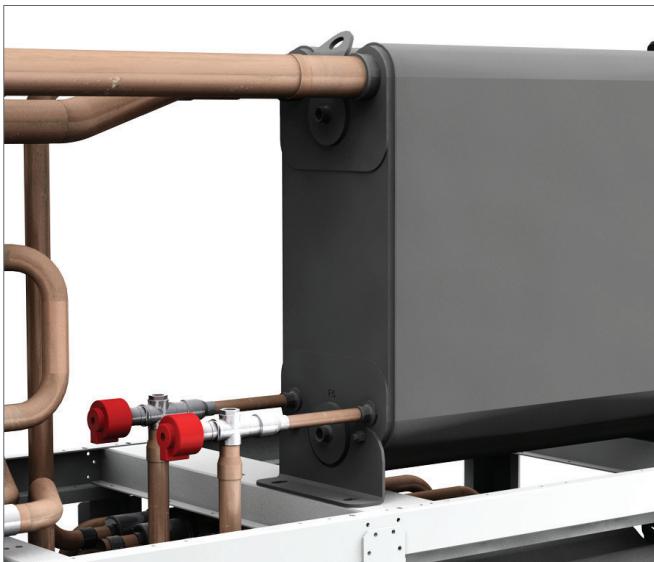
The high configurability of the TETRIS W FC NG series also allows a hydraulic module PSM TW complete with pump and tank on the user side to be selected. Also as regards the PSM module, there is the possibility of choosing from the various configurations described below:

- /1PV: single pump for standard discharge head controlled by inverter
- /2PV: double pump for standard discharge head controlled by inverter
- /1PMV: single pump with increased discharge head controlled by inverter
- /2PMV: double pump with increased discharge head controlled by inverter

Where there are 2 pumps, these always work in redundant mode, that is, with one on standby while the other is working.

The inverter is always included in the supply.

DUAL CIRCUIT HEAT EXCHANGERS



All models of TETRIS W FC/NG with double refrigerant circuit use dual circuit evaporators and condensers. This allows us to:

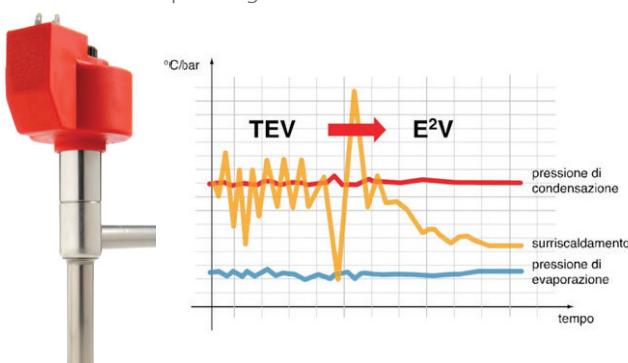
- Reduce the load of refrigerant
- Reduce the size of the unit
- Eliminate the need for external manifolds, so reducing hydraulic head losses and, consequently, pumping costs
- Increase the level of efficiency of the unit with capacity reduction, thanks to the increase in evaporating temperature and reduction in condensing temperature

ELECTRONIC EXPANSION VALVE

Guaranteed energy savings, precision and comfort, with the electronic thermostatic valve and precise control of delivered capacity, installed as standard.

The electronic thermostatic valve allows you to obtain:

- Quality in refrigerant flow control.
- Speed in reaching machine stability.
- Heat load variability followed with absolute precision.
- Large working field with consequent extension of the operating limits of the unit.
- Reduction in operating costs.



ALSO IN FULLY PANELLED VERSION



In its standard set-up, TETRIS W FC/NG meets the requirements of the customer who does not require particular soundproofing levels. In this set-up, TETRIS W FC/NG is lighter and costs less.



Otherwise, for applications requiring maximum containment of noise levels, TETRIS W FC/NG includes the /LN version that consists of a set-up fully closed by panels lined with sound absorbing and soundproofing material that therefore allows noise emissions to be reduced by 7dB(A) compared to the standard unit. In the /LN version, the hydraulic module, if present, is also enclosed by panelling. Besides making the technical room tidier, this also contributes to deadening the noise of the pumps dedicated to the machine.

THE STRENGTH OF INTEGRATION



The numerous operating modes of a system that can guarantee total or partial free cooling are made possible through the composition of several control parts. Their integration is an essential element to guarantee advanced control of them that will lead to maximizing the benefits that each of them can guarantee.

The supply of a complete system, in terms of the components and their control, is the result that we ensure through TETRIS W FC NG.

The remote dry cooler, the three-way valve for free cooling management and the source-side inverter-controlled pump, are all components that the machine management software can control according to a common logic, which is one of lowest energy cost that will allow the request to be fully met.

Also as regards the installation operations, TETRIS W FC NG can guarantee the maximum efficiency because its body considers its division into two sections for sizes with plan length greater than five metres. This allows easy handling and the possibility of placing two modules in any reciprocal position provided they are adjacent to each other. In this configuration, each module will be equipped with its own electrical control panel and the main power supply will be supplied to the electrical control panel of the chiller module that the one for the hydraulic module will then be taken from.

SPECIFICATIONS

High efficiency water-condensed liquid chillers with R410A scroll compressors with the possibility of working in free cooling mode, for indoor installation.

BODY

The body consists of a load-bearing frame made of epoxy polyester powder coated steel sheet, in RAL 7035 (light grey).

The body is monoblock up size 34.4 and will contain the components of the chiller section, the hydraulic section and the free cooling module.

But from size 38.4, the body is divided into two parts to guarantee easy handling. A first module consists of the chiller (compressors and refrigerant circuit) while the second module is made to contain the free cooling section and the hydraulic circuit with the pumps. The two modules can be placed in any reciprocal position provided they are adjacent to each other.

Once positioned on site they must be connected hydraulically and electrically (by the customer).

PANELLING

The units in LN set-up are fully panelled with epoxy polyester powder coated steel sheet panels, in RAL 7035 (light grey), lined with matting made of sound absorbing material.

COMPRESSORS

The compressors are hermetic orbiting spiral scroll compressors connected in tandem or trio, fitted with oil level sight glass, oil equalization line and electronic protection.

SOURCE-SIDE HEAT EXCHANGER

Braze-welded stainless steel AISI 316 plate heat exchanger with anti-condensation insulation made of closed-cell insulating material. The models with 2 refrigerant circuits are fitted with dual circuit heat exchanger with a single hydraulic connection.

The use of plate heat exchangers allows us to:

- achieve higher COP/EER
- reduce the amount of refrigerant in the circuit
- reduce the size and weight of the unit
- make maintenance easier.

USER-SIDE HEAT EXCHANGER

Braze-welded stainless steel AISI 316 plate heat exchanger with anti-condensation insulation made of closed-cell insulating material.

Each heat exchanger is provided with a temperature probe for freeze protection and a probe for measuring the incoming water.

The models with 2 refrigerant circuits are fitted with dual circuit heat exchanger with a single hydraulic connection.

FREE COOLING EXCHANGER

Braze-welded stainless steel AISI 316 plate heat exchanger with anti-condensation insulation made of closed-cell insulating material.

The exchanger makes the separation between the source side (glycol) and the user side (non-glycol) and allows transfer of the refrigeration capacity from one side to the other during operation in free cooling mode.

REFRIGERANT CIRCUIT

The composition of the refrigerant circuit depends on the chosen set-up. The circuit of the standard unit comprises the following components:

- liquid valve
- charging valve
- liquid sight glass
- dehydrator filter on each circuit
- electronic expansion valve
- high and low pressure switches for models with up to 2 compressors
- safety valves
- pressure transducers for reading, by the control, of the high and low pressure values and relevant evaporating and condensing temperatures, high pressure switches and safety valves for models with 3 to 6 compressors.

The solenoid valve function on the liquid line is performed by the electronic expansion valve, which shuts off the liquid by closing when the circuit stops. On request, the electronic valve can be fitted with a backup battery that will guarantee it closes even without mains power.

ELECTRICAL CONTROL PANEL

The electrical control panel comprises:

- Main disconnect switch
- Automatic circuit breakers for compressors with fixed calibration
- Fuses to protect the auxiliary circuits
- Thermal magnetic circuit breakers for pumps (if present)
- Contacts for the control of an external user-side pump (only for units without user-side pumps)
- Contactors and protection devices for source-side pump
- Source-side pump inverter
- Microprocessor control for control of the following functions:
 - Water temperature control, with inlet control
 - Freeze protection
 - Compressor timings
 - Automatic rotation of compressor starting sequence
 - Alarm signal
 - Alarm reset
 - Stepped capacity reduction of the capacity delivered by the unit
 - Cumulative alarm contact for remote signalling
 - Forcing of capacity reduction due to pressure limit

- Management of log of last 100 alarms
- Display of the following on the display:
 - > Incoming water temperature
 - > Temperature and differential set points
 - > Description of alarms
 - > Hour meter of operation and number of starts of unit, compressors and pumps (if present)
 - > High pressure and relevant temperature
 - > Low pressure and relevant temperature

The terminals that are to have connections for external OK signal devices to be made by the installer are coloured blue to make them easier to identify.

All the electrical cables inside the panel are identified by numbered collars.

From size 38.4, the free cooling module is separate from the chiller module and is equipped with a secondary electrical control panel having a main disconnect switch and into which are transferred components for management of the pumps, dry cooler and 3-way valve. The power supply to the secondary electrical control panel is taken from the main electrical control panel.

STANDARD POWER SUPPLY [V/f/Hz] 400/3~/50

$\pm 5\%$

SAFETY DEVICES

- High pressure switch with automatic reset and limited interventions managed by the control
- Low pressure switch with automatic reset and limited interventions managed by the control
- High pressure safety valve
- Anti-freeze probe at evaporator outlet
- Differential pressure switch for the user-side water flow check
- Chilled water temperature probe (located on the evaporator return)
- Protection against compressor overtemperature

SOURCE-SIDE HYDRAULIC MODULE

The source-side hydraulic module is always present as standard and includes the following:

- A source-side pump (1SV)
- Inverter speed controller
- 3-way valve for total and partial free cooling management
- Shut-off valves on hydraulic circuit delivery and return

For more details, see the "Hydraulic configurations" section.

SOURCE-SIDE HYDRAULIC MODULE SET-UPS

All the possible set-ups are described in the "Hydraulic configurations" section.

USER-SIDE HYDRAULIC MODULE

The standard unit is supplied without user-side hydraulic set-up but it is possible to choose from a complete range of configu-

rations available as optional extras.

Differential pressure switch for checking the presence of water flow is always installed.

USER-SIDE HYDRAULIC MODULE SET-UPS

All the possible set-ups are described in the "Hydraulic configurations" section.

ACCESSORIES

THE BASIC UNIT COMPRISSES:

- Variable flow source-side pump controlled by user-side inverter
- Three-way valve for free cooling management
- Plate heat exchanger for carrying out free cooling
- Electronic thermostatic valve
- User-side differential pressure switch
- Relay for management of a user-side pump
- Main disconnect switch
- Automatic circuit breakers for compressors with fixed calibration
- Fuses for auxiliary circuits
- Microprocessor control
- Microprocessor display of high and low pressure
- Alarm log management with "black box" function
- Remote On/Off from digital input
- RS485 with ModBus protocol only
- Phase monitor
- OK signal for dry-cooler and 0-10V signal for speed governor control
- EC Directive 97/23 (PED) certification

HYDRAULIC CIRCUIT ACCESSORIES

- User-side safety valve
- Source-side safety valve
- User-side flow switch instead of the differential pressure switch (supplied).

REFRIGERANT CIRCUIT ACCESSORIES

- Pressure gauges
- Compressor suction and delivery valves
- Backup battery for electronic thermostatic valve.

ELECTRICAL ACCESSORIES

- Provision for Blue Box Remote Dry Cooler
- Additional RS485 serial card
- Bacnet serial card
- Lon serial card
- Ethernet serial card
- User-side outgoing water temperature control
- Double set point from digital input
- Variable set point with remote signal (0-1V, 0-10V, 4-20mA)
- Set point compensation depending on external air temperature

- Relay for management of 2 external user-side pumps
- Remote-controlled user terminal panel
- Electronic soft-starter
- Automatic circuit breakers (instead of fuses)
- Power factor correction to $\cos \varnothing \geq 0.9$
- Remote-controlled user-side operation probe
- 415/3/50 power supply
- Maximum and minimum voltage relay

OTHER ACCESSORIES

- Rubber anti-vibration mounts
- Spring anti-vibration mounts
- Partially assembled construction
- Packaging in wooden crate
- Kit of water filters (user, source)

CODE	Accessory	Operation and advantages
VSS	Source-side water safety valve	Safety valves are typically used for pressure control in heating systems. When the calibration pressure is reached, the valve opens and, by discharging to atmosphere, prevents the system pressure from reaching limits that are dangerous for the components present in the system. The valves have positive action, that is, performance is guaranteed even if the diaphragm deteriorates or breaks.
VSWU	User-side water safety valve	Safety valves are typically used for pressure control in heating systems. When the calibration pressure is reached, the valve opens and, by discharging to atmosphere, prevents the system pressure from reaching limits that are dangerous for the components present in the system. The valves have positive action, that is, performance is guaranteed even if the diaphragm deteriorates or breaks.
FLUU	User-side flow switch	The water flow switch detects when there is no water flow to the user-side exchanger and sends a signal to the control of the unit that will stop the compressors to prevent damage to the exchangers. The flow switch (supplied) replaces the water differential pressure switch (standard).
MAFR	Freon pressure gauges	The pressure gauges are situated in a clearly visible position and allow real time reading of the working pressures of the refrigerant gas on the low pressure side and on the high pressure side.
RUB	Compressor suction and delivery valves	The valves situated on the delivery side and on the suction side of the compressors allow the compressor to be isolated from the rest of the refrigerant circuit, so making the maintenance operations quicker and less invasive.
BT	Backup battery for electronic thermostatic valve	When the compressors stop, the controller always closes the electronic thermostatic valve to prevent dangerous refrigerant migration. The presence of the backup battery ensures operation of the electronic valve even when there is no power supply
PDC	Provision for Blue Box Remote Dry Cooler	When this accessory is installed, the remote dry cooler is controlled directly by the machine. In order to manage the remote dry cooler, the following are included in the electrical control panel of the unit: speed governor, contactors and protection devices for the dry cooler fans. When this accessory is present, the dry cooler power supply is taken directly from the machine.
SERI	Additional RS485 serial card	RS485 serial card for connection of the unit to an external supervisor via ModBus protocol. This card is in addition to the RS485 serial connection with ModBus protocol present as standard.
BAC	Bacnet serial card	RS485 serial card for connection of the unit to an external supervisor via BACnet MS/TP protocol. This card is in addition to the RS485 serial connection with ModBus protocol present as standard.
LON	Lon serial card	FTT-10 serial card for connection of the unit to an external supervisor via LonWorks protocol. This card is in addition to the RS485 serial connection with ModBus protocol present as standard.
ETH	Ethernet serial card	Ethernet serial card for connection of the unit to an external supervisor via ModBus TCP/IP, BACnet/IP, BACnet/Ethernet, SNMP, FTP, http protocol. The card has an integrated webserver with a preloaded web page for viewing the main parameters of the unit. This card is in addition to the RS485 serial connection with ModBus protocol present as standard.
COTW	User-side outgoing water temperature control	The accessory allows you to change the operating logic of the control that normally envisages control on the basis of the return temperature from the system. If selected, this accessory allows you to implement control according to the temperature of the water sent to the system. Installation of this accessory is recommended for units with a high number of compressors (number of compressors ≥ 4).
SETD	Double set point from digital input	For units fitted with this accessory, it is possible to preset two different operating set points and manage the change from one to the other through a digital signal.
SETV	Variable set point with remote signal (0-1V, 0-10V, 4-20mA)	The set point can be varied continuously between two preset values, a maximum and a minimum, depending on an external signal that can be of the 0-1V, 0-10V or 4-20mA type.
CSP	Set point compensation depending on external air temperature	The set point of the unit is set so that it can vary between two values, a maximum and a minimum, depending on the external air temperature. The compensation ramp and the maximum and minimum values of the set point can be changed by the user. In the absence of other information, the set point follows a so-called "negative" ramp, that is, it decreases as the external temperature rises in summer and increases as the external temperature falls in winter.
OVER-LOAD PROT.	Remote-controlled user terminal panel	The remote terminal allows the terminal normally situated on the machine to be replicated on a support situated at a distance from the machine. This accessory is particularly suitable when the main unit is placed in an area that is not easily accessible.
SOFT	Electronic soft-starter	This accessory allows the inrush currents associated with the switching on of each individual compressor to be reduced.
IA	Automatic circuit breakers (instead of fuses)	This accessory requires the installation of automatic circuit breakers, instead of fuses, for the protection of auxiliary loads. Also, the same accessory envisages the use of automatic circuit breakers with adjustable thermal overload protection to protect the compressors.
RIF	Power factor correction to $\cos \emptyset \geq 0.9$	Inherently linked to the absorption of any electric motor, there is always also a portion of reactive power that however does not produce any useful effect, only magnetization of the motor. The use of power factor correction condensers allows this portion to be lowered to bring the $\cos\emptyset$ value to above 0.9 thereby reducing the absorbed current.
SFU	Remote-controlled user-side operation probe (stopping of pump on reaching the set point)	When this accessory is present, the operation probe, that is, the probe that measures the temperature of the reference water of the system, is supplied with it so that it can be placed on a tank outside the unit. When the set point temperature is reached in the tank, the control stops the compressors and also stops the pump of the unit so as to guarantee the maximum energy saving. The circulation of water from the tank to the unit is to be provided by the customer.
A41	415/3/50 power supply	415/3/50 power supply
RMMT	Maximum and minimum voltage relay	This accessory constantly monitors the voltage value and the unit's power supply phase sequence. If the power supply is not correct, an alarm is generated that stops the machine to prevent damage to its main parts.

CODE	Accessory	Operation and advantages
AG	Rubber anti-vibration mounts	These are supplied as a separate package from the unit and must be installed on site following the assembly diagram supplied. They allow you to reduce the vibrations transmitted from the unit to the surface it is standing on.
AM	Spring anti-vibration mounts	These are supplied as a separate package from the unit and must be installed on site following the assembly diagram supplied. They allow you to reduce the vibrations transmitted from the unit to the surface it is standing on.
PREA	Partially assembled construction	The unit is delivered so that it can be disassembled easily on site if this makes the installation operations easier. A unit requested with this option is supplied: <ul style="list-style-type: none"> • screwed instead of riveted • with plugged and not welded pipes • without refrigerant charge • untested • covered by the warranty only if reassembled and screwed together by personnel authorized by the factory
GABB	Packaging in wooden crate	The unit is protected by a made-to-measure wooden crate. The accessory is mandatory if shipping by container is required
KFW	Kit of water filters (user, source)	To protect the elements of the hydraulic circuit (in particular, the plate exchangers), there are Y filters that can stop and settle the particles that are normally present in the water flow and would otherwise settle in the more delicate parts of the circuit. The filters are supplied as a separate package and their installation is mandatory.

DRY COOLER

Rejection of the excess heat produced by the operation of the compressors takes place through the glycol water circuit on the source side via a remote dry cooler module.

Blue Box offers the possibility of combining the TETRIS W FC NG unit with two types of liquid chiller differentiated in terms of the noise emission level they are able to guarantee. The customer will therefore choose from the two versions:

- Standard
- Low noise

All modules are equipped with main disconnect switch.

If the "Provision for Standard Blue Box Remote Dry Cooler" in the catalogue of the TETRIS W FC NG unit is selected, then speed governor and contactors to protect the fans will be installed in the electrical control panel of the unit.

For the specifications of the dry cooler and for the combinations with TETRIS W FC/NG units, please refer to the dedicated documentation provided.



TECHNICAL SPECIFICATIONS - TETRIS W FC NG

Unit size			3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2
MECHANICAL cooling (EG30%35; W10) (GROSS)										
Refrigeration capacity	(1)	kW	40	46	52	58	67	75	86	104
Total absorbed power	(2)	kW	9	10	11	12	14	16	18	22
EER 100%			4,69	4,66	4,74	4,77	4,72	4,73	4,78	4,79
MECHANICAL cooling (EG30%35; W10) (EN 14511:2011-3)										
Refrigeration capacity	(1)	kW	39	45	52	57	66	74	85	103
Total absorbed power	(2)	kW	10	11	12	14	16	18	20	24
EER 100%			4,10	4,01	4,14	4,18	4,20	4,09	4,17	4,23
FREE COOLING										
TFT basic version		°C	-2	-2	-2	-2	-2	-2	-2	-2
TFT /HE version		°C	1	1	1	1	1	1	1	1
Compressors										
Quantity/Refrigerant circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Capacity reduction steps		%	50%	50%	50%	50%	50%	50%	50%	50%
Total refrigerant charge		kg	3	3	3	4	4	6	7	7
User-side heat exchanger										
Water flow rate		l/h	6.863	7.826	8.961	9.925	11.455	12.866	14.723	17.888
Total head loss		kPa	80	95	96	109	112	104	113	127
Exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Head loss		kPa	23	24	26	23	27	35	34	38
Basic version of free-cooling exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Head loss		kPa	43	57	44	58	49	62	59	73
HE version of free-cooling exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Head loss		kPa	43	57	44	58	56	59	65	88
Source-side heat exchanger										
Flow rate of water and 35% glycol		l/h	9.413	10.749	12.271	13.574	15.694	17.619	20.128	24.446
Total head loss		kPa	88	111	112	122	128	85	97	108
Quantity		n°	1	1	1	1	1	1	1	1
User-side hydraulic module										
Standard pump type			P2	P3	P5	P5	P5	P5	P8	P8
Available discharge head 1P		kPa	121	117	143	126	117	119	111	95
Available discharge head 2P		kPa	96	87	100	91	75	99	88	70
Oversize pump type		P3	P6	P6	P6	P6	P6	P9	P9	P9
Available discharge head 1PM		kPa	153	186	183	166	156	158	159	142
Available discharge head 2PM		kPa	128	156	139	131	115	138	136	118
Source-side hydraulic module										
Standard pump type			P10	P11	P11	P11	P11	P9	P9	P9
Available discharge head of 1SV		kPa	149	161	156	138	127	177	157	130
Available discharge head of 2SV		kPa	130	134	127	101	85	149	124	88
Oversize pump type		P11			P9	P9	P12	P12	P13	P13
Available discharge head of 1SVM		kPa	188		153	144	243	207	244	
Available discharge head of 2SVM		kPa	170		116	102	216	174	201	
Pump type for glycol		P11	P11	P11	P9	P9	P9	P9	P14	
Available discharge head of 1SVG		kPa	139	148	141	131	127	164	140	141
Available discharge head of 2SVG		kPa	119	128	121	111	117	144	120	121
Noise levels										
Sound power level	(5)	dB(A)	73	75	75	77	77	78	79	80
Sound pressure level	(4)	dB(A)	57	59	60	62	62	63	63	65
Sound power level (LN version)	(5)	dB(A)	66	68	68	70	70	71	72	73
Sound pressure level (LN version)	(4)	dB(A)	50	52	53	55	55	56	56	58
Dimensions and weights of basic unit										
Length		mm	1633	1633	1633	1633	1633	1633	1633	1633
Depth		mm	800	800	800	800	800	800	800	800
Height		mm	1880	1880	1880	1880	1880	1880	1880	1880
Operating weight of basic version		kg								

(1) Source inlet-outlet temperature 35/40°C; source inlet-outlet temperature 15/10°C.

(2) The total power is given by the sum of the power absorbed by the compressors and by the fans.

(4) Sound pressure levels measured at a distance of 1 metre from the unit in free field, with directivity factor Q=4.

(5) Sound power levels calculated according to ISO 3744.

(9) Values compliant with standard EN 14511-3:2011.

TECHNICAL SPECIFICATIONS - TETRIS W FC NG

Unit size			12.2	13.2	15.2	17.2	19.2	20.2	24.2	27.2
MECHANICAL cooling (EG30%35; W10) (GROSS)										
Refrigeration capacity	(1)	kW	118	136	151	167	190	208	231	261
Total absorbed power	(2)	kW	25	28	31	35	40	45	50	56
EER 100%			4,78	4,79	4,82	4,79	4,76	4,67	4,66	4,69
MECHANICAL cooling (EG30%35; W10) (EN 14511:2011-3)										
Refrigeration capacity	(1)	kW	117	135	150	166	188	206	229	258
Total absorbed power	(2)	kW	27	32	35	39	44	49	54	61
EER 100%			4,31	4,26	4,29	4,23	4,24	4,17	4,26	4,23
FREE COOLING										
TFT basic version		°C	-2	-2	-2	-2	-2	-2	-2	-2
TFT /HE version		°C	1	1	1	1	1	1	1	1
Compressors										
Quantity/Refrigerant circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Capacity reduction steps		%	50%	50%	50%	50%	50%	50%	50%	50%
Total refrigerant charge		kg	9	10	11	13	14	15	22	22
User-side heat exchanger										
Water flow rate		l/h	20,296	23,392	25,972	28,724	32,680	35,776	39,732	44,892
Total head loss		kPa	107	116	114	103	114	135	119	141
Exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Head loss		kPa	38	37	36	36	42	47	53	56
Basic version of free-cooling exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Head loss		kPa	42	52	44	54	40	50	38	48
HE version of free-cooling exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Head loss		kPa	36	46	57	33	44	55	47	59
Source-side heat exchanger										
Flow rate of water and 35% glycol		l/h	27.752	31.972	35.453	39.265	44.710	49.105	54.570	61.571
Total head loss		kPa	92	100	111	120	147	142	110	130
Quantity		n°	1	1	1	1	1	1	1	1
User-side hydraulic module										
Standard pump type			P9	P9	P27	P27	P28	P28	P32	P32
Available discharge head 1P		kPa	149	131	157	157	198	157	176	145
Available discharge head 2P		kPa	105	81	136	133	159	113	127	108
Oversize pump type		P24	P24	P25	P28	P29	P29	P33	P33	P33
Available discharge head 1PM		kPa	203	166	225	226	267	220	257	226
Available discharge head 2PM		kPa	160	117	204	202	228	176	208	190
Source-side hydraulic module										
Standard pump type			P9	P14	P14	P15	P32	P32	P32	P33
Available discharge head of 1SV		kPa	129	148	117	159	141	134	152	198
Available discharge head of 2SV		kPa	110	122	87	123	97	106	119	158
Oversize pump type		P15	P15	P15	P16	P17	P33	P33	P34	P34
Available discharge head of 1SVM		kPa	239	218	188	218	251	217	236	254
Available discharge head of 2SVM		kPa	221	192	158	183	207	188	203	214
Pump type for glycol		P15	P15	P15	P29	P18	P19	P19	P19	P19
Available discharge head of 1SVG		kPa	236	209	176	205	115	205	220	178
Available discharge head of 2SVG		kPa	226	189	156	185	95	185	200	158
Noise levels										
Sound power level	(5)	dB(A)	83	84	85	85	86	87	87	88
Sound pressure level	(4)	dB(A)	66	67	69	69	70	71	71	71
Sound power level (LN version)	(5)	dB(A)	76	77	78	78	79	80	80	81
Sound pressure level (LN version)	(4)	dB(A)	59	60	62	62	63	64	64	64
Dimensions and weights of basic unit										
Length		mm	3300	3300	3300	3300	3300	3300	3300	3300
Depth		mm	800	800	800	800	800	800	800	800
Height		mm	1880	1880	1880	1880	1880	1880	1880	1880
Operating weight of basic version		kg								

(1) Source inlet-outlet temperature 35/40°C; source inlet-outlet temperature 15/10°C.

(2) The total power is given by the sum of the power absorbed by the compressors and by the fans.

(4) Sound pressure levels measured at a distance of 1 metre from the unit in free field, with directivity factor Q=4.

(5) Sound power levels calculated according to ISO 3744.

(9) Values compliant with standard EN 14511-3:2011.

TECHNICAL SPECIFICATIONS - TETRIS W FC NG

Unit size			30.3	34.3	40.3	18.4	20.4	24.4	26.4	30.4
MECHANICAL cooling (EG30%35; W10) (GROSS)										
Refrigeration capacity	(1)	kW	331	374	418	170	206	235	265	300
Total absorbed power	(2)	kW	68	77	86	35	43	49	55	62
EER 100%			4,81	4,84	4,86	4,74	4,72	4,77	4,77	4,78
MECHANICAL cooling (EG30%35; W10) (EN 14511:2011-3)										
Refrigeration capacity	(1)	kW	328	370	413	168	204	232	262	297
Total absorbed power	(2)	kW	75	85	94	40	47	53	62	67
EER 100%			4,37	4,35	4,36	4,22	4,33	4,34	4,23	4,39
FREE COOLING										
TFT basic version		°C	-2	-2	-2	-2	-2	-2	-2	-2
TFT /HE version		°C	1	1	1	1	1	1	1	1
Compressors										
Quantity/Refrigerant circuits		n°/n°	3/1	3/1	3/1	4/2	4/2	4/2	4/2	4/2
Capacity reduction steps		%	33%	33%	33%	25%	25%	25%	25%	25%
Total refrigerant charge		kg	26	31	34	13	15	17	20	22
User-side heat exchanger										
Water flow rate		l/h	56.933	64.329	71.897	29.240	35.432	40.420	45.581	51.601
Total head loss		kPa	125	145	142	82	97	113	117	112
Exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Head loss		kPa	57	58	58	30	32	33	32	35
Basic version of free-cooling exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Head loss		kPa	47	50	47	34	47	59	46	41
HE version of free-cooling exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Head loss		kPa	52	63	44	38	51	46	57	44
Source-side heat exchanger										
Flow rate of water and 35% glycol		l/h	77.751	87.767	98.016	40.043	48.541	55.289	62.349	70.556
Total head loss		kPa	150	133	158	117	103	124	119	123
Quantity		n°	1	1	1	1	1	1	1	1
User-side hydraulic module										
Standard pump type			P32	P33	P33	P27	P27	P28	P32	P32
Available discharge head 1P		kPa	141	191	171	171	132	159	170	164
Available discharge head 2P		kPa	97	141	136	145	112	136	134	123
Oversize pump type			P33	P34	P34	P28	P28	P29	P33	P33
Available discharge head 1PM		kPa	225	250	220	241	203	217	252	247
Available discharge head 2PM		kPa	181	200	186	215	183	194	215	206
Source-side hydraulic module										
Standard pump type			P33	P37	P37	P15	P32	P32	P18	P33
Available discharge head of 1SV		kPa	137	151	113	149	177	140	127	184
Available discharge head of 2SV		kPa	111	121	77	110	150	108	88	161
Oversize pump type			P20	P21	P21	P16	P33	P33	P34	P34
Available discharge head of 1SVM		kPa	179	187	149	205	259	224	224	232
Available discharge head of 2SVM		kPa	154	158	113	166	232	192	209	209
Pump type for glycol			P21	P21		P29	P18	P19	P19	P19
Available discharge head of 1SVG		kPa	132	138		190	166	209	193	181
Available discharge head of 2SVG		kPa	112	118		170	146	189	173	161
Noise levels										
Sound power level	(5)	dB(A)	88	88	90	82	83	86	87	88
Sound pressure level	(4)	dB(A)	71	71	73	65	66	69	69	71
Sound power level (LN version)	(5)	dB(A)	81	81	83	75	76	79	80	81
Sound pressure level (LN version)	(4)	dB(A)	64	64	66	58	59	62	62	64
Dimensions and weights of basic unit										
Length		mm	4505	4505	4505	3685	3685	4502	4502	4502
Depth		mm	880	880	880	880	880	880	880	880
Height		mm	1880	1880	1880	1880	1880	1880	1880	1880
Operating weight of basic version		kg								

(1) Source inlet-outlet temperature 35/40°C; source inlet-outlet temperature 15/10°C.

(2) The total power is given by the sum of the power absorbed by the compressors and by the fans.

(4) Sound pressure levels measured at a distance of 1 metre from the unit in free field, with directivity factor Q=4.

(5) Sound power levels calculated according to ISO 3744.

(9) Values compliant with standard EN 14511-3:2011.

TECHNICAL SPECIFICATIONS - TETRIS W FC NG

Unit size			34.4	38.4	40.4	48.4	54.4	56.6	60.6
MECHANICAL cooling (EG30%35; W10) (GROSS)									
Refrigeration capacity	(1)	kW	334	380	427	471	531	567	639
Total absorbed power	(2)	kW	70	81	90	102	113	120	135
EER 100%			4,75	4,72	4,73	4,62	4,70	4,73	4,73
MECHANICAL cooling (EG30%35; W10) (EN 14511:2011-3)									
Refrigeration capacity	(1)	kW	331	377	423	468	527	563	634
Total absorbed power	(2)	kW	78	88	100	109	123	131	148
EER 100%			4,23	4,29	4,23	4,28	4,29	4,28	4,28
FREE COOLING									
TFT basic version		°C	-2	-2	-2	-2	-2	-2	-2
TFT /HE version		°C	1	1	1	1	1	1	1
Compressors									
Quantity/Refrigerant circuits		n°/n°	4/2	4/2	4/2	4/2	4/2	6/2	6/2
Capacity reduction steps		%	25%	25%	25%	25%	25%	17%	17%
Total refrigerant charge		kg	26	45	49	37	42	44	48
User-side heat exchanger									
Water flow rate		l/h	57.449	65.361	73.445	81.013	91.333	97.525	109.909
Total head loss		kPa	123	96	131	102	118	100	118
Exchanger									
Quantity		n°	1	1	1	1	1	1	1
Head loss		kPa	34	48	50	30	32	33	37
Basic version of free-cooling exchanger									
Quantity		n°	1	1	1	1	1	1	1
Head loss		kPa	49	43	53	41	51	43	53
HE version of free-cooling exchanger									
Quantity		n°	1	1	1	1	1	1	1
Head loss		kPa	55	40	35	43	34	34	34
Source-side heat exchanger									
Flow rate of water and 35% glycol		l/h	78.626	89.556	100.583	111.435	125.242	133.605	150.524
Total head loss		kPa	144	151	172	108	128	140	154
Quantity		n°	1	1	1	1	1	1	1
User-side hydraulic module									
Standard pump type			P32	P32	P33	P37	P37	P37	P38
Available discharge head 1P		kPa	139	142	166	185	158	168	166
Available discharge head 2P		kPa	94	119	130	145	112	119	137
Oversize pump type			P33	P33	P34	P38	P38	P39	P39
Available discharge head 1PM		kPa	223	229	211	221	194	275	239
Available discharge head 2PM		kPa	178	206	175	181	148	226	210
Source-side hydraulic module									
Standard pump type			P19	P37	P21	P21	P42	P43	P43
Available discharge head of 1SV		kPa	134	127	126	172	114	153	121
Available discharge head of 2SV		kPa	107	94	87	154	93	132	96
Oversize pump type			P20	P21	P22	P22	P43	P44	P44
Available discharge head of 1SVM		kPa	174	163	197	245	173	205	173
Available discharge head of 2SVM		kPa	147	130	158	227	153	184	148
Pump type for glycol			P21	P22	P22	P22	P43	P44	P44
Available discharge head of 1SVG		kPa	135	148	178	245	170	201	167
Available discharge head of 2SVG		kPa	115	128	158	225	150	181	147
Noise levels									
Sound power level	(5)	dB(A)	88	89	90	90	91	91	91
Sound pressure level	(4)	dB(A)	71	72	72	73	73	73	73
Sound power level (LN version)	(5)	dB(A)	81	82	83	83	84	84	84
Sound pressure level (LN version)	(4)	dB(A)	64	65	65	66	66	66	66
Dimensions and weights of basic unit									
Length		mm	4502	2820+2930	2820+2930	2820+2930	2820+2930	2820+2930	2820+2930
Depth		mm	880	880	880	880	880	880	880
Height		mm	1880	1880	1880	1880	1880	1880	1880
Operating weight of basic version		kg							

(1) Source inlet-outlet temperature 35/40°C; source inlet-outlet temperature 15/10°C.

(2) The total power is given by the sum of the power absorbed by the compressors and by the fans.

(4) Sound pressure levels measured at a distance of 1 metre from the unit in free field, with directivity factor Q=4.

(5) Sound power levels calculated according to ISO 3744.

(9) Values compliant with standard EN 14511-3:2011.

GENERAL ELECTRICAL SPECIFICATIONS - BASIC VERSION

Unit size			3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2
Max. absorbed power	(1)	kW	16,0 (16,9)	18,4 (19,3)	19,0 (20,5)	22,3 (23,8)	25,6 (27,1)	30,0 (31,5)	32,3 (34,2)	37,4 (39,3)
Max. absorbed current	(1)	A	27,3 (29,6)	32,5 (34,8)	33,1 (36,2)	38,7 (41,8)	44,9 (48,0)	52,1 (55,2)	56,7 (60,6)	66,7 (70,6)
Max. inrush current	(1)	A	90 (93)	119 (122)	119 (123)	132 (135)	142 (145)	147 (150)	171 (175)	210 (214)
Standard user pumps										
Nominal power of standard pump		kW	0,9	0,9	1,5	1,5	1,5	1,5	1,9	1,9
Nominal current of standard pump		A	2,4	2,4	3,1	3,1	3,1	3,1	3,9	3,9
Oversize user pumps										
Nominal power of oversize pump		kW	0,9	1,9	1,9	1,9	1,9	1,9	3,0	3,0
Nominal current of oversize pump		A	2,4	3,9	3,9	3,9	3,9	3,9	6,1	6,1
Standard source pumps										
Nominal power of standard pump		kW	1,5	1,9	1,9	1,9	1,9	3,0	3,0	3,0
Nominal current of standard pump		A	3,1	3,9	3,9	3,9	3,9	6,1	6,1	6,1
Oversize source pumps										
Nominal power of oversize pump		kW	1,9	1,9	1,9	3,0	3,0	4,0	4,0	5,5
Nominal current of oversize pump		A	3,9	3,9	3,9	6,1	6,1	7,8	7,8	10,4
Source pumps for 50% glycol										
Nominal power of glycol pump		kW	1,9	1,9	1,9	3,0	3,0	3,0	3,0	4,0
Nominal current of glycol pump		A	3,9	3,9	3,9	6,1	6,1	6,1	6,1	7,8
Power supplies										
Power supply		V/ph/Hz					400/3~/50 ± 5%			
Power supply for auxiliary circuits		V/ph/Hz					230/1~/50 ± 5%			

Unit size			12.2	13.2	15.2	17.2	19.2	20.2	24.2	27.2
Max. absorbed power	(1)	kW	42,8 (45,8)	49,2 (52,2)	54,2 (57,2)	60,7 (63,7)	69,2 (73,2)	77,7 (81,7)	92,1 (97,6)	100,3 (105,8)
Max. absorbed current	(1)	A	72,9 (79,1)	80,8 (86,9)	88,9 (95,0)	99,6 (105,7)	114,3 (122,1)	129,0 (136,8)	153,0 (163,4)	167,7 (178,1)
Max. inrush current	(1)	A	261 (268)	269 (275)	316 (322)	327 (333)	327 (335)	380 (387)	349 (359)	389 (399)
Standard user pumps										
Nominal power of standard pump		kW	3,0	3,0	3,0	3,0	4,0	4,0	5,5	5,5
Nominal current of standard pump		A	6,1	6,1	6,1	6,1	7,8	7,8	10,4	10,4
Oversize user pumps										
Nominal power of oversize pump		kW	3,0	3,0	4,0	4,0	5,5	5,5	7,5	7,5
Nominal current of oversize pump		A	6,1	6,1	7,8	7,8	10,4	10,4	14,3	14,3
Standard source pumps										
Nominal power of standard pump		kW	3,0	4,0	4,0	5,5	5,5	5,5	5,5	7,5
Nominal current of standard pump		A	6,1	7,8	7,8	10,4	10,4	10,4	10,4	14,3
Oversize source pumps										
Nominal power of oversize pump		kW	5,5	5,5	5,5	7,5	9,2	7,5	7,5	9,2
Nominal current of oversize pump		A	10,4	10,4	10,4	14,3	16,7	14,3	14,3	16,7
Source pumps for 50% glycol										
Nominal power of glycol pump		kW	5,5	5,5	5,5	5,5	7,5	9,2	9,2	9,2
Nominal current of glycol pump		A	10,4	10,4	10,4	10,4	14,3	16,7	16,7	16,7
Power supplies										
Power supply		V/ph/Hz					400/3~/50 ± 5%			
Power supply for auxiliary circuits		V/ph/Hz					230/1~/50 ± 5%			

(1) The value in brackets relates to the machine with user pumps installed on it (source side is always present)

GENERAL ELECTRICAL SPECIFICATIONS - BASIC VERSION

Unit size			30.3	34.3	40.3	18.4	20.4	24.4	26.4	30.4
Max. absorbed power	(1)	kW	115,8 (121,3)	139,1 (146,6)	148,4 (155,9)	64,1 (67,1)	74,3 (77,3)	85,1 (89,1)	97,9 (103,4)	107,9 (113,4)
Max. absorbed current	(1)	A	192,2 (202,6)	230,6 (244,9)	246,8 (261,1)	111,6 (117,7)	131,6 (137,7)	144,0 (151,8)	160,3 (170,7)	176,5 (186,9)
Max. inrush current	(1)	A	443 (453)	426 (441)	468 (482)	226 (232)	275 (281)	333 (340)	349 (359)	404 (414)
Standard user pumps										
Nominal power of standard pump		kW	5,5	7,5	7,5	3,0	3,0	4,0	5,5	5,5
Nominal current of standard pump		A	10,4	14,3	14,3	6,1	6,1	7,8	10,4	10,4
Oversize user pumps										
Nominal power of oversize pump		kW	7,5	11,0	11,0	4,0	4,0	5,5	7,5	7,5
Nominal current of oversize pump		A	14,3	20,3	20,3	7,8	7,8	10,4	14,3	14,3
Standard source pumps										
Nominal power of standard pump		kW	7,5	9,2	9,2	5,5	5,5	5,5	7,5	7,5
Nominal current of standard pump		A	14,3	16,7	16,7	10,4	10,4	10,4	14,3	14,3
Oversize source pumps										
Nominal power of oversize pump		kW	11,0	11,0	11,0	7,5	7,5	7,5	7,5	9,2
Nominal current of oversize pump		A	20,3	20,3	20,3	14,3	14,3	14,3	14,3	16,7
Source pumps for 50% glycol										
Nominal power of glycol pump		kW	11,0	11,0	15,0	5,5	7,5	9,2	9,2	9,2
Nominal current of glycol pump		A	20,3	20,3	26,2	10,4	14,3	16,7	16,7	16,7
Power supplies										
Power supply		V/ph/Hz				400/3~/50 ± 5%				
Power supply for auxiliary circuits		V/ph/Hz				230/1~/50 ± 5%				

Unit size			34.4	38.4	40.4	48.4	54.4	56.6	60.6
Max. absorbed power	(1)	kW	119,6 (125,1)	136,6 (142,1)	155,4 (162,9)	184,2 (193,4)	196,6 (205,8)	206,1 (215,3)	231,6 (242,6)
Max. absorbed current	(1)	A	195,1 (205,5)	224,5 (234,9)	257,5 (271,8)	305,5 (322,2)	327,1 (343,8)	337,9 (354,6)	382,0 (402,3)
Max. inrush current	(1)	A	423 (433)	437 (448)	508 (523)	501 (518)	548 (565)	551 (567)	633 (653)
Standard user pumps									
Nominal power of standard pump		kW	5,5	5,5	7,5	9,2	9,2	9,2	11,0
Nominal current of standard pump		A	10,4	10,4	14,3	16,7	16,7	16,7	20,3
Oversize user pumps									
Nominal power of oversize pump		kW	7,5	7,5	11,0	11,0	11,0	15,0	15,0
Nominal current of oversize pump		A	14,3	14,3	20,3	20,3	20,3	26,2	26,2
Standard source pumps									
Nominal power of standard pump		kW	9,2	9,2	11,0	11,0	11,0	15,0	15,0
Nominal current of standard pump		A	16,7	16,7	20,3	20,3	20,3	26,2	26,2
Oversize source pumps									
Nominal power of oversize pump		kW	11,0	11,0	15,0	15,0	15,0	18,5	18,5
Nominal current of oversize pump		A	20,3	20,3	26,2	26,2	26,2	32,9	32,9
Source pumps for 50% glycol									
Nominal power of glycol pump		kW	11,0	15,0	15,0	15,0	15,0	18,5	18,5
Nominal current of glycol pump		A	20,3	26,2	26,2	26,2	26,2	32,9	32,9
Power supplies									
Power supply		V/ph/Hz				400/3~/50 ± 5%			
Power supply for auxiliary circuits		V/ph/Hz				230/1~/50 ± 5%			

(1) The value in brackets relates to the machine with user pumps installed on it (source side is always present)

CONFIGURATIONS THAT ARE NOT POSSIBLE WITH HYDRONIC MODULE

SOURCE SIDE	1SV				2SV				1SVM				2SVM				1SGV				2SGV			
USER SIDE	1P	2P	1FM	2FM	1P	2P	1FM	2FM	1P	2P	1FM	2FM	1P	2P	1FM	2FM	1P	2P	1FM	2FM	1P	2P	1FM	2FM
3.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8.2	X	X	X	X	X	X	X	X	X	np	np	np	np	X	np	np	np	np	X	X	X	X	X	X
9.2	X	X	X	X	X	X	X	X	X	np	np	np	np	X	np	np	np	np	X	X	X	X	X	X
10.2	X	X	X	X	X	X	X	X	X	np	np	np	np	X	np	np	np	np	X	np	np	np	np	np
12.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30.3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40.3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
54.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
56.6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
60.6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X | POSSIBLE

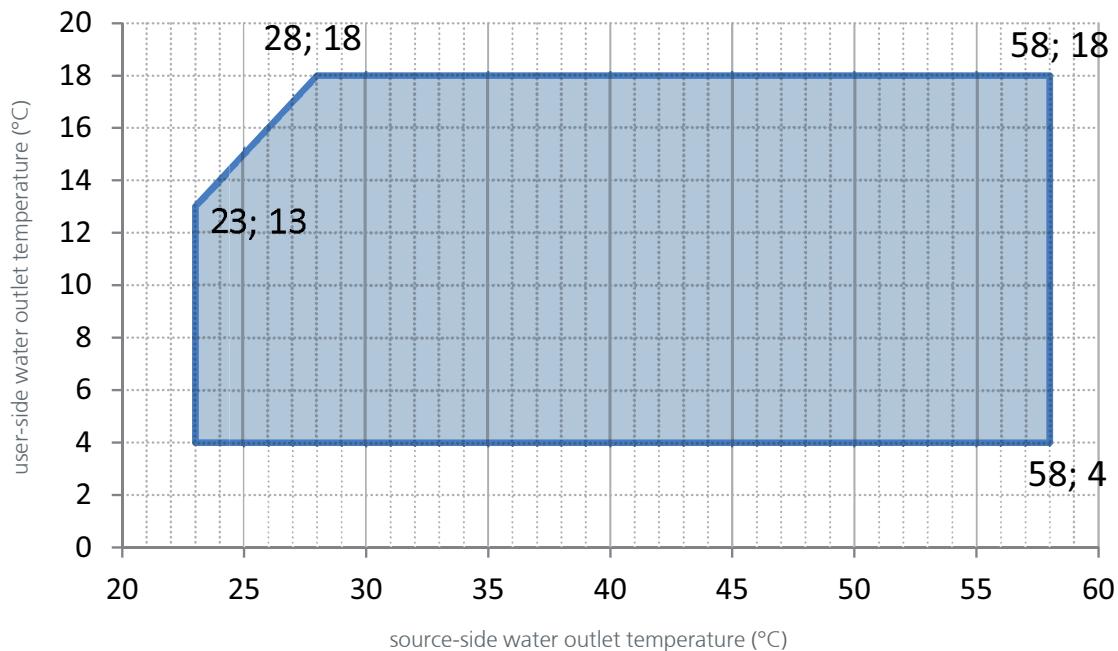
np | NOT POSSIBLE

OPERATING LIMITS

ΔT allowed between 4°C and 7°C.

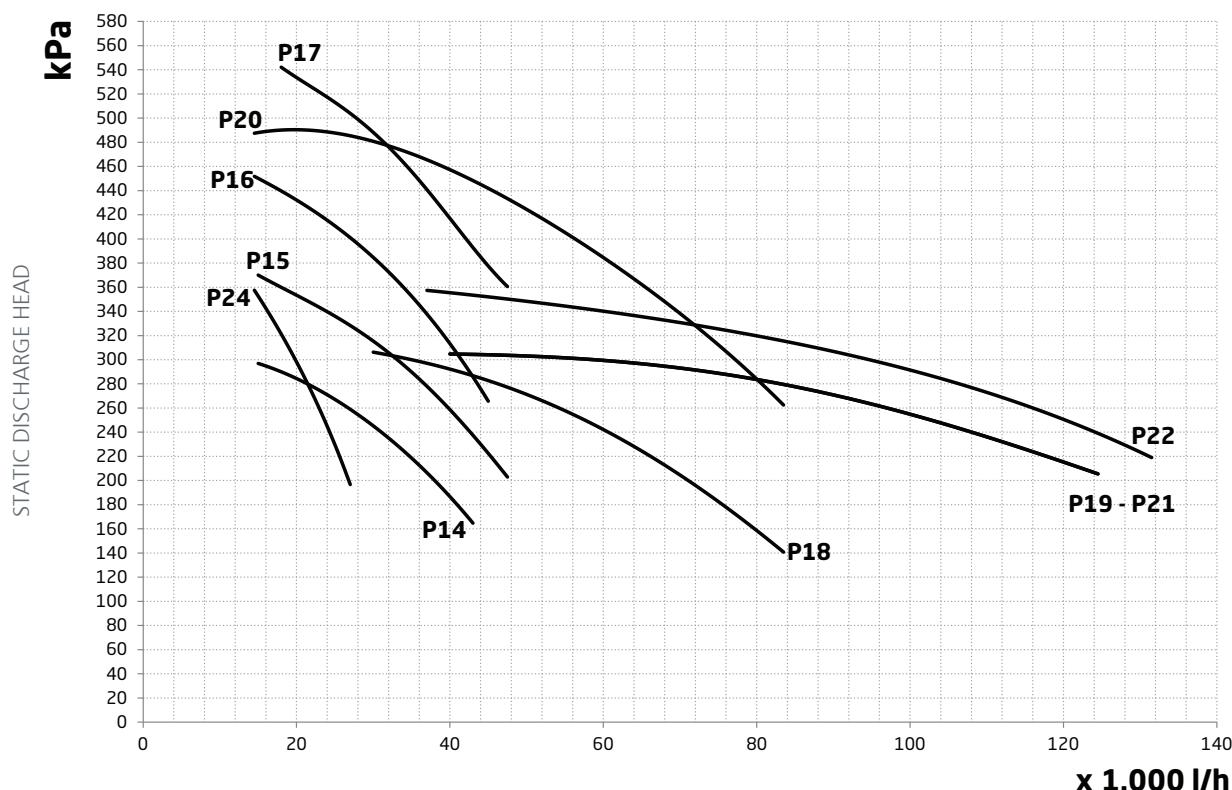
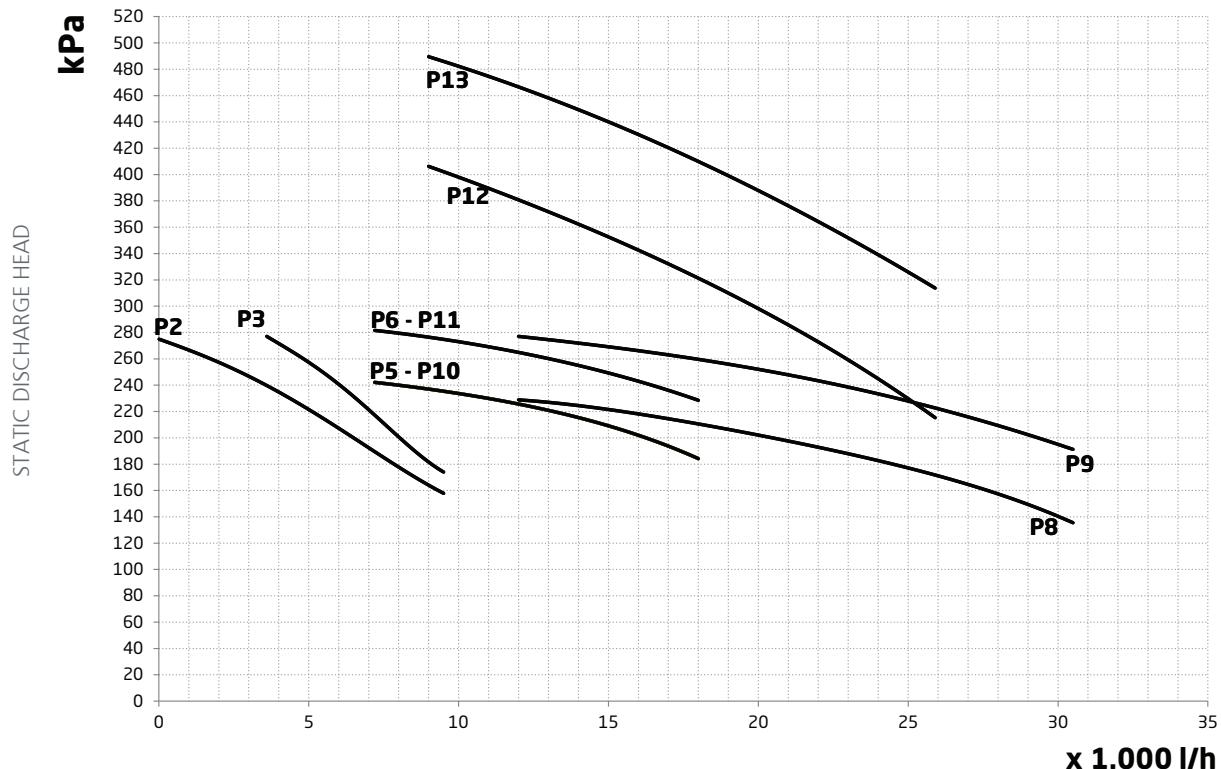
The diagram refers to the operating limits of the chiller section.

The allowable maximum and minimum temperature limits as regards the external air obviously depend on the liquid chiller combined with the internal unit.



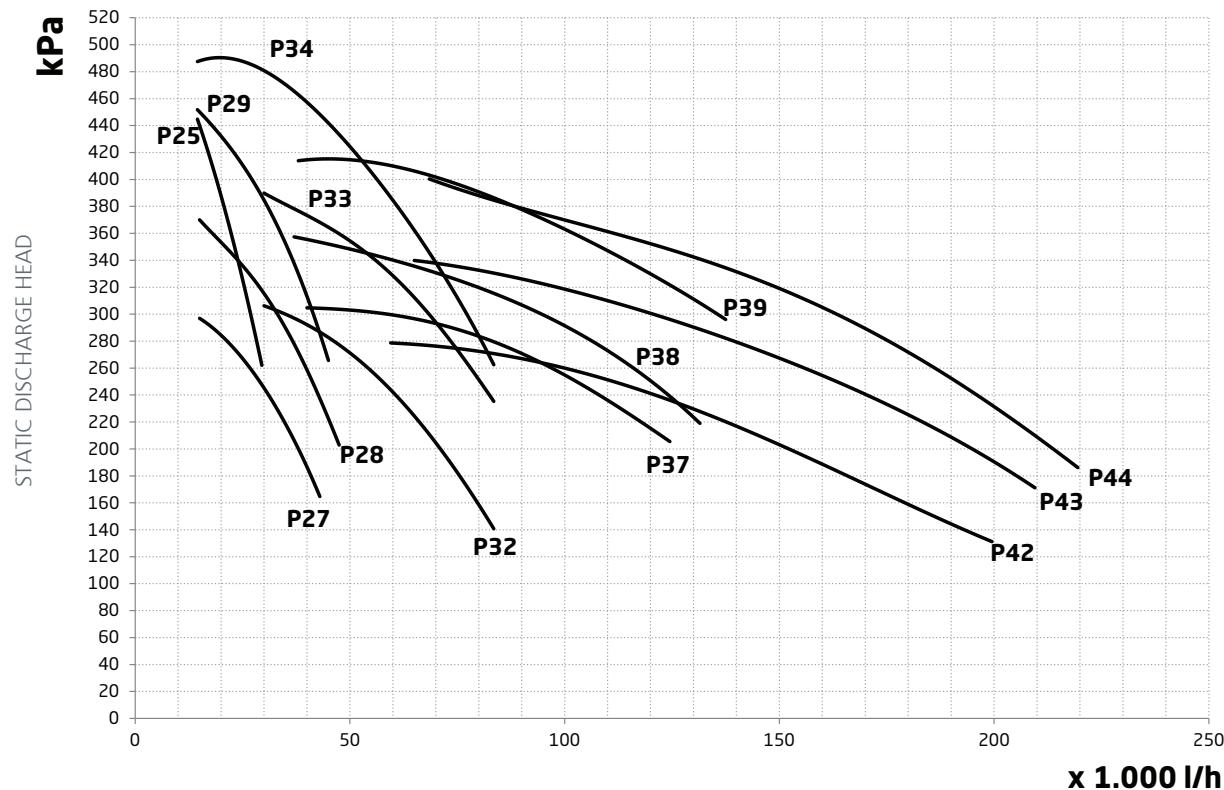
DIAGRAMS OF PUMPS

The following diagrams show the flow rate - static discharge head curves of the individual load pumps. The inherent losses of the machine must be subtracted from these discharge heads to obtain the available discharge head.

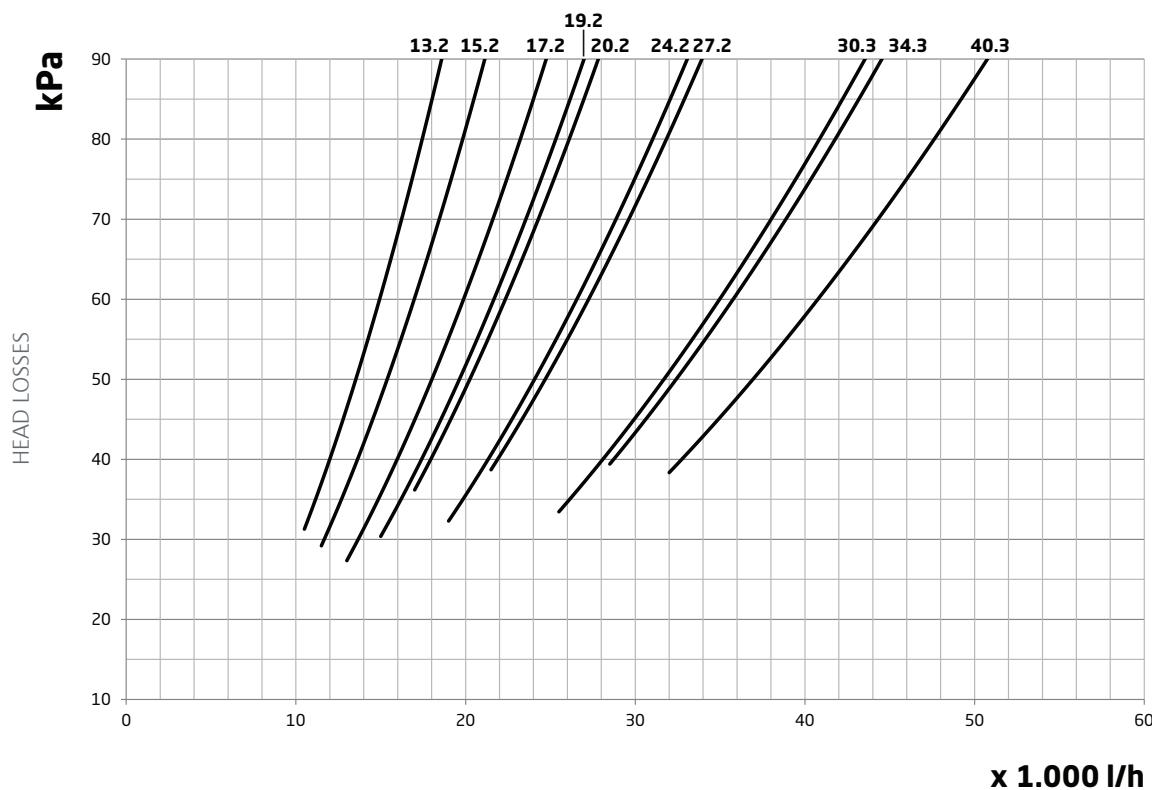
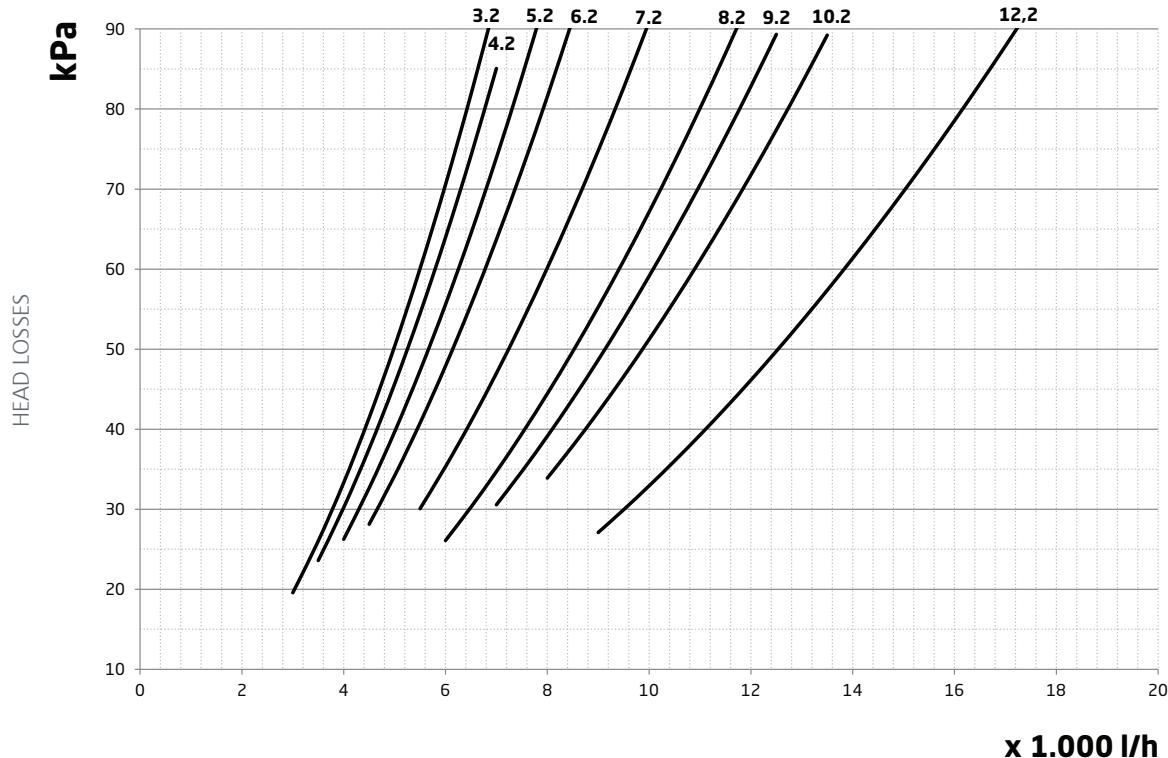


DIAGRAMS OF PUMPS

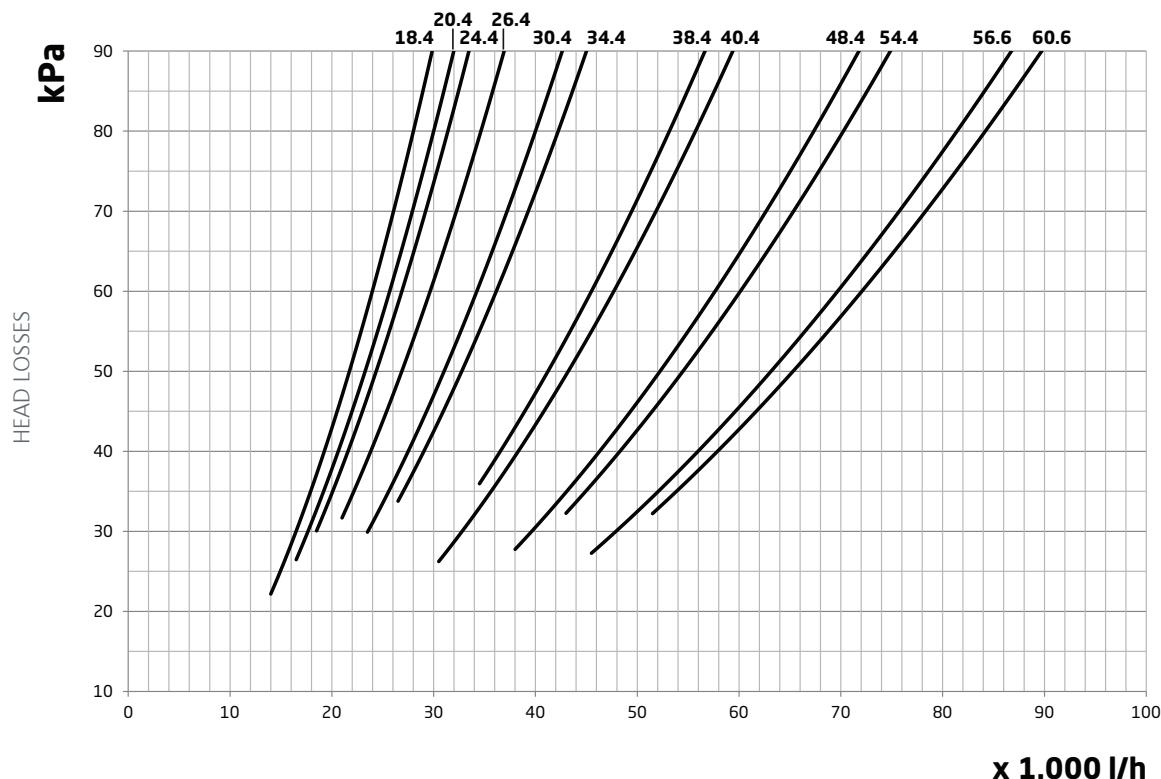
The following diagrams show the flow rate - static discharge head curves of the individual load pumps. The inherent losses of the machine must be subtracted from these discharge heads to obtain the available discharge head.



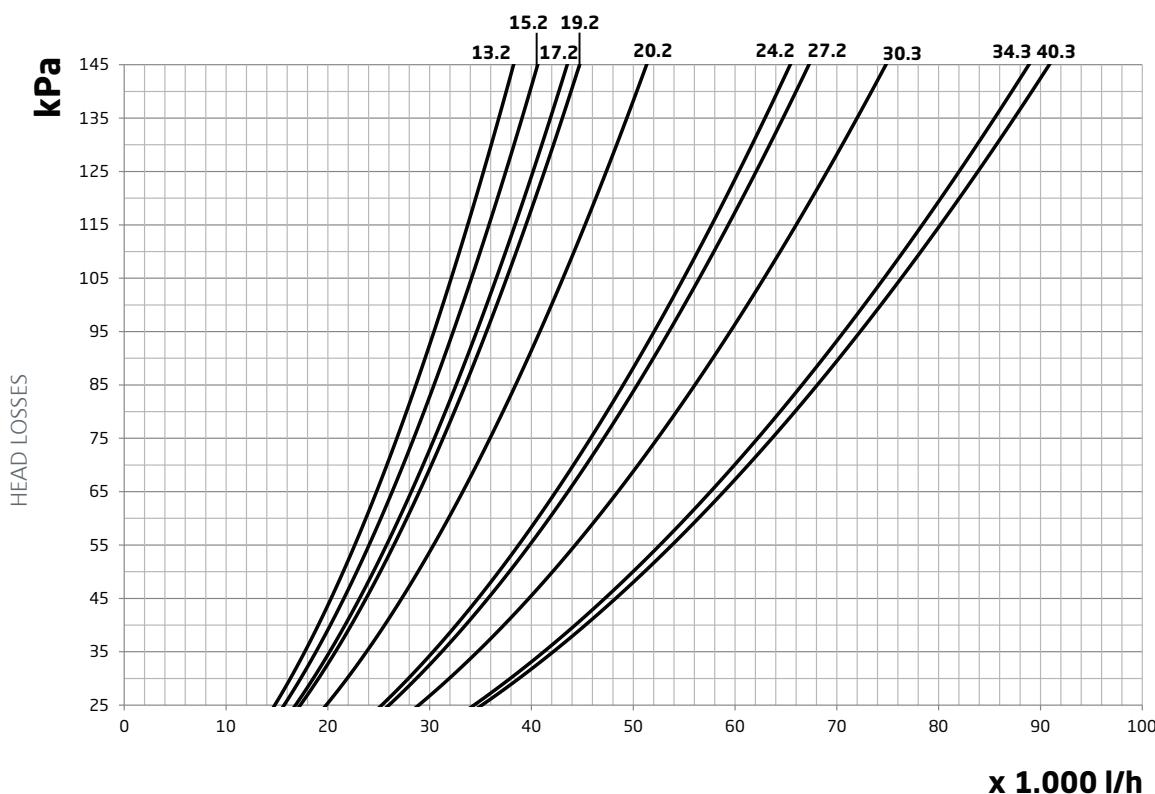
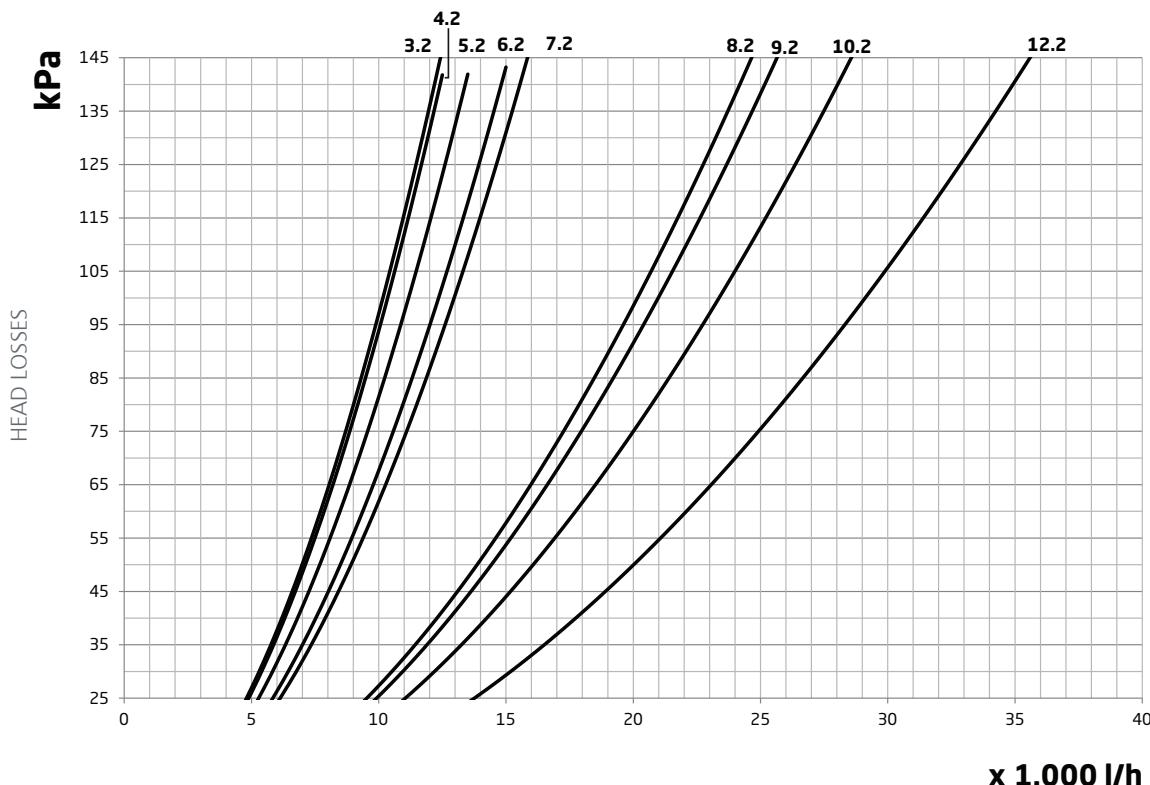
HEAD LOSSES IN USER-SIDE HYDRAULIC CIRCUIT - 1 PUMP



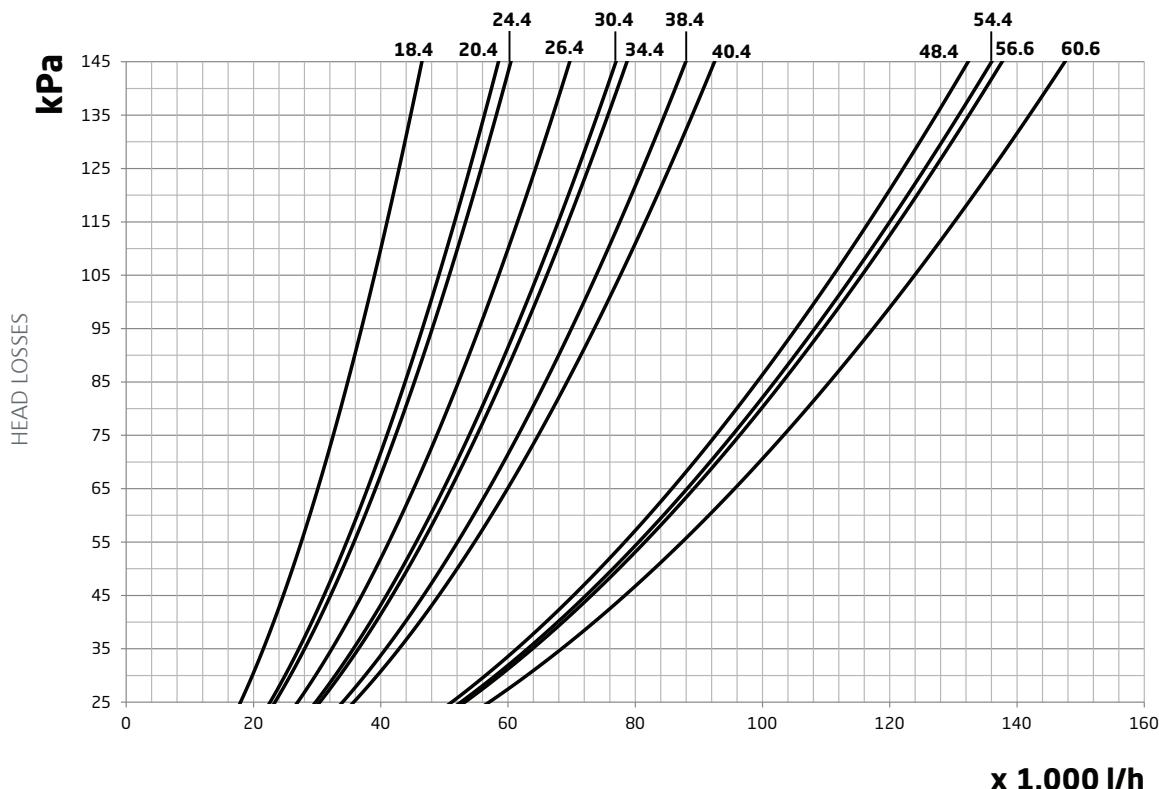
HEAD LOSSES IN USER-SIDE HYDRAULIC CIRCUIT - 1 PUMP



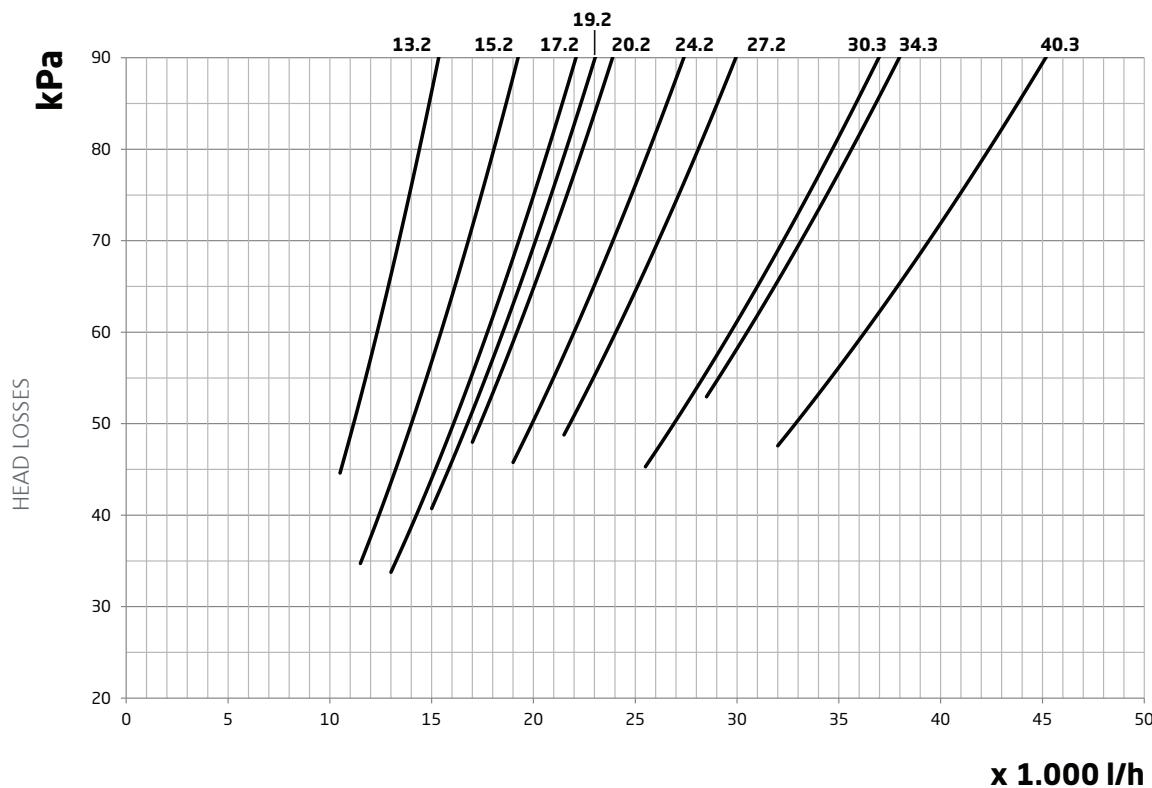
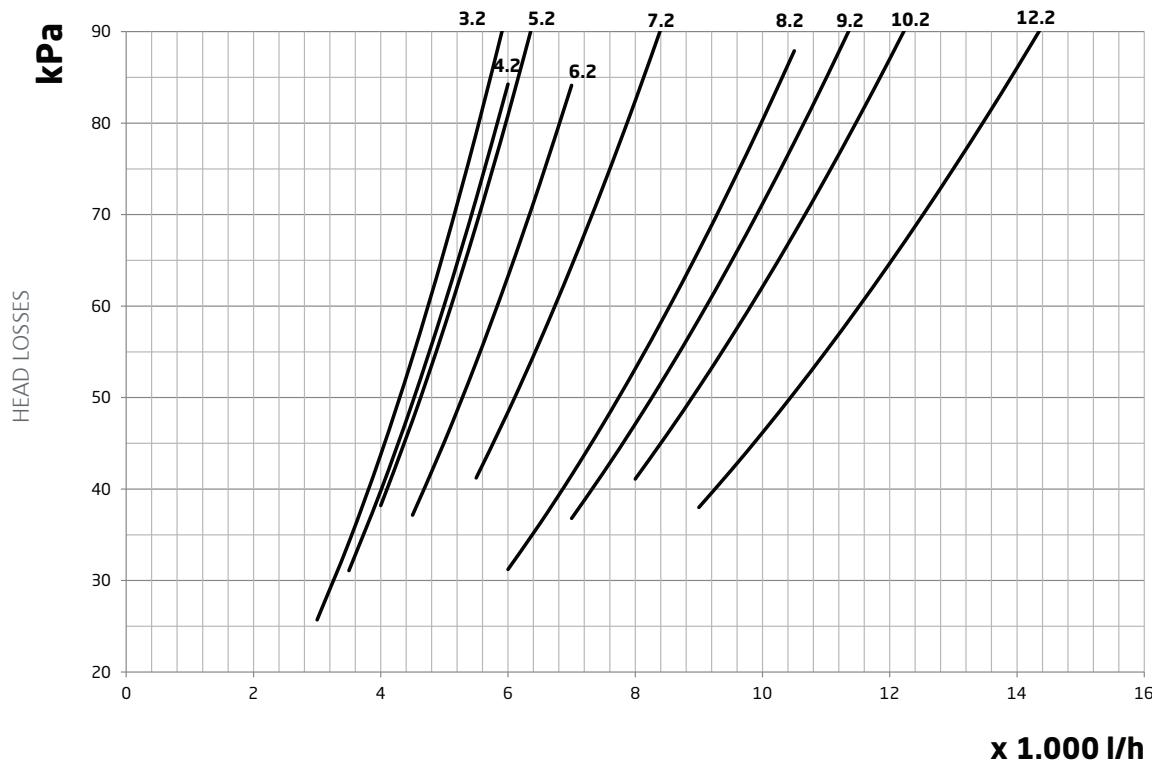
HEAD LOSSES IN SOURCE-SIDE HYDRAULIC CIRCUIT - 1 PUMP



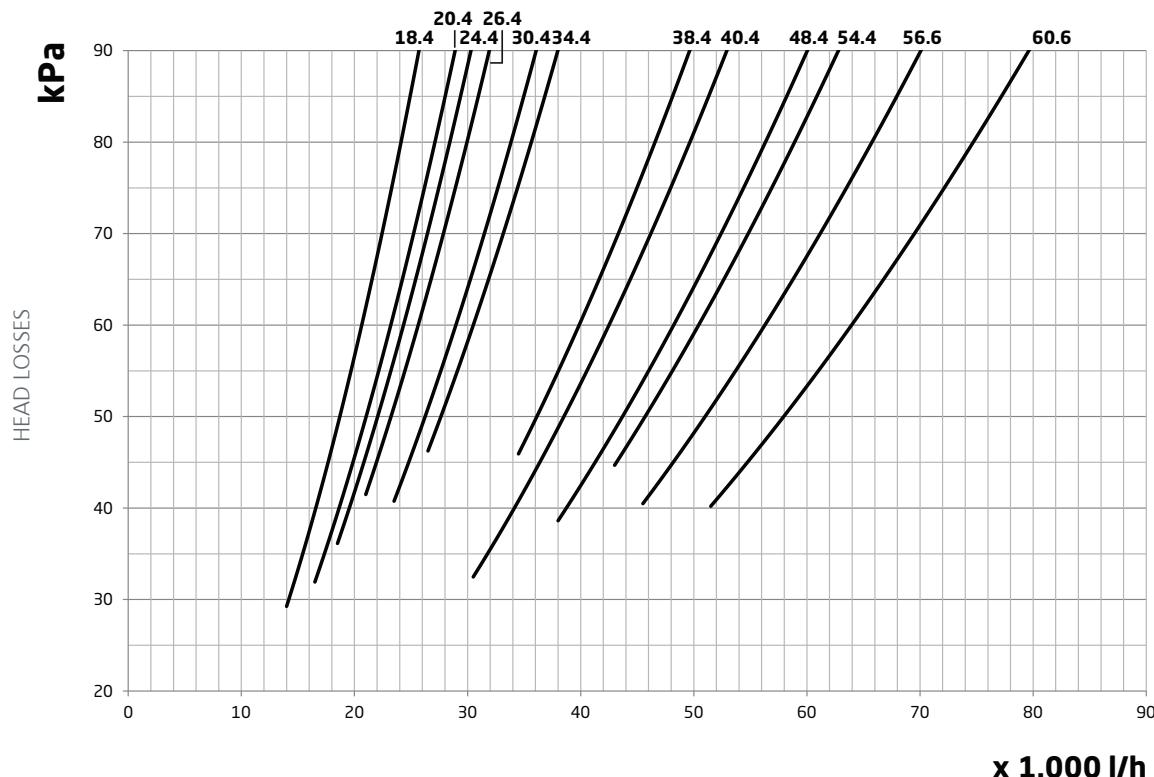
HEAD LOSSES IN SOURCE-SIDE HYDRAULIC CIRCUIT - 1 PUMP



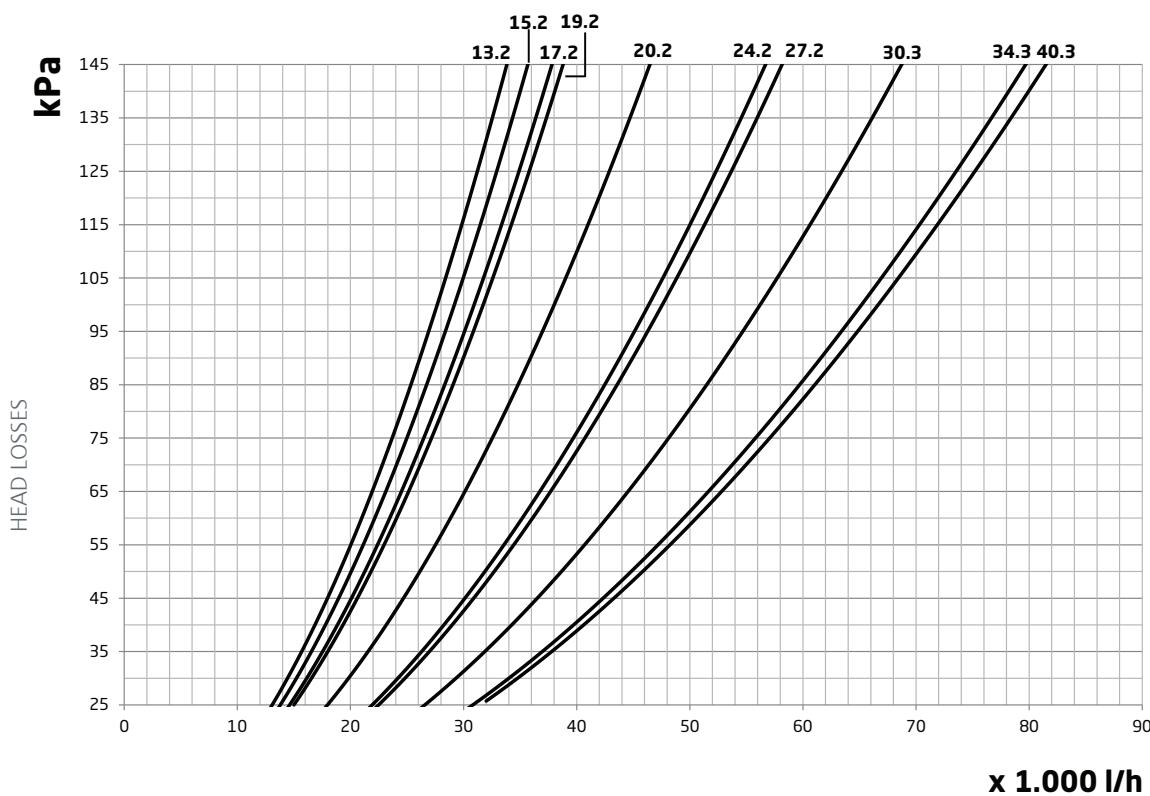
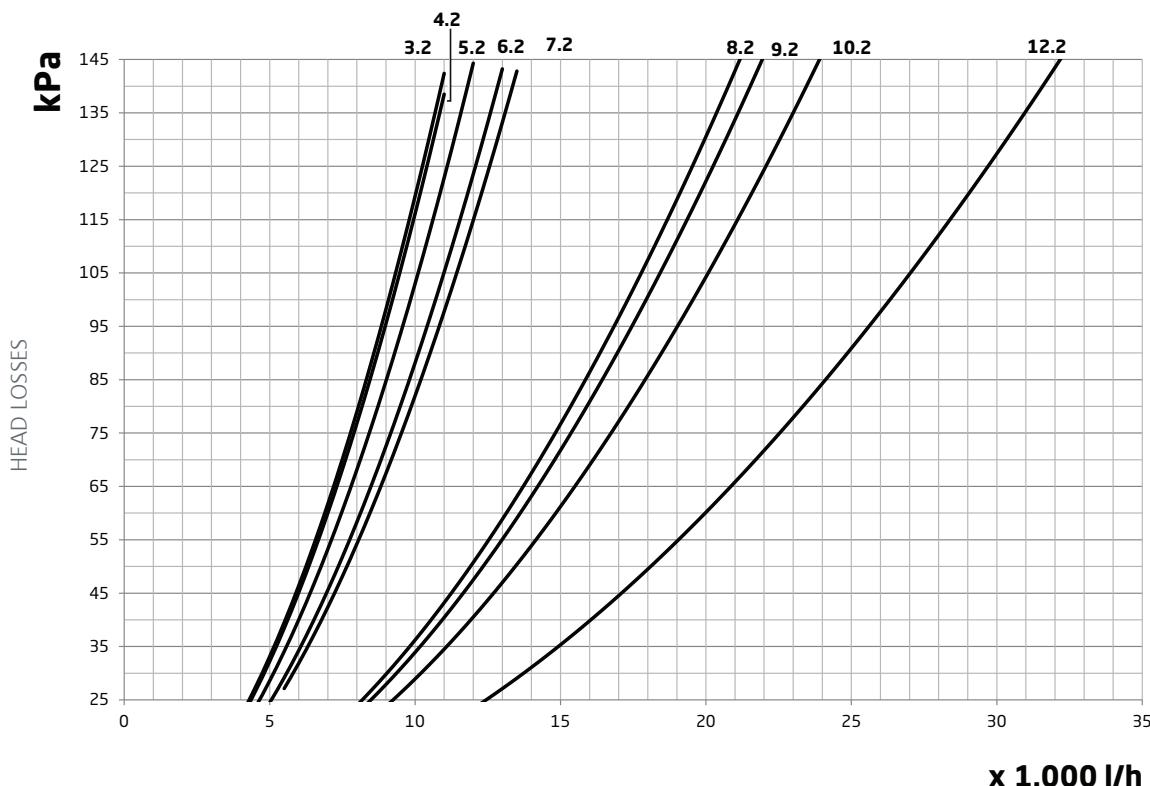
HEAD LOSSES IN USER-SIDE HYDRAULIC CIRCUIT - 2 PUMPS



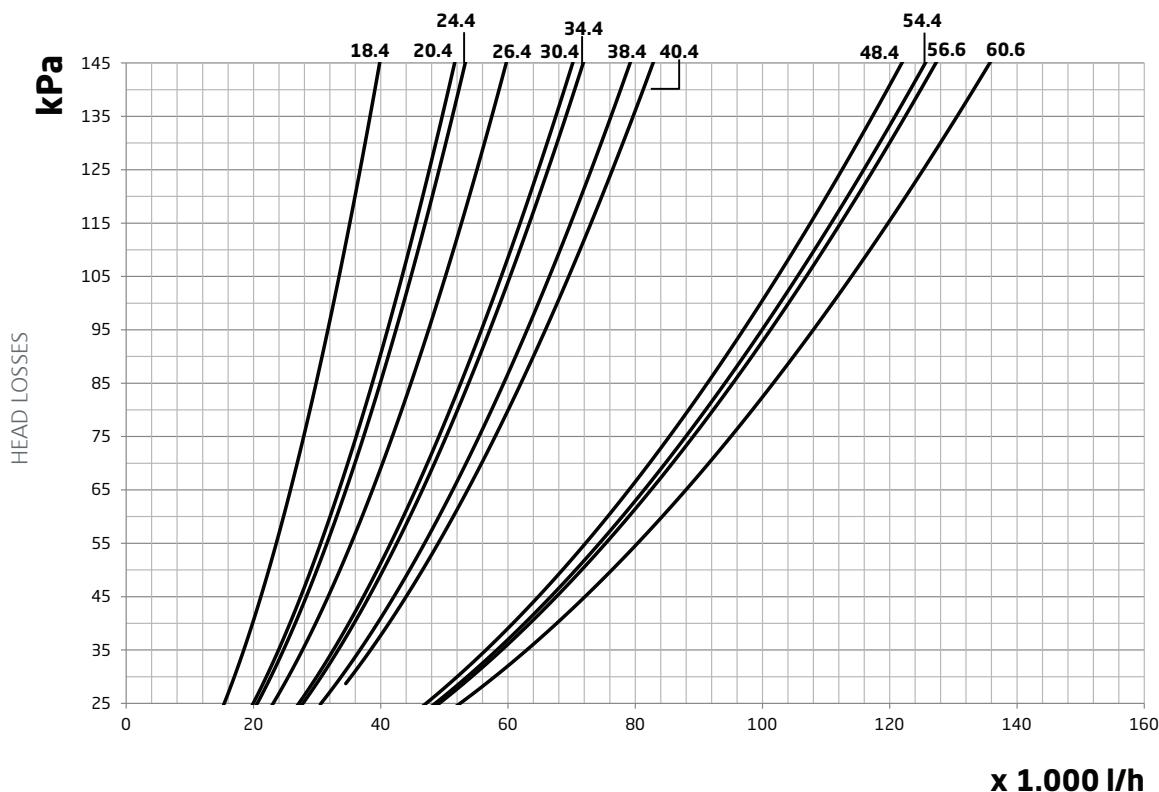
HEAD LOSSES IN USER-SIDE HYDRAULIC CIRCUIT - 2 PUMPS



HEAD LOSSES IN SOURCE-SIDE HYDRAULIC CIRCUIT - 2 PUMPS



HEAD LOSSES IN SOURCE-SIDE HYDRAULIC CIRCUIT - 2 PUMPS



NOISE LEVELS - BASIC VERSION

MODEL	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lpt	Lw	Lp	Lw	Lp
3.2	30	14	22	10	39	24	57	42	64	49	65	50	68	53	65	49	73	57
4.2	30	14	22	10	44	29	64	49	72	56	67	51	68	52	60	44	75	59
5.2	34	18	24	10	49	33	68	52	69	54	70	55	67	52	56	41	75	60
6.2	35	19	26	11	50	34	70	54	70	55	73	58	69	54	58	43	77	62
7.2	35	20	21	10	49	33	70	54	72	56	72	57	69	54	59	43	77	62
8.2	37	21	28	12	47	31	65	49	73	57	74	59	70	54	62	47	78	63
9.2	41	25	31	16	50	34	68	53	72	56	75	60	71	56	60	44	79	63
10.2	39	24	32	17	46	30	69	54	72	57	76	61	74	58	64	48	80	65
12.2	40	24	33	17	47	31	72	55	75	59	79	63	76	60	66	49	83	66
13.2	37	21	35	18	61	44	70	53	70	54	82	66	72	56	55	38	84	67
15.2	38	21	35	19	61	45	71	54	71	55	83	67	73	56	56	39	85	69
17.2	36	19	30	14	59	43	69	52	77	61	82	66	75	58	64	47	85	69
19.2	36	20	30	14	60	44	70	53	78	62	83	67	76	59	64	48	86	70
20.2	38	22	30	14	65	49	75	59	80	64	84	67	78	61	63	46	87	71
24.2	38	22	30	14	65	49	75	59	80	64	84	67	78	61	63	46	87	71
27.2	38	22	30	14	62	45	68	52	83	66	84	68	75	59	62	45	88	71
30.3	39	22	31	14	66	49	76	59	81	64	85	68	78	61	64	47	88	71
34.3	39	22	31	14	66	49	76	59	81	64	85	68	78	61	64	47	88	71
40.3	39	22	31	14	63	46	70	53	85	68	87	70	78	61	63	46	90	73
18.4	43	26	33	16	52	35	71	54	75	58	78	61	75	58	63	46	82	65
20.4	40	23	33	16	47	30	72	55	75	58	79	62	76	59	66	49	83	66
24.4	42	25	35	17	49	32	75	57	78	61	82	65	79	62	69	51	86	69
26.4	39	21	36	19	63	45	72	55	73	55	85	68	75	57	57	39	87	69
30.4	39	21	37	19	64	46	73	56	74	56	86	69	76	58	58	40	88	71
34.4	37	20	31	14	62	44	71	54	80	62	85	68	77	60	66	48	88	71
38.4	38	20	32	14	62	45	72	55	81	63	86	69	78	61	67	49	89	72
40.4	40	22	31	14	68	50	78	60	83	65	87	69	80	63	65	48	90	72
48.4	40	22	31	14	68	50	78	60	83	65	87	69	80	63	65	48	90	73
54.4	40	22	31	14	64	47	71	53	86	68	88	70	78	61	64	46	91	73
56.6	39	21	32	14	64	46	74	56	83	65	88	70	80	62	68	50	91	73
60.6	40	22	32	14	68	50	79	61	84	66	88	70	81	63	66	48	91	73

Lw: sound power values measured in free field calculated according to standard ISO 3744.

Lp: sound pressure levels measured at 1 metre from the unit in free field under nominal operating conditions, according to ISO 3744.

NOISE LEVELS - LN VERSION

MODEL	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp
3.2	27	11	20	10	36	20	52	36	58	42	59	43	62	46	58	43	66	50
4.2	27	12	19	10	40	25	58	43	65	49	60	45	61	46	54	38	68	52
5.2	30	15	22	10	44	28	61	45	62	47	63	48	60	45	50	35	68	53
6.2	31	16	23	10	44	29	63	47	63	48	66	50	62	47	52	37	70	55
7.2	32	16	18	10	44	28	63	47	64	49	65	49	62	47	53	37	70	55
8.2	33	18	25	10	42	26	58	43	65	50	67	51	62	47	56	41	71	56
9.2	37	21	28	13	45	30	62	46	65	49	68	52	65	49	54	39	72	56
10.2	35	20	29	14	41	26	63	47	65	50	69	53	66	51	57	42	73	58
12.2	37	20	30	14	43	27	65	49	68	52	72	55	69	53	60	43	76	59
13.2	34	17	32	15	55	39	64	47	64	48	75	58	66	49	50	34	77	60
15.2	34	18	32	16	56	40	64	48	65	49	76	60	67	50	51	34	78	62
17.2	33	16	27	11	54	38	63	46	70	54	75	59	68	52	58	42	78	62
19.2	33	17	28	11	55	38	64	47	71	55	76	60	69	53	59	42	79	63
20.2	35	18	28	11	60	43	69	52	73	57	77	60	71	54	57	41	80	64
24.2	35	18	28	11	60	43	69	52	73	57	77	60	71	54	57	41	80	64
27.2	35	19	28	11	57	40	63	46	76	59	78	61	69	53	57	40	81	64
30.3	35	18	28	11	60	43	70	53	74	57	78	61	72	55	58	41	81	64
34.3	35	18	28	11	60	43	70	53	74	57	78	61	72	55	58	41	81	64
40.3	36	19	28	11	58	41	64	47	78	61	80	63	71	54	58	41	83	66
18.4	39	22	30	13	47	30	65	48	68	51	71	54	68	51	57	40	75	58
20.4	37	20	30	13	43	26	65	48	68	51	72	55	69	52	60	43	76	59
24.4	38	21	32	14	45	28	68	51	71	54	75	57	72	55	62	45	79	62
26.4	35	18	33	16	58	40	66	49	67	49	78	61	68	51	52	35	80	62
30.4	36	18	34	16	58	41	67	50	68	50	79	62	69	52	53	35	81	64
34.4	34	17	29	11	56	39	65	48	73	56	78	61	71	53	60	43	81	64
38.4	35	17	29	11	57	40	66	49	74	57	79	62	72	54	61	44	82	65
40.4	36	19	29	11	62	45	71	54	76	59	80	62	74	56	60	42	83	65
48.4	36	19	29	11	62	45	71	54	76	59	80	62	74	56	60	42	83	66
54.4	37	19	29	11	59	41	65	48	79	61	81	63	72	55	59	41	84	66
56.6	35	17	30	12	59	41	68	50	76	58	81	63	74	56	63	45	84	66
60.6	37	19	29	11	63	45	72	54	77	59	81	63	75	57	60	42	84	66

Lw: sound power values measured in free field calculated according to standard ISO 3744.

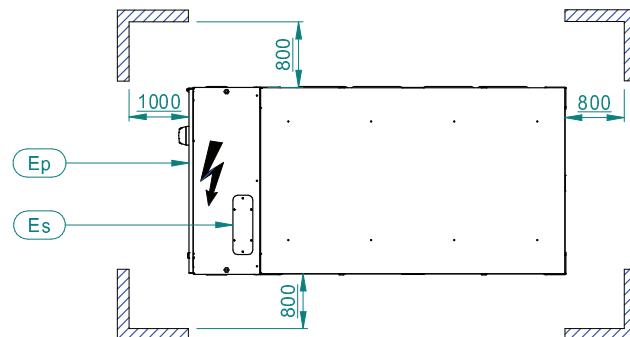
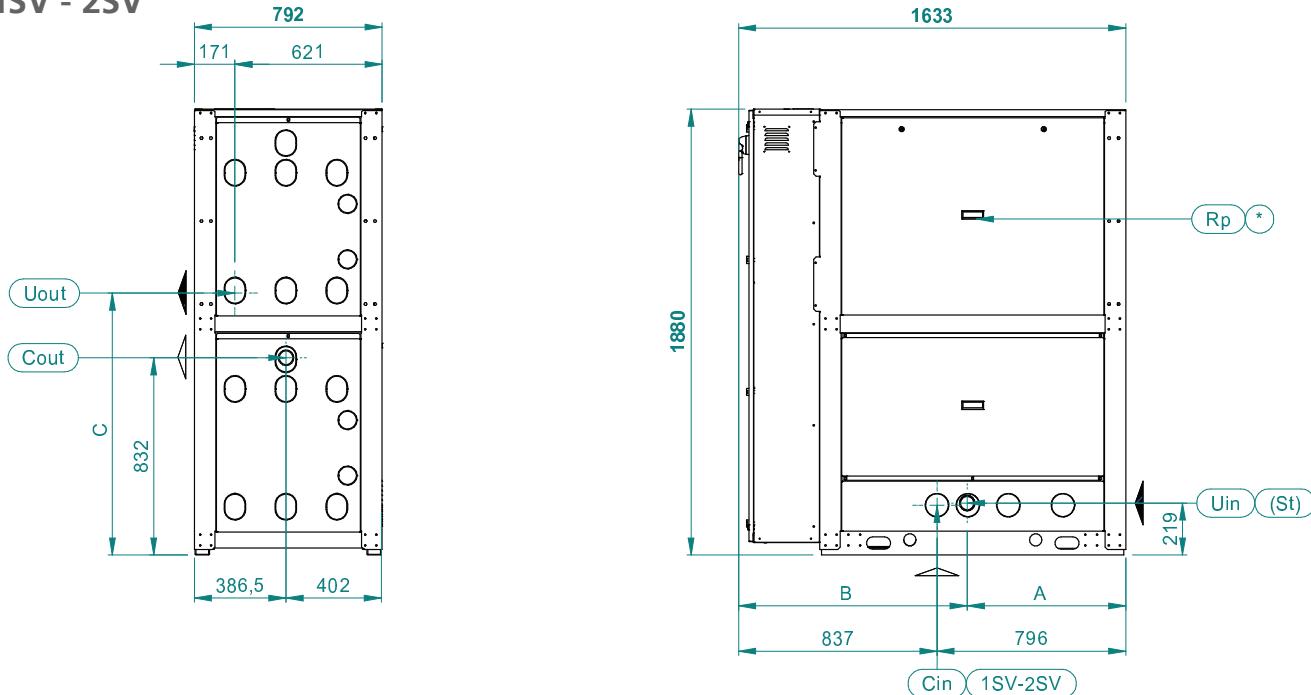
Lp: sound pressure levels measured at 1 metre from the unit in free field under nominal operating conditions, according to ISO 3744.

DIMENSIONAL DIAGRAMS

TETRIS W FC NG 3.2-10.2

A4F301-A

1SV - 2SV



**THE POSITIONS OF THE WATER CONNECTIONS SHOWN IN THE DRAWING
DOES NOT APPLY FOR THE FOLLOWING VERSIONS: 2SM - 2SG

* = OPTIONAL

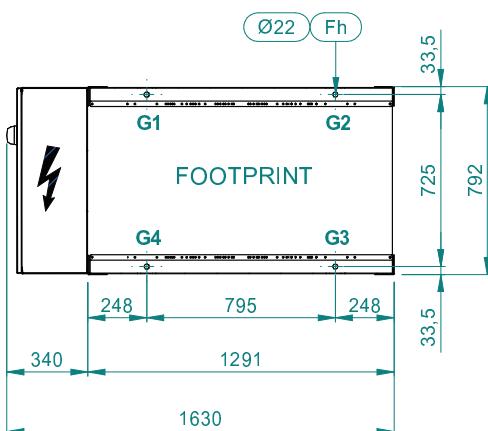
SIZE	3.2	4.2	5.2	6.2	7.2	8.2**	9.2**	10.2**
Uin Ø	G 1" 1/4 M	G 2" F	G 2" F	G 2" F				
Uout Ø	G 1" 1/4 M	G 2" M	G 2" M	G 2" M				
Cin Ø	G 1" 1/2 F	G 2" F	G 2" F	G 2" F				
Cout Ø	G 1" 1/2 F	G 2" F	G 2" F	G 2" F				
A (mm)	495	495	495	495	495	668	668	668
B (mm)	1138	1138	1138	1138	1138	965	965	965
C (mm)	1131	1131	1131	1131	1131	1105	1105	1105

DIMENSIONAL DIAGRAMS

TETRIS W FC NG 3.2-10.2

1SV - 2SV

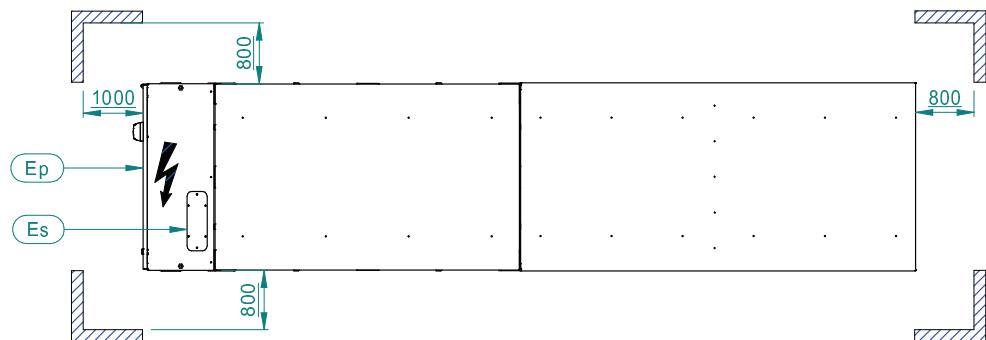
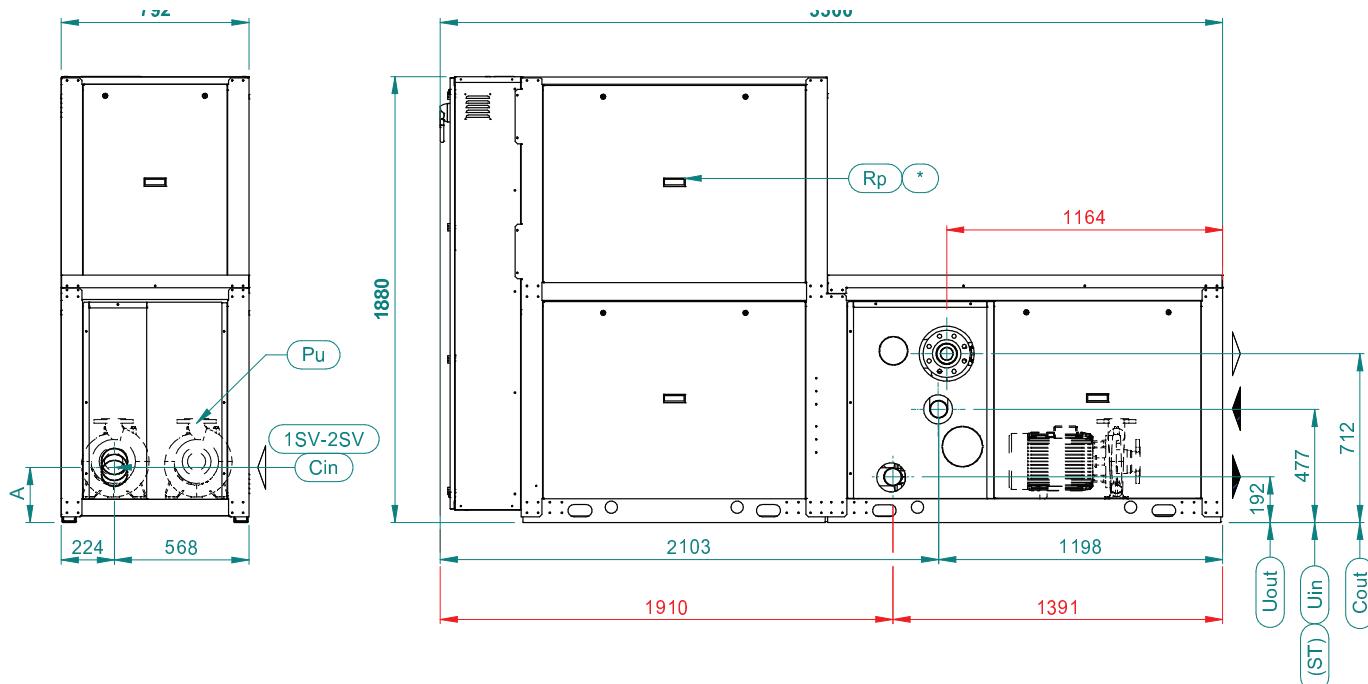
A4F301-A



MODEL	WEIGHT(kg)	OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS W FC/NG 3.2 _1SV	444	461	187	55	50	169
TETRIS W FC/NG 4.2 _1SV	448	465	186	57	52	170
TETRIS W FC/NG 5.2 _1SV	485	504	208	63	55	178
TETRIS W FC/NG 6.2 _1SV	505	525	209	64	59	193
TETRIS W FC/NG 7.2 _1SV	511	532	207	67	63	195
TETRIS W FC/NG 8.2 _1SV	557	583	224	97	79	183
TETRIS W FC/NG 9.2 _1SV	574	602	230	102	83	187
TETRIS W FC/NG 10.2 _1SV	582	612	229	107	88	188
TETRIS W FC/NG 3.2 _1SV_LN	544	561	214	78	72	197
TETRIS W FC/NG 4.2 _1SV_LN	548	565	213	80	74	198
TETRIS W FC/NG 5.2 _1SV_LN	585	604	235	86	76	207
TETRIS W FC/NG 6.2 _1SV_LN	604	624	236	86	81	221
TETRIS W FC/NG 7.2 _1SV_LN	611	632	235	89	85	223
TETRIS W FC/NG 8.2 _1SV_LN	657	683	251	120	101	211
TETRIS W FC/NG 9.2 _1SV_LN	672	700	257	124	104	215
TETRIS W FC/NG 10.2 _1SV_LN	681	711	256	130	109	216
TETRIS W FC/NG 3.2 _2SV	466	483	192	57	54	180
TETRIS W FC/NG 4.2 _2SV	470	487	191	59	56	181
TETRIS W FC/NG 5.2 _2SV	506	525	212	65	58	190
TETRIS W FC/NG 6.2 _2SV	527	547	213	66	63	205
TETRIS W FC/NG 7.2 _2SV	531	552	212	68	66	206
TETRIS W FC/NG 8.2 _2SV	582	608	236	102	81	189
TETRIS W FC/NG 9.2 _2SV	598	626	242	106	85	193
TETRIS W FC/NG 10.2 _2SV	606	636	241	111	90	194
TETRIS W FC/NG 3.2 _2SV_LN	566	583	219	80	76	208
TETRIS W FC/NG 4.2 _2SV_LN	570	587	218	82	78	209
TETRIS W FC/NG 5.2 _2SV_LN	606	625	239	88	80	218
TETRIS W FC/NG 6.2 _2SV_LN	627	647	241	88	85	233
TETRIS W FC/NG 7.2 _2SV_LN	633	654	240	91	89	234
TETRIS W FC/NG 8.2 _2SV_LN	681	707	263	124	103	217
TETRIS W FC/NG 9.2 _2SV_LN	697	725	269	129	106	221
TETRIS W FC/NG 10.2 _2SV_LN	705	735	268	134	111	222

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 12.2 - 20.2
1SV-2SV

A4F302-B

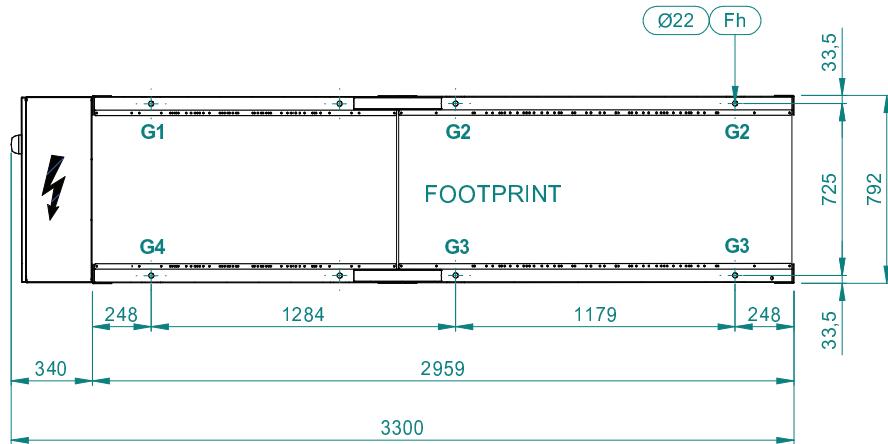


SIZE	12.2	13.2	15.2	17.2	19.2	20.2
Uin Ø	OD 60.3	OD 60.3	OD 76.1	OD 76.1	OD 76.1	OD 76.1
Uout Ø	OD 60.3	OD 60.3	OD 76.1	OD 76.1	OD 76.1	OD 76.1
Cin Ø	OD 76.1	OD 88.9				
Cout Ø	DN 65	DN 80				
A (mm)	208	229	229	229	257	257
OD 60.3, OD 76.1 and OD 88.9 are Grooved Connections						

* = OPTIONAL

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 12.2 - 20.2
1SV-2SV

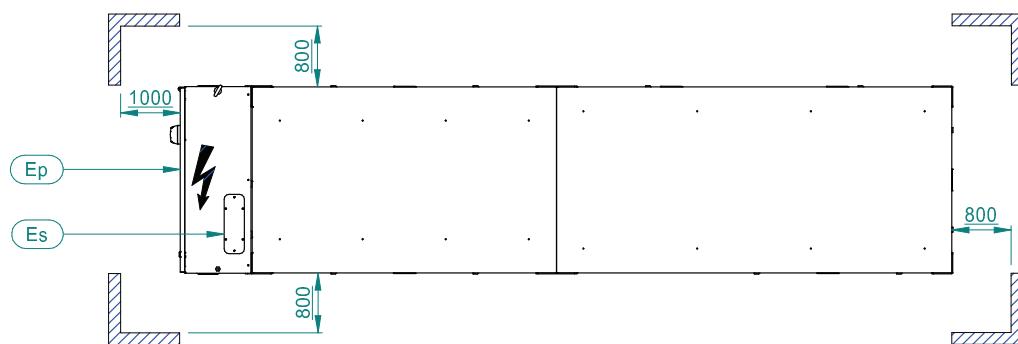
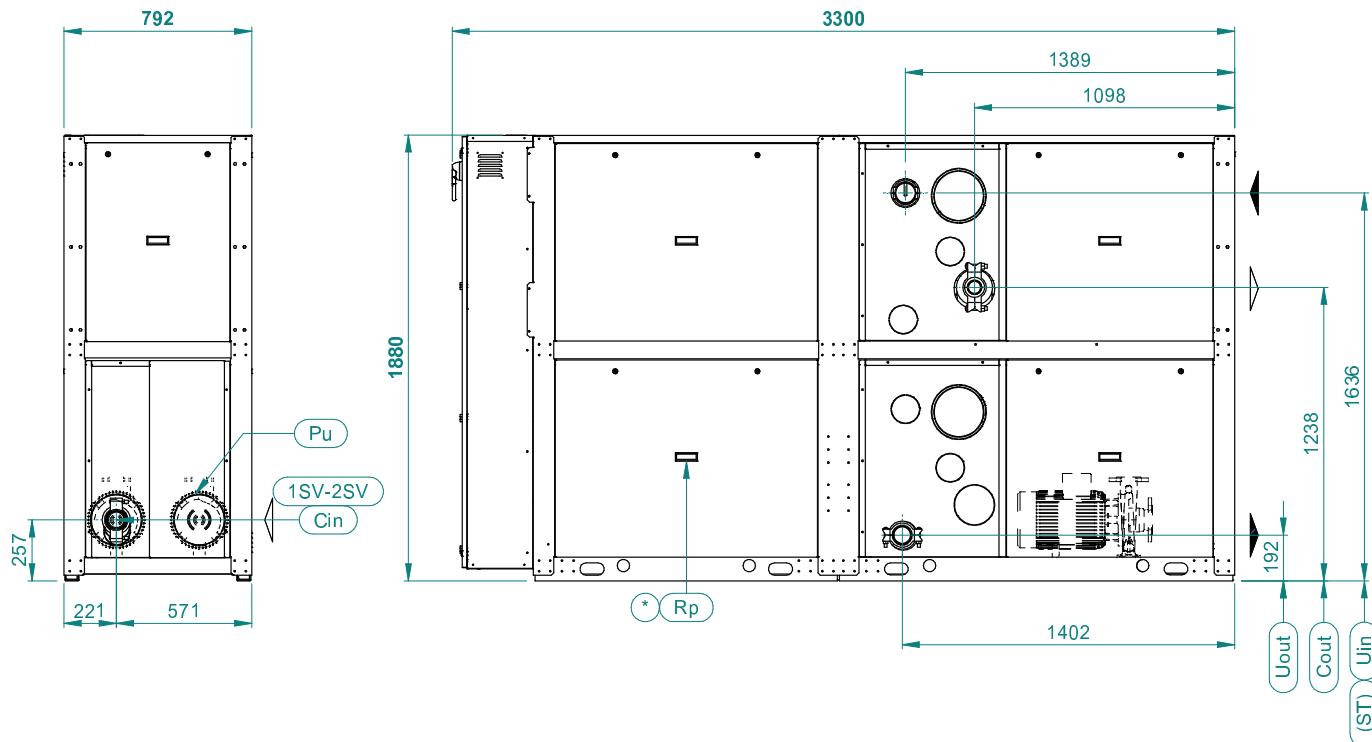
A4F302-B



MODEL	WEIGHT(kg)	OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS W FC/NG 12.2 _1SV	765	812	292	72	62	252
TETRIS W FC/NG 13.2 _1SV	884	934	328	86	75	284
TETRIS W FC/NG 15.2 _1SV	919	971	343	89	77	296
TETRIS W FC/NG 17.2 _1SV	989	1060	368	102	87	314
TETRIS W FC/NG 19.2 _1SV	1028	1102	381	106	91	327
TETRIS W FC/NG 20.2 _1SV	1067	1143	391	111	96	338
TETRIS W FC/NG 12.2 _1SV_LN	912	959	326	91	81	289
TETRIS W FC/NG 13.2 _1SV_LN	1032	1082	362	106	94	320
TETRIS W FC/NG 15.2 _1SV_LN	1067	1119	377	109	96	332
TETRIS W FC/NG 17.2 _1SV_LN	1138	1209	403	122	106	350
TETRIS W FC/NG 19.2 _1SV_LN	1176	1250	415	126	110	363
TETRIS W FC/NG 20.2 _1SV_LN	1215	1291	425	131	115	374
TETRIS W FC/NG 12.2 _2SV	799	851	283	82	74	256
TETRIS W FC/NG 13.2 _2SV	946	1001	312	104	96	289
TETRIS W FC/NG 15.2 _2SV	980	1037	327	106	98	302
TETRIS W FC/NG 17.2 _2SV	1068	1144	348	124	114	320
TETRIS W FC/NG 19.2 _2SV	1121	1200	358	131	123	334
TETRIS W FC/NG 20.2 _2SV	1159	1240	367	136	128	345
TETRIS W FC/NG 12.2 _2SV_LN	948	1000	317	102	94	291
TETRIS W FC/NG 13.2 _2SV_LN	1093	1148	347	123	115	325
TETRIS W FC/NG 15.2 _2SV_LN	1128	1185	362	126	117	337
TETRIS W FC/NG 17.2 _2SV_LN	1219	1295	383	144	134	356
TETRIS W FC/NG 19.2 _2SV_LN	1269	1348	393	151	142	369
TETRIS W FC/NG 20.2 _2SV_LN	1307	1388	402	156	147	380

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 24.2,27.2

A4F303-A

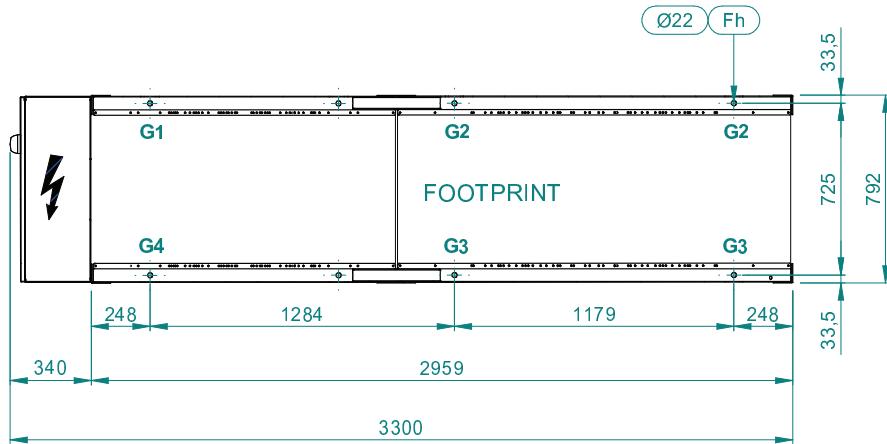
1SV - 2SV

SIZE	24.2	27.2
Uin Ø	OD 88.9	OD 88.9
Uout Ø	OD 88.9	OD 88.9
Cin Ø	OD 88.9	OD 88.9
Cout Ø	OD 88.9	OD 88.9
	OD 88.9	Grooved Connection

* = OPTIONAL

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 24.2,27.2
1SV - 2SV

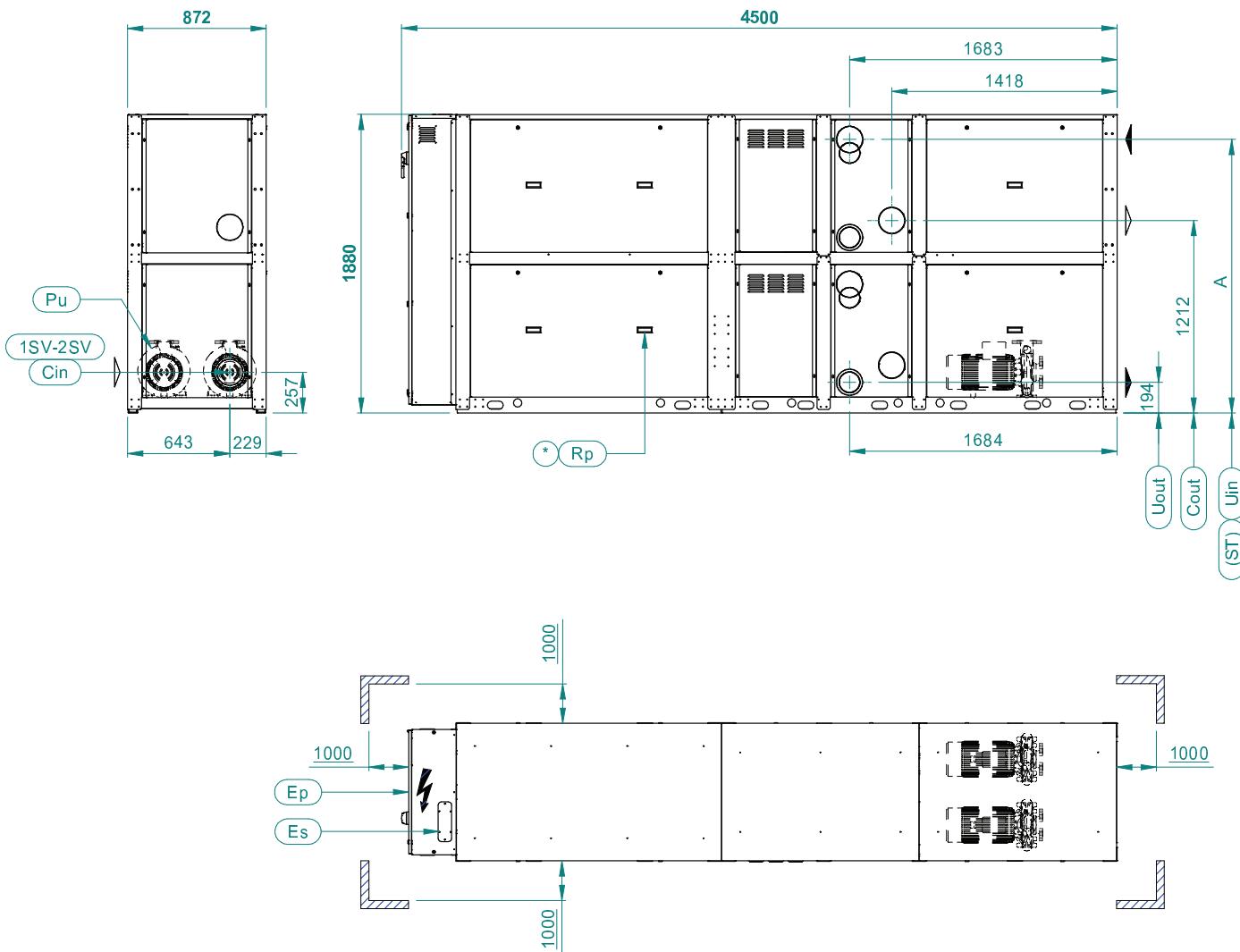
A4F303-A



MODEL	WEIGHT(kg)	OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS W FC/NG 24.2 _1SV	1174	1284	429	151	114	325
TETRIS W FC/NG 27.2 _1SV	1216	1326	432	158	122	334
TETRIS W FC/NG 24.2 _1SV_LN	1379	1489	462	186	146	363
TETRIS W FC/NG 27.2 _1SV_LN	1419	1529	465	192	154	372
TETRIS W FC/NG 24.2 _2SV	1279	1399	422	193	141	309
TETRIS W FC/NG 27.2 _2SV	1314	1434	404	187	158	340
TETRIS W FC/NG 24.2 _2SV_LN	1483	1603	456	227	173	347
TETRIS W FC/NG 27.2 _2SV_LN	1520	1640	438	221	191	378

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 30.3 - 40.3
1SV - 2SV

A4F304-A



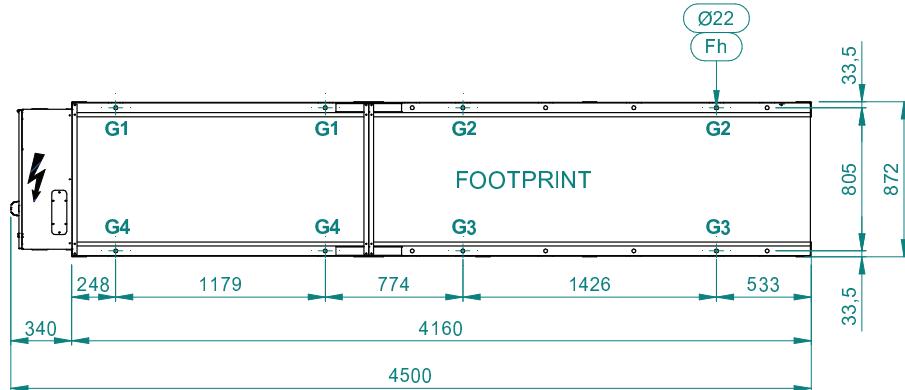
SIZE	30.3	34.3	40.3	
Uin Ø	OD 88.9	OD 88.9	OD114.3	
Uout Ø	OD 88.9	OD 88.9	OD114.3	
Cin Ø	OD114.3	OD114.3	OD114.3	
Cout Ø	OD114.3	OD114.3	OD114.3	
A (mm)	1635	1635	1720	

OD 88.9 and OD 114.3 are Grooved Connections

* = OPTIONAL

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 30.3 - 40.3
1SV - 2SV

A4F304-A



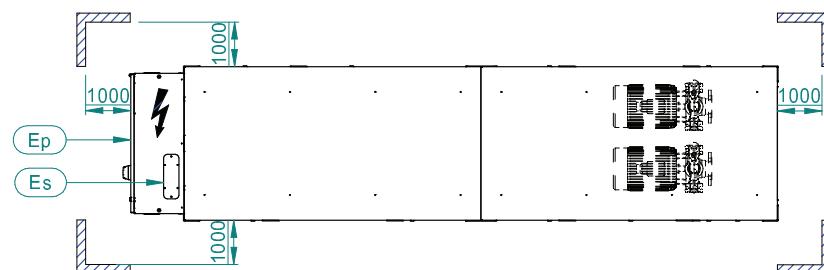
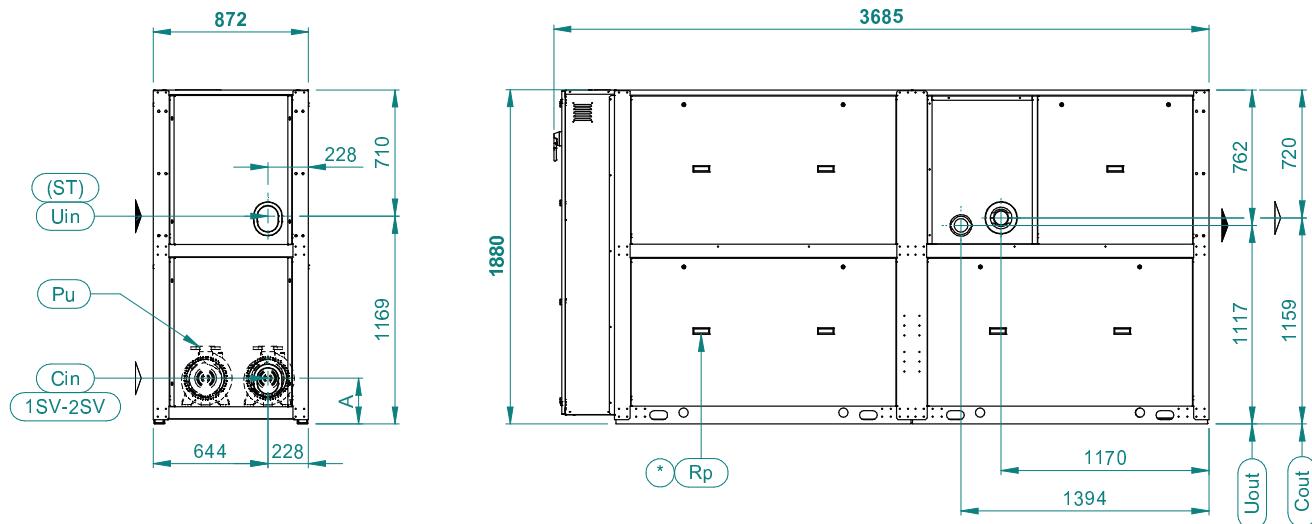
MODEL	WEIGHT(kg)	OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS W FC/NG 30.3 _1SV	1678	1824	379	161	111	261
TETRIS W FC/NG 34.3 _1SV	1716	1872	392	163	112	269
TETRIS W FC/NG 40.3 _1SV	1822	2002	417	166	119	299
TETRIS W FC/NG 30.3 _1SV_LN	1970	2116	400	213	155	290
TETRIS W FC/NG 34.3 _1SV_LN	2008	2164	413	215	155	299
TETRIS W FC/NG 40.3 _1SV_LN	2112	2292	439	216	162	329
TETRIS W FC/NG 30.3 _2SV	1808	1964	350	209	158	265
TETRIS W FC/NG 34.3 _2SV	1846	2012	363	211	159	273
TETRIS W FC/NG 40.3 _2SV	1952	2142	389	212	166	304
TETRIS W FC/NG 30.3 _2SV_LN	2102	2258	373	259	204	293
TETRIS W FC/NG 34.3 _2SV_LN	2138	2304	386	261	204	301
TETRIS W FC/NG 40.3 _2SV_LN	2242	2432	412	262	211	331

DIMENSIONAL DIAGRAMS

TETRIS W FC/NG 18.4, 20.4

1SV - 2SV

A4F305-A



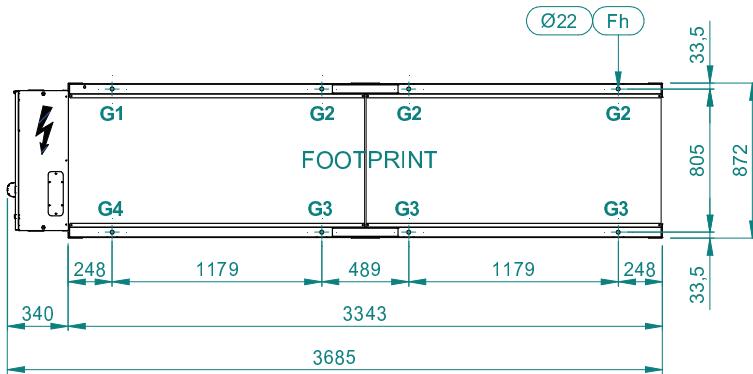
SIZE	18.4	20.4
Uin Ø	OD 76.1	OD 88.9
Uout Ø	OD 76.1	OD 88.9
Cin Ø	OD 76.1	OD 88.9
Cout Ø	OD 76.1	OD 88.9
A (mm)	229	257

OD 76.1 and OD 88.9 Are Grooved Connections

* = OPTIONAL

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 18.4, 20.4
1SV - 2SV

A4F305-A



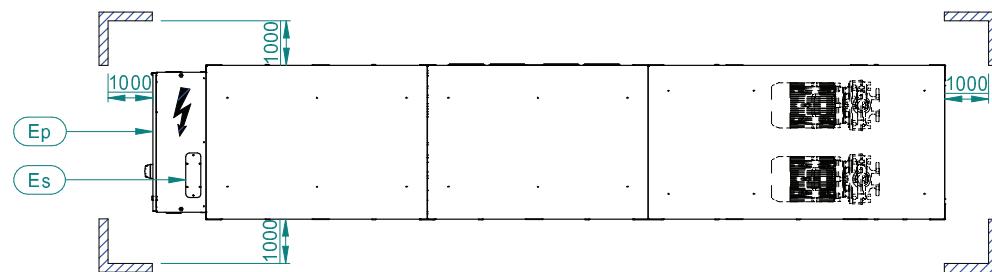
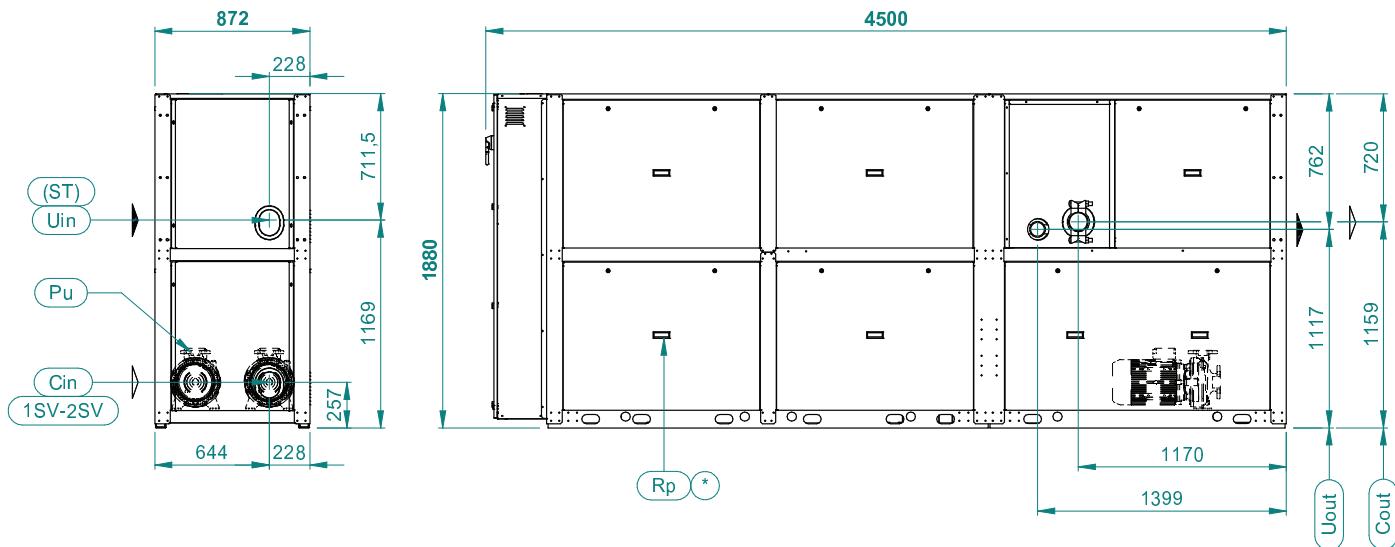
MODEL	WEIGHT(kg)	OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS W FC/NG 18.4 _1SV	1084	1175	339	103	84	275
TETRIS W FC/NG 20.4 _1SV	1142	1246	340	115	94	279
TETRIS W FC/NG 18.4 _1SV_LN	1301	1392	364	131	110	305
TETRIS W FC/NG 20.4 _1SV_LN	1360	1464	366	143	120	309
TETRIS W FC/NG 18.4 _2SV	1173	1274	306	124	109	269
TETRIS W FC/NG 20.4 _2SV	1248	1362	303	139	124	270
TETRIS W FC/NG 18.4 _2SV_LN	1393	1494	332	152	136	298
TETRIS W FC/NG 20.4 _2SV_LN	1471	1585	329	167	152	299

DIMENSIONAL DIAGRAMS

TETRIS W FC/NG 24.4 - 34.4

A4F306-A

1SV - 2SV

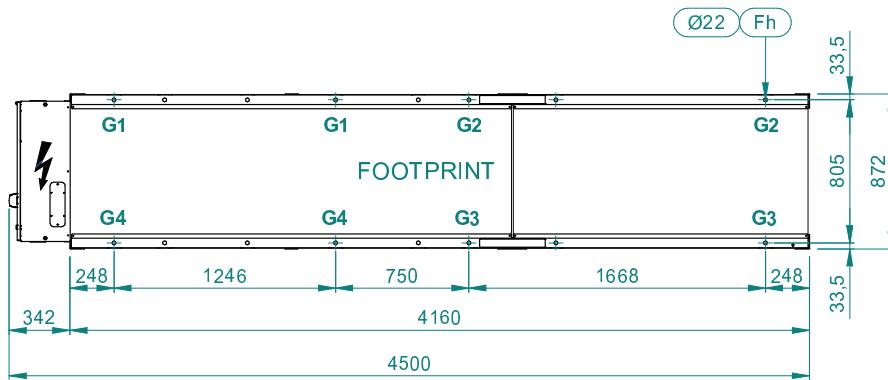


SIZE	24.4	26.4	30.4	34.4		
Uin Ø	OD 88.9	OD 88.9	OD 88.9	OD 88.9		
Uout Ø	OD 88.9	OD 88.9	OD 88.9	OD 88.9		
Cin Ø	OD 88.9	OD 88.9	OD 114.3	OD 114.3		
Cout Ø	OD 88.9	OD 88.9	OD 114.3	OD 114.3		
OD 88.9 and OD 114.3 Are Grooved Connections						

* = OPTIONAL

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 24.4 - 34.4
1SV - 2SV

A4F306-A



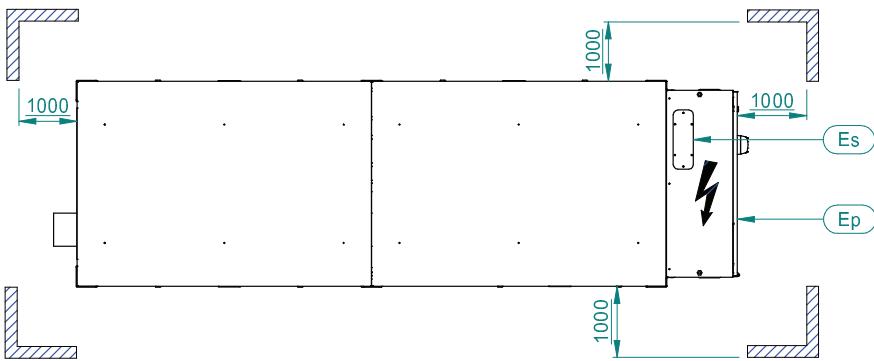
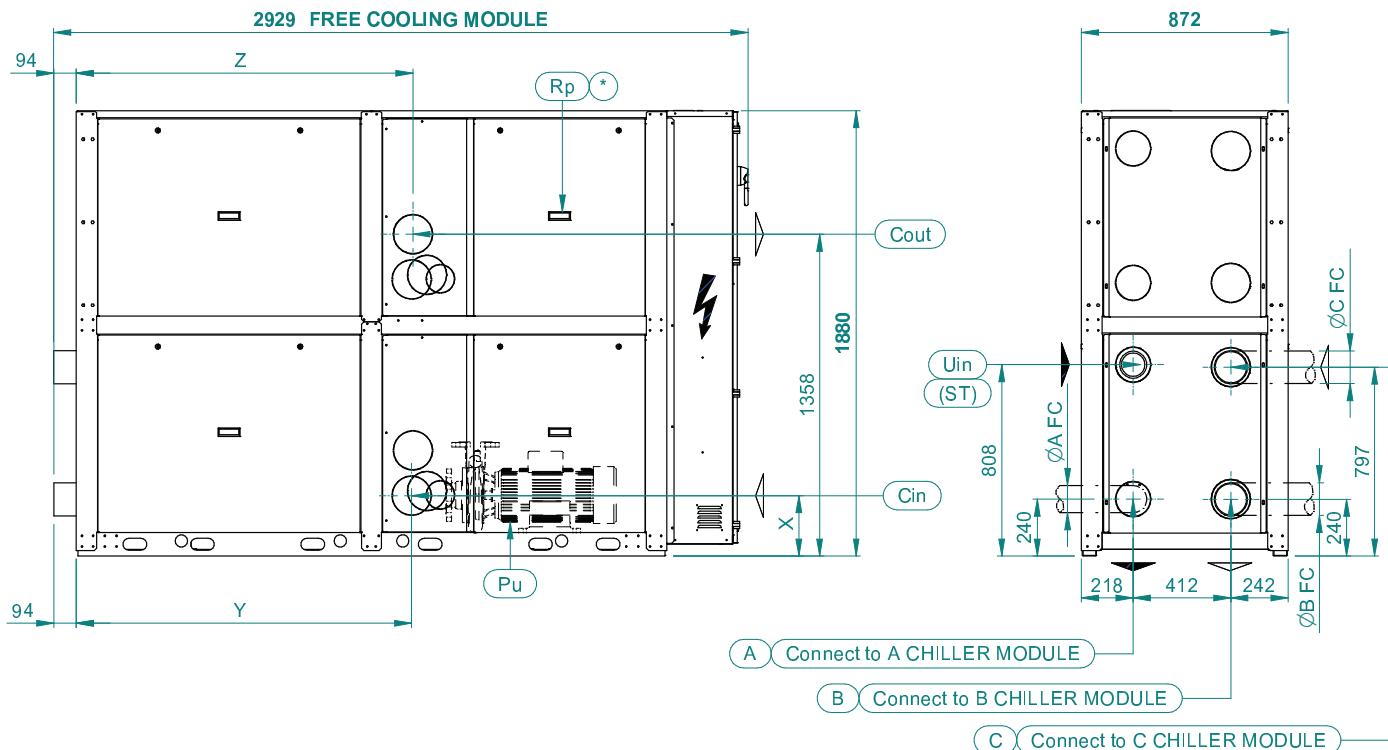
MODEL	WEIGHT(kg)	OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS W FC/NG 24.4 _1SV	1420	1538	274	140	120	235
TETRIS W FC/NG 26.4 _1SV	1603	1728	325	145	122	272
TETRIS W FC/NG 30.4 _1SV	1755	1924	348	176	147	291
TETRIS W FC/NG 34.4 _1SV	1836	2014	363	182	154	308
TETRIS W FC/NG 24.4 _1SV_LN	1724	1842	308	182	160	271
TETRIS W FC/NG 26.4 _1SV_LN	1907	2032	358	188	162	308
TETRIS W FC/NG 30.4 _1SV_LN	2057	2226	381	218	187	327
TETRIS W FC/NG 34.4 _1SV_LN	2140	2318	397	224	194	344
TETRIS W FC/NG 24.4 _2SV	1520	1648	273	183	147	221
TETRIS W FC/NG 26.4 _2SV	1721	1856	323	196	154	255
TETRIS W FC/NG 30.4 _2SV	1892	2076	346	236	185	271
TETRIS W FC/NG 34.4 _2SV	1969	2162	362	240	191	288
TETRIS W FC/NG 24.4 _2SV_LN	1824	1952	307	225	188	256
TETRIS W FC/NG 26.4 _2SV_LN	2025	2160	357	238	194	291
TETRIS W FC/NG 30.4 _2SV_LN	2200	2384	380	279	226	307
TETRIS W FC/NG 34.4 _2SV_LN	2277	2470	396	283	232	324

DIMENSIONAL DIAGRAMS

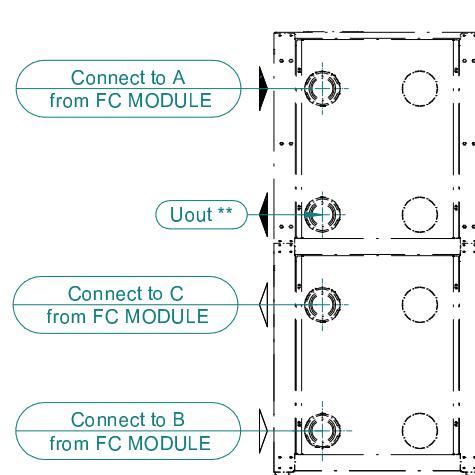
TETRIS W FC/NG 38.4 - 60.6

A4F307-A

1SV - 2SV FREE COOLING MODULE



CHILLER MODULE



SIZE	38.4	40.4	48.4	54.4	56.6	60.6
Uin Ø	OD 114.3					
Cin Ø	OD 114.3	OD 114.3	OD 139.7	OD 139.7	OD 139.7	OD 139.7
Cout Ø	OD 114.3	OD 114.3	OD 139.7	OD 139.7	OD 139.7	OD 139.7
X (mm)	255	255	255	276	255	255
Y (mm)	1381	1381	1421	1481	1421	1421
Z (mm)	1381	1381	1421	1421	1421	1421
ØA FC	OD 114.3					
ØB FC	OD 114.3	OD 114.3	OD 139.7	OD 139.7	OD 139.7	OD 139.7
ØC FC	OD 114.3	OD 114.3	OD 139.7	OD 139.7	OD 139.7	OD 139.7

**REFER TO AS INDICATED ON THE CHILLER UNIT DIMENSIONAL DRAWING

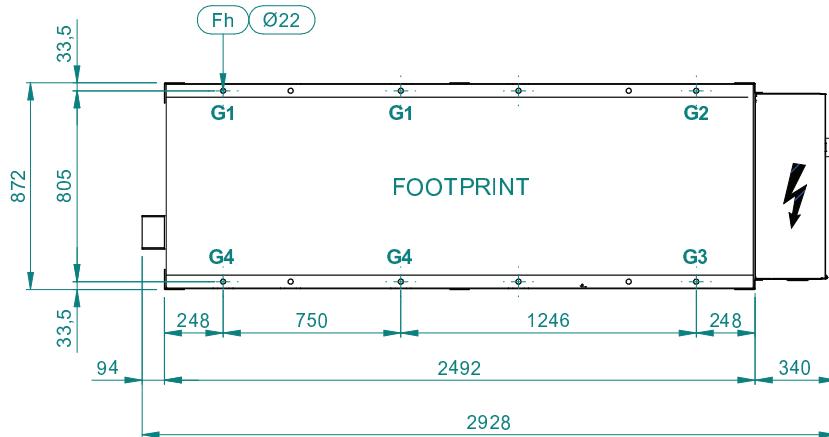
OD 114.3 AND OD 139.7 are Grooved Connections

DIMENSIONAL DIAGRAMS

TETRIS W FC/NG 38.4 - 60.6

A4F307-A

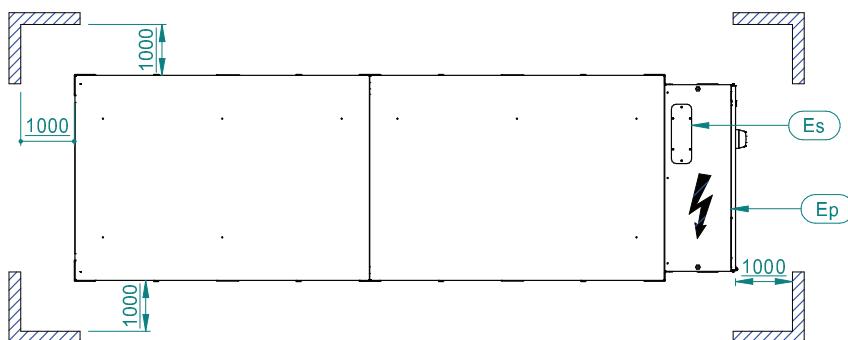
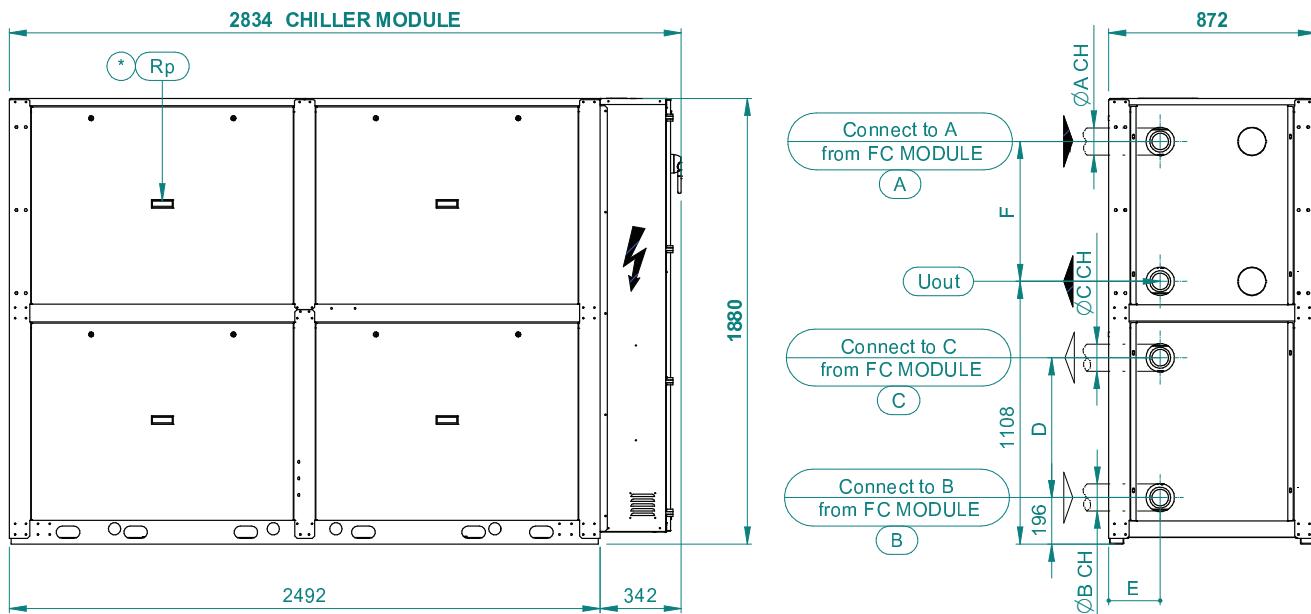
1SV - 2SV FREE COOLING MODULE



MODEL	WEIGHT(kg)	OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS W FC/NG 38.4 _1SV	654	759	93	152	189	116
TETRIS W FC/NG 40.4 _1SV	673	790	101	157	189	121
TETRIS W FC/NG 48.4 _1SV	710	847	103	168	213	130
TETRIS W FC/NG 54.4 _1SV	762	924	116	185	225	141
TETRIS W FC/NG 56.6 _1SV	792	974	112	206	260	142
TETRIS W FC/NG 60.6 _1SV	792	974	112	206	260	142
TETRIS W FC/NG 38.4 _1SV_LN	855	960	124	191	227	147
TETRIS W FC/NG 40.4 _1SV_LN	872	989	131	196	227	152
TETRIS W FC/NG 48.4 _1SV_LN	911	1048	133	207	251	162
TETRIS W FC/NG 54.4 _1SV_LN	963	1125	147	224	263	172
TETRIS W FC/NG 56.6 _1SV_LN	992	1174	142	246	298	173
TETRIS W FC/NG 60.6 _1SV_LN	992	1174	142	246	298	173
TETRIS W FC/NG 38.4 _2SV	808	933	119	225	228	121
TETRIS W FC/NG 40.4 _2SV	829	966	110	185	257	152
TETRIS W FC/NG 48.4 _2SV	877	1034	111	199	289	162
TETRIS W FC/NG 54.4 _2SV	941	1123	120	229	320	167
TETRIS W FC/NG 56.6 _2SV	991	1193	110	266	387	160
TETRIS W FC/NG 60.6 _2SV	991	1193	110	266	387	160
TETRIS W FC/NG 38.4 _2SV_LN	1008	1133	150	263	266	152
TETRIS W FC/NG 40.4 _2SV_LN	1029	1166	140	224	294	184
TETRIS W FC/NG 48.4 _2SV_LN	1076	1233	141	239	326	193
TETRIS W FC/NG 54.4 _2SV_LN	1142	1324	150	269	357	199
TETRIS W FC/NG 56.6 _2SV_LN	1191	1393	140	307	422	192
TETRIS W FC/NG 60.6 _2SV_LN	1191	1393	140	307	422	192

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 38.4 - 54.4
CHILLER MODULE

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**FREE COOLING MODULE**

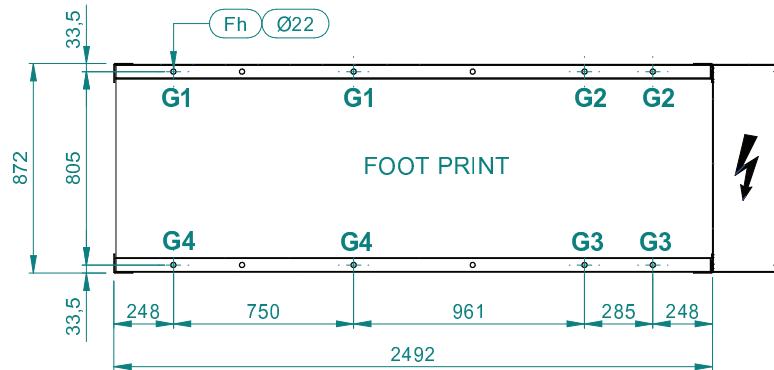
SIZE	38.4	40.4	48.4	54.4
Uout Ø	OD 88.9	OD 88.9	OD 114.3	OD 114.3
D (mm)	590	590	532	532
E (mm)	218	218	205	205
F (mm)	590	590	532	532
ØA CH	OD 88.9	OD 88.9	OD 114.3	OD 114.3
ØB CH	OD 88.9	OD 88.9	OD 114.3	OD 114.3
ØC CH	OD 88.9	OD 88.9	OD 114.3	OD 114.3

OD 88.9 AND OD 114.3 are Grooved Connections



DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 38.4 - 54.4
CHILLER MODULE

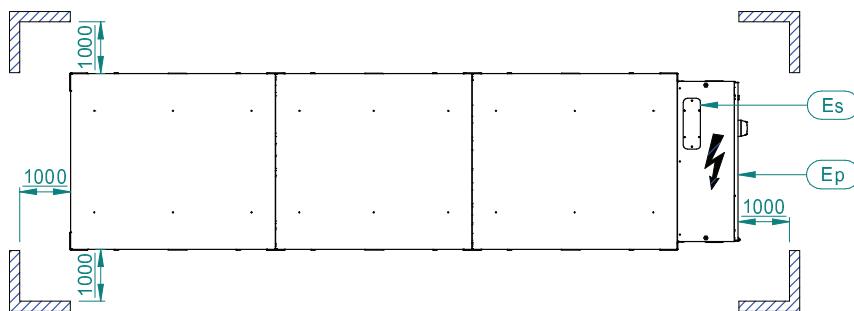
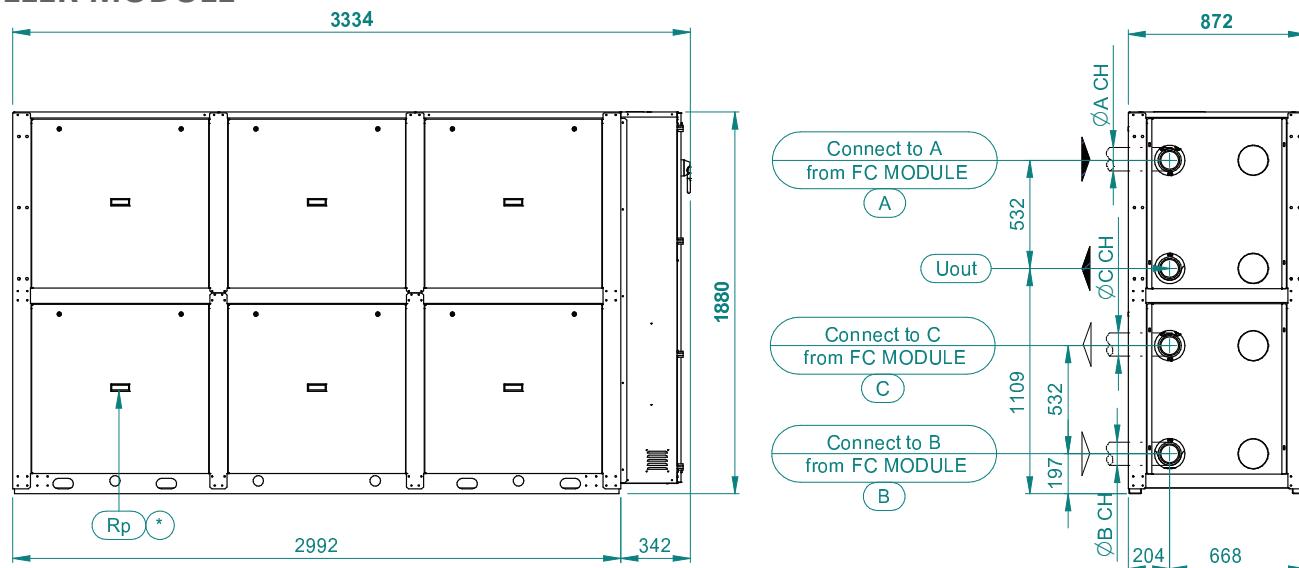
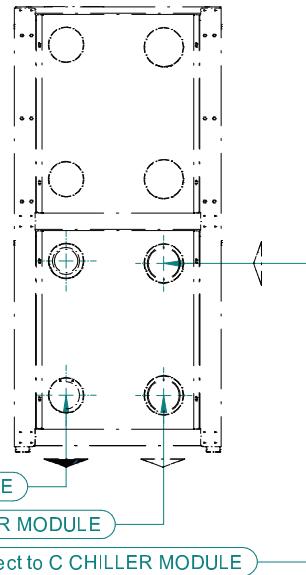
A4F371-A



MODEL	WEIGHT(kg)	OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS W FC/NG 38.4	1416	1502	157	223	218	153
TETRIS W FC/NG 40.4	1481	1576	168	233	225	162
TETRIS W FC/NG 48.4	1530	1630	182	242	223	168
TETRIS W FC/NG 54.4	1598	1712	198	253	227	178
TETRIS W FC/NG 38.4_LN	1618	1704	191	239	234	188
TETRIS W FC/NG 40.4_LN	1681	1776	203	248	241	196
TETRIS W FC/NG 48.4_LN	1730	1830	217	257	239	202
TETRIS W FC/NG 54.4_LN	1798	1912	233	268	243	212

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 56.6, 60.6
CHILLER MODULE

A4F372-A

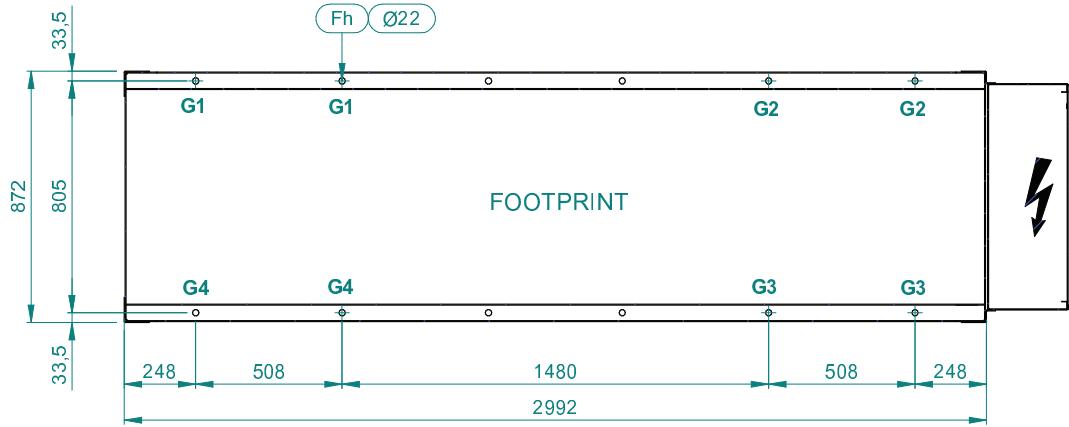
**FREE COOLING MODULE**

SIZE	56.6	60.6
Uout Ø	OD114.3	OD114.3
ØA CH	OD 114.3	OD 114.3
ØB CH	OD 114.3	OD 114.3
ØC CH	OD 114.3	OD 114.3
OD 114.3 Grooved Connections		

(* = OPTIONAL)

DIMENSIONAL DIAGRAMS
TETRIS W FC/NG 56.6, 60.6
CHILLER MODULE

A4F372-A



MODEL	WEIGHT(kg)	OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS W FC/NG 56.6	1912	2030	186	313	324	192
TETRIS W FC/NG 60.6	2014	2146	199	331	339	204
TETRIS W FC/NG 56.6_LN	2116	2234	219	343	339	216
TETRIS W FC/NG 60.6_LN	2218	2350	232	361	354	228

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