FREE COOLING SOLUTIONS

Product overview **2026**

BlueBox
by Swegon

FREE COOLING APPLICATIONS

The applications
produces **heat**
which needs to be **rejected outside**

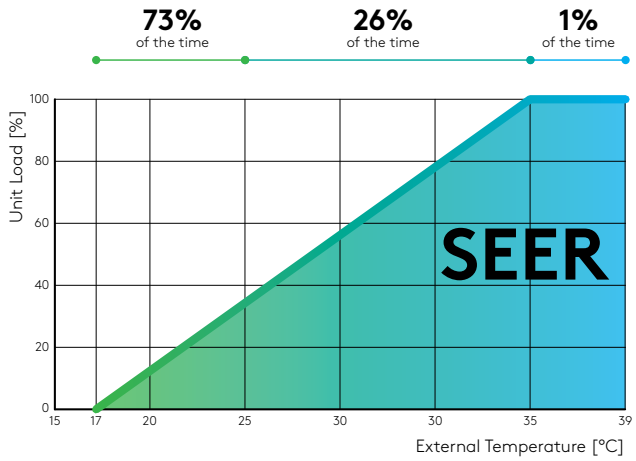
The **heat**
is mostly linked to the **internal process**
and **independent**
from the **outside conditions**

The application often requires
precision in the temperature control
to protect the process results

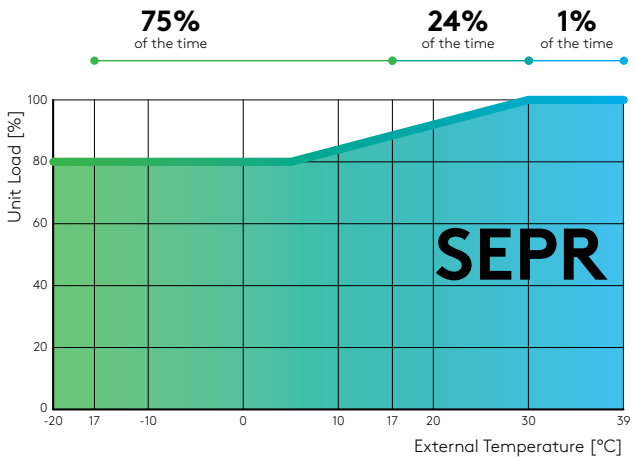
(SEASONAL ENERGY PERFORMANCE RATIO)

SEPR is one of the Key Driver

The ECODESIGN Directive, with its Regulations, sets new challenging standards for a more efficient use of energy.
For the European market, all chillers dedicated to process cooling must comply with related seasonal efficiency target:
SEPR is defined in order to have a proper Efficiency at Full loads all year long.
Efficiency Regulations target therefore efficiency levels at different load conditions, weighted for an average yearly profile.



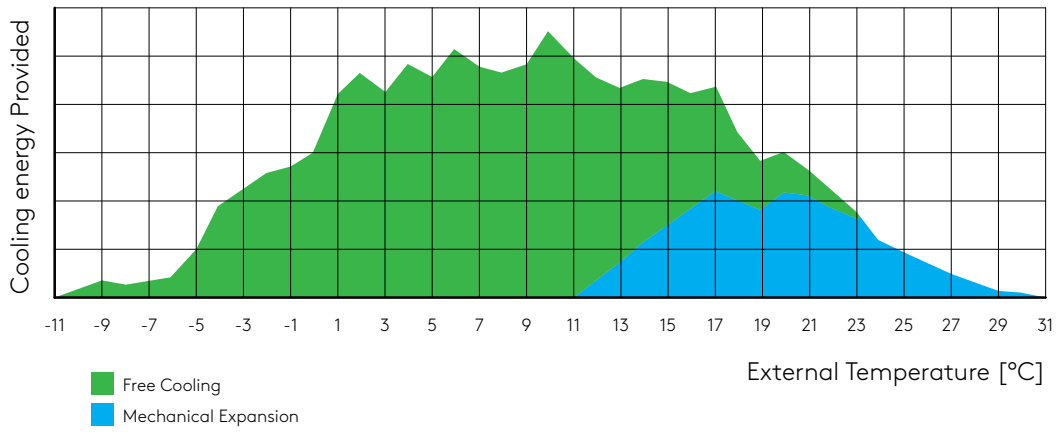
73% of the time : chiller load ≤ 50%



75% of the time : chiller operation < 17°C ambient

Annual Energy Consumption

Often these processes work with specific water temperatures.
Customer also are looking for the specific energy consumption calculated for the precise yearly distribution of the city of installation.
Loads are also considered constant all year.



Annual Energy Consumptions are not inside any European Directive.
Anyhow they are often requiredas output from the selection software.

EUROPE
F-Gas legislation

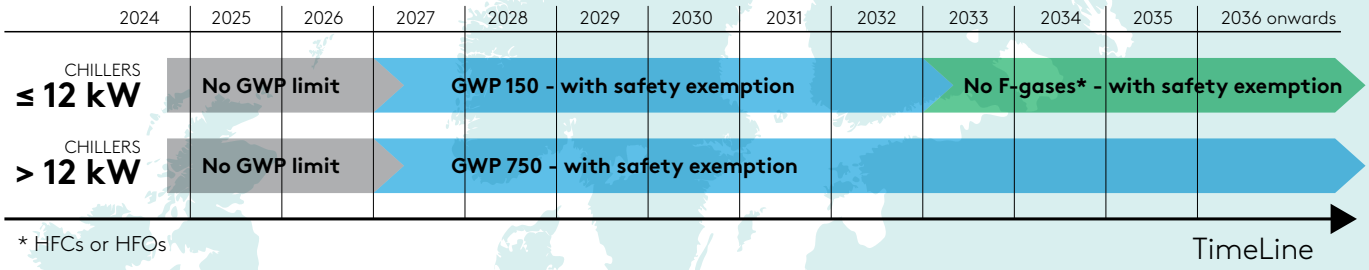
In response to the European Climate Law and the need for stronger climate action, the European Commission reviewed the 2014 F-gas Regulation and, on 7 April 2022, proposed a new regulation to the European Parliament and the Council of the European Union.

Building on the success of its predecessor, the F-gas Regulation (EU) 2024/573 was adopted on 7 February 2024 and started to apply on 11 March 2024.

The F-gas Regulation applies to:

- the fluorinated greenhouse gases listed in Annexes I, II and III, whether alone or as mixtures
- products and equipment, and parts thereof, containing fluorinated greenhouse gases or whose functioning relies upon those gases.

The Key measures of the F-gas Regulation: Phasing out hydrofluorocarbons, Expanding the quota system, Stricter rules to prevent emissions, Facilitating better monitoring, Capping EU production of HFCs, Life-cycle optimisation.



From January 1, 2027:

- Placing on the market prohibitions for fluorinated greenhouse gases with a GWP of 150 GWP or more for chillers up to and including a rated capacity (P_{rated}) of 12 kW, except if required to meet safety requirements at the site of operation; only products containing a refrigerant with a GWP < 150 may be placed on the market for chillers with $P_{rated} \leq 12$ kW
- Placing on the market prohibitions for fluorinated greenhouse gases with a GWP of 750 or more for chillers with a rated capacity (P_{rated}) above 12 kW, except if required to meet safety requirements at the site of operation.

From January 1, 2032

- Placing on the market prohibitions for fluorinated greenhouse gases for chillers up to and including a rated capacity (P_{rated}) of 12 kW, except if required to meet safety requirements at the site of operation.

The new Regulation and Fouther details, available for consultation in various EU languages and formats at the link :

https://climate.ec.europa.eu/index_en
https://eur-lex.europa.eu/eli/reg/2024/573/oj

FREE COOLING APPROACH

AIR COOLED FREE COOLING

Independent modular design

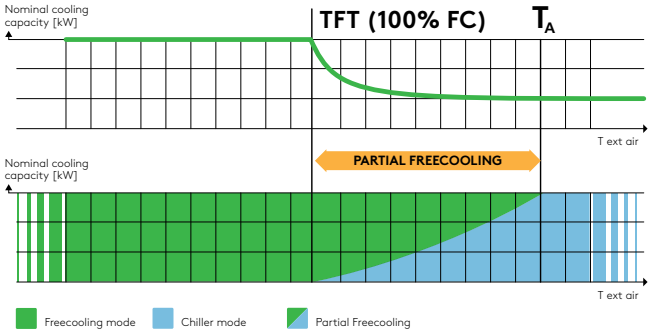
Condensing and free cooling coils are completely independent:

- Better free cooling coil design.
- Less pressure drops through coils , less power absorbed by the fans.
- Better Condensing and Free cooling control.
- Easier maintenance and cleaning of the coils.

WATER COOLED FREE COOLING

Application Operating principle

A strong point of our free cooling units is the control system that allows maximum use to be made of the free resource, consisting of outside air, minimizing the power used by the compressors. The controller of the unit activates the chiller section and the free cooling section, also in combined mode, based on the actual external air temperatures, the set point and the required load level. The free cooling section is hydraulically in series with the evaporator and this allows a benefit to be obtained from its activation even when the outside air temperature is sufficient to carry out only a pre-cooling of the water.

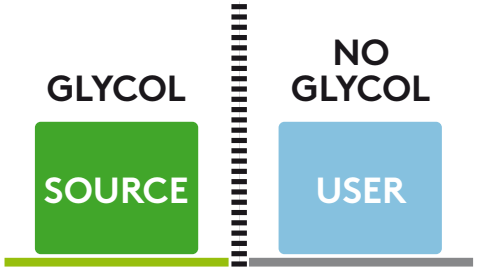


FREE COOLING NO GLYCOL OPTION

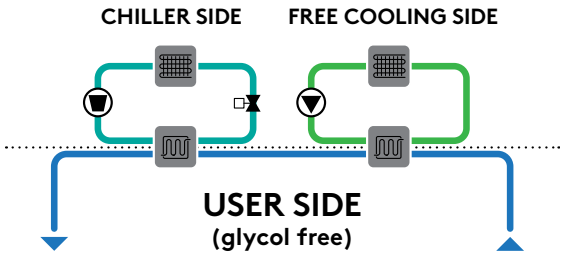
Free cooling no glycol version uses an intermediate plate heat exchanger to separate the user's water circuit from the outside air.

The unit operates with two distinct loops, on the source side an external loop with glycol-water mixture and on user side an internal loop with a pure water .

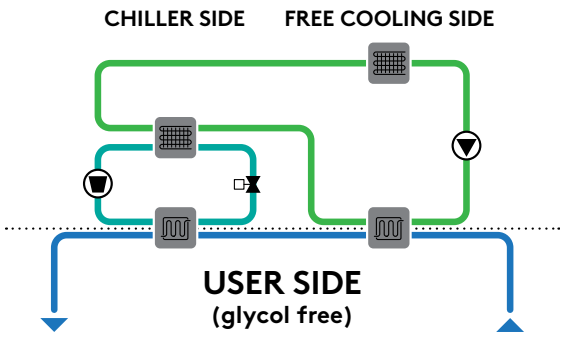
This intermediate plate heat exchanger separates internal and external loops, improving resilience, simplifying maintenance, and preventing contaminants of the user's equipment.



Air Cooled



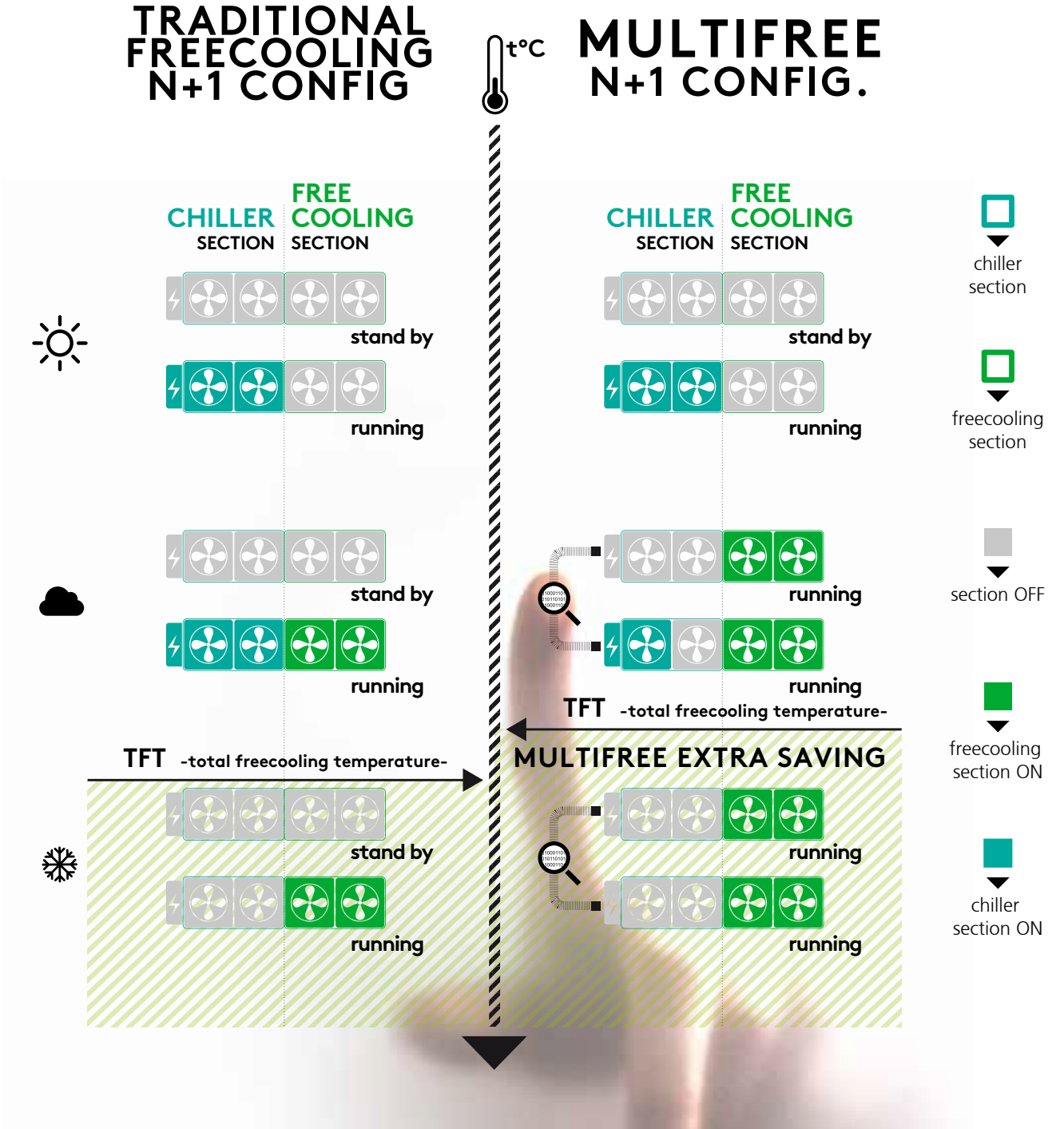
Water Cooled



TRANSLATE REDUNDANCY INTO EFFICIENCY

MULTIFREE

is a specific
function designed to maximize free cooling operations
in multiunits plant.
It uses the **entire free cooling capacity of all units** before starting any compressors.
This means **higher TFT** and **energy saving.**



CHILLED WATER DYNAMIC SETPOINT

SYSTEM APPROACH WITH THE HIGHEST LEVEL OPTIMIZATION

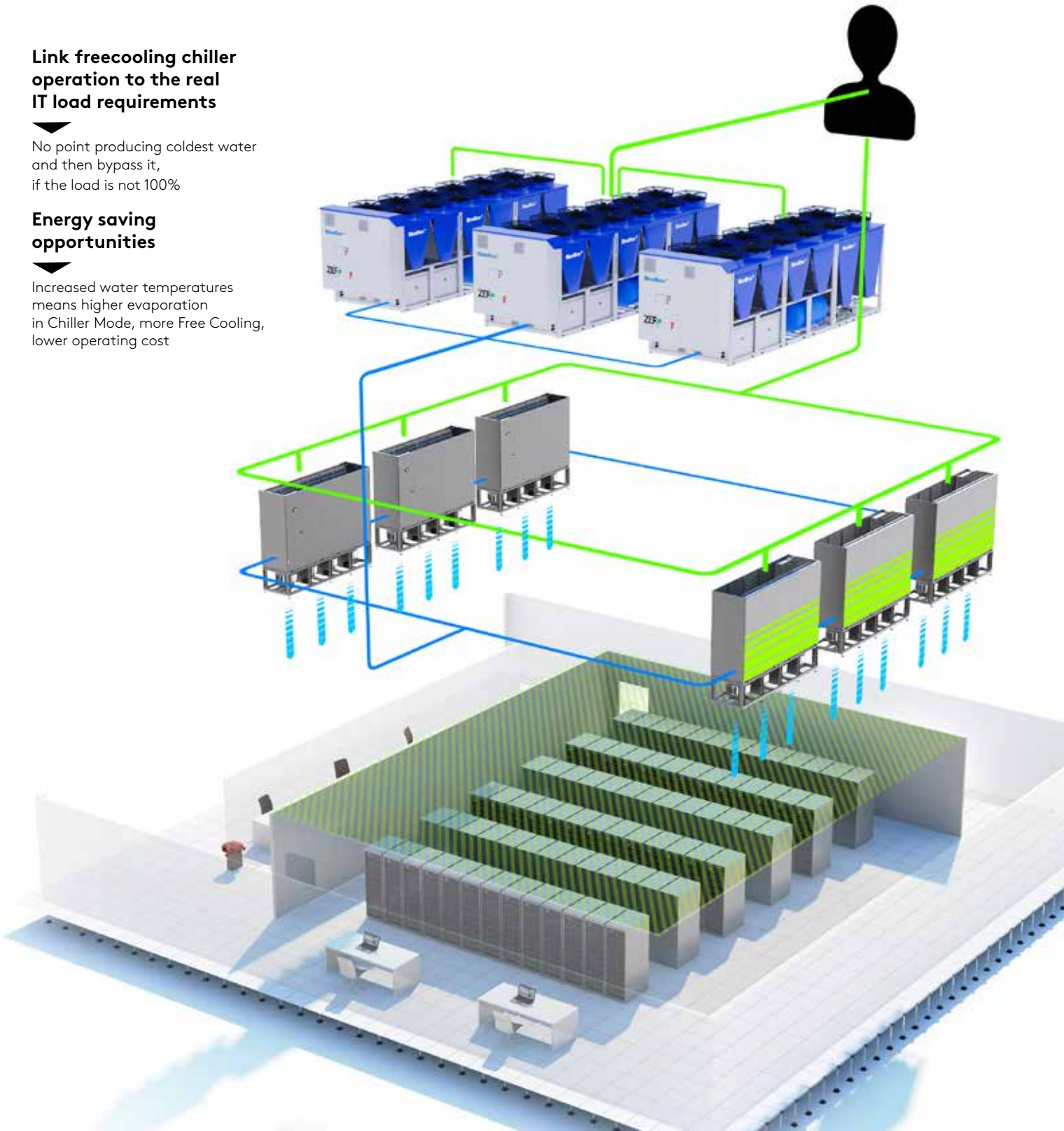
Communication and interaction between the system components is essential to maximize the performance of the units and to ensure the best efficiency throughout the operation, continuity of service and optimal control of the thermal load across the data center.

Link freecooling chiller operation to the real IT load requirements

No point producing coldest water and then bypass it, if the load is not 100%

Energy saving opportunities

Increased water temperatures means higher evaporation in Chiller Mode, more Free Cooling, lower operating cost



TITAN Sky FC
30÷150 kW

Single or double circuit Free-cooling chillers featuring reciprocating semi-hermetic inverter compressors and R290 natural refrigerant. Free cooling coil with independent modular design.

Configurations

Hi: chiller with inverter compressor
/SLN: super low noise version
NG: No-Glycol Free-Cooling options

Strengths

- Low environmental impact, Refrigerant R290 - GWP≈0.
- Full inverter compressors
- Low charge design.
- Durable Units for any Application
- Free cooling coil with Independent Modular design that allows a premium energy saving. High total free cooling temperature (TFT).
- Extended working limits. Chilled water from 20°C down to -15°C
- Options : NO Glycol version , Flowzer (Inverter driven pump), Multilogic function designed for free cooling.

TITAN Zero FC
250÷450 kW

Double circuit Free-cooling chillers featuring reciprocating semi-hermetic inverter compressors and R290 natural refrigerant. Free cooling coil with independent modular design.

Configurations

Hi: chiller with inverter compressor
/SLN: super low noise version
NG: No-Glycol Free-Cooling options
/DS: execution featuring a desuperheater

Strengths

- Low environmental impact, Refrigerant R290 - GWP≈0.
- Full inverter compressors
- Low charge design.
- Durable Units for any Application
- Free cooling coil with Independent Modular design that allows a premium energy saving. High total free cooling temperature (TFT).
- Extended working limits. Chilled water from 20°C down to -15°C
- Options : NO Glycol version , Desuperheater (how water production) , Flowzer (Inverter driven pump), Multilogic function designed for free cooling.

TETRIS Sky FC
220÷480 kW

Single or double circuit Free-cooling chillers with scroll compressors and R32 refrigerant. Free cooling coil with independent modular design.

Configurations

Standard: Chiller version + free cooling
/LN: low-noise unit
/SLN: super low noise version
NG: No-Glycol Free-Cooling options
/DS: execution featuring a desuperheater

Strengths

- Very high efficiency, top seasonal space cooling energy efficiency ratio
- Free cooling coil with Independent Modular design that allows a premium energy saving. High total free cooling temperature (TFT).
- Wide range of chilled water temperature from 20°C down to -8°C
- Three sound level possible : Standard , LN , SLN
- Options : NO Glycol version , Desuperheater (how water production) , Flowzer (Inverter driven pump), Multilogic function designed for free cooling.

KAPPA Sky FC
263÷886 kW

Single or double circuit free-cooling chillers for large systems featuring screw compressors with variable compression ratio and an inverter for capacity modulation. Free cooling coil with independent modular design available in BASIC or EXTRA version.

Configurations

Xi: high efficiency , unit with full inverter compressors
Sh: compact dimensions, , unit with hybrid compressors
LGW Xi: refrigerant with low GWP , unit with full inverter compressors
LGW Sh: refrigerant with low GWP compact dimensions, unit with hybrid compressors
/LN: low-noise unit
NG: no-glycol execution
/DS: execution featuring a desuperheater

Strengths

- Free cooling coil with Independent Modular design available in BASIC or EXTRA version.
- Extended working limits. Chilled water from 23°C down to -8°C
- High efficiency and compact dimensions
- Options : NO Glycol version , Desuperheater (how water production) , Flowzer (Inverter driven pump), Multilogic function designed for free cooling.

SIGMA Zero
20÷250 kW

Water cooled chiller featured with scroll or reciprocating semi-hermetic inverter compressors and R290 natural refrigerant. Indoor unit with Single or double circuit, Free cooling No Glycol version available as option.

Configurations

Hi: chiller with inverter compressor

Strengths

- Low environmental impact, Refrigerant R290 - GWP≈0.
- Full inverter compressors
- Low charge design
- Extended working limits. Chilled water from 20°C down to -15°C
- Ventilated enclosure design : installation class IV according to EN378-1
- Options: Free-Cooling No-Glycol version (FG NG), Arrangement for Single fan for multiple units (SVEX), Arrangement for outdoor installation (PIE), Automatic air/refrigerant separator (SARA).

SIGMA Sky FC/NG
46÷674 kW

Water cooled free-cooling no glycol chiller featured with scroll compressors and R32 refrigerant. Indoor unit with Single or double circuit, many sizes available.

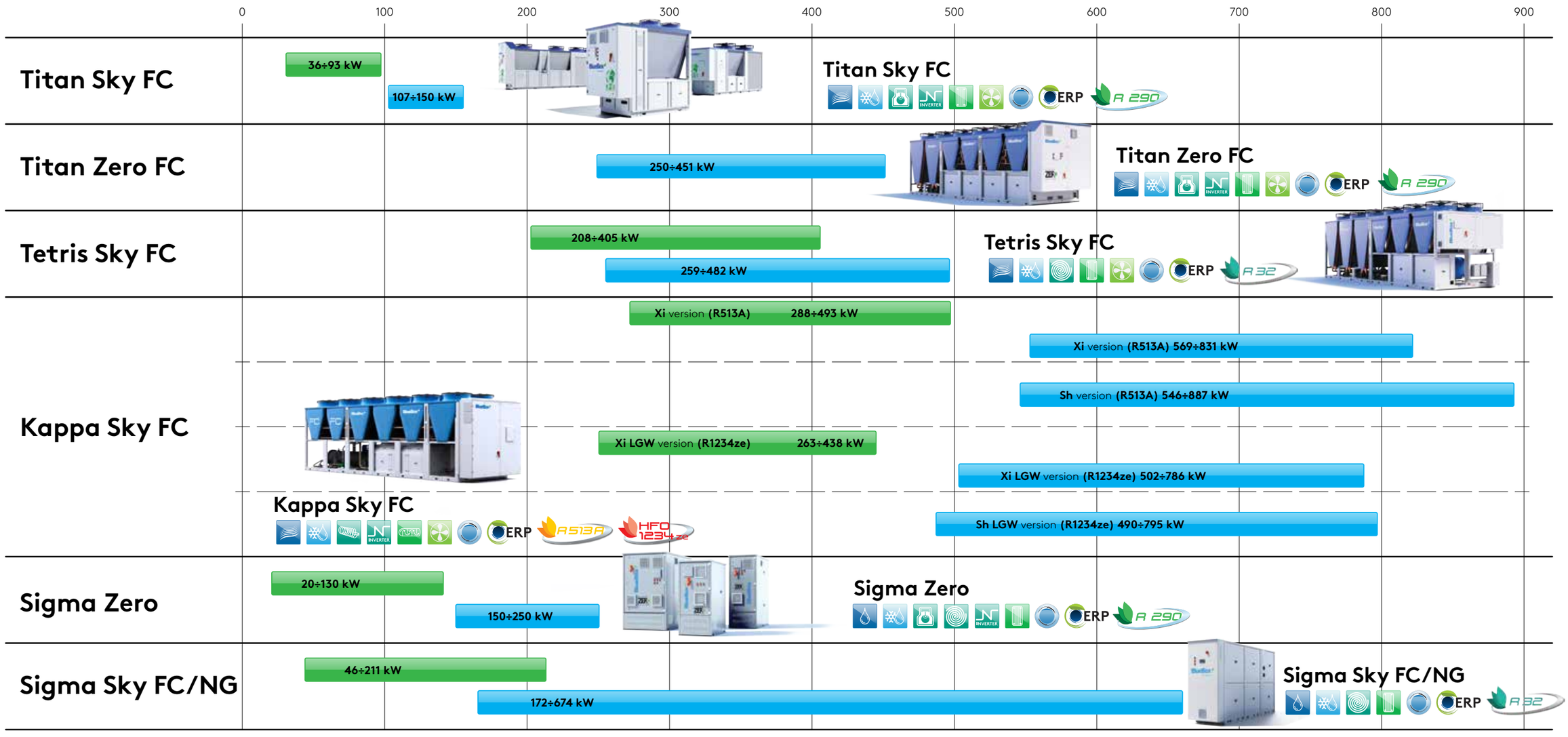
Configurations

FC NG Free Cooling No-Glycol Version
/XLN: Super low-noise unit

Strengths

- 25 sizes – from 45 kW to 674 kW
- Compact footprint.
- Extended working limits. Chilled water from 20°C down to -5°C.
- Refrigerant gas sensor supplied as standard.
- One pump on source side supplied as standard.
- Options : Arrangment for outdoor installation (PIE) , Flowzer (Inverter driven pump), Dry cooler management kit for low external air temperature

BLUEBOX FREE COOLING CHILLERS RANGE



Single circuit
Double circuit
Air cooled
Water cooled
Chiller unit
Scroll compressors
Screw compressors
Reciprocating compressors
Inverter driven compressors
Plates exchanger
Shell&Tubes exchanger
Axial fans

Bluethink control: available options Blueye, Multilogic, Flowzer, Hyzer according to models.

ERP Model compliant to the applicable Ecodesign.

BlueBox by Swegon

DECHEMA

DECHEMA is a non-profit association for chemical engineering and biotechnology based in Frankfurt, Germany. A KAPPA Sky series chiller with a free cooling module was used to cool the production processes in the building.

▲
Research center

Laboratory in Sweden.
2 TITAN Sky FC units working in Multilogic / Multifree combination.
R290 refrigerant,
200 kW.

◀ **IT cooling application**

Datacenter in Sweden.
2 KAPPA Sky FC LGW units working in Multilogic / Multifree combination.
In the project there is also Datatech PFW HE units (perimetral IT cooling conditioners) included in the system design.
R1234ze refrigerant,
940 kW.

Feel good **inside**

Swegon

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