



ELFO Energy Storm EVO FC

WSAT-YES FC 18.2 – 35.2

Product presentation

New hydronic range

NEW ELFOEnergy STORM EVO R-32



5 kW

ELFOEnergy EDGE EVO



ELFOEnergy SHEEN EVO



90 kW

ELFOEnergy STORM EVO



New hydronic range

NEW ELFOEnergy STORM EVO R-32

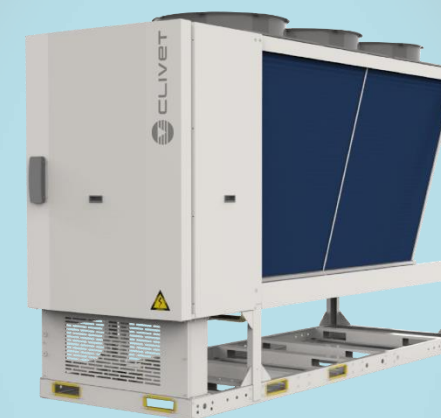


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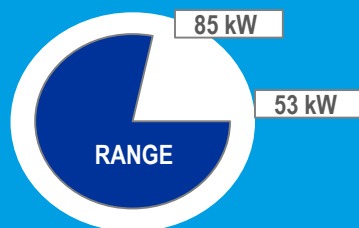
ELFOEnergy STORM EVO



ELFOEnergy Storm EVO

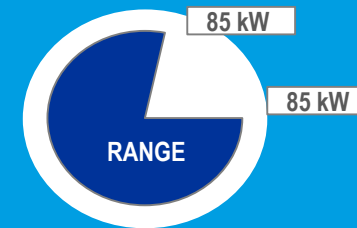
Cooling only version (Chiller) WSAT-YES

- Chilled water production for air conditioning and process applications



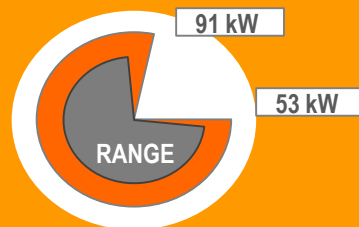
Cooling only version (Chiller) with Free Cooling WSAT-YES FC

- Efficient chilled water production even in cold months for process cooling applications



Heat pump version WSAN-YES

- Alternate Hot water and chilled water production for air conditioning application and domestic hot water



ELFOEnergy Storm EVO: new refrigerant R-32



ELFOEnergy Storm EVO is the sustainable solution for the all year round comfort thanks to the new ecological **refrigerant R-32**:

- Low GWP (Global Warming Potential): -70% compared to R410A
- Better performance under severe conditions
- Less charged volume is needed in the system
- Higher heat transfer coefficient

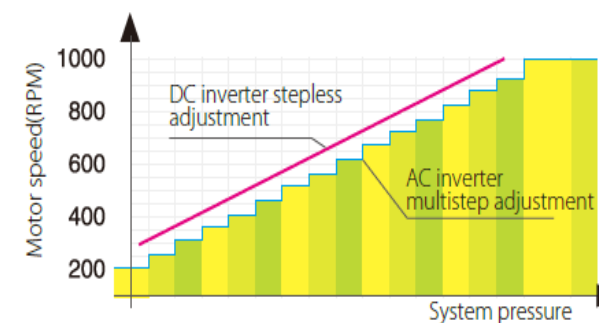
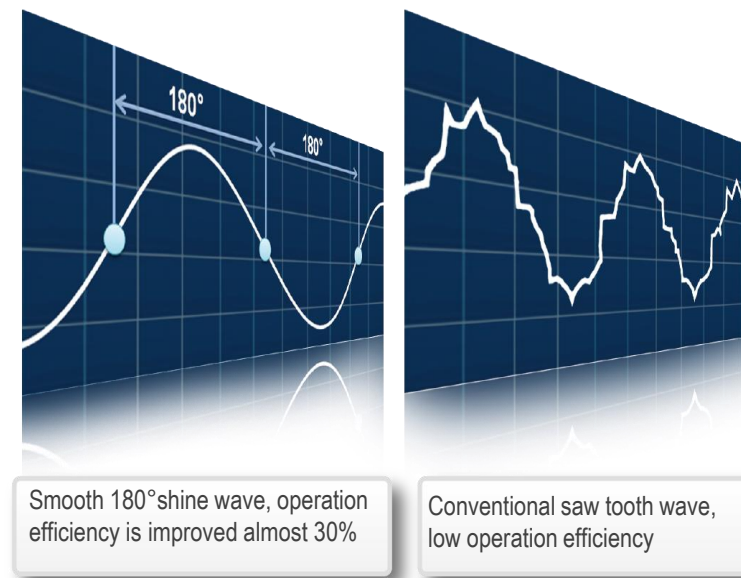
Full DC Inverter Technology

DC inverter scroll compressor

- ✓ New designed compressor with Permanent Magnets:
 - low working sound
 - wide working frequency.
- ✓ Full DC frequency conversion system that dramatically **reduces power consumption by more than 30%**.

DC inverter fan motor

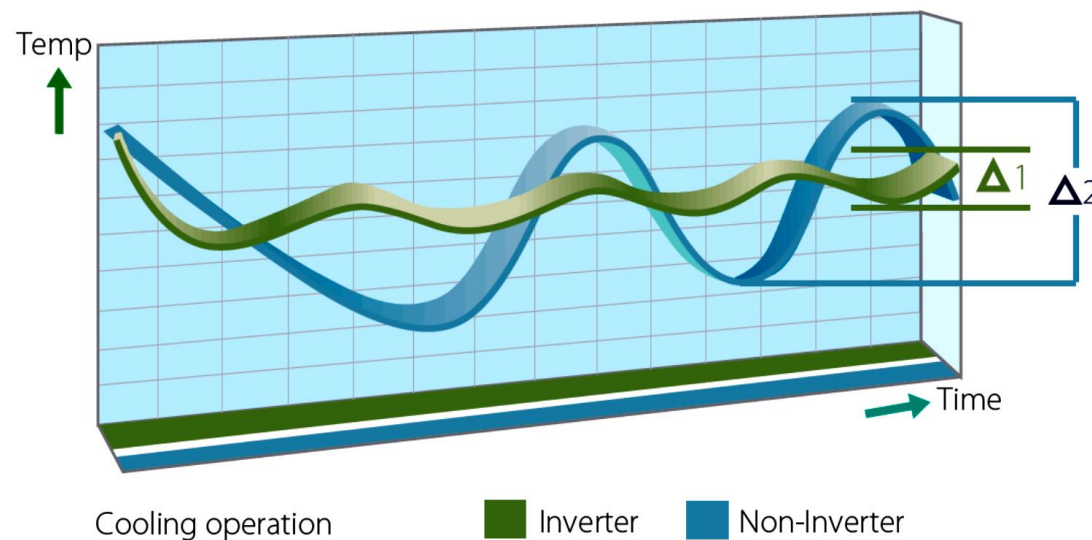
- ✓ Brushless DC (BLDC) fan motor helps to meet up-to-date heating and cooling demands with **low noise fan**, as well **low power consumption**.
- ✓ Fan blower and fan guard designed with **CFD air flow technology** (Computation Fluid Dynamics), bringing quiet and high efficient operation.



Full DC Inverter Technology

Thanks to the **inverter system** the rotary speed of compressor is precisely controlled according to the energy demand, offering:

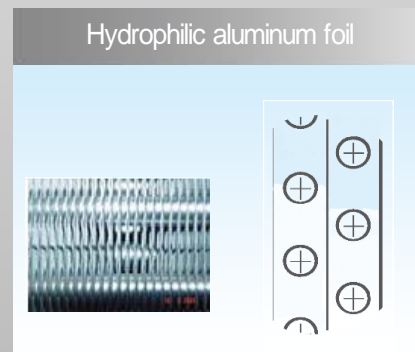
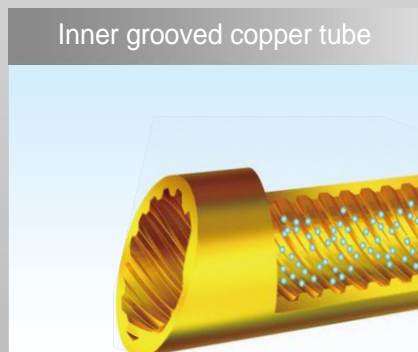
- **Start-up time** is reduced
- **Comfort conditions** are achieved in **less time** than systems without inverter
- **Lower levels of temperature fluctuation** during operation



High Efficiency heat exchanger

Finned coil Cu/Al

- **Inner-threaded** copper pipes to optimize heat exchange efficiency.
- Plate type **hydrophilic** aluminum foil to enhance water drain and to prevent ice formation
- Available only for Chiller and Heat Pump versions.



Microchannel

- **Aluminum alloy coil** with possibility of **E-coated** coating for higher corrosion resistance and longer life expectancy.
- **-30% refrigerant charge** compared to traditional solutions.



Newly designed User Interface

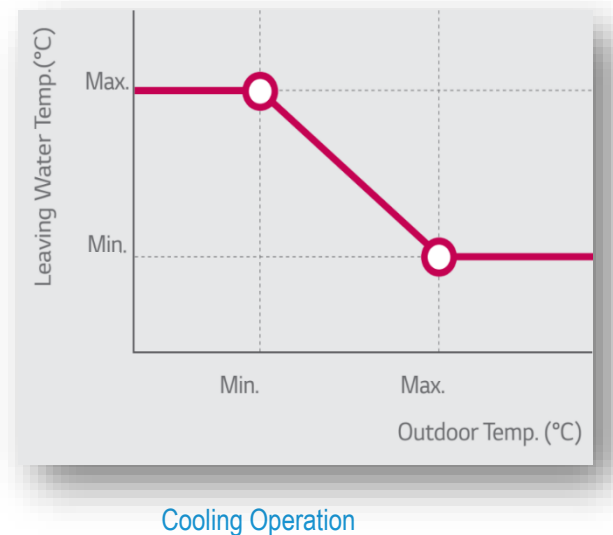
New generation integrated user interface, that guarantees a **complete control solution**:

- Unit ON/OFF
- Auto-restart function
- Time setting: 12H/24H
- Timer ON/OFF setting, Day/Weekly
- Display components status
- Query, malfunction code, parameters
- Two multi-authorization control levels
- **Modbus connection** as standard
- **Connection of up to 16 units in parallel**
- Adapt for **remote** use



Climatic compensation with outdoor air temperature

In cooling mode, the user can set the **Climate correlation curve** according to its needs, then system will set the outlet water temperature according to the outdoor ambient temperature automatically.

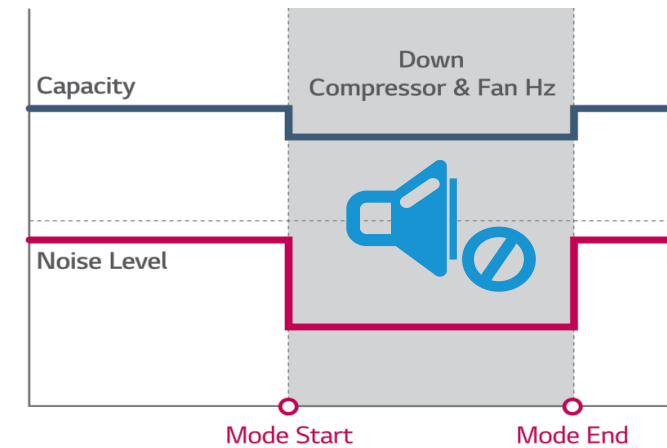


- **Cooling operation:** if outdoor temperature increases outlet water set-point will decrease automatically to allow a higher cooling capacity to the system.

Features & Specifications

Silent mode

- Silent mode operation can reduce the noise level specially during the night time.
- When the silent mode operation starts, the outdoor unit will reduce the compressor and fan motor speed to lower the noise.
- **3 silent mode levels** are available (standard, Silent, Super Silent).
- The **silent mode** operation must be set manually.



Modularity

- Manages up to 16 units in local network

Respect to a single unit with the overall capacity it offers many advantages such as:

- Increased energy efficiency
- Maximum reliability

ELFOEnergy Storm designed for modularity:

- ✓ Fast connection
- ✓ Reduced safe clearance
- ✓ No additional piping work needed on site!

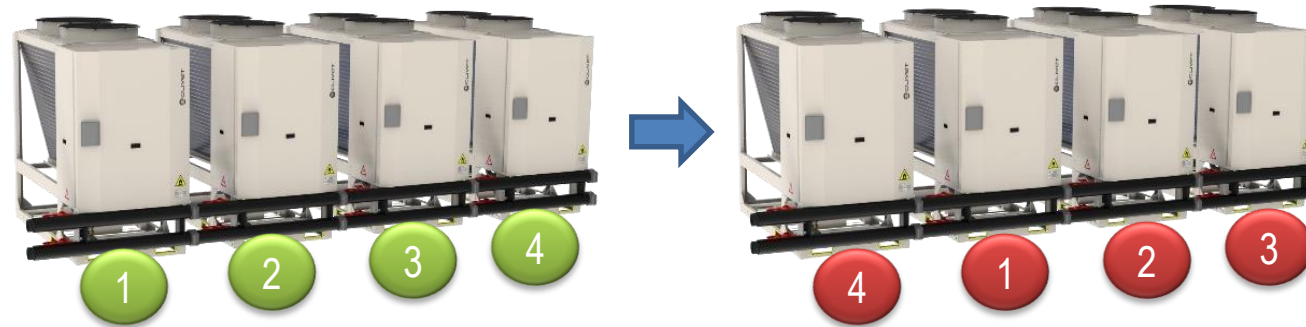


Hydraulic connections:
Up to 4 units

Operation logic of the modular system:

Horizontal saturation

- Capacity supplied is set by the master unit, based on the outlet water temperature and set-point temperature. Activation of the slaves units follows the logic «**first in first out**».
- Loading/unloading of the units depends on **current temperature distance from the set-point** and the ones **before the unit loaded/unloaded**.

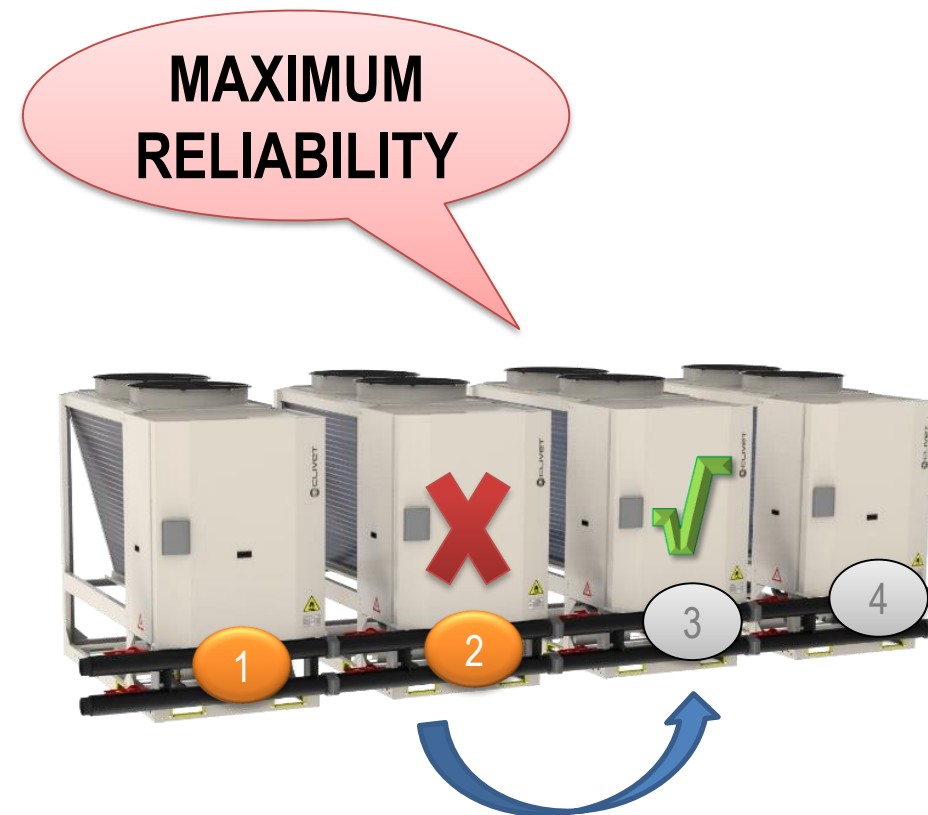


True redundancy!

- In a multi-unit system, if one module fails, the other modules provide **backup** so that the system can continue operating.
- **Separate module electrical feeds** provide true electrical redundancy.
- **Independent refrigerant circuits** per module provide true mechanical redundancy.

Protection mode

- **Protection mode** assures system continuity when a malfunction occurs to Master unit
- If **Master unit fails**, simply assign Master address to another module



More efficient system operation!

**HIGHER
OVERALL
EFFICIENCY**

- Different size can be combined together!

Perfect solution when **full capacity** is needed only for **short time** during the year

- **Horizontal saturation** improve part load performance

When FULL system's capacity is not requested, **modules** do not operate at 100%



Eg. System requiring 50% of installed capacity

Modularity

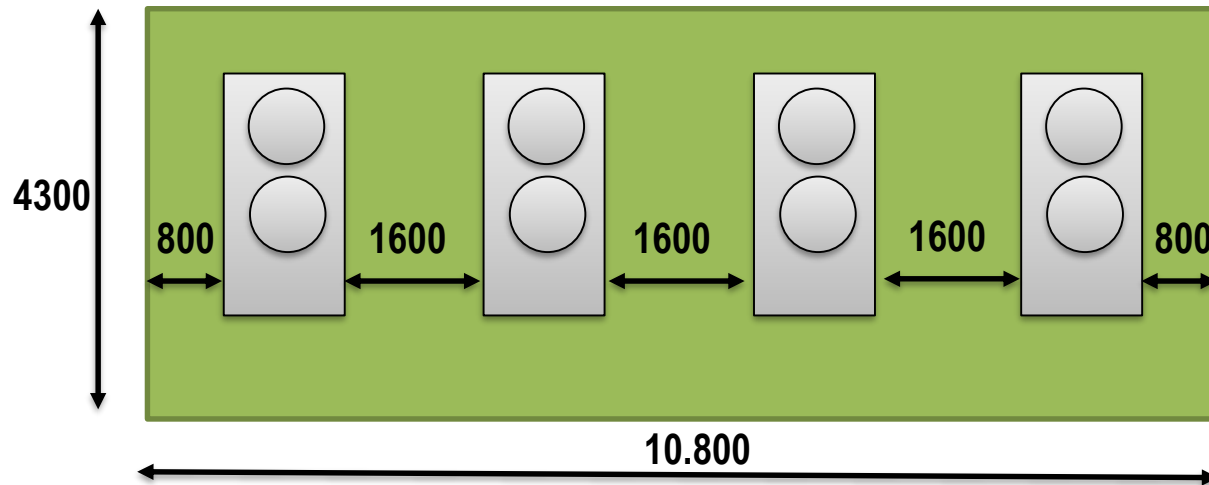
Space-saving installation with all the benefits of modularity

- Optimized air flow for minimum clearance.
- Frame design specially developed for modularity.
- **INTEGRATED system tank**

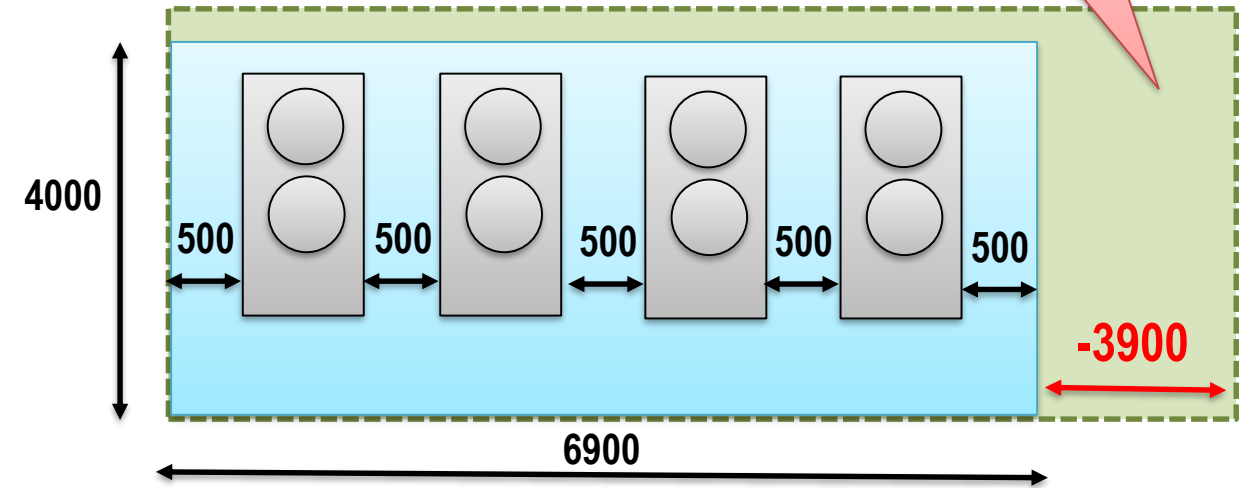
CASE STUDY:

- 240 kW cooling load
- Same redundancy

Competitor A
Size 302 – 4x60 kW



Clivet ELFOEnergy Storm
Size 20.2 – 4x60 kW



**40%
SPACE SAVING**

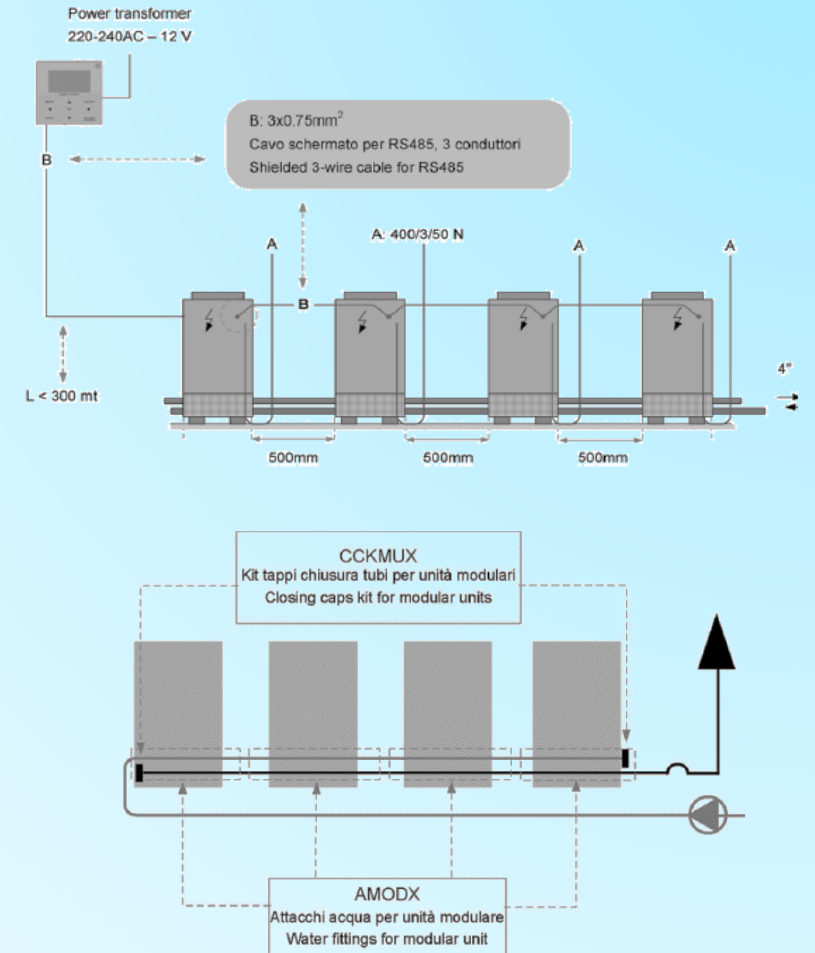
Modularity

- **Easy to design**
 - **Simple to configure**
 - **Fast to install**

PLUG AND PLAY
Time and money saving

- **No additional software or electronic devices** to be supplied:
 - Modular system can be easily **set on wired controller**
 - **Just a wire** to connect the units
- **Piping connection** for modularity provided by Clivet
 - **fast and simple** to install
- Units can be configured with integrated system or 3-way valve
 - **Reduced time and intallation work**

Schematics with simple instructions on technical documentation



FREE-COOLING



THE BEST FEATURES AND MOST ADVANCED TECHNOLOGY

- **Direct Free-cooling**
- **New refrigerant R-32**
- **High Seasonal efficiency – SEER up to 4,56**
- **SEPR up to 5,84**
- **Scroll DC inverter compressor and DC inverter fan**
- **Microchannel condensing coil**
- **Cooling operation from -25°C to +48°C air temperature**
- **Chilled water down to 5°C**
- **Silent mode and super silent mode** for night operation
- **Modular solution**
- **Built-in solution** for hydronic pump and system tank

Nominal cooling capacity:
(A35/W7) from **50** to **81 kW**



ELFOEnergy Storm EVO FC: the Range

Series	WSAT-YES FC 18.2 – 35.2				
Size	18.2	20.2	25.2	30.2	35.2
Cooling Capacity [kW] (A35/W7)	50	56	69	74	81
Dimensions					
n° compressors / n° circuits	2/1				
Refrigerant	R-32				
Power Supply	400/3/50+N				

Key Technology

ELFOEnergy Storm EVO brings best energetic performances thanks to:

- **DC Inverter technology**, ideal for the operation at partial load.
- **Electronic expansion valve**, that quickly and precisely adapts to the effective load required.
- The **plate heat exchanger** maximizes the thermal efficiency thanks to large exchange surfaces.
- **Microchannel Coil** ensures an high efficiency heat exchange, reducing the refrigerant charge.

EER up to 2,85
A35/W7

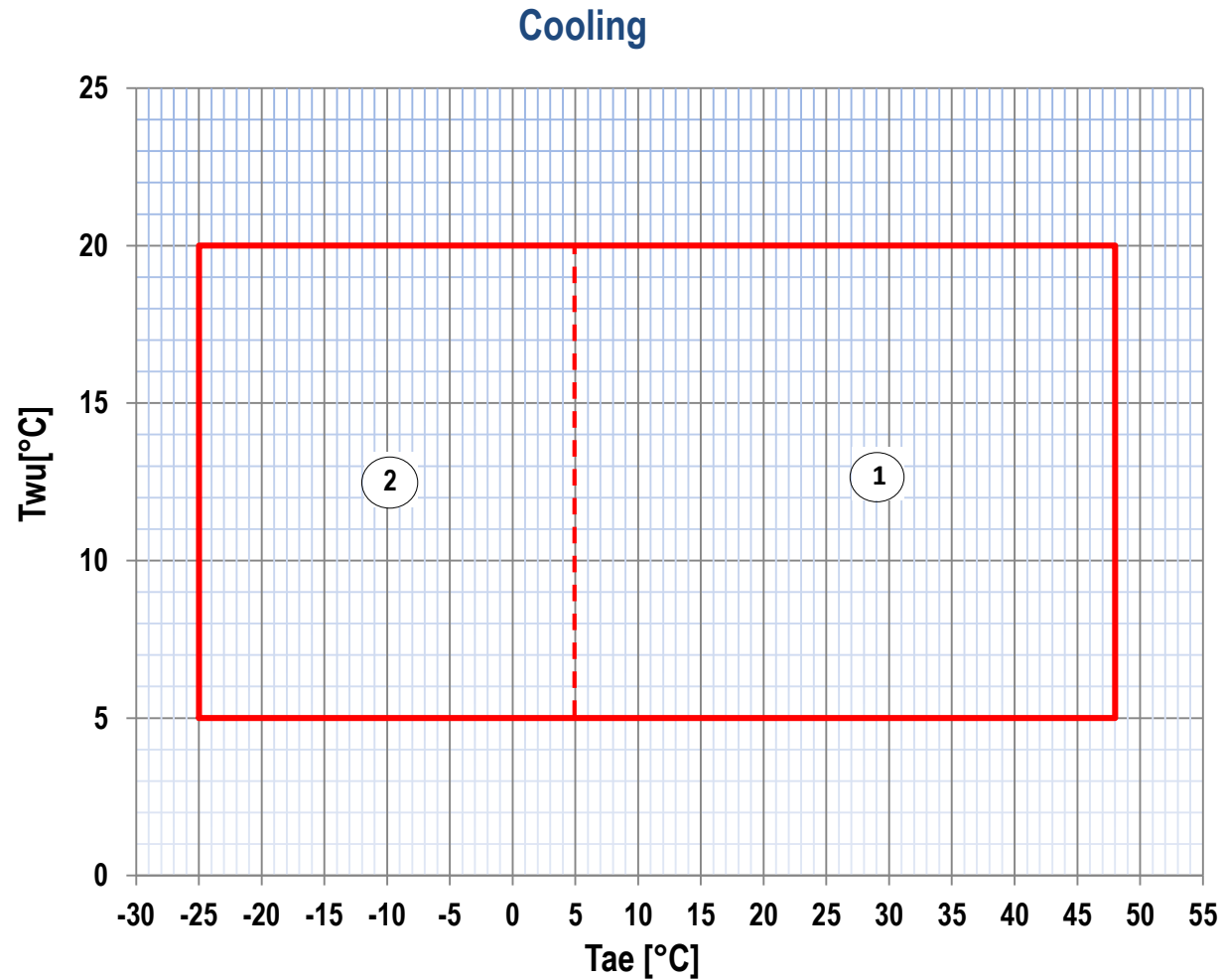
SEER up to 4,81

SEPR up to 5,84

LOT21 READY!!!



Extended operation ranges

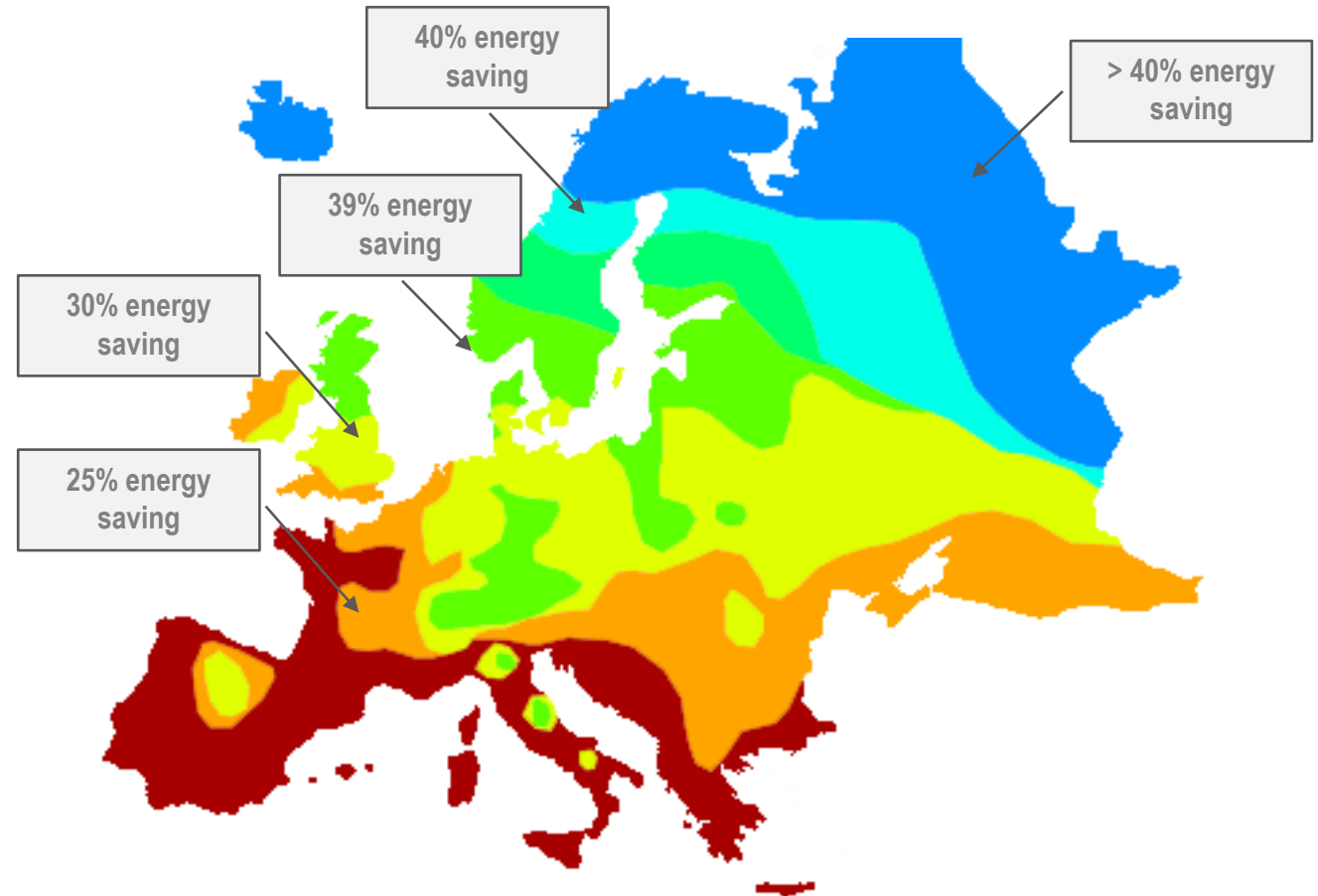


Chilled water from **-15°C** up to **+48°C** of outdoor air temperature!

- T_{wu} [°C] = Leaving exchanger water temperature
- T_{ae} [°C] = External exchanger inlet air temperature
- ① = Normal operating range
- ② = Operating range with glycol

FREE-COOLING for relevant energy savings

- When the outdoor air temperature is lower than the temperature of the system's return water, the **FREE-COOLING** system recovers cold from the external environment and **reduces the operation of the compressors until they stop completely.**
- For continental climates (air temperatures often lower +15°C) the **saving with FREE-COOLING** is higher than **40%**



DIRECT FREE-COOLING

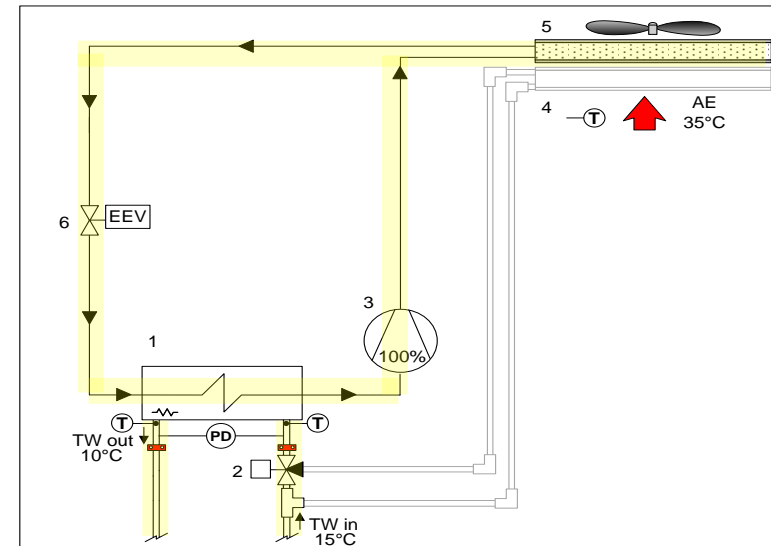
Management logic

There are **three** main operating modes, which basically differ in terms of position of the three-way switching valve and compressors activation.

– SUMMER SEASON: High external temperature

- FREE-COOLING = OFF
- In operation = Only compressors

➔ Operation as a traditional chiller

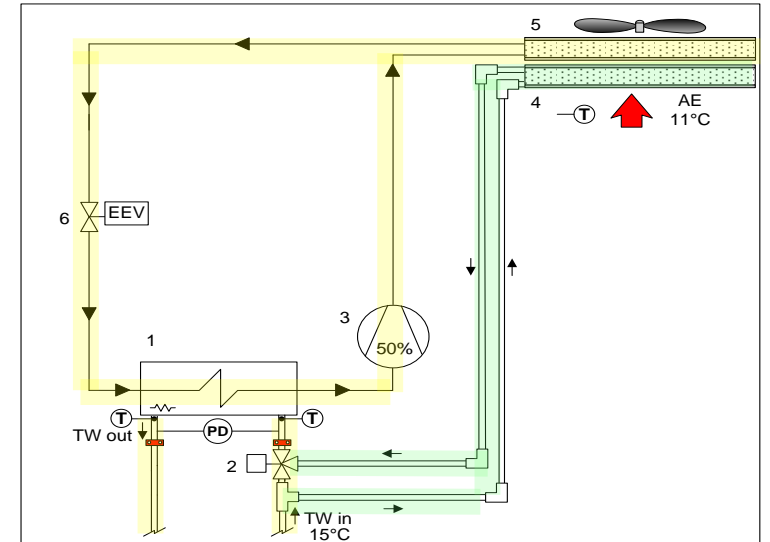


DIRECT FREE-COOLING

– INTERMEDIATE SEASON: Mid external temperature

- ❑ FREE-COOLING = ON
- ❑ Compressors + FREE-COOLING

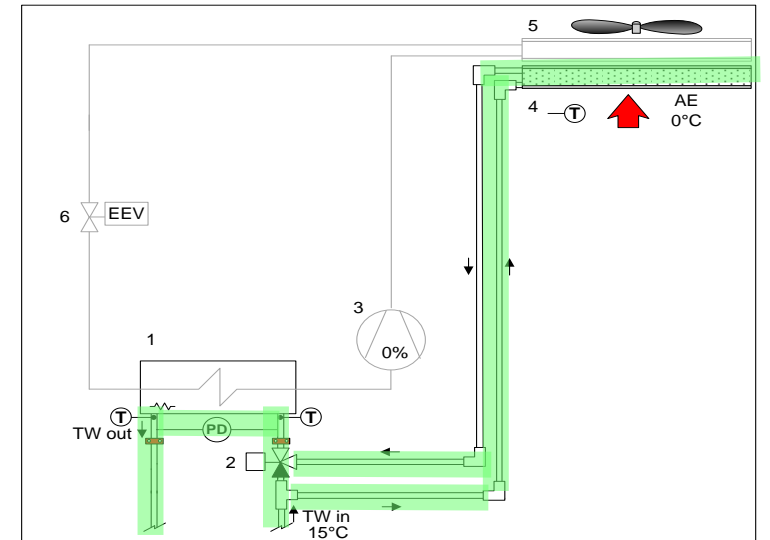
➔ First cooling in a 'natural way and free of charge', provides any missing capacity via the cooling circuit using compressors with partial operation.



– WINTER SEASON: Low external temperature

- ❑ Full FREE-COOLING
- ❑ Compressors = Off

➔ the outdoor air temperature brings the solution at the outlet of the FREE-COOLING coils already at the temperature required by the utility: **maximum saving!**



ZET = Zero Energy Temperature

ZET

Outdoor air temperature at which the unit is able to supply the **whole design cooling capacity** (@30°C outdoor air) using **fans only**: **compressors are completely OFF**



Even at **positive** air temperature:
Storm Evo presents
ZET values up to 1,6°C

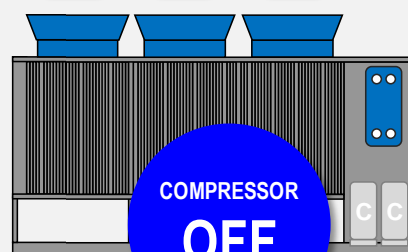
COOLING CAPACITY
(FREECOOLING)



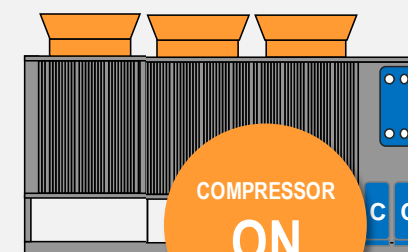
COOLING CAPACITY
(MECHANICAL COOLING)



ZET

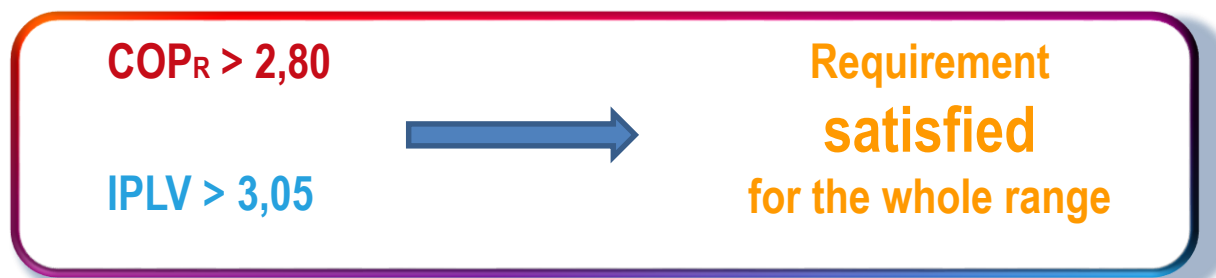


30°C



LEED compliant

ELFOEnergy Storm satisfies prerequisites related to “Minimum Energy Performance” and “Fundamental Refrigerant Management” of LEED certification.



AHRI performances reported in the technical documentation:

Size			18.2	20.2	25.2	30.2	35.2
AHRI data							
Cooling capacity (AHRI 550/590)	kW	6	58,2	65,6	76,7	83,7	90,7
Total power input (AHRI 550/590)	kW	6	12,9	14,6	16,5	18,7	20,8
COP_R		6	4,51	4,50	4,64	4,48	4,36
IPLV		6	4,85	4,88	4,85	4,77	4,70

CONFIGURATIONS

Configurations

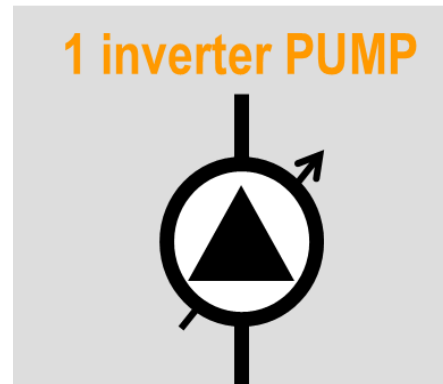
➤ Hydronic assemblies

Optional integrated pumping groups save:

- Time and cost for the set-up
- Floor area for pumping equipment and relevant clearance

Available options:

- Inverter pump
- System tank



CONCLUSIONS

THE BEST FEATURES AND MOST ADVANCED TECHNOLOGY

- Direct Free-cooling
- New R-32 refrigerant
- 5 models are available for any capacity needs
- Top performances for a even higher seasonal efficiency for all sizes:
 - ZET up to 1,6°C
 - SEPR up to 5,84
- Cooling operation from -25°C to +48°C air temperature
- The most advanced Full DC technology
- Modular operation: up to 16 units managed in a local system



Thank you!

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