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→ WATER-TO-WATER HEAT PUMP - WATER CHILLER

## **Dynaciat** *Power*

*Smart equipment that  
boosts performance*



# AGENDA

---

- ◆ RANGE
- ◆ DESIGN
- ◆ EFFICIENCY-COMPETITIVENESS
- ◆ RUNNING LIMIT
- ◆ SOUND LEVEL
- ◆ ACCESSIBILITY-HYDRAULIC
- ◆ CONTROL
- ◆ OPTIONS
- ◆ LGN serial



# AGENDA

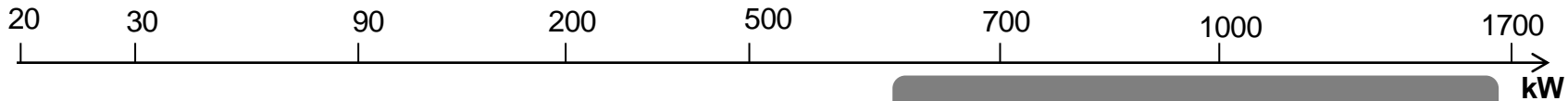
---

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## WC Range



**+** Wide range: an answer adapted to each needs



*dynaciAT*<sup>POWER</sup>



**11 sizes of water / water chiller and heat pump**



**LG Cooling capacity from 200 to 700 kW**



**LG Heating capacity from 250 to 820 kW**



**3 ACOUSTICS VERSIONS  
STD – LN - XLN**

# The range

**2 refrigerant circuits**

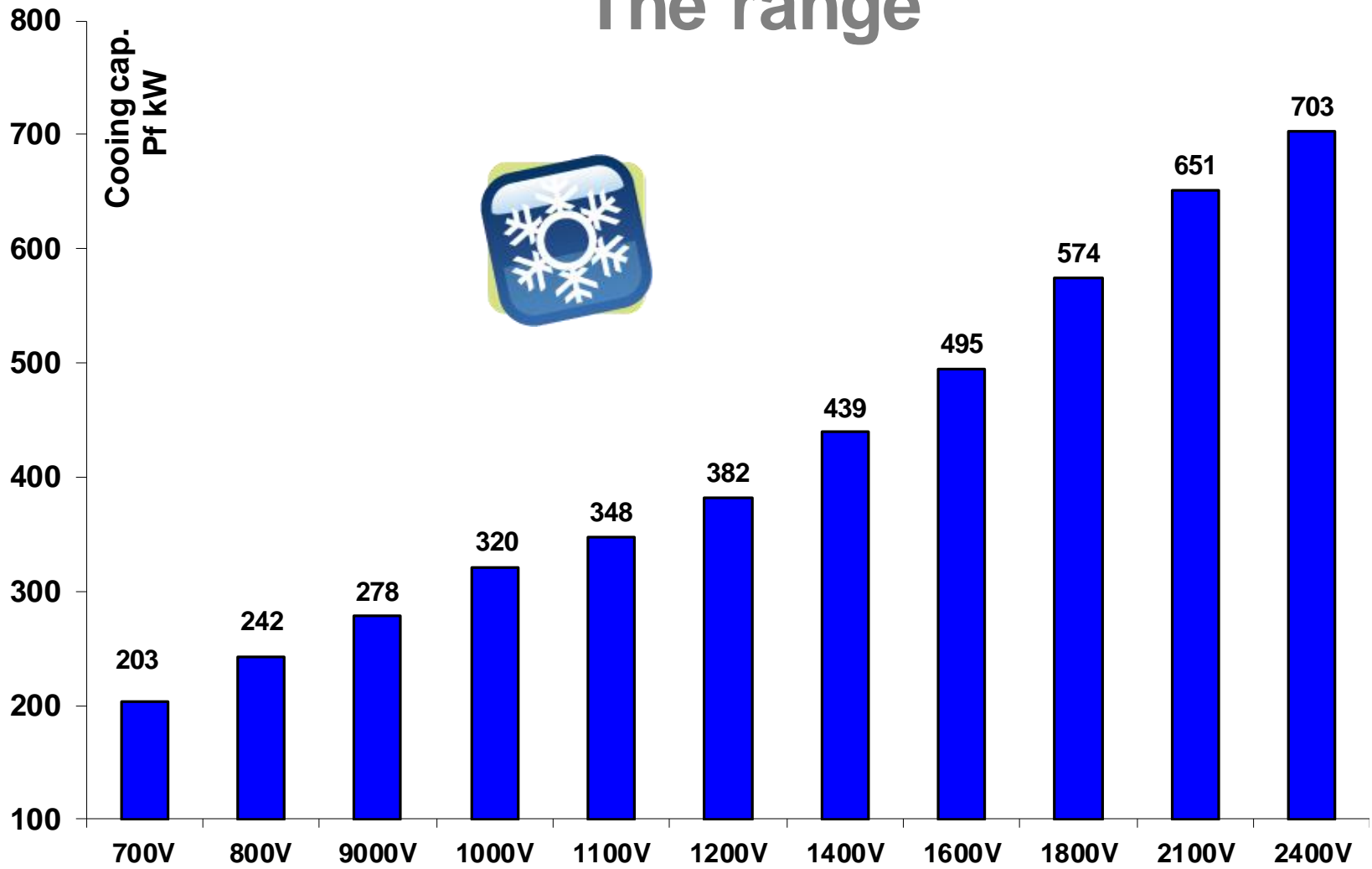
**700V  
800V  
900V  
1000V  
1100V  
1200V**

**1400V  
1600V**

**1800V  
2100V  
2400V**

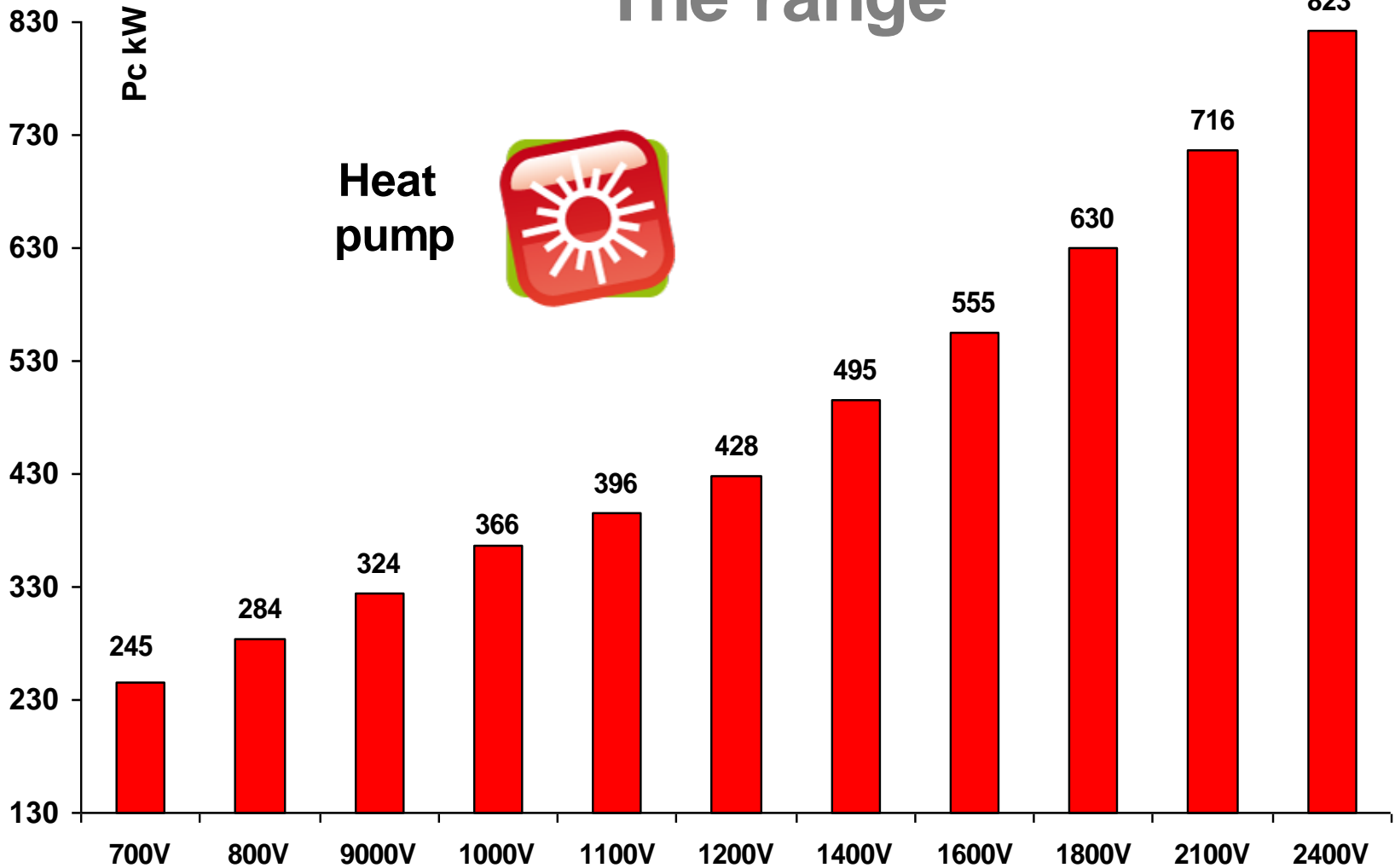


## The range



Chilled water = 12°C / 7°C    Hot water = 30°C / 35°C

# The range



Hot water = 40°C / 45°C Chilled water inlet = 10°C with same water flow than cooling mode



# AGENDA

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## Design



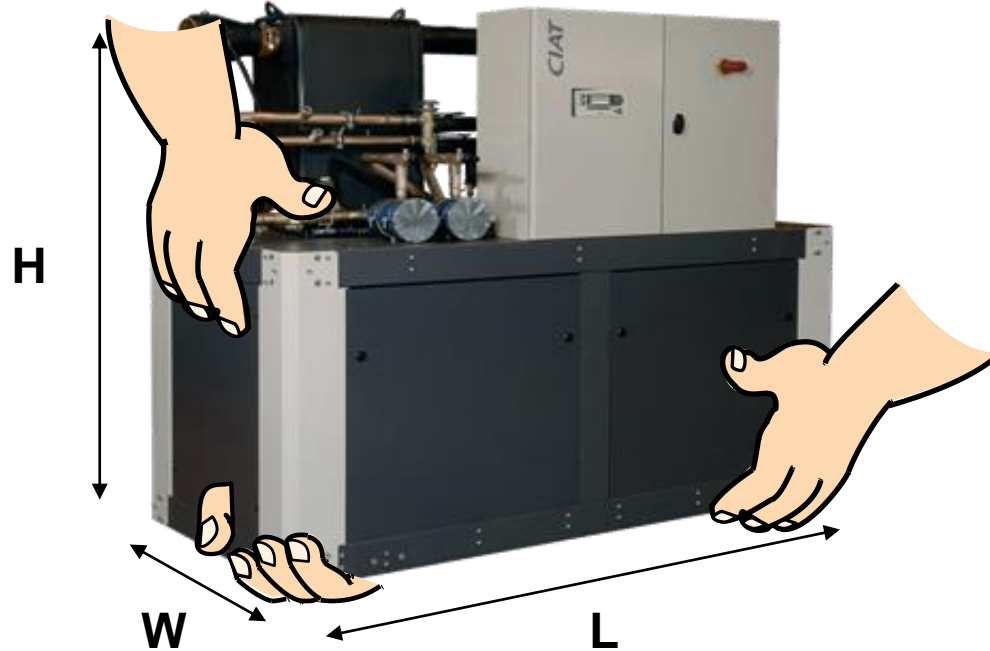
**STANDARD VERSION**

**LN – XLN VERSIONS**



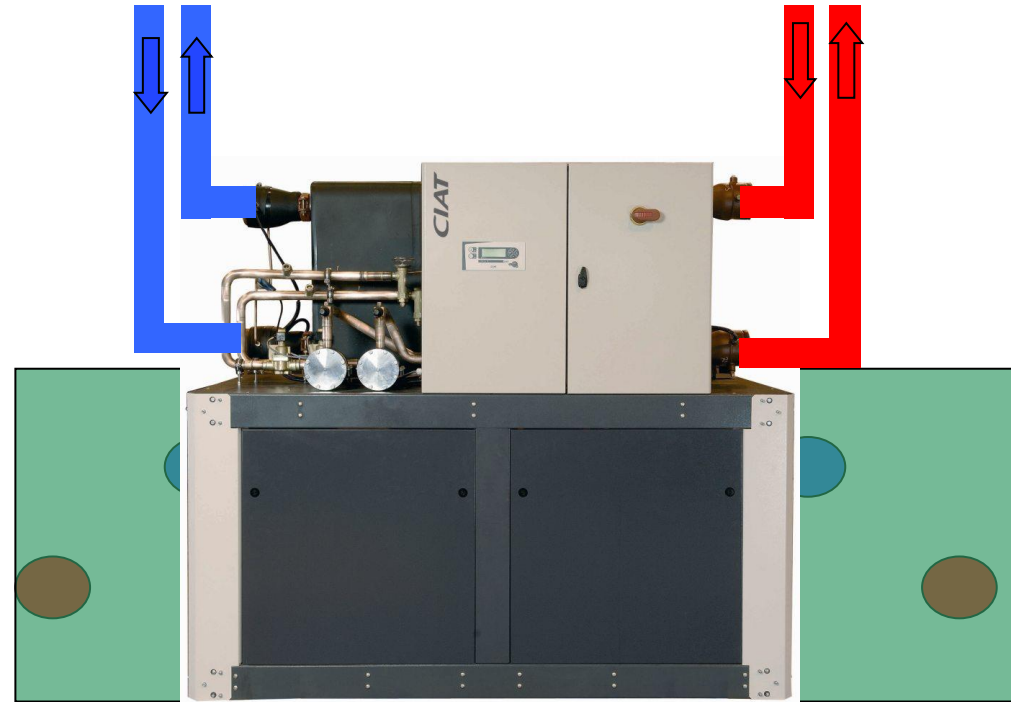
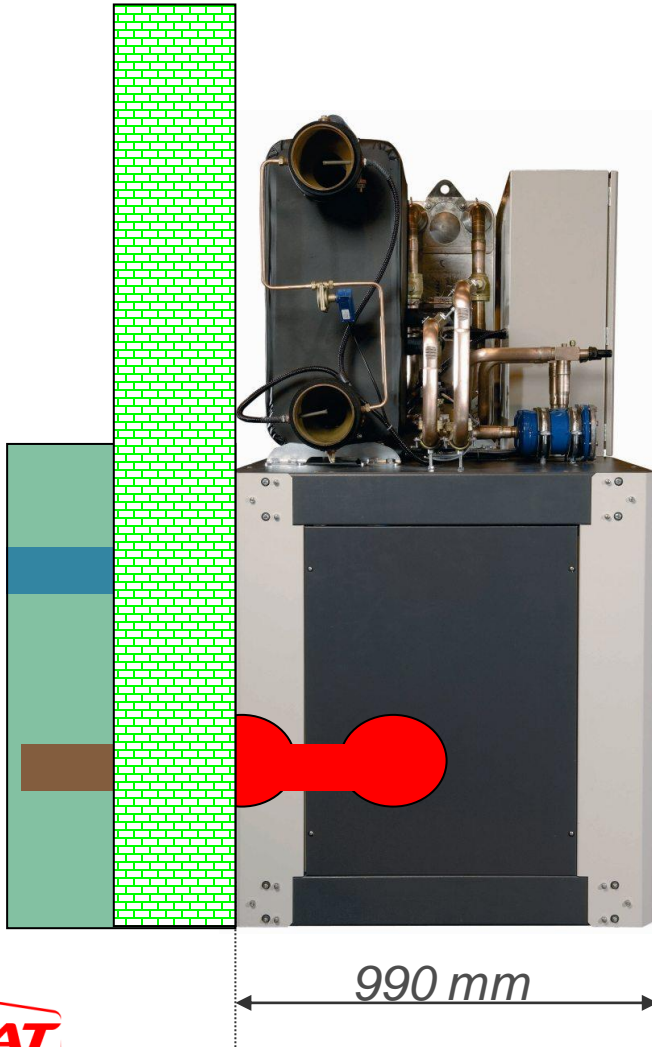
## Design

**Compact units  
up to 200 kW / m<sup>2</sup>**



Modèles	Pf kW	Dimensions (mm)		
		L	P	H
700V à 1200V	<b>218 à 386</b>	2099	996	1869
1400V à 1600V	<b>444 à 500</b>	2499		1970
1800V à 2400V	<b>584 à 716</b>	3350		

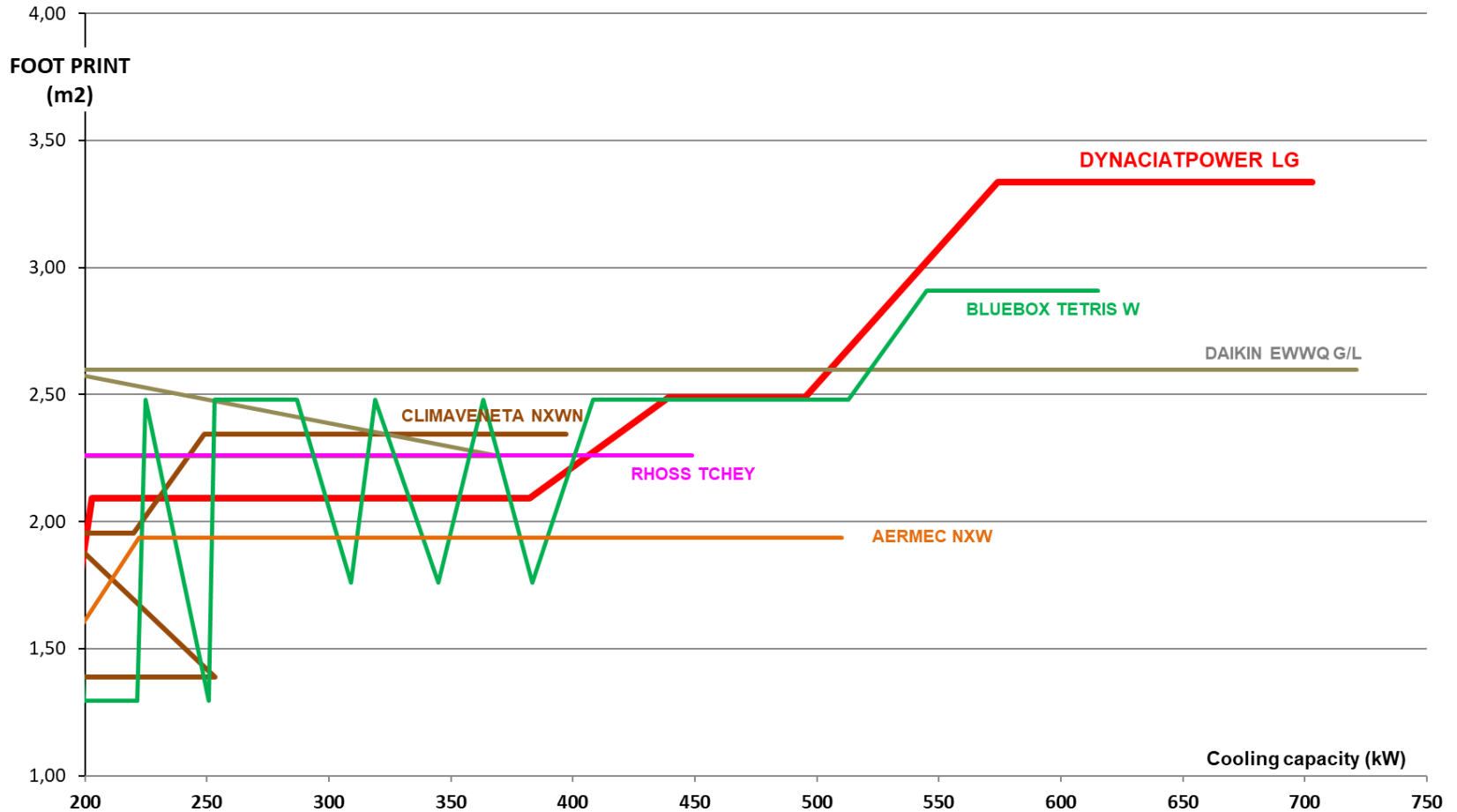
## Design



Foot print reduced  
40% to 50% vs Screw Solution

Easy integration in all  
technical rooms

## Benchmark Foot Print



DYNACIAT<sup>POWER</sup> foot print is similar than competition

## Components



Latest generation of scroll compressors



=



**2 refrigerant circuits** brazed plates evaporator

**2 refrigerant circuits** brazed plates condenser



**CIAT** Controller  
**CONNECT2**

## Brazed plates heat exchanger

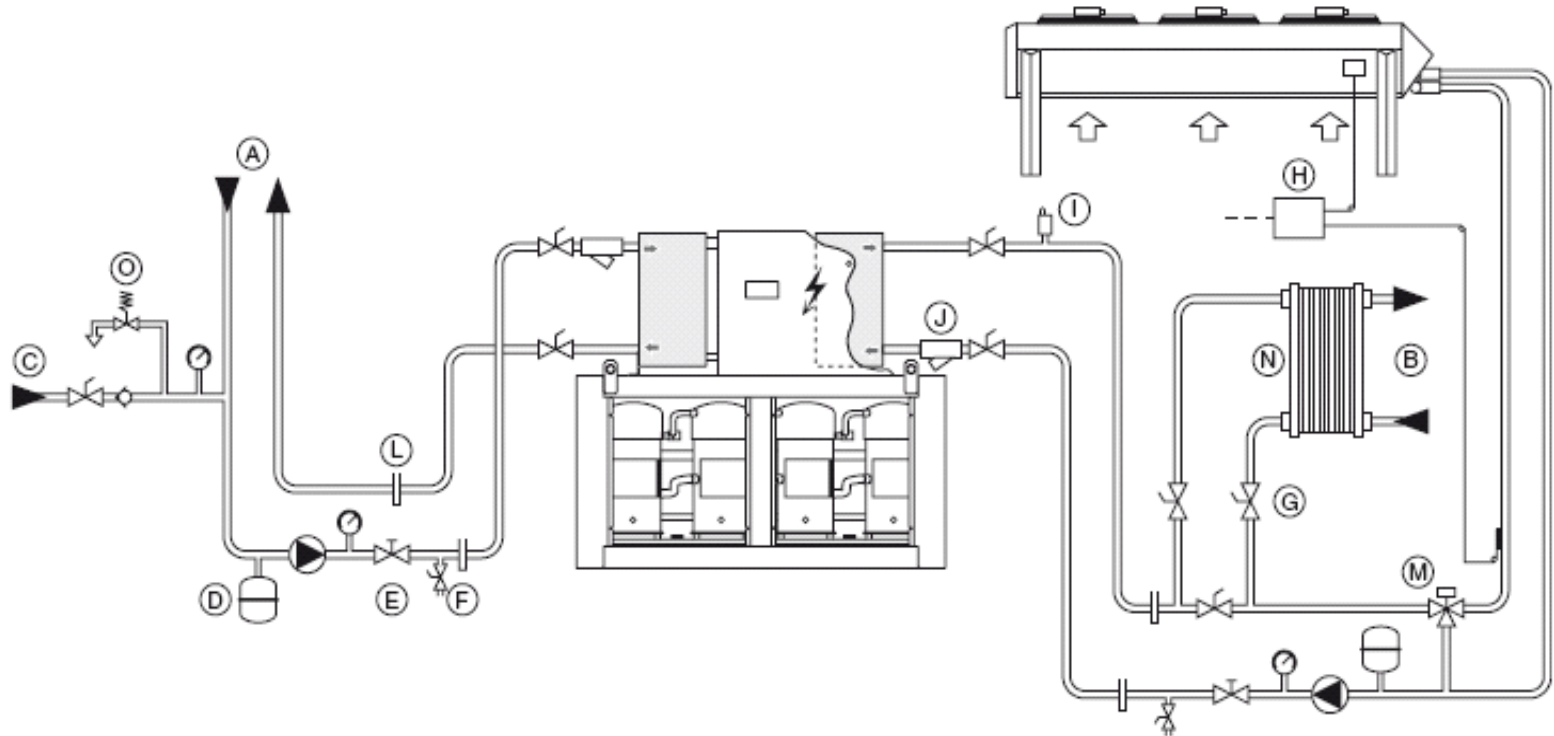
### Maximum cooling capacity in a minimum place

- ▶ **Reduction of refrigerant charge**
- ▶ High efficiency vs shell and tubes
- ▶ Plates in stainless steel 316L
- ▶ VICTAULIC connection
- ▶ Water differential pressure switch mounted
- ▶ ARMAFLEX thermal insulation



## FUNCTIONAL DRAWING

### COOLING WITH DRY-COOLER



- (A) Chilled water circuit
- (B) Recovery water circuit
- (C) Water supply valve
- (D) Expansion vessel
- (E) Control valve

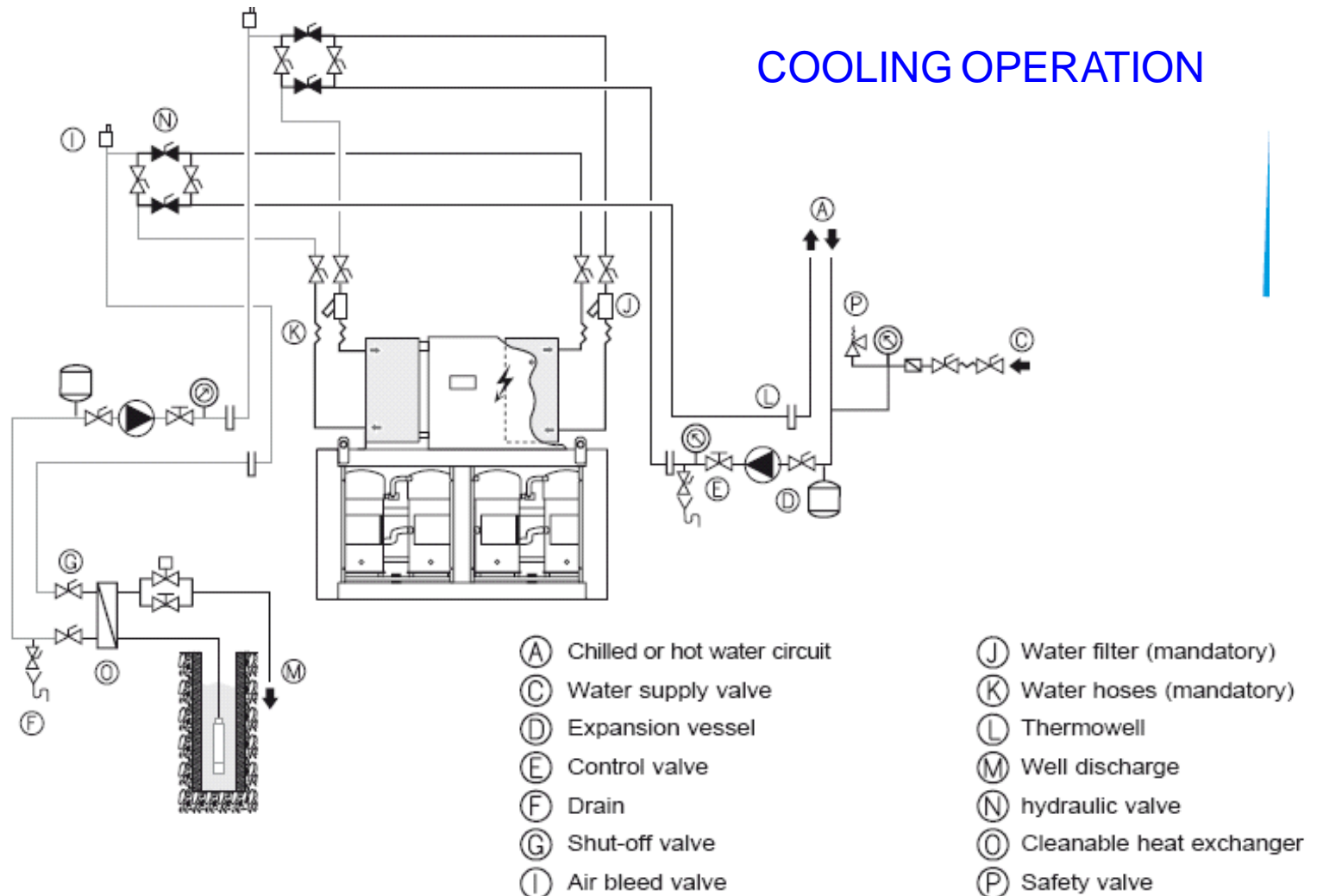
- (F) Drain
- (G) Shut-off valve
- (H) Temperature controller
- (I) Air bleed valve
- (J) Water filter (mandatory)

- (L) Thermowell
- (M) 3-way hydraulic valve
- (N) Cleanable heat exchanger
- (O) Safety valve



## FUNCTIONAL DRAWING

### HEATING/COOLING HYDRAULIC INVERSION





# AGENDA

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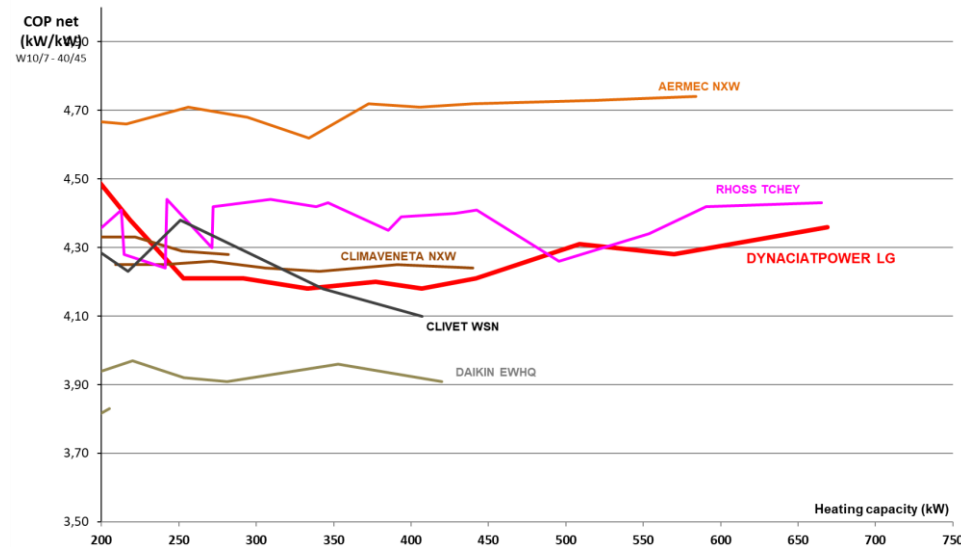
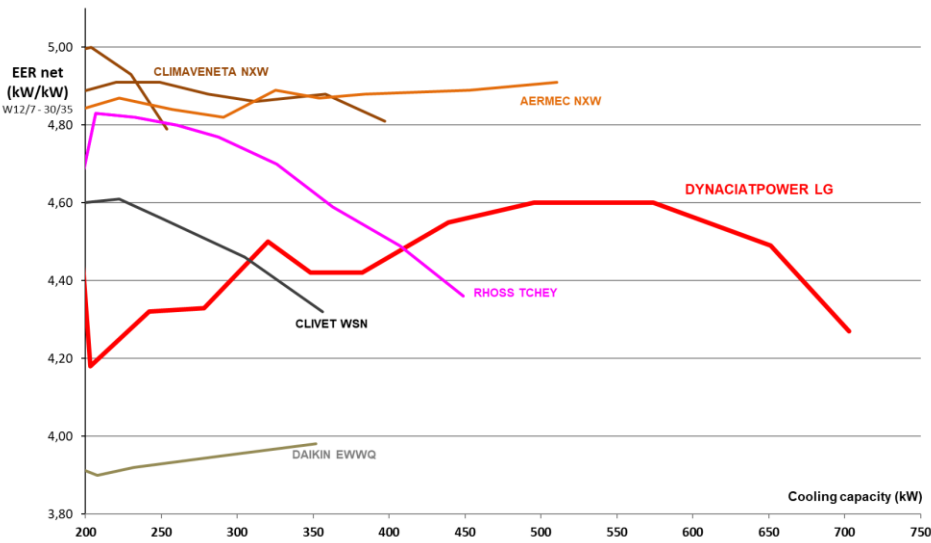
## FULL LOAD PERFORMANCES



### EER



### COP

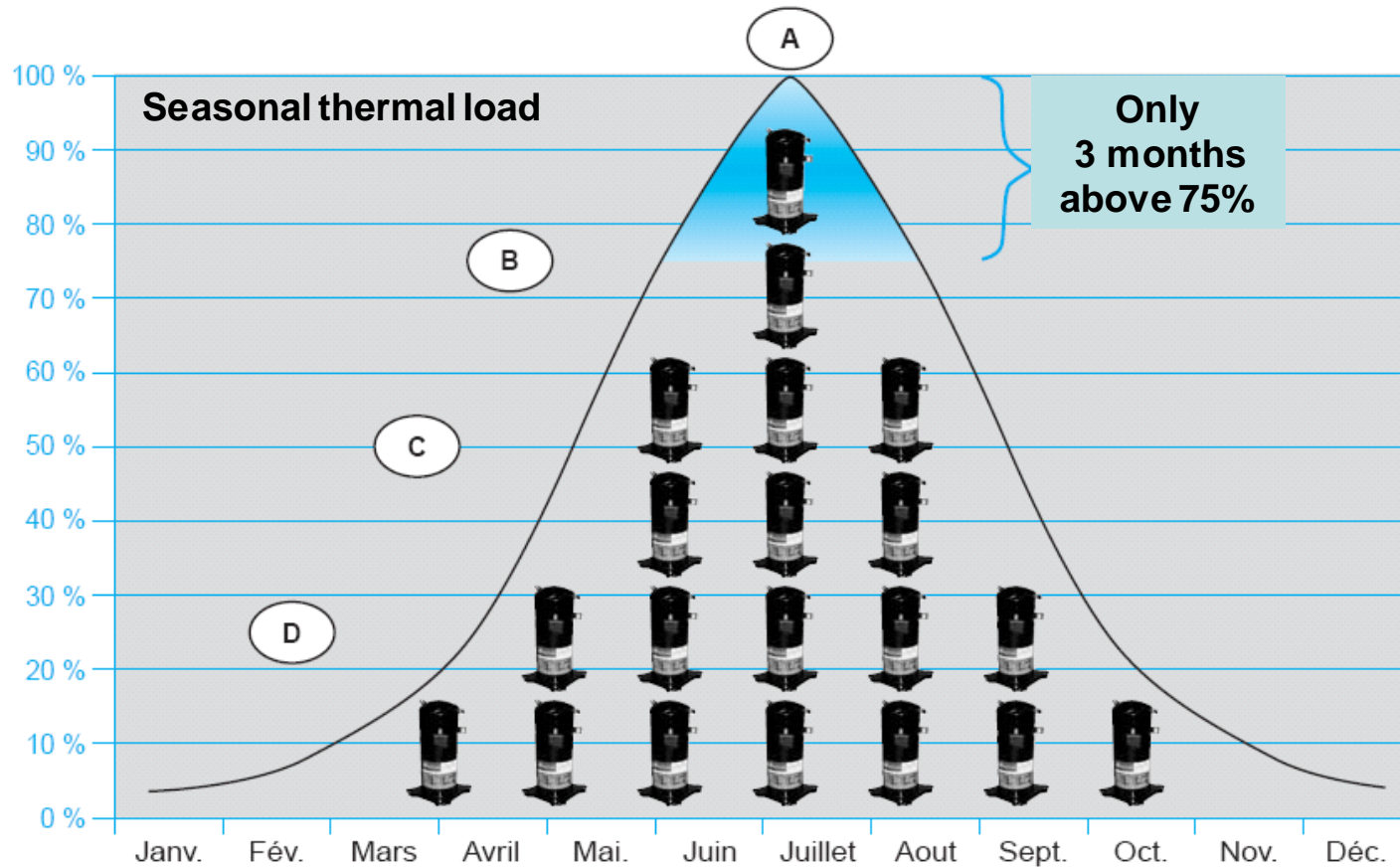


Do not focus on the EER It accounts for only 3% of the annual power consumption

➔ In HVAC let us focus on the annual energy efficiency SEER & SCOP

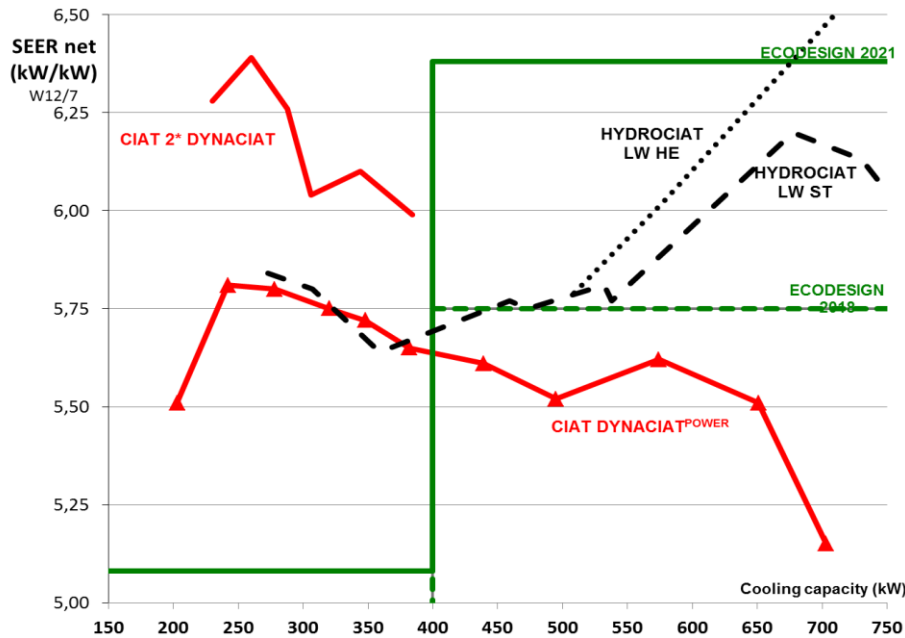
➔ In Process let us focus on SEPR

## SCROLL technology Seasonal optimization





### COMFORT SEER

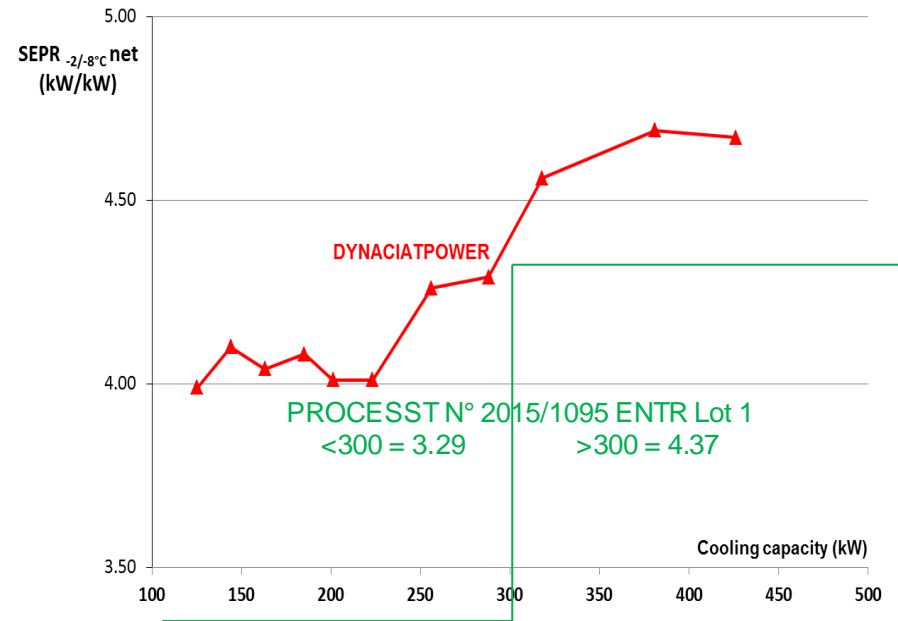


Up to 400kW DYP LG is efficient as a screw solutions

ECODESIGN 2021 SEER up to 400kW



### PROCESS SEPR

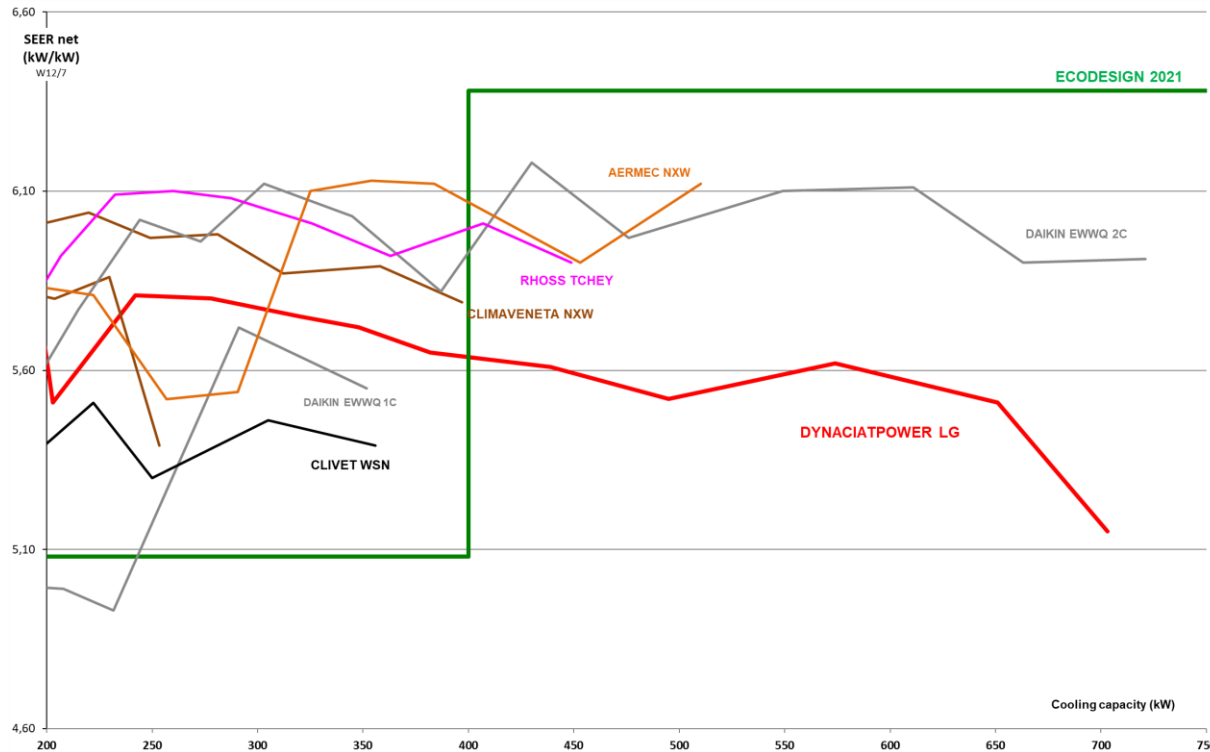


✓ ECODESIGN Process SEPR

## SEASONAL PERFORMANCES – Part Load



### COMFORT SEER



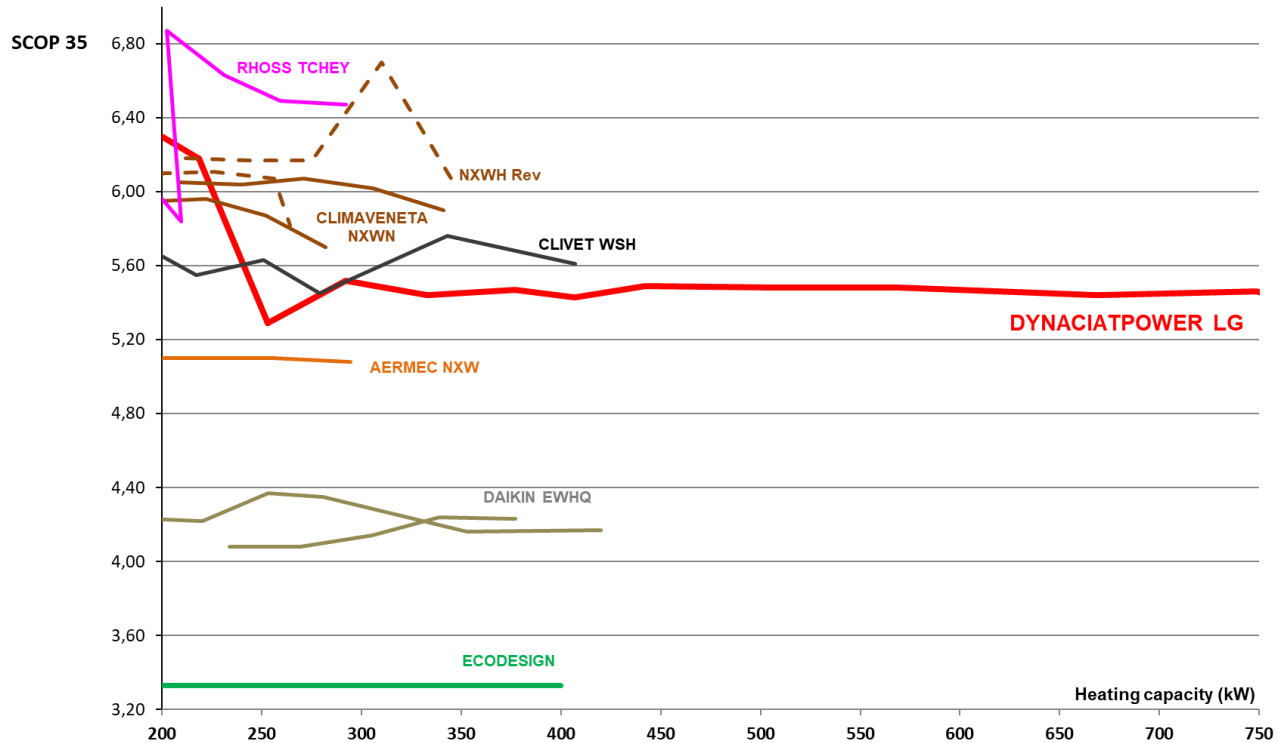
**Bellow 400kW performances** similar to competition

No Scroll offer SEER compliance > 400kW  
 Units > 400kW sales as HP (SCOP)

## SEASONAL PERFORMANCES – Part Load





### SCOP




No datas from competition over 400kW  
(Ecodesign limit for HP)



## ECODESIGN COMPLIANCE

		HEATING T2 SCOP 35° SCOP 55° Heating 813/2013		COMFORT SEER 12/7° or 23/18° N° 2016/2281 ENER Lot 21		PROCESS SEPR 12/7° N° 2016/2281 ENER Lot 21	
		Sept 2017	Sept 2017	Janv 2018	Janv 2021	Janv 2018	Janv 2021
< 400 kW		2.95	3.33	4.98	5.08	6.5	7.0
400 - 1500 kW		NA	NA	5.75	6.38	7.5	8
Size	Pnom. Eurovent	 5.59		 5.78			
700	217 kW						
800	251 kW						
900	288 kW						
1000	327 kW						
1100	356 kW						
1200	385 kW						
1400	443 kW						
1600	499 kW	NA					
1800	582 kW						
2100	657 kW						
2400	713 kW						

		PROCESS SEPR -2-8° N° 2015/1095 ENTR Lot 1		
		July 2016	July 2018	
< 300 kW		2.86	3.29	
> 300 kW		3.8	4.37	
Size	P. Design Process	 3.99		
<300 kW	700			125 kW
	800			144 kW
	900			163 kW
	1000			185 kW
	1100			201 kW
	1200			223 kW
	1400			256 kW
>300 kW	1800	318 kW		
	2100	381 kW		
	2400	426 kW		

Compliance SCOP & SEPR-8°C  
= Conformity = CE mark

# AGENDA

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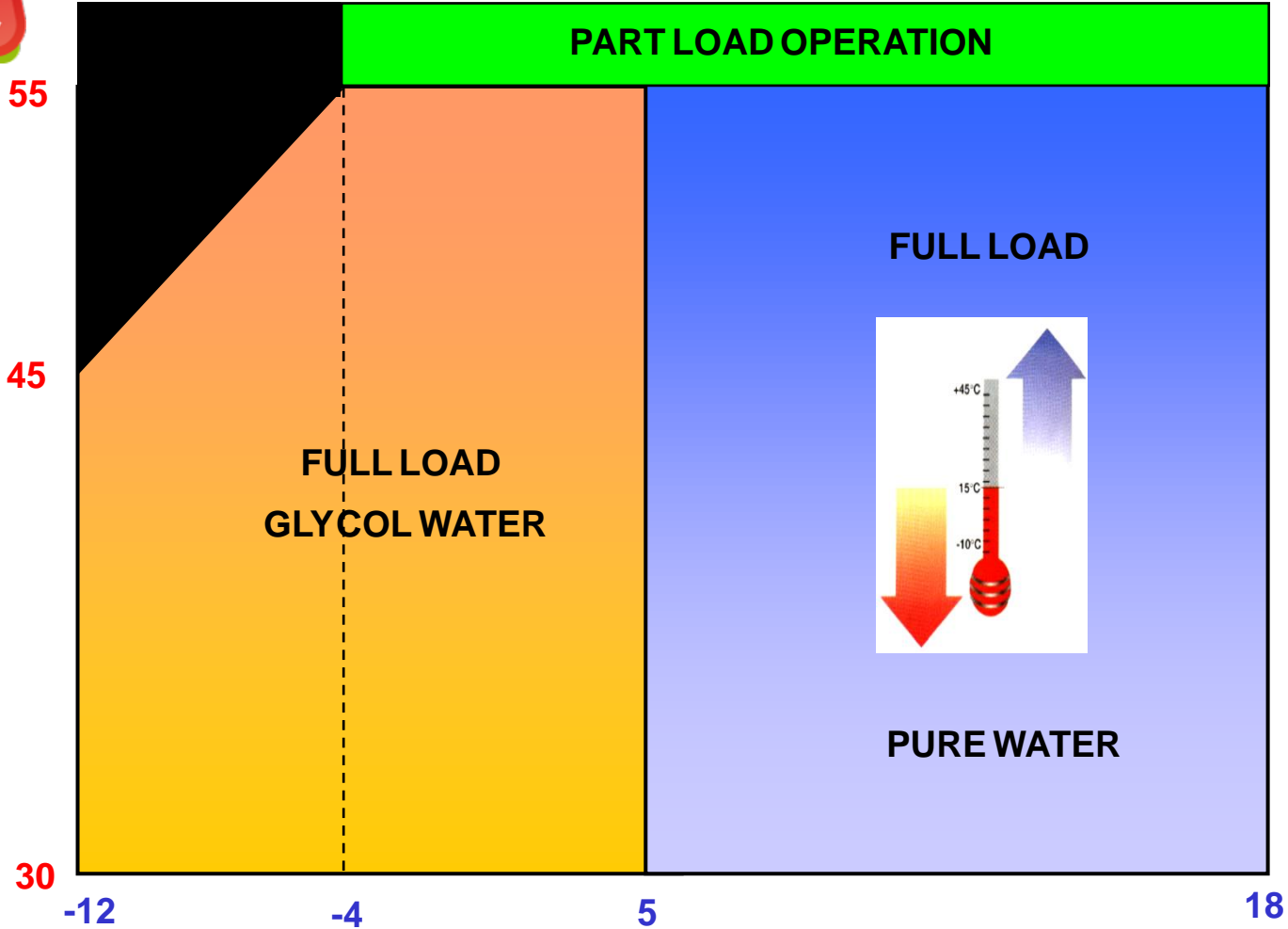
- ◆ RANGE
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# Running limit



Condenser water outlet °C



Evaporator water outlet °C

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3 versions

Standard

Low Noise

Xtra Low Noise



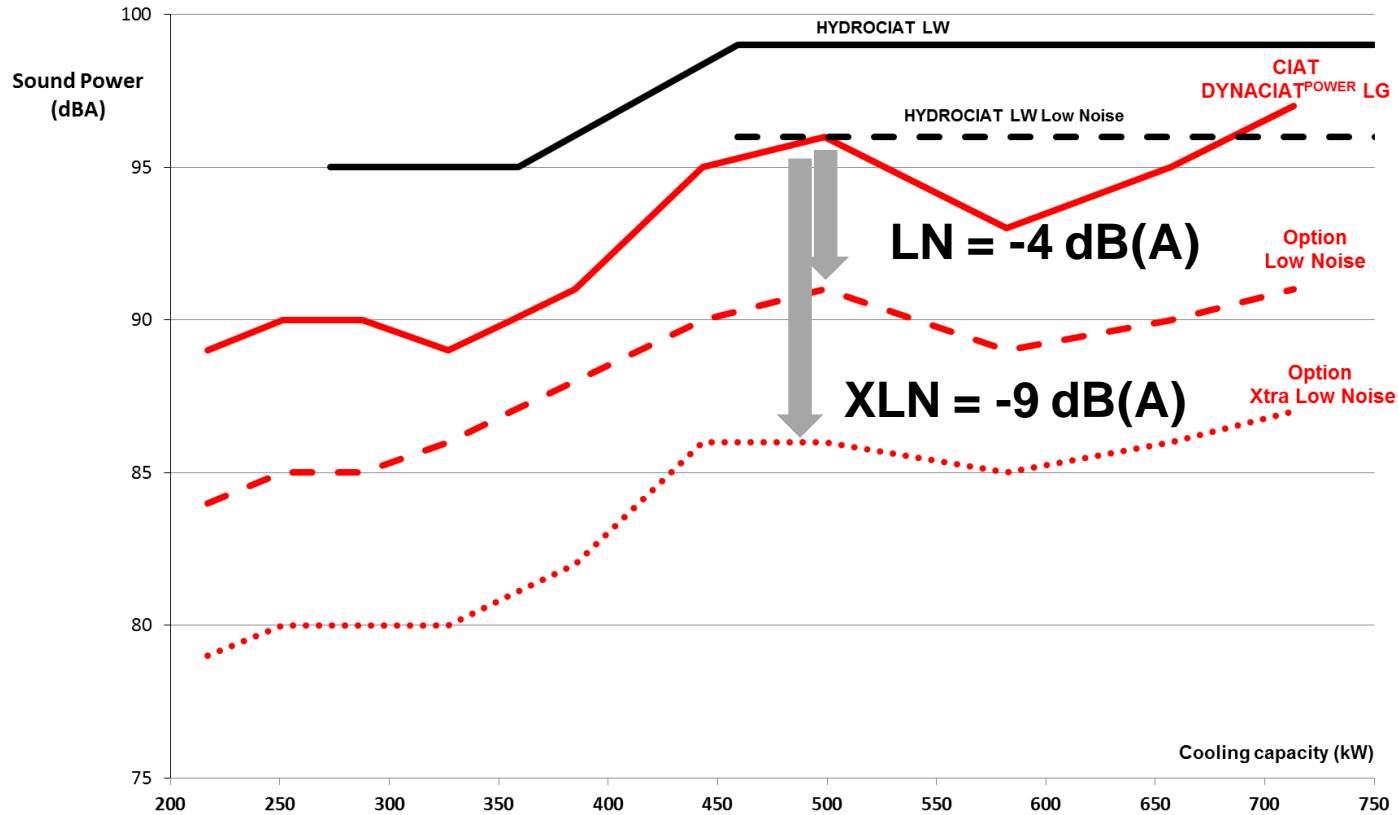
Casing only (LN)

Casing + phonic insulation (XLN)



# *dynaciat*<sup>POWER</sup>

## Acoustic Performance



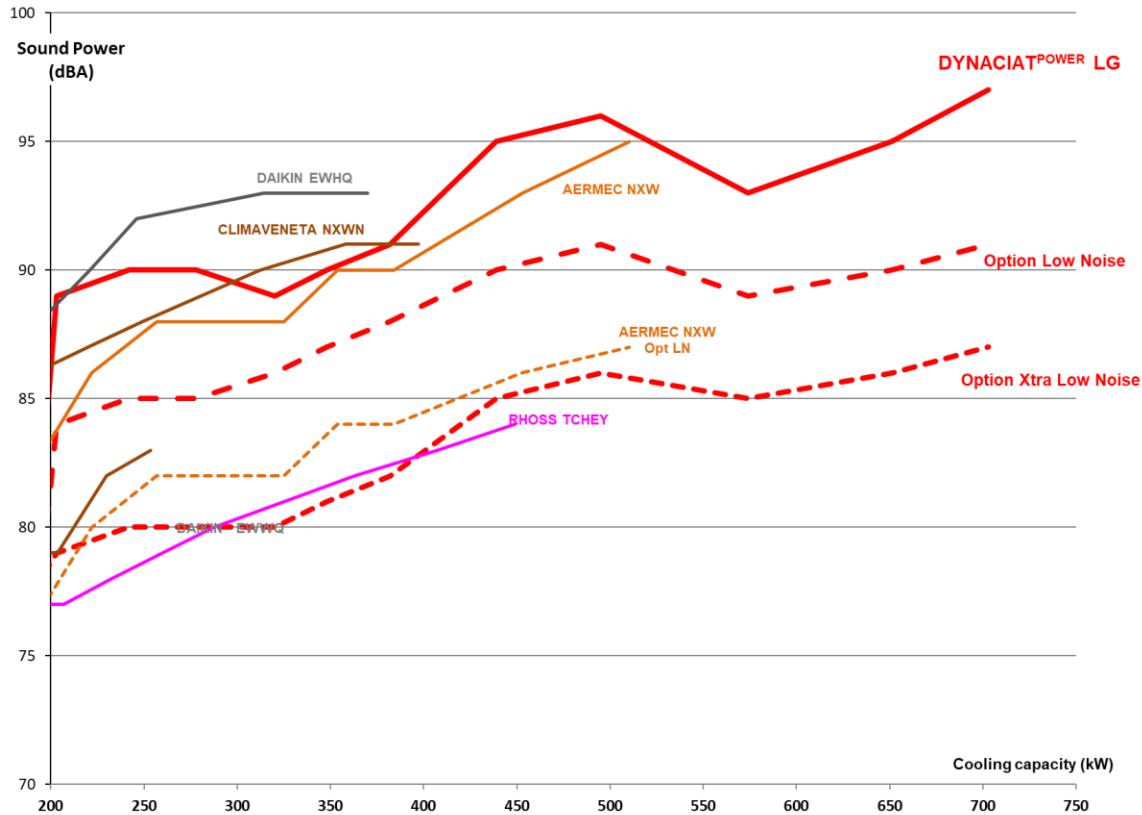
Standard version of *DYNACIAT*<sup>POWER</sup> is quieter than a screw solution





# dynaciat<sup>POWER</sup>

## Acoustic Performance



**DYNACIAT<sup>POWER</sup>** a quiet solution vs competition



# AGENDA

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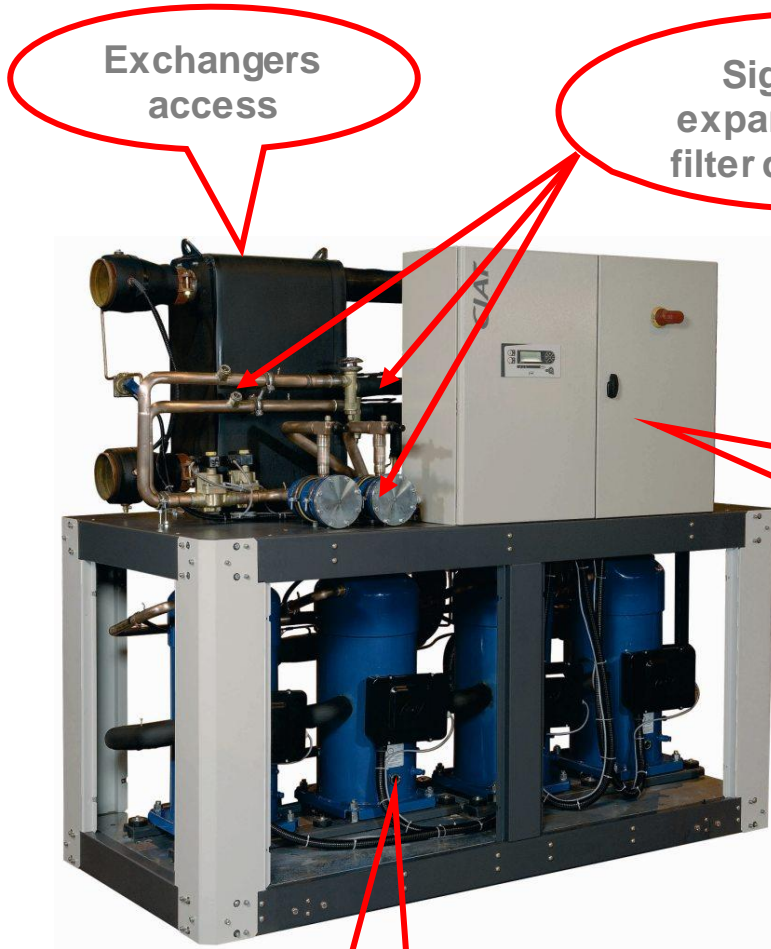




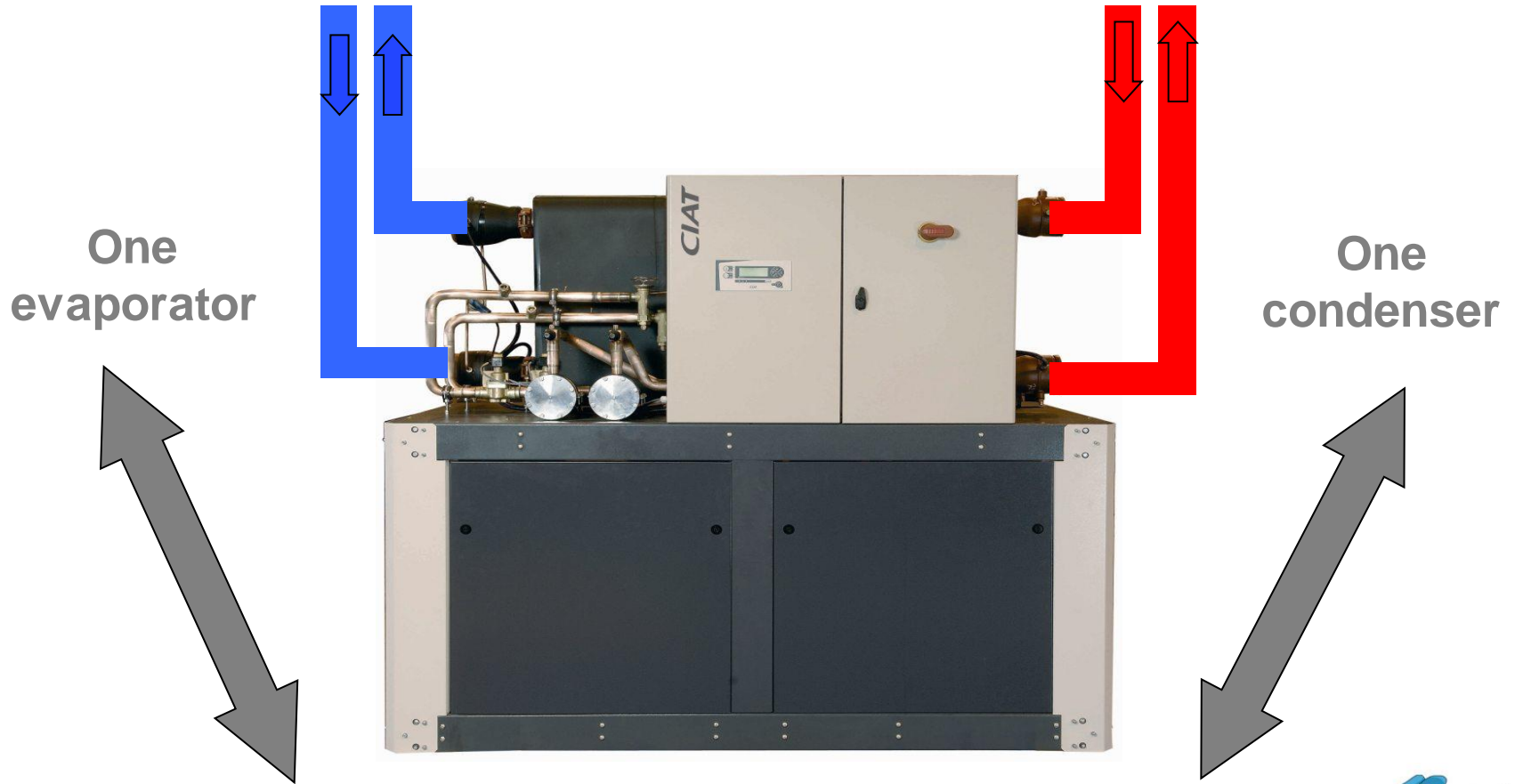
# Accessibility

Easy access for all the components

Easy maintenance



# Hydraulics connections



**Easy hydraulic connections**

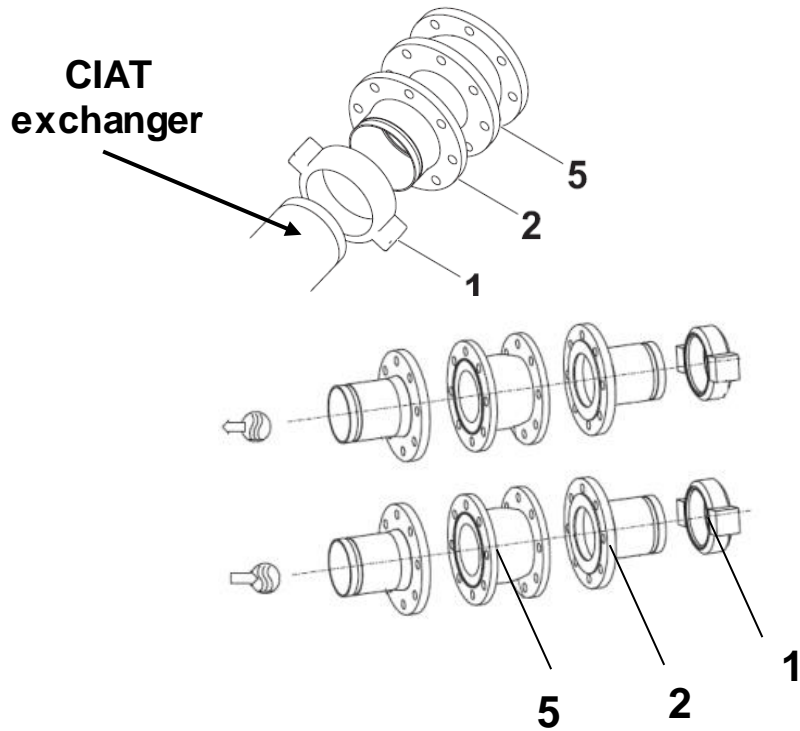


# Hydraulics connections

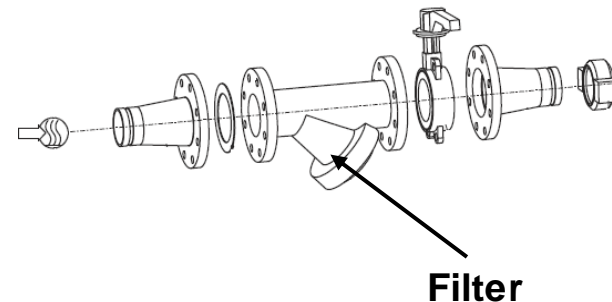
Victaulic in standard

Victaulic-flange adapter (option)+ connection sleeve (option)

Water filter (option)



Item	Description
1	Victaulic clamp
2	Flange connection
5	Anti-vibration sleeve



Complete components  
for easy installation

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# Controller **Connect2**

- **A control for all running conditions**
  - ▶ Chilled water inlet or outlet control
  - ▶ Control according to external temperature
  - ▶ Low temperature ice storage control
  - ▶ Two set points management



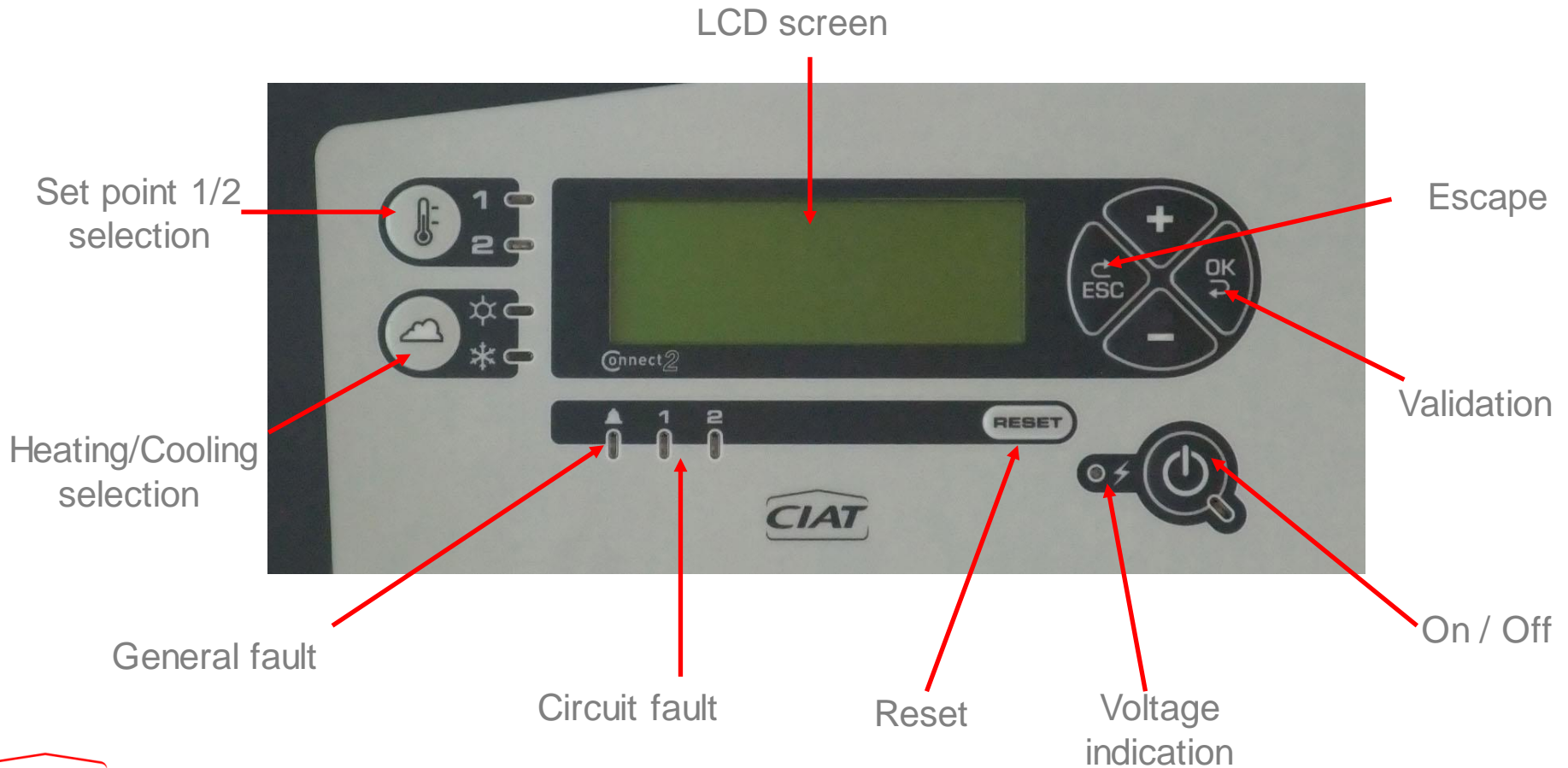
## Controller **Connect2**

- ▶ LCD **4 lines of 24** characters multilingual (F-GB-D-SP-NL-ITA-RUS)
- ▶ Running and fault parameter management
- ▶ Pressures and temperatures reading
- ▶ Compressors starting and running time management
- ▶ Compressors anti-short cycle
- ▶ Pump management – **Stand by function**
- ▶ Fault memory **20 faults memory**
- ▶ **Master/slave function for two units**
- ▶ **Hourly programming**
- ▶ **Password access (3 levels)**



# Controller **Connect2**

## Ergonomic display



LCD screen

Set point 1/2 selection

Escape

Heating/Cooling selection

Validation

General fault

Circuit fault

Reset

Voltage indication

On / Off

# Controller **Connect2**

- **Available free voltage contacts inputs :**

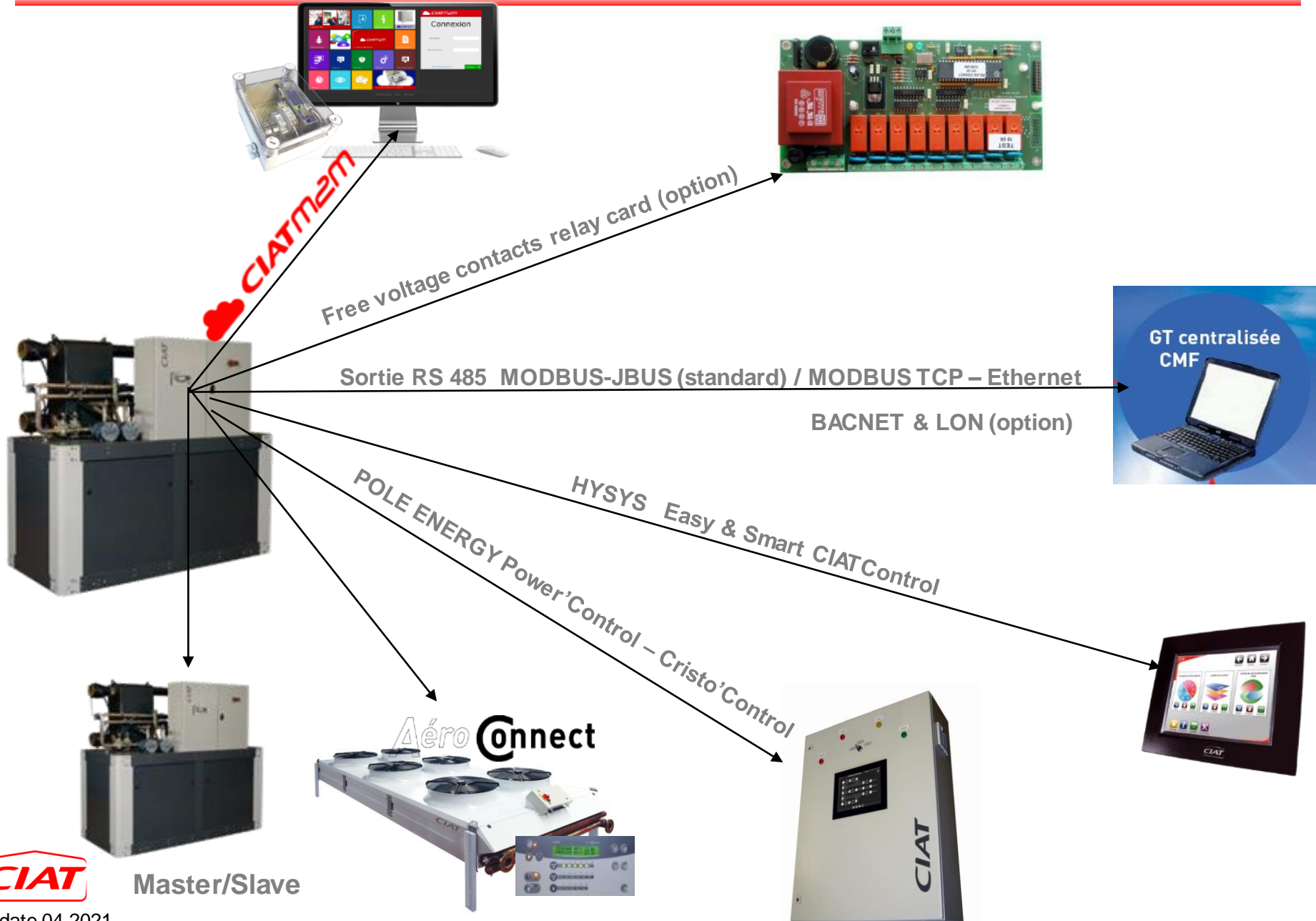
- ▶ Unit and pump ON/OFF contact
- ▶ Compressor load shedding
- ▶ Set point 1/2 selection
- ▶ HEATING / COOLING mode selection
- ▶ Set point control by 4-20mA SIGNAL



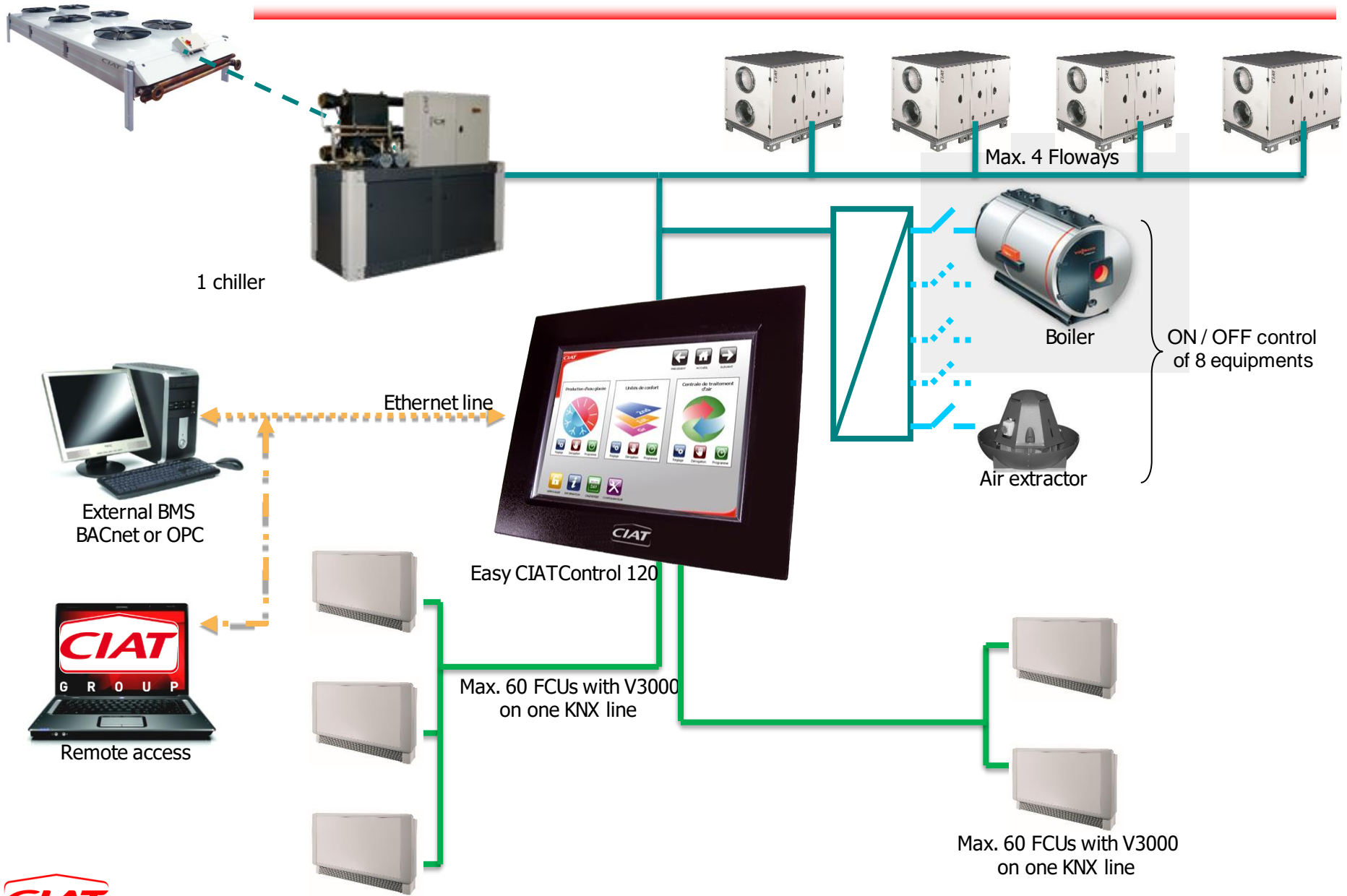
- **Available free voltage contacts outputs :**

- ▶ General fault of the unit
- ▶ Pump control

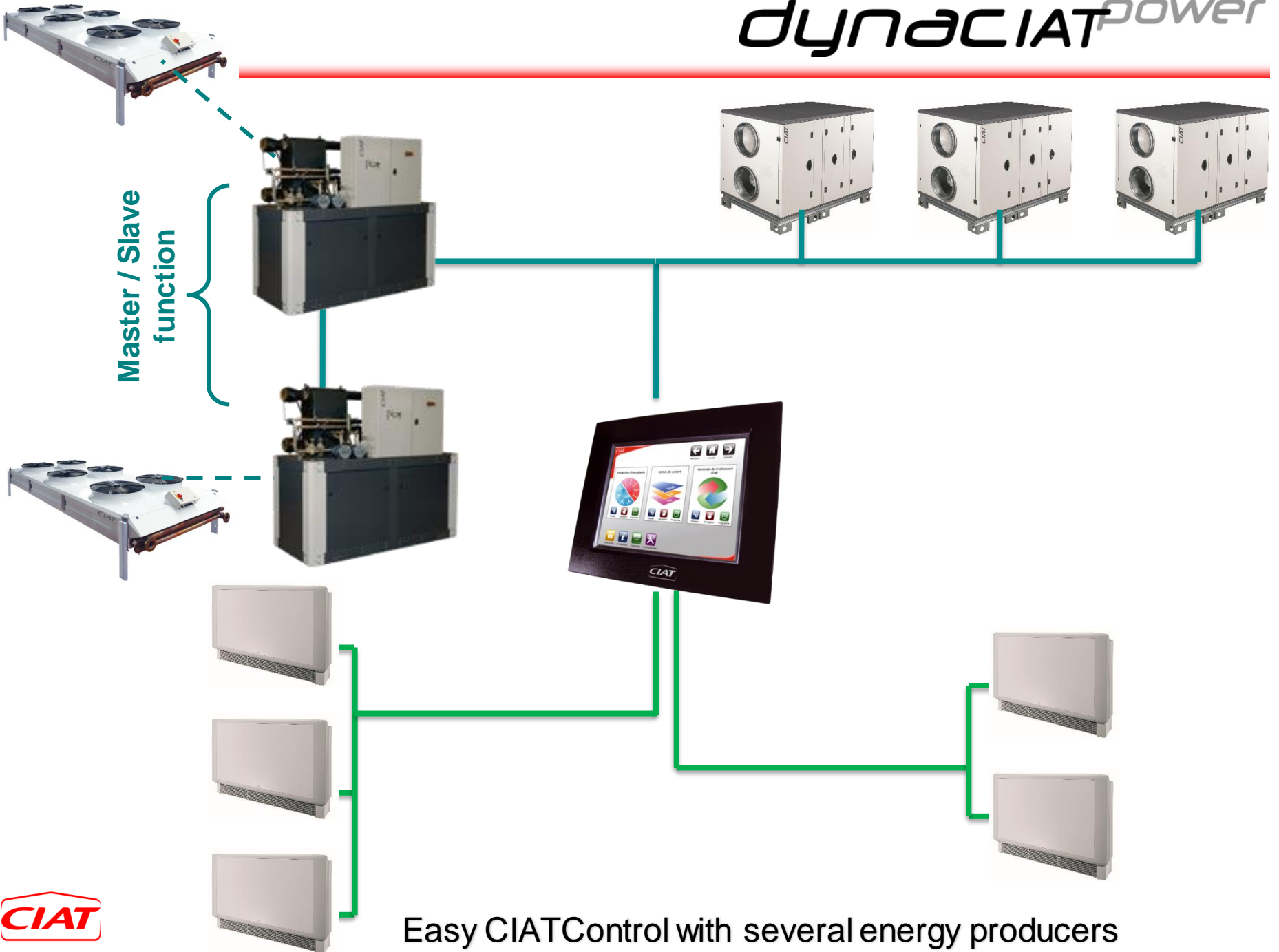




Master/Slave



Design example with Easy CIATControl 120



Easy CIATControl with several energy producers

## Communication **Connect2**



RS 485 (2 shielded wires)

1000 meters maxi

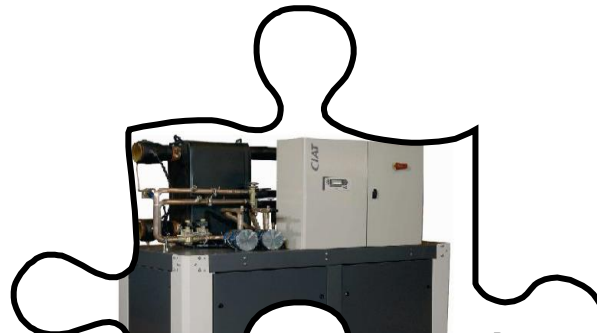
- **Free contact relay card**

- ▶ Water flow fault
- ▶ Antifreeze fault
- ▶ HP and LP fault
- ▶ Compressors stage fault
- ▶ Fans fault (air / water unit)
- ▶ Discharge temperature fault
- ▶ Compressors stage status

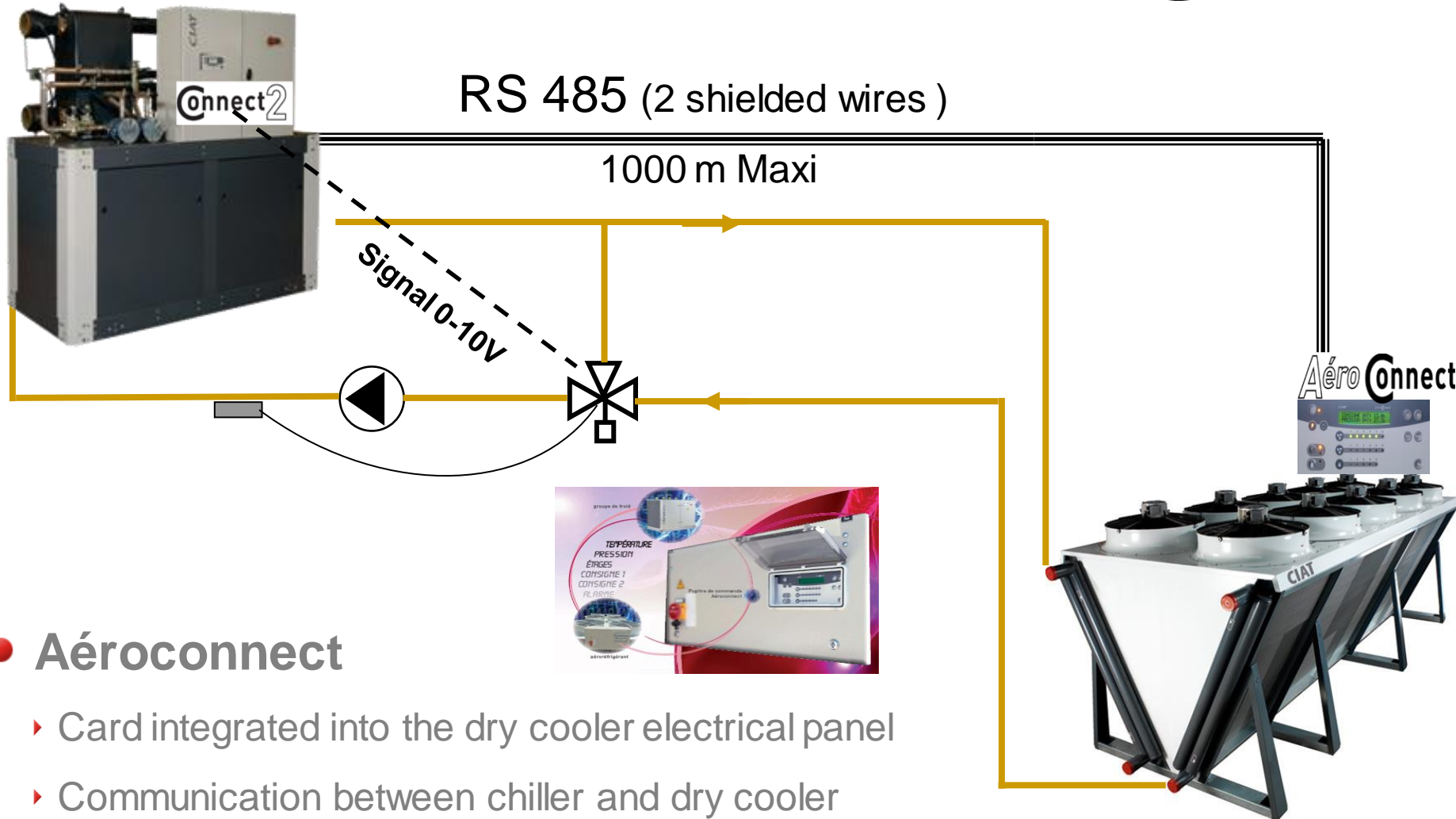


**230 V-1Ph-50Hz**

# AEROCONNECT Offre System



## Connect2 + Aéro Connect



### ● Aéroconnect

- ▶ Card integrated into the dry cooler electrical panel
- ▶ Communication between chiller and dry cooler
- ▶ Chiller + dry cooler operation optimization



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## Standard equipments

- Water flow switch (differential pressure switch)
- Compressors mounted on anti vibration mounts
- Main safety switch
- Auxiliary transformer
- RS485-TC/IP for BMS connection on open protocol Modbus-Jbus
- Electrical panel Wiring numbering
- Electrical components marking
- Compressor discharge valve (1 per circuit)
- Master / slave management for two units
- Electronic expansion valves (sizes 1800V to 2400V)
- Stand by pump function
- Low temperature glycol water (-12°C)

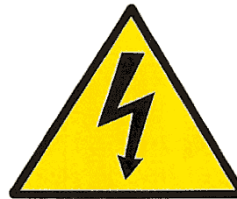


## Options

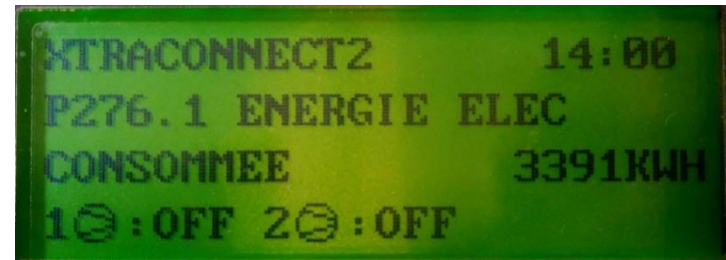
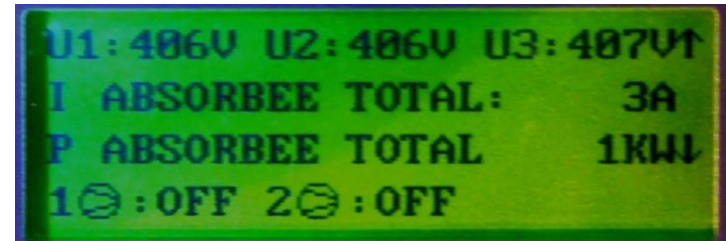
- Low Noise and Xtra Low Noise versions
- Compressor suction valve (1 per refrigerant circuit)
- Anti vibration mounts
- Hydraulic connection sleeves
- Free contacts relay card
- LON gateway  
- Bacnet over IP Gateway 
- Phases control relay
- Soft start
- Power & Energy counter
- External sensor
- Condenser insulation

## Power counter

Power counter



Available values on CONNECT 2 controller



Reduction of the electrical consumption of the unit according to maximum value

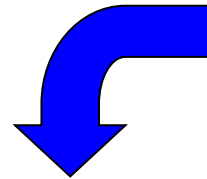
Voltage on each phase (V)  
Current (A)  
Electrical power input (kW)  
Electrical consumption (kWh)

## Soft start

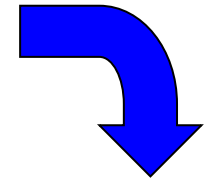
Electronic device which allows to reduce the starting current on each compressor



LG 1200V  
Starting current



Direct on line  
480 A



With Soft Start  
352 A

**-25%**

## Phases control relay

Relay mounted on the main power supply of the unit for the surveillance of the electricity network and safety of the unit

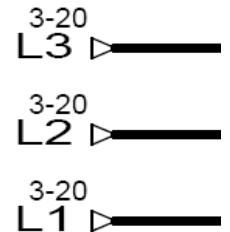


**Phases rotation direction**

**no phase**

**Asymmetry of phases**

**under and over voltage control**



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- ◆ LGN serial





Quality

## Compliance :



- ▶ To European regulations

## Guaranty :

- ▶ Performances certified EUROVENT



## Quality :

- ▶ Design and manufacture as per ISO 9000-14000 quality management system



Quality and Environment  
Management Systems  
Approval

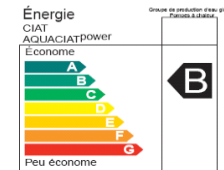
11 sizes  
220 à 700 kW  
250 à 820 kW



Compactness  
Easy maintenance



High efficiency



ESEER > 6



Heat pump  
operation  
up to **+55°C**

All  
applications  
**-12°C / +18°C**

3 acoustic  
design  
STD-LN-XLN



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10/918



→ WATER-TO-WATER HEAT PUMP - WATER CHILLER

## **Dynaciat** *Power*

*Smart equipment that  
boosts performance*

