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Utopia Prime for tech room application

Cooling & Heating

Server rooms & data center requirements

Cooling & Heating

Facts about data centers

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characteristics

Data centers operate 24/7, all year round
Reliability and control are a must.

They are very energy intensive with typical power densities of 538 – 2, 153 W/m2.
The data center sector is estimated to account for 1.4% of the global electricity consumption.
Efficiency is key decision maker for this kind of applications

They are key system for the business operation, failure-safe is a must.
Temperature target is constant 24/7
Redundancy, duty operation and remote maintenance are vital.

Most of demand comes from internal load, heat.
Humidity is very low in this kind of applications, typically 30%
Cooling is needed 24/7, whatever the weather conditions

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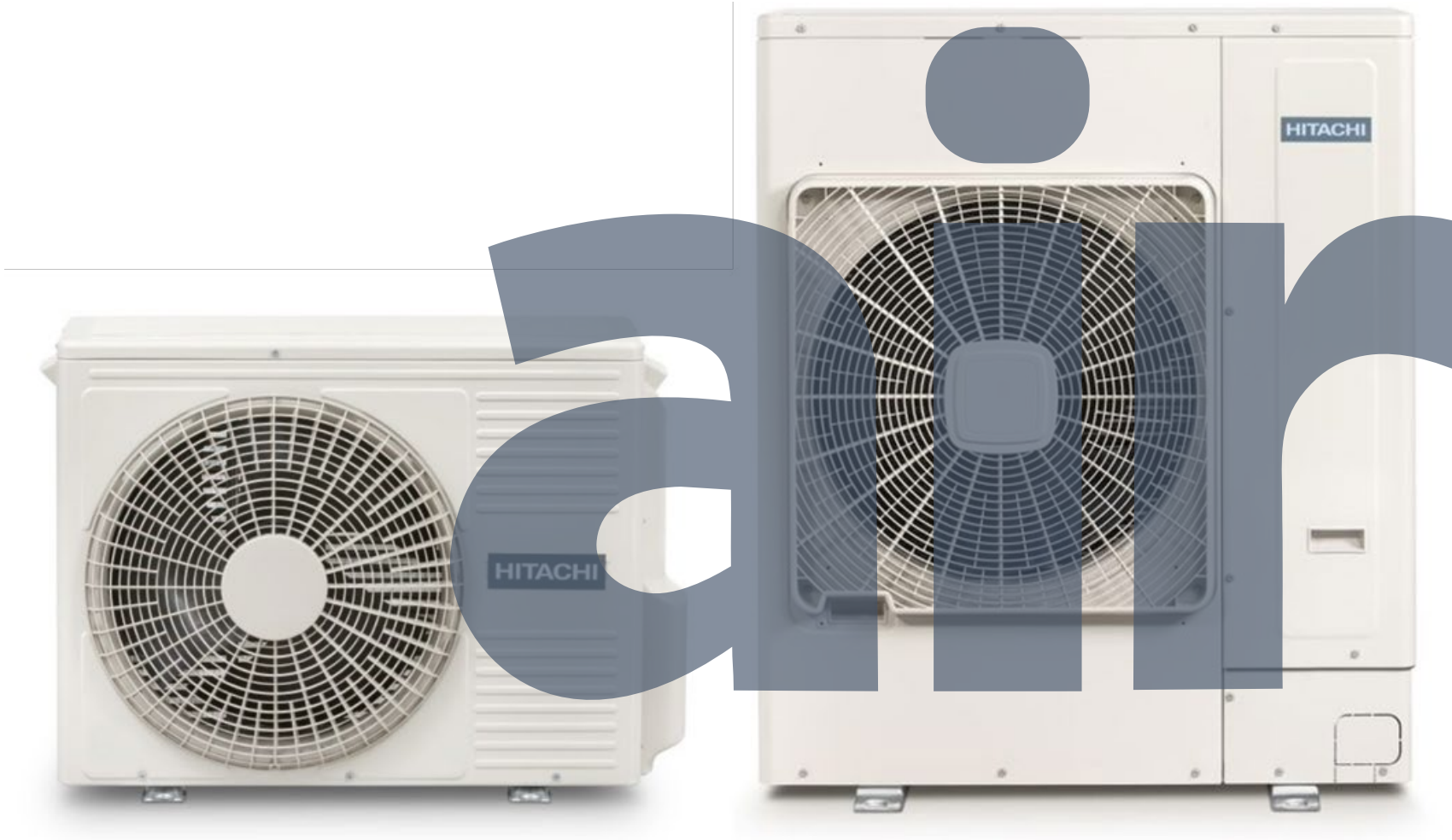
Utopia Prime



Cooling & Heating

Utopia Prime

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Utopia Prime

- 3-6 HP (7.1 – 14kW)
- Monosplit and multisplit **simultaneous** control (“twin”)

Line up

			3HP	4HP	5HP	6HP
Utopia Prime	R32	Monophase	•	•	•	•
		triphase		•	•	•
	R410A	Monophase		•	•	•
		triphase		•	•	•

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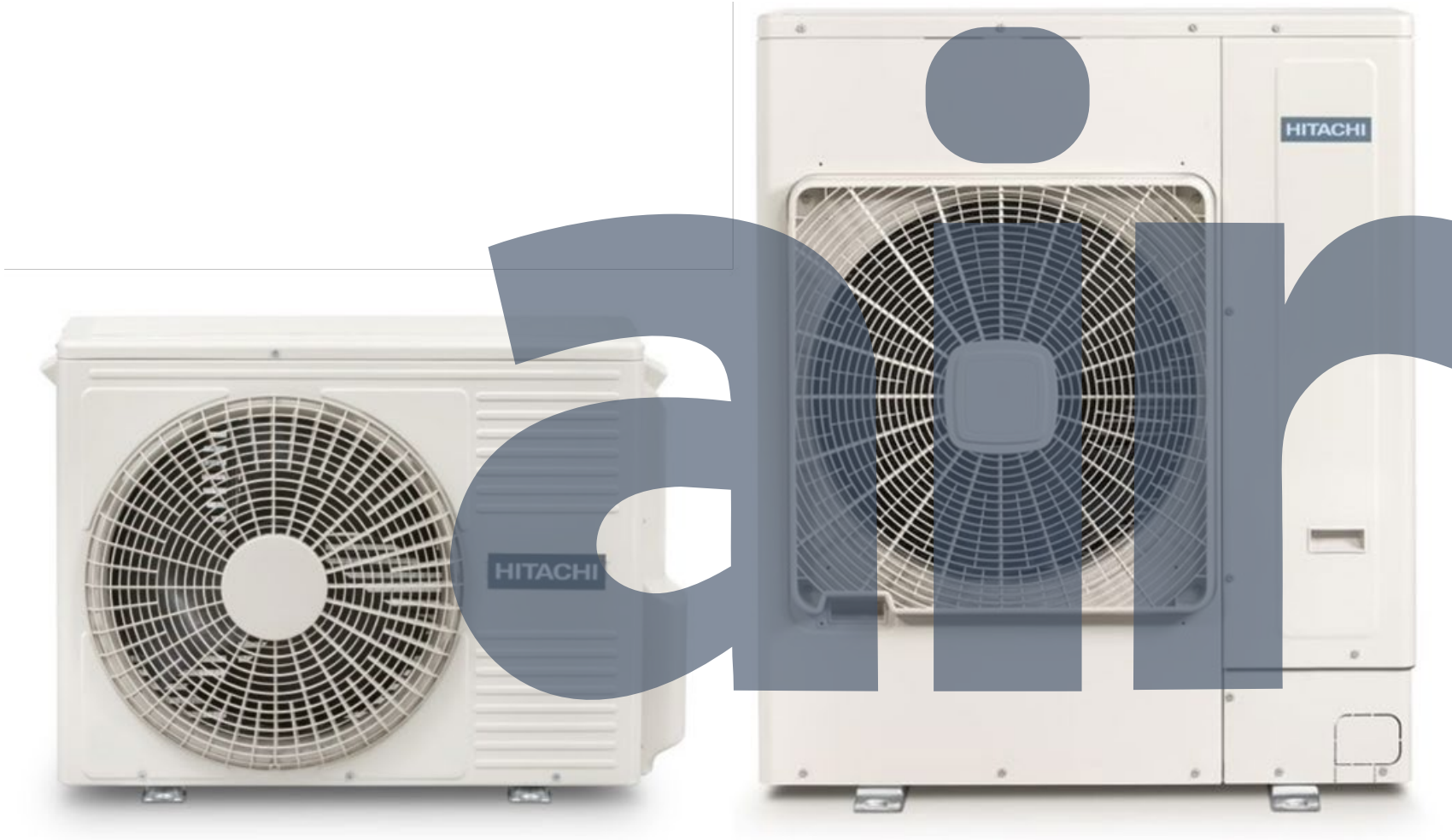
Prime series for technical rooms

Cooling & Heating



Prime series vs other solutions

Reliable

- Oversized indoor units boost cooling capacity.
  Capacity ratio up to 115%
- Wide operating range envelope: operation range in cooling down **to -15°C and up to +46°C**

Efficient

- **Lower running costs** compared to other DX systems and water based chillers.
- Offers **premium efficiency** levels
- Can further boost efficiency with the use of **free cooling** systems.

Flexible

- **Scalable in capacity** for Infrastructure changes
- Detailed **control** and management
- **Wide range of indoor units** to suit application preferences (ceiling suspended cassettes, wall mounted, ducted indoors)

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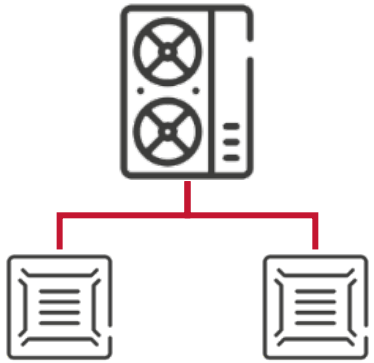
Capacity ratio up to 115%

- Due to the low humidity in these application, it is needed bigger capacity indoor units to extract energy by cooling dry air.
- Using a bigger indoor unit maximizes the heat transfer capacity of the indoor unit.
- Increasing the indoor unit capacity would be an alternative of increasing the capacity of both indoor and outdoor units.
- Using a bigger indoor unit allows the system to operate on a more safe working point and allows continuous operation avoiding safety downtimes

Example:

Standard configuration for comfort application

RAS-4HRVC2E

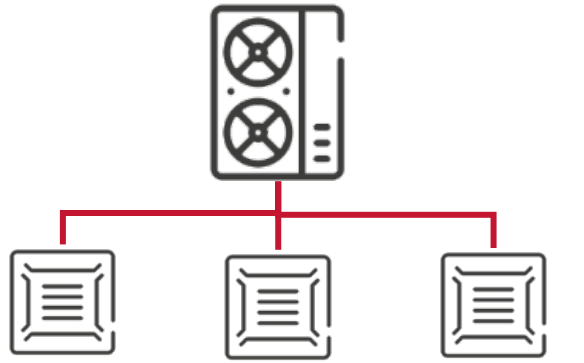


RCI-2.0FSRE RCI-2.0FSRE

Indoor unit total nominal capacity = 4HP

Specific configuration for technical rooms application

RAS-4HRVC2E



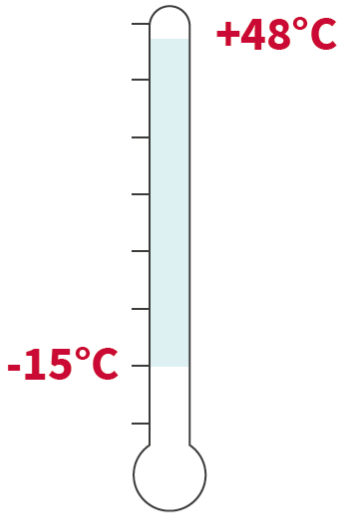
RCI-1.5FSRE RCI-1.5FSRE RCI-1.5FSRE

Indoor unit total nominal capacity = 4.5HP

Reliability & efficiency

Wide operation range in cooling mode

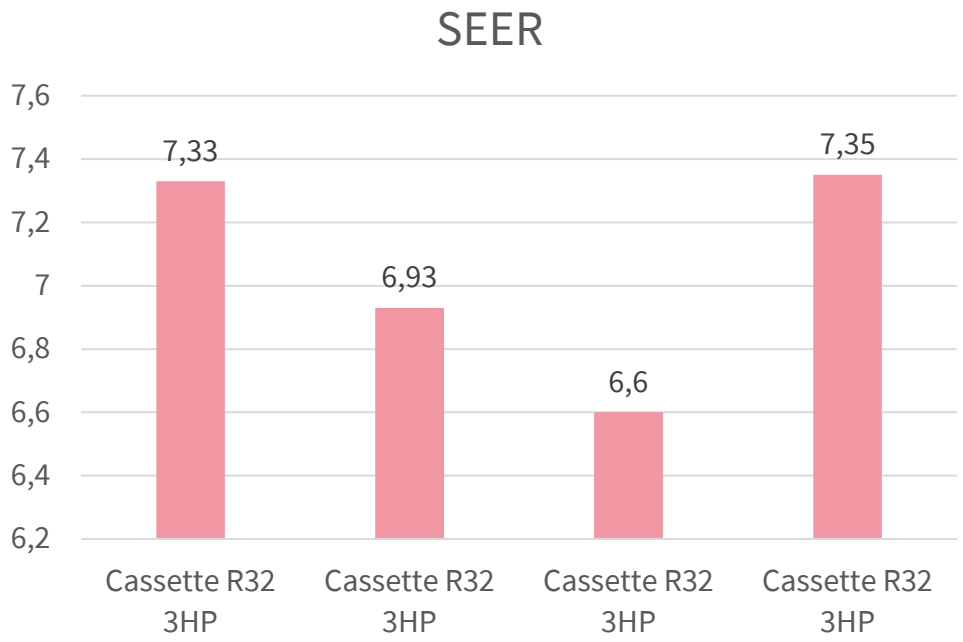
- Cooling operating range from -15°C to +48°C.



Cooling mode

State of the art efficiency

- Excellent SEER values: up to 7.35



Design flexibility

Design flexibility

- Most comprehensive indoor unit range in the market: 60 indoor units
- Compatible with monosplit and twin combinations
- Any indoor combination is ok: all indoor unit types can be mixed

NEW

New slim high ESP ducted (RPI-FSR)

NEW

New silent and low profile mini cassette (RCIM-FSR)

NEW

Cassette with iconic panel

Wall mounted unit (RPK-FSR)

Ceiling unit (RPC-FSR)

Indoor units line up

	4-way cassette	mini cassette	2-way cassette	Ceiling	LSP ducted	MSP ducted	HSP ducted	Wall mounted	Floor
Utopia Prime R410a	•	•	•	•	•	•	•	•	• 2
Utopia Prime R32	• 1	• 1	• 1	• 1	• 1	• 1	• 1	• 1	

1) Only compatible with FSR series
2) Only compatible if mixed with other IU types. Not valid for monosplit application

Compatibility table can be found at annexes

Twin combinations

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Twin combinations

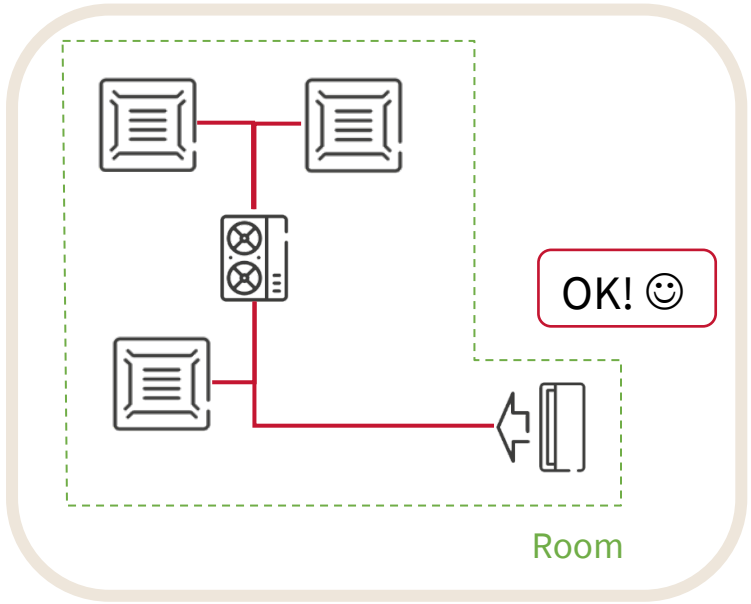
- Twin set up might improve air distribution in the whole tecnical room compared with monosplit application
- Up to 4 indoor units can be connected to the same outdoor unit

		Hitachi Utopia Prime			
		3HP	4HP	5HP	6HP
R32	Twin	✓	✓	✓	✓
	Triple		✓	✓	✓
	Quad		✓	✓	✓
R410a	Twin		✓	✓	✓
	Triple		✓	✓	✓
	Quad		✓	✓	✓

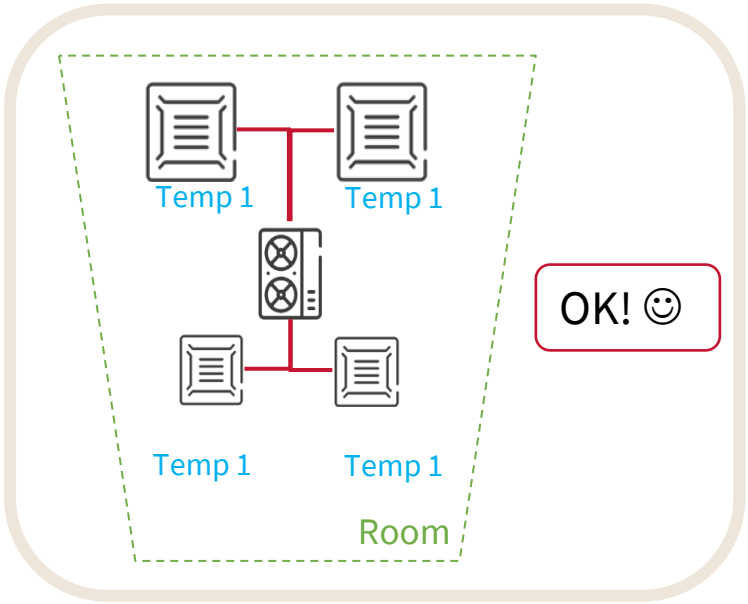
BEST ORIGINAL

- Twin, triple and quad combination available for OU from 3-6HP
- All IU types available to be combined

Twin flexibility: better air flow distribution



Not symmetrical area



Narrower area

- Different indoor types and different indoor capacitites can be used to provide best air distribution

Control

CS-NET manager

Duty cycle control

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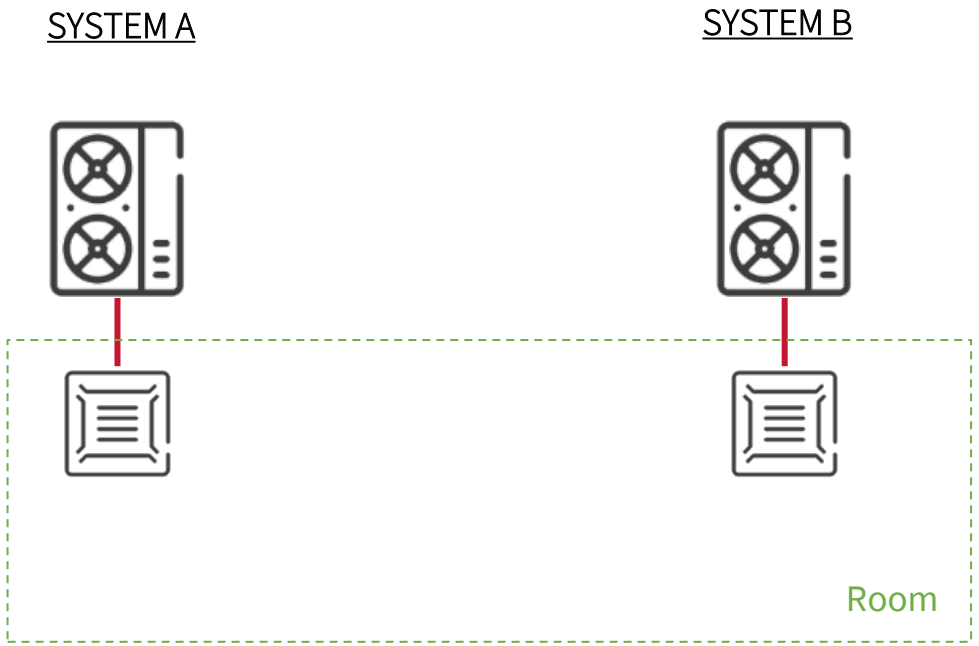
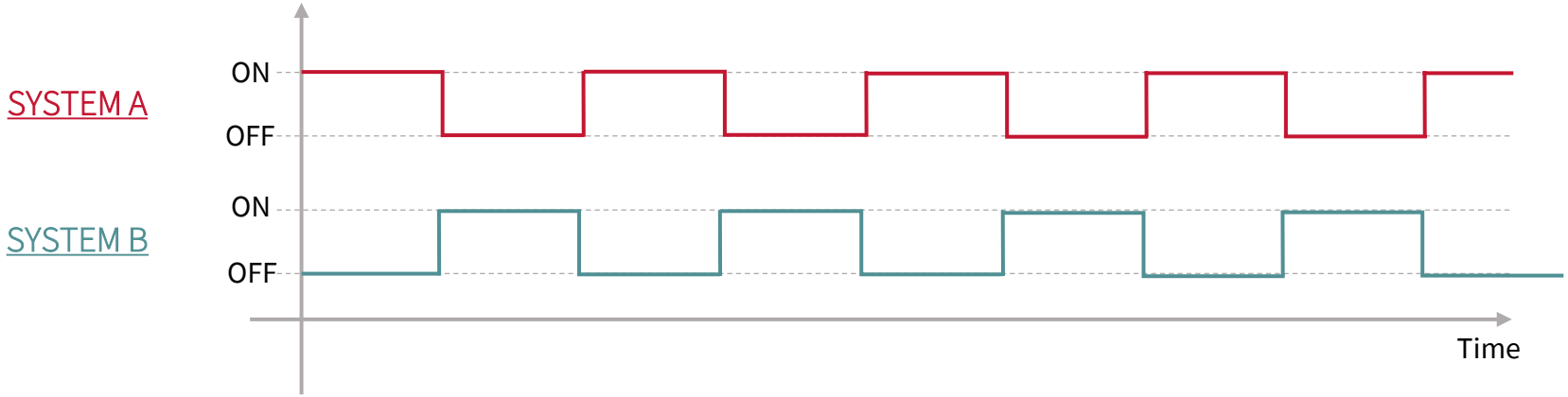
Rotative operation

- In order to balance running hours of the equipments when redundant units is used, duty cycle might be used
- Control enables that both of the systems A and B are operating same number of hours, and not simultaneously.





Redundancy

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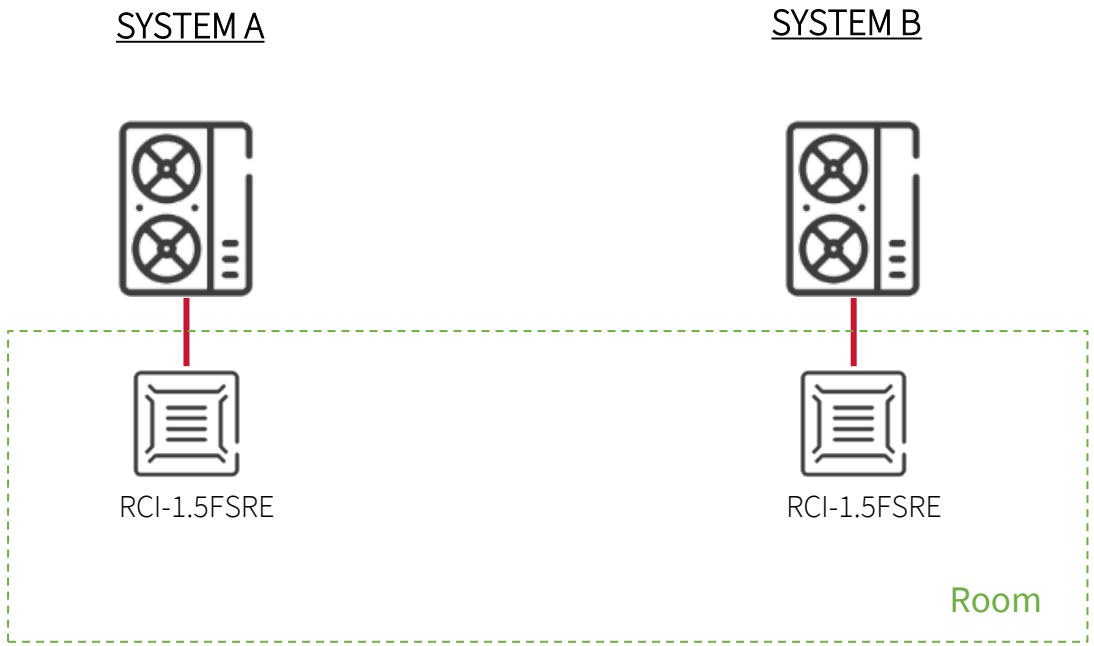
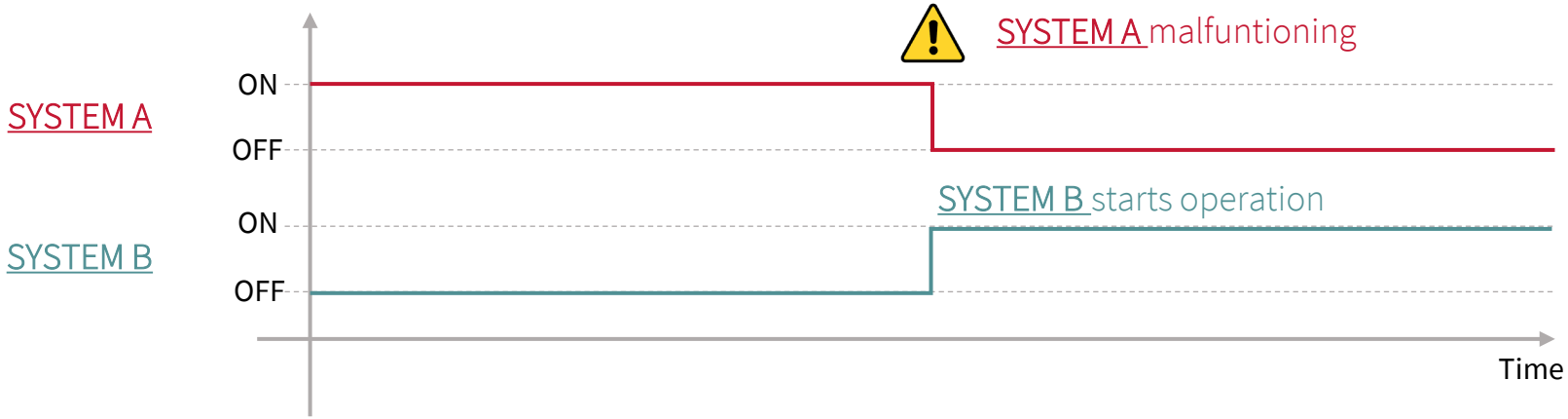
Back up operation

- In case of redundant unit (backup unit), in case of failure of the main unit the backup unit should start immediately
- This way we ensure the continous operation 100% of the time





Free cooling control

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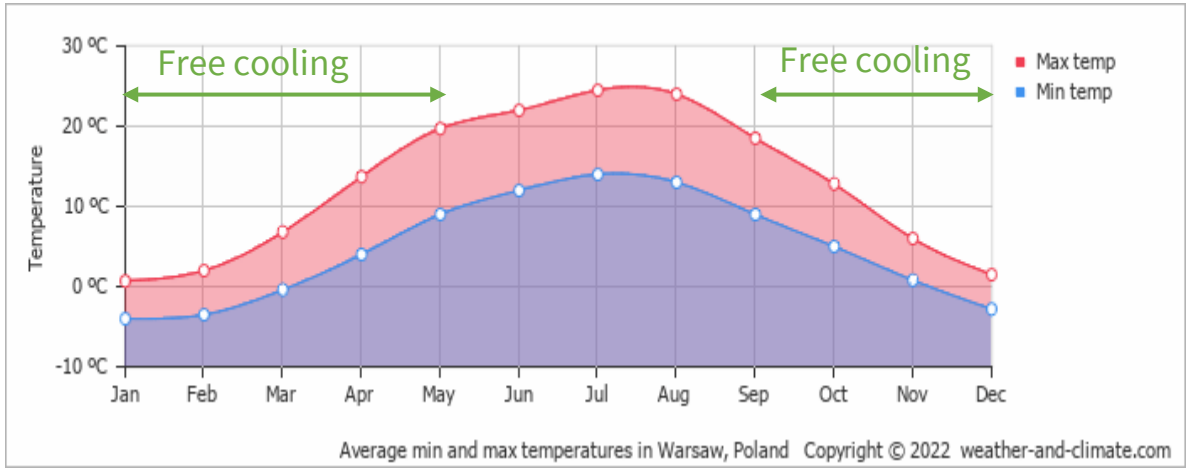
- Technical room precise of cooling every day of the year, whatever the weather conditions
- For such periods of time where the ambient is cooler outside the room, fresh air could be used as a “free cooling” source
- Energy savings can be really significant in case of regions where the climate is cold or mild

Example:



Free cooling might be used whenever the outside temperature is lower than Tset

Control implementation: CSNET

Why the CSNET Manager is the perfect solution for technical rooms?

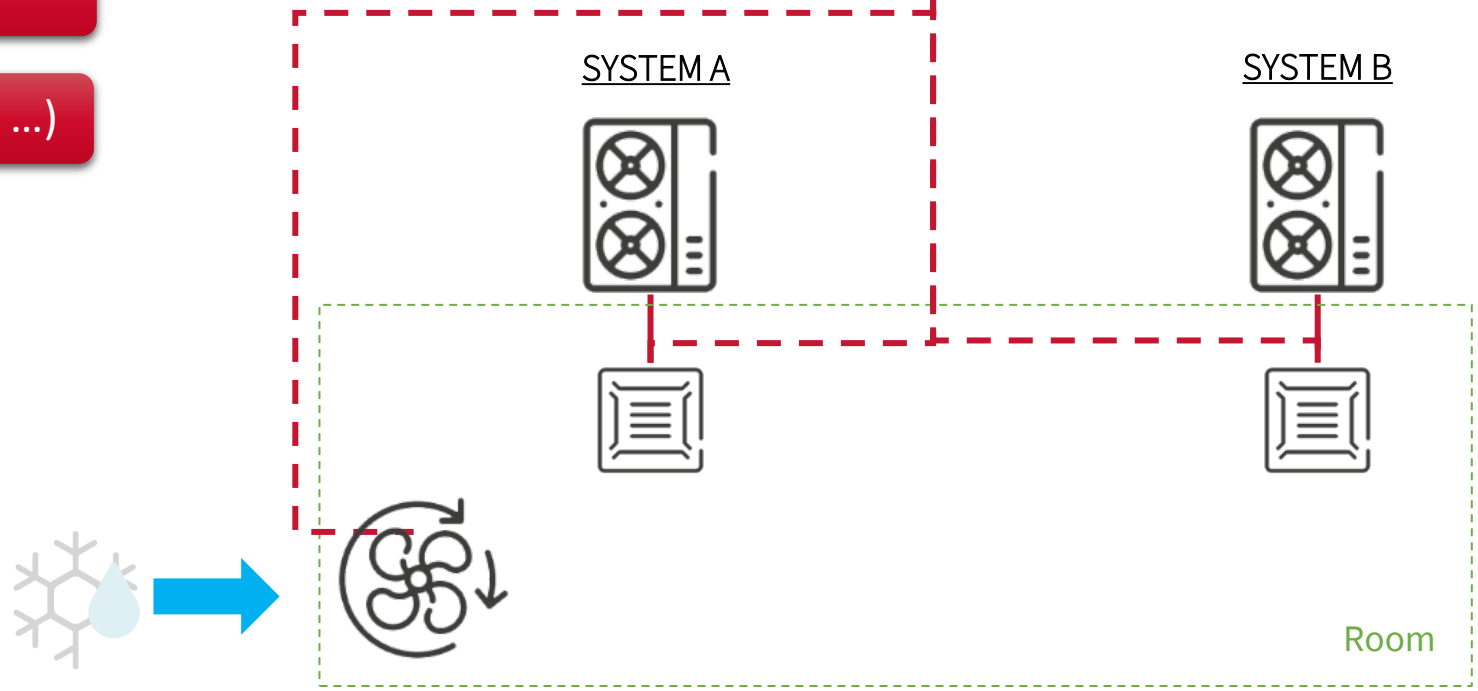
1. Rotative operation function
2. Back up operation function
3. Free-cooling management
4. Full control solution (VRF, RAC, IT room, …)

- CS-Net manager can manage duty operation, redundancy control and free cooling operation with the help of an external fresh air fan with input control

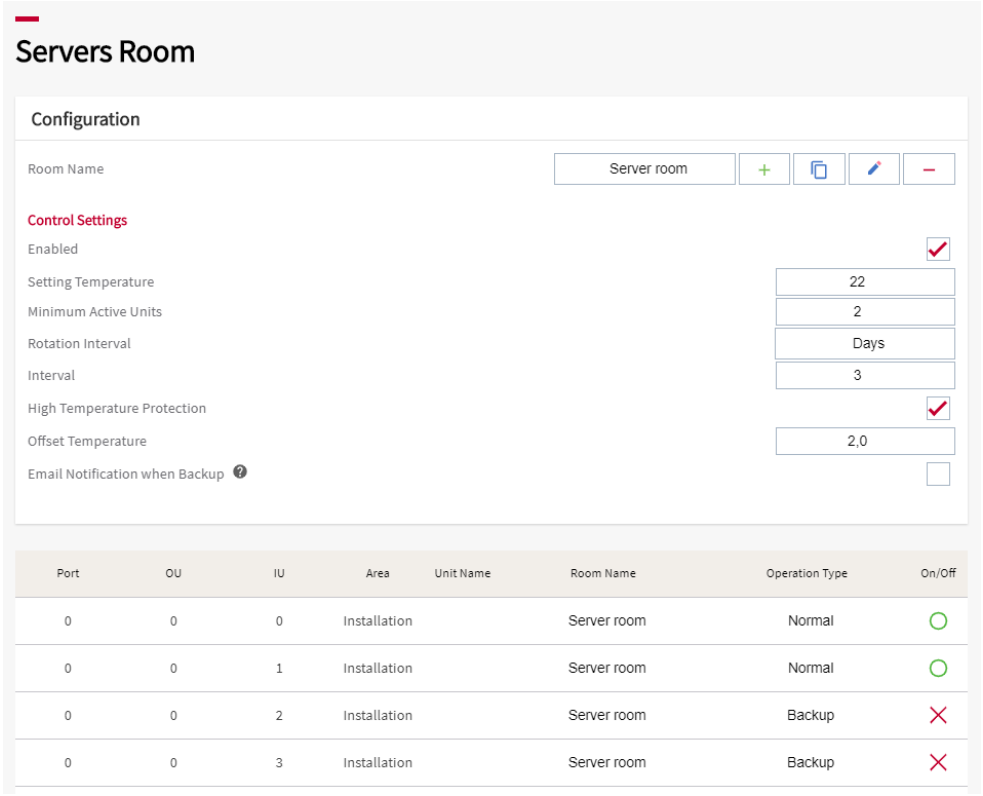
- CS-NET is accessible remotely from PC, mobile or Tablet, so maintenance team can be warned immediately of any misoperation of the system even remotely

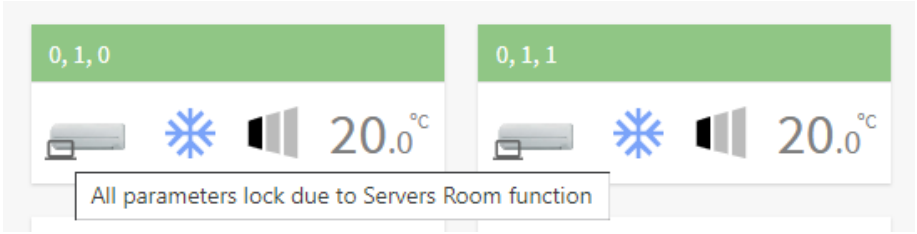
CS-NET manager

Exclusive!



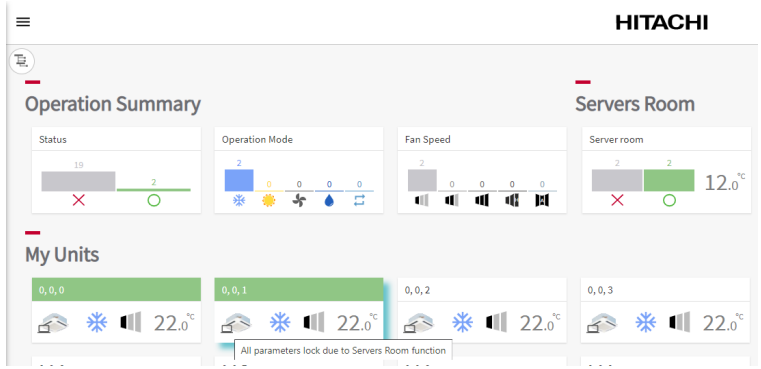
CSNET Manager 2 – server room function





- All the parameters are available to setup easily units that are used for the server room.
  No additional wiring or setup on the units, all the orders are sent through HLINK by CSNET.

- On the dashboard, a new card for this function is available, as well as a new icon for units controlled by this function.



CSNET Manager 2 – server room functionalities

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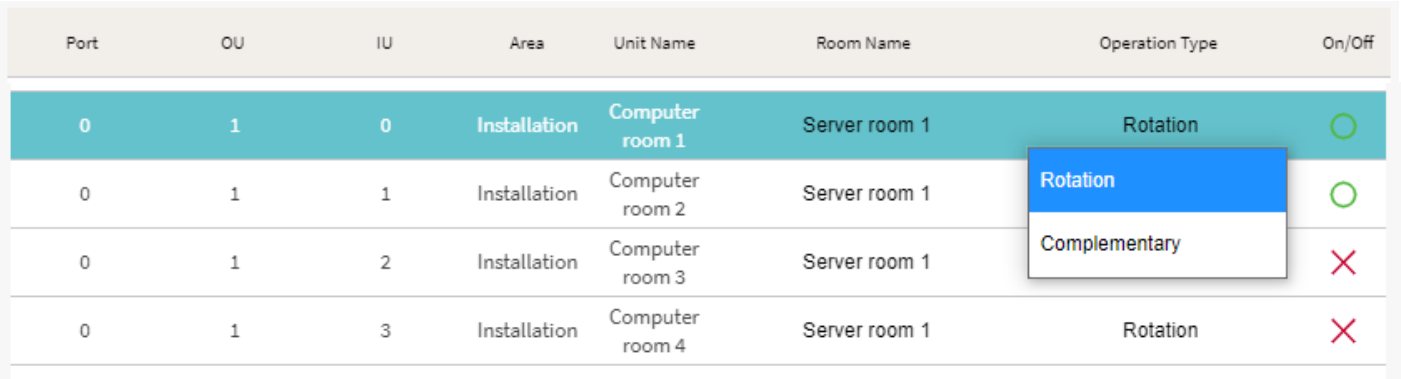
Available control modes:

- Back up operation in case of alarm on another unit used in the server room
- Rotation control to balance running hours (interval to be set, in hours, days, or weeks)
- High temperature protection of the room: automatic start of the backup indoor units if the room temperature is getting over a defined limit + possible notification by email
- Possibility to add “complementary units” that will not participate to the rotation control, but that can be started in case of alarm or in case of high room temperature.



CSNET Manager 2 – software update 2.0

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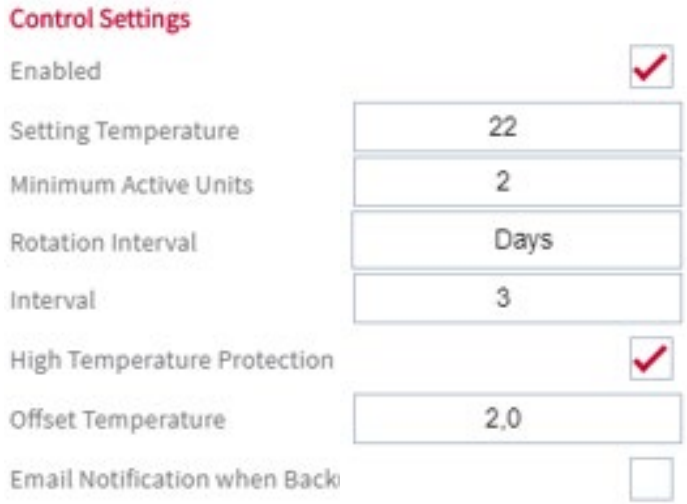
Settings:

- Setting temperature defining the default set point in the room (parameters for the selected units are locked by the server room function, e.g. run/stop status, mode and Tset).
- Minimum active units: qty of units running simultaneously in the server room
- Rotation internal defined in weeks, days or hours
- High temperature protection: trigger temperature defined by Tset + offset, to start all the units affected to the server room when the room temperature is over this trigger.
- Email notification: when backup units are becoming active, a notification can be sent by email (requires email configuration)



CSNET Manager 2 – software update 2.0

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- Backup control in case of alarm:

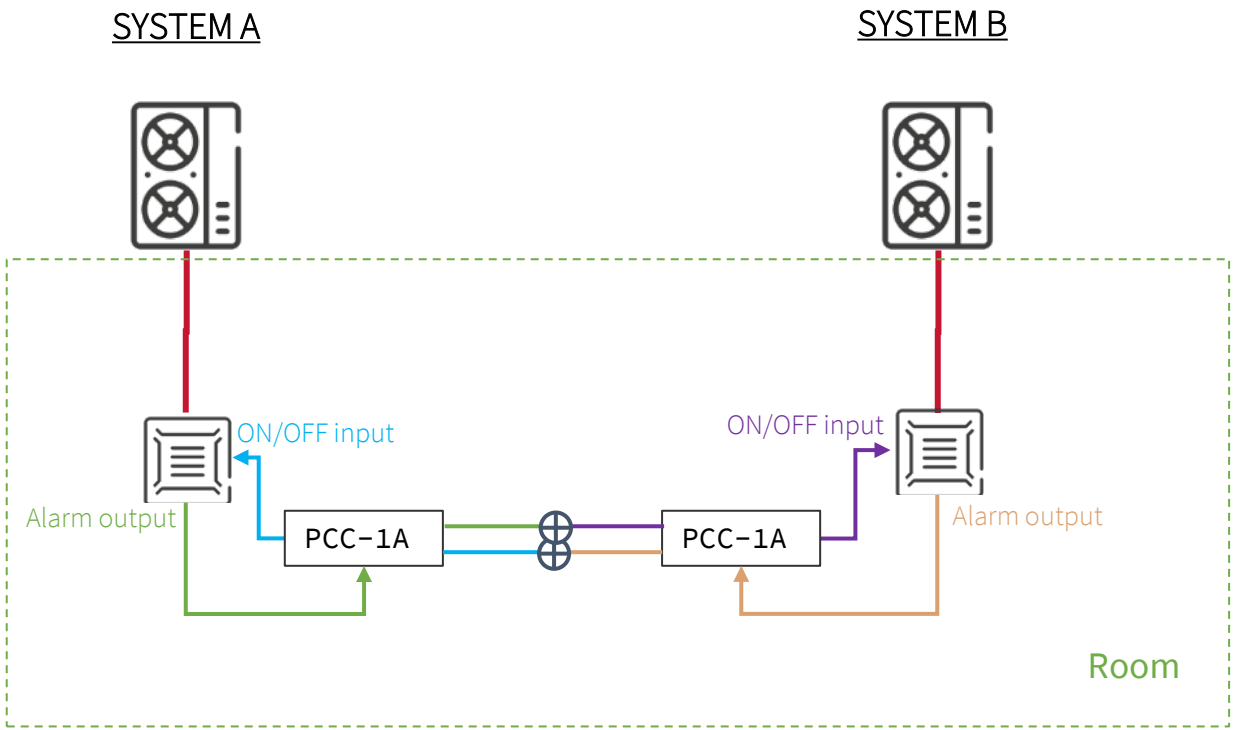
  In case of alarm for one of the selected indoor unit of the server room, all the back up units and complementary units are switched on automatically, using the defined temperature set point.

- High temperature protection:

  When the room temperature measured by the control sensor of the active indoor unit (set as rotation mode) is getting over Tset + offset:
  - A first back up unit is started using the default Temperature set point of the server room
  - If the room temperature is still higher than Tset + offset after 5 minutes, another back up unit will start.
  - When all the backup units of the rotation control are used, complementary units are started in the same way, if they are available.
  - When the room temperature is reaching the set point, back up units will be stopped one by one every 5 minutes, checking that the room temperature is maintained

Redundancy and duty cycle operation without CS-Net manager

- Redundancy can be also implemented with input /output from the indoor units. Alarm output of main unit (A) should be connected to input of backup unit (B) as an “ON input”.
- If this is done for the B unit, then A unit would work as backup unit of B unit.
- Duty rotation can be done by weekly timer from wired remote for each of the systems A and B, by programming different working shifts per each one of the systems



Connection diagram for backup control wihtout central controller

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Thanks for your attention

Cooling & Heating