BlueBox

Omicron Rev S4

Multi-function unit for
simultaneous generation
of hot and cold water
(outdoor installation)

Swegon
Cooling

MONTE DEI PASCHI DI SIENA
Siena - Italy
4 multi-purpose units
Output: 2.16 MW

Highly efficient multi-function unit for 4-pipe systems: OMICRON REV S4

Commercial premises increasingly require **simultaneous cooling and heating** during transitional periods and in winter.

With the BlueBox **OMICRON REV S4** Swegon introduces a multi-function facility designed as an air/water unit for simultaneous generation of hot and cold water. A distinct advantage is the related restructuring of legacy systems by exchanging two different generators for a single unit.

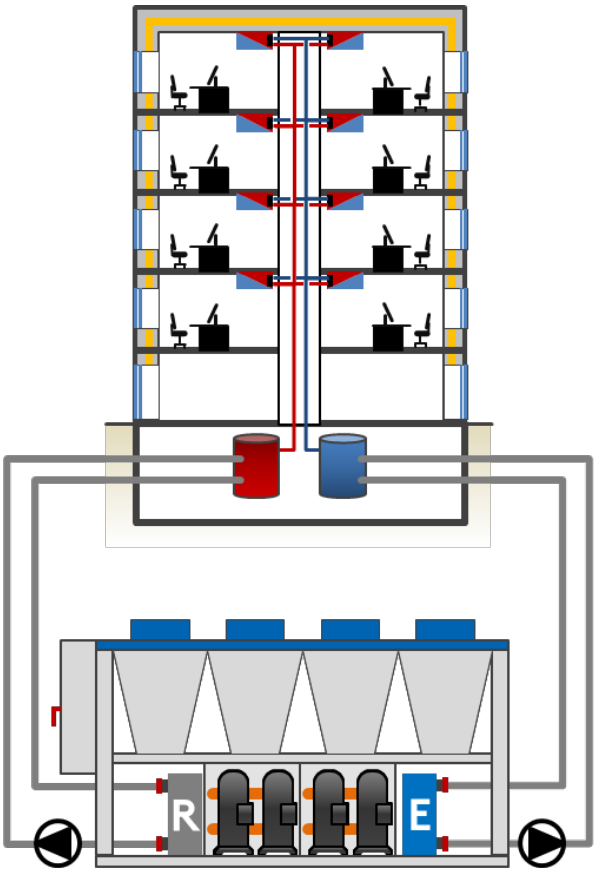
The OMICRON REV series provides a **cooling capacity of between 100 and 860 kW** and a **heating capacity of between 100 and 944 kW.** There are 13 different unit sizes, each equipped with 4-8 scroll compressors and 2-4 cooling circuits.
The system is designed in such a way that either excess heat is discharged via the air-cooled heat exchanger or the required energy is absorbed in the heat pump function.

If there is simultaneous demand for hot and cold water, the energy is shifted internally. During this action the OMICRON REV S4 achieves an average overall performance **(TER) of up to 7.66.**

Thanks to the modular design it is possible, while in heating mode, to defrost the cooling circuits at different times. This ensures an almost fully consistent hot water operation throughout the premises.

Optionally, hydraulic modules for hot-water and/or cold-water sides may be integrated with a tank and/or pumps. BlueBox's inverter-controlled pump control, also called **Flowzer**, ensures an additional potential for energy-saving.

Contained within the **Blue Think®** control platform are an integrated **Web Server** (Ethernet) or the **Multilogic** master/slave function.



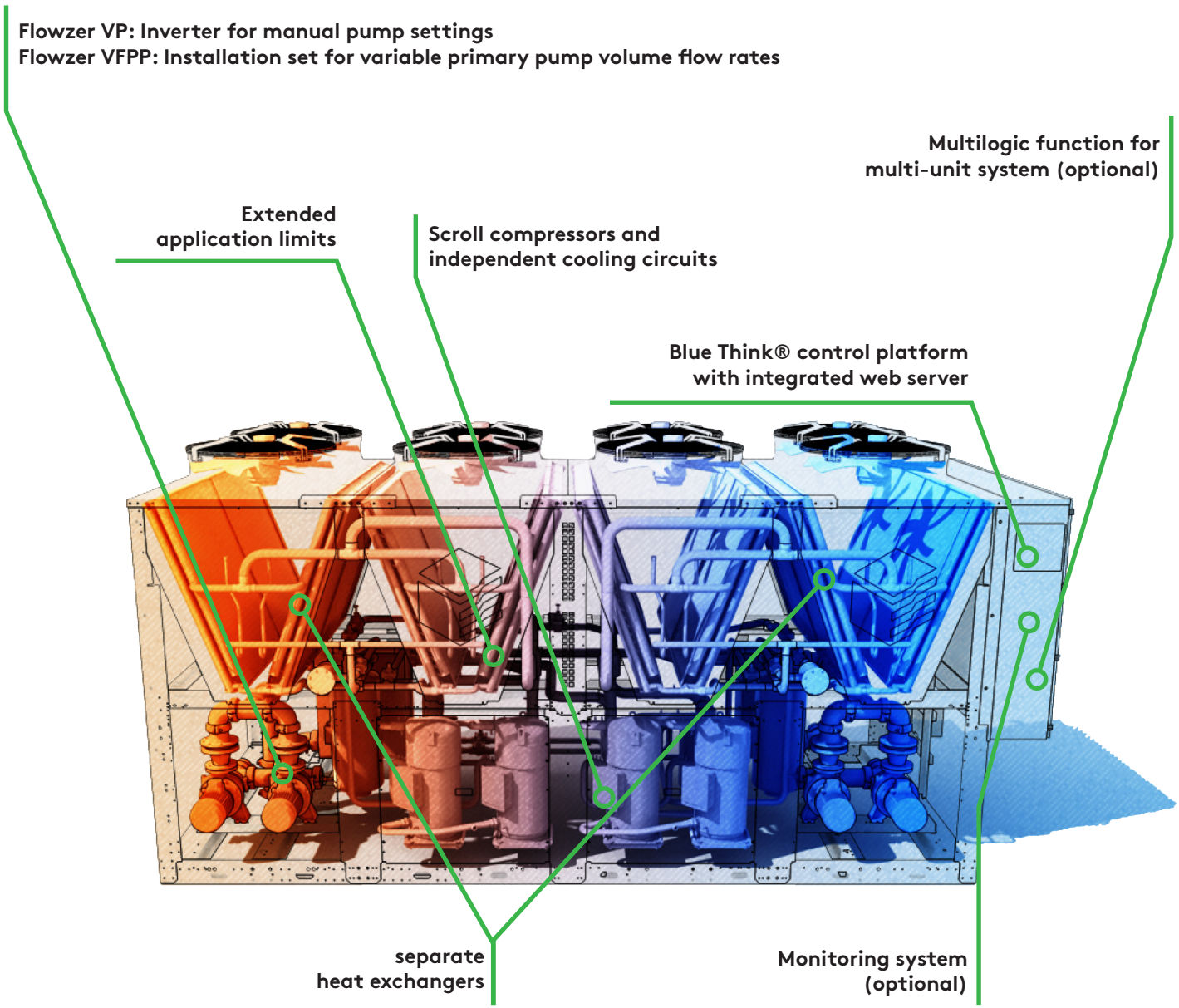
Benefits

- highly efficient in all service conditions
  - TER up to 7.66 (total efficiency rate)
  - Minimal impact of defrosting in heating mode
  - integrated web server
  - 4-pipe system
  - 13 different unit sizes
  - Extended application limits
  - Multilogic function for multi-unit system (optional)
  - Blueye monitoring system (optional)
  - Flowzer: System with variable water flow (options available). Flowzer VFPP implemented in all water circuits (optional)
  - Integrated hydraulic modules (optional): 1 or 2 pumps on each water side, also inverted-controlled
  - Applications: Outside temperatures of -15°C to +45°C or hot water temperatures up to 55°C

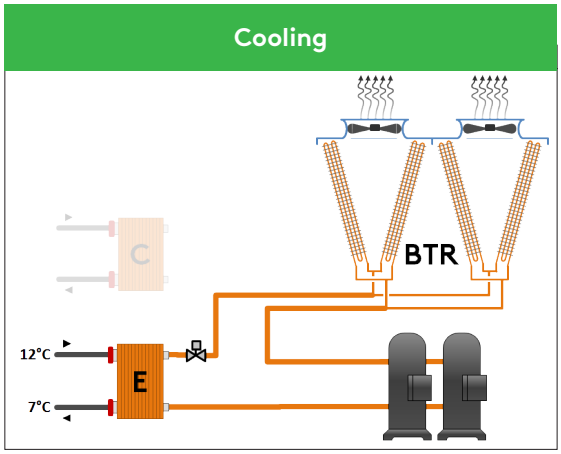
General

The OMICRON REV S4 series is a highly efficient modular multi-function unit for 4-pipe systems.
The units are equipped with scroll compressors, 2-4 independent cooling circuits, axial fans and plate heat exchangers.
The OMICRON REV S4 series also offers two heat exchangers for independent and simultaneous supply of hot and cold water.

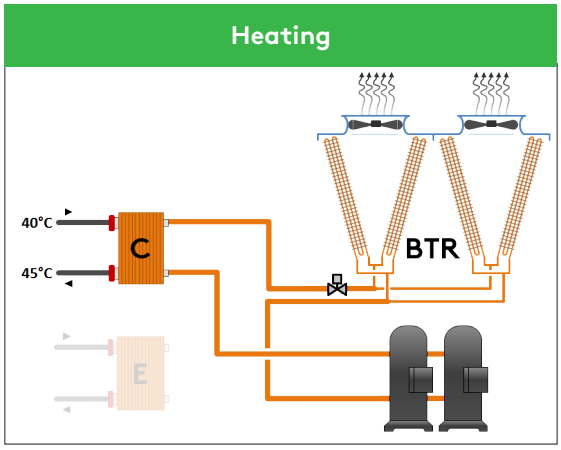
Options:
HE: High Efficiency
HE/LN: High Efficiency/Low Noise
SLN: Super Low Noise



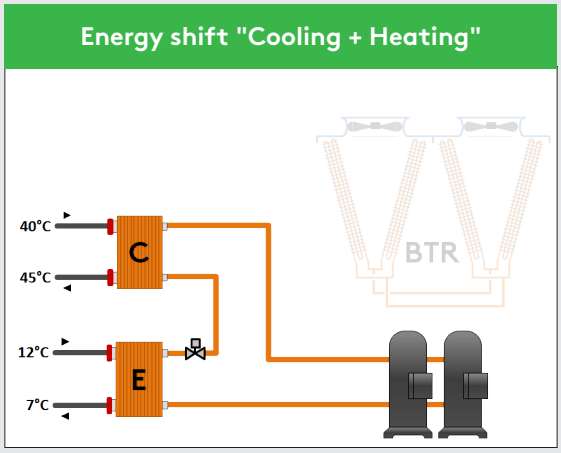
Operating modes and functions



"Cooling" mode
OMICRON REV S4 adopts the "Cooling" mode when the system requests the generation of cold water only. It uses the "BTR" registers as source-side heat exchangers and generates cooled water at heat exchanger "E". This is connected to the dedicated circuit which supplies cold water to the building's air conditioning system.



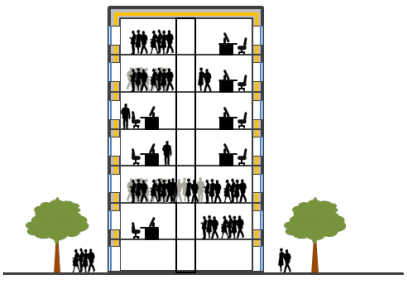
"Heating" mode
OMICRON REV S4 adopts the "Heating" mode when the system requests the generation of hot water only.
It uses the "BTR" registers as source-side heat exchangers and generates hot water at heat exchanger "E". This is connected to the dedicated circuit which supplies water to the building's heating system.



"Energy shift" mode:
If there are simultaneous requests for hot and cold water, OMICRON REV S functions as water/water-heating pump. The unit undertakes the condensation at heat exchanger "C" as well as the vaporization at heat exchanger "E", i.e. it works simultaneously with both circuits. The changeover from Cooling to Heating is fully automated. Used energy is optimized depending on the user's needs.
One circuit undertakes the recovery operation while the other circuit is working in Cooling or Heating mode so that requests for hot and cold water (which are not always balanced) are fulfilled.
This is possible because all units of the series have at least two circuits.
This ensures maximum energy recovery.

Typical applications of 4-pipe systems

Buildings with large glass surfaces and dual exposure to sunlight



Highly insulated buildings with inhomogeneous internal load capacities

Optimal performance with small footprint
Cooling capacities of over 200 kW can be achieved with a unit length of only 2.3 meters. All essential components are contained within the unit.

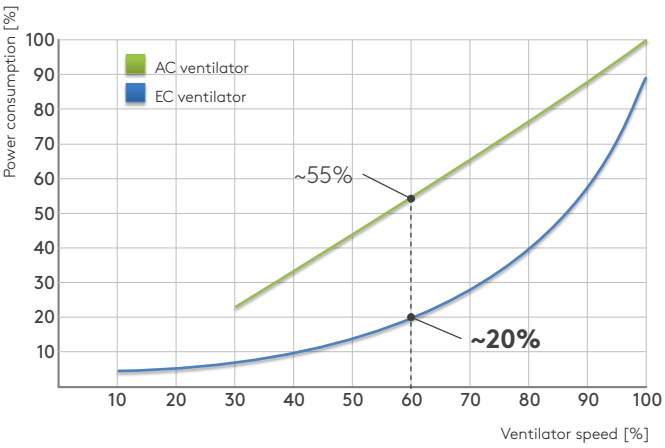
OMICRON REV S4 impresses with its high performance yet short length, so that the unit only takes up very little floor space.
This is particularly important for restructuring projects requiring an exchange of two individual generators for heating and cooling, but the unit also offers significant advantages in hew buildings.
The SLN has the same dimensions as the HE unit, so that this low-noise version offers the same small footprint.

The cooling output which is absorbed from rooms is converted into heat energy which will in turn be supplied to other rooms.

Night-shift system
If required, the unit settings can be changed on a daily basis OMICRON REV S4 can either be operated in high-efficiency or low-noise mode. The latter achieves a noise reduction of up to 3 db(A) which offers significant advantages for night-time operations in mixed-use areas.

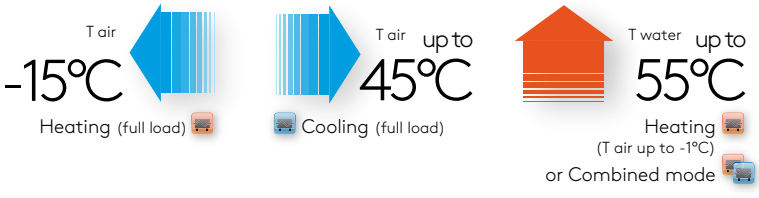
Optional energy-saving EC ventilators
Efficiency can be further increased by using energy-saving EC (Electronically Communicated) ventilators which are optionally available. These ventilators are powered by brushless motors and can achieve power savings of up to 35% per year.

Example: Unit with 8 ventilators, 8,700 annual operating hours; 0.10 € / kW.
This adds up to savings of up to 2,000 € per year.



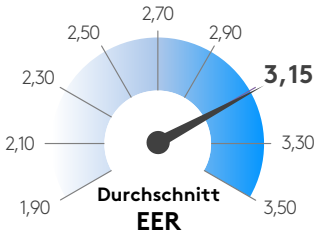
Another attractive feature is the highly efficient air/water unit with a wide functional range:
Outside temperatures of between -15°C and +45°C and hot water temperatures of up to 55°C are possible, opening up new fields of application.

EC ventilator



Performance and efficiency

The OMICRON REV S4 is a multi-function unit for 4-wire systems and one of the most efficient machines in its class: The series is optimized for "Heating + Cooling" operation and impresses with a COP of over 3.3 and, in cooling mode, an EER of over 3.15.
If there is simultaneous demand for hot and cold water, the energy is shifted internally.
During this action the OMICRON REV S4 achieves an average overall performance (TER) of up to 7.66.

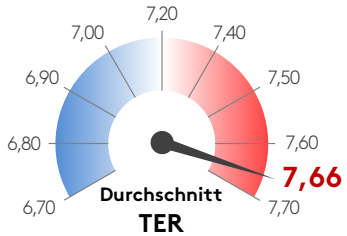


EER

Luft 35°C; Kaltwasser 12/7°C

Exclusive Cooling mode

$$EER = \frac{P_{\text{“cooling”}}}{(P_{\text{a condenser}} + P_{\text{a ventilator}})}$$

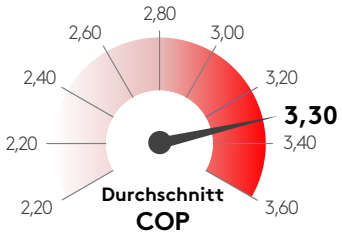


TER

Kaltwasser 12/7°C;
Warmwasser 40/45°C

Performance at full energy shift "Heating + Cooling"

$$TER = \frac{(P_{\text{a “cooling”}} + P_{\text{a “heating”}})}{P_{\text{a condenser}}}$$



COP

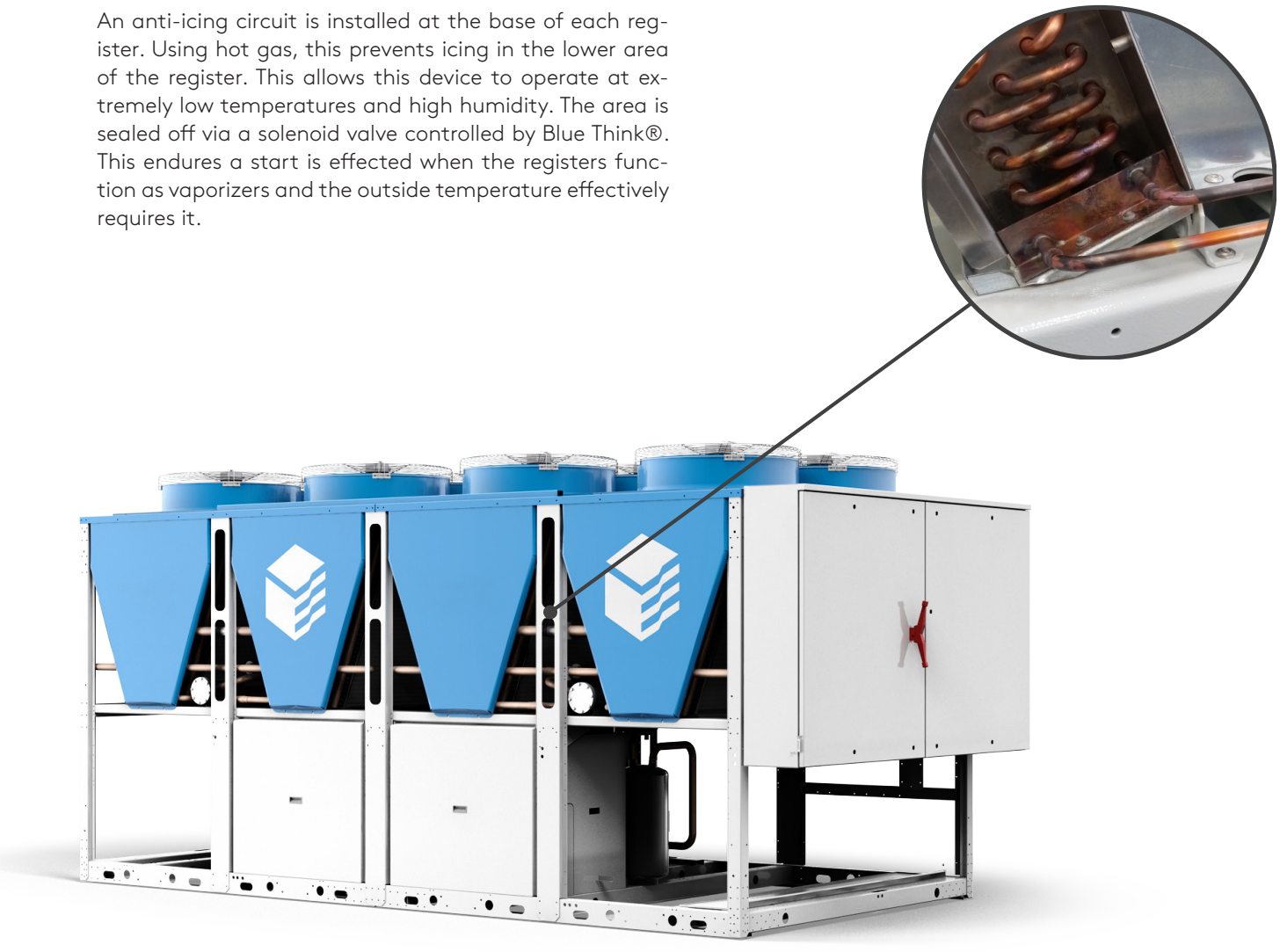
Luft 7°C DB; Warmwasser 40/45°C

Exclusive Heating mode

$$COP = \frac{P_{\text{“heating”}}}{(P_{\text{a condenser}} + P_{\text{a ventilator}})}$$

Anti-icing circuit

An anti-icing circuit is installed at the base of each register. Using hot gas, this prevents icing in the lower area of the register. This allows this device to operate at extremely low temperatures and high humidity. The area is sealed off via a solenoid valve controlled by Blue Think®. This endures a start is effected when the registers function as vaporizers and the outside temperature effectively requires it.



Blue Think® -control

Contained within the **Blue Think**® BlueBox control platform may be an integrated **web server** (Ethernet), the **Multilogic** master/slave function or the inverter-controlled pump control **Flowzer**.

Integrated web servers Main features

- Nominal values
- Maintenance/ service area
- Inputs/Outputs
- System values
- Trend curves
- Alarm signals

Expanded electronic control functions

- Up to 5 languages supported
- User-friendly interface based on visual symbols
- Simple parameters – Access and control via Ethernet / USB
- Recording of data using FIFO logic every 15 seconds for 24 days
- All parameters are recorded and stored based on status change
- Input/output is adjustable in case of problems or errors
- View and administration of device via WiFi (optional) if you are in the vicinity of the unit
- Quick restart following power cuts
- Digital commissioning guide

Innovative technology

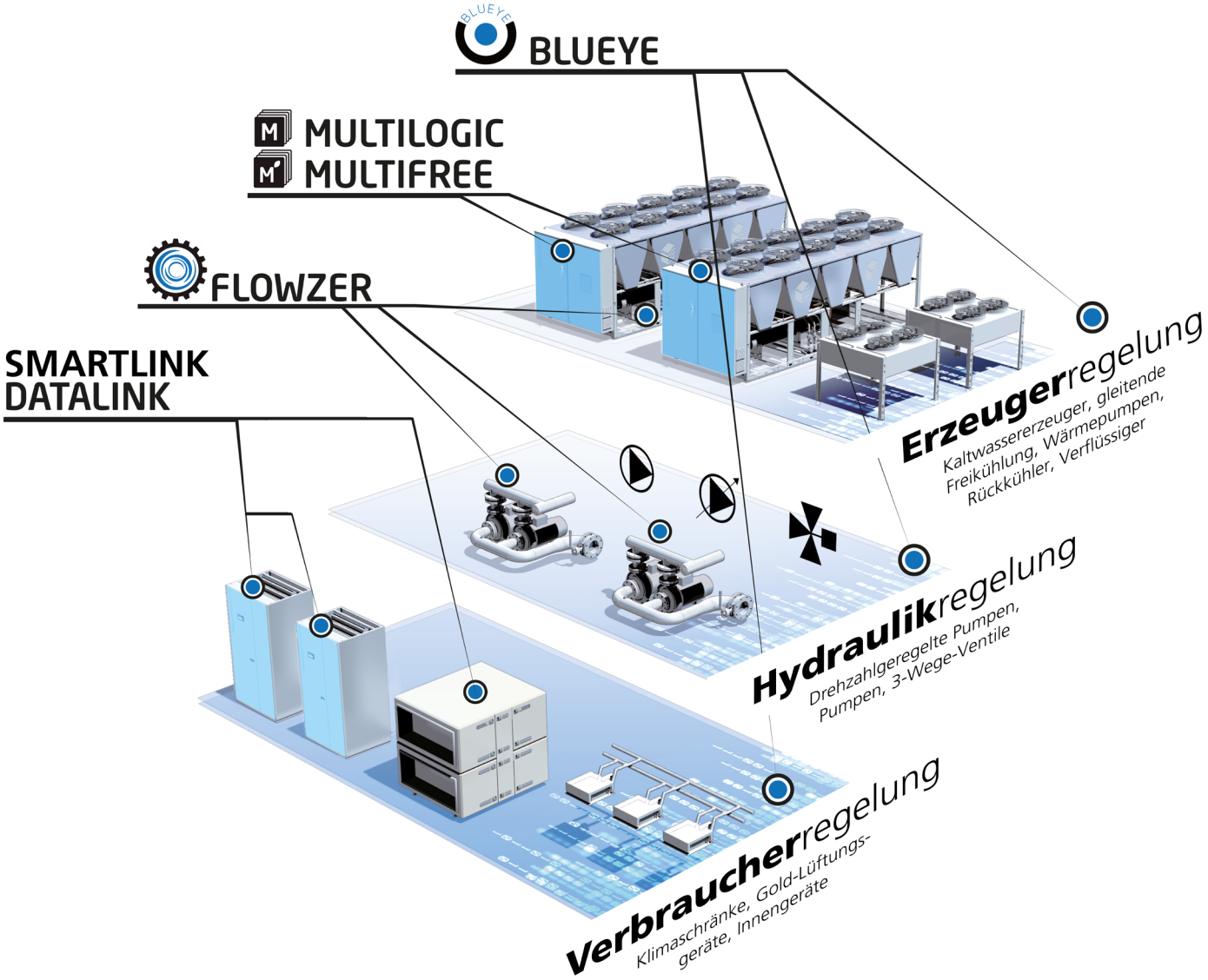
Blue Think® is the latest "Plug & Play" device by BlueBox. The entire function and control logic was developed by our in-house "Systems & Control Team".
One major advantage of the comprehensive software development by BlueBox is that it enables fast reactions to changing market needs.
Plus: the development of functions for system optimization, system integration and monitoring.

BLUE THINK
Systems & Controls

Generator regulation: Regulation for intelligent control of cold water generators and heat pumps.

Hydraulics regulation: Hydraulics optimization by adapting volume flows to load conditions.
Flowzer VP: Inverter for manual pump settings.
Flowzer VD: Differential pressure transducer for automatic adjustment.
Flowzer VFPP: Installation set for variable primary pump volume flow rates

Consumer regulation: Needs-based regulation of generators by consumers using e.g. smart/data links.



For further information on the device please consult our BLUE THINK® brochure.

Blue Box SRL via Valletta 5, 30010 Cantarana di Cona Venezia.
www.blueboxcooling.com, www.swegoncooling.com.
Tel: +39 0426 92 11 11 Fax: +39 0426 30 22 22

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