Swegon

Kappa Sky

BlueBox

KAPPA SKY

Swegon

Modular air source chillers for large systems.
Inverter-driven screw compressors.
Wide capacity range with multiple versions.
Free-cooling models available.

BlueBox

R134a R513A HFO 1234ze

Configurations

X. / S.	efficiency / footprint
.i / .h	full / hybrid inverter
SLN, LN	low noise versions
FC, FC-NG	free-cooling models

Strengths

- Performance vs compactness with 4 choices
- Variable VI & inverter-driven compressor via proprietary control
- Ecodesign compliance, Reg. 2281 tier 2
- Environment: 3 options of GWP. Low refrigerant charge
- Low noise versions
- Bluethink advanced control: integrated web server. Multilogic and Blueye (options)
- Flowzer options: Bluethink-based solutions for fully variable primary flow systems

SKY – new breed of Blue Box models

KAPPA SKY

- CHILLER
- INVERTER SCREW COMPRESSOR

Low GWP refrigerant

- R513A default
- Three choices offered

New inverter screw chillers – 1

260÷1360 kW – 15 sizes *

- Modular chillers for large systems
- Wide capacity range - extended on the low end
- Extensive family, flexible selection
- Performance vs compactness with 4 choices
  - Ideal for retrofit or refurbishment
- Dedicated new compressor range
  - Combination of Variable VI & external inverter-driven compressor
  - Blue Box proprietary development
- Full compliance to **Ecodesign Reg. 2281 tier 2**

Cooling net capacity: air 35°C; water 12/7°C according to EN14511
Xi default model R513A

New inverter screw chillers – 2

- Environment:
  - 3 options of GWP.
  - Low refrigerant charge: microchannel coils, shell & tube dry evaporator
  - Low noise versions
- Bluethink advanced control: integrated web server. Multilogic and Blueye (options)
- Saving & smart use of energy:
  - Modular Free-cooling models
  - Flowzer options: Bluethink-based solutions for fully variable primary flow systems

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Performance vs compactness with 4 choices

Refrigerant	Footprint vs Efficiency	Inverter
	X. High Efficiency S. Compact	.i Full inverter .h Hybrid

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Refrigerant choice

R513A R134a

- Default for full line-up and models
- Non flammable – category A1
- Smart GWP 573 (*)
- Not subject to shortage or price hikes
- May be promoted by local incentive schemes
- R134a as option

HFO 1234ze

- **LGW range (Xi model)**
- Category A2L, classified as PED group 2
- Lowest GWP < 1 (*)
- Not subject to shortage or price hikes
- Totally exempted by local taxation / bans
- Best future-proof choice

(*) GWP (AR5) according to IPCC V time horizon 100 years

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Two levels of efficiency/footprint

X. Models
- High efficiency

S. Models
- Compact footprint

all models =
single assembly
execution
13m max length

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Swegon

Two levels of efficiency/footprint

X. Models

- High efficiency
- Matching green requisites such as lowest GWP and low noise

SEER
up to 4,94

S. Models

- Compact footprint
- Ideal for refurbishments

SEER
up to 4,89

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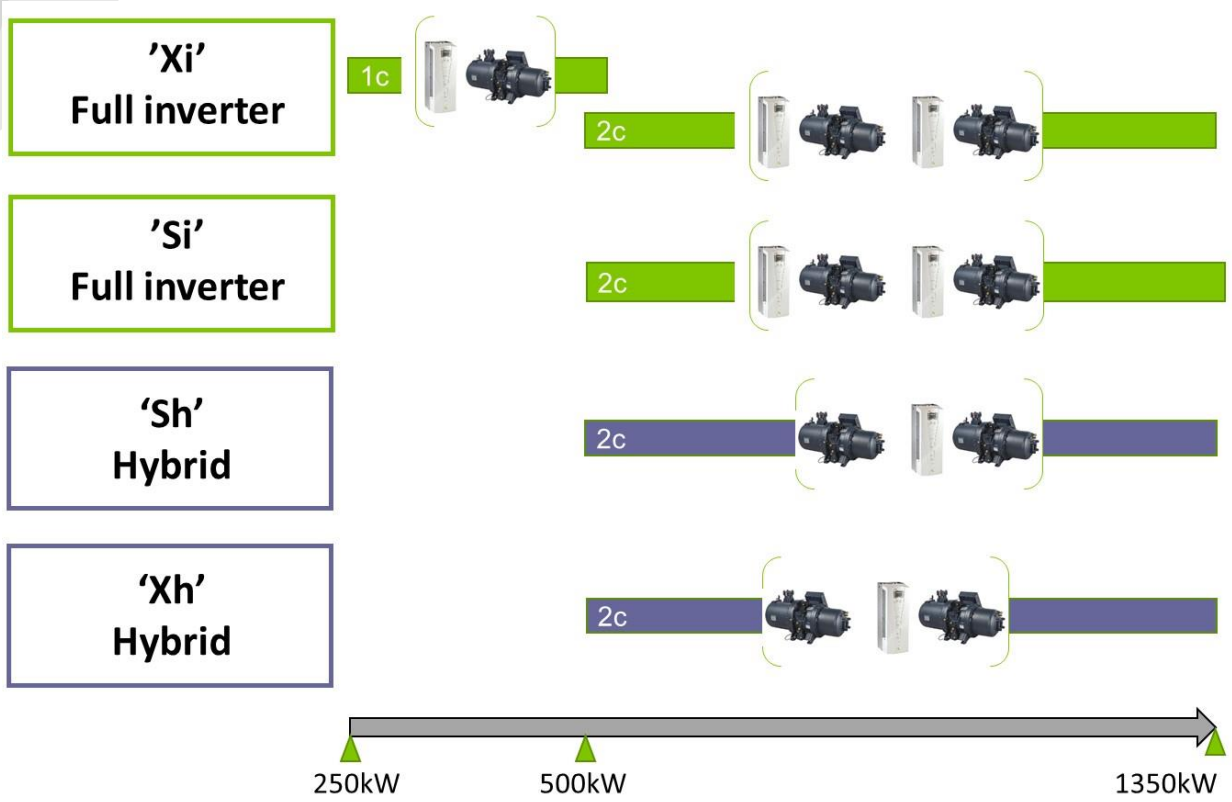
* R134a

Two levels of inverterization



Xi /Si Inverter on each compressor

- Competing on tenders
- Extension to low capacity

Xh /Sh Inverter on just one compressor

- Competitive price

Cooling net capacity: air 35°C; water 12/7°C according to EN14511
Default model

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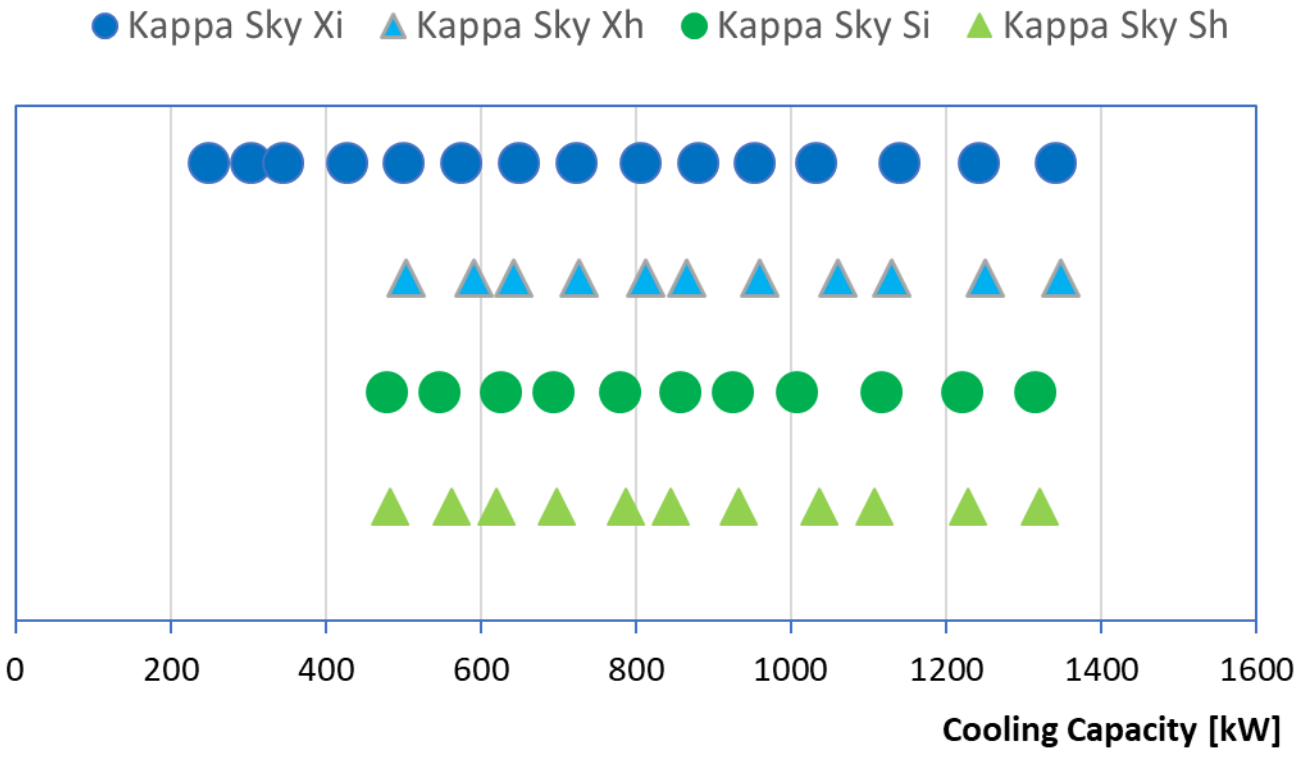
Line -up

Xi 260÷1360 kW
15 sizes (4+11)
1 to 2 circuits/compressors

Xh 500÷1330 kW
11 sizes
2 circuits/compressors

Si 490÷1310 kW
11 sizes
2 circuits/compressors

Sh 480÷1290 kW
11 sizes
2 circuits/compressors



Cooling net capacity: air 35°C; water 12/7°C according to EN14511
Default model

LGW line-up

- BlueBox has been developing HFO chillers since 2014
- Kappa Sky reaps this know-how

→ KAPPA SKY Xi LGW model designed to **fine-tune** price vs efficiency

- Efficiency aligned to default Xi (R513A/R134a)

Range:

- 240÷1050kW
- 11 sizes (4 single compressor)
- Versions: base (naked) / LN / SLN

LGW line-up

Versions:

- Base (naked) execution
  - Installer to adopt provisions based on specific risk analysis
  - Leak detector, option
- LN and SLN
  - Compressor housing includes leak detector and fan

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High performance solutions

Fan speed adjuster standard

Variable Frequency Driver Continuous modulation according to cooling demand

Screw compressors with variable compression ratio (Vi) modulated according to envelope condition

New modular V-shape aluminum microchannel coils

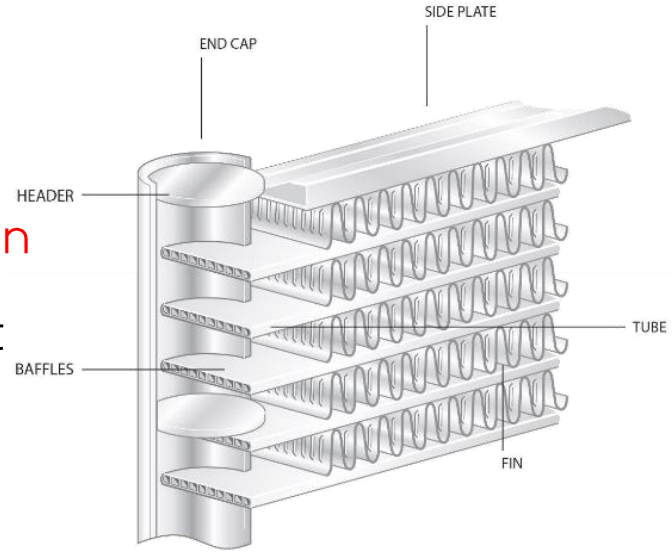
BlueBox

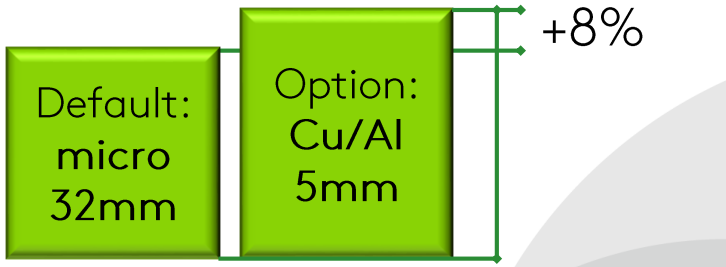
High performance solutions

Modular V-shape

32mm microchannel coils:

- more capacity / cross section
- smart efficiency vs footprint





Refrigerant charge:

- minimized
- even with Cu/Al & coatings

Coil options as usual

- E-coated microchannel
- Cu/Al coils & coatings: minichannel (5mm)
- type

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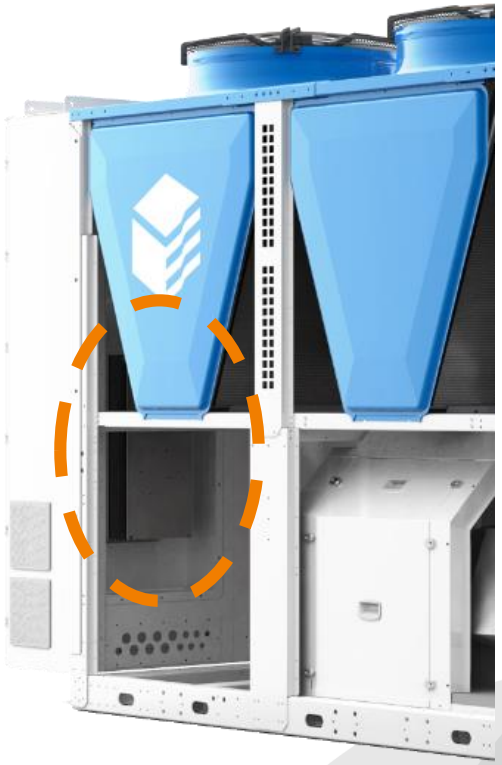
High performance solutions

Inverter

- External
- Flexible design of each model, consistent with performance targets
- Directly managed by Bluethink



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High performance solutions

BlueBox reserved screw compressor

- Optimized for air-water applications
- Fully tailored VI ports
- Exclusive optimization of our units
- Directly managed by Bluethink

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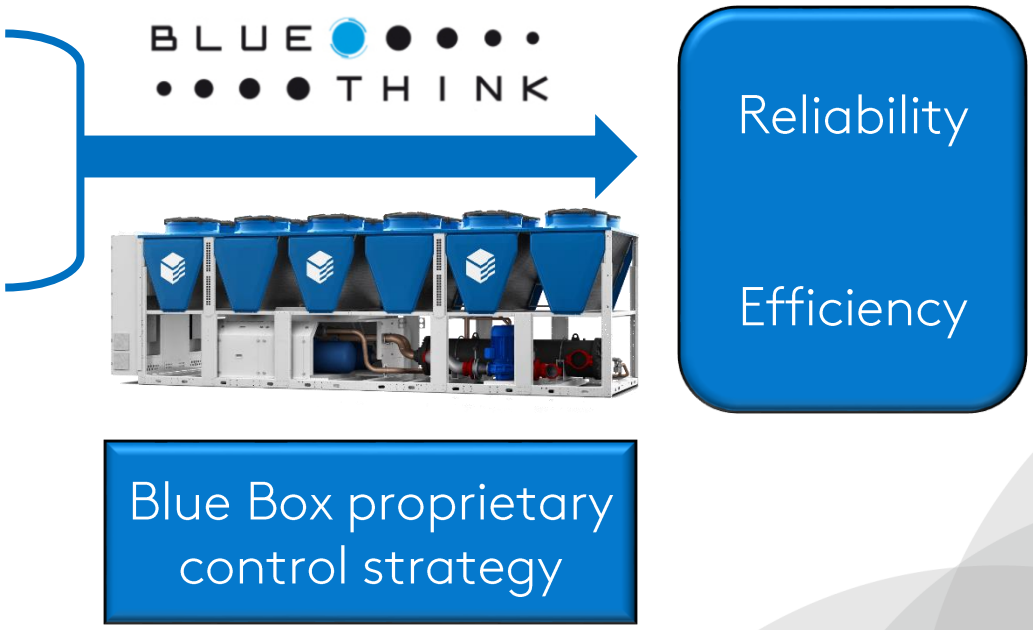
High performance solutions

- External inverter
- Variable VI – reserved screw compressor



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Inverter & Variable VI - efficiency

Variable VI

VI = ratio between suction/discharge volumes

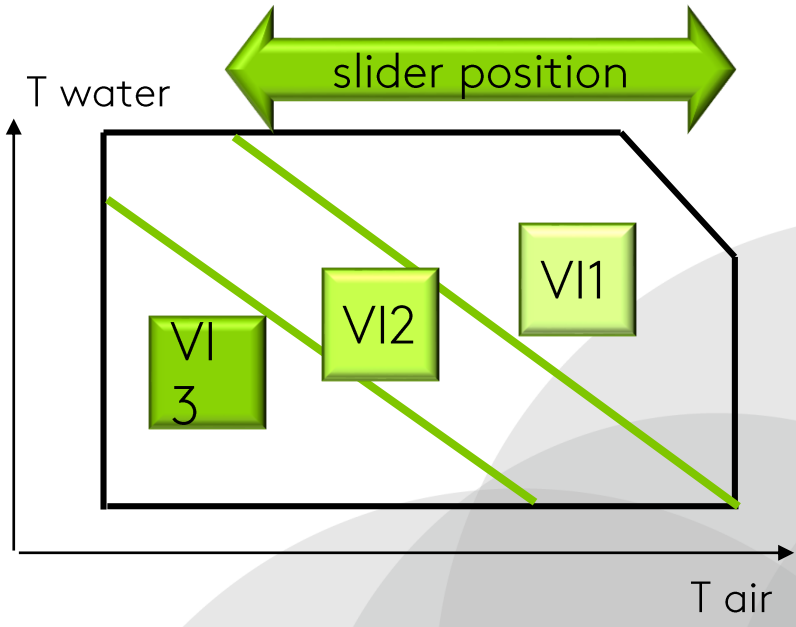
---> compression ratio

---> condensing / evaporating temperatures

VI can switch among 3 conditions, directly managed by

Bluethink

- Detects pressures
- Calculates volumetric ratio
- Defines slider position ---> VI port to adapt internal volume
- Drives 3 solenoid valves

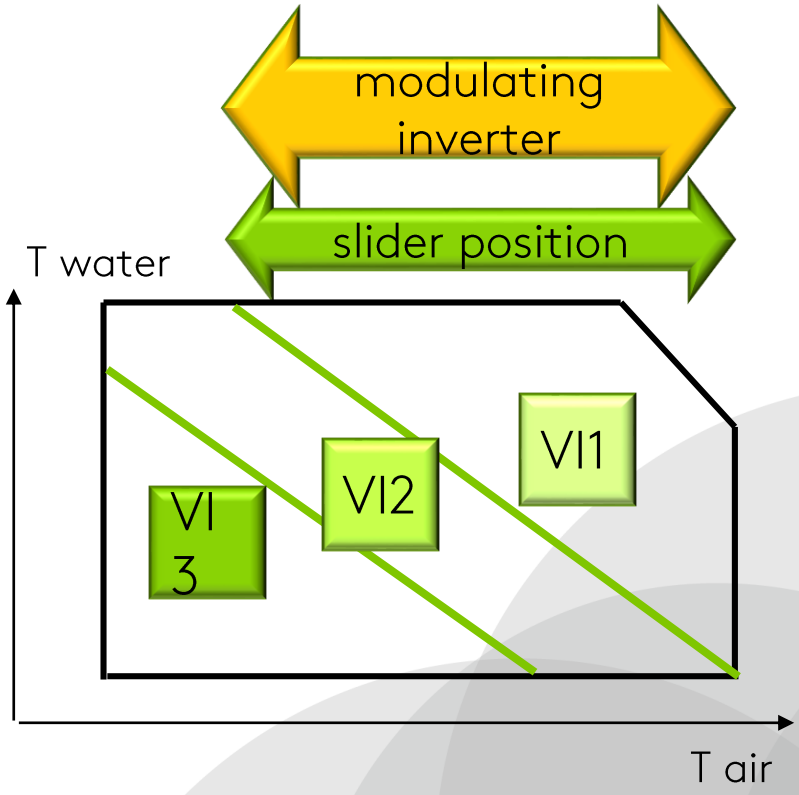


Inverter & Variable VI - efficiency

Variable VI

Efficiency enhanced at

- Part-load
- Full load & low condensing



Inverter & Variable VI - efficiency

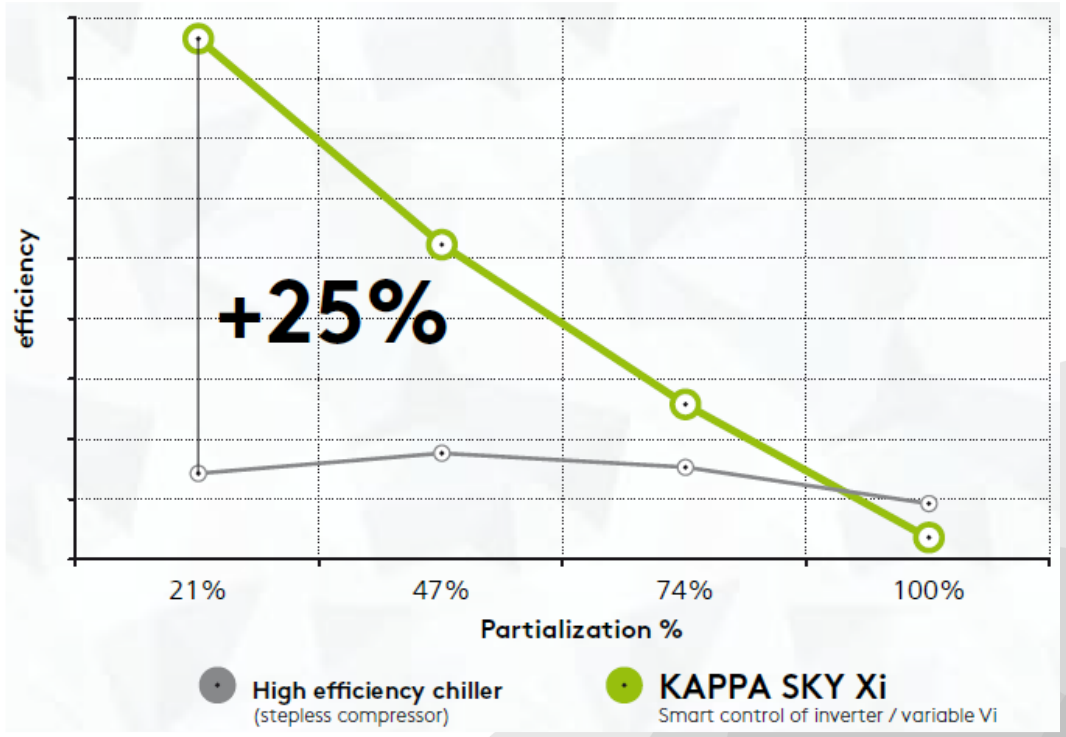
Variable VI

Benefit on SEER and more on SEPR

Single compressor units gets further advantage

Example:

- **Xi** 2-compressor units, average
- SEER conditions - load: 100 / 74/ 47 /21 %
- Efficiency up to +25% vs stepless models (at minimum load)



Ecodesign compliance

- Regulation 2281: SEER 12/7 and SEPR
- All units compliant to current tier 1
- Compliance to tier 2 (2021):
  - Xi & Xh
  - Xi SLN
  - Xi LGW
  - All other models have different compliance levels based on refrigerant (R513A vs R134a)
  - Most Si units reach tier 2, both SEER and SEPR
  - Otherwise, all models satisfy tier 2 by adopting EC fans

Comfort applications

SEER rules

- Xi as best choice
  - ideal with variable load
  - wider lineup & low-noise options
  - power supply line sizing
- Si for footprint-critical cases
- EC fan option boosts SEER

SEER
up to 4,94

SEER
up to 4,89

Swegon

Process applications

SEPR / EER rule

- **Xh** – competitive option
- **Xi** – advantages of full inverter
- **Xi/ Si** also available as **FC models**

SEPR
up to 6
EER~3,18

BlueBox

air 35°C; water 12/7°C according to EN14511
R134a

Smart envelope for any application

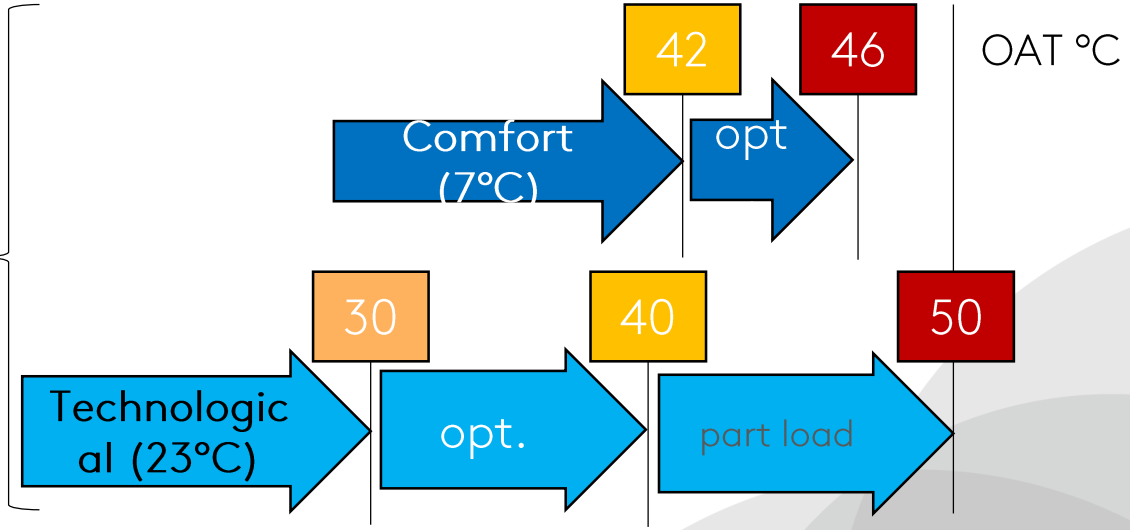
- Water temperature from -8 to 23°C
- Covering also process / technological uses

Si/Sh compact versions:
- Comfort application up to 44°C OAT

Xi/Xh efficient versions:
- Fits to nowadays high temperature cooling
- Comfort up to 48°C OAT *

- Part load operation extended to 50°C *

(* = with option)



Default model

Smart envelope for any application

Si/Sh = simple approach for refurbishment tenders
Xi/Xh = 2 levels of envelope to fit different climates / applications

Fan speed adjuster as standard
Brine kit option for low LWT
HAT option = upgraded inverter

- available for Xi/Xh except SLN

Minimum OAT -10°C

- OAT can reach -20°C (adequate provisions or no wind condition)

Multiple low-noise options

1. Base (naked) execution
2. \LN option --> compressor housing only
3. SLN --> no impact on footprint
   - Compressors housing
   - Lower fan speed setting
   - Available only for Xi and Xh

Compressors easily inspectable thanks to removable panels

Multiple low-noise options

Base

\LN
-4dB(A)

SLN
-7dB(A)

- Intrinsically silent
- One more option: SLN
- Competitive segmentation

Free-cooling chillers

- All free cooling units manufactured and shipped in a single assembly
- 2 sizes of FC modules:
  - BASIC
  - EXTRA
- 2 types of operation:
  - Conventional (FC)
  - No-glycole (FC/NG)

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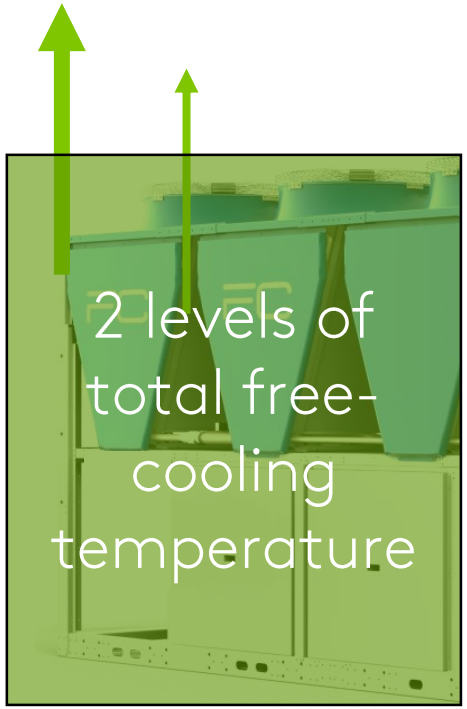
Free-cooling chillers



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Free-cooling chillers

FC modules:

BASIC, TFT = -5 ÷ -4 °C

EXTRA, TFT= +1 ÷ +2 °C

Indicative cooling net capacity: air 30°C; water 15/10°C gl.30%; EN14511
Default model

Free-cooling chillers

Free-cooling units can be configured also as no-glycole

Intermediate heat exchanger allows to operate the indoor circuit with just water

- better heat exchange properties and less energy for pumping
- suitable for systems where glycol mixtures are not allowed
- safe operation e.g. in case of leakages
- cost saving: circuit's filling and safety arrangements

Highlight on accessories

- Adoption of inline pumps
- New pump selection:
  - 1p/2p 100 ÷ 150kPa net head
  - 1pm/2pm 200 ÷ 250kPa net head
  - (tank option: only for sizes from 800kW and up)
- All models /versions can adopt all Flowzer options

- Energy meter options, new release: connectivity to BlueThink & power shedding

KAPPA SKY

Bluethink

- Regulation resources
- System management

Flowzer VFPP /VPS
ALL SIZES

Proprietary platform
Advanced / Programmable control

Swegon Cooling

Bluethink

BLUE THINK control platform

Advanced control:

- Integrated web server
- Data logging
- Connectivity protocols
- Multilogic: management for multiple units' system (*)
- Blueye®: supervision system (*)
- Compatibility to Flowzer VFPP / VPS (*)
- Compatibility to energy meter & power shedding (*)

(*) options

BlueBox

Swegon Cooling

Flowzer

- Hydraulic management based on inverter-driven pumps
- Associated to the range of built-in pump modules
- Best fitting solutions for different system's layouts
- Operational cost saving: minimized pumping energy consumption
- No external devices required

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Swegon Cooling

Flowzer

Energy optimization at system level

Scalable application-focused options:

- FLOWZER VP — Inverter for manual setting of pump
- FLOWZER VD — Transducer for automatic setting
- FLOWZER VFPP — Bluethink-based solution for fully variable primary flow systems
- FLOWZER VPS — Bluethink-based solution for fully variable primary + secondary flow systems

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