

# Kappa Rev LGW



Air cooled & modular freecooling screw chiller

240 ÷ 1020 kW



## General

Low GWP, high efficiency air cooled modular chiller with screw compressors and shell&tube heat exchanger. Available also with freecooling module.

## Configurations

LN: low noise version  
HE-LN: high efficiency, low noise version  
HE-SLN: high efficiency, super low noise version  
DC: option, unit with condensing heat exchangers for total heat recovery

## Bullet points

- ▶ Eurovent-certified model
- ▶ 3 versions with 34 sizes
- ▶ Free-cooling option with 3 selectable module sizes
- ▶ A-class efficiency according to Eurovent
- ▶ High seasonal energy efficiency
- ▶ Low refrigerant charge
- ▶ Microchannel condensing coil
- ▶ Multilogic and Multifree functions
- ▶ Integrated web server
- ▶ Blueeye supervision system
- ▶ Flowzer variable flow system
- ▶ Integrated hydraulic modules (option) with 3 selectable pump sizes, buffer tank, inverter-driven pumps



# SUSTAINABILITY

HVAC/R industry is increasingly focused on the environmental sustainability of its equipment.

Regulations and related bans have aimed at the ozone depletion first (ODP=0 with HFCs) and then at Global Warming Potential.

Lower GWP means, at equal emissions in the atmosphere, lower impact of the greenhouse effect, i.e. limited increase of the heat trapped in the atmosphere as a consequence.

Fluorinated refrigerants ("F-gas") comply with ODP limits, but most of them will stay in the atmosphere for centuries, contributing to greenhouse effect, up to 8000 times more than carbon dioxide (CO<sub>2</sub>). The European Union is taking regulatory action to control F-gases as part of its policy to combat climate change.

Emissions of F-gases account for 2% of the overall greenhouse gases in EU, but they rose by 60% since 1990, in contrast with the trend of all other greenhouse gases.

A new Regulation applies from 1 January 2015 and strengthens the existing measures with far-reaching changes: by 2030 it is expected to cut the EU's F-gas emissions by two-thirds compared to 2014 levels.

The stepwise restrictions on high-GWP refrigerants will lead to the ban of R134a and R410A.

The adoption of new alternative fluid must ensure the appropriate balance of performance and sustainability.

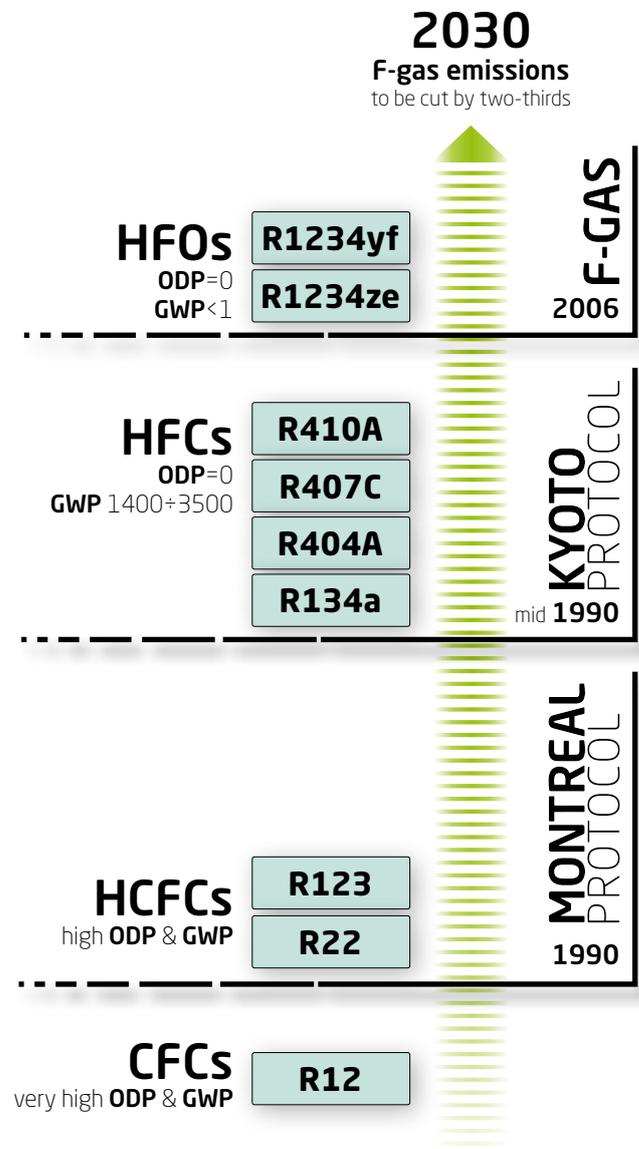
Few refrigerants can comply with scheduled reduction of CO<sub>2</sub>-equivalent impact, thanks to their GWP values: this is the case of HFOs (Hydro Fluoro Olefins).

HFO is the best-fitting alternative to HFC refrigerants for the next-generation chillers.

Other options (ammonia, propane...) pose serious concerns about safety, due to toxicity and/or flammability.

Among HFOs, the R1234ze is the ideal replacement for R134a. It features GWP<1 and ODP=0.

Next-generation chillers are not just a matter of refrigerant's replacement, as the challenge is about combining cost, energy efficiency, reliability, safety – besides low environmental impact – means research and testing.



Alternative refrigerant's perspective for commercial HVAC application		
<b>CURRENT REFRIGERANT</b>	<b>R134a</b> - GWP=1430	<b>R410A</b> - GWP=2088
<b>MILDLY FLAMMABLE</b>	<b>R1234ze</b> - GWP <1 <b>R1234yf</b> - GWP <1	<b>R32</b> - GWP 675
<b>DANGEROUS</b>	<b>R290</b> (Propane) GWP 3 HIGH FLAMMABLE	<b>R717</b> (Ammonia) GWP 0 HIGH FLAMMABLE AND TOXIC
		<b>R744</b> (Carbon dioxide) GWP 1 HIGH WORKING PRESSURE

## GWP

Global-warming potential (GWP) is a relative measure of how much heat a greenhouse gas traps in the atmosphere.

It compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by carbon dioxide.

GWP is calculated over a specific time interval, commonly 20, 100 or 500 years. GWP is expressed as a multiplying factor of carbon dioxide value that is standardized equal to GWP=1.

In the past, refrigerant's artificial category **HCFC** (Hydro-Chloro-Fluoro-Carbides) were used but, later were banned because they were one of main causes of Ozone layer depletion (high ODP value).

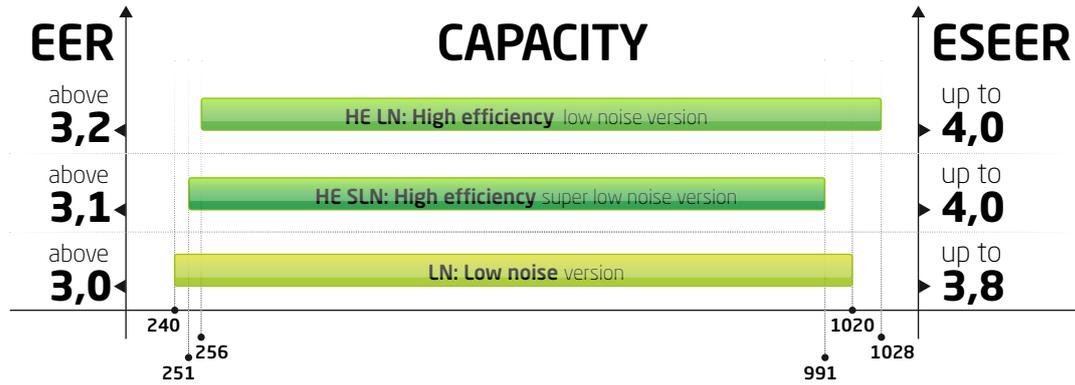
Currently the used refrigerants used as HCFC substitutes, belong to **HFC** category (Hydro-Fluoro-Carbides) with ODP=0, but with still strong greenhouse effect (High GWP).

Natural refrigerants (R744, R717) and hydrocarbons HC (R290) may be an alternative to HFCs but with several implications and limitations.

**New refrigerants belonging to HFO category (Hydro-Fluoro-Olefin) like R1234ze/R1234yf offer a good alternative to HFC, offering:**

- **Adaptation to existing chillers design**
- **Higher efficiency**
- **Longer life of components**
- **Suitable for all climate zones**

# WIDE CAPACITY RANGE



## • K • N • I • T • H • I • P • L • A • T • F • O • R • M

- > USB, RS485 and Ethernet ports as standard
- > Recording of unit parameters one month long
- > Integrated web server as standard for remote management
- > Fast restart procedure in case of power supply interruptions



### MULTILOGIC/MULTIFREE FUNCTION

- > Up to 31 different units managed together with master / slave logic
- > Different plant configurations
- > Maximise the efficiency using the freecooling from stand-by unit in n+1 configuration.



### FLOWZER

- > Smart logic of managing variable flow inverter pumps to saving pumping energy consumption



### BLUEYE

- > Supervision system by Bluebox that allows several function and advantages as monitoring one or more units, pumps, energy meters, valves, record parameters and graphs in the cloud

## MICROCHANNEL ALUMINIUM COIL

Kappa Rev LGW units use this new generation of condensing coil on chiller section as standard.



This means:

- Extended life cycle
- 10% overall chiller weight reduction
- less air side pressure drop

**30% less refrigerant**

## LEAK DETECTION



R1234ze is rated as not toxic / not flammable (PED Group 2).

ASHRAE rates it as A2L (Light Flammable): a critical combination of high temperature and concentration plus strong, continuous ignition source would cause flammability.

- Leak detection system placed in the compressor housing
- Pump-down automatic procedure ensuring that refrigerant is segregated into coils' section
- Compressor housing features forced ventilation and the absence of electric or electronic components

Kappa Rev LGW LN														
Unit size			33.2	40.2	51.2	54.2	58.2	67.2	80.2	90.2	100.2	115.2	120.2	130.2
cooling capacity	(1)	kW	240	323	380	424	486	544	600	699	785	881	950	1020
absorbed power	(1)	kW	80	111	129	144	167	181	197	240	269	299	319	336
EER	(1)		2,99	2,92	2,93	2,93	2,91	3,00	3,04	2,91	2,92	2,95	2,98	3,03
EER class (Eurovent)			B	B	B	B	B	B	B	B	B	B	B	B
ESEER			3,74	3,79	3,80	3,81	3,79	3,75	3,74	3,76	3,76	3,78	3,75	3,76
water flow rate	(1)	m <sup>3</sup> /h	41	56	66	73	84	94	104	121	135	152	164	176
pressure drop at evaporator	(1)	kPa	25	45	34	41	30	36	26	35	45	21	24	27
noise power level	(1)(2)	dB(A)	89	91	92	93	93	94	95	95	96	97	97	98

Kappa Rev LGW HE LN													
Unit size			33.2	40.2	51.2	54.2	58.2	67.2	80.2	90.2	100.2	115.2	120.2
cooling capacity	(1)	kW	259	350	410	454	532	576	644	754	858	955	1028
absorbed power	(1)	kW	81	110	128	142	167	182	202	237	268	300	323
EER	(1)		3,19	3,19	3,20	3,19	3,19	3,17	3,19	3,19	3,20	3,18	3,18
EER class (Eurovent)			A	A	A	A	A	A	A	A	A	A	A
ESEER			3,98	3,94	3,83	3,84	3,93	3,82	3,83	3,80	4,01	3,88	3,87
water flow rate	(1)	m <sup>3</sup> /h	45	60	71	78	92	99	111	130	148	165	177
pressure drop at evaporator	(1)	kPa	30	29	22	26	21	24	29	42	43	24	28
noise power level	(1)(2)	dB(A)	89	91	92	93	93	94	95	95	96	97	97

Kappa Rev LGW HE SLN													
Unit size			33.2	40.2	51.2	54.2	58.2	67.2	80.2	90.2	100.2	115.2	120.2
cooling capacity	(1)	kW	251	337	396	438	515	558	621	729	828	922	991
absorbed power	(1)	kW	80	108	127	140	165	180	198	234	266	295	319
EER	(1)		3,13	3,12	3,12	3,13	3,13	3,10	3,13	3,12	3,11	3,13	3,11
EER class (Eurovent)			A	A	A	A	A	A	A	A	A	A	A
ESEER			3,96	3,92	3,81	3,82	3,91	3,80	3,81	3,78	3,98	3,86	3,85
water flow rate	(1)	m <sup>3</sup> /h	43	58	68	75	89	96	107	126	143	159	171
pressure drop at evaporator	(1)	kPa	28	27	21	25	19	22	27	39	41	23	26
noise power level	(1)(2)	dB(A)	86	88	89	90	90	91	92	92	93	94	94

Kappa Rev LGW FC												
Unit size			33.2	40.2	51.2	54.2	58.2	67.2	80.2	90.2	100.2	115.2
<b>LN</b> - Basic (TFT temperature)		°C	-3,7	-2,4	-4,9	-3,0	-2,2	-4,0	-2,7	-4,5	-1,7	-1,1
<b>LN</b> - Custom (TFT temperature)		°C	0,7	1,8	0,3	-0,7	0,2	-1,2	0,7	-0,6	0,3	0,5
<b>LN</b> - Extra (TFT temperature)		°C	4,0	3,5	2,3	1,6	3,0	2,0	2,5	2,7	3,0	2,8
<b>HE-LN</b> - Basic (TFT temperature)		°C	-4,9	-3,4	-2,5	-1,2	-3,6	-1,9	-3,0	-1,2	-0,6	
<b>HE-LN</b> - Custom (TFT temperature)		°C	-0,1	1,2	-0,4	0,9	-0,9	1,2	0,5	0,7	0,9	
<b>HE-LN</b> - Extra (TFT temperature)		°C	3,4	3,0	1,8	3,5	2,3	2,9	3,4	3,2	3,1	
<b>HE-SLN</b> - Basic (TFT temperature)		°C	-4,1	-2,9	-5,3	-3,2	-3,0	-4,4	-2,5	-0,8	-0,2	
<b>HE-SLN</b> - Custom (TFT temperature)		°C	0,4	1,5	0,0	-0,9	-0,5	-1,5	0,8	1,0	1,2	
<b>HE-SLN</b> - Extra (TFT temperature)		°C	3,8	3,3	2,1	1,5	2,5	1,8	2,6	3,5	3,4	

TFT: total freecooling temperature

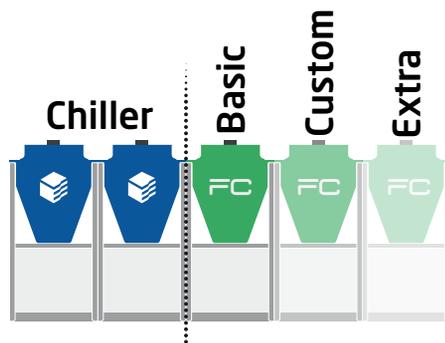
(1) EN14511 A35W7

(2) ISO3744

all models: R1234ze refrigerant, 2 circuits, 2 screw compressors, 1 shell&tube evaporator

# MODULAR FREECOOLING AVAILABLE

**Kappa Rev LGW** allows all combinations with 3 freecooling levels. Every chiller version can be coupled with each size of freecooling modules.



**TFT**  
UP TO  
**4°C**

**ESEER**  
UP TO  
**4.0**

# LGW BY BLUE BOX

KAPPA REV LGW models belong to the KAPPA REV series. LGW stands for Low Global Warming potential thanks to the adoption of R1234ze refrigerant, belonging to the HFO family.

The legislative scenario will further push on low GWP refrigerants in the future, with an additional focus on energy efficiency (Ecodesign regulations).

Therefore the development of products featuring both energy efficiency and environmental sustainability is essential.

KAPPA REV LGW is already the answer to such requirements, allowing right now to design the cooling systems of the future generation.

This grants the system's long-term compliance and its return of investment.

Blue Box launched KAPPA REV LGW in 2014, achieving so far significant installation references.

Pioneering the HFO technology, Blue Box invested on extensive lab testing and on dedicated design.

The wide and reliable range of chillers now available is the result of all this.

KAPPA REV LGW models are also listed in the Eurovent certification programme



DATAHUB  
Winterthur - Switzerland  
2 x Kappa Rev FC LGW

NOVARTIS  
Stein - Switzerland  
Kappa Rev LGW 43.2 + 67.2



CKW Fibe  
Luzern - Switzerland  
3 x Kappa Rev LGW 500 kW each



# Blue Box technological product range

find out the complete product range on our web site and catalogues



## Zeta Rev .Ei > 32÷91 kW

High efficiency air cooled chillers with brushless DC inverter scroll compressor.



## Zeta Rev FC > 44÷143 kW

High efficiency air cooled free cooling chillers. Patented system. Available also with brushless DC inverter compressor.



## Tetris FC > 97÷518 kW

High efficiency air cooled free cooling modular chillers.



## Kappa Rev .Ei > 286÷1451 kW

High efficiency air cooled modular chillers with inverter screw compressors.



## Kappa Rev FC > 320÷1300 kW

High efficiency air cooled free cooling modular chillers. Available also with inverter compressors.



## Kappa V Evo FC > 325÷1178 kW

Air cooled freecooling chiller.



## Tetris W FC/NG > 39÷634 kW

High efficiency water cooled free cooling chillers with integrated hydronic module.



Blue Box Group S.r.l.

Via Valletta, 5 - 30010 Cantarana di Cona, (VE) Italy

www.bluebox.it - info@bluebox.it

Phone +39 0426 921111 - Fax +39 0426 302222