



AQUAFORCE[®] VISION INNOVATION AT WORK



AQUAFORCE greenspeed 
PUREtec



CARRIER PRESENTS AQUAFORCE VISION

30KAV/P-ZE

RANGE: Air-cooled variable-speed screw chiller, 350-800 kW. Capacity extension next years.

REFRIGERANT: HFO R-1234ze with ultra low GWP.

APPLICATIONS: Commercial and industrial. Operation from -20°C up to 55°C air ambient temperature.



The range is fully compliant with the 2021 Ecodesign regulations.



The range is fully certified according to the LCP/HP ECP program



The range is fully certified according to the ANSI/AHRI 550/590 (IP) & 550/591(SI)



KEY BENEFITS



**LONG-TERM
REFRIGERANT SOLUTION**



TOP ENERGY EFFICIENCY



SMART ENERGY METERING



**SMART REFRIGERANT
LEAK DETECTION**



LOW NOISE





30KAV-ZE: ONE PRODUCT MANY APPLICATIONS



MULTI-RESIDENTIAL



HOTEL



HOSPITAL



INDUSTRY



GREEN BUILDING



DATA CENTER



30KAVP-ZE: ONE PRODUCT MANY APPLICATIONS



INDUSTRY



HOSPITAL



HOTEL



GREEN BUILDING



MULTI-RESIDENTIAL



DATA CENTER



30KAVP-ZE UPGRADED TECHNOLOGIES

Inverter-driven Flying Bird™ fans with EC technology



Additional condenser

Inverter-driven Carrier screw compressor & reliable air-cooled VFD



Permanent magnet motor technology



HFO R-1234ze





INNOVATION AT WORK

Smart energy metering & leak detection

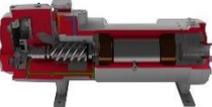
Inverter-driven Flying Bird™ fans with EC technology

“W” shape Novation® Micro channel with Carrier coating (option)



Inverter-driven Carrier screw compressor & reliable air-cooled VFD (30KAV-ZE)

Permanent magnet motor technology (30KAVP-ZE)



Flooded shell and tube evaporator

Inverter-driven dual pumps (option)



MANUFACTURING SITE IN FRANCE



800
employees



7,500m²
Largest European
HVAC laboratory



32,000m²
Largest European
chiller plant



**8,000 -
10,000**
Chillers per
year





THE LARGEST EUROPEAN HVAC LABORATORY



12 individual test rooms

Ambient control from
-25°C to +55°C

1.200 measurement sensors

Water-cooled unit test
capacity of **3.600kW**

Air-cooled unit test capacity of
2.800kW

Total test capacity of **6MW**

Quality and accuracy to reach and maintain
stable conditions

High precision method for
acoustic measurement

Specific test on demand



PURETEC, THE LONG-TERM REFRIGERANT SOLUTION



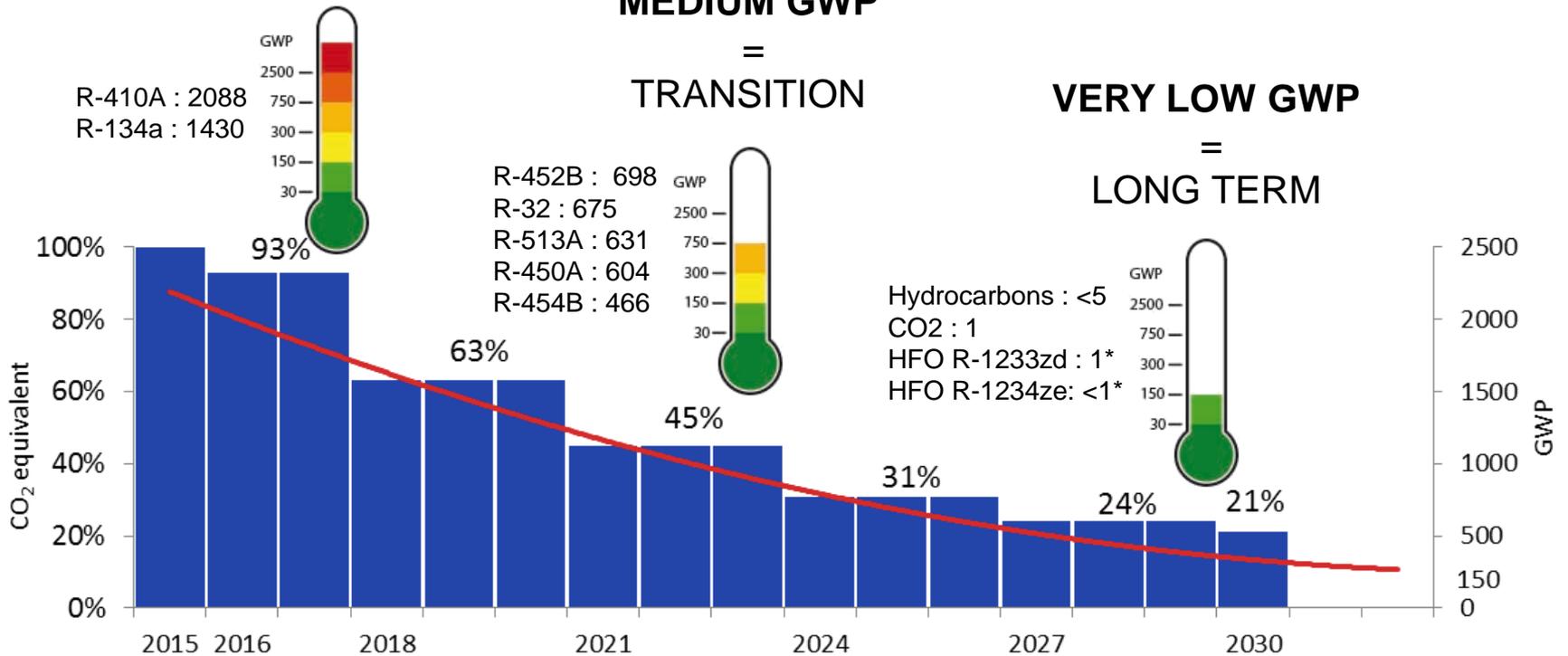
EU F-GAS REGULATION

HFC PHASE DOWN

HIGH GWP
=
CURRENT

MEDIUM GWP
=
TRANSITION

VERY LOW GWP
=
LONG TERM

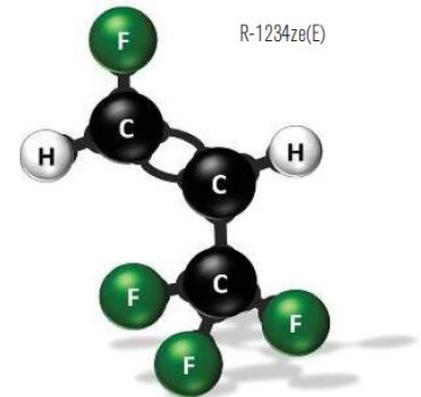


Long term refrigerants should have GWP < 150

Note: GWP according to IPCC AR4, except for HFOs: IPCC AR5

WHAT ARE HFOs ?

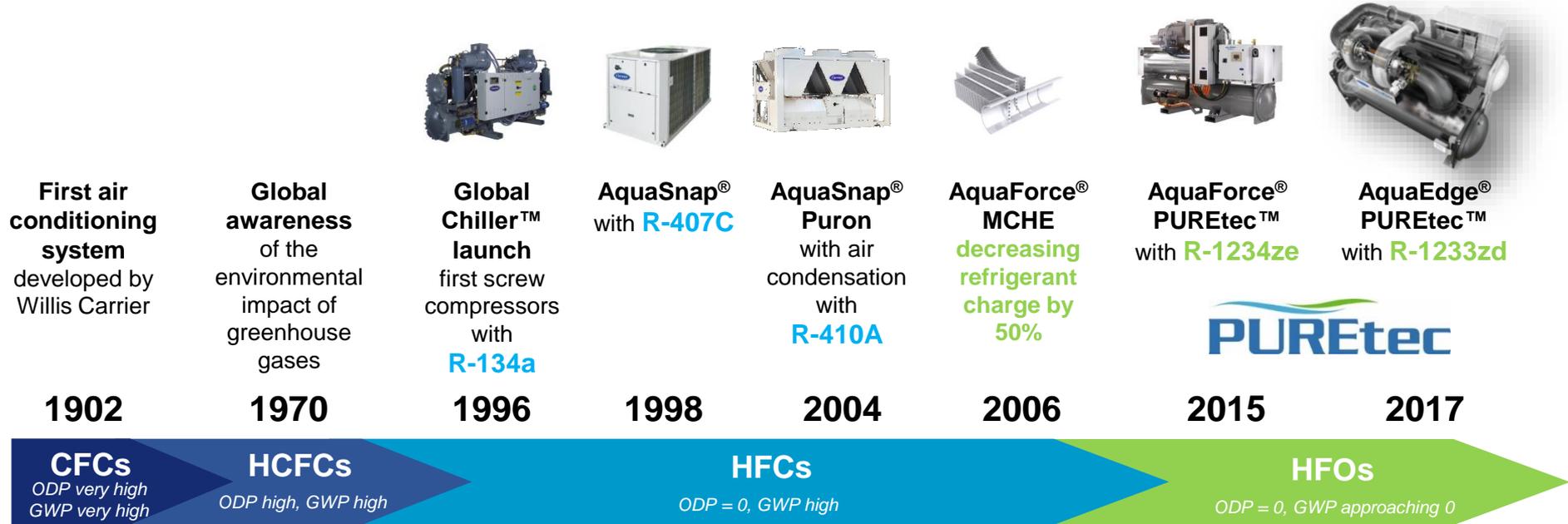
- Molecule with carbon-carbon double bond = less stable in the atmosphere than HFCs
- Very short atmospheric life-time = ultra low GWP
- Very energy efficient
- Low pressure R-1233zd(E) for turbo machines, not flammable (A1)
- Medium pressure R-1234ze(E) for screw machines, mildly flammable (A2L)



	Atmospheric life time	GWP IPCC AR5
R-134a	13,4 years	1430
R-1233zd(E)	26 days	1
R-1234ze(E)	16 days	<1



CARRIER ALWAYS AHEAD



MONTREAL protocol

KYOTO protocol



F-GAS regulations



THE PURETEC RANGE

2016

2017-2018

2019

AQUAFORCE
PUREtec

**Air-cooled
screw chillers**

30XA-ZE (300 - 1100 kW)
30XAV-ZE (400 - 900 kW)
30XWP-ZE (250 - 1100 kW)
30XWV-ZE (450 - 1350 kW)



AQUAFORCE
PUREtec

**High temperature
water sourced
heat-pump**

61XWHZE (200 - 2500 kW)



AQUAEDGE
PUREtec

**Water-cooled
centrifugal chiller**

19DV (1400-3500 kW)



AQUAFORCE
PUREtec

**Air-cooled
variable-speed
screw chillers**

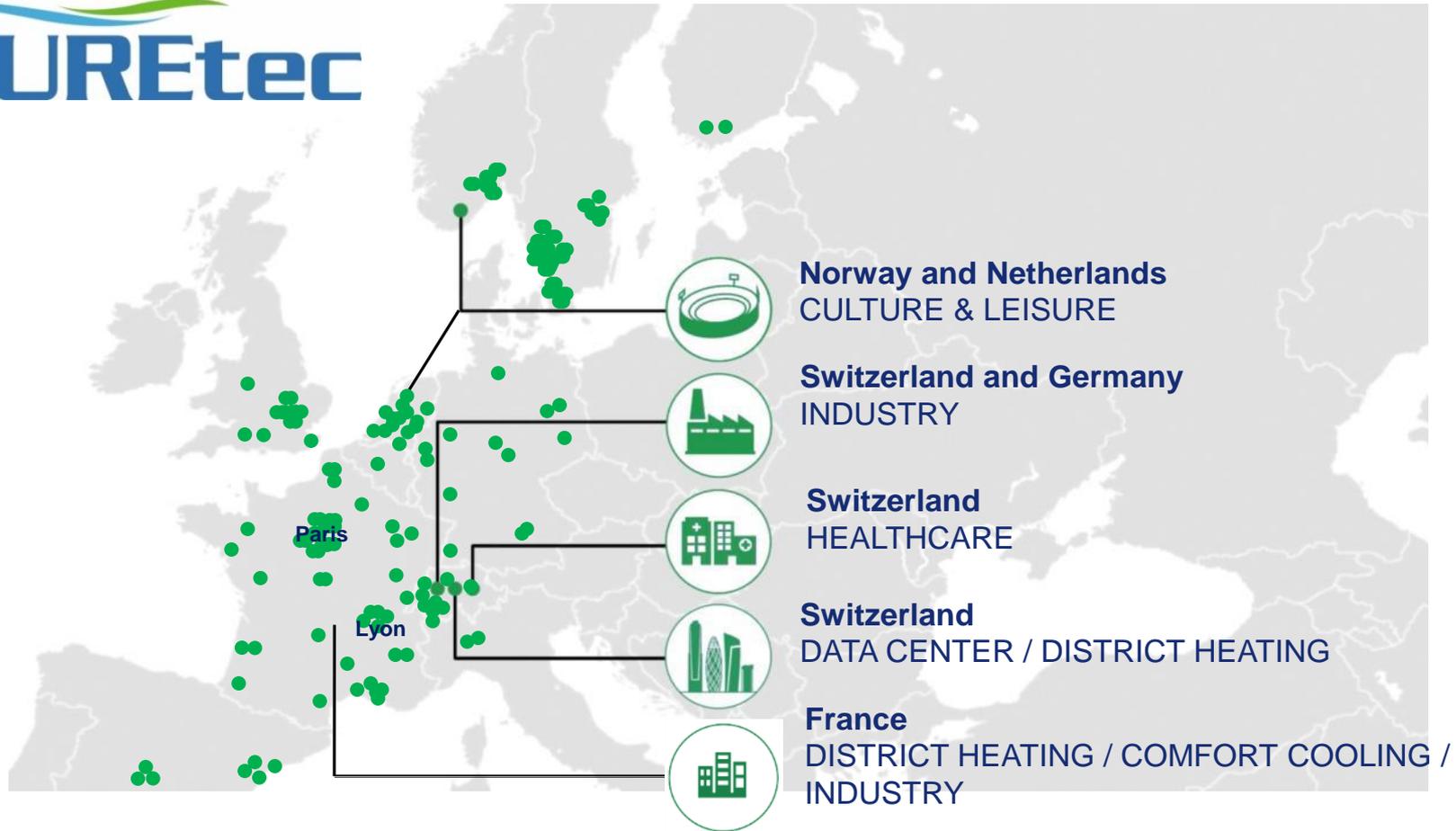
30KAV-ZE (350-850 kW)





TRIED AND TRUSTED SOLUTION

PUREtec





KEY BENEFITS



TOP ENERGY EFFICIENCY



Up to
25%

Above Ecodesign
2021 requirements

30 KAVP-ZE

Permanent magnet motor screw chiller with Greenspeed® Intelligence + EC fans + additional condenser surface

Standard

Variable-speed screw chiller, variable-speed fans with AC motors

SEER

EER

5.6

3.5

5.3

3.1

EU ECODESIGN MEPS(*) for air-cooled chillers		Tier 1 (from 01/01/2018)	Tier 2 (from 01/01/2021)
SEER for comfort Chillers < 400 kW	kWh/kWh	3,80	4,10
SEER for comfort Chillers > 400 kW	kWh/kWh	4,10	4,55



The range is fully certified according to the LCP/HP ECP program



ACOUSTIC COMFORT



-6 dB(A)
vs former 30XAV-ZE

3x SOUND LEVELS

Standard unit

New 06Z compressor, new oil separator design,
6th generation Flying Bird™ fans

Unit with option 15

Compressor sound enclosure

Unit with option 15 LS

Compressor sound enclosure + low speed fans

**Sound Power
(dBA)**

96

95

90



The range is fully certified according
to the LCP/HP ECP program

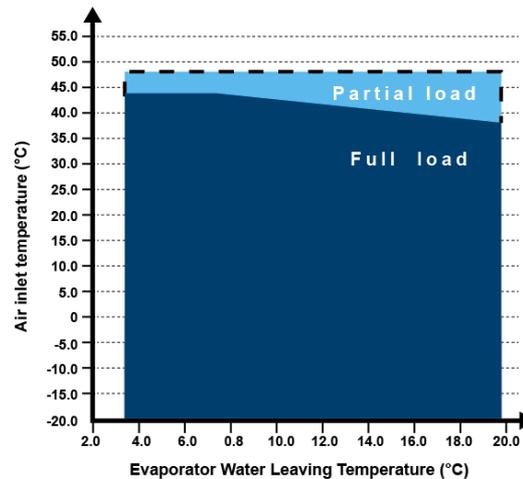


LARGE OPERATING MAP



UP TO
55°C

Extended operating temperatures **from -20°C to 55°C** outdoor air temperatures and negative water temperatures make it ideal for various sectors of activity. From high-end office buildings and hotels to healthcare facilities, data centers and industrial projects, **AquaForce® Vision 30KAV/P-ZE** meets the most demanding expectations in terms of energy efficiency and savings, whatever the climate and wherever the location.





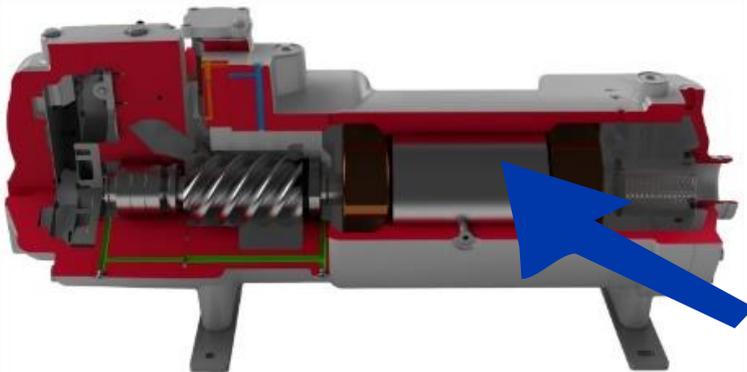
INDUSTRY-LEADING CARRIER TECHNOLOGIES



LEADING-EDGE TECHNOLOGY

HIGH EFFICIENCY SCREW COMPRESSOR WITH PERMANENT MAGNET SYNCHRONOUS MOTOR

- Twin screw compressor designed for variable speed operation
- Permanent magnet synchronous motor
- Step-less inverter control (25%-100%)
- Integrated resonator array for compressor acoustic attenuation
- Air-cooled inverter drive for increased reliability
- Bearing life exceeding 100,000 hours



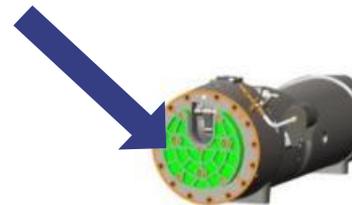
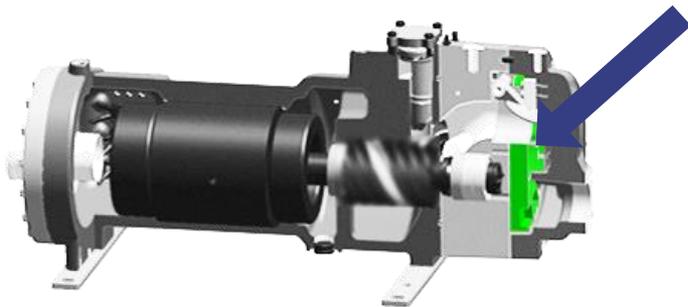
Permanent magnet synchronous motor



INTEGRATED COMPRESSOR FEATURE

INTEGRATED RESONATOR ARRAY AT COMPRESSOR DISCHARGE

- Exclusive Carrier design
- Pulsation at discharge reduced by 5 for improved reliability
- Contributes to reduce global acoustic level
- No pressure drop addition
- Footprint reduction (no additional muffler)





AIR-COOLED VARIABLE SPEED COMPRESSOR

VARIABLE SPEED DRIVE COOLING SYSTEM: AIR COOLED

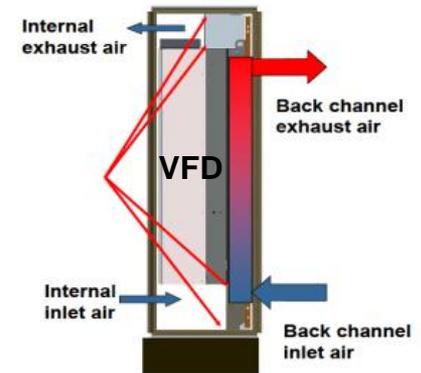
- All VSD are air-cooled: compressors, fans, pumps

ADVANTAGES

- No need of a liquid cooling system
- Expected better quality (risk of leakage, no risk of chilled cold plate and condensing water, no need of pumps)
- Simplicity (VSD can be replaced without disconnect/connect/empty/refill a cooling circuit)
- No capacity loss (VSD losses are dissipated in the air, no chiller capacity loss)

PAY ATTENTION

- Need a regular maintenance, making sure filters are not obstructed



ELECTRICAL BOX

ELECTRICAL BOX

- One box for compressor & main power
- One box for fan, pump and electronic
- Design for Europe and high ambient
- 2 entrances for customer connection



Fan drives + Pump drives + electronic boards



Compressor drives + main power connection



Bottom access

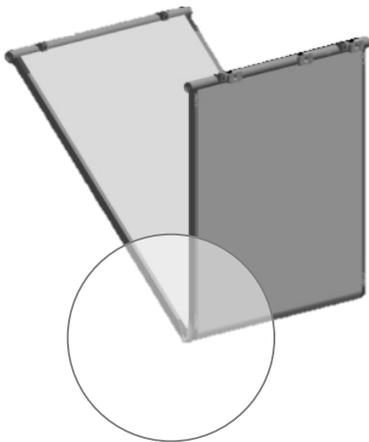
Side access



NOVATION[®] MICRO CHANNEL

3RD GENERATION OF “W” SHAPE NOVATION[®] MCHE

- Exclusive Carrier design
- Increased reliability with new aluminum alloy
- Significantly reduces refrigerant charge (-50% vs cu/al coils)
- More compact units (-25% vs previous 30XAV generation)
- Enviro-shield™ coating for mildly corrosive environments
- Super Enviro-shield™ coating for highly corrosive environments (industry or marine applications)
- Easy cleaning with high pressure air or water washer





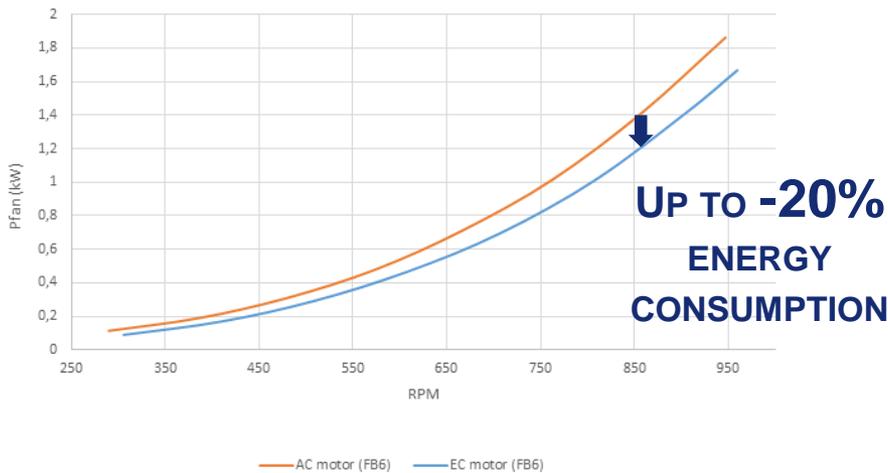
HIGH EFFICIENCY VARIABLE-SPEED FANS

FLYING BIRD™ EC FANS

- Exclusive Carrier design
- EC motor technology (efficiency up to +10% compared with AC motor)



Fan consumption : AC motor vs EC





FLOODED SHELL AND TUBE EVAPORATOR

FLOODED SHELL AND TUBE EVAPORATOR

- Exclusive Carrier design
- Flooded technology for high energy efficiency
- New generation of copper tubes with specific profile to reduce pressure drops when operating with glycol
- Able to produce brine up to -12°C





SMART VIEW TOUCH SCREEN

ADVANCED SMARTVIEW™ 7 INCH COLOR TOUCH SCREEN INTERFACE

- Exclusive Carrier design
- 10 languages available: DE, EN, ES, FR, IT, NL, PT, TR, RU + one additional customer choice
- Touch screen user interface
- BACnet, J-Bus or LON communication interfaces
- Optional wireless connectivity





SMART ENERGY MONITORING

POWERFUL SMART ENERGY MONITORING FUNCTION

- Provides smart data based on intelligent algorithms
- Real time energy consumption measurement (kWh)
- Cooling energy output measurement (kWh)
- Instantaneous and average Energy Efficiency Ratio



COOLING MODE		
Cooling Power Output	152.0	KW
Electical Power Input	49.8	KW
Energy Efficiency (EER)	3.0	
Cooling Energy Output	19534	KWH
Electrical Energy Input	3143	KWH
Integrated EER	3.2	

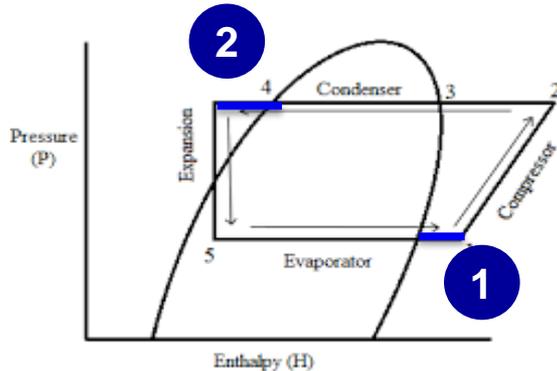




SMART REFRIGERANT LEAK DETECTION

AUTOMATIC REFRIGERANT LEAK DETECTION

- Algorithm that can detect serious refrigerant loss at any point on the system
- Sensitivity: 25% refrigerant charge loss per circuit means ~12% refrigerant charge loss per unit
- Help to achieve recognition within pollution prevention assessment programs, ideal for assisting in the design of sustainable buildings.



LEAK DETECTION



Indirect Method based on Smart Algorithms





INVERTER-DRIVEN DUAL PUMPS

INVERTER-DRIVEN DUAL PUMPS WITH AC MOTOR

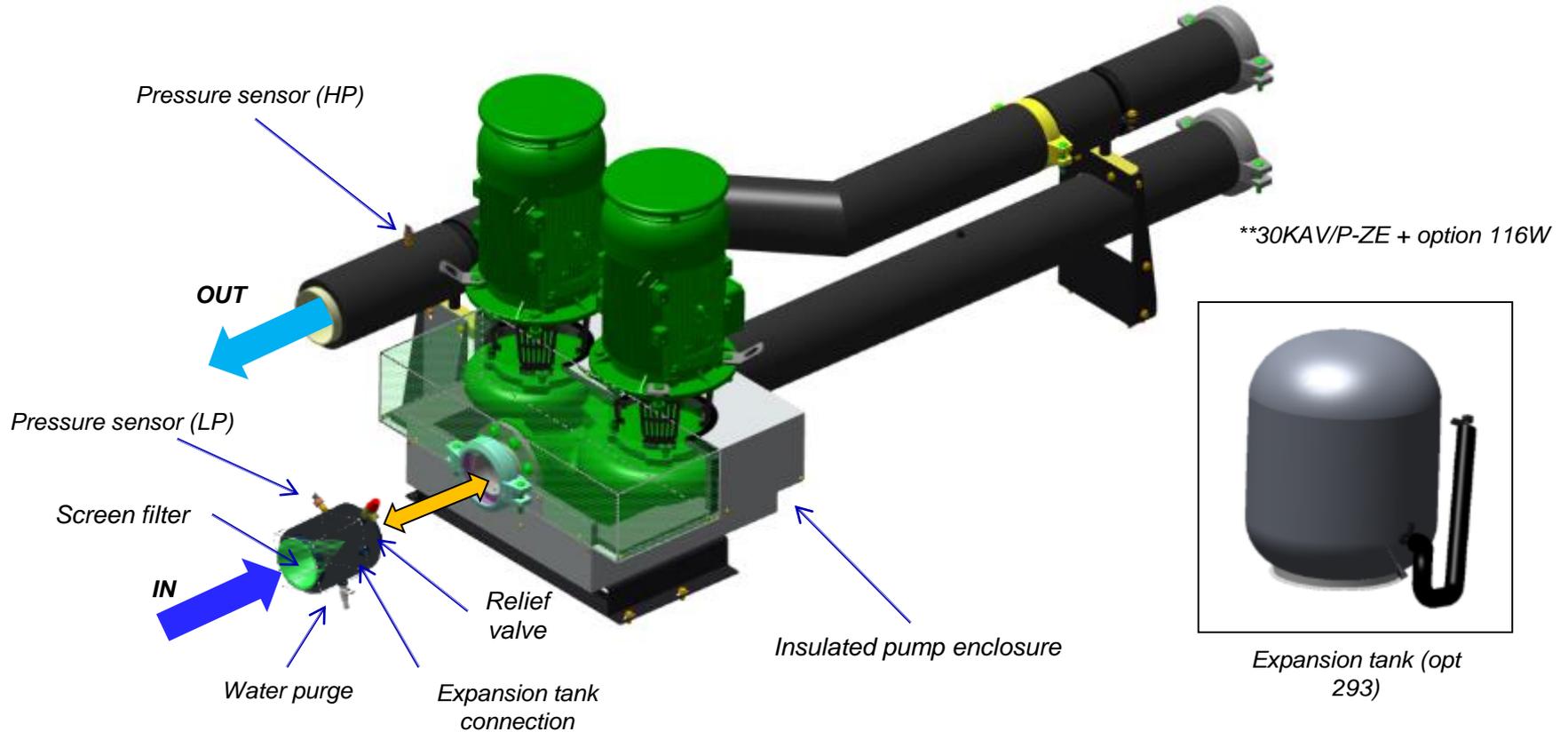
- Dual pumps designed for variable speed operation
- High efficiency AC motor
- Low static pressure (~100 kPa) or high static pressure (~180 Kpa) available
- 3 pump control modes available: constant water flow with 2 speeds, variable water flow based on constant delta T or constant delta P





INVERTER-DRIVEN DUAL PUMPS

VSD dual pumps (HP)

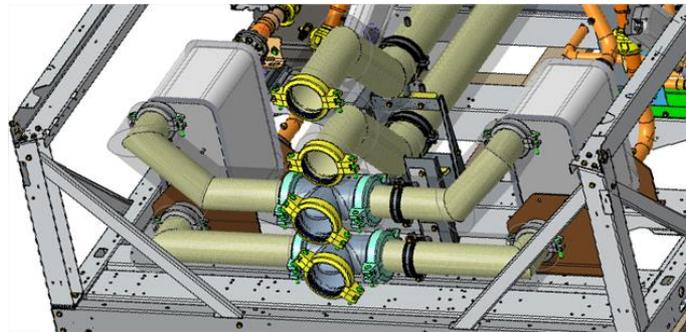




HEAT RECOVERY

HEAT RECOVERY (OPTIONS 49 & 50)

- Partial heat recovery (Option 49)
- Total heat recovery (Option 50)
- Variable reclaim : No load limit to activate reclaim
- BPHE in serial with air condenser
- Less complexity, more flexibility
- Desuperheater mode





TECHNICAL CHARACTERISTICS



30KAV-ZE HIGH ENERGY EFFICIENCY



30KAVP Standard Efficiency	350	400	450	500	550	600	650	750	800
Cooling capacity * @ 35°C / 12/7°C	372 kW	404 kW	458 kW	483 kW	533 kW	606 kW	673 kW	751 kW	823 kW
SEER ** 35°C / 12/7°C (kW/kW)	4,99	4,99	5,20	5,19	5,30	5,20	5,19	5,16	5,30
SEPR ** 35°C / 12/7°C (kW/kW)	5,40	5,68	6,45	6,52	6,46	6,43	6,40	6,32	6,49
EER* (kW/kW)	3,08	3,01	3,13	3,08	3,13	3,15	3,18	3,17	3,20
Power Factor correction	0.98								
Length (mm)	4350	4350	5540	5540	6735	6735	7925	7925	9120
Refrigerant	R-1234ze								

(*) In accordance with standard EN14511-3:2013.

(**) In accordance with standard EN14825-2016. Average climate.

Eurovent certified values



30KAVP-ZE HIGH ENERGY EFFICIENCY



30KAVP Standard Efficiency	350	400	450	500	550	600	650	750	800
Cooling capacity * @ 35°C / 12/7°C	380 kW	421 kW	467 kW	491 kW	541 kW	625 kW	684 kW	773 kW	836 kW
SEER ** 35°C / 12/7°C (kW/kW)	5,59	5,60	5,69	5,68	5,71	5,67	5,59	5,59	5,61
SEPR ** 35°C / 12/7°C (kW/kW)	6,38	7,10	7,05	7,18	6,89	7,01	6,84	6,83	6,85
EER* (kW/kW)	3,57	3,56	3,43	3,36	3,36	3,48	3,40	3,47	3,42
Power Factor correction	0.98								
Length (mm)	6735	6735	6735	6735	7925	9120	9120	10305	10305
Refrigerant	R-1234ze								

(*) In accordance with standard EN14511-3:2013.

(**) In accordance with standard EN14825-2016. Average climate.

Eurovent certified values



THANK YOU