



**SUSTAINABLE COOLING AND HEATING SOLUTIONS
FOR HEALTHCARE APPLICATIONS**



HEALTHCARE



EXPERTISE IN HEALTHCARE APPLICATIONS

With over 80 years' experience in climatic engineering, we build our expertise on a close relationship with our customers. Serving the medical field, we put our innovative abilities into the design and manufacture of systems that push the boundaries of hygiene and comfort.

With genuine innovations, we work alongside hospitals, clinics and care homes to provide you with optimal engineered solutions.

With hygiene and comfort requirements in mind, we provides global solutions with a low carbon footprint that go beyond the simple notion of kW/h consumed and energy savings.



HIGH EFFICIENCY FOR MEDICAL FIELD

Hygiene & Air quality

Knowledge of microbiological pollutants, chemical particles and air is fundamental to guarantee maximum hygiene. Our solutions meet the hygiene norms (EN 13779, EN 15251, NFS 90 351, ISO 14644, ISO 14698...). With innovations such as the Epure Dynamics® function, CIAT goes even further to eliminate pollution and contamination.

Comfort

CIAT is recognized for the acoustic, thermal and air quality of the indoor environments created to ensure health and comfort of your patients.

Energy optimization

We develop energy efficient solutions allowing substantial savings to be made without compromising on your patients' comfort.



GUIDING YOU RIGHT FROM THE START

To ensure you are provided with the right solutions, the CIAT Healthcare Experts will work alongside you from conception and throughout the implementation of your project.

They will analyse your specifications, and thanks to their expertise and specific software designed by our engineers, will provide you with the optimum solution to meet your requirements.



WORLD-CLASS AIRSIDE FACILITIES

Airside expertise

Our Research and Design Center and Laboratory has seven innovation platforms, equipped with state-of-the-art test and measurement tools, fully dedicated to airside applications.

Teams at this 3000m² facility in eastern France carry out prototyping and testing for our development teams and ultimately for our customers, who are looking for the best in innovation.

Industrial Excellence

The skills and expertise of our teams are backed by completely integrated powerful production facilities resulting in a fully-mastered industrial procedure.

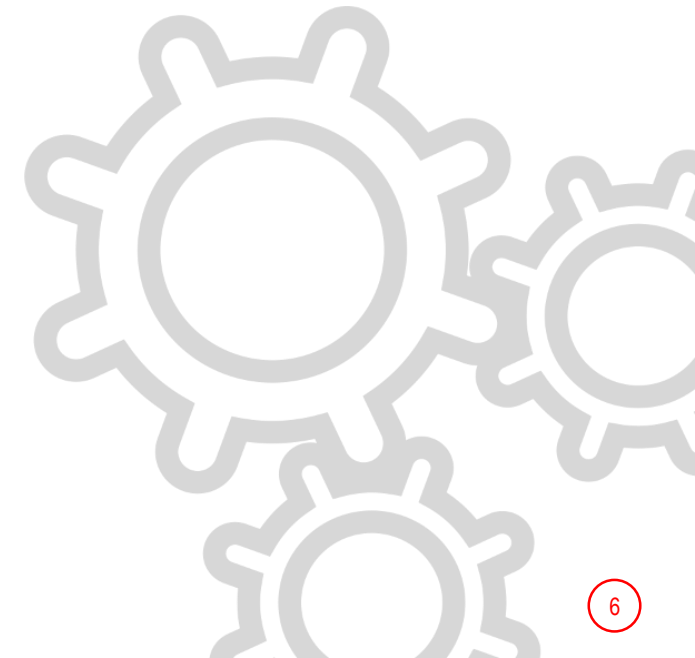
Our manufacturing sites are certified with ISO 9001, ISO 14000 and OSHAS 8001.



YOUR CHALLENGES

TECHNICAL PLATFORM & RISK AREAS

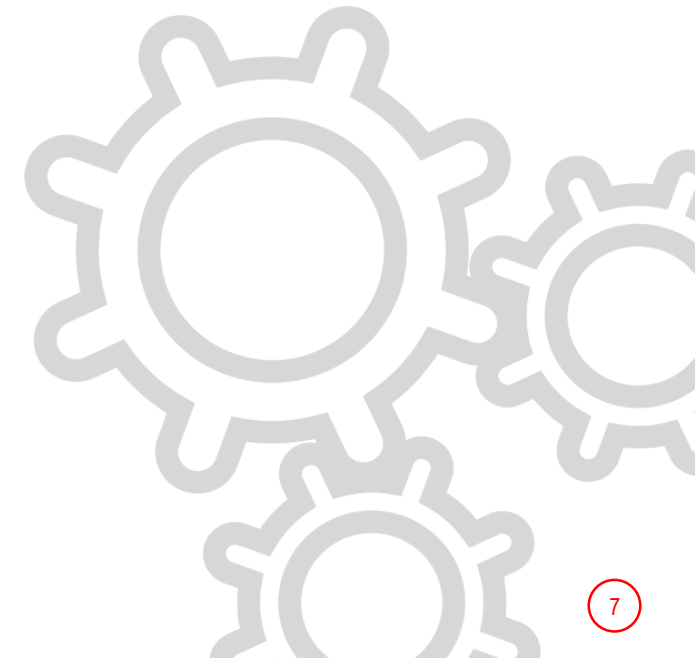
- ▶ **Control of airborne contamination**
- ▶ **Control of noise levels**
- ▶ **Peace-of-mind**



YOUR CHALLENGES

PATIENT ROOMS & RECEPTION

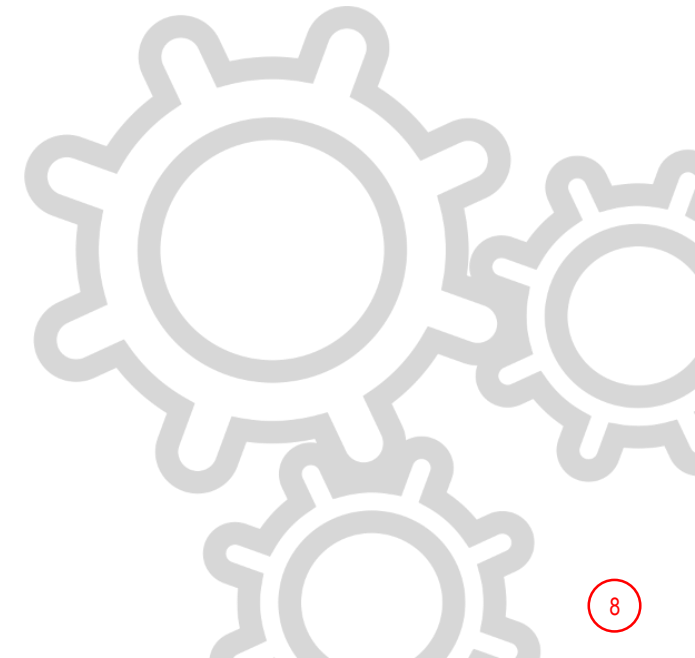
- ▶ Protection of health in patients' rooms and reception areas
- ▶ Control thermal and acoustic comfort



YOUR CHALLENGES

ENERGY OPTIMISATION

- ▶ **Energy savings**
- ▶ **Installation, commissioning and maintenance cost reduction**





HEALTHCARE



TAILOR-MADE SOLUTIONS FOR ALL YOUR CHALLENGES

Technical platform Risk areas



CLIMACIAT AIRCLEAN

Air handling unit designed for the specific characteristics of controlled environments
Certified Eurovent
DIN 1946-4 /VDI 6022

Patient rooms, reception, etc.



COADIS LINE

Cassette comfort unit with Coanda effect for increased occupants' comfort.



COMFORT LINE

Ductable comfort units with excellent acoustic comfort and Epure Dynamics technologies for air purification



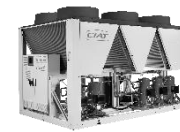
EPURE DYNAMICS

Smart CIAT control air purification function for higher quality indoor air, specifically through purification on fine particles in accordance with WHO recommendations

Energy optimisation



POWERCIAT
High efficiency air-cooled chiller with noise reduction technologies



AQUACIAT^{POWER}
High efficiency air-cooled chiller with scroll compressor



ITEX
High thermal transfer capacity gasketed plate heat exchanger



THERMAL ENERGY STORAGE

Non-stop support and reduced operating cost



POWER' CONTROL

Plant system management designed to control a complete thermal energy production system (heating and cooling)



HEALTHCARE



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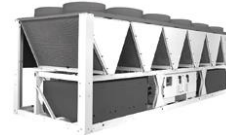


COMFORT LINE
Ductable comfort units with excellent acoustic comfort and Epure Dynamics technologies for air purification

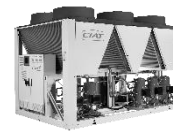


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POWER' CONTROL
Plant system management designed to control a complete thermal energy production system (heating wand cooling)

AQUACIAT^{POWER} WITH R-32



AQUACIAT^{POWER} WITH R-32

PERFECTLY SUITED FOR HEALTHCARE APPLICATIONS



ENVIRONMENTAL RESPONSIBILITY



PATIENTS' COMFORT



ENERGY SAVINGS



SIMPLICITY



RELIABILITY



GLOBAL SYSTEM OFFERING



Now available with R-32 refrigerant

The AQUACIAT^{POWER} range is now available with R-32 refrigerant for a lower ecological footprint, **up to 80% less carbon footprint**, while improving even further its **energy performances +10%** and preserving its **acoustic level** and its **installation simplicity**.



R-32 



RANGE OVERVIEW



CHILLER COOLING ONLY LD

170 kW

400 kW

940 kW

EC fans motors option (➔ Seasonal performances)

Variable speed fans option (➔ Seasonal performances)

High performance option / High temperature: High speed fans (➔ Nominal performances & Operating map)

Fixed speed scroll compressors, **AC** fans-low speed

Fixed speed scroll compressors, **VSD** fans-low speed



HEAT PUMP ILD

160 kW

520 kW

EC fans motors option (➔ Seasonal performances)

VSD option (➔ Seasonal performances)

High performance option / High temperature: High speed fans
(➔ Nominal performances & Operating map)

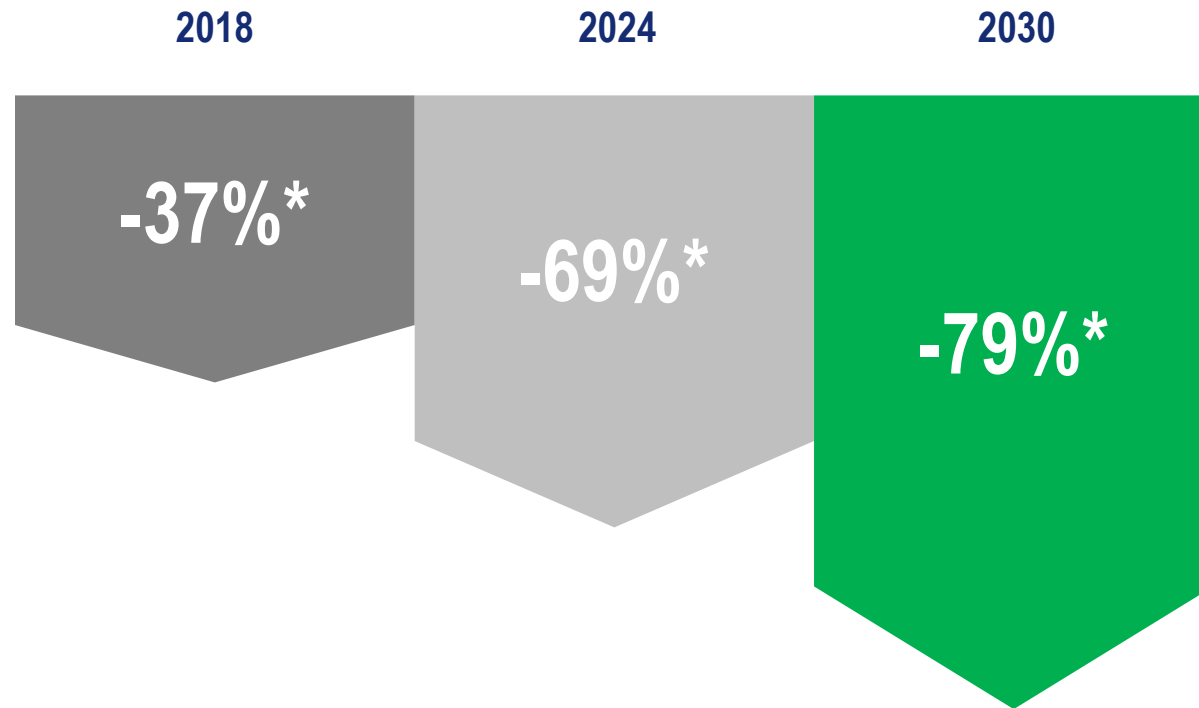
Fixed speed scroll compressors, **AC** fans motors-low speed

R-32, THE BEST REFRIGERANT SOLUTION FOR SCROLL CHILLERS



EU F-GAS REGULATION

HFC PHASE DOWN



Note: EU F-Gas Regulation No. 517/2014
*Versus 2015 reference value

WHY R-32?



**UP TO 80% LESS CO₂
EQUIVALENT THAN R-410A**



USER FRIENDLY



**UP TO 10% MORE ENERGY
EFFICIENT**



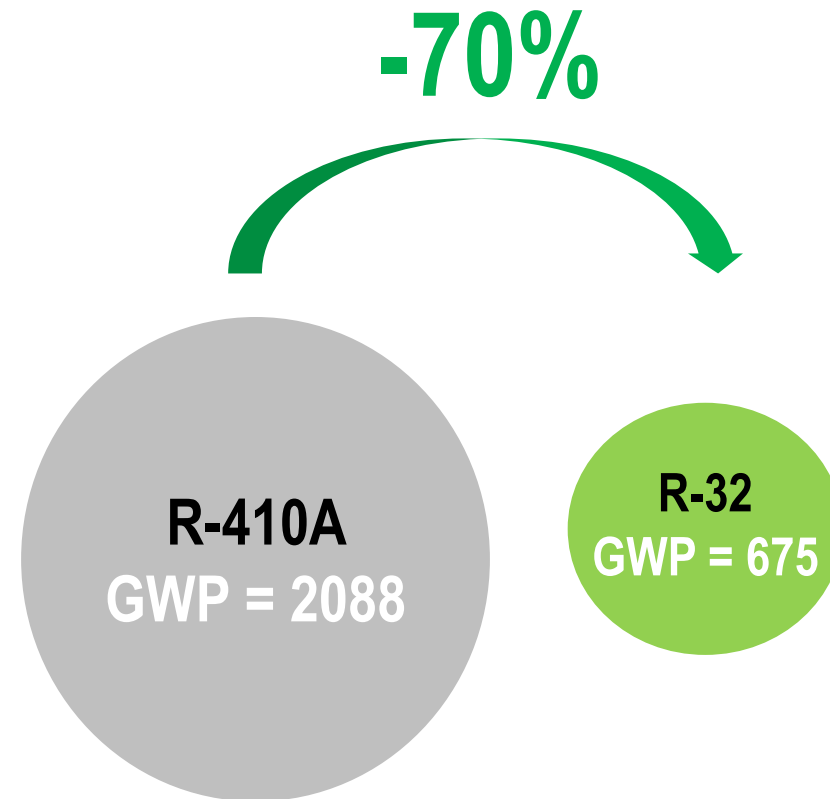
SAFE

ENVIRONMENTALLY RESPONSIBLE

LOWER GWP

Refrigerant global warming potential (GWP) reduction:

- ▶ Lower ecological impact
- ▶ Anticipating the HFC phase-down



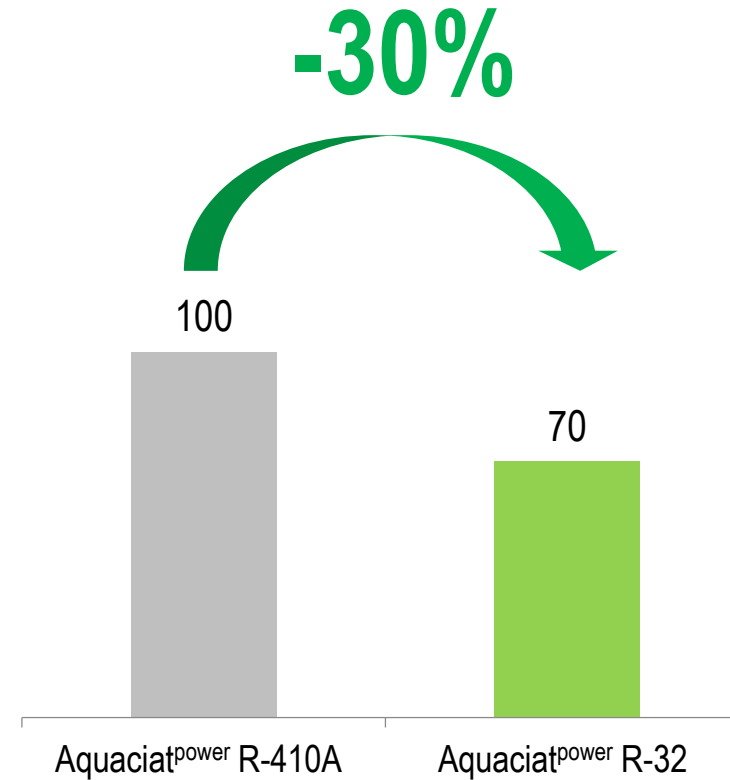
Note: GWP according to IPCC AR4

ENVIRONMENTALLY RESPONSIBLE

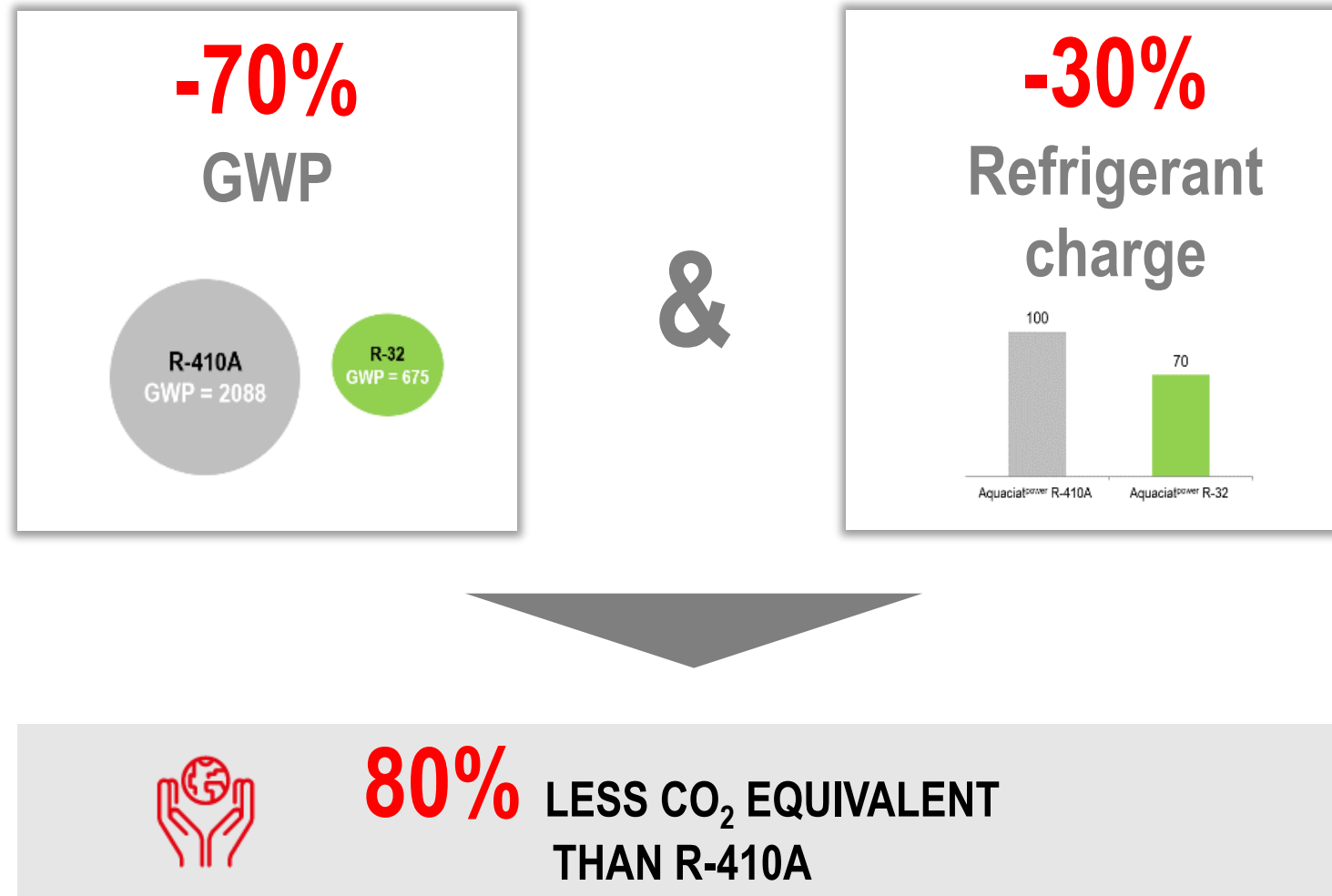
REFRIGERANT CHARGE REDUCTION

Refrigerant charge reduction due to:

- ▶ R-32 thermodynamic properties
- ▶ Optimized component selection for R-32



ENVIRONMENTALLY RESPONSIBLE

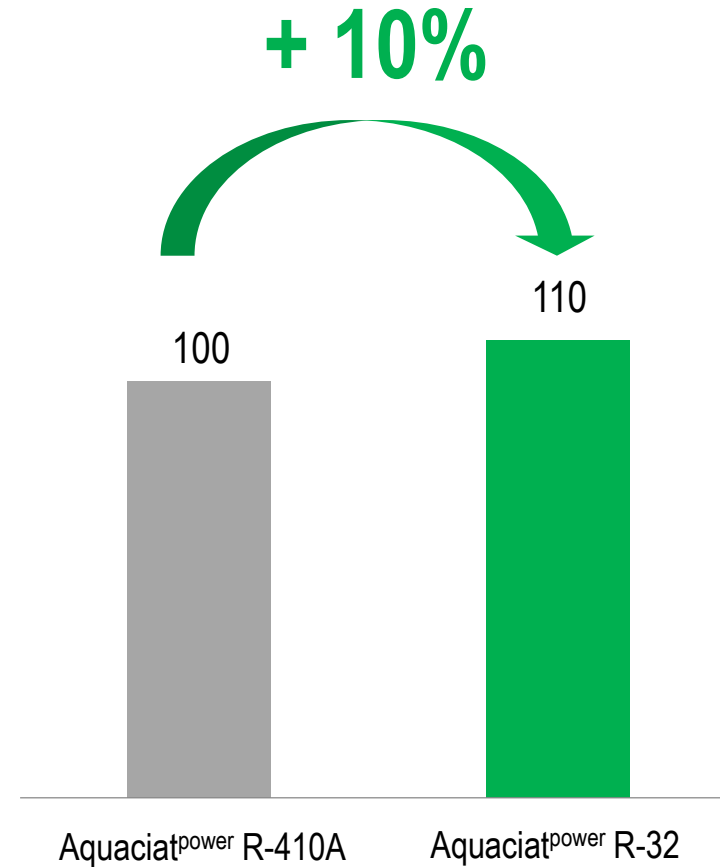


ENERGY SEASONAL EFFICIENCY



Aquaciat^{power} with R-32 chillers exceed Ecodesign 2021 SEER requirements due to:

- ▶ Multiple scroll compressors
- ▶ Asymmetric brazed plate heat exchangers
- ▶ Smart energy monitoring function



Note: ErP Ready 2021 according to EU Regulation No. 2016/2281

USER FRIENDLINESS

- ▶ R-32 is a **tried and trusted** solution already used in residential air conditioners (millions AC in use.)
- ▶ Easy refrigerant charge complement
- ▶ It is **available from all refrigerant distributors** in cylinders of 5, 10, 20 or 45 kg with top in red color.



- ▶ Service tools must be **qualified for A2L** refrigerants according to ISO 817 or EN378
- ▶ Service engineers shall be **qualified for brazing** of components containing PED fluid group 1
- ▶ Specific safety rules for compliance with UN3358 for road transportation and DS291 IMDG for sea shipping:
 - **Road transportation:**
 - UN code: 3358 REFRIGERATING MACHINES containing flammable, non-toxic, liquified gas
 - Road tunnels class D & E not allowed
 - **Sea transportation:**
 - International Maritime Dangerous Goods (IMDG) code: DS 291
 - **Air transportation:**
 - Not allowed



AQUACIAT^{POWER} WITH R-32 PERFECTLY SUITED FOR HEALTHCARE APPLICATIONS



AQUACIAT^{POWER} WITH R-32

PERFECTLY SUITED FOR HEALTHCARE APPLICATIONS



ENVIRONMENTAL
RESPONSIBILITY



PATIENTS' COMFORT



ENERGY SAVINGS



SIMPLICITY



RELIABILITY



GLOBAL SYSTEM OFFERING





ENVIRONMENTAL RESPONSIBILITY

We strive to conform to your highest environmental commitments.

We concentrate our efforts on making our units more efficient and more environmentally friendly.

Aquaciat^{power} with R-32 goes beyond 2021 Ecodesign requirements.

R-32 





PATIENTS' COMFORT

We take care of your patients' acoustic comfort.

Thanks to low-speed fans in standard & the noise-reduction technologies used in the new Aquaciat^{power} range, you can guarantee a low noise level and no vibrations.

Optional variable-speed fans allow noise reduction in part load operation (night, mid-season...).

VERY LOW NOISE



-3 to -4 dB(A)

thanks to the compressor enclosure

ULTRA LOW NOISE



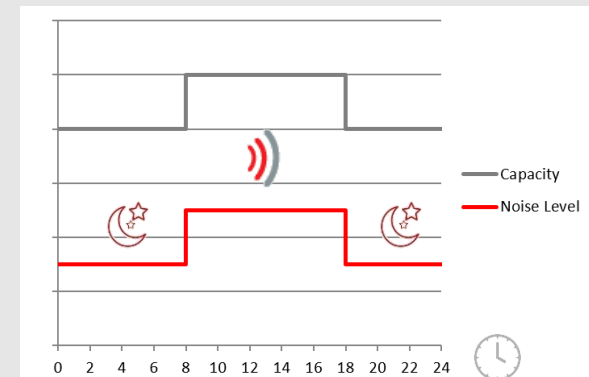
-5 to -6 dB(A)

thanks to specific insulation on compressor enclosure and unit's panels

NIGHT MODE



noise reduction in part load operation





ENERGY SAVINGS

We develop energy efficient solutions allowing substantial savings to be made without compromising on your patients' comfort nor your environmental impact.

The recovery of the partial heating capacity supplied by the chiller enables the unit to produce free additional hot water up to 55°C. This free heat is used for domestic hot water or distributed to spaces where it is needed, such as swimming pools, spas and whirlpool baths.

30%
energy



100% Chilled or Hot Water Production



25% Domestic Hot Water Production



SIMPLICITY

We ensure easy installation and integration in the building system management for time savings.

- ▶ No technical room required to house pumps and other accessories.
- ▶ Optimum use of the surface area for easy integration into an existing building.
- ▶ Quick, easy and cost-effective installation and commissioning.
- ▶ Packaged solution, which saves you time and increases your installation's reliability.
- ▶ Communication with all types of Building Management System (BMS) via Modbus protocol available as standard, LON or BACNET as option.



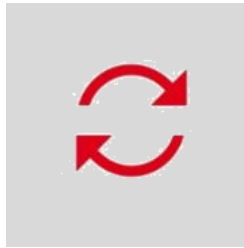
RELIABILITY

We ensure full reliability of your equipment with advanced monitoring solutions for a complete peace of mind.

CIATM2M enables you to track and monitor your CIAT equipment.

- ▶ Real-time data retrieve through a custom access to the CIATM2M website (synoptic, controller dashboard, event and temperature curve, alert & fault memory, black box and parameters log).
- ▶ Email alert at any event on the equipment.
- ▶ Monthly and annual reports with analysis and recommendations from CIAT experts.





GLOBAL SYSTEM OFFERING

We offer a complete range of equipment designed to work together for the best possible results providing optimised energy efficiency, high indoor air quality and comfort for your patients.

Technical platform Risk areas



CLIMACIAT AIRCLEAN

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Patient rooms, reception, etc.



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ITEX

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THERMAL ENERGY STORAGE

Non-stop support and reduced operating cost



POWER' CONTROL

Plant system management designed to control a complete thermal energy production system (heating wand cooling)

A COMBINATION OF TECHNOLOGIES



A COMBINATION OF TECHNOLOGIES

Fixed-speed fans (standard)

Variable speed fans
(Drive or EC option)



Composite fan stacks

MCHE condenser coil LD

RTPF coil heat-pump ILD



Buffer tank module

Variable speed pump
(option)



Connect Touch
control



Optimized
scroll compressors



Asymmetric
brazed plate
heat exchanger



Electronic
expansion valve

MAXIMUM EFFICIENCY

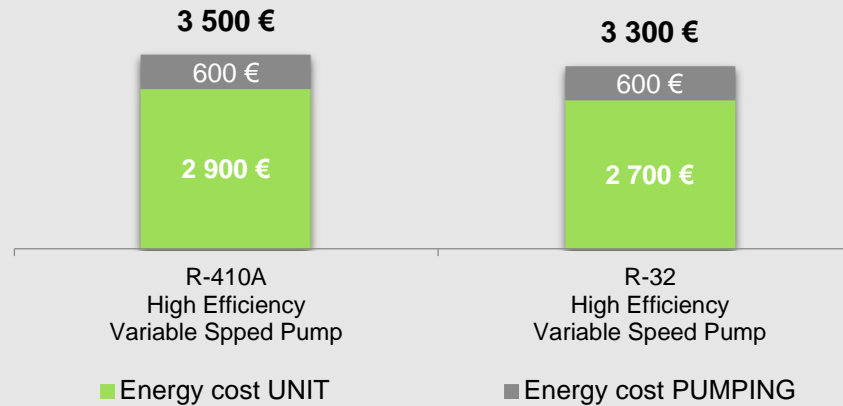


MAXIMUM EFFICIENCY

CASE STUDY

Annual Energy Cost

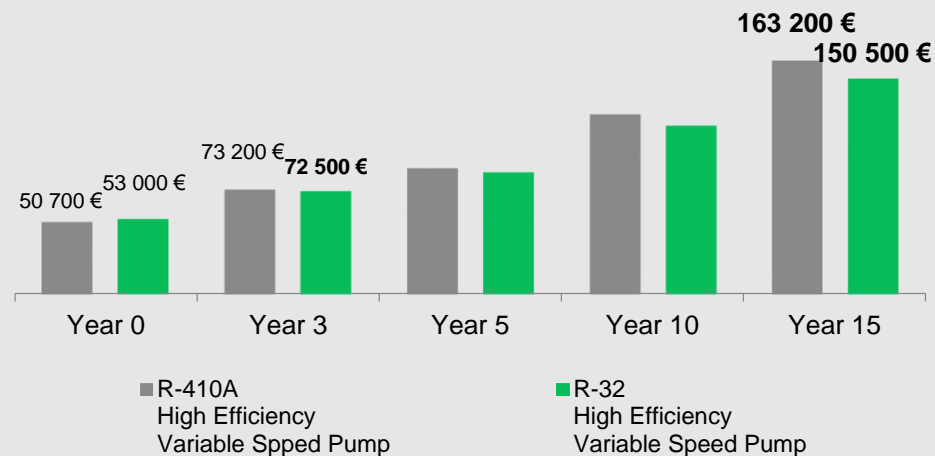
- ▶ Application: Air conditioning
- ▶ Capacity: 300kW
- ▶ Running conditions: 12/7°C/35°C
- ▶ Operating: unit 1800 h/year – pump 4300h/year
- ▶ Unit R410A: AQP LD HE 1100 + HP pump
- ▶ Unit R-32: AQP LD 1200R + Opt High Performance + Pump HP
- ▶ Electricity cost: 0.07€/kWh
- ▶ Simulation on BenchHVAC Tools



- 7%
Annual unit energetic cost

Total Cost of Ownership

- ▶ Device cost installed: R410A: 45000€ / R-32: 47500€ (+5%)
- ▶ Maintenance contract cost: R410A = R-32 = 2200€/year
- ▶ Cost of repair: R410A: 1800€/year / R-32: 1000€/year (difference due to refrigerant taxes)



Payback
< 3
years

Gain
€13k
in 15 years

MAXIMUM EFFICIENCY

COOLING ONLY VERSIONS



		AQUACIAT ^{POWER} LD									
		0602R	0650R	0750R	0900R	1100R	1200R	1350R	1400R	1600R	1750R
STANDARD UNIT											
NOMINAL COOLING CAPACITY *	KW	164	180	198	217	256	296	328	361	394	428
EER*	KW/KW	3,05	3,24	3,04	3,02	2,81	2,96	2,86	2,94	2,86	2,93
SEER 12/7°C COMFORT LOW TEMP.	KWH/KWH	4,29	4,61	4,52	4,47	4,35	4,69	4,66	4,65	5,09	5,37
DS COOL 12/7°C	%	169	181	178	176	171	185	183	183	201	212
SEER 23/18°C COMFORT MEDIUM TEMP.	KWH/KWH	4,93	5,41	5,23	5,26	4,99	5,66	5,45	5,48	5,95	6,25
SEPR 12/7°C PROCESS HIGH TEMP.	KWH/KWH	5,27	5,42	5,34	5,19	5,14	5,44	5,47	5,60	6,34	6,38
UNIT + OPTION HIGH OAT / HIGH NOMINAL PERFORMANCES											
NOMINAL COOLING CAPACITY *	KW	172	187	206	227	270	311	346	380	416	450
EER*	KW/KW	3,20	3,36	3,21	3,16	3,03	3,15	3,09	3,14	3,09	3,14
SEER 12/7°C COMFORT LOW TEMP.	KWH/KWH	4,63	4,99	4,89	4,92	4,78	5,25	5,08	5,19	5,11	5,28
DS COOL 12/7°C	%	182	196	193	194	188	207	200	205	201	208
SEER 23/18°C COMFORT MEDIUM TEMP.	KWH/KWH	5,63	6,17	5,95	5,98	5,69	6,35	6,06	6,13	6,06	6,33
SEPR 12/7°C PROCESS HIGH TEMP.	KWH/KWH	6,30	6,62	6,43	6,13	5,97	6,30	6,24	6,36	6,31	6,41
SOUND POWER LEVELS **											
STANDARD UNIT		88,5	89,0	89,0	89,5	89,5	90,5	90,5	91,0	91,0	91,5
UNIT + OPTION HIGH OAT / HIGH NOMINAL PERFORMANCES		91,0	91,5	91,5	92,0	92,0	93,0	93,0	93,5	93,5	94,0
UNIT + OPTION VERY LOW NOISE	dB(A)	85,5	85,5	85,5	86,5	86,5	87,5	87,5	88,0	88,0	88,5
UNIT + OPTION ULTRA LOW NOISE	dB(A)	83,5	83,5	83,5	84,5	84,5	85,5	85,5	86,0	86,0	86,5
STANDARD UNIT											
LENGTH - WIDTH - HEIGHT	mm	2410 2253 2324	2410 2253 2324	2410 2253 2324	2410 2253 2324	2410 2253 2324	3604 2253 2324	3604 2253 2324	3604 2253 2324	3604 2253 2324	4798 2253 2324
REFRIGERANT		R32									

* In accordance with standard EN14511-3:2013.

** In dB ref-10⁻¹² W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). Measured in accordance with ISO 9614-1 and certified by Eurovent.

MAXIMUM EFFICIENCY

COOLING ONLY VERSIONS



AQUACIAT ^{POWER} LD			1800R	2000R	2200R	2400R	2650R	2800R	2950R	3200R	3500R
STANDARD UNIT											
NOMINAL COOLING CAPACITY *	KW		458	523	587	646	689	743	765	836	889
EER*	KW/KW		2,85	2,85	2,94	2,93	2,83	2,85	2,81	2,77	2,66
SEER 12/7°C COMFORT LOW TEMP.	KWH/KWH		5,30	5,21	5,13	5,35	5,20	5,43	5,30	5,22	5,07
DS COOL 12/7°C	%		209	205	202	211	205	214	209	206	200
SEER 23/18°C COMFORT MEDIUM TEMP.	KWH/KWH		6,12	6,25	6,25	6,59	6,33	6,69	6,46	6,34	6,07
SEPR 12/7°C PROCESS HIGH TEMP.	KWH/KWH		6,28	6,24	6,27	6,33	6,11	6,17	6,10	6,03	5,79
UNIT + OPTION HIGH OAT / HIGH NOMINAL PERFORMANCES											
NOMINAL COOLING CAPACITY *	KW		484	552	617	678	727	782	807	882	943
EER*	KW/KW		3,09	3,08	3,15	3,14	3,06	3,07	3,04	3,00	2,92
SEER 12/7°C COMFORT LOW TEMP.	KWH/KWH		5,24	5,30	5,23	5,32	5,20	5,33	5,23	5,31	5,18
DS COOL 12/7°C	%		207	209	206	210	205	210	206	209	204
SEER 23/18°C COMFORT MEDIUM TEMP.	KWH/KWH		6,23	6,32	6,39	6,51	6,28	6,54	6,38	6,56	6,32
SEPR 12/7°C PROCESS HIGH TEMP.	KWH/KWH		6,32	6,27	6,27	6,33	6,14	6,26	6,18	6,07	5,88
SOUND POWER LEVELS **											
STANDARD UNIT			91,5	92,0	96,5	96,5	97,0	97,0	97,5	97,5	98,0
UNIT + OPTION HIGH OAT / HIGH NOMINAL PERFORMANCES			94,0	94,5	97,5	97,5	98,0	98,0	98,5	98,5	99,0
UNIT + OPTION VERY LOW NOISE			88,5	89,0	92,5	92,5	93,0	93,0	93,5	93,5	94,5
UNIT + OPTION ULTRA LOW NOISE			86,5	87,0	90,0	90,0	90,5	90,5	90,5	90,5	91,0
STANDARD UNIT											
LENGTH - WIDTH - HEIGHT	mm		4798	4798	5992	5992	5992	5992	7186	7186	7186
			2253	2253	2253	2253	2253	2253	2253	2253	2253
			2324	2324	2324	2324	2324	2324	2324	2324	2324
REFRIGERANT			R32								

* In accordance with standard EN14511-3:2013.

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FEATURES AVAILABILITY



AQUACIAT ^{power}			
4"3 user-friendly touch screen	●	Coil Anti-corosion protection	▲
Multi-language controller	●	Anti-Intrusion Coil protective grille	▲
Energy consumption measurement	●	Compressors Soft starter	▲
WEB connectivity	●	Hydraulic pump high/Low pressure Single/twin Fixe/Variable speed	▲
Modbus BMS connectivity	●	Water buffer tank	▲
Lon / Bacnet protocol BMS connectivity	▲	Flanged connexion	▲
M2M monitoring	▲	Flexible connexion	▲
Very Low Noise level	▲	Antivibratil mounts	▲
Ultra Low Noise level	▲	Partial heat recovery	▲
Variable speed fans (Drive or EC solutions)	▲		
All year round operations	▲		Supplied as standard ✓ ●
			Option * ▲

CIAT AT YOUR SERVICE

At CIAT, our objective is to develop partnerships with you and provide high quality service throughout the lifecycle of your HVAC system. We understand your changing needs, and develop smart services and energy solutions that optimise energy performance and enable savings.

We provide the support you need to get the most out of your solution:

- Preventive and corrective service maintenance.
- On-site inspection by experts close at hand.
- Online parts shop.
- Dedicated hotline for off-site technical support.

We also offer you a comprehensive range of smart services:

- Consulting on energy performance upgrade.
- Advanced monitoring and plant system management solutions.
- Equipment and system modernization.



PRESENT
IN
OVER **50**
countries

OVER
80
years
OF EXPERIENCE

AVAILABLE
24/7



THANK YOU FOR YOUR ATTENTION





A CARRIER COMPANY

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Availability depends on each country. Please contact your CIAT representative.

Aquaciat^{power} – English – May 2020

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