DISCOVERING iMEX - N R290 RANGE

iMEX-N

Air to water heat pumps with propane
and scroll inverter compressors from 8 up to 36 kW

NEW Extension range up to 66 kW!

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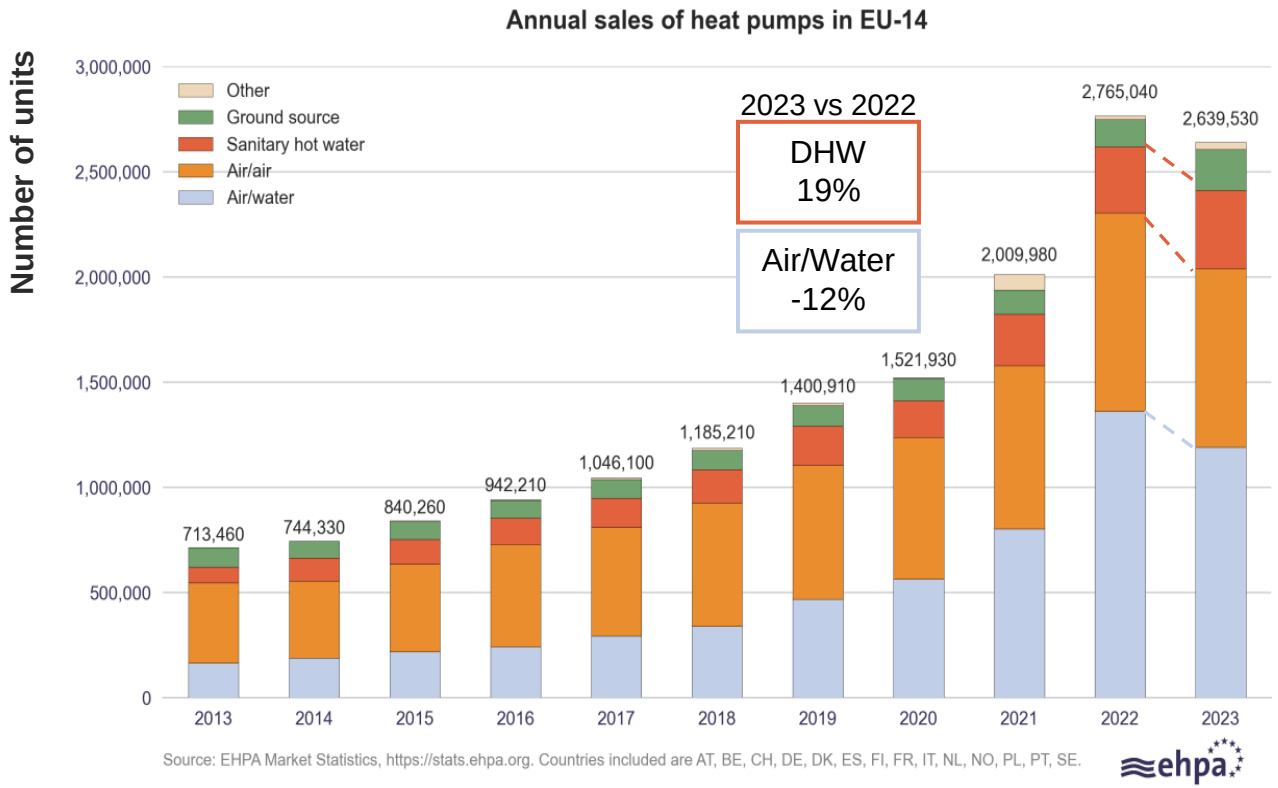
Market Size Europe – EHPA report 2024



Sanitary hot water
new potential playground for iMEX-N thanks to strong operating map

- Heat pump sales in 14 European countries fell by around 5% overall in 2023 (-33% in ITALY) due high interest rates and changing national policy measures.
- Five largest EU heat pump markets in 2022:
  - **France**: 605,000 units
  - **Germany**: 435,000 units
  - **Italy**: 340,000 units
  - **Spain**: 210,000 units
  - **Poland**: 190,000 units

- The total EU-21 heat pump stock increased 13% in 2023 (22,2M)
- EU 2030 target is 49% renewables in heating and the 60M heat pumps to meet REPowerEU

Expected sustained growth for hydronic HP market: “We Are In The Heat Pump Decade”

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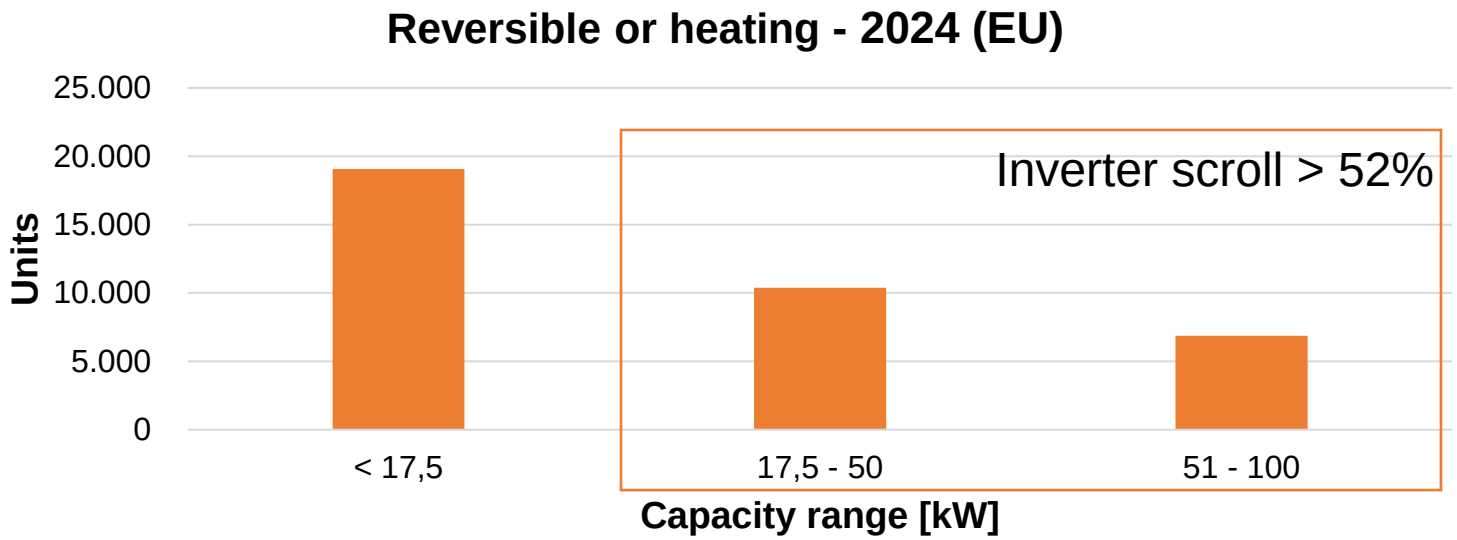
Hydronic HPs Market Size in Europe (2024)

Eurovent Statistics 2025



Eurovent Statistics 2025

Reversible or heating only						
Capacity range [kW]	**R 290**	**R 454B**	R 32	R 410A	OTHERS	TOTAL
< 17,5	**645**	0	13.846	1.273	3.315	19.079
17,5 - 50	**339**	65	7.870	1.933	175	10.382
51 - 100	**212**	640	4.825	850	336	6.863
Total	**1.196**	705	26.541	4.056	3.826	36.324

Hydronic PdC up to 100kW

- 36000 units, 81% below 50 kW
- The transition to sustainable refrigerants is on-going : more than 80% HPs using medium/low GWP ref.
- Hydrocarbons (R290) >1196 pcs. (45 in 2022), 3,3% of the total

By 2027, all PdC below 50 kW will shift to low-GWP ref. (F-Gas ban)

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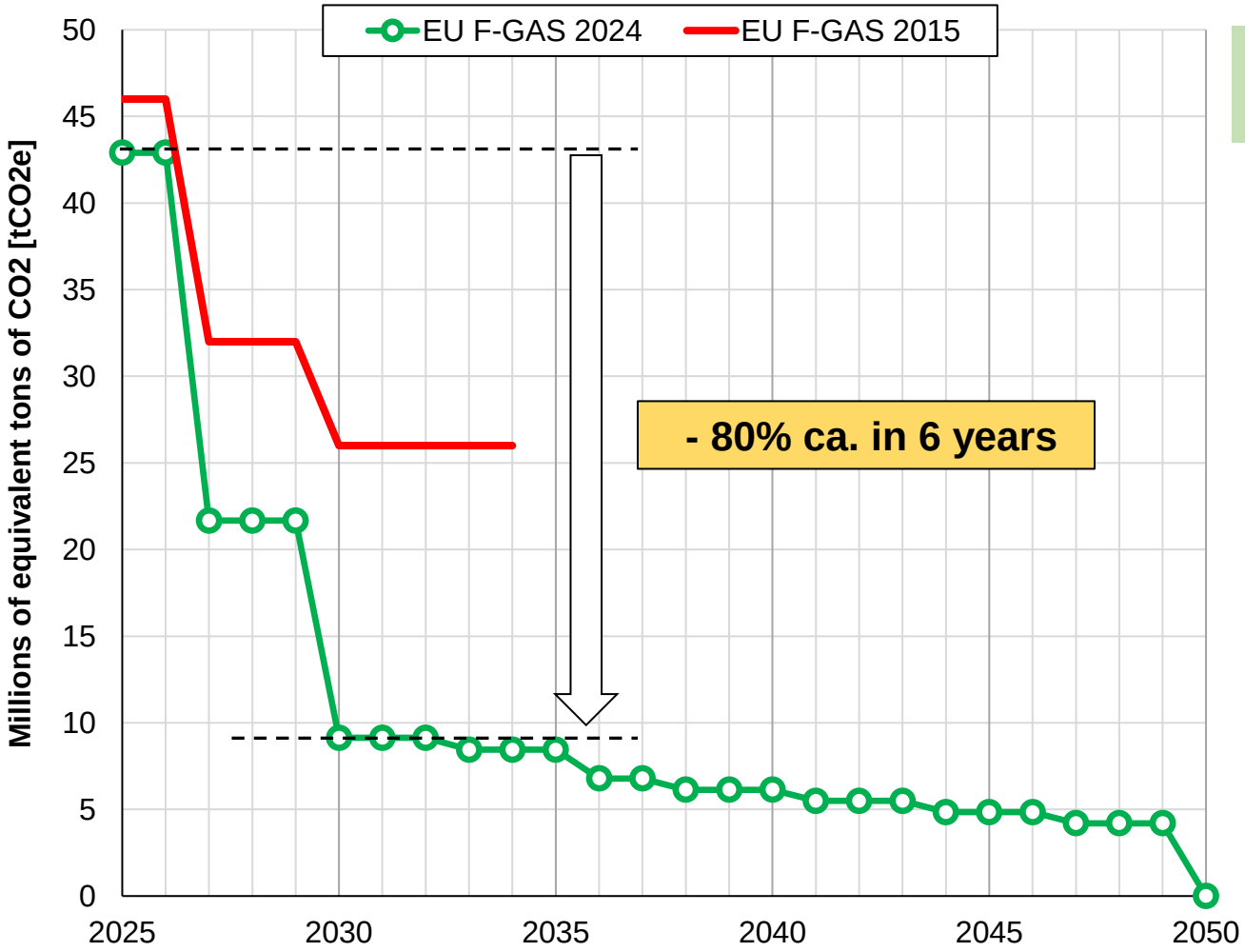
New F-Gas Regulation 2024/573, Phase-down and Quota System



The EU Regulation on fluorinated greenhouse gases
A path towards sustainability

2006 - First EU F-gas regulation

2015 - 2nd F-gas, introducing the phase down of high-GWP hydrofluorocarbon (HFC) refrigerants

2022 - F-gas revision proposal

March 2024
New EU F-Gas Regulation 2024/573

The EU F-gas regulation is considered a front runner. From 2030 the available amount of F-gases is extremely reduced, even for service.

From 2025, the quota is significantly reduced from the previous gradual reduction

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F-Gas 2024/573: Prohibitions for New Products - Heat Pumps

The quota reductions are accompanied by Placing on the market Prohibitions* (Bans)

Definition

"Heat pump: Equipment capable of using ambient heat or waste heat from air, water or ground sources to provide heating or cooling. …"

Stationary air-conditioning and heat pumps	F-gas GWP bans	From
Plug-in room, monoblock and other self-contained **≤ 12 kW**	**≥ 150** All HFCs forbidden	**Jan. 2027** **Jan. 2032**
Monoblock and other self-contained AC and heat pumps **from 12 kW up to 50 kW**	**≥ 150** (or max. limit of 750 in case Safety prevails at jobsite)	**Jan. 2027**
Other self-contained AC products and heat pumps **(i.e. > 50 kW)**	**≥ 150** (or max. limit of 750 in case Safety prevails at jobsite)	**Jan. 2030**

**For all prohibitions: F-gas with GWP <750 potentially can be used if safety restrictions at the place of use require it.*

Each installation to be evaluated.

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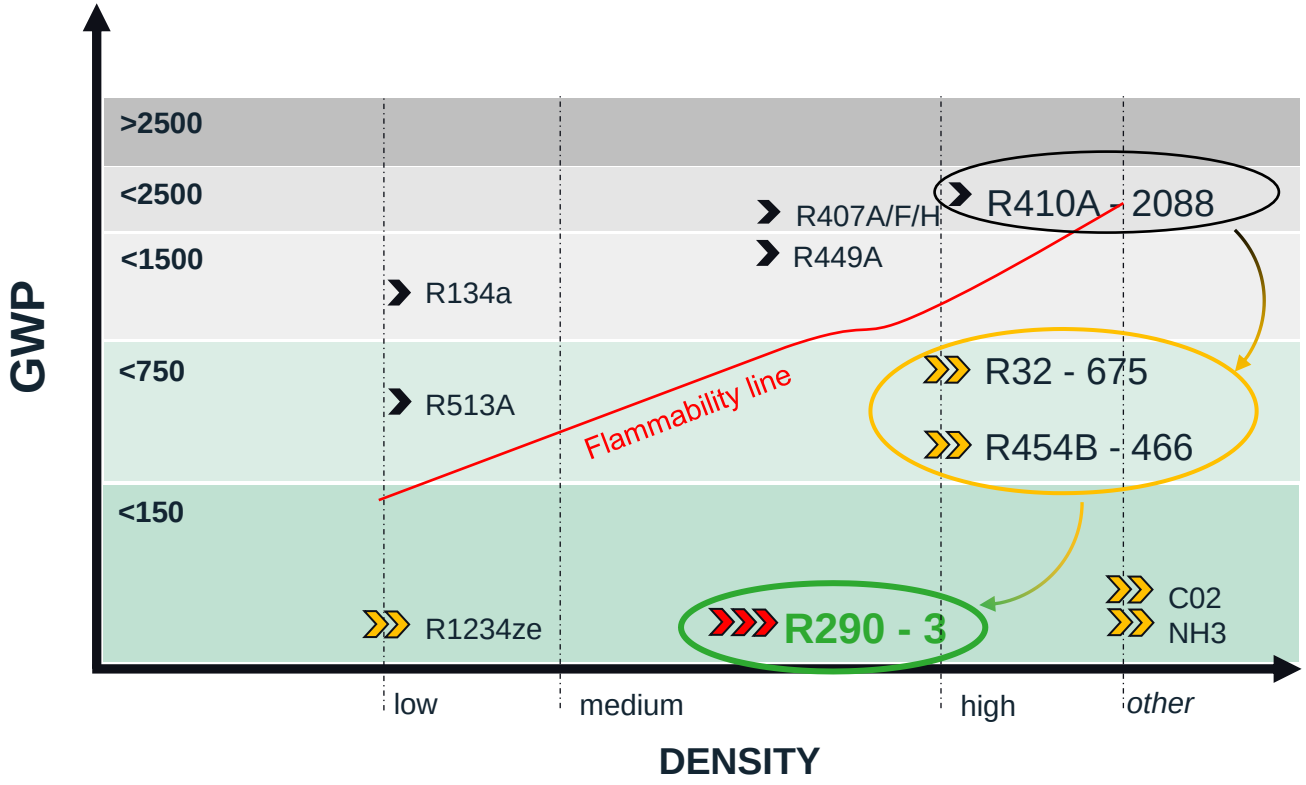
Why choose propane and inverter scroll compressors?

Transition to lower GWP refrigerants

R290

Depending on their size and the compressor technology they use, chillers operate with low to high pressure refrigerants and are divided into two categories: low/medium (L/M) and medium/high (M/H) pressure.



A1 Non-Flammable

A2L Mildly Flammable

A3 Highly Flammable

According to ASHRAE 34 and ISO 817, refrigerants are divided into classes depending on **toxicity** and **flammability**

No Low-GWP for high density refrigerant, must move to low density

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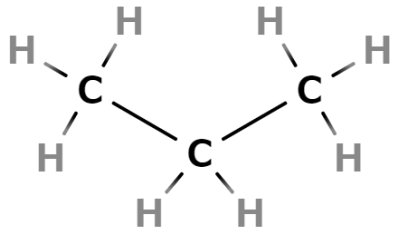
Why choose propane and inverter scroll compressors?

R290



Global Warming Potential – GWP **0,02** (AR6)

Ozone depletion potential – ODP **0** (AR6)

Non-toxic

- Negligible environmental impact, the sustainable long-term solution
- Pure fluid, avoids all the inconveniences related to glide
- High performance, thanks to excellent thermodynamic properties.

A3 SAFETY

Comprehensively engineered

Propane is A3 flammable classified according to ASHRAE Standard 34 and ISO 817.

PED groove 1, hazardous fluids

Safety always comes first on iMEX-N heat pumps: accurate design in strict compliance with safety standards.

R290 is the answer

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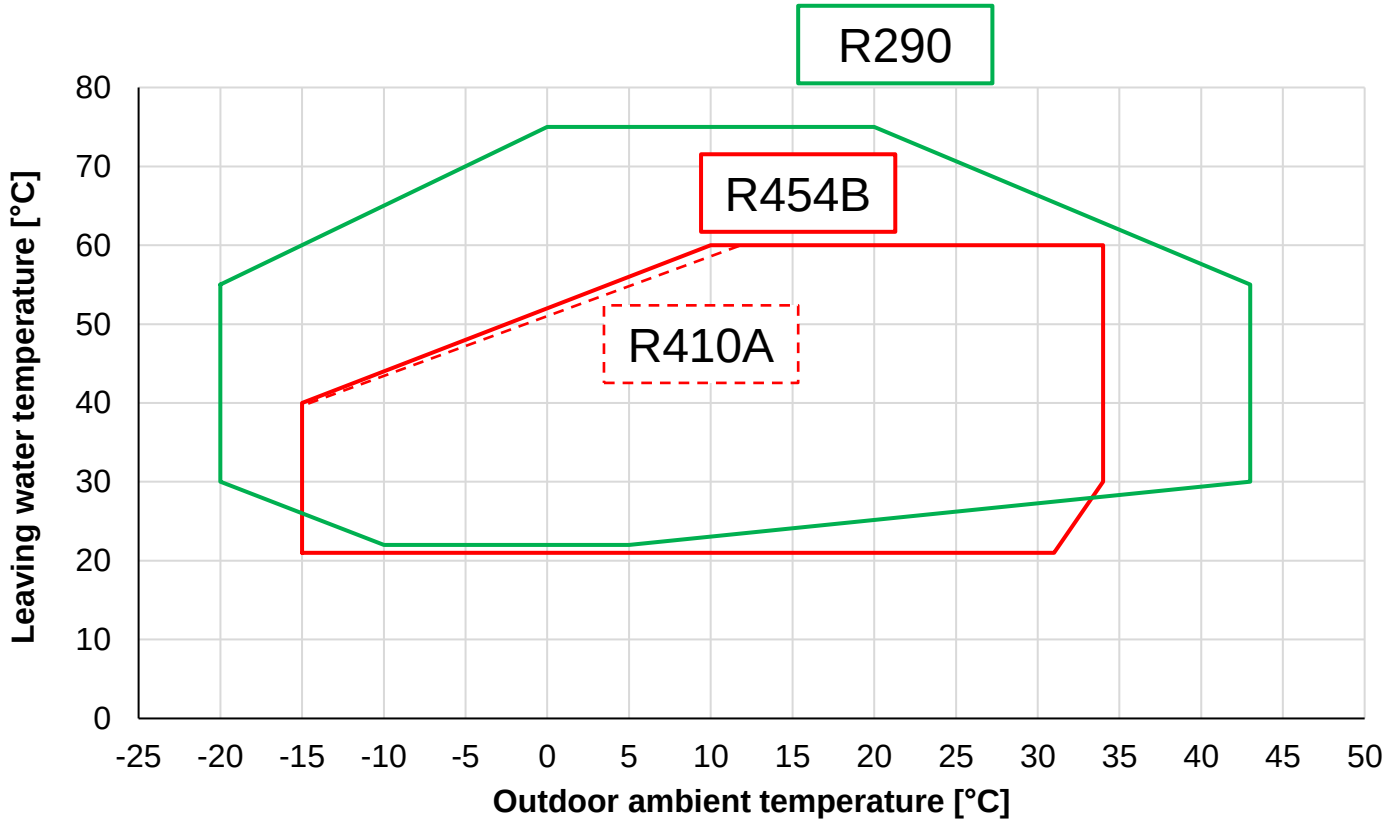
Why choose propane and inverter scroll compressors?

HIGH TEMPERATURE:

The heat pump with R290 can produce higher water temperatures than HPs using traditional refrigerants.



+75 °C

- **Versatile** in renovations

- **Ideal** for domestic hot water – DHW production

Strong Heating Operating Map !

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UNI EN 378
Refrigeration Systems and Heat Pumps - Safety and Environmental Requirements.

General standard
Intended for:

DESIGNERS

INSTALLERS

PLANT MANAGERS

PART 1

Basic requirements, definitions, classification, and selection criteria

How much charge can be put into a piece of equipment?

PART 2

Design, construction, labeling and documentation

What construction and safety requirements must a piece of equipment have?

PART 3

Installation site and personnel protection

What safety requirements must the room where the equipment is installed have?

PART 4

Operation, maintenance, repair and recovery

What are the procedures for operating and maintaining the equipment?

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UNI EN 378
Refrigeration Systems and Heat Pumps - Safety and Environmental Requirements.

OUTDOOR INSTALLATION

“Outdoor space is defined as any unenclosed space, possibly but not necessarily with a ceiling. ”*

**A room is considered open space if at least one of the longest walls is open to the outside air with gratings or louvers having 75 percent free area covering at least 80 percent of the wall area*

- The equipment must be located to **prevent refrigerant leakage inside the buildings**;
- If provided with an enclosure, have the latter **ventilated in a natural or forced way**;
- **Prevent refrigerant from entering the intake**, air exchange, and similar ducts in case of leakage. (with vents, intermediate exchangers, etc.).

For ref. A3

The maximum allowable charge is:

Up to 5 kg

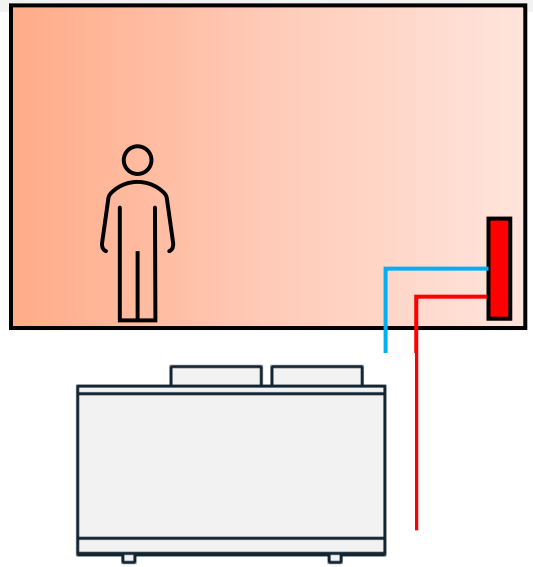
Generic, unrestricted access environment

Up to 10 kg

Supervised environment, access to a limited number of people, some must be instructed with plant safety precautions

Over 10 kg

Authorized access environment, access only to authorized persons trained in general and specific security procedures



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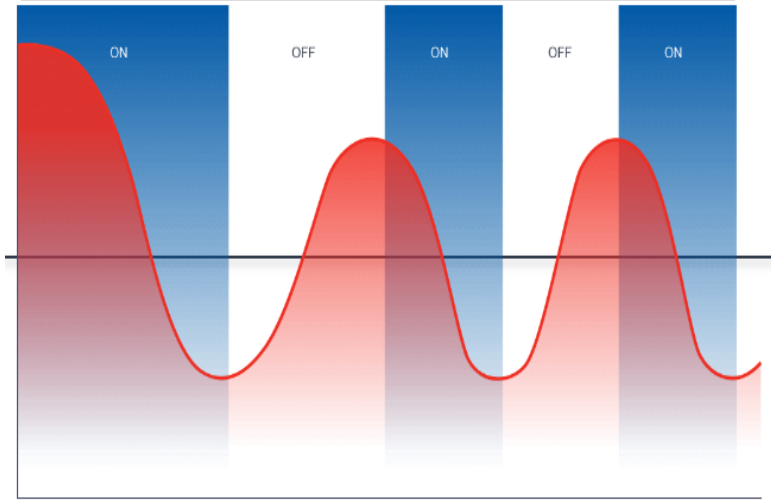
Why choose propane and inverter scroll compressors?

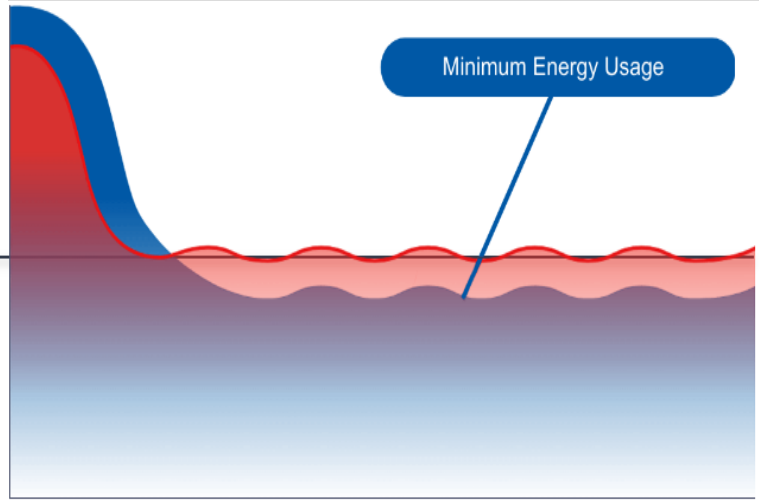
VARIABLE SPEED TECHNOLOGY on fans and compressors is the most energy efficient technology to meet climate control needs.

Meet the market needs: avoid system oversizing, reduce electricity bill and inrush current, increase comfort are key drivers for using variable capacity technologies

ON-OFF heat pump



Continuos capacity modulation



Huge benefits:

-Energy savings

-Accurate temperature control

-Extended operating limits

-Low-noise operation

-Greater comfort

The best performance, always

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Let’s reinvent heating with heat pumps

In our journey towards a sustainable future, innovation is enhancing electrical grids and power generation, making them more efficient and smarter and facilitating the integration of renewable energies.

As electricity becomes greener, the transition to all-electric heating systems using heat pumps is key to achieve net-zero emissions targets.

iMEX-N

Sustainable, in every detail

iMEX-N is the brand-new air-source heat pump, with inverter compressor, delivering high water temperatures with maximum efficiency and silent operation

The ultimate sustainable solution to eliminate fossil fuels from your buildings

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R290 heat pump design, its features and its benefits

iMEX-N can efficiently provide hot water for space heating and sanitary hot water purposes all-year round, even in extremely cold weather. It is the perfect replacement for gas boilers as well.

Heating capacity 8 - 14 - 21 - 29 kW

Heating Capacity (kW)
30/35°C - 7°C - RH 87%

L (mm)	W	H
1253	547	1066

L (mm)	W	H
1253	547	1365

L (mm)	W	H
1887	748	1816

L (mm)	W	H
1887	748	1816

What's needed, from a single system

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R290 heat pump design, its features and its benefits

iMEX-N Highlights

High efficiency
Full inverter technology (on compressor and fan) for achieving very high efficiency in all working conditions

Heating optimized
Heat pump operates down to -20°C outdoor air. Providing hot water of
75°C at 0°C air
60°C at -15°C air

Quiet operation
Optimized for low noise emissions in every condition.
Full load 61 dB(A)*.
**** 8 kW capacity***

Certified performance
All models will be Eurovent certified

Packaged solution
Plug & play unit, thanks to the integrated hydronic module and available options

Easy installation and maintenance
Improved accessibility, practicality and flexibility

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iMEX-N 002 / 004 – How it’s made

Hermetically sealed refrigeration circuit

Graphic display
4,3” touch screen with user friendly interface. Remote on models 002/004.

Variable speed scroll “Low sound” compressor
Optimized for R290 with continuos capacity modulation for ultimate efficiency.

High efficiency EC fan
Total control of the fan speed for optimum performance, at any condition.

User-side brazed plate heat exchanger
Efficient and compact

Source-side heat exchanger
Copper pipes (mini tubes, 5 mm) and aluminum fins, with hydrophilic treatment

Removable panels
Great accessibility to internal components for service operations

Coil protection grill (Opt.)
Robust and effective in protecting the air side coils during transportation, installation and extreme weather conditions

Plug&Play

Packaged monobloc heat pump, can be equipped with integrated pump

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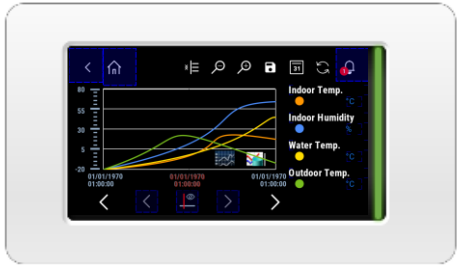
iMEX-N – Insight

Graphic display and electronic controller

- **4,3” touch screen** with user friendly interface.

Remote on models 002/004, on-board on models 006/008;

- **Carel uPC3** electronic unit controller;
- Heating and Cooling capacity calculation (visible to Service);
- Setpoint management via climatic curves;
- DHW with **anti-legionella cycles** management;
- Leak detector maintenance warning (006/008);
- Integration with different sources (El. Heaters) (Expansion module required);
- BMS connectivity via MODBUS TCP/IP or RTU.



Scalable system

Possibility to connect up to **4** units, increasing the total system capacity

Smart grid ready

The controller is designed to be easily integrated with a smart grid, following its operating logic.

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iMEX-N 006 / 008 – How it’s made

Graphic display
4,3” touch screen with user friendly interface. On board on models 006/008.

Separated electrical box
All electrical components are protected in a separate and ventilated electrical box (IP54).

Pressure safety valves
Models 006/008 are equipped with relief valves on the high and low pressure sides to protect the refrigeration circuit.

Leak detection and ventilation system
If a refrigerant leak is detected, the unit stops immediately and the fan ensures its safe dispersion.

High-efficiency gas/water separator
Mounted externally, it guarantees optimal system operation and can separate refrigerant from the water flow in case of heat exchanger failure.

Packaged solution – Designed to simplify installation and maintenance

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iMEX-N - Performances

Preliminary

OAT +35°C

Model	CC (kW)	SEER
002	6,3	4,13
004	10,7	4,33
006	16,5	4,37
008	22,3	4,46

12/7°C

OAT +7°C / RH 87%

Model		COP	SCOP LT / ηs
002	8,4	4,25	4,44 / 174,5
004	14,2	4,35	4,39 / 172,7
006	21,2	4,41	4,50 / 176,5
008	29,1	4,40	4,45 / 175,0

30/35°C

Av. ηs
174

OAT +7°C

Model	HC (kW)	COP
002	8,1	3,54
004	13,6	3,73
006	20,5	3,71
008	28,1	3,63

40/45°C

OAT +7°C

Model	SCOP MT / ηs
002	3,58 / 140,0
004	3,70 / 145,0
006	3,67 / 144,0
008	3,64 / 142,5

47/55°C

Av. ηs
143

Leaving water temperature

5 7 10 15 20 25 30 35 40 45 50 55 60 65 70 75

OAT -5°C

Model	HC (kW)	COP
002	5,6	2,5
004	8,9	2,7
006	13,7	2,5
008	17,8	2,5

40/45°C

up to 4.5 SCOP 35°C | up to 3.7 SCOP 55°C

Values in compliance with EN14511. Unit without P1 integrated pump (option);
SEER - Seasonal energy efficiency ratio in cooling [REGULATION (EU) N. 2016/2281];
SCOP LT - Seasonal space heating energy efficiency, LOW TEMPERATURE, [REGULATION (EU) N. 813/2013];
SCOP MT - Seasonal space heating energy efficiency, MEDIUM TEMPERATURE, [REGULATION (EU) N. 813/2013];

High performance in all conditions

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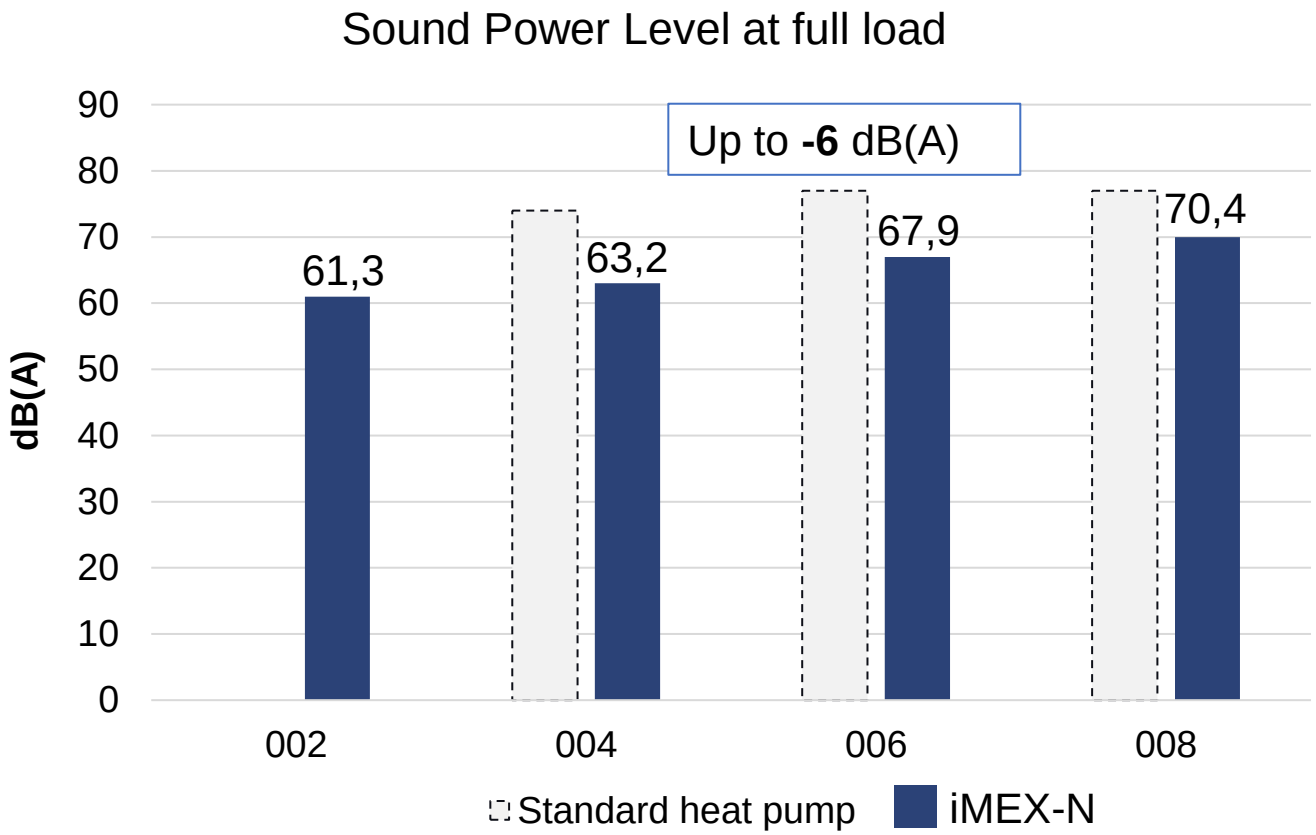
iMEX-N - Performances



iMEX-N is designed with an intense focus on acoustics and equipped with cutting-edge low-noise technologies on the compressor and on the EC axial fans with aerodynamic blade design.

Sound power level in cooling, measured in compliance with ISO 3744;

Extremely quiet operation

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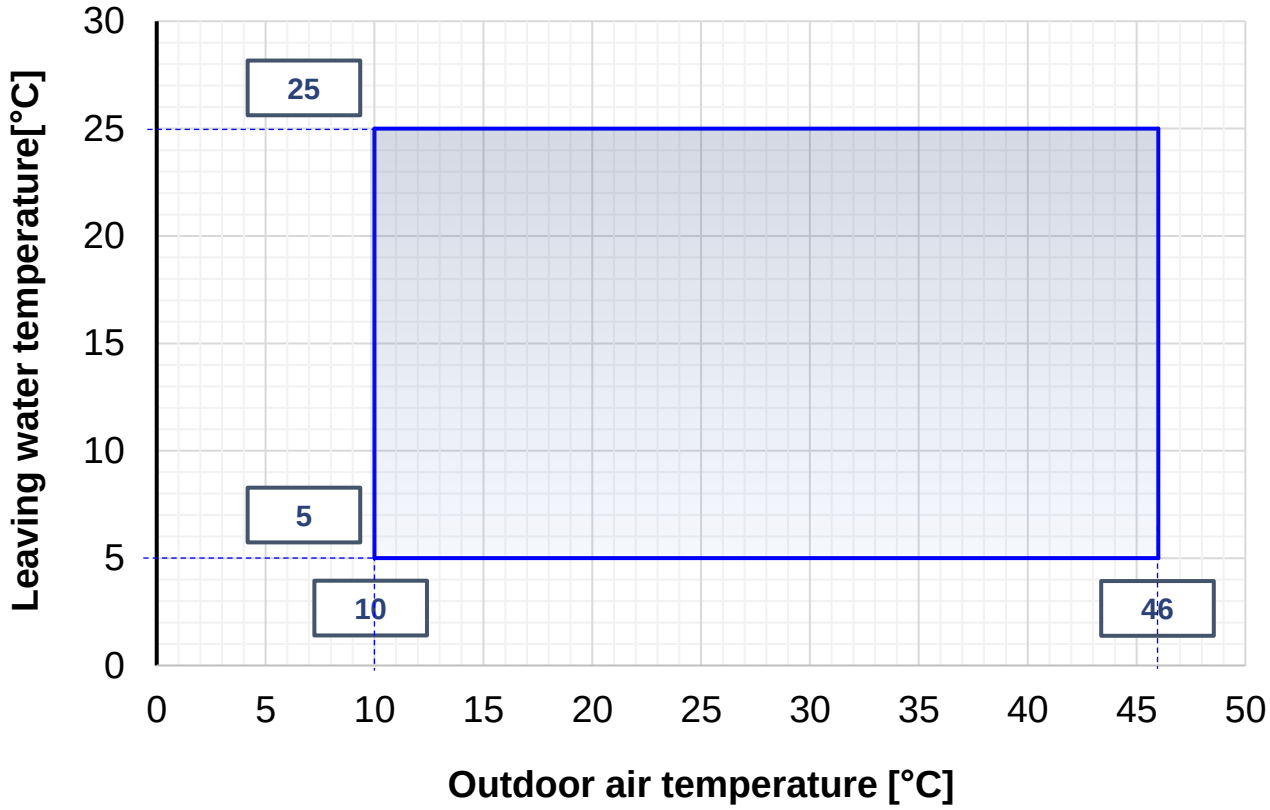
iMEX-N - Operating map in cooling mode

What is needed for cooling needs

The unit can deliver chilled water for air-conditioning, operating up to 46 °C outdoor air temperature.



Optimal operation with high outdoor air temperature

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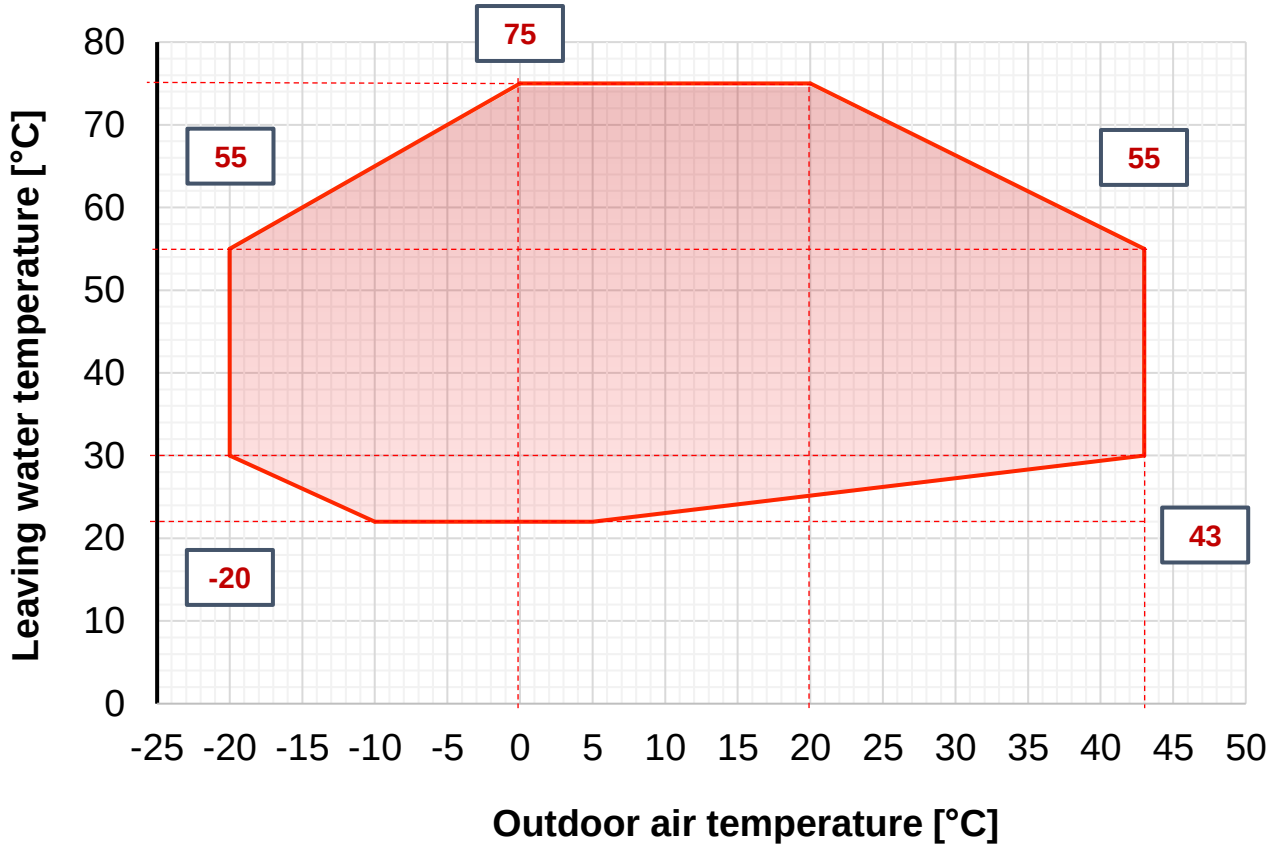
iMEX-N – Operating map in heating mode

Strong Heating Operating Map !

Heat pump operates down to -20°C outdoor air.
Providing hot water of 60°C at -15°C air

Opening access to Domestic Hot Water market and for replacing gas boilers in older light commercial buildings.

Note: >60°C kills legionella bacteria



The ultimate sustainable solution to eliminate fossil fuels from buildings

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iMEX-N – Options

	002	004	006	008
Power supply	230/1/50 V/Ph/Hz	230/1/50 or 400/3+n/50	400/3+n/50	400/3+n/50
FACTORY MOUNTED OPTIONS				
Pump P1	√	√	√	√
El. Heater on BPHE	√	√	√	√
El. Heater on BASEMENT	√	√	√	√
Protective grille on coils	√	√	√	√
Protective coating on coils	√	√	√	√
LOOSE OPTIONS				
Modularity kit (required with 3/4 units)	√	√	√	√
Remote display (for 006/008 models)	X	X	√	√
Controller expansion kit	√	√	√	√
3-Way valve for DHW management	√	√	√	√
Antivibration feets and beams kits	√	√	√	√

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iMEX-N – Approach to safety

A3 SAFETY

002 – 004 models (8-14 kW heating)

CEI EN 60079 – 10 – 1: 2016 / IEC 60335 – 2 – 40:2022

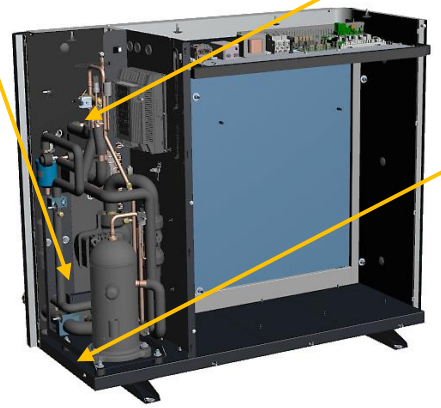
LOW R290 charge:
002: 0,85 kg
004: 1,10 kg

006 – 008 models (21 & 29 kW heating)

CEI EN 60079 – 10 – 1: 2016 / CEI EN 378:2021

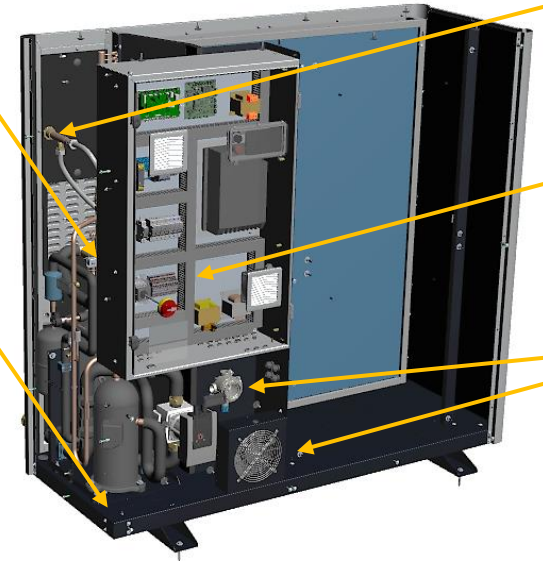
LOW R290 charge:
006: 2,1 kg
008: 2,5 kg

Hermetically sealed circuit:
No additional safety requirements



Welded
Pressure safety switch
Pressure transducer

Holes in the basement to promote a natural ventilation



Safety Valves

IP54
Sealed Electric Box

ATEX certified
Leak detector
Extraction Fan

Safety deaerator on water circuit helps removing refrigerant in case of leakage

Accurate design in strict compliance with safety standards

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iMEX-N – Extension range NEW

iMEX-N

010 – 019 models
(35 - 66 kW)

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iMEX-N 010-019

PRELIMINARY

APPLICATIONS

Replacement of gas boilers and electric boilers in existing buildings.

Newly built systems for high-efficiency heating and cooling.

Production of domestic hot water.

MAIN FEATURES

R290: pure refrigerant with excellent thermodynamic properties

Uncompromising safety: **SDS²E** (Segregate / Detect / Stop / Signal / Extract).

Hot water all year round, even in cold climates (full load at -20°C). The maximum temperature limit has been raised on the new models to **78°C**; the unit produces water at **75°C** with **-10°C** ambient.

High seasonal efficiency average SCOP = **170**.

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iMEX-N 010-019

PRELIMINARY

010 - 014
H: 1800 mm
L: 2180 mm
W: 1115 mm

Charge <5kg

016 - 019
H: 1800 mm
L: 2860 mm
W: 1115mm

Charge <10kg

Master /slave
Up to **4** units
Heating capacity
up to **260** kW

Heating capacity (kW)
30/35°C - 7°C

A3 – CHARGE	< 5kg	< 10kg	UNI EN 378-1
INSTALLATION TYPE	III – OUTDOOR INSTALLATION		
ACCESS CATEGORY	a GENERIC	b SUPERVISED	

Access categories are classified according to national requirements / Safety distances and precautions suggested by regulations and the manufacturer must always be observed

5 new models!

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iMEX-N – Features

PRELIMINARY

EC fans

Safety Valves

Protection grills (opz.)

Electrical panel P54

Touch screen 4.3”

Leakage sensor malfunction

Leakage sensor

Reset

Leakage sensor and scavenging fan (ATEX)

Plate heat exchanger

Inverter-controlled scroll compressor
Modulation capability ~30%-100%

OPTIONS

Built-in hydraulic module

- Single pump P1 (~100kPa)
- Single pump P2 (~200kPa)
- Tank 150L / 250L
- Flow meter
- Gas/water separator

All-in-one, efficient, sustainable

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iMEX-N – Operating maps

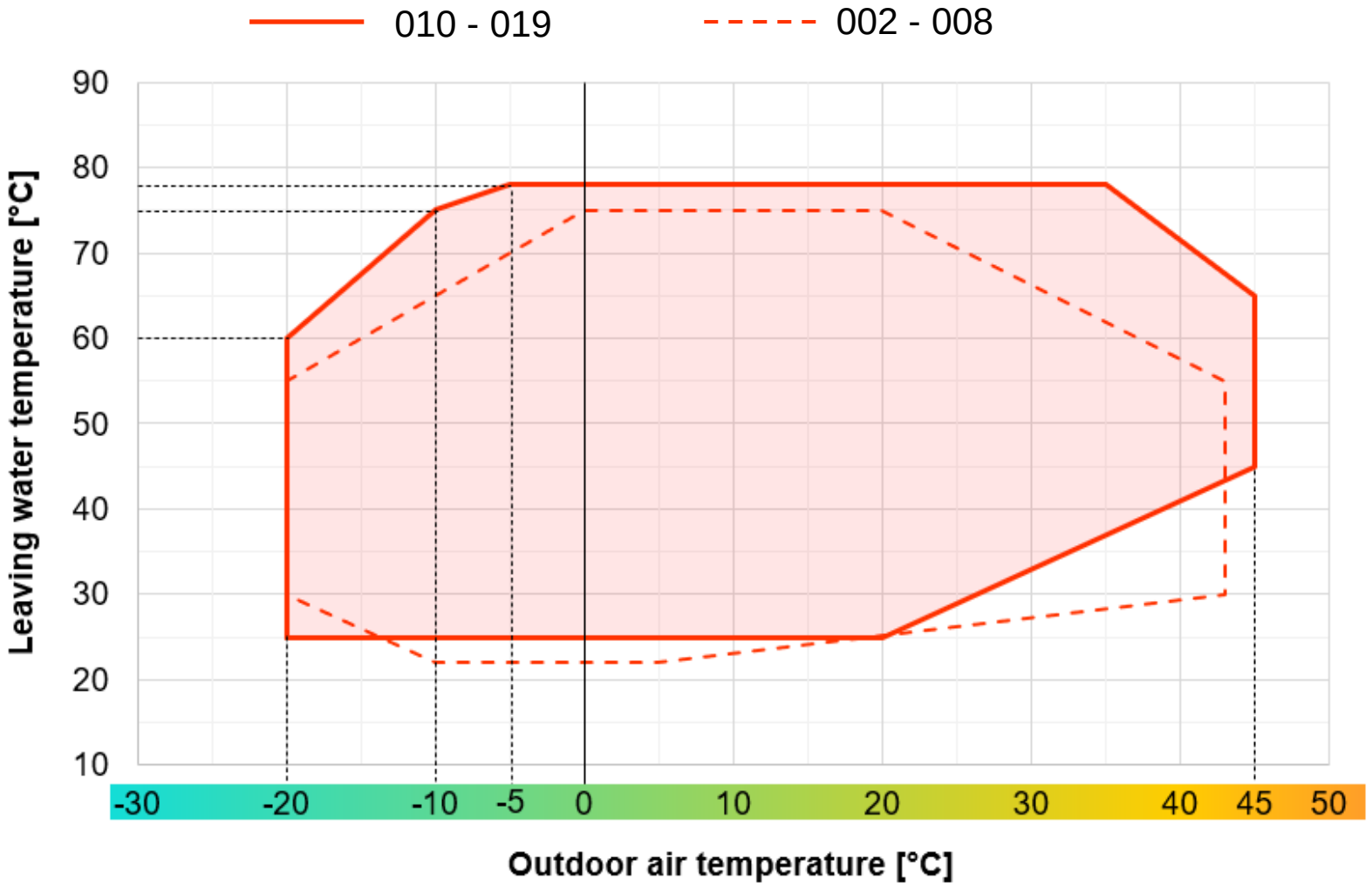
WIDER OPERATING LIMITS

78°C

WATER TEMPERATURE

-20°C

MIN. AMBIENT



Hot water for space heating and sanitary use all year round

PRELIMINARY

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iMEX-N – Performances

PRELIMINARY

		iMEX HP-N				
	Model	**010**	**012**	**014**	**016**	**019**
COOLING	kW (12/7°C; 35°C)	27,8	32,2	37,4	45,5	51,8
	EER	2,9	2,8	2,8	3,1	3,0
	SPL- dB(A)	80,0	81,0	83,0	83,0	85,0
	SEER	4,6	4,6	4,5	4,8	4,7
HEATING	kW (40/45°C; 7°C)	34,1	39,8	45,7	54,3	63,3
	COP	3,6	3,4	3,4	3,5	3,3
	SCOP LT (35°C)	4,4	4,3	4,3	4,4	4,2
	SCOP MT (55°C)	3,4	3,4	3,4	3,6	3,4
DIMENSIONS	Length - mm	1110	1110	1110	1110	1110
	Width - mm	1800	1800	1800	1800	1800
	Height - mm	2180	2180	2180	2860	2860

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iMEX-N – Performances

HIGH TEMPERATURE APPLICATIONS

*Outlet **75**°C*

Decrease in heating capacity
About 15%

PRELIMINARY

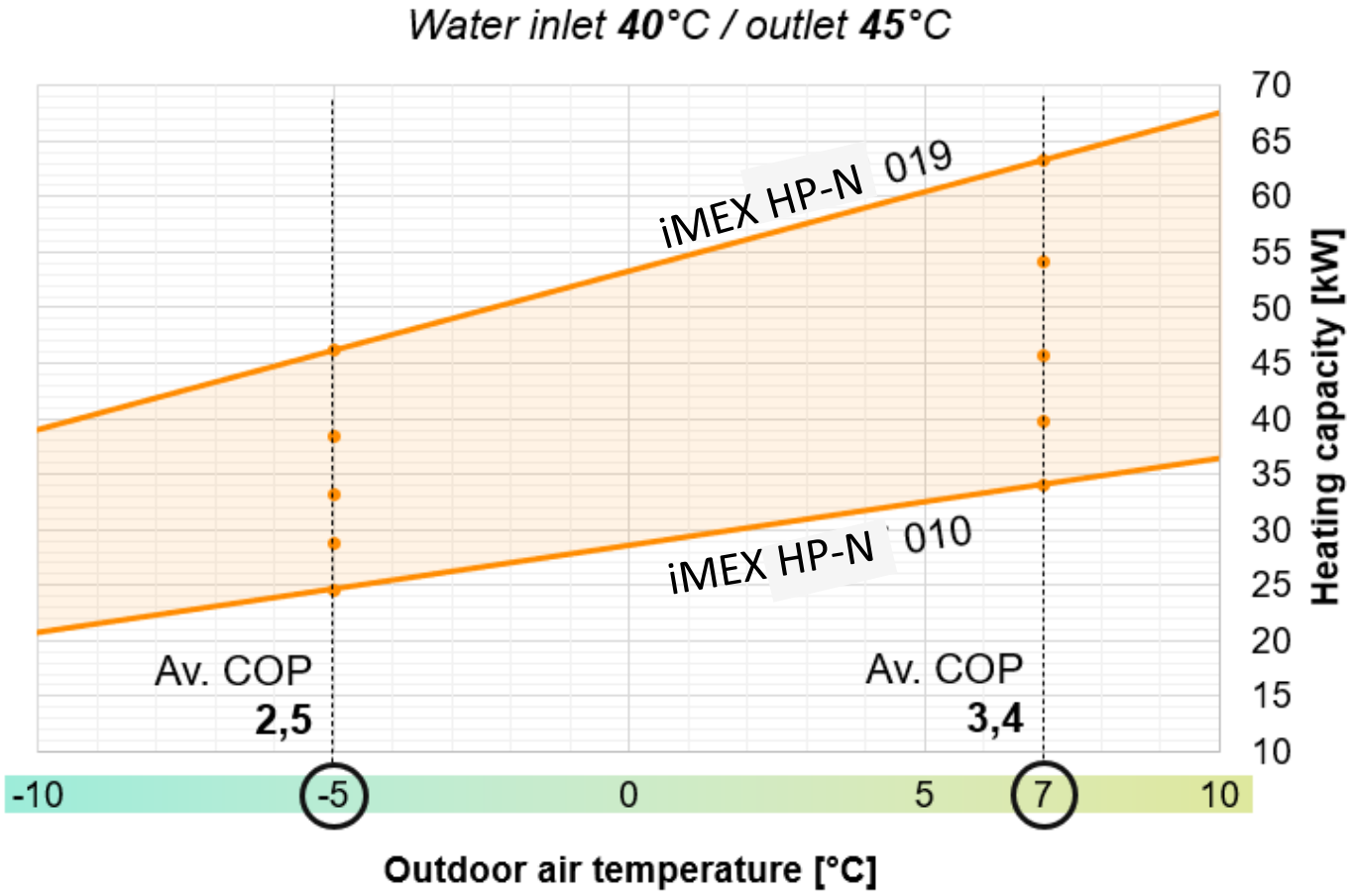
Average values

4,6 / 172
SEER

4,3 / 170
SCOP LT (35°)

3,4 / 134
SCOP MT (55°)

FAN COIL APPLICATION



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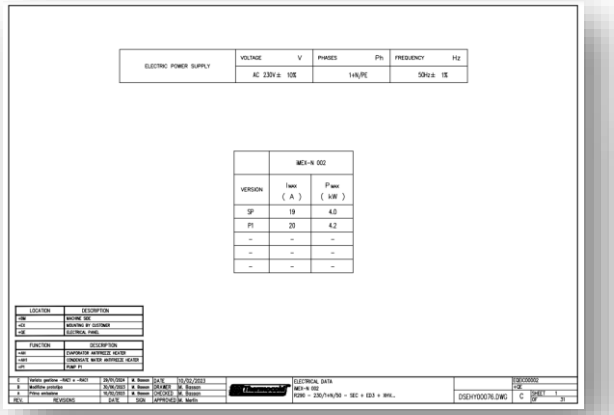
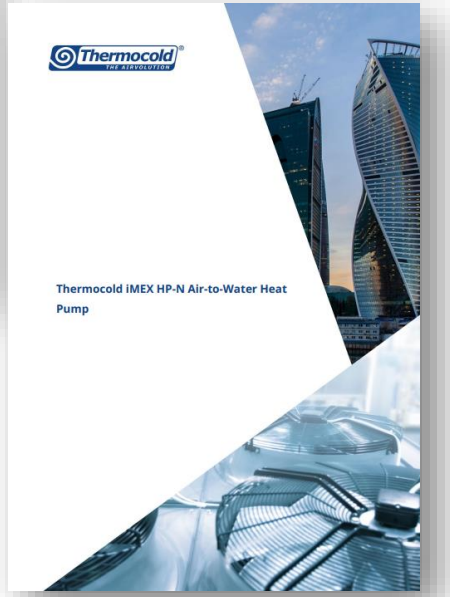
iMEX-N – Documentations is available in “Download Area” into the website www.thermocold.it

Technical data sheet

Install. and Maintenance Manuale + focus on controller



Wiring diagrams



Brochure

BIM File, DWGs and Guide Specifications are also available at the same path in the website!

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Thank you for your kind attention!