



Promouvoir
une attitude
responsable

HVAC

AIR-TO-AIR SOLUTIONS - COLLECTIVE HOUSING HEATING AND COOLING

POSSIBLE SOLUTIONS



DESIGN OF THE SYSTEM (ACCORDING TO EN 378 GUIDANCE)

R-454C

R-290

Class II

Compressor in technical room or open range (indoor evaporator)

Air-to-water heat pump / Air conditioner	Air-to-water heat pump / Air conditioner
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Refrigerant type (HFC/HFO/HC/Inorganic)

HFC/HFO	HC
146	0.02

Safety classification Lower Flammability Level LFL

A2L - 0.293 kg/m ³	A3 - 0.038 kg/m ³
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Classification (according to Pressure Equipment Directive PED)

1	1
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F-gas quotas

Applicable	Non-applicable
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Specific regulatory constraints

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Maintenance complexity (training, safety, tooling, Personal Protection Equipment PPE ..)

Training is mandatory Specific tooling PPE	Training is mandatory Specific tooling PPE
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Coefficient of Performance COP (theoretical)¹

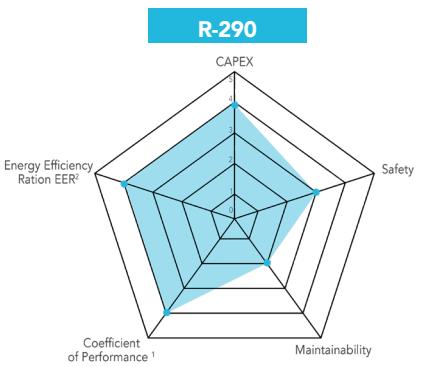
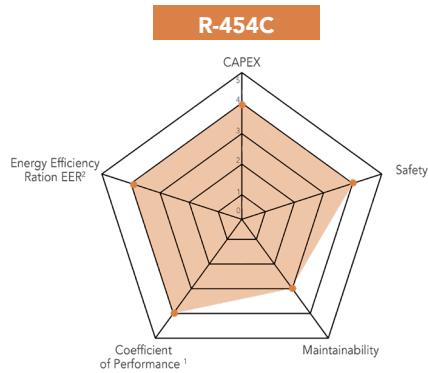
7.0	7.1
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Energy Efficiency Ratio EER (theoretical)²

5.1	5.2
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Technology readiness (prototyping, field test, availability)

Under development	Monoblock : available Multi-split : under development
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¹ Tk = 40°C - To = 2°C - SC = 5K - SR = 3K - Isentropic efficiency = 100%

² Tk = 45°C - To = 2°C - SC = 5K - SR = 3K - Isentropic efficiency = 100%

CONCLUSION

Class II : R-32 is the most-commonly used refrigerant in this type of application. Flammability is the main blocking point to a wider usage of low-GWP refrigerants, which are actually limited to «monosplit» units, due to their charge limit. «Multi-split» are under development.