



Promouvoir
une attitude
responsable

HVAC

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

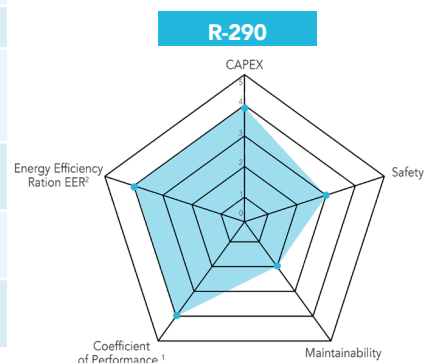
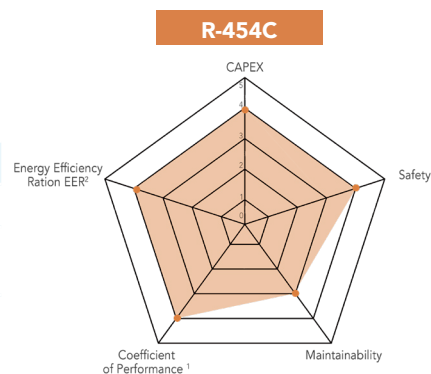
POSSIBLE SOLUTIONS

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
Refrigerant type (HFC/HFO/HC/Inorganic)	HFC/HFO	HC
GWP (according to F-Gas UE/2024/573)	146	0.02
Safety classification Lower Flammability Level LFL	A2L - 0.293 kg/m ³	A3 - 0.038 kg/m ³
Classification (according to Pressure Equipment Directive PED)	1	1
F-gas quotas	Applicable	Non-applicable
Specific regulatory constraints	++	+++
Maintenance complexity (training, safety, tooling, Personal Protection Equipment PPE ..)	Training is mandatory Specific tooling PPE	Training is mandatory Specific tooling PPE
Coefficient of Performance COP (theoretical) ¹	7.0	7.1
Energy Efficiency Ratio EER (theoretical) ²	5.1	5.2
Technology readiness (prototyping, field test, availability)	Under development	Monoblock : available Multi-split : under development

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.