NRE- CWU NRE -CWR NRE-HDP R454B

WATER CHILLERS & REVERSIBLE HEAT PUMPS AIR/WATER FROM 40 TO 650 KW

BIM READY

ErP 2021 COMPLIANT

R454B

- Refrigerant R454B: GWP = 466 (-78% R410A / -31% R32)
- Very high SEASONAL EFFICIENCY in cold and heat
- High modulation of the power delivered
- Wide refrigeration and hydronic configurability
- Small footprint
- High efficiencies at partial loads
- Reduced quantities of refrigerant
- Maximum accessibility to the refrigeration circuit compartment

The chillers and heat pumps are designed for use in air conditioning and heating systems for commercial and industrial users.
The High Efficiency Units of the NRE-CWU, NRE-CWR and NRE-HDP series guarantee unparalleled results in terms of TLC (Total Life Cost) containment.
By favoring the use of energy from renewable sources, they can contribute to obtaining the best energy classification levels and the best performance of the building to which they are dedicated, based on various global protocols in the field of Green Buildings, such as LEED® and BREEAM ®.
Particular attention has been paid to energy efficiency and has Minimum Energy Performance Standards values foreseen by the ECODESIGN regulation (EU) n. 2016/2281. Achieving compliance with all energy efficiency indices: SEER, SEPR and SCOP makes the series usable in any context.
From the point of view of noise emissions, the design of the units allows the noise of the compressor section to be effectively confined and decrease the one produced by fans section.

Pubblicazione: scheda tecnico-commerciale unità NRE-CWU, NRE-CWR, CRE-HDP R454B

Versions

- CWU only cold
- CWR reversible water cooler
- HDP reversible heat pump
- SL silenced up to -6.8 dB(A) vs Standard
- SLN super silent up to -9.2 dB(A) vs Standard
- HR recovery partial
- CT/CTS marine type Onshore/Offshore

Accessories

- 1/2 PB - 1/2 low head pump (10-15m)
- 1/2 PA - 1/2 high head pump (20-25m)
- 1/2 PBS - 1/2 low head pump (10-15m) + Buffer tank
- 1/2 PAS - 1/2 high head pump (20-25m) + Inertial tank
- 1/2 P(B)(A)V - 1/2 Inverter pumps

Applications

Industrial

Sports facilities

Airports
Railway stations

Tertiary

Cinema, Theatres

Hospitals, Nursing homes

Catering

Supermarkets

Shops

Wellness centers

Schools and Institutes

Multi-family dwellings

Hotels

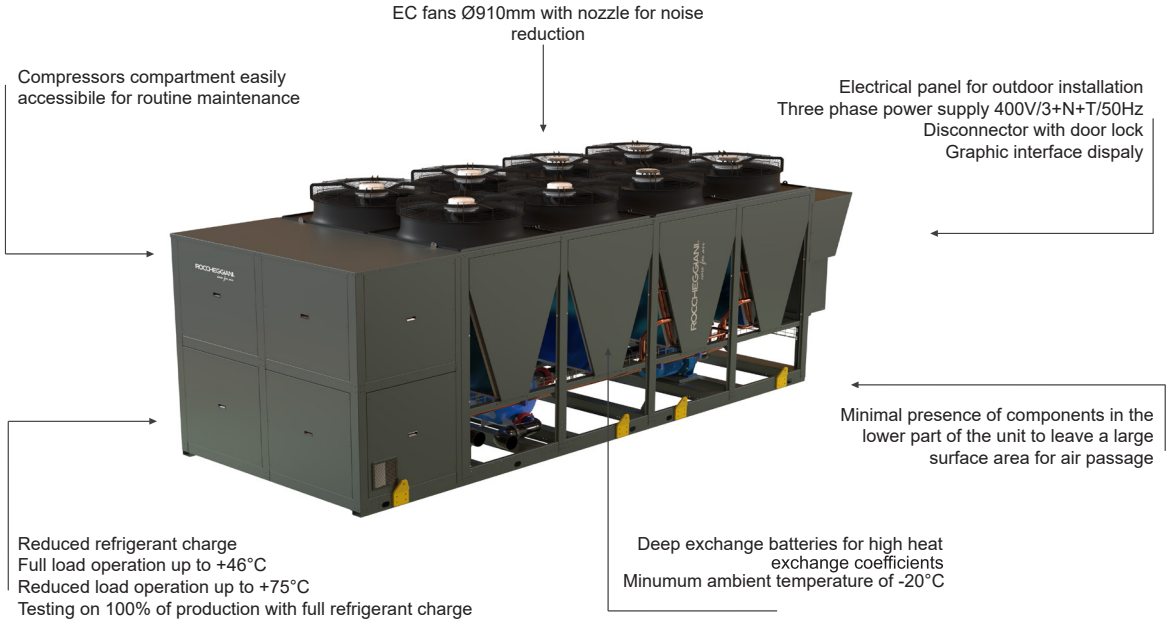
Offices

Marine and Offshore
Power Plant

Refrigerant , Care-for-air for a greener Future

R454B is a zeotropic blend (69% R-32 + 31% R-1234yf), non-ozone depleting (ODP = 0), developed as a low GWP alternative to R-410A in air conditioning and heating, in heat pump mode, in volumetric displacement systems.
GWP equal to 466 (IPCC 5), 78% reduction compared to R-410A (GWP = 2088), 31% reduction compared to R-32 (GWP = 675).
R454B is a class A2L refrigerant, odorless, non-toxic, with low flammability (according to ISO 817), belonging to Group 1 fluids (PED).
Refrigerant charge reduced by 30% compared to R-410A. Overall carbon footprint reduced by 84.4% compared to R-410a (kg $CO_{2,eq}$).

Main components



Structure

Small footprint
Monobloc load-bearing structure in painted galvanized steel
Stainless steel small parts
RAL7012 epoxy painting
Suitable for outdoor installation
Corrosion resistance
Prepared for the insertion of vibration dampers
Prepared with lifting eyebolts (except single fan)

Refrigeration circuit

SCROLL compressors in tandem and/or trio
Low GWP refrigerant gas (466): R454B
Microtube air exchanger : Ø 7 mm (NRE-CWR, NRE-HDP)
Micro-channel air exchanger (NRE-CWU)
Single circuit plate evaporator for greater reliability
Electronic expansion valve
Gas leak sensor present as standard

Aeraulic circuit

Fans Ø 910 mm EC
Batteries with multi-V geometry
Noise control for night hours

Hydraulic circuit

Standard setup with evaporator only
Suitable for operation with glycol up to 40%
UV-resistant external pipe insulation
Prepared for monobloc parallel free- cooling version

Plumbing accessories

1/2 low/high head pumps
Inverter pumps
Inertial tank
Pipes in AISI304 or AISI316 stainless steel
Water pressure gauges upstream and downstream of the pump(s).
Air vent valve
Vacuum/ vacuum breaker valves with tank

Mechanical accessories

Rubber vibration dampers
Spring vibration dampers
Battery protection filters

Refrigerator accessories

Partial heat recovery
Refrigerant pressure gauges

Electrical accessories

Antifreeze resistance
Relay for managing 1/2 external pumps
Double set point from digital input
Variable set point from analogue input
Soft Starter compressors
Remote user terminal
BMS network cards

Technical data – NRE-CWU – R454B – Water chiller

NRE-CWU MODEL			45.1	55.1	65.1	90.1	110.1	130.1	160.1	190.1	220.2	250.2	320.2	390.2	430.2	480.2	520.2	540.2	600.2	650.2
Refrigeration yield	(1)	kW	41,6	53,5	59,4	87,1	105,0	123,0	158,0	188,0	209,0	245,0	313,0	377,0	417,0	465,0	511,0	519,0	565,0	623,0
Total electrical power absorbed	(1)	kW	12,9	16,1	18,3	25,6	32,2	39,5	48,1	59,1	64,6	78,5	96,0	121,0	127,0	145,0	164,0	159,0	178,0	191,0
EEA (UNI EN 14511-22)	(1)		3,2	3,3	3,3	3,4	3,3	3,1	3,3	3,2	3,3	3,1	3,3	3,1	3,3	3,2	3,1	3,3	3,2	3,3
SEER	(2)		4,4	4,2	4,3	4,7	4,7	4,6	4,7	4,4	4,7	4,6	4,8	4,7	4,6	4,6	4,7	4,7	4,7	4,9
ηs	(2)	%	174	166	168	186	184	179	184	175	187	181	187	185	182	183	184	184	187	194
SEPR HT	(3)		6,4	5,5	5,3	5,8	5,7	5,4	5,7	5,5	5,7	5,5	5,7	5,6	5,8	5,7	5,5	5,8	5,8	5,9
Compressors																				
Number of circuits			1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Number of compressors			2	2	2	2	2	2	2	2	4	4	4	5	4	5	6	5	6	6
Minimum partialization step			50%	50%	44%	40%	38%	32%	41%	45%	19%	16%	33%	22%	25%	18%	17%	20%	18%	17%
Refrigerant charge			3,8	4,9	5,4	7,9	9,5	11,2	14,4	17,1	19,0	22,3	28,5	34,3	37,9	42,3	46,5	47,2	51,4	56,6
Tons CO2,eq			1,8	2,3	2,5	3,7	4,4	5,2	6,7	8,0	8,9	10,4	13,3	16,0	17,7	19,7	21,6	22,0	23,9	26,4
Frequency of checks (Reg. 573/2024)			Free									24 months								
Hydronics																				
Nominal water flow rate		m^3/h	7,2	9,2	10,2	15,0	18,1	21,2	27,2	32,3	35,9	42,1	53,8	64,8	71,7	80,0	87,9	89,3	97,2	107,2
Water pressure drops		kPa	31	28	31	33	29	32	30	29	32	31	30	33	32	31	30	33	31	33
H Low head pump		m	19	18	18	16	16	15	15	14	19	18	16	14	16	15	14	18	17	15
H High head pump		m	22	21	21	22	22	21	27	27	26	24	28	28	25	23	22	31	30	28
Tank capacity		dm^3	150	150	150	200	200	200	250	250	300	300	300	300	300	300	300	600	600	600
Hydraulic diameters		'	1''1/2	1''1/2	1''1/2	2" 1/2	2" 1/2	2" 1/2	2" 1/2	2" 1/2	3"	3"	4"	4"	5"	5"	5"	5"	5"	5''
Hydraulic diameters		DN	40	40	40	65	65	65	65	65	80	80	100	100	125	125	125	125	125	125
Aeraulica																				
Type of fans			Axial EC																	
Fan diameter		Ø	910																	
Number of fans		n°	1	1	1	2	2	2	3	3	4	4	6	6	8	8	8	10	10	12
Air flow		m^3/h	23000	23000	23000	46000	46000	46000	69000	69000	92000	92000	138000	138000	184000	184000	184000	230000	230000	276000
Acoustics																				
Sound Power Level	(5)	dBA	86	86	86	88	88	88	90	90	91	91	93	93	95	95	95	97	97	98
Dimensions																				
Height		mm	1973	1973	1973	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444
Length		mm	1099	1099	1099	1100	1100	1100	1100	1100	2240	2240	2240	2240	2240	2240	2240	2240	2240	2240
Length		mm	2592	2592	2592	3043	3043	3043	4113	4113	3942	3942	5076	5076	6210	6210	6210	7344	7344	8476
Power supply			400 / 3 / 50																	
		kW	20	27	30	44	55	62	83	95	110	124	163	189	216	235	254	270	289	324
Max absorbed power (FLI)		A	42	47	51	75	91	104	141	159	182	208	269	318	355	391	427	444	480	533
Max absorbed current (FLA)		A	121	148	170	245	248	364	391	373	339	468	483	578	569	605	687	658	694	747
Max starting current (MIC)																				

NOTES: **(1)** External air temperature equal to 35°C and exchanger water inlet-outlet temperature on the user side equal to 12-7°C. Values compliant with EN 14511-2022; **(2)** User side exchanger inlet/outlet water temperature 12/7°C (low temperature application), with reference to regulation 2016/2281 and standard EN 14825; **(3)** Exchanger inlet/outlet water temperature on user side 12/7°C, with reference to regulation 2016/2281 and standard EN 14825; **(5)** Unit operating at nominal power, without accessories of any kind - external air temperature 35°C and exchanger and user water inlet/outlet temperature equal to 12/7°C. Values according to ISO 3744

Technical data – NRE-CWR – R454B – Reversible water chiller

NRE-CWR MODEL			45.1	55.1	65.1	90.1	110.1	130.1	160.1	190.1	220.2	250.2	320.2	390.2	430.2	480.2	520.2	540.2	600.2	650.2
Refrigeration yield	(1)	kW	39.3	50.4	56.4	82.6	98.0	116.0	148.0	177.0	196.0	231.0	294.0	352.0	394.0	430.0	473.0	490.0	530.0	590
Electrical power absorbed	(1)	kW	13.9	17.2	19.7	27.3	34.7	42.7	52.1	64.5	69.2	85.4	103.0	132.0	135.0	158.0	178.0	170.0	192.0	204
EER (UNI EN 14511-22)	(1)		2.83	2.93	2.86	3.03	2.82	2.72	2.84	2.74	2.83	2.70	2.85	2.67	2.92	2.72	2.66	2.88	2.76	2.9
thermal yield	(2)	kW	44.9	56.4	62.5	92.6	111.0	131.0	166.0	194.0	223.0	261.0	334.0	400.0	443.0	489.0	537.0	556.0	606.0	677
Electrical power absorbed	(2)	kW	13.9	16.2	18.3	26.3	33.5	39.5	52.1	60.6	66.7	79.0	99.8	122.0	135.0	148.0	165.0	169.0	184.0	two hundr
COP (UNI EN 14511-22)	(2)		3.23	3.48	3.42	3.52	3.31	3.32	3.19	3.20	3.34	3.30	3.35	3.28	3.28	3.30	3.25	3.29	3.29	3.38
SCOP	(4)		3,72	3,96	4,06	4,20	4,18	4,06	4,05	3,99	4,24	3,81	4,24	3,84	4,11	4,15	3,76	4,15	3,71	4,27
ηs		%	145,6	155,3	159,6	165,0	164,1	159,3	159,0	156,6	166,6	149,4	166,6	150.6	161.5	163.0	147.4	163.2	147.4	167.8
Compressors																				
Number of circuits		n°	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Number of compressors		n°	2	2	2	2	2	2	2	2	4	4	4	5	4	5	6	5	6	6
Minimum bias		%	50%	50%	44%	40%	38%	32%	41%	45%	19%	16%	33%	22%	25%	18%	17%	20%	18%	17%
Refrigerant charge		kg	9	11	13	19	23	25	36	41	46	51,5	67	79	95	102	110	112	122	140
Tons $CO_{2,eq}$		t,eq	4,0	5,0	6,1	8,9	10,7	11,6	16,8	19,1	21,4	24,0	31,2	36,8	44,3	47,5	51,3	52,2	56,9	65,2
Frequency of checks (Reg. 573/2024)			Free					24 months												
Hydronics																				
Nominal water flow rate		m^3/h	7,7	9,7	10,8	15,9	19,1	22,5	28,6	33,4	38,4	44,9	57,4	68,8	76,2	84,1	92,4	95,6	104,2	116,4
Water pressure drops		kPa	38	37	41	42	38	41	40	39	41	40	38	42	41	41	40	42	39	41
H Low head pump		m	17,8	17,1	16,6	15,3	14,7	13,7	14,2	13,0	17,9	16,8	15,0	13,0	14,7	14,0	13,0	12,5	12,1	14,5
H High head pump		m	21	21	20	21	21	20	26	26	25	23	27	27	24	22	21	31	30	28
Tank capacity		dm^3	150	150	150	200	200	200	250	250	300	300	300	300	300	300	300	600	600	600
Hydraulic diameters		'	1''1/2	1''1/2	1''1/2	2'' 1/2	2'' 1/2	2'' 1/2	2'' 1/2	2'' 1/2	3''	3''	4''	4''	5''	5''	5''	5''	5''	5''
Hydraulic diameters		DN	40	40	40	65	65	65	65	65	80	80	100	100	125	125	125	125	125	125
Aeraulica																				
Type of fans			Assiali EC																	
Fan diameter		Ø	910																	
Number of fans		n°	1	1	1	2	2	2	3	3	4	4	6	6	8	8	8	10	10	12
Fan air flow		m^3/h	23000	23000	23000	46000	46000	46000	69000	69000	92000	92000	138000	138000	184000	184000	184000	230000	230000	276000
Acoustics																				
Sound Power Level	(5)	dBA	86	86	86	88	88	88	90	90	91	91	93	93	95	95	95	97	97	98
Dimensioni																				
Height		mm	1973	1973	1973	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444
Length		mm	1099	1099	1099	1100	1100	1100	1100	1100	2240	2240	2240	2240	2240	2240	2240	2240	2240	2240
Length		mm	2592	2592	2592	3043	3043	3043	4113	4113	3942	3942	5076	5076	6210	6210	6210	7344	7344	8476
Power supply			400 / 3 / 50																	
Max absorbed power (FLI)		kW	20	27	30	44	55	62	83	95	110	124	163	189	216	235	254	270	289	324
Max absorbed current (FLA)		A	42	47	51	75	91	104	141	159	182	208	269	318	355	391	427	444	480	533
Max starting current (MIC)		A	121	148	170	245	248	364	391	373	339	468	483	578	569	605	687	658	694	747

NOTES: **(1)** -In accordance with standard EN14511-2022: inlet/outlet chilled water: 12/7°C, air temperature 35°C DB; **(2)** In accordance with standard EN14511-2022: inlet/outlet hot water: 40/45°C, air temperature 7°C DB/6°C W**B**; **(4)** User side exchanger inlet/outlet water temperature 30/35°C, average climate profile, with reference to regulation 2013/813 and standard EN 14825; **(5)** Unit operating at nominal power, without accessories of any kind - external air temperature 35°C and exchanger and user water inlet/outlet temperature equal to 12/7°C. Values according to ISO 3744

Technical data – NRE-HDP – R454B – Reversible heat pump

NRE-HDP MODEL			**45.1**	**55.1**	**65.1**	**90.1**	**110.1**	**130.1**	**160.1**	**190.1**	**220.2**	**250.2**	**320.2**	**390.2**	**430.2**	**480.2**	**520.2**	**540.2**	**600.2**	**650.2**
Refrigeration yield	**(1)**	**kW**	**34,1**	**44,6**	**50,3**	**73,6**	**87,1**	**103**	**130**	**154**	**173**	**205**	**256**	**314**	**344**	**380**	**420**	**428**	**464**	**512**
Electrical power absorbed	(1)	kW	13,7	16,6	19,1	26,3	33,6	41,4	50,6	62,3	67,1	82,8	99,8	127	133	152	173	166	187	197
EEA (UNI EN 14511-22)	**(1)**		**2,49**	**2,69**	**2,63**	**2,8**	**2,59**	**2,49**	**2,57**	**2,47**	**2,58**	**2,48**	**2,57**	**2,47**	**2,59**	**2,5**	**2,43**	**2,58**	**2,48**	**2,59**
Thermal output	(2)	kW	45,2	56,8	62,9	93,4	113	131	167	195	225	263	337	402	449	493	542	561	610	682
Electrical power absorbed	(2)	kW	12,9	15,1	16,9	24,5	31,1	36,9	47,6	56	62,1	73,8	92,4	113	123	137	153	156	171	187
COP (UNI EN 14511-22)	(2)		3,5	3,76	3,72	3,81	3,63	3,55	3,51	3,48	3,62	3,56	3,65	3,56	3,65	3,6	3,54	3,6	3,57	3,65
SCOP	(4)		3,96	4,16	4,27	4,39	4,37	4,25	4,26	4,25	4,45	4,01	4,50	4,03	4,34	4,41	4,16	4,36	3,97	4,47
ηs		%	155	163	168	173	172	167	167	167	175	157	177	158	171	174	163	172	156	176
Compressors																				
Number of circuits		n°	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Number of compressors		n°	2	2	2	2	2	2	2	2	4	4	4	5	4	5	6	5	6	6
Minimum bias		%	50%	50%	44%	40%	38%	32%	41%	45%	19%	16%	33%	22%	25%	18%	17%	20%	18%	17%
Refrigerant charge		kg	9	11	13	19	23	25	36	41	46	51,5	67	79	95	102	110	112	122	140
Tons $CO_{2\,eq}$		t,eq	4,0	5,0	6,1	8,9	10,7	11,6	16,8	19,1	21,4	24,0	31,2	36,8	44,3	47,5	51,3	52,2	56,9	65,2
Frequency of checks (Reg. 573/2024)			Free					24 months												
Hydronics																				
Nominal water flow rate		m^3/h	7,8	9,8	10,8	16,1	19,4	22,5	28,7	33,5	38,7	45,2	58,0	69,1	77,2	84,8	93,2	96,5	104,9	117,3
Water pressure drops		kPa	38,0	37,0	41,0	42,0	38,0	41,0	40,0	39,0	41,0	40,0	38,0	42,0	41,0	41,0	40,0	42,0	39,0	41
H Low head pump		m	17,8	17,1	16,6	15,3	14,7	13,7	14,2	13,0	17,9	16,8	15,0	13,0	14,7	14,0	13,0	12,5	12,1	14,5
H High head pump		m	21,0	20,5	20,1	20,8	20,7	20,2	26,0	25,8	24,8	23,2	27,0	27,0	24,0	22,0	21,0	30,5	29,5	28
Tank capacity		dm^3	150	150	150	200	200	200	250	250	300	300	300	300	300	300	300	600	600	600
Hydraulic diameters		'	1''1/2	1''1/2	1''1/2	2'' 1/2	2'' 1/2	2'' 1/2	2'' 1/2	2'' 1/2	3''	3''	4''	4''	5''	5''	5''	5''	5''	5''
Hydraulic diameters		DN	40	40	40	65	65	65	65	65	80	80	100	100	125	125	125	125	125	125
Aeraulica																				
Type of fans			Axial EC																	
Fan diameter		Ø	910																	
Number of fans		n°	1	1	1	2	2	2	3	3	4	4	6	6	8	8	8	10	10	12
Fan air flow		m^3/h	23000	23000	23000	46000	46000	46000	69000	69000	92000	92000	138000	138000	184000	184000	184000	230000	230000	276000
Acoustics																				
Sound Power Level	(5)	dBA	86	86	86	88	88	88	90	90	91	91	93	93	95	95	95	97	97	98
Dimensions																				
Height		mm	1973	1973	1973	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444
Length		mm	1099	1099	1099	1100	1100	1100	1100	1100	2240	2240	2240	2240	2240	2240	2240	2240	2240	2240
Length		mm	2592	2592	2592	3043	3043	3043	4113	4113	3942	3942	5076	5076	6210	6210	6210	7344	7344	8476
Power supply			400 / 3 / 50																	
Max absorbed power (FLI)		kW	20	27	30	44	55	62	83	95	110	124	163	189	216	235	254	270	289	324
Max absorbed current (FLA)		A	42	47	51	75	91	104	141	159	182	208	269	318	355	391	427	444	480	533
Max starting current (MIC)		A	121	148	170	245	248	364	391	373	339	468	483	578	569	605	687	658	694	747

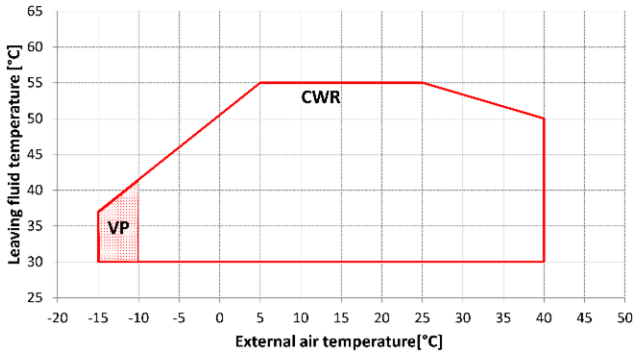
NOTES: **(1)** In accordance with standard EN14511-2022: inlet/outlet chilled mix of water and glycol: 12/7°C, air temperature 35°C DB; **(2)** In accordance with standard EN14511-2022: inlet/outlet hot water: 40/45°C, air temperature 7°C DB/6°C WB; **(4)** User side exchanger inlet/outlet water temperature 30/35°C, Average climate profile, with reference to regulation 2013/813 and standard EN14825; **(5)** Unit operating at nominal power, without accessories of any kind - external air temperature 35°C and exchanger and user water inlet/outlet temperature equal to 12/7°C. Values according to ISO 3744

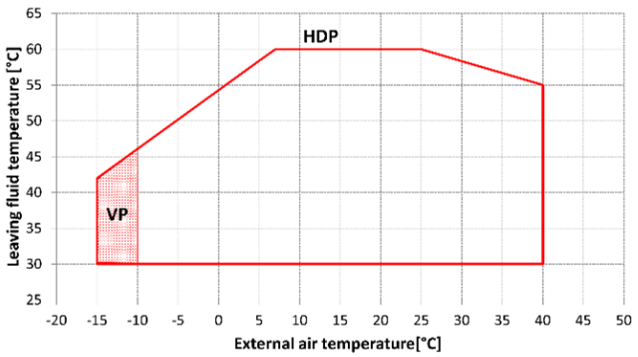
Technical data – Partial Recovery – R454B

MODEL NRE		45.1	55.1	65.1	90.1	110.1	130.1	160.1	190.1	220.2	250.2	320.2	390.2	430.2	480.2	520.2	540.2	600.2	650.2
Thermal power	kW	9,2	11,8	13,1	19,2	23,1	27,1	34,8	41,4	46,0	53,9	68,9	82,9	91,7	102,3	112,4	114,2	124,3	137.1
Water flow rate W40/45	m^3/h	1,6	2,0	2,2	3,3	4,0	4,7	6,0	7,1	7,9	9,3	11,8	14,3	15,8	17,6	19,3	19,6	21,4	23,6
Water pressure drops	kPa	37,0	38,0	40,0	38,0	39,0	42,0	40,0	41,0	38,0	42,0	40,0	41,0	42,0	43,0	45,0	44,0	47,0	49

R454B operating limits

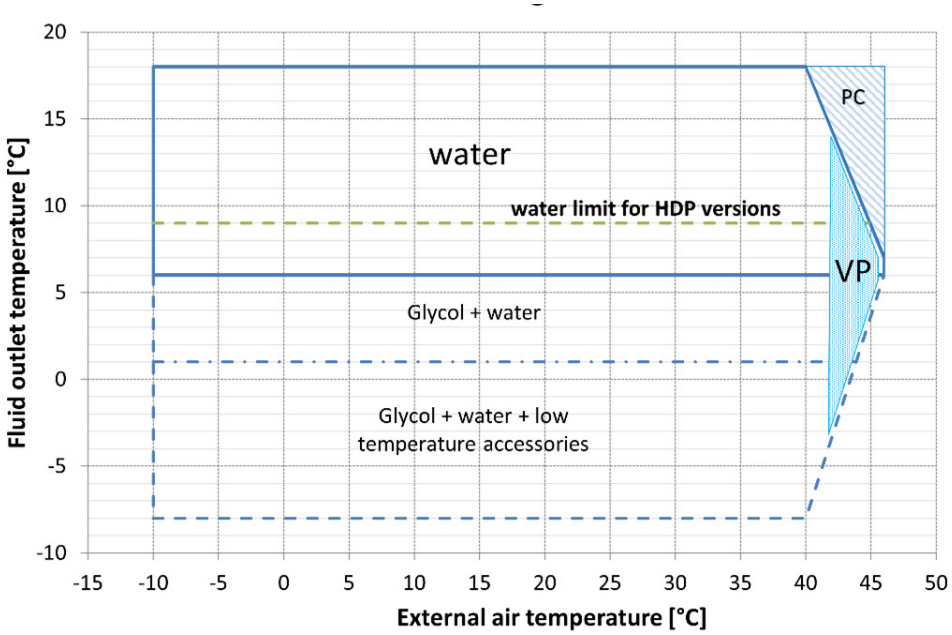
HEATING





The temperature difference at the user side exchanger must be between 3°C and 6°C
Operating outside the operating limits may cause the intervention of the safety devices or serious malfunctions
The water inlet temperature at the user side exchanger cannot be lower than 20°C
Within the operating limits, the ventilation section can be subject to modulation
Operating limits are subject to change based on humidity in the air
PC: In the indicated area the control could implement a forced partialization of the compressors to avoid the intervention of the safety devices.
VP: area in which is mandatary the use of high head fans

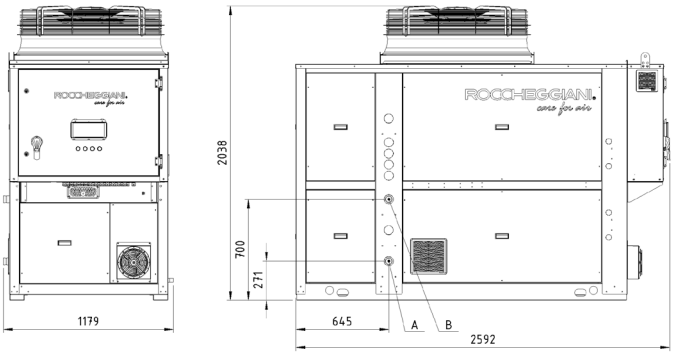
COOLING



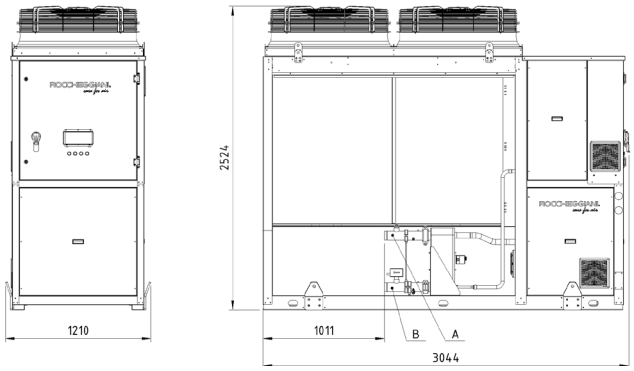
The temperature difference at the user side exchanger must be between 3°C and 6°C
Operating outside the operating limits may cause the intervention of the safety devices or serious malfunctions
The water inlet temperature at the user side exchanger cannot be higher than 25°C
Within the operating limits, the ventilation section can be subject to modulation
Operating limits are subject to change based on humidity in the air
PC: In the indicated area the control could implement a forced partialization of the compressors to avoid the intervention of the safety devices.
VP: area in which is mandatary the use of high head fans

Dimensional – R454B

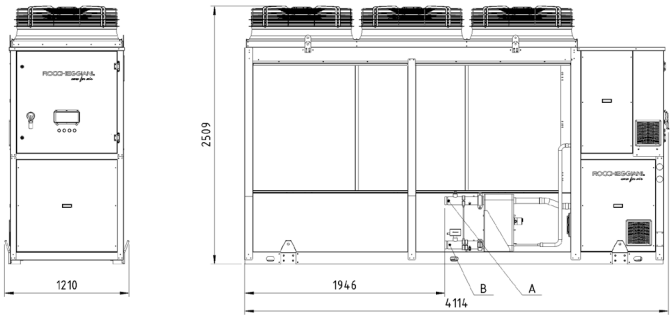
SIZE 45.1 – 55.1 – 65.1



SIZE 90.1 – 110.1 – 130.1

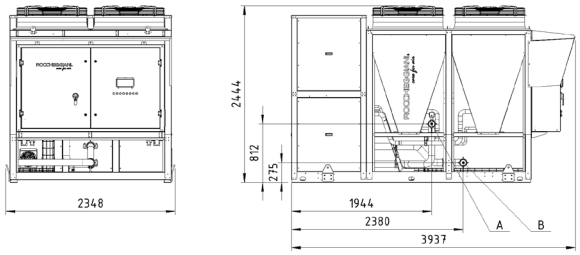


SIZE 160.1 - 190.01

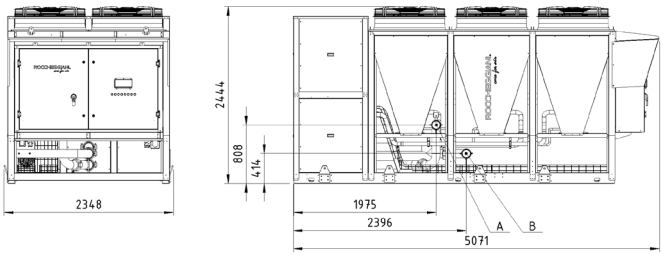


Dimensional – R454B

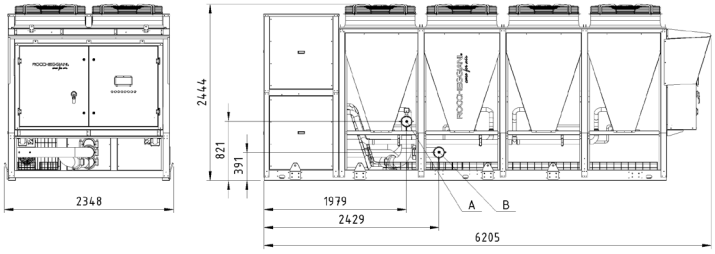
SIZE 220.2 - 250.2



SIZE 320.2 - 390.2

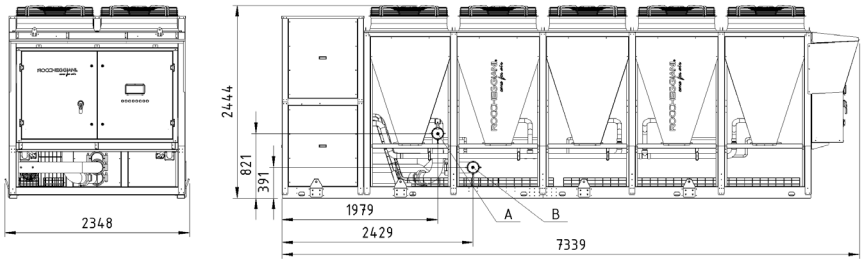


SIZE 430.2 - 480.2 - 520.2

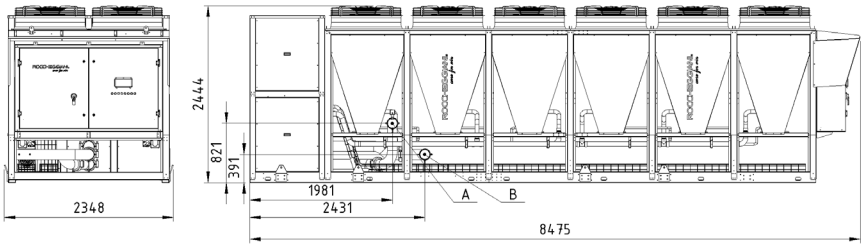


Dimensionali – R454B

TAGLIA 540.2 - 600.2



TAGLIA 650.2



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