

RAE N S Kc/Kr



CLIMATE DESIGN

AIR COOLED CHILLERS FOR OUTDOOR INSTALLATION EQUIPPED WITH SCROLL COMPRESSORS AND AXIAL FANS

Cooling capacity from 143 kW to 640 kW

R410a

R454B



AIR



AC



ERP
2021



VERSIONS

RAE N S - silenced version

Packaged air cooled chillers of RAE N S series are suitable for outdoor installation and can be used to cool pure fluid solutions for air conditioning or in industrial applications.

Multiscroll technology allows to reach great efficiency improvements at part load, if compared to the other traditional systems for cooling capacity control.

The coupling of high-efficiency finned exchangers and the thermo physical purity of R410A or R454B refrigerant, particularly glide-free at state exchanges, allows this range to attain EER nominal values close to 3.

These units have been designed considering limited space requirements and keeping, at the same time, high cooling performances. Such result has been attained with high-quality and up-to-date components. All units are completely assembled and tested in the factory with specific quality procedures and are already equipped with all necessary hydraulic, refrigerant and electrical connections for a quick installation on site.

Before factory testing, cooling circuits are tested under pressure and then supplied with refrigerant and a non-freezing oil charge.

MAIN COMPONENTS

STRUCTURE

Made of a base and a chassis manufactured in high-thickness galvanised steel, assembled with stainless steel rivets. All galvanised steel surfaces are powder-coated with colour RAL 7035.

SCROLL COMPRESSOR

Operating on one single circuit or on two independent circuits in either tandem or trio version. The compressors are installed on rubber isolation dampers, provided with direct-start motors cooled by suction gas and fitted with both overload protection and crankcase heaters. They are charged with polyester oil and the terminal board is IP54. The on-board microprocessor automatically controls the individual compressors to regulate the cooling capacity.

STAINLESS STEEL PLATE EVAPORATOR

Of single or dual circuit type, with high thickness close cell insulation and UV ray-proof. The evaporator is also equipped with safety water flow switch switching off the unit in case of low water flow through the evaporator.

HEAT EXCHANGE EXTERNAL COILS

With micro-finned copper tubes, positioned in staggered rows and mechanically expanded into an aluminium finned pack. Fins are designed with such a shape providing the highest heat exchange efficiency (turbo-fin). The max operating pressure refrigerant side is 45 relative bar.

AXIAL FANS

Of directly coupled type, with wing-profile aluminium blades, are designed not to create air turbulence. This ensures the max efficiency with the lowest sound level. Each fan is provided with a galvanized steel protection grid, which is painted after construction. The IP54 fans motors are completely closed and provided with in-built overload protection thermostat, incorporated to the motor windings. With this type of fans the air flow rate that invests the heat exchange coil is adjusted with more precision allowing the unit to operate with external temperatures up to -20°C while maintaining high efficiency.

AXIAL FANS WITH INVERTER SYSTEM

(only 6102 size)

With 6-poles electrical motor with external rotor directly coupled to the impeller and driven by a V/F inverter system which

controls the condensation temperature. Aluminum blades with wings profile are suitably designed to avoid any turbulence in the air detachment zone, granting in this way the max efficiency with the minimum noise level. The fan is equipped with galvanized steel protection grid painted after the construction. The fan motors are of totally closed type and have got a protection factor IP54 and protection winding-flooded thermostat.

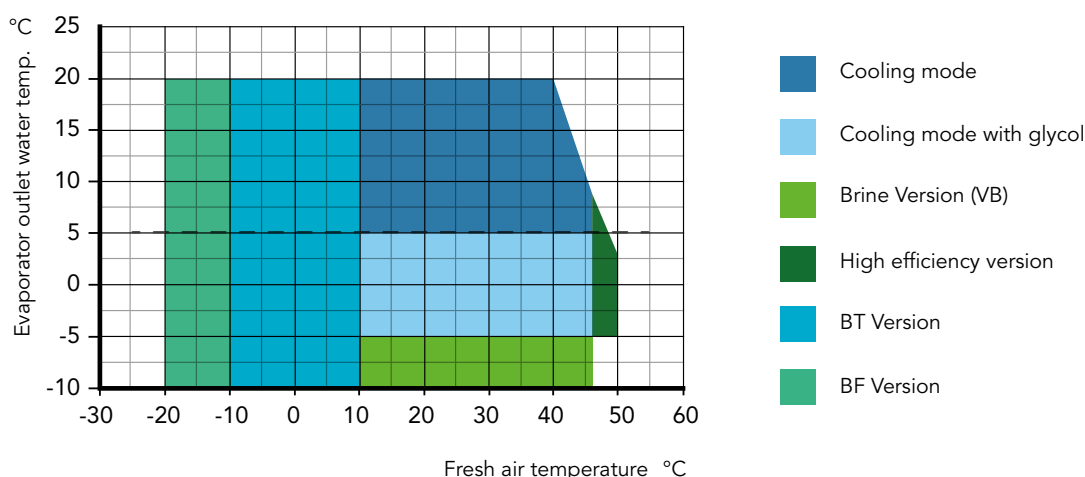
COOLING CIRCUIT

Each provided with a shut-off valve for refrigerant charge, anti-freeze sensor, shut-off valves on liquid lines, certified liquid receiver, 4-way valve for cycle inversion, sight glass, dehydrating filter, high-pressure safety device on high pressure refrigerant side and mechanical thermostatic expansion valve up to 3802 model and electronic type for all remaining sizes, as well as high and low pressure switches and gauges.

ELECTRICAL BOARD

Built in compliance with CE Norms, inside of which are placed the control system and the components for motors starting, wired and tested in the factory. It is made by a cabinet suitable for outdoor installation, containing power and control devices, microprocessor electronic board complete with keypad and display, for visualizing the several functions available, main switch of lock-door type, isolation transformer for auxiliary circuits, automatic switches, fuses and protection switches for compressors and fans, terminals for general alarm and remote ON/OFF, terminal board and possibility to interface to BMS systems.

OPERATING RANGE



ACCESSORIES

RAE N S Kc / Kr		1501	1701	2002	2302	2502	2902	3202	3402
Amperometer	A	o	o	o	o	o	o	o	o
Electrical power supply different than standard	AE	o	o	o	o	o	o	o	o
Operation in cooling mode down to -20°C	BF	o	o	o	o	o	o	o	o
Operation in cooling mode down to -10°C	BT	o	o	o	o	o	o	o	o
Overall compressor and technical compartment cabinet	CFT	o	o	o	o	o	o	o	o
Soundproofed compressors cabinet with higher thickness material	CFU	o	o	o	o	o	o	o	o
Compressors inrush counter	CS	o	o	o	o	o	o	o	o
Axial fans with electronic commutated motor	EC	o	o	o	o	o	o	o	o
Condensing coil protection grid	GP	o	o	o	o	o	o	o	o
Anti-intrusion grid	GP3	o	o	o	o	o	o	o	o
Victaulic insulation on pump side	I1	o	o	o	o	o	o	o	o
Victaulic insulation buffer tank side	I2	o	o	o	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o	o	o	o
LON Protocol serial interface	IH-LON	o	o	o	o	o	o	o	o
Seawood packing	IM	o	o	o	o	o	o	o	o
TCP/IP Protocol serial interface	IWG	o	o	o	o	o	o	o	o
Phase monitor	MF	o	o	o	o	o	o	o	o
Buffer tank module	MV	o	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o	o
Pump + tank	P1+MV	o	o	o	o	o	o	o	o
Higher available pressure pump group	P1H	o	o	o	o	o	o	o	o
Higher available pressure pump group + tank	P1H+MV	o	o	o	o	o	o	o	o
Double pump group	P2	o	o	o	o	o	o	o	o
Double pump group + tank	P2+MV	o	o	o	o	o	o	o	o
Higher available pressure double pump group	P2H	o	o	o	o	o	o	o	o
Higher available pressure double pump group + tank	P2H+MV	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	o
Spring-type vibration dampers	PM	o	o	o	o	o	o	o	o
Remote display	PQ	o	o	o	o	o	o	o	o
In-line twin pump group (only one working)	PT	o	o	o	o	o	o	o	o
In-line twin pump group (only one working) + tank	PT+MV	o	o	o	o	o	o	o	o
Anti-freeze heater on evaporator	RA	o	o	o	o	o	o	o	o
Shut-off valve on compressors discharge side	RD	o	o	o	o	o	o	o	o
Power factor correction system cosfi ≥0,9	RF	o	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o	o
Compressor overload relays	RL	o	o	o	o	o	o	o	o
Batteria con alette preverniciate	RM	o	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o	o
Copper/Copper coil	RR	o	o	o	o	o	o	o	o
Total heat recovery	RT	o	o	o	o	o	o	o	o
Personalized frame painting	RV	o	o	o	o	o	o	o	o
Electronic thermostatic valve	TE	•	•	•	•	•	•	•	•
Voltmeter	V	o	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o	o
Solenoid valve	VS	o	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

RAE N S Kc / Kr		3602	4102	4402	4902	5202	5602	6102
Amperometer	A	o	o	o	o	o	o	o
Electrical power supply different than standard	AE	o	o	o	o	o	o	o
Operation in cooling mode down to -20°C	BF	o	o	o	o	o	o	•
Operation in cooling mode down to -10°C	BT	o	o	o	o	o	o	--
Overall compressor and technical compartment cabinet	CFT	o	o	--	--	--	--	--
Soundproofed compressors cabinet with higher thickness material	CFU	o	o	o	o	o	o	o
Compressors inrush counter	CS	o	o	o	o	o	o	o
Axial fans with electronic commutated motor	EC	o	o	o	o	o	o	o
Condensing coil protection grid	GP	o	o	o	o	o	o	o
Anti-intrusion grid	GP3	o	o	o	o	o	o	o
Victaulic insulation on pump side	I1	o	o	o	o	o	o	o
Victaulic insulation buffer tank side	I2	o	o	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o	o	o
LON Protocol serial interface	IH-LON	o	o	o	o	o	o	o
Seawood packing	IM	o	o	o	o	o	o	o
TCP/IP Protocol serial interface	IWG	o	o	o	o	o	o	o
Phase monitor	MF	o	o	o	o	o	o	o
Buffer tank module	MV	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o
Pump + tank	P1+MV	o	o	o	o	o	o	o
Higher available pressure pump group	P1H	o	o	o	o	o	o	o
Higher available pressure pump group + tank	P1H+MV	o	o	o	o	o	o	o
Double pump group	P2	o	o	o	o	o	o	o
Double pump group + tank	P2+MV	o	o	o	o	o	o	o
Higher available pressure double pump group	P2H	o	o	o	o	o	o	o
Higher available pressure double pump group + tank	P2H+MV	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o
Spring-type vibration dampers	PM	o	o	o	o	o	o	o
Remote display	PQ	o	o	o	o	o	o	o
In-line twin pump group (only one working)	PT	o	o	o	o	o	o	o
In-line twin pump group (only one working) + tank	PT+MV	o	o	o	o	o	o	o
Anti-freeze heater on evaporator	RA	o	o	o	o	o	o	o
Shut-off valve on compressors discharge side	RD	o	o	o	o	o	o	o
Power factor correction system cosfi ≥0,9	RF	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o
Compressor overload relays	RL	o	o	o	o	o	o	o
Condensing coil with pre-painted fins	RM	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o
Copper/Copper coil	RR	o	o	o	o	o	o	o
Total heat recovery	RT	o	o	o	o	o	o	o
Personalized frame painting	RV	o	o	o	o	o	o	o
Electronic thermostatic valve	TE	•	•	•	•	•	•	•
Voltmeter	V	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o
Solenoid valve	VS	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

RAE N S Kc		1501	1701	2002	2302	2502	2902	3202	3402
Cooling capacity	kW	143,0	162,1	205,9	237,0	254,7	289,4	317,6	344,5
Total input power	kW	49,5	59,1	71,1	84,8	92,1	102,8	105,4	116,5
Nominal input current	A	84,6	100,3	126,1	148,2	157,0	174,7	179,4	197,7
EER	W/W	2,89	2,74	2,90	2,79	2,77	2,81	3,01	2,96
SEER (EN14825)	W/W	4,21	4,10	4,14	4,19	4,14	4,10	4,39	4,14
Circuits	n°	1	1	2	2	2	2	2	2
Compressors	n°	2	2	4	4	4	4	4	4
Refrigerant R410A									
Refrigerant charge	kg	38	24	38	48	58	48	78	60
Global warming potential (GWP)	-	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	79,3	50,1	79,3	100,2	121,1	100,2	162,9	125,3
Axial fans ⁽¹⁾									
Quantity	n°	2	3	3	3	3	4	4	5
Total air flow	m ³ /h	34630	67280	62850	59010	55750	83770	74250	104720
Total power input	kW	2,8	4,0	4,0	4,1	4,1	5,4	5,5	6,7
Total input current	A	5,2	7,5	7,6	7,7	7,7	10,2	10,3	12,7
Evaporator ⁽²⁾									
Quantity	n°	1	1	1	1	1	1	1	1
Water flow	m ³ /h	24,6	27,9	35,4	40,8	43,8	49,8	54,6	59,3
Pressure drop	kPa	32,3	33,3	25,9	33,2	37,7	32,6	36,5	36,4
Weight									
Transport weight	kg	1455	1473	1885	1994	2086	2147	2379	2389
Operating weight	kg	1464	1480	1894	2004	2096	2160	2392	2410
Dimensions									
Length	mm	2660	3700	3700	3700	3700	4740	4740	5780
Width	mm	1370	1370	1370	1370	1370	1370	1370	1370
Height	mm	2420	2420	2420	2420	2420	2420	2420	2420
Sound data									
Total LWA ⁽³⁾	dB(A)	89,0	89,0	90,0	91,0	91,0	92,0	92,0	93,0
Total SPL 10m ⁽⁴⁾	dB(A)	57,0	56,9	57,9	58,9	58,9	59,8	59,8	60,6
Power supply									
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data									
Maximum input power	[kW]	65,1	75,6	90,4	110,8	118,3	130,3	137,7	149,6
Maximum input current	[A]	119,8	139,9	173,9	207,5	215,9	239,6	253,2	276,9
Inrush current	[A]	364,4	465,3	412,8	452,1	460,5	484,2	578,6	602,3
RAE N S Kc		3602	4102	4402	4902	5202	5602	6102	
Cooling capacity	kW	379,4	399,0	435,8	504,7	543,2	602,3	640,7	
Total input power	kW	128,7	147,0	137,9	168,0	183,5	195,1	213,8	
Nominal input current	A	217,5	247,0	241,6	286,0	310,7	330,5	360,0	
EER	W/W	2,95	2,71	3,16	3,00	2,96	3,09	3,00	
SEER (EN14825)	W/W	4,23	4,13	4,54	4,58	4,57	4,55	4,59	
Circuits	n°	2	2	2	2	2	2	2	
Compressors	n°	4	6	6	6	6	6	6	
Refrigerant R410A									
Refrigerant charge	kg	78	100	96	124	152	152	154	
Global warming potential (GWP)	-	2088	2088	2088	2088	2088	2088	2088	
Equivalent CO ₂ charge	t	162,9	208,8	200,4	258,9	317,4	317,4	321,6	
Axial fans ⁽¹⁾									
Quantity	n°	5	5	8	8	8	10	10	
Total air flow	m ³ /h	98300	92900	133130	126380	121020	157980	158010	
Total power input	kW	6,8	6,8	8,4	8,4	8,4	10,6	10,6	
Total input current	A	12,8	12,9	15,9	15,9	16,0	20,0	19,9	
Evaporator ⁽²⁾									
Quantity	n°	1	1	1	1	1	1	1	
Water flow	m ³ /h	65,3	68,6	74,9	86,8	93,4	103,6	110,2	
Pressure drop	kPa	43,1	31,3	32,9	40,8	46,4	55,6	52,7	
Weight									
Transport weight	kg	2495	2495	3202	3584	3818	4428	4529	
Operating weight	kg	2516	2516	3228	3614	3850	4465	4566	
Dimensions									
Length	mm	5780	5780	4750	4750	4750	5720	5720	
Width	mm	1370	1370	2300	2300	2300	2300	2300	
Height	mm	2420	2420	2560	2560	2560	2560	2560	
Sound data									
Total LWA ⁽³⁾	dB(A)	93,0	93,0	94,0	94,0	94,0	95,0	95,0	
Total SPL 10m ⁽⁴⁾	dB(A)	60,6	60,6	61,6	61,6	61,6	62,5	62,5	
Power supply									
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	
General electrical data									
Maximum input power	[kW]	170,0	187,8	190,0	226,6	244,4	264,7	282,5	
Maximum input current	[A]	310,5	344,9	350,4	412,4	446,8	486,2	520,6	
Inrush current	[A]	635,9	670,3	675,8	657,0	772,2	811,6	846,0	

(1) Ambient air temperature 35°C

(2) Fluid: Water - In/out Temperature: 12/7°C

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10m from the unit in free field conditions, in accordance with ISO 3744

RAE N S Kr		1501	1701	2002	2302	2502	2902	3202	3402
Cooling capacity	kW	147,3	167,0	212,1	244,1	262,3	298,1	327,1	354,8
Total input power	kW	50,5	60,3	72,5	86,5	93,9	104,9	107,5	118,8
Nominal input current	A	86,3	102,3	128,6	151,2	160,1	178,2	183,0	201,7
EER	W/W	2,9	2,8	2,9	2,8	2,8	2,8	3,0	3,0
SEER (EN14825)	W/W	4,26	4,15	4,19	4,24	4,19	4,15	4,44	4,19
Circuits	n°	1	1	2	2	2	2	2	2
Compressors	n°	2	2	4	4	4	4	4	4
Refrigerant R454B									
Refrigerant charge	kg	38	24	38	48	58	48	78	60
Global warming potential (GWP)	-	466	466	466	466	466	466	466	466
Equivalent CO ₂ charge	t	17,7	11,2	17,7	22,4	27,0	22,4	36,3	28,0
Axial fans ⁽¹⁾									
Quantity	n°	2	3	3	3	3	4	4	5
Total air flow	m³/h	34630	67280	62850	59010	55750	83770	74250	104720
Total power input	kW	2,8	4,0	4,0	4,1	4,1	5,4	5,5	6,7
Total input current	A	5,2	7,5	7,6	7,7	7,7	10,2	10,3	12,7
Evaporator ⁽²⁾									
Quantity	n°	1	1	1	1	1	1	1	1
Water flow	m³/h	25,4	28,8	36,5	42,0	45,2	51,3	56,3	61,1
Pressure drop	kPa	31,9	32,9	25,6	32,8	37,2	32,2	36,0	35,9
Weight									
Transport weight	kg	1475	1493	1911	2021	2114	2176	2411	2421
Operating weight	kg	1484	1500	1920	2031	2124	2189	2424	2443
Dimensions									
Length	mm	2660	3700	3700	3700	3700	4740	4740	5780
Width	mm	1370	1370	1370	1370	1370	1370	1370	1370
Height	mm	2420	2420	2420	2420	2420	2420	2420	2420
Sound data									
Total LWA ⁽³⁾	dB(A)	89,0	89,0	90,0	91,0	91,0	92,0	92,0	93,0
Total SPL 10m ⁽⁴⁾	dB(A)	57,0	56,9	57,9	58,9	58,9	59,8	59,8	60,6
Power supply									
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data									
Maximum input power	[kW]	65,1	75,6	90,4	110,8	118,3	130,3	137,7	149,6
Maximum input current	[A]	119,8	139,9	173,9	207,5	215,9	239,6	253,2	276,9
Inrush current	[A]	364,4	465,3	412,8	452,1	460,5	484,2	578,6	602,3
RAE N S Kr		3602	4102	4402	4902	5202	5602	6102	
Cooling capacity	kW	390,8	411,0	448,9	519,8	559,5	620,4	659,9	
Total input power	kW	131,3	149,9	140,7	171,4	187,2	199,0	218,1	
Nominal input current	A	221,9	251,9	246,4	291,7	316,9	337,1	367,2	
EER	W/W	3,0	2,7	3,2	3,0	3,0	3,1	3,0	
SEER (EN14825)	W/W	4,28	4,18	4,60	4,64	4,63	4,61	4,65	
Circuits	n°	2	2	2	2	2	2	2	
Compressors	n°	4	6	6	6	6	6	6	
Refrigerant R454B									
Refrigerant charge	kg	78	100	96	124	152	152	154	
Global warming potential (GWP)	-	466	466	466	466	466	466	466	
Equivalent CO ₂ charge	t	36,3	46,6	44,7	57,8	70,8	70,8	71,8	
Axial fans ⁽¹⁾									
Quantity	n°	5	5	8	8	8	10	10	
Total air flow	m³/h	98300	92900	133130	126380	121020	157980	158010	
Total power input	kW	6,8	6,8	8,4	8,4	8,4	10,6	10,6	
Total input current	A	12,8	12,9	15,9	15,9	16,0	20,0	19,9	
Evaporator ⁽²⁾									
Quantity	n°	1	1	1	1	1	1	1	
Water flow	m³/h	67,3	70,8	77,3	89,5	96,3	106,8	113,6	
Pressure drop	kPa	42,5	30,9	32,5	40,3	45,8	48,9	46,7	
Weight									
Transport weight	kg	2529	2529	3245	3633	3870	4488	4590	
Operating weight	kg	2550	2550	3272	3663	3902	4526	4628	
Dimensions									
Length	mm	5780	5780	4750	4750	4750	5720	5720	
Width	mm	1370	1370	2300	2300	2300	2300	2300	
Height	mm	2420	2420	2560	2560	2560	2560	2560	
Sound data									
Total LWA ⁽³⁾	dB(A)	93,0	93,0	94,0	94,0	94,0	95,0	95,0	
Total SPL 10m ⁽⁴⁾	dB(A)	60,6	60,6	61,6	61,6	61,6	62,5	62,5	
Power supply									
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	
General electrical data									
Maximum input power	[kW]	170,0	187,8	190,0	226,6	244,4	264,7	282,5	
Maximum input current	[A]	310,5	344,9	350,4	412,4	446,8	486,2	520,6	
Inrush current	[A]	635,9	670,3	675,8	657,0	772,2	811,6	846,0	

