RAE N HE Kc

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

Cooling capacity from 18 kW to 195 kW

VERSIONS

RAE N HE - high efficiency version
RAE N S HE - high efficiency silenced version

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

All the units are totally factory assembled and tested, following specific quality procedures. Besides they are totally hydraulic, cooling and electrical connected permitting a quick installation once on site. Before the test the cooling circuits of each unit are subjected to a pressure test and then charged with Refrigerant R410A or R454B and non-freezing oil. So, once on site, the units must be only positioned and electrically and hydraulically connected.

For versions S, the reduction of the sound level is achieved thanks to an increase of the condensing surfaces, to the fan speed reduction and to the soundproofed compressor cabinet.

Units CE certified in compliance with the European regulation 2016/2281 ERP 2021.

MAIN COMPONENTS

STRUCTURE
All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel. The standard colour of the units is RAL9018.

SCROLL COMPRESSOR
Scroll compressors with R410a refrigerant, operating on one or two independent circuits in single, 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.

SOURCE HEAT EXCHANGER
The source heat exchanger is made from copper pipes and aluminium fins. Dimensioning of the copper pipes and the aluminium fins is optimized in order to obtain excellent performance.
The tubes are mechanically expanded into the fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans. All heat exchangers are supplied standard with fins hydrophilic coating.

USER HEAT EXCHANGERS
The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. The use of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.
The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for antifreeze protection.

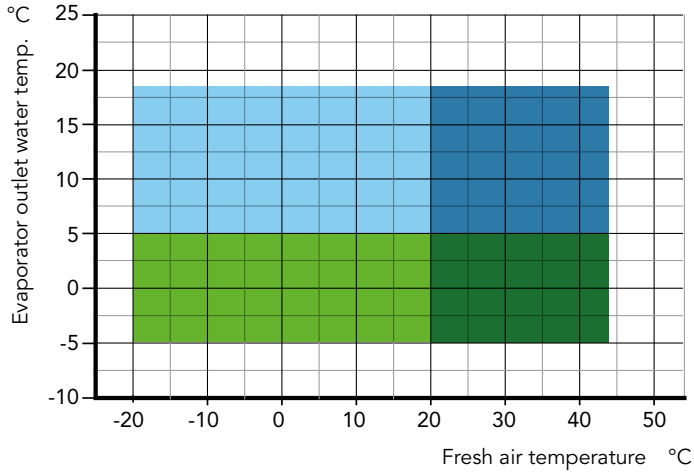
AXIAL FANS
With external rotor directly coupled to a three-phase electronically commutated motor (EC) they have the possibility of a continuous regulation of the speed by means of a 0-10V signal completely managed by the microprocessor. Aluminum blades with wings profile are suitably designed to avoid 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. These fans, thanks to a more accurate regulation of the airflow, allow the unit to operate with an external air temperature up to - 20 °C.

COOLING CIRCUITS
Each cooling circuit is equipped with the following elements: filter drier, sight glass, electronic thermostatic valve, high and low pressure safety valves, shut-off valve on liquid line, non-return valve on compressor discharge, high and low pressure gauges, high and low pressure switches, temperature probes to evaporator inlet and outlet.The above-mentioned components are connected in a close circuit through copper pipes and connections. The permanent junctions among components are made by brazing or welding, following processes and made by qualified staff.

ELECTRICAL BOARD
The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is quick and easy thanks to hinged panels. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

MICROPROCESSOR
All the units are subject to a safety cycle with continuity tests on the protection circuit, insulation resistance and tension test (dielectric strength). The unit management is realized by the management program uploaded in the electronic microprocessor. The microprocessor is made up of: an electronic control board with terminals for working parameters transmission and control devices activation, a user interface board with programming buttons and graphic display to show operation status and alarms. The electronic control board manages all the devices installed in the unit based on the values of the operation variables, with the following main functions: unit ON/OFF from board or from remote position, management and storage of alert and alarm status. The user interface display of the microprocessor allows also to see the following information: working parameters set values, functional variables values; analogue and digital inputs and outputs status, unit operation status, alert and alarm indications.Possibility to interface EMS/BMS management systems.

OPERATING RANGE



Cooling mode with cond. press. contr.

Cooling mode

Cooling mode with cond. press. contr. and glycol (Only VB versions)

Cooling mode without cond. press. contr. and glycol (Only VB versions)

EMICON
INNOVATION AS ENERGY

ACCESSORIES

RAE N HE KC / RAE N HE S KC		191	251	311	411	461	511	601	651
Axial fans with electronic commutated motor	EC	•	•	•	•	•	•	•	•
RS 485 Serial interface	IH	o	o	o	o	o	o	o	o
High and low pressure gauges	MT	o	o	o	o	o	o	o	o
Antifreeze kit for pump/s	NSP	o	o	o	o	o	o	o	o
Antifreeze kit for pump/s + tank	NSPS	o	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o	o
Double pump group	P2	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
Integrated hydraulic kit 1 pump + Water tank	PS	o	o	o	o	o	o	o	o
Integrated hydraulic kit 2 pumps + Water tank	PTS	o	o	o	o	o	o	o	o
User heat exchanger antifreeze kit for basic unit	RQK	o	o	o	o	o	o	o	o
Electronic soft starter	SF	o	o	o	o	o	o	o	o
Electronic thermostatic valve	TE	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
Partial heat recovery	RP	o	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

RAE N HE KC / RAE N HE S KC		751	901	951	1101	1201	1401	1551	2001
Axial fans with electronic commutated motor	**EC**	•	•	•	•	•	•	•	•
RS 485 Serial interface	**IH**	o	o	o	o	o	o	o	o
High and low pressure gauges	**MT**	o	o	o	o	o	o	o	o
Antifreeze kit for pump/s	**NSP**	o	o	o	o	o	o	o	o
Antifreeze kit for pump/s + tank	**NSPS**	o	o	o	o	o	o	o	o
Pump group	**P1**	o	o	o	o	o	o	o	o
Double pump group	**P2**	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
Integrated hydraulic kit 1 pump + Water tank	**PS**	o	o	o	o	o	o	o	o
Integrated hydraulic kit 2 pumps + Water tank	**PTS**	o	o	o	o	o	o	o	o
User heat exchanger antifreeze kit for basic unit	**RQK**	o	o	o	o	o	o	o	o
Electronic soft starter	**SF**	o	o	o	o	o	o	o	o
Electronic thermostatic valve	**TE**	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
Partial heat recovery	**RP**	o	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

TECHNICAL DATA

RAE N HE Kc		191	251	311	411	461	511	601	651
Cooling capacity	kW	19,6	26,7	32,3	42,8	46,8	55,0	61,5	68,4
Total input power	kW	6,3	8,6	10,3	13,8	15,0	17,1	19,6	22,0
Nominal input current	A	13,3	16,7	18,6	25,3	27,3	31,8	35,3	40,9
EER	W/W	3,10	3,11	3,13	3,11	3,11	3,22	3,13	3,11
SEER (EN14825)	W/W	4,11	4,20	4,19	4,11	4,12	4,20	4,19	4,19
Circuits	n°	1	1	1	1	1	1	1	1
Compressors	n°	2	2	2	2	2	2	2	2
Refrigerant R410A									
Refrigerant charge	kg	6,5	6,5	6,5	10,0	8,5	8,5	14,5	14,5
Global warming potential (GWP)	-	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO_2 charge	t	13,57	13,57	13,57	20,88	17,74	17,74	30,27	30,27
Axial fans (1)									
Quantity	n°	2	2	2	2	2	2	2	2
Total air flow	m^3/h	8990	8913	17188	17079	17026	18949	18862	18802
Total power input	kW	0,39	0,38	1,05	1,04	1,04	0,97	0,95	0,93
Total input current	A	1,75	1,73	2,24	2,22	2,22	2,13	2,12	2,12
Evaporator (2)									
Quantity	n°	1	1	1	1	1	1	1	1
Water flow	m^3/h	3,36	4,56	5,53	7,33	8,01	9,42	10,54	11,72
Pressure drop	kPa	10,0	17,0	11,7	12,4	10,0	13,7	13,8	12,4
Weight									
Transport weight	kg	547	547	670	690	720	1035	1035	1044
Operating weight	kg	560	560	967	1016	1015	1040	1060	1070
Dimensions									
Length	mm	1915	1915	2400	2400	2400	2905	2905	2905
Width	mm	875	875	1145	1145	1145	1145	1145	1145
Height	mm	1490	1490	1670	1670	1670	1840	1840	1840
Sound data									
Total LWA (3)	dB(A)	75	75	75	75	77	77	77	78
Total SPL 10m (4)	dB(A)	43	43	43	43	45	45	45	46
Power supply									
Voltage/phase/frequency	V/ph/Hz	400/3+N/50	400/3+N/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]	9,80	12,6	16,1	20,1	21,7	25,0	27,4	30,8
Maximum input current	[A]	17,6	22,0	26,5	34,3	44,5	46,5	52,5	64,5
Inrush current	[A]	57,8	75,0	80,5	115,0	135,0	143,0	146,0	174,0

RAE N HE Kc		751	901	951	1101	1201	1401	1551	2001
Cooling capacity	kW	82,6	93,5	104,5	121,4	133,3	151,6	168,9	195,0
Total input power	kW	26,2	30,0	33,6	38,1	42,9	48,7	54,3	62,7
Nominal input current	A	50,5	55,6	61,0	68,2	75,8	86,2	97,2	109,0
EER	W/W	3,15	3,12	3,11	3,19	3,11	3,11	3,11	3,11
SEER (EN14825)	W/W	4,14	4,13	4,12	4,13	4,19	4,13	4,17	4,18
Circuits	n°	1	1	1	1	1	1	1	1
Compressors	n°	2	2	2	2	2	2	2	2
Refrigerant R410A									
Refrigerant charge	kg	19,0	19,0	20,0	28,0	30,0	30,0	30,0	30,0
Global warming potential (GWP)	-	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO_2 charge	t	39,67	39,67	41,76	58,46	62,64	62,64	62,64	62,64
Axial fans (1)									
Quantity	n°	2	2	2	3	3	3	3	3
Total air flow	m^3/h	41115	40998	40875	61987	61834	61624	61450	62820
Total power input	kW	2,94	2,88	2,81	4,38	4,37	4,29	4,17	4,16
Total input current	A	6,31	6,29	6,27	9,46	9,43	9,40	9,37	9,20
Evaporator (2)									
Quantity	n°	1	1	1	1	1	1	1	1
Water flow	m^3/h	14,12	16,02	17,84	20,78	22,82	25,93	28,78	33,43
Pressure drop	kPa	18,3	22,4	26,4	20,4	20,4	13,1	15,4	28,0
Weight									
Transport weight	kg	1094	1134	1204	1520	1539	1557	1577	1736
Operating weight	kg	1100	1140	1210	1530	1550	1570	1590	1750
Dimensions									
Length	mm	2905	2905	2905	3905	3905	3905	3905	3905
Width	mm	1145	1145	1145	1145	1145	1145	1145	1145
Height	mm	1840	1840	1840	1890	1890	1890	1890	2280
Sound data									
Total LWA (3)	dB(A)	83	84	85	87	88	88	88	89
Total SPL 10m (4)	dB(A)	51	52	53	55	56	56	56	57
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]	37,7	43,3	49,0	55,9	60,9	69,4	77,9	86,8
Maximum input current	[A]	75,8	81,8	87,8	100,0	109,0	126,0	142,0	160,0
Inrush current	[A]	216,0	267,0	273,0	324,0	332,0	370,0	387,0	485,0

(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 HE S Kc		191	251	311	411	461	511	601	651
Cooling capacity	kW	20,5	27,0	31,9	42,6	46,1	54,0	61,2	68,1
Total input power	kW	6,6	8,7	10,2	13,7	14,9	17,4	19,6	22,0
Nominal input current	A	14,6	17,7	18,0	25,0	27,0	31,6	35,5	41,1
EER	W/W	3,11	3,10	3,14	3,11	3,10	3,11	3,12	3,10
SEER (EN14825)	W/W	4,14	4,11	4,15	4,13	4,11	4,16	4,15	4,15
Circuits	n°	1	1	1	1	1	1	1	1
Compressors	n°	2	2	2	2	2	2	2	2
Refrigerant R410A									
Refrigerant charge	kg	6,5	6,5	6,5	10,0	8,5	8,5	14,5	14,5
Global warming potential (GWP)	-	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO_2 charge	t	13,57	13,57	13,57	20,88	17,74	17,74	30,27	30,27
Axial fans (1)									
Quantity	n°	2	2	2	2	2	2	2	2
Total air flow	m^3/h	11669	11591	13900	13791	13738	15749	15678	15636
Total power input	kW	0,72	0,70	0,76	0,74	0,74	0,71	0,68	0,67
Total input current	A	3,24	3,21	1,27	1,26	1,25	1,18	1,17	1,17
Evaporator (2)									
Quantity	n°	1	1	1	1	1	1	1	1
Water flow	m^3/h	3,5	4,6	5,5	7,3	7,9	9,2	10,5	11,7
Pressure drop	kPa	10,4	18,0	11,4	12,0	9,6	13,1	13,1	11,8
Weight									
Transport weight	kg	547	547	680	710	740	1035	1035	1044
Operating weight	kg	570	570	967	1016	1015	1060	1080	1090
Dimensions									
Length	mm	1915	1915	2400	2400	2400	2905	2905	2905
Width	mm	875	875	1145	1145	1145	1145	1145	1145
Height	mm	1490	1490	1670	1670	1670	1840	1840	1840
Sound data									
Total LWA (3)	dB(A)	70	70	70	70	72	72	72	73
Total SPL 10m (4)	dB(A)	38	38	38	38	40	40	40	41
Power supply									
Voltage/phase/frequency	V/ph/Hz	400/3+N/50	400/3+N/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]	10,1	12,9	15,8	19,7	21,3	24,6	27,0	30,4
Maximum input current	[A]	19,2	23,6	25,5	33,3	43,5	45,5	51,5	63,5
Inrush current	[A]	59,4	76,6	79,5	114,0	134,0	142,0	144,0	172,0

RAE N HE S Kc		751	901	951	1101	1201	1401	1551	2001
Cooling capacity	kW	80,7	91,2	103,2	118,8	130,1	150,1	166,8	189,1
Total input power	kW	25,4	29,4	33,3	36,9	42,0	48,1	53,8	60,8
Nominal input current	A	49,1	54,6	60,6	66,0	74,0	85,2	96,7	107,0
EER	W/W	3,18	3,10	3,10	3,22	3,10	3,12	3,10	3,11
SEER (EN14825)	W/W	4,16	4,17	4,16	4,20	4,11	4,25	4,12	4,27
Circuits	n°	1	1	1	1	1	1	1	1
Compressors	n°	2	2	2	2	2	2	2	2
Refrigerant R410A									
Refrigerant charge	kg	19,0	19,0	20,0	28,0	30,0	30,0	30,0	30,0
Global warming potential (GWP)	-	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO_2 charge	t	39,67	39,67	41,76	58,46	62,64	62,64	62,64	62,64
Axial fans (1)									
Quantity	n°	2	2	2	3	3	3	3	3
Total air flow	m^3/h	31482	31373	31277	47528	47380	47180	46991	48165
Total power input	kW	1,45	1,42	1,38	2,18	2,17	2,21	2,04	2,04
Total input current	A	3,94	3,92	3,91	5,91	5,89	5,87	5,84	5,77
Evaporator (2)									
Quantity	n°	1	1	1	1	1	1	1	1
Water flow	m^3/h	13,9	15,6	17,7	20,3	22,2	25,6	25,6	32,4
Pressure drop	kPa	17,6	21,4	25,2	19,6	19,4	12,5	14,7	27,3
Weight									
Transport weight	kg	1094	1134	1204	1520	1539	1557	1577	1736
Operating weight	kg	1120	1160	1230	1560	1580	1600	1620	1780
Dimensions									
Length	mm	2905	2905	2905	3905	3905	3905	3905	3905
Width	mm	1145	1145	1145	1145	1145	1145	1145	1145
Height	mm	1840	1840	1840	1890	1890	1890	1890	2280
Sound data									
Total LWA (3)	dB(A)	75	77	78	80	81	81	81	83
Total SPL 10m (4)	dB(A)	43	45	46	48	49	49	49	51
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]	35,5	41,2	46,8	52,7	57,7	66,2	74,7	83,6
Maximum input current	[A]	72,4	78,4	84,4	95,1	104,0	120,0	137,0	155,0
Inrush current	[A]	212,0	263,0	269,0	319,0	327,0	365,0	382,0	480,0

(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