

WATER CHILLERS R407C – R22

AIR COOLED WATER CHILLERS

WITH SCROLL COMPRESSORS AND CENTRIFUGAL FANS



RAE 482 C

RAE...C Series

2 refrigerant circuits - cooling capacities from 47 to 250 kW

Water chillers suitable for various environments: blocks of flats, offices, shops and factories, etc. etc.

Designed for internal installation

Centrifugal fans

Realized in a strong and compact housing coated with treated and painted zinc steel plate

2 cooling circuits

Operating conditions from +15 °C to +45 °C for standard models

The following versions are available:

RAE...C with centrifugal fans at vertical air flow

RAE...C K version with R407C ecological gas

RAE...C U ultra-silenced version

RAE...C U K ultra-silenced version with R407C ecological gas

RAE...C O with centrifugal fans at horizontal air flow

RAE...C O K version with R407C ecological gas

RAE...C O U ultra-silenced version

RAE...C O U K ultra-silenced version with R407C ecological gas

Made up of:

High-efficiency scroll compressor (COP 3.37 under ARI conditions), with low sound level (on average 6dB(A) less than the hermetic compressors), internal heat protection, installed on rubber vibration dampers, supplied with oil sump heater when necessary.

Heat-exchange external coil with high-efficiency aluminium fins and copper pipe designed for cooling fluids.

Centrifugal fans dragged by electrical motors pulleys/belts system coupled, provided with thermal protection (short circuit and overload) and external safety protection grid.

Weld-brazed plate evaporator with heat insulation.

Electric panel, in compliance with CE norms, supplied with a main switch and both overload and short circuit protections at each electrical components.

The cooling circuit is composed of: thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Unit management microprocessor for all models.

The available water accessories, like pump and buffer tank, are installed inside in a housing under the unit including electric control device of the pump.

Compressors hour counter.

Accessories

1M	Higher available pressure for fan
2M	Higher available pressure for fan
AE	Electrical power supply different from standard
BF	Low temperature operation (-20 °C) with inverter fan speed regulation
BFa	Low temperature operation (-20 °C) with inverter fan speed regulation (with 1M option)
BFb	Low temperature operation (-20 °C) with inverter fan speed regulation (with 2M option)
BT	Low temperature operation (-20 °C) with modulating fan speed regulation
BTa	Low temperature operation (-20 °C) with modulating fan speed regulation (with 1M or 2M option)
CF	Soundproofed compressors cabinet (included on ultra-silenced version)
CI	Soundproofing jackets on compressors
CS	Compressor inrush counter
GP	Condensing coil protection grid
IH	RS 485 serial interface
IM	Seawood packing
MF	Phase monitor
MT	High and low pressure gauges
MV	Buffer tank/expansion vessel/safety valve/water gauge/water charge and discharge valves/air discharge valves
P1	Pump group/expansion vessel/safety valve/water gauge/water charge and discharge valves/air discharge valve
P1H	High head pump group/expansion vessel/safety valve/water gauge/water charge and discharge valves/air discharge valve
PT	Twin-pump group/expansion vessel/safety valve /water gauge/water charge and discharge valves/air discharge valve
PA	Rubber-type vibration dampers
PF	Safety water flow switch on evaporator
PQ	Remote microprocessor
RA	Anti-freeze heater on evaporator
RL	Compressors overload relays
RM	Epoxy coating of condensing coil for sea environment
RP	Partial heat recovery
RR	Condensing coil with copper/copper fins
RT	Total heat recovery (available from size 842 – it is necessary to order option BT)
RV	Personalized RAL paint
VB	Brine version (water temperature < 0 °C)
VS	Solenoid valve

RAE...C Technical data

MODEL	RAE...C	482	562	702	822	842	962	1102	1402	1502	1602	2202	2402	2602
Cooling capacity with R407C	kW	48,1	55,6	67,9	83,5	80,8	86,1	96,0	126,0	133,0	149,0	193,0	215,0	229,0
Absorbed power with R407C	kW	15,4	17,5	22,2	26,6	27,1	31,8	38,0	44,4	50,2	56,0	72	73,4	80
Cooling capacity with R22	kW	50,8	58,7	71,2	89,0	84,8	93,5	106,0	139,0	149,0	163,0	212,0	233,0	250,0
Absorbed power with R22	kW	14,1	16,1	20,2	23,6	25,6	28,2	33,4	40,4	45,3	48,8	65,2	68,6	75,2
Centrifugal fans														
Quantity	n	2	2	2	2	3	3	3	4	4	4	4	6	6
Total air flow	l/s	4.684	5.806	6.834	7.889	11.110	10.415	10.415	13.890	13.890	13.330	13.330	20.330	20.330
Total air flow	m ³ /h	16.700	20.900	24.600	28.400	39.996	37.494	37.494	50.004	50.004	47.988	47.988	73.188	73.188
STD Version														
Available pressure	Pa	80	80	80	80	50	70	70	70	70	100	70	80	80
Rotation speed	rpm	782	919	640	745	920	900	900	915	915	935	900	920	920
Motors power	kW	4,4	8	6	11	12	12	12	16	16	16	16	24	24
Nominal absorbed current	A	10,6	18,8	13,4	24	30,3	30,3	30,3	41,6	41,6	41,6	40,4	60,6	60,6
Sound pressure level 2)	dB(A)	68	71	71	71	76	77	77	78	78	78	78	78	79
1M Version														
Available pressure	Pa	120	120	120	120	100	180	180	190	190	240	240	220	220
Rotation speed	rpm	830	959	669	769	970	1.030	1.030	1.030	1.030	1.065	1.070	1.050	1.050
Motors power	kW	4,4	8	8	11	12	12	12	16	16	16	16	24	24
Nominal absorbed current	A	10,6	18,8	18,8	24	30,3	30,3	30,3	41,6	41,6	41,6	40,4	60,6	60,6
Sound pressure level 2)	dB(A)	69	71	74	77	78	78	78	79	79	79	80	82	81
2M Version														
Available pressure	Pa	200	200	200	200	260	270	270	350	350	355	360	350	350
Rotation speed	rpm	923	1.037	725	819	1.110	1.100	1.100	1.170	1.170	1.170	1.175	1.170	1.170
Motors power	kW	6	8	8	11	15,5	15,5	15,5	22	22	22	22	33	33
Nominal absorbed current	A	13,4	18,8	18,8	24	30,3	30,3	30,3	41,6	41,6	41,6	40,4	60,6	60,6
Sound pressure level 2)	dB(A)	70	72	74	77	79	79	79	80	80	80	81	83	81
Evaporator 3)														
Quantity	n	2	2	2	2	1	1	1	1	1	1	1	1	1
Water flow rate with R407C	l/s	2,30	2,66	3,24	3,99	3,86	4,11	4,59	6,02	6,35	7,12	9,22	10,27	10,94
Water flow rate with R407C	m ³ /h	8,27	9,56	11,68	14,36	13,90	14,81	16,51	21,67	22,88	25,63	33,20	36,98	39,39
Pressure drop with R407C	kPa	49	48	47	72	21	27	30	49	55	69	47	74	80
Water flow rate with R22	l/s	2,43	2,81	2,39	4,25	3,96	4,46	5,07	6,62	7,12	7,78	10,13	11,14	11,94
Water flow rate with R22	m ³ /h	8,70	10,10	12,20	15,30	14,26	16,06	18,25	23,83	25,63	28,01	36,47	40,10	42,98
Pressure drop with R22	kPa	48	50	48	73	25	32	37	60	69	82	56	87	90
Pumps														
Available pressure with P1	kPa	132	113	180	107	124	118	110	116	100	76	133	101	86
Motor power with P1	kW	0,75	0,75	1,1	1,1	1,1	1,1	1,1	1,5	1,5	1,5	3	3	3
Available pressure with P1H	kPa	237	223	250	157	159	153	145	161	145	121	183	151	136
Motor power with P1H	kW	1,1	1,1	1,5	1,5	1,5	1,5	1,5	2,2	2,2	2,2	4	4	4
Available pressure with PT	kPa	132	133	135	127	149	138	130	131	110	86	123	86	71
Motor power with PT	kW	1,5	1,5	1,5	1,5	1,5	1,5	1,5	2,2	2,2	2,2	3	3	3
Buffer tank water volume	l	240	240	240	240	720	720	720	720	720	720	720	720	720
Scroll compressors														
Quantity	n	2	2	2	2	2	4	4	4	4	4	4	4	4
Circuits	n	2	2	2	2	2	2	2	2	2	2	2	2	2
Standard steps capacity	n	G2	G2	G2	G2	G2	G2	G2	G2	G2	G2	G2	G2	G2
Optional steps capacity	n	–	–	–	–	–	G4	G4	G4	G4	G4	G4	G4	G4
Nominal absorbed current	A	30	32	38	46	48	57	68	77	89	93	121	126	139
Maximum absorbed current	A	51	63	67	88	107	117	137	190	190	190	214	227	240
Inrush current	A	154	168	207	254	263	227	232	330	330	331	398	429	442
Electrical data														
Total absorbed power with R407C	kW	20	26	28	38	39	44	50	60	66	72	88	97	104
Total absorbed power with R22	kW	19	24	26	35	38	40	45	56	61	65	81	93	99
Total nominal absorbed current	A	41	51	51	70	78	88	98	118	131	135	161	187	200
Total maximum absorbed current	A	62	82	80	112	137	147	167	232	232	232	254	288	301
Total inrush current	A	165	187	226	278	293	257	262	372	372	373	438	490	503
Dimensions														
Length	mm	2.120	2.120	2.280	2.280	2.610	2.610	2.610	3.460	3.460	3.460	3.460	5.150	5.150
Length with MV included	mm	2.280	2.280	2.280	2.280	3.460	3.460	3.460	4.305	4.305	4.305	4.305	5.995	5.995
Width	mm	778	778	990	990	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245
Width with MV included	mm	990	990	990	990	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245
Height	mm	1.570	1.570	1.845	1.845	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Height with MV included	mm	1.995	1.995	2.270	2.270	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Weight	kg	752	782	856	929	1.334	1.449	1.456	1.800	1.840	1.840	2.000	2.450	2.540
Weight with empty MV included	kg	982	1.012	1.086	1.159	1.564	1.679	1.686	2.030	2.070	2.070	2.230	2.680	2.770
Refrigerant charge for each circuit	kg	5,8	5,9	7,8	9,7	9	12	13	17	22	22	23	35	35
Refrigerant charge for each circuit with O option	kg	–	–	–	–	9,4	9,4	9,4	20	20	20	30	31	31

– = not available

Nominal condition referred to: air 35 °C - chilled water 7/12 °C

2) Measured at 1 m in open field (ISO 3746) with air suction and air discharge in ducts

In case an even higher available pressure is required, different from what stated above but anyway not higher than 2M, the option 1M &/or 2M must be ordered, stating clearly on the order the pressure value effectively requested on site. The factory will adjust the motor's pulley according.

3) P = Brazed plate - FT = Shell & tube

WATER CHILLERS R407C – R22

AIR COOLED WATER CHILLERS

WITH SCROLL COMPRESSORS AND CENTRIFUGAL FANS

RAE...CU Technical data

MODEL	RAE...CU	482	562	702	842	962	1102	1402	1502	1602	2202	2402	2602
Cooling capacity with R407C	kW	47,9	55,4	67,9	74,6	84	94,5	126	137	147	191	212	225
Absorbed power with R407C	kW	15,5	17,7	22,2	28,2	32,8	38,2	43,8	49,1	57,2	72,4	75,2	81,2
Cooling capacity with R22	kW	50,3	58,3	71,2	81,9	92,4	106	140	149	162	210	232	248
Absorbed power with R22	kW	14,2	16,3	20,2	25,0	29,0	33,6	39,8	44,5	49,4	65,2	69,6	76,4
Centrifugal fans													
Quantity	n	2	2	2	3	3	4	6	6	6	6	8	8
Total air flow	l/s	4.083	5.000	5.750	5.920	8.000	8.000	12.170	12.170	12.170	11.330	15.110	15.110
Total air flow	m ³ /h	14.700	18.000	20.700	21.312	28.800	28.800	43.812	43.812	43.812	40.788	54.396	54.396
STD Version													
Available pressure	Pa	80	80	80	60	70	70	70	70	70	100	100	100
Rotation speed	rpm	460	509	582	590	760	590	610	610	610	650	650	650
Motors power	kW	3	3	4,4	3,3	6,6	4,4	6,6	6,6	6,6	6,6	8,8	8,8
Nominal absorbed current	A	7,4	7,4	10,6	9,6	16,5	12,8	19,2	19,2	19,2	19,2	25,6	25,6
Sound pressure level 2)	dB(A)	66	61	61	63	70	62	67	67	67	66	67	67
1M Version													
Available pressure	Pa	120	120	120	160	190	160	250	250	250	250	250	250
Rotation speed	rpm	508	548	616	750	890	720	880	880	880	870	870	870
Motors power	kW	3	3	4,4	3,3	6,6	4,4	9	9	9	9	12	12
Nominal absorbed current	A	7,4	7,4	10,6	9,6	16,5	12,8	25,2	25,2	25,2	25,2	33,6	33,6
Sound pressure level 2)	dB(A)	67	68	71	70	73	70	73	73	74	75	79	79
2M Version													
Available pressure	Pa	200	200	200	250	270	270	360	360	360	370	370	370
Rotation speed	rpm	599	626	684	870	975	870	1.015	1.015	1.015	1.015	1.015	1.015
Motors power	kW	3	4,4	6	4,5	9	6	13,2	13,2	13,2	13,2	17,6	17,6
Nominal absorbed current	A	7,4	10,6	13,4	12,6	22,5	16,8	33	33	33	33	44	44
Sound pressure level 2)	dB(A)	67	69	71	71	74	71	74	74	74	75	79	79
Evaporator 3)													
Quantity	n	2	2	2	1	1	1	1	1	1	1	1	1
Water flow rate with R407C	l/s	2,29	2,65	3,24	3,56	4,01	4,52	6,02	6,55	7,02	9,13	10,13	10,75
Water flow rate with R407C	m ³ /h	8,24	9,53	11,68	12,83	14,45	16,25	21,67	23,56	25,28	32,85	36,46	38,70
Pressure drop with R407C	kPa	49	48	47	20	26	29	49	58	67	46	72	81
Water flow rate with R22	l/s	2,40	2,79	3,40	3,91	4,41	5,06	6,69	7,12	7,74	10,03	11,08	11,85
Water flow rate with R22	m ³ /h	8,65	10,03	12,25	14,09	15,89	18,23	24,08	25,63	27,86	36,12	39,90	42,66
Pressure drop with R22	kPa	47	50	48	24	31	37	61	69	75	55	86	80
Pumps													
Available pressure with P1	kPa	132	114	180	124	118	110	120	97	83	133	101	86
Motor power with P1	kW	0,75	0,75	1,10	1,1	1,1	1,1	1,5	1,5	1,5	3	3	3
Available pressure with P1H	kPa	237	224	250	159	153	145	175	142	133	183	151	136
Motor power with P1H	kW	1,1	1,1	1,5	1,5	1,5	1,5	2,2	2,2	2,2	4	4	4
Available pressure with PT	kPa	132	134	135	149	138	130	135	107	93	123	86	71
Motor power with PT	kW	1,5	1,5	1,5	1,5	1,5	1,5	2,2	2,2	2,2	3	3	3
Buffer tank water volume	l	240	240	240	720	720	720	720	720	720	720	720	720
Scroll compressors													
Quantity	n	2	2	2	2	4	4	4	4	4	4	4	4
Circuits	n	2	2	2	2	2	2	2	2	2	2	2	2
Standard steps capacity	n	62	62	62	62	62	62	62	62	62	62	62	62
Optional steps capacity	n	–	–	–	–	64	64	64	64	64	64	64	64
Nominal absorbed current	A	30	32	38	48,8	58,8	68	75,8	87	95	121	129	141
Maximum absorbed current	A	47	51	65	82,6	102	116	172	173	173	198	221	234
Inrush current	A	150	156	205	239	212	211	313	314	315	382	423	436
Electrical data													
Total absorbed power with R22	kW	17	19	25	28	36	38	46	51	56	72	78	85
Total absorbed power with R407C	kW	19	21	27	32	39	43	50	56	64	79	84	90
Total nominal absorbed current	A	38	40	48	58	75	81	95	106	114	140	155	167
Total maximum absorbed current	A	54	58	76	92	119	129	191	192	192	217	247	260
Total inrush current	A	157	163	216	249	229	224	332	333	334	401	449	462
Dimensions													
Length	mm	2.280	2.280	2.280	2.610	2.610	3.460	5.150	5.150	5.150	5.150	6.840	6.840
Length with MV included	mm	2.280	2.280	2.280	3.460	3.460	4.305	5.995	5.995	5.995	5.995	6.840	6.840
Width	mm	990	990	990	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245
Width with MV included	mm	990	990	990	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245
Height	mm	1.845	1.845	1.845	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Height with MV included	mm	2.270	2.270	2.270	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Weight	kg	825	825	869	1.352	1.467	1.757	2.485	2.525	2.535	2.700	3.000	3.020
Weight with empty MV included	kg	1.055	1.055	1.099	1.582	1.697	1.987	2.715	2.775	2.765	2.930	3.230	3.250
Refrigerant charge for each circuit	kg	7,5	7,6	9,5	12	12	17	26	26	26	35	46	46,5
Refrigerant charge for each circuit with 0 option	kg	–	–	–	9,4	9,4	20	30	30	30	40	41	41
Power supply													
400V / 50Hz / 3 Ph + T + N													

– = not available

Nominal condition referred to: air 35 °C - chilled water 7/12 °C

2) Measured at 1 m in open field (ISO 3746) with air suction and air discharge in ducts

In case an even higher available pressure is required, different from what stated above but anyway not higher than 2M, the option 1M &/or 2M must be ordered, stating clearly on the order the pressure value effectively requested on site. The factory will adjust the motor's pulley according.

3) P = Brazed plate - FT = Shell & tube

CORRECTION FACTOR FOR COOLING CAPACITY R407C - R22

		External air temperature °C								
		28	30	32	35	38	40	42	45	48
Water evaporator outlet °C	17	1,522	1,492	1,463	1,416	1,370	1,339	1,304	1,252	1,212
	16	1,477	1,448	1,419	1,374	1,330	1,300	1,265	1,213	1,174
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763
	4	0,948	0,928	0,909	0,880	0,851	0,831	0,802	0,759	0,735
	3	0,915	0,896	0,877	0,848	0,820	0,801	0,773	0,732	0,708
	2	0,881	0,863	0,845	0,817	0,789	0,770	0,744	0,706	0,681
	1	0,848	0,830	0,813	0,785	0,757	0,739	0,715	0,680	0,654
	0	0,815	0,798	0,781	0,753	0,726	0,708	0,686	0,653	0,626
	-1	0,781	0,765	0,749	0,722	0,695	0,677	0,657	0,627	0,599
	-2	0,748	0,732	0,717	0,690	0,664	0,647	0,628	0,601	0,572
-3	0,715	0,700	0,685	0,659	0,633	0,616	0,599	0,575	0,544	
-4	0,681	0,667	0,653	0,627	0,602	0,585	0,570	0,548	0,517	
-5	0,648	0,634	0,621	0,596	0,571	0,554	0,541	0,522	0,490	

If the machine runs with evaporator water outlet temperature below 5 °C it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the table shown at the relevant section of the present catalogue.

Emicon AC SpA disclaims all responsibilities in case of damages deriving from violation of these instructions.

The correction factors listed above are not to be taken into consideration for the Free-cooling units.

For further clarifications or informations, you are kindly request to contact our sales department.

N.B.

The listed coefficients are mean values referred to different units, so the performances calculated by the tables could be different up to 5% from the data for a specific unit.

CORRECTION FACTOR FOR ABSORBED CAPACITY R407C - R22

		External air temperature °C								
		28	30	32	35	38	40	42	45	48
Water evaporator outlet °C	17	1,007	1,039	1,071	1,126	1,180	1,217	1,257	1,316	1,366
	16	0,994	1,026	1,058	1,113	1,168	1,204	1,244	1,304	1,355
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201
	4	0,853	0,884	0,915	0,961	1,006	1,036	1,074	1,132	1,189
	3	0,839	0,870	0,901	0,947	0,992	1,023	1,061	1,119	1,177
	2	0,825	0,856	0,888	0,933	0,979	1,009	1,048	1,106	1,166
	1	0,812	0,843	0,874	0,919	0,965	0,996	1,034	1,093	1,154
	0	0,798	0,829	0,860	0,906	0,951	0,982	1,020	1,080	0,142
	-1	0,784	0,815	0,846	0,892	0,938	0,968	1,008	1,067	1,130
	-2	0,770	0,801	0,832	0,878	0,924	0,955	0,994	1,054	1,118
-3	0,757	0,787	0,818	0,864	0,911	0,941	0,981	1,041	1,060	
-4	0,743	0,774	0,804	0,850	0,897	0,928	0,968	1,028	1,094	
-5	0,729	0,760	0,790	0,837	0,883	0,914	0,954	1,015	1,082	

If the machine runs with evaporator water outlet temperature below 5 °C it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the table shown at the relevant section of the present catalogue.

Emicon AC SpA disclaims all responsibilities in case of damages deriving from violation of these instructions.

The correction factors listed above are not to be taken into consideration for the Free-cooling units.

For further clarifications or informations, you are kindly request to contact our sales department.

N.B.

The listed coefficients are mean values referred to different units, so the performances calculated by the tables could be different up to 5% from the data for a specific unit.