

WATER CHILLERS R22 - R407C

AIR COOLED CHILLERS WITH SEMI-HERMETIC COMPRESSORS AND CENTRIFUGAL FANS

RAS...C

Cooling capacities from 120 to 290 kW



RAS 1402C.F

- Water chillers suitable for water cooling in air-conditioning and industrial environments
- Compact and packaged housing coated in zinc steel plates and painted with epoxy powders. Base-frame provided with sandwich insulating panels
- Operating temperatures from +15 °C to +42 °C in the standard version
- The following versions are available:
 - RAS...C, standard version
 - RAS...C.U, ultrasilenced version
 - RAS...C.F free cooling version
 - RAS...C.F.U ultrasilenced free cooling version
 - RAS...C.K version with ecological gas R407C

Provided with:

- 2 high efficiency semi-hermetic compressors, motor speed 1450 rpm, with built-in thermal protection, electric oil heater, lubricating pump, differential oil switch and rubber dampers contained in a suitable housing
- 2 circuits shell & tube evaporator, with ruled copper pipes for highly efficient heat exchange
- Heat-exchange external coil with high-efficiency aluminium fins and copper pipes designed for cooling fluids; independent circuits
- the RAS...C.F version is provided with the free cooling coil and modulating 3-way valve
- double suction centrifugal fans with onward wheel dynamically balanced; electric motor with driving belt, pulley with variable pitch
- Electric panel, in compliance with CE norms, supplied with a main switch with magnetothermic protection
- The cooling circuit is composed of: thermostatic expansion valve, dehydrating filter, sight glass, safety device, anti-freeze thermostat, high and low pressure switches, high and low pressure gauges, oil gauge and shut-off valve on suction side
- Microprocessor for chilled water temperature regulation, overall check of the running parameters, auto-detection failure system, remote management and supervision (option IH, IB)

- Antifreeze electric heater on evaporator
- Compressors hour counter

Options:

- | | |
|---------|--|
| AE | Electrical supply different from the standard |
| FI - BT | Low temperature operation down to $\bar{n}5$ °C and $\bar{n}20$ °C standard for versions F and F.U |
| BTa | Low temperature operation with 1M,2M |
| CS | Pickup counter |
| EA | Extractable tube evaporator |
| FA | Coil protection filters |
| G4-G6 | 4/6 control capacity steps |
| GP | Protection grid for the external coil |
| I1-I2 | Victaulic insulation on pump and buffer tank side |
| I3 | Victaulic insulation for the free cooling version |
| IB/IH | RS422 RS485 serial interface |
| IG | Watch card |
| IM | Seawood packing |
| MF | Phase monitor |
| MP | Oversized microprocessor |
| MV | Buffer tank capacity 720 lt. |
| P1 | Single pump group |
| PA-PM | Rubber/spring type vibration dampers |
| PF | Safety water flow switch |
| PQ | Remote microprocessor |
| PT | Twin pump group |
| PW | Part-winding start-up |
| QR | Electrical board on opposite side |
| RF | Rephasing system cost |
| RL | Compressor overload relays |
| RR-RM | 2 treatments for the condensing coil |
| RP | Partial heat recovery |
| RT | Total heat recovery |
| RV | Personalized RAL paint |
| SU | Sound-insulation of compressors room with lead material (standard on U version) |
| VS | Solenoid valve standard for F and F.U versions |
| 1M-2M | Higher available pressure not available on F version |

WATER CHILLERS R22 - R407C

AIR COOLED CHILLERS WITH SEMI-HERMETIC COMPRESSORS AND CENTRIFUGAL FANS

RAS...C Technical data

RAS...C		1202	1402	1602	1802	2002	2202	2402	2602	2802	3002
Cooling capacity with R22	kW	125.2	137.1	165.3	180.2	194.2	206	229.4	251.6	261.4	282.1
Absorbed capacity with R22	kW	34.7	43.3	50.2	55.8	58.8	65.5	69	76.7	83.7	95.3
Cooling capacity with R407C	kW	119.2	130.6	157.4	171.6	185.0	196.2	218.5	239.6	249.0	268.7
Absorbed capacity with R407C	kW	36.8	45.9	53.2	59.1	62.3	69.4	73.1	81.3	88.7	101.0
[Fans]											
Number of fans	n	4	4	4	4	6	6	6	6	6	6
Total air flow rate	l/s	10000	10000	13110	13110	18050	18050	18050	18050	20000	20000
[Version: Standard]											
Available pressure	Pa	80	80	110	110	75	75	75	75	85	85
Rotation speed	rpm	850	850	985	985	890	890	890	890	960	960
Motor capacity	kW	9	9	16	16	18	18	18	18	24	24
Nominal absorbed current	A	17	17	20	20	30	30	30	30	54	54
Sound pressure level	dB(A)	69	69	69	69	71	71	71	71	71	71
[Version: 1M]											
Available pressure	Pa	250	250	280	280	255	255	255	255	275	275
Rotation speed	rpm	1015	1015	1120	1120	1050	1050	1050	1050	1115	1115
Motor capacity	kW	12	12	20	20	24	24	24	24	30	30
Nominal absorbed current	A	20	20	45	45	54	54	54	54	68	68
Sound pressure level	dB(A)	72	72	72	72	74	74	74	74	74	74
[Version: 2M]											
Available pressure	Pa	440	440	na	na	425	425	425	425	na	na
Rotation speed	rpm	1190	1190	na	na	1190	1190	1190	1190	na	na
Motor capacity	kW	16	16	na	na	30	30	30	30	na	na
Nominal absorbed current	A	36	36	na	na	68	68	68	68	na	na
Sound pressure level	dB(A)	74	74	74	74	76	76	76	76	na	na
[Shell and Tube evaporator]											
Water flow with R22	l/s	5.98	6.55	7.90	8.61	9.28	9.84	10.96	12.02	12.49	13.48
Pressure drop with R22	kPa	25	31	23	28	31	34	26	30	26	29
Water flow with R407C	l/s	5.70	6.24	7.52	8.20	8.84	9.37	10.44	11.45	11.89	12.84
Pressure drop with R407C	kPa	23	28	21	25	28	31	24	27	24	26
Water volume	l	35	35	46	46	59	59	71	71	81	81
[Pumps]											
Available pressure with P1	kPa	128	103	92	59	124	117	98	100	113	106
Motor capacity with P1	kW	1.5	1.5	1.5	1.5	3.0	3.0	3.0	3.0	3.0	3.0
Available pressure with PT	kPa	140	114	94	61	115	105	84	83	91	76
Motor capacity with PT	kW	2.2	2.2	2.2	2.2	3.0	3.0	3.0	3.0	3.0	3.0
Buffer tank water volume	l	720	720	720	720	720	720	720	720	720	720
[Semihhermetic compressors]											
Number of compressors	n	2	2	2	2	2	2	2	2	2	2
Circuits	n	2	2	2	2	2	2	2	2	2	2
Capacity steps - standard	n	2	2	2	2	2	2	2	2	2	2
Capacity steps - optional	n	4	4	4	4-6	4-6	4-6	4-6	4-6	4-6	4-6
Nominal input current	A	63	80	89	99	110	123	131	143	160	178
Max input current	A	89	110	122	133	153	170	181	192	214	236
Inrush current (direct)	A	217	248	339	351	380	397	520	531	634	656
Inrush current (part-winding)	A	156	179	239	250	269	286	366	377	443	466
Compressors' max absorbed capacity	kW	55.4	65.8	72.6	79.4	87.4	95.2	105.7	112.1	123.5	134.9
Total absorbed capacity with R22	kW	45.0	53.6	67.7	73.3	79.8	86.5	90.0	97.7	110.7	122.3
Total absorbed capacity with R407C	kW	47.1	56.2	70.7	76.6	83.3	90.4	94.1	102.3	115.7	128.0
[Dimensions]											
Length	mm	3460	3460	3460	3460	5150	5150	5150	5150	5150	5150
Width	mm	1245	1245	1245	1245	1245	1245	1245	1245	1245	1245
Height	mm	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995
Weight	kg	1896	1917	1969	1979	2606	2636	2790	2810	2887	2959
Power supply		400V / 3 Ph / 50Hz + T + N									

Nominal conditions: air temperature 32 °C - water temperature 7/12 °C

Nominal conditions in Free-cooling: air +5 °C - water inlet 15 °C - glycol 20%

Sound pressure level measured at 1 m in free field (ISO 3746)

Notes:

- Operating limits and correction factors for performances at temperatures different than nominal ones are on page 31

WATER CHILLERS R22 - R407C

AIR COOLED CHILLERS

WITH SEMI-HERMETIC COMPRESSORS AND CENTRIFUGAL FANS

RAS...C.U Technical data

RAS...C.U		1202	1402	1602	1802	2002	2202	2402	2602	2802	3002
Cooling capacity with R22	kW	123.0	139.9	161.8	178.7	198.1	208.5	230.9	246.7	261.4	276.2
Absorbed capacity with R22	kW	34.1	42.5	47.1	53.2	61.3	68.1	68.5	74.1	83.7	93.2
Cooling capacity with R407C	kW	117.1	133.2	154.1	170.2	188.7	198.6	219.9	235	249	263
Absorbed capacity with R407C	kW	36.1	45.1	49.9	56.4	65.0	72.2	72.6	78.5	88.7	98.8
[Fans]											
Number of fans	n	6	6	6	6	6	6	6	6	8	8
Total air flow rate	l/s	7000	9170	9170	9170	12000	12000	15280	15280	21000	21000
[Version: Standard]											
Available pressure	Pa	65	90	90	90	75	75	60	60	55	55
Rotation speed	rpm	760	800	810	810	810	810	840	840	825	825
Motor capacity	kW	4.5	6.6	6.6	6.6	9.0	9.0	13.2	13.2	17.6	17.6
Nominal absorbed current	A	9.6	13.2	13.2	13.2	18.0	18.0	25.2	25.2	33.6	33.6
Sound pressure level	dB(A)	63	63	63	63	64	64	65	65	65	65
[Version: 1M]											
Available pressure	Pa	180	200	200	200	225	225	220	220	215	215
Rotation speed	rpm	925	935	945	945	980	980	1000	1000	980	980
Motor capacity	kW	7	9	9	9	13	13	18	18	24	24
Nominal absorbed current	A	13	18	18	18	25	25	30	30	40	40
Sound pressure level	dB(A)	66	66	66	66	67	67	68	68	68	68
[Version: 2M]											
Available pressure	Pa	300	390	380	380	400	400	410	410	400	400
Rotation speed	rpm	1065	1140	1140	1140	1145	1145	1180	1180	1150	1150
Motor capacity	kW	9	13	13	13	18	18	24	24	32	32
Nominal absorbed current	A	18	25	25	25	30	30	36	36	48	48
Sound pressure level	dB(A)	68	68	68	68	69	69	70	70	70	70
[Shell and Tube evaporator]											
Water flow with R22	l/s	5.9	6.7	7.7	8.5	9.5	10.0	11.0	11.8	12.5	13.2
Pressure drop with R22	kPa	25	32	24	29	30	33	26	30	25	29
Water flow with R407C	l/s	5.6	6.4	7.4	8.1	9.0	9.5	10.5	11.2	11.9	12.6
Pressure drop with R407C	kPa	23	29	22	26	27	30	24	27	23	26
Water volume	l	35	35	46	46	59	59	71	71	81	81
[Pumps]											
Available pressure with P1	kPa	128	103	92	59	124	117	98	100	113	106
Motor capacity with P1	kW	1.5	1.5	1.5	1.5	3.0	3.0	3.0	3.0	3.0	3.0
Available pressure with PT	kPa	140	114	94	61	115	105	84	83	91	76
Motor capacity with PT	kW	2.2	2.2	2.2	2.2	3.0	3.0	3.0	3.0	3.0	3.0
Buffer tank water volume	l	720	720	720	720	720	720	720	720	720	720
[Semihhermetic compressors]											
Number of compressors	n	2	2	2	2	2	2	2	2	2	2
Circuits	n	2	2	2	2	2	2	2	2	2	2
Capacity steps - standard	n	2	2	2	2	2	2	2	2	2	2
Capacity steps - optional	n	4	4	4	4-6	4-6	4-6	4-6	4-6	4-6	4-6
Nominal input current	A	63	79	87	97	111	125	130	142	160	178
Max input current	A	89	110	122	133	153	170	181	192	214	236
Inrush current (direct)	A	217	248	339	351	380	397	520	531	634	656
Inrush current (part-winding)	A	156	179	239	250	269	286	366	377	443	466
Compressors' max absorbed capacity	kW	51.1	61.5	68.3	75.1	85	92.8	101.3	107.7	119.1	130.5
Total absorbed capacity with R22	kW	40.1	50.6	55.2	61.3	73.3	80.1	84.7	90.3	104.3	113.8
Total absorbed capacity with R407C	kW	42.1	53.2	58.0	64.5	77.0	84.2	88.8	94.7	109.3	119.4
[Dimensions]											
Length	mm	5150	5150	5150	5150	5150	5150	5150	5150	6840	6840
Width	mm	1245	1245	1245	1245	1245	1245	1245	1245	1245	1245
Height	mm	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995
Weight	kg	2582	2603	2655	2665	2720	2750	2880	2930	3480	3552
Power supply		400V / 3 Ph / 50Hz + T + N									

Nominal conditions: air temperature 32 °C - water temperature 7/12 °C

Nominal conditions in Free-cooling: air +5 °C - water inlet 15 °C - glycol 20%

Sound pressure level measured at 1 m in free field (ISO 3746)

Notes:

- Operating limits and correction factors for performances at temperatures different than nominal ones are on page 31

WATER CHILLERS R22 - R407C

AIR COOLED CHILLERS WITH SEMI-HERMETIC COMPRESSORS AND CENTRIFUGAL FANS

RAS...C.F Technical data

RAS...C.F		1202	1402	1602	1802	2002	2202	2402	2602	2802	3002
Cooling capacity with R22	kW	124.6	141	161.8	175.3	198.3	206.6	234	249.9	265	283.6
Absorbed capacity with R22	kW	33.6	42.2	47.1	52.9	57.6	63.8	67.6	73.1	82.5	93.6
Cooling capacity with R407C	kW	118.7	134.3	154.1	167.0	188.9	196.8	222.9	238.0	252.4	270.1
Absorbed capacity with R407C	kW	35.6	44.7	49.9	56.1	61.1	67.6	71.7	77.5	87.5	99.2
Cooling capacity in free-cooling	kW	82.5	85.8	90.2	92.4	129.8	130.9	144.1	146.3	147.4	154
[Fans]											
Number of fans	n	4	4	4	4	6	6	6	6	6	6
Total air flow rate	L/s	10000	10000	13110	13110	20000	20000	20000	20000	20000	20000
[Version: Standard]											
Available pressure	Pa	50	50	50	50	50	50	50	50	45	45
Rotation speed	rpm	860	860	985	985	970	970	970	970	970	970
Motor capacity	kW	9	9	16	16	24	24	24	24	24	24
Nominal absorbed current	A	17	17	20	20	54	54	54	54	54	54
Sound pressure level	dB(A)	69	69	69	69	71	71	71	71	71	71
[Version: 1M]											
Available pressure	Pa	205	205	210	210	230	230	230	230	225	225
Rotation speed	rpm	1015	1015	1120	1120	1115	1115	1115	1115	1115	1115
Motor capacity	kW	12	12	20	20	30	30	30	30	30	30
Nominal absorbed current	A	20	20	45	45	68	68	68	68	68	68
Sound pressure level	dB(A)	72	72	72	72	74	74	74	74	74	74
[Version: 2M]											
Available pressure	Pa	395	395	na	na	na	na	na	na	na	na
Rotation speed	rpm	1190	1190	na	na	na	na	na	na	na	na
Motor capacity	kW	16	16	na	na	na	na	na	na	na	na
Nominal absorbed current	A	36	36	na	na	na	na	na	na	na	na
Sound pressure level	dB(A)	74	74	na	na	na	na	na	na	na	na
[Shell and Tube evaporator]											
Water flow with R22	l/s	6.0	6.7	7.7	8.4	9.5	9.9	11.2	11.9	12.7	13.5
Pressure drop with R22	kPa	30	38	28	34	37	40	32	36	31	34
Water flow with R407C	l/s	5.7	6.4	7.4	8.0	9.0	9.4	10.6	11.4	12.1	12.9
Pressure drop with R407C	kPa	27	34	25	31	34	36	29	33	28	31
Pressure drop in free-cooling	kPa	56	64	64	79	95	101	104	114	114	124
Water volume	l	83	83	94	94	126	126	150	150	159	159
[Pumps]											
Available pressure with P1	kPa	119	99	111	85	93	131	103	101	114	96
Motor capacity with P1	kW	3	3	3	3	3	4	4	4	4	4
Available pressure with PT	kPa	138	115	125	101	110	100	69	67	82	61
Motor capacity with PT	kW	4	4	4	4	4	4	4	4	4	4
Buffer tank water volume	l	720	720	720	720	720	720	720	720	720	720
[Semihhermetic compressors]											
Number of compressors	n	2	2	2	2	2	2	2	2	2	2
Circuits	n	2	2	2	2	2	2	2	2	2	2
Capacity steps - standard	n	2	2	2	2	2	2	2	2	2	2
Capacity steps - optional	n	4	4	4	4-6	4-6	4-6	4-6	4-6	4-6	4-6
Nominal input current	A	62	78	87	97	107	121	129	140	158	176
Max input current	A	89	110	122	133	153	170	181	192	214	236
Inrush current (direct)	A	217	248	339	351	380	397	520	531	634	656
Inrush current (part-winding)	A	156	179	239	250	269	286	366	377	443	466
Compressors' max absorbed capacity	kW	58.6	69	75.8	82.6	91.6	99.4	110.5	116.9	128.3	139.7
Total absorbed capacity with R22	kW	45.4	54.0	66.1	71.9	84.6	91.8	95.6	101.1	110.5	121.6
Total absorbed capacity with R407C	kW	47.4	56.5	68.9	75.1	88.1	95.6	99.7	105.5	115.5	127.2
[Dimensions]											
Length	mm	3460	3460	3460	3460	5150	5150	5150	5150	5150	5150
Width	mm	1385	1385	1385	1385	1385	1385	1385	1385	1385	1385
Height	mm	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995
Weight	kg	2211	2232	2284	2294	2996	3026	3180	3200	3277	3349
Power supply		400V / 3 Ph / 50Hz + T + N									

Nominal conditions: air temperature 32 °C - water temperature 7/12 °C

Nominal conditions in Free-cooling: air +5 °C - water inlet 15 °C - glycol 20%

Sound pressure level measured at 1 m in free field (ISO 3746)

Notes:

- Operating limits and correction factors for performances at temperatures different than nominal ones are on page 31

WATER CHILLERS R22 - R407C

AIR COOLED CHILLERS WITH SEMI-HERMETIC COMPRESSORS AND CENTRIFUGAL FANS

RAS...C.F.U Technical data

RAS...C.F.U		1202	1402	1602	1802	2002	2202	2402	2602	2802	3002
Cooling capacity with R22	kW	127.1	139	160.7	175.5	196.3	209.2	230.9	246.7	261.4	274.1
Absorbed capacity with R22	kW	35.7	42.7	47.4	53.4	60.8	68.4	68.5	74.1	83.7	93
Cooling capacity with R407C	kW	121.05	132.4	153	167.1	187.0	199.2	219.9	235	249	261
Absorbed capacity with R407C	kW	37.8	45.3	50.2	56.6	64.4	72.5	72.6	78.5	88.7	98.6
Cooling capacity in free-cooling	kW	91.3	95.7	100	102.3	115.5	117.7	151.8	154	155.1	157.3
[Fans]											
Number of fans	n	6	6	6	6	6	6	6	6	8	8
Total air flow rate	l/s	7000	9170	9170	9170	12000	12000	16670	16670	19440	19440
[Version: Standard]											
Available pressure	Pa	65	70	65	65	50	50	85	85	75	75
Rotation speed	rpm	780	800	800	800	810	810	940	940	870	870
Motor capacity	kW	4.5	6.6	6.6	6.6	9.0	9.0	18.0	18.0	17.6	17.6
Nominal absorbed current	A	9.6	13.2	13.2	13.2	18.0	18.0	30.0	30.0	33.6	33.6
Sound pressure level	dB(A)	63	63	63	63	64	64	65	65	65	65
[Version: 1M]											
Available pressure	Pa	175	185	180	180	210	210	275	275	235	235
Rotation speed	rpm	925	945	945	945	990	990	1100	1100	1030	1030
Motor capacity	kW	7	9	9	9	13	13	24	24	24	24
Nominal absorbed current	A	13	18	18	18	25	25	54	54	40	40
Sound pressure level	dB(A)	66	66	66	66	67	67	68	68	68	68
[Version: 2M]											
Available pressure	Pa	305	365	360	360	380	380	385	385	425	425
Rotation speed	rpm	1075	1140	1140	1140	1155	1155	1200	1200	1200	1200
Motor capacity	kW	9	13	13	13	18	18	30	30	32	32
Nominal absorbed current	A	18	25	25	25	30	30	68	68	72	72
Sound pressure level	dB(A)	68	68	68	68	69	69	70	70	70	70
[Shell and Tube evaporator]											
Water flow with R22	l/s	6.07	6.64	7.68	8.39	9.38	10.00	11.03	11.79	12.49	13.10
Pressure drop with R22	kPa	29	37	27	33	35	39	31	35	30	34
Water flow with R407C	l/s	5.78	6.32	7.31	7.99	8.93	9.52	10.51	11.23	11.89	12.47
Pressure drop with R407C	kPa	26	34	24	30	32	35	28	32	27	31
Pressure drop in free-cooling	kPa	64	72	73	84	91	99	112	124	126	139
Water volume	l	109	109	120	120	126	126	150	150	185	185
[Pumps]											
Available pressure with P1	kPa	119	99	111	85	93	131	103	101	114	96
Motor capacity with P1	kW	3	3	3	3	3	4	4	4	4	4
Available pressure with PT	kPa	138	115	125	101	110	100	69	67	82	61
Motor capacity with PT	kW	4	4	4	4	4	4	4	4	4	4
Buffer tank water volume	l	720	720	720	720	720	720	720	720	720	720
[Semihhermetic compressors]											
Number of compressors	n	2	2	2	2	2	2	2	2	2	2
Circuits	n	2	2	2	2	2	2	2	2	2	2
Capacity steps - standard	n	2	2	2	2	2	2	2	2	2	2
Capacity steps - optional	n	4	4	4	4-6	4-6	4-6	4-6	4-6	4-6	4-6
Nominal input current	A	63	79	88	98	111	125	130	142	160	178
Max input current	A	89	110	122	133	153	170	181	192	214	236
Inrush current (direct)	A	217	248	339	351	380	397	520	531	634	656
Inrush current (part-winding)	A	156	179	239	250	269	286	366	377	443	466
Compressors' max absorbed capacity	kW	51.1	61.5	68.3	75.1	86.2	94	101.3	107.7	119.1	130.5
Total absorbed capacity with R22	kW	43.2	52.3	57	63	72.8	81.4	90.5	96.1	105.3	114.6
Total absorbed capacity with R407C	kW	45.3	54.9	59.8	66.2	76.4	85.5	94.6	100.5	110.3	120.2
[Dimensions]											
Length	mm	5150	5150	5150	5150	5150	5150	5150	5150	6840	6840
Width	mm	1385	1385	1385	1385	1385	1385	1385	1385	1385	1385
Height	mm	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995
Weight	kg	2967	2988	3040	3050	3078	3108	4019	4039	4116	4188
Power supply		400V / 3 Ph / 50Hz + T + N									

Nominal conditions: air temperature 32 °C - water temperature 7/12 °C

Nominal conditions in Free-cooling: air +5 °C - water inlet 15 °C - glycol 20%

Sound pressure level measured at 1 m in free field (ISO 3746)

Notes:

- Operating limits and correction factors for performances at temperatures different than nominal ones are on page 31

AIRCOOLED WATER CHILLER RAE... - RAS...

OPERATION LIMITS - ABSORPTION AND CAPACITY CORRECTION FACTORS

AIR: The operation limits are listed in the descriptions of each series.

WATER: The operation temperature ranges from a minimum of +4 to a maximum of +20°C. By adding glycole in the hydraulic circuit it is possible to reach a minimum temperature of -8°C (to be required when ordering).

CORRECTION FACTORS FOR COOLING CAPACITY

Outlet water temp. °C	EXTERNAL AIR TEMPERATURE °C								Outlet water temp. °C
	25	28	30	32	35	38	40	42	
5	1.027	0.991	0.962	0.940	0.918	0.896	0.861	0.819	5
6	1.046	1.024	1.007	0.967	0.941	0.916	0.876	0.854	6
7	1.091	1.050	1.032	1.000	0.974	0.942	0.915	0.893	7
8	1.121	1.075	1.058	1.041	0.996	0.963	0.949	0.928	8
9	1.159	1.112	1.100	1.079	1.040	1.009	0.972	0.956	9
10	1.191	1.161	1.129	1.112	1.068	1.036	1.002	—	10
11	1.228	1.190	1.162	1.130	1.101	1.058	1.049	—	11
12	1.262	1.220	1.207	1.175	1.136	1.096	1.061	—	12
13	1.308	1.250	1.226	1.200	1.158	1.122	—	—	13
14	1.335	1.300	1.278	1.251	1.195	1.160	—	—	14
15	1.365	1.345	1.307	1.272	1.232	1.196	—	—	15

CORRECTION FACTORS FOR COMPRESSOR ABSORPTION

Outlet water temp. °C	EXTERNAL AIR TEMPERATURE °C								Outlet water temp. °C
	25	28	30	32	35	38	40	42	
5	0.870	0.909	0.943	0.963	0.995	1.021	1.047	1.065	5
6	0.900	0.927	0.962	0.981	1.010	1.045	1.068	1.092	6
7	0.910	0.946	0.980	1.000	1.032	1.071	1.096	1.116	7
8	0.930	0.972	0.996	1.021	1.051	1.089	1.112	1.135	8
9	0.948	0.990	1.008	1.036	1.075	1.111	1.141	1.162	9
10	0.965	1.005	1.035	1.061	1.098	1.138	1.158	—	10
11	0.968	1.017	1.046	1.082	1.120	1.158	1.180	—	11
12	0.996	1.031	1.072	1.095	1.140	1.170	1.207	—	12
13	1.015	1.048	1.082	1.116	1.160	1.199	—	—	13
14	1.030	1.070	1.100	1.132	1.171	1.226	—	—	14
15	1.045	1.096	1.120	1.146	1.200	1.250	—	—	15

WATER-GLYCOL OPERATION

Ethylenic glycol percentage	5%	10%	15%	20%	25%	30%	35%	40%
Freezing point	-2.1	-4.5	-7	-10	-13	-17	-21	-25
Nominal performances correction factors								
Cooling drop	0.993	0.988	0.982	0.978	0.973	0.968	0.958	0.948
Increase on water flow	1.006	1.015	1.025	1.040	1.060	1.080	1.113	1.142
Increase on pressure drop	1.040	1.090	1.125	1.187	1.25	1.312	1.375	1.460

If the machine runs with an external air temperature below 0°C, it is advisable to use water added with glycol in the percentages listed in the above table.

Emicon S.p.a. disclaims all responsibilities in case of damages deriving from violation of this suggestion.

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

Please, ask for further information to our Eng. Dept.