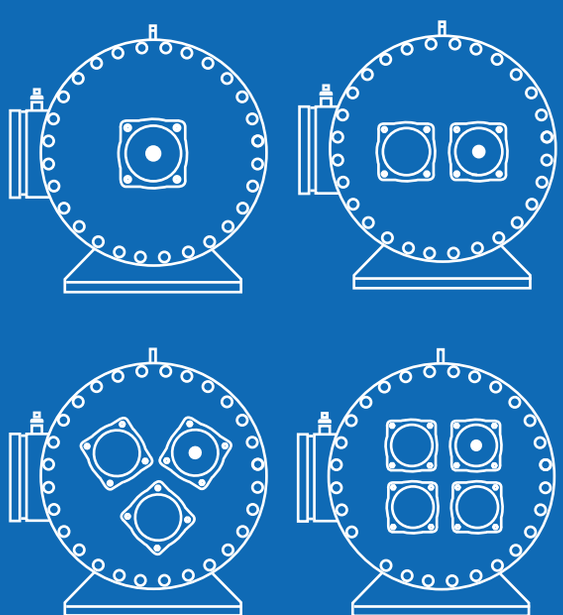
RL SERIES
EVAPORATOR



REFKAR
HEAT TRANSFER SOLUTIONS

Turkey
Discover
the potential

ABOUT US

Refkar is one of the preferred institutions in the Turkish market for heat transfer products related to freon systems. With its 15 years of experience, it aims to gain strength and become a global brand in the international market.

OUR FACTORY

It performs production in international standards with its 3.500 m² closed factory area established on 6.500 m² outdoor area, advanced technology production systems, and trained operator staff.

COMPETENT STAFF

Since its establishment, Refkar has worked with a highly skilled team. It has trained and developed its employees within the framework of their competencies.

FAIRS AND TRAVELS

Refkar has conducted business trips, partner visits, and participated in fairs to more than 50 countries. As a result, it has succeeded in becoming a recognized brand in the international market.

PERFORMANCE

Refkar RL range shell&tube evaporators are designed for industrial coolingapplications, comfort and air-conditioning systems, low-temperature saltingapplications and heat pump systems. RL evaporators are designed for R134A coolant but they can be used with a wide range of coolants. The cooling capacityof RL line ranges from 160 kW to 1750 kW and they are manufactured with up to3 standalone circuits. RL evaporators are designed to offer the high efficiency ofreverse flow. This ensures minimum material cost and guarantees maximum efficiency.

DESIGN AND MATERIAL

Materials used in Refkar products comply with EN norms. Materials with thefollowing specifications are used in standard products.

- Cast iron or carbon steel covers
- Tube sheet carbon steel
- Carbon steel body pipe, coolant and water connections
- Copper heat transfer piping
- Plastic cross curtains
- Asbestos-free cylinder head gasket
- Steel bolts
- Manufacturing with other materials on request

QUALITY AND TEST

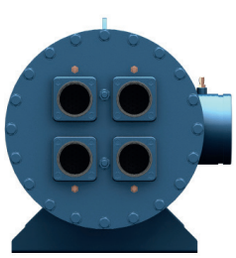
Mechanical calculations of Refkar RL line evaporators are in accordance with TSEN13445-3 standard and with a CE certificate in compliance with ISO 9001:2008 quality management system. Refkar Shell&Tube evaporators are tested with agas side of 27 bars and a water side of 10 bars. Helium leak test is a standardtest for all products. For Refkar products, a guarantee is offered against coolantleak for up to 2 gr/year. Tests are performed at various pressure levels for multicircuit products and prevention of leakage between circuits is guaranteed.

Approval	PS		Ts min	Ts max	Category
	Tube Side	Shell Side			
CE/EAC	18 bar	10 bar	-10 °C	90 °C	Up to Cat.IV, 2014/68/EU
CE/EAC	23 bar	10 bar	-10 °C	90 °C	Up to Cat.IV, 2014/68/EU

RLS - 1 Circuit

RLD - 2 Circuits

RLT - 3 Circuit



RLQ - 4 Circuits

FOULING FACTOR

Fouling factor (f.f.) is important in selecting an evaporator. The fouling factorlevels under certain conditions are given below.

Closed-circuit mains water	f.f.= 0,000043 m²K/W
Open-circuit mains water	f.f.= 0,000086 m²K/W
Glycol solution < %40	f.f.= 0,000086 m²K/W
Glycol solution > %40	f.f.= 0,000172 m²K/W

ANTIFREEZE RECOMMENDATIONS

The table below lists the recommended glycol solution for low-temperatureoperating conditions.

Freezing Point [°C]	Ethilene Glycol [% Weight]	Propylene Glycol [% Weight]
-5	12	16
-10	22	26
-15	30	34
-20	36	40
-25	40	44
-30	44	48
-35	48	52
-40	52	56

INSTALLATION AND OPERATION

Please ensure the following operating conditions for best use of your operator.

- The evaporator should be used in horizontal position.
- The air inside the product should be discharged before filling water.
- Ensure that the pressure drop and implementation conditions are inaccordance with catalog values.
- Do not stop the water flow before the coolant in the evaporator isdischarged.
- When not in use, fill the evaporator fully with anti-freeze fluid with no airin it and fully evacuate it, ensuring that it is dry.
- Regularly check the chemical properties of the water inside theevaporator. Incompliant water damages the evaporator.
- In case of a capacity decrease, you can reverse-operate the system for ashort time for cleaning.
- Keep the evaporator away from sources of vibration.
- Prevent foreign particles in the water.
- Use anti-frees solution below 0°C.
- Prevent air in the pump cavitation and the system.
- Do not run the cooled fluids close to their freezing conditions.
- Do not exceed the allowed water flow.

RLS

CAPACITY, WATER FLOW AND VOLUME TABLE

The values listed in the table were calculated based on the following operating conditions.

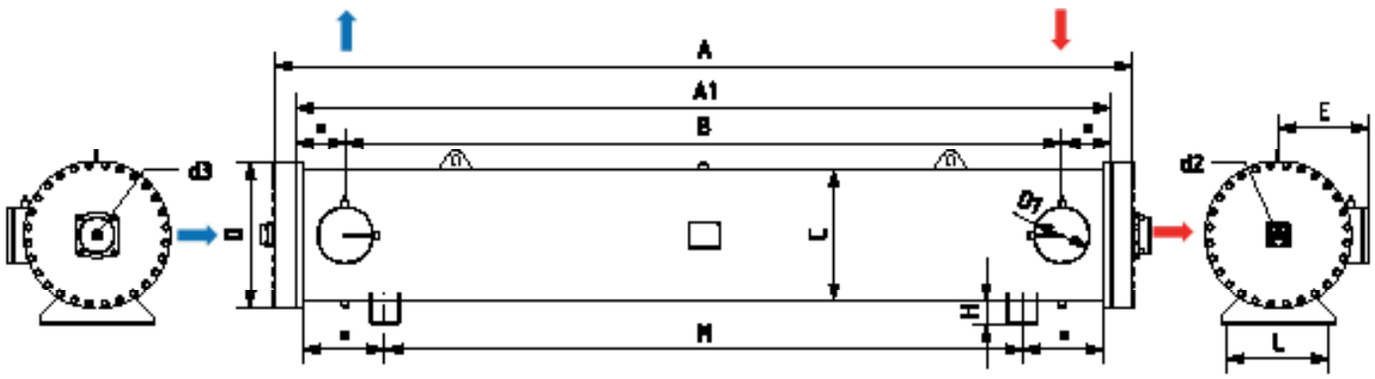
Coolant	Inlet water temperature	Outlet water temperature	Condensation temperature	Evaporation temperature	Superheat value	Pollution factor
R134A	12°C	7°C	40°C	3°C	5 K	0,000043 m^2 K/W

RLS SERIES 1 CIRCUIT EVAPORATORS

MODEL	Q Nominal (kW)	ΔP Nominal (kPa)	W Nominal (m^3/h)	W Max (m^3/h)	Gas Volume (L)	Water Volume (L)
RLS 200	175	18	28	39	26,60	125,48
RLS 250	260	30	43	60	41,11	176,20
RLS 300	340	41	59	83	46,08	170,38
RLS 350	380	48	67	94	55,37	175,18
RLS 400	425	41	74	104	60,95	168,64
RLS 450	475	53	81	113	65,01	163,89
RLS 500	510	43	88	123	70,34	157,66
RLS 550	520	41	89	125	79,80	285,12
RLS 600	580	33	100	140	87,66	275,91
RLS 620	640	41	110	154	95,79	266,41
RLS 650	700	50	120	168	99,34	262,25
RLS 700	780	65	132	185	113,29	245,92
RLS 770	800	27	95	133	124,05	488,40
RLS 850	840	31	144	202	136,23	474,15
RLS 900	920	38	158	221	148,68	459,58
RLS 950	1000	49	172	241	158,15	448,49
RLS 1000	1050	54	180	252	164,65	440,89
RLS 1100	1150	54	197	276	181,63	460,11
RLS 1200	1220	63	208	291	191,70	448,33
RLS 1300	1280	71	220	308	199,18	439,58
RLS 1400	1350	52	232	325	180,88	637,04
RLS 1500	1520	67	262	367	203,71	610,32
RLS 1600	1600	62	275	385	213,46	758,26
RLS 1700	1750	80	300	420	243,60	722,98

Q Nominal (kW)	Nominal cooling capacity
ΔP Nominal (kPa)	Nominal water circuit pressure loss
W Nominal (m^3/h)	Nominal water flow
W Max (m^3/h)	Maximum water flow
Gas Volume (L)	Coolant circuit volume
Water Volume (L)	Water circuit volume

RLS SERIES 1 CIRCUIT EVAPORATORS



MODEL	Dimensions												
	A(mm)	A1 (mm)	B(mm)	C(mm)	D(mm)	E(mm)	H(mm)	L(mm	M(mm)	d1	d2	d3	P(kg)
RLS 200	2930	2800	2530	273	337	236	88	280	2100	J5”	FL 42	FL 76	228
RLS 250	2940	2800	2500	324	390	262	95	300	2300	J6”	FL 54	FL 105	314
RLS 300	2940	2800	2500	324	390	262	95	300	2300	J6”	FL 54	FL 105	336
RLS 350	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 54	FL 105	344
RLS 400	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 54	FL 105	351
RLS 450	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 54	FL 105	355
RLS 500	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 54	FL 105	361
RLS 550	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 54	FL 140	509
RLS 600	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 54	FL 140	519
RLS 620	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 54	FL 140	531
RLS 650	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 54	FL 140	534
RLS 700	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 54	FL 140	552
RLS 770	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 76	FL 140	757
RLS 850	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 76	FL 168	771
RLS 900	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 76	FL 168	781
RLS 950	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 76	FL 168	799
RLS 1000	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 76	FL 219	802
RLS 1100	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 76	FL 219	850
RLS 1200	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 76	FL 219	858
RLS 1300	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 76	FL 219	868
RLS 1400	3800	3600	3150	558	620	380	95	400	2900	J10”	FL 105	FL 219	1026
RLS 1500	3800	3600	3150	558	620	380	95	400	2900	J10”	FL 105	FL 219	1060
RLS 1600	3820	3600	3150	609	680	405	95	500	2900	J10”	FL 105	FL 219	1168
RLS 1700	3820	3600	3150	609	680	405	95	500	2900	J10”	FL 105	FL 219	1208

RLD

CAPACITY, WATER FLOW AND VOLUME TABLE

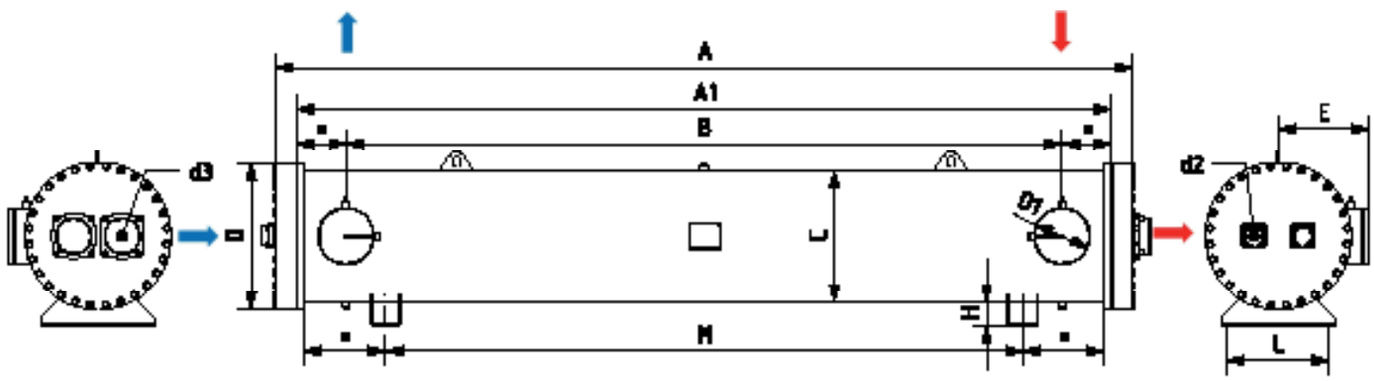
The values listed in the table were calculated based on the following operating conditions.

Coolant	Inlet water temperature	Outlet water temperature	Condensation temperature	Evaporation temperature	Superheat value	Pollution factor
R134A	12°C	7°C	40°C	3°C	5 K	0,000043 m^2 K/W

RLD SERIES 2 CIRCUITS EVAPORATORS

MODEL	Q Nominal (kW)	ΔP Nominal (kPa)	W Nominal (m^3/h)	W Max (m^3/h)	Gas Volume (L)	Water Volume (L)
RLD 200	175	18	28	39	26,70	125,48
RLD 250	260	30	43	60	41,00	176,20
RLD 300	340	41	59	83	45,73	170,65
RLD 350	380	48	67	94	55,01	175,47
RLD 400	425	41	74	104	60,59	168,94
RLD 450	475	53	81	113	64,90	163,89
RLD 500	510	43	88	123	70,48	157,36
RLD 550	520	41	89	125	79,30	285,12
RLD 600	580	33	100	140	87,16	275,91
RLD 620	640	41	110	154	95,28	266,41
RLD 650	700	50	120	168	98,84	262,25
RLD 700	780	65	132	185	112,54	246,22
RLD 770	800	27	95	133	124,28	488,40
RLD 850	840	31	144	202	136,46	474,15
RLD 900	920	38	158	221	148,65	459,89
RLD 950	1000	49	172	241	158,39	448,49
RLD 1000	1050	54	180	252	164,89	440,89
RLD 1100	1150	54	197	276	182,16	459,77
RLD 1200	1220	63	208	291	191,94	448,33
RLD 1300	1280	71	220	308	199,13	439,92
RLD 1400	1350	52	232	325	180,57	637,40
RLD 1500	1520	67	262	367	203,71	610,32
RLD 1600	1600	62	275	385	213,46	758,26
RLD 1700	1750	80	300	420	243,60	722,98

RLD SERIES 2 CIRCUITS EVAPORATORS



MODEL	Dimensions												
	A(mm)	A1 (mm)	B(mm)	C(mm)	D(mm)	E(mm)	H(mm)	L(mm	M(mm)	d1	d2	d3	P(kg)
RLD 200	2930	2800	2530	273	337	236	88	280	2100	J5”	FL 42	FL 76	259
RLD 250	2940	2800	2500	324	390	262	95	300	2300	J6”	FL 42	FL 80	336
RLD 300	2940	2800	2500	324	390	262	95	300	2300	J6”	FL 42	FL 80	337
RLD 350	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 42	FL 80	359
RLD 400	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 42	FL 80	366
RLD 450	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 42	FL 80	372
RLD 500	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 42	FL 80	378
RLD 550	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 42	FL 114	501
RLD 600	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 42	FL 114	512
RLD 620	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 42	FL 114	523
RLD 650	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 42	FL 114	530
RLD 700	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 42	FL 114	545
RLD 770	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 42	FL 140	735
RLD 850	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 42	FL 140	750
RLD 900	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 42	FL 140	766
RLD 950	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 42	FL 140	778
RLD 1000	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 42	FL 140	787
RLD 1100	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 42	FL 140	836
RLD 1200	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 42	FL 140	842
RLD 1300	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 42	FL 140	855
RLD 1400	3800	3600	3150	558	620	380	95	400	2900	J10”	FL 54	FL 140	1015
RLD 1500	3800	3600	3150	558	620	380	95	400	2900	J10”	FL 54	FL 140	1046
RLD 1600	3820	3600	3150	609	680	405	95	500	2900	J10”	FL 54	FL 140	1175
RLD 1700	3820	3600	3150	609	680	405	95	500	2900	J10”	FL 54	FL 140	1216

RLT

CAPACITY, WATER FLOW AND VOLUME TABLE

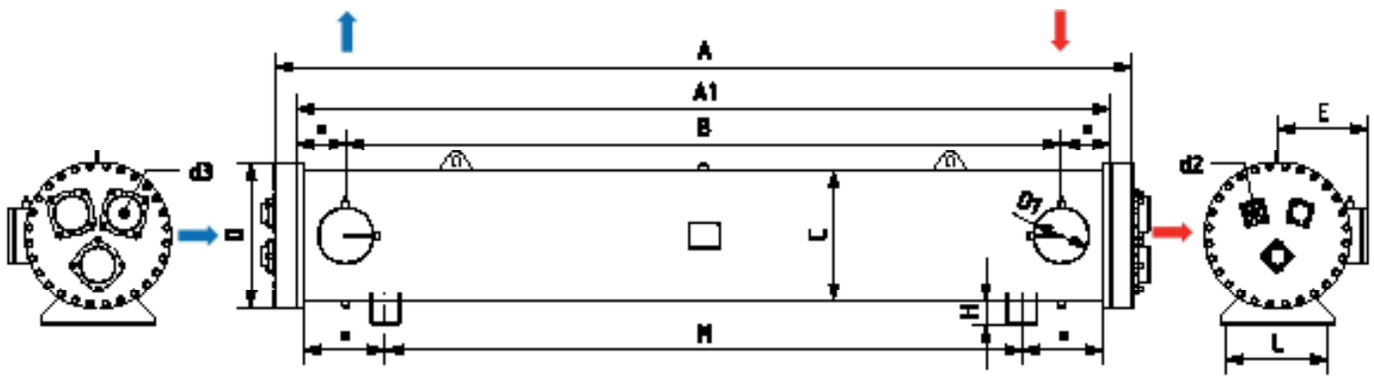
The values listed in the table were calculated based on the following operating conditions.

Coolant	Inlet water temperature	Outlet water temperature	Condensation temperature	Evaporation temperature	Superheat value	Pollution factor
R134A	12°C	7°C	40°C	3°C	5 K	0,000043 m^2 K/W

RLT SERIES 3 CIRCUITS EVAPORATORS

MODEL	Q Nominal (kW)	ΔP Nominal (kPa)	W Nominal (m^3/h)	W Max (m^3/h)	Gas Volume (L)	Water Volume (L)
RLT 200	175	18	28	39	26,81	125,48
RLT 250	260	30	43	60	40,39	176,20
RLT 300	340	41	59	83	45,62	170,65
RLT 350	380	48	67	94	54,89	175,47
RLT 400	425	41	74	104	60,35	169,09
RLT 450	475	53	81	113	65,30	163,30
RLT 500	510	43	88	123	68,60	159,44
RLT 550	520	41	89	125	78,30	286,90
RLT 600	580	33	100	140	85,91	277,99
RLT 620	640	41	110	154	95,81	266,41
RLT 650	700	50	120	168	99,11	262,55
RLT 700	780	65	132	185	112,81	246,51
RLT 770	800	27	95	133	124,56	488,08
RLT 850	840	31	144	202	135,92	474,78
RLT 900	920	38	158	221	148,65	459,89
RLT 950	1000	49	172	241	158,12	448,81
RLT 1000	1050	54	180	252	164,89	440,89
RLT 1100	1150	54	197	276	182,16	459,77
RLT 1200	1220	63	208	291	192,22	447,99
RLT 1300	1280	71	220	308	199,13	439,92
RLT 1400	1350	52	232	325	180,27	637,76
RLT 1500	1520	67	262	367	203,71	610,32
RLT 1600	1600	62	275	385	213,46	758,26
RLT 1700	1750	80	300	420	243,76	722,80

RLT SERIES 3 CIRCUITS EVAPORATORS



MODEL	Dimensions												
	A(mm)	A1 (mm)	B(mm)	C(mm)	D(mm)	E(mm)	H(mm)	L(mm	M(mm)	d1	d2	d3	P(kg)
RLT 200	2930	2800	2530	273	337	236	88	280	2100	J5”	FL 28	FL 54	259
RLT 250	2940	2800	2500	324	390	262	95	300	2300	J6”	FL 35	FL 67	336
RLT 300	2940	2800	2500	324	390	262	95	300	2300	J6”	FL 35	FL 67	337
RLT 350	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 35	FL 67	359
RLT 400	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 35	FL 76	366
RLT 450	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 35	FL 76	372
RLT 500	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 35	FL 76	378
RLT 550	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	518
RLT 600	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	528
RLT 620	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	539
RLT 650	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	546
RLT 700	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	561
RLT 770	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 35	FL 105	776
RLT 850	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 35	FL 105	791
RLT 900	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 35	FL 105	807
RLT 950	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 35	FL 105	820
RLT 1000	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 42	FL 140	829
RLT 1100	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 42	FL 140	877
RLT 1200	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 42	FL 140	884
RLT 1300	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 42	FL 140	897
RLT 1400	3800	3600	3150	558	620	380	95	400	2900	J10”	FL 54	FL 140	1015
RLT 1500	3800	3600	3150	558	620	380	95	400	2900	J10”	FL 54	FL 140	1046
RLT 1600	3820	3600	3150	609	680	405	95	500	2900	J10”	FL 67	FL 140	1175
RLT 1700	3820	3600	3150	609	680	405	95	500	2900	J10”	FL 67	FL 140	1216

RLQ

CAPACITY, WATER FLOW AND VOLUME TABLE

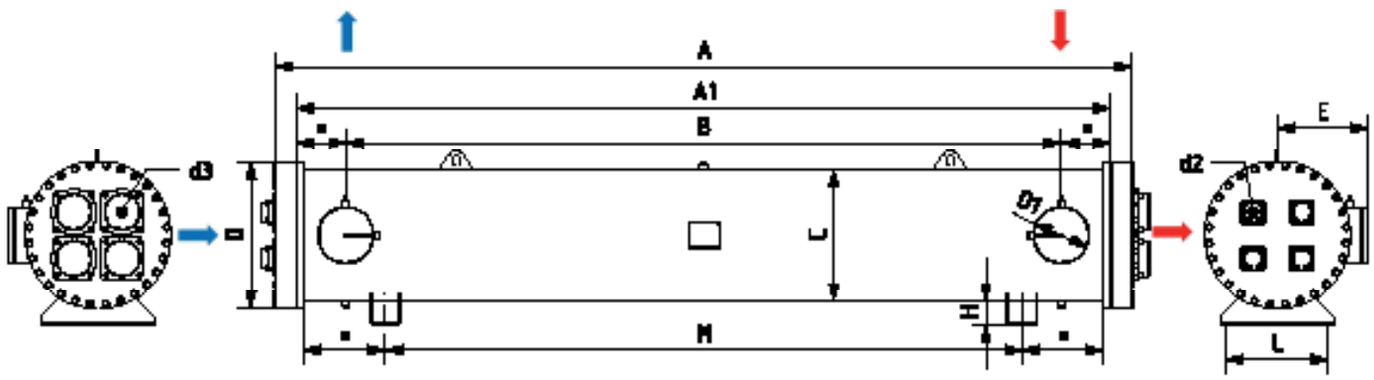
The values listed in the table were calculated based on the following operating conditions.

Coolant	Inlet water temperature	Outlet water temperature	Condensation temperature	Evaporation temperature	Superheat value	Pollution factor
R134A	12°C	7°C	40°C	3°C	5 K	0,000043 m^2 K/W

RLQ SERIES 4 CIRCUITS EVAPORATORS

MODEL	Q Nominal (kW)	ΔP Nominal (kPa)	W Nominal (m^3/h)	W Max (m^3/h)	Gas Volume (L)	Water Volume (L)
RLQ 250	260	30	43	60	41,12	175,92
RLQ 300	340	41	59	83	45,86	170,38
RLQ 350	380	48	67	94	54,89	175,47
RLQ 400	425	41	74	104	60,48	168,94
RLQ 450	475	53	81	113	64,03	164,78
RLQ 500	510	43	88	123	70,63	157,06
RLQ 550	520	41	89	125	79,57	285,41
RLQ 600	580	33	100	140	87,69	275,91
RLQ 620	640	41	110	154	95,81	266,41
RLQ 650	700	50	120	168	99,36	262,25
RLQ 700	780	65	132	185	113,07	246,22
RLQ 770	800	27	95	133	124,28	488,40
RLQ 850	840	31	144	202	136,46	474,15
RLQ 900	920	38	158	221	148,65	459,89
RLQ 950	1000	49	172	241	158,39	448,49
RLQ 1000	1050	54	180	252	164,89	440,89
RLQ 1100	1150	54	197	276	182,16	459,77
RLQ 1200	1220	63	208	291	191,65	448,67
RLQ 1300	1280	71	220	308	199,13	439,92
RLQ 1400	1350	52	232	325	180,57	637,40
RLQ 1500	1520	67	262	367	203,71	610,32
RLQ 1600	1600	62	275	385	213,15	758,61
RLQ 1700	1750	80	300	420	243,60	722,98

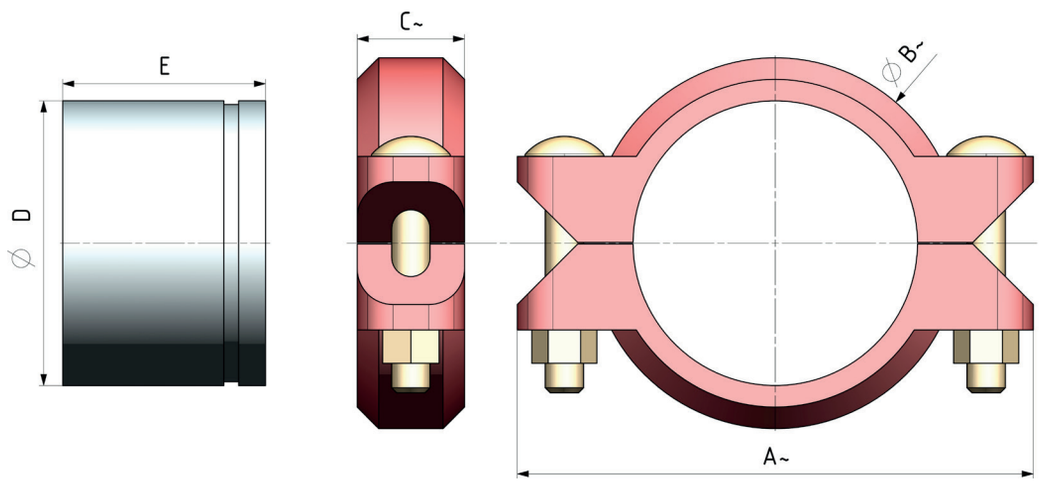
RLQ SERIES 4 CIRCUITS EVAPORATORS

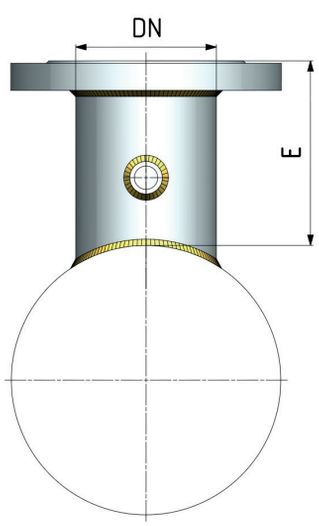


MODEL	Dimensions												
	A(mm)	A1 (mm)	B(mm)	C(mm)	D(mm)	E(mm)	H(mm)	L(mm	M(mm)	d1	d2	d3	P(kg)
RLQ 250	2940	2800	2500	324	390	262	88	300	2300	J5”	FL 35	FL 67	336
RLQ 300	2940	2800	2500	324	390	262	95	300	2300	J6”	FL 35	FL 67	337
RLQ 350	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 35	FL 67	359
RLQ 400	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 35	FL 76	366
RLQ 450	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 35	FL 76	372
RLQ 500	3140	3000	2700	324	390	262	95	300	2300	J6”	FL 35	FL 76	378
RLQ 550	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	518
RLQ 600	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	528
RLQ 620	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	539
RLQ 650	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	546
RLQ 700	3170	3000	2700	406	470	303	95	400	2300	J6”	FL 35	FL 105	561
RLQ 770	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 35	FL 105	776
RLQ 850	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 35	FL 105	791
RLQ 900	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 35	FL 105	807
RLQ 950	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 35	FL 105	820
RLQ 1000	3380	3200	2810	508	572	354	95	400	2500	J8”	FL 42	FL 140	829
RLQ 1100	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 42	FL 140	877
RLQ 1200	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 42	FL 140	884
RLQ 1300	3580	3400	3010	508	572	354	95	400	2700	J8”	FL 42	FL 140	897
RLQ 1400	3800	3600	3150	558	620	380	95	400	2900	J10”	FL 54	FL 140	1015
RLQ 1500	3800	3600	3150	558	620	380	95	400	2900	J10”	FL 54	FL 140	1046
RLQ 1600	3820	3600	3150	609	680	405	95	500	2900	J10”	FL 67	FL 140	1175
RLQ 1700	3820	3600	3150	609	680	405	95	500	2900	J10”	FL 67	FL 140	1216

ACCESSORIES

Dimensions					
CODE	A	B	C	D	E
J3 FLC089	165	115	50	88,9	80
J4 FLC114	200	145	50	114,3	100
J5 FLC140	245	175	50	139,7	100
J6 FLC168	275	205	55	168,3	150
J8 FLC220	345	265	60	219,1	150





Flanged Connection (DN)

Dimensions		
CODE	DN(mm)	E(mm)
DN 100	114,3	150
DN 125	139,7	150
DN 150	168,3	150
DN 200	219,1	200

Refkar Soğutma ve Isı Transfer Cihazları San. Ve Tic. Ltd. Şti

Office Address: Yeşilköy Mah. Atatürk Cad. EGS Business Park Blokları
B3 Blok No:167 Kat:3 Bakırköy/İstanbul – Türkiye / Tel: +90 212 671 95 99

Factory Address: Kırklareli Organize Sanayi Bölgesi 15 Sk. No: 6
Kızılcıkdere Köyü Mevkii Merkez/Kırklareli – Türkiye / Tel: +90 288 502 34 08