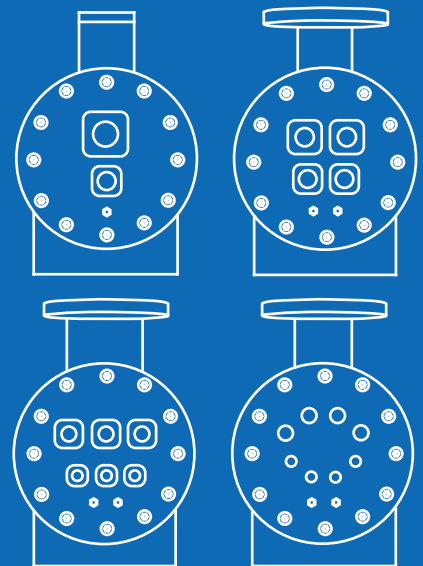


# RC SERIES EVAPORATOR





# 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 m<sup>2</sup> closed factory area established on 6.500 m<sup>2</sup> 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

RC range evaporators are standard-manufactured for R407C and designed to be used with R410A, R134A and other HFC, HFO (R 1234ze etc.) coolants. Areas of use include comfort and industrial chillers under high-evaporation temperatures (+2-+10).

RC range evaporators offer cooling gas circuit options based on the number of compressors:

- **RCS** for 1 independent compressor circuit,
- **RCD** for 2 independent compressor circuits,
- **RCT** for 3 independent compressor circuits,
- **RCQ** for 4 independent compressor circuits.

“Refkar SELECTOR Software” can be used to select evaporators for other operating temperatures.



RCS - 1 Circuit



RCD - 2 Circuits



RCT - 3 Circuits



RCQ - 4 Circuits

## DESIGN AND MATERIAL

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

Heat transfer pipes	Copper / internal threads
Tube sheet	Carbon steel
Chassis piping and water connections	Carbon steel
Guide screens	Plastic
Cover and coolant connections	Carbon steel

Evaporators can be manufactured with the materials and for the requirements listed below.

Heat transfer pipes	Copper-Nickel 90/10 alloy, AISI 316L and AISI 304L stainless steel, carbon steel
Tube sheet	AISI 316L or AISI 304L stainless steel
Chassis piping and water connections	AISI 316L and AISI 304L stainless steel
Guide screens	Carbon steel, AISI 316L and AISI 304L stainless steel

## QUALITY AND TEST

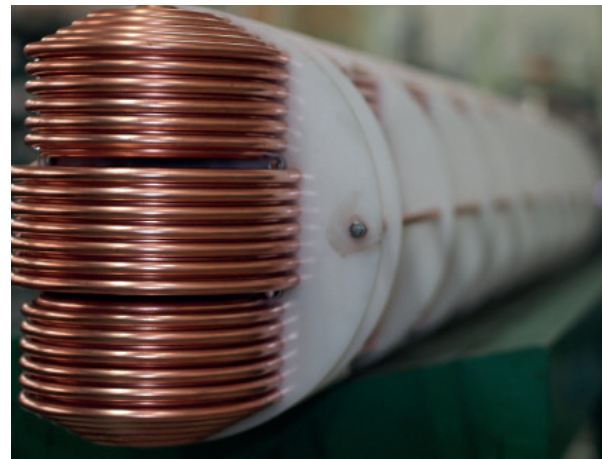
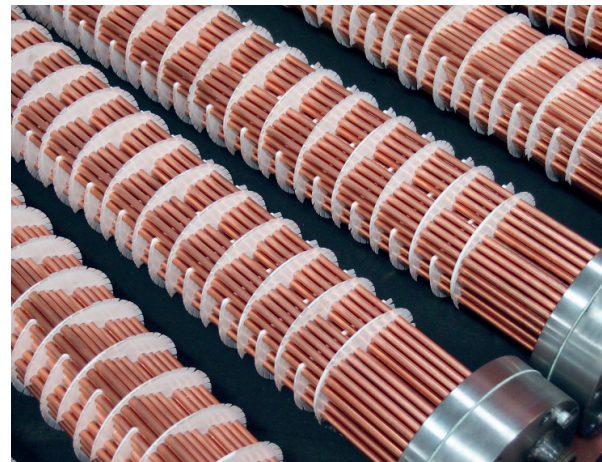
Mechanical calculations of Refkar RC line evaporators are in accordance with TS EN13445-3 standard and with a CE certificate in compliance with ISO 9001:2008 quality management system. Refkar Shell&Tube evaporators are tested with a gas side of 33 bars and a water side of 11 bars. Helium leak test is a standard test for all products. For Refkar products, a guarantee is offered against coolant leak 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	30 bar	10 bar	-10 °C	90 °C	Up to Cat.IV, 2014/68/EU

## FOULING FACTOR

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

Closed-circuit mains water	f.f.= 0,000043 m <sup>2</sup> K/W
Open-circuit mains water	f.f.= 0,000086 m <sup>2</sup> K/W
Glycol solution < %40	f.f.= 0,000086 m <sup>2</sup> K/W
Glycol solution > %40	f.f.= 0,000172 m <sup>2</sup> K/W



## ANTIFREEZE RECOMMENDATIONS

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

Freezing Point [°C]	Ethilene Glyco [% 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 evaporator.

- 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 in accordance with catalog values.
- Do not stop the water flow before the coolant in the evaporator is discharged.
- When not in use, fill the evaporator fully with anti-freeze fluid with no air in it and fully evacuate it, ensuring that it is dry.
- Regularly check the chemical properties of the water inside the evaporator. Incompliant water damages the evaporator.
- In case of a capacity decrease, you can reverse-operate the system for a short 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.



## CAPACITY, WATER FLOW AND VOLUME TABLE

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

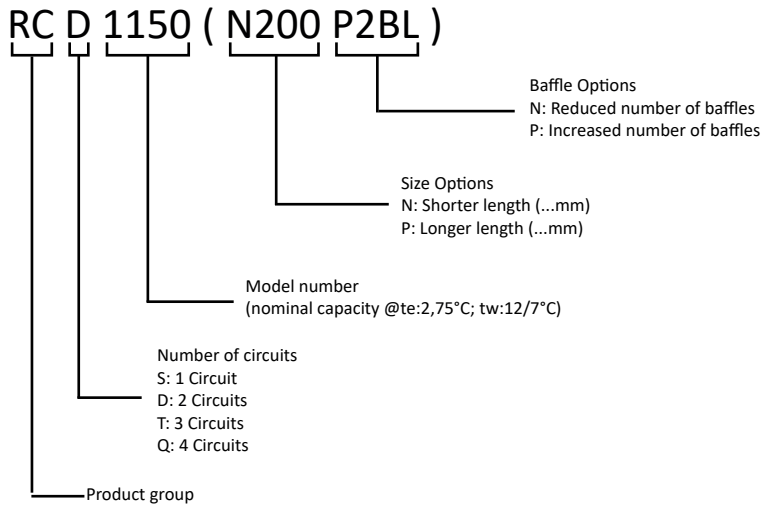
Coolant	Water input	Water output	Condensation temperature	Evaporation temperature	Superheat value	Pollution factor f.f
R407C	12°C	7°C (It is 8°C for RC20 and RC30)	42°C	2,75°C (dew)	5 K	0,000043 m <sup>2</sup> K/W

MODEL	Q Nominal (kW)	ΔP Nominal (kPa)	W Nominal (m <sup>3</sup> /h)	W Max (m <sup>3</sup> /h)	Volume Freon (L)	Volume Water (L)
RC 20	21	16	4	6	2,6	8,0
RC 30	32	20	5	7	3,1	9,5
RC 40	42	45	8	11	3,8	11,6
RC 50	50	48	9	13	4,3	13,2
RC 60	61	41	11	15	5,7	18,7
RC 70	74	48	13	18	6,4	20,9
RC 80	86	61	15	21	7,3	23,8
RC 100	104	64	18	25	8,0	26,1
RC 135	135	49	22	31	11,1	35,8
RC 145	144	54	25	35	12,9	41,2
RC 165	162	53	28	39	14,2	45,2
RC 185	185	28	32	45	15,8	34,2
RC 205	202	35	35	49	19,4	59,2
RC 245	242	54	42	59	21,9	66,7
RC 290	295	28	50	70	26,1	116,6
RC 340	345	50	59	83	28,7	113,5
RC 390	395	34	68	95	33,9	107,4
RC 450	450	36	77	108	40,8	165,4
RC 500	515	39	88	123	45,2	160,2
RC 590	585	54	99	139	51,0	153,4
RC 660	665	37	116	162	61,2	268,8
RC 770	775	59	132	185	69,6	259,0
RC 850	850	58	145	210	76,7	250,7
RC 920	900	58	160	224	82,9	243,4
RC 1050	1050	62	181	253	98,1	286,2
RC 1150	1150	58	200	280	118,9	373,0
RC 1250	1250	63	213	298	124,3	366,8
RC 1350	1350	66	236	330	134,7	471,8
RC 1500	1450	73	265	371	151,3	452,5

Q Nominal (kW)	Nominal cooling capacity
ΔP Nominal (kPa)	Nominal water circuit pressure loss
W Nominal (m <sup>3</sup> /h)	Nominal water flow
W max (m <sup>3</sup> /h)	Maximum water flow
Volume Freon (L)	Coolant circuit volume
Volume Water (L)	Water circuit volume

Note: Common capacity table for all RC models (RCS, RCD, RCT, RCQ).

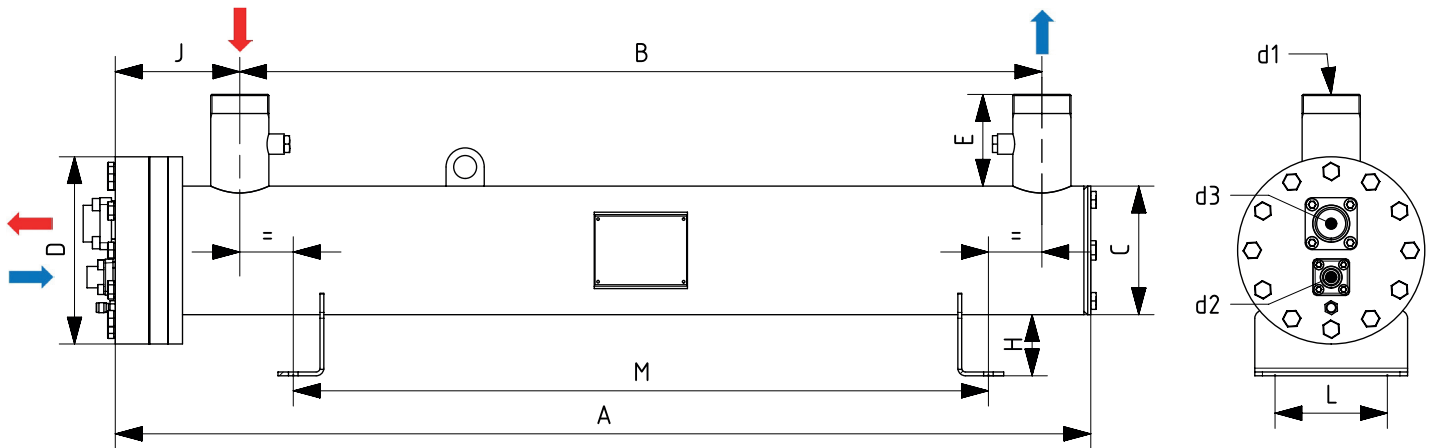
## SELECTION NOTATION SAMPLE



## RCS

### MEASURING TABLES

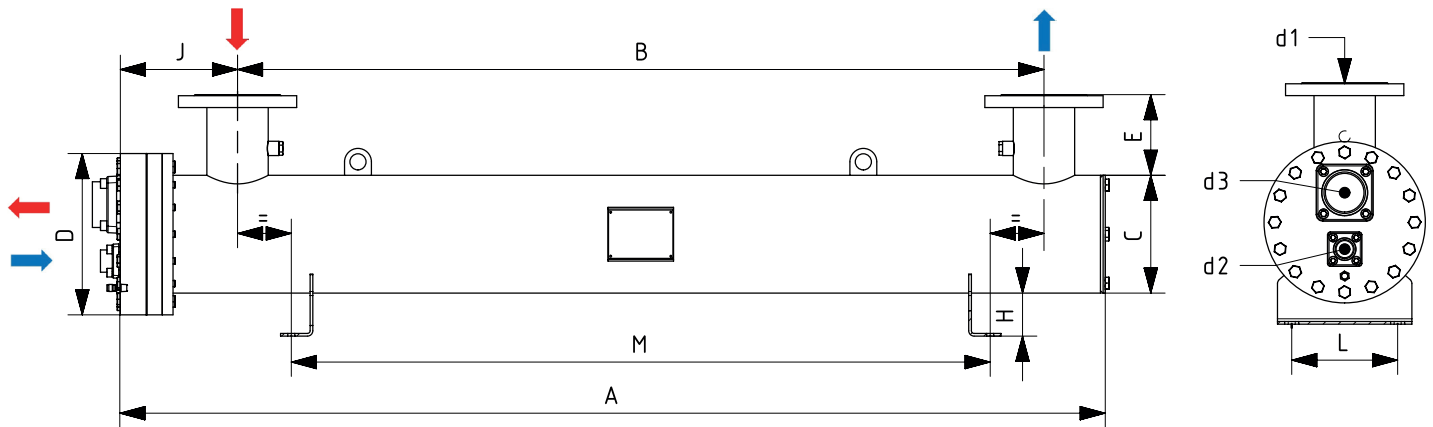
RCS 0020 - RCS 0165 / 1 Independent Compressor Circuit



MODEL	A(mm)	B(mm)	C (mm)	D(mm)	E(mm)	H(mm)	L(mm)	J(mm)	M(mm)	d1	d2	d3	P (kg)
RCS0020	865	660	140	195	120	80	117	160	550	G 1½	FL 22	FL 35	40
RCS0030	1015	810	140	195	120	80	117	160	700	G 1½	FL 22	FL 35	43
RCS0040	1215	1000	140	195	120	80	117	160	900	G 2	FL 22	FL 35	47
RCS0050	1375	1160	140	195	120	80	117	160	1060	G 2	FL 22	FL 35	50
RCS0060	1285	1050	168	245	120	80	147	170	910	G 2½	FL 22	FL 42	66
RCS0070	1435	1200	168	245	120	80	147	170	1060	G 2½	FL 22	FL 42	71
RCS0080	1635	1385	168	245	120	80	147	170	1260	G 2½	FL 22	FL 42	74
RCS0100	1785	1535	168	245	120	80	147	170	1410	G 2½	FL 22	FL42	77
RCS0135	1830	1555	194	260	120	80	180	195	1200	G 3	FL 35	FL 54	90
RCS0145	2110	1835	194	260	120	80	180	195	1500	G 3	FL 35	FL 54	98
RCS0165	2310	2035	194	260	120	80	180	195	1700	G 3	FL 35	FL 54	106



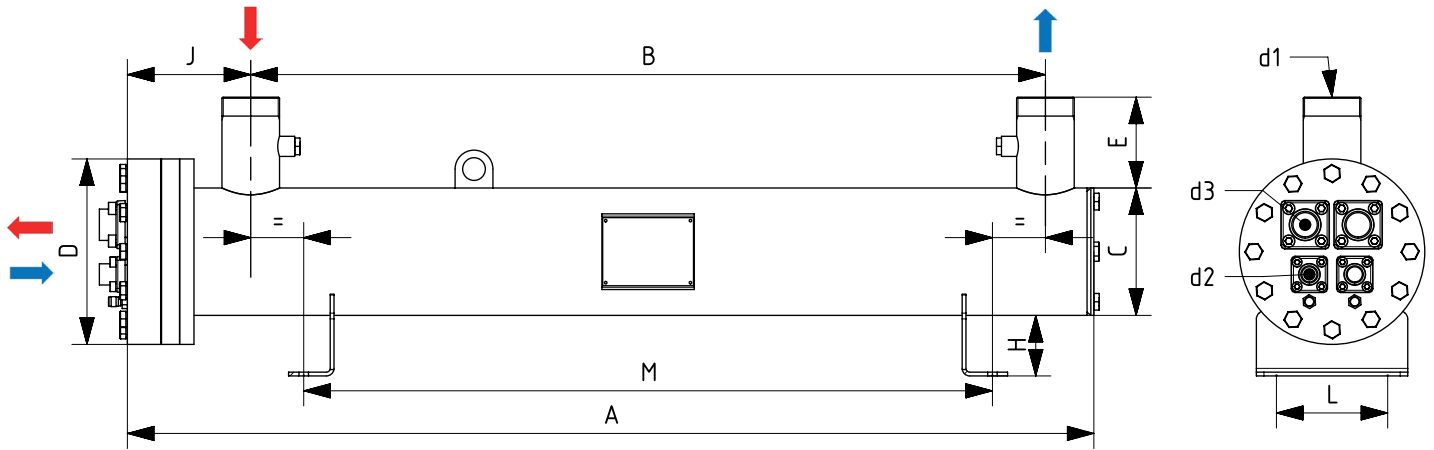
## RCS 0185 - RCS 1500 / 1 Independent Compressor Circuit



MODEL	A(mm)	B(mm)	C (mm)	D(mm)	E(mm)	H(mm)	L(mm)	J(mm)	M(mm)	d1	d2	d3	P (kg)
RCS0185	1920	1580	219	300	150	80	200	225	1400	DN 100	FL 35	FL 80	125
RCS0205	2340	2000	219	300	150	80	200	225	1800	DN 100	FL 35	FL 80	143
RCS0245	2640	2300	219	300	150	80	200	225	2100	DN 100	FL 35	FL 80	155
RCS0290	2670	2270	273	350	150	100	245	255	2100	DN 125	FL 42	FL 80	209
RCS0340	2670	2270	273	350	150	100	245	255	2100	DN 125	FL 42	FL 80	220
RCS0390	2670	2270	273	350	150	100	245	255	2100	DN 125	FL 42	FL 80	230
RCS0450	2720	2270	324	420	150	100	280	285	2100	DN 150	FL 42	FL 80	285
RCS0500	2720	2270	324	420	150	100	280	285	2100	DN 150	FL 42	FL 80	292
RCS0590	2720	2270	324	420	150	100	280	285	2100	DN 150	FL 42	FL 80	301
RCS0660	2750	2200	406	510	200	100	370	335	2000	DN 200	FL 54	FL 105	440
RCS0770	2750	2200	406	510	200	100	370	335	2000	DN 200	FL 54	FL 105	455
RCS0850	2750	2200	406	510	200	100	370	335	2000	DN 200	FL 54	FL 105	480
RCS0920	2750	2200	406	510	200	100	370	335	2000	DN 200	FL 54	FL 105	506
RCS1050	3275	2700	406	510	200	100	370	335	2200	DN 200	FL 54	FL 105	550
RCS1150	3275	2700	457	570	200	100	420	335	2200	DN 200	FL 67	FL 140	650
RCS1250	3275	2700	457	570	200	100	420	335	2200	DN 200	FL 67	FL 140	670
RCS1350	3285	2700	508	620	200	100	470	335	2200	DN 200	FL 67	FL 140	750
RCS1500	3285	2700	508	620	200	100	470	335	2200	DN 200	FL 67	FL 140	780

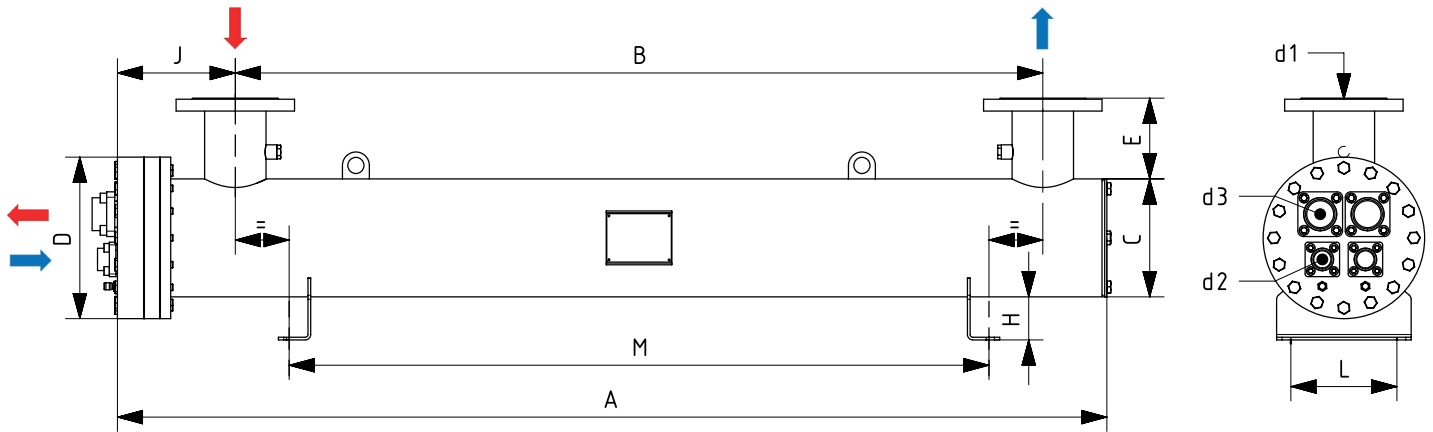
## RCD

RCD 0020 - RCD 0165 /2 Independent Compressor Circuits



MODEL	A(mm)	B(mm)	C (mm)	D(mm)	E(mm)	H(mm)	L(mm)	J(mm)	M(mm)	d1	d2	d3	P (kg)
RCD0020	865	660	140	195	120	80	117	160	550	G 1½	FL 16	FL 28	40
RCD0030	1015	810	140	195	120	80	117	160	700	G 1½	FL 16	FL 28	43
RCD0040	1215	1000	140	195	120	80	117	160	900	G 2	FL 16	FL 28	47
RCD0050	1375	1160	140	195	120	80	117	160	1060	G 2	FL 16	FL 28	50
RCD0060	1285	1050	168	245	120	80	147	170	910	G 2½	FL 22	FL 35	66
RCD0070	1435	1200	168	245	120	80	147	170	1060	G 2½	FL 22	FL 35	71
RCD0080	1635	1385	168	245	120	80	147	170	1260	G 2½	FL 22	FL 35	74
RCD0100	1785	1535	168	245	120	80	147	170	1410	G 2½	FL 22	FL 35	77
RCD0135	1830	1555	194	260	120	80	180	195	1200	G 3	FL 22	FL 42	90
RCD0145	2110	1835	194	260	120	80	180	195	1500	G 3	FL 22	FL 42	98
RCD0165	2310	2035	194	260	120	80	180	195	1700	G 3	FL 22	FL 42	106

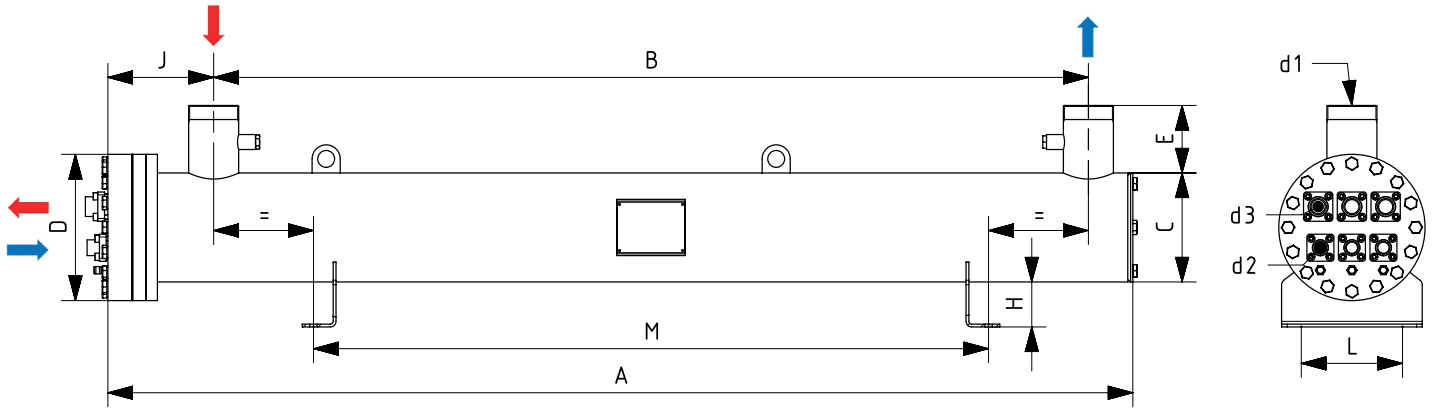
## RCD 0185 - RCD 1500 / 2 Independent Compressor Circuits



MODEL	A(mm)	B(mm)	C (mm)	D(mm)	E(mm)	H(mm)	L(mm)	J(mm)	M(mm)	d1	d2	d3	P (kg)
RCD0185	1920	1580	219	300	150	80	200	225	1400	DN 100	FL 35	FL 54	125
RCD0205	2340	2000	219	300	150	80	200	225	1800	DN 100	FL 35	FL 54	143
RCD0245	2640	2300	219	300	150	80	200	225	2100	DN 100	FL 35	FL 54	155
RCD0290	2670	2270	273	350	150	100	245	255	2100	DN 125	FL 42	FL 67	209
RCD0340	2670	2270	273	350	150	100	245	255	2100	DN 125	FL 42	FL 67	220
RCD0390	2670	2270	273	350	150	100	245	255	2100	DN 125	FL 42	FL 67	230
RCD0450	2720	2270	324	420	150	100	280	285	2100	DN 150	FL 42	FL 80	285
RCD0500	2720	2270	324	420	150	100	280	285	2100	DN 150	FL 42	FL 80	292
RCD0590	2720	2270	324	420	150	100	280	285	2100	DN 150	FL 42	FL 80	301
RCD0660	2750	2200	406	510	200	100	370	335	2000	DN 200	FL 42	FL 80	440
RCD0770	2750	2200	406	510	200	100	370	335	2000	DN 200	FL 42	FL 80	455
RCD0850	2750	2200	406	510	200	100	370	335	2000	DN 200	FL 42	FL 80	480
RCD0920	2750	2200	406	510	200	100	370	335	2000	DN 200	FL 42	FL 80	506
RCD1050	3275	2700	406	510	200	100	370	335	2200	DN 200	FL 42	FL 80	550
RCD1150	3275	2700	457	570	200	100	420	335	2200	DN 200	FL 54	FL 105	650
RCD1250	3275	2700	457	570	200	100	420	335	2200	DN 200	FL 54	FL 105	670
RCD1350	3285	2700	508	620	200	100	470	335	2200	DN 200	FL 54	FL 105	750
RCD1500	3285	2700	508	620	200	100	470	335	2200	DN 200	FL 54	FL 105	780

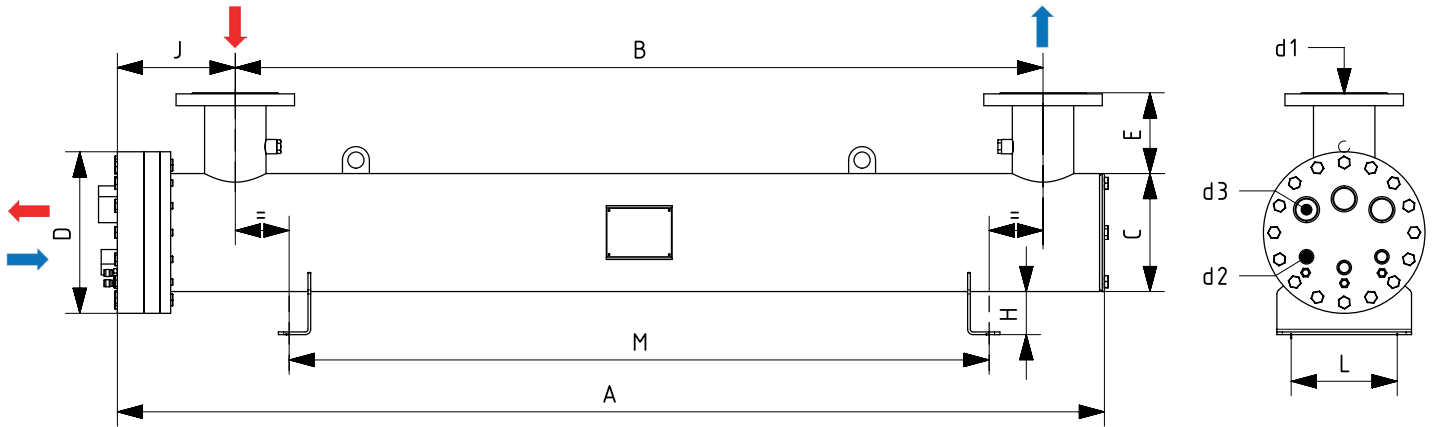
## RCT

RCT 0135 - RCT 0165 / 3 Independent Compressor Circuits



MODEL	A(mm)	B(mm)	C (mm)	D(mm)	E(mm)	H(mm)	L(mm)	J(mm)	M(mm)	d1	d2	d3	P (kg)
RCT0135	1830	1555	194	260	120	80	180	195	1200	G 3	FL 22	FL 35	90
RCT0145	2110	1835	194	260	120	80	180	195	1500	G 3	FL 22	FL 35	98
RCT0165	2310	2035	194	260	120	80	180	195	1700	G 3	FL 22	FL 35	106

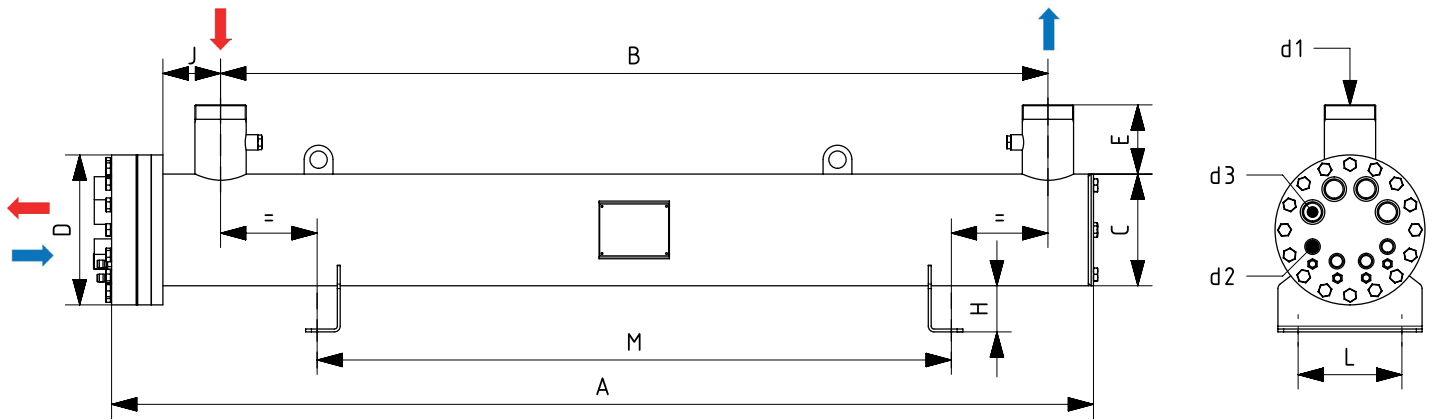
## RCT 0185 - RCT 1500 / 3 Independent Compressor Circuits



MODEL	A(mm)	B(mm)	C (mm)	D(mm)	E(mm)	H(mm)	L(mm)	J(mm)	M(mm)	d1	d2	d3	P (kg)
RCT0185	1920	1580	219	300	150	80	200	225	1400	DN 100	W 22	W 42	125
RCT0205	2340	2000	219	300	150	80	200	225	1800	DN 100	W 22	W 42	143
RCT0245	2640	2300	219	300	150	80	200	225	2100	DN 100	W 22	W 42	155
RCT0290	2670	2270	273	350	150	100	245	255	2100	DN 125	W 35	W 54	209
RCT0340	2670	2270	273	350	150	100	245	255	2100	DN 125	W 35	W 54	220
RCT0390	2670	2270	273	350	150	100	245	255	2100	DN 125	W 35	W 54	230
RCT0450	2720	2270	324	420	150	100	280	285	2100	DN 150	W 35	W 54	285
RCT0500	2720	2270	324	420	150	100	280	285	2100	DN 150	W 35	W 54	292
RCT0590	2720	2270	324	420	150	100	280	285	2100	DN 150	W 35	W 54	301
RCT0660	2750	2200	406	510	200	100	370	335	2000	DN 200	W 42	W 80	440
RCT0770	2750	2200	406	510	200	100	370	335	2000	DN 200	W 42	W 80	455
RCT0850	2750	2200	406	510	200	100	370	335	2000	DN 200	W 42	W 80	480
RCT0920	2750	2200	406	510	200	100	370	335	2000	DN 200	W 42	W 80	506
RCT1050	3275	2700	406	510	200	100	370	335	2200	DN 200	W 42	W 80	550
RCT1150	3275	2700	457	570	200	100	420	335	2200	DN 200	W 42	W 80	650
RCT1250	3275	2700	457	570	200	100	420	335	2200	DN 200	W 42	W 80	670
RCT1350	3285	2700	508	620	200	100	470	335	2200	DN 200	W 42	W 80	750
RCT1500	3285	2700	508	620	200	100	470	335	2200	DN 200	W 42	W 80	780

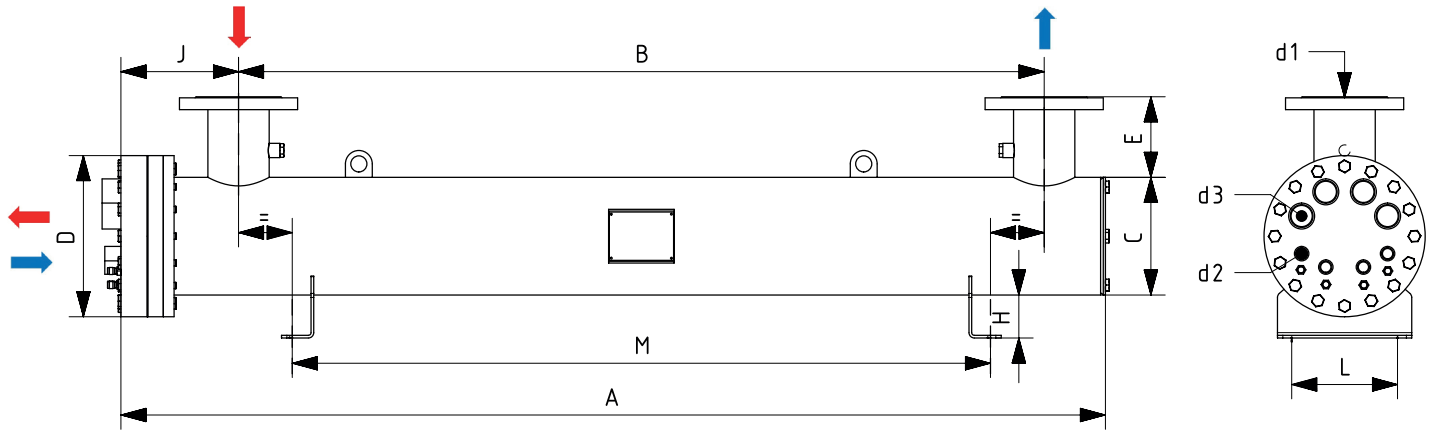
## RCQ

RCQ 0135 - RCQ 0165 / 4 Independent Compressor Circuits



MODEL	A(mm)	B(mm)	C (mm)	D(mm)	E(mm)	H(mm)	L(mm)	J(mm)	M(mm)	d1	d2	d3	P (kg)
RCQ0135	1830	1555	194	260	120	80	180	195	1200	G 3	W 22	W 35	90
RCQ0145	2110	1835	194	260	120	80	180	195	1500	G 3	W 22	W 35	98
RCQ0165	2310	2035	194	260	120	80	180	195	1700	G 3	W 22	W 35	106

## RCQ 0185 - RCQ 1500 / 4 Independent Compressor Circuits



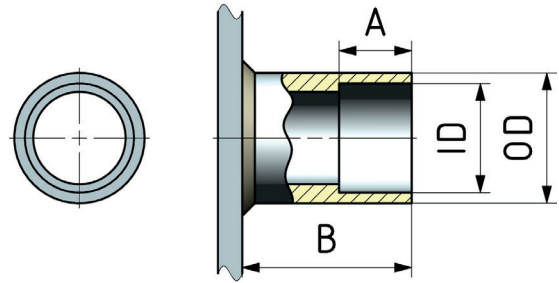
MODEL	A(mm)	B(mm)	C (mm)	D(mm)	E(mm)	H(mm)	L(mm)	J(mm)	M(mm)	d1	d2	d3	P (kg)
RCQ0185	1920	1580	219	300	150	80	200	225	1400	DN 100	W 22	W 42	125
RCQ0205	2340	2000	219	300	150	80	200	225	1800	DN 100	W 22	W 42	143
RCQ0245	2640	2300	219	300	150	80	200	225	2100	DN 100	W 22	W 42	155
RCQ0290	2670	2270	273	350	150	100	245	255	2100	DN 125	W 22	W 42	209
RCQ0340	2670	2270	273	350	150	100	245	255	2100	DN 125	W 22	W 42	220
RCQ0390	2670	2270	273	350	150	100	245	255	2100	DN 125	W 22	W 42	230
RCQ0450	2720	2270	324	420	150	100	280	285	2100	DN 150	W 35	W 54	285
RCQ0500	2720	2270	324	420	150	100	280	285	2100	DN 150	W 35	W 54	292
RCQ0590	2720	2270	324	420	150	100	280	285	2100	DN 150	W 35	W 54	301
RCQ0660	2750	2200	406	510	200	100	370	335	2000	DN 200	W 35	W 80	440
RCQ0770	2750	2200	406	510	200	100	370	335	2000	DN 200	W 35	W 80	455
RCQ0850	2750	2200	406	510	200	100	370	335	2000	DN 200	W 35	W 80	480
RCQ0920	2750	2200	406	510	200	100	370	335	2000	DN 200	W 35	W 80	506
RCQ1050	3275	2700	406	510	200	100	370	335	2200	DN 200	W 35	W 80	550
RCQ1150	3275	2700	457	570	200	100	420	335	2200	DN 200	W 42	W 80	650
RCQ1250	3275	2700	457	570	200	100	420	335	2200	DN 200	W 42	W 80	670
RCQ1350	3285	2700	508	620	200	100	470	335	2200	DN 200	W 42	W 80	750
RCQ1500	3285	2700	508	620	200	100	470	335	2200	DN 200	W 42	W 80	780



## COOLANT CONNECTION OPTIONS

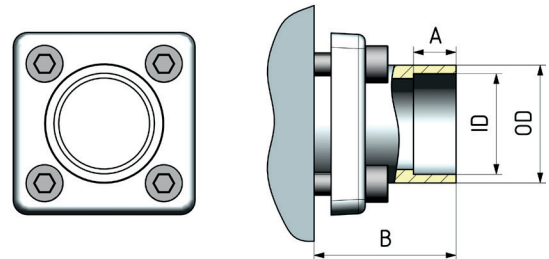
### Welded connection (W)

Dimensions				
CODE	A	B	ID	OD
W 16	15	30	16,2	21,3
W 19	15	30	19,4	25
W 22	15	30	22,6	26,9
W 28	15	30	28,8	33,7
W 35	15	30	35,4	42,4
W 42	15	35	42,3	48,3
W 54	15	45	54,3	60,3
W 67	20	50	67	76
W 80	20	50	80,5	88,9
W 105	20	50	106	114



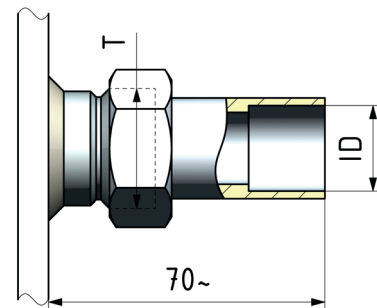
### Flanged connection (FL)

Dimensions				
CODE	A	B	ID	OD
FL 16	15	40	16,1	20,5
FL 19	15	40	19,4	24
FL 22	15	40	22,6	28
FL 28	15	40	29	35
FL 35	15	40	35,4	41,4
FL 42	15	40	42	48
FL 54	15	50	54,8	61
FL 67	25	55	67	74
FL 80	25	55	80,5	85
FL 105	25	55	106	115



### Rotalock connection (RLA)

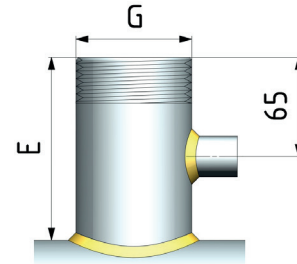
Dimensions		
CODE	ID	T
RLA 16	16,2	1"14-UNS
RLA 19	19,4	1"14-UNS
RLB 22	22,6	1 1/4"12-UNF
RLB 28	28,8	1 1/4"12-UNF
RLC 28	28,8	1 3/4"12-UN
RLC 35	35,4	1 3/4"12-UN
RLC 42	42,3	1 3/4"12-UN



WATER CIRCUIT CONNECTION OPTIONS

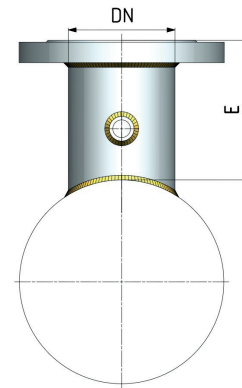
Threaded pipe connection (G)

Dimensions			
CODE	G	G(mm)	E(mm)
G1	G 1"	33,7	120
G11	G 1 ½"	48,3	120
G2	G 2"	60,4	120
G21	G 2 ½"	73,1	120
G3	G 3"	88,9	120



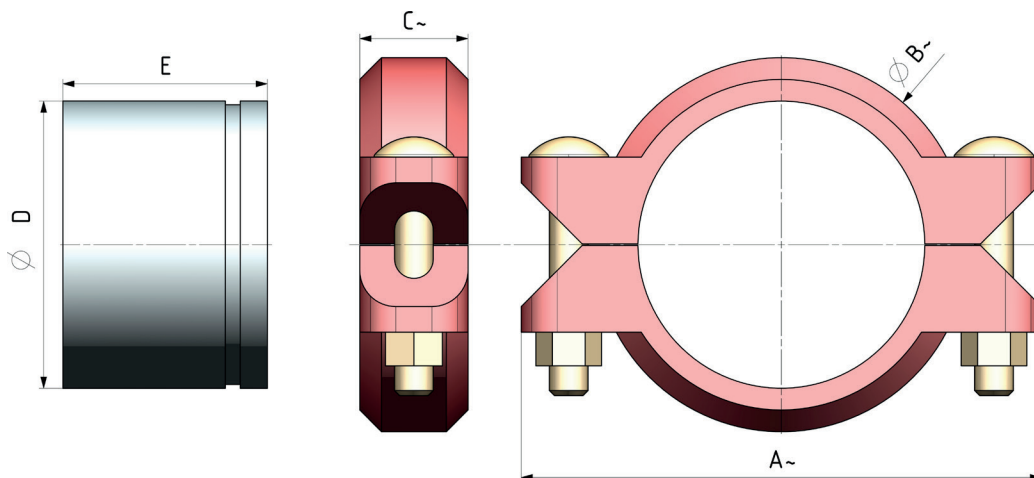
Flanged connection (DN)

Dimensions		
CODE	DN(mm)	E(mm)
DN 100	114	120
DN 125	140	120
DN 150	168	120
DN 200	220	120



Flexible coupling (FLC)

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







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