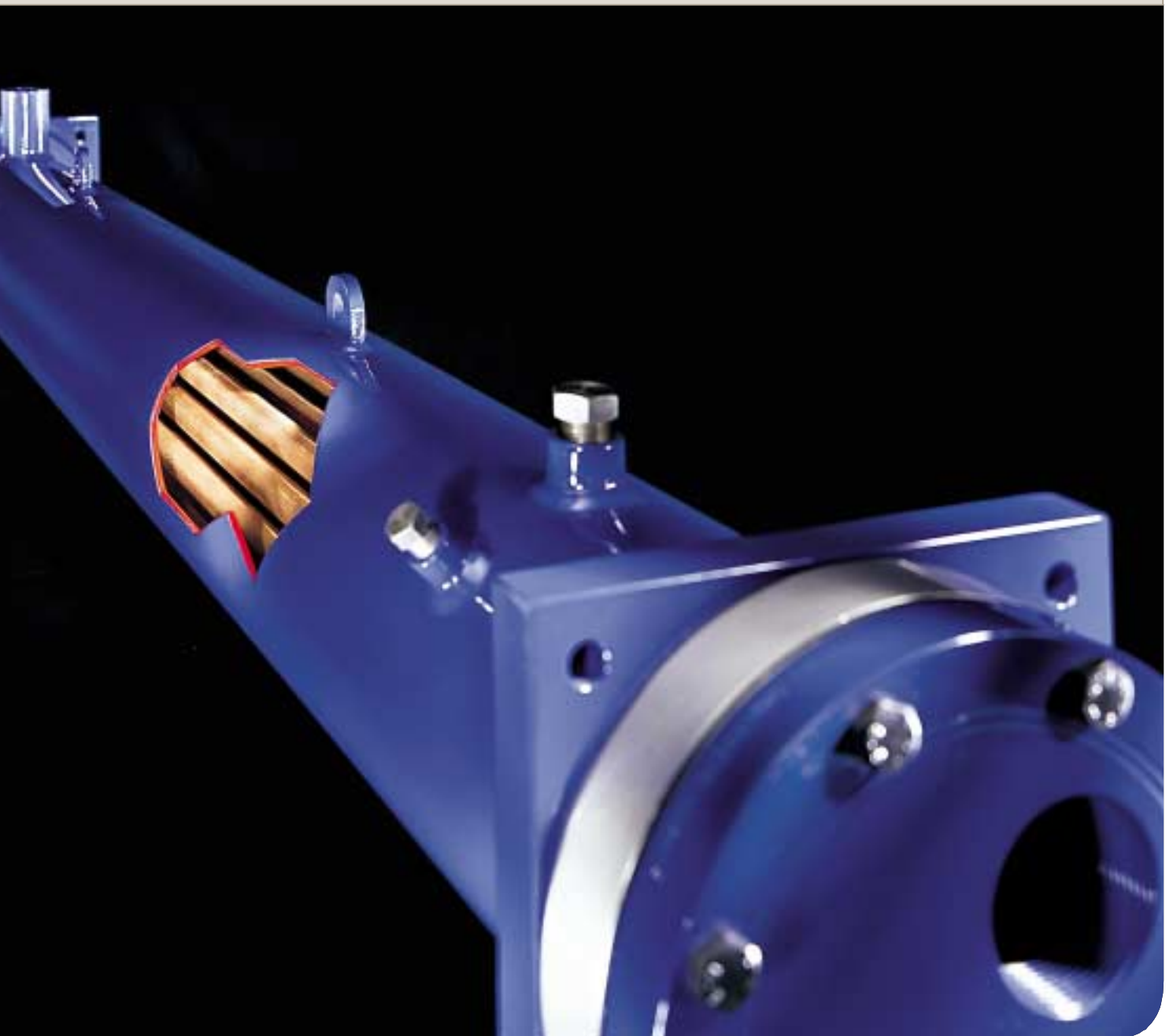




Water cooled condensers

Shell and tube condensers for fresh and sea water applications



Water cooled condensers

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 - A world of applications
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The widest range

Alfa Laval's shell and tube production includes a wide range of condensers and desuperheaters with 9 different series providing individual solutions for each conditioning, refrigeration and cooling application. Standard models fulfil condensation capacities ranging from 3 to 900 kW and 1680 kW can easily be reached with the extension of the new CDEW series. The different condenser series have been carefully optimised for the most used HFC refrigerants. All condenser models can be opened for inspection and maintenance purposes. CFC, CRS, CPLUS, ACFL and CDEW series are designed to operate with fresh water and CFC/M, CFL/M, ACFC/M and

ACFL/M series are dedicated to sea water applications thanks to material selection and correct sizing in order to prevent fouling and corrosion. All condenser models can be supplied in HR desuperheater version for water heating in a partial or total heat recovery system. Thanks to HRC configuration, CDEW and CPLUS can be supplied with two heat exchanger assembled in one shell. This configuration allows to operate alternatively the condenser and the total heat recovery functions. Alfa Laval quality systems are certified in accordance with ISO9001 from TÜV-D, a further warranty of the shell and tube condenser's high quality level.

A world of applications

Alfa Laval's shell and tube condensers represent the optimal solution for all the application where HFC condensation is required. Water cooled chillers and heat pumps for air conditioning or industrial cooling in combination with several types

of processes. Commercial and industrial refrigeration plants with water condensation. On-board or all the other applications where sea, lake or river water is available.



Air Conditioning



Process Cooling



Commercial and Industrial Refrigeration



Marine

1 High performances due to special design finned Cu and Cu/Ni tubes and tube geometry.

3 The only shell and tube condenser series optimised for R407C.

5 Easy installation.

7 All models can be opened for inspection & maintenance

9 All the most diffused pressure vessel approvals are available as a standard. Specific approvals available on request.

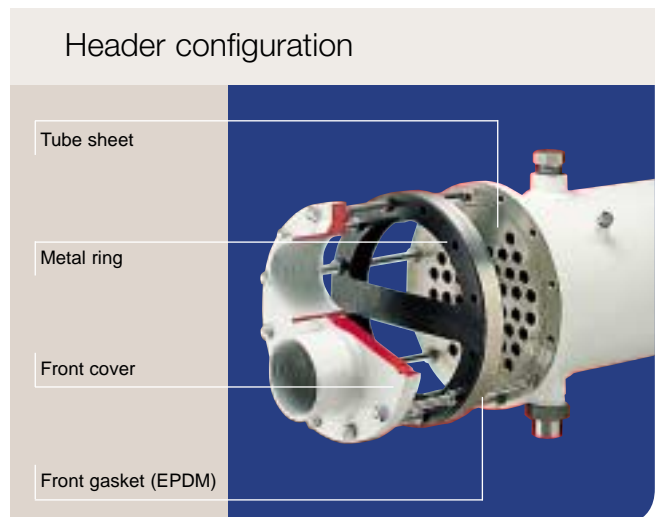
2 9 different condenser series for a total of 105 models: the correct solution for each application.

4 2 passes & 4 passes version.

6 Desuperheater version!

8 Solutions for applications with fresh water & sea water

10 Every single condenser is pressure leak tested before delivery ensuring top quality products.



CDEW series of shell and tube condensers has been optimised by Alfa Laval's R&D dept. and Laboratory in order to ensure the highest performance with HFC-R407C. This refrigerant is particularly affected by glide and this phenomenon can be relevant during the condensing phase causing losses in performance if standard condensers designed to operate with azeotrop refrigerant are used. Thanks to its special design and sizing, CDEW condensers can now reduce 3K

the condensation temperature with respect to the standard condenser series. In a water chiller this means:

- COP improvement +11%
- Input power -6%

Also supports and brackets costs are reduced by the condenser square tube sheets that provide a simple and cheap solution.

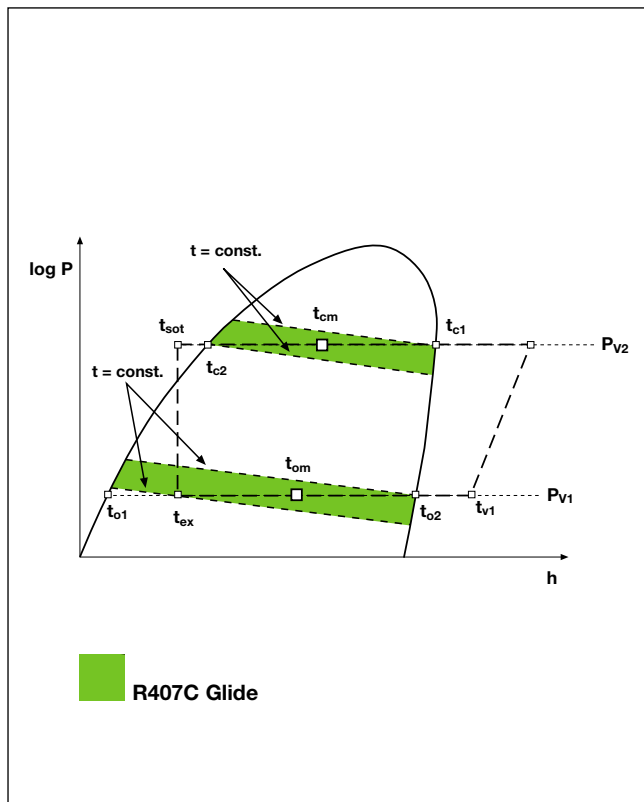
Performance on a wide range

The new CDEW series capacity range is from 57 to 840 kW with standard models and up to 1680 kW. CDEW shell and tube heat exchangers are available in condenser and desuperheater version in order to provide partial or total heat reco-

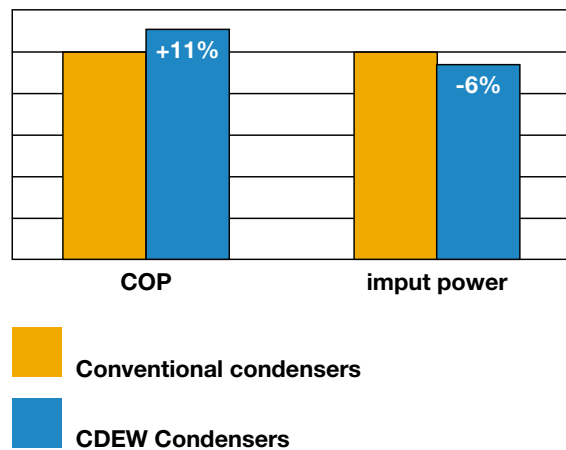
very in cooling systems.

CDEW heat exchangers are available in accordance with the major pressure vessel codes as CE (Europe), UDT (Poland), GOST (Russia), SQL (China), ASME (USA).

CDEW



CDEW Performances with R407C

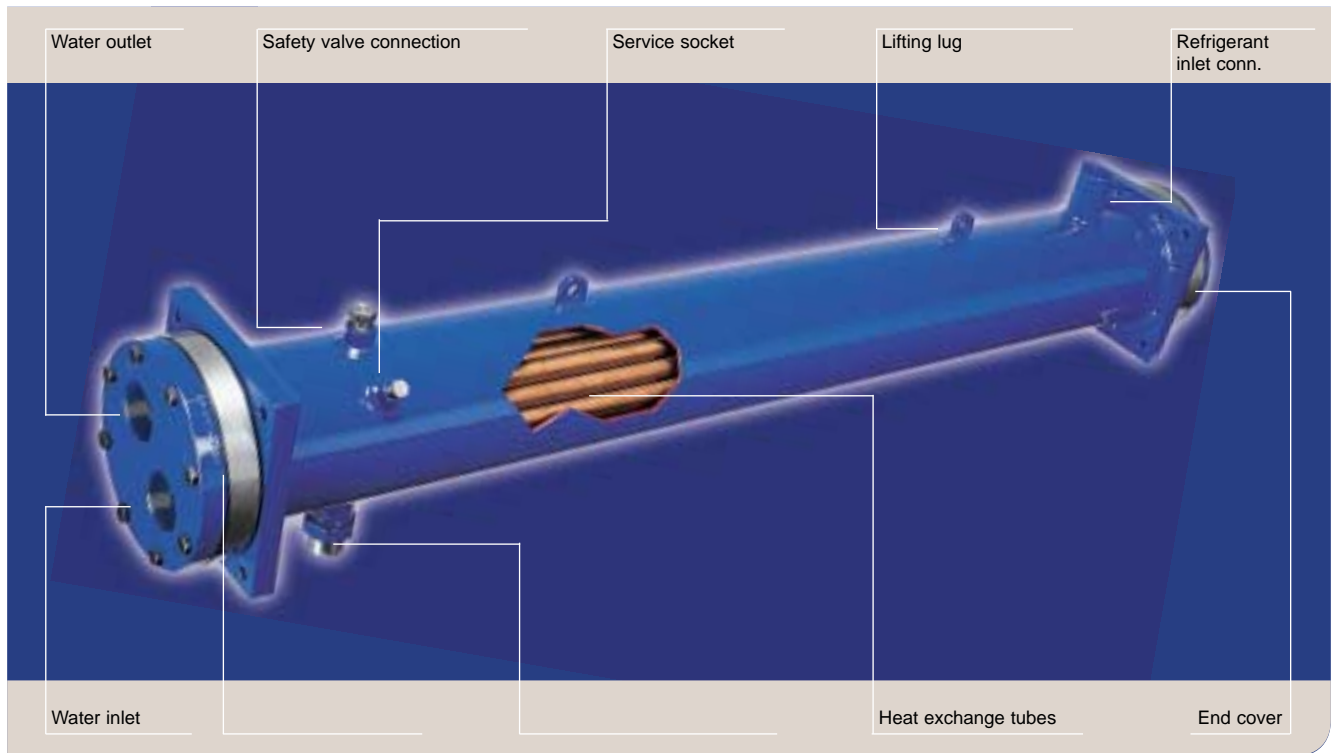


Models designed for fresh water applications (series CFC, CRS, ACFL, CPLUS and CDEW) use the following components:

- Shell: carbon steel
- Tube sheets: carbon steel
- Tubes: integrally finned thick wall copper tubing
- Covers: carbon steel
- Gasket: thermopolymer compound
- Baffles: teflon

All the carbon steel components are sand blasted, including

the internal wall of the shell. The precise fit of the tube exchanger baffle eliminates the risk of copper filings collecting. Models belonging to series CFC, CRS and ACFL on request can be manufactured in stainless steel execution. The new header configuration for CPLUS and CDEW allows an increase in water pressure to 10 bar. The special gasket configuration resists high pressure and gives the best resistance to ageing in the working temperature range. For models with shell diameter larger than 219 mm a sight glass is available as an option.



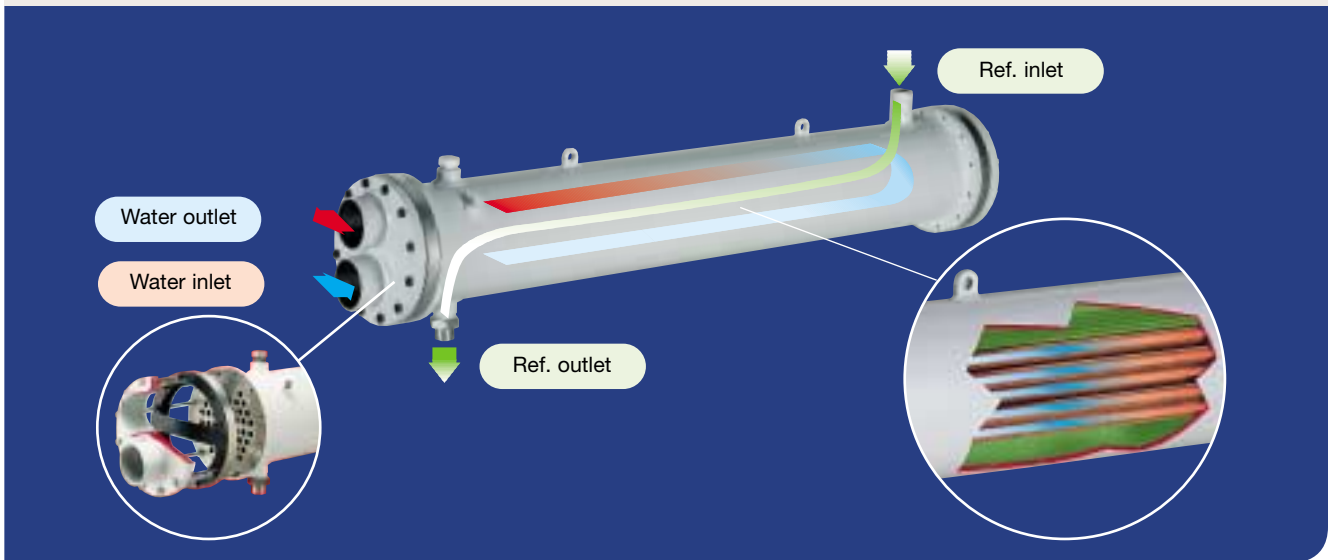
Quality tests and pressure vessel approvals

The working limits are defined by the design pressure (i.e. the maximum working pressure) and the working temperature range. These limits depend on the pressure vessel approval required. Alfa Laval's condensers are available as a standard with the most diffused pressure vessel approvals. On request

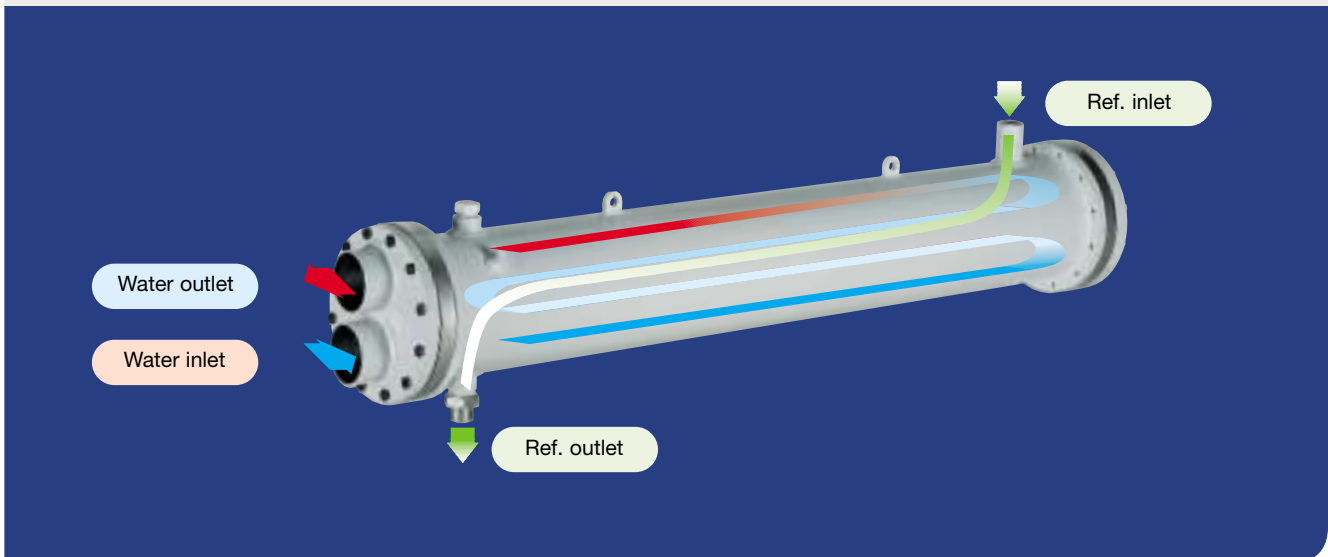
marine or other specific approvals are available. Alfa Laval shell and tube condensers are manufactured in accordance with ISO9001. Each unit undergoes an individual pressure and leak test as specified by the relevant authority and in accordance with Alfa Laval internal quality procedures.

NOMINAL DATA		ALFA LAVAL (self inspected)	CE (PED 97/23 EC)	UDT P×V>300 bar x dm ³	ASME OD ≥ 6"	SQL	GOST
Design pressure refrigerant side	bar	30	30	24,5	30	24,5	24,5
Test pressure refrigerant side	bar	33	43	27	45	27	27
Design pressure water side	bar	10	10	10	10,3	10	10
Test pressure water side	bar	15	15	15	15,5	15	15
Design temperature range	°C	-10/+90	-10/+90	-10/+90	-10/+90	-10/+90	-10/+90

2 passes (Cooling tower water)



4 passes (City water)



Sea water for a trouble-free condensation

4 condenser series are dedicated to sea water, for on board marine applications and for all the other installations where it is possible to use the sea as a natural source of cooling water.

Standard capacities range from 7 to 900 kW. Marine models are equipped with the following components:

- Shell: carbon steel
- Tube sheets: AISI 316 stainless steel
- Tubes: integrally finned Cu/Ni tubing
- Covers: AISI 316 stainless steel
- Gasket: thermopolymer compound
- Baffles: carbon steel

Marine units are provided with interchangeable anodes made of soft iron.



Where the water flows

The nominal performances have been calculated on the basis of an FF equal to 0.000043 m²K/W (0.00005 h m²K/kcal).

v > 1.2 m/s	Normal city water	FF 0.000086 m ² K/W
	Treated tower water	
	Clear river water	
	Sea Water	

v > 1.2 m/s	City lime water	FF 0.000172 m ² K/W
	Normal tower water	
	Brine	

v > 1.2 m/s	Tower lime water	FF 0.000344 m ² K/W
	Muddy river water	



The ideal choice, when maintenance is needed

Shell and tube condensers are often used in combination with not perfectly clean water for heavy duty applications. It is an exciting challenge for a product designed in order to have a long working life. In these cases, periodical cleaning is required in order to

keep the heat exchanger's performances unchanged time by time.

Alfa Laval fresh and sea water condensers ensure easy opening for inspection, cleaning and maintenance purposes.

Fittings

CDEW condensers are equipped with square tube sheets ensuring a simple solution for the unit positioning. CPLUS and all the other series can be supplied with bolt-on supports (fig. A) or with supports welded directly to the shell body (fig. B).

Universal brackets to be easily mounting during the condenser installation can be supplied (fig. C). The type of required support should be specified when ordering.

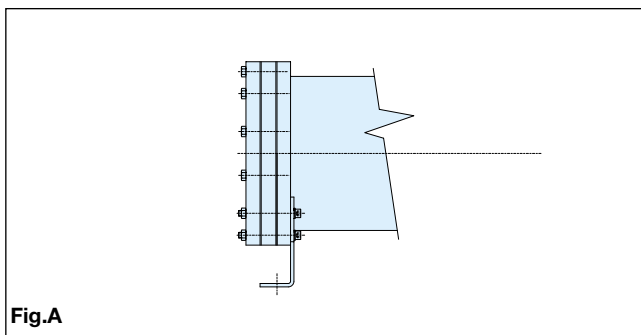


Fig.A

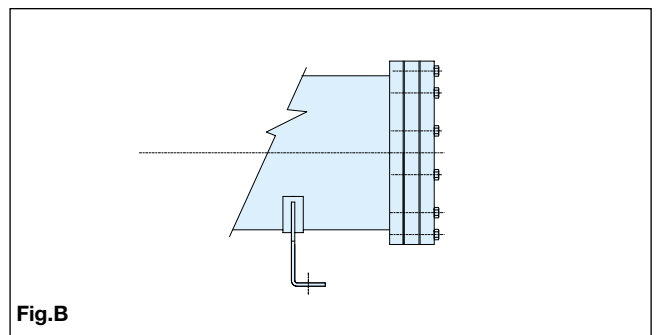


Fig.B

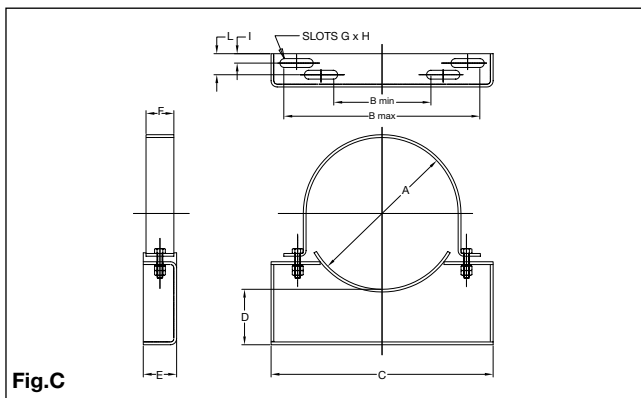


Fig.C

Universal Brackets Dimensions (mm)										
A	B		C	D	E	F	SLOTS		I	L
	min	max					G	H		
140	82	178	220	60	50	40	12	60	25	-
168	112	208	250	60	50	40	12	60	25	-
194	46	238	280	60	50	40	12	60	15	32
219	82	276	320	80	50	40	12	60	15	32
273	176	352	400	100	60	50	16	60	17	38
324	108	372	420	100	60	50	16	60	17	38
406	216	468	520	120	80	60	18	60	20	54

Model	CDEW	60	80	100	120	135	165	190	215	240	260	300	360	400	450	470	520	550	610	680	760	840
Cooling tower water (2 passes)																						
R407C refrigerant	Qn (kW)	57	75	100	118	135	165	190	215	233	260	300	360	400	450	470	520	550	610	680	760	840
Tc, mean = 42 °C	Wn (m³/h)	9.5	12.7	17.5	20.6	20.2	25.5	27.7	30.7	33.6	37.0	44.0	53.3	59.2	62.9	68.4	75.8	83.4	90.8	99.9	110.5	121.7
Ti = 29,4 °C	Wm (m³/h)	12.3	16.4	22.5	26.6	27.6	35.8	38.9	43.0	43.0	51.1	61.4	73.6	81.8	86.9	94.1	104	114	122.7	135	151.4	167.7
FF = 0.000043m² K/W	Dpn (bar)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
City water (4 passes)																						
R407C refrigerant	Qn (kW)	60	81	109	130	146	182	203	225	250	280	330	396	452	487	510	566	635	670	740	828	924
Tc, mean = 35°C	Wn (m³/h)	3.4	4.5	6.1	7.2	7.5	9.3	10.2	11.3	12.1	14	16.8	20	22.1	23.8	25.6	28	31.5	33.8	37.1	41.6	46.2
Ti = 15°C	Wm (m³/h)	4.1	5.5	7.5	8.9	8.9	11.8	12.9	14.3	14.5	17.1	20.4	24.4	26.9	28.9	31.8	34.9	39	43	47.3	53	58.7
FF = 0.000043 m² K/W	Dpn (bar)	0.35	0.35	0.35	0.35	0.38	0.38	0.38	0.38	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.43	0.43	0.43	0.43

Model	CPS	35	45	60	80	70	100	120	145	160	180	210	235	260	285	335	390	440	520
Cooling tower water (2 passes)																			
R22 refrigerant	Qn (kW)	33.5	46.2	59.1	81.8	68	96.1	120.7	144.3	162.4	182	208	236	260	285	336	388	438	522
Tc = 40.6°C	Wn (m³/h)	5.2	6.9	8.6	11.7	10.3	13.8	17.3	20.7	23.3	25.9	29.4	32.8	36.3	41.4	48.4	55.3	62.2	73.4
Ti = 29.4°C	Wm (m³/h)	6.2	8.3	10.4	14	12.4	16.6	20.7	24.9	28	31.1	35.2	39.4	43.5	49.7	58	66.3	74.6	88.1
FF = 0.000043 m² K/W	Dpn (bar)	0.44	0.44	0.44	0.44	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
City water (4 passes)																			
R22 refrigerant	Qn (kW)	37	50.1	63.1	87.1	69.9	98.6	121.5	146.7	165.6	182	207	234	260	288	339	389	442	523
Tc = 35°C	Wn (m³/h)	2	2.6	3.3	4.4	4	5.3	6.5	7.9	8.8	9.8	11.2	12.4	13.7	15.6	18.3	20.9	23.5	27.1
Ti = 15°C	Wm (m³/h)	2.6	3.5	4.3	5.8	5.2	6.9	8.6	10.4	11.7	13	14.7	16.4	18.1	20.7	24.2	27.6	31	36.7
FF = 0.000043 m² K/W	Dpn (bar)	0.5	0.5	0.5	0.5	0.42	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.42

Model	CFC	8	12	15	20	25	30	40	50	60
Cooling tower water (4 passes)										
R22 refrigerant	Qn (kW)	8.1	12.2	15.2	20.3	25.3	30.4	40.5	50.6	60.8
Tc = 40.6°C	Wn (m³/h)	1.5	2.2	2.2	3	3.7	4.5	6	7.5	9
Ti = 29.4°C	Wm (m³/h)	1.7	2.6	2.6	3.4	4.3	5.1	6.8	8.6	10.3
FF = 0.000043 m² K/W	Dpn (bar)	0.38	0.38	0.43	0.43	0.43	0.43	0.43	0.43	0.43
City water (8 passes)										
R22 refrigerant	Qn (kW)	9.1	13.6	15.7	21	26.2	31.5	42	52.5	63
Tc = 35°C	Wn (m³/h)	0.6	0.9	0.9	1.2	1.5	1.7	2.3	2.9	3.5
Ti = 15°C	Wm (m³/h)	0.8	1.3	1.3	1.7	2.1	2.6	3.4	4.3	5.1
FF = 0.000043 m² K/W	Dpn (bar)	0.48	0.48	0.54	0.54	0.54	0.54	0.54	0.54	0.54

Model	CRS	3	6	8	12	15	20	25
Cooling tower water (2 passes CRS 3-6 • 4 passes CRS 8-25)								
R22 refrigerant	Qn (kW)	3.2	6.5	8.1	12.2	15.2	20.3	25.3
Tc = 40.6°C	Wn (m³/h)	0.8	1.6	1.5	2.2	2.2	3	3.7
Ti = 29.4°C	Wm (m³/h)	0.9	1.8	1.7	2.6	2.6	3.4	4.3
FF = 0.000043 m² K/W	Dpn (bar)	0.22	0.22	0.38	0.38	0.43	0.43	0.43
City water (4 passes CRS 3-6 • 8 passes CRS 8-25)								
R22 refrigerant	Qn (kW)	3.8	7.7	9.1	13.6	15.7	21	26.2
Tc = 35°C	Wn (m³/h)	0.3	0.6	0.6	0.9	0.9	1.2	1.5
Ti = 15°C	Wm (m³/h)	0.5	0.9	0.8	1.3	1.3	1.7	2.1
FF = 0.000043 m² K/W	Dpn (bar)	0.28	0.28	0.48	0.48	0.54	0.54	0.54

Model	ACFL	450/360	450/414	450/468	450/522	450/576	750/648	750/738	750/828	750/900
Cooling tower water (2 passes)										
R22 refrigerant	Qn (kW)	360	414	468	522	576	648	738	828	900
Tc = 40.6°C	Wn (m³/h)	48.9	56.2	63.5	70.9	78.2	88	100	112	122
Ti = 29.4°C	Wm (m³/h)	55.5	63.9	72.2	80.5	88.9	99	113	127	138
FF = 0.000043 m² K/W	Dpn (bar)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
City water (4 passes)										
R22 refrigerant	Qn (kW)	360	414	468	522	576	-	-	-	-
Tc = 35°C	Wn (m³/h)	18.9	21.7	24.5	27.4	30.2	-	-	-	-
Ti = 15°C	Wm (m³/h)	27.8	31.9	36.1	40.3	44.4	-	-	-	-
FF = 0.000043 m² K/W	Dpn (bar)	0.43	0.43	0.43	0.43	0.43	-	-	-	-

Qn nominal condensation capacity **Wm** maximum water flow rate **Ti** water inlet temperature
Wn nominal water flow rate **Tc** maximum condensing temperature **FF** water inlet fouling factor

Model	CFC/M	8	12	15	20	25	30	40	50	60
Sea Water (4 passes)										
R22 refrigerant	Qn (kW)	7.6	11.3	13.5	18	22.5	27	36.4	45.5	54.7
Tc = 40.6°C	Wn (m³/h)	1.2	1.8	1.8	2.6	3.1	3.7	4.9	6.1	7.4
Ti = 29.4°C	Wm (m³/h)	1.4	2.0	2.1	2.9	4.3	4.2	4.5	6.9	8.4
FF = 0.000043 m² K/W	Dpn (bar)	0.27	0.27	0.30	0.33	0.33	0.33	0.33	0.33	0.33
Sea Water (8 passes)										
R22 refrigerant	Qn (kW)	8.6	12.9	14.9	19.9	24.9	29.9	39.9	49.9	59.8
Tc = 35°C	Wn (m³/h)	0.6	0.9	0.9	1.2	1.5	1.7	2.3	2.9	3.5
Ti = 15°C	Wm (m³/h)	0.8	1.3	1.3	1.7	2.1	2.6	3.4	4.3	5.1
FF = 0.000043 m² K/W	Dpn (bar)	0.53	0.51	0.58	0.57	0.59	0.52	0.52	0.54	0.55

Model	CFL/M	42	50	56	75	95	110	125	145	165
Sea Water (2 passes)										
R22 refrigerant	Qn (kW)	38	45.6	50.9	67.8	84.9	101.6	111.1	129.7	149.4
Tc = 40.6°C	Wn (m³/h)	6.2	7.4	7.4	9.8	12.3	14.8	14.8	17.3	18.5
Ti = 29.4°C	Wm (m³/h)	7.0	8.4	8.4	11.1	13.9	16.7	16.7	19.6	20.9
FF = 0.000043 m² K/W	Dpn (bar)	0.27	0.27	0.29	0.29	0.29	0.29	0.31	0.31	0.34
Sea Water (4 passes)										
R22 refrigerant	Qn (kW)	38	50.1	54.4	72.5	90.6	108.7	115.6	134.7	156.8
Tc = 35°C	Wn (m³/h)	3.1	3.7	3.7	4.9	6.2	7.4	7.4	8.6	9.3
Ti = 15°C	Wm (m³/h)	3.5	4.2	4.2	5.5	7.0	8.4	8.4	9.7	10.5
FF = 0.000043 m² K/W	Dpn (bar)	0.38	0.38	0.38	0.42	0.42	0.42	0.45	0.46	0.49

Model	ACFC/M	150/122	150/152	150/183	240/183	240/213	240/244	240/274	240/337
Sea Water (2 passes)									
R22 refrigerant	Qn (kW)	110.5	138.8	166.5	166.5	194.2	222	249.8	305
Tc = 40.6°C	Wn (m³/h)	14.8	18.5	22.2	22.2	25.8	29.5	33.3	37.6
Ti = 29.4°C	Wm (m³/h)	16.7	20.9	25.1	25.1	29.2	33.3	37.6	42.5
FF = 0.000043 m² K/W	Dpn (bar)	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.34
Sea Water (4 passes)									
R22 refrigerant	Qn (kW)	118	145.5	171.5	171.5	200.7	229.3	258	318.5
Tc = 35°C	Wn (m³/h)	7	8.75	10.5	10.5	12	14	15.8	17.8
Ti = 15°C	Wm (m³/h)	10.3	12.8	15	15	18	20.5	23.1	26
FF = 0.000043 m² K/W	Dpn (bar)	0.41	0.41	0.39	0.39	0.39	0.41	0.41	0.44

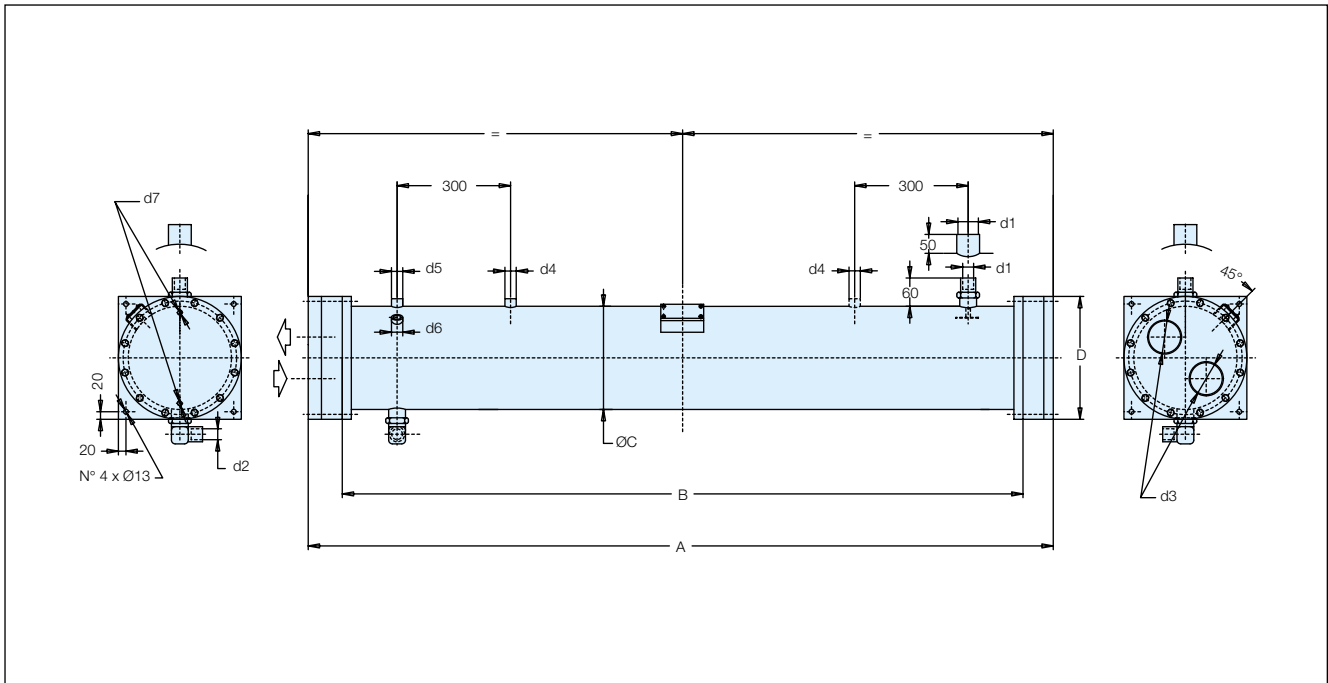
Model	ACFL/M	180/162	180/207	300/207	300/252	300/306	300/360
Sea Water (2 passes)							
R22 refrigerant	Qn (kW)	146.2	186.2	186.2	226.3	278.5	323
Tc = 40.6°C	Wn (m³/h)	18	23	23	27.9	33.8	39.8
Ti = 29.4°C	Wm (m³/h)	20.3	26	26	31.5	38.2	45
FF = 0.000043 m² K/W	Dpn (bar)	0.33	0.33	0.33	0.33	0.33	0.33
Sea Water (4 passes)							
R22 refrigerant	Qn (kW)	162	207	207	252	306	360
Tc = 35°C	Wn (m³/h)	9	11.4	11.4	13.9	16.9	20
Ti = 15°C	Wm (m³/h)	10.2	12.9	12.9	15.7	19.1	22.6
FF = 0.000043 m² K/W	Dpn (bar)	0.49	0.48	0.48	0.48	0.48	0.49

Model	ACFL/M	450/360	450/414	450/468	450/522	450/576	750/648	750/738	750/828	750/900
Sea Water (2 passes)										
R22 refrigerant	Qn (kW)	323.1	372.5	420.8	468.5	517	583.5	664.2	760	808.5
Tc = 40.6°C	Wn (m³/h)	39.8	45.9	51.8	57.8	63.7	72	81.9	91.8	99.7
Ti = 29.4°C	Wm (m³/h)	45	51.9	58.5	65.3	72	81.4	92.6	103.7	112.7
FF = 0.000043 m² K/W	Dpn (bar)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Sea Water (4 passes)										
R22 refrigerant	Qn (kW)	344	394	445	497.5	547.5	-	-	-	-
Tc = 35°C	Wn (m³/h)	18.9	21.7	24.5	27.4	30.2	-	-	-	-
Ti = 15°C	Wm (m³/h)	27.8	31.9	36.1	40.3	44.4	-	-	-	-
FF = 0.000043 m² K/W	Dpn (bar)	0.44	0.44	0.44	0.44	0.44	-	-	-	-

Qn nominal condensation capacity
Wn nominal water flow rate

Wm maximum water flow rate
Tc condensing temperature

Ti water inlet temperature
FF fouling factor



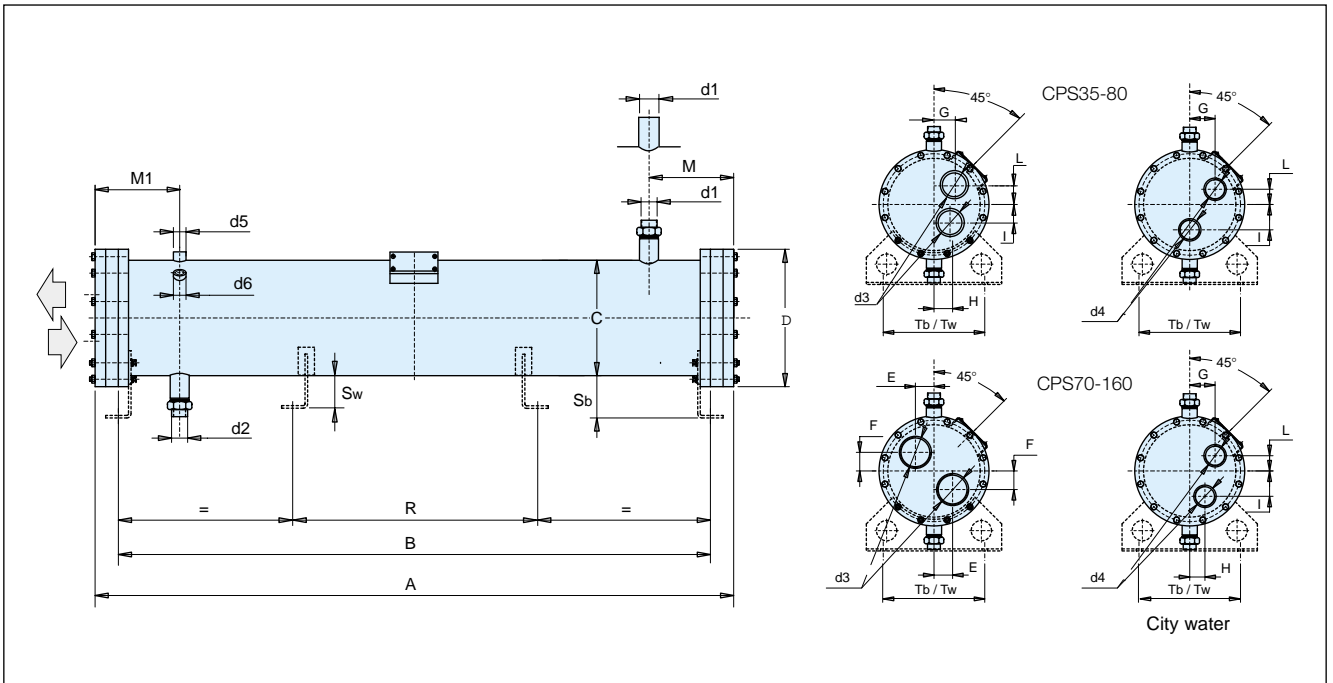
Model CDEW		60	80	100	120	135	165	190	215	240	260	300	360	400	450	470	520	550	610	680	760	840	
Dimensions	A [mm]	1500			1700		1740			1940		1970				1980			1980				
	B [mm]	1400			1600		1600			1800		1800				1800			1800				
	C [mm]	168			194		194			273		273				324			406				
	D [mm]	215			245		245			325		325				380			480				
Connections (Tower)	d1 [mm]	RC35			WA42		WA42			WA54		WA54				WA54			WA80				
	d2 [mm]	RC28			RC35		RC35			WA42		WA42				WA42			WA54				
	d3 [mm]	T2			T21		T21			T3		T3				T4			T5				
	d4 [in-NPT]	-			-		-			-		1				1			1				
	d5 [in-NPT]	1/2			3/4		3/4			1		1				1			1				
	d6 [in-NPT]	1/4			1/4		1/4			1/4		1/4				1/4			1/4				
	d7 [in-G]	1/4			1/4		1/4			1/4		1/4				1/4			1/4				
Connections (City)	d1 [mm]	RC35			WA42		WA42			WA54		WA54				WA54			WA80				
	d2 [mm]	RC28			RC35		RC35			WA42		WA42				WA42			WA54				
	d3 [mm]	T11			T2		T2			T21		T21				T3			T4				
Volumes	Vr [dm ³]	22.3	20.8	19.4	18.1	20.1	24.9	23.7	21.9	24.9	70.6	66.1	57	53.1	50.6	90.5	86.1	81.7	152.1	146	137.8	129.6	
	Lreserve [dm ³]	3.8	3.8	3.4	3.1	0.9	7.1	6.7	3.2	3.1	10	10	8.4	8.4	3.4	5.2	5.2	4.7	14.8	14.8	14.8	14.8	
	VH ₂ O [dm ³]	4.8	5.9	7.3	8.2	10.1	13.3	14.2	15.4	17.1	24.7	27.7	31.2	33.9	35.7	41	44.1	47.5	52.4	57.7	64.7	71.7	
Weight	P																						
	ES [kg]	58	61	64.5	67.5	85	105	108	111	121	194.7	203	215	222	227	293	304	313	441	452	467	482	

d1 refrigerant inlet
d2 refrigerant outlet

d3 water connections
d4 = d5 safety valve connection

VR gas side volume
VH₂O fouling factor

P net weight
ES exchange surface



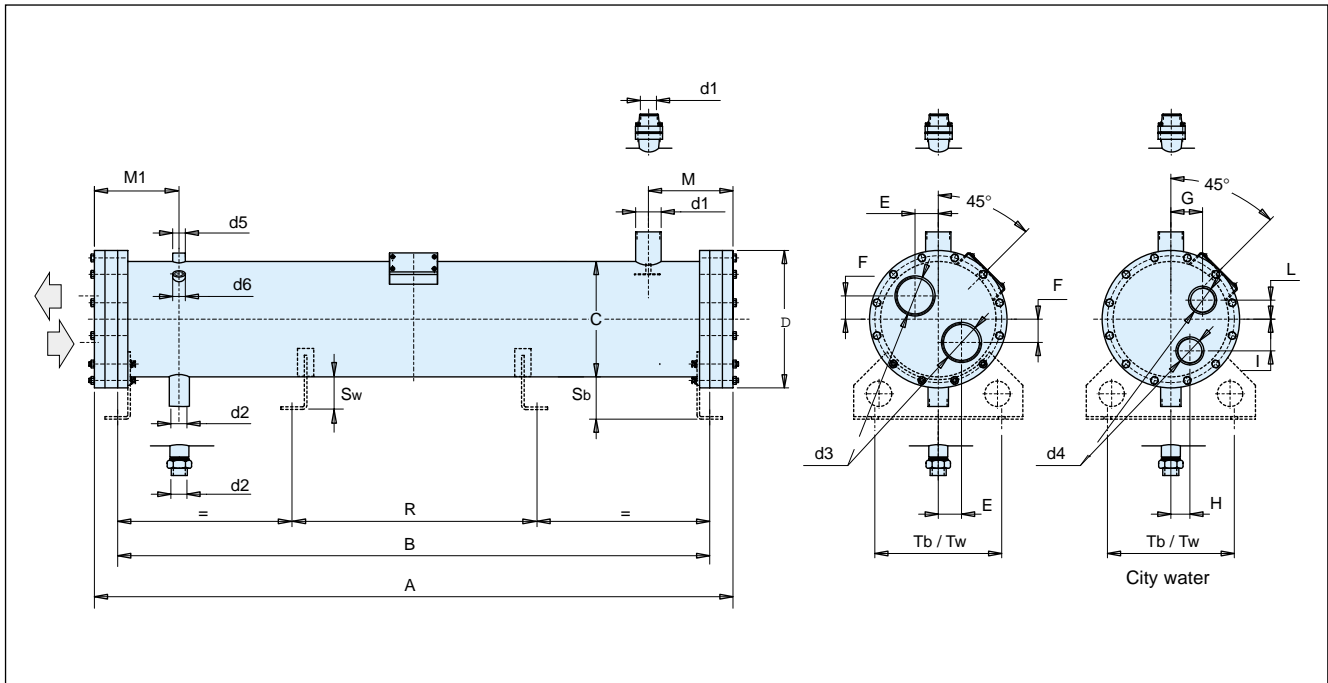
Model			CPS35	CPS45	CPS60	CPS80	CPS70	CPS100	CPS120	CPS145	CPS160
Dimensions	A	mm	800	800	800	800	1500	1500	1500	1500	1500
	B	mm	700	700	700	700	1400	1400	1400	1400	1400
	C	mm	168	168	168	168	168	168	168	168	168
	D	mm	215	215	215	215	215	215	215	215	215
	E	mm	-	-	-	-	30	30	30	30	30
	F	mm	-	-	-	-	30	30	30	30	30
	G	mm	Tower 43 - City 45				43	43	43	43	43
	H	mm	Tower 22				22	22	22	22	22
	I	mm	Tower 43 - City 55				43	43	43	43	43
	L	mm	Tower 22 - City 32				22	22	22	22	22
	M	mm	160	160	160	160	170	170	170	170	190
M1	mm	170	170	170	170	180	180	180	180	200	
Supports	R	mm	350	350	350	350	900	900	900	900	900
	Sb	mm	80	80	80	80	80	80	80	80	80
	Sw	mm	60	60	60	60	60	60	60	60	60
	Tb	mm	210	210	210	210	210	210	210	210	210
	Tw	mm	160	160	160	160	160	160	160	160	160
Connections	d1	-	RC28	RC28	RC28	RC28	RC35	RC35	RC35	RC35	WA42
	d2	-	RB22	RB22	RB22	RB22	RC28	RC28	RC28	RC28	RC35
	d3	-	T11	T11	T11	T11	T2	T2	T2	T2	T2
	d4	-	T1	T1	T1	T1	T11	T11	T11	T11	T11
	d5	in	3/8	3/8	3/8	3/8	1/2	1/2	1/2	1/2	1/2
	d6	in	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Volumes	VR	dm ³	11	10,3	9,6	8,5	22,7	21,3	19,9	16,5	17,5
	VH ₂ O	dm ³	2,4	2,9	3,4	4,4	4	5	6,1	7,2	8
Weight	P	Kg	43	45	47	49	60	63	66	69	72

d1 refrigerant inlet
d2 refrigerant outlet

d3 water connections
d4 = d5 safety valve connection

VR gas side volume
VH₂O fouling factor

P net weight
ES exchange surface



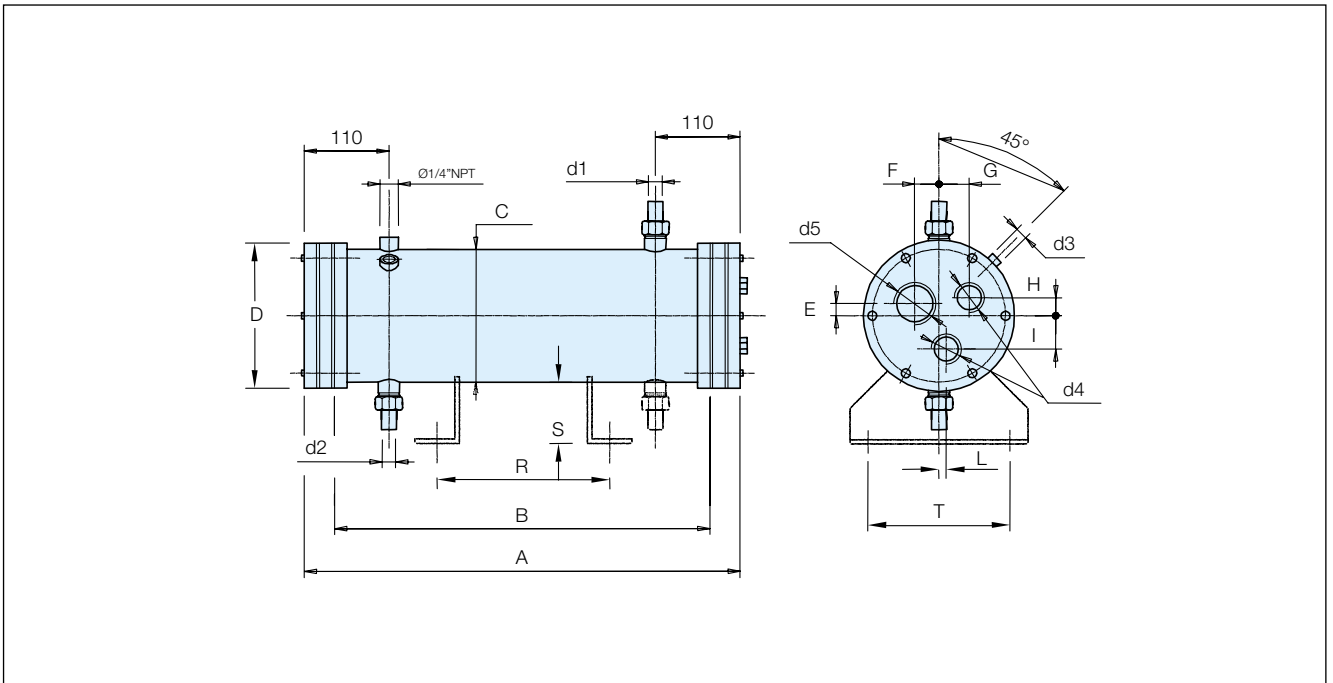
Model			CPS180	CPS210	CPS235	CPS260	CPS285	CPS335	CPS390	CPS440	CPS520
Dimensions	A Tower/City	mm	1540/1535	1540/1535	1540/1535	1540/1535	1570/1560	1570/1560	1570/1560	1570/1560	1570/1560
	B	mm	1400	1400	1400	1400	1400	1400	1400	1400	1400
	C	mm	194	194	194	194	273	273	273	273	273
	D	mm	245	245	245	245	325	325	325	325	325
	E	mm	35	35	35	35	55	55	55	55	55
	F	mm	35	35	35	35	55	55	55	55	55
	G	mm	55	55	55	55	75	75	75	75	75
	H	mm	25	25	25	25	45	45	45	45	45
	I	mm	55	55	55	55	75	75	75	75	75
	L	mm	25	25	25	25	45	45	45	45	45
	M	mm	200	200	200	200	225	225	225	225	225
M1	mm	210	210	210	210	235	235	235	235	235	
Supports	R	mm	900	900	900	900	900	900	900	900	900
	Sb	mm	80	80	80	80	100	100	100	100	100
	Sw	mm	60	60	60	60	100	100	100	100	100
	Tb	mm	210	210	210	210	300	300	300	300	300
	Tw	mm	160	160	160	160	300	300	300	300	300
Connections	d1	-	WA42	WA42	WA54	WA54	WA54	WA54	WA54	WA54	WA54
	d2	-	RC35	RC35	RC35	RC35	WA42	WA42	WA42	WA42	WA42
	d3	-	T21	T21	T21	T21	T3	T3	T3	T3	T3
	d4	-	T11	T11	T11	T11	T2	T2	T2	T2	T2
	d5	in	3/4	3/4	3/4	3/4	1	1	1	1	1
	d6	in	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Volumes	VR	dm ³	24,8	23,4	22	20,6	54,7	51,9	49,1	46,3	41,8
	VH ₂ O	dm ³	9,4	10,5	11,6	12,6	16,2	18,3	20,5	22,6	26,1
Weight	P	Kg	91	94	97	100	164	170	176	182	195

d1 refrigerant inlet
d2 refrigerant outlet

d3 water connections
d4 = d5 safety valve connection

VR gas side volume
VH₂O fouling factor

P net weight
ES exchange surface



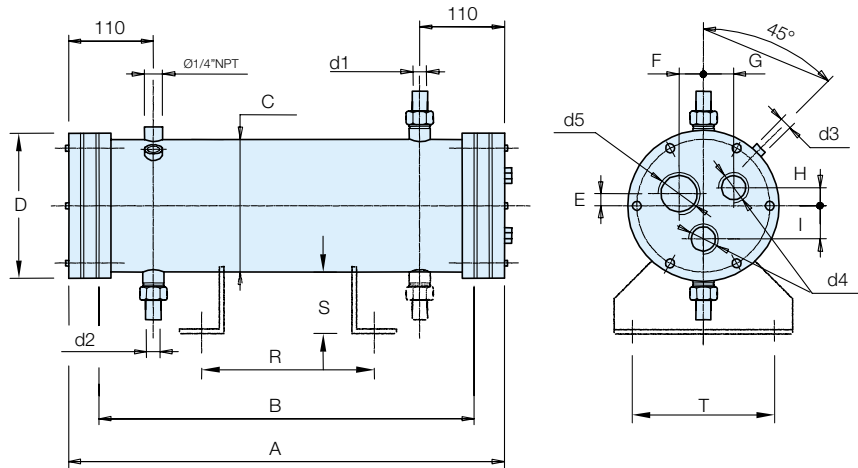
			CFC 8	CFC 12	CFC 15	CFC 20	CFC 25	CFC 30	CFC 40	CFC 50	CFC 60
Dimensions	A	mm	660	660	860	860	870	870	870	870	870
	B	mm	600	600	800	800	800	800	800	800	800
	C	mm	114	114	114	114	168	168	168	193	193
	D	mm	120	120	120	120	170	170	170	195	195
	E	mm	13	13	13	13	19	19	19	20	20
	F	mm	28	28	28	28	44	44	44	50	50
	G	mm	23	23	23	23	44	44	44	50	50
	H	mm	28	28	28	28	32	32	32	35	35
	I	mm	28	28	28	28	52	52	52	58	58
	L	mm	23	23	23	23	0	0	0	0	0
	R	mm	300	300	500	500	500	500	500	500	500
	S	mm	60	60	60	60	60	60	60	60	60
	T	mm	160	160	160	160	160	160	160	160	160
	d1	RT	1"	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
	d2	RT	1"	1"	1"	1"	1"	1"	1"	1 1/4"	1 1/4"
	d3	NPT	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
	d4	FPT	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	1 1/4"	1 1/4"
	d5	FPT	3/4"	3/4"	3/4"	3/4"	1 1/4"	1 1/4"	1 1/4"	1 1/2"	1 1/2"
	VR	dm ³	4,3	3,9	5,3	4,8	12,5	12	11	14,9	12,5
	VH ₂ O	dm ³	0,75	1,0	1,2	1,5	2,1	2,4	3,0	3,6	4,2
P	kg	13,5	14,5	17	18,5	33	34,5	37,5	49,5	52,5	
ES	m ²	0,82	1,23	1,67	2,23	2,79	3,35	4,5	5,6	6,7	

d1 refrigerant inlet
d2 refrigerant outlet

d3 safety valve connection
d4 = d5 water connections

VR gas side volume
VH₂O fouling factor

P net weight
ES exchange surface



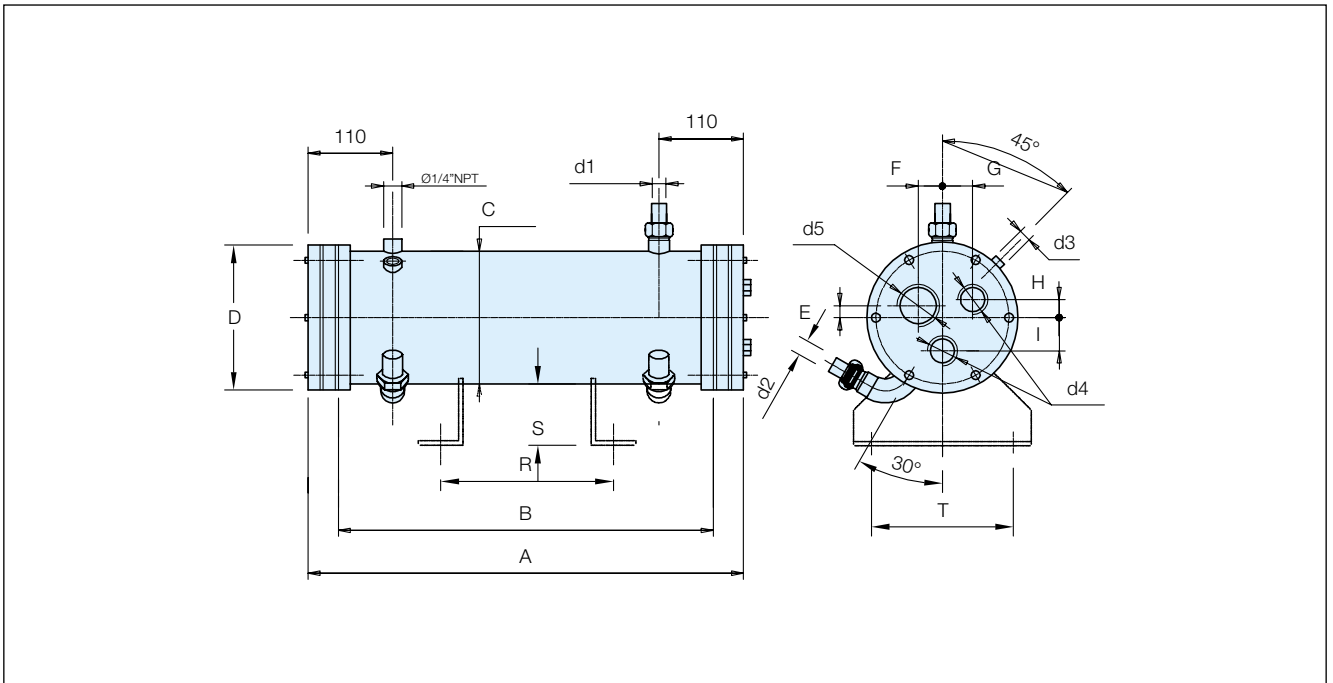
			CFL 42	CFL 50	CFL 56	CFL 75	CFL 95	CFL 110	CFL 125	CFL 145	CFL 165	
Dimensions	A	mm	1270	1270	1470	1470	1470	1470	1670	1670	1870	
	B	mm	1200	1200	1400	1400	1400	1400	1600	1600	1800	
	C	mm	168	168	193	193	193	193	193	193	193	
	D	mm	170	170	195	195	195	195	195	195	195	
	E	mm	19	19	22	22	22	22	22	22	22	
	F	mm	41	41	38	38	38	38	38	38	38	
	G	mm	44	44	50	50	50	50	50	50	50	
	H	mm	27	27	27	27	27	27	27	27	27	
	I	mm	52	52	58	58	58	58	58	58	58	
	R	mm	850	850	1000	1000	1000	1000	1150	1150	1300	
	S	mm	60	60	60	60	60	60	60	60	60	
	T	mm	160	160	160	160	160	160	160	160	160	
	d1	RT		1 1/4"	1 1/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	60x60
	d2	RT		1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 3/4"	1 3/4"	1 3/4"
	d3	NPT		3/8"	3/8"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
	d4	FPT		1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	3/4"	1 1/4"	1 1/4"
	d5	FPT		1 1/2"	1 1/2"	2"	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"
	VR	dm ³		19,3	18,5	24,8	23,4	21,9	20,5	24,8	22,9	23,5
VH ₂ O	dm ³		2,9	3,3	4,0	5,1	6,2	7,2	8,1	9,4	11,1	
P	kg		44	46	65	70	76	82	90	96	108	
ES	m ²		4,3	5,1	6,0	8,0	10,0	12,0	13,7	16,0	19,4	

d1 refrigerant inlet
d2 refrigerant outlet

d3 safety valve connection
d4 = d5 water connections

VR gas side volume
VH₂O fouling factor

P net weight
ES exchange surface



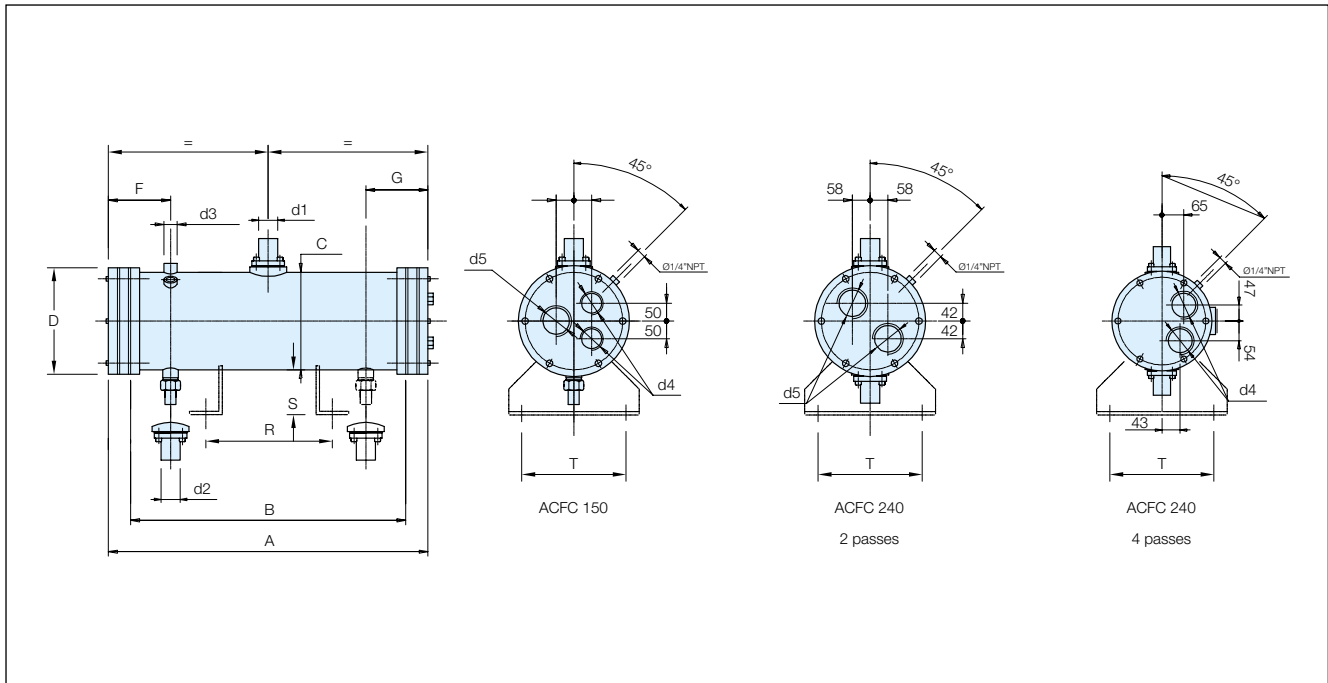
			CRS 3	CRS 6	CRS 8	CRS 12	CRS 15	CRS 20	CRS 25
Dimensions	A	mm	670	670	670	670	870	870	870
	B	mm	600	600	600	600	800	800	800
	C	mm	168	168	168	168	193	193	193
	D	mm	170	170	170	170	195	195	195
	E	mm	19	19	19	19	20	20	20
	F	mm	41	41	44	44	50	50	50
	G	mm	44	44	44	44	50	50	50
	H	mm	27	27	32	32	35	35	35
	I	mm	52	52	52	52	58	58	58
	R	mm	300	300	300	300	500	500	500
	S	mm	60	60	60	60	60	60	60
	T	mm	160	160	160	160	160	160	160
	d1	RT	1"	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"
	d2	RT	1"	1"	1"	1"	1"	1"	1"
	d3	NPT	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
	d4	FPT	3/4"	3/4"	3/4"	3/4"	1 1/4"	1 1/4"	1 1/4"
	d5	FPT	1"	1"	1"	1"	1 1/2"	1 1/2"	1 1/2"
	VR	dm ³	10,8	10,4	10,4	10	18,5	18	17,5
	VH ₂ O	dm ³	0,8	1,0	1,2	1,4	1,8	2,1	2,4
P	kg	23	24	24	25	39	40,5	42	
ES	m ²	0,41	0,82	0,82	1,23	1,67	2,23	2,79	

d1 refrigerant inlet
d2 refrigerant outlet

d3 safety valve connection
d4 = d5 water connections

VR gas side volume
VH₂O fouling factor

P net weight
ES exchange surface



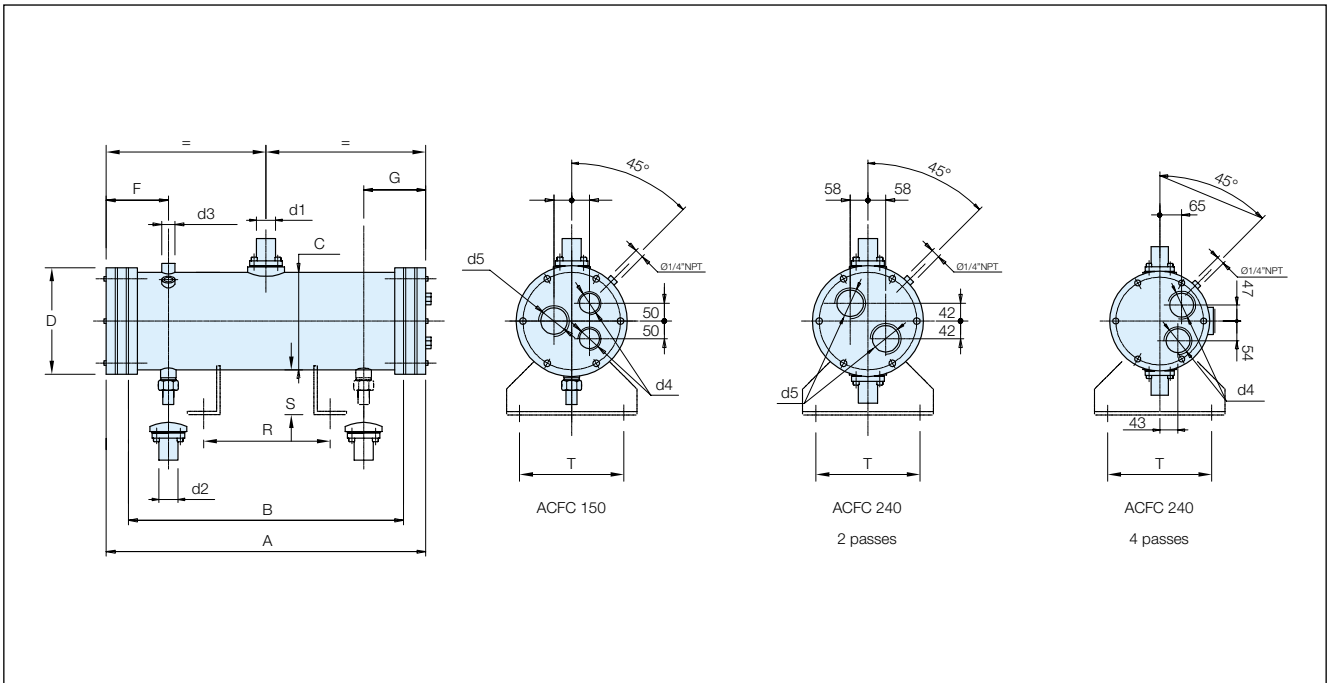
			ACFC 150/122	ACFC 150/152	ACFC 150/183	ACFC 240/183	ACFC 240/213	ACFC 240/244	ACFC 240/274	ACFC 240/337	
Dimensions	A	mm	1680	1680	1680	1700	1700	1700	1700	1900	
	B	mm	1600	1600	1600	1600	1600	1600	1600	1800	
	C	mm	219	219	219	273	273	273	273	273	
	D	mm	220	220	220	220	275	275	275	275	
	F	mm	170	170	170	185	185	185	185	185	
	G	mm	162	162	162	180	180	180	180	180	
	R	mm	1150	1150	1150	1150	1150	1150	1150	1150	
	S	mm	80	80	80	100	100	100	100	100	
	T	mm	260	260	260	300	300	300	300	300	
	d1	FL		60x60	60x60	60x60	70x70	70x70	70x70	70x70	90x90
	d2	RT-FL		1 3/4"	1 3/4"	1 3/4"	60x60	60x60	60x60	60x60	60x60
	d3	NPT		1"	1"	1"	1"	1"	1"	1"	1"
	d4	FPT		1 1/2"	1 1/2"	1 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
	d5	FPT		2 1/2"	2 1/2"	2 1/2"	3"	3"	3"	3"	3"
	VR	dm ³		39,4	36,3	33,1	62,5	59,4	56,3	53,1	55
	VH ₂ O	dm ³		8,5	10,3	12,1	13,6	15,5	17,3	19,1	23,8
	P	kg		102,5	111	119,5	158,5	166,5	175	183,5	212
ES	m ²		13,6	16,9	20,4	20,3	23,8	27,1	30,5	39	

d1 refrigerant inlet
d2 refrigerant outlet

d3 safety valve connection
d4 = d5 water connections

VR gas side volume
VH₂O fouling factor

P net weight
ES exchange surface



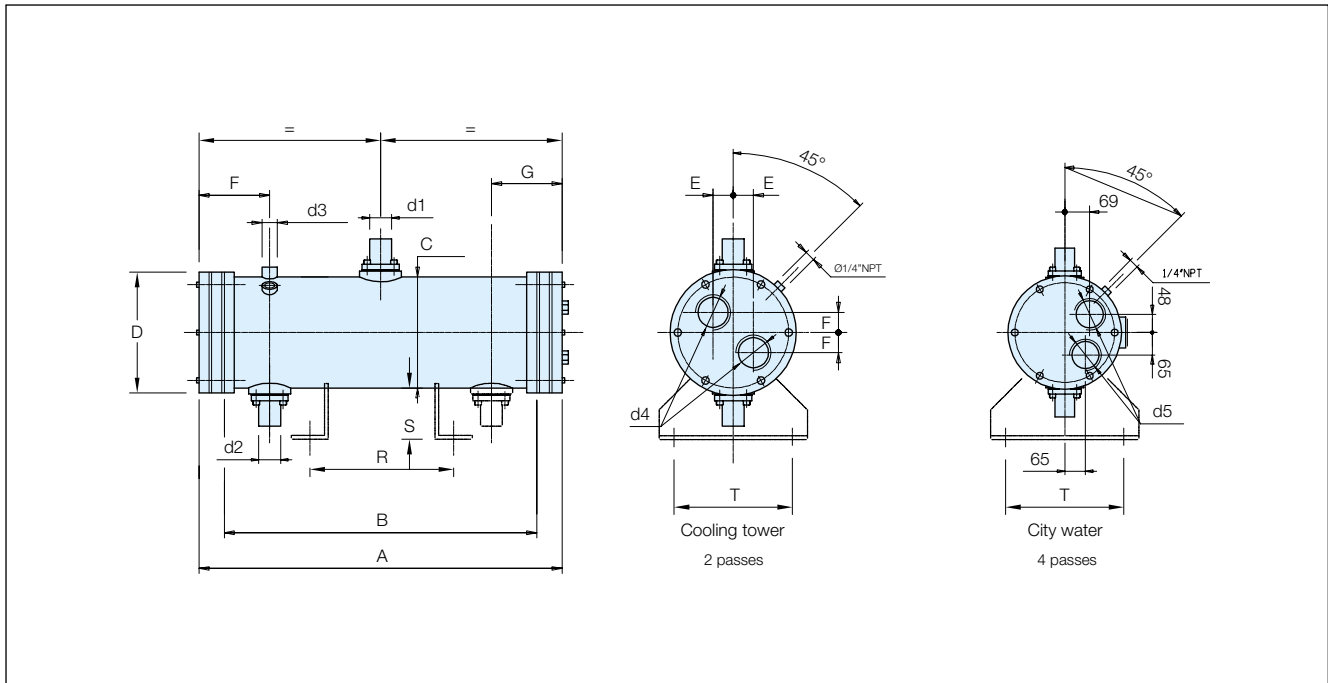
			ACFL 180/162	ACFL 180/207	ACFL 300/207	ACFL 300/252	ACFL 300/306	ACFL 300/360
Dimensions	A	mm	2480	2480	2500	2500	2500	2500
	B	mm	2400	2400	2400	2400	2400	2400
	C	mm	219	219	273	273	273	273
	D	mm	220	220	275	275	275	275
	F	mm	170	170	185	185	185	185
	G	mm	162	162	180	180	180	180
	R	mm	1700	1700	1700	1700	1700	1700
	S	mm	80	80	100	100	100	100
	T	mm	260	260	300	300	300	300
	d1	FL	70x70	70x70	90x90	90x90	90x90	90x90
	d2	RT-FL	1 3/4"	1 3/4"	60x60	60x60	60x60	60x60
	d3	NPT	1"	1"	1"	1"	1"	1"
	d4	FPT	1 1/2"	1 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
	d5	FPT	2 1/2"	2 1/2"	3"	3"	3"	3"
	VR	dm ³	58,8	53,1	96,9	91,2	85	78,8
VH ₂ O	dm ³	14,5	18,2	19,7	23,4	27,8	32,3	
P	kg	141	154	200	212	227	242	
ES	m ²	189	24,1	24,1	29,4	35,7	42	

d1 refrigerant inlet
d2 refrigerant outlet

d3 safety valve connection
d4 = d5 water connections

VR gas side volume
VH₂O fouling factor

P net weight
ES exchange surface



			ACFL 450/360	ACFL 450/414	ACFL 450/468	ACFL 450/522	ACFL 450/576	ACFL 750/648	ACFL 750/738	ACFL 750/828	ACFL 750/900
Dimensions	A	mm	2500	2500	2500	2500	2500	2540	2540	2540	2540
	B	mm	2400	2400	2400	2400	2400	2400	2400	2400	2400
	C	mm	324	324	324	324	324	406	406	406	406
	D	mm	325	325	325	325	325	410	410	410	410
	E	mm	56	56	56	56	56	70	70	70	70
	F	mm	205	205	205	205	205	225	225	225	225
	G	mm	200	200	200	200	200	220	220	220	220
	R	mm	1700	1700	1700	1700	1700	1700	1700	1700	1700
	S	mm	100	100	100	100	100	120	120	120	120
	T	mm	300	300	300	300	300	400	400	400	400
	d1	FL	100x100	100x100	100x100	100x100	100x100	145	145	145	145
	d2	FL	70x70	70x70	70x70	70x70	70x70	90x90	90x90	90x90	90x90
	d3	NPT	2x1"	2x1"	2x1"	2x1"	3x1"	3x1"	3x1"	3x1"	3x1"
	d4	FPT	4"	4"	4"	4"	4"	5"	5"	5"	5"
	d5	FPT	3"	3"	3"	3"	3"	-	-	-	-
	VR	dm ³	133,8	126,9	120	113,1	106,2	205	193,7	182,5	173,8
	VH ₂ O	dm ³	33,4	37,8	42,2	46,7	51,1	62,8	70,2	77,6	83,7
P	kg	295	309,5	324	338,5	353	494	518	541	559	
ES	m ²	42	48,3	54,5	60,8	67,1	75,5	86	96,5	104,9	

d1 refrigerant inlet
d2 refrigerant outlet

d3 safety valve connection
d4 = d5 water connections

VR gas side volume
VH₂O fouling factor

P net weight
ES exchange surface

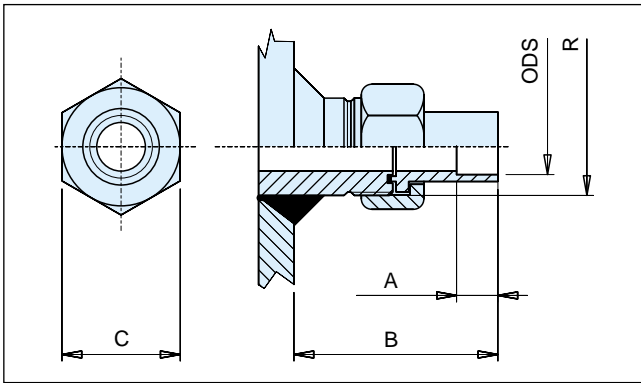
Refrigerant connections

Refrigerant inlet and outlet can be equipped with Rotalock brazing (ODS), welding (OD) or flanged (F) connections. All data concerning the different connections available are indicated in

the following table.

Sea water series have two refrigerant outlet connections.

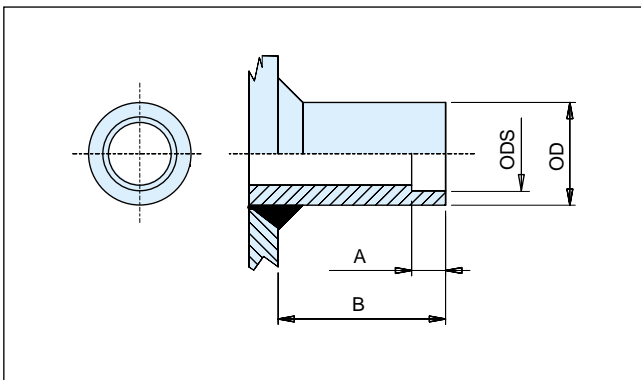
Rotalock connection (R)



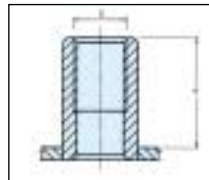
Rotalock (CPLUS)							
Type	A	B	C	RT	Name	ODS	ID
	[mm]	[mm]	[mm]			[mm]	[mm]
B	20	80	36	1 1/4" - 12UNF	RB22	22	22,5
	20	80	50	1 3/4" - 12UNF	RC28	28	28,3
C	20	80	50	1 3/4" - 12UNF	RC35	35	35,3

Rotalock (• CFC • CRS • CFL • ACFC • ACFL)				
B	C	RT	Name	ODS
[mm]	[mm]			[mm]
63	30	1" - 14UNF	RB16	16
36	36	1 1/4" - 12UNF	RC22	22
63	50	1 3/4" - 12UNF	RC38	35

Welding connection (W)

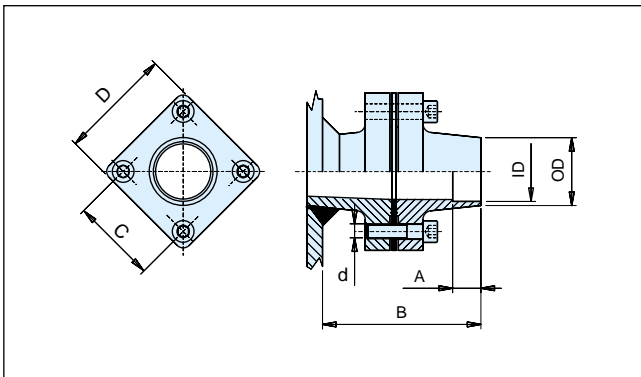


Welding (CPLUS)						
Type	A	B	Name	ODS	ID	OD
	[mm]	[mm]		[mm]	[mm]	[mm]
A	20	70	WA42	42	42,4	48,3
	20	70	WA54	54	54,4	60,3
	20	70	WA80	80	80,6	88,9

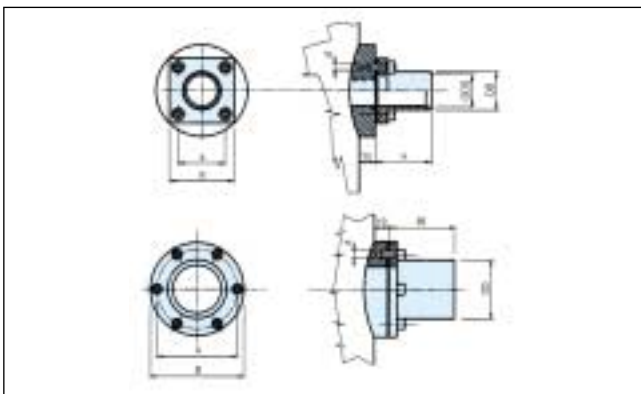


NPT (• CFC • CRS • CFL • ACFC • ACFL)				
D	1/4"	3/8"	1/2"	1"
d (mm)	20	24	30	40
H (mm)	22	22	25	25

Flange connection (F)



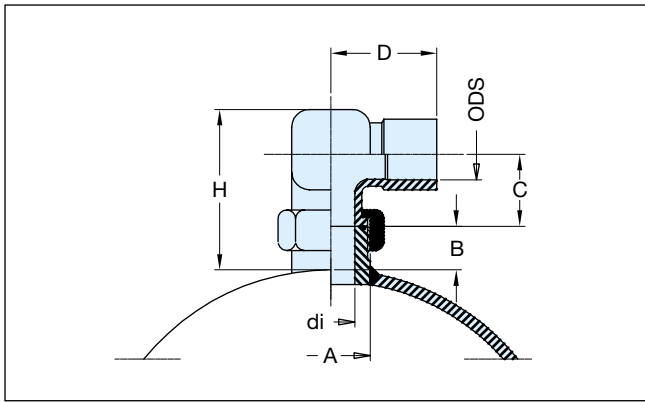
Flange (CPLUS)									
Type	A	B	C	D	d	Name	ODS	ID	OD
	[mm]	[mm]	[mm]	[mm]			[mm]	[mm]	[mm]
A	20	110	55	75	M10	FA35	35	35,3	-
	20	110	55	75	M10	FA42	42	42,4	-
	20	110	55	75	M10	FA54	54	54,4	-
B	20	130	70	90	M10	FB54	54	54,4	-
	20	130	70	90	M10	FB67	67	67,4	76
C	20	130	90	110	M12	FC67	67	67,4	76
	20	130	90	110	M12	FC80	80	80,6	88,9



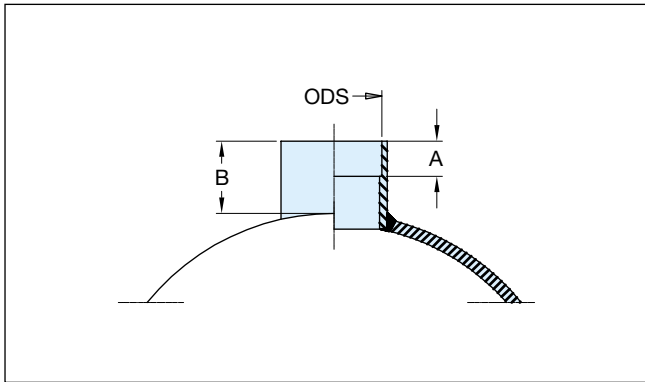
Flange (• CFC • CRS • CFL • ACFC • ACFL)						
FL	60X60	70X70	90X90	100X100	145	160
A (mm)	60	70	90	100	Ø145	Ø160
B (mm)	80	90	110	125	Ø170	Ø190
ODS (mm)	42	54			-	-
OD (mm)			76,1	88,9	101,6	114,3
H (mm)	70	85	100	125		
d	M10	M10	M12	M12	M12	M16

Special connections (CPLUS)

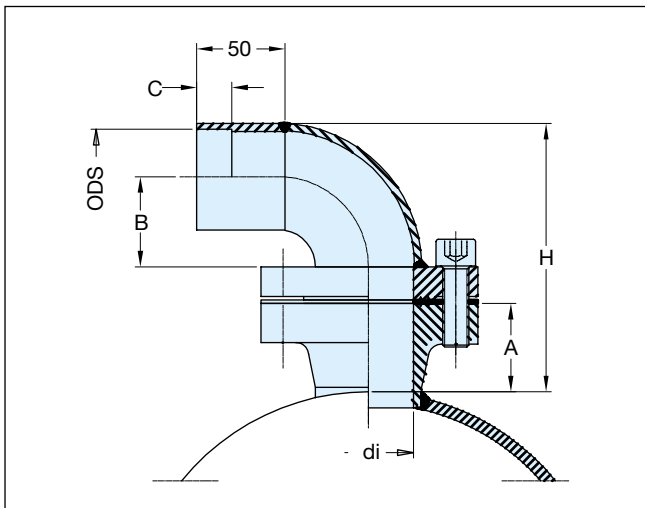
CPS	160	180	210	235	260	285	335	390	440	520
Refrigerant inlet (d1)	Type A					Type B				
Refrigerant outlet (d2)	-	-	-	-	-	Type A				



Rotalock (CDEW)		Type B	Type C	
Rotalock Type	Name	RB 22	RB 28	RB 35
A	UNF	1 1/4"	1 3/4"	
B	mm	28	27	27
C	mm	29	38	
D	mm	44	47	52
di	mm	19	31	
H	mm	71	83	
ODS	mm	22	28	35



Welding connections (CDEW)		Type A	Type B	Type C	Type D
Welding Type	Name	WA 42	WA 54	WA 67	WA 80
A	mm	20	20	25	25
B	mm	50	50	50	50
ODS	mm	42	54	67	80
OD	mm	48.3	60.3	76.1	88.9

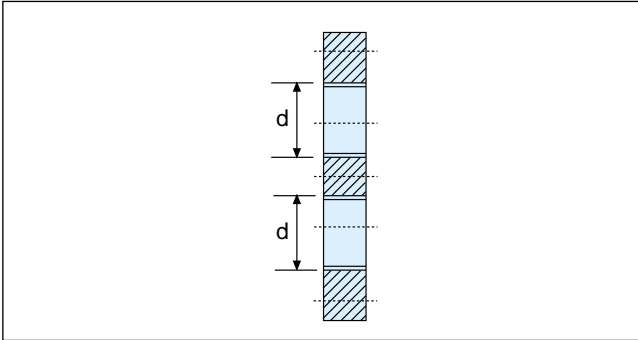


Special flange connections (CDEW)		Type A		Type B	Type C	
Flange Type	Name	FA 35	FA 42	FB 54	FC 67	FC 80
A	mm	45		45	45	
B	mm	32	38	51	63	76
C	mm	20		20	25	
di	mm	39		51	75	
H	mm	119	128	152	172	191
ODS	mm	35	42	54	67	80
OD	mm	42.4	48.3	60.3	76.1	88.9

CDEW, CPLUS

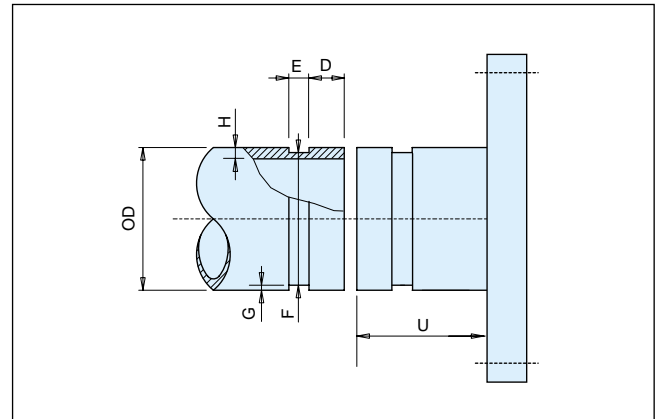
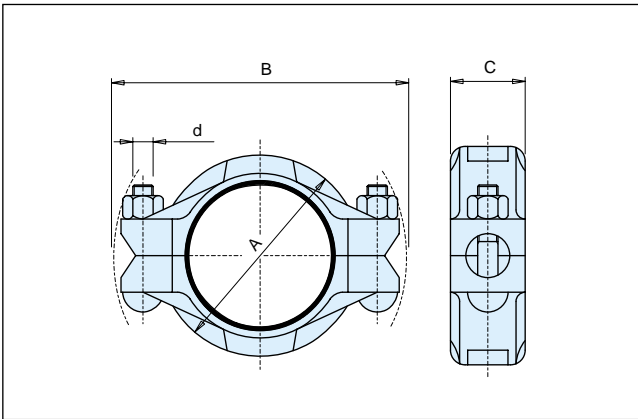
Water inlet and outlet connections on the condenser are ISO 228/1-G female threaded connections. As an optional for models CPS285-520, the connection can be provided via a flexible joint using a clamp and a gasket in EPDM. A stub-end is supplied to which the water pipework can be welded.

flexible joint using a clamp and a gasket in EPDM. A stub-end is supplied to which the water pipework can be welded.



Threaded connections (T)				
Model	TOWER		CITY	
	Name	d (in)	Name	d (in)
CPS 35-80	T11	1 1/2	T1	1
CPS 70-160 / CDEW 60-135	T2	2	T11	1 1/2
CPS 180-260 / CDEW 165-240	T21	2 1/2	T11	1 1/2
CPS 285-520 / CDEW 260-450	T3	3	T2	2
CDEW 470-550	T4	4	T3	3
CDEW 610-840	T5	5	T4	4

Flexible joint with connection pipe (J)

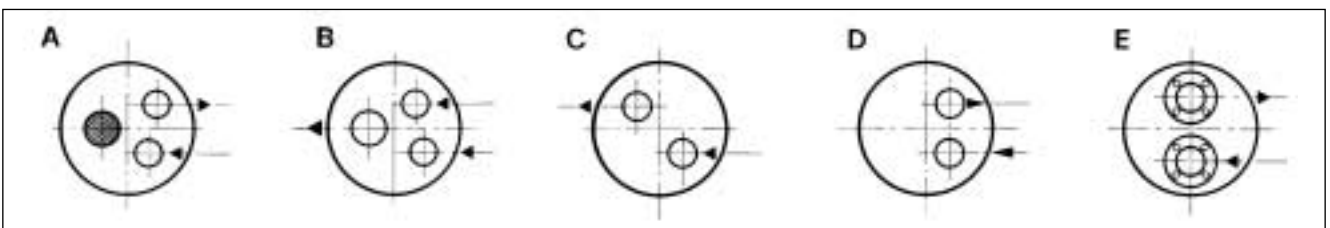


Model	FLEXIBLE JOINT							CONNECTION PIPE							
	A	B	C	d	Name	OD	DN	OD	DN	D	E	F	G	H	U
	[mm]	[mm]	[mm]			[mm]		[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
CPS 285-520	117,5	181	44,5	M12	JP	88,9	80 (3")	88,9	80 (3")	15,9	7,9	84,9	2	4,8	73

CFC • CRS • CFL • ACFC • ACFL

Condensers series CFC, CRS, CFL, ACFC series up to model 150/183 and ACFL series up to model 180/207 can have two types of connections: city water (scheme A) and tower water (scheme B). Condensers series ACFC starting with model 240/183 and ACFL series starting with model 300/207 are provided with tower water connection (scheme C, 2 passes) or on request with city water connection (scheme D, 4 passes). Starting from ACFL 750/648 only tower connection is available (scheme C or scheme E, 2 passes). Marine condensers are not available with A or B connections.

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Alfa Laval in brief

Alfa Laval is leading global provider of specialized products and engineering solutions.

Our equipment, systems and services are dedicated to assisting customers in optimizing the performance of their processes. Time and time again.

We help them heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuff, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

