Fluid Dynamics®

INTEGRITY

FD BRAZED PLATE

INDIVIDUAL SOLUTIONS - LEADING TECHNOLOGIES

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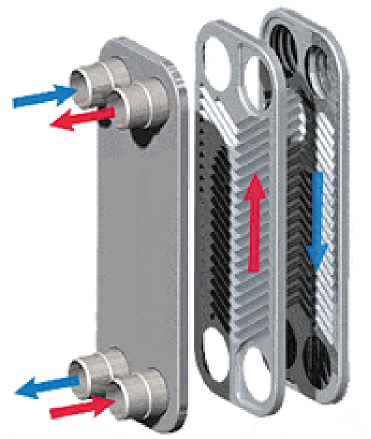
INTRODUCTION

Since 1981 Fluid Dynamics has specialised in one thing - Heat Exchange. In this catalogue we have highlighted our FD Brazed Plate range.

Fluid Dynamics' FD Brazed Plate Heat Exchangers consist of corrugated chevron plates with various brazing materials available for different working conditions.



The high quality of FD Brazed Plate heat exchangers ensures that they are capable of working in high pressure and high temperature environments subject to model selection.

FD Brazed Plate heat exchangers come in a wide range of applications, sizes and brazing materials to ensure the right solution for your needs.

ADVANTAGES

- **Long life durability**
- **Corrosion resistance**
- **High thermal transfer efficiency**
- **Compact**
- **Easy installation**
- **Proven & reliable quality**
- **Flexible flows & temperature monitor option**

The information provided in this document is for reference only. The data may vary under different working conditions and specifications.

ALL SERIES SUMMARY

	FD-K	FD-R	FD-Z	FD-C
FEATURES	Standard	High Heat Transfer R410A	Diagonal Flow Large Heat Capacity High Flow Rate	Super High Pressure R744 (CO_2) Up to 140 bar
Maximum Working Pressure	45 bar	45 bar	45 bar	140 bar
Brazing Material	Copper/Nickel	Copper	Copper	Copper
APPLICATIONS				
HVAC	●	●	●	●
Refrigeration Storage System	●	●	●	●
Heat Pump	●	●	●	●
Chiller	●	●	●	
Semiconductor Cooling	●			
Air Dryer				
Process Cooling	●			
Swimming Pools				
Waste Heat Recovery	●		●	
Injection Moulding Machinery	●			
Pasteuriser	●			
Laser Cutting / Welding Machinery	●		●	
Hydraulic Systems	●			
Wind Power Transmission	●			
Boilers	●			
Food Processing				
Fuel Cells				
Pre-Cooler / Pre-Heater	●	●	●	●
Evaporator / Condenser	●	●	●	●
De-Superheater / Subcooler	●	●	●	●
Economiser	●	●	●	●
Oil Cooler	●			

	FD-E/F	FD-H	FD-M/P/S	FD-I	FD-A
	Low Pressure Low flow rate Water to Water	High Temperature Fluid	Corrosion Resistant Material	Impact Pressure & Thermal Shock Resistant	Air Dryer for Evaporator, Separator & Precooler all in one
	10 bar	10 bar	30 bar	30 bar	16 bar
	Copper	Nickel	Nickel	Copper	Copper
			●		
	●			●	
	●				●
			●		
				●	
				●	
				●	
	●			●	
		●		●	
		●			
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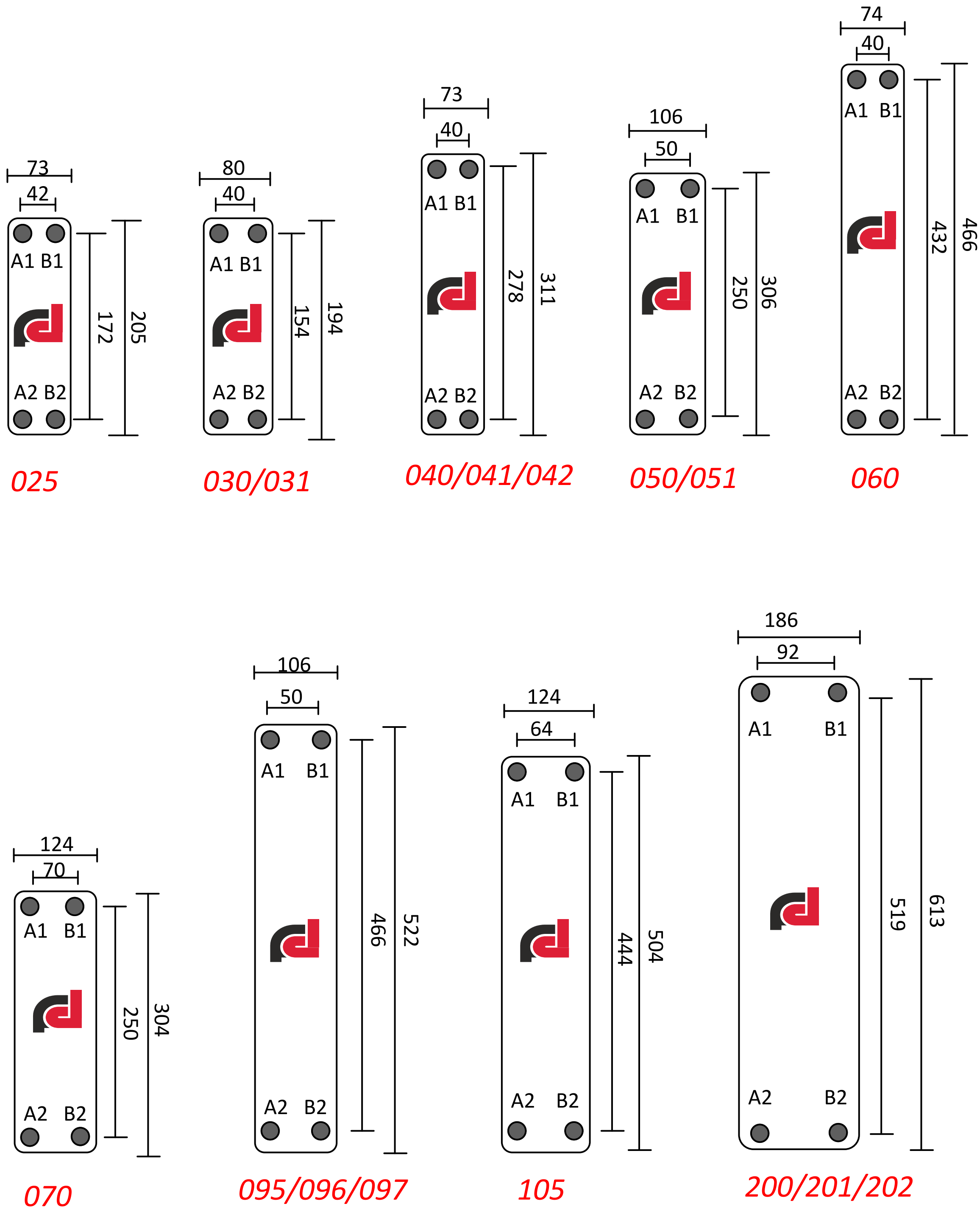
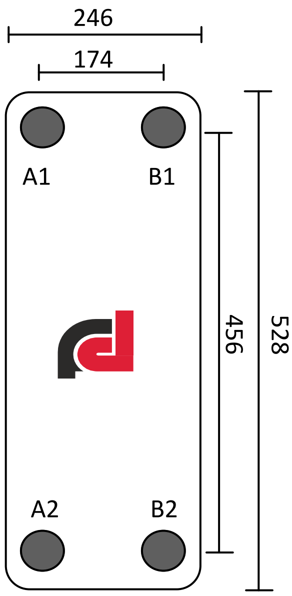
				●	

DIMENSIONS



• PROVEN RELIABILITY • PROVEN PERFORMANCE •



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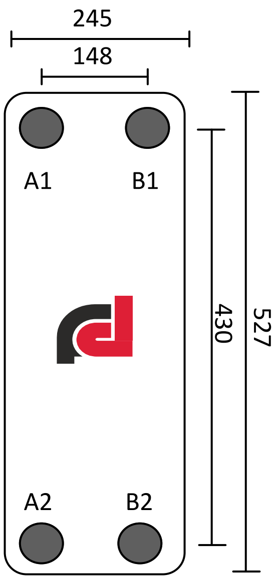

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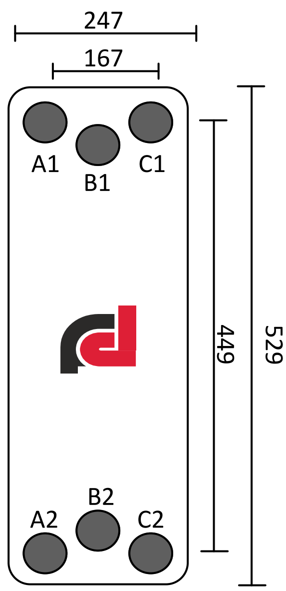

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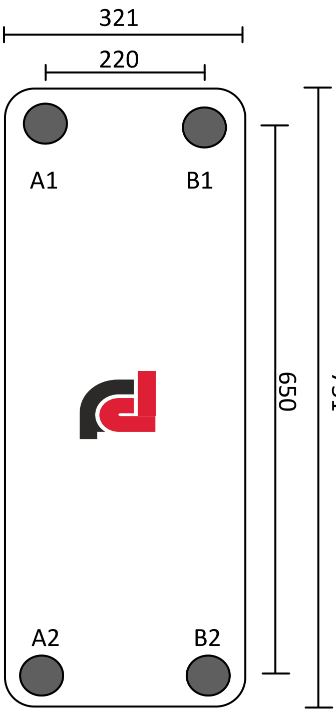

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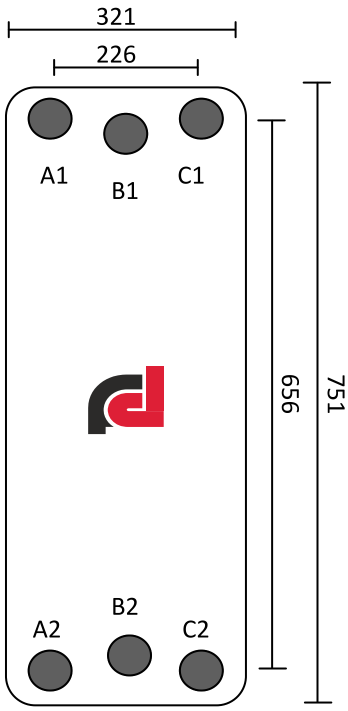

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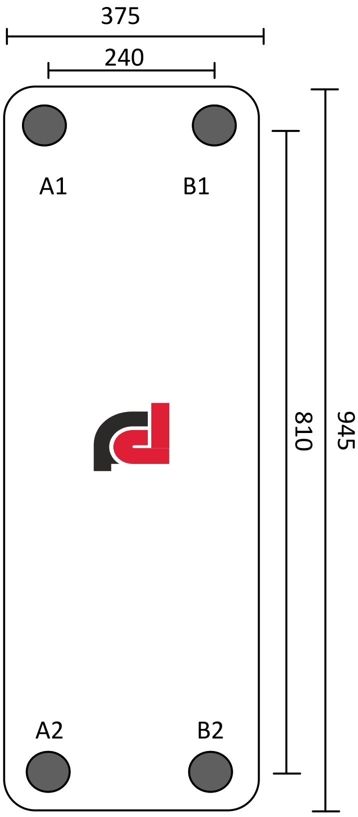

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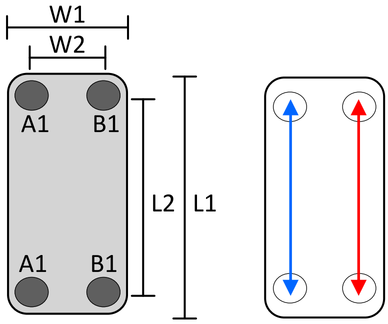
FD-K SERIES STANDARD

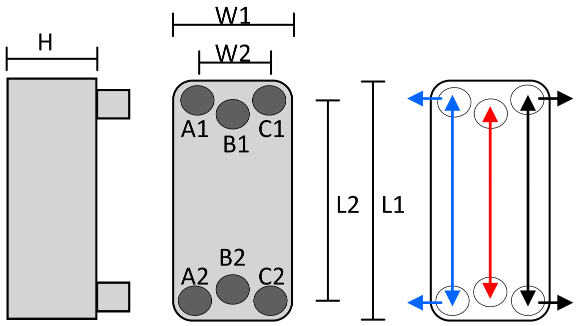
FD-K Series has the largest range of sizes and is widely used in many applications. Versatile and robust they are ideal for use in HVAC, Heat Pumps, Chillers, Oil Coolers, Process Cooling and Heating.

Note:

- The FD-K Series is rated to a maximum working pressure of 45 bar;
- FD-K 215 is dual circuit with 6 connections.



Brazing Material	Copper	Copper (Extra Strength)	Nickel
		(A1,A2/B1,B2)	
Max. Working Pressure (bar)	30/30	45/30	10/10
Min. Test Pressure (bar)	43/43	65/43	15/15
Max. Working Temperature (°C)		200	



K215: Dual Circuit—6 Connections

Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm) N = No. of plates	Weight (kg) N = No. of plates	Heat Transfer Area/Plate (m2)	Total Heat Transfer Area (m2) N = No. of plates	Volume/ Channel (Litres)	Total Volume (Litres) N = No. of plates
FD-K025	205	172	73	42	6.70+2.27*N	0.73+0.040*N	0.0120	(N-2)*0.0120	0.025	(N-1)*0.025
FD-K030	194	154	80	40	9.00+2.20*N	0.67+0.047*N	0.0117	(N-2)*0.0117	0.025	(N-1)*0.025
FD-K040	311	278	73	40	9.00+2.30*N	0.95+0.070*N	0.0195	(N-2)*0.0195	0.040	(N-1)*0.040
FD-K050	306	250	106	50	10.0 +2.38*N	1.48+0.116*N	0.0255	(N-2)*0.0255	0.055	(N-1)*0.055
FD-K060	466	432	74	40	10.0+2.30*N	1.39+0.100*N	0.0302	(N-2)*0.0302	0.064	(N-1)*0.064
FD-K070	304	250	124	70	10.0+2.38*N	1.65+0.134*N	0.0300	(N-2)*0.0300	0.065	(N-1)*0.065
FD-K095	522	466	106	50	11.0+2.38*N	3.09+0.204*N	0.0475	(N-2)*0.0475	0.095	(N-1)*0.095
FD-K105	504	444	124	64	11.0+2.38*N	3.80+0.230*N	0.0533	(N-2)*0.0533	0.107	(N-1)*0.107
FD-K200	613	519	186	92	14.0+2.40*N	8.04+0.404*N	0.0945	(N-2)*0.0945	0.206	(N-1)*0.206
FD-K205	528	456	246	174	14.0+2.40*N	8.01+0.480*N	0.1099	(N-2)*0.1099	0.232	(N-1)*0.232
FD-K210	527	430	245	148	11.5+2.85*N	7.33+0.465*N	0.1036	(N-2)*0.1036	0.289	(N-1)*0.289
FD-K215	529	449	247	167	13.0+2.40*N	8.31+0.473*N	0.1103	(N-2)*0.1103	0.220	(N-1)*0.220
FD-K025S	205	172	73	42	7.30+2.27*N	0.79+0.040*N	0.0120	(N-2)*0.0120	0.025	(N-1)*0.025
FD-K030S	194	154	80	40	11.0+2.20*N	1.13+0.047*N	0.0117	(N-2)*0.0117	0.025	(N-1)*0.025
FD-K040S	311	278	73	40	9.00+2.30*N	0.80+0.070*N	0.0195	(N-2)*0.0195	0.040	(N-1)*0.040
FD-K050S	306	250	106	50	12.0+2.38*N	2.39+0.116*N	0.0255	(N-2)*0.0255	0.055	(N-1)*0.055
FD-K060S	466	432	74	40	10.0+2.30*N	1.27+0.100*N	0.0302	(N-2)*0.0302	0.064	(N-1)*0.064
FD-K070S	304	250	124	70	12.0+2.38*N	2.78+0.134*N	0.0300	(N-2)*0.0300	0.065	(N-1)*0.065
FD-K095S	522	466	106	50	13.0+2.38*N	5.74+0.204*N	0.0475	(N-2)*0.0475	0.095	(N-1)*0.095
FD-K105S	504	444	124	64	13.0+2.38*N	6.32+0.237*N	0.0533	(N-2)*0.0533	0.107	(N-1)*0.107
FD-K200S	613	519	186	92	17.0+2.40*N	13.03+0.404*N	0.0945	(N-2)*0.0945	0.206	(N-1)*0.206
FD-K205S	528	456	246	174	16.5+2.40*N	14.25+0.480*N	0.1099	(N-2)*0.1099	0.232	(N-1)*0.232
FD-K215S	529	449	247	167	16.0+2.40*N	13.80+0.567*N	0.1103	(N-2)*0.1103	0.220	(N-1)*0.220

MODEL SELECTION CHART

R410A vs. Water Condenser — Based on ARI -450

RT	kW	BTU/H	FD-K025S	FD-K030S	FD-K040S	FD-K050S	FD-K060S	FD-K070S
0.2	0.70	2400	FD-K025Sx8	FD-K030Sx8				
0.5	1.76	6000	FD-K025Sx16	FD-K030Sx16	FD-K040Sx10			
1.0	3.52	12000	FD-K025Sx28	FD-K025Sx28	FD-K040Sx16	FD-K050Sx12	FD-K060Hx10	FD-K070x12
1.5	5.27	18000			FD-K040Sx20	FD-K050Sx16	FD-K060Hx14	FD-K070x16
2.0	7.03	24000			FD-K040Sx24	FD-K050Sx20	FD-K060Hx18	FD-K070x20
2.5	8.79	30000				FD-K050Sx26	FD-K060Hx22	FD-K070x26
3.0	10.55	36000				FD-K050Sx32	FD-K060Hx28	FD-K070x32
4.0	14.06	48000				FD-K050Sx42	FD-K060Hx38	FD-K070x42
5.0	17.58	60000				FD-K050Sx52	FD-K060Hx46	FD-K070x52

R410A vs. Water Condenser — Based on ARI -450

RT	kW	BTU/H	FD-K095S	FD-K105S	FD-K200S	FD-K205S	FD-K215S
2.0	7.03	24000	FD-K095Sx10	FD-K105Sx10			
2.5	8.79	30000	FD-K095Sx12	FD-K105Sx12			
3.0	10.55	36000	FD-K095Sx14	FD-K105Sx14			
4.0	14.06	48000	FD-K095Sx20	FD-K105Sx20			
5.0	17.58	60000	FD-K095Sx24	FD-K105Sx24	FD-K200Sx12	FD-K205Sx12	
7.5	26.37	90000	FD-K095Sx36	FD-K105Sx36	FD-K200Sx16	FD-K205Sx16	
10.0	35.16	120000	FD-K095Sx48	FD-K105Sx48	FD-K200Sx20	FD-K205Sx20	FD-K215SxD22
12.5	43.95	150000			FD-K200Sx26	FD-K205Sx26	
15.0	52.74	180000			FD-K200Sx30	FD-K205Sx30	FD-K215SxD30
20.0	70.32	240000			FD-K200Sx40	FD-K205Sx42	FD-K215SxD38
25.0	87.90	300000			FD-K200Sx52	FD-K205Sx54	FD-K215SxD50
30.0	105.48	360000			FD-K200Sx64	FD-K205Sx66	FD-K215SxD58
40.0	140.64	480000			FD-K200Sx96	FD-K205Sx98	FD-K215SxD82
50.0	175.80	600000				FD-K205Sx170	

R410A vs. Water Evaporator — Based on ARI -480

RT	kW	BTU/H	FD-K025	FD-K030	FD-K040	FD-K050	FD-K060	FD-K070
0.2	0.70	2400	FD-K025x12	FD-K030x12				
0.5	1.76	6000	FD-K025x20	FD-K030x20	FD-K040x12			
1.0	3.52	12000	FD-K025x34	FD-K025x34	FD-K040x20	FD-K050x12	FD-K060Hx10	FD-K070x12
1.5	5.27	18000			FD-K040x30	FD-K050x18	FD-K060Hx16	FD-K070x16
2.0	7.03	24000			FD-K040x40	FD-K050x22	FD-K060Hx20	FD-K070x20
2.5	8.79	30000				FD-K050x26	FD-K060Hx22	FD-K070x24
3.0	10.55	36000				FD-K050x36	FD-K060Hx32	FD-K070x34
4.0	14.06	48000				FD-K050x46	FD-K060Hx40	FD-K070x44
5.0	17.58	60000				FD-K050x54	FD-K060Hx48	FD-K070x52

R410A vs. Water Evaporator — Based on ARI -480

RT	kW	BTU/H	FD-K095	FD-K105	FD-K200	FD-K205	FD-K215
2.0	7.03	24000	FD-K095x10	FD-K105x14			
2.5	8.79	30000	FD-K095x12	FD-K105x16			
3.0	10.55	36000	FD-K095x16	FD-K105x18			
4.0	14.06	48000	FD-K095x20	FD-K105x24			
5.0	17.58	60000	FD-K095x24	FD-K105x30	FD-K200x14	FD-K205x12	
7.5	26.37	90000	FD-K095x38	FD-K105x44	FD-K200x18	FD-K205x16	
10.0	35.16	120000	FD-K095x50	FD-K105x56	FD-K200x24	FD-K205x22	FD-K215xD26
12.5	43.95	150000			FD-K200x30	FD-K205x28	
15.0	52.74	180000			FD-K200x36	FD-K205x32	FD-K215xD34
20.0	70.32	240000			FD-K200x48	FD-K205x44	FD-K215xD42
25.0	87.90	300000			FD-K200Sx60	FD-K205x56	FD-K215xD54
30.0	105.48	360000				FD-K205x70V	FD-K215xD62
40.0	140.64	480000				FD-K205x108V	FD-K215xD86

R134a vs. Water Condenser — Based on ARI-450 Standard

RT	kW	BTU/H	FD-K025	FD-K030	FD-K040	FD-K050	FD-K060	FD-K070
0.2	0.70	2400	FD-K025x8	FD-K030x8				
0.5	1.76	6000	FD-K025x16	FD-K030x16	FD-K040x10			
1.0	3.52	12000	FD-K025x30	FD-K025x30	FD-K040x18	FD-K050x16	FD-K060Hx14	FD-K070x16
1.5	5.27	18000			FD-K040x24	FD-K050x22	FD-K060Hx20	FD-K070x22
2.0	7.03	24000			FD-K040x32	FD-K050x28	FD-K060Hx24	FD-K070x26
2.5	8.79	30000				FD-K050x34	FD-K060Hx30	FD-K070x32
3.0	10.55	36000				FD-K050x42	FD-K060Hx38	FD-K070x40
4.0	14.06	48000				FD-K050x56	FD-K060Hx50	FD-K070x54
5.0	17.58	60000				FD-K050x68	FD-K060Hx60	FD-K070x66

R134a vs. Water Condenser — Based on ARI-450 Standard

RT	kW	BTU/H	FD-K095	FD-K105	FD-K200	FD-K205	FD-K215D
2.0	7.03	24000	FD-K095x14	FD-K105x14			
2.5	8.79	30000	FD-K095x16	FD-K105x16			
3.0	10.55	36000	FD-K095x18	FD-K105x18			
4.0	14.06	48000	FD-K095x24	FD-K105x24			
5.0	17.58	60000	FD-K095x28	FD-K105x28	FD-K200Hx18	FD-K205x12	
7.5	26.37	90000	FD-K095x42	FD-K105x42	FD-K200Hx24	FD-K205x18	
10.0	35.16	120000	FD-K095x56	FD-K105x56	FD-K200Hx30	FD-K205x20	FD-K215Dx18
12.5	43.95	150000			FD-K200Hx38	FD-K205x26	
15.0	52.74	180000			FD-K200Hx46	FD-K205x30	FD-K215Dx30
20.0	70.32	240000			FD-K200Hx60	FD-K205x42	FD-K215Dx38
25.0	87.90	300000			FD-K200Hx76	FD-K205x54	FD-K215Dx50
30.0	105.48	360000			FD-K200Hx90	FD-K205x66	FD-K215Dx58
40.0	140.64	480000			FD-K200Hx120	FD-K205x98	FD-K215Dx82
50.0	175.80	600000				FD-K205x138	

R134a vs. Water Evaporator — Based on ARI-480 Standard

RT	kW	BTU/H	FD-K025	FD-K030	FD-K040	FD-K050	FD-K060	FD-K070S
0.2	0.70	2400	FD-K025x12	FD-K030x12				
0.5	1.76	6000	FD-K025x20	FD-K030x20	FD-K040x12			
1.0	3.52	12000	FD-K025x36	FD-K025x36	FD-K040x20	FD-K050x12	FD-K060Mx14	FD-K070x14
1.5	5.27	18000			FD-K040x32	FD-K050x18	FD-K060Mx18	FD-K070x18
2.0	7.03	24000			FD-K040x40	FD-K050x22	FD-K060Mx22	FD-K070x20
2.5	8.79	30000				FD-K050x26	FD-K060Mx28	FD-K070x26
3.0	10.55	36000				FD-K050x36	FD-K060Mx36	FD-K070x34
4.0	14.06	48000				FD-K050x46	FD-K060Mx44	FD-K070x42
5.0	17.58	60000				FD-K050x54	FD-K060Mx56	FD-K070x54

R410a vs. Water Evaporator — Based on ARI-480 Standard

RT	kW	BTU/H	FD-K095	FD-K105	FD-K200	FD-K205	FD-K215
2.0	7.03	24000	FD-K095x14	FD-K105x16			
2.5	8.79	30000	FD-K095x16	FD-K105x20			
3.0	10.55	36000	FD-K095x20	FD-K105x24			
4.0	14.06	48000	FD-K095x24	FD-K105x30			
5.0	17.58	60000	FD-K095x30	FD-K105x36	FD-K200x16	FD-K205x16	
7.5	26.37	90000	FD-K095x46	FD-K105x54	FD-K200x24	FD-K205x24	
10.0	35.16	120000	FD-K095x64	FD-K105x84	FD-K200x32	FD-K205x32	FD-K215Dx34
12.5	43.95	150000			FD-K200x38	FD-K205x40	
15.0	52.74	180000			FD-K200x46	FD-K205x48	FD-K215Dx46
20.0	70.32	240000			FD-K200x60	FD-K205x64V	FD-K215Dx62
25.0	87.90	300000				FD-K205x84V	FD-K215Dx78
30.0	105.48	360000				FD-K205x108V	FD-K215Dx94
40.0	140.64	480000				FD-K205x180V	FD-K215Dx126V

R407C vs. Water Condenser — Based on ARI-450 Standard

RT	kW	BTU/H	FD-K025	FD-K030	FD-K040	FD-K050	FD-K060	FD-K070
0.2	0.70	2400	FD-K025x12	FD-K030x12				
0.5	1.76	6000	FD-K025x26	FD-K030x26	FD-K040x14			
1.0	3.52	12000	FD-K025x44	FD-K025x44	FD-K040x24	FD-K050x20	FD-K060Hx18	FD-K070x18
1.5	5.27	18000			FD-K040x32	FD-K050x30	FD-K060Hx14	FD-K070x28
2.0	7.03	24000			FD-K040x42	FD-K050x38	FD-K060Hx34	FD-K070x36
2.5	8.79	30000				FD-K050x50	FD-K060Hx44	FD-K070x48
3.0	10.55	36000				FD-K050x60	FD-K060Hx54	FD-K070x58
4.0	14.06	48000				FD-K050x76	FD-K060Hx68	FD-K070x74

R407C vs. Water Condenser — Based on ARI-450 Standard

RT	kW	BTU/H	FD-K095	FD-K105	FD-K200	FD-K205	FD-K215D
2.0	7.03	24000	FD-K095x18	FD-K105x18			
2.5	8.79	30000	FD-K095x20	FD-K105x20			
3.0	10.55	36000	FD-K095x26	FD-K105x28			
4.0	14.06	48000	FD-K095x36	FD-K105x38			
5.0	17.58	60000	FD-K095x44	FD-K105x48	FD-K200x24	FD-K205x22	
7.5	26.37	90000	FD-K095x66	FD-K105x72	FD-K200x36	FD-K205x34	
10.0	35.16	120000	FD-K095x88	FD-K105x96	FD-K200x46	FD-K205x42	FD-K21Dx22
12.5	43.95	150000			FD-K200x58	FD-K205x54	
15.0	52.74	180000			FD-K200x70	FD-K205x64	FD-K215Dx30
20.0	70.32	240000			FD-K200x94	FD-K205x86	FD-K215Dx38
25.0	87.90	300000			FD-K200x118	FD-K205x108	FD-K215Dx50
30.0	105.48	360000			FD-K200x140	FD-K205x128	FD-K215Dx58
40.0	140.64	480000				FD-K205x176	FD-K215Dx82

R407C vs. Water Evaporator — Based on ARI -480 Standard

RT	kW	BTU/H	FD-K025	FD-K030	FD-K040	FD-K050	FD-K060	FD-K070
0.2	0.70	2400	FD-K025x10	FD-K030x10				
0.5	1.76	6000	FD-K025x16	FD-K030x16	FD-K040x10			
1.0	3.52	12000	FD-K025x28	FD-K025x28	FD-K040x14	FD-K050x10	FD-K060Mx10	FD-K070x10
1.5	5.27	18000			FD-K040x20	FD-K050x14	FD-K060Mx14	FD-K070x14
2.0	7.03	24000			FD-K040x26	FD-K050x16	FD-K060Mx16	FD-K070x16
2.5	8.79	30000				FD-K050x18	FD-K060Mx18	FD-K070x18
3.0	10.55	36000				FD-K050x22	FD-K060Mx22	FD-K070x22
4.0	14.06	58000				FD-K050x28	FD-K060Mx30	FD-K070x28
5.0	17.58	60000				FD-K050x36	FD-K060Mx40	FD-K070x36

R407C vs. Water Evaporator — Based on ARI -480 Standard

RT	kW	BTU/H	FD-K095	FD-K105	FD-K200	FD-K205	FD-K215
2.0	7.03	24000	FD-K095x10	FD-K105x10			
2.5	8.79	30000	FD-K095x12	FD-K105x12			
3.0	10.55	36000	FD-K095x16	FD-K105x14			
4.0	14.06	48000	FD-K095x20	FD-K105x18			
5.0	17.58	60000	FD-K095x24	FD-K105x22	FD-K200x12	FD-K205x12	
7.5	26.37	90000	FD-K095x38	FD-K105x38	FD-K200x16	FD-K205x16	
10.0	35.16	120000	FD-K095x50	FD-K105x50	FD-K200x22	FD-K205x22	FD-K215Dx22
12.5	43.95	150000			FD-K200x28	FD-K205x28	
15.0	52.74	180000			FD-K200x34	FD-K205x34	FD-K215Dx30
20.0	70.32	240000			FD-K200x44	FD-K205x44	FD-K215Dx42
25.0	87.90	300000			FD-K200Sx56	FD-K205x58	FD-K215Dx54
30.0	105.48	360000				FD-K205x72V	FD-K215Dx66
40.0	140.64	480000				FD-K205x110V	FD-K215Dx86

FD-E / F SERIES LOW PRESSURE

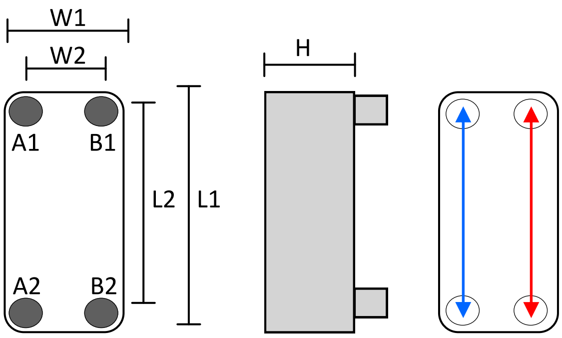
FD-E Series FD-F Series

The FD-E/F Series is designed specifically for small volume water to water applications.

FD-E Series has a flat cover design while the more economical FD-F Series does not have a flat plate. A multi-pass pattern is also available for different working conditions and requirements.

Main applications for the FD-E/F Series are residential gas boilers, district heating and solar heating systems.

Brazing Material	Copper			
Model	F025	E030	E040	E060
	(A1,A2/B1,B2)			
Max. Working Pressure (bar)	10/10			
Min. Test Pressure (bar)	15/15			
Max. Working Temperature (°C)	200			



Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm) N = No. of plates	Weight (kg) N = No. of plates	Heat Transfer Area/Plate (m2)	Total Heat Transfer Area (m2) N = No. of plates	Volume/ Channel (Litres)	Total Volume (Litres) N = No. of plates
F025	206.2	172	74.2	40 / 42	6.5+2.27*N	0.38+0.040*N	0.0120	(N-2)*0.0120	0.025	(N-1)*0.025
E030	194.5	154	80.5	40	7.0+2.25*N	0.47+0.047*N	0.0117	(N-2)*0.0117	0.025	(N-1)*0.025
E040	311	278	73	40	9.0+2.30*N	0.80+0.070*N	0.0195	(N-2)*0.0195	0.040	(N-1)*0.040
E060	466	432	74	40	9.0+2.30*N	0.80+0.10*N	0.0302	(N-2)*0.0302	0.064	(N-1)*0.064

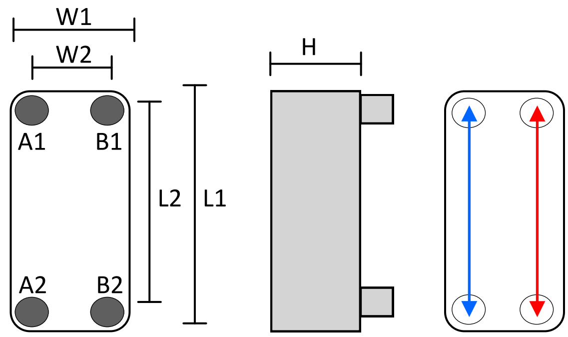
MODEL SELECTION CHART

RT	kW	BTU/H	Hot Water Temperature	Cold Water Temperature	FD-F025	FD-E030	FD-E040	FD-E060
1.0	3.5160	12000	70°C— 50°C	10°C— 60°C	F025x12	E030x12		
2.0	7.0320	24000	70°C— 50°C	10°C— 60°C	F025x16	E030x16		
3.0	10.5480	36000	70°C— 50°C	10°C— 60°C	F025x22	E030x22		
4.0	14.0640	48000	70°C— 50°C	10°C— 60°C	F025x26	E030x26		
5.0	17.5800	60000	70°C— 50°C	10°C— 60°C	F025x32	E030x32	E040x10	
7.5	26.3700	90000	70°C— 50°C	10°C— 60°C	F025x44	E030x44	E040x14	E060x10
10.0	35.1600	120000	70°C— 50°C	10°C— 60°C	F025x56	E030x56	E040x18	E060x12
15.0	52.7400	180000	70°C— 50°C	10°C— 60°C			E040x26	E060x18
20.0	70.3200	240000	70°C— 50°C	10°C— 60°C			E040x36	E060x24
25.0	87.9000	300000	70°C— 50°C	10°C— 60°C			E040x50	E060x30
30.0	105.480	360000	70°C— 50°C	10°C— 60°C				E060x40

FD-R SERIES HIGH HEAT TRANSFER

FD-R Series represents the upgrade version of the FD-K Standard Series. It is specially designed for R410A systems with heat transfer efficiency of 10% more than the FD-K Standard Series.
The FD-R Series is perfectly suited to those applications where pressure drop is not the main concern.
Fluid Dynamics' FD-R Series is ideal for Heat Pumps and HVAC applications
The FD-KR Series is rated to a maximum working pressure of 45 bar.

Brazing Material	Copper		Copper (Extra Strength)	
Model	R050	R095	R051	R096
	(A1,A2 / B1,B2)			
Max. Working Pressure (bar)	30/30	30/30	45/30	45/30
Min. Test Pressure (bar)	43/43	43/43	65/43	65/43
Max. Working Temperature (°C)	200			



Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm) N = No. of plates	Weight (kg) N = No. of plates	Heat Transfer Area/Plate (m2)	Total Heat Transfer Area (m2) N = No. of plates	Volume/ Channel (Litres)	Total Volume (Litres) N = No. of plates
FD-R050	306	250	106	50	10.0+1.80N	1.38+0.89N	0.0255	(N-2)0.0255	0.038	(N-1)0.038
FD-R095	522	466	106	50	10.0+1.85N	2.98+0.154N	0.0475	(N-2)0.0475	0.076	(N-1)0.076
FD-R051	306	250	106	50	12.0+1.80N	2.32+0.089N	0.0255	(N-2)0.0255	0.038	(N-1)0.038
FD-R096	522	466	106	50	10.0+1.85N	3.07+0.154N	0.0475	(N-2)0.0475	0.076	(N-1)0.076

MODEL SELECTION CHART

FD-R410A Water Condenser — Based on ARI-450 Standard

RT	Kw	BTU/H	FD-R051	FD-R096
1.0	3.52	12000	FD-R051x10	FD-R096Mx6
2.0	7.03	24000	FD-R051x16	FD-R096Mx10
2.5	8.79	30000	FD-R051x20	FD-R096Mx12
3.0	10.55	36000	FD-R051x24	FD-R096Mx14
4.0	14.06	48000	FD-R051x30	FD-R096Mx18
5.0	17.58	60000	FD-R051x38	FD-R096Mx24
7.5	26.37	90000	FD-R051x56	FD-R096Mx34
10.0	35.16	120000	FD-R051x74	FD-R096Mx46
12.5	43.95	150000		FD-R096Mx58
15.0	52.74	180000		FD-R096Mx72
20.0	70.32	240000		FD-R096Mx100

FD-R410A Water Evaporator — Based on ARI-480 Standard

RT	Kw	BTU/H	FD-R051	FD-R096
1.0	3.52	12000	FD-R051x10	FD-R096Mx6
2.0	7.03	24000	FD-R051x18	FD-R096Mx10
2.5	8.79	30000	FD-R051x20	FD-R096Mx12
3.0	10.55	36000	FD-R051x24	FD-R096Mx14
4.0	14.06	48000	FD-R051x32	FD-R096Mx20
5.0	17.58	60000	FD-R051x40	FD-R096Mx24
7.5	26.37	90000	FD-R051x62	FD-R096Mx36
10.0	35.16	120000	FD-R051x90	FD-R096Mx48
12.5	43.95	150000		FD-R096Mx62
15.0	52.74	180000		FD-R096Mx76
20.0	70.32	240000		FD-R096Mx108

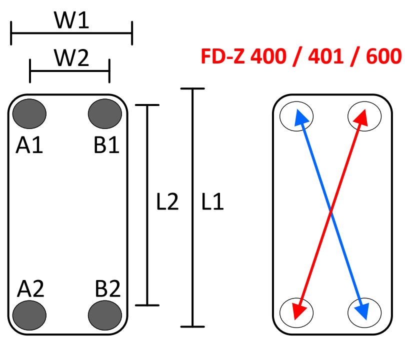
FD-Z SERIES LARGE DIAGONAL FLOW

The newly innovative FD-Z Series is designed with a diagonal flow pattern which provides higher efficiency and is a worthy replacement of shell & tube, double tube and multi-tube heat exchangers in various applications.

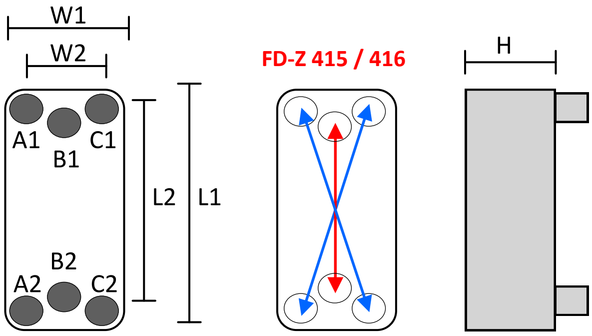
The advantage of the FD-Z Series dual circuit is it provides the best performance in both full load and part load conditions.

The FD-Z Series single circuit is specially designed for large volume and high heat transfer efficiency.

Note: 400/401/Z600 - 4 connections. 415 / 416 Dual Circuit - 6 connections.



Brazing Material	Copper		Copper (Extra Strength)	
Model	FD-Z400/Z600 (A2,B1/A1,B2)	FD-Z415 (A2,C1/A1,C2/B1,B2)	FD-Z401 (A2,B1/A1,B2)	FD-Z416 (A2,C1/A1,C2/B1,B2)
Max. Working Pressure (bar)	30/30	30/30/30	45/30	45/45/30
Min. Test Pressure (bar)	43/43	43/43/43	65/43	65/65/43
Max. Working Temperature (°C)	200			



Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm) N = No. of plates	Weight (kg) N = No. of plates	Heat Transfer Area/Plate (m2)	Total Heat Transfer Area (m2) N = No. of plates	Volume/ Channel (Litres)	Total Volume (Litres) N = No. of plates
FD-Z400	751	650	321	220	14.0+2.38*N	33.64+0.89*N	0.2074	(N-2)*0.2074	0.423	(N-1)*0.423
FD-Z415	751	656	321	226	14.0+2.40*N	33.82+0.87*N	0.2074	(N-2)*0.2074	0.414	(N-2)*0.414
FD-Z600	945	810	375	240	14.0+2.38*N	45.94+1.23*N	0.3	(N-2)*0.3	0.62	(N-1)*0.62
FD-Z401	751	650	321	220	23.0+2.38*N	39.02+1.03*N	0.2074	(N-2)*0.2074	0.423	(N-1)*0.423
FD-Z416	751	656	321	226	23.0+2.40*N	39.60+1.01*N	0.2074	(N-2)*0.2074	0.414	(N-2)*0.414

MODEL SELECTION CHART

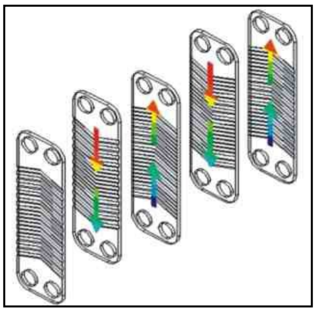
R134 vs Water Condenser			Based on ARI-450 Standard		
RT	Kw	BTU/H	FD-Z400	FD-Z415	FD-Z600
40	140.64	720	FD-Z400Mx58	FD-Z415x58	
50	175.80	900	FD-Z400Mx72	FD-Z415x74	
60	210.96	1200	FD-Z400Mx84	FD-Z415x86	
75	263.70	1500	FD-Z400Mx106	FD-Z415x106	
100	351.60	1800	FD-Z400Mx140	FD-Z415x142	
125	439.50	2100	FD-Z400Mx176	FD-Z415x178	
150	527.40	2400			FD-Z600Mx190
175	615.30				FD-Z600Mx224
200	703.20				FD-Z600Mx254

R134 vs Water Condenser			Based on ARI-480 Standard		
RT	Kw	BTU/H	FD-Z400	FD-Z415	FD-Z600
40	140.64	480	FD-Z400Hx64	FD-Z415x66	
50	175.80	600	FD-Z400Hx80	FD-Z415x82	
60	210.96	720	FD-Z400Hx98V	FD-Z415x98V	
75	263.70	900	FD-Z400Hx126V	FD-Z415x126V	
100	351.60	1200	FD-Z400Hx202V	FD-Z415x202V	
125	439.50	1500			FD-Z600Hx206
150	527.40	1800			FD-Z600H-254

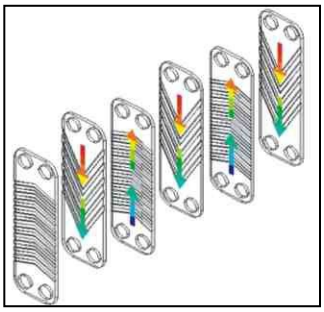
R410A vs Water Condenser			Based on ARI-450 Standard	
RT	Kw	BTU/H	FD-Z401	FD-Z416
40	140.64	480	FD-Z401Mx48	FD-Z416x50
50	175.80	600	FD-Z401Mx60	FD-Z416x62
60	210.96	720	FD-Z401Mx72	FD-Z416x74
75	263.70	900	FD-Z401Mx90	FD-Z416x90
100	351.60	1200	FD-Z401Mx124	FD-Z416x126
125	439.50	1500	FD-Z401Mx162	FD-Z416x162
150	527.40	1800	FD-Z401Mx208	FD-Z416x210

R410A vs Water Condenser			Based on ARI-480 Standard		
RT	Kw	BTU/H	FD-Z400	FD-Z415	FD-Z600
40	140.64	480	FD-Z401Mx50	FD-Z416x50	
50	175.80	600	FD-Z401Mx62	FD-Z416x62	
60	210.96	720	FD-Z401Mx76	FD-Z416x78	
75	263.70	900	FD-Z401Mx96	FD-Z416x98	
100	351.60	1200	FD-Z401Mx130v	FD-Z416x130	
125	439.50	1500	FD-Z401Mx172v	FD-Z416x174v	
150	527.40	1800			FD-Z600Mx200
175	615.30	2100			FD-Z600Mx244

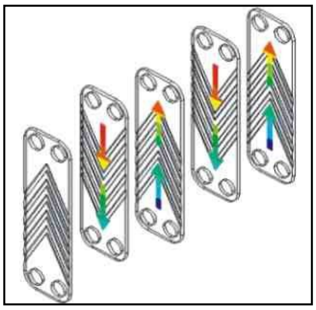
FD-Z series is designed with 3 different types of plates which satisfy various working conditions.



High Heat Transfer



Standard



Low Pressure Drop

• PROVEN RELIABILITY • PROVEN PERFORMANCE •

FD-C SERIES SUPER HIGH PRESSURE

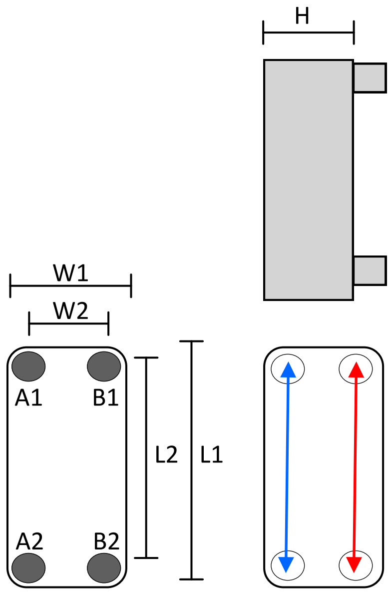
The FD-C Series is specially designed for evaporators, condensers, economisers and oil coolers in R744 (CO_2) heat pumps and refrigeration systems.

Different designs with maximum working pressure of 70 bar, 100 bar and 140 bar are available for a variety of duties and performance specifications.

Compact size, outstanding heat transfer performance and low pressure drop are the three key features.

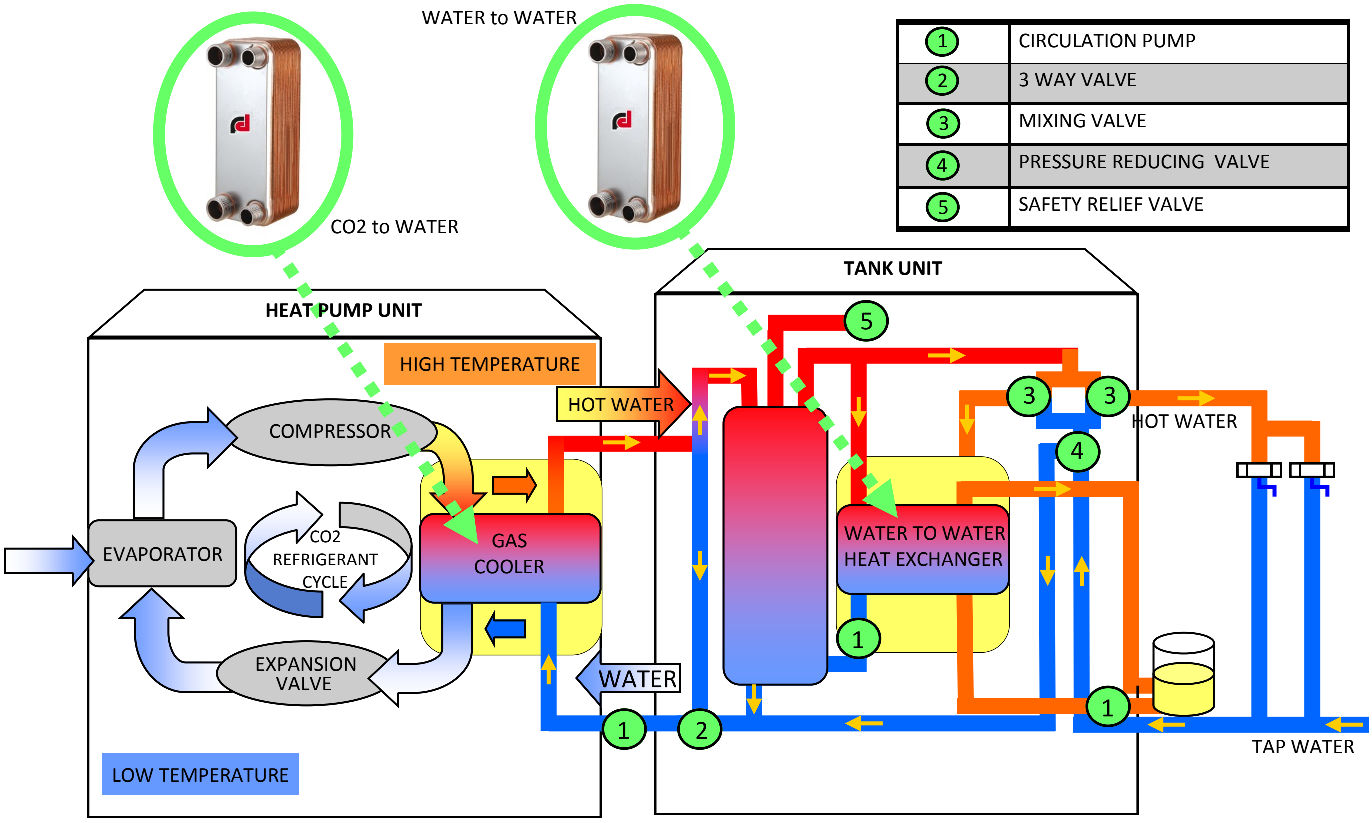
The quality and durability of the FD-C Series is proved by achieving burst test pressures up to 650 bar and testing over 100,000 cycles.

Brazing Material	Copper		
Model	FD-C040 FD-C095 FD-C200	FD-C041 FD-C096 FD-C201	FD-C042 FD-C097 FD-C202
	(A1,A2/B1,B2)		
Max. Working Pressure (bar)	70/30*	100/30*	140/30*
Min. Test Pressure (bar)	100/43*	143/43*	200/43*
Max. Working Temperature (°C)	200		



Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm) N = No. of plates	Weight (kg) N = No. of plates	Heat Transfer Area/Plate (m2)	Total Heat Transfer Area (m2) N = No. of plates	Volume/ Channel (Litres)	Total Volume (Litres) N = No. of plates
FD-C040	314	275	76	40	13.0+2.00*N	1.93+0.145*N	0.0193	(N-2)*0.0193	0.030	(N-1)*0.03
FD-C095	524	466	108	50	13.2+2.16*N	5.70+0.32*N	0.0475	(N-2)*0.0475	0.071	(N-1)*0.071
FD-C200	616	519	189	92	14.0+2.15*N	13.0+0.603*N	0.0950	(N-2)*0.0950	0.156	(N-1)*0.156
FD-C041	314	275	76	40	13.0+2.00*N	2.01+0.145*N	0.0193	(N-2)*0.0193	0.030	(N-1)*0.030
FD-C096	524	466	108	50	13.2+2.16*N	6.10+0.320*N	0.0475	(N-2)*0.0475	0.071	(N-1)*0.071
FD-C201	616	519	189	92	14.0+2.15*N	12.6+0.631*N	0.0950	(N-2)*0.0950	0.156	(N-1)*0.156
FD-C042	314	275	76	40	13.0+2.0*N	1.95+0.152*N	0.0193	(N-2)*0.0193	0.030	(N-1)*0.03
FD-C097	524	466	108	50	13.2+2.16*N	5.80+0.346*N	0.0475	(N-2)*0.0475	0.071	(N-1)*0.071
FD-C202	616	519	189	92	14.0+2.15*N	12.4+0.755*N	0.0950	(N-2)*0.0950	0.156	(N-1)*0.156

RT	Kw	BTU/H	FD-Z400	FD-Z415	FD-Z600
1.0	3.52	12000	C042x24(4 Pass)		
1.5	5.27	18000	C042x32(4 Pass)		
2.0	7.03	24000	C042x40(4 Pass)	C097x24(4 Pass)	
3.0	10.55	36000		C097x24(4 Pass)	
4.0	14.06	48000		C097x32(4 Pass)	
5.0	17.58	60000		C097x40(4 Pass)	C202x24(3 Pass)
7.5	26.37	90000		C097x48(4 Pass)	C202x30(3 Pass)
10.0	35.16	120000		C097x64(4 Pass)	C202x36(3 Pass)
12.5	43.95	150000		C097x72(4 Pass)	C202x48(3 Pass)
15.0	52.74	180000		C097x88(4 Pass)	C202x54(3 Pass)
20.0	70.32	240000			C202x66(3 Pass)
25.0	87.90	300000			C202x84(3 Pass)
30.0	105.48	360000			C202x102(3 Pass)
35.0	123.06	420000			C200x114(3 Pass)
40.0	140.64	480000			C200x132(3 Pass)

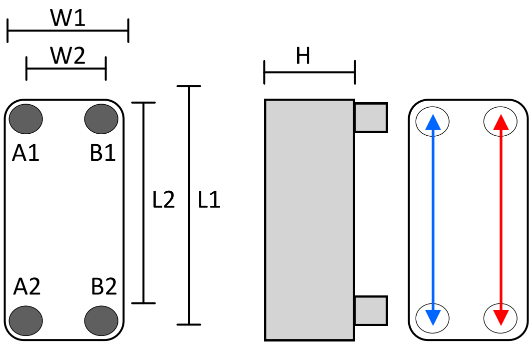


FD-H SERIES HIGH TEMPERATURE

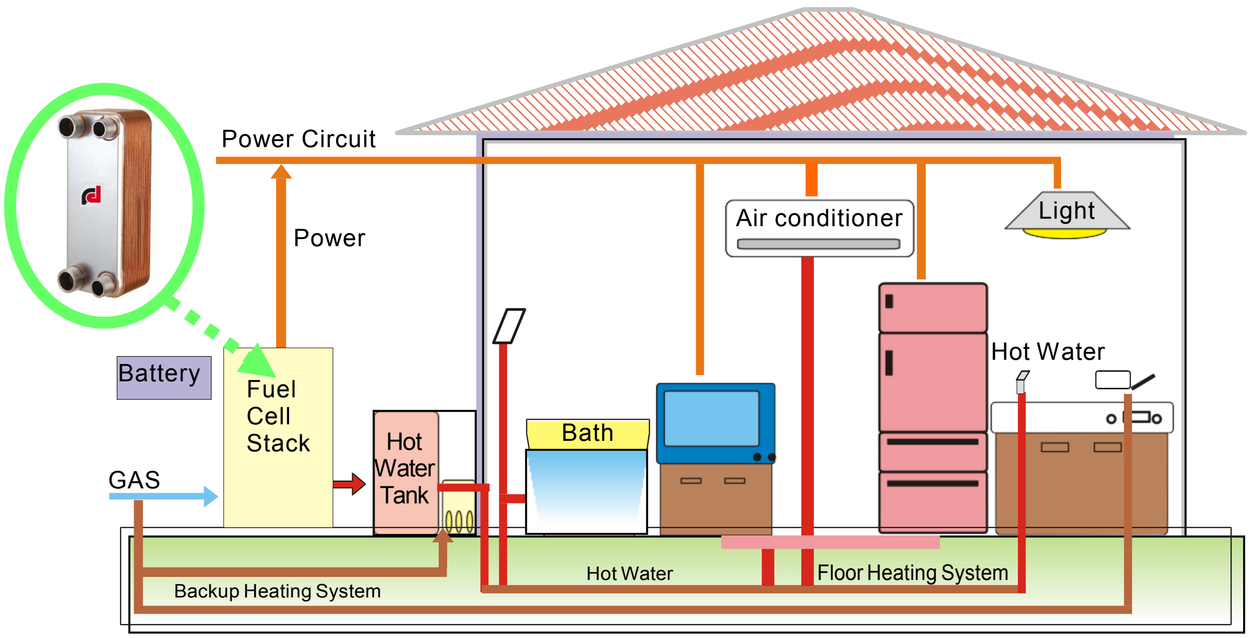
The FD-H Series is manufactured from material which is resistant to high temperatures up to 900°C.

This quality makes the FD-H Series perfectly suited to serve as gas heating or cooling heat exchangers in clean energy technology such as fuel cells and waste heat recovery systems.

Brazing Material	Nickel				
Model	H050,H095,H205 (A1,A2/B1,B2)				H051,H096,H206 (A1,A2/B1,B2)
Max. Working Pressure (bar)	10/10	7/7	3/3	2/2	10/10
Max. Working Temperature (°C)	0~650	~700	~800	~900	~550
Min. Test Pressure (bar)	15/15				15/15



Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm) N = No. of plates	Weight (kg) N = No. of plates	Heat Transfer Area/Plate (m2)	Volume/ Channel (Litres)
FD-H050/H051	306	250	106	50	10.0+2.40*N	1.64+0.137*N	0.0255	0.055
FD-H095/H096	522	466	106	50	10.0+2.40*N	3.32+0.240*N	0.0475	0.095
FD-H205/H206	528	456	246	174	11.5+2.40*N	8.00+0.514*N	0.1099	0.232

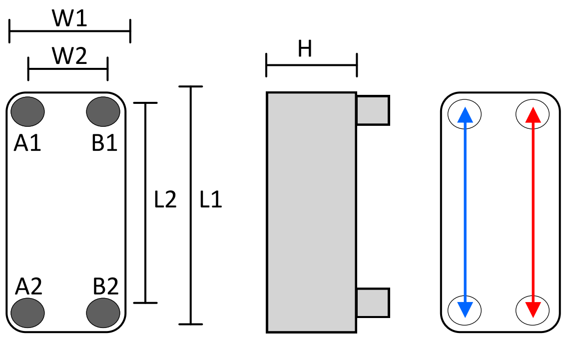


• PROVEN RELIABILITY • PROVEN PERFORMANCE •

FD-M SERIES CORROSION RESISTANT

The FD-M Series is specially designed for higher chlorine content applications.

The FD-M Series is manufactured from corrosion resistant stainless steel equivalent to SM0254 and is ideal for use in chlorine or salt dosed spas and swimming pools.



Brazing Material	Nickel
Model	M050,M095,M205
Plate Material	Equivalent to SMO254
	(A1,A2/B1,B2)
Max. Working Pressure (bar)	10/10
Min. Test Pressure (bar)	15/15
Max. Working Temperature (°C)	200

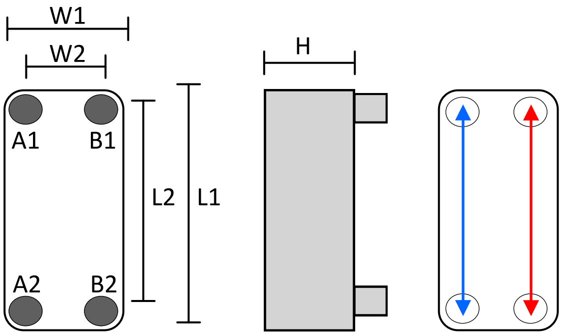
Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm) N = No. of plates	Weight (kg) N = No. of plates	Heat Transfer Area/Plate (m2)	Volume/Channel (Litres)
FD-M050	306	250	106	50	10.0+2.40*N	1.54+0.136*N	0.0255	0.055
FD-M095	522	466	106	50	10.0+2.40*N	3.12+0.240*N	0.0475	0.095
FD-M205	528	456	246	174	11.5+2.40*N	7.91+0.544*N	0.1099	0.232

FD-I SERIES IMPACT RESISTANT

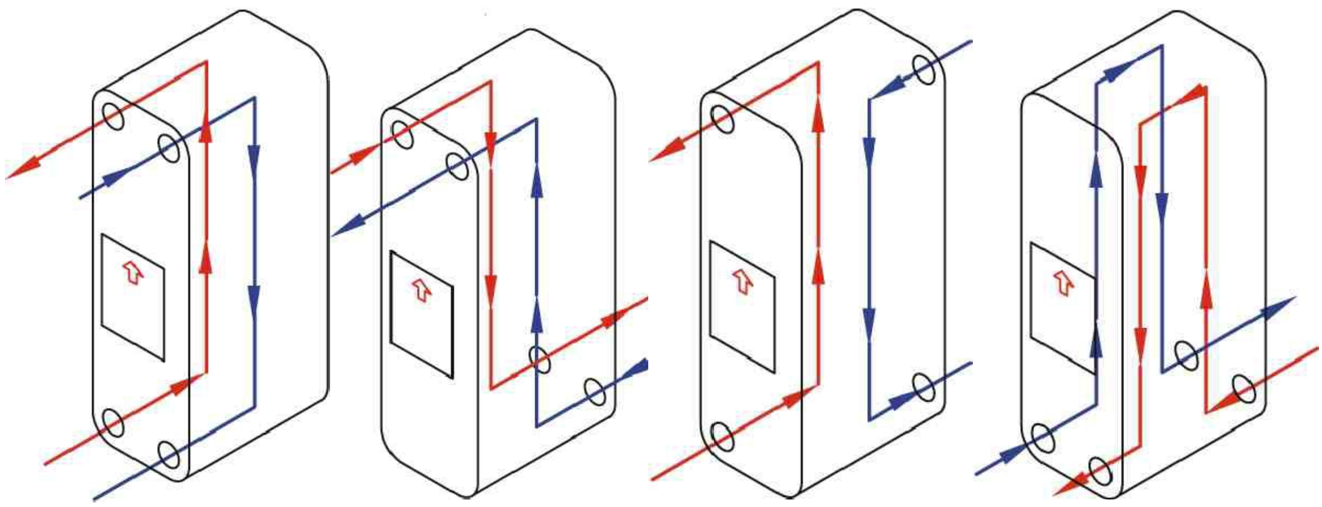
The FD-I Series is suitable for applications which require protection from thermal shocks or pressure shocks.

FD-I Series is designed particularly for use in hydraulic and boiler systems.

Brazing Material	Copper			
Model	FD-I 030	FD-I 070	FD-I 105	FD-I 205
	(A1,A2 / B1,B2)			
Max. Working Pressure (bar)	30/30			
Min. Test Pressure (bar)	43/43			
Max. Working Temperature (°C)	200			



Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm) N = No. of plates	Weight (kg) N = No. of plates	Heat Transfer Area/Plate (m2)	Total Heat Transfer Area (m2) N = No. of plates	Volume/ Channel (Litres)	Total Volume (Litres) N = No. of plates
FD-I030	194	154	80	40	10.0+2.25*N	0.90+0.047*N	0.0117	(N-6)*0.0117	0.025	(N-5)*0.025
FD-I070	304	250	124	70	10.0+2.40*N	1.96+0.131*N	0.0300	(N-6)*0.0300	0.065	(N-5)*0.065
FD-I05	504	444	124	64	10.0+2.40*N	4.06+0.237*N	0.0533	(N-6)*0.0533	0.107	(N-5)*0.107
FD-I205	528	456	246	174	11.5+2.40*N	8.12+0.438*N	0.1099	(N-6)*0.1099	0.232	(N-5)*0.232



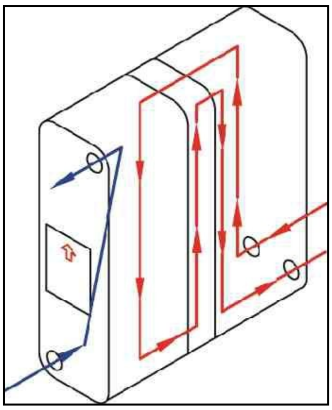
FD-A SERIES AIR DRYER

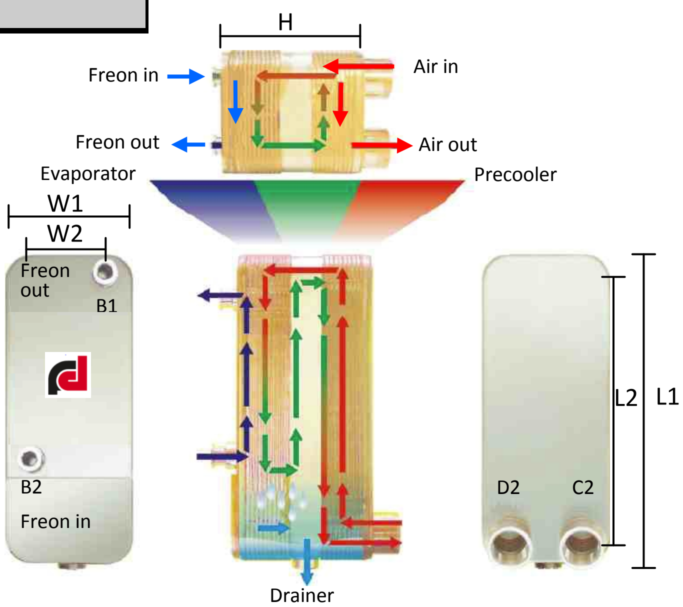
The FD-A Series is the innovative design for air dryers.

Combining a precooler, evaporator and separator, this heat exchanger provides both compact size and high thermal transfer performance in one unit.

The patented designed separator dehumidifies compressed air and eliminates the need for a filter avoiding problems with clogging

Brazing Material	Copper	
Model	FD-A070	FD-A210
	(A1,B1 / C2,D2)	
Max. Working Pressure (bar)	30/16	30/10
Min. Test Pressure (bar)	43/23	43/15
Max. Working Temperature (°C)	200	





Model	Air Floe Rate @ 7 bar (m3/min)	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	Weight (kg) N = No. of plates	H (mm) N = No. of plates	Air Connection (Inch)
FD-A070*20*26	2.4	304	250	124	70	11.2	158.3	1"
FD-A070*32*40	4.2	304	250	124	70	14.9	232.7	1-1/4"
FD-A070*46*66	7	304	250	124	70	21.3	356.6	1-1/2"
FD-A210*20*26	11	527	430	245	148	47.8	180.6	2"
FD-A210*26*32	14	527	430	245	148	57.4	248.9	2"
FD-A210*40*50	22	527	430	245	148	77.6	394.4	2-1/2"
FD-A210*50*64	28	527	430	245	148	95.9	501.0	3”

STANDARD CONNECTIONS DATA

Model	Male/Female Thread Connections								Solder Connections											Height
	PT/NPT/GB								Ø6.6 mm	Ø9.73 mm	Ø12.9 mm	Ø16.15 mm	Ø19.25 mm	Ø22.36 mm	Ø25.6 mm	Ø28.8 mm	Ø35.25 mm	Ø41.5 mm	Ø54.3 mm	
	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 3/8"	1 5/8"	2 1/8"	
025	◎								△	△	△	△	△							20
030	◎	◎							△	△	△	△	△	△						20
040/041/042	◎	◎							△	△	△	△	△							20
050/051	◎	◎	◎						△	△	△	△	△	△	△	△				27
060	◎	◎							△	△	△	△	△							27
070	◎	◎	◎	●	●				△	△	△	△	△	△	△	△	△			27
095/096/097	◎	◎	◎						△	△	△	△	△	△	△	△	△			27
105	◎	◎	◎	◎	●				△	△	△	△	△	△	△	△	△			27
200/201/202	○		◎	◎	◎	●	●				△	△	△	△		△	△	△	△	27/54
205/206	○		◎	◎	◎	●					△	△	△	△		△	△	△	△	27/54
210	○				◎	◎	◎	●						△		△	△	△		27/54
215	○		○	○	◎	◎	◎				△	△	△	△		△	△	△	△	27/54
400/401/415/416	○				◎	◎	◎	●			△	△	△	△		△	△	△	△	27/54

Model	Flange/Thread Connections						Solder Connections					Height
	◎Thread Connections/Flange ○Thread Connections						△ Solder					
	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	2 1/8"	2 3/8"	3 1/8"	3 3/8"	4"	
600/601	○	◎	◎	◎	◎	◎	△	△	△	△	△	54/81

Connections types include: Soldered for copper tube; female/male thread; hydraulic; nickel brazed; temperature control; opposite side etc. Fluid Dynamics can customise connections to meet specific demand and requirements. Contact Fluid Dynamics for more information.

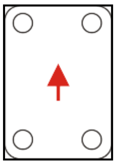
SOLDERING CONNECTIONS

In HVAC systems the refrigerant side is usually soldered with the copper pipe. The connection of brazed plate heat exchanger is stainless steel. Accordingly it is necessary to use high silver content solder. Please follow the guides below:

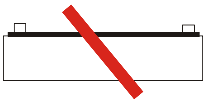
- Before starting soldering the copper pipe and the connections should be perfectly cleaned.
- During the soldering process soldering flux is recommended to protect the pipe and heat exchanger from oxidisation and to help lower the temperature.
- The brazed plate heat exchanger should be placed in a horizontal position during the entire process, and place wet cloth around the connection base to reduce heat reaching the plates.
- Silver solder containing at least 45% silver should be used. Soldering temperature must not exceed 800 °C.
- Excessive soldering temperature or exposure to heat may cause melting of the brazing points and damage to

INSTALLATION & MOUNTING

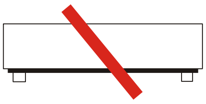
The brazed plate heat exchanger should be installed vertically.



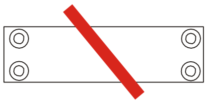
Preferred



Incorrect

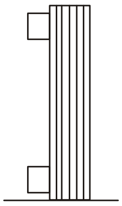


Incorrect

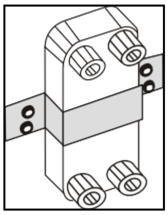


Incorrect

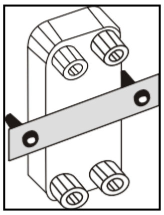
Recommended installation:



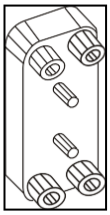
Bottom Support



Sheet Metal Bracket



Crossbar & Bolts



Stud Bolts

SOFTENING COOLING TOWER WATER

Softening treatment and regular maintenance for cooling towers can reduce scale clogging problems. While using chemical additives to do the cleaning, the concentration of the additive should be carefully controlled. Avoid using corrosive additives. If stainless steel and copper react to the corrosive content it will reduce the pressure resistance of the brazing joints and possibly lead to internal or external leakages. To avoid problems ensure the proper chemical additives comply with the following:

pH: 6—8	**SO ± <30mg/L**	**Cl < 50ppm (<100°C);**	**NH ± <0.1 mg/L**

PREVENTION OF WATER HAMMER

Water hammer occurs when the flow of non-compressible fluids in pipes suddenly changes its velocity. The most common cause is when the rapid closure of a solenoid valve causes sudden pressure in the pipes. This may damage the valve, heat exchanger and other equipment on the circuit. To avoid water hammer installation of pressure suction pipes, water hammer arrestors, air chambers etc. are highly recommended.

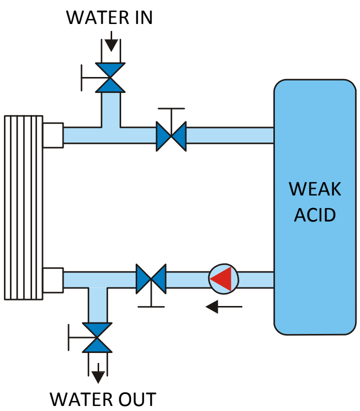
CLEANING

Ultrasonic cleaning using the correct chemicals and procedures is the ideal way to clean all plate heat exchangers. It is safe and does not damage the plates.

Fluid Dynamics has one of the latest, and possibly biggest, ultrasonic cleaning systems in Australia and is happy to answer all your questions on the process.

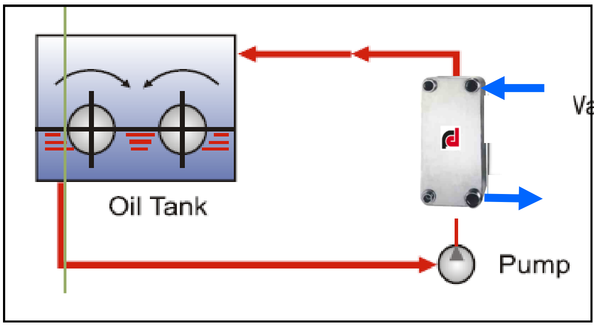
To otherwise clean brazed plate heat exchangers it is recommended to use weak acid (5% phosphoric, nitric or oxalic acid) and back flush to remove soft debris inside the unit (as shown in the diagram).

The flow rate of the cleaning solution should be at least 1.5 to 2 times the normal flow rate for at least 30 minutes. After cleaning, thoroughly rinse the heat exchanger with large amounts of clean water to purge any remaining acid solution.

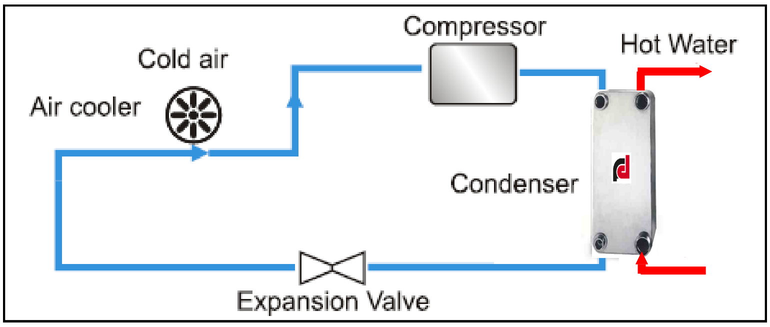


TYPICAL FLOW DIAGRAMMES

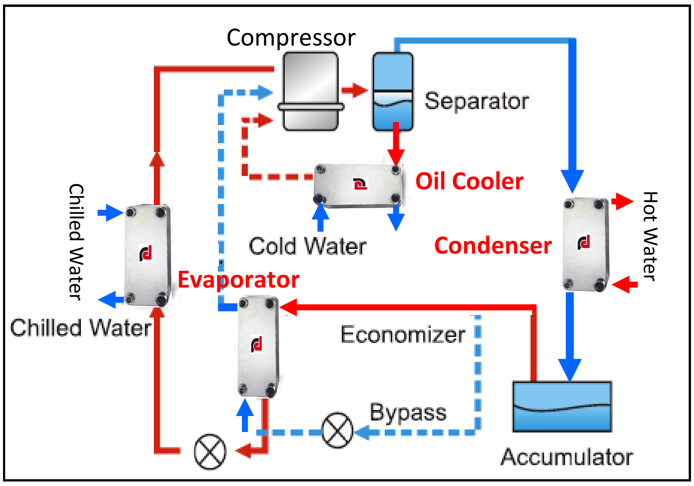
OIL COOLER SYSTEM



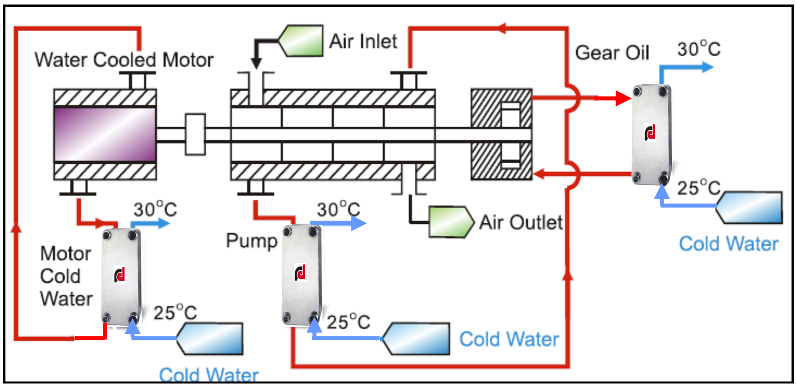
HEAT PUMP SYSTEM



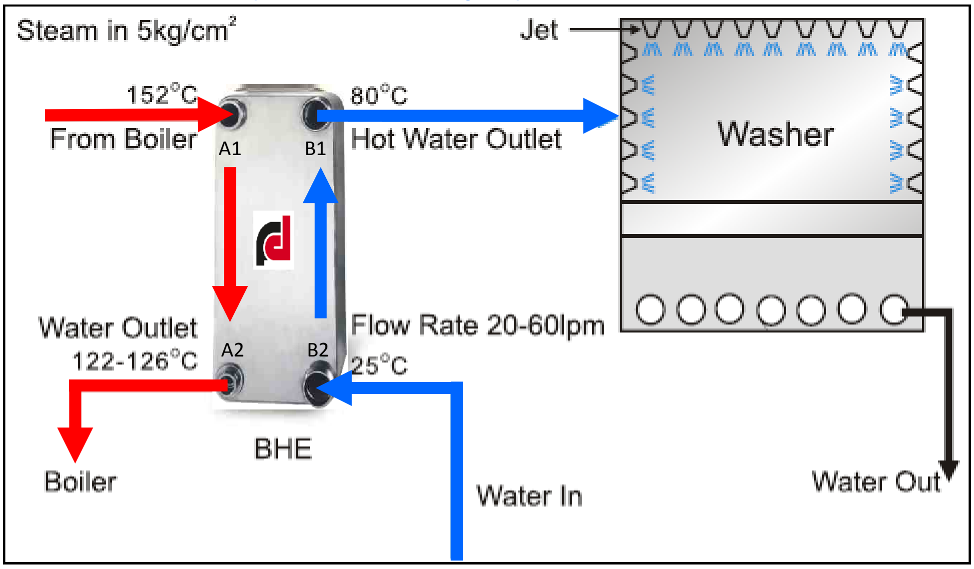
CHILLER SYSTEM



VACUUM PUMP COOLING SYSTEM



WASHER SYSTEM (Boiler Heat Recycle)



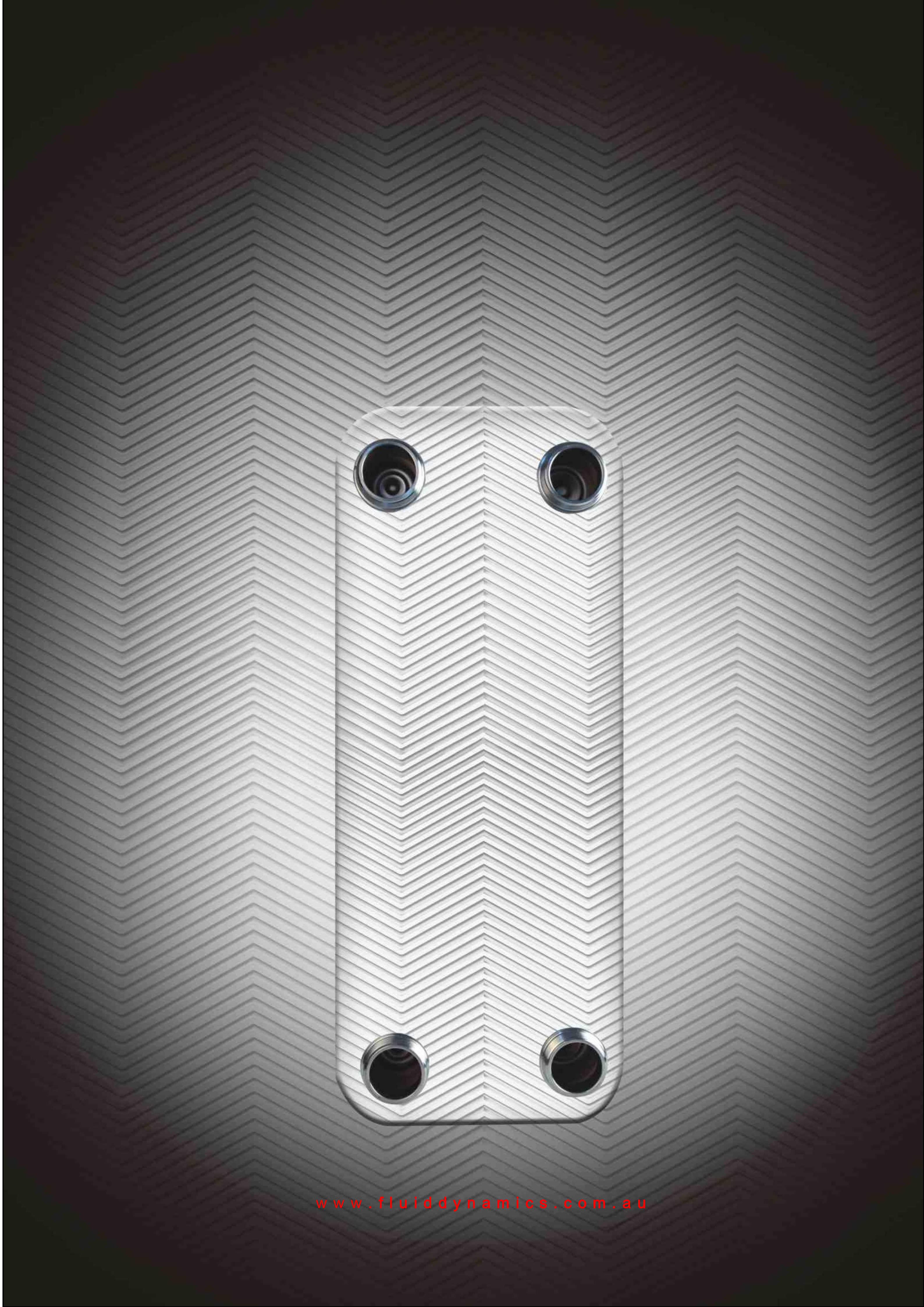
A WORLD OF HEAT EXCHANGERS

Fluid Dynamics can assist you with all your heat exchanger needs:

- Shell & Tube
    - FluidEX® Off the Shelf
    - Marine
    - Fail Safe™
    - Hybrid
    - Custom Build
    - Corrugated
        - Multitube Industrial
        - Multitube Hygienic
        - Annular Space
        - Tube in Tube
        - Exhaust Gas
- Scraped Surface Heat Exchangers
-
- Special Projects
- FD-Plate™
    - Gasket
    - Gasket - Fail Safe™
    - Brazed
    - Brazed - Fail Safe™
    - Fully Welded
- Fin Tube
- Coil Condensers
- Dry Air Coolers
- Adiabatic Coolers
- Air Cooled Condensers & Evaporators
- FluidAIR® Bar & Plate
- FT Range™ On Road / Off Road
- Ultrasonic Cleaning
- Aftermarket
- Heat Pumps
- Piston Pumps

Fluid Dynamics

Fluid Dynamics Pty Ltd
HEAT EXCHANGERS SINCE 1981
25 Star Crescent
Hallam, Melbourne
Vic 3803 Australia
T: +61 3 9796 5988
F: +61 3 9796 5777
E: mail@fluiddynamics.com.au
W: www.fluiddynamics.com.au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