

Refrigeration Product & Application Catalog

 **FlatPlate®**
 GEA PHE Systems North America, Inc.

- Liquid DX Evaporators
- High Pressure Models XP-Series
- Condenser/Heat Pumps
- Industrial Condensers
- Subcoolers
- Liquid to Liquid
- Special Applications
- Shell and Tube Replacement



Brazed Plate Heat Exchangers

GEA Heat Exchangers
 GEA PHE Systems North America

Index of Applications

Application	Page	Application	Page
Refrigeration Heat Exchangers	3	Heat Pumps	17
Direct Expansion Evaporators	5	Liquid to Liquid General Purpose	19
Two Refrigerant Circuit	7	Replacement Hx's - Refrigeration	22
CHN Direct Expansion Evaporators	9	Replacement Hx's - Liquid to Liquid	23
CH-M Direct Expansion Evaporators	10	Accessories To Make Your Life Easier	24
Condensers	11	Field Application Tips	27
C-M Condensers	13	Conversion Formulas and Reference Information	31
Industrial Condensers	14	Refrigeration Installation Instructions	32
Subcoolers and Specials	15	Terms and Conditions of Sale	34

FlatPlateSelect Free Online Selection Software

Application

Although the selections in this catalog cover the common design situations, there may be times when you have a less common design, or you may need submittal sheets. All of this is available at www.flatplateselect.com.

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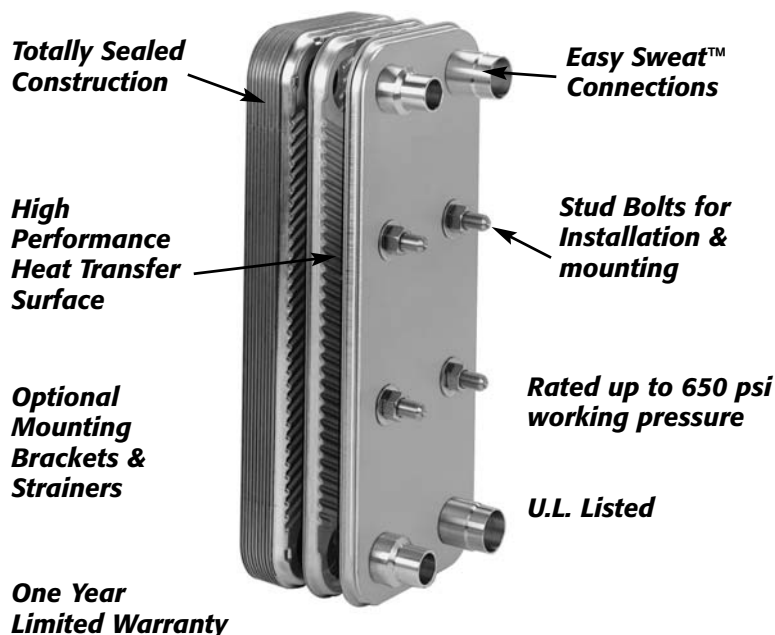
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Refrigeration Heat Exchangers



Simply Effective

FlatPlate® brazed plate heat exchangers consist of 4 to 300 specially formed stainless steel plates, which are then brazed together in a vacuum furnace for leak-tight, rugged construction.

When stacked the plates form two separate flow passages between the plates, thus allowing a liquid to flow between every other plate.

This provides heat transfer and complete separation of the two media.

With FlatPlate's high performance heat transfer surface, a very compact, cost effective design is the result.

Easy To Select

- Refer to the pages that follow for the full range of operating conditions.
- For more detailed operating conditions, go to www.flatplateselect.com.

Easy To Install

- Mounting Studs allow the use of mounting brackets to hold the unit in place while you pipe it up.
- Compact size means it fits easily into confined spaces, especially when replacing a much larger shell-and-tube heat exchanger.
- Insulation is a snap with our tools-free insulation kits.

High Performance

- High turbulence created by corrugations in the plates result in closer approach temperatures with much smaller units.
- Fully brazed construction handles high operating pressures.
- Choice of brazing materials (copper or nickel-chrome) broadens the range of media possible.
- Choice of plate material (316L Stainless or Marine Grade Stainless) means you can pick the right heat exchanger for your application, not a "good enough" heat exchanger.

Proven and Reliable

- Easily complies with requirements of UL, CE and ASME Section VIII (UM-Stamp).
- CRN (Canadian Registration Number) optional.
- Every heat exchanger is tested before it leaves our plant.

'FlatPlate' is a Registered Trademark of GEA Group.

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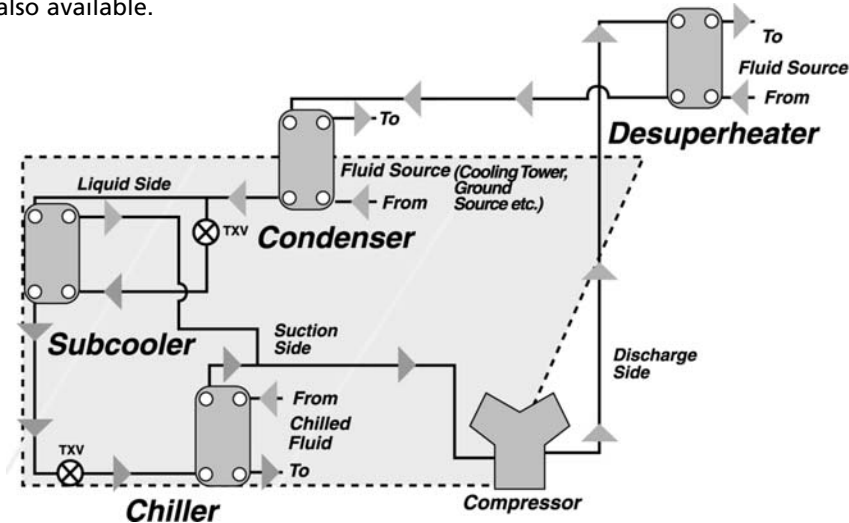
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Refrigeration Heat Exchangers

We Speak Refrigeration™.....

Applications for FlatPlate® heat exchangers in air conditioning and refrigeration systems span the full range of compressorized systems, in both OEM and Contractor installed equipment.

FlatPlate® heat exchangers models are used as Evaporators, Liquid Chillers, Condensers, Subcoolers, Economizers, Compressor Oil Coolers, Gas Driers, and much more. Standard models can be configured for all most any application, and custom models are also available.



Here are the many FlatPlate® applications:

Water Chillers for:

- Comfort Cooling, Air Conditioning Systems
- Comfort Heating/Cooling, Heat Pumps
- Computer Room Systems
- Ships & Yachts

Process Chillers for:

- Machine Cooling
- MRI/X-Ray Machines
- Lasers
- Plastics Injection Mold Cooling
- Food Process
- Semi-conductor Systems
- De-ionized Water Chilling
- Laboratory Chillers

Glycol Chillers for:

- Low Temperature Processes
- Food Processes
- Printing Presses
- Ice Rinks
- Special Processes

Economizers/Subcoolers

- DX Refrigerant to Refrigerant

Supermarket Systems

- Subcoolers
- Liquid Coolers
- Condensers

Ice Making Machines

- Condensers
- Pre-coolers

Environmental Chambers

- Cascade Condensers
- Desuperheaters

Compressed Air & Gas Driers

- Refrigerant to Gas
- Gas to Gas re-heater

Hydraulic Oil Cooling

- Refrigerant to Oil
- Oil to Water

Hydrocarbon Processing

- Condensers
- Evaporators/Chillers

Beverage, Beer, & Wine Cooling

- Glycol to Liquid

Swimming Pool Heating/Cooling

- Heating
- Cooling

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Direct Expansion Evaporators

CH Series 1/2 to 80 tons



FlatPlate®'s brazed plate CH series DX evaporators represent a breakthrough in heat transfer technology. They offer a cost efficient alternative to conventional "chiller barrels" and other liquid chiller designs. The CH series is designed specifically for DX water chilling and liquid cooling applications that utilize R-22, R-134a, R-404a, R-407c and other halocarbon refrigerants. The advantages of FlatPlate®'s CH series DX evaporators include their compact size and lighter weight, which reduce shipping and installation costs. All CH series models are made from copper brazed 316L stainless steel plates and are pressure rated to 450 psig on both the refrigerant side and the liquid side. Select models have a built-in DX distributor for enhanced operation. All CH series models are U.L. Listed, with ASME code optional.

Model	Tons	Application ¹	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
			Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CH1/2AG	1/2	Liquid Chiller	5.1	13.3	1.1	5/8 IDS	5/8 IDS	7/8 IDS	5.0
CH3/4AG	3/4	Liquid Chiller	5.1	13.3	1.3	5/8 IDS	5/8 IDS	7/8 IDS	5.7
CH1AG	1	Liquid Chiller	5.1	13.3	1.4	5/8 IDS	5/8 IDS	7/8 IDS	6.3
CH1-1/2AG	1-1/2	Liquid Chiller	5.1	13.3	1.8	5/8 IDS	5/8 IDS	7/8 IDS	7.6
CH2AG	2	Liquid Chiller	5.1	13.3	2.2	5/8 IDS	5/8 IDS	7/8 IDS	8.9
CH2-1/2AG	2-1/2	Liquid Chiller	5.1	13.3	2.5	5/8 IDS	5/8 IDS	7/8 IDS	10.1
CH3AG	3	Liquid Chiller	5.1	13.3	3.1	5/8 IDS	5/8 IDS	7/8 IDS	12.2
CH3-1/2AG	3-1/2	Liquid Chiller	5.1	13.3	3.6	5/8 IDS	5/8 IDS	7/8 IDS	14.0
CH4AG*	4	Liquid Chiller	5.1	13.3	4.3	7/8 IDS	5/8 IDS	1-1/8 IDS	16.5
CH5AG*	5	Liquid Chiller	5.1	13.3	5.2	7/8 IDS	5/8 IDS	1-1/8 IDS	19.4
CH1-1/2G	1/2	Liquid Chiller	5.1	21.1	1.1	5/8 IDS	5/8 IDS	7/8 IDS	8.7
CH2G	2	Liquid Chiller	5.1	21.1	1.3	5/8 IDS	5/8 IDS	7/8 IDS	9.8
CH2-1/2G	2-1/2	Liquid Chiller	5.1	21.1	1.4	5/8 IDS	5/8 IDS	7/8 IDS	10.9
CH3G	3	Liquid Chiller	5.1	21.1	1.6	5/8 IDS	5/8 IDS	7/8 IDS	12.0
CH3-1/2G	3-1/2	Liquid Chiller	5.1	21.1	2.0	5/8 IDS	5/8 IDS	7/8 IDS	14.6
CH4G*	4	Liquid Chiller	5.1	21.1	2.2	7/8 IDS	5/8 IDS	1-1/8 IDS	15.4
CH5G	5	Liquid Chiller	5.1	21.1	2.5	7/8 IDS	5/8 IDS	1-1/8 IDS	17.6
CH6G	6	Liquid Chiller	5.1	21.1	3.1	1-1/8 IDS	7/8 IDS	1-1/8 IDS	21.0
CH7-1/2G	7-1/2	Liquid Chiller	5.1	21.1	4.0	1-1/8 IDS	7/8 IDS	1-1/8 IDS	26.6
CH10BG	10	Liquid Chiller	5.1	21.1	4.9	1-3/8 IDS	7/8 IDS	1-3/8 IDS	32.2
CH12BG	12-1/2	Liquid Chiller	5.1	21.1	5.8	1-3/8 IDS	7/8 IDS	1-3/8 IDS	37.8
CH15BG*	15	Liquid Chiller	5.1	21.1	6.7	1-3/8 IDS	7/8 IDS	1-3/8 IDS	43.4
CH10G*	10	Liquid Chiller	11.1	21.4	2.5	1-3/8 IDS	7/8 IDS	1-5/8 IDS	48.0
CH12G*	12	Liquid Chiller	11.1	21.4	3.1	1-3/8 IDS	7/8 IDS	1-5/8 IDS	54.0
CH15G*	15	Liquid Chiller	11.1	21.4	4.0	1-3/8 IDS	7/8 IDS	1-5/8 IDS	64.0
CH20G*	20	Liquid Chiller	11.1	21.4	4.9	1-5/8 IDS	7/8 IDS	1-5/8 IDS	74.0
CH25G*	25	Liquid Chiller	11.1	21.4	5.8	1-5/8 IDS	1-1/8 IDS	2-1/8 IDS	85.0
CH30G*	30	Liquid Chiller	11.1	21.4	6.7	2-1/8 IDS	1-1/8 IDS	2-1/8 IDS	95.0
CH35G*	35	Liquid Chiller	11.1	21.4	8.5	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	115.0
CH40G*	40	Liquid Chiller	11.1	21.4	9.4	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	125.0
CH50G*	50	Liquid Chiller	11.1	21.4	12.1	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	156.0
CH60G*	60	Liquid Chiller	11.1	21.4	13.9	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	176.0
CH70G*	70	Liquid Chiller	11.1	21.4	15.7	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	197.0
CH80G*	80	Liquid Chiller	11.1	21.4	17.5	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	217.0

*Models have built-in DX Distributors.

- Notes:**
1. Nominal tons - 12,000 BTUH per ton, 54°F EWT, 44°LWT, 35°F Evap Temp, 6°F Superheat, 2.4 gpm per ton, R-22.
 2. For Glycol, special liquids or design conditions other than listed above, please contact the factory for special computer selection.
 3. Maximum allowable working pressure: 450 psig.

- Options:**
1. For fittings and configurations other than standard, consult the factory for pricing.
 2. For ASME code version, the model number should include "-UM". Example CH40-UM

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Direct Expansion Evaporators

CH-XP Series for R410A Applications, 1/2 to 80 tons



Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CH1/2A-XP	1/2	4.9	12.2	1.1	5/8 IDS	5/8 IDS	7/8 IDS	16.4
CH3/4A-XP	3/4	4.9	12.2	1.4	5/8 IDS	5/8 IDS	7/8 IDS	17.1
CH1A-XP	1	4.9	12.2	1.6	5/8 IDS	5/8 IDS	7/8 IDS	17.7
CH1-1/2A-XP	1-1/2	4.9	12.2	1.9	5/8 IDS	5/8 IDS	7/8 IDS	19.0
CH2A-XP	2	4.9	12.2	2.3	5/8 IDS	5/8 IDS	7/8 IDS	20.3
CH2-1/2A-XP	2-1/2	4.9	12.2	2.6	5/8 IDS	5/8 IDS	7/8 IDS	22
CH3A-XP	3	4.9	12.2	3.2	5/8 IDS	5/8 IDS	7/8 IDS	23
CH3-1/2A-XP	3-1/2	4.9	12.2	3.7	7/8 IDS	5/8 IDS	7/8 IDS	25
CH4A-XP	4	4.9	12.2	4.4	7/8 IDS	5/8 IDS	1-1/8 IDS	28
CH5A-XP	5	4.9	12.2	5.3	7/8 IDS	5/8 IDS	1-1/8 IDS	31

Maximum Allowable Working Pressure: 650 psig (44.8 Bar)

Code Approvals: UL Listed, Optional ASME, CE-PED (CH2-1/2A +)

Models CH4A & CH5A-XP have built-in DX distributors

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CH1-1/2-XP	1-1/2	5.0	20.3	1.2	5/8 IDS	5/8 IDS	7/8 IDS	27.2
CH2-XP	2	5.0	20.3	1.4	5/8 IDS	5/8 IDS	7/8 IDS	28.3
CH2-1/2-XP	2-1/2	5.0	20.3	1.6	5/8 IDS	5/8 IDS	7/8 IDS	29.4
CH3-XP	3	5.0	20.3	1.7	5/8 IDS	5/8 IDS	7/8 IDS	30.6
CH3-1/2-XP	3-1/2	5.0	20.3	2.1	5/8 IDS	5/8 IDS	7/8 IDS	32.8
CH4-XP	4	5.0	20.3	2.3	7/8 IDS	5/8 IDS	1-1/8 IDS	33.9
CH5-XP	5	5.0	20.3	2.6	7/8 IDS	5/8 IDS	1-1/8 IDS	36.2
CH6-XP	6	5.0	20.3	3.2	1-1/8 IDS	7/8 IDS	1-1/8 IDS	39.5
CH7-1/2-XP	7-1/2	5.0	20.3	4.1	1-1/8 IDS	7/8 IDS	1-1/8 IDS	45.1
CH10B-XP	10	5.0	20.3	5.0	1-3/8 IDS	7/8 IDS	1-3/8 IDS	50.7
CH12B-XP	12	5.0	20.3	5.9	1-3/8 IDS	7/8 IDS	1-3/8 IDS	56.3
CH15B-XP	15	5.0	20.3	6.8	1-3/8 IDS	7/8 IDS	1-3/8 IDS	61.9

Maximum Allowable Working Pressure: 650 psig (44.8 Bar)

Code Approvals: UL Listed, Optional ASME, CE-PED (CH2-1/2 +)

Models CH4 - CH15B-XP have built-in DX distributors

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CH10-XP	10	9.8	20.3	2.6	1-3/8 IDS	7/8 IDS	1-5/8 IDS	81
CH12-XP	12	9.8	20.3	3.2	1-3/8 IDS	7/8 IDS	1-5/8 IDS	87
CH15-XP	15	9.8	20.3	4.1	1-3/8 IDS	7/8 IDS	1-5/8 IDS	97
CH20-XP	20	9.8	20.3	5.0	1-5/8 IDS	7/8 IDS	1-5/8 IDS	107
CH25-XP	25	9.8	20.3	5.9	1-5/8 IDS	1-1/8 IDS	2-1/8 IDS	117
CH30-XP	30	9.8	20.3	6.8	2-1/8 IDS	1-1/8 IDS	2-1/8 IDS	128
CH35-XP	35	9.8	20.3	8.6	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	148
CH40-XP	40	9.8	20.3	9.5	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	158
CH50-XP	50	9.8	20.3	12.2	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	189
CH60-XP	60	9.8	20.3	14.0	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	209
CH70-XP	70	9.8	20.3	15.8	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	230
CH80-XP	80	9.8	20.3	17.6	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	250

Maximum Allowable Working Pressure: 650 psig (44.8 Bar)

Code Approvals: UL Listed, Optional ASME, CE-PED

All have built-in DX distributors

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Two Refrigerant Circuit

2C Series 3 to 80 tons



FlatPlate® offers the most advanced and cost effective heat exchanger for two compressor systems, liquid chillers and for shell & tube replacement. The 2C Series is designed for R22, R407C, R134a, R404A and other halocarbon refrigerants for DX evaporator, condenser and heat pump operation. Two Refrigerant Circuits are “inter-laced” with the liquid side, such that 100% of the liquid is cooled when one compressor is operating. High Performance and very compact, all 2C models are made from copper brazed, 316L stainless steel plates and rated for 450 psig on refrigerant side and 350 psig on liquid side. Select models have a built-in DX distributor for enhanced operation. All 2C models are U.L. Listed, with optional ASME code and optional European CE code.

Liquid Chillers			Dimensions in inches			Connections in inches			Net Wt. (lbs.)
Model	Tons	Application¹	Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CH3-2C	3	Liquid Chiller	9.8	20.3	1.3	7/8 IDS	5/8 IDS	1 MPT	47.3
CH5-2C	5	Liquid Chiller	9.8	20.3	1.7	7/8 IDS	5/8 IDS	1 MPT	51.5
CH6-2C	6	Liquid Chiller	9.8	20.3	2.1	7/8 IDS	5/8 IDS	1 MPT	55.7
CH8-2C	8	Liquid Chiller	9.8	20.3	2.4	7/8 IDS	5/8 IDS	1 MPT	59.9
CH10-2C	10	Liquid Chiller	9.8	20.3	2.8	1-1/8 IDS	7/8 IDS	1-1/2 MPT	64.1
CH12-2C	12-1/2	Liquid Chiller	9.8	20.3	3.2	1-1/8 IDS	7/8 IDS	1-1/2 MPT	68.3
CH15-2C	15	Liquid Chiller	9.8	20.3	3.9	1-1/8 IDS	7/8 IDS	1-1/2 MPT	76.7
CH20-2C	20	Liquid Chiller	9.8	20.3	5.1	1-3/8 IDS	7/8 IDS	1-1/2 MPT	89.3
CH25-2C	25	Liquid Chiller	9.8	20.3	6.2	1-3/8 IDS	7/8 IDS	2 MPT	102.0
CH30-2C	30	Liquid Chiller	9.8	20.3	7.3	1-3/8 IDS	7/8 IDS	2 MPT	115.0
CH35-2C	35	Liquid Chiller	9.8	20.3	8.8	1-3/8 IDS	7/8 IDS	2 MPT	131.0
CH40-2C	40	Liquid Chiller	9.8	20.3	9.9	1-5/8 IDS	7/8 IDS	2-1/2 MPT	144.0
CH50-2C	50	Liquid Chiller	9.8	20.3	12.6	1-5/8 IDS	1-1/8 IDS	2-1/2 MPT	173.0
CH60-2C	60	Liquid Chiller	9.8	20.3	14.5	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	194.0
CH70-2C	70	Liquid Chiller	9.8	20.3	16.3	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	215.0
CH80-2C	80	Liquid Chiller	9.8	20.3	19.2	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	245.0

Fluid Cooled Condensers			Dimensions in inches			Connections in inches			Net Wt. (lbs.)
Model	Tons	Application¹	Width	Length	Depth	Refrig Out	Refrig In	Liquid	
C3-2C	3	Condenser	9.8	20.3	1.3	5/8 IDS	7/8 IDS	1 MPT	47.0
C5-2C	5	Condenser	9.8	20.3	1.7	5/8 IDS	7/8 IDS	1 MPT	52.0
C6-2C	6	Condenser	9.8	20.3	2.1	5/8 IDS	7/8 IDS	1 MPT	56.0
C8-2C	8	Condenser	9.8	20.3	2.4	5/8 IDS	7/8 IDS	1 MPT	60.0
C10-2C	10	Condenser	9.8	20.3	2.8	7/8 IDS	1-1/8 IDS	1-1/2 MPT	64.0
C12-2C	12-1/2	Condenser	9.8	20.3	3.2	7/8 IDS	1-1/8 IDS	1-1/2 MPT	68.0
C15-2C	15	Condenser	9.8	20.3	3.6	7/8 IDS	1-1/8 IDS	1-1/2 MPT	77.0
C20-2C	20	Condenser	9.8	20.3	4.3	7/8 IDS	1-3/8 IDS	1-1/2 MPT	89.0
C25-2C	25	Condenser	9.8	20.3	5.1	7/8 IDS	1-3/8 IDS	2 MPT	102.0
C30-2C	30	Condenser	9.8	20.3	6.0	7/8 IDS	1-3/8 IDS	2 MPT	115.0
C40-2C	40	Condenser	9.8	20.3	8.1	1-1/8 IDS	1-5/8 IDS	2-1/2 MPT	144.0
C50-2C	50	Condenser	9.8	20.3	9.9	1-1/8 IDS	1-5/8 IDS	2-1/2 MPT	173.0
C60-2C	60	Condenser	9.8	20.3	12.6	1-1/8 IDS	2-1/8 IDS	2-1/2 MPT	194.0
C70-2C	70	Condenser	9.8	20.3	14.5	1-1/8 IDS	2-1/8 IDS	2-1/2 MPT	215.0
C80-2C	80	Condenser	9.8	20.3	16.3	1-1/8 IDS	2-1/8 IDS	2-1/2 MPT	245.0

- Notes:**
1. All models include (2) 1/2" FPT Waterside Temperature Probe Fittings.
 2. CH models have built-in DX distributors.
 3. CH models nominal rating at 54F EWT, 44F LWT, 35F Et, R22
 4. C models nominal rating at 85F EWT, 95F LWT, 105F Ct, R22
 5. Pressure rated to 450 psig.

- Options:**
1. For fittings and configurations other than standard, consult the factory for pricing.
 2. For ASME code version, the model number should include “-UM”.
- Example: CH40-2C-UM

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Two Refrigerant Circuit

2C Series Perfect for R410A Applications, 3 to 80 tons



Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CH3-2C-XP	3	9.8	20.3	1.4	7/8 IDS	5/8 IDS	1 MPT	75
CH4-2C-XP	4	9.8	20.3	1.7	7/8 IDS	5/8 IDS	1 MPT	79
CH6-2C-XP	6	9.8	20.3	2.1	7/8 IDS	5/8 IDS	1 MPT	83
CH8-2C-XP	8	9.8	20.3	2.5	7/8 IDS	5/8 IDS	1 MPT	87
CH10-2C-XP	10	9.8	20.3	2.8	1-1/8 IDS	7/8 IDS	1-1/2 MPT	91
CH12-2C-XP	12	9.8	20.3	3.2	1-1/8 IDS	7/8 IDS	1-1/2 MPT	95
CH15-2C-XP	15	9.8	20.3	3.9	1-1/8 IDS	7/8 IDS	1-1/2 MPT	104
CH20-2C-XP	20	9.8	20.3	5.0	1-3/8 IDS	7/8 IDS	1-1/2 MPT	116
CH25-2C-XP	25	9.8	20.3	6.1	1-3/8 IDS	7/8 IDS	2 MPT	128
CH30-2C-XP	30	9.8	20.3	7.1	1-3/8 IDS	7/8 IDS	2 MPT	140
CH35-2C-XP	35	9.8	20.3	8.4	1-3/8 IDS	7/8 IDS	2 MPT	155
CH40-2C-XP	40	9.8	20.3	9.7	1-5/8 IDS	7/8 IDS	2-1/2 MPT	169
CH50-2C-XP	50	9.8	20.3	12.2	1-5/8 IDS	1-1/8 IDS	2-1/2 MPT	197
CH60-2C-XP	60	9.8	20.3	14.0	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	218
CH70-2C-XP	70	9.8	20.3	15.8	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	238
CH80-2C-XP	80	9.8	20.3	18.3	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	267

Maximum Allowable Working Pressure: A&B (2x Refrigerant) Channels 650 psig (44.8 Bar), C (Common) Channel 350 psig (24.1 Bar)

Code Approvals: UL Listed, Canadian CRN; Optional ASME and CE-PED

All Include (2) 1/2" FPT Waterside Temperature Probe Fittings.

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
C3-2C-XP	3	9.8	20.3	1.2	5/8 IDS	7/8 IDS	1 MPT	71
C5-2C-XP	4	9.8	20.3	1.6	5/8 IDS	7/8 IDS	1 MPT	75
C6-2C-XP	6	9.8	20.3	1.9	5/8 IDS	7/8 IDS	1 MPT	79
C8-2C-XP	8	9.8	20.3	2.2	5/8 IDS	7/8 IDS	1 MPT	83
C10-2C-XP	10	9.8	20.3	2.6	7/8 IDS	1-1/8 IDS	1-1/2 MPT	87
C12-2C-XP	12	9.8	20.3	3.4	7/8 IDS	1-1/8 IDS	1-1/2 MPT	95
C15-2C-XP	15	9.8	20.3	3.7	7/8 IDS	1-1/8 IDS	1-1/2 MPT	99
C20-2C-XP	20	9.8	20.3	4.4	7/8 IDS	1-3/8 IDS	1-1/2 MPT	108
C25-2C-XP	25	9.8	20.3	5.2	7/8 IDS	1-3/8 IDS	2 MPT	116
C30-2C-XP	30	9.8	20.3	6.2	7/8 IDS	1-3/8 IDS	2 MPT	140
C40-2C-XP	40	9.8	20.3	8.0	1-1/8 IDS	1-5/8 IDS	2-1/2 MPT	148
C50-2C-XP	50	9.8	20.3	9.8	1-1/8 IDS	1-5/8 IDS	2-1/2 MPT	169
C60-2C-XP	60	9.8	20.3	12.4	1-1/8 IDS	2-1/8 IDS	2-1/2 MPT	197
C70-2C-XP	70	9.8	20.3	14.2	1-1/8 IDS	2-1/8 IDS	2-1/2 MPT	218
C80-2C-XP	80	9.8	20.3	16.0	1-1/8 IDS	2-1/8 IDS	2-1/2 MPT	238

Maximum Allowable Working Pressure: A&B (2x Refrigerant) Channels 650 psig (44.8 Bar), C (Common) Channel 350 psig (24.1 Bar)

Code Approvals: UL Listed, Canadian CRN; Optional ASME and CE-PED

All Include (2) 1/2" FPT Waterside Temperature Probe Fittings.

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CHN Direct Expansion Evaporators

All Stainless, Nickel Brazed 1/2 to 80 tons



For de-ionized water, solvents, and liquids not compatible with copper, FlatPlate®'s ALL STAINLESS, Nickel brazed models are industry standards. The CHN Series is designed for DX (direct expansion) liquid cooling applications that utilize R22, R134a, R404A, R407C, and other halocarbon refrigerants. Extremely compact and cost effective, the CHN Series is made with 316L stainless steel plates, nickel brazed. All models have sweat solder connections on the refrigerant side and MPT on the liquid side, and select models have a built-in DX distributor for enhanced operation. All CHN models are U.L. Listed, optional ASME Code, and optional European Code.

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CHN1/2A (1" MPT)	1/2	4.9	12.2	1.1	5/8 IDS	5/8 IDS	1 MPT	5.0
CHN3/4A (1" MPT)	3/4	4.9	12.2	1.3	5/8 IDS	5/8 IDS	1 MPT	5.7
CHN1A (1" MPT)	1	4.9	12.2	1.5	5/8 IDS	5/8 IDS	1 MPT	6.3
CHN1-1/2A (1" MPT)	1-1/2	4.9	12.2	1.9	5/8 IDS	5/8 IDS	1 MPT	7.6
CHN2A (1" MPT)	2	4.9	12.2	2.2	5/8 IDS	5/8 IDS	1 MPT	8.9
CHN2-1/2A (1" MPT)	2-1/2	4.9	12.2	2.6	5/8 IDS	5/8 IDS	1 MPT	10.1
CHN3A (1" MPT)	3	4.9	12.2	3.2	5/8 IDS	5/8 IDS	1 MPT	12.1
CHN3-1/2A (1" MPT)	3-1/2	4.9	12.2	3.7	5/8 IDS	5/8 IDS	1 MPT	14.0
CHN4A (1" MPT)	4	4.9	12.2	4.5	7/8 IDS	5/8 IDS	1 MPT	16.5
CHN5A (1" MPT)	5	4.9	12.2	5.4	7/8 IDS	5/8 IDS	1 MPT	19.7
CHN1-1/2 (1" MPT)	1-1/2	5	20.3	1.1	5/8 IDS	5/8 IDS	1 MPT	8.7
CHN2 (1" MPT)	2	5	20.3	1.3	5/8 IDS	5/8 IDS	1 MPT	9.8
CHN2-1/2 (1" MPT)	2-1/2	5	20.3	1.5	5/8 IDS	5/8 IDS	1 MPT	10.9
CHN3 (1" MPT)	3	5	20.3	1.7	5/8 IDS	5/8 IDS	1 MPT	12.0
CHN3-1/2 (1" MPT)	3-1/2	5	20.3	2.1	5/8 IDS	5/8 IDS	1 MPT	14.3
CHN4 (1" MPT)	4	5	20.3	2.2	7/8 IDS	5/8 IDS	1 MPT	15.4
CHN5 (1" MPT)	5	5	20.3	2.6	7/8 IDS	5/8 IDS	1-1/4 MPT	17.6
CHN6 (1" MPT)	7	5	20.3	3.2	1-1/8 IDS	7/8 IDS	1-1/4 MPT	21.0
CHN7-1/2 (1" MPT)	7-1/2	5	20.3	4.1	1-1/8 IDS	7/8 IDS	1-1/4 MPT	26.6
CHN10B (1" MPT)	10	5	20.3	5.1	1-3/8 IDS	7/8 IDS	1-1/4 MPT	32.2
CHN12B (1" MPT)	12	5	20.3	6.0	1-3/8 IDS	7/8 IDS	1-1/4 MPT	37.8
CHN15B (1" MPT)	15	5	20.3	6.9	1-3/8 IDS	7/8 IDS	1-1/4 MPT	43.4
CHN10 (1-1/2" MPT)	10	9.8	20.3	2.6	1-3/8 IDS	7/8 IDS	1-1/2 MPT	47.9
CHN12 (1-1/2" MPT)	12	9.8	20.3	3.2	1-3/8 IDS	7/8 IDS	1-1/2 MPT	54.0
CHN15 (1-1/2" MPT)	15	9.8	20.3	4.1	1-3/8 IDS	7/8 IDS	1-1/2 MPT	64.2
CHN20 (1-1/2" MPT)	20	9.8	20.3	5.1	1-5/8 IDS	7/8 IDS	1-1/2 MPT	74.4
CHN25 (2" MPT)	25	9.8	20.3	6.0	1-5/8 IDS	1-1/8 IDS	2 MPT	84.6
CHN30 (2" MPT)	30	9.8	20.3	6.9	2-1/8 IDS	1-1/8 IDS	2 MPT	94.8
CHN35 (2-1/2" MPT)	35	9.8	20.3	8.8	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	115.0
CHN40 (2-1/2" MPT)	40	9.8	20.3	9.8	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	125.0
CHN50 (2-1/2" MPT)	50	9.8	20.3	12.6	2-5/8 IDS	1-1/8 IDS	2-1/2 MPT	156.0
CHN60 (2-1/2" MPT)	60	9.8	20.3	14.5	2-5/8 IDS	1-1/8 IDS	2-1/2 MPT	176.0
CHN70 (2-1/2" MPT)	70	9.8	20.3	16.4	2-5/8 IDS	1-1/8 IDS	2-1/2 MPT	197.0
CHN80 (2-1/2" MPT)	80	9.8	20.3	19.3	2-5/8 IDS	1-1/8 IDS	2-1/2 MPT	217.0

- Notes:**
1. Design Pressure: 300psig, all CHN models
 2. Non-stock models lead time subject to factory load at time of order.
 3. Sweat connections on refrigerant side with MPT on liquid side.

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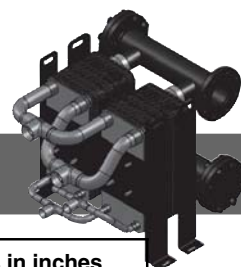
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CH-M Direct Expansion Evaporators

Manifolded DX Evaporators 80 to 160 tons

For 80 to 160 ton chiller applications, the CH-M Series is the most compact design available for new system designs and ideal for shell & tube replacements. Comprised of two heat exchangers with a large common liquid side manifold, the CH-M Series can be ordered as a single (1), dual (2) or quad (4) refrigerant circuits. The CH-M Series is made with 316L stainless steel plates, copper brazed. Refrigerant side has sweat solder connections. Liquid side manifold and Flange connections are carbon steel, with optional stainless steel for potable water applications. Rated 450 psig refrigerant side and 150 psig Liquid side. CH-M models have individual modules that are U.L. Listed and optional ASME Code.



Single & Dual Circuit Units

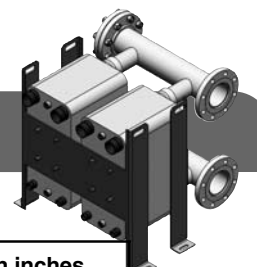
Single Circuit

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CH80M-1C	80	26.0	24.0	34.1	2-5/8 IDS	1-5/8 IDS	4 flange	525
CH100M-1C	100	26.0	24.0	37.9	3-1/8 IDS	2-1/8 IDS	4 flange	670
CH120M-1C	120	26.0	24.0	41.6	3-1/8 IDS	2-1/8 IDS	4 flange	714
CH140M-1C	140	26.0	24.0	44.0	3-5/8 IDS	2-5/8 IDS	4 flange	802
CH160M-1C	160	26.0	24.0	46.3	3-5/8 IDS	2-5/8 IDS	5 flange	893

Dual Circuit

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CH80M-2C	80	26.0	24.0	34.1	2-1/8 IDS	1-1/8 IDS	4 flange	525
CH100M-2C	100	26.0	24.0	37.9	2-1/8 IDS	1-1/8 IDS	4 flange	670
CH120M-2C	120	26.0	24.0	41.6	2-5/8 IDS	1-3/8 IDS	4 flange	714
CH140M-2C	140	26.0	24.0	44.0	2-5/8 IDS	1-5/8 IDS	4 flange	802
CH160M-2C	160	26.0	24.0	46.3	2-5/8 IDS	1-5/8 IDS	5 flange	893

Quad Circuit Units



Quad Circuit

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
CH80M-4C	80	26.0	24.0	24.5	1-5/8 IDS	7/8 IDS	4 flange	383
CH100M-4C	100	26.0	24.0	28.3	1-5/8 IDS	1-1/8 IDS	4 flange	449
CH120M-4C	120	26.0	24.0	30.7	2-1/8 IDS	1-1/8 IDS	4 flange	493
CH140M-4C	140	26.0	24.0	33.1	2-1/8 IDS	1-1/8 IDS	4 flange	537
CH160M-4C	160	26.0	24.0	35.4	2-1/8 IDS	1-1/8 IDS	5 flange	628

1. For Glycol, special liquids or design conditions contact the factory for special computer selections.
2. Heat Exchanger Material: 316L Stainless Steel Plates, Copper Braze.
3. Manifold assemblies fabricated from Carbon Steel. Stainless Steel Manifold assemblies available as cost added option. Consult Factory.
4. Maximum Allowable Working Pressure: Refrigerant side 450 psig, Liquid side 150 psig.
5. All Models have built-in DX distributors.
6. Code Approvals (Heat Exchangers Only): UL Listed, Canadian CRN, optional ASME and CE.
7. ASME and/or CE option: Consult Factory.
8. Fitting Options: Contact Factory for options and pricing.
9. For High Pressure, R410A, Consult Factory.

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Condensers

C Series - rated to 450 psig 1/2 to 80 tons



FlatPlate® C Series condenser/heat pump models' compact design reduces size without sacrificing efficiency. They are designed for use with R-22, R-134a, R404A and other halocarbon refrigerants. Select models can be used for heat pump applications. All C Series models are constructed from copper brazed 316L stainless steel plates and come in sizes from 1/2 to 80 tons. All units are rated at 450 psig working pressure on both refrigerant side and water side. The C Series is UL listed. ASME and/or CE certification is optional.

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
C1/2AG	1/2	5.1	13.3	1.1	5/8 IDS	5/8 IDS	7/8 IDS	5.0
C3/4AG	3/4	5.1	13.3	1.3	5/8 IDS	5/8 IDS	7/8 IDS	5.7
C1AG	1	5.1	13.3	1.4	5/8 IDS	5/8 IDS	7/8 IDS	6.3
C1-1/2AG	1-1/2	5.1	13.3	1.8	5/8 IDS	5/8 IDS	7/8 IDS	7.6
C2AG	2	5.1	13.3	2.2	5/8 IDS	5/8 IDS	7/8 IDS	8.9
C2-1/2AG	2-1/2	5.1	13.3	2.5	5/8 IDS	5/8 IDS	7/8 IDS	10.1
C3AG	3	5.1	13.3	3.1	5/8 IDS	5/8 IDS	7/8 IDS	12.2
C3-1/2AG	3-1/2	5.1	13.3	3.6	5/8 IDS	5/8 IDS	7/8 IDS	14.0
C4AG	4	5.1	13.3	4.3	5/8 IDS	7/8 IDS	1-1/8 IDS	16.5
C5AG	5	5.1	13.3	5.2	5/8 IDS	7/8 IDS	1-1/8 IDS	19.4
C2G	2	5.1	21.1	1.3	5/8 IDS	5/8 IDS	7/8 IDS	9.8
C2-1/2G	2-1/2	5.1	21.1	1.4	5/8 IDS	5/8 IDS	7/8 IDS	10.9
C3G	3	5.1	21.1	1.6	5/8 IDS	5/8 IDS	7/8 IDS	12.0
C3-1/2G	3-1/2	5.1	21.1	2.0	5/8 IDS	5/8 IDS	7/8 IDS	14.3
C4G	4	5.1	21.1	2.2	5/8 IDS	5/8 IDS	1-1/8 IDS	15.4
C5G	5	5.1	21.1	2.5	5/8 IDS	5/8 IDS	1-1/8 IDS	17.6
C6G	6	5.1	21.1	3.1	5/8 IDS	5/8 IDS	1-1/8 IDS	21.0
C7-1/2G	7-1/2	5.1	21.1	4.0	7/8 IDS	1-1/8 IDS	1-1/8 IDS	26.6
C10G	10	5.1	21.1	4.9	7/8 IDS	1-1/8 IDS	1-3/8 IDS	32.2
C12BG	12-1/2	5.1	21.1	5.8	7/8 IDS	1-3/8 IDS	1-3/8 IDS	37.8
C15BG	15	5.1	21.1	6.7	7/8 IDS	1-3/8 IDS	1-3/8 IDS	43.4
C10GC	10	11.1	21.4	2.5	7/8 IDS	1-3/8 IDS	1-5/8 IDS	48
C12G	12-1/2	11.1	21.4	3.1	7/8 IDS	1-3/8 IDS	1-5/8 IDS	54
C15G	15	11.1	21.4	4.0	7/8 IDS	1-3/8 IDS	1-5/8 IDS	64
C20G	20	11.1	21.4	4.9	1-1/8 IDS	1-5/8 IDS	1-5/8 IDS	74
C25G	25	11.1	21.4	5.8	1-1/8 IDS	1-5/8 IDS	2-1/8 IDS	85
C30G	30	11.1	21.4	6.7	1-1/8 IDS	2-1/8 IDS	2-1/8 IDS	95
C35G	35	11.1	21.4	8.5	1-3/8 IDS	2-1/8 IDS	2-5/8 IDS	115
C40G	40	11.1	21.4	9.4	1-3/8 IDS	2-1/8 IDS	2-5/8 IDS	125
C50G	50	11.1	21.4	12.1	1-5/8 IDS	2-1/8 IDS	2-5/8 IDS	156
C60G	60	11.1	21.4	13.9	1-5/8 IDS	2-3/8 IDS	2-5/8 IDS	176
C70G	70	11.1	21.4	15.7	1-5/8 IDS	2-3/8 IDS	2-5/8 IDS	197
C80G	80	11.1	21.4	17.5	1-5/8 IDS	2-1/8 IDS	2-5/8 IDS	217

- Notes:**
1. Nominal tons - 15,000 BTUH per ton, 85°F EWT, 105°F Condensing Temp, 3 gpm per ton, R-22.
 2. For Heat Pump application, contact the factory for specific heat pump model.
 3. For City Water application 75°F EWT, 105°F Condensing Temp, 3 gpm per ton, multiply unit nominal capacity by 1.59.

- Options:**
1. For fittings and configurations other than standard, consult the factory for pricing.
 2. For ASME code version, the model number should include "-UM". Example C40-UM

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Condensers

C-XP Series - rated to 650 psig For R410A Applications, 1/2 to 80 tons



Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
C1/2A-XP	1/2	4.9	12.2	1.2	5/8 IDS	5/8 IDS	7/8 IDS	16.4
C3/4A-XP	3/4	4.9	12.2	1.4	5/8 IDS	5/8 IDS	7/8 IDS	17.1
C1A-XP	1	4.9	12.2	1.6	5/8 IDS	5/8 IDS	7/8 IDS	17.7
C1-1/2A-XP	1-1/2	4.9	12.2	1.9	5/8 IDS	5/8 IDS	7/8 IDS	19.0
C2A-XP	2	4.9	12.2	2.3	5/8 IDS	5/8 IDS	7/8 IDS	20.3
C2-1/2A-XP	2-1/2	4.9	12.2	2.6	5/8 IDS	5/8 IDS	7/8 IDS	21.6
C3A-XP	3	4.9	12.2	3.2	5/8 IDS	5/8 IDS	7/8 IDS	23.5
C3-1/2A-XP	3-1/2	4.9	12.2	3.7	7/8 IDS	5/8 IDS	7/8 IDS	25.4
C4A-XP	4	4.9	12.2	4.4	7/8 IDS	5/8 IDS	1-1/8 IDS	28.0
C5A-XP	5	4.9	12.2	5.3	7/8 IDS	5/8 IDS	1-1/8 IDS	31.2
C2-XP	2	5.0	20.3	1.4	5/8 IDS	5/8 IDS	7/8 IDS	28.3
C2-1/2-XP	2-1/2	5.0	20.3	1.6	5/8 IDS	5/8 IDS	7/8 IDS	29.4
C3-XP	3	5.0	20.3	1.7	5/8 IDS	5/8 IDS	7/8 IDS	30.6
C3-1/2-XP	3-1/2	5.0	20.3	1.9	5/8 IDS	5/8 IDS	7/8 IDS	31.7
C4-XP	4	5.0	20.3	2.1	7/8 IDS	5/8 IDS	7/8 IDS	32.8
C5-XP	5	5.0	20.3	2.5	7/8 IDS	5/8 IDS	1-1/8 IDS	35.0
C6-XP	6	5.0	20.3	2.6	1-1/8 IDS	5/8 IDS	1-1/8 IDS	36.2
C7-1/2-XP (*)	7-1/2	5.0	20.3	3.2	1-1/8 IDS	7/8 IDS	1-1/8 IDS	39.5
C10B-XP (*)	10	5.0	20.3	4.1	1-1/8 IDS	7/8 IDS	1-3/8 IDS	45.1
C12B-XP (*)	12	5.0	20.3	5.0	1-3/8 IDS	7/8 IDS	1-3/8 IDS	50.7
C12B-XP (*)	15	5.0	20.3	5.9	1-3/8 IDS	7/8 IDS	1-3/8 IDS	56.3
C10-XP	10	9.8	20.3	2.3	1-3/8 IDS	7/8 IDS	1-5/8 IDS	76.7
C12-XP	12-1/2	9.8	20.3	2.6	1-3/8 IDS	7/8 IDS	1-5/8 IDS	80.8
C15-XP	15	9.8	20.3	3.2	1-3/8 IDS	7/8 IDS	1-5/8 IDS	86.9
C20-XP (*)	20	9.8	20.3	4.1	1-5/8 IDS	7/8 IDS	1-5/8 IDS	97.1
C25-XP (*)	25	9.8	20.3	5.0	1-5/8 IDS	1-1/8 IDS	2-1/8 IDS	107.3
C30-XP (*)	30	9.8	20.3	5.9	2-1/8 IDS	1-1/8 IDS	2-1/8 IDS	117.5
C35-XP (*)	35	9.8	20.3	6.8	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	127.7
C40-XP (*)	40	9.8	20.3	7.7	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	138
C50-XP (*)	50	9.8	20.3	9.5	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	158
C60-XP (*)	60	9.8	20.3	11.3	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	179
C70-XP (*)	70	9.8	20.3	13.1	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	199
C80-XP (*)	80	9.8	20.3	14.9	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	219

Maximum Allowable Working Pressure: 650 psig (44.8 Bar)
Code Approvals: UL Listed, Optional ASME, CE-PED

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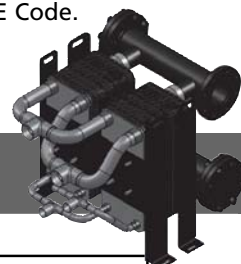
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C-M Condensers

Manifolded Condensers 80 to 160 tons

C-M Condensers

For 80 to 160 ton condenser applications, the C-M Series is the most compact available for new system designs and ideal for shell & tube replacements. Comprised of two heat exchangers with a large common liquid side manifold, the C-M Series can be ordered as a single (1), dual (2) or quad (4) refrigerant circuits. The C-M Series is made with 316L stainless steel plates, copper brazed. Refrigerant side has sweat solder connections. Liquid side manifold and Flange connections are carbon steel, with optional stainless steel for potable water applications. Rated 450 psig refrigerant side and 150 psig Liquid side. C-M models have individual modules that are U.L. Listed and optional ASME Code.



Single & Dual Circuit Units

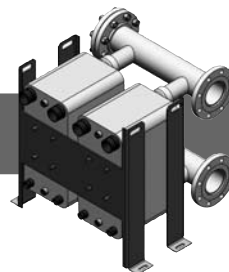
Quad Circuit

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
C80M-1C	80	26.0	24.5	30.7	1-5 / 8 IDS	2-5 / 8 IDS	4 flange	418
C100M-1C	100	26.0	24.5	32.5	1-5 / 8 IDS	2-5 / 8 IDS	4 flange	460
C120M-1C	120	26.0	24.5	34.3	2-1 / 8 IDS	3-1 / 8 IDS	5 flange	482
C140M-1C	140	26.0	24.5	36.1	2-1 / 8 IDS	3-1 / 8 IDS	5 flange	504
C160M-1C	160	26.0	24.5	37.9	2-1 / 8 IDS	3-1 / 8 IDS	5 flange	566

Dual Circuit

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
C80M-2C	80	26.0	24.5	30.7	1-1 / 8 IDS	2-1 / 8 IDS	4 flange	494
C100M-2C	100	26.0	24.5	32.5	1-5 / 8 IDS	2-1 / 8 IDS	4 flange	582
C120M-2C	120	26.0	24.5	34.3	1-1 / 8 IDS	2-5 / 8 IDS	5 flange	670
C140M-2C	140	26.0	24.5	36.1	1-3 / 8 IDS	2-5 / 8 IDS	5 flange	758
C160M-2C	160	26.0	24.5	37.9	1-3 / 8 IDS	1-5 / 8 IDS	5 flange	846

Quad Circuit Units



Quad Circuit

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
C80M-4C	80	26.0	24.5	21.2	7 / 8 IDS	1-5 / 8 IDS	4 flange	470
C100M-4C	100	26.0	24.5	23.0	1-1 / 8 IDS	1-5 / 8 IDS	4 flange	558
C120M-4C	120	26.0	24.5	24.8	1-1 / 8 IDS	2-1 / 8 IDS	5 flange	646
C140M-4C	140	26.0	24.5	26.6	1-1 / 8 IDS	2-1 / 8 IDS	5 flange	734
C160M-4C	160	26.0	24.5	28.4	1-1 / 8 IDS	2-1 / 8 IDS	5 flange	822

1. For Glycol, special Liquids or design conditions contact the factory for special computer selections.
2. Heat Exchanger Material: 316L Stainless Steel Plates, Copper Braze.
3. Manifold assemblies fabricated from Carbon Steel. Stainless Steel Manifold assemblies available as cost added option. Consult Factory.
4. Maximum Allowable Working Pressure: Refrigerant side 450 psig, Liquid side 150 psig.
5. ASME and/or CE option: Consult Factory.
6. Fitting Options: Contact Factory for options and pricing.
7. For High Pressure, R410A, Consult Factory.

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Industrial Condensers

MCN Series 1/2 to 80 tons



FlatPlate® MCN Industrial Refrigeration Condensers are designed for Brackish water, chlorinated and swimming pool water and liquids with corrosion potential or micro-biological elements. MCN models are compact workhorses for applications up to 80 tons. All models are fabricated from nickel-chrome brazed marine grade stainless steel with stainless steel sweat connections on the refrigerant side (front) and female pipe thread connections on the liquid side (rear). Zinc anode and anode fitting included.

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
MCN1/2A	1/2	4.9	12.2	1.1	5 /8 IDS	5 /8 IDS	3/4 FPT	5.0
MCN3/4A	3/4	4.9	12.2	1.3	5 /8 IDS	5 /8 IDS	3/4 FPT	5.7
MCN1A	1	4.9	12.2	1.4	5 /8 IDS	5 /8 IDS	3/4 FPT	6.3
MCN1-1/2A	1-1/2	4.9	12.2	1.8	5 /8 IDS	5 /8 IDS	3/4 FPT	7.6
MCN2A	2	4.9	12.2	2.2	5 /8 IDS	5 /8 IDS	3/4 FPT	8.9
MCN2-1/2A	2-1/2	4.9	12.2	2.5	5 /8 IDS	5 /8 IDS	1 FPT	10.1
MCN3A	3	4.9	12.2	3.1	5 /8 IDS	5 /8 IDS	1 FPT	12.1
MCN3-1/2A	3-1/2	4.9	12.2	3.6	5 /8 IDS	5 /8 IDS	1 FPT	14.0
MCN4A	4	4.9	12.2	4.3	5 /8 IDS	7 /8 IDS	1 FPT	16.5
MCN5A	5	4.9	12.2	5.2	5 /8 IDS	7 /8 IDS	1 FPT	19.7
MCN7-1/2A	7-1/2	4.9	12.2	7.6	7 /8 IDS	1-1 /8 IDS	1-1/4 FPT	28.1
MCN10A	10	4.9	12.2	10.3	7 /8 IDS	1-1 /8 IDS	1-1/4 FPT	37.7
MCN10L	10	9.8	20.3	2.2	1-1 /8 IDS	1-5 /8 IDS	1-1/2 FPT	43.8
MCN12L	12	9.8	20.3	2.5	1-1 /8 IDS	1-5 /8 IDS	1-1/2 FPT	47.9
MCN15L	15	9.8	20.3	3.1	1-1 /8 IDS	1-5 /8 IDS	1-1/2 FPT	54.0
MCN20L	20	9.8	20.3	4.0	1-1 /8 IDS	1-5 /8 IDS	1-1/2 FPT	64.3
MCN25L	25	9.8	20.3	4.9	1-1 /8 IDS	1-5 /8 IDS	2 FPT	74.4
MCN30L	30	9.8	20.3	5.8	1-3 /8 IDS	2-1 /8 IDS	2 FPT	84.6
MCN35L	35	9.8	20.3	6.7	1-3 /8 IDS	2-1 /8 IDS	2 FPT	94.8
MCN40L	40	9.8	20.3	7.6	1-3 /8 IDS	2-1 /8 IDS	2 FPT	105.0
MCN50L	50	9.8	20.3	9.4	1-5 /8 IDS	2-1 /8 IDS	2 FPT	125.0
MCN60L	60	9.8	20.3	11.2	1-5 /8 IDS	2-1 /8 IDS	2 FPT	146.0
MCN70L	70	9.8	20.3	13.8	1-5 /8 IDS	2-1 /8 IDS	2 FPT	166.0
MCN75L	75	9.8	20.3	17.5	1-7 /8 IDS	2-1 /8 IDS	2 FPT	217.0

- NOTES:
1. Nominal tons @ 105F Ct = 15,000 Btu/Hr per ton, 85F EWT, 105F condensing temperature, 3 gpm per ton.
 2. Designed for Brackish Water, Swimming Pool Water, < 5 Ph, and water with chlorides and other corrosive properties.
 3. For city water applications, 75F Ewt, 105F condensing temperature, 3 gpm per ton, multiply unit nominal capacity at 105F Ct by 1.59.
 4. Materials: Marine Stainless, Nickel Brazed.
 5. The MCN model is not recommended for shipboard seawater duty, or applications where electrical potentials may cause galvanic corrosion.

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Subcoolers and Specials

SC Series 1 to 120 tons



The SC Series Subcooler features advanced technology and compact design. An important feature is low load stability and capacity control made possible by the built-in Direct Expansion (DX) distribution device. The highly versatile SC Series Subcooler can be configured for standard and custom designs ranging from one to 120 tons. These units have wide application in supermarkets, food processing, industrial refrigeration, two-stage systems and economizers. The SC is ideal for any application where subcooled refrigerant is used to enhance system efficiency and capacity. Constructed of copper brazed 316L stainless steel plates. Rated working pressure 450 psig. All models are UL listed. Optional ASME and European PED CE Approval.

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
SC1G	1	5.1	13.3	1.1	7/8 ID	5/8 ID	1-1/8 ID	5.0
SC2G	2	5.1	13.3	1.4	7/8 ID	5/8 ID	1-1/8 ID	6.3
SC3G	3	5.1	13.3	1.8	7/8 ID	5/8 ID	1-1/8 ID	7.6
SC5G	5	5.1	13.3	2.3	1-1/8 ID	7/8 ID	1-1/8 ID	10.0
SC7G	7	5.1	13.3	3.1	1-1/8 ID	7/8 ID	1-1/8 ID	12.0
SC10G	10	5.1	13.3	4.0	1-3/8 ID	7/8 ID	1-3/8 ID	15.0
SC12G	12	5.1	13.3	4.9	1-3/8 ID	7/8 ID	1-3/8 ID	18.0
SC14G	14	5.1	13.3	5.8	1-3/8 ID	7/8 ID	1-3/8 ID	22.0

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
SC16G	16	11.1	21.4	2.3	1-5/8 ID	1-1/8 ID	2-1/8 ID	33
SC22G	22	11.1	21.4	3.3	1-5/8 ID	1-1/8 ID	2-1/8 ID	44
SC28G	28	11.1	21.4	4.2	2-1/8 ID	1-1/8 ID	2-5/8 ID	55
SC35G	35	11.1	21.4	5.1	2-1/8 ID	1-1/8 ID	2-5/8 ID	66
SC42G	42	11.1	21.4	6.1	2-1/8 ID	1-1/8 ID	2-5/8 ID	77
SC54G	54	11.1	21.4	8.0	2-5/8 ID	1-1/8 ID	2-5/8 ID	88
SC66G	66	11.1	21.4	9.8	2-5/8 ID	1-1/8 ID	2-5/8 ID	121
SC80G	80	11.1	21.4	11.7	2-5/8 ID	1-1/8 ID	2-5/8 ID	155
SC90G	90	11.1	21.4	13.6	2-5/8 ID	1-3/8 ID	2-5/8 ID	165
SC100G	100	11.1	21.4	14.5	2-5/8 ID	1-5/8 ID	2-5/8 ID	176
SC120G	120	11.1	21.4	16.4	2-5/8 ID	1-5/8 ID	2-5/8 ID	198

Note: 1. Design Conditions: Liquid Refrigerant Subcooled from 110°F to 50°F, 35°F Etp R22 or R404a 12,000 Btu/ton.

Special Applications

Brazed Plate heat exchangers can be used in a wide variety of refrigeration designs, including low temperature applications, high viscosity liquids, and many more. Standard and custom units can be computer selected by FlatPlate® application department. The following is a partial list of other refrigeration applications:

Application	Conditions
GLYCOL CHILLER	to -50°F liquid chillers
OIL COOLERS	for compressor or/and hydraulic oil coolers
ULTRA LOWTEMP CHILLERS	to -100°F chillers
CRYOGENIC CHILLERS	to -320°F using liquid Nitrogen
GAS DRIERS	from 30 SCFM to 5000 SCFM
HYDROCARBON PROCESSES	from +100°F to -320°F
CASCADE CONDENSERS	for environmental chambers and low temp chillers
DESUPERHEATERS	for water heating or 2 stage compressor cooling
NEW REFRIGERANT	SR134a, R410a, R404a, AZ20, R407c AND OTHERS
SPECIAL LIQUID	Call the factory

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Subcoolers and Specials

SC-XP Series For R410A Applications, 1 to 120 tons



Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
SC1-XP	1	4.9	12.2	1.2	7/8 IDS	5/8 IDS	1-1/8 IDS	16.4
SC2-XP	2	4.9	12.2	1.6	7/8 IDS	5/8 IDS	1-1/8 IDS	17.7
SC3-XP	3	4.9	12.2	1.9	7/8 IDS	5/8 IDS	1-1/8 IDS	19.0
SC4-XP	4	4.9	12.2	2.3	1-1/8 IDS	5/8 IDS	1-1/8 IDS	20.3
SC5-XP	5	4.9	12.2	2.5	1-1/8 IDS	7/8 IDS	1-1/8 IDS	21
SC7-XP	7	4.9	12.2	3.2	1-3/8 IDS	7/8 IDS	1-1/8 IDS	23
SC8-XP	8	4.9	12.2	3.7	1-3/8 IDS	7/8 IDS	1-3/8 IDS	25
SC10-XP	10	4.9	12.2	4.1	1-3/8 IDS	7/8 IDS	1-3/8 IDS	27
SC12-XP	12	4.9	12.2	5.0	1-3/8 IDS	7/8 IDS	1-3/8 IDS	30
SC14-XP	14	4.9	12.2	5.9	1-3/8 IDS	7/8 IDS	1-3/8 IDS	33

Maximum Allowable Working Pressure: 650 psig (44.8 Bar)

Code Approvals: UL Listed, Canadian CRN; Optional ASME, CE-PED (SC7 & Lgr)

All Models have built-in DX distributors on side A.

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Fluid	
SC16-XP	16	9.8	20.3	2.3	1-5/8 IDS	1-1/8 IDS	2-1/8 IDS	77
SC22-XP	22	9.8	20.3	3.2	1-5/8 IDS	1-1/8 IDS	2-1/8 IDS	87
SC28-XP	28	9.8	20.3	4.1	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	97
SC35-XP	35	9.8	20.3	5.0	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	107
SC42-XP	42	9.8	20.3	5.9	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	117
SC54-XP	54	9.8	20.3	7.7	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	138
SC66-XP	66	9.8	20.3	9.5	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	158
SC80-XP	80	9.8	20.3	11.3	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	179
SC90-XP	90	9.8	20.3	13.1	2-5/8 IDS	1-3/8 IDS	2-5/8 IDS	199
SC100-XP	100	9.8	20.3	14.0	2-5/8 IDS	1-5/8 IDS	2-5/8 IDS	209
SC120-XP	120	9.8	20.3	15.8	2-5/8 IDS	1-5/8 IDS	2-5/8 IDS	230

Maximum Allowable Working Pressure: 650 psig (44.8 Bar)

Code Approvals: UL Listed, Canadian CRN; Optional ASME, CE-PED

All Models have built-in DX distributors on side A.

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Heat Pumps

HP Series

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
HP1/2AG	1/2	5.1	13.3	1.1	5/8 IDS	5/8 IDS	7/8 IDS	6.0
HP3/4AG	3/4	5.1	13.3	1.3	5/8 IDS	5/8 IDS	7/8 IDS	6.6
HP1AG	1	5.1	13.3	1.5	5/8 IDS	5/8 IDS	7/8 IDS	7.2
HP1-1/2AG	1-1/2	5.1	13.3	1.8	5/8 IDS	5/8 IDS	7/8 IDS	8.4
HP2AG	2	5.1	13.3	2.2	5/8 IDS	5/8 IDS	7/8 IDS	9.6
HP2-1/2AG	2-1/2	5.1	13.3	2.5	5/8 IDS	5/8 IDS	7/8 IDS	11
HP3AG	3	5.1	13.3	3.0	5/8 IDS	5/8 IDS	7/8 IDS	13
HP3-1/2AG	3-1/2	5.1	13.3	3.6	7/8 IDS	5/8 IDS	7/8 IDS	14
HP4AG (*)	4	5.1	13.3	4.3	7/8 IDS	5/8 IDS	1-1/8 IDS	17
HP5AG (*)	5	5.1	13.3	5.2	7/8 IDS	5/8 IDS	1-1/8 IDS	20
HP1/2G	1-1/2	5.1	21.1	1.1	5/8 IDS	5/8 IDS	7/8 IDS	9.8
HP2G	2	5.1	21.1	1.3	5/8 IDS	5/8 IDS	7/8 IDS	10.8
HP2-1/2G	2-1/2	5.1	21.1	1.5	5/8 IDS	5/8 IDS	7/8 IDS	11.8
HP3G	3	5.1	21.1	1.6	5/8 IDS	5/8 IDS	7/8 IDS	12.7
HP3-1/2G	3-1/2	5.1	21.1	2.0	5/8 IDS	5/8 IDS	7/8 IDS	14.6
HP4G (*)	4	5.1	21.1	2.2	7/8 IDS	5/8 IDS	1-1/8 IDS	15.6
HP5G (*)	5	5.1	21.1	2.5	7/8 IDS	5/8 IDS	1-1/8 IDS	17.5
HP6G (*)	6	5.1	21.1	3.0	1-1/8 IDS	7/8 IDS	1-1/8 IDS	20.4
HP7-1/2G (*)	7-1/2	5.1	21.1	3.9	1-1/8 IDS	7/8 IDS	1-1/8 IDS	25.2
HP10BG (*)	10	5.1	21.1	4.8	1-3/8 IDS	7/8 IDS	1-3/8 IDS	30.0
HP12BG (*)	12	5.1	21.1	5.7	1-3/8 IDS	7/8 IDS	1-3/8 IDS	34.8
HP15BG (*)	15	5.1	21.1	6.6	1-3/8 IDS	7/8 IDS	1-3/8 IDS	39.6
HP10G (*)	10	11.1	21.4	3.0	1-3/8 IDS	7/8 IDS	1-5/8 IDS	55
HP12G (*)	12	11.1	21.4	3.6	1-3/8 IDS	7/8 IDS	1-5/8 IDS	62
HP15G (*)	15	11.1	21.4	4.7	1-3/8 IDS	7/8 IDS	1-5/8 IDS	73
HP20G (*)	20	11.1	21.4	5.7	1-5/8 IDS	7/8 IDS	1-5/8 IDS	84
HP25G (*)	25	11.1	21.4	6.8	1-5/8 IDS	1-1/8 IDS	2-1/8 IDS	95
HP30G (*)	30	11.1	21.4	7.8	2-1/8 IDS	1-1/8 IDS	2-1/8 IDS	106
HP35G (*)	35	11.1	21.4	9.9	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	128
HP40G (*)	40	11.1	21.4	10.9	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	139
HP50G (*)	50	11.1	21.4	14.0	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	172
HP60G (*)	60	11.1	21.4	16.1	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	194
HP70G (*)	70	11.1	21.4	18.2	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	216
HP80G (*)	80	11.1	21.4	20.3	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	238

Maximum Allowable Working Pressure: 450 psig (31 Bar)

Code Approvals: UL Listed, Optional ASME, CE-PED (CH2-1/2 +)

(*) Models have built-in DX distributors

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
HP3-2C	3	9.8	20.3	1.26	7/8 IDS	5/8 IDS	1 MPT	47.3
HP5-2C	5	9.8	20.3	1.62	7/8 IDS	5/8 IDS	1 MPT	51.5
HP6-2C	6	9.8	20.3	1.98	7/8 IDS	5/8 IDS	1 MPT	55.7
HP8-2C	8	9.8	20.3	2.34	7/8 IDS	5/8 IDS	1 MPT	59.9
HP10-2C	10	9.8	20.3	2.7	1-1/8 IDS	7/8 IDS	1-1/2 MPT	64.1
HP12-2C	12	9.8	20.3	3.06	1-1/8 IDS	7/8 IDS	1-1/2 MPT	68.3
HP15-2C	15	9.8	20.3	3.78	1-1/8 IDS	7/8 IDS	1-1/2 MPT	76.7
HP20-2C	20	9.8	20.3	4.86	1-3/8 IDS	7/8 IDS	1-1/2 MPT	89.3
HP25-2C	25	9.8	20.3	5.94	1-3/8 IDS	7/8 IDS	2 MPT	101.9
HP30-2C	30	9.8	20.3	7.02	1-3/8 IDS	7/8 IDS	2 MPT	114.5
HP35-2C	35	9.8	20.3	8.46	1-3/8 IDS	7/8 IDS	2 MPT	131
HP40-2C	40	9.8	20.3	9.54	1-5/8 IDS	7/8 IDS	2-1/2 MPT	143.9
HP50-2C	50	9.8	20.3	12.06	1-5/8 IDS	1-1/8 IDS	2-1/2 MPT	173.3
HP60-2C	60	9.8	20.3	13.86	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	194.3
HP70-2C	70	9.8	20.3	15.66	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	215.3
HP80-2C	80	9.8	20.3	18.18	2-1/2 IDS	1-1/8 IDS	2-1/2 MPT	244.7

Maximum Allowable Working Pressure: A&B (2xRefrigerant) Channels 450 psig (31 Bar), C (Common) Channel 350 psig (24.1 Bar)

Code Approvals: UL Listed, Optional ASME and CE-PED

All Include (2) 1/2" FPT Waterside Temperature Probe Fittings.

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High Pressure Heat Pumps

HP-XP Series Perfect for R410A Applications



Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
HP1/2A-XP	1/2	4.9	12.2	1.2	5/8 IDS	5/8 IDS	7/8 IDS	16.4
HP3/4A-XP	3/4	4.9	12.2	1.4	5/8 IDS	5/8 IDS	7/8 IDS	17.1
HP1A-XP	1	4.9	12.2	1.6	5/8 IDS	5/8 IDS	7/8 IDS	17.7
HP1-1/2A-XP	1-1/2	4.9	12.2	1.9	5/8 IDS	5/8 IDS	7/8 IDS	19.0
HP2A-XP	2	4.9	12.2	2.3	5/8 IDS	5/8 IDS	7/8 IDS	20.3
HP2-1/2A-XP	2-1/2	4.9	12.2	2.6	5/8 IDS	5/8 IDS	7/8 IDS	22
HP3A-XP	3	4.9	12.2	3.2	5/8 IDS	5/8 IDS	7/8 IDS	23
HP3-1/2A-XP	3-1/2	4.9	12.2	3.7	7/8 IDS	5/8 IDS	7/8 IDS	25
HP4A-XP (*)	4	4.9	12.2	4.4	7/8 IDS	5/8 IDS	1-1/8 IDS	28
HP5A-XP (*)	5	4.9	12.2	5.3	7/8 IDS	5/8 IDS	1-1/8 IDS	31
HP1-1/2-XP	1-1/2	5.0	20.3	1.2	5/8 IDS	5/8 IDS	7/8 IDS	27.2
HP2-XP	2	5.0	20.3	1.4	5/8 IDS	5/8 IDS	7/8 IDS	28.3
HP2-1/2-XP	2-1/2	5.0	20.3	1.6	5/8 IDS	5/8 IDS	7/8 IDS	29.4
HP3-XP	3	5.0	20.3	1.7	5/8 IDS	5/8 IDS	7/8 IDS	30.6
HP3-1/2-XP	3-1/2	5.0	20.3	2.1	5/8 IDS	5/8 IDS	7/8 IDS	32.8
HP4-XP (*)	4	5.0	20.3	2.3	7/8 IDS	5/8 IDS	1-1/8 IDS	33.9
HP5-XP (*)	5	5.0	20.3	2.6	7/8 IDS	5/8 IDS	1-1/8 IDS	36.2
HP6-XP (*)	6	5.0	20.3	3.2	1-1/8 IDS	7/8 IDS	1-1/8 IDS	39.5
HP7-1/2-XP (*)	7-1/2	5.0	20.3	4.1	1-1/8 IDS	7/8 IDS	1-1/8 IDS	45.1
HP10B-XP (*)	10	5.0	20.3	5.0	1-3/8 IDS	7/8 IDS	1-3/8 IDS	50.7
HP12B-XP (*)	12	5.0	20.3	5.9	1-3/8 IDS	7/8 IDS	1-3/8 IDS	56.3
HP15B-XP (*)	15	5.0	20.3	6.8	1-3/8 IDS	7/8 IDS	1-3/8 IDS	61.9
HP10-XP (*)	10	9.8	20.3	2.6	1-3/8 IDS	7/8 IDS	1-5/8 IDS	81
HP12-XP (*)	12	9.8	20.3	3.2	1-3/8 IDS	7/8 IDS	1-5/8 IDS	87
HP15-XP (*)	15	9.8	20.3	4.1	1-3/8 IDS	7/8 IDS	1-5/8 IDS	97
HP20-XP (*)	20	9.8	20.3	5.0	1-5/8 IDS	7/8 IDS	1-5/8 IDS	107
HP25-XP (*)	25	9.8	20.3	5.9	1-5/8 IDS	1-1/8 IDS	2-1/8 IDS	117
HP30-XP (*)	30	9.8	20.3	6.8	2-1/8 IDS	1-1/8 IDS	2-1/8 IDS	128
HP35-XP (*)	35	9.8	20.3	8.6	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	148
HP40-XP (*)	40	9.8	20.3	9.5	2-1/8 IDS	1-1/8 IDS	2-5/8 IDS	158
HP50-XP (*)	50	9.8	20.3	12.2	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	189
HP60-XP (*)	60	9.8	20.3	14.0	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	209
HP70-XP (*)	70	9.8	20.3	15.8	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	230
HP80-XP (*)	80	9.8	20.3	17.6	2-5/8 IDS	1-1/8 IDS	2-5/8 IDS	250

Maximum Allowable Working Pressure: 650 psig (44.8 Bar)

Code Approvals: UL Listed, Canadian CRN; Optional ASME, CE-PED (CH2-1/2 +)

(*) Models have built-in DX distributors

Model	Tons	Dimensions in inches			Connections in inches			Net Wt. (lbs.)
		Width	Length	Depth	Refrig Out	Refrig In	Liquid	
HP3-2C-XP	3	9.8	20.3	1.4	7/8 IDS	5/8 IDS	1 MPT	75.0
HP5-2C-XP	5	9.8	20.3	1.7	7/8 IDS	5/8 IDS	1 MPT	79.0
HP6-2C-XP	6	9.8	20.3	2.1	7/8 IDS	5/8 IDS	1 MPT	83.1
HP8-2C-XP	8	9.8	20.3	2.5	7/8 IDS	5/8 IDS	1 MPT	87.2
HP10-2C-XP	10	9.8	20.3	2.8	1-1/8 IDS	7/8 IDS	1-1/2 MPT	91.3
HP12-2C-XP	12.5	9.8	20.3	3.2	1-1/8 IDS	7/8 IDS	1-1/2 MPT	95.4
HP15-2C-XP	15	9.8	20.3	3.9	1-1/8 IDS	7/8 IDS	1-1/2 MPT	103.5
HP20-2C-XP	20	9.8	20.3	5.0	1-3/8 IDS	7/8 IDS	1-1/2 MPT	115.8
HP25-2C-XP	25	9.8	20.3	6.1	1-3/8 IDS	7/8 IDS	2 MPT	128.0
HP30-2C-XP	30	9.8	20.3	7.1	1-3/8 IDS	7/8 IDS	2 MPT	140.2
HP35-2C-XP	35	9.8	20.3	8.4	1-3/8 IDS	7/8 IDS	2 MPT	154.5
HP40-2C-XP	40	9.8	20.3	9.7	1-5/8 IDS	7/8 IDS	2-1/2 MPT	168.8
HP50-2C-XP	50	9.8	20.3	12.2	1-5/8 IDS	1-1/8 IDS	2-1/2 MPT	197.4
HP60-2C-XP	60	9.8	20.3	14.0	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	217.8
HP70-2C-XP	70	9.8	20.3	15.8	2-1/8 IDS	1-1/8 IDS	2-1/2 MPT	238.2
HP80-2C-XP	80	9.8	20.3	18.3	2-1/2 IDS	1-1/8 IDS	2-1/2 MPT	266.7

Maximum Allowable Working Pressure: A&B (2xRefrigerant) Channels 650 psig (44.8 Bar), C (Common) Channel 350 psig (24.1 Bar)

Code Approvals: UL Listed, Canadian CRN; Optional ASME and CE-PED

All Include (2) 1/2" FPT Waterside Temperature Probe Fittings.

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Liquid to Liquid General Purpose

FG and FP Models



FlatPlate® FG and FP Series is designed for a wide variety of liquid to liquid applications such as process separation, high pressure system isolation, fluid cooling with chilled water, oil cooling, hydronic heating, domestic water heating and close approach (as low as 3 deg. F for the larger models) situations. All FG and FP Series models are constructed from copper brazed 316L stainless steel plates with stainless steel MPT connections and mounting studs as standard. The configuration of FlatPlate® high efficient heat transfer surface minimizes fouling, even in hard water conditions. All models are rated at 450 psig pressure on both sides. The FG and FP Series are UL Listed, with ASME code and/or European CE code optional.

Model	Capacity (BTUH)	Plate Count	Dimensions in inches			Side A (Liquid)		Side B (Liquid)		Net Wt. (lbs.)
			Width	Length	Depth	Min Flow Rate gpm	Pressure drop (psig)	Min Flow Rate gpm	Pressure drop (psig)	
FG5X12-8 (3/4" MPT)	50,000	8	3.4	8.9	1.1	5.1	6.6	5.1	3.9	5.0
FG5X12-14 (3/4" MPT)	100,000	14	3.4	8.9	1.6	10.2	6.6	10.2	5.0	6.9
FG5X12-20 (1" MPT)	150,000	20	3.4	8.9	2.2	15.4	6.7	15.4	5.6	8.9
FG5X12-24 (1" MPT)	200,000	24	3.4	8.9	2.5	20.5	8.0	20.5	6.9	10.1
FG5X12-36 (1-1/4" MPT)	300,000	36	3.4	8.9	3.6	30.7	7.9	30.7	7.2	14.0
FG5X12-50 (1-1/4" MPT)	400,000	50	3.4	8.9	4.9	41.0	7.6	41.0	7.2	18.5
FG5X12-70 (1-1/4" MPT)	500,000	70	3.4	8.9	6.7	51.2	6.8	51.2	6.6	24.9
FG5X12-80 (1-1/4" MPT)	600,000	80	3.4	8.9	7.6	61.4	8.0	61.4	7.8	28.1
FP10X20L-24 (1-1/2" MPT)	700,000	24	9.8	20.3	2.5	71.7	6.7	71.7	5.8	47.9
FP10X20L-30 (2" MPT)	800,000	30	9.8	20.3	3.1	81.9	5.7	81.9	5.1	54.0
FP10X20L-30 (2" MPT)	900,000	30	9.8	20.3	3.1	92.9	7.1	92.9	6.4	54.0
FP10X20L-40 (2" MPT)	1,000,000	40	9.8	20.3	4.0	102.4	5.2	102.4	4.8	64.2
FP10X20L-40 (2" MPT)	1,250,000	40	9.8	20.3	4.0	128.0	7.9	128.0	7.3	64.2
FP10X20L-50 (2-1/2" MPT)	1,500,000	50	9.8	20.3	4.9	153.6	7.7	153.6	7.4	74.4
FP10X20L-60 (2-1/2" MPT)	1,750,000	60	9.8	20.3	5.8	179.2	7.9	179.2	7.6	84.6
FP10X20L-80 (2-1/2" MPT)	2,000,000	80	9.8	20.3	7.6	204.8	7.0	204.8	6.9	105.0
FP10X20L-90 (2-1/2" MPT)	2,250,000	90	9.8	20.3	8.5	230.4	7.7	230.4	7.6	115.0
FP15X34AL-80-FB (4" FLG)	2,500,000	80	15.2	34.3	8.4	256.0	7.7	256.0	2.9	311.0
FP15X34AL-90-FB (4" FLG)	2,750,000	90	15.2	34.3	9.3	281.6	7.4	281.6	2.8	339.0
FP15X34AL-100-FB (4" FLG)	3,000,000	100	15.2	34.3	10.2	307.2	7.2	307.2	2.8	367.0

Use nickel-chrome alloy brazed heat exchangers in applications where copper is not compatible with one or both working fluids. Nickel-chrome alloy brazed heat exchangers are available. Consult factory.

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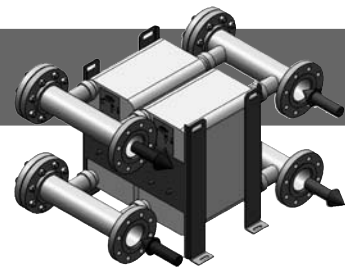
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Liquid to Liquid

"M" Manifolded Series 200 to 400 gpm



The FP-M Series is an ultra-compact, versatile unit designed for liquid to liquid applications up to 400 gpm and for practical use up to 2000 gpm with multiple units. One fifth the size of typical shell & tube heat exchangers, these models are space savers in large commercial and industrial applications. Large external manifolds allow easy piping for 4", 5" and 6" flange connections. All models use 316L Stainless Steel, copper brazed plates. Standard models use Carbon steel external piping manifolds rated for 150 psig. Higher working pressure versions available. Optional Stainless Steel manifolds and flanges. Individual modules are UL Listed and optional ASME stamped.

Model	Connections in inches	Plate Count	Dimensions in inches			GPM at 9.5 psig PD	Net Wt. (lbs.)
			Width	Length	Depth		
FP10X20-160M (4 Flg)	4 FLG	2 x 80	24.6	42.8	30.7	224	280
FP10X20-200M (4 Flg)	4 FLG	2 x 100	24.6	42.8	32.5	270	321
FP10X20-240M (4 Flg)	4 FLG	2 x 120	24.6	42.8	34.3	310	362
FP10X20-280M (5 Flg)	4 FLG	2 x 140	24.6	42.8	36.1	348	402
FP10X20-320M (5 Flg)	4 FLG	2 x 160	24.6	42.8	37.9	382	443
FP10X20-360M (5 Flg)	4 FLG	2 x 180	24.6	42.8	39.7	410	484
FP10X20-400M (5 Flg)	4 FLG	2 x 200	24.6	42.8	41.5	440	525

- Notes:
1. FP Models shown above rated for 150psig working pressure.
 2. Optional 300psig and 400psig versions.
 3. Liquid side manifold piping is carbon steel material not recommended for potable water. Stainless steel manifold assemblies available for potable water applications. Liquid temperatures on the process side below -20°F (-29°C) require stainless steel manifold piping. Please consult your sales representative or the factory for availability.
 4. Four versions available:
 FP and FP-L – 316L, copper brazed
 FPN – 316L, All Stainless, Nickel brazed
 MPN – Marine Stainless, Nickel brazed
 5. For ASME code version, the model number should include "-UM". Example CH80M-2C-UM. ASME code approval does not apply to the manifold piping. BPHE units are ASME code stamped individually.



Liquid to Liquid

DW Series – DOUBLE WALL, VENTED 1 to 150 gpm

FlatPlate® DW Series is a Double Wall, Vented Heat Exchanger designed to meet local and state plumbing regulations, and food process regulations that require double separation of potable water or food process liquids from glycols, boiler water and other non-potable liquids. As a full range Liquid to Liquid heat exchanger, the DW Series is a "True" double wall Vented design, with double wall plates, which have positive leak detection vents. Design working pressure 450 psig. UL Listed. Optional ASME.

Double Wall Models	Capacity (BTUH)	Plate Count	Dimensions in inches			Side B (Boiler)		Side A (Domestic)		Net Wt. (lbs.)
			Width	Length	Depth	Min Flow Rate gpm	Pressure drop (psig)	Min Flow Rate gpm	Pressure drop (psig)	
DW5X12-10 (1 MPT)	75,000	10	4.9	13.1	0.5	7.7	6.2	1.7	0.3	6.6
DW5X12-20 (1 MPT)	150,000	20	4.9	13.1	0.6	15.4	7.6	3.4	0.4	9.6
DW5X12-30 (1 MPT)	200,000	30	4.9	13.1	0.7	20.5	5.8	4.5	0.3	12.6
DW5X12-40 (1 MPT)	300,000	40	4.9	13.1	0.8	30.7	7.2	6.7	0.4	15.6
DW5X12-50 (1 MPT)	350,000	50	4.9	13.1	0.8	35.8	6.4	7.8	0.4	18.6
DW5X12-60 (1-1/4 MPT)	400,000	60	4.9	13.1	0.9	41.0	6.0	8.9	0.3	21.6
DW5X12-70 (1-1/4 MPT)	500,000	70	4.9	13.1	1	51.2	7.2	11.2	0.4	24.6
DW5X12-90 (1-1/4 MPT)	600,000	90	4.9	13.1	1.2	61.4	7.0	13.4	0.4	30.6
DW5X12-110 (1-1/4 MPT)	700,000	110	4.9	13.1	1.4	71.7	7.3	15.6	0.4	36.6
DW10X20-110 (2 MPT)	700,000	110	9.8	20.3	10.4	71.7	6.8	15.6	0.4	152.0
DW10X20-134 (2 MPT)	800,000	134	9.8	20.3	12.5	81.9	6.1	17.9	0.4	178.0
DW10X20-134 (2 MPT)	900,000	134	9.8	20.3	12.5	92.2	7.7	20.1	0.5	178.0
DW10X20-134 (2 MPT)	1,000,000	154	9.8	20.3	14.3	102.4	7.3	22.3	0.4	199.0

Refrigeration versions of the DW Series are available.
 DW 5x12 models are imported from Germany.

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Liquid to Liquid

MPN Series - Swimming Pool, Steam, Industrial Process 1/2 to 200 gpm



FlatPlate® MPN Series is designed specifically for swimming pool applications, where chlorine, biological elements or low concentrations of acids are present. The MPN Series is rugged, yet very compact, representing the latest technology in aggressive environment duty plate heat exchangers. Its nickel-chrome brazed, marine stainless alloy plates offer significant improvements in reliability over traditional stainless materials and have high efficiency heat transfer for applications up to 75+ gpm per unit. All MPN Series models have male pipe thread fittings and mounting stud bolts. Rated for 300 psig.

MPN Series applications include:

Swimming Pool

- Swimming pool to boiler
- Swimming pool to heat pump water loop

Steam

- Steam to domestic water
- Steam to process

Process

- Brackish water
- Treated steam to liquid
- Steam condensate to liquid
- Cooling tower water
- Low acid concentrations

Model	Connections in inches	Plate Count	Dimensions in inches			GPM@5.0psi PD		GPM@7.5psi PD		Net Wt. (lbs.)
			Width	Length	Depth	Side A	Side B	Side A	Side B	
MPN5X12-4 (1 MPT)	1 MPT	4	4.9	12.2	0.7	1.1	2.1	1.6	3.1	7.6
MPN5X12-6 (1 MPT)	1 MPT	6	4.9	12.2	0.9	2.1	3.1	3.2	4.7	8.2
MPN5X12-8 (1 MPT)	1 MPT	8	4.9	12.2	1.0	3.2	4.2	4.8	6.4	8.8
MPN5X12-10 (1 MPT)	1 MPT	10	4.9	12.2	1.2	4.2	5.2	6.4	8.0	9.8
MPN5X12-16 (1 MPT)	1 MPT	16	4.9	12.2	1.7	7.3	8.3	11.1	12.7	11.4
MPN5X12-20 (1-1/4 MPT)	1-1/4 MPT	20	4.9	12.2	2.0	9.3	10.3	14.2	15.7	12.7
MPN5X12-24 (1-1/4 MPT)	1-1/4 MPT	24	4.9	12.2	2.4	11.3	12.3	17.3	18.7	14.0
MPN5X12-30 (1-1/4 MPT)	1-1/4 MPT	30	4.9	12.2	2.9	16.6	17.5	25.3	26.7	15.9
MPN5X12-40 (1-1/4 MPT)	1-1/4 MPT	40	4.9	12.2	3.7	18.9	19.7	28.8	30.0	19.1
MPN5X12-50 (1-1/4 MPT)	1-1/4 MPT	50	4.9	12.2	4.6	25.4	26.0	38.7	39.7	22.3
MPN5X12-60 (1-1/4 MPT)	1-1/4 MPT	60	4.9	12.2	5.4	26.6	27.3	40.6	41.6	25.5
MPN5X12-70 (1-1/4 MPT)	1-1/4 MPT	70	4.9	12.2	6.3	29.8	30.5	45.5	46.5	28.7
MPN5X12-80 (1-1/4 MPT)	1-1/4 MPT	80	4.9	12.2	7.1	33.0	33.4	50.3	50.9	31.9
MPN10X20L-20 (1-1/2 MPT)	1-1/2 MPT	20	9.8	20.3	2.2	50.0	53.0	62.0	66.0	66.1
MPN10X20L-24 (1-1/2 MPT)	1-1/2 MPT	24	9.8	20.3	2.6	61.0	63.5	75.0	78.0	70.2
MPN10X20L-30 (2 MPT)	2 MPT	30	9.8	20.3	3.2	76.0	78.5	94.0	97.0	76.3
MPN10X20L-36 (2 MPT)	2 MPT	36	9.8	20.3	3.7	91.0	92.0	112.0	114.0	82.4
MPN10X20L-40 (2 MPT)	2 MPT	40	9.8	20.3	4.1	100.0	101.0	124.0	125.0	86.5
MPN10X20L-50 (2-1/2 MPT)	2-1/2 MPT	50	9.8	20.3	5.1	121.0	121.0	149.0	150.0	96.7
MPN10X20L-60 (2-1/2 MPT)	2-1/2 MPT	60	9.8	20.3	6.0	141.0	141.0	173.0	173.0	106.9
MPN10X20L-70 (2-1/2 MPT)	2-1/2 MPT	70	9.8	20.3	6.9	156.0	156.0	193.0	193.0	117.0
MPN10X20L-80 (2-1/2 MPT)	2-1/2 MPT	80	9.8	20.3	7.9	171.0	171.0	210.0	210.0	127.0
MPN10X20L-90 (2-1/2 MPT)	2-1/2 MPT	90	9.8	20.3	8.8	183.0	183.0	224.0	224.0	138.0
MPN10X20L-100 (2-1/2 MPT)	2-1/2 MPT	100	9.8	20.3	9.8	194.0	194.0	236.0	236.0	148.0

- NOTES:
1. All units are Industrial duty; swimming pool, brackish water, low PH water, ground water, river water, treated steam & condensate and select acids.
 2. Made with Marine Stainless Alloy, Nickel Brazed.
 3. Stainless steel MPT fittings and mounting stud bolts.
 4. Design Working Pressure: 300 psig.
 5. For pools with electronic chlorinating devices use Titanium Plate & Frame Models. Consult factory for selection.

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Replacement Hx's – Refrigeration



FlatPlate® heat exchangers are easy replacement models for several import brands used in a wide range of HVAC/R equipment, supermarket systems and process chillers. Because FlatPlate® design is a "Next Generation" design, all FlatPlate® models meet or exceed performance and design pressure ratings of these models. **Use the Selection Chart below,**

Find the FlatPlate® Model which has the: 1) Closest model match, and 2) Design Applications/performance required, and 3) Approximate Unit dimensions

Selection Table

GEA FlatPlate Model	Replaces SWEP Model	Replaces ALFA-LAVAL Model
Liquid Chillers		
CH3x8-14	E5 or B5-14	CB14-14
CH3x8-20	E5 or B5-20	CB14-20
CH3x8-30	E5 or B5-30	CB14-30
CH3/4AG	B10*10 & B8*20	CB25 & CB26-12
CH1AG	B10*16 & B8*30	CB25 & CB26-14
CH2AG	B10*20	CB25 & CB26-24
CH3AG	B10*30	CB25 & CB26-34
CH3-1/2AG	B10*40	CB25 & CB26-44
CH2G	B15*20 & B25*10	CB50 & CB51-14
CH3G	B15*30 & B25*20	CB50 & CB51-20
CH4G	B25*26 & B15*40	CB50 & CB51-26
CH5G	B25*30 & V27*30	CB50 & CB51-30
CH7-1/2G	V27*40 & B25*50	CB50 & CB51-50
CH10BG	V27*50	
CH10G	V45*30 & V50*30	CB75 & CB76-30HX
CH15G	V45*40 & V50*40	CB75 & CB76-40HX
CH20G	V45*50 & V50*50	CB75 & CB76-50HX
CH25G	V45*70 & V50*70	CB75 & CB76-70HX
CH30GG	V45*80 & V50*80	CB75 & CB76-80HX
CH40	V45*100, V45*130, V50*130	CB75 Y CB76-100HX
Condenser/Heat Pumps		
C1AG	B8*20 & B10*16	CB25 & CB26-16
C2AG	B8*30 & B10*20	CB25 & CB26-20
C3AG	B8*50 & B10*30	CB25 & CB26-30
C2G	B15*20	CB50 & CB51-14
C3G	B15*30 & B25*16	CB50 & CB51-16
C4G	B15*50 & B25*20	CB50 & CB51-20
C5G	B15*60 & B25*26	CB50 & CB51-26
C7-1/2G	B25*30	CB50 & CB51-30
C10G	B25*40	CB50 & CB51-40
C10CG	B45*20 & B35*40	CB75 & CB76-20
C15G	B45*30 & B35*24	CB75 & CB76-30
C20G	B45*40 & B35*30	CB75 & CB76-40
C25G	B45*50 & B35*40	CB75 & CB76-50
C30G	B45*60 & B35*50	CB75 & CB76-60

For Models not on this list consult factory.

Dimensional Fit

For replacement applications, check the dimensional fit for the following units which maybe slightly larger or smaller than the unit it is replacing.

B5, E5, CB14 models are 2.7"W x 8"H, to be replaced with a FlatPlate® 3x8 model, 3.3"W x 7.8"H
 B10, CB25, CB26 models are, 4.0"- 4.5"W x 12"H, to be replaced with a FlatPlate® 5x12 model, 4.9"W x 12"H
 B45, B50 models are, 9.5"-10"W x 20"H, to be replaced with a FlatPlate® 10x20 model, 9.8"W x 20"H
 CB75, CB76 models are 7.5"W x 24.5"H to be replaced with a FlatPlate® 10x20 model, 9.8"W x 20"H

Pressure Rating

All FlatPlate® FP series models are rated for 450 psig, equal to or greater than the units listed above.
 FlatPlate® MPN models can be substituted at 300 psig rating.

Failure Analysis

If the unit being replaced has been in service for less than 5 years (Plate Heat Exchanger or Shell & Tube), the cause or mode of failure may repeat itself, due to water quality, and other factors.

An MPN Series unit is recommended for units being replaced that have been in service less than 5 years.

A failure analysis report can be performed by FlatPlate® for non-FlatPlate® models, for a nominal cost, as part of a replacement heat exchanger order.

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Replacement Hx's – Liquid to Liquid



FlatPlate® heat exchangers are easy replacement models for several import brands used in a wide range of HVAC/R equipment. Because FlatPlate® design is a "Next Generation" design, all FlatPlate® models meet or exceed performance and design pressure ratings of these models. **Use the Selection Chart below,**

Find the FlatPlate® Model which has the: 1) Closest model match, and 2) Design Applications/performance required, and 3) Approximate Unit dimensions

REPLACEMENT HX'S - Selection Table

Liquid to Liquid

EA FlatPlate Models	Replaces SWEP, Elge Models	Replaces ALFA-LAVAL Model
FG3X8-14 (3/4 MPT)	B5*14	CB12-14 & CB14-14
FG3X8-20 (3/4 MPT)	B5*20	CB12-20 & CB14-20
FG3X8-30 (3/4 MPT)	B5*30	CB12-30 & CB14-30
FG5X12L-4 (3/4 MPT)	B8*10	CB25-6 & CB26-6
FG5X12L-6 (3/4 MPT)	B8*10	CB25-8 & CB26-8
FG5X12L-8 (3/4 MPT)	B8*16	CB25-12 & CB26-12
FG5X12-10 (3/4 MPT)	B8*20	CB25-14 & CB26-14
FG5X12-12 (3/4 MPT)	B8*20	CB25-16 & CB26-16
FG5X12-14 (3/4 MPT)	B5*36 & B10*20	CB25-16 & CB26-16
FG5X12-16 (3/4 MPT)	B8*24	CB25-24 & CB26-24
FG5X12-20 (1 MPT)	B8*36 & B10*30	CB25-28 & CB26-28
FG5X12-24 (1 MPT)	B8*40 & B10*30	CB25-34 & CB26-34
FG5X12-30 (1 MPT)	B10*40	CB25-44 & CB26-44
FG5X12-40 (1 MPT)	B10*50	CB25-54 & CB26-54
FG5X12-50 (1 MPT)	B10*60	CB25-64 & CB26-64
FG10X20-20 (1-1/2 MPT)	B45*20 & B50*20	CB75*20 & CB76*20
FG10X20-24 (1-1/2 MPT)	B45*24 & B50*20	CB75*24 & CB76*20
FG10X20-30 (1-1/2 MPT)	B45*30 & B50*30	CB75*30 & CB76*30
FG10X20-40 (1-1/2 MPT)	B45*40 & B50*40	CB75*40 & CB76*40
FG10X20-50 (2 MPT)	B45*50 & B50*50	CB75*50 & CB76*50
FG10X20-60 (2 MPT)	B45*60 & B50*60	CB75*60 & CB76*60
FG10X20-70 (2 MPT)	B45*70 & B50*70	CB75*70 & CB76*70
FG10X20-80 (2 MPT)	B45*80 & B50*80	CB75*80 & CB76*80

For Larger Models contact your local GEA FlatPlate representative.

Dimensional Fit

For replacement applications, check the dimensional fit for the following units which maybe slightly larger or smaller than the unit it is replacing.

B5, E5, CB14 models are 2.7"W x 8"H, to be replaced with a FlatPlate® 3x8 model, 3.3"W x 7.8"H

B10, CB25, CB26 models are, 4.0"- 4.5"W x 12"H, to be replaced with a FlatPlate® 5x12 model, 4.9"W x 12"H

B45, B50 models are, 9.5"-10"W x 20"H, to be replaced with a FlatPlate® 10x20 model, 9.8"W x 20"H

CB75, CB76 models are 7.5"W x 24.5"H to be replaced with a FlatPlate® 10x20 model, 9.8"W x 20"H

Pressure Rating

All FlatPlate® FG series models are rated for 450 psig, equal to or greater than the units listed above.

FlatPlate® MPN marine models can be substituted at 300 psig rating.

Failure Analysis

If the unit being replaced has been in service for less than 5 years (Plate Heat Exchanger or Shell & Tube), the cause or mode of failure may repeat itself, due to water quality, and other factors.

An MPN unit is recommended for units being replaced that have been in service less than 5 years.

A failure analysis report can be performed by FlatPlate® for non-FlatPlate® models, for a nominal cost, as part of a replacement heat exchanger order.

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Accessories to Make Your Life Easier

Mounting Brackets

Application

Holding a brazed plate heat exchanger in place while you pipe it up can be a difficult challenge. Piping alignment problems can decrease system efficiency, and cause premature piping failures. FlatPlate makes this easy to prevent. Every FlatPlate brazed plate heat exchanger is equipped as standard with mounting studs which allow the use of our proprietary mounting brackets.

The FlatPlate Advantage.

With these brackets, installation is easy. Screw the bracket to the floor, then use the mounting studs on the FlatPlate heat exchanger to bolt it to the mounting bracket. This will hold it firmly in place (off the ground) while you pipe it up. The bracket is made of 304 stainless steel, for a durable installation.

The result is a faster, more cost efficient installation, while at the same time guaranteeing a properly aligned piping arrangement.



10X20 Size Shown

What size is your heat exchanger?	Use this Bracket
5X12 (FG, FP or MPN)	BKT5X12
5X20 (FG, FP or MPN)	BKT5X20
10X20 with up to 80 plates (FG, FP or MPN)	BKT10X20
10X20 with 81-200 plates (FG, FP or MPN)	FR10X20

"Y" Strainer

Application

It is important to keep the liquid media clean because this reduces fouling and clogging of the FlatPlate heat exchanger. In some cases, it is a requirement for operation of the system. Elsewhere in this catalog, you see strainers included in recommended piping arrangements.

FlatPlate offers quality Y-Strainers designed to filter out particulate contamination.

- Construction material is cast bronze.
- They are rated for working pressure of 400 psig at 150°F.
- Connection at both ends are Female Pipe Thread (FPT).
- The 20 mesh filter is removable and cleanable.



What is your connection size?	Use this Strainer	Flow rate at 1 psi pressure drop	Flow rate at 2 psi pressure drop
3/4"	STR3/4	18 GPM	26 GPM
1"	STR1	28 GPM	40 GPM
1-1/4"	STR1-1/4	42 GPM	60 GPM
1-1/2"	STR1-1/2	70 GPM	100 GPM
2"	STR2	110 GPM	140 GPM
2-1/2"	STR2-1/2	140 GPM	190 GPM
3"	STR3	180 GPM	260 GPM
4"	STR4	300 GPM	420 GPM

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Accessories to Make Your Life Easier

Insulation Kits

for R22, R134a and all other refrigerants except R410A



Insulation Kits are available and recommended for all CH, SC and all other FlatPlate® models to prevent excessive sweating, ice build-up, or heat loss. Designed to be applied quickly in 10 minutes or less, the Insulation Kits consist of three sections: a pre-cut front, back and side panel made from 1/2" black Armaflex, with extra strength adhesive backing.

Single insulation kit recommended for Evaporator temperatures 20°F or higher
Minimum operating temperature: -40°F. Maximum operating temperature: 220°F

Insulation Kit Model	Use with GEA FlatPlate Model
3x8" Models	
IN-CH3x8-14	CH3x8-14
IN-CH3x8-20	CH3x8-20
IN-CH3x8-30	CH3x8-30
IN-CH3x8-40	CH3x8-40
5x12" Models	
IN-CH1/2AG	CH1/2AG
IN-CH3/4AG	CH3/4AG
IN-CH1AG	CH1AG
IN-CH1-1/2AG	CH1-1/2AG
IN-CH2AG	CH2AG
IN-CH2-1/2AG	CH2-1/2AG
IN-CH3AG	CH3AG
IN-CH3-1/2AG	CH3-1/2AG
IN-CH4AG	CH4AG
IN-CH5AG	CH5AG
5x20" Models	
IN-CH1-1/2G	CH1-1/2G
IN-CH2G	CH2G
IN-CH2-1/2G	CH2-1/2G
IN-CH3G	CH3G
IN-CH4G	CH4G
IN-CH5G	CH5G
IN-CH6G	CH6G
IN-CH7-1/2G	CH7-1/2G
IN-CH10BG	CH10BG
IN-CH12BG	CH12BG
IN-CH15BG	CH15BG

Insulation Kit Model	Use with GEA FlatPlate Model
10x20" Models	
IN-CH10G	CH10G
IN-CH12G	CH12G
IN-CH15G	CH15G
IN-CH20G	CH20G
IN-CH25G	CH25G
IN-CH30G	CH30G
IN-CH35G	CH35G
IN-CH40G	CH40G
IN-CH50G	CH50G
IN-CH60G	CH60G
IN-CH70G	CH70G
IN-CH80G	CH80G
10x20-2 Circuit Models	
IN-CH10-2C	CH10-2C
IN-CH12-2C	CH12-2C
IN-CH15-2C	CH15-2C
IN-CH20-2C	CH20-2C
IN-CH25-2C	CH25-2C
IN-CH30-2C	CH30-2C
IN-CH35-2C	CH35-2C
IN-CH40-2C	CH40-2C
IN-CH50-2C	CH50-2C
IN-CH60-2C	CH60-2C
IN-CH70-2C	CH70-2C
IN-CH80-2C	CH80-2C

CH80M thru CH160 - Consult the Factory
Models FP, FPN & others - Consult the Factory

Insulation Kit Model	Use with GEA FlatPlate Model
Subcoolers	
IN-SC1G	SC1G
IN-SC2G	SC2G
IN-SC3G	SC3G
IN-SC5G	SC5G
IN-SC7G	SC7G
IN-SC10G	SC10G
IN-SC12G	SC12G
IN-SC14G	SC14G
IN-SC16G	SC16G
IN-SC22G	SC22G
IN-SC28G	SC28G
IN-SC35G	SC35G
IN-SC42G	SC42G
IN-SC54G	SC54G
IN-SC66G	SC66G
IN-SC80G	SC80G
IN-SC90G	SC90G
IN-SC100G	SC100G
IN-SC120G	SC120G

- NOTES:
1. All insulation Kits are three piece die cut, with front, back and side wrap-a-round, 1/2" Armaflex, with peel off pre-glued backing.
 2. Rated for 20°F minimum, 220°F maximum temperatures.
 3. For <20°F, Two insulation kits recommended. Consult the Factory for correct models.

Zinc Anode



A Zinc Anode is required for any application where galvanic corrosion is possible. A Zinc Anode is installed and shipped with all MCN Condensers, and not provided with MPN liquid to liquid models.

Model	Female Pipe Connection
ANODE 3/8	3/8" FPT

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Insulation Kits for R410A (XP-Models)



Insulation Kits are available and recommended for all CH, SC and all other FlatPlate® models to prevent excessive sweating, ice build-up, or heat loss. Designed to be applied quickly in 10 minutes or less, the Insulation Kits consist of three sections: a pre-cut front, back and side panel made from 1/2" black Armaflex, with extra strength adhesive backing.

Single insulation kit recommended for Evaporator temperatures 20°F or higher
Minimum operating temperature: -40°F. Maximum operating temperature: 220°F

Insulation Kit Model	Use with GEA FlatPlate Model
3x8" Models	
IN-CH3x8-14	CH3x8-14
IN-CH3x8-20	CH3x8-20
IN-CH3x8-30	CH3x8-30
IN-CH3x8-40	CH3x8-40
5x12" Models	
IN-CH1/2A-XP	CH1/2A-XP
IN-CH3/4A-XP	CH3/4A-XP
IN-CH1A-XP	CH1A-XP
IN-CH1-1/2A-XP	CH1-1/2A-XP
IN-CH2A-XP	CH2A-XP
IN-CH2-1/2A-XP	CH2-1/2A-XP
IN-CH3A-XP	CH3A-XP
IN-CH3-1/2A-XP	CH3-1/2A-XP
IN-CH4A-XP	CH4A-XP
IN-CH5A-XP	CH5A-XP
5x20" Models	
IN-CH1-1/2-XP	CH1-1/2-XP
IN-CH2-XP	CH2-XP
IN-CH2-1/2-XP	CH2-1/2-XP
IN-CH3-XP	CH3-XP
IN-CH4-XP	CH4-XP
IN-CH5-XP	CH5-XP
IN-CH6-XP	CH6-XP
IN-CH7-1/2-XP	CH7-1/2-XP
IN-CH10B-XP	CH10B-XP
IN-CH12B-XP	CH12B-XP
IN-CH15B-XP	CH15B-XP

Insulation Kit Model	Use with GEA FlatPlate Model
10x20" Models	
IN-CH10-XP	CH10-XP
IN-CH12-XP	CH12-XP
IN-CH15-XP	CH15-XP
IN-CH20-XP	CH20-XP
IN-CH25-XP	CH25-XP
IN-CH30-XP	CH30-XP
IN-CH35-XP	CH35-XP
IN-CH40-XP	CH40-XP
IN-CH50-XP	CH50-XP
IN-CH60-XP	CH60-XP
IN-CH70-XP	CH70-XP
IN-CH80-XP	CH80-XP
10x20-2 Circuit Models	
IN-CH10-2C-XP	CH10-2C-XP
IN-CH12-2C-XP	CH12-2C-XP
IN-CH15-2C-XP	CH15-2C-XP
IN-CH20-2C-XP	CH20-2C-XP
IN-CH25-2C-XP	CH25-2C-XP
IN-CH30-2C-XP	CH30-2C-XP
IN-CH35-2C-XP	CH35-2C-XP
IN-CH40-2C-XP	CH40-2C-XP
IN-CH50-2C-XP	CH50-2C-XP
IN-CH60-2C-XP	CH60-2C-XP
IN-CH70-2C-XP	CH70-2C-XP
IN-CH80-2C-XP	CH80-2C-XP

CH80M thru CH160 - Consult the Factory
Models FP, FPN & others - Consult the Factory

Insulation Kit Model	Use with GEA FlatPlate Model
Subcoolers	
IN-SC1-XP	SC1-XP
IN-SC2-XP	SC2-XP
IN-SC3-XP	SC3-XP
IN-SC5-XP	SC5-XP
IN-SC7-XP	SC7-XP
IN-SC10-XP	SC10-XP
IN-SC12-XP	SC12-XP
IN-SC14-XP	SC14-XP
IN-SC16-XP	SC16-XP
IN-SC22-XP	SC22-XP
IN-SC28-XP	SC28-XP
IN-SC35-XP	SC35-XP
IN-SC42-XP	SC42-XP
IN-SC54-XP	SC54-XP
IN-SC66-XP	SC66-XP
IN-SC80-XP	SC80-XP
IN-SC90-XP	SC90-XP
IN-SC100-XP	SC100-XP
IN-SC120-XP	SC120-XP

- NOTES:**
1. All insulation Kits are three piece die cut, with front, back and side wrap-a-round, 1/2" Armaflex, with peel off pre-glued backing.
 2. Rated for 20°F minimum, 220°F maximum temperatures.
 3. For <20°F, Two insulation kits recommended. Consult the Factory for correct models.

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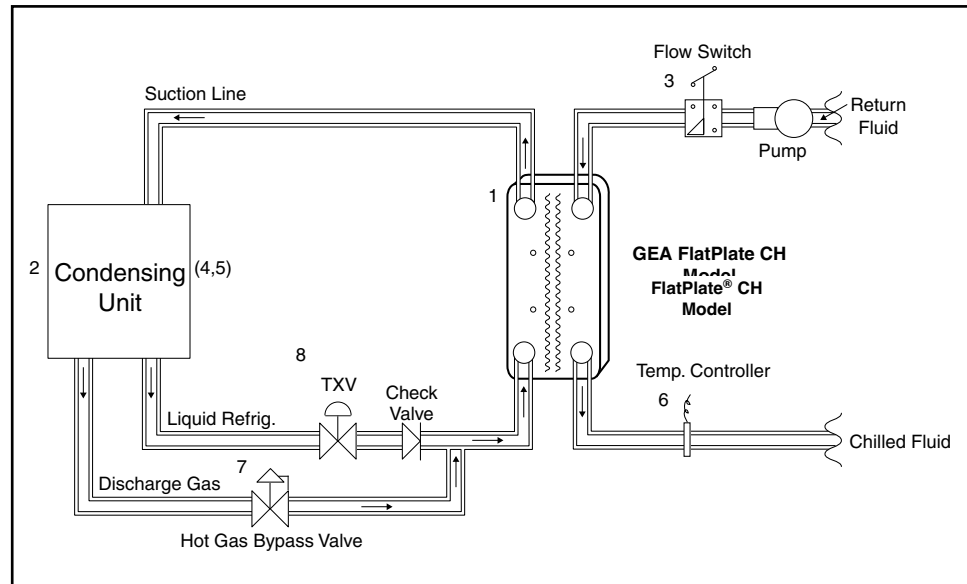
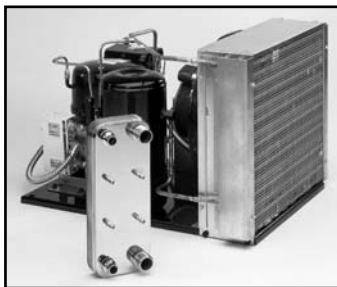


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Liquid Chillers

For projects involving comfort cooling for large homes, commercial or industrial cooling, or process cooling, a Liquid Chiller can be configured using standard industry condensing units, both residential and commercial versions. These applications are typically non-critical temperature control and allow a highly economical and reliable installation.

FlatPlate® units also are used in widely available process liquid chillers packages, available from a number of manufacturers for greater capabilities, precision liquid temperature control and other features.



Applications Tips:

Condensing Unit Selection: A basic liquid chiller can be put together using a standard FlatPlate® CH or CHN Series Chiller (evaporator) and a standard high, medium or low temp condensing unit. Matching BTUH performance of the condensing unit (at design Etp Evap Temperature at design Evap Pressure) to the appropriate FlatPlate® Model (or one model larger) is highly important. For example: For a condensing unit rated at 230,000 BTUH at 45F Etp, use a FlatPlate® model CH20 or CH25. Note: Under-sizing the FlatPlate® unit, or over-sizing the condensing unit could cause freeze conditions. Evap temps below 34F should be avoided, unless glycol or non-freezing liquid is used. Other: a) Applications below 25F Etp should include use of oil separator. b) Applications with high transient loads should use suction accumulator. c) Suction to Liquid heat exchanger recommended for applications with long suction or liquid pipe runs.

Pumps: Liquid pump should be sized for 2.4gpm to 3 gpm per ton, with ample pump head capacity for the heat exchanger, piping, and load for full flow. Variable flow through a FlatPlate® Chiller is not recommended. For medium and low temp applications, be sure to include pump power and piping thermal losses in the load calculations.

Controls & Freeze Protection: Proper controls are required to maintain liquid temperatures and prevent freeze conditions. 1. A flow switch or differential pressure switch must be used to verify that liquid flow exists before the refrigerant circuit is activated. 2. A low pressure cut out must be incorporated into the suction line after the heat exchanger, set to cut off the compressor should the refrigerant pressure decrease below the equivalent freeze point of the liquid being chilled, but no less than 28°F for water chillers. 3. A temperature controller should be utilized to maintain liquid temperatures. Compressor anti-cycling may be needed. 4. A hot gas bypass valve and modulating control should also be utilized for low load control, and part load requirements, if needed. 5. Digital pulsing expansion valves and digital (on/off) hot gas valves are not suitable.

Application Selection: For applications using water, 9F to 10F approach temps (Leaving water temp minus Etp Evap temp), use standard models. For all other design conditions, glycols oils, and other liquids, contact your local GEA FlatPlate rep or distributor for a computer selection.

Item: (Bill of Material)

1. FlatPlate® Heat Exchanger
2. Condensing Unit
3. Flow Switch
4. L.P. Cut-Out (may be included w/cond. unit)
5. H.P. Cut-Out (may be included w/cond. unit)
6. Temperature Control
7. Hot Gas Bypass Valve
8. TXV

Manufacturer:

GEA PHE Systems North America, Inc.
 Copeland, Tecumseh, HeatCraft, Maneurop, Bitzer, others
 Johnson Controls, United Electronics, and others
 Ranco, Penn, and others
 Ranco, Penn, and others
 Honeywell Air/Water, HeatCraft others
 Sporlan, Alco
 Sporlan, Alco, Danfoss

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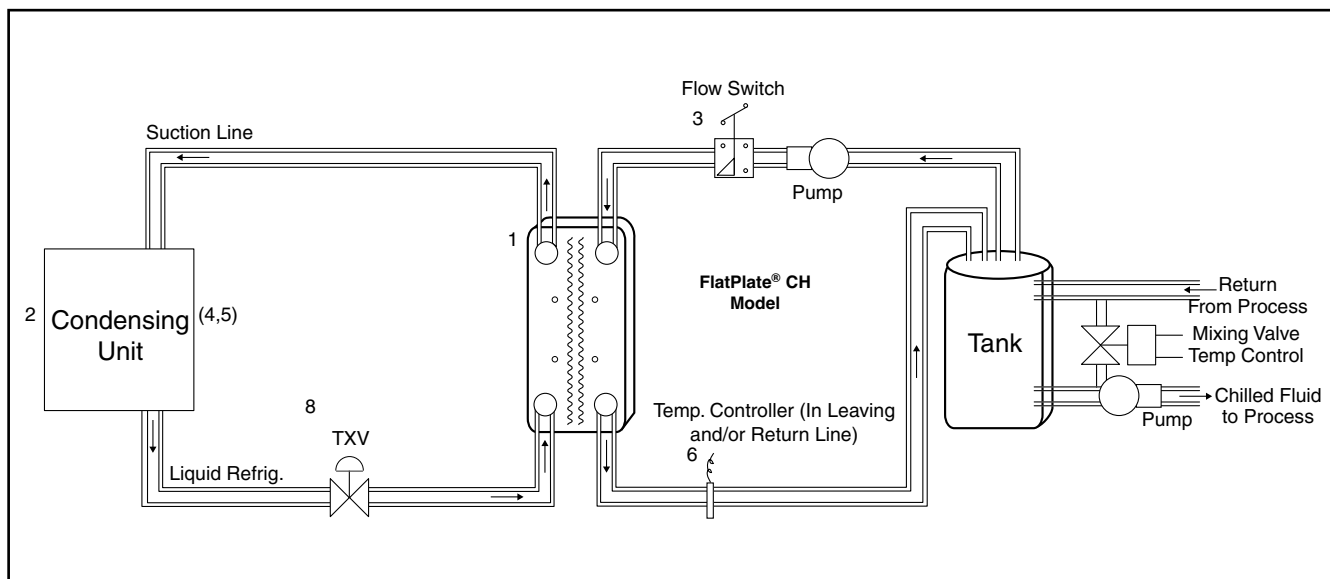


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Process Liquid Chillers with Storage Tank

Liquid Chillers with storage tanks have several advantages, including: 1) better process temperature control 2) higher transient load capabilities 3) ability to handle variable flow rates, 4) better compressor/chiller operation and 5) sometimes, allows for smaller chillers, depending upon the average and peak loads. Some process applications also have highly variable loads and require chilled liquid storage tanks, or make-up water tanks. A Liquid Chiller can be configured (same as previous section), integrating a standard storage tank, 40 to 200 gallons, or larger up to several thousand gallons.



Applications Tips:

Condensing Unit Selection: When combined with a Liquid Storage tank, the overall compressor size and condensing unit selection is sometimes smaller, yet highly dependent upon pull-down rate required for the tank, tank recovery rate needed, and maximum transient load, if a continuous full load is not always present. Tank size selection is also important.

Piping: The pump for the chiller is the same 2.4gpm to 3 gpm per ton, but is constantly re-circulated to the tank. This allows variable flow or and constant flow to the load. A temperature control mixing valve can be added to provide precise liquid temp control, if needed.

Controls: Proper controls are required to maintain liquid temperatures and prevent freeze conditions.

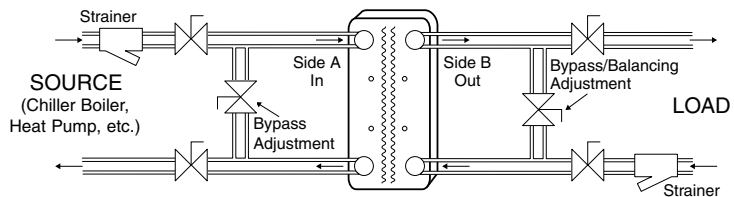
1. A flow switch or differential pressure switch must be used to verify that liquid flow exists before the refrigerant circuit is activated.
2. A low pressure cut out must be incorporated into the suction line after the heat exchanger, set to cut off the compressor should the refrigerant pressure decrease below the equivalent freeze point of the liquid being chilled, but no less than 28F for water chillers.
3. A temperature controller should be utilized to maintain liquid temperatures. Compressor anti-cycling may be needed.
4. A hot gas bypass valve is typically not needed depending upon tank size.
5. Digital pulsing expansion valves and hot gas valves are not suitable.

Application Selection: For applications using water, 9F to 10F approach temps (Leaving water temp minus Etp Evap temp), use standard models. For all other design conditions, glycols oils, and other liquids, contact your local FlatPlate® rep or distributor for a computer selection.

Liquid Isolation - Special Cooling Processes

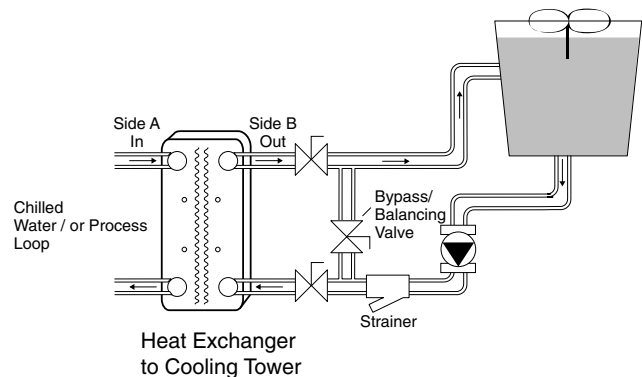
Some cooling applications require liquid isolation, such that 1) any possible failure of the refrigeration system will not contaminate the process with refrigerant or refrigerant oil, and/or 2) to properly control the process, or 3) protect the refrigeration system. These applications require a second LIQUID TO LIQUID heat exchanger and pump to be installed, in addition to the refrigeration chilled liquid loop.

Taking the simple step to put in an Isolation Heat Exchanger, is good design practice for system reliability, safety, and easier maintenance.



Isolation Heat Exchangers are especially required for:

- Potable make-up water
- Water chilling to 35F for bakeries
- Ethylene Glycol to Potable water
- Food process liquids
- Wine and liquor cooling
- Live fish and wildlife cooling
- Critical (and medical) liquids and gases
- High temperature liquids (ie, water or oil)
- Cooling acids or solvents
- Machinery oil cooling
- Hydraulic systems cooling
- Liquids with particulates



Isolation Heat Exchangers are also very popular in industrial manufacturing operations where a plant chilled water (or glycol) loop, or hot water loop is present. Isolation (or Interface) Heat Exchangers can be used to interface machinery and process needs, to provide high quality temperature control and to protect the machinery from variable water quality.

Application Tips:

Heat Exchanger Selection(s): Typically a FlatPlate® LIQUID TO LIQUID model is selected based on a 10F approach (Chiller Liquid Loop Design Temp minus the Process Loop Design Temp). Approaches of 5 to 6F are also practical and approaches of 2-3F are also possible, but less economical. Depending upon the liquid or application, and FP, FPN, or MPN model is chosen based on design conditions and overall BTUH load. A computer selection is required. Contact your local FlatPlate® representative or distributor.

Piping: The chilled Liquid loop should be a constant run-a-round loop, whereas the Process loop can be variable or constant.

Controls: Several methods of control are possible, depending upon the requirement. The Process loop temperature can be controlled by modulating the Chilled Liquid bypass valve, or modulating a Process loop valve, or left to run full at all times, but controlling the Chiller/Compressor.

Special Notes:

1. 35 F Water - For applications requiring 35F potable water on the process side, the Chilled Liquid loop should be 15% or greater Propylene Glycol, operating at 28F to 30F. The appropriate Isolation Heat Exchanger can be selected for 5F approach for achieving 35F water temperatures.
2. High Temperature Liquids or Oils – For Cooling 80F to 220F temperature liquids, the appropriate heat exchanger is typically selected based on 50F Entering Chilled Water/ 60F Leaving and the Process Liquid temperatures as desired. This allows the Liquid Chiller to operate normally and the Isolation Heat Exchanger to be very small and cost effective.
3. Fish and Aquatic Wildlife – Many fish and crustaceans are toxic to copper. Use only MPN Series, Polymer, or Titanium for the Isolation heat exchanger.
4. For compatibility with special liquids, contact your local FlatPlate® representative or distributor.

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Chiller Barrel Replacement



FlatPlate® CH and CH-2C models can be used for replacement of chiller barrels in comfort cooling chillers and process chillers. The GEA FlatPlate unit will be significantly smaller and easier to install, and require some piping installation modifications.

The overall reasons to use a FlatPlate® CH, CH-2C or CHN Series unit include lower installed cost, lower shipping costs, easier rigging and installation, and much less space needed.

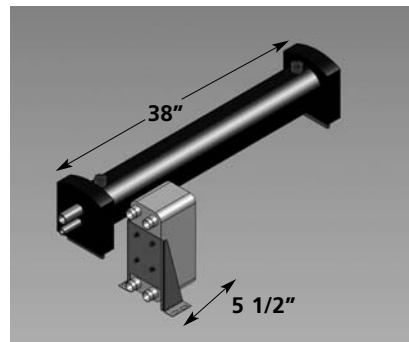
Application Tips:

Heat Exchanger Selection: The FlatPlate® heat exchanger should be selected based on total BTUH load (design tons at 12,000 BTUH/ton), based on design Etp (Evaporator Temperature at Pressure) and Liquid Temperatures IN/Out and flow rate. For most applications used 2.4 gpm per ton and select from the standard models, based on 9F or 10F approach. Over-sizing one or two models is ok. If operating conditions are different than standard, contact your local FlatPlate® rep or distributor for a computer selection.

Liquid Piping: Strainer is recommended to catch debris in pipes. Heat exchanger must be piped in counterflow.

Controls: Use existing low pressure (LP) cut-out and flow switch for primary safety controls. Check all controls for proper operation. For water chiller, LP cut-out should NOT be set below 28F based on refrigerant pressure. Note: Leaving chilled water cut-out is not adequate to protect any evaporator heat exchanger from freeze-up. If pump-down cycle is present, set LP cut-out at 28F or 4F below freezing temperature of liquid.

Key Considerations: 1. If the FlatPlate® heat exchanger is being used to replace a failed chiller barrel, determine the cause of the failure (ie low pressure cut-out failure or flow switch failure) and thoroughly check out the system operation.



35 Ton Chiller shown

Condensers (Replacement & New Applications)

FlatPlate® C and MCN models are used widely for water-cooled systems and replacement of shell & tube condensers. The overall reasons to use a FlatPlate® C Series or MCN Series unit include lower installed cost, lower shipping costs, easier rigging and installation, and much less space needed.

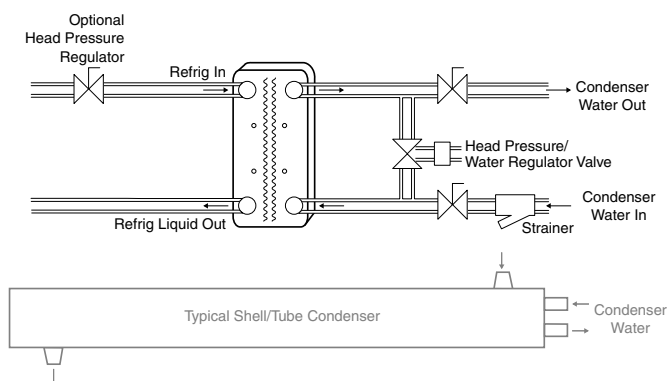


Condenser replacements include:

Comfort Chillers, Modular Chillers, Process Equipment, Ice Machines, Fan Coil / Terminal / Heat Pumps, Supermarket systems, Computer room systems

Condensers for new applications also include:

Closed loop systems using Dry Coolers (Air to Water), Process Chillers, Refrigerated Warehouses, Floor warmers, Walk-in Freezers, Supermarket systems, Earth-Coupled Heat Pumps, Lake & River Water



Application Tips:

Heat Exchanger Selection: The FlatPlate® heat exchanger should be selected based on total BTUH heat of rejection (tons at 15,000 BTUH/ton), based on design Ctp (Condensing Temperature) and Water Temperatures IN/Out and flow rate. For most applications used 3 gpm per ton and select from the standard models. Over-sizing one or two models is ok. If operating conditions are different than standard, contact your local FlatPlate® rep or distributor for a computer selection. For closed loop condensers, use C Series. For open loop condensers using cooling towers, applications with variable water quality, consider using the MCN Series. For lake water, water with pH below 6.0, brackish water or sea water, use the MCN Series.

Waterside Piping: A 20 to 60 mesh strainer MUST be installed on the condenser waterside to protect from pipe debris and tower debris. Heat Exchanger MUST be piped in counter-flow.

Controls: A water flow regulator valve used to control compressor head pressure is typical. However, if water flow rates drop below 1 gpm per ton (for open loop systems), or water content has high scale build up, a) use a pump "run-a-round" loop to maintain constant flow to the condenser, or b) use a discharge head pressure regulator valve to maintain compressor head pressures, while maintaining lower condensing pressures (thus higher water flow rates for lower fouling and better system control).

Key Considerations: If the FlatPlate® condenser is being used to replace a failed shell & tube condenser, or coiled coaxial condenser, consider the life of the previous condenser and reason it failed. Upgrading to the MCN model may improve overall life and customer satisfaction.

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Conversion Formulas and Reference Information

BTU	=	Amount heat required to raise (heat or cool) 1 lb of water 1°F
	=	1054.8 Joules
	=	252 gram-calories
BTU/H	=	Amount of heat over time to raise (heat or cool) 1 lb of water 1°F in ONE hour
BTU/H (water at 68°F)	=	Temp Difference x GPM x 500
BTU/H (30% E. Glycol at 68°F)	=	Temp Difference x GPM x 445
BTU/H (50% E. Glycol at 20°F)	=	Temp Difference x GPM x 375
BTU/H (Most Oils)	=	Temp Difference x GPM x 250
BTU/H (any liquid or gas)	=	$\frac{\text{Temp Difference} \times \text{Specific Heat (BTU/lb}^\circ\text{F)}}{\text{Mass Flow Rate (lbs/hr)}}$
	=	$\frac{\text{Temp Difference} \times \text{Specific Heat (BTU/lb}^\circ\text{F)} \times \text{Density (lb/cu ft)}}{7.4805}$
Celsius (°C)	=	(°F-32)x5/9
Conductivity (BTU/hr-ft2-°F.ft)	=	°C/cm x .05782
1 Cubic Foot	=	7.481 Gallons
	=	1728 Cubic inches
	=	38.32 liters
Density (lb/cu ft)	=	Specific Gravity x 62.344
	=	g/ml x 62.4
Fahrenheit (°F)	=	(°Cx9/5) + 32
1 Ft. of Head	=	2.307 psi (lbs per sq inch)
1 Foot of Water (68°F)	=	.4335 psi (lb per sq inch)
	=	.2930 watts
1 Horsepower (boiler)	=	34.5 lb of steam at 212°F
	=	33476 BTU/hr
1 Gallon	=	8.346 lbs of water at 68°F
	=	231 cubic inches
	=	3.785 litres
GPM	=	.060308 Liters/sec
	=	3.62 Liters/min
Kelvin (°K) to °F	=	K x 1.8 - 459.7
Kilowatt (KW)	=	3414 BTU/hr
1 Lb of Water	=	.01602 Cu Ft
	=	27.68 Cu Inches
	=	.120 gallons
1psi (Pound/sq in)	=	2.307 Feet of water
	=	2.036 inches of Mercury
	=	.06802 Bar (atmospheres)
	=	°R +459.67
Rankin (°R) to °F	=	
Specific Heat (BTU/lb-°F)	=	cal/g-°C x 1
Tank Capacity Calculation (gallons) (rectangular)	=	Length(ft) x Width(ft) x Depth(ft) x 7.481 (gal/cu ft)
Tank Capacity Calculation (gallons) (cylinder)	=	$\frac{\text{Diameter(ft)}^2 \times 3.14 \times \text{Height(ft)} \times 7.481 \text{ (gal/cu ft)}}{4}$
Tank Heating Total Requirement (BTU total)	=	Tank Temperature Rise x Gallons x 8.346 (plus tank & piping external losses)
Tank Heating Rate (BTU/hr) (Boiler Capacity needed)	=	$\frac{\text{Tank Heating Requirement(BTU)}}{\text{Hrs (hrs desired to bring tank up to temperature)}}$
Tank Heat up Rate (hrs)	=	$\frac{\text{Tank Heating Requirement(BTU)}}{\text{BTU/hr Heat Source Boiler}}$
1 Ton (Refrigeration, chilling)	=	12,000 BTU/hr
1 Ton (Refrigeration, condensing side)	=	15,000 BTU/hr
Viscosity Cp (Centipoise)	=	Centistokes x Density(g/ml)
Viscosity (lb/ft-hr)	=	Cp x 2.42
1 Watt	=	3.413 BTU/hr

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Refrigeration Installation Instructions



With extensive experience in halocarbon refrigeration systems, GEA FlatPlate recommends a few key application tips when applying "BRAZED PLATE" heat exchangers in evaporator, desuperheater, condenser, heat pump or subcooler applications.

LIQUID CHILLERS - DIRECT EXPANSION: (CH Models)

GEA FlatPlate CH Series heat exchangers are applicable for all types of halocarbon refrigerants. CH Series are applicable to water chiller, glycol chillers, refrigerant cooled oil coolers, and other chiller applications.

CONDENSERS: (C SERIES/HP SERIES)

C Series are applicable to condensing units, air conditioners, refrigeration applications, and desuperheaters. C Series and HP Series are applicable for reverse cycle heat pumps. Water regulating valves should be set to deliver no less than 1.8 gpm/Ton.

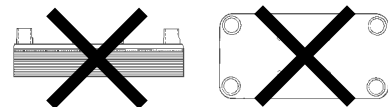
SUB-COOLERS: (SC SERIES)

SC Series are applicable to standard and custom design refrigeration systems for all types of applications where subcooled refrigerant liquid is used to enhance system efficiency and capacity.

FP Series are either custom models or liquid to liquid.

INSTALLATION:

Unit **MUST** be installed in a VERTICAL position, as shown.

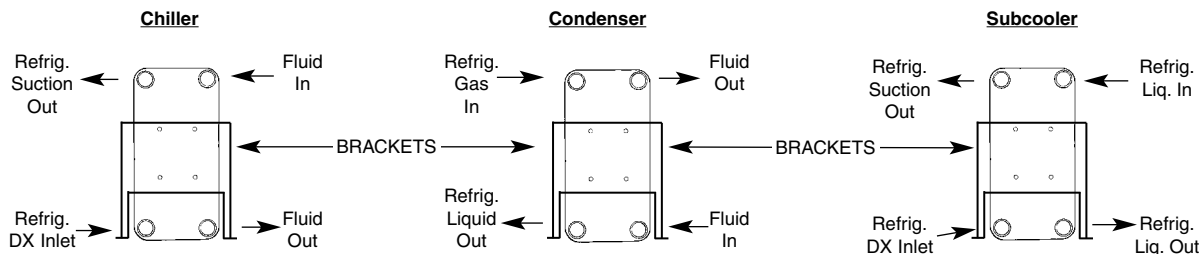


SAFETY:

Each side of the unit should be properly protected from over-pressurizing through the use of an appropriate safety relief device.

MOUNTING:

Customers responsibility to properly secure the heat exchanger. Do not weld or braze mounting bracket to heat exchanger.



FLOW SWITCH: (CH Chillers only)

A pressure differential switch or flow switch **MUST** be installed on the liquid side of all chillers to prevent possible freeze-up due to loss of flow. Due to the fast reaction time of brazed plate type heat exchangers a low pressure cutout or leaving temperature sensor does not have adequate response time.

WATER STRAINER: (CH Chillers and Condensers Only)

A water strainer **MUST** be installed in water inlet circuit to protect the heat exchanger from restricted flow rate and/or blockage (16-20 mesh minimum, 20-40 mesh best choice).

INTERNAL DISTRIBUTOR: (Chillers and Sub-Coolers only)

Chiller Models CH4A, CH5A, CH4, CH5, CH6, CH7-1/2, CH10B, CH12B, CH15B, CH15 thru CH160 and all SC sub-coolers have a built-in DX distributor tube with calibrated orifices. The DX distribution tube is designed to distribute the gas evenly to provide optimum performance and operating stability. The thermal expansion valve may need a slight adjustment to obtain proper operation, with 5°F to 10°F Superheat. For optimum performance, do not oversize the expansion valve and where practical, do not install elbows between the expansion valve and the DX inlet.

For heat pump applications consult a sales office.

-10°F to 50°F suction
<-10°F suction

Piping

Chillers and Subcoolers

DX inlet at bottom connection, no oil return problems
DX inlet at bottom connection, possible oil return problems
below 20°F depending upon gas velocities, install oil separator
or other method if needed
DX inlet piping should be sized to 100 fpm (liquid) (.50 m/s), or
greater.

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Refrigeration Installation Instructions

LOW PRESSURE CUT-OUT: (CH chillers)

In water chiller applications, in addition to the flow switch, the low pressure cut out on the refrigerant side is the most important freeze protection control. To prevent potential freeze damage and to protect the heat exchanger and compressor, the low pressure cut out should be set no lower than 28F, based on evaporator refrigerant pressure at this temperature. If part-load or transient loads cause the chiller to cycle off, use a resetting low pressure control with anti-cycling timer, or, install a hot gas bypass control to maintain the appropriate suction pressure at low loads. Note: Use of a leaving chilled water sensor will not provide adequate freeze protection.

In glycol and special liquid applications, make sure glycol type (or liquid) and concentration is maintained at all times and that the freeze point is at least 10F below the operating evaporator temperature.

AMMONIA:

Contact the factory for correct model and application instructions.

INSULATION:

Recommend 1/2" to 3/4" insulation for all chillers and subcoolers.

SWEAT CONNECTIONS:

Use 45% silver solder with white brazing flux. Use wet rag around base of connection. Do not overheat. Purge with nitrogen. Do not braze with the unit horizontal or sitting flat, since braze material may fall into the tube, clogging the distribution holes. Braze a complete joint to seal the tube to fitting joint.

THREADED CONNECTIONS:

Use Teflon or Mylar Tape or other sealant on pipe thread connections to prevent leakage.

WATER QUALITY:

Water quality should be maintained at a ph of 7.4, and not less than 7.0 or higher than 8.0, for proper heat exchanger life.

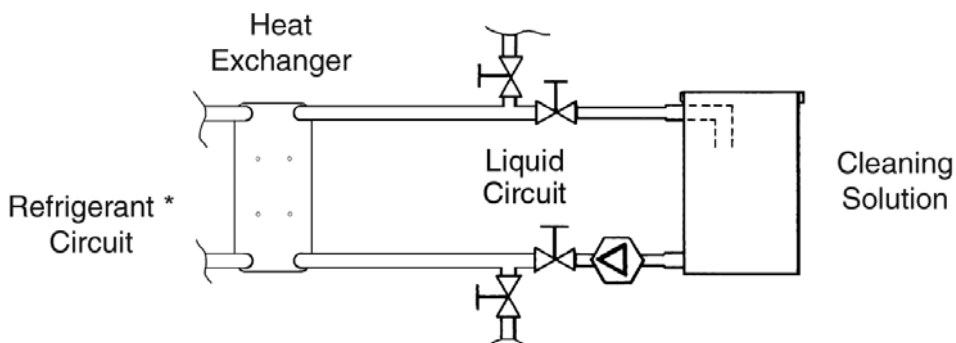
Ground water with high sulphur content or sulfuric acid, and low ph, may cause gradual copper erosion and failure of the heat exchanger after a few years service. Contact the factory for alternate models.

Sea water and highly chlorinated water such as pool water is not acceptable and will cause premature heat exchanger failure. Contact a sales office for a suitable heat exchanger.

CLEANING:

In some applications the FlatPlate® brazed plate heat exchanger may be subjected to severe liquid or operating conditions that will lead to mineral scaling. This will penalize the performance of the heat exchanger. A *nickel safe* or *ice making machine* de-scaling solution available from a local wholesaler, or a 5.0% phosphoric acid solution used at room temperature, in many cases will restore the heat exchanger's performance.

Use all cleaning solutions according to the manufacturer's instructions. Do not use sulfuric or hydrochloric acids. Follow the manufacturer's safety instructions. Always flush the heat exchanger thoroughly with fresh water after cleaning.



* Do not chemically clean refrigerant circuit

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Terms and Conditions of Sale

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1.1. GENERAL TERMS.

1.1 Binding Contract. Unless otherwise noted in the Seller's Proposal, the Proposal shall lapse automatically upon the expiration of a thirty (30) day period after the date of its submission unless it has been previously accepted by Purchaser or revoked in writing by Seller. The Contract incorporating these Terms and Conditions does not become a binding contract until the Seller receives the Purchaser's unqualified acceptance of the Proposal or the Seller confirms the Purchaser's order in writing.

These Terms and Conditions are the only terms and conditions on which the Seller contracts for the supply of Equipment and they are incorporated in all contracts entered into by the Seller. Any other terms and conditions are hereby specifically rejected and are therefore excluded.

1.2 Plans, Drawing and Illustrations. Proposal pages, catalogue illustrations and preliminary drawings are submitted only to show the general style, arrangement, approximate dimensions and weight of equipment. The Seller reserves the right to make such changes of design, construction or arrangement as it deems necessary to achieve the specifications contained herein.

1.3 Proprietary and Confidential Information. This Proposal and all drawings, notebooks, operating data, specifications, and other information, data and material (whether orally disclosed, printed, handwritten, typed, numerically or computer generated, computer stored, or otherwise) furnished to Purchaser by either Seller or any of its subcontractors or sub-suppliers shall remain the proprietary and confidential property of Seller or the subcontractor or sub-supplier, respectively, and shall be used by Purchaser only with respect to the work covered by the Contract and shall not be used by Purchaser in connection with any other project. Such proprietary and confidential information and data shall not be shown or otherwise made available to any third party at any time without Seller's prior written consent.

Neither Purchaser itself shall, nor shall Purchaser permit any third party to, reverse engineer, measure or otherwise technically examine or test Seller's Equipment without Seller's prior written consent. Any such proprietary and confidential information which Purchaser determines must be disclosed to its employees shall only be disclosed to them on a need-to-know basis for the operation, maintenance, and repair of the Equipment provided under the Contract. Intellectual property or patent rights which may be obtained on the basis of the information given or made available to Purchaser under the Contract or with respect to Seller's Equipment shall remain the exclusive property of Seller or its subcontractor and/or sub-supplier, respectively.

2. SAFETY REQUIREMENTS OF PURCHASER.

Purchaser shall use, and shall train and require its employees to use and shall cause any end user to use, and all safety devices, guards, and proper safety operating and maintenance procedures as prescribed by all applicable laws, rules, regulations, codes and standards and as set forth in operating and maintenance manuals and instruction sheets furnished by Seller. Purchaser shall not, and shall cause any end user not to, remove or modify any safety device, guard or warning sign.

If the Purchaser fails to strictly observe any of the obligations set forth in the preceding paragraph with regard to any of the Equipment, Purchaser agrees to defend Seller against, and indemnify and save Seller harmless from, any claim, liability or obligation (including the costs and attorneys' fees of any suit or claims related thereto) incurred by Seller as a result of persons being injured or property being damaged directly or indirectly in connection with the operation of such Equipment as a result of such failure. Purchaser also agrees to indemnify and save Seller harmless from, any claim, liability or obligation incurred by Seller as a result of persons being injured or property being damaged directly or indirectly in connection with the operation of such Equipment for materials or products not specified in the Contract or use of non-original replacement parts not specifically authorized in writing by Seller or due to changes in the Seller equipment made by Purchaser without Seller's specific written authorization.

3. COMPLIANCE WITH LAWS.

The Seller shall use reasonable endeavors to ensure that the Equipment complies in technical respect with the agreed standards and in all other respects with applicable laws, rules, regulations, codes and standards of all federal, state, local and municipal governmental agencies having applicable regulatory jurisdiction, as such laws, rules, regulations, codes and standards are in effect on the date of the contract, provided that: (i) the Purchaser will include in its specifications or will bring to the attention of Seller in writing any state, local or municipal laws, rules, regulations, codes or standards which are different from those imposed by the federal governmental agencies and authorities (including the state, local or municipal laws, rules, regulations, codes or standards are changed, or if new laws, regulations, codes or standards or interpretations thereof are enacted or adopted subsequent to the date of the contract, which require a change in Seller's equipment or work, an equitable adjustment shall be made to the contract price, delivery schedule and payment terms; and (ii) Seller does not guarantee any compliance with laws, rules, regulations, codes or standards which require a change in Seller's equipment or work to comply with, any federal, state or local pollution control, effluent or utility control laws, rules, regulations, codes or standards.

4. PRICE AND PAYMENT.

4.1 The purchase price shall be paid in accordance with the Proposal. Any right to retain due payments or to set-off counterclaims shall be excluded unless any such claim or counterclaim of the Purchaser is undisputed by Seller or has been determined by a final judgment of the competent court or arbitration panel.

Any tax or other governmental charge now or hereafter levied upon the production, sale, use or shipment of equipment ordered or sold will be charged to and paid for by the Purchaser. Such taxes are not covered in the Seller's price(s) unless expressly so stated on the Seller's Proposal.

4.2 Whatever the means of payment used, payment shall not be deemed to have been effected before the Supplier's account has been fully and irrevocably credited.

4.3 If the Purchaser fails to pay by the stipulated date, the Seller shall be entitled to interest from the day on which payment was due. The rate of interest shall be one and one-half percent (1-1/2%) per month until the payment is made in full. Additionally, if Seller is required to expend costs and expenses in collecting any payments, Purchaser shall reimburse the Seller for such costs of collection (including reasonable attorneys' fees).

In case of late payment the Seller may suspend his performance of the Contract until it receives payment. If the Purchaser has not paid the amount due within three months of the due date, Seller shall be entitled to terminate the Contract by notice in writing to the Purchaser and to claim compensation for the losses and damages it has incurred.

5. TRANSPORTATION; INSURANCE; RISK OF LOSS.

5.1 Transportation; Delivery.

5.1.1 Where transportation costs are prepaid, Equipment will be shipped to an unloading point designated by the Purchaser. Unloading, including the designated unloading point and further necessary handling shall be at the Purchaser's risk and expense, independent of any installation services that may be requested by the Purchaser.

5.1.2 Shipping instructions are to be supplied by the Purchaser at least 10 business days before the agreed on shipping date. In the event Purchaser fails to supply shipping instructions Seller at its option may place the Equipment in Seller's or any public or private storage facilities at the Purchaser's risk and expense. All such expenses shall be invoiced to Purchaser.

5.1.3 Equipment on which manufacture or delivery is delayed due to any cause within Purchaser's control may be placed in storage by Seller, for the Purchaser's account and risk, and regular charges and expenses in connection therewith shall be paid by Purchaser; but if, in Seller's sole opinion, it is unable to obtain or continue such storage, Purchaser will, on request, provide or arrange for suitable storage facilities and assume all

costs and risks in connection therewith. When such delay is due to causes beyond control of either party, the matter of storage and the payment of charges therefore shall be negotiated in good faith.

5.2 Insurance. Purchaser accepts full responsibility for the safeguarding of all equipment delivered to the Purchaser until it is paid for in full. Until the contract price is paid in full, Purchaser shall provide and maintain insurance to the total value of the Equipment delivered hereunder against all risks of fire and explosion in the names of Purchaser and Seller, as their respective interests may appear, and shall also provide and maintain such insurance to the above value against flood, earthquake, windstorm, cyclone, tornado, hurricanes, riot and strike and civil commotion.

5.3 Title; Right of Possession; Security for Payment. The parties mutually agree that the Equipment specified herein shall at all times remain personal property regardless of the degree of its annexation to the real property and that the Equipment shall not by reason of any annexation to real property become a part thereof or otherwise a fixture. Title and right of possession of such Equipment shall remain in Seller at all times. Title shall pass to Purchaser in accordance with the delivery terms for the Equipment. Without waiving any rights to elect to proceed under applicable lien laws, Seller reserves a security interest in the equipment and parts furnished by it. By accepting delivery of the Equipment or parts, Purchaser grants to Seller a security interest in such Equipment and parts to secure the full and prompt payment for such Equipment and parts under the agreed price (including any notes therefor) for such Equipment and parts has been fully paid in cash. In the event of default in payment, Seller shall have all rights of repossession and other rights available to a secured party under the laws applicable thereto. Any Equipment or parts may be separated from real estate for purpose of repossession by Seller or by its agent without liability for such removal if the Purchaser is in default in payment. Seller is authorized to execute, deliver and file with the appropriate filing office or offices all assignments, financing statements and other documents which Seller may require to evidence or perfect such security interest in accordance with applicable laws.

6. SELLER'S REMEDIES.

6.1 In the event of a material deterioration of Purchaser's financial situation or in the event of the insolvency of the Purchaser, Seller reserves the right to cancel the contract as well as the right to stop delivery of the goods and to resell same. Such a right shall not restrict or otherwise impair Seller's remedies for damages in the event of Purchaser's breach.

6.2 Should Purchaser fail to comply with the terms and conditions set forth herein, or if any writ or execution be levied on any of Purchaser's property, or a receiver be appointed, or if a petition in bankruptcy be filed by or against Purchaser, Seller may, upon election, demand the entire purchase price stated herein or may without notice or demand by process of law or otherwise, take possession of all or any of the equipment, wherever located, and retain all monies theretofore paid as compensation for the reasonable use of such equipment. If a contract arising from this Proposal is breached and is placed in the hands of an attorney for collection of any balance due or enforcement of any other of Seller's remedies, Purchaser agrees to pay all reasonable attorneys' fees and other expenses involved therein paid or incurred by Seller. Purchaser hereby waives any and all claims, damages and demands against Seller arising out of the repossession, retention and repair as aforesaid. All rights and remedies contained herein are cumulative and not alternative.

6.3 Seller reserves all other rights and remedies at law or equity available to it in the event of Purchaser's breach.

7. ASSIGNMENT.

The Purchaser shall not have the right to assign the agreement without the written consent of Seller.

8. SELLER'S LIABILITY; FORCE MAJEURE.

8.1 Seller shall not be liable for delay or loss or damage of any kind resulting from: (i) Purchaser failing to supply any necessary technical data, as required; (ii) Purchaser failing to supply the apparatus, materials and services required; (iii) any changes in designs or specifications made subsequent to acceptance of this Proposal; (iv) failure of suppliers to furnish purchased material or auxiliary equipment within scheduled dates provided that the purchased material or auxiliary equipment was properly ordered and appropriately expedited; (v) by any other reason beyond Seller's control; or (vi) any delay caused by late payments by Purchaser.

8.2 Seller shall attempt to overcome but shall not be liable for any loss or damage from delay in delivery of any Equipment or completion of any work as a result of causes of any kind beyond the reasonable control of Seller, including, but not limited to, strikes or other labor difficulties, war, riots, changes in laws and regulations and other acts of governmental authorities, inclement weather, fire, flood or unavoidable casualties, or any delays in transportation of materials, or inability to obtain timely delivery of material or equipment supplied for such transportation or delivery. Seller has been properly procured and appropriately expedited. In the event of any such delay, Seller will notify the Purchaser within a reasonable time after Seller becomes aware of such cause of delay and it is agreed that the time for delivery or completion shall be extended for a period of time at least equal to the time lost by reason of the delay.

9. MATERIAL AND WORKMANSHIP WARRANTY.

Seller warrants to the Purchaser that the Equipment purchased from Seller is free from defects in material and workmanship. The warranty shall be twelve (12) months from the date of Purchaser's initial operation using the Equipment but not more than eighteen (18) months from the date of delivery of the Equipment. Any warranty given by the Seller shall be subject to the following: (i) the Equipment is installed in accordance with Seller's specifications and instructions and is used and maintained normally and properly in accordance with Seller's instructions as to maintenance and operation, as set forth in written operating and maintenance manuals and instruction sheets furnished by Seller; (ii) the Equipment has not been changed without the prior written approval of Seller; (iii) Purchaser gives prompt written notice to Seller before the end of the warranty period specifying all alleged defects in the Equipment purchased; and (iv) Purchaser preserves and turns over to Seller and reasonable inspection by Seller of all allegedly defective Equipment, parts or items supplied to the Equipment to observe its startup, operation and maintenance.

This warranty shall not cover (i) any equipment furnished by Purchaser or any third party (other than a subcontractor of Seller), (ii) any defects arising from corrosion, abrasion, use of unsuitable lubricants, freezing or other operation outside of prescribed temperature ranges, or negligent attendance or faulty operation, (iii) ordinary wear and tear (e.g., gaskets), or (iv) any defects caused by errors on the part of the Purchaser in not providing a suitable place in which the Equipment is to be located, adequate foundation works, or adequate protection against influences within or outside the place where the Equipment is to be located which may affect the Equipment or its operation (improper storage), or (v) the performance of any equipment sold by Seller under conditions varying materially from those under which such equipment is usually tested under existing industry standards. Notwithstanding the warranty set forth above, Seller shall not warrant any equipment, where the vendor of such equipment (other than Seller) is specified by Purchaser, for a period longer than warranted by the vendor.

UNLESS OTHERWISE EXPRESSLY STATED IN ANY DOCUMENT ATTACHED TO THESE TERMS AND CONDITIONS, THIS WARRANTY OF MATERIAL AND WORKMANSHIP IS THE ONLY WARRANTY MADE BY SELLER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND SELLER DISCLAIMS ON BEHALF OF ITSELF, ITS SUBCONTRACTORS AND SUBSUPPLIERS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A SPECIFIC PURPOSE (OTHER THAN THE PURPOSE STATED IN THE PURCHASER'S SPECIFICATIONS SET FORTH IN THE CONTRACT), SUITABILITY OR PERFORMANCE. No other promise or affirmation of fact (including, but not limited to, statements regarding capacity or performance of the Equipment) shall constitute a warranty of Seller or give rise to any liability or obligation on the part of Seller.

Seller's obligation under this warranty and any other warranty or guarantee which is part of the Contract is strictly and exclusively limited to furnishing repairs or replacements for Equipment or parts determined to be defective on inspection by an authorized representative of Seller. Notwithstanding this exclusive remedy, if it is ultimately determined that the remedy fails in its essential purpose, then any action which may be brought against Seller subject to the terms of the contract will be limited to 100% of the contract price for the purchased Equipment for which the exclusive remedy has so failed. Seller assumes no responsibility and shall have no liability for any repairs or replacements by Purchaser without Seller's prior written authorization. If Seller did not originally install the Equipment, Seller shall have no liability for the costs of removing or segregating any defective Equipment so that the repairs or replacements can be made. If tests are requested by the Purchaser to determine the performance of the Equipment covered in the Seller's Proposal, the test procedure to be used must be acceptable to the Seller, and the Purchaser agrees to pay to the Seller the cost of any such test.

10. DAMAGES.

NOTWITHSTANDING ANY OTHER PROVISION OF THE CONTRACT TO THE CONTRARY:

(A) SELLER'S AND ITS SUBCONTRACTORS' AND SUBSUPPLIERS' AGGREGATE RESPONSIBILITY AND LIABILITY, WHETHER ARISING OUT OF CONTRACT OR TORT OR ANY OTHER LEGAL CONTEXT OR THEORY, INCLUDING NEGLIGENCE AND STRICT LIABILITY, UNDER THE CONTRACT, INCLUDING, BUT NOT LIMITED TO, ALL CLAIMS FOR BREACH OF ANY WARRANTY OR GUARANTEE, FAILURE OF PERFORMANCE OR DELAY IN PERFORMANCE BY SELLER OR PERFORMANCE OR NON-PERFORMANCE OF THE PURCHASED EQUIPMENT SHALL NOT EXCEED THE CONTRACT PRICE FOR THE PURCHASED EQUIPMENT. PROVIDED, HOWEVER, THAT THIS LIMITATION WILL NOT APPLY TO ANY LIABILITY OF SELLER FOR DIRECT DAMAGES CLAIMED BY PURCHASER FOR PHYSICAL DAMAGE TO PURCHASER'S PROPERTY (OTHER THAN EQUIPMENT PROVIDED BY SELLER) OR FOR DIRECT DAMAGES CLAIMED BY THIRD PARTIES FOR SUCH THIRD PARTIES' PERSONAL INJURY OR PHYSICAL PROPERTY DAMAGE (FOR WHICH PURCHASER IS LIABLE) TO THE EXTENT CAUSED BY THE NEGLECT ACTS OR OMISSIONS OR WILLFUL MISCONDUCT OF THE SELLER, FOR ALL OF WHICH MATTERS SELLER SHALL BE LIABLE UP TO AN AMOUNT OF \$1,000,000 IN THE AGGREGATE, AND

(B) IN NO EVENT SHALL SELLER, ITS SUBCONTRACTORS OR SUBSUPPLIERS BE LIABLE IN CONTRACT OR IN TORT OR UNDER ANY OTHER LEGAL CONTEXT OR THEORY, INCLUDING NEGLIGENCE AND STRICT LIABILITY, FOR ANY SPECIAL, PUNITIVE, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OF ANY KIND OR CHARACTER, INCLUDING, BUT NOT LIMITED TO, LOSS OF USE OF PRODUCTIVE FACILITIES OR EQUIPMENT, COSTS OF PRODUCT RECALL, PLANT DOWNTIME, DAMAGE TO OR LOSS OF PRODUCT, CHEMICALS, CATALYSTS, FEEDSTOCK OR OTHER RAW MATERIALS, LOSS OF REVENUES OR PROFITS OR LOSS UNDER PURCHASES OR CONTRACTS MADE IN RELIANCE ON THE PERFORMANCE OR NON-PERFORMANCE OF THE PURCHASED EQUIPMENT, WHETHER SUFFERED BY PURCHASER OR ANY THIRD PARTY, OR FOR ANY LOSS OR DAMAGE ARISING OUT OF THE SOLE OR CONTRIBUTORY NEGLIGENCE OF THE PURCHASER, ITS EMPLOYEES OR AGENTS OR ANY THIRD PARTY.

TO THE EXTENT THAT SELLER OR THE PURCHASER MAKES ANY CLAIM UNDER ANY FRAUD OR TORT THEORY FOR THE PURPOSE OF CIRCUMVENTING THE LIMITATIONS AND DISCLAIMERS SET FORTH ABOVE AND IS UNSUCCESSFUL IN PROCEEDING ON THAT CLAIM, IT HEREBY AGREES TO REIMBURSE AND INDEMNIFY THE OTHER PARTY FOR ALL ATTORNEYS' FEES AND EXPENSES AND COSTS INCURRED BY THE OTHER PARTY IN DEFENDING SUCH CLAIM.

11. ALTERATION - MODIFICATION.

No waiver, alteration or modification of these Terms and Conditions, except as noted in the text of the Proposal shall be valid unless made in writing and signed by an authorized representative of Seller.

12. PATENTS.

Seller shall hold Purchaser harmless against any claim that Seller's Equipment infringes United States apparatus patents, but Seller makes no representation or warranty, and Seller shall have no responsibility for any infringement or unfair competition resulting from, the use of Seller's Equipment with the Purchaser's process, or in combination with other equipment not supplied by Seller.

13. PRODUCT SELECTION AND USE.

Notwithstanding Seller's warranty obligations pursuant to these General Terms and Conditions of Sale, the Purchaser shall be responsible for accurate design and operating conditions used in the selection and use of the Seller's products. The Purchaser's selection and use of Seller's products from published literature shall be at the Purchaser's risk as to appropriate application, design conditions and performance criteria use.

14. STANDARDS AND TOLERANCES.

All product dimensions and published information is subject to change without notice. All of Seller's products furnished to the Purchaser shall also be subject to tolerances and variations consistent with usages of the trade concerning dimensions, composition and mechanical properties and normal variations in performance characteristics and quality.

15. INTEGRATION CLAUSE.

Purchaser acknowledges (1) that the Contract may not be modified or terminated except in writing signed by a duly authorized representative of Seller making specific reference to the Contract, and (2) the Purchaser may not assign the contract without the prior written consent of Seller.

16. DISPUTE RESOLUTION; GOVERNING LAW

Any determination, agreement or performance which is disputed or cannot be made, resolved or agreed within fourteen (14) days of the date requested by either Purchaser or Seller or such longer period for resolution as may be mutually agreed shall be submitted for resolution by the chief executive officers of the Purchaser and the Seller. It shall be a condition precedent to any subsequent proceeding that the dispute shall be submitted for resolution by such chief executive officers, but if those officers shall not reach a resolution within twenty-one (21) days of submittal to them, then the matter shall be finally settled by arbitration under the Rules of the American Arbitration Association by one or more arbitrators appointed in accordance with such Rules. The place of arbitration will be Philadelphia, Pennsylvania. The contract between the Seller and the Purchaser and their respective performances shall be construed under and governed by the laws of Pennsylvania.

17. DEFINITIONS

In these Terms and Conditions:

"Contract" means the contract between the Seller and the Purchaser for the supply of Equipment which will comprise these Terms and Conditions, the Seller's Proposal, any documents referenced in the Proposal as forming part of the contract, the Purchaser's order and the Seller's confirmation of that order (or the Purchaser's unqualified acceptance of the Proposal);

"Equipment" means the equipment, goods and materials to be supplied to the Purchaser under the Contract;

"Proposal" means the Seller's written proposal to the Purchaser for the supply of the Equipment;

"Purchaser" means the person identified as the purchaser of the Equipment in the Proposal and the Contract;

"Seller" means GEA PHE Systems North America, Inc.

Notes

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To find a wholesaler near you
Call 800-774-0474
 Ask for Brazed Technical Support

To run your own detailed selection
www.flatplateselect.com



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www.flatplate.com

The specifications contained in this printing unit are intended only to serve the non-binding description of our products and services and are not subject to guarantee. Binding specifications, especially pertaining to performance data and suitability for specific operating purposes, are dependent upon the individual circumstances at the operation location and can, therefore, only be made in terms of precise requests.

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