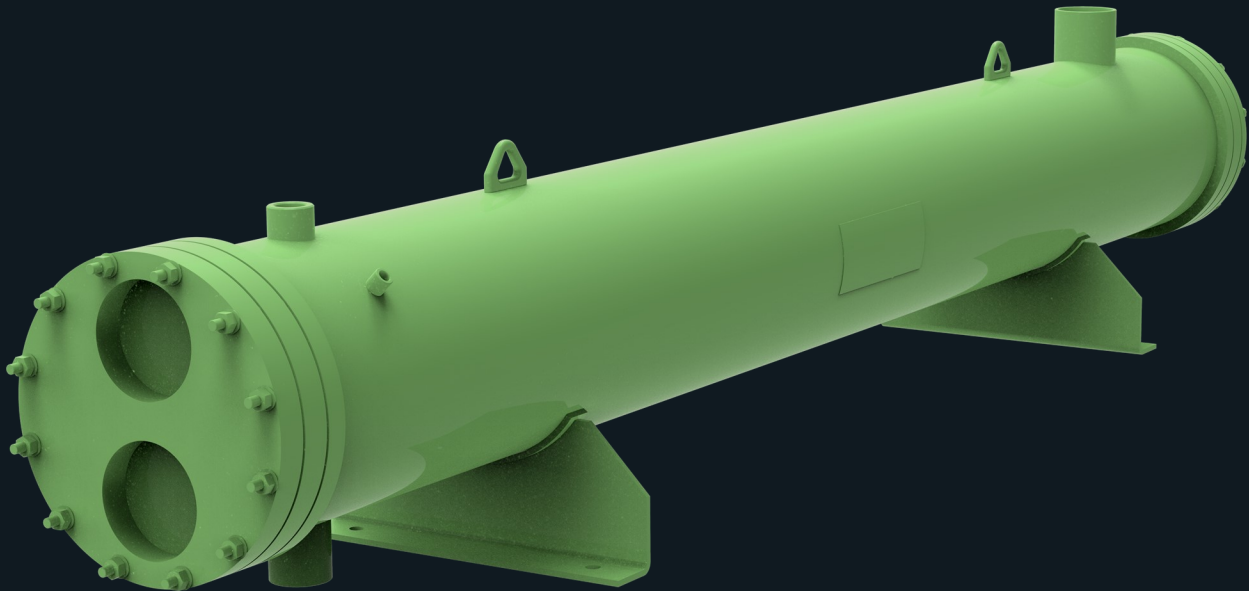


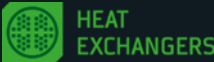


WATER COOLED  
**CONDENSERS**

CRFA / CRMA



DP-260-1 // ASME





### NEW Shell-and-Tube Water Cooled Condensers

In keeping with the BITZER strategy of offering the most advanced design and technology, CRFA and CRMA condensers are designed for maximum efficiency, reliability, and performance.

BITZER CRFA and CRMA are ideal water cooled condensing solutions for commercial and industrial applications using cooling towers or city water.

### NEW Improvements to BITZER US Condensers

- Higher performing tubes utilizing latest technology with special inner and outer groove patterns to maximize heat transfer
- Optimized baffles, heads and shell design improve heat transfer
- Refrigerant connections optimized for R134a to reduce refrigerant pressure drop

### Performance Advantages

- Optimized for today's refrigerants including entire R407 Series, R448A, R449A, R134a, and lower GWP refrigerants like R450A, R513A
- Also applicable for R410A, R404A, R507A and pure HFO refrigerants.
- Maximum efficiency to create a low cost per BTU/hr of heat rejection while maintaining low water pressure drops
- Optimized water flow to reduce fouling and erosion
- Compact design – best in class length and weight
- Worldwide BITZER engineering and pressure vessel testing, design, and experience
- All products are made in the USA

### ASME Design Safety

BITZER ASME condensers are manufactured in accordance with the latest edition of ASME Section VIII, Division 1, and are designed for use in air-conditioning and refrigeration applications. CRN is available upon request. All models available in PED (CE) and CRN is available upon request.



### Design Specifications

- Refrigerant side:
  - Standard Models: 435 psi @ -20° to 200°F
- Shell / Water side:
  - All Models: 145 psi @ -20° to 200°F

### Explanation of Model Number

**C R F A 3 2 4 - 5 - 2 P - N G**

#### Product Series

CRF = S&T Condenser (Fresh Water)  
CRM = S&T Condenser (Marine)

**C R F A 3 2 4 - 5 - 2 P - N G**

#### Code

A = ASME

**C R F A 3 2 4 - 5 - 2 P - N G**

#### Shell Diameter Designation

16 = 6 NPS  
21 = 8 NPS  
27 = 10 NPS  
32 = 12 NPS  
40 = 16 NPS  
45 = 18 NPS  
50 = 20 NPS

**C R F A 3 2 4 - 5 - 2 P - N G**

#### Tube Designation (1,2,3,4)

**C R F A 3 2 4 - 5 - 2 P - N G**

#### Tube Length Designation

5 = 60"  
6 = 72"  
7 = 84"

**C R F A 3 2 4 - 5 - 2 P - N G**

#### Additional Options

2P = Two Pass  
4P = Four Pass

**C R F A 3 2 4 - 5 - 2 P - N G**

#### Additional Options

N = Feet  
H = Feet with Top Brackets  
G = Sightglass  
C = Cast Head  
P = High Pressure Version



### Selecting the Right Heat Exchanger

Selecting a heat exchanger by a table or chart can be challenging because many parameters and requirements are involved. These factors affect one another and lead to an iterative process to reach a suitable selection. Furthermore, one selection may be valid for a certain set of conditions; however, A/C and refrigeration systems operate a wide range of seasonal loads and conditions that must also be considered by the system designer.

Therefore, it is strongly recommended use the **smarTube** sizing software or consult BITZER USA for assistance. **smarTube** is available for download from [www.bitzerus.com](http://www.bitzerus.com).

### Specifications (Fluid Side)

The CRFA series of condensers cover a broad range of capacities but have limitations due to maximum and minimum Flow Rates. A lower flow may reduce heat transfer while a higher flow may create undesirable pressure drop for pumps to overcome. In addition, an optimal velocity range is necessary to prevent fouling at the tube surface.

For each model, three tube lengths (60, 72, and 84 inches) are possible to increase heat exchange surface area. With more heat exchange surface area, a lower condensing temperature is possible to improve the system efficiency. Use **smarTube** to enter exact water temperatures, flow rates, refrigerant, fouling factors and desired condensing temperature to be sure your heat exchanger is sized correctly.

Model	Shell Dia. (NPS)	Heat Rejection Capacity at Max Flow $\Delta 10^{\circ}\text{F}$ 2 Pass (kBTU/h)	Heat Rejection Capacity at Max Flow $\Delta 20^{\circ}\text{F}$ 4 Pass (kBTU/h)	Maximum Flow Rate 2P / 4P (GPM)	Water Pressure Drop at Max Flow by Tube Length		
					"-5" (60 in) 2P / 4P (psid)	"-6" (72 in) 2P / 4P (psid)	"-7" (84 in) 2P / 4P (psid)
CRFA162	6	491	205	99 / 41	8.2 / 11.7	9.3 / 13.2	10.4 / 14.9
CRFA163		581	243	117 / 49	8.5 / 11.9	9.6 / 13.4	10.7 / 15.0
CRFA164		671	270	135 / 54	8.8 / 11.2	9.9 / 12.7	11.0 / 14.1
CRFA211	8	761	318	153 / 64	8.3 / 11.7	9.4 / 13.3	10.5 / 14.9
CRFA212		940	392	189 / 79	8.7 / 11.9	9.8 / 13.4	10.9 / 15.0
CRFA213		1072	448	215 / 90	8.9 / 12.0	10.0 / 13.6	11.1 / 15.1
CRFA214		1184	480	238 / 96	9.3 / 11.4	10.4 / 12.9	11.5 / 14.4
CRFA271	10	1343	560	270 / 113	7.9 / 11.8	9.0 / 13.3	10.1 / 14.9
CRFA272		1519	635	305 / 128	7.9 / 11.9	9.0 / 13.4	10.1 / 15.0
CRFA273		1677	701	337 / 141	8.0 / 12.0	9.1 / 13.5	10.2 / 15.1
CRFA274		1944	750	391 / 151	8.2 / 9.2	9.3 / 11.8	10.4 / 13.2
CRFA322	12	2277	953	458 / 191	8.4 / 11.9	9.5 / 13.5	10.6 / 15.0
CRFA323		2544	1065	511 / 214	8.6 / 12.0	9.7 / 13.6	10.8 / 15.2
CRFA324		2908	1079	584 / 217	8.6 / 9.7	10.1 / 11.0	11.2 / 12.3
CRFA401	16	3305	1382	664 / 278	7.9 / 11.8	9.0 / 13.4	10.1 / 14.9
CRFA402		3623	1513	728 / 304	8.0 / 11.9	9.1 / 13.4	10.2 / 15.0
CRFA403		4024	1681	808 / 338	8.1 / 12.0	9.2 / 13.5	10.3 / 15.1
CRFA404		4550	1906	914 / 383	8.2 / 12.1	9.3 / 13.7	10.4 / 15.3
CRFA452	20	4918	2055	988 / 413	8.5 / 11.7	9.6 / 13.3	10.7 / 14.9
CRFA453		5154	2223	1036 / 447	8.1 / 11.8	9.2 / 13.3	10.2 / 14.9
CRFA454		5154	2401	1036 / 482	7.2 / 11.8	8.1 / 13.4	9.0 / 15.0

- Max capacity may not be possible depending on refrigerant selection and limitation of refrigeration velocity
- $\Delta 10^{\circ}\text{F}$  is the Range = Leaving Water Temp – Entering Water Temp
- Max Flow Rates are established using a combination of max fluid velocity and pressure drop

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