COPPER & STEEL CONSTRUCTION

Features

- Young Touchstone Interchange (Thermal)
- Optional Non-Ferrous Construction
- Competitively Priced
- 1/4” or 3/8” Tubes Standard
- Water to Water Applications
- Sea Water Applications
- Optional 90/10 Copper Nickel Cooling
  Tubes and Bronze End Bonnets for Sea
  Water Service
- NPT, SAE O-Ring, SAE Flange, or BSPP
  Shell Side Connections Available
- End Bonnets Removable for Servicing
- Mounting Feet Included (May be
  Rotated in 90° Increments)

Materials

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<td>Gaskets</td>
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How to Order

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ADD FOR B SERIES MODELS ONLY:
BR-CN-B-Z is to be used for all seawater/dirty water applications.

ADD FOR SERIES MODELS ONLY:
BR-CN-B-Z is to be used for all seawater/dirty water applications.

**SAE flanges available on some models. Consult factory for details.**

Fluid Cooling Shell & Tube B Series
Dimensions

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B-401 and B-402 SAE Flange not available. NOTE: We reserve the right to make reasonable design changes without notice. Consult factory. All dimensions are inches.
Dimensions

Two Pass

Flange Size

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Dimensions

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Flange Size

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NOTE: We reserve the right to make reasonable design changes without notice. Consult factory. All dimensions are inches.
Performance Curves

Maximum Flow Rates

Example Model No.
B - 1003 - C4 - F

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<tr>
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Caution: Incorrect installation can cause this product to fail prematurely, causing the shell side and tube side fluids to intermix.

Piping Hook-up

One Pass

IN HOT FLUID IN OUT

COOLING WATER

Two and Four Pass

HOT FLUID (MAY BE REVERSED)

IN OUT

COOLING WATER

Specific applications may have different piping arrangements.
Contact factory for assistance.

Shipping weights are approximate.
Selection Procedure

Performance Curves are based on 100SSU oil leaving the cooler 40°F higher than the water temperature used for cooling. This is also referred to as a 40°F approach temperature. Curves are based on a 2:1 oil to water flow ratio. *Curves are 1:1.

Step 1 Determine the Heat Load. This will vary with different systems, but typically coolers are sized to remove 25 to 50% of the input nameplate horsepower. (Example: 100 HP Power Unit x .33 = 33 HP Heat load.) If BTU/Hr. is known: \( HP = \frac{BTU/Hr}{2545} \)

Step 2 Determine Approach Temperature. Desired oil leaving cooler °F – Water Inlet temp. °F = Actual Approach (Max. reservoir temp.)

Step 3 Determine Curve Horsepower Heat Load. Enter the information from above:
\[ \text{Horsepower heat load} \times \frac{40}{\text{Actual Approach}} \times \text{Viscosity} = \text{Curve Correction A Horsepower} \]

Step 4 Enter curves at oil flow through cooler and curve horsepower. Any curve above the intersecting point will work.

Step 5 Determine Oil Pressure Drop from Curves:
- ○ = 5 PSI; □ = 10 PSI; ● = 20 PSI. Multiply pressure drop from curve by correction factor B found on oil viscosity correction curve.

Oil Temperature

Oil coolers can be selected using entering or leaving oil temperatures.

Typical operating temperature ranges are:
- Hydraulic Oil 110°F - 130°F
- Hydrostatic Drive Oil 130°F - 180°F
- Bearing Lube Oil 120°F - 160°F
- Lube Oil Circuits 110°F - 130°F.

Desired Reservoir Temperature

Return Line Cooling: Desired temperature is the oil temperature leaving the cooler. This will be the same temperature that will be found in the reservoir.

Off-Line Recirculation Cooling Loop: Desired temperature is the oil temperature entering the cooler. In this case, the oil temperature change must be determined so that the actual oil leaving temperature can be found. Calculate the oil temperature change (oil ▲T) with this formula:
\[ \text{Oil ▲T} = \frac{\text{BTU's/Hr.}}{\text{GPM Oil Flow} \times 210}. \]

To calculate the oil leaving temperature from the cooler, use this formula:
\[ \text{Oil Leaving Temp.} = \text{Oil Entering Temp.} - \text{Oil ▲T}. \]

This formula may also be used in any application where the only temperature available is the entering oil temperature.

Oil Pressure Drop: Most systems can tolerate a pressure drop through the heat exchanger of 20 to 30 PSI. Excessive pressure drop should be avoided. Care should be taken to limit pressure drop to 5 PSI or less for case drain applications where high back pressure may damage the pump shaft seals.