American Industrial Heat Transfer Inc.®
Manufacturer of Quality Heat Exchangers

website : www.aihti.com
general email : sales@aihti.com
technical email : engineering@aihti.com

Shell & Tube Application Request: *(For air / gas to liquid heat exchangers)*

For ABR Series

Email form to: sales@aihti.com or engineering@aihti.com or fax to 434-757-1810

Contact Name _____ Telephone _____ Date _____

Company Name _____ Email _____

Address: _____ Fax _____

_____

Hot Side

Fluid Type _____

If available:

Density _____ lb/ft3
Viscosity _____ cP
Conductivity _____ Btu/hr.ft.°F
Specific Heat _____ Btu/lb.°F

1. Flow Rate _____
2. Temperature In _____
3. Desired Temperature Out _____
4. Heat Load _____

Cold Side

Fluid Type _____

If available:

Density _____ lb/ft3
Viscosity _____ cP
Conductivity _____ Btu/hr.ft.°F
Specific Heat _____ Btu/lb.°F

1. Flow Rate _____
2. Temperature In _____

Maximum Allowable Pressure Drop:

Hot Side _____ Cold Side _____

To properly size the heat exchanger we need 3 of the 4 perameter on the Hot Side and 2 on the Cold Side.

Shell Material Construction:

Brass ☐ Steel ☐ Stainless Steel ☐

Tube Material Construction:

Copper ☐ 90/10 Copper Nickel ☐ Stainless Steel ☐

ASME Code and Certified Yes ☐ No ☐

Require All Stainless Steel Heat Exchanger Yes ☐ No ☐

Comment: _____

_____

_____

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ABR SERIES

FIXED TUBE BUNDLE / LIQUID COOLED

AFTER COOLERS

FOR COMPRESSED AIR AND GAS APPLICATIONS

- Copper, 90/10 Copper/Nickel, or Stainless Steel Tubing.
- Optional Bronze Bonnets.
- Operating Pressure for Tubes 150 PSI.
- Operating Pressure for Shell 300 PSI.
- Operating Temperatures of 300° F.
- Computer generated data sheet available for any application
- Can be customized to fit any applications.

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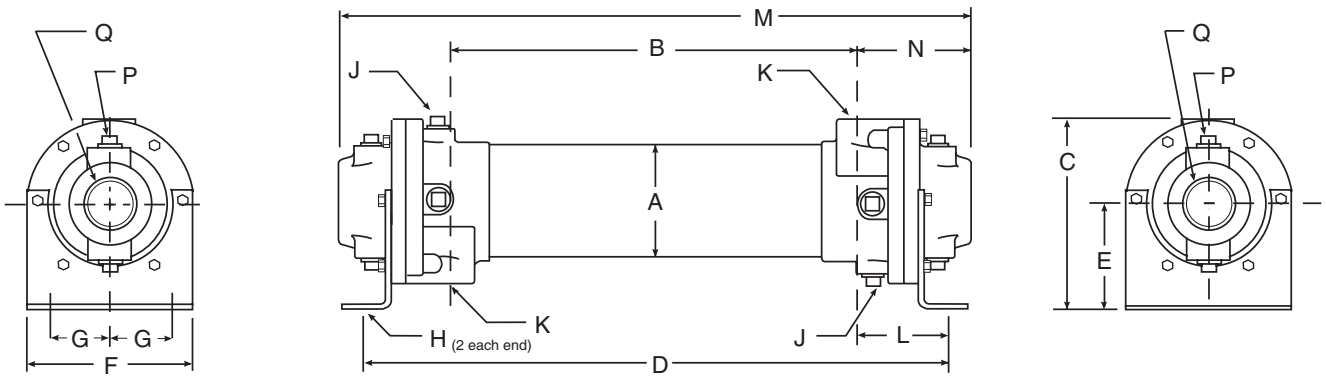
ABR Series *performance*



COMMON DIMENSIONS

Model	A	B	C	D	E	F	G	H	J NPT	K NPT	L	M	N	P NPT	Q NPT	Weights (lbs.)
ABR-403-A4-SP	2.13	25.62	3.50	29.06	1.94	2.62	0.88	0.41 DIA.	N/A	0.50	1.72	33.36	3.87	N/A	1.50	13
ABR-404-A4-SP	2.13	34.62	3.50	38.06	1.94	2.62	0.88			0.50	1.72	42.36	3.87		1.50	16
ABR-405-B4-SP	2.13	43.62	3.50	47.06	1.94	2.62	0.88			0.50	1.72	51.36	3.87		1.50	18
ABR-705-B4-SP	3.66	43.00	6.25	48.38	3.62	5.25	1.50	0.44x 1.00	(2) 0.38	1.00	2.89	50.40	3.70		2.50	40
ABR-1006-B6-SP	5.13	51.50	7.38	57.62	4.00	6.75	2.00		(6) 0.38	1.50	3.06	59.60	4.05		3.00	80
ABR-1206-C6-SP	6.13	50.50	8.81	57.38	4.75	7.50	2.50	0.44x .88		2.00	3.44	60.25	4.88	(4) 0.50	3.00	130
ABR-1207-C6-SP	6.13	59.60	8.81	66.38	4.75	7.50	2.50			2.00	3.44	69.25	4.88		3.00	150
ABR-1606-C6-SP	8.00	49.60	12.13	58.38	6.50	8.62	3.50	0.44x 1.00		3.00	4.39	62.62	6.52		5.00	259
ABR-1607-D6-SP	8.00	58.60	12.13	67.38	6.50	8.62	3.50			3.00	4.39	71.62	6.52		5.00	270
ABR-1608-D6-SP	8.00	67.60	12.13	76.38	6.50	8.62	3.50			3.00	4.39	80.62	6.52		5.00	315

CAPACITY SELECTION CHART

MODEL	2-Stage 250 ^{0}F Inlet Air		Rotary 200 ^{0}F Inlet Air	
	SCFM Capacity In Tubes	△P, PSI, In Rated Capacity	SCFM Capacity In Tubes	△P, PSI, In Rated Capacity
ABR-403-A4-SP	45	0.15	56	0.15
ABR-404-A4-SP	85	0.35	115	0.65
ABR-405-B4-SP	155	1.25	200	2.01
ABR-705-B4-SP	315	1.10	435	1.65
ABR-1006-B6-SP	445	0.35	650	0.55
ABR-1206-C6-SP	645	0.35	950	0.65
ABR-1207-C6-SP	1245	1.15	1680	1.95
ABR-1606-C6-SP	1605	0.60	2270	0.95
ABR-1607-D6-SP	2105	1.10	3075	1.75
ABR-1608-D6-SP	2810	1.65	3165	2.10

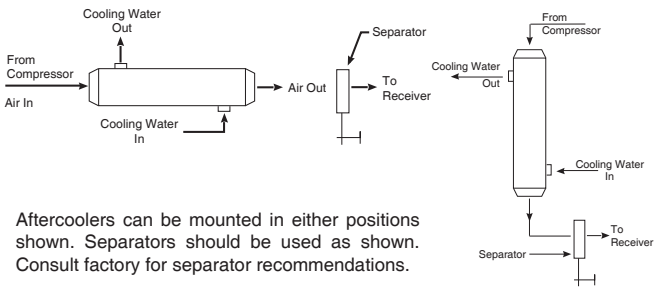
EXAMPLE

A two stage compressor with a 340 SCFM air delivery at 100psi and a 250° F discharge temperature. Two psi is the maximum allowable pressure loss. Rate of water flow, to be determined.

SELECTION

To find a solution, select ABR-1006-B6-SP from the 2-stage column in the above chart. It has a capacity of 445 SCFM.
Next, identify the value for △P by reading the sub-column within the 2-stage column. The information in that column should be △P= 0.35 psi.
Data for water flow is 340 SCFM x .035 = 11.9 gpm.

PIPING HOOK-UP DIAGRAMS



Aftercoolers can be mounted in either positions shown. Separators should be used as shown. Consult factory for separator recommendations.

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PIPING HOOK-UP

Receiving / Installation

a) Inspect unit for any shipping damage before uncrating. Indicate all damages to the trucking firms' delivery person, and mark it on the receiving bill before accepting the freight. Make sure that there is no visible damage to the outside surface of the heat exchanger. The published weight information located in this brochure is approximate. True shipment weights are determined at the time of shipping and may vary. Approximate weight information published herein is for engineering approximation purposes and should not be used for exact shipping weight. Since the warranty is based upon the unit date code located on the model identification tags, removal or manipulation of the identification tags will void the manufacturers warranty.

b) When handling the shell & tube heat exchanger, special care should be taken to avoid dropping the unit since mishandling could cause the heat exchanger to crack and leak externally. Mishandling of the unit is not covered under the manufacturers warranty. All units are shipped with partial wood/corrugated cardboard containers for safe handling.

c) Storage: American Industrial heat exchangers are protected against the elements during shipment. If the heat exchanger cannot be installed and put into operation immediately upon receipt, certain precautions are required to prevent deterioration during storage. The responsibility for integrity of the heat exchanger(s) is assumed by the user. American Industrial will not be responsible for damage, corrosion, or other deterioration of the heat exchanger during transit or storage.

Proper storage practices are important when considering the high costs of repair or replacement, and the possible delays for items which require long lead times for manufacture. The following listed practices are provided solely as a convenience to the user, who shall make their own decision on whether to use all or any of them.

1) Heat exchangers not to be placed in immediate service, require precautionary measures to prevent corrosion or contamination.
2) Heat exchangers made of ferrous materials, may be pressure-tested using compressed air at the factory. Residual oil coating on the inside surfaces of the heat exchanger(s) as a result of flushing does not discount the possibility of internal corrosion. Upon receipt, fill the heat exchanger(s) with the appropriate corrosion preventing inhibitor for storage.
3) Corrosion protection compounds for interior surfaces for long term storage or other applications are applied solely at the request of customers. Upon request, American Industrial can provide a customer approved corrosion preventative if available when included in the original purchase order specifications.
4) Remove all dirt, water, ice, or snow and wipe dry before moving heat exchanger(s) into storage. Heat exchangers are generally shipped empty, open drain plugs to remove any accumulated condensation moisture, then reseal. Accumulation of moisture usually indicates corrosion has already started and remedial action should be taken.
5) Store in a covered, environmentally stable area. The ideal storage environment for heat exchangers is in a dry, low-humidity atmosphere which is sealed to prevent the entry of blowing dust, rain, or snow. Maintain in atmospheric temperatures between 70°F and 105°F (Large temperature swings may cause condensation and moisture to form on steel components, threads, shell, etc...) Use thermometers and humidity indicators and maintain the atmosphere at 40% relative humidity, or lower.

d) Standard Enamel Coating: American Industrial provides its standard products with a normal base coat of oil base air cure enamel paint. The enamel paint is applied as a temporary protective and esthetic coating prior to shipment. While the standard enamel coating is durable, American Industrial does not warranty it as a long-term finish coating. It is strongly suggested that a more durable final coating be applied after installation or prior to long-term storage in a corrosive environment to cover any accidental scratches, enhance esthetics, and further prevent corrosion. It is the responsibility of the customer to provide regular maintenance against chips, scratches, etc... and regular touch up maintenance must be provided for long-term benefits and corrosion prevention.

e) Special Coatings: American Industrial offers as customer options, Air-Dry Epoxy, and Heresite (Air-Dry Phenolic) coatings at additional cost. American Industrial offers special coatings upon request, however American Industrial does not warranty coatings to be a permanent solution for any equipment against corrosion. It is the responsibility of the customer to provide regular maintenance against chips, scratches, etc... and regular touch up maintenance must be provided for long-term benefits and corrosion prevention.

f) American Industrial recommends that the equipment supplied should be installed by qualified personnel who have solid understanding of system design, pressure and temperature ratings, and piping assembly. Verify the service conditions of the system prior to applying any shell & tube heat exchanger. If the system pressure or temperature does not fall within the parameters on model rating tag located on the heat exchanger, contact our factory prior to installation or operation.

g) Plan the installation to meet the requirements indicated on the piping installation diagram as illustrated above. It is recommended to put the

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compressed air to be cooled through the tube side and the cold fluid through the shell side. The indicated port assembly sequence in the diagram maximizes the performance, and minimizes the possibility of thermal shock. In instances where the fluids are required to be reversed, *compressed air in the shell side and cold fluid in the tube side* the heat exchanger will work, however it may not meet the performance requirements of the application. Installations may be vertical or horizontal or a combination thereof. However, the installation must allow for complete draining of the heat exchanger regardless of orientation. Complete drainage is important to prevent the heat exchanger from freezing, over-heating of a fluid, or mineral deposit buildup.

h) For fixed bundle heat exchangers, provide sufficient clearance at one end to allow for the removal or replacement of tubes. On the opposite end, provide enough space to allow removal of the bonnet to provide sufficient clearance to permit tube rolling and cleaning. Allow accessible room for scheduled cleaning as needed. Include thermometer wells and pressure gauge pipe ports in piping to and from the heat exchanger located as close to the heat exchanger as possible. For more information please contact American Industrial.

i) Standard shell & tube coolers are built with a rolled tube-sheet construction. However, the differential operating temperature between the entering shell side fluid and the entering tube side fluid should not exceed 150°F. If this condition exists, a severe thermal shock could occur leading to product failure and mixing of the fluids. For applications with a differential temperatures of 150°F or more, we recommend using a series with a floating tube-sheet, u-tube, or expansion joint to reduce the potential for the effects of thermal shock.

j) Water requirements vary from location to location. If the source of cooling water is from other than a municipal water supply, it is recommended that a water strainer be installed ahead of the heat exchanger to prevent dirt and debris from entering and clogging the flow passages. If a water modulating valve is used it is recommended to be installed at the inlet to the cooler to regulate the water flow.

k) For steam service, or other related applications, please consult our engineering department for additional information.

Maintenance

a) Inspect the heat exchanger for loosened bolts, connections, rust spots, corrosion, and for internal or external fluid leakage. Any corroded surfaces should be cleaned and recoated with paint.

b) Shell side: In many cases with clean hydraulic system oils it will not be necessary to flush the interior of the shell side of the cooler. In circumstances where the quality of hydraulic fluid is in question, the shell side should be disconnected and flushed on a yearly basis with a clean flushing oil/solvent to remove any sludge that has been deposited. For severe cases where the unit is plugged and cannot be flushed clean with solvent, the heat exchanger should be replaced to maintain the proper cooling performance.

c) Tube side: In many cases it will be necessary to clean the tube side of the heat exchanger due to poor fluid quality, debris, calcium deposits, corrosion, mud, sludge, seaweed, etc.... To clean the tube side, flush with clean water or any good quality commercial cleaner that does not attack the particular material of construction. With straight tube heat exchangers you can use a rod to carefully push any debris out of the tubes.

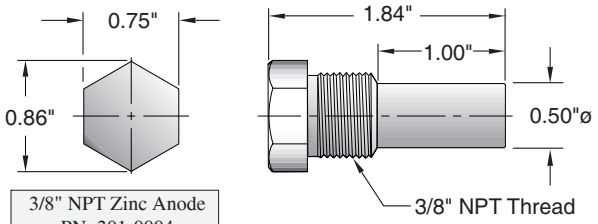
d) Zinc anodes are normally used to reduce the risk of failure due to electrolysis. Zinc anodes are a sacrificial component designed to wear and dissolve through normal use. Normally, zinc anodes are applied to the water supply side of the heat exchanger. Depending upon the amount of corrosive action, one, two, three, or more anodes can be applied to help further reduce the risk of failure. American Industrial Heat Transfer, Inc. offers zinc anodes as an option, to be specified and installed at the request our customers. It is the responsibility of the customer to periodically check and verify the condition of the zinc anode and replace it as needed.

Applications vary due to water chemical makeup and quality, material differences, temperature, flow rate, piping arrangements, and machine grounding. For those reasons, zinc anodes do not follow any scheduled factory predetermined maintenance plan moreover they must be checked routinely by the customer, and a maintenance plan developed based upon the actual wear rate.

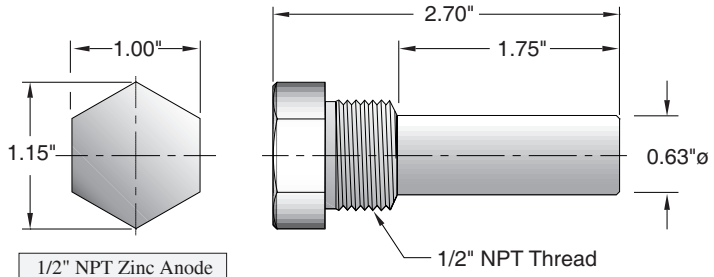
If substantial wear occurs or zinc dissolves without replacement, premature failure or permanent damage may occur to the heat exchanger. American Industrial does not warranty customer applications. It is the responsibility of the customer to verify and apply the proper system materials of construction and overall system requirements. Failures resulting from properly applied or misapplied use of zinc anode(s) into non-specified or specified applications will be the sole responsibility of the customer.

e) A routine maintenance schedule should be developed and adjusted to meet your systems requirements based upon water quality, etc….Failure to regularly maintain and clean your heat exchanger can result in a reduction in operational performance and life expectancy.

Note: *Since applications can vary substantially, the installation and maintenance information contained in this catalog should be used as a basic guideline. The safe installation, maintenance, and use of any American Industrial Heat Transfer, Inc. heat exchanger are solely the responsibility of the user.*



3/8" NPT Zinc Anode PN: 301-0004
AB-400 thru AB-1000 AA-400 thru AA-1000 CS-600 thru CS-1000



1/2" NPT Zinc Anode PN: 301-0003
AB-1200 thru AB-2000 AA-1200 thru AA-1600 CS-1200 thru CS-1700

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