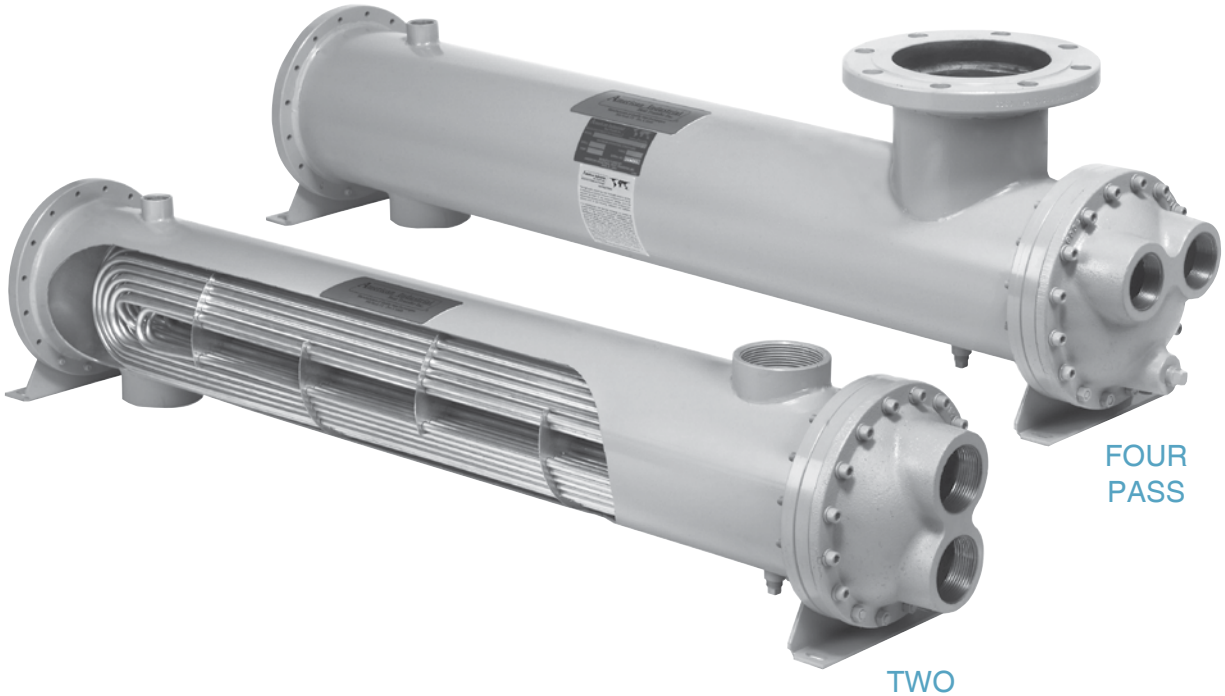
Fit to Screen



Click here to see unit schematic and parts

U-TUBE FIXED & REMOVEABLE BUNDLE

HEAT EXCHANGERS

For steam to liquid service

- Operating pressure for tubes 100 PSI.
- Operating pressure for shell 100 PSI.
- Operating temperature 400 °F.
- Can be customized to fit your needs.
- Applications: Heating water, oils, and other compatible chemicals used in paper mills, steel mills, or anywhere steam heating is required.

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UCN, URCN, UCF & URCF Series *overview*

UCN, URCN SERIES

U-tube heat exchangers with fixed or removeable tube bundle for steam service. Normally applied when the differential temperature between the hot fluid entering and the cooling fluid entering is 150°F or greater. U-tube design allows tubing to freely expand and contract independently of the shell. Welded outer shell construction made of carbon steel with NPT connection ports. Sizes from 5" to 10" diameters. Standard two and four pass units available. Optional 90/10 copper nickel, stainless steel, and carbon steel tube. Can be modified to meet your requirements.

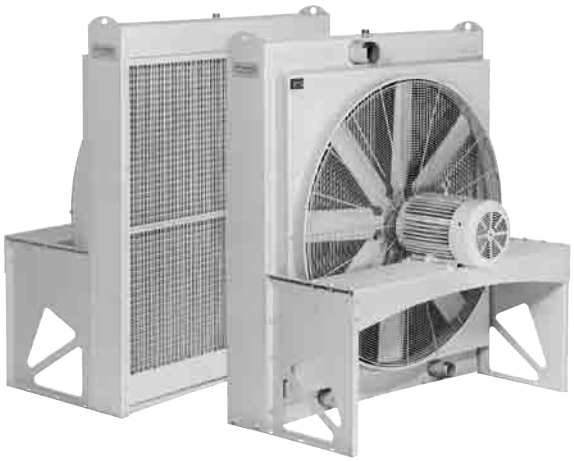
UCF & URCF SERIES

U-tube heat exchangers with fixed or removeable tube bundle for steam service. Normally applied when the differential temperature between the hot fluid entering and the cooling fluid entering is 150°F or greater. U-tube design allows tubing to freely expand and contract independently of the shell. Welded outer shell construction made of carbon steel with ANSI flange ports. Sizes from 5" to 10" diameters. Standard two and four pass units available. Optional 90/10 copper nickel, stainless steel, and carbon steel tube. Can be modified to meet your requirements.

URCS OEM SERIES

U-tube heat exchangers with removeable tube bundle for fluids with high differential inlet temperatures or where tube bundle requires removal. Normally applied when the differential temperature between the hot fluid entering and the cooling fluid entering is 150°F or greater. U-tube design allows tubing to freely expand and contract independently of the shell. Welded outer shell construction made of carbon steel with NPT or ANSI flange ports and viton o-ring seals. Sizes from 4" to 8" diameters. Standard two pass units available. Can be modified to meet your requirements.

(See Page 101)



WITH ELECTRIC DRIVE

Severe duty air-cooled oil coolers, super capacity, rolled tube industrial series heat exchangers with direct electric drive cooling fan, OSHA guard, and heavy duty front screen. Rated operating temperature of 300ºF at 200 PSIG. Standard flow rates from 10 to 600 GPM. NPT, ANSI flange, or SAE code 61 four bolt flange port connections. Optional built-in bypass relief valve 30 PSI or 65 PSI. Can be modified to meet your requirements. Suitable for most hydraulic oils, lubrications oils, synthetic compressor oils, ethylene glycol, and many other fluids compatible with listed material.

In applications where water is not available for cooling (see page 157)

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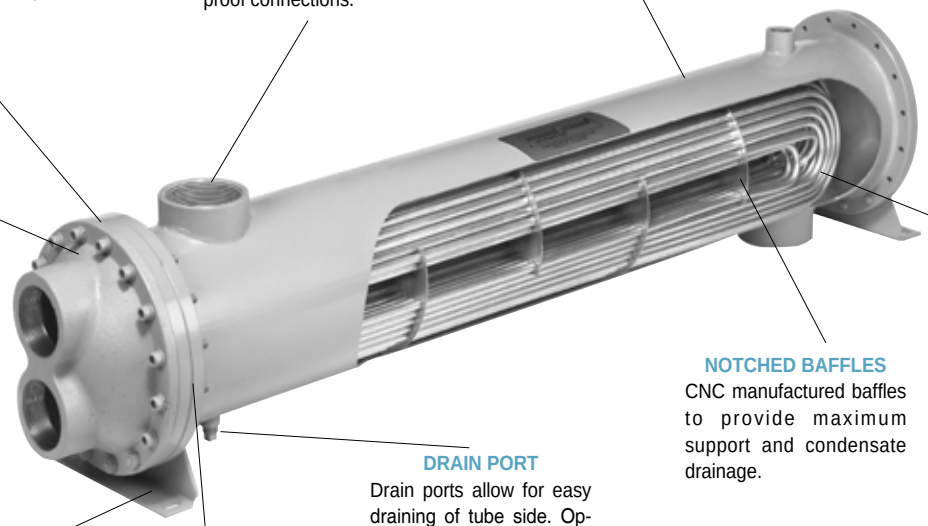

TUBE SHEET
Precision-machined tube-sheet provides for long lasting high strength service.

THREAD
CNC precision threading to provide accurate leak-proof connections.

FINISH
Gray semigloss enamel. Can be used as a base for additional coats.

CAST BONNET
Provides fluid into tubes with minimum restriction. Two or four pass inter-changeability.

BUNDLE ASSEMBLY
CNC precision manu-factured parts to guar-antee a close fit between the baffles, tubes, and shell. Clearances are minimized to provide for maximum heat transfer.

NOTCHED BAFFLES
CNC manufactured baffles to provide maximum support and condensate drainage.

DRAIN PORT
Drain ports allow for easy draining of tube side. Op-tional zinc anode can be inserted in place of plug.

GASKET
High Temperature compos-ite gasket.

MOUNTING BRACKET
Heavy gauge steel mounting brackets are adjustable in orientations to 360 degrees.

UNIT CODING

Example Model

Options

UCN - 1748 - 6 - TP - CNT - B - Z - BT

Model
UCN
URCN
UCF
URCF

Shell Diameter
1000 = 5.25"
1200 = 6.25"
1700 = 8.00"
2000 = 10.75"

Effective Tube Length
(12" increments)

Cooling Tube Diamenter
6 = 3/8"
10 = 5/8"

Tube Side Passes
TP = 2 pass
FP = 4 pass

Tubing
Blank = Copper
Options
CNT= 90/10 Cu Ni
STS = Stainless Steel
C = Carbon Steel

End Bonnets
Blank = Cast Iron
Options
B = Bronze

Zinc Anode
Z = 1 Zinc Anode
2Z = 2 Zinc Anode etc.

Tube Sheets
Blank = Steel
BT = Brass
ST = Stainless Steel

STANDARD CONSTRUCTION MATERIALS & RATINGS

Standard Model	UCN / URCN & UCF / URCF	Options	Standard Unit Ratings
Shell	Steel	Stainless Steel	Operating Pressure Tubes 100 psig Operating Pressure Shell 100 psig Operating Temperature 400 °F
Tubes	Copper	90/10 Cu. Ni. / Stainless Steel	
Baffles	Brass	Steel / Stainless Steel	
Tube Sheet	Steel	Brass / Stainless Steel	
End Bonnets	Cast Iron	Stainless Steel	
Mounting Brackets	Steel	Stainless Steel	
Gasket	High Temperature Gasket	Viton	

Example [A] Calculate surface area required.

Heat 50gpm fresh water from 70°F to 170°F, using saturated steam at 50psig.

T_s = Steam temperature °F
t_{in} = Cold side entering fluid °F
t_{out} = Cold side exiting fluid °F

Step 1. Calculate the heat load Btu/hr [Q].

Q = GPM x CN x △T
Q = 50gpm x 500 x (170°F-70°F) = 2,500,000 Btu/hr

Step 2 Acquire steam temperature and enthalpy from graphs T&L

50psig = 297°F steam. From graph **T** (pg. 110).
50psig = 912 Btu/lb. From graph **L** (pg. 111).

Step 3. Calculate the mean temperature difference (MTD)

$$\frac{T_s - t_{in}}{T_s - t_{out}} = \frac{297^oF - 70^oF}{297^oF - 170^oF} = \frac{227^oF \text{ (Larger) L}}{127^oF \text{ (Smaller) S}}$$

$$\frac{S}{L} = \frac{127^oF}{227^oF} = .559 \quad \text{Go to Table A } .559 = .758$$

Find the LMTD = [.758 x (L) 227] = 172.0

Step 4. Calculate the surface area required.

$$A_s = \frac{Q \text{ (Btu/hr)}}{LMTD \times U} = \frac{2{,}500{,}000}{172 \times 300} = 48.4 \text{ sq. ft.}$$

Step 5. Calculate the Capacity Factor [F_c] for steam.

$$F_c = \frac{Q}{Btu/lb} = \frac{2{,}500{,}000 \text{ Btu/hr}}{912 \text{ Btu/lb}} = 2{,}741.3 \text{ lbs/hr steam}$$

Step 6. Select a the proper diameter heat exchanger using graphs F or G and F_c from step 5.

Capacity = 2741.3 @ 50psig = 1700 series 3/8 or 5/8 tubes from chart (G).

Use table **D** to determine the final heat exchanger size.
48.4 sq.ft. = **URCF-1748-6-TP**

Application [B] Calculate using the graphs.

Heat 70gpm fresh water from 50°F to 180°F using 65psig saturated steam.

Step 1. Calculate the heat load Btu/hr [Q].

Q = GPM x CN x △T
Q = 70 x 500 x (180°F - 50°F) = 4,550,000 Btu/hr

Step 2. Derive the steam temperature [T_s] from the graph **T**. *Derive the capacity factor [F_c] from graph* **L**.

65psig = 312°F steam. From graph **T**
65psig = 901 Btu/lb. From graph **L**

Step 3. Calculate the F_s required.

$$F_s = \frac{Btu/hr \text{ [Q]}}{T_s - t_{out}} = \frac{4{,}550{,}000}{312^oF - 180^oF} = 34{,}470$$

Step 4. Calculate the Capacity Factor F_c for steam.

$$F_c = \frac{Q}{Btu/lb} = \text{lbs/hr} \quad \frac{2{,}500{,}000 \text{ Btu/hr}}{912 \text{ Btu/lb}} = 5{,}050 \text{ lbs/hr steam required}$$

Step 5. Select the proper diameter heat exchanger using the capacity graphs F or G and F_c from step 4.

Capacity = 5050 = 2000 series with 5/8" Tubes.

Step 6. Select the proper size heat exchanger from the performance curves corresponding to the series selected using the capacity factor. Select the heat exchanger closest to the line landing on or above the calculated point.

F_s = 34,470 Btu/hr f = URCF 2084-6-TP

Application [C] Calculate batch heating of a tank.

Heat a 1000 gallon stainless steel tank of water from 50°F to 150°F in 1.5 hours using 40psig saturated steam, circulating at 30gpm. Tank size 6ft w x 6ft h x 6ft d. Ambient air temperature 60°F worse case.

Step 1. Calculate the total heat load [Q] Btu/hr.

Q = Total Gallons x lbs/gallon x Specific heat Btu/lb x △T
Q = 1000 x 8.34 x 1.0 x 100°F = 834,000 Btu

$$\text{Corrected Q for time} = \frac{834{,}000 \times 60 \text{ min}}{(1.5\text{hours}) \times 60 \text{ min}} = 556{,}00 \text{ Btu/hr}$$

Step 2. Calculate the $\triangle T_{average}$ (T_a) for the heated water.

$$\triangle T_a = \frac{T_f - T_i}{2} + T_i \quad T_a = \frac{150^oF - 50^oF}{1.5 \text{ hours}} + 50^oF = 116.7^oF$$

Q_{Loss} = Surface area tank sq.ft x .001 x $\triangle t_a$ x 2545
Q_{Loss} = 6x6x6 x .001 x (116.7°F_a - 60°F) x 2545 = 31,169 Btu/hr

$Q_t = Q + Q_{Loss} = Q_t$ 556,000 + 31,169 = 587,169 Btu/hr

Step 3. Derive the steam temperature [T_s] from graph T. Derive the capacity factor from graph L.

Given 40psig saturated steam = 287°F steam acquired from graph T.
Given 40psig saturated steam = 920 Btu/lb acquired from graph L.

Step 4. Calculate the mean temperature difference (MTD)

$$\frac{T_s - T_a}{T_s - T_e} = \frac{287^oF - 100^oF}{287^oF - 150^oF} = \frac{187^oF}{137^oF}$$

$$\frac{S}{L} = \frac{137^oF}{187^oF} = .732 \text{ Goto Table A. } .732 = .659$$

Calculate the Log mean temperature difference LMTD

LMTD = [.659 x (L) 187°F] = 123.2

Step 5. Calculate the required surface area.

$$A_s = \frac{Q}{LMTD \times U} = \frac{587{,}169 \text{ Btu/hr}}{123.2 \times 300} = 15.9 \text{ sq. ft.}$$

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Step 6. Select the proper diameter heat exchanger by calculating the capacity factor.

$$F_c = \frac{Q}{\text{Btu/lb}} = \text{lbs/hr} \qquad \frac{587{,}169\ \text{Btu/hr}}{920\ \text{Btu/lb}} = 639\ \text{lbs/hr}$$

From graph F or G select the proper diameter heat exchanger. Capacity 639 lbs/hr saturated steam required @ 40psig.

Capacity = 639 lbs/hr = 1000 series 3/8" tubes

Step 7. Select the proper size heat exchanger from the surface area chart in table D.

Minimum surface area required = 15.9 sq.ft. = URCN1036-6-TP

Step 8. Select same using the performance chart.

$$F_s = \frac{\text{Btu/hr}}{T_s - T_{exit}} = \frac{587{,}169}{287 - 150} = 4{,}286\ F_s$$

From the chart 1000, 3/8" tubes on page ( ) select unit landing closest on or above intersection point of 30gpm & 4,286 Btu/hr ^{O}F

Selection = URCN1036-6-TP

TABLE A- FACTOR M/LMTD = L x M

S/L	M	S/L	M	S/L	M	S/L	M
		.25	.541	.50	.721	.75	.870
.01	.215	.26	.549	.51	.728	.76	.864
.02	.251	.27	.558	.52	.734	.77	.879
.03	.277	.28	.566	.53	.740	.78	.886
.04	.298	.29	.574	.54	.746	.79	.890
.05	.317	.30	.582	.55	.753	.80	.896
.06	.334	.31	.589	.56	.759	.81	.902
.07	.350	.32	.597	.57	.765	.82	.907
.08	.364	.33	.604	.58	.771	.83	.913
.09	.378	.34	.612	.59	.777	.84	.918
.10	.391	.35	.619	.60	.783	.85	.923
.11	.403	.36	.626	.61	.789	.86	.928
.12	.415	.37	.634	.62	.795	.87	.934
.13	.427	.38	.641	.63	.801	.88	.939
.14	.438	.39	.648	.64	.806	.89	.944
.15	.448	.40	.655	.65	.813	.90	.949
.16	.458	.41	.662	.66	.818	.91	.955
.17	.469	.42	.669	.67	.823	.92	.959
.18	.478	.43	.675	.68	.829	.93	.964
.19	.488	.44	.682	.69	.836	.94	.970
.20	.497	.45	.689	.70	.840	.95	.975
.21	.506	.46	.695	.71	.848	.96	.979
.22	.515	.47	.702	.72	.852	.97	.986
.23	.524	.48	.709	.73	.658	.98	.991
.24	.533	.49	.715	.74	.864	.99	.995

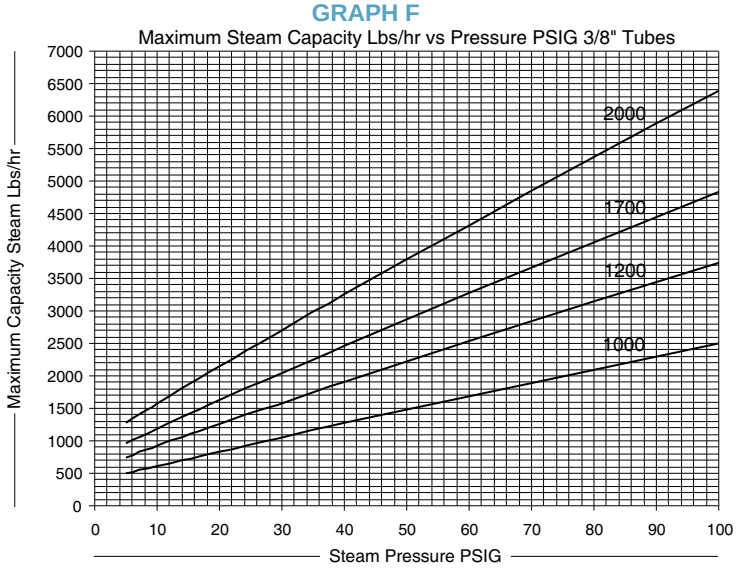
TABLE D- Surface Area

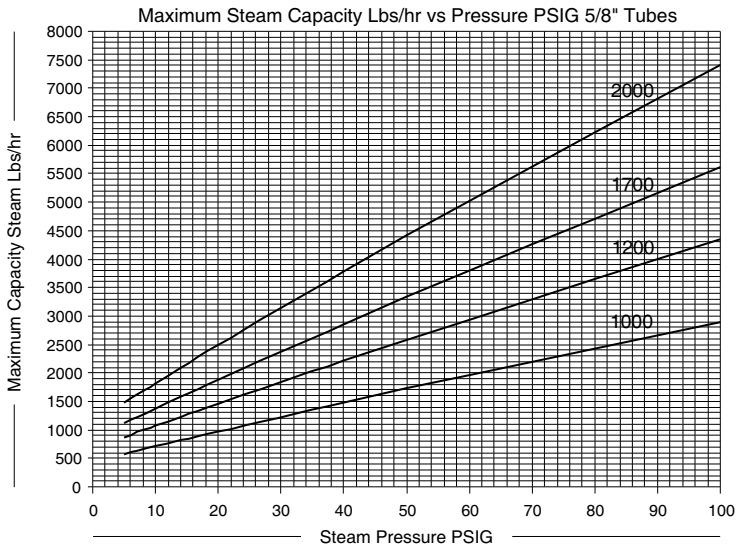
Model Number	Surface Area in Sq.ft. 3/8" O.D Tubing Code 6	Surface Area in Sq.ft. 5/8" O.D Tubing Code 10	Model Number	Surface Area in Sq.ft. 3/8" O.D Tubing Code 6	Surface Area in Sq.ft. 5/8" O.D Tubing Code 10
1024	11.0	6.5	1724	32.2	17.0
1036	16.5	9.8	1736	48.3	25.5
1048	22.0	13.0	1748	64.4	34.0
			1760	80.5	42.5
1224	17.3	9.1	1772	96.6	51.0
1236	25.9	13.7	1784	112.7	59.5
1248	34.5	18.3			
1260	43.2	22.9	2036	80.1	41.2
1272	51.8	27.5	2048	106.8	55.0
1284	60.5	32.0	2060	133.5	68.7
			2072	160.2	82.5
			2084	186.9	96.2

TABLE E- Flow Rate for Shell & Tube

Shell dia. Code	Liquid Flow - Tube Side 3/8" TP Min.	3/8" TP Max.	5/8" TP Min.	5/8" TP Max.	3/8" FP Min.	3/8" FP Max.	5/8" FP Min.	5/8" FP Max.
1000	5	60	5	60	5	37	5	33
1200	5	100	5	100	7.5	56	7.5	50
1700	10	180	10	160	14	90	14	80
2000	15	340	15	300	25	160	25	145

GRAPH F





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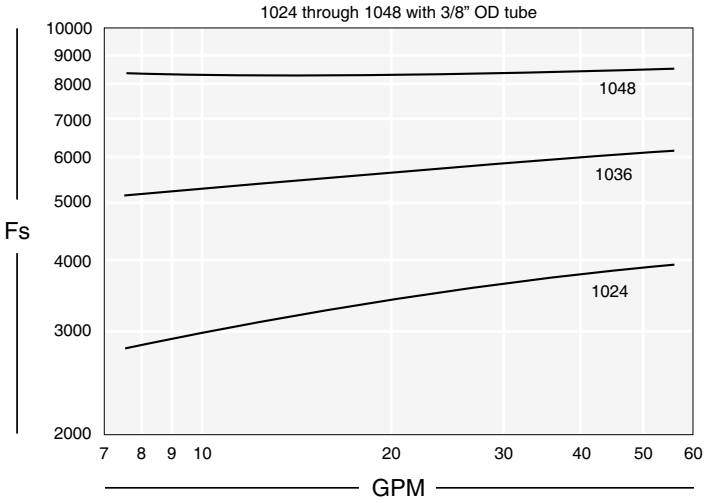
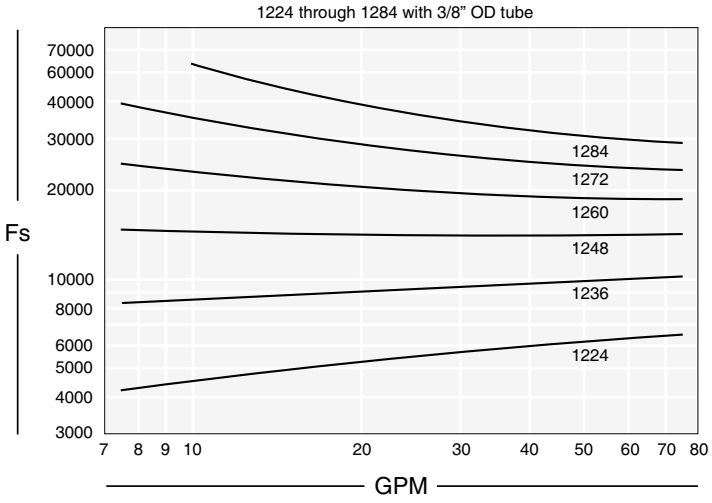
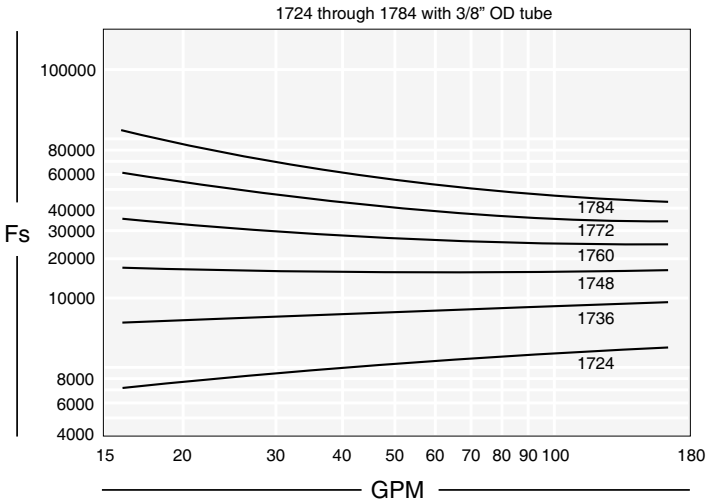
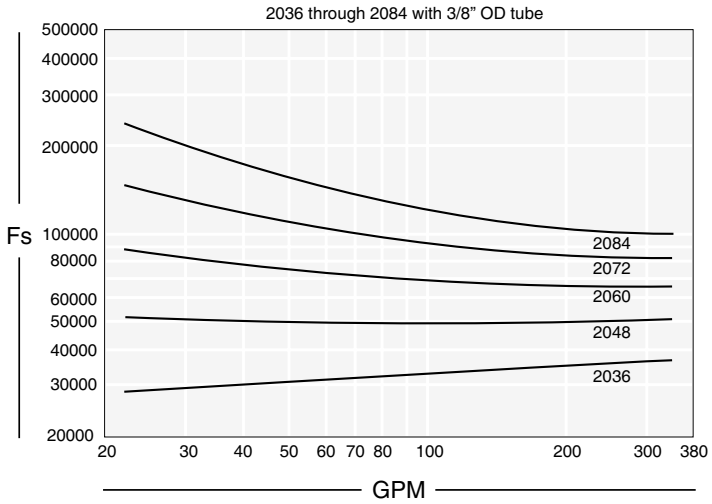
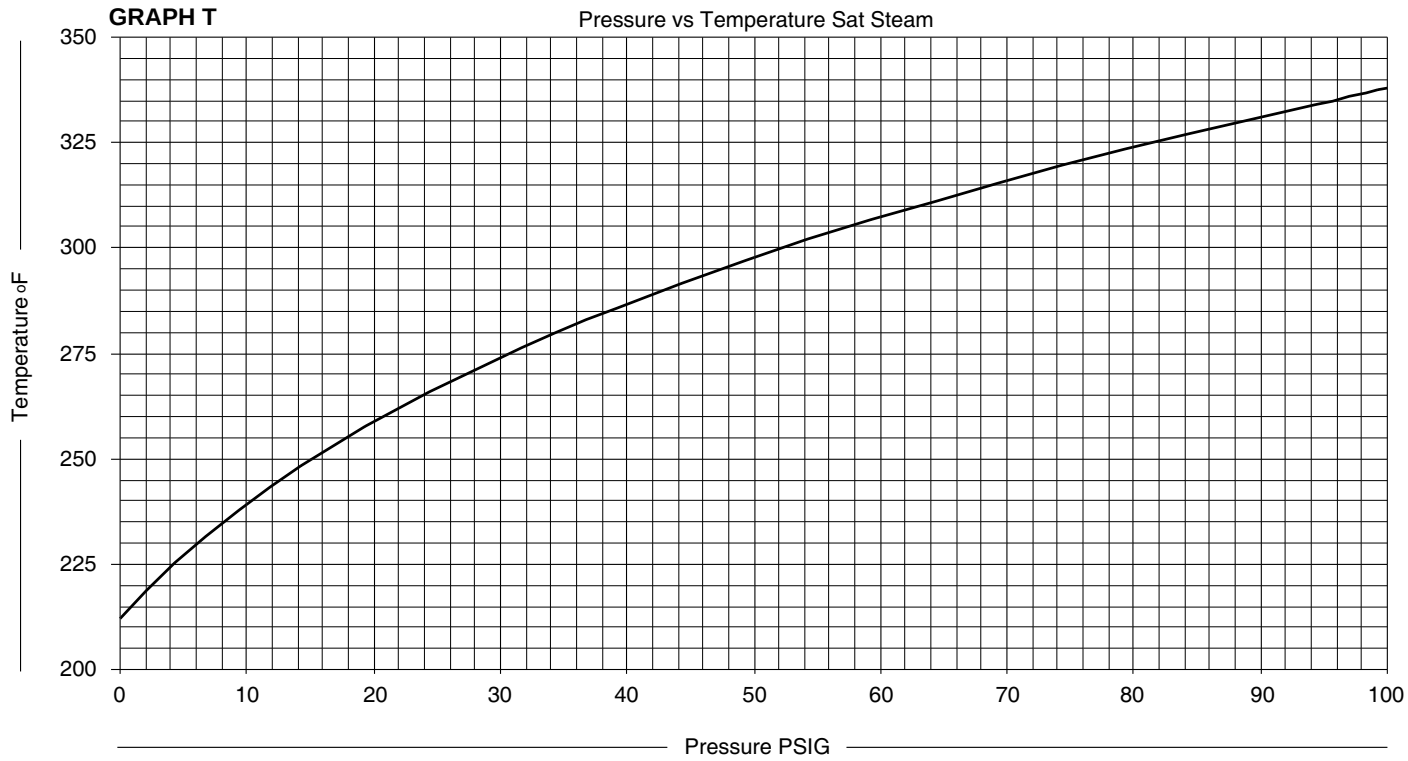
UCN, URCN, UCF & URCF Series *selection*











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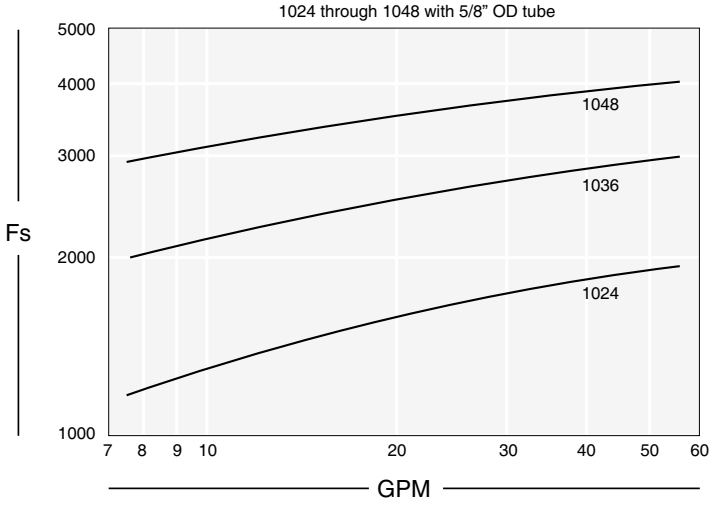
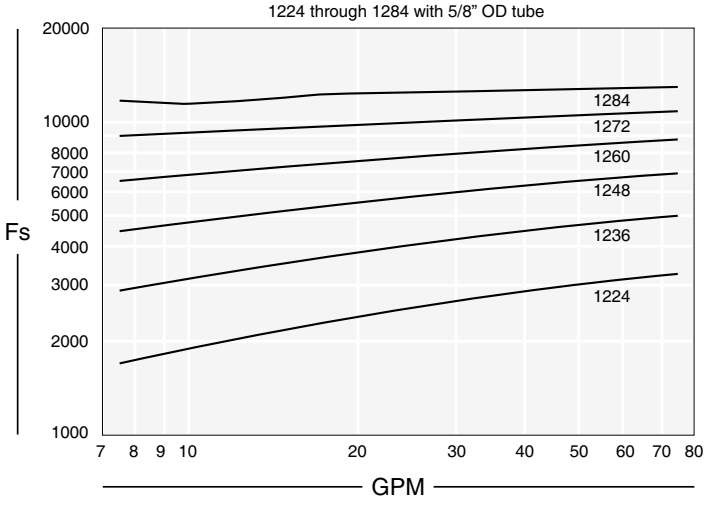
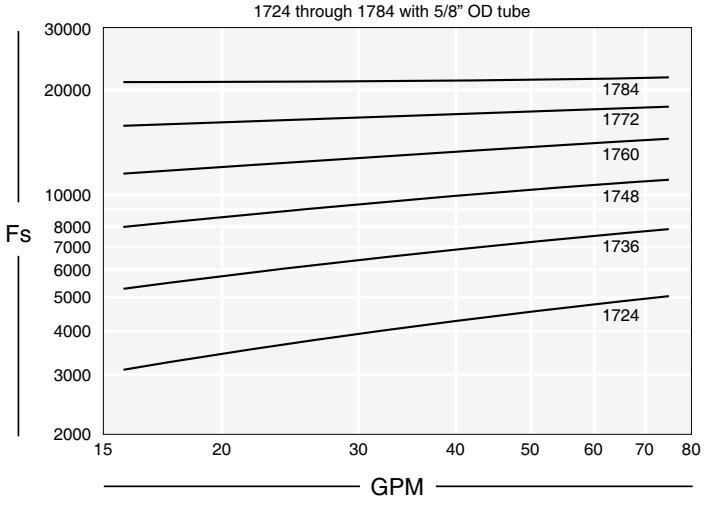
1024 through 1048 with 5/8" OD tube



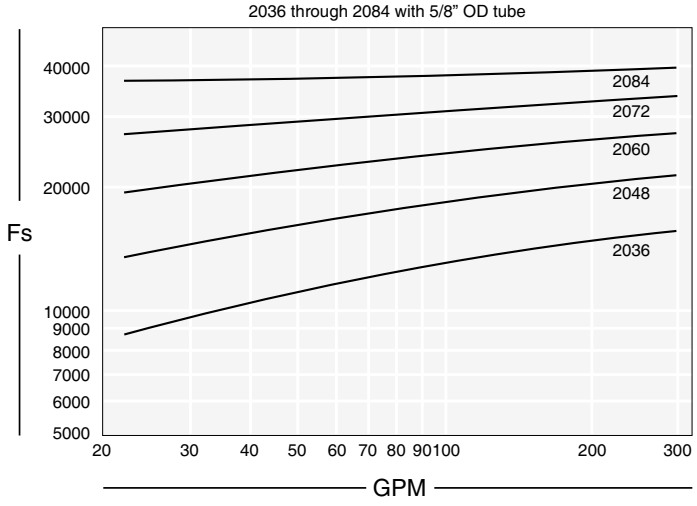
1224 through 1284 with 5/8" OD tube



1724 through 1784 with 5/8" OD tube

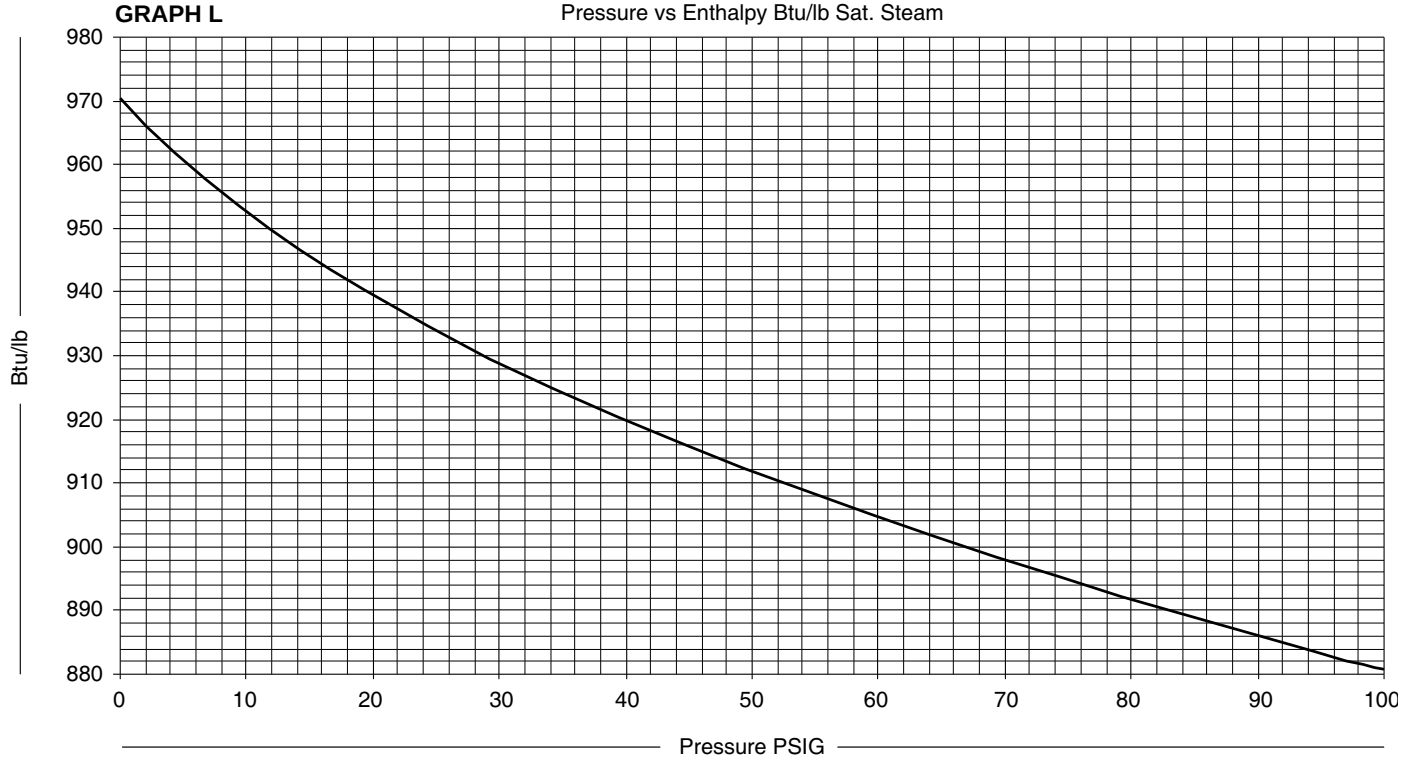


2036 through 2084 with 5/8" OD tube



GRAPH L

Pressure vs Enthalpy Btu/lb Sat. Steam



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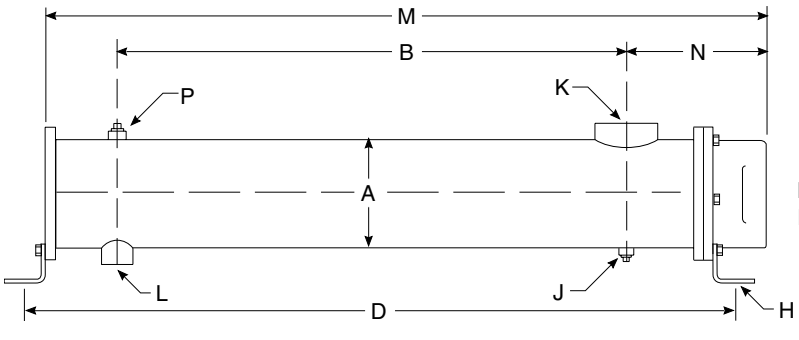
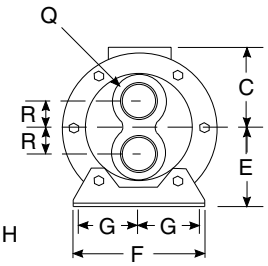
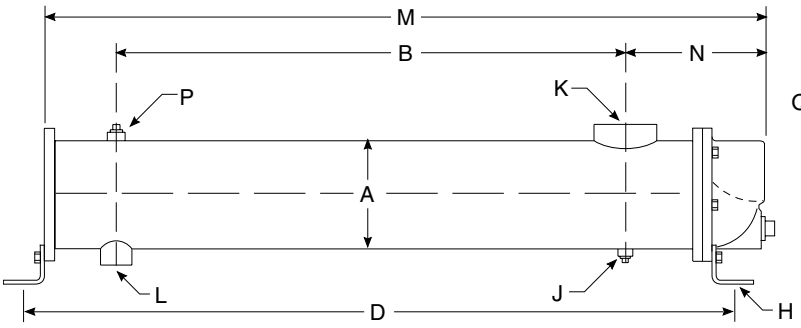
UCN Series *diminsions*

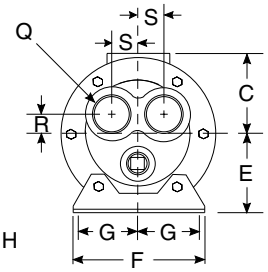




TWO PASS (TP)

Model	M	N	Q NPT	R
UCN-1024	28.88	6.00	1.50	1.19
UCN-1036	40.88			
UCN-1048	52.88			
UCN-1224	29.17	6.67	2.00	1.44
UCN-1236	41.17			
UCN-1248	53.17			
UCN-1260	65.17			
UCN-1272	77.17			
UCN-1284	89.17			
UCN-1724	30.13	7.88	2.50	1.88
UCN-1736	42.13			
UCN-1748	54.13			
UCN-1760	66.13			
UCN-1772	78.13			
UCN-1784	90.13			
UCN-2036	43.91	10.16	3.00	2.50
UCN-2048	55.91			
UCN-2060	67.91			
UCN-2072	79.91			
UCN-2084	91.91			





FOUR PASS (FP)

Model	M	N	Q NPT	R	S
UCN-1024	29.21	6.34	1.00	.75	1.19
UCN-1036	41.21				
UCN-1048	53.21				
UCN-1224	29.58	7.08	1.50	1.06	1.44
UCN-1236	41.58				
UCN-1248	53.58				
UCN-1260	65.58				
UCN-1272	77.58				
UCN-1284	84.58				
UCN-1724	29.78	7.53	2.00	1.38	1.88
UCN-1736	41.78				
UCN-1748	53.78				
UCN-1760	65.78				
UCN-1772	77.78				
UCN-1784	89.78				
UCN-2036	44.00	10.26	2.50	1.75	2.50
UCN-2048	56.00				
UCN-2060	68.00				
UCN-2072	80.00				
UCN-2084	92.00				

COMMON DIMENSIONS

Model	A	B	C	D	E	F	G	H	J NPT	K NPT	L NPT	P NPT	Weight	Model
UCN-1024	5.25	20.00	3.69	29.13	4.00	5.25	2.00	.44 x 1.00 thru slot	.375	2.00	1.50	.75	55.00	UCN-1024
UCN-1036		32.00		41.13									70.00	UCN-1036
UCN-1048		44.00		53.13									85.00	UCN-1048
UCN-1224	6.25	19.00	4.19	29.59	4.50	6.25	2.50	.44 x 1.00 thru slot	.375	2.50	2.00	.75	83.00	UCN-1224
UCN-1236		31.00		41.59									108.00	UCN-1236
UCN-1248		43.00		53.59									132.00	UCN-1248
UCN-1260		55.00		65.59									158.00	UCN-1260
UCN-1272		67.00		77.59									182.00	UCN-1272
UCN-1284		79.00		89.59									206.00	UCN-1284
UCN-1724	8.00	19.00	5.06	29.50	5.75	8.25	3.50	.44 x 1.00 thru slot	.375	3.00	2.00	1.00	138.00	UCN-1724
UCN-1736		31.00		41.50									180.00	UCN-1736
UCN-1748		43.00		53.50									219.00	UCN-1748
UCN-1760		55.00		65.50									258.00	UCN-1760
UCN-1772		67.00		77.50									300.00	UCN-1772
UCN-1784		79.00		89.50									342.00	UCN-1784
UCN-2036	10.75	30.00	6.88	42.63	8.00	11.50	5.00	.781 x 1.25 thru slot	.50	4.00	3.00	1.25	620.00	UCN-2036
UCN-2048		42.00		54.63									670.00	UCN-2048
UCN-2060		54.00		66.63									730.00	UCN-2060
UCN-2072		66.00		78.63									820.00	UCN-2072
UCN-2084		78.00		90.63									870.00	UCN-2084

note: AIHTI reserves the right to make reasonable design changes without notice.

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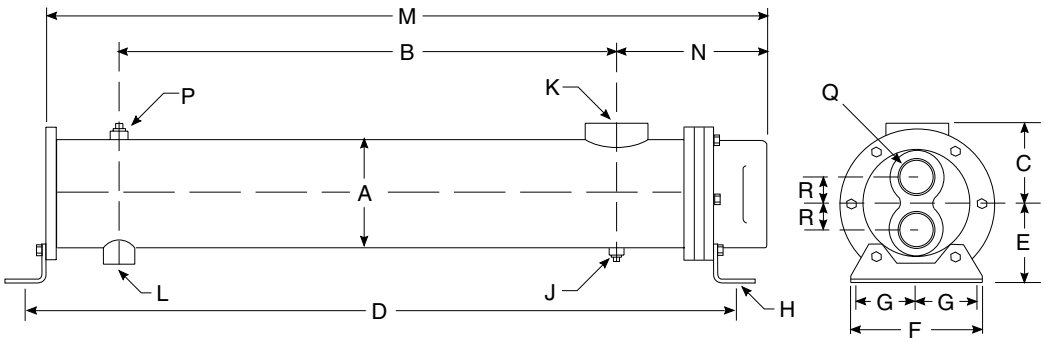
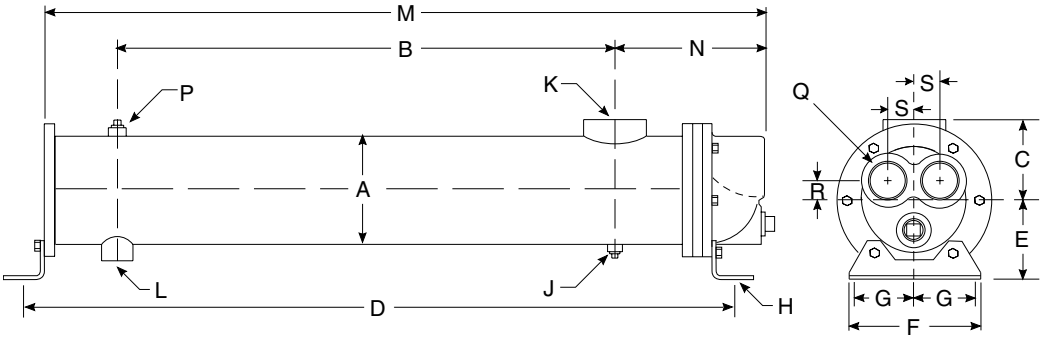


Model	M	N	Q NPT	R
URCN-1024	28.88	6.00	1.50	1.19
URCN-1036	40.88			
URCN-1048	52.88			
URCN-1224	29.17	6.67	2.00	1.44
URCN-1236	41.17			
URCN-1248	53.17			
URCN-1260	65.17			
URCN-1272	77.17			
URCN-1284	89.17			
URCN-1724	30.13	7.88	2.50	1.88
URCN-1736	42.13			
URCN-1748	54.13			
URCN-1760	66.13			
URCN-1772	78.13			
URCN-1784	90.13			
URCN-2036	43.91	10.16	3.00	2.50
URCN-2048	55.91			
URCN-2060	67.91			
URCN-2072	79.91			
URCN-2084	91.91			

TWO PASS (TP)



Model	M	N	Q NPT	R	S
URCN-1024	29.21	6.34	1.00	.75	1.19
URCN-1036	41.21				
URCN-1048	53.21				
URCN-1224	29.58	7.08	1.50	1.06	1.44
URCN-1236	41.58				
URCN-1248	53.58				
URCN-1260	65.58				
URCN-1272	77.58				
URCN-1284	84.58				
URCN-1724	29.78	7.53	2.00	1.38	1.88
URCN-1736	41.78				
URCN-1748	53.78				
URCN-1760	65.78				
URCN-1772	77.78				
URCN-1784	89.78				
URCN-2036	44.00	10.26	2.50	1.75	2.50
URCN-2048	56.00				
URCN-2060	68.00				
URCN-2072	80.00				
URCN-2084	92.00				

FOUR PASS (FP)

COMMON DIMENSIONS

Model	A	B	C	D	E	F	G	H	J NPT	K NPT	L NPT	P NPT	Weight	Model
URCN-1024	5.25	20.00	3.69	29.13	4.00	5.25	2.00	.44 x 1.00 thru slot	.375	2.00	1.50	.75	55.00	URCN-1024
URCN-1036		32.00		41.13									70.00	URCN-1036
URCN-1048		44.00		53.13									85.00	URCN-1048
URCN-1224	6.25	19.00	4.19	29.59	4.50	6.25	2.50	.44 x 1.00 thru slot	.375	2.50	2.00	.75	83.00	URCN-1224
URCN-1236		31.00		41.59									108.00	URCN-1236
URCN-1248		43.00		53.59									132.00	URCN-1248
URCN-1260		55.00		65.59									158.00	URCN-1260
URCN-1272		67.00		77.59									182.00	URCN-1272
URCN-1284		79.00		89.59									206.00	URCN-1284
URCN-1724	8.00	19.00	5.06	29.50	5.75	8.25	3.50	.44 x 1.00 thru slot	.375	3.00	2.00	1.00	138.00	URCN-1724
URCN-1736		31.00		41.50									180.00	URCN-1736
URCN-1748		43.00		53.50									219.00	URCN-1748
URCN-1760		55.00		65.50									258.00	URCN-1760
URCN-1772		67.00		77.50									300.00	URCN-1772
URCN-1784		79.00		89.50									342.00	URCN-1784
URCN-2036	10.75	30.00	6.88	42.63	8.00	11.50	5.00	.781 x 1.25 thru slot	.50	4.00	3.00	1.25	620.00	URCN-2036
URCN-2048		42.00		54.63									670.00	URCN-2048
URCN-2060		54.00		66.63									730.00	URCN-2060
URCN-2072		66.00		78.63									820.00	URCN-2072
URCN-2084		78.00		90.63									870.00	URCN-2084

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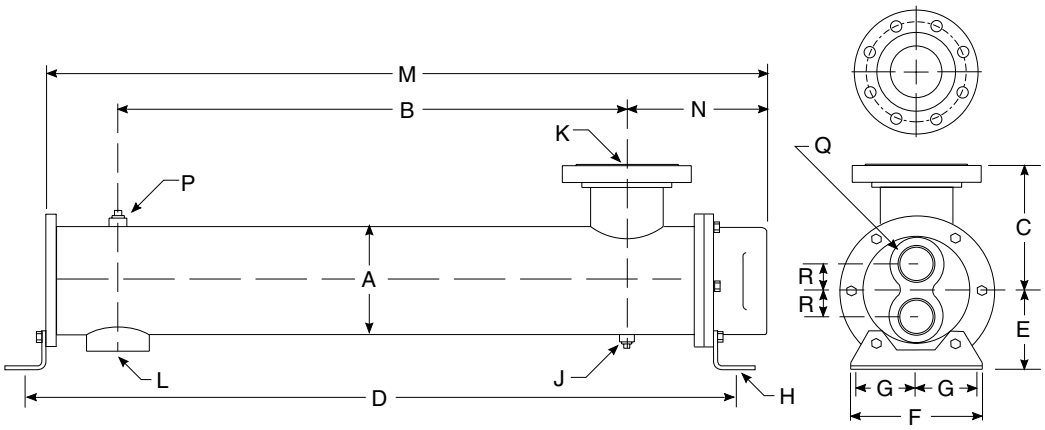
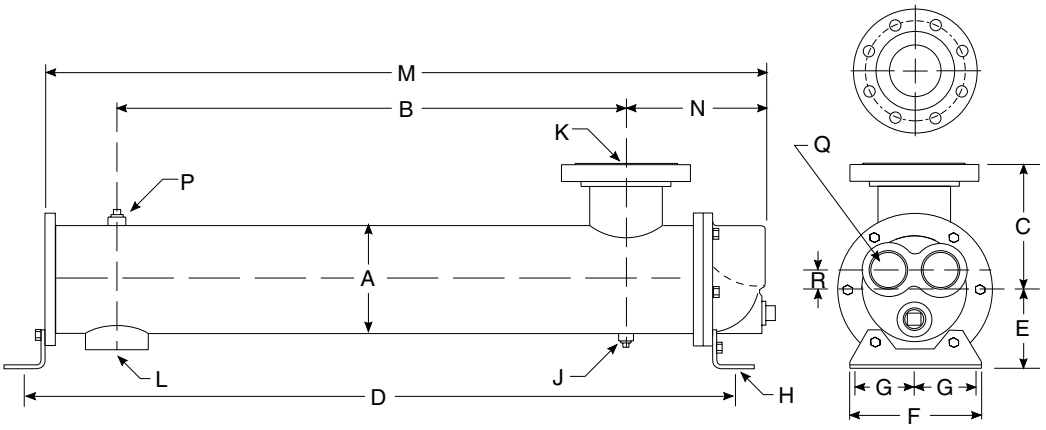
UCF Series *dimensions*

FIXED TUBE BUNDLE *(U-TUBE DESIGN)*



TWO PASS (TP)

Model	M	N	Q NPT	R
UCF-1024	28.88	6.43	1.50	1.19
UCF-1036	40.88			
UCF-1048	52.88			
UCF-1224	29.17	7.23	2.00	1.44
UCF-1236	41.17			
UCF-1248	53.17			
UCF-1260	65.17			
UCF-1272	77.17			
UCF-1284	89.17			
UCF-1724	30.13	8.64	2.50	1.88
UCF-1736	42.13			
UCF-1748	54.13			
UCF-1760	66.13			
UCF-1772	78.13			
UCF-1784	90.13			
UCF-2036	43.91	11.07	3.00	2.50
UCF-2048	55.91			
UCF-2060	67.91			
UCF-2072	79.91			
UCF-2084	91.91			



FOUR PASS (FP)

Model	M	N	Q NPT	R	S
UCF-1024	29.21	6.77	1.00	.75	1.19
UCF-1036	41.21				
UCF-1048	53.21				
UCF-1224	29.58	7.64	1.50	1.06	1.44
UCF-1236	41.58				
UCF-1248	53.58				
UCF-1260	65.58				
UCF-1272	77.58				
UCF-1284	84.58				
UCF-1724	29.78	8.29	2.00	1.38	1.88
UCF-1736	41.78				
UCF-1748	53.78				
UCF-1760	65.78				
UCF-1772	77.78				
UCF-1784	89.78				
UCF-2036	44.00	11.16	2.50	1.75	2.50
UCF-2048	56.00				
UCF-2060	68.00				
UCF-2072	80.00				
UCF-2084	92.00				

Model	A	B	C	D	E	F	G	H	J NPT	K ANSI Flange	L NPT	P NPT	Weight	Model
UCF-1024	5.25	19.75	7.63	29.13	4.00	5.25	2.00	.44 x 1.00 thru slot	.375	3.00	1.50	.75	55.00	UCF-1024
UCF-1036		31.75		41.13									70.00	UCF-1036
UCF-1048		43.75		53.13									85.00	UCF-1048
UCF-1224	6.25	19.00	8.13	29.59	4.50	6.25	2.50	.44 x 1.00 thru slot	.375	4.00	2.00	.75	83.00	UCF-1224
UCF-1236		31.00		41.59									108.00	UCF-1236
UCF-1248		43.00		53.59									132.00	UCF-1248
UCF-1260		55.00		65.59									158.00	UCF-1260
UCF-1272		67.00		77.59									182.00	UCF-1272
UCF-1284		79.00		89.59									206.00	UCF-1284
UCF-1724	8.00	18.25	9.00	29.50	5.75	8.25	3.50	.44 x 1.00 thru slot	.375	5.00	2.00	1.00	138.00	UCF-1724
UCF-1736		30.25		41.50									180.00	UCF-1736
UCF-1748		42.25		53.50									219.00	UCF-1748
UCF-1760		54.25		65.50									258.00	UCF-1760
UCF-1772		66.25		77.50									300.00	UCF-1772
UCF-1784		78.25		89.50									342.00	UCF-1784
UCF-2036	10.75	29.00	10.38	42.63	8.00	11.50	5.00	.781 x 1.25 thru slot	.50	6.00	3.00	1.25	620.00	UCF-2036
UCF-2048		41.00		54.63									670.00	UCF-2048
UCF-2060		53.00		66.63									730.00	UCF-2060
UCF-2072		65.00		78.63									820.00	UCF-2072
UCF-2084		76.00		90.63									870.00	UCF-2084

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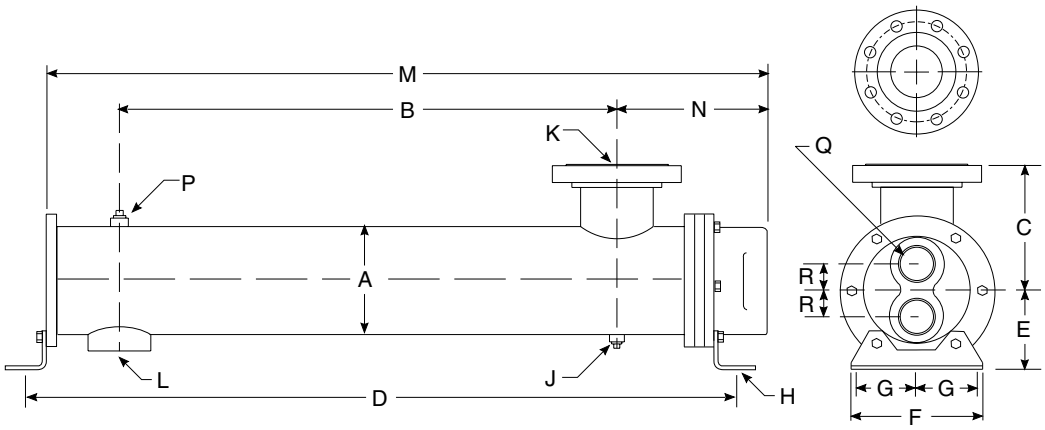
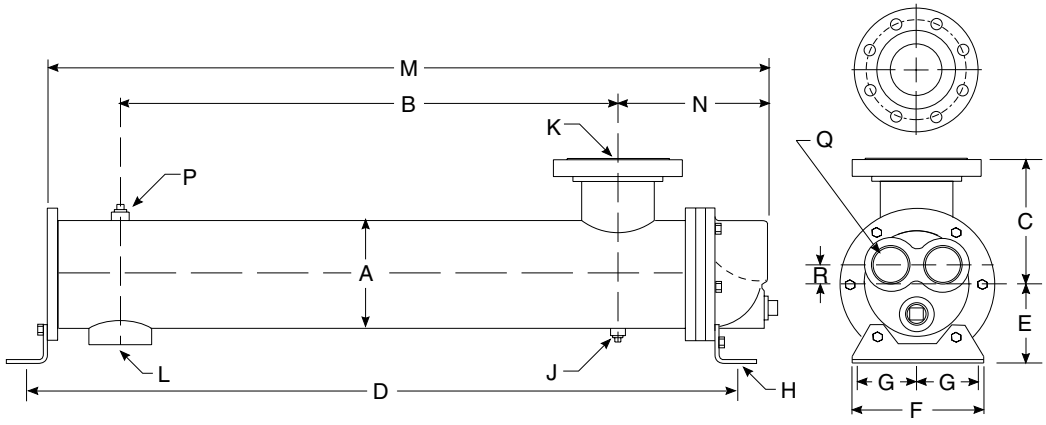
REMOVABLE TUBE BUNDLE *(U-TUBE DESIGN)*



TWO PASS (TP)

Model	M	N	Q NPT	R
URCF-1024	28.88	6.43	1.50	1.19
URCF-1036	40.88			
URCF-1048	52.88			
URCF-1224	29.17	7.23	2.00	1.44
URCF-1236	41.17			
URCF-1248	53.17			
URCF-1260	65.17			
URCF-1272	77.17			
URCF-1284	89.17			
URCF-1724	30.13	8.64	2.50	1.88
URCF-1736	42.13			
URCF-1748	54.13			
URCF-1760	66.13			
URCF-1772	78.13			
URCF-1784	90.13			
URCF-2036	43.91	11.07	3.00	2.50
URCF-2048	55.91			
URCF-2060	67.91			
URCF-2072	79.91			
URCF-2084	91.91			



FOUR PASS (FP)

Model	M	N	Q NPT	R	S
URCF-1024	29.21	6.77	1.00	.75	1.19
URCF-1036	41.21				
URCF-1048	53.21				
URCF-1224	29.58	7.64	1.50	1.06	1.44
URCF-1236	41.58				
URCF-1248	53.58				
URCF-1260	65.58				
URCF-1272	77.58				
URCF-1284	84.58				
URCF-1724	29.78	8.29	2.00	1.38	1.88
URCF-1736	41.78				
URCF-1748	53.78				
URCF-1760	65.78				
URCF-1772	77.78				
URCF-1784	89.78				
URCF-2036	44.00	11.16	2.50	1.75	2.50
URCF-2048	56.00				
URCF-2060	68.00				
URCF-2072	80.00				
URCF-2084	92.00				

COMMON DIMENSIONS

Model	A	B	C	D	E	F	G	H	J NPT	K ANSI Flange	L NPT	P NPT	Weight	Model
URCF-1024	5.25	19.75	7.63	29.13	4.00	5.25	2.00	.44 x 1.00 thru slot	.375	3.00	1.50	.75	55.00	URCF-1024
URCF-1036		31.75		41.13									70.00	URCF-1036
URCF-1048		43.75		53.13									85.00	URCF-1048
URCF-1224	6.25	19.00	8.13	29.59	4.50	6.25	2.50	.44 x 1.00 thru slot	.375	4.00	2.00	.75	83.00	URCF-1224
URCF-1236		31.00		41.59									108.00	URCF-1236
URCF-1248		43.00		53.59									132.00	URCF-1248
URCF-1260		55.00		65.59									158.00	URCF-1260
URCF-1272		67.00		77.59									182.00	URCF-1272
URCF-1284		79.00		89.59									206.00	URCF-1284
URCF-1724	8.00	18.25	9.00	29.50	5.75	8.25	3.50	.44 x 1.00 thru slot	.375	5.00	2.00	1.00	138.00	URCF-1724
URCF-1736		30.25		41.50									180.00	URCF-1736
URCF-1748		42.25		53.50									219.00	URCF-1748
URCF-1760		54.25		65.50									258.00	URCF-1760
URCF-1772		66.25		77.50									300.00	URCF-1772
URCF-1784		78.25		89.50									342.00	URCF-1784
URCF-2036	10.75	29.00	10.38	42.63	8.00	11.50	5.00	.781 x 1.25 thru slot	.50	6.00	3.00	1.25	620.00	URCF-2036
URCF-2048		41.00		54.63									670.00	URCF-2048
URCF-2060		53.00		66.63									730.00	URCF-2060
URCF-2072		65.00		78.63									820.00	URCF-2072
URCF-2084		76.00		90.63									870.00	URCF-2084

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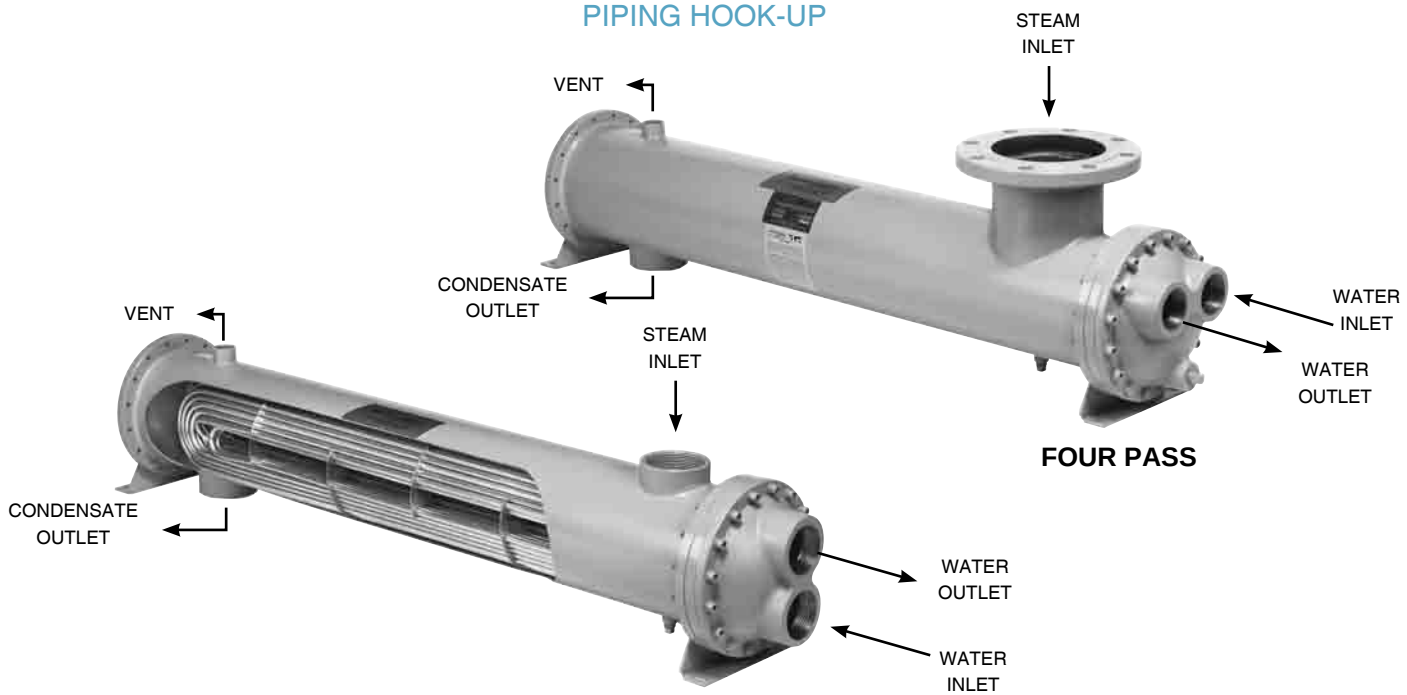
PIPING HOOK-UP



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 steam system design, pressure and temperature ratings, and steam piping assembly. Verify the service conditions

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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 steam through the shell side and the liquid to be heated through the tube side. The indicated port assembly sequence presented in the installation diagram maximizes the performance and minimizes the possibility of failure. American Industrial does not recommend that steam be applied to the tube side. Failure to properly install the heat exchanger with the steam on the shell side and the liquid through the tube side could result in damage to the heat exchanger or personal injury. American Industrial does not warranty any product for misapplication. Installation may be vertical or horizontal or a combination thereof. However, the installation must allow for complete draining of condensate from the heat exchanger shell side and liquid tube side regardless of two pass or four pass construction. Complete drainage is important to prevent the heat exchanger from loosing efficiency, over-heating of a fluid, or mineral deposit buildup. The capacity of the boiler should be checked to be certain that it is sufficiently sized and matched to the heat exchangers capacity capability. Some method of controlling steam flow and pressure to the heat exchanger should be provided and installed in accordance with the manufacturers instructions by a qualified person.

h) For removable tube bundle heat exchangers, provide sufficient clearance at the stationary tube-sheet end to allow for the removal of the tube bundle from the shell. In some cases it is possible to remove the end bonnet to aid in cleaning of the tubes without removing the tube bundle. Allow accessible room for scheduled cleaning as needed. For more information please contact American Industrial.

i) Liquid flow carrying lines should be sized to handle the appropriate flow and to meet system pressure drop requirements based upon the systems parameters, and not based upon the units supply and return connection size. If preventative filtration is used it should be located ahead of the heat exchanger on the tube side to catch any scale or sludge from the system before it enters. Failure to install filtration ahead of the heat exchanger could lead to possible heat exchanger plugging and result in failure due to high pressure or reduced performance.

j) Standard fixed bundle shell & tube heat exchangers 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 series SRCS with a floating tube-sheet, URCS or URCF U-tube, or EAB with expansion joint to reduce the potential for the effects of thermal shock.

k) Water requirements vary from location to location. If the source of 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.

l) For steam service or other related application questions not listed, 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. Take corrective measures prior to return to service. Any corroded surfaces should be cleaned and recoated with paint.

b) 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.

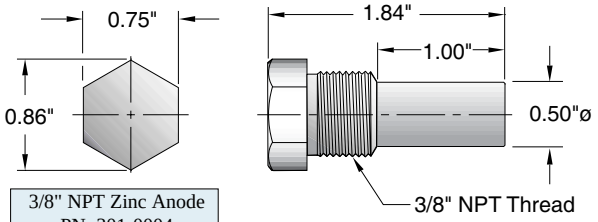
c) Zinc anodes are normally used to reduce the risk of failure due to electrolysis. Zinc anodes are a sacrificial component designed to wear and dissolve through normal use. Normally, zinc anodes are applied to the water supply side of the heat exchanger. Depending upon the amount of corrosive action, 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.

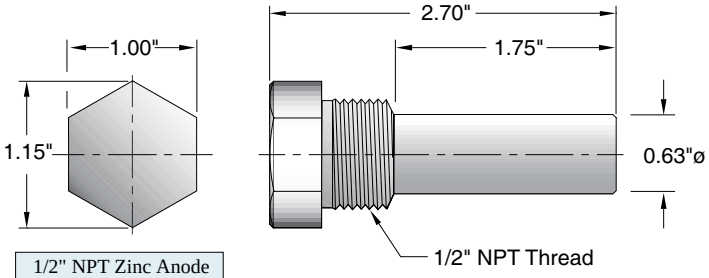
If substantial wear occurs or zinc dissolves without replacement, premature failure or permanent damage may occur to the heat exchanger. American Industrial does not warranty customer applications. It is the responsibility of the customer to verify and apply the proper system materials of construction 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

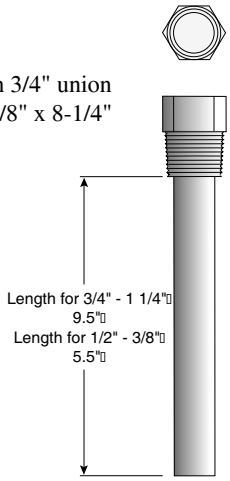
 355 American Industrial Drive LaCrosse, VA 23950 tel: 434-757-1800 fax: 434-757-1810 email: sales@aihti.com

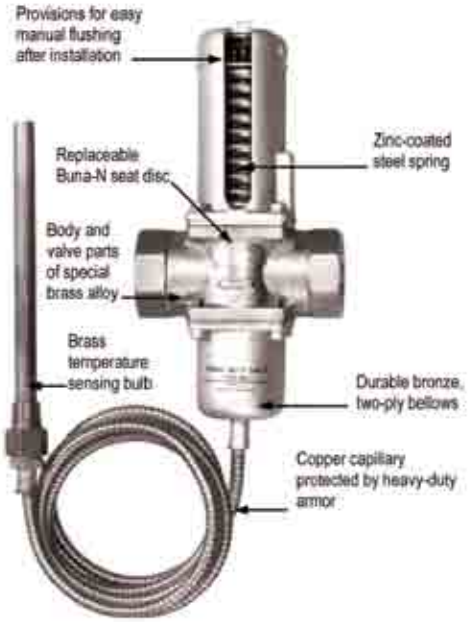
56T THERMOSTATIC MODULATING WATER VALVE WITH BULB WELL ASSEMBLY

(for Shell & Tube Heat Exchangers And Air/Oil Coolers)

SPECIFICATIONS

Sizes	0.375", 0.50", 0.75", 1.00", 1.25" FPT
Fluid Pressure	125psi (max.)
Standard Temperature	40° - 100° F., 60° - 140° F., 100° - 175° F., 125° - 200° F., 140° - 240° F., 200° - 275°F.
Body	Brass alloy casting
Valve Parts	Brass alloy
Standard Capillary Length	6' & 20' foot
Standard Bulbs	For 3/8" & 1/2" valve sizes: 5/8" x 6 with 3/4" union connections. For 3/4" & 1" valve sizes: 5/8" x 8-1/4" with 3/4" union connections. Stainless steel construction available.
Standard Bulb Mounting	3/4" NPT
Seat Disk	Buna-N-replaceable
Seat Bead	Stainless Steel - replaceable





APPLICATION INFORMATION

- Built for rugged machine tool and hydraulic applications.
- Adjustable temperature range to meet your requirements.
- Quick response to temperature changes.
- Extra heavy-duty direct acting bellows for longer service.

Note: Please consult factory if a non-cataloged temperature is required.

The type 56-T valve gives smooth regulation of water and other fluids. It's designed for the most rugged application. For example: hydraulic power packaging equipment, hydraulic presses, plastic molding equipment, and anywhere reliability in temperature control is demanded. The type 56-t valve is a better designed product that won't leak or chatter. To insure dependability, every valve is factory tested three times in different temperature baths. Extra performance can be expected of the bellows also. They are direct acting with sturdy walls, and the inner spring is zinc coated. The seat beads are stainless steel to resist the erosive effects of *wire drawing* and provide longer life for your needs. Additional features include mounting in any position, Buna-N seat disc, and manual flushing.

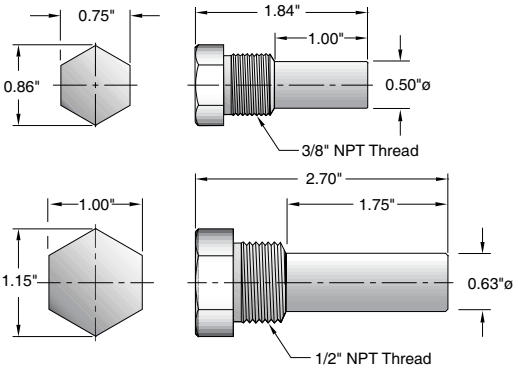
Thermostatic Modulating Water Valve

Part Number	Description	
	Size NPT	Temp. Range
310-1001	3/8"	60 °F - 140 °F
310-1004	1/2"	60 °F - 140 °F
310-1008	3/4"	60 °F - 140 °F
310-1014	1"	60 °F - 140 °F
310-1020	1-1/4"	60 °F - 140 °F
310-1046	1-1/2"	60 °F - 140 °F
310-1047	2"	60 °F - 140 °F
310-1025	3/8"	100 °F - 175 °F
310-1005	1/2"	100 °F - 175 °F
310-1010	3/4"	100 °F - 175 °F
310-1015	1"	100 °F - 175 °F
310-1026	1-1/4"	100 °F - 175 °F

Bulb Well	
Part Number Brass	Part Number Stainless Steel
310-2001	310-2003
310-2001	310-2003
310-2002	310-2004
310-2002	310-2004
310-2002	310-2004
310-2001	310-2003
310-2001	310-2003
310-2002	310-2004
310-2002	310-2004
310-2002	310-2004

Zinc Anode List Prices

Description	
Part Number	Size NPT
301-0004	3/8" NPT
301-0003	1/2" NPT



note: AIHTI reserves the right to make reasonable design changes without notice.

355 American Industrial Drive LaCrosse, VA 23950 tel: 434-757-1800 fax: 434-757-1810 email: sales@aihti.com