HEATX

UCN, URCN & UCF, URCF SERIES

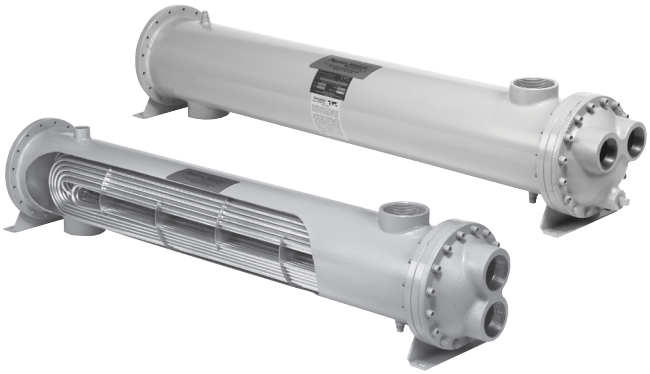
U-TUBE FIXED & REMOVEABLE BUNDLE

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 any application.
- Computer generated data sheet available for any application
- As an option, available in ASME Code and Certified

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.

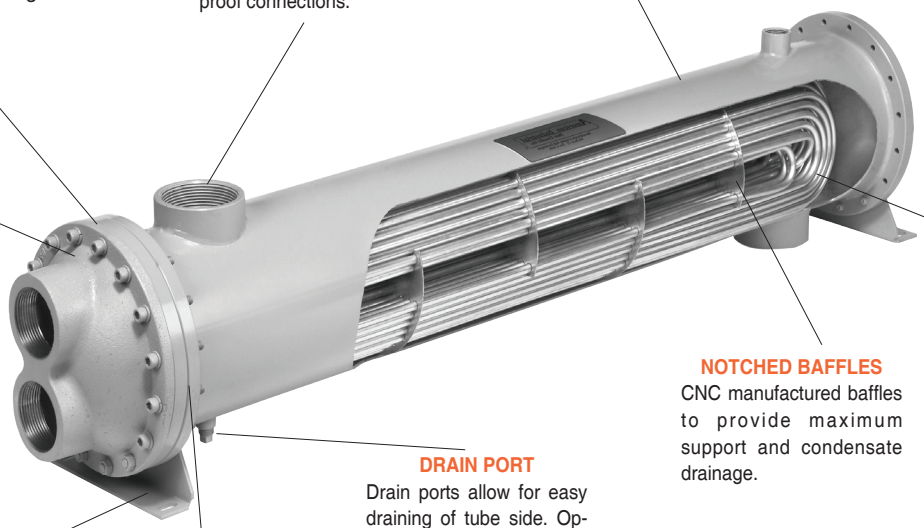
STANDARD URCS STOCK UNIT FOR STEAM APPLICATION

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 140 for detailed dimension.

ACW / AOCHW SERIES

Can be use as a Space heater by using steam or hot water

UCN, URCN, UCF & URCF Series *construction*



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.

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

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.

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
4 = 1/4"
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

End Bonnets
Blank = Cast Iron
Options
B = Bronze
SB = Stainless Steel

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	Aluminum / Brass	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)

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

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

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

Step 4. Calculate the surface area required.

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

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

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

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.

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

Step 4. Calculate the Capacity Factor F_c for steam.

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

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

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

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

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

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.

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

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

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

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	.874
.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	.858	.98	.991
.24	.533	.49	.715	.74	.864	.99	.995

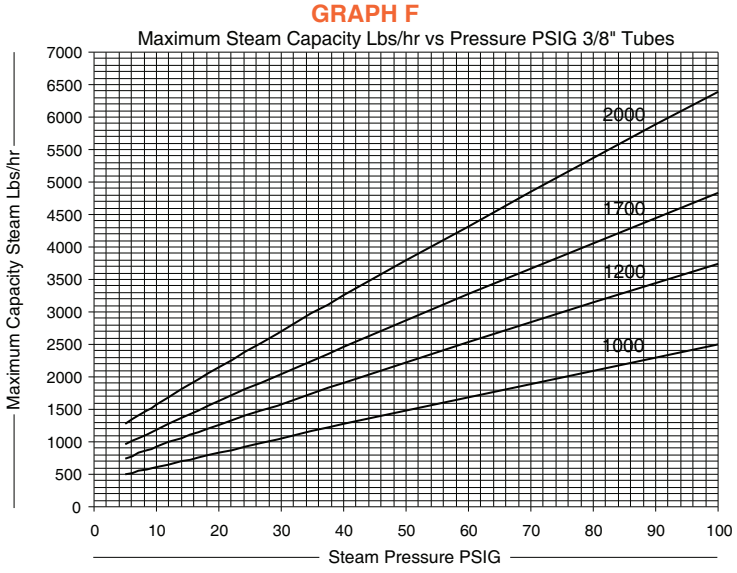
TABLE D- Surface Area

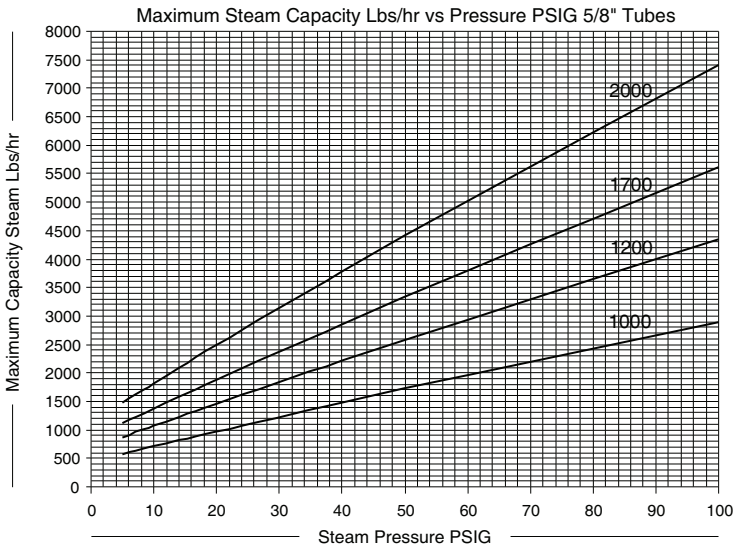
Model Number	Surface Area in Sq.ft. 3/8" O.D Tubing Code 6	Surface Area in Sq.ft. 5/8" O.D Tubing Code 10	Model Number	Surface Area in Sq.ft. 3/8" O.D Tubing Code 6	Surface Area in Sq.ft. 5/8" O.D Tubing Code 10
1024	11.0	6.5	1724	32.2	17.0
1036	16.5	9.8	1736	48.3	25.5
1048	22.0	13.0	1748	64.4	34.0
			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		5/8" TP		3/8" FP		5/8" FP	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	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

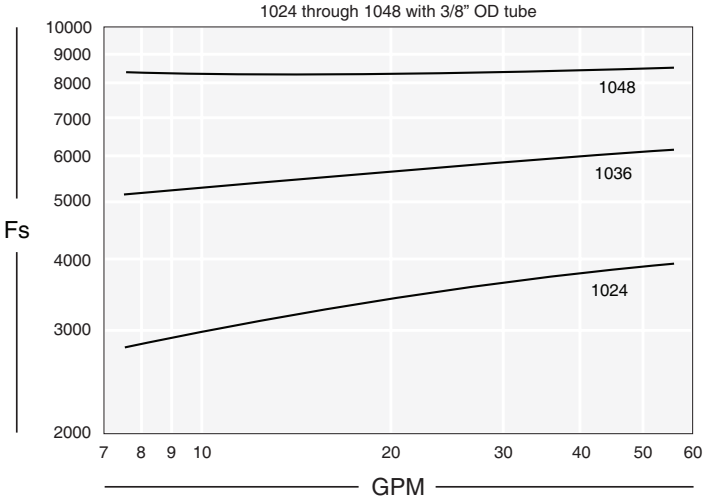
GRAPH F



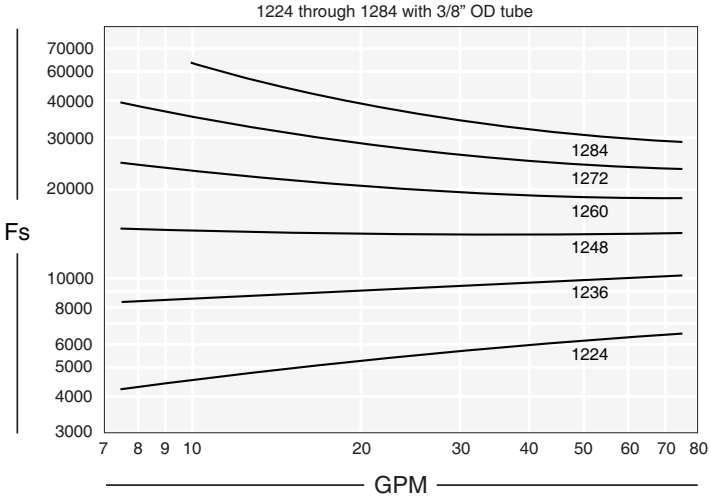


UCN, URCN, UCF & URCF Series *selection*

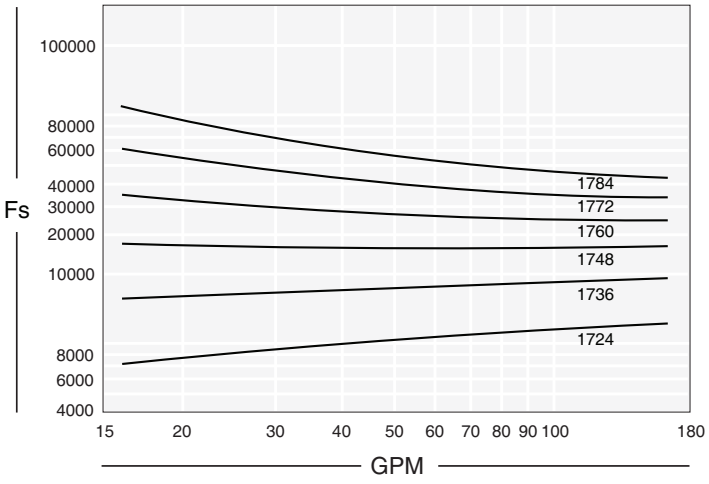
1024 through 1048 with 3/8" OD tube



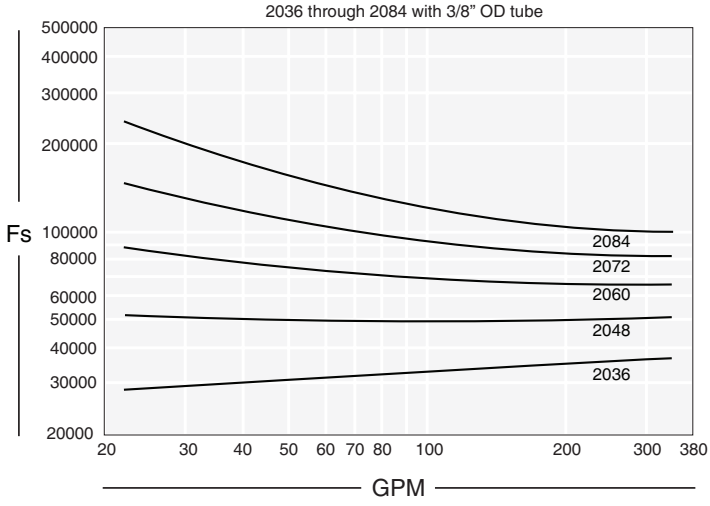
1224 through 1284 with 3/8" OD tube



1724 through 1784 with 3/8" OD tube

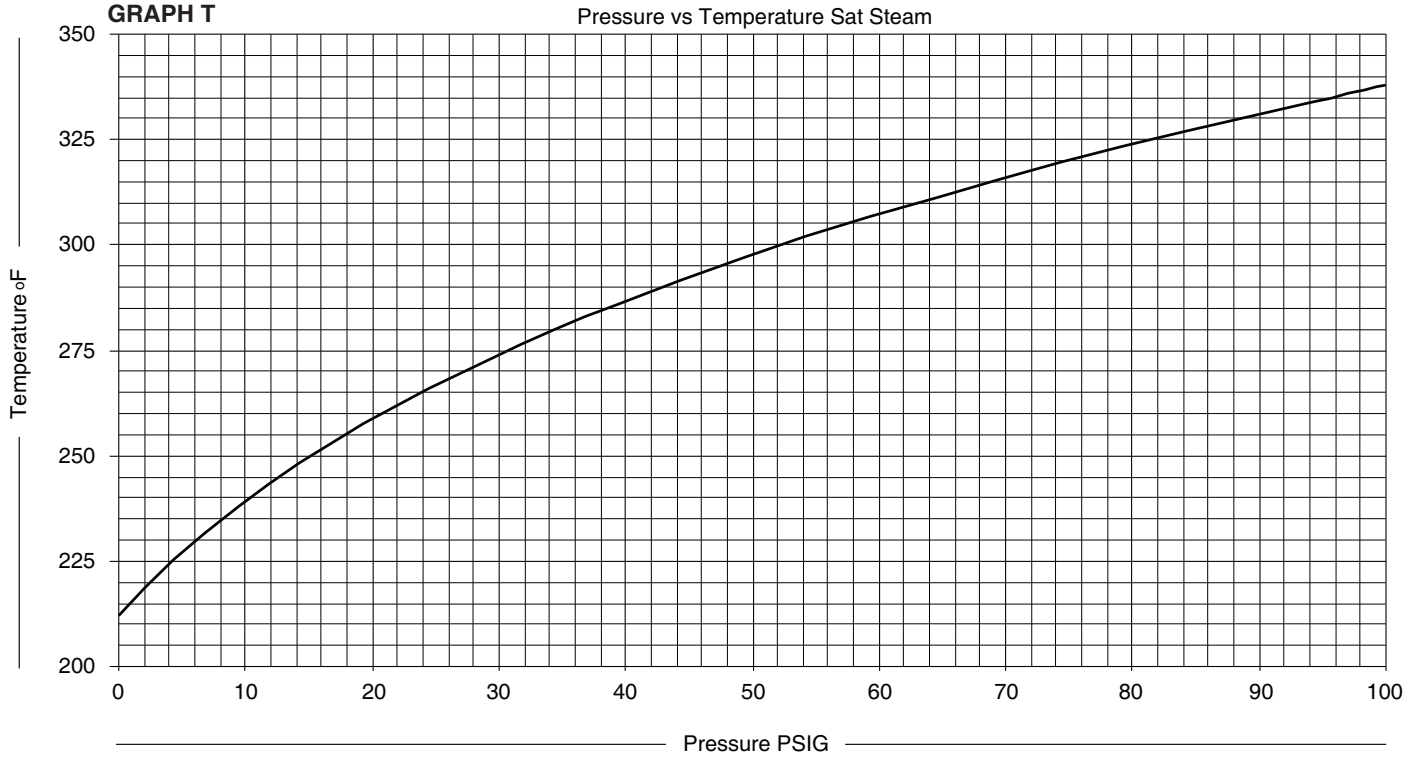


2036 through 2084 with 3/8" OD tube

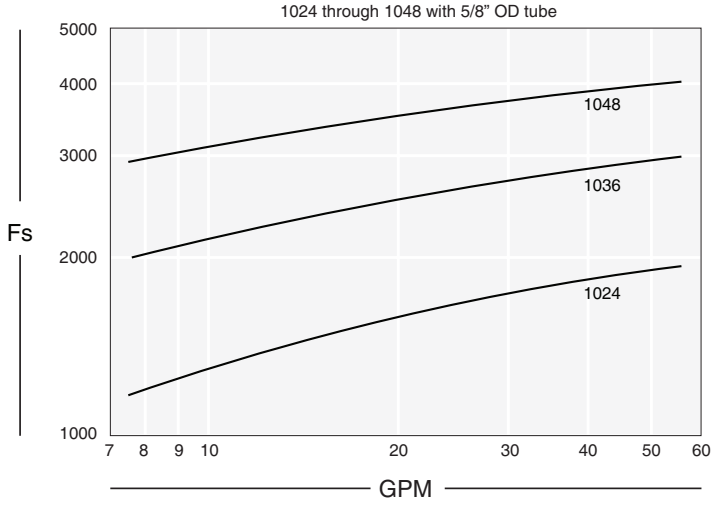


GRAPH T

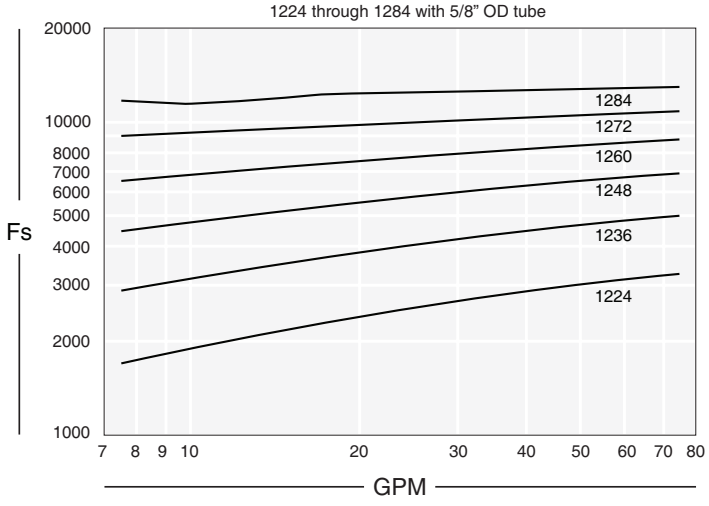
Pressure vs Temperature Sat Steam



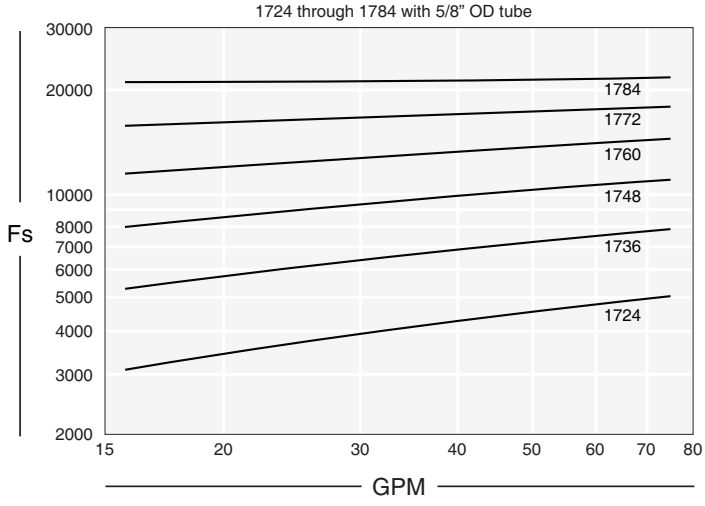
1024 through 1048 with 5/8" OD tube



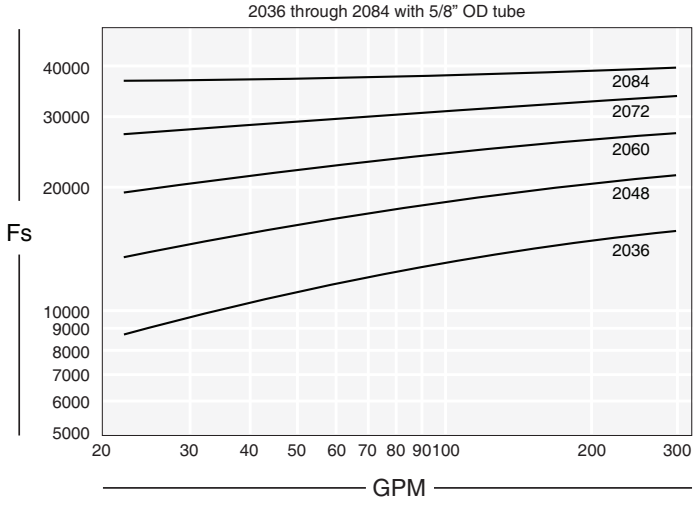
1224 through 1284 with 5/8" OD tube



1724 through 1784 with 5/8" OD tube

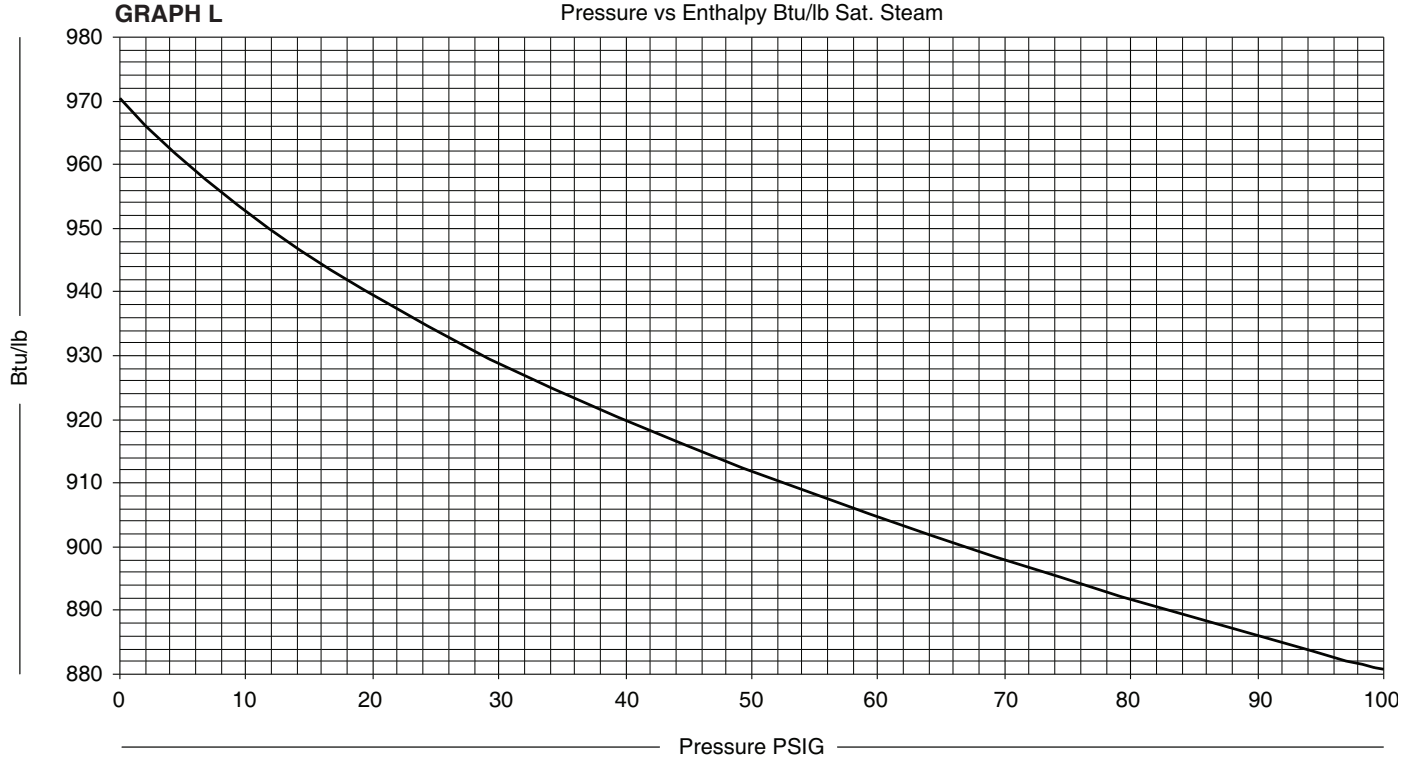


2036 through 2084 with 5/8" OD tube

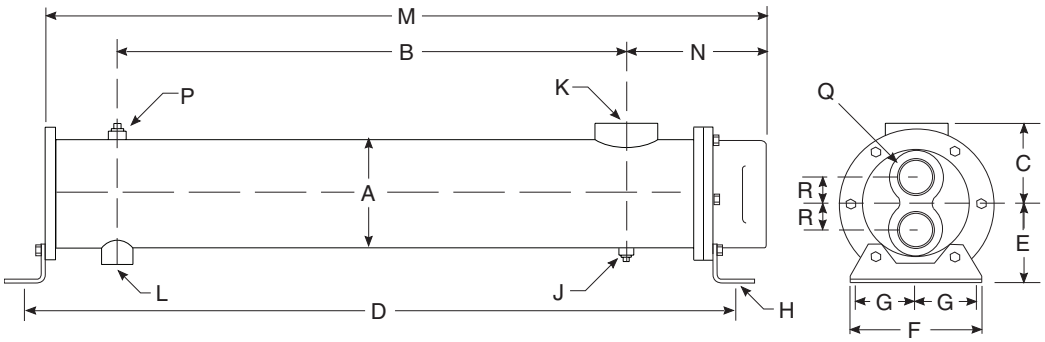


GRAPH L

Pressure vs Enthalpy Btu/lb Sat. Steam

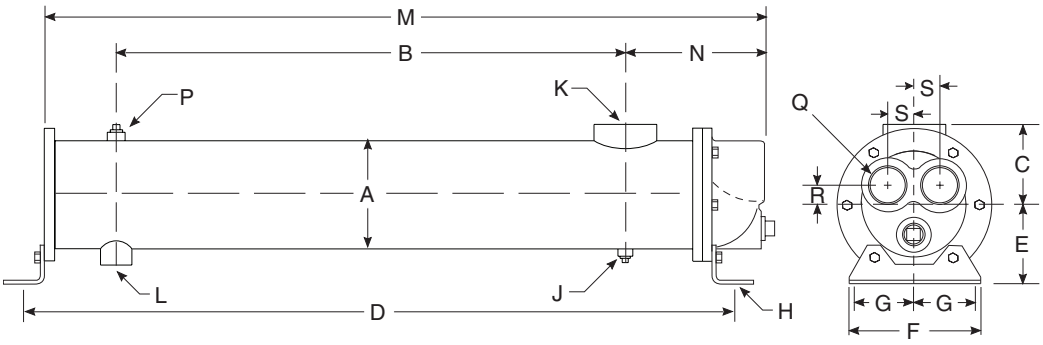


UCN Series



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			

TWO PASS (TP)



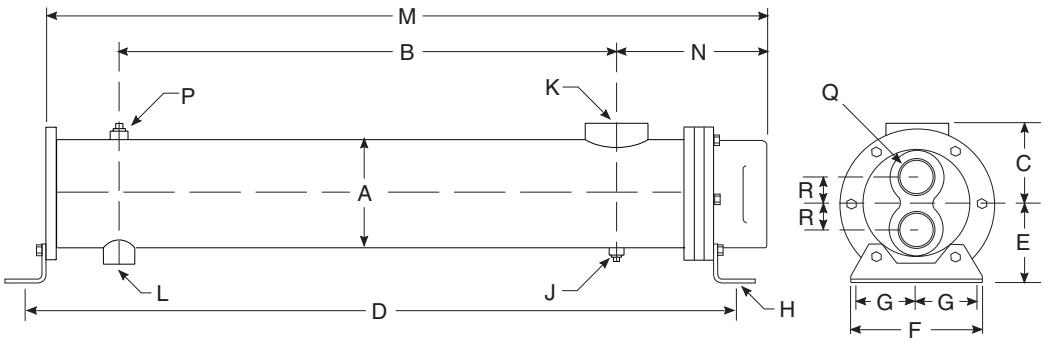
Model	M	N	Q NPT	R	S
UCN-1024	29.21	6.34	1.00	.75	1.19
UCN-1036	41.21				
UCN-1048	53.21				
UCN-1224	29.58	7.08	1.50	1.06	1.44
UCN-1236	41.58				
UCN-1248	53.58				
UCN-1260	65.58				
UCN-1272	77.58				
UCN-1284	84.58				
UCN-1724	29.78	7.53	2.00	1.38	1.88
UCN-1736	41.78				
UCN-1748	53.78				
UCN-1760	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				

FOUR PASS (FP)

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

URCN *dimensions*



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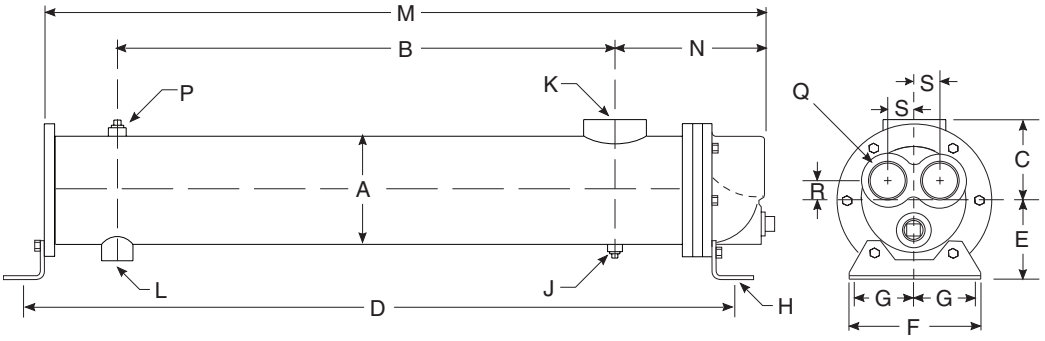
URCN-1224	29.17	6.67	2.00	1.44
URCN-1236	41.17			
URCN-1248	53.17			
URCN-1260	65.17			
URCN-1272	77.17			
URCN-1284	89.17			
URCN-1724	30.13	7.88	2.50	1.88
URCN-1736	42.13			
URCN-1748	54.13			
URCN-1760	66.13			
URCN-1772	78.13			
URCN-1784	90.13			
URCN-2036	43.91	10.16	3.00	2.50
URCN-2048	55.91			
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				

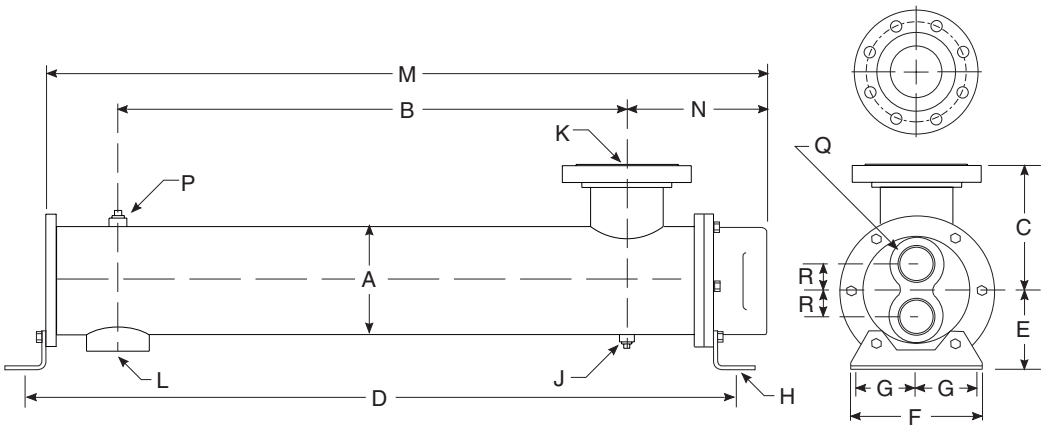
FOUR PASS (FP)

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

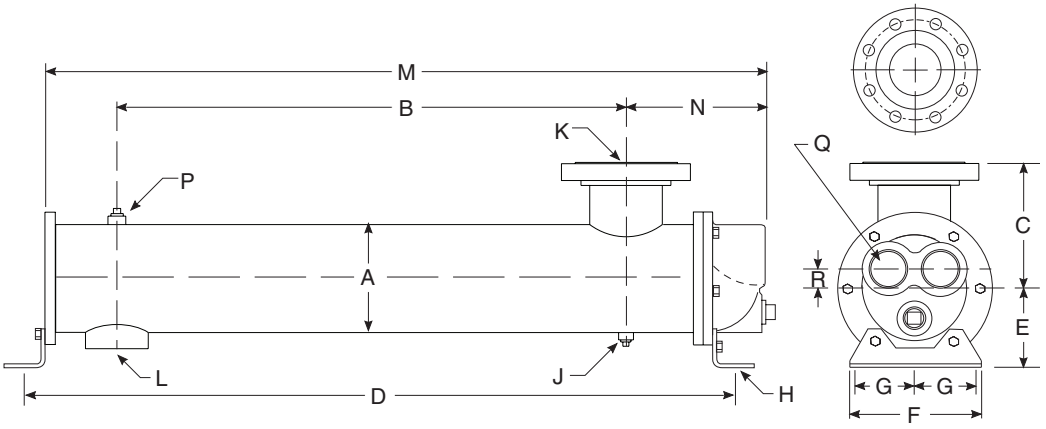
UCF Series *dimensions*

FIXED TUBE BUNDLE *(U-TUBE DESIGN)*



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			

TWO PASS (TP)



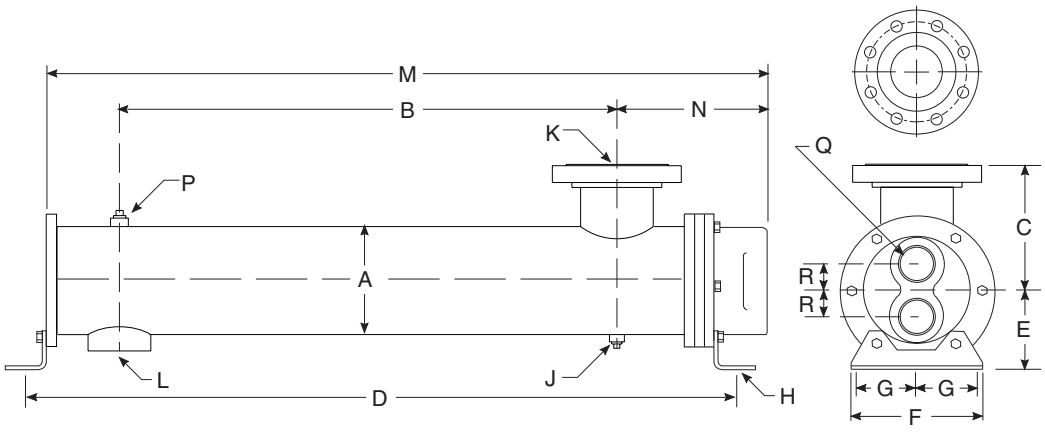
Model	M	N	Q NPT	R	S
UCF-1024	29.21	6.77	1.00	.75	1.19
UCF-1036	41.21				
UCF-1048	53.21				
UCF-1224	29.58	7.64	1.50	1.06	1.44
UCF-1236	41.58				
UCF-1248	53.58				
UCF-1260	65.58				
UCF-1272	77.58				
UCF-1284	84.58				
UCF-1724	29.78	8.29	2.00	1.38	1.88
UCF-1736	41.78				
UCF-1748	53.78				
UCF-1760	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				

FOUR PASS (FP)

COMMON DIMENSIONS

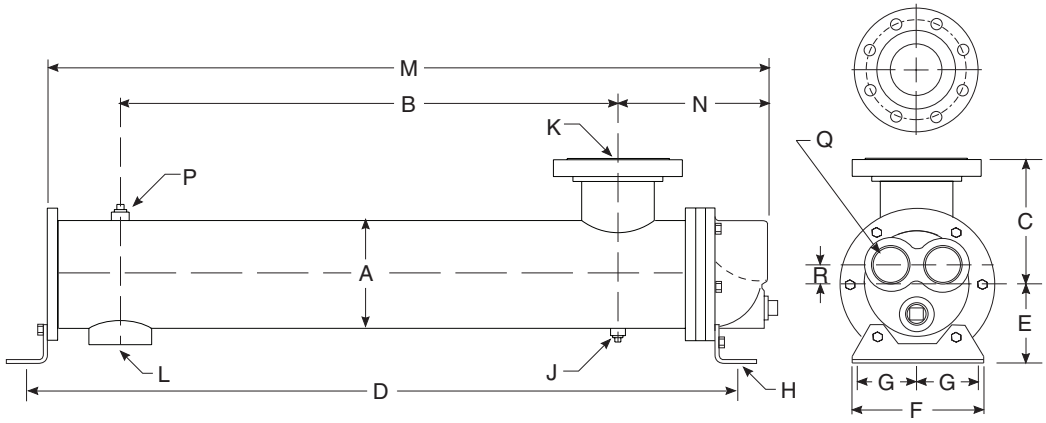
Model	A	B	C	D	E	F	G	H	J NPT	K ANSI Flange	L NPT	P NPT	Weight	Model
UCF-1024	5.25	19.75	7.63	29.13	4.00	5.25	2.00	.44 x 1.00 thru slot	.375	3.00	1.50	.75	55.00	UCF-1024
UCF-1036		31.75		41.13									70.00	UCF-1036
UCF-1048		43.75		53.13									85.00	UCF-1048
UCF-1224	6.25	19.00	8.13	29.59	4.50	6.25	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

REMOVABLE TUBE BUNDLE *(U-TUBE DESIGN)*



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			

TWO PASS (TP)



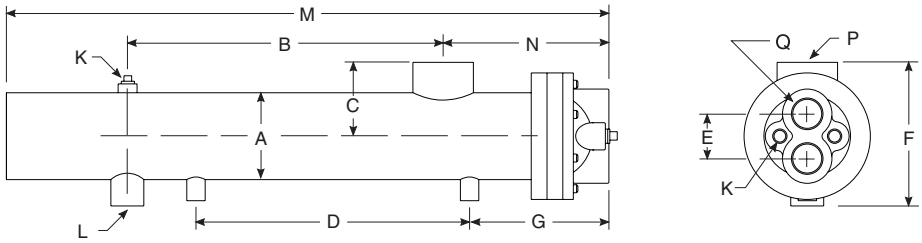
Model	M	N	Q NPT	R	S
URCF-1024	29.21	6.77	1.00	.75	1.19
URCF-1036	41.21				
URCF-1048	53.21				
URCF-1224	29.58	7.64	1.50	1.06	1.44
URCF-1236	41.58				
URCF-1248	53.58				
URCF-1260	65.58				
URCF-1272	77.58				
URCF-1284	84.58				
URCF-1724	29.78	8.29	2.00	1.38	1.88
URCF-1736	41.78				
URCF-1748	53.78				
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				

FOUR PASS (FP)

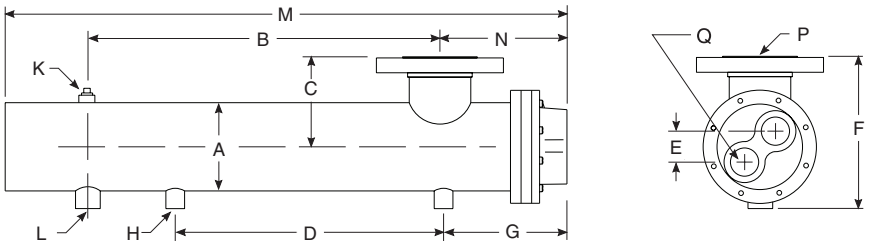
COMMON DIMENSIONS

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

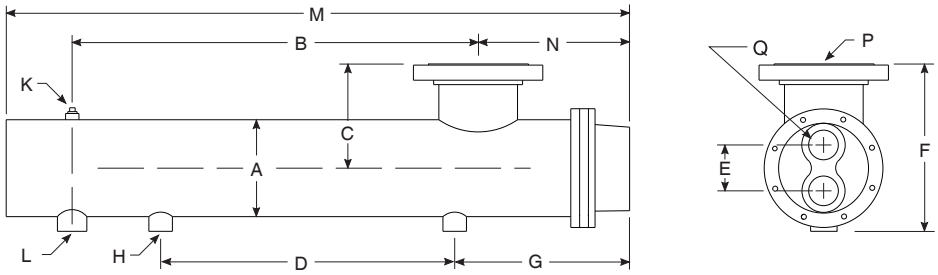
Standard URCS stock unit for steam application



URCS-830



URCS-1230, URCS-1242, URCS-1254



URCS-1754

COMMON DIMENSIONS

MODEL	A	B	C	D	E	F	G	H NPT	K NPT	L NPT	M	N	P	Q NPT	WEIGHT
URCS-830-25180	4.25	15.00	3.56	13.00	2.38	6.81	5.75	1.00	.38	1.25	28.63	7.88	2.5" NPT	1.25	35
URCS-1230-25182	6.25	13.00	6.38	13.00	3.12	10.75	5.75	1.00	—	1.50	27.75	9.00	4" ANSI	2.00	69
URCS-1242-25183	6.25	25.00	6.38	19.00	3.12	10.75	8.75	1.00	—	1.50	39.75	9.00	4" ANSI	2.00	87
URCS-1254-25184	6.25	37.00	6.38	25.00	3.12	10.75	11.75	1.00	—	1.50	51.75	9.00	4" ANSI	2.00	105
URCS-1754-25185	8.00	34.50	8.75	25.00	4.50	14.00	14.88	1.25	—	2.00	53.00	12.88	6" ANSI	2.50	187

STANDARD CONSTRUCTION MATERIALS & RATINGS

Construction Material		Optional Material	Standard Unit Ratings
Shell	Steel	Steel	Operating Pressure Tubes 100 psig Operating Pressure Shell 100 psig Operating Temperature 400 °F
Tubes	Copper	90/10 Cu. Ni. / S. Steel	
Baffle	Aluminum / Brass	Brass	
End Bonnet	Cast Iron	Brass / Stainless Steel	
Gasket	Viton O-Ring		

SURFACE AREA

Model Number	Surface Area in Sq.ft.	
	1 / 4" O.D. Tubing	3 / 8" O.D. Tubing
URCS-830-25180	15.0	—
URCS-1230-25182	—	21.5
URCS-1242-25183	—	30.2
URCS-1254-25184	—	38.8
URCS-1754-25185	—	72.4

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 grade of oil or apply a 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.

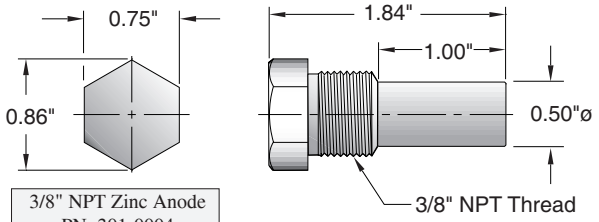
d) Standard Enamel Coating: American Industrial provides its standard products with a normal base coat of oil base air cure enamel paint. The enamel paint is applied as a temporary protective and esthetic coating prior to shipment. While the standard enamel coating is durable, American Industrial does 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.

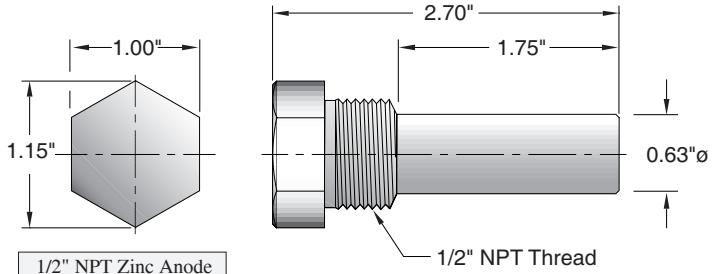
f) American Industrial recommends that the equipment supplied should be installed by qualified personnel who have solid understanding of system design, pressure and temperature ratings, and piping assembly. Verify the service conditions of the system prior to applying any shell & tube heat exchanger. 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 hot fluid to be cooled through the shell side and the cold fluid through the tube side. The indicated port assembly sequence in the installation diagram maximizes the performance, and minimizes the possibility of thermal shock. In instances where the fluids are required to be reversed, hot fluid in the tubes and cold fluid in the shell the heat exchanger will work with reduced performance. Installation may be vertical or horizontal or a combination thereof. However, the installation must allow for complete draining of the heat exchanger regardless of two pass or four pass construction. Complete drainage is important to prevent the heat exchanger from freezing, over-heating of a fluid, or mineral deposit buildup.
For removable bundle heat exchangers, provide sufficient clearance at the stationary tube-sheet end to allow for the removal of the tube bundle from the shell. Bonnet can be removed to aid in cleaning the tubes without disassembling the tube bundle. For more information please contact American Industrial.

h) It is recommended to use flexible hose wherever possible to reduce vibration and allow slight movement. However, hoses are not required. Hydraulic carrying lines should be sized to handle the appropriate flow and to meet system pressure drop requirements



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