73 SERIES

HEAT EXCHANGER MODEL 34

STAINLESS STEEL TUBES / COPPER FINS 12.1" × 10.0" × 2.6"

734SBC0

THERMATRON ENGINEERING, INC.

MODEL 734 73 SERIES

MODEL **734** is a mid-size model of the Thermatron Engineering **73** *SERIES* Heat Exchanger Family. Built to market-highest quality standards *MODEL* **734** features all-Stainless Steel tubing for ultra-clean or corrosive applications. *MODEL* **734** provides maximum reliability heat transfer for closed-loop cooling in medical and industrial lasers, fuel cells, instrumentation, and many diverse high-end electronics applications.

Thermatron also manufactures many custom configurations of *MODEL* **734** per specific dimensional and performance requirements. Please consult the factory for your application requirements.



SPECIFICATIONS

HX DESIGN:	Round tube / Wavy fin. Two tube-rows deep in air flow direction (deeper designs available upon request)	MAX. OPERATING PRESSURE:	150 PSIG continuous duty (higher pressure ratings available upon request)		
MATERIALS:	316L Stainless Steel tubes / C11000 Copper	MAX. OPERATING TEMPERATURE:	316C		
SIZE:	Air flow area 15.9" x 8", standard mounting	MAX. FAN OPERATING TEMPERATURE:	60C typical		
WEIGHT:	8.0 lbs (no fan), 12.1 lbs (with fan)	FITTINGS:	%" or ½" OD tubes, %" or ½" AN flare nuts, %" or ½" hose beads, ¼", %", or ½" NPTF		
FIN GEOMETRY:	Thermatron's unique riffled & corrugated wavy fin, 0.0053" thick, stacked 17.5 fins per inch, full collared		or NPTM, Metric, or any custom fitting specific to the application. All fittings also available with 90 degree bends rotated at any orientation. Alternate fittings available upon request. Brass, Stainless Steel, and other fitting materials available upon request.		
TUBE GEOMETRY:	(14) tubes per row x (2) rows = (28) total tubes. Tubes 0.375" OD x 0.028" wall				
	located on 0.750" centers. Rows located on 0.650" centers.	STANDARD FANS:	Orion OA254AP-11-1 (115VAC), Orion OA254AP-22-1 (230VAC), or Orion		
TUBE CIRCUIT:	Two parallel circuits of (14) tubes each. Alternate all-series circuit is available for reduced coolant flow rates.		OD254AP-24M (24VDC). Many other alternate fans are available or the hea exchanger can be provided without far		
MAX. RECOMMENDED FLOW:	(Tap water) 8 GPM for standard two- parallel tube circuits / 4 GPM for optional	THERMAL PERFORMANCE:	75-to-140 W/C pending fan selection and coolant flow (see performance curves)		
	all-series tube circuit	RoHS:	All standard 73 SERIES heat exchangers		
COOLANT COMPATIBILITY:	Corrosive coolants (Typically deionized water or other aggressive coolants)		can be made RoHS compliant upon request. Any alternate fans, sensors, or non-standard fitting may affect RoHS		
PRESSURE TEST:	100% pressure tested at 150 PSIG Nitrogen under water.		compliance. Please consult the factory.		

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SUPERIOR CONSTRUCTION

FINS: -

C11000 Copper, Oxygen-free high thermal conductivity (OFHC). Thermatron's unique riffled & corrugated wavy fin, 0.0053" thick, stacked 17.5 fins per inch. The highest thermal performer in its class worldwide. Mechanically-expanded full collar fin/tube interface for maximum heat transfer.

METAL JOINING: -

All joints precision TIG welded by Thermatron experts under Argon purge to keep tube interiors free of oxidation and ensure weld integrity. Thermatron TIG welds have no known life failures after 40+ years of field operation. All **73** *SERIES* heat exchangers are 100% pressure tested at 150 PSIG Nitrogen under water. Thermatron inspectors scribe their unique ID code on every HX to confirm successful pressure test.

EXTERIOR:

All **73** SERIES heat exchanger shrouds are 5052-H32 Aluminum \times 0.060" thick and have gold iridite finish.

QUALITY ASSURANCE:

All **73** *SERIES* heat exchangers are 100% pressure tested at 150 PSIG Nitrogen under water. Thermatron inspectors scribe their unique ID code on every HX to confirm successful pressure test.

WETTED INTERIOR:

Tubes, manifolds, return bends, and fittings 316L Stainless Steel. All core tubes 0.375" OD x 0.028" wall thickness. Precision "1D" tube bends are supported by internal mandrels for smooth ID flow, minimizing distortion and wall thinning.

DATE CODE:

All **73** *SERIES* heat exchangers are date coded by lot.

INTERNAL CLEANLINESS:

Industry-leading internal tube cleanliness, computer grade. High temperature / high flow flushes of Liqualin, Drycid and neutralizer, followed by COBRATEC 99 flush for corrosion inhibition.



O-O-C

MODEL **734 73** SERIES

FAN SELECTION

The intersection of the heat exchanger pressure curve (black curve) with the chosen fan performance curve is the expected air flow through the heat exchanger, assuming no additional air flow restrictions other than the heat exchanger itself (e.g. cabinet blockage, ducts, bends inair loop, dust filters, etc.) As a baseline, Fans A, B and C represent standard selections for 230VAC, 115VAC, and 24VDC respectively. If higher thermal performance is required a stronger (and louder) fan option like Fan D, E, or F can be selected to increase the airflow.

Air flow direction is available in two options (by flipping fan):

- **1.** *PUSH AIR* Air enters fan first and exhausts through HX last. Slightly better for applications cooling the water.
- 2. PULL AIR Air enters HX first and exhausts through fan last. Slightly better for applications cooling the air.

Air flow direction does not affect volumetric air flow.





PUMP SELECTION

MODEL 734 Heat Exchanger standard plumbing configuration has 28 tubes connected in two parallel circuits. This is an excellent configuration for larger heat exchangers since it offers both high thermal performance and reduced coolant pressure drop as shown by the blue line. Maximum recommended flow is 8 GPM in order to avoid long-term erosion corrosion. For coolant flows > 8 GPM MODEL 734 can also be offered with 7 or 14 parallel circuits. For coolant flows < 4 GPM *MODEL* 734 can also be offered with one all-Series coolant circuit as shown by the red line. The all-Series circuit maximizes coolant velocity and thermal performance improves +5% over standard two parallel circuits. Please contact Thermatron Engineering directly to discuss specific application requirements.



PERFORMANCE

Heat exchangers require some temperature difference between the entering liquid and entering air in order to transfer heat, the larger this temperature difference, the more heat can be transferred.

Thermal performance of all Thermatron Engineering heat exchangers is determined as follows:

COOLING THE WATER:

PERFORMANCE (W/C) =

Water Temp Enter HX (°C) - Air Temp Enter HX (°C)

Heat Load (W)

COOLING THE AIR:

PERFORMANCE (W/C) =

Air Temp Enter HX (°C) - Water Temp Enter HX (°C)

Heat Load (W)

THERMAL PERFORMANCE vs. AIRFLOW

Water Properties @ 40C, Air Properties @ 30C, 1 Bar



TABULATED PERFORMANCE

HEAT			FAN VOLTAGE	FAN NOISE	PRESSURE DROP & AIRFLOW	PRESSURE DROP & WATER FLOW	HEAT LOAD WHEN: (WATER TEMP IN) - (AIR TEMP IN) =			
EXCHANGER	EXCHANGER FAIN	FAIN P/IN					1C	10C	30C	50C
Model 734 Fan A		(1) ORION OA254AP-	230 VAC, 50 Hz	52 dB(A)	0.12 in H2O @ 186 ACFM	3.3 PSID @ 2.0 GPM	73.0 W	730 W	2191 W	3651 W
	Fan A					12.5 PSID @ 4.0 GPM	77.1 W	771 W	2313 W	3855 W
	22-1		0.2(7.1)		48.2 PSID @ 8.0 GPM	79.3 W	793 W	2380 W	3966 W	
Model 734 Fan B	(1) ORION				3.3 PSID @ 2.0 GPM	78.6 W	786 W	2359 W	3932 W	
	Fan B	OA254AP- 11-1	115VAC, 60 Hz	55 dB(A)	0.14 in H2O @ 207 ACFM	12.5 PSID @ 4.0 GPM	83.5 W	835 W	2504 W	4174 W
						48.2 PSID @ 8.0 GPM	86.1 W	861 W	2584 W	4307 W
		an C (1) ORION OD254AP- 24M	24 VDC	47 dB(A)	0.21 in H2O @ 263 ACFM	3.3 PSID @ 2.0 GPM	92.2 W	922 W	2766 W	4609 W
Model 734 Fan C	Fan C					12.5 PSID @ 4.0 GPM	99.1 W	991 W	2974 W	4957 W
						48.2 PSID @ 8.0 GPM	103.0 W	1030 W	3091 W	5151 W
Model 734 Fan D	(1) ORION				3.3 PSID @ 2.0 GPM	106.8 W	1068 W	3203 W	5339 W	
	Fan D	OD254AP-	24VDC	64 dB(A)	0.31 in H2O @ 333 ACEM	12.5 PSID @ 4.0 GPM	116.5 W	1165 W	3494 W	5824 W
	24H		30(, ()		48.2 PSID @ 8.0 GPM	122.0 W	1220 W	3661 W	6102 W	
Model 734 Fan E		Fan E (1) EBM W1G200H	24 VDC	60 dB(A)	0.39 in H2O @ 379 ACFM	3.3 PSID @ 2.0 GPM	115.3 W	1153 W	3458 W	5763 W
	Fan E					12.5 PSID @ 4.0 GPM	126.8 W	1268 W	3804 W	6340 W
						48.2 PSID @ 8.0 GPM	133.5 W	1335 W	4005 W	6675 W
Model 734		(1) ORION OA254AN- 11-1XC	115 VAC, 60 Hz	69 dB(A)	0.44 in H2O @ 408 ACFM	3.3 PSID @ 2.0 GPM	120.2 W	1202 W	3607 W	6011 W
	Fan F					12.5 PSID @ 4.0 GPM	132.9 W	1329 W	3988 W	6646 W
						48.2 PSID @ 8.0 GPM	140.4 W	1404 W	4211 W	7018 W

MODEL 734 73 SERIES

TECHNICAL DRAWING (734SLCO)



MORE STANDARD MODEL 734 DRAWINGS

734 SBC0	734 SBE0	734 SPC0	734 <i>TBP2</i>
734 SBC1	734 SBE1	734 SRE0	734 <i>TLC0</i>
734 <i>SBC2</i>	734 <i>SLC1</i>	734 <i>TBC0</i>	734 <i>TLC1</i>
734 <i>SBC5</i>	734 <i>SLC2</i>	734 <i>TBC1</i>	734 <i>TPC1</i>
734 SBC6	734 SNC1	734 <i>TBC2</i>	

PART NUMBERING SYSTEM



CONTACT OUR EXPERTS

Our thermal experts will be happy to review your application and offer standard or custom solutions, including thermal analysis (single phase or multi-phase) and CAD drawings tailored to your special requirements...*ALL AT NO CHARGE AND WITHIN 24 HOURS!*

For many custom applications Thermatron will also ship heat exchanger prototypes for *FREE 90-DAY CLIENT EVALUATIONS*, with purchase subject only to *COMPLETE CLIENT SATISFACTION*, and pricing subject only to follow-on orders. Thermatron engineers will also add recommendations for fans, pumps, filters, fittings, cabinet adaptations, brackets, etc., so that you receive the best overall thermal solution the very first time...*PUT US TO THE TEST*!

For more information please contact the factory at **978.687.8844** or **INFO@THERMATRONENG.COM**.