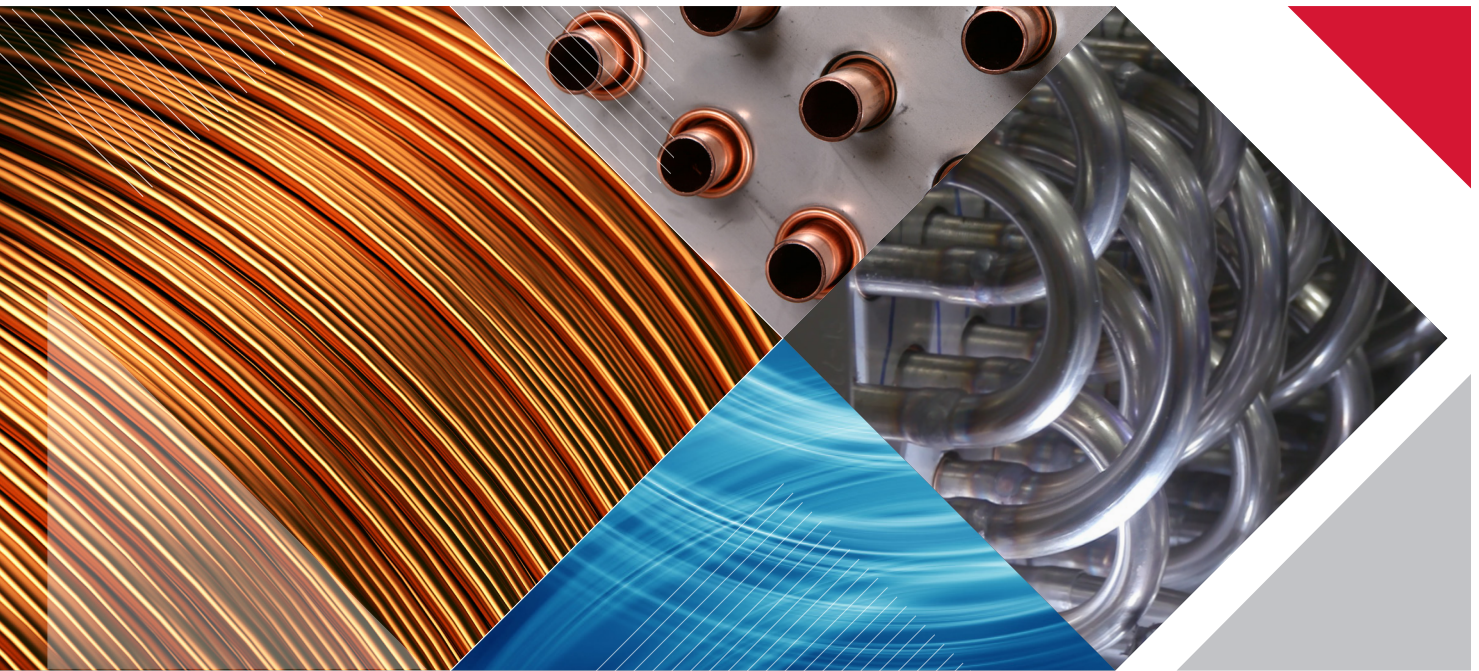


MARLO
HEAT TRANSFER SOLUTIONS



Industrial and Commercial Coil Products

 **LEONARDO DRS**

MARLO HISTORY

Since 1925, Marlo Heat Transfer Solutions has manufactured quality heat transfer, refrigeration, and air handling equipment for industrial, commercial, utility, and marine markets, including the US Navy. Our custom engineered heat transfer solutions are used in a variety of configurations to cool, heat, and dehumidify air streams for process and building comfort.



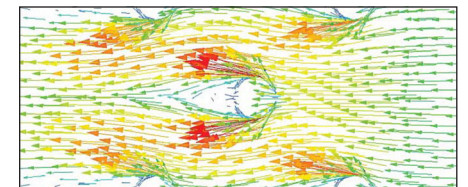
Centrally located in the United States, Marlo Heat Transfer Solutions' 180,000sqft. production facility is just thirty minutes from downtown St. Louis, Missouri. Our industrial heat transfer products are manufactured from quality materials typically in heavier grades and thicknesses. This ensures dependable performance and years of service, even in the most demanding conditions.

ENGINEERING

Marlo Heat Transfer Solutions coils are engineered for all types of applications, from common comfort heating and cooling to complex thermal processes. Heat recovery, vapor recovery, process heating and moisture removal are common applications for Marlo designed coils.

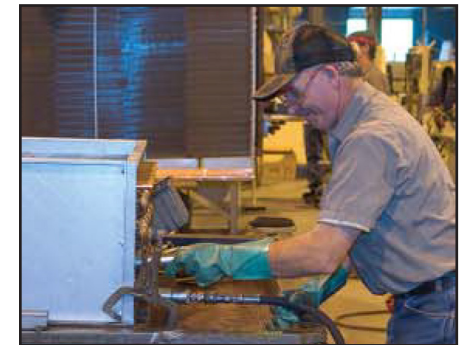
COMPUTATIONAL FLUID DYNAMICS

Marlo Heat Transfer Solutions uses the latest analysis technology to design all types of coils. By using Computational Fluid Dynamics (CFD), Marlo Heat Transfer Solutions is able to accurately predict the air and water flow patterns through the coil. With specific customer flow conditions, the analysis results show the air and fluid flow velocity vectors as well as calculate the pressure drop and heat transfer values if required.



MANUFACTURING

To ensure customer satisfaction, our products are efficiently manufactured in our modern production facility using LEAN manufacturing techniques and one or more of our quality assurance programs. We can provide coils that conform to all major quality systems: ASM, ARI, PED, CRN, ISO. If you have a special requirement, contact your IMR.



TESTING

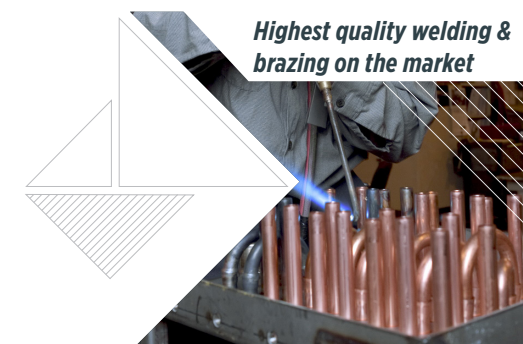
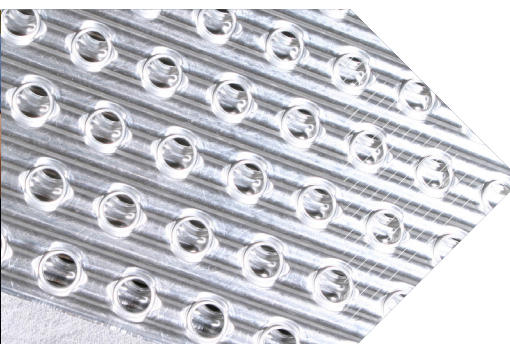
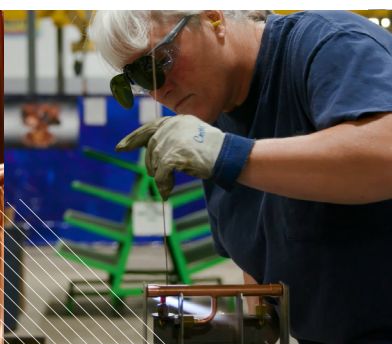
All Marlo Heat Transfer Solutions' products are thoroughly tested prior to shipment. Coils are tested using high pneumatic pressure while the coil is submerged in water. Alternative test methods and air side testing are also available.

Marlo Quality
ISO 9001:2015



Coils are 100% tested

Marlo Coils are made using "hairpins" where applicable which minimizes braze joints, providing you the highest quality coil at a competitive price.



Highest quality welding & brazing on the market

Our tube-sheets have extruded holes. This creates a smooth surface that prolongs the life of the coil under the constant thermal cycling they experience.



FLUID, REFRIGERANT, STANDARD STEAM & DISTRIBUTING STEAM COILS

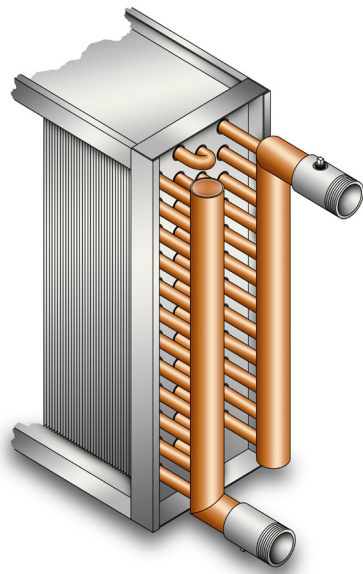
FLUID COILS

W & P Coils

Fluid coils typically feature multiple row coils with various circuit options. Full-size return bends and properly sized headers are utilized to ensure uniform flow and minimized pressure loss. Fluid coils are available for chilled water, hot water, glycol and special fluid applications.

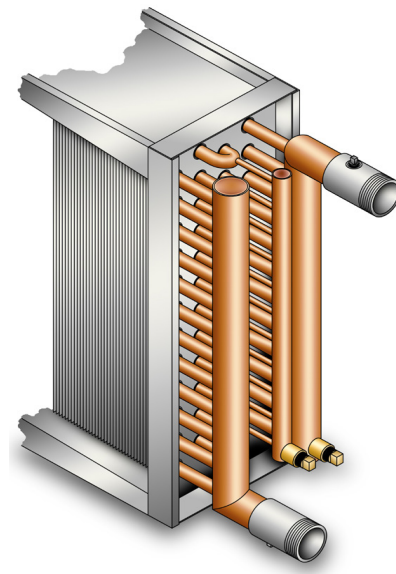
W Coils

Standard water coils typically consisting of multiple rows and circuits.



P Coils

Similar to our standard water coils; however, the core on a "P" coil is pitched within the casing and auxiliary drain headers are used to ensure fast and complete drainage of the coil.



J, X & K Coils

Fluid coils featuring brass end caps on tube ends that allow access to the interior of the coil for cleaning. These coils are typically applied in environments where sediment or foreign materials may accumulate within the coil. Individual tube access allows for simple inspection and isolated cleaning. Can be ASME "U" stamped for extreme environments.

J Coils

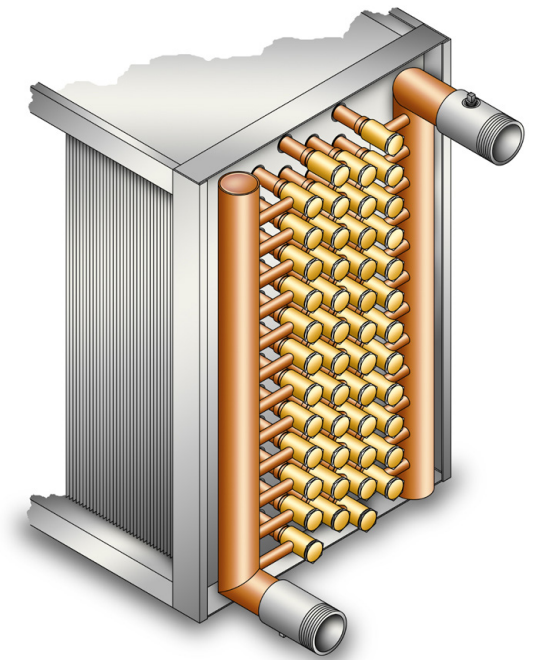
Cleanable plugs located on the supply header end of the coil.

X Coils

Cleanable plugs located opposite the header end of the coil.

K Coils

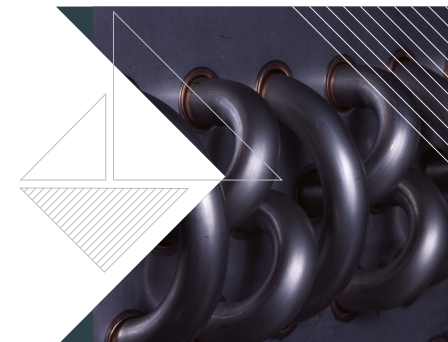
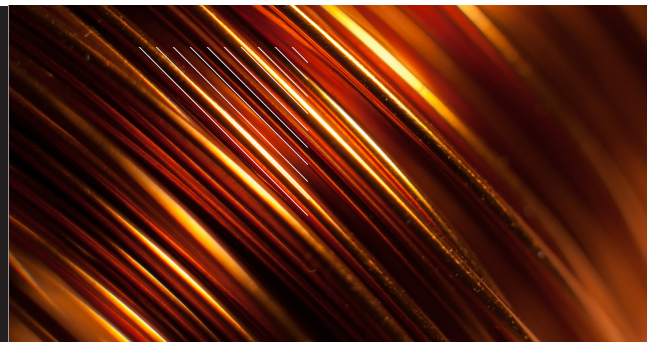
Cleanable plugs on both ends of the coil to allow straight-through cleaning.



Multiple fin configurations available



Copper is commonly used for tubes within the coil. Steel, Stainless Steel and Copper/Nickel are available to suit your specific requirements. Inquire if your application requires a different material.



Circuits are arranged for optimum heat transfer, but we also build custom circuits to meet your specific requirements.

Q, Y & R Coils

Fluid coils featuring removable box headers to allow access to the interior of the coil for cleaning. The removable box is ideal for high-sediment fluid environments, such as river or lake water. Removing the headers exposes all of the tubes for easy inspection or cleaning. For higher pressure applications see our J, X and K coils.

Q Coils

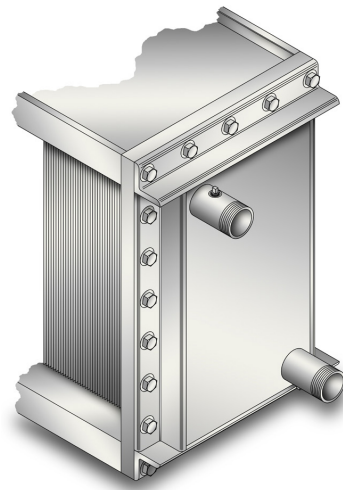
A removable box header is located on the supply header end of the coil.

Y Coils

A removable box header is located on the fluid-return end of the coil.

R Coils

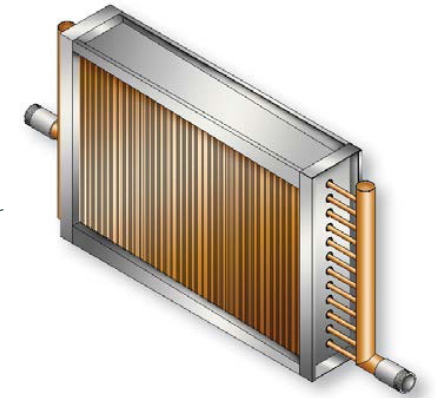
Removable box headers are located on both ends of the coil to allow straight-through cleaning.



STANDARD STEAM COILS

S & V Coils

Steam coils featuring a continuous straight-through steam path with opposite end supply and condensate headers. Cores are pitched within the casing toward the condensate header to promote condensate removal. Available for low or high-pressure steam applications and in several combinations of materials.



S Coils

Steam coil utilizing 0.625" diameter tubes and a straight through steam path.

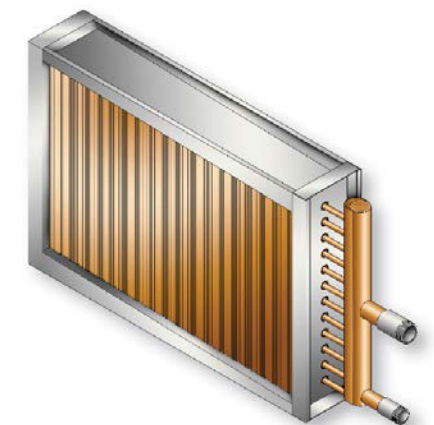
V Coils

Steam coil utilizing 1.0" diameter tubes and a straight through steam path.

DISTRIBUTING STEAM COILS

D & H Coils

Steam coils featuring inner steam distributing tubes and same-end supply and condensate connections in a single common header. Cores are pitched within the casing toward the header to promote condensate removal. Available for low or high pressure steam applications and in several combinations of materials.



D Coils

Steam coil utilizing 0.625" diameter outer tubes with 0.375" inner steam distributing tube.

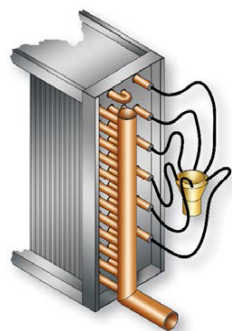
H Coils

Steam coil utilizing 1.0" diameter tubes with 0.625" inner steam distributing tube. Marlo "H" coils have tighter spacing. This leads to more performance in a smaller package. Multiple rows in one casing means less piping.

REFRIGERANT COILS

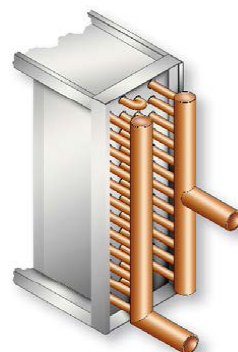
E & C Coils

Our refrigeration coils include evaporator and condenser coils. With heat transfer surface areas similar to our fluid coils, direct expansion evaporator coils also feature distributors, capillary tubes, suction headers, and optional thermal expansion valves. Condenser coils feature various circuiting options, including sub-cooling circuits. Care is taken to ensure the interior of our refrigeration coils remains contaminant free during production and testing, including a nitrogen charge prior to shipment.



E Coils

Direct expansion evaporator coils for use with most refrigerants.



C Coils

Condenser coils for use with most refrigerants.

SPECIAL PRODUCTS

AIR TIGHT HOUSING

Some industrial processes require a coil to be installed in an air tight housing to allow heat transfer while preventing environmental contamination. Our housings are constructed from heavy gauge materials that are selected for suitability in their specific application. Features of our airtight coils include:

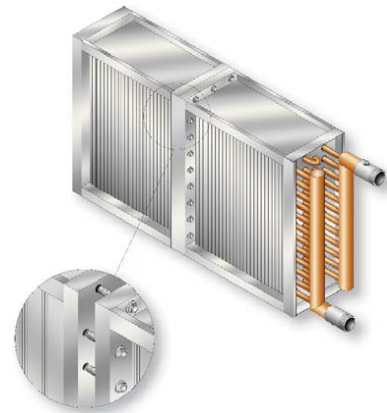
- Designed for pressures from 10" to 10 PSI; higher available
- Coils can be removable or permanently mounted
- Gaskets for doorplates are selected for temperature and chemical resistance
- Available with integral drain pans for condensing applications
- Transitions and flanges are available to mate housings to square or round ducts



SPLIT CORE COIL

Our split core coil is an optional feature that allows nearly any coil we manufacture to be divided into smaller sections to ease installation in limited space applications. The coil is split in the core area with divider plates and re-assembled on-site for a permanent installation. Features of the split core coil design:

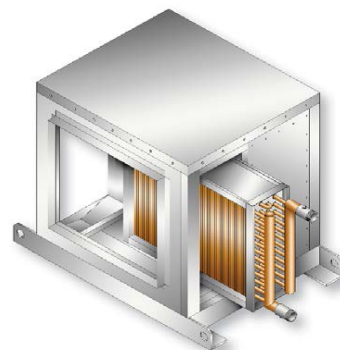
- Allows direct replacement of long-finned length coils with minimal performance loss
- A coil can be divided into several sections if required
- Existing AHU or ducts can be used with little or no modifications
- Existing piping can be used without modification in most cases
- Coil core is leak tested at the factory prior to shipment
- A unique sealant is used to seal the assembled coil without plugging tubes



REMOVABLE COIL MODULE (RCM)

Marlo Heat Transfer Solutions Removable Coil Module is a direct replacement coil section for existing modular air-handling units. The RCM can simplify coil replacement while adding new coil supports and a stainless steel drain pan to existing units. RCM's are available in custom sizes ranging from approximately 2 sq. ft. to approximately 60 sq. ft. of coil face area. Features include:

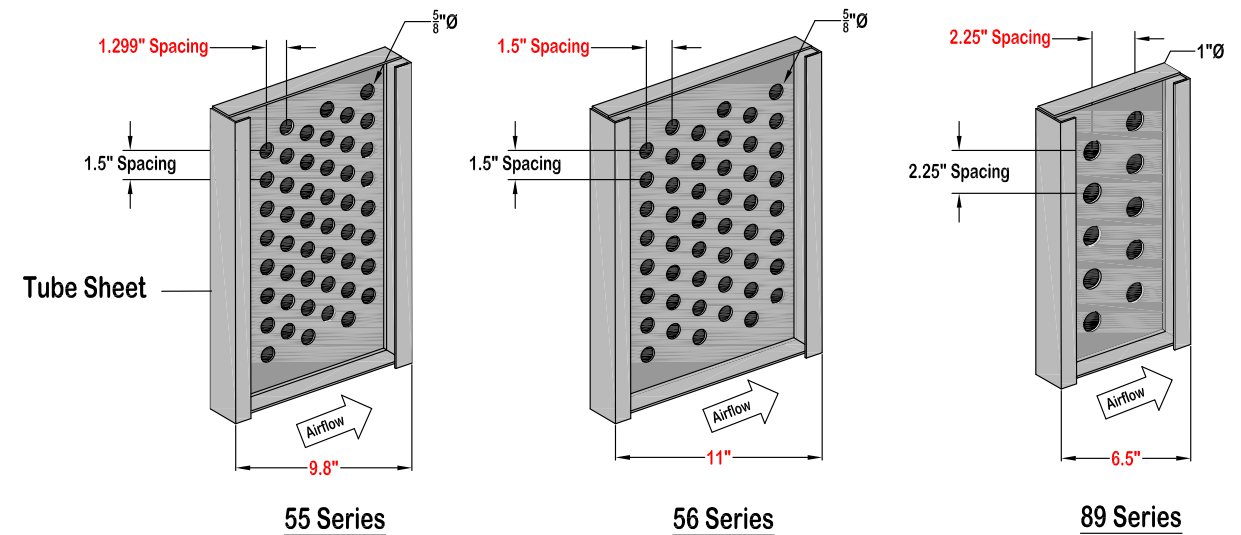
- Galvanized or stainless steel cabinets; optional painted exterior
- Custom heating or cooling coils including steam and water coil combinations
- Integrated lifting lugs
- Full-length stainless steel drain pan with IAQ slope
- Coils removable from either side of cabinet
- Single or double wall construction
- Choice of 1" or 2" insulation
- Optional integrated filter section



MATERIAL CAPABILITIES

Fin Capability

Fin Material	Fin Thickness (in.)	(55 Series) 5/8" O.D. tube Fin Spacing (FPI)		(56 Series) 5/8" O.D. tube Fin Spacing (FPI)		(89 Series) 1" O.D. tube Fin Spacing (FPI)	
		Turbex	Flat	Turbex	Flat	Turbex	Flat
Aluminum & Copper	.007", .008" *	5 - 14	4 - 14	5 - 14	5 - 14	-	-
	.010", .012"	5 - 14	4 - 14	6 - 14	4 - 14	4 - 12	4 - 12
	.016"	5 - 14	4 - 14	6 - 12	4 - 12	4 - 12	4 - 12
	.020", .025"	-	4 - 14	4 - 12	4 - 10	4 - 12	4 - 10
90/10 Copper/Nickel	.007"	-	-	6 - 12	5 - 12	-	-
	.010"	-	-	-	5 - 12	-	5 - 12
Carbon Steel	.010"	-	-	-	5 - 12	-	5 - 12
	.016"	-	-	-	5 - 10	-	5 - 10
304 & 316 Stainless Steel	.008"	-	-	6 - 12	5 - 12	-	5 - 12
	.010"	-	-	-	5 - 12	-	5 - 12



Other Materials

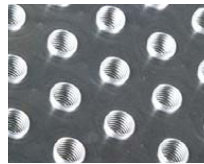
Material	5/8" or 1" O.D. Tubes Tube Wall (in.)	Headers	Casing
Copper	.020", .025", .028", .035", .049", .065"	Types M, K & L tubing	0.125"
Aluminum	.049", .065", .083"	Sch. 40, 80	.063" to .125"
90/10 or 70/30 Copper/Nickel	.035", .049", .065"	Sch. 40, Class 200	-
Admiralty Brass	.035", .049", .065"	Sch. 40, 80	-
Carbon Steel	.035", .049", .065"	Sch. 40, 80 or 10 GA.	16 to 10 GA. **
304 & 316 Stainless Steel	.035", .049", .065"	Sch. 40, 80 or 10 GA.	16 to 10 GA.
AL6XN, Red Brass, Carpenter 20, Incoloy, Hastelloy, Monel, SMO254, Titanium or many other special materials	Contact Factory		

*.007" fins are Copper, .008" fins are Aluminum; ** Steel casing material is galvanized unless otherwise specified

CONSTRUCTION DETAILS

Assure maximum heat transfer and a strong structural fin and tube bundle that prevents coil failures due to tube sagging and tube vibrations. Coil cleaning is easier since a continuous path exists to clear debris.

Flat Fin
Smooth design offers lower airside pressure drop and greater cleaning ability.



Turbex Fin
Corrugated design for greater heat transfer and less surface.



Spun Tube Ends
Our distributing steam coils feature tube ends which are spun down to close the tube completely without adding an end disc or cap. The tip of the spun end is then brazed to ensure closure thus eliminating concern of leakage.



Hairpin Tubes and Return Bends
Continuous hairpin tubes offer maximum leak protection by eliminating joints within the circuit. When return bends must be used on our copper tube coils, they are sized one wall thickness heavier than the tube to provide superior erosion resistance.



Heavy Gauge Casings
Heavy gauge galvanized or stainless steel casings are used to provide support while lifting and handling the coil. Bolts with nuts and lock washers or welding are used to construct the casing. Baffling and supports can be attached using selftapping screws or optional duct mounting holes can be added to facilitate using bolts and nuts for installation.



Staggered Tube Design
Our multiple row coils feature staggered tubes to maximize heat transfer efficiency.



Engineered Header System
Our headers are designed to reduce the potential for leaks and provide connection locations that allow venting and draining at the highest and lowest points on the coil. Extruded tube holes increase surface contact for our braze joints, providing a strong bond with minimal potential for leaks.



Tube Sheets Extruded Hole/ Copper Ferrule Inserts
Our standard tube sheets feature extruded tube holes to allow thermal expansion and contraction of the tubes while preventing scoring with a raw sheet metal edge. Optionally copper ferrules can be used, which provide a sacrificial bearing surface for the tubes to move against without contacting the sheet metal.



Integrated Pitched Casing
Marlo Heat Transfer Solutions steam and drainable fluid coils feature a heat transfer core that is pitched within the casing to promote drainage even when the coil is installed level.



Coil Model Nomenclature

Fluid Coils	8W24-96-5608T-24.3-H-1.0-R-B	8	W	24	96	56	08	T-24.3	H-	1-	R-	B
		↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Typical Model Numbers	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k) - (l)
Steam Coils	2D16-60-5610F-10.2-H-B	2	D	16	60	56	10	F-	10.2	H-		B
		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Description

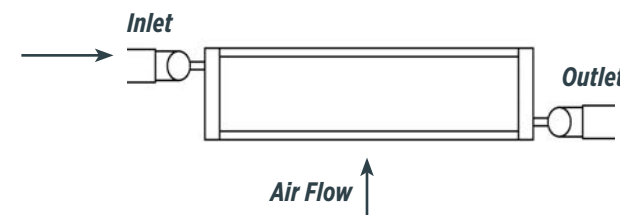
- (a) Rows in Direction of Airflow
- (b) Coil Type*
- (c) Number of Tubes High in Face of Coil
- (d) Finned Length
- (e) Tube O.D.: 56 = 5/8"; 89=1.0"
- (f) Fin Spacing In Fins Per Inch
- (g) Fin Style: T (Turbex) or F (Flat)
- (h) Face Area of Coil (sq ft)
- (i) Airflow Direction: H (horiz) or V (vert)
- (j) Serpentine (Circuit)
- (k) Coil Hand: R (Right) or L (Left)
- (l) Joint construction: B (Brazed) or W (Welded)

* Coil Types

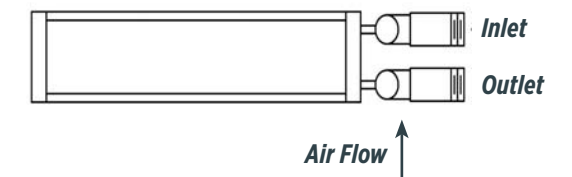
- WWater
- EEvaporator
- PPitched & drainable
- J, X, KCleanable plug
- Q, Y, RRemovable box header
- A.....Ammonia coil
- CCondenser coil
- D 5/8" tube distributing steam
- H 1.0" tube distributing steam
- S 5/8" tube blast steam
- V 1.0" tube blast steam

Coil Hand

Coil Hand is determined by position of outlet connection when facing entering air side.



RIGHT HAND COIL - Opposite End Connections



RIGHT HAND COIL - Same End Connections

Circuiting Options

Rows	Available Circuits
1	Row/tubes, .25, .33, .50, 1.0
2	Row/tubes, .25, .33, .50, 1.0, 2.0
3	.25, .33, .50, .75, 1.0, 1.5, 3.0
4	.25, .33, .50, .667, 1.0, 2.0, 4.0
5	.25, .33, .50, .83, 1.0, 1.25
6	.25, .33, .50, .75, 1.0, 1.5, 2.0, 3.0
7	.25, .33, .50, 1.0
8	.25, .33, .50, 1.0, 1.33, 1.5, 2.0, 4.0
9	.25, .33, .50, .75, 1.0, 1.5, 3.0
10	.25, .33, .50, .83, 1.0, 1.25, 1.67, 2.0, 2.5
12	.25, .33, .50, .75, 1.0, 1.5, 2.0, 3.0, 4.0
16	.25, .33, .50, 1.0, 1.33, 1.5, 2.0, 4.0

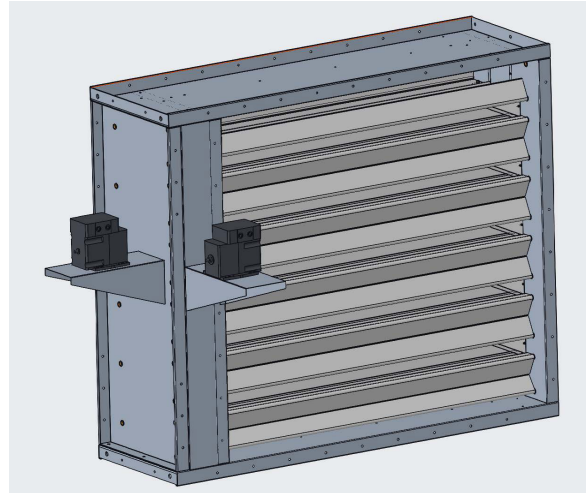
Consult factory for additional row and circuit availability



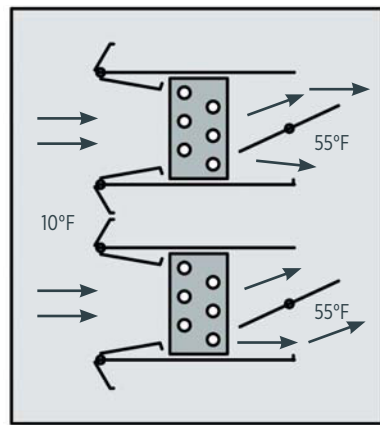
STRATOMIZER® CONSTRUCTION

CONSTRUCTION

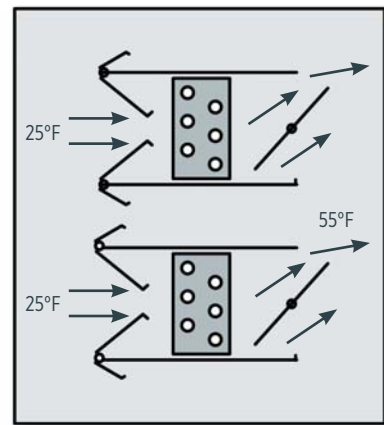
Stratomizer® dampered face and bypass coil provides a reliable method of preheating and tempering fresh outside air by maintaining full steam pressure or hot water flow to the coil at all times. By positioning dampers, proportioned volumes of air are either directed through the heating surface or bypassed to achieve the required discharge air temperature.



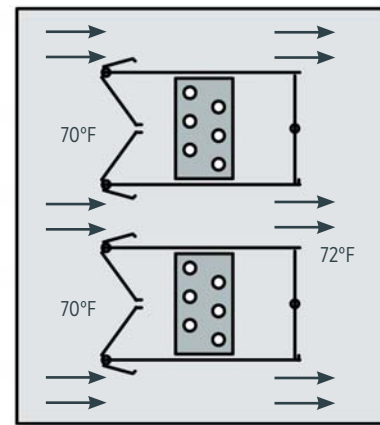
OPERATION



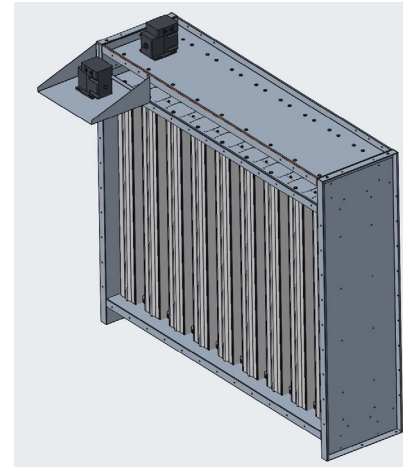
When entering air temperature conditions require maximum heating, the dampers fully open and the upstream dampers direct all the entering air through the heating coil face.



As the entering air temperature increases, the dampers are automatically repositioned, proportioning the correct amount of entering air through both the heating coil faces and bypasses.



When no heating is required, the dampers are closed and the upstream dampers direct all the entering air through the bypasses. The rear dampers enclose the heating cores minimizing temperature override.



Vertical

FEATURES

- Vertical or horizontal tube orientation
- 14-gauge galvanized or stainless steel casing
- 16-gauge galvanized or stainless steel integral bypass baffles
- Optional epoxy-painted casing or phenolic coatings
- Downstream actuator mounting available for reduced width/height
- Optional connection locations to simplify piping
- Extruded anodized aluminum damper blades
- Integral EPDM blade edge seals – silicone optional
- “D” shaped damper shafts for positive torque without slipping
- Stainless steel primary drive shafts
- Oil-impregnated bronze bearings
- Non-ferrous damper linkage – out of the air stream
- Distributing steam design on horizontal models
- Floating header design
- Three-year warranty

Blades

Extruded anodized aluminum damper blades with integral edge seals and “D”-shaped damper shafts to prevent slipping.

Casing

14-gauge galvanized or stainless steel casing with 16-gauge integral bypass baffles.

Stratomizer Model Number Nomenclature

Typical Model : K72-56-2-10-T-R-0

Nomenclature: K 72 - 56 - 2 - 10 - T - R - 0
 ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑
 (a) (b) (c) (d) (e) (f) (g) (h)

Description

- (a) Model designation
(A - F = Horizontal, G - N = Vertical orientation)
- (b) Finned length
- (c) Tube o.d. : 56 = 5/8”, 89=1.0”
- (d) Number of rows in direction of airflow
- (e) Fin Spacing in Fins Per Inch
- (f) Fin Style - T or F (Turbex or Flat)
- (g) Coil Hand - R or L - Right or Left
- (h) Serpentine (Circuit): 0 = Steam, .333, .375, .750, 1.00, 1.5 = Water

Linkage

Stainless steel and non-ferrous linkage located out of the air stream.

Heating Core

Plate fins provide excellent heat transfer while offering simple cleaning.

Controls

Pneumatic or electrical proportional actuators, including direct drive options.

Floating Header

Vertical Stratomizers feature a floating header assembly designed to allow for thermal movement.

FEATURES CONTINUED...

HORIZONTAL STRATOMIZER

UNIT DESIGNATION	FACE SECTIONS	HEIGHT (INCHES)	NOMINAL FIN LENGTH									
			29	35	41	47	53	59	72	84	96	120
			WIDTH (INCHES)									
			42	48	54	60	66	72	85 3/8	97 3/8	109 3/8	133 3/8
OUTLET AREA (FT ²)												
NOM. WEIGHT (LBS)												
A	3	27.00	4.57	5.53	6.49	7.45	8.41	9.36	11.50	13.42	15.33	19.17
B	4	35.38	--	7.54	8.85	10.16	11.47	12.77	15.69	18.30	20.92	26.15
C	5	43.75	--	9.56	11.21	12.87	14.53	16.18	19.88	23.19	26.50	33.13
D	6	52.13	--	11.57	13.58	15.58	17.59	19.59	24.06	28.07	32.08	40.10
E	7	60.50	--	13.59	15.94	18.29	20.65	23.00	28.25	32.96	37.67	47.08
F	8	68.88	--	15.60	18.30	21.01	23.71	26.41	32.44	37.84	43.25	54.06
			--	555	625	695	765	840	910	980	1050	1190

VERTICAL STRATOMIZER

UNIT DESIGNATION	FACE SECTIONS	WIDTH (INCHES)	NOMINAL FIN LENGTH								
			35	41	47	53	59	72	84	96	108
			HEIGHT (INCHES)								
			49.63	55.63	61.63	67.63	73.63	87.00	99.00	111.00	123.00
OUTLET AREA (FT ²)											
NOM. WEIGHT (LBS)											
G	4	35.88	7.66	8.99	10.32	11.65	12.98	15.94	18.89	--	--
H	6	52.63	11.69	13.72	15.74	17.77	19.80	24.31	28.36	32.42	--
J	8	69.38	15.72	18.44	21.17	23.89	26.62	32.69	38.14	43.58	49.03
K	10	86.13	19.75	23.17	26.59	30.01	33.43	41.06	47.91	54.75	61.59
L	12	102.88	23.77	27.89	32.01	36.13	40.25	49.44	57.68	65.92	74.16
M	14	119.63	27.80	32.62	37.44	42.26	47.07	57.81	67.45	77.08	86.72
N	16	136.38	31.83	37.35	42.86	48.38	53.89	66.19	77.22	88.25	99.28
			1010	1135	1265	1390	1515	1645	1770	1895	2020

← Subtract 6.625" for water coils

 3 YEAR WARRANTY

Marlo Heat Transfer Solutions' products are thoroughly tested at the factory and warranted against defective workmanship and materials for a period of thirty six (36) months from date of shipment. If a defect should develop within the warranty period, Marlo Heat Transfer Solutions will repair or replace, at our option, the defective item. Transportation, or removal and installation of repaired or replaced items, are not covered by this warranty. This warranty does not apply to fan belts, filters, gaskets, and other maintenance items, or buyer/user furnished components. The warranty is void if the product is modified without Marlo Heat Transfer Solutions' written approval. No agent, salesman, or other representative, unless authorized in writing by an officer of the company, has any authority to waive, alter or enlarge the terms of this warranty.

Marlo Heat Transfer Solutions' warranty extends to commonly supplied purchased components such as fans, electric motors, actuators, dampers, spring isolators, etc., even when the Original Equipment Manufacturer's (OEM) warranty has expired.

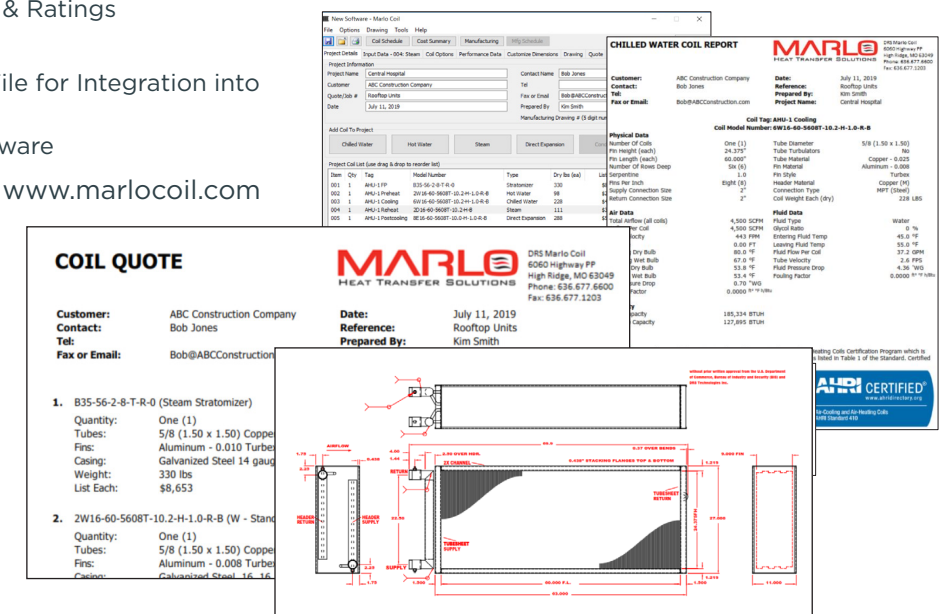
Marlo Heat Transfer Solutions products purchased through OEM are warranted for a term not to exceed the warranty term of the OEM equipment or system. Additional restrictions may apply. Consult your OEM vendor for specific information regarding warranty.

 MARLOMETRICS™

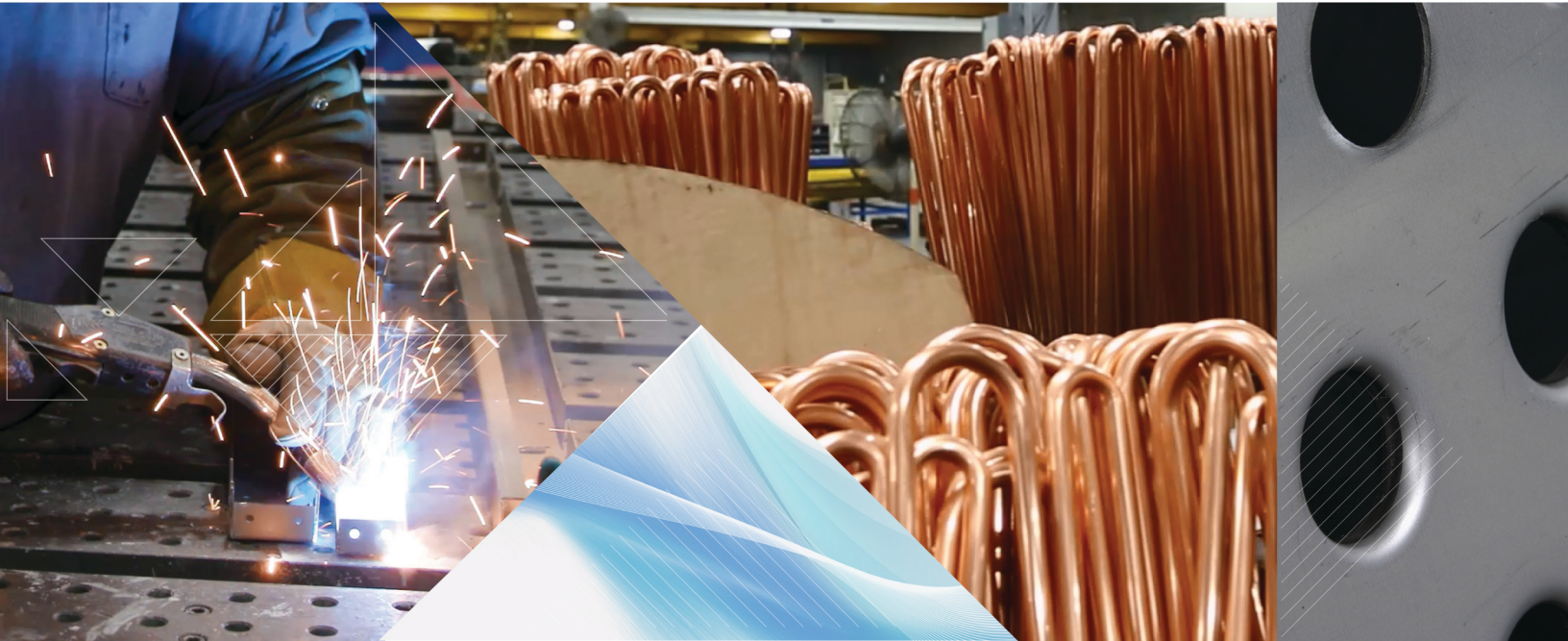
COIL & STRATOMIZER SOFTWARE

- Performance Selection & Ratings
- Drawing Program
- Available as a Library File for Integration into Host Programs
- Windows™-Based Software

Also available online at www.marlocoil.com



The screenshot displays the Marlo Coil & Stratometer software interface. It includes a 'CHILLED WATER COIL REPORT' with fields for Project Name, Customer, Date, and various coil specifications. Below the report is a 'COIL QUOTE' section with a list of items, quantities, and prices. To the right, there are technical drawings of the coils with dimensions and labels. The Marlo logo and contact information are also visible.



 **LEONARDO DRS**

RLKUNZ
AIR SYSTEM PROS

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