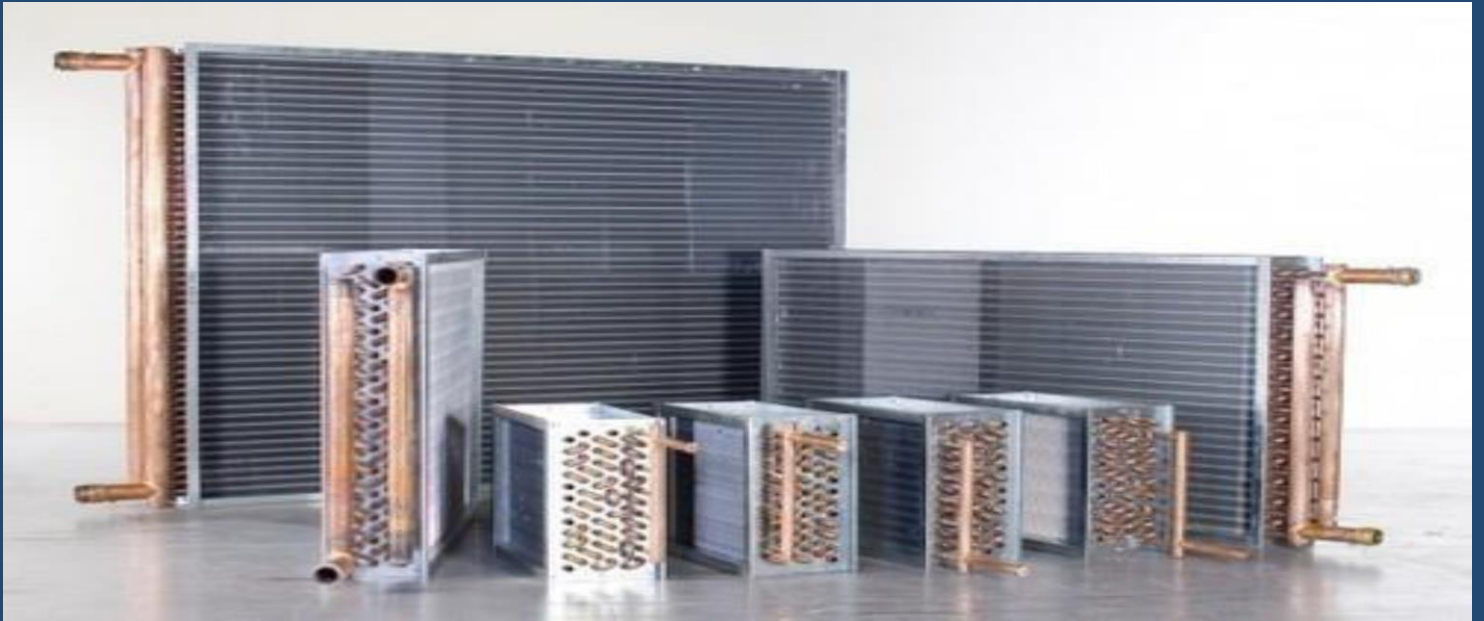


# innovent

TECHNOLOGIES



# **COOLING AND HEATING** **COILS**

## **CONTANTS**

- **About Innovent Technologies Coils**
- **Application of Cooling and Heating Coils**
- **Coil Nomenclature**
- **Coil Types**
- **Innovent Technologies Coils Software**

### ■ **About Innovent Technologies Coils**

“**Innovent technologies coils**” was formed with the objective of establishing a sustainable and continually improving HVAC company which is able to deliver high quality and predictable products to our valuable customer with the shortest lead time possible.

“**Innovent technologies coils**” is a cooling coil manufacturer, which is able to manage the technical specifications as well as the installation process from conception to completion.

## **Vision of “Innovent technologies coils”**

Our vision is to become a benchmark manufacturing company focused on providing world-class products to satisfy customers through continual improvement driven by integrity, teamwork, and creativity

## **Mission of “Innovent technologies coils”**

Dedication to the highest level of Customer Service and company spirit. We will do this with warmth, friendliness, and dedication to the service required by our customers

### **▪ Application of Cooling and Heating Coils**

#### **1. Air Handling Units**

AHU's supply fresh air to the room. The units take air from the outside, filter it and recondition it (cooled by a cooling coil or heated by a heating coil). Where hygienic needs for air quality are lower, the air from the rooms can be re-circulated for energy saving purposes

#### **2. Split Air Conditioner Indoor & Outdoor Unit**

The most common type of home system is the split system air conditioner. This type consists of a main indoor air conditioning unit and outdoor unit that both connect together. The inside unit contains the evaporator coils and a filter, whereas the outdoor unit is home to the condensing coil, fan and compressor.

#### **3. Fan Coil Unit**

A fan coil unit (FCU) is a device that uses a coil and a fan to heat or cool a room without connecting to ductwork. Indoor air moves over

the coil, which heats or cools the air before pushing it back out into the room

#### **4. Refrangent Based Dehumidifiers**

A dehumidifier is an electrical appliance which reduces and maintains the level of humidity in the air, usually for health or comfort reasons, or to eliminate musty odour and to prevent the growth of mildew by extracting water from the air. It can be used for household, commercial, or industrial applications

#### **5. Oil Cooled Chillers**

Cools and regulates the temperature of oil without any loss of cooling performance even in harsh environments

#### **6. Cold Room Indoor Units**

A refrigerating chamber or cold room is a warehouse in which a specific temperature is artificially generated. It is generally designed for storing products in an environment below the outside temperature

#### **▪ COIL NOMENCLATURE**

<b>CT DIA</b>	<b>COIL TYPE</b>	<b>CIRCUITING TYPE</b>	<b>HEADER POSITION</b>	<b>FPI</b>	<b>NO. ROWS</b>	<b>FIN CONFIGARATION</b>	<b>FIN HEIGHT</b>	<b>FIN LENGTH</b>
<b>38</b>	<b>CC</b>	<b>FC</b>	<b>R</b>	<b>12</b>	<b>06</b>	<b>W</b>	<b>12</b>	<b>12</b>

**38-CC-FC-R-12-06-W-12-12**

#### **I. Copper Tube Dia**

**a. 3/8"-9.52mm-0.28mm (t)-38**

**b. 1/2"-12.7mm-0.28mm(t)-12**

## **II. Coil type**

- a. Chilled water -CW**
- b. Hot water -HW**
- c. Condensing coil-CC**
- d. Evaporating coil-DX**
  - **Normal dx coil -DX-N**
  - **Face control dx coil-DX-FC**
  - **Row control dx coil-DX-RC**
  - **Interlaced coil dx coil-DX-IC**

## **III. Circuiting design**

- a. Normal - single circuit-SC**
- b. Face control - multiple circuits-MC**
- c. 1/4 serpentine -quarter circuit-QC**
- d. 1/2 serpentine-half circuit -HC**
- e. 1 serpentine-full circuit -FC**
- . 1 1/2 serpentine**
- g. 2 serpentine-double circuit-DC**

## **IV. Header location**

- a. Right hand-R**
- b. Left hand -L**

## **V. Fins per inch**

- a. FPI-12-13**

## **VI. Number of rows**

## **VII. Fin configuration**

- a. Corrugated (al)-w**

## **VIII. Fin height (in or mm)**

- a. Starting from 12 inches or 300 mm**

## **IX. Fin length (in or mm)**

### **a. Starting from 12 inches or 300 mm**

- **COIL TYPE**

- ❖ **CHILLED OR HOT WATER COIL**

### **TYPE- FC (FLUID COIL)**

#### **Elementary Surface**

Round seamless copper tubes are expanded using hydro pneumatics water expansion system into the fin collars of the secondary surface. The hydro pneumatics water expansion system provides a permanent

metal-to-metal bond for efficient heat transfer. Tubes are staggered in the direction of airflow



## **Secondary Surface**

Corrugated aluminum or copper plate type fin that is die- formed. Fin collars are full-drawn to provide accurate control of fin spacing and maximum contact with tubes

## **Headers**

Seamless copper with die-formed holes that provide a parallel surface to the coil tube for strong brazing joints. Standard 1/8" brass female pipe thread (FPT) vent and drain with optional 1/2" or 3/4". All circuiting is designed to gravity-drain with the coil mounted vertically and tubes running horizontally

## **Connections**

Red Brass Schedule 40 male pipe thread (MPT) std. with optional copper female pipe thread (FPT), sweat and Victaulic Red Brass available

## **Casing**

Casing is die-formed with 1½" flanges to permit easy stacking and mounting. Intermediate tube supports are supplied on coils over 44" fin length with an additional support every 42".

## **Testing and Performance**

All coil assemblies are leak tested under water with nitrogen at 315 PSIG. Standard construction is suitable for 250 PSIG and up to 300degrees F.

## **❖ CONDENSER COIL**

### **Type CC**

#### **Elementary Surface**

Round seamless copper tubes are expanded using hydropneumatics water expansion system into the fin collars of the secondary surface. The hydropneumatics water expansion system provides a permanent metal-to-metal bond for efficient heat transfer. Tubes are staggered in the direction of airflow.



## **Secondary Surface**

Corrugated aluminum or copper plate type fin that is die-formed. Fin collars are full-drawn to provide accurate control of fin spacing and maximum contact with tubes

## **Headers**

Seamless copper with die-formed holes that provide a parallel surface to the coil tube for strong brazing joints

## **Connections**

Copper outside diameter (O.D.) Sweat with standard arrangement for one compressor circuit. FACE SPLIT circuiting available for two or more compressors



## **Casing**

Casing is die-formed with 1½” flanges to permit easy stacking and mounting. Intermediate tube supports are supplied on coils over 44” fin length with an additional support every 42”.



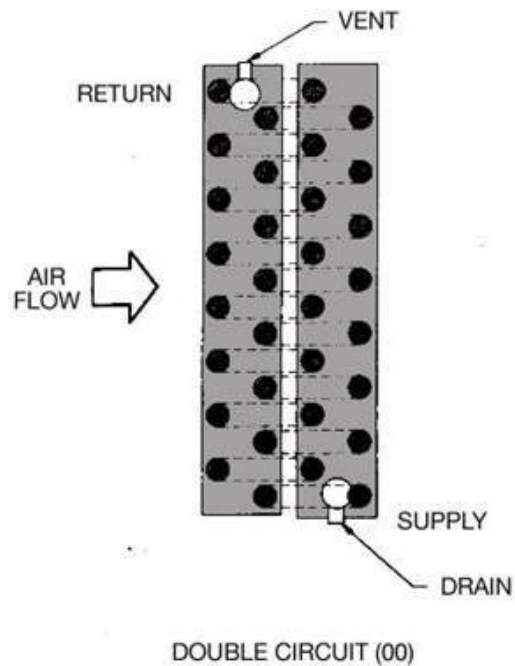
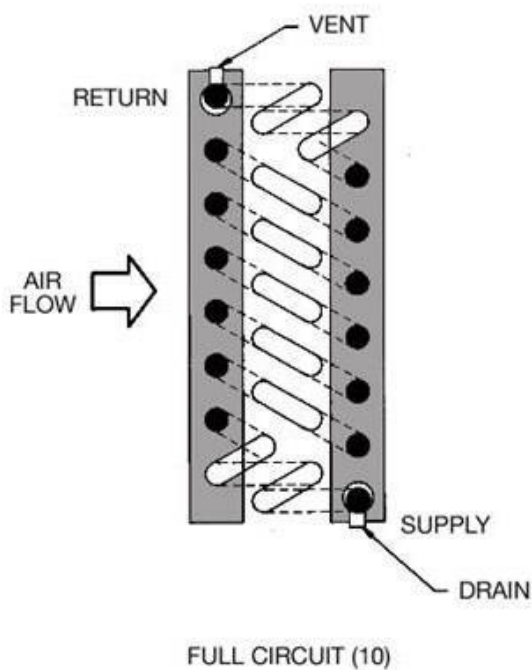
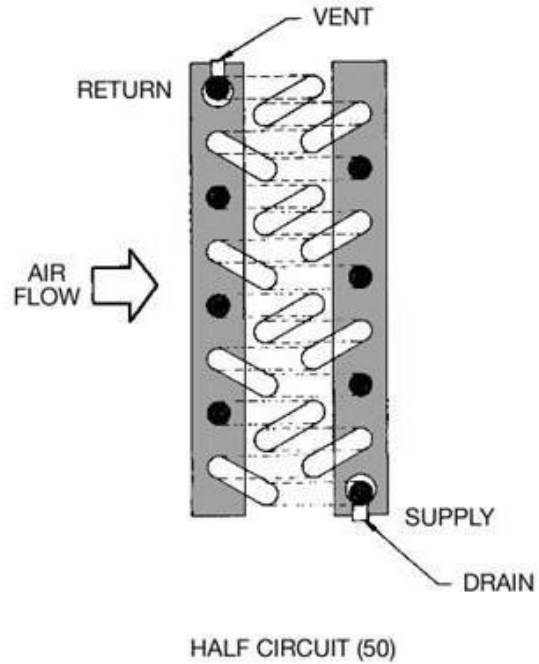
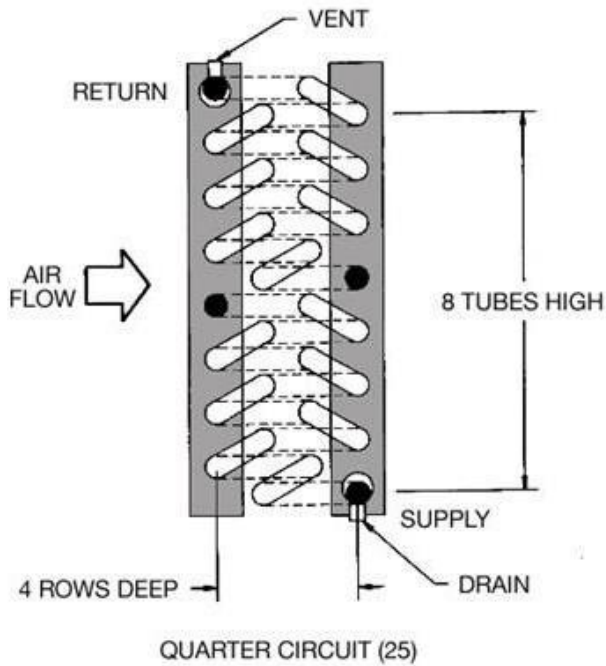
## Testing

All coil assemblies are leak tested under water with nitrogen at 400 PSIG.

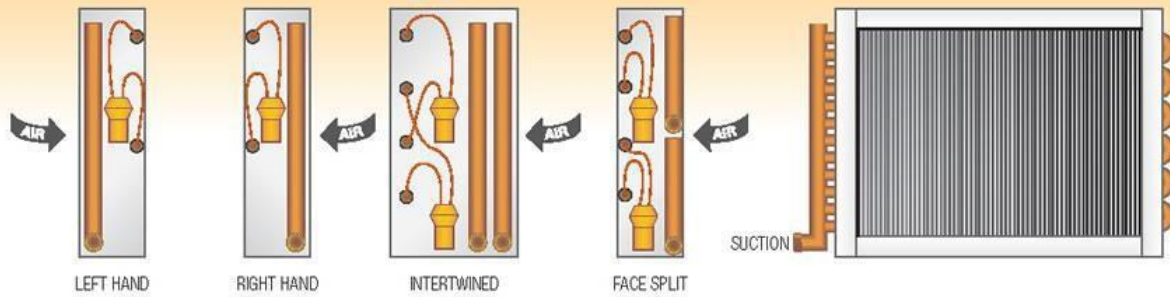
## Circuiting

Coil circuiting options include: full face (std.) and horizontal (face) split.

### TYPICAL CIRCUITING ARRANGEMENTS



## Direct Expansion Evaporator Coils



## ❖ DIRECT EXPANSION COIL

### Type DX

#### Elementary Surface

Round seamless copper tubes are expanded using hydropneumatics water expansion system into the fin collars of the secondary surface. The hydropneumatics water expansion system provides a permanent metal-to-metal bond for efficient heat transfer. Tubes are staggered in the direction of airflow.

#### Secondary Surface

Corrugated aluminum or copper plate type fin that is die-formed. Fin collars are full-drawn to provide accurate control of fin spacing and maximum contact with tubes.

#### Headers

Seamless copper with die-formed holes that provide a parallel surface to the coil tube for strong brazing joints.

#### Connections

Interchangeable nozzle type refrigerant distributors are brass and suction connections are copper sweat. Standard coil has one distributor for one compressor circuit. An INTERTWINED coil has two distributors that provide full face control using two compressor circuits. A FACE SPLIT coil has two or more distributors for multiple compressor circuits.

## Casing

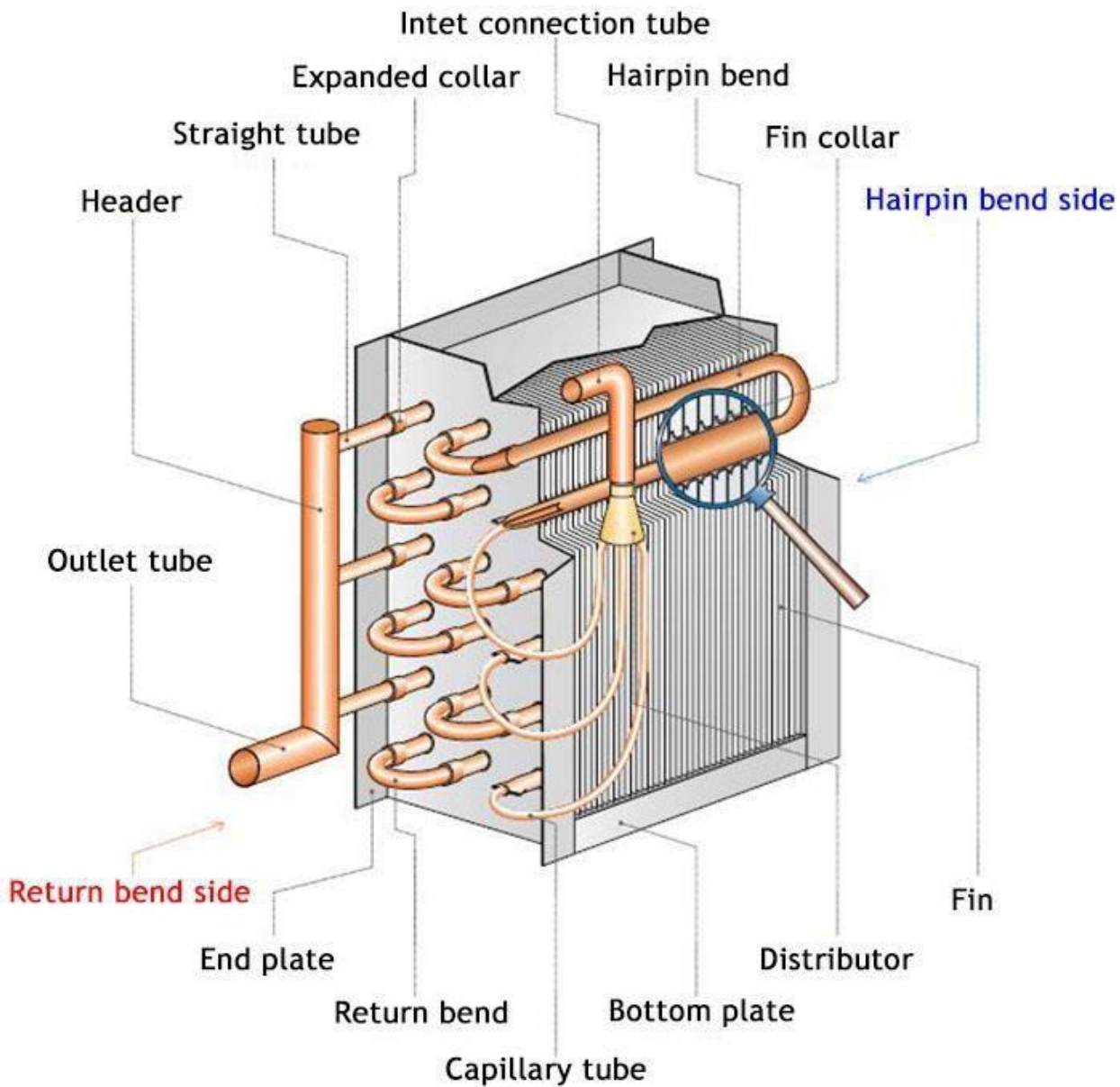
Casing is die-formed with 1½” flanges to permit easy stacking and mounting. Intermediate tube supports are supplied on coils over 44” fin length with an additional support every 42”.

## Testing and Performance

All coil assemblies are leak tested under water with nitrogen at 315 PSIG

## Circuiting

Coil circuiting options include full face (std.), intertwined, horizontal (face) split, and face split / intertwined.



## ❖ STEAM COIL

### Type SS

#### Elementary Surface

Round seamless copper tubes are expanded using hydropneumatics water expansion system into the fin collars of the secondary surface. The hydropneumatics water expansion system provides a permanent metal-to-metal bond for efficient heat transfer. Tubes are staggered in the direction of airflow

#### Secondary Surface

Corrugated aluminum or copper plate type fin that is die-formed. Fin collars are full-drawn to provide accurate control of fin spacing and maximum contact with tubes.



#### Headers

Seamless copper with die-formed holes that provide a parallel surface to the coil tube for strong brazing joints.

#### Connections

Red brass Schedule 40 male pipe thread (MPT) is standard with optional copper female pipe thread (FPT) and sweat available. Maximum fin length of 108" with same end connections. Steam pressure above 50 PSIG will have opposite end connections.

## Casing

Casing is die-formed with 1½” flanges to permit easy stacking and mounting. Coil as shown above must be mounted level (NO pitched case). Opposite end connection coils can be supplied with pitched casing. Intermediate tube supports are supplied on coils over 44” fin length with an additional support every 42”.

## Testing and Performance

All coil assemblies are leak tested under water with nitrogen at 315 PSIG. Standard construction is suitable for 25 PSIG steam pressure. Heavier wall construction is available for steam pressures up to 100 PSIG.

## COIL OPTIONS FOR ALL COILS

<b>TYPE OF COIL</b>	<b>ALL TYPES</b>
<b>COPPER TUBE DIA</b>	<b>3/8" x0.23 to 0.28 (t) (Both Plan &amp; IG)</b>
<b>FIN MATERIAL</b>	<b>Aluminum Foil-0.15 mm Thickness</b>

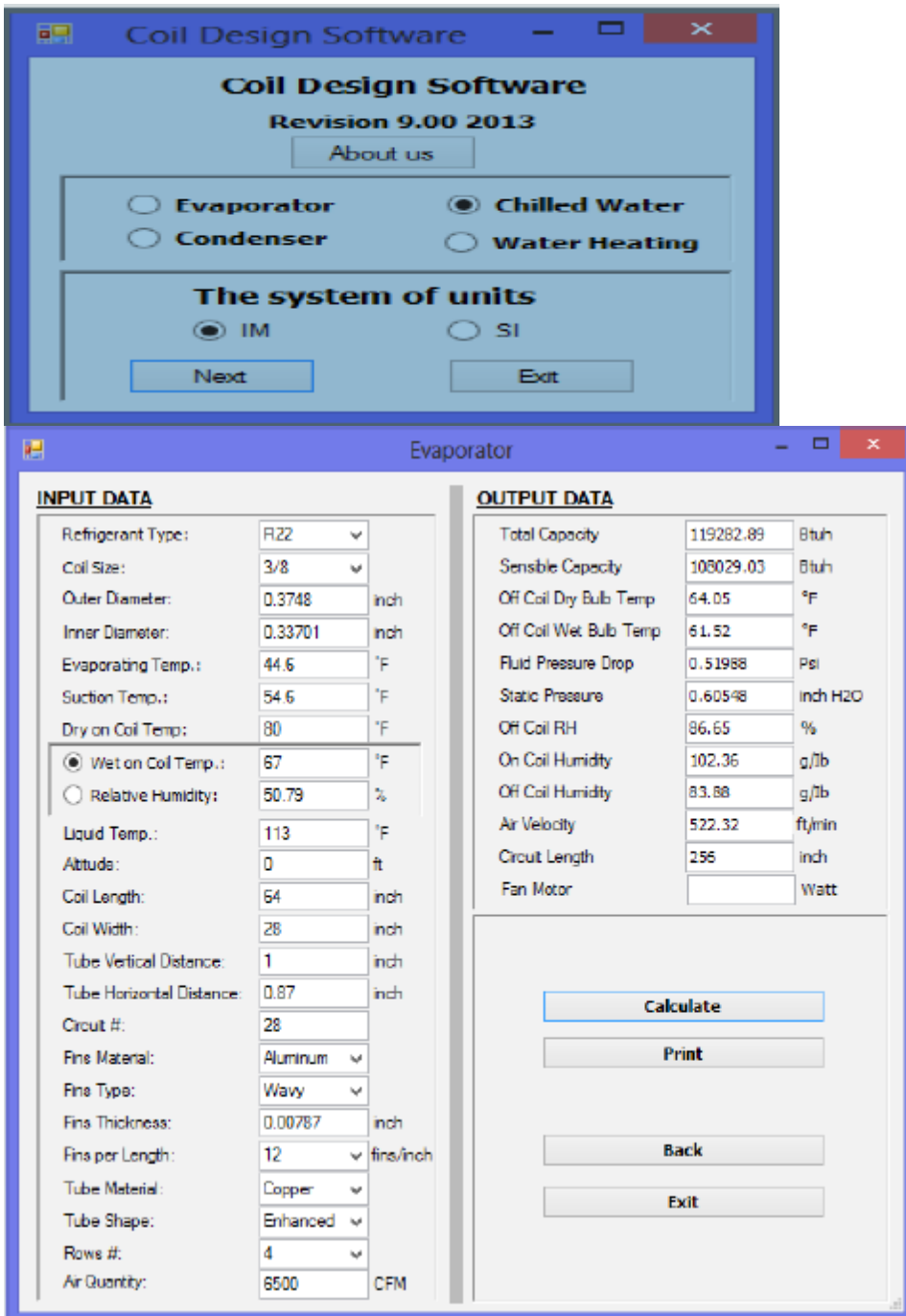
<b>ROWS</b>	<b>FIN HEIGHT</b>	<b>FIN LENGTH</b>	<b>FIN SPACING</b>	<b>TUBE SPACING FACE x ROW</b>	<b>CASING</b>	<b>MAX STD OPERATING CONDITION</b>
1,2,4,6,8	6" TO 40"  152.4 mm TO 1016 mm	12" TO 40"  304.8 mm TO 1016 mm	<b>10 &amp; 12 FPI</b>	1"x 0.866"  25.40 mm x 22 mm	16 or 14 GA Galvanized Steel  304, 316 Stainless Steel	250 PSIG 300° F

<b>TYPE OF COIL</b>	<b>ALL TYPES</b>
<b>COPPER TUBE DIA</b>	<b>1/2" x0.32 to 0.48 (t) (Both Plan &amp; IG)</b>
<b>FIN MATERIAL</b>	<b>Aluminum Foil-0.15 mm Thickness</b>

<b>ROWS</b>	<b>FIN HEIGHT</b>	<b>FIN LENGTH</b>	<b>FIN SPACING</b>	<b>TUBE SPACING FACE x ROW</b>	<b>CASING</b>	<b>MAX STD OPERATING CONDITION</b>
1,2,4,6,8	6" TO 40"  190.5 mm TO 1270 mm	12" TO 40"  381 mm TO 1270 mm	<b>6 TO12 FPI</b>	1.25"x 1.083"  31.75 mm x 27.50 mm	16 or 14 GA Galvanized Steel  304, 316 Stainless Steel	250 PSIG 300° F

- **CH COILS SELECTION SOFTWARE**

Using our coil selection software, we can calculate the performance of currently used coils and make intelligent choices for the most appropriate coils for any project





### Condenser

INPUT DATA		OUTPUT DATA	
Refrigerant Type:	R22	Capacity	303245.49 Btuh
Coil Size:	3/8	Off Coil Dry Bulb Temp.:	124.82 °F
Outer Diameter:	0.3748 inch	Fluid Pressure Drop	4.48886 Psi
Inner Diameter:	0.33701 inch	Static Pressure	0.00019 inch H2O
On Coil Dry Bulb Temp.:	95 °F	Air Velocity	441.44 ft/min
Discharge Temp.:	185 °F	Circuit Length	512 inch
Condensing Temp.:	122 °F	Fan Motor	700 Watt
Altitude:	0 ft	<div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 100px;">Calculate</div> <div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 100px;">Print</div> <div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 100px;">Price</div> <div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 100px;">Back</div> <div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 100px;">Exit</div>	
Coil Length:	64 inch		
Coil Width:	48 inch		
Tube Vertical Distance:	1 inch		
Tube Horizontal Distance:	0.87 inch		
Circuit #:	24		
Fins Material:	Aluminum		
Fins Type:	Wavy		
Fins Thickness:	0.00787 inch		
Fins per Length:	12 fins/inch		
Tube Material:	Copper		
Tube Shape:	Enhanced		
Rows #:	4		
Air Quantity:	9417.32 CFM		

### Chilled Water

INPUT DATA		OUTPUT DATA	
Power Supply:	380-415/3/50 V/Ph/Hz	Capacity	36651.26 Btuh
Fan Speed:	1400 RPM	Sensible Capacity	36651.26 Btuh
Fan Motor:	315 Watt	Off Coil Dry Bulb Temp	69.05 °F
Motor Current:	0.19 A	Off Coil Wet Bulb Temp	61.13 °F
Coil Size:	3/8	Water Pressure Drop	0.12 Psi
Outer Diameter:	0.3748 inch	Water Pressure Drop 2	0 kPa
Inner Diameter:	0.33701 inch	Static Pressure	0.11239 inch H2O
On Coil Dry Bulb Temp.:	80 °F	Off Coil Relative Humidity	63.56 %
On Coil Wet Bulb Temp.:	67 °F	Off Coil Humidity	65.77 g/lb
<b>Calculation Depends On:</b> <input checked="" type="radio"/> Water in/out: <input type="radio"/> Flow Rate		Air Flow Rate	6500 CFM
Water In Temp:	45 °F	Water Out Temp.	55 °F
Water Out Temp.:	55 °F	Water Flow Rate	7.33 GPM
Water Flow Rate:	30 GPM	Circuit Length	128 inch
Altitude:	0 ft	Water Pressure Drop In Header and Connection	0.06 Psi
Air Flow Rate:	6500 CFM	Water Pressure Drop in Valve	0 Psi
Fluid Type:	Water 10 %	Total Water Pressure Drop	0.18 Psi
		Water Volume Across Coil	5.5 L
Coil Length:	64 inch	<div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 100px;">Calculate</div> <div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 100px;">Back</div> <div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 100px;">Print</div> <div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 100px;">Exit</div>	
Coil Width:	28 inch		
Tube Vertical Distance:	1 inch		
Tube Horizontal Distance:	0.87 inch		
Header Diameter:	0.875 inch		
Header Length:	39.37 inch		
Header Connection Diameter:	0.75 inch		
Header Connection Length:	5.91 inch		
Valve Size:	no valve KV 1		
Circuit #:	<input type="radio"/> Calculated		
	<input checked="" type="radio"/> Circuting # 28		
	<input type="radio"/> Tube # per Circuit 10		
	10		
Fins Material:	Aluminum		
Fins Type:	Flat		
Fins Thickness:	0.00787 inch		
Fins per Length:	10 fins/inch		
Tube Material:	Copper		
Tube Shape:	Smooth		
Riffled Tube Affect Percentage:	10 %		
Rows #:	2		
<div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 150px;">Psychrometric</div> <div style="border: 1px solid gray; padding: 5px; margin: 5px auto; width: 150px;">Pipe Sizing</div>			



**Water Heating**

INPUT DATA				OUTPUT DATA			
Models:	WRMW-10V-250511-C	Coil Length:	64	inch	Total Capacity	104179.56	Btu/h
Power Supply:	380-415/3/50 V/Ph/Hz	Coil Width:	28	inch	Off Coil Dry Bulb Temp.	99.29	°F
Fan Speed:	1400	Tube Vertical Distance:	1	inch	Water out Temp.	104	°F
Fan Motor:	0.02 hp	Tube Horizontal Distance:	0.87	inch	Water Flow Rate	1.58	GPM
Motor Current:	0.19 A	Header Diameter:	0.875	inch	Circuit Length	128	inch
Coil Tube Size:	3/8	Header Length:	39.37	inch	Air Flow Rate	5000	CFM
Outer Diameter:	0.3748	Header Connection Diameter:	0.75	inch	Static Pressure	0.03508	inchH2O
Inner Diameter:	0.33701	Header Connection Length:	5.91	inch	Water Pressure Drop	0.07	Psi
Dry on Coil Temp.:	80 °F	Valve Size:	no valve	Kv 1	Water Pressure Drop 2	0	Psi
Wet on Coil Temp.:	67 °F	Circuit #:	<input type="radio"/> Calculated		Water Pressure Drop in Header and Connection	0.15	Psi
<b>Calculation Depends On:</b> <input checked="" type="radio"/> <b>Water in/out:</b> <input type="radio"/> <b>Flow Rate</b>		<input checked="" type="radio"/> <b>Circuiting #</b>	28		Water Pressure Drop in Valve	0	Psi
Water in Temp.:	122 °F	<input type="radio"/> <b>Tube # per Circuit</b>	10	10	Total Water Pressure Drop	0.22	Psi
Water Out Temp.	104 °F	Fins Material:	Aluminum		Water Volume Across Coil	5.5	L
Water Flow Rate	158.4 GPM	Fins Thickness:	0.00787	inch	<div style="text-align: center;"> <input type="button" value="Calculate"/>  <input type="button" value="Back"/>  <input type="button" value="Print"/>    <input type="button" value="Price"/>  <input type="button" value="Exit"/>  <input type="button" value="Save"/>    <input type="button" value="Retrive Data"/>  <input type="button" value="Pipe Sizing"/> </div>		
Altitude:	0 m/h	Fins per Length:	10	fins/inch			
Air Flow Rate:	5000 CFM	Fins Type:	Wavy				
Fluid:	Water	Tube Material:	Copper				
		Tube Shape:	Filled				
		Rifled Tube Affect Percentage	10	%			
		Rows #:	2				

If you have any queries, please feel free to contact us

# INNOVENT TECHNOLOGIES

Thank you .....!



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