REZNOR®

# COOLING COIL MODULE WITH DX OR CHILLED WATER COIL

## Description

PREEVA units have a wide selection of factory installed custom designed DX and Chilled Water coils tailor made to the application, from 100% outside air in severe climates to 100% return air in mild climates. Coil application is designed by Reznor Software such as RezQuote™ or RezPro® Toolbox. The performance data is in compliance with ARI Standard 410. Design/Performance Data Sheets are generated by the software or are available from your Reznor Representative by submitting the Request Form found later in this catalog.

The double wall insulated draw-through coil cabinet is factory assembled to the system blower cabinet. Both DX and Chilled Water Coil cabinets are available. Both sides of the cooling coil section have easily removable door panels for routine coil inspection and cleaning. The removable stainless steel drain pan has an exterior 1" NPT connection.

- Reznor Coil Selection Software is downloadable from www.RezSpec.com

Primary considerations are:

1) Sizing the PREEVA unit to meet both heating and cooling requirements.

2) Deciding on condenser capacity and staging.

3) Specifying cooling controls

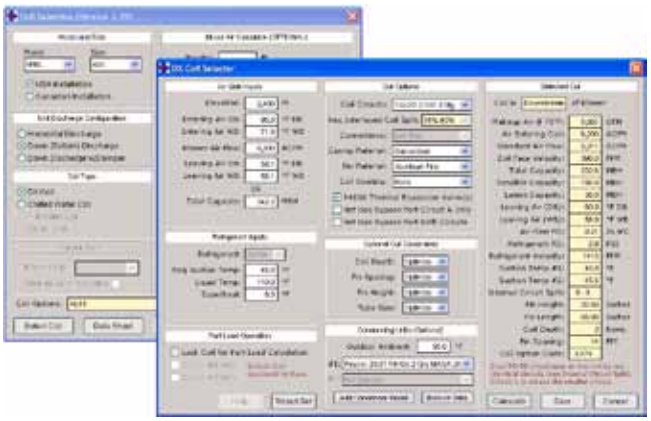
Approximate cooling airflow ranges and capacity ranges (sea level at 45° suction and 45° chilled water) are shown in the DX and Chilled Water Performance Range Tables. Somewhat higher or lower capacities will result from changes in elevation, operating temperatures, flow rates, etc.

## Cooling Coil Module Options

| | |
|---|---|
| **DX Coil and dH Coil Circuiting** | Single Circuit |
| | 50-50 Dual Circuit |
| | 1/3 - 2/3 Split Circuit |
| **Coil Casing** | Galvanized Steel |
| | Stainless Steel |
| **Refrigerant Options** | R22, R134a, R407c, R410a |
| **Filters** | 2", or 4" Pleated |
| **Coil Material** | Copper Tube with Aluminum Fins |
| | Copper Tube with Copper Fins |
| **Coil Coating** | ElectroFin™ Polymeric Coating |
| **Cabinet** | Double wall w/ insulation |
| | Double wall with high desnity insulation |

***ElectroFin™ is a registered trademark of AST ElectroFin, Inc.***

**NOTE: To select the correct coil, you (or your Reznor Representative) must run the Reznor Coil Selection Software Program.**



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# COIL SELECTION SOFTWARE

The Reznor Coil Selection Software (DX selection, shown above) that is part of RezQuote™ and RezPro® Toolbox packages will optimally design heating and cooling coils for your specific application for all Reznor models utilizing custom coils.

Exact design and performance are shown on coil data sheets output by Reznor coil selection software. You may request or download a copy of the software or submit the coil request form (found at the end of this section on cooling) to your Reznor Representative, who can then provide you with a detailed coil run.

## DX Coil Controls and Circuits

DX coils are available for one, two, or three stage operation. Two or three stage operation is generally recommended for makeup air, where the load on the coil may vary considerably. PREEVA digital control options DG5, DG6 and D12 are ideally suited to sense makeup air discharge temperature and provide two or three stages of capacity, as required. Up to 3:1 cooling turndown makes hot gas bypass unnecessary or keeps hot gas bypass operation to a minimum.

Two stage DX cooling operation is accomplished by two equal capacity interlaced coil circuits for connection to a two stage condensing unit or two equal capacity single stage condensers. Three stage operation is accomplished by two unequal interlaced circuits, with approximately 1/3 of the coil tubes on the first circuit and 2/3 of the coil tubes on the second. Two condensing units of unequal capacity are used – one 5 ton and one 10 ton for example. The first circuit is connected to the smaller condenser and the second to the larger. The 3 stage digital cooling control system in the PREEVA will activate the first condenser on first stage. On second stage, the first condenser is deactivated and the larger second condenser is activated. On third stage, both condensers are activated. The three-stage digital cooling control and thermostat (Option DG1, DG2, DG5, DG6, D12D or D12E) in the PREEVA actually makes 3 separate staging relays, so other logics are configurable. TXV's, liquid line solenoids, any desired hot gas bypass valves, and condensing units are provided by others. Alternate analog heating controls are available for cooling controls by others or heating/cooling by room thermostat only. Call your Reznor Representative for special requirements.

## Coil Design – DX Coils

Individual coils are custom designed and internally circuited by Reznor coil selection/design software to optimize for the exact conditions specified. Variables are:

External Circuiting: Single (one stage), Dual 50-50 (2 stage), Dual 1/3-2/3 (3 stage)

Refrigerants: R410a

Rows: 2, 3, 4, or 6

Fins per Inch: 8, 10, 12, or 14

Tube OD: 1/2" (standard) or 3/8" (low load)

Fin Height: 20", 22.5", or 25" (75 to 150 sizes)
30", 32.5", or 35" (175 to 400A sizes)

Internal Circuiting: The number of internal coil circuits is thermodynamically optimized, but circuits may be increased to decrease refrigerant pressure drop or decreased to increase refrigerant velocity. Refrigerant velocity should be above 1000 fpm and refrigerant pressure drop should be less than 8 psi. When coil loads are light and refrigerant velocity would be less than 1100 fpm with 1/2" tube, 3/8" tube is used to improve refrigerant velocity . Note that higher refrigerant velocities are available with 20", 25", 30" and 35" height coils and lower refrigerant pressure drop with optimal thermodynamic efficiency are available with 22.5" and 32.5" height coils (due to internal circuiting). In general, preference is given to coils having the lowest air pressure drop, which favors taller fin heights.

## Coil Design - Chilled Water Coils

Individual coils are custom designed and internally circuited by Reznor coil selection/design software to optimize for the exact conditions specified. Variables are:

Refrigerants: Water, Ethylene Glycol(%), or Propylene Glycol(%)

Rows: 4 or 6

Fins per Inch: 6, 8, 10, 12, or 14

Tube OD: 1/2

Fin Height: 25" (75 to 150 sizes) or 35" (175 to 400A sizes)

Internal Circuiting: Quarter, Half, Three Quarter, or Single serpentine

Quarter circuit coils are used for low flow rates and have high pressure drops. Full circuit coils are for high flow rates and have low pressure drops. Half and Three Quarter circuit coils are in between. The best circuiting for a given application can be optimized based on flow rate, pressure drop and output requirements.

Chilled water coil performance is significantly diminished by glycol, higher percentages causing lower performance. The unit size/coil face may have to be increased to achieve adequate cooling performance with glycol in some cases. See approximate derates in the table below:

**Chilled Water Coil Output Derate (from pure water) for Glycol**

| Glycol Type | % Glycol by Wt | 12% | 20% | 28% | 36% | 40% |
|---|---|---|---|---|---|---|
| Ethylene | Derate | **2.7%** | **4.2%** | **6.4%** | **10.1%** | **11.7%** |
| | Freezing Point ºF | 24.7 | 17.9 | 9.2 | -1.5 | -8.1 |
| Propylene | Derate | **3.9%** | **7.0%** | **13.6%** | **22.9%** | **28.2%** |
| | Freezing Point ºF | 24.9 | 19.2 | 2.2 | 0.8 | -6.0 |

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# R410 DX & CHILLED WATER PERFORMANCE TABLES

**DX Coil Performance Range Table R-410a @ 45º F Sat Suction, Sea Level**

| PEH, REH Cabinet Size | PDH, RDH, SDH Size | RHH, SHH Size | PXH, RXH Size | Entering Air DB/ WB ºF | Fin Height (in.) | Cooling Airflow (scfm) | Face Vel (sfpm) | 2 Row, 8 Fin (minimum) | | | | 6 Row, 14 Fin (maximum) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Total/Sens MBH | Leaving DB/WB ºF | APD (in. WC) | Coil Wt (lbs) | Total/Sens MBH | Leaving DB/WB ºF | APD (in. WC) | Coil Wt (lbs) |
| A | 75, 100 | - | 000A | 80/67 | 20 | 833 | 250 | 19 / 14 | 64.6 / 60.4 | 0.06 | 36 | 39 / 26 | 51.2 / 51.2 | 0.32 | 73 |
| | | | | | 25 | 2083 | 500 | 30 / 26 | 68.5 / 62.9 | 0.20 | 42 | 88 / 60 | 53.4 / 53.4 | 0.74 | 93 |
| B | 125, 150 | - | 000B | 80/67 | 20 | 1181 | 250 | 25 / 19 | 64.9 / 60.6 | 0.06 | 43 | 60 / 39 | 49.7 / 49.7 | 0.25 | 100 |
| | | | | | 25 | 2951 | 500 | 40 / 36 | 68.7 / 63.0 | 0.19 | 51 | 121 / 84 | 53.8 / 53.8 | 0.74 | 120 |
| C | 175, 200, 225 | 130C, 180C | 000C | 80/67 | 30 | 1250 | 250 | 28 / 21 | 64.6 / 60.4 | 0.06 | 53 | 59 / 39 | 51.2 / 51.2 | 0.32 | 102 |
| | | | | | 35 | 2917 | 500 | 43 / 37 | 68.4 / 62.7 | 0.20 | 56 | 123 / 84 | 53.4 / 53.4 | 0.74 | 124 |
| D | 250, 300 | 260D | 000D | 80/67 | 30 | 2096 | 250 | 45 / 34 | 64.9 / 60.6 | 0.06 | 64 | 105 / 68 | 50.0 / 50.0 | 0.25 | 160 |
| | | | | | 35 | 4892 | 500 | 71 / 61 | 68.4 / 62.8 | 0.20 | 72 | 206 / 141 | 53.4 / 53.4 | 0.74 | 182 |
| E | 350, 400A | 350E | 000E | 80/67 | 30 | 2513 | 250 | 56 / 42 | 64.6 / 60.3 | 0.06 | 72 | 123 / 80 | 50.6 / 50.6 | 0.32 | 172 |
| | | | | | 35 | 5864 | 500 | 89 / 75 | 68.2 / 62.6 | 0.20 | 81 | 253 / 171 | 53.0 / 53.0 | 0.74 | 211 |
| PEH, REH Cabinet Size | Gas Unit Size | RHH, SHH Size | PXH/ RXH Size | Entering Air DB/ WB ºF | Fin Height (in.) | Cooling Airflow (scfm) | Face Vel (sfpm) | 2 Row, 8 Fin (minimum) | | | | 6 Row, 14 Fin (maximum) | | | |
| | | | | | | | | Total/Sens MBH | Leaving DB/WB ºF | APD (in. WC) | Coil Wt (lbs) | Total/Sens MBH | Leaving DB/WB ºF | APD (in. WC) | Coil Wt (lbs) |
| A | 75, 100 | - | 000A | 95/75 | 20 | 833 | 250 | 41 / 28 | 72.7 / 66.1 | 0.06 | 43 | 65 / 40 | 51.1 / 51.1 | 0.25 | 77 |
| | | | | | 25 | 2083 | 500 | 46 / 38 | 78.2 / 69.5 | 0.20 | 42 | 135 / 87 | 56.5 / 56.5 | 0.74 | 93 |
| B | 125, 150 | - | 000B | 95/75 | 20 | 1181 | 250 | 40 / 28 | 72.9 / 66.3 | 0.06 | 43 | 89 / 55 | 52.2 / 52.2 | 0.32 | 94 |
| | | | | | 25 | 2951 | 500 | 68 / 54 | 77.9 / 69.3 | 0.20 | 51 | 194 / 124 | 56.2 / 56.1 | 0.74 | 120 |
| C | 175, 200, 225 | 130C, 180C | 000C | 95/75 | 30 | 1250 | 250 | 41 / 30 | 73.1 / 66.5 | 0.06 | 49 | 98 / 59 | 51.1 / 51.1 | 0.25 | 109 |
| | | | | | 35 | 2917 | 500 | 64 / 53 | 78.2 / 69.5 | 0.20 | 56 | 189 / 121 | 56.5 / 56.5 | 0.74 | 124 |
| D | 250, 300 | 260D | 000D | 95/75 | 30 | 2096 | 250 | 73 / 51 | 72.5 / 65.9 | 0.06 | 64 | 158 / 97 | 52.4 / 52.4 | 0.32 | 149 |
| | | | | | 35 | 4892 | 500 | 118 / 89 | 78.2 / 68.9 | 0.17 | 76 | 327 / 208 | 55.7 / 55.7 | 0.74 | 182 |
| E | 350, 400A | 350E | 000E | 95/75 | 30 | 2513 | 250 | 90 / 61 | 72.7 / 65.6 | 0.05 | 76 | 200 / 120 | 50.6 / 50.6 | 0.25 | 185 |
| | | | | | 35 | 5864 | 500 | 148 / 108 | 78.0 / 68.6 | 0.17 | 85 | 392 / 249 | 55.7 / 55.7 | 0.74 | 211 |

***Note: Coils designed in the RezPro Coil Designer are optimized (fin height, tube diameter, circuiting, fin type, refrigerant velocity & PD) for specific conditions and condenser circuit capacities. Above selections are based on 45 ºF SST, 100 ºF liquid line temp, 8 ºF superheat. Coil weights vary depending upon specific circuiting and coil design.***

**Chilled Water Coil Performance Range Table, 45º Water, Sea Level (no glycol)**

| PEH, REH Cabinet Size | PDH, RDH, SDH Size | RHH, SHH Size | PXH, RXH Size | Entering Air WB/ DB ºF | Fin Height (in.) | Cooling Airflow (scfm) | Face Vel (sfpm) | 4 Row, 6 Fin (minimum) | | | | | | 6 Row, 14 Fin (maximum) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Total/ Sens MBH | Leaving WB/DB ºF | APD (in. WC) | LWT ºF | Dry Wt (lbs) | Fluid Wt (lbs) | Total/ Sens MBH | Leaving WB/DB ºF | APD (in. WC) | LWT ºF | Dry Wt (lbs) | Fluid Wt (lbs) |
| A | 75, 100 | - | 000A | 80/67 | 25 | 1042 | 250 | 35 / 24 | 59.3 / 56.4 | 0.09 | 53.3 | 62 | 82 | 48 / 32 | 51.7 / 51.6 | 0.25 | 56.6 | 93 | 121 |
| | | | | | | 2083 | 500 | 54 / 38 | 63.1 / 59.1 | 0.28 | 51.4 | 62 | 82 | 88 / 60 | 53.5 / 53.3 | 0.74 | 55.5 | 93 | 121 |
| B | 125, 150 | - | 000B | 80/67 | 25 | 1476 | 250 | 51 / 34 | 59.0 / 56.1 | 0.09 | 53.6 | 78 | 103 | 65 / 44 | 52.6 / 52.5 | 0.25 | 56.0 | 120 | 157 |
| | | | | | | 2951 | 500 | 79 / 56 | 62.7 / 58.7 | 0.28 | 51.7 | 78 | 103 | 130 / 88 | 52.7 / 52.6 | 0.74 | 56.0 | 120 | 157 |
| C | 175, 200, 225 | 130C, 180C | 000C | 80/67 | 35 | 1458 | 250 | 49 / 33 | 59.3 / 56.4 | 0.09 | 53.3 | 82 | 110 | 67 / 45 | 51.7 / 51.6 | 0.25 | 56.6 | 124 | 164 |
| | | | | | | 2917 | 500 | 75 / 54 | 63.1 / 59.1 | 0.28 | 51.4 | 82 | 110 | 123 / 85 | 53.5 / 53.3 | 0.74 | 55.5 | 124 | 164 |
| D | 250, 300 | 260D | 000D | 80/67 | 35 | 2446 | 250 | 80 / 55 | 59.5 / 56.6 | 0.09 | 53.2 | 114 | 155 | 110 / 75 | 52.1 / 52.1 | 0.25 | 56.3 | 182 | 241 |
| | | | | | | 4892 | 500 | 133 / 93 | 62.6 / 58.6 | 0.28 | 51.8 | 114 | 155 | 218 / 147 | 52.5 / 52.3 | 0.74 | 56.1 | 182 | 242 |
| E | 350, 400A | 350E | 000E | 80/67 | 35 | 2932 | 250 | 98 / 66 | 59.3 / 56.4 | 0.09 | 53.3 | 130 | 178 | 136 / 91 | 51.7 / 51.6 | 0.25 | 56.6 | 211 | 280 |
| | | | | | | 5864 | 500 | 162 / 113 | 62.4 / 58.4 | 0.28 | 51.9 | 130 | 178 | 256 / 174 | 52.8 / 52.7 | 0.74 | 55.9 | 211 | 280 |
| PEH, REH Cabinet Size | PDH, RDH, SDH Size | RHH, SHH Size | PXH, RXH Size | Entering Air ºF WB/DB | Fin Height (in.) | Cooling Airflow (scfm) | Face Vel (sfpm) | 4 Row, 6 Fin (minimum) | | | | | | 6 Row, 14 Fin (maximum) | | | | | |
| | | | | | | | | Total/ Sens MBH | Leaving WB/DB ºF | APD (in. WC) | LWT ºF | Dry Wt (lbs) | Fluid Wt (lbs) | Total/ Sens MBH | Leaving WB/DB ºF | APD (in. WC) | LWT ºF | Dry Wt (lbs) | Fluid Wt (lbs) |
| A | 75, 100 | - | 000A | 95/75 | 25 | 1042 | 250 | 57 / 36 | 63.7 / 59.7 | 0.09 | 52.7 | 62 | 82 | 74 / 47 | 54.0 / 53.8 | 0.25 | 55.1 | 93 | 121 |
| | | | | | | 2083 | 500 | 89 / 58 | 69.5 / 63.6 | 0.28 | 51.0 | 62 | 82 | 148 / 93 | 54.4 / 54.1 | 0.74 | 55.0 | 93 | 121 |
| B | 125, 150 | - | 000B | 95/75 | 25 | 1476 | 250 | 79 / 50 | 64.2 / 60.1 | 0.09 | 52.5 | 78 | 103 | 118 / 72 | 50.7 / 50.5 | 0.25 | 56.3 | 120 | 157 |
| | | | | | | 2951 | 500 | 124 / 82 | 69.6 / 63.7 | 0.28 | 50.9 | 78 | 103 | 208 / 131 | 54.5 / 54.3 | 0.74 | 54.9 | 120 | 157 |
| C | 175, 200, 225 | 130C, 180C | 000C | 95/75 | 35 | 1458 | 250 | 80 / 50 | 63.7 / 59.7 | 0.09 | 52.7 | 82 | 110 | 104 / 65 | 54.0 / 53.8 | 0.25 | 55.1 | 124 | 163 |
| | | | | | | 2917 | 500 | 124 / 81 | 69.5 / 63.6 | 0.28 | 51.0 | 82 | 110 | 207 / 130 | 54.4 / 54.1 | 0.74 | 55.0 | 124 | 164 |
| D | 250, 300 | 260D | 000D | 95/75 | 35 | 2446 | 250 | 133 / 83 | 63.9 / 59.9 | 0.09 | 52.6 | 114 | 155 | 178 / 111 | 53.5 / 53.4 | 0.25 | 55.2 | 182 | 245 |
| | | | | | | 4892 | 500 | 211 / 137 | 69.4 / 63.4 | 0.28 | 51.1 | 114 | 155 | 339 / 215 | 54.9 / 54.6 | 0.74 | 54.8 | 182 | 241 |
| E | 350, 400A | 350E | 000E | 95/75 | 35 | 2932 | 250 | 162 / 100 | 63.7 / 59.6 | 0.09 | 52.8 | 130 | 178 | 219 / 135 | 52.8 / 52.7 | 0.25 | 55.5 | 211 | 284 |
| | | | | | | 5864 | 500 | 250 / 164 | 69.5 / 63.6 | 0.28 | 51.0 | 130 | 177 | 396 / 253 | 55.6 / 55.3 | 0.74 | 54.5 | 211 | 284 |

***Note: Some variation in capacity is possible by varying circuiting (Quarter, Half, Three-Quarter, and Single serpentine available), Flow Rate and Fluid Pressure Drop. Values shown represent a requested fluid temp rise of 10 ºF with a requested max fluid PD of 18 ft WC. All circuit types are represented.***

[A] Actual Main Coil Capacity and Total System Cooling MBH will depend upon design of main coil and condenser selected. It is not feasible to achieve an exact main coil temperature or system discharge temperature - condenser used will either be smaller or larger than requested capacity. The goal of neutral air and the neutral air control system is to provide outside air to the space at a temperature and humidity ratio that will allow a conventional cooling system for the space to maintain precise conditions regardless of outside air condition.

[B] Wet bulb temperature (essentially enthalpy) is by far the primary determinant of system performance at a given SCFM. Entering dry bulb and main coil condenser ambient have a much less dramatic effect. A system operating at 100/74 can be conservatively estimated at 95/75.