# hot water coils

## APPLICATION

- Hot water (glycol)-to-air heat exchanger
- Attached to air terminal to provide heat into a space
- Typically used in perimeter zones

## PRODUCT FEATURES

- Designed for maximum heat transfer and low water pressure drops using single and multi-circuited designs.
- Performance data per AHRI Standard 410.
- Factory pressure tested for leaks with dry nitrogen to 400 psi with a minimum burst pressure of 2500 psi.
- 20 gauge galvanized sheet metal casing with 18 gauge end plates
- 1/2" O.D. copper tubes, .016" wall thickness, mechanically expanded in fins. Manifolds are minimum .028" wall thickness.
- Aluminum corrugated fins with rippled edges, .0055" thick, 10 per inch.
- Connections are male solder headers. Refer to submittal sheet for diameter.
- Factory installed to air terminal

## OPTIONS

- Right hand or left hand connections – factory configured
- 1, 2, and 4 row coils (see specific model for availability)
- Clean-out access doors factory installed in air terminal casing.
- "Steam" construction available. Contact your local Anemostat representative.

## PERFORMANCE NOTES

- Data is based on AHRI 410 test standards. Water flows below the allowed lower limit may reduce heat transfer due to laminar water flow through tubes.


**Model EZT Single Duct with 2 row hot water coil, right hand header connections**

## TABLE 81: HOT WATER HEATING COIL PERFORMANCE – INLET SIZES 05, 06

| | Water Flow (GPM) | Water PD (ft. w.g.) | | AIR FLOW CFM 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5", 6" HVIR 1 Row | 0.50 | 0.2 | MBH | 5.5 | 6.8 | 7.7 | 8.5 | 9.2 | 9.8 | 10.2 | 10.7 |
| | 1.00 | 0.6 | | 6.0 | 7.5 | 8.8 | 9.9 | 10.8 | 11.6 | 12.3 | 13.0 |
| | 2.00 | 1.9 | | 6.3 | 8.0 | 9.5 | 10.8 | 11.9 | 12.9 | 13.8 | 14.6 |
| | 3.00 | 3.9 | | 6.4 | 8.2 | 9.8 | 11.2 | 12.3 | 13.4 | 14.4 | 15.3 |
| | 4.00 | 6.5 | | 6.4 | 8.3 | 9.9 | 11.3 | 12.6 | 13.7 | 14.7 | 15.7 |
| 5", 6" HVIR 2 Row | 1.00 | 0.3 | MBH | 8.9 | 11.5 | 13.6 | 15.2 | 16.6 | 17.8 | 18.9 | 19.8 |
| | 2.00 | 1.1 | | 9.5 | 12.6 | 15.1 | 17.2 | 19.1 | 20.7 | 22.2 | 23.5 |
| | 3.00 | 2.4 | | 9.7 | 13.0 | 15.7 | 18.0 | 20.1 | 21.9 | 23.6 | 25.1 |
| | 4.00 | 4.1 | | 9.8 | 13.2 | 16.0 | 18.4 | 20.6 | 22.6 | 24.4 | 26.1 |
| | 5.00 | 6.2 | | 9.9 | 13.3 | 16.2 | 18.7 | 21.0 | 23.0 | 24.9 | 26.6 |
| 5", 6" HVIR 4 Row | 3.00 | 0.5 | MBH | 12.7 | 17.7 | 22.0 | 25.7 | 29.0 | 32.0 | 34.7 | 37.2 |
| | 4.00 | 0.8 | | 12.9 | 18.0 | 22.5 | 26.4 | 30.0 | 33.3 | 36.2 | 38.9 |
| | 5.00 | 1.3 | | 12.9 | 18.2 | 22.8 | 26.9 | 30.6 | 34.1 | 37.2 | 40.1 |
| | 6.00 | 1.8 | | 13.0 | 18.3 | 23.0 | 27.2 | 31.1 | 34.6 | 37.9 | 40.9 |
| | 7.00 | 2.4 | | 13.0 | 18.4 | 23.1 | 27.5 | 31.4 | 35.0 | 38.4 | 41.5 |

## HOT WATER HEATING COIL PERFORMANCE – INLET SIZES 07, 08

| | Water Flow (GPM) | Water PD (ft. w.g.) | | AIR FLOW CFM 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7", 8" HVIR 1 Row | 0.50 | 0.2 | MBH | 8.3 | 10.0 | 11.1 | 12.1 | 12.8 | 13.4 | 13.9 | 14.3 |
| | 1.00 | 0.6 | | 9.5 | 11.7 | 13.4 | 14.8 | 15.9 | 16.9 | 17.8 | 18.5 |
| | 2.00 | 2.1 | | 10.2 | 12.9 | 15.0 | 16.7 | 18.2 | 19.5 | 20.7 | 21.7 |
| | 3.00 | 4.2 | | 10.5 | 13.3 | 15.6 | 17.5 | 19.2 | 20.6 | 22.0 | 23.2 |
| | 4.00 | 7.0 | | 10.7 | 13.6 | 15.9 | 18.0 | 19.7 | 21.3 | 22.7 | 24.0 |
| 7", 8" HVIR 2 Row | 1.00 | 0.3 | MBH | 14.5 | 17.9 | 20.4 | 22.4 | 24.0 | 25.3 | 26.4 | 27.4 |
| | 2.00 | 1.1 | | 16.0 | 20.4 | 23.9 | 26.7 | 29.1 | 31.2 | 33.0 | 34.6 |
| | 3.00 | 2.4 | | 16.6 | 21.4 | 25.4 | 28.6 | 31.4 | 33.9 | 36.1 | 38.1 |
| | 4.00 | 4.2 | | 16.9 | 22.0 | 26.2 | 29.7 | 32.8 | 35.5 | 37.9 | 40.1 |
| | 5.00 | 6.4 | | 17.1 | 22.4 | 26.7 | 30.4 | 33.6 | 36.5 | 39.1 | 41.4 |
| 7", 8" HVIR 4 Row | 2.00 | 0.2 | MBH | 22.0 | 28.8 | 34.2 | 38.5 | 42.0 | 45.1 | 47.6 | 49.9 |
| | 3.00 | 0.5 | | 22.9 | 30.6 | 36.8 | 42.1 | 46.5 | 50.3 | 53.7 | 56.7 |
| | 4.00 | 0.9 | | 23.3 | 31.5 | 38.3 | 44.1 | 49.1 | 53.4 | 57.3 | 60.8 |
| | 6.00 | 1.9 | | 23.8 | 32.5 | 39.9 | 46.3 | 52.0 | 57.0 | 61.5 | 65.6 |
| | 8.00 | 3.2 | | 24.1 | 33.1 | 40.8 | 47.6 | 53.6 | 59.0 | 63.9 | 68.3 |

## HOT WATER HEATING COIL PERFORMANCE – INLET SIZES 09, 10

| | Water Flow (GPM) | Water PD (ft. w.g.) | | AIR FLOW CFM 300 | 425 | 550 | 675 | 800 | 925 | 1050 | 1175 | 1300 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9", 10" HVIR 1 Row | 0.50 | 0.2 | MBH | 11.6 | 13.4 | 14.6 | 15.6 | 16.4 | 17.1 | 17.7 | 18.1 | 18.6 |
| | 1.00 | 0.8 | | 13.6 | 16.2 | 18.2 | 19.8 | 21.2 | 22.3 | 23.4 | 24.3 | 25.1 |
| | 2.00 | 2.7 | | 14.9 | 18.1 | 20.7 | 22.8 | 24.7 | 26.4 | 27.8 | 29.2 | 30.4 |
| | 3.00 | 5.6 | | 15.4 | 18.8 | 21.7 | 24.1 | 26.2 | 28.1 | 29.8 | 31.3 | 32.7 |
| | 4.00 | 9.3 | | 15.7 | 19.2 | 22.2 | 24.8 | 27.0 | 29.1 | 30.9 | 32.5 | 34.1 |
| 9", 10" HVIR 2 Row | 1.00 | 0.4 | MBH | 20.5 | 24.2 | 27.0 | 29.2 | 31.0 | 32.5 | 33.8 | 34.8 | 35.8 |
| | 2.00 | 1.3 | | 23.2 | 28.4 | 32.5 | 36.0 | 38.9 | 41.4 | 43.6 | 45.6 | 47.3 |
| | 3.00 | 2.8 | | 24.3 | 30.1 | 34.9 | 38.9 | 42.4 | 45.5 | 48.2 | 50.7 | 52.9 |
| | 4.00 | 4.9 | | 24.9 | 31.0 | 36.2 | 40.6 | 44.5 | 47.9 | 50.9 | 53.7 | 56.3 |
| | 5.00 | 7.4 | | 25.2 | 31.6 | 37.0 | 41.7 | 45.8 | 49.4 | 52.7 | 55.7 | 58.5 |
| 9", 10" HVIR 4 Row | 2.00 | 0.3 | MBH | 31.9 | 39.8 | 46.0 | 50.9 | 55.0 | 58.5 | 61.5 | 64.0 | 66.3 |
| | 4.00 | 1.1 | | 34.4 | 44.3 | 52.5 | 59.6 | 65.7 | 71.1 | 75.9 | 80.2 | 84.1 |
| | 6.00 | 2.3 | | 35.3 | 45.9 | 55.1 | 63.1 | 70.1 | 76.5 | 82.2 | 87.4 | 92.1 |
| | 8.00 | 3.9 | | 35.7 | 46.8 | 56.4 | 64.9 | 72.5 | 79.4 | 85.7 | 91.4 | 96.7 |
| | 10.00 | 5.8 | | 36.0 | 47.3 | 57.3 | 66.1 | 74.1 | 81.3 | 87.9 | 94.0 | 99.7 |

1 MBH = 1,000 BTU / HR
GPM = Gallons / Min
CFM = Cubic Feet / Min
See page B-24 for calculation details.

**Note:** All selections based on 180°F EWT and 55°F EAT (125°ΔT). For other ΔT's adjust capacities by the following factors:

| ΔT | 65 | 75 | 85 | 95 | 105 | 115 | 125 | 135 | 145 | 155 | 165 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Factor** | .51 | .59 | .67 | .75 | .83 | .92 | 1.00 | 1.08 | 1.17 | 1.25 | 1.33 |

## HOT WATER HEATING COIL PERFORMANCE – INLET SIZE 12, 14

| | Water Flow (GPM) | Water PD (ft. w.g.) | | AIR FLOW CFM 500 | 800 | 1100 | 1400 | 1700 | 2000 | 2300 | 2600 | 2900 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **12", 14" HVIR 1 Row** | 2.00 | 0.3 | MBH | 24.0 | 30.2 | 34.8 | 38.3 | 41.1 | 43.5 | 45.5 | 47.3 | 48.8 |
| | 3.00 | 0.6 | | 25.5 | 32.7 | 38.1 | 42.5 | 46.0 | 49.1 | 51.7 | 54.0 | 56.1 |
| | 4.00 | 1.1 | | 26.3 | 34.1 | 40.1 | 45.0 | 49.0 | 52.5 | 55.6 | 58.3 | 60.7 |
| | 5.00 | 1.6 | | 26.9 | 35.1 | 41.4 | 46.7 | 51.0 | 54.9 | 58.2 | 61.2 | 63.9 |
| | 6.00 | 2.3 | | 27.2 | 35.7 | 42.4 | 47.9 | 52.5 | 56.6 | 60.1 | 63.3 | 66.2 |
| **12", 14" HVIR 2 Row** | 2.00 | 0.5 | MBH | 37.9 | 48.4 | 55.8 | 61.3 | 65.6 | 69.2 | 72.1 | 74.5 | 76.7 |
| | 3.00 | 1.1 | | 40.5 | 53.2 | 62.5 | 69.9 | 75.8 | 80.8 | 85.0 | 88.6 | 91.8 |
| | 4.00 | 1.8 | | 42.0 | 55.9 | 66.5 | 75.0 | 82.0 | 88.0 | 93.2 | 97.7 | 101.7 |
| | 6.00 | 3.8 | | 43.5 | 58.9 | 70.9 | 80.9 | 89.3 | 96.5 | 102.9 | 108.6 | 113.7 |
| | 8.00 | 6.4 | | 44.3 | 60.5 | 73.4 | 84.1 | 93.4 | 101.4 | 108.6 | 115.0 | 120.8 |
| **12", 14" HVIR 4 Row** | 4.00 | 1.0 | MBH | 57.4 | 79.3 | 95.7 | 108.6 | 118.9 | 127.4 | 134.5 | 140.6 | 145.9 |
| | 6.00 | 2.1 | | 59.4 | 84.0 | 103.5 | 119.5 | 132.8 | 144.2 | 154.0 | 162.5 | 170.1 |
| | 8.00 | 3.5 | | 60.5 | 86.5 | 107.8 | 125.5 | 140.7 | 153.8 | 165.4 | 175.6 | 184.8 |
| | 10.00 | 5.3 | | 61.1 | 88.0 | 110.4 | 129.4 | 145.8 | 160.1 | 172.9 | 184.3 | 194.6 |
| | 12.00 | 7.4 | | 61.5 | 89.1 | 112.2 | 132.0 | 149.3 | 164.6 | 178.2 | 190.5 | 201.7 |

**Note:** All selections based on 180°F EWT and 55°F EAT (125°ΔT). For other ΔT's adjust capacities by the following factors:

| **ΔT** | 65 | 75 | 85 | 95 | 105 | 115 | 125 | 135 | 145 | 155 | 165 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Factor** | .51 | .59 | .67 | .75 | .83 | .92 | 1.00 | 1.08 | 1.17 | 1.25 | 1.33 |

**Reheat Coil Definitions**

CFM = $Ft^3$ / minute
BTUH = BTU / hour
1 MBH = 1,000 BTU's / hour = 1,000 BTUH
GPM = Gallons / minute
EAT = Entering Air Temperature,°F
LAT = Leaving Air Temperature,°F
$\Delta T_A$ = Differential air temperature,°F = LAT - EAT
EWT = Entering Water Temperature,°F
LWT = Leaving Water Temperature,°F
$\Delta T_W$ = Differential water temperature,°F = EWT - LWT
kW = Kilowatt
1 kW = 3412 BTU / HR

**Water Coil Equations**

BTUH = CFM x 1.08 x $\Delta T_A$ = CFM x 1.08 x (LAT – EAT)
$\Delta T_A$ = MBH x 926 / CFM
$\Delta T_W$ = MBH x 2 / GPM

**Electric Coil Equations**

kW = CFM x $\Delta T_A$ / 3,160 = CFM x (LAT – EAT) / 3,160
$\Delta T_A$ = 3160 x kW / CFM

**Sizing Reheat Coils:**

1. Knowing the heating load of the space (BTUH or MBH), room temp setpoint, and the air flow rate during heating (based on minimum ventilation rates, max recommended discharge temps for best ADPI, etc.), determine the supply air temperature required to satisfy the load:

   Supply Air Temp = (MBH x 926 / CFM) + Room Temp Setpoint

2. The hot water heating coil is located in the primary air stream, and heats only the primary air flow. During the heating cycle, the total flow into the space is a mixture of induced plenum air and heated primary air, with each component having a different CFM value and temperature. The supply air temperature (SAT) into the space must then be calculated as:

   SAT = [(Induced CFM / Total CFM) x Induced Temp] + [(Primary CFM / Total CFM) x Coil LAT]

   Example:

   • Primary Air: 55°F, 500 CFM
   • Hot Water Coil LAT: 105 F
   • Induction Air: 78°F, 350 CFM
   • Total Air to Space: 500 + 350 = 850 CFM

   SAT = [(350 CFM / 850 CFM x 78°F] + [(500 CFM / 850 CFM) x 105°F] = 94°F

   By rearrangement:

   Coil LAT = [(SAT x Total CFM) – (Induced CFM x Induced Temp)] / Primary CFM

   Applying energy transfer equations for electric or hot water coils determines performance characteristics required to select the coil:

   Water Coils: BTUH = CFM x 1.08 x (LAT – EAT)

   Electric Coils: kW = CFM x (LAT – EAT) / 3,160