

# 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 ARI 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 ARI 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.

<b>Note:</b> 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<sup>3</sup> / 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
- ΔT<sub>A</sub> = Differential air temperature, °F = LAT - EAT
- EWT = Entering Water Temperature, °F
- LWT = Leaving Water Temperature, °F
- ΔT<sub>W</sub> = Differential water temperature, °F = EWT - LWT
- kW = Kilowatt
- 1 kW = 3412 BTU / HR

**Water Coil Equations**

BTUH = CFM x 1.08 x ΔT<sub>A</sub> = CFM x 1.08 x (LAT - EAT)  
 ΔT<sub>A</sub> = MBH x 926 / CFM  
 ΔT<sub>W</sub> = MBH x 2 / GPM

**Electric Coil Equations**

kW = CFM x ΔT<sub>A</sub> / 3,160 = CFM x (LAT - EAT) / 3,160  
 ΔT<sub>A</sub> = 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:

$$\text{Supply Air Temp} = (\text{MBH} \times 926 / \text{CFM}) + \text{Room Temp Setpoint}$$

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:

$$\text{SAT} = [(\text{Induced CFM} / \text{Total CFM}) \times \text{Induced Temp}] + [(\text{Primary CFM} / \text{Total CFM}) \times \text{Coil LAT}]$$

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

$$\text{SAT} = [(350 \text{ CFM} / 850 \text{ CFM} \times 78^\circ\text{F})] + [(500 \text{ CFM} / 850 \text{ CFM}) \times 105^\circ\text{F}] = 94^\circ\text{F}$$

By rearrangement:

$$\text{Coil LAT} = [(\text{SAT} \times \text{Total CFM}) - (\text{Induced CFM} \times \text{Induced Temp})] / \text{Primary CFM}$$

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