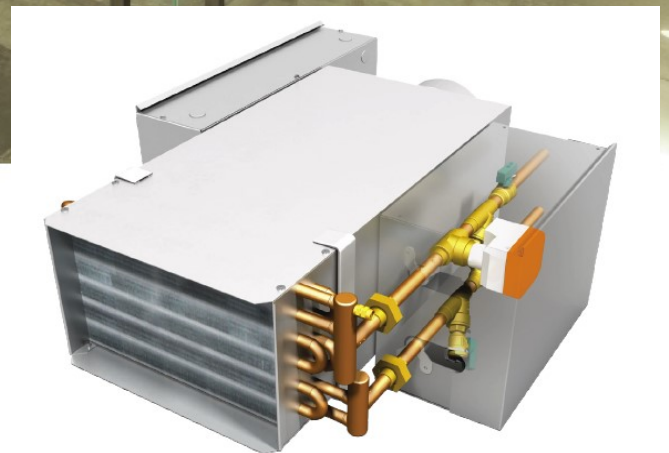


Acu-Zone™

Hot Water Zone Heater



Modular Pressure Control and Hot Water Heating Solution

BENEFITS AT A GLANCE

CONSTANT TEMPERATURE HEAT FOR VAV SYSTEMS

Acu-Zone™ heaters are specially designed to provide a constant supply air temperature at both design and at very low air flows to a single Therma-Fuser™ VAV diffuser or to larger Therma-Fuser™ VAV Zones. The field adjustable supply air temperature is factory set at an optimal point for low room air stratification, approximately 90°F/32°C. Use the type –HC, VAV heating, or type –CW, constant volume heating (warm-up) Therma-Fuser™ Diffusers

MODULATING “PI” HEAT CONTROLLER FOR LOW AIR FLOW

Acu-Zone™ heaters are equipped with a Digital PIC Controller that allows the heater to operate efficiently at extremely low air flows. When the room temperature falls below the room mode control thermostat set point, the discharge temperature is automatically controlled by PI (Proportional Integral) control modulation (0-10vDC) of the hot water valve, using the minimum amount of energy.

EASY TO INSTALL PACKAGE

Acu-Zone™ heaters can be installed in any existing or new forced air system. The remote mounted electronic, mode control thermostat accurately controls the temperature in each zone. The units with the PIC Controller is ready to install with a single 120/1/60 volt, single point connection, and an internal 120/24vAC step-down transformer for 24vAC wall thermostat and hot water valve connections. The discharge air sensor has four feet of wire for easy field installation.

HOW IT WORKS

DESCRIPTION

The Acu-Zone™ hot water heater is equipped with a proportional Integral (PI) Controller. When the room temperature falls below the room mode control thermostat set point, the controller and hot water valve are energized, and then modulated by the PI Controller (0-10vDC) to produce a constant discharge air temperature, even at extremely low air flow conditions.

INSTALLATION

Each Acu-Zone™ heating unit comes ready to install with a single point 120/1/60 connection, 24vAC step-down transformer, PIC Controller, wall mounting thermostat and configured according to the descriptions shown in the next section.

For configurations that include the damper, install the units as you would a terminal unit with a reheat coil with the same considerations and cautions.

For installing the Hot Water Coil Section with the controller, simply locate and install the AZON-IIW in a duct as you would a convention coil section, and allow at least one duct diameter of straight duct before and after the heater. The controller can be installed on the outside of the duct, and the room thermostat should be located out of direct sunlight and away from exterior walls. The discharge air thermostat should be installed in the duct downstream within the limits of the wire length.

CONFIGURATION

Since the Acu-Zone™ Hot Water Heater is for modular or system installation, several configurations are available for use:

Configurations:

1. PIC Controller only (Damper and Coil by others)
2. PIC Controller with Damper
3. PIC Controller with Hot Water Coil
4. PIC Controller with Damper and Hot Water Coil
5. PIC Controller with Damper, Hot Water Coil, and Water Valve

NOTES:

- PIC Controller includes a step-down transformer, damper actuator, static pressure sensor, 0-10vDC connections for valve control, discharge air temperature sensor with 4ft wire, and (OPTIONAL) BACnet® expansion module
- Damper s are available in a variety of sizes (see Dimensions (page 15))
- Water Coils available with copper tubes and aluminum fins (10FPI), 1 or 2 row, and standard or high capacity (see Performance starting on Page 6)
- Water Valve—Pressure Independent Characterized Control Valve PICCV) for variable speed pumping applications or a Three-way Bypass Characterized Control Valve (CCV)

CONSTRUCTION

Based on the Configurations noted in the previous section, the construction of the components of each are as follows:

- **PIC Controller** (with or without damper) complete controller package that includes digital control board and actuator assembled in a package on a common backplate. Unit will include a single point electrical connection, 120/24vAC step-down transformer, discharge air temperature sensor connection (input), discharge air temperature sensor with 4' of wire, 0-10vDC control to hot water valve connection (output), Differential Pressure Transducer and tubing connections (for static pressure control when a damper is furnished), and an optional BACnet® Expansion Module. Unit will be complete with an enclosure
- **Hot Water Coil**—Copper Tubes and Aluminum Fins (10FPI, 1/2"OD) with O.D. sweat connections, a galvanized steel header and a 5" long coil housing with slip & drive connections. when ordered as a **coil only**. A 9" long galvanized steel housing will be furnished with a transition when ordered as a **Damper with Coil** configuration. Please refer to Page 16 for further dimensional information, and for sizing refer to Page 4 for the *Quick Selection Chart* and the *Coil Performance Data* charts [Standard & High Capacity Coils] in the following pages.
- **Round / Rectangular Inlet Damper (PIM**—Pressure Independence Module) for **Damper with Coil Configuration** with galvanized steel construction suitable for air system static pressure control. Round sizes: 6", 8", 10", 12", 14", and 16"Ø. Square size: 24" x 16". Custom square and rectangular sizes for dampers and coils are available. Please consult the factory for further information.
- **Hot Water Valve** (Optional) - Hot Water Valves are available and are offered in two different types. The Pressure Independent Characterized Control Valve (PICCV) creates a water pressure drop at the valve and is typically used in variable speed pumping applications. The Characterized Control Valve (CCV) is a three-way bypass valve which directly bypasses flow back into the system. Both choices are selected based on the application characteristics (GPM or CV). Please consult the factory for further information and assistance.

APPLICATION

Acu-Zone™ Zone Heaters are specifically designed to provide a constant temperature supply air for Therma-Fuser™ VAV systems. Heater capacities are available to handle the heating (both primary and supplementary) for a single Therma-Fuser™ Diffuser or large enough for many VAV Diffusers that are grouped together in a zone.

Acu-Zone™ Heaters can be applied in Therma-Fuser™ VAV systems to provide primary heating, supplementary heating where the central heating system is insufficient, and for tempering cooling supply air to trim the space temperature when high minimum flows (ventilation air) are present.

By adding heat proportionally based on the air flow demand from the Therma-Fuser™ Diffusers, the Acu-Zone™ heaters minimize energy consumption by only adding the precise amount of heat necessary to mitigate the load in the space and accurately control the space temperature via the VAV Diffusers.

Acu-Zone™ heaters can be used with the Acutherm Pressure Independence Modules (PIM™) that provide static pressure control at both full flow all the way through low flow conditions. Please refer to *Configurations* on the previous page for further information.

Applications that incorporate the PIM / Acu-Zone™ together create a modular zone of pressure control and supply air create thermal zones with the ability to accurately control the air flow required into that space using the Pressure Independence Modules and provide tempered supply air into the space as well.

Once the pressure control and heating requirements have been calculated, sizing and selection can be accomplished using the *Quick Selection Chart* on the following page which matches the PIM size with the appropriate Acu-Zone II W size based on airflow. The standalone heater and packaged heater configurations can be selected from the chart; however, the *Performance Charts* for the individual sizes show the complete capacity information (Air Flow, Heating MBH, Air Pressure Drop, Coil GPM, and Head Pressure Drop) for the individual sizes within the range of that heater's specific size.

Please refer to *Useful Formulas* for additional formulas for calculating required capacity information.

USEFUL FORMULAS

MBH= 1000 x BTU/h

Air Heat Change (BTU/h) = cfm x 1.10 x ΔT (°F)

Air Temperature Rise (°F) = 909 x MBH / cfm

Water Temperature Drop (°F) = 2.04 x MBH / GPM

MBH = kw x 0.293

Air Heat Change (W) = L/s air x 1.23 x ΔT (°C)

Air Temperature Rise (°C) = 570 x kw / L/s air

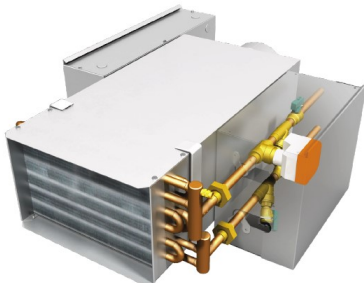
Water Temperature Drop (°C) = 0.17 x kw / L/s water

AZON-II W Quick Selection Chart for Low Pressure Drop Applications

Size	Number of Coils	Maximum CFM* for 35°F ΔT	ΔP Air - In Water Gage	Maximum CFM* for 20°F ΔT	ΔP Air In Water Gage
6	1	250	0.06	300	0.09
8	1	300	0.05	400	0.09
10	1	400	0.03	600	0.09
12	1	600	0.05	800	0.09
14	1	800	0.04	1200	0.09
16	1	1000	0.05	1400	0.09
24 x 16	1	1500	0.04	2250	0.09

*Max CFM calculated using 180°F inlet water and 90°F exiting air temperature. Water limited to 6 GPM and ΔP air limited to 0.1"wg. 35°F ΔT limited by heat capacity. 20°F ΔT limited by air pressure drop

Hot Water Heating Coils



Acu-Zone™ Hot Water Coils are constructed from high quality materials and are AHRI 410 certified. Designed to optimize heat transfer and minimize pressure drop, in addition to those sizes shown in the following *Performance Charts*, hot water coils are available in high capacity and oversized configurations to meet the requirements of nearly every project.

CORRECTION FACTORS - HOT WATER COILS

		Entering Water Temperature °F										
		120	130	140	150	160	170	180	190	200	210	220
Entering Air Temperature °F	50	0.54	0.62	0.71	0.79	0.87	0.96	1.04	1.12	1.21	1.29	1.38
	55	0.50	0.59	0.67	0.75	0.83	0.92	1.00	1.08	1.17	1.25	1.34
	60	0.47	0.55	0.63	0.71	0.79	0.88	0.96	1.04	1.13	1.21	1.30
	65	0.473	0.51	0.59	0.67	0.75	0.84	0.92	1.00	1.09	1.17	1.26

Performance Data Notes

1. Tabulated values are in MBH (thousands of BTU/HR)
2. Tables are based on a temperature difference of 125°F (180°F entering water temperature and 55°F entering air temperature). For other temperature differences, multiply MBH by the factors listed above
3. Minimum air flow and water flow values are based on ASHRAE recommendations for coil selections. For selections below these tabulated air or water values, please consult the factory
4. Do not select coils for a leaving air temperature above 120°F
5. HD (Head) loss is in feet of water
6. Air ΔP is pressure drop - in WG across the coil
7. Values in Performance Data tables are for 0ft of altitude and with no glycol in the system
8. Performances outside of the ranges used in the tables, consult the factory for additional information
9. Heating coils have been performance rated and certified with the current edition of AHRI Standard 410
10. Connections: Standard Coils (1-row) Sizes 6 & 8 and High Capacity Coils (1 Row) Sizes: 6, 8, 10, 12, 14" are 1/2" male solder; Standard Coils (1row) Sizes 10, 12, 14, 16, 24 x 16 are 7/8"OD male solder
11. Connections: Standard Coils (2-row) Sizes 6, 8, 10, 12, 14, 16, 24 x 16 and High Capacity Coils (2-row) Sizes 6, 8, 10, 12, 14, 16, 24 x 16 are all 7/8" OD male solder



PERFORMANCE DATA

AZON 1 and 2 Row Hot Water Coil Data

Rows	Water		AIR FLOW (CFM)						
	Coil GPM	HD Loss ΔP ft	175	200	225	250	300	350	400
1	0.5	0.15	6.2	6.5	6.8	7.1	7.6	8.0	8.4
	1	0.45	7.1	7.6	8.0	8.4	9.1	9.7	10.3
	2	1.35	7.7	8.3	9.8	9.3	10.2	11	11.8
	3	2.59	8.0	8.6	9.2	9.7	10.6	11.5	12.2
	AIR ΔP in WG		0.03	0.04	0.05	0.06	0.09	0.11	0.14
2	1	0.2	11.8	12.7	13.4	14.1	15.3	16.3	17.2
	2	0.65	13.3	14.4	15.4	16.3	17.9	19.3	20.6
	5	2.15	14.2	15.4	16.6	17.7	19.7	21.4	23.0
	6	4.38	14.5	15.8	17.1	18.2	20.4	22.2	23.9
	AIR ΔP in WG		0.07	0.09	0.11	0.13	0.18	0.24	0.3

SIZE 6
Hot Water
Capacity - MBH
 (Standard Coils)
 IP Units

Rows	Water		AIR FLOW (CFM)						
	Coil GPM	HD Loss ΔP ft	175	200	225	250	300	350	400
1	0.5	0.15	6.8	7.1	7.5	7.8	8.3	8.7	9.0
	1	0.45	7.9	8.4	8.9	9.3	10.1	10.7	11.3
	2	1.35	8.7	9.3	9.9	10.4	11.4	12.3	13.0
	3	2.59	9.0	10.3	10.3	10.9	12.0	12.9	13.7
	AIR ΔP in WG		0.04	0.06	0.07	0.07	0.1	0.13	0.17
2	1	0.2	12.7	13.6	14.4	15.2	16.4	17.5	18.4
	2	0.65	14.4	15.6	16.7	17.7	19.5	21.0	22.4
	5	2.15	15.4	16.9	18.2	19.4	21.5	23.5	25.3
	6	4.38	15.8	17.3	18.7	20.0	22.4	24.5	26.4
	AIR ΔP in WG		0.08	0.1	0.13	0.16	0.21	0.28	0.35

SIZE 6
Hot Water
Capacity - MBH
 (High Capacity Coils)
 IP Units

Refer to Page 5 for *Performance Data Notes*



PERFORMANCE DATA

AZON 1 and 2 Row Hot Water Coil Data

Rows	Water		AIR FLOW (CFM)						
	Coil GPM	HD Loss ΔP ft	300	350	400	500	600	700	800
1	0.5	0.2	8.7	9.2	9.6	10.3	10.9	11.3	11.7
	1	0.6	10.4	11.2	11.8	12.9	12.9	14.5	15.2
	2	1.77	11.8	12.5	13.4	14.8	14.8	17.0	17.9
	3	3.37	12.1	13.1	14.0	15.6	15.6	18.1	19.1
	AIR ΔP in WG			0.05	0.07	0.09	0.13	0.13	0.24
2	1	0.25	17.2	18.4	19.4	21.2	22.6	23.7	24.7
	2	0.79	20.0	21.7	23.3	25.9	28.0	29.8	31.4
	5	2.58	21.0	24.0	25.6	29.1	32.0	34.4	36.5
	6	5.16	22.6	24.0	26.9	30.5	33.5	36.3	38.7
	AIR ΔP in WG			0.11	0.14	0.18	0.27	0.38	0.5

SIZE 8
Hot Water
Capacity - MBH
 (Standard Coils)
 IP Units

Rows	Water		AIR FLOW (CFM)						
	Coil GPM	HD Loss ΔP ft	300	350	400	500	600	700	800
1	0.5	0.2	9.4	10.0	10.4	11.1	11.6	12.1	12.5
	1	0.6	11.5	12.3	13.0	14.2	15.1	15.9	16.6
	2	1.77	13.0	14.6	14.9	16.5	17.8	18.9	19.9
	3	3.37	13.5	14.7	15.7	17.5	19.0	20.3	21.4
	AIR ΔP in WG			0.06	0.08	0.1	0.15	0.21	0.27
2	1	0.25	18.4	19.7	20.8	22.6	24.0	25.2	26.2
	2	0.79	21.7	23.6	25.2	28.1	30.4	32.3	34.0
	5	2.57	23.9	26.2	28.3	32.0	35.1	37.7	40.1
	6	5.16	24.8	27.3	29.8	33.6	37.0	40.0	42.7
	AIR ΔP in WG			0.13	0.17	0.21	0.31	0.43	0.57

SIZE 8
Hot Water
Capacity - MBH
 (High Capacity Coils)
 IP Units

Refer to Page 5 for *Performance Data Notes*

PERFORMANCE DATA

AZON 1 and 2 Row Hot Water Coil Data



Rows	Water		AIR FLOW (CFM)							
	Coil GPM	HD Loss ΔP ft	400	500	600	700	800	900	1000	1100
1	0.5	0.19	12.9	14.1	15.0	15.8	16.5	17.1	17.6	18.1
	1	0.8	15.0	16.6	18.0	19.2	20.2	21.2	22.0	22.7
	2	2.02	16.4	18.4	20.1	21.6	22.9	24.1	25.2	26.2
	3	4.15	17.0	19.1	21.0	22.6	24.1	26.6	26.8	27.7
	AIR ΔP in WG		0.03	0.07	0.09	0.12	0.15	0.23	0.23	0.27
2	1	0.32	22.4	24.6	26.3	27.8	29.0	30.0	30.9	31.7
	2	1.0	26.7	30.0	32.7	35.1	37.1	38.9	40.5	42.0
	5	3.16	29.6	33.7	37.3	40.4	43.2	45.7	48.0	50.0
	6	6.27	30.7	35.2	39.1	42.6	45.7	48.6	51.2	53.5
	AIR ΔP in WG		0.09	0.14	.019	0.25	0.32	0.4	0.48	.057

SIZE 10
Hot Water
Capacity - MBH
 (Standard Coils)
 IP Units

Rows	Water		AIR FLOW (CFM)							
	Coil GPM	HD Loss ΔP ft	400	500	600	700	800	900	1000	1100
1	0.5	0.32	10.8	11.5	12.1	12.5	12.9	13.2	13.4	13.6
	1	1.0	14.1	15.3	16.3	17.1	17.8	18.4	19.0	19.4
	2	3.16	16.6	18.4	19.9	21.2	22.3	23.3	24.1	24.9
	3	6.27	17.8	19.8	21.6	23.1	24.4	25.6	26.6	27.6
	AIR ΔP in WG		0.05	0.08	0.11	0.14	0.18	0.22	0.26	0.31
2	1	0.32	23.9	26.2	28	29.4	30.7	31.7	32.6	33.4
	2	1.0	28.9	32.4	35.4	37.9	40.1	42.0	43.6	45.1
	4	3.16	32.2	36.8	40.8	44.2	47.3	50.0	52.5	54.7
	6	6.27	33.6	38.6	43.0	46.9	50.3	53.4	56.3	58.9
	AIR ΔP in WG		0.11	0.16	0.22	.029	0.37	0.46	0.55	0.65

SIZE 10
Hot Water
Capacity - MBH
 (High Capacity Coils)
 IP Units

Refer to Page 5 for *Performance Data Notes*

PERFORMANCE DATA



AZON 1 and 2 Row Hot Water Coil Data

Rows	Water		AIR FLOW (CFM)							
	Coil GPM	HD Loss ΔP ft	500	600	700	800	1000	1200	1400	1600
1	1	0.23	16.2	17.4	18.4	19.2	20.6	21.7	22.6	23.4
	2	0.72	19.1	20.8	22.3	23.6	25.8	27.6	29.1	30.4
	4	2.36	21.1	23.2	25.1	26.7	29.6	32.0	34.1	35.9
	6	4.77	21.9	24.2	26.2	28.0	31.2	33.9	36.2	38.3
	AIR ΔP in WG			0.04	0.05	0.07	0.09	0.13	0.18	0.24
2	1	0.41	27.3	29.4	31.1	32.5	34.8	36.5	37.9	39.1
	2	1.23	33.4	36.6	39.5	41.9	48	49.4	52.1	54.5
	4	3.83	37.5	41.7	45.5	48.9	54.7	59.6	63.8	67.4
	6	7.51	39.1	43.8	48.0	51.7	58.4	64.0	68.9	73.2
	AIR ΔP in WG			0.08	0.11	0.14	0.18	0.27	0.38	0.5

SIZE 12
Hot Water
Capacity - MBH
 (Standard Capacity)
 IP Units

Rows	Water		AIR FLOW (CFM)							
	Coil GPM	HD Loss ΔP ft	500	600	700	800	1000	1200	1400	1600
1	1	0.15	13.3	13.9	14.4	14.9	15.5	16.0	16.4	16.8
	2	0.4	17.6	18.9	19.9	20.8	22.2	23.3	24.2	24.9
	4	1.99	21.2	23.0	24.6	26.0	28.3	30.2	31.8	33.1
	6	4.3	22.8	24.9	26.8	28.5	31.3	33.6	35.6	37.3
	AIR ΔP in WG			0.04	0.06	0.08	0.1	0.15	0.21	0.34
2	1	0.41	28.9	31.1	32.8	34.3	36.6	38.3	39.7	40.8
	2	1.24	35.9	39.4	42.5	45.1	49.4	52.9	55.8	58.2
	4	3.83	40.7	45.4	49.6	53.3	59.6	64.9	69.4	73.4
	6	7.51	42.6	47.8	52.5	56.7	64.0	70.2	75.6	80.3
	AIR ΔP in WG			0.09	0.13	0.17	0.21	0.31	0.43	0.57

SIZE 12
Hot Water
Capacity - MBH
 (High Capacity Coils)
 IP Units

Refer to Page 5 for *Performance Data Notes*

PERFORMANCE DATA



AZON 1 and 2 Row Hot Water Coil Data

Rows	Water		AIR FLOW (CFM)								
	Coil GPM	HD Loss ΔP ft	600	800	1000	1200	1400	1600	1800	2000	2200
1	1	.29	20.3	22.6	24.4	25.7	26.9	27.8	28.6	29.3	29.9
	2	.89	24.4	27.9	30.6	32.9	34.9	36.6	38.0	39.3	40.5
	4	2.85	27.1	31.5	35.2	38.3	41.0	43.4	45.5	47.4	47.4
	6	5.68	28.2	33.0	37.1	40.6	43.6	46.3	48.7	50.9	50.9
	AIR ΔP in WG			0.03	0.04	0.07	0.09	0.12	0.15	0.19	0.23
2	1	.42	36.8	41.7	45.4	48.3	50.6	52.6	54.3	55.7	56.9
	2	1.35	43.9	51.3	57.3	62.3	66.5	70.1	73.2	76.0	78.5
	4	4.44	48.5	57.9	65.8	72.6	78.5	83.7	88.4	92.6	96.4
	6	9.0	50.3	60.5	69.2	76.8	83.5	89.5	94.9	99.8	104.3
	AIR ΔP in WG			0.05	0.09	0.14	0.19	0.25	0.32	0.4	0.48

SIZE 14
Hot Water
Capacity - MBH
 (Standard Capacity)
 IP Units

Rows	Water		AIR FLOW (CFM)								
	Coil GPM	HD Loss ΔP ft	600	800	1000	1200	1400	1600	1800	2000	2200
1	1	.48	17.5	18.8	19.8	20.5	21.0	21.5	21.8	22.1	22.4
	2	1.39	23.5	26.2	28.3	29.9	31.3	32.4	33.3	34.1	34.8
	4	4.04	28.1	32.3	35.6	38.4	40.7	42.7	44.4	46.0	47.4
	6	7.57	30.1	34.9	38.9	42.2	45.1	47.6	49.8	51.8	53.6
	AIR ΔP in WG			0.03	0.05	0.08	0.11	0.14	0.18	0.22	0.26
2	1	0.53	34.5	18.8	19.8	20.5	21.0	21.5	21.8	22.1	22.4
	2	1.59	43.9	26.2	28.3	29.9	31.3	32.4	33.3	34.1	34.8
	4	4.83	50.6	32.3	35.8	38.4	40.7	42.7	44.4	46.0	47.4
	6	9.35	53.2	34.9	38.9	42.2	45.1	47.6	49.8	51.8	53.6
	AIR ΔP in WG			0.07	0.05	0.08	0.11	0.14	0.18	0.22	0.26

SIZE 14
Hot Water
Capacity - MBH
 (High Capacity Coils)
 IP Units

Refer to Page 5 for *Performance Data Notes*

PERFORMANCE DATA



AZON 1 and 2 Row Hot Water Coil Data

Rows	Coil GPM	Water HD Loss ΔP ft	AIR FLOW (CFM)										
			800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
1	1	0.32	24.2	26.1	27.7	28.9	29.9	30.8	31.6	32.2	32.8	33.3	33.8
	2	0.98	29.9	33.0	35.6	37.8	39.6	41.3	42.7	44.0	45.2	46.3	47.2
	4	3.09	33.9	38.0	41.5	44.5	47.2	49.6	51.8	53.7	55.5	57.2	58.7
	6	6.14	35.5	40.1	44.0	47.4	50.5	53.2	55.7	58.0	60.1	62.1	63.9
AIR ΔP in WG			0.03	0.05	0.07	0.09	0.11	0.14	0.16	0.19	0.23	0.26	0.3
2	1	0.47	44.0	48.0	51.2	53.8	55.9	57.7	59.2	60.6	61.7	62.7	63.7
	2	1.47	54.3	60.9	66.3	71.0	75.0	78.5	81.6	84.3	86.8	89.0	91.1
	4	4.77	61.3	69.9	77.4	84.0	89.8	95.0	99.8	104.0	108.0	111.6	115.0
	6	9.62	64.0	73.6	82.0	89.4	96.1	102.1	107.7	112.7	117.4	121.7	125.8
AIR ΔP in WG			0.07	0.1	0.14	0.18	0.23	0.28	0.34	0.41	0.48	0.55	0.63

SIZE 16
Hot Water
Capacity - MBH
 (Standard Capacity)
 IP Units

Refer to Page 5 for *Performance Data Notes*

PERFORMANCE DATA



AZON 1 and 2 Row Hot Water Coil Data

Rows	Coil GPM	Water HD Loss ΔP ft	AIR FLOW (CFM)										
			800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
1	1	0.32	26.1	28	29.6	30.8	31.8	32.7	33.4	34.0	34.6	35.1	35.5
	2	0.98	32.9	36.2	38.9	41.2	43.2	44.8	46.3	47.7	48.8	49.9	50.9
	4	3.09	37.8	42.3	46.2	49.5	52.4	55.0	57.3	59.4	61.3	63.0	64.6
	6	6.14	39.8	44.9	49.2	53.0	56.4	59.4	62.2	64.7	66.9	69.1	71.0
	AIR ΔP in WG			0.04	0.06	0.08	0.1	0.13	0.16	0.19	0.22	0.26	0.3
2	1	0.47	46.6	50.7	53.9	56.5	58.7	60.4	61.9	63.2	64.4	65.3	66.2
	2	1.47	58.3	65.4	71.2	76.1	80.3	84.0	87.2	90.0	92.5	94.8	96.9
	4	4.77	66.4	76.0	84.2	91.4	97.7	103.4	108.5	113.1	117.3	121.2	124.7
	6	9.62	69.6	80.3	89.6	97.8	105.2	111.9	117.9	123.5	128.6	133.3	137.7
	AIR ΔP in WG			0.08	0.12	0.16	0.21	0.27	0.33	0.4	0.47	0.55	0.63

SIZE 16
Hot Water
Capacity - MBH
 (High Capacity Coils)
 IP Units

Refer to Page 5 for *Performance Data Notes*

PERFORMANCE DATA



AZON 1 and 2 Row Hot Water Coil Data

Rows	Coil GPM	Water HD Loss ΔP ft	AIR FLOW (CFM)										
			1200	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000
1	1	0.43	32.4	34.5	37.1	38.8	40.2	41.2	42.0	42.7	43.3	43.8	44.2
	2	1.28	42.4	46.4	51.5	55.3	58.4	60.8	62.9	64.6	66.1	67.5	68.6
	4	3.96	49.8	55.6	63.3	69.4	74.4	78.7	82.3	85.5	88.4	90.9	93.2
	6	7.75	52.9	59.4	68.4	75.7	81.8	87	91.5	95.6	99.2	102.4	105.4
AIR ΔP in WG			0.03	0.04	0.07	0.11	0.15	0.2	0.25	0.31	0.37	0.44	0.52
2	1.5	0.61	57.9	62.3	67.3	70.7	73.2	75.1	76.6	77.8	78.8	79.6	80.3
	3	1.88	76.0	84.4	95.0	102.9	109.1	114.1	118.2	121.7	124.6	127.2	129.4
	6	59.3	89.2	101.3	117.7	130.7	141.5	150.5	158.3	165.0	171.0	176.3	181.1
	9	11.76	94.6	108.3	127.5	143.1	156.3	167.6	177.5	186.2	194.0	201.0	207.4
	AIR ΔP in WG			0.06	0.09	0.15	0.22	0.31	0.41	0.52	0.65	0.78	0.93

SIZE 24 x 16
Hot Water Capacity - MBH
 (Standard Capacity Coils)
 IP Units

Refer to Page 5 for *Performance Data Notes*



PERFORMANCE DATA

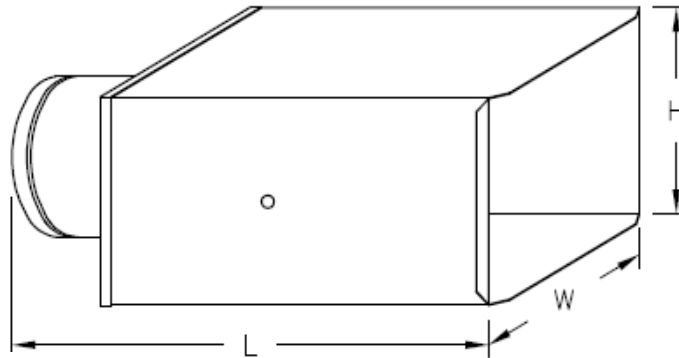
AZON 1 and 2 Row Hot Water Coil Data

Rows	Water		AIR FLOW (CFM)										
	Coil GPM	HD Loss ΔP ft	1200	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000
1	1	0.43	34.4	36.5	39.0	40.7	41.9	42.8	43.6	44.2	44.7	45.2	45.5
	2	1.29	46.2	50.4	55.6	59.5	62.5	65.0	67.0	68.7	70.1	71.4	72.5
	4	3.97	55.2	61.5	69.8	76.4	81.7	86.1	89.9	93.2	96.1	98.7	101.0
	6	7.75	59.0	66.3	76.2	84.1	90.7	96.3	101.2	105.4	109.2	112.6	115.7
AIR ΔP in WG			0.03	0.05	0.08	0.12	0.17	0.23	0.28	0.35	0.42	0.5	0.58
2	1.5	0.61	60.6	65.0	69.9	73.2	75.6	77.3	78.7	79.8	80.7	81.4	82.1
	3	1.88	81.0	89.8	100.9	109	115.3	120.2	124.3	127.7	130.6	133.0	135.2
	6	5.93	96.2	109.4	127.1	141.1	152.6	162.1	170.3	177.3	183.5	188.9	193.8
	9	11.76	102.4	117.7	138.7	155.8	170.1	182.4	193.0	202.3	210.6	518.0	224.7
AIR ΔP in WG			0.07	0.11	0.18	0.26	0.36	0.47	0.6	0.74	0.88	1.05	1.22

SIZE 24 x 16
Hot Water Capacity - MBH
 (High Capacity Coils)
 IP Units

Refer to Page 5 for *Performance Data Notes*

DIMENSIONAL DATA



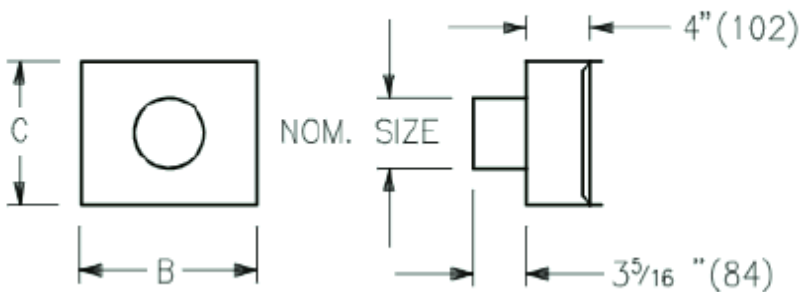
PIM (Round & Rectangular)

Size	Height (H)	Width (W)	Width (W) with Silencer	Length (L)	
				Basic Box*	With Attenuator ATT*
6	8 in.	12 in.	12 in.	22-1/8 in.	42-3/16 in.
8	10 in.	12 in.	12 in.	20-1/8"	40-3/16 in.
10	12-1/2 in.	14 in.	14 in.	20-1/8 in.	40-3/16 in.
12	15 in.	16 in.	24 in.	20-1/8 in.	40-3/16 in.
14	17-1/2 in.	20 in.	28 in.	23-5/8 in.	40-3/16 in.
16	18 in.	24 in.	32 in.	23-5/8 in.	40-3/16 in.
24 x 16**	18 in.	38 in.	46 in.	10 in.	

*For 1 and 2 row water coils, add 5in. to length

**Size 24 x 16 is provided with a rectangular inlet

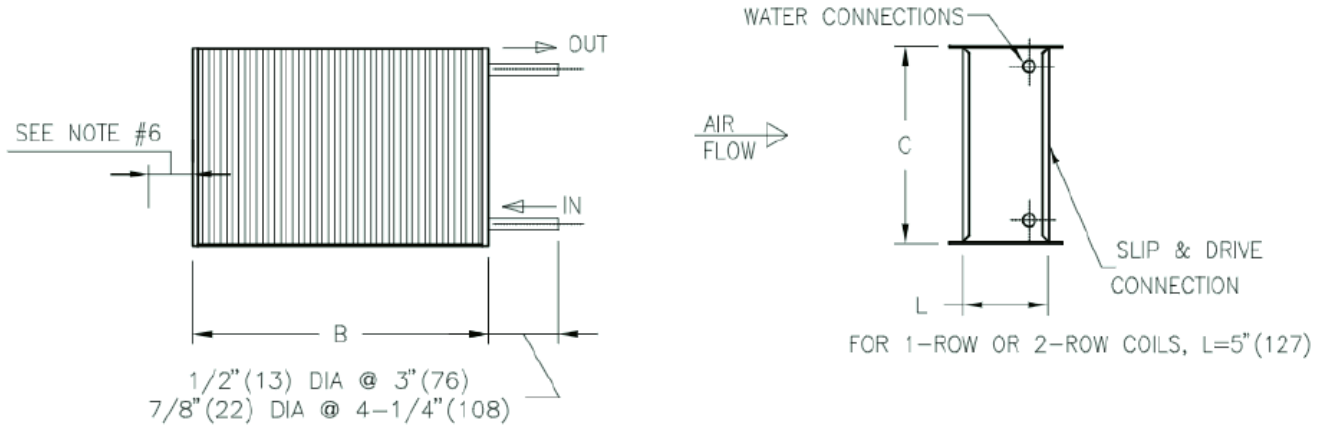
Round Discharge Collar



Unit Size	B	C	RDC Outlet
6	12	8	6
8	12	10	8
10	14	12-1/2	10
12	16	15	12
14	20	17-1/2	14
16	24	18	16
24x16	38	18	A/A

AZON-II W—Hot Water Coil Sections

Dimensional Data



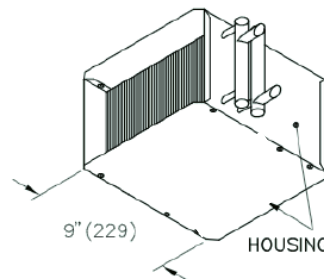
SI UNITS (mm)					
NOMINAL SIZE	B	C	COIL CONNECTIONS		
			1 row	1 row	2
			standard	H.C.	rows
6	305	203	13	13	22
8	305	254	13	13	22
10	356	318	22	13	22
12	406	381	22	13	22
14	508	445	22	13	22
16	610	457	22	22	22
24x16	965	457	22	22	22

IMPERIAL UNITS (inches)					
NOMINAL SIZE	B	C	COIL CONNECTIONS		
			1 row	1 row	2
			standard	H.C.	rows
6	12	8	1/2	1/2	7/8
8	12	10	1/2	1/2	7/8
10	14	12 1/2	7/8	1/2	7/8
12	16	15	7/8	1/2	7/8
14	20	17 1/2	7/8	1/2	7/8
16	24	18	7/8	7/8	7/8
24x16	38	18	7/8	7/8	7/8

NOTES:

1. Fabricated from 22GA Galvanized Steel , mechanically sealed, leak resistant construction.
2. Hot Water Coils have copper tubes, and aluminum fins with O.D. sweat Connections.
3. Refer to the Submittal Schedule for air volumes and reheat coil capacities.
4. Method of venting reheat coil is to be provided by installing contractor
5. Hand of water coil connections is determined when viewed from air inlet side with access door on bottom, right hand coil connection illustrated above
6. Allow 1-1/2 " (38mm) minimum clearance for installation at this end
7. Configuration of coil connection varies with size and circuitry of the coil
8. Performance rated and certified in accordance with the current edition of ADI Standard 410
9. Standard coils are supplied with 10FPI

OPTIONS:



Coil Detail with Housing Shown

PIM—Pressure Independence Module

The Pressure Independence Module (PIM) is a packaged damper/controller that controls pressure within a duct system. VAV Diffusers are low pressure air devices that operate within a pressure range of 0.05” through 0.25” WG. The Configurations noted on Page 2 indicate the versatility of this product and also highlights its ability to be combined with the Acu-Zone™ Heater package to yield both static pressure control and also heated air discharge temperature control from a single controller package (previously referred to as the PIC). Applications for the PIM include Zone and Bypass damper control as described in the following:

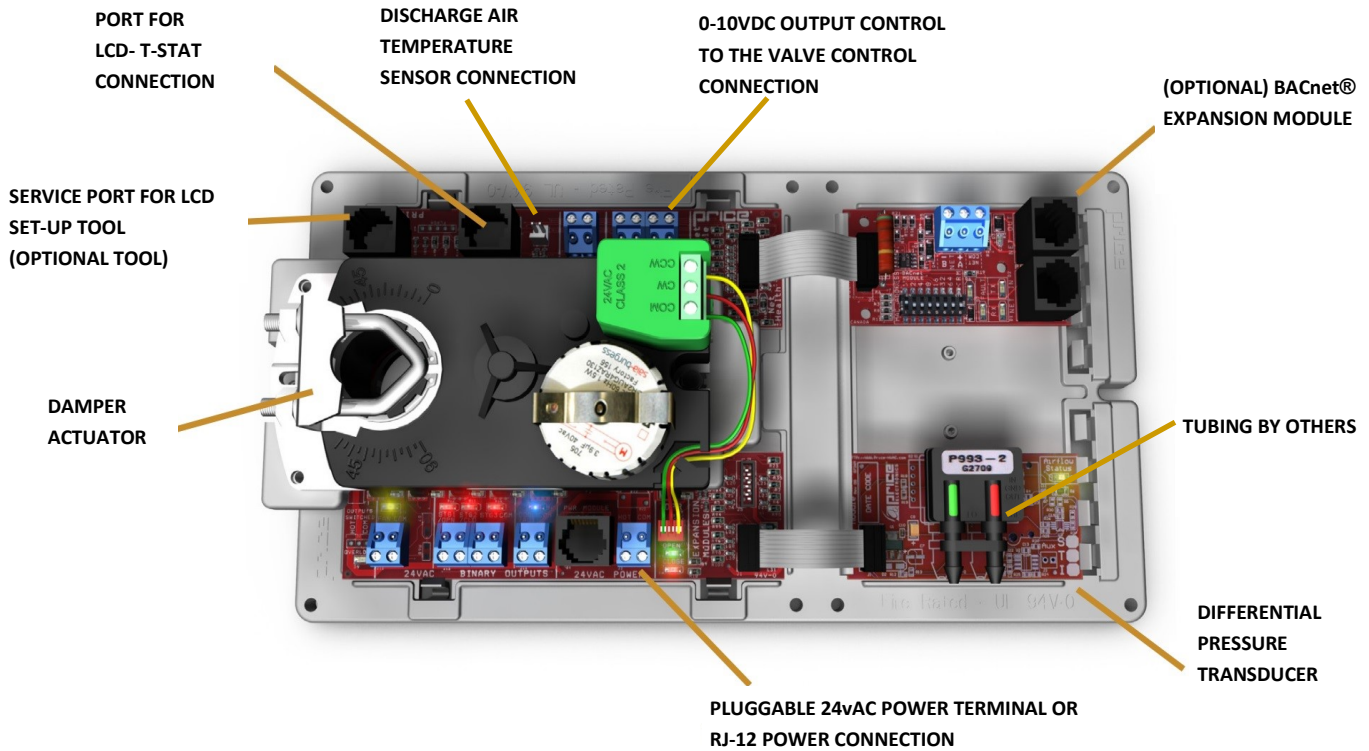
Zone Control

Zone control has the PIM package “in-line” with the supply duct to modulate the damper to maintain a “constant” downstream pressure set point

Bypass Control

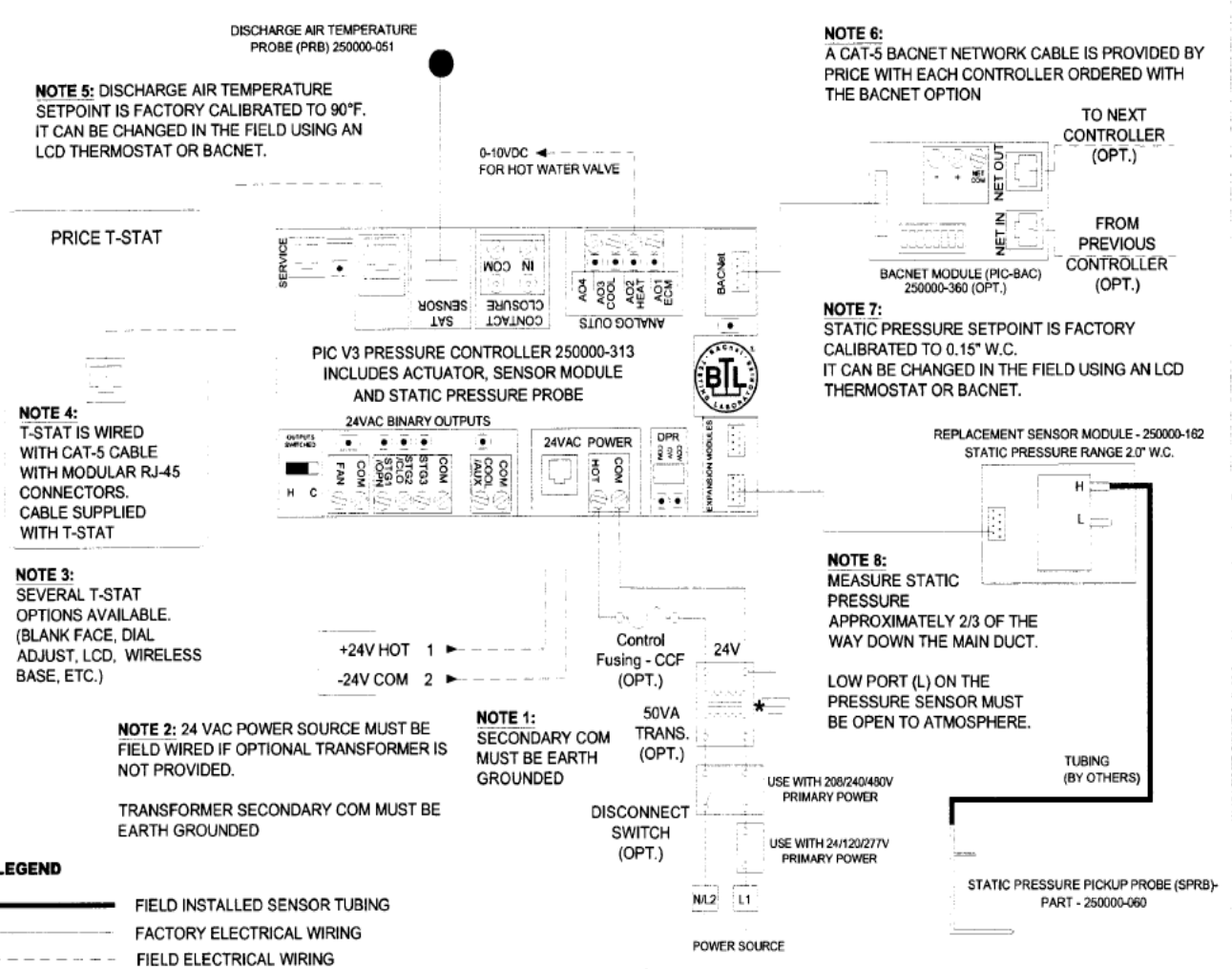
Bypass control maintains a constant pressure set point and bypasses air from the supply duct to the return duct. The bypass duct can be ducted back to the unit’s return or left open into the ceiling return plenum

CONTROLLER FEATURES

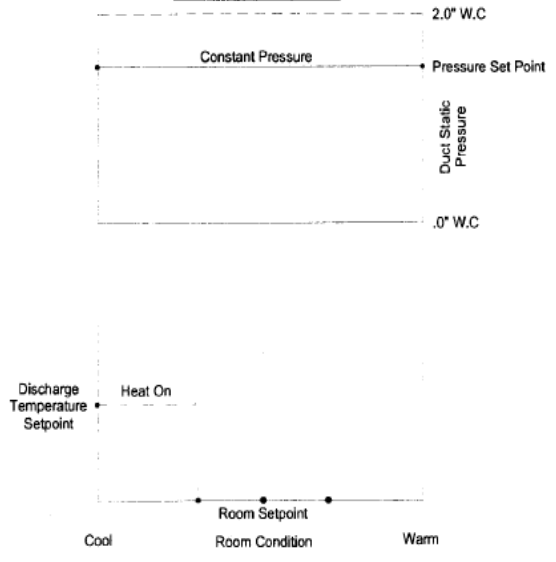


**PCV & PIM
DIGITAL CONTROLS**

**Control Sequence
Number 1553**



CONTROL GRAPH



Sequence of Operation – Constant Pressure, Downstream with Analog modulating reheat for hot water valve

On startup, the controller will calibrate to the fully-open position for 2 minutes.

On an increase in duct static pressure the controller/actuator will close the VAV damper to decrease the amount of air delivered downstream of the box.

On a decrease in duct static pressure the controller/actuator will open the VAV damper to increase the amount of air delivered downstream of the box. Duct static pressure is held constant.

Upon detection of air handler shutdown (zero duct pressure with VAV damper fully open), the controller/actuator will place the damper at the pre-selected setback position (default: 50% open) and reheat turned off.

Reheat Operation: On a decrease in room temperature, the controller engages the 0-10VDC output to maintain a pre-set discharge air temperature setpoint (adjustable) until room setpoint has been met.

Acu-Zone™ Hot Water Zone Heater

Models: AZON-II W Hot Water Duct Heaters

GUIDE SPECIFICATION

(Suitable for the CSI Master Format)

Hot Water Duct Heaters

- A. Hot Water Duct Heaters shall be Acu-Zone™ model AZON-II W as manufactured by Acutherm by Price, Dublin, California
- B. Each **Heater Only** configuration unit shall be a complete hot water duct heater with a modulating PIM / PIC controller, discharge air temperature sensor, room thermostat and a hot water control valve to provide a constant supply air temperature at both design and at very low air flows. Unit will be factory mounted in a standard 9" deep casing. Optional oversized casing options are available. Units that do not supply constant supply air temperature shall not be allowed.
- C. Each **Pressure Control and Heater Configuration** unit shall have a factory installed inlet damper—PIM (Pressure Independence Module) with galvanized steel construction suitable for air system static pressure control. A unit shall be a complete hot water duct heater with a modulating PIM / PIC controller, discharge air temperature sensor, room thermostat and a hot water control valve to provide a constant supply air temperature at both design and at very low air flows. Unit will be factory mounted in a standard 9" deep casing.
- D. Each **Configuration** unit shall have a built-in digital controller to modulate the hot water flow through the coil in response to the discharge air temperature sensor to maintain the discharge air temperature set point (adjustable). In addition, the controller shall include a differential pressure transducer (tubing by others), static pressure probe (when damper is specified), single point electric service connection, 115/24 or 230/24vAC step-down transformer contained completely within an enclosure. Controller shall allow the heater section to operate at very low air volumes and to best match the heating load to the exact capacity required for minimum energy consumption. Provide a wall mounting LCD-Thermostat with each controller to provide mode control for the space that each heater serves. The overall set points for the heater, as well as, the static pressure set points and damper functions for the PIM will be set-up using the LCD thermostat.
- E. A discharge air temperature sensor, digital mode control thermostat, and hot water valve shall be supplied for field installation
- F. Optional BACnet® MS/TP control interface board shall be provided if interoperability and network interface are required
- G. The controls enclosure shall be NEMA 1 and the cover shall be easily removable for access to a single point 115 (or 230) single phase/60HZ, single point electrical connection and step-down transformer as noted above. The discharge air temperature sensor shall be connected 4 feet / 1.2m of wire coiled next to the control box for installation by others. All components within the controls enclosure shall be UL / ETL rated.
- H. Hot water coils shall be factory mounted within an integral sleeve that is approximately 9" long to complete the heater section, and for the **Heater Only Configuration** and for the **Pressure Control and Heater Configuration**, the heater section is by the factory connected to the damper using a transition for a complete package. The coils shall be one or two rows as indicated and shall be 1/2" Copper Tubes, aluminum fins with a galvanized steel header.
- I. The hot water valve shall be a Pressure Independent Characterized Control Valve model PICCV or CCV Characterized Control Valve (Three-way Bypass) complete with Multi-Function Technology with controller / actuator model LRX24-MFT as manufactured by Belimo™, Danbury, CT. The valve shall be direct-coupled to the controller / actuator and have an equal percentage characteristic and shall accurately control the hot water flow from design to very low water flow. A minimum of 5PSI shall be required to operate the valve pressure independently (PICCV). The hot water valve shall be installed by others.

Acu-Zone™ Hot Water Zone Heater

Models: AZON-II W Hot Water Duct Heaters

GUIDE SPECIFICATION

(Suitable for the CSI Master Format)

Hot Water Duct Heaters (Continued)

- J. The hot water valve shall require no maintenance with nickel-plated, forged brass bodies with female NPT threads. Body size of 1-1/4" shall be rated at 600PSI and sizes 1-1/2" to 3" at 400PSI. Valves shall have a self-aligning, blow-out proof brass stem with dual EPDM O-ring packing design, fiberglass reinforced Teflon seats shall be used. Valves shall have a four-bolt mounting flange to provide a four position, field changeable, electronic actuator arrangement. A non-metallic coupling constructed of high temperature, continual use material shall provide a direct, mechanical connection between the valve body and actuator. The coupling shall be designed to provide thermal isolation and eliminate lateral and rotation stem forces. A vent hole shall be provided to reduce condensation build-up. Valves shall not contain replaceable cartridges.
- K. The manufacturer shall warrant that all Acu-Zone hot water heaters shall be free from defect in material and workmanship for two years from date of shipment.