

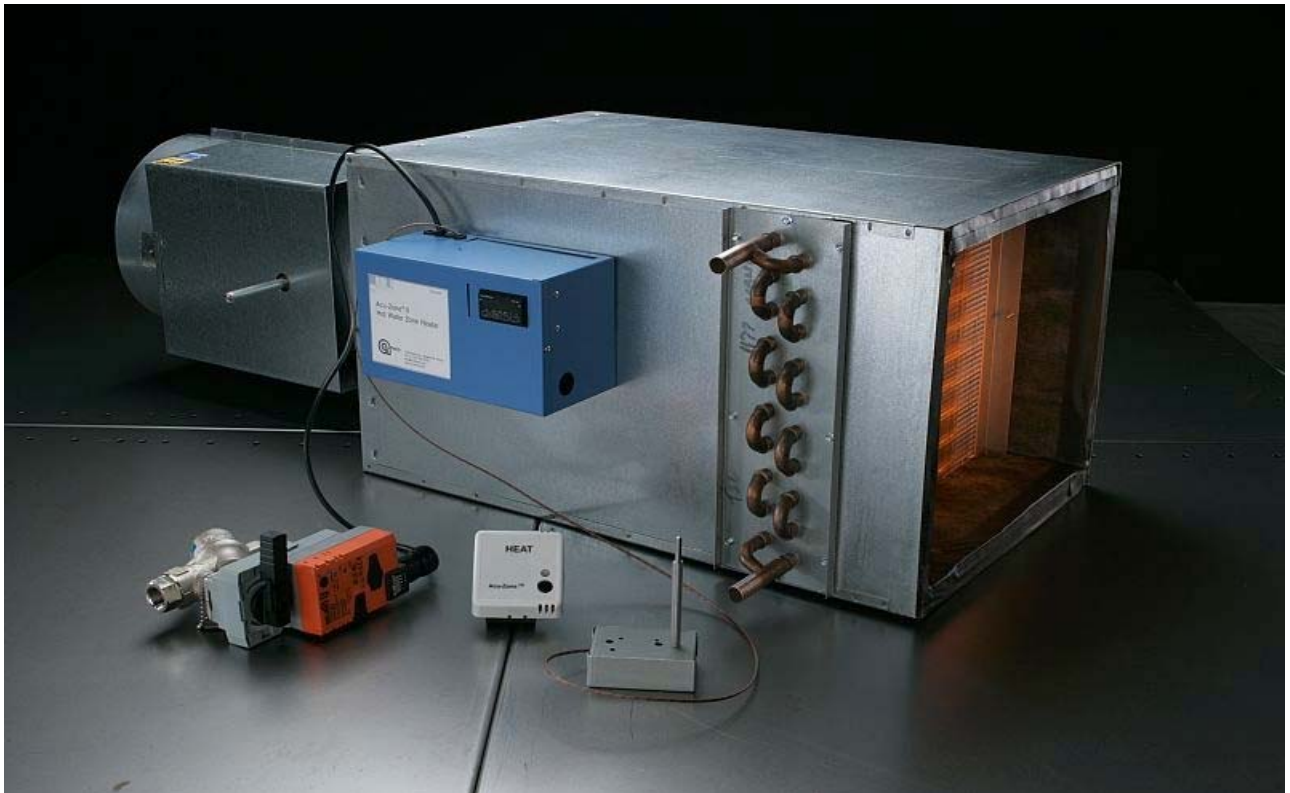


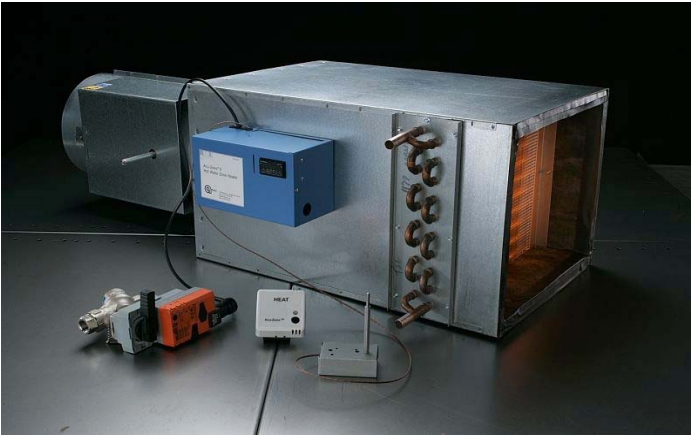
Variable Air Volume Systems Optimized!

DownstreamSolutions®

Acu-Zone™ II W

Installation, Operation, and Maintenance Manual



ACU-ZONE™ HOT WATER ZONE HEATERS

Acu-Zone™ - II - W

Hot Water Zone Heater

The **Acu-Zone™ II W** heater is your source for individual heating comfort requirements. The heater provides accurate temperature control in each zone or for each **Therma-Fuser™ Diffuser** by providing proportional heating based on the airflow coming to each zone and to each diffuser.

The **Acu-Zone™ II W** Heaters are equipped with the most advanced modulating hot water valves that will allow the heaters to maintain a constant discharge temperature based on a chosen discharge air temperature by proportionally varying the hot water flow through the coil.

Acutherm uses **BELIMO®** Pressure Independent Characterized Control Valves that proportionally adjust the hot water flow through the coil to maintain a constant discharge air temperature regardless of the air flow through the coil. The **BELIMO™** valve and actuator package is shipped with the units for field location and installation (by others) – eliminating the typical coordination issues that usually occur.

The **Acu-Zone™ II W** constant discharge temperature will reliably deliver the air to the space through the **Therma-Fuser™** Diffusers eliminating stratification, hot spots, cold spots, and discomfort.

The **Acu-Zone™ II W** hot water heater may be added to any existing or new forced air system. This unit can be your solution for total zone comfort.

The electronic, wall-mounting sensor can accurately control the temperature in each zone, and each **Acu-Zone™ II W** unit is ready to install with a single point electrical supply connection and the wall sensor. Piping and installation of the valves and actuators by the installing contractor is quick and easy. No Water Balancing Required.

Note: Suffix on the Model # W-1 (One Row) & W-2 (Two Row) Coils

Inspection

Damage or Shortage

All Acutherm equipment is shipped F.O.B. Factory which means that the title for the goods passes to you from Acutherm when the shipment is picked up. Therefore, inspect all equipment for shortage and damage upon receipt. Note all shortages and damage on the delivery receipt—Bill of Lading - this action notifies the carrier that YOU intend to file a claim. If there is any shortage or damage discovered when the unit (s) are unpacked, call the delivering freight carrier for a concealed damage or shortage inspection. Have all related paperwork for the inspector including the delivery receipt and the carrier's liability for

ACU-ZONE™ HOT WATER ZONE HEATERS**Acu-Zone™ - II - W****Installation, Operation & Maintenance
Instructions****Introduction**

Acutherm manufactures its products from the highest quality materials that are available. Please use the following instructions to insure a long coil life and to maintain optimal efficiency throughout the useful life of the coil.

Installation Instructions

- **Do not install these coil sections in areas that are prone to freezing or on “pre-heat applications connected directly to outside air via a louver**
- **Shut off the water supply before installing the coil into an active hot water flow. Shut-off cocks should be provided for coil servicing**
- The coil and duct section should be mounted level, in the position it was designed for to ensure that the coil will drain properly
- The coil section MUST be adequately supported independently from the duct to which it is installed. A minimum of three (3) supports should be used (both ends and center) from the overhead structure
- Coil sections MUST be securely fastened to the duct to which it is installed. Use screws or other duct connectors as required
- All ducts should be adequately insulated and sealed to minimize heat losses
- Flashing should be used to prevent air from bypassing over the coil frame if the duct and coil sleeves have different dimensions
- It is recommended that the air coming to the coils be pre-Filtered (30% or more) to minimize the capture of oil, dirt, and lint that might foul the surface of the coil
- All piping MUST BE supported independently of the coil and duct section
- All coil connections extend through the duct casing section
- All connections to the heating coil should have flexible fittings or swing joints to absorb expansion and contraction strains
- Install piping in accordance with local codes and accepted industry standards
- See the following sections for suggested piping diagrams when the coils are installed with the *BELIMO®* PICCV or the CCV characterized control valves
- A strainer MUST be provided on the entering water side of the coil to trap foreign particles in the hot water supply stream
- Extreme care must be taken when drilling into the coil duct section near the coil. Damage to the headers and/or the tubes may result
- Use a fin comb to straighten damaged fins

ACU-ZONE™ HOT WATER ZONE HEATERS**Acu-Zone™ - II - W****Installation, Operation & Maintenance
Instructions****Operation Instructions**

- Drain the coil when conditions exist that would allow the water in the coil to freeze.
- Compressed air **MUST** be used to evacuate any remaining water in the coil
- The coil should be operated using the controls that have been provided as part of the Acu-Zone™ Hot Water Control Package
- Coils are provided with sweat connections as follows:
 - * One (1) row hot water coils are provided with 1/2" O.D. Nominal connections
 - * Two (2) row hot water coils are provided with 5/8" O.D. Nominal connections
- ◆ Follow the separate operating instructions for the Belimo® valves if they are provided as part of the controls package provided by Acutherm
- ◆ The maximum standard operating pressure is 250 PSI
- ◆ The maximum standard operating temperature is 300°F
- ◆ The maximum standard tube velocity is 8 fps

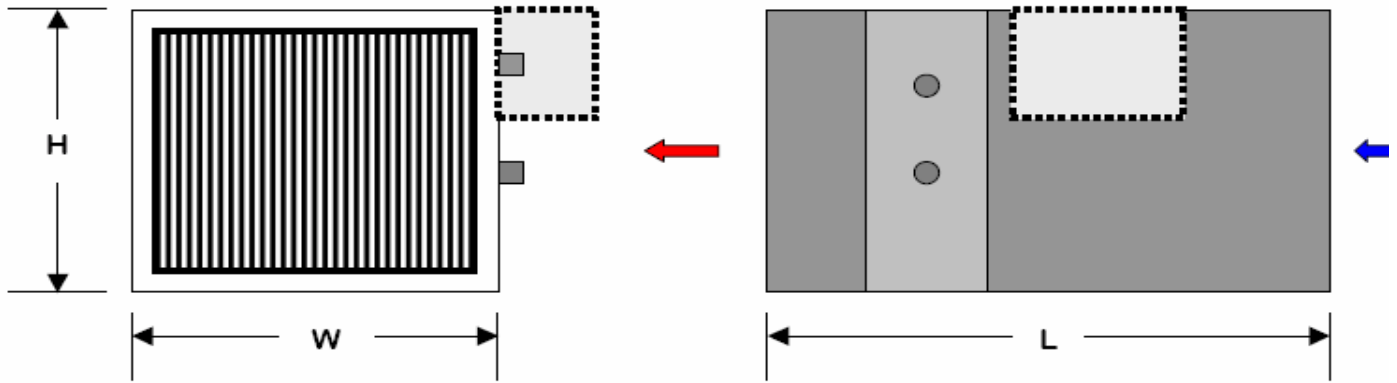
Maintenance Instructions

- If the Acu-Zone™ Coil is leaking it must be replaced
- If the Acu-Zone™ Coil is under warranty (See Limited Warranty Statement) , obtain return authorization from your Acutherm Agent or as directed by Acutherm Customer Service at 1-510-785-0510 (8:00 AM—5:00 PM PST)
- Keep the coil fins clean by using LOW PRESSURE air and/or a soft bristle brush
- Because of their smaller dimensions it may be more practical to use a vacuum with a soft bristle attachment
- Coils may not be washed because they are installed in an internally lined duct section. The use of detergent and water is only practical if the coil section IS COMPLETELY REMOVED from the duct and extreme care is taken to not saturate the liner component of the sleeve
- Coils can be internally cleaned using non-corrosive cleaning solvents or flushing with clean water
- ◆ All Acu-Zone™ coil sections do not contain any moving parts or electrical components that can be replaced in the field. Damaged coil sections must be replaced as a unit
- ◆ Hot Water Valves by Belimo® are replaced under Belimo® Warranty criteria. Warranty information is available upon request

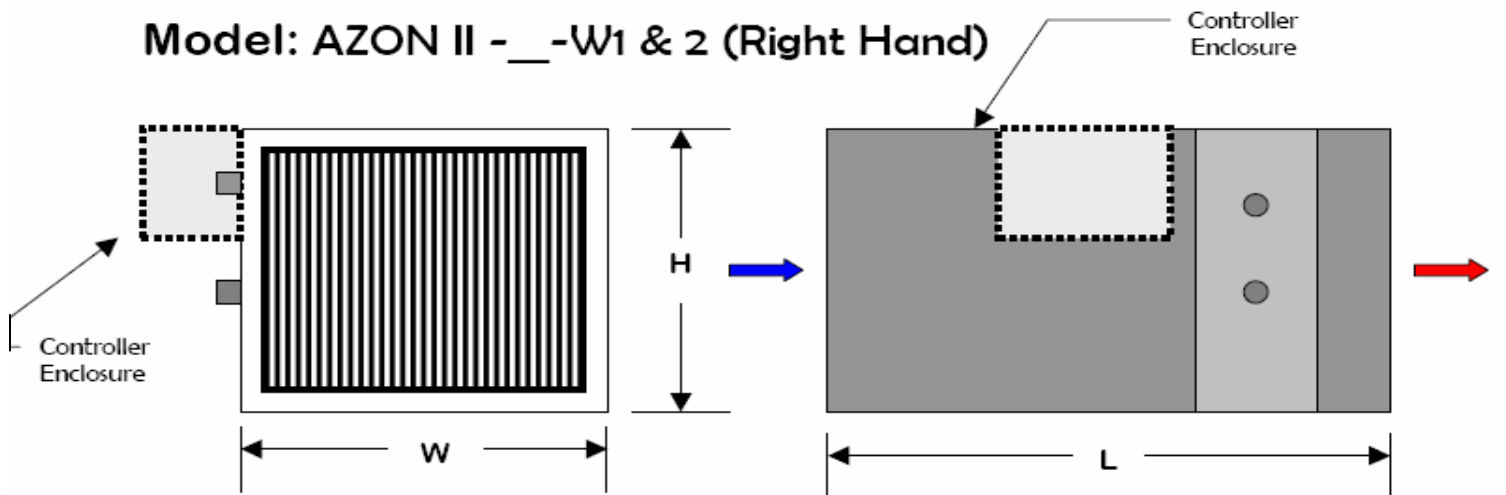
ACU-ZONE™ HOT WATER ZONE HEATERS

Acu-Zone™ II – W1 & W2 and R-PIM-W1 & W2

Model: AZON II - __-W1 & 2 (Left Hand)



Model: AZON II - __-W1 & 2 (Right Hand)



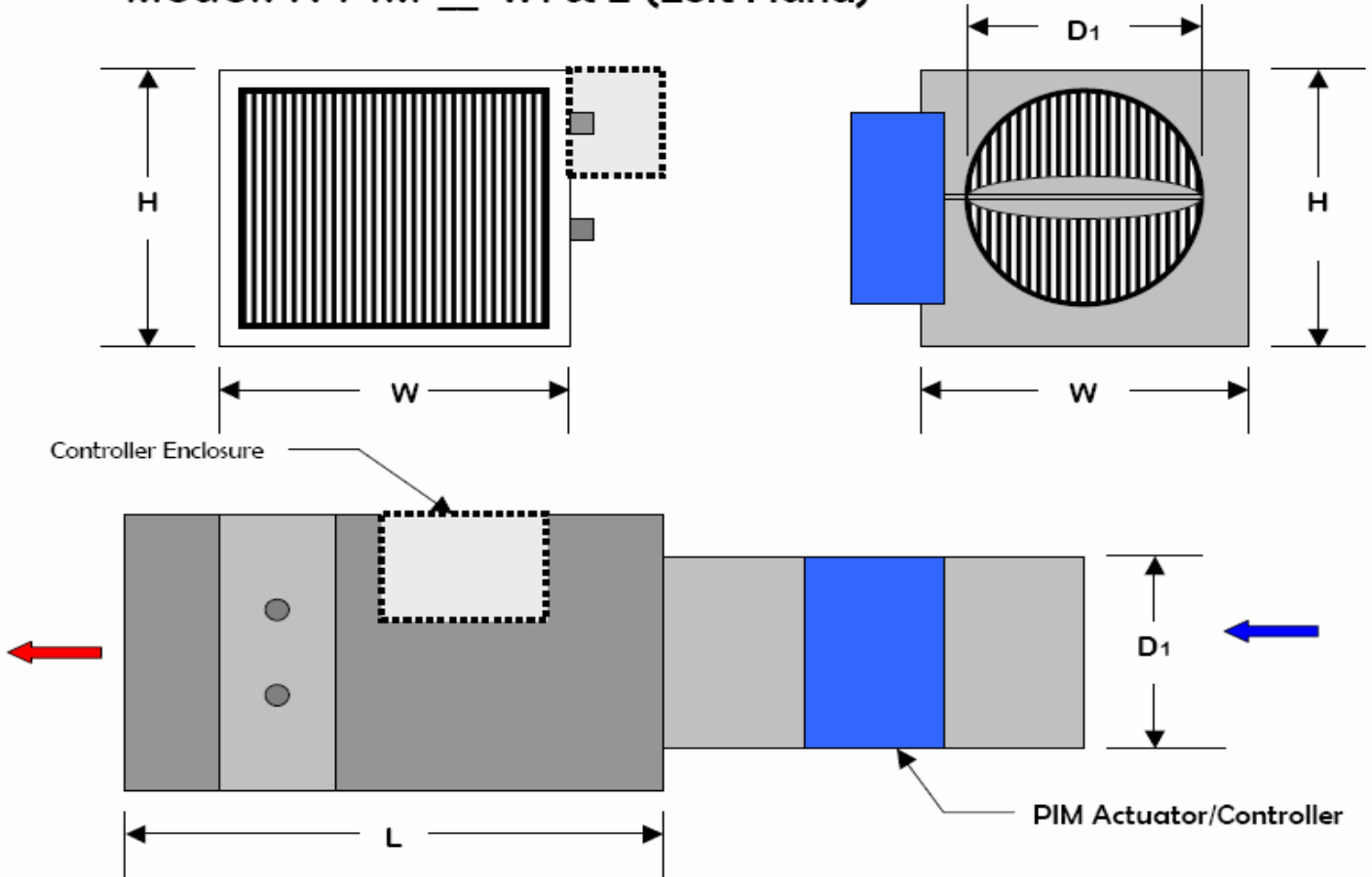
Acu-Zone II Hot Water Units – Dimensional Data

Model	Size	W	H	L1	L2	L3
AZON II	06	11"	10"	12"	24"	48"
AZON II	08	15"	10"	12"	24"	48"
AZON II	10	16"	14"	12"	24"	48"
AZON II	12	17"	17"	12"	24"	48"
AZON II	14	18"	19"	12"	24"	48"
AZON II	16	24"	19"	12"	24"	48"

ACU-ZONE™ HOT WATER ZONE HEATERS

Acu-Zone™ II – W1 & W2 and R-PIM-W1 & W2

Model: R-PIM-__-W1 & 2 (Left Hand)



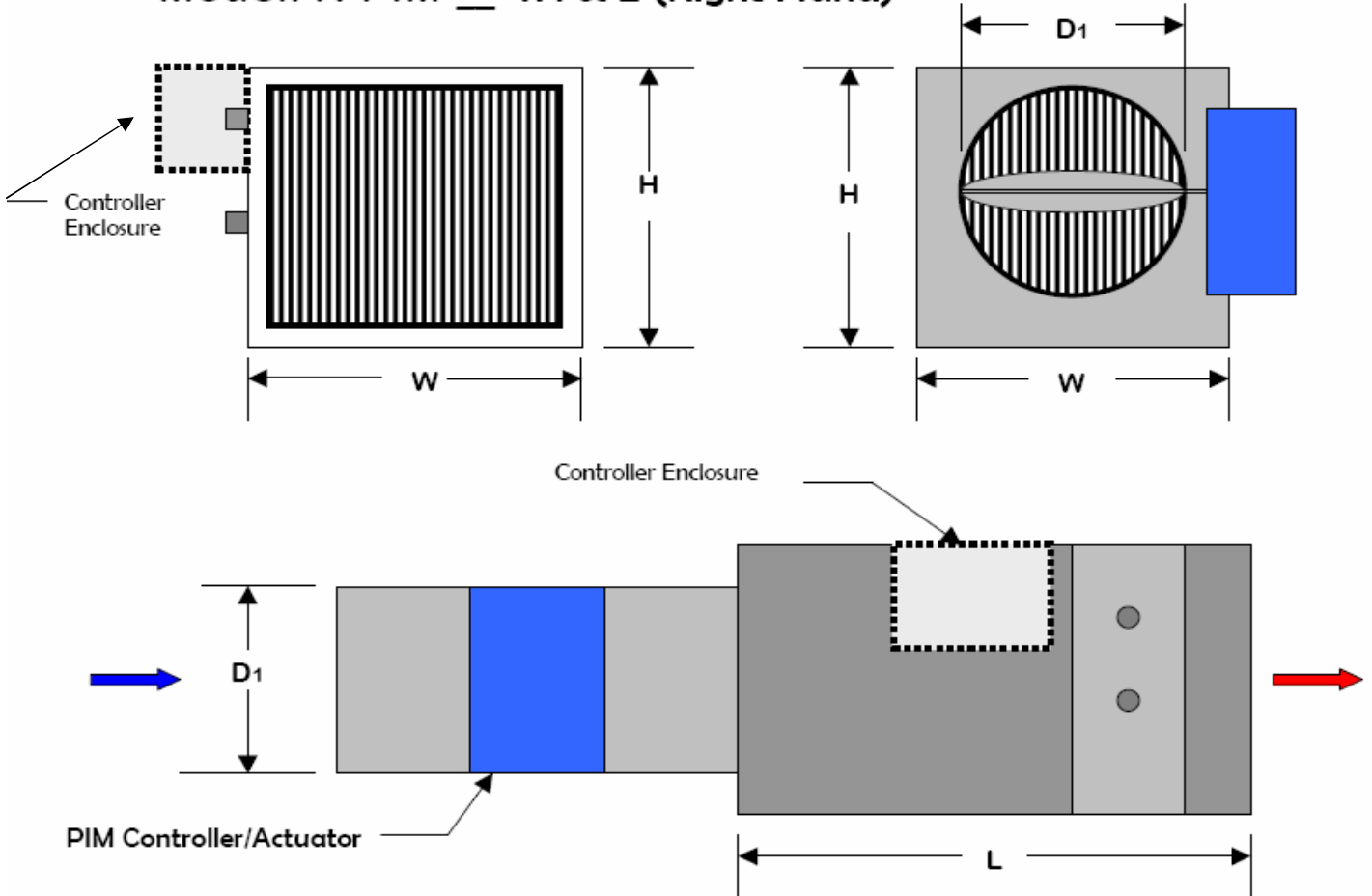
R-PIM Dampers with Hot Water Supplementary Heat – Dimensional Data

Model	Size	C	D1	W	H	L1	L2	L3
R-PIM-	06	17"	5.875"	11"	10"	12"	24"	48"
AZON II	08	17"	7.875"	15"	10"	12"	24"	48"
AZON II	10	19"	9.875"	16"	14"	12"	24"	48"
AZON II	12	19"	11.875"	17"	17"	12"	24"	48"
AZON II	14	21"	13.875"	18"	19"	12"	24"	48"
AZON II	16	21"	15.875"	24"	19"	12"	24"	48"

ACU-ZONE™ HOT WATER ZONE HEATERS

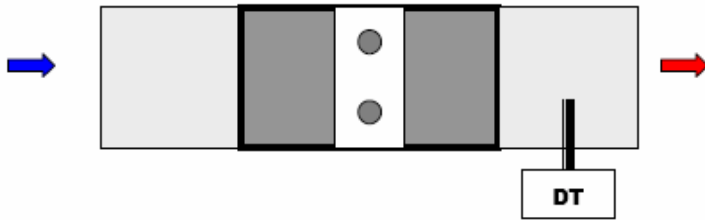
Acu-Zone™ II – W1 & W2 and R-PIM-W1 & W2

Model: R-PIM-__-W1 & 2 (Right Hand)

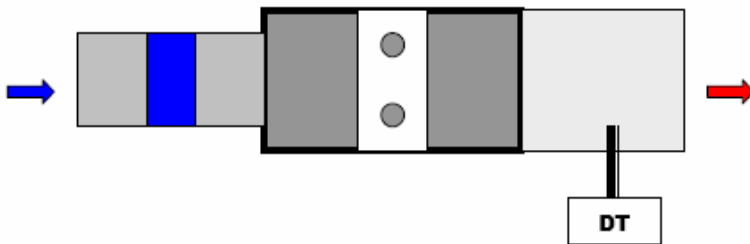


R-PIM Dampers with Hot Water Supplementary Heat – Dimensional Data

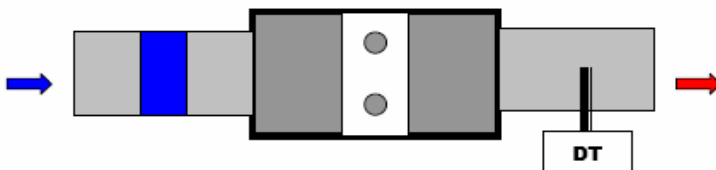
Model	Size	C	D1	W	H	L1	L2	L3
R-PIM-	06	17"	5.875"	11"	10"	12"	24"	48"
AZON II	08	17"	7.875"	15"	10"	12"	24"	48"
AZON II	10	19"	9.875"	16"	14"	12"	24"	48"
AZON II	12	19"	11.875"	17"	17"	12"	24"	48"
AZON II	14	21"	13.875"	18"	19"	12"	24"	48"
AZON II	16	21"	15.875"	24"	19"	12"	24"	48"

ACU-ZONE™ HOT WATER ZONE HEATERS**Acu-Zone™ II – W1 & W2 and R-PIM-W1 & W2****Configurations:**

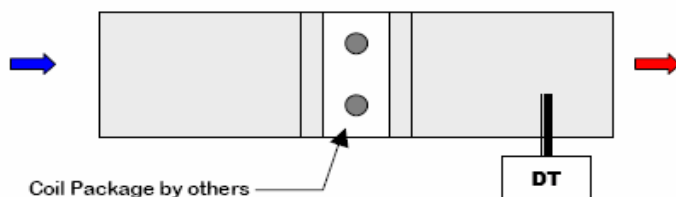
This is the **STANDARD** configuration for the **Acu-Zone™ - W** hot water zone heater and controls. The unit dimensions are as shown on page 4 and can be arranged for *Right Hand or Left Hand piping connections* (AMCA designation for "coil hand" is determined with the air blowing on the back of one's head). The Standard configuration will be rectangular duct into and out of the unit with the discharge thermostat (**DT**) field located and installed 12-24" downstream from the heater discharge.



This is the **R-PIM-W** configuration for the **Acu-Zone™ - W** hot water zone heater and controls. The unit dimensions are as shown on pages 5 & 6 and can be arranged for *Right Hand or Left Hand piping connections* (AMCA designation for "coil hand" is determined with the air blowing on the back of one's head). The R-PIM-W configuration will be a package with the R-PIM mounted to the coil section. The connection to the coil section will be round and the duct out of the unit will be rectangular. The discharge thermostat (**DT**) field located and installed 12-24" downstream from the heater discharge. Refer to Form # 30.2 for capacity information for the R-PIM.



This is the **R-PIM-W - R** configuration for the **Acu-Zone™ - W** hot water zone heater and controls. The unit dimensions are as shown on pages 5 & 6 and can be arranged for *Right Hand or Left Hand piping connections* (AMCA designation for "coil hand" is determined with the air blowing on the back of one's head). The R-PIM-W configuration will be a package with the R-PIM mounted to the coil section. The connection to the coil section will be round and the duct out of the unit will be round. The discharge thermostat (**DT**) field located and installed 12-24" downstream from the heater discharge. Refer to Form # 30.2 for capacity information for the R-PIM.



This is the **Controls Only** configuration for the **Acu-Zone™ - W** hot water zone heater. The package includes the **BELIMO™** model PICCV – Pressure Independent Characterized Control Valves with Actuators, Wall Sensor, and the Controller/Discharge Thermostat. The discharge thermostat (**DT**) field located and installed 12-24" downstream from the heater discharge. Coils are by others.
Please Note: Valves must be sized on application and will depend on the coil flow, capacity, and pressure drop. The controller, discharge thermostat, and wall sensor operate on 24VAC. Transformers and interconnecting wiring is by others. Installation of controls is by others.


ACU-ZONE™ HOT WATER ZONE HEATERS

Acu-Zone™ - II - W

Installation, Operation & Maintenance Instructions

Belimo® Characterized Control Valves

Electronic Pressure Independent Characterized Control Valves™
U.S. Patent




PICCV

PICCV	Two-way
1/2" to 2"	
Service:	Chilled/Hot Water, 60% glycol
Flow Rate:	0.5-100 GPM
Material:	Brass Body Brass/Stainless Trim
Control:	Floating Multi-Function Technology® Spring Return or Non-Spring Return

Typical Application

Air Handling Units:	- Heating Coils - Cooling Coils
Unit Ventilators	
VAV Box Re-heat Coils	
Heat Pumps	

Electronic Characterized Control Valves™
U.S. Patent



CCV

B2... Series	Two-way
B3... Series	Three-way Mixing/Diverting
B6... Series	Two-way Flanged

For detailed information and submittal data for the Belimo® Valves, please contact Acutherm or go to www.belimo.com

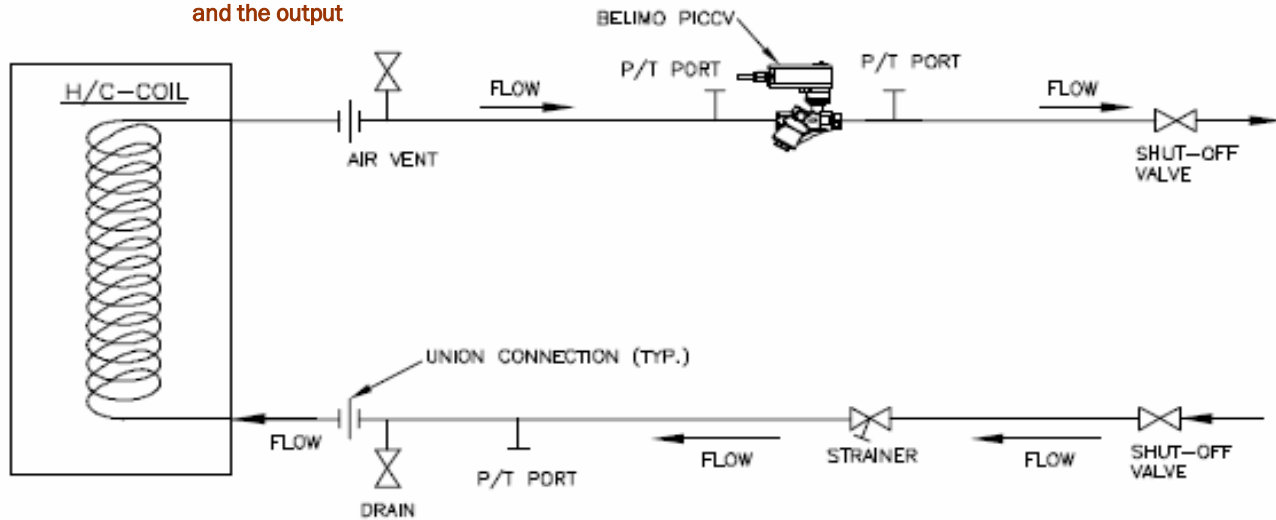
ACU-ZONE™ HOT WATER ZONE HEATERS

Acu-Zone™ - II - W

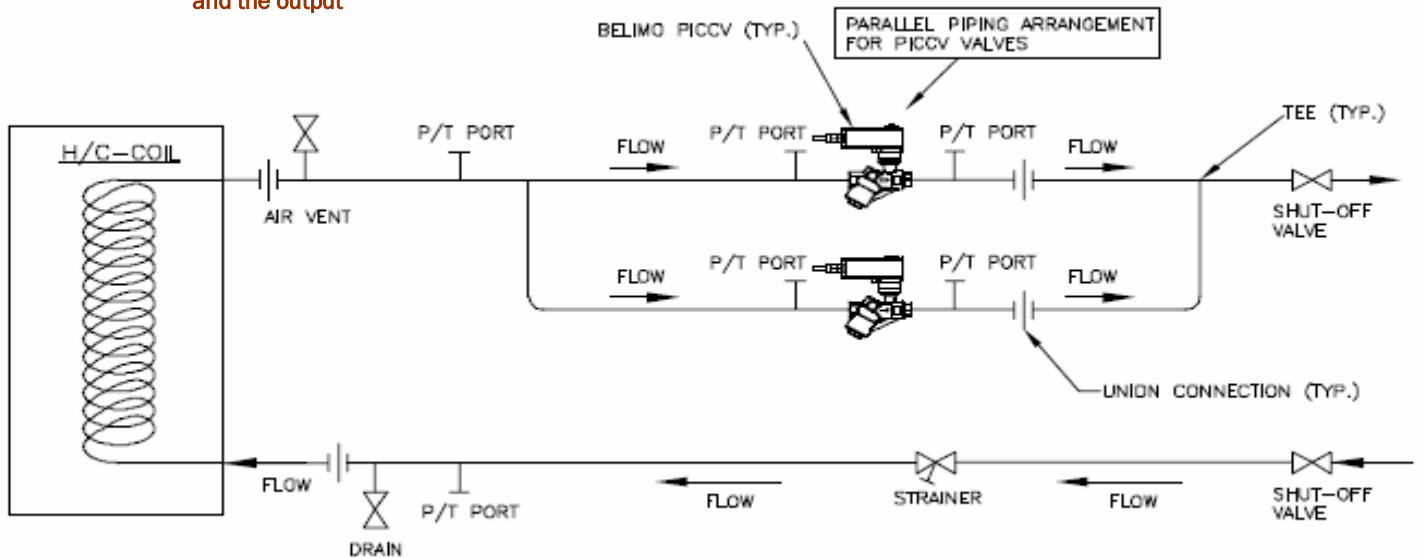
Installation, Operation & Maintenance Instructions

Suggested Piping Diagrams for Belimo® Characterized Control Valves

Model PICCV— Typical Piping in relation to the Input and the output



Model PICCV— Parallel Piping in relation to the Input and the output



ACU-ZONE™ HOT WATER ZONE HEATERS

Acu-Zone™ - II - W

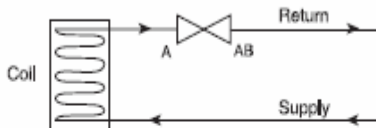
Installation, Operation & Maintenance Instructions

Suggested Piping Diagrams for Belimo® Characterized Control Valves

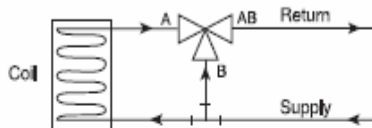
Model CCV—Correct Piping Details

2-way valves should be installed with the disc upstream. If installed with disc downstream, flow curve will be deeper. If installed "backwards" it is NOT necessary to remove and change. No damage or control problems will occur.

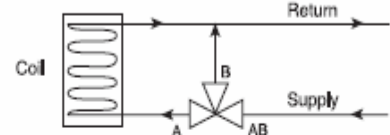
2-way Valve Piping Diagram
(1 Input, 1 Output)



3-way Mixing Valve Piping Diagram
(2 Inputs, 1 Output)



3-way Diverting Valve Piping Diagram
(1 Input, 2 Outputs)



3-WAY VALVES MUST BE PIPED CORRECTLY. They can be mixing or diverting. Mixing is the preferred piping arrangement.

The BELIMO Characterized Control Valve is a CONTROL valve, not a manual valve adapted for actuation. The control port is the A-port. It is similar to the globe valve in that the middle port is the B or bypass port. The common port AB is on the main opposite the A-port. These diagrams are for typical applications only. Consult engineering specification and drawings for particular circumstances.

REDUCED B-PORT FLOW

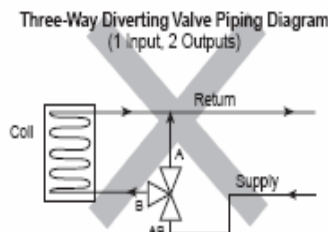
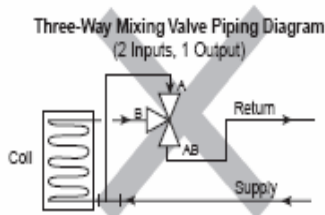
Note: The B-port flow of the 3-way CCV is lower than that of the A-port. In most applications this is beneficial since the reduced flow compensates for the in-existent pressure drop across the coil in the bypass mode. Therefore, proper sizing is important to avoid flow noise in particular when the system is designed with constant speed pumps. Please refer to our valve sizing and selection guidelines.

The flow velocity in the pipe upstream and downstream of the valve should be considered as well. The typical HVAC design maximum flow is 4 to 8 ft/s to avoid noise issues.

Also, the pipe reduction factor must be considered and can be found on pages 3 and 4. Pipe reducers decrease the C_v value of a valve and consequently increase the pressure drop across the valve, a situation that could lead to noise or a lower than designed flow.

Model CCV—Incorrect Piping Arrangements

The A-port must be piped to the coil to maintain proper control.



WARNING! Do Not Pipe in this manner!

Note Valve Porting!

The A-port must be piped to the coil! Not the B-port!

Flow is not possible from A to B. If AB-port is not piped as the common port, the valve must be re-piped. It is good practice to install a balancing valve in the bypass line. These valves are intended for closed loop systems. Do not install in an open loop system or in an application that is open to atmospheric pressure.

ACU-ZONE™ HOT WATER ZONE HEATERS**Acu-Zone™ II – W1 & W2 and R-PIM-W1 & W2****Two Year Warranty**

Acutherm warrants that the model AZON Hot Water Zone Heater, exclusive of any options and accessories (whether factory or field installed) shall be free from defects in material or workmanship for a period of two (2) years from the date of shipment and agrees to repair or replace, at its option, any parts that fail during said two (2) year period due to any such defects which would not have occurred had reasonable care been taken, provided that such parts have been inspected by Acutherm and found defective and provided the units have been given normal and proper usage and all parts and controls remain unaltered. Acutherm makes no WARRANTY OF MERCHANTABILITY OF PRODUCTS OR OF THEIR FITNESS FOR ANY PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY WHICH EXTENDS BEYOND THE LIMITED WARRANTY ABOVE. ACUTHERM'S LIABILITY FOR ANY AND ALL LOSSES AND DAMAGES RESULTING FROM DEFECTS SHALL IN NO EVENT EXCEED THE COST OF REPAIR OR REPLACEMENT OF PARTS FOUND DEFECTIVE UPON EXAMINATION BY ACUTHERM. IN NO EVENT SHALL ACUTHERM BE LIABLE FOR INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES OR DAMAGES FOR INJURY TO PERSONS OR PROPERTY. Acutherm shall not be responsible for freight to or from its plant(s) in connection with the inspection, repair or replacements of parts under the terms of this limited warranty nor for cost of removal or installation.

For further information, please refer to the Acutherm website: www.acutherm.com or the Acutherm Catalog: Complete System Design Manual



Variable Air Volume Systems Optimized!

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