Acu-Zone™

Electric Zone Heater

acutherm™
Therma-Fuser™ Systems

AZON-I-E & AZON-II-E: Product Overview

FORM 082.101 REV 1110

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 very low air flows to a single Therma-Fuser™ 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 with type -HC, VAV heating, or type -CW, constant volume heating (warm-up), Therma-Fuser diffusers.

MODULATING SCR HEAT CONTROLLER FOR LOW AIR FLOW

Acu-Zone™ heaters are equipped with a patented electronic air flow sensor and the most advanced modulating SCR proportional heat controller which allows the zone heater to operate at extremely low airflows. When the room temperature falls below the room mode control thermostat setpoint, the discharge temperature is controlled by automatically and proportionally modulating the heat to match the airflow, using the minimum amount of energy.

EASY TO INSTALL PACKAGE

Acu-Zone™ heaters may be installed either vertically or horizontally in any existing or new forced air system. The remote wall-mounted electronic thermostat accurately controls the temperature in each zone. All other controls, safeties and sensors are built-in. Each Acu-Zone™ unit is ready to install with a single point electrical supply and thermostat connections. Installation of the discharge air thermostat is also required for AZON-II-E models.

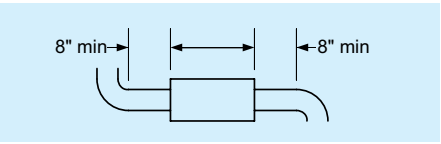
AZON-I-E: Smaller kW packaged units available in 6”/150mm, 8”/200mm, 10”/250mm and 12”/300mm round sizes to match Therma-Fuser diffuser inlet sizes. **AZON-II-E:** Larger kW custom built units available in round or square/rectangular duct sizes for multiple Therma-Fuser diffusers. **NOTE:** For hot water heaters see **AZON-II-W** Form 083.101 REV 0901

HOW IT WORKS

The Acu-Zone electric heater is equipped with the most advanced modulating airflow sensor. When the room temperature drops below the room mode control thermostat set point, the heating coil is energized. Airflow is measured by the patented airflow sensor and power to the heating coil is modulated by a SCR proportional heat controller to produce a constant discharge air temperature even at extremely low air-flow conditions.

INSTALLATION

Each Acu-Zone heater comes ready to install with a single point electrical supply connection and room mode control thermostat connection. All controls, safeties and sensors are built-in. The discharge air thermostat is built in the AZON-I-E models. Installation of the discharge air thermostat in the down stream duct is required for AZON-II-E models.



Simply install the Acu-Zone in the duct as you would a conventional heater with insulated duct on the inlet connection and un-insulated duct on the outlet. Allow at least one duct diameter (8in/200mm minimum) of straight duct before and after the heater. The heater may be installed vertically or horizontally. The controller must be oriented correctly to properly vent the heat sink.

Install the room thermostat as you would a conventional thermostat choosing a location out of direct sunlight and away from exterior walls.
The adjustable discharge temperature is factory set at approximately 90˚F/ 32˚C and the room mode control thermostat is adjustable by the occupant, either On/ Setback or between a 70˚F/21˚C and 75˚F/24˚C set point

CONSTRUCTION

- Modulatiing Airflow Sensor – built-in – senses radiant heat of the element instead of air pressure.
- Discharge Temperature Sensor – AZON-II-E only.
- SCR Controller - Proportionally modulates the heating load to match the exact capacity required.
- Magnetic Contactors – partial break.
- Automatic and Manual Cut-Outs – Safety Feature preventing overheating.
- Open Coil Elements – Made of the highest-grade nickel-chrome resistance wire; will not age or oxidize insuring longer heater life.
- Transformer – fused.
- Interlock terminal strip.
- Disconnect switch.
- Manual cut-out.
- Enclosure – Corrosion resistant galvanized steel.

USEFUL FORMULAS

BTU/h = CFM x 1.10 x ΔT

kW = BTU/h ÷ 3412

kW = (CFM x 1.10 x ΔT°F) ÷ 3412

kW = (L/s x 1.23 x ΔT°C) ÷ 1000

SELECTION GUIDELINES

AZON-I-E models may be selected from the AZON-I-E Performance Guide chart. Determine the required heater size based on the maximum air volume. Select the desired voltage to match the available power supply. For custom built AZON-II-E models and for AZON-I-E models with other than a 35˚F temperature rise, calculate the required kW based on the design air volume and temperature rise. For applications only tempering cooling supply air, design air is the volume at the minimum flow stop setting. To achieve low room air stratification, temperature rise should be no more than required for a supply air temperature of 90˚F/ 32˚C. Size the heater area for a maximum of 21kW/sqft / 226kW/m². Specify the kW, voltage, phase, and connection dimensions and contact the factory for performance and availability.

Diameters available for round inlet heaters are in 2 inch increments from a 6 inch/150mm minimum to a 30inch/750mm maximum. Square and rectangular heaters are available from a 6x6 inch/150x150mm minimum to above 130x100 inches/3.3x2.5m.

APPLICATION

Acu-Zone heaters are specifically designed to provide constant temperature supply air for Therma-Fuser VAV systems. Heaters are available small enough for one Therma-Fuser diffuser and large enough for

(continued on next page)

AZON-I-E PERFORMANCE GUIDE

Nom. Inlet	kW	Voltage[1]	Max CFM[2]	Min CFM[3]
6in. Dia.	1	120/208/240/277	90	30
	1.5	120/208/240	135	45
	2	120/208/240/277	180	60
	3	208/240/277	270	90
8in. Dia.	2	120/208/240/277	180	60
	3	208/240/277	270	90
	4	208/240/277	360	120
10in. Dia.	3	208/240/277	270	90
	4	208/240/277	360	120
	5	208/240/277	450	150
	6	208/240/277	540	180
	7	208/240/277	630	210
12in. Dia.	4	208/240/277	360	120
	5	208/240/277	450	150
	6	208/240/277	540	180
	7	208/240/277	630	210
	8	208/240/277	720	240

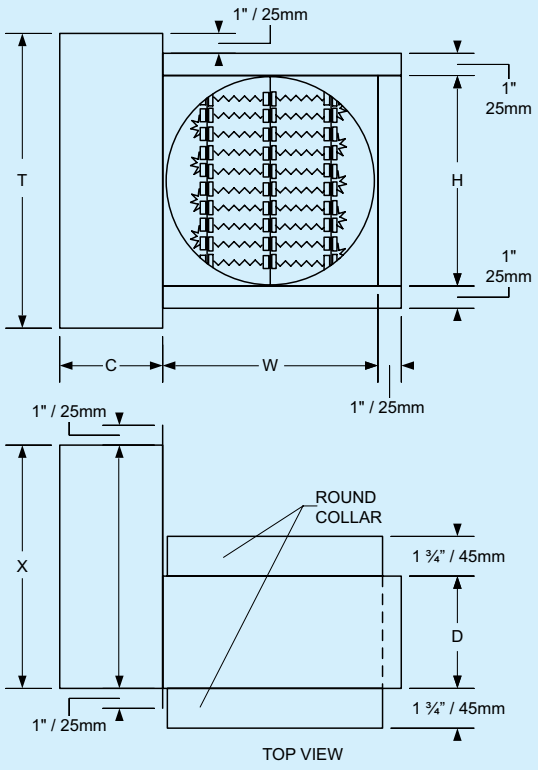
1. Heater will accept voltages as shown, single phase only, 50 or 60 Hz.
2. Maximum CFM through the heater for 35˚F temperature rise.
3. Minimum CFM through heater for full power. Lower CFM will result in pulse control of the heater.
4. Metric table is available on request.

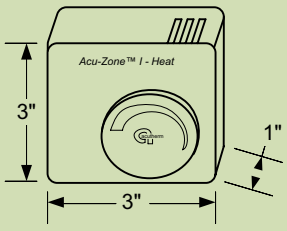
APPLICATION (continued)

many Therma-Fuser diffusers. Acu-Zone heaters can be used in Therma-Fuser VAV systems for primary heating, for supplementary heating where the central heating system is insufficient and for tempering cooling supply air temperature when minimum flow stops are used. For each application, Acu-Zone heaters add heat proportionally in the precise amount that is necessary to meet discharge air temperature at any air flow and to minimize energy consumption.

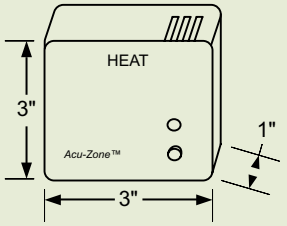
Acu-Zone heaters may be used with Acutherm Pressure Independence Modules (PIM™) to provide static pressure control at both full and low air flows. One PIM and one Acu-Zone heater may be used together (match the PIM size and the Acu-Zone inlet size) or one PIM may be used with many Acu-Zone heaters.

DIMENSIONS AZON-I-E





AZT1 Mode Control Thermostat



AZT2 Mode Control Thermostat

AZON-I-E DIMENSION CHART

Size	C	T	X	D	H
6	6.5	10	14	10	6
8	6.5	14	11	10	8
10	6.5	14	14	5	10
12	6.5	16	14	5	12

1. All dimensions in inches. Metric chart available upon request

GUIDE SPECIFICATION

Electric duct heaters shall be Acu-Zone™ model AZON-I-E or AZON-II-E manufactured by Acutherm, Hayward, CA.

Each unit shall be a complete open coil duct heater with modulating SCR proportional controller, airflow sensor, discharge air sensor and room thermostat to provide a constant supply air temperature at both design and very low airflows. Units that do not provide a constant supply air temperature shall not be allowed.

The discharge thermostat shall be field adjustable. It shall be factory set for a constant supply temperature of approximately 90˚F/32˚C to minimize room air stratification. The discharge air temperature thermostat shall be factory installed in the AZON-I-E models and shall be field installed by others for AZON-II-E models. An electronic mode control room thermostat shall be supplied for field installation by others.

The unit shall be packaged in a heavy duty galvanized steel box complete with electric heating elements, controls and safety devices for over temperature control. The controls enclosure shall be NEMA 1 and a cover shall be easily removable for access to a single point electric supply connection and a room thermostat connection. AZON-II-E models also have a discharge air thermostat connection. The unit shall be CSA (C & US) labeled for safety and reliability.

Electric heating elements shall be open coil type constructed from the highest-grade nickel-chrome resistance wire ensuring that the wires will not age or oxidize to provide longer life. Each unit shall have an automatic reset thermal cutout, a safety feature to prevent overheating, that will reset after cooling down. Each unit shall also incorporate a manual reset thermal cutout for redundancy and to prevent the heater frame from overheating.

Model AZON-I-E shall have a round inlet and outlet as scheduled. Inlet and outlet for model AZONE-II-E shall be either round, square or rectangular as scheduled.

The Acu-Zone electric zone heater shall have a Two Year Warranty.

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Acu-Zone™ Electric Zone Heater

ACUTHERM PRODUCT GUIDE

Square VAV Diffusers

Round VAV Diffusers

Linear VAV Diffusers

Accessories

Pressure Control

Temperature control

PRODUCT INFORMATION DESCRIPTION

Use the following model number nomenclature to order Acu-Zone heaters, options and accessories.

Product

(1) Model	(2) Type	(3) Heat
AZON	▶	E

(4) Width	(5) Height	(6) Power	(7) Voltage
▶			

Product
1. Model: **AZON** – Acu-Zone heater
2. Type: **I** (smaller kW packaged) or **II** (larger kW custom)
3. Heat: **E** - Electric
4. Width: **R** for round (AZON-I-E only available w/ round inlet and outlet) or Width
5. Height: Diameter for round (AZON-I-E only available w/round inlet and outlet) or Height
6. Power: Heater power in kW
7. Voltage: Volts and phase (i.e. 208v 3Ø= 2083)

Note: Not all power ratings available for all sizes.
See Performance Guide for options.

Accessories

(1) Thermostat	(2) Plate
▶	

Accessories
1. Thermostat: **AZT1** (Adjustable 70˚F/21˚C to 75˚F/24˚C) or **AZT2** (Adjustable to ON or Setback)
2. Plate: **2WP**–Double wall plate for Acu-Zone thermostat & Digital Wall Adjuster

TWO YEAR WARRANTY

Acutherm warrants that its Model AZON Electric Zone heater exclusive of any options and accessories (whether factory or field installed) shall be free from defective 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 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 in connection with the inspection, repair or replacement of parts under the terms of this limited warranty nor for cost of removal or installation.

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