Technical Data

Power supply
24 VAC ± 20%, 50/60 Hz; Class 2 power source

Power consumption rating *
- 4 VA base control (ECON-ZIP-BASE)
- 5.5 VA base control with Energy Module (ECON-ZIP-BASE + ECON-ZIP-EM)
- 5 VA base control with Communication Module (ECON-ZIP-BASE + ECON-ZIP-CUM)
- 6.5 VA base with Energy Module and Communication Module. (ECON-ZIP-BASE + ECON-ZIP-EM + ECON-ZIP-COM)

Rated impulse voltage 330V
Connectors 1/4” male spade connectors
Environmental RoHS, conformally coated
Software class A
Control pollution degree 3
Temperature input signal NTC 10 kΩ, Type II
Humidity 5 to 95% RH non-condensing
Humidity input signal 0-10 VDC, corresponds to 0 to 100%
Housing NEMA 1
Housing material UL94-0VA
Ambient temperature range -40°F to +158°F (-40°C to +70°C)
Storage temperature range -40°F to +176°F (-40°C to +80°C)
Display 2x16 character LCD; LED backlight; transflective
Display op. range** -22°F to +176°F (-30°C to +80°C)
Agency listing cULus acc. to UL873, CAN/CSA C22.2, No. 24-93
Energy code compliant ASHRAE 90.1, CA Title 24, NECB

Installation

You can mount the ZIP Economizer in any orientation; it is recommended that you mount it in a position that will allow full utilization of the LCD and key pad and proper clearance for installation, servicing, wiring, and removal.

Take the overall dimensions of 6.63” [168.5] x 7.12” [181] x 2” [50.8] and mount in the interior of the RTU in a convenient location that you can access. Secure the ZIP utilizing #8 self-tapping screws (included). A minimum of two tabs need to be secured, one which is a top tab. Ideally secure all four tabs. Wire the electrical connection using ¼” female insulated spade connectors to prevent corrosion.

Input/Output Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
<th>Electrical Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input R</td>
<td>Supply Hot</td>
<td>24 VAC, ± 20%, 50/60Hz</td>
<td></td>
</tr>
<tr>
<td>Input G</td>
<td>Fan Signal (occupied)</td>
<td>On/Off, 24 VAC, ± 20%, 50/60Hz</td>
<td></td>
</tr>
<tr>
<td>Input C</td>
<td>Supply Common</td>
<td>Common</td>
<td></td>
</tr>
<tr>
<td>Input Y1</td>
<td>Cooling requirement Stage 1</td>
<td>On/Off, 24 VAC, ± 20%, 50/60Hz</td>
<td></td>
</tr>
<tr>
<td>Input Y2</td>
<td>Cooling requirement Stage 2</td>
<td>On/Off, 24 VAC, ± 20%, 50/60Hz</td>
<td></td>
</tr>
<tr>
<td>Input W1</td>
<td>Heating requirement Stage 1</td>
<td>On/Off, 24 VAC, ± 20%, 50/60Hz</td>
<td></td>
</tr>
<tr>
<td>Input SAT ±</td>
<td>Supply Air Temperature Sensor</td>
<td>Type: 10K NTC (Type II thermistor)</td>
<td></td>
</tr>
<tr>
<td>Input OAT ±</td>
<td>Outdoor Air Temperature</td>
<td>Type: 10K NTC (Type II thermistor)</td>
<td></td>
</tr>
<tr>
<td>Input OAH ±</td>
<td>Outdoor Air Humidity</td>
<td>0-10 VDC Auto Detection: Sensor present if voltage 0.5V-10V</td>
<td></td>
</tr>
<tr>
<td>Input RAT ±</td>
<td>Return Air Temperature</td>
<td>Type: 10K NTC (Type II thermistor)</td>
<td></td>
</tr>
<tr>
<td>Input RAH ±</td>
<td>Return Air Humidity</td>
<td>0-10 VDC Auto Detection: Sensor present if voltage 0.5V-10V</td>
<td></td>
</tr>
</tbody>
</table>

Output CC1
- Compressor 1 RTU Stage 1 Mechanical Cooling Circuitry
- 100,000 cycles @ inrush current of 3A, normal current 1.5A
- Impedance for Auto detection @ 24 V: <600 Ω @ 60Hz, <800 Ω @ 50Hz

Output CC2
- Compressor 2 RTU Stage 2 Mechanical Cooling Circuitry
- 100,000 cycles @ inrush current of 3A, normal current 1.5A
- Impedance for Auto detection @ 24 V: <600 Ω @ 60Hz, <800 Ω @ 50Hz

Output Act 1
- Actuator supply common Common

Output Act 2
- Actuator supply hot 24 VAC, 50/60Hz

Output Act 3
- Actuator control output 2-10 VDC

Output Act 5
- Actuator feedback signal 2-10 VDC

* The power consumption is for the control only and does not include connected loads such as actuators, compressors, fans, and sensors. For transformer sizing, the power consumption of these attached components must be included.

** At low temperature the display has decreased response time. Below -22°F [-30°C] it will not function.
Installation

Avoid mounting in areas where acid fumes or other deteriorating vapors can disintegrate the metal parts of the module’s circuit board, or in areas where escaping gas or other explosive vapors are present.

You must mount the sensor in a position that will allow for proper clearance for installation, servicing, wiring, and removal.

Using the dimensions as a reference, mount the Temperature and Humidity Sensor on the outside of the dampers to measure outside temperature and humidity, or inside the return air duct to measure the return temperature and humidity. If mounted outside, the sensor must be placed within hood behind the outdoor air filter. It needs to be protected from direct exposure to water (snow/rain) and direct exposure to sunlight (UV radiation).

The orientation of the sensor is critical to ensure optimal performance. (Please see figures on recommended orientation.)

Ensure installation matches an approved orientation before securing with #8 self-tapping screws (included in kit).

The electrical connection needs to be wired using appropriate insulated spade connectors, ¼” female, according to the wiring diagram.

Wiring

Input/Output Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
<th>Electrical Specification</th>
<th>ZIP Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>24V Supply</td>
<td>24 VAC, ± 20%, 50/60Hz</td>
<td>Same Power Supply</td>
<td>R</td>
</tr>
<tr>
<td>Output</td>
<td>T(+) Temperature</td>
<td>Type: 10K NTC (Type II thermistor)</td>
<td>DAT (+/-); RAT (+/-)</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>RH(+) Relative Humidity</td>
<td>0-10 VDC</td>
<td>DAH (+/-); RAH (+/-)</td>
<td></td>
</tr>
</tbody>
</table>
Installation

Avoid mounting in areas where acid fumes or other deteriorating vapors can attack the metal parts, or in areas where escaping gas or other explosive vapors are present.

Mount the sensor in a position that will allow for proper clearance for installation, servicing, wiring, and removal.

Using the dimensions as a reference, mount the 10K Sensor on the outside of the dampers to measure outside temperature, or inside the return air duct to measure the return temperature. If mounted outside, the sensor must be placed within hood behind the outdoor air filter. It needs to be protected from direct exposure to water (snow/rain) and direct exposure to sunlight (UV radiation).

Secure the sensor with #8 self-tapping screws (included in kit) using a size 16 or 18 drill.

Technical Data

<table>
<thead>
<tr>
<th>Temperature output signal</th>
<th>NTC 10k Ohm, Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectors</td>
<td>1/4” female spade insulated connectors, 3 ft. cable</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 0.36°F (± 0.2°C)</td>
</tr>
<tr>
<td>Stability drift</td>
<td>less than 0.036°F/yr (0.02°C/yr)</td>
</tr>
<tr>
<td>Material</td>
<td>etched Teflon, plenum-rated &amp; FEP jacketed cable; galvanized t-bracket</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-67°F to +176°F (-55°C to +80°C)</td>
</tr>
</tbody>
</table>

Wiring Diagram

```
Sensor

To Controller
Analog Input (AI) (No Polarity)

To Controller
Analog Input (AI) (No Polarity)
```

Dimensions in Inches [mm]

```
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Inches (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.71” (95mm)</td>
<td></td>
</tr>
<tr>
<td>.875” (22.23mm)</td>
<td></td>
</tr>
<tr>
<td>.160” (4.06mm)</td>
<td></td>
</tr>
<tr>
<td>1.75” (44.5mm)</td>
<td></td>
</tr>
<tr>
<td>1.44” (36.5mm)</td>
<td></td>
</tr>
<tr>
<td>.160” (4.06mm)</td>
<td></td>
</tr>
</tbody>
</table>
```

ECON-ZIP-10K

**ZIP Economizer Terminal inputs**

<table>
<thead>
<tr>
<th>Terminal inputs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT (+/-)</td>
<td></td>
</tr>
<tr>
<td>DAT (+/-)</td>
<td></td>
</tr>
<tr>
<td>RAT (+/-)</td>
<td></td>
</tr>
</tbody>
</table>
### Technical Data

**Power supply**: 24 VAC ± 20%, 50/60Hz, class 2 power source

**Power consumption rating**: 1.5 VA (ECON-ZIP-EM), 5.5 VA (ECON-ZIP-BASE + ECON-ZIP-EM)

**Connectors**: 1/4" male spade connectors

**Environmental**: RoHS, conformally coated

**Indoor fan speed selection**: 100,000 cycles @ inrush current of 3A, normal current 1.5A

**Exhaust fan selection**: 100,000 cycles @ inrush current of 3A, normal current 1.5A

**Supported CO₂ sensor**: 0-10 VDC, sensor auto-detection, 0-2000ppm

**Auxiliary input - purge contact**: On/off - 24 VAC, 50/60Hz - current load min 10mA

**Auxiliary input - remote potentiometer**: 2-10VDC

**Humidity**: 5 to 95% RH non-condensing

**Housing**: NEMA 1

**Housing material**: UL94-5VA

**Ambient temperature range**: -40°F to +158°F (-40°C to +70°C)

**Storage temperature range**: -40°F to +176°F (-40°C to +80°C)

**Agency listing**: cULus acc. to UL873, CAN/CSA C22.2, No. 24-93

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### Input/Output Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
<th>Electrical Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>CO₂ +/-</td>
<td>CO₂ sensor input</td>
<td>0-10 VDC Sensor auto-detection</td>
</tr>
<tr>
<td>Output</td>
<td>IF</td>
<td>Indoor fan low speed enable</td>
<td>100,000 cycles @ inrush current of 3A, normal current 1.5A Impedance for Auto detection @ 24 V: &lt;600 Ω @ 60Hz &lt;800 Ω @ 50Hz</td>
</tr>
<tr>
<td>Output</td>
<td>EF</td>
<td>Exhaust fan enable</td>
<td>100,000 cycles @ inrush current of 3A, normal current 1.5A Impedance for Auto detection @ 24 V: &lt;600 Ω @ 60Hz &lt;800 Ω @ 50Hz</td>
</tr>
<tr>
<td>Input</td>
<td>AUX1 ±</td>
<td>Auxiliary input Purge contact</td>
<td>On/Off, 24 VAC, 50/60 Hz Current load min. 10mA</td>
</tr>
<tr>
<td>Input</td>
<td>AUX2 ±</td>
<td>Auxiliary input Remote Potentiometer Input</td>
<td>2-10 VDC</td>
</tr>
</tbody>
</table>

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*The power consumption is for the control only and does not include connected loads such as actuators, compressors, fans, and sensors. For transformer sizing, the power consumption of these attached components must be included.*

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### Dimensions (Inches [mm])

![Dimensions Diagram]

**Height**: 1.88 [47.8]

**Width**: 2.71 [68.8]

**Depth**: 2.24 [56.9]

**Height**: 1.53 [38.9]

**Width**: 1.25 [31.8]
Wiring Diagram

- Power source should be the same as ECON-ZIP-BASE.
- W1 must be wired for Heat Pump operation if conventional thermostat is used in conjunction with Defrost Board. If Thermostat and RTU use O/B control reversing valve position, O/B must be wired to W1 on ECON-ZIP-BASE.
- Not supplied by Belimo.
- Sold separately by Belimo.

**NOTICE**

*All diagrams and information are subject to change. © Belimo Aircontrols (USA), Inc.*