

Fast Route to Reliable Energy Savings – ZIP Economizer™

LCD Display

Automotive quality, easy-to-read display allows easy verification of set values and real time operating information

Alarm Notification

ECON-ZIP-TH

Temperature and humidity sensor for calculating enthalpy.

Onboard Information

Integrated help for setup and/or troubleshooting.

Future Expansion Module!

Expanded Functionality

with Belimo Actuator for continuous feedback and quicker running times in test mode.

ECON-ZIP-BASE

The plug and play modular design gives users flexibility without complex set-up or configuration. The ZIP Base allows for non proprietary sensors to be used.



ECON-ZIP-EM

Optional Energy module that add I/Os to offer higher control functionalities that will save energy and will meet new and future minimum code requirements, such as 2 speed fan and Demand Control Ventilation (DCV).

Remote Alarm

ECON-ZIP-COM

Optional Communication module that provides alarm output and firmware update with future capabilities such as data trending, building automation integration and OEM communication integration.

ECON-ZIP-10K

Air temperature sensors.



ECON-ZIP-BASE

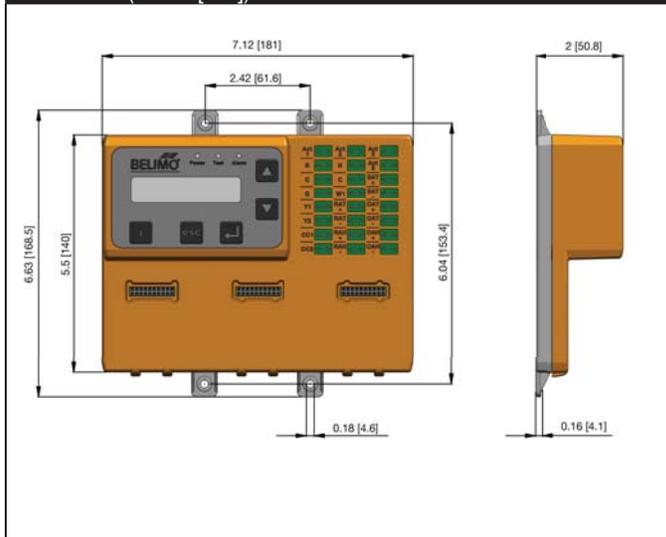
ZIP Economizer™ Base Unit



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-COM)
	6.5 VA Base with Energy Module and Communication Module.
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 10kOhm
Humidity	5 to 95% RH non-condensing
Humidity Input Signal	0-10 VDC; corresponds to 0 to 100%
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)
Display	2x16 character LCD; LED backlight; transfective
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

Dimensions (Inches [mm])



Product Features

The ZIP Economizer™ is a modular designed, plug and play economizer control solution. The ZIP offers an extended temperature transfective LCD display, with on board help, providing information every step of the way. Through its patented ZIP code set up, the system will automatically recognize your climate zone and will set the high limit change over temperature providing automatic compliance. Integrated onboard test sequence that ensures effortless compliance with California Title 24, and verification of proper operation. Auto-detection of inputted devices and non-proprietary sensors, allows for a quicker, and easier set up. Through its superior fault detection and diagnostics (FDD), it troubleshoots faults, initiates alarms, and reconfigures for best operation. Up to 10 alarms are stored as historic alarms, and with operating hours tracking it makes troubleshooting and maintenance easier.

Application

Direct expansion RTUs up to 30 tons, single dry bulb, single enthalpy, differential dry bulb, differential enthalpy change over strategies. Integrated cooling operations only when damper is 100% open (2 stages thermostat required). When optional energy module is used (ECON-ZIP-EM) demand control ventilation, pre occupancy purge, power exhaust, remote damper position override, fan speed switch. When optional communication module (ECON-ZIP-COM) is used remote alarm indication is available.

Suitable Actuators

Spring Return	
ECON-ZIP-BASE	AFB24-SR, NFB24-SR, LF24-SR, TFB24-SR

I/O Specifications

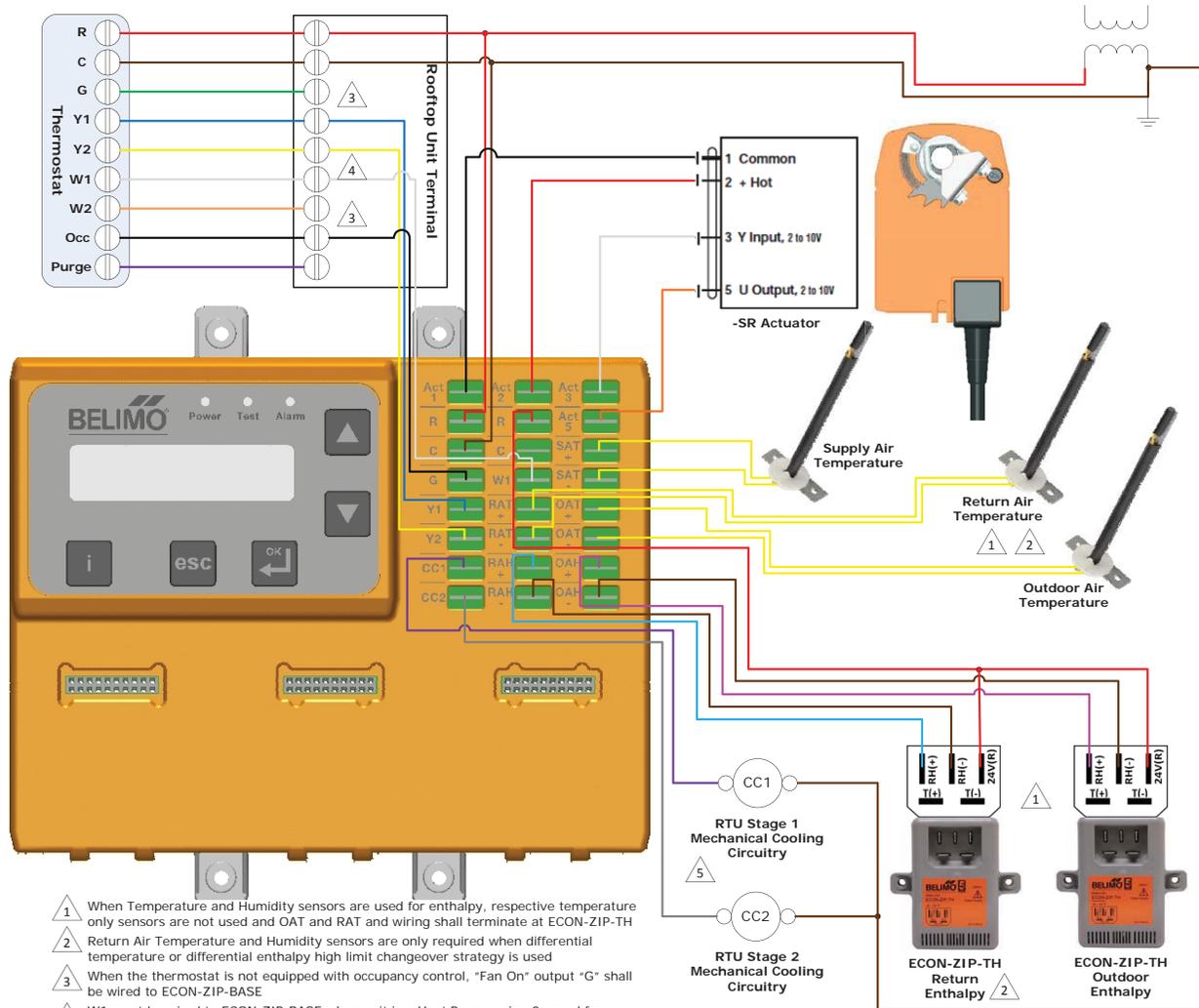
Type	Name	Description	Electrical Specification
Input	R	Supply Hot	24 VAC, ± 20%, 50/60Hz
Input	G	Fan Signal (occupied)	On/Off, 24 VAC, ± 20%, 50/60Hz
Input	C	Supply Common	Common
Input	Y1	Cooling requirement Stage 1	On/Off, 24 VAC, ± 20%, 50/60Hz
Input	Y2	Cooling requirement Stage 2	On/Off, 24 VAC, ± 20%, 50/60Hz
Input	W1	Heating requirement Stage 1	On/Off, 24 VAC, ± 20%, 50/60Hz
Input	SAT ±	Supply Air Temperature Sensor	Type: 10K NTC (Type II thermistor)
Input	OAT ±	Outdoor Air Temperature	Type: 10K NTC (Type II thermistor)
Input	OAH ±	Outdoor Air Humidity	0-10 VDC Auto Detection: Sensor present if voltage 0.5V-10V
Input	RAT ±	Return Air Temperature	Type: 10K NTC (Type II thermistor)
Input	RAH ±	Return Air Humidity	0-10 VDC Auto Detection: Sensor present if voltage 0.5V-10V
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 Ohm @ 60Hz <800 Ohm @ 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 Ohm @ 60Hz <800 Ohm @ 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
Input	Act 5	Actuator feedback signal	2-10 VDC

*The power consumption is for the control only and does not include connected loads such as actuator, 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.

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Wiring Diagram



- 1 When Temperature and Humidity sensors are used for enthalpy, respective temperature only sensors are not used and OAT and RAT and wiring shall terminate at ECON-ZIP-TH
- 2 Return Air Temperature and Humidity sensors are only required when differential temperature or differential enthalpy high limit changeover strategy is used
- 3 When the thermostat is not equipped with occupancy control, "Fan On" output "G" shall be wired to ECON-ZIP-BASE
- 4 W1 must be wired to ECON-ZIP-BASE when unit is a Heat Pump, using 2 speed fan, and when it is desired to record operational hours in heating
- 5 Existing refrigeration safety devices may exist, consult RTU wiring diagram



Technical Data

Power Supply	24 VAC ± 20%, 50/60Hz, Class 2 power source
Power Consumption Rating*	2.5 VA (ECON-ZIP-COM), 6.5 VA (ECON-ZIP-BASE + ECON-ZIP-COM)
Connectors	1/4" male spade connectors
Environmental	RoHS, Conformally Coated
Communication Interface	RS485 Interface, Optical Isolation max. 1kVDC (for max.1 min), Pin 4: RS485 Com Gnd, Pin 7: RS485 Com A, Pin 8: RS485 Com B
Supported Remote Alarm	Normal Current: 0.5A, Inrush Current: 1A
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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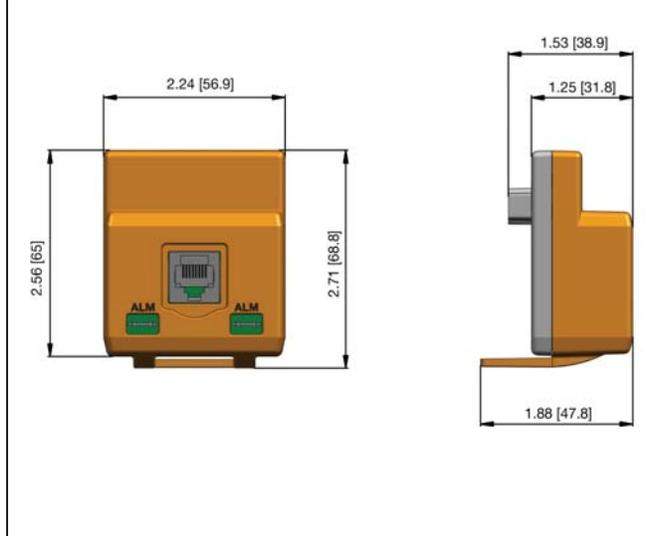
Product Features

The ZIP Economizer™ Communication Module provides alarm output with future capabilities such as data trending, building automation integration, and OEM communication integration.

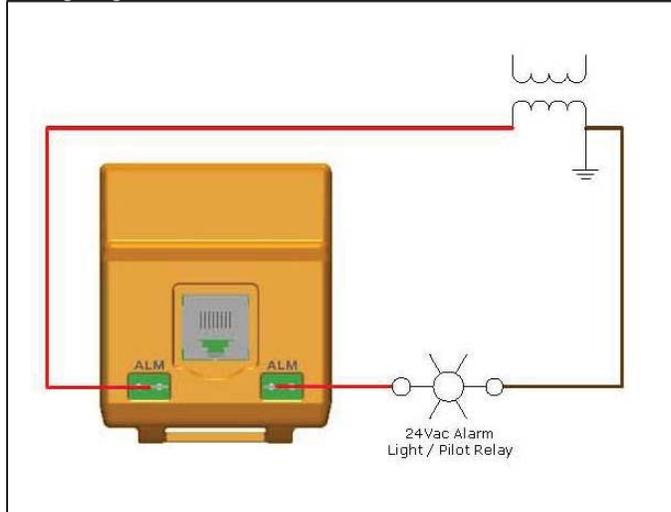
Operation

The ZIP Economizer™ Communication Module has full functionality when connected to the ECON-ZIP-Base. With its unique keyed slot, it makes installation a breeze.

Dimensions (Inches [mm])



Wiring Diagram



ECON-ZIP-EM

ZIP Economizer™ Energy Module



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
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)
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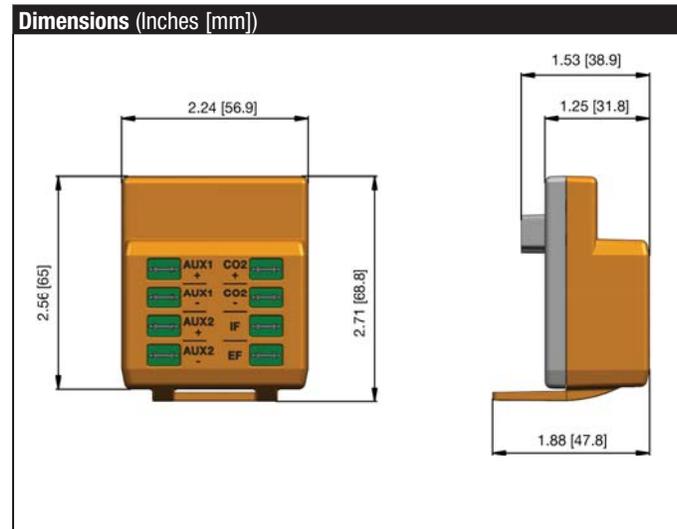
Product Features

The ZIP Economizer™ Energy Module provides additional I/Os to offer higher control functionalities that will save energy and will meet new and future minimum code requirements. The Energy Module is needed for CO2 sensors, Indoor Fan, 2 Speed Fan, Exhaust Fan, Remote Potentiometer for Damper Positioning, as well as purge control. The auto-detection and plug and play capability offers quick set up.

Application

The ZIP Economizer™ Energy Module offers demand control ventilation for high occupancy areas. (A third party CO2 sensor required). Pre-occupancy purge input for VOC removal (requires thermostat with purge contact). Power exhaust for building pressure control (requires power exhaust fan) Remote damper override (requires remote potentiometer installed). 2 speed fan control (requires supply fan to be equipped with multi speed fan or VFD).

Dimensions (Inches [mm])

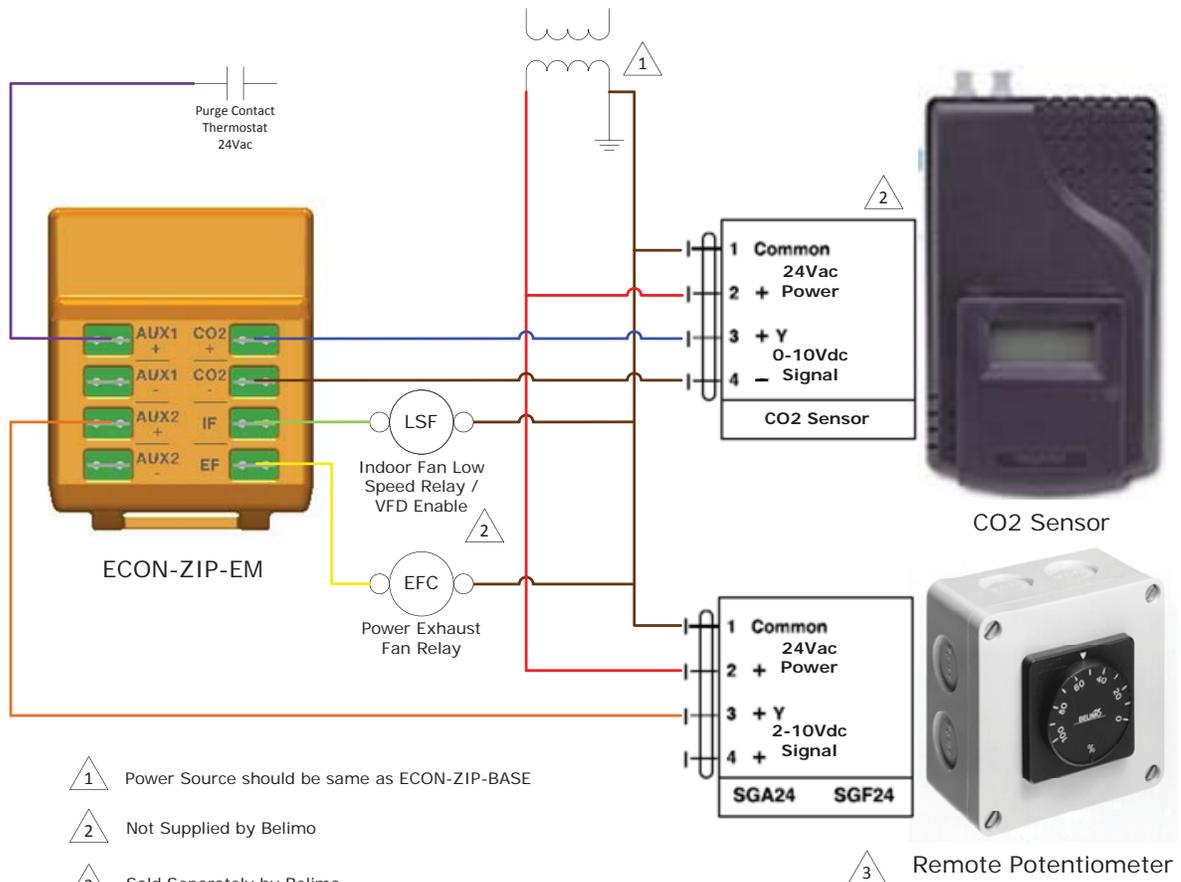


I/O Specifications

Type	Name	Description	Electrical Specification
Input	CO2 ±	CO2 sensor input	0-10 VDC (0-2000 ppm) Sensor auto-detection
Output	IF	Indoor fan low speed enable	100'000 cycles @ inrush current of 3A, normal current 1.5A Impedance for Auto detection @24 V: <600 Ohm @ 60Hz <800 Ohm @ 50Hz
Output	EF	Exhaust fan enable	100'000 cycles @ inrush current of 3A, normal current 1.5A Impedance for Auto detection @ 24 V: <600 Ohm @ 60Hz <800 Ohm @ 50Hz
Input	AUX1 ±	Auxiliary input Purge contact input	On/Off, 24 VAC, 50/60 Hz Current load min. 10mA
Input	AUX2 ±	Auxiliary input Remote Potentiometer Input	2-10 VDC

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Wiring Diagram



ECON-ZIP-10K

ZIP Economizer™ Temperature Sensor



Application

ECON-ZIP-10K allows for reliable temperature air readings. The sensor may be used for outdoor air (OAT), return air (RAT), or supply air (SAT) temperature measurements and control, with no configuration required. A minimum of one SAT and one OAT sensor is required for the ZIP Economizer to function. An RAT sensor can be added for differential temperature change over strategy. For best control results, sensors should be placed in the air stream. With the T-Bracket mounting is universal and can be inserted through the ductwork, fan housing or surface mounted.

Technical Data

Temperature Output Signal	NTC 10k Ohm, Type II
Connectors	1/4" female spade insulated connectors, 3 ft. cable
Accuracy	$\pm 0.36^{\circ}\text{F}$, ($\pm 0.2^{\circ}\text{C}$)
Stability Drift	less than $0.036^{\circ}\text{F}/\text{yr}$ [$0.02^{\circ}\text{C}/\text{yr}$]
Material	Etched Teflon, Plenum-Rated & FEP Jacketed Cable; Galvanized t-bracket
Ambient Temperature Range	-67°F to $+176^{\circ}\text{F}$ (-55°C to $+80^{\circ}\text{C}$)

ECON-ZIP-TH

ZIP Economizer™ Temperature and Humidity Sensor



Technical Data

Power Supply	24 VAC ± 20%, 50/60Hz, Class 2 power source
Current Consumption	Max. 5mA
Rated Impulse Voltage	800V
Connectors	1/4" male spade connectors
Environmental	RoHS conformally coated
Software Class	A
Control Pollution Degree	3
Temperature Sensor Type	NTC 10kOhm
Humidity	0 to 100% RH
Humidity Sensor Type	0-10VDC (0 to 100% RH) max load 10kOhm, Class 2 limited energy
Housing	NEMA 1
Ambient Temperature Range	-40°F to +140°F (-40°C to +60°C)
Storage Temperature Range	-40°F to +158°F (-40°C to +70°C)
Accuracy	± 3% 35-65% rH @ 75°F ± 5% 0-34%, 66-100% rH @ 75°F
Response Time	<45 seconds @ 40 FPM, 75°F
Hysteresis	<2.5% rH
Long Term Stability	<1% rH/year
Agency Listing	UL60730-1,-2-9,-2-13. UL2043 compliant, CE 2004/108/EC "Electromagnetic compatibility (EMC)", EN60730-1,-2-9 and-2-13

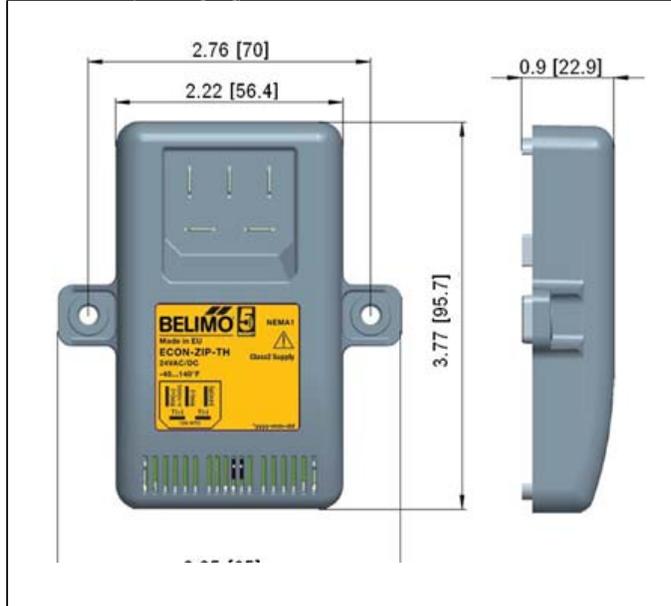
Product Features

- Temperature and humidity sensor in the same footprint
- Reliable and accurate
- 0-10VDC output to relative humidity
- NTC 10kOhm temperature sensor
- Large operating range: -40°F...140°F; 0-100% RH

Application

ECON-ZIP-TH Sensor may be used to measure temperature and humidity in the outdoor air or return air location. The temperature and humidity output is via 2 discrete channels that can be independently measured with a multimeter. One sensor is used in the outdoor air intake for single enthalpy changeover strategy. An additional sensor can be added in the return air stream for differential changeover strategy. When using the ECON_ZIP_TH it is not necessary to use a separate temperature sensor ECON-ZIP-10K for OAT or RAT.

Dimensions (Inches [cm])



Wiring Diagram

