Smart Temperature & Humidity Control for Air Handling Units (AHUs)

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HumiTherm-AH Pro

Universal Inputs (RTD/mA/V)
Programmable Economic & Comfort Zones
Heat, Humidifier & 'Cool + De-humidifier' Outputs
¼ DIN (96x96) Compact Enclosure

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HumiTherm-AH Pro is a dedicated AHU temperature and humidity controller designed to deliver stable comfort, energy-efficient operation, and easy field commissioning. Developed from real-world HVAC practices and aligned with global AHU control philosophy, it offers the right balance between performance and simplicity.

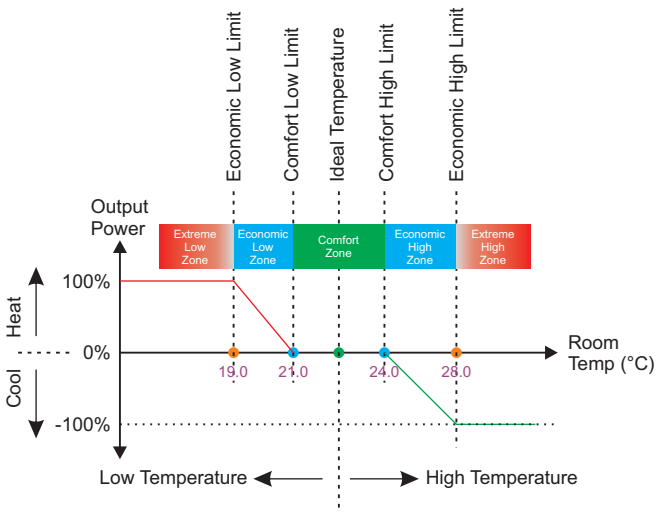
Applications

- Comfort AHUs in Commercial Buildings
- Clean Rooms and Laboratories
- Pharmaceutical and Healthcare HVAC
- Data Centers and Control Rooms
- Industrial Process Ventilation
- Textile, Food, and Storage Environments
- HVAC Systems Requiring Stable RH Control

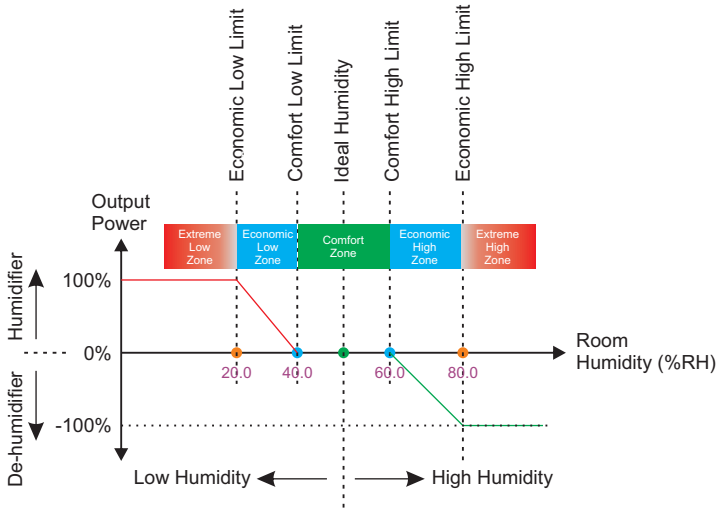
Designed for How AHUs Actually Work

HumiTherm-AH Pro follows a 'zone-based control approach', widely adopted by leading AHU manufacturers.

Temperature Control Algorithm



Humidity Control Algorithm



Note : The zone-limits are user settable. The values shown in the figure are for illustration purpose only.

Comfort Zone : No active heating, cooling, humidification, or dehumidification
Economic Zones : Smooth, proportional control action
Extreme Zones : Full control action for fast recovery

The zone-based control approach ensures stable conditions without unnecessary energy usage or actuator stress.

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Smooth & Predictable Temperature Control

- Progressive heating and cooling based on deviation from comfort limits
- No hunting or frequent ON/OFF switching
- Ideal for electric heaters, hot water valves, and chilled water valves

This control approach ensures stable room temperature, reduced actuator wear, and improved occupant comfort.

Intelligent & Energy-Aware Humidity Control

- Dedicated logic for humidification and dehumidification
- Dehumidification achieved through controlled cooling below dew point
- Wide comfort bands prevent over-control and excessive energy consumption

The controller inherently supports **cool - dehumidify - reheat sequences**, applied only when required, helping to balance comfort and efficiency.

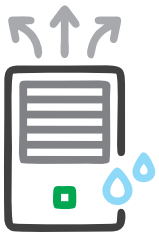
Occupancy-Based Energy Optimization

HumiTherm-AH Pro supports an intelligent Occupancy / Unoccupancy mode that automatically adjusts temperature and humidity control limits to reduce energy consumption while maintaining safe environmental conditions.

- Automatic switching between Occupied and Unoccupied operation
- Mode change through Digital Input or MODBUS command
- Adjustable temperature and humidity setback offsets for unoccupied operation
- Optional humidification disable during unoccupied operation
- Dehumidification protection retained to prevent excessive humidity buildup

Integrated Cooling & Dehumidification

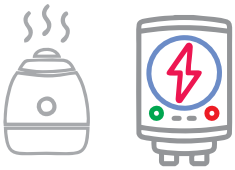
In AHU systems, cooling and dehumidification are inseparable processes. **HumiTherm-AH Pro** reflects this reality by combines **cooling and dehumidification demands** intelligently.



- Supports sensible cooling (temperature control)
- Supports latent cooling (humidity control)
- Minimizes unwanted cool - reheat cycles

The above approach ensues better comfort with optimized energy usage.

Flexible Outputs for Real AHUs



- Heating, cooling, humidification outputs
- Relay / SSR / Analog Outputs (mA/V) supported
- Compatible with common AHU actuators and humidifiers

This flexibility allows seamless integration with Electric Heaters, Hot Water Valves, and Steam or Ultrasonic Humidifiers.

Why HumiTherm-AH Pro

- Based on **global AHU control philosophy**
- Optimized for **real field conditions**
- Built-in occupancy / night setback control for energy saving
- Simple, stable, and energy-efficient
- Ideal for OEMs and system integrators

Operator Interface

Display	2 Rows of 4 Digits, 0.8” Luminous Green, 7 Segment LED
Status Indicators	8 Red LEDs
Keys	4 Tactile Switches PAGE, DOWN, UP, ENTER

Channel Specifications

Temperature Input (User Configurable)	RTD Pt100, 3 wire 0-20 mA / 4-20 mA 0-5 VDC / 0-10 VDC / 1-5 VDC
Humidity (%RH) Input (User Configurable)	0-20 mA / 4-20 mA 0-5 VDC / 0-10 VDC / 1-5 VDC
Accuracy	RTD Pt100 : ± 0.25% of reading ± 1 LSD DC mA / Volts : ± 0.20% of reading ± 1 LSD
Resolution	Temperature : 0.1 °C Humidity : 0.1 %
Range	RTD Pt100 Input : 0 to 600.0 °C DC Linear mA / V : Adjustable from -199.9 to 999.9 Counts
Zero Offset	Independent for Temperature & Humidity (Adjustable over Full Range)
ADC	16 Bit (± 32,768 Counts), Sigma-Delta (ΣΔ)
Input Resistance	> 8 MΩ for Pt100 > 47 KΩ for Voltage Input 249 Ω Precision Shunt for mA Input
Common Mode Rejection	> 100dB at 50/60 Hz
Input Protection	ESD : 8KV EFT : 2KV Surge : 1KV
Input Conditioning	First Order Analog R-C Low-Pass Filter & Settable Digital Low-Pass Filter

Excitation Voltage

Ratings	24 V @ 50 mA (Standard) 12 V @ 15 mA (Optional) 5 V @ 15 mA (Optional)

Alarms

Numbers	4, Independent (2 Each for Temperature & Humidity)
Programmable Parameters	Type : Process Low, Process High Logic : Normal, Reverse Hysteresis : 0.1 to 25.0 Unit Counts Inhibit : No, Yes
Output (Optional)	Relay Change-over Contacts (Can be programmed to activate on Temperature Alarm or Humidity Alarm or Both Alarms)

Temperature (Heat) Control

Type	Proportional
Output (Specify)	Relay / SSR / (0/4-20) mA / (0-5/10) V

%RH (Humidification) Control

Type	Proportional
Output (Specify)	Relay / SSR

'Cool + Dehumidification' Control

Type	Proportional
Output Strategy (User Settable)	Greater of Cool & De-Humidification Power **OR** Algebraic Sum of Cool & De-Humidification Power
Output (Specify)	Relay / SSR / (0/4-20) mA / (0-5/10) V

Electrical Specifications for Outputs

Relay	Contact Type : Potential-free Change-over Contacts Contact Rating : 5A Resistive @ 250 Vac Contact Life : > 5,00,000 Operations at Rated Voltage / Current
SSR Drive	12 VDC @ 30 mA
DC Linear	Current : 0-20mA, 4-20mA (into 500 Ohm Maximum) Voltage : 0-5V, 0-10V (into 1KOhm Minimum)
Isolation	All Outputs are Isolated from Power, Analog Inputs & Serial Communication Rating : 1500VAC for 1 second or 250VAC continuous Isolation.

Serial Communication

Port	RS485, 2-wire, Half Duplex, Start-Stop Synchronized
Protocol	MODBUS RTU
Baud Rate	Settable : 4800, 9600, 19200
Parity	Settable : None, Even, Odd
Max. Units per Loop	31
Max. Distance	1200 Meters

Power Supply

Type	Switch Mode (SMPS)
Line Voltage	85~264 VAC, 50/60Hz
Consumption	5 VA Max

Physical

Mounting	Plug-in with Panel Mounting Clamps
Overall Dimensions	96(H) X 96(W) X 84(D), mm
Panel Cutout	92(H) X 92(W), mm
Terminals	Screw Type
Weight	400 gm, Appx.

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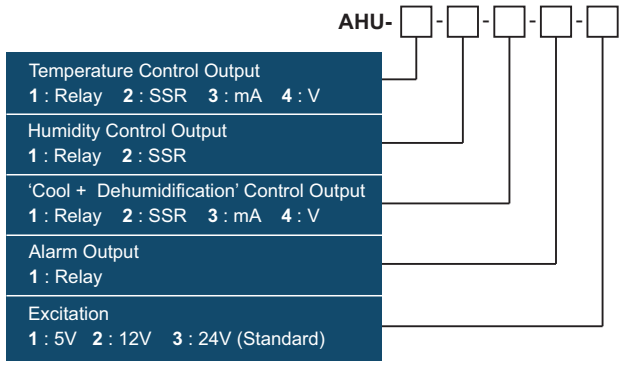
Environmental

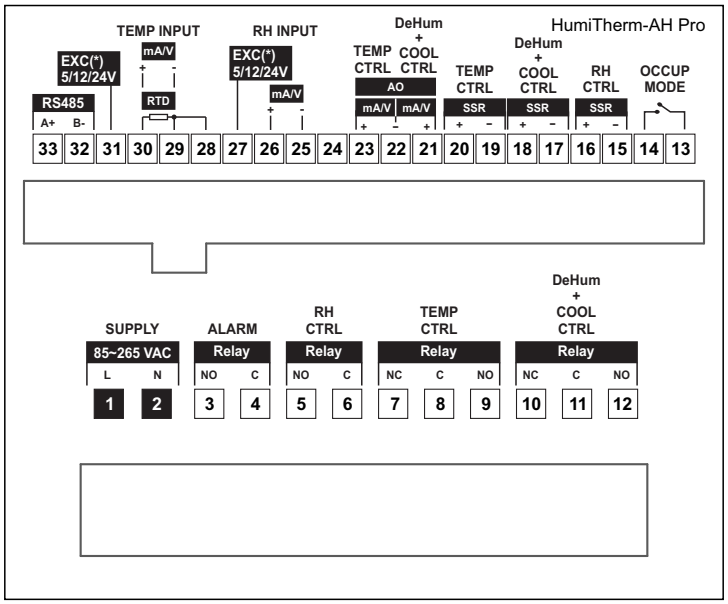
Operating Ambient	0 to 55°C & 5 to 90%RH Non-condensing
Storage Temperature	-10 to +70°C
Atmospheres	Not Suitable for use in Corrosive or Explosive Atmospheres. The Panel in which the Instrument is Mounted must be free of Electrically Conductive Pollution.

Ordering Code



Example Code : AHU-2-2-4-1-3
Temperature Control Output : SSR,
Humidity Control Output : SSR,
'Cool + Dehumidification' Control Output : Volt,
Alarm Output : Relay,
Excitation : 24V

Terminations



Process Precision Instruments (An ISO 9001 : 2008 Company)

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