

## Versatile VAV

Designed to exceed the expectations of typical Variable Air Volume (VAV) specifications, the Reliable Controls<sup>®</sup> MACH-Air<sup>™</sup> is a fully programmable BACnet Application Specific Controller (B-ASC) with feature rich versatility.



Better by design

[www.reliablecontrols.com/MA](http://www.reliablecontrols.com/MA)

## TECH SPECS

### Processor

- 25 MHz, high-performance, 16-bit embedded microcontroller

### Memory

- 32k RAM
- 128k Flash EEPROM operating system firmware and controller configurations

### Supply Voltages

- 24 VAC/VDC, 25 VA max.

### Communications

- EIA-485 @ 76.8 kbps max.
- SMART-Net™ (4 SMART-Sensors™ max.)

### SETUP-Tool™

- SETUP-Tool™ used for configuration

### Universal Inputs

- 3 universal inputs
- 10-bit A/D converter
- Analog: 0–5 VDC, 4–20 mA, thermistor
- Digital: dry contact
- Impedance: 15k Ω on 0-5 VDC range, 250 Ω on 4-20 mA range, 10k Ω on thermistor range
- 40 Hz pulse counting (supports flow meters)
- 24 VAC over-voltage protection

### Universal Outputs

- 8-bit D/A converter
- Analog: 0–12 VDC
- Digital: 0–12 VDC
- Output power: 75 mA @ 12 VDC
- 24 VAC over-voltage and short protection

### TRIAC Outputs

- 24 VAC @ 0.5 A
- Common return

### Velocity Sensors

- Flow-through thermistor
- 0–1" W.C.

### Actuator

- Torque: 35 in-lb.
- Brushless DC

### Enclosure

- NEMA type 1
- UL94-5V

### Dimensions

- 22.3 cm L x 14.2 cm W x 6.6 cm H (8 13/16" L x 5 5/8" W x 2 5/8" H)

### Weight

- 0.7 kg (1.8 lb.)

### Ambient Limits

- Operating: 0 °C to 40 °C (32 °F to 104 °F)
- Shipping: -20 °C to 60 °C (-4 °F to 140 °F)
- Humidity: 10% to 90% RH non-condensing

## FEATURES

### Protocols

- BACnet®
  - MS/TP (EIA-485)
- Reliable Controls Protocol
  - Network (EIA-485/Token Bus)

### 4 Control-BASIC™ Programs

- User programmable control strategy in a readable, BASIC-like language
- 2000 bytes per program

### 6 Inputs

- 3 inputs with universal ranges
- Jumper selectable 0–5 VDC, 4–20 mA, thermistor/dry contact
- Input #4 dedicated to the flow sensor
- Input #5 dedicated to the damper position feedback
- Input #6 dedicated to indicate damper at end of position

### 5 Outputs

- 3 outputs with universal ranges (base model)
- Scalable 0–12 VDC, 75 mA max.
- Output #3 is dual stage TRIAC (T model only) – configurable for floating point or 2 stage
- Output #4 dedicated to damper motor (available as floating point on models without actuator)
- Output #5 dedicated to control direction of rotation to close
- Single stage TRIAC (T model only)

### 48 Variables

- Selectable standard and custom ranges, as well as fixed or program-driven values
- Variable #1 dedicated to flow calibration

### 4 PID Loops

- Standard P, PI, or PID controllers for closed loop control

### 2 Trend Logs

- Each Trend Log stores 72 samples of 6 points at programmable time intervals

### 4 Runtime Logs

- Totals the On time and records the On/Off times of a digital point
- Holds 48 samples

### 2 System Groups

- Related points can be grouped in one display
- 50 points/group

### 1 Weekly Schedule

- 4 On/Off times for each weekday and 2 override days

### 5 Custom Tables

- For creating custom input ranges and Control-BASIC lookup tables

### SMART-Net™ Port

- Networks up to 4 SMART-Sensors™
- SMART-Sensor™ #5 is dedicated to SETUP-Tool™

### 32 Network In Points

### 32 Network Out Points

### Warranty

- 5 years

### Certification

- BTL Listed (B-ASC)
- ISO 16484-5
- UL916 Listed
- UUKL Listed

## ORDERING

### MAH (base model)

- MACH-Air™ controller with 3 universal inputs, 3 universal outputs, onboard flow sensor, onboard motor actuator

### MAH-WA

- Base model without motor actuator, includes 3 universal outputs and one floating point output using two TRIACS terminated inside enclosure

### MAH-WF

- Base model without flow sensor

### MAH-T

- MACH-Air™ controller with 1 universal output, 1 single stage TRIAC output, 1 dual stage TRIAC output (500 mA current per TRIAC)

### MAH-TWA

- MAH-T without motor actuator, includes 1 universal output, 1 single stage TRIAC, 1 dual stage TRIAC and one floating point output using two TRIACS terminated inside enclosure

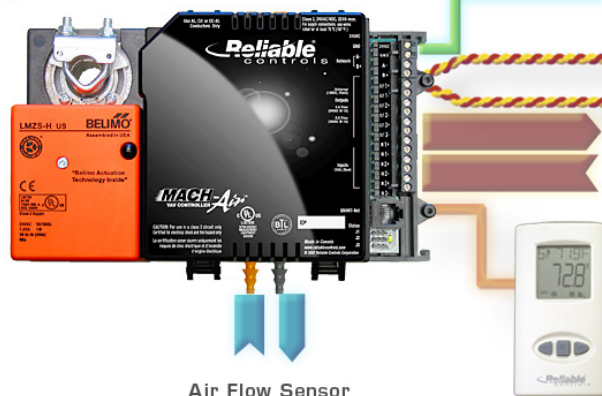
### MAH-TWF

- MAH-T without flow sensor

(Add "-SMK" to order # for UUKL models)

## APPLICATION DIAGRAM

95° Adjustable Cam



Power 24 VAC/VDC

Network to other controllers MS/TP (EIA-485)

3 - Outputs

3 - Inputs

SMART-Sensor™ LCD