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Honeywell

Excel 10
W7751H Smart VAV Actuator

EXCEL 5000 OPEN™ SYSTEM

SPECIFICATION DATA



GENERAL

The W7751H Smart VAV Actuator is a factory-integrated Variable Air Volume (VAV) Box Controller and a 108 second ML6174 Direct-Coupled Actuator in the Excel 10 family product line. This VAV Box Controller provides pressure-independent air flow control and pressure-dependent damper control. VAV systems generally provide cool air only to the zones. The W7751H Controller provides two additional outputs that control a fan or VAV box reheat coils. The heaters can be staged electric or modulating hot water. Supply and exhaust pressurization control are provided on a zone basis.

FEATURES

- **Uses Echelon® LonWorks® network (E-Bus) protocol.**
- **Free Topology Transceiver (FTT) high-speed 78 kbaud communications network.**
- **Compliant with VAV Device Object Type number 8010 functional LonMark™ profile.**
- **Capable of stand-alone operation, but can also use LonWorks® network communications.**
- **120 controllers per Q7750A Excel 10 Zone Manager.**
- **Designed for pressure-independent or pressure-dependent single or dual-duct Variable Air Volume (VAV) control.**
- **Uses a Microbridge air flow sensor with patented dual integral restrictor design.**
- **Easy user access to air flow sensor inputs.**
- **Provides Proportional Integral Derivative (PID) temperature control.**
- **Floating hot water, two-stage electric or modulating hot water heat.**
- **Provides patented nonlinear floating algorithm for velocity control loops.**
- **Individual zone pressurization for supply and exhaust control.**
- **Factory configured via EEPROM with critical user parameter default values.**
- **Supports motion sensor interface, via network, for enhanced energy savings.**
- **Supports Terminal Regulated Air Volume (TRAV) concept.**
- **Supports pressurize and depressurize, night purge, and morning warm-up sequences.**
- **Actuator included in W7751H mounts directly onto VAV box damper shaft and has up to 8 Nm (70 lb.-in.) torque, 90 degree stroke, and 108 sec. timing at 50 Hz.**
- **Both controller housing and actuator are UL plenum rated.**

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DESCRIPTION

The W7751H Smart VAV Actuator is a factory-integrated Variable Air Volume (VAV) Box Controller and a 108-second ML6174 Direct-Coupled Actuator in the Excel 10 family product line. This VAV Box Controller provides pressure-independent air flow control and pressure-dependent damper control. VAV systems generally provide cool air only to the zones. The W7751H Controller provides two additional outputs that control a fan or VAV box reheat coils. The heaters can be staged electric or modulating hot water. Supply and exhaust pressurization control are provided on a zone basis.

Control techniques supported (heating and cooling):

- Up to two stages of electric or hot water heat.
- Floating hot water heat.
- Pulse width modulated heat.
- Floating damper output.

Additional control features:

- Occupied—Normal hours or if bypass invoked from a wall module during unoccupied hours.
- Unoccupied—Off hours.
- Supply and exhaust pressurization control are provided on a zone basis.
- Occupancy sensor override and window open override (only via the network).

SPECIFICATIONS

Model

W7751G

The W7751H Smart VAV Actuator assembly is field mounted to the VAV box damper shaft similar to the mounting of a standard actuator. Field wiring 14 to 22 AWG (2.0 to 0.34 mm^2) passes through conduit connecting to screw terminals, located under a snap-on cover, on the bottom of the controller.

Input/Output

The W7751H is a NEC Class 2 rated device. This listing makes sure that the power consumed by the W7751H or devices it directly controls must be limited to a sum total of 100 VA. (Any devices connected to the controller must obtain power from the same transformer.) Any hardware that will be driven by the Triac outputs must have a minimum current draw, when energized, of 25 mA at 20 Vac and a maximum current draw of 400 mA at 30 Vac.

Inputs:

- Space temperature sensor.
- Remote wall module setpoint input or duct air temperature sensor.
- Remote wall module override.
- Air flow sensor.

Outputs:

- Internally wired VAV actuator (floating +).
- Internally wired VAV actuator (floating -).
- Floating heat (+) or stage 1 heat.
- Floating heat (-) or stage 2 heat.

Power Supply

24 Vac with a valid range of 20 to 30 Vac at 50/60 Hz.

Power Consumption

6 VA maximum at both 50 and 60 Hz.

Hardware

CPU:

Motorola or Toshiba 3150 Neuron® processor, containing three eight-bit CPUs. Each Neuron has a unique 48-bit network identification number.

Memory Capacity:

The W7751H Smart VAV Actuator uses a 64K by 8 ROM / PROM, 512 bytes of EEPROM, and 2K of RAM.

Differential Pressure Range

0 to 2.0 inch water (0 to 0.5 kPa) maximum for the onboard flow sensor.

Specified Sensing Temperature Range

20 Kohm NTC sensor temperature range of 45 to 99°F (7 to 37°C) with an allowable control setpoint range from 50 to 90°F (10 to 32°C) when initiated from the network and 55 to 85°F (13 to 29°C) when configured and connected to a T7770 Wall Module, T7780A Digital Display Wall Module (DDWM) or C7770A Air temperature Sensor.

Status Information

See Table 1.

Table 1. W7751G Controller LED Status Information.

LED Status	Controller Status
Off	No power to processor
On	Non-operational or (not configured)
Slow Blink	Operational (communicating in normal state)
Fast Blink	An alarm is present or in (Manual Test Mode)

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Communications

The W7751H uses an FTT transformer-coupled communications port with manchester-encoded data presented to controllers and devices on the LONWORKS® network at 78 kilobits per second (kbaud) via Echelon® communication protocol. Using the transformer-coupled communications interface offers a much higher degree of common mode-noise rejection while assuring DC isolation. The LONWORKS® network is insensitive to polarity, eliminating installation errors due to miswiring.

The maximum LONWORKS® network length up to 5,000 ft (1,524 m). For LONWORKS® network lengths greater than 5,000 ft (1,524 m), see form 74-2865 *E-Bus* (LONWORKS® network) *Wiring Guidelines*.

The maximum number of nodes per LONWORKS® network segment is 60.

Approved cable types for LONWORKS® network communications wiring is Level IV 22 AWG (0.34mm^2) plenum or non-plenum rated unshielded, twisted pair, solid conductor wire.

Damper Shaft Mounting

The actuator on the W7751H mounts directly onto the VAV box damper shaft and has up to 8 Nm (70 lb.-in.) of torque, 90 degree stroke, and 90 sec. timing at 60 Hz. The actuator is suitable for mounting onto a 3/8 in. (10 mm) square or round VAV box damper shaft, using the included 201391 Shaft Adapter, or onto a 1/2 in. (13 mm) square or round VAV box damper shaft. The minimum VAV box damper shaft length is 1-3/4 in. (45 mm). The W7751H is designed for vertical or horizontal mounting options with the exception that the wiring compartment may not be on top; these mounting options allow adequate air flow to keep the wiring compartment below 140°F (60°C).

LonMark™ Functional Profile

The W7751H Controller supports the LonMark™ Functional Profile number 8010 VAV Controller, version 1.0 (see Fig. 1).

Dimensions (H/W/D)

W7751H: 5-7/8 x 4-1/16 x 3-3/4 in. (149 x 103 x 95 mm).

Environmental Ratings

Operating Temperature: 32 to 125°F (0 to 50°C).

Shipping Temperature: -40 to 150°F (-40 to 65.5°C).

Relative Humidity

5% to 95% non-condensing.

Vibration

V2 level.

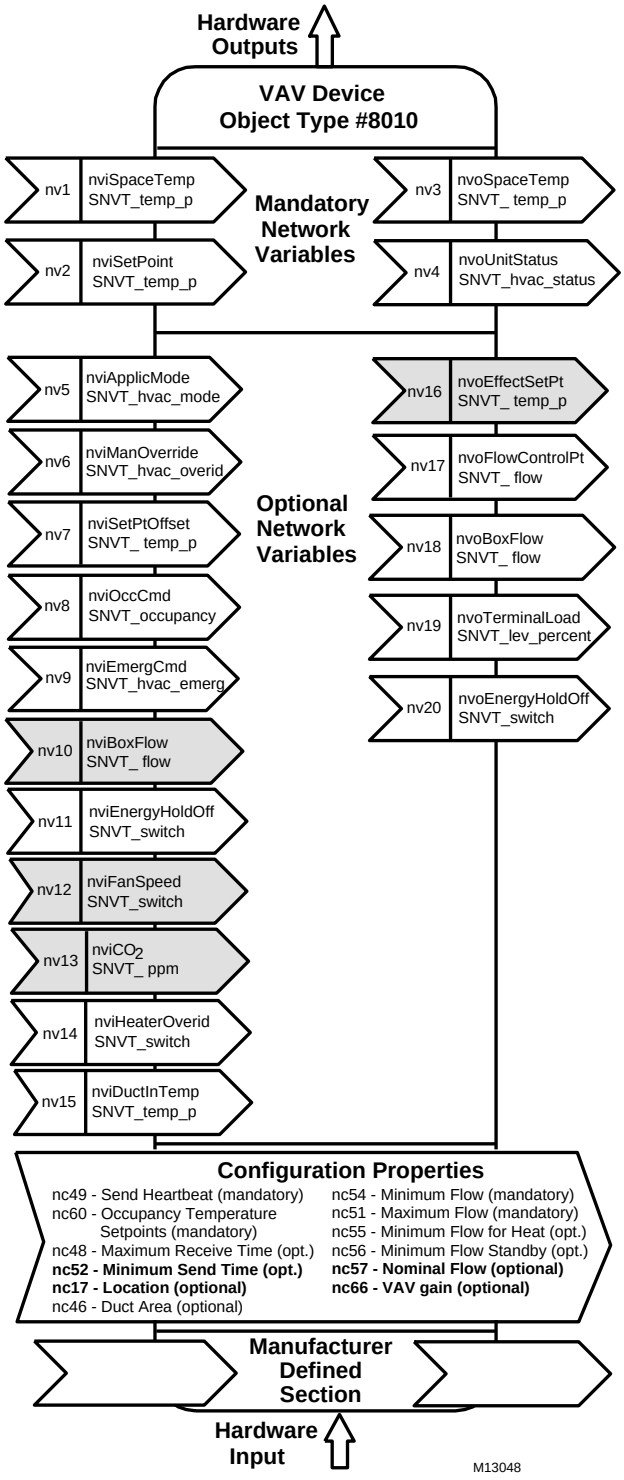


Fig. 1. Functional profile of LonMark™ VAV object details (variables not implemented in Excel 10 Smart VAV II Actuator are grayed, or are in bold print in Configuration Properties).

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Corrosion

Office environment.

Approval Bodies

The W7751H is listed under UL 916 (E87741) and is also listed under cUL (E87741). The W7751H meets FCC part 15 Class B requirements. The W7751H conforms to requirements per European Consortium standards EN50081-1 (CISPR 22 Class B) and EN 50082-1 (IEC 801-2, IEC 801-3 and IEC 801-4) for CE mark labeling.

Accessories

- Excel 10 T7770 Wall Modules.
- T7780A DDWM.
- Excel 10 C7770A Air Temperature Sensor.
- Excel 10 Q7750A Zone Manager.
- Excel 10 Q7751A,B Router.
- Excel 10 Q7752A,B Serial Interface Adapter.
- Excel 10 Connector Cable 205979 from the Excel 10 Q7752A Serial Interface Adapter to Excel 10 Controller or Wall Module.
- 209541B Excel 10 Termination Module.
- 201052A,B,C Auxiliary Switches (one, two, or three switches).

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