



TAC Xenta 102-AX

VAV Controller with Actuator and Airflow Transducer

20 Feb 2003



TAC Xenta® 102-AX is a zone controller intended for VAV heating and cooling applications with one or two stages of reheating. The controller keeps a constant temperature in the zone by controlling the air flow and heating stages. By using a carbon dioxide sensor, the air quality can be controlled in the zone.

TAC Xenta 102-AX is equipped with an integrated, static air velocity transducer and a motorized bidirectional actuator in a single package.

The differential pressure air velocity transducer requires a minimum of maintenance. Thus it is also well suited to be placed in the zone return air duct.

The controller is a LONMARK® compliant device aimed at communicating on a LONTALK® TP/FT-10 network via a twisted-pair, unpolarized cable. It is able to operate both as a stand-alone unit and as part of a system. All relevant network variables can be monitored and configured via the Network Plug-in or, locally, via the intelligent thermostat device I/STAT or the commissioning device M/STAT.

TECHNICAL DATA

Supply voltage, single class two source,
 24 V AC +/-10%, 50–60 Hz

Power consumption:
 Controller 8 VA
 Digital outputs, each max. 18 VA
 Total, all outputs max. 48 VA

Ambient temperature:
 Operation 0 °C to +50 °C (32 °F to 122 °F)
 Storage -20 °C to +50 °C (-4 °F to 122 °F)

Humidity 10 to 90% RH, non-condensing

Enclosure:
 Dimensions 197x159x63 mm (7.75"x6.25"x2.50")
 Enclosure rating NEMA 1 and IP 10
 Meets .. UL94-5V UL flammability for plenum applications
 Weight 1.04 kg (2.30 lb.)

Inputs – Digital:
 Dry Contact, excitation 5 V DC at 0.5 mA

Input – Analog:
 Thermistor type 10 kOhm NTC (Dale 1M1002-C3)
 Accuracy 0.25 % typical span (resistance)
 Resolution 0.1 % span

Velocity Pressure Input:
 Span 0–249 Pa (0–1.0" Water column)
 Accuracy 5 % at 250 Pa (1.0" Water column)
 Resolution 1.07 Pa (0.0043" Water column)
 Sensor fitting FRPE polyethylene tubing 6.3 mm (¼")
 Dead-End device – No air consumption

Outputs:
 Low voltage TRIAC 24 V AC, voltage sourcing,
 max. 0.75 A (2 A total for all three outputs)
 Torque rating 6 Nm (53 lb.-in.)
 Stroke 0° to 95°, fully adjustable
 Timing 2.4 sec/degree rotation (50 Hz)
 2 sec/degree rotation (60 Hz)
 Position indication Visual indication
 Manual override Push-button clutch release
 Terminations Removable screw terminal connectors

Damper linkage: round shaft extending a minimum of
 25 mm (1") from the box, diameter 12.7 mm (½")

Application program:
 Cycle time 1 s

Indication LED colors:
 Power On green
 LON network activity transmission amber
 LON network activity receive green
 Neuron service amber

Interoperability standard conforms to:
 LONMARK Interoperability Guidelines and
 LONMARK Functional Profile: VAV Controller

Communication protocol LONTALK
 Physical channel TP/FT-10, 78 kbps
 Neuron® type 3150®, 10 MHz

Complies with the requirements of:
 FCC Part 15
 C-Tick
 CE EN 61326:1998
 UL916 Energy Management Equipment
 US Patent no. RE37, 245E (reissue of no. 5,450,999)

Part numbers, TAC Xenta 102-AX:
 Controller 0-073-0540
 I/STAT, LED version ISTAT-A-C
 I/STAT, LCD version ISTAT-LDC-C
 M/STAT, LED version MSTAT-A-C
 STR200 0-046-0300
 STR200-W 0-046-0301
 STR202 0-046-0320
 STR250 0-046-0330
 S/STAT SLIDESTAT
 TTS100WJ TTS100WJ
 Installation Handbook 0-004-7838
 SW and HW Reference Handbook 0-004-7839
 Installation Instruction OFL-4063
 Pocket Reference Card OFL-4064



APPLICATION EXAMPLE

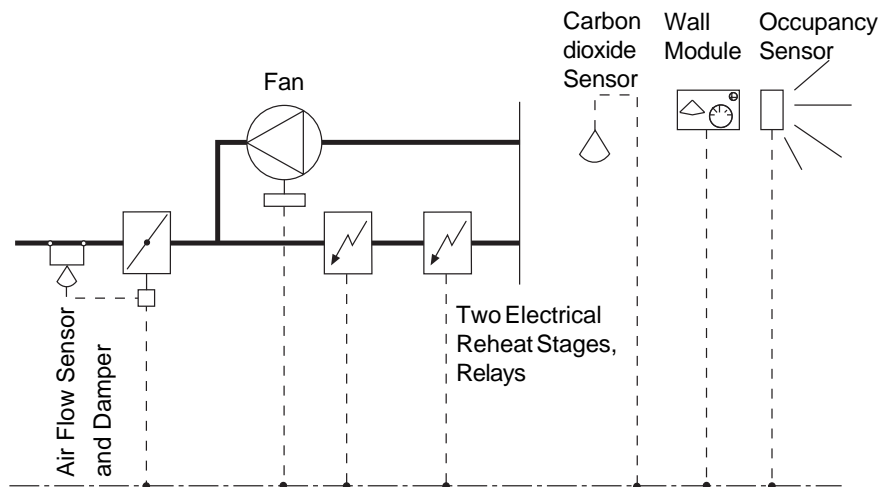


Figure 1

FUNCTIONS

The TAC Xenta 102-AX VAV controller is a component of a single path VAV air delivery system (Figure 1).

The controller has an integrated static air velocity transducer and a motorized bidirectional actuator. Other features:

- CO₂ monitoring;
- reheat control;
- damper control;
- heating/cooling changeover;
- occupancy/light control.

Reheating control may be done in several ways:

- 3-stage heating
- Pulse Width Modulation (up to 999 s)
- Increase/decrease (floating)

Fan control can be enabled/disabled, either in a parallel or serial mode.

The TAC Xenta 102-AX VAV can operate in a stand-alone configuration or as part of an interconnected network.

All network variables are preconfigured at the factory. This reduces setup time for both stand-alone and integrated configurations and allows stand-alone operation by providing the required data. Please refer to figure 2.

Air flow calibration and essential configuration can be made directly from the wall module (I/STAT) and the hand-held M/STAT.

Plug-In

When the controller is connected to a LonMaker LNS 3 network, a software Plug-In is provided to simplify the setting and monitoring of the controller functions, for example the Network Variables and the Configuration Parameters.

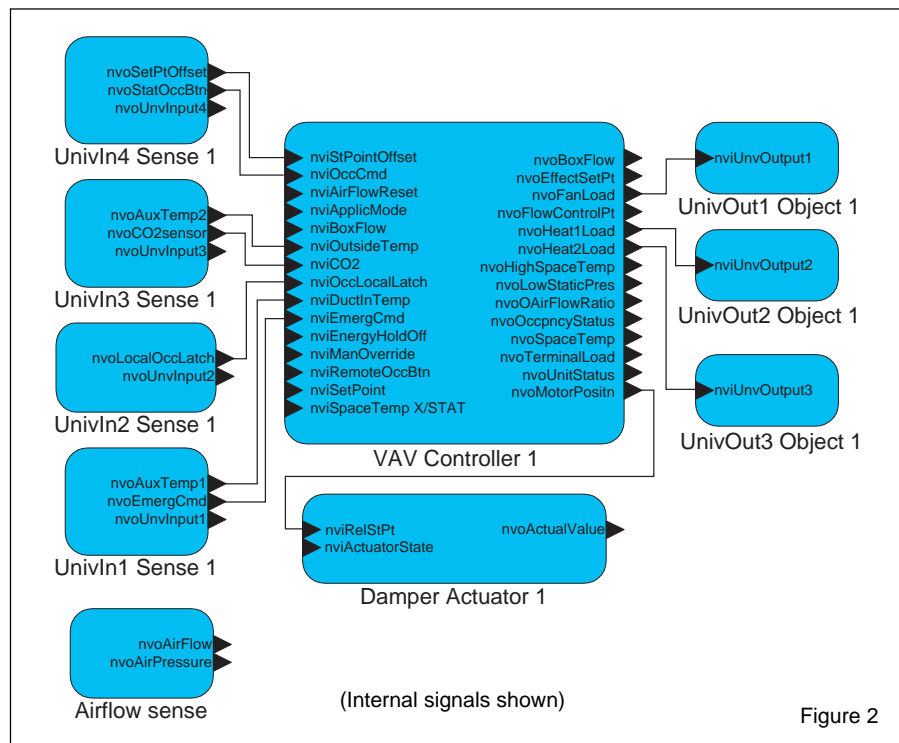
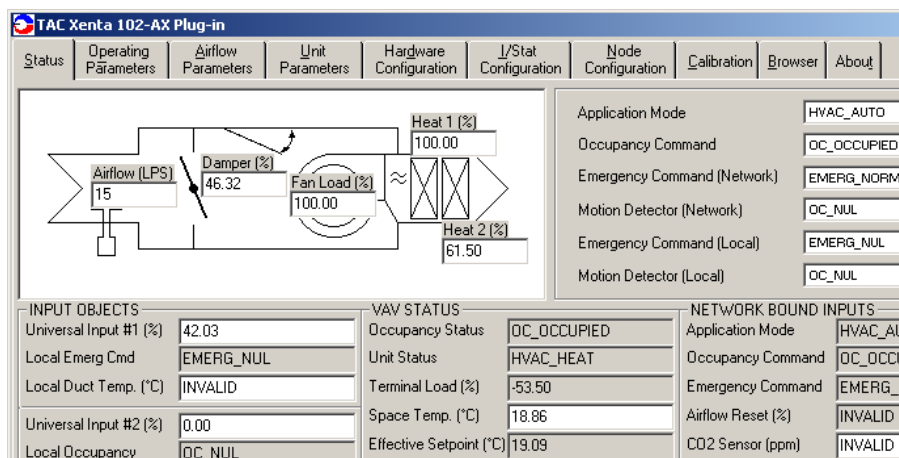


Figure 2



OPERATING AND APPLICATION MODES

Occupied mode

Occupied mode is used when the zone is occupied. This mode is also the default mode after a reset or a power up.

Standby mode

The standby mode is to raise the active cooling setpoint/lower the heating setpoint when the zone is temporarily unoccupied.

Bypass mode

When the TAC Xenta VAV controller is in unoccupied scheduled times of the day or week, a push-button Bypass, or manual override from the local wall module (for example I/STAT or S/STAT) can activate the Bypass mode to the occupied setpoints for an adjustable override period.

If the button is pressed again before the defined override period expires, the unit will return operation to unoccupied setpoints unless the local hardware input or the network input are calling for occupancy.

Unoccupied mode

Unoccupied is to prevent the zone from overheating/overcooling after-hours.

Morning Warmup

Adjusting the temperature, before a set time, so that the correct comfort temperature is reached as required.

Night Purge

Using cool night air to ventilate the building in Unoccupied mode.

Emergency pressurization/depressurization

Optional pressurization control supporting smoke control systems for the entire area served.

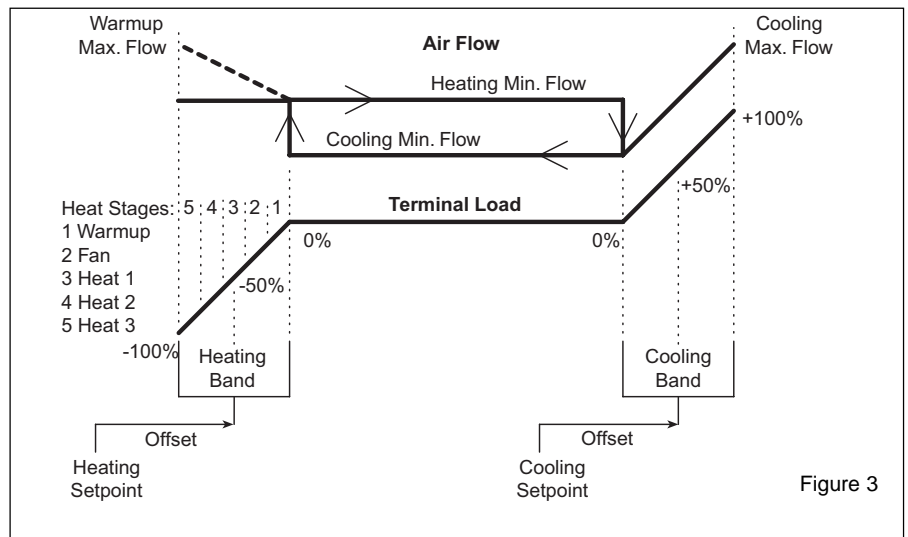


Figure 3

Air Quality Control

The controller includes an additional air quality controller, which will modulate the airflow to maintain the carbon dioxide level in the zone between set limits, see figure 4.

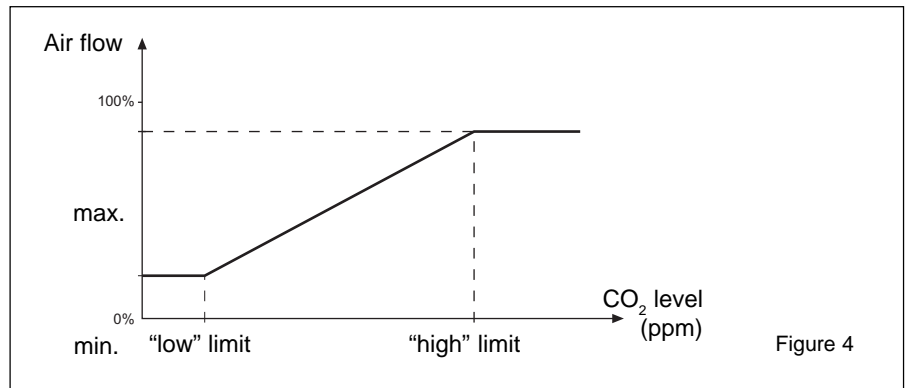


Figure 4

Pre-cooling

Lowering the temperature during the night to anticipate and lessen the cooling demand during the day.

CABLES AND ACCESSORIES

Cables

G and G0:

Min. cross-sectional area 0,75 and 1,5 mm² (AWG 18 and 14).

C1 and C2:

TP/FT-10 allows the user to wire the control devices with virtually no topology restrictions.

The max. wire distance in one segment depends on the type of wire and the topology.

The TAC Xenta Network guide (part no. 0-004-7460) gives a more detailed description.

Accessories

I/STAT

An intelligent wall-mount sensor with display and keypad control.

M/STAT

Portable maintenance version of I/STAT, equipped with interface cable and connector.

S/STAT

A wall-mount sensor with bypass button, a slide potentiometer to adjust the temperature setpoint and an M/STAT communication jack.

TTS100WJ

A thermistor wall-mount sensor with an M/STAT communication jack.

STR200

Wall module with temperature sensor

STR200-W

As STR200, but all white.

STR202

Wall module with temperature sensor, bypass button and setpoint offset wheel.

STR250

Wall module with temperature indication, setpoint adjustment, bypass button, fan speed control and display.

LONMARK OBJECTS AND NETWORK VARIABLES

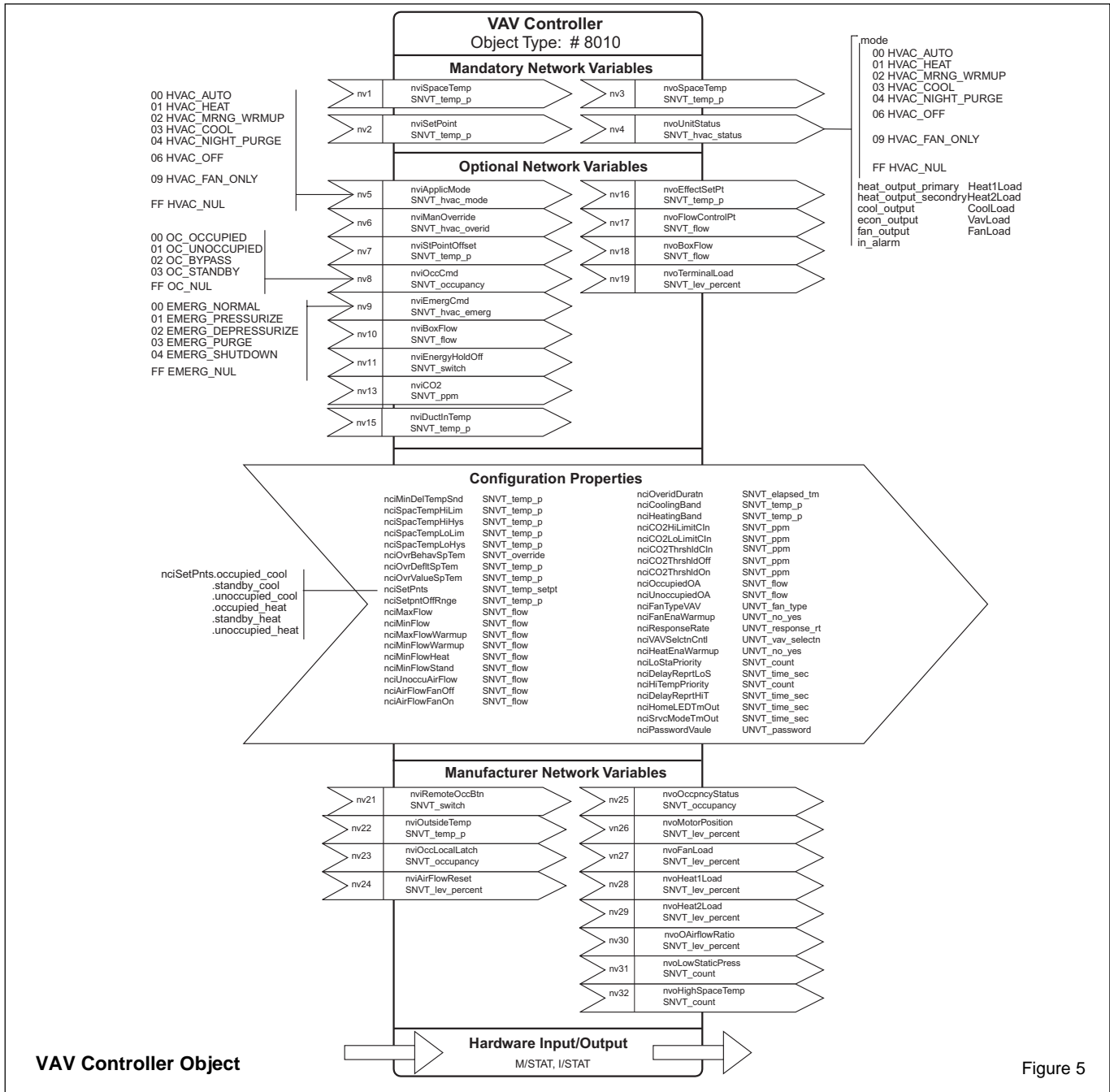


Figure 5

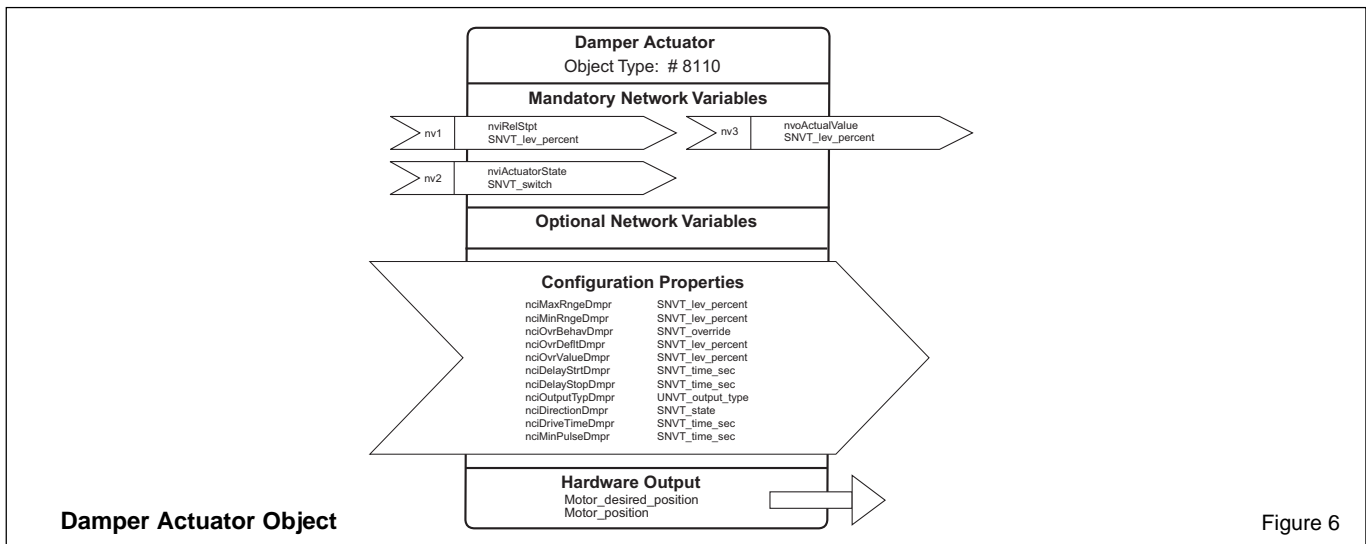


Figure 6

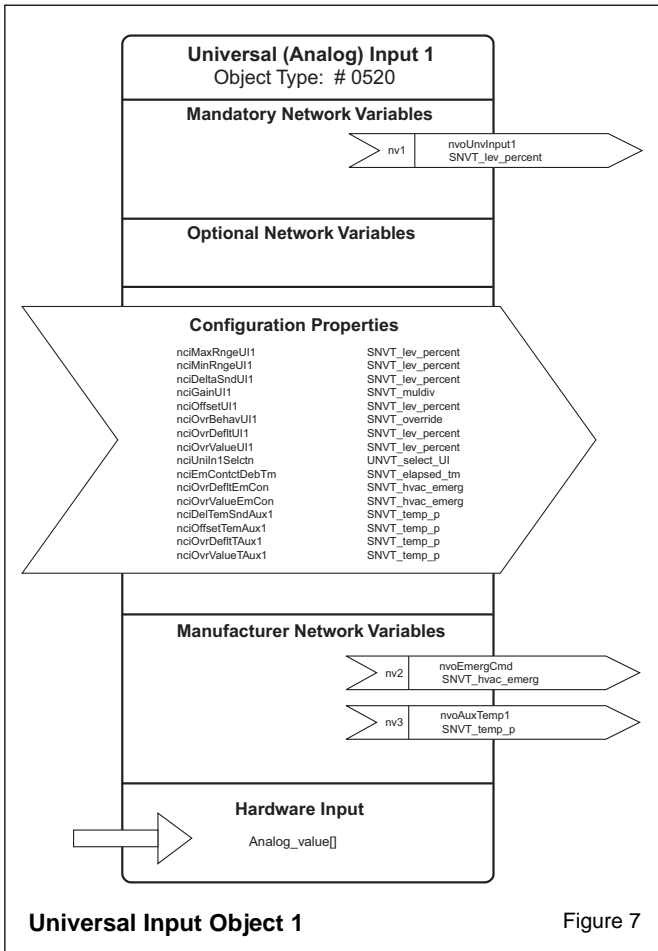


Figure 7

Universal Input Object 1

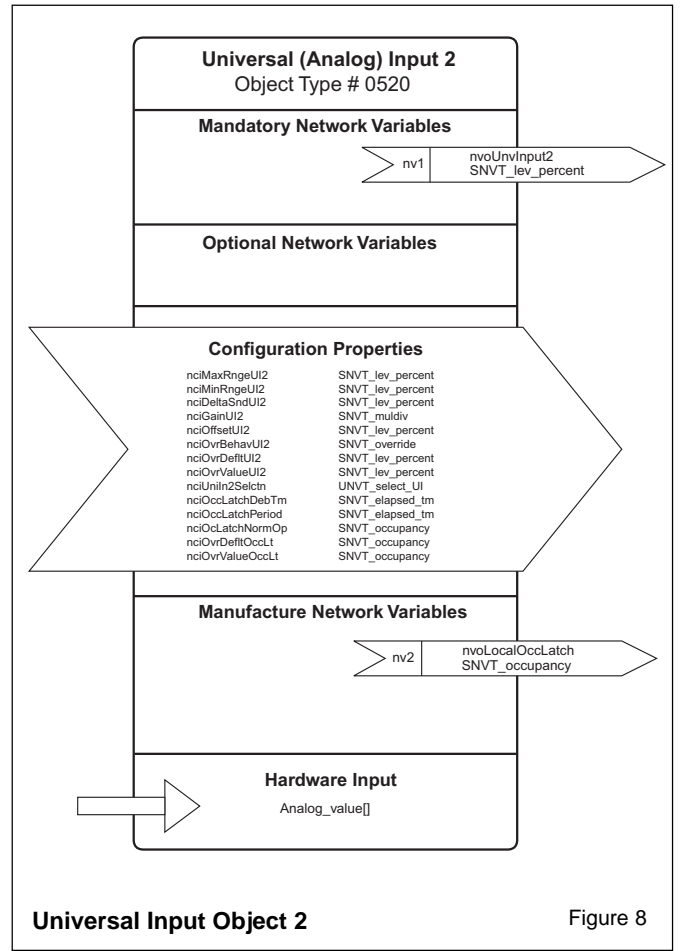


Figure 8

Universal Input Object 2

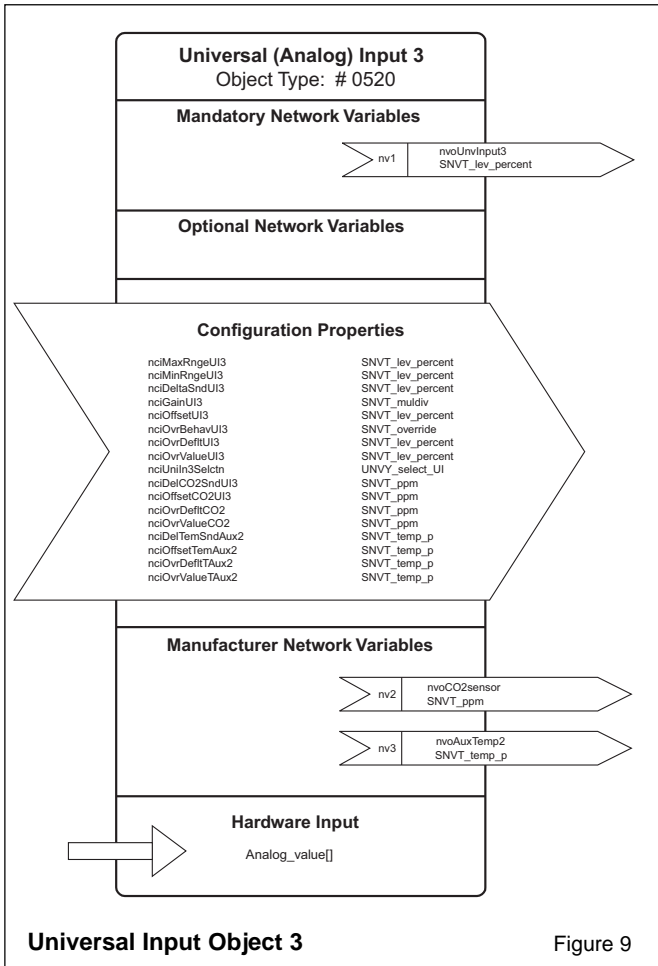


Figure 9

Universal Input Object 3

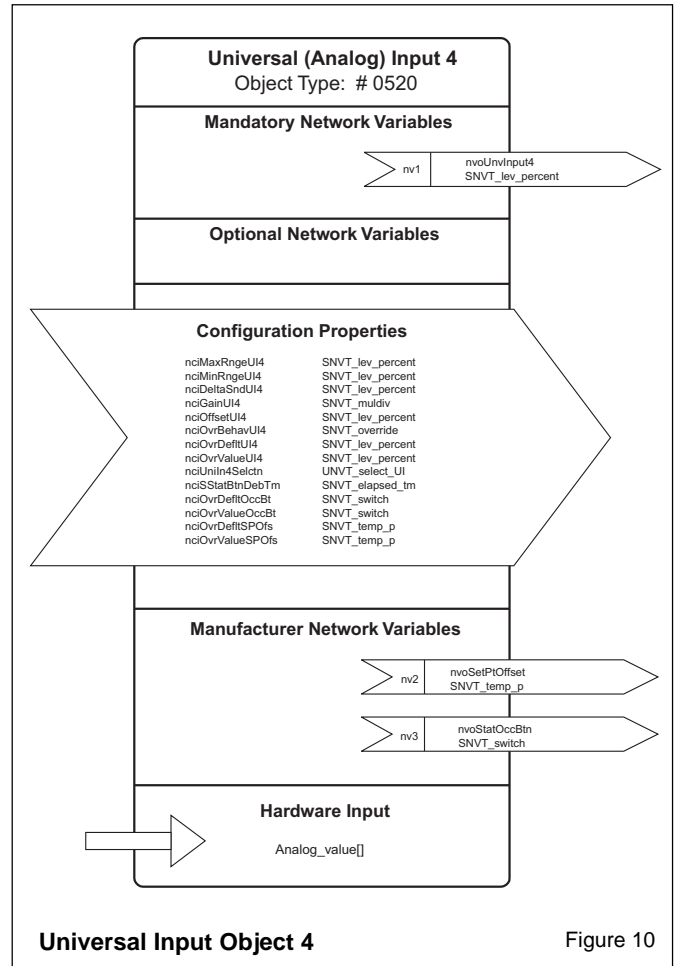
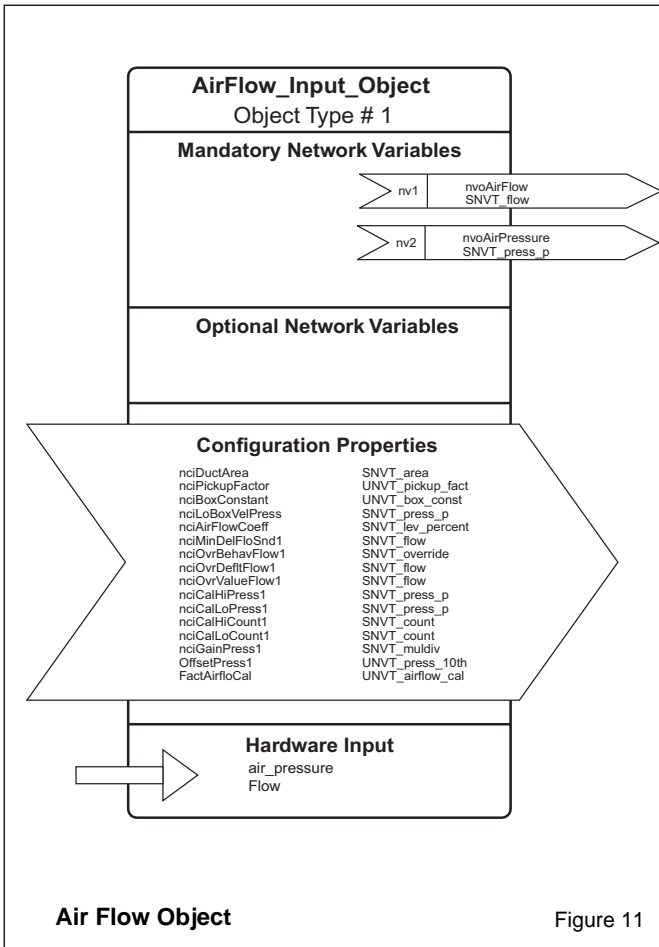


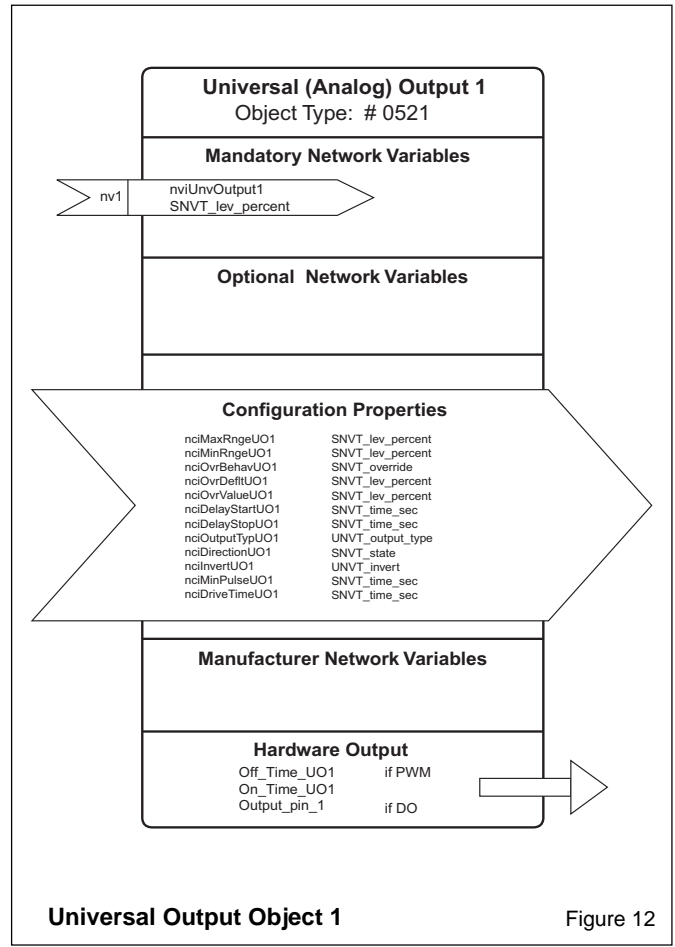
Figure 10

Universal Input Object 4



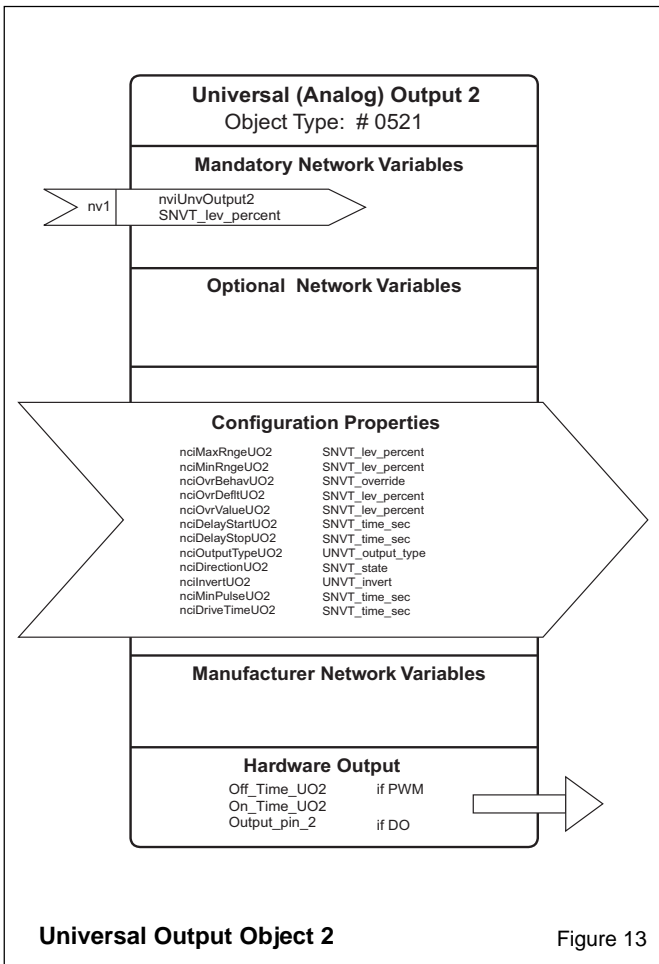
Air Flow Object

Figure 11



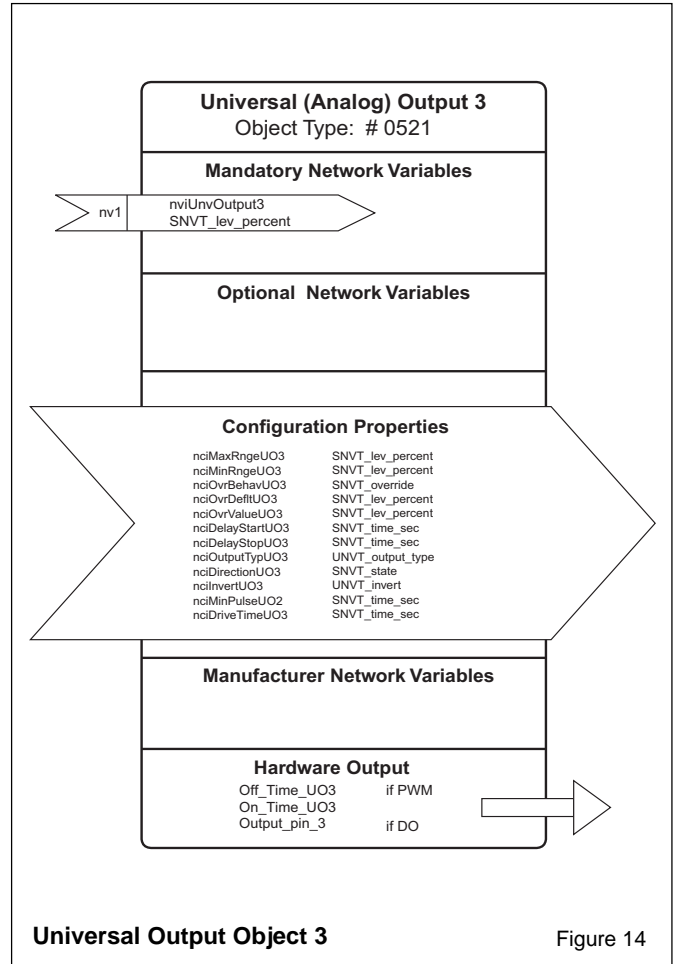
Universal Output Object 1

Figure 12



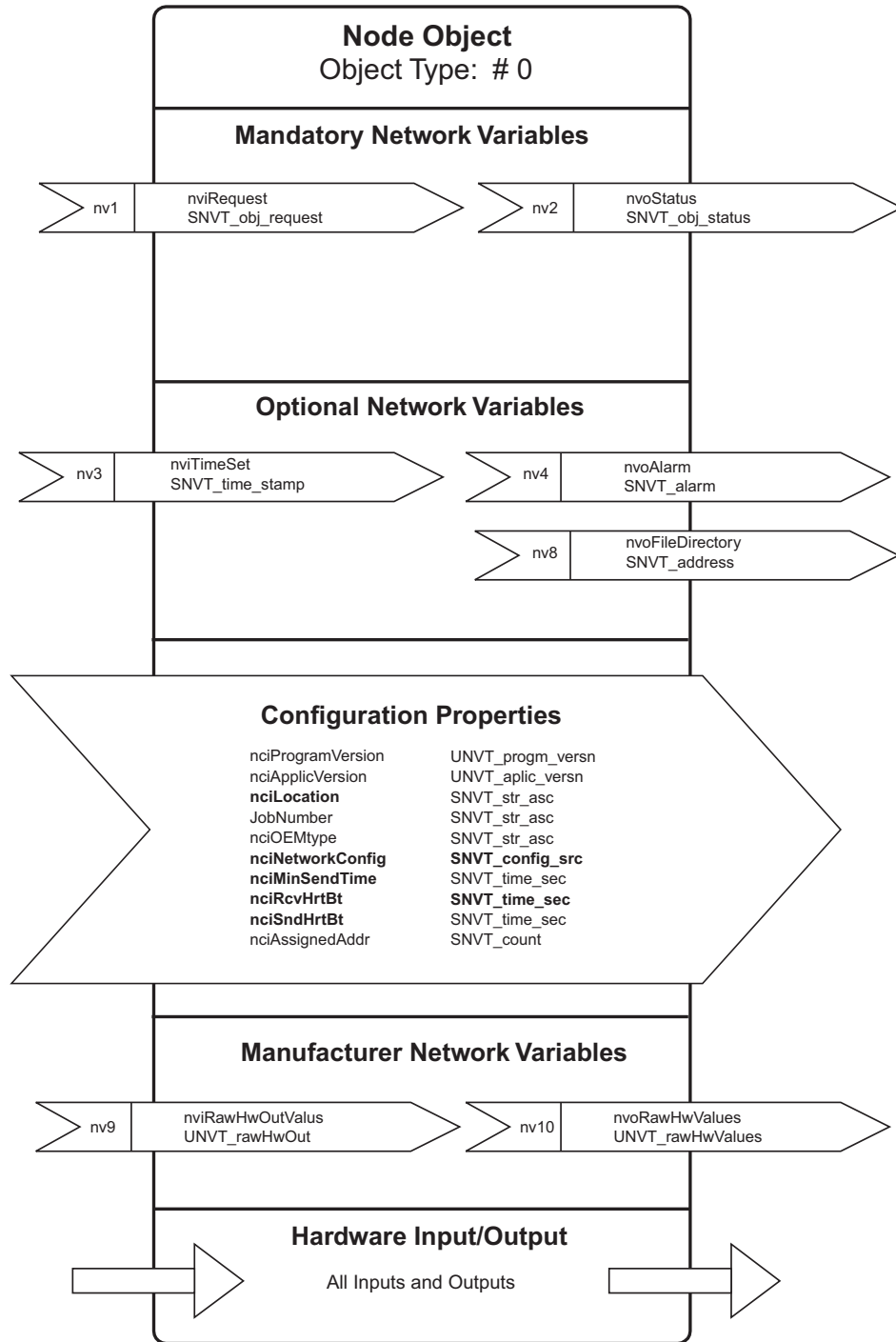
Universal Output Object 2

Figure 13



Universal Output Object 3

Figure 14



VAV Node Object 0

Figure 15

HARDWARE INTERFACE

TB	Term. no.	Label no.	Designation	Description
1	1	12	G	24 VAC (G) input
	2	13	G0	24 VAC (G0) input
2	1	14	V1	Digital Out.: Fan Relay Load
	2	15	V2	Digital Out.: H1 Aux/Heat Relay Load (Increase)
	3	16	V3	Digital Out.: H2 Aux/Heat Relay Load (Decrease)
3	1	10	C1	TP/FT-10 LON communication channel
	2	11	C2	TP/FT-10 LON communication channel
4	1	7	STAT-DATA	I/STAT, M/STAT or S/STAT, white connection STR200-202 Signal 11 STR250 Data 11
	2	8	STAT-PWR	I/STAT, M/STAT or S/STAT, red connection STR200-202 Pwr 12 STR250 Pwr 12
	3	9	STAT-GND	I/STAT, M/STAT or S/STAT, black connection STR200-202 Gnd 13 STR250 Gnd 13
5	1	1	U1	Universal Input: Thermistor / Discrete (Duct temp. or Emergency contact)
	2	2	U2	Universal Input: Thermistor / Discrete (Occupancy sensor)
	3	3	U3	Universal Input: Thermistor / Discrete (CO2 or Outside air)
	4	4	U4	Universal Input: Resistor / Discrete (S/STAT blue and yellow) STR202 Adjust and Switch
5	5	—	—	Not used
6	6	M	M	Measurement neutral

DIMENSIONS

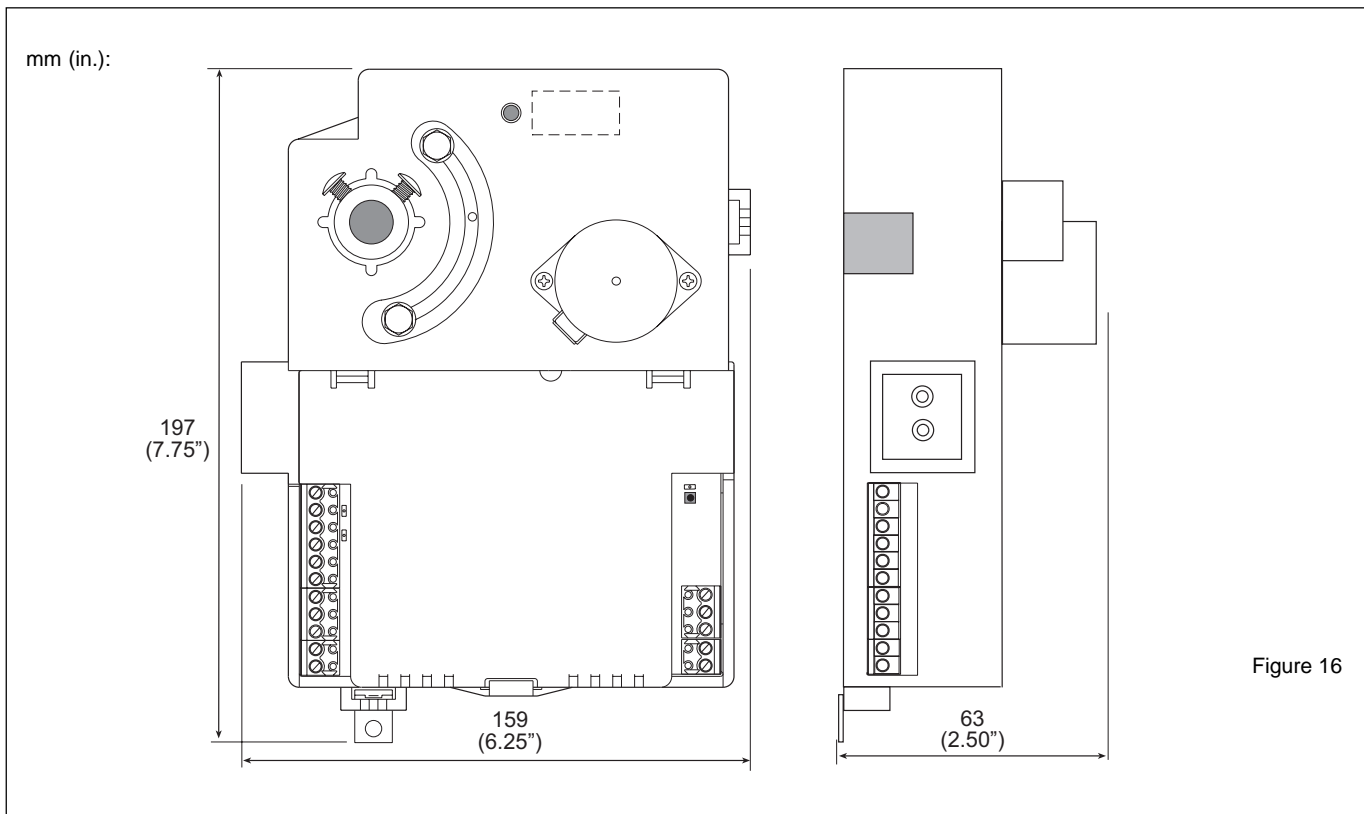


Figure 16

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