TAC I/NET MR-VAV-X1 Installation Sheet

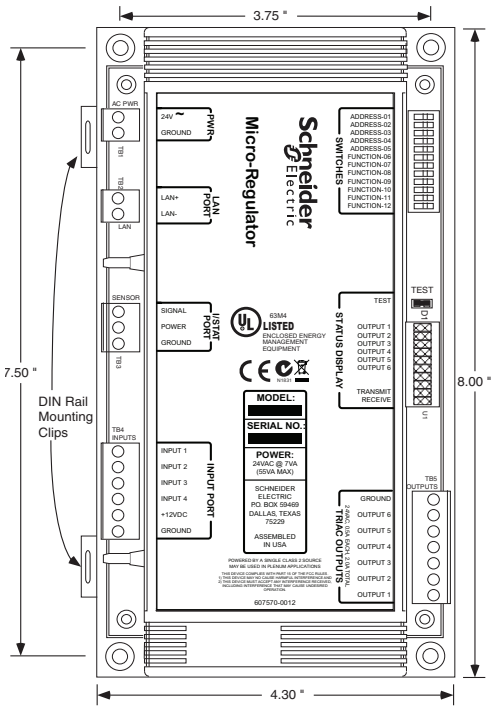

Figure 1. MR-VAV-X1 (Covered)

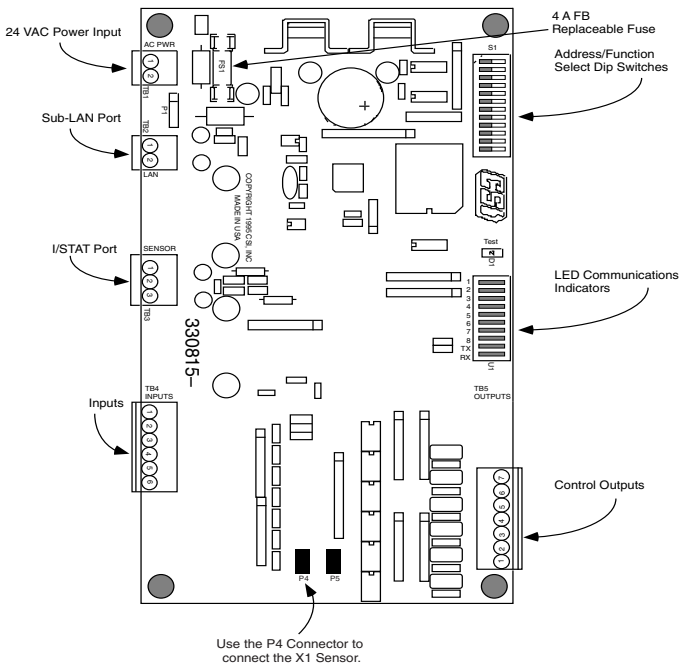

Figure 2. MR-VAV-X1 (Cover Removed)

Controller Installation

1. Check the mounting location for the MR-VAV-X1. The available area must measure at least 4.3" × 8" (11 × 20 cm) and should be in a moisture free container away from any large electrical devices. The screw holes are 3.75" × 7.5" (9.5 × 19.1 cm) as shown in Figure 1, and will require phillips or slotted pan head screws.

   Note: *The onboard velocity sensor requires that you install the controller within four feet of the pickup probe in the air inlet duct of the VAV box. The onboard velocity sensor also requires that you mount the controller on a vertical surface. Installing the controller with the barb fittings of the velocity sensor pointing down will help prevent condensate from migrating into the onboard sensor.*

2. You will not need to remove the plastic cover to install the MR-VAV-X1, or any of the connections. To replace the 4A FB fuse, remove the plastic cover, remove the old fuse and install a new fuse (see Figure 2).

Connecting the Air Velocity Sensor

Perform the following steps to connect the airflow detection probe or pickup ring to the controller.

1. Connect the low pressure side of the velocity sensor to the barbed fitting labeled Low on the MR-VAV-X1.
2. Connect the high pressure side of the velocity sensor to the barbed fitting labeled High on the MR-VAV-X1.

   Note: *Use a maximum length of 4' (1.4 m) of 0.170" (4.3 mm) I.D. FRPE polyethylene tubing or 0.25" (6.34 mm) O.D./0.125" (3.175 mm) I.D. Tygon tubing.*

Caution! *Do not make connections to the pressure sensor or transmitter with excessive force. Applying excessive force on either fitting could cause permanent damage to the sensor or transmitter.*

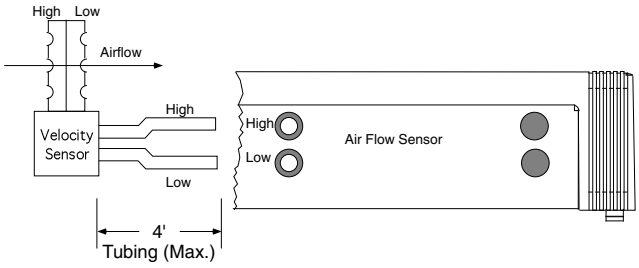

Figure 3. Velocity Sensor Connections

Note: *Do **not** expose the on-board velocity transmitter to moisture during installation or operation. If moisture is a potential problem, orient the tubing and controller so that the barbed fittings are situated at an elevation higher than the lowest part of the tubing to create a trap for any moisture accumulation.*

Connecting the Input Devices

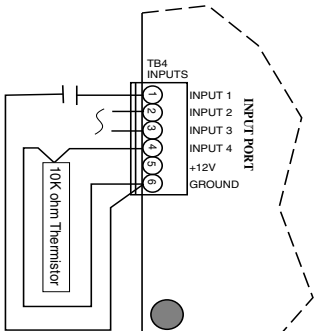

Figure 4. Input Device Connections

Warning!!! *Ensure that no power is connected to the MR-VAV-X1 during electrical installation. Failure to disconnect power from all interconnected equipment when performing electrical installation may result in damage to the components and/or electrical shock or burns*

1. Connect the external input devices (contact or thermistor) leads to an input terminal, TB4 – 1 through TB4 – 4 (Input 1 to Input 4, see Figure 4).
2. Connect the other input device lead (common return lead) to the signal ground terminal, TB4 – 6 (Ground).

I/STAT, S/STAT and W/STAT Connections

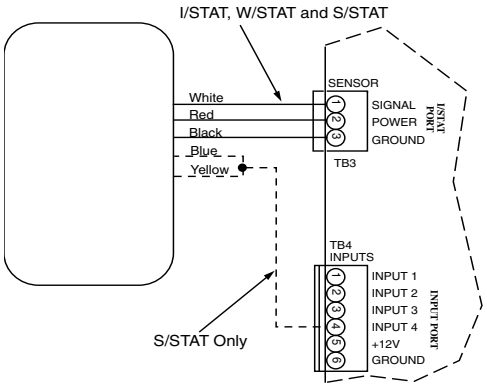

Figure 5. I/STAT and S/STAT Connection

1. Connect the I/STAT, S/STAT, or W/STAT white, red, and black conductors to TB3 – 1 through TB3 – 3 (Signal, Power, and Ground) as shown in Figure 5.
2. When connecting an S/STAT connect the blue and yellow conductors to TB4 – 4 (Input 4). Refer to Table 2, "DIP Switch Configuration Settings".

Connecting the Sub-LAN

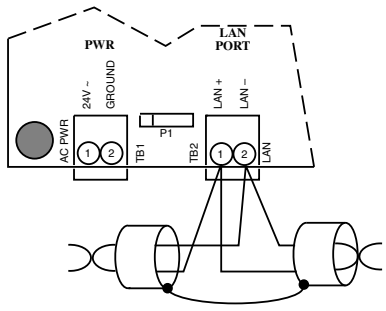

Figure 6. Sub-LAN Connections

1. Connect the + lead of the twisted pair sub-LAN cable to terminal TB2 – 1 (LAN+), see Figure 6.
2. Connect the – lead of the twisted pair sub-LAN cable to terminal TB2 – 2 (LAN –).
3. Shield drain wire continuity must be maintained as the sub-LAN cable passes through each MR-VAV-X1. Shield drain wires from each controller sub-LAN cable must be twisted together, insulated, and tied back such that wires do not come in contact with ground or any conductive surface.
4. Connect the shield drain wire directly to Electrical Service Earth Ground at **only** one end of the cable (e.g., at the MCI, MRI, or at one MR-VAV-X1).

Note: *Refer to "Cable Requirements" in "Specifications" on page 4.*

Connecting the Output Devices

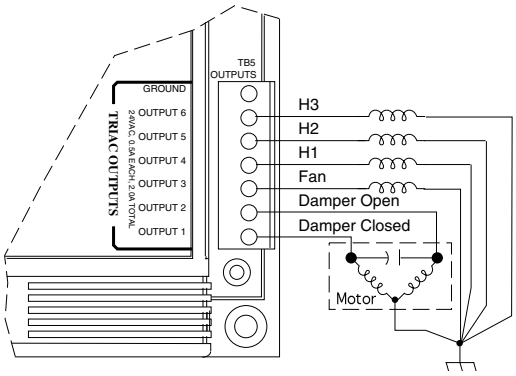

Figure 7. Output Device Connections

1. Connect one lead of the control relays to TB5 – 1 through TB5 – 6 (Output 1 through Output 6) as shown in Figure 7.
2. Connect the other lead of the control relays to earth ground as shown.

Note: *You must establish a proper earth ground connection point prior to connecting wires to electrical equipment.*

- *Electrical Service Earth Ground wire must be securely connected to the equipment chassis.*
- *The 24 VAC transformer secondary lead must be securely connected to the Electrical Service Earth Ground wire.*

Note: *The Electrical Service Earth Ground wire must be connected to the ground terminal on the controller power input terminal block, TB1 – 2 (Ground).*

Connecting the Power Supply

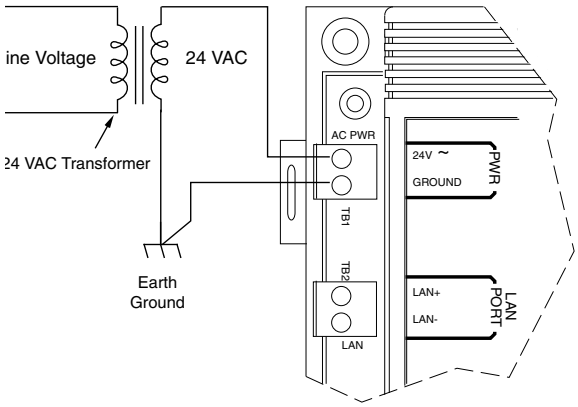

Figure 8. Power Connections

1. Connect the 24 VAC input lead from a separate, isolated 24 VAC transformer to TB1 – 1 (24 VAC, see Figure 8).
2. Connect TB1 – 2 (Ground) to earth ground using 14-AWG wire (2.1 mm^2). TB1 – 2 connects to the same earth ground connection as the neutral lead from the transformer.

Note: *Connecting TB1 – 2 to a chassis bonding post separated by seams, welds, or fasteners in the metal chassis could produce continuity ground faults.*

Caution! *Applying 24 VAC power to any connector other than TB1 will cause component damage to the MR-VAV-X1 circuit board.*

Switch Settings

The DIP switch settings define the sub-LAN address and basic configuration of the unit. Define the sub-LAN address using switches 1 – 5 to set an address ranging from 0 to 31. The value is the accumulated value of switches 1 – 5 when set to the ON position (refer to Table 1). The ON position of the switch is away from the "Open" label on the switch base. The operational configuration can be initially set using the DIP switch settings in Table 2. For information concerning specific application configurations refer to TCON155, *Application Specific Controller, MR-VAV-X1 Installation/Reference Guide*.

Table 1. MR-VAV-X1 LAN Address

Switch Number	1	2	3	4	5
Switch Value (Switch On)	1	2	4	8	16

Switch Settings *(continued)*

Table 2. DIP Switch Configuration Settings

Central Plant Heat or Warmup Present		Fan Present		Auxiliary Heating Stages			Fan Type		S/STAT		Damper Rotation (Close Direction)	
SW 6		SW7			SW8	SW9	SW10		SW11		SW12	
No	Off	No	Off	None	Off	Off	Series	On	Yes	On	Counter-clockwise	Off
Yes	On	Yes	On	1 Heat Stage	On	Off	Parallel	Off	No	Off	Clockwise	On
				2 Heat Stages	Off	On						
				3 Heat Stages	On	On						

Specifications

Dimensions

MR-VAV-X1: 8.0"L × 4.3"W × 2.5"H (20 × 11 × 6.1 cm)

Operating Environment

Temperature: 32° to 122°F (0° to 50°C)

Humidity: 10 to 90% RH, non-condensing

Input power: 24 VAC ±10%, 50/60 Hz @ 8VA plus Output Load, 4 A fused (with I/STAT)
24 VAC @ 7 VA plus Output Load, 4 A fused (without I/STAT)

Cable Requirements

MR LAN

Maximum Length: 5,000 ft. (1,500 m)
22 AWG (0.324 mm^2) shielded, twisted pair (Belden 9184 equivalent) 5,000 feet (1,500 m) max.
or
24 AWG (0.206 mm^2) shielded, twisted pair (Belden 9841 equivalent) 4,000 feet (1,200 m). 30 pF/ft. or less between conductors, 55 pF/ft. or less conductor to shield, 85 to 150 ohm impedance. Belden 9841 or equivalent.

Inputs/Outputs

Inputs: Quantity 4

Analog — 10K Ohm NTC Thermistor, Dale 1M1002-C3 (Reference TAC TTS100 specification)
Accuracy: 1%
Resolution: 0.4% Span
Span: 25° to 113°F (–4° to 45°C)

Discrete — Contact excitation: 5 V @ 0.5 mA, contact duration 0.2 second minimum

CFM Pressure Inputs (2) — Span 0–1" (0–250 Pa) Water Column Span
Resolution: 0.0043" WC (1.07 Pa)
Accuracy: 5% @ 1.00" WC (250 Pa)

Outputs: Six Low voltage Triac — 24 VAC @ 0.5 A maximum each output (2.0 A maximum total), voltage sourcing

MicroRegulator Interface

7792 MRI

7793 MCI

7798 I/SITE LAN

Agency Approvals

FCC Part 15, CE, ACA
UL916 LISTED Energy Management Equipment
UL94-V0/5V Rated Enclosure
UL Approved for plenum applications

On October 1st, 2009, TAC became the Buildings business of its parent company Schneider Electric. This document reflects the visual identity of Schneider Electric; however, there remains references to TAC as a corporate brand in the body copy. As each document is updated, the body copy will be changed to reflect appropriate corporate brand changes..

TCON156–09/10