TAC I/NET MR-VAV-X2 Installation Sheet

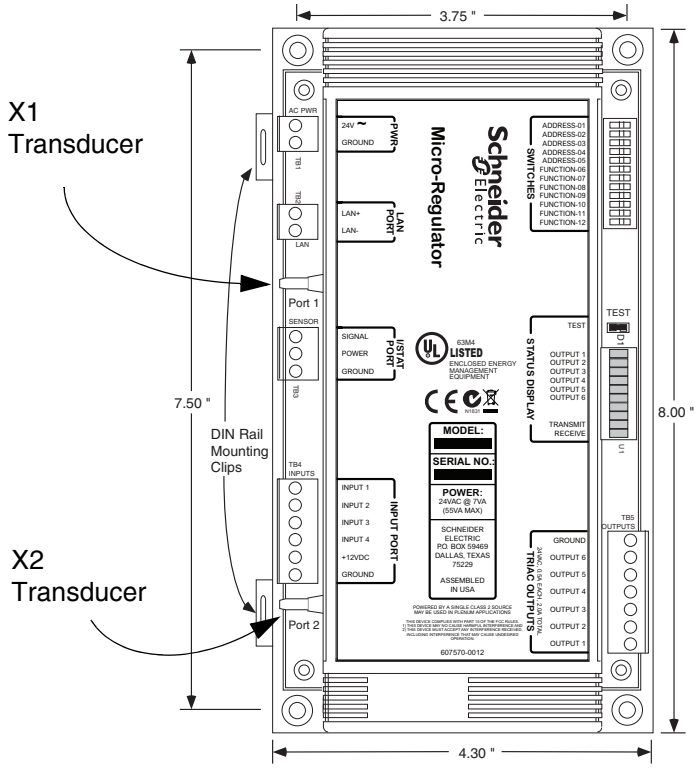

Figure 1. MR-VAV-X2 (Covered)

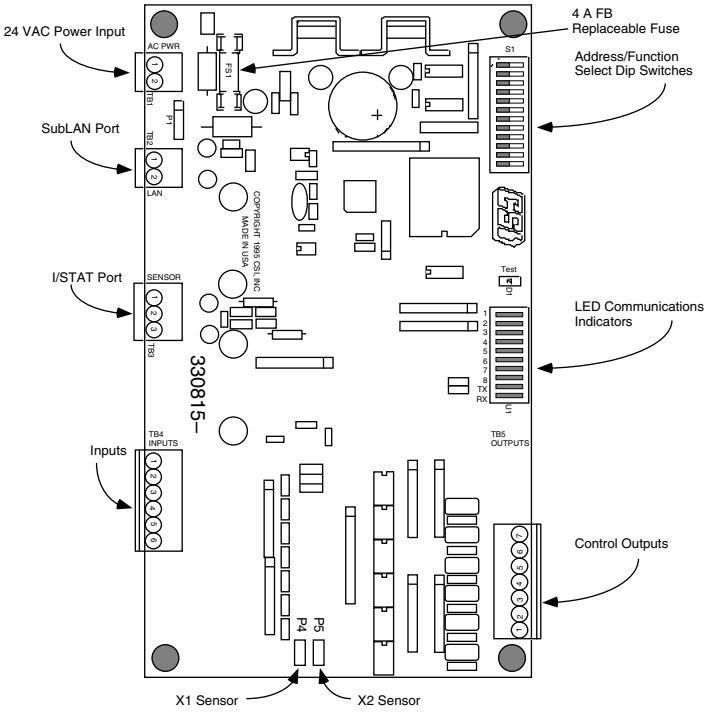

Figure 2. MR-VAV-X2 (Cover Removed)

Controller Installation

1. Check the mounting location for the MR-VAV-X2. The available area must measure at least 8" W × 4.3"W × 2.5" D (20.3 × 10.9 × 6.4 cm) and should be in a moisture free environment away from any large electrical devices. The onboard velocity sensor requires that the controller be installed within four feet (1.2 m) of the pickup probe in appropriate ducts of the VAV box. The MR-VAV-X2 onboard velocity sensors also require that the controller be mounted to a vertical surface. However, the controller can be operated in any position.
2. Use phillips or pan head screws to mount the controller.

Note: *Installing the controller (with the barbed fittings pointing down will help to prevent condensate from migrating into the on-board velocity sensors.*

Connecting a Velocity Sensor

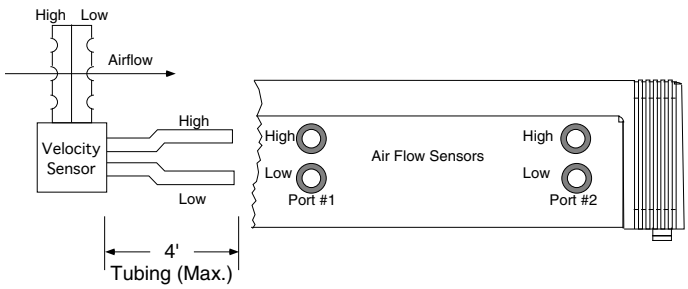

Figure 3. Velocity Sensor Connections

Connecting to either the X1 or X2 transducer, use the following steps.

1. Connect the low-pressure side of the velocity sensor to the barbed fitting labeled Low on the MR-VAV-X2 (see Figure 3).
2. Connect the high-pressure side of the velocity sensor to the barbed fitting labeled High on the MR-VAV-X2.

Note: *Use a maximum length of 4' (1.2 m) of 0.170" (4.3 mm) I.D. FRPE polyethylene tubing or 0.25" (6.35 mm) O.D./0.125" (3.175 mm) I.D. Tygon tubing.*

Note: *Do **not** expose the velocity sensors to moisture. If moisture condensate is a potential problem, orient the tubing and controller so that the barbed fittings are above the lowest part of the tubing to create a moisture trap.*

Connecting the Input Devices

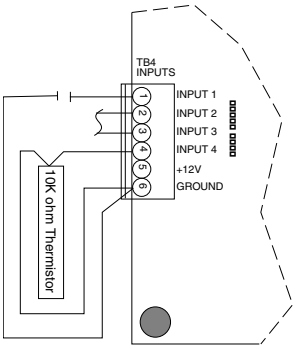

Figure 4. Input Device Connections

Warning!!! *Ensure that no power is connected to the MR-VAV-X2 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 terminals TB4-1 (Input 1) through TB4-4 (Input 4), see Figure 4.
2. Connect the other input device lead to the signal ground terminal, TB4-6 (Ground).

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

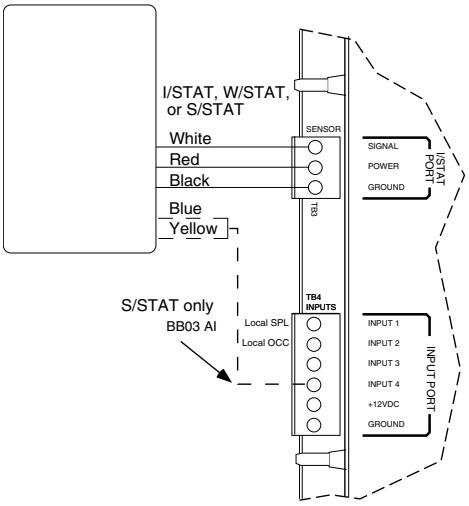

Figure 5. I/STAT, W/STAT and S/STAT Connections

1. Connect the I/STAT, W/STAT, or S/STAT white, red, and black conductors to TB3-1, TB3-2, and 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," on page 4.

Connecting the SubLAN

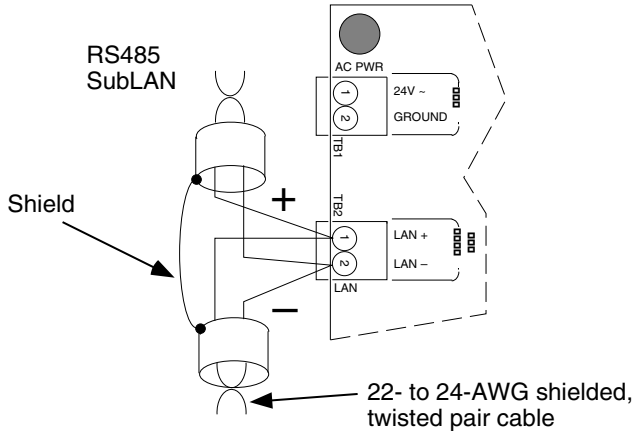

Figure 6. subLAN Connections

1. Connect the + lead of the twisted pair subLAN cable to terminal TB2-1 (LAN+), see Figure 6.
2. Connect the – lead of the twisted pair subLAN cable to terminal TB2-2 (LAN –).
3. Shield drain wire continuity must be maintained as the subLAN cable passes through each MR-VAV-X2. Shield drain wires from each controller subLAN cable must be twisted together, insulated, and tied back such that wires do not come in contact with ground or any conductive surface.

Note: *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-X2*).*

Connecting the Output Devices

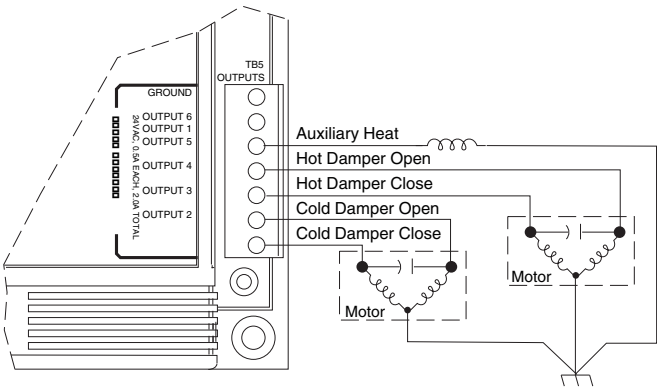

Figure 7. Output Connections

1. Connect one lead of the load to TB5-1 through TB5-5 (Output 1 through Output 5) as shown in Figure 7.
2. Connect the other lead of the load to same earth ground.

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

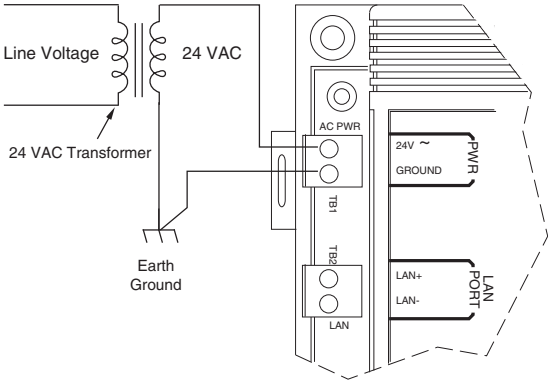

Figure 8. Power Connections

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.*

Actuator Installation

To ensure proper operation of the damper actuator, perform the following steps.

1. Rotate the damper shaft until it is fully closed. Note the closed direction as clockwise or counter-clockwise.
2. Slide the actuator over the shaft and secure the actuator to the VAV box.
3. With the ASC power **off**, set the DIP switch (10 for the hot deck and 12 for the cold deck) for the closed direction of the damper as noted in Step 1.
4. Apply power to the ASC. The ASC will use the current switch setting and the power cycle will also cause the ASC to drive the actuator in the closed direction for 125% of the damper stroke time.
5. When the actuator has reached its closed position, secure the actuator to the damper shaft.

Switch Settings

The DIP switch settings define the subLAN address and basic configuration of the unit. Define the subLAN address using switches 1 – 5 to set an address ranging from 0 to 31 (see Table 1). The value is the accumulated value of switches 1 – 5 when set to the ON position. 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 TCON164, *Application Specific Controller, MR-VAV-X2 Installation Guide.*

Switch Settings *(continued)*

Table 1. MR-VAV-X2 LAN Address

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

Table 2. DIP Switch Configuration Settings

Auxiliary Heat Stage Present		Airflow Sensors			Hot Duct Damper Rotaion (Close Direction)		S/STAT		Cold Duct Damper Rotation (Close Direction)	
Y/N	SW6	Description	SW7	SW8	SW10	Direction	SW11		Direction	SW12
No	Off	Cold Damper controls cold inlet flow Hot Damper controls hot inlet flow	Off	Off	CCW	Off	No	Off	CCW	Off
Yes	On	Cold Damper controls total discharge flow[1] Hot Damper controls hot inlet flow	On	Off	CW	On	Yes	On	CW	On
		Cold Damper controls cold inlet flow Hot Damper controls total discharge flow[2]	Off	On						
		Cold Damper controls for temperature only Hot Damper controls total discharge flow	On	On						

[1] This configuration is accomplished using the sum of the cold inlet and the hot inlet as the process variable for the cold damper.
[2] This configuration is accomplished using the sum of the cold inlet and the hot inlet as the process variable for the hot damper.

Specifications

Dimensions

MR-VAV-X2: 7.75" W × 6.25" H× 2.5" D
(19.7 × 15.9 × 6.4 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 @ 8 VA plus output load, 4 A fused (with I/STAT)
24 VAC @ 7 VA plus output load, 4 A fused (without I/STAT)

Inputs/Outputs

Inputs: Digital — Dry Contact, excitation 5 V at 0.5 mA
Analog — 10K Ohm NTC Thermistor, Dale 1M1002-C3 (Reference TAC TTS100 specification)
Accuracy: 1% Typical (2% max.)
Resolution: 0.4% Span

Velocity Pressure Input:
Span: 0–1" (0–250 Pa) Water Column
Resolution: 0.0043" WC (1.07 Pa)
Accuracy: 5% @ 1.00" WC (250 Pa)

Outputs: 24 VAC @ 0.5A max. each output (3.0 A max.)

Cable Requirements

MR LAN Maximum Length: 5,000 ft. (1,500 m)
30 pF/ft. or less between conductors, 55 pF/ft. or less conductor to shield, 85 to 150 ohm impedance 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) max.

I/STAT, S/STAT, and W/STAT: 18 – 24 AWG (0.897 – 0.206 mm^2) three-conductor cable or shielded, twisted pair (Belden 9184 equivalent) 100 feet (30 m) maximum from the controller.

Note: *The S/STAT will require four conductors.*

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..