MANUAL – INSTALLATION

DISIO DISPLAY
Varitherm Wall Adjuster

DISIO Display - Varitherm Wall Adjuster

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PRODUCT OVERVIEW & INSTALLATION INSTRUCTIONS

General Description

Price's Disio Display provides Varitherm VAV diffusers with a remotely adjustable temperature control set point. Similar to a wall mounted thermostat, the Disio Display allows the occupant to easily adjust the temperature set point of the Varitherm VAV diffuser. The set point is applied to the Varitherm's built-in thermostat/actuator to control the room temperature in cooling and heating.

The Disio Display thermostat comes equipped with the following features:

- 7 Segment Display

- Capacitive touch buttons

- Menu button for basic information

- Temperature Sensing

- Optional BACnet MS/TP compatible (terminal blocks)

How It Works

The temperature control level (set point) of the Varitherm VAV diffuser is lowered by adding heat to the thermostat/actuator. A small resistance heater attached to the thermostat warms it and adds just enough heat to create a precise thermal differential between the temperature sensed at the Varitherm VAV diffuser thermostat and actual temperature in the space. This bias heat causes the diffuser thermostat to control at the lower temperature as selected at the Disio Display.
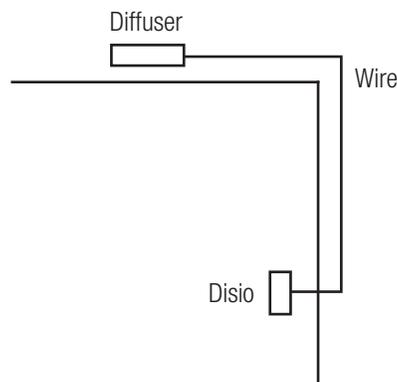
Installation

When the Disio Display units are received, inspect for damage which may have occurred during shipment. If damage is evident, it should be noted on the carrier's freight bill. A written request for inspection by the carrier's agent should be made at once.

The Disio Display can be installed to any standard single gang electrical box (1110) in the vertical orientation or be mounted to drywall using appropriate mounting hardware. The Disio Display comes as an assembly with two parts; the backing plate which is mounted to an electrical box or to the wall, and the front plate with screen that snaps onto the backing plate by aligning with the pins and the tabs.
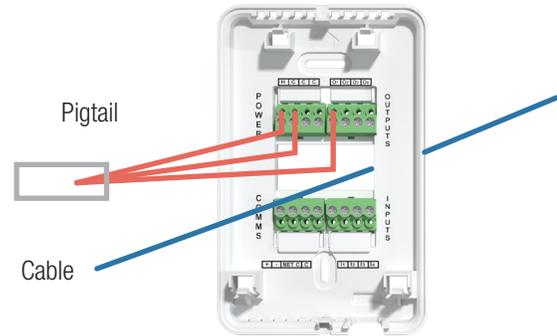
Step 1

Install Varitherm VAV diffuser and pull supplied cable down wall.

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Step 2

Separate front screen from backplate by carefully using a small flat screwdriver to pry the bottom of the backplate from the front screen in the pry slot provided. Next pry the top in the same way until separated, then pull apart.

NOTE: The first time the screen and backplate are separated, they will be very tight.
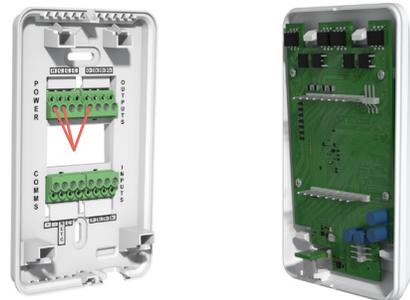

Step 3

Pull the cable from the diffuser down the wall and through large hole in backplate, and mount backplate to electrical junction box or to wall by running screws through the slots in the backplate.

NOTE: If mounting directly to drywall, drywall anchors must be used.
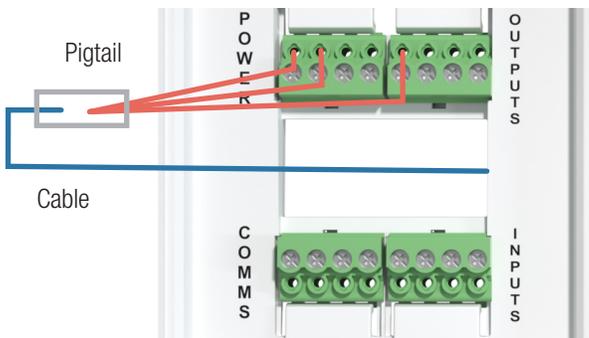
Step 4

Plug in the cable from the diffuser to the wiring pigtail supplied with the Disio Display.

Step 5

Once the wiring is complete, carefully line up the front face to the backplate and snap back together.
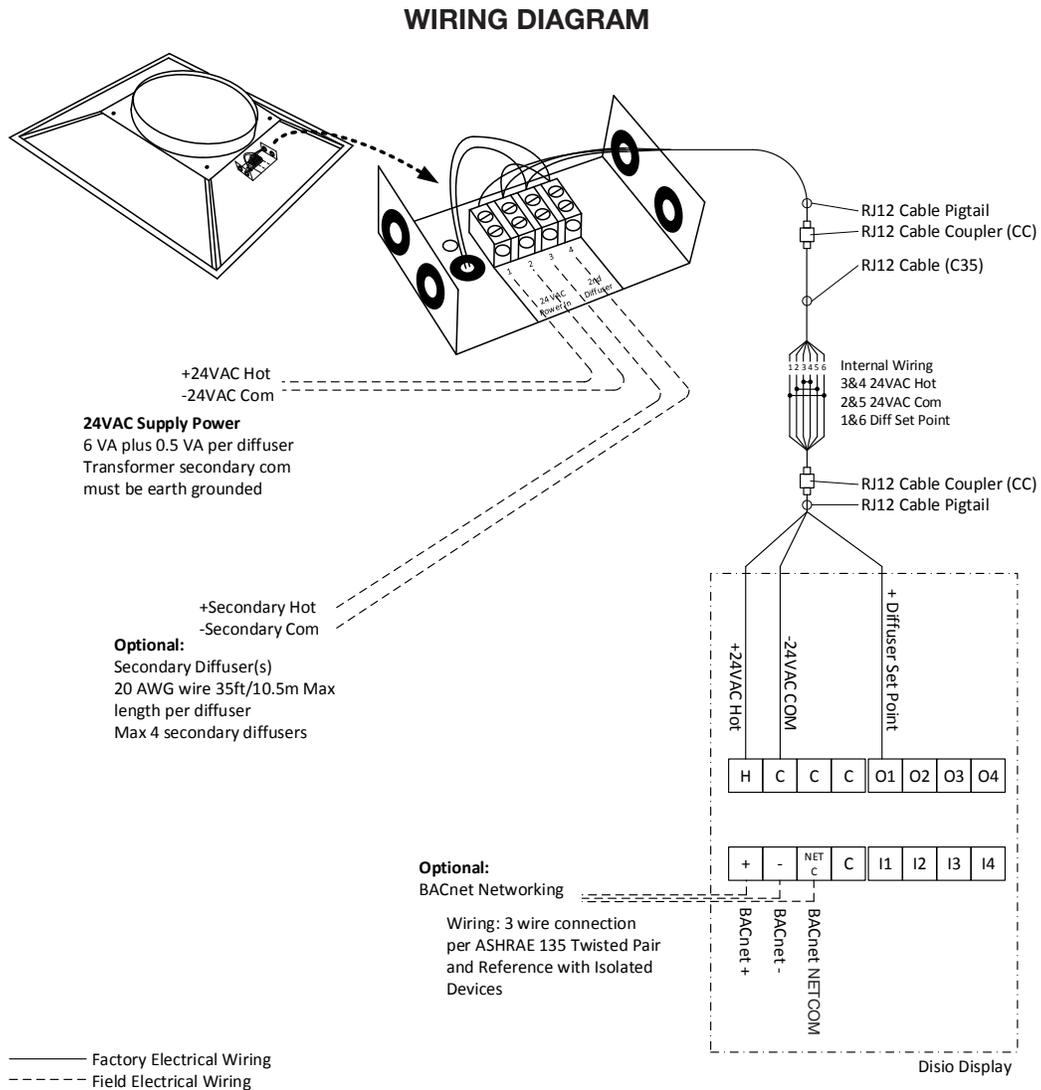
Caution

The thermostat(s) in the Varitherm VAV diffuser are factory adjusted to 76°F/24°C and should remain at 76°F/24°C for the Disio Display to function correctly. Changing the diffuser thermostat adjustment will cause the temperature control in the space to deviate from the control temperature selected at the Disio Display.

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Step 6

Connect 24VAC 6VA + 0.5VA per diffuser to terminals on diffuser.

WIRING DIAGRAM

RJ12 Cable Pigtail
RJ12 Cable Coupler (CC)
RJ12 Cable (C35)

Internal Wiring
3&4 24VAC Hot
2&5 24VAC Com
1&6 Diff Set Point

RJ12 Cable Coupler (CC)
RJ12 Cable Pigtail

+24VAC Hot
-24VAC Com

24VAC Supply Power
6 VA plus 0.5 VA per diffuser
Transformer secondary com
must be earth grounded

+Secondary Hot
-Secondary Com

Optional:
Secondary Diffuser(s)
20 AWG wire 35ft/10.5m Max
length per diffuser
Max 4 secondary diffusers

Optional:
BACnet Networking

Wiring: 3 wire connection
per ASHRAE 135 Twisted Pair
and Reference with Isolated
Devices

| H | C | C | C | O1 | O2 | O3 | O4 |

| + | - | NET C | C | I1 | I2 | I3 | I4 |

BACnet +
BACnet -
BACnet NETCOM

Factory Electrical Wiring
Field Electrical Wiring

Disio Display

Set point Adjustment

Set point adjustment on the Disio Display thermostat is easy! Just use the UP arrow button to increase your set point, and the DOWN arrow button to decrease your set point. The display will flash to indicate there is a set point adjustment, and then stop flashing once accepted.

Info Menu

The Menu button displays basic information of the controller regarding application, units of measure, and room temperature. Values cannot be changed from the menu, just viewed for information only.

Press and hold (approx. 5 sec) the **'Enter Menu'** ☰ button to enter the Info Menu. Scroll through using the UP and DOWN buttons.

AP	Application: AS for model VPD (AT reserved for future use)
TU	Temperature Units: F - Fahrenheit, C - Celcius
RT	Room Temperature at Disio Display

Configuration

The Disio Display comes factory programmed to operate the set point adjustment of the Varitherm VAV diffusers.

Options

Optional Secondary Diffusers

The Disio Display will support set point adjustment on six Varitherm VAV diffusers (one Master and five Secondary). The Master diffuser is wired directly to the Disio Display. Additional Secondary diffusers are wired to the Master.

Optional BACnet Networking

BACnet Wiring

The Disio Display thermostat can be used as a stand-alone thermostat or be integrated into a BACnet MS/TP network using the + (plus), - (minus) and NETCOM terminals. Price follows the T568B wiring standard, using the Orange Complement, Orange, Brown, Brown Complement wires for BACnet communication.

BACnet networks must be run in a daisy chain configuration, meaning there is only one main cable and each network device is connected directly along its path, with no more than 30 devices per segment, and MS/TP segment lengths must not exceed 1050 feet.

Termination

BACnet MS/TP networks must be terminated to ensure proper operation. A network should be terminated twice, once at the beginning and once at the end. Termination helps reduce reflections and noise. The terminating can be done with a 100 ohm resistor across the + and - lines. Most Price controllers have the option for enabling termination by a software menu selection. Turning on termination via software will enable the resistor across the lines.

Tech Tip: The Price BACnet MS/TP to IP Router has built in termination and it is enabled by default (since the router is typically the beginning of the entire MS/TP network). Now you only have to go and find/terminate that last device.

Electrical Noise

Electrical noise can affect both analog signal and digital communications such as BACnet. **Therefore do not route high voltage lines next to the BACnet network.** Avoid noisy electrical sources such as:

- Variable Frequency Drives
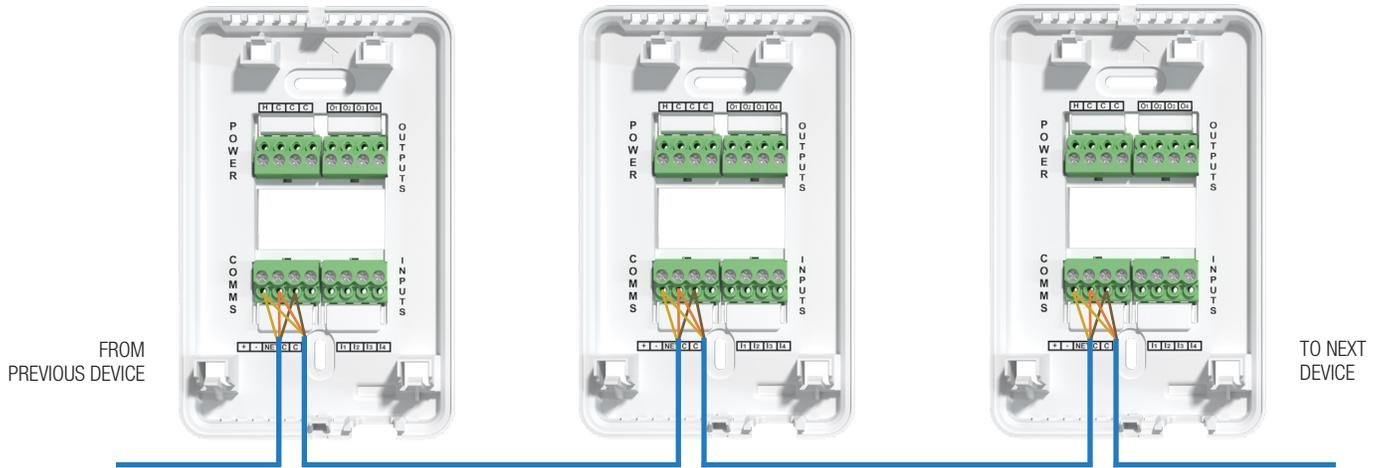- High current power lines (main panel feeds)
- Fluorescent light fixtures

If you must pass near noisy electrical lines cross at right angles. This will help reduce the amount of noise coupled to the network wires.
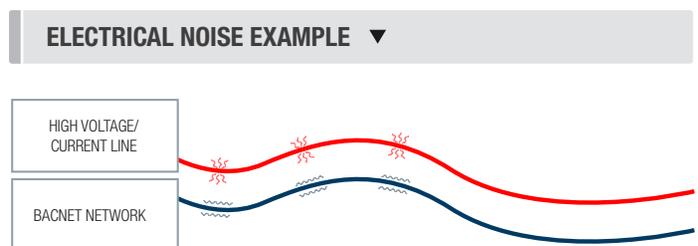
ELECTRICAL NOISE EXAMPLE ▼

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FROM PREVIOUS DEVICE

TO NEXT DEVICE

Network Wire Specifications

For the BACnet MS/TP network specific wire is required. Do not use standard power or "thermostat" wire. This wire does not have the necessary requirements for digital communications. While it's possible it may work (temporarily) the network will be unreliable and not operating at optimal.

BACnet MS/TP Wire type recommendations

- Use one balanced twisted pair
- Low capacitance (17pF or less)
- Plenum rated (FT6, CMP ratings)
- 100-120 ohm, balanced
- (CAT5, CAT5E, CAT6 network cable has excellent specifications and will work in almost any BACnet MS/TP application.)
- **Price recommends using the Orange Complement for (+), the Orange for (-), and the Brown and Brown Complement for the (NETCOM) connections. These are paired in a standard CAT5E cable.**

NOTE: **NETCOM MUST BE WIRED**
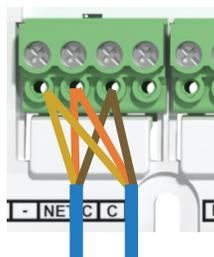
WIRING ▼

	T568B Color
PIN 1	white/orange stripe
PIN 2	orange solid
PIN 3	white/green stripe
PIN 4	blue solid
PIN 5	white/blue stripe
PIN 6	green solid
PIN 7	white/brown stripe
PIN 8	brown solid

Maintenance

Hardware Specifications

Power Requirements	24 VAC ± 10%, 47 -63 Hz 6VA (not including output loading) NEC Class ll
Ambient Ratings	32º to 122º F (0º to 50º C) 10 to 90% RH (non-considering)
Universal/Configurable Outputs (4)	24VAC Binary Output. Max 0.5A each, MAX 1.85A total Switched HOT or Switched COMMON Analog 0-10VDC, Max: 10mA each
Unversal/Configurable Inputs (4)	Thermistor Sensor (10k), accuracy of +/- 0.5F from 55º F to 85ºF (+/0.25ºC from 13ºC to 25ºC) Analog 0-10V inputs. 20k ohm input impedance • Thermostat Inputs • Room Set point • Termperature Sensor (10k Type J Thermistor) • Accuracy of +/-0.5ºF from 55ºF to 85ºF (+/0.25ºC from 13ºC to 25ºC)
Communication ports	BACnet MS/TP Connection (optional) • Communication speeds: 9,600, 19,200, 38,400, 76,800 (default) • Maximum recommended devices per MS/TP segment: 30 devices • For local setup using Windows-based Disio Setup software
Size	3.31" x 1.25" x 5.18"
Weight	.2 lb. (100g)

price | VAV DIFFUSERS