



TAC Xenta® 102-VF

VAV Controller with Valve Reheat

TAC Xenta 102-VF is a zone controller for VAV heating and cooling applications that use fan on/off control and modulating valve reheat.

The controller keeps a constant temperature by controlling the air flow with the aid of a Belimo® VAV Compact; a valve reheat coil is used for the heating stage. Through a carbon dioxide sensor, the air quality can be controlled in the zone.

The controller is a LonMark compliant device that communicates 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 network variables can be monitored and configured via the TAC Xenta OP, if the OP version is 3.11 or higher.

STR 100 is a range of wall modules intended to be used together with TAC Xenta 102.

There are plug-in terminal blocks available for the TAC Xenta 100 series that can be attached to the existing terminals.

TECHNICAL DATA

Supply voltage 24 V AC -10% $+20\%$, 50–60 Hz

Power consumption:

Controller with TAC Xenta OP 4 VA

Actuator supply max. 12 VA

Digital output max. 19 VA

Total max. 35 VA

Ambient Temperature

Storage -20 °C to $+50\text{ °C}$ (-4 °F to 122 °F)

Operation 0 °C to $+50\text{ °C}$ (32 °F to 122 °F)

Humidity max. 90% RH non-condensing

Mechanical

Enclosure ABS/PC

Enclosure rating IP 30

Flammability class, materials UL 94 5VB

Dimensions see Fig. 1

Weight 0.4 kg (0.88 lb.)

Inputs/Outputs

Inputs for occupancy sensor and window contact, X2–X3:

Voltage across open contact 23 V DC $\pm 1\text{ V}$ DC

Current through closed contact 4 mA

Minimum pulse input duration X2/X3 250 ms / 15 sec.

Output for fan on/off control, V1:

Minimum output voltage supply voltage $- 1.5\text{ V}$

Maximum load 0.8 A

Input for bypass button on wall module, X1:

Minimum pulse input duration 250 ms

Maximum current, LED 2 mA, for ZS 100 series

Input for temperature sensor, B1:

Thermistor type NTC, 1800 Ω at 25 °C (77 °F)

Measuring range -10 °C to 50 °C (14 °F to 122 °F)

Accuracy $\pm 0.2\text{ °C}$ ($\pm 0.36\text{ °F}$)

Inputs for air flow and carbon dioxide sensor, Z1–Z2:

Measuring range 0–10 V DC

Accuracy $\pm 0.05\text{ V}$

Input setpoint adjustment on wall module, R1:

Type 10 k Ω linear potentiometer

Adjustment range $\pm 5\text{ °C}$ ($\pm 9\text{ °F}$)

Accuracy $\pm 0.1\text{ °C}$ ($\pm 0.18\text{ °F}$)

Outputs for air flow controller and reheat actuator, Y1–Y2:

Output range 0–10 V DC

Maximum current 2 mA

Accuracy $\pm 0.2\text{ V}$

Application Program

Cycle time 15 sec.

Indication LED Colors

Power On green

Service red

LonMark Standard

. LonMark Interoperability Guidelines

. LonMark Functional Profile: VAV Controller

Communication protocol LonTalk

Physical channel TP/FT-10, 78 kbps

Neuron type 3150, 10 MHz

Agency Compliances

Emission:

CE EN 61000-6-3, C-Tick, FCC Part 15

Immunity:

CE EN 61000-6-1

Safety

CE EN 61010-1

UL 916, C-UL US, Open Energy Management Equipment

Approved for plenum installations

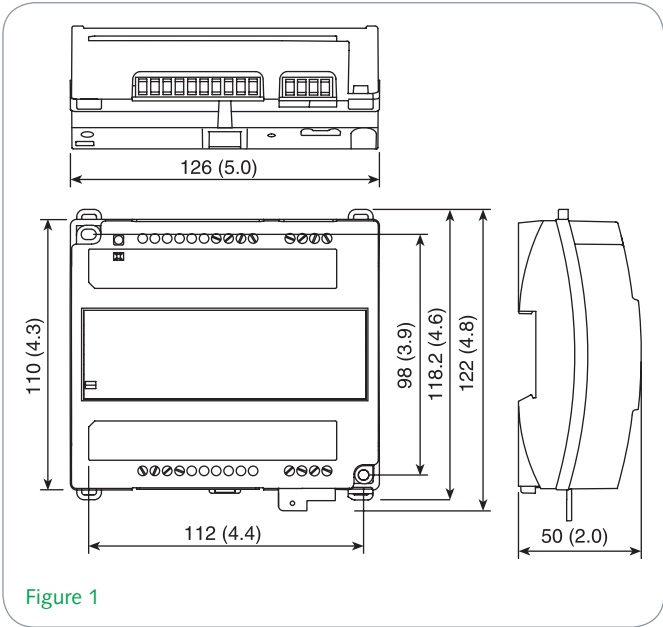
RoHS directive 2002/95/EG

Part Numbers

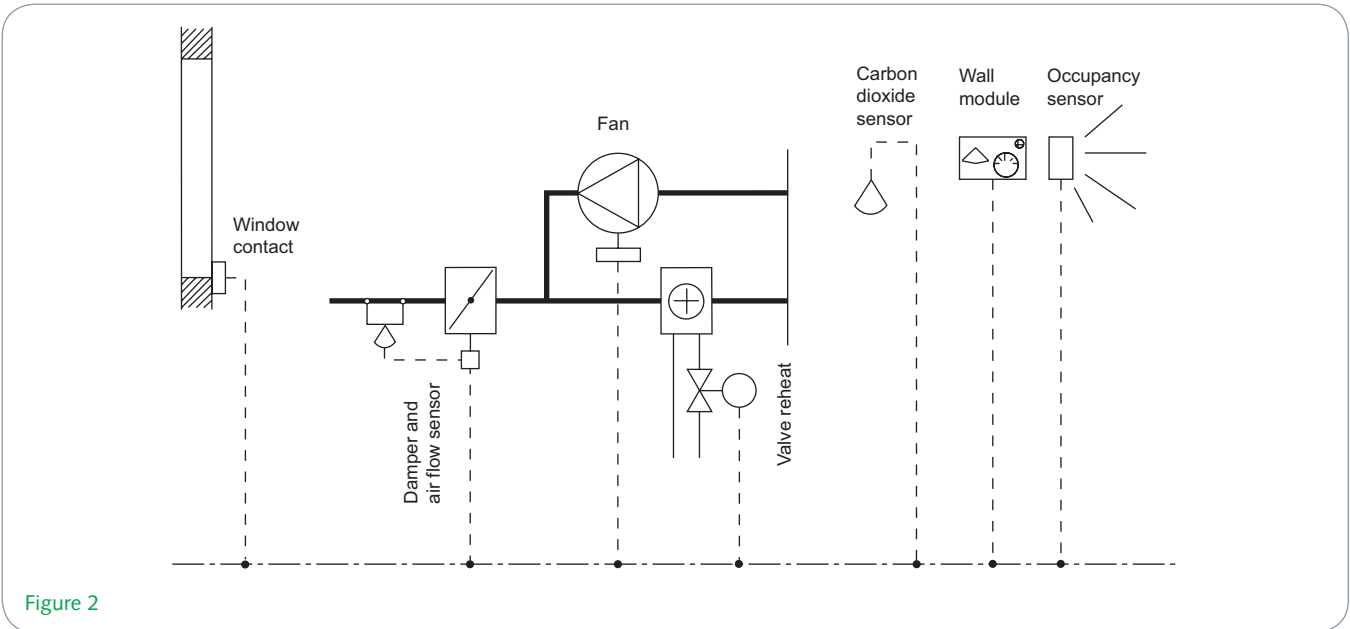
Controller 007305350

Manual 0-004-7516

Plug-in Terminal Blocks TAC Xenta 100 007309140



APPLICATION EXAMPLE



MAIN FUNCTIONS

The function of TAC Xenta 102-VF is determined by the occupancy mode, the application mode, the emergency mode, the manual mode and the node state.

The airflow and a valve reheat coil are controlled to maintain the zone temperature in sequence. The airflow increases when the cooling demand increases. If the cooling demand in the zone decreases, the valve reheat is started, and the fan runs (if a fan is enabled). Furthermore, the airflow is set to its minimum value with a fan, and the minimum heat value without a fan.

Air Quality Control

In order to maintain the air quality, the controller selects the highest of three possible air flow values: the air flow ordered from the cooling sequence, the air quality control or the set minimum air flow. When carbon dioxide concentration is high, the airflow is set from the air quality control (see fig. 3); at other times, it is set by the temperature control sequence. The air quality control is enabled in the occupied and bypass modes.

OPERATING 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. The fan is on if it is enabled and the heating stage is active.

Standby Mode

The standby mode is enabled. The neutral zone is larger than in occupied mode, and the air flow is diminished from "minimum occupied air flow" to "minimum standby air flow".

Bypass Mode

To bypass the centrally set standby mode, press the bypass button on the wall module. The controller switches to occupied mode. When two hours have passed, the controller reverts to standby mode.

Unoccupied Mode

This mode is used when the building is unoccupied for a longer period. In this mode, the neutral zone is even larger than that of the standby mode. The fan is controlled in standby mode.

Off Mode

The controller stops running when off mode is centrally ordered, when a window is opened or slave mode is enabled in the controller.

Slave Mode

When the network variable nciAppOptions is set so that slave mode is enabled, the following happens:

The slave controller goes into off mode and receives copies of output signals from the master controller.

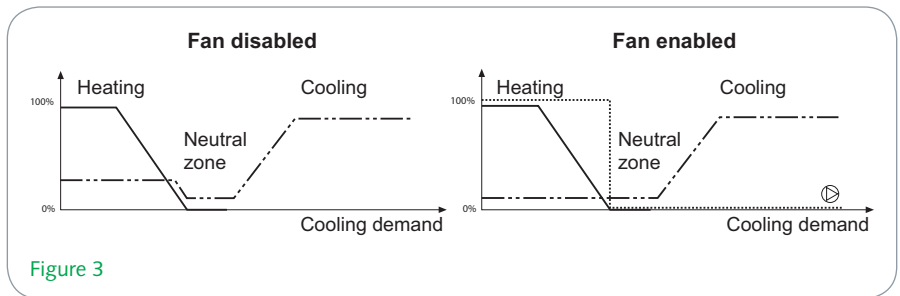


Figure 3

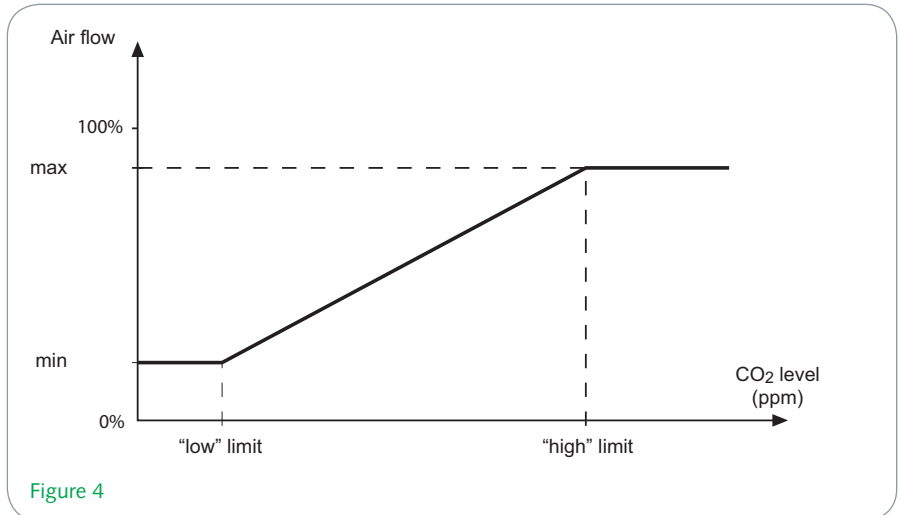


Figure 4

In slave mode, both the slave and master controllers must be equipped with identical actuators and valves.

Night Purge Mode

In night purge mode, the air flow is set to its maximum value in order to cool the zone with outdoor air. If the controller is used in a heating application, the heating is off.

EMERGENCY MODE

Emergency mode is forced and has two different settings:

- Shutdown mode – The damper is fully closed.
- Purge mode – The air flow is set to its nominal value, which equals a fully open damper.

When emergency mode is not needed, the network variable is set to normal control.

INSTALLATION

The controller may be mounted on a DIN rail or fastened onto a ceiling or a wall. Two sockets are included to allow for this type of installation.

CABLES

Communication cables: refer to the TAC Xenta Network Guide, part number 0-004-7460.

Other cables: maximum length 30 m (100 ft), minimum wire size of 0.7 mm² (18 AWG) applies to all other cables and all other equipment. The cables are to be twisted, but not shielded.

CONFIGURATIONS OPTIONS

By changing the network variable nciAppOptions (see figure 6), it is possible to achieve different options in TAC Xenta 102-EF.

The factory setting of the controller is that all auxiliary units are disabled. Below is a list of the different options:

- Occupancy sensor enabled/disabled
- Window contact enabled/disabled
- Fan enabled/disabled
- Air quality controller enabled/disabled
- Slave mode enabled/disabled
- Occupancy sensor normally open/normally closed

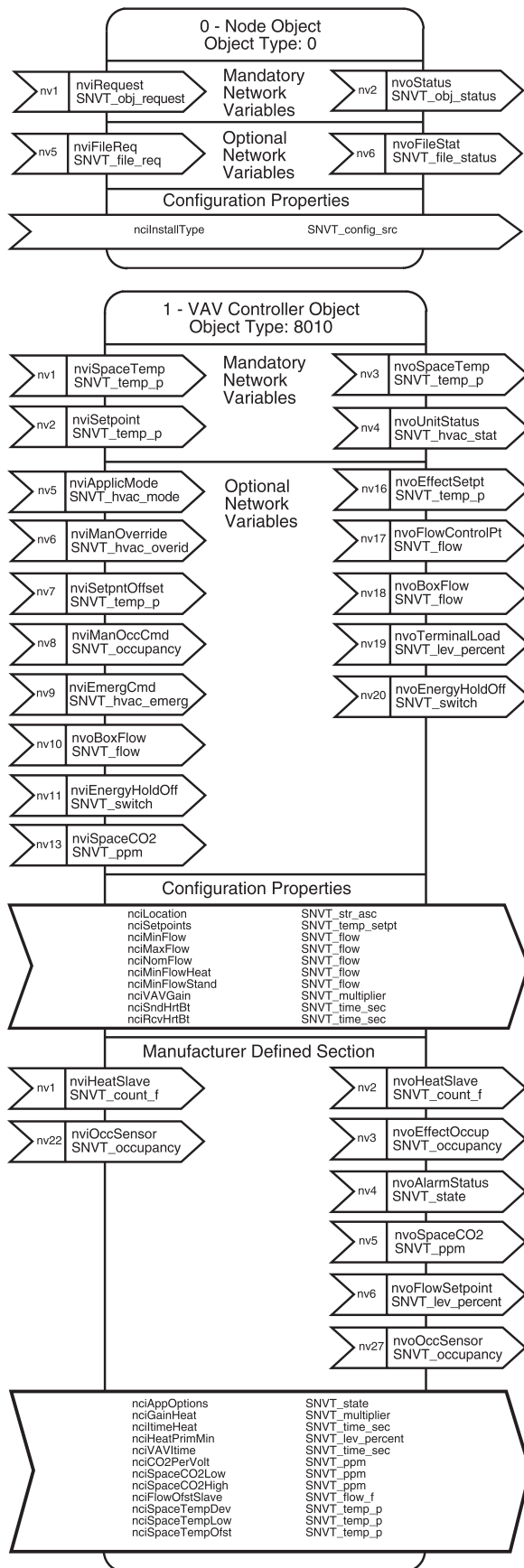


Figure 5: LonMark Objects and Network Variables

HARDWARE INTERFACE

Term. No.	Term. Name	Description
1	C1	TP/FT-10 communication channel
2	C2	TP/FT-10 communication channel
3	X3	Input, window contact
4	M	Measurement neutral
5	X2	Input, occupancy sensor
6	Z2	Input, carbon dioxide sensor
7	M	Measurement neutral
8	Z1	Input, air flow
9	D1	Output, indication on wall module
10	M	Measurement neutral
11	X1	Input, bypass button on wall module
12	R1	Input, setpoint offset dial on wall module
13	M	Measurement neutral
14	B1	Input, temperature sensor
15	G	24 V AC (G) input
16	G0	24 V AC (G0) input
17	OP	24 V AC supply for TAC Xenta OP
18	G	24 V AC supply for TAC Xenta OP
19	V1	Fan on-off control
20	G	24 V AC (G) output
21	G0	24 V AC (G0) output
22	Y2	Reheat valve actuator
23	M	Measurement neutral
24	Y1	Air flow controller setpoint
25	–	Not used
26	–	Not used
27	–	Not used
28	–	Not used

ROOM UNITS

The STR is a series of wall modules optimized for public facilities such as office buildings, hotels, hospitals, schools, and shopping malls.

The following room units can be configured with the TAC Xenta 102-VF.

Model	Temp. Sensor	Mode Indicator	Setpoint Offset	Bypass Button	Back Light	SNVT Binding Required
STR100	X					
STR101	X	X				
STR102	X	X	X			
STR103	X	X		X		
STR104	X	X	X	X		
STR350	X	X	X	X		X
STR351	X	X	X	X	X	X

PART NUMBERS

STR100004600100
STR100-W (White)004600110
STR101004600200
STR102004600300
STR103004600700
STR104004600400

LON Modules

STR350004605000
STR351004605100

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