



TAC Xenta[®] 102-EF

VAV Controller with Electrical Reheat

5 Sep 2002



TAC Xenta[®] 102-EF is a zone controller for VAV heating and cooling applications that use electrical reheat fan and on/off control. The relay output may also be used to control radiator thermal actuators. The controller keeps a constant temperature in the zone by controlling the air flow with the aid of a Belimo[®] VAV Compact.

For heating, the electrical reheat with the optional fan is used. 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, polarity insensitive 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.

ZS 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 which 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:

- Operation 0 to 50 °C (32 to 122 °F)
- Storage -20 to 50 °C (-4 to 122 °F)

Humidity max. 90% RH, non-condensing

Enclosure:

- Material ABS/PC plastic
- Enclosure rating IP 30
- Color grey/red
- Dimensions 127x126x50 mm (5 x 5 x 2 in)
- Weight 0.4 kg (0.88 lbs)

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

- Voltage across open contact 23 V DC ± 1 V DC
- Current through closed contact 4 mA
- Minimum pulse input duration X2/X3 250 ms / 15 s

Output for fan on/off control, V1:

- Minimum output voltage supply voltage - 1.5 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 to 50 °C (14 to 122 °F)
- Accuracy ±0.2 °C (±0.36 °F)

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

- Measuring range 0-10 V DC
- Accuracy 0.05 V

Input setpoint adjustment on wall module, R1:

- Type 10 kΩ linear potentiometer
- Adjustment range ±5 °C (±9 °F)
- Accuracy ±0.1 °C (±0.18 °F)

Output for air flow controller, Y1:

- Output range 0-10 V DC
- Maximum current 2 mA
- Inaccuracy 0.2 V

Relay output for electrical reheat or radiator thermal actuators, K1 and KC1:

- Thermal actuator NC/NO
- Maximum voltage 250 V AC
- Maximum load 2 A

Application program:

- Cycle time 15 s

Indication LED colors:

- Power green
- Service red

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

Conformance to standards:

- Emission C-Tick, FCC Part 15, EN 50081-1
- Immunity EN 50082-1

Safety:

- CE EN 61010-1
- UL 916 Energy Management Equipment
- ETL listing UL 3111-1, first edition
- CAN/CSA C22.2 No. 1010.1-92
- Flammability class, materials UL 94 V-0

Part number, TAC Xenta 102-EF:

- Controller 0-073-0533
- Manual (GB) 0-004-7516
- Plug-in Terminal Blocks TAC Xenta 100 0-073-0914
- Disk with external interface files (XIF) for the TAC Xenta 100 series 0-008-5582



APPLICATION EXAMPLE

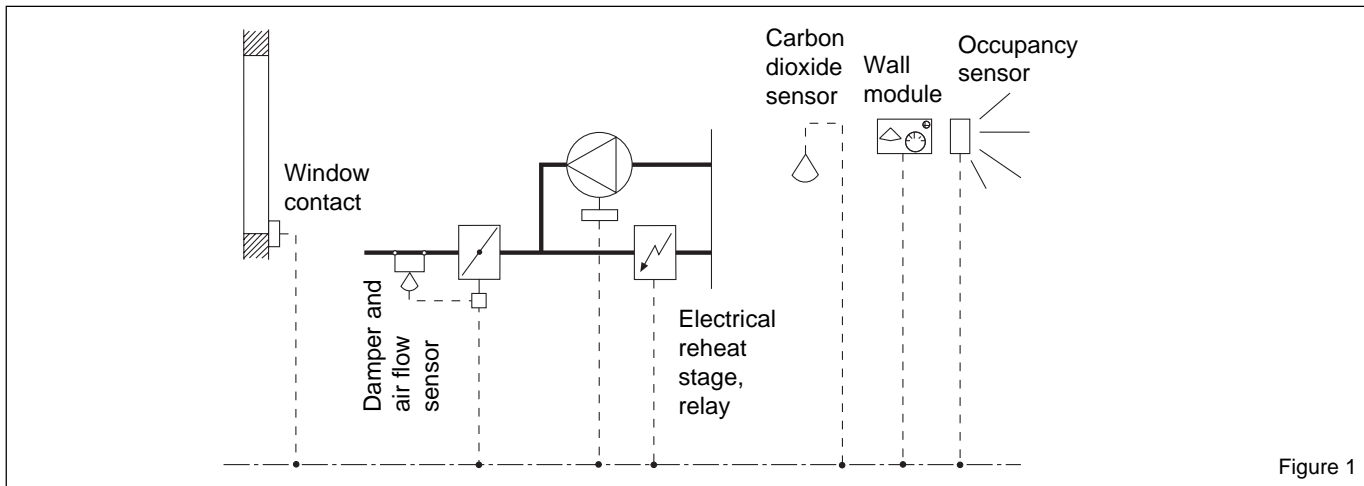


Figure 1

FUNCTIONS

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

The airflow and an optional heating coil or radiator are controlled to maintain the zone temperature in sequence (see figure 2). The air flow increases when the cooling demand rises. When cooling demand diminishes, the reheat coil is started via the relay, and the airflow is decreased toward its current minimum setpoint.

If there is a fan installed, it will run when the heating is active (see figure 2).

Air quality control

In order to maintain the air quality, the controller selects the highest of three airflow values: the 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

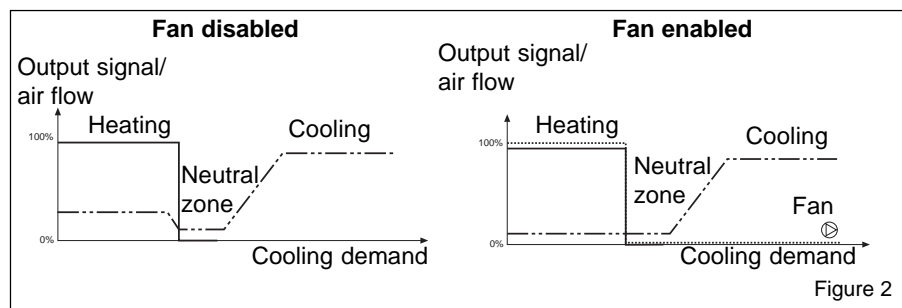


Figure 2

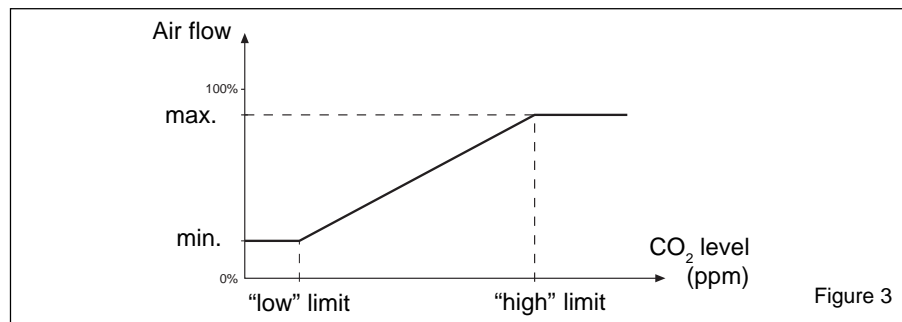


Figure 3

(see figure 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 and off modes

The controller stops running when centrally ordered, when a window is opened or slave mode is enabled. The damper is fully closed.

Slave mode

The following occurs when the network variable *nciAppOptions* enables the slave mode:

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

In slave mode, both the slave and master controllers must be equipped with identical auxiliary units.

OPERATING MODES (CONT'D.)

Night purge mode

In night purge mode, the air flow is set to its maximum value in order to cool the zone with night air. 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 enabled, the network variable forcing emergency mode 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 provided for that purpose.

Cable lengths

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.

CONFIGURATION OPTIONS

By changing the network variable *nci-AppOptions* (see figure 4), it is possible to achieve different options in TAC Xenta 102-EF.

The controller's default setting disables all auxiliary units. Below is a list of the different options:

- Occupancy sensor enabled/disabled
- Window contact enabled/disabled
- Fan enabled/disabled
- Air quality controller enabled/disabled
- Relay is used for the electric reheat stage/thermal actuator for radiators
- Slave mode enabled/disabled
- Occupancy sensor normally open/normally closed
- Thermal actuator NC/NO

LONMARK OBJECTS AND NETWORK VARIABLES

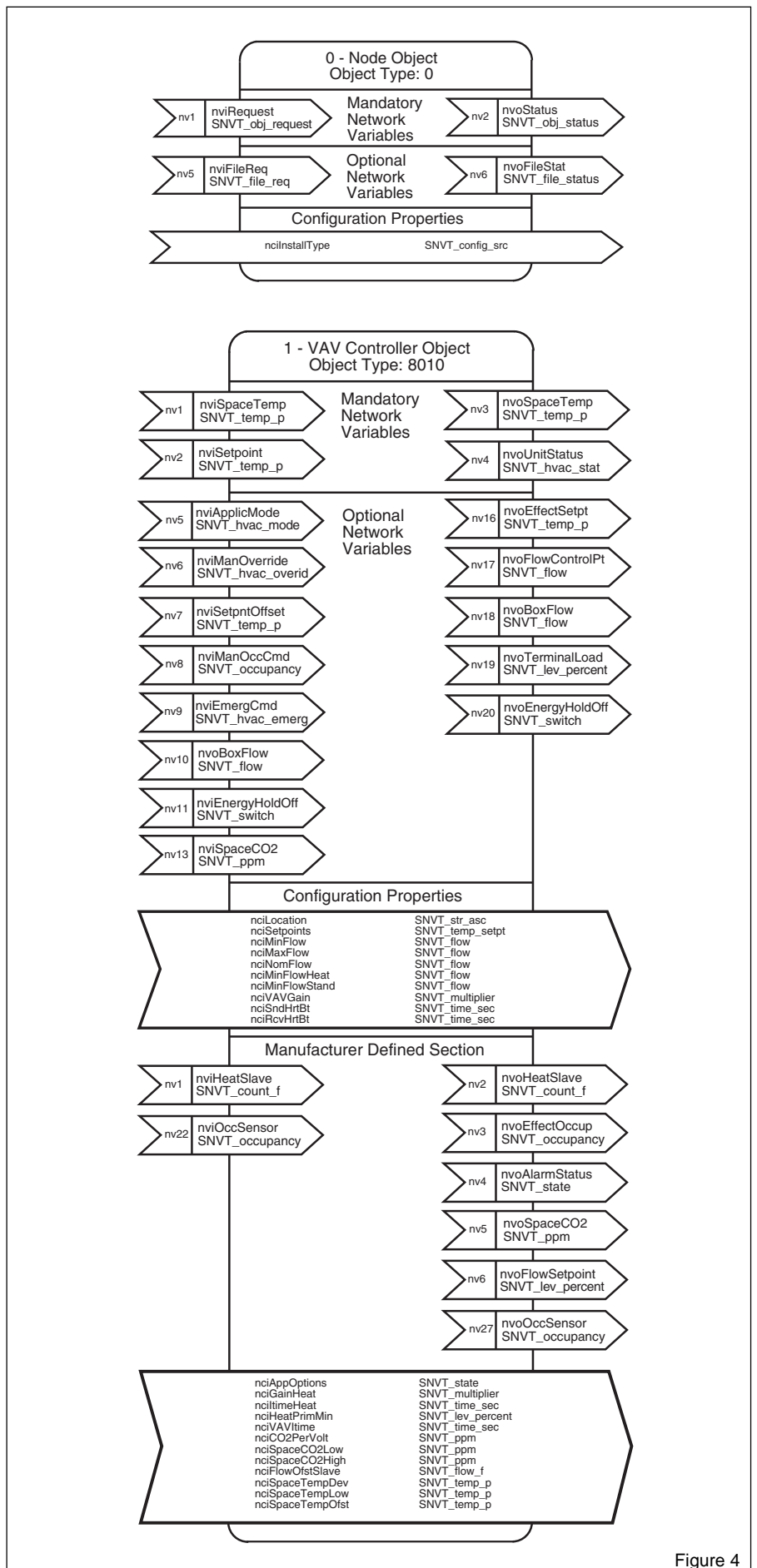
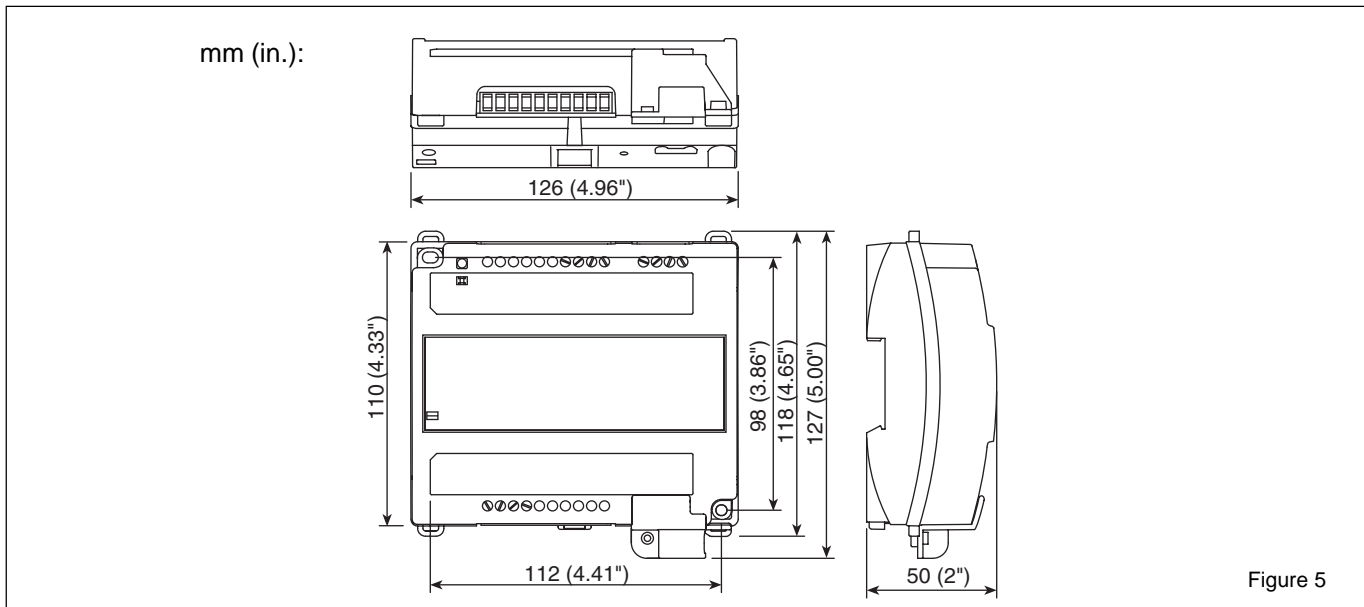


Figure 4

HARDWARE INTERFACE

No.	Designation	Description	No.	Designation	Description
1	C1	TP/FT-10 communication channel	15	G	24 V AC (G) input
2	C2	TP/FT-10 communication channel	16	G0	24 V AC (G0) input
3	X3	Input, window contact	17	OP	24 V AC supply for TAC Xenta OP
4	M	Measurement neutral	18	G	24 V AC supply for TAC Xenta OP
5	X2	Input, occupancy sensor	19	V1	Fan on-off control
6	Z2	Input, carbon dioxide sensor	20	G	24 V AC (G) output
7	M	Measurement neutral	21	G0	24 V AC (G0) output
8	Z1	Input, air flow	22	—	Not used
9	D1	Output, indication on wall module	23	M	Measurement neutral
10	M	Measurement neutral	24	Y1	Air flow controller setpoint
11	X1	Input, bypass button on wall module	25	—	Not used
12	R1	Input, setpoint offset dial on wall module	26	—	Not used
13	M	Measurement neutral	27	K1	Electric reheat stage or thermal actuator NC/NO for radiator control
14	B1	Input, temperature sensor	28	KC1	see above

DIMENSIONS



WALL MODULES

Designation	Description	Part number
Sensor Zone ZS 101	Wall module with temperature sensor, mode indication LED and OP connector	0-073-0908
Sensor Zone ZS 102	Wall module with temperature sensor, mode indication LED, setpoint dial and OP connector	0-073-0909
Sensor Zone ZS 103	Wall module with temperature sensor, mode indication LED, bypass button and OP connector	0-073-0910
Sensor Zone ZS 104	Wall module with temperature sensor, mode indication LED, bypass button, setpoint dial and OP connector	0-073-0911

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