TAC Xenta 102-B

C-95-10

VAV controller

1999-08-11

TAC Xenta® 102-B is a zone controller intended primarily for VAV cooling applications. It is possible to switch between the heating and the cooling stages via the network. The controller keeps a constant temperature in the zone by means of controlling the air flow with the aid of a Belimo® VAV Compact. It is also possible to limit the air flow. By using a carbon dioxide sensor, the air quality can be controlled in the zone.

The controller is a LonMark® compliant device aimed at communicating 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.

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
- Total ..... max. 16 VA

Ambient temperature:
- Operation ..... 0 °C – +50 °C
- Storage ..... –20 °C – +50 °C

Humidity ..... max. 90% RH, non-condensing
Enclosure:
- Material ..... ABS/PC plastic
- Enclosure rating ..... IP 30
- Colour ..... grey/red
- Dimensions ..... 122×126×50 mm
- Weight ..... 0,4 kg

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

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 zone temperature sensor, B1:
- Thermistor type ..... NTC, 1800 Ω at 25 °C
- Measuring range ..... –10 °C – +50 °C
- Accuracy ..... ±0,2 °C

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 – +5 °C
- Accuracy ..... ±0,1 °C

Output for air flow controller, Y1:
- Output range ..... 0–10 V DC
- Maximum current ..... 2 mA
- Accuracy ..... ±0,2 V

Application program:
- Cycle time ..... 15 s

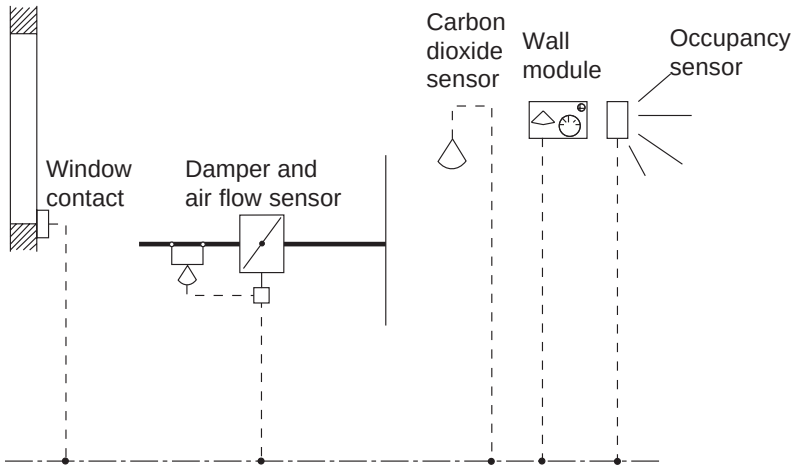
Indication LED colours:
- Power ..... green
- Service ..... red

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 ..... EN 50081-1
- Immunity ..... EN 50082-1
- Safety ..... EN 61010-1
- ETL listing ..... UL 3111-1, first version ..... CAN/CSA C22.2 No. 1010.1-92
- Flammability class, materials ..... UL 94 V-0
- CE marking ..... complies with requirements

Part number, TAC Xenta 102-B:
- Controller 0-073-0531
- 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



N.B.!
It is **not** appropriate to mix TAC Xenta 102-B, TAC Xenta 102-EF and TAC Xenta 102-VF in a project when TAC Xenta 102-B is to control a heating application, as TAC Xenta 102-B uses hot air from the central air handling unit in the heating mode.

Figure 1

FUNCTIONS

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

Normally, the controller has cooling control only. The air flow increases when the cooling demand increases, see figure 2. Via a network variable, the control sequence can be changed to heating instead; in this case, the air flow increases when there is a heating demand and provides heated supply air.

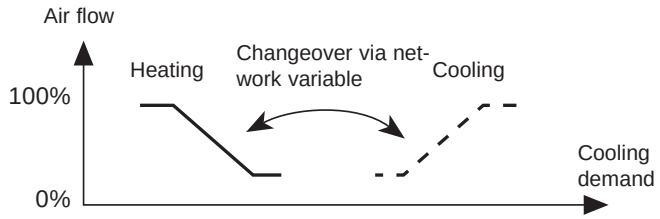


Figure 2

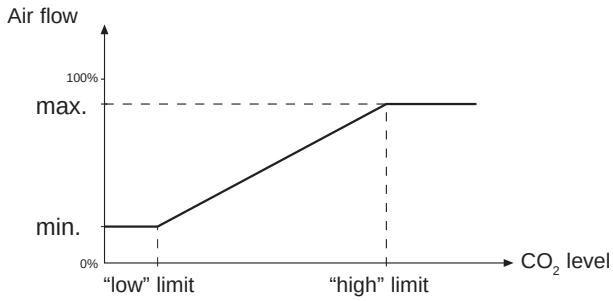


Figure 3

Air quality control

In order to maintain the air quality, the controller selects the highest of three air flow values: the air flow ordered from the cooling sequence or the air quality control or the set minimum position for the damper. At a high carbon dioxide concentration, the air flow is set from the air quality control, 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.

Standby mode

The controller reduces the energy consumption in the zone when standby mode is enabled. Standby setpoints for heating or cooling are used, and the air flow is diminished from "minimum occupied air flow" to "minimum standby air flow".

Bypass mode

When someone wants to bypass the centrally set standby mode, bypass mode is activated by pressing the bypass button on the wall module. The controller starts running in occupied mode. When two hours have passed, the controller goes back to standby mode again.

Unoccupied and off modes

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

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. 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 the 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, see below:

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 forcing emergency mode is set to normal control.

INSTALLATION

The controller may be mounted on a DIN rail or by fastening it onto a ceiling or a wall with screws. There are two sockets 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, minimum cross-sectional area of 0,7 mm^2 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 *nciAppOptions*, see figure 4, it is possible to achieve different options in TAC Xenta 102-B.

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
- Cooling only enabled/disabled
- Air quality controller enabled/ disabled
- Slave mode disabled/enabled
- Occupancy sensor normally open/ normally closed

LONMARK OBJECTS AND NETWORK VARIABLES

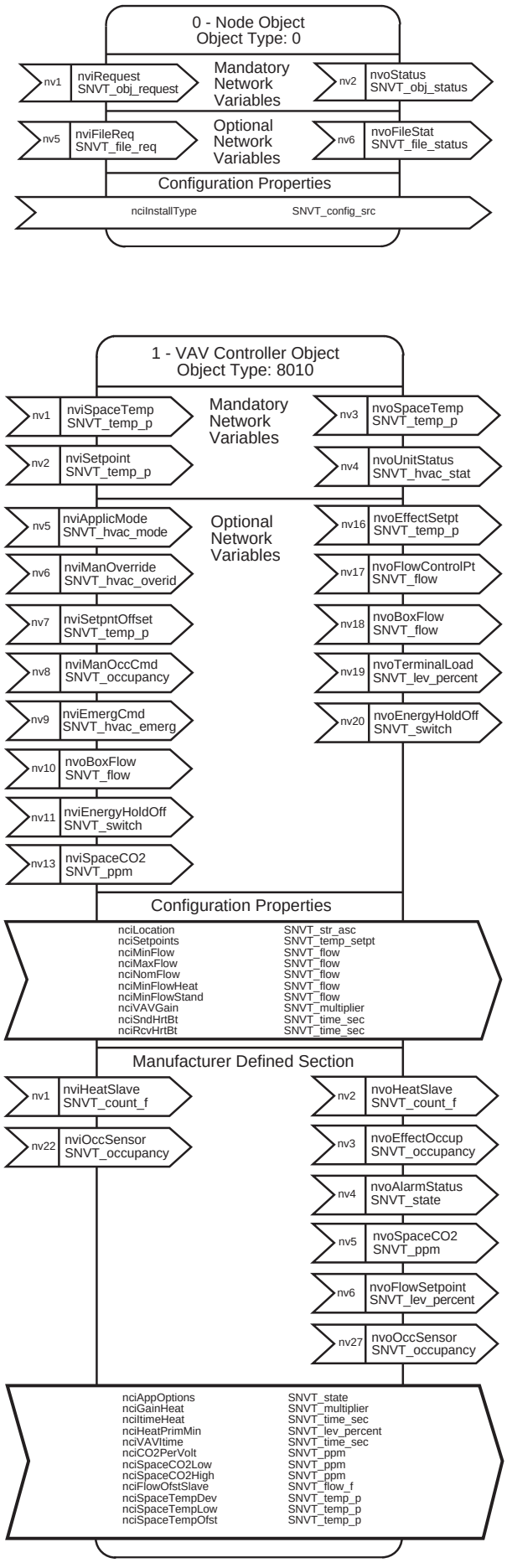


Figure 4

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	—	Not used
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
			27	—	Not used
13	M	Measurement neutral	28	—	Not used
14	B1	Input, temperature sensor			

DIMENSIONS

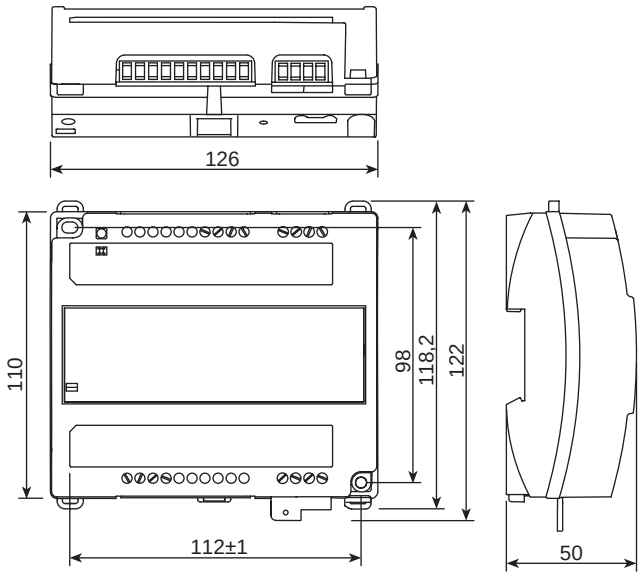


Figure 5

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

TAC AB, Jägershillgatan 18, SE-213 75 MALMÖ, SWEDEN, +46 40 38 68 50 (vx)