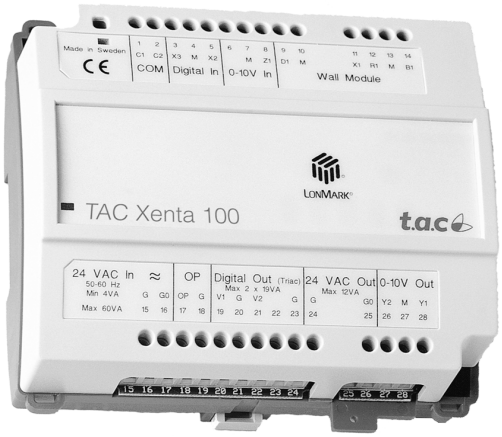
TAC Xenta 101-1VFC

Fan coil controller with one valve output and fan speed control

C-95-2

1999-08-11



TAC Xenta® 101-1VFC is a zone controller intended primarily for fan coil applications with a heating or a cooling stage. The controller keeps a constant temperature in the zone. By using a separate discharge air temperature sensor, the discharge and zone temperatures can be controlled in cascade. It is also possible to limit the discharge air temperature. Normally, the changeover from the heating to the cooling function is done by the central system, but a water temperature sensor may also be used. The fan speed is controlled continuously via a 0-10 V DC analog output. Depending on the operating mode, the fan is on continuously or controlled by the heating or cooling demand.

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 101.

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
- Digital outputs ..... max. 2×19 VA = 38 VA
- Total ..... max. 42 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 X2–X3 for occupancy sensor and window contact:
- Voltage across open contact ..... 23 V DC ± 1 V DC
- Current through closed contact ..... 4 mA
- Minimum pulse input duration X2/X3 ..... 250 ms / 16 s

Outputs V1–V2 for heating/cooling valve actuator (triac):
- Type of actuator .... incr./decr. or thermal actuator NC/NO
- Minimum output voltage ..... supply voltage – 1,5 V
- Maximum load ..... 0,8 A

Input X1 for bypass button on wall module:
- Minimum pulse input duration ..... 250 ms
- Maximum current, LED ..... 2 mA, for ZS 100 series

Inputs for water, zone and discharge air temperature sensors, U1 and B1–B2:
- Thermistor type ..... NTC, 1800 Ω at 25 °C
- Measuring range ..... –10 °C – +50 °C
- Accuracy ..... ±0,2 °C

Input R1, setpoint adjustment on wall module:
- Type ..... 10 kΩ linear potentiometer
- Adjustment range ..... –5 °C – +5 °C
- Accuracy ..... ±0,1 °C

Output Y1, fan speed control:
- Output range ..... 0–10 V DC
- Maximum current ..... 2 mA
- Accuracy ..... ±0,2 V

Application program:
- Cycle time ..... 16 s

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

Interoperability:
- Standard ..... conforms to LonMark Interoperability Guidelines and LonMark Functional Profile: Fan Coil Unit
- 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 101-1VFC:
- Controller 0-073-0502
- Manual (GB) 0-004-7513
- 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

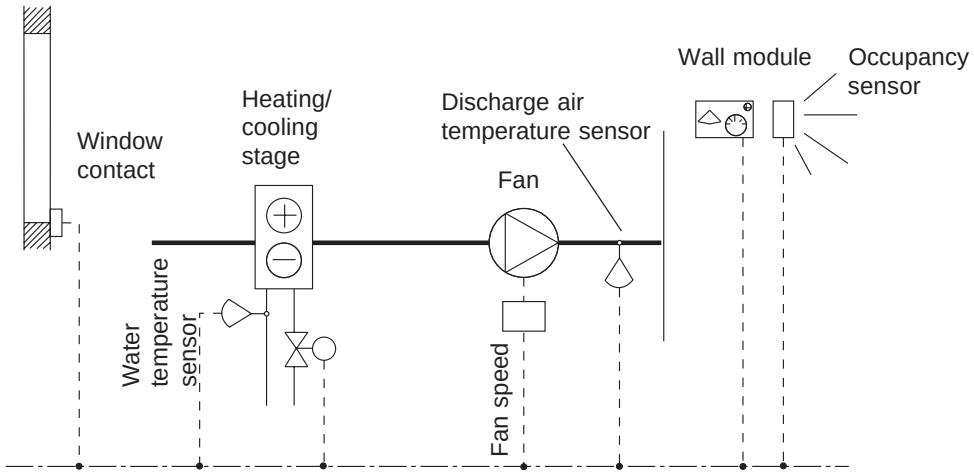


Figure 1

FUNCTIONS

The function of TAC Xenta 101-1VFC is determined by the occupancy mode, the application mode and the node state.

When the temperature increases, the heating valve closes or the cooling valve opens. Furthermore, the fan speed is increased in some operating modes or runs at a minimum speed in others, see figures 2 and 3. The fan speed starts increasing as soon as the valve is fully open.

The controller switches between the heating and the cooling stage when it is com-manded via a network variable or depending on the temperature of the water.

Cascade control
If there is a deviation from the temperature setpoint, the controller is able to assign a temperature setpoint to the discharge air temperature sensor as a function of the control error. The discharge air temperature is limited. When it is too cool in the zone, the controller will use the maximum discharge air temperature; its minimum setting is used when the zone temperature rises above a certain limit.

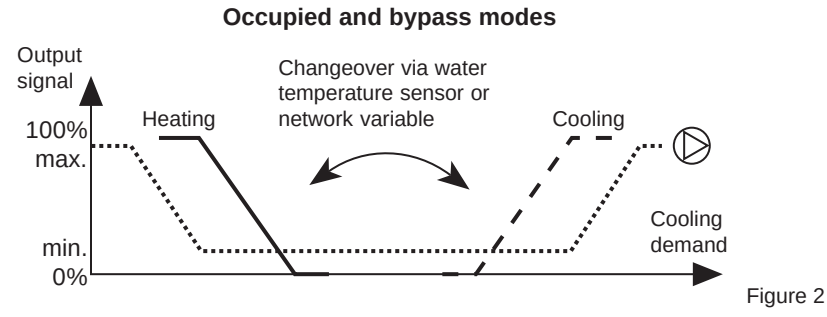


Figure 2

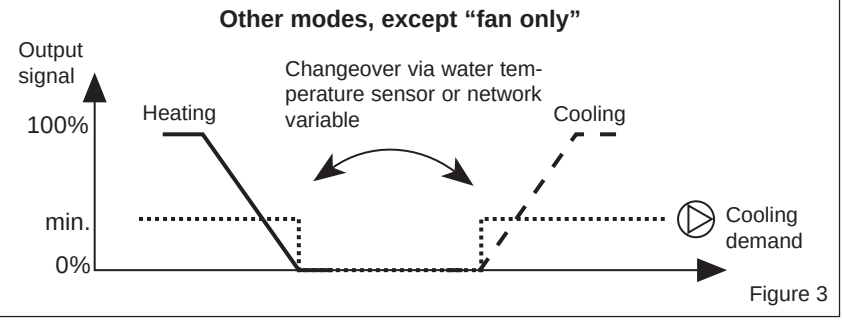


Figure 3

Low temperature protection
When the zone temperature drops below 10 °C, the controller goes into heating mode in order to ensure low temperature protection in the off and “fan only” modes, see below.

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 runs at a mimimum speed as long as the required temperature is maintained by the heating and cooling valves. If the heating or cooling valve is fully open, the fan speed is controlled to maintain the zone temperature.

Standby mode
The controller reduces the energy consumption in the zone when standby mode is enabled. When there is a heating or cooling demand, the fan runs at the minimum speed.

Bypass mode
When someone wants to bypass the centrally set standby mode, bypass mode is used by pressing the bypass button on the wall module, upon which the controller starts running in occupied mode. When two hours have passed, the controller goes back to standby mode again. The fan is controlled as in occupied mode while the bypass mode is active.

Unoccupied mode
Unoccupied mode is used when the building is unoccupied for a longer period. The fan is controlled as in standby mode.

OPERATING MODES (CONT'D.)

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.

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

"Fan only" mode
"Fan only" mode is set from the central system using the network variable *nviApplicMode*, see figure 4. When this mode is active, the fan runs at full speed.

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 101-1VFC.

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
- Cascade control enabled/disabled. Requires a discharge air temperature sensor.
- Slave mode enabled/disabled
- Occupancy sensor normally open/ normally closed
- Thermal actuator NC/NO

LONMARK OBJECTS AND NETWORK VARIABLES

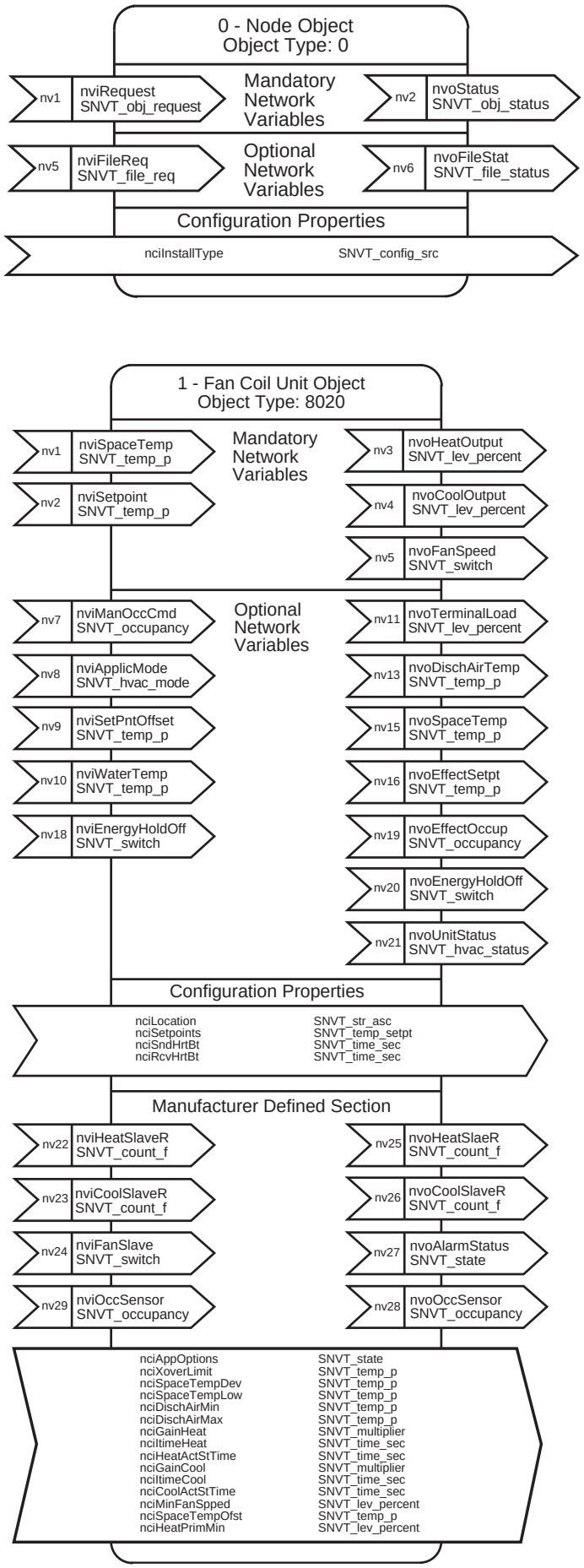


Figure 4

HARDWARE INTERFACE

No.	Designation	Description	No.	Designation	Description
1	C1	TP/FT-10 communication channel	15	G	24 V AC (G) input
2	C2	see above	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	Output, heating/cooling valve: increase
6	B2	Input, discharge air temperature sensor	20	G	24 V AC (G) output for V1 and V2
7	M	Measurement neutral	21	V2	Output, heating/cooling valve: decrease
8	U1	Input, water temperature sensor	22	—	Not used
9	D1	Output, indication on wall module	23	—	Not used
10	M	Measurement neutral	24	—	Not used
11	X1	Input, bypass button on wall module	25	M	Measurement neutral
12	R1	Input, setpoint offset dial on wall module	26	Y1	Control signal, fan, 0–10 V DC
13	M	Measurement neutral	27	—	Not used
14	B1	Input, temperature sensor	28	—	Not used

DIMENSIONS

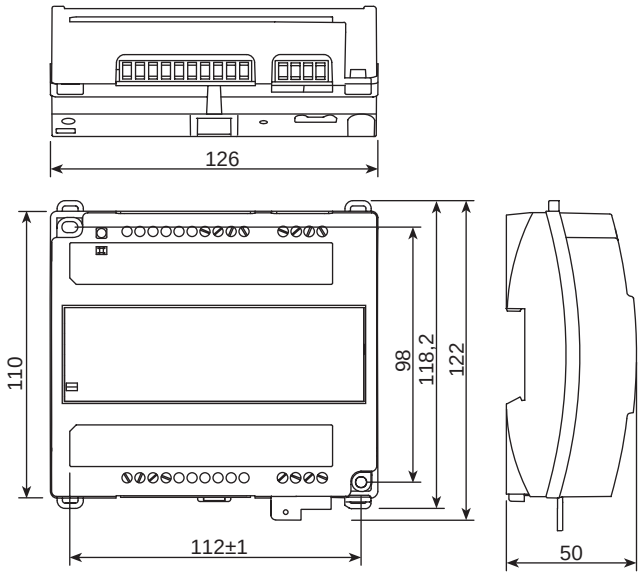


Figure 5

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