

Features

- Modern Appearance
- Stylish touch-screen LCD with backlight
- Fan coil application database pre-loaded
- Supports standalone operation on BACnet MS/TP communication failure
- RS485 communication port baud rate setting: 9,600, 19,200, 38,400 or 76,800 bps
- Pluggable wiring terminal blocks on NCU
- High performance separate Power Supply unit
- Retention of temperature set-point and fan-speed upon power failure
- Unoccupied mode contact for energy saving
- Window contact for remote system on-off control
- Digital output for on-off interlocking
- Two additional digital inputs
- One additional digital output
- 2-wire on-off, 3-wire floating and 0-10 VDC models available
- Dual-output model provides auto cooling/heating changeover with adjustable deadband
- PI Algorithm
- Remote sensor capability
- Seasonal changeover sensor availability
- Optional remote controller
- Optional energy metering objects

Selectable Functions

- °C or °F temperature display
- Retain last operation event upon power failure
- Adjustable Measured temperature off-set
- Adjustable P-band and I-time
- Selection of Actuator stroke time for 3-wire floating model
- 1 to 5 K deadband for dual-output models
- Adjustable high and low set point limit
- Adjustable cooling and heating energy-saving mode set points
- Selectable fan action in unoccupied mode
- Selectable Auto Fan sequence in heating mode
- Selectable operating mode sequence for dual-output models
- Selectable manual/auto operating sequence for single output models
- Selectable constant display of temperature between sensing or set-point



General

The NT900 Series BACnet MS/TP Touch-screen LCD Fan Coil thermostats are BACnet Master-Slave/Token-Passing (MS/TP) networked devices designed in strict accordance with ASHRAE standard 135-2010 and are native BACnet devices. The technologically advanced NT900 thermostats feature a BACnet MS/TP communication capability that enables remote monitoring and programmability for efficient space or return air temperature control.

NT900 are designed to control heating, cooling, or year round air conditioning unit in Commercial Industrial and Residential Installation. Typical Application includes the control of fan coil units, packaged terminal air conditioners and combination heating and cooling equipment. As part of the system that consists of two-way or three-way valve and a multi-speed line voltage fan.

Ordering

To order the NT900 Series thermostat, contact the nearest Cyrus' representative. Specify the desired product code number from model selection guide.

Product Overview

NT900 are line voltage BACnet MS/TP Touch-screen LCD fan coil thermostat with 8 basic models that cover all type of FCU standalone applications in addition to networking capability. NT900 consists of two units; the Networking Control Unit (NCU) and Power Supply Unit (PSU). There are models for cooling only, heating only and heating-cooling fan coil system integrate with 2-wire, 3-wire or 0-10 VDC input valve control. On-board high accuracy NTC sensor allows precision comfort control over occupied space area.

NT921 consists of NCU91 and PSU921 (220 VAC supply, 220 VAC single 2-wire on-off output)
NT921-24 consists of NCU91 and PSU921-24 (220 VAC supply, 24 VAC single 2-wire on-off output)
NT921F consists of NCU91F and PSU921F (220 VAC supply, 220 VAC single 3-wire floating output)
NT921F24 consist of NCU91F and PSU921F24 (220 VAC supply, 24 VAC single 3-wire floating output)
NT921A consists of NCU91A and PSU921A (220 VAC supply, 0-10 VDC single output)
NT922 consists of NCU92 and PSU922 (220 supply, 220 VAC dual 2-wire on-off output)
NT922-24 consists of NCU92 and PSU922F24 (220 VAC, 24 VAC dual 2-wire on-off output)
NT922A consists of NCU92A and PSU922A (220 VAC, dual 0-10 VDC output)

Model NT921 & NT921-24

The Model NT921 is BACnet networking LCD with backlight line voltage touch-screen fan coil thermostat that is designed for cooling only / heating only fan coil unit with 2-wire line-voltage valve actuator application (NT921-24 provides 24 VAC valve output). Integral with system of Cooling/Heating-Fan-Off touch-icon that allows users to cutoff power for fan and the output for valve actuator. Simply tapping the fan speed icon, allows users to select Auto-High-Med-Low fan speed. All fan outputs by relay that can withstand max. of 5 Amp (resistive) 2 Amp (Inductive) operating current.

Model NT921F & NT921F-24

The Model NT921F is BACnet networking LCD with backlight line voltage touch-screen fan coil thermostat that is designed for cooling only / heating only fan coil unit with 3-wire line-voltage valve actuator application (NT921-24 provides 24 VAC valve outputs). Integral with system of Cooling/Heating-Fan-Off touch-icon that allows users to cutoff power for fan and the output for valve actuator. Simply tapping the fan speed icon, allows users to select Auto-High-Med-Low fan speed. All fan outputs by relay that can withstand max. of 5 Amp (resistive) 2 Amp (Inductive) operating current.

Model NT921A

The Model NT921A is BACnet networking LCD with backlight line voltage touch-screen fan coil thermostat that is designed for cooling only / heating only fan coil unit with 0-10 VDC valve actuator application. Integral with system of Cooling/Heating-Fan-Off touch-icon that allows users to cutoff power for fan and regulate the output for valve actuator. Simply tapping the fan speed icon, allows users to select Auto-High-Med-Low fan speed. All fan outputs by relay that can withstand max. of 5 Amp (resistive) 2 Amp (Inductive) operating current.

Model NT922 & NT922-24

The Model NT922 is BACnet networking LCD with backlight line voltage touch-screen fan coil thermostat that is designed for cooling / heating fan coil unit with 2-wire line-voltage valve actuator application (NT922-24 provides 24 VAC valve outputs). Integral with system of Cooling-Heating-Auto-Fan-Off touch-icon that allows users to cutoff power for fan and regulate the output for valve actuator. Simply tapping the fan speed icon, allows users to select Auto-High-Med-Low fan speed. All fan outputs by relay that can withstand max. of 5 Amp (resistive) 2 Amp (Inductive) operating current.

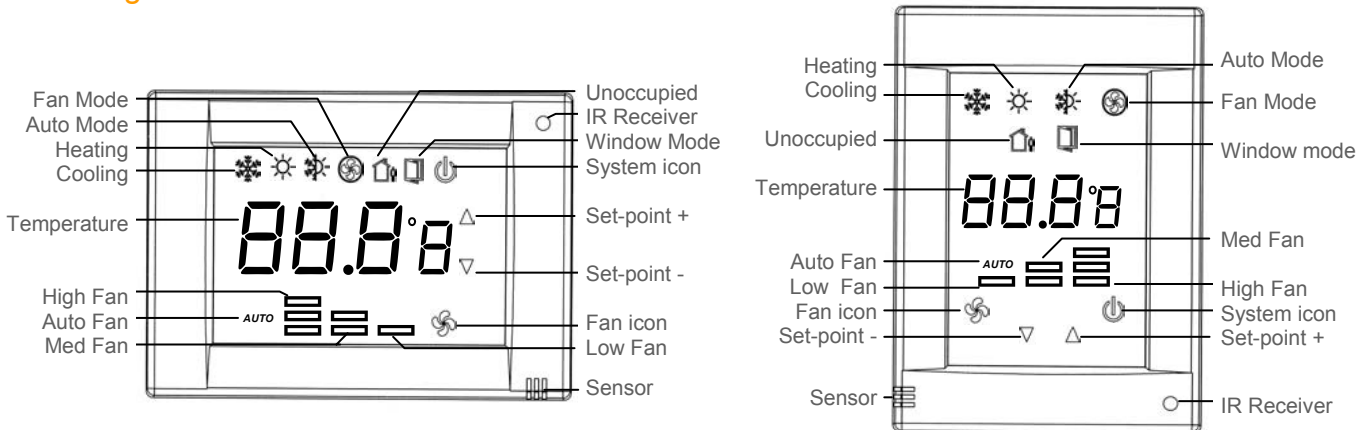
Model NT922A

The Model NT922A is BACnet networking LCD with backlight line voltage touch-screen fan coil thermostat that is designed for cooling / heating fan coil unit with 0-10 VDC valve actuator application. Integral with system of Cooling-Heating-Auto-Fan-Off touch-icon that allows users to cutoff power for fan and regulate the output for valve actuator. Simply tapping the fan speed icon, allows users to select Auto-High-Med-Low fan speed. All fan outputs by relay that can withstand max. of 5 Amp (resistive) 2 Amp (Inductive) operating current.

Mounting

The NT900 Touch Series digital room thermostats can be surface mounted or secured to a standard American 2"x 4" single gang box or a standard European 75 x 75 x 35 mm electrical box. The same mounting method is applicable to both vertical and horizontal versions. Two M3.5 mounting screws are included.

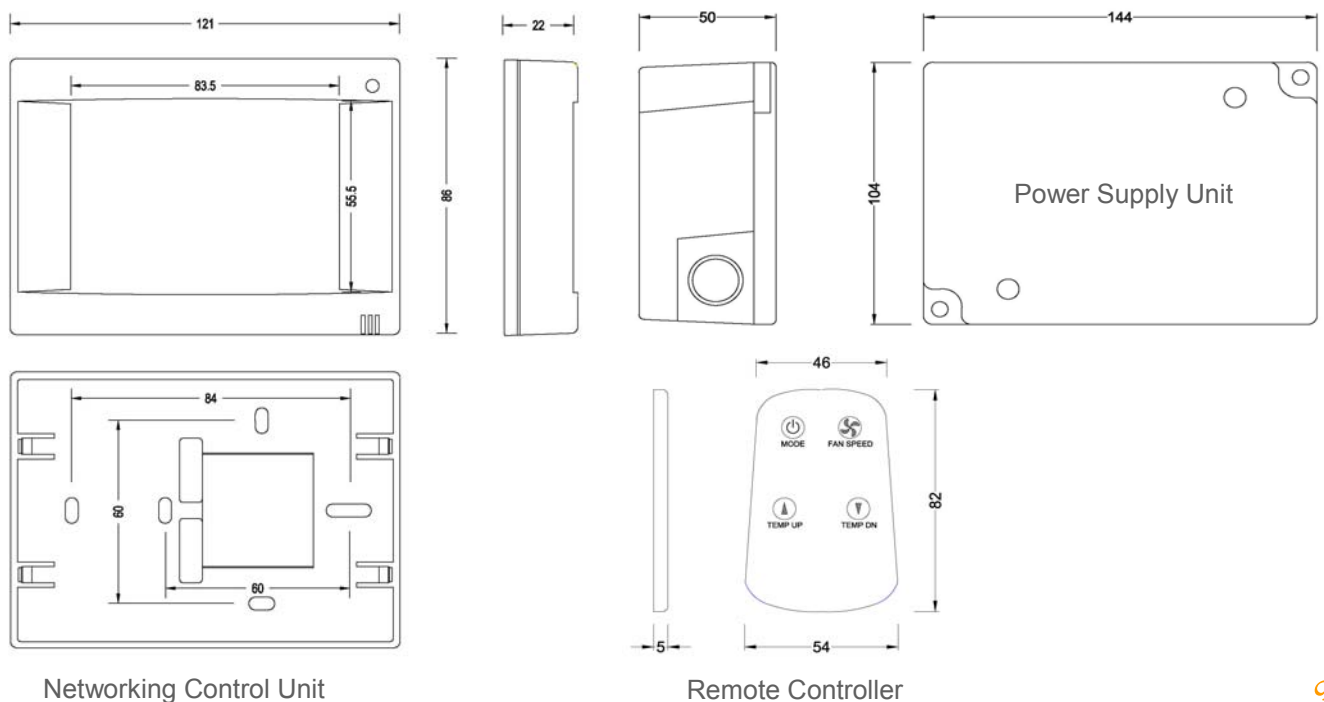
LCD Segments & Touch icons



Operation Notes

- Temperature Display LCD shows measured temperature constantly except when temperature set point adjustment is being made
- Backlight The backlight will light up for 5 seconds when any icon is tapped
- Mode of operation Tap the system icon to enter into the desired operating mode: Cooling-Heating-Auto-Fan Only-Off
- Fan speed Tap the fan icon to change the fan speed mode: High-Med-Low-Auto
- Temperature Set-point Increase or decrease temperature set point by tapping adjustment operating icons and respectively. When the adjustment icon is tapped, the LCD shows the existing set point value.
- Unoccupied Mode (Energy-saving) The energy saving mode is activated while "OCU" contact is in closure. In unoccupied mode, all buttons are locked and preset temperature set points are 26 °C and 16 °C for cooling and heating respectively. Fan speed is always set at "low".
- Window Contact Window contact closure turns off the thermostat and locks all operating icons
- Parameter setup menu **The thermostat allows authorized service agent to change the certain number of operating parameters, please refer to parameter setup manual for details.**

Dimensions in mm



Model Selection Guide

	NT9	2	1F-24	-	H
Power	2	= 220 V, 50/60 Hz	2		
Valve Control Output	1	= 2-wire line-voltage on-off (Heating only or Cooling only 2-pipe)			
	1-24	= 2-wire 24 VAC on-off (Heating only or Cooling only 2-pipe)			
	1F	= 3-wire line-voltage floating (Heating only or Cooling only 2-pipe)			
	1F-24	= 3-wire 24 VAC floating (Heating only or Cooling only 2-pipe)			
	1A	= 0-10 VDC (Heating only or Cooling only 2-pipe)			
	2	= 2-wire line-voltage on-off (Heating / Cooling 4-pipe)			
	2-24	= 2-wire 24 VAC on-off (Heating / Cooling 4-pipe)			
	2A	= 0-10 VDC (Heating / Cooling 4-pipe)	1F-24		
Options & LCD layout	H	= Horizontal LCD			
	V	= Vertical LCD			
	R	= IR Receiver for Remote Controller			
	E	= Energy Meter			H

Repair and Replacement Ordering Information

If the thermostat fails to operate within its specifications, replace the unit of the **NCU** or the **PSU** or a complete set. To order the replacement, contact the nearest Cyrus' representative. Specify the desired product code number from table above.

IMPORTANT:

The power supply to the thermostat must include overload protection. Failure to include overload protection may result in damage to the thermostat.

Use this NT900 BACnet MS/TP Touch-screen Series Line Voltage Fan Coil Thermostat only as an operating control. Where failure or malfunction of the NT900 Series Thermostat could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the system. Incorporate and maintain other devices such as supervisory or alarm systems or safety or limit controls intended to warn of, or protect against, failure or malfunction of the NT900 Series Thermostat.

Network & Cabling Requirements

To ensure network stability and reliable communications, particularly at high speeds on a BACnet MS/TP network with a number of devices, it is imperative that the following network and cabling requirements are adhered to:

Cabling	<p>It is recommended to use networking cabling that matches the following specifications:</p> <ul style="list-style-type: none"> Balanced 100 to 120 ohms nominal impedance, 22 or 24 AWG Twisted Shielded Pair (TSP) Cable Nominal capacitance of 52 pF/m or lower Nominal velocity of propagation of 66% or higher Terminating the shield to ground at one end only for each isolated segment will prevent ground loops in the shield and drain RF energy to ground. Grounding at the BACnet router or controller is preferred.
Topology	Ensure the MS/TP network cable is installed as a daisy chain from one device to the next.
Maximum Nodes	The maximum number of devices is 32 per MS/TP network segment and 64 per network trunk with one repeater.
Terminator	A terminator of 120-ohm impedance must be installed at each end of each MS/TP network segment, or two per MS/TP network.
Repeater	A repeater is not necessary unless more than 32 nodes will be installed on a network or the MS/TP network is extended beyond 1,000 m.

Wiring Diagrams and Application Notes

The NT900 thermostats consist of two basic units: the Network Control Unit and the Power Supply Unit. While all line-voltage wiring is terminated at the Power Supply Unit, all connections between Network Control Unit and Power Supply Unit are of low-voltage signaling wires.

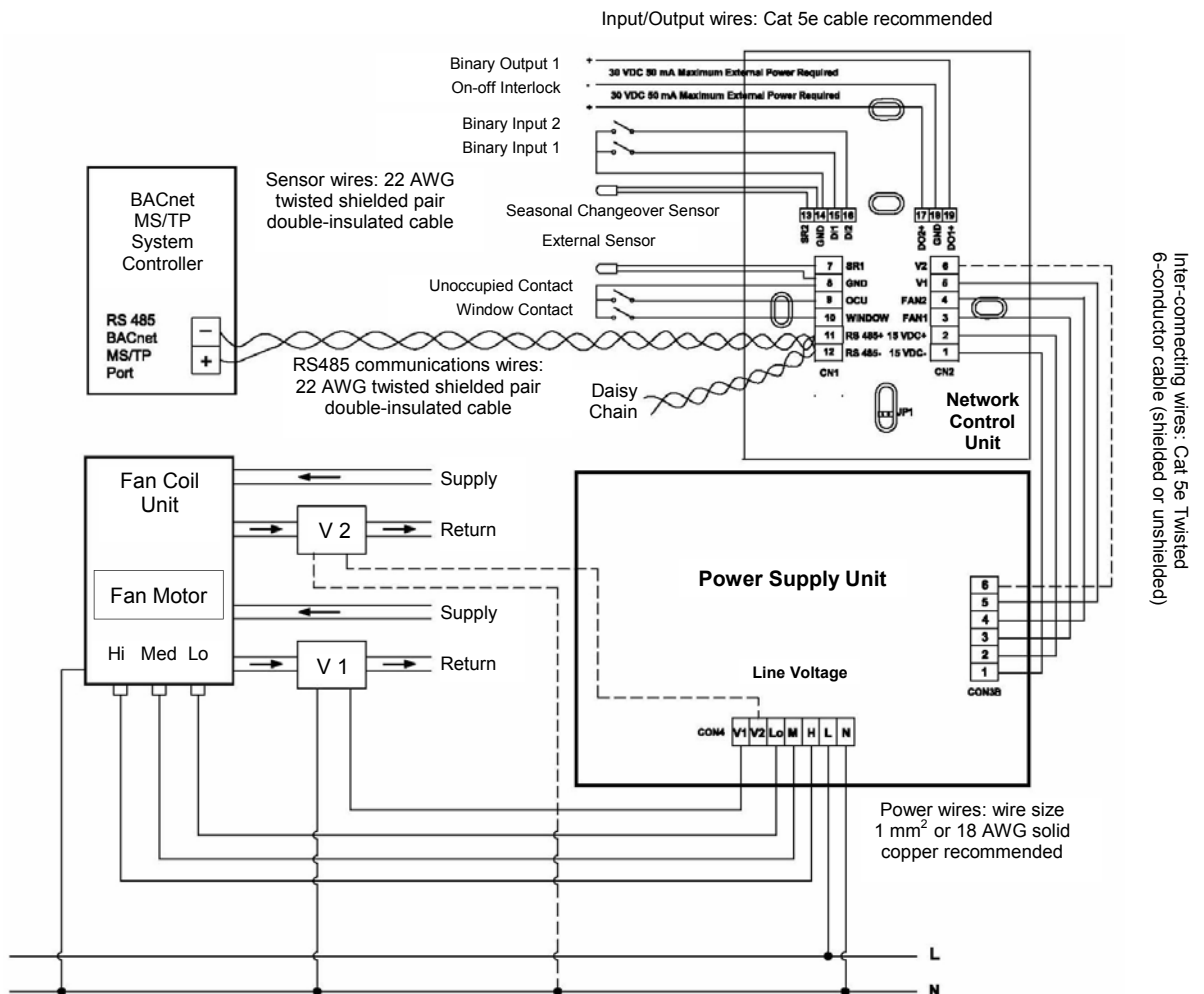
- Cut jumper JP1 if external sensor is wired to SR1 and GND. Run the wiring away from any electrical motors or power wiring. Failure to do so may result in poor thermostat performance due to electrical noise.
- 22 AWG twisted shielded pair double-insulated cable is recommended as remote sensor wiring and its length must not exceed 25 m.
- Do not bundle and run power wiring and remote sensor wiring in the same conduit.
- Connecting wires between Network Control Unit and Power Supply Unit must not exceed 15 m.
- Seasonal changeover sensor or switch is only applicable to heat only or cool only 2-pipe model only.
- The seasonal changeover sensor should be wrapped around the supply water pipe when associated with a water system. When the changeover sensor temperature exceeds 30 °C, the thermostat enters into heating mode.
- Unoccupied contact closure activates energy saving mode.
- Window contact closure locks out all thermostat functions.
- Digital output 2 is programmed as thermostat on-off status interlock output.
- Hidden-line wiring for Terminals V2 and 6 are applicable to dual-output model only.
- The thermostat outputs are designed for controlling zone valves. If used for controlling electric heaters, external contactors must be used.

More wiring diagrams are available, please contact the nearest Cyrus' representative for details

WARNING

Incorrect wiring connection may cause permanent equipment damages to the thermostat

Wiring Diagrams applicable to NT921 & NT922



Specifications

Product	NT900 Series BACnet MS/TP Networking Touch-Screen Thermostat	
	NT921	2-wire 220 V on-off Heating only or Cooling only 2-pipe
	NT921-24	2-wire 24 V on-off Heating only or Cooling only 2-pipe
	NT921F	3-wire 220 V floating Heating only or Cooling only 2-pipe
	NT921F-24	3-wire 24 V floating Heating only or Cooling only 2-pipe
	NT921A	0-10 VDC Heating only or Cooling only 2-pipe
	NT922	2-wire 220 V on-off Heating / Cooling 4-pipe
	NT922-24	2-wire 24 V on-off Heating / Cooling 4-pipe
	NT922A	0-10 VDC Heating / Cooling 4-pipe
Power	220 V, ±10%, 50/60 Hz	
Temperature display range	5-35°C in 0.5 K increments: accuracy ±1 K	
Temperature set point range	5-35°C in 0.5 K increments	
Temperature set point limits	5-35°C	
Sensing element	NTC thermistor, 10 kΩ @ 25°C, accuracy ± 0.5 K @ 25°C	
Binary inputs	3 binary inputs for external voltage-free contacts (including Unoccupied / Window Contact)	
Binary outputs	2 photo-coupler outputs for 30 VDC@50mA external power (including on-off interlocking output)	
RS-485 communication speed	Selectable baud rate at 9600, 19200, 38400 or 76,800 bps	
Maximum number of BACnet	9999 thermostat addresses: from 0001 to 9999 by Software Setup	
BACnet MS/TP network	Maximum 32 devices and maximum 1,000 m cable length per segment; segments per network trunk with one repeater; maximum 64 devices per only one segment allowed at 76,800 bps baud rate	
Enclosure	Material: Self-extinguishing, molded ABS Finish: Off white housing	
Protective class	IP30	
Electrical ratings	Valve output (on-off and 3-wire floating models)	220 V, 5 A (2A)
	Valve output (on-off and 3-wire floating models)	24 V, 0.3A (0.3 A)
	Valve output impedance (0-10 VDC models)	Minimum 10,000 Ω
	Fan output relays	220 V, 5 A (2 A)
	Total rating	220 V, 5 A
Ambient/Storage temperature	0 to 55°C / -30 to 50°C, 10 to 90% RH non-condensing	
Termination	Non-removable terminal blocks on PSU Pluggable terminal blocks and sockets on NCU	
Certifications	CE	
Shipping weight	Approx. 600g	
Dimensions	See Dimension drawing	

The specification above are normal and conform to generally acceptable industry standard. Cyrus is not responsible for damages resulting from misapplication or misuse of its products.