NPB SERIES BACNET COMMUNICATING CONTROLLER

NETWORKING CONTROLLERS

NPB SERIES

NPB series BacNet Communicating Cabinet/Box mounted Controller. The NPB is programmable electronic universal controller with communication capabilities.

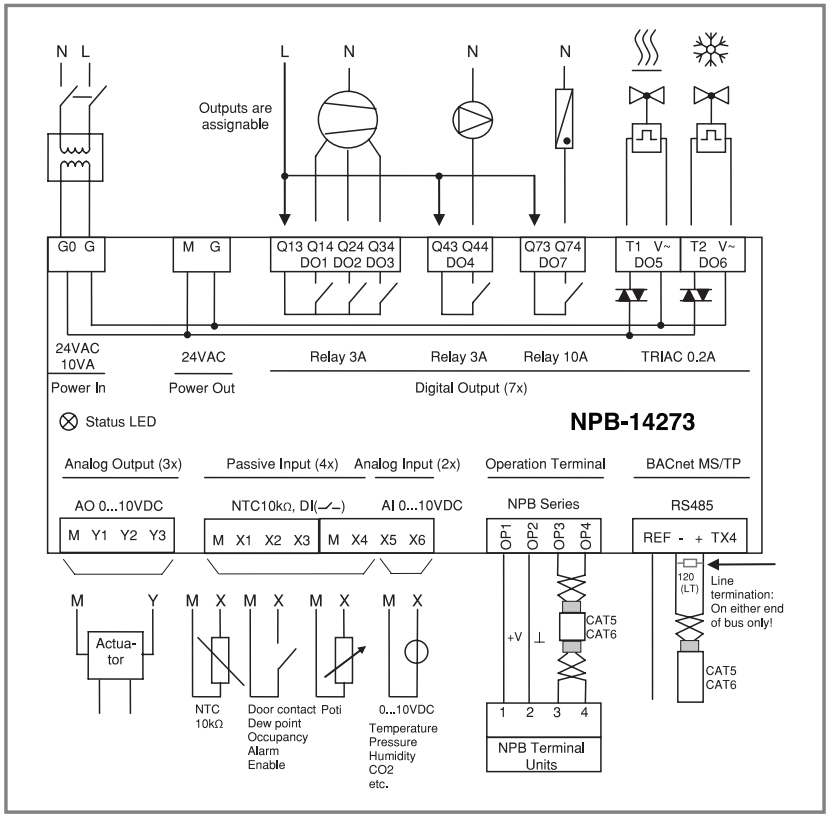
PRODUCT FEATURE

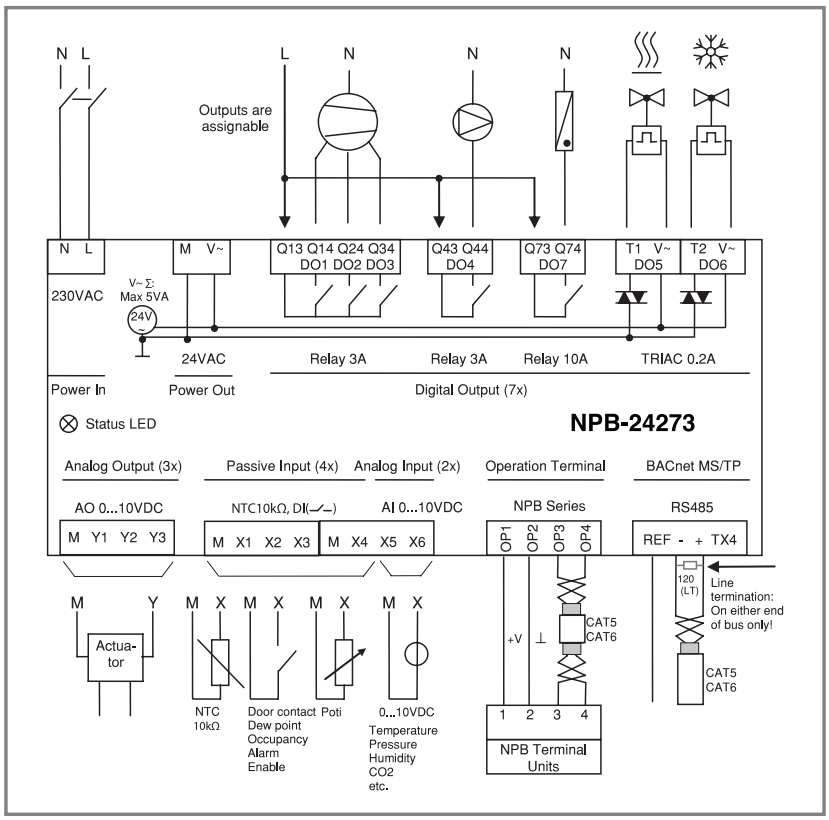
- BACnet™ MS/TP communication over RS485
- BACnet™ B-ASC device profile
- Models for 24VAC or 230VAC power supply
- RS485 bus communication with remote operation terminal NDB500
- Universal PI and/or binary control for any analog input/output signal and range
- Multiple auxiliary functions: heat-cool auto changeover, automatic enable, set point compensation
- Free heating or cooling with economizer function based on enthalpy or temperature
- Differential, averaging, min and max functions
- Cascading of control loops
- 8 free assignable alarm or interloTck conditions, Selectable state of each output on alarm condition
- Transmitter function for inputs and set points
- Functions for dehumidifying, set point shift and many more
- Password protected and lockable settings
- Annual and 7-day programmable schedules for change of operation mode, set points and position of manual outputs. Note: no real time clock included. Time need to be synced every 24 hours.
- Clone parameter sets with plug-in memory card – easily transport application parameters to multiple controllers
- Program and monitor using free pc software: EasySet!

TECHNICAL SPECIFICATION

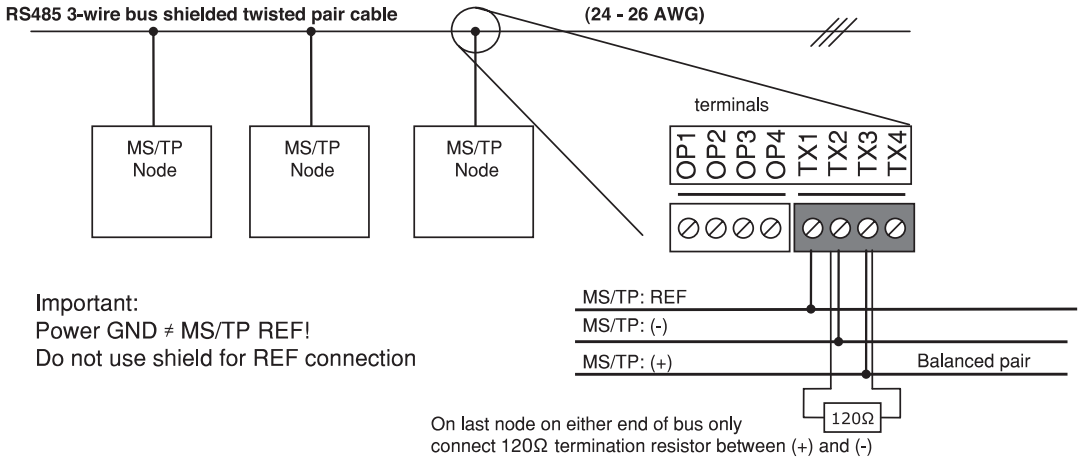
MODEL NUMBER	**NPB -14273**	2 Loop, 4 passive inputs, 7 Binary outputs, 3 Analog outputs Controller 24VAC/DC with BACnet® MS/TP
	NPB -24273	2 Loop, 4 passive inputs, 7 Binary outputs, 3 Analog outputs Controller 230VAC/DC with BACnet® MS/TP
POWER CONSUMPTION	Max. 10 VA	
SIGNAL INPUT	Passive input	X1 to X4, Passive Temperature NTC or open contact
	Analog input	X5 to X6
	Input signal	0...10 V
	Resolution	9.76 mV (10 bit)
	Impedance	98kΩ
SIGNAL OUTPUT	Analog outputs	Y1 to Y3
	Output signal	DC 0...10 V
	Resolution	9.76 mV (10 bit)
	Maximum load	≥1kΩ
RELAYS OUTPUT	DO1, DO2, DO3, DO4	0…250 VAC, 0...30 VDC full-load current 3A (1.5)
	DO7	0…250 VAC, 0...125 VDC full-load current 10A (5A)
TRIAC OUTPUT	DO5 (T1), DO6 (T2)	24VAC (provided by NPB), 0.2A max. (switched to M) Note: Combined load of both TRIAC and any device connected to power output must not exceed 5VA!
CONNECTION TO REMOTE TERMINAL	Hardware interface	RS485 in accordance with EIA/TIA 485
	Cabling	Twisted pair cable category 5 or 6
NETWORK	Hardware interface Max nodes per network Nominal Max nodes per segment	RS485 in accordance with EIA/TIA 485 128 64 (Nenutec devices only)
	Conductors Impedance Nominal capacitance	Shielded Twisted Pair (STP) cable 100 - 130 ohm 100 pF/m 16pF/ft. or lower
	Galvanic isolation	The communication circuitry is isolated
	Line termination	A line termination resistance (120 ohm) shall be connected between the terminals (+) and (-) of the furthermost node of the network
	Network topology	Daisy chain according EIA/TIA 485 specifications
	Recommended maximum length per chain	1200 m (4000 ft.)
BACNET™ COMMUNICATION STANDARD	BACnet™ MS/TP Master on RS485	
BACNET™ COMMUNICATION SPEED	9600, 19200, 38400, 57600, 76800, 115200	
ENVIRONMENT	Operation temperature & RH: 0 to 50°C; <85% RH Non-condensing	
CERTIFICATION	CE with EMC directive 2004/108/EC & Low voltage directive 2006/95/EC	
DEGREE OF PROTECTION	IP00 to EN 60 529	
BODY MATERIAL	Fire Proof ABS plastic	
DIMENSIONS (H X W X D)	57 x 147 x 115 mm (2.3 x 5.8 x 4.5 in)	
WEIGHT	NPB-14273: 380g (13.4 oz.) NPB-24273: 660g (23.3 oz.)	

WIRING DIAGRAM





BUS CONNECTION



FAIL SAFE BIASING

The device supports fail-safe biasing (line polarization). 680Ω per wire, maximum 1 set per RS485 segment

SHIELD CONNECTION

See Ashrae standard 135 for detailed recommendation regarding how to connect the shield depending on type of nodes present in network. Nenutec Controls bus modules are isolated devices.

WIRE TYPE

An EIA-485 network shall use shielded, twisted-pair cable for data signaling with characteristic impedance between 100 and 130 ohms. Distributed capacitance between conductors shall be less than 100 pF per meter (30 pF per foot). Distributed capacitance between conductors and shield shall be less than 200 pF per meter (60 pF per foot). Foil or braided shields are acceptable.

LINE TERMINATION

On last node on either end of bus only connect 120Ω termination resistor between (+) and (-).

MAXIMUM LENGTH

The maximum recommended length per segment is 1200 meters (4000 feet) with AWG 18 (0.82 mm2 conductor area) cable.

SHIELD CONNECTION

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LED INDICATOR

A status LED is located on the upper left side of the controller housing. During normal operation the LED blinks briefly once every 5 seconds. If there is an alarm or fault condition it will blink every second.

The BACnet interface features a green LED and a red LED for indication of traffic on the RS-485 bus. The green LED is lit when an incoming packet is received, and the red LED is lit when an outgoing packet is transmitted to the bus.

At power-up, both LED blink twice simultaneously as a sign of the boot process being completed. A constantly lit LED serves as an indication of a fault condition in the reception or sending process.

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BACNET® SPECIFICATION

PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS)

Vendor Name: **NENUTEC**

Product Name: NPB Controls series

NPB product description: The NPB communicating BACnet® controllers are designed as universal controls equipment suitable for a large number of applications. They may be used in zoning and other applications which are monitored by a BACnet® MS/TP network.

SUPPORTED BACNET® INTEROPERABILITY BLOCKS (BIBB)

The BACnet® interface conforms to the B-ASC device profile (BACnet® Application Specific Controller).
The following BACnet® Interoperability Building Blocks (BIBB) is supported.

BIBB	TYPE	NAME
DS-RP-B	Data sharing	Read property - B
DS-RPM-B	Data sharing	Read property multiple - B
DS-WP-B	Data sharing	Write property - B
DM-DCC-B	Device management	Device communication Control - B
DM-DDB-B	Device management	Dynamic device binding - B
DM-DOB-B	Device management	Dynamic object binding - B
DM-TS-B	Device management	Time synchronisation - B
DM-UTC-B	Device management	UTC Time synchronisation - B
DM-RD-B	Device management	Reinitialize device - B

SUPPORTED STANDARD BACNET® APPLICATION SERVICES

Read Property	I-Am	I-Have
Read Property Multiple	Device Communication Needs a password which is “Nenu” (case sensitive and without the quotes)	Reinitialize Device (“cold” or “warm”). Needs a password which is “Nenu” (case sensitive and without the quotes).
Write Property	UTC Time Synchronisation	Time Synchronisation

SUPPORTED STANDARD OBJECT TYPES

- Device
- Analog input
- Analog value
- Binary value
- Multi-state value

LED INDICATORS

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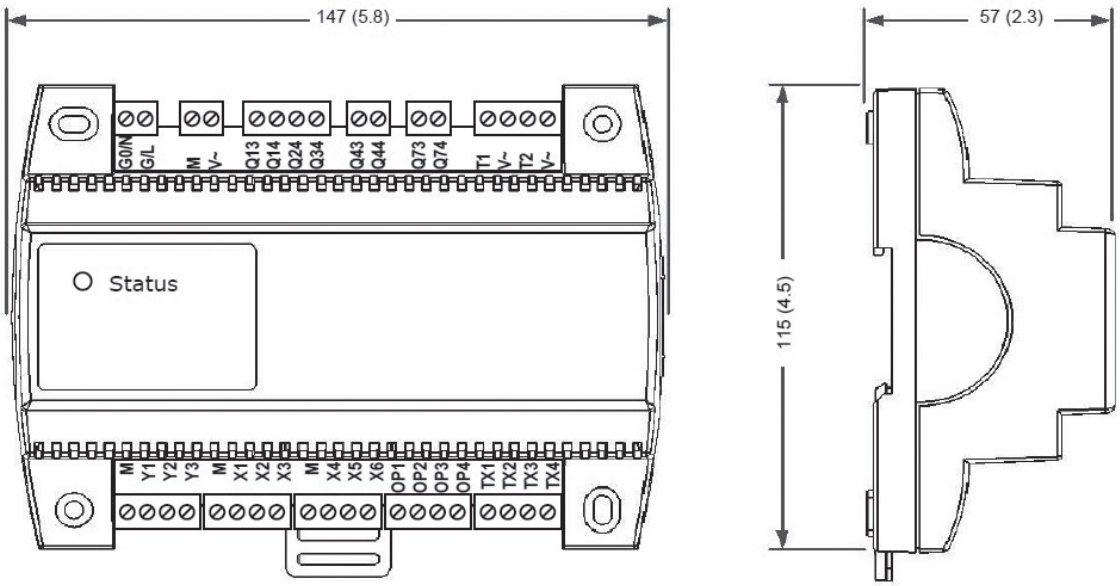
DIMENSION (mm)



SELECTION OF ACTUATORS AND SENSORS

TEMPERATURE SENSOR	For connections on X1 to X3 use Nenutec NTC sensors to achieve maximum accuracy
ACTUATOR	Choose modulating actuators with an input signal type of 0/2-10 VDC. 3-point actuators with constant running time are recommended
BINARY AUXILIARY DEVICES (E.G. PUMPS, FANS, ON/OFF VALVES, HUMIDIFIERS, ETC.)	Do not directly connect devices that exceed specified limits in technical specifications – observe startup current on inductive loads
ELECTRICAL CONNECTION	Use only twisted pair copper conductors for input connections. The operating voltage must comply with the requirements for safety extra-low voltage (SELV) as per EN 60 730
FOR DEVICE WITH 24VAC POWER SUPPLY	Use safety insulating transformers with double insulation. They must be designed for 100% ON-time. When using several transformers in one system the connection terminal 1 must be galvanically connected. The NPB is designed for operation by AC 24 V, max. 10 Amp, safety extra-low voltage that is short-circuit-proof. Supplying voltages above AC 24 V may damage or destroy the controller or any other connected devices Additionally, connections to voltages exceeding 42 V endanger personnel safety. Observe limits mentioned in the technical specifications. Local regulations must be observed at all times.