OrionM2M

FAN COIL ROOM THERMOSTAT

NT-303 · NT-304

LoRaWAN EU868 / IN865 / KZ865 / RU864 · Class C · 100 … 240 V AC supply · IP20



01 FEATURES

- For 2- and 4-pipe fan coils: relay or 0–10 V outputs
- 2.7" E-ink screen: temperature, humidity, target temp. and mode
- Temperature and humidity sensors, NTC sensor input
- Input for a keycard switch or window sensor
- 8 schedule plans, freeze protection
- Configuration via mobile app (NFC) and downlink commands

APPLICATIONS

- Remote climate control via LoRaWAN
- Group control via multicast
- Replacing wired fan coil controllers
- Energy saving: keycard, open-window detection

02 GENERAL

Screen	**2.7" E-ink**	black & white
Control buttons	**5**	
Configuration	**NFC · downlink**	
Power supply, 50…60 Hz	**100 … 240**	V AC
Power consumption, no load	**< 2**	W
Operating temp.: device · screen	**–20 … +60 · 0 … +40**	°C
Operating RH, non-condensing	**0 … 95**	%
Housing (UL94 V0) · protection	**PC + ABS, white**	IP20
Dimensions	**86 × 86 × 42**	mm
Wall box: square / round	**86 / 60**	mm
Wire cross-section (AWG 26…14)	**0.13 … 2.08**	mm²

03 MEASUREMENT

Temperature · resolution	**–20 … +60 · 0.1**	°C
T accuracy: 0…+60 / –20…0	**±0.5 / ±1**	°C
Humidity · resolution	**0 … 100 · 0.1**	% RH
RH accuracy: typ. / max	**±2 / ±5**	% RH

04 FAN COIL CONTROL

VALVES / FAN	3-SPEED	EC 0–10 V
2-pipe: 2- / 3-wire on/off	**NT-303**	**NT-304**
2-pipe: 0–10 V	**NT-304**	**NT-304**
4-pipe: 2 × 2-wire on/off	**NT-303**	**NT-304**
4-pipe: 2 × 0–10 V	**NT-304**	—

Outputs: NT-303 / NT-304	**5 relays / 3 relays, 2 × 0–10 V**	
Relay current: resistive / inductive	**4 / 3**	A
Target temp. · selectable step	**5 … 35 · 0.5 / 1**	°C
Modes	**heat · cool · ventilation**	
Inputs: NTC · dry contact (DI)	**1 · 1**	

05 LORAWAN

Specification version	**1.0.2 / 1.0.3**	
Class · activation	**C · OTAA / ABP**	
Frequency plans	**EU868 · IN865 · KZ865 · RU864**	
Tx power (868 MHz) · sensitivity	**16 · –137**	dBm
Antenna	**internal**	
Reporting interval (def. 10)	**1 … 1440**	min

06 ORDER INFO

SKU	DESCRIPTION
NT-303/[F] **NT-304/[F]** F — frequency plan	**LoRaWAN thermostat for 2- and 4-pipe fan coils**

MODEL
- NT-303 — 5 relays: on/off valves, 3-speed fan
- NT-304 — 3 relays, 2 × 0–10 V: 0–10 V valves or EC fan

F — FREQUENCY PLAN
- EU — EU868
- IN — IN865
- KZ — KZ865
- RU — RU864

PACKAGE CONTENTS
- thermostat
- 2 M4×25 screws, M2×4 fixing screw
- signal cable for the DI input
- product passport, warranty card

NT-303 · NT-304

INTEGRATION REFERENCE

07 LORAWAN PROTOCOL

Default FPort · payload format	**85 · ID + data**	little-endian
Retries if no ACK	**1**	
Link check (OTAA)	**LinkCheckReq**	fail: rejoin
Network time sync, LoRaWAN 1.0.3	**DeviceTimeReq**	every 5 days
Multicast · OTA firmware update	**4 groups · FUOTA**	

08 UPLINK FIELD MAP

ID	FIELD	DATA
PERIODIC REPORT: BY INTERVAL AND ON SETTING CHANGE		
01	Temperature	INT16/100 · °C
02	Relative humidity	UINT16/10 · %
03	Active target temperature	INT16/100 · °C
04	T source: internal, NTC, server, sensor	00 … 03
05	Temperature control mode · status	4 + 4 bits
06	Valve: 0 / 100; NT-304 — 0…100	UINT8 · %
07	Fan: mode and speed	4 + 4 bits
08	Schedule plan; ff — not executed	00 … 07
67	Fan coil off / on	00 / 01
EVENTS		
09	Temperature alarm: type, value	1 + 2 bytes
0a	Humidity: error, out of range	00 … 03
0b	Target temp. invalid: ventilation	03
10	Relay: bits 0–2 Low…High / Q1…Q3, 3–4 V1, V2	UINT32
BASIC INFORMATION — ON NETWORK JOIN		
da	Hardware · software versions	2 + 2 + 4 bytes
db	Serial number	8 bytes
cf00	Device class	02 = Class C

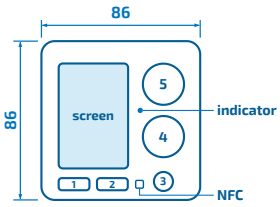
Example: 01040b 025402 03a406 0400 0510 0600 0700 08ff 6701 — 28.2 °C; 59.6 % RH; target 17 °C; internal sensor; heat, standby; valve closed; fan auto, off; schedule not executed; fan coil on. Field 05: bits 7–4 / 3–0 — mode / status: 0 ventilation / standby, 1 heat, 2 cool. Field 07: bits 7–4 — mode (0 auto, 1…3 — low…high speed), 3–0 — current speed (0 off, 1…3). Alarm 09, type: 00…03 — error, out of range (1 byte); 10…17 — thresholds; 20…23 — persistent deviation; 30…31 — freeze protection; 32…33 — open window; for 10…33 even code — cleared, odd — triggered. Also sent on network join: df, d9 (2 bytes each), c8 (1 byte); after reset — ee (0 bytes).

09 KEY DOWNLINK COMMANDS

ID	FUNCTION	DATA
67	Fan coil: turn off / on	00 / 01
68	Ventilation / heat / cool	00 / 01 / 02
6b / 6c	Heat / cool target temperature	INT16/100 · °C
72	Fan: auto / 3 speeds	00 / 01 … 03
5e	Execute schedule plan 1…8	00 … 07
75	Child lock (buttons)	00 / 01 · mask
62	Reporting interval, s / min	00 / 01 · UINT16
90	Relay change report	00 / 01
85	T source; for 02, 03 — 2 more bytes	00 … 03 · min · 00 … 02
5b	Temperature from server	INT16/100 · °C
b9 / be	Report enquiry / reboot	–
NT-304 ONLY: 0–10 V VALVE, EC FAN		
7d00	Valve adjustment range, 1…15	INT16/100 · °C
7d01	Valve opening: min, max	2 × UINT8 · %
7d02	Valve control interval, 1…60	UINT8 · s
7e00…02	EC fan: low / mid / high, 1…100	UINT8 · %
8f	Valve in standby: min / 0 %	00 / 01

Examples: 6c6009 — cool target temperature 24 °C; 750111 — lock button 3, reboot and reset (bits 0 and 4); 85023c02 — T source: server; if no data for 60 min (1…60), use internal sensor (code 02; 00 — keep current status, 01 — close valve and switch to ventilation); 7d00e803, 7d011464 — adjustment range 10 °C, opening 20…100 %. Target temperature is accepted within the range set for the mode. Reply in Confirmed mode: ef, result byte (bits 7–4 — code: 0 — success; 3–0 — ID length), command ID; example: ef016c.

10 DIMENSIONS AND MOUNTING



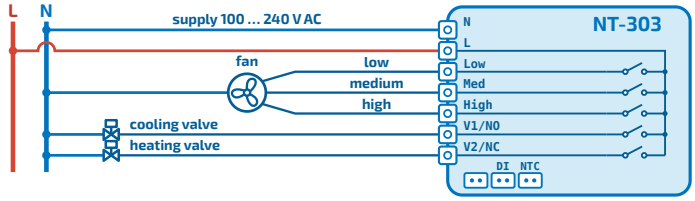
Dimensions in mm; depth 42, front part 12

Wall box 86 mm square or 60 mm round; 118 and 120 mm — via the wall plate (optional).

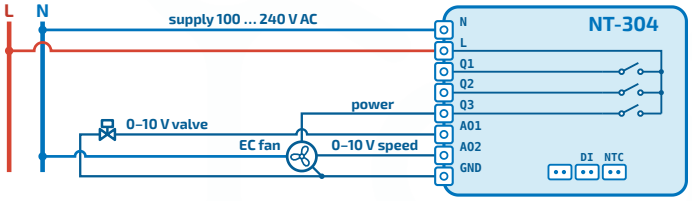
Mounting switch off the power; remove the terminal block, connect the wires, screw the block to the box; fit the device, tighten the fixing screw.

Buttons 1 — mode, 2 — fan, 3 — on/off, 4 and 5 — target temperature "–" and "+"; hold 1 and 3 for over 3 s — reboot, over 10 s — reset.

11 WIRING



NT-303: 4-pipe, 2-wire valves, 3-speed fan



NT-304: 2-pipe, 0–10 V valve, EC fan

NT-303: SYSTEM TYPE	V1/NO	V2/NC
2-pipe · 2-wire valve	**valve**	**—**
2-pipe · 3-wire valve	**open**	**close**
4-pipe · 2-wire valves	**cooling**	**heating**

Set the system type and DI function via NFC after installation. Capacitive loads on relays are not permitted. NTC — 10 kΩ ±1 %, B = 3950 K; DI — physical switches only. On NT-304, GND is the 0–10 V common.

NT-304: SYSTEM TYPE	Q1	Q2	Q3	AO1	AO2
2-pipe · 0–10 V valve	**low · medium · high**			**valve**	**—**
4-pipe · 0–10 V valves	**low · medium · high**			**cooling**	**heating**
2-pipe · 0–10 V · EC	**—**	**—**	**power**	**valve**	**speed**
2-pipe · 2-wire · EC	**valve**	**—**	**power**	**—**	**speed**
2-pipe · 3-wire · EC	**open**	**close**	**power**	**—**	**speed**
4-pipe · 2-wire · EC	**cooling**	**heating**	**power**	**—**	**speed**