

NRT 105: Electronic fan-coil controller, equiflex

How energy efficiency is improved

ECO Meter for displaying the current energy consumption and digital input for the change-over between presence and absence

Features

- Individual single room, apartment and zone temperature control in 2- and 4-pipe systems for heating, cooling or heating/cooling
- Automatic activation of the valves (heating/cooling)
- P controller with pulse-pause or analogue output (0...10 V)
- Measurement of room temperature by either integrated or external temperature sensor
- Input for C/O signal
- Easy to use with frontal keys and large LCD
- 3-speed fan control with configurable on/off switching points for each level
- Frost-protection/anti-overheating functions
- Hours-run meter

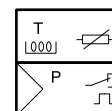
Technical data

Power supply		
Power supply		110...230 V~/24 V~
Tolerance in power supply		±15%, 50...60 Hz
Power consumption		< 1 VA
Parameters		
	Max. switching capacity of internal sensor (NTC)	2(1.6) A, 250 V~
	Max. switching capacity of external sensor (Ni1000)	5(3) A, 250 V~
	Setting range ¹⁾	8...37 °C
	Proportional band	1...20 K
	Operating modes	Normal, reduced (N/R)
	Dead zone (N/R)	0...10 K/0...12 K
Temperature sensor, internal	Time constant	22 min
	Dead time	2 min
	Frost-protection temperature	8 °C (when heating OFF)
	Thermal overload temperature	38 °C (when cooling OFF)
Additional data for NRT105F011	Switching interval	4...30 min
	Control factor	indicated in ten levels
	Min. pulse	30 s
Ambient conditions		
	Admissible ambient temperature	0...50 °C
	Admissible ambient humidity	5...95% rh, no condensation
Indicators, display, operation		
	Display range, actual temperature	-8...50 °C
Construction		
	Weight	0.27 kg
	Housing material	fire-retardant thermoplastic
	Housing	pure white (RAL 9010)
	Fitting	wall fitting/recessed junction box
	Screw terminals	for wires of up to 2.5 mm ²
	Cable feed	at rear
Standards and directives		
	Type of protection	IP 30 (EN 60529)
	Protection class	II (IEC 60730)
	Software class A	EN 60730

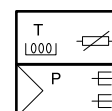
¹⁾ Depends on the setting parameters P05, P08



NRT105F0*1



NRT105F011



NRT105F061



CE conformity as per	EMC directive 2004/108/EC	EN 61000-6-1, EN 61000-6-2 EN 61000-6-3, EN 61000-6-4
	Low-voltage directive 2006/95/EC	EN 60730-1

Overview of types

Type	Control characteristics	Power supply	Type of installation	Outputs for fan	Valve outputs
NRT105F011	P, quasi-continuous	110...230 V~	2-, 4-pipe	Relay, 3 stages	Relay
NRT105F061	P, continuous, 0...10 V	24 V~	4-pipe	Relay, 3 stages	0...10 V, load > 4 kΩ, max. 2.5 mA

Accessories

Type	Description
AXT2**	Thermal valve actuators (see product data sheet)
AXM***	Motorised valve actuator (see product data sheet)
EGT***	External temperature sensor Ni1000 (see product data sheet)
0303124000	Recessed junction box

Description of operation

The room temperature is measured by a precision temperature sensor and compared with the current setpoint. Depending on the control offset and the control characteristic, the heating/cooling in the room is increased or decreased and the required room temperature is kept constant. Optimal comfort is ensured by the fully-automatic controlling. For individual temperature requirements, the time-limited and time-unlimited manual operating modes are available for using the absence and presence functions.

The operating status of the system is shown on the display (LCD) with visual symbols and a numerical field. Service mode is available for adapting the device to the installation etc. The following can be parameterised: the control behaviour, the switching points of the blower levels, the frost-protection and anti-overheating functions, the anti-jamming function for valves, the setpoint limiting, etc.

Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product documents must also be adhered to. Changing or converting the product is not admissible.

Engineering and fitting notes

The device must be supplied with power all year round due to the frost-protection, anti-overheating and valve anti-jamming functions.

The unit should be fitted approx. 1.5 m above the floor, and protected from direct sunlight, draughts and sources of heat and cold.

Additional technical data

Temperature setpoint	23 °C (factory setting)
Time-limited changing of operating mode	2...9 hours, with the remaining time displayed
SERV parameters	Non-volatile EEPROM
Temperature measurement	NTC sensor (internal)
Input for ext. temperature sensor	Ni1000; selectable internally/externally (closes dew-point switch and switches off c/o input respectively)
Zero-point correction, e.g. influence of wall	±6 K
Granularity for setpoints	0.5 K
Granularity for display of actual value	0.1 K
Measuring accuracy	0.3 K at 20 °C

Setting limit for setpoint	Limitable minimum and maximum setpoints via SERV (T_{\min} , T_{\max}), factory setting not limited
Universal input PROG	For external potential-free gold-plated contacts. Multiple controllers can be connected in parallel to one contact, but connecting more than 20 is not recommended. Cross-section of cable $\geq 0.5 \text{ mm}^2 \text{ Cu}$ and distance for contact controller $\leq 100 \text{ m}$.

Suitable for one of the following functions:

	Absence	Energy-saving operation with "reduced" temperature level
	Presence	Normal temperature level (N)
	Window contact	Reduced temperature level (R)
	External clock	Extended dead zone (temperature level reduced, R)
	Remote control	Stand-by/normal mode
	Malfunction (e.g. filter contamination)	Display with warning symbol
	Keyboard locking (key switch)	Display with symbol

TEMP input for external potential-free gold-plated contacts

Dew point	Cooling off (closes ext. temperature sensor and C/O off)
Changeover (C/O)	For 2-pipe system, only F011 (closes ext. temperature sensor and temperature detector off)
Anti-jamming function for valve	After a week, the valve outputs are activated for 0...15 minutes if none of the valves has been activated previously (adjustable)
Frost-protection and anti-overheating functions	Selectable via SERV, without display of setpoint
Child protection	Locked and unlocked using key sequence; display with symbol
Valve output	With indication of switching status
Ventilator control	Automatic level 0, 1, 2, 3. Manual override with level 1, 2, 3, with indication of switching status; heating without fan possible; however, the priority of manual fan control remains for ventilation purposes. Minimum fan speed level 0 or 1 selectable (for channel controller)
Mode of operation in accordance with EN 60730	Type 1C, normally-open contacts, partially with power applied - see connection diagrams
Hours-run meter for fan	Can be queried via SERV 0...9990 h; non-deletable
Relay switching frequency, mechanical	> 5 million.

SERV parameters with factory settings (setting range)

P01:000	TEMP input	0 = external temperature 1 = dew point 2 = C/O (only F011) See table below ²⁾
P02:000	Type of sensor	0 = NTC 1 = Ni1000 ³⁾
P03:000	NTC influence of wall	(-60...60 = $\pm 6 \text{ K}$)
P04:000	Ni1000 influence of wall	(-60...60 = $\pm 6 \text{ K}$)
P05:020	2 K proportional band X_p heating and cooling valves (010...200)	
P06:004	4 min. period t_p heating and cooling valves (004...030)	
P07:008	0.8 K dead zone normal X_{tn} (002...98)	
P08:100	10.0 K dead zone extended X_{tr} (004...120) $X_{tr} > X_{tn}$	
P09:030	30 % cut-in point for 1st fan level G1 in % of P band (005...040)	
P10:090	90 % cut-in point for 2nd fan level G2 in % of P band (020...120)	
P11:120	120 % cut-in point for 3rd fan level G3 in % of P band (040...160); $G1 \leq G2 \leq G3$	
P12:015	15 % switching difference for fan X_{SdG} in % of P band (005...040)	
P13:002	2 min. fan follow-up t_G (000...010) when fan switched off automatically	
P14:000	Fan function for heating and cooling = 0 Only for cooling = 1	

²⁾ Dew point sensor or c/o input and Ni1000 sensor are mutually exclusive

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P15:000	Minimum fan speed level G1	0 = inactive 1 = active ⁴⁾
P16:000	Contact input PROG: See table below	
P17:000	Frost-protection and anti-overheating functions	0 = active <i>graphic</i> 8 °C 1 = active <i>graphic</i> 38 °C 2 = active <i>graphic</i> and <i>graphic</i> 3 = inactive
P18:000	Anti-jamming function for valve (0 = inactive, 1...15 = active minutes)	
P19:014	Minimum limitation setting range for temperature setpoint T _{min} (009...035) ⁵⁾	
P20:032	Maximum limitation setting range for temperature setpoint T _{max} (011...037) ⁶⁾	
P21:000	Hours-run meter for fan in units of 10 hours. Non-deletable	
P22:10x	Software version	

Input functions

		Input functions are closed					Possible mode when				Activated by contacts	Symbols when contacts are closed
P16	000	Absence	PROG	N	R	R	✓	✓	✓	✓	Absence sensor	
	001	Presence	PROG	R	N	N	✓	✓	✓	✓	Occupancy detector	
	002	Window contacts	PROG	N	R	R	✓	✓	✓	✓	Window contacts	
	003	External time-switch	PROG	N	R	R	✓	✓	✓	✓	External timer	
	004	Remote control	PROG	N			✓	✓	✓	✓	Telephone	
	005	Fault indicator	PROG	N	N		✓	✓	✓	✓	Fault contacts	
P01	006	Keys disabled	PROG	N	N						Key-operated sw.	
	001	Dew point ¹⁾	TEMP	N	N	¹⁾ OFF	✓	✓	✓	✓	Dew-point monitor	
	002	Change-over ²⁾	TEMP				✓	✓	✓	✓	c / o	

N = normal temperature setpoint (normal comfort and energy requirement)
 R = reduced temperature setpoint (reduced comfort and energy requirement)

¹⁾ If the dew point is exceeded, the cooling valve is closed; control mode no longer possible; display of actual value:

²⁾ Only F011

Disposal

When disposing of the product, observe the currently applicable local laws.

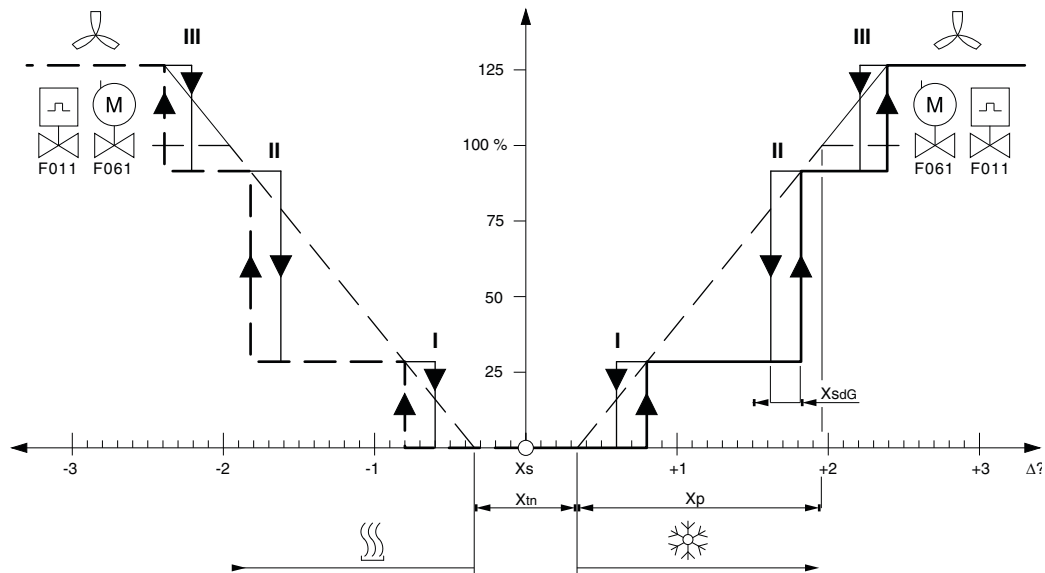
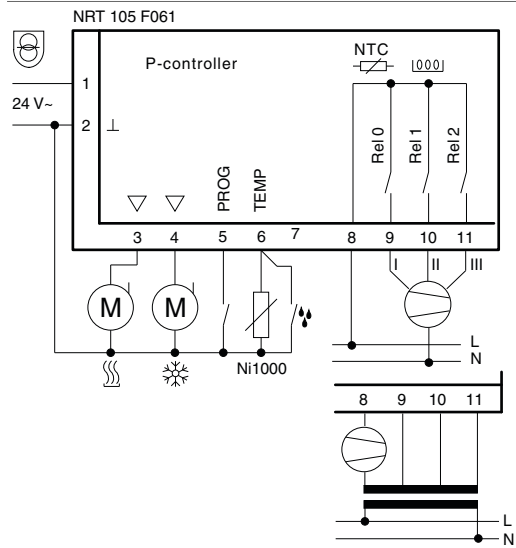
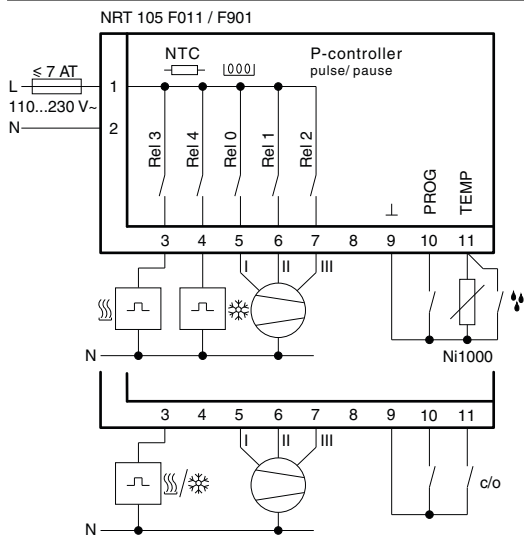
More information on materials can be found in the Declaration on materials and the environment for this product.

⁴⁾ Apart from P17:003, and P16:004 with contacts input closed (stand-by mode)

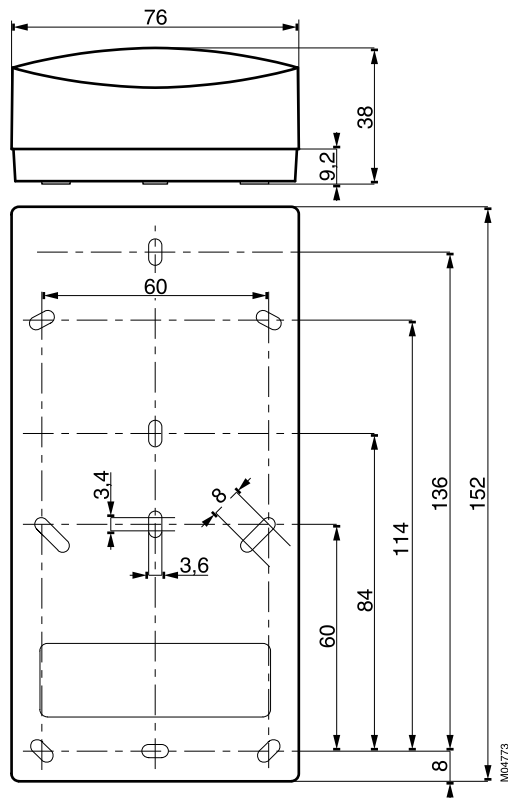
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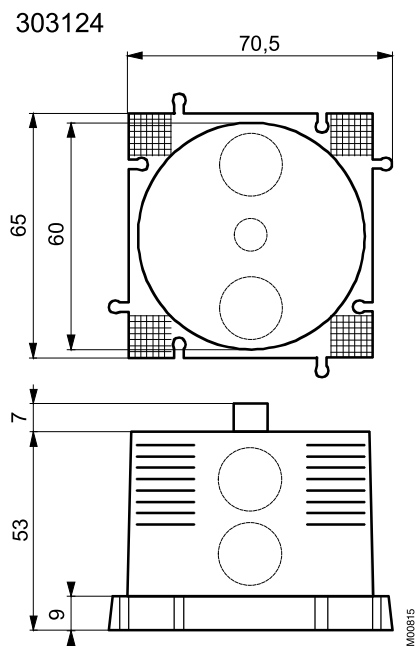
Connection diagrams



Dimension drawing



Accessories



Example applications

