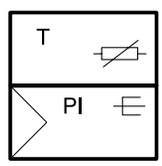
NRT 300: Electronic air-conditioning controller for 6-way ball valve, heating/cooling

How energy efficiency is improved

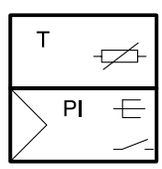
Front key on device for individual changeover between presence and absence

Features

- Air-conditioning controller for 4-pipe systems (heating/cooling)
- Measurement of the room temperature either by integrated or external temperature sensor, e.g. in heated/chilled ceilings in hotels and residential and business spaces
- Saves energy costs by means of presence/absence key and rotary knob on front
- Inputs for changeover between presence and absence, dew point monitoring and setpoint shift
- P- /PI control (F063) or PI control (F062)
- LED indicator for presence, heating, cooling and dew point
- Servicing level with adjustable control parameters
- Frost-protection facility
- Electrical connection in baseplate
- Adjustable limiting of the heating volume flow



NRT300F062



NRT300F063

Technical data

Power supply		
	Power supply	24 V~, ±20%, 50...60 Hz
	Power consumption	Approx. 2.5 VA
Parameters		
	Setting range X_s	10...30 °C
	Proportional band	2...22 K
	Integral action time	2...20 minutes or OFF (as P-controller)
	Control parameters	Non-volatile
Dead zone X_t	Normal	0.2...6 K
	Extended	8 K
Sensor time constant for air	In room (0.1 m/s)	8 minutes
Ambient conditions		
	Admissible ambient temperature	0...50 °C
	Admissible ambient humidity	5...95% rh, no condensation
Inputs		
	Setpoint shift w	0...10 V, Ri = 90 kΩ
	Dead zone	ON/OFF
	Dew point	ON/OFF
Function		
	Operating mode	Sequence (heating/cooling)
	Change-over functions[1)]	X_t, TP
Construction		
	Weight	0.1 kg
	Housing	Pure white (RAL 9010)
	Housing material	Flame-retardant thermoplastic
	Fitting	Wall mounting/recessed junction box
	Cable feed	At rear
	Screw terminals	For electrical cables of up to 1 mm²
Standards and directives		
	Type of protection	IP30 (EN 60529)
	Protection class	III (IEC 60730)

1) *X_t = dead zone ON/OFF; TP = dew point monitoring*

	Energy class	I = 1 % as per EU 811/2013, 2010/30/EU, 2009/125/EC
CE conformity according to	EMC Directive 2014/30/EU	EN60730-1 EN60730-2-9

Overview of types

Type	Function	Output
NRT300F062	Regulation of heating/cooling with 6-way ball valve	1 x 10 V load > 5 kΩ; with overflow at 11 V (load-dependent)
NRT300F063	Heating/cooling changeover with 6-way ball valve; control with dynamic regulating valve	1 x 0...10 V load > 5 kΩ; with overflow > 11 V (load-dependent) 1 x switching 0.5 A (0.9 A with external sensor)

Accessories

Type	Description
AKM115SF132	Rotary actuator with SAUTER Universal Technology (SUT) for ball valve; 24 V
AKM115F122	Rotary actuator for ball valve 2-/3-pt; 24 V~
AXM***	Motorised valve actuator (see product data sheet)
AXS2**	Continuous thermal actuators for unit valves (see product data sheet)
EGH102F001	Dew-point monitor with sensor in housing
EGH102F101	Dew-point monitor with sensor on cable
0303124000	Recessed junction box
0313214001	Fixing kit (holder, heat-conducting paste, retaining strap)
0313347001	Cover plate, pure white, for 76 × 76 mm
EGT353F101	Cable temperature sensor; NTC 10k; -35...100 °C; L = 1.5 m
EGT353F103	Cable temperature sensor; NTC 10k; -35...100 °C; L = 3 m
EGT353F110	Cable temperature sensor; NTC 10k; -35...100 °C; L = 10m
EGT353F120	Cable temperature sensor; NTC 10k; -35...100 °C; L = 20m
0386273001	Plug-in power unit, input 230 V~, output 21 V~ (0.34 A), length of cable 1.8 m, IP30
0313501001	Housing with scale 10...30 °C

Description of operation

This electronic air-conditioning controller is for intelligent unitary control in rooms. The air-conditioning controller may not be used outdoors.
The product is only permitted for installation indoors and the individual control of single rooms with 4-pipe heating and cooling systems.

The temperature is measured with a temperature sensor. In the room controller, the sensor is integrated into the housing. Instead of an internal sensor, an external sensor can also be connected. The resistance of the sensor is converted into an actual-value signal (x_i) by a measuring bridge, and is then compared with the setpoint X_S. The controller amplifies the control offset and, depending on its type, creates the corresponding output signals:

F062:
Continuous signal for proportional-integral control in the heating/cooling changeover mode using a continuous actuator in combination with a 6-way ball valve in 4-pipe systems.

F063:
OPEN/STOP/CLOSE signal for the changeover between heating/cooling using a 2-/3-point actuator.
Continuous signal for proportional-integral control of the volume flow using a pressure-independent valve and continuous actuator for unit valves.
The operating statuses are displayed with LED indicators. Heating: red / Cooling: blue.

Dead zone changeover (X_t):
For the heating/cooling sequence, this increases the dead zone to 4 Xp. As a result, the temperature is decreased in heating mode and increased in cooling mode (Eco mode).

Setpoint shift (command variable w):
The setpoint is increased with respect to the defined value X_S with an influence of + 1.5 K/V. This can be used, for example, to adjust the room temperature to the increasing outside temperature (summer shift), or to avoid condensation due to rising humidity.
If the setpoint shift is active in cooling mode, the blue LED flashes quickly.

Dew point (TP):
When the contact of the dew point monitor is closed, the cooling output becomes inactive or the cooling valve is closed. In case of a dew point alarm, the blue LED flashes. The dew point alarm has priority over the indication of the setpoint shift.

Frost-protection function:
Independently of the defined setpoint and dead zone, at temperatures < 6 °C, the heating valve is opened. If the temperature rises above 7 °C, the frost-protection function becomes inactive. If necessary, the temperature must be compensated in order to adhere precisely to the switching points. The frost-protection facility has the highest priority.

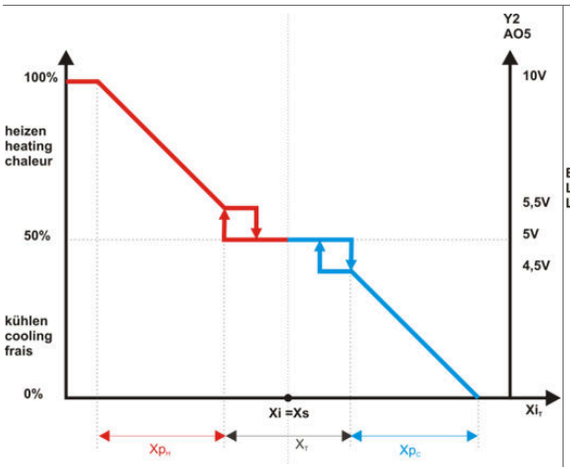
Volume flow limiting for heating (F063):
The energy emitted in the heating mode can be limited using parameters, and the maximum flow rate can be set via the pressure-independent regulating valve.

Factory settings:

Proportional band	X_p = 2 K
Dead zone for normal	X_{tn} = 1 K
Integral action time	t_n = inactive
Temperature compensation	ZERO = inactive
Slope of setpoint shift	0.5 K/V
Volume flow limiting for heating (F063)	100%

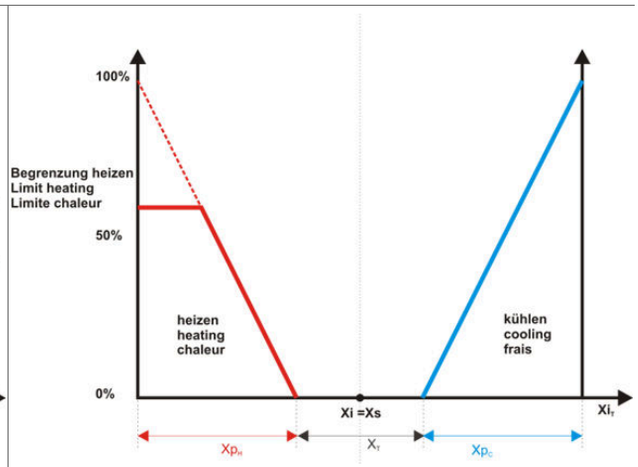
Note
The factory settings can be modified based on the application (see description in the fitting instructions).

Control characteristics



NRT300F062

Sequence operating mode (heating/cooling)
Control via 6-way ball valve
For actual value xi = setpoint xs, the valve is closed
Contact xt closed = absence, dead zone enlarged by 4 K



NRT300F063

Sequence operating mode (heating/cooling)
Changeover via 6-way ball valve
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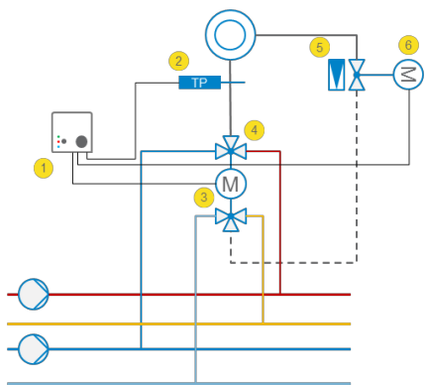
Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the “Description of operation” section.
All related product regulations must also be adhered to. Changing or converting the product is not admissible.

Disposal

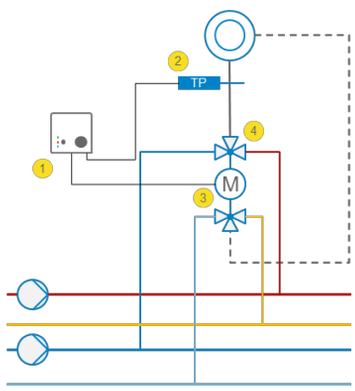
When disposing of the product, observe the currently applicable local laws.
More information on materials can be found in the Declaration on materials and the environment for this product.

Application: Room-temperature control via 6-way ball valve and 2-way regulating valve for hydronic balancing.



1. Room-temperature controller	NRT300F063
2. Dew point monitor and transducer	EGH102F001
3. Rotary actuator for 6-way ball valve	AKM115F122
4. 6-way ball valve	B2KL0**F400
5. 2-way regulating valve for dynamic hydronic balancing	VDL 015/VDL 020
6. Motorised valve actuator or continuous actuator for unit valves	AXM217SF40* AXS215SF122

Application: Continuous room-temperature control via 6-way ball valve.



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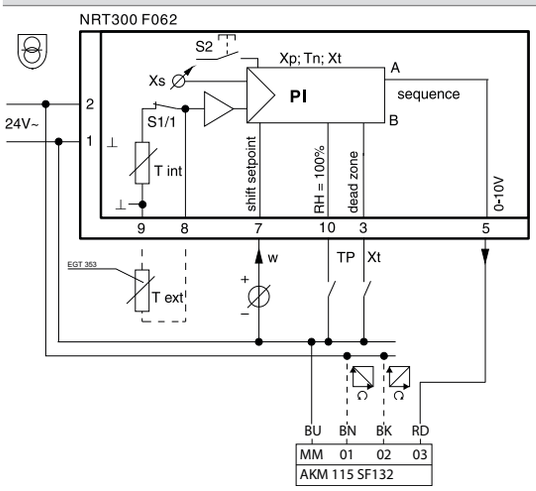
Connection diagrams

NRT300F062



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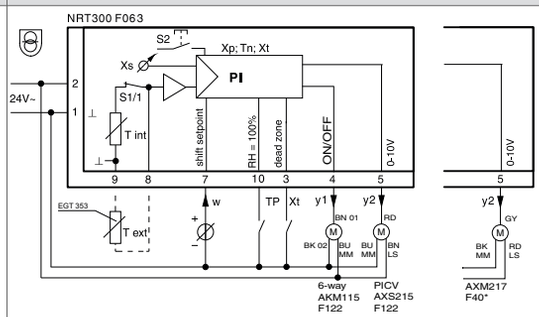

Dimension drawing

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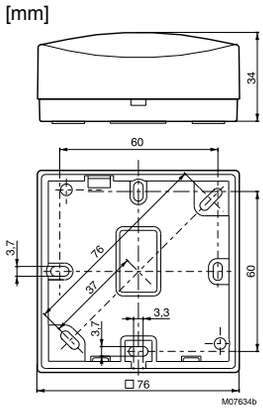

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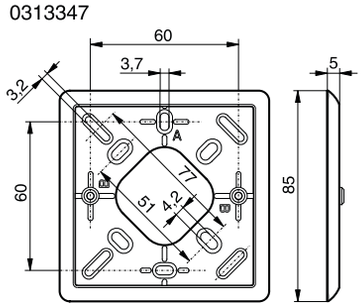

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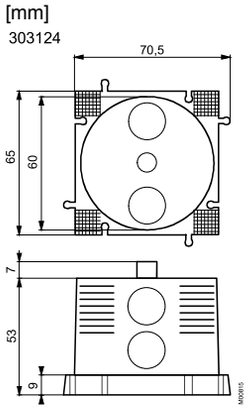

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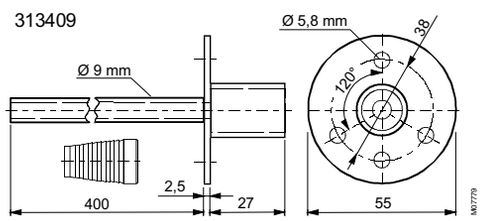

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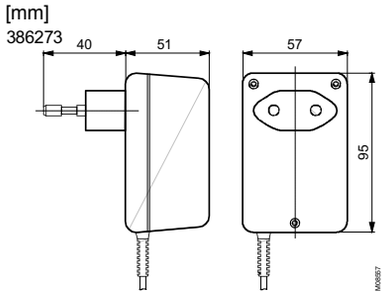

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