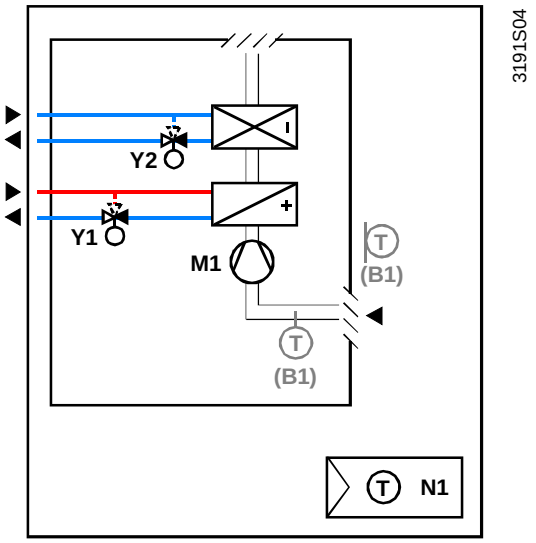
4-pipe fan coil

- Heating and cooling
- On/off control of heating and cooling actuators
- Automatic or manual fan speed control, 1 or 3-speed
- Automatic or manual heating / cooling changeover
- Multifunctional inputs for keycard contact, external sensor, etc.
- Adjustable commissioning and control parameters
- Backlit LCD
- KNX bus communications (RDF301, RDF301.50 only)

Variants for room thermostat

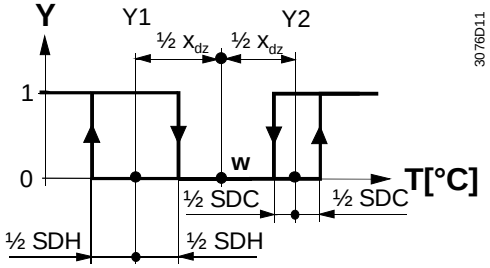
- RDF301.50 (buttons for KNX switching groups)
- RDF300 (standalone, without backlight for LCD)
- RDF300.02 (standalone, with backlit LCD)
- RDF400.01 (standalone, with time program)

Plant diagram



Function diagrams
(valve actuators on/off)

Example: Heating and cooling mode (P01 = 04)

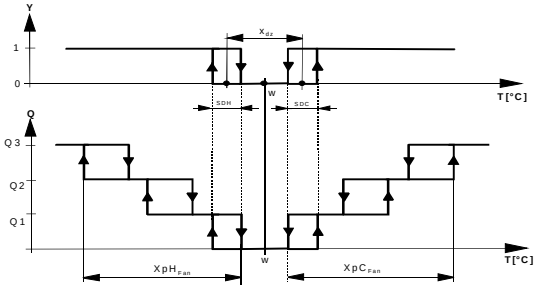


T	Room temperature	SDH	Switching differential “Heating” (P30)
w	Room temperature setpoint	SDC	Switching differential “Cooling” (P31)
Y	Output signal	wD	Setpoint differential (P34)
Y1	Heating valve	Xdz	Dead zone (P33)
Y2	Cooling valve		

4-pipe fan coil

Function diagrams (fan)

Fan control in case of 2-position valve control (On/off)



T[°C]	Room temperature
w	Room temperature setpoint
Q1	Fan speed 1
Q2	Fan speed 2
Q3	Fan speed 3
Y	Control command “Valve”
Y_H	Control demand “Heating”
Y_C	Control demand “Cooling”

XpH	Proportional band “Heating” (P30)
XpC	Proportional band “Cooling” (P31)
Xdz	Dead zone (P33)
SDH	Switching differential “Heating” (P30)
SDC	Switching differential “Cooling” (P31)
XpHFan	Switching range for fan “Heating” *
XpCFan	Switching range for fan “Cooling” *

* XpHFan / XpCFan are a function of XpH / XpC :

SDH / SDC [K]	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	>4.5
XpH_{Fan} / XpC_{Fan} [K]	2	3	4	5	6	7	8	9	10

Description of functions

When"4-pipe fan coil" is selected (via DIP switches or via tool), the following functions are available.
For details see basic documentation (P3171 for RDF301... ; P3076 for RDF3..., RDF4...)

Sequence
- P / PI control (Parameter P35)
- Control of thermal or motorized valve actuators (On/off)
- Heating and cooling (P01 = 4, factory setting)
- Manual heating / cooling changeover (P01 = 2)
- Automatic heating / cooling changeover (P01 = 3)

Fan control
- 1...3-speed, automatic
- Manual speed control on room thermostat
- Fan control in dead zone

For advanced fan settings see basic documentation:
– P3171 for RDF301
– P3076 for RDF3... , RDF4...

Room temperature measurement
- Internal sensor
- External room temperature sensor
- External return air sensor

Setpoint adjustment
- Locally on room thermostat
- Via bus (RDF301, RDF301.50 only)

Room operating modes
- Comfort, Economy and Protection mode
- Switchover of operating mode via switch on room thermostat, window contact, or via bus

Multifunctional inputs, digital input
- Room temperature sensor
- Return air temperature sensor
- Heating / cooling changeover sensor
- Operating mode switchover (window switch)
- Dewpoint monitor
- Fault input
- Monitor input (RDF301, RDF301.50 only)

General functions
- Button lock
- Extended Comfort mode

4-pipe fan coil

Device list

Legend	Type of unit	Data sheet	Product No.	Qty.
N1	Semi Flush-mount room thermostat with KNX communications, 2-/4-pipe fan coils or DX type equipment	N3171	RDF301	1
Y1	2- or 3-port valve		V..P4..	1
	Actuator for small valves, 2-position, AC 230 V		ST..2.. / SF..2..	1
Y2	2- or 3-port valve		V..P4..	1
	Actuator for small valves, 2-position, AC 230 V		ST..2.. / SF..2..	1

+ For selection of actuators and valves please refer to the product catalog

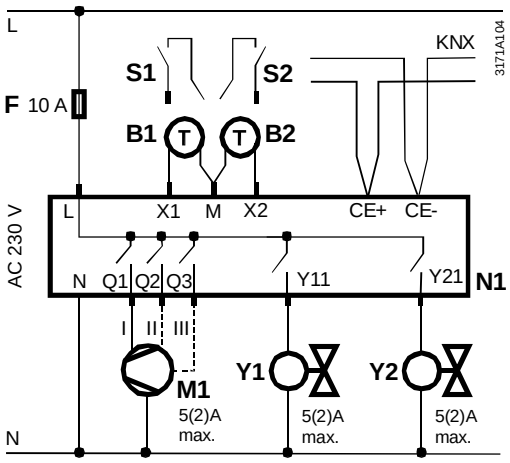
Optional

Legend	Type of unit	Data sheet	Product No.	Qty.
B1	Cable temperature sensor PVC 2.5 m, NTC 3 kOhm, with connectors 2.8 x 0.8 mm	N1840	QAH11	1

Variants

Legend	Type of unit	Data sheet	Product No.	Qty.
N1a	Semi Flush-mount room thermostat with KNX communications, 2-/4-pipe fan coils or DX type equipment, four buttons for switching lights and blinds	N3171	RDF301.50	1
N1b	Semi Flush-mount room temperature controller for 2-/4-pipe fan coils or DX type equipment, infrared remote control, 7-day time switch, backlit LCD	N3076	RDF400.01	1
N1c	Semi Flush-mount room temperature controller for 2-/4-pipe fan coils or DX type equipment, backlit LCD	N3076	RDF300.02	1
N1d	Semi Flush-mount room temperature controller for 2-/4-pipe fan coils or DX type equipment	N3076	RDF300	1
B1a	Room temperature sensor NTC 3 kOhm	N1747	QAA32	1

Connection diagram



N1	Room thermostat RDF301	B1, B2	Optional sensor or switch
M1	1- or 3-speed fan	S1, S2	Optional switch
Y1	Heating valve actuator (On/off)		
Y2	Cooling valve actuator (On/off)	CE+, CE–	KNX bus (RDF301, RDF301.50 only)

Notes

- Multifunctional input function selectable via parameters P38 to P41 (Room temp. / return air temp, H/C changeover, operating mode changeover, dewpoint sensor, fault input)
- 3- or 1-speed fan selectable via parameter P53
- Changeover sensor B2 for "Main and secondary" function must be inserted separately in HIT

4-pipe fan coil

	Application	DIP switches	Remarks
DIP switch settings (Application)	Remote configuration (factory setting)		Application and parameters will be downloaded via commissioning tool
	4-pipe fan coil • On/off actuator control		

	Function	Parameters	Remarks
Parameter settings (Multifunctional inputs, digital input)	No function	Pxx = 0	
	External / return air temperature	Pxx = 1	Factory set on X2 (RDF301...)
	Heating / cooling changeover	Pxx = 2	Factory set on X2 (RDF300... , RDF400...)
	Operating mode switchover	Pxx = 3	Factory set on X1
	Dewpoint monitor	Pxx = 4	
	Fault input	Pxx = 6	
	Monitor input (Digital)	Pxx = 7	Only available with RDF301...
	Monitor input (Temp)	Pxx = 8	Only available with RDF301...

NotePxx:
P38, P39 define function on X1
P40, P41 define function on X2

	Function	Parameters	Remarks
Parameter settings (Fan)	Fan type 1-speed	P53 = 1	
	Fan type 3-speed	P53 = 2	Factory setting
	Fan operation in dead zone, Comfort mode (fan kick interval, time until next kick)	P60 = 0...89 min, OFF	Factory setting = 0 min (fan ON in dead zone) OFF = fan OFF in dead zone
	Fan operation in dead zone, Economy mode (fan kick interval, time until next kick)	P61 = 0…359 min, OFF	Factory setting = OFF (fan OFF in dead zone) 0 min = fan ON in dead zone
	Clean filter reminder operating hours	P62 = OFF, 100…9900 h	Factory setting OFF (0 h)

4-pipe fan coil

Miscellaneous parameters

Function	Parameters	Remarks
User operating mode profile	P02 = 1, 2	1 = Auto – Protection (Factory setting) 2 = Auto - Comfort - Economy - Protection
Selection of °C or °F	P04 = °C, °F	Factory setting 0 (°C)
Sensor calibration (internal, external)	P05 = -3...3 K	Factory setting 0 K
Standard temperature display	P06 = 0, 1	0 = Room temperature (Factory setting) 1 = Setpoint
Comfort setpoint	P08 = 5...40 °C	Factory setting 21 °C
Minimum setpoint in Comfort mode	P09 = 5...40 °C	Factory setting 5 °C
Maximum setpoint in Comfort mode	P10 = 5...40 °C	Factory setting 35 °C
Economy heating setpoint	P11 = OFF, 5…WCoolEco	Factory setting 15 °C W Cool Eco = 40 °C max.
Economy cooling setpoint	P12 =OFF, WHeatEco …40	Factory setting 30 °C W Heat Ecog = 5 °C min.
Button lock function	P14 = 0...2	0 = Unlocked (Factory setting) 1 = Auto lock 2 = Manual lock
P-band / Switching differential in heating mode	P30 = 0.5...6 K	Factory setting 2 K
P-band / Switching differential in cooling mode	P31 = 0.5...6 K	Factory setting 1 K
Dead zone in Comfort mode	P33 = 0.5...5 K	Factory setting 2 K
Setpoint differential (SpD)	P34 = 0.5...5 K	Factory setting 2 K

Engineering

For a complete list of parameters and detailed description of functions see basic documentation:
P3171 for RDF301... ; P3076 for RDF3..., RDF4...
For engineering of RDF in conjunction with Synco see CE1P3127 (Communication via the KNX bus for Synco 700, and Synco 900, Basic documentation)

4-pipe fan coil

Energy efficiency

Heating control		Evaluation		Definition of classes				Remarks
				Non residential				
		RDF301...	RDF standalone	D	C	B	A	
Emission control *The control system is installed at the emitter or room level, for case 1 one system can control several rooms*								
0	No automatic control			■				
1	Central automatic control			■				
2	Individual room automatic control by thermostatic valves or electronic controller		X	■	■			
3	Individual room control with communication between controllers and to BACS			■	■	■		
4	Integrated individual room control including demand control (by occupancy, air quality, etc.)	X		■	■	■	■	29
Control of distribution network hot water temperature (supply or return) *Similar function can be applied to the control of direct electric heating networks*								7
0	No automatic control			■				
1	Outside temperature compensated control			■	■			
2	Indoor temperature control			■	■	■	■	
Control of distribution pumps *The controlled pumps can be installed at different levels in the network*								7
0	No control			■				
1	On off control			■				
2	Variable speed pump control with constant Δp			■	■	■	■	
3	Variable speed pump control with proportional Δp			■	■	■	■	
Intermittent control of emission and/or distribution *One controller can control different rooms/zone having same occupancy patterns*								7
0	No automatic control			■				
1	Automatic control with fixed time program			■	■			
2	Automatic control with optimum start/stop			■	■	■	■	
Generator control								7
0	Constant temperature			■				
1	Variable temperature depending on outdoor temperature			■	■	■	■	
2	Variable temperature depending on the load			■	■	■	■	
Sequencing of different generators								7
0	Priorities only based on loads			■	■			
1	Priorities based on loads and generator capacities			■	■	■		
2	Priorities based on generator efficiency (check other standard)			■	■	■	■	

4-pipe fan coil

Energy efficiency

Cooling control		Evaluation		Definition of classes				Remarks
				Non residential				
		RDF301...	RDF standalone	D	C	B	A	
Emission control *The control system is installed at the emitter or room level, for case 1 one system can control several rooms*								
0	No automatic control			■				
1	Central automatic control			■				
2	Individual room automatic control by thermostatic valves or electronic controller		X	■	■			
3	Individual room control with communication between controllers and to BACS			■	■	■		
4	Integrated individual room control including demand control (by occupancy, air quality, etc.)	X		■	■	■	■	29
Control of distribution network cold water temperature (supply or return) *Similar function can be applied to the control of direct electric heating networks*								7
0	No automatic control			■				
1	Outside temperature compensated control			■	■			
2	Indoor temperature control			■	■	■	■	
Control of distribution pumps *The controlled pumps can be installed at different levels in the network*								7
0	No control			■				
1	On off control			■				
2	Variable speed pump control with constant Δp			■	■	■	■	
3	Variable speed pump control with proportional Δp			■	■	■	■	
Intermittent control of emission and/or distribution *One controller can control different rooms/zone having same occupancy patterns*								7
0	No automatic control			■				
1	Automatic control with fixed time program			■	■			
2	Automatic control with optimum start/stop			■	■	■	■	
Interlock between heating and cooling control of emission and/or distribution								7
0	No interlock			■				
1	Partial interlock (dependant of the HVAC system)			■	■	■		
2	Total interlock			■	■	■	■	
Generator control								7
0	Constant temperature			■				
1	Variable temperature depending on outdoor temperature			■	■	■	■	
2	Variable temperature depending on the load			■	■	■	■	
Sequencing of different generators								7
0	Priorities only based on loads			■	■			
1	Priorities based on loads and generator capacities			■	■	■		
2	Priorities based on generator efficiency (check other standard)			■	■	■	■	

4-pipe fan coil

Summary	**Energy efficiency class:**	**RDF301...**	**(communicating)**	**A**
		RDF300..., RDF400...	**(standalone)**	**C**

Remarks

No.	Remark
7	Only together with Efficiency Class A application
29	Presence detector required

Home automation / building automation and control system and technical home/building management required satisfying Efficiency Class A

Efficiency Class rating based on EN15232:2007