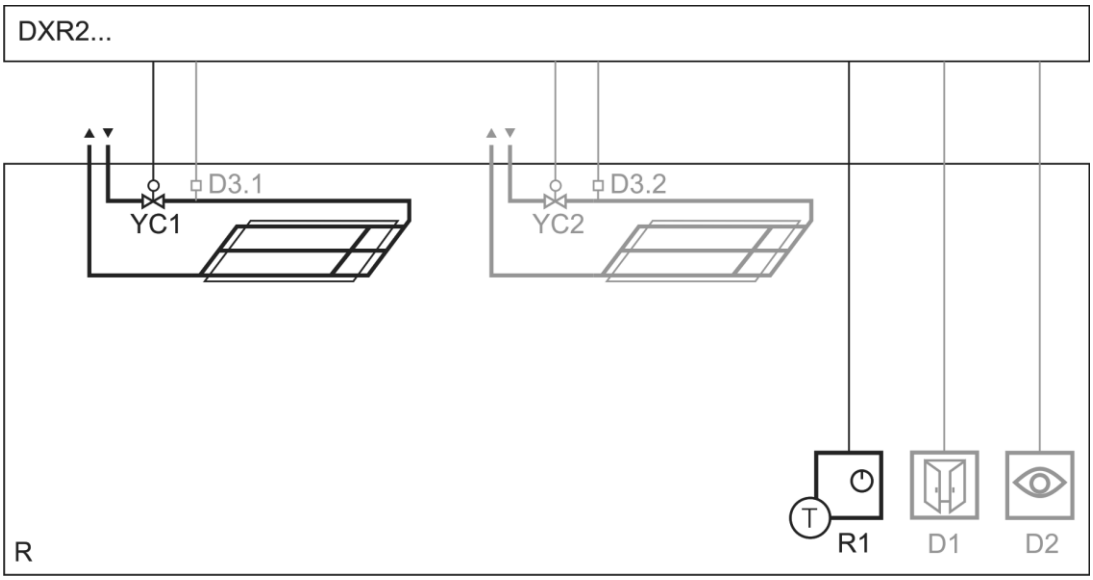
Chilled ceiling on triac output

DXR2..09T-101A

- **Cooling with chilled ceiling on triac outputs**
- **Modulating control of cooling valve**
- **Condensation monitoring**
- **Room temperature operation via KNX PL-Link room operator unit with temperature measurement**

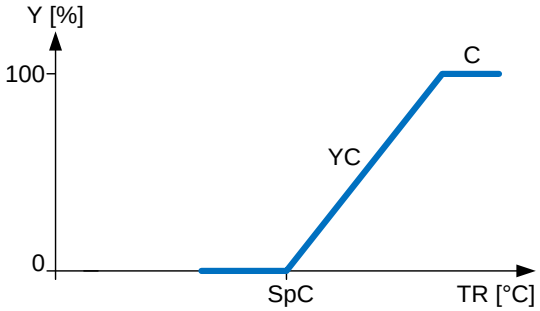
Plant diagram



DXR2…	Room automation station	R	Room
D1	Window contact	R1	Room operator unit with temperature sensor
D2	Presence detector		
D3.1	Condensation monitor 1	YC1	Cooling valve 1
D3.2	Condensation monitor 2	YC2	Cooling valve 2

Function diagrams

Cooling valve



C	Cooling sequence	Y	Output signal
SpC	Effective cooling setpoint	YC	Cooling valve
TR	Room temperature		

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Description of functions

Basic functions

- PID control for cooling.
- 3-position valves are controlled by triac outputs for cooling.
- The temperature is measured in the room operator unit.
- The application allows customers to adjust the room temperature setpoints via the room operator unit.
- The operating modes are Comfort, Pre-Comfort, Economy and Protection.
- Change of operating mode via room unit, presence detector, window contact or central command.

Options

- 2nd chilled ceiling.
- Condensation monitoring.
- Optimal energy efficiency by presence detector or window contact.
- Optional system alarms displayed on the management station notify building operators of possible faults.
- Optional trends can be activated for room sensors.

Auxiliary functions

- Green Leaf (RoomOptiControl) function.
- Multisegment use of DXR2 automation stations.
- The application allows for control via centralized commands (e.g. scheduler program for room operating mode).
- Central optimum start control provides best room comfort at the start of occupancy.
- Central operation or reset of setpoints, timed valve kick function.
- Central override functions for valves.
- Seasonal compensation of room temperature setpoints.

Variants

- PWM constant (incl. spring return) or PWM thermal control can be selected for valves.
- The room temperature can be measured by:
  - KNX PL-Link wall-mount sensor
  - KNX PL-Link flush-mount room operator unit
  - KNX PL-Link flush-mount sensors
- Presence can be detected by KNX PL-Link sensor or binary sensor.

Siemens devices

Legend	Type of unit	Data sheet	Product No.	Qty.
DXR2…	Compact room automation station, BACnet/IP, 230 V, flat housing, 1 DI, 2 UI, 1 DO relay, 4 DO triacs, 1 AO 0…10 V	N9204 N9206	DXR2.E09T-101A DXR2.M09T-101A	1
R1	KNX PL-Link room operator unit with temperature sensor, segmented backlit display, touchkeys	N1602	QMX3.P34	1
YC1	2-port, 3-port valve or 3-port valves with bypass, PN16	N4847	V..P47..	1
	Motorized 3-positioning actuator for V..P47.., AC 24 V	N4864	SSP81..	1

Optional [1)]

Legend	Type of unit	Data sheet	Product No.	Qty.
D1	Door/window contact, white	[2)]	S 290/11	[3)]
D2	KNX PL-Link presence detector with brightness sensor	[2)]	UP 258D12	1 - 4
D3.1	Condensation monitor	A6V10741072	QXA21..	1
D3.2	Condensation monitor	A6V10741072	QXA21..	1
YC2	2-port, 3-port valve or 3-port valves with bypass, PN16	N4847	V..P47..	1
	Motorized 3-positioning actuator for V..P47.., AC 24 V	N4864	SSP81..	1

[1)] Can be combined according to available on-board I/Os on controller.
[2)] Further documents on www.siemens.com/gamma-td.
[3)] Type of operation (NO or NC). Multiple devices of the same type can be connected.

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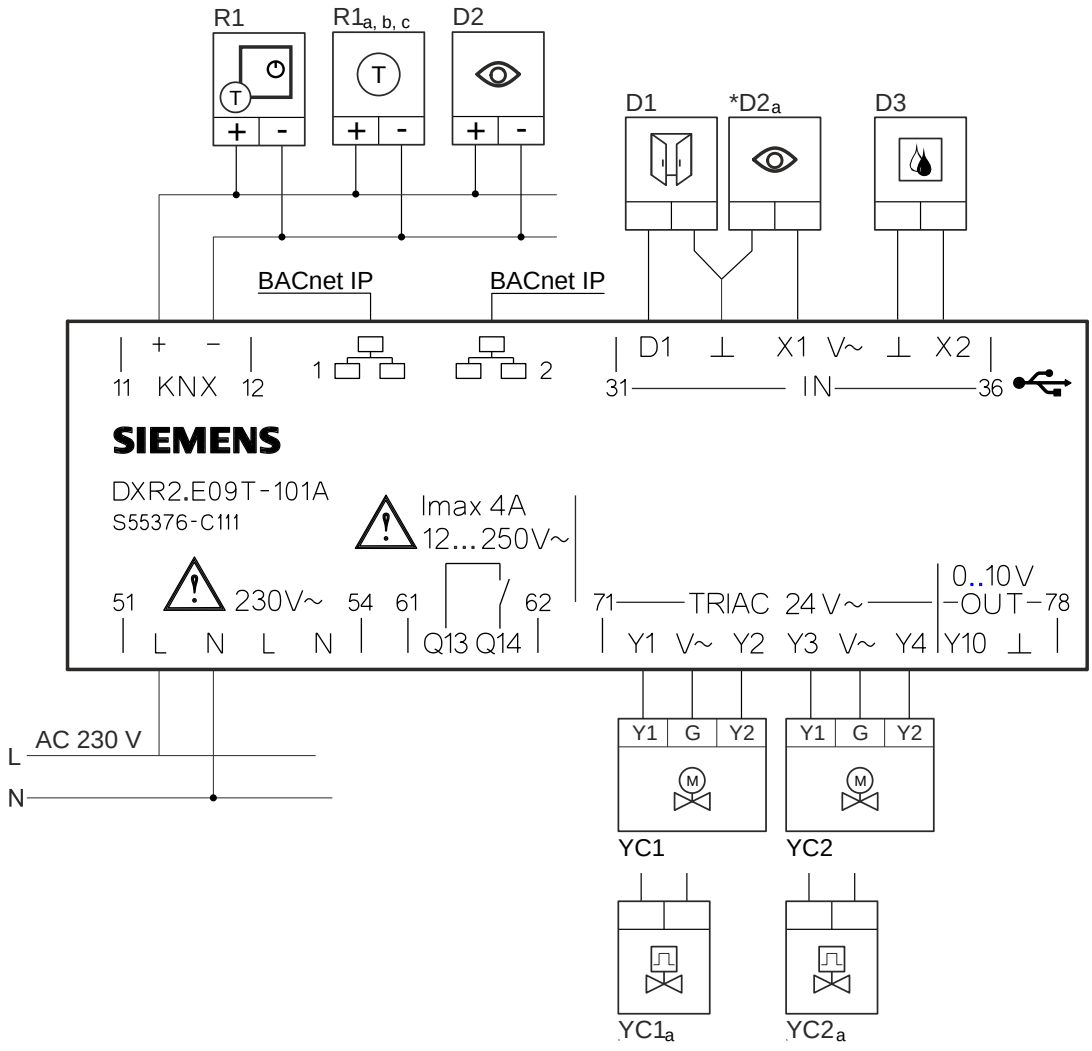
Variants	Legend	Type of unit	Data sheet	Product No.	Qty.
	$R1_a$	KNX PL-Link wall-mount room sensor for temperature	N1602	QMX3.P30	1
	$R1_b$	KNX PL-Link flush-mount room operator unit	N1601	QMX3.P36	1
	$R1_c$	KNX PL-Link flush-mount room sensors	N1411	AQR253… AQR257…	1
	$YC1_a$	2-port, 3-port valve or 3-port valves with bypass, PN16	N4847	V..P47..	1
		Thermal actuator, AC/DC 24 V, NO, 2P, 1 m	N4884	STP73	1
	$YC2_a$	2-port, 3-port valve or 3-port valves with bypass, PN16	N4847	V..P47..	1
		Thermal actuator, AC/DC 24 V, NO, 2P, 1 m	N4884	STP73	1

Connection diagram



*3rd party device

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Application configuration

	Equipment	Values/Range	Template settings
On-board output	Radiant ceiling valve position 1	Chilled; Y1, Y2; 3-position Chilled; Y3, Y4; 3-position Chilled; Y1; Pulse width modulation thermal Chilled; Y4; Pulse width modulation thermal Heating/chilled 2-pipe; Y1, Y2; 3-position Heating/chilled 2-pipe; Y3, Y4; 3-position Heating/chilled 2-pipe; Y1; Pulse width modulation thermal Heating/chilled 2-pipe; Y4; Pulse width modulation thermal Heating; Y1, Y2; 3-position Heating; Y3, Y4; 3-position Heating; Y1; Pulse width modulation thermal Heating; Y4; Pulse width modulation thermal	Chilled; Y1, Y2; 3-position
KNX PL-Link devices	Room operator unit device 1	QMX3.P02, QMX3.P34, QMX3.P36, QMX3.P37, QMX3.P74	QMX3.P34

Optional configuration

	Equipment	Values/Range	Template settings
On-board output	Radiant ceiling valve position 2	Chilled; Y1, Y2; 3-position Chilled; Y3, Y4; 3-position Chilled; Y2; Pulse width modulation thermal Chilled; Y3; Pulse width modulation thermal Heating/chilled 2-pipe; Y1, Y2; 3-position Heating/chilled 2-pipe; Y3, Y4; 3-position Heating/chilled 2-pipe; Y2; Pulse width modulation thermal Heating/chilled 2-pipe; Y3; Pulse width modulation thermal Heating; Y1, Y2; 3-position Heating; Y3, Y4; 3-position Heating; Y2; Pulse width modulation thermal Heating; Y3; Pulse width modulation thermal	Chilled; Y3, Y4; 3-position
On-board input	Presence detector 2 ($D2_a$)		X1, Normally open
	Window contact (D1)		D1; Normally closed
	Condensation monitor (D3.1, D3.2)		X2; Normally closed
KNX PL-Link devices	Sensor device 1…4 (D2)		UP 258D12

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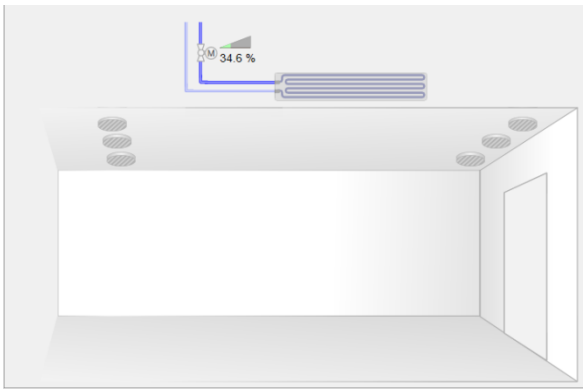
Default values

	Parameter	Values/Range	Template settings
Temperature setpoints	Cooling setpoint for Comfort	0 … 50 °C	24 °C
	Delta cooling setpoint for Pre-comfort	0 … 10 K	1 K
	Cooling setpoint for Economy	0 … 50 °C	35 °C
	Cooling setpoint for Protection	0 … 50 °C	40 °C
Radiant ceiling	Enable condensation monitor input	Yes, No	Yes
Room operator unit	Room unit, display temperature	None Display room temperature	Display room temperature
	Room unit, display windows status	Yes, No	No
	Room unit, display heat./cool. status	Yes, No	Yes
	Enable operation: room temp. setpoint	Yes, No	Yes
	Room unit, room temp. setpoint display	Absolute temperature setpoint Relative setpoint shift	Relative setpoint shift
	Enable operation: fan speed setpoint	Yes, No	No
	Enable operation: presence button	Yes, No	No
	Enable operation: temporary Comfort	Yes, No	No
	Enable operation: room op. mode	Yes, No	No
	Enable operation: Green Leaf	Yes, No	Yes

Engineering

- ABT Site engineering tool is required to configure the DXR2 automation stations.
- See the Siemens Download Center at www.siemens.com/bt/download for the latest application configuration and workflow tutorials.
- Option combination according to available on-board I/Os on controller.
- $D2_a$ (on-board presence detector) to be configured in ABT Site under ‚Presence detector 2' for maximum combination of optional devices.
  Type of operation (N/O or N/C). Multiple devices of the same type can be connected.

Management station



Sample presentation of a chilled ceiling application on the Desigo CC management station.

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