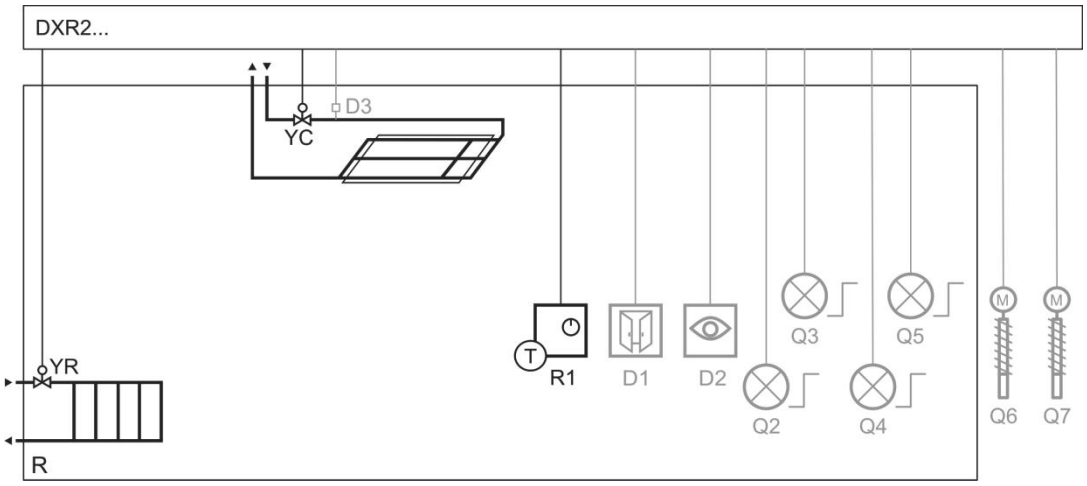
Chilled ceiling with hot water radiator on triac output including lighting and blinds operation

DXR2.E09T-101A

- **Heating with radiator/floor heating and cooling with chilled ceiling on triac outputs**
- **Modulating control of heating and cooling valve on triac outputs**
- **Downdraft compensation**
- **Condensation monitoring**
- **Including the control of 4 lighting zones & 2 blinds**
- **Room temperature operation via KNX PL-Link room operator unit with temperature measurement & lighting and blinds operation**

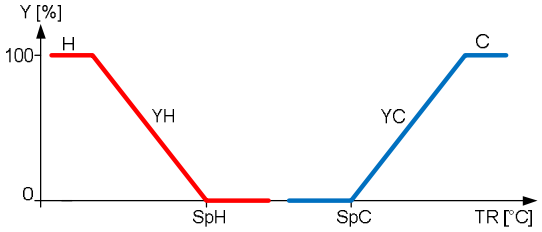
Plant diagram



DXR2…	Room automation station	Q6, Q7	2 blinds motors
D1	Window contact	R	Room
D2	Presence detector	R1	Room operator unit with temperature sensor
D3	Condensation monitor		
Q2, Q3, Q4, Q5	4 lighting zones	YC	Cooling valve
		YR	Radiator valve

Function diagrams

Heating/cooling valves



C	Cooling sequence	TR	Room temperature
H	Heating sequence	Y	Output signal
SpC	Effective cooling setpoint	YC	Cooling valve
SpH	Effective heating setpoint	YH	Heating valve

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Description of functions

Basic functions

HVAC

- PID control for heating and cooling.
- 3-position valves are controlled by triac outputs for radiator heating and chilled ceiling 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 including the operation of lighting and blinds.
- The operating modes are Comfort, Pre-Comfort, Economy and Protection.
- Change of operating mode via room unit, presence detector, window contact or central command.
- Downdraft compensation.
- Outside temperature (for downdraft compensation) distributed over BACnet.

Lighting

- The application allows room users to control lighting via a standard function switching and/or
- The application allows customers to control lighting operation via room unit.

Blinds

- The application allows room users to operate the blinds via the following commands:
  - Move up/down
  - Step up/down
- The reference model applied ensures exact positioning of the shading products.
- The application allows customers to control shading operation via room unit.

Auxiliary functions

- Green Leaf (RoomOptiControl) function.
- Multisegment use of DXR2 automation stations.
- Standard hot water supply chain control.
- 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 or outside temperature dependent heating limit.
- Central override functions for valves.
- Seasonal compensation of room temperature setpoints.

Lighting

- The application allows for control via centralized commands (e.g. scheduler program).
- The application function supports runtime totalization for each lighting group for maintenance and service purposes (burn in/operation h/ EOL end of life cycle).

Blinds

- The application allows for control via centralized commands (e.g. scheduler program or weather station).

Options

HVAC

- 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.

Lighting

- Optional system alarms displayed on the management station notify building operators of possible faults (e.g. defective electronic control gear or lamps).
- Optional trends can be activated for room lighting.

Blinds

- Optional system alarms displayed on the management station notify building operators of possible faults (e.g. defective actuator).
- Reliable, central override of local operation only for emergencies, service, and cleaning.
- Central weather protection function preventing damages to shading products due to high winds or frost.
- Optional trends can be activated for room blinds.

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
- KNX PL-Link switches for lighting and blinds operation.
- Presence can be detected by KNX PL-Link sensor or binary sensor.

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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	DXR2.E09T-101A	1
	R1	KNX PL-Link room operator unit with temperature sensor, segmented backlit display, touchkeys	N1602	QMX3.P34	1
	Q2, Q3	Lighting output	2)	UP 510/13	2
	Q4, Q5	Lighting output	2)	UP 510/13	2
	Q6, Q7	Blinds actuator, 2 x AC 230 V, 6 A	2)	RL 521/23	1
	YC	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
	YR	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

2) Further documents on www.siemens.com/gamma-td.

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	Condensation monitor	A6V10741072	QXA21..	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.

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
	YC_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
	YR_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

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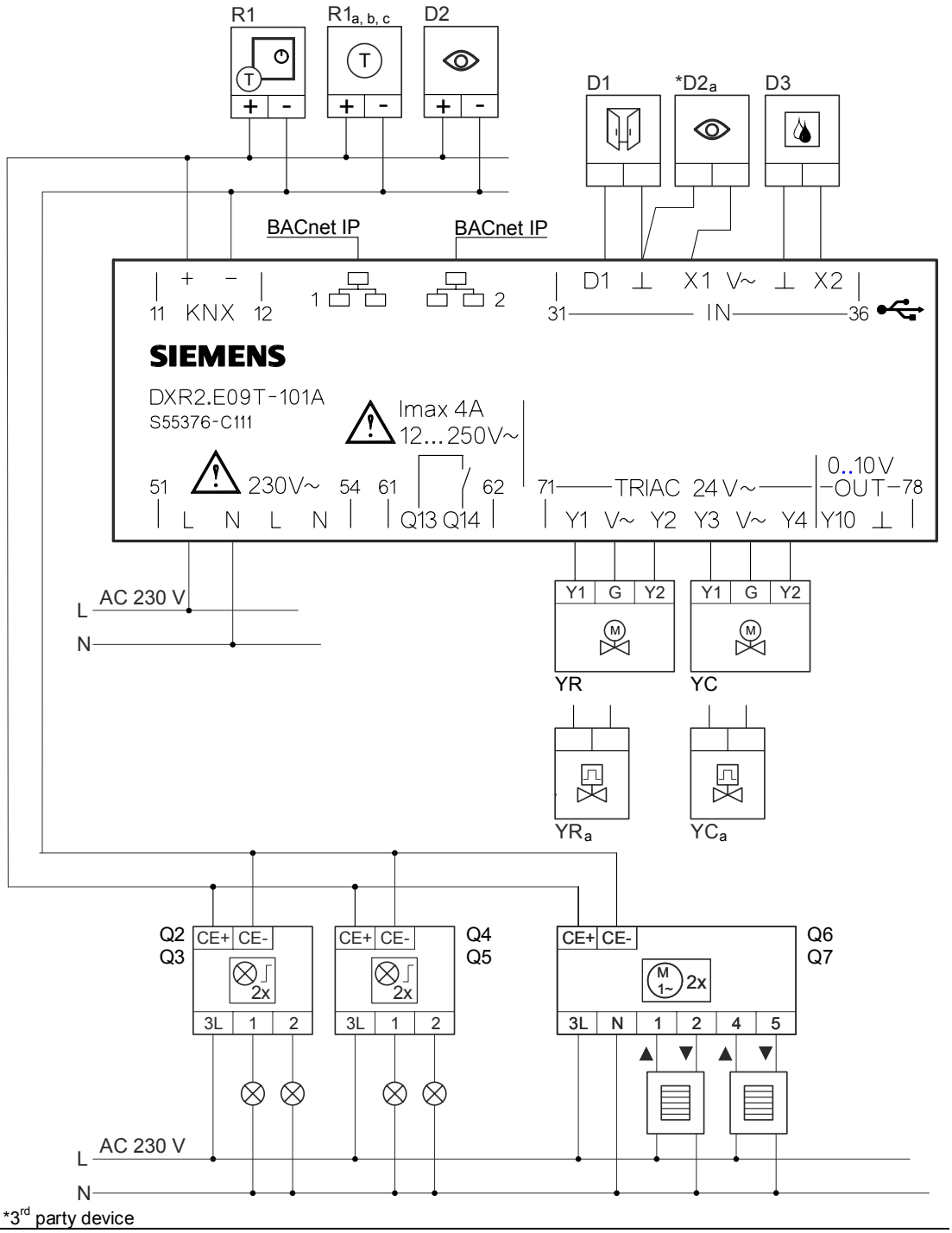
Connection diagram



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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; 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
	Radiator valve position 1	Water; Y1, Y2; 3-position Water; Y3, Y4; 3-position Water; Y1; Pulse width modulation thermal Water; Y4; Pulse width modulation thermal Electric 1-stage; Y1; Normally open Electric 1-stage; Y4; Normally open Electric modulating; Y1; Pulse width modulation constant period Electric modulating; Y4; Pulse width modulation constant period	Water; Y1, Y2; 3-position
KNX PL-Link devices	Room operator unit device 1	QMX3.P37; General HVAC; 4x dimming QMX3.P37; General HVAC; 2x dimming, 2x blinds QMX3.P37; General HVAC; 4x toggle, 2x blinds	QMX3.P37; General HVAC; 4x toggle, 2x blinds
	Lighting device 1	RL 512/23 - JB 512C23; 1x lighting, switching RL RS 510/23 - JB 510C23; 2x lighting, switching UP 510/03; 2x lighting, switching UP 510/13; 2x lighting, switching RS 525/23 - JB 525C23; 1x lighting, dimming UP 525/03; 1x lighting, dimming UP 525/13; 1x lighting, dimming	UP 510/13; 2x lighting, switching
	Lighting device 3	RL 512/23 - JB 512C23; 1x lighting, switching RL RS 510/23 - JB 510C23; 2x lighting, switching UP 510/03; 2x lighting, switching UP 510/13; 2x lighting, switching RS 525/23 - JB 525C23; 1x lighting, dimming UP 525/03; 1x lighting, dimming UP 525/13; 1x lighting, dimming	UP 510/13; 2x lighting, switching
	Blinds device 1	RS 520/23 - JB 520C23; 1x blinds RS 520/23 - JB 520C23; 1x awnings UP 520/03; 1x blinds UP 520/03; 1x awnings UP 520/13; 1x blinds UP 520/13; 1x awnings RL 521/23 - JB 521C23; 2x blinds RL 521/23 - JB 521C23; 2x awnings	RL 521/23 - JB 521C23; 2x blinds

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Optional configuration

	Equipment		Values/Range	Template settings
On-board input	Presence detector 2	($D2_a$)		X1, Normally open
	Window contact	(D1)		D1; Normally closed
	Condensation monitor	(D3)		X2; Normally closed
KNX PL-Link devices	Sensor device 1…4	(D2)		UP 258D12

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
	Heating setpoint for Comfort	0 … 50 °C	21 °C
	Delta heating setpoint for Pre-comfort	0 … 10 K	1 K
	Heating setpoint for Economy	0 … 50 °C	15 °C
	Heating setpoint for Protection	0 … 50 °C	12 °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

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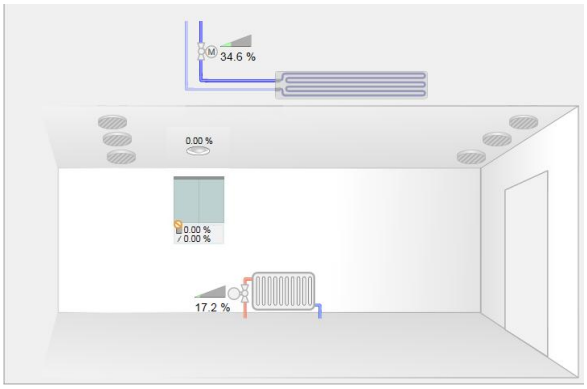
Engineering

- 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 (NO or NC). Multiple devices of the same type can be connected.
- All DXR2 can control two radiator device and two radiant ceilings. This configuration can control only one radiator device and one radiant ceiling device because of the limited I/O mix of the selected controller.

Management station



Sample presentation of a chilled ceiling with hot water radiator application with lighting and blinds operation on the Desigo CC management station.

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