

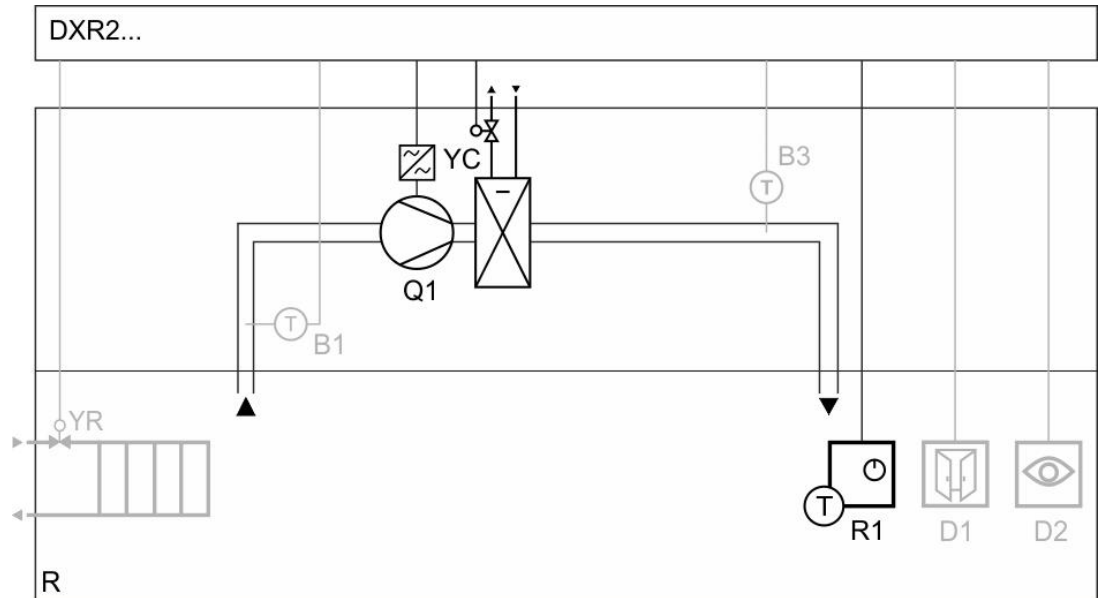
Active chilled beam with variable fan, cooling coil and hot water radiator on triac output

DXR2.E09T-101A



- Cooling with active chilled beam on triac output
- Optional heating with LTHW radiator on triac output
- Automatic or manual variable fan speed control DC 0...10 V
- Room temperature and fan speed operation via KNX PL-Link room operator unit with temperature measurement

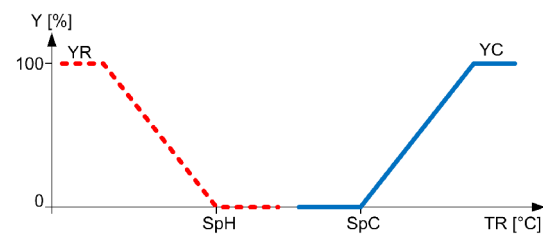
Plant diagram



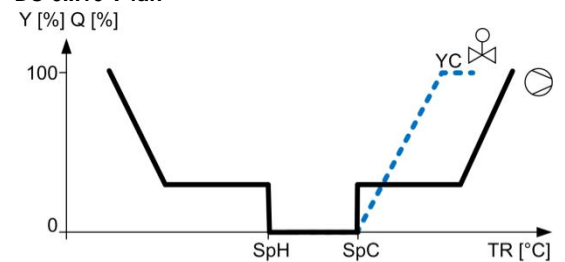
DXR2...	Room automation station	R	Room
B1	Extract air temperature sensor	R1	Room operator unit with temperature sensor
B3	Supply air temperature sensor	YC	Cooling coil valve
D1	Window contact	YR	Radiator valve
D2	Presence detector		
Q1	Variable speed fan		

Function diagrams

Heating/cooling valves



DC 0...10 V fan



Q	Fan output signal	Y	Valve output signal
SpC	Effective cooling setpoint	YC	Cooling coil valve
SpH	Effective heating setpoint	YR	Radiator 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 fan is controlled manual on the room operator unit or automatic with variable speed.
- 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.
- The air flow for heating and cooling is operated in sequence to the valves. Parallel operation can be configured.

Auxiliary functions

- Green Leaf (RoomOptiControl) function.
- Multisegment use of DXR2 automation stations with fan coil unit application.
- Standard hot and cold 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.

Options

- Optimal energy efficiency by including the option for room/supply air cascade control, presence detector or window contact.
- Optional radiator.
- PID control for LTHW radiator heating.
- Optional system alarms displayed on the management station notify building operators of possible faults.
- Optional trends can be activated for room sensors.

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
 - Analog extract air temperature sensor
- 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	DXR2.E09T-101A	1
	R1	KNX PL-Link room operator unit with temperature sensor, segmented backlit display, touchkeys	N1602	QMX3.P34	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

Optional ¹⁾	Legend	Type of unit	Data sheet	Product No.	Qty.
	B1	Cable temperature sensor PVC 2 m, LG-Ni1000	N1831	QAP22	1
	B3	Cable temperature sensor PVC 2 m, LG-Ni1000	N1831	QAP22	1
	D1	Door/window contact, white	2)	S 290/11	3)
	D2	KNX PL-Link presence detector	2)	UP 258D12	1 - 4
	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

¹⁾ Can be combined according to available on-board I/Os on controller.

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

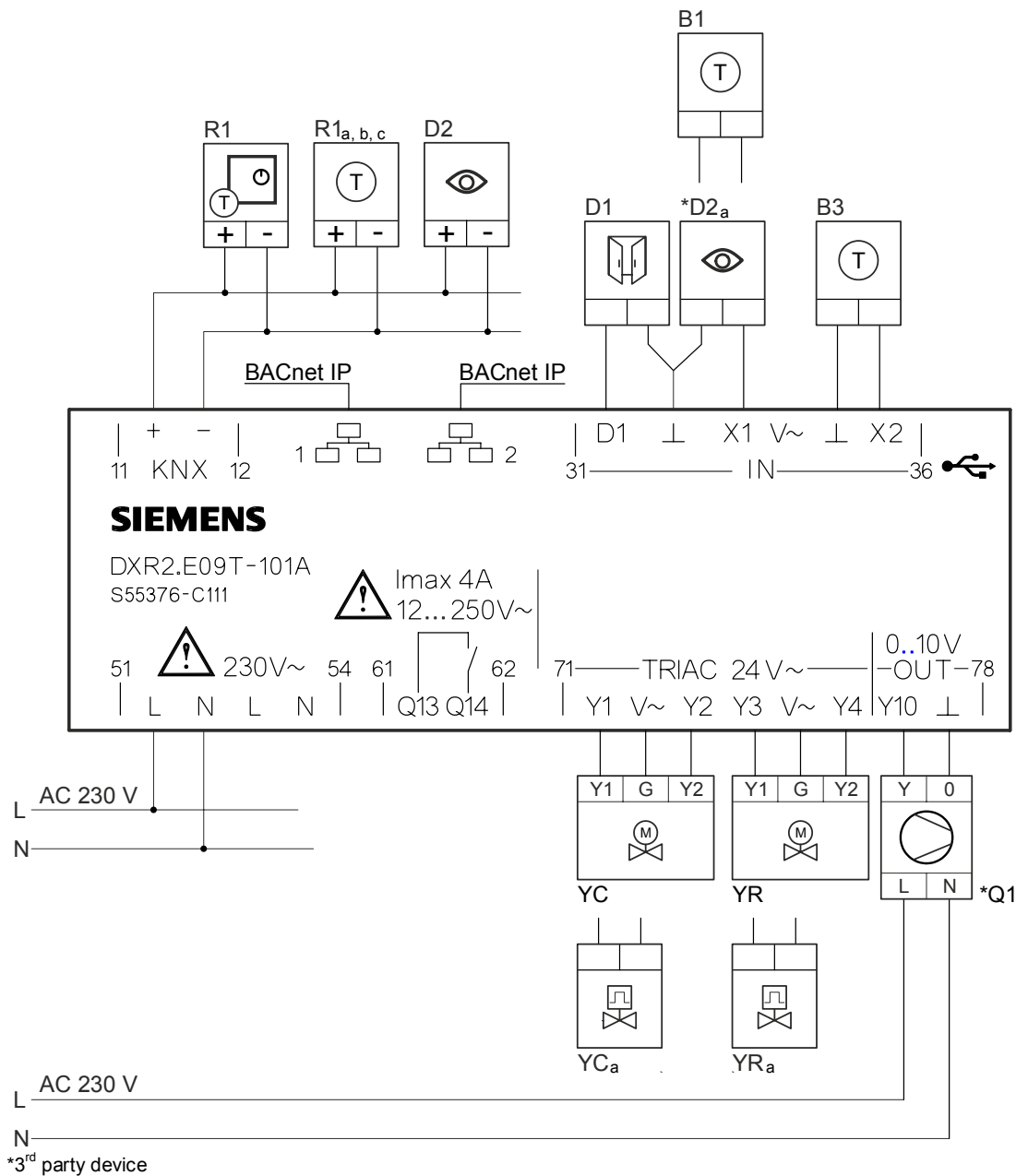
³⁾ Type of operation (NO or NC). Multiple devices of the same type can be connected.

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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
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

Connection diagram



Active chilled beam with variable fan, cooling coil and hot water radiator on triac output

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Application configuration

	Equipment	Values/Range	Template Settings
On-board output	Fan speed	Variable speed; Y10; 0...10 V	Variable speed; Y10; 0...10 V
	Enable fan speed	Q14; Normally open	Q14; Normally open
	Cooling coil valve position	Water; Y1, Y2; 3-position Water; Y1; Pulse width modulation thermal Water; Y1; Pulse width modulation spring return DX; Y1; Normally open DX; Y1, Y2; Normally open Chilled beam active; Y1, Y2; 3-position Chilled beam active; Y1; Pulse width modulation thermal Chilled beam active; Y1; Pulse width mod.spring return	Chilled beam active; 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	Radiator valve position	Water; Y1, Y2; 3-position Water; Y3, Y4; 3-position Water; Y2; Pulse width modulation thermal Water; Y3; Pulse width modulation thermal Electric 1-stage; Y2; Normally open Electric 1-stage; Y3; Normally open Electric modulating; Y2; Pulse width modulation constant period Electric modulating; Y3; Pulse width modulation constant period	Water; Y3, Y4; 3-position
On-board input	Room temperature (B1)		X1; LG-Ni1000
	Supply air temperature (B3)		X2; LG-Ni1000
	Presence detector 2 (D2 _a)		X1, Normally open
	Window contact (D1)		D1; Normally closed
KNX PL-Link devices	Sensor device 1...4 (D2)		UP 258D12

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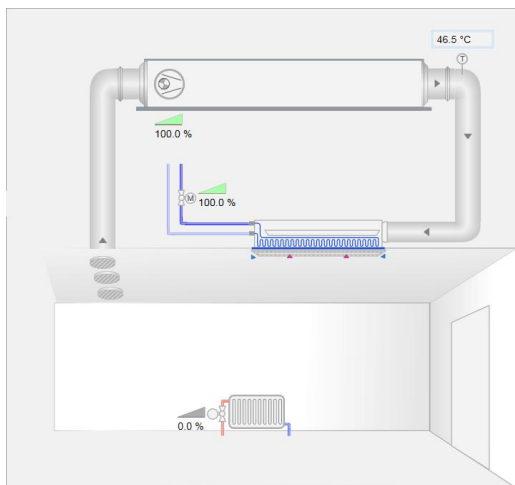
Default values

	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
	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
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	Yes
	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.
- B1 (optional extract air temperature sensor) to be configured under ‚Room temperature‘ in order to serve for room temperature control.
- 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.

Management station



Sample presentation of an active chilled beam with hot water radiator application on the Desigo CC management station.

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