

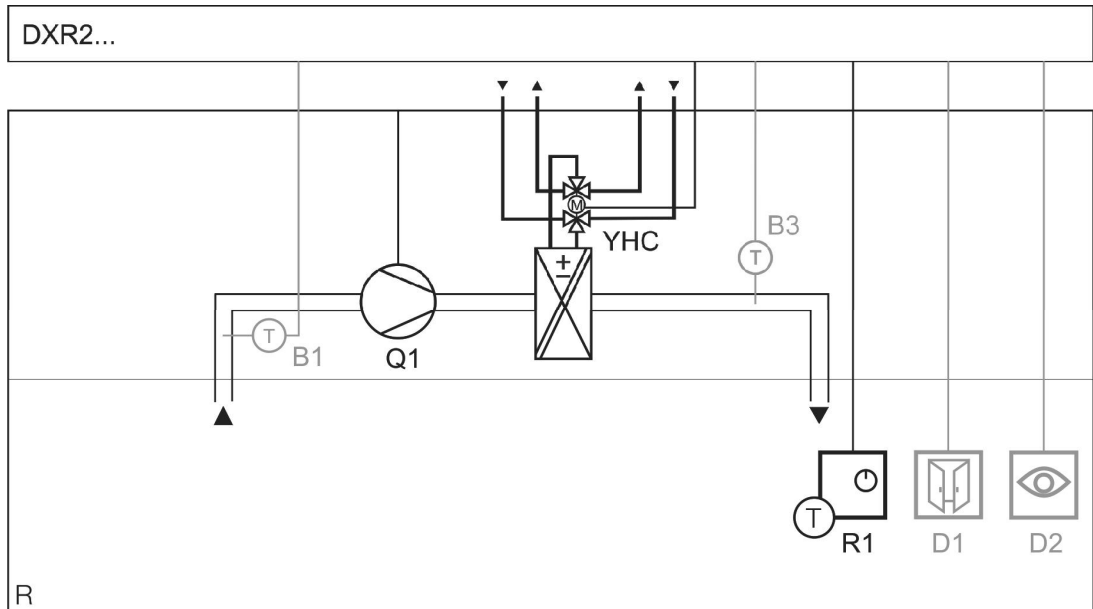
Fan coil unit with staged fan, 6-way heating/cooling coil (4 pipe) on analog output

DXR2.E09-101A



- Heating with LTHW and cooling with CHW changeover
- Modulating control of heating/cooling coil 6-way valve (4 pipe) on analog output
- Automatic or manual 3-speed fan control
- Room temperature and fan speed operation via KNX PL-Link room operator unit with temperature measurement

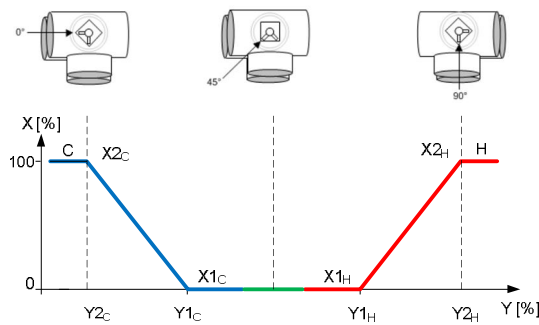
Plant diagram



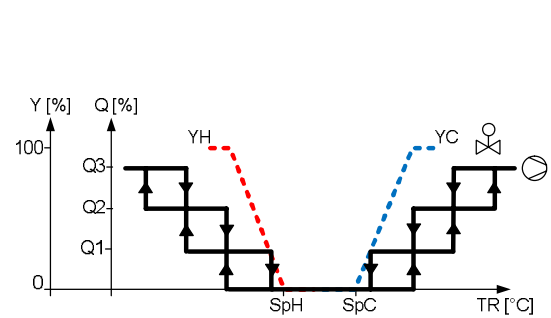
| | | | |
|---------|--------------------------------|-----|--|
| DXR2... | Room automation station | Q1 | 3-speed fan |
| B1 | Extract air temperature sensor | R | Room |
| B3 | Supply air temperature sensor | R1 | Room operator unit with temperature sensor |
| D1 | Window contact | YHC | Heating/cooling coil valve |
| D2 | Presence detector | | |

Function diagrams

6-way valve



1-2-3-speed fan



| | | | |
|-----------------|--|-----------------|--|
| C | Cooling sequence | X2 _C | Cooling coil valve position for value X2 |
| H | Heating sequence | X2 _H | Heating coil valve position for value X2 |
| Q | Fan output signal | Y | Valve output signal |
| SpC | Effective cooling setpoint | Y1 _C | Cooling coil valve position for value Y1 |
| SpH | Effective heating setpoint | Y1 _H | Heating coil valve position for value Y1 |
| TR | Room temperature | Y2 _C | Cooling coil valve position for value Y2 |
| X | Valve opening | Y2 _H | Heating coil valve position for value Y2 |
| X1 _C | Cooling coil valve position for value X1 | YC | Cooling valve |
| X1 _H | Heating coil valve position for value X1 | YH | Heating valve |

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Description of functions

Basic functions

- PID control for heating and cooling.
- The 4 pipe system provides hot and chilled water for the heating/cooling coil.
- 6-way valve 0...10 V controlled by analog output for heating and cooling.
- The fan is controlled manual on the room operator unit or automatic in 3 speeds.
- 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 system alarms displayed on the management station notify building operators of possible faults.
- Optional trends can be activated for room sensors.

Variants

- 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, 3 DO relays, 3 AO 0...10 V | N9204 | DXR2.E09-101A | 1 |
| | R1 | KNX PL-Link room operator unit with temperature sensor, segmented backlit display, touchkeys | N1602 | QMX3.P34 | 1 |
| | YHC | 6-way valve | A6V10564480 | VWG41.20.. | 1 |
| | | Electromotive actuator, AC 24 V, DC 0...10 V | N4657 | GDB161.9E | 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 with brightness sensor | ²⁾ | UP 258D12 | 1 - 4 |

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

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

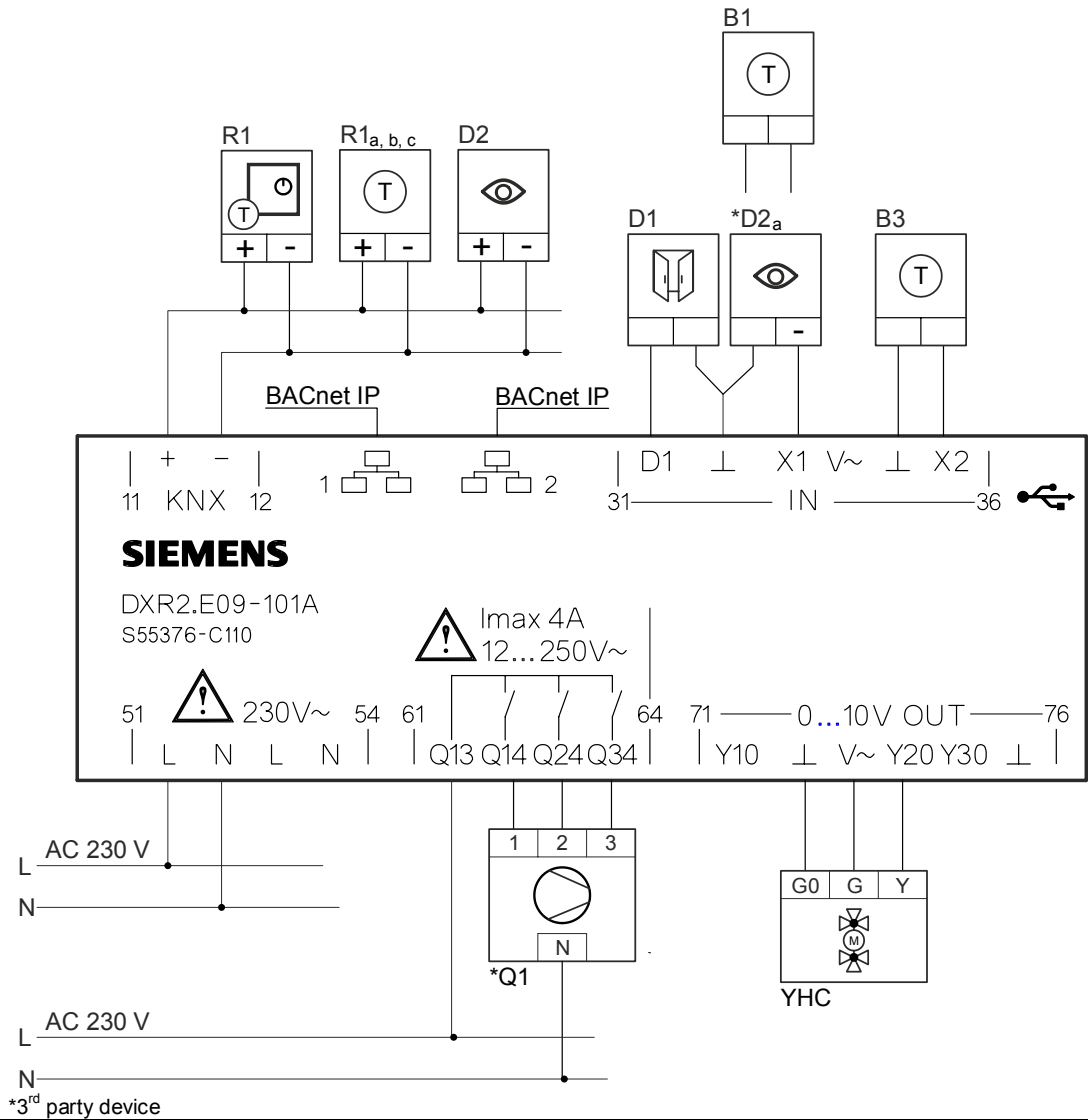
³⁾ Type of operation (NO or NC). Multiple devices of the same type can be connected.

Fan coil unit with staged fan, 6-way heating/cooling coil (4 pipe) on analog output

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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 |

Connection diagram



Fan coil unit with staged fan, 6-way heating/cooling coil (4 pipe) on analog output

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Application configuration

| | Equipment | Values/Range | Template settings |
|---------------------|-------------------------------------|---|---------------------------------------|
| On-board output | Fan speed | 1-stage; Q14; Normally open 2-stage; Q14, Q24; Normally open 3-stage; Q14, Q24, Q34; Normally open Variable speed; Y10; 0...10 V | 3-stage; Q14, Q24, Q34; Normally open |
| | Heating/cooling coil valve position | 2-pipe; Y20; 0...10 V 2-pipe; Y30; 0...10 V 4-pipe 6-way; Y20; 0...10 V 4-pipe 6-way; Y30; 0...10 V | 4-pipe 6-way; Y20; 0...10 V |
| 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 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) | | JP 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 |
| Heating/cooling coil | Cooling coil valve position for value X1 | 0 ... 100 % | 0 % |
| | Cooling coil valve position for value Y1 | 0 ... 100 % | 50 % |
| | Cooling coil valve position for value X2 | 0 ... 100 % | 100 % |
| | Cooling coil valve position for value Y2 | 0 ... 100 % | 0 % |
| | Heating coil valve position for value X1 | 0 ... 100 % | 0 % |
| | Heating coil valve position for value Y1 | 0 ... 100 % | 50 % |
| | Heating coil valve position for value X2 | 0 ... 100 % | 100 % |
| | Heating coil valve position for value Y2 | 0 ... 100 % | 100 % |
| 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 |

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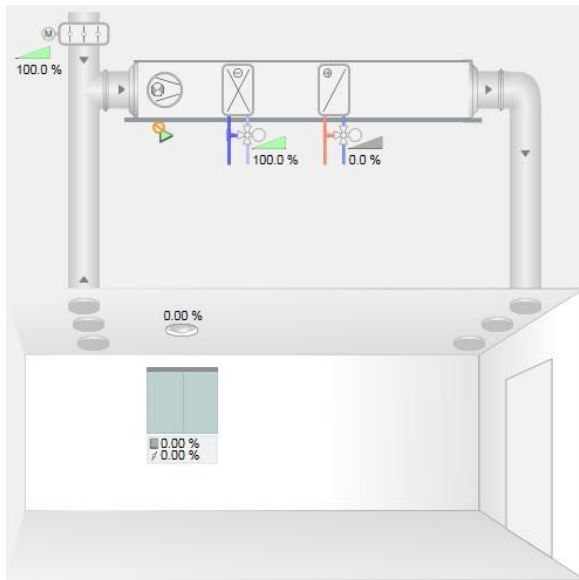
Default values

| | Parameter | Values/Range | Template settings |
|--|--------------------------------------|--------------|-------------------|
| | 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.
- D2a (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 fan coil unit application on the Desigo CC management station.

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