

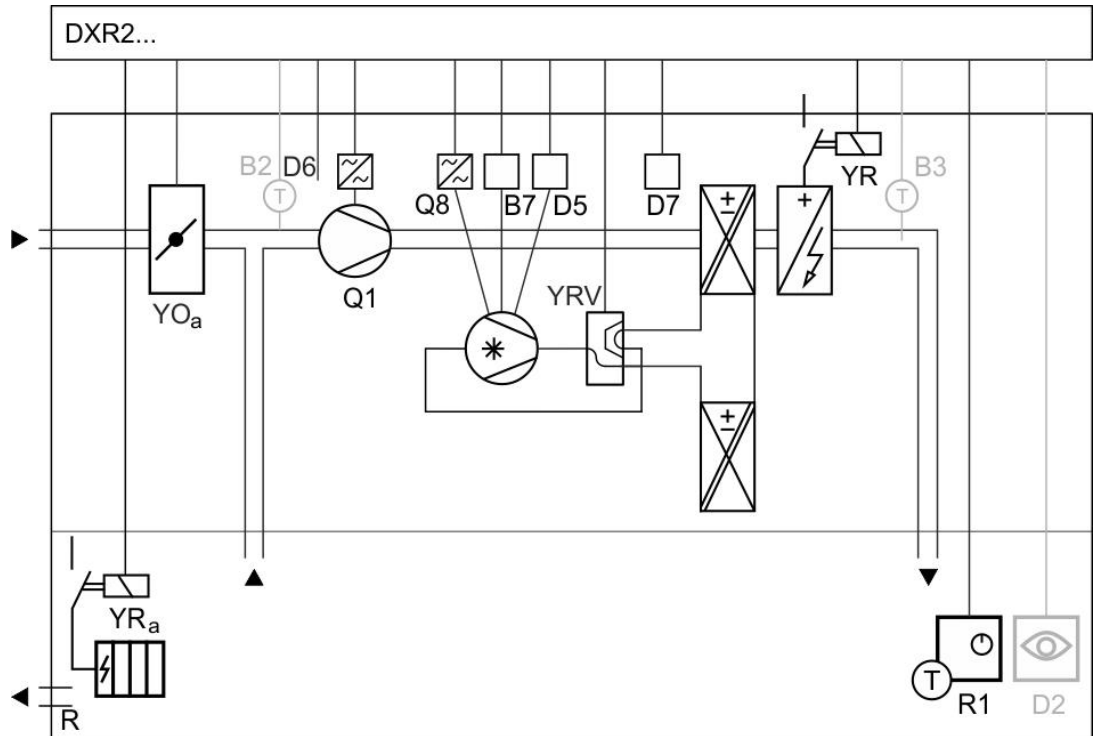
Heat pump, variable fan, reversing valve, 2-stage electric heating,
1-stage electric radiator and outside air damper

DXR2.E18-102A



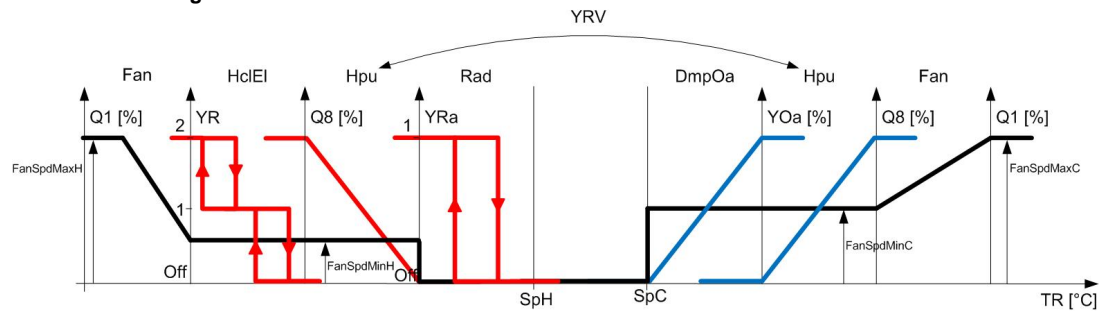
- Room temperature control
- Heating and cooling with variable speed heat pump DC 0...10 V
- Modulating control of outside air damper for free cooling when available DC 0...10 V
- 2-stage electric reheater with on/off control on triac
- 1-stage electric radiator with on/off control on triac
- Automatic 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
- Presence detector via KNX PL-Link device

Plant diagram



DXR2...	Room automation station	Q8	Variable speed heat pump
B2	Mixed air temperature	R	Room
B3	Supply air temperature sensor	R1	Room operator unit with temperature sensor
B7	Power heat pump	YOa	Outside air damper
D2	Presence detector	YR	Electric reheater, 2-stage
D5	Heat pump fault	YRa	Electric radiator, 1-stage
D6	Fan state	YRV	Reversing valve heat pump
D7	Condensate level monitor		
Q1	Variable speed fan		

Function diagrams **Air flow with 2-stage electric reheat**



DmpOa	Outside air damper	Q8	Variable speed heat pump
Fan	Fan	Rad	Radiator
FanSpdMaxC	Max. fan speed cooling	SpC	Effective cooling setpoint
FanSpdMaxH	Max. fan speed heating	SpH	Effective heating setpoint
FanSpdMinC	Min. fan speed cooling	TR	Room temperature
FanSpdMinH	Min. fan speed heating	YOa	Outside air damper
HclEI	Electric heating coil	YR	Electric reheat, 2-stage
Hpu	Heat pump	YRa	Electric radiator, 1-stage
Q1	Variable speed fan	YRV	Reversing valve heat pump

Description of functions

Basic functions

- PID control for heating and cooling.
- 3-position valves are controlled by triac outputs for heating and 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 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 heat pump unit application.
- 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.
- Seasonal compensation of room temperature setpoints.

Options

- 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
- Presence can be detected by KNX PL-Link sensor or binary sensor.

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DXR2.E18-102A

Siemens devices	Legend	Type of unit	Data sheet	Product No.	Qty.
DXR2...		Compact room automation station, BACnet/IP, 24 V, DIN housing, 2 DI, 4 UI, 8 DO triacs, 4 AO 0...10 V	N9205	DXR2.E18-102A	1
R1		KNX PL-Link room operator unit with sensors for temperature, humidity, CO ₂ , segmented backlit display, touchkeys	N1602	QMX3.P74	1

Optional ¹⁾	Legend	Type of unit	Data sheet	Product No.	Qty.
B3		Cable temperature sensor PVC 2 m, LG-Ni1000	N1831	QAP22	1
D2		KNX PL-Link presence detector with brightness sensor ²⁾		UP 258D12	1 - 4

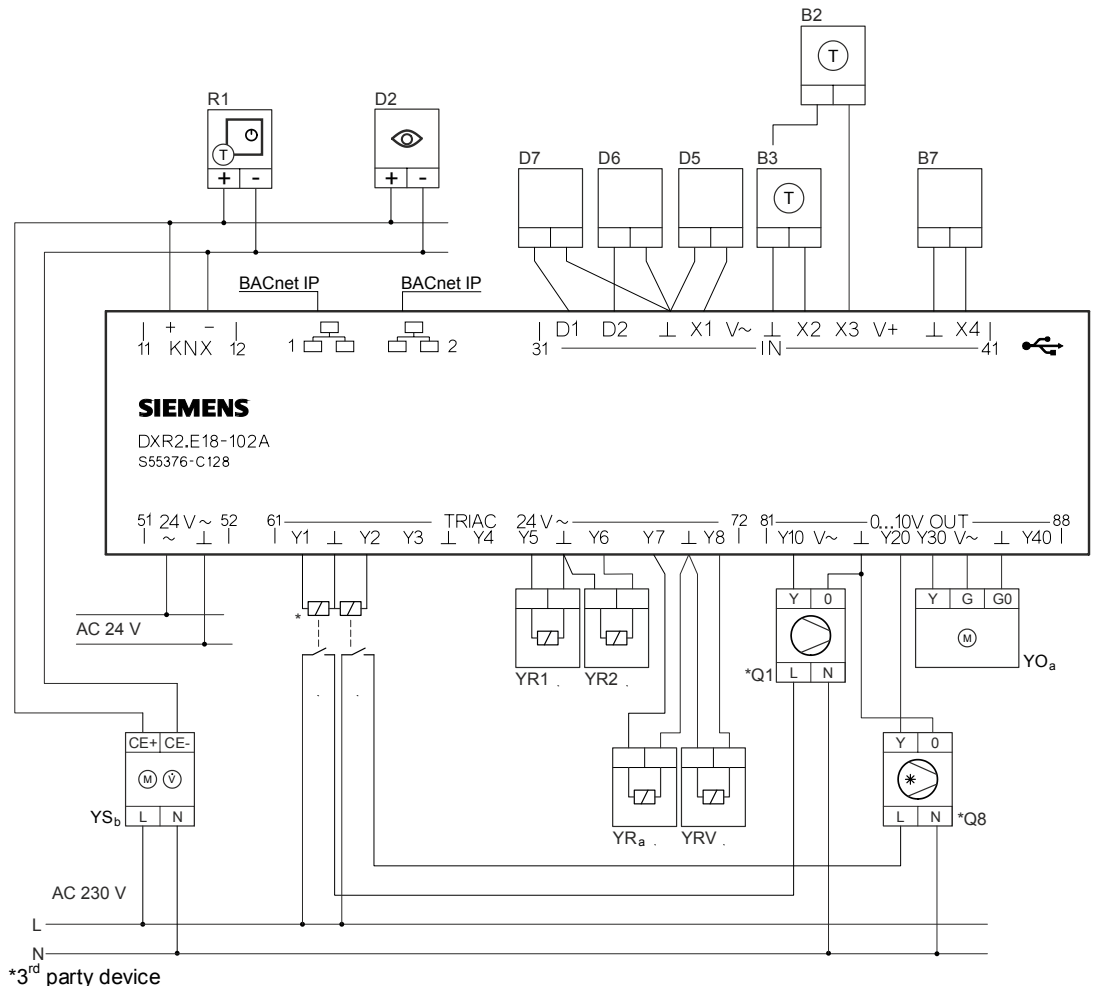
¹⁾ Can be combined according to available on-board I/Os on controller.

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.

Variants	Legend	Type of unit	Data sheet	Product No.	Qty.
R1 _a		KNX PL-Link wall-mount room sensor for temperature	N1602	QMX3.P34	1

Connection diagram



*3rd party device

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DXR2.E18-102A

Application
configuration

	Equipment	Values/Range	Template settings
On-board output	Outside air damper position (YOa)	Y1, Y2; 3-position Y3, Y4; 3-position Y5, Y6; 3-position Y7, Y8; 3-position Y10; 0...10 V Y20; 0...10 V Y30; 0...10 V Y40; 0...10 V	Y30; 0...10 V
	Fan speed (Q1)	1-stage; Y1; Normally open 2-stage; Y1, Y2; Normally open Variable speed; Y10; 0...10 V	Variable speed; Y10; 0...10 V
	Enable fan speed (Q1)	Y1; Normally open	Y1; Normally open
	Heat pump control (Q8)	1-stage; Y3; Reversing valve; Y2 1-stage; Y3; Reversing valve; Y8 2-stage; Y3, Y4; Reversing valve; Y2 2-stage; Y3, Y4; Reversing valve; Y8 2-stage, cooling; Y3, Y4; 2-stage, heating; Y7, Y8 Variable speed; Y20; Reversing valve; Y2 Variable speed; Y20; Reversing valve; Y8	Variable speed; Y20; Reversing valve; Y8
	Enable heat pump variable speed (Q8)	Y2; Normally open Y3; Normally open	Y3; Normally open
	Heating coil valve position (YR)	Water; Y5, Y6; 3-position Water; Y5; Pulse width modulation thermal Water; Y5; Pulse width modulation spring return Water; Y30; 0...10 V Electric 1-stage; Y5; Normally open Electric 2-stage; Y5, Y6; Normally open Electric modulating; Y5; Pulse width mod.constant period Electric modulating; Y30; 0...10 V	Electric 2-stage; Y5, Y6; Normally open
On-board input	Radiator valve position 1 (YRa)	Water; Y3, Y4; 3-position Water; Y7, Y8; 3-position Water; Y3; Pulse width modulation thermal Water; Y7; Pulse width modulation thermal Water; Y3; Pulse width modulation spring return Water; Y7; Pulse width modulation spring return Water; Y20; 0...10 V Water; Y40; 0...10 V Electric 1-stage; Y3; Normally open Electric 1-stage; Y7; Normally open Electric modulating; Y3; Pulse width mod.constant period Electric modulating; Y7; Pulse width mod.constant period Electric modulating; Y20; 0...10 V Electric modulating; Y40; 0...10 V	Electric 1-stage; Y7; Normally open
	Power heat pump (B7)	X1; 0...10 V X2; 0...10 V X3; 0...10 V X4; 0...10 V	X4; 0...10 V
	Fan state (D6)	D1; Normally open D2; Normally open X1; Normally open X2; Normally open X3; Normally open X4; Normally open	D2; Normally open

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DXR2.E18-102A

**Application
configuration**

	Equipment	Values/Range	Template settings
	Heat pump fault 1 (D1)	D1; Normally closed D2; Normally closed X1; Normally closed X2; Normally closed X3; Normally closed X4; Normally closed	X1; Normally closed
	Condensate level monitor (D3)	D1; Normally closed D2; Normally closed X1; Normally closed X2; Normally closed X3; Normally closed X4; Normally closed	D1; Normally closed
KNX PL-Link devices	Room operator unit device 1 (R1)	QMX3.P02, QMX3.P34, QMX3.P36, QMX3.P37, QMX3.P74, QMX2.P33, QMX2.P43	QMX3.P74

**Optional
configuration**

	Equipment	Values/Range	Template settings
On-board output			
On-board input	Supply air temperature (B3)	X2; LG-Ni1000 X2; 0...10 V X2; NTC 100k X2; NTC 10k X2; T1 (PTC) X2; Pt1000 (EU) X2; Pt1000 (NA)	X2; LG-Ni1000
	Mixed air temperature (B2)	X1; LG-Ni1000 X2; LG-Ni1000 X3; LG-Ni1000 X4; LG-Ni1000 X1; 0...10 V X2; 0...10 V X3; 0...10 V X4; 0...10 V X1; NTC 100k X2; NTC 100k X3; NTC 100k X4; NTC 100k X1; NTC 10k X2; NTC 10k X3; NTC 10k X3; NTC 10k X4; NTC 10k X1; T1 (PTC) X2; T1 (PTC) X3; T1 (PTC) X4; T1 (PTC) X1; Pt1000 (EU) X2; Pt1000 (EU) X3; Pt1000 (EU) X4; Pt1000 (EU) X1; Pt1000 (NA) X2; Pt1000 (NA) X3; Pt1000 (NA) X4; Pt1000 (NA)	X3; LG-Ni1000
KNX PL-Link devices	Sensor device 1...4 (D4)	UP 258D12; Presence detector	UP 258D12; Presence detector

5/6

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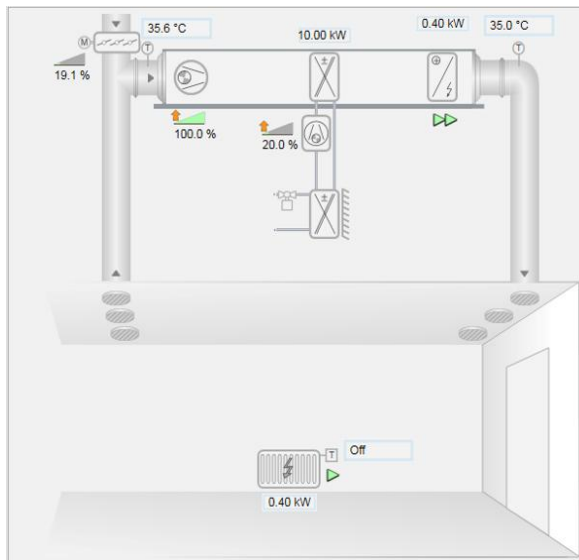
Default values

	Parameter	Values/Range	Template settings
Temperature control for cooling	Fan Operation	Series, Parallel	Series
Temperature control for heating	Fan Operation	Series, Parallel	Series
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
HVAC	Enable condensate level monitor	Yes, No	Yes
Heating cooling coil	Enable fault input	Yes, No	Yes
	Heat pump power	Calculated, Measured	Measured

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.

Management station



Sample presentation of a heat pump application on the Desigo CC management station.

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