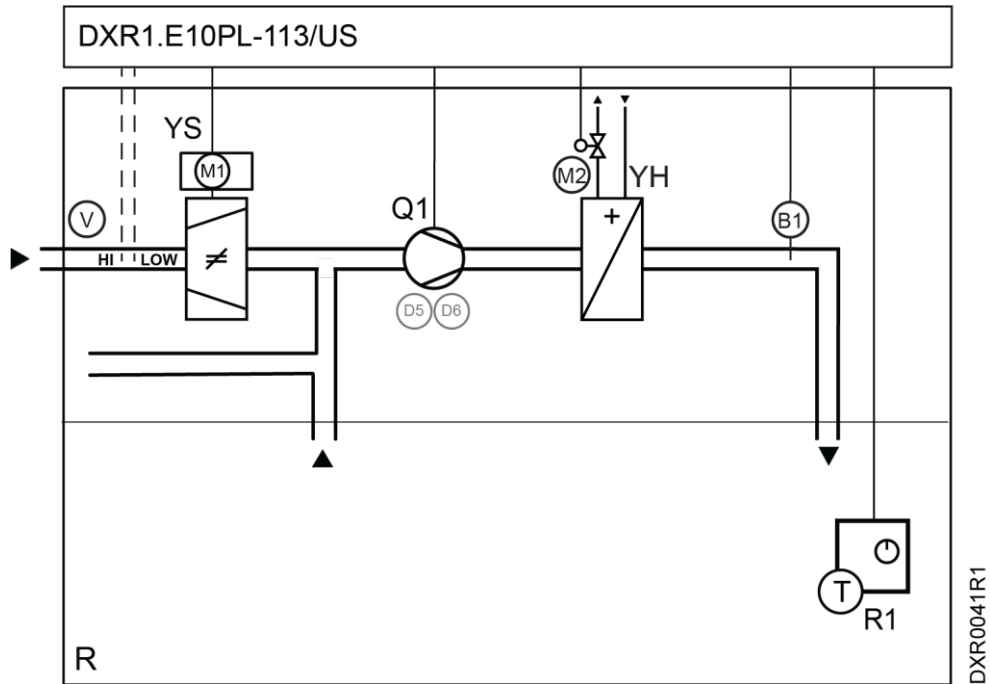




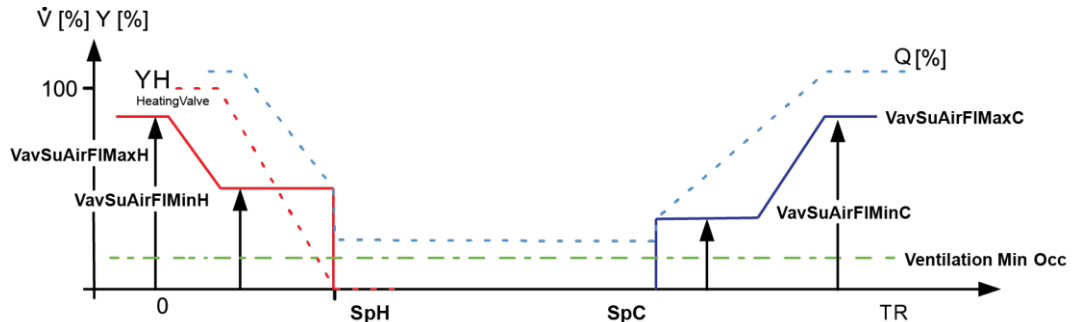
- Supply air volume control with integrated damper actuator (88 lb-in [10 Nm])
- Terminal fan control
- Room temperature control
- Air quality control
- Relative humidity monitor
- Room temperature and rapid ventilation operation via KNX PL-Link room operator unit with temperature, air quality and relative humidity measurement

Plant diagram



DXR1.E10PL-113/US	Zone Controller Actuator	R1	Room sensor/operator unit with temperature sensor and optional indoor air quality and relative humidity sensor
B1	Supply air temperature sensor	V	Differential pressure sensor (Supply air – integrated in DXR1)
D5	Enable fan speed	YH	Heating coil valve/Electric reheat
D6	Fan state	YS	Supply air control actuator (integrated in DXR1)
M2	Heating coil actuator		
Q1	Fan		
R	Room		

Function diagrams Airflow with 2-stage electric reheater or 0 to 10V



Q	Fan output	VavSuAirFIMaxC	Max. volume, cooling
SpC	Effective cooling setpoint	VavSuAirFIMaxH	Max. volume, heating
SpH	Effective heating setpoint	VavSuAirFIMinC	Min. volume, cooling
TR	Room temperature	VavSuAirFLMinH	Min. volume, heating
V	Supply air volume airflow	Y	Output signal
Vent Min Occ	Min. airflow ventilation per Occupancy mode	YH	Heating coil

Description of functions

Basic functions

- PID control for supply VAV, temperature and air quality..
- Supply air differential pressure control sensor integrated in controller.
- Internal air flow controller controls supply air damper actuator integrated in controller.
- Series terminal fan control standard.
- The application allows customers to adjust the room temperature setpoints and rapid ventilation via the room operator unit.
- Display of room air quality on room unit.

- The operating modes are Occupied, Pre-occupied, and Unoccupied.
- The airflow for heating is operated in sequence to the valves or electric heating coils. Parallel operation can be configured.
- Heating coil with 3-position valves controlled by triac outputs.

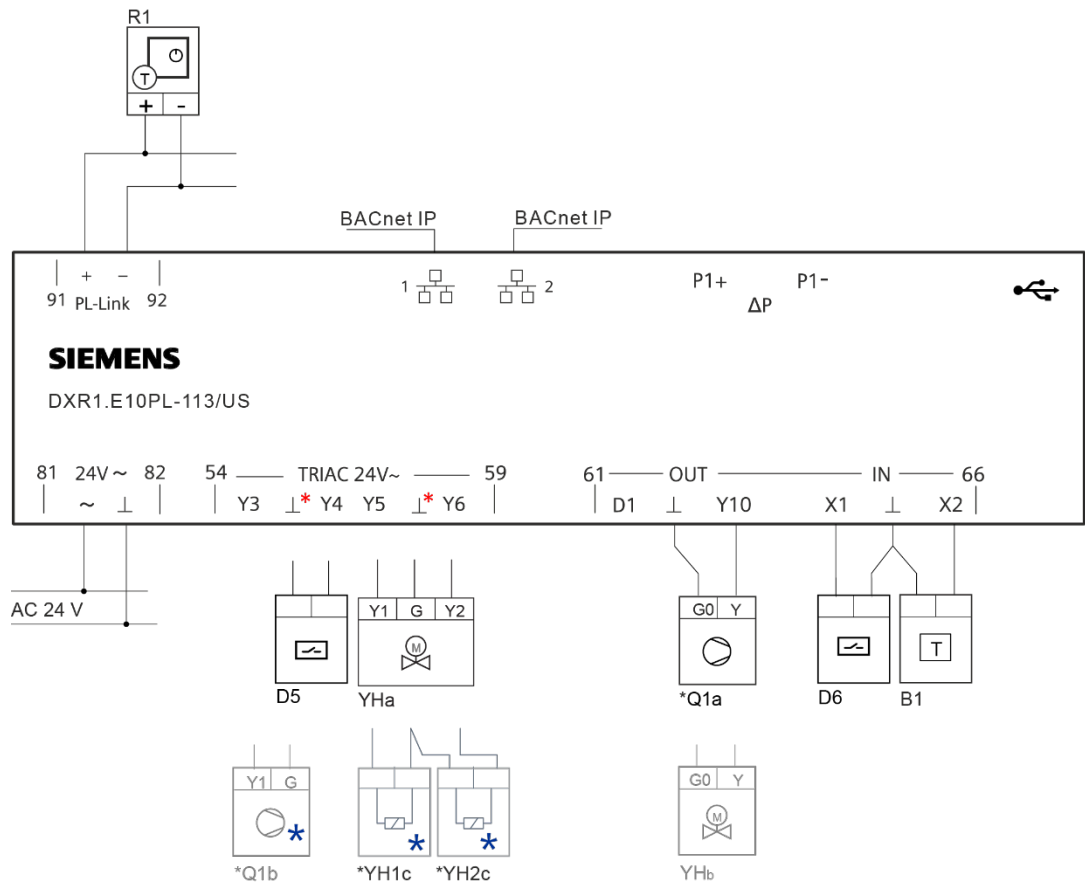
Auxiliary functions

- Rapid ventilation.
- The application allows control via centralized commands (for example, scheduler program for room operating mode).

- 0 to 10V output can be selected for valves and modulating electric heaters.
- Room operator unit and sensor variants:
 - KNX PL-Link wall-mount sensor
 - KNX PL-Link wall-mount room operator unit

Siemens devices	Legend	Type of unit	Data sheet	Product No.
DXR1..		Zone Controller, BACnet/IP, 24 Vac, 1 DI, 2 UI, 1 AO, 4 triac, differential pressure sensor	A6V12842519	DXR1.E10PL-113/US
R1		Wall-mounted room operator unit for KNX PL-Link for temperature, RH and CO2	149-151	QMX3.P74
Optional ¹⁾		NOTE: Further documents on usa.siemens.com/vav-solutions		
		Legend	Data sheet	Product No.
B1		Duct temperature sensor NTC 10K	149-915	QAM2030.010
YH		2-way and 3-way Powermite globe valve/actuator assemblies	155-306P25 155-307P25	
		2-way and 3-way ball valve assemblies	154-038	
Variants		¹⁾ Can be combined according to available on-board I/Os on controller.		
		Legend	Data sheet	Product No.
R1		Wall-mounted room operator unit for KNX PL-Link for temperature	149-151	QMX3.P34
R1		KNX PL-Link wall-mount room sensor for temperature	149-151	QMX3.P30
R1		KNX PL-Link wall-mount room sensor for temperature, RH and CO2	149-151	QMX3.P70

Connection diagram



- ⊥ internally connected
- ⊥ * internally connected, but not internally connected with ⊥
- * 3rd party device
- * connect with relay to control the high voltage devices

Application configuration

	Equipment	Channel/Signal	Settings example
On-board output	Supply air VAV position (integrated actuator)	Y1, Y2; 3-position	Y1, Y2; 3-position
	Fan speed Q1	1-stage; Y4; Normally open 1-stage; Y6; Normally open 2-stage; Y3, Y4; Normally open 2-stage; Y5, Y6; Normally open 3-stage; Y4, Y5, Y6; Normally open Variable speed fan; Y10; 0...10 V	Variable speed fan; Y10; 0...10 V
	Fan enable D5	Y4; Normally open Y6; Normally open	Y4; Normally open
	Heating coil valve position YH	Water; Y3, Y4; 3-position Water; Y5, Y6; 3-position Water; Y3; Pulse width modulation spring return Water; Y5; Pulse width modulation spring return Water; Y10; 0...10 V Electric 1-stage; Y3; Normally open Electric 1-stage; Y5; Normally open Electric 2-stage; Y3, Y4; Normally open Electric 2-stage; Y5, Y6; Normally open Electric 3-stage; Y3, Y4, Y5; Normally open Electric 3-stage; Y4, Y5, Y6; Normally open Electric modulating; Y10; 0...10 V	Electric 2-stage; Y5, Y6; Normally open
On-board input	Supply air VAV differential air pressure (integrated sensor) (YS)	P1	P1
KNX PL-Link devices	Room operator unit device 1 (R1)	QMX3.P34 QMX3.P74	QMX3.P74
	Sensor device 1	QMX3.P30 QMX3.P70	
HVAC	Supply air VAV	Min Air Flow Heating/Cooling Max Air Flow Heating/Cooling K Factor	K Factor 1
	Fan speed	Single-speed fan 11 Multi-speed fan 11 Variable speed fan 11	Single fan speed 11
	Heating coil	Hot water heating coil 11 Hot water heat.coil 12, sply.temp.ctrl. Electric heating coil 11, mod.output Electric heating coil 12, sply.temp.ctrl Electric heating coil 13, 1 binary outp. Electric heating coil 14, 2 binary outp. Electric heating coil 15, 3 binary outp.	Electric heating coil 14, 2 binary output

Optional configuration

	Equipment	Channel/Signal	Settings example
On-board input	Supply air temperature (B1)	X2; Ni1000 X2; 0...10 V X2; NTC100K X2; NTC10K X2; PT1K_EU X2; PT1K_NA	X2; NTC10K
	Fan status (D6)	D1; Normally open X1; Normally open X2; Normally open	D1: Normally open

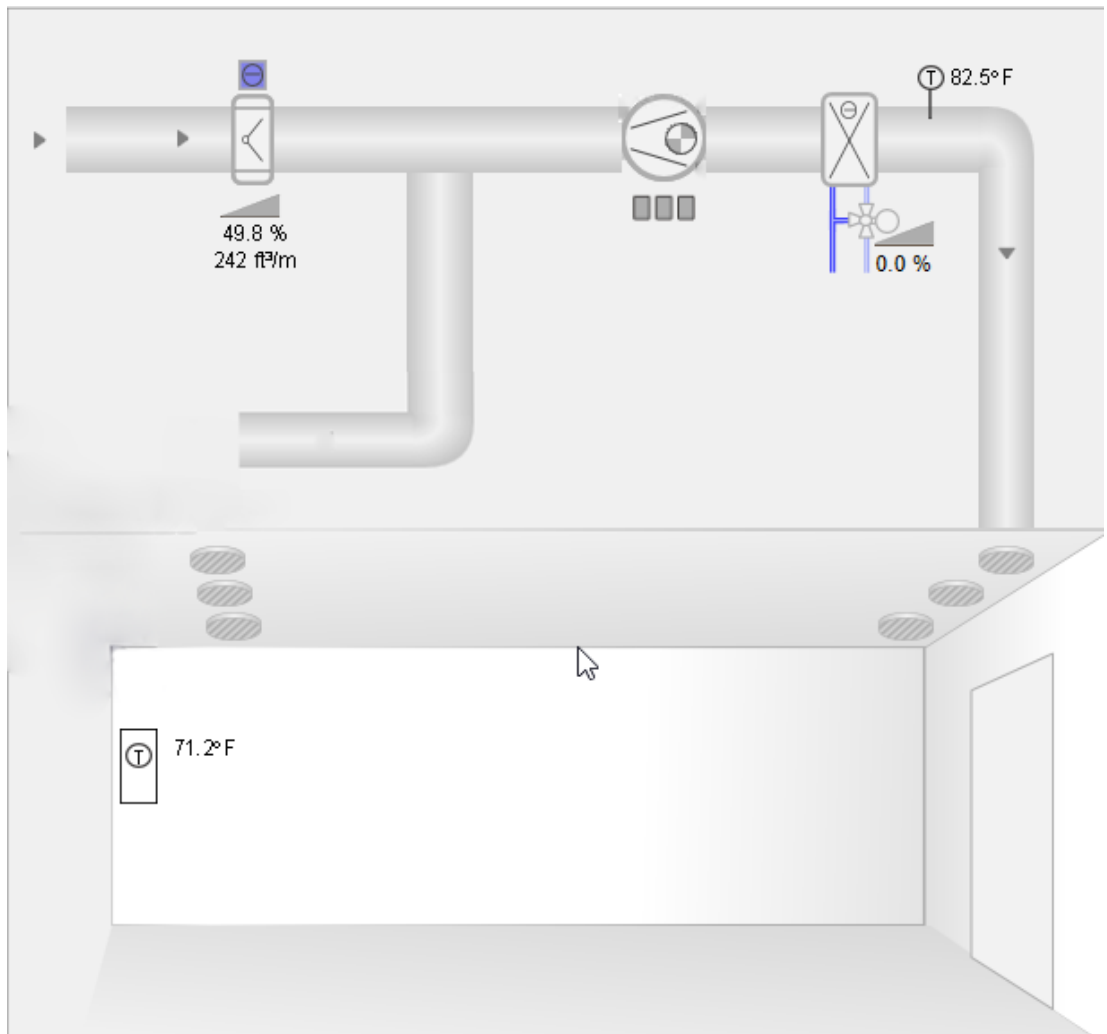
Default values

	Parameter	Range	Default value
Temperature setpoints	Cooling setpoint for Occupied	32 to 122°F (0 to 50°C)	75.2°F (24°C)
	Delta cooling setpoint for Pre-occupied	0 ... 10 K	2 F (1 K)
	Cooling setpoint for Unoccupied	32 to 122°F (0 to 50°C)	84°F (29°C)
	Heating setpoint for Occupied	32 to 122°F (0 to 50°C)	70°F (21°C)
	Delta heating setpoint for Pre-occupied	0 ... 10 K	2 F (1 K)
	Heating setpoint for Unoccupied	32 to 122°F (0 to 50°C)	60°F (15°C)
Ventilation Control	Setpoint room air quality for Occupied	0 ... 2000 ppm	1000 ppm
	Setp. room air quality for pre-occupied	0 ... 2000 ppm	1100 ppm
	Setpoint room air quality for Unoccupied	0 ... 2000 ppm	1500 ppm
Supply air VAV	Supply air VAV max.air vol.flow f.cool	0 to 5,885 CFM (0 ... 10'000 m³/h)	29 CFM (100 m³/h)
	Supply air VAV min.air vol.flow f.cool	0 to 5,885 CFM (0 ... 10'000 m³/h)	58 CFM (50 m³/h)
	Supply air VAV max.air vol.flow f.heat	0 to 5,885 CFM (0 ... 10'000 m³/h)	29 CFM (100 m³/h)
	Supply air VAV min.air vol.flow f.heat	0 to 5,885 CFM (0 ... 10'000 m³/h)	29 CFM (100 m³/h)
	Ventilation min. airflow for Occupied	0 to 5,885 CFM (0 ... 10'000 m³/h)	20 CFM (0 m³/h)
	Ventilation min. airflow for Pre-occupied	0 to 5,885 CFM (0 ... 10'000 m³/h)	20 CFM (0 m³/h)
	Ventilation min. airflow for Unoccupied	0 to 5,885 CFM (0 ... 10'000 m³/h)	0 CFM (0 m³/h)
	Box manufacturer K factor	0...4	1
	Pickup coefficient	0 ... 1	0.76
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 air quality	None Display room air quality	Display room air quality
	Room unit, air quality display	Numeric (in ppm) Symbolic (with the symbols +, ++, and +++) Textual (Poor, Ok, Good)	Numeric (in ppm)
	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	Absolute temperature setpoint
	Enable rapid ventilation	Yes, No	No
	Enable temporary occupancy	Yes, No	Yes
Fan	Single speed fan operation	No (fan coil unit or heat pump) On request (parallel fan-powered VAV box) Continuous on (series fan-powered VAV box)	Continuous on

Engineering

- The Climatix app is required to configure the DXR1 automation stations.
- Option combination according to available on-board I/Os on controller.

Management station



Sample presentation of a fan-powered box (FPB) application.

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