

Desigo™ Room Automation

Compact room automation stations, BACnet/IP and BACnet/SC, AC 230 V

DXR2.E09.., DXR2.E09T.., DXR2.E10..



For building with increased demands placed on functionality and flexibility in Room Automation and fan coil applications.

- Compact, programmable room automation stations for HVAC, lighting, and shading
- BACnet/IP communication (BTL certified)
- BACnet Secure Connect communication
- KNX PL-Link bus to connect sensors, actuators, and operator units (including bus power)
- 2 port Ethernet switch
- USB interface
- Operating voltage AC 230 V
- Mounted on standard DIN rails or on the wall
- Plug-in terminal blocks





Programmable

The DXR2... room automation stations provide the infrastructure for system and application-specific functions and can be programmed.

Compact series

The compact build permits mounting in narrow spaces and on standardized rails, and is particularly well suited for compact panels or plants with integrated panel.

Plug-in terminal blocks

Plug-in terminal blocks to easily exchange room automation stations.

معاا

- Radiators, chilled/heated ceilings, fan coil applications.
- Room Automation applications combining multiple disciplines (HVAC, lighting, shading) into one comprehensive solution. Room Automation offers the highest level of flexibility for energy-optimized solutions without sacrificing comfort.
- Room Automation applications can be extended with lighting and blinds applications via KNX PL-Link.

Preinstalled applications

- Fan coil: Cooling or heating, cooling and heating (2-pipe), or cooling/heating (4-pipe), supply air minimum limitations, outside air control
- Chilled beam active or passive cooling (2-pipe) or cooling/heating (2-pipe) or cooling/heating (4-pipe)
- Radiant ceiling: Cooling, cooling and heating (2-pipe), or cooling/heating (4-pipe)
- Radiator: Hot water, steam (2 or 4-pipe) or electric stepped controlled
- Light: Up to 4 separate zones
- Blinds: 1 or 2 motors

Application options

- Separate temperature setpoints for up to 4 operating modes.
- Chilled water and hot water valve (2-pipe or 4-pipe)

Functions

The selected application and its parameters as well as input and output configuration determine the room automation station's functionality.

A detailed description of functionality is available in the ABT (Automation Building Tool) online help.

Communication

- 2-Port Ethernet switch for cost-effective cabling via line topology.
- USB connection for service and commissioning, firmware download, and LAN access.
- The following functions are available with the KNX PL-Link bus:
 - Communication with room operator units, switches, sensors, actuators, and luminaires.
 - Plug-and-play connection of Siemens field devices with KNX PL-Link.
 - Integration of common devices using KNX S-Mode (ETS engineering required).

LED indication

LED	Color	Activity	Function
RUN	Green	Steady ON	Device is ready for operation
		Steady OFF	Device is not powered
		Regular flashing	Start-up or the program is stopped
	Red	Steady OFF	ок
		Steady ON	Program error Communications error (KNX PL-Link) Hardware fault
		Rapid flashing	Wrong or corrupt software No application loaded
		Blinking per wink command	Physical device identification
		5 Hz	21s 922202 5 Hz 2s 1s
SVC (Service button)		Short press	Physical identification on the network
buttorij		Factory reset	Power off the device.
			2. Power on the device.
			Wait until the RUN LED lights up and turns off again, then press the Service button.
			Keep the Service button pressed until the RUN LED lights up, then release the button. The device restarts.
			Wait until the device has fully started – unconfigured (green RUN LED on, flashes red)

Technical design

Power supply

The power supply provides controlled voltages to the actuators. The room automation stations also supply AC 24 V field supply. The supply is located in the device to simplify wiring and diagnostics.

The processor controls the power supply. This ensures clean conditions for field devices connected to the I/Os during startup, shutdown, and undervoltage.

Bus power supply

The room automation station includes the bus power for KNX PL-Link. The bus power is switched on by default, but can be switched off via web interface or configuration in the Automation Building Tool (ABT).

The internal KNX PL-Link supply cannot be operated parallel to external power supplies. The internal KNX PL-Link power must be switched off during the engineering phase for external power. This is typically the case if the 50 mA from the internal supply is not enough to supply all devices connected on the KNX PL-Link bus.

Type summary

The devices are supplied without terminal covers. The terminal covers must be ordered separately. See **Accessories**.

Individual packages

Туре	Stock number	Applications	Inputs	Outputs
DXR2.E09-101A	S55376-C110	Fan coil, radiant ceiling, radiator,	1 DI, 2 UI	3 relays, 3 AO
DXR2.E09T-101A	S55376-C111	4 luminaires & 2 blinds		4 triac, 1 AO, 1 relay
DXR2.E10-101A	S55376-C109			4 triac, 3 relays

Bulk packages (18 pieces)

Туре	Stock number	Applications	Inputs	Outputs
DXR2.E09-101A/BP	S55376-C165	Fan coil, radiant ceiling, radiator,	1 DI, 2 UI	3 relays, 3 AO
DXR2.E09T- 101A/BP	S55376-C166	4 luminaires & 2 blinds		4 triac, 1 AO, 1 relay
DXR2.E10-101A/BP	S55376-C164			4 triac, 3 relays

Accessories

7	Гуре	Stock number	Designation
[DXA.H110	S55376-C119	Terminal cover for DXR 110 mm, 2 pieces

Product documentation

Topic	Title	Document ID:
Engineering, mounting and installation	Desigo [™] Room Automation	CM111043
Engineering and commissioning, workflow	ABT online help	n/a
Commissioning	Desigo Raumautomation - Setup and Service Assistant	CM111050
Product environmental declaration	Product environmental declaration 230 V	CM1E9204
Product environmental declaration	Product environmental declaration 24 V	CM1E9205

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

www.siemens.com/bt/download

Safety

A CAUTION



National safety regulations

Failure to comply with national safety regulations may result in personal injury and property damage.

Observe national provisions and comply with the appropriate safety regulations.

Engineering

Identification

Each device has a unique serial number to ensure efficient commissioning. It is provided on the adhesive barcode label. The serial number can be read directly into the engineering tool using a barcode reader.

Wiring

Wiring must be sufficiently insulated to the available rated voltage. Sizing and fusing of the wiring depends on the connected load.

The looped supply (230 V) is interrupted when plug 51-54 is disconnected from the device. Bridges 51-53 and 52-54 are located on the PCB, not the plug.

Potential-free relay outputs AC 230 V

Potential-free relay outputs allow for switching loads up to AC 250 V, 4 A (3 A). The circuits have no internal fuse. They must have an external fuse (≤ 10 A).

Sizing Triacs on preloaded applications

The entire load (Triacs) for actuators cannot exceed 4 VA (6 VA briefly for heating up thermal actuators).

On preloaded applications, PWM, priorities, alternating locking, and division of sequences ensures that no more than one Triac is active at any time.

For details, see Installation guide Desigo Room Automation CM111043.

In other words, only the highest connected load on one of the Triacs is relevant to calculating power.

An exception is the use of Triacs as digital outputs. Triacs as digital outputs are not subject to locking or prioritization and must be added to the power consideration.

They must be operated with internal power to protect Triac outputs against overloading.

The maximum overall load is calculated as follows:

Highest load at one of the Triacs used by the application

+ Load at digital outputs

Examples

	Example 1: DXR2x10, 09T			Example 2: DXR2.x10, 09T			
Use	Туре	Signal	Load	Use	Туре	Signal	Load
Fan coil heating	STP73	PWM	2.5 W / (6 VA)	Radiator	STP73	PWM 550%	2.5 W / (6 VA)
Chilled ceiling cooling	STP73	PWM	2.5 W / (6 VA)	Radiator	STP73	PWM 550%	2.5 W / (6 VA)
Outside air damper	GEB131.1 E	3- position	4 VA	Chilled ceiling	STP73	PWM 550%	2.5 W / (6 VA)
Digital output	-	-	-	Chilled ceiling	STP73	PWM 550%	2.5 W / (6 VA)
Overall load	4 VA / (6 VA)					2.5 W / (6 VA)	

Sizing DC 0...10 V outputs and field supply

Total load (V~) cannot exceed 4 VA (6 VA briefly for actuator synchronization at start up or boost heating of thermal actuators).

The DC 0...10 V outputs supply max. 1 mA.

	Example 1:	Example 1: DXR2x09			Example 2: DXR2.x09		
Use	Туре	Signal	Load	Use	Туре	Signal	Load
Fan coil heating	SSB61	DC 010 V	2.5 VA	Radiator	STP63	DC 010 V	2.5 W / (6 VA)
Chilled ceiling cooling	-	-	-	Radiator	-	-	-
Outside air damper	GLB161.1 E	DC 010 V	3 VA	Chilled ceiling	STP63	DC 010 V	2.5 W / (6 VA)
Digital output	Relay	во	0.5 VA	Chilled ceiling	-	-	-
Overall load			3.5 VA				2.5 W / (6 VA)

	Example 3: DXR2x09		
Use	Туре	Signal	Load
Chilled/heated ceiling	-	-	-
6-port control ball valve	GDB116.9E	010 V	3 VA
Condensation monitor	QXA2100	DI	1 VA
Overall load			4 VA

NOTICE



Separate AC 24 V supply for field devices (V~)

A separate AC 24 V field supply is required if field devices and Triac outputs use more than 4 VA or have peak loads in excess of 6 VA.

Do not use the external field supply for the triacs. The external field supply is reserved for field devices only, which in turn, must be controlled by an analog output (Y10...Y30).

Connecting an external supply to the triacs (V~) will destroy the room automation station.

Digital inputs

Digital inputs are not suitable for operating lighting or blinds. Use the KNK PL-Link pushbutton.

Mounting

The room automation stations can be snapped onto standard rails or screwed onto a flat surface.

A CAUTION



Risk of overheating for failure to comply with ambient temperature

Burning and damage to the device

Ensure sufficient ventilation to comply with the permissible ambient temperature within the panel or installation box. The temperature must be at least 10 K (18° F) lower outside the installation box.

Mounting position

Am	nbient temperature -545 °C (23113°F)	Ambient temperature -550 °C (23122°F)	
1.	Overhead	Wall, horizontal	
2.	Wall, vertically	From left to right	
	 From top to bottom 	From right to left	
	 From bottom to top 		
3.	On a horizontal surface		

Installation

NOTICE



No protection against incorrect wiring on 230 V

The device is damaged

• Do not connect mains power to the low voltage side.

A WARNING



No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits!

 Adapt the wire cross sections as per local regulations to the rated value of the installed fuse.

7

A WARNING



The connected plug-in terminals supply mains voltage

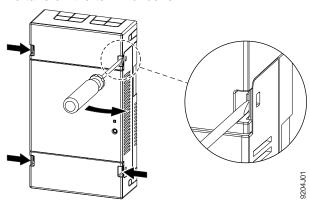
Can result in death or serious injury.

 Disconnect all power to the plug-in terminals prior to plugging in or taking off the connectors.

Terminal cover

Terminal covers protect the connection terminals against dirt, and users against electrical shock. Break off the cable inlets to insert the cables to the room automation station.

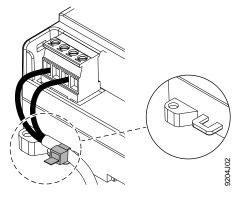
To take off the terminal cover:



Strain relief

Strain relief protects flexible electrical wiring against mechanical stress. Cable strain relief is required for wires to terminals 51...64 (AC 230 V).

The wiring must be fixed using cable binders to the tabs on the housing base.



Operation

The outputs have no electricity when power fails.

Disposal



The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.

- Use only designated channels for disposing the devices.
- Comply with all local and currently applicable laws and regulations.

8

Siemens CM1N9204en
Smart Infrastructure 2023-07-04

Warranty

Technical data on specific applications is only valid on Siemens products. Siemens rejects any and all warranties in the event that third-party products are used.

Technical data

Housing

Color	RAL 7035 (light-gray)
Dimensions	See Dimensions
Weight Automation station Terminal cover Packaging	ca. 310 g ca. 60 g ca. 30 g

Function data

Processor	Texas Instruments AM3352, 300 MHz
RAM	128 MByte SDRAM (DDR3) 512 MByte NAND Flash
Communication A/D Resolution (analog in) D/A Resolution (analog out)	14 Bit 12 Bit

Power data

Power supply				
Operating voltage	AC 230 V +10% / -15%			
Frequency	50/60 Hz			
Power consumption including connected field devices	Max. 20 VA			
Internal fuse	0.5 A irreversible			
Transit power	Max. 6 A			

Apparent power at 23	Apparent power at 230 V (VA)			
	Basic load including I/O without Triacs and field supply at 167 mA		Max. load KNX PL- Link	Power consumption including connected field devices
DXR2.E09	8	8	4	20
DXR2.E09T				
DXR2.E10				

The inputs are protected against incorrect wiring AC 24 V.

Inputs: Overview	
Type Inputs	
DXR2.E09	1 DI, 2 UI
DXR2.E09T	1 DI, 2 UI
DXR2.E10	1 DI, 2 UI

Resistance sensor, analog (inputs X)		
Туре	Range (over range)	Resolution
AI 1000 Ohm *)	1 kΩ (01.05 kΩ)	1 Ω
AI 2500 Ohm *)	2.5 kΩ (02625 kΩ)	2.5 Ω
AI 10 kOhm *)	10 kΩ (010.5 kΩ)	10 Ω
AI 100 kOhm *)	100 kΩ (0105 kΩ)	100 Ω

Temperature measurement, analog (inputs X)		
Туре	Range (over range)	Resolution
AI PT1K 375 (NA) *)	-4070 °C (-4575 °C) -40158 °F (-49167 °F)	25 mK 0.045 °F
AI PT1K 385 (EU) *)	-4070 °C (-4575 °C) -40158 °F (-49167 °F)	25 mK 0.045 °F
AI (LG-)Ni1000 *)	-4070 °C (-4575 °C) -40158 °F (-49167 °F)	25 mK 0.045 °F
AI Ni1000 DIN *)	-4070 °C (-4575 °C) -40158 °F (-49167 °F)	25 mK 0.045 °F
AI T1 (PTC) *)	-4070 °C (-4575 °C) -40158 °F (-49167 °F)	100 mK 0.18 °F
AI NTC10K (Typ II / Beta (0-50 °C) = 3892 K)	-4070 °C (-4575 °C) -40158 °F (-49167 °F)	25 mK (25 °C) 0.045 °F (77 °F)
AI NTC100K	-1070 °C (-1575 °C) 14158 °F (5167 °F)	25 mK (25 °C) 0.045 °F (77 °F)

 $^{\star})$ A fixed value of 1 Ω is calibrated to correct line resistance.

Voltage measurement, analog (inputs X)		
Type Range (over range) Resolution		
AI 010 V	010 V (-111 V)	2 mV
AI 010 V standard	0100% (-10110%)	2 mV
Open connection: Negative voltage -1.5 V, 8 μA (line failure detection)		

Digital input (inputs X or D)	
Contact query voltage	Universal input: 18 V Digital input: 21 V
Contact query current	Universal input: 1.2 mA, 7.4 mA initial current Digital input: 1.6 mA, 9.4 mA initial current
Contact resistance for closed contacts	Max. 100 Ω
Contact resistance for open contacts	Min. 50 kΩ

Outputs

NOTICE The outputs are protected against short circuiting and incorrect wiring AC 24 V. But mind the following exception: Separate AC 24 V supply for field devices (V~). Connecting an external supply to the triacs (V~) will destroy the room automation station.

Outputs: Overview	
Type Outputs	
DXR2.E09	3 relays, 3 AO
DXR2.E09T	4 Triacs, 1 AO, 1 relay
DXR2.E10	4 Triacs, 3 relays

Analog (outputs Y10Y40)			
Туре	Range (over range)	Resolution	Output current
AO 0-10 V	010 V (010.5 V)	2 mV	Max. 1 mA
AO 0-10 V standard	0100% 0% = 0 V, 100% = 10 V (010.5 V)	2 mV	Max. 1 mA

Relay outputs (outputs Q)	
External supply line fusing Non-renewable fuse Circuit breakers	max. 10 A, slow max. 13 A, characteristic B, C, D per EN 60898
Switching voltage AC/DC	max. AC 250 V / DC 30 V min. AC/DC 12 V
Current load AC	max. 4 A resistive, 3 A inductive (cos phi 0.6) min. 1 mA at AC 250 V min. 10 mA at AC 12 V
Current load DC	max. 3 A resistive at DC 30 V min. 10 mA resistive at DC 12 V
Switch-on current	Max. 10 A (1 s)
Response/release time	7 ms/3 ms typical
Contact life at AC 250 V (reference values) at 0.1 A resistive at 0.5 A resistive at 4 A resistive Reduction factor at ind. load (cos phi = 0.6)	5 x 10 ⁶ switching cycles 1 x 10 ⁶ switching cycles 1 x 10 ⁵ switching cycles 0.6
Insulating strength between relay contacts and system electronics (reinforced insulation).	AC 3750 V, as per EN 60730-1

Switching outputs Triac *) (outputs Y1Y4)	
Туре	Low side The Triac closes the contact to system neutral
Switching voltage	AC 24 V
Permissible load (continuous)	167 mA / 4 VA overall and per output
Permissible load (<300 s)	250 mA / 6 VA overall and per output
Protection against overload	Power limitation internal, max. 250 mA, resetting

Supply for field devices *) (outputs V~)	
Output voltage	AC 24 V
Permissible load (continuous)	Max. 4 VA
Permissible load (<300 s)	Max. 6 VA
Protection against overload	Power limitation internal, max. 250 mA, resetting Switch-on current max. 1 A, resetting

 $^{^{\}star})$ The maximum common load of the Triacs and field supply is 4 VA (continuous).

Interfaces	
Ethernet	Plugs: 2 x RJ45, screened Interface type: 10Base-T/100BASE-TX, IEEE 802.3 compatible Bitrates: 10/100 Mbps, autosensing Protocol: BACnet/IP (Annex J)
	BACnet/SC (Annex AB), as BACnet Secure Connect node
USB (2.0)	Plug: Type B Data rate: 12 Mbps
KNX	Type: KNX TP1 PL-Link, galvanic isolation Baud rate: 9.6 kbps Bus power: 50 mA Short-circuit proof, and protected against faulty wiring at max. AC 24 V

Wiring connections			
Pluggable screw terminals	Copper wire or copper stranded wire with connector sleeves 1 x 0.6 mm ø to 2.5 mm ² (22 to 14 AWG) or 2 x 0.6 mm ø to 1 mm ² (22 to 18 AWG)		
	Copper stranded wire without connector sleeves 1 x 0.6 mm ø to 2.5 mm 2 (22 to 14 AWG) or 2 x 0.6 mm ø to 1.5 mm 2 (22 to 16 AWG)		
Stripping length	67.5 mm (0.240.29 in)		
Slotted screws	Size 1, tightening torque 0.6 Nm (0.44 lb-ft)		
Wiring lengths for signals	KNX PL-Link 80 m (260 ft) with internal bus power or 300 m (990 ft) with external power supply		
	Ethernet 100 m (330 ft)		
	Signal lines 80 m (260 ft) For inputs AI 100 kOhm, AI NTC10K, AI NTC100K: 30 m (100 ft) or 80 m (260 ft), if shielded.		

Ambient conditions and protection classification	
Classification per IEC/EN 60730 Function of automatic control devices Pollution degree Overvoltage category	Type 1 2 III
Protection against electric shock	Suitable for use in protection class I or II systems
Degree of protection of housing to IEC EN 60529 Room automation station With terminal cover	IP20 IP30
Climatic ambient conditions Transport (packaged for transport) as per IEC EN 60721-3-2 Operation as per IEC/EN 60721-3-3	 Class 2K3 Temperature -2570 °C (-13 158 °F) Air humidity 595% (non-condensing) Class 3K5 Temperature -545 °C (23 113 °F)/ -550 °C (23 122 °F) See Mounting Air humidity 595% (non-condensing)
Mechanical ambient conditions Transport as per IEC/EN 60721-3-2 Operation as per IEC/EN 60721-3-3	Class 2M2 Class 3M2

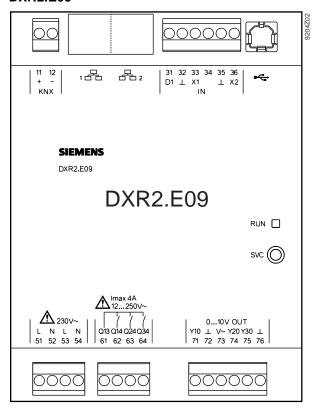
Standards, directives and approvals				
Product standard	IEC/EN 60730-1 Automatic electronic controls for household and similar use			
Product family standard	EN 50491-2, EN 50491-3, EN 50491-5 General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)			
Electromagnetic compatibility	For residential, commercial, and industrial environments			
EU conformity (CE)	EU declaration of conformance DXR2 AC 230 V, see CM1T9204xx_1 EU declaration of conformance DXR2 AC 24 V, see CM1T9204xx_2			
RCM conformity	RCM declaration of conformance DXR2 see CM1T9204xx_C1			
EAC compliance	Eurasien compliance for all DXR2.xxx-xxxA variants			
UL Approbation Federal Communications Commission	UL as per UL916, http://ul.com/database cUL as per CSA - C22.2 No. 205 FCC CFR 47 Part 15 Class B			
BACnet	BTL listed, BACnet Advanced Application Controller (B-AAC) BACnet Protocol Revision 15			

Standards, directives and approvals			
eu.bac certification	DXR2.E room automation stations are eu.bac certified for different applications. Detailed information can be found on the CLMS website: http://www.eubaccert.org/licences-by-criteria.asp.		
Environmental compatibility	The product environmental declaration () contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal). See Section Product documentation .		
Quality	ISO 9001 (Quality)		

European Union conformity

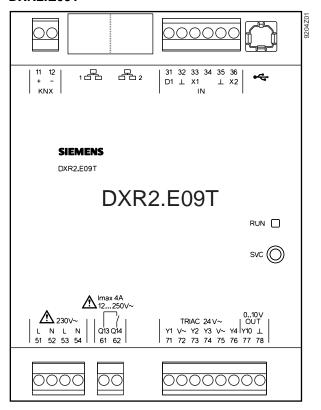
Contact for regulatory topics: (EU) Siemens AG, Berliner Ring 23, DE-76437 Rastatt

DXR2.E09



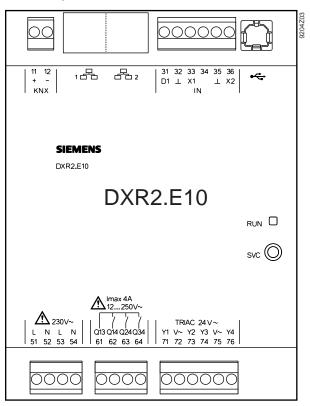
Terminal	Symbol	Description	Module	Channel
1, 2 Ethernet		2 x RJ45 interface for 2-port Ethernet switch		
11, 12 KNX	+, -	KNX connection		
3136 inputs	D1	Digital input	1	1
	X1, X2	Universal input	1	5, 6
		System zero		
USB	•	USB interface		
5154 feed	N	Neutral conductor		
	L	Phase wire AC 230 V		
6164 relays	Q13	Common wiring for Q14, Q24 and Q34		
	Q14, Q24, Q34	NO contact	11	911
7176 analog outputs	Y10, Y20, Y30	Positioning output DC 010 V	21	13
	上	System zero		
	V~	Field supply AC 24 V		
Service	SVC	Service button		
Display	RUN	Operation LED		

DXR2.E09T



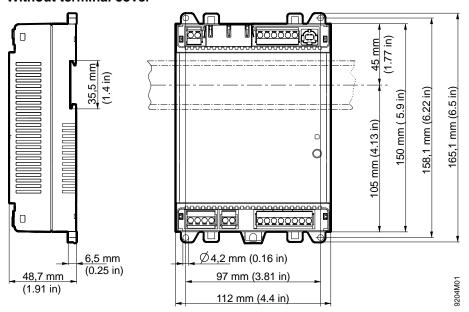
Terminal	Symbol	Description	Module	Channel
1, 2 Ethernet	4	2 x RJ45 interface for 2-port Ethernet switch		
11, 12 KNX	+, -	KNX connection		
3136 inputs	D1	Digital input	1	1
	X1, X2	Universal input	1	5, 6
	上	System zero		
USB	•	USB interface		
5154 feed	N	Neutral conductor		
	L	Phase wire AC 230 V		
6164 relays	Q13	Wiring for Q14		
	Q14	NO contact	11	9
7176 Triacs	Y1Y4	Switching output AC 24 V, 0.15 A	11	14
	V~	Actuator voltage AC 24 V		
7778 analog output	Y10	Positioning output DC 010 V	21	1
	上	System zero		
Service	SVC	Service button		
Display	RUN	Operation LED		

DXR2.E10

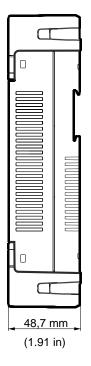


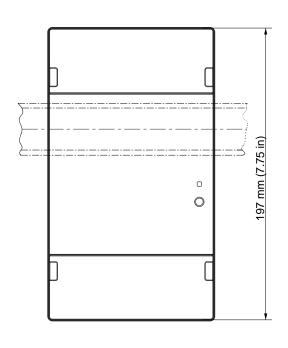
Terminal	Symbol	Description	Module	Channel
1, 2 Ethernet	52	2 x RJ45 interface for 2-port Ethernet switch		
11, 12 KNX	+, -	KNX connection		
3136 inputs	D1	Digital input	1	1
	X1, X2	Universal input	1	5, 6
	上	System zero		
USB	•	USB interface		
5154 feed	N	Neutral conductor		
	L	Phase wire AC 230 V		
6164 relays	Q13	Common wiring for Q14, Q24 and Q34		
	Q14, Q24, Q34	NO contact	11	911
7176 Triacs	Y1Y4	Switching output AC 24 V	11	14
	V~	Actuator feed AC 24 V		
Service	SVC	Service button		
Display	RUN	Operation LED		

Without terminal cover



With terminal cover





Issued by
Siemens Switzerland Ltd
Smart Infrastructure
Global Headquarters
Theilerstrasse 1a
CH-6300 Zug
+41 58 724 2424
www.siemens.com/buildingtechnologies

© Siemens 2013 Technical specifications and availability subject to change without notice.

Document ID CM1N9204en Edition 2023-07-04