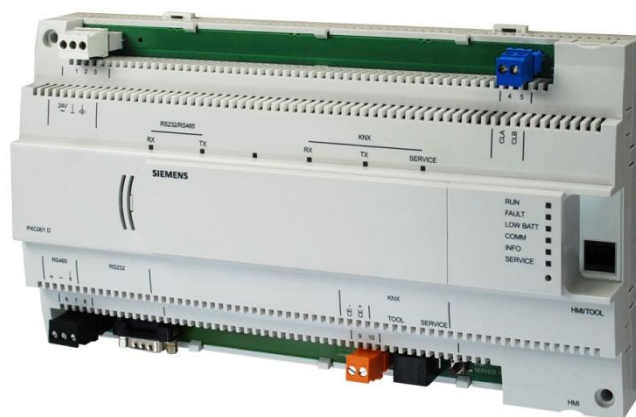




Desigo™ PX

System controllers

PXC001.D
PXC001-E.D
PXA40-RS...

for the integration of third-party devices and systems in Desigo

- Integration platforms and system controllers for third-party devices and systems via KNX, Modbus TCP, Modbus RTU, M-Bus and other protocols into the automation level via BACnet
- System controllers for the integration of Desigo RXB/RXL room controllers
- Native BACnet devices with communication via BACnet/LonTalk or BACnet/IP
- BTL label (BACnet communications passed the BTL test)
- Comprehensive management and system functions (alarm management, time scheduling, trends, remote management, access protection etc.)
- Supports operation via local or network-compatible operator units PXM...

Use

- The system controllers support the integration of Desigo RXB/RXL room controllers as well as third-party devices and systems via KNX, Modbus or M-Bus etc. in the automation level using BACnet/LonTalk or BACnet/IP
- Mapping and monitoring of third-party disciplines as HVAC, light, PLC etc.
- Functionality as freely programmable system controllers for standard or proprietary protocol applications

Functions

- The system controllers provide the infrastructure to hold and execute the system and application specific functions. They are freely programmable.
- Integration of data points and/or subsystems over Modbus RTU and/or Modbus TCP
- Comprehensive management and system functions are available:
 - Alarm management
 - Time scheduling
 - Trends
 - Access protection

Type summary

System controllers	Type
System-Controller for the integration of KNX, M-Bus, Modbus RTU or SCL over BACnet/LonTalk	PXC001.D
System-Controller for the integration of KNX, M-Bus, Modbus TCP, Modbus RTU or SCL over BACnet/IP	PXC001-E.D
Option modules	Type
Up to 800 data points	PXA40-RS1
SCL: up to 1000 data points M- Bus and Modbus (TCP, RTU): up to 2000 data points	PXA40-RS2

Equipment combinations

	PXC001.D PXC001-E.D	PXA40-RS1	PXA40-RS2
Interfaces			
KNX	X	--	--
Serial RS232	X	--	--
Serial RS485	X	--	--
Network functions			
Integration KNX	2000 DP	--	--
Integration M-Bus	250 DP	800 DP	2000 DP
Integration Modbus TCP, RTU	250 DP	800 DP	2000 DP
Integration SCL	250 DP	800 DP	1000 DP

Option modules are "hot-pluggable"

PXA40-... option modules can be plugged and unplugged when the automation station is operating.

- The functionality is available immediately after inserting.
- The functionality disappears approx.1 minute after unplugging.

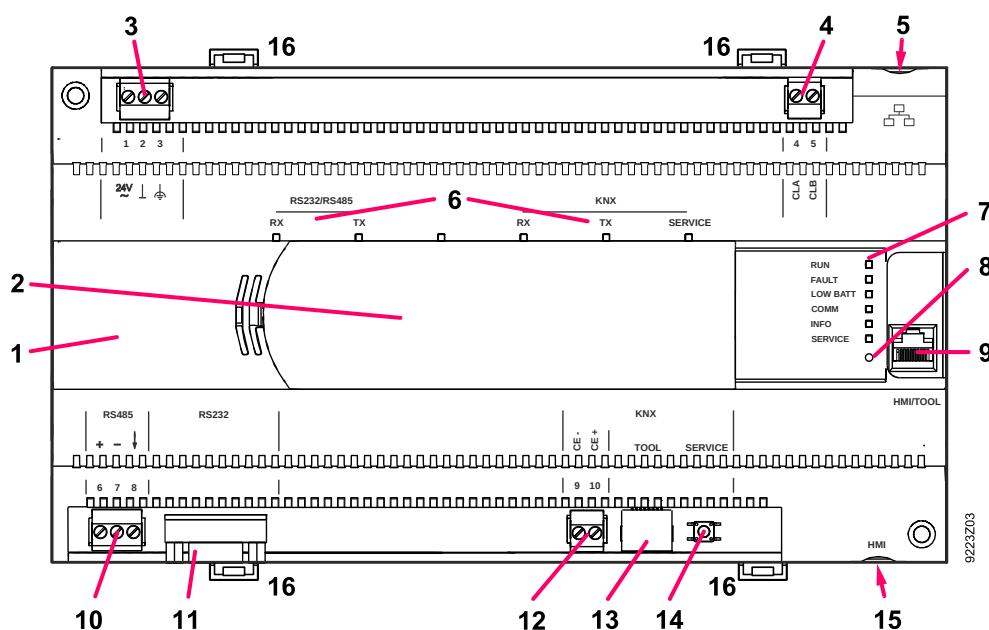
Ordering

Product number	Stock number	Designation
PXC001.D	S55372-C113	System controllers (BACnet/LonTalk)
PXC001-E.D	S55372-C114	System controllers (BACnet/IP)
PXA40-RS1	S55372-C115	Option module RS1
PXA40-RS2	S55372-C116	Option module RS2

Mechanical design

The compact construction enables the devices to be mounted on a standard mounting rail.

PXC001...



1	Plastic housing
2a	Front cover
2b	PXM40-RS... option module
3	Plug-in screw terminal block (operating voltage)
4	Plug-in screw terminal block (LONWORKS bus, PXC001.D only)
5	Network interface RJ45 for BACnet/IP and Modbus TCP (PXC001-E.D only)
6	LED indicators for communication
7	LED indicators for device and system status
8	Service pin (Network identification)
9*)	RJ45 Interface for PXM10, XWP and PX KNX-Tool (RJ45, PXC001.D only) RJ45 interface for PXM20 (PXC001.D only)
10	Plug-in screw terminal block (RS485)
11	RS232 interface
12	Plug-in screw terminal block (KNX)
13	RJ45 interface (ETS tool for service use)
14	KNX programming pin
15*)	RJ45 interface for PXM10, XWP and PX KNX-Tool (PXC001-E.D only) RJ45 interface for PXM20 (PXC001.D only)
16	Slider for mounting on DIN rail

*) PX KNX does not support the PXM10.



Terminal blocks

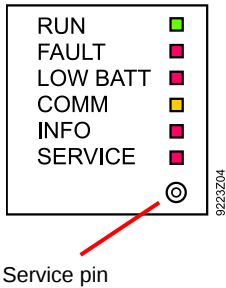
The terminal blocks are removable for easy wiring.

LED indicators

Communication

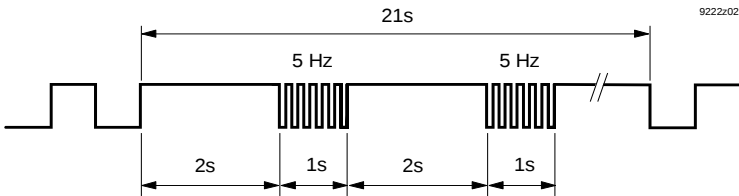
RS232/RS485: RX (Green) TX (Yellow)
KNX: RX (Green) TX (Yellow) Service (Red)

The other LEDs have the following meaning:



LED	Color	Activity	Function
RUN	Green	Continuously ON Continuously OFF	Power OK No power
FAULT	Red	Continuously OFF Continuously ON Rapid flashing	OK Fault Firmware missing / corrupt
LOW BATT	Red	Continuously OFF Continuously ON	Battery OK Battery empty– replace!
COMM	Red	Continuously ON Continuously OFF Flashing	Connection to switch OK No connection to switch Communication
INFO	Red		Freely programmable
SERVICE (Ethernet, PXC001-E.D)	Red	Continuously OFF Continuously ON Flashing Flashing per wink command *)	OK No connection to switch or DHCP Server No IP address configured Physical identification of system controller after receipt of wink command
SERVICE (LonTalk, PXC001.D)	Red	Continuously OFF Continuously ON Flashing Flashing per wink command *)	LONWORKS node is configured Faulty LONWORKS chip, or service pin currently depressed LONWORKS node is not configured Physical identification of system controller after receipt of wink command

*) Wink command pattern:



Service pin

Identification of the system controller in the IP network or LONWORKS network
See "Commissioning".

Engineering

Workflow	See the PX open documents CM110761.
Bus terminating resistor for RS485	Depending on the bus topology, a 120 Ohm resistor must be connected.

Mounting

The devices can be snapped onto standardized rails.

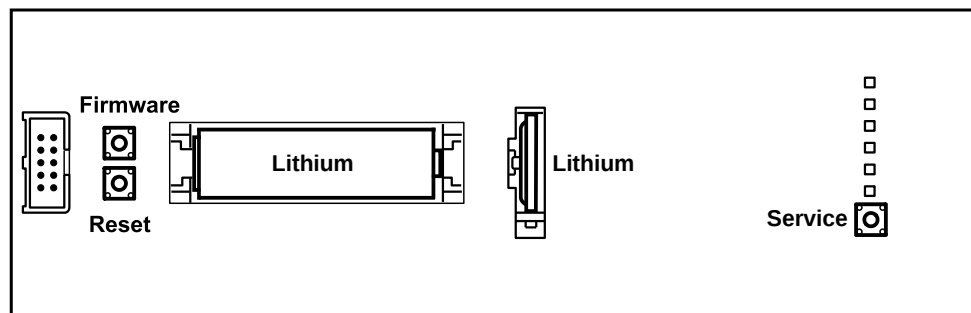
The power supply, LonTalk, RS485 and KNX connections have plug-in screw terminal blocks. The other interfaces are quick plug-in connections.

Instead of the front cover a PXA40-RS... option module can be fitted on the device.

Commissioning

	In order to prevent equipment damage and/or personal injuries always follow local safety regulations and the required safety standards.
Load plant operating program	The plant operating program is downloaded using the CFC from XWP – locally via the automation station's RJ45 interface or via the network (BACnet/IP or BACnet/LonTalk).
Setting parameters and configurations	Use the PX Design tool in XWP for setting the control parameters and the configuration data. Data visible on the network may also be edited with an operator unit PXM20 / PXM20-E (BACnet / LonTalk or BACnet / IP). Part of the data can also be edited locally using the operator unit PXM10 (PX KNX does not support the PXM10).
Wiring test	Use the Point Test Tool.
Network connection	The network addresses are configured with XWP. For unique identification in the network (BACnet/IP or BACnet/LonTalk), press the Service button with a long, pointed object or send a wink command to the appropriate system controller (service LED blinks).
Force Firmware Download	• Variant via V24: If the Force Firmware Download Key is pressed for approx. 10 s during a restart (reset), the current D-MAP program is deleted from the FLASH. The system controller waits briefly for the signal to activate the FWLoader and then starts the system controller. • IP variant: (for PXC001-E.D, significantly faster than via V24) Press the Force Firmware Download key for 5 seconds (without hitting the reset button). Prerequisite: A node setup of the controller has been conducted and no application is loaded or it was deleted in the CFC by clear/reset (communication settings remain – which would not be the case when restart erasing by pressing the reset key). For details see the Firmware Download Tool User's guide, CM110626.
Restart	Press the Reset button to force a restart

Position of buttons and batteries



Note

The KNX programming pin is situated next to the KNX terminal block and the KNX tool plug

Maintenance

Battery life

The **real time clock** is backed by a lithium battery type CR2032 (optionally BR2032)

- Life span without load: 10 years.
- Life span with battery operation (cumulative): 10 years.
- After the "Battery low" event ¹⁾ the remaining life span under load is several days.

The **trend data** and the **actual parameters** stored in the SDRAM memory are backed by a Lithium battery type FR6/AA AA.

- Life span without load: 10 years.
- Life span with battery operation (cumulative): min. 2 weeks
- After the "Battery low" event ¹⁾ the remaining life span under load is approx. 15 hrs.

1) "Battery low" event: The "LOW BATT" LED lights up when one of the batteries' charge is low, and the automation station automatically sends a system event.

Replacing the battery

To change the battery, remove the front cover. The battery can be removed indefinitely as long as the unit has power. Insert new battery correctly (+ / -).



Caution!

- **Note the special disposal notes on Li batteries.**
- **A wrist-strap and grounding cable must be used to avoid hardware damage through electrostatic discharge (ESD).**

Firmware upgrades

Firmware and operating system stored in non-volatile Flash ROM. Flash ROM memory can be easily updated on the plant, when a new firmware version is available.

Disposal



The devices are classified as waste electronic equipment in terms of the European Directive 2012/19/EU (WEEE) and should not be disposed of as unsorted municipal waste.

The relevant national legal rules are to be adhered to.

Regarding disposal, use the systems setup for collecting electronic waste.

Observe all local and applicable laws.

Lithium batteries: May catch fire, explode or leak. Do not short circuit, charge, disassemble, dispose of in fire, heat above 100°C, or expose to water.

Disposal: Seal battery terminals with tape.

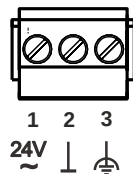
Technical data

General device data	Operating voltage	AC 24 V $\pm$ 20% (SELV / PELV) or AC 24 V class 2 (US) HD 384
	Safety extra-low voltage SELV or Extra-low voltage PELV	
Operating data	Operating frequency	50/60 Hz
	Energy consumption	Max. 3.5 VA
	External supply line protection (EU)	Fuse slow max. 10 A or Circuit breaker max. 13 A Characteristic B, C, D according to EN 60898 or Power source with current limitation of max. 10 A
	Processor	Motorola Power PC MPC885
	Storage	64MB SDRAM / 32MB FLASH (96MB total)
Interfaces, communication	Data backup in event of power failure	
	Battery Backup of realtime clock Lithium CR2032 (optionally BR2032) (field replaceable)	Battery operation (cumulative): 10 years Without load: 10 years
	Battery backup for SDRAM 1 x FR6/AA Lithium (field replaceable)	Battery operation (cumulative): min. 2 weeks Without load: 10 years
	PXC001.D	PXC001-E.D
	Building Level Network	LonWorks FT5000 Transceiver Twisted Pair, 78 kBit/s (Screw terminals)
Local Communication (HMI, Tool)	- PXM10 (RS232) - PXM20 (BACnet/LonTalk, RJ45) - FW Download Tool (RJ45) Connection cable max. 3 m	--
Local Communication (HMI)	PXM20 (BACnet/LonTalk) (RJ45) Connection cable max. 3 m	- PXM10 (RS232) - FW Download Tool (RJ45) Connection cable max. 3 m
	One PXM10 operator unit and one PXM20 per system controller may be connected. But not twice the same type.	One PXM10 on RJ45
KNX Tool-Interface	RJ45	CE+, CE–
KNX bus	Interface type	KNX (electrically isolated)
	Transceiver	TP-UART
	Bus current	5 mA
	Baud rate	9.6 kbit/s
	Bus topology, bus termination	Refer to KNX manual
RS232 interface	Baud rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (depends on software)
	Data bits	7 or 8 (depending on software)
	Stop bits	1 or 2 (depending on software)
	Parity	None, even or odd (depending on software)
	Flow control	Xon/Xoff, hardware or none (depending on software)
	Cable type	9-core standard screened cable
	Cable length	Max. 3 m

RS485 interface	Interface type		RS485, (electrically isolated)
	Baud rate, data bits / stop bit(s), parity		As for RS232 (depends on software)
Plug-in screw terminal	Cable type		Standard RS bus cable
	Cable length		Max. 1200 m
	External Bus termination		Depending on the bus topology, a 120 Ohm resistor must be connected externally
	Internal bus polarization		47 kOhm pull-up/pull-down resistors
Simple cable lengths, cable types	Solid or stranded conductors		0.25...2.5 mm2 or 2 x 1.5 mm2
	Connection cable	Ethernet and PXM20-E	Max. 100 m
	Cable type		Standard at least CAT5 UTP (Unshielded Twisted Pair) or STP (Shielded Twisted Pair)
	Connection cable	LONWORKS bus	See Installation Guide CA110396
Protection data	Cable type		CAT5
	Housing Protection standard		IP 20 to EN 60529
Ambient conditions	Protection class		III to EN 60730-1
	Normal operation		To IEC 60721-3-3
	Environmental conditions		Class 3K5
	Temperature		0...50 °C
	Humidity		5...95 % r.h. (non-condensing)
	Mechanical conditions		Class 3M2
	Transport		To IEC 60721-3-2
	Environmental conditions		Class 2K3
	Temperature		-25...70 °C
	Humidity		5...95 % r.h. (non-condensing)
Standards, directives and approvals	Mechanical conditions		Class 2M2
	Product standard	EN 60730-1	Automatic electrical controls for household and similar use
	Product family standard	EN 50491-x	General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)
	Electromagnetic compatibility (Applications)		For use in residential, commerce, light-industrial and industrial environments
	EU conformity (CE)		CM1T9223xx *)
	UL certification (US)		UL916 https://ul.com/database/
	RCM-conformity (EMC)		CM1T9222en_C1 *)
			BTL-30054
	AMEV: Supports profiles AS-A and AS-B to AMEV directive "BACnet in public buildings"		BACnet revision 1.12
	Environmental compatibility	Product environmental declaration (contains data on RoHS compliance, materials composition, packaging, environmental benefit, disposal)	
See "Dimensions"			
Dimensions	Without / with packaging		
	PXC001.D, PXC001-E.D		0.635 kg / 0.731 kg
	PXA40-RS1, PXA40-RS2		0.048 kg / 0.060 kg
	Weight		
*) The documents can be downloaded from http://siemens.com/bt/download .			

Pin assignment

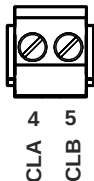
Supply plug



Plug-in screw terminal block

- 1 AC 24 V (G)
- 2 Ground (G0)
- 3 Functional earth

LONWORKS plug (PXC001.D)

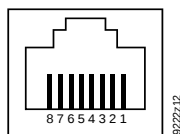


Plug-in screw terminal block

- 4 CLA LonWorks Data A
- 5 CLB LonWorks Data B

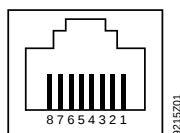
Ethernet plug (PXC001-E.D)

RJ45 socket screened, standard connection in accordance with AT&T256



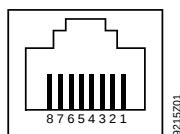
1. Tx+
2. Tx –
3. Rx +
4. Not used
5. Not used
6. Rx –
7. Not used
8. Not used

"HMI" plug (PXC001-E.D)



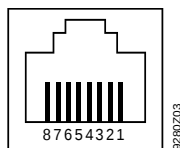
1. **Unoccupied**
2. **Unoccupied**
3. G0, GND
4. G/Plus
5. Not used
6. Not used
7. COM1/TxD
8. COM1/RxD

Plug "HMI" and "HMI/Tool" (PXC001.D)



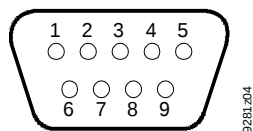
1. **LonWorks Data A (CLA)**
2. **LonWorks Data B (CLB)**
3. G0 / GND
4. G / Plus
5. Not used
6. Not used
7. COM1 / TxD
8. COM1 / RxD

Tool plug (KNX)



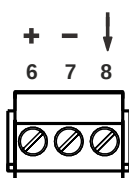
1. **KNX data (CE+)**
2. **KNX data (CE-)**
3. Not used
4. Not used
5. Not used
6. Not used
7. Not used
8. Not used

RS232 plug serial



- 1 DCD Data carrier detect
- 2 RXD Received data
- 3 TXD Transmit data
- 4 DTR Data terminal ready
- 5 GND Signal ground
- 6 DSR Data set ready
- 7 RTS Request to send
- 8 CTS Clear to send
- 9 NC Not connected

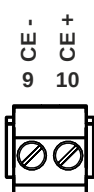
RS485 plug



Plug-in screw terminal block

- 6 + B
- 7 – A
- 8 ↓ Screen, connected to functional earth

KNX plug

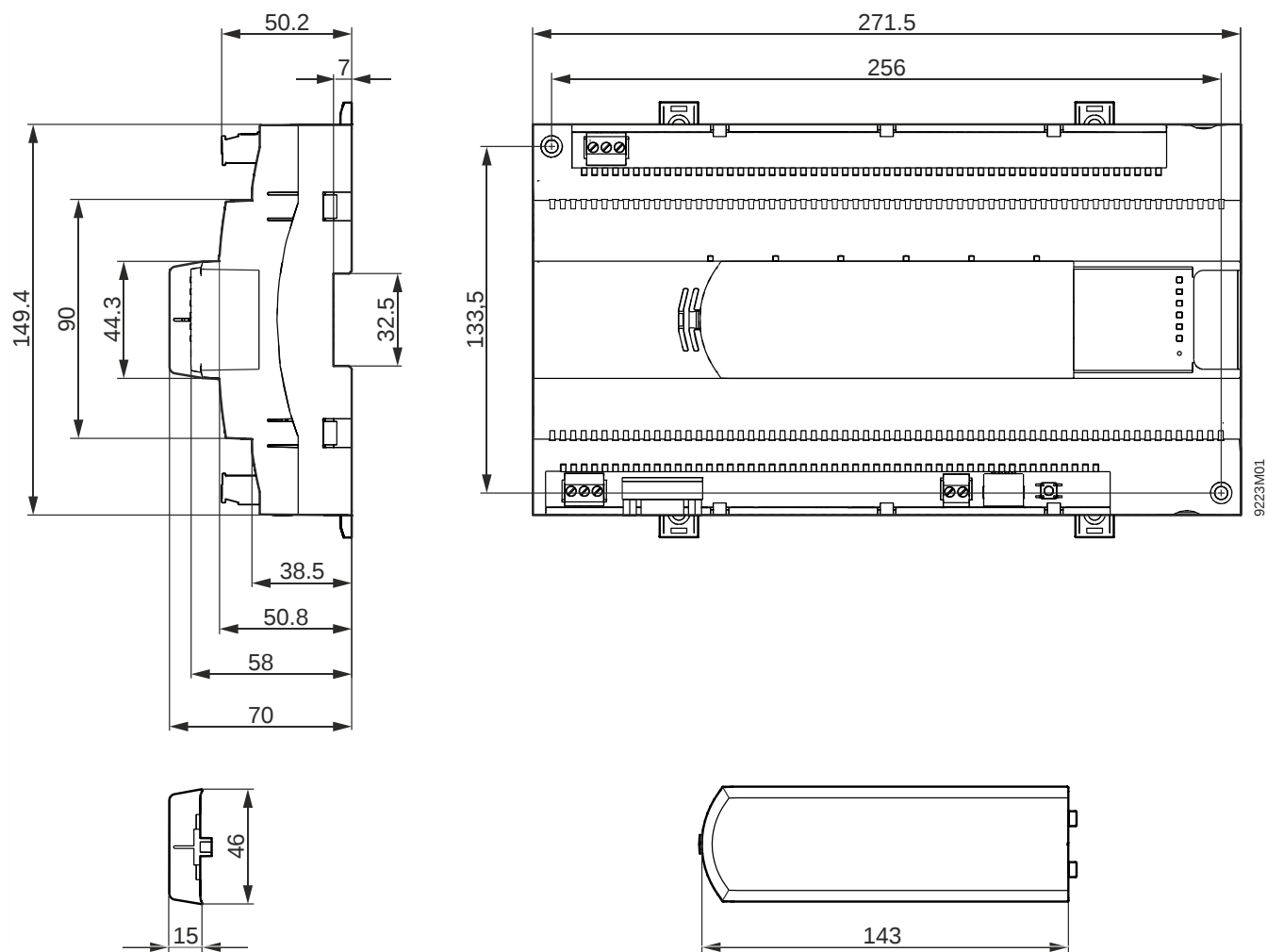


Plug-in screw terminal block

- 9 (CE–) – KNX data cable
- 10 (CE+) + KNX data cable

Dimensions

All dimensions in mm



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