

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, 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.
- 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 or SCL over BACnet/LonTalk | PXC001.D |
| System-Controller for the integration of KNX, M-Bus, Modbus 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: 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 | 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.

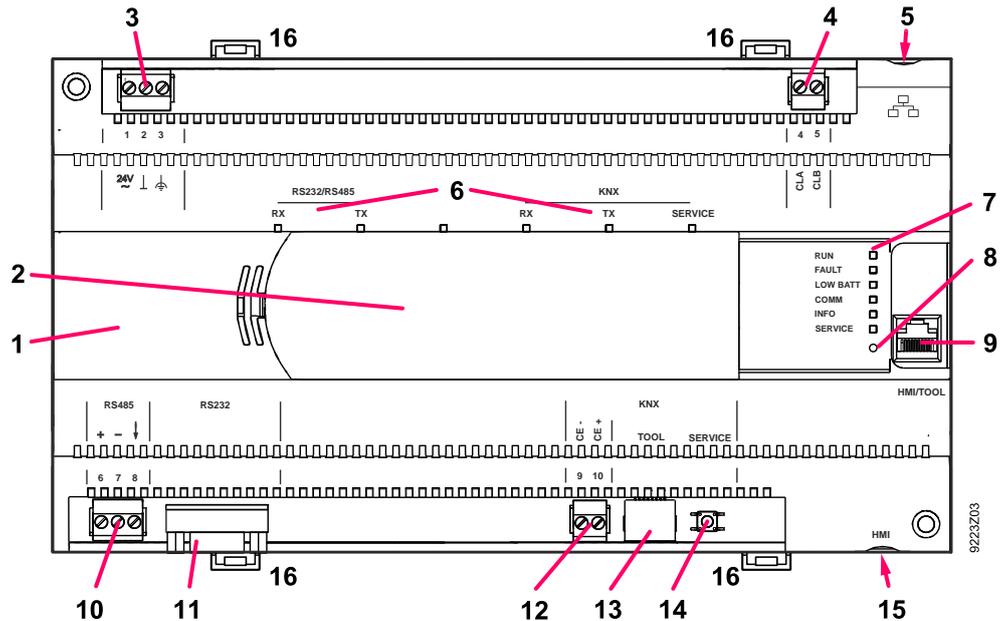
Ordering

| 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 (BACnet / IP, 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.

PXA40-RS...



Terminal blocks

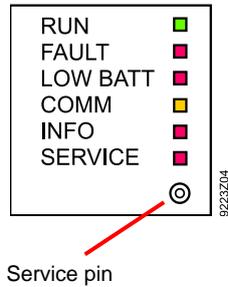
The terminal blocks are removable for easy wiring.

LED indicators

Communication

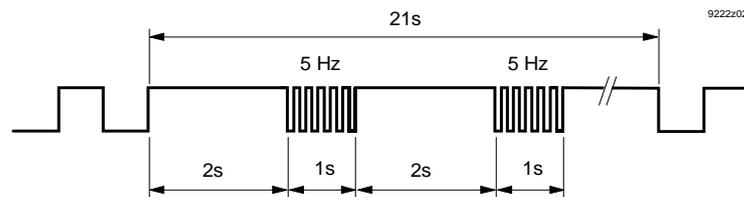
RS232/RS485: RX (Green) TX (Yellow)
 KNX: RX (Green) TX (Yellow) Service (Red)

The other LEDs have the following meaning:



| LED | Color | Activity | Function |
|--------------------------------------|-------|---|---|
| RUN | Green | Continuously ON | Power OK |
| | | Continuously OFF | No power |
| FAULT | Red | Continuously OFF | OK |
| | | Continuously ON | Fault |
| | | Rapid flashing | Firmware missing / corrupt |
| LOW BATT | Red | Continuously OFF | Battery OK |
| | | Continuously ON | Battery empty– replace! |
| COMM | Red | Continuously ON | Connection to switch OK |
| | | Continuously OFF | No connection to switch |
| | | Flashing | Communication |
| INFO | Red | | Freely programmable |
| SERVICE (Ethernet, PXC001-E.D) | Red | Continuously OFF | OK |
| | | Continuously ON | No connection to switch or DHCP Server |
| | | Flashing Flashing per wink command *) | No IP address configured Physical identification of system controller after receipt of wink command |
| SERVICE (LonTalk, PXC001.D) | Red | Continuously OFF | LONWORKS node is configured |
| | | Continuously ON | Faulty LONWORKS chip, or service pin currently depressed |
| | | Flashing Flashing per wink command *) | 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).

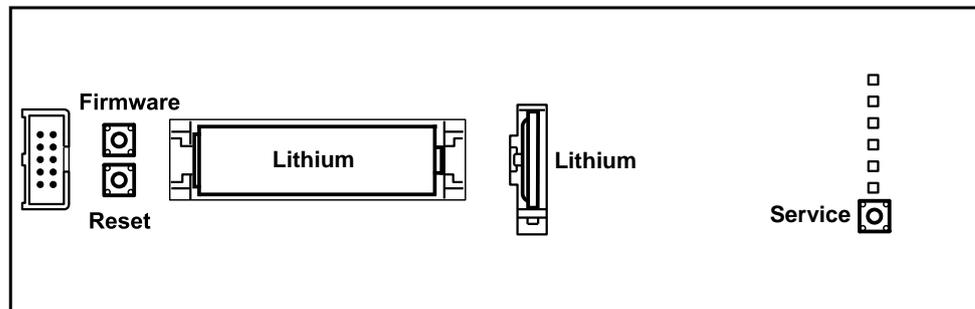
Prerequisite: A node setup of the controller has been conducted and no application is loaded or it was deleted in the CFC by clear/reset (communication settings remain – which would not be the case when restart erasing by pressing the reset key).

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

- 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

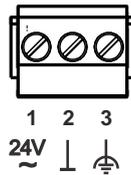
| | | |
|------------------------------------|--|---|
| General device data | Operating voltage | AC 24 V ± 20% (SELV / PELV) or AC 24 V class 2 (US) HD 384 |
| | Safety extra-low voltage SELV or Extra-low voltage PELV | |
| Operating data | Operating frequency | 50/60 Hz |
| | Energy consumption | Max. 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) |
| Operating data | Data backup in event of power failure | |
| | Battery Backup of realtime clock Lithium CR2032 (field replaceable) | Battery operation (cumulative): 10 years Without load: 10 years |
| Operating data | Battery backup for SDRAM 1 x FR6/AA Lithium (field replaceable) | Battery operation (cumulative): min. 2 weeks Without load: 10 years |
| | Interfaces, communication | |
| Building Level Network | PXC001.D | PXC001-E.D |
| | LonWorks FT5000 Transceiver Twisted Pair, 78 kBit/s (Screw terminals) | BACnet on UDP/IP IEEE802.3, Auto-sensing 10 Base-T / 100 Base-TX (RJ45, shielded) |
| Local Communication (HMI, Tool) | <ul style="list-style-type: none"> PXM10 (RS232) PXM20 (BACnet/LonTalk, RJ45) FW Download Tool (RJ45) Connection cable max. 3 m | -- |
| Local Communication (HMI) | <ul style="list-style-type: none"> PXM20 (BACnet/LonTalk) (RJ45) Connection cable max. 3 m | <ul style="list-style-type: none"> 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 |
| | | Solid or stranded conductors 0.25...2.5 mm ² or 2 x 1.5 mm ² |
| Simple cable lengths, cable types | 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 |
| | Cable type | CAT5 |
| Protection data | Housing Protection standard | IP 20 to EN 60529 |
| | Protection class | III to EN 60730-1 |
| Ambient conditions | 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) |
| | Mechanical conditions | Class 2M2 |
| Standards, directives and approvals | Product standard | EN 60730-1 |
| | Product family standard | EN 50491-x |
| | Electromagnetic compatibility (Applications) | Automatic electrical controls for household and similar use General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) For use in residential, commerce, light-industrial and industrial environments |
| | EU conformity (CE) | CM1T9223xx *) |
| | UL certification (US) | UL916 http://database.ul.com/ |
| | RCM-conformity (EMC) | CM1T9222en_C1 *) |
| |  | Certificate |
| | AMEV: Supports profiles AS-A and AS-B to AMEV directive "BACnet in public buildings" | BACnet 2011, V1.1 |
| Environmental compatibility | Product environmental declaration (contains data on RoHS compliance, materials composition, packaging, environmental benefit, disposal) | CM1E9223 *) |
| Dimensions | See "Dimensions" | |
| Weight | Without / with packaging | |
| | PXC001.D, PXC001-E.D | 0.635 kg / 0.731 kg |
| | PXA40-RS1, PXA40-RS2 | 0.048 kg / 0.060 kg |

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Pin assignment

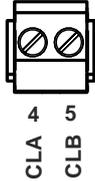
Supply plug



Plug-in screw terminal block

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

LonWORKS plug (PXC001.D)

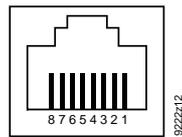


Plug-in screw terminal block

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

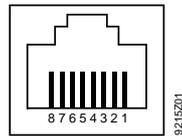
Ethernet plug (PXC001-E.D)

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



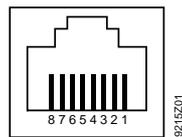
- 1. Tx+
- 2. Tx –
- 3. Rx +
- 4. Not used
- 5. Not used
- 6. Rx –
- 7. Not used
- 8. Not used

"HMI" plug (PXC001-E.D)



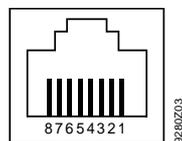
- 1. **Unoccupied**
- 2. **Unoccupied**
- 3. G0, GND
- 4. G/Plus
- 5. Not used
- 6. Not used
- 7. COM1/TxD
- 8. COM1/RxD

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



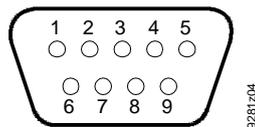
- 1. **LonWORKS Data A (CLA)**
- 2. **LonWORKS Data B (CLB)**
- 3. G0 / GND
- 4. G / Plus
- 5. Not used
- 6. Not used
- 7. COM1 / TxD
- 8. COM1 / RxD

Tool plug (KNX)



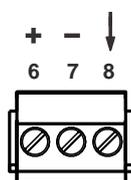
- 1. **KNX data (CE+)**
- 2. **KNX data (CE–)**
- 3. Not used
- 4. Not used
- 5. Not used
- 6. Not used
- 7. Not used
- 8. Not used

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

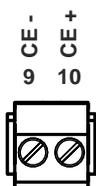
RS485 plug



Plug-in screw terminal block

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

KNX plug

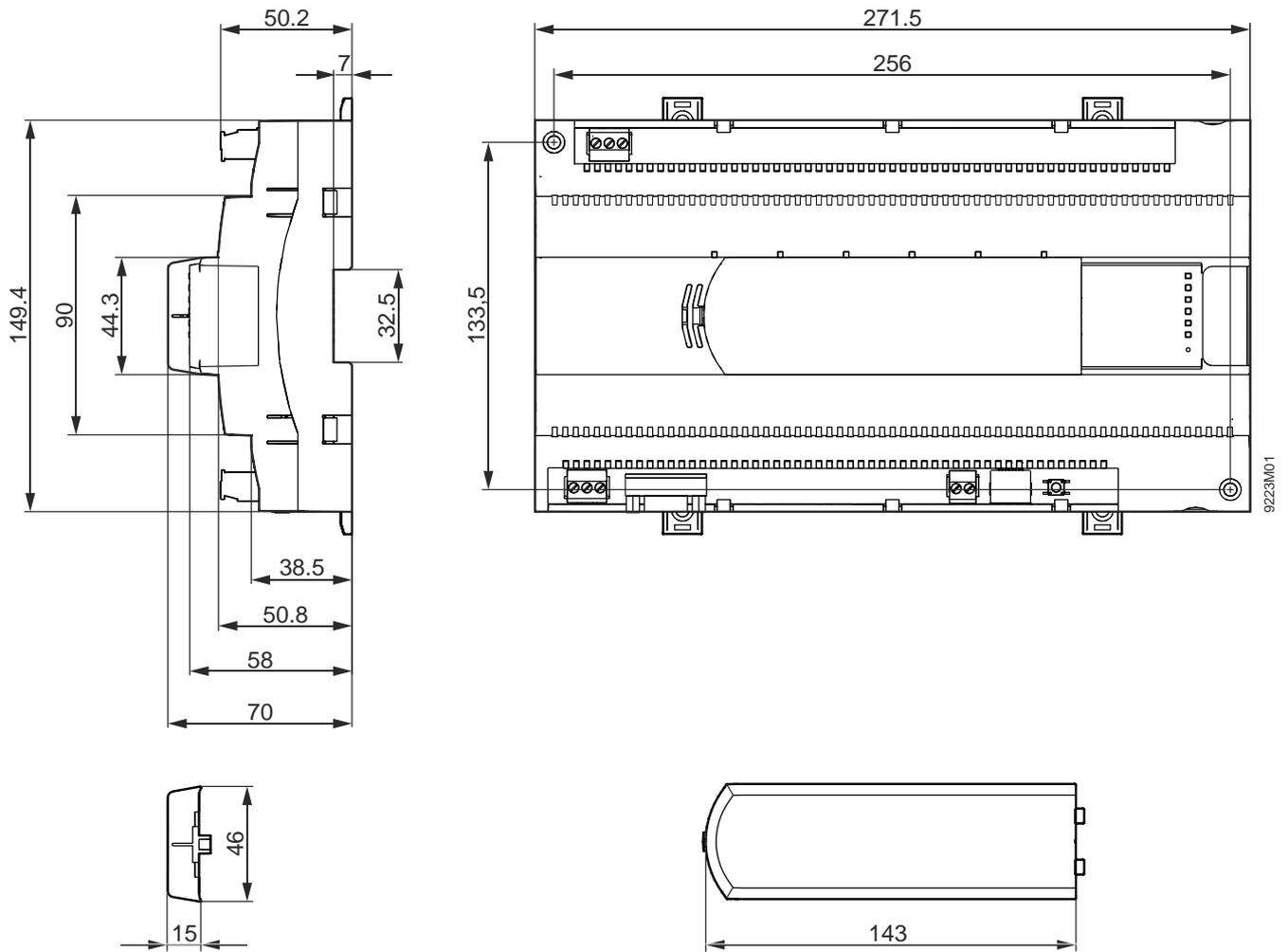


Plug-in screw terminal block

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

Dimensions

All dimensions in mm



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