SIEMENS

9203

Desigo™ Room automation

Room automation stations PXC3.E...

- **Modular, programmable room automation stations for HVAC, lighting, and shading.**
- **BACnet / IP communications; BACnet profile AAC (BTL label).**
- **Optional island bus (including bus power supply) to connect TX-I/O modules with any data point mix.**
- **Optional KNX PL-Link peripheral bus (including bus power supply) to connect sensors, actors and room units.**
- **Optional DALI-2 bus (including bus power supply) to connect ballasts and certified DALI-2 input devices.**
- **Optional Connection of individual devices with KNX S-Mode via KNX PL-Link.**
- **Ethernet switch for communication and tool connection.**
- **USB Device interface.**
- **Operating voltage AC 24 V.**
- **Mounting on standard mounting rail.**

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Smart Infrastructure

Use

PXC3 series room automation stations can be used for buildings with more sophisticated requirements on functionality and flexibility.
Desigo Room Automation is used when several disciplines (HVAC, lighting, shading) are combined to form one solution and when high flexibility is required.
Desigo Room Automation is perfect for solutions optimizing energy (class A) without loss of comfort.

Functions

Control of several rooms

A PXC3 series room automation station can assume control for multiple rooms.

These programmable room automation stations provide the infrastructure to provide and process system- and application-specific functions.

Variants

Desigo version	Product No. Stock No.	Function	Number of I/O data points	KNX PL-Link	TX-I/O modules	DALI bus
V7	**PXC3.E16A-200A** S55376-C177	DALI applications only	90 [2]	- -	- -	DALI-2 max. 64 ballasts [3] and max. 63 input devices[4] On-board bus power supply: 230 mA
	PXC3.E72A-200A S55376-C178	typically 4 rooms typically 8 room segments [1]	140 [2]	max. 64 devices	max. 72 physical I/O points	
	PXC3.E75A-200A S55376-C179	typically 8 rooms typically 16 room segments [1]	280 [2]	max. 64 devices	max. 200 physical I/O points	
V6	**PXC3.E16A-100A** S55376-C118	DALI applications only	64 [2]	- -	- -	DALI max. 64 ballasts [3] On-board bus power supply: 128 mA
	PXC3.E72-100A S55376-C130	typically 4 rooms typically 8 room segments [1]	140 [2]	max. 64 devices	max. 72 physical I/O points	- -
	PXC3.E72A-100A S55376-C131	typically 4 rooms typically 8 room segments [1]	140 [2]	max. 64 devices	max. 72 physical I/O points	DALI max. 64 ballasts [3] On-board bus power supply: 128 mA
	PXC3.E75-100A S55376-C132	typically 8 rooms typically 16 room segments [1]	280 [2]	max. 64 devices	max. 200 physical I/O points	- -
	PXC3.E75A-100A S55376-C133	typically 8 rooms typically 16 room segments [1]	280 [2]	max. 64 devices	max. 200 physical I/O points	DALI max. 64 ballasts [3] On-board bus power supply: 128 mA

[1] Architectural building grid (also called room axis).

[2] Total number of data point used by TX-I/O, KNX PL-Link and DALI.
For details see Desigo Technical principles CM110664, chapter 18.

[3] For commercially available DALI -ballasts up to 64 DALI addresses are supported.

[4] For commercially available DALI-2 input devices up to 63 DALI-2 addresses are supported.
Note! The current consumption of the connected DALI ballasts and input devices must not exceed the guaranteed bus supply current of the PCX3.
The DALI bus power supply may limit number of connectable DALI devices.
See Planning manual, CM111043.

Communications

- The room automation stations have a 2-port Ethernet switch to support for low-cost cabling via line topology.
- A USB Device port is available for service and commissioning.
- TX-I/O modules connected directly to the PXC3 allow for direct connection of field devices. This offers maximum flexibility.
- The KNX PL-Link peripheral bus supports room operator units, sensors, and actuating devices. Selected Siemens field devices to the KNX PL-Link bus (devices with the KNX PL-Link logo) can be connected.
  The KNX PL-Link bus supports integration of commercially available devices with KNX S-Mode (requires ETS engineering).
- The DALI bus supports lighting control. Commercially available DALI ballasts as well as DALI-2 input devices can be connected.

Equipment combinations

TX-I/O, KNX PL-Link

Depending on the type, PXC3 series room automation stations can be operated with **TX-I/O** devices and devices with KNX **PL-Link**.

DALI ballasts
(16-bit frames)

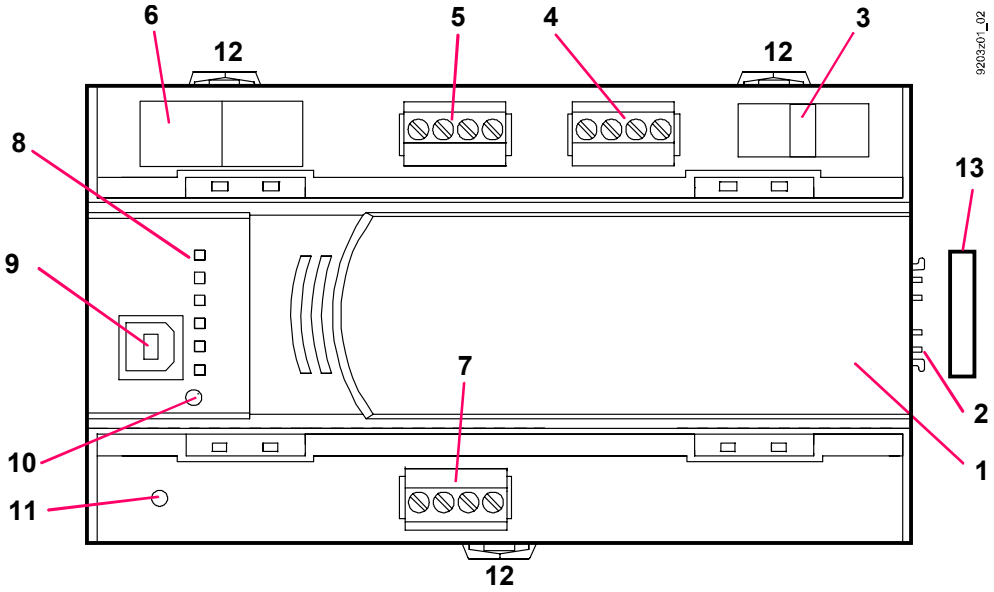
DALI device type	Description	Supported
0	Fluorescent Lamps	Yes
7	Switching Function	Yes
1	Self-contained Emergency Lighting	Yes
3	Low Voltage Halogen Lamps	Partly *)
5	Conversion digital into D.C. Voltage	Partly *)
4	Incandescent Lamps	No
2	HID Discharge Lamps	No
6	LED Modules	Yes
8	Colour Control	No
9	Sequencer	No
10	Optical Control	No

*) Partly supported means that basic functions are supported like with type 0, but no further type specific functions.

DALI-2 input devices
(24-bit frames)

DALI-2 instance type	Description	Supported
0	General Purpose Input	No
1	Push Button	No
2	Absolute Input Device	No
3	Occupancy Sensor	Yes
5	Lighting Sensor	Yes
6	Color Sensor	No

The compact build allows for mounting the devices on a standard mounting rail.



1 Plastic housing
2 Island bus plug connection
3 Fuse for AC 24 V peripheral supply via island bus
4 Plug-in terminal block (operating voltage)
5 Plug-in terminal block KNX PL-Link
6 2-port Ethernet switch (with 2 LEDs per port for display purposes)
7 DALI bus
8 LED display for device and system status
9 USB Device interface
10 Service pin
11 Service pin DALI
12 Slider for mounting on DIN rail
13 Island bus cover (supplied with the device)

Power supply

The bus supplies for island bus, KNX PL-Link and DALI are integrated in the room automation station.
For better reliability of the room automation station, the bus supplies and the AC 24 V outlets are independent from the room automations station's own supply.

The bus supplies are switched on by default and can be switched off via tool if not needed.

KNX PL-Link supply

The internal KNX PL-Link supply must not be operated in parallel with an external supply. It must be switched off via tool when using an external supply. This is typically the case if the devices connected to the KNX PL-Link consume more than the 160 mA available from the internal supply.

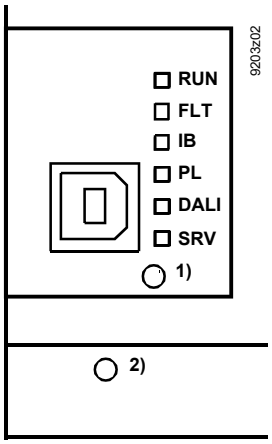
DALI supply

Operation with external DALI supply is NOT possible.

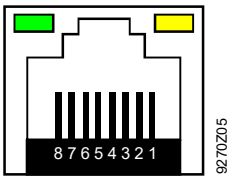
Island bus supply

The internal bus supplies can be reinforced by external power supply modules. An additional TXS1.12F10 supply module must be switched on and off at the same time as the room automation station. Otherwise, DC 24 V island bus supply may sag, resulting in alarms.

LED indicators (depending on the type)

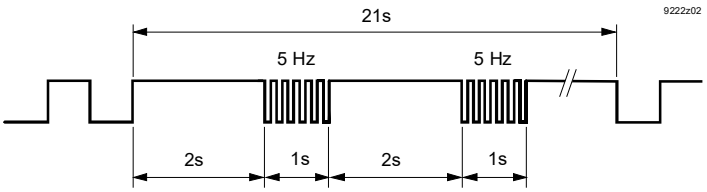


1) Service pin
2) Service pin DALI



LED	Color	Activity	Function
RUN	Green	Continuously ON Continuously OFF Flashing	Device ready to operate. No supply for device. Start-up or program halted
FLT	Red	Continuously OFF Continuously ON Rapid flashing	OK HW or SW error. Wrong or corrupted application.
IB	Yellow	Continuously ON Flashing Continuously OFF	OK. Island bus communication. No modules connected TX-I/O modules not configured or communication fault.
PL	Yellow	Continuously ON Flashing Continuously OFF	OK. KNX PL-Link communication. KNX PL-Link not used or communication fault.
DALI	Yellow	Continuously ON Continuously OFF Flashing Blinking per IDENTIFY DEVICE command	OK DALI not used or communication fault. DALI bus communication DALI-2 only: Physical identification of the room automation station (5 Hz for 10 s)
SVC	Red	Continuously OFF Blinking Blinking per wink command*)	OK. No application loaded. Physical identification of the room automation station.
Ether-net 1 / 2	Green	Continuously ON Continuously OFF Flashing	Link active Link inactive Network activity
	Yellow	Continuously ON Continuously OFF	Link 100 Mbps Link 10 Mbps

*) Wink command pattern:



Service pins
(depending on the type)

Pin	Action	Description	
1)	Short press	Ethernet	Physical identification of the room automation station in the network.
2)	Short press	DALI test:	All ballasts On or Off Stops sending the DALI-2 IDENTIFY DEVICE commands
	Long press > 4 s	DALI test:	Start / stop the following function: All ballasts blink (2 s On, 2 s Off). Sends continuously DALI-2 IDENTIFY DEVICE commands. The identify behavior of the devices is vendor specific (e.g. LED blinking, buzzer)

Product documentation

- Engineering and commissioning: See ABT online help.
- Planning manual Desigo Room automation, CM111043.
- TX-I/O planning and installation manual, CM110562.
- Application Guide for IP Networks in Building Automation Systems, CM110668.
- Desigo Technical principles CM110664, chapters 18 and 26.

Engineering

- Each device has a unique serial number for commissioning support.
  It is also located on the removable barcode label: See the ABT online help for the associated workflow.
- Each device has a unique MAC address.
- Each device with KNX PL-Link has a unique KNX ID.
- Cable length, topology, etc.: See planning manual Desigo Room automation, CM111043.
- The cable insulation must always comply with the present rated voltage.

Caution! ⚠

- When the supply voltage of the room automation station is transited to external devices, the cable **cross section** must always correspond to the rated current of the safety circuit breaking device.
  Observe local regulations in any case.

Mounting

The room automation stations can be snapped onto a standard mounting rail.

The automation station has pluggable screw terminal blocks to connect the AC 24 V supply, the AC 24 V outlets, the KNX PL-Link, and the DALI bus.

The TX-I/O modules are snapped onto the mounting rail on the right side of the room automation station. The island bus is created automatically in this process.

Mounting position

Recommended	With restrictions *)
• Wall, horizontal from left to right or from right to left	• Overhead. • On a horizontal surface. • Wall, vertical from bottom to top or from top to bottom.
Ambient temperature -5...50 °C / 23...122 °F	**Ambient temperature -5...45 °C / 23...113 °F *)**

*) 50 °C / 122 °F is admissible if the bus supplies are used with reduced load: KNX PL-Link 105 mA, DALI 85 mA and island bus 400 mA.
PXC3.E16A…: 50 °C / 122 °F is admissible without restrictions.

Note **You must ensure, however, that sufficient ventilation is available to maintain the permissible ambient temperature for the devices (inside the cabinet / installation box).**
Outside, the temperature must be 10 K lower.

Installation

See planning manual Desigo Room automation, CM111043.

Note!

Island bus Polarity: If a TXS1.12F10 supply module is connected to output ↑ 24 V, do not invert ~ and ⊥.

The devices are not damaged but island bus communications will not work.

Operation

If island bus or USB communications do not work, this is an indicator that the AC 24 V operating voltage is incorrectly wired (conductors ~ and ⊥ inverted).

Technical data

Operating voltage (24V~, ⊥)	Safety extra-low voltage SELV or protection by extra-low voltage PELV Half-wave load	AC 24 V -15% / +20% 48...63 Hz Symmetric
Operating data	Processor Memory	Texas Instruments AM3352, 600 MHz 512 MB SDRAM (DDR3) 512 MB NAND Flash
Power consumption	**Max. permissible input current AC 24 V (through terminals 5 and 6)**	**Total max. 10 A (Ext. fusing compulsory: max. T 10 A melting fuse or max. C 13 A circuit breaker)**
	Base load (without loading by modules and field devices)	8 VA / 0.33 A
	Island bus supply *)	30 VA / 1.25 A
	KNX PL-Link supply *) **)	12 VA / 0.50 A
	DALI supply *) ***)	9 VA / 0.37 A (PXC3.E...A-100A) 16 VA / 0.61 A (PXC3.E...A-200A)

*) The bus supplies can be switched off via tool if not used.

**) The KNX PL-Link supply MUST be switched off via tool if an external bus supply is used.

***) When DALI bus supply is switched off then the DALI interface is disabled too

Transit power AC 24 V	TX-IO (island bus)	144 VA / 6 A
	KNX PL-Link: AC 24V (terminals 3, 4)	48 VA / 2 A
	AC 24 V / 6 A (terminals 7 and 8, for additional AC 24 V consumers)	144 VA / 6 A (only if the sum of 10 A at terminals 5 and 6 is not exceeded)
Fusing of the supply outputs for field supply Caution! ⚠	AC 24 V / 2 A ↑ (KNX PL-Link, terminals 3 and 4)	PTC resistor, short-circuit proof
	AC 24 V ↑ (terminals 7 and 8)	No internal fusing
	Island bus conductor V~	M 10 A fuse (Medium time lag, exchangeable)
Response to power / communication failure	• Energy reserve (supercap) to support real-time clock (3 days). • Start-up time after power failure: approx. 90 s	

Ethernet interface	Plug	2 x RJ45, screened
	Interface type	100BaseTX, IEEE 802.3 compatible
	Bit rate	10 / 100 Mbps, autosensing
	Protocol	BACnet over UDP/IP
USB interface	Plug	Type B (USB device)
	Data rate	12 MBit/s (Full speed)
	Galvanic isolation of ⊥	No
	Protective circuit against surges and over current	Yes (balancing currents are limited, also in the GND conductor)
Island bus interface		
Communications	Interface type	Siemens specific protocol
DC output	Nominal voltage	DC 24 V
	Max. current	600 mA (sufficient for typically 8 TX-I/O modules)
	Parallel switchable with 3 supply modules TXS1.12F10	For details, see: TX-I/O planning and installation manual, CM110562)
	Short-circuit proof, overload-proof	Self-resetting
	Protection	Short-circuit proof
Island bus connector on side	Protection against faulty wiring with AC 24 V	No electric protection. Use the terminal cover.
KNX PL-Link interface	Standard	IEC 14543-3
Communications	Interface type	KNX, galvanically separated
	Transceiver	TP-UART
	Baud rate	9.6 kbps
Bus power supply	Nominal voltage	DC 29 V
	Max. supply *Note: for devices with higher power requirement, use the output AC 24 V 2 A, see above.*	160 mA for max 32 devices with KNX PL-Link. Default: Auto detection; must be turned off via ABT if external bus supply is used. Up to 64 devices with KNX PL-Link can be operated using one or two external bus supplies.
	Protection	Short-circuit proof Protection against miswiring up to AC 24 V
DALI interface		
Communications	Interface type	DALI, galvanically separated
	Baud rate	1.2 kBit/s
	Insulation strength	Basic insulation for 230 V (1.5 kV) Suitable for installations in overvoltage category III (4 kV).
Dali-2 certification	General requirements	PXC3.E…A-200A only:
	System components	IEC 62386-101
	Control devices	IEC 62386-103
Bus power supply	Nominal voltage	DC 16 V
	Guaranteed supply current	128 mA (PXC3.E…A-100A) 230 mA (PXC3.E…A-200A)
	Maximum supply current	250 mA
	Shutdown mechanism	PXC3.E…A-200A only:
	Shutdown delay time	700 ms
	Restart period	10 s
	Protection	Short-circuit proof Upon power-on, AC 230 V bus voltage is recognized on terminals DA+ and DA–.
	NO operation with external bus power supply admitted. **NO protection against miswiring with AC 24 V or AC 230 V:** **Voltage between DA+ / DA+ or between DA– / DA– will destroy the device!**	

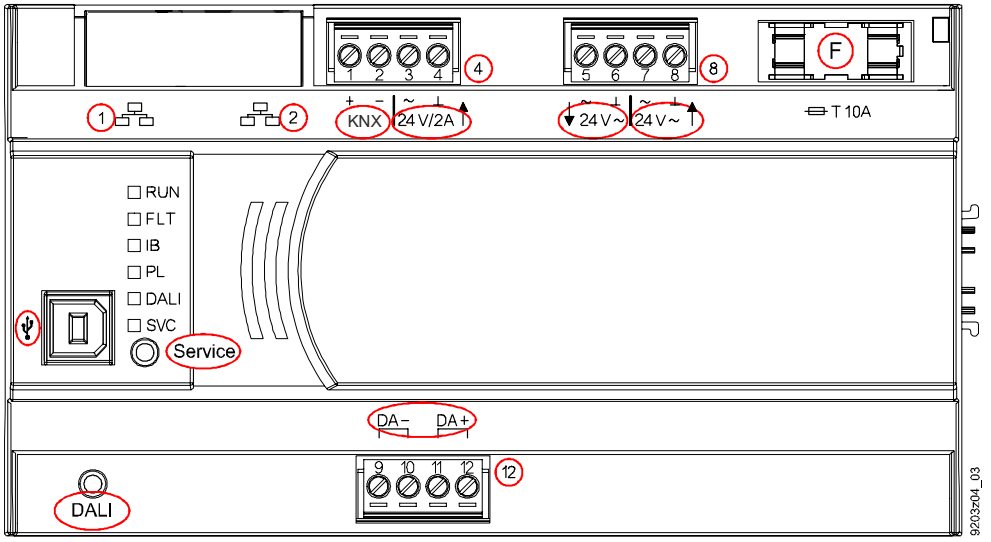
Wiring, topology, cable length, cross section	See planning manual Room automation, CM111043.		
Connection terminals, plug-in	Construction type	Pluggable screw terminals	
	Copper-wire or Cu-stranded	1 x 0.6 mm dia. to 2.5 mm^2	(22 to 14 AWG)
	with wire end sleeve	or 2 x 0.6 mm dia. to 1,0 mm^2	(2 x 22 to 18 AWG)
	Copper-stranded	1 x 0.6 mm dia. to 2.5 mm^2	(22 to 14 AWG)
	without wire end sleeve	or 2 x 0.6 mm∅ to 1.5 mm^2	(2 x 22 to 16 AWG)
	Screwdriver	Slot screws Screwdriver, size 1	
	Max. tightening torque	0.6 Nm (0.44 lb-ft)	
Assignment as per EN 60730	Operation of automatic controller	Type 1	
	Pollution degree	2	
	Protection class	III	
Housing protection standard	Protection degree as per EN 60529		
	Front parts in the DIN section	IP30	
	Terminal part	IP20	
Ambient conditions	Operation	As per IEC 60721-3-3	
	Climatic conditions	Class 3K23	
	Temperature (see page 6)	-5 ... 50 / 45 °C (23...122/113 °F)	
	Humidity	5…95% r.h. (non-condensing)	
	Mechanical conditions	Class 3M11	
	Transport / Storage	As per IEC 60721-3-2/3-1	
	Climatic conditions	Class 2K12 / 1K22	
	Temperature	-25...70 °C (-13 ...158 °F)	
	Humidity	5…95% r.h. (non-condensing)	
	Mechanical conditions	Class 2M4 / 1M11	
Standards, directives and approvals	Product standard	EN 60730-1	
	Product family standard		
	General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)	EN 63044-3 EN 63044-5	
	EU conformity (CE)	See CM1T9203xx *)	
	Electromagnetic compatibility (EMC)	For use in residential, commercial and industrial environments	
	RCM conformity (EMC)	See CM1T9222en_C1 *)	
	UL listing	UL 916	
	EAC Eurasian conformity	For all PXC3.E... types	
	Meets the requirements for eu.bac certification (excepted PXC3.E16A…). See product list on: http://www.eubaccert.org/licences-by-criteria.asp		
Environmental compatibility	The product environmental declaration CM1E9203 *) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal)	ISO 14001 (Environment) ISO 9001 (Quality)	
	*) The documents can be downloaded from http://siemens.com/bt/download.		
Color	Housing	RAL 7035 (light-gray)	
Dimensions	Housing as per DIN 43880, see dimensions		
Weight			
Without / with packaging	PXC3.E7xA...	389 g / 432 g	
	PXC3.E16A...	359 g / 402 g	
	PXC3.E7x-100A	367 g / 410 g	

Disposal

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

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

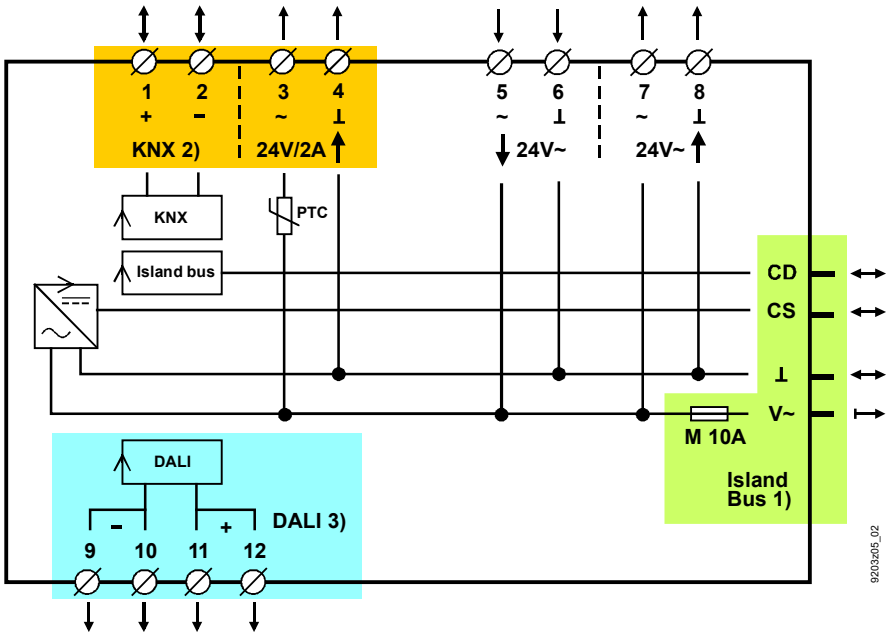
Connection terminals and interfaces



			PXC3.E7x...	PXC3.E7xA...	PXC3.E16A...
1, 2		2 x RJ45 interface for Ethernet (2-port Ethernet switch)	X	X	X
4 KNX	+, –	KNX PL-Link connection	X	X	*)
4 24 V / 2 A ↑	~, ⊥, 2 A	Output AC 24 V for externally supplied devices with KNX PL-Link (Short-circuit proof with PTC resistor)	X	X	*)
8 ↓ 24 V~	~, ⊥	Operating voltage AC 24 V	X	X	X
8 24 V ↑	~, ⊥, 6 A	Output AC 24 V to supply other PXC3... room automation stations (internally connected to ↓ 24 V on pcb – **no internal fusing**)	X	X	X
F		M 10 A fuse for island bus conductor V~	X	X	*)
	USB	USB interface	X	X	X
12	DA-, DA+	DALI bus connection	*)	X	X
Service		Service pin Ethernet	X	X	X
DALI		DALI test	*)	X	X
(Without labels)	Island bus	The island bus is created automatically when TX-I/O devices are snapped on the standard mounting rail	X	X	*)

*) Fitted, but no labeling and no function in this type

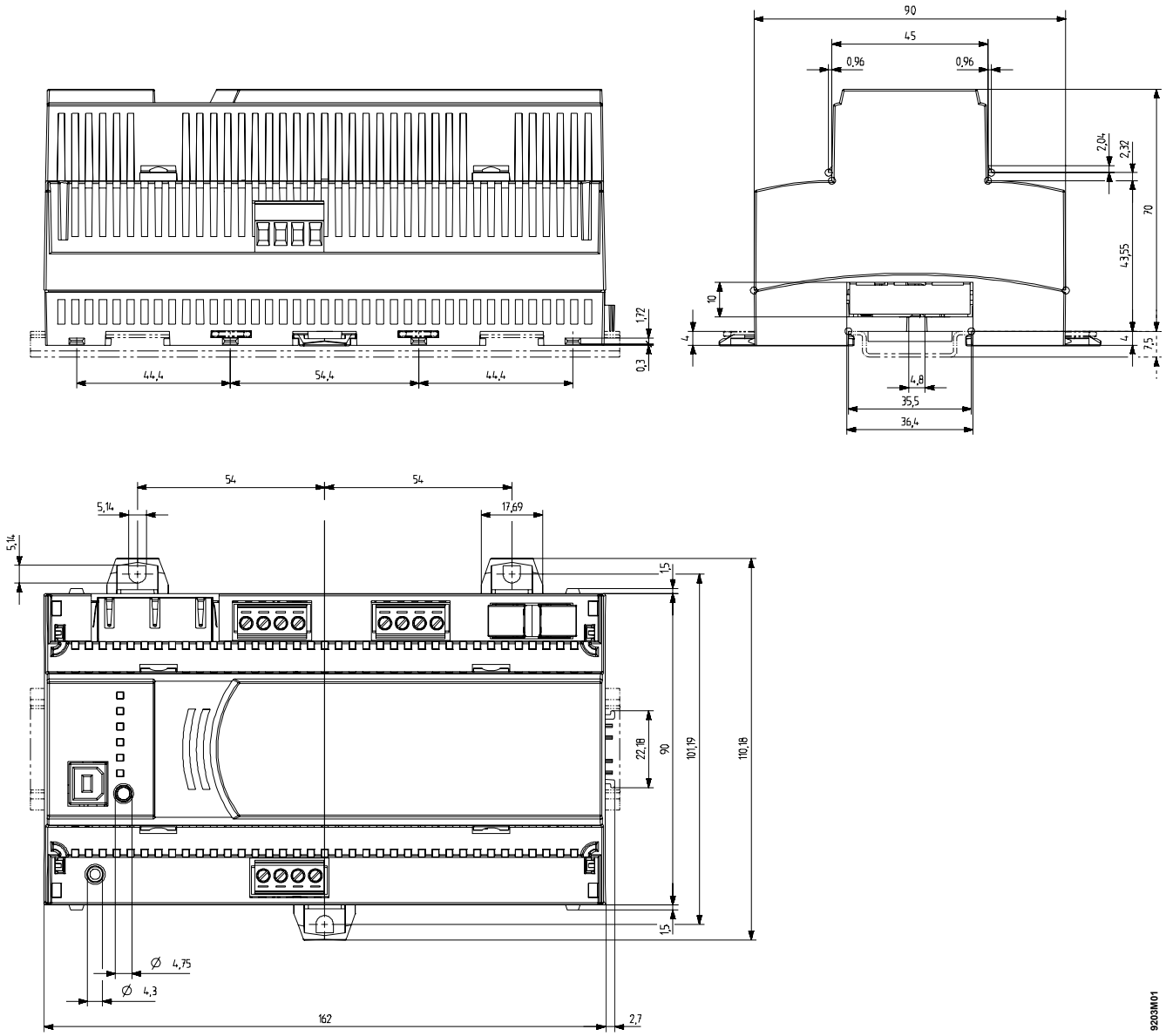
Basic circuit diagram
(connections AC 24 V, fusing)



1), 2) Not with PXC3.E16A… types
3) Only with PXC3.E....A... types

Dimensions

All dimensions in mm



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