1.6 PCD1 E-Line
Compact design for electrical distributors

E Line

Overview of Saia PCD E-Line device series

Automation stations

1

Operation and monitoring

2

Room controllers

3

Consumer data acquisition

4

Switch cabinet components

5

1.6.1 PCD1 E-Line system overview

The Saia PCD1 E-Line series was specifically developed for installation in electrical sub-distributors. The compact design enables automation in confined spaces. The two-wire bus connection between individual modules enables both centralised and decentralised automation over a distance of up to 1000 m. The modules are designed and produced in accordance with IEC 61131-2 to industrial quality. The extensive programmability and integration of Web+IT technologies enables effective automation over the entire service life of plants and properties.



Ethernet

RS-485

Control system

Visualisation and control of the connected components is an important aspect of automation. The web server can directly undertake the tasks of the control system for this purpose for small applications. For more complex projects, data is transferred to a control system via standard communication protocols such as BACnet. The Saia PCD® Supervisor control system is suitable for this.
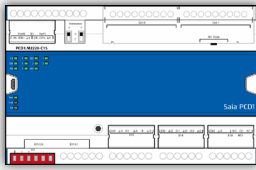
Controller

The Saia PCD controller functions as a master for the attached modules. Here it can undertake more complex controls and form the interface to the control level. The integrated automation server and the Web+IT functions can be directly used here to visualise the control via a web panel or browser. Saia PCD is the ideal interface for other plants thanks to the support of numerous protocols such as BACnet, Modbus, etc.

Programmable I/O modules

The programmable I/O modules of the Saia PCD1 E-Line series with Saia PG5® enable the autonomous and safe operation of the modules even if communication to the master station is interrupted.
The local function of a room, for example, is therefore guaranteed at any time. The modules are programmed with Saia PG5® via the master controller or directly via USB.
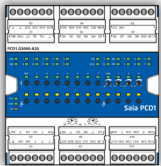
I/O modules

The PCD1 E-Line I/O modules enable centralised automation in the control cabinet and the decentralised distribution of the components through the bus connection. They can be commissioned quickly using the implemented override operation.

System Accessories

Power supplies are offered as a supplement for installation in the electrical distribution.
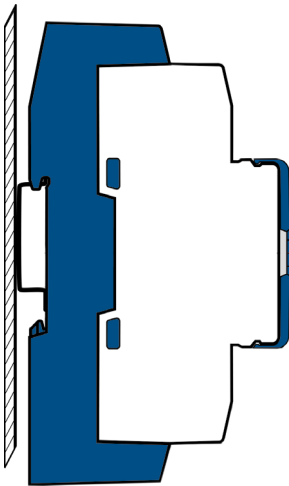
General properties of the Saia PCD1 E-Line modules

Mounting in the sub-distributor

The E-Line design enables the modules to be mounted in standard electrical sub-distributors. This significantly reduces the complexity of the mounting compared to automation control cabinets.
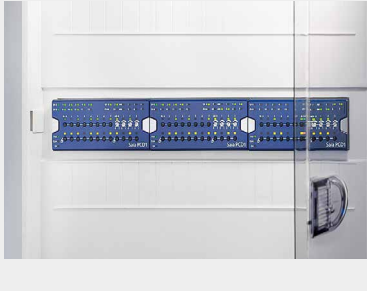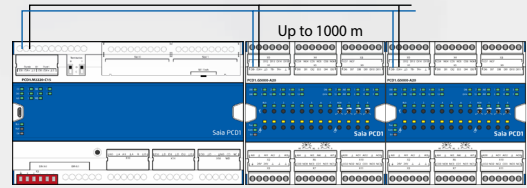
Mounting

on DIN rails 35 mm
(in accordance with DIN EN 60715) TH35

Bus topology

Communication with the S-Bus protocol is optimised for speed and creates a reliable connection up to 1000 m. The modules can be used as local or remote modules.

Up to 1000 m

Bus wiring

DB- and /DA+ terminals must be used for exchanging data between the modules. The bus is through-wired to a terminal to ensure the exchange between modules to avoid an interruption in the bus connection.
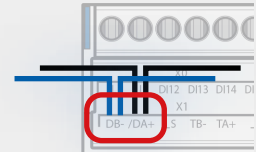
! Flexible cables with a cross section of no more than 0.75 mm² are permissible for bus wiring. 1.5 mm² on maximum applies for the overall terminal.

Product number key (ASN key)

Some main features of the E-Line modules can be identified immediately using the product number key. For example, if a module is fully programmable (5 at the end) or suitable for RIO mode (a 0).

Example:
PCD1.Gxxxx-C15

0: not programmable
5: programmable

1: with LED for I/O
2: with LED and man. override op.
3: with LED and display

A: 24 VDC
C: 24 VDC / VAC
F: 230 VAC
J: 110…230 VAC

Dimensions

Compatible with electrical control cabinets (in accordance with DIN 43880, size 2 × 55 mm)

Housing width 2 HP (35 mm) 2 module wide

Housing width 6 HP (105 mm) 6 module wide

Housing width 10 HP (175 mm) 10 module wide
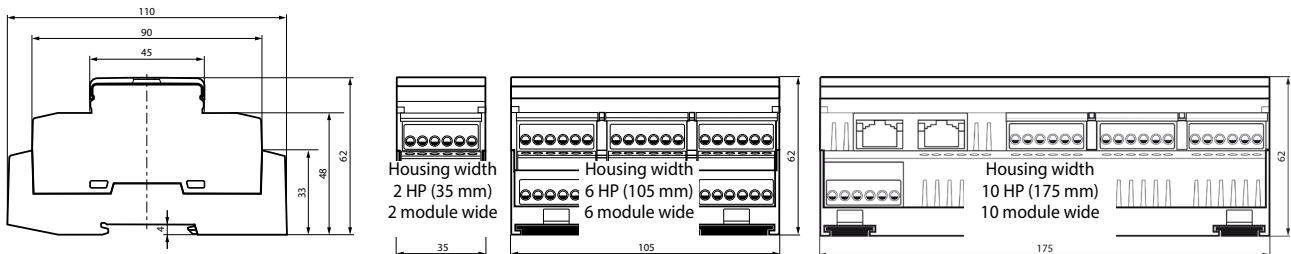
Accessories and consumables*

EPLAN macros

EPLAN macros are available for project planning and engineering

The EPLAN® electric P8 macros are available on the support site.

The macros and article data are also provided on the EPLAN® data portal.

*In preparation

1.6.2 PCD1 E-Line controller

The Saia PCD1 E-Line CPU series was specifically developed for installation in electrical sub-distributors. The compact design enables automation in confined spaces. The E-Line CPU is designed and produced to industrial quality in accordance with IEC 61131-2. The extensive programmability and integration of web+IT technologies enables effective automation over the entire service life of plants and properties. The Saia PCD E-Line CPU is the ideal interface for other plants owing to the support of numerous protocols such as BACnet, Modbus, etc. It is also ideal to achieve (energy-) efficient and i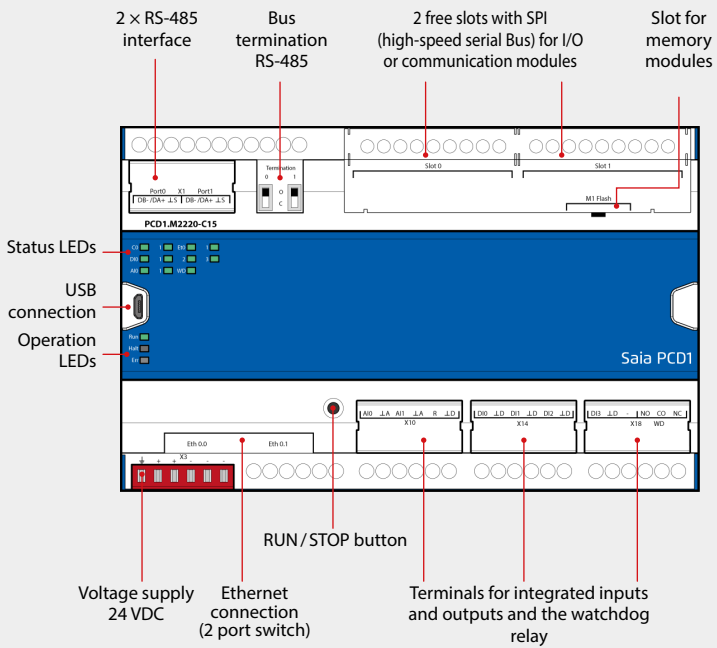ndividual room automation. It also provides a good basis to achieve the energy efficiency classes in accordance with EN 15232:2012.

Device design

- 2 × RS-485 interface
- Bus termination RS-485
- 2 free slots with SPI (high-speed serial Bus) for I/O or communication modules
- Slot for memory modules
- Status LEDs
- USB connection
- Operation LEDs
- RUN / STOP button
- Voltage supply 24 VDC
- Ethernet connection (2 port switch)
- Terminals for integrated inputs and outputs and the watchdog relay

Features

- ▶ 4 digital inputs
- ▶ 2 analogue inputs, individually configurable via software
- ▶ 1 Watchdog relay/changeover contact
- ▶ Electrical isolation between supply, bus and I/Os
- ▶ Pluggable terminal blocks protected by flaps
- ▶ Status LEDs on the front
- ▶ Ethernet switch, 2× RS-485 and USB interface
- ▶ Large onboard memory for data (up to 128 MByte file system)
- ▶ Automation server for integration in web+IT systems
- ▶ Freely programmable with Saia PG5®
- ▶ FRAM technology

FTP   WWW   EMAIL   SNMP   SD

AUTOMATION SERVER INTEGRATED IN THE BASE UNIT

Dimensions and installation

Housing width 10 HP (175 mm)
Compatible with electrical control cabinets
(in accordance with DIN 43880, size 2 × 55 mm)
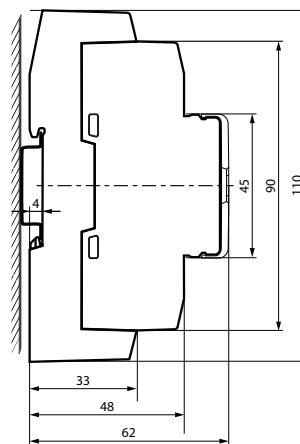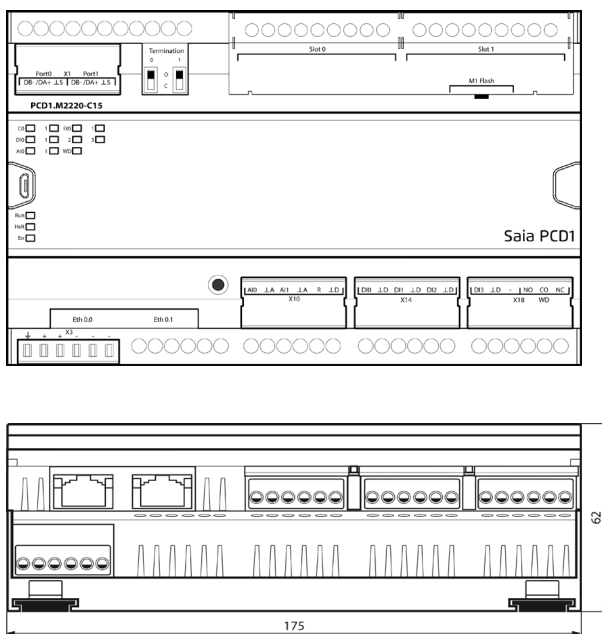
on DIN rails 35 mm
(in accordance with DIN EN 60715 TH35)

Connection concept

The device is supplied by a 24 VDC or AC voltage supply.

Overview Saia PCD1.M2220-C15

PCD1.M2220-C15

Technical data

Memory and file system	
Program memory, DB/Text (Flash)	512 kByte
User memory, DB/Text (RAM)	128 kByte
Onboard user flash file system	128 MB
Integrated communication	
Ethernet connection (2-port switch)	Yes
10/100 Mbit/s, full-duplex, auto-sensing, auto-crossing	Yes
Service interface: Micro USB	Yes
RS-485, up to 115 kbit/s	Yes

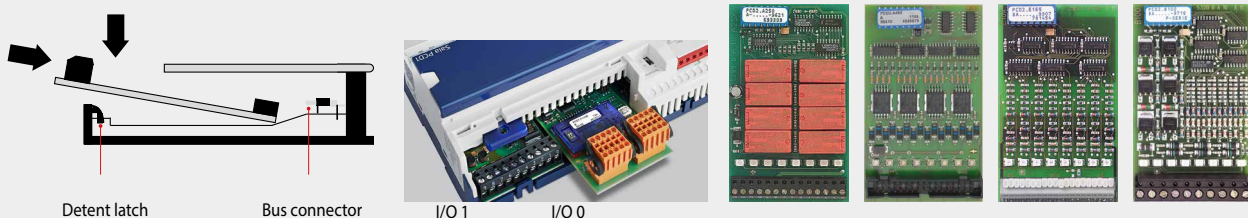## General specifications

Operating voltage	Nominal 24 VAC (50 Hz) or DC, 24 VDC, −20/+25 % incl. 5% ripple, 24 VAC, −15 %/+15% (in accordance with EN/IEC 61131-2)
Operating temperature:	0…55 °C
Dimensions (W × H × D)	175 × 110 × 62 mm
Mounting location	2 × DIN rails in accordance with DIN EN60715 TH35 (2 × 35 mm) or on a flat surface
Power consumption	typically 6.5 W

Onboard inputs/outputs

Inputs		Terminal
4 Digital inputs	24 VAC / VDC source operation (positive switching) or sink operation	X14 + X18
2 Analogue inputs, selectable via "Device Configurator"	−10…+10 VDC, Pt1000, Ni1000, Ni1000 L&S, 0…2.5 kΩ, 0…7.5 kΩ, 0…300 kΩ (NTC10k and NTC20k), 12 bit resolution	X10
Outputs		
1 Watchdog relay or change-over contact	48 VAC or VDC, 1 A With DC switching voltage a free-wheeling diode should be connected in parallel to the load	X18

Plug-in I/O modules for slots I/O 0 and I/O 1
The modules listed in the PCD2.M4 and PCD2.M5 series (Chapter 1.4) are also used for the E-Line CPUs.

Detent latch   Bus connector   I/O 1   I/O 0

Automation stations

1

Operation and monitoring

2

Room controllers

3

Consumer data acquisition

4

Switch cabinet components

5

PCD1.M2220-C15 interface options

In addition to the onboard interfaces, the interface functions can also be expanded in a modular way using the various slots. Numerous protocols are therefore supported by the Saia PCD1.M2220-C15. Detailed information and an overview is contained in the Chapter BA communication systems.

Communication		Electrical isolation	Internal current consumption 5V +V (24 V)		Slot	I/O connector type [1]
PCD7.F110S	RS-422 with RTS/CTS or RS-485 [2]	---	40 mA	–	Slot A [3]	
PCD7.F121S	RS-232 with RTC/CTS, DTR/DSR, DCD, suitable for modem or EIB connection	---	15 mA	–	Slot A [3]	
PCD7.F150S	RS-485 [2]	●	130 mA	–	Slot A [3]	
PCD7.F180S	Belimo MP-Bus, for connecting up to 8 drives on one line	---	15 mA	15 mA	Slot A [3]	
PCD2.F2100	RS-422/RS-485 [2], plus PCD7.F1xxS en option	---	110 mA	–	IO 0/1	2× K
PCD2.F2150	BACnet® MS/TP RS-485 plus PCD7.F1xxS as an option	---	110 mA	–	IO 0/1	2× K
PCD2.F2210	RS-232 plus PCD7.F1xxS as an option	---	90 Ma	–	IO 0/1	2× K
PCD2.F2610	DALI master for up to 64 DALI devices	---	90 Ma	–	IO 0/1	L
PCD2.F27x0	M-Bus master with 2 M-Bus interfaces	---	70 mA	8 mA	IO 0/1	L
PCD2.F2810	Belimo MP-Bus plus PCD7.F1xxS as an option	---	90 Ma	15 mA	IO 0/1	2× K

[1] Plug-in I/O terminal blocks are supplied with I/O modules.
Spare terminals, ribbon connectors with system cables and separate terminals are ordered as accessories.

[2] with line termination resistors that can be activated.

[3] On slot A of the PCD2 communication cards PCD2.Fxxxx.
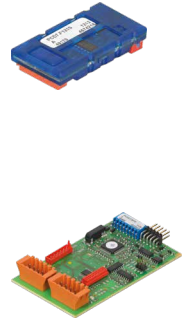
System properties of PCD2.F2xxx modules

The following points must be noted when using the PCD2.F2xxx interface modules:

▸ Max. 2 modules PCD2.F2xxx (4 interfaces) can be used in slots I/O 0/1 per PCD1.M2220-C15.

Memory modules

The onboard memory of the E-Line CPU can be expanded using a Saia PCD7.Rxxx module in slot M1.
In addition, the controller can be expanded with BACnet® IP.

Additional information about the memory management and structure is contained in the chapter Saia PCD System Description.

PCD7.R562

Memory expansion and communication

PCD7.R562	Flash memory module for BACnet® firmware with 128 MB file system	M1
PCD7.R610	Basic module for Micro SD flash card	M1
PCD7.R-MSD1024	Micro SD flash card 1024 MB, PCD formatted	PCD7.R610

PCD7.R610

System design with PCD1 E-Line modules and Saia PCD® controllers
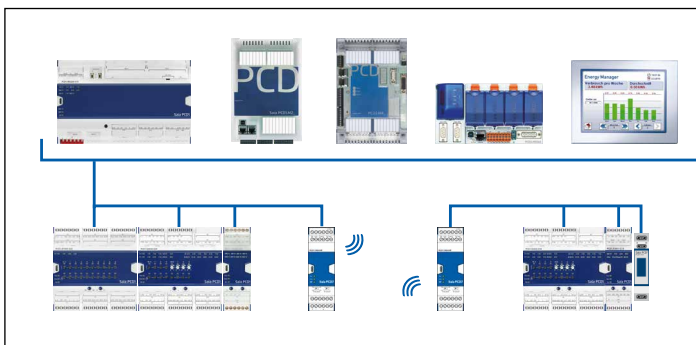
The PCD1.M0/PCD1.M2 controllers and PCD2.M5, PCD3.M3/5/6 CPUs as well as the programmable Micro Browser panel PCD7.D4xxxT5F can be used as head-end stations.
Here, the controller can process higher-level control processes and gather, process and visualise data and form the interface to the control level.

1.6.3 PCD1 E-Line fully programmable modules
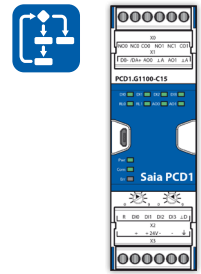
The Saia PCD1 E-Line fully programmable modules are for specific applications. For example for room automation, zone control and decentralised automation. The modules are freely programmed using the Saia PG5® tool. The Saia PCD1 E-Line series enables autonomous and safe operation of the modules even if communication to the master station is interrupted. The local function of a room, for example, is therefore guaranteed at any time.

System properties

▸ Freely programmable modules for specific applications
▸ Galvanic isolation between supply, bus and I/Os
▸ Pluggable terminal blocks protected by covers
▸ Status LEDs on the front
▸ RS-485 and USB interface
▸ Industrial quality
▸ Each wire is a connection

Connection concept

The modules are supplied with a 24 VDC or AC voltage supply. Supply to the modules is below.
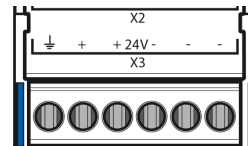
Bus topology and applications

Level controllers for all rooms on the same floor
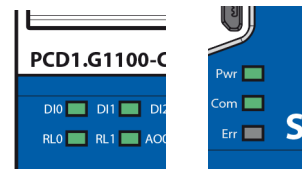
RS-485

Backbone
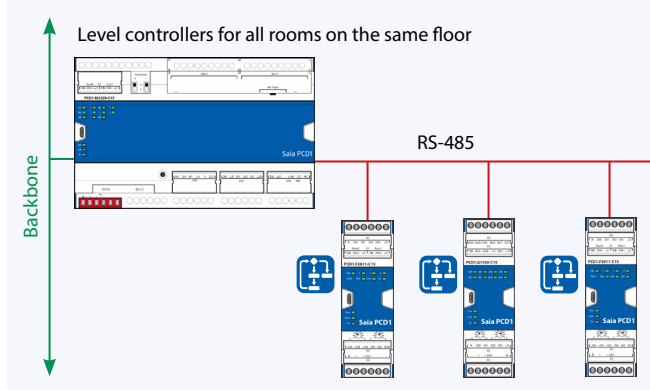
All the modules are freely programmable and can be operated as "standalone". Data is exchanged between them via the RS-485 connection and a terminal, e.g. a level controller.

Thanks to the options with the autonomous functions, the modules are ideally suitable for:
▸ Room automation
▸ Zone control
▸ Decentralised automation

LED

The currently active statuses are displayed on the respective LEDs for the inputs and outputs. The same applies to the voltage supply, communication and errors.

Configuration via USB interface

E-Line Configuration App

This app can be used to configure the communication protocol on the RS-485 of the E-Line RIO's, the baud rate, parity and stop bits as well as the station number of the E-Line RIO.

S-Bus or Modbus can be selected as the serial communication protocol. The modules are delivered from the factory with S-Bus.

If the rotary switches are set to position 99, the station number can be defined by the device configuration in a range of 0 … 253.

The E-Line app can be operated on PCs with Windows 7 and Windows 10 operating systems.

A USB connection between the PC and the E-Line RIO is required.

! The installation programme can be downloaded from the SBC Support page:
www.sbc-support ► E-Line RIO I/O modules.

Programming

The modules are programmed with Saia PG5® via a master controller or directly via Micro-USB. This enables additional options for commissioning and during operation.
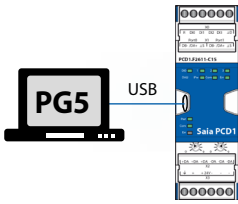
Programming direct via USB

E-Line modules have a Micro-USB connection at the front of the module. For example, the user program for the related module or a firmware update for the module can be loaded via the direct connection of the PC to the module via USB.
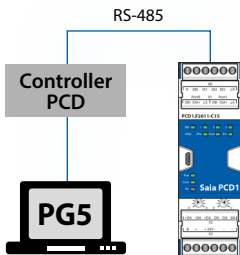
Programming via a master controller (PCDx.Mxxxx)

The master controller connected to the freely programmable E-Line modules uses the RS-485 bus (S-Bus), to load the user program or a firmware update on the corresponding modules.
Here the master controller is used as a gateway.

The modules are programmed with Saia PG5® using FBoxes or IL.
A range of FBoxes is therefore available to simplify engineering.

List of libraries that are supported:

PG5 standard FBox libraries

▶ Binary
▶ Blinker
▶ Block Control (no SB)
▶ Buffers
▶ Com.Text (not interpreted)
▶ Converter
▶ Counter
▶ DALI E-Line Driver (new)
▶ Data Block
▶ Data Buffer
▶ EIB Driver (partly)
▶ EnOcean (partly)

▶ Flip-Flop
▶ Floating Point (IEEE only)
▶ HVC (partly)
▶ Indirect
▶ Integer
▶ Ladder
▶ Move In / Out
▶ Modbus (E-Suite)
▶ Regulation (partly)
▶ Special, sys Info (partly)
▶ Timer
▶ PHC

In addition to these libraries, a new "E-Suite V2" library is available for specific applications that can be created with the Saia PCD1 E-Line modules.
An example for the electrical plant: Shade control, light dimming…
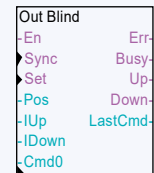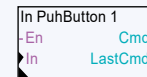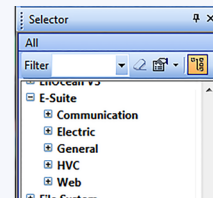
Program
Non-volatile memory (Flash memory)

Program blocks

COB	COB 0
XOB	XOB 10, 12, 13 and 16
PB / FB	100 with maximum hierarchy of 8

Data types

ROM Text / DB	50

Memory

Program memory	64 kBytes

The media
Volatile memory (RAM) without battery backup

Data types

Register	2000
Flag	2000
Timer / Counter	200

Memory

Memory (RAM) for 50 Text / DB	5 kBytes
Memory (EEPROM) for parameter (media) backup	256 Bytes
Cyclic synchronisation with PCD controller	Real-time clock (RTC)

Not all functions are available compared to a PCDx.Mxxxx controller. These modules do not have an automation server for example.

! More details on which FBoxes are supported is available on our support page
www.sbc-support.com

PCD1.G1100-C15 (light and shade module)

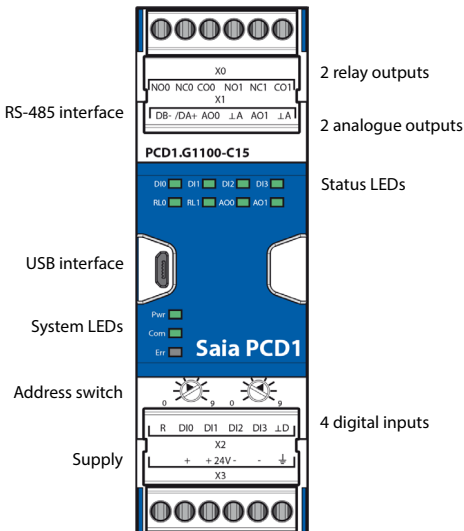The freely programmable module with a housing width of 35 mm (2 HP) can be controlled via RS-485 and enables light and shade control. It has two analogue and two relay outputs and four digital inputs. The user can optionally use the relay for the direct switching of two light groups or control of window shading. The blinds or shading can be positioned and defects localised via the integrated load current measurement. The user can use the digital inputs to connect electrical sensors.

Device design

RS-485 interface — X0 NO0 NC0 CO0 NO1 NC1 CO1 — 2 relay outputs
X1 DB- /DA+ AO0 ⊥A AO1 ⊥A — 2 analogue outputs
PCD1.G1100-C15
DI0 DI1 DI2 DI3 / RL0 RL1 AO0 AO1 — Status LEDs
USB interface
Pwr / Com / Err — System LEDs
Saia PCD1
Address switch
R DI0 DI1 DI2 DI3 ⊥D — 4 digital inputs
X2
+ +24V – ⊥ — Supply
X3

System properties

▸ 4 digital inputs
▸ 2 relays incl. current detection
▸ 2 analogue outputs
▸ Galvanic isolation between supply, bus and I/Os
▸ Pluggable terminal blocks protected by covers
▸ Status LEDs on the front
▸ RS-485 and USB interface
▸ Freely programmable with Saia PG5®

Technical Data

Interfaces

Communication interface	RS-485 with galvanic isolation Baud rate: 9,600, 19,200, 38,400, 57,600, 115,200 bps (autobauding)
Address switch for S-Bus address	Two rotary switches 0…9
Service interface	USB (Micro-USB)

General specifications

Supply voltage	Nominal 24 VAC (50 Hz) or VDC (in accordance with EN / IEC 61131-2) 24 VDC, −15 / +20% max., incl. 5% ripple 24 VAC, −15 / +10%
Electrically isolated	500 VDC between power supply and RS-485 and between current supply and inputs/outputs
Dimensions	Housing width 2 HP (35 mm), compatible with electrical control cabinet (in accordance with DIN 43880, size 2 × 55 mm)
Mounting type	DIN rail in accordance with DIN EN 60715 TH35 (1 × 35 mm)
Ambient temperature	Operation: 0…+55°C, without forced ventilation Storage: −40…+70°C
Power consumption	Typical 2 W

Inputs and outputs

Inputs

4 digital inputs	24 VAC / VDC

Outputs

2 analogue outputs	0…10 VDC, 12 bit resolution
2 relays (inrush)	250 VAC / 30 VDC 8 AAC (AC1) / 8 ADC (resistive load) Max. inrush current 15 A Current measurement ≥ 200 mA, resolution 100 mA

1 Automation stations
2 Operation and monitoring
3 Room controllers
4 Consumer data acquisition
5 Switch cabinet components

PCD1.W5300-C15 (analogue module)

The programmable analogue module with a housing width of 35 mm (2 HP) has four inputs and outputs. Each input and output is electrically separated and can be configured separately. Small and purely analogue tasks such as recording the room temperature and subsequent control of 0–10 V drives can therefore be realised.

Device design

RS-485 interface — 4 analogue outputs / 2 analogue inputs

Status LEDs

USB interface

System LEDs

Address switch

Supply — 2 analogue inputs

System properties

▸ 4 analogue inputs
▸ 4 analogue outputs
▸ Galvanic isolation between supply, bus and I/Os
▸ Pluggable terminal blocks protected by covers
▸ Status LEDs at the front
▸ RS-485 and USB interface
▸ Freely programmable with Saia PG5®

Technical Data

Interfaces

Communication interface	RS-485 with galvanic isolation Baud rate: 9,600, 19,200, 38,400, 57,600, 115,200 bps (autobauding)
Address switch for S-Bus address	Two rotary switches 0…9
Service interface	USB (Micro-USB)

General specifications

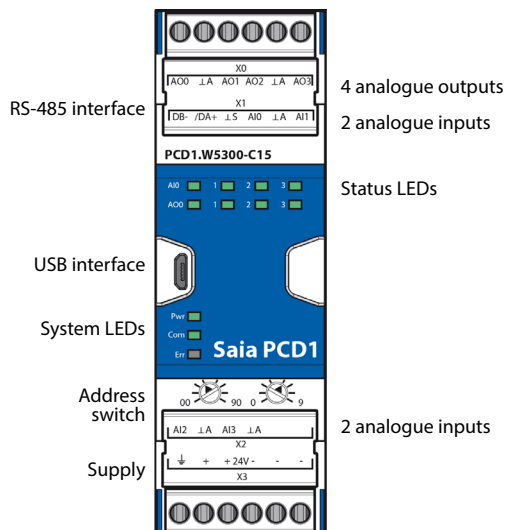|	
Supply voltage	Nominal 24 VAC (50 Hz) or VDC (in accordance with EN / IEC 61131-2) 24 VDC, −15 / +20% max., incl. 5% ripple 24 VAC, −15 / +10%
Electrically isolated	500 VDC between power supply and RS-485 as well as between current supply and inputs/outputs
Dimensions	Housing width 2 HP (35 mm), compatible with electrical control cabinet (in accordance with DIN 43880, size 2 × 55 mm)
Mounting type	DIN rail in accordance with DIN EN 60715 TH35 (1 × 35 mm)
Ambient temperature	Operation: 0…+55°C, without forced ventilation Storage: −40…+70°C
Power consumption	Typical 2 W

Inputs and outputs

Inputs	
4 analogue inputs (adjustable via software)	0…10 V, ±10 V, ±20 mA (0…20 mA, 4…20 mA), Pt/Ni1000, Ni1000 L&S, 0…2500 Ω, 0…7500 Ω, 0 Ω…300 kΩ 12/13 bit resolution, depending on the measured values

Outputs	
4 analogue outputs	0…10 VDC, ±10 V, 12 bit resolution

PCD1.F2611-C15 (DALI module + add. RS-485)

The freely programmable module with a housing width of 35 mm (2 HP) can be controlled via RS-485 and enable the direct control of 64 DALI subscribers. It has the DALI line as well as four digital inputs. The user can implement the digital inputs to connect electrical sensors. The module is freely programmable and can also be used as a "standalone" DALI small controller. For example, smaller DALI lighting systems for enhanced individual rooms can therefore be implemented and subsequent linking to a higher level controller is no longer an obstacle.
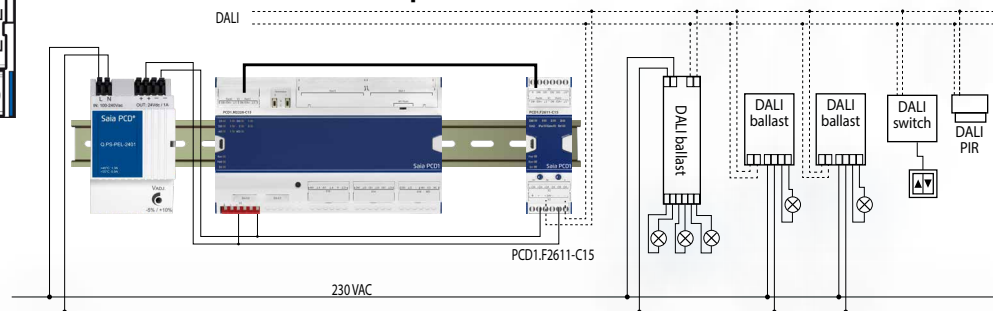
Device design
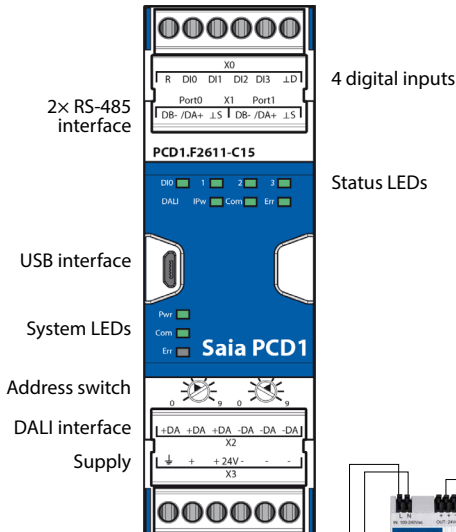
System properties

▸ S-Bus (RS-485) / DALI interface
▸ incl. DALI voltage supply (can be deactivated)
▸ Up to 64 DALI ballasts
▸ 4 digital inputs
▸ Galvanic isolation between supply, bus and I/Os
▸ Pluggable terminal blocks protected by covers
▸ Status LEDs on the front
▸ RS-485 and USB interface
▸ Freely programmable with Saia PG5®

Connection example

Technical Data

Interfaces

Communication interface	RS-485 with galvanic isolation Baud rate: 9,600, 19,200, 38,400, 57,600, 115,200 bps (autobauding)
Address switch for S-Bus address	Two rotary switches 0…9
Service interface	USB (Micro-USB)
DALI	incl. DALI voltage supply (can be deactivated) for up to 64 DALI subscribers 160 mA max. Output current basic insulation (1350 VAC)
Additional interface	RS-485 in SASI mode C (E-Suite, Modbus, EnOcean, PHC)

General specifications

Supply voltage	Nominal 24 VAC (50 Hz) or VDC (in accordance with EN / IEC 61131-2) 24 VDC, −15 / +20% max., incl. 5% ripple 24 VAC, −15 / +10%
Electrically isolated	500 VDC between current supply and RS-485 and between current supply and inputs/outputs
Dimensions	Housing width 2 HP (35 mm), compatible with electrical cabinet (in accordance with DIN 43880, size 2 × 55 mm)
Mounting type	DIN rail in accordance with DIN EN 60715 TH35 (1 × 35 mm)
Ambient temperature	Operation: 0…+55°C without forced ventilation Storage: −40…+70°C
Power consumption	Typical 2 W

Inputs

4 digital inputs	24 VAC / VDC

1.6.4 PCD1 E-Line input and output modules

The remote I/O modules are controlled via RS-485 and enable decentralised automation using industrial quality components. The data poin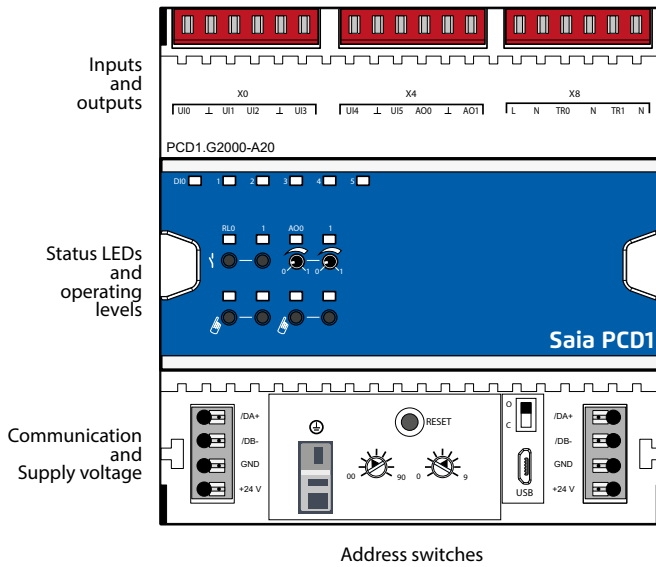t mix is specifically designed for applications in the HVAC sector. Moreover, the compact design enables the use of electrical distribution boxes alongside installations even in confined spaces. Commissioning and servicing are facilitated due to the local override operating level for each output. Remote maintenance is also possible using the optional access to the override operating level via the web interface in the Saia PCD controller. Programming is also very efficient and fast using a comprehensive FBox library with web templates.
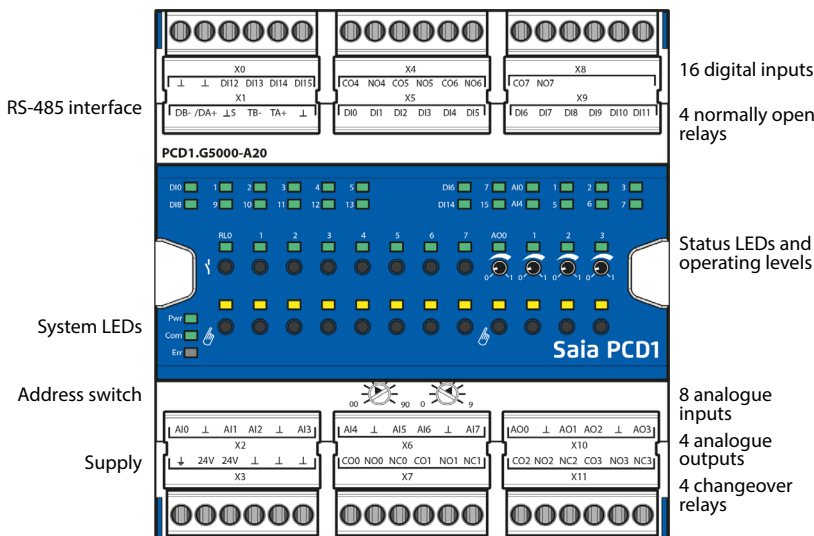

Device design – S-Serie

Inputs and outputs

Status LEDs and operating levels

Communication and Supply voltage
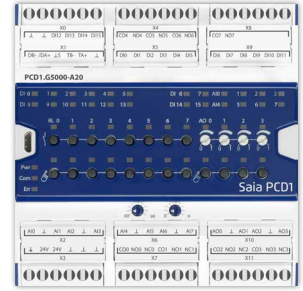
Address switches

System properties

▶ Optimised S-Bus protocol for fast data communication

▶ Local override operating level via web panel or buttons on the module

▶ Specific I/O mix suitable for HVAC systems

▶ Convenient programming using the FBox library and web templates

▶ Industrial quality in accordance with IEC EN 61131-2

▶ Pluggable terminal blocks protected by covers

▶ RS-485 interface

▶ Easy installation with connector bridge

Device design – L-Serie

RS-485 interface

System LEDs

Address switch

Supply

16 digital inputs

4 normally open relays

Status LEDs and operating levels

8 analogue inputs

4 analogue outputs

4 changeover relays

System properties

▶ Optimised S-Bus protocol for faster communication (4 × faster)

▶ Local override operating level via web panel or buttons on the module

▶ Specific I/O mix suitable for HVAC systems

▶ Convenient programming using the FBox library and web templates

▶ Industrial quality in accordance with IEC EN 61131-2

▶ Pluggable terminal blocks protected by covers

▶ Electrically isolated RS-485 interface

▶ High I/O density thanks to two-sided connection terminals

Manual or remote override operating level
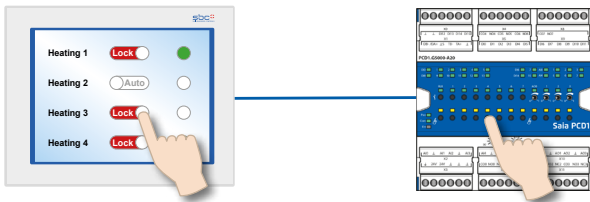
For modules with a manual override operating level, commissioning can occur independent of the master station.

The manual operating level can also be controlled remotely from a touch panel. If the bus line is disconnected, the module retains the manually set values. Traditional manual operating levels in the control cabinet door via potentiometers and switches can therefore be completely replaced.

Five security levels can be defined for the manual operating level:

1. Manual operation completely deactivted

2. Operation permitted only from the module

3. Operation permitted from the module and limited operation from the panel. If manual operation is activated at the module, it cannot be reset from the panel.

4. Unlimited operation from the panel and module.

5. Operation permitted only from "remote".

> **!** Depending on the application, manually set values may not be reset from the panel. This can therefore be deactivated or limited.
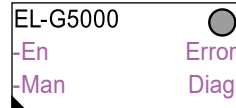
Bus wiring

S-Series : Easy and reliable installation through connector bridges for communication and supply voltage.

L-Series : Most modules are equipped with integrated terminating resistors that enable wiring without additional external components.

Programming

The modules are addressed and programmed via FBoxes.

```
ref:Channel
EL-G5000          ◯
-En            Error-
-Man            Diag-
```

Communication FBox:

▸ Data exchange for I/O via optimised S-Bus
▸ Configurable fall back state for bus interruption or timeout
▸ Direct generation of the symbols
▸ Reading and writing of the status of the override operating level
▸ Direct compatibility for web macros

Web templates:

▸ Web templates are available for the operation and visualisation of the override operating level

General technical data

Power supply

Supply voltage	24 VDC, −15 / +20% max., incl. 5% ripple (in accordance with EN / IEC 61131-2)
Electrically isolated	500 VDC between power supply and RS-485 and between inputs/outputs and RS-485 *
Power consumption max.	3 W
Interfaces	
Communication	RS-485 with galvanic isolation * / baud rate: 9,600, 19,200, 38,400, 57,600, 115,200 bps (autobauding)
Address switch for S-Bus	Two rotary switches 0…9
Terminating resistor	Integrated, can be activated via a wire jumper
General specifications	
Ambient temperature	Operation: 0…+55°C without forced ventilation / storage: −40…+70 °C
Terminals	Push-in spring-loaded terminals – max. 1.5 mm².
Width	6TE (105mm)

* Only for L-Series

Technical data for inputs and outputs

Digital inputs

Input voltage	24 VDC, high active
Relay outputs	
Switching voltage max.	250 VAC / 30 VDC
Switching current max.	see below board, datasheet
Contact protection	n/a
Analogue inputs	
Resolution	12/13 bit resolution, depending on the measured values
Measured values	0…10 V, Pt/Ni1000, Ni1000 L&S, NTC, 0…2,500 Ω, 0…7,500 Ω, 0 Ω…300 kΩ can be set via FBoxes
Precision	0.3% at 25°C
Analogue outputs	
Resolution	10 bits
Signal range	0…10 V (10 mA max.)
Man. Override operation	Operation via buttons and potentiometer

S-Series

Type	Digital input (DI), universal input (UI)	Relay, triac, digital output (DO)	Analogue output	Manual override operation
PCD1.A1000-A20	–	10 DO 24 VDC, 0.5 A	–	Yes
PCD1.A2000-A20	–	6 relays 230 V, 16 A	–	Yes
PCD1.B1100-A20	4 DI	10 relays (6 NO, 4 CO)	–	Yes
PCD1.B1120-A20	16 DI	4 relays change over	–	Yes
PCD1.B5000-A20	6 DI 230 V	3 relays 230 V, 6 A	–	Yes
PCD1.B5010-A20	6 DI 24 VAC/DC	3 relays 230 V, 6 A	–	Yes
PCD1.E1000-A10	12 DI 24 VDC	–	–	–
PCD1.G2000-A20	6 UI	2 triacs 24…230 VAC, 1 A	2	Yes
PCD1.G2100-A10	8 UI	–	–	–
PCD1.G2200-A20	8 UI	–	4	Yes
PCD1.W5200-A20	–	–	8	Yes

L-Series

Type	Digital input	Relay (NO / changeover)	Analogue input	Analogue output	Manual override operation
PCD1.B1000-A20	4	10 (6 / 4), 4A	---	---	Yes
PCD1.B1010-A20	24	10 (6 / 4), 4A	---	---	Yes
PCD1.B1020-A20	16	4 (0 / 4), 4A	---	---	Yes
PCD1.G5000-A20	16	8 (4 / 4), 4A	8	4	Yes
PCD1.G5010-A20	12	4 (0 / 4), 4A	12	8	Yes
PCD1.G5020-A20	8	4 (0 / 4), 4A	16	4	Yes

Accesories

Type	Short text	Description	Weight
32304321-003-S	Terminal set – S+L-Serie	6-pin terminal. Set of 6 terminal blocks	40 g

Accessories

Type	Short text	Description	Weight
PCD1.K0206-005	E-Line Cover Set 5×6 HP*	E-Line cover and labelling set consisting of 5× covers (6 HP=105 mm) and labelling sheets for installation in automation control cabinets	365 g
PCD1.K0206-025	E-Line Cover Set 5×6 HP* w.h.	E-Line cover and labelling set w.h. consisting of 5× covers (6 HP =105 mm) with holes for the manual priority operating level and labelling sheets for installation in automation control cabinets	365 g

* Horizontal pitch: 1 HP corresponds to 17.5 mm

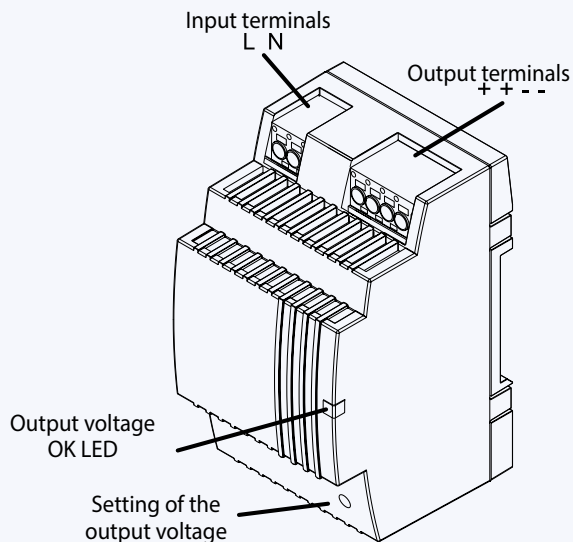### Mounting and labelling in the automation control cabinet

The modules can be mounted in the standard automation control cabinet as well as mounting in the electrical sub-distributor. Covers are available for this for easy labelling. They also serve as contact protection for the buttons and terminals to prevent faulty operation.

1.6.5 E-Line system components

Power units for installation in electrical distributor boxes

The compact Q.PS-PEL-240x power units with 24 VDC output voltage can be installed in a very restricted space and therefore the installation in cost-effective electrical distributor boxes in accordance with DIN 43880 is possible. They are therefore ideally suited for combining with the E-Line family. Modern push-in terminals enable efficient and fast wiring without the use of tools.

Input terminals
L N

Output terminals
+ + - -

Output voltage OK LED

Setting of the output voltage

System properties

▸ Short-circuit protection and constant overload limiter
▸ Protection class II (in closed switch cabinet)
  → dual isolation
▸ Power failure bypass up to 100 ms
▸ LED for output voltage OK display
▸ Stabilised and adjustable output voltage for the conductor resistance compensation
▸ Parallel operation possible to increase max. output current
▸ IP20 housing for mounting on DIN rail

Mounting in the sub-distributor

The design of the Q.PS-PEL2-40x power units complies with the required standard dimensions according to DIN 43880. The power units can therefore be easily integrated in electrical distribution boxes and are ideally suited to supply the components of the E-Line family with voltage

Power unit overview

Single phase 110/230 VAC

▸ Q.PS-PEL-2401: 24 VDC / up to 1.3 A
▸ Q.PS-PEL-2403: 24 VDC / up to 4.0 A

Standards and certifications

| Compliant certifications	Electrical safety
▸ CE	▸ EN61558
▸ DNV GL (shipping approval)	▸ EN60950 (SELV)
▸ UL (cURus, cULus)	
▸ EAC	

EMC

▸ EN61204-3
▸ Immunity pursuant to EN61000-6-2 (for the industrial sector)
▸ Emitted interference in accordance with EN61000-6-4 (for the domestic sector)

Terminal technology

Push-in terminals for efficient and fast wiring without tools for single wire conductors with a cross section of up to 2.5 mm² or fine wire ferrules up to 1.5 mm². However fine wire conductors up to 2.5 mm² can also be connected directly by simply applying pressure (screwdriver).

Dimensions

59 mm
54 mm
B
89 mm
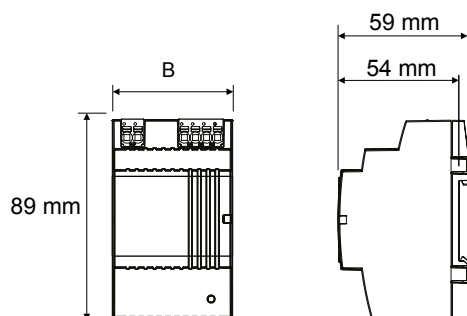
Model	Q.PS-PEL-2401	Q.PS-PEL-2403
Width (W)	54 mm	90 mm
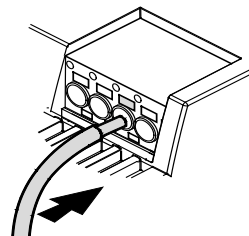
Installation information

Distance to adjacent parts:
Right/left: no minimum distance required
Top/bottom: min. 50 mm

50 mm

50 mm
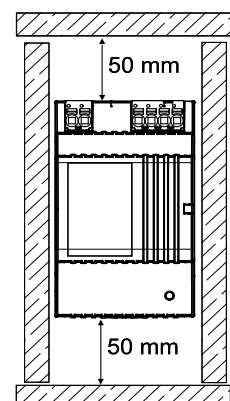
Technical data

Input data	Q.PS-PEL-2401	Q.PS-PEL-2403
Input voltage	100…240 VAC	
Permitted input voltage range	85…264 VAC	
Nominal frequency range	44…66 Hz	
Nominal input current for nominal load (110 / 230 VAC)	0.7 / 0.5 A	1.6 / 0.9 A
Internal input fuse	2 AT	4 AT
Recommended external pre-fuse	6 A, 10 A, 16 A, characteristics B, C	
Power failure bypass for nominal load (110 / 230 VAC)	10 / 80 ms	15 / 100 ms

Output data		
Output voltage (V_N)	24 VDC ± 2%	
Output voltage range (V_{ADJ})	22.8…26.4 VDC	
Output current (I_N) at ≤ 45°C	1.3 A	4 A
Output current (I_N) at ≤ 55°C	0.9 A	2.8 A
Current load rating for any installation system	max. 0.9 A	max. 2.4 A
Efficiency	typical 82%	typical 88%
Residual ripple (for nominal load)	≤ 100 mVpp	
Overload behaviour	Constant current (U/I characteristic curve)	
Short-circuit protection	Yes	
Overvoltage output protection	Yes (max. 30 VDC)	
Parallel connection	Yes	

Status		
Operating indicator	LED green	

Environment		
Ambient temperature (operation)	−25°C to +55°C (load reduction >45°C, 3%/°C)	
Storage temperature	−25°C to +80°C	
Permitted humidity	30–85% relative humidity, no condensation permitted	
Areas of use	Use in areas with contamination level 2	

Connection terminals		
Connections	Push-in	
Input/output terminals	Single wire and fine wire conductors up to max. 2.5 mm² / conductors with wire ferrules up to max. 1.5 mm²	

Output characteristics

Voltage/current characteristic curve for short-circuit and overload protection

Output characteristic curve (U/I characteristic curve)
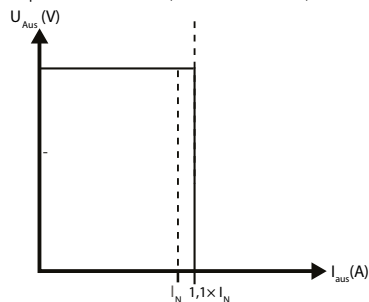
The current overload protection limits the current to a constant value of 1.1 × nominal current

Output derating curve

Q.PS-PEL-2401

Q.PS-PEL-2403