SAIA BURGESS CONTROLS

PCD7.LRxx-P5
Saia PG5® programmable room controller

GENERAL

- Freely programmable using Saia PG5.
- Mains or 24 V AC supply voltage.
- Flexible use of relays and Triacs (24 V AC or 230 V AC).
- 24 V AC supply for field devices.
- Support of Honeywell Sylk wall modules.
- Smart engineering and commissioning tools reduce the total installation costs.

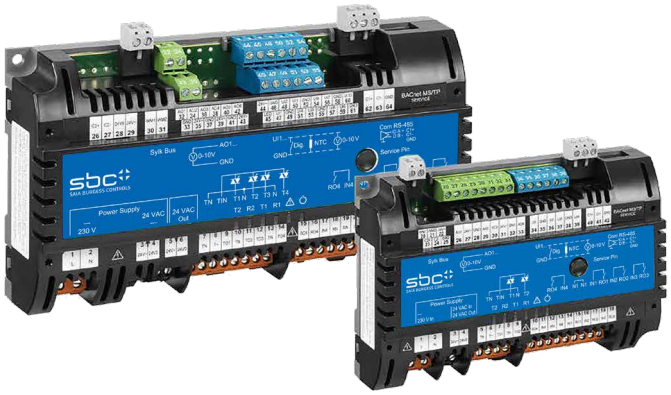


Fig. 1 PCD7.LRxx (without optional covers)

FUNCTIONS

- Freely programmable using Saia PG5.
- Two housing dimensions and several different I/O versions for the fulfilment of individual needs.
- Universal installation options, including connection covers and colour-coded connections.
- The 230 V AC models offer a 24 V AC auxiliary output voltage, which enables direct connection and feeding of field devices.
- Two serial S-bus interfaces: S-bus / Modbus RTU
- Polarity-insensitive two-line bus interface (proprietary record) for the connection of Honeywell Sylk wall modules.

SYSTEM OVERVIEW

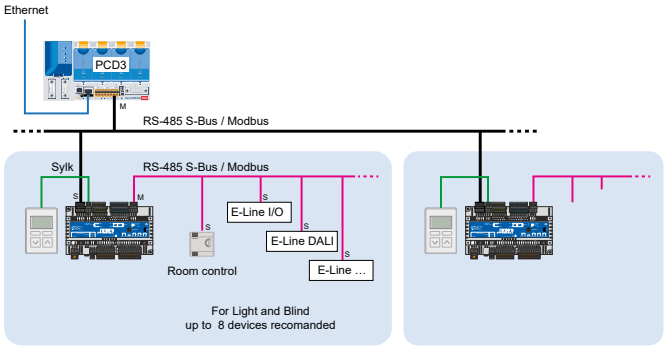


Fig. 2 Example with PCD7.LRL2

Table 1. Model overview

Item number	Housing	Power supply	Analogue outputs (AO)	Universal inputs (UI)	Relay	Triacs (24/230 V AC)	I/O total	Micro USB	2× RS-485	All connections with plug	72 hours data maintenance	24 V AC output for field devices and Triac outputs	Comment
PCD7.LRL2-P5	Large	230 V AC	2	6	4	4	16	×	×	×	×	max. 300 mA	All connections removable
PCD7.LRL4-P5	Large	230 V AC	6	10	4	4	24	×	×	×	×	max. 300 mA	
PCD7.LRL5-P5	Large	24 V AC	6	10	4	4	24	×	×	×	×	max. 600 mA	
PCD7.LRS4-P5	Small	230 V AC	4	4	4	2	14	×	×	×	×	max. 300 mA	
PCD7.LRS5-P5	Small	24 V AC	4	4	4	2	14	×	×	×	×	max. 600 mA	

DIMENSIONS AND INSTALLATION

Housing

The controller is deliverable in two housing sizes in compliance with IP20:

- **PCD7.LRLx-P5** (large housing):
  W × L × H = 110 × 198 × 59 mm
- **PCD7.LRSx-P5** (small housing):
  W × L × H = 110 × 162 × 59 mm

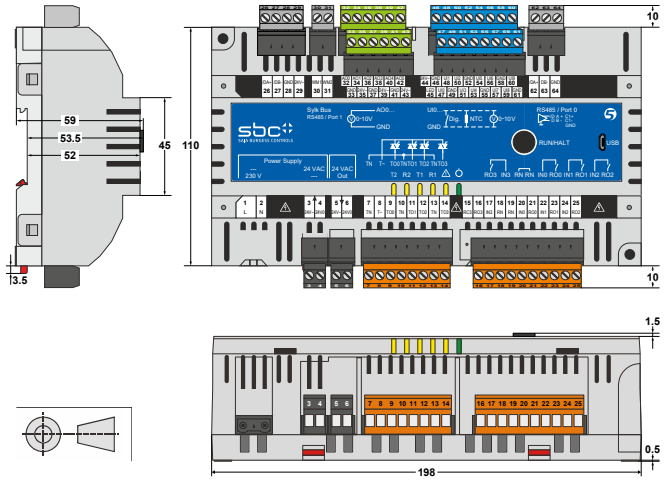


Fig. 3 PCD7.LRLx dimensions (in mm)

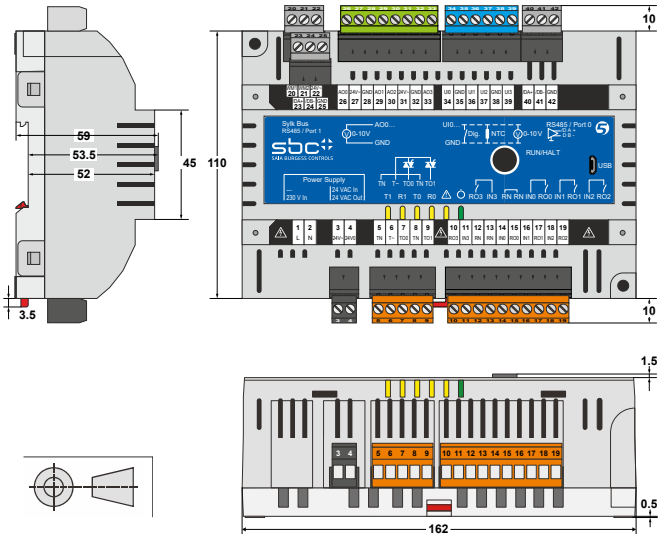


Fig. 4 PCD7.LRSx-P5 dimensions (in mm)

Mounting

The device is suitable for mounting on a standard rail, on walls and in control cabinets or fuse boxes.

Connection protection covers for IP30

For controllers installed outside a control cabinet, the connection protection covers (bulk packaging with 10 units, order no.: IRM-RLC for large housing and IRM-RSC for small housing) for an IP30 conformity must be installed before connection to the voltage supply of the device.

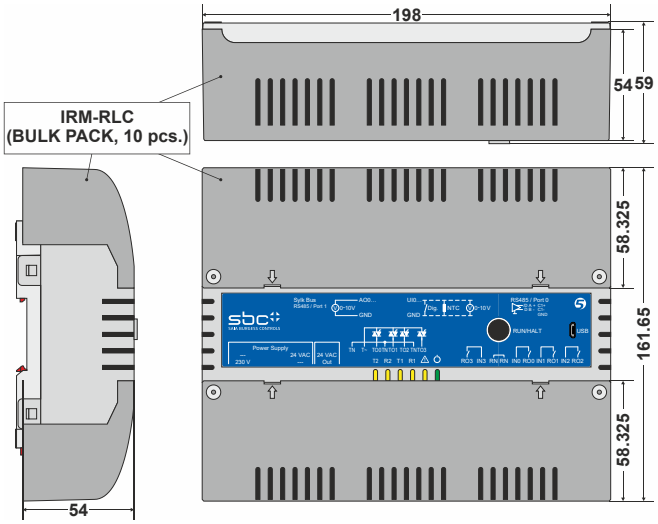


Fig. 5 Large housing with connection protection covers, dimensions (in mm)

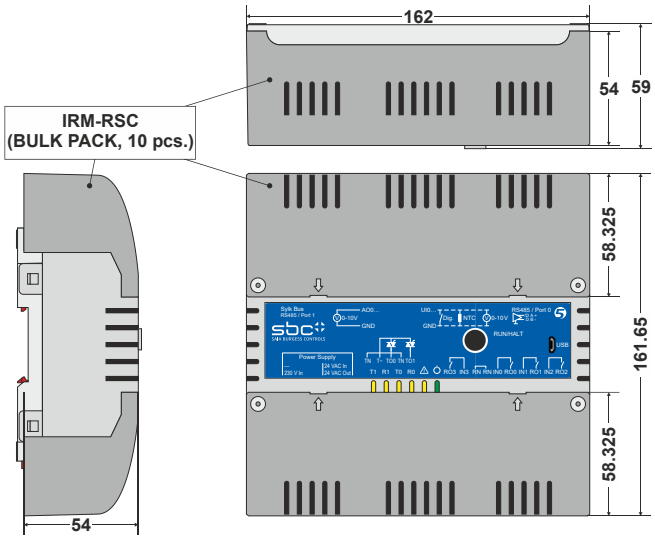


Fig. 6 Small housing with connection protection covers, housing (in mm)

CONNECTION OCCUPATION

General

See tables 7 and 8 for a complete list of all connections and their functional descriptions.

Communication interfaces

All the controller models have the following communication interfaces:

- 1× Sylk bus for connection to wall modules TR4x, TR4x-H, TR4x-CO2 and TR4x-H-CO2.
- 2× RS-485 for free use.
- 1× Micro USB for programming and service.

Table 2. Relay output types and properties

	Type 1 (standard)	**Type 2** (high activation current)
According to the relay outputs of RSxx	RO0, RO1, RO2	RO3
Based on the relay outputs of RLxx	RO1, RO2	RO0, RO3
Contact	Closed	Closed
Min. load	5 V AC, 100 mA	24 V AC, 40 mA
Control voltage range	15…253 V AC	15…253 V AC
Permanent load at 250 V AC (cos φ = 1)	4 A	10 A
Permanent load at 250 V AC (cos φ = 0.6)	4 A	10 A
Activation current (20 ms)	---	80 A
Application	Controlling of the light, fan motor	Controlling of the light, fan motor and electric heater

NOTE: The max. sum load of all simultaneous relay flows is 14 A.

Table 3. Triac output types

	Type 3
Designation	TO0 … TO3
Switching voltage range	15…253 V AC
Max. load	300 mA*
Application	Valve, Light

* To increase the power triac outputs can be connected in parallel.

Table 4. Analog output types and properties

	Type 4	**Type 5**	**Type 6**
Output voltage	0…10 V		
Output current	0…1 mA	0…5 mA	0…10 mA
Min. Precision	±150 mV		
Max. ripple	±100 mV		
Precision at zero point	0…200 mV		

Table 5. Universal input types and properties

	Type 7	**Type 8**	**Device-config. ***
0…10 V	Yes	Yes	0…10 V
2.5 kΩ	No	Yes	2.5 kΩ
10 kΩ (NTC 10 kΩ)	No	Yes	0…10 kΩ
100 kΩ (NTC 20 kΩ)	Yes	No	0…100 kΩ
PT/NI 1000	No	Yes	PT/NI 1000 L&S
Galvanical separated: closed: ..... Resistance <10 kΩ open: ..... Resistance > 20 kΩ max. ..... 0.2 Hz Pull-up voltage: 10 V	Yes	No	dry contact
Fast binary input (meter) max. 30 Hz: Pulse ON ..... min. 16 ms Pulse OFF ..... min. 16 ms closed: ..... Voltage < 1 V open: ..... Voltage > 5 V	Yes	Yes	digital

* Setting in PG5 (V2.3) Device Configurator

Table 6. Resources

	PCD7.LRLx, PCD7.LRSx
Program memory, DB/text (flash)	128 kB
User memory, DB/text (RAM)	10 kB
Supported RAM and ROM text/DB	100
Flag	0…4049[1), 2)]
Register	0…4049[1), 2)]
Timer/Counter	0…399
Text/DB	100
Interpreted text	No
COB	0 and 1
Available XOBs	10, 12, 13, 16
Number of FBs and PBs per	100
Graftec	No
Flow point arithmetics in accordance with IEEE	Yes
Retrieval of system function (CSF)	few
Real time clock (RTC) with SuperCap	72 hrs

[1)] I/O media mapping 4000 …4049
[2)] Max. 1000 adjust values can be saved by the FBox Media Backup/Restore.

Table 7. PCD7.LRSx-P5 room controller: Overview of connections and functions

Connection	Imprint	Function	RS4	RS5
1, 2	„L“, “N“	230 V control voltage	×	---
3, 4	„24 V~“, „24V0“	24 V control voltage	---	×
3, 4	„24 V~“, „24V0“	Auxiliary output voltage (24 V AC) for all Triacs	×	---
5, 8	„TN“	Auxiliary connection for a Triac wiring (internally connected)	×	×
6	„T~“	Triac input voltage (24 V AC/230 V AC) for all Triacs	×	×
7	„TO0“	Triac-controlled output	Type 3	Type 3
9	„TO1“	Triac-controlled output	Type 3	Type 3
10, 11	„RO3“, „IN3“	Output to relay 3, input to relay 3	Type 2	Type 2
12, 13	„RN“	Auxiliary connections with a relay wiring (internally connected)	×	×
14, 15	„IN0“, „RO0“	Input of relay 0, output of relay 0	Type 1	Type 1
16, 17	„IN1“, „RO1“	Input of relay 1, output of relay 1	Type 1	Type 1
18, 19	„IN2“, „RO2“	Input of relay 2, output of relay 2	Type 1	Type 1
20, 21	„WM1“, „WM2“	Interface for the Sylk bus	×	×
22	„24V~“	24 V AC voltage supply for field devices	×	×
23, 24, 25	“/DA+”, “DB-”, “GND”	RS-485 interface #1, commone mass	×	×
26	„AO0“	Analog output 0	Type 5	Type 5
27, 31	„24V~“	24 V AC voltage supply for field devices	×	×
28, 32	„GND“	Commone mass	×	×
29	„AO1“	Analog output 1	Type 4	Type 4
30	„AO2“	Analog output 2	Type 4	Type 4
33	„AO3“	Analog output 3	Type 4	Type 4
34	„UI0“	Universal input 0	Type 7	Type 7
35, 38	„GND“	Commone mass	×	×
36	„UI1“	Universal input 1	Type 7	Type 7
37	„UI2“	Universal input 2	Type 7	Type 7
39	„UI3“	Universal input 3	Type 7	Type 7
40, 41, 42	“/DA+”, “DB-”, “GND”	RS-485 interface #0, commone mass	×	×

Relay output types: See Table 2 | Analog output types: See Table 4 | Universal input types: See Table 5.

Table 8. PCD7.LRLx-P5 room controller: Overview of connections and functions (by model)

Connection	Imprint	Function	RL2	RL4	RL5
1, 2	“L”, “N”	230 V control voltage	×	×	---
3, 4	“24V~”, “24V0”	Removable 24 V AC supply voltage input	---	---	×
5, 6	“24V~”, “24V0”	Auxiliary output voltage (24 V AC) for all Triacs	×	×	×
7, 10, 13	“TN”	Auxiliary connection for a Triac wiring (internally connected)	×	×	×
8	“T~”	Triac input voltage (24 V AC/230 V AC) for all Triacs	×	×	×
9	“TO0”	Triac-controlled output	Type 3	Type 3	Type 3
11	“TO1”	Triac-controlled output	Type 3	Type 3	Type 3
12	“TO2”	Triac-controlled output	Type 3	Type 3	Type 3
14	“TO3”	Triac-controlled output	Type 3	Type 3	Type 3
15		not used	---	---	---
16, 17	“RO3”, “IN3”	Output to relay 3, input to relay 3	Type 2	Type 2	Type 2
18, 19	“RN”	Auxiliary connection for a relay wiring (internally connected)	×	×	×
20, 21	“IN1”, “RO0”	Input of relay 0, output of relay 0	Type 1	Type 1	Type 1
22, 23	“IN2”, “RO1”	Input of relay 1, output of relay 1	Type 1	Type 1	Type 1
24, 25	“IN3”, “RO2”	Input of relay 2, output of relay 2	Type 1	Type 1	Type 1
26, 27, 28	“/DA+”, “DB-”, “GND”	RS-485 Modbus interface #1, commone mass	×	×	×
29	“24V~”	24 V AC voltage supply for field devices	×	×	×
30, 31	“WM1”, “WM2”	Interface for the Sylk bus	×	×	×
32	“AO0”	Analog output 0	Type 6	Type 6	Type 6
33, 37, 41	“GND”	Commone mass	×	×	×
34	“AO1”	Analog output 1	Type 6	Type 6	Type 6
35, 39, 43	“24V~”	24 V AC voltage supply for field devices	×	×	×
36	“AO2”	Analog output 2	---	Type 4	Type 4
38	“AO3”	Analog output 3	---	Type 4	Type 4
40	“AO4”	Analog output 4	---	Type 4	Type 4
42	“AO5”	Analog output 5	---	Type 4	Type 4
44	“24V~”	24 V AC voltage supply for field devices	×	---	---
45	“LED”	Output to LED from PCD7.L632, Q.RCU-A-TSOx and T7460C, E, F	×	---	---
46, 49, 52 55, 58, 61	“GND”	Commone mass	×	×	×
47	“UI0”	Universal input 0	Type 7	Type 7	Type 7
48	“UI1”	Universal input 1	Type 7	Type 7	Type 7
50	“UI2”	Universal input 2	Type 7	Type 7	Type 7
51	“UI3”	Universal input 3	Type 7	Type 7	Type 7
53	“UI4”	Universal input 4	Type 7	Type 7	Type 7
54	“UI5”	Universal input 5	Type 7	Type 7	Type 7
56	“UI6”	Universal input 6	---	Type 8	Type 8
57	“UI7”	Universal input 7	---	Type 8	Type 8
59	“UI8”	Universal input 8	---	Type 8	Type 8
60	“UI9”	Universal input 9	---	Type 8	Type 8
62, 63, 64	“/DA+”, “DB-”, “GND”	RS-485 interface #0, commone mass	×	×	×

Relay output types: See Table 2 | Analog output types: See Table 4 | Universal input types: See Table 5.

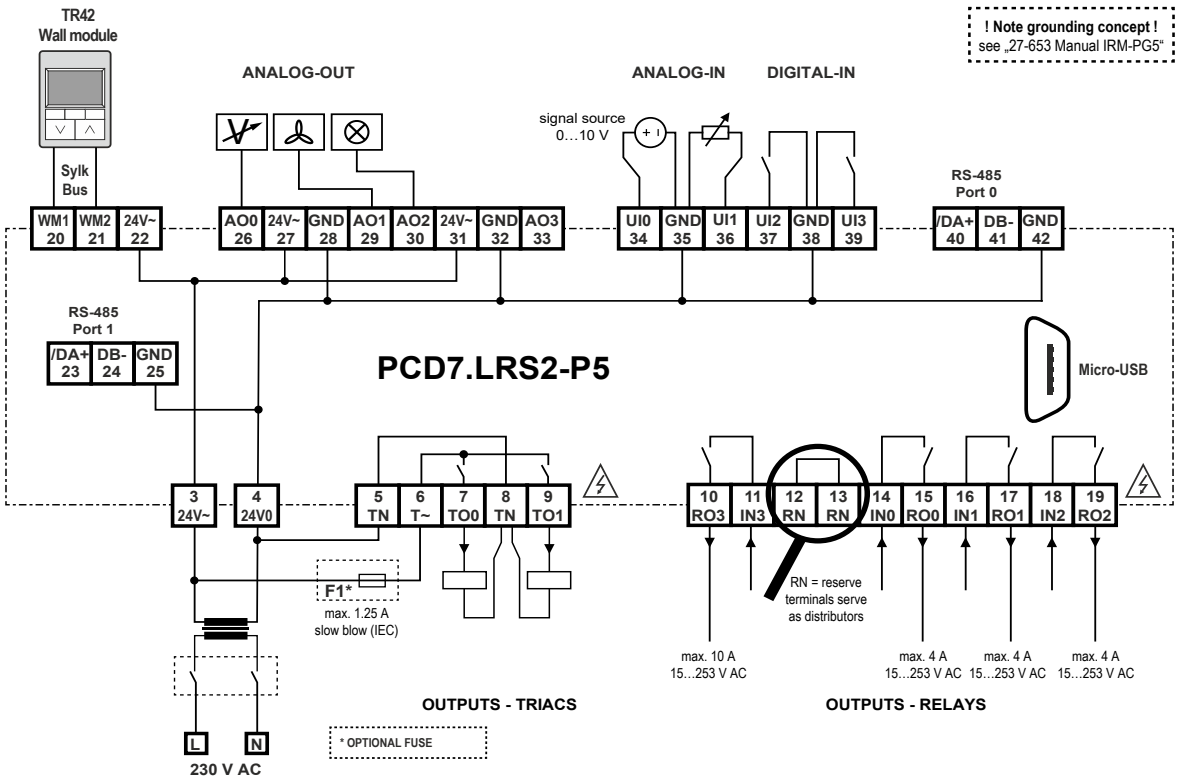


Fig. 7 PCD7.LRSx-P5 example wiring

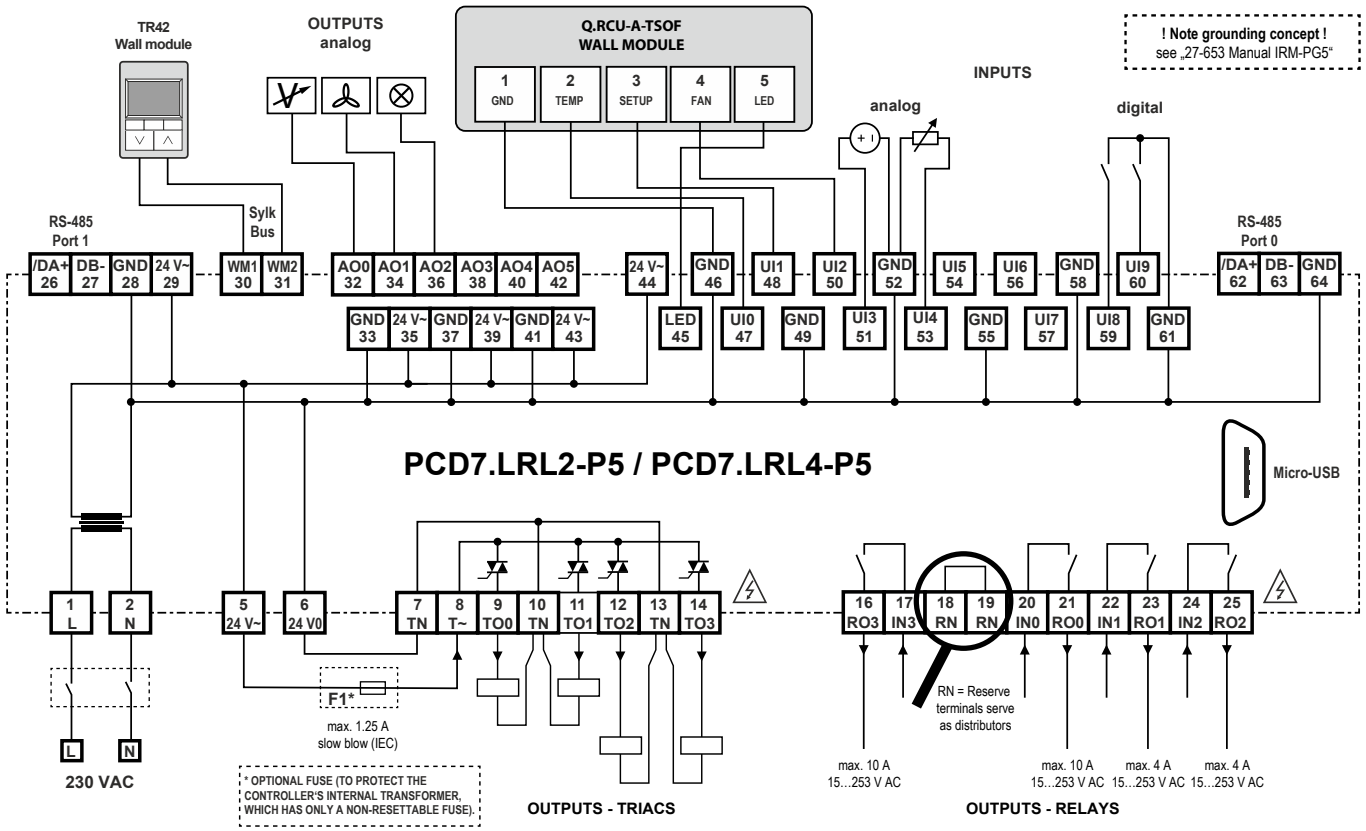


Fig. 8 PCD7.LRLx-P5 example wiring

ELECTRICAL DATA

RL2-P5, RL4-P5 and RS4-P5 (230 V AC)

Voltage supply
via connections 1 + 2: 230 V AC +10%/–15%, 50/60 Hz.
Max. Power input (unloaded): 8 W.
Max. Power input (unloaded): 18 W.

The controller is “loaded” if, in addition to the inherent load is active at the 24 V output connections.
The max. output voltage without load at terminals 3 and 4 is 33 V AC (typically 28 V AC).

RL5 and RS5 (24 V AC)

Supply voltage
via connections 3 + 4: 24 V AC ±20%, 50/60 Hz.
Max. Power input (unloaded): 300 mA.
Max. Power input (loaded): 900 mA.

The controller is “unloaded” if no external load is active. The heat discharge is 7 W. The controller is “loaded” if an additional sum load of max. **600 mA** is active on the 24 V output connections.

COMMUNICATION INTERFACES

Table 9. RS-485 interfaces

Design size	Port #0			Port #1		
RLx	/DA+	DB-	GND	/DA+	DB-	GND
Pin	62	63	64	26	27	28
RSx	/DA+	DB-	GND	/DA+	DB-	GND
Pin	40	41	42	23	24	25

The holder of the connection block is black.
The cable length influences the baud rate (Table 10).

Table 10. Baud rate compared to cable length

Baud rate	Max. Cable length (L)
9.6, 19.2, 38.4, 57.6 and 76.8 KBaud/s	1200 m
115.2 KBaud/s	800 m

The standard EIA-485 contains details regarding the max. permissible wire thickness, max. permissible cable length, possible shielding and earthing requirements and the max. number of devices that can be connected to a bus.

Wall modules

The Sylk bus wall modules TR4x, TR4x-H, TR4x-CO2, TR4x-H-CO2 and the conventional PCD7.L63x, Q.RCU-A-Txxx and T7460x can be used with the controller for room temperature entry, setpoint setting, manual override of the fan speed and occupation.

Operation and status display

RUN/STOP button

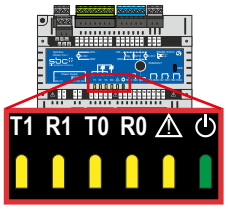
The controller RUN/STOP button is used to trigger special functions.

➔ **RUN/HALT**
If the RUN/STOP button is pressed during the runtime, the controller switches to STOP. A cold start is carried out when actuating again (fresh program start).

➔ **Operating system updated**
If during activation of the controller the RUN/STOP button is pressed for under 6 seconds, the controller remains in boot mode (operating system update possible).

➔ **Controller RESET**
If the RUN/STOP button is pressed for between 6 and 10 seconds when activating the controller, it is reset into the delivery status (user program and configuration are deleted). Controller switches to RUN mode.

Table 11. Operating status display by LEDs

#	Function, description	T1	R1	T0	R0	⚠	⏻
1	Data transmission via the RS-485 interface #1	■/□	–	–	–		
2	Data receipt via the RS-485 interface #1	–	■/□	–	–		
3	Data transmission via the RS-485 interface #0	–	–	■/□	–		
4	Data receipt via the RS-485 interface #0	–	–	–	■/□		
5	Deactivated	–	–	–	–	□	□
6	RUN (program execution)	–	–	–	–	□	■
7	STOP (no program execution)	–	–	–	–	■	□
8	Conditional program execution	–	–	–	–	□	■/□ Flashes = 1Hz
9	STOP (no program execution)	–	–	–	–	■	■/□ Flashes = 1Hz
10	FW download	–	–	–	–	□/■ Flashes = 1Hz	■/□ Flashes = 1Hz
11	RESET / Service key pressed	–	–	–	–	□/■ Flashes = 2Hz	■/□ Flashes = 2Hz

□ = LED off
■ = LED on
■/□ = LED flashes

I/O CONNECTIONS

Relay outputs

CAUTION

Mixing different voltages (e.g. 24 V and 230 V) within the relay block is not permissible.The colour of the connection blocks for relay outputs of the controller is orange. Relay output types: See Table 2.

NOTE: If inductive components are connected to the relay and if these relays switch more frequently than once every two minutes, these components must be protected against radiation from damaging radio or TV receipt radio disturbances (conformity with EN 45014).

Triac outputs

The colour of the connection blocks for Triac outputs of the controller is orange. These Triac outputs can be configured for a large number of various functions, e. g. for connection with a dimension-free or thermal drive (e.g. with the ROOMUP configuration tool).

NOTE: Recommended fuse (F1): 1.25 A slow blow fuse (IEC): The user must consider the correct voltage and the max. switching power/interruption rate (a mains supply voltage urgently requires a high switching power/interruption rate).

After the configuration of the Triac outputs, the corresponding devices can be connected to them directly.

NOTE: The actuator VC6983 is only intended for use with relay outputs and may not be used in controllers with Triac outputs.

Current restrictions of Triacs

The 2 or 4 Triacs have a **permanent total current load** available with a permanent load of 0.6 A and short-term switching 1.4 A.

NOTE: A parallel switching of the Triacs is possible.

CAUTION

The max. permissible output current of all 24 V AC connections is a combined 300 mA! If the Triacs alone are loaded at 300 mA, it is not permitted to connect a load with any of the other 24 V AC output connections.

NOTE: In all other cases, the rule is that if the Triacs are supplied with a current of either 24 V AC or 230 V AC from an external source, 700 mA (peak) and 600 mA (max.), i.e. two to three thermal actuators can be operated in parallel (depending on the power input of the relevant drive).

Universal inputs

The colour of the connection blocks for universal inputs of the controller are blue. Universal input types: See Table 5. The universal inputs are protected against currents of max. 29 V AC And 30 V DC (e.g. against faulty wiring). Each universal input has a pre-current resistance.

Analog outputs

The colour of the connection blocks for analog outputs of the controller is green. Analog output types: See Table 4. The analog outputs of the controllers RLxx (large housing) are protected against currents of max. 29 V AC and 30 V DC (e.g. against faulty wiring).

NOTE: The connection of 24 V AC to a random analog output of the controller PCD7.RSxx-P5 (small housing) damages the device.

STANDARDS, CERTIFICATIONS AND APPROVALS

Approvals and certifications

- CE-certified,
- FCC part 15 B-conform.

Classification in accordance with EN 60730-1

EN 60730 subsection	EN 60730-2-9
Ambient conditions	For use in environments in residential buildings (apartment, commercial and light industry)
Construction	Independently installed electronic controlling unit with fixed wiring, panel installation on DIN rail
Action:	Type 1.C
Nominal pulse current	230 V switching: 2500 V
24 V switching	500 V
Degree of soiling	2
Protection against surge loads	Category 0 (without connection cover) category II (with 0)
Software category	A

Classification in accordance with EN 60529

(via the protection category provided by the housing) IP20.

For controllers installed outside a control cabinet, the connection protection covers must be installed before connection to the voltage supply of the device. Covers (10 units, bulk packaging, order no.: IRM-RLC for large housings and IRM-RSC for small housings) installed for IP30 conformity.

Ambient conditional thresholds

5–95% relative humidity, not condensing

Operating temperature (floor/ceiling installation): 0…40°C
Operating temperature (wall/rail installation): 0…50°C
Storage temperature: -20…70°C

Device variants in the overview



PCD7.LRS4-P5
PCD7.LRS5-P5



PCD7.LRL2-P5
PCD7.LRL4-P5
PCD7.LRL5-P5

Fig. 9 Deviation variants without connection cover

WEEE Directive 2012/19/EC Waste Electrical and Electronic Equipment directive

The product should not be disposed of with other household waste. Check for the nearest authorized collection centers or authorized recyclers. The correct disposal of end-of-life equipment will help prevent potential negative consequences for the environment and human health.

ACCESSORIES

Connection protection cover

Required for wall installation.
Bulk packaging, set of ten protective packages.

- For controller PCD7.LRLx-P5, order no.: **IRM-RLC**
- For controller PCD7.LRSx-P5, order no.: **IRM-RSC**

IRM-RSC (10 covers narrow) to PCD7.LRSx-P5



IRM-RLC (10 covers wide) to PCD7.LRLx-P5



Fig. 10 Two examples with narrow and wide connection cover

Saia-Burgess Controls AG
Bahnhofstrasse 18
3280 Murten
Switzerland
T +41 26 580 30 00
F +41 26 580 34 99
www.saia-pcd.com

info.ch@saia-pcd.com
www.sbc-support.com

® U.S. Registered Trademark
Copyright © 2018 Honeywell Inc.
All Rights Reserved