MM4A

Electrical distribution and switching unit for growing house

Technical manual

Hardware version: v190919
Technical manual version: v1.0
Issue date: 2019-09-19
Drawing number: 59/4/1-2

Content

I. Equipment

You can use this unit with MM3D or MM5D digital contol and remote device to switch heater, lighting and ventilating of growing house.

1. Technical data

Supply voltage:	230 V AC 50/60 Hz
Auxiliary voltage:	230 V AC
Max. supply current:	max. 16 A
Required protection:	16 A fuse or overcurrent breaker
Isolation class:	Class I.
Mechanical size:	300 x 400 x 170 mm
IP protection:	IP 54
IK protection:	IK 03
Material of cover:	termoplast (ABS)

Outputs

	Heating	**Lighting**	**Ventilating**	**Outdoor lighting**	**Internal connector**	**Wall connector**
Contolled	yes	yes	yes	no	no	no
Manual control	no	yes	yes			
External control	yes	yes	yes			
Mode of ext. control[*]	with NO contact					
Output voltage	230 V AC	230 V AC	230 V AC	230 V AC	230 V AC	230 V AC
Max. output current[**]	10 A	6 A	6 A	6 A	6 A	10 A
Protection of output	overcurrent breaker	overcurrent breaker	overcurrent breaker	overcurrent breaker	overcurrent breaker	overcurrent breaker
Warning light of protection	yes	yes	yes	no	yes	no

[*] WARNING! There are 230 V AC between opened contacts!

[**] The value indicates the load capacity of a given branch, but the sum of the total output currents must not exceed the total current consumption of the device.

2. Description

a) Heating

The output of the channel is protected by a F4 circuit-breaker inside the cabinet, and its active status is indicated by the green LED marked Active. The channel cannot be operated manually, it can be

activated by a short-circuit to its input. The external thermostat prevents overheating of the growing area due to a malfunction. The off contact disconnects the heaters from the mains (L-N).

The red light on the Protection error LED indicates overcurrent protection.

b) Lighting

The output of the channel is protected by an F5 circuit breaker inside the cabinet, and its active status is indicated by the green LED marked Active. The channel can be switched on manually and by a short circuit to its input. Manual mode is indicated by the yellow LED marked Manual mode. When the contactor is off, the lamps are disconnected from the mains (L-N).

The red light on the Protection error LED indicates overcurrent protection.

c) Ventilating

The output of the channel is protected by an F6 circuit breaker inside the cabinet, and its active status is indicated by the green LED marked Active. The channel can be switched on manually and by a short circuit to its input. Manual mode is indicated by the yellow LED marked Manual mode. When the contactor is off, the ventilators are disconnected from the mains (L-N).

The red light on the Protection error LED indicates overcurrent protection.

d) Outdoor lighting

The channel is used to supply the outside lighting of the growing house, this output is protected by a circuit breaker F1 located inside the cabinet.

e) Wall socket

The channel is used to power the wall socket inside the growing house, this output is protected by a circuit breaker F2 inside the cabinet.

f) Internal socket

The channel is used to supply the socket inside the enclosure and the control unit can be connected to it. The output is protected by F3 circuit breaker.

The red light on the Protection error LED indicates overcurrent protection.

3. Schematic and other drawings

The schematic of MM4A is shown in Annex 1, the wiring diagram is shown in Annex 2. This diagrams, drilling drawings and front foil can be downloaded from the developer / manufacturer's website *as part of the complete documentation* in a variety of formats.

4. Terms of use

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5. Look of the unit

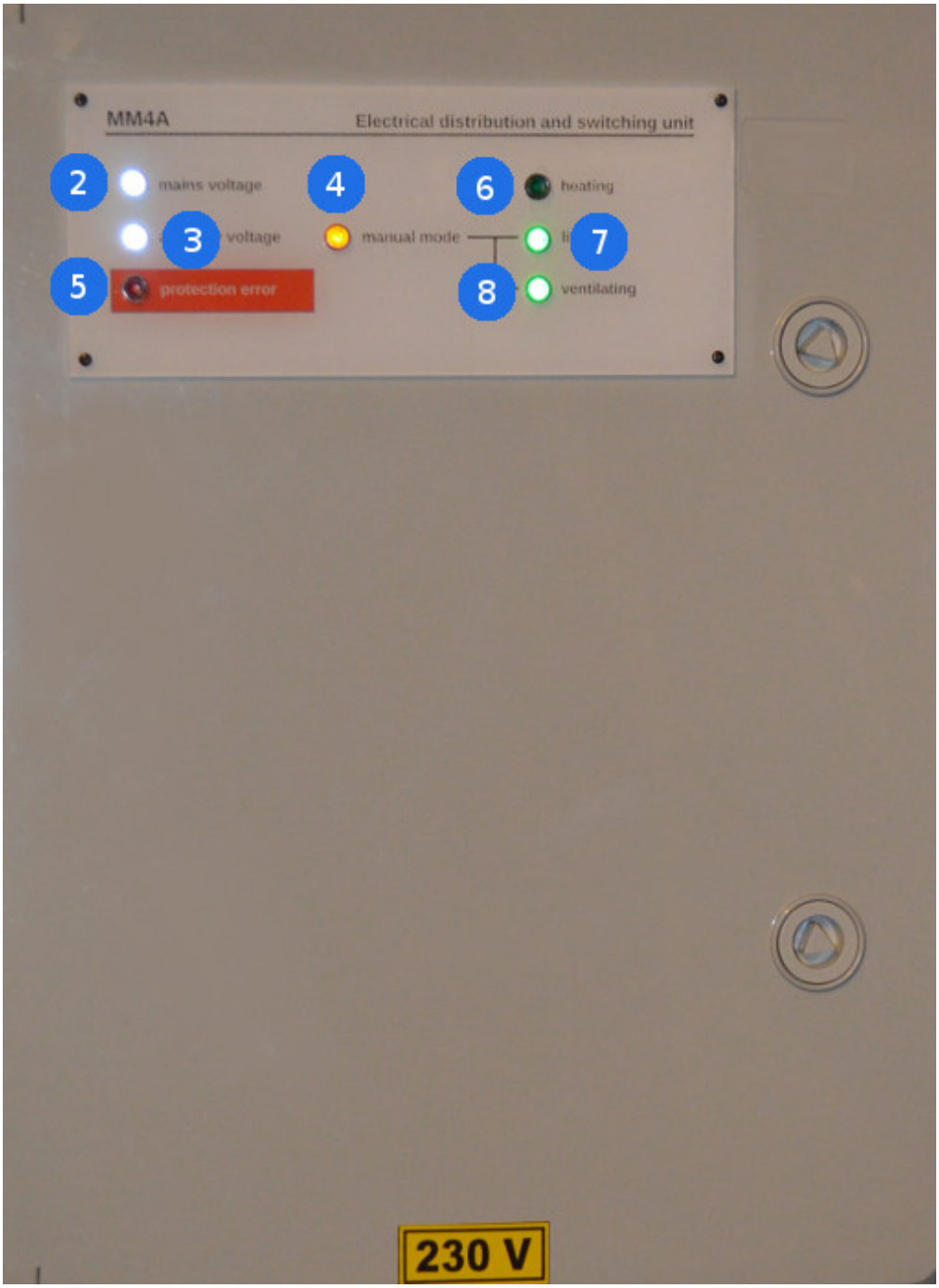

Figure 1: Front panel

Figure 2: Internal construction

a) Manuals

1: *Mains* - Power switch

2: *Mains voltage* - presence of mains voltage (white LED)

3: *Auxiliary voltage* - the presence of auxiliary voltage (white LED)

4: *Manual mode* - manual mode of lighting and ventilating (yellow LED)

5: *Protection error* - status of overcurrent protection (red LED)

6: *Active* - heater output is under voltage (green LED)

7: *Active* - lighting output is under voltage (green LED)

8: *Active* - ventilating output is under voltage (green LED)

b) Connector pinout

P1: mains power - L (input terminal of power switch)

P2: mains power - N (input terminal of power switch)

P3: mains power - PE (screw connection on mounting plate)

P4: outdoor lamp - L

P5: outdoor lamp - N

P6: outdoor lamp - PE

P7: wall socket - L

P8: wall socket - N

P9: wall socket - PE

P10: internal socket - L

P11: internal socket - N

P12: internal socket - PE

P13: signal output - common

P14: signal output - manual operation (NO relay contat)

P15: signal output - protection error (NO relay contat)

P16: heater control input - auxiliary voltage

P17: heater control input - from control unit

P18: heater control input - safety thermostat

P19: heater control input - safety thermostat

P20: lighting control input - auxiliary voltage

P21: lighting control input - manual switch

P22: lighting control input - from control unit and manual switch

P23: ventilating control input - auxiliary voltage

P24: ventilating contol input - manual switch

P25: ventilating contol input - from control unit and manual switch

P26: heater power output - L

P27: heater power output - N

P28: heater power output - PE

P29: lighting power output - L

P30: lighting power output - N

P31: lighting power output - PE

P32: ventilating power output - L

P33: ventilating power output - N

P34: ventilating power output - PE

6. Downloadable documentation

The complete hardware documentation can be downloaded from the manufacturer's website in a compressed file in .tar.gz format. (Refer to Chapter II for references.)

Name of package: *mm4a-190919-1.0.tar.gz*

Content of package - important files only:

```
mm4a
├──cad_files                        CAD files
│     ├──connecting                 connecting drawing (KiCAD)
│     │     connecting.pro              project file
│     │     connecting.sch              schematic
│     │     *.*                         others
│     │
│     ├──drilling                   drilling drawings (LibreCAD)
│     │     bottom.dxf                  bottom of cover
│     │     front.dxf                   front of cover
│     │
│     └──mm4a                       MM4A unit (KiCAD)
│           mm4a.pro                    project file
│           mm4a.sch                    schematic
│           *.*                         others
│
├──documents                        documentation
│     drill_bottom.pdf                drilling bottom of cover
│     drill_front.pdf                 drilling front of cover
│     manual-source.tar.gz            source of manual
│     mm4a_en.pdf                     Technical manual (EN)
│     mm4a_hu.pdf                     Technical manual (HU)
│     sch_connecting.pdf              connection of unit
│     sch_mm4a.pdf                    MM4A schematic
│
├──frontpage                        frontpage
│     frontpage.eps                   frontpage
│     frontpage.odg                   frontpage
│     frontpage.svg                   frontpage
│     preview.png                     preview of frontpage
│     size.txt                        size of frontpage
│
├──pictures                         pictures
│     mm4a.jpg                        look
│     sch_connecting.svg              connection of unit
│     sch_mm4a.svg                    MM4A schematic
│
├──LICENCE                          Terms of use (EN)
└──README                           Short description (EN)
```

II. Related links

1. Equipment

Full documentation	http://www.szerafingomba.hu/equipments/mm4a/mm4a-190919-1.0.tar.gz
Technical manual (EN)	http://www.szerafingomba.hu/equipments/mm4a/tech-manual-190919-1.0-en.pdf
Technical manual (HU)	http://www.szerafingomba.hu/equipments/mm4a/tech-manual-190919-1.0-hu.pdf

Schematic drawings:

MM4A (PDF)	http://www.szerafingomba.hu/equipments/mm4a/sch_mm4a.pdf
Connection (PDF)	http://www.szerafingomba.hu/equipments/mm4a/sch_mm4a-connecting.pdf

2. Terms of use

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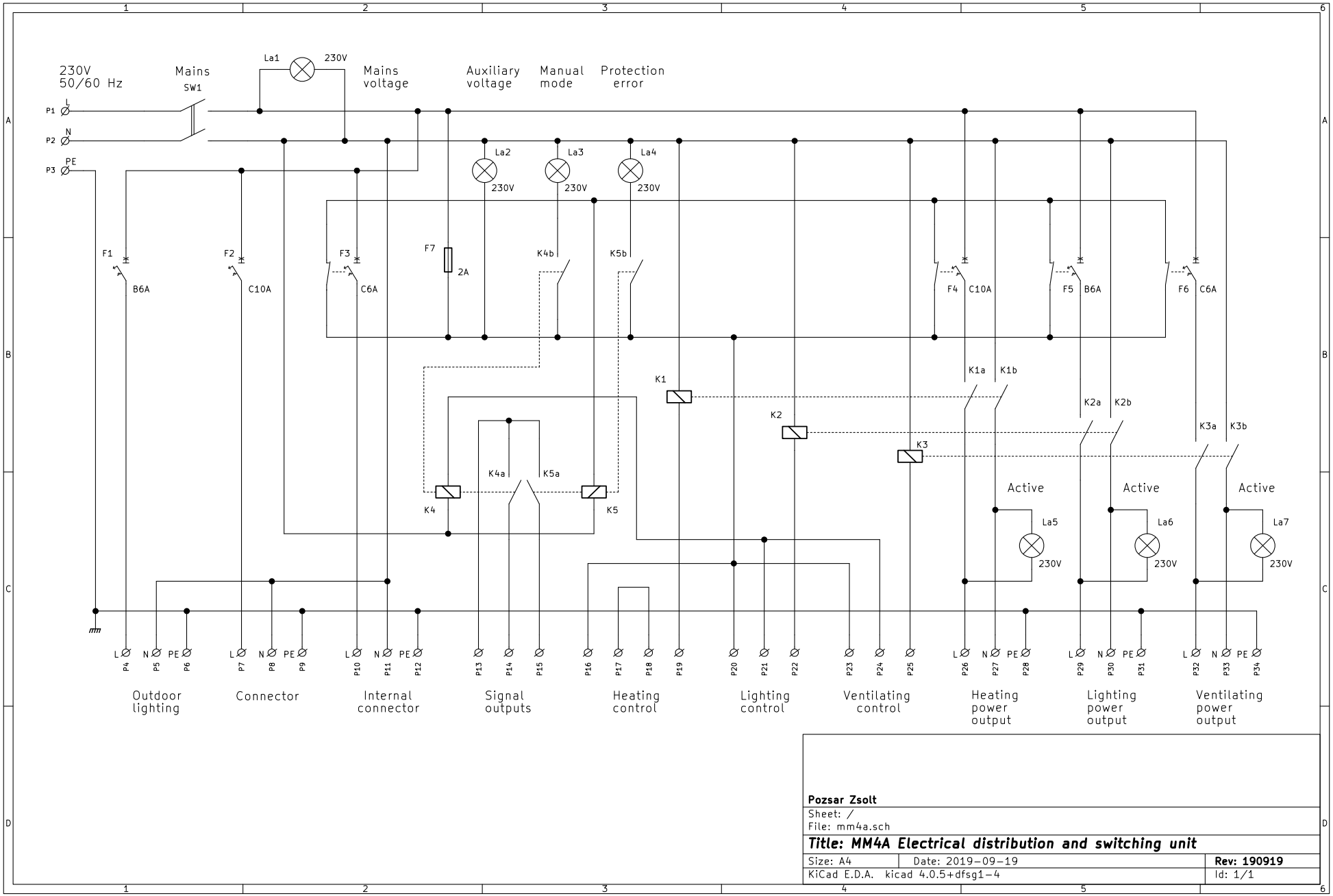
3. Developer and manufacturer

Homepage	http://www.szerafingomba.hu
E-mail	info@szerafingomba.hu

III. Annexes

1. Schematic drawings

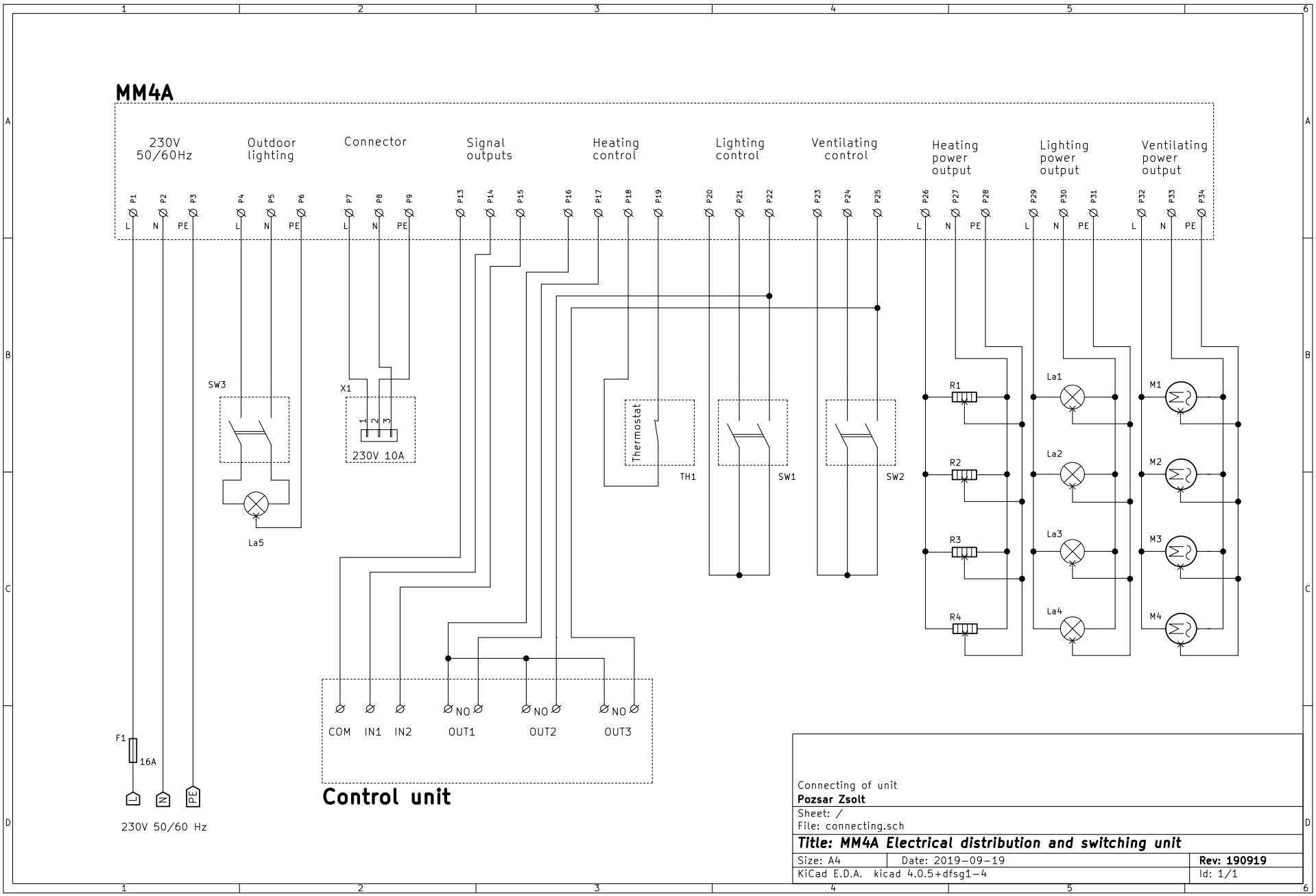
1. MM4A schematic and list of materials
2. Connecting schematic and list of materials



Annex 1: MM4A schematic

List of materials

Pos. n.	Value	Description	Note	Pos. n.	Value	Description	Note
F1	6 A	overcurrent breaker B type		La5	230 V, green	signalling lamp	
F2	10 A	overcurrent breaker C type		La6	230 V, green	signalling lamp	
F3	6 A	overcurrent breaker C type		La7	230 V, green	signalling lamp	
	240 V/6 A	auxiliary contact		P4-P34	0,5-6mm^2	screw connectors	
F4	10 A	overcurrent breaker C type		Sw1	250 V 16 A	two-pole switch	
	240 V/6 A	auxiliary contactor					
F5	6 A	overcurrent breaker B type		1 db	300x400x170	cabinet with mounting plate	ABS
	240 V/6 A	auxiliary contact		2 m	25x60	wiring trunking	
F6	6 A	overcurrent breaker C type		1 m	35 mm	mounting rail	
	240 V/6 A	auxiliary contact					
F7	2 A	fuse					
	800 V/6,3 A	fuse holder					
K1	230 V AC	contactor					
K2	230 V AC	contactor	suitable for the load				
K3	230 V AC	contactor					
K4	230 V AC	relay	with two changeover contacts				
K5	230 V AC	relay					
La1	230 V, white	signalling lamp					
La2	230 V, white	signalling lamp					
La3	230 V, yellow	signalling lamp					
La4	230 V, red	signalling lamp					



Annex 2: Connecting schematic

List of materials

Pos. n.	Value	Description	Note	Pos. n.	Value	Description	Note
F1	16 A	fuse	or overcurrent breaker				
La1-4	230 V AC	waterproof luminaires	as needed				
La5	230 V AC	waterproof luminaire	as needed				
R1-4	230 V AC	heaters	as needed				
M1-4	230 V AC	ventilators	as needed				
SW1	230 V AC	two-pole waterproof switch					
SW2	230 V AC	two-pole waterproof switch					
SW3	230 V AC	two-pole waterproof switch					
TH1	230 V AC	thermostat with changeover contact					
X1	230 V/10 A	waterproof socket					
	230 V/6 A	swinging socket	for adaptor				