Laboratory drying ovens and incubators
line Standard

VENTICELL	**55, 111, 222, 404, 707**
INCUCELL	**55, 111, 222, 404, 707**
INCUCELL V	**55, 111, 222, 404, 707**
ECOCELL	**55, 111, 222, 404, 707**
STERICELL	**55, 111, 222, 404**
DUROCELL	**55, 111, 222**

Service instructions

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10. 2. 2004

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1 Introduction

These Service instructions contain a complex information about the product, that are necessary for repairing, maintaining and checking of the unit.
A knowledge of The Operation Instructions of the Laboratory cabinets and incubators, written in a separate manual is expected.

2 Technical data

Technical data are given in the Operation instructions.

3 Description of the unit

3.1 Functional parts

3.1.1 Chamber

The chambers of individual types are made of stainless steel DIN 1.4301, examples are given in appendixes in chapter 7.
The resistance heating bodies in stainless tubes are placed according to the type – in VC, ICV, SC in front of the inner surface of the rear wall, - in EC, IC, DC in front of the left and right side wall and the bottom of the chamber.
The safety thermostat sensor is fixed according to the type – in VC, EC, SC, DC inside the outer door under the insulation – in ICV on the rear wall of the chamber, in IC on the right side wall.
The thermoregulator sensor PT 100 is fixed on the top of the chamber rear wall in all types. In types with ventilator – VC, ICV, SC - there is an opening for an axis with a ventilator leading into the chamber.
The ventilator ensures the forced air circulation inside the chamber. If you open the air outlet valve (in types with ventilator you open the suction valve at the same time, in types without ventilator the suction opening has no valve – it is always open), the ambient air is let in the chamber (in types with ventilator it is drawn in actively).
Sheets of the **inner chamber** are inserted one after another into this outer chamber, the projections and the holes of the sheets fit together.
Steel (with Ni/Cr- couting) or stainless-steel **wire trays** are slid into the profiles on sides of the inner chamber.
The sheets of outer chamber are covered with a **thermoinsulating wool of mineral fibers** from the outside.
The front edge of the chamber is provided with a **sealing made of silicone rubber**.
The chamber door - the front entrance into the chamber is closed – in case of IC and ICV – both by the inner glass door and the outer metal sheet door, in case of VC, EC, SC DC only by the outer metal sheet door.
The outer metal door is isolated by **thermoinsulating wool of mineral fibers**.

3.1.2 The covers of the unit

The covers are made of a galvanized steel sheet (zinc layer 3 µm) and they are these main parts:

- chamber cover
- door cover.

The galvanized steel sheet is coated layer of water-soluble varnish that is then heat-cured.

3.2 Functional systems

3.2.1 Electroinstallation

The plastic body of the regulator with **regulator board with control elements** and **the safety thermostat** is fixed on the door. The regulator board is connected to the **supply terminal board** inside the right foot (front view) with a cable, which is led through the bushing in the lower door hinge. In case of single-phase types also the supply voltage is connected to this supply board with a net cable. In case of three-phase types a **board with filters and elements switching the heating bodies** (solid state relay) is placed inside the left foot (front view). In three-phase types also the supply voltage is connected to this board with a net cable. Other data – concerning **heating bodies, safety thermostat sensor, thermoregulator sensor** – are given in chapter 3.2.1. There are two **microswitches** in Stericell – one of them on the outlet tubing valve and the other in the bottom door opening, where the hooks of the door lock move.
Appropriate documentation and pictures are given in chapter 7.

3.2.2 Connection

Basic data for connection:

Mains connection	**1x230V/50(60)Hz** **3x400V/50(60)Hz+N+PE;**
(standard types are marked with bold face)	
	1x110-125V/230-240V//50(60)Hz; 3x110-125V/230-240V//50(60)Hz;
protection against dangerous contact - class	I
external circuits isolation	double isolation (tested by 4 kV voltage)
type of unit plug	as a standard CEE-7/VII, IEC-83/CH, 16 A/250 V (or another according to the type)
socket protection	10 A – 32 A (acc. tech. parameters in the Operating instructions of the unit)
protection according to EN 60529	IP 20
overvoltage category according to (IEC 664 – EN 61010)	II in case of pollution degree 2
used fuses	according to corresponding schemes in the Service instructions
Ambient conditions:	
ambient temperature:	+5 °C to + 40 °C
max.relative humidity:	80 % at 31 °C

4 The functions of the unit

4.1 Function and control

described in Operation instructions of the Laboratory drying ovens and incubators.

4.2 Operating software

The user's services mode is used for:

- setting the operating parameters (for example setting the printing interval)

Operating engineer's service is used for:

- setting the basic parameters, that are not changed under normal conditions. In an ideal case they should be set once in case of activating the unit. Practically this mode is used, when (for example in case of repairing or upgrade) some parts of the unit are exchanged (most often it is the electronic board or EPROM).

4.2.1 User's services

User's services are service operations usually accessible to the user and they are described in the Operation instructions.

4.2.2 Operating engineer's services

4.2.2.1 Entry and quit the operating engineer's services

Enter this group of operations (if you are in the normal or error mode) by pressing the buttons 

and 

simultaneously *for ca. 2 sec*. The display shows *Sr* and *the Service-No.,* by means of  and  select the required number and enter the service by pressing 

. After setting the data quit the service by pressing 

and by pressing 

quit the group of operations and get to the normal mode.

4.2.2.2 Service 1 - Calibration of the temperature converter at the resistance 110 Ω.

It is supposed in this service, that there is a resistor 110 Ω connected instead of PT 100. Note: After connecting the resistor wait for ca. 15 sec till the temperature is stabilized. Then carry the calibration out. The not calibrated temperature is shown on the display. The calibration is carried out by pressing 

. Then either the calibrated temperature(and flickering dots) or pauses are shown on the display. After carrying both the services – 1 and 2 – out the pauses should not be shown on the display any more and the unit is calibrated. If the pauses are still shown, it is probable, that some step has not been carried out correctly during the calibration and the whole calibration must be repeated.

Note 1: After finishing the calibration it is suitable to check, which (calibrated) temperature is shown in case of resistor 110 Ω (corresponds to 25,7 °C), and which one is shown in case of resistor 150 Ω (corresponds to 130,4 °C). If these values are different, another calibration should be carried out.

Note 2: After the calibration you can switch over between the calibrated and not calibrated temperatures by means of following buttons:

△ shows the calibrated temperature (dots are flickering on the display)

▽ shows the not calibrated temperature

Note 3: The calibration must be carried out also if the display does not report the error 1 – not calibrated.

4.2.2.3 Service 2 -Calibration of the temperature converter at the resistance 150 Ω.

See Service 1 – only resistor 150 Ω is connected instead of the PT 100 sensor.

4.2.2.4 Service 3 – 5 - Setting the offset at the temperatures 40, 70/100 and 250/190 °C

Legends:

- Temperature of the first offset……..40 °C (the required temperature, the first offset corresponds to – service 3).
- Temperature of the second offset… …. According to the type of the cabinet: 70 °C for IC and ICV; and 100 °C for other cabinets (the required temperature, the second offset corresponds to – service 4).
- Temperature of the third offset……. According to the type of the cabinet: for IC and ICV it is not measured; for other cabinets 190 °C (the required temperature, the third offset corresponds to – service 5).

At first set all three offsets to 0.0. Then come back from the operating engineer's service to the normal mode. Place the sensor of the independent thermometer to the centre of the chamber, in normal mode set the temperature of the first offset, temper the cabinet and let the temperature stabilize at the temperature T_1 for ca. 30 minutes. Measure the temperature T_2 in the centre of the chamber by means of the independent thermometer, calculate the difference $T_2 - T_1$ and record it. The tempering and calculating of the difference $T_2 - T_1$ carry out also for the temperature of the second and third offset. Then enter the operating engineer's service and set the obtained offsets.

The way of setting is identical in all three services:

Offset in °C with one decimal figure is shown on the display. By means of ▽ and △ this value can be changed. The value can be both positive and negative, maximally ± 99,9 °C. Perform for all types of cabinets.

4.2.2.5 Service 6 - Identification of the EPROM version

After entering the service CRC – identification number of EPROM – is shown on the display, by means of ▽ and △ you can find the date of translation – the display reports month.year, press the button ON/OFF and hold it – the display shows day in month, by means of ▽ or △ switch over (while still pressing ON/OFF) , the display shows hour and minute.

4.2.2.6 Service 7 – Initialization of EEPROM

After entering the service the report “IEEPr” is shown on the display, press ON/OFF and then △ . Caution, by initializing you cancel all data stored in EEPROM. (Note: the non-backed EXTRAM is a part of the processor, important settings are included in EEPROM.)

4.2.2.7 Service 8 – Setting the type of cabinet

After entering the service the abbreviation of the cabinet type (=VC, EC, IC, ICV, SC, DC, VAC, ≡IC, ≡ICV, ≡VC) is shown on the display. By means of ▽ and △ select the appropriate type.

Note

- =VC is up to 250 °C and ≡VC is up to 300 °C
- IC, ICV are up to 70 °C and ≡ IC, ≡ ICV are up to 100 °C, ǀ ǀ ICV, ǀ≡ǀ ICV are provided with switch-off-ventilator – against drying-up of cultivating mediums and tissue cultures
- DC is up to 125 °C
- do not use VAC

4.2.2.8 Service 9 – Setting the volume of cabinet

After entering the service the volume of the cabinet (22, 55, 111, 222, 404, 707) is shown on the display. By means of ▽ and △ select set the appropriate volume.

4.2.2.9 Note to Service 8 and Service 9

It is possible to set only the legal type and volume of the cabinet. If for example the type of the cabinet is set to ICV and you are in service 9, than you do not succeed in setting the volume to 22, because the type ICV is not produced in this volume. On the other hand at the set volume of 22 you cannot set the types IC, ICV, VC, EC, DC, SC. If such a situation occurs, it is necessary to switch over to the other (of the two services 8 and 9) service, change it and then set the parameter in the former service correctly.

4.2.2.10 Service 10 – Setting the two-door version of Stericell

Confirm/cancel – ON/OFF – the two-door version by means of ▽ or △.

4.2.2.11 Service 11 - Different types of the heating

Set the heating type by means of ▽ or △,

1 – corresponds to the single-acting heating,

2 – corresponds to the double-acting heating.

4.2.2.12 Service 12 – Differentiation between door without and with window

The door with window causes higher thermal losses and therefore the regulation is adapted.

After entering the service Losn (or LosY) is shown on the display, set symbol „n“ or „Y“by means of ▽ or △ door without window is marked as „n“ or symbol „n“ or „Y“, door without window is marked as „n“.

4.2.2.13 Service 13 – Correction of the temperature offset with Stericell 404 2D

After entering the service the report IHCn or IHCY is shown on the display, by means of ▽ or △ symbol „n“ or „Y“, in case of SC4042D set „Y“. The activation of the correction secures that the temperature at all measuring points in the cabinet (inside the useful space) above value T= (set temperature –1 °C).

The principle explanation is as follows:

The offsets are set in that way that the temperature measured with the independent sensor in the middle of the chamber is higher by the **correction** value than the value on the device display. The **correction** values are listed in the table 1.

Tab. 1:

Volume	**Correction**		
	40 °C	100 °C	190 °C
55	0	0	0
111	0.5	1.0	2.0
222	0.5	1.5	2.5
404	0.5	0.5	2.0

Note: SC4042D –providing with memories: dirty side EPROM 3464 (16.12.2002),
clean side – EPROM 2A33 (12.9.2001)

5 Adjustment of the unit

After manufacturing the device the output control performs following procedures according to the check and adjusting regulations (which can be performed also by an operating engineer with appropriate qualification):

5.1 Electricity safety check-up
5.2 Initialization of EPROM
5.3 Calibration of the temperature convertor
(steps 5.2 and 5.3 need not be carried out in case they have been carried out by the producer of the printed wiring board)
5.4 Setting the temperature offset
5.5 Setting the printer and check of the printer control
5.6 Setting the type and volume of the unit

5.7 Setting the safety thermostat
5.8 Adjusting the door
5.9 Check of the technical parameters including the one-day continuos operating of each unit.

5.1 Electricity safety check- up

After eliminating a defect (event. after starting the work) prove the unit safety in the electricity part before starting the operation in case the electricity safety of the unit might have changed when mounting and replacing the defected part.
When checking the unit according to EN 61010-1 do the following:
inspection of the unit,
measuring of the protective conductor resistance – R_{PE}
measuring of current loss– I_{Δ}
Then measure the current consumption in the mode of heating.
Record the measured values.

Inspection of the unit
Do the following:
check the integrity and the mechanic connections of the protective conductors,
check the connection of the other conductors and cables (connector connections),
check the mechanical fitting of the electrical as well as the mechanical parts.

Measuring of the protective conductor – R_{PE}

There shall not be a resistance higher than 0,1 Ω between the main protective clamp (plug cavity) and conductive parts that are accessible through a touch (EN 61010-1). The resistance of the lead-in wire is not included.

Measuring of the current loss – I_{Δ}

The loss of current must not be higher than 3,5 mA (EN 61010 -1).

Measuring of the current supplying the unit when heating

It can be done when replacing the heating bodies, or when the heating-up time considerably longer than at the previous tests or longer than the value in the technical parameter table. Do the measuring with a clamps ammeter or with a standard ammeter with a range of 20 A ac. The measuring is the easiest when used special instruments (for example PU 184) which are connected between the mains socket and the plug of the unit while the panels do not have to be demounted in order to have an access to the electrical circuits.
Manufacturers of certain clamps ammeters include a special interconnecting cable which enables to connect the ammeter directly to the supply.
(If the value of the current is lower than the table parameters, it can be caused by a defected heating body, wrong connection of the bodies or a defect on the supply board.)

The recording of the measured values

Record the measured values properly (a test protocol) for the customer as well as for the service organization.

5.2 Initialization of EEPROM

By initializing the EEPROM is set to the initial state.
By initializing, if it is carried out on an already set board, some important information (setting the converter, offset etc.) can be lost and you must do all settings again!
Further procedure see chapter 4.2.2 of the the Service instructions.

5.3 Calibration of the temperature converter

Carry out the calibration according to the chapter 4.2.2. of these instructions.

5.4 Setting the temperature offset

Carry out according to the chapter 4.2.2 of these instructions.

5.5 Setting the printer and check of the printer control

Carry out according to the chapter 4.4 and 4.6 of the Operation instructions

5.6 Setting the type and volume of the cabinet

Carry out according to the chapter 4.2.2 of these instructions.

5.7 Setting the safety thermostat

Carry out according to the chapter 4.7 of the Operation instructions

5.8 Adjusting the door

The door can be adjusted in four places (see Fig. 12).
The pins of the lock 3 + 4: These pins can be loosen with a lock nut and the position can be adjusted forwards/backwards by means of a thread.
Door hinge 1: By loosening the bolt M8 at the right side of the foot the door can be adjusted in horizontal level forwards/backwards.
Door hinge upper 2: Take the plastic cover off to enable access to the bolt M8. By loosening this bolt position of the door can be adjusted.
Adjust the door so that when closed the rubber sealing of the chamber would fit to the sheet of the floating door along the whole perimeter. To check it up place a sheet of paper between the sealing and the metal sheet of the floating door before it is closed, it is possible to take the paper out against a small resistance.

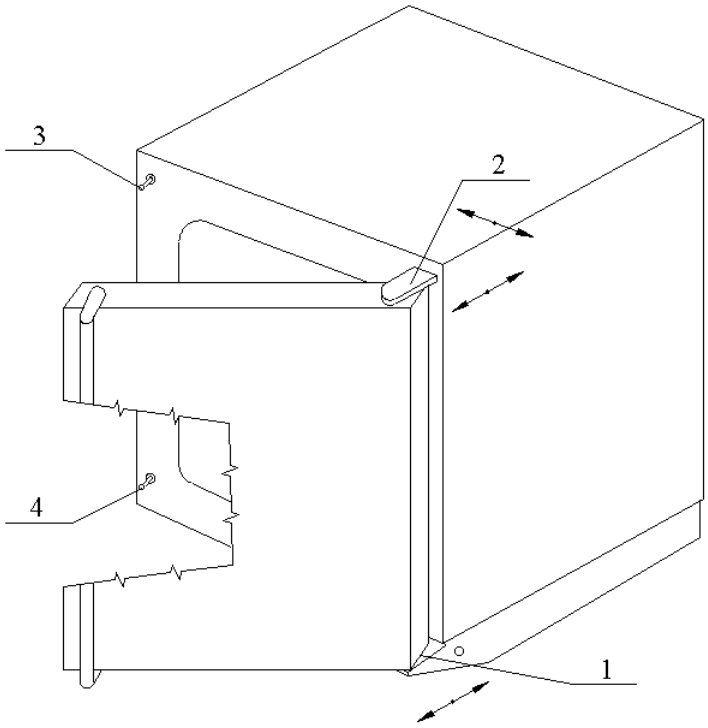


Figure 12

5.9 Check of the technical parameters

a) Record of the temperature control course at the temperatures
- for IC and ICV – 37 °C and 70 °C
- for EC, VC, SC - 150 °C
- for DC - 125 °C
  so that the resolution of the temperature variation with accuracy 0.1 °C is possible and the rise time can be read.
  Record at the temperature for at least 5 hours.

b) According to the results decide about further procedure.

6 Error messages

Error messages are placed on LCD and have the following meaning:

Error 01 = not calibrated
Error 02 = temperature below the sterilization temperature (SC only)
Error 03 = temperature above the sterilization temperature (SC only)
Error 04 - 10 = development purposes SW, HW

Error message can be cancelled by pressing the button X/W for ca. 2 sec, or by entering the service mode (see chapter Operating software).

7 Mounting and dismounting of parts

7.1 Electrical parts

Caution!

All operations must be carried out on a device, which has been disconnected from power supply – disconnect the power supply cord plug from the socket!

7.1.1 Regulator board - demounting, mounting

The regulator board is placed on the back side of the metal regulator panel. The panel is fixed in the upper part by slamming the projections to the openings of the plastic body of the regulator, the bottom piece is fixed to the plastic body with two screws at the back. The plastic body of regulator is attached to the door by slamming the fixing hooks and elastic levers to the counter-openings. If you want to demount the panel, take two elastic levers out with a thin pin (∅ 3) or with a screwdriver, then take the fixing hooks out of the counter-openings. Disconnect following parts from the panel or the regulator board: the wires of the PT 100-sensor, connector of the interconnecting cable (of the power supply board), connector of the safety connection and safety thermostat connectors. Then demount the nuts fixing the regulator board to the panel and take the panel out. Follow a reverse procedure to do mounting. Carry out all service procedures according to 4.2.2.

7.1.2 Power supply board - mounting, demounting

7.1.2.1 Single-phase units

The supply board with the power supply lead is fixed inside the right foot (front view) with two screws. You can shift the board out after unscrewing the screws – eventually disconnect the connectors and flat tubes (they must be marked, so that they are not exchanged during connecting) – from the foot and do the appropriate procedure. Before shifting the supply board back in the foot make sure, that all protective wires have been connected properly. Make sure, that the board is shifted into the profiles in the side walls of the foot.

The power supply board must not be shifted out when connected to a voltage!

Follow a reverse procedure to do mounting, do not forget to connect the protective wires.

7.1.2.2 Three-phase units

These units have two boards, the first one is made and fixed identically with the board described in 7.1.2.1, the other one – with anti-interference parts and elements switching the heating bodies and the power supply is fixed in the left foot in a similar way. Demounting and mounting is similar to the procedure described in 7.1.2.1.

7.1.3 Thermosensor PT100 – demounting, mounting

Remove all metal sheets of the inner chamber. Loosen the bolt on the sensor holder and take the sensor out. In order not to have to pull the wire out of the cable connection, cut the sensor wires in a suitable place off. Then connect the new sensor to the appropriate place by means of clamps or crimping tubes. Shift the new sensor through the polyurethane insulation and the rear wall in the holder and fix with a screw. After the exchange set the offsets – see 4.2.2.4.

7.1.4 Ventilator – demounting, mounting

Remove the metal sheets of the inner chamber, loosen the bolts of the sensor holders, unscrew the front screws holding the ventilator cover, slide the cover out. Demount the three nuts fixing the ventilator. Shift the ventilator out and after disconnecting the wires take it out. Caution, the runner is fixed to the shaft with a left-hand nut. Follow a reverse procedure to do mounting.

7.1.5 Safety thermostat - demounting, mounting

In VC, EC, SC, DC the safety thermostat sensor is placed inside the outer door under the insulation – in ICV on the rear wall of the chamber, in IC on the right side wall.

In case of VC, EC, SC, DC demount the outer door and loosen the safety thermostat sensor. Remove the knob of the thermostat shaft and take the thermostat out after unscrewing the two fixing screws.

In case of ICV and IC remove the sheets of the inner chamber, loosen the safety thermostat sensor and take the sensor out through the rear wall of the chamber (after demounting the rear cover of the unit). Remove the knob of the thermostat shaft and take the thermostat out after unscrewing the two fixing screws.

Follow a reverse procedure to do mounting.

7.1.6 Heating body – demounting, mounting

Demount the rear cover of the unit and disconnect the wires of the heating bodies. Remove the metal sheets of the inner chamber. After unscrewing the nuts holding the heating bodies remove the heating bodies. Follow a reverse procedure to do mounting of the new heating bodies.

7.2 Mechanical part

7.2.1 Door - adjusting

Description in chapter 5.

7.2.2 Sealing - exchange

Take off the sealing, begin in the middle bottom part.

Fix the new sealing on the edge of the chamber, begin in the middle bottom part. Slam the sealing between the chamber and the outer cover.

7.3 Recommended measuring apparatuses and instruments:

7.3.1 Measuring apparatuses

Voltage ranges:

750 VAC (± 0,8 % range up to 40 V)
1000 VDC (± 0,3 % range up to 40 V)

Current ranges:

up to 20 A (± 2,0 % of readout)

Frequence:

up to 1000 kHz, ± 0,1 %

Temperature:

from 0 °C to 350 °C
± 0.2 °C for range from 0 to 199,9 °C
± 0,2 % of the measured value from 200 to 350 °C
Caution! Calibrate the system measuring sensor–measuring apparatus at the temperatures used for setting the offsets with accuracy of 0.1 °C.

Resistance:

up to 2 Mohm (± 0,5 % of readout, displaying in 0,1 R to 400 R)

7.3.2 Tools

Screwdrivers – besides the standard types

screwdriver 2.5 x 0.4
screwdriver 3.5 x 0.5
screwdriver 5.5 x 0.8
cross screwdrivers for screws M3, M4, M5,

Spanners

side spanner 21
socket spanner 6

Pliers:

wire nippers
crimping tool for flat tubes 6.3 “non-insulated”
crimping tool for flat tubes 6.3 “insulated”
crimping tool for cable sockets M 3, 4, 5, 6 “insulated”
crimping tool for tubes for wire endings
0.34, 0.5, 0.75, 1, 1.5, 2.5, 4, 6

Other material and tools

Soldering lamp (do not use a transformer soldering lamp on printed wiring boards),
solder, rosin, connecting and coupling material, isolating tubes,
wires, lighter for shrinking the isolation tubes
sets of spare electronic boards including memories and spare parts corresponding to the specification of the fault.

Special tools

socket spanner 5 lengthened to ca. 350 mm

8 Supplement

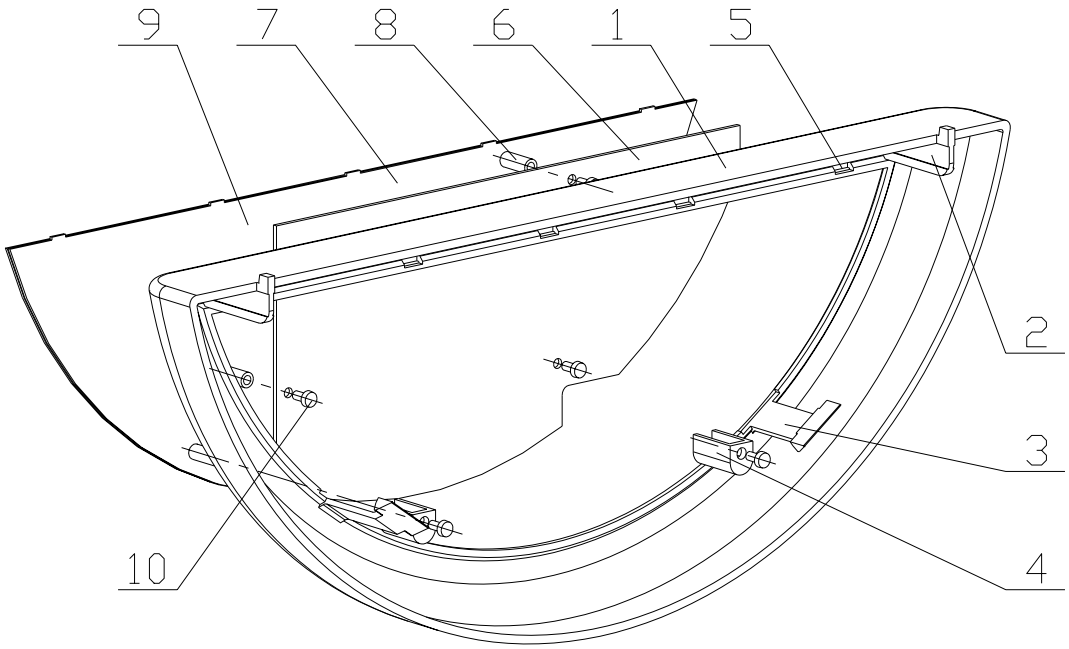
Mechanical part

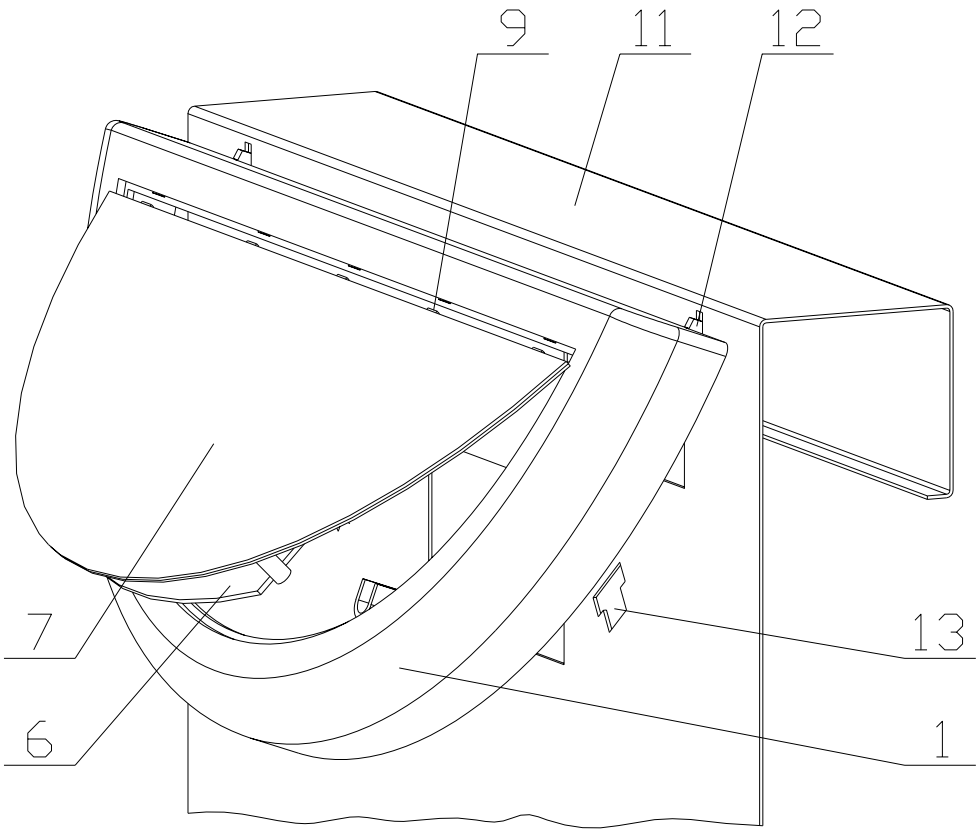
Par. 8.1.1 – 8.1.8

Electroinstallation

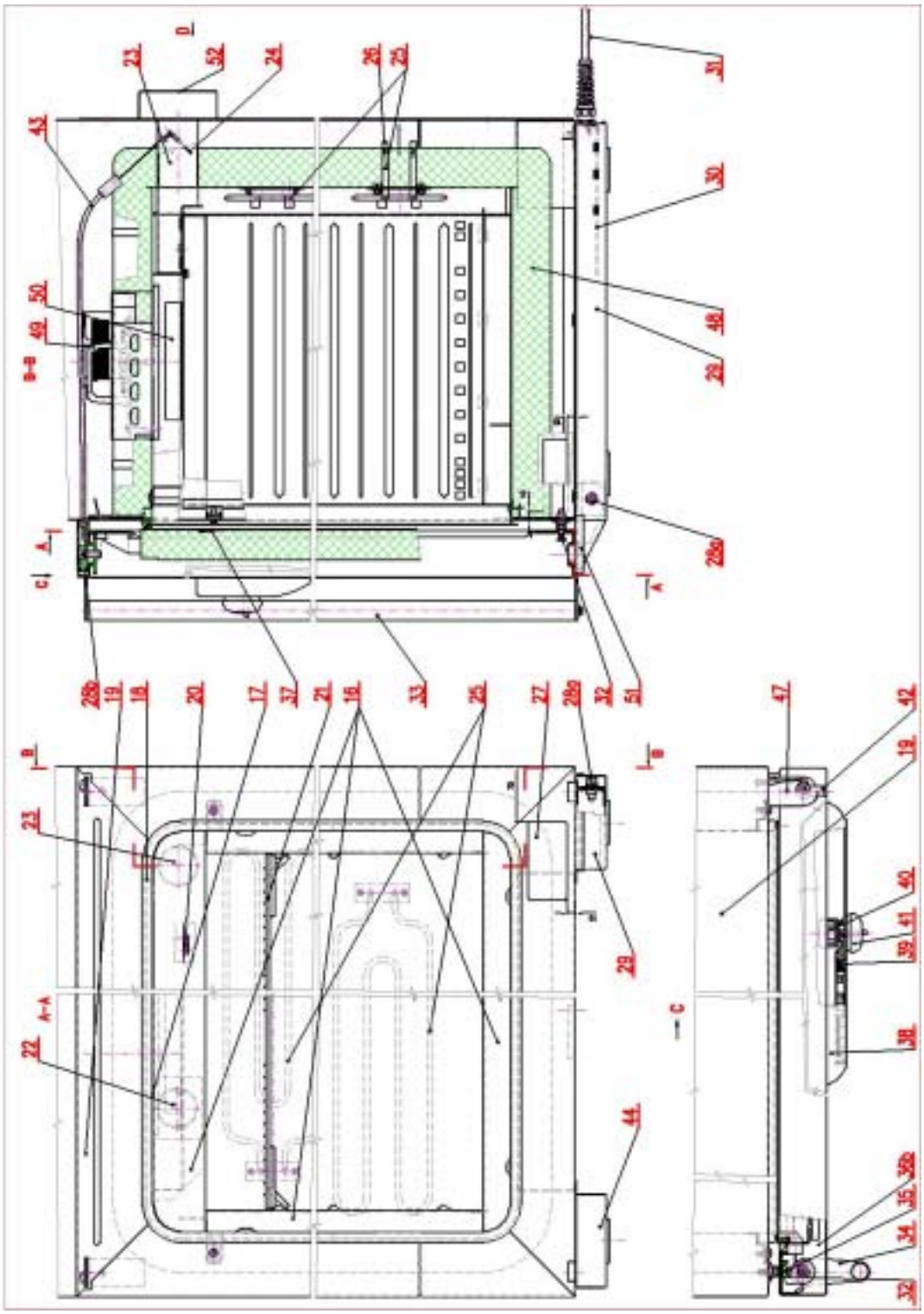
Par. 8.1.9 – 8.1.18

8.1.1 Details of the regulator control panel

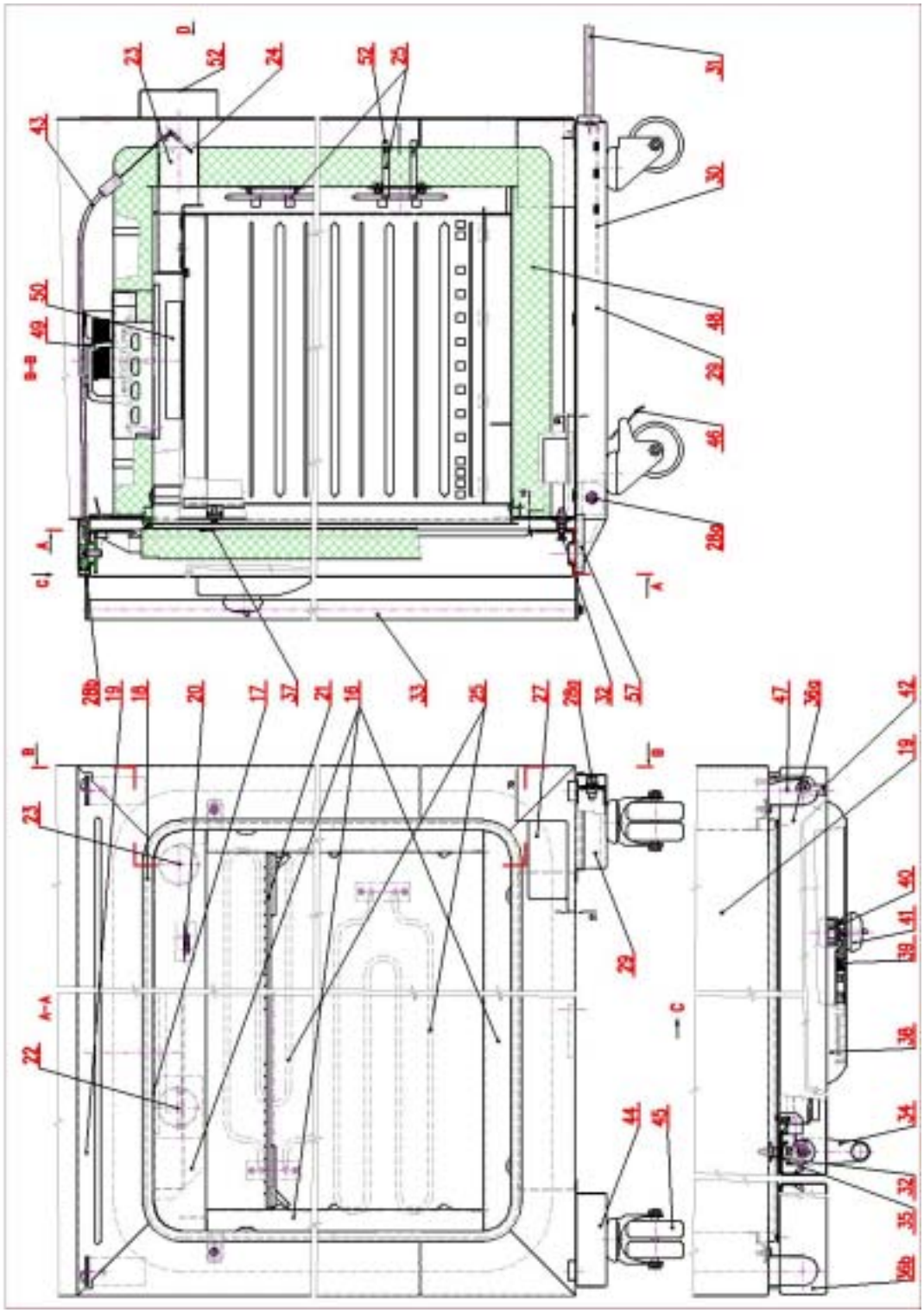




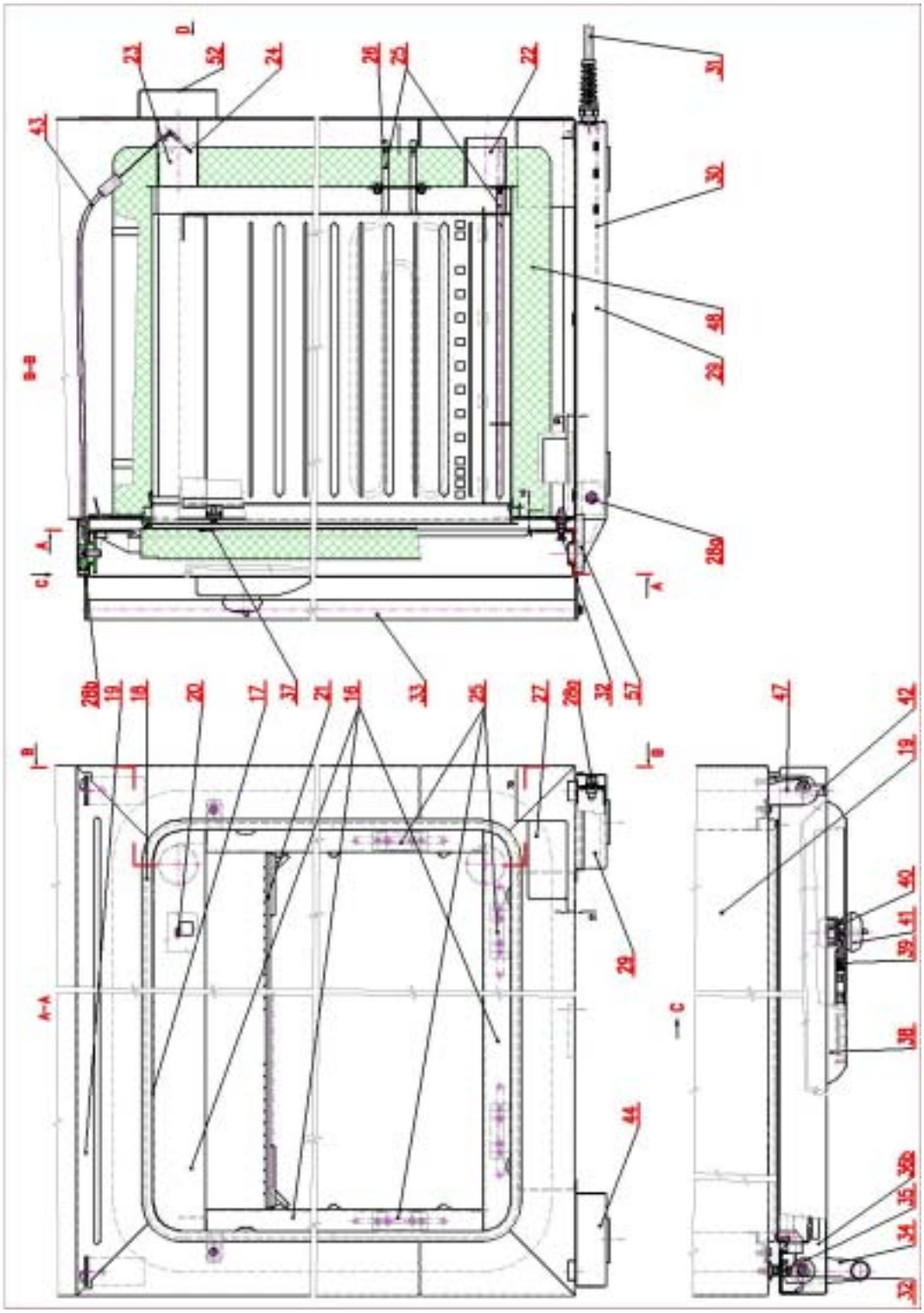
8.1.2 Venticell 55 (eventually Stericell, or Incucell with ventilator without glass door)



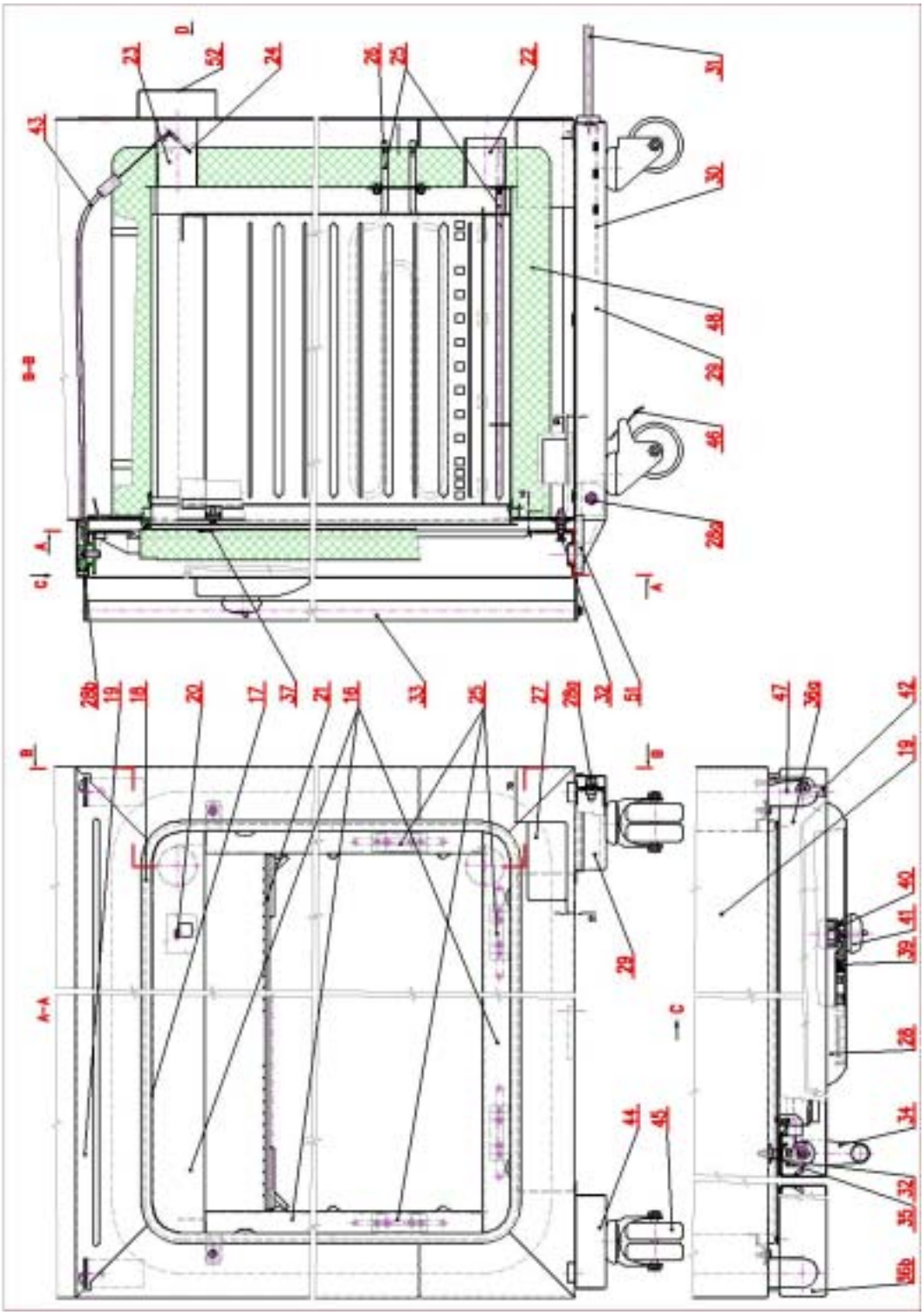
8.1.3 Venticell 707 (eventually Stericell, or Incucell with ventilator without glass door)



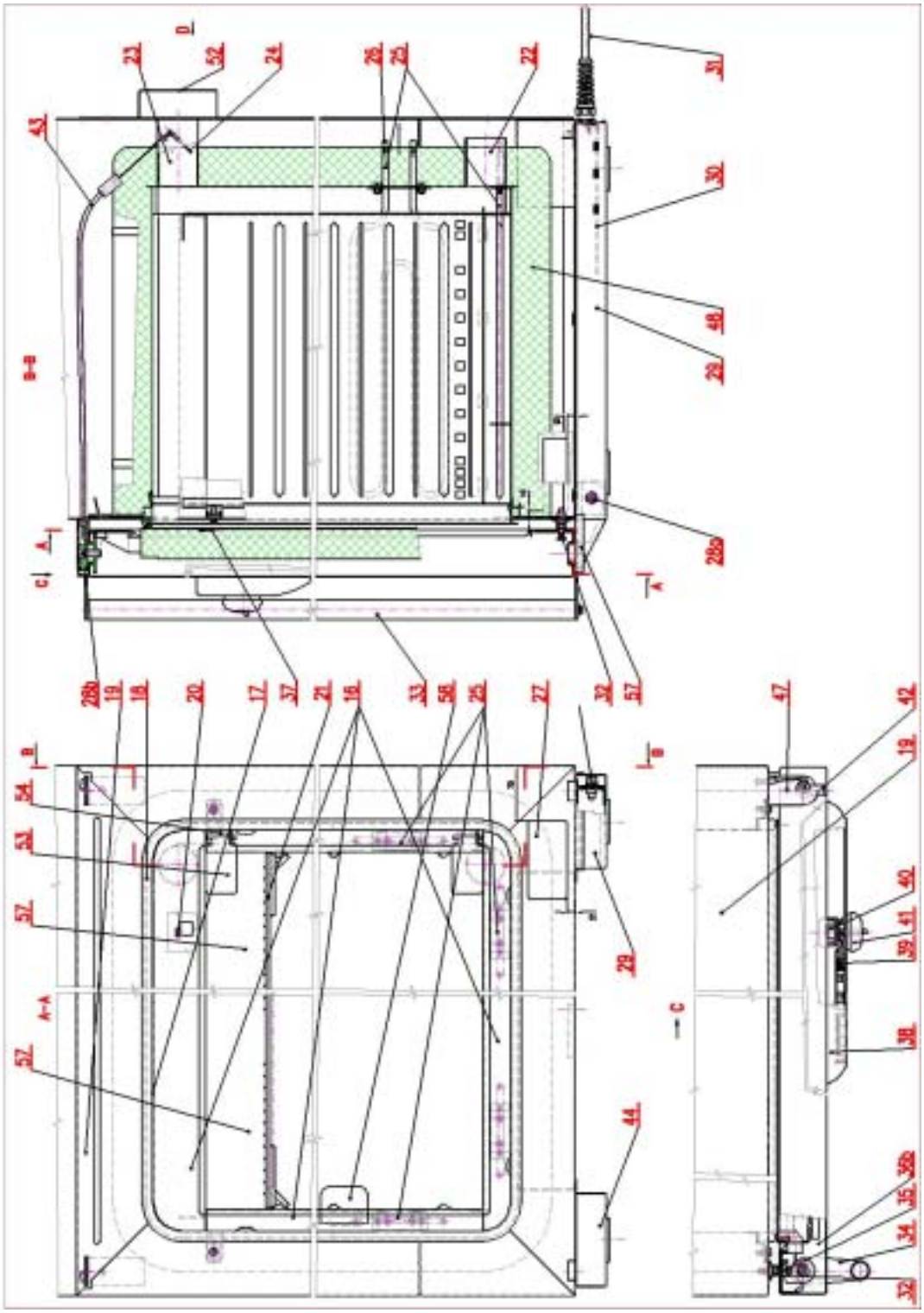
8.1.4 Ecocell 55 (eventually Durocell, or Incucell without glass door)



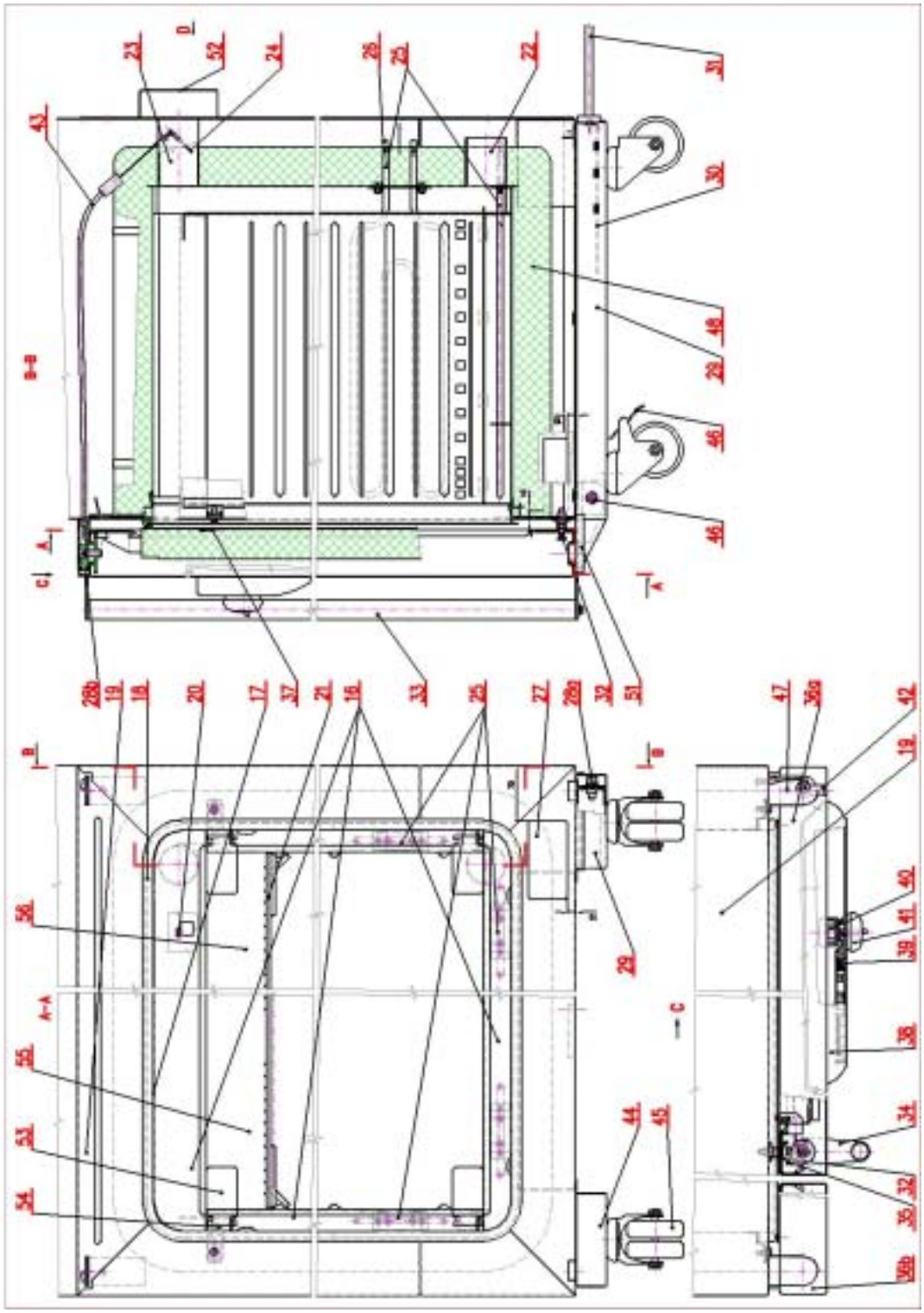
8.1.5 Ecocell 707 (eventually Durocell, or Incucell without glass door)



8.1.6 Incucell 55



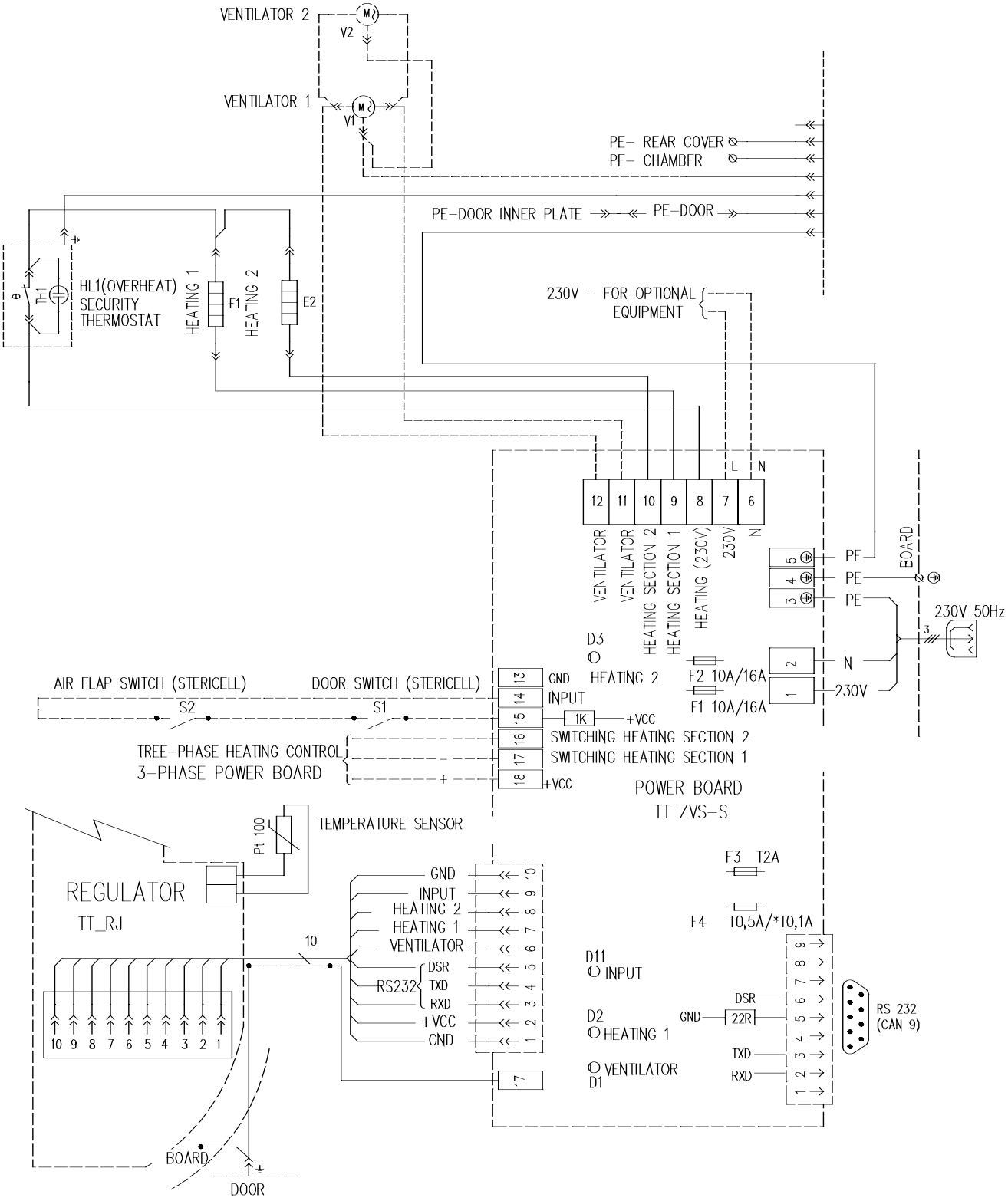
8.1.7 Incucell 707



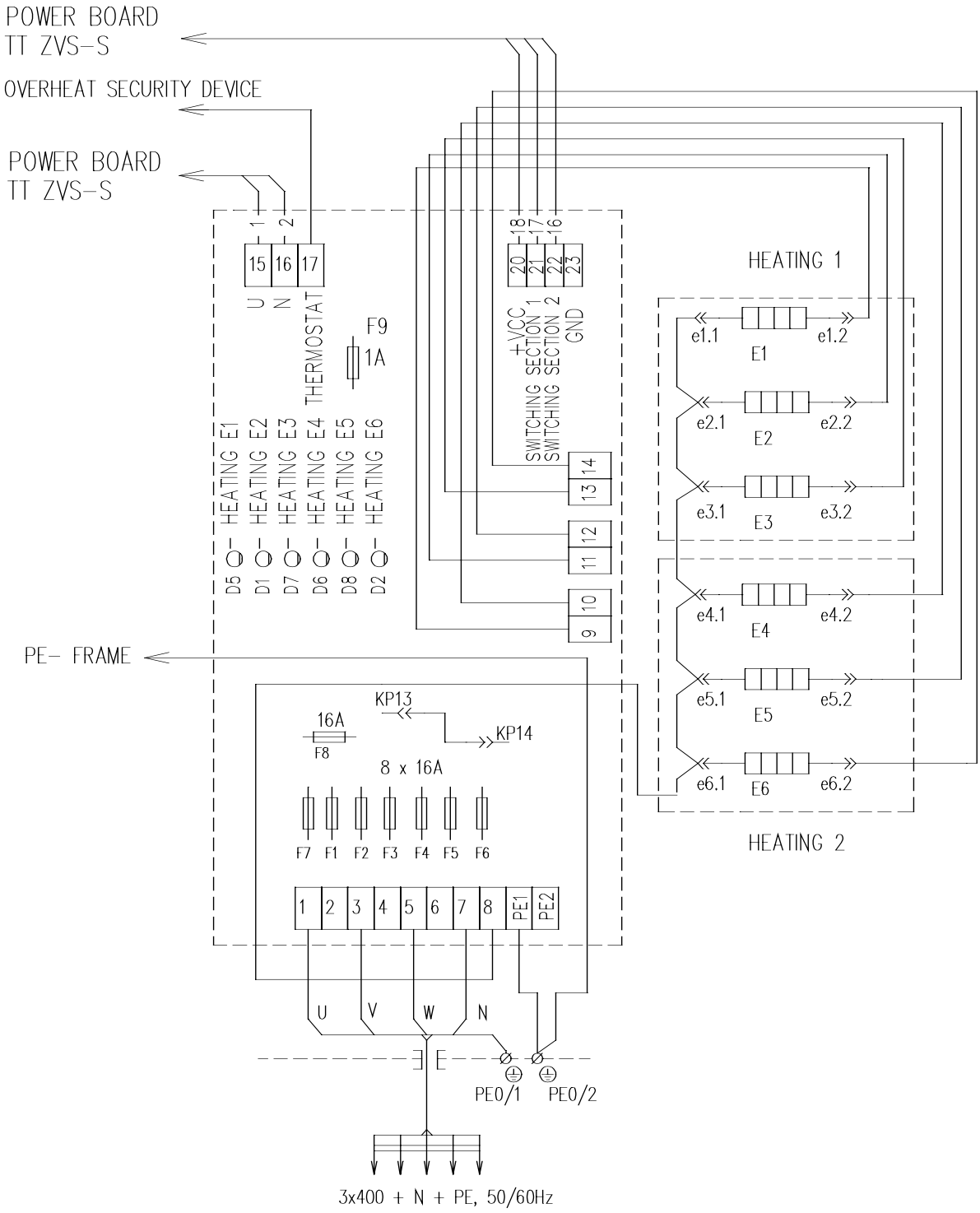
8.1.8 Legend to the figures

1	Plastic body of the regulator	31	Power supply cord (inside the right foot in volumes 55, 111, 222)
2	Fixing hooks of the plastic body	32	Pin of the door lock
3	Fixing slamming levers of the plastic body	33	Hand rail
4	Pins for fixing the regulator board	34	Attachment of the hand rail
5	Openings for projections of the panel	35	Hooks of the door lock
6	Printed wiring board of the regulator	36	Door jacket (a)/b) – right/left in the volume 707)
7	Panel (with foil keyboard)	37	Outer door
8	Pins for fixing the board to the panel	38	Plastic body of the regulator fitted
9	Projections of the panel	39	Regulator board
10	Screws for fixing the board to the panel	40	Switching box of the safety thermostat
11	Metal sheet of the door	41	Control knob of the safety thermostat
12	Opening in the door sheet for slamming the hooks 2)	42	Control lever of the outlet valve (and the suction valve in VC, ICV, SC)
13	Opening in the door sheet for slamming the levers 3)	43	Bowden of the control of the valve position
14	Not used	44	Left foot (in 3-phase units with the supply board II and the power supply cord)
15	Not used	45	Roll (volumes 404, 707)
16	Sheets of the inner chamber	46	Roll brakes
17	Wall of the outer chamber	47	Door hinge with the plastic cover
18	Sealing between the door and the chamber	48	Insulation
19	Outer jacket of the cabinet	49	Ventilator motor (in volumes 404, 707 2 pc)
20	Regulator sensor PT 100	50	Ventilator runner
21	Wire shelf (sieve)	51	Bushing for the el. installation – connection of the regulator and supply board
22	Suction opening with the valve	52	Cover of the outlet opening
23	Outlet opening with the valve	53	Hinge of the glass door (IC, ICV) – part I
24	Outlet valve	54	Hinge of the glass door (IC, ICV) – part II
25	Heating bodies	55	Left glass door (IC, ICV 707)
26	Contacts of heating bodies	56	Right glass door (IC, ICV 707)
27	Product plate	57	glass door (IC, ICV 55 – 404)
28	a), b) adjusting screw of the door hinge	58	Catch of the magnetic lock of the glass door
29	Right foot (with power supply board I)		
30	Power supply board		

8.1.9 Wiring diagram of single-phase types VC, EC, IC, ICV, SC, DC



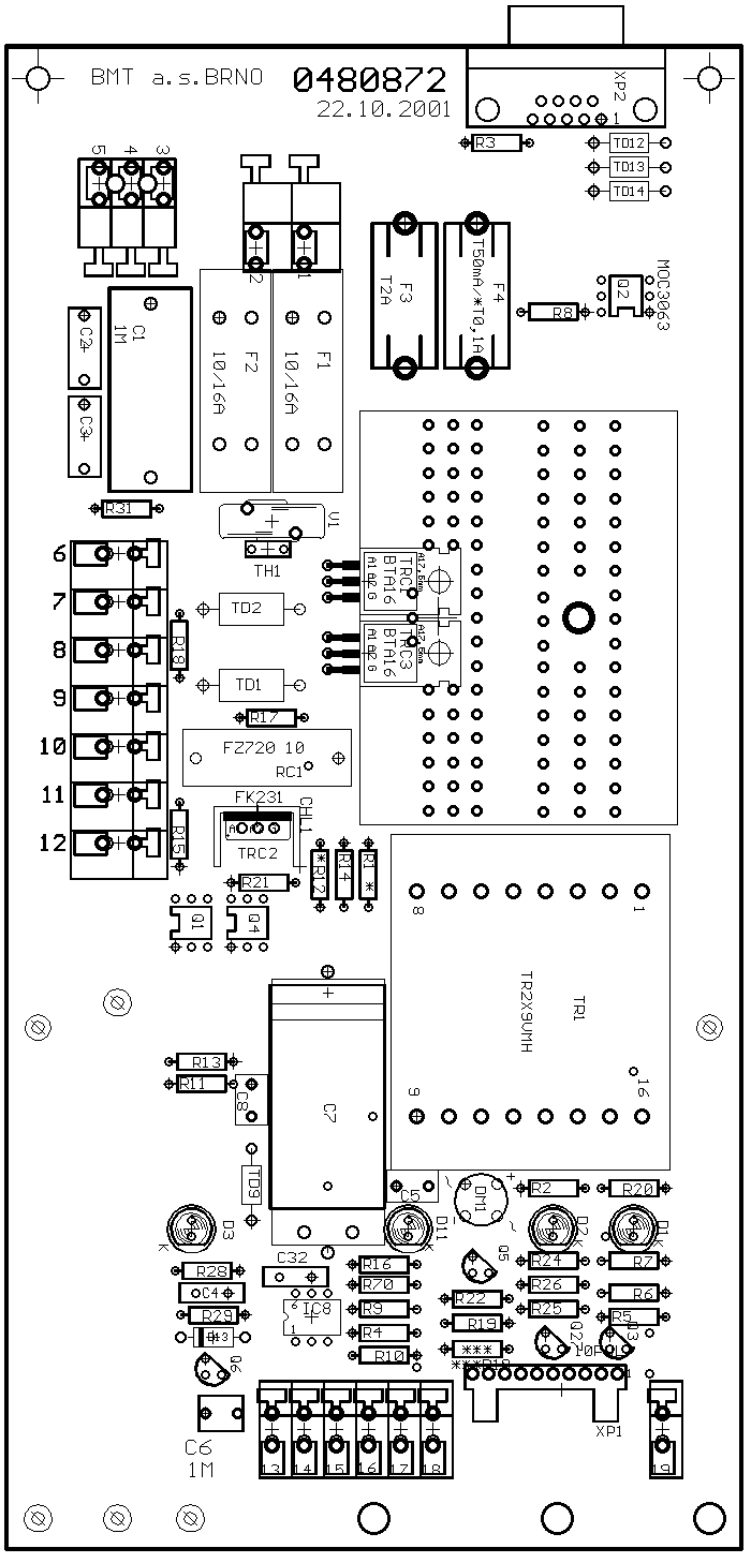
8.1.10 Wiring diagram of three-phase types VC, EC, IC, ICV, SC



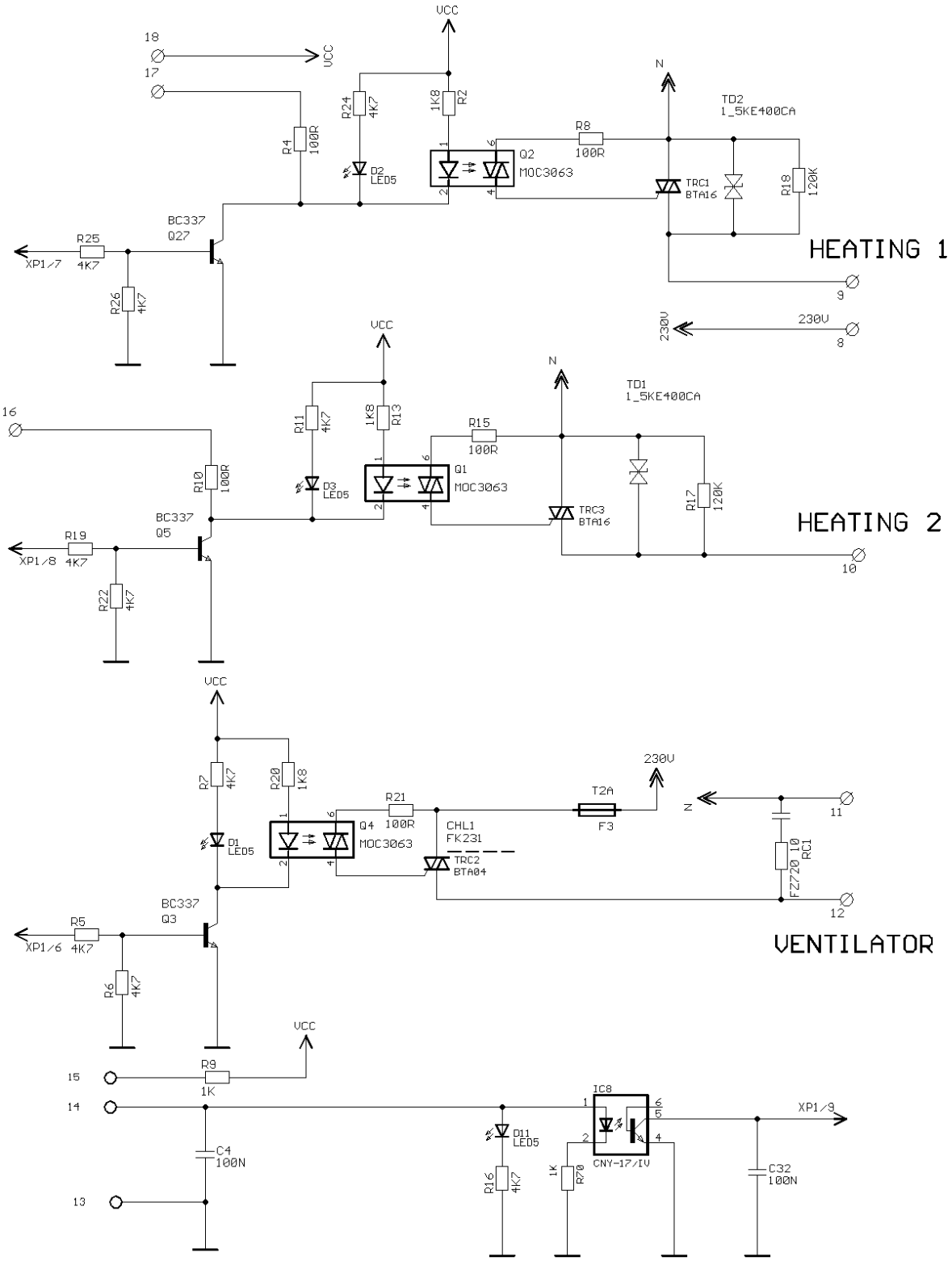
8.1.11 Table – Heating bodies – according to the type and volume of the unit Using the heating bodies

Unit type	Volume	Type of heating body			Supply voltage	Power	Sections-division
		300W/230V	**900W/230V**	**600W/230V**			
mat.No.		**0387238**	**387243**	**0387241**			
VC,STE	55			2	230V	1200W	600+600
	111		2		230V	1800W	900+900
	222		2		230V	1800W	900+900
	404			6	3x400V	3600W	600+600 600+600 600+600
	707		4	2	3x400V	4800W	900+900 900+900 600+600
ICV	55	2			230V	600W	300+300
	111	2			230V	600W	300+300
	222	2			230V	600W	300+300
	404			2	230V	1200W	600+600
	707	4			230V	1200W	600+600
		300W/230V	**450W/230V**				
mat.No.		**0387237**	**0387239**				
IC	55	4			230V	300W	150+150
	111	4			230V	300W	150+150
	222		4		230V	450W	225+225
	404		8		230V	900W	450+450
	707		8		230V	900W	450+450
EC	55	4			230V	1200W	600+600
	111	6			230V	1800W	900+900
	222		4		230V	1800W	900+900
	404		8		3x400V	3600W	900+900 450+450 450+450
	707		10		3x400V	4500W	900+900 900+900 450+450

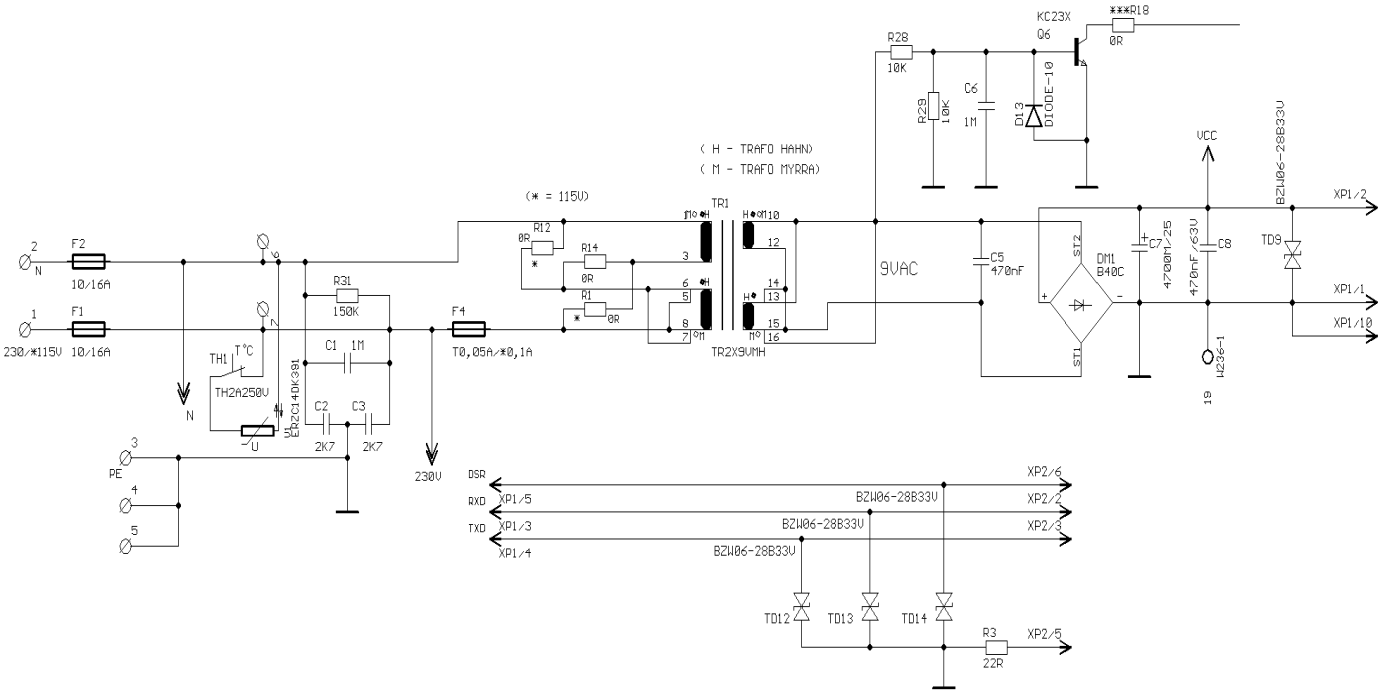
8.1.12 Layout of elements on the supply board 0480872 – “standard” (for all volumes and types)



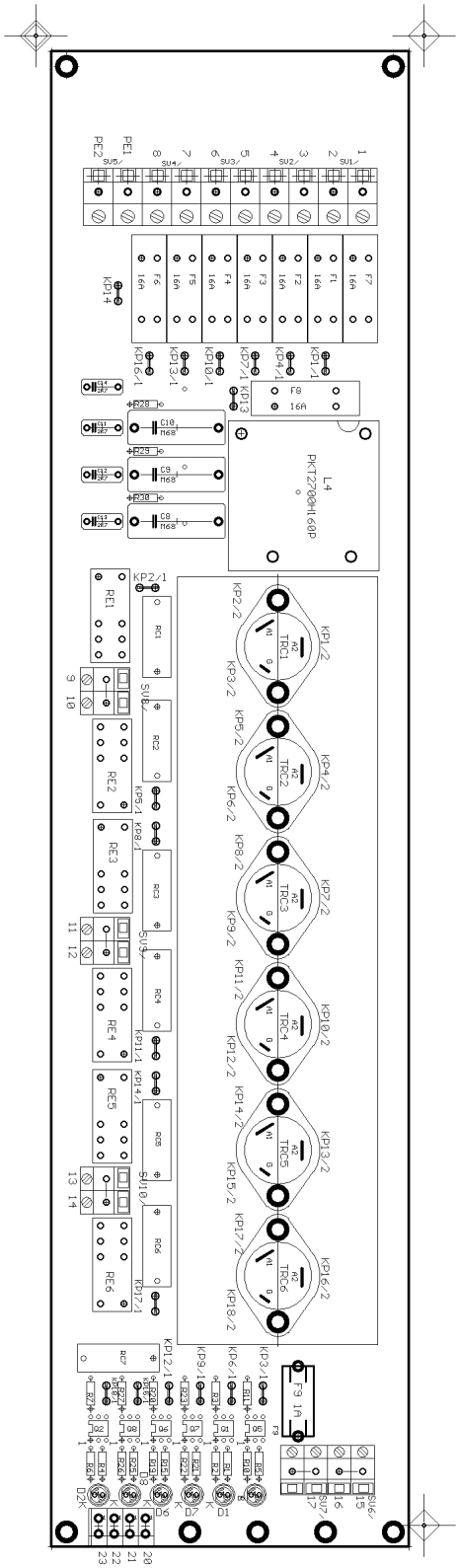
8.1.13 Supply board 0480872- wiring 1/2



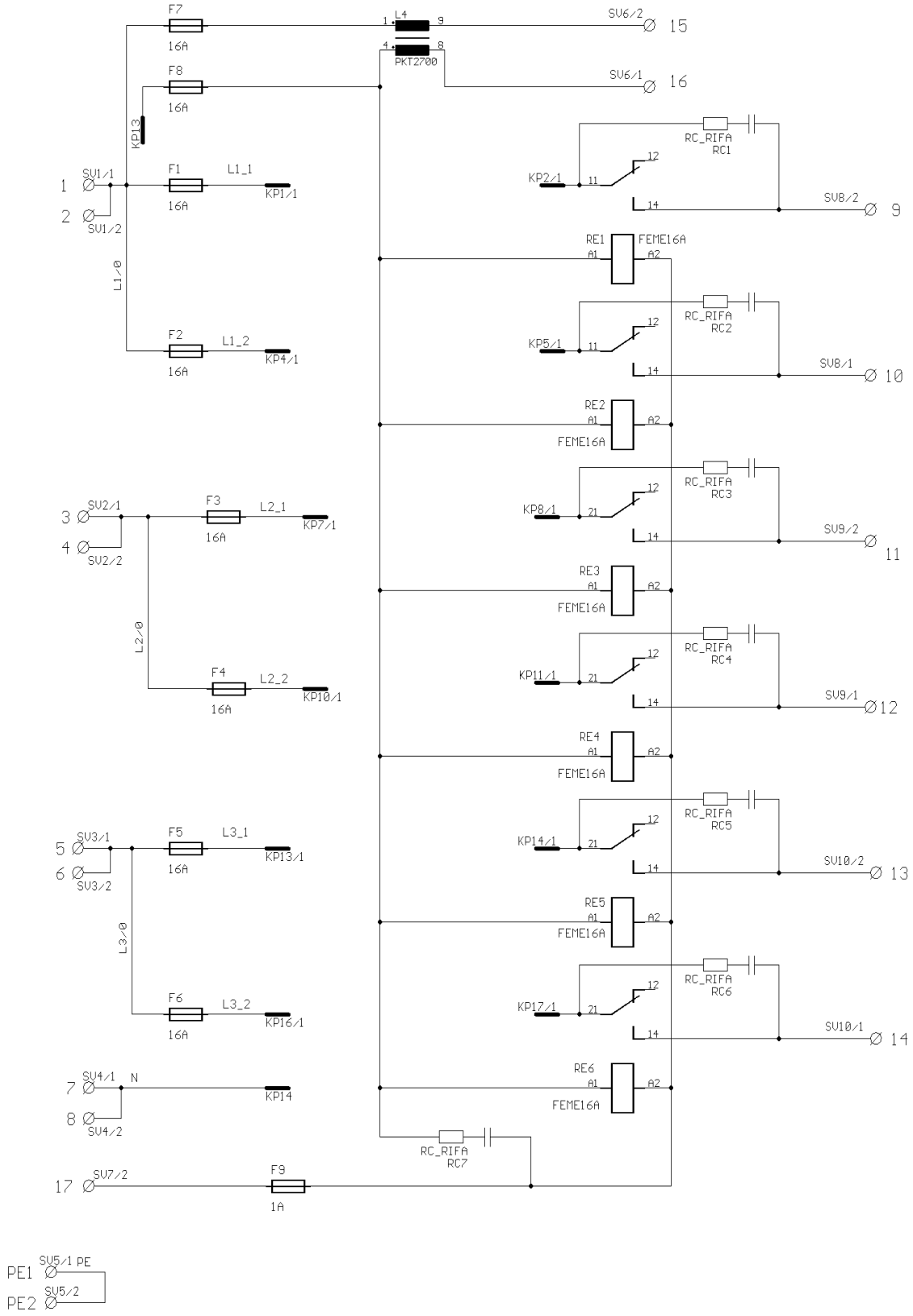
8.1.14 Supply board 0480872- wiring 2/2



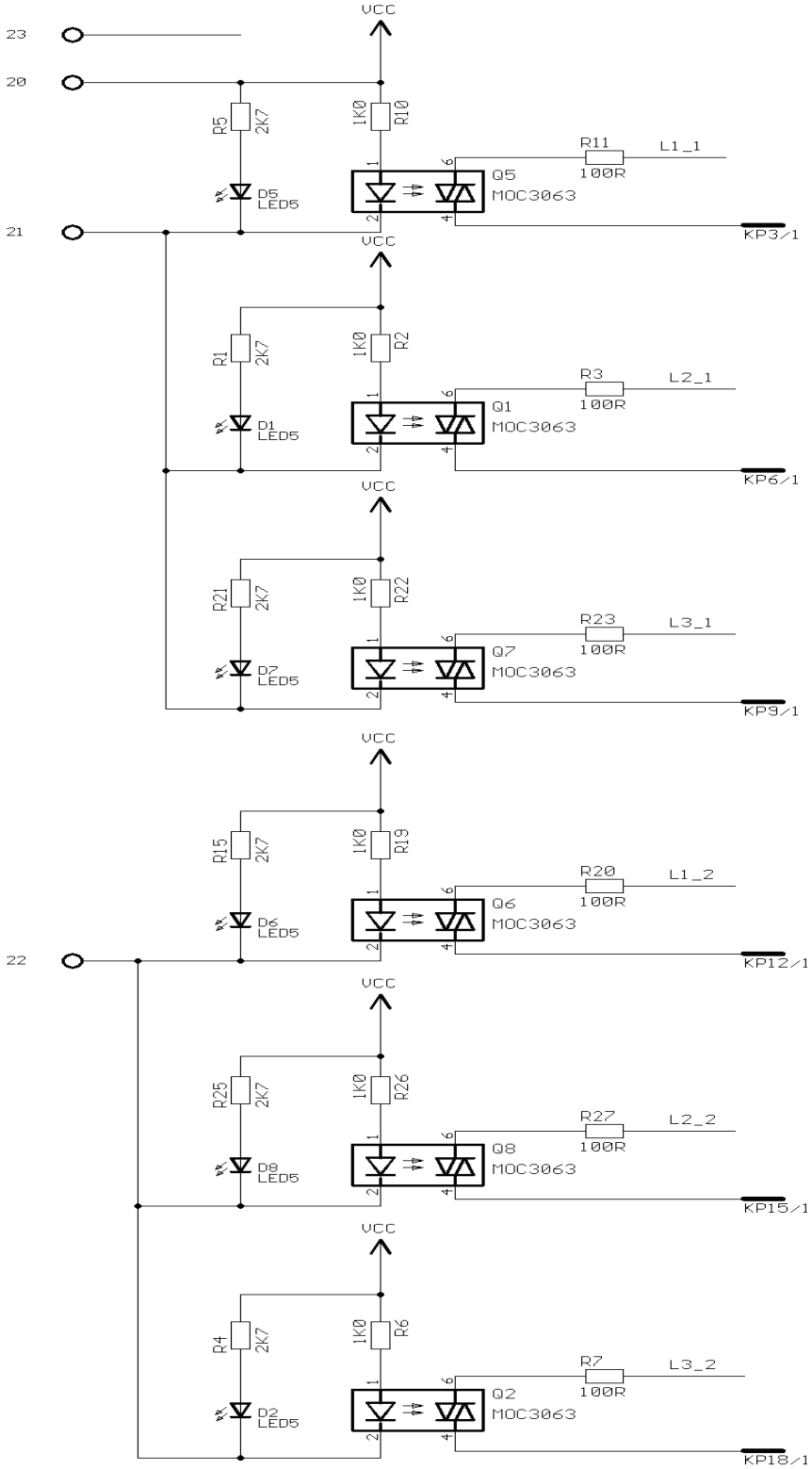
8.1.15 Layout of elements on the three-phase supply board 0480878 (for three-phase units)



8.1.16 Three-phase supply board 0480878 – wiring 1/3



8.1.17 Three-phase supply board 0480878 – wiring 2/3



8.1.18 Three-phase supply board 0480878 – wiring 3/3

