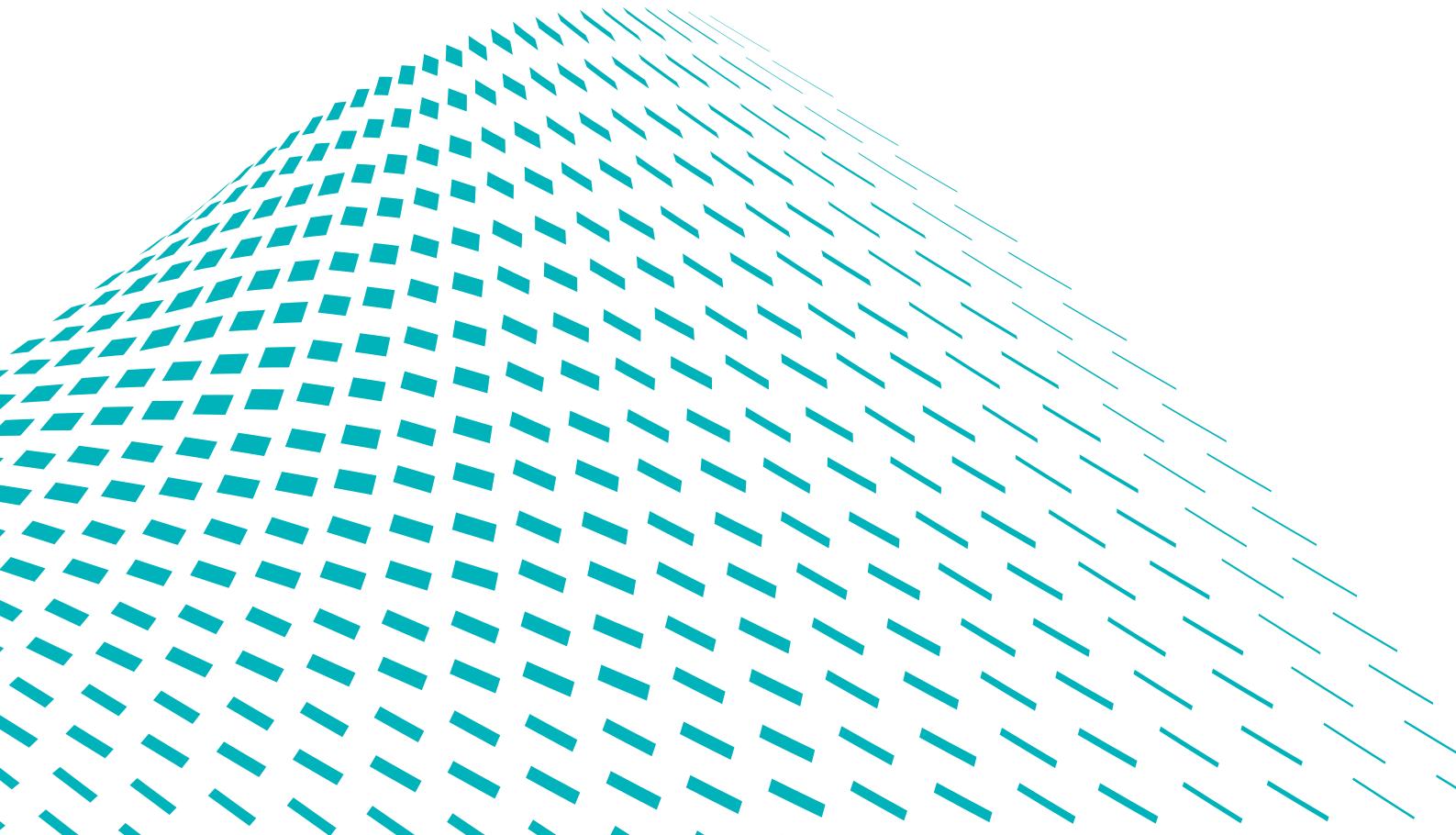




## SCPC System Service Manual



## SCPC System • Service Manual

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### **Intended Use**

In accordance with the applicable regulations, the SCPC System is used for **operating** the Stöckert Centrifugal Pump System (SCP System).

Service Manual  
Version 02/2017 – CP\_SEM\_60-03-00.002

Valid for SCPC System with firmware version V1.x/ V1.x / V1x

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# 1 Introduction

## 1.1 About this Service Manual

This Service Manual (in addition to the training courses given by LIVANOVA DEUTSCHLAND GMBH) provides basic information on the maintenance and repair of the Stöckert Centrifugal Pump Console System (abbreviation: **SCPC System**). This manual has been designed solely for use by suitably qualified service technicians. In the interest of the safety of patients and all users:

**Only service technicians who have been trained and duly authorised by LIVANOVA DEUTSCHLAND GMBH may perform service on the SCPC System.**



All information on the operation of the SCPC System can be found in the Operating Instructions. This Service Manual will refer to the appropriate chapter of the Operating Instructions as required.

### 1.1.1 Symbols used in this Service Manual

The symbols are intended to help the user find particular text passages. The meaning of the symbols is as follows:



Danger! Failure to pay attention may put the health and safety of the patient and/or the operator at risk.



Warning! Failure to pay attention may cause damage to the machine or other equipment.



A check list for a quick and safe follow-up on whether operational steps have been carried out completely.



Primary list (main groups)



Secondary list (subgroups)

## 1.1.2 The chapters in this Service Manual

In chapter...	you will find the following information:
1 Introduction	→ Symbols used in the Service Manual → Overview of chapters (this table)
2 Safety	→ Important safety instructions for operating and servicing the SCPC System
3 System description	→ A brief description of all service-relevant components
4 User menu and service menu	→ Information on the available menus
5 Error messages and error diagnosis	→ A list of all error messages and information on localising errors
6 Replacing components	→ Information on removing and replacing service-relevant components
7 Appendix	→ Technical data on all components → Part numbers/spare parts → Circuit diagram

## 2 Safety

### 2.1 Approvals

Like development and manufacturing, service must also be conducted in accordance with the following standards and legal regulations:

	<ul style="list-style-type: none"> <li>– This device complies with the requirements of EU Directive 93/42/EEC of the European Council for Medical Devices.</li> </ul>
IEC 62353	<ul style="list-style-type: none"> <li>– Recurrent test and test after repair of medical electrical equipment</li> </ul>
IEC 60601-1-2	<ul style="list-style-type: none"> <li>– EMC (Electromagnetic Compatibility)</li> </ul>
MDD	<ul style="list-style-type: none"> <li>– Medical Device Directive 93/42/ EEC</li> </ul>
DIN EN ISO 13485	<ul style="list-style-type: none"> <li>– Quality Management System</li> </ul>
UVV	<ul style="list-style-type: none"> <li>– Regulations for Accident Prevention</li> </ul>

The SCPC System is a medical device, class IIb (MDD 93/42/EEC). A Declaration of Conformity has been issued for the SCPC System.

### 2.2 Regulations and safety instructions

#### 2.2.1 Intended use

- In accordance with the applicable regulations, the SCPC System is used for **operating** the Stöckert Centrifugal Pump System (SCP System).



#### Instructions for use

- Any use beyond this specification is not as intended. LIVANOVA DEUTSCHLAND GMBH will not assume any liability for any damage resulting from such use. The intended use also includes compliance with the operating instructions, as well as repair and maintenance according to the maintenance instructions.
- Relevant accident prevention measures according to existing local policy and employees' health and safety regulations must be complied with. LIVANOVA DEUTSCHLAND GMBH will not accept any liability for damage due to non-compliance with these regulations.
- LIVANOVA DEUTSCHLAND GMBH will not assume any liability for injuries and/or damage caused by failure to observe the safety instructions or by the operator not taking due care. This also applies if the operator's duty to take due care has not been specifically expressed to the user.

#### 2.2.2 Contraindications

- There are no known contraindications for the SCPC System. The attending physician is solely responsible for the use of the system.

## 2.2.3 Safety instructions related to service

### Note:

For additional information on general safety instructions as well as safety instructions related to use and operation, refer to chap. 2 in the Operating Instructions.

### Occupational health and safety

- ▷ Correct handling of objects reduces mechanical stress to the spine and back muscles.
- ▷ Do not wear metal jewellery such as rings, bracelets, etc., when performing maintenance and service tasks.
- ▷ Wear protective gloves when cleaning and disinfecting the SCPC System.
- ▷ The SCPC System must not be used in the presence of explosive substances.



### Instructions on the system

- ▷ The SCPC System must only be used with the Stöckert centrifugal pump system (abbreviation: SCP System). 
- ▷ The serial port is only intended to transmit DMS data (e.g. to another computer).
- ▷ Make sure that the air circulation at the ventilation openings is unimpeded. Insufficient ventilation may cause overheating.
- ▷ Keep the following in mind when operating the SCPC system in combination with an SCP system with a Revolution® and an Electrical Remote-Controlled Tubing Clamp:  
If the speed **exceeds 3200 RPM**, the batteries are not charged in order to guarantee the power supply to the Electrical Remote-Controlled Tubing Clamp.

## Instructions on repair and replacement

- Modifications or extensions to the system or the use of spare parts which have not been tested and approved by LIVANOVA DEUTSCHLAND GMBH may have a detrimental effect on the safety and operation of the system. In such cases, LIVANOVA DEUTSCHLAND GMBH cannot accept any liability or responsibility.
- Proof must be provided for accessories and supplementary devices which have not been tested and approved by LIVANOVA DEUTSCHLAND GMBH that their use does not represent a safety hazard.
- While the SCPC System is switched on, no electrical connections may be disconnected or established. The SCPC System must be completely powered down when connecting or disconnecting the SCP System.
- The mains switch does not disconnect the SCPC System from the mains power supply. Disconnect the SCPC System from the power supply completely before carrying out maintenance and cleaning work.
- Note that the SCPC System has an Uninterruptible Power Supply (UPS) which is powered by 2 batteries. When working on the device with the housing open, there is a risk of short-circuits even if the mains cable is unplugged when the batteries are inserted and charged.
- Note the specific design of individual electrical components depending on the region in question, and observe the relevant mains connection regulations according to the circuit diagram in the Appendix section.
- It is essential that ESD protective safety measures are taken when working with components susceptible to ESD. When removing or installing circuit boards or components susceptible to ESD, ensure that you use ESD mats, wrist straps, or similar protective equipment.
- Observe the ESD guidelines when packing or shipping components susceptible to ESD.
- Always use suitable removal and insertion tools in order to avoid bending contacts (e.g. of plug connectors) or damaging plugs or socket housings.
- Make sure not to damage cables or their insulation on the sharp edges of panels and circuit boards during assembly. Route the cables in a way that prevents them from being pinched by fasteners or by the edges of panels. Secure all cables on the cable holders provided for this purpose.
- A defective cable harness or a defective circuit board must not be repaired but must be replaced completely. To guarantee safe and reliable operation of the system and the safety of patients and users, only genuine spare parts from LIVANOVA DEUTSCHLAND GMBH must be used.



## Instructions on initial operation

- ▷ Prior to assembly of the SCP System, you must have thoroughly read the separate operating instructions and have become familiar with the machine functions.
- ▷ When mounting the SCP System, ensure balanced loading. Unbalanced loading leads to instable positioning of the SCPC System.
- ▷ Stable positioning of the SCPC System can only be guaranteed if the system has been mounted with the appropriate adapter plate
- ▷ Ensure that the tubes are laid out as straight as possible and do not kink or twist the cables. Kinked or twisted cables could pose a hazard to any persons present (causing them to stumble or get caught up in them).
- ▷ Check all cables, tubes, connectors and other accessories to make sure that they are connected correctly, are not leaking and are in perfect working order. Replace all damaged components immediately. 
- ▷ Do not use any more connectors or tubing than is necessary for operating the machine in accordance with the regulations. Additional connectors etc. increase the risk of faults. 

## Instructions on cleaning and disinfection

- ▷ The system and its components are to be regarded as potentially infectious after use. Observe the current regulations on hygiene and safety when handling and packing the SCPC System and/or its components.
- ▷ Use recommended cleaning agents.
- ▷ Ensure that no liquids or cleaning agents enter the machine housing through the vents or other openings.

## 2.2.4 Electrical Safety

- ▷ Mains power quality should be that of a typical commercial or hospital environment.
- ▷ The SCPC System must be connected to a power supply network with protective conductor (earth) to protect the device against electric shock.
- ▷ A potential equalization cable must be connected to a point intended for such purpose in the operating theatre (OT).
- ▷ Check the functional safety of all electrical connections, cables and sockets regularly.
- ▷ Accessories and supplementary devices must comply with the relevant IEC or ISO standards (e.g. IEC 60950 regarding information technology equipment). In addition, any configuration must meet the requirements for medical electrical systems (see IEC 60601-1-1 or paragraph 16 of IEC 60601-1, 3rd edition). Any person connecting additional devices to medical electrical equipment is considered a system configurer and is thus responsible for ensuring that the system meets the standard-related requirements for systems. Please note that local legislation takes precedence over the above-mentioned standard-related requirements.
- ▷ The devices must only be connected by means of serial connection cables which comply with the specifications of LIVANOVA DEUTSCHLAND GMBH (e.g. part no. 45-11-03). The end of the cable marked with the part number must be plugged into the jack (of the LIVANOVA DEUTSCHLAND GMBH equipment) intended for serial connection.
- ▷ Medical electrical equipment may not be placed directly next to or on top of each other during operation in order to avoid electromagnetic interference. If such a set-up is required for operation, the devices must be monitored to ensure that they are functioning properly.



# 3 System description

## 3.1 General description

The SCPC System permits the operation of the Stöckert Centrifugal Pump System (abbreviated to: SCP System) independently from a Stöckert Heart-Lung Machine (S3/SC/CAPS).

A touch-sensitive screen (touch screen) on the front is the interface between the user and the SCPC System. The following functions of the system are displayed or operated, depending on the configuration:

- ▷ Pressure control
- ▷ Flow display
- ▷ Temperature monitor
- ▷ Timer
- ▷ Level control/bubble detector
- ▷ UPS operation
- ▷ Operation of the SCP System

## 3.2 Design of the SCPC System

### 3.2.1 Complete overview

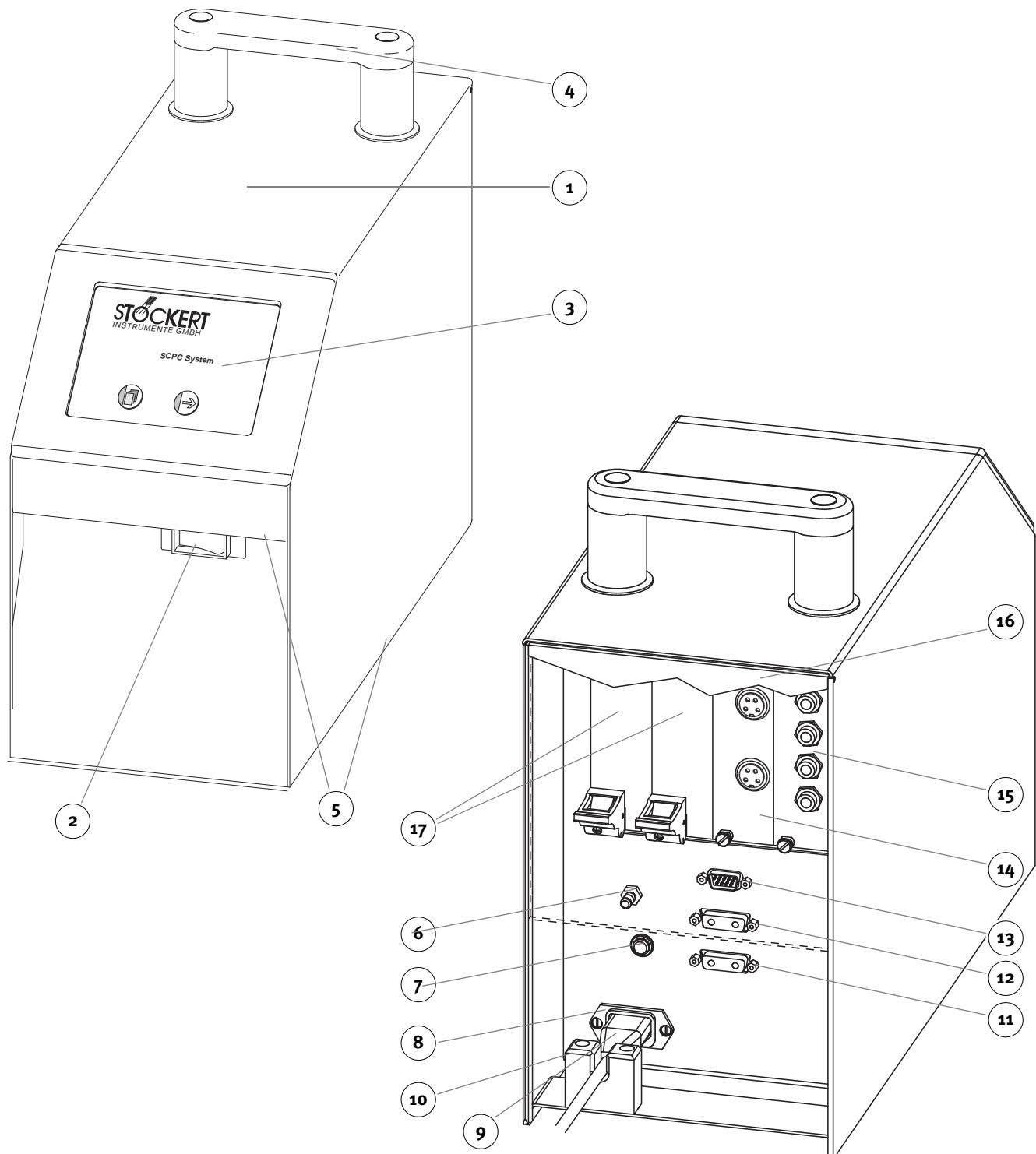


fig. 1: Overview SCPC System

Item Description	Function
<b>1</b> SCPC System	
<b>2</b> Mains power switch	→ Powering the SCPC System up/down
<b>3</b> Touchscreen	→ Operation and configuration of the SCPC System: – Pressure control – Temperature monitor – Level control – Bubble detector – Two independent timers – Controlling the UPS operation – Time and date
<b>4</b> Grip	→ Transportation of the SCPC System → Mounting of the SCP pump control panel and the SCP drive unit
<b>5</b> Ventilation grills	→ Ventilation of the SCPC System (above the mains power switch and at the bottom of the device)
<b>6</b> Potential equalization point	→ Connection of the potential equalization cable
<b>7</b> Mains protection	→ Automatic circuit breaker 8 A
<b>8</b> Jack for AC power cable	→ Power supply of the SCPC System
<b>9</b> AC power cable	
<b>10</b> Retaining bracket	→ Securing the AC power cable
<b>11</b> Jack for connection of the SCP pump control panel	→ Connection of the pump control panel to the SCPC System
<b>12</b> Jack for connection to the Electrical Remote-Controlled Tubing Clamp (ERC)	→ Connection of the ERC to the SCPC System
<b>13</b> Jack for connection to the serial port	→ Connection of the Sorin Data Management System (abbr: Sorin DMS)
<b>14</b> Sensor module dual pressure	→ Connection of the sensors for pressure displays 1 and 2
<b>15</b> Sensor module temperature monitor	→ Connection of the temperature probes for temperature monitoring
<b>16</b> Cover plate	→ Splash protection
<b>17</b> Blanking plates	→ Covering the power module

### 3.2.2 Overview of modules and individual components

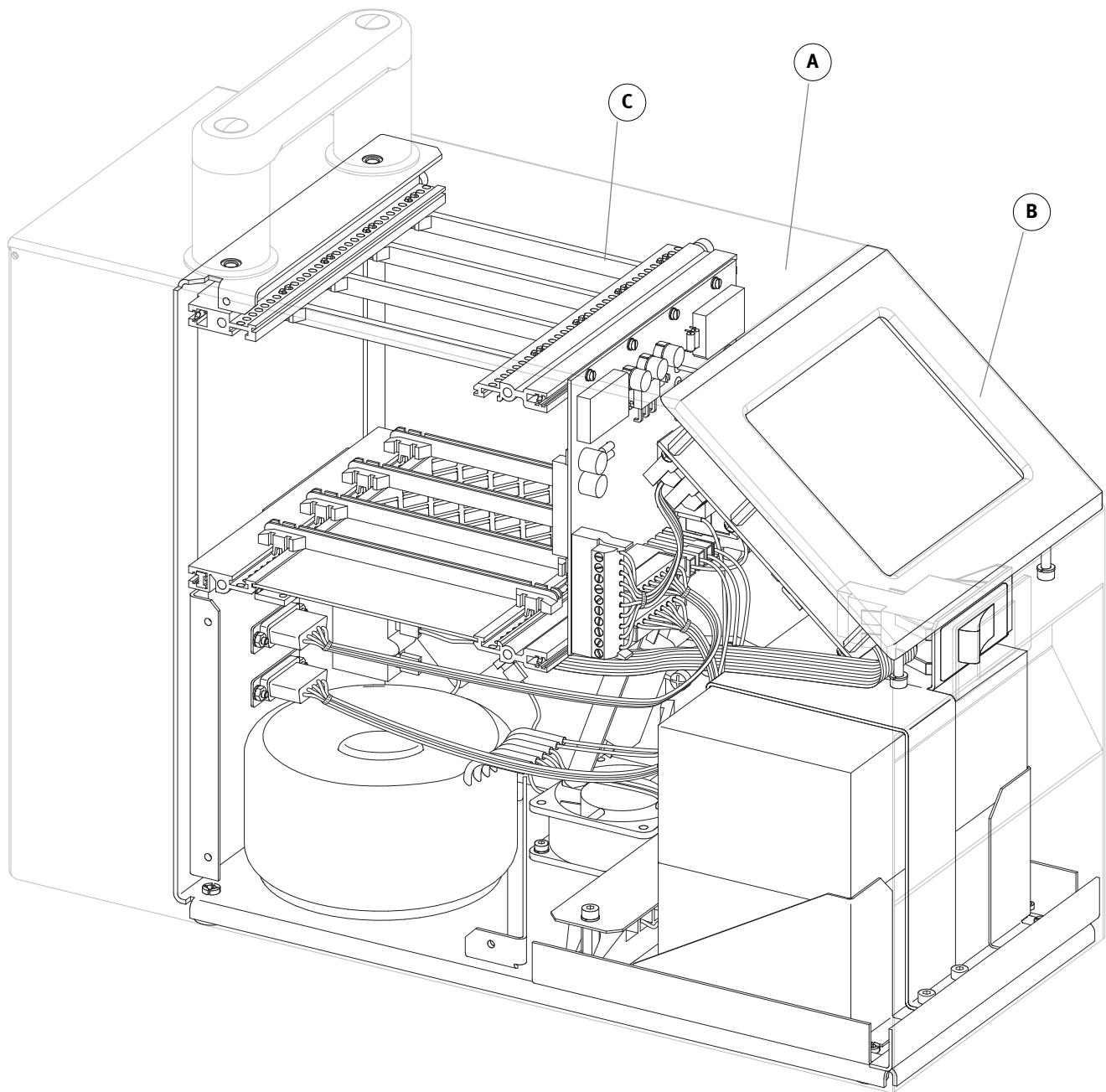


fig. 2: Overview of device components

<b>Mod.</b>	<b>Component</b>	<b>contains the following service-relevant modules/components:</b>
<b>A</b>	SCPC System casing	<ul style="list-style-type: none"> <li>▷ Touch screen module (B)</li> <li>▷ Card and module support assembly (C) (sensor modules and circuit boards)</li> <li>▷ Mains switch</li> <li>▷ 2 batteries</li> <li>▷ Discharge resistor for batteries</li> <li>▷ Ring core transformer</li> <li>▷ Rectifier</li> <li>▷ Mains filter</li> <li>▷ Fan</li> <li>▷ Connections: serial interface, Electrical Remote-Controlled Tubing Clamp, SCP System</li> </ul>
<b>B</b>	Touch screen module	<ul style="list-style-type: none"> <li>▷ Touch-sensitive screen incl. display electronics</li> <li>▷ <i>CPU (ZDS)</i> circuit board</li> <li>▷ <i>Interface (ZIS)</i> circuit board</li> </ul>
<b>C</b>	Card and module support assembly	<ul style="list-style-type: none"> <li>▷ <i>Battery monitoring (ZAU)</i> circuit board</li> <li>▷ <i>Mains monitoring (ZNU)</i> circuit board</li> <li>▷ Sensor modules (optional, depending on order)</li> </ul>

### 3.2.3 Individual components

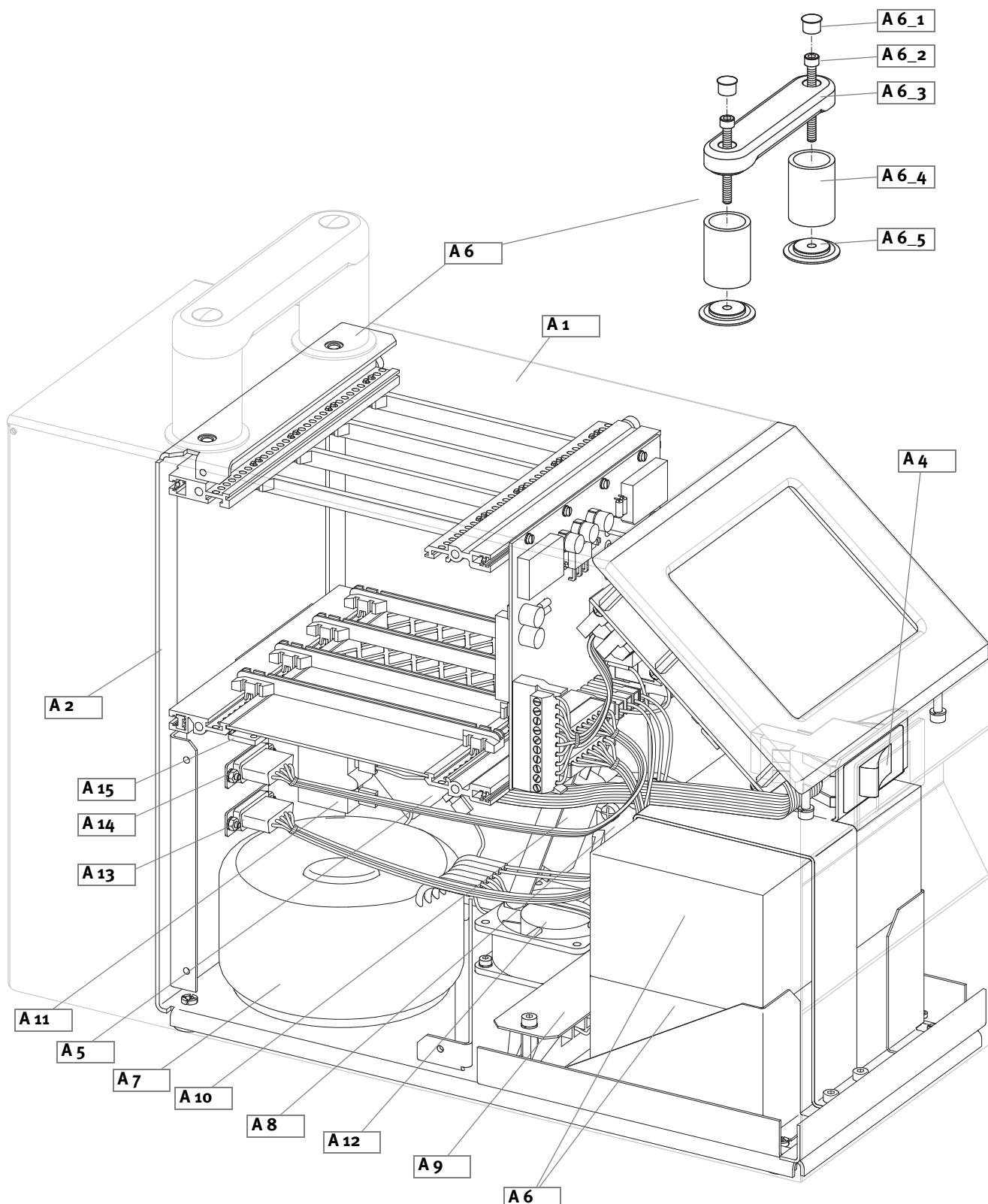


fig. 3: Overview of individual components

<b>Mod. Item</b>	<b>Description</b>	<b>Number</b>	<b>SP number</b>
A 1	Upper casing		60-03-02
A 2	Lower casing		
A 3	Housing grip, compl., consisting of:		
	(1) Screw cap, D 13 mm		96-531-015
	(2) Allen bolt, 2 pcs., DIN 912, M6x60		71-115-055
	(3) Grip		60-03-35
	(4) Mast segment, 2 pcs., L 45mm		60-03-36
	(5) Termination plate, 2 pcs.		60-03-37
A 4	Mains switch (voltage-dependent)		
	220-240 V/1.0 A	3120-F321	96-143-006 (96-143-002 obsolete)
	110-127 V/2.0 A	3120-F321	96-143-007 (96-143-004 obsolete)
	100 V/2.5 A	3120-F321	96-143-008 (96-143-005 obsolete)
A 5	Mains filter		
	220-240 V	FN610A-06/6	96-401-011
	100-127 V	FN610-B-10	96-401-013
A 6	Batteries		96-405-003
A 7	Ring core transformer		96-403-058
A 8	Rectifier		93-154-028
A 9	Clamping strip (mains – ring core transformer connection)		96-204-098
A 10	Discharge resistor (for battery discharge)		97-103-642
A 11	Automatic circuit breaker 8.0 A		96-148-115
A 12	Fan		96-406-003
A 13	SCP System Connections		97-101-901
A 14	Connection for Electrical Remote-Controlled Tubing Clamp (for short: ERC)		
A 15	Serial interface connection		

### 3.2.4 Touch screen module

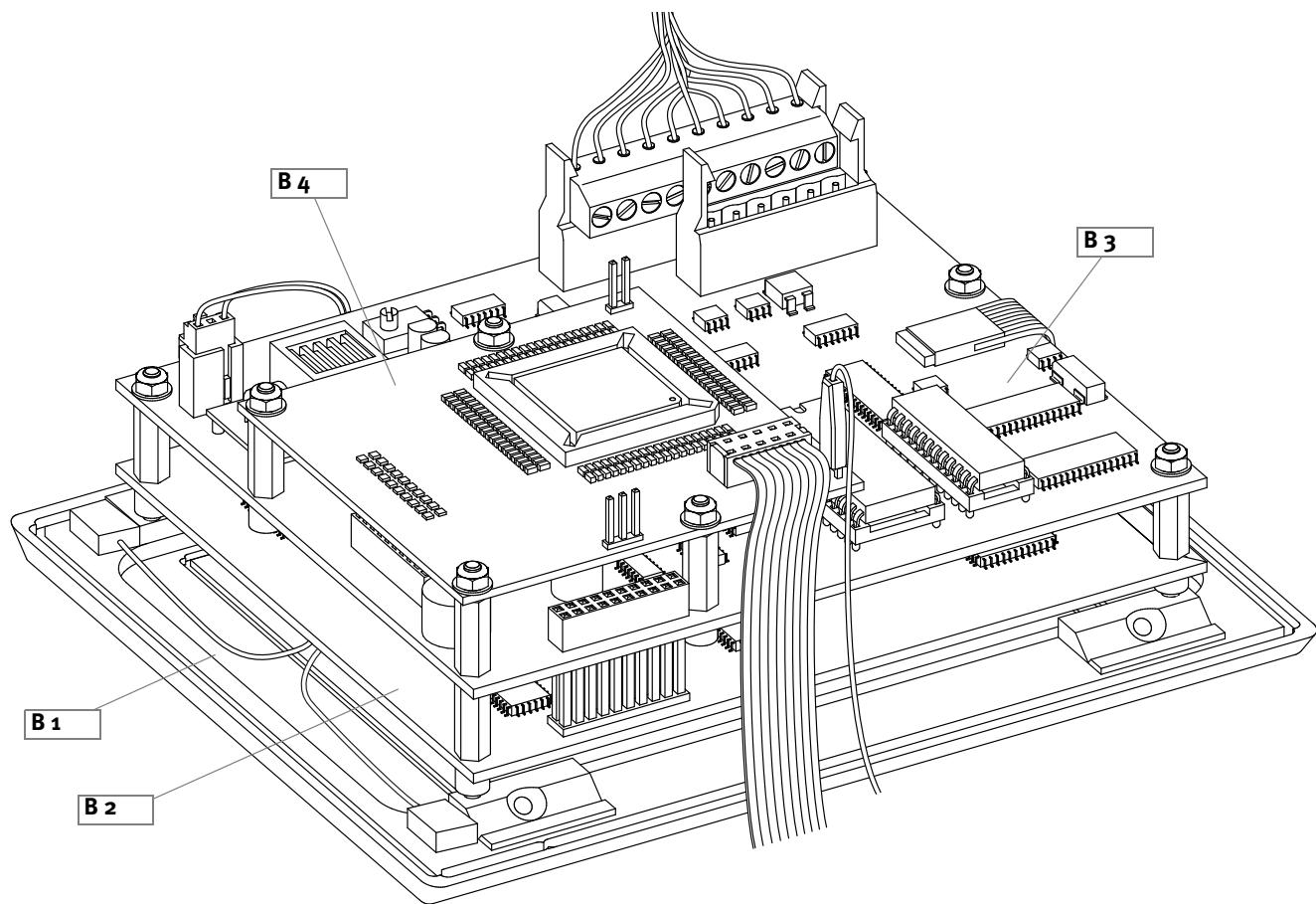


fig. 4: Overview of the touch screen module

Mod. Item	Description	Number	SP number
B 1	SCPC Front panel, complete (set includes assembly frame, touch screen, <i>Display</i> circuit board, ZDS 2006, ZIS 0202, EMC sealing cords, assembly material)		60-03-10
B 2	<i>Display</i> circuit board (fixed component of the touch screen, can only be replaced as a unit)		
B 3	<i>CPU</i> circuit board (ZDS)	ZDS 2006	90-305-250
B 4	<i>Interface</i> circuit board (ZIS)	ZIS 0202	90-305-300

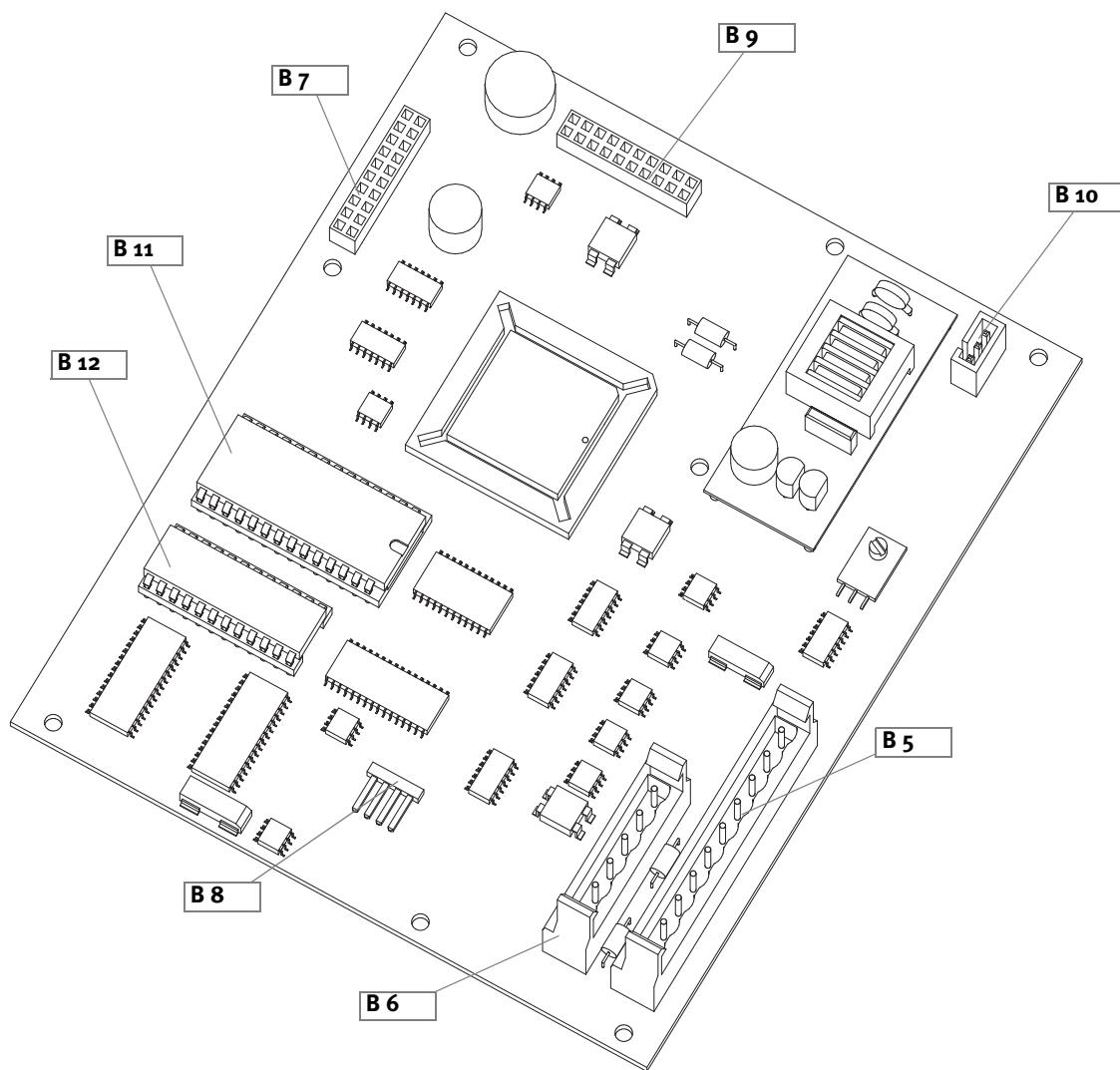
**CPU board (ZDS 2006)**

fig. 5: CPU board (ZDS 2006)

Mod. Item	Description	Number	SP number
B 5	Connection for <i>Backplane</i> circuit board (CON 12)	CON 1	
B 6	HLM connection (not used)	CON 2	
B 7	Connection for <i>Display</i> (display) circuit board	CON 3	
B 8	Connection for <i>Display</i> (touch screen) circuit board	CON 4	
B 9	Connection for <i>Interface</i> (ZIS) circuit board	CON 6	
B 10	Connection for <i>Display</i> (LCB lighting) circuit board	CON 7	
B 11	EPROM (firmware) ZDS	IC 3	93-484-236
B 12	GAL (ADRDEC3)	IC 9	93-484-112

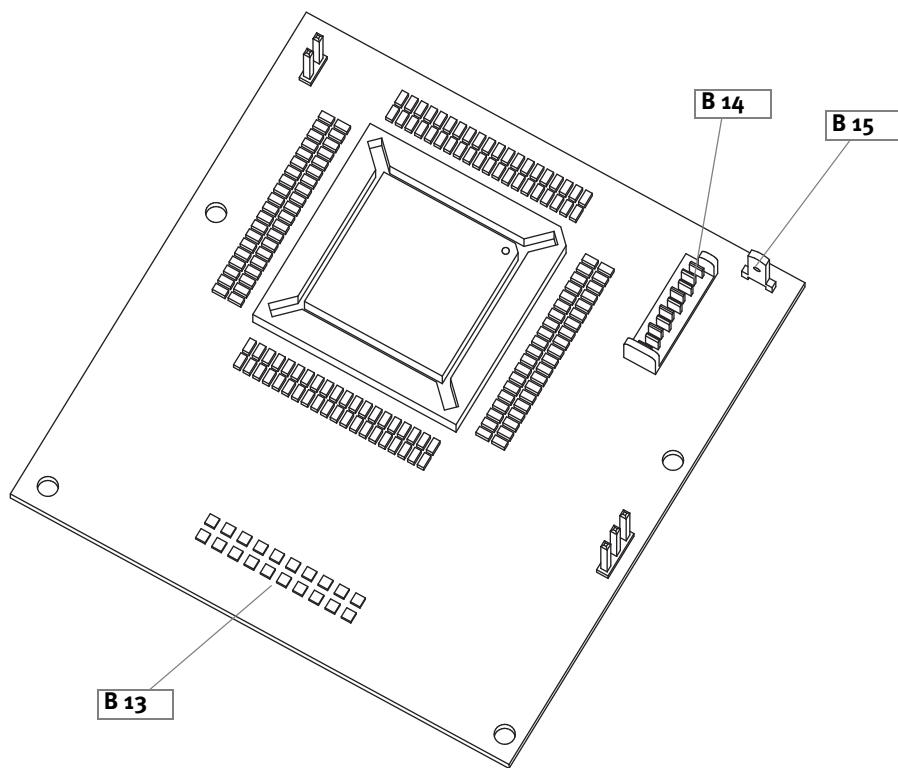
**Interface (ZIS 0202) circuit board**

fig. 6: CPU board (ZDS 2006)

Mod. Item	Description	Number	SP number
B 13	Connection for CPU circuit board	CON 1	
B 14	Serial interface connection (external 13)	CON 2	see page 14.
B 15	Connection for backplane circuit board	CON 6	

### 3.2.5 Card and module support assembly

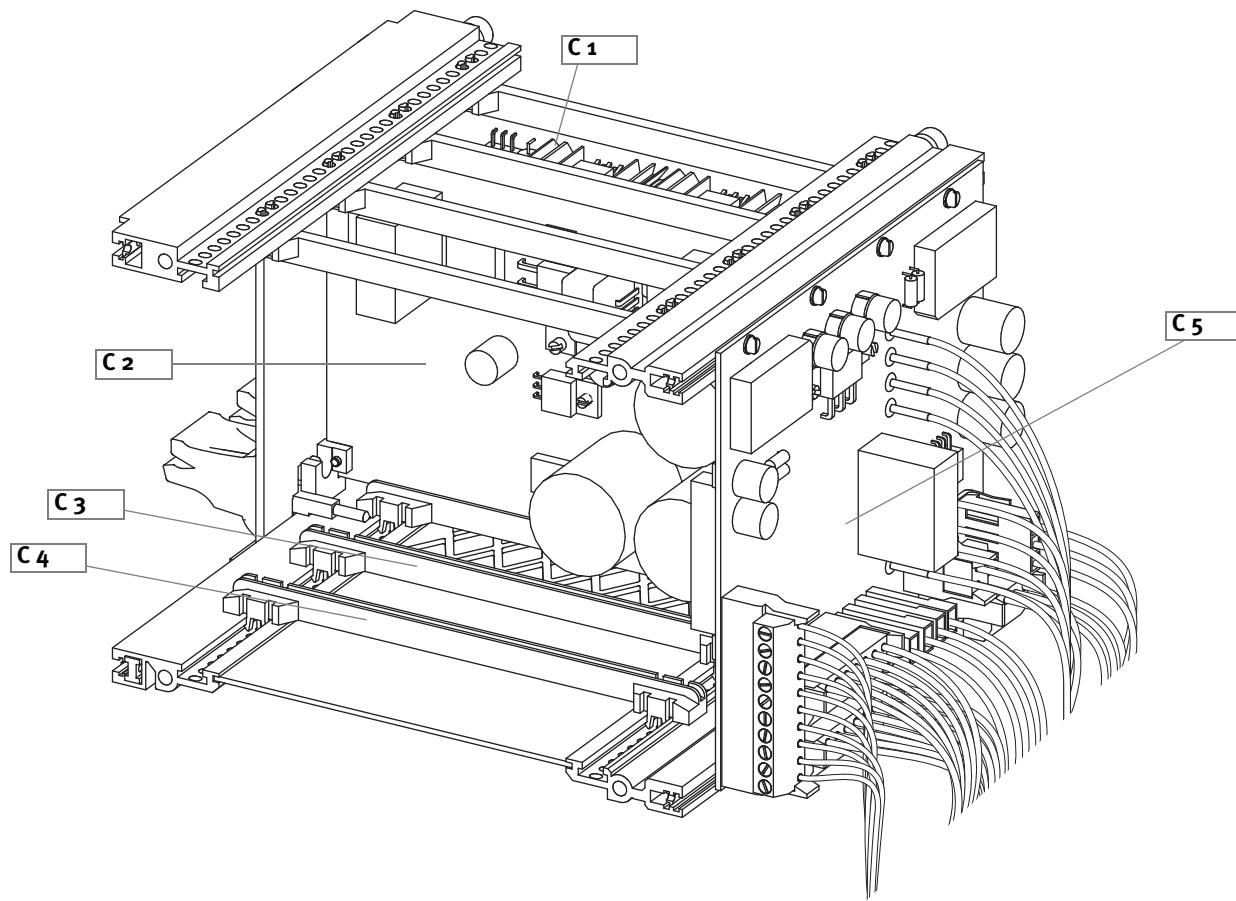


fig. 7: Overview of card and module support assembly

Mod. Item	Description	Number	SP number
C 1	<i>Battery monitoring</i> circuit board	ZAU 2002	90-305-210
C 2	<i>Mains monitoring</i> circuit board	ZNU 2003	90-305-220
C 3	Slot for sensor module		
C 4	Slot for sensor module		
C 5	<i>Backplane</i> circuit board	ZBP 2004	- factory repair only -

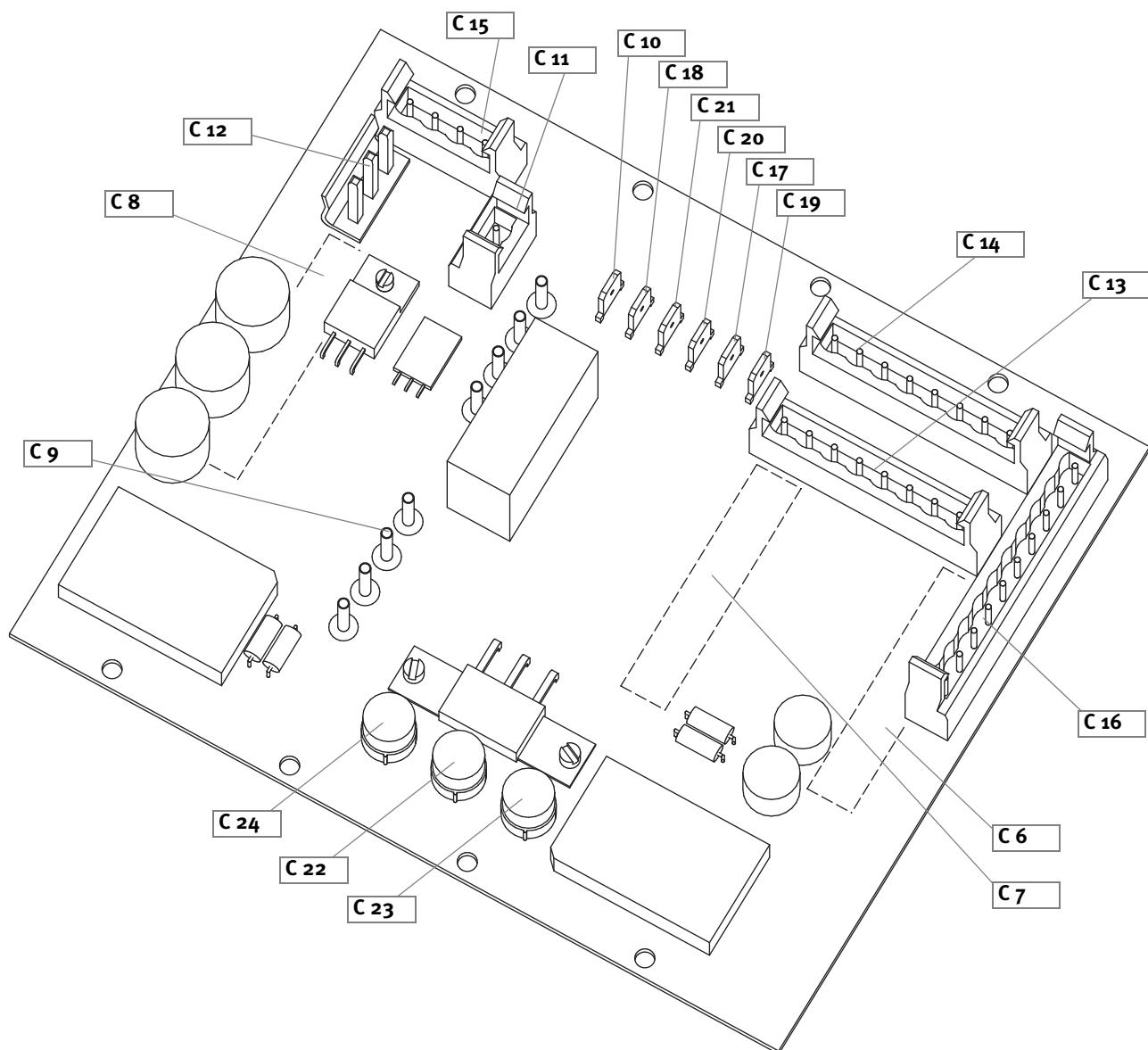
**Backplane circuit board (ZBP 2004)**

fig. 8: Backplane circuit board

<b>Mod. Item</b>	<b>Description</b>	<b>Number</b>	<b>SP number</b>
C 6	Module connection	CON 1	
C 7	Module connection	CON 2	
C 8	Connection for <i>battery monitoring</i> (ZAU) circuit board	CON 3	
C 9	Connection for <i>mains monitoring</i> (ZNU) circuit board	CON 4	
C 10	Connection 24 V DC_H_EX (HLM, not used)	CON 5	
C 11	Connection U_SEK (from the rectifier)	CON 6	
C 12	Fan connection	CON 7	
C 13	SCP System connection (external 11)	CON 8	See page 15.
C 14	ERC connection (external 12)	CON 9	See page 15.
C 15	Mains switch auxiliary contact connection	CON 10	
C 16	Connection for CPU (ZDS, CON 1) circuit board	CON 12	
C 17	Connection 24 V DC_Ho from ZNU circuit board	CON 13	
C 18	Connection 24 V DC_L from ZNU circuit board	CON 14	
C 19	Connection 24 V DC_L_EX (HLM, not used)	CON 15	
C 20	Connection 24 V DC_Ho to automatic circuit breaker	CON 17	
C 21	Connection 24 V DC_H to automatic circuit breaker	CON 18	
C 22	Miniature fuse 1 A, slow-blow (+ 12 V DC supply)	F 1	93-510-039
C 23	Miniature fuse 1 A, slow-blow ( $\pm$ 12 V DC supply)	F 2	93-510-039
C 24	Miniature fuse 1 A, slow-blow (5 V DC supply)	F 3	93-510-039

## Battery monitoring (ZAU 2002) circuit board

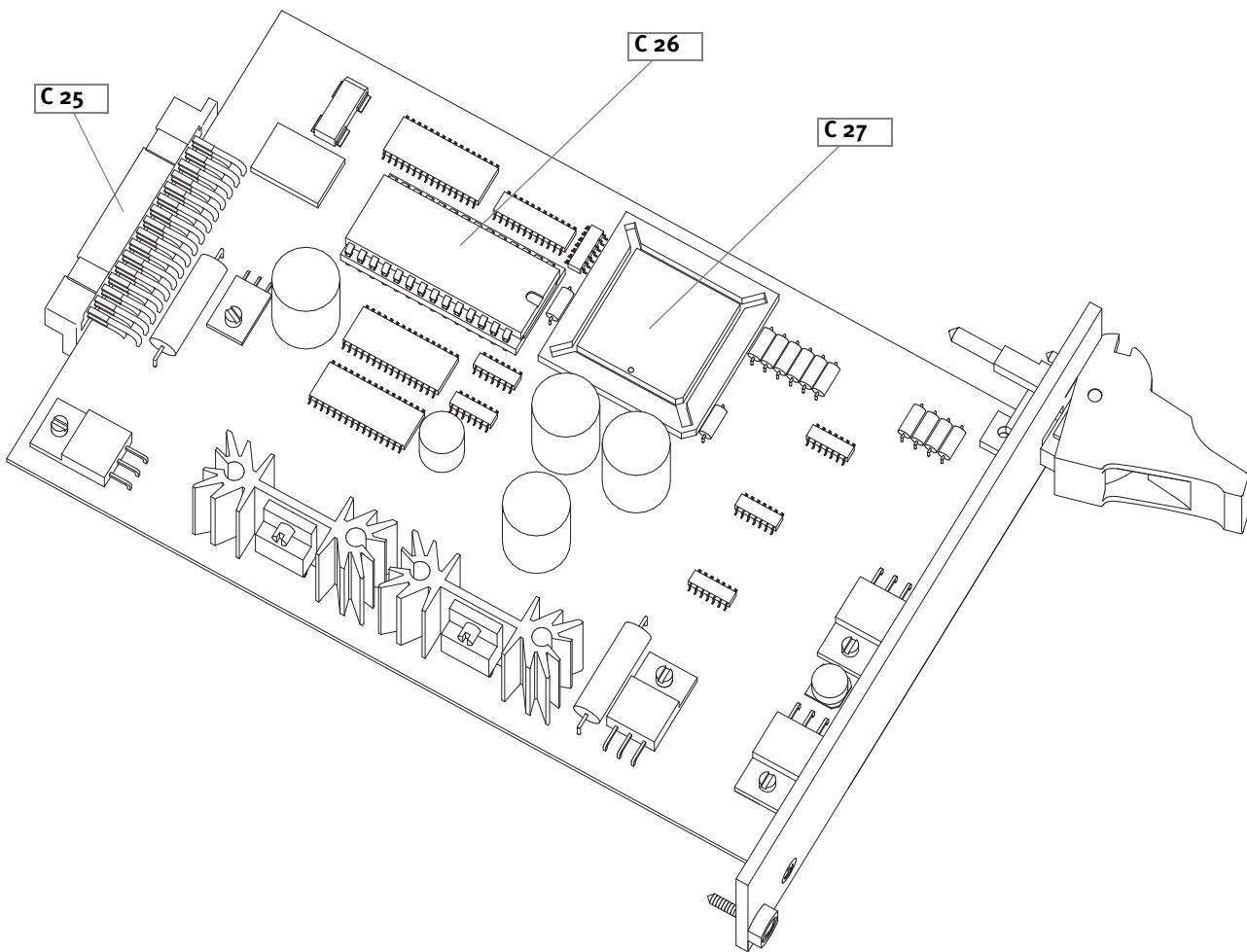


fig. 9: Overview of battery monitoring (ZAU 2002) circuit board

Mod. Item	Description	Number	SP number
C 25	Connection for backplane circuit board	CON 2	
C 26	EPROM (firmware) ZAU	IC 6	93-484-234
C 27	CPU 80C196KC	IC 1	

### Additional information on the EPROM ZAU

With EPROMs < V1.3 the charge function of the SCPC batteries is interrupted when the speed of the pump exceeds 3200 RPM and there is no Electrical Remote-Controlled Tubing Clamp connected. This feature was originally intended for the use with the JMS-SCP as the lower volume of the JMS disposable requires a higher speed for the same flow rate than with a Revolution®- based SCP. The interruption was intended for cases when an Electrical Remote-Controlled Tubing Clamp was connected.

As of EPROM V1.3 the charge cycle is interrupted when the pump speed exceeds 3200 RPM and there is an Electrical Remote-Controlled Tubing Clamp connected to the system.

## Mains monitoring (ZNU 2003) circuit board

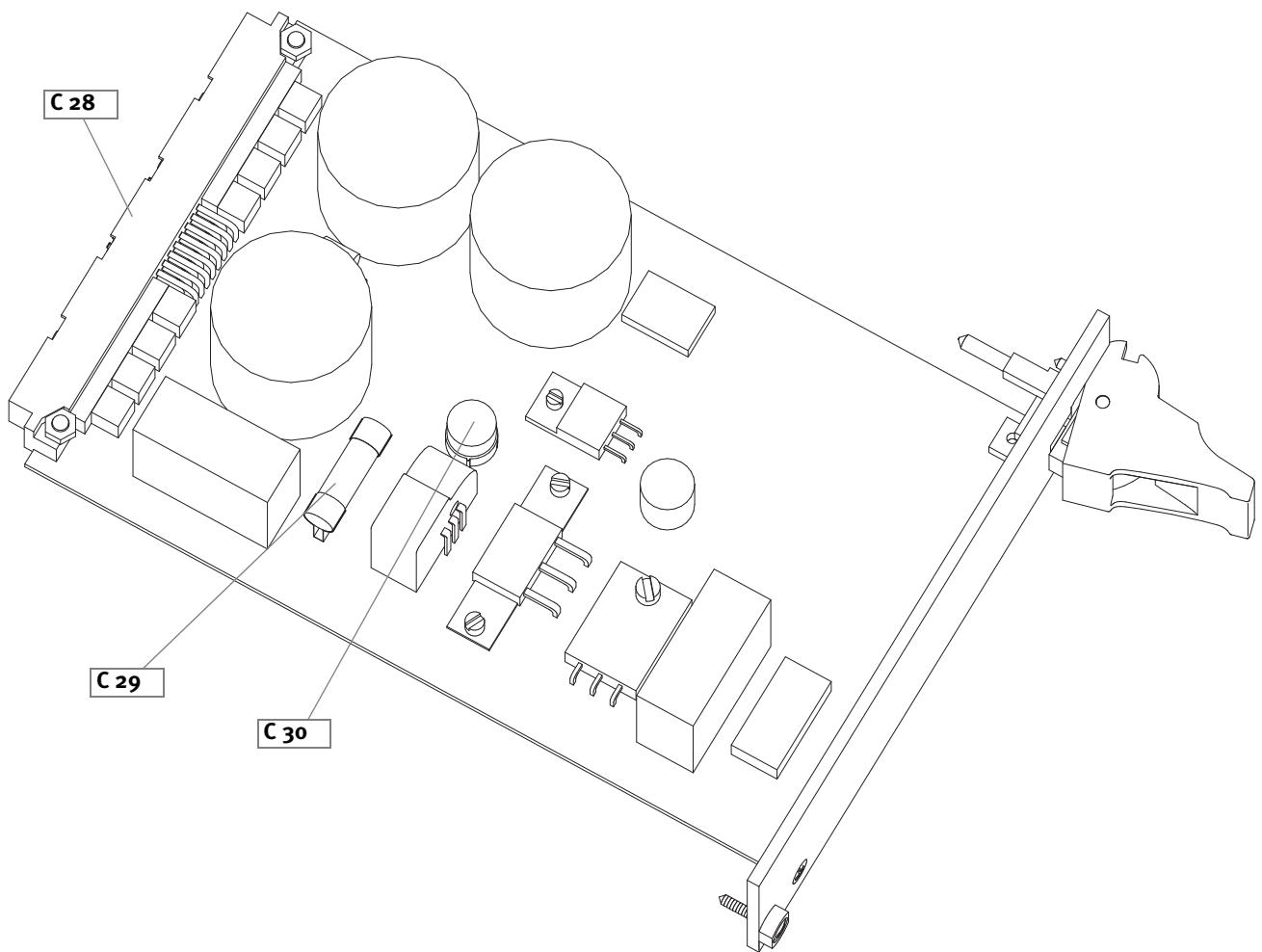


fig. 10: Overview of battery monitoring (ZAU 2002) circuit board

Mod. Item	Description	Number	SP number
C 28	Connection for <i>Backplane</i> circuit board	CON 1	
C 29	Fuse 10 A, slow-blow (battery)	S 1	93-511-030
C 30	1 A miniature fuse, slow-blow	S 2	93-510-039



# 4 User menu and service menu

## 4.1 User menu (summarised overview)

Detailed information on operating the SCPC System can be found in the relevant operating instructions. The following pages provide a short overview of the menu structure for simplified orientation.

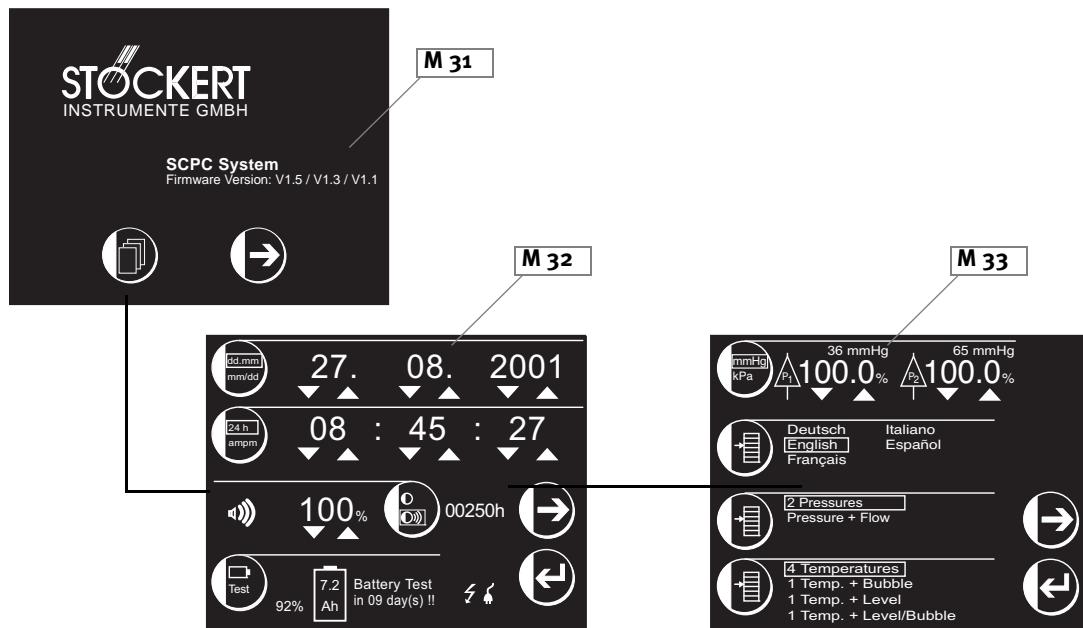


fig. 11: System menu overview

Item	Description	Function
<b>M 31</b>	Start page	<ul style="list-style-type: none"> <li>→ Goes to the Main and System Menu, (hidden) access to the Service Menu</li> <li>→ Display of the firmware versions (in this sequence) of:           <ul style="list-style-type: none"> <li>- CPU (ZDS 2006) circuit board</li> <li>- <i>Battery monitoring</i> circuit board (ZAU 2002)</li> <li>- <i>Interface</i> (ZIS 0202) circuit board</li> </ul> </li> </ul>
<b>M 32</b>	System menu 1	<ul style="list-style-type: none"> <li>→ Configuration of the basic settings</li> <li>→ Batteries test (battery test)</li> </ul>
<b>M 33</b>	System menu 2	<ul style="list-style-type: none"> <li>→ Changes the language</li> <li>→ Configuration of the monitoring functions (depending on the modules installed)</li> </ul>

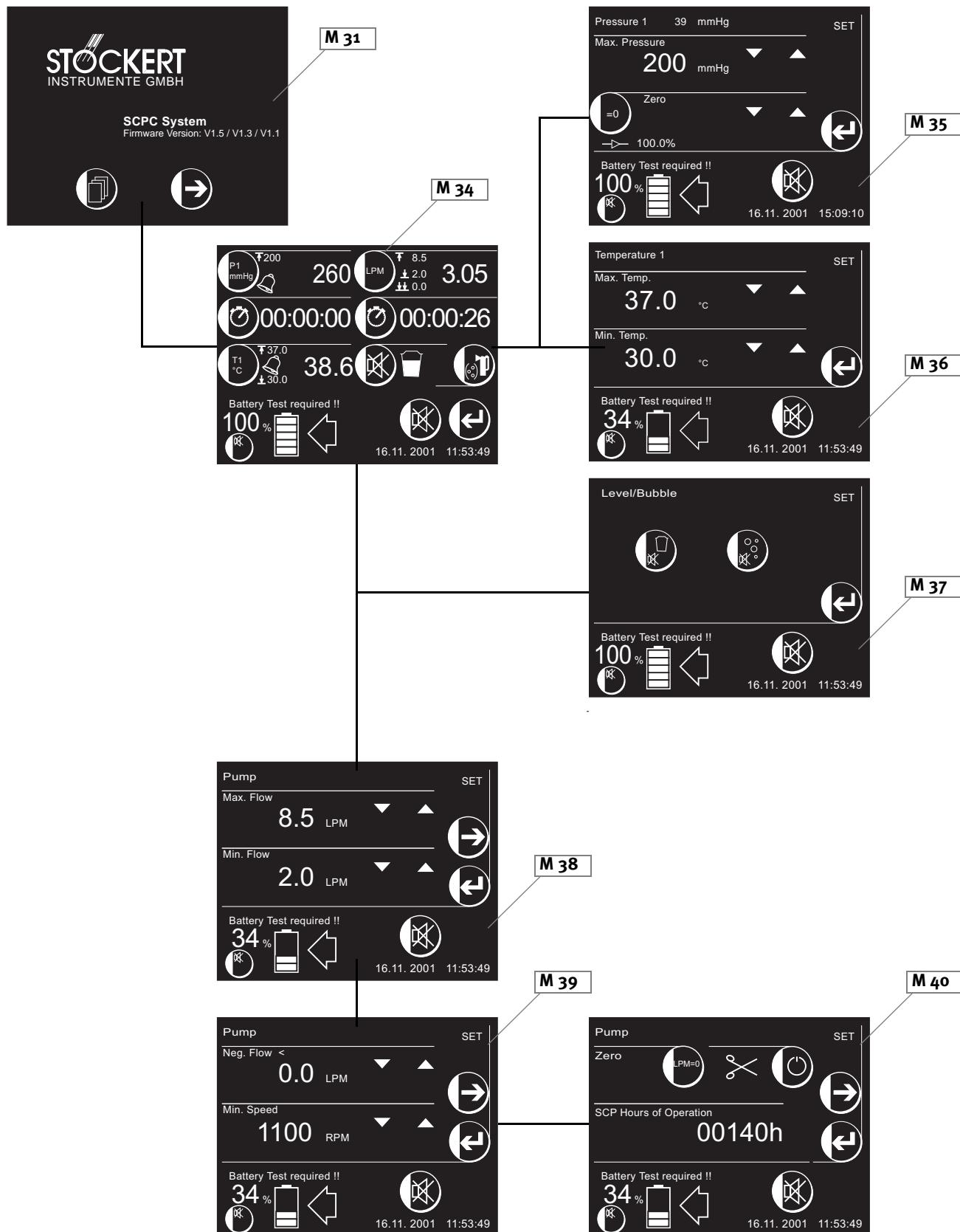


fig. 12: Overview of main and device menu

<b>Item Description</b>		<b>Function</b>
<b>M</b>	<b>34</b>	Main menu
		<ul style="list-style-type: none"> <li>→ Display of all set parameters and measured values (in this case for the configuration: “Pressure + flow” and “1 temperature channel + level/bubble”)</li> <li>→ Go to           <ul style="list-style-type: none"> <li>- Pressure menu</li> <li>- Temperature menu</li> <li>- Level/bubble menu</li> <li>- Pumps menu</li> </ul> </li> </ul>
<b>M</b>	<b>35</b>	Pressure menu
<b>M</b>	<b>36</b>	Temperature menu
<b>M</b>	<b>37</b>	Level/bubble menu
<b>M</b>	<b>38</b>	Pumps menu 1
<b>M</b>	<b>39</b>	Pumps menu 2
<b>M</b>	<b>40</b>	Pumps menu 3

## 4.2 Service menu

To open the Service menu, press the top right corner and then the left bottom corner on the start page in quick succession. The first page of the Service menu will be opened.

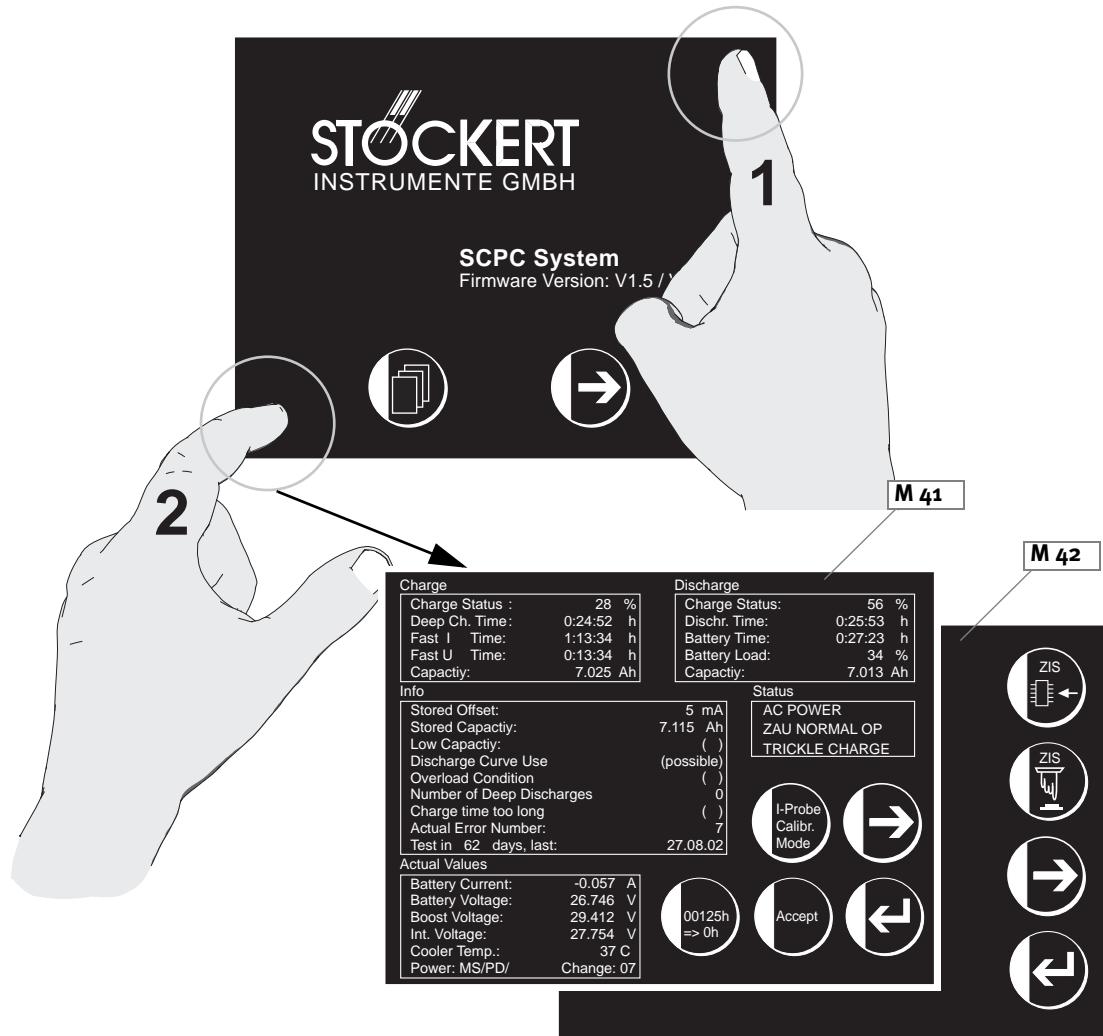


fig. 13: Service menu overview

Item	Description	Function
M 41	Service menu page 1	<ul style="list-style-type: none"> <li>→ Information on system and UPS parameters</li> <li>→ Starting the current sensor calibration</li> <li>→ Reset the hours of operation counter</li> </ul>
M 42	Service menu page 2	<ul style="list-style-type: none"> <li>→ Load the firmware for the <i>serial interface</i> circuit board via “Flash” memory programming</li> </ul>

## 4.2.1 Overview of keys and functions in the Service menu

Service menu pages 1 and 2	Function
	Key symbol <i>Next</i> → Move between the pages in the Service menu
	Key symbol <i>Return</i> (Return key) → Exit Service menu, back to start page
<b>Service menu page 1</b>	
	Key symbol <i>i-Probe Calib. Mode</i> → Calibration of the current sensor (e.g. after replacing the batteries)
	Key symbol <i>Accept</i> → Confirm the successful calibration and apply the value determined
	Key symbol <i>00125h &gt; 0h</i> → Reset the hours of operation counter
<b>Service menu page 2</b>	
	Key symbol <i>ZIS Flash Write</i> → Enable write access to the firmware for <i>serial interface</i> (ZIS) circuit board. The programming is carried out via an external PC and the relevant Flash software.
	Key symbol <i>ZIS Reset</i> → Manual reset of the <i>serial interface</i> (ZIS) circuit board. This is also carried out automatically when exiting the Service menu.

## 4.2.2 Displays in the Service menu

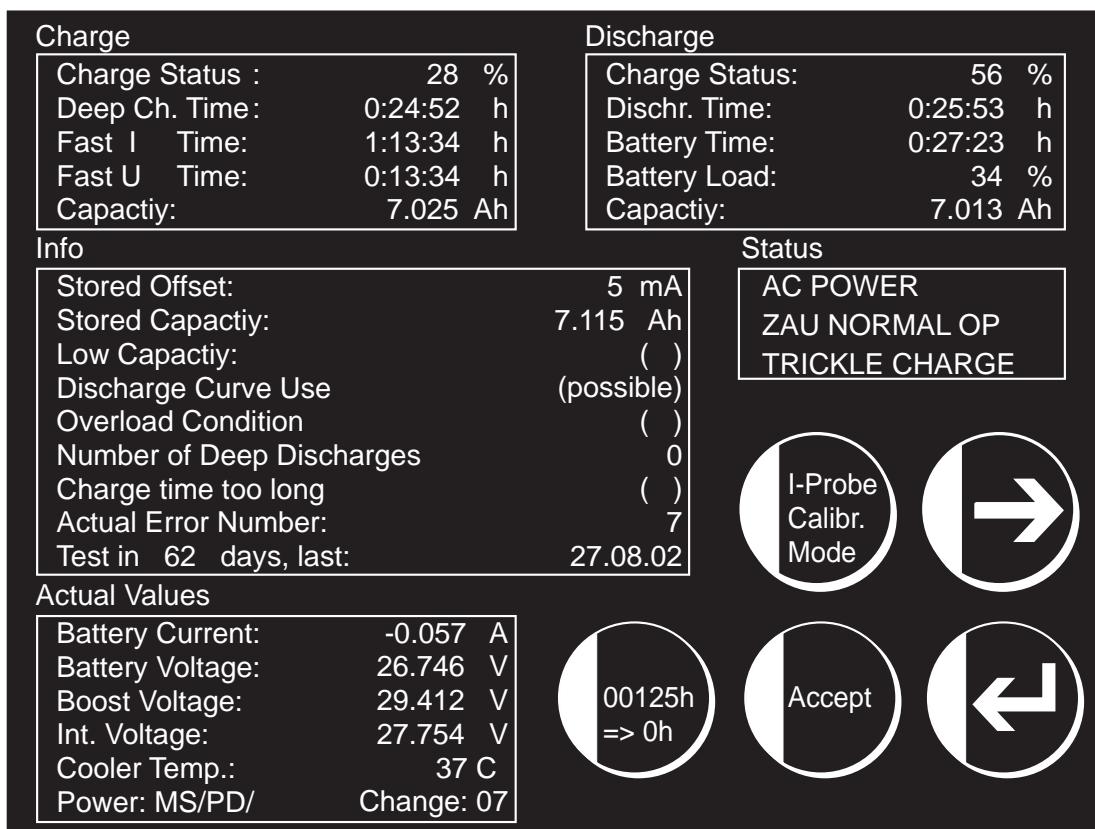


fig. 14: Overview of Service menu (page 1)

### Charge (all details are only updated during the charge process)

Charge Status [%]	Charging level
Deep Ch. Time [h]	Duration of the 1st battery charge phase
Fast I Time [h]	Duration of the 2nd battery charge phase
Fast U Time [h]	Duration of the 3rd and last battery charge phase
Capacity [Ah]	Battery capacity

### Discharge (all details are only updated during the discharge process)

Charge Status [%]	Charge remaining
Dischr. Time [h]	Duration of the current discharge process
Battery Time [h]	Remaining time for battery operation at current load
Battery Load [%]	Battery load
Capacity [Ah]	Battery capacity

<b>Status</b>	
AC Power	Normal main operation
Battery Power	Battery/UPS operation
Power Off	Error, ZAU cannot perform shut-down operation (ZAU or ZBP defective)
Power Failure	Error, ZAU defective/UPS defective
ZAU Normal OP	Normal function of battery monitoring
ZAU T1 Test	Switch-on self-test (for mains operation only)
ZAU Calibration	
Trickle Charge	Maintenance charge (keeps the charging state at 100 %)
Battery Test	Running battery test
No Battery	No batteries found/batteries faulty
Battery Not Charged	Battery voltage less than approx. 12 V
Charge From Deep	1st Charge phase, battery voltage less than 18 V
Fast I Charge	2nd charge phase
Fast U Charge	3rd charge phase
Discharge	Discharge, battery/UPS operation
Deep Discharge	Deep charge activated
<b>Info</b>	
Stored Offset [mA]	Stored offset of the current sensor following calibration (nominal value M ± 70 mA)
Stored Capacity [Ah]	Capacity determined at last battery test
Low Capacity	Capacity determined at battery test less than 80% of nominal capacity (7.0 Ah)
Discharge Curve Use (in use/possible/not used)	Use of recorded discharge curves to determine the calculated values (e.g. remaining battery time)
Overload Condition	Current overload in battery operation Possible consequence: Faulty current sensor
Number of Deep Discharges	Saved number of deep discharges, deleted after battery test
Charge Time too long	Charge time over 140% of the normal value
Actual Error Number	Number of current error (see Chap. 5.1.2)
Test in xx days, last: dd.mm.yy	Information on the battery test
<b>Actual Values</b>	
Battery Current [A]	Battery current positive (+) during discharge negative (-) during charge
Battery Voltage [V]	Current battery voltage
Boost Voltage [V]	Internally generated, increased charge voltage (required for battery charge for operation on HLM)
Int. Voltage [V]	Internal (currently used) voltage
Cooler Temp [° C]	Temperature on the cooler/charge dropping resistor of battery monitoring (ZAU)
Power: **/** Change: **	Not relevant for service, internal message

### 4.2.3 Calibrate current sensor

The calibration of the current sensor does **not** form part of the regular maintenance and checking work on the SCPC System. Re-calibration is only normally possible in the following cases:

- After replacing the batteries
- If the battery current display is fluctuating strongly

Calibration work should only be performed at normal room temperature (20-25 °C). To perform the current sensor calibration:

	▶ Press the key symbol <i>i-Probe Calib. Mode</i>	→ The calibration process is started. Wait for approx. 2-3 minutes, before performing the next steps.
	▶ Check the display <i>Battery Current</i> (in the <i>Actual Values</i> field)	→ If the current displayed here has settled at a value of $M \pm 70$ mA, it can be assumed that the current sensor is correctly calibrated.
	▶ Press the key symbol <i>Accept</i>	→ The value determined is then transferred to the <i>Stored Offset</i> display.

If you close the calibration process without confirming afterwards (*Accept*), the original value saved is retained.

#### 4.2.4 Update firmware of serial interface (ZIS) circuit board

Unlike the other firmware (EPROMs) in the SCPC System, this update is performed using Flash memory programming. The following is required:

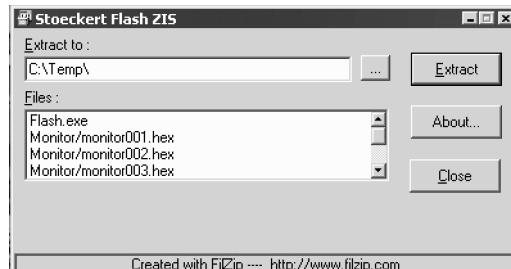
- A PC with Windows 95/98/NT/2000
- A "crossed" serial cable (null modem or "DTE to DTE" cable) for connecting the PC to the serial interface port of the SCPC system (included in scope of delivery).
- The update software and current data files included in the scope of delivery.



- 
- ▶ Connect the serial cable to the PC and the SCPC System. This can be done when the device is switched on (and active Service menu).
  - ▶ Press the key symbol *ZIS Flash Write* to enable write access to the firmware and simultaneously activate the serial interface of the SCPC System.
  - ▶ Now, access the *ZISFW10.exe* file. If you are using the relevant update CD-ROM and the Autostart option is activated in the system settings, the program for extracting and installing the firmware will run automatically. If the Autostart option is deactivated, or if you wish to repeat the procedure, start the program by double-clicking the icon.



- ▶ Confirm the update by clicking on the button "Extract" in the dialog box shown below.



The update will now be carried out. You will see a field on the display confirming the successful update of the Firmware.



If you then exit the Service menu, the serial interface is reset automatically. Check the display of the firmware versions on the start page of the SCPC User menu. The third version number should now match the version of the file just transferred.

## Manual installation

If the update program and the data files (ZIS\_V\*.H86 or ZIS\_V\*.HEX, where V\* specifies the version number, e.g. ZIS\_V1.0.HEX) are already unpacked on your harddrive, you can manually perform the update as described below:

- ▶ Press the key symbol *ZIS Flash Write* to enable write access to the firmware and simultaneously activate the serial interface of the SCPC System.
- ▶ Start the MS-DOS prompt on the PC. Go to the folder where the Flash program and the update file is located on your PC and start the FLASH.EXE program. Example for the input (folder names may be different on your machine):

c:\programs\scpc\zis\flash

The Flash program then transfers the most recent update file in this folder to the SCPC System. You can also select a specific update file by entering the name of the file when starting the program. Example:

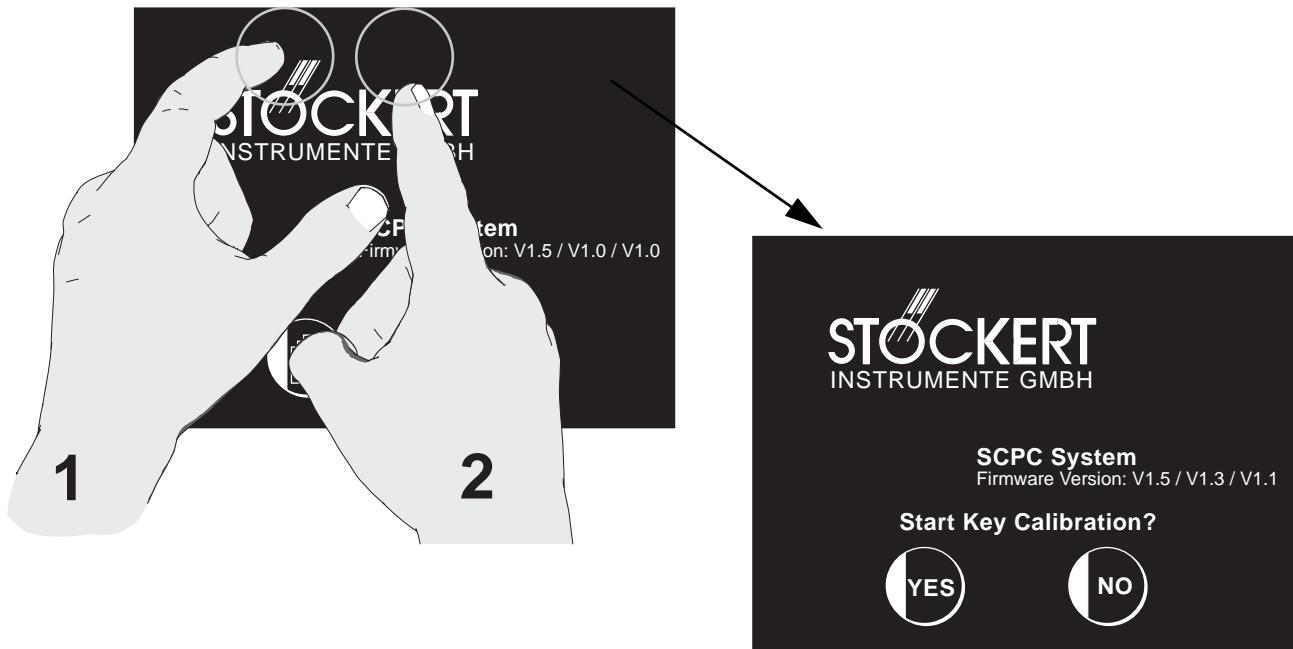
c:\programs\scpc\zis\flash zis\_v1.0.hex

If you are using a serial interface other than COM 1 or 2 on your PC, this **must** be specified when the program is started. Example:

c:\programs\scpc\zis\flash com3 zis\_v1.1.hex

#### 4.2.5 Calibrate the touch screen

If software buttons react only if you press a button at several positions, that is, if the position where the button reacts has shifted, it may be necessary to calibrate the touch screen. It may also be necessary to calibrate after ZDS board and/or EPROM replacement.



- ▶ To open the *Key Calibration* menu, press the two hidden buttons on the start page in quick succession:
  - the stripes/dots above the letter "o"(the "ö") in the Stöckert logo, and
  - the area just above the letter "E" in the Stöckert logo.
  -
- ▶ To start calibration, press "YES".

The display now goes blank and displays the number "1" in a small circle.

- ▶ Press the displayed number; the small button will disappear and the number "2" button is displayed.
- ▶ Press the displayed numbers through number "54".

The small buttons will be displayed in different locations across the touch screen.

- ▶ After you have finished, wait for 2-3 seconds.
- The start page is displayed again and the calibration procedure is completed.





# 5 Error messages and error diagnosis

The SCPC System is subjected to continual self-monitoring. Any errors occurring (e.g. failure of a component) are displayed on the touch screen (both on the normal user interface and in the Service menu).

## 5.1 Error messages

### 5.1.1 Non-specific errors

Error	Description/Possible Causes	Corrective Measures (please observe sequence)
System will not start although the batteries are charged	Switch defective	<ul style="list-style-type: none"> <li>– Check/replace switch</li> </ul>
System will not start if the batteries are not charged or are missing	Mains cable missing or faulty Transformer/connecting terminal wiring Switch defective Mains filter defective Rectifier faulty	<ul style="list-style-type: none"> <li>– Connect/check mains cable</li> <li>– Check wiring/connecting terminal</li> <li>– Check/replace switch</li> <li>– Check/replace mains filter</li> <li>– Check/replace rectifier</li> </ul>
System starts (audibly), but display remains dark	Contact fault ( <i>CPU</i> board, display/CON 3 connection or lighting/CON 7)	<ul style="list-style-type: none"> <li>– Test connector (CON 3) between <i>CPU</i> board and <i>display</i> board, clean contacts</li> <li>– Check CON 7 connector/cable, clean contacts</li> <li>– If plug contacts (CON 3) are bent or broken, replace entire touch screen</li> <li>– If the socket contacts are broken or corroded, replace <i>CPU</i>board</li> </ul>
	<i>Display</i> circuit board faulty	<ul style="list-style-type: none"> <li>– Replace entire touch screen</li> </ul>
	<i>CPU</i> circuit board (ZDS 2006) faulty	<ul style="list-style-type: none"> <li>– Replace <i>CPU</i>board</li> </ul>

## 5.1.2 Error codes

The following error messages are displayed on the touch screen (both in the normal user interface and in the Service menu). In the Service menu this is always displayed in the form of an error code, whereas in the user interface is given partly as symbols (e.g. battery with a line through it) or plain text messages (e.g. "No COM!").

Error code	Description	Corrective Measures (please observe sequence)
<b>01</b>	RAM defective	– Replace ZAU circuit board
<b>02</b>	EPROM defective, checksum incorrect	– Replace EPROM, if the error remains displayed: – Replace ZAU circuit board
<b>04</b>	EEPROM write error	– Repeat battery test (one occurrence of this error is tolerable) – Replace ZAU circuit board if necessary
<b>05</b>	ADC (analog/digital converter) faulty	– Replace ZAU circuit board
<b>07</b>	Battery faulty, charge/discharge interrupted (operation possible without UPS)	– Check batteries/voltage – Check battery wiring – Check fuse S 1 (10 A) on ZNU circuit board – Check relay on ZNU circuit board – Replace ZAU/ZNU circuit boards if necessary
<b>08</b>	Saved data (battery test) incorrect	– Repeat battery test (one occurrence of this error is tolerable)
<b>09</b>	Saved capacity (battery test) incorrect	– Replace ZAU circuit board if necessary
<b>Error in T1 test (switch-on self-test)</b>		
<b>10</b>	Current sensor faulty (value > 300 mA)	– Replace ZNU circuit board; if the error display persists: – Replace ZAU circuit board
<b>11</b>	Relay on ZAU circuit board faulty, battery charging not possible	– Replace ZAU circuit board
<b>12</b>	Boost voltage 1/ZAU circuit board	– Replace ZAU circuit board
<b>13</b>	Boost voltage 2/ZAU circuit board	
<b>14</b>	Charge indicator faulty (Symptom: Charge times too long)	
<b>15</b>	Discharge circuit faulty (Symptom: Battery test not possible)	– Check wiring from <i>backplane</i> (CON 4) circuit board to discharge resistance – Check discharge resistance – Replace ZAU circuit board
<b>17</b>	Saved offset of current sensor (in EEPROM) incorrect	– Calibrate current sensor – Replace ZAU circuit board
<b>18</b>	Voltage test delivers different results (2 independent test circuits in the SCPC System)	– Check mains voltage, if stable and over 190 V (for the 230 V variant): – Replace ZNU/ZAU circuit boards
<b>19</b>	Charge time too long	– Check batteries and wiring

**Other error codes:** Error codes from **20** to **28** originate from the SCP System and are stored only in the SCPC System. Information on these can be found in the Service Manual for the SCP System. Error code **30** indicates a software error following successful completion of the T1 test (switch-on self-test). The cause for this could be a fault in the EEPROM on circuit board *CPU*.

### 5.1.3 Current sensor

The current sensor is a critical part of the battery monitoring function. The previous section mentioned various error numbers which indicate an error in the current sensor. In principle a fault in the current sensor may occur if a current of over 5 A has been flowing for an extended period (e.g. during/after a total discharge). In this case, observe the offset of the current sensor in the Service menu. If this is continually fluctuating or is constantly over 100 mA, the current sensor is faulty. The nominal value for the current sensor offset is a value  $M \pm 70 \text{ mA}$ . In the event of a fault:

- ▷ Replace the *Mains monitoring* (ZNU) circuit board
- ▷ Calibrate the current sensor (see Chap. 4.2.3 on page 4.36)

If this measure does not resolve the error:

- ▷ Replace the *Battery monitoring* (ZAU) circuit board
- ▷ Calibrate the current sensor (see Chap. 4.2.3 on page 4.36)
- ▷ Perform a battery test

If this measure also does not produce the desired result:

- ▷ Replace the batteries
- ▷ Calibrate the current sensor (see Chap. 4.2.3 on page 4.36)
- ▷ Perform a battery test



# 6 Replacing components

## 6.1 Accessing SCPC System modules

### 6.1.1 Externally accessible modules

It is not necessary to open the SCPC System to replace the following modules:

- ▷ *Battery monitoring* circuit board
- ▷ *Mains monitoring* circuit board
- ▷ Sensor modules

#### **Battery monitoring (ZAU 2002) and Mains monitoring (ZNU 2003)**

The layout of these circuit boards conforms to the description on page 6.47. Other parts of the casing do not need to be opened.

Notes on replacing individual components on these circuit boards (e.g. fuses, EPROM) can be found in chap. 6.9.

**Caution:** When the front panel and touch screen are removed and the housing is open there is access to battery voltage. Remove the bridge between the batteries to reduce the risk of short circuits.



## 6.1.2 Opening the SCPC System

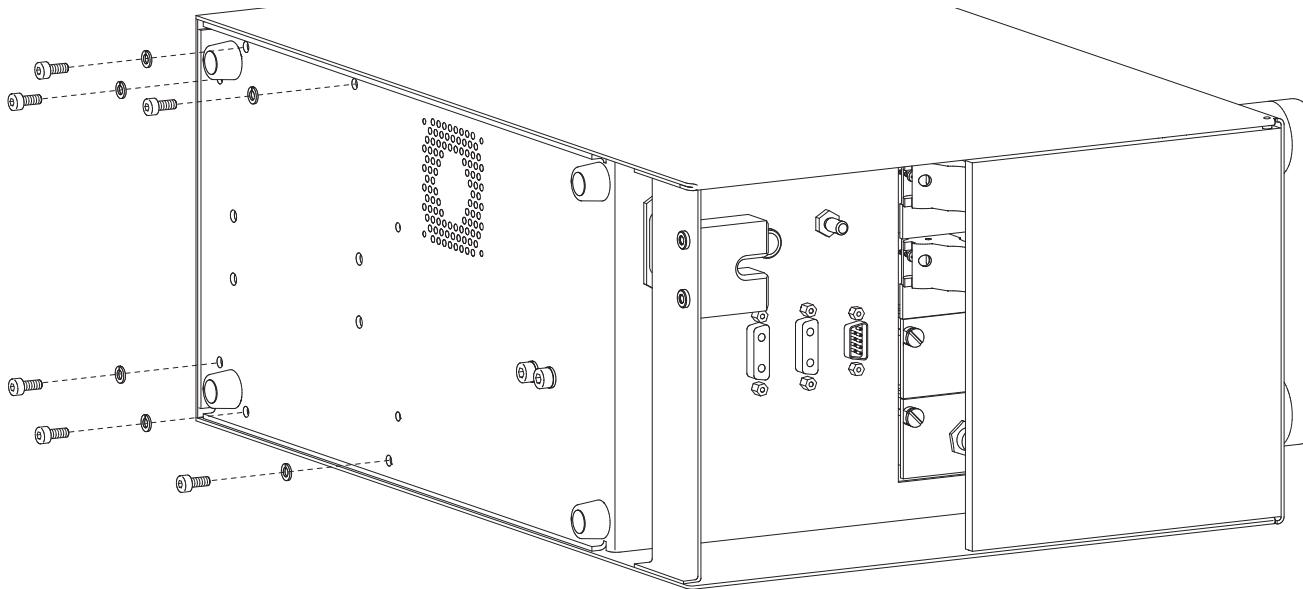


fig. 15: Opening the casing

- ▶ Carefully place the SCPC System on its side.
- ▶ Unfasten the six screws shown above (Allen screws size. 3) on the bottom of the casing including the washers.

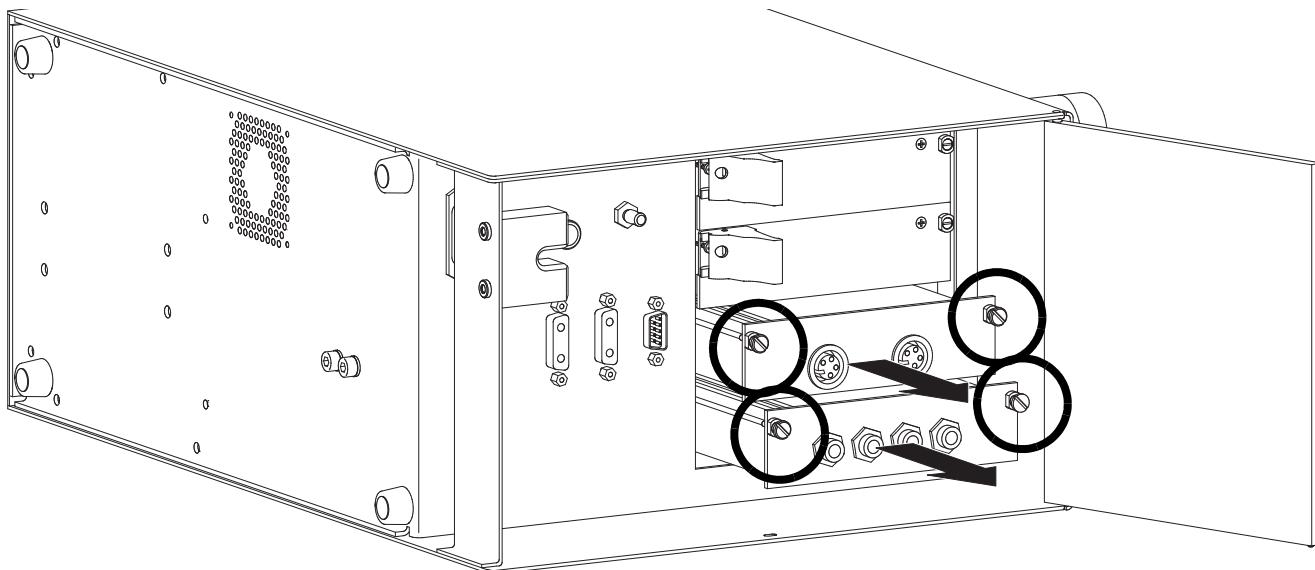


fig. 16: Removing the modules

- ▶ Open the cover plate.
- ▶ Unscrew the four screws on the sensor modules as shown (slotted screwdriver size 2).
- ▶ Pull out both modules.

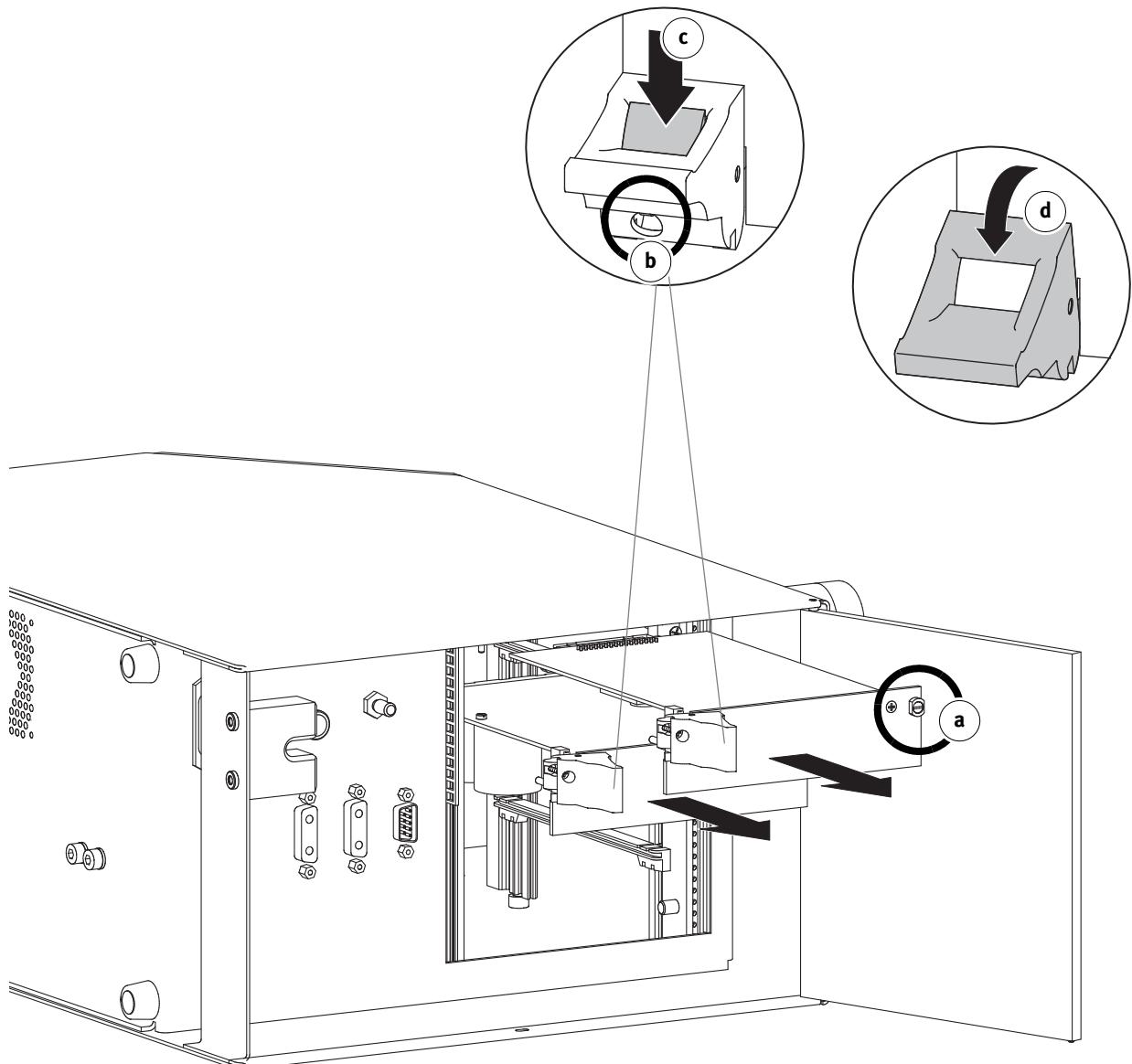


fig. 17: Removing the circuit boards

- ▷ Unfasten the screws (**a**) on the upper edges of the circuit boards *battery monitoring* (ZAU 2002) and *mains monitoring* (ZNU 2003) (slotted screwdriver size 2).
- ▷ Unfasten the screws (**b**) on the eject levers (slotted screwdriver size 2).
- ▷ Press the lock on the eject lever downwards (**c**).
- ▷ Tilt the eject lever (**d**).
- ▷ Pull both circuit boards straight out on the eject levers.

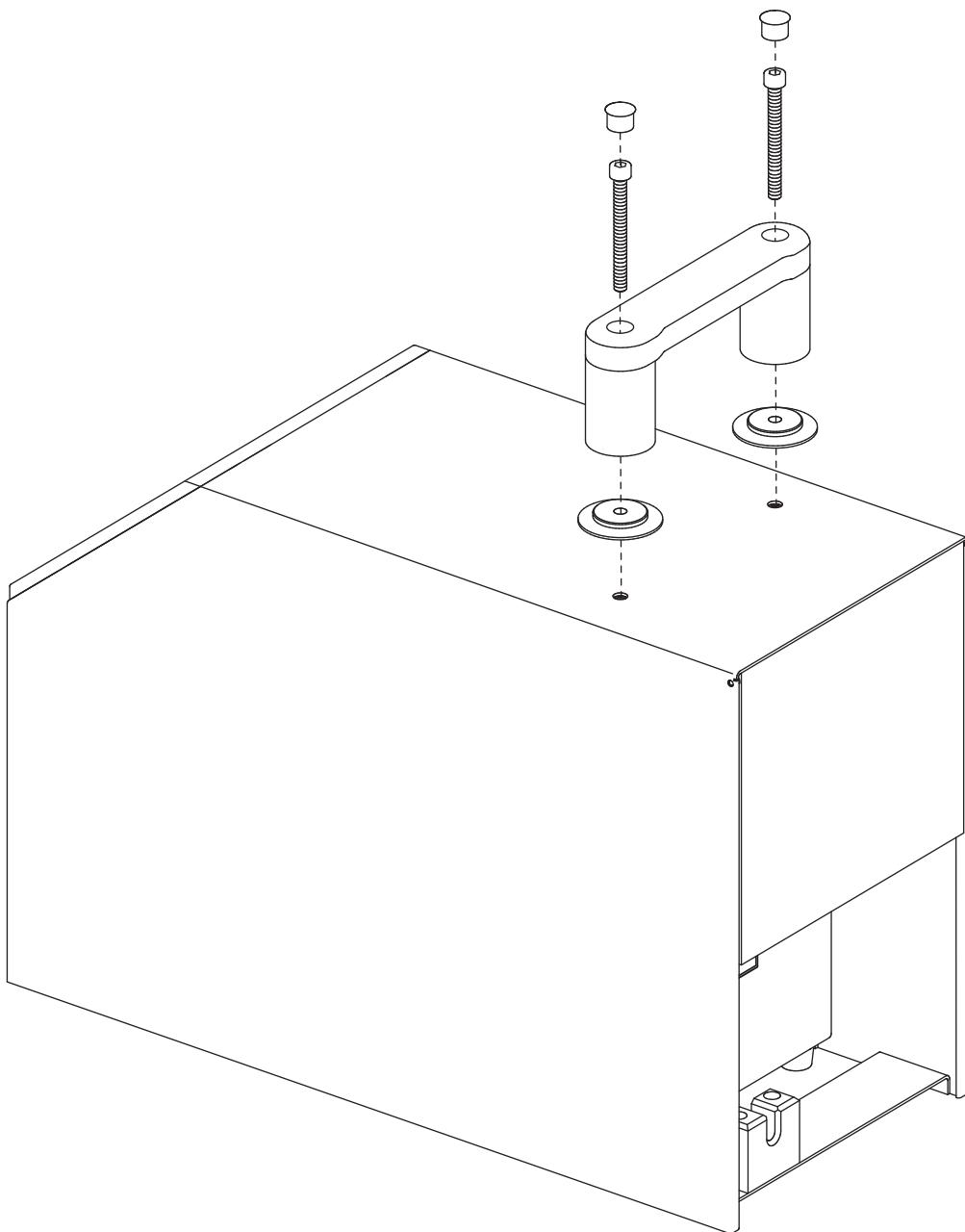


fig. 18: Unfastening the grip

- ▶ Place the SCPC System upright once more.
- ▶ Remove the two plastic caps on the grip.
- ▶ Unfasten both screws (Allen key 5) in the grip.
- ▶ Take off the grip including the spacing washers.

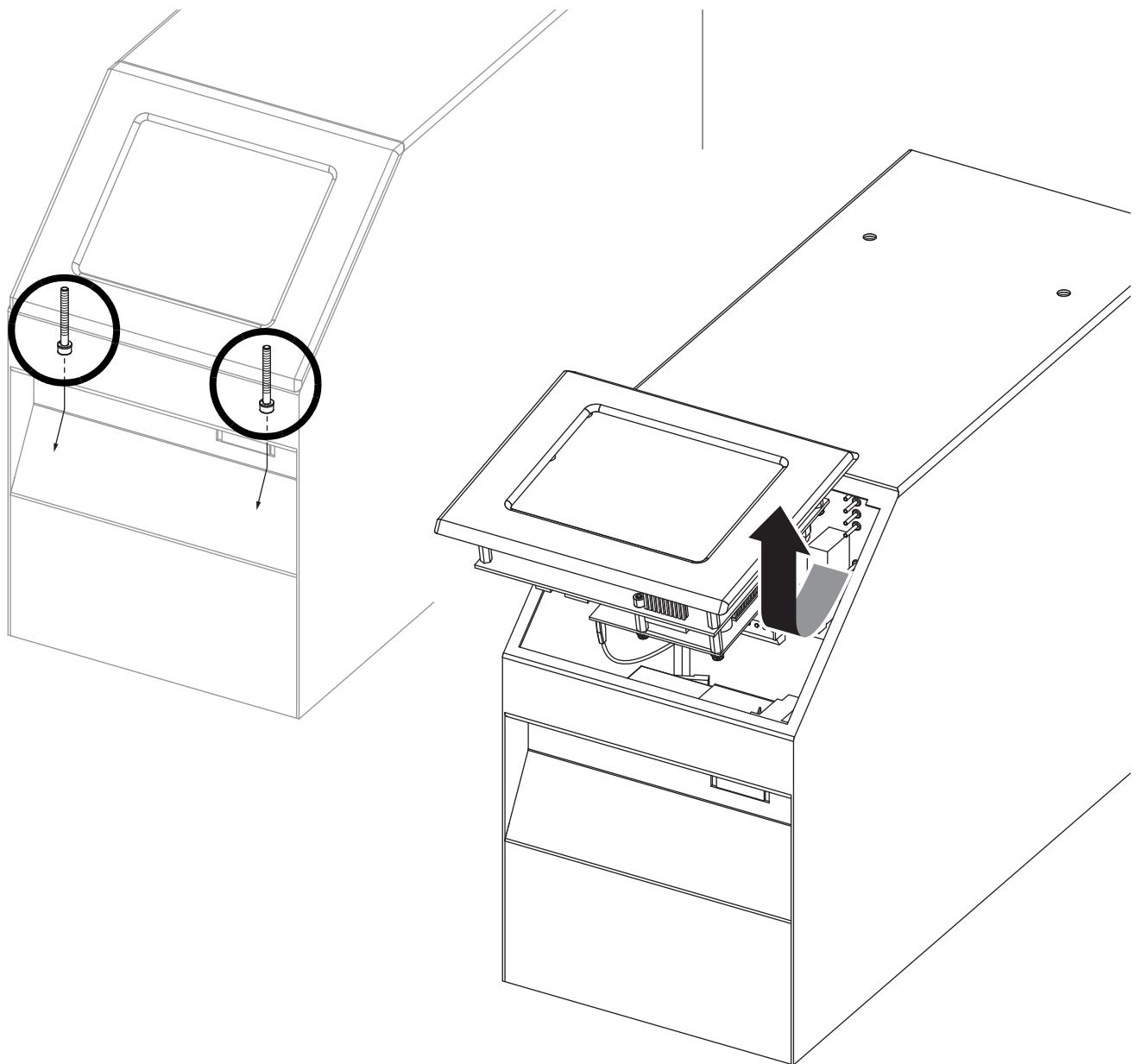


fig. 19: Removing the touch screen module

**Caution:** The casing cannot be taken off at this point because various connections to the touch screen module need to be disconnected first!



- ▶ Unfasten the two screws as shown (Allen key size 3) in the front ventilation access.
- ▶ On the upper side the module is fixed using a catch on the casing. Carefully move the module (in the direction of the arrow) downwards slightly to release this catch from the SCPC System casing.
- ▶ Now carefully lift the module until you can see the circuit boards and cable connections.

**Caution:** When the front panel and touch screen are removed and the housing is open there is access to battery voltage. Remove the bridge between the batteries to reduce the risk of short circuits.



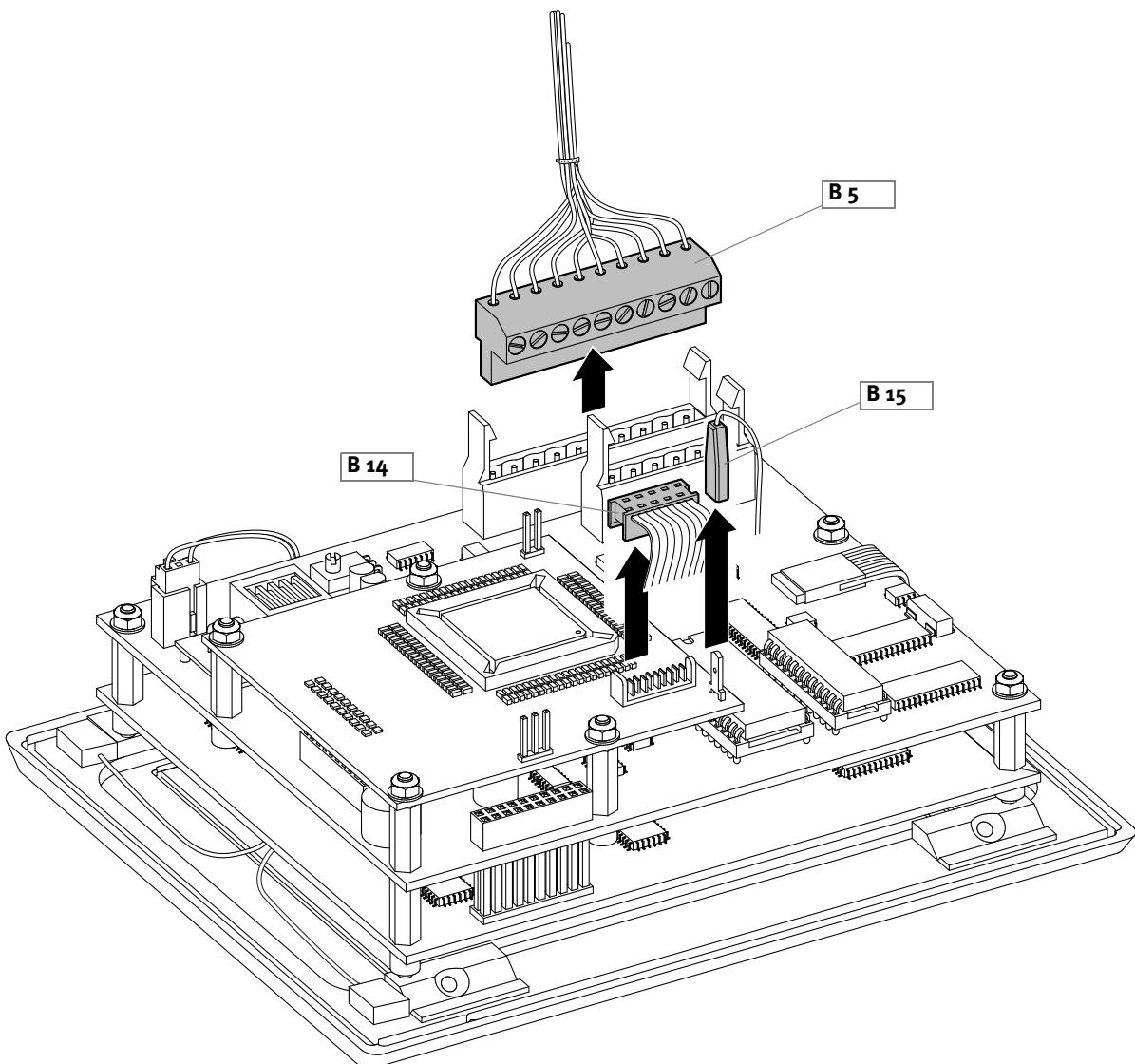


fig. 20: Arranging the touch screen module

- ▷ Remove the connector **B 5** (*CPU* circuit board to *backplane* circuit board), **B 14** (serial interface flat cable) and **B 15** (*Interface* circuit board to *Backplane* circuit board).
- ▷ Carefully place the touch screen module on a soft, level surface with the display surface facing downwards. Ensure that the screen is not scratched.

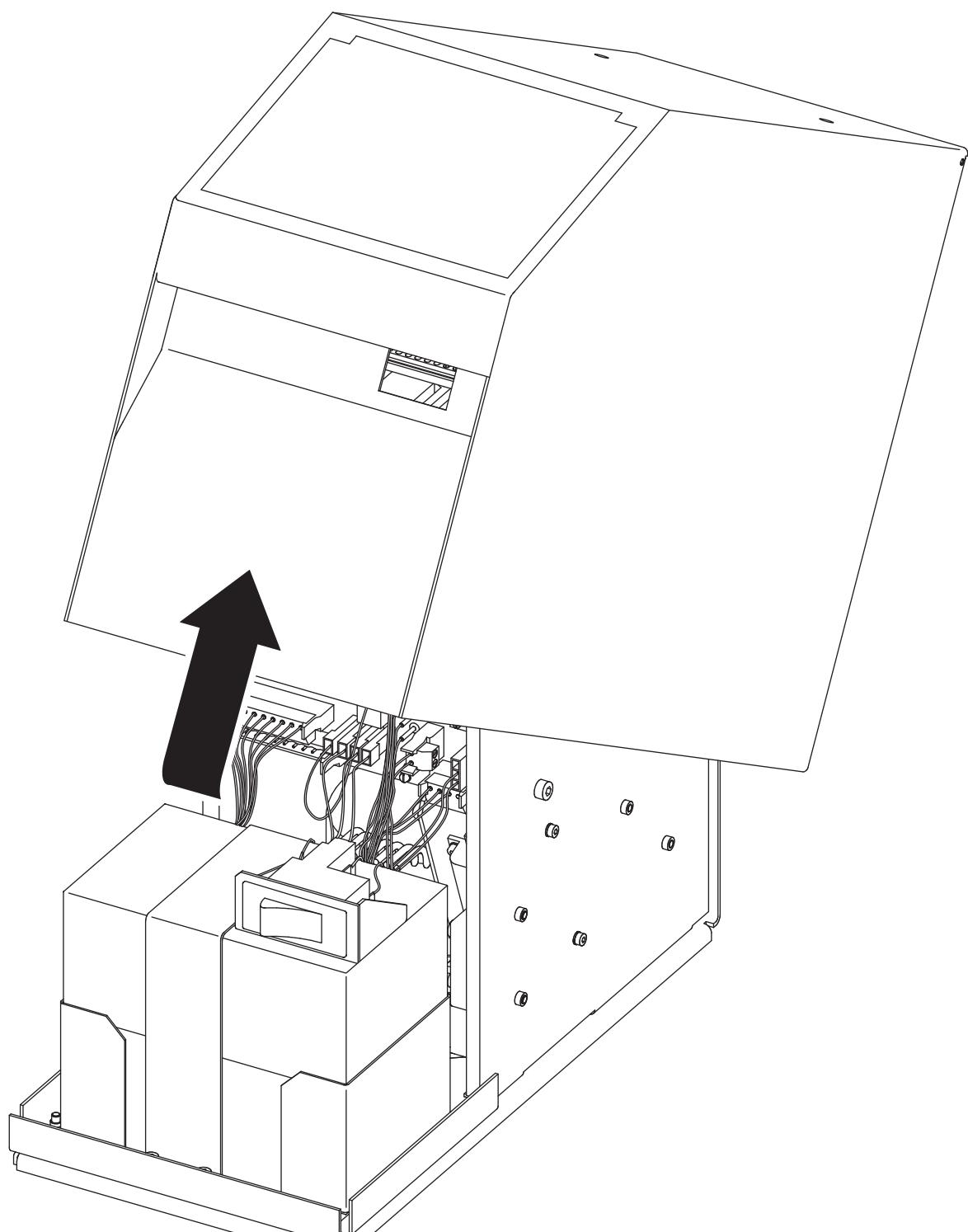


fig. 21: Removing the casing

**Caution:** When the front panel and touch screen are removed and the housing is open there is access to battery voltage. Remove the bridge between the batteries to reduce the risk of short circuits.



- Now carefully lift the upper part of the casing upwards.

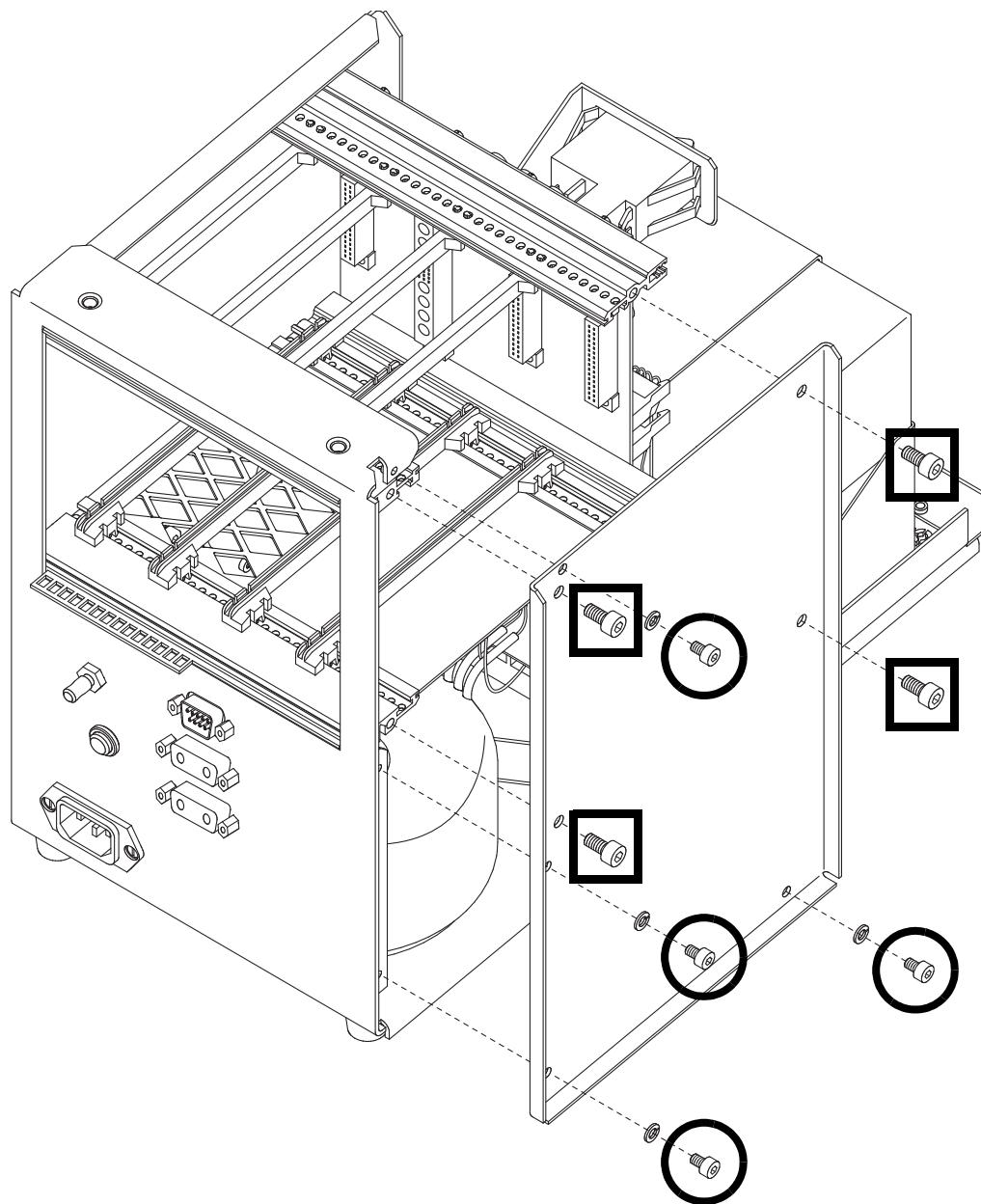


fig. 22: Disassembling the side panel

The side panel needs to be disassembled to access the ring core transformer, rectifier, main filter, automatic circuit breaker, fan and all interfaces on the rear of the device

- ▷ Unscrew the four screws indicated (Allen key size 4).
- ▷ Unscrew the four screws indicated (Allan key size 2) including the washers.
- ▷ Take off the side panel.

## 6.2 Batteries

The SCPC System has an integrated test routine for the batteries (see operating instructions). If the batteries no longer match the required performance values or are faulty, they must be replaced immediately (to ensure the UPS function).

### 6.2.1 Removing the batteries

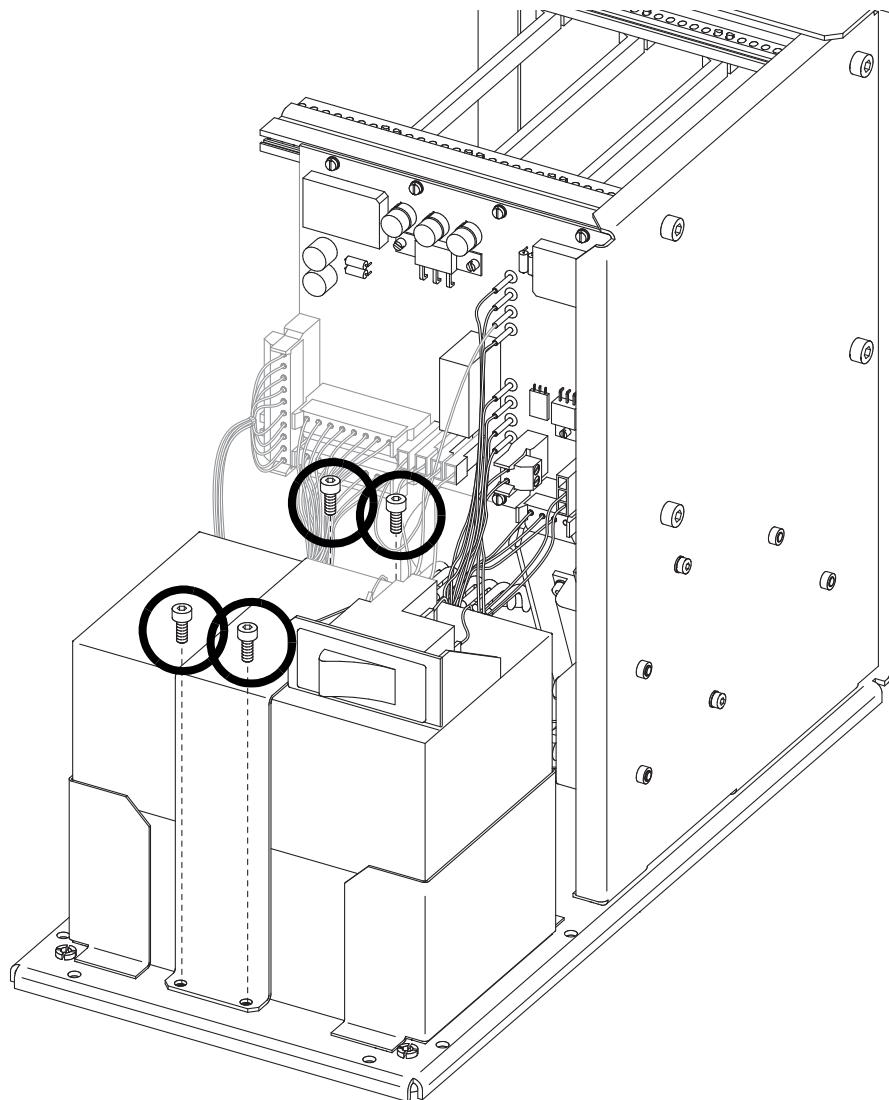


fig. 23: Removing the batteries 1

- ▶ Unscrew the four screws indicated (Allen key size 3) including the washers. It is recommended that you use a (magnetic, if possible) hexagon screwdriver with a long shaft and spherical head.

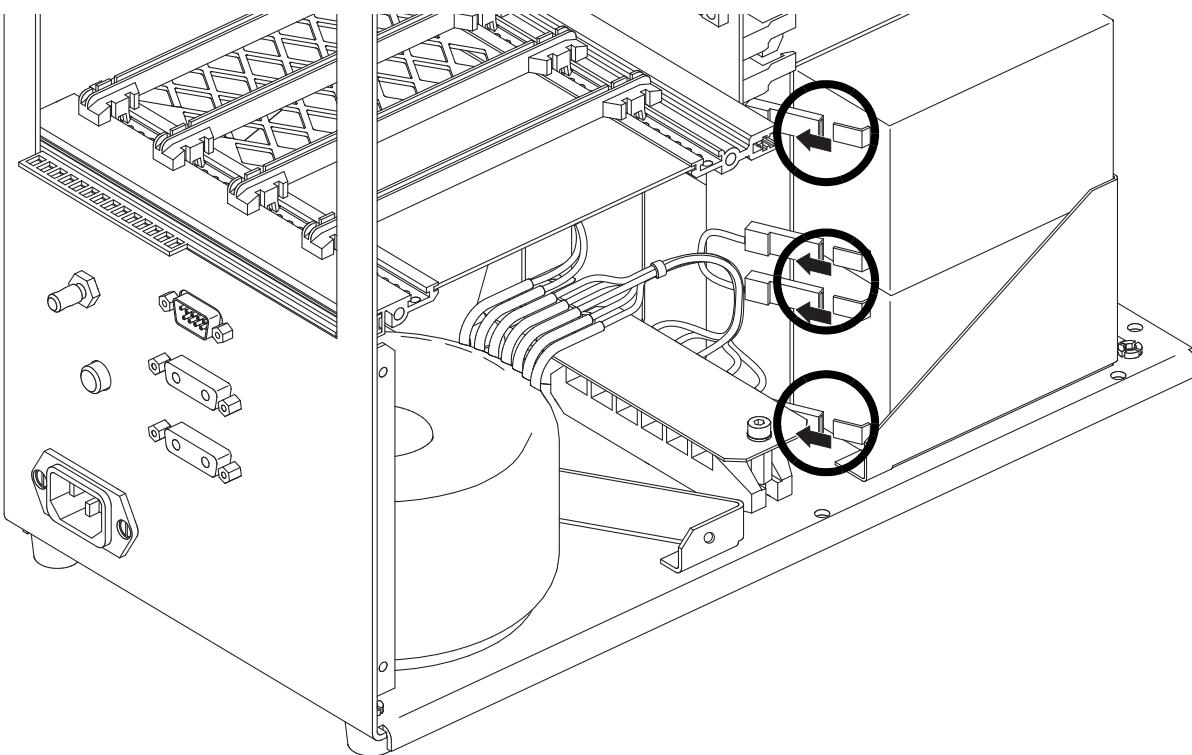


fig. 24: Removing the batteries 2

- Unfasten the four connectors on the rear side of the batteries.

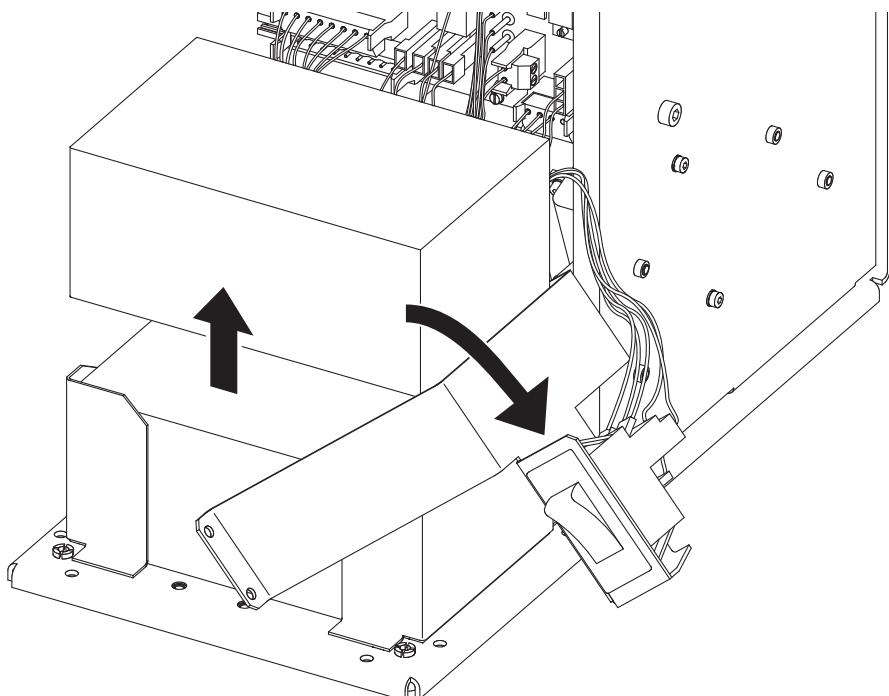


fig. 25: Removing the batteries 3

- Tilt the clip using the toggle switch on the side.
- Lift the batteries out of the casing vertically one by one. Ensure that the bare contacts do not touch any other components (risk of short-circuits).

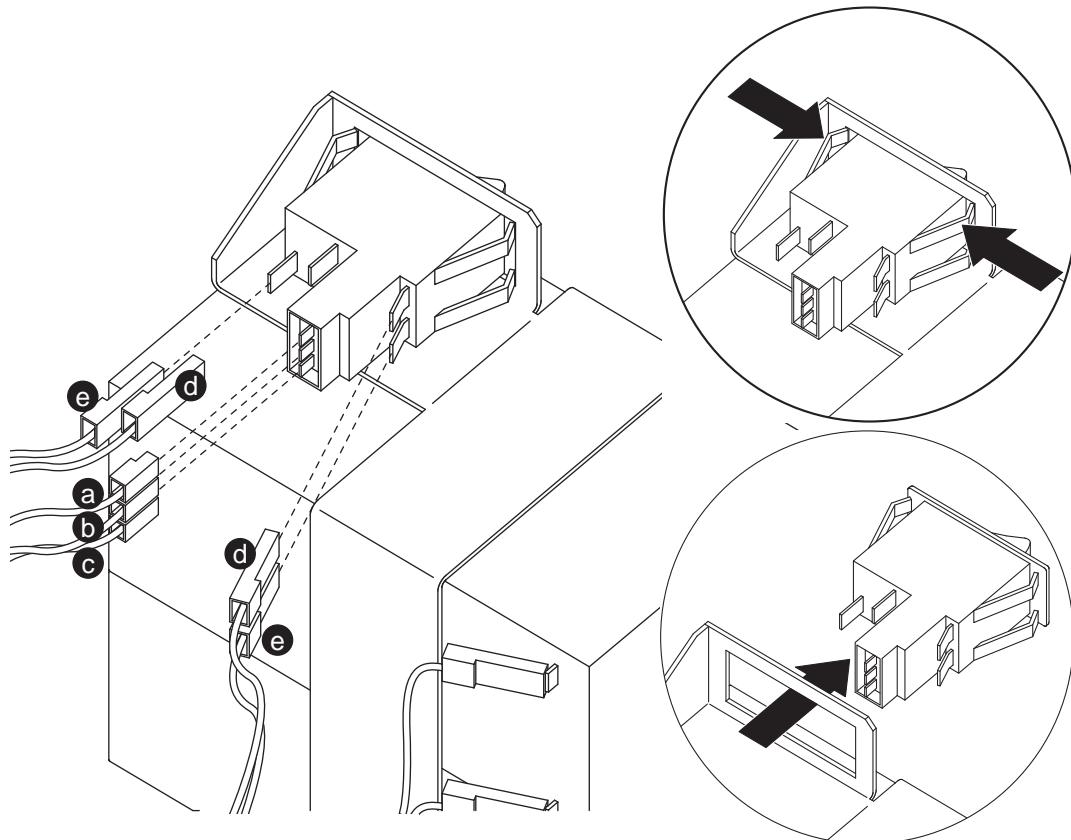
!

The new batteries are installed by following the same steps, in reverse order.

## 6.3 Primary-side mains connection

It may be necessary to replace the mains switch if the SCPC System cannot be shut down.

### 6.3.1 Removing the mains switch



#### Auxiliary contacts

- a** red
- b** blue
- c** yellow

#### Input/output

- d** blue (~)
- e** brown (~)

fig. 26: Removing the mains switch

- Unplug all connectors from the mains switch.
- Press together the support brackets on the sides of the switch and take out the mains switch.

When installing the new switch, make sure you are using the correct new version of the mains switch. Part numbers 96-143-002, 96-143-004 and 96-143-005 have become obsolete and must no longer be used.

Also ensure that the polarity is correct (see diagram above) and that the ON-side of the switch is positioned correctly.



### 6.3.2 Removing the mains filter

It may be necessary to replace the mains switch if the SCPC System cannot be shut down. Before removing the mains filter, the side panel (see page 6.52) needs to be removed.

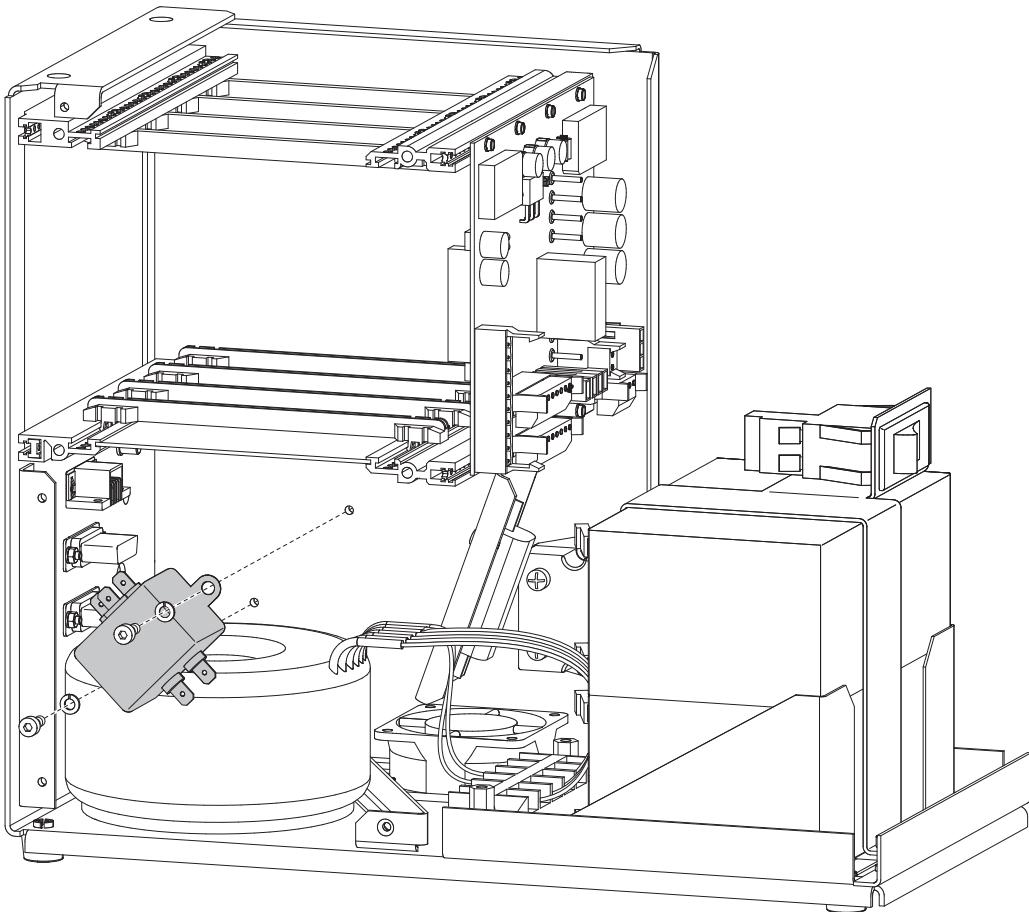
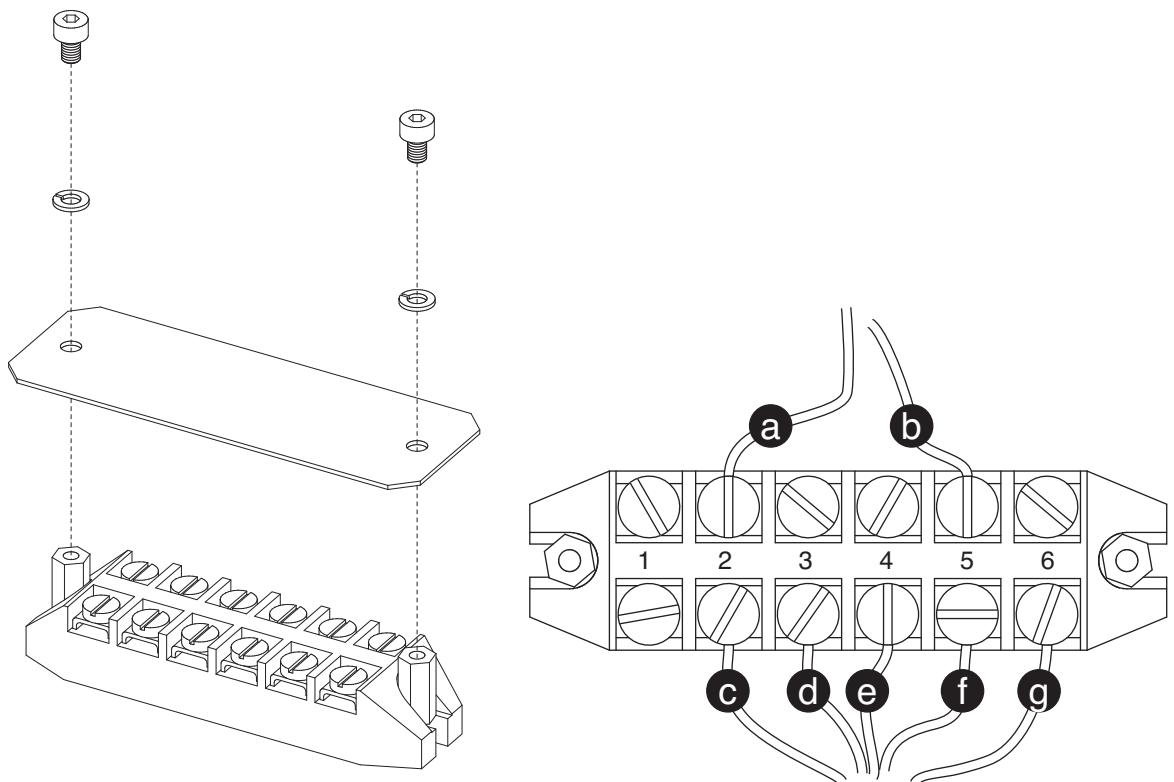


fig. 27: Removing the mains filter

- ▶ Unfasten the two screws on the mains filter as shown **A 5** (Allen key size 3) including the washers.
- ▶ Unplug the five connectors from the mains filter.

Assemble the new mains filter in reverse order.

### 6.3.3 Clamping strip



Input	Output	No.	Transformer U49092	Transformer U49109
a blue (mains switch)		2		
b brown (mains switch)		5		
c white	2	N		N
d blue	3	100 V		110 V
e grey	4	120 V		115 V
f orange	5	230 V		127 V
g violet	6	240 V		220 V

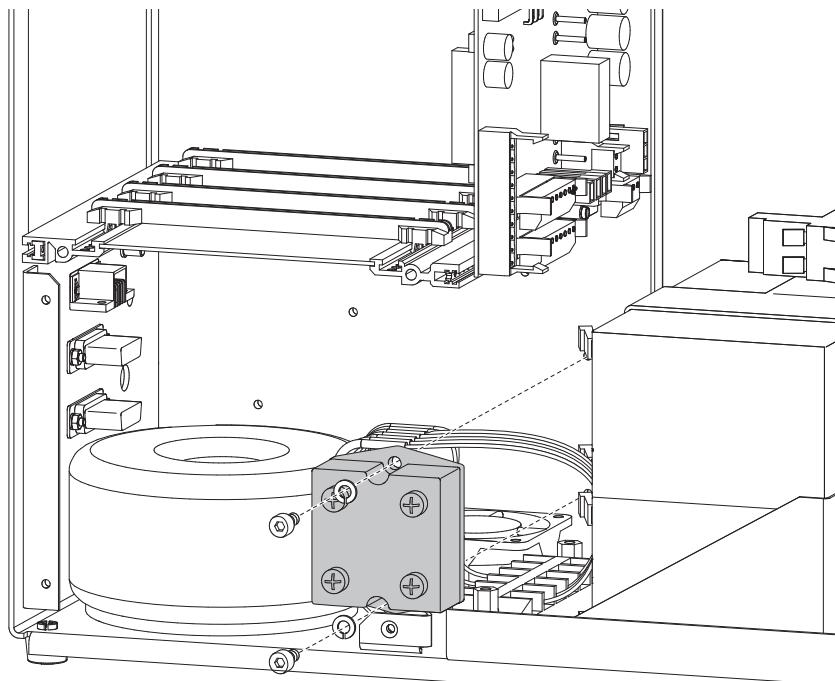
fig. 28: Clamping strip

- ▷ To access the clamping strip, remove the two screws (Allen key size 3) including the washers.
- ▷ Remove the cover plate.

## 6.4 Rectifier

It may be necessary to replace the rectifier if, for example, the SCPC System cannot be switched on without the batteries being charged.

### 6.4.1 Removing the rectifier



Input	Output
c yellow (~)	a red (+)
d grey (~)	b black (-)

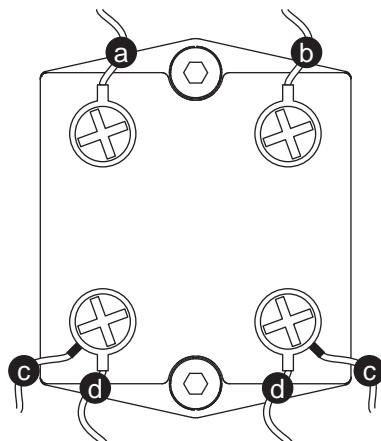


fig. 29: Removing the rectifier

- ▷ Open the four screws (Phillips size 2) to remove the connecting cable on the rectifier.
- ▷ Remove the two screws (Allen key size 3) to take out the rectifier.

Assemble the new rectifier in reverse order. Ensure that the cables are connected correctly according to the table given above.

## 6.5 Automatic circuit breaker

### 6.5.1 Removing the automatic circuit breaker

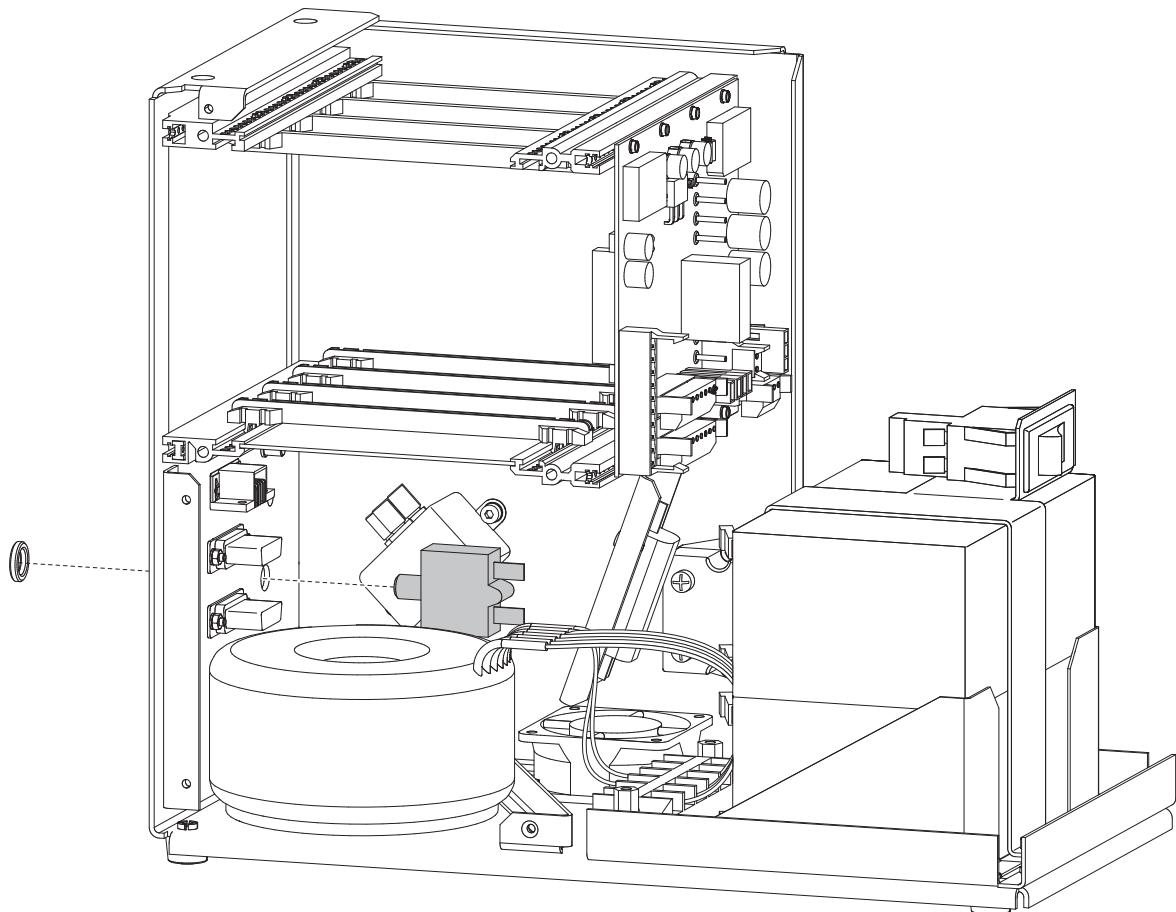


fig. 30: Removing the automatic circuit breaker

- ▶ Disconnect the two connectors on the automatic circuit breaker.
- ▶ Hold the automatic circuit breaker with one hand and unfasten the crown nut on the back of the device.
- ▶ Remove the automatic circuit breaker.

Assemble the new automatic circuit breaker in reverse order.

## 6.6 Discharge resistor

It may be necessary to replace the discharge resistor if the corresponding messages (e.g. error number 15) indicate a fault in the discharge circuit.

### 6.6.1 Removing the discharge resistor

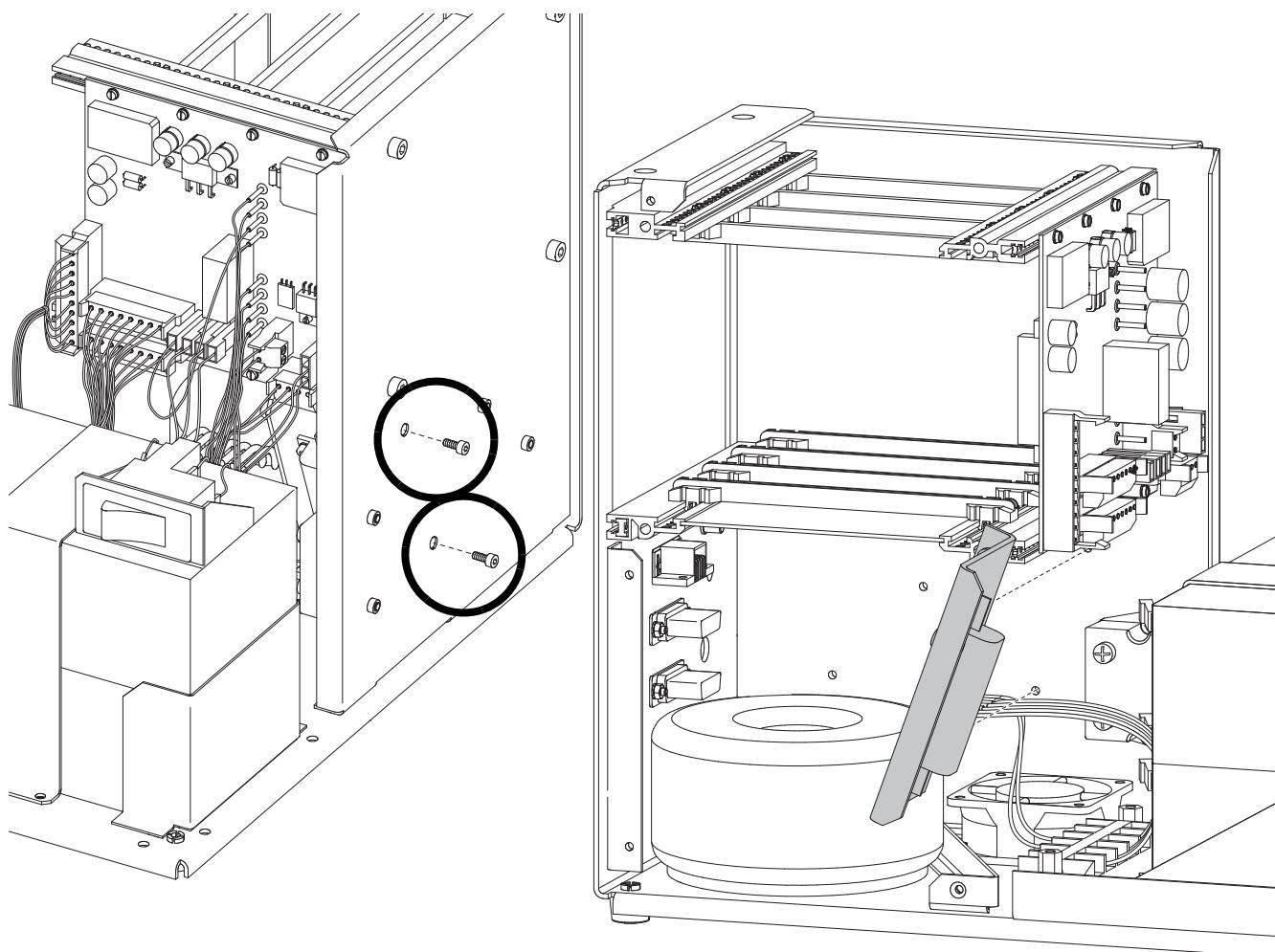


fig. 31: Removing the discharge resistor

- ▶ Disconnect the two connectors on the discharge resistor.
- ▶ Unfasten the two screws as shown (Allen key size 2.5) on the outside of the frame plate.
- ▶ Remove the holding angle along with the discharge resistor.
- ▶ Once removed, the two screws on the holding angle fixing the discharge resistor in place can be unfastened.

Assemble the new discharge resistor in reverse order.

## 6.7 Fan

Before disassembling the fan, the following components need to be removed:

- Side panel (see page 6.52)
- the holder for the discharge resistor (see page 6.60) and
- the entire card and module support assembly (along with the Backplane circuit board)

### 6.7.1 Removing the fan

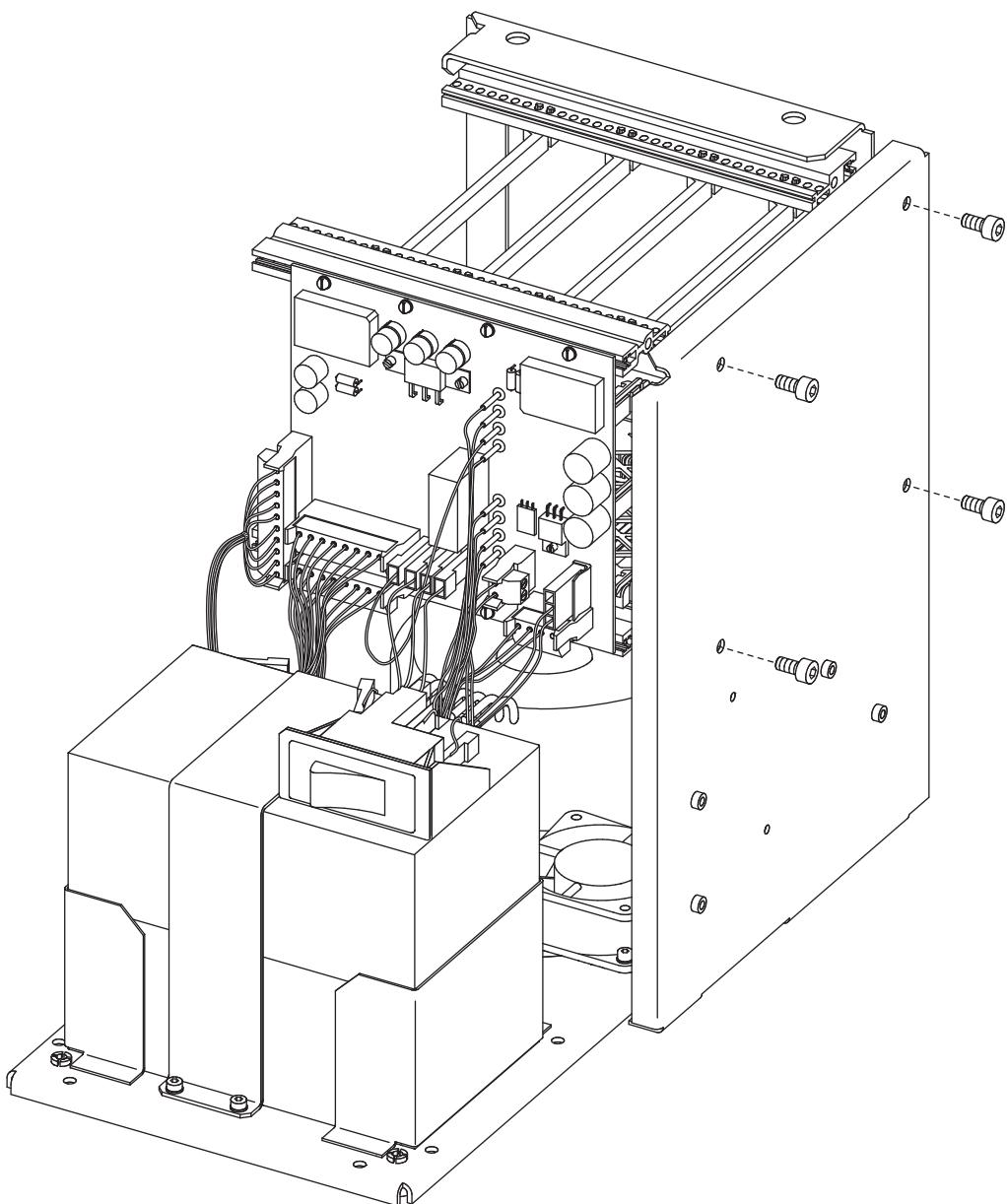


fig. 32: Dismounting the card-/ module carrier group

- Remove the four indicated screws (Allen, size 4) from the side panel.

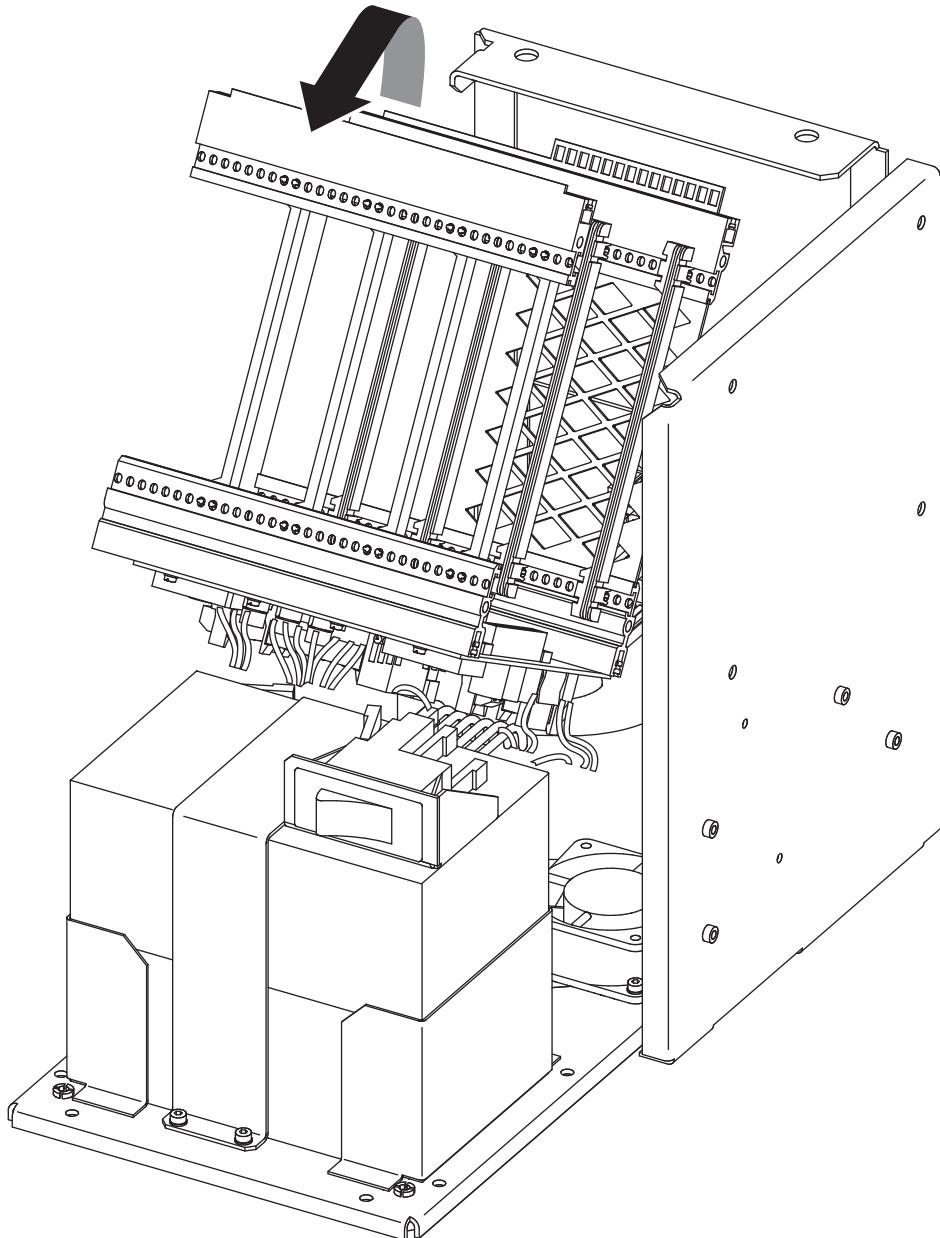


fig. 33: Dismounting the card-/ module carrier group

- ▶ Tip the card- /module carrier group carefully toward the front end of the unit. Ensure that the carrier group does not tip or fall unintentionally. This can also be avoided by placing the unit on its side (on the side panel) after removing the four screws securing the carrier group.

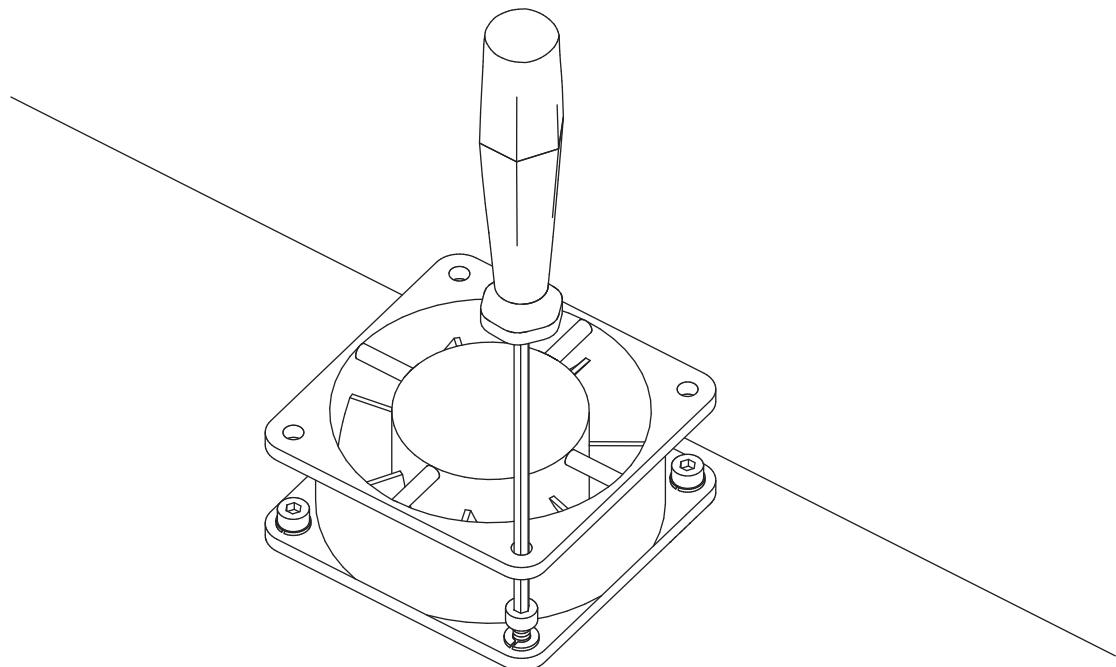


fig. 34: Removing the fan

- ▶ Unfasten the four screws on the fan as shown **A 12** (Allen key size 2.5) including the washers.
- ▶ Disconnect the connector **C 12** on the *backplane* circuit board.
- ▶ Detach any cable clips that prevent the fan from being removed.

Assemble the new fan in reverse order.

## 6.8 Touch screen module

The touch screen consists of the components LCD screen (with a touch-sensitive surface) and the relevant *Display* circuit board. In the event of a fault, both components should normally be replaced together. For disassembly, the circuit boards *CPU* and *interface* also need to be removed.

### 6.8.1 Removing the interface (ZIS 0202) circuit board

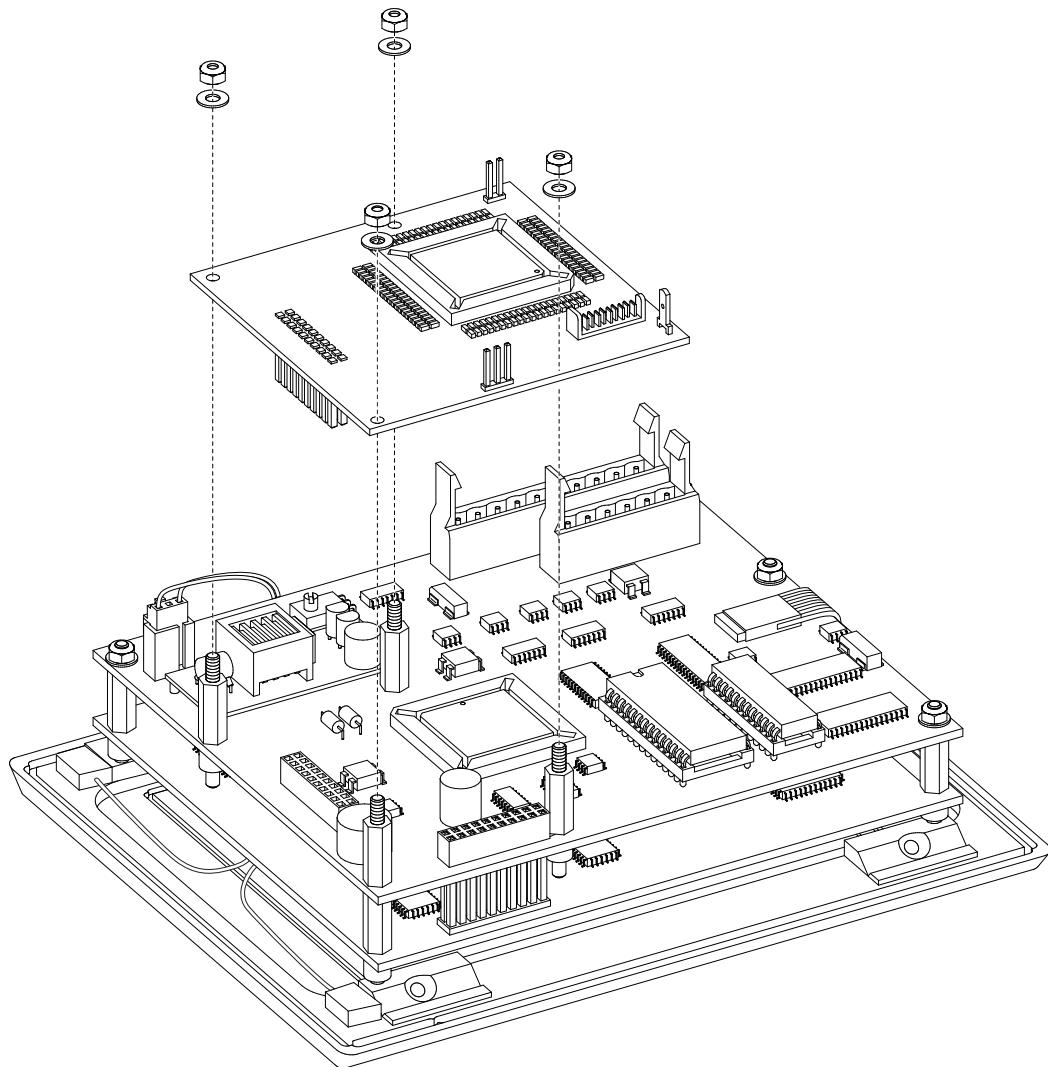


fig. 35: Removing the interface circuit board

- All connectors have already been removed when disassembling the touch screen module.
- Remove the four nuts (self-locking, size 5.5) including the washers and carefully lift the circuit board, keeping it in a vertical position, away from the bolts. Ensure that the contacts on the connector **B 9** (*CPU* circuit board to the *interface*) circuit board are not bent.

### 6.8.2 Removing the CPU board (ZDS 2006)

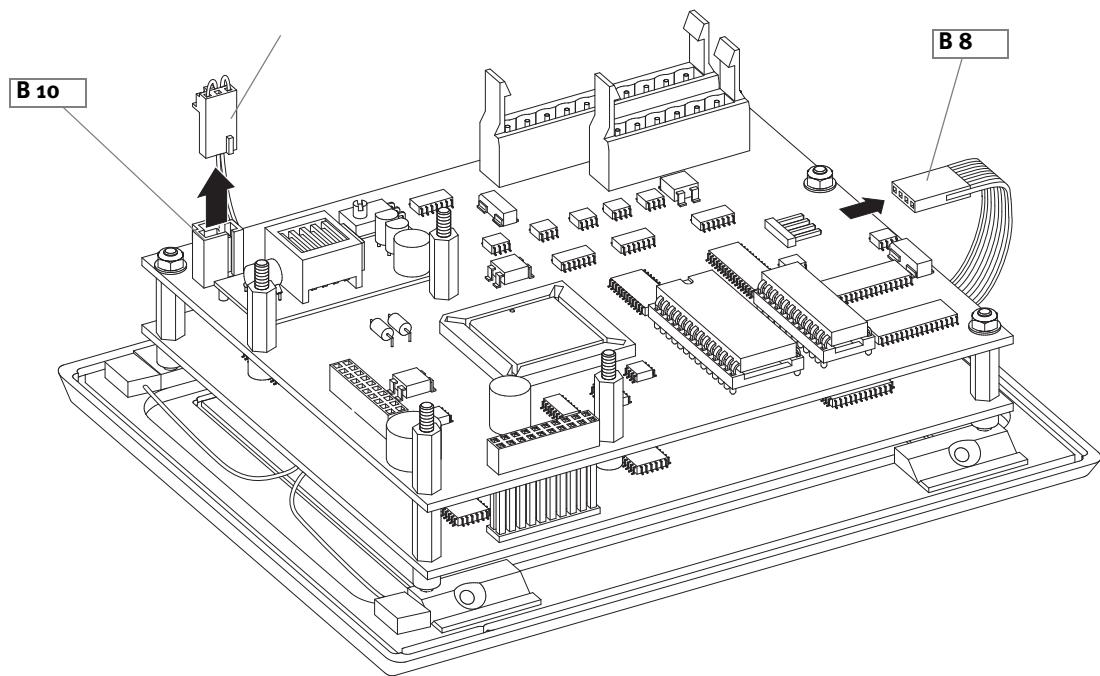


fig. 36: Removing the CPU board (1)

- ▶ Remove connectors **B 8** (display) and **B 10** (lighting). Take care not to bend the membrane contacts on connector **B 8** (display) as otherwise the contact paths may break.

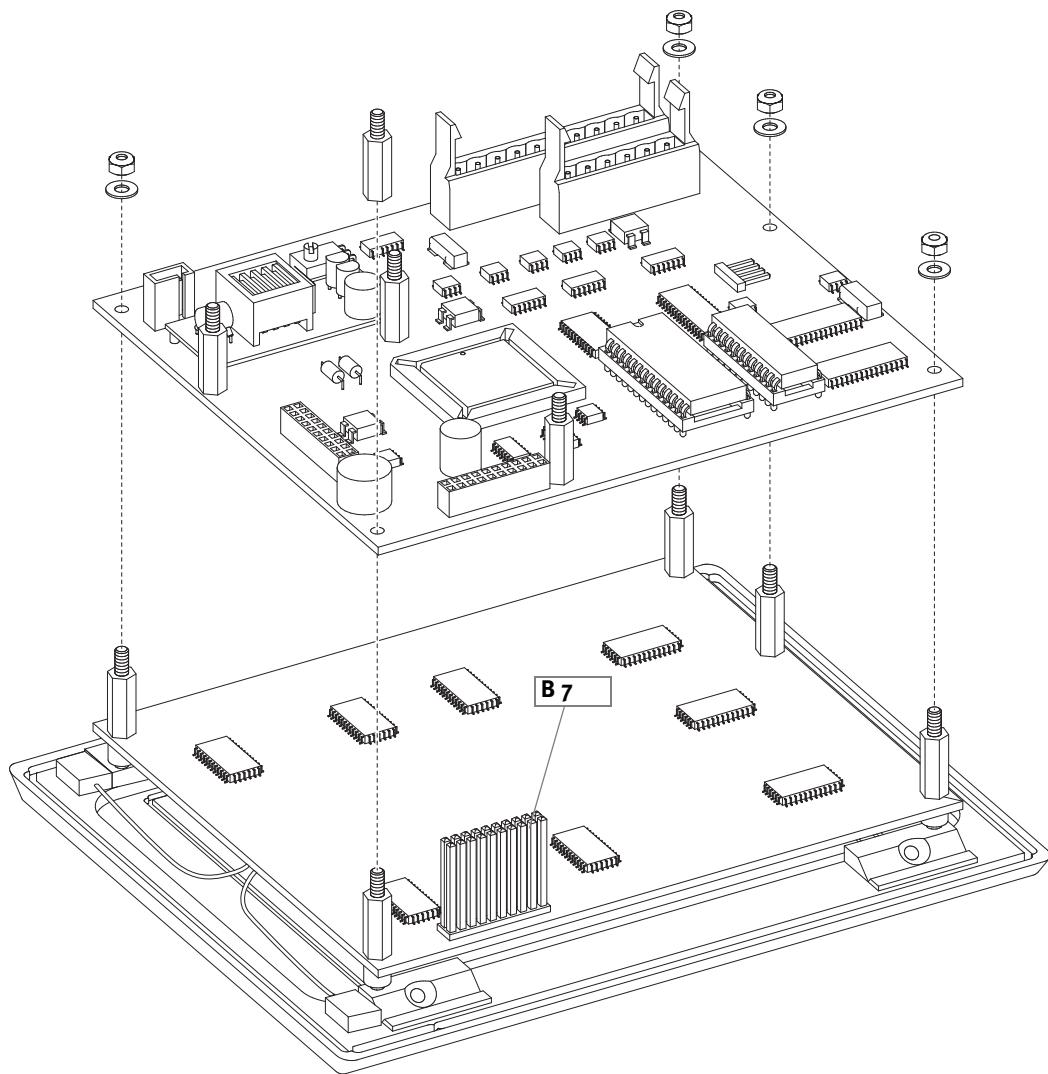


fig. 37: Removing the CPU board (2)

- ▶ Remove (only) the bolts indicated (size 5.5) and the four nuts (self-locking, size 5.5), including the washers.
- ▶ Lift the CPU board carefully away from the bolts, keeping it vertical. Ensure that the contacts on connector **B 7** (display) are not bent.
- ▶ Assembly is done in reverse order.

**Note the following during assembly:**

Make sure to fix the wires for the backlight illumination to one of the stand-off bolts.  
The wires should not come near the main CPU chip (processor) of the CPU board (EMI-sensitive!).

## 6.9 Replacing circuit board components

### 6.9.1 Battery monitoring (ZAU 2002) circuit board

#### Replacing the EPROM

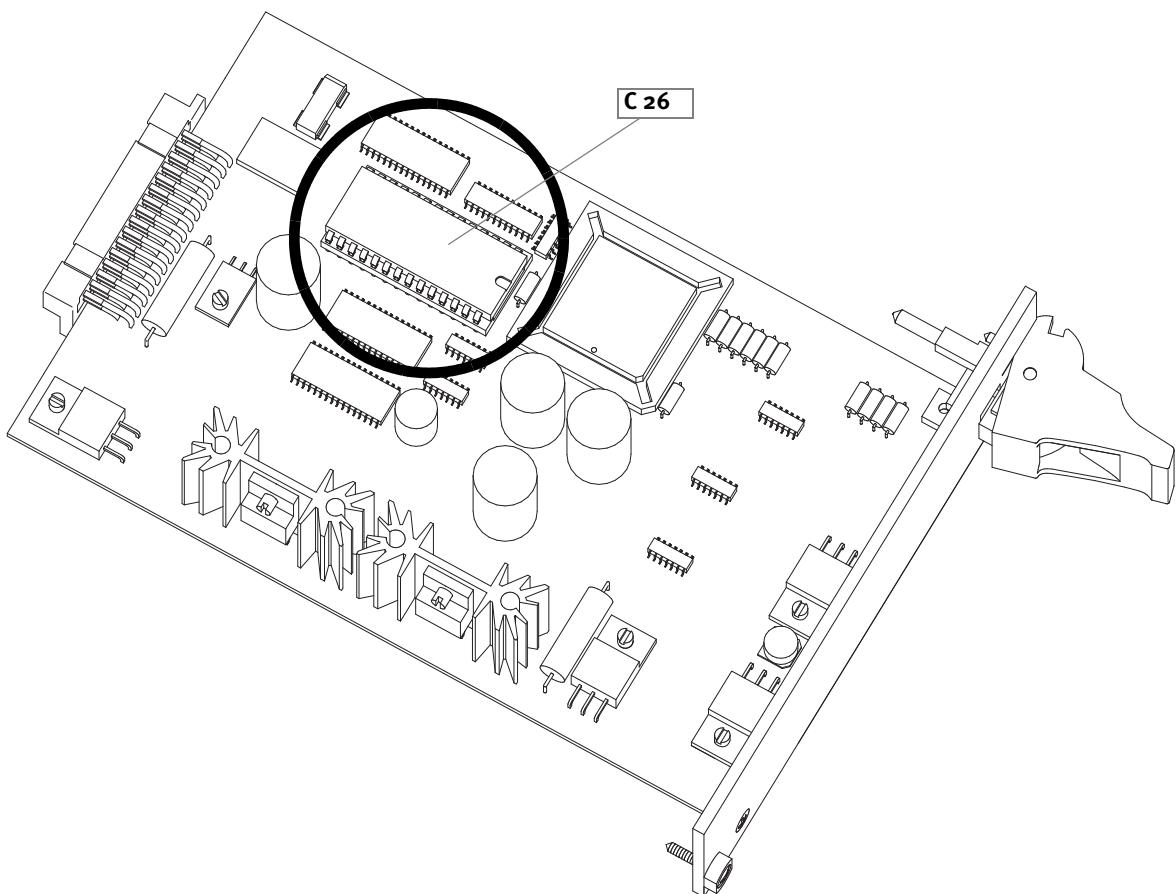


fig. 38: Replacing the EPROM

The EPROM **C 26** contains the operating software (firmware) for the battery monitoring. Replacement is necessary in the following cases:

- ▷ To perform an update
- ▷ In the event of error messages that indicate a defect in the EPROM (e.g. error o2).

Observe the following instructions when replacing the EPROM:

- ▷ Always use suitable removal and insertion tools so as not to bend the contacts.
- ▷ Avoid static charging (and hence damaging the electronic components) by suitable earthing measures.
- ▷ When inserting the new EPROM, ensure the correct alignment (notch pointing towards centre of board).

## 6.9.2 Mains monitoring (ZNU 2002) circuit board

### Replacing fuses

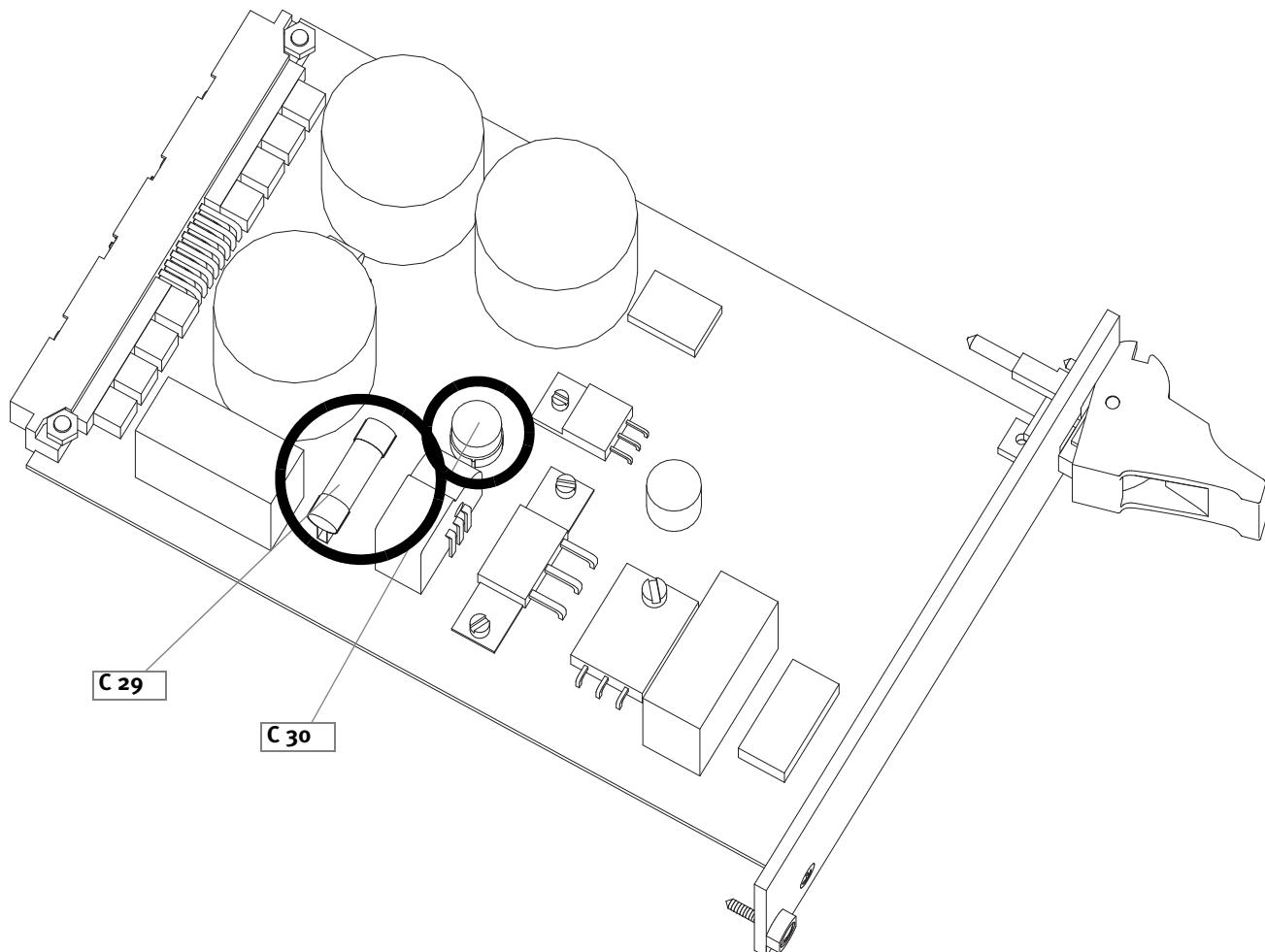


fig. 39: Mains monitoring circuit board fuses

Description	Number	SP number
C 29      10 A fuse slow-blow (battery)	S 1	93-511-030
C 30      Miniature fuse 1 A, slow-blow	S 2	93-510-039

Only replace the fuses with the fuses of the same type and specifications! Otherwise damage may be caused to the SCPC System.



### 6.9.3 Backplane circuit board (ZBP 2004)

#### Replacing fuses

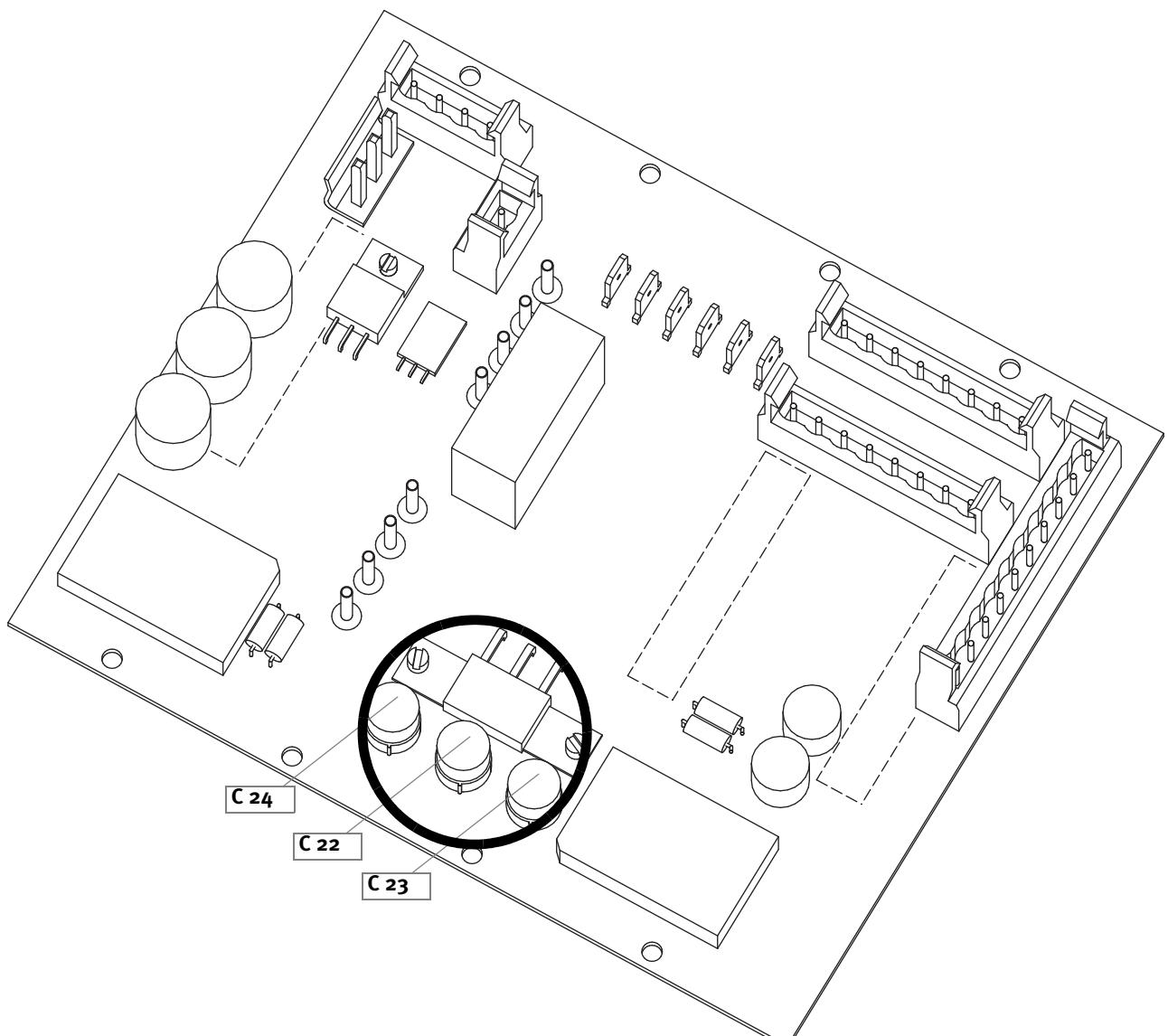


fig. 40: Backplane circuit board fuses

Description	Number	SP number
C 22	F 1	93-510-039
C 23	F 2	93-510-039
C 24	F 3	93-510-039

Only replace the fuses with the fuses of the same type and specifications! Otherwise damage may be caused to the SCPC System.



## 6.9.4 CPU board (ZDS 2006)

### Replacing the EPROM

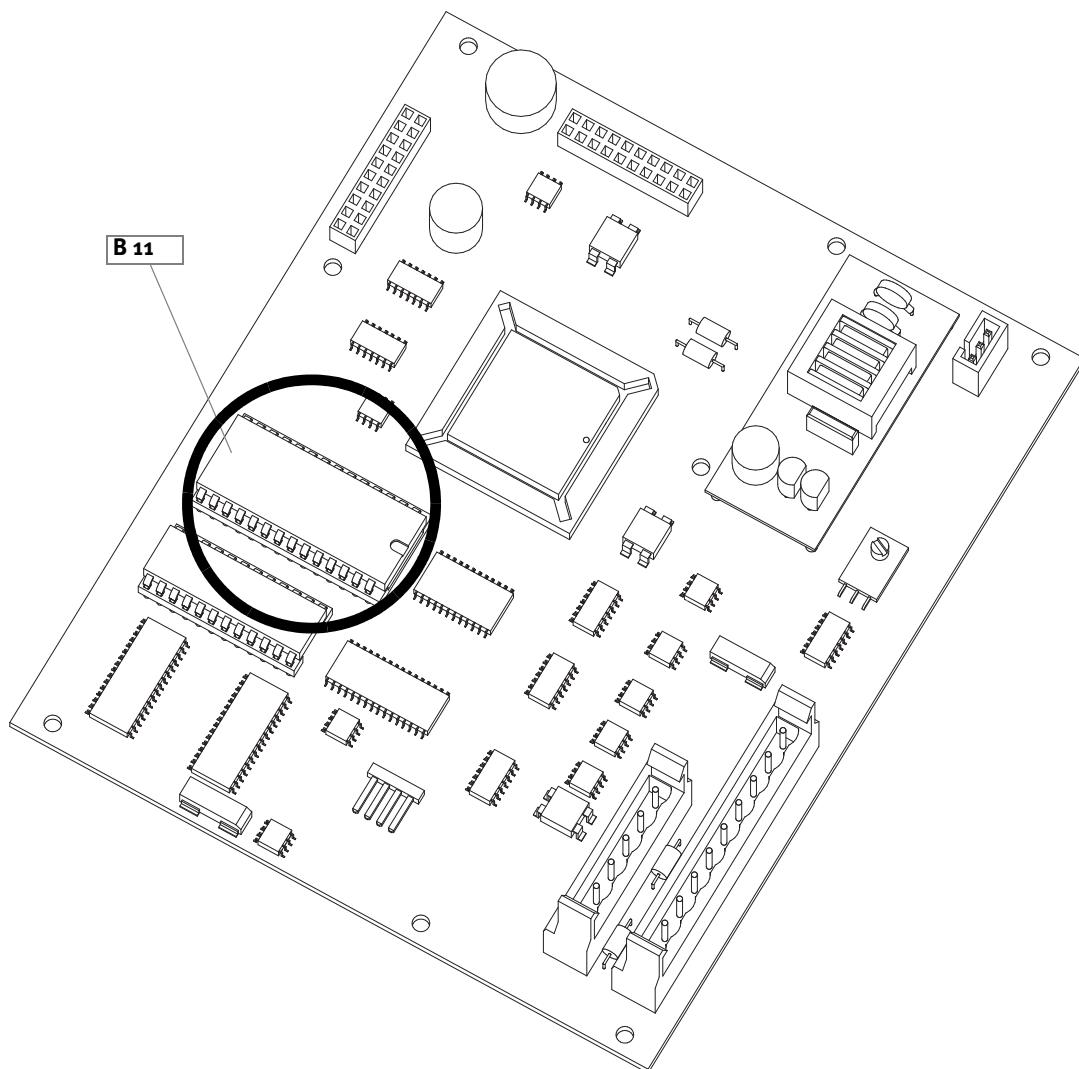


fig. 41: Control circuit board

The EPROM **B 11** contains the operating software (firmware) of the SCPC System. It needs to be replaced to perform an update. Observe the following instructions when replacing the EPROM:

- ▷ Always use suitable removal and insertion tools so as not to bend the contacts.
- ▷ Avoid static charging (and hence damaging the electronic components) by suitable earthing measures.
- ▷ When inserting the new EPROM, ensure the correct alignment (notch pointing towards centre of board).

# 7 Appendix

## 7.1 Technical data

### 7.1.1 Dimensions, weights, operating conditions

<b>SCPC System</b>	
Width	180 mm/7.1 in.
Height	365 mm/14.4 in. (with grip)
Depth	423 mm/16.7 in.
Weight	20 kg/44 lbs.

<b>Operating conditions</b>	
Operating temperature	+10 °C/50°F through +40 °C/104°F
Storage temperature	0 °C/32 °F through +40 °C/104 °F
Relative humidity (operation and storage)	30% through 75%
Operating altitude (atmospheric pressure)	0 ... 3,000 m (700 hPa to 1,060 hPa)

## 7.1.2 Electrical specifications

<b>SCPC System</b>	
Drip-proof	IPX2
Input voltages	100 V ~, 110 V ~, 115 V ~, 120 V ~, 127 V ~, 220 V ~, 230 V ~, 240 V ~ ; 50 / 60 Hz
Power consumption	220 VA
Primary fuse (also the mains switch)	Automatic circuit breaker 1.0 A nominal trigger current at 230 V 2.0 A nominal trigger current at 120 V
<b>Sensor module: Pressure control</b>	
Operating voltages	+5 V, ±12 V
Power consumption	3 W
Output voltage to pressure transducer	< 10 V
Input resistance	100 Ω

**Sensor module: Temperature monitor**

Operating voltages	+5 V, ±12 V
Power consumption	3 W
Temperature measurement range	0 °C through 50 °C
Resolution	0.1 °C
Accuracy	0.0 °C through 25.0 °C ± 0.2 °C 25.0 °C through 45.0 °C ± 0.1 °C 45.0 °C through 50.0 °C ± 0.2 °C

**Sensor module: Level/bubble**

Operating voltages	+5 V, ±12 V
Power consumption	3 W
Alarm limit (level sensor) for oxygenators/reservoirs made of rigid polycarbonate, wall thickness at sensor position 3 mm max.	Level arrow of sensor holder ±10 mm (0.4 in.)

**Serial port**

Baud rate (fixed)	9600
Word length (fixed)	7 bits
Parity (fixed)	none
Stop bits (fixed)	1
Polling interval (fixed) (TX-Data interval from the SCPC System)	10 seconds

## Port electrically isolated:

Isolation voltage	1.5 kV
Resistance to high voltage	up to 4 kV

## Serial connection cable:

2 x D-SUB 9f

**UPS****Operating time of UPS**

With the SCP System as operational load: (5.0 LPM at 400 mmHg back pressure)	Minimum: 90 minutes
Charging time	20 hours max.

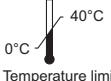
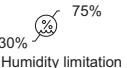
### 7.1.3 Dimensions and weights of the SCPC trolley

<b>Dimensions and weights</b>	
Height (without mast)	165 mm
Depth	609 mm
Width (incl. push grip)	425 mm
Weight	approx. 21.5 kg (incl. two masts and push grip)
A set up overall system must not exceed a total weight of 61.5 kg.	
<b>Maximum admissible load</b>	
Maximum load per mast	10 kg
Maximum total load	40 kg
<b>Masts</b>	
<b>Telescope mast (movable)</b>	
Height (from floor level)	1,250 mm min. 1,800 mm max.
Diameter (fixed part)	Ø 33 mm
Diameter (telescope)	Ø 25 mm
Maximum load	10 kg (max. mounting height at 1,200 mm and max. cantilever 200 mm)
<b>Vertical mast</b>	
Height (from floor level)	1,200 mm
Diameter	Ø 33 mm
Maximum load	10 kg (max. mounting height at 1,200 mm and max. cantilever 200 mm)

## 7.2 Labelling

Designations and icons on the nameplates:

SCPC	Designation: SCPC System (Stöckert Centrifugal Pump Console System)
 0123	Declaration of Conformity
	Degree of protection against electric shock: Type B (the tubing set is a Type B applied part)
	Protection Class I
IPX2	Drip-proof: protected against drops of water falling at an angle (with housing tilted up to 15°)
REF	Purchase order number
SN	Serial number
	Date of manufacture
	Manufacturer
V	Voltage V ~ (alternating current)
VA	Power [in volt-ampere]
f	Frequency
	A set up overall system must not exceed a total weight of 61.5 kg.
	Maximum permitted load
	Observe the operating instructions (white icon on blue background)
	Follow the operating instructions
	Potential equalization
	8 A automatic circuit breaker (resettable)
	Serial interface connection

	Quantity (in this case: package contains 100 sensor holders)
EA	Quantity
	Use by
	Temperature limit (Operating and Storing) 0°C      40°C
	Relative humidity (Operating and Storing) 30%      75%
	Non sterile
Rx ONLY	Only applies in the U.S.A.: Sale (and prescription) is restricted to physicians
USE ULTRASONIC GEL!	Use ultrasonic gel

## 7.3 Part numbers

<b>SCPC with Temperature &amp; Pressure</b>	<b>60-03-00</b>
complete, consists of	
AC power cable	<b>96-403-50X</b>
Potential equalization cable (5 m)	<b>45-10-50</b>
Pressure control sensor module (SCPC)	<b>22-10-20</b>
with blocking ferrite (designation: 742 711 4)	<b>96-530-112</b>
Temperature monitor sensor module (SCPC)	<b>20-20-20</b>
<b>SCPC with Level/Bubble &amp; Pressure</b>	<b>60-03-75</b>
complete, consists of	
AC power cable	<b>96-403-50X</b>
Potential equalization cable (5 m)	<b>45-10-50</b>
Pressure control sensor module (SCPC)	<b>22-10-20</b>
with blocking ferrite (designation: 742 711 4)	<b>96-530-112</b>
Level/Bubble sensor module (SCPC)	<b>23-30-20</b>
with blocking ferrite (designation: 742 711 12)	<b>96-530-111</b>
with blocking ferrite (designation: 742 711 4)	<b>96-530-112</b>
Level control sensor	<b>23-27-40</b>
Level control pads, white, 100 items	<b>23-27-41</b>
Level control pads, green, 100 items	<b>23-27-60</b>
Bubble detector sensor 3/8"	<b>23-07-50</b>
3-joint mast holder with fast clamp connector	<b>23-26-96</b>
<hr/>	
<b>Accessories</b>	
SCP System	<b>60-00-00</b>
Electrical Remote-Controlled Tubing Clamp 500 mm (S3)	<b>60-05-00</b>
Serial connection cable	<b>45-11-03</b>
with blocking ferrite (designation: 742 711 4)	<b>96-530-112</b>
Adapter plate for	<b>60-03-50</b>
the Stöckert S3 System	<b>60-03-50</b>
the Stöckert Caps	<b>60-03-55</b>
the Sarns 8000	<b>60-03-65</b>
<hr/>	
Medex transducer (MX 960)	<b>45-04-03</b>
Cable for Medex transducer	<b>45-04-15</b>
Holder for one Medex transducer	<b>45-04-16</b>
Holder for 2 Medex transducers	<b>45-04-17</b>

<b>Temperature Probes for Direct Measurement in the Oxygenator:</b>		
Rigid bar probe for liquids	Length 115 mm, Ø 4.0 mm	<b>45-03-07</b>
For LivaNova oxygenators		<b>45-03-10</b>
For DIDEO oxygenators		<b>45-03-11</b>
For MEDTRONIC oxygenators		<b>45-03-30</b>
Blocking ferrites (4 pcs/designation: 742 711 4)		<b>96-530-112</b>
SCPC Trolley complete, consists of		<b>60-04-00</b>
Base		<b>60-04-10</b>
Telescope mast (movable) with infusion rack		<b>60-04-30</b>
Vertical mast		<b>60-04-25</b>
Push grip (U-shaped)		<b>60-04-46</b>
Mast connector for push grip (2 pcs)		<b>60-04-40</b>

## 7.4 Accessories

The safe usage of accessories (as stated in the European Directive 93/42 EEC, Appendix 9.1/Basic Requirements) in conjunction with the SCPC System must be proved and guaranteed by the respective manufacturer. All safety checks and functional checks must be carried out in accordance with the respective separate instructions for use.

When using disposables from other manufacturers, it is incumbent upon the user to provide proof of the safe operation of the overall system.

## 7.5 Part numbers of service components

These part numbers refer to parts and components that are used exclusively for service purposes. The details on the item numbers relate to the components overview in chapter 3.

### 7.5.1 Individual SCPC System components

Item	Description	Number	SP number
<b>A 1</b>	Upper casing		60-03-02
<b>A 2</b>	Lower casing		
<b>A 3</b>	Housing grip, compl., consisting of:		
(1)	Screw cap, D 13 mm		96-531-015
(2)	Allen bolt, 2 pcs., DIN 912, M6x60		71-115-055
(3)	Grip		60-03-35
(4)	Mast segment, 2 pcs., L 45mm		60-03-36
(5)	Termination plate, 2 pcs.		60-03-37
<b>A 4</b>	Mains switch (voltage-dependent) 220-240 V/1.0 A, 110-127 V/2.0 A 100 V/2.5 A	3120-F321 3120-F321 3120-F321	96-143-006 96-143-007 96-143-008
<b>A 5</b>	Mains filter 220-240 V 100-127 V	FN610A-06/6 FN610-B-10	96-401-011 96-401-013
<b>A 6</b>	Batteries		96-405-003
<b>A 7</b>	Ring core transformer		96-403-058
<b>A 8</b>	Rectifier		93-154-028
<b>A 9</b>	Clamping strip (mains – ring core transformer connection)		96-204-098
<b>A 10</b>	Discharge resistor (for battery discharge)		97-103-642
<b>A 11</b>	Automatic circuit breaker 8.0 A		96-148-115
<b>A 12</b>	Fan		96-406-003
<b>A 13</b>	SCP System Connections		
<b>A 14</b>	Connection for Electrical Remote-Controlled Tubing Clamp (for short: ERC)		
<b>A 15</b>	Serial interface connection		

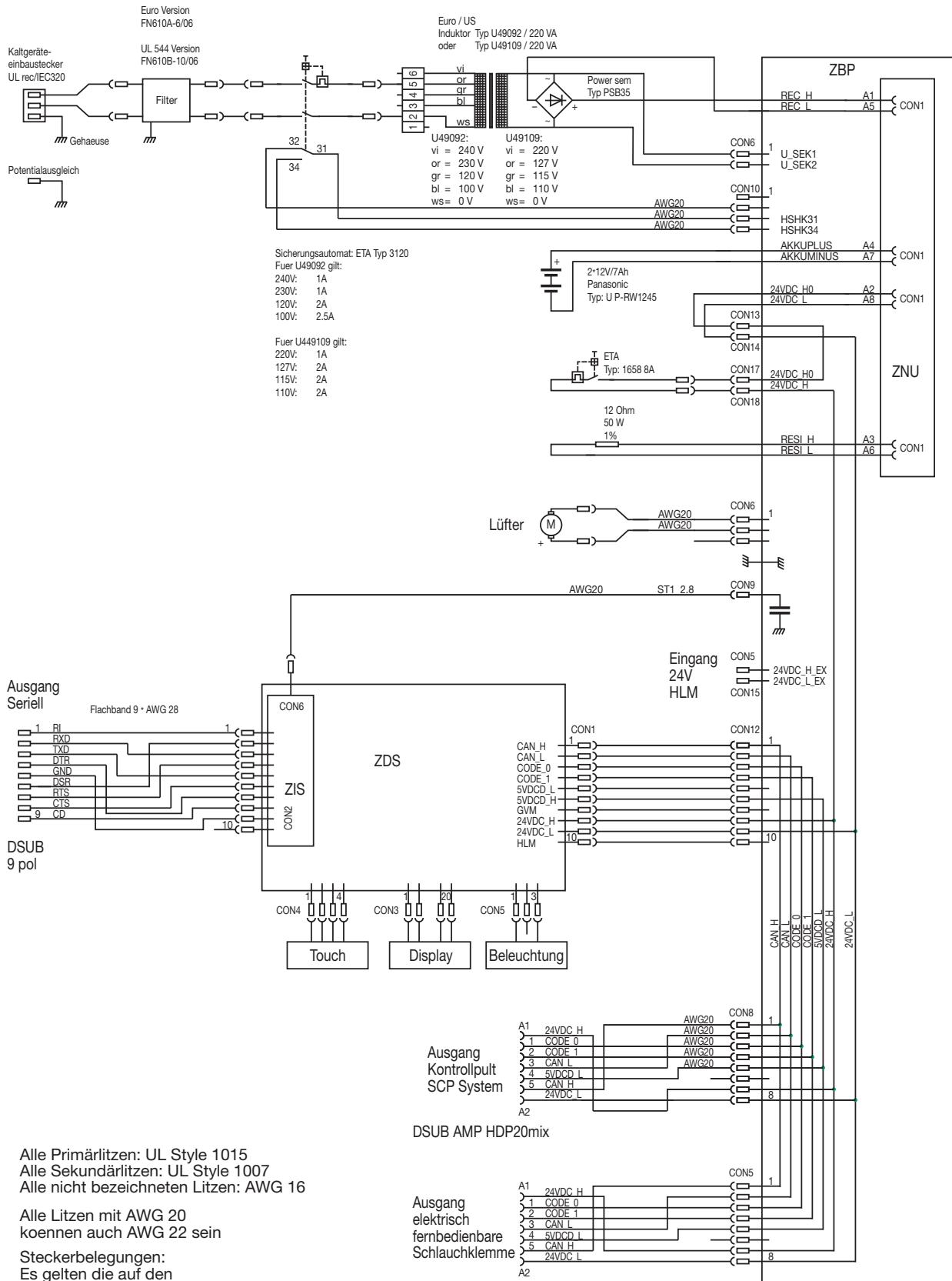
## 7.5.2 Touch screen module

Item	Description	Number	SP number
<b>B 1</b>	SCPC Front panel, complete (set includes assembly frame, touch screen, <i>Display</i> circuit board, ZDS 2006, ZIS 0202, EMC sealing cords, assembly material)		60-03-10
	Touch screen		97-103-614
	EMC sealing cord for SCPC Front panel, 610 mm		96-530-127
<b>B 2</b>	<i>Display</i> circuit board (fixed component of the touch screen, can only be replaced as a unit)		
<b>B 3</b>	<i>CPU</i> circuit board (ZDS)	ZDS 2006	90-305-250
<b>B 4</b>	<i>Interface</i> circuit board (ZIS)	ZIS 0202	90-305-300
<b>B 11</b>	EPROM (firmware) circuit board <i>CPU</i> (ZDS)	IC 3	93-484-236
<b>B 12</b>	GAL circuit board <i>CPU</i> (ADRDEC <sub>3</sub> )	IC 9	93-484-112

## 7.5.3 Card and module support assembly

Item	Description	Number	SP number
<b>C 1</b>	<i>Battery monitoring</i> circuit board	ZAU 2002	90-305-210
<b>C 2</b>	<i>Mains monitoring</i> circuit board	ZNU 2003	90-305-220
<b>C 5</b>	<i>Backplane</i> circuit board	ZBP 2004	- factory repair only -
<b>C 22 ...</b>	Miniature fuse 1 A, slow-blow (on ZBP 2004)	F 1 ... 3	93-510-039
<b>C 24</b>			
<b>C 30</b>	(on ZNU 2003)	S 2	
<b>C 29</b>	Fuse 10 A, slow-blow (on ZNU 2003)	S 1	93-511-030
<b>C 26</b>	EPROM (firmware) circuit board ZAU	IC 6	93-484-234

## 7.6 Circuit diagram



Alle Primärlitzen: UL Style 1015  
Alle Sekundärlitzen: UL Style 1007  
Alle nicht bezeichneten Litzen: AWG 16  
  
Alle Litzen mit AWG 20  
können auch AWG 22 sein  
  
Steckerbelegungen:  
Es gelten die auf den

