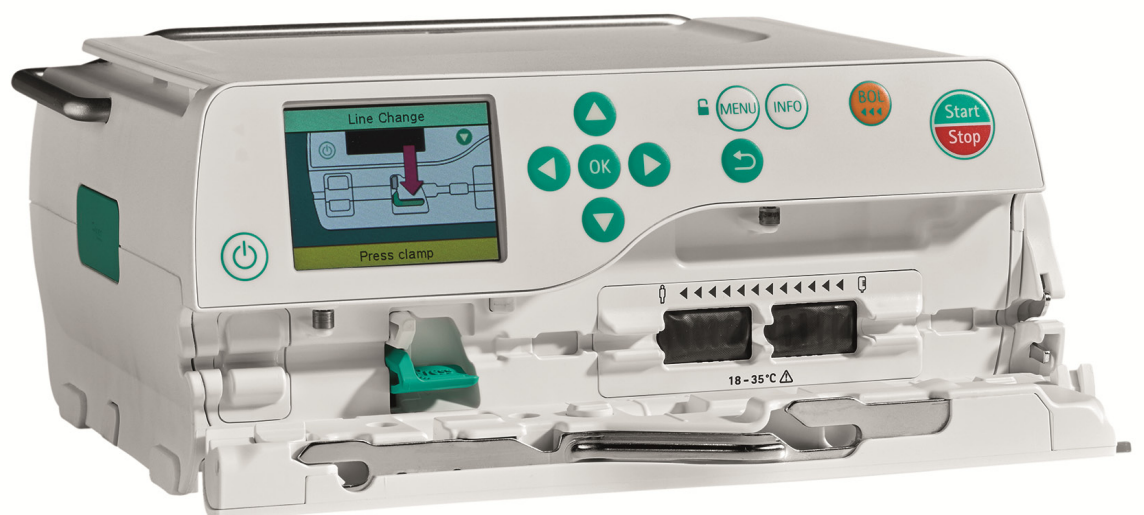


# Infusomat<sup>®</sup> compact<sup>plus</sup> P

Service Manual EN, Version 1.0



**For internal use, only**

THIS SERVICE MANUAL IS VALID FOR

<b>Designation</b>	<b>Part No.</b>
Infusomat® compact <sup>plus</sup> P .....	8717070

AVAILABILITY OF THIS SERVICE MANUAL

This Service Manual can be downloaded as PDF file under the following document number from the B. Braun Service Portal:

<b>Designation</b>	<b>Doc. No.</b>
Infusomat® compact <sup>plus</sup> P .....	I0003_000616
Service Manual, English	

LANGUAGES OF THIS SERVICE MANUAL

The Service Manual for this unit can be downloaded as PDF file in the following languages from the B. Braun Service Portal:

<b>Designation</b>	<b>Doc. No.</b>
Infusomat® compact <sup>plus</sup> P .....	I0003_000615
Service Manual, German	

OTHER APPLICABLE DOCUMENTS

This Service Manual is valid only in combination with the following additional documents:

<b>Designation</b>	<b>Doc. No.</b>
compact <sup>plus</sup> Service Tool (Software) .....	IXXX2_000645
Instructions for Use, English	

THE COMPLETE SERVICE MANUAL CONTAINS THE FOLLOWING PAGES:

Page 0 - 1	to Page 0 - 16
Page 1 - 1	to Page 1 - 8
Page 2 - 1	to Page 2 - 8
Page 3 - 1	to Page 3 - 32
Page 4 - 1	to Page 4 - 14
Page 5 - 1	to Page 5 - 2
Page 6 - 1	to Page 6 - 4
Page 7 - 1	to Page 7 - 10
Page 8 - 1	to Page 8 - 2
Page 9 - 1	to Page 9 - 4
Page 10 - 1	to Page 10 - 2
Page 11 - 1	to Page 11 - 2

# Table of Contents

---

## 0 - 5 Important Preliminary Remarks

- 0 - 5 Service work
- 0 - 5 Technical safety checks
- 0 - 6 Current versions
- 0 - 6 Product availability
- 0 - 6 Responsibility of the manufacturer
- 0 - 6 Quality management
- 0 - 6 Technical training
- 0 - 7 Check after repair
- 0 - 7 Notes on ESD
- 0 - 7 Spare parts
- 0 - 8 Calibration of gauges
- 0 - 9 Measuring equipment
- 0 - 10 Safety data sheets
- 0 - 10 Setting off
- 0 - 11 Special PDF functions
- 0 - 12 List of abbreviations

---

## 0 - 15 Contact Information

- 0 - 15 Technical training
- 0 - 15 Entry for technical training
- 0 - 15 Ordering of spare parts and test equipment
- 0 - 15 Service hotline
- 0 - 15 Returns
- 0 - 15 Returns for repairs
- 0 - 15 Safety officer (§ 30 MPG)
- 0 - 15 Service portal

---

## 1 - 1 Overview of the Device

- 1 - 1 System overview
- 1 - 2 Description of device
- 1 - 2 Intended use
- 1 - 2 Device overview
- 1 - 2 Mechanical design
- 1 - 3 Function
- 1 - 5 Unit software
- 1 - 5 Service program
- 1 - 6 Technical data
- 1 - 6 Options
- 1 - 6 Accessories
- 1 - 7 Functional test

---

## 2 - 1 Unit Diagnosis / Adjustments

- 2 - 1 Alarms and error messages
- 2 - 1 Log files
- 2 - 1 Pre-alarms and operating alarms
- 2 - 2 Standard device alarms
- 2 - 3 Device alarms with reduced display
- 2 - 6 The most important fault events
- 2 - 7 Adjusting the mechanical pressure

---

## 3 - 1 Disassembly / Assembly

- 3 - 1 Remarks on disassembly
- 3 - 3 Remarks on assembly
- 3 - 4 Housing foot
- 3 - 5 Gasket for rubber connector
- 3 - 6 Membrane
- 3 - 7 Pole clamp
- 3 - 8 Battery module
- 3 - 10 Second clamp
- 3 - 11 Pump door
- 3 - 12 Opening/closing the unit
- 3 - 15 Loudspeaker
- 3 - 17 Processor board
- 3 - 18 Accessory connector
- 3 - 19 Display board with display

3 - 20 Housing, upper part  
 3 - 22 Housing front  
 3 - 30 Pump  
 3 - 31 Power supply  
 3 - 32 Checks after Repair

---

4 - 1 **Check after Repair**  
 4 - 1 Check after Repair matrix  
 4 - 2 Pump RUN IN  
 4 - 4 Checklist for Check after Repair  
 4 - 6 Procedural instructions on the Check after Repair

---

5 - 1 **Servicing the Unit**  
 5 - 1 Cleaning and disinfecting  
 5 - 1 Servicing the battery

---

6 - 1 **Technical Safety Check (TSC)**  
 6 - 1 Checklist for Technical Safety Check (TSC)

---

7 - 1 **Procedural Instructions on the TSC**  
 7 - 1 Visual inspection  
 7 - 2 Electrical safety according to IEC 62353  
 7 - 2 Functional inspection

---

8 - 1 **Test Equipment and Tools**  
 8 - 1 Test equipment  
 8 - 1 Standard Tools  
 8 - 2 Special tools

---

9 - 1 **Spare Parts List**

---

10 - 1 **Index**

---

11 - 1 **Appendix**  
 11 - 1 Revision documentation  
 11 - 1 Current information  
 11 - 1 History of spare parts  
 11 - 2 Service Report



# Important Preliminary Remarks

## SERVICE WORK

The present manual is for information only. The possession of this manual does not authorize the performance of service work. Service tasks may only be executed by persons, who:

- Have received technical training on the system from B. Braun
- Observe the latest information in the B. Braun Service Portal [bbraun.com/mybbraun](https://www.bbraun.com/mybbraun) > Service Portal (access granted in connection with a technical training, only)
- Possess the necessary test equipment and special tools
- Fulfill the personal requirements (training and knowledge including the respective standards and regulations)

### WARNING

The Infusomat® compact<sup>plus</sup> P is a life-saving device or part of a life-saving system that, on the other hand, can pose a risk if it is not working properly.

#### **Danger of injury to the patient!**

- Perform all service works with due care following the instructions given in this Service Manual.

### NOTICE

Make sure to be familiar with the Instructions for Use.

## TECHNICAL SAFETY CHECKS

Performing the TSC is an obligation of the owner of the equipment and is subject to the laws of the country where the equipment is located. In countries in which a TSC is mandatory, B. Braun prescribes an interval of 24 months. The owner may decide on shorter intervals or shorter intervals may be prescribed by the law. The TSC obligation applies independently of possible repairs.

B. Braun also recommends training on the Technical Safety Checks, or to perform at least the steps indicated in the current version of the manual, as:

- The TSC requires that the instructions in the manuals are observed
- The manuals are a reference for measurements
- Depending on the unit type, a service program must be used which may lead to a dangerous unit condition in case of inappropriate operation. Furthermore, a special service connector may be necessary.

## CURRENT VERSIONS

This manual version corresponds to the state when the manual was written. B. Braun reserves the right to make technical modifications. The state of the revision is indicated by the version number in the footer of every page.

To view the current Service Manual, please visit the Service Portal at: [bbraun.com/mybbraun](https://bbraun.com/mybbraun) > Service Portal.

Approval to use the service portal will only be granted after completion of a technical training course.

## PRODUCT AVAILABILITY

Not all software versions, hardware, or spare parts are available in all regions. Please consult the local B. Braun representative for availability.

## RESPONSIBILITY OF THE MANUFACTURER

The manufacturer or the person who assembles, installs or imports a device can only be held responsible for safety, reliability and performance if

- mounting, enhancements, new settings, changes or repairs are carried out by duly authorized persons,
- the electrical installation in the corresponding room meets the requirements of the IEC 60364-7-710 and applicable national standards like VDE 0100 part 710,
- the device is used in accordance with the Instructions for Use,
- the Technical Safety Checks are performed at regular intervals in the case TSCs are mandatory for that device,
- a current Service Manual is used when performing maintenance, repair or other servicing activities,
- the technician has participated in a technical training for the specific B. Braun device.

## QUALITY MANAGEMENT

B. Braun is certified to be compliant with DIN EN ISO 9001 and ISO 13485. This certification also includes maintenance and service.

The device bears the CE mark. The CE mark indicates that the device is in conformity with the provisions of the COUNCIL DIRECTIVE 93/42/EEC of 14 June 1993 concerning medical devices.

## TECHNICAL TRAINING

Technical training may only be performed by B. Braun. The possession of the Service Manual does not authorize to perform repairs.

## CHECK AFTER REPAIR

The checks after repair depend on the service work performed. They follow the Check after Repair Matrix. If several servicing activities have been carried out, the total of all necessary tests (checks) has to be performed.

If no Check after Repair Matrix is defined, perform the checks after repair according to the TSC checklist as mentioned later in this manual.

## NOTES ON ESD

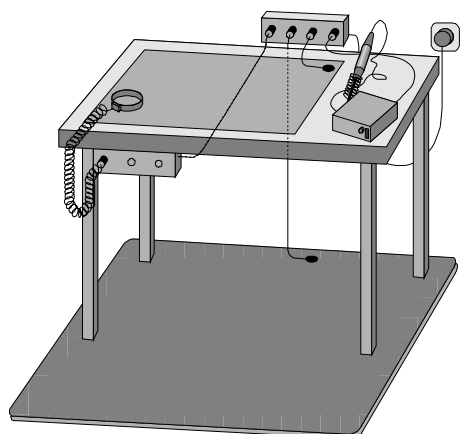


Fig. 0 - 1 Example of a workstation with ESD protection equipment

Semiconductors can be destroyed by electrostatic discharge. Especially MOS components can be damaged by interference from electrostatic fields, even without discharge via contact. This type of damage is not immediately recognizable. Unit malfunctions can even occur after a longer period of operation.

Each workstation must be equipped according to the recommendations with the necessary static protective measures, if ESD components or boards are handled (Fig. 0 - 1).

Each workstation must be equipped with a conductive table surface. The conductive surface, the soldering iron or the soldering stations must be grounded via protective resistors.

Chairs must be of antistatic design. The floor or floor mats should be of electrically conductive material.

Personnel must wear conductive wristbands which are connected to a central ground potential via protective resistors, e.g. the ground contact of a wall outlet. Furthermore it is recommended that personnel wear cotton clothing and electrically conductive shoes to prevent electrostatic charge.

## SPARE PARTS

Only use original spare parts from B. Braun. Do not tamper with them. Never integrate assembly groups into a device that have been extracted from an other device.

**NOTICE**

The use of spare parts with a serial number or a batch number has to be documented. Affected spare parts are specified in the list of spare parts.

Parts with a serial number (SN) carry a sticker with the part number and the serial number as well as a data matrix code. In case there are several stickers on the part, the number starting with 3452XXXX has to be used. Additionally the serial number is on the label of the packaging.

Parts with a batch number carry the number only on the label of the packaging (LOT).

In case a set or kit (3477XXX) contains a part with a batch number the number is on the bag containing the part.

The documentation has to be realized at least in the service report (see "Service Report" → p. 11 - 2).

**CALIBRATION OF GAUGES**

B. Braun calibration gauges are delivered with a calibration certificate for the gauge itself. Calibration intervals are stated in this document. Regular recalibrations of the gauge according to the stated intervals are mandatory.

Additional recalibrations may be required in the following cases:

- If a gauge has been repaired or modified
- After an event which might potentially have compromised the validity of the calibration, for example, after a gauge has been exposed to shock, vibration, or physical damage
- Whenever observations appear questionable or indications of the gauge do not match the output of surrogate instruments

Service personnel are responsible for assuring regular or additional recalibration of their test equipment at any time. Original test equipment must be calibrated at the works of B. Braun. Further information is available upon request.

## MEASURING EQUIPMENT

Additional measuring and test equipment used for servicing our devices must comply with the following standards and/or measuring equipment specifications:

### Electrical safety:

IEC 60601-1, ed 3.1

EN 62353

For example, Bender UNIMET 800/810ST

[bender-de.com/en](http://bender-de.com/en)

or comparable

Voltage measurement: For example, Multimeter Fluke 177

[fluke.com/en-us](http://fluke.com/en-us)

or comparable

### Clearance measurement:

Slip gauges

According to DIN 2275, tolerance T2 or better.

For example,

[wemas.de](http://wemas.de)

or comparable

### Pressure measurements:

Measurement accuracy  $\leq$  80 mbar (1.16 psi)

For example, Kobold MAN-SD1S Y A3 0

S#2062378.8 customer-specific

[kobold.com/en](http://kobold.com/en)

or Sika MH 3750

[sika.net](http://sika.net)

or Fluke 717

[fluke.com](http://fluke.com)

or comparable

### Flow accuracy:

Scales:

Measurement range 220 g

Linearity deviation  $\pm$ 0.1 mg

Standard deviation  $\pm$ 0.05 mg

Readability 0.01 mg



In this case "Fig. 1 - 1" is the figure number and "Item 1" the item number within the figure.

When the Service Manual is stored as pdf-file, these references are displayed green. Click with the mouse button on a reference to jump to the corresponding source.

### Markup of paragraphs and text

Working steps are numbered in the required sequence of the workflow. Sub-steps are marked alphabetically:

1. Working step 1
2. Working step 2
  - a) First sub-step of working step 2
  - b) Second sub-step of working step 2

Prerequisites of working steps are shown as follows:

✓ Working step xy has been performed.

Menu commands are described as:

Menu *File*.

In the PDF format of this manual, special functionality is integrated, which can be used with Adobe® Reader®:

- Form function
  - For completing, saving, and printing the TSC or other forms on a PC, laptop, etc.

### Software requirements

- Adobe® Reader® Version XI or higher is installed.

### Form function

Forms included in the manual, which are to be filled out by the reader, each show an "Edit" button at the top of the first page (Fig. 0 - 2). The list can be completed and printed online or saved locally as a PDF:

1. Click the "Edit" button.
  - The form is opened in a separate PDF file.
2. If you want to save the form as a PDF, you can save an empty copy of the form locally with *File > Save As* and open this for editing.
3. The following form field functions are available:
  - Entry of text and figures in the form fields with the keyboard.

## SPECIAL PDF FUNCTIONS



### Technical Safety Check (TSC)

Index g  
(Master – to be added to the documentation)

Fig. 0 - 2

- Checking test steps by clicking the check boxes (click again to clear).
  - Deletion of non-applicable test steps by marking the entry with the mouse and selecting "Strikethrough Text" in the shortcut menu (right mouse key; only for editing in the local form copy).
  - Printing the completed form with *File > Print* and then selecting a connected printer.
  - Saving the completed form as a PDF with *File > Save*.
4. To end the form, close the PDF file.

**NOTICE**

After the PDF file has been closed, the entered data are only saved if you were working in the local copy. This can be opened at any time to continue editing.

## LIST OF ABBREVIATIONS

Abbreviations which are not generally known, but are used in this Service Manual, are listed below..

CE	Communauté Européenne (European Community)
CP	compact <sup>plus</sup> (System)
DIN	Deutsche Industrie Norm (German Industrial Standard)
EN	Europäische Norm (European Standard)
ESD	Electrostatic Discharge
FuP	Function Microprocessor
IEC	International Electrotechnical Commission
IfU	Instructions for Use
ISO	International Organisation for Standardisation
ICP	Infusomat® compact <sup>plus</sup>
ICPP	Infusomat® compact <sup>plus</sup> – variant for PVC tube
KuP	Monitoring microprocessor
KVO	Keep Vein Open Low rate infusion mode to avoid system occlusion
LCD	Liquid Crystal Display



MOS	Short name of the company: MOS Technology, Inc. (Commodore Semiconductor Group)
PCP	Perfusor® compact <sup>plus</sup>
STCP	Station compact <sup>plus</sup> (rack system)
TEMP	Temperature
TSC	Technical Safety Checks
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik e.V (German Association for Electrical, Electronic & Information Technologies)
VTBI	Volume to be infused



# Contact Information

## TECHNICAL TRAINING

Via local representative.

## ENTRY FOR TECHNICAL TRAINING

Application for a technical training course must be made via the responsible representative.

## ORDERING OF SPARE PARTS AND TEST EQUIPMENT

Please contact your local B. Braun subsidiary.

### **International technicians (Intercompany)**

e-mail: Spare-Parts\_HC@bbraun.com

## SERVICE HOTLINE

### **Service hotline international**

e-Mail: Service-Hotline\_HC@bbraun.com

## RETURNS

Return of spare parts, test equipment, and units for calibration or complaints:

B. Braun Melsungen AG  
Schwarzenberger Weg 73-79  
Wareneingang Werk C  
34 212 Melsungen  
Germany

## RETURNS FOR REPAIRS

Please contact your local B. Braun subsidiary.

## SAFETY OFFICER (§ 30 MPG)

Dr. Stephan Krause

e-mail: stephan.krause@bbraun.com

## SERVICE PORTAL

Check current information regularly on  
[bbraun.com/mybbraun](https://www.bbraun.com/mybbraun) > Service Portal



# 1 Overview of the Device

## SYSTEM OVERVIEW



Fig. 1 - 1 System compact<sup>plus</sup>

- 1 Station compact<sup>plus</sup>
- 2 Infusomat® compact<sup>plus</sup> P
- 3 Perfusor® compact<sup>plus</sup>
- 4 Data module compact<sup>plus</sup>

The compact<sup>plus</sup> system is a modular design of modern infusion technology for stationary use in a rack system or for mobile use. The key modules and their connection among each other as well as to the peripheral devices are shown in Fig. 1 - 1.

All pump types, Perfusor® compact<sup>plus</sup>, Infusomat® compact<sup>plus</sup>, Infusomat® compact<sup>plus</sup> P, as well as other devices of the system are based on a modular design. Up to three pumps can be connected together mechanically using L rails on the bottom of the unit and grooves on the top. They can then be fastened to a drip stand using the pole clamp.

The Station compact<sup>plus</sup> allows the set-up of a complete pump system with up to 18 pumps. Up to three pumps can be installed in every Station compact<sup>plus</sup>. The pumps are supplied with mains power via built-in connectors. Infrared technology is applied to accomplish the data transfer between the Station compact<sup>plus</sup> and the pumps. The Station compact<sup>plus</sup> is connected with the Data module, if integrated.

Up to four Station compact<sup>plus</sup> units can be set-up as a pillar with a total of 12 pumps.

Station compact<sup>plus</sup> units at the same patient can be connected via special connection cables, if the maximum number of six Station compact<sup>plus</sup> units in maximum two pillars is not exceeded.

## DESCRIPTION OF DEVICE

## INTENDED USE

## DEVICE OVERVIEW

The Infusomat® compact<sup>plus</sup> P is an infusion pump system which includes an external transportable electronic infusion pump and pump accessories.

See the Instructions for Use.

The Infusomat® compact<sup>plus</sup> P is provided with the following operation-related elements:

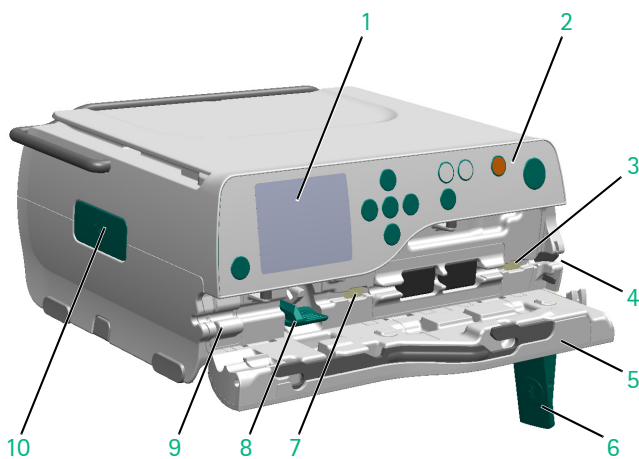
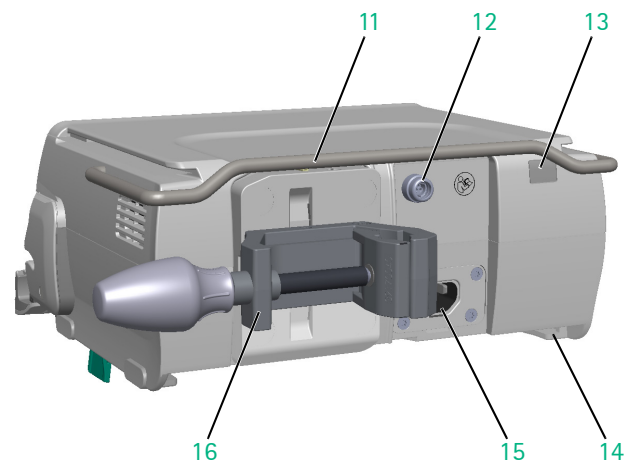


Fig. 1 - 2

- 1 Display
- 2 Keyboard
- 3 Pressure sensor, upstream
- 4 Second clamp
- 5 Pump door
- 6 Door opener
- 7 Pressure sensor, downstream
- 8 Fixation for SHK with push button
- 9 Air sensor
- 10 Release button



- 11 Carrying handle
- 12 Accessory connector
- 13 IR window
- 14 Guide rails for connecting pumps
- 15 Power connector (IEC socket)
- 16 Pole clamp

## MECHANICAL DESIGN

The Infusomat® compact<sup>plus</sup> P housing mainly consists of the bottom part and the upper part. The pump door is screwed to the housing, bottom part. The pole clamp is mounted on the rear of the housing. The operating unit (keyboard and display) is integrated into the front of the housing, upper part.

The processor board is located directly under the cover of the housing, upper part.

## FUNCTION

### Power supply

There are several ways of powering the Infusomat® compact<sup>plus</sup> P:

- via the built-in battery module,
- via an external 12 V DC power supply cable connected at the connector (e.g. from an ambulance),
- via line voltage and the integrated power supply unit, or
- via the Station compact<sup>plus</sup>.

The voltage supplied is converted to the required internal voltages in a voltage transforming and monitoring circuit on the processor board. The processor board monitors the battery cells and controls their charge condition.

### Processors

The function processor controls all the functions of the Infusomat® compact<sup>plus</sup> P. Data is stored in a non-volatile memory. External data transmission is also controlled from here. The monitoring microprocessor monitors all important responses of the function processor to incoming information. If a response does not correspond to that expected by the monitoring microprocessor, an error message is generated and the device is switched to a safe state (stop plus alarm).

### User interface

The display is illuminated.

### Block diagram

(see "Block diagram Infusomat® compact<sup>plus</sup> P" → p. 1 - 4)

The following abbreviations are used in the block diagram:

- SHK  
SHK ICPP
- PCB  
Printed circuit board

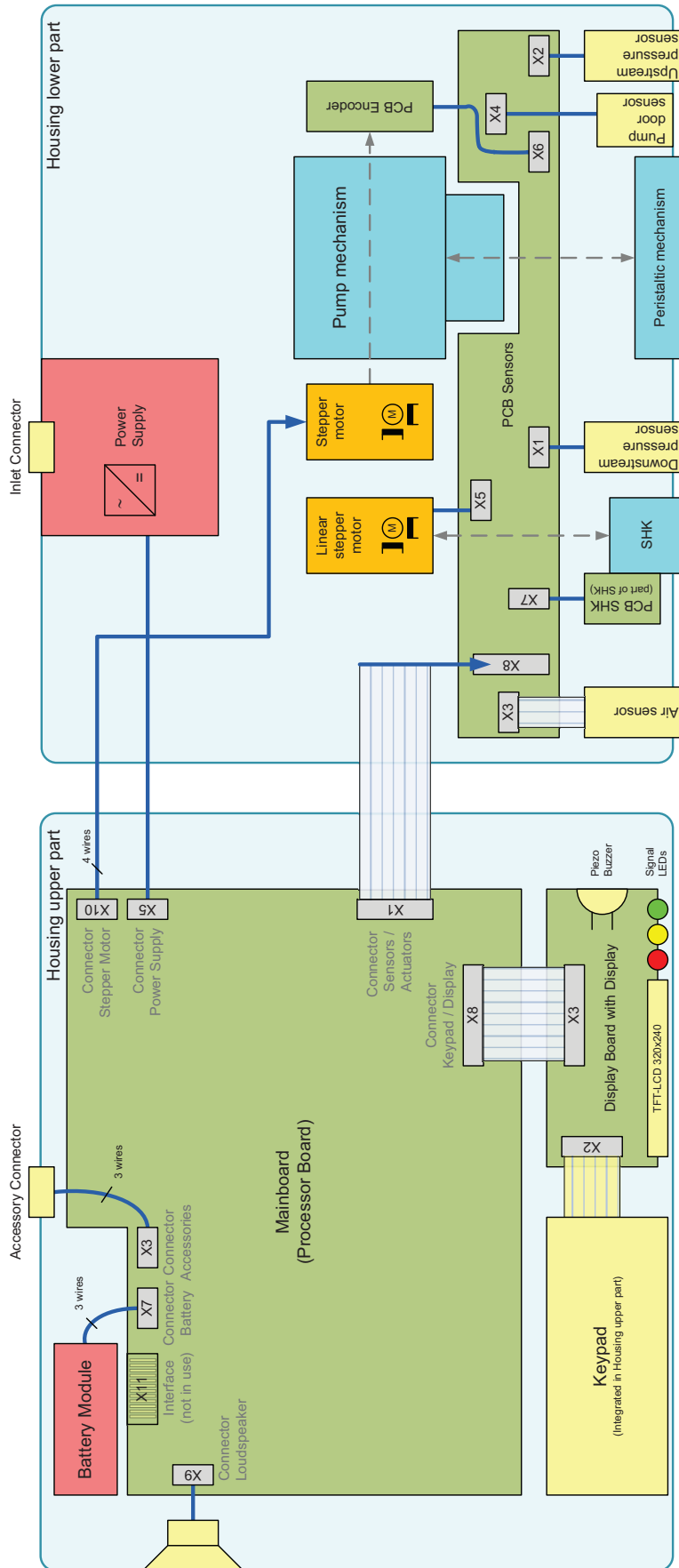


Fig. 1 - 3 Block diagram Infusomat® compactplus P



## UNIT SOFTWARE

Position	1	2	3	4	5	6	7	8	9	10
Digit	I	0	0	0	3	A	0	0	0	1
	Infusomat® compact <sup>plus</sup> P					Revision		Deployment version number		Version
						Revision		Deployment version number		Version
						Revision		Deployment version number		Version

Fig. 1 - 4 Software version information

## History

■ 003A00XX (or I0003A00XX depending on version of nomenclature)

Basic software

The Infusomat® compact<sup>plus</sup> P is supported with SW version I0003A0006 and above.

## Software update of the unit

Updating the software is performed with the service program. (see "compact<sup>plus</sup> Service Tool" Instructions for Use).

### NOTICE

If the unit is disconnected or the device or PC is switched off while the software is being updated, a component of the software may be irreparably damaged. The software can then no longer be updated via the PC and the device must be returned to B. Braun.

### NOTICE

A Functional Test has to be performed after every software update.

### NOTICE

Security issues (cybersecurity, e.g., newly discovered vulnerabilities in the device software) may require an update or patch of the device software. These security updates or security patches are performed in the same way as any other update of the device software.

## SERVICE PROGRAM

### Installation and operation

Installation and operation of the service program is described in the Instructions for Use.

(see "compact<sup>plus</sup> Service Tool" Instructions for Use).

### Connection between unit and PC

The unit is connected to the PC via the USB service adapter CP.

(see "compact<sup>plus</sup> Service Tool" Instructions for Use).

TECHNICAL DATA

All technical data is listed in the Instructions for Use.

OPTIONS

The functions of the individual options are described in detail in the Instructions for Use.

<b>Designation</b>	<b>Part No.</b>
Power cord EU .....	8717110
Power cord GB .....	8717111
Power cord US .....	8717112
Power cord AU .....	8717113
Power cord CH .....	8717114
Power cord ZA, IN .....	8717115
Power cord CN .....	8717117
Power cord DK .....	8717118
Power cord BR .....	8717119
Power cord AR .....	8717121

All cables have a length of 2.5 m.

it is necessary to use one of the power cords listed above as these do not have any raised lettering on the rubber connector.

ACCESSORIES

<b>Designation</b>	<b>Part No.</b>
Connection lead 12V .....	8718020
for ambulance vehicles	
Staff call cable compact <sup>plus</sup> .....	8718030
USB service adapter CP .....	34522008

**NOTICE**

Only original B. Braun products may be used for replacement of interchangeable or detachable parts to ensure that the device remains operational.

## FUNCTIONAL TEST\*

**⚠ WARNING** **Danger of injury to the patient!**  
 Device must not be connected to a patient.  
 Observe the Instructions for Use when performing the test.

Item	OK
<b>1. Completeness, Integrity</b>	
1.1 Instructions for Use is available.	<input type="checkbox"/>
1.2 Final Inspection Sheet is available.	<input type="checkbox"/>
1.3 No mechanical damage is found on Infusomat® compact <sup>plus</sup> P.	<input type="checkbox"/>
1.4 Type plate is present.	<input type="checkbox"/>
1.5 Read serial number from type plate and enter this below on this page.	<input type="checkbox"/>
1.6 Seal is present and undamaged.	<input type="checkbox"/>
1.7 Infusomat® compact <sup>plus</sup> P is clean.	<input type="checkbox"/>
<b>2. Switching on and Self-test</b>	
2.1 Switch on Infusomat® compact <sup>plus</sup> P.	<input type="checkbox"/>
2.2 Display shows "Self test".	<input type="checkbox"/>
2.3 Two signal tones are audible.	<input type="checkbox"/>
2.4 Red LED flashes twice. Green LED flashes once.	<input type="checkbox"/>
2.5 Is the battery charged? If not: connect device to mains power supply.	<input type="checkbox"/>
2.6 Is the required language displayed? If not: select language.	<input type="checkbox"/>

Item	OK
<b>3. Functional Test (see Instructions for Use)</b>	
3.1 Open pump door, insert a primed line, close pump door.	<input type="checkbox"/>
3.2 Open roller clamp, confirm line. "Rate" menu appears after successful self-test.	<input type="checkbox"/>
3.3 Deny priming if this message appears (configurable).	<input type="checkbox"/>
3.4 Select a rate of 1.1 ml/h and start Infusomat® compact <sup>plus</sup> P: Green LED lights up, arrows move from right to left.	<input type="checkbox"/>
3.5 Administer a bolus by preselecting a volume of 3 ml – bolus is administered, volume counter counts up.	<input type="checkbox"/>
3.6 Close roller clamp – red LED lights up, alarm text is displayed.	<input type="checkbox"/>
3.7 Confirm alarm by pressing the "OK" button and restart Infusomat® compact <sup>plus</sup> P.	<input type="checkbox"/>
3.8 Press "Menu" button – the "Main Menu" opens.	<input type="checkbox"/>
3.9 Press "Info" button – therapy information is given.	<input type="checkbox"/>
<b>4. Finalizing the Test</b>	
4.1 Remove line from Infusomat® compact <sup>plus</sup> P and dispose properly. Switch device off.	<input type="checkbox"/>
4.2 Place Instructions for Use with Infusomat® compact <sup>plus</sup> P.	<input type="checkbox"/>
4.3 Complete this form and file properly.	<input type="checkbox"/>
4.4 Also file the Final Inspection Sheet.	<input type="checkbox"/>

Functional Test performed at Infusomat® compact<sup>plus</sup> P with serial number:

Infusomat® compact<sup>plus</sup> P was handed over without any damage and is in proper working order.

\_\_\_\_\_  
 Date Signature B. Braun Signature Owner

\* Do not use the device if the functional test fails. Contact your local representative for replacement or repair.



# 2 Unit Diagnosis / Adjustments

## ALARMS AND ERROR MESSAGES

The alarms of the Infusomat® compact<sup>plus</sup> P are grouped into different categories. The categories are listed below in order of increasing importance.

### ■ Advisory alarm

A message is output if incorrect entries are made (e.g. "Maximum reached", "The parameter cannot be changed") and an audible signal is output.

### ■ Reminder alarm

A reminder alarm is triggered if the device is not operated for two minutes after an incomplete entry or operator action on the device.

### ■ Pre-alarm

Pre-alarms are triggered several minutes (depending on the service settings) before the operating alarms.

### ■ Operating alarm

If an operating alarm is output, infusion is stopped. An audible signal is output, the red LED flashes and a staff call is triggered. The message "Alarm" and the cause of the alarm appear on the display.

### ■ Device alarm

If a device alarm is output, infusion is stopped immediately. If the device is restarted and the alarm is displayed again, servicing of the unit is required.

The most important alarms and error codes as well as their meaning and possible fault clearance are specified in the following sections.

## LOG FILES

The device logs activity including security relevant events in a ring-buffer.

This buffer is protected against manipulation, i.e. it is not possible to add, change, or delete single entries. Each entry includes date, time and event description. The files are stored in the device memory and can be retrieved using the Service Tool (see "[compact<sup>plus</sup> Service Tool](#)" Instructions for Use).

The log files are not automatically analyzed.

## PRE-ALARMS AND OPERATING ALARMS

See Instructions for Use.

## STANDARD DEVICE ALARMS

**Appearance**

Header with short information (e.g., "Device alarm") and 4-digit error code (e.g., „0325"). Footer with on/off-icon and short text (e.g., "Turn Pump off").

**NOTICE**

In case a device alarm appears, please switch the device off and on. Further action only needs to be taken if the alarm persists.

**Error codes of the function microprocessor (FuP)**

Code	Definition	Possible cause	Fault rectification
319	Validation of the Displayed Disposable failed	Software failure	
325	Key panel activated	Key panel failure	Change upper part of housing
326	Key panel not confirmed by KuP	Hardware defect	Change upper part of housing
350	Pressure values delayed	Software failure	
358	Unexpected error in the timer management of the pump	Software failure	
359	Deviation during periodic "Readback" of KuP data	Software error, e.g due to corrupted data in RAM	

Table 2 - 1 Error codes of the FuP

**Error codes of the control microprocessor (KuP)**

Code	Definition	Possible cause	Fault rectification
704	Disposable table damaged	Software failure	
705	Disposable data not plausible	Software failure	
706	Disposable table damaged	Software failure	
707-709	Plausibility of sensor data concerning status of the pump invalid	Software failure	
719	Change of pressure value, user confirmation not detected by KuP	Software failure	
735	Self check not ready on start of infusion	Software failure	
740	Battery voltage inconsistent	Battery defect	Change battery

Table 2 - 2 Error codes of the KuP

Code	Definition	Possible cause	Fault rectification
750	Key panel, key activated	Key panel faulty	Change upper part of housing
751	Key panel, activation not confirmed by FuP	Hardware defect	Change upper part of housing
806-811	Infusion monitoring	Software failure	
816-817	Infusion monitoring	Software failure	
825	General failure during flow monitoring	Software failure	
850	Alarm invalid	Software failure	
851	Alarm delayed	Software failure	
853	Different temperature values of FuP and KuP	Hardware defect	

Table 2 - 2 Error codes of the KuP (Cont.)

## DEVICE ALARMS WITH REDUCED DISPLAY

### Appearance

Reduced visual display. Red screen background, one line text information (e.g., "Device alarm, switch off device") followed by a 5 digit alarm code.

Detailed alarm code will appear after a re-start as follows:

FuP: 11110:11e:ecdd:13a

KuP: 11556:11e:79e7:248

The last 3 digits of the first block contain the error code (e.g., FuP: 110, KuP: 556).

To derive the real error code from the displayed code, subtract 100 from the first block of the FuP or 500 from the first block of the KuP error codes, respectively.

For example, FuP -110 = error code 10 (CPU self check failure),  
KuP -500 = error code 56 (error on program flow).

### NOTICE

In case a device alarm appears, please switch the device off and on. Further action only needs to be taken if the alarm persists.

## Error codes

Code	Definition	Possible cause	Fault rectification
0-5	Internal error	Send history to B. Braun for fault clarification	
10	CPU self check failure	CPU defective	Change main PCB
11	RAM self check failure	RAM defective	Change main PCB
13	Flash self check failure	Firmware damaged	Re-install firmware
		Flash defective	Change main PCB
14	Switch off self check failure	If error appears frequently: Hardware defect	
15	Voltage monitoring self check failure	If error appears frequently: Hardware defect	
16	Red LED failure on monitoring	If error appears frequently: Hardware defect	
17	Green LED failure on monitoring	If error appears frequently: Hardware defect	
18	Speaker self check failure	If error appears frequently: Hardware defect	Check/replace speaker
19	Grafic processor, monitoring failure	If error appears frequently: Hardware defect	
20	Common Time Base, monitoring failure	If error appears frequently: Hardware defect	Change main PCB
21	Key panel. monitoring failure	If error appears frequently: Hardware defect	
22	Encoder monitoring failure	If error appears frequently: Hardware defect	
23-24	Light sensor monitoring failure	If error appears frequently: Hardware defect	
27	Event Queue Stack Overflow High Prio	Software failure	
28	Delay delivery kernel	Software failure	
29	Delivery segment, deviation	Software failure	
31	General failure during flow monitoring	Software failure	
32	Stack over-/underrun	Software failure	
33-34	Task monitoring, failure	Software failure	
35	Readback (Displaychecker) failure	Software failure	
36	Therapy time monitoring failure	Software failure	
37	Bolus time monitoring failure	Software failure	
38	Service Mode monitoring failure	Software failure	
39	Language file: wrong version	Wrong or invalid language file	Install correct language file

Table 2 - 3 Error codes



Code	Definition	Possible cause	Fault rectification
40	Fonts: wrong version	Wrong or invalid fonts	Install correct fonts file
41	Bitmaps: wrong version	Wrong or invalid bitmaps	Install correct bitmaps file
42	Config file: wrong version	Wrong or invalid config file	Install correct config file
43	Hardware: wrong version	Wrong or invalid firmware	Install correct firmware
		Hardware defect	Change main PCB
44	Display: wrong version	Wrong or invalid firmware	Install correct firmware
		Hardware defect	
45	Language file: wrong checksum	Language file damaged	Replace language file
46	Fonts: wrong checksum	Fonts invalid	Replace fonts file
47	Bitmaps: wrong checksum	Bitmaps invalid	Replace bitmaps file
48	Config file: wrong checksum	Config file invalid	Replace config file
49	Communication failure FuP ↔ KuP	Software failure	
		If error appears frequently: Hardware defect	Change main PCB
50	Queue Overflow communication FuP ↔ KuP	Software failure	
51-63	Flow monitoring, failure	Software failure. Code 56 following error to FuP problem.	
66	Registry monitoring: failure	Software failure	
		If error appears frequently: Hardware defect	Change main PCB
67	Missing character in font file	Language file invalid	
68	Software version doesn't match: FuP ↔ KuP	Firmware on FuP or KuP wrong or invalid	Install correct firmware
69	Disposable table: Wrong version	Disposable table wrong or invalid	Install correct disposable table
70	Display F Mark interrupt not triggered	Hardware defect	
71	FuP with unexpected reset	Hardware defect	
72	KuP with unexpected reset	Hardware defect	
73	Invalid voltage VB1	Hardware defect	
74	Invalid voltage Super Cap	Hardware defect	
75	Invalid voltage battery	Hardware defect	

Table 2 - 3 Error codes (Cont.)

Code	Definition	Possible cause	Fault rectification
76	Invalid voltage motor	Hardware defect	
200-202	Air-sensor supervision	Hardware defect	
206	Light barrier supervision	Hardware defect	
207	Opening / closing of the clamp (SHK,FFC) is not detected by the photocell	Hardware defect	
209	Air-sensor calibration data invalid	Hardware defect	
210	Air-sensor flash data invalid	Hardware defect	
211	Air-sensor hardware version invalid		
213	Air-sensor in service mode	Software failure. If persisting: hardware defect	
214	Pressure-sensor values out of range	Hardware defect	
215	Sensor PCB hardware version invalid		
216	Temperature supervision	Hardware defect	

Table 2 - 3 Error codes (Cont.)

### THE MOST IMPORTANT FAULT EVENTS

The following list specifies the most important known errors and how they are rectified.

	Error	Possible cause	Fault rectification
1.	The battery is discharging too fast.	The device has not been used for a longer period of time. The battery has not been discharged and recharged on a regular basis.	Discharge and recharge battery several times. Replace battery module.

Table 2 - 4 Most important fault events

#### NOTICE

The unit must be checked after every repair or service.  
(see "Checks after Repair" → p. 3 - 32)

## ADJUSTING THE MECHANICAL PRESSURE

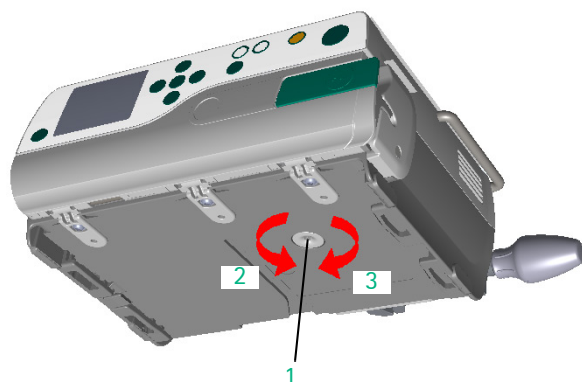


Fig. 2 - 1

- 1 Access to adjustment screw of mechanical pressure
- 2 Increasing mechanical pressure
- 3 Decreasing mechanical pressure

The mechanical pressure can be adjusted with a T30 TORX screwdriver inserted in the opening of the housing, bottom part (Fig. 2 - 1 / Item 1). Opening the unit is not required.

1. If the pressure is too high during the mechanical pressure test, reduce the pressure by rotating clockwise (Fig. 2 - 1 / Item 3). If the pressure is too low, increase the pressure by rotating counterclockwise (Fig. 2 - 1 / Item 2).
2. Repeat the mechanical pressure test after adjustment.
3. If the pressure is within limits, seal the plug again.

### NOTICE

Be sure to use the correct screwdriver (T30 TORX) for adjusting the mechanical pressure.

Do not use a T25 TORX screwdriver which will unscrew the lock screw (see "Power supply" → p. 3 - 31).



# 3 Disassembly / Assembly

## REMARKS ON DISASSEMBLY

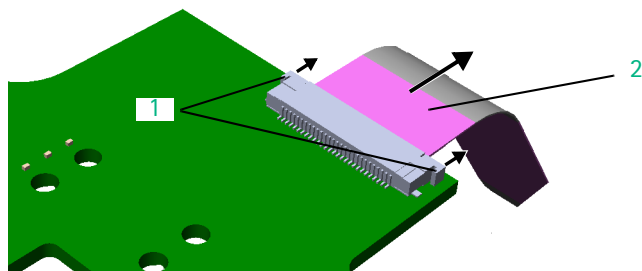


Fig. 3 - 1

- 1 Lock
- 2 Ribbon cable

## Safety notes

### **⚠ WARNING**

Live parts of the device.

#### **Danger of electric shock!**

- Comply with national and international safety regulations.
- Pull out the power plug.

## General

The steps required to remove or disassemble the unit are described in full, from the complete unit down to the last spare part. Prerequisites that must be met are given at the beginning of each section. Steps that are not necessary can be omitted.

## Zero force insertion connector

To disconnect the plug-in connection, the ribbon cable must be unlocked completely:

1. Carefully push the locks of the connector (Fig. 3 - 1 / Item 1) on the right and left toward the ribbon cable using a small screwdriver or special tool.
2. Pull the ribbon cable (Fig. 3 - 1 / Item 2) out of the connector.

## Sets of small parts

Some small parts of the Infusomat® compact<sup>plus</sup> P, such as cover caps or screws, are grouped into sets.

### **NOTICE**

The content of service kits may vary based on experience from repairs during the product life cycle.

<b>Designation</b>	<b>Ord. No.</b>
Small parts ICP .....	34522210
with:	
Cylinder screw M4x16 ISO 14580 A2 (40 Pcs)	
Delta PT screw WN5451 25x6 (10 Pcs)	
Delta PT screw A2 WN5454 30x9 (10 Pcs)	
Delta PT screw 22x8 WN5451 (4 Pcs)	
Delta PT screw A2 WN5452 30x10 (20 Pcs)	
Delta PT screw 35x10 WN5451 (10 Pcs)	
Delta PT screw 30x8 WN 5451 (10 Pcs)	
Cover cap poleclamp (40 Pcs)	
Cover cap housing (100 Pcs)	
Cover cap drive head (5 Pcs)	
Foot (10 Pcs)	
Magnet 7x7x3 (5 Pcs)	
Hexagon nut M8,5x1 DIN 934 (2 Pcs)	
Speaker flap	
Lock screw (5 Pcs)	
O-Ring 12x3 NBR 50 Shore (5 Pcs)	
Seal ring 3x1 50 ShoreA Silicon red (5 Pcs)	
Coil valve mechanics (5 Pcs)	
Fixing plate (3 Pcs)	
Sealing pole clamp (3 Pcs)	
IR-LED 100 mA OSRAM IRL 81 A (2 Pcs)	
Hall sensor A3212EUA-T (2 Pcs)	
Optical sensor (TSL254R) (2 Pcs)	
Halkey-Robt.Swabable T-port (PC) 245454024 (2 Pcs)	
Cover cap set CP .....	34774501
with:	
Cover cap housing (500 Pcs)	
Cover cap Pole Clamp (150 Pcs)	
Cover cap drive head (70 Pcs)	
O-ring 12x3 NBR 50 Shore (5 Pcs)	
Lock screw (5 Pcs)	

## REMARKS ON ASSEMBLY

**General**

The modules and subassemblies are installed or assembled in reverse order of removal or disassembly. Work steps that require special attention are given in the sections following the disassembly instructions of each part. Therefore read the assembly instructions in reverse order starting with the part disassembled at last. Prerequisites that must be met are given at the beginning of each section.

The Infusomat® compact<sup>plus</sup> P is ingress-protected according to IP34 classification. Therefore, following the instructions about thread locking and greasing is obligatory.

Always use new cover caps only.

**Special screws****NOTICE**

Special screws for plastic housings are used in this device. These are screws specially designed for plastic housings. Pay attention to the relevant notes when you fit the screws.

The special screws for plastic housings are not self-cutting but form a thread in the plastic of the housing by deformation when first inserted.

When inserted subsequently, the screw will produce a new thread if it does not coincide with the exact start of the existing thread. This destroys the old thread. The screw fastening will then not be secure.

Proceed as follows to fit the special screws for plastic housings:

1. Position the special screw for plastic housings on the thread.
2. Turn the screw counterclockwise (unscrew) until a faint click can be heard. This click is produced when the screw thread drops into the thread of the housing.
3. Screw in the screw and tighten with the specified torque.

### 3.1 HOUSING FOOT

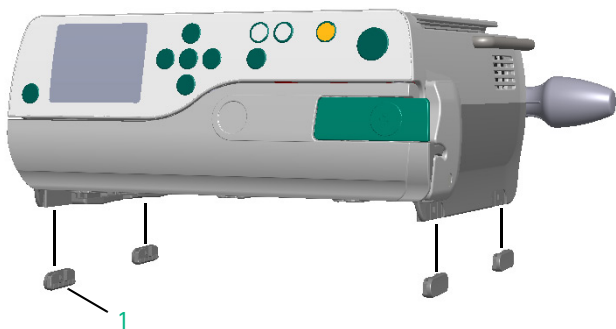


Fig. 3 - 2  
1 Housing foot

#### Zero force insertion connector

##### NOTICE

Make sure that the ribbon cable is centered between the guides of the connector when the zero force insertion connector is locked. Check the lock and that the ribbon cable is correctly seated before continuing with installation.

#### Designation

Ord. No.

Housing foot

(see "Sets of small parts" → p. 3 - 1)

#### Disassembly

1. Pull the four housing feet (Fig. 3 - 2 / Item 1) out of the lower part of the housing.

#### Assembly

1. Push the housing feet into the guides in the lower part of the housing.



### 3.2 GASKET FOR RUBBER CONNECTOR

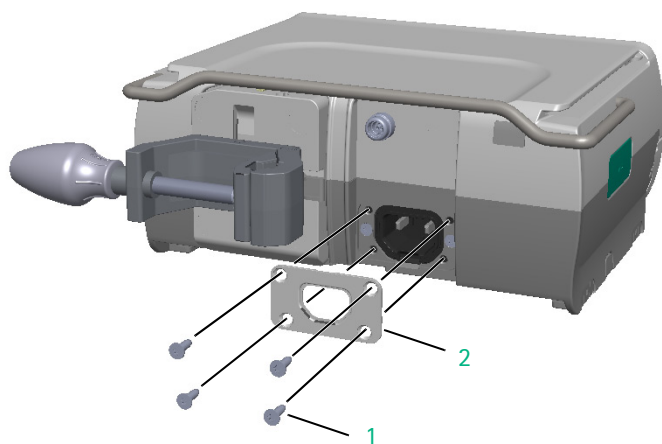


Fig. 3 - 3

- 1 Screw DELTA PT 30x9 WN 5454
- 2 Gasket

#### Designation

Gasket for rubber connector CP. .... 34522010  
Screws

**Ord. No.**

(see "Sets of small parts" → p. 3 - 1)

#### Disassembly

1. Unscrew the four screws (Fig. 3 - 3 / Item 1) using a 10IP TORX plus screwdriver.
2. Remove the gasket (Fig. 3 - 3 / Item 2).

#### Assembly

✓ Power supply is installed in the housing, bottom part.

1. Attach the gasket with the correct orientation.

#### *NOTICE*

Use a new gasket whenever the gasket has been removed.

2. Tighten the screws with a torque of  $0.75 \text{ Nm} \pm 0.1 \text{ Nm}$ .

### 3.3 MEMBRANE

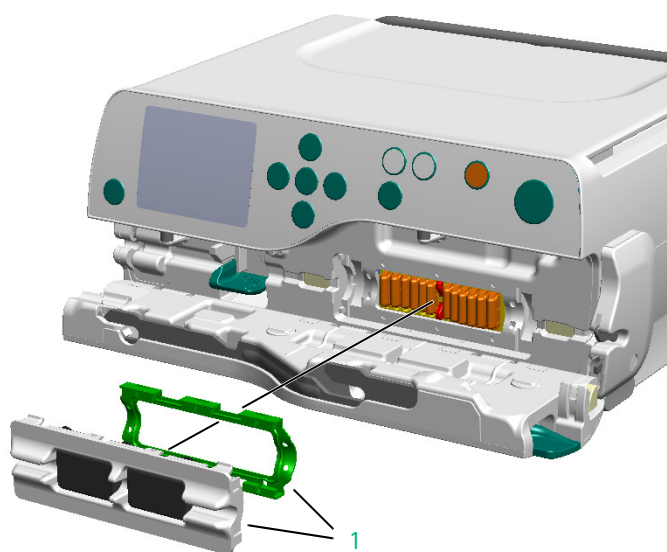


Fig. 3 - 4  
1 Membrane with gasket

<b>Designation</b>	<b>Ord. No.</b>
Membrane ICPP.....	34522292

#### Disassembly

1. Open the pump door.
2. Place a small screwdriver at a position where the slides are retracted and carefully lever out the membrane (Fig. 3 - 4 / Item 1).

**NOTICE**

Remove the membrane only if necessary (for example, if it is damaged or contaminated).

#### Assembly

- ✓ Housing front has been mounted to the housing, bottom part.
1. Check the membrane for damage before mounting to the pump, and replace it, if necessary.
  2. Check for correct seating of the membrane gasket (see Fig. 3 - 4).
  3. Push the membrane in until it audibly latches into position.

### 3.4 POLE CLAMP

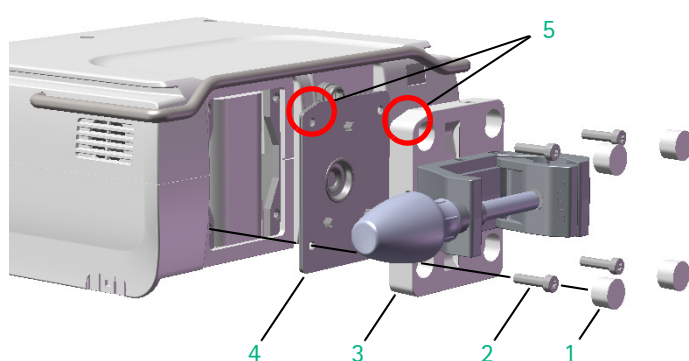


Fig. 3 - 5

- 1 Cover cap
- 2 Screw cylinder-head M4x16
- 3 Pole clamp
- 4 Sealing
- 5 Orientation coding

#### Designation

Ord. No.

Pole Clamp complete CP.....34522004

Cover plate CP.....34522012

Screws and cover caps

(see "Sets of small parts" → p. 3 - 1)

#### Disassembly

1. Pierce the four cover caps (Fig. 3 - 5 / Item 1) with a small screwdriver or twist gimlet and remove them.
2. Unscrew the four screws (Fig. 3 - 5 / Item 2) using a T20 TORX screwdriver.
3. Remove the pole clamp (Fig. 3 - 5 / Item 3) and the sealing (Fig. 3 - 5 / Item 4).

#### Assembly

- ✓ Battery has been inserted and connected.

#### NOTICE

Depending on the usage of the Infusomat® compact<sup>plus</sup> P, the Cover plate CP may be mounted instead of the pole clamp..

1. Before inserting the sealing, apply high-vacuum grease to the pole clamp at the marked position (see Fig. 3 - 6).
2. Attach the pole clamp and seal with the correct orientation (Fig. 3 - 5 / Item 5).

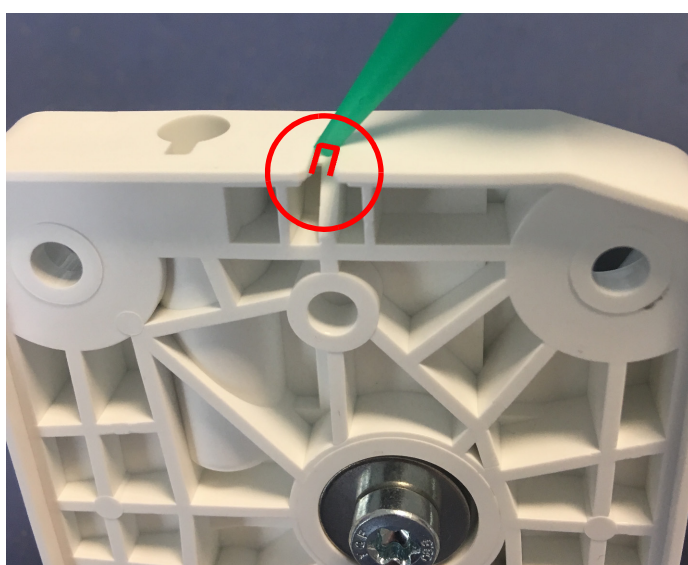


Fig. 3 - 6

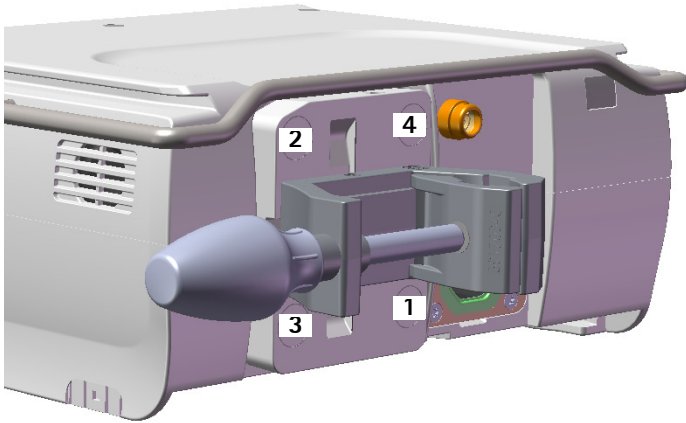


Fig. 3 - 7

3. Tighten the screws with a torque of  $0.7 \text{ Nm} \pm 0.07 \text{ Nm}$  (first and second screwing).  
Be sure to observe the correct screw sequence (see Fig. 3 - 7).

**NOTICE**

Use new screws whenever the pole clamp has been removed. Remove residues from old precote material with a 4.3 mm / 90° countersink. Fix the new screws with Loctite 243 if not coated with precote.

4. Test function after installation: turn the pole clamp in all directions (4x90°) and check for correct latching.

### 3.5 BATTERY MODULE

<b>Designation</b>	<b>Ord. No.</b>
Battery module CP .....	34522005

**CAUTION**

Replacement with a wrong battery type may result in excessive temperatures, fire or explosion.  
**Risk of injury to the patient or personnel!**  
■ Only original B. Braun battery modules must be used.

#### Disassembly

- ✓ Pole clamp has been removed.
1. Remove the battery (Fig. 3 - 8 / Item 1).
  2. Pull off the 3-pole battery cable from the processor board.

**NOTICE**

To avoid tearing do not pull at the cable. Always grasp the connector and pull. Use grippers if necessary.

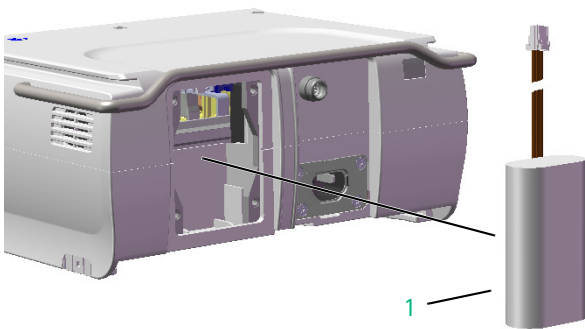


Fig. 3 - 8

1 Battery module

**Assembly**

✓ Unit is closed.

**NOTICE**

There are two versions of batteries in the market, one version with white and one version with black shrinking tube. Both battery versions are compatible.

1. When inserting the battery, route the cable inside the housing toward the processor board and place the battery with the cable facing inwards.

**NOTICE**

Do not squeeze the ribbon cable.



Fig. 3 - 9

### 3.6 SECOND CLAMP

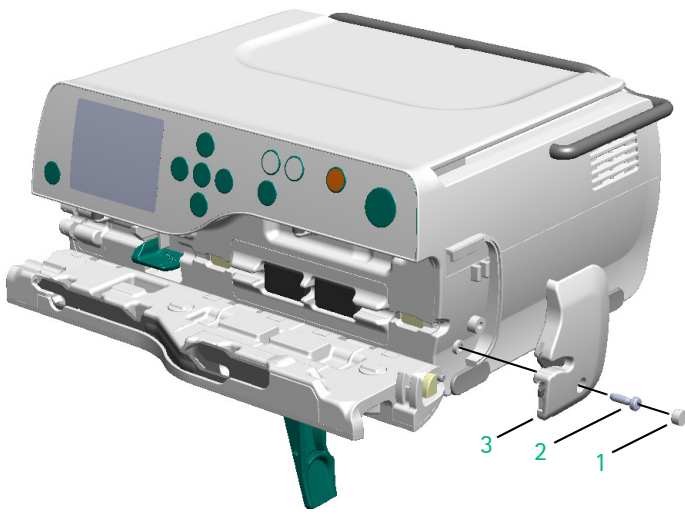


Fig. 3 - 10

- 1 Cover cap
- 2 Screw DELTA PT 30x10 WN 5452
- 3 Second clamp

#### Designation

Ord. No.

Second clamp ICPP ..... 34522286

Screw and cover cap

(see "Sets of small parts" → p. 3 - 1)

#### Disassembly

✓ Pump door is open.

1. Pierce the cover cap (Fig. 3 - 10 / Item 1) with a small screwdriver or twist gimlet and remove it.
2. Remove the screw (Fig. 3 - 10 / Item 2) using a 10IP TORX plus screwdriver.
3. Slightly lift the second clamp (Fig. 3 - 10 / Item 3) toward the top and remove it to the side.

#### Assembly

✓ Unit is closed.

1. Tighten the screw with a torque of  $0.65 \text{ Nm} \pm 0.1 \text{ Nm}$  (first and second screwing).

#### NOTICE

If the second clamp ICPP has to be replaced, the transport bracket must be removed from the new spare part before it is mounted to the pump.

### 3.7 PUMP DOOR

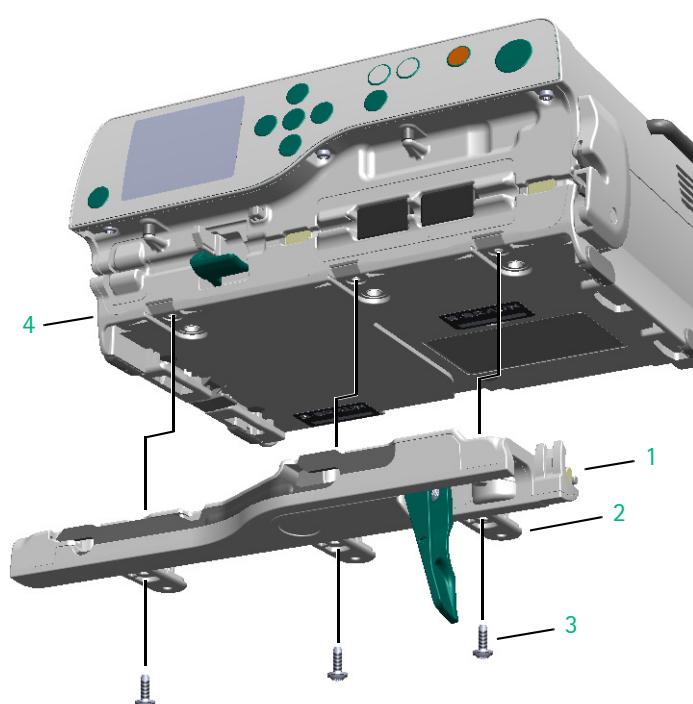


Fig. 3 - 11

- 1 Pump door
- 2 Hinge
- 3 Screw DELTA PT 35x10 WN 5452
- 4 Housing, bottom part

#### Designation

Ord. No.

Pump door ICPP .....34522294

Screws

(see "Sets of small parts" → p. 3 - 1)

#### Disassembly

✓ Pump door is open.

1. Unscrew the three screws (Fig. 3 - 11 / Item 3) using a 15IP TORX plus screwdriver.
2. Lift the hinges (Fig. 3 - 11 / Item 2) from the housing, bottom part (Fig. 3 - 11 / Item 4).
3. Remove the pump door (Fig. 3 - 11 / Item 1).

#### NOTICE

The complete check after repair has to be performed whenever the pump door has been removed.

#### Assembly

✓ Unit is closed.

✓ Second clamp has been mounted.

1. Tighten the screws with a torque of  $0.7 \text{ Nm} \pm 0.07 \text{ Nm}$  (first and second screwing).

### 3.8 OPENING/CLOSING THE UNIT

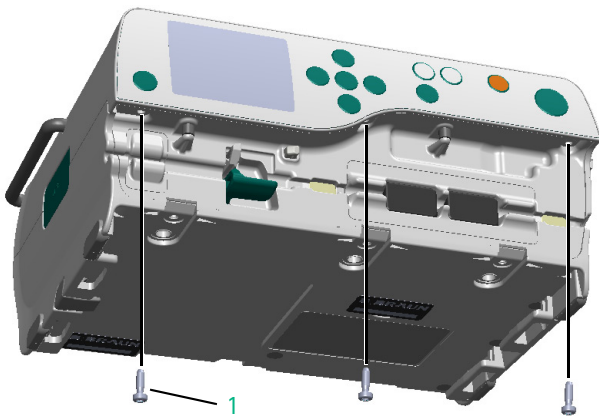


Fig. 3 - 12

- 1 Screw DELTA PT 30x10 WN 5452

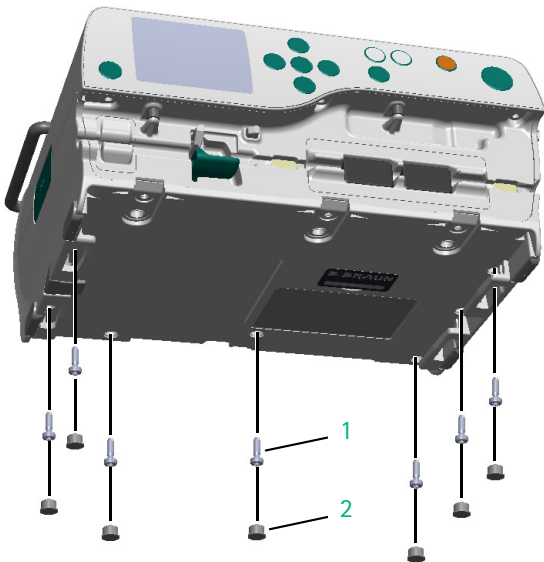


Fig. 3 - 13

- 1 Screw DELTA PT 30x10 WN 5452
- 2 Cover cap

#### Designation

Screws and cover caps

(see "Sets of small parts" → p. 3 - 1)

Ord. No.

#### Opening the unit

✓ Battery module has been removed.

✓ Pump door has been removed.

1. Unscrew the three screws (Fig. 3 - 12 / Item 1) at the housing front using a 10IP TORX plus screwdriver.

2. Pierce the seven cover caps (Fig. 3 - 13 / Item 2) at the housing, bottom part with a small screwdriver or twist gimlet and remove them.
3. Unscrew the seven screws (Fig. 3 - 13 / Item 1) using a 10IP TORX plus screwdriver.



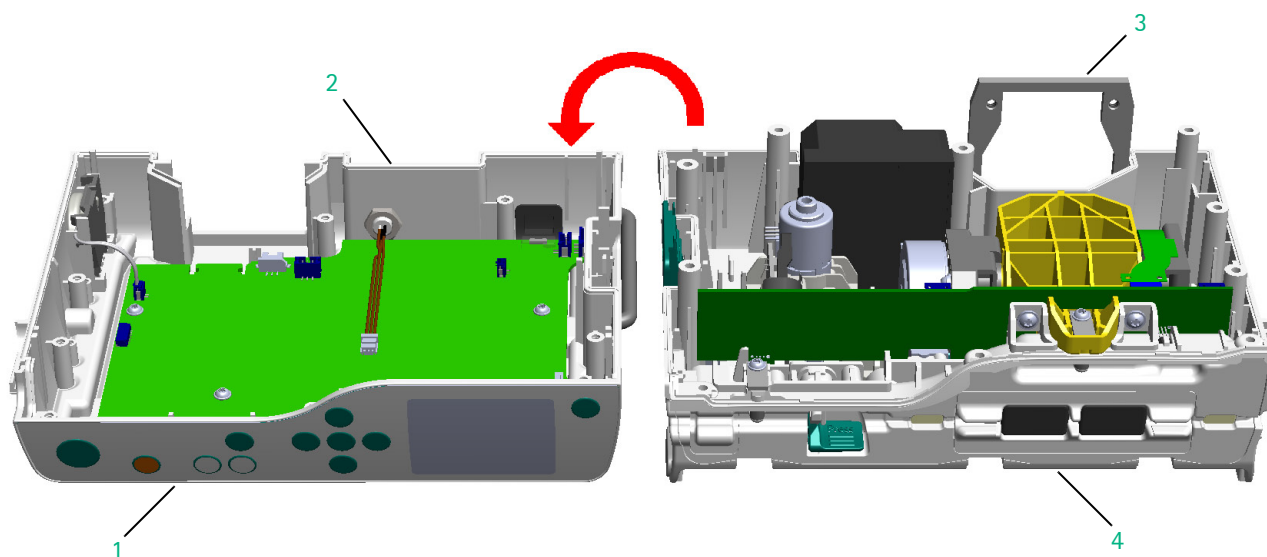


Fig. 3 - 14

- 1 Upper part of the unit
- 2 Gasket (all-round)

- 3 Fixing plate
- 4 Lower part of the unit

4. Carefully lift the upper part of the unit (Fig. 3 - 14 / Item 1), swing it over to the left and set it down.
5. Remove the fixing plate (Fig. 3 - 14 / Item 3) from the lower part of the unit (Fig. 3 - 14 / Item 4).
6. Disconnect the connector of the ESD wire (Fig. 3 - 15 / Item 1) on the processor board.
7. Disconnect the connector of the power supply (Fig. 3 - 15 / Item 2) on the processor board.
8. Disconnect the connector of the stepper motor (Fig. 3 - 15 / Item 3) on the processor board.
9. Completely unlock the connector for the connecting cable of the sensor board and pull out the ribbon cable (Fig. 3 - 15 / Item 4).

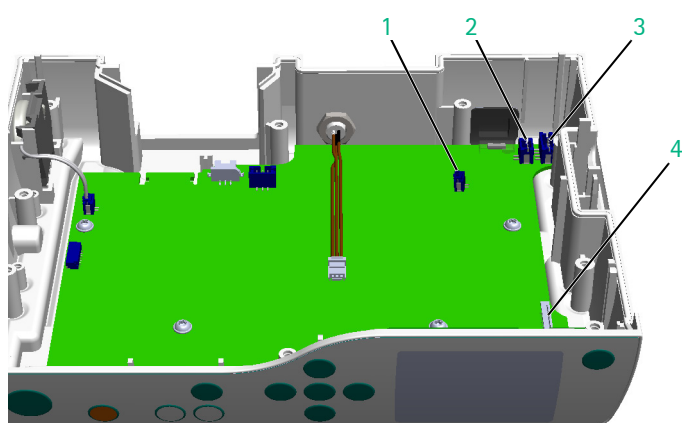


Fig. 3 - 15

- 1 Connector for ESD wire
- 2 Connector for power supply
- 3 Connector for stepper motor
- 4 Connector for sensor board

**NOTICE**

Check the gasket (Fig. 3 - 14 / Item 2) for integrity. In case of any visible damage replace the housing, upper part.

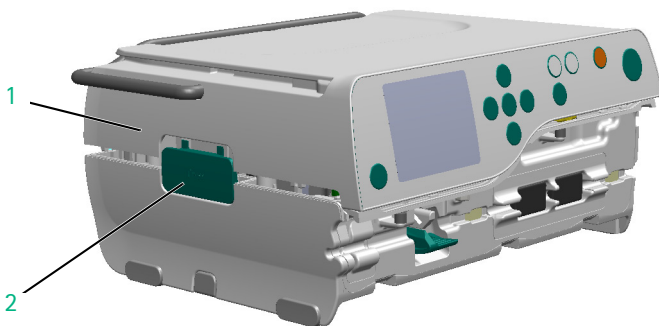


Fig. 3 - 16

- 1 Housing, upper part
- 2 Release button

### Closing the unit

#### NOTICE

Use new screws whenever the pole clamp has been removed. Remove residues from old precote material with a 4.3 mm / 90° countersink. Fix the new screws with Loctite 243 if not coated with precote

- ✓ The following modules are mounted in the housing, upper part:
  - Processor board and display board with display
  - Accessory connector
  - Loudspeaker
- ✓ The power supply is installed in the housing, bottom part.
- ✓ The housing front has been mounted to the housing, bottom part, with the following modules installed in the housing front:
  - Pump (including stepper motor and encoder PCB)
  - SHK (including SHK board)
  - Air sensor and pressure sensors

1. Place the upper and the lower part of the unit side by side (see Fig. 3 - 14).
2. Reconnect all plug connections.
3. Insert the fixing plate (Fig. 3 - 14 / Item 3).
4. Carefully place the upper part of the unit onto the lower part of the unit from above.

When aligning, make sure that the release button (Fig. 3 - 16 / Item 2) is flush with the shell of the housing, upper part (Fig. 3 - 16 / Item 1).

#### NOTICE

When closing the unit, make sure no cables are trapped.

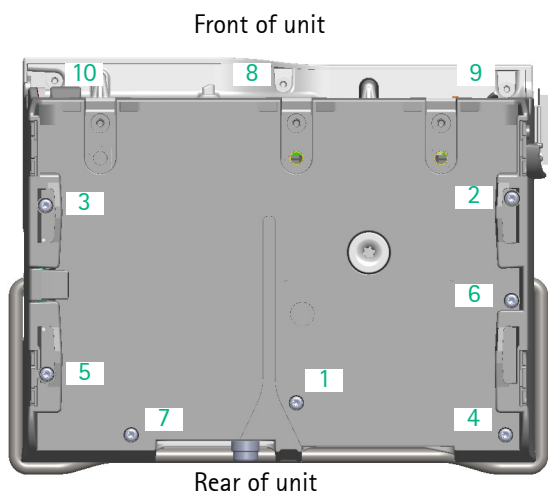


Fig. 3 - 17 Sequence of screwing

5. Tighten the screws of the housing and the housing front with a torque of  $0.8 \text{ Nm} \pm 0.08 \text{ Nm}$  (first and second screwing) following the sequence given in Fig. 3 - 17.

### 3.9 LOUDSPEAKER

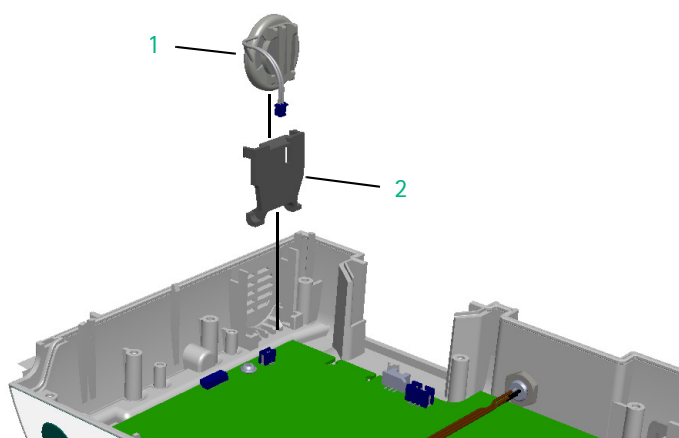


Fig. 3 - 18

- 1 Loudspeaker
- 2 Speaker bracket

#### Designation

Ord. No.

Loudspeaker CP.....34522001

#### Disassembly

- ✓ Unit has been opened.
1. Disconnect the connector of the loudspeaker (Fig. 3 - 18 / Item 1) on the processor board.
  2. Completely unlock the speaker bracket (Fig. 3 - 18 / Item 2) and tilt it towards the interior of the unit.
  3. Remove the loudspeaker with gasket and the speaker bracket.

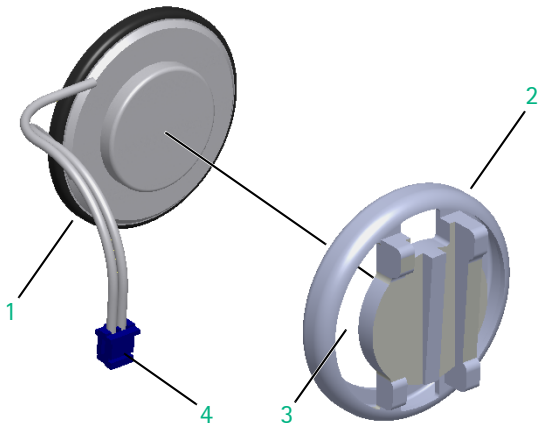


Fig. 3 - 19

- 1 Speaker
- 2 Gasket
- 3 Cable bushing
- 4 Speaker cable

### Assembly

✓ Processor board is mounted.

1. When replacing the loudspeaker, route the speaker cable (Fig. 3 - 19 / Item 4) through the opening (Fig. 3 - 19 / Item 3) of the gasket.
2. Insert the speaker (Fig. 3 - 19 / Item 1) into the gasket (Fig. 3 - 19 / Item 2).

#### NOTICE

Be careful not to damage the solder connections of the speaker cable.

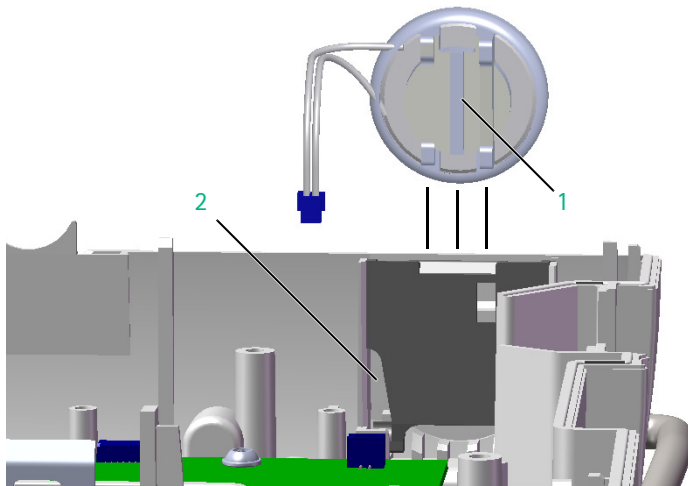


Fig. 3 - 20

- 1 Ridges of gasket
- 2 Cable opening

3. When inserting the loudspeaker into the housing, make sure that the ridges of the gasket are vertical (Fig. 3 - 20 / Item 1).
4. Route the cable of the loudspeaker through the left opening (Fig. 3 - 20 / Item 2) of the loudspeaker bracket and connect it to the processor board.
5. Ensure that the loudspeaker is locked in the loudspeaker bracket and that the bracket is locked in the housing on both sides.  
Make sure that no cables are trapped.

### 3.10 PROCESSOR BOARD

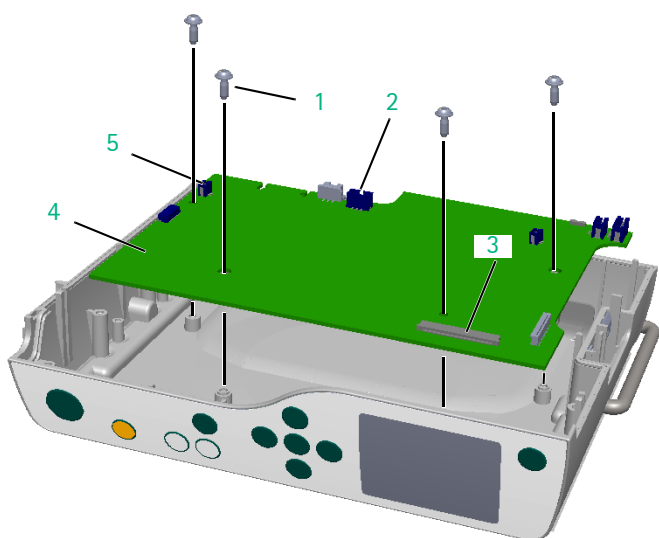


Fig. 3 - 21

- 1 Screw DELTA PT 30x8 WN 5451
- 2 Connector accessory cable
- 3 Connector display board
- 4 Processor board
- 5 Connector loudspeaker

#### Designation

Ord. No.

Processor board ICP .....34522201

#### Disassembly

- ✓ Unit has been opened.
  - ✓ Loudspeaker connector (Fig. 3 - 21 / Item 5) has been disconnected from the processor board.
  - ✓ Data of the pump are backed up before the processor board is replaced (see "compact<sup>plus</sup> Service Tool" Instructions for Use).
1. Unlock and disconnect the connector of the accessory connector cable on the processor board (Fig. 3 - 21 / Item 2).
  2. Completely unlock the connector for the connecting cable of the display board (Fig. 3 - 21 / Item 3) and pull out the ribbon cable.
  3. Unscrew the four screws (Fig. 3 - 21 / Item 1) using a 10IP TORX plus screwdriver and remove the processor board (Fig. 3 - 21 / Item 4).

#### Assembly

- ✓ Accessory connector is mounted.
1. Establish all cable connections.
  2. Tighten the screws with a torque of  $0.7 \text{ Nm} \pm 0.07 \text{ Nm}$  (first and second screwing).

#### NOTICE

When a new processor board ICP has been installed, the data backed up on PC must be imported back into the unit.  
(see "compact<sup>plus</sup> Service Tool" Instructions for Use)

If the processor board ICP has been replaced, the serial number of the device must be re-entered via the compact<sup>plus</sup> Service Tool, and the device must be recalibrated.

When the check after repair was passed, the device must be reset to factory settings using the compact<sup>plus</sup> Service Tool. Otherwise, the message "Do not use the device on patient." will be displayed after switching on the device.

### 3.11 ACCESSORY CONNECTOR

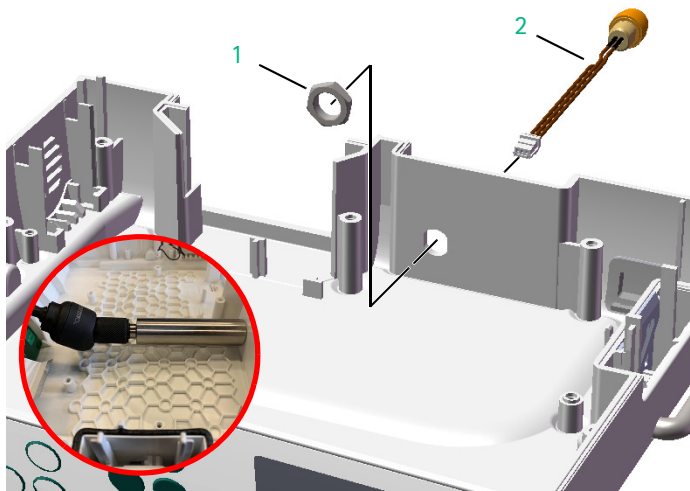


Fig. 3 - 22

- 1 Hexagon nut M8.5x1
- 2 Accessory connector

#### Designation

Ord. No.

Accessory connector CP ..... 34522002

#### Disassembly

✓ Processor board has been removed

1. Unscrew the hexagon nut (Fig. 3 - 22 / Item 1) using the angle hinge & socket wrench accessory connector CP.
2. Remove the accessory connector (Fig. 3 - 22 / Item 2) from the rear wall of the unit.

#### Assembly

1. Observe the alignment aids when mounting the connector (see Fig. 3 - 23).
2. Fasten the hexagon nut carefully with a torque of  $0.35 \text{ Nm} \pm 0.05 \text{ Nm}$  (first and second screwing).

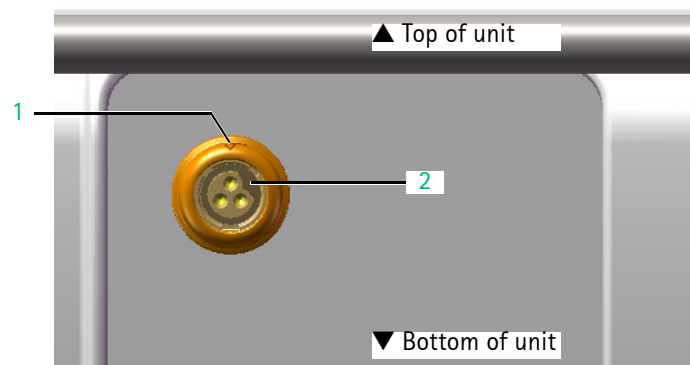


Fig. 3 - 23

- 1 Orientation triangle (marking the 12 o'clock position)
- 2 Coding notch (marking the 2 o'clock position)

## 3.12 DISPLAY BOARD WITH DISPLAY

Designation	Ord. No.
Display board with display CP . . . . .	34522116
(devices with serial number 1199 and lower)	
Ribbon cable display CP . . . . .	34774502

**NOTICE**

Starting with serial number 1200 of the device, the display board with display is affixed to the housing, upper part with keypad. If one of these components is defective, the housing upper part including keypad and display board with display has to be replaced with the corresponding spare part, ord. no 34522290. (see "Housing, upper part" → p. 3 - 20)

**Disassembly**

✓ Unit has been opened.

1. On the processor board, completely unlock the connector for the connecting cable of the display board and pull out the ribbon cable (Fig. 3 - 24 / Item 2).  
(not necessary if the processor board has been removed as shown in Fig. 3 - 24)
2. Completely unlock the connector for the connecting cable of the membrane keyboard (Fig. 3 - 24 / Item 1) and pull out the ribbon cable.
3. Unscrew the two screws (Fig. 3 - 24 / Item 4) using an 8IP TORX plus screwdriver and remove the display board (Fig. 3 - 24 / Item 3) with the display.
4. To replace the connecting cable for the display board (Fig. 3 - 24 / Item 2), completely unlock the connector on the display board and pull out the ribbon cable.
5. To replace the housing, upper part (Fig. 3 - 24 / Item 5), the processor board has to be removed as well.

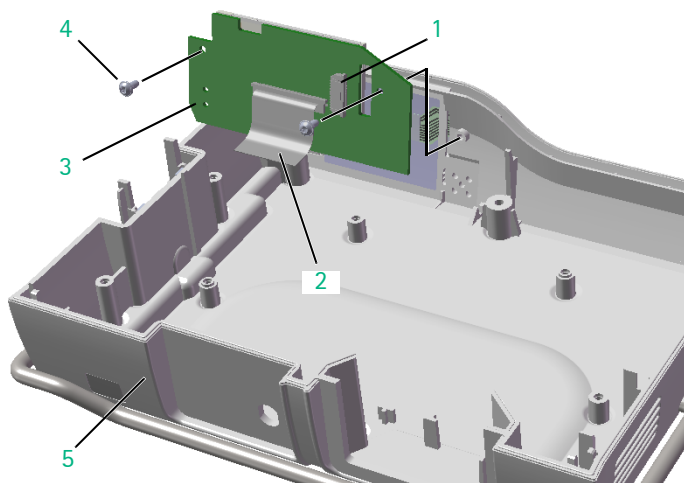


Fig. 3 - 24

- 1 Connector membrane keyboard
- 2 Ribbon cable display board
- 3 Display board
- 4 Screw DELTA PT 25x6 WN 5451
- 5 Housing, upper part

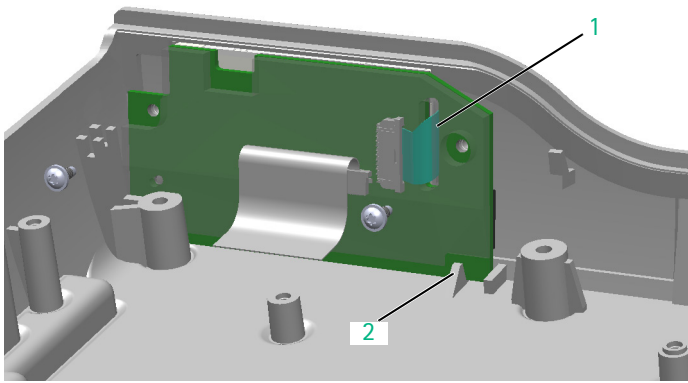


Fig. 3 - 25

- 1 Slot for ribbon cable for membrane keyboard
- 2 Catch for display board

**Assembly**

1. Guide the ribbon cable through the slot (Fig. 3 - 25 / Item 1) in the display board.
2. Position the display board upright between the housing wall and spigot (Fig. 3 - 25 / Item 2).
3. Establish all cable connections.
4. Tighten the screws with a torque of  $0.27 \text{ Nm} \pm 0.03 \text{ Nm}$  (first and second screwing).

3.13 HOUSING, UPPER PART

<b>Designation</b>	<b>Ord. No.</b>
Housing, upper part ICPP .....	34522291
with keypad (devices with serial number 1199 and lower)	
Housing, upper part ICPP .....	34522290
with keypad and display	

*NOTICE*

Starting with serial number 1200 of the device, the display board with display is affixed to the housing, upper part with keypad. If one of these components is defective, the housing upper part including keypad and display board with display has to be replaced with the corresponding spare part, ord. no 34522290.



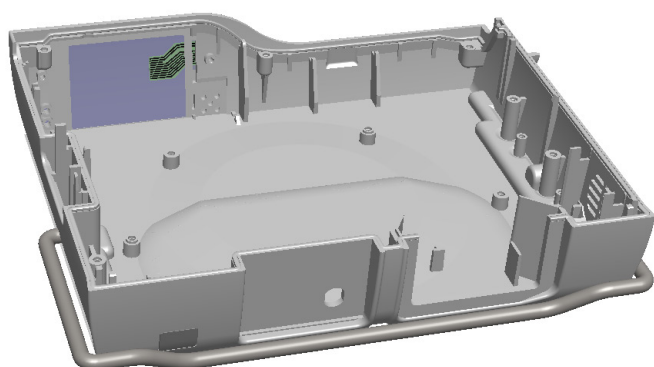


Fig. 3 - 26 Housing, upper part with keypad

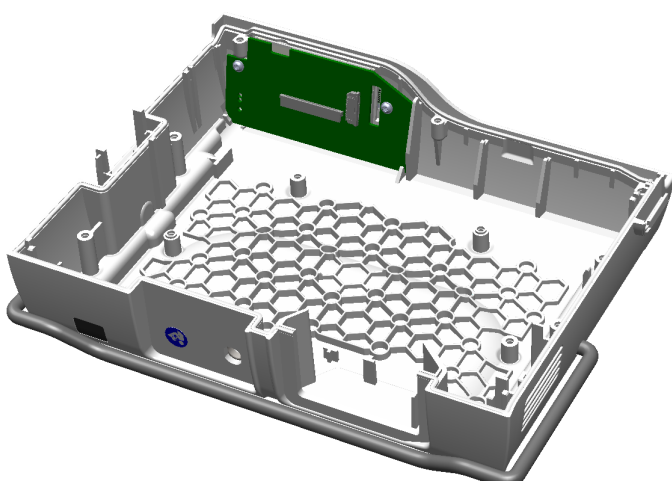


Fig. 3 - 27 Housing, upper part with keypad and display

### Disassembly

✓ Unit has been opened.

1. Remove the following parts from the housing, upper part (Fig. 3 - 26 for devices with serial number 1199 and lower, Fig. 3 - 27 for devices with serial number 1200 and higher):
  - a) Loudspeaker.  
(see "Loudspeaker" → p. 3 - 15)
  - b) Accessory connector.  
(see "Accessory connector" → p. 3 - 18)
  - c) Processor board.  
(see "Processor board" → p. 3 - 17)
  - d) Display board with display (possible for devices with serial number 1199 or lower, only).  
(see "Display board with display" → p. 3 - 19)

### Assembly

1. Mount the removed parts to the housing, upper part in reverse order of removal following the instructions given in the corresponding sections.

3.14 HOUSING FRONT

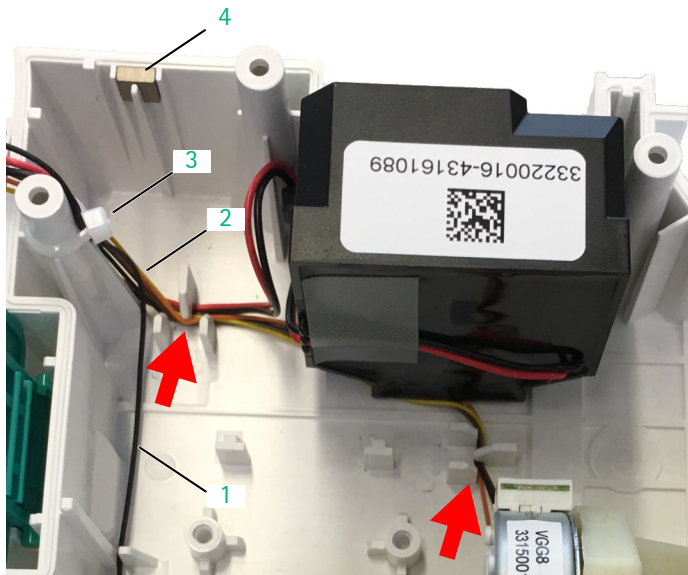


Fig. 3 - 28  
 1 ESD wire  
 2 Cable of stepper motor, 4-pole  
 3 Cable tie  
 4 Magnet

<b>Designation</b>	<b>Ord. No.</b>
SHK ICPP .....	34522293
(including SHK PCB)	
SHK PCB ICPP .....	34522287
Air sensor ICP .....	34522204
Pressure sensor ICP .....	34522203
Sensor PCB ICPP .....	34522288
Ribbon cable sensors PCB ICP .....	34774507
Ribbon cable pressure sensor ICP .....	34774508
Ribbon cable air sensor ICP .....	34774509
ESD wire ICP .....	34774510
Membrane	
(see "Membrane" → p. 3 - 6)	
Magnet	
(see "Sets of small parts" → p. 3 - 1)	

**Disassembly**

✓ Unit has been opened.

**NOTICE**

Remove the membrane only if necessary (for example, if it is damaged or contaminated).  
 (see "Membrane" → p. 3 - 6)

1. Remove the cable tie (Fig. 3 - 28 / Item 3) and unthread the 4-pole cable (Fig. 3 - 28 / Item 2) of the stepper motor (see arrows).
2. Unthread the ESD wire (Fig. 3 - 28 / Item 1).

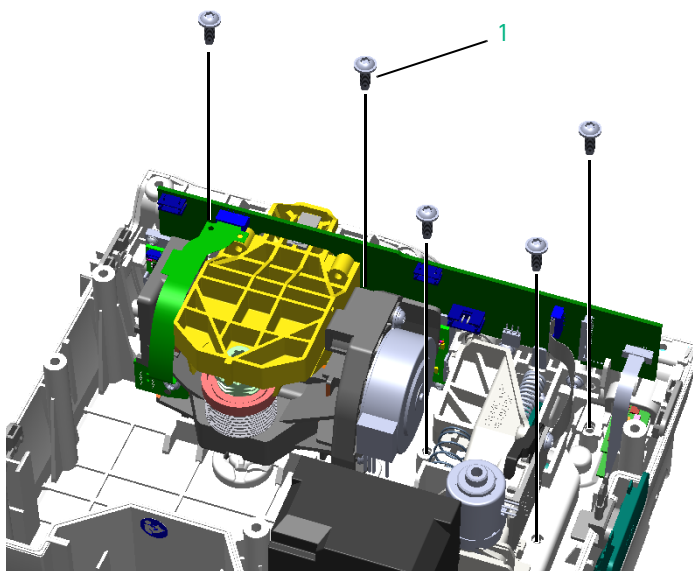


Fig. 3 - 29

1 Screw DELTA PT 35x10 WN 5451

3. Remove five screws (Fig. 3 - 29 / Item 1) using a 15IP TORX plus screwdriver.

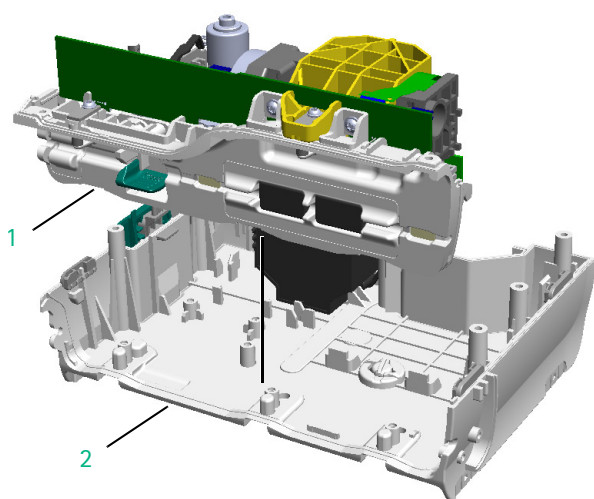


Fig. 3 - 30

1 Housing front  
2 Housing, bottom part

4. Remove the housing front (Fig. 3 - 30 / Item 1) from the housing, bottom part (Fig. 3 - 30 / Item 2).

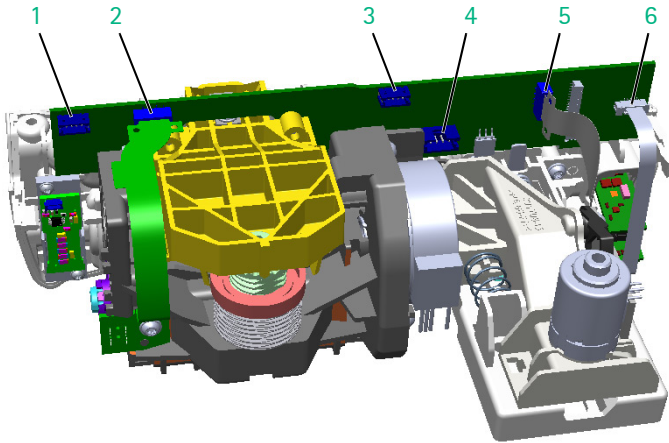


Fig. 3 - 31

- 1 Connector of pressure sensor, upstream
- 2 Connector of pump
- 3 Connector of pressure sensor, downstream
- 4 Connector of SHK motor
- 5 Connector of SHK PCB ICPP
- 6 Connector of air sensor

5. Disconnect the connectors of the following components on the sensor board:
  - a) Pressure sensor, upstream (Fig. 3 - 31 / Item 1).
  - b) Pressure sensor, downstream (Fig. 3 - 31 / Item 3).
  - c) SHK motor (Fig. 3 - 31 / Item 4).
6. Completely unlock the connectors of the following components and pull out the ribbon cable:
  - a) Pump (Fig. 3 - 31 / Item 2).
  - b) SHK PCB ICPP (Fig. 3 - 31 / Item 5).
  - c) Air sensor (Fig. 3 - 31 / Item 6).

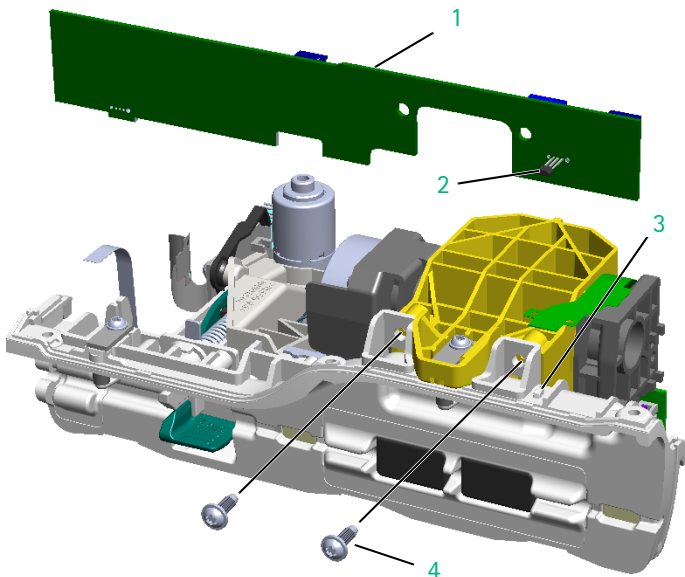


Fig. 3 - 32

- 1 Sensor board
- 2 Hall sensor
- 3 Bracket for Hall sensor
- 4 Screw DELTA PT 35x10 WN 5451

7. Push the movable Hall sensor (Fig. 3 - 32 / Item 2) approx. half the way towards the interior of the unit until it is released from the bracket (Fig. 3 - 32 / Item 3).
8. Remove two screws (Fig. 3 - 32 / Item 4) using a 15IP TORX plus screwdriver.
9. Take the sensor board (Fig. 3 - 32 / Item 1) out of the housing front from above.

**NOTICE**

Make sure not to damage the Hall sensor (Fig. 3 - 32 / Item 2) when removing the sensor board.

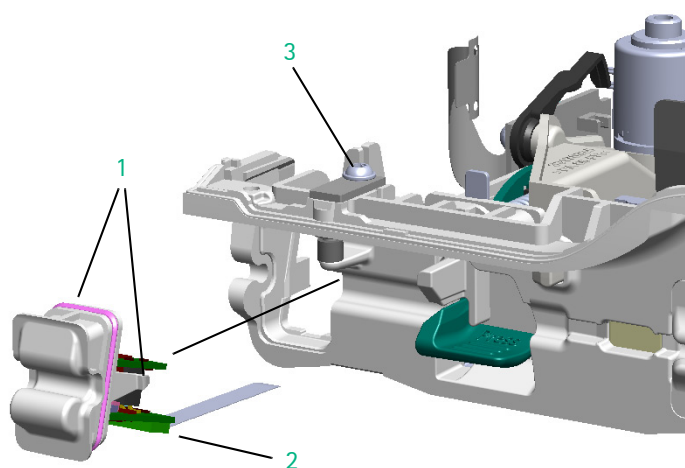


Fig. 3 - 33

- 1 Snap-fits (on both sides)
- 2 Air sensor
- 3 ESD wire connection

10. Press the two snap-fits (Fig. 3 - 33 / Item 1) to disengage the air sensor from the housing front.

11. Remove the air sensor (Fig. 3 - 33 / Item 2) from the front.

12. If the ESD wire has to be exchanged, remove the lug terminal from the screw (Fig. 3 - 33 / Item 3).

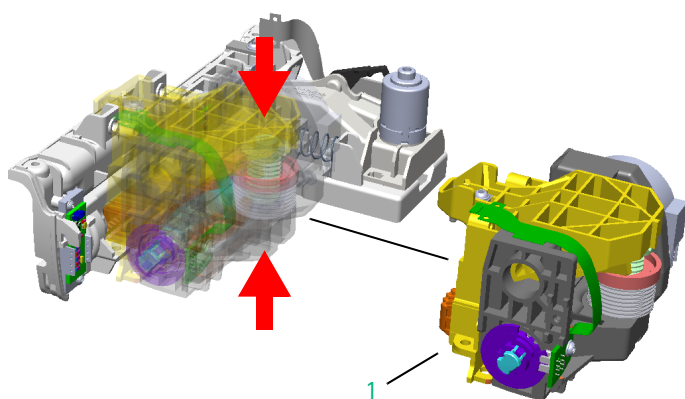


Fig. 3 - 34

- 1 Pump

13. Compress the spring of the pump (see arrows) and remove the pump (Fig. 3 - 34 / Item 1) from the housing front.

#### NOTICE

When detaching the pump from the housing front, the pump roll (Fig. 3 - 38 / Item 1) will drop out of the housing front. Keep the pump roll safe.

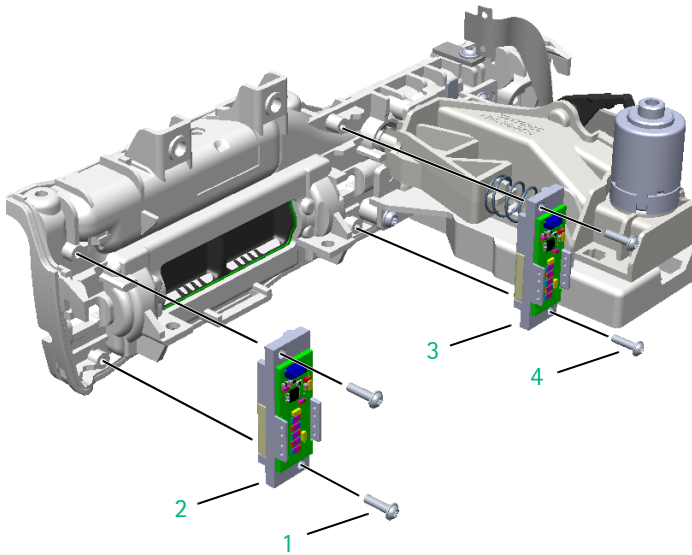


Fig. 3 - 35

- 1 Screw DELTA PT 22x8 WN 5451
- 2 Pressure sensor, upstream
- 3 Pressure sensor, downstream
- 4 Screw DELTA PT 22x8 WN 5451

- 14. Unscrew two screws (Fig. 3 - 35 / Item 1) using a 6IP TORX plus screwdriver.
- 15. Remove the pressure sensor, upstream (Fig. 3 - 35 / Item 2).
- 16. Unscrew two screws (Fig. 3 - 35 / Item 4).
- 17. Remove the pressure sensor, downstream (Fig. 3 - 35 / Item 3).

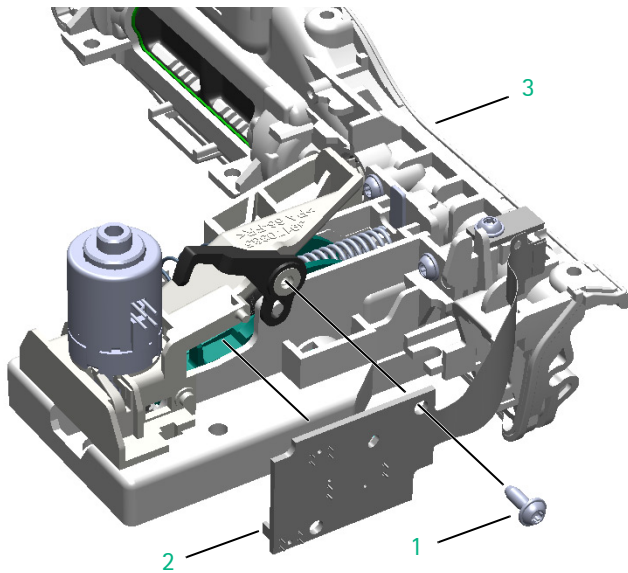


Fig. 3 - 36

- 1 Screw DELTA PT 30x8 WN 5451
- 2 SHK PCB ICPP
- 3 SHK unit

- 18. Unscrew one screw (Fig. 3 - 36 / Item 1) using a 10IP TORX plus screwdriver.
- 19. Remove the SHK PCB ICPP (Fig. 3 - 36 / Item 2) from the SHK unit (Fig. 3 - 36 / Item 3).

**NOTICE**

Except for the SHK PCB ICPP, no other parts may be dismantled from the SHK unit!

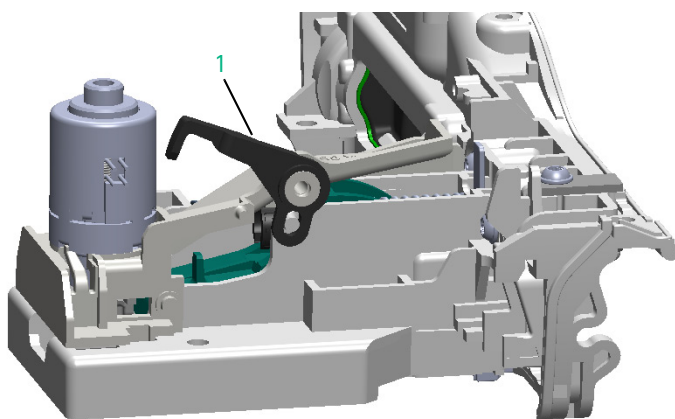


Fig. 3 - 37

1 Lever of SHK unit

### Assembly

✓ Pump has been completely assembled.

1. Before mounting the SHK board, ensure that the lever (Fig. 3 - 37 / Item 1) is in place and correctly seated.
2. Tighten the screw of the SHK board with a torque of  $1.2 \text{ Nm} \pm 0.12 \text{ Nm}$  (first and second screwing).
3. Tighten the screws of the pressure sensors with a torque of  $0.25 \text{ Nm} \pm 0.03 \text{ Nm}$  (first and second screwing).

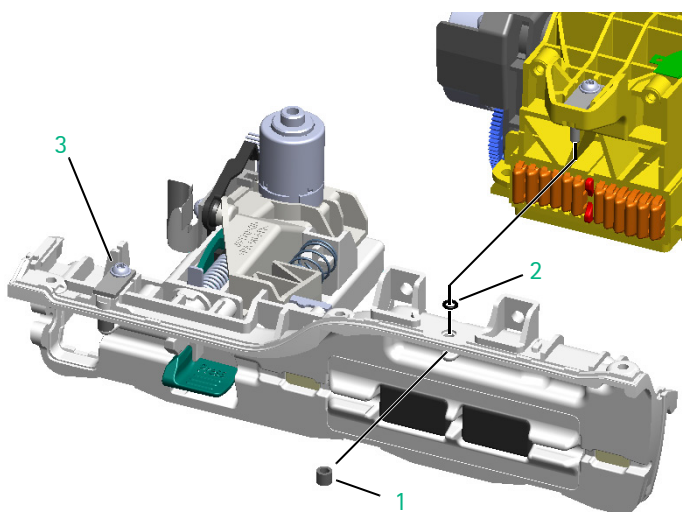


Fig. 3 - 38

- 1 Pump roll
- 2 O-ring
- 3 ESD wire connection

4. Check the O-ring (Fig. 3 - 38 / Item 2) for damage and replace it, if necessary (the O-ring is contained in the Service part kit).
5. Insert the pump roll (Fig. 3 - 38 / Item 1) when attaching the pump to the housing front. The pump roll can be reused or taken from the Service part kit.
6. Push the air sensor in until it audibly latches into position.
7. Mount the new ESD wire (Fig. 3 - 38 / Item 3) if it has to be replaced.



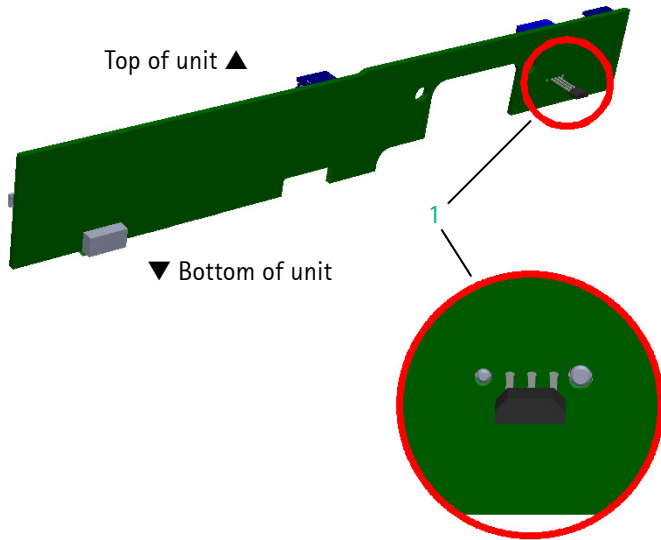


Fig. 3 - 39  
1 Hall sensor

8. If the sensor board has to be replaced, first plug in the new Hall sensor (Fig. 3 - 39 / Item 1) in its correct orientation before inserting the sensor board.
9. Screw the pump to the housing front with a torque of  $0.6 \text{ Nm} \pm 0.06 \text{ Nm}$  (first and second screwing).
10. Push the Hall sensor into the bracket (Fig. 3 - 32 / Item 3).
11. Establish all cable connections to the sensor board.

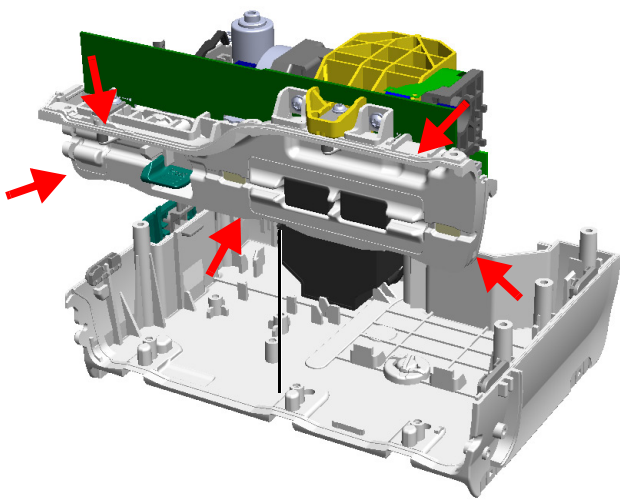


Fig. 3 - 40

12. Before inserting the housing front, apply high-vacuum grease to the groove all around (see Fig. 3 - 40).
13. Mount the housing front flush with the front edges of the housing, bottom part.
14. Screw the housing front to the housing, bottom part with a torque of  $0.6 \text{ Nm} \pm 0.06 \text{ Nm}$  (first and second screwing).



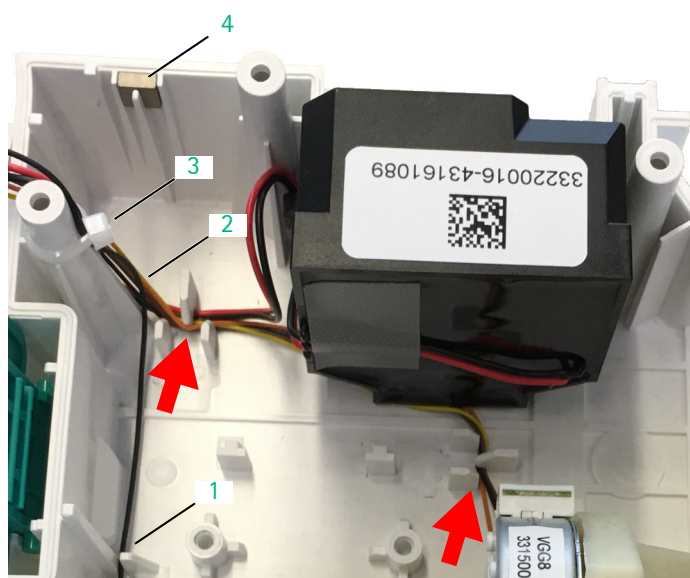


Fig. 3 - 41

- 1 ESD wire
- 2 Cable of stepper motor, 4-pole
- 3 Cable tie
- 4 Magnet

15. Route the 4-pole cable (Fig. 3 - 41 / Item 2) of the stepper motor through the cable router (see arrows in Fig. 3 - 41).
16. Route the ESD wire (Fig. 3 - 41 / Item 1) through the cable router.
17. Fix the cables to the screw boss with a cable tie (Fig. 3 - 41 / Item 3).
18. Ensure that the magnet is in place (Fig. 3 - 41 / Item 4).

3.15 PUMP

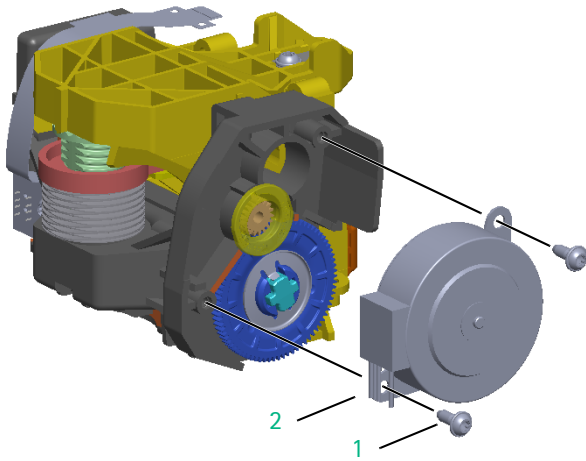


Fig. 3 - 42  
 1 Screw DELTA PT 30x8 WN 5451  
 2 Stepper motor

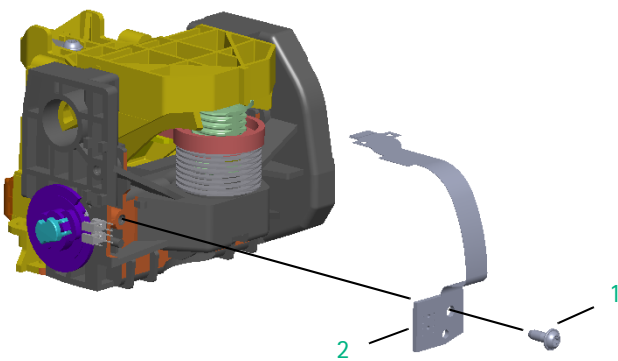


Fig. 3 - 43  
 1 Screw DELTA PT 30x8 WN 5451  
 2 Encoder board

**Designation**

**Ord. No.**

Pump ICP .....	34522206
(including stepper motor and encoder PCB)	
Stepper motor CP .....	34522107
Encoder PCB ICP .....	34522205

**Disassembly**

- ✓ Pump has been dismantled from the housing front.
- 1. Unscrew the two screws (Fig. 3 - 42 / Item 1) using a 10IP TORX plus screwdriver.
- 2. Remove the stepper motor (Fig. 3 - 42 / Item 2).

- 3. Unscrew one screw (Fig. 3 - 43 / Item 1).
- 4. Remove the encoder board (Fig. 3 - 43 / Item 2) using a 10IP TORX plus screwdriver.

**Assembly**

- 1. Tighten the screw of the encoder board with a torque of 0.8 Nm ± 0.08 Nm (first and second screwing).
- 2. Tighten the screws of the stepper motor with a torque of 0.7 Nm ± 0.07 Nm (first and second screwing).

**NOTICE**

After exchanging the pump perform the "pump run-in" procedure (see "Checks after Repair" → p. 3 - 32).

## 3.16 POWER SUPPLY

Designation	Ord. No.
Power supply CP .....	34522000
Housing, bottom part ICP.....	34522208
Screws	
(see "Sets of small parts" → p. 3 - 1)	

**Disassembly**

- ✓ Gasket for rubber connector has been removed  
(see "Gasket for rubber connector" → p. 3 - 5).
  - ✓ Unit has been opened.
1. Unscrew the two screws (Fig. 3 - 44 / Item 1) using a 10IP TORX plus screwdriver.
  2. Remove the power supply (Fig. 3 - 44 / Item 2).

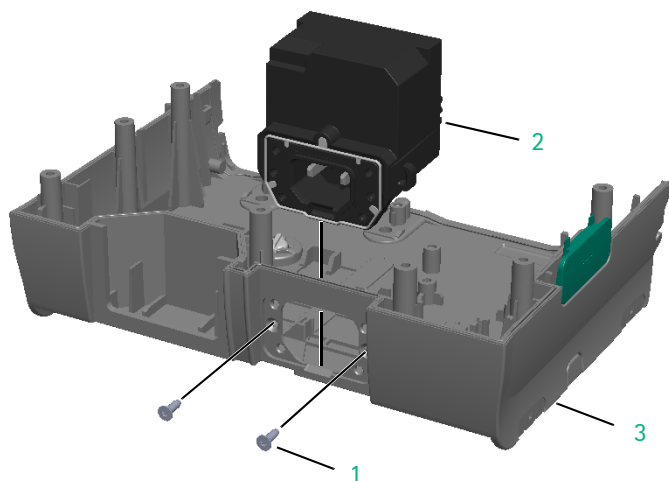


Fig. 3 - 44

- 1 Screw DELTA PT 30x9 WN 5454
- 2 Power supply
- 3 Housing, bottom part

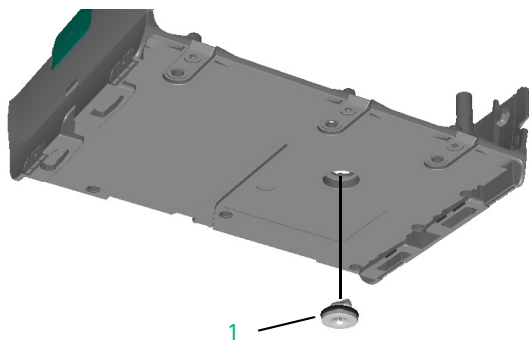


Fig. 3 - 45

- 1 Lock screw

3. If the housing, bottom part (Fig. 3 - 44 / Item 3) has to be replaced, additionally remove the housing front (see "Housing front" → p. 3 - 22) and the lock screw (Fig. 3 - 45 / Item 1).

## CHECKS AFTER REPAIR

### Assembly

1. If the housing, bottom part has been replaced, mount the lock screw (Fig. 3 - 45 / Item 1) of the old housing to the new housing from below, or use a new lock screw from the Small parts ICP.
2. Tighten the screws of the power supply unit with a torque of  $0.85 \text{ Nm} \pm 0.1 \text{ Nm}$ .

### Procedure

Always perform the check after repair whenever any repair work has been done on the unit (see "Check after Repair" → p. 4 - 1).

# 4 Check after Repair

Depending on the repairs carried out, the relevant tests of the checklist for check after repair must be performed (see "Checklist for Check after Repair" → p. 4 - 4).

For assignment of tests to repair tasks, refer to table 4 - 1.

If several servicing activities have been carried out, the total of all necessary tests (checks) has to be performed.

## CHECK AFTER REPAIR MATRIX

### Tests depending on the repair task performed

Repair task performed	T1 Visual Inspection	T2 Electrical Safety	T3 Mechanical Inspection	T4 Operational Test	T5 Pressure cut-off, electronic	T6 Pressure limitation, mechanical	T7 SHK	T8 Second clamp	T9 Delivery accuracy	T10 Air sensor	T11 Temperature sensor	T12 Staff call test
3.1 Housing foot	X		X									
3.2 Gasket for rubber connector	X		X									
3.3 Membrane	X				X	X			X			
3.4 Pole clamp	X		X									
3.5 Battery module	X	X	X	X	X	X	X	X	X	X		X
3.6 Second clamp	X		X	X	X	X	X	X	X	X	X	
3.7 Pump door												
3.8 Opening/closing the unit												
3.9 Loudspeaker												
3.10 Processor board												
3.11 Accessory connector												
3.12 Display board with display												
3.13 Housing, upper part												
3.14 Housing front												
3.15 Pump												
3.16 Power supply												

The complete check after repair has to be performed whenever the pump door has been removed.

#### NOTICE

If the Pump ICP (see "Spare Parts List" → p. 9 - 1) has been replaced, run-in the drive before performing the checks after repair / TSC (see "Pump RUN IN" → p. 4 - 2).

PUMP RUN IN

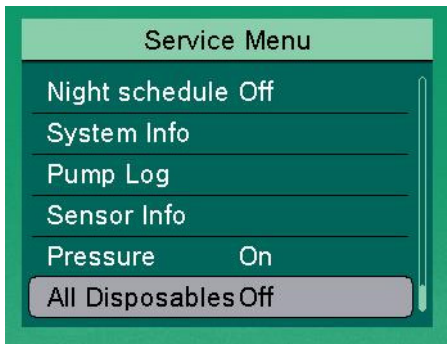


Fig. 4 - 1



Fig. 4 - 2

**Performing the RUN IN**

1. To run-in the drive, insert an Intrafix Primeline (see "Test Equipment and Tools" → p. 8 - 1) and fill with water.  
Do not close the pump door, yet.

*NOTICE*

The "All Disposables On" function has to be activated before the pump door is closed.

2. Use the "Menu" button and the arrow keys to select the "Settings" menu item and confirm with "OK".
3. Select "Service" and confirm the device code with "OK".
4. Confirm selection of "All Disposables Off" with "OK" (Fig. 4 - 1).
5. Select "On" with "OK".  
"Service active" is displayed.

6. Confirm " Do not use at Patient" with "OK" (Fig. 4 - 2).
7. Close the pump door.

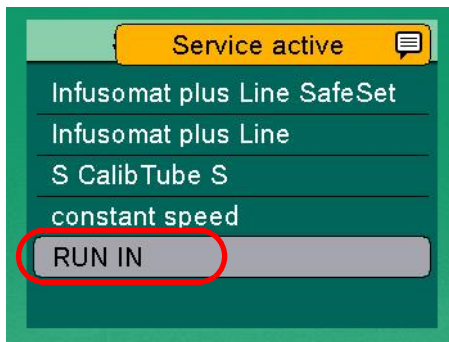


Fig. 4 - 3

8. Select "RUN IN" and confirm with "OK" (Fig. 4 - 3).  
Line calibration is started.

**NOTICE**

This service function is automatically deactivated again after 5 minutes. The RUN IN has to be selected within these 5 minutes. After selection of RUN IN, the RUN IN line remains active until the next line change.

# Check after Repair

(Master – to be added to the documentation)

## Checklist for Check after Repair – After Repair or Calibration

Unit: Infusomat® compact<sup>plus</sup> P

Manufacturer: B. Braun Melsungen AG



<b>Owner</b>

<b>Year of Procurement</b>

<b>Software Version</b>

Observe the Service Manual and the Instructions for Use. All measured values are to be documented. Accessories used should be included in testing. Only use calibrated measuring equipment.

Article No. (REF)	Serial No. (SN)	Inventory No. (of the Owner)
<p><b>T1 Visual Inspection</b> <span style="float: right;"><input type="checkbox"/> YES <input type="checkbox"/> N/A</span></p> <p><input type="checkbox"/> Infusomat® compact<sup>plus</sup> P: Cleanliness, completeness, damage, and defects affecting safety, damage and readability of the labels. Particularly:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Housing</li> <li><input type="checkbox"/> Screw covers</li> <li><input type="checkbox"/> Pump door</li> <li><input type="checkbox"/> SHK ICPP</li> <li><input type="checkbox"/> Air sensor (free from grease or ultrasonic gel, free from cracks)</li> <li><input type="checkbox"/> Pressure sensor, downstream (membrane)</li> <li><input type="checkbox"/> Pump membrane</li> <li><input type="checkbox"/> Pressure sensor, upstream (membrane)</li> <li><input type="checkbox"/> Second clamp</li> <li><input type="checkbox"/> Keypad/display</li> <li><input type="checkbox"/> Accessory connector</li> <li><input type="checkbox"/> IR window</li> <li><input type="checkbox"/> Mains power supply connection</li> </ul> <p><input type="checkbox"/> Accessories Cleanliness, completeness, damage, and faults affecting safety, damage, and readability of the labels</p> <p><input type="checkbox"/> Check the unit and the accessories for compatibility</p> <p><input type="checkbox"/> Mains power supply cable</p>	<p><b>T2 Electrical Safety</b> <span style="float: right;"><input type="checkbox"/> YES <input type="checkbox"/> N/A</span></p> <p><input type="checkbox"/> Protective conductor resistance of mains connecting line (<math>\leq 0.1 \Omega</math>) _____ <math>\Omega</math></p> <p><input type="checkbox"/> Measure mains voltage _____ V~</p> <p><input type="checkbox"/> Equipment leakage current (alternative method for devices of protection class II) (<math>\leq 10 \mu A</math>) _____ <math>\mu A</math> Measure between mains input and pin 3 of accessory connector. Use the Measuring Adapter Accessory Connector CP.</p> <p><b>T3 Mechanical Inspection</b> <span style="float: right;"><input type="checkbox"/> YES <input type="checkbox"/> N/A</span></p> <p><input type="checkbox"/> Locking with second unit</p> <p><input type="checkbox"/> Pole clamp</p> <p><b>T4 Operational Test</b> <span style="float: right;"><input type="checkbox"/> YES <input type="checkbox"/> N/A</span></p> <p>Connect unit to mains power supply</p> <p><input type="checkbox"/> Status display</p> <p>Switch on unit with mains power supply</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Self-test</li> <li><input type="checkbox"/> Information on display</li> <li><input type="checkbox"/> Audible alarm</li> <li><input type="checkbox"/> Visual alarm</li> </ul>	<p><b>T4 Operational Test (cont.)</b> <span style="float: right;"><input type="checkbox"/> YES <input type="checkbox"/> N/A</span></p> <p>Switch on unit without mains power supply</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Self-test</li> <li><input type="checkbox"/> Battery test</li> <li><input type="checkbox"/> Opening and closing mechanism of the operating unit</li> <li><input type="checkbox"/> Infusion</li> <li><input type="checkbox"/> Buttons on the operating unit</li> <li><input type="checkbox"/> Trigger bolus at the device</li> <li><input type="checkbox"/> Staff call (if available)</li> </ul> <p><b>T5 Pressure cut-off, electronic</b> <span style="float: right;"><input type="checkbox"/> YES <input type="checkbox"/> N/A</span></p> <p>Delivery rate: 250 ml/h.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Upstream <ul style="list-style-type: none"> <li><input type="checkbox"/> Alarm</li> </ul> </li> <li><input type="checkbox"/> Downstream <ul style="list-style-type: none"> <li><input type="checkbox"/> Pressure stage 5 (0.1 ... 0.7 bar) _____ bar (or 1.5 ... 10 psi) _____ psi</li> <li><input type="checkbox"/> Pressure stage 9 (0.7 ... 1.3 bar) _____ bar (or 10 ... 19 psi) _____ psi</li> </ul> </li> </ul> <p><b>T6 Pressure limitation, mechanical</b> <span style="float: right;"><input type="checkbox"/> YES <input type="checkbox"/> N/A</span></p> <p>Delivery rate: 250 ml/h.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> P<sub>max</sub> (2.4 ... 4.0 bar) _____ bar (or 35 ... 58 psi) _____ psi</li> </ul>

(Sheet 1 of 2)



# Check after Repair

(Master – to be added to the documentation)

<p><b>T7 SHK</b> <input type="checkbox"/> <input type="checkbox"/> YES N/A</p> <p><input type="checkbox"/> Is closed after opening the pump door.</p> <p><input type="checkbox"/> P<sub>SHK</sub> (&gt; 0.5 bar) _____ bar (or &gt; 7.3 psi) _____ psi</p> <p><b>T8 Second clamp</b> <input type="checkbox"/> <input type="checkbox"/> YES N/A</p> <p><input type="checkbox"/> Is closed after opening the pump door.</p> <p><input type="checkbox"/> P<sub>2ndClamp</sub> (&gt; 0.5 bar) _____ bar (or &gt; 7.3 psi) _____ psi</p> <p><b>T9 Delivery accuracy</b> <input type="checkbox"/> <input type="checkbox"/> YES N/A</p> <p>Ambient temperature 20 ... 25°C, delivery rate: 250 ml/h</p> <p><input type="checkbox"/> Divergence (± 5 %) _____ %</p>	<p><b>T10 Air sensor</b> <input type="checkbox"/> <input type="checkbox"/> YES N/A</p> <p><input type="checkbox"/> Water value (1100 ... 2250 mV) _____ mV</p> <p><input type="checkbox"/> Air alarm</p> <p><input type="checkbox"/> Air value (&lt; 100 mV) _____ mV</p> <p><b>T11 Temperature sensor</b> <input type="checkbox"/> <input type="checkbox"/> YES N/A</p> <p><input type="checkbox"/> FuP Temp - KuP Temp (-1.0 ... +1.0 °C) _____ °C</p>	<p><b>T12 Staff Call Test</b> <input type="checkbox"/> <input type="checkbox"/> YES N/A</p> <p>Connect the staff call cable compact<sup>plus</sup>. Start infusion and open the pump door.</p> <p><input type="checkbox"/> An alarm goes off</p> <p><input type="checkbox"/> Red LED of staff call cable compact<sup>plus</sup> lights up</p> <p><b>Fixing the Seal</b> <input type="checkbox"/> <input type="checkbox"/> YES N/A</p> <p><input type="checkbox"/> Pump is sealed with a new seal</p>
---	--	--

Mech. Aids and Measuring Equip. Used	Accessories used
<p><input type="checkbox"/> Disposables Type: _____ Part No.: _____</p> <p><input type="checkbox"/> Manometer Ident. No.: _____ Calibrated until: _____</p> <p><input type="checkbox"/> Scales Ident. No.: _____ Calibrated until: _____</p>	<p><input type="checkbox"/> Safety tester Ident. No.: _____ Calibrated until: _____</p> <p><input type="checkbox"/> Measuring Adapter Accessory Connector CP</p> <p><input type="checkbox"/> Graduated cylinder</p> <p><input type="checkbox"/> Stop watch</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p>
	<p><input type="checkbox"/> Mains power supply cable</p> <p><input type="checkbox"/> Staff call cable compact<sup>plus</sup></p> <p><input type="checkbox"/> Connection lead 12V</p> <p><input type="checkbox"/> Infusion line</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p>

<p><b>Test result:</b> Defects found that could endanger patients, users, or third parties: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Measures to be taken: <input type="checkbox"/> None <input type="checkbox"/> Repair <input type="checkbox"/> _____</p> <p>Special features / documentation: _____</p>	<p>Check performed by: _____</p> <p>Unit handed over on: _____</p> <p>To: _____</p> <p>Date / Signature: _____</p>
---	--

(Sheet 2 of 2)

## PROCEDURAL INSTRUCTIONS ON THE CHECK AFTER REPAIR

### T1 Visual inspection

1. Check the Infusomat® compact<sup>plus</sup> P for cleanliness, completeness, damage, and defects affecting safety, damage, and readability of the labels.  
Pay special attention to the following parts:
  - a) Housing  
Housing is clean and undamaged.
  - b) Screw covers  
Screw covers on the housing present and undamaged.
  - c) Pump door
  - d) SHK ICPP
  - e) Air sensor
  - f) Pressure sensor, downstream
  - g) Membrane  
Membrane in the housing front is undamaged
  - h) Pressure sensor, upstream
  - i) Second clamp
  - j) Keypad/display  
Keypad/display is clean and undamaged, correct bonding of the foil.
  - k) Accessory connector  
Accessory connector is clean and undamaged.
  - l) IR window  
IR window is clean and undamaged.
  - m) Mains power supply connection  
Gasket for rubber connector CP (IEC socket) is present and undamaged. Electrical contacts are clean and undamaged.
2. Check the accessories for cleanliness, completeness, damage, and faults affecting safety, damage, and readability of the labels.  
Pay special attention to the following parts:
  - a) Mains power supply cable
  - b) Staff call cable compact<sup>plus</sup>
  - c) Connection lead 12V for ambulance vehicles.
3. Check how the Infusomat® compact<sup>plus</sup> P and accessories are configured.

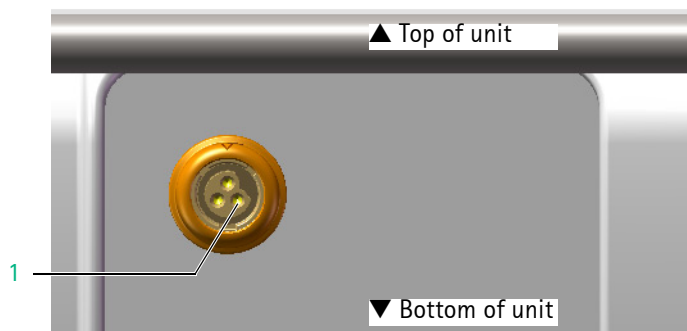


Fig. 4 - 1

1 Pin 3 of accessory connector

## T2 Electrical safety according to IEC 62353

The values to be measured for electrical safety are listed in the checklist (see "Checklist for Check after Repair" → p. 4 - 4).

Equipment leakage current (alternative method):

1. Measure between mains input and pin 3 (GND) of accessory connector (Fig. 4 - 1 / Item 1).

For safer measurement, use the Measuring Adapter Accessory Connector CP.

## T3 Mechanical inspection

1. Fit the unit to be tested on top of another compact<sup>plus</sup> device and check that the lock functions correctly.
2. Fit the unit to be tested underneath another compact<sup>plus</sup> device and check that the lock functions correctly.
3. Rotate the pole clamp in all directions (4x90°) and check for correct latching.
4. Check that the rotary knob of the pole clamp can be turned clockwise and counterclockwise.

## T4 Operational test

1. Connect the unit to the power supply without switching it on and check the status display:
  - a) Battery capacity
  - b) Mains operation symbol
2. Switch the unit on and check the following details:
  - a) Self-test
  - b) Display of software version
  - c) Audible alarm
    - one high sound from piezo buzzer
    - one deep sound from loudspeaker
  - d) Visual alarm
    - The green LED flashes once. The red LED flashes twice.





3. Check infusion with the following steps:
  - a) Open the pump door, insert a primed line, and close the pump door.
  - b) Open the roller clamp and confirm the line.
  - c) Deny priming if this message appears (configurable).
  - d) Select a rate of 1.1 ml/h and start infusion.  
The green LED lights up, arrows move from right to left.
4. Press all buttons except the On/Off button at least once.  
All buttons trigger the desired function.
5. Administer a bolus by preselecting a volume of 3 ml.  
A bolus is administered, the volume counter counts up.
6. Stop infusion and remove the line.
7. Check the battery with the following steps:
  - a) Switch the unit off and disconnect from mains power supply.
  - b) Switch the unit on. Self-test is performed.
  - c) Insert a line and let the pump run.
  - d) Connect, disconnect, and reconnect the unit to/from mains power supply (wait approx. 5 s after each step).  
The mains/battery operation symbol changes accordingly.
  - e) Disconnect the unit from mains power supply and perform all further tests (infusion etc.) in battery mode. If necessary, recharge battery first.  
Device should be able to perform the entire operational test in battery mode.
8. Connect the pump to staff call and check staff call under real conditions by triggering an operating alarm.  
As an alternative, connect the staff call cable compact<sup>plus</sup> (part No. 8718030) to the pump and check the staff call signal at the wires. Refer to [Table 4 - 1](#).

Status	Connecting wire	
	white and green	white and brown
Alarm	disconnected	connected
Operation	connected	disconnected

Table 4 - 1

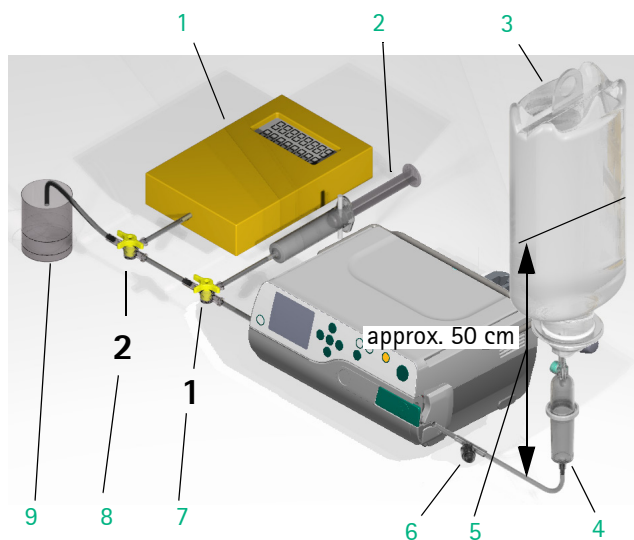


Fig. 4 - 2

- 1 Electronic pressure gauge accuracy class 1
- 2 10 ml syringe (piston fixed)
- 3 Infusion bottle
- 4 Intrafix Primeline
- 5 Distance between liquid level and middle Intrafix Primeline
- 6 Injection port
- 7 Three-way valve 1
- 8 Three-way valve 2
- 9 Graduated cylinder

### Test Setup

For the following tests, perform test setup with the subassemblies listed below, please see also Fig. 4 - 2:

#### NOTICE

The filling level in the container must be approx. 50 cm above the middle of the unit opening for the Intrafix Primeline.

Intrafix Primeline (new, unused, can be used for the complete check after repair incl. functional check)

(1 piece)

Infusion bag or bottle, min. 100 ml

(1 piece)

Three-way valve (2 pieces for measurement with electronic pressure gauge)

Injection port, inserted into the infusion line which has been cut off approx. 2 cm on the right side next to the second clamp.

10 ml syringe (air buffer for measurement with electronic pressure gauge)

(syringe drawn up to 10 ml and piston fixed mechanically)

(1 piece)

1 ml syringe for air bubble injection (1 piece)

Electronic pressure gauge with peak value recognition (1 piece)

Graduated cylinder 25 ml,  $\pm 0.04$  ml (1 piece)

### T5 Pressure cut-off, electronic

1. Insert the Intrafix Primeline of the test setup (Fig. 4 - 2) in the device.

#### NOTICE

The occlusion test with an air-filled line may fail. In this case, insert an Intrafix Primeline filled with water.

2. Enter a delivery rate according to the checklist and a volume of 250 ml.
3. Select pressure stage according to the checklist.

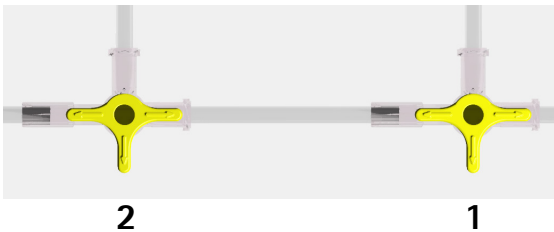


Fig. 4 - 3

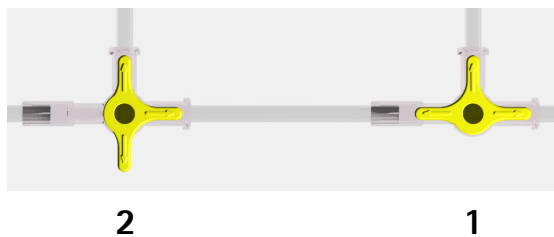


Fig. 4 - 4

4. Vent test setup, for position of the three-way cocks please see Fig. 4 - 3, start infusion and deliver first of all in to an open system (without pressure gauge).

Upstream:

5. Push roller clamp of the Intrafix Primeline up to approx. 30 cm before the pump and close the roller clamp or pinch the Intrafix Primeline between the container and 30 cm before the pump. An alarm is output.
6. Open roller clamp.

Downstream:

7. Switch over three-way valve, please see Fig. 4 - 4, and deliver towards the pressure gauge. Read off maximum value on the pressure gauge upon an alarm and before an automatic pressure reduction and compare with the specifications in the checklist.
8. Check all pressure stages listed in the checklist and document values. Do not reduce pressure.

#### T6 Pressure limitation, mechanical

##### NOTICE

Do not use an Intrafix Primeline with an upstream "Y" site. The back check-valve associated with the upstream "Y" site may skew mechanical pressure limitation test results.

$P_{max}$

1. Deactivate electronic pressure cut-off:
  - a) Via "Menu" button and arrow keys, select the "Settings" menu item and confirm with "OK".
  - b) Select "Service" and confirm device code with "OK".
  - c) Confirm selection of "Pressure" "Off" with "OK". (pressure "off" will be active for 5 minutes)
2. Input a delivery rate according to the checklist. Enter a sufficiently large VTBI, e.g. 50ml (required for infusion lines other than SafeSet).
3. Switch over three-way valve, please see Fig. 4 - 4, and deliver towards the pressure gauge for 3 minutes.

- After the 3 minutes have elapsed, read off the corresponding value for  $P_{max}$  (observe for 30 seconds) on the pressure gauge and compare with the specifications for  $P_{max}$  in the checklist.

**NOTICE**

If the pressure values are not reached, the mechanical pressure can be adjusted without opening the unit (see "Adjusting the mechanical pressure" → p. 2 - 7).

- Document value ( $P_{max}$ ). Do not reduce pressure.

### T7 SHK

- Open the pump door.

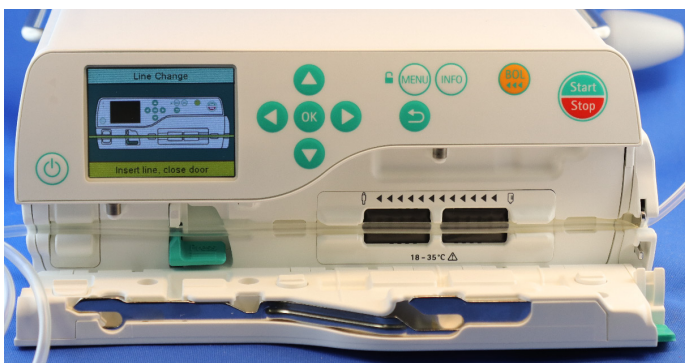


Fig. 4 - 5

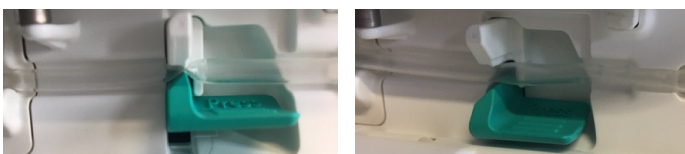


Fig. 4 - 6 SHK closed (left) and opened (right)

- Check if opening the door has caused closing of the SHK (Fig. 4 - 6, left).



Fig. 4 - 7 Second clamp opened (right)

- Move the pump door towards the closed position as far as possible keeping the door opener in closed position. The second clamp opens (see Fig. 4 - 7, right).
- Read off the  $P_{SHK}$  value on the pressure gauge after min. 10 seconds and compare with the specifications for  $P_{SHK}$  in the checklist.
- Document value ( $P_{SHK}$ ). Release the pump door.

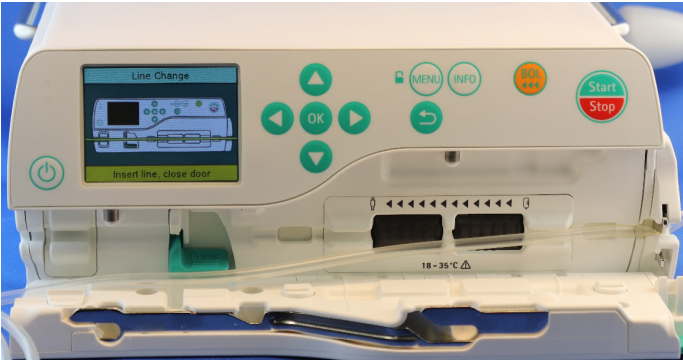


Fig. 4 - 8

**T8 Second clamp**

1. Manually open the SHK
2. Remove the infusion line from the SHK.  
Still **leave** the infusion line in the second clamp Fig. 4 - 8!
3. Read off the "P<sub>2ndClamp</sub>" value on the pressure gauge, compare with the specifications in the checklist, and document.

**NOTICE**

In case the pressure does not reduce as expected, check if the roller clamp has been closed, accidentally.

4. Dispose of the infusion line (the injection port may be used again).

**T9 Delivery accuracy (simple method)**

Requirements:

- Test setup according to Fig. 4 - 2, with the liquid level approx. 50 cm above the pump
- Ambient temperature according to the checklist
- Target volume: 25 ml

Measurement:

1. Set a volume of 30 ml (VTBI) to reduce possible spilling.
2. Insert the Intrafix Primeline of the test setup (Fig. 4 - 2) in the device.  
Do not stretch the line when inserting.
3. Close three-way cocks to the syringe and the measuring device, please see Fig. 4 - 9.
4. Vent test setup. Bottom part of drop chamber must be 2/3 filled.
5. Set delivery rate according to the checklist.
6. Let device deliver for ≥5 min into a vessel for waste fluid (not into the measuring container). Then, stop the pump.
7. Insert cannula in empty graduated cylinder and at the same time start the stop watch and the Infusomat® compact<sup>plus</sup> P.
8. Stop the stop watch when the target volume is reached.

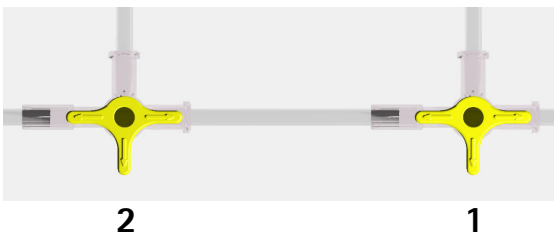


Fig. 4 - 9



Measuring Time		Deviation
6 min	36.0 sec	-10 %
6 min	18.0 sec	-5 %
6 min	14.4 sec	-4 %
6 min	10.8 sec	-3 %
6 min	7.2 sec	-2 %
6 min	3.6 sec	-1 %
6 min	0.0 sec	0 %
5 min	56.4 sec	1 %
5 min	52.8 sec	2 %
5 min	49.2 sec	3 %
5 min	45.6 sec	4 %
5 min	42.0 sec	5 %
5 min	24.0 sec	10 %

Table 4 - 2

9. Evaluate deviation in percent according to [Table 4 - 2](#) and document.

### T9 Delivery accuracy (alternative measuring method)

Checking of the flow accuracy by weight measurement.

Avoid errors due to evaporation!

Measuring equipment:

- Scales
- Measuring duration: 12 min

Delivery rate determination:

1. Deactivate KVO:
  - a) Via "Menu" button and arrow keys, select the "Settings" menu item and confirm with "OK".
  - b) Select "Service" and confirm device code with "OK".
  - c) Scroll to "KVO" with the arrow keys and select with "OK".
  - d) Confirm selection of "Off" with "OK"
2. Set a delivery rate of 200 ml/h and let device deliver for  $\geq 5$  min into a vessel for waste fluid (not into the measuring container). Then, stop the pump.
3. Hang the outlet cannula over the measuring container and at the same time start the stop watch and the Infusomat® compact<sup>plus</sup> P.
4. After the time has expired stop the stop watch and the Infusomat® compact<sup>plus</sup> P.
5. Determine the delivery rate immediately.
  - Delivery volume to be expected:  
at 12 min: 40 g  $\pm$  2 g ( $\pm$  5%)

### T10 Air sensor

1. Keep the Intrafix Primeline filled with water in the device.
2. Display sensor information:
  - a) Via "Menu" button and arrow keys, select the "Settings" menu item and confirm with "OK".
  - b) Select "Service" and confirm device code with "OK".
  - c) Scroll to "Sensor info" with the arrow keys and select with "OK".
3. Wait at least 120 seconds.
4. Read off the "Air Voltage" value and document.

**NOTICE**

If the water or air value is not reached immediately, these values must be read again after 120 seconds.

5. Enter a delivery rate of 250 ml/h and a volume of 250 ml.
6. Start infusion.
7. Generate an air bubble of approx. 0.4 ml (approx. 56 mm length of line with air) in the supply line (injection port) to the pump. An alarm is triggered when the air bubble is detected.
8. Insert an air-filled Intrafix Primeline into the device and close the operating unit, or disconnect the line at the container and "empty", so that there is no longer any water in the line.
9. Display sensor information via "Sensor info" menu item.
10. Wait at least 120 seconds.
11. Read off the "Air Voltage" value and document.

**NOTICE**

If the water or air value is not reached immediately, these values must be read again after 120 seconds.

**T11 Temperature sensor**

1. Display the air sensor information (see "T10 Air sensor" → p. 4 - 13).
2. Read off the values of the FuP and KuP temperature sensors on the LC display and compare the difference with the specifications in the checklist.
3. Calculate the temperature differences according to the checklist and document.

**T12 Staff Call Test**

1. Connect the staff call cable compact<sup>plus</sup> to the accessory connector of the pump.
2. Insert the Intrafix Primeline and start the pump with an arbitrary delivery rate.
3. Open the pump door.
4. An alarm goes off and the red LED of the staff call cable lights up.

**Fixing the Seal**

1. After each repair do not forget to re-seal the device with your individual seal.

# 5 Servicing the Unit

## CLEANING AND DISINFECTING

## SERVICING THE BATTERY

### Notes

#### WARNING

Liquid may penetrate live parts of the unit.

#### **Danger of electric shock!**

- Disconnect the Infusomat® compact<sup>plus</sup> P from the power supply before cleaning.
- Let the unit dry after cleaning.

- Disconnect and remove all pumps before you start cleaning the device.
- Do not use sharp objects for cleaning.
- Prevent excessive loads on the clamps.
- The current internal hygiene measures of the hospital apply.

### Housing

See the Instructions for Use for a detailed description on how to clean and disinfect the Infusomat® compact<sup>plus</sup> P. Heed to the disposal and hygienic instructions!

### Accessories

Clean the accessories according to the instructions provided.

The Instructions for Use contain a detailed description on how to use and service the battery.



# Technical Safety Check (TSC)

(Master – to be added to the documentation)

## Checklist for Technical Safety Check – Every 24 Months

Unit: Infusomat® compact<sup>plus</sup> P

Manufacturer: B. Braun Melsungen AG



<b>Owner</b>

<b>Year of Procurement</b>

<b>Software Version</b>

Observe the Service Manual and the Instructions for Use. All measured values are to be documented. Accessories used should be included in testing. Only use calibrated measuring equipment.

Article No. (REF)	Serial No. (SN)	Inventory No. (of the Owner)

Visual Inspection	Electrical Safety According to IEC 62353	Functional Inspection
<ul style="list-style-type: none"> <li><input type="checkbox"/> Infusomat® compact<sup>plus</sup> P: Cleanliness, completeness, damage, and defects affecting safety, damage and readability of the labels. Particularly:                             <ul style="list-style-type: none"> <li><input type="checkbox"/> Housing</li> <li><input type="checkbox"/> Screw covers</li> <li><input type="checkbox"/> Pump door</li> <li><input type="checkbox"/> SHK ICPP</li> <li><input type="checkbox"/> Air sensor (free from grease or ultrasonic gel, free from cracks)</li> <li><input type="checkbox"/> Pressure sensor, downstream (membrane)</li> <li><input type="checkbox"/> Pump membrane</li> <li><input type="checkbox"/> Pressure sensor, upstream (membrane)</li> <li><input type="checkbox"/> Second clamp</li> <li><input type="checkbox"/> Keypad/display</li> <li><input type="checkbox"/> Accessory connector</li> <li><input type="checkbox"/> IR window</li> <li><input type="checkbox"/> Mains power supply connection</li> </ul> </li> <li><input type="checkbox"/> Accessories Cleanliness, completeness, damage, and faults affecting safety, damage, and readability of the labels</li> <li><input type="checkbox"/> Check the unit and the accessories for compatibility</li> <li><input type="checkbox"/> Mains power supply cable</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Protective conductor resistance of mains connecting line (<math>\leq 0.1 \Omega</math>) _____ <math>\Omega</math></li> <li><input type="checkbox"/> Measure mains voltage _____ V~</li> <li><input type="checkbox"/> Equipment leakage current (alternative method for devices of protection class II) (<math>\leq 10 \mu A</math>) _____ <math>\mu A</math> Measure between mains input and pin 3 of accessory connector. Use the Measuring Adapter Accessory Connector CP.</li> </ul>	<p>Mechanical Inspection:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Locking with second unit</li> <li><input type="checkbox"/> Pole clamp</li> </ul> <p>Operational Test: Connect unit to mains power supply</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Status display</li> </ul> <p>Switch on unit with mains power supply</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Self-test</li> <li><input type="checkbox"/> Information on display</li> <li><input type="checkbox"/> Audible alarm</li> <li><input type="checkbox"/> Visual alarm</li> </ul> <p>Switch on unit without mains power supply</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Self-test</li> <li><input type="checkbox"/> Battery test</li> <li><input type="checkbox"/> Opening and closing mechanism of the operating unit</li> <li><input type="checkbox"/> Infusion</li> <li><input type="checkbox"/> Buttons on the operating unit</li> <li><input type="checkbox"/> Trigger bolus at the device</li> <li><input type="checkbox"/> Staff call (if available)</li> </ul>

# Technical Safety Check (TSC)

(Master – to be added to the documentation)

Visual Inspection	Electrical Safety According to IEC 62353	Functional Inspection
		<p>Pressure cut-off, electronic: Delivery rate: 250 ml/h</p> <p><input type="checkbox"/> Upstream</p> <p style="padding-left: 20px;"><input type="checkbox"/> Alarm</p> <p><input type="checkbox"/> Downstream</p> <p style="padding-left: 20px;"><input type="checkbox"/> Pressure stage 5 (0.1 ... 0.7 bar) _____ bar (or 1.5 ... 10 psi) _____ psi</p> <p style="padding-left: 20px;"><input type="checkbox"/> Pressure stage 9 (0.7 ... 1.3 bar) _____ bar (or 10 ... 19 psi) _____ psi</p> <p>Pressure limitation, mechanical: Delivery rate: 250 ml/h</p> <p><input type="checkbox"/> P<sub>max</sub> (2.4 ... 4.0 bar) _____ bar (or 35 ... 58 psi) _____ psi</p> <p>SHK</p> <p><input type="checkbox"/> Is closed after opening the pump door.</p> <p><input type="checkbox"/> P<sub>SHK</sub> (&gt; 0.5 bar) _____ bar (or &gt; 7.3 psi) _____ psi</p> <p>Second clamp</p> <p><input type="checkbox"/> Is closed after opening the pump door.</p> <p><input type="checkbox"/> P<sub>2ndClamp</sub> (&gt; 0.5 bar) _____ bar (or &gt; 7.3 psi) _____ psi</p> <p>Delivery accuracy Ambient temperature 20 ... 25°C, delivery rate: 250 ml/h</p> <p><input type="checkbox"/> Divergence (± 5 %) _____ %</p> <p>Air sensor</p> <p><input type="checkbox"/> Water value (1100 ... 2250 mV) _____ mV</p> <p><input type="checkbox"/> Air alarm</p> <p><input type="checkbox"/> Air value (&lt; 100 mV) _____ mV</p> <p>Temperature sensor</p> <p><input type="checkbox"/> FuP Temp - KuP Temp (-1.0 ... +1.0 °C) _____ °C</p>

# Technical Safety Check (TSC)

(Master – to be added to the documentation)

Mech. Aids and Measuring Equip. Used		Accessories used
<input type="checkbox"/> Disposables Type: _____ Part No.: _____	<input type="checkbox"/> Safety tester Ident. No.: _____ Calibrated until: _____	<input type="checkbox"/> Mains power supply cable <input type="checkbox"/> Staff call cable compact <sup>plus</sup> <input type="checkbox"/> Connection lead 12V <input type="checkbox"/> Infusion line <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Manometer Ident. No.: _____ Calibrated until: _____	<input type="checkbox"/> Measuring Adapter Accessory Connector CP <input type="checkbox"/> Graduated cylinder <input type="checkbox"/> Stop watch <input type="checkbox"/> _____ <input type="checkbox"/> _____	
<input type="checkbox"/> Scales Ident. No.: _____ Calibrated until: _____		

**Test result:** Defects found that could endanger patients, users, or third parties:       Yes     No

Measures to be taken:       None  
     Repair  
     \_\_\_\_\_

Special features / documentation:  
 \_\_\_\_\_  
 \_\_\_\_\_

Inspection performed by:

---

Unit handed over on:

---

To:

---

Date / Signature:

---

Next deadline:





# 7 Procedural Instructions on the TSC

## VISUAL INSPECTION

### Infusomat® compact<sup>plus</sup> P

1. Check for cleanliness, completeness, damage, and defects affecting safety, damage, and readability of the labels.  
Pay special attention to the following parts:
  - a) Housing  
Housing is clean and undamaged.
  - b) Screw covers  
Screw covers on the housing present and undamaged.
  - c) Pump door
  - d) SHK ICPP
  - e) Air sensor
  - f) Pressure sensor, downstream
  - g) Membrane  
Membrane in the housing front is undamaged
  - h) Pressure sensor, upstream
  - i) Second clamp
  - j) Keypad/display  
Keypad/display is clean and undamaged, correct bonding of the foil.
  - k) Accessory connector  
Accessory connector is clean and undamaged.
  - l) IR window  
IR window is clean and undamaged.
  - m) Mains power supply connection  
Gasket for rubber connector CP (IEC socket) is present and undamaged. Electrical contacts are clean and undamaged.

### Accessories

1. Check for compatibility, cleanliness, completeness, damage, and faults affecting safety, damage, and readability of the labels.  
Pay special attention to the following parts (if available):
  - a) Mains power supply cable
  - b) Staff call cable compact<sup>plus</sup>
  - c) Connection lead 12V for ambulance vehicles.

**ELECTRICAL SAFETY  
ACCORDING TO IEC 62353**

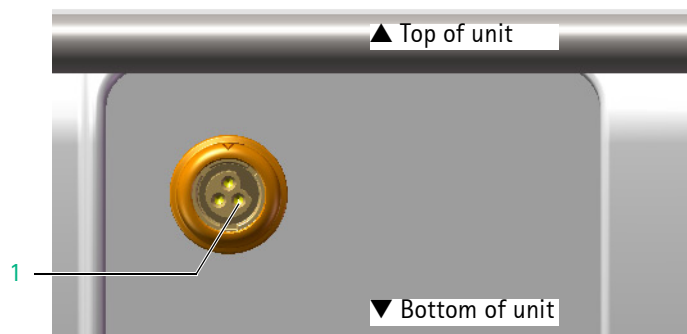


Fig. 7 - 1  
1 Pin 3 of accessory connector

**FUNCTIONAL INSPECTION**

The values to be measured for electrical safety are listed in the TSC (see "Technical Safety Check (TSC)" → p. 6 - 1).

**Equipment leakage current (alternative method)**

1. Measure between mains input and pin 3 (GND) of accessory connector (Fig. 7 - 1 / Item 1).  
For safer measurement, use the Measuring Adapter Accessory Connector CP.

**Mechanical inspection**

1. Fit the unit to be tested on top of another compact<sup>plus</sup> device and check that the lock functions correctly.
2. Fit the unit to be tested underneath another compact<sup>plus</sup> device and check that the lock functions correctly.
3. Rotate the pole clamp in all directions (4x90°) and check for correct latching.
4. Check that the rotary knob of the pole clamp can be turned clockwise and counterclockwise.

**Operational test**

1. Connect the unit to the power supply without switching it on and check the status display:
  - a) Battery capacity
  - b) Mains operation symbol
2. Switch the unit on and check the following details:
  - a) Self-test
  - b) Display of software version
  - c) Audible alarm  
one high sound from piezo buzzer  
one deep sound from loudspeaker
  - d) Visual alarm  
The green LED flashes once. The red LED flashes twice.



3. Check infusion with the following steps:
  - a) Open the pump door, insert a primed line, and close the pump door.
  - b) Open the roller clamp and confirm the line.
  - c) Deny priming if this message appears (configurable).
  - d) Select a rate of 1.1 ml/h and start infusion.  
The green LED lights up, arrows move from right to left.
4. Press all buttons except the On/Off button at least once.  
All buttons trigger the desired function.
5. Administer a bolus by preselecting a volume of 3 ml.  
A bolus is administered, the volume counter counts up.
6. Stop infusion and remove the line.
7. Check the battery with the following steps:
  - a) Switch the unit off and disconnect from mains power supply.
  - b) Switch the unit on. Self-test is performed.
  - c) Insert a line and let the pump run.
  - d) Connect, disconnect, and reconnect the unit to/from mains power supply (wait approx. 5 s after each step).  
The mains/battery operation symbol changes accordingly.
  - e) Disconnect the unit from mains power supply and perform all further tests (infusion etc.) in battery mode. If necessary, recharge battery first.  
Device should be able to perform the entire operational test in battery mode.
8. Connect the pump to staff call and check staff call under real conditions by triggering an operating alarm.  
As an alternative, connect the staff call cable compact<sup>plus</sup> (part No. 8718030) to the pump and check the staff call signal at the wires. Refer to [Table 7 - 1](#).



Status	Connecting wire	
	white and green	white and brown
Alarm	disconnected	connected
Operation	connected	disconnected

Table 7 - 1

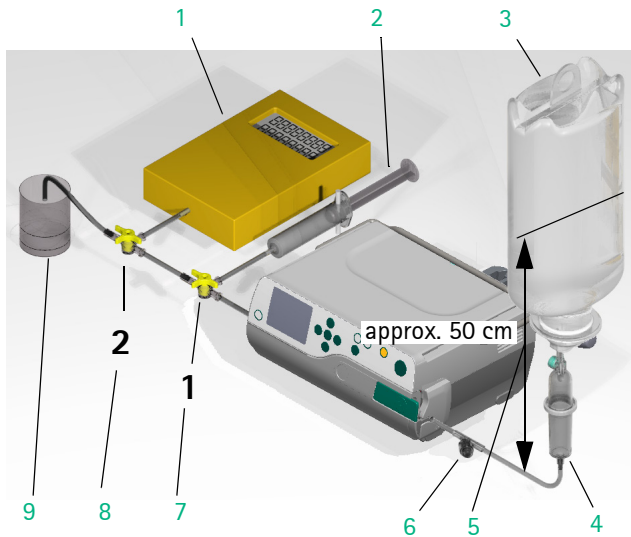


Fig. 7 - 2

- 1 Electronic pressure gauge accuracy class 1
- 2 10 ml syringe (piston fixed)
- 3 Infusion bottle
- 4 Intrafix Primeline
- 5 Distance between liquid level and middle Intrafix Primeline
- 6 Injection port
- 7 Three-way valve 1
- 8 Three-way valve 2
- 9 Graduated cylinder

### Test Setup

Perform test setup with the subassemblies listed below, please see also Fig. 7 - 2:

#### NOTICE

The filling level in the container must be approx. 50 cm above the middle of the unit opening for the Intrafix Primeline.

Intrafix Primeline (new, unused, can be used for the complete TSC incl. functional check)

(1 piece)

Infusion bag or bottle, min. 100 ml

(1 piece)

Three-way valve (2 pieces for measurement with electronic pressure gauge)

Injection port, inserted into the infusion line which has been cut off approx. 2 cm on the right side next to the second clamp.

10 ml syringe (air buffer for measurement with electronic pressure gauge)

(syringe drawn up to 10 ml and piston fixed mechanically)

(1 piece)

1 ml syringe for air bubble injection (1 piece)

Electronic pressure gauge with peak value recognition (1 piece)

Graduated cylinder 25 ml,  $\pm 0.04$  ml (1 piece)

### Pressure cut-off, electronic

1. Insert the Intrafix Primeline of the test setup (Fig. 7 - 2) in the device.

#### NOTICE

The occlusion test with an air-filled line may fail. In this case, insert an Intrafix Primeline filled with water.

2. Enter a delivery rate according to the checklist and a volume of 250 ml.
3. Select pressure stage according to the checklist.

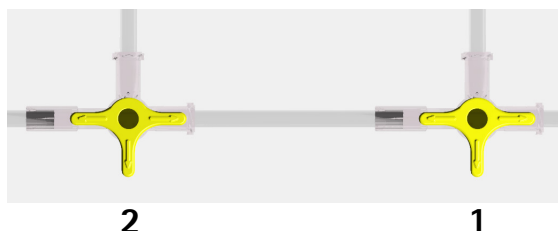


Fig. 7 - 3

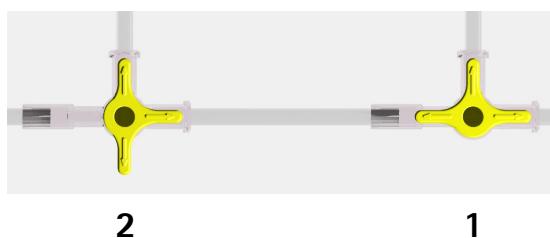


Fig. 7 - 4

- Vent test setup, for position of the three-way cocks please see Fig. 7 - 3, start infusion and deliver first of all in to an open system (without pressure gauge).

Upstream:

- Push roller clamp of the Intrafix Primeline up to approx. 30 cm before the pump and close the roller clamp or pinch the Intrafix Primeline between the container and 30 cm before the pump. An alarm is output.
- Open roller clamp.

Downstream:

- Switch over three-way valve, please see Fig. 7 - 4, and deliver towards the pressure gauge. Read off maximum value on the pressure gauge upon an alarm and before an automatic pressure reduction and compare with the specifications in the TSC.
- Check all pressure stages listed in the TSC and document values. Do not reduce pressure.

#### Pressure limitation, mechanical

##### *NOTICE*

Do not use an Intrafix Primeline with an upstream "Y" site. The back check-valve associated with the upstream "Y" site may skew mechanical pressure limitation test results.

$P_{max}$

- Deactivate electronic pressure cut-off:
  - Via "Menu" button and arrow keys, select the "Settings" menu item and confirm with "OK".
  - Select "Service" and confirm device code with "OK".
  - Confirm selection of "Pressure" "Off" with "OK". (pressure "off" will be active for 5 minutes)
- Input a delivery rate according to the checklist. Enter a sufficiently large VTBI, e.g. 50ml (required for infusion lines other than SafeSet).
- Switch over three-way valve, please see Fig. 7 - 4, and deliver towards the pressure gauge for 3 minutes.

- After the 3 minutes have elapsed, read off the corresponding value for  $P_{max}$  (observe for 30 seconds) on the pressure gauge and compare with the specifications for  $P_{max}$  in the checklist.

**NOTICE**

If the pressure values are not reached, the mechanical pressure can be adjusted without opening the unit (see "Adjusting the mechanical pressure" → p. 2 - 7).

- Document value ( $P_{max}$ ). Do not reduce pressure.

**SHK**

- Open the pump door.

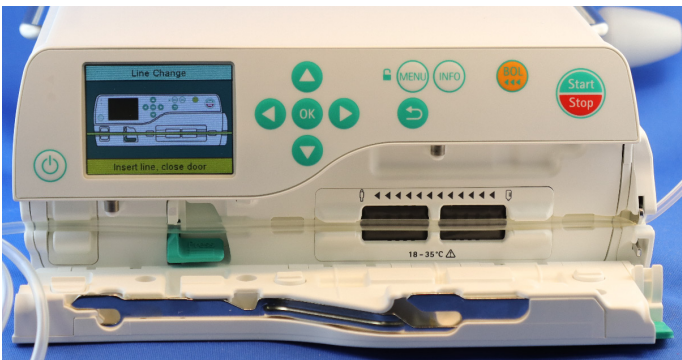


Fig. 7 - 5

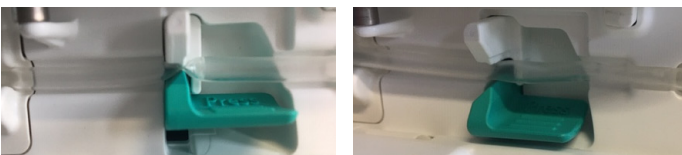


Fig. 7 - 6 SHK closed (left) and opened (right)

- Check if opening the door has caused closing of the SHK (Fig. 7 - 6, left).



Fig. 7 - 7 Second clamp opened (right)

- Move the pump door towards the closed position as far as possible keeping the door opener in closed position. The second clamp opens (see Fig. 7 - 7, right).
- Read off the  $P_{SHK}$  value on the pressure gauge after min. 10 seconds and compare with the specifications for  $P_{SHK}$  in the checklist.
- Document value ( $P_{SHK}$ ). Release the pump door.



Fig. 7 - 8

### Second clamp

1. Manually open the SHK
2. Remove the infusion line from the SHK.  
Still **leave** the infusion line in the second clamp Fig. 7 - 8!
3. Read off the "P<sub>2ndClamp</sub>" value on the pressure gauge, compare with the specifications in the checklist, and document.

#### NOTICE

In case the pressure does not reduce as expected, check if the roller clamp has been closed, accidentally.

4. Dispose of the infusion line (the injection port may be used again).

### Delivery accuracy (simple method)

Requirements:

- Test setup according to Fig. 7 - 2, with the liquid level approx. 50 cm above the pump
- Ambient temperature according to the checklist
- Target volume: 25 ml

Measurement:

1. Set a volume of 30 ml (VTBI) to reduce possible spilling.
2. Insert the Intrafix Primeline of the test setup (Fig. 7 - 2) in the device.  
Do not stretch the line when inserting.
3. Close three-way cocks to the syringe and the measuring device, please see Fig. 7 - 9.
4. Vent test setup. Bottom part of drop chamber must be 2/3 filled.
5. Set delivery rate according to the TSC template.
6. Let device deliver for  $\geq 5$  min into a vessel for waste fluid (not into the measuring container). Then, stop the pump.
7. Insert cannula in empty graduated cylinder and at the same time start the stop watch and the Infusomat® compact<sup>plus</sup> P.
8. Stop the stop watch when the target volume is reached.

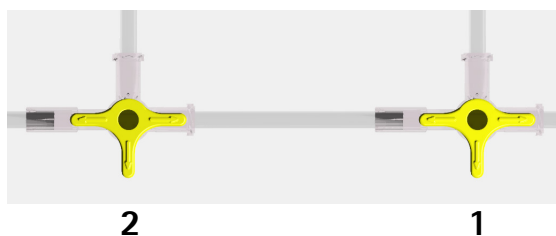


Fig. 7 - 9

Measuring Time		Deviation
6 min	36.0 sec	-10 %
6 min	18.0 sec	-5 %
6 min	14.4 sec	-4 %
6 min	10.8 sec	-3 %
6 min	7.2 sec	-2 %
6 min	3.6 sec	-1 %
6 min	0.0 sec	0 %
5 min	56.4 sec	1 %
5 min	52.8 sec	2 %
5 min	49.2 sec	3 %
5 min	45.6 sec	4 %
5 min	42.0 sec	5 %
5 min	24.0 sec	10 %

Table 7 - 2

9. Evaluate deviation in percent according to [Table 7 - 2](#) and document.

#### Delivery Accuracy (alternative measuring method)

Checking of the flow accuracy by weight measurement.

Avoid errors due to evaporation!

Measuring equipment:

- Scales
- Measuring duration: 12 min

Delivery rate determination:

1. Deactivate KVO:
  - a) Via "Menu" button and arrow keys, select the "Settings" menu item and confirm with "OK".
  - b) Select "Service" and confirm device code with "OK".
  - c) Scroll to "KVO" with the arrow keys and select with "OK".
  - d) Confirm selection of "Off" with "OK"
2. Set a delivery rate of 200 ml/h and let device deliver for  $\geq 5$  min into a vessel for waste fluid (not into the measuring container). Then, stop the pump.
3. Hang the outlet cannula over the measuring container and at the same time start the stop watch and the Infusomat® compact<sup>plus</sup> P.
4. After the time has expired stop the stop watch and the Infusomat® compact<sup>plus</sup> P.
5. Determine the delivery rate immediately.
  - Delivery volume to be expected:  
at 12 min: 40 g  $\pm$  2 g ( $\pm$  5%)

#### Air sensor

1. Keep the Intrafix Primeline filled with water in the device.
2. Display sensor information:
  - a) Via "Menu" button and arrow keys, select the "Settings" menu item and confirm with "OK".
  - b) Select "Service" and confirm device code with "OK".
  - c) Scroll to "Sensor info" with the arrow keys and select with "OK".
3. Wait at least 120 seconds.
4. Read off the "Air Voltage" value and document.



**NOTICE**

If the water or air value is not reached immediately, these values must be read again after 120 seconds.

5. Enter a delivery rate of 250 ml/h and a volume of 250 ml.
6. Start infusion.
7. Generate an air bubble of approx. 0.4 ml (approx. 56 mm length of line with air) in the supply line (injection port) to the pump. An alarm is triggered when the air bubble is detected.
8. Insert an air-filled Intrafix Primeline into the device and close the operating unit, or disconnect the line at the container and "empty", so that there is no longer any water in the line.
9. Display sensor information via "Sensor info" menu item.
10. Wait at least 120 seconds.
11. Read off the "Air Voltage" value and document.

**NOTICE**

If the water or air value is not reached immediately, these values must be read again after 120 seconds.

**Temperature sensor**

1. Display the air sensor information (see "Air sensor" → p. 7 - 8).
2. Read off the values of the FuP and KuP temperature sensors on the LC display and compare the difference with the specifications in the checklist.
3. Calculate the temperature differences according to the checklist and document.



# 8 Test Equipment and Tools

## TEST EQUIPMENT

### Designation

### Order No.

#### For TSC and Check after Repair

Measuring instrument for electrical safety

USB service adapter CP .....34522008

compact<sup>plus</sup> Service Tool .....34522009

Staff call cable compact<sup>plus</sup> .....8718030

Intrafix Primeline, Standard, PVC, 240 cm .....8700310

Injection port. ....c2454540

Measuring Adapter Accessory Connector CP .....7705208

Graduated cylinder

Manometer

Syringe 10 ml

Syringe 1 ml

## STANDARD TOOLS

### Screwdriver

Screwdriver TORX T20, T25, T30

Screwdriver TORX plus 6IP, 8IP, 10IP, 15IP

#### *NOTICE*

Take care of the specified torques – make sure to have the necessary torque screwdrivers at hand.

(see "Special tools" → p. 8 - 2)

### Further tools

Countersink 4.3 mm / 90°

SPECIAL TOOLS



Fig. 8 - 1 Torque Screw Driver Set AIS

**Designation**

**Order No.**

Torque Screw Driver Set AIS. . . . . 10129AIS  
 with:  
 Torque screwdrivers 0,10-0,34 / 0,30-1,20 /  
 1,20-3,00 Nm  
 Bit 6iPx89 / TX8x89 / 8iPx89 / TX10x89 / 15iPx89 / 10iPx89 /  
 TX20x89 / TX25x89 / TX30x89  
 Countersink with handle Ø4,3mm  
 Tool shank 1/4"x100mm  
 Wrench socket 1/4" SW8  
 Slot bit 2,5x70  
 Angle hinge & socket wrench accessory connector CP

For ordering the torque screwdriver set and for further queries,  
 please exclusively contact:  
 WERMAS Werkzeughandels GmbH  
 Justus-Liebig-Str. 1, 34253 Lohfelden, Germany  
 Tel. +49 5615 7069-0  
 Fax +49 5615 7069-29  
[www.wermas.de](http://www.wermas.de)  
 E-Mail: [euler@wermas.de](mailto:euler@wermas.de)  
 (Every part of the set can be ordered as a single part from Wermas)

Test equipment set AIS. . . . . 10129STSAIS  
 with:  
 1x TANOS case  
 1x Foam insert set, removable  
 For safe transport and storage of the calibration gauges.

Test and calibration gauges have to be ordered separately from  
 B. Braun. They are not included in the Test equipment set AIS.

# 9 Spare Parts List

Designation	Order - No.	BN*	Designation	Order - No.	BN*
Small parts ICP .....	34522210		Cover cap set CP .....	34774501	
with:			with:		
Cylinder screw M4x16 ISO 14580 A2 (40 Pcs)			Cover cap housing (500 Pcs)		
Delta PT screw WN5451 25x6 (10 Pcs)			Cover cap Pole Clamp (150 Pcs)		
Delta PT screw A2 WN5454 30x9 (10 Pcs)			Cover cap drive head (70 Pcs)		
Delta PT screw 22x8 WN5451 (4 Pcs)			O-ring 12x3 NBR 50 Shore (5 Pcs)		
Delta PT screw A2 WN5452 30x10 (20 Pcs)			Lock screw (5 Pcs)		
Delta PT screw 35x10 WN5451 (10 Pcs)			Ribbon cable sensors PCB ICP .....	34774507	
Delta PT screw 30x8 WN 5451 (10 Pcs)			Ribbon cable pressure sensor ICP .....	34774508	
Cover cap poleclamp (40 Pcs)			Ribbon cable air sensor ICP .....	34774509	
Cover cap housing (100 Pcs)			Ribbon cable display CP .....	34774502	
Cover cap drive head (5 Pcs)			ESD wire ICP .....	34774510	
Foot (10 Pcs)			Loctite 243 .....	Individual purchase	
Magnet 7x7x3 (5 Pcs)			High Vaccum grease .....	34507930	
Hexagon nut M8,5x1 DIN 934 (2 Pcs)					
Speaker flap					
Lock screw (5 Pcs)					
O-Ring 12x3 NBR 50 Shore (5 Pcs)					
Seal ring 3x1 50 ShoreA Silicon red (5 Pcs)					
Coil valve mechanics (5 Pcs)					
Fixing plate (3 Pcs)					
Sealing pole clamp (3 Pcs)					
IR-LED 100 mA OSRAM IRL 81 A (2 Pcs)					
Hall sensor A3212EUA-T (2 Pcs)					
Optical sensor (TSL254R) (2 Pcs)					
Halkey-Robt.Swabable T-port (PC) 245454024 (2 Pcs)					

**NOTICE**

The content of service kits may vary based on experience from repairs during the product life cycle.

\* Sets containing spare parts with batch number (BN). Refer to the packaging labels. Documentation of batch numbers of spare part and affected medical device required.

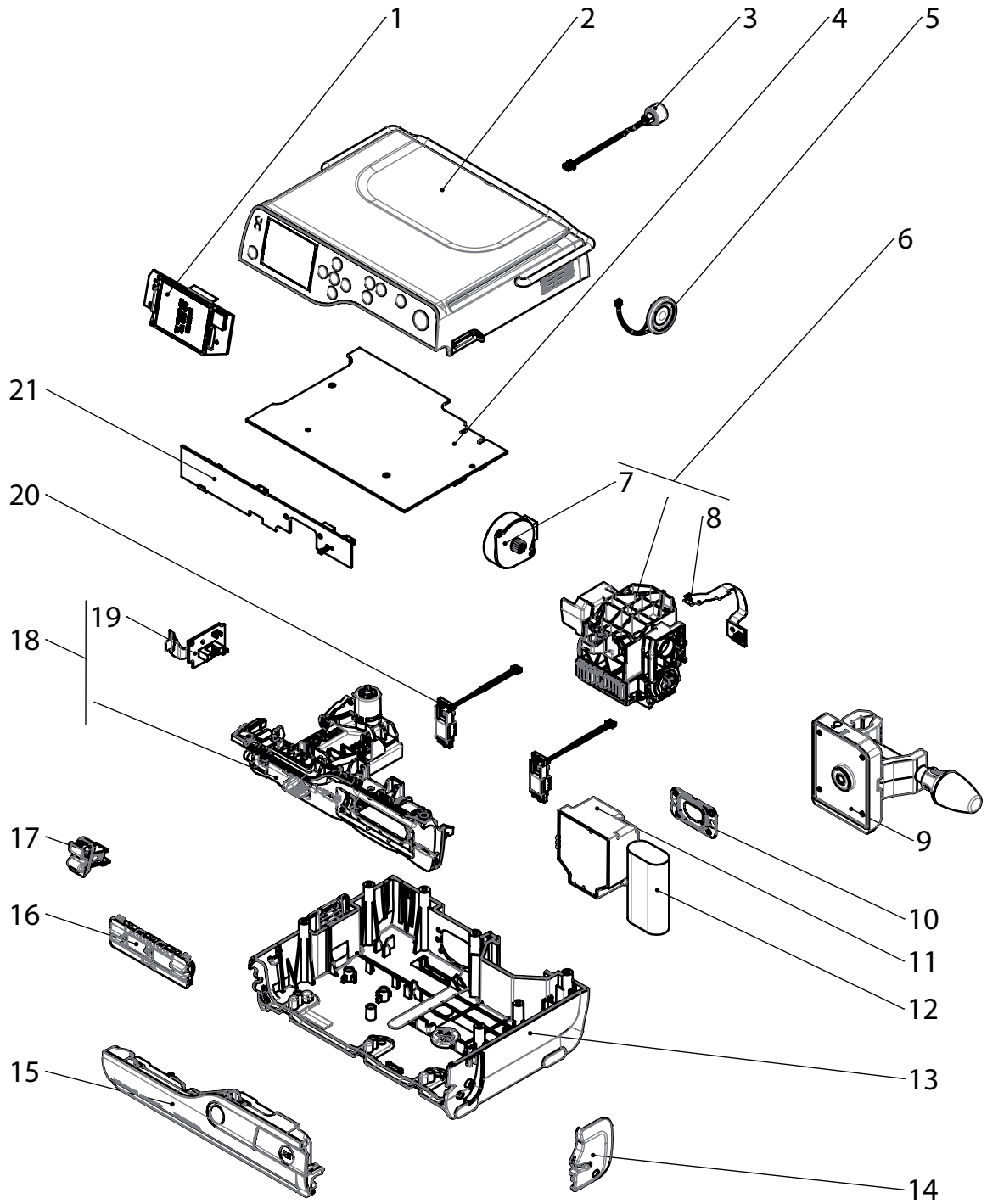


Fig. 9 - 1 Exploded drawing Infusomat® compact<sup>plus</sup> P

<b>Designation</b>	<b>Order - No.</b>	<b>SN/BN*</b>
1 Display board with display CP . . . . .	34522116 . . . . .	SN (devices with serial number 1199 and lower)
2 Housing, upper part ICPP . . . . .	34522291 . . . . .	BN with keypad (devices with serial number 1199 and lower)
1+2 Housing, upper part ICPP . . . . .	34522290 . . . . .	BN with keypad and display
3 Accessory connector CP . . . . .	34522002	
4 Processor board ICP . . . . .	34522201 . . . . .	SN
5 Loudspeaker CP . . . . .	34522001 . . . . .	BN
6 Pump ICP . . . . .	34522206 . . . . .	SN (including stepper motor and encoder PCB)
7 Stepper motor CP . . . . .	34522107	
8 Encoder PCB ICP . . . . .	34522205 . . . . .	SN
9 Pole Clamp complete CP . . . . .	34522004 . . . . .	BN
10 Gasket for rubber connector CP . . . . .	34522010 . . . . .	BN
11 Power supply CP . . . . .	34522000 . . . . .	BN
12 Battery module CP . . . . .	34522005 . . . . .	BN
13 Housing, bottom part ICP . . . . .	34522208 . . . . .	BN
14 Second clamp ICPP . . . . .	34522286 . . . . .	BN
15 Pump door ICPP . . . . .	34522294 . . . . .	SN
16 Membrane ICPP . . . . .	34522292 . . . . .	BN
17 Air sensor ICP . . . . .	34522204 . . . . .	SN
18 SHK ICPP . . . . .	34522293 . . . . .	SN (including SHK PCB)
19 SHK PCB ICPP . . . . .	34522287 . . . . .	SN
20 Pressure sensor ICP . . . . .	34522203 . . . . .	BN
21 Sensor PCB ICPP . . . . .	34522288 . . . . .	SN

---

\* Spare parts with serial number (SN) or batch number (BN). Documentation of serial/batch numbers of spare part and affected medical device required.





# 10 Index

- A**
  - Abbreviations 0-12
  - Accessories 1-6
- B**
  - Battery module
    - Servicing 5-1
- C**
  - Cable sets 3-1
  - Check after repair
    - Instructions 4-6
    - Matrix 4-1
  - Cleaning 5-1
  - Commissioning 1-7
  - Cover cap 3-1
  - Current information 11-1
  - Current versions 0-6
- D**
  - Description 1-2
  - Device
    - Description 1-2
    - Overview 1-2
  - Drehmomentschraubendreher 8-2
- E**
  - Error
    - Most important error modes 2-6
- F**
  - Functional inspection
    - Mechanical inspection 7-2
    - Operational test 7-2
  - Functional test 1-7
- L**
  - List of abbreviations 0-12
  - Log files 2-1
  - Loudspeaker 3-15
- M**
  - Mechanical design 1-2
- O**
  - Options 1-6
  - Overview
    - Device 1-2
    - System 1-1
- P**
  - Product safety
    - Log file 2-1
    - Update of device software 1-5
- R**
  - Release button 3-14
  - Responsibilities 0-6
  - Revision documentation 11-1
- S**
  - Safety data sheets 0-10
  - Safety of the product
    - Log file 2-1
    - Update of device software 1-5
  - Screws 3-1
  - Service program 1-5
  - Small parts 3-1
  - Software
    - Service program 1-5
    - Unit 1-5
    - Update 1-5
  - Spare parts
    - History 11-1
  - Special screws for plastic housings 3-3
  - Special tools 8-2
  - System
    - Function 1-3
    - Mechanical design 1-2
    - Overview 1-1

## T

Technical data 1-6  
Technical Safety Check 0-5, 6-1  
Test equipment 8-1  
Tools 8-1  
TSC 0-5, 6-1

## U

Unit  
Accessories 1-6  
Opening/closing 3-12  
Options 1-6  
Software 1-5  
Technical data 1-6

## V

Visual inspection 7-1

## Z

Zero force insertion connector 3-1, 3-4

# 11 Appendix

## REVISION DOCUMENTATION

### Version 1.0 (Base Version)

- First version of this Service Manual

## CURRENT INFORMATION

n/a

## HISTORY OF SPARE PARTS

### Changed or updated spare parts

Designation	Ord. No.	Modification	Starting with SN	of unit/module
Housig, upper part ICPP	34522290	Spare part includes display board with display CP and keypad (no separate availability of display board with display CP and housing, upper part with keypad)	1200	ICPP

Table 11 - 1

Customer Address

Service Provider

Contact:  
Phone number:  
E-Mail:  
Work Order Number:  
Date of service:

Device details

Article number	Article name	Serial number	Working hours
----------------	--------------	---------------	---------------

Customer nr.	Inventory nr.	Cust. ref. nr.	Software version
--------------	---------------	----------------	------------------

Problem description

Work performed

Labor details

Activity Type	Work Note	Quantity	Unit
---------------	-----------	----------	------

Parts consumed

Article number	Name	Serial number	Batch number	Quantity	Unit
----------------	------	---------------	--------------	----------	------

Test Equipment and Special Tools

Article number	Name	Ident. number	Article number	Name	Ident. number
----------------	------	---------------	----------------	------	---------------

Date:

Technician:

Technician signature: \_\_\_\_\_



B. Braun Melsungen AG | Carl-Braun-Straße 1 | 34209 Melsungen | Germany  
Phone +49 5661 71-0 | Fax +49 5661 71-4567 | [www.bbraun.com](http://www.bbraun.com)