

# Perfusor® Space

## Service Manual



Version 3.0 English

This document is not a complete Service Manual. It only encompasses the pages that describe how to determine the age and how to check the condition of batteries as well as the accordingly adapted template for Technical Safety Check.

### 3.2 Battery Module

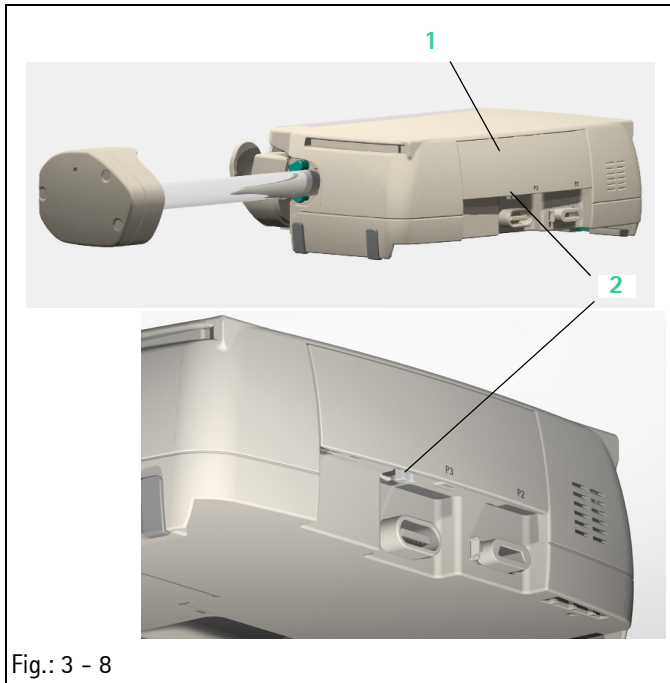


Fig.: 3 - 8

Legend of fig. 3 - 8:

ItemDesignation

- 1 Battery compartment cover
- 2 Battery compartment cover lock

#### Designation

#### Ord. No.

Battery compartment cover PSP, cpl. ....	3452 0872
Battery module SP (NiMH)	
without fixing pin.....	3452 0856
with fixing pin.....	3452 0856A
Battery module SP (Li-Ion)	
with WLAN and fixing pin .....	8713182A

#### Note

Users have been informed as follows: If a Perfusor® Space pump used on battery only and showing full battery charge stops during syringe change and alarms, users should remove the pump from use and return it to the Medical Engineering Department for replacement of the battery.

In this case the battery has to be replaced regardless of its age or any further test.

#### Disassembly

#### Note

Move the drive head to the extended end position before starting disassembly (see "General" ➔ pg. 3 - 1).

1. Press the lock (Fig.: 3 - 8 / Item 2) on the battery compartment cover (Fig.: 3 - 8 / Item 1) and remove the battery compartment cover.

#### Note

The battery compartment cover of more recent devices is shorter and can only be unlocked using a pointed object.

# Technical Safety Check (TSC)

Index g

(Master – to be added to the documentation)

## Checklist for Technical Safety Check – Every 24 Months

Unit: Perfusor®Space

Manufacturer: B. Braun Melsungen AG



User
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Observe the Service Manual and the instructions for use. All measured values are to be documented. Accessories used should be included in testing. Make exclusive use of calibrated measuring equipment.

Article No.	Unit No.	Year of Procurement	Stock No.

Visual Inspection	Electrical Safety	Functional Inspection
	According to IEC / EN 60601-1 or VDE 0750 and VDE 0751	
<input type="checkbox"/> Perfusor® Space: Cleanliness, completeness, damage and defects affecting safety, damage and readability of the labels. Particularly: <input type="checkbox"/> Syringe holder with blade <input type="checkbox"/> Syringe fastening <input type="checkbox"/> Membrane in drive head <input type="checkbox"/> Axial clearance of drive <input type="checkbox"/> Screw covers <input type="checkbox"/> Connectors "P2" and "P3" <input type="checkbox"/> Protection cap at drive head  <input type="checkbox"/> Accessories: Cleanliness, completeness, damage and faults affecting safety, damage and readability of the label <input type="checkbox"/> Check the unit and the accessories for compatibility	The patient and housing leakage current of the Perfusor® Space is caused exclusively by the operating voltage supply (Power Supply SP or SpaceStation).  The Technical Safety Checks of the power supply SP (drawing No. M001321005 F04) or of the SpaceStation (drawing No. M690000046 F04) serve to check whether both limit values are met.	<input type="checkbox"/> Locking with second unit <input type="checkbox"/> Operating unit magnets <input type="checkbox"/> Battery compartment cover  Determine age of battery <input type="checkbox"/> If older than 4 years: recommend replacement of battery or perform battery check (refer to ► <b>"Procedural Instructions on the TSC"</b> )  Switch on unit with power supply <input type="checkbox"/> Self-test <input type="checkbox"/> Indicator lamps (LEDs) <input type="checkbox"/> Audible alarm <input type="checkbox"/> Visual alarm <input type="checkbox"/> Status display <input type="checkbox"/> Lighting <input type="checkbox"/> Battery alarm

# Technical Safety Check (TSC)

Index g

(Master – to be added to the documentation)

Visual Inspection	Electrical Safety According to IEC / EN 60601-1 or VDE 0750 and VDE 0751	Functional Inspection
		<p>Operation</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Syringe fastening</li> <li><input type="checkbox"/> Syringe recognition</li> <li><input type="checkbox"/> Infusion</li> <li><input type="checkbox"/> Buttons on the operating unit</li> <li><input type="checkbox"/> Staff call</li> <li><input type="checkbox"/> Trigger bolus at the device</li> <li><input type="checkbox"/> Trigger bolus by pressing the PCA button</li> <li><input type="checkbox"/> PCA lock (bottom side of pump) with inserted 50/60 ml syringe</li> <li><input type="checkbox"/> PCA lock Syringe Anti Removal CAP PSP with inserted 50/60 ml syringe</li> </ul> <p>Switch on unit without power supply</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Self-test</li> <li><input type="checkbox"/> Magnetic function of the battery compartment cover</li> </ul> <p>Pressure cut-off</p> <p style="padding-left: 20px;">Syringe type: "#LehreOPS50"</p> <p style="padding-left: 20px;">Delivery rate: 200 ml/h</p> <p>- Strain gauge pressure measurement</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Pressure stage 1 (9...15N)_____N</li> <li><input type="checkbox"/> Pressure stage 3 (25...33N)_____N</li> <li><input type="checkbox"/> Pressure stage 8 (63...76N)_____N</li> <li><input type="checkbox"/> Error message "Alarm / pressure too high" at every pressure stage</li> </ul> <p>- Motor power limitation</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Pressure stage 1 (11...28N)_____N</li> <li><input type="checkbox"/> Pressure stage 3 (30...49N)_____N</li> <li><input type="checkbox"/> Pressure stage 6 (58...80N)_____N</li> <li><input type="checkbox"/> Error message "Alarm / drive blocked" at every pressure stage</li> </ul>

# Technical Safety Check (TSC)

Index g

(Master – to be added to the documentation)

Mechanical Aids and Measuring Equipment Used	Accessories Used	
<input type="checkbox"/> Syringe gauge, serial No. _____ Calibrated until _____ <input type="checkbox"/> Service connector SP <input type="checkbox"/> _____ <input type="checkbox"/> _____	<input type="checkbox"/> Power Supply SP <input type="checkbox"/> Battery module <input type="checkbox"/> Staff call lead <input type="checkbox"/> Space PCA Kit (PCA button) <input type="checkbox"/> Syringe Anti Removal Cap PSP <input type="checkbox"/> _____	

**Test result:**

Defects found which could endanger patients, users or third parties:  Yes  No

Measures to be taken:  Repair  
 Replacement of battery recommended  
 \_\_\_\_\_

Special features / documentation:

Inspection performed by:

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Unit handed over on:

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To:

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Date / Signature:

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Next deadline for TSC:

Functional Inspection Perfusor® Space

Mechanical Inspection

1. Fit the unit to be tested on top of another Space device and check the proper functioning of the lock.
2. Fit the unit to be tested under another Space device and check the proper functioning of the lock.
3. Hold the device with the operating unit downwards. The operating unit must not open.
4. Check the battery compartment cover lock for proper operation.

Functional Check

1. Determine age of battery  
 Open battery compartment cover and remove battery.  
 Read the batch number printed on the type plate of the battery and determine the age of the battery.
  - a) For NiMH batteries, see Fig.: 6 - 2
  - b) For Li-Ion batteries, see Fig.: 6 - 3

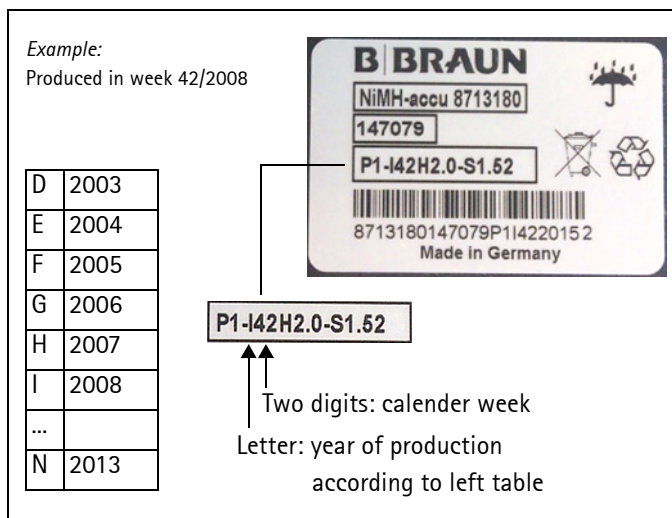


Fig.: 6 - 2 NiMH batteries

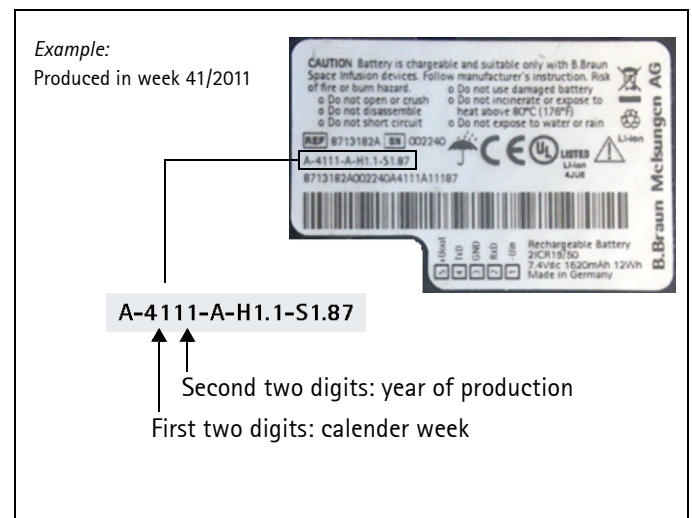


Fig.: 6 - 3 Li-Ion batteries

Note

If the battery is older than 4 years recommend the replacement of the battery or perform the battery check.

2. Battery check

Use the battery maintenance mode to discharge the battery to battery pre-alarm (the battery status indicator displays no bar).

Perform 5 syringe changes with emptied syringe.

  - Replace the battery if a battery alarm occurs during the syringe changes.
3. Switch on unit with the power supply connected and check the following details:
  - Self-test  
Display on the LC display
  - Indicator lamps  
LEDs (yellow, green, blue) light up for a short moment  
LED changes from green to red  
Changed order for units from SW J on:  
LEDs (yellow, red, blue) light up for a short moment  
LED changes from red to green
  - Audible alarm  
A deep and a high sound
  - Status display  
Battery capacity, mains operation (service connector SP)
  - Lighting  
Illumination of syringe compartment, LC display and buttons
4. Syringe fastening
  - a) Axial fastening holds syringe wing
  - b) Syringe holder blade fixes syringe piston
  - c) Both claws in drive head catch the syringe piston plate
5. Check syringe recognition.
  - a) Insert approved 2 ml / 3 ml syringe.  
The syringe size is recognized.
  - b) Insert approved 50 ml / 3 ml syringe.  
The syringe size is recognized.
6. Carry out infusion and bolus with any syringe and press all buttons at least once.

Infusion and bolus are performed and all buttons trigger the function desired.

7. Trigger bolus by pressing the PCA button.  
For this purpose, select a PCA drug from the database, fit the PCA button to P2, and trigger bolus.  
Confirm that the green LED on the PCA button lights up. Bolus is delivered.
8. Staff call
  - a) Plug service connector SP on connector "P2".
  - b) Open syringe holder while the infusion is administered.  
The red LED on the service connector SP lights up.
9. PCA lock on the Perfusor® Space
  - a) Check the PCA lock with an approved 50/60ml syringe.
10. PCA lock of the Syringe Anti Removal Kit PSP
  - a) Place on the drive head and lock.
  - b) Check the Syringe Anti Removal Kit PSP with an approved 50/60ml syringe.
  - c) Unlock and remove from the drive head.

#### **Battery Alarm**

1. Switch device off.
2. Pull off the power supply.
3. Switch on unit.  
Self-test is carried out.
4. Open battery compartment cover during operation.  
An alarm is activated.
5. Remove battery.  
An alarm sounds with the piezo buzzer for at least 3 minutes.



**Version 3.0**

- Changed TSC of the unit
- Revised procedural instructions on the TSC
- Release date: 25.10.2013

