Read Instructions for Use prior to use. Application only under regularly supervision by specially trained staff.

Operation
➤ Ensure the unit is properly positioned and secured.
➤ Prior to use check audible and visual alarms during self test. Also check the device for possible damage.
➤ If staff call is used we recommend to check the equipment once after connecting the pump.
➤ Connect to patient only after switching on the device. Interrupt the connection during changing administration set(s) to prevent incorrect dose delivery.
➤ Select cannula/catheter suitable for use with the intended medical application.
➤ Position the infusion line free of kinks.
➤ Recommended change of disposables after 24 h (consider national hygiene regulations).
➤ Compare displayed value with entered value. Start infusion only if values are corresponding.
➤ Installation in medically used rooms must comply with the appropriate regulations (e.g. VDE 0100, VDE 0107 or IEC-publications).
➤ Possible explosion hazard if used in presence of flammable anaesthetics!
➤ Air in line cannot be detected by the air detector at stop-cocks, infusion ports and additional administration set components.

Other components
➤ Variations in pressure (e.g. as caused by change of level) can affect the accuracy of the device.
➤ Where several infusion lines are connected on one single vascular access the possibility of their exerting a mutual influence vice-versa cannot be excluded.
➤ Refer to respective manufacturer’s information for possible incompatibilities of equipment resp. drugs.
➤ Use only compatible combinations of equipment, accessories, working parts and disposables.
➤ It is recommended to use original Infusomat® infusion lines only.
➤ The use of not recommended resp. incompatible disposables may influence the technical specification.

➤ Connected electrical equipment must comply with the relevant IEC/EN-publications (e.g. IEC/EN 60950 for data-processing equipment). The user/operator is responsible for the system configuration if additional equipment is connected. The international standard IEC/EN 60601-1-1 has to be taken into account.

Safety Standards
➤ The EMC-limits (electro-magnetic compatibility) according to IEC/EN 60601-1-2 and IEC/EN 60601-2-24 are maintained. If the equipment is operated in the vicinity of other equipment which may cause high levels of interference (e.g. HF surgical equipment, nuclear spin tomography units, mobile telephones etc.) maintain the recommended protective distances for these devices. Under certain conditions malfunctions may occur which lead to a device alarm with permanent alarm tone (see also alarm conditions, page 13). Interferences may occur e.g. at electro-magnetic fields > 10 V/m resp. electro-magnetic discharges > 8 kV.

⚠ Special Function "without drip control", see page 10.
Infusomat® fmS

Contents

Infusomat® fmS / Overview Page 4
Operation Page 6
Additional Settings Page 7
Special Functions Page 8
Alarm Conditions Page 13
Start-up Graphs and Trumpet Curves Page 15
Technical Data Page 16
Warranty / TSC*1 / Service / Cleaning Page 18
Ordering Page 19

*1 Technical Safety Check

The Infusomat® fmS is according to IEC/EN 60601-1 resp. IEC/EN 60601-2-24 a volumetric infusion pump for infusion of small and large volumes at highest accuracy and is suitable for intravenous and intra-arterial applications, for blood transfusion and for enteral nutrition.

The medical specialist has to decide on the suitability of the application. The decision has to be made on the basis of the specified properties and technical data.

For further details please refer to the Instructions for Use.
Overview

Handle
For easy transport.

Display
All important information in plain text. Green background illumination only if connected to mains or a key is pushed at battery operation.

Keypad for Input
Correct Input/CLEAR
Display reset to 000.0

Red LED indicates alarm condition
Additionally "AAA.A" is flashing in the display. Possible alarms: "drop alarm, air alarm, pressure alarm, pump-door open, battery alarm, standby-alarm"

Operating Indicator
Additional operating control indicator in display.

Holder for Drop Chamber
Prevents unintended movement (swaying).

Adapter for Drop Sensor
Replaceable, depending on drop chamber size. Press lateral and pull off.

Universal Pole Clamp
Attach the Infusomat® fmS from above, clicking into its place. To release, press the black button.
Guide for Short Infusion Pole

Mains/Power Connection
(protect against ingress of moisture). In case of mains/power failure, the pump switches to battery operation. Battery operation time: > 3.5 h at highest delivery rate. Automatic overload protection. Mains fuse: directly above the mains/power connector.

Potential Equalisation
To be connected for CF-applications.

Mains/Power Supply
For operation with fluid manager system.

Function Keys
Mains/Power Switch ON/OFF
Suppress alarm tone for 2 min
Infusion START/STOP

Multi-Function-Connector (MFC)
Connection for staff call, ambulances (12 V DC) and interface for fm anaesthesia/fm intensive.

Optical Interface
Infrared Interface for operation on "fluid manager system".

Flow Inhibitor
Opening door clamps off infusion line automatically.

Peristaltic Pump
For precise and reliable dosage.

Function Keys

VOL Infusion Volume
Press key below VOL. Enter volume (0.1 ... 9999.9 ml). Confirm. Press again key below VOL.

TIME Infusion Time
Press key below TIME. Enter time e.g. 50 min as 5 0 or 2 h 30 min as 2 3 0. Confirm. Press again key below TIME.

RATE Delivery Rate
Only active when rate is calculated automatically. The key below RATE confirms the calculated rate.

SF Special Functions
If activated: dose calculation / bolus function / standby / drug selection / occlusion pressure / drop control / piggyback / battery capacity / data lock / contrast / date, time.
Operation

Infusion
1. Ensure reliable installation
Never position infusion bottle below pump level.
➤ Connect staff call.
➤ Insert spike vertically into infusion bottle. Fill lower part of drop chamber to max. 2/3.
➤ Open roller clamp.

2. Filling and Venting
Fill infusion line from bottom to top.
➤ Close roller clamp.

3. Insert Infusion Line
Press door opener.
➤ Insert infusion line: Locate clips first on top, then on bottom.
➤ Keep infusion line in place at air sensor.
➤ Close door. In the area of the peristaltic pump segments and free-flow clamp the infusion line will be positioned self-acting.
➤ Open roller clamp completely. There may not be a continuous drip.
➤ Place drop sensor on drop chamber (if necessary, use an appropriate adapter).

4. Switch On with ✅
Green mains/power control or yellow battery control, alarm tone and display LED's are briefly activated.

5. Puncture

6. Setting the Delivery Rate
In the range: 0.1 - 999.9 ml/h and check (selectable in 0.1 ml/h-increments).
Correction: Press C, then set new rate. Select additional settings, if desired (see page 7).

7. Press START
Operating symbol appears on the display and the green operating indicator lights.

8. Stop the infusion
➤ Press STOP. Green operating indicator goes out
➤ Close roller clamp.
➤ Press door opener. Infusion line will be clamped off when opening the door.
➤ Remove infusion line. First bottom, then top.- Replacement: Insert new infusion line as described. Then press START again.
➤ To end switch off
Press ✅ for 2 sec.
To Change the Delivery Rate
➤ Press START/STOP.
Green operating indicator goes out.
➤ Press C.
Display reset to 000.0
➤ Enter new delivery rate. (No setting possible, when C has not been pressed.).
➤ Press START/STOP to restart infusion. (Alarm if no restart within 2 min).

To Change the Rate Without Interrupting the Infusion (Function can be deactivated by Service staff)
➤ Enter new rate.
➤ Press key below RATE. Rate is transferred to the upper level as large numbers.
➤ Pump operates at new rate. (If new rate is not confirmed within 10 sec, infusion continues at previous rate.).

Target Volume (Volume Pre-selection)
The target volume will be administered independent on the infused volume.
➤ Press key below VOL.
➤ Enter target volume via keypad and confirm with VOL. Values between 0.1 and 9999.9 ml. After confirming the display shows the residual volume instead of the target volume.

Note:
When target- / residual volume has been administered, the device switches to KOR-mode. Stop pump and press VOL. Clear displayed residual volume with C (in display appears target volume ----.- ml) and confirm with VOL.
If desired, enter new target volume.
To continue infusion, the target volume has to be displayed as ----.- ml or a new target volume has to be set.

Target Time (Time Pre-selection)
➤ Press key below TIME.
Enter target time via keypad (50 min = 50; 2 h 30 min = 2 3 0).
➤ Confirm: Press key below TIME again, instead of the target time the residual time is displayed now.
➤ Correction
Press C. Display --h--m. New entry.

Note:
When pre-selected time has been expired, the device switches to KOR-mode. Stop pump and press TIME. Clear resid. time with C (in display appears target time --h--m) and confirm with TIME.
If desired, enter new target time. To continue infusion, the target time has to be displayed as --h--m or a new target time has to be set.

Rate Calculation
(Displayed delivery rate must be 000.0)
➤ Enter volume and time.
The delivery rate is calculated automatically and displayed (rounded to one decimal place).
➤ Confirm: Press key below RATE.
➤ Start infusion with START/STOP.

Clear Time/Volume
➤ Press STOP, then key below VOL or TIME.
➤ Press C to clear.
1x: Target Vol/Time = ----.-ml / --h--m
2x: Infused Volume/Real Time = 0.0ml / 00h00m
KOR-Mode (KVO)
After expiring of the pre-selected time or infusion of the pre-selected volume automatic reduction to keep-open rate (KOR).
▶ KOR and delivery rate flash alternately. Deactivation and alarm after 30 min.
▶ Switch off with START/STOP.

Status request
Only when infusion is running.
▶ Press 1 x resp. 2 x key below INFO for actual values.
The display disappears after 10 sec or after all information has been requested.
▶ Press 3 x key below INFO for battery capacity in h min and hours of operation.

Special Functions

History Function
In connection with the software “IFME” the Infusomat fmS is equipped with a history function (memory of events). This permanent memory records the last 350 events time- and date related:
- Set delivery rate
- Changes of the rate
- Switching on/off
- Start/Stop of infusion
- Remote Control
- Operating and device alarms
At the moment of an event also the volume infused from switching on is recorded.
The history function is activated ex works.
After a software-update the function has to be installed again (service programme: menu 560 calibration history card). With this programme the function also can be deactivated. A faultless time-related recording requires exact setting of time and date.

Recording the data:
The protocol of events only can be transferred to a computer via interface (MFC interface lead). For this a terminal programme installed in the computer has to be selected (settings: 9600 baud, 1 start – 8 data, 1 stopbit).

For the data transfer the Infusomat® fmS has to be switched off and connected to mains. The protocol can be requested with key “##” and begins with the latest event. Data are screened in the terminal programme of the computer.
To stop data transfer: Press key below END.

The history function mainly is used for failure analysis for the technical service. A data transfer via fm system is not possible.
Select Special Mode SF
Depending on the version, several functions may be deactivated. Contact service.
➤ To set special functions press key below SF repeatedly until desired special function is displayed. – Then follow Instructions for Use as described.

Activate Bolus Function
For additional bolus.
➤ Pressing key below ON activates the function (function is maintained after switching on again).
To change bolus rate:
➤ Press key below RATE. Enter new value and confirm.
Correction: Press C and re-enter.
Exit bolus function:
➤ Press key below END.

Bolus application during infusion:
Bolus with volume pre-selection
➤ Press key below BOL and release.
Display: BOLUS RELEASE?
➤ Enter bolus. Values between 0.1 and 99.9 ml (if no entry is made within 10 sec function is exited automatically).
➤ Press key below YES. Bolus is administered. After the bolus application the infusion continues at basic rate.
To stop bolus:
➤ Press key below STOP.

Bolus without Volume Pre-selection
➤ Press and hold BOL until a second BOL is displayed.
➤ Hold both BOL-keys. Bolus is administered as long as both keys are pressed. Per ml bolus administered a short audible signal sounds.

Interval bolus
Automatic bolus in set time interval. In case of manual bolus administration the interval bolus is skipped.
➤ Select bolus function under SF.
➤ Press key below VOL, TIME or RATE. Enter values and confirm. After value below TIME has been confirmed, interval times runs automatically. Exit function with END, set basal rate and start. Remaining interval time is displayed in h:min:sec.
A bolus on demand is possible at any time during infusion at basal rate.

Bolus and dosage calculation
➤ Operation as in volumetric mode.
Depending on the settings in ml (volume), quantity of active agent (e.g. mg) or in quantity of active agent per kg weight (mg/kg) the bolus may be administered. During bolus administration on all three values are displayed.

Standby/Pause
In case of extended interruptions set values are retained.
➤ Press STOP.
➤ Press key below SF until "Standby" is displayed.
➤ Press key below ON.
➤ Enter length/duration of interruption interval or confirm time displayed.
Correction: Press C. Display 00h 00m. New entry.
➤ Confirm TIME. Timer for interruption on display is running. Alarm at the end of interruption interval.
➤ End of interruption interval: Press key below END.
**Special Functions**

**Drug Display**
9 selectable drug names can be stored (input via service program only).
➤ Select with key below (+). Drug is displayed, also during infusion.
➤ Key below CLR deletes drug name from display.
➤ Exit selection: Press key below END.

**Occlusion Pressure**
Due to variable pressure limits shortened alarm times are possible. Occlusion pressure high/medium/low. See Technical Data.
➤ Select pressure with key below (+) or (-).
➤ Exit selection: Press key below END (select pressure as low as possible).

**Switch off Drop Control**
Caution:
- No alarm will be emitted if the drop control is switched off and the roller clamp is closed (underdosage).
- No alarm will be emitted in case of occlusion within the infusion line and pressure sensor fails.
- Drop control may only be switched off where underdosage is not critical for the patient or where the patient is maintained under constant observation.

Operation without drop control only with volume pre-selection:
➤ Set infusion volume.
(The volume in the infusion bottle has to be sufficient!).
➤ Press key below SF as many times as necessary for "drop control" to appear.
➤ Press key below OFF. "no drop control" appears.
➤ To switch on again: Press key below ON.

**Check Battery Capacity**
Remaining battery life time is displayed, e.g. battery capacity = 02 h 30 min. In addition the operating hours are displayed. To switch off display again: Press key below END.

➤ With device switched off and mains/power lead detached: Briefly press . Short display of remaining battery life time after 3 sec. – Device switched off and mains/power lead connected: Permanent display of remaining battery life time.
Battery replacement is recommended if a remaining life time of less than 2 h is displayed after 16 h charging time.

**Data Lock**
Interlocks keys to prevent unauthorised use.
➤ Press key below ON. Keys are interlocked.
➤ Key release: Press decimal point key, then key below END.

**Loudness control** (only Software IFME)
The loudness of the audible alarm can be adjusted in 9 steps.
➤ Increase with key below (+) resp. decrease with key below (-).
➤ Exit selection: Press key below END.

**Set Date/Clock**
➤ Set date: Press key below DAT, enter date and confirm with DAT.
➤ Set time: Press key below TIME, enter time and confirm with TIME.
➤ Exit selection: Press key below END.
Dosage Calculation (Overview)
The dosage calculation automatically calculates the delivery rate in ml/h.

Setting parameters:
1. Concentration
   - per ml or
   - quantity per volume of infusion bottle.
   Entry: mcg, mg, IU or mmol, each from 0.001 to 99999 (5-digit, decimal point counts as one digit).
2. Selection for weight- and time-related or only time-related dosage. Entry of body weight: from 0.01 kg to 200 kg.
3. Entry of dosage:
   a) Weight- and time-related in mcg/kg, mg/kg, IU/kg, mmol/kg, each per /min, /h or /24 h.
   b) Only time-related in mcg, mg, IU or mmol, each per /min, /h or /24 h.

Dosage Calculation (Operation)
➤ Press key below SF repeatedly until DOSAGE CALC.OFF appears.
➤ Press key below ON.
➤ Select quantity unit.
Select with key below mcg.
Note: After numerical entry change of quantity unit is not possible anymore.
(Remedy: delete numbers).
➤ Enter concentration by moving flashing star to desired entry position with arrow keys.
Confirm all numbers with OK.
Entry of concentration per 1 ml or per volume of infusion bottle.
➤ For dosage by body weight enter body weight and confirm. Otherwise confirm 0 kg.
➤ Select desired quantity- and time unit.
➤ Enter values (at flashing star as described) and confirm with OK. Automatically calculated values (rate or dosage) are displayed.
➤ First check rate displayed for plausibility, then confirm RATE. Value is displayed.
➤ Start infusion.
Note: Dosage value with unit is displayed (down on the right). As the automatically calculated value of the rate is rounded, the dosage value may change insignificantly.

Info Request
➤ Press key below INFO.
1x: Infused Volume, Run Time
2x: Infused Volume, Actual Dose
3x: Battery Capacity, Operating Hours.

Change Rate / Dosage
➤ Press STOP.
➤ Enter new dosage value and confirm with RATE.
➤ Start infusion again.

Change Rate or Dosage without Interruption of Infusion
During infusion a star is flashing down on the right.
➤ Enter new value and confirm with RATE.
Pump operates with new rate / dosage.
Note: Alternatively the star can be moved with the arrow key to change the rate in ml/h.

Change Concentration with Dosage Calculation Activated
➤ Press key below SF repeatedly until DOSAGE CALC.ON appears and confirm with OK.
➤ Press CLR.
Concentration is cleared.
➤ Enter new value and confirm.

Change dosage
➤ Press key below SF repeatedly until DOSAGE CALC.ON appears and confirm with OK.
➤ Change values (move flashing star as described) and confirm entries with OK.
Special Functions

➤ Check entered or calculated rate for plausibility and confirm with key below RATE. Rate is displayed.
➤ Start infusion.

Switch off Dosage Calculation
The dosage calculation remains activated until it is switched off in Special Functions. If the Infusomat® fmS is switched off in the meantime all previous values except the body weight are maintained.

Switch off from Basic Menu
➤ Press key below SF, display DOSISCALC.ON.
➤ Press DOSISCALC.OFF.
Dosage calculation is deactivated.
➤ With key below END back to basic menu.

Piggyback Function
The piggyback-mode offers the possibility to interrupt the current (primary) infusion temporarily in order to administer a piggyback (secondary) medication. Above the pump the piggyback-infusion line (8250740) is connected with a Y-connector to the administration set (Infusomat® line 8250715). Close clamp of primary infusion. All infusion lines must be primed.

➤ Select Special Function Piggyback with key SF.
➤ Key below ON activates function (remains active also after switching on the Infusomat® again).
➤ Enter primary rate and volume and confirm. The softkey PIGY only will be displayed after a target volume had been entered before.
➤ Press key below PIGY, enter piggyback rate and volume and confirm.

➤ Start infusion. Pump delivers the piggyback volume with the set piggyback rate.
As soon as the programmed piggyback volume has been infused, delivery continues with “keep open-rate”(KOR) resp. after 30 min KOR-operation the pump stops and activates an alarm. The operator must switch over to the primary infusion manually. Close clamp of secondary medication and re-open clamp of primary infusion.

Please note: The Piggyback mode requires the input of a target volume resp. a target time for the primary as well as for the secondary infusion. It also is possible to start with the primary infusion (after entering the Piggyback values switch back to primary with END). In STOP mode it is always possible to switch over between Piggyback and primary mode.
Alarms

Operating alarms

Remedy failure and restart infusion.

**Drop Alarm / Pressure Alarm**
- Infusion bottle empty?
- Roller clamp closed?
- Flow? – Close roller clamp.
Infusion STOP. There may not be a continuous drip. Insert new infusion line, if necessary.
- Occlusion? – Insert infusion line free of kinks and check the free flow (consider bolus).
- Condensed drop chamber? Shake to remove.
- Drop sensor fitted/connected? Replace drop sensor, if necessary.

**Air Alarm**
- Air in administration set? – Insert infusion line correctly. Vent and reset fluid level in drop chamber.

**Standby Alarm**
- Alarm after pre-selected pause? Switch to Standby with key below SF. Then end pause with key below OFF or extend pause with key below ON.

**Battery Pre-Alarm**
- Battery pre-alarm 30 min before battery is discharged:
  - Alternately rate and AAA.A are displayed,
  - battery indicator flashes,
  - audible alarm every 9 sec.
Alarm can be cleared by pressing -key. The alarm continues in short intervals until the battery is fully discharged.
- Battery Alarm:
  - Alternately rate and AAA.A are displayed.
  - The text display shows: "battery discharged, connect to mains"
  - battery indicator flashes,
  - red alarm indicator is on,
- audible alarm every 4 sec.,
- operating indicator off,
- staff call.
- Switch off device.
Connect to mains/power or 12 V DC power source.

**KOR-Alarm (KVO)**
- Pre-alarm: audible alarm every 9 sec max.
- 30 min. End of infusion alarm: Permanent interval signal tone (also via staff call).
- Delay of Alarm Tone
  - When connected to staff call the alarm tone on the device can be suppressed for 10 min. (This function can be activated via service only.)
- Further Alarms / Displays
  - "pump door open"? – Close door.
  - "invalid rate"? – Enter different value.

**Device Alarms**

When display indicates "device alarm" an audible alarm sounds permanently.
- Press ON/OFF-key repeatedly until display indication "do not press any key until display is off". Pump switches off automatically after a few seconds.
- Switch on device again.
In case of repeated device alarm inform service.
Alarms

Mains Operation, 12 V DC or Battery

➤ Check mains voltage as per type plate!
➤ Plug in mains/power lead at rear (screw in 12 V DC lead in ambulance car).
➤ In case of mains/power failure or if 12 V DC or mains/power is not connected the unit automatically will be switched to integrated rechargeable battery.

Charge Battery
➤ Charge battery in case of:
  - first use
  - battery alarm
  - non-use > 2 months.
Battery is charged if 12 V DC or mains are connected – even during infusion.

Charging Time
➤ Approx. 16 hours. Longer charging is not detrimental.

Capacity
A fully charged battery is sufficient for more than 3.5 h with highest delivery rate.

Rechargeable Batteries Ageing
After 2 years the original capacity is only approx. 50 %.
➤ The lifetime of the battery can be extended by completely discharging from time to time and recharging afterwards.

Interface

Interface Operation
Connection to interface input via MFC-plug. Interface descriptions available from B. Braun.

➤ Send Proposal
The delivery rate and a drug can be entered in the Infusomat® fmS as "proposal" via an external computer. Both items of data must be checked on the Infusomat fmS and acknowledged.

➤ Remote Control
Via fm controller possible. When using a commercially available external computer this must satisfy the requirements acc. to IEC/EN 60601-1 as well as the single-fault fail-safe condition acc. to IEC/EN 60513.

➤ Documentation
All operating data of the Infusomat® fmS can be requested and logged via external computer.
The graphs show the accuracy/uniformity of flow in relation to time. Allow for the following:
The delivery behaviour resp. delivery accuracy is essentially influenced by the types of disposables used. Significant deviations may be encountered if use is made of disposables others than those stated in the order data.

**Trumpet Curves**
Measured values for second and last hour in each case.
Measurement interval \( \Delta t = 0.5 \) min
Observation interval \( p \times \Delta t \) min

**Start-up Graphs**
Measurement interval \( \Delta t = 0.5 \) min
Measurement duration \( T = 120 \) min
Flow \( Q \), ml/h
# Technical Data

<table>
<thead>
<tr>
<th>Type of unit</th>
<th>Volumetric infusion pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification (acc. to IEC/EN 60601-1)</td>
<td>🏥 defibrillator-proof, CF equipment</td>
</tr>
<tr>
<td>Protection Class</td>
<td>I;</td>
</tr>
<tr>
<td>IP 22 (Moisture protection: drip protected)</td>
<td></td>
</tr>
<tr>
<td>Class (acc. to Directive 93/42 EEC)</td>
<td>II b</td>
</tr>
<tr>
<td>Rated voltage / current</td>
<td>230 V AC~ (0.06 A), 50/60 Hz</td>
</tr>
<tr>
<td>Mains fuse T 0.16 A or</td>
<td></td>
</tr>
<tr>
<td>200 V/230 V/240 V AC~ * (0.06 A), 50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>Mains fuse T 0.16 A or</td>
<td></td>
</tr>
<tr>
<td>100 V/110 V/120 V AC~ * (0.12 A), 50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>Mains fuse T 0.315 A</td>
<td></td>
</tr>
<tr>
<td>* Mains voltage can be selected at appliance inlet.</td>
<td></td>
</tr>
<tr>
<td>External extra-low voltage</td>
<td>12 V DC ——</td>
</tr>
<tr>
<td>Staff call</td>
<td>Max. 24 V / 1 A / 24 VA</td>
</tr>
<tr>
<td>Arbitrary connection polarity (VDE 0834)</td>
<td></td>
</tr>
<tr>
<td>EMC</td>
<td>EN 55011</td>
</tr>
<tr>
<td>IEC/EN 60601-1-2 and IEC/EN 60601-2-24</td>
<td></td>
</tr>
<tr>
<td>Time of operation</td>
<td>100 % (continuous operation)</td>
</tr>
<tr>
<td>Operating conditions</td>
<td>30 % ... 90 % (without condensation)</td>
</tr>
<tr>
<td>-Relative humidity</td>
<td>+ 10 °C ... + 40 °C</td>
</tr>
<tr>
<td>-Temperature</td>
<td>700 mbar ... 1060 mbar</td>
</tr>
<tr>
<td>-Atmospheric pressure</td>
<td></td>
</tr>
<tr>
<td>Storage conditions</td>
<td>10 % ... 90 %</td>
</tr>
<tr>
<td>-Relative humidity</td>
<td>- 25 °C ... + 55 °C</td>
</tr>
<tr>
<td>-Temperature</td>
<td>500 mbar ... 1060 mbar</td>
</tr>
<tr>
<td>-Atmospheric pressure</td>
<td></td>
</tr>
<tr>
<td>Battery type (rechargeable)</td>
<td>NiCd (7.2 V; 1.2 Ah)</td>
</tr>
<tr>
<td>Operating time of rech. battery</td>
<td>&gt; 3.5 h at highest delivery rate</td>
</tr>
<tr>
<td>Recharging time</td>
<td>&gt; 16 h</td>
</tr>
<tr>
<td>Weight / Dimensions (WxHxD)</td>
<td>Approx. 3.1 kg / 140 x 240 x 200 mm</td>
</tr>
</tbody>
</table>
Air detector

Technical sensitivity
Air bubbles > 0.01 ml
Alarm triggering: With air bubble size
of typ. 0.3 ml\(^1\)
(limit value 0.4 ml) or 1.5 ml/h\(^2\)
(cumulative value of 1 h as of air bubble
volume 0.01 ml)

\(^1\) Can be set from 0.01 to 0.3 ml via service program only
\(^2\) Can be set from 0.5 to 3.5 ml/h via service program only

Accuracy of set delivery rate
typ. ± 5 % measured values of second hour acc.
to IEC/EN 60601-2-24

Delivery range
0.1 ... 999.9 ml/h (0.1 ml/h-increments)

Delivery pre-selection
0.1 ... 9999.9 ml (in 0.1 ml-increments)

Occlusion alarm pressures

<table>
<thead>
<tr>
<th>Rate</th>
<th>Low app. 0.4 bar</th>
<th>Medium app. 0.8 bar</th>
<th>High app. 1.2 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ml/h</td>
<td>15 min</td>
<td>21 min</td>
<td>30 min</td>
</tr>
<tr>
<td>25 ml/h</td>
<td>36 sec</td>
<td>52 sec</td>
<td>72 sec</td>
</tr>
<tr>
<td>100 ml/h</td>
<td>9 sec</td>
<td>13 sec</td>
<td>18 sec</td>
</tr>
</tbody>
</table>

Max. bolus volume
(measured at 22 °C with OIL infusion set)
0.25 ml
0.35 ml
0.5 ml

Mechanical occlusion pressure limit
under fault conditions
Occlusion alarm pressure max. 1.6 bar (160 kPa)
max. bolus volume 2 ml

Alarm in case of incorrect dosage
In case of incorrect dosage of max. 0.6 ml due
to apparatus malfunction the pump switches off
automatically.

KOR-rate (KVO)
Delivery rate > 10 ml/h = 3 ml/h
Delivery rate < 10 ml/h = 1 ml/h
Delivery rate < 1 ml/h = STOP
Responsibility of the Manufacturer
The manufacturer, assembler, installer or importer considers himself responsible for the effects on safety, reliability and performance of the equipment only if:
• assembly operations, extensions, re-adjustments, modifications or repairs are carried out by persons authorised by him,
• the electrical installation of the relevant room complies with the appropriate requirements (e.g. VDE 0100, 0107 and/or the IEC-publications resp. national requirements),
• the equipment is used in accordance with the Instructions for Use and
• the Technical Safety Checks are carried out regularly.

Warranty
B. Braun provides as from the date of delivery a warranty of 2 years for every Infusomat® fmS. This covers repair or replacement of parts damaged as a result of design/manufacturing errors or material defects. Modifications or repairs to the unit undertaken by the owner or by third parties invalidate the warranty.

The warranty does not cover the following: Elimination of faults attributable to incorrect/inexpert handling, or to normal wear and tear and rechargeable batteries.

Technical Safety Check*) / Service
The Technical Safety Check is recommended to be carried out every 2 years and should be documented. Servicing work must be carried out exclusively by personnel instructed by B. Braun.

Check regularly
Check for cleanliness, completeness and damage. Use only according to Instructions for Use. Check each time when switching on: self-check, audible alarm, process- and alarm control indication.

Cleaning
Clean using mild soap suds. Do not use spray disinfectants at the mains power connection. Recommended: disinfectant for wiping available from B. Braun (e.g. Meliseptol®). Before operation the device allow to vent for at least 1 min. Do not spray into openings in the device. Be sure to observe the instructions provided concerning waste disposal and hygiene for batteries and disposables.

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Items included
Infusomat® fmS, Power Cord, Drop Sensor, Pole Clamp, Instructions for Use.

Inspection on Delivery
Despite careful packaging, the risk of transport damage cannot be entirely prevented. Upon delivery, please check that nothing is missing. Do not use a damaged device. Contact the service department.
### Ordering

<table>
<thead>
<tr>
<th>Infusomat® fmS 230 V</th>
<th>Art.-Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>871 5548</td>
</tr>
<tr>
<td>Infusomat® fmS 200 – 240 V</td>
<td>871 5440</td>
</tr>
<tr>
<td>Infusomat® fmS 100 – 120 V</td>
<td>871 5416</td>
</tr>
</tbody>
</table>

**Recommended accessories for Infusomat® fmS**

- Connecting lead for potential equalisation | 870 1628
- MFC-Connecting lead for staff call | 871 1682
- MFC-Connecting lead for ambulance cars (12 V DC) | 871 1674
- MFC-RS 232 interface lead with electrical isolation | 871 1661

- Short stand with drop chamber holder | 870 1644
- Original-Infusomat®-infusion set CVP with line for CVP-measuring, 340 cm | 870 0010
- Original-Infusomat®-infusion line 250 cm | 870 0036
- Original-Infusomat®-infusion set 5 µm with 5 µm-filter, 275 cm | 870 0052
- Original-Infusomat®-infusion set K with injection port, 270 cm | 870 0087
- Original-Infusomat®-infusion line S black for light-sensitive drugs, 250 cm | 870 0125
- Original-Infusomat®-infusion set E for enteral nutrition with bottle connection total length 250 cm, pressure-proof | 873 1934
- Original-Infusomat® infusion line with Y-connector for Piggyback mode | 825 0715
- Piggyback-connection infusion line | 825 0740