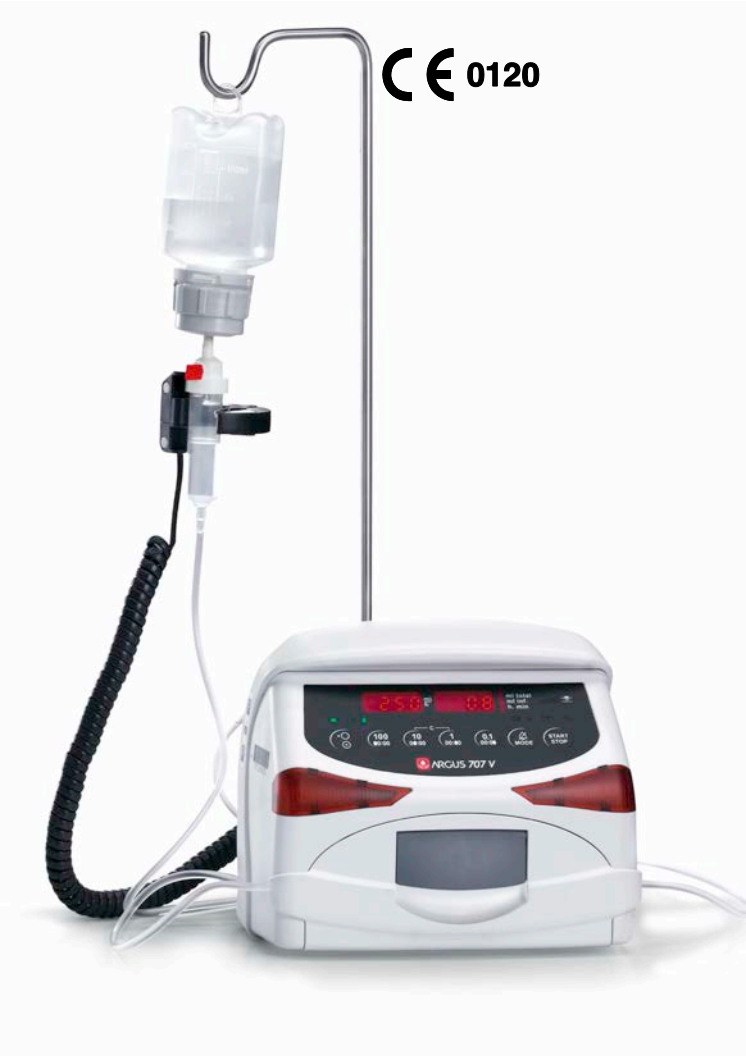
Manual for Volumetric Infusion Pump

ARGUS 707 V

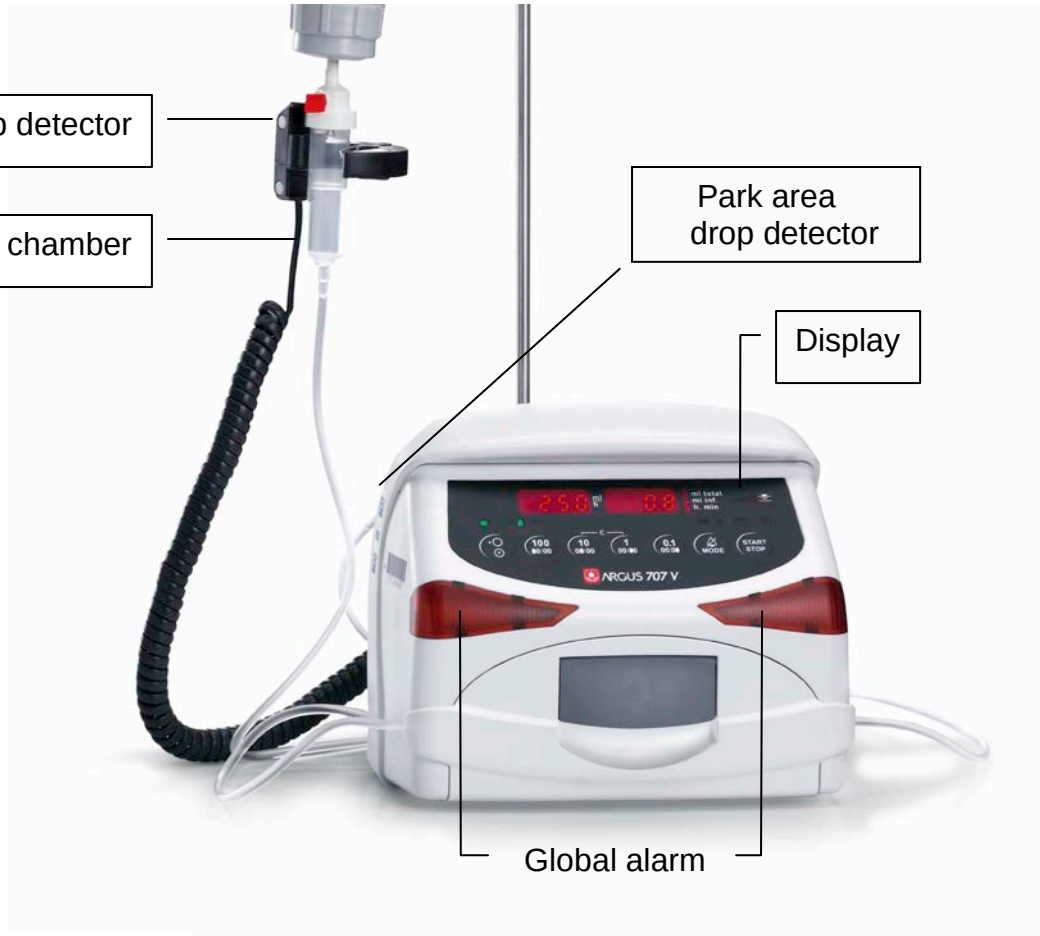
Made in Switzerland

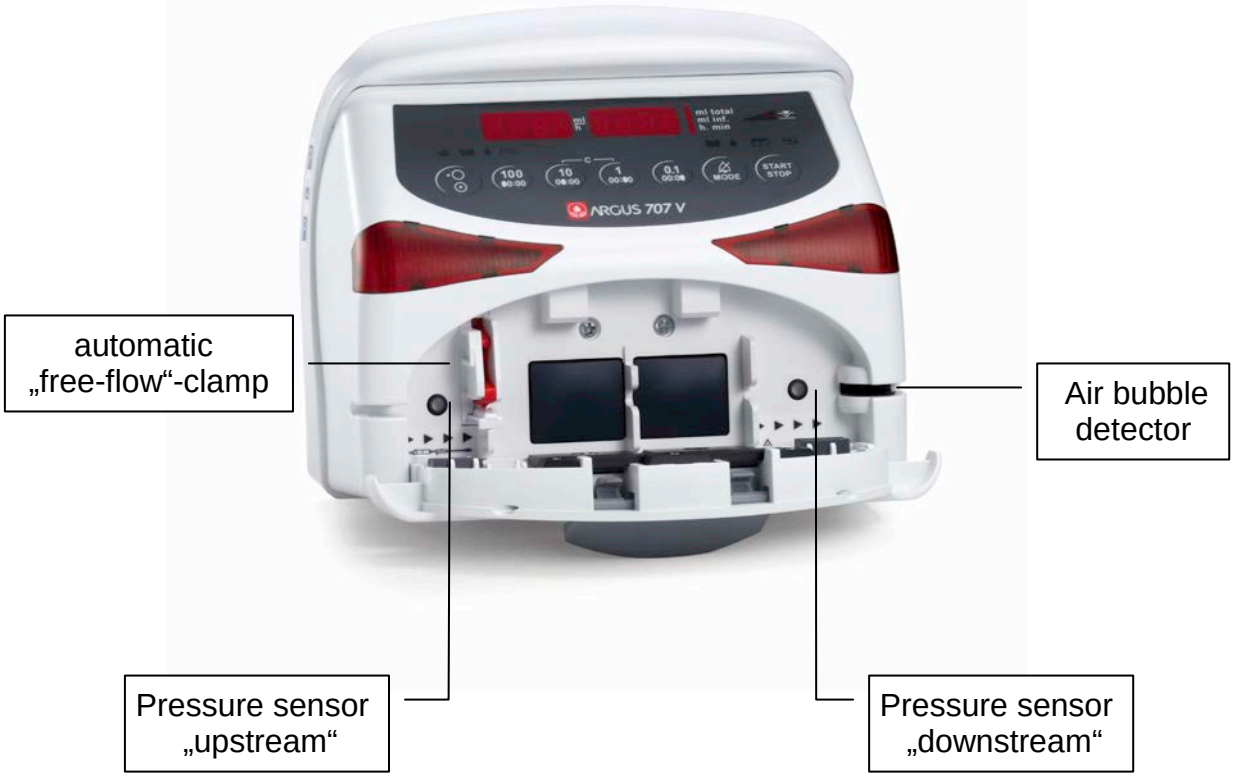


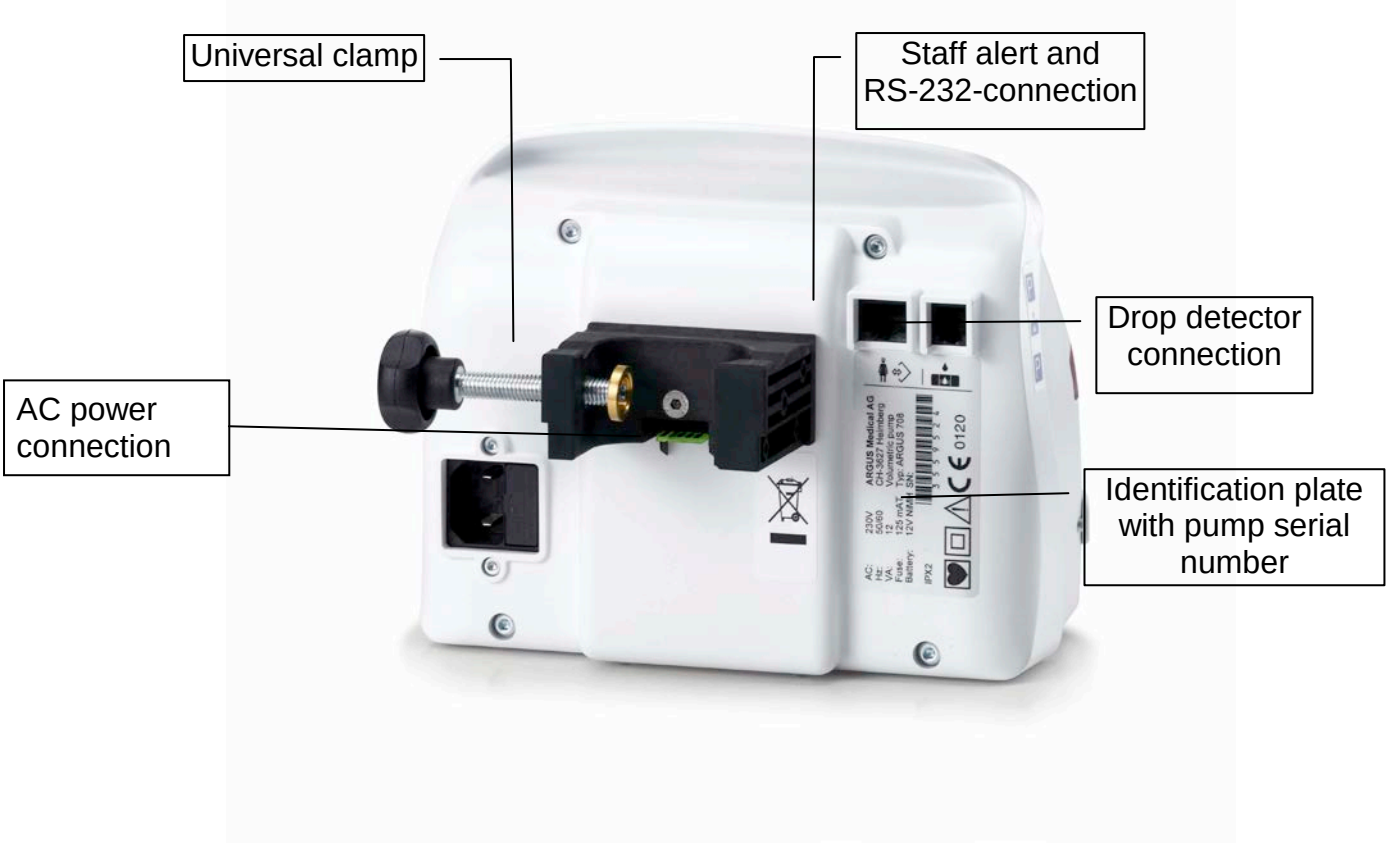
CODAN ARGUS AG
CH-6340 Baar / Switzerland

(a member of the CODAN group)

TABLE OF CONTENTS


Drop detector
Drop chamber
Park area
drop detector
Display
Global alarm
ARGUS 707 V


automatic
„free-flow“-clamp
Air bubble
detector
Pressure sensor
„upstream“
Pressure sensor
„downstream“
ARGUS 707 V


Universal clamp
Staff alert and RS-232-connection
Drop detector connection
AC power connection
Identification plate with pump serial number

1 Introduction

1.1 General information

Congratulations on selecting the Swiss high-tech and top quality ARGUS 707 V infusion pump. This medical device meets all the provisions of the directive MDD 93/42/EEC which apply to it.

The ARGUS 707 V infusion pump is characterized particularly by the following advantages:

- Swiss made high-tech quality volumetric pump
- Intuitive, very easy operation
- Modern design, light-weight and compact
- Uses standard sets
- User-selectable occlusion alarm limit
- Upstream & downstream pressure monitoring with bar graph display of line pressure
- ARGUS multifunctional clamping system
- Table top operation possible
- ARGUS Docking Station A60/100 compatible
- Flash memory for fast software updates

1.2 Use

The ARGUS 707 infusion pump can be used in standard applications requiring the highest degree of accuracy, as well as in special cancer therapies, blood transfusions and parenteral nutrition.

Caution! The ARGUS 707 V infusion pump may only be used with calibrated consumables and sets specified in the appendix and recommended by CODAN ARGUS AG. The safety of the patient may be endangered.

1.3 Scope of supply

ARGUS 707 V infusion pump with power cord, external drop detector and user manual.

Options: Bottle holder, rail combi clamp.

1.4 Maintenance

No special maintenance is necessary for the ARGUS 707 V infusion pump, apart from the technical safety check. There are no wear and tear parts that will require preventive replacement.

1.5 **Support**

Servicing should only be carried out by CODAN ARGUS AG trained personnel or by an approved local distributor. In case of repair, send the unit with the filled out “repair order form” (see service manual) to the local distributor. Further information is available from:

CODAN ARGUS AG
CH-6340 Baar / Switzerland
EMAIL: info@codanargus.com
www.codanargus.com

1.6 **Symbols**

Caution: consult accompanying documents

IPX2 Protected against dripping (±15° □tilted)when operated in horizontal position

Complies with MDD 93/42/EEC directive

Applied parts CF type device (leak currents protection)

Double insulation

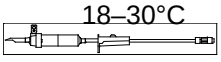
Staff alerting system

Conform to WEEE 2002/96/EC directive
(Waste in Electrical and Electronic Equipment)

Data communication interface

Drop detector

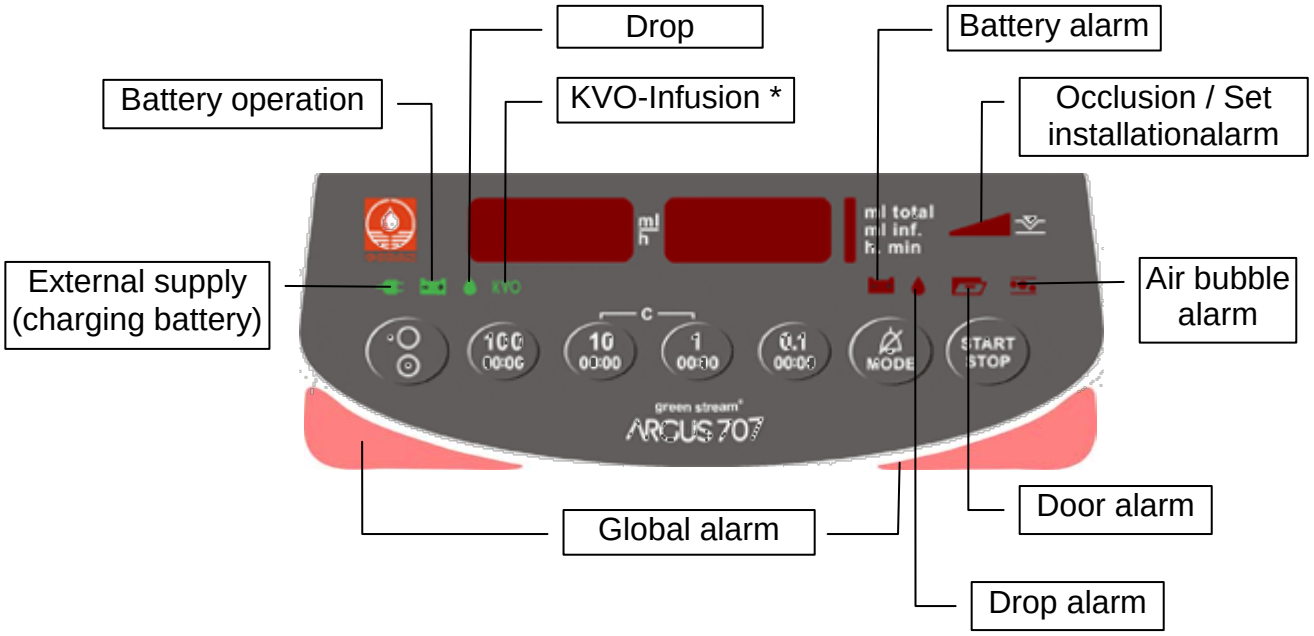
Infusion flow direction



Recommended temperature range for the solution and IV sets

2 Control panel

2.1 **Operations and alarm displays**



* KVO-operation (Keep Vein Open):

- 3 ml/h for infusion rates ≥ 10 ml/h
- 1 ml/h or set infusion rate, whichever is less, for infusion rates <10 ml/h

Alarm situation:
- An intermittent acoustic sound is released (can be momentarily muted with „Mode“ key)
- The staff alert system is activated
- A pictogram is turned on and the global alarm is flashing

Caution! The ARGUS infusion pump cannot be started, if:

- the tube is not properly installed in the pump
- the pressure in the tube is too high or the infusion solution too cold
- the infusion tube contains air bubbles inside air detector
- the infusion rate is = “0.0” ml/h
- the door is open
- the battery is depleted (applies only when operated on battery)
- a non recommended IV set might be used

Occlusion alarm

Downstream Occlusion

(The patient side pressure in the tube exceeds the electronic pressure alarm level, the entire pressure bar graph turns on, an intermittent acoustic alarm sounds, the alarm lights are blinking)

Needle obstructed? Kinked line patient side?

Roller clamp patient side closed? Bad set position inside door?

➜ Check above points and resolve problem.

Caution!

The automatic pressure reduction can withdraw blood from the patient.

Upstream-Occlusion

(exceeded under pressure bottle side, the right segment of the bar graph turns on, an intermittent acoustic alarm sounds, the alarm lights are blinking)

Filter in drop chamber obstructed? Kinked line bottle side?

Drop chamber ventilation cap closed? Bottle empty?

Bad set position inside door?

➜ Check above points and resolve problem. If no obvious problem is found, close roller clamp, open pump door, shift set approximately 12cm towards the right, close pump door, reopen roller clamp and start pump again.

Air bubble alarm

Air was detected

Air bubbles in the IV set? Tube not properly positioned?

➜ Remove air bubbles, reinstall the IV set or check if recommended IV set is used

Door alarm

Door open

Drop alarm

Deviation of the total number of drops with regard to the set infusion rate

Infusion bottle empty? The tube roller clamp is closed?

The level of the liquid in the drop chamber is too high? Free-flow?

Deviation of the total number of drops with regard to the set infusion rate?

➜ Check above points and resolve problem

Battery alarm

Pre alarm battery low

(The battery pictogram turns on, an intermittent acoustic alarm sounds)

Battery almost empty, pump will stop in approx. 15 minutes

Battery empty

(The battery pictogram turns on, an intermittent acoustic alarm sounds, the alarm lights are blinking)

- The pump goes in stop mode while the battery alarm continues for 6 min. Thereafter the pump is switched off automatically in order to prevent a total discharge of the battery.

➔ Immediately connect the power cord to the mains outlet and continue to infuse, battery will be recharged automatically.

End alarm

Infusion end

The volume total has been reached (→ KVO operation)

Safety check

Reminder alarm for safety standard check

If the display flashes "CtrL" several times after switching the pump on, it is time for the safety standard check.

➔ Please refer to your technical staff

Stand-by alarm

No manipulation has been made for 2 minutes

(pump in stop mode)

➔ Press key “MODE”

Technical alarm

F-code (F-XX)

Technical alarm (failure) with continuous acoustic sound.

➔ If F-code is invisible, press the “MODE” key

NURSE CALL

Staff alerting system

A connecting socket allows the unit to be hooked up to an external paging system. The optical and acoustic alarms of the pump are not affected.

2.2 **Special key functions**

ALARM MUTING *“MODE” muting system*

By pressing the “MODE” key the acoustic alarm can be interrupted for 2 minutes. After the muting time has elapsed the alarm is reactivated automatically.

CLEARING *Clearing of the alarm condition*

After the cause of the failure has been corrected, press the “Start/Stop” key to clear the alarm condition and to restart the infusion.

"ON/OFF"

This key is used to switch the pump on and off.
To switch the unit off, press the key 2 seconds.

"100", "10", "1", "0.1"

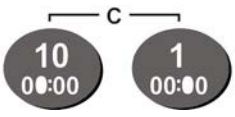
These keys are used for all numerical inputs.

"MODE"

The key "MODE" has the following 4 functions:
- Acoustic and flashing global alarm muting system (for 2 minutes)
- Input mode (select the display for an input)
- Interrogation mode for "ml total" and "h.min"
- Selection of the programmable features *(see chapter 4.2)*

"START/STOP"

This key is used to start or stop an infusion. In alarm state, this key starts the pump and mutes the acoustic and global alarm. In stopped state "KVO" operation is switched on (default, configurable). If the stopped state lasts for more than 2 minutes, an acoustic reminder signal is activated.



Clear the display

The selected display will be set to zero by pressing both keys simultaneous.

Auto repeat

Pressing a key for longer than 1 sec., the corresponding number is set automatically forward.

Software release display and display test

Keep the key "MODE" pressed and press the key "ON/OFF".

The left hand display shows "**707**", the right hand display "**rx.xx**" (software release) during 3 sec.

Afterwards the visual display test starts as follows:

Display of "2", "4", "7", "F.", "ml total", "ml inf", h.min", pressure display, operation symbols, alarm symbols and "ALARM" with acoustical beeps.

Call back of the last infusion values

Keep the key "1" pressed and press the key "ON/OFF".

The following values are now available in the display:

Infusion rate, preset volume, infused volume, infusion time, pressure limit, medicament No. and the last pre-selected bolus volume.

PC-configuration

Keep the key "10" pressed and press the key "ON/OFF". For further information about this function please refer to the technical staff.

3 Set-up

3.1 **General information**

The infusion pump must only be used under the supervision of qualified clinical or nursing staff. The user has the responsibility to read and to observe the following instructions. Also use only standard IV administration sets in accordance with the instructions of the manufacturer, check for valid set selection and be sure that the inserted set is calibrated! Under normal conditions, we recommend changing the IV administration set every 24 hours or after 2.5 liters infused.

Caution! Only use the recommended accessories, consumables and IV sets with Luer- Look connections (see appendix). The functional safety of the pump is not guaranteed if non approved IV sets are used. The safety of the patient may be endangered. This also applies in the case the patient line is connected with other infusion systems.

3.2 **Installation**

The ARGUS 707 V infusion pump can be mounted on a table top, an IV-stand / ceiling pole (up to diameter 38mm), a standard rail system (optional accessory) and on a pole on the ARGUS Docking Station A60/100.

When fixed to an IV stand, the equipment should not be mounted higher than 1.2 m over the floor so that the stability remains.

To fix the equipment to a rail system, use the optional available ARGUS multifunctional clamping system.

3.3 **Pump set-up**

The ARGUS 707 V infusion pump must only be used under the supervision of qualified clinical or nursing staff. The user has the responsibility to read and to observe the following instructions.

Only use standard IV administration sets in accordance with the instructions of the manufacturer.

Caution! The connection of several infusion types (gravity, syringe pumps, peristaltic pumps, etc.) together into the same tube can be very dangerous.

The combination is allowed with the ARGUS 707 V if at least an IV set equipped with a back check valve is used in every line.

This type of connection should only be used if expressively specified in the operation manual of each device and/or approved by a notified body and applied under a trained qualified clinical or nursing staff.

a) Connect the power cord to the AC line

b) Open the IV set packaging, **slide the roller clamp down the line to be able to place it between pump and patient,** then close roller clamp and connect the IV set to the fluid container

c) Fill the drop chamber 1/3 to max. 1/2, open the roller clamp and fill the entire set (make sure to remove all air bubbles)

d) Close the roller clamp again

e) Slide the drop detector over the drop chamber as shown in picture B and C. Observe the notch and **do not pull on the spring** (see picture D).

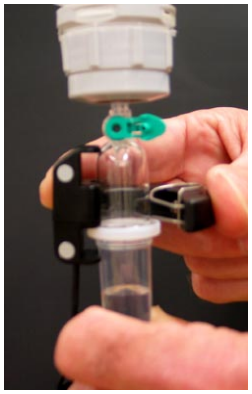
A

Drop detector

B

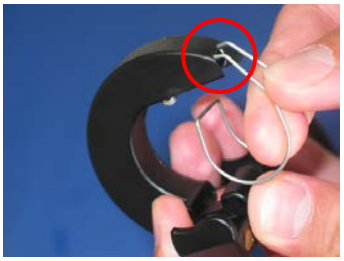
CODAN-set

C



B.Braun-set

D



WRONG !

f) Open the pump door by pulling up the door handle

g) Insert the tube into the pump from the left, place the tube slightly stretched in the tube guides (observe flow direction left to right) and push the tube properly into the notches both sides of the pump

h) Close the pump door and open the tube roller clamp

i) Check that there is no "free-flow"

j) Connect the IV set to the patient IV catheter
k) Be sure that the pressure in the tube is zero (= 0 bar)
l) Switch the pump ON
m) Proceed to the flow rate input in accordance with the following chapters

Caution! Please mind the position of the decimal point:

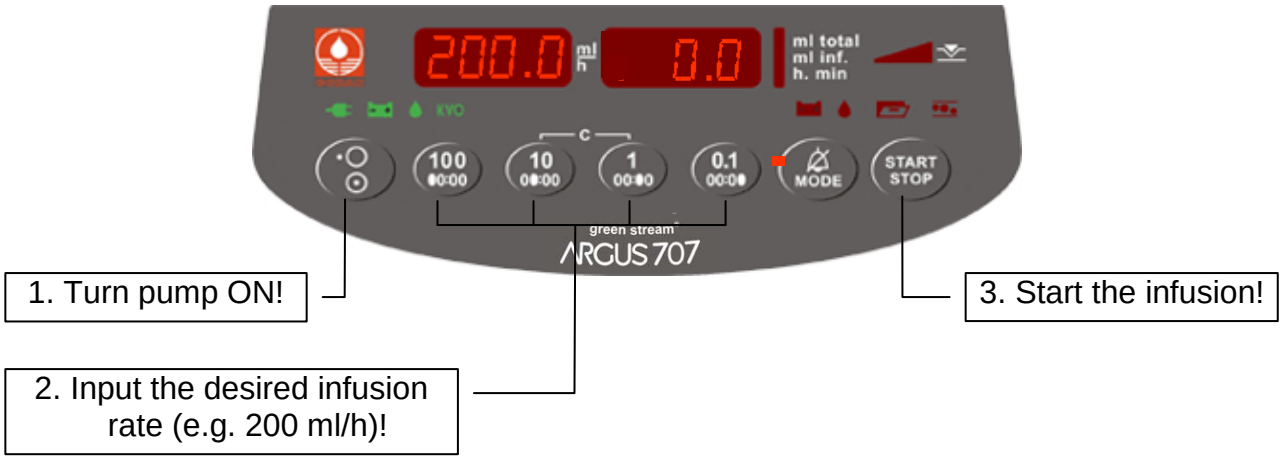
For display values up to 999.9

For display values ≥ 1000

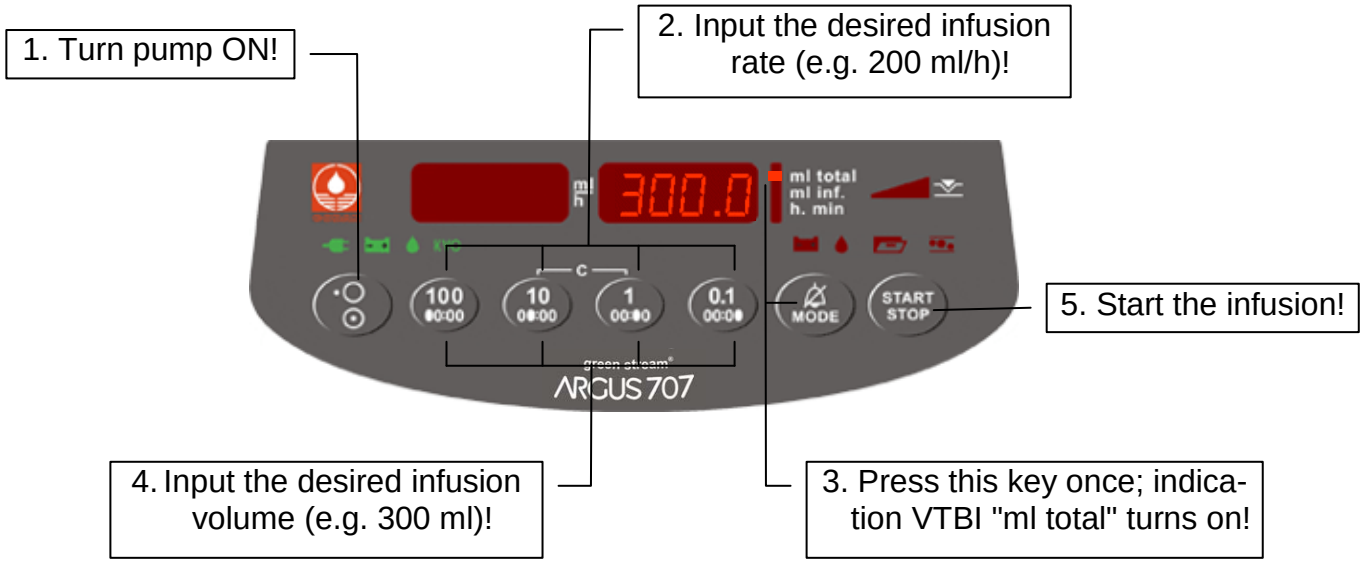
Display auto increment: If a numerical key is pressed for longer than 1 sec., the corresponding number is automatically incremented. If key “100” is pressed for automatic increment, check for correct decimal point position since 1000 values can be entered this way.

3.4 Delivery operation without a preset volume

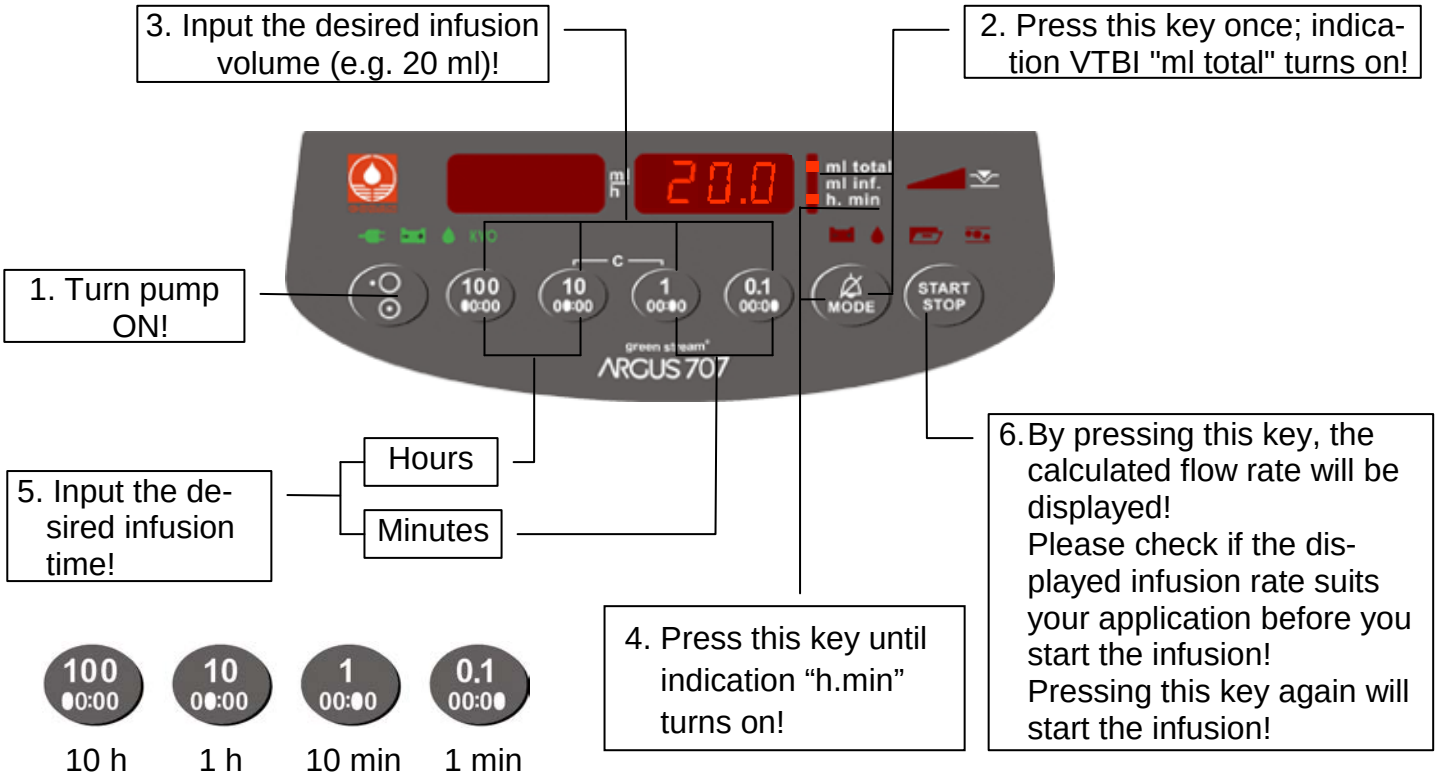
This function is only available if drop detector is enabled!



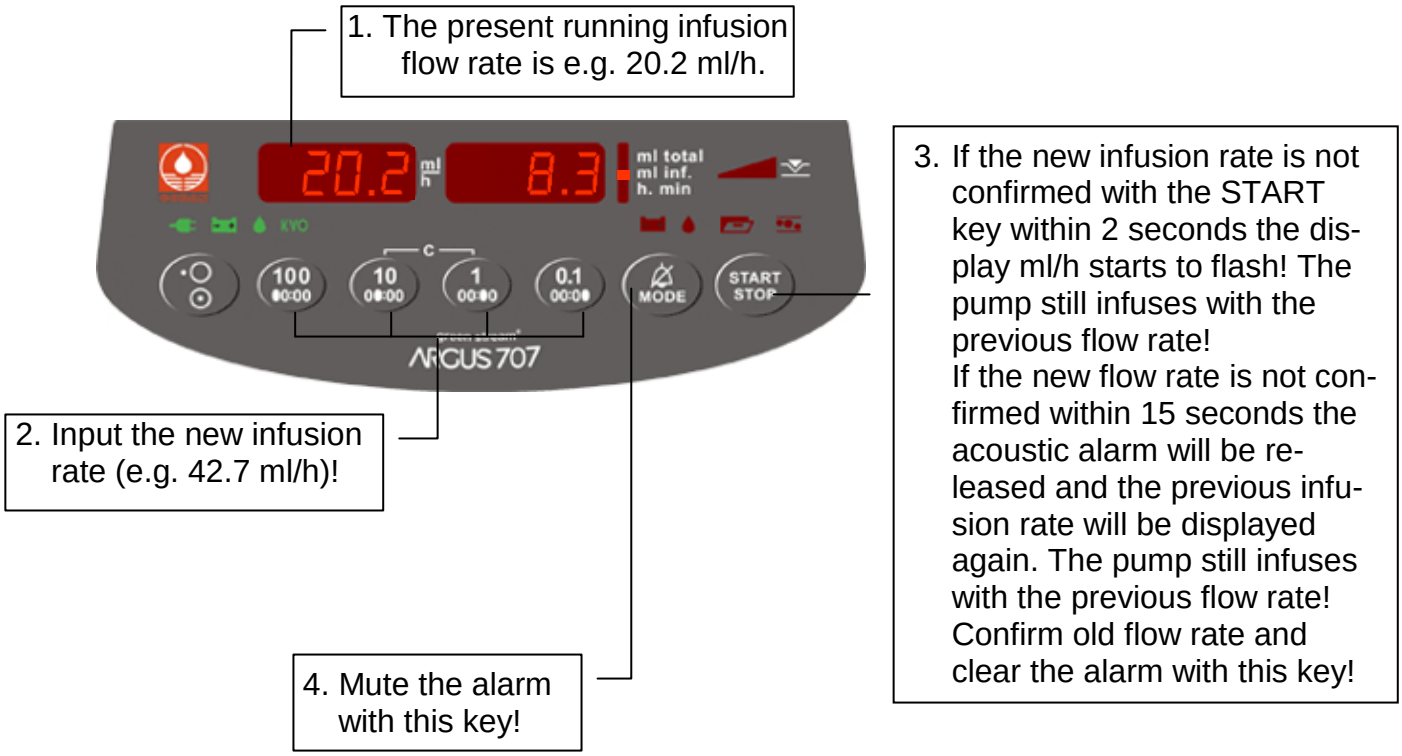
3.5 **Delivery operation with a preset volume (VTBI)**



3.6 **Input of volume and infusion time with automatic rate calculation**



3.7 **Change the infusion rate without infusion interruption**



4 Special functions

4.1 **The electronic pressure sensor**

The electronic pressure sensors provide a fast alarm reaction time and a very low occlusion bolus volume. Both patient side (downstream) and container side (upstream) occlusions are recognized.

Caution! Place the IV set in the pump before the pump is switched on.

The electronic pressure sensor can be used in two different modes:

a) Fixed pressure level

If the pressure in the downstream system exceeds the programmed pressure alarm level, the infusion will be stopped and an occlusion alarm released. The ARGUS 707 V will then automatically reduce the pressure in the set; **possibly patient blood could flow back into the tube.** Before starting the infusion again, search carefully for the cause and eliminate the problem.

Caution! If the door has been opened, switch the pump off, close the door and switch the pump on again while maintaining the “1” key pressed (recall of previous infusion data).

b) Adjustable pressure level

At any time the staff has the possibility to adjust the pressure alarm level in the menu "PrL" from 100 to 1000 mbar in 10 steps of 100 mbar (10 to 100 kPa, 75 – 750 mmHg).

If the pressure alarm level is changed while the infusion is running and no key is pressed during 5 seconds (programmable), both displays change back to the basic position!

After switching the pump off and on again or opening the door, the default programmed alarm level will be set and the sensor reinitialized.

The full scale of the bar graph pressure display equals the selected patient side pressure alarm level.

The bottle side pressure alarm level is a fixed preprogrammed value. The alarm condition is shown with a single bar on the right side of the bar graph.

4.2 **Programmable options**

If one of the following option is to be used, please get in touch with the local distributor or with CODAN ARGUS AG service department.

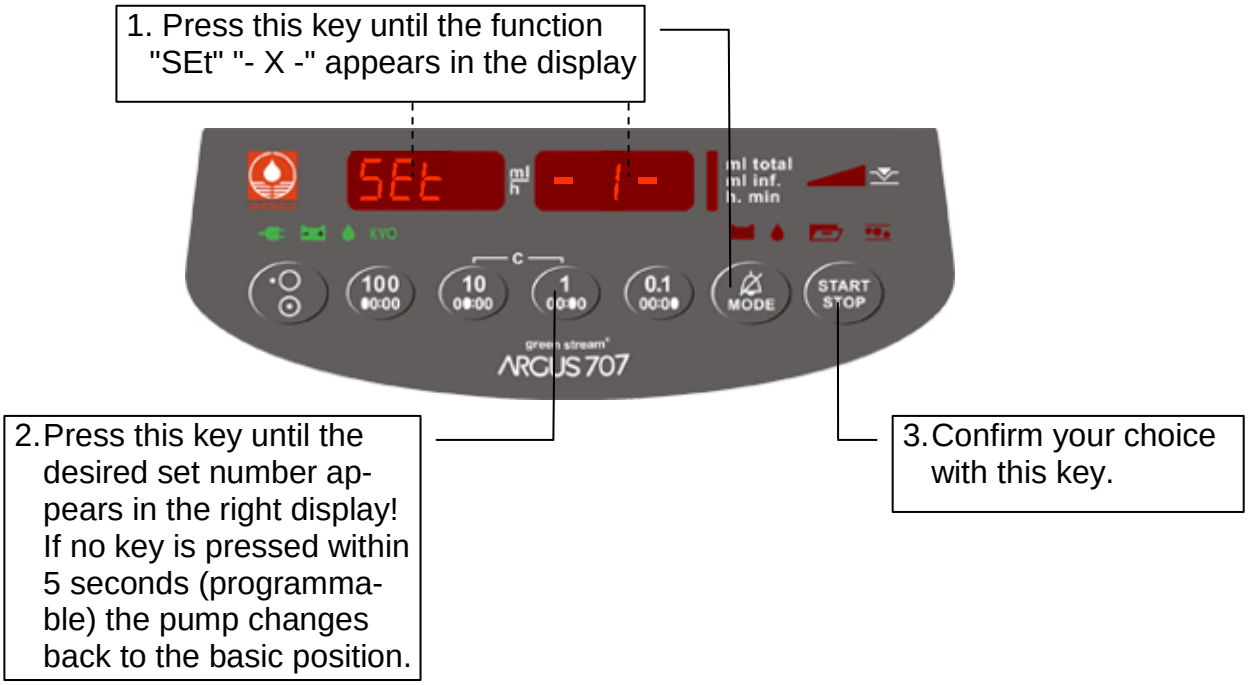
a) Display of the infusion time
   The elapsed infusion time is indicated in hours and minutes.
   In the VTBI-mode the remaining time is indicated.
b) SBS (step by step)
   If the preset volume is reached and increased afterwards only the difference between the new and the old value is infused after the pump is restarted.
c) VTBI (volume to be infused)
   The volume to be infused is indicated.
d) Set rate "ml/h" automatically to “0.0” when the pump is switched on again.
e) The last preset volume "ml” will automatically appear when the pump is switched on again.
f) Automatic return on default infusion set 1 after power up if set 2, 3 or 4 was used before power off
g) Neonatology option with inline pressure indication and precision occlusion pressure limit adjustment (see chapter 4.10)
h) Choice of the occlusion threshold display unit (mbar, mmHg, kPa, cmH2O, Psi)
i) No automatic pressure release after occlusion.
j) Air detector, air bubble size programmable (50...1000 µl)
   The air bubble size is max.100 µl for rates <10 ml/h
k) Air detector, air volume accumulated over time (e.g. 1 ml over 0,5 h)
l) No acoustic acknowledgement when pump starts to infuse
m) Buzzer volume adjustable
n) Display brightness adjustable
o) KVO options (KVO only at infusion end)
p) Second rate input is required
q) no detection of the upstream occlusion
r) Additional functions:

"SEt" "-x-"	IV-set selection	(see chapter 4.3)
"SEt" "FILL"	Fill IV set	(see chapter 4.4)
"boLu"	Bolus application	(see chapters 4.5 - 4.7)
"CAP"	Battery capacity	(see chapter 4.8)
"PrL"	Pressure limit	(see chapter 4.9)
"trA"	Transport mode	(see chapter 4.11)
"CLr"	Clear "ml inf." (volume infused)	(see chapter 4.12)
"InF"	Display of accumulated "ml inf." since last power up (balance)	(4.13)
"dLo"	Data-lock	(see chapter 4.14)
"Stb"	Stand-by	(see chapter 4.15)
"MEd"	Medication name	(see chapter 4.16)
"tM"	Timer	(see chapter 4.17)
	Air Bubble Detection	(see chapter 4.18)

4.3 Selecting or checking an IV set

This function is only available if it was enabled by the technical service.It allows selecting or checking one of the configured IV set number (brand/type).

The infusion line should be already inserted in accordance with *chapter 3.3*. The IV set selection is only available after switching on the pump and if more than one IV set is enabled (do not press the "START" key). As soon as the pump was started once, this function allows only displaying the selected IV set (both in stop and infusion mode).
The last used IV set will be stored at switching off the pump.
Insert the chosen set in the pump, close the door and turn on the pump (“ON/OFF” key).

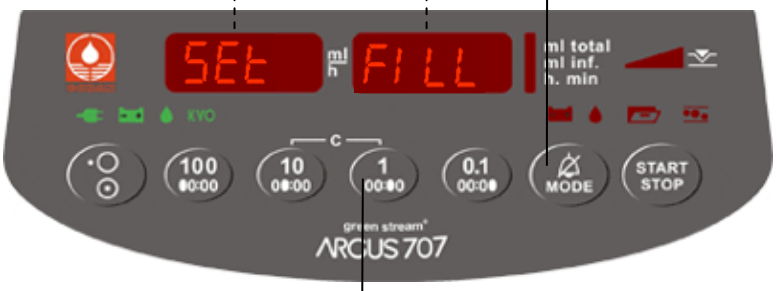


4.4 **Fill IV set**

With this function the user can fill an empty IV set. This function (only accessible after the pump is switched on) is only available if it was enabled by the technical service. While the function "SEt" "FILL" is active, important alarm functions are suppressed!

Caution! **Do not connect the IV-set to the patient!**

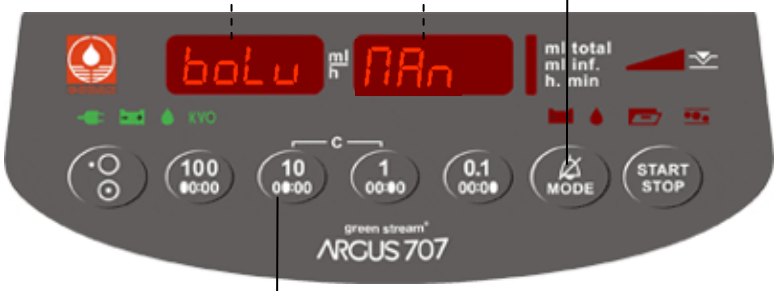
1. Press this key until the function "SEt" "FILL" appears in the displays!



2. As long as this key is pressed the pump runs at the maximum speed. The display "FILL" is flashing. After 60 seconds the delivery will be interrupted. In order to pump more, you have to press the key again!
   If no key is pressed within 5 seconds (programmable) the pump changes back to the basic position.

4.5 **Input of the bolus rate and the bolus volume**

This function (accessible in stop- and run-mode) is only available if it was enabled by the technical service.



1. Press this key until the function "bolu" "MAn" or "bolu" "Auto" appears in the displays!

2. Pressing this key to activate pre-selection of the bolus rate. The left hand display shows the last active bolus rate. "boLr"!

Input of bolus rate:

This function (accessible in stop- and run-mode) is only available if it was enabled by the technical service.

3. Use these keys to enter a new bolus rate!
   If no key is pressed during 5 seconds (programmable), both displays change back to the basic position!

Input of bolus volume:

This function (accessible in stop- and run-mode) is only available if it was enabled by the technical service. To activate the automatic bolus, it is mandatory to input a bolus volume.

4. Press this key to activate the pre-selection of the bolus volume. The left display shows “tot”, the right hand display shows the last active bolus volume!

5. Use these keys to enter a new bolus volume (e.g.10.0)! If no key is pressed during 5 seconds (programmable), both displays change back to the basic position!

4.6 Manual Bolus application

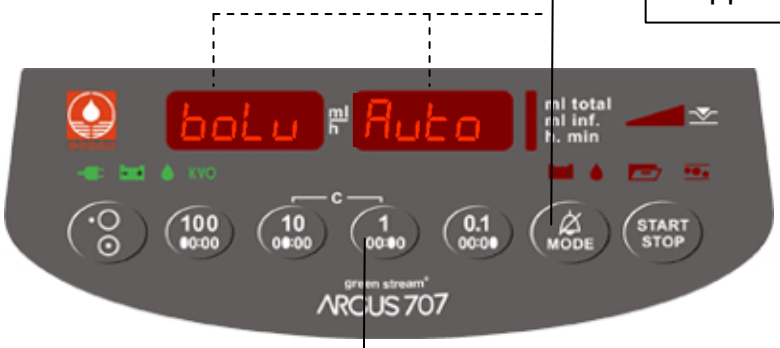
This function (accessible in stop- and run-mode) is only available if it was enabled by the technical service.

1. Press this key until the function "bolu" "MAn" appears in the displays!

2. Start the bolus application with this key. Hold it down until the desired bolus volume is infused or the maximum pre selected volume is reached!

4.7 **Automatic Bolus application**

This function (accessible in stop- and run-mode) is only available if it was enabled by the technical service and a bolus rate and a bolus volume has been entered (see chap. 4.5).



1. Press this key until the function "bolu" "Auto" appears in the displays!

2. Press this key to start the automatic bolus application!
   Press this key again to interrupt the running automatic bolus; pump will then continue to infuse at the normal rate!

4.8 **Battery capacity**

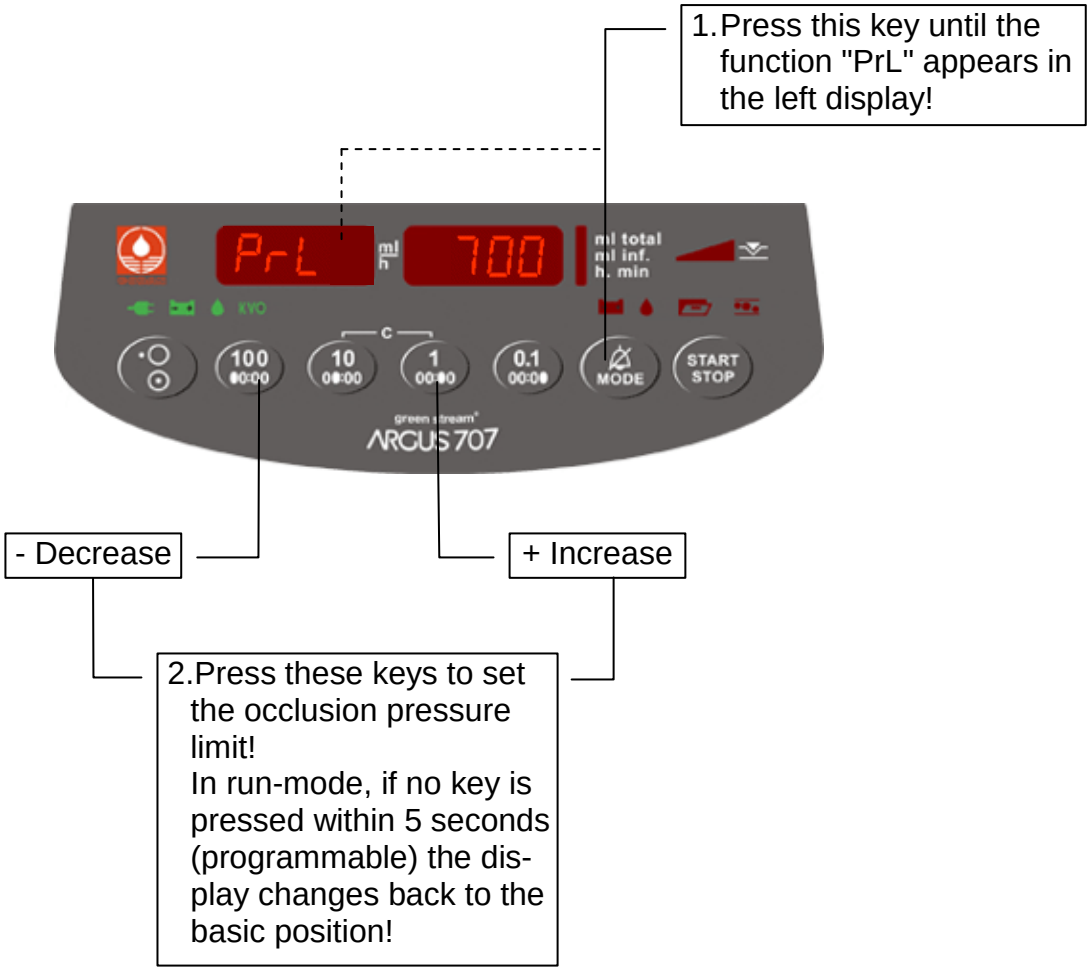
This function is accessible in stop- and run-mode.

1. Press this key until the function "CAP" appears in the left display!

2. The right display shows the battery running time in hours and minutes (e.g. 2 h 30 min).
   If no key is pressed within 5 seconds (programmable) the display changes back to the basic position!

4.9 **Setting of occlusion pressure limit**

This function is accessible in stop- and run-mode.



Occlusion pressure limits				
mbar	**mmHg**	**kPa**	**Psi**	**cmH2O**
100	75	10	1.4	101
200	150	20	2.9	203
300	225	30	4.3	305
400	300	40	5.8	407
500	375	50	7.2	509
600	450	60	8.7	611
700	525	70	10.1	713
800	600	80	11.6	815
900	675	90	13.0	917
1000	750	100	14.5	1019

4.10 Activation of the neonatology mode and neonatology occlusion pressure limit setting

This function (only accessible after a successful START) is only available if it was enabled by the technical service and the pump was started once after start up.

This special function allows selecting a new occlusion pressure limit based on the present line pressure and adding a configured step value according to the following formula

> New occlusion pressure limit = Present line pressure + « Configured step »*

*The step value is configured by the technical service.

1. Press this key until the function "PrL" appears in the left display!

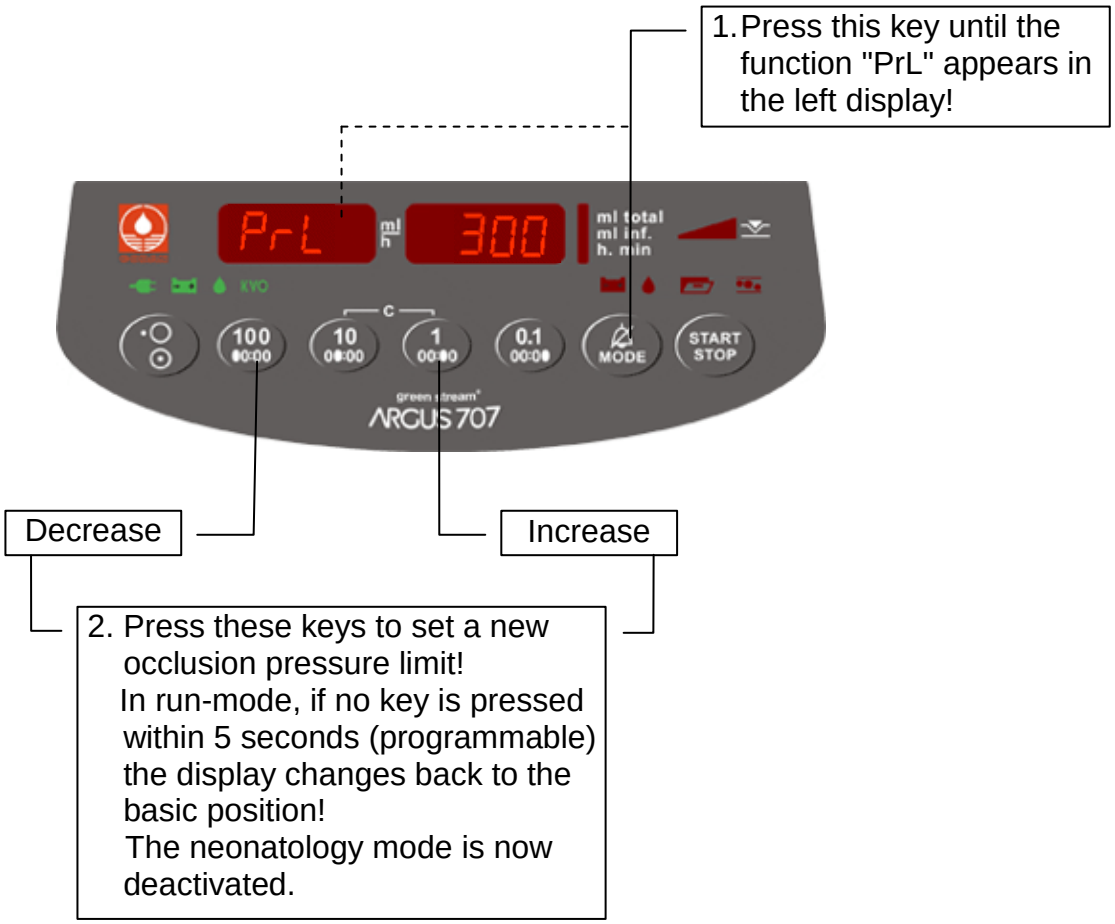
2. Press this key and the new occlusion pressure limit appears in the right display! (Limit is set according to above mentioned formula). The neonatology mode is now activated.
If no key is pressed within 5 seconds (programmable) the display changes back to the basic position!

The maximum bar graph level corresponds now to the « Configured step »

4.10.1 Line pressure display in neonatology mode

In normal neonatology infusion mode, an approximate value of the line pressure is displayed alternatively with the rate and volume display:

4.10.2 Deactivation of the neonatology mode



CAUTION : **Opening the door, turning OFF the pump or the occlusion alarm will automatically deactivate the neonatology mode.**

In all these cases, the neonatology mode must be explicitly reactivated.

4.11 **Patient transport**

This function (accessible in stop- and run-mode) is only available if it was enabled by the technical service.

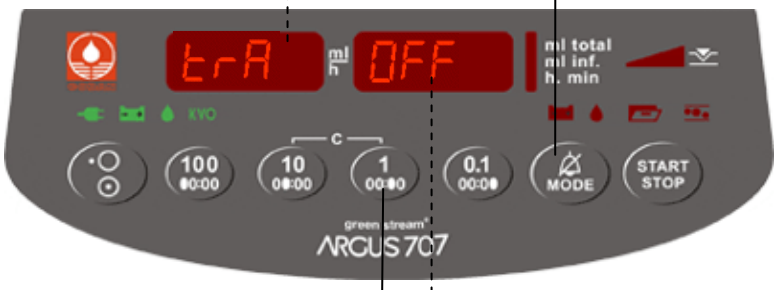
If this function is activated (On), no drop alarm is released if too many drops (splashes by vibration) are detected. A drop alarm is released only if no drop is detected within a certain time.

This special function must only be used in uncritical applications and for the following special circumstances:

-Transport of patients in the internal hospital area.

-Rescue ambulance or in other rescue equipment.

-Infusion of protein or vitamin based solutions.



1. Press this key until the function "trA" appears in the left display!

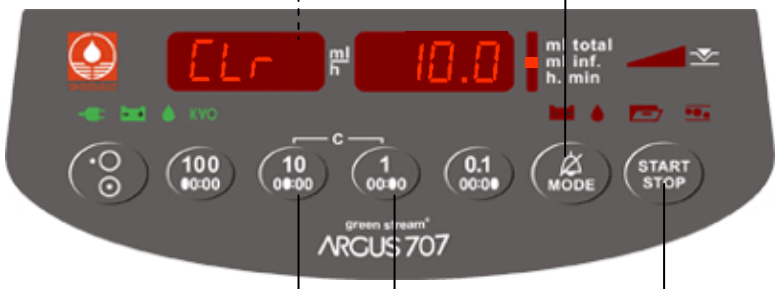
2. Use this key to switch the transport mode On or OFF (toggle function)! If no key is pressed within 5 seconds (programmable) the display changes back to the basic position.

In run mode, if this function is turned on, the message "trAn" "SPOr" is blinking alternatively with the infusion rate display.

If the pump is switched off, the transport mode is also automatically switched off. If needed again, it must be reactivated (On).

4.12 Clear "ml inf." (volume infused) in stop and run mode

This function is only available if it was enabled by the technical service.



1. Press this key until the function "CLr" appears in the left display!

2. Press both keys simultaneously to clear "ml inf"! Right display will be set to 0.

3. RUN MODE: If the clear function is not confirmed with this key within 15 seconds, the acoustic alarm will be released and the previous value will be displayed again! Confirm old value and clear the alarm with this key!

4.13 Display of accumulated "ml inf." since last power up (balance)

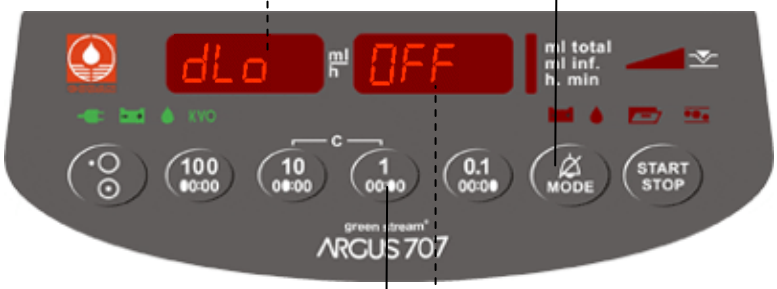
This function (accessible in stop- and run-mode) is only available if it was enabled by the technical service

1. Press this key until the function "InF" appears in the left display!

2. The total infused volume since last power up of the pump is displayed! If no key is pressed within 5 seconds (programmable) the display changes back to the basic position.

4.14 **Data-lock (keyboard lock)**

All input keys can be locked with this function.
This function (accessible in stop-mode) is only available if it was enabled by the technical service.

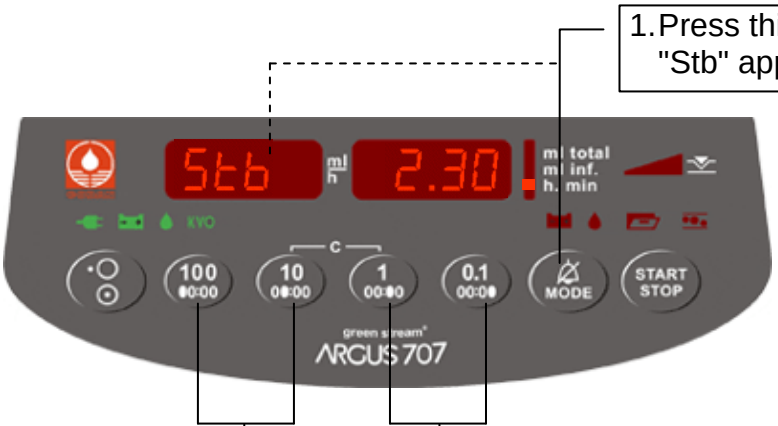


1. Press this key until the function "dLo" appears in the left display!

2. Use this key to switch the data lock ON or OFF (toggle function)! If no key is pressed within 5 seconds (programmable) the display changes back to the basic position.

4.15 **Setting the stand-by alarm time**

With this function you can set an individual stand-by alarm time longer then 2 minutes (default value). This function (accessible in stop-mode) is only available if it was enabled by the technical service.



1. Press this key until the function "Stb" appears in the left display!

Hours

Minutes

2. Input the desired stand by time! (>2 minutes, e.g. 2 hours 30 minutes) The entered time is activated as soon as the displays change back to the basic position. During that time, no stand-by alarm is released.

4.16 **Input of medication name**

With this function you can select a medication name from a pre-programmed list which will be displayed. This function (accessible in stop-mode) is only available if it was enabled by the technical service. If no key is pressed within 5 seconds (programmable) the display changes back to the basic position!

1. Press this key until the function "MEd" appears in the left display!

2. Use this key to scroll the pre-programmed list and to select the desired medication name!
   If no key is pressed within 5 seconds (programmable) the displays change back to the basic position!

4.17 **Timer alarm**

With this function you can set an individual timer alarm. After alarm the pump will stop! This function (accessible in stop-mode) is only available if it was enabled by the technical service.

1. Press this key until the function "tM" appears in the left display!

2. Input the desired alarm time!
   The entered time is activated as soon as the displays change back to the basic position.

3. The message: "tM" "End" appears with an acoustic alarm if the timer has run out!
   Press this key to acknowledge the message. The displays changes back to the basic position.

The remaining time can be checked by selecting the function timer "tM".
The timer runs in stop and run mode.

4.18 Air Bubble Detection

Pumps with a standard factory setting detect air bubbles featuring a volume of 250 µl (~ 0.247 ml or 35 mm length) upwards and trigger off a specific air-bubble alarm. Your technical department can adjust this value by means of the configuration menu to within a range from 50 to 1,000 µl.

Depending on the operating range of the device, it is also possible – again by means of the configuration menu – to switch on an additional function for monitoring the accumulation of small air bubbles (the volume of the bubbles can be set to anywhere between 100 and 2,000 µl) over a given period of time (settable between 8 and 64 minutes). Setting this function is recommended in particular for solutions that tend to foam.

The size of the air bubbles to be detected by the pump shall be defined by the medical personnel in charge.

The following precautions should be observed in order to minimise the risk of air bubbles forming:

1. The drop chamber must always be at least one third full to a maximum of half full. When high flow rates are used, it should be half full.

2. The tube must be filled completely and checked before connection to the patient; any air bubbles must be removed.

3. Y fittings must be properly sealed and 3-way valves must be set correctly.

4. Solutions that have to be stored in a refrigerated condition must be warmed at least to room temperature before use.

5 Safety information

5.1 Risk and danger

Caution! The infusion pump must only be used under the supervision of qualified clinical or nursing staff.

Caution! The ARGUS 707 V pump was designed and manufactured to be used only as an IV infusion pump.

Caution! The ARGUS 707 V infusion pump may only be used with spare parts, accessories, consumables and sets with Luer-Lock connections (specified in the appendix) recommended by CODAN ARGUS AG. The functional safety of the pump is not guaranteed if non approved materials are used. The safety of the patient may be endangered**.**

Caution! The connection of several infusion types (gravity, syringe pumps, peristaltic pumps, etc.) together into the same tube can be very dangerous. This type of connection should only be used if expressively specified in the operation manual of each device and/or approved by a notified body and applied under a trained qualified clinical or nursing staff.

Caution! Keep the ARGUS 707 V pump clean and dry. If inadvertently liquid is poured over the unit, immediately remove the AC power cord of the unit or the ARGUS Docking Station and contact the relevant hospital department for cleaning and drying.

Caution! The ARGUS 707 V must not be operated in hazardous locations and explosive gaze environment.

Caution! After each falling the pump has to be tested by the tech. service.

Caution! The ARGUS 707 V pump has to be connected to mains supplies in accordance to the limits specified in *chapter 9*. The pump can only completely be disconnected from the mains by removing the mains power cord.

Caution! No interferences by external high frequency electromagnetic fields (e.g. in combination with surgical equipment) are known that could influence the safe operation of the pump. In case of doubt we suggest that you contact your local distributor.

Caution! Be aware that a free-flow and/or under-flow will not be detected when the pump is operated without a drop detector!
Furthermore the following security steps have to be taken:
You must install the roller clamp on the patient side of the pump.
An infusion volume (ml total smaller than the content of the bottle) must be entered.

Caution! The pump must not be operated with a defective battery pack. Pumps that do not have a functioning battery pack may present a danger to patients because the pump will turn off immediately and without prior warning in the case of a power failure. For safety reasons the pump should only be fitted with battery packs provided by CODAN ARGUS AG.

Emboli: To avoid this risks flush the IV set and the extension line before use, make sure no air bubbles remain in the entire system!

Pulmonary Oedema: An excessive or to rapid infusion may endanger the patient or cause death!

5.2 Safety standard checks (SSC)

The maintenance safety standard check has to be performed at least every 24 months or after maximum 10’000 hours of operation. The checks have to be performed according to the description available in the service manual.

6 Cleaning / Disinfection

6.1 General references

Caution! The pump has to be switched off and must be unplugged from the power line before cleaning! Remove all connections and cables.

Caution! It is strictly forbidden to autoclave the ARGUS infusion pump or to dip it into liquid.

Caution! Take care that no liquid gets into the unit or the plugs.

Caution! Keep the ARGUS 707 V pump clean and dry. If inadvertently liquid is poured over the unit, immediately remove the AC power cord of the unit or the ARGUS Docking Station and contact the relevant hospital department for cleaning and drying.

The pump must only be cleaned by "swabbing". Only alcoholic disinfectants may be used.

Caution! Do not use scrubbing agents for cleaning!

In order to keep the pump full operational, we recommend regular cleaning. Use a cloth moistened with lukewarm water for cleaning. Alcoholic cleaning agents must only be used diluted.

For more information regarding the supply of suitable cleaning agents and disinfectants please contact the specialists in your house.

7 Warranty

7.1 **Warranty duration**

The warranty period is determined by the distributor and is subject to its general conditions of sale. The warranty covers the repair and replacement of defective parts in case of manufacturing or material faults.

7.2 **Warranty limitations**

The warranty terminates in the event of modifications or repairs carried out by non-authorized persons and in case of non-adherence to the inspection /maintenance intervals.
The warranty does not include the batteries, failures that are due to wrong manipulation, inexpert handling, liquid ingress or normal wear and tear.

The supplier assumes responsibility for the safety, reliability and performance of the unit only if all following conditions are met:

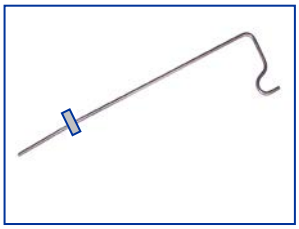
a) Exclusively authorized persons have carried out the assembly, additions, readjustments, modifications or repairs.
b) The electrical installations in the room where the unit is operated meets the requirements of the IEC regulations.
c) The unit has been operated in compliance with the instructions for use.

Caution! The ARGUS 707 V infusion pump may only be used with spare parts, accessories, consumables and sets with Luer-Lock connections (specified in the appendix) recommended by CODAN ARGUS AG. The functional safety of the pump is not guaranteed if non approved materials are used. The safety of the patient may be endangered.

This manual contains the latest data available. It is subject to further modifications in accordance with technical improvements.

8 Accessories

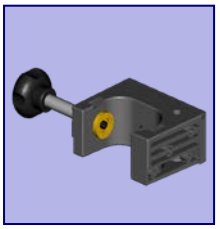
Bottle holder
(45cm / 60 cm)
REF 11.005 / 11.043



Drop detector

REF 10.089

Combi clamp
(basic)
REF 10.087

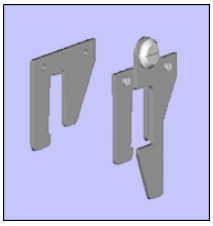


Power distributor

REF 90.009

Barcode Reader
with holder
REF 90.151

Combi clamp
(upgrade kit)
REF10.108 -10.111



AMService Utility
Software

ARGUS IV-stands
various

Docking Station
REF 90.100

Transport Unit
REF 90.052

9 Specifications

ARGUS 707 V

	Designation	Volumetric peristaltic infusion pump ARGUS 707 V
	Order number	18.1110 (230V AC) / 18.1111 (115V AC)

CONFORMITY

		CE-marked (CE 0120), Directive 93/42/EEC Appendix II
	IP-protection against liquid ingress	IPX2 (protected against dripping, 15° ☐tilted)
	Applied part	Type CF
	Protection class	II
	Medical device classification:	IIb
	Regulations & Electrical safety	EN 60601-1-1, EN 60601-1-4, EN 60601-2-24
	Electromagnetic compatibility	EN 61000-3-2, EN 61000-3-3, EN 60601-1-2
	Certification	ISO 13485, ISO 9001

INPUT

Volume / Rate	Infusion rate	0.1 - 999.9 ml/h (in 0.1-step up to 999.9 ml/h)
	Volume total (VTBI)	0.1 - 9999 ml (in 0.1-step up to 999.9 ml and in 1-step from 1000 to 9999 ml)
	Set Fill (prime) rate	1 - 999 ml/h (in 1-step up to 999 ml/h)
	Rate calculation	Volume total (VTBI) and infusion delivery time
Bolus	Bolus rate	0.1 - 1200 ml/h programmable without flow interruption (in 0.1-step up to 999.9 ml/h and in 1-step from 1000 to 1200 ml/h)
	Bolus volume (automatic & manual)	0.1 - 999 ml programmable without flow interruption (in 0.1-step up to 999 ml)
Time	Infusion delivery time	1 min - 99 h 59 min (in 1 min-step up to 99:59 h)
KVO	KVO rate (KOR)	0.1 - 3 ml/h (depending on entered infusion rate)

ACCURACY

Rate	Flow rate deviation	≤ ± 5% • For rates from 1 to 999.9 ml/h • IV-set changed every 24 hours or after 2.5 liters infused • Maximum back pressure +/- 100 mmHg • Depends on the infusion set used
	Flow discrepancy in the event of a technical failure	≤ ± 10%
Tech.	Technical deviation	< 1%

OPERATING REQUIREMENT

	Temperature range	5 °C -40 °C
	Medication temperature	18 °C -30 °C
	Storage temperature range	0 °C -40 °C
	Relative humidity (permissible)	20 -90 %; no condensation

POWER SUPPLY

	Battery type	NiMH- 12 V / 1.5 Ah (maintenance-free)
	Battery operation	5 h @ 25 ml/h
	Battery charging time	16 h
	External DC power supply	20 V / 0.3 A
	Power consumption	max. 12 VA
	Line fuse	125 mAT
	AC power supply	230 V +/- 10%, 50 - 60Hz
Optional	AC power supply	115 V +/- 10%, 50 - 60Hz

INTERFACE

	Data interface	2 x RS-232 (1 x galvanic isolated)

DISPLAY

LED	1 large 4-digit LED-display (left)	Infusion rate, additional information
	1 large 4-digit LED-display (right)	Volume infused (0.1- 9999ml), volume total (VTBI), infused time (1 min – 99 h 59 min), additional information
	Pictograms and LED'S	Operation and alarm conditions
	LED bar graph	Pressure monitoring display

ALARM

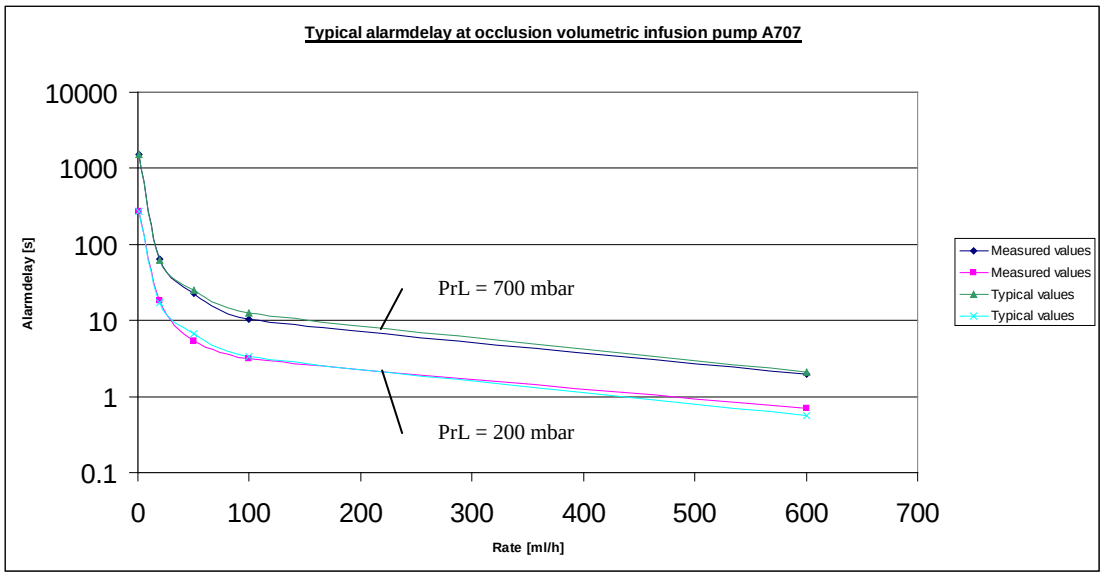
Acoustic alarm		Volume adjustable in 6 steps (cannot be completely turned off)
Pre alarm	Battery near empty	ca. 15 minutes before infusion stop
	Battery depleted	ca. 6 minutes before power turn-off
Occlusion	Patient side	
	Bottle side	
Volume	Total (VTBI) reached	
Empty	Infusion bottle empty	
Drop	Deviation too big	
Air bubble		
Door open		
KVO	Reminder alarm (KOR)	
Service	Suggestion	
Failure	Technical	

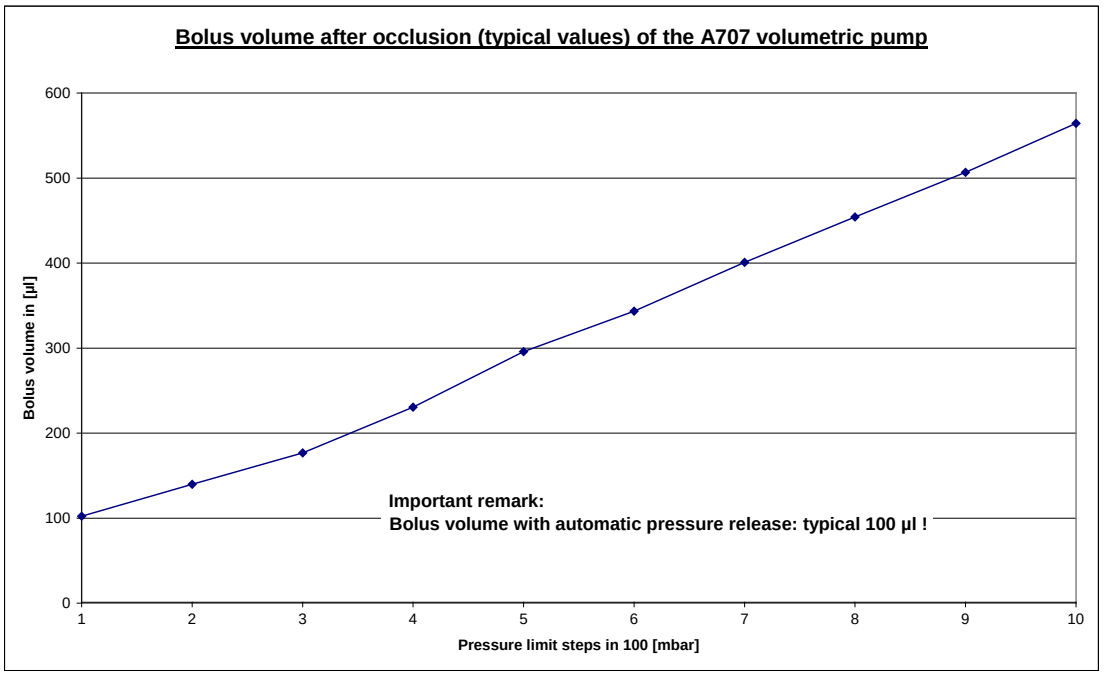
SAFETY & INFORMATION

Air bubble	Air bubble detector (single bubble)	50 - 1000 µl (programmable)
	Air bubble accumulation	100 - 2000 µl (50 µl steps) within 8 -64 min (8 min-steps), config.
Drop detector	Configurable drop window	10 - 65 drops/ml
Occlusion	Pressure reduction	YES
	Pressure limit (adjustable)	100 - 1000 mbar (10 - 100 kPa, 75 - 750 mmHg) in 10 steps programmable without flow interruption
	Alarm reaction time and related bolus vol.	See separate table below
IV set	Approved sets	See appendix
Nurse call	Staff-alerting system	24 V / 0.2 A (potential free change over contact; static/dynamic)
History		400 events
Installation		Horizontal
	Mounting possibilities	- Table top - IV-stand / ceiling pole (up to diameter 38mm) - Standard rail system (optional accessory) - ARGUS Docking Station A60/100
Storage time	3 months	recharge the battery after each storage time or at latest all 3 months to maintain the battery capacity specified
Transport	In original packaging	
Disposal	Recyclable	

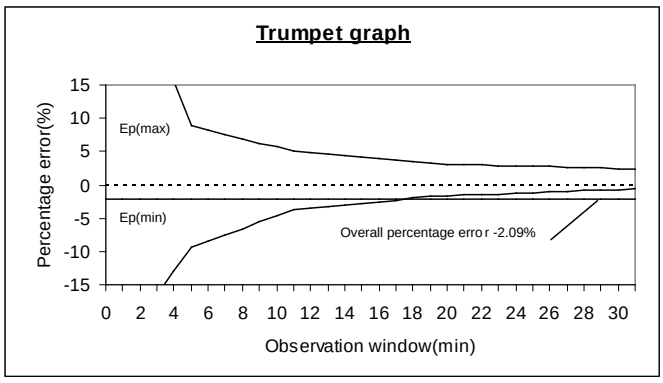
MEASUREMENT / MATERIAL

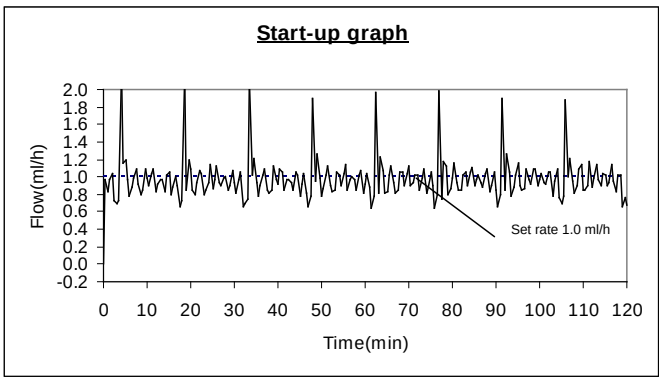
Dimensions	190 x 160 x 130 mm (W x H x D) excluded combi clamp
Weight	2 kg including battery (without accessories)
Housing	ASA (high performance plastic)



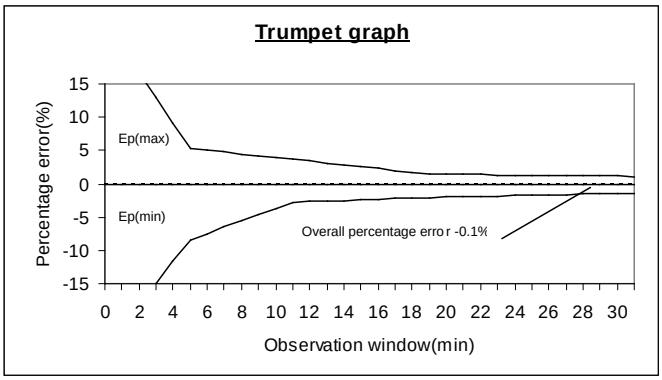


Test I in the first two hours of the test period of 24 hours at 1.0 ml/h (initial period)

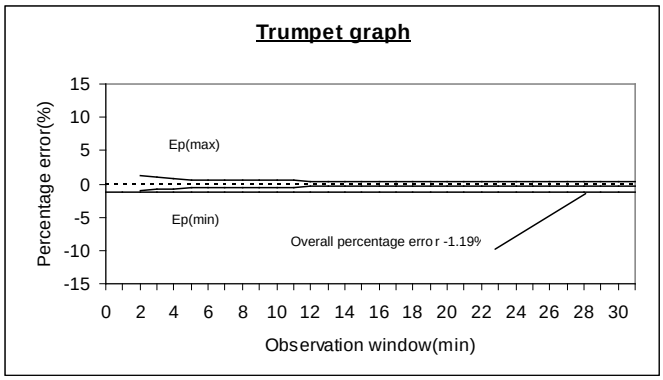


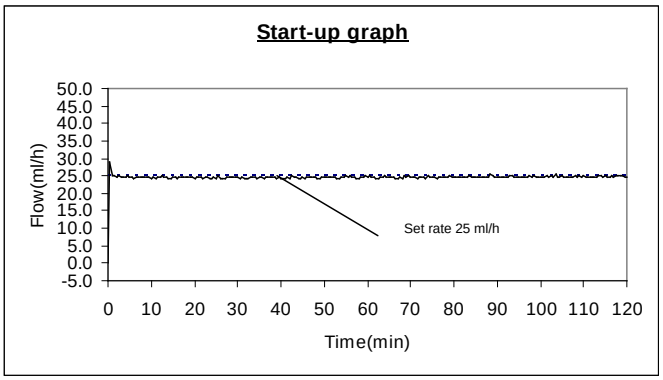


Test II in the last two hours of the test period of 24 hours at 1.0 ml/h (end period)

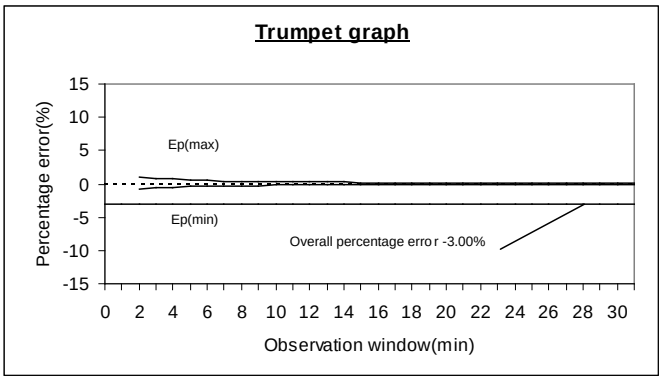


Test I in the first two hours of the test period of 24 hours at 25 ml/h (initial period)





Test II in the last two hours of the test period of 24 hours at 25 ml/h (end period)



All measurements are done under laboratory conditions!

Appendix: Recommended IV sets

Caution! The ARGUS 707 V infusion pump may only be used with the recommended sets listed below. The sets must have Luer-Lock connections. The functional safety of the pump is not guaranteed if non approved materials are used. The safety of the patient may be endangered.

Caution! Each time you change set brand (manufacturer) or tube material you have to perform a new set calibration (contact your service department).

Caution! Unless otherwise specified by the customer, the ARGUS 707 V has been calibrated with the CODAN L86 Art. 43.3030 (NoDEHP) infusion set.

Manufacturer	***IV set***	***Order Number***
CODAN	V86-P / S86-P / L86-P (NoDEHP)	various
	green line V86 (NO PVC)	43.4825
	CYTO-Z	various
B.Braun	Intrafix Air P	406 2990
	Intrafix Primeline Comfort	406 2981L
	Intrafix Primeline Classic	406 2957
	Intrafix Safeset	406 3000
Fresenius	Infudrop-Air PD	288 63 51
Becton Dickinson	R87 P	3963.50
Becton Dickinson	R87 P with backflow-stop	3963.53

The accuracy of ± 5 % cannot be guaranteed for infusion rates > 600 ml/h for the following IV set:

Clinico	Perfudrop Air P	484 036 08
CODAN	V86-I.V.STAR 10 (NoDEHP)	43.4401