• Certified Management System
• EN ISO 9001
• EN ISO 13485

Peristaltic Infusion Pump

AP 31P

OPERATOR'S MANUAL

Dear Customer,

Thank you very much for purchasing medical equipment from Ascor S.A. We can assure you that you have made a good choice. Our Company devotes much effort and time to improving its products. It will be a pleasure and satisfaction for us if our product fulfils your requirements and expectations. If during operation of our equipment you have any doubts or remarks regarding its operation or functionality, please do not hesitate to inform us about them. We will do our best to remedy all your problems and your remarks will be taken into consideration in designing our new products.

President of the Managing Board
ASCOR S.A.

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1. Application of infusion pump AP 31P

The AP 31P peristaltic, volumetric infusion pump is designed for precise dosing of infusion liquids and drugs. The pump is easy to operate, a fully reliable and universal device, usable in virtually all areas of patient care, including: intensive care units, operation and recovery rooms, paediatric wards, emergency, etc. The mounted backup battery enables its use in case of the mains failure.

The infusion can be performed only with the use of **special (dedicated) ASCOSET® Peristaltic I.V. infusion sets** with a silicone insert, which guarantee a safe and high accuracy dosing even during long lasting infusions. The pump is equipped with an ultrasonic air-bubble detector, that insures that the patient is not blown with air.

The pump can me mounted on a stand, bed frame or on any flat surface by the patient. It can be positioned both below and above the level of the patient, in any position (not necessarily horizontal).

NOTES:

- **THE AP 31P PUMP SHOULD NOT BE OPERATED IN THE PRESENCE OF FLAMMABLE ANEASTHETICS**
- **THE AP 31P PUMP SHOULD NOT BE USED FOR BLOOD AND BLOOD-DERIVATIVES INFUSIONS**

2. View of pump

Fig.1. AP 31P front view

1. handle
2. display
3. keyboard
4. positioning foots

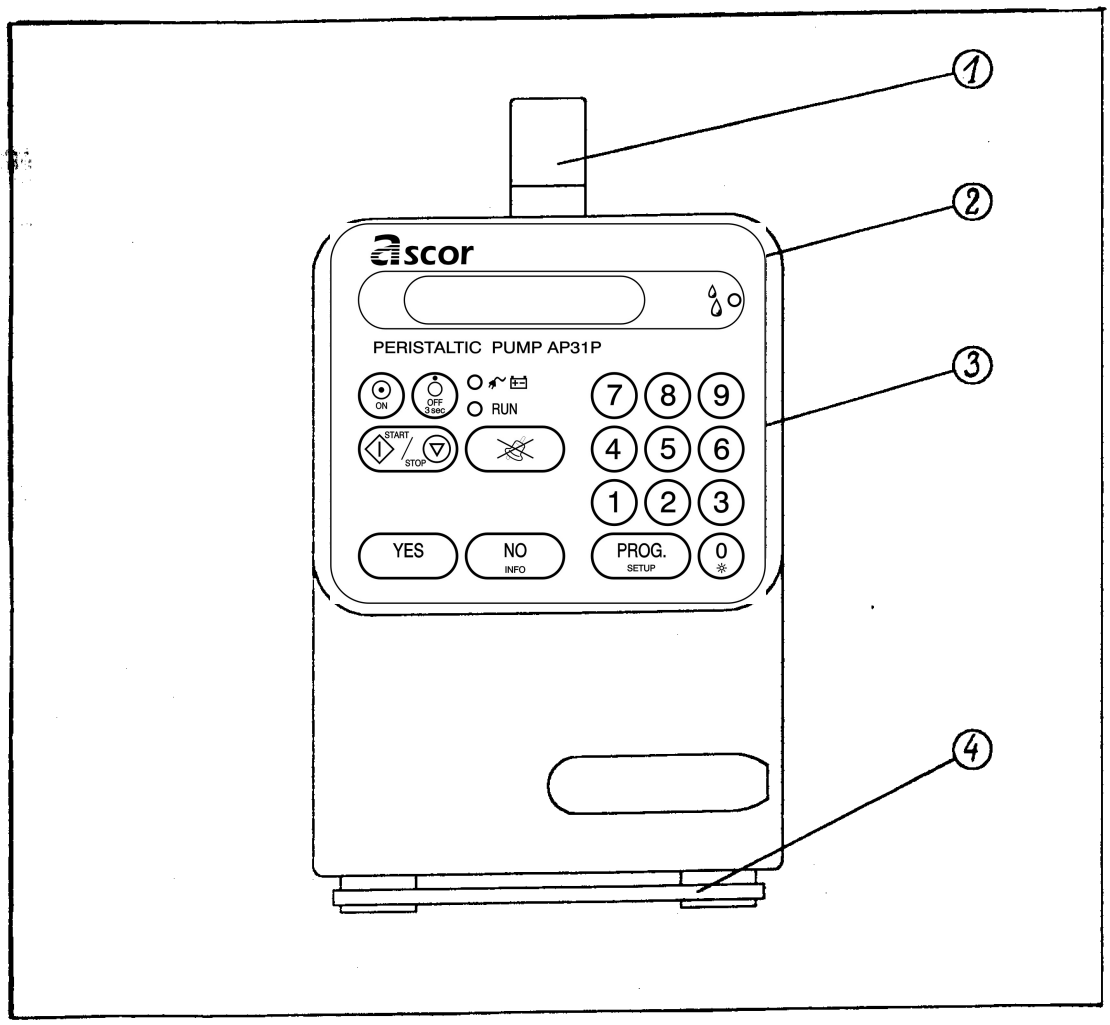


Fig. 2. AP 31P side view

1. handle
2. flap-door locking arm
3. clamping unit for attaching pump to stand
4. flap-door
5. positioning foots

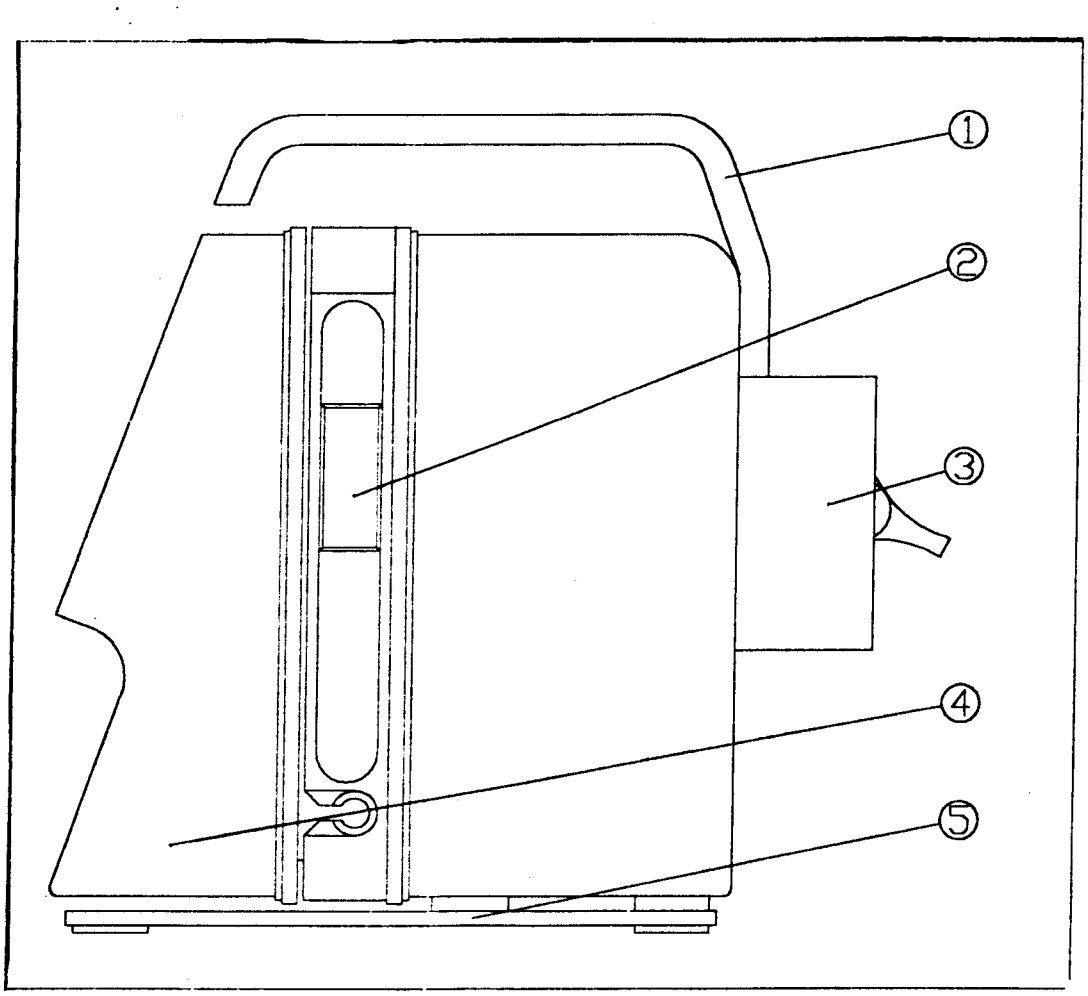


Fig. 3. AP 31P back view

1. handle
2. clamping unit for attaching pump to stand
3. screwing knob
4. positioning foots
5. drop detector jack
7. interface RS 232 port – only in option.
8. power jack

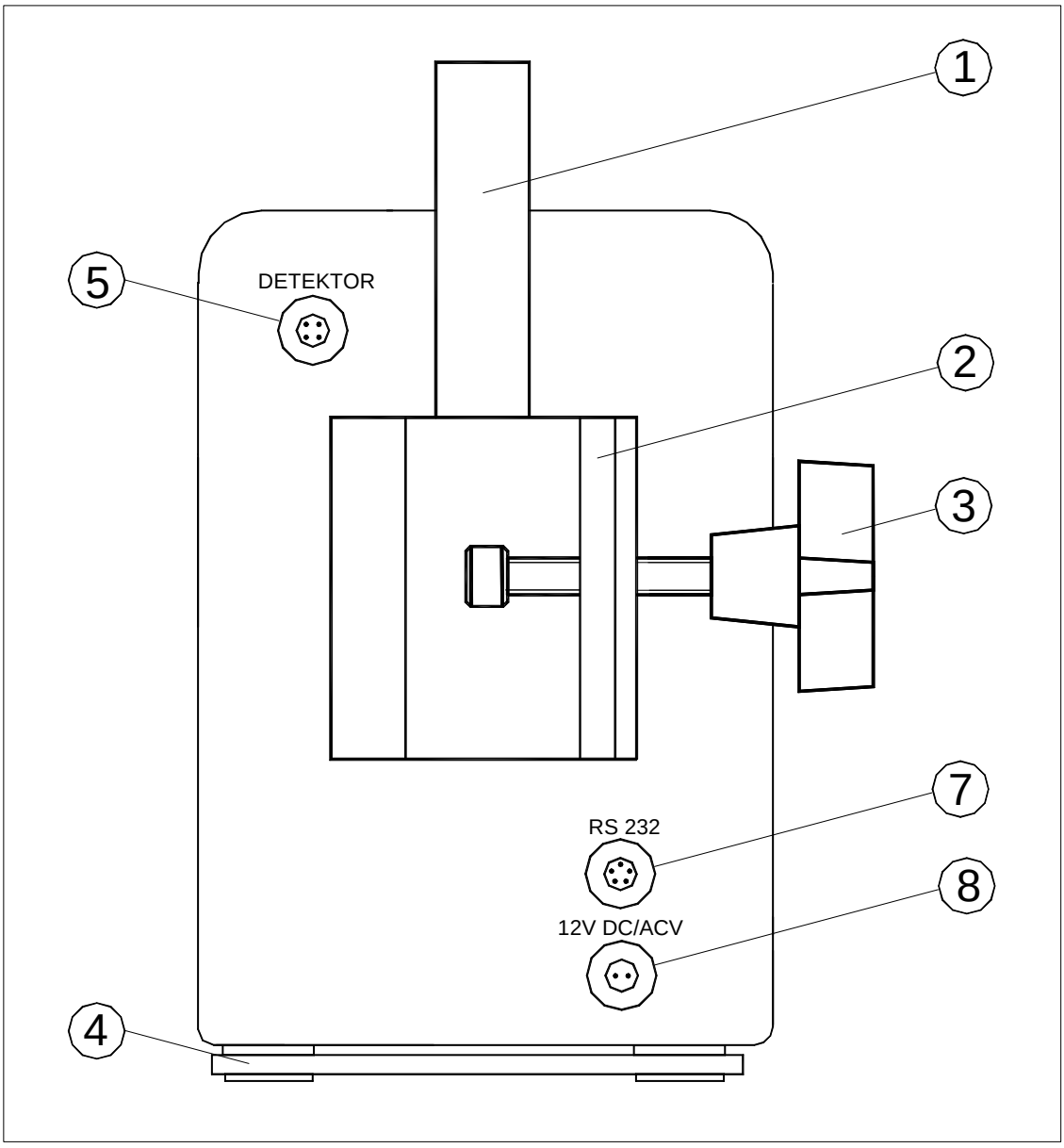
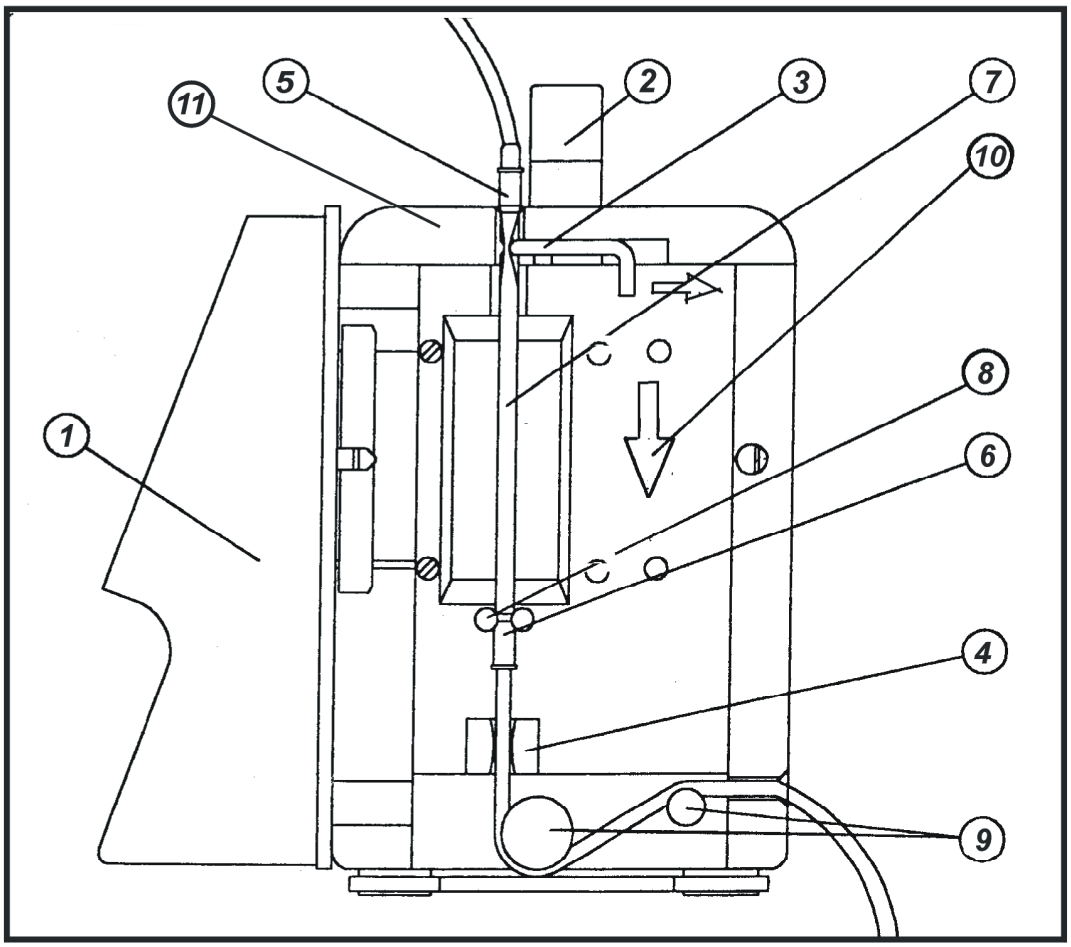


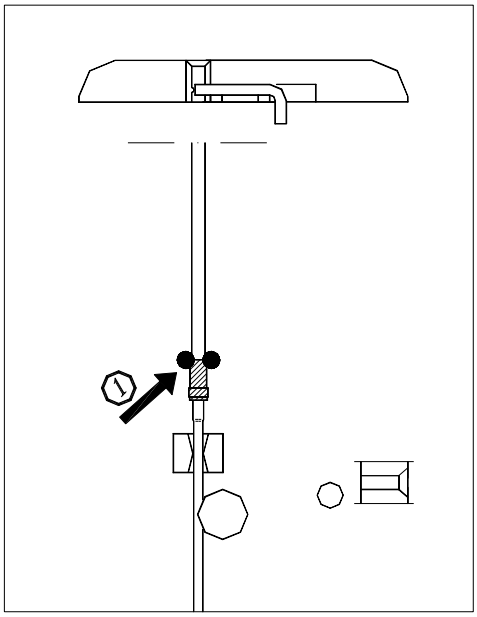
Fig.4. Infusion set installation

1. casing with keyboard - pump flap-door
2. handle
3. flow blocking clamp when the pump's door is open
4. air bubble sensor
5. top part of silicone tubing/insert
6. bottom part of silicone tubing/insert
7. silicone tubing/insert
8. holder
9. infusion set guide
10. direction of liquid flow

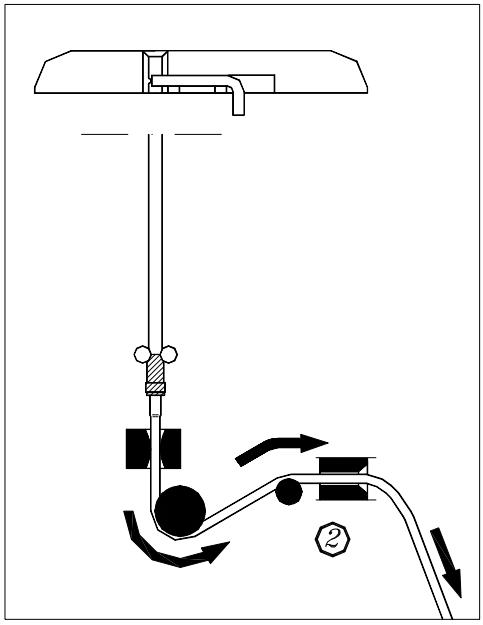


REMARK !
It is extremely important to install an infusion set correctly.
Please pay special attention where the top and bottom parts of silicone tubing/insert should be positioned.

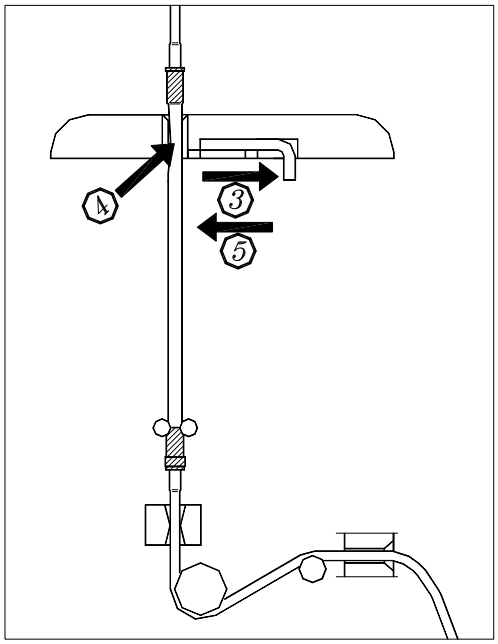
ADDITIONAL INSTRUCTIONS ON THE INFUSION SET INSTALLATION



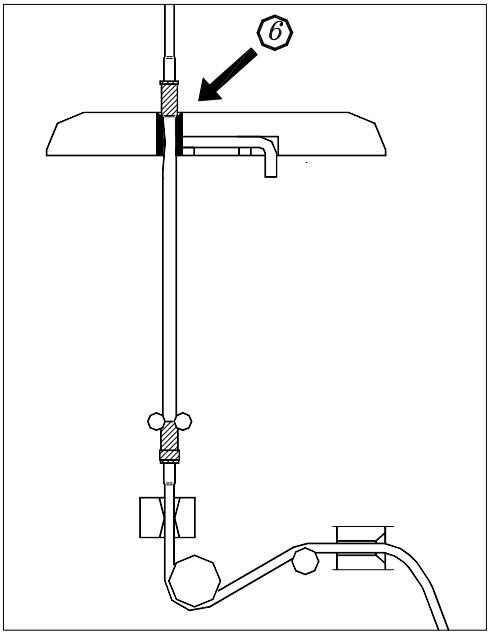
1.Installation of the infusion set should begin from the bottom part of the silicone insertion. Insert it under the round holders.



2. Install the infusion set accordingly to the drawing – it should go through the air bubble sensor, then lay along the round guide pins and go outside the pump.



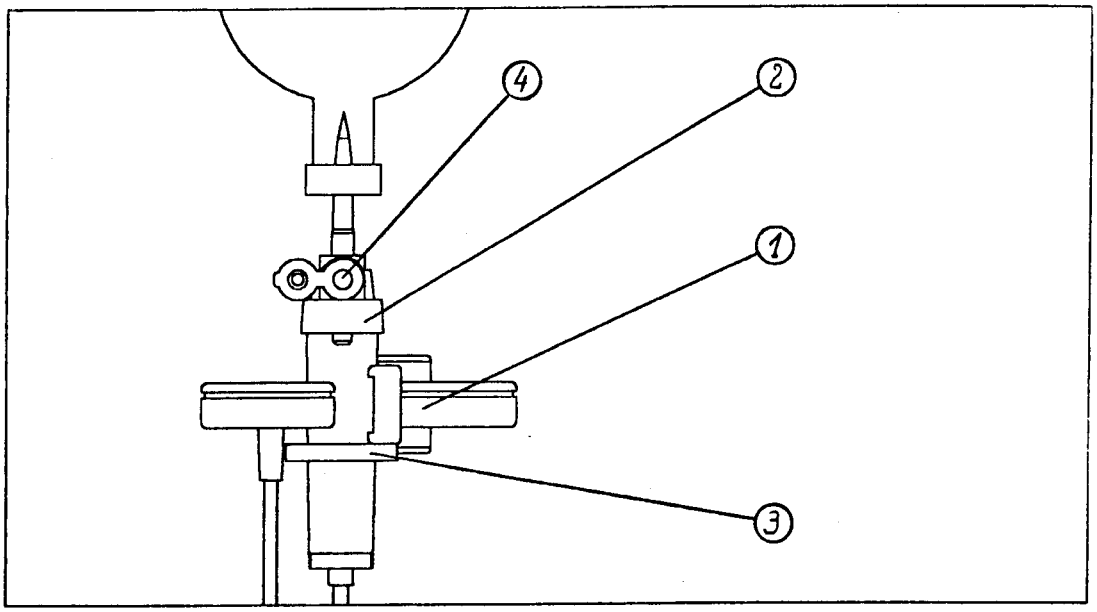
3. Pull the flow blocking clamp softly right.
4. Insert the upper part of silicone insertion on the top rail of the pump in such way that the connection silicone/PVC is above the pump casing. **The upper connection silicone/PVC should never be pushed <u>by force</u> into the the top rail of the pump.**
5. Release the flow blocking clamp.



6. Close the pump door. Thanks to it's elasticity, the infusion set will shrink and take the proper place

Fig. 5. Mounting of drop detector on drop chamber of infusion set

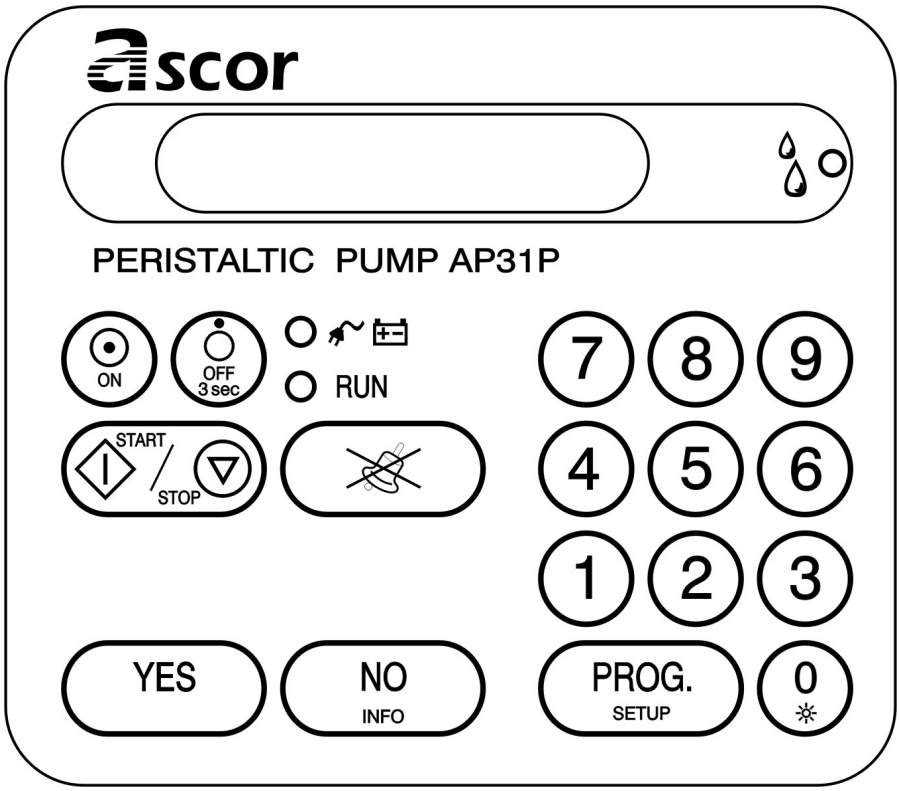
1. drop detector
2. drop chamber
3. rubber disk preventing detector from slipping off
4. air vent with filter



IMPORTANT !!!

The drop detector should be positioned above the level of the liquid, about 1/3 length from the top of the drop chamber and rest on the rubber disk.

Fig. 6. AP 31P keyboard



RUN
- green indicator, showing that the pump has been connected to mains power and the backup battery is being charged
- yellow indicator, flashing during infusion

ON / OFF 3 sec
- Switch-on button
- Switch-off button - **hold 3 seconds**

START / STOP
- START/STOP infusion button

- Alarm muting (SILENCE) button

YES
- YES button for accepting and confirming/memorising displayed messages and values

NO INFO
- NO button for deleting or changing displayed messages
- It also serves as INFO button – pressed repeatedly enables scrolling through infusion data: volume infused and time to the end or time elapsed

PROG. SETUP
- PROGRAMME button enabling scrolling pre-set infusion parameters: flow rate, volume or time of infusion.

0 9
- Number buttons for setting infusion parameters
- **0** also for changing the brilliance of display

3. Setting up the pump

To set up the pump, proceed as follows:

- mount the pump on a stand, bed frame or on any flat surface by the patient, with the use of the jig (2, fig. 3) and screwing knob(3, fig.3)
- plug the pump to an AC 220V outlet using the supplied cable with adapter, connect to the power jack of the pump (8, fig.3) - which should make the "**MAINS**" green indicator light-up fig.6
- connect the drop detector to the detector jack at the rear of the pump (5, fig.3) - push softly in and turn right the hoop for secure connection. Position the drop detector temporarily on the pump handle
- mount the infusion liquid container above the pump
- prepare the infusion set, filling the drop chamber in 1/3, vent all air from the tube and block flow with a clamp
- place the infusion set inside the pump, paying special attention where the top and bottom parts of silicone tubing/insert (short tube) should be positioned (fig.4).
- mount the drop detector on the drop chamber (fig.5)
- switch on the pump and set the infusion parameters
- insert the needle into the patient's vein and unblock the infusion set
- commence infusion by pressing "**START**" button

4. Pump operation

THE INFUSION MUST BE CARRIED OUT ONLY WITH SPECIALLY MADE ASCOSET® PERISTALTIC INFUSION SETS. OTHERWISE PRODUCER DOES NOT GUARANTEE THE PUMP'S SECURE FUNCTIONING AND DOES NOT TAKE ANY RESPONSIBILITY FOR THE DANGER CAUSED TO THE PATIENT!

4.1 Infusion set installation

The infusion set ASCOSET ® Peristaltic designed for use with the AP 31P pump differs from a typical set, by having a silicone tube which guarantees a safe and high precision dosing.

Before installing the set in the AP 31P pump, it should be prepared in the same way as for a normal drop infusion, i.e. mount the infusion liquid container on the stand, insert the drop chamber into the container, open the air vent, fill the chamber in 1/3 to 1/2, expel the air from the tube and block the liquid flow with a pressure roll. **Insert the needle into the vein only after having programmed the pump.**

Open the pump's door by pulling out softly the bottom part of the locking arm (2,fig.2).
The way of installing the set inside the pump is shown on fig.4
Special attention should be paid to the direction of liquid flow in the pump (10). The infusion set should be positioned in such a way, so that the top end of silicone tube (5, fig. 4) is installed on the top rail of the pump while the bottom end of the silicone insert (6, fig. 4) is mounted just under the holder (8, fig. 4) and laid along the guide pins (9, fig.4), as shown on a drawing (fig. 4). The infusion set should not be tightened (the bottom end of the silicon tube 6, should rest under the holder 8), otherwise it could cause incorrect dosing. It should however pass through the air-bubble sensor guide (4). The last step is closing the pump's door (1,fig.4) and mounting the drop detector (1) on the drop chamber (2,fig.5).

The detector should be positioned above the level of the liquid, about 1/3 length from the top of the chamber and rest on the rubber disk (3) preventing it from slipping down.

NOTES:

- Too low level of liquid in the drop chamber (less than 1/3 length) can cause the appearance of tiny air-bubbles, that can merge into larger ones causing "**AIR in line !!**" alarm. For high infusion rates this can cause air-blocking of the infusion set.
- Too high level of liquid in the drop chamber (more than 1/2 length), can cause malfunctioning of the drop detector and "**OCCLUSION / END**" alarm
- The drop detector is an optical instrument, which is sensitive to strong sources of light
- Closing the air vent in the drop chamber can cause major infusion errors and can result in the "**OCLUSION / END**" alarm

4.2 Switching pump on/off

The pump starts working on pressing the "**ON**" button

To switch off the pump press and hold for 3 seconds "OFF" button. This clears data such as volume administered and time of infusion !!! The only data that is saved are the set infusion parameters (infusion rate, total volume or time).

4.3 Setting infusion parameters

After having pressed the "**ON**" button the following message is displayed:

AUTO – TEST

This informs the operator that the pump has completed series of self-checking tests. If any malfunctioning is found, the pump blocks further operation and an audible alarm will sound. If this were to persist, please contact the nearest authorised servicing station, which will carry out a maintenance check or repair the pump.

After the positive auto-test, if the pump has not been connected to AC power, the following message will appear:

NO MAINS !!!

If the pump is to be powered from the backup battery, "**YES**" button should be pressed. Otherwise the pump should be connected to AC power (the "**MAINS**" green indicator should light up).

Programming commences with the appearance of the following message:

RATE XXX ml/h

This signals the need to set the infusion rate. The display shows the infusion rate of the last infusion (the AP 31P pump saves all pre-set parameters of the last infusion for the period of 5

years, regardless of the battery's charging level). If the new infusion is to be performed at the same rate as the last one, only **YES** button should be pressed. If the infusion rate is to be changed, the new value should be introduced with the number buttons **and confirmed by pressing YES**. The new value not confirmed with **YES** will not be active. The maximum admissible value for the infusion rate is 1000 ml/h (no higher value will be accepted).

VOLUME XXXXX ml

The XXXXX shows the volume of the last infusion. If the same volume of infusion liquid is to be administered to the patient, only the **YES** button should be pressed. If the new infusion volume is to be pre-set, the new value should be introduced with the number buttons and **confirmed by pressing YES**.
The maximum admissible volume of infusion is 10'000 ml (the pump will not accept bigger values).

Instead of setting the volume, it is possible to set the time during which the pump is to administer the liquid at the pre-set infusion rate. These two parameters (i.e. volume or time) can be pre-set alternatively. Changing from VOLUME to TIME and vice versa can be done by pressing twice the "**NO**" button.

If neither "VOLUME" nor "TIME" parameters are pre-set (the previously set value is deleted by pressing the "NO" button and then the „YES" button is pressed**), the pump will operate at programmed infusion rate until all the liquid to be administered has run out what will be signalled by the DROP DETECTOR alarm activated.**

The volume of the liquid already administered can be checked at any moment during infusion by a short pressing of NO button.

4.4 Infusing

After having programmed the pump, the infusion set correctly installed and the drop detector duly connected, the display should show the following question:

READY to run ..??

or if the flap-door has not been closed properly (1, fig.4) then the message

DOOR IS OPEN !!

If the drop detector is not connected or is mounted improperly on the drop chamber, then the display shows the message

DROP DETECTOR

If the infusion set contains air bubbles or it has been incorrectly installed (fig.4), than the following message will be displayed:

AIR in line !!

The air should be immediately expelled from the drain tube by easing the clamp (3, fig.4) and inducing a fast flow of the infusion liquid (after having disconnected the infusion set from the patient).

Confirmation of total correctness and readiness of the pump for infusion will be signalled with the message:

READY to run ...

The infusion can be started by pressing the "**RUN/STOP**" or "**YES**" buttons. The flow of the infusion liquid is signalled by flashing of the "**RUN**" yellow indicator and the message:

run... XXXX ml/h

XXXX ml/h shows the rate of infusion.

At any time during infusion, by short pressing "NO" button the following information can be obtained:

- **volume of the liquid already administered**
- **time left till the end of infusion** (if the volume or time has been programmed) **or**
- **time that has elapsed from the start** (if neither volume nor time has been pre-set)

After 5 seconds the display will return to showing the infusion rate. This kind of checking can be done as often as needed during the infusion running without disturbing the process.

During operation the rate of infusion can be easily changed, without the necessity of pausing. To do this a new value should be introduced with the number buttons and confirmed by pressing "**YES**" button. Right from that moment the pump will operate at the new infusion rate.

Remark! A new value not confirmed with YES button will not be active.

The pump enables the infusion to be stopped without switching off power. To do this the "**RUN/STOP**" button should be pressed, the "**RUN**" yellow indicator stops flashing and the following message appears:

STOP XXXX ml/h

XXXX stands here for the rate of infusion. By short clicking of "**NO**" button, in the same way as during the running infusion, all information about the volume already administered, the time left till the end of infusion or time elapsed from the start can be checked on the display. By pressing the "**RUN/STOP**" button for a second time, the infusion can be restarted. However **if the infusion is stopped for more than 2 minutes an audible alarm will sound and the infusion liquid will start to be administered in KVO (keep vein open) mode** (explained further on).

If the volume or time of infusion have been programmed, then 5 minutes before the infusion ends an alarm will sound and the following message will be displayed (after muting the alarm sound by pressing "**SILENCE**" button):

5 min. PREALARM

It will disappear automatically after 5 seconds or by pressing any button.

The end of the infusion process is signalled by an alarm and the message:

END of infusion

This message appears only if the volume or time of infusion had been programmed. Henceforth the pump starts operating in **KVO** mode and displaying its rate.

The **KVO** mode (Keep Vein Open), operates so as to prevent the needle from clotting by infusing the patient with a minimum dose of liquid. The rate of such slow infusion depends on the original delivery rate and is as follows:

1 ml/h	for delivery rate 1-10 ml/h
2 ml/h	for delivery rate 11-100 ml/h
3 ml/h	for delivery rate 101-300 ml/h
4 ml/h	for delivery rate 301-500 ml/h
5 ml/h	for delivery rate 501-1000 ml/h

At any moment during infusion, without interrupting it, all programmed parameters can be checked. Just the "**PROG**" button should be pressed and held, than by pressing the "**YES**" button one can scroll all the programmed values (infusion rate and volume or time).
"**NO**" button enables both infusion parameters to be modified. **All new values introduced should be always confirmed (memorised) by pressing** "**YES**" **.**

Pressing and holding "NO" button for more than 3 seconds during the infusion process, will zero the counters of both: volume administered and time elapsed.
This is equivalent to restarting the infusion from the beginning.

CAUTION !
Switching the pump off with "OFF" button will mean the loss of infusion data (i.e. volume administered and time elapsed). Only the programmed parameters will be saved (i.e. delivery rate and volume or time)

4.5 Messages and warnings

All situations requiring the assistance or intervention of medical personnel are signalled by acoustic alarms, pulsating display glow-light and messages clearly displayed.

To mute alarm tone press "SILENCE" button.

4.5.1 Power alarms

The message:

NO MAINS !!!

informs the operator, that the pump has switched over to operate on batteries, because of the AC power failure or just the cable having been disconnected from the outlet.
The infusion process is not interrupted and continues running.
Pressing **YES** button will mean acceptation of further operation on batteries.

The message:

LOW BATTERY

informs that there is reserve power for another 30 minutes of infusion at the rate of 1000 ml/h (or 90 minutes for 25 ml/h).
This does not inhibit the pumps functioning.
The pump should be immediately connected to the mains power.

The message:

BATTERY

informs that further operation on batteries is impossible.

PUMP OPERATION HAS BEEN STOPPED. The pump should be switched off!

By connecting the pump to mains power, the battery will start recharging and a **new infusion** can start.

4.5.2. Occlusion alarm

The message:

OCCLUSION / END

informs the operator, that the maximum admissible pumping pressure level has been passed as a result of:

- accidental blocking of the infusion set
- clotting of the needle or piercing the vein wall
- using up all the infusion liquid in the container or closing the air vent of the drop chamber

PUMP OPERATION HAS BEEN SUSPENDED

From the moment the occlusion occurs some time elapses, which is dependent on the infusion rate. The lower the rate, the longer it takes for the pump to react to the occlusion.

Blocking of the infusion set can be checked starting the infusion and observing the falling drops or by opening the flap-door and allowing the free flow of the liquid (ease the blocking clamp 3, fig.4). This second method can only be used if a low drug concentration in high volume of liquid is being administered; the dosing error in this case will be minimal.

Another reason for **OCCLUSION / END** alarm can be **problems with the drop detector**, when:

- the level of liquid in the drop chamber is too high, i.e. more than 1/2 length of the chamber
- the drop detector is too near the surface of the liquid in the drop chamber, i.e. it should be 1/3 length from the top of the chamber and be secured with a rubber disk from slipping down
- too much light falls on the drop detector (this is an optical device, sensitive to strong sources of light)

By short pressing the "**NO**" button, similarly as during running infusion, it is possible to scroll such infusion data as: volume already administered and time left till the end of infusion or time elapsed from the start and reset the saved values of the process.

After having cleared the cause, the pump can resume its operation, without losing any data on the dose administered and time elapsed or time left till the end of infusion.

4.5.3. Drop detector alarm

The message

DROP DETECTOR

signals the switching off, incorrect mounting or malfunction of the detector. It should be remembered that the drop detector is an optical device and direct light sensitive.
See also 4.5.2. and 4.1.

PUMP OPERATION HAS BEEN SUSPENDED

After having cleared the cause, the pump can resume its operation, without losing any data on the volume administered and time elapsed or time left till the end of the infusion.

4.5.4. "AIR in line" alarm

The message

AIR in line !!

signals that air bubbles have appeared in the infusion set. This can be caused by a too low level of liquid in the drop chamber (it should be between 1/3 and 1/2 chamber length), the drain tube not being properly filled (not fully vented), the set being damaged, **the air-bubble sensor being soiled** (4, fig.4) or the set being incorrectly installed in the pump.

4.5.5. "DOOR IS OPEN" alarm

The message:

DOOR IS OPEN !!

signals to the operator that the pump's door is not fully shut or has opened during the infusion process (with the pump running).

PUMP OPERATION HAS BEEN SUSPENDED

After having shut the door, the pump can resume its operation, without losing any data on the dose administered and time elapsed or time left till the end of the infusion.

4.5.6. "5 min. PREALARM"

The message

5 min. PREALARM

signals that the infusion process will shortly end. **This alarm will only appear if the volume or time of infusion have been programmed !!!** The pump carries on uninterrupted.

4.5.7. "END of infusion" alarm

The message

END of infusion

signals that the full programmed volume of the infusion liquid has been administered to the patient or pre-set time of infusion has elapsed. **This alarm will only appear if the**

volume or infusion time have been programmed !!! The pump automatically switches to **KVO** mode with the display showing the new infusion rate.

The **KVO** mode (Keep Vein Open), operates so as to prevent the needle from clotting by infusing the patient with a minimum dose of liquid. The rate of such an infusion depends on the normal delivery rate and is as follows:

1 ml/h for flow rate 1-10 ml/h
2 ml/h for flow rate 11-100 ml/h
3 ml/h for flow rate 101-300 ml/h
4 ml/h for flow rate 301-500 ml/h
5 ml/h for flow rate 501-1000 ml/h

4.5.8. „CONTINUE ?" and „NEW INFUSION ?" questions

The question

CONTINUE ...???

appears if an interruption in the infusion process occurs which cause is signalled by the:

- "**OCCLUSION**" alarm (see 4.5.2.)
- "**AIR in line**" alarm (see 4.5.4.)
- "**DOOR IS OPEN**" alarm (see 4.5.5.)
- "**END of infusion**" alarm (see 4.5.7.)

After having cleared the cause of above alarms, the pump displaying **CONTINUE?** question will ask whether the interrupted infusion is to be continued.
If "**YES**" button is pressed, the administered volume and time elapsed counters will not be zeroed, and the pump will carry on with the process.

While pressing "**NO**" button will cause another question to be displayed:

NEW INFUSION?

which if answered with the "**YES**" button will zero the counters and restart the infusion process (counting) from the beginning.

4.6 Operating notes

4.6.1. General notes

- **THE AP 31P PUMP SHOULD NOT BE OPERATED IN THE PRESENCE OF FLAMMABLE ANEASTHETICS**
- **THE AP 31P PUMP SHOULD NOT BE USED FOR BLOOD AND BLOOD-DERIVATIVES TRANSFUSIONS**
- Use mains power whenever possible. Connect pump to mains power during storage to ensure a fully-charged battery for emergencies.
- The connection of the pump to AC power is signalled by the the "**MAINS**" green indicator lighting.

- **Any repairs must be carried out by a producer or an authorized service station. Unauthorized servicing done by the end-user can lead to malfunctioning of the pump and present danger to the patient!**

4.6.2. Infusion set

- **THE INFUSION MUST BE CARRIED OUT ONLY WITH SPECIALLY MADE ASCOSET® PERISTALTIC I.V. INFUSION SETS. OTHERWISE PRODUCER DOES NOT GUARANTEE THE PUMP'S SECURE FUNCTIONING AND DOES NOT TAKE ANY RESPONSIBILITY FOR THE DANGER CAUSED TO THE PATIENT.**
- The infusion set should not be used for more than 24 hours. After a prolonged infusion (of a large volume of liquid) the precision of dosing tends to fade due to the deformation of the silicone insert
- Too low level of liquid in the drop chamber (less than 1/3 length) can cause the appearance of tiny air-bubbles, that can merge into larger ones causing the lighting of the "**AIR in line !!**" alarm. For high infusion rates this can cause air-blocking of the infusion set.
- Too high level of liquid (more than 1/2 length), can cause malfunctioning of the drop detector and lighting of the "**OCLUSION / END**" alarm.
- Closing the air vent in the drop chamber, can cause major infusion errors and the lighting of the "**OCLUSION / END**" alarm.

4.6.3. Operation using backup battery

The AP 31P. pump can be battery powered for emergency backup and temporary portable operation. A fully charged new battery enables operating as follows:

- 12 hours minimum for rate of 25 ml/h
- 4 hours minimum for rate of 1000 ml/h

NOTES:

- The charging time is 24 hours for 80% capacity and 36 hours for 100% capacity.

Battery automatically recharges whenever pump is connected to mains power (i.e. the "**MAINS**" green indicator is lit). Operation of the pump does not hinder or influence the time of charging.

- **The above figures are true only for a first-hand battery**
- **If the LOW BATTERY alarm sounds, immediately connect the pump to mains power.**
- Use mains power whenever possible. Store pump connected to mains to ensure a fully charged battery for emergencies.

When operating on battery, brilliance of the display switches off just to save the battery's power. **By pressing the "O" number button the brilliance of the display can be changed** (will light up).

4.6.4. Operation without setting volume or infusion time

The AP 31P pump can be operated without programming the volume to be administered. In this case the infusion process will end when the liquid container has been emptied. The volume already administered and the time elapsed from the beginning of infusion appear on the display after pressing the "**NO**" button. After restarting the process (if the pump has not been switched off with the "**OFF**" button), the pump will carry on counting the volume and time starting from where it left off. The counters are zeroed whenever the pump is turned out or by pressing the "**NO**" button and holding it for 3 seconds. The volume counter can read up to 100'000 ml (i.e. 100l) and the time counter up to 99 hours 59 minutes and 59 seconds (i.e. 100 hours minus 1 second).

4.6.5. Changing infusion rate during operation

The infusion rate can be easily changed in running course without the necessity to have the infusion interrupted. The new value should be introduced with number buttons and confirmed by pressing the "**YES**" button. From that moment on, the pump will operate with the new rate. The time and volume counters will not be zeroed by this operation.

IMPORTANT! **Not confirmed (memorised) with YES button, the new value will not be active and the pump will continue infusing at the previous rate.**

4.6.6. Changing volume or infusion time during operation

During operation of the pump, it is possible to change the volume or time of infusion. To do this the "**PROG"** button should be pressed enabling thus scrolling through pre-set parameters. When the displayed parameter is not to be modified, just press **YES**. If you wish to modify it press **NO** (to delete the previous value) , introduce a new value with number buttons and confirm/memorise it by pressing "**YES**" button. **The time and volume counters will not be zeroed by this operation. If the new value is less than the one stated by the counters, the alarm** "**END of infusion" will show up.**

4.6.7. Zeroing volume and infusion time counters

To zero the counters **press and hold for 3 seconds NO button.**
This is equivalent to starting a new infusion (just as switching on the pump).

4.6.8. KVO mode

The **KVO** mode (Keep Vein Open), operates so as to prevent the needle from clotting by infusing the patient with a minimum dose of liquid. The rate of such an infusion depends on the normal infusion rate and is as follows:

1 ml/h for flow rate 1-10 ml/h
2 ml/h for flow rate 11-100 ml/h
3 ml/h for flow rate 101-300 ml/h
4 ml/h for flow rate 301-500 ml/h
5 ml/h for flow rate 501-1000 ml/h

5. Maintenance and servicing

All repairs during the warranty and post-warranty period must be carried out by a producer, ASCOR S.A., or a service station authorized by ASCOR S.A. Servicing done by the end-user or any unauthorized service station can lead to malfunctioning of the pump and present danger to the patient !!!

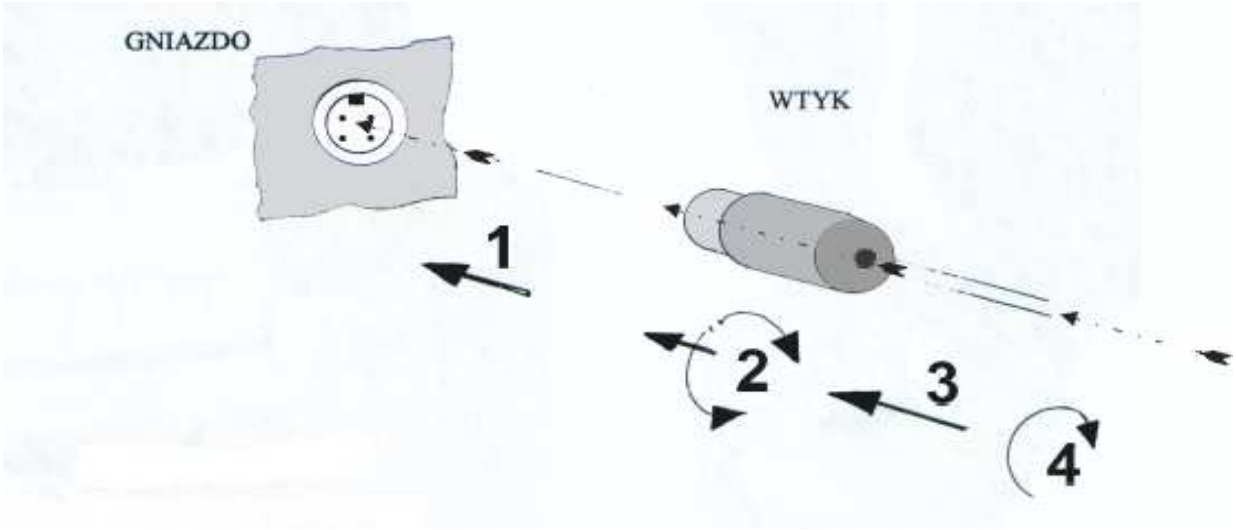
ASCOR S.A. declines any responsibility for malfunctioning of a pump due to servicing done by unauthorized persons or unauthorized service stations.

Any malfunctions of the pump should be addressed to the ASCOR distributor, from whom the pump was bought or directly to ASCOR S.A., Warsaw, Poland (detailed address is given below).

6. Technical specifications of the infusion pump AP 31P

Pump type:	peristaltic, volumetric
Infusion set:	special, with silicone insertion
Delivery rate:	1 - 1000 ml/h, programmable by 1 ml/h
Accuracy of dosing:	< 5%
Maximum infusion volume:	10.000 ml, programmable in 1 ml steps
Maximum infusion time:	99h 59' 59"
Infusion rate in KVO mode:	1 ml/h for the flow rate 1-10 ml/h 2 ml/h for the flow rate 11-100 ml/h 3 ml/h for the flow rate 101-300 ml/h 4 ml/h for the flow rate 301-500 ml/h 5 ml/h for the flow rate 501-1000 ml/h
Max. occlusion pressure:	80 +/- 20 kPa (0.8 +/- 0.2 kG/cm2)
Air-bubble sensor:	ultrasonic, sensitivity 0.05 ml of air
Drop detector:	optical, with digital interference filter
Backup battery:	NiCd of increased durability, Battery life: min. 4h at a flow rate 1000ml/h, 12h at a flow rate 25 ml/h
Power supply:	220 V AC +/- 10%, 50/60Hz power consumption maximum 5W
Protection class:	II
Protection type:	BF
Interference level:	N
Temperature range:	0 - 40 ºC
Weight:	3.6 kg
Dimensions:	230x140x230 mm
Accessories:	power adapter, drop detector, clamping unit

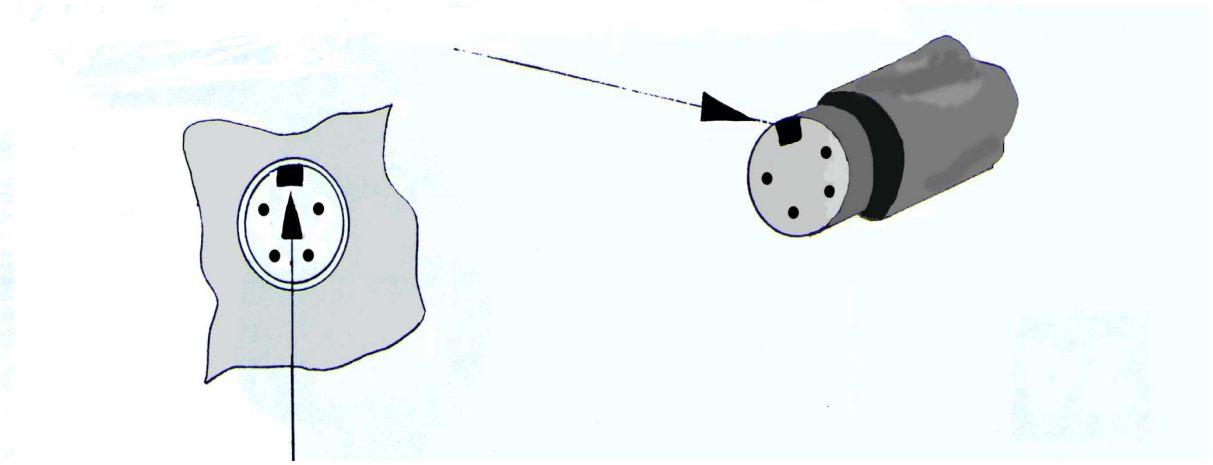
7. Instruction on the proper use of connectors in AP 31P pump



(drop detector & power transformer connectors)

Sequence of operations:

1. Softly insert the plug jack into the socket.
2. Pushing softly, turn it left and right to find the right position such as the element sticking out of the plug slips into the hollow in the socket (the moment of slipping in is easily perceptible) .



3. Softly slip the plug in untill resistance is felt.
4. By turning the external hoop softly right (untill resistance) the connector will be well secured against slipping out.

DO NEVER PUSH THE PLUG <u>BY FORCE</u> INTO THE SOCKET !!!
IT WILL CAUSE DAMAGE OF THE CONNECTOR.

8. About product and manufacturer

Volumetric infusion pump AP 31P has been manufactured by the company ASCOR S.A. which introduced and maintains the quality management systems, complying with the word and European standards, what has been approved by ISO 9001-2000, EN 46001 and ISO 13485 certificates.

Above certificates have been issued by TÜV Rheinland Product Safety GmbH – Am Grauen Stein – D-51105 Köln (code 0197).

Manufacturer:

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SERIAL NO.: .

Notes: