

Medical electric suction unit

MEVACS M90

Ordering number: MEVACS M90 - 72001.02

User's Manual



D40-0085-2-0

Dear Customers,


Thank you for the decision to buy the MEDIST medical electric suction unit.

Read the manual carefully, please, in order to be able to utilise all its features.

General instructions

- This user's manual is inseparable component of the device. It should be stored so that it can be at disposal at any moment.

• Especially important instructions are bounded in this manner

- Device **MEVACS** M90 is labelled with a mark  according to MDD 93/42/EEC outline and meets requests of the attachment 1 of the outline. 1293
- Device meet requests of security specifications according to EN 60601-1, EN ISO 10079-1 and interference requests EN 60601-1-2.
- Failure-free operation is guaranteed when
 - parts and accessories used are listed into this operation manual and they are approved by firm MEDIST
 - device installation, its set-up, variations, service extension are made by MEDIST company or authorized service organizations
 - the device is used in accordance with this instruction manual
- **Use only microbiological filters supplied by manufacturer, because these filters are hydrophobic (prevent penetration of fluid into vacuum pump and protected it from damage) with very high bacterial efficiencies up to 99,99999% particles bigger than 0,027 micron (which is smaller than Hepatitis A, B and C).**
- Company MEDIST does not warrant for secure operation and failure-free operation if uncertified accessories were used.
- Duration and guarantee conditions follow standard clauses listed into warranty. Duration of warranty is extended in the repair time in the case of warranted repair.
- Quality management system used by the company MEDIST meets international standards EN ISO 9001 and EN ISO 13485.

Security warning

SECURITY

- The device can only by operated by an operator advised with the instruction manual and device application methodic. Needed level of qualification – staff instructed how to operate with electric equipment.
- Disposal of cover material perform in accordance with valid standards.
- Suction unit is not intended for explosive conditions. These conditions can arise by using flammable anaesthetic gases and disinfecting skin agents. The instrument and foot-operated manipulator must be placed outside this area.

• Suction hose must be always connected with filtering catheter, filtering nozzle or filtering set and there must be no direct contact with the filtering place.

- Do not open the unit cover in order to avoid the electric shock.

- Device is protected by a safety valve into the lid of jar and safety valve into the lid of safety jar, and hydrophobic filter against secret sucking into the vacuum pump. In spite of this secret is sucked, further using is possible as late as a control was made. The control can only be provided by a authorized service organization.

- Before connecting the mains cord ensure that the local electric mains voltage is 230 V/ 50 Hz.
- Protect the mains cord against mechanical damage, especially against cutting and short-circuiting.
- Do not bend the mains cord too much.
- Pull the plug of the mains cord when unplugging.
- Never leave the mains cord plugged in electric mains, when unplugged from the unit socket.
- Attendant must make certain before every use of suction unit about its good condition and device ready.

- **Don't expose the collection vessels for direct UV ray of the germicidal lamps**

Installation

- The device should have sufficient air circulation in order to avoid the overheating.
- Do not put the device on subjects, which could block the vents on the unit bottom part.
- Do not use or locate the device in the vicinity of heat sources.

Note

- Do not forget regular replacement of filters.
- When you are interconnecting the vessels, **keep the rule that the vessel input leads through a direct connector and the vessel output leads through the connector** under which the safety valve is located.

- When you are autoclaving, the vessels must stand freely upside down, they must not touch each other and must not be loaded in order to avoid distortions. Max. temperature is 121°C.

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1. Introduction

*High-power fly suction unit **MEVACS M90** is available for using into all kinds of surgery, gynaecology and liposuction. Oilless vacuum-pump guarantees long time for no service-need operation. Microbiological filter, silicone hoses and unbreakable vessels guard high hygiene at work. Collecting secret vessels are autoclave*

Main advantages of the suction unit are the following:

1. **Oil-free vacuum pump**, maintenance-free.
2. **High level of vacuum** - 92,4 kPa / 693 mmHg (92,4 % vacuum).
3. **High suction output vacuum pump - 108 lit / min**
4. **Long-term operation** - several days.
5. **Simple control of vacuum** level by regulator valve
6. **Very low noise level.**
7. **Two suction circuits**
8. **Possibility switching of suction circuit**
9. **Suction volume of up to 8 litres without bottle change**
10. **Quadruple overflow protection**
 - ◆ safety jar
 - ◆ overflow valve in lid of safety jar
 - ◆ overflow valve in lid of suction jar
 - ◆ hydrophobic bacteriological filter
11. **Protection of the unit, personnel and patient against infection** by means of fitted bacteriologic filter.
12. **The possibility of all functions operation by means of foot control.**
13. **Wide range of additional equipment:**
 - unbreakable autoclavable vessels for secretion with volume 2 L and 4 L
 - suction adapters, single-use suction bags, cylinders ...
 - various diameters of silicone suction hoses
 - ◆ vacuum-extractors, curettage adapters

1.1. Areas of use

- a) Surgery - Plastic surgery - Accident surgery - Orthopaedics
- b) Gynaecology (suction curettage, vacuum extraction)

2. Equipment

2.1. Basic equipment

You can find the following in the transport packing of the unit of basic performance delivery:

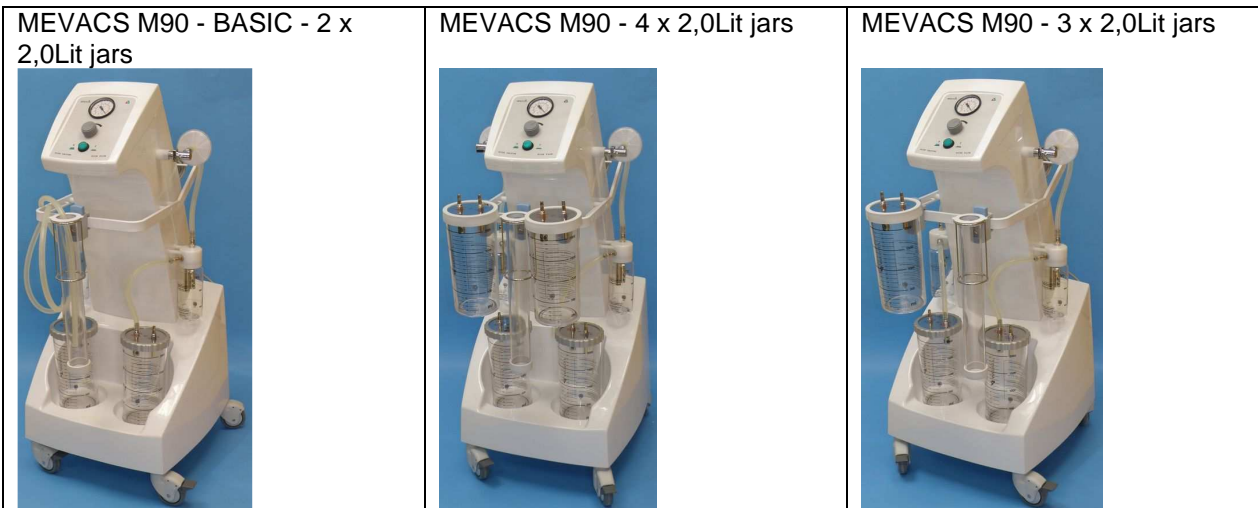
- **suction unit MEVACS**, on which the following is fitted:
 - ⇒ plastic polycarbonate vessel for secretion 2.0 L - 2 pcs
 - ⇒ safety vessel - 2 pcs
 - ⇒ suction catheter container 50/400 mm
 - ⇒ suction microbiologic filter - 2 pcs
 - ⇒ suction silicone hose \varnothing 8 x 3mm - long 2 m
- **electric cord**

2.2. Supplementing equipment

No	Name/type	Ordering number
1.	Suction hydrophobic microbiologic filter 2200/902	42101.04
2.	Silicone hose 10 x 3	40100.04
3.	Silicone hose 8 x 3	40100.00

4.	Suction adapter with suction interrupting for adults	42205.00
5.	Suction adapter with suction interrupting for children	42206.00
6.	STOP valve for adults - disposable	42201.05
7.	STOP valve for children - disposable	42201.04
8.	2.0 L jar TM, polycarbonate, with pressure-fit lid and metal tubing nipple	42011.11
9.	2.0 L jar TM, polysulfone, with pressure-fit lid and metal tubing nipple	42011.09
10.	2.0 L jar TM, polycarbonate, with silicone ring lid and metal tubing nipple	42011.15
11.	2.0 L jar TM, polysulfone, with silicone ring lid and metal tubing nipple	42011.13
12.	2.0 L jar TM, polycarbonate, with screw-fit metal lid and metal tubing nipple	42011.14
13.	2.0 L jar TM, polysulfone, with screw-fit metal lid and metal tubing nipple	42011.21
14.	4.0 L jar TM, polycarbonate, with pressure-fit lid and metal tubing nipple	42011.12
15.	4.0 L jar TM, polysulfone, with pressure-fit lid and metal tubing nipple	42011.10
16.	MONOVAC suction liner – capacity 1.4 L	42002.01
17.	EURO universal rail adapter TM - plastic	70105.16
18.	Direct hose connector 7-7	42803.07
19.	Direct hose connector 10-10	42803.06
20.	Direct hose connector 4-7	42804.04
21.	Direct hose connector reduced 4-10	42804.05
22.	Direct hose connector reduced 7-10	42804.06
23.	Direct hose connector reduced 6.5-15-6.5	42804.07
24.	T hose connector 5-5-5	42801.02
25.	T hose connector 7-7-7	42801.03
26.	Y hose connector 5-5-5	42805.04
27.	Y hose connector 7-7-7	42805.02
28.	Y hose connector 9-9-9	42805.03
29.	Suction catheter container 50/400 mm - TM	42003.01
30.	Footswitch for MEVACS M	73000.04
31.	Silicone vacuum extraction cup 50mm	70101.18
32.	Silicone vacuum extraction cup 60mm	70101.08
33.	Silicone vacuum extraction cup 70mm	70101.09

2.3. Sample of some version suction unit:



MEVACS M90 - 1 x 4,0Lit jar + 1 x 2,0Lit jar



MEVACS M90 - 2 x 4,0Lit jars



MEVACS M90 - 2 x 4,0Lit jars + 1 x 2,0Lit jar



MEVACS M90 - 2 x 4,0Lit jars + 2 x 2,0Lit jars



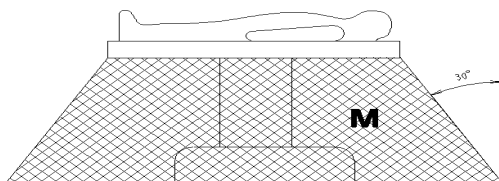
MEVACS M90 - 2 x 4,0Lit jars + 1 x 2,0Lit jar + foot switch



3. Installation

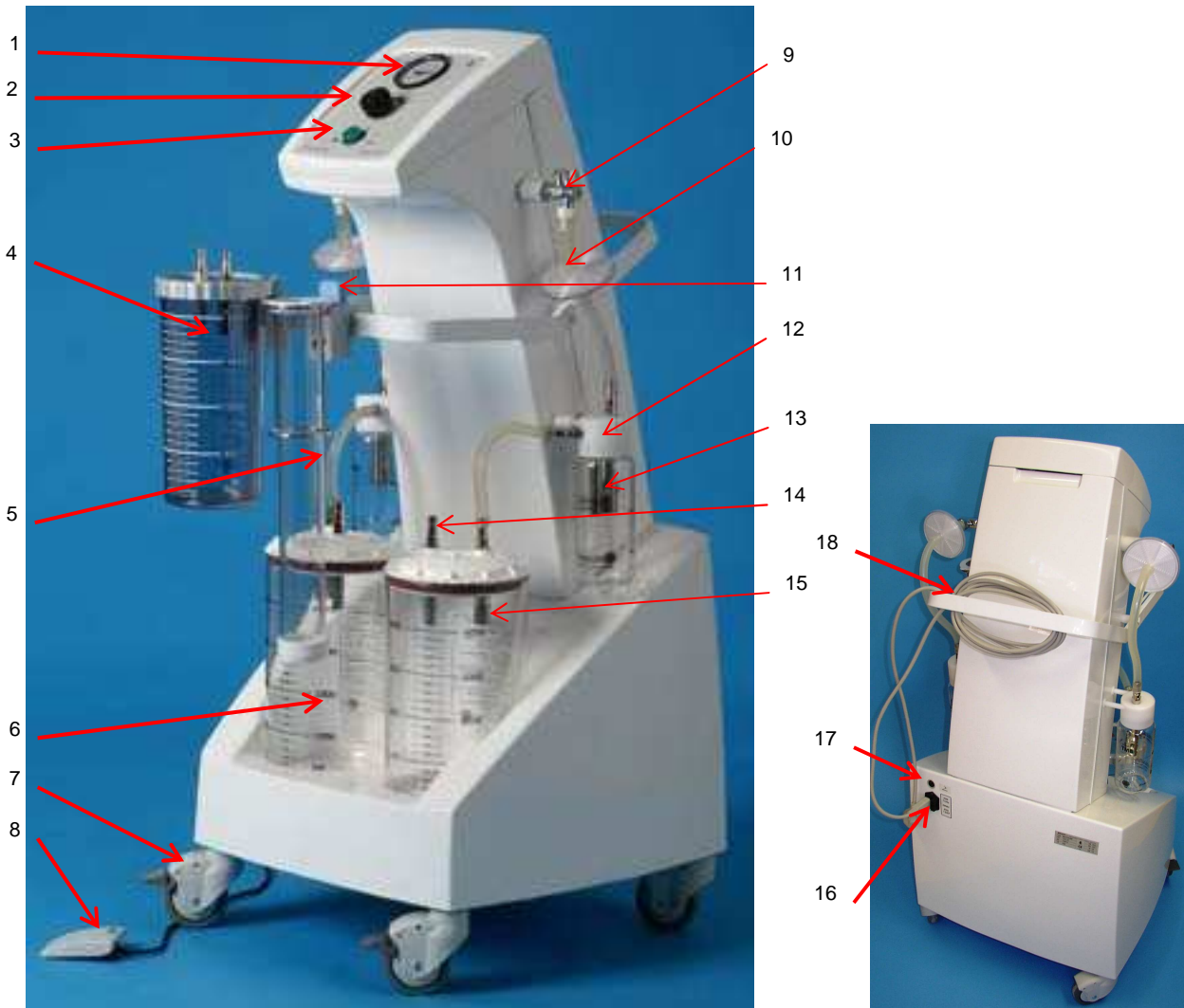
The MEVACS suction unit is a compact unit. There is no needed assembly.

3.1. Unit location



WARNING! Suction unit is not intended for explosive conditions. The instrument and foot-operated manipulator must be placed **outside this area „M“**.

4. Product description







The suction unit consists of the following:

1. vacuum meter	10. microbiologic hydrophobic filter
2. regulator valve	11. EURO rail adapter
3. mains switch	12. safety jar
4. 2.0 L jar for secretion	13. safety overflow valve
5. suction catheter container	14. hose connector for connection of vacuum branch
6. 4.0 L jar for secretion	15. safety overflow valve
7. wheels with brake	16. electric socket
8. foot control	17. connector for foot switch
9. change valve	18. electric cord holder

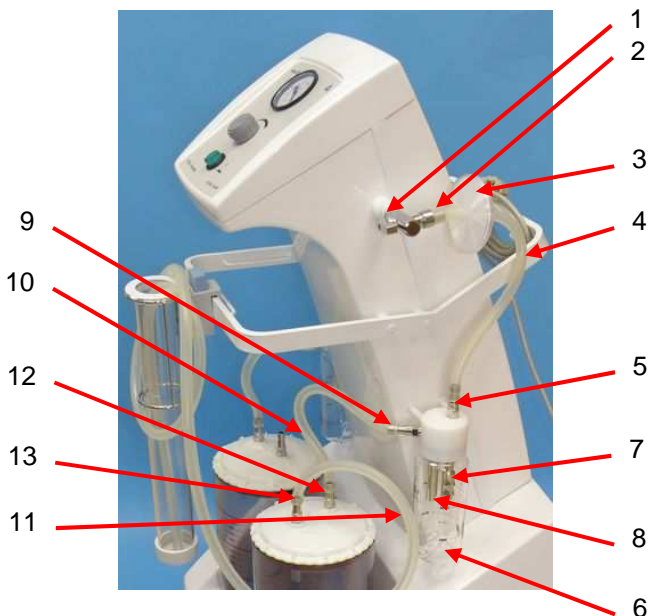
4.1. Symbols description

Symbol	Description	Location
	Type B Equipment	Serialized Label
	Year of Manufacturing	Serialized Label

0 / I	Switch On-Switch Off	Control Panel
	Turn the right - the vacuum is rising	Control Panel
	Attention, see the User's Manual	Control Panel
	Foot Control	Electric Label
	Fuse	Electric Label

5. Unit interconnection

5.1. Interconnection of the unit with basic equipment



Procedure:

1. Connect the silicone hose (2) to the hose connector **VACUUM** (1).
2. Connect the bacteriologic filter (3) to the hose (2). The side of filter marked „**IN**“ was directed to the safety jar (6).
3. Shift the hose (4) onto the other bacteriologic filter connector.
4. Shift the hose (4) to the output connector (5) (safety valve under the connector is safety valve (7)) of safety jar.
5. Shift the hose (10) on the input connector (9) (stream-line tip (8) is under connector) of safety jar (6).
6. Shift the loose end of the hose (10) on the output connector (12) of collecting jar - a safety valve is under connector - it is labelled as "VACUUM".
7. Shift the suction hose (11) on the input connector (13) (without safety valve) of the collecting jar - it is labelled as "PATIENT".

6. Switching on and operation

Attention: Ensure so as before each suction by new patient was realized sterilization of suction hose with suction adapter, vessel for secretion, safety vessel and interconnection hose to microbiological filter.

6.1. Suction unit operational set-out

Connect a suction unit with a vessel exit connector to secret – it is labelled as "VACUUM". Hoses must not be damaged, cracked or messed up.

Important!!! Check the bacteriologic filter from side "IN" and if the filter is glazed replace its.

6.2. Vessel preparation for secret

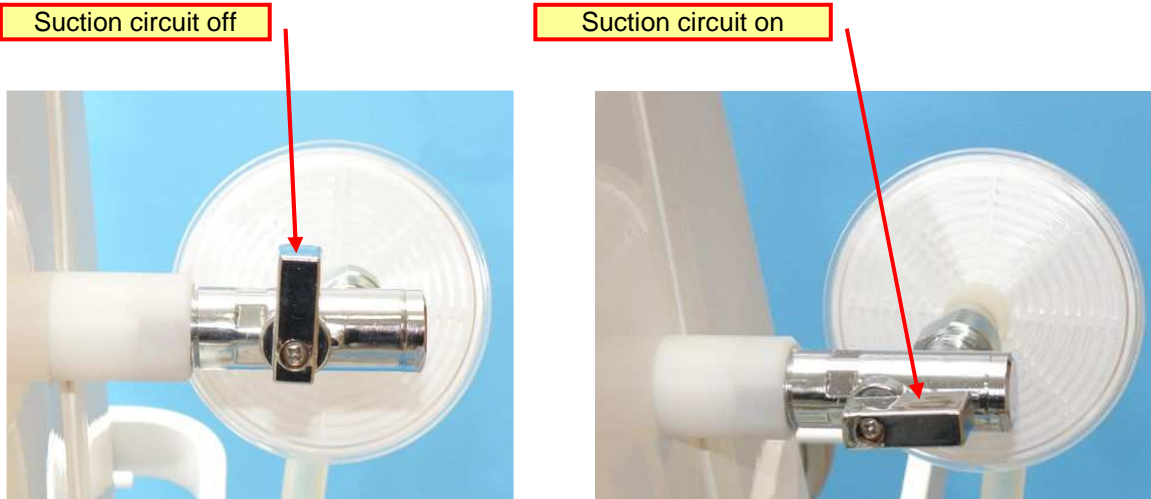
Vessels must be controlled for possible breaks, granularity or damage before use. Any defect can produce leakage or split of the vessel (implosion of the vessel on secret is possible at vacuum).

Before sucking we recommend to infuse into the secret vessel a little water or disinfecting agent for easier cleaning.

6.3. Switching on

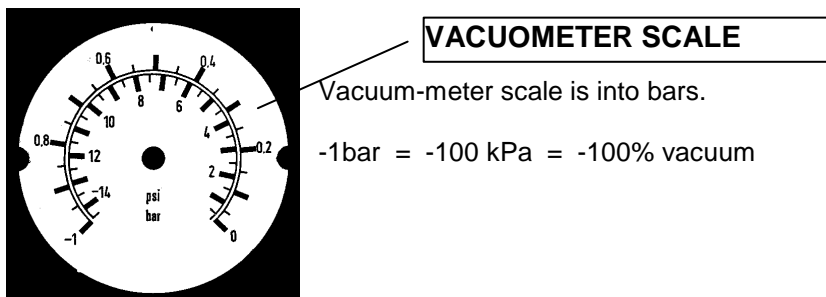
1. The unit is switched on by means of ON-OFF switch.
 - position „0“ - the unit **is off**
 - position „I“ - the unit **is on** (the switch illuminates)
2. Suction circuit - option and switching on

You can choose left or right suction circuit. It is possible to use both suction circuits at the same time.



3. Select the respective required value by regulator valve.

Vacuum is increasing by turning round of a regulating vent with the sun. Value of vacuum is displayed only if filtering perimeter is closed, e.g. by cranking the end of the filtering hose.



6.4. Functional examination of suction unit

6.4.1. Inner suction circuit

- turn the suction unit on
- cover the connector **(1)** on the suction unit by your finger
- turn the vacuum regulating vent with the sun till it stop
- maximum vacuum value must be displayed on the vacuum-meter (see point “Technical data”)

Status of components and leakage inside of suction unit is controlled by the test.

6.4.2. Outer suction circuit

- turn the suction unit on
- crank or cover free end of the suction hose **(11)** by your finger
- turn the vacuum regulating vent with the sun till it stop
- vacuum-meter must display maximum value of vacuum (see point “Technical data”) after some time (it depends of the secret vessel volume)

Status of components and leakage inside of suction unit outside its own body is controlled by the test.

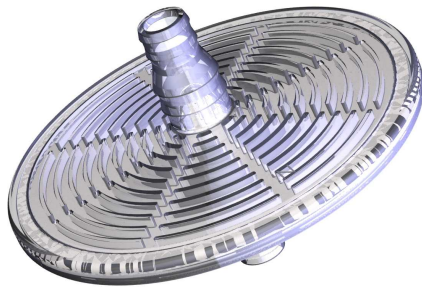
Note:

If the suction unit meets the first test but not the second, leakage must be into outer suction circuit (incorrectly mounted a vessel lid, defective filter, hoses put on deficiently, released connectors,...)

6.5. Changing of the secret vessel

Secret vessels must be replaced or cleared when they are filled up to 4/5 of their volume. We recommend having always a spare vessel in order to exchange the vessel quickly. Plastic vessel covers are equipped with a security float vent protecting it against over-flowing. The vent must be removed during clearing.

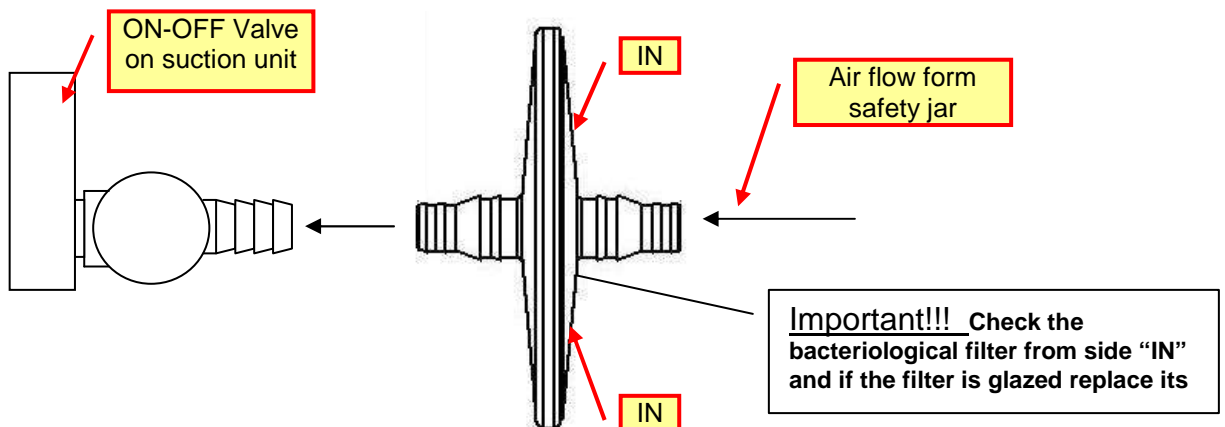
6.6. Changing of bacteriologic filter



Suction microbiologic filter eliminated risk of contamination with bacteria, viruses and infected particle from patient to suction pump or central vacuum distribution. Suction microbiological filter is **hydrophobic** with very high bacterial efficiencies up to 99,99999% particles bigger than 0,027 micron (which is smaller than **Hepatitis A, B and C**).

Applications:

Suction filter located behind output of the jar in front of the vacuum source. The filter put on so as the side of filter marked „**IN**“ was directed to the jar and the side without marked to the vacuum source.



Exchange:

The filter is necessary replaced, as it is glazed with dirtiness or by liquid sucked. Maximum using time is 30 days. After ending of suction of infection patient we recommended immediately exchanged the filter. It prevents spread of infection.

7. Technical data

<i>Typology MDD/93/43/EEC</i>		<i>Medical Device CLASS IIa</i>
<i>Model</i>		MEVACS M90
<i>Specification by EN ISO 10079-1</i>		<i>High Vacuum - High Flow</i>
<i>Electrical safety</i>		Class I
<i>Direct/indirect contact safety</i>		Type B
<i>Substances penetration protection</i>		IP 20
<i>Safety level in presence of anaesthetic/explosive mixture</i>		Not protected device
<i>Power consumption</i>		220-230V ± 10% / 50 Hz
<i>Input power</i>		420W + 15%
<i>Electric protection</i>		2 fuses Ø 5 x 20 T - 3,15 A
<i>Electric motor</i>		<i>Induction mono-phase with thermic protection</i>
<i>Vacuum pump</i>		<i>Maintenance-free piston vacuum pump</i>
<i>Suction</i>	<i>Air flow rate of pump</i>	108 L/min
	<i>Air flow rate on socket of suction unit</i>	89 L/min
	<i>Air flow rate on the end of suction tube in the base version</i>	76 L/min
	<i>Maximum vacuum</i>	up to - 92,4 kPa (693mmHg)
	<i>Jars</i>	1or 2 x 2,0 / 4,0 LT polycarbonate jars with overflow valve
	<i>Suction tube</i>	Silicone - Ø 8 x 3 mm - 2,0 m
<i>Operation</i>		<i>Continuous</i>
<i>Filtration</i>		<i>Hydrophobic suction microbiological filter with very high bacterial efficiencies up to 99,99999% particles bigger than 0,027 micron</i>
<i>Noise level</i>		45 +15% dB (A) @1m (by ISO 7779)
<i>Weight</i>		33 kg
<i>Dimension (L x W x H)</i>		apr. - 500x500x1080 mm
<i>Supply cord</i>		4 m
<i>Vacuum control valve</i>		
<i>Control vacuum gauge (precision ± 2.5%)</i>		
<i>Polycarbonate jar ml. graduated - autoclavable</i>		
<i>Special features (optional):</i>		
- <i>operation with foot control (IPX8)</i>		
<i>Working condition</i>	<i>Surrounding environment temperature</i>	5 ÷ 35 °C
	<i>Relative humidity</i>	30 ÷ 75%
<i>Storage condition</i>	<i>Surrounding environment temperature</i>	- 40 ÷ 70 °C
	<i>Relative humidity</i>	10 ÷ 100%
<i>Packing - wrappage</i>		<i>5 laminated cardboard carton</i>
<i>International Standards:</i>		
MDD 93/42/EEC; EN 60601-1; EN 60601-1-2; EN ISO 10079-1; EN ISO 14971		
<i>Technical life:</i>		10 years

8. Basic maintenance and cleaning

8.1. Unit attending and cleaning

After each use of the MEVACS unit the cleaning and disinfection of secretion vessel and suction hose is necessary to be performed and you have to perform sterilization. The filter replacement when it has blocked with liquid or dirty over time. After ending of suction of infection patient we recommended 12 / 15

immediately exchanged the filter and used up filter to disposal. It prevents spread of infection. The vessel content is decontaminated in a way utilised on site and the vessels including hoses are submerged into the disinfection solution. Keep the following rules during maintenance of the polycarbonate secretion reservoir and silicone hoses:

- **Do not use abrasives**
- **Check the compatibility of polycarbonate and detergents used in the hospital.** Polycarbonate enters into reaction with aldehyde residues, which are always present after use of disinfection solutions containing formaldehyde, glyoxale, glutaraldehyde
- Since we cannot know the whole range of cleaning and sterilization agents used in hospitals, we recommend to contact your suppliers and consult the compatibility of their agents and polycarbonate. Disinfection agents proved to be successful in practice are sekusept and chloramine (**Formalin and organic solvents are prohibited**)
- Before putting into autoclave wash the bottle thoroughly and dry in order to remove all residues of disinfection agents and water
- **Put the bottle into autoclave always upside down without contact with other components**
- **Autoclave the bottle and the cover always separately**
- **Do not put heavy subjects on the bottle in the autoclave to prevent its deformation**
- Autoclave the polycarbonate and silicone hoses at temperatures **not exceeding 121°C** max. for the period of 20 min.), autoclave mode „RUBBER“.

The microbiologic filter is disposable. The filter replacement when it has blocked with liquid or dirty over time. The microbiologic filter protected in the main patient or operating personnel into the face of infection and protect together suction unit for overflow secretion.

The plastic case, holders, truck and other equipment can be cleaned with soft, wet cloth moistened by cleaning agent, which does not react with the plastic and its surface finish,(SEKUSEPT). Agents with organic solvents are prohibited.

Also cleaning agents based on synthetic spirit (OKENA) are suitable, but also disinfection agents on the basis of sprays can be used.

Important! It is necessary to disconnect the mains cord before cleaning the unit. During cleaning the electric connectors, switch and the mains socket must be protected against water or cleaning agents, do not submerge the unit into water.

Note: No lubrication is necessary.

8.2. Small faults correction, unit trouble shooting

As each unit of our company, also MEVACS suction unit was tested and found trouble-free. Despite that fact some faults can occur, which follow either from blocking protection systems or from incorrect use.

For better orientation the faults, you can correct yourselves, are shown in the following table.

Damage symptom	Possible reason	Repairing action
Vacuum pump engine does not operate	<ul style="list-style-type: none"> • Switch is not on ⇒ Power supply • Instrument is not connected ⇒ Fuses • Air pump engine is damaged 	<ul style="list-style-type: none"> • Turn the switch into the position "I" ⇒ Repair electric socket into the room • Connect a power cord into the instrument ⇒ Replace fuses into the instrument socket • Call service technician
Inadequate sucking	<ul style="list-style-type: none"> ⇒ Leakage into the vacuum pump or inner suction perimeter • Hoses are damaged or set up incorrectly ⇒ Glazed filter • Damaged filter body ⇒ Damaged connectors or "O" rings on the vessel lid ⇒ Damaged gasket into the vessel lid • Damaged vessel, ripped or torn boundaries 	<ul style="list-style-type: none"> ⇒ Determine failure source according to point 6.4.1. Call service technician. • Control and push hoses ⇒ Replace the filter • Replace the filter ⇒ Replace a vessel lid, call service technician ⇒ Replace a vessel lid, call service technician • Replace the vessel

Vacuum pump engine operates, however a suction unit does not suction and vacuum-meter displays vacuum	<ul style="list-style-type: none"> Leech security float into the vessel lid 	<ul style="list-style-type: none"> Turn the suction unit off and disconnect a hose carefully from the suction unit socket
	⇒ Hoses blocking into the inner suction system <ul style="list-style-type: none"> Absorbed liquid into the hydrophobic filter 	⇒ Determine failure source according to point 6.4.1. Call service technician. <ul style="list-style-type: none"> Replace the filter

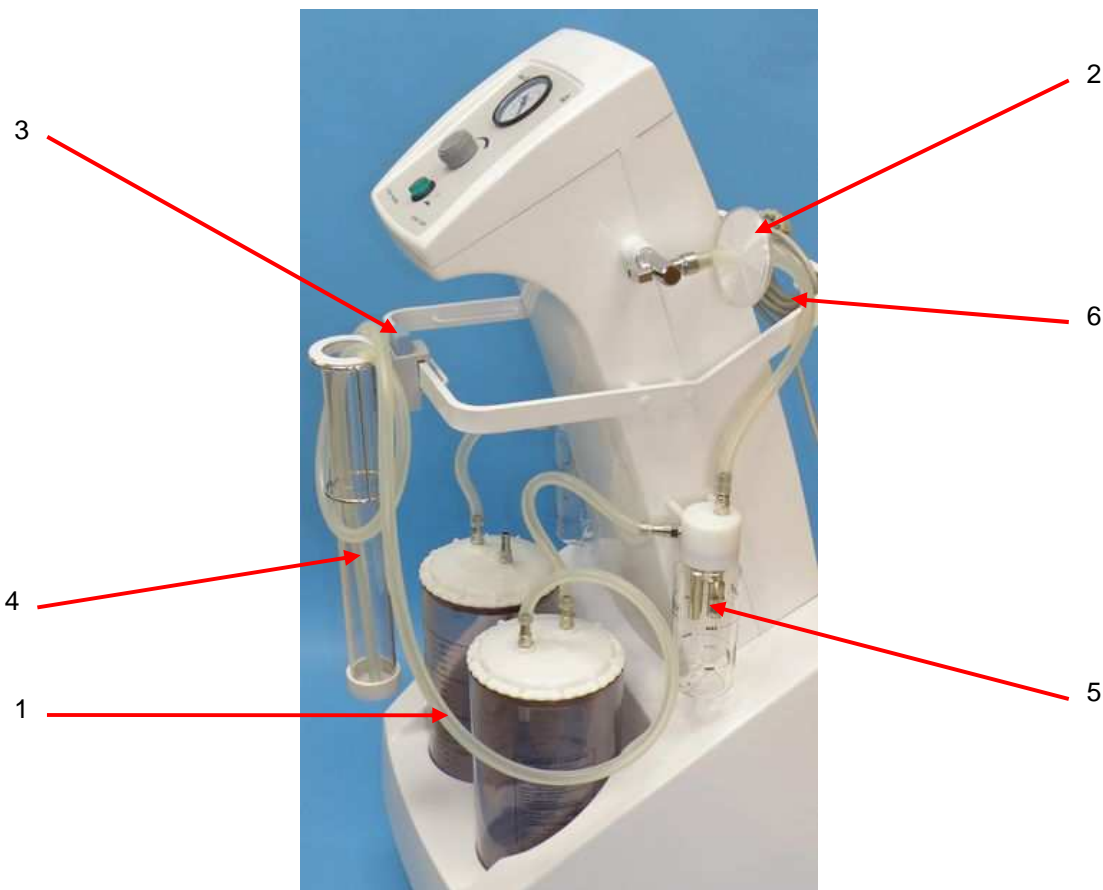
- Since it is not possible to specify all possibilities of faults, which can occur during the unit operation, in case of not specified faults contact either qualified persons of service company, or directly the manufacturer:

MEDIST s.r.o., Petrusovskeho 4, 066 01 Humenne, Slovakia
tel./fax 00421-57-7753276, E-mail: medist@medist.sk

8.3. Regular check





Suction flask MEVACS is no service-needed device. We recommend perform regular check minimally once a year for mistake-free operation. Only service technicians can perform check and repair. They have authority from the company MEDIST s.r.o., Humenne.

9. Main assemblies, subassemblies, components and spare parts



No	Ord. number	Name	No	Ord. number	Name
1	40100.00	Silicone hose 8x3 - 2 m	5	70105.35-X	Safety jar right or left
2	42101.04	Suction filter	6	40100.00	Connecting silicone hose 8x3 mm
3	70105.16	EURO rail adapter	7	13801.00	Electric cord
4	42003.01	Suction catheter container			

Jars:

<p>B-15/16</p>		<p>2.0 L jar TM with silicone ring lid</p> <ul style="list-style-type: none"> ☛ polycarbonate, autoclavable 121°C (No: 42011.15) ☛ polysulfone, autoclavable 134°C (No: 42011.13) ☛ safety valve in lid ☛ metal connectors
<p>B-17/18</p>		<p>2.0 L jar TM with screw metal lid</p> <ul style="list-style-type: none"> ☛ polycarbonate, autoclavable 121°C (No: 42011.14) ☛ polysulfone, autoclavable 134°C (No: 42011.21) ☛ safety valve in lid ☛ metal connectors
<p>B-22/23</p>		<p>4.0 L jar TM with pressure-fit lid</p> <ul style="list-style-type: none"> ☛ polycarbonate, autoclavable 121°C (No: 42011.12) ☛ polysulfone, autoclavable 134°C (No: 42011.10) ☛ safety valve in lid ☛ metal connectors
<p>B-27/28</p>		<p>MONOVAC suction liner</p> <ul style="list-style-type: none"> ☛ MONOVAC 1.4 L (No: 42001.31) ☛ safety valve in lid