OLYMPUS®

INSTRUCTIONS

SUCTION PUMP

KV-5

CAUTION
Federal (USA) law restricts this device to sale by or on the order of a physician.

CE
0086

IMPORTANT

Please read this manual carefully before attempting to use the Olympus KV-5 suction pump as it contains important information on the proper care, handling and use of the equipment. In addition, read the manuals of any other units (endoscope, light source, etc.) that form part of the system.

The safety and performance of an endoscopic system depends not only on the endoscope but also on the ancillary equipment used with it. Ensure any ancillary equipment is compatible with the endoscope and other equipment used. These instructions should be retained for reference during the life of the product. If you have any questions concerning the material contained in this manual, please contact your Olympus representative or nearest Olympus office.

INTENDED USE

The Olympus KV-5 suction pump is a simple, reliable pump intended for aspiration use during flexible endoscopy and general medical or surgical suction. The compact size of the unit enables it to be conveniently used and stored on an endoscopy workstation. It is intended for use within a health care facility, not for domiciliary or field and transport use.

The KV-5 is not designed for thoracic drainage.

Do not use the equipment for any purpose other than its intended use.

WARNING SYMBOLS USED ON DEVICE

Refer to instructions

SIGNAL WORDS

WARNING: ● Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: ● Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices or potential equipment damage.

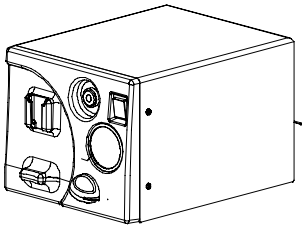
NOTE: ● Indicates additional, helpful information.

CONTENTS

1 STANDARD SETS & FEATURES

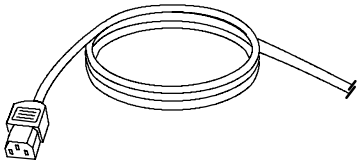
The KV-5 is available in two configurations - as a single-use suction system or a reusable suction system. Unpack the equipment and confirm the items in the standard set ordered are present and undamaged. Retain the packaging for future use. Contact Olympus if any parts are damaged or missing.

1.1 Standard set - Single-use suction system

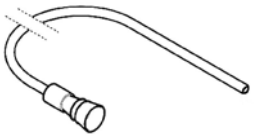


KV-5 suction pump

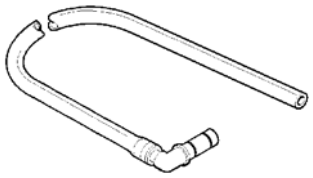
Microbial Filter
(pack of 10)



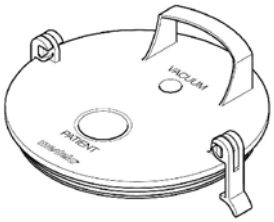
Power
cable



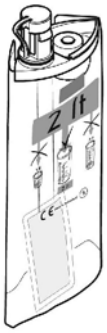
Patient connecting tube 2m
pk 5 (sterile)



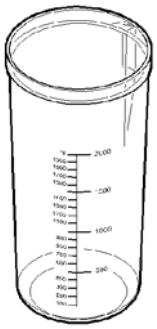
Filter connecting tube 900mm
pk 10 (non-sterile)
K7503657



Lid for use with single-use liner*
K7503761

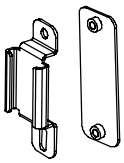


Single-use liner 2 ltr pk 25
K7503430



Suction jar 2 ltr
K7503763

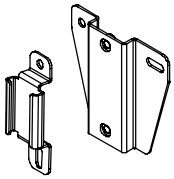
4mm A/F Allen key x1



Suction jar mounting kit for
Olympus WM-30/60
K7503555

Supplied with standard sets:
p/no 2000455, 2000456

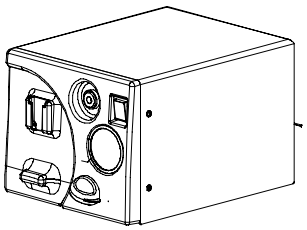
or



Suction jar mounting kit for
Olympus WM-N60/D60, Olympus TC-C1/NE
K7503556

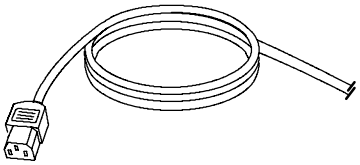
Supplied with standard sets:
p/no 2000450, 2000451

1.2 Standard set - Reusable suction system

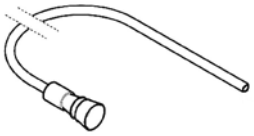


KV-5 suction pump

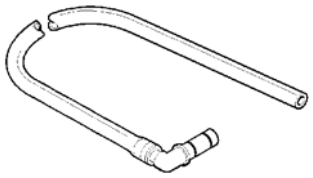
Microbial Filter
(pack of 10)



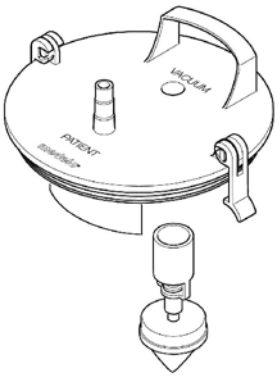
Power
cable



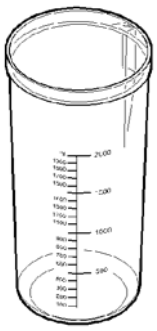
Patient connecting tube 2m
pk 5 (sterile)



Filter connecting tube 900mm
pk 10 (non-sterile)
K7503657

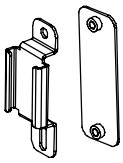


Lid with float mechanism*
K7503760



Suction jar 2 ltr
K7503763

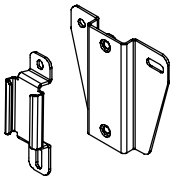
4mm A/F Allen key x1



Suction jar mounting kit for
Olympus WM-30/60
K7503555

Supplied with standard sets:
p/no 2000455, 2000456

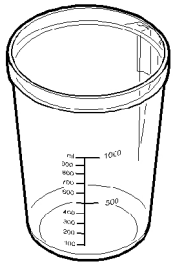
or



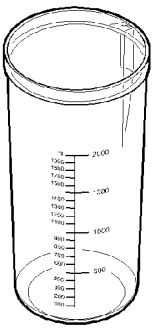
Suction jar mounting kit for
Olympus WM-N60/D60, Olympus TC-C1/NE
K7503556

Supplied with standard sets:
p/no 2000450, 2000451

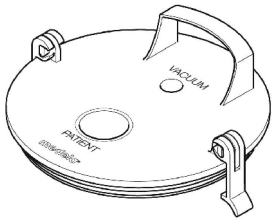
1.3 Replacement / Optional parts



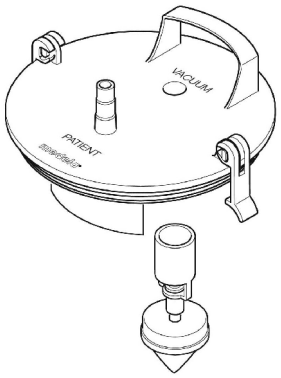
Suction jar 1 ltr
K7503762



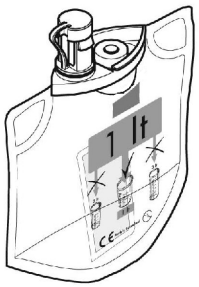
Suction jar 2 ltr
K7503763



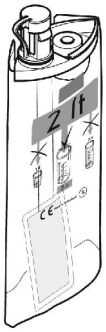
Lid for use with single-use liner*
K7503761



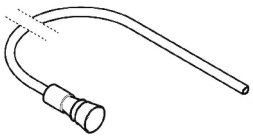
Lid with float mechanism*
K7503760



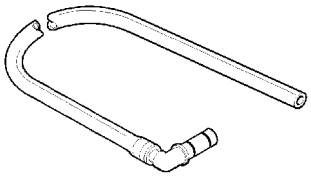
Single-use liner 1 ltr
pk 30
K7503428



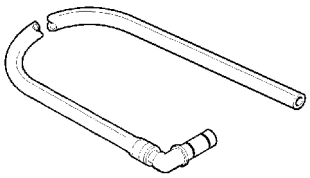
Single-use liner 2 ltr
pk 25
K7503430



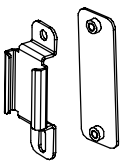
Patient connecting tube 2m
pk 50 (sterile)
K7503432 (Rest of World)
K7505595 (Americas only)



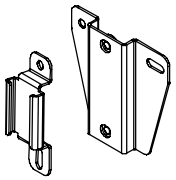
Filter connecting tube 340mm
pk 10 (non-sterile)
K7503486
For use with1 litre KV-5 mounted suction jar



Filter connecting tube 900mm
pk 10 (non-sterile)
K7503657
For use with trolley mounted suction jar



Suction jar mounting kit for
Olympus WM-30/60
K7503555



Suction jar mounting kit for
Olympus WM-N60/D60
Olympus TC-C1/NE
K7503556

* The suction jar lid can be used with both 1 and 2 litre suction jars.

1.4 Features

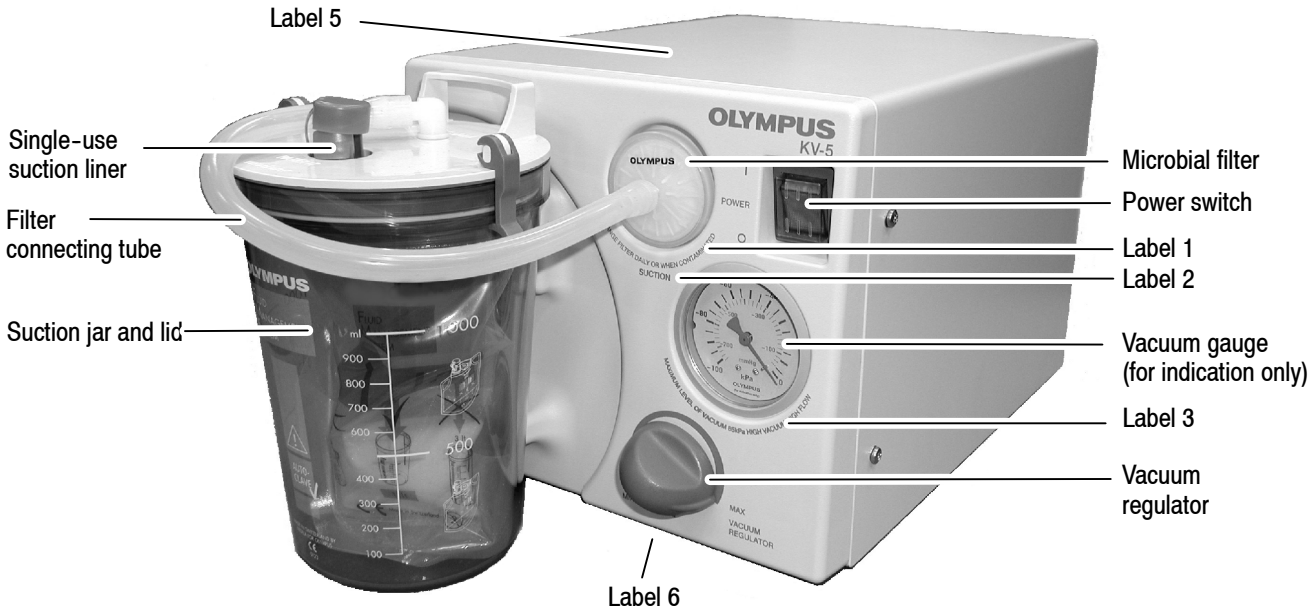


FIGURE 1-1

1.5 Labels

Label 1	CHANGE FILTER DAILY OR WHEN CONTAMINATED	Label 2	SUCTION
Label 3	MAXIMUM LEVEL OF VACUUM 85kPa HIGH VACUUM / HIGH FLOW	Label 4	RATING PLATE
Label 5	CAUTION: REMOVE TRANSIT SCREWS FROM BASE BEFORE USE. REPLACE BEFORE TRANSPORTATION.	Label 6	CAUTION: REMOVE TRANSIT SCREWS BEFORE USE. REPLACE BEFORE TRANSPORTATION.

NOTE

Label 5 should be removed and stored safely when the transit screws have been removed (Section 2.1). When the unit is to be transported, replace the transit screws and affix the label on top of the unit.

Label 6 is permanent.

2 OPERATING PRECAUTIONS

2.1 Before use

- The unit must be used solely for its designed purpose, that is endoscopic aspiration and general medical or surgical suction in a health care facility. This device is a 'high vacuum, high flow' device and is not intended for thoracic drainage.
- Explosion hazard - never install or use the KV-5 within the zone of risk of flammable gases.
- The unit is fitted with two M6 transit screws to protect the pump during transportation. Before use, remove both screws with fibre washers using the 4mm A/F Allen key provided (Figure 2-1), then remove the label from the top of the unit. Store these items safely as they must be refitted when transporting the unit.

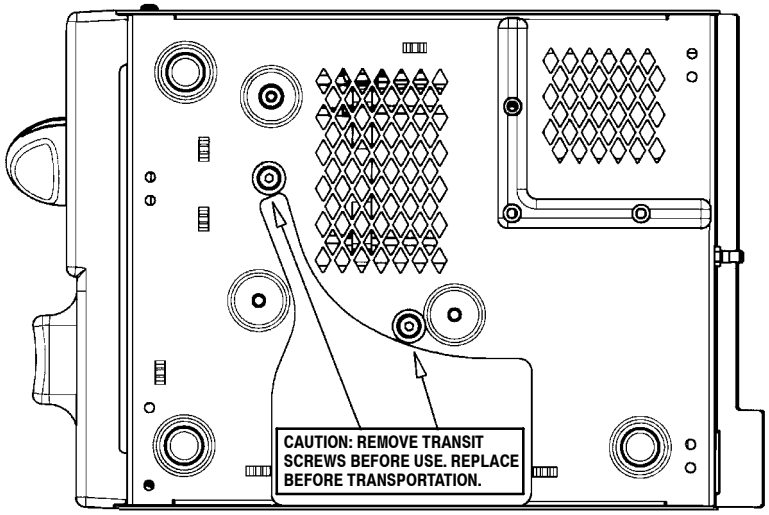


FIGURE 2-1

- Excessive frothing in the suction jar during use may inhibit operation of the fluid cut-off mechanism - use a proprietary anti-foam agent as necessary to minimise frothing.
- The electrical installation of the room where the unit is to be used must comply with local or national regulations.
- The KV-5 is not intended to be used when positioned on inclined surfaces as the suction jar fluid cut-off mechanism may not function correctly.
- The unit is only to be used by suitably qualified personnel in accordance with these instructions.
- Replace the microbial filter daily or when contaminated.
- Do not use anti-static tubing to connect the endoscope to the suction pump as patient safety may be compromised.
- The suction jar must never be used 'free standing' on the workstation or any surface. The 1 litre suction jar simply slides into the bracket provided on the front panel of the unit as shown on page 2, the 2 litre suction jar should be secured to workstation using the suction jar bracket.
- Periodically inspect the suction jar for obvious signs of wear/damage and replace if necessary.
- If the suction jar is dropped, it must be thoroughly inspected to ensure there are no cracks and tested to ensure the lid is sealing correctly. If damage or a leak is evident, discard the suction jar and replace.
- When a suction jar is attached to a workstation using the optional suction jar bracket, remove the suction jar before manoeuvring the workstation.

- Ensure the exhaust at the rear of the unit is unobstructed when the unit is operational.
- Store and use the KV-5 within the environmental conditions described in Section 6; failure to do so may lead to equipment malfunction or failure.
- Only use replacement parts and accessories as specified in Section 5.3. Failure to do so may lead to equipment malfunction or failure.

2.2 During use

- Do NOT lift the suction jar by the lid, always grip with two hands on either side of the suction jar, otherwise the cap and jar may become separated and spillage of its contents may result.
- If aspirated material has been drawn past the microbial filter and into the pump, the unit must be removed from use and returned to Olympus for service.
- To prevent liquid backflow within the patient connecting tube, always leave the unit running until the patient tube is disconnected from the suction jar.

2.3 After use

- If single use suction liners are not being used, the suction jar will contain potentially infectious body fluids. Take suitable precautions, as dictated by local hospital policy, such as use of personal protective equipment, and empty into a suitable waste disposal system, together with an appropriate quantity of water to dilute the jar contents.
- Single use suction liners, used filters and suction tubing will contain potentially infectious material. Dispose of carefully as dictated by local hospital policy as clinical waste for incineration.
- Always empty the suction jar before moving the equipment. Care should be taken to obtain a firm grip underneath the body of the equipment before moving. The suction jar holder must never be used as a hand hold or carrying handle.

3 INSTRUCTIONS FOR USE

3.1 Place the KV-5 on a level flat surface.

3.2 Thoroughly inspect the suction jar for cracks or signs of damage and any suction tubing to be used for signs of wear or damage. Do not use if damage is noted.

WARNING
Defects in the suction jar may cause the jar to implode when under vacuum.

NOTE
The suction jar may be used with or without single-use suction liners. Use without requires an optional suction jar lid with integral float mechanism (p/no K7503760).

3.3 **Use with single-use suction liners**

NOTE
The standard set supplied is a 2 litre suction system. If a 1 litre system is required, a 1 litre suction jar, a 1 litre single-use suction liner and 340mm filter connecting tube will be required. These items are optional and are detailed in Section 1.3.

(1) Refer to the instructions supplied with the single use suction liner and fit the liner to the suction jar.

NOTE
The single-use liners incorporate a solidifier to aid disposal.

(2) Referring to Figure 3-1, locate the suction jar into the suction jar holder located on the front panel of the unit.

NOTE

The suction jar holder will only accommodate the 1 litre suction jar. 2 litre suction jars should be mounted on the workstation and require the use of a suction jar mounting bracket (see Section 1). Fitting instructions for the suction jar mounting brackets are provided with the brackets.

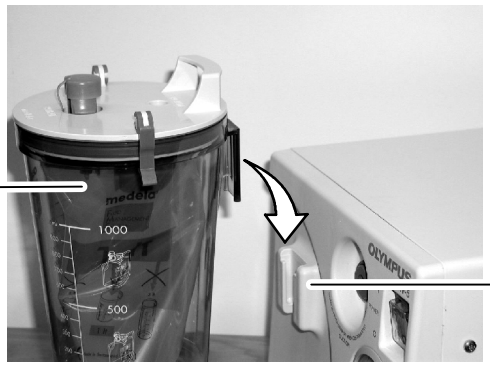


FIGURE 3-1

(3) Remove the transit bung from the filter housing (retain for transportation) on the front of the unit and insert the microbial filter with the word 'Olympus' facing outermost (see Figure 3-2)

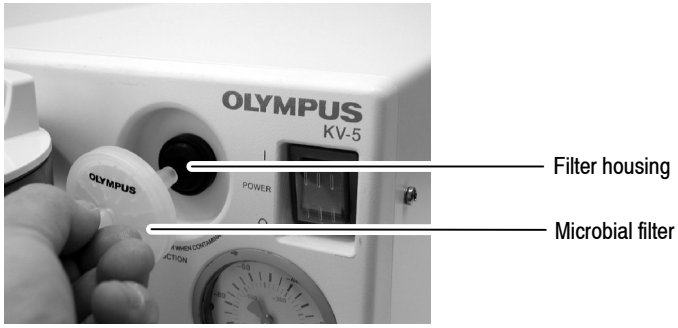
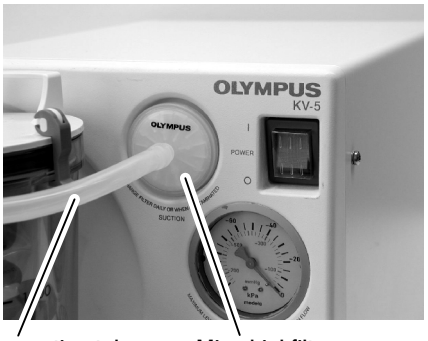
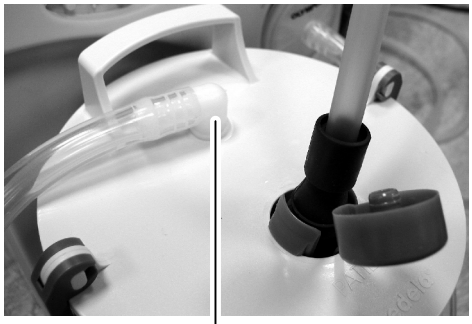


FIGURE 3-2





(4) Connect the patient tube between the suction jar lid (Figure 3-3) and endoscope or other equipment as required.

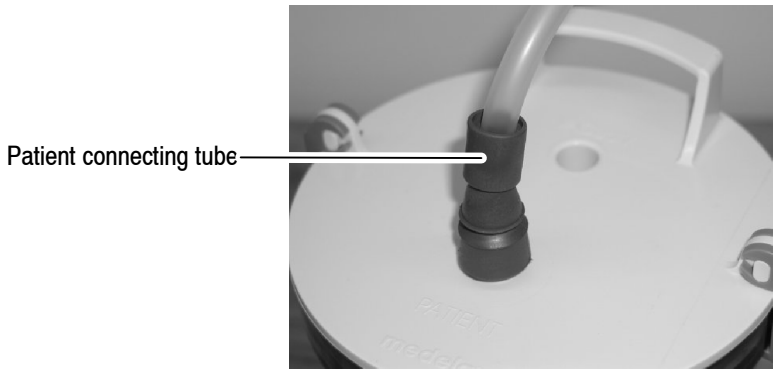
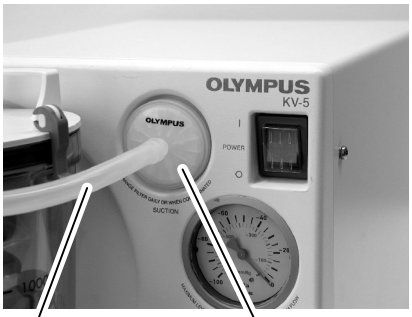


FIGURE 3-3

(5) Push the open end of the filter connecting tube onto the microbial filter and fully insert the 90° connector into the suction jar lid marked VACUUM (Figure 3-4).



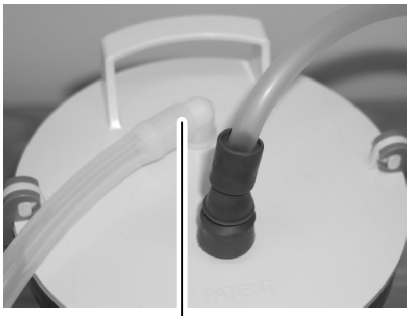


FIGURE 3-4

(6) Ensure the KV-5 power switch is OFF and the vacuum regulator is set to 'MIN', then connect the power cable into the IEC receptacle on the rear of the unit and a suitably grounded AC wall outlet or isolation transformer socket.

(7) Set the power switch to the 'I' position, the switch will illuminate and the pump will start to run.

(8) The suction level can be increased and set as required by turning the vacuum regulator in a clockwise direction. To obtain suction via an endoscope, refer to the instructions for the endoscope.

(9) Suction should be stopped when the fluid reaches the 1 litre / 2 litre mark.

NOTE
If the liner is overfilled, an integral hydrophobic filter will prevent further suction. To allow suction to continue, proceed as below.

(10) Change the liner as follows:

CAUTION
The single-use suction liner, filters and suction tubing will contain potentially infectious body fluids. Take suitable precautions, as dictated by local hospital policy, such as use of personal protective equipment, and dispose of carefully as clinical waste for incineration.

Do NOT lift the suction jar by the lid, otherwise the lid and jar may become separated and spillage of its contents may result.

When using single-use liners, if the liner is over filled or filled rapidly and the KV-5 is switched OFF with the patient tube disconnected from the endoscope, aspirated fluid may syphon from the single use suction liner into the patient connecting tube. Always leave the unit running until the patient connecting tube is disconnected from the suction jar to prevent liquid back flow..

The patient tube may contain residual fluid so carry holding both ends of the tube upright, taking care to ensure it is properly drained before disposal in line with local hospital policy.

a) Keep the KV-5 switched ON and disconnect the patient connecting tube from the single use suction liner.

b) Replace the cap on the single use suction liner and press the cap firmly downwards, through the lid into the suction jar. The contents of the liner are now sealed.

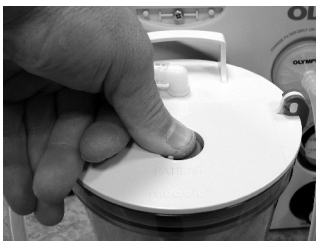


FIGURE 3-5

c) Switch OFF the KV-5, remove the filter connecting tube if required and then remove the suction jar lid. Finally, remove the single use suction liner from the suction jar and dispose of in line with local hospital policy.

3.4 Use with reusable suction system

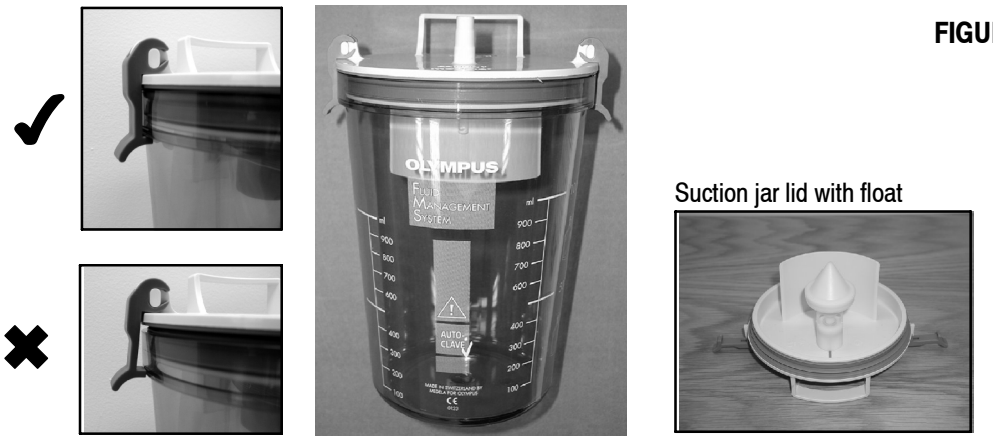
NOTE

The standard set supplied is a 2 litre suction system. If a 1 litre system is required, a 1 litre suction jar and a 340mm filter connecting tube will be required. These items are optional and are detailed in Section 1.3.

(1) Push the float fully onto the vacuum spigot inside the lid (see Figure 3-6).

(2) Position the suction jar lid with float mechanism onto the jar with the word PATIENT on the lid facing the front of the jar, then press the lid down firmly and secure the two fasteners, see Figure 3-6.

FIGURE 3-6

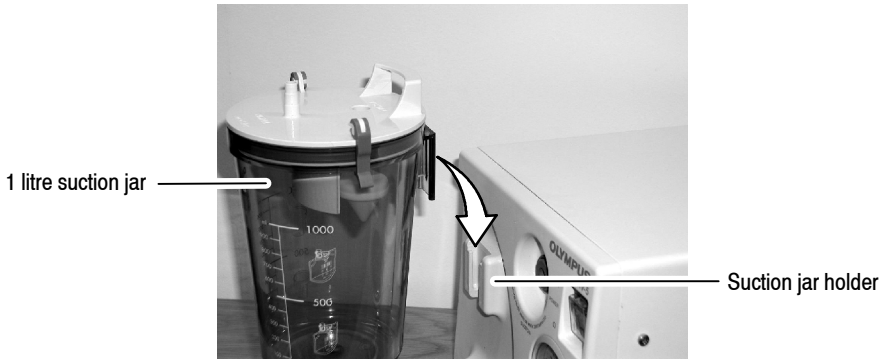


(3) Referring to Figure 3-7, locate the suction jar into the suction jar holder located on the front panel of the unit.

NOTE

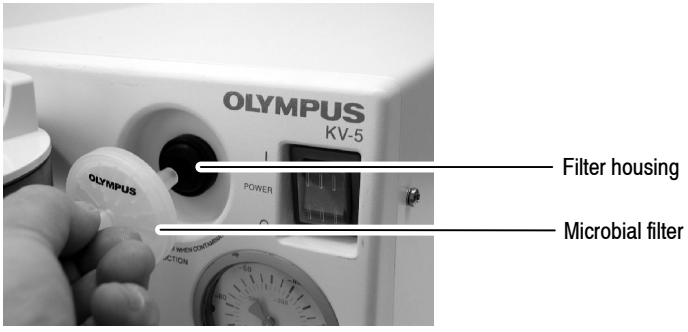
The suction jar holder will only accommodate the 1 litre suction jar. 2 litre suction jars should be mounted on the workstation and require the use of a suction jar mounting bracket (see Section 1). Fitting instructions for the suction jar mounting brackets are provided with the brackets.

FIGURE 3-7



(4) Remove the transit bung from the filter housing on the front of the unit and insert the microbial filter with the word "Olympus" facing outermost (see Figure 3-2)

FIGURE 3-8



(5) Connect the patient tube between the suction jar lid (Figure 3-9) and endoscope or other equipment as required.

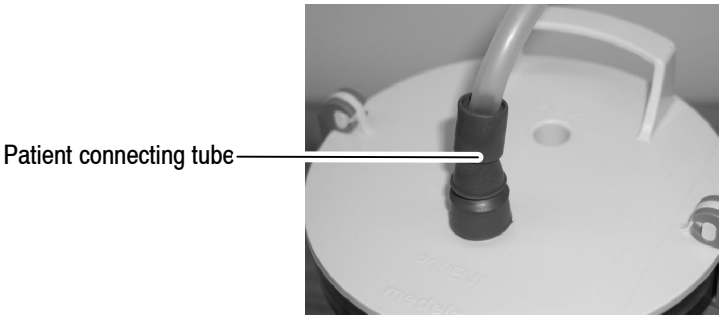
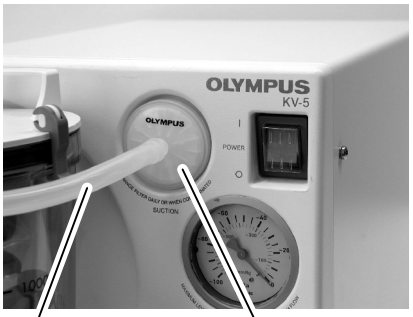
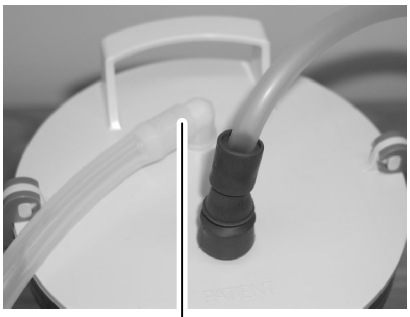


FIGURE 3-9

(6) Push the open end of the filter connecting tube onto the microbial filter and fully insert the 90° connector into the suction jar lid marked VACUUM (Figure 3-10).





Filter connecting tube

Microbial filter

Filter connecting tube 90° connector

FIGURE 3-10

(7) Ensure the KV-5 power switch is set to O and the vacuum regulator set to 'MIN', then connect the power cable into the IEC receptacle on the rear of the unit and a suitably grounded AC wall outlet or isolation transformer socket.

(8) Set the power switch to the 'I' position, the switch will illuminate and the pump will start to run.

(9) The suction level can be increased and set as required by turning the vacuum regulator in a clockwise direction. To obtain suction via an endoscope, refer to the instructions for the endoscope.

(10) Suction should be stopped when the fluid reaches the 1 litre / 2 litre mark.

NOTE
When the fluid in the suction jar reaches the float, the float will rise and seal the patient tube when capacity is reached, preventing further suction. Empty the suction jar replace the lid to allow suction to continue.

(11) Empty the suction jar as follows:

CAUTION
The suction jar, filters and suction tubing will contain potentially infectious body fluids. Take suitable precautions, as dictated by local hospital policy, such as use of personal protective equipment, and dispose of carefully as clinical waste for incineration.

Do NOT lift the suction jar by the lid, otherwise the lid and jar may become separated and spillage of its contents may result.

The patient tube may contain residual fluid so carry holding both ends of the tube upright, taking care to ensure it is properly drained before disposal in line with local hospital policy.

a) Keep the KV-5 switched ON and disconnect the patient connecting tube from the suction jar lid.

b) Turn off the unit and remove the filter tube from the suction jar lid.

c) Taking suitable precautions, as dictated by local hospital policy, such as use of personal protective equipment, empty the jar into a suitable waste disposal system, together with an appropriate quantity of water to dilute the jar contents.

d) Clean the suction jar and lid as described in Section 4 before re-use.

4 CLEANING CARE AND STORAGE

4.1 Remove the filter connecting tube and clean using neutral detergent and water. The tube may be sterilised by autoclaving (up to 137˚C max) after removing the 90˚ connector, which should be replaced. The microbial filter should be replaced daily or when contaminated. Replace the patient connecting tube when contaminated or at the end of each patient list.

CAUTION
The patient tube is not autoclavable.

4.2 Following use, remove the lid from the jar by disconnecting the lid clips and where applicable remove the float assembly. Clean thoroughly using a soft brush and mild detergent solution. The suction jar cap may be sterilised by autoclaving up to 137˚C max according to hospital policy, then reassembled for further use.

CAUTION
Do not use phenol- or chlorine-based disinfectants to decontaminate the suction jar lid as damage and rapid deterioration of these components will result.

4.3 The suction jar may be sterilised by autoclaving up to 137˚C max according to hospital policy, or disinfected by cold fluid immersion.

CAUTION
Do not use phenol or chlorine based disinfectants to clean the suction jar as damage to the jar may result.

Do not place alcohol or aldehyde-based detergents, antiseptics or antifoam agents in the suction jar prior to use, as any vapour released may damage the hydrophobic filter. This may result in fluid ingress to the vacuum pump, which will then need to be serviced or replaced.

Do not stack suction jars when autoclaving as damage to the jar may result.

Contact with non-ionic detergents, such as those found in thermo-chemical disinfection can cause cracking of the suction jar.

Ensure the suction jar is thoroughly rinsed with fresh water following disinfection.

4.4 Clean the KV-5 casing, including the microbial filter housing, by wiping with a cloth dampened with detergent and water or alcohol impregnated swab. Thoroughly rinse off any detergent using a soft cloth dampened with clean water.

4.5 Before storing the KV-5, ensure the unit has been thoroughly cleaned and its accessories have been sterilised or disinfected. Do not leave a single use liner in the suction jar.

CAUTION
Do not store single use liners in damp or wet conditions as damage to the hydrophobic filter will result and the liners will be unusable

4.6 If the KV-5 is to be transported, ensure that:

(1) The unit is thoroughly cleaned.

(2) The filter is removed and the transit bung fitted.

(3) The two transit screws with fibre washers are replaced and tightened using the 4mm A/F Allen key.

(4) The label (label 5) is affixed to the top of the unit.

(5) The unit is packed in its transit packing.

CAUTION
Failure to fit the transport screws when transporting the unit may result in damage to the pump.

5 MAINTENANCE AND REPAIR

There are no operator-serviceable components inside the KV-5. Refer servicing to qualified service personnel. If repair of the KV-5 is required, contact Olympus.

Olympus will not be liable for any incident resulting from repair, adjustment or modification carried out by other than personnel authorised by Olympus.

5.1 Preventive Maintenance

Daily - by user

- Check that the filter connecting tube, suction jar and lid are in good condition.
- Replace the microbial filter and or filter connecting tube (with 90° connector) if contaminated.
- Clean (and disinfect/sterilise if required by local policy) the suction jar, suction jar lid and filter connecting tube.

Weekly - by user:

- Clean the unit's casework, ensuring the exhaust at the rear of the unit is clear.
- Inspect the suction jar for cracks or signs of wear, replace if necessary.
- Check the maximum vacuum available by sealing the patient connection of the suction jar lid. This should be at least 85 kPa.

Six-monthly - by qualified hospital engineer or Olympus agent:

- Check internal condition of unit, wiring security, etc.
- Check the flow rate by timing how long it takes to reach 60 kpa with a 2 litre suction jar connected - should be approximately 10 seconds. Contact Olympus if less than this for the pump to be serviced.

A maintenance & repair manual is available from Olympus, part number 5070225.

5.2 Troubleshooting

Symptom	Possible cause
Pump fails to operate	Check that the unit is correctly connected to the power supply and that the power switch illuminates when set to **I.**
	Check the fuses, located within the pull-out fuseholder above the power plug connector **NOTE:** Always replace a fuse with one of the correct type and rating. If a fuse continues to blow, contact Olympus.
	The thermal cut-out within the windings of the pump motor may have operated. Check the vents are clear. When the temperature of the windings falls to an acceptable level normal operation will resume. If the problem recurs, contact Olympus.
Pump operates but no suction or suction level is too low.	Check that all connections are secured. Check the unit is correctly connected to the endoscope or other device.
	Check that the microbial filter is not blocked and suction tubes are correctly positioned and are not kinked, blocked or punctured. Check the jar liner is not full and that the float mechanism (if used) is not stuck in the closed position.
	Check performance of the pump as per Section 5.1.
	Check the vacuum regulator is set to the correct position.
	Check all connections and tubing for air leakage. **NOTE:** If aspirated fluid or solid material has been drawn into the unit, the pump will continue to operate, but the unit should be returned to Olympus for inspection and repair.

5.3 Replacement parts & accessories

Fuse T1.25H (20mm) 220-240V units	7146299
Fuse T2.5H (20mm) 100-120V units	7146302
Microbial filter (pack of 10)	7048271
Power cable 230V (UK)	7145454
Power cable 230V (Europe)	7145462
Power cable 110V (USA)	7146311
Power cable 100V (Japan)	7146329
Suction jar 1ltr	K7503762
Suction jar 2ltr	K7503763
Lid for single-use liner	K7503761
Lid with float mechanism	K7503760
Single-use liner 1ltr pk 30	K7503428
Single-use liner 2ltr pk 25	K7503430
Patient connecting tube 2m pk 50 (Rest of World)	K7503432
Patient connecting tube 2m pk 50 (Americas only)	K7505595
Filter connecting tube 340mm pk 10	K7503486
Filter connecting tube 900mm pk 10	K7503657
Jar mounting kit Olympus WM-30/60	K7503555
Jar mounting kit Olympus WM-D60/N60, TC range	K7503556
Transit screw	K3921028
Fibre washer	K3921029

6 SPECIFICATIONS

Items	Specifications	
Product name	Olympus Suction Pump KV-5	
Classification (electromedical equipment)	Standards compliance	Complies with EN ISO 10079-1 and EN IEC 60601-1 (220-240V model), UL 2601-1 and Certified to CAN/CSA Std. No. C22.2 No. 601.1-M90 (100-120V model).
	Electro-magnetic compatibility	This product complies with the requirements of EN IEC 60601-1-2 for emissions and immunity, and as such, its operation is unlikely to be affected by, or cause interference with, equipment meeting appropriate EMC standards. As a precaution, equipment which may be sensitive to interference outside the limits specified by EN IEC 60601-1-2 should not be placed in close proximity to the KV-5.
	Type of protection against electrical shock	Classification according to EN IEC 60601-1 / UL 2601-1: Class I with Type BF applied part.
	Degree of protection against electrical shock	In accordance with EN IEC 60601-1 and UL 2601-1, the KV-5 is marked with the symbol to indicate the provision of an adequate degree of protection against electrical shock and that it has an applied part isolated from all other parts of the equipment.
	Degree of protection against explosion	None: the Olympus KV-5 must NOT be used in the zone of risk of flammable anaesthetic gases.
	Mode of operation	Continuous
Regulatory status	European Economic Area (EEA)	CE 0086 This mark on the product (220-240V model) indicates compliance with Directive 93/42/EEC relating to medical devices, Class IIa. The year of manufacture is given in the first two digits of the serial number.
End of life		In accordance with European Directive 2002/96/EC on Waste Electrical and Electronic Equipment, this symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately. Refer to your local Olympus distributor for return and/or collection systems available in your country.
Dimensions and weight	Dimensions	Height: 220 mm Width: 255 mm Depth: 310 mm
	Weight	12.7 kg
Power switch	Marking	The power switch is marked: **I** - on, **O** - off.
Power requirements	**Power supply** / **Frequency** / **Fusing** / **Power rating** 220-240V~ / 50/60Hz / 2 x T1.25H / 130VA 100-120V~ / 50/60Hz / 2 x T2.5H / 130VA **Marking:** The mark ~ on the product indicates the requirement for an AC power supply.	
Environmental conditions	Ambient temperature	Operational: +10˚C to +40˚C (+50˚F to +104˚F) Storage: -40˚C to +70˚C (-40˚F to +158˚F)
	Relative humidity	Maximum: 95% at 40˚C relative non-condensing
	Atmospheric pressure	Operational: 70 to 106 kPa Storage: 23.5 to 106 kPa
Fluid ingress	In accordance with EN IEC 60601-1/UL 2601-1, the product is marked IPX1 to indicate that it is provided with an enclosure that prevents entry of such an amount of falling liquid as might interfere with its safe and satisfactory operation when correctly positioned.	
Resistance to chemicals	The external surfaces of the Olympus KV-5 are resistant to: 2% aqueous neutral detergent, 70% ethyl alcohol, isopropyl alcohol, water.	
Pump specification	Nominal vacuum: 85 kPa ±10% Minimum free air flow rate: 20 l/min In accordance with ISO 10079-1, the unit is marked with the words 'HIGH VACUUM, HIGH FLOW' to indicate it attains a vacuum of at least 60 kPa in 10 seconds and a free air flow rate of 20 l/min or greater.	
Thermal cut-out	A thermal cut-out is contained within the windings of the pump motor, set to operate if the temperature of the windings exceeds 125˚C (257˚F).	

Single-use suction liner	To prevent fluid from being drawn up to the pump, the single-use suction liners, available in 1 or 2 litre versions, contain a mechanism to shut off the flow when the liner is overfilled. This mechanism is activated when contact is made with aspirated fluid. The single-use liners also contain a solidifier to aid safe disposal.
Suction jar	The 1 and 2 litre suction jars are manufactured from polysulfone, allowing them to be autoclaved up to 137˚C max. The suction jar is impact resistant.
Suction jar lid	The suction jar lid clips and where applicable the float mechanism, are autoclavable up to 137˚C max. The inlet connection (from the endoscope) is marked with the word PATIENT, the outlet connection (to the filter) is marked with the word VACUUM. An optional lid is available having an integral float mechanism for use without single-use suction liners.
Suction tubing	The filter tubing supplied is silicone rubber, 6.0mm internal diameter, 12.0mm external diameter. The sterile patient tubing supplied is PVC, 7.0mm internal diameter, 10.0mm external diameter. Use only tubing with the specified dimensions, otherwise equipment malfunction may result. The patient tube connects to a barbed connector on the suction jar cap and the filter tube has a removable 90˚ connector which is a push-fit into the suction jar cap.
Vacuum gauge	Range: 0 to 100 kPa Accuracy: better than ±2.5% of full scale

Olympus is continually developing its product range and reserves the right to alter the above specification without notice. The Olympus KV-5 is manufactured in the UK by KeyMed (Medical & Industrial Equipment) Ltd.

7 TECHNICAL DESCRIPTION

7.1 Mechanical Operation

Refer to Figure 7-1

The pump used in the KV-5 is a piston unit. The pump is connected to the suction jar by silicone tubing and has an in-line microbial filter. A suction tube connects the endoscope or other devices to the suction jar. When the KV-5 is switched on, a vacuum is created in the suction jar, which results in suction through the endoscope when the appropriate endoscope control is operated, or through other devices. The vacuum level is controlled by a regulator located on the front panel to which a vacuum gauge is connected. Air is drawn through the pump and is then exhausted to atmosphere, passing through the exhaust at the rear of the unit.

7.2 Electrical Operation

Refer to Figure 7-2

Power is provided to the unit from the AC power supply by the power supply lead.

The power socket at the rear of the unit has an integral fuseholder through which power is supplied to the power switch.

When the power switch is switched to the '**I**' position, power is supplied to the motor, enabling the pump to operate.

Technical information regarding this product is available on request to assist suitably qualified personnel with repairs. Contact Olympus regarding this information.

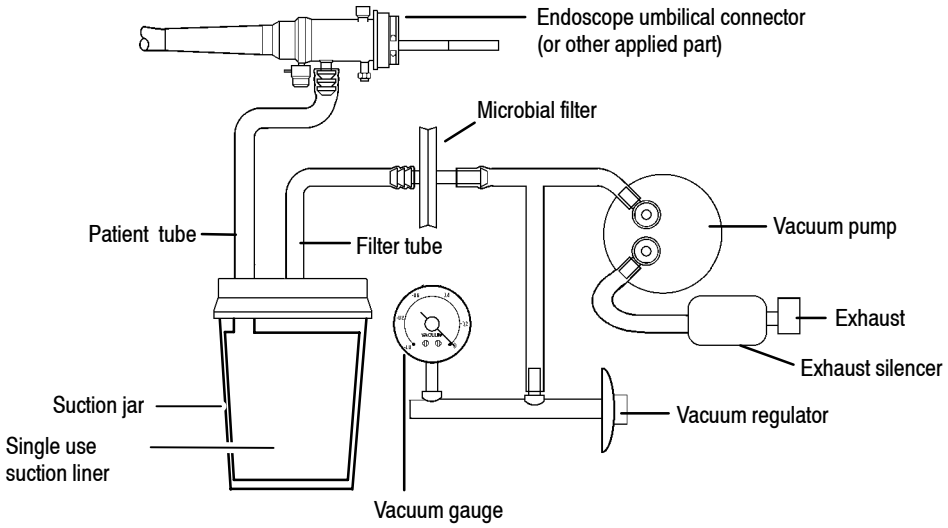


FIGURE 7-1

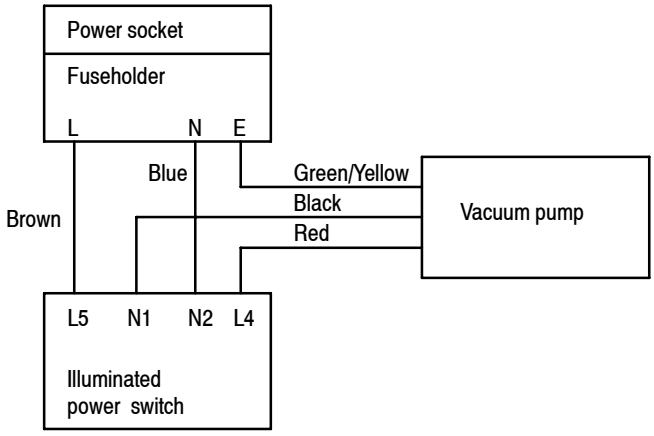


FIGURE 7-2

8 ENVIRONMENTAL PROTECTION

There are no known risks associated with disposal of the KV-5 at the end of its working life. If however, aspirated fluid has entered the pump, it may be contaminated with infectious material and should therefore be disposed of in accordance with local regulations or policy.

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Issue 7
January 2008

KT5070196/108