ENDOSCOPE SUCTION UNIT MODEL NKJX-2

Operating Manual

I. GENERAL

Endoscope suction unit model NKJX-2 is especially designed for extract mucus and residue *etc* from stomach or intestines and *etal. When endoscopy is carried out,, in which case the resolving power and clearness of imaging of endoscope can be enhanced as to improve accuracy for diseases examination.*

Endoscope suction unit model NKJX-2 can also be used for suction in operating rooms, wards and other related departments in hospital.

It is not intended for the use in the case of inflammable and /or explosive gas existing.

- The unit shall work continually within 30 minutes with intermittent loading. The ratio of duration can reach more than 50%.
- Electrical requirement: Class Ⅰ and type B equipment.

II. STRUCTURAL FEATRUES AND OPERATIONAL PRINCIPLE

- An oil-less piston-type pump which requires no lubrication or daily maintenance, can provide the suction tubing and storage bottle with an effective vacuum;
- The overflow protection device is intended to prevent liquid or solid particles from entering the intermediate tubing.
- The vacuum adjusting system controls the level of vacuum required in clinic shown on vacuum meter by two means of fixed setting (stomach and intestines) and stepless regulation.
- Low noise, large capacity, powered by hand or foot switch , easy to operate.

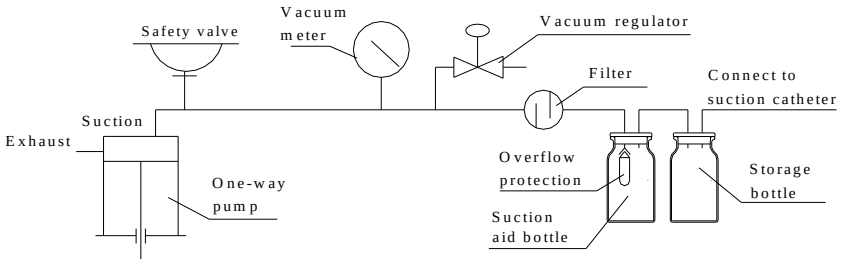

Fig.1Operation principle diagram

III. SPECIFICATIONS

- Pump : piston-type
- Max.vacuum :. ≥ 640㎜Hg
- Adjustable vacuum range :150mmHg ~ Max.vacuum
- Flow rate : ≥24L/min
- Storage bottle :1500mL×2
- Power supply : ~220V±10% , 50 Hz
- Input power 110VA
- Fuse : RF1 φ 5×20/ 0.5A (for mains)
  RF1 φ 5×20/ 0. 5A (for transformer)
- Net : 11. 5kg
- Dim (mm) : 320×300×450

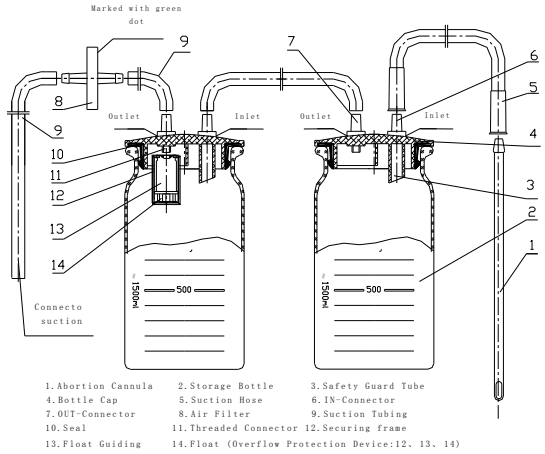

Fig.2 Pipeline connection diagram

IV. UNPACKING

Unpack for inspecting the product's outward before assembling and adjusting. Check up the accessories according to the packing list. Please contact with the supplier or manufacturer in time if there is any problem.

V. ASSEMBLY AND ADJUSTMENT

1. **Connect pipeline** (see also Fig .2)

Note *The inlet of air filter marked green dot should be connected to the outlet of storage bottle.*

2. **Connect to mains**

Connecting the unit to power supply, the power lamp lights.

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Warning: *The unit mains plug acts as a mains cutting-off device。The mains socket must be grounding reliably.*

3. Verify pipeline

- Turn around the working valve to the position of INTESTINES, THEN tighten the vacuum regulator knob clockwise , occlude the inlet with finger or fold up the hose and hold it with finger.
- Run the unit by turning on hand or foot- switch, the readings shown on vacuum meter should rise up rapidly to more than 640mmHg; let the inlet free and the readings should return to less than 150mmHg.
  Corresponding to the condition above indicates that the pipeline is connected correctly.

4. Adjust vacuum

Turn around the working valve to the position of INTESTINES, Run the unit with occluded inlet, set the vacuum level to 560mmHg by adjusting the vacuum regulator (for intestines), and then turn around the working valve to the position of STOMACH, and vacuum level of 300mmHg is provided (for stomach) The settings of vacuum for intestines and stomach should be made by doctor according to the requirement in clinic.

Note1 *turn around the vacuum regulator clockwise for an increase in vacuum.*

Note2 ***The vacuum level should be released to less than 150m****mHg before stop working.*

5. Inspect and test overflow protection device

- Open the bottle cap with overflow protection device; clean the valve entrance and even the rubber valve vane which should be connected to the float satisfactorily. Check up whether bending or tearing and other defects exist. The float should move flexibly without any obstruction.
- Hold the cap, make the float come into contact with water level vertically, the float should float up along the float frame as moving the cap slowly downward.
- Press the cap tightly, connect suction hose to the inlet of the storage bottle, and run the equipment with the regulator tightened clockwise.
- Immerse the suction hose into a clear water container, or suck liquid into the storage bottle simulating the conditions in normal use until the shut-off mechanism of the overflow protection device activates while suction ceases automatically. Different application in suction shall result in variety of the final liquid level.
- Slacken down the vacuum regulator, shut off the unit switch, open the bottle cap then, and empty the storage bottle. When fix the cap tightly once more, the float should be located at the bottom of the float frame with the valve entrance opening.
  Corresponding to the condition above proves the overflow protection device to be effective.

Note 1*:Two possible cases in the follow shall lead to the liquid level continuing to go upwards even if the shut-off mechanism of the overflow protection has activated.① Owning to the vacuum reside in the storage bottle. ② The valve entrance has* ***not been occluded totally. In the first case, the liquid level shall not arise any longer when the suction hose removed from*** *the liquid is re-inserted. In the second case the liquid level shall continue to go up. Special attention must be paid to this matter. When the storage bottle is about to be full, take the suction hose away from the liquid immediately, turn off the unit and find out the reason why the overflow protection device loses efficacy.*

Note 2: Suction ceases when the shut-off mechanism of the protection device activates. But the float is probably sucked into the valve entrance because of the vacuum inside the intermediate tubing. Under this condition, slacken vacuum regulator or shut down the equipment to release the vacuum inside the intermediate tubing, ensure the float to fall down by gravity.

Do not pull down the float by force to protect it against separating from rubber valve vane.

Note 3: Do not open the bottle cap until vacuum has released by switching off the unit..

Note 4: Do not operate the apparatus with the overflow protection device unassembled.

6. Stop working

When completing adjustment or operation, turn off the switch on the unit, and then pull out the plug from the mains socket to cut off the electricity supply.

VI. OPERATION AND MAINTENANCE

1. Operation

- Inspect the apparatus according to the procedure of assembly and adjustment. Ensure its performances are satisfactory. Then connect the disinfected suction hose and catheter ready for operation.
- During the period of operation, the required vacuum level can be controlled by adjusting vacuum regulator and observe the liquid level in the storage bottle frequently.
- In normal condition, the collected liquid is not allowed to entering the suction aid bottle. When the liquid level in first storage bottle goes up to the stated capacity, stop operating, empty and clean the storage bottle then go on suction.
- The second storage bottle acting as a suction aid bottle prevents the liquid from entering into pump. If the collected volume is larger for one time and the liquid has to enter into the second bottle, empty the bottle in

time before the overflow protection device activates.

• If the liquid level continues to go upwards even if the overflow device has activated, solve out the problem refer to "**Inspect and test overflow protection device"**

***Note** : The aspirator should be operated by professional doctor according to the directions of medical science and the instruction in the operating manual strictly.*

If there is any doubt about operation, please get in touch with supplier or manufacturer.

2. Replacement for air filter

If sucked into foam or occluded by dirt, the air filter diaphragms shall change its color from lightness to deepness. Further lead to suction force in the inlet reducing even disappearing, but the reading shown on vacuum meter shall increase to more than 300mmHg. Under this condition, replace the air filter with the one provided by manufacturer.

***Note 1:** That the shut-off mechanism of overflow protection device activates or the tubing has been occluded shall also cause the suction force reducing or disappearing as well as the vacuum increasing(see item 2 in "troubleshooting").*

***Note 2:** The air filter should be summed up to destroyed when replaced.*

3. Replacement for fuses

• When the fuses for mains fixed on the side of the unit case need to be replaced, align to the cross-groove of the fuse seating with a screw driver and rotary in counter-clockwise to withdraw the seating cover, then inspect or replace the fuses.

• The fuse for transformer fixed on the bottom of the unit case need to be replaced, align to the cross-groove of the fuse seating with a screw driver and rotary in counter-clockwise to withdraw the seating cover, then inspect or replace the fuses..

4. Maintenance

• Before stop working, sucking a little clear water will be helpful to make suction tubing clean.

• After stop working, put out the Suction Hose and Tubing, remove the Bottle with Lid carefully from the retaining nest and dispose of the contents appropriately. The unit and parts used should be cleaned and disinfected thoroughly.

• It is recommended that immerse the storage bottle and caps as well as suction tubing into Kangweida disinfect solution (referring to its instructions) for one hour.

***Note**: Please avoid the storage bottles made of glass being knocked against sharp body or falling down.*

• The used phlegm catheter should be clean and rinse to remove off the thick phlegm and grume remained in the catheter. If blocked, the phlegm catheter should be replaced. The single-use catheter is recommended.

• The outer casing of the unit may be wiped with some cloth sodden with disinfector. And the cloth should be squeezed so as to prevent liquid from seeping into the chinks of the case

• The unit should be kept in a dry and clean place, and run it periodically (once half a year).

• All of the applied parts should be cleaned and disinfected thoroughly according to the relevant regulations, and should measure up the proof when put into use.

Note: When operating the unit another time, the overflow protection device and suction tubing must be connected correctly according to Fig.2

5. Safety symbol meanings

Symbol	Meaning	Symbol	Meaning
~	Alternating current		Grounding
	Type B equipment	⏚	Attention！Look up the documents

VII.TROUBLESHOOTING

Item	Fault	Cause	Solution	Remarks
1	Max. vacuum <640mmHg	1) Leakage in the entrance of storage bottle . 2) Vacuum regulator loose. 3) Leakage in the safety valve or in the tubing connection.	1) Clean the entrance of bottle and press bottle cap tightly. 2) Screw down the regulator 3) Make the tubing be connected correctly or inspect and repair the safety valve.	1) Non-smooth cap shall result in leakage too. Replace the cap if necessary 3）Replace the broken suction tubing 4) The parts inside the unit case should be examined or repaired by professionals .
2	Vacuum value ≥ 300mmHg，but the suction force in the entrance of tubing is obviously reducing or disappearing.	1) The shut-off mechanism of the overflow device activates 2) Suction tubing occluded. 3) Air filter blocked.	1) Slacken the regulator to release the vacuum in tubing then tighten it. 2) dredge and rinse or replace the occluded tubing. 3) Replace the filter	1）Empty the storage bottle in time. 3）The filter's inlet marked with green dot.
3	The power lamp doesn't light and the unit fails to run.	1) The plug and socket contacts fault. 2) The fuses are fusing	1) Repair or replace the socket. 2) Replace the broken fuses.	Examining or repairing by professionals (see Fig.3 Circuit diagram)
4	Being connected to mains, the fuse is broken immediately.	1) Electrical fault 2) Defective relay 3) Pump obstructed results in current increasing.	1) Examine the circuit to work out the problem. 2) Fix or replace the relay 3) Inspect pump and motor	
5	Liquid is sucked into pump	1) The shut-off mechanism of the overflow protection device loses efficacy. 2) Suction for a longer time	1) Repair or replace the defective overflow protection device . 2) Clean out the pump	1) Use the storage bottle within its stated capacity. 2) Carry out by professionals

Note : It is recommended that the pump should be unassembled or repaired by professionals. If necessary, please get in touch with the manufacturer.

VIII. ENVIRONMENTAL CONDITIONS IN NORMAL USE

- Temperature : 5~40˚C
- Relative humidity : ≤ 80%
- Atmospheric pressure : 860~1060 hPa

Note: *When stored or in transport with the temperature less than 5 ℃, the unit should be placed in the environmental conditions in normal use for about four hours before operation.*

IX. ENVIRONMENTAL CONDITIONS IN TRANSPORT OR STORAGE

- Temperature : -40~55˚C

- Relative humidity : ≤ 95%
- Atmospheric pressure : 500~1060 hPa

Note : *The packed aspirators should be kept indoor with no corrosive gas and well ventilated.*

X. SERVICE

- Any of our products is promised to be repaired free or replaced within one year from the date of purchasing if the packed unit stored and operated complying with the rules recommended by the manufacturer does not work normally.

- Circuit diagrams part lists and other technical information are available upon request for qualified technical personnel.

XI. ACCESSORIES

• Suction hose			1
• Fuse	RF1	φ 5×20/ 0.5A	2
	RF1	φ 5×20/ 0. 5A	1
• Air filter			2

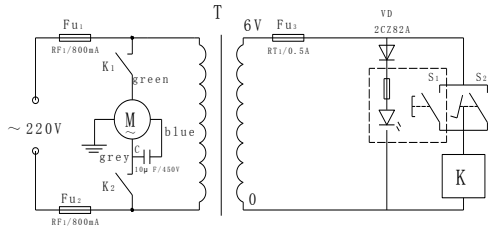

Fig4 Circuit Diagram

Before the products are put to the market, they have been examined according to the requirement of Q/CYFM1 standerd, all meet such requirement and are qualified.

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