KITAGAWA
KOMYO RIKAGAKU KOGYO

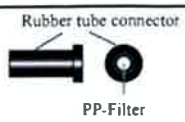
INSTRUCTION MANUAL
FLOW CONTROL ORIFICE (MODEL 20K)
FOR KITAGAWA GAS ASPIRATING PUMP

★This flow control orifice is for Model AP-20, AP-20S and 400B KITAGAWA gas aspirating pump and cannot be used with any other aspirating pumps such as Model AP-1, AP-1S and 400A. Ensure to use this orifice only when you take a measurement with specified detector tubes undermentioned.

※Specified detector tubes	ALCOHOL IN BLOOD(290EA), HYDROGEN CYANIDE IN BLOOD(290CN), CARBON MONOXIDE IN BLOOD(290CO), HYDROGEN SULPHIDE IN BLOOD(290HS), ACETYLENE･ETHYLENE-SEPARATION MEASUREMENT(280S), PHOSPHINE (SA)(SB)

◆ OPERATION

1. Attach the flow control orifice to the Model AP-20, AP-20S or 400B gas aspirating pump.
2. Conduct the "CHECKING PRIOR TO USE (Leakage test)" undermentioned.
3. Conduct the "ASPIRATING TEST" undermentioned.
4. Take a measurement in accordance with the instruction manuals of each gas detector tubes.



◆ HOW TO ATTACH THE FLOW CONTROL ORIFICE

1. **Detach the connector holder and the rubber tube connector** from the each gas aspirating pump.
2. Remove the PP-Filter from the rubber tube connector.
3. **Put the flow control orifice and O-Ring into the inlet of the gas** aspirating pump as shown in Fig. 1.
4. Attach the connector holder and the rubber tube connector to the gas aspirating pump.

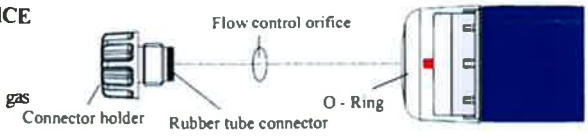


Fig. 1 How to attach

◆ CHECKING PRIOR TO USE (Leakage test)

(Conduct the Leakage test with attaching the FLOW CONTROL ORIFICE to the each gas aspirating pump in accordance with the below procedure)

1. Push the pump handle completely to the original position.
2. Insert a sealed, unbroken detector tube into the pump.
3. Align the guide marks on the shaft and stopper of the pump.
4. Pull the handle to a full stroke and wait for 3 minutes*.
5. Unlock the handle to turn the pump handle right or left by 1/4 (90°) and allow it to return slowly into the pump by holding the cylinder and handle securely.

▲CAUTION HANDLE WILL TEND TO SNAP BACK INTO THE PUMP QUICKLY.

6. If the handle returns completely to the original position (Fig.2), the performance is satisfactory. Otherwise (like shown in Fig. 3), refer to maintenance procedures shown in the instruction manual of the pump to correct the leakage.

*If you pull the handle to full stroke, the shaft will be locked.

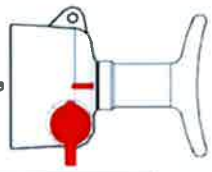


Fig. 2 No Leakage

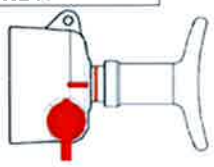


Fig. 3 Leakage

◆ ASPIRATING TEST

1. Push the pump handle completely to the original position.
2. Align the guide marks on the shaft and stopper of the pump and pull the handle to full stroke (100mL) until it locks. At the same time, start to count with the seconds on a clock. (At this time, the inside of the aspirating pump is in full vacuum.)
3. After 50 seconds punctually, insert a sealed, unbroken detector tube into the rubber tube connector in order to seal the aspirating pump.
4. Unlock the handle by turning it 1/4 turn (90°), and the shaft will stop in somewhere in the middle. At this time, if the shaft stops in the pass criteria shown in the Fig.4, the pump has no leakage.

(Note 2) When the lock is released under full vacuum, the handle tends to snap back quickly. To prevent possible damage to the pump, allow the handle to return slowly by holding the cylinder and handle securely.

(Note 3) If the shaft does not stop in the pass criteria, refer to maintenance procedures shown in the instruction manual of the pump to correct the leakage.

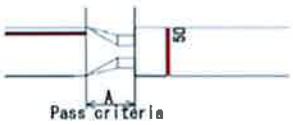
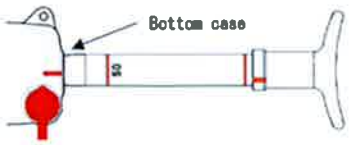


Fig. 4



◆ MAINTENANCE

If the shaft stops short of the pass criteria as shown in Fig.5, take off the flow control orifice. Make it clean with solvent such as benzine or thinner, dry well and attach to the gas aspirating pump in order to conduct aspirating test again.

※Never pick at the small hole with needles to enlarge the hole. If the small hole gets larger, you cannot get the correct readings. Moreover, if the shaft stops at more than the pass criteria as shown in Fig.6, it is impossible to repair the flow control orifice and it needs to be replaced by a new flow control orifice.

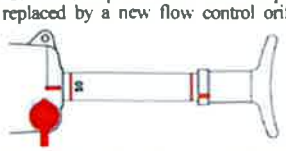


Fig. 5 Stops after the pass criteria

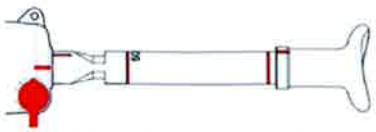


Fig. 6 Stops short of the pass criteria

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