



青岛创梦仪器有限公司

Qingdao Chuangmeng Instrument Co., Ltd.



高温高压滤失仪
High Temperature High Pressure Filter Press

型号 Model:1213/1214

使用手册
Instruction Manual

版本 1.0

Version 1.0

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请你仔细阅读《使用手册》，正确掌握本产品的安装和使用方法。阅读后请将本《使用手册》妥善保管，以备今后进行检修和维护时使用。

Please read the *Instruction Manual* carefully, for correctly grasping the installation and using method of this product. Please keep properly this *Instruction Manual* after reading, for the usage during troubleshooting and maintenance in the future.

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I. 概述 Introduction

高温高压滤失仪是一种模拟深井（高温高压）下钻井液和水泥浆的滤失量，并同时可制取在高温高压状态下，滤失后形成的滤饼。

仪器整体设计采用加热和控制系统一体，主要部件均采用优质不锈钢，操作方便，移动灵活，表面精制坚固耐用。

温度控制系统采用数字温控器，具有控温精度高，重复性好，操作简单，测试数据准确等特点。

适用于各油田现场、科研院所的实验室使用。



The High Temperature High Pressure Filter Press is a kind of instrument which simulates the filtrate volume of drilling fluid and cement paste under the deep well (high temperature and high pressure), also at the same time, could extract the formed filter cake after filtration under the high-temperature and high-pressure condition.

The overall design of this instrument adopts heating and control system. The main parts are made of high quality stainless steel, which is easy to operate and durable.

The temperature control system adopts a digital temperature controller, which has the characteristics of high temperature control accuracy, good repeatability, simple operation and accurate test data.

It is suitable for laboratories in oil field and scientific research institutes.

II. 型号和参数 Model and technical parameter

		
型号 Model	71-A (1213)	71-B (1214)
电源 Power	220V±5% 50Hz	220V±5% 50Hz
加热功率 Heating power	950W	950W
温度 Temperature	室温至 232℃ Room temperature-232℃	室温至 232℃ Room temperature-232℃
浆杯压力 Slurry cup 's pressure	7. 1MPa	7. 1MPa
接收器压力 Receiver pressure	3. 5MPa	3. 5MPa
有效过滤面积 Effective filtration area	22. 6cm ²	22. 6cm ²
气源 Air supply	氮气、二氧化碳气体 O ₂ 、CO ₂	氮气、二氧化碳气体 O ₂ 、CO ₂
温度控制 Temperature control	双金属调温器 Bimetal thermostat	数字温控器 Digital thermostat

III. 仪器结构及原理 Instrument structure and principle

1. 单孔泥浆杯 Slurry cup with single hole:

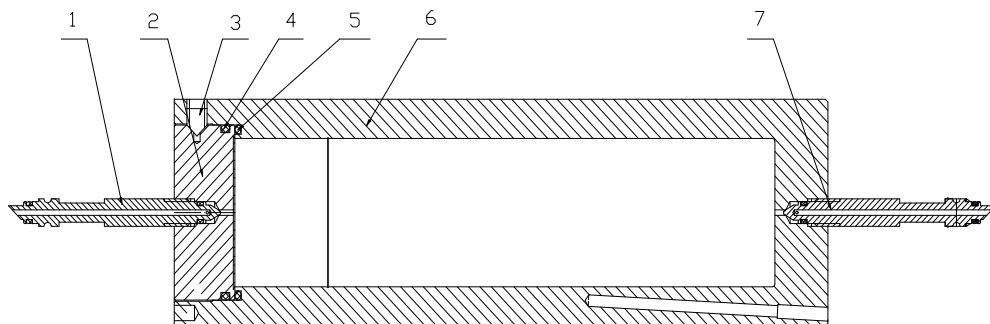


图 1 (Figure 1)

序号 No	编号 Serial number	名称 Name
1	121002	连通阀杆 Valve stem
2	1210304a	杯盖(带滤网) Cup cover (with screen)
3	S0193	内六角锥端紧定螺钉 Hexagon socket set screws with cone point
4	S0526	“O”型圈 O-ring
5	S0526	“O”型圈 O-ring
6	1211101a	泥浆杯 Slurry cup
7	121002	连通阀杆 Valve stem

2. 通孔泥浆杯 Slurry cup with through-hole:

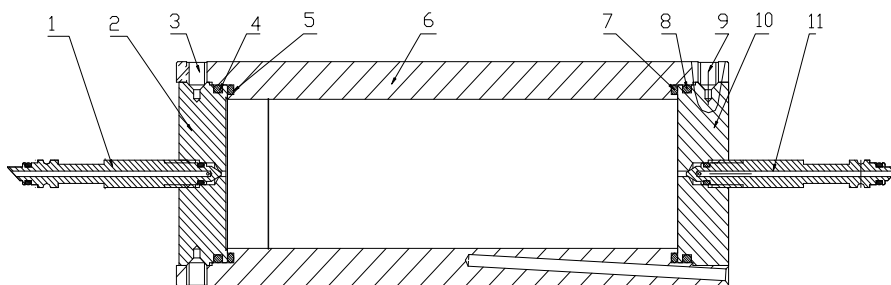
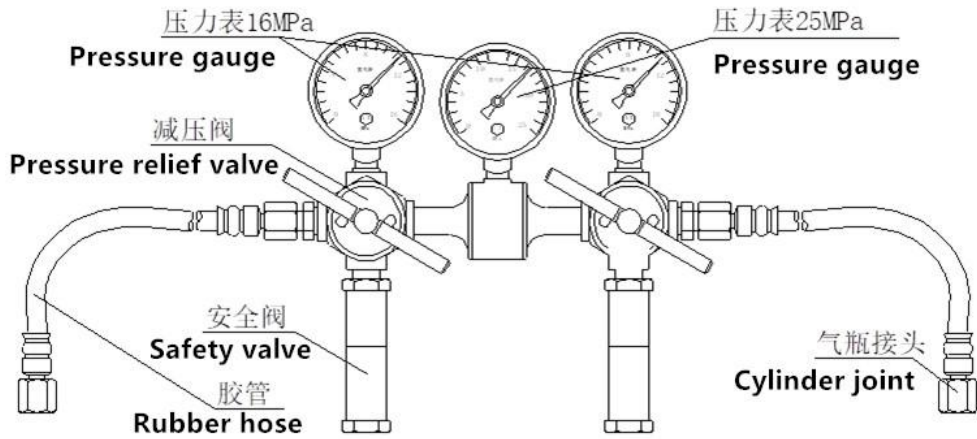


图 2 (Figure 2)

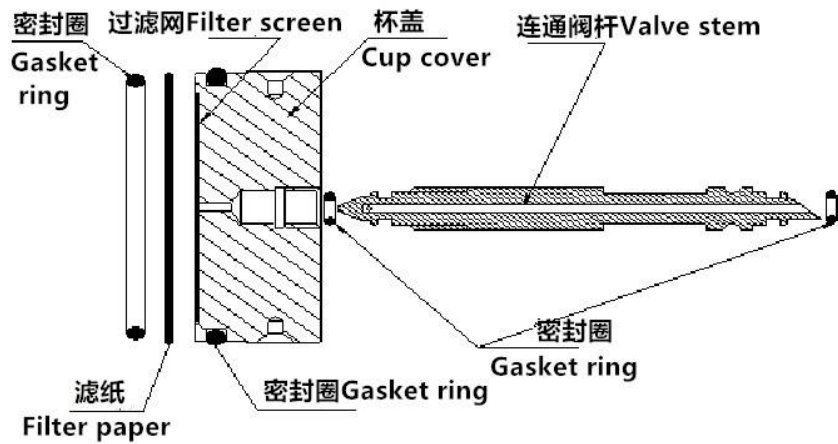


序号 No	编号 Serial number	名称 Name
1	121002	连通阀杆 Valve stem
2	1210304a	杯盖(带滤网) Cup cover (with screen)
3	S0193	内六角锥端紧定螺钉 Hexagon socket set screws with cone point
4	S0526	“0”型圈 O-ring
5	S0526	“0”型圈 O-ring
6	1211101b	泥浆杯 Slurry cup
7	S0526	“0”型圈 O-ring
8	S0526	“0”型圈 O-ring
9	S0193	内六角锥端紧定螺钉 Hexagon socket set screws with cone point
10	1210301b	杯盖 Cup cover
11	121002	连通阀杆 Valve stem



(图3) 高压管汇示意图

(Figure3) schematic diagram of the manifold of high pressure



(图4) 操作示意(Figure 4) operation schematic diagram

推荐的最小的回压 Recommended minimum backpressure

温度 Temperature		始 压 (浆杯压力) Start pressure (slurry cup pressure)			回 压 (接收器压力) Backpressure (receiver pressure)		
°C	°F	MPa	Kg·f/cm ²	磅/吋 ²	MPa	Kg·f/cm ²	磅/吋 ²
<94	<200	3.15	35.15	500	0	0	0
94~149	200~300	4.14	42.18	600	0.67	7.0	100
149.~177	301~350	4.48	45.70	650	1.03	10.5	150
177.~190.5	351~375	4.82	49.20	700	1.37	14.0	200
191~204.5	376~400	5.17	52.73	750	1.73	17.6	250
205~218	401~425	5.86	59.75	850	2.40	24.6	350
218.9~232	426~450	6.55	66.80	950	3.10	31.6	450
232.8~246	451~475	7.24	73.80	1050	3.80	38.7	550
246.7~260	476~500	8.27	84.36	1200	4.82	49.2	700

VI. 仪器的操作 The operation of the instrument:

实验前的准备：按图（3）所示将管汇组件安装于气瓶上由 G5/8 螺帽紧固。在确定调压手柄处于自由状态未加压时，打开气源，此时管汇中间 25MPa 压力表应显示压力为 $\geq 8\text{MPa}$ 。将两高压胶管分别于管汇和三通组件对应部位连接牢固。

1、取出主机，检查各部件、管件及电源部件是否可靠。

2、打开电源开关。

3、加热设置

1) 71-A(1213)型, 顺时针旋转调温旋钮，旋转到底。此时指示灯亮开始加热，查看前方的双金属温度计，到达所需温度后，逆时针旋转调温旋钮，看指示灯灭的一瞬间停止旋转，此时温度将保持在所需温度。

注：前方双金属温度计显示的是加热套温度，上方双金属温度计显示的是浆杯温度。

2) 71-B(1214)型, 按动数字温控器“▲”“▼”按键设定所需温度（SV 设定温度，PV 当前温度），设定完毕打开加热开关进入加热状态。

注：数字表显示的是加热套温度。双金属温度计显示的是浆杯温度

4. 将泥浆杯杯底密封

1) 单孔杯：按（图 1）所示的“7”将带有密封圈的连通阀杆旋入泥浆杯底并拧紧。

2) 通孔杯：按（图 2）所示的“7、8、9、10、11”部分，按照图中所示顺序安装，连通阀杆拧紧。

5. 按（图 5）所示将泥浆杯放到杯座上，杯底朝下，然后把配制好的钻井液，倒入浆杯内，注入量不得超过杯中刻线。

6. 安装杯顶的杯盖，根据（图 4）操作示意图

1) 先将密封圈放入泥浆杯内的凹槽内。

2) 将高温滤纸平放在泥浆杯内的密封圈上。

3) 将带滤网的杯盖装入泥浆杯，紧固紧定螺钉均匀受力。

7. 将泥浆杯顶部的连通阀杆拧紧，此时泥浆杯内处于密封状态。然后将泥浆杯倒置使杯顶端朝下，杯底朝上。慢慢放入加热套内，慢慢旋转浆杯，使其固定在定位销上。

8. 将三通组件按（图 6）所示连接到上方连通阀杆，并插入固定销锁好。

9. 将回压接收器连接到下方的连通阀杆上，插入固定销锁好，并关闭放气阀。

10. 将高压管汇输气胶管按（图 6）所示其中一根与三通组件接头连接并紧固，另一根与回压接收器接头连接并紧固。

11. 打开气源总阀，顺时针方向旋转管汇调压手柄，看着压力表先将连接三通组件一端的压力表调到 0.7MPa ，将连接回压接收器一端的压力表调到所需要回压压力。

12. 逆时针打开上方连通阀杆（旋转 90° 左右）。往泥浆杯内输入一定压力（ 0.7MPa ）的气体，输入气体后再次关闭上方连通阀杆。

13. 观察泥浆杯上的双金属温度计，当温度达到实验要求温度时，将连接三通组件一端的压力表调到实验所需压力值，打开上方的连通阀杆，使泥浆杯内的压力升至实验所用压力，最后打开底部连通阀杆开始滤失实验。

14. 从打开下方连通阀杆起开始计时，30 分钟后立即关闭下阀杆，收集 30 分钟滤失量，记录滤液总体积、温度、压力和时间。在收集滤液时，应注意防止滤液喷撒，影响实验效果。

注：如果在测定过程中回压端的压力表升到额定压力以上时，可慢慢地松开放气阀从回压接收器中放出部分滤液以便降低压力。

15. 实验结束后，关闭电源开关，关闭上下连通阀杆。将管汇的调压手柄逆时针松开，打开

三通组件上的手柄和回压接收器的放气阀。放掉管汇内剩余的气压，将胶管从三通组件和回压接收器上卸下，最后从加热套中取出泥浆杯（刚做完实验取出时带好护具避免烫伤），用空气或水冷却。

注意：当浆杯温度高于 100℃ 时，排气处理、松开盖子紧定螺栓是很危险的，必须使浆杯在冷水中冷却或在空气中冷却至室温后，将泥浆杯盖朝下使其直立于杯座上，逆时针旋松上连通阀杆，放掉杯内余气，在有压力的情况下打开杯盖容易发生事故。

16、取下杯盖，取下滤饼用清水慢慢清洗留作测量。倒出钻井液，洗净擦干所有部件。

注意：1) 严禁使用氧气。

2) 打开钻井液杯盖之前必须放掉杯内余气。

3) 仪器使用完毕要将调压手柄松开。

4) 输气胶管严禁与腐蚀介质接触。不得划伤。

Preparation before the experiment: according to the diagram (3), the manifold assembly is fastened to the gas cylinder by G5/8 nut. When the pressure regulating handle is in a free state and not pressurized, open the gas source. At this time, the 25MPa pressure gauge in the middle of the manifold should show a pressure ≥ 8 MPa. The two high pressure hose is connected firmly to the corresponding parts of the pipe junction and the three-way component.

1. Remove the main engine and check whether the components, fittings and power components are reliable.

2. Turn on the power switch.

3. Heating setting:

1) Model 71-A(1213), The clockwise rotation knob rotates to the end. At this time, the pilot lamp is on and begins heating, and Look at the bimetallic thermometer ahead. After reaching the required temperature, a rotary thermostat knob is counterclockwise. When the pilot lamp is extinguished for a instant, stop the rotation. At this time, the temperature will be kept at the required temperature.

Note: the bimetallic thermometer in front shows the temperature of the heating sleeve. The bimetallic thermometer above shows the temperature of the slurry cup.

2) Model 71-B(1214), Adjust the temperature of the digital thermostat button “▲” “▼” (SV set temperature, PV current temperature), after the setting, open the heating switch into the heating state.

Note: the number table shows the temperature of the heating sleeve. The bimetallic thermometer shows the temperature of the slurry cup

4. Seal the bottom of slurry cup.

1) Slurry cup with single hole: according to the “7” (shown in Figure 1), the valve stem with sealing ring is screwed into the bottom of the slurry cup and tightened.

2) Slurry cup with through-hole: according to the “7, 8, 9, 10, 11” parts (shown in Fig 2), according to the order shown in the picture, the valve stem is screwed tightly.

5. The slurry cup is placed on the cup seat as shown in (Figure 5), the bottom of the cup is down, and then the prepared drilling fluid is poured into the slurry cup, and the amount of injection shall not exceed the line in the cup.

6. Install the cup lid on the top of the cup, according to (Fig. 4) operation diagram.

- 1) Put the gasket ring in the grooves in the slurry cup first.
- 2) Put the high-temperature filter paper on the sealing ring in the slurry cup.
- 3) Install the cup cover with filter screen into the slurry cup, and tighten the screws tightly and tighten evenly.

7. Tighten the valve stem at the top of the slurry cup, then the slurry cup is sealed. Then pour the slurry cup upside down so that the top of the cup is facing down and the bottom of the cup is upwards. Slowly put into the heating sleeve, slowly rotating the slurry cup, so that it is fixed on the positioning pin.

8. Connect the three-way components to the upper connected valve stem according to (Fig. 6) and insert the fixing pin to lock it.

9. Connect the return pressure receiver to the connecting stem below, insert the retaining pin, and close the bleed valve.

10. The high pressure manifold gas hose is connected and fastened with the three-way component connector according to (Fig. 6), and the other one is connected with the back pressure receiver connector and is fastened.

11. Open the total valve of the gas source, adjust the handle to the clockwise rotation tube, and look at the pressure gauge, adjust the pressure gauge at one end of the three-connection to 0.7MPa, and adjust the pressure gauge at one end of the back pressure receiver to the required back pressure.

12. Counterclockwise open the top connecting stem (rotate about 90°). Pour a certain pressure (0.7MPa) into the slurry cup, and then close the valve stem again after entering the gas.

13. To observe the bimetallic thermometer on the slurry cup, when the temperature reaches the experimental requirement, adjust the pressure gauge at one end of the three-connected component to the pressure value of the experiment. The valve stem above is opened, Increase the pressure in the mud cup to the pressure of the experiment. Finally, the bottom valve stem is opened to start the filtration experiment.

14. When the connecting stem below is opened, the timing is started, and the lower stem is closed immediately after 30 minutes. The 30 minute filter loss is collected. Record the total volume, temperature, pressure and time of the filtrate . When collecting filtrate, we should pay attention to prevent the filtrate from spreading and affect the experimental results.

Note: if the pressure meter of the backpressure end is raised above the rated pressure during the determination process, the open air valve is slowly loosed out of the filter fluid from the back pressure receiver in order to reduce the pressure.

15. When the experiment is finished, turn off the power switch and close the upper and lower valve stem. Unclip the pressure regulating handle of the manifold to counterclockwise, open the handle on the three-way assembly and the bleeder valve of the return pressure receiver. The residual pressure in the pipe is removed and the hose is removed from the three-component and back pressure receiver. Finally, the slurry cup is removed from the heating sleeve (when the protective gear is taken out to avoid scald when the experiment is taken out), and the air or water is cooled.

Note: when the temperature of the pulp cup is higher than 100°C , it is very dangerous

to exhaust the exhaust and release the bolt to tighten the bolt. It is necessary to make the slurry cup cool in cold water or to cool it in the air to room temperature. The cup cover is made upright to the cup seat, Reverse clockwise loosening of a valve stem, the residual gas in the cup is released. It is easy to have accidents when opening the cup cover under pressure.

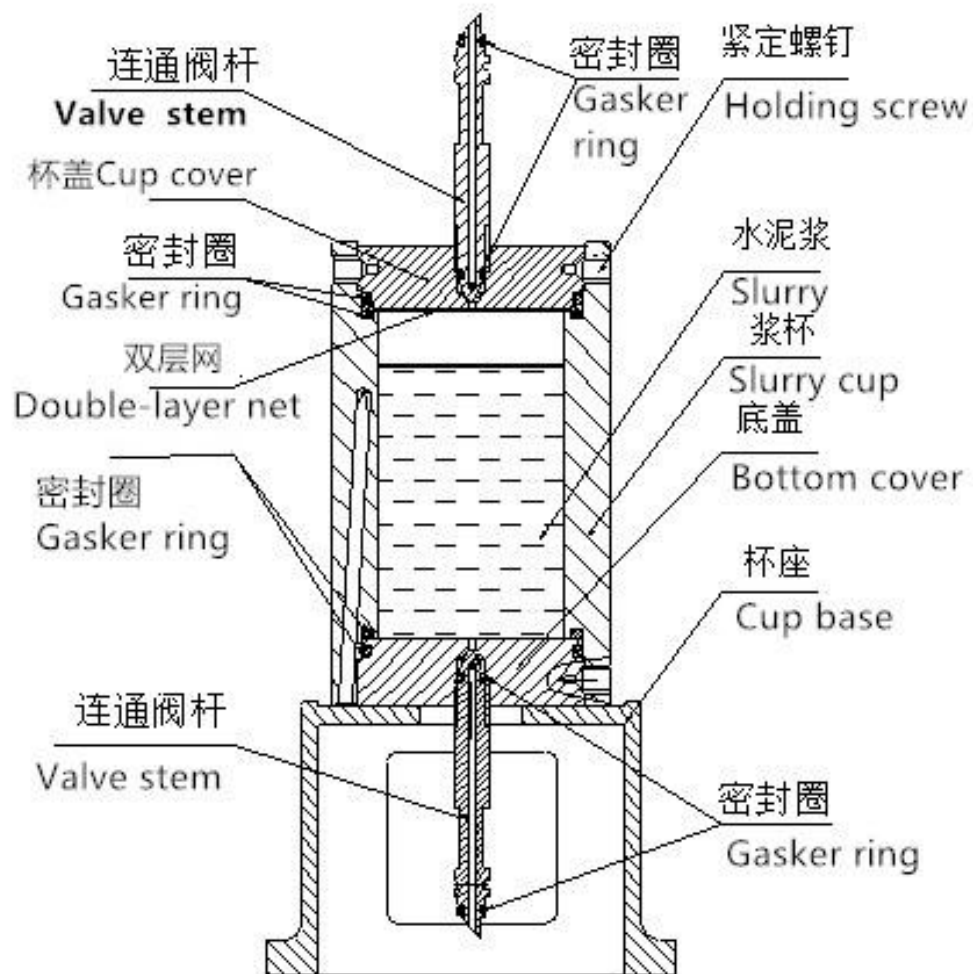
16. Remove cup cover, remove filter cake and rinse slowly with clean water for measurement. Pour out the drilling fluid and wash and dry all the parts

Note: 1) No oxygen is used.

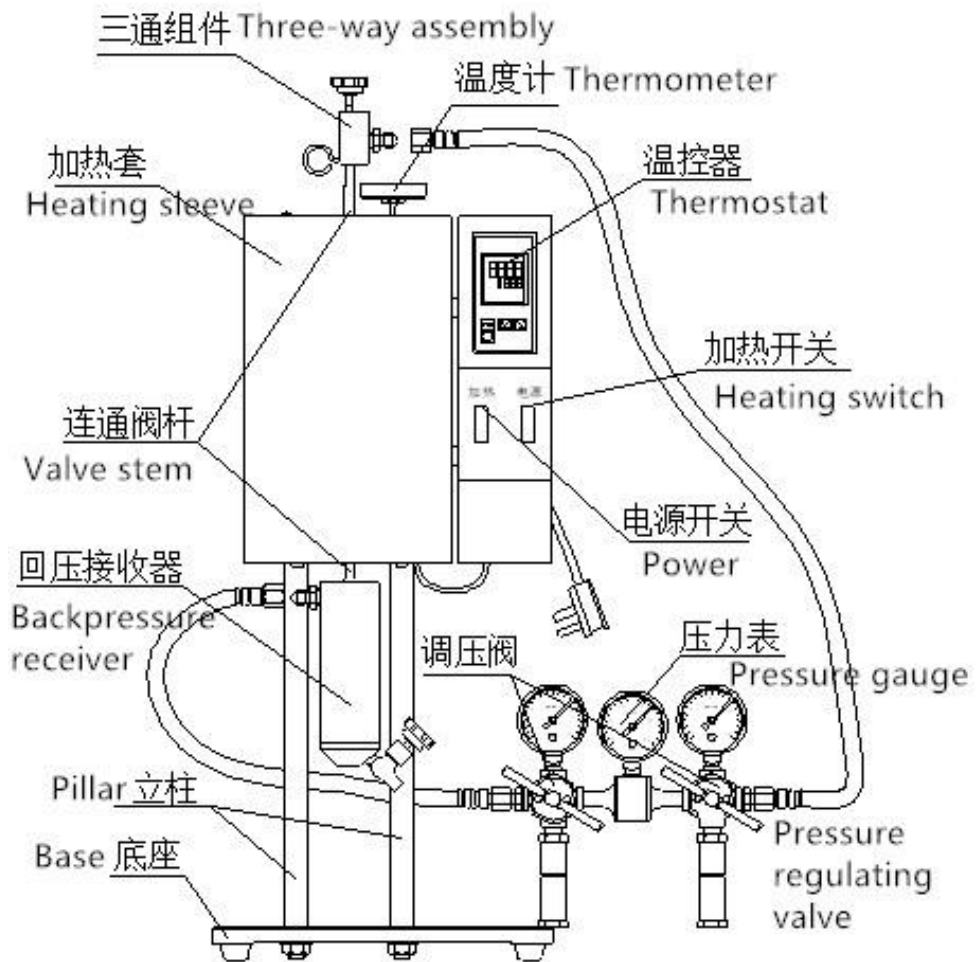
2) The remaining gas in the cup must be released before opening the cup cover.

3) When the instrument is finished, the handle shall be loosened.

4) The gas transmission hose is strictly forbidden to contact with the corrosive medium. No scratch.



(图5) 操作示意图 (Figure 5) operation schematic diagram



(图 6) 整机安装图
 (Figure 6) the installation of the whole machine

VII. 仪器的维护与保养

Maintenance and maintenance of instrument

1. 当移动、维修或清洁仪器时。要轻拿、轻放，以免造成部件变形影响精度和使用。
2. 要按时检查“O”型密封圈，经常更换。
3. 调压时，要逐渐加压，以防止损坏压力表，不得敲击压力表。
4. 仪器使用完毕要将钻井液杯、钻井液杯盖、紧固螺钉、连通阀杆等零部件烘干并涂上润滑油或润滑脂，以备下次使用。
5. 实验过程中要随时观察指示滤液接收器内压力的压力表数值，若压力超过 0.7MPa 时，应小心地从滤液接收器三通阀中放出部分滤液以便降低压力。

1. When moving, repairing, or cleaning the instrument. It is necessary to take lightly and put it lightly so as not to cause deformation of parts and affect accuracy and use.

2. Check the "O"-ring regularly and replace it regularly.

3. When the pressure is adjusted, it should be gradually pressurized to prevent damage to the pressure gauge and not to hit the pressure gauge.

4. After the use of the instrument, the drilling fluid cup, the cup cover, the fastening screw, the valve stem and other parts should be dried and coated with lubricating oil or grease for the next use.

5. During the experiment, the pressure gauge that indicates the pressure in the filter receiver should be observed at any time. If the pressure exceeds 0.7MPa, the filter liquid should be carefully released from the filter receiver triple valve to reduce the pressure.

VIII. 仪器的运输与储存


Transportation and storage of instruments

仪器的运输与储存应符合于 JB/T9329-1999 标准。产品应储存在通风的室内，室内空气中不含有能引起器件腐蚀的杂质。

The transportation and storage of instruments should be in line with the JB/T9329-1999 standard. Products should be stored in ventilated rooms, and indoor air does not contain impurities that cause corrosion of devices.

IX. 故障的判定与排除

Fault determination and elimination

故障 Fault	原因 Reason	维修方法 Maintenance method
回压接收器溢出泥浆。 Backpressure receiver overflow slurry	1. 滤网受损。 2. 滤纸破碎。 1. Damage of filter net. 2. Filter paper crushing.	1. 更换滤网。 2. 更换滤纸。 1. Replace filter net. 2. Replace filter paper.
杯盖漏浆。 Cup cover leakage	1. 杯盖安装不当。 2. 杯内“O”型圈老化或破损。 1. cup cover is not properly installed. 2. "O" ring is aging or damaged.	1. 重新安装杯盖。 2. 更换密封圈“O”型圈。 1. Reinstall the cup cover. 2. Replace the seal ring "O" ring.
升温太慢 The temperature is too slow	加热棒有烧坏现象。 The heating rod is burnt out	更换加热棒 Replace the heating rod.
如何鉴别连通阀杆的好坏。 How to identify the quality of the valve stem.	 <p>不好 Bad 尖嘴有凹痕</p> <p>不好 Bad 尖嘴有凹痕</p> <p>好 Good</p>	

X. 一年备件 (选购) One year spare parts (selected)

编 号 Numbered	名称及规格 Name and specification	数量 Quantity
S0193	内六角锥端紧定螺钉 Hexagon socket set screws with cone point	12
G0106	连通阀杆 Valve stem	4
P0302	高温高压滤纸 HTHP filter paper	5
P0314	双金属温度计 Bimetallic thermometer	1
S0502	“O”型密封圈 (φ8×1.9) O-ring (φ8×1.9)	50
S0507	“O”型密封圈 (φ37×1.9) O-ring (φ37×1.9)	50
S0508	“O”型密封圈 (φ64×3.5) O-ring (φ64×3.5)	50
S0501	“O”型密封圈 (φ6×1.9) O-ring (φ6×1.9)	50
P0115	保险丝 Fuse	30
G0102	量筒 (25ml) Measuring cylinder (25ml)	10

青岛创梦仪器有限公司 装箱单

Qingdao Chuangmeng Instrument Co., Ltd. Packing list

生产企业：青岛创梦仪器有限公司

Manufacturing enterprise: Qingdao Chuangmeng Instrument Co.,Ltd.

生产地址：青岛市城阳区流亭街道兴海路3号

Production address: No. 3 Xinghai Road, Liuting Street, Chengyang District, Qingdao

主机型号：

Model of the main motor:

出厂编号：

Manufacturing No:

序号 No	编号	名称及规格 Name and specification	数量 Quantity	备注 Remarks
1		主机 Main engine	1	
2		管汇 Mainifold QG-80	1	
3		高温高压滤纸 HTHP filter paper	1	
4		回压接收器 Backpressure receiver	1	
5		浆杯 Slurry cup	1	
6		连通阀杆 Valve stem	2	
7		三通阀 Three-way valve	1	
8		杯座 Cup base	1	
9		量筒 Measuring cylinder (25ml)	1	
10		双金属温度计 Bimetallic thermometer (300℃)	1	
11		内六角扳手 (4mm)	1	
12		呆扳手 Wrench17mm	1	
13		呆扳手 Wrench (7mm)	1	
14		“O”型圈 O-ring ($\phi 8 \times 1.8$)	8	
15		“O”型圈 O-ring ($\phi 37 \times 1.8$)	1	
16		“O”型圈 O-ring ($\phi 64 \times 3.5$)	4	
17		电源线 Power cord	1	
18		使用手册 Manual Instruction	1	
19		合格证 Certificate	1	