



青岛创梦仪器有限公司

Qingdao Chuangmeng Instrument Co. Ltd.

动态线性膨胀仪  
(多联)  
Dynamic Linear Swell Meter

Model:

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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## 一、概述 Summary

智能页岩膨胀量测定仪主要是用于检测在一定温度范围（常温~93℃）常压条件下泥页岩膨胀变化情况的一套精密测量仪器。

Smart shale expansion amount measuring instrument for detecting a precision measuring instruments in a certain temperature range (room temperature to 93 ° C) under atmospheric conditions shale swelling changes.

## 二、型号及规格 Type and Specification

型号	名称	配置
1702	动态线性膨胀仪（多联） Dynamic Linear Swell Meter	四个测试杯

## 三、仪器的主要技术参数

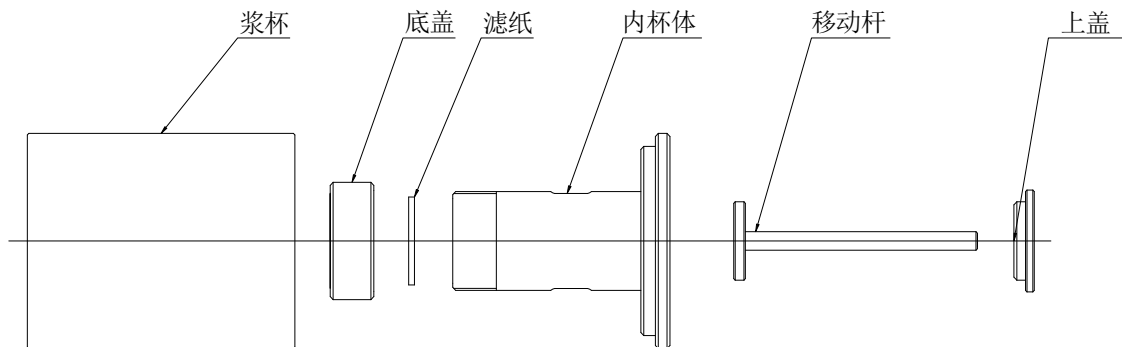
名称 Name	技术参数
电源 Power	230V±10% 50/60Hz
加热功率 Heating Power	500W
磁力搅拌转速 Magnetic Stirring Speed	100~2000r/min
工作温度 Operation Temperature	≤88℃ 恒温误差±5℃
测试量程 The Test Range	0~20mm
测量精度 Measuring Accuracy	0.1mm
试样模内径 Sample Die Inner Diameter	φ 28.6mm
仪器工作环境 Instrument Working Environment	-15℃~40℃
抗电磁场干扰 Resistance To electromagnetic Interference	在强电磁干扰条件下，有明显记录可加以排除 Under the condition of strong electromagnetic interference, have obvious records can be ruled out

## 四、仪器的结构及工作原理

### Main technical parameters of the instrument

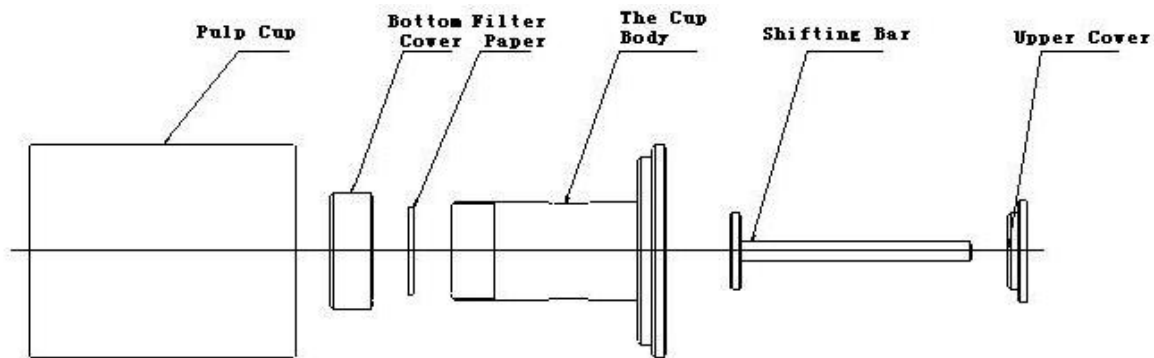
#### (一) 组成

- 1、传感器组件：测量样品在竖直方向上的膨胀量并将信号传递给计算机。
- 2、杯体组件：是在测试过程中盛装页岩饼。
- 3、磁力搅拌加热器：在实验过程中加热样品和搅拌添加剂。
- 4、工控通讯装置：将精密位移传感器获得位移信号转换成电信号。
- 5、计算机：包括测试软件、主机和显示屏，记录、保存和显示数据结果。
- 6、压模组件：制备测试样品。



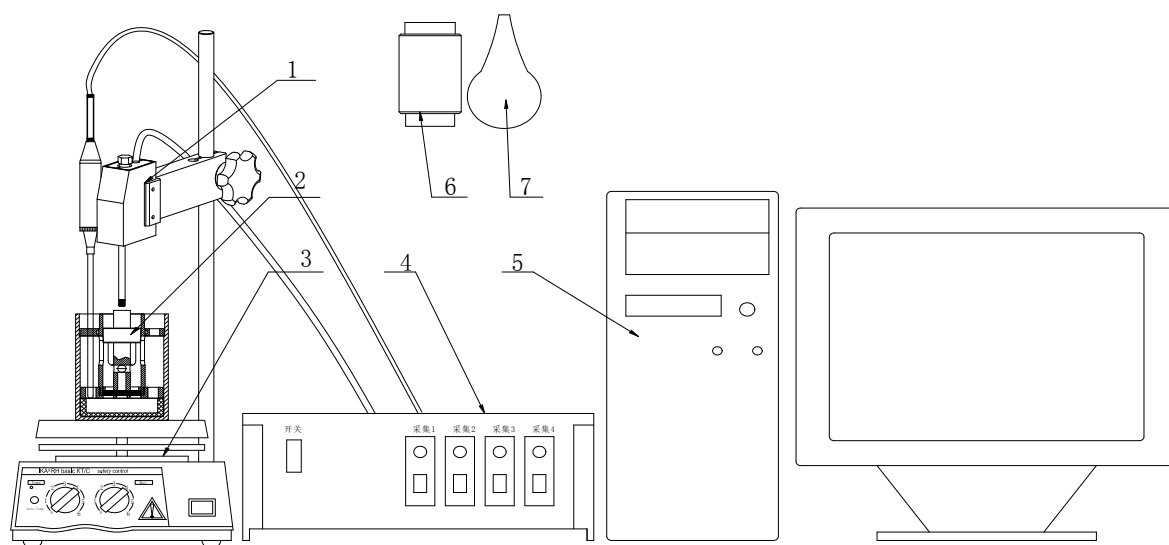
#### (一) Composition

- 1、Sensor module: Measure the expansion of the sample in vertical direction, and pass signals to the computer
- 2、The cup body components: Dressed up shale cake is in the test process
3. Magnetic stirring heater: Heating the sample during the testing process and mixing st additive
- 4、Industrial control communication device: Converting precision displacement sensor for displacement signal into electrical signals.
- 5、Computer: Including test software host and display, record keeping and display the data results.
- 6、Die assembly: Preparation of test samples。



## (二) 工作原理

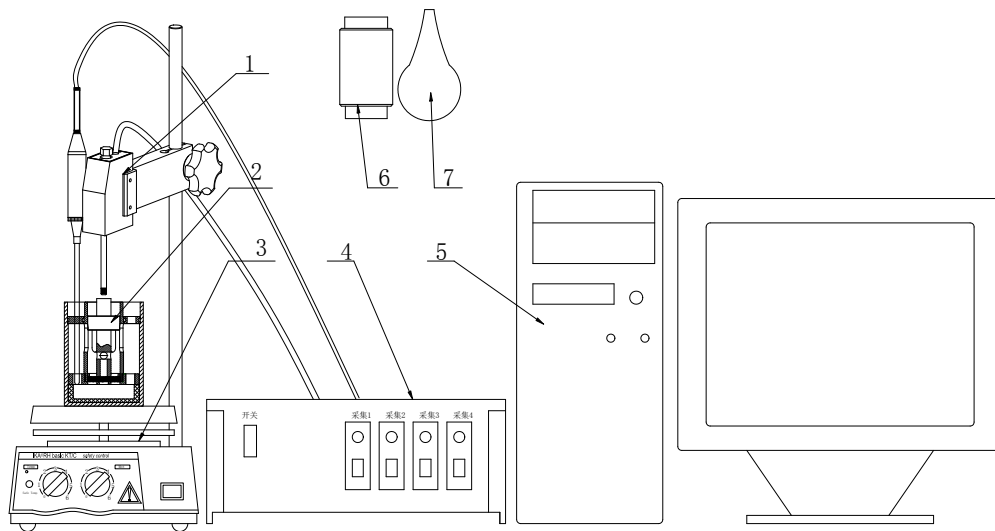
该装置是将泥页岩粉在压模中压实成饼，放入杯体中进行测试，将精密位移传感器竖直固定在杯体的移动杆上方，将添加剂注入杯体内，开始加热搅拌添加剂，页岩泥饼吸收液体添加剂后会膨胀，推动精密位移传感器测量探头竖直向上移动，由工控通讯装置将位移量转换成电信号，最后由计算机采集，记录、保存和输出试验结果即为样品的膨胀量。



序号	名称
1	传感器组件
2	样品杯组件
3	磁力搅拌加热器
4	通讯装置
5	计算机
6	压膜组件

## (二) Working principle

The device is compacted the powder of the shale into a cake in the die, then , put it into the cup for testing. Precision displacement sensor is fixed on the top of the cup shipper rod ,put [additive](#) into the cup body, Start heating and stirring [additive](#), Shale cake will expands after absorbing the liquid additive promote the probe of precision displacement sensor upward mobile vertically, the IPC communication device converted the amount of displacement into an electrical signal. finally , collected 、 record 、 keeping by computer, and output test results is the expansion of the sample.



No.	Name
1	Sensor assembly
2	The cup Sample assembly
3	Magnetic stirring heater
4	IPC communication device
5	Computer
6	Pressure membrane module

## 五、仪器的操作 The operation of the instrument

### (一) 试样制作

1、土样：样土或泥页岩样粉（过 100 目筛网），经 105℃烘干，储于干燥器内备用。

### (二) 实验方法

1、按(图二)所示将仪器平稳的摆放在台面上。

- 2、取出杯体组件，手拿移动杆上部取出移动杆，分别将滤网、滤纸、压制好的泥饼放入测试筒内。
- 3、此时杯体为一整体，将杯体组件按（图二）所示放到磁力加热搅拌器上。
- 4、将移动杆上端中心对正位移传感器测头，松开缩紧手柄，调整位移传感器上下位置。测头与移动杆上端要有一定的预紧力，使电脑显示初始位移大于 0 小于 10, 拧紧锁紧手柄，保持传感器不动，整机保持平稳。
- 5、启动膨胀量采集系统软件开始试验（具体操作参见膨胀量采集系统 V1.1 操作说明书）。
- 6、将添加剂注入盛液杯（装入量至少满过泥饼），最大容量为 200ml，泥饼膨胀情况由计算机直观显示，实验时间用户自定。
- 7、实验完毕，松开锁紧手柄，将位移传感器提起并固定，将杯体组件取下，依次将移动杆、上固定盘、测试筒等取出清洗干净并擦干，以备下次使用。
- 8、可从计算机上读取、保存和打印实验结果。

#### **（一） Sample preparation**

- 1、 Soil samples: Soil sample or shale-like powder(Through 100 mesh sieve), drying by the 105 °C , Stored in a desiccator for use.

#### **（二） Experimental methods**

- 1、 According to (Figure 2) shows the instrument steady placed on the table.
- 2、 Take out the cup assembly , hand moving rod upper lever to take out the mobile, Respectively, the filter, filter paper, suppress good mud cake, placed in a test tube。
- 3、 Now, the cup body as a whole, put the cup assembly on the magnetic stirres according to (Figure 2).
- 4、 Will move the pole top center to alignment the displacement sensor probe, loosen the tightening grip, Adjust the displacement sensor up or down position. Probe and mobile bar top to have a certain preload, the computer displays the initial displacement is greater than 0 and less than 10, tighten the lock handle to keep the sensor does not move, the whole remained stable.
- 5、 Start the expansion volume acquisition system software to start test(Specific operation see the inflation V1.1 signal gathering system operation manual)
- 6、 Put the additive into the liquid cup (Loading quantity at least full the mud cake), the maximum capacity of 200ml, expansion of mud cake is visual display by computer, experimental time by user.
- 7、 Release the locking handle, when the experiment is completed,. lift and fixed displacement sensor, take down the components of the cup, and in turn move the lever, fixed disk, remove the

test cylinder clean and dry for the next use.

8、 Can be read, save and print the experimental results from the computer.

## 六、仪器的维护与保养

### **The care and maintenance of the instrument**

1、清洗各部件并干燥待用，仪器置于干燥环境中。

2、移动、维修或保养仪器时。要轻拿、轻放，以免造成部件变形影响精度和使用。

1、 Cleaning the various components and stand-drying, put the Instrument in a dry environment

2、 Mobile, repair or maintenance of the instrument., should be handled gently, so as not to cause the warp affect the accuracy and the use of.



# 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

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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	编号	名称及规格	单位	数量	备注
1		电脑	台	1	
2		磁力搅拌机	台	4	
3		传感器	套	4	
4		传感器支架	根	4	
5		岩芯杯	套	4	
6		滤纸	盒	1	
7		过滤网	个	8	
8		活扳手 150mm	把	1	
9		热电偶	个	4	
10		采集通讯盒	台	1	
11		数据线	根	1	
12		使用说明书	份	1	
13		合格证	份	1	