DOCN
东辰阀门

安装、使用及维护说明书

Installation, operation and maintenance instructions

DC1620系列套筒调节阀
DC1220系列高压多级涡流调节阀
DC1820系列高压调节阀

DC1620 series sleeve regulating valve
DC1220 series high pressure multistage eddy current regulating valve
DC1820 series high pressure regulating valve

专业提供过程控制阀门解决方案

Professionally provide process control valve solutions

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中国 · 杭州
Hangzhou, China

浙江东辰阀门科技有限公司
ZHEJIANG DONGCHEN VALVE TECHNOLOGY CO., LTD.

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安全注意事项
Safety precautions

一般性注意事项 General notes

除了如下所述规则，工厂管理人员必须严格遵守有关现场工作人员安全及健康的强制性规定。

In addition to the following rules, plant management personnel must strictly abide by the mandatory regulations on the safety and health of site staff.

操作阀门的人员必须是培训合格的人员。

东辰公司对由于如下所诉问题引起的人身伤害或设备损坏不承担任何责任：

1、不正确的操作

2、使用非DOCN原厂备品备件

3、非授权人员执行维修

从出厂到现场的运输过程必须使用原厂包装。

东辰公司对由于擅自更改原厂包装引起的人身伤害或货物损坏不负任何责任。

Operators of valves must be trained and qualified.

Dongchen company shall not be liable for personal injury or equipment damage caused by the following problems:

1.incorrect operation

2.use of non docn original spare parts

3.repair by unauthorized personnel

The transportation from the factory to the site must use the original packaging.

Dongchen company is not responsible for personal injury or goods damage caused by unauthorized change of original packing.

使用与维护 Use and maintenance

小心阀杆及执行机构推杆连接件和反馈杆(若有)。

Be careful with stem and actuator stem connections and feedback levers, if any.

禁止将手伸到阀杆和反馈杆处，即使阀门没有动作，除非气源断开或弹簧压力完全释放。

Do not extend your hand to the stem and feedback lever, even if the valve does not act, unless the air supply is disconnected or the spring pressure is completely released.

拆卸 Disassemble

危险警告 Danger warning ⚠

为了避免人身伤害及损坏设备系统，在对阀门进行拆卸之前要对阀门进行压力隔离并泄压，包括部分拆卸。

In order to avoid personal injury and damage to the equipment system, the valve shall be pressure isolated and pressure relieved before disassembly, including partial disassembly.

危险警告 Danger warning ⚠

在拆卸执行机构之前，必须确认气动连接没有处于加压状态。

为了避免人身伤害及损坏设备系统，执行机构必须与任何压力隔断。在拆卸连接块之前，必须对执行机构泄压。

当拆卸执行机构时，即使是部分拆卸，也要按照使用说明书执行。

Before disassembling the actuator, make sure that the pneumatic connection is not pressurized.

In order to avoid personal injury and damage to the equipment system, the actuator must be isolated from any pressure. Before removing the connecting block, the actuator must be depressurized.

When disassembling the actuator, even if it is partially disassembled, it shall be carried out in accordance with the operating instructions.

吊装及搬运 Hoisting and handling

如果配有吊耳，阀门的吊装要使用吊耳，否则吊装阀体。

If equipped with lifting lugs, the lifting lugs shall be used for valve hoisting, otherwise, the valve body shall be hoisted.

危险警告Danger warning ⚠

当整体吊装阀门－执行机构时，如果执行机构上配有吊耳，执行机构上的吊耳可用于吊装，除非有其它特殊说明。

When hoisting the valve actuator as a whole, if the actuator is equipped with lifting lugs, the lifting lugs on the actuator can be used for hoisting unless otherwise specified.

噪音 Noise

对于某些特殊应用场合，阀门可能产生很高的噪音，这种情况下，必须按照规程设有预警标志。

For some special applications, the valve may produce high noise, in this case, warning signs must be set according to the regulations.

温度 Temperature

对于高温介质，操作人员必须注意没有隔热的部件。

For high temperature media, the operator must pay attention to the parts without heat insulation.

填料函 Stuffing box

危险警告 Danger warning ⚠

阀门内部保持有压力时，禁止对填料函进行拆卸及更换。

When there is pressure inside the valve, it is forbidden to disassemble and replace the stuffing box.

使用限制
Restrictions on use

如果没有其它特殊说明，如下所述使用限制仅用于DOCN调节阀，球形阀体。

If there are no other special instructions, the following use restrictions are only applicable to docn regulating valve, spherical valve body.

最高工作压力及温度 Maximum working pressure and temperature

在将阀门装到管道上之前，必须确认最大工作压力和温度是否在阀体的压力－温度等级限定范围内及低于铭牌上显示的最大允许值。

Before installing the valve on the pipeline, it is necessary to confirm whether the maximum working pressure and temperature are within the limit of the pressure temperature class of the valve body and lower than the maximum allowable value shown on the nameplate.

最低工作温度 Minimum operating temperature

当工作压力为阀体压力等级对应的压力值时，碳钢(SA105或SA216 WCB)阀体的最低工作温度为－20℃。当最低工作温度为－29℃时，最高工作压力为其压力等级对应压力值的1/3。当阀体材质为CrMo合金钢(SA217 WC6,SA217 WC9,SA217 C12A, SA182 F11, SA182 F22, SA182 F91等)时，适用于高温场合，当其工作温度为阀体压力等级对应压力值时，最低工作温度为0℃(静水压测试)。最低工作温度也可为－29℃，但最大工作压力必须低于其常温时压力等级对应压力值的1/3。

When the working pressure is the corresponding pressure value of valve body pressure grade, the minimum working temperature of carbon steel (sa105 or sa216 WCB) valve body is – 20 ℃. When the minimum working temperature is – 29 ℃, the maximum working pressure is 1/3 of the corresponding pressure value of its pressure grade. When the valve body is made of CrMo alloy steel (sa217 wc6, sa217 wc9, sa217 c12a, SA182 F11, SA182 F22, SA182 F91, etc.), it is suitable for high temperature occasions. When the working temperature is the corresponding pressure value of the valve body pressure grade, the minimum working temperature is 0 ℃ (hydrostatic test). The minimum working temperature can also be – 29 ℃, but the maximum working pressure must be lower than 1/3 of the corresponding pressure value of the pressure level at normal temperature.

表1 Table 1

压力等级ANSI Pressure rating	额定压力 (1)bar Rated pressure	压力值Pressure value T ≤ 20° C (1) (2)bar
150	20	7
300	51.7	17
600	103.4	34
900	155.1	52
1500	258.6	86
2500	431	144
4500	775.7	259

(1) 参照SA217 WC6/WC9 或 SA182 F11/F22
(2) 同样用于T≤20℃的静水压测试
(1) Refer to sa217 WC6 / WC9 or SA182 F11 / F22
(2) It is also used for hydrostatic test at t ≤ 20 ℃

预期使用寿命－蠕变温度 Expected service life－creep temperature

当调节阀工作温度在蠕变温度范围内（见表2）时，在工作温度对应的压力等级限定的压力范围内，可保证的连续运行预期寿命为100,000小时。

When the operating temperature of the regulating valve is within the creep temperature range (see Table 2), the guaranteed continuous operation life expectancy is 100000 hours within the pressure range limited by the pressure level corresponding to the operating temperature.

表2 Table 2

材质 Texture of material	开始蠕变温度 Starting creep temperature
碳钢 (比如: A216 WCB－A105) Carbon steel (e.g. A216 wcb－a105)	343℃
CrMo 合金钢 (比如: A217 WC9－A182 F22) CrMo alloy steel (e.g. A217 wc9－a182 F22)	455℃
300 系列铸造奥氏体不锈钢 300 series cast austenitic stainless steel	510℃
9% Cr Mo V 合金钢 (比如: A217 C12A－A182 F91) 9% Cr Mo V alloy steel (e.g. A217 c12a－a182 F91)	538℃
300 系列锻造奥氏体不锈钢 300 series Forged austenitic stainless steel	538℃

地震应力 Seismic stress

当调节阀配DOCN标准气动执行机构用于震区，且垂直于执行机构轴线方向的地震加速度不大于1.5g时，DOCN调节阀不需进行额外的分析。1.5g加速度值是在调节阀配竖直执行机构在最低压力等级和及其恶劣工况条件下计算的结果。对于特殊阀门或装有不同执行机构时，抗震计算仅在要求时执行。

When the control valve is equipped with docn standard pneumatic actuator for seismic area, and the seismic acceleration perpendicular to the axis direction of the actuator is not more than 1.5g, no additional analysis is required for docn control valve. The acceleration value of 1.5g is calculated under the condition of the lowest pressure level and severe working conditions when the control valve is equipped with vertical actuator. For special valves or with different actuators, the seismic calculation is only performed when required.

管道应力 Pipe stress

通常，如果管道尺寸不大于1.5倍的阀门公称尺寸，无需进行管道应力检查及计算（当阀门尺寸≤3" 时，为2倍）。

由于调节阀不必用于一个固定地方，如果入口与出口管道尺寸不同，应该考虑小管道尺寸作为管道设计的重要参数。

In general, if the pipe size is not more than 1.5 times of the nominal size of the valve, there is no need to check and calculate the pipe stress (when the valve size is ≤ 3 ", it is 2 times).

Since the regulating valve does not need to be used in a fixed place, if the size of the inlet and outlet pipes is different, the small pipe size should be considered as an important parameter of the pipe design.

振动、疲劳等 Vibration, fatigue, etc

如果是经过正确计算选型的（合适的阀内件类型及阀体端口尺寸），调节阀本身不会产生显著的振动。然而，恶劣工况下（气蚀或闪蒸），工况条件的稍微改变可能会引起振动，甚至强烈的振动会破坏阀内件及执行机构附件。这种情况下，如果可能，必须恢复原始工况参数，否则必须选择不同的阀内件。

If it is correctly calculated and selected (appropriate trim type and valve body port size), the regulating valve itself will not produce significant vibration. However, under severe working conditions (cavitation or Flash), slight change of working conditions may cause vibration, and even strong vibration may damage the valve internals and actuator accessories. In this case, if possible, the original operating parameters must be restored, otherwise different trim must be selected.

使用限制
Restrictions on use

侵蚀、腐蚀 Erosion, corrosion

1、闪蒸及气蚀液体 Flash and cavitation liquid

当出现闪蒸或气蚀时，建议采用CrMo合金钢或不锈钢阀体，增加阀体尺寸及压力等级，采用特殊设计的阀内件形式。

In case of flash or cavitation, it is recommended to use CrMo alloy steel or stainless steel valve body, increase the valve body size and pressure grade, and adopt the valve trim form of special design.

2、腐蚀 Corrosion

对于腐蚀性应用场合，DOCN调节阀的设计考虑了阀体壁厚允许腐蚀余量：对于最大壁厚不大于30mm的阀体，铸造阀体-2mm，锻造阀体-1mm。对于扩散性晶间腐蚀，在考虑增加壁厚的情况下，预期使用寿命是可以预见的。对于局部腐蚀，特别是氯化物，比如点腐蚀，垫片密封面的间隙腐蚀及应力腐蚀，任何实际阀门使用寿命的预见是不可能的。因此，正确地选择阀体材质是非常重要的。

For corrosive applications, the allowable corrosion allowance of valve body wall thickness is considered in the design of docn control valve: for the valve body with maximum wall thickness not greater than 30mm, cast valve body – 2mm and forged valve body – 1mm.For the diffusion intergranular corrosion, the expected service life can be predicted when the wall thickness is increased. For local corrosion, especially chloride corrosion, such as spot corrosion, gap corrosion and stress corrosion of gasket sealing surface, it is impossible to predict the service life of any actual valve. Therefore, it is very important to choose the valve body material correctly.

3、硫化物应力裂纹 Sulfide stress crack

对于流体含有硫化氢时，硫化物应力裂纹必须给予考虑(见NACE MR01-75标准，对于材质的选择)，并且所有阀门构造材质必须正确选择。

When the fluid contains hydrogen sulfide, the sulfide stress crack must be considered (see NACE mr01-75 standard for material selection), and all valve construction materials must be correctly selected.

4、流体中含有磨损性固体颗粒 Abrasive solid particles in the fluid

流体中磨损性固体颗粒的存在，是阀芯的侵蚀的主因，另外也会引起承压部件阀体壁厚变薄。

The existence of abrasive solid particles in the fluid is the main cause of the erosion of the valve core. In addition, it will also cause the wall thickness of the valve body of pressure parts to become thinner.

外部火烧External fire

DOCN调节阀的设计不考虑经受外部火烧。

The design of the docn control valve does not consider external fire.

超压保护Overpressure protection

1、安全阀泄压期间的超压 Overpressure during relief of safety valve

调节阀必须进行超压保护防止超过最大允许压力。在安全阀泄压期间，限定时间内，超过最大允许工作压力10%的压力峰值是允许的。

The regulating valve must be overpressured to prevent the maximum allowable pressure from being exceeded. During the relief period of the safety valve, the pressure peak value exceeding 10% of the maximum allowable working pressure is allowed within the limited time.

2、快关引起的水锤 Water hammer caused by quick closing

特别是对于不可压缩流体，防止阀芯快关非常重要，防止水力冲击波产生不可控的超压及破坏管道和相连的设备。考虑到这一方面，调节阀采用非平衡型阀芯配标准气动执行机构时，必须避免流关设计。

Especially for the incompressible fluid, it is very important to prevent the valve core from closing quickly, to prevent the hydraulic shock wave from generating uncontrollable overpressure and damaging the pipeline and connected equipment. In consideration of this, when the regulating valve is equipped with non-equilibrium valve element and standard pneumatic actuator, it is necessary to avoid the design of flow shut.

执行机构最大推力 Maximum thrust of actuator

当调节阀配DOCN标准气动执行机构时，无需进行额外的检查。对于其它特殊情况，在最大推力允许的情况下，必须严格进行计算。

When the regulating valve is equipped with docn standard pneumatic actuator, no additional inspection is required. For other special cases, the calculation must be carried out strictly when the maximum thrust is allowed.。

管道终端阀 Pipe end valve

DOCN调节阀的设计不考虑用于管道终端切断，即使其用于开关场合。

DOCN control valves are not designed to be used for pipe end shutoff, even when they are used in switching applications.

压力－温度负荷周期 Pressure temperature load cycle

在大部分安装条件下，可能的温度或压力周期变化不会影响调节阀的预期使用寿命。假设条件如下：

1、最大工作温度不超 550℃
2、流体温度变化率不大于 2K/min
3、周期性的工作压力变化不超过在对应温度下的最大允许压力的1/3

当工况条件超出以上范围时，必须执行特殊的复核以计算调节阀的预期寿命。

Under most installation conditions, possible temperature or pressure cycle changes will not affect the expected service life of the control valve. The assumptions are as follows:

1.The maximum working temperature shall not exceed 550 ℃
2.The change rate of fluid temperature is not more than 2K / min
3.The periodic working pressure change shall not exceed 1/3 of the maximum allowable pressure at the corresponding temperature

When the working condition exceeds the above range, special recheck must be carried out to calculate the expected life of the regulating valve.

DC1620系列调节阀
DC1620 series regulating valve

前言 Preface

在DC1620系列阀门安装之前，必须确认过程工作压力不高于阀体在设计温度下的允许压力。

另外特定的压力等级也必须给予考虑(见常规样本)。在有些情况下，这一参数更为重要。

Before installation of dc1620 series valves, it must be confirmed that the process working pressure is not higher than the allowable pressure of the valve body at the design temperature.

In addition, specific pressure levels must also be considered (see regular samples). In some cases, this parameter is more important.

安装 Install

阀门上游直管段长度至少为10DN，下游直管段长度至少为5DN。这一要求的目的是防止流体流束在阀体入口段偏离。

以上提及的直管段内允许装有适当锥度的同心大小头。

对以上要求的符合性越好，阀门的操作就越趋近于设计条件，越接近计算结果，比如，噪音，阀芯稳定性等。

在将新阀门装入管道之前，必须将管道及阀门内的杂物清理掉，比如焊渣、碎块、油脂或杂物等。

当阀门采用法兰连接时，要检查管道连接布置的尺寸、同轴性及平行性，以避免连接过程中产生拉伸及弯曲应力。

如果阀门采用对焊连接，其与管道焊接连接时要避免阀体过热。当阀芯带塑性软密封环时，在焊接时最好将阀芯升起，使之不接触阀座。

如果预期可能引起阀体过热（比如小阀门、现场退火、MIG气体保护焊等），并且阀内件带有塑性软密封环时，在焊接过程中必须控制阀体的温度。距离焊接区70－80mm的阀体外表面温度必须不超过100℃。

如果不能确定焊接是否会影响阀内件，在焊接之前最好将阀内件拆去。

DOCN调节阀面到面结构长度符合IEC 534-3-1 表1.

当阀门采用螺纹连接端口时，需要采用活接头连接，以方便从管线上拆下。

调节阀通常需要安装旁通管路，以便在不关闭工艺过程的情况下对阀门进行维护。任何特定的应用场合都必须指出旁路的需求。

调节阀的上下游必须装有两个与管道同尺寸的关断阀，防止全开时引起压力损失。旁路阀的口径必须与调节阀的口径相同（全通径或缩径）。

DC1624及DC1621系列阀门通常的安装方式为流开，除非有其它说明。

流向，如上所述，采用箭头标识牌。

阀门通常采用垂直安装方式，也即执行机构垂直向上。

阀门也可采用其它安装方向并可实现适当操作。如果流体中有固体颗粒，阀门的执行机构安装方向不能朝下，以避免颗粒堆积损坏填料。

The upstream straight pipe length of the valve shall be at least 10dn, and the downstream straight pipe length shall be at least 5dn. The purpose of this requirement is to prevent the flow beam from deviating at the inlet section of the valve body.

Concentric reducer with proper taper is allowed in the above mentioned straight pipe section.

The better the compliance with the above requirements, the closer the valve operation is to the design conditions and the closer the calculation results, such as noise, valve core stability, etc.

Before installing the new valve into the pipeline, the sundries in the pipeline and valve must be removed, such as welding slag, debris, grease or sundries.

When the valve is connected by flange, the size, coaxiality and parallelism of the pipe connection arrangement shall be checked to avoid tensile and bending stress in the connection process.

If the valve is butt welded, the valve body shall not be overheated when it is welded to the pipeline.

When the valve core is provided with plastic soft sealing ring, it is better to raise the valve core during welding so that it does not contact the valve seat.

If it is expected that the valve body may overheat (such as small valve, field annealing, MIG gas shielded welding, etc.), and the valve trim has plastic soft sealing ring, the temperature of the valve body must be controlled during the welding process. The external surface temperature of the valve 70-80mm away from the welding area must not exceed 100 ℃.

If it is uncertain whether welding will affect the valve trim, it is better to remove the valve trim before welding.

The face to face structure length of docn regulating valve shall conform to table 1 of IEC 534-3-1

When the valve uses threaded connection end, it needs to use union connection to facilitate the removal from the pipeline.

The control valve usually needs to be installed with a bypass line to maintain the valve without closing the process. Any specific application must indicate the need for bypass.

The upstream and downstream of the regulating valve must be equipped with two shut-off valves of the same size as the pipeline to prevent pressure loss when fully open. The diameter of bypass valve must be the same as that of regulating valve (full bore or reduced bore).

DC1624 and DC1621 series valves are usually installed by flow opening, unless otherwise specified.

Flow direction, as described above, with arrow identification plate.

The valve is usually installed vertically, i.e. the actuator is vertically upward.

The valve can also be installed in other directions and can be operated properly. If there are solid particles in the fluid, the actuator of the valve shall not be installed downward to avoid particle accumulation and damage to the packing.

DC1620系列调节阀
DC1620 series regulating valve

表3 Table3

零件号 Part number	零件名称 Part name
1	阀体 Valve body
2	阀盖 Bonnet
3	双头螺柱 Stud
4	螺母 Nut
5	阀芯 Spool
6	阀座 Valve seat
7	阀杆 Stem
8	垫片 Shim
9	套筒 Sleeve
12	销钉 Pin
14	阀座垫片 Seat gasket
27	填料组件 Packing as
31	先导阀芯 Pilot valve element
32	弹簧 Spring

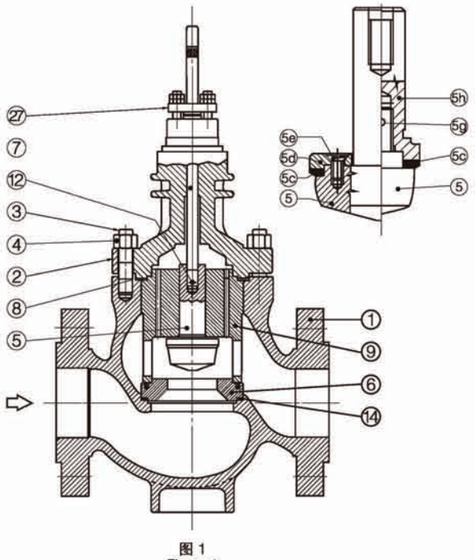

图 1
Figure 1

阀门的拆卸与装配
Disassembly and assembly of valve

1、拆卸 Disassemble

1.1 DC1621系列阀门的拆卸
disassembly of dc1621 series valve

拆卸并移去阀门执行机构（见执行机构使用说明书）。

松开填料组件 (27), 拧下螺母 (4) 并移去阀盖 (2)。

从阀体内移去垫片 (8)，若垫片出现问题或破坏，建议采用DOCN原装备件更换。

套筒 (9) 必须通过抽阀杆(7)将其与阀芯一起从阀体内取出。如果由于杂物或卡涩使套筒难以取出，可以在其上部端口周围轻轻敲打。

如果阀门装有套筒适配套(11)，需要将其随套筒一起取出。

移去阀盖填料密封组件(27)，见DOCN“调节阀填料手册”。

通过阀座上预留的适当的螺纹孔，将阀座(6)取出，并取出垫片(14)。

Remove and remove the valve actuator (see the actuator instruction manual).

Loosen packing assembly (27), unscrew nut (4) and remove bonnet (2). Remove the gasket (8) from the valve body. If the gasket is defective or damaged, it is recommended to replace it with original docn spare parts.

The sleeve (9) must be taken out of the valve body together with the valve element by means of the extraction stem (7). If the sleeve is difficult to take out due to sundries or jamming, it can be gently knocked around its upper port.

If the valve is fitted with a sleeve adapter (11), it needs to be taken out with the sleeve.

Remove the bonnet packing seal assembly (27), see docn "packing manual for control valves.".

Take out the valve seat (6) and take out the gasket (14) through the appropriate threaded hole reserved on the valve seat.

1.2、阀芯上PTFE密封环的更换
Replacement of PTFE sealing ring on valve element

DN≤3”：将螺丝刀插入阀芯上部适当的凹槽中，将阀芯(5)从阀杆(5h)上拧下。

DN>3”：拧下螺钉(5e) 和法兰 (5d).

Teflon 密封环 (5c) 为部分加工部件。密封面必须在装入阀芯后进行加工。

紧固阀芯法兰，直到金属面与金属面接触。(对于 DN≤3” 检查阀杆和阀芯的孔要完全对齐，将销钉5g插好。)

在车床上使阀芯完全对中，注意不要破坏阀芯导向杆。

按照图纸加工Teflon软密封环。

检查确认加工面是否平滑且无划痕。然后紧固阀芯软密封环使其外径膨胀增大。

DN ≤ 3 ": insert the screwdriver into the appropriate groove on the upper part of the valve core, and screw off the valve core (5) from the valve stem (5H).

DN > 3 ": screw out screw (5e) and flange (5d)

Teflon seal ring (5C) is a partially machined part. The sealing surface must be machined after the valve core is installed.

Tighten the valve element flange until the metal surface contacts the metal surface. (for DN ≤ 3 ", check that the holes of valve rod and valve element are completely aligned, and insert 5g pin.)

Align the valve core completely on the lathe, and pay attention not to damage the valve core guide rod.

Process Teflon soft seal ring as per drawing.

Check that the machined surface is smooth and free of scratches. Then tighten the soft sealing ring of the valve core to increase its outer diameter expansion.

DC1620系列调节阀
DC1620 series regulating valve

1.3、DC1624 系列阀门的拆卸 Disassembly of dc1624 series valve

拆卸并移去阀门执行机构（见执行机构使用说明书）。

松开填料组件 (27), 拧下螺母 (4) 并移去阀盖 (2)。

从阀体内移去垫片 (8)，若垫片出现问题或破坏，建议采用DOCN原装备件更换。

通过抽阀杆 (7) 将阀芯 (5) 取出。

通过适当的螺纹孔将套筒 (9) 从阀体内取出。

如果由于杂物或卡涩使套筒难以取出，可以在其上部端口周围轻轻敲打。

如果阀门装有套筒适配套 (11)，需要将其随套筒一起取出。

移去阀盖填料密封组件 (27)，见DOCN“调节阀填料手册”。

通过阀座上预留的适当的螺纹孔，将阀座(6)取出，并取出垫片(14)。

Remove and remove the valve actuator (see the actuator instruction manual).

Loosen packing assembly (27), unscrew nut (4) and remove bonnet (2).

Remove the gasket (8) from the valve body. If the gasket is defective or damaged, it is recommended to replace it with original docn spare parts.

Take out the valve element (5) by pulling out the valve rod (7).

Remove the sleeve (9) from the valve body through a suitable threaded hole.

If the sleeve is difficult to take out due to sundries or jamming, it can be gently knocked around its upper port.

If the valve is fitted with a sleeve adapter (11), it needs to be taken out with the sleeve.

Remove the bonnet packing seal assembly (27), see docn "packing manual for control valves.".

Take out the valve seat (6) and take out the gasket (14) through the appropriate threaded hole reserved on the valve seat.

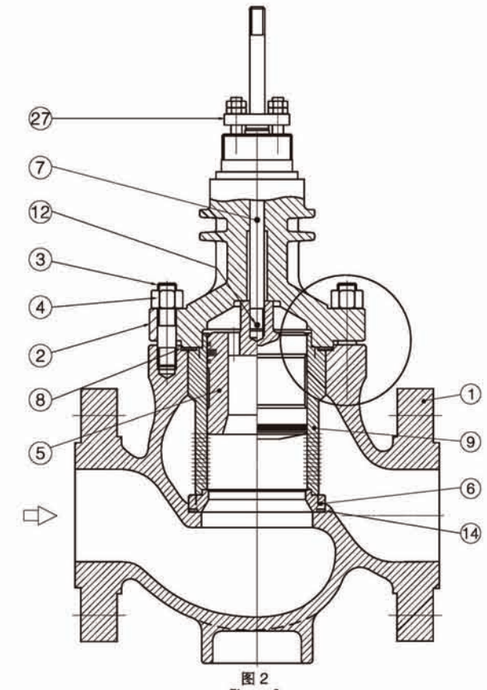

图 2
Figure 2

缩径阀内件配适配套
Fitting of reducing valve trim

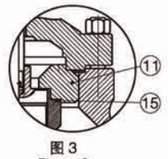

图 3
Figure 3

HT 高温型配盘形弹簧垫片
HT high temperature type with disc spring gasket

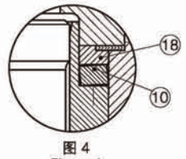

图 4
Figure 4

AG 附加垫片型
AG additional gasket type

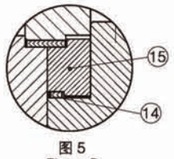

图 5
Figure 5

DC1620系列调节阀
DC1620 series regulating valve

1.4、DC1629 系列阀门的拆卸 Disassembly of dc1629 series valve

拆卸并移去阀门执行机构（见执行机构使用说明书）。

松开填料组件 (27), 拧下螺母 (4) 并移去阀盖 (2)。

从阀体内移去垫片 (8)，若垫片出现问题或破坏，建议采用DOCN原装备件更换。

如果由于杂物或卡涩使套筒难以取出，可以在其上部端口周围轻轻敲打。

抽阀杆(7)，将阀芯(5)和套筒(9)一起从阀体内取出。

Remove and remove the valve actuator (see the actuator instruction manual).

Loosen packing assembly (27), unscrew nut (4) and remove bonnet (2).

Remove the gasket (8) from the valve body. If the gasket is defective or damaged, it is recommended to replace it with original docn spare parts.

If the sleeve is difficult to take out due to sundries or jamming, it can be gently knocked around its upper port.

Pull out the valve rod (7), and take out the valve core (5) and sleeve (9) from the valve body together.

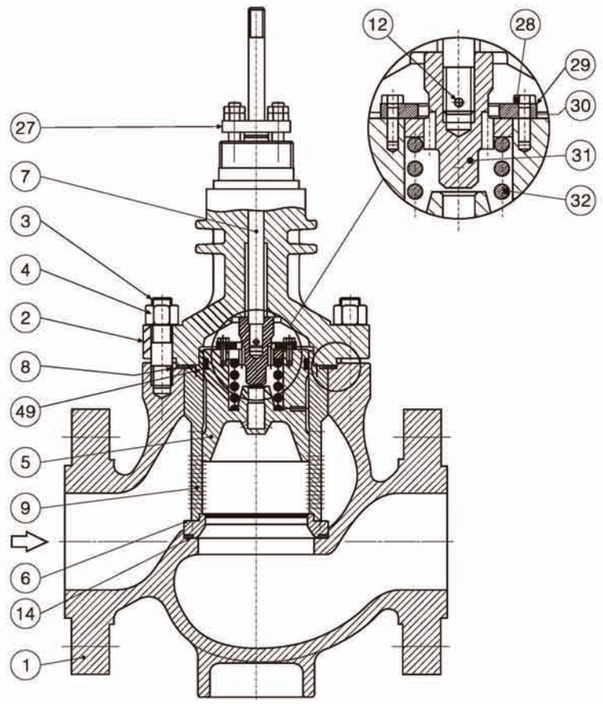

图 6
Figure 6

如果阀门装有套筒适配套 (11)，需要将其随套筒一起取出。

对于阀芯的拆卸，见DOCN“先导平衡型阀芯”使用手册。

移去阀盖填料密封组件 (27)，见DOCN“调节阀填料手册”。

通过阀座上预留的适当的螺纹孔，将阀座(6)取出，并取出垫片 (14)。

If the valve is fitted with a sleeve adapter (11), it needs to be taken out with the sleeve.

For the disassembly of valve element, see docn "pilot balanced valve element" manual.

Remove the bonnet packing seal assembly (27), see docn "packing manual for control valves.".

Take out the valve seat (6) and take out the gasket (14) through the appropriate threaded hole reserved on the valve seat.

1.5、阀杆和阀芯的更换 Replacement of valve stem and valve element

阀杆与阀芯采用螺纹和销钉连接时，虽然供货时通常是装配好的，但是两个部件的连接方法应该掌握。

当阀芯可以再使用时，建议用一个新的阀杆(无钻孔)。

不能将阀杆的螺纹端切去一部分再与阀芯连接，因为阀杆与执行机构推杆之间的距离会太长而不能完成连接。

用一个冲头将销钉冲出。

用一个采用橡胶保护的钳子将新阀杆完全拧进阀芯。注意不要破坏研磨面。

将阀芯的导向部分放入一个“V”楔块中。

按照表4中数据通过阀芯中已存在的孔在阀杆上钻孔。

将钻屑清理掉。

在新的销钉上涂油脂，然后将其装到孔中。

在车床上检查阀杆和阀芯的对中。如果有必要，用一个塑料或橡胶锤将其校直。

When the valve rod and valve core are connected by thread and pin, although they are usually assembled when supplied, the connection method of the two parts should be mastered.

When the valve element can be reused, it is recommended to use a new valve stem (without drilling).

It is not allowed to cut off a part of the threaded end of the valve stem and connect with the valve core, because the distance between the valve stem and the actuator push rod will be too long to complete the connection.

Use a punch to drive the pin out.

Screw the new stem completely into the valve element with a rubber protected pliers. Take care not to damage the grinding surface.

Put the guide part of the valve element into a "V" wedge.

According to the data in Table 4, drill holes on the valve stem through the existing holes in the valve core.

Clean up the cuttings.

Grease the new pin and fit it into the bore.

Check the alignment of the valve stem and valve core on the lathe. If necessary, straighten it with a plastic or rubber hammer.

DC1620系列调节阀
DC1620 series regulating valve

表4 Table 4

销钉公称直径 Nominal diameter of pin	3	4	5
销孔直径 Pin hole diameter	$3^{0}_{0.1}$	$4^{0}_{0.12}$	$5^{0}_{0.12}$

2、装配 Assembling

装配阀门之前，先将阀体–阀盖垫片(8)装入阀体，安装阀盖(2) 并按照 图6a 测量尺寸"A"。

完全清理垫片 (8)、(14) 及 (16) 的密封表面，其用于密封阀体与阀盖、阀体与套筒、阀体与阀座及套筒与适配套。

Before assembling the valve, install the body bonnet gasket (8) into the valve body, install the bonnet (2) and measure dimension "a" according to figure 6A.

Completely clean the sealing surfaces of gaskets (8), (14) and (16), which are used to seal the valve body and bonnet, the valve body and sleeve, the valve body and seat, and the sleeve and matching.

表5 Table 5

DN (in.)	螺柱类型 Stud type	螺柱数量 Number of studs	扳手规格 Wrench specifications	紧固力矩 * Tightening torque* 最小(Nm) Minimum	最大(Nm) Maximum	A – B (mm)
1/2"	M12	6	19	20	30	0.6
3/4"–1"	M12	6	19	20	30	0.6
	M16	8	24	30	80	0.8
	M20	8	30	55	150	1
1 1/2"	M14	8	22	45	50	0.6
	M20	8	30	90	150	0.8
	M27	8	41	190	390	1
2"	M16	10	24	30	80	0.6
	M27	8	41	190	390	0.8
	M33	8	50	310	720	1
2 1/2"	M18	8	27	100	110	0.6
	M27	8	41	190	390	0.8
	M33	8	50	310	720	1
3"	M20	8	30	130	150	0.6
	M30	8	46	250	530	0.8
	M33	10	50	340	720	1
4"	M20	10	30	130	150	0.6
	M30	10	46	250	530	0.8
	M36x3	10	55	470	980	1
6"	M24	12	36	170	260	0.6
	M33	12	50	300	720	0.8
8"	M27	12	41	250	390	0.6
	M36x3	12	55	430	980	0.8
10"–14"	M27	12	41	270	390	0.6
	M33	12	50	420	720	0.6
	M36x3	12	55	590	980	0.8
	M39x3	16	60	480	1270	0.8
12"–16"	M30	12	46	370	530	0.6
	M33	16	50	390	720	0.6
12"	M42x3	12	65	850	1600	0.8
	M45x3	16	70	680	2000	0.8
14"–16"	M33	16	50	390	720	0.6
	M36x3	16	55	520	980	0.6
16"–20"	M33	20	50	400	720	0.6
	M36x3	20	55	560	980	0.6
20"–24"	M30	20	46	500	530	0.6
	M36x3	24	55	500	980	0.6
	M42x3	24	65	740	1600	0.6
24"	M33	24	50	560	720	0.6
	M39x3	24	60	600	1270	0.6
	M45x3	24	70	970	2000	0.6

* 对于不锈钢阀门，最大紧固力矩可为表中最大值的1.5倍。
*For stainless steel valves, the maximum tightening torque can be 1.5 times of the maximum value in the table.

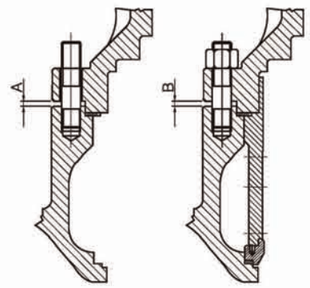

图 6a
Figure 6a

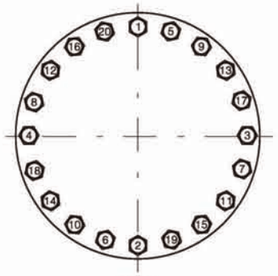

图 6b
Figure 6b

DC1620系列调节阀
DC1620 series regulating valve

2.1、DC1621 系列阀门的装配 Assembly of dc1621 series valves

将阀座垫片(14) 放入阀体内。请始终采用原厂备件，为了正确应用，其厚度已经校核。不正确的垫片厚度会使套筒与阀体错误紧固。

将阀座(6)装入阀体。

装配套筒和阀芯，然后通过控制阀杆将其装入阀体内。要确认阀芯已接触阀座。

通过相对旋转其中一个部件检查两个部件的对中性。

保证套筒的上端面与阀体上密封端面的高度差不超过0.4~0.85mm.

装入阀盖(2)，并按照表5中的力矩拧紧螺母(4)，螺母的拧紧顺序按照图6b.

检查图6a所示的"B"尺寸，如果需要，继续拧紧螺母(4)，直到"A-B"尺寸等于表5所示值。

Place the seat gasket (14) into the body. Please always use the original spare parts. In order to apply them correctly, their thickness has been checked. Incorrect gasket thickness will lead to incorrect tightening of sleeve and valve body.

Install the seat (6) into the valve body.

Assemble the sleeve and valve element, and then install it into the valve body through the control valve rod. Make sure that the valve element contacts the valve seat.

Check the centring of both parts by rotating one of them relative to each other.

Ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body is not more than 0.4 ~0.85mm

Install the valve cover (2) and tighten the nut (4) according to the torque in Table 5. The tightening sequence of the nut is as shown in Figure 6B

Check the "B" dimension shown in Figure 6a, and if necessary, continue to tighten the nut (4) until the "A-B" dimension is equal to the value shown in Table 5.

2.2、DC1624 系列阀门的装配 Assembly of dc1624 series valves

将阀座垫片(14) 放入阀体内。请始终采用原厂备件，为了正确应用，其厚度已经校核。不正确的垫片厚度会使套筒与阀体错误紧固。

将阀座(6)装入阀体 (软密封阀座的装配见 2.2.3)。

将套筒装入阀体内，并保证其与阀座完全接触。

通过相对旋转其中一个部件，检查对中性。

Place the seat gasket (14) into the body. Please always use the original spare parts. In order to apply them correctly, their thickness has been checked. Incorrect gasket thickness will lead to incorrect tightening of sleeve and valve body.

Install the valve seat (6) into the valve body (see 2.2.3 for the assembly of soft seal valve seat).

Install the sleeve into the valve body and make sure it is in full contact with the valve seat.

Check the alignment by rotating one of the components relative to each other.

2.2.1、无适配套型 No matching type

STD标准型: 保证套筒的上端面与阀体上密封端面的高度差不超过0.4~0.95mm.

AG附加垫片型: 放入垫片(14) 和隔垫，保证套筒的上端面与阀体上密封端面的高度差不超过 0.7~1.55mm.

HT高温型: 将盘形弹簧垫片装到套筒上端，并使盘形弹簧的大端朝上。装入隔垫并保证套筒的上端面与阀体上密封端面的高度差不超过表7中所列间隙值。

STD standard type: ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body is not more than 0.4 ~0.95mm

AG additional gasket type: put the gasket (14) and the spacer to ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body does not exceed 0.7~1.55mm

HT high temperature type: install the disc spring gasket on the upper end of the sleeve with the big end of the disc spring facing up. Install the spacer and ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body does not exceed the clearance value listed in Table 7.

2.2.2、带适配套型 With adapter

将适配套装到套筒上部，不装垫片(11)。

STD标准型: 保证套筒的上端面与阀体上密封端面的高度差不超过 0.3~1mm.

AG附加垫片型: 垫片(14) 和隔垫装到套筒的上部，保证套筒的上端面与阀体上密封端面的高度差不超过 0.6~1.65mm.

HT高温型: 将盘形弹簧垫片装到套筒上端，并使盘形弹簧的大端朝上。装入隔垫并保证套筒的上端面与阀体上密封端面的高度差不超过表7中所列间隙值。

Install the adapter over the sleeve without the gasket (11).

STD standard type: ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body is not more than 0.3~1mm

AG additional gasket type: the gasket (14) and spacer are installed on the upper part of the sleeve to ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body is not more than 0.6~ 1.65mm

HT high temperature type: install the disc spring gasket on the upper end of the sleeve with the big end of the disc spring facing up. Install the spacer and ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body does not exceed the clearance value listed in Table 7.

2.2.3、软密封阀座型 Soft seal seat type

将垫片 (14) 放到阀体内，并将阀座置入阀体内，不带O型圈(20)和软密封环(19)。

装入套筒，并按照AD附加垫片型的说明进行装配。

保证套筒的上端面与阀体上密封端面的高度差不超过如下所列间隙值:

STD标准型: 0.4~0.95mm

AG附加垫片型: 0.3~1mm

移去所有部件，并保证没有O型圈(20)时，软密封环(19)与阀座(6)的高度差为~0.2mm.

按照图11，重新装配所有部件。

Place the gasket (14) into the body and seat into the body without O-ring (20) and soft seal ring (19)

Install the sleeve and assemble according to the instructions of ad additional gasket type.

Ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body does not exceed the clearance values listed below:

STD standard type: 0.4~0.95mm

AG additional gasket type: 0.3~1mm

Remove all components and ensure that when there is no O-ring (20), the height difference between the soft seal ring (19) and the valve seat (6) is ~ 0.2mm

Reassemble all components per Figure 11.

装入阀盖 (2) 并按照表5所示扭矩值拧紧螺母 (4)。

检查图6a 所示的"B"尺寸，如果需要，继续拧紧螺母(4)，直到"A-B"尺寸等于表5所示值。

Install the bonnet (2) and tighten the nuts (4) to the torque values shown in Table 5.

Check the "B" dimension shown in Figure 6a, and if necessary, continue to tighten the nut (4) until the "A-B" dimension is equal to the value shown in Table 5.

DC1620系列调节阀
DC1620 series regulating valve

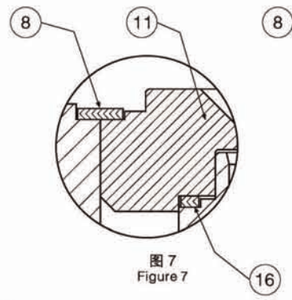

图 7
Figure 7

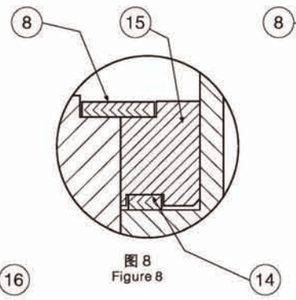

图 8
Figure 8

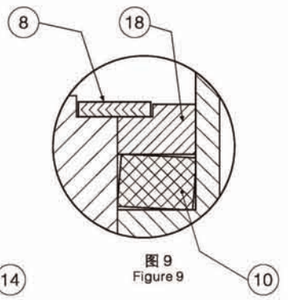

图 9
Figure 9

表6 Table6

零件号Part number	零件名称Part name
8	垫片Shim
10	盘形弹簧垫片Disc spring gasket
11	适配套Matching
14	垫片Shim
15	AG 型隔垫AG type spacer
16	垫片Shim
18	HT高温型隔垫HT high temperature type spacer

2.3、DC1629 系列阀门的装配 Assembly of dc1629 series valves

将阀座 (6) 装入阀体内，不装垫片(14)，并将套筒(9)装到阀座上。

STD标准型: 保证套筒的上端面与阀体上密封端面的高度差不超过-0.05~0.45mm.

AG附加垫片型: 放入垫片(14) 和隔垫，保证套筒的上端面与阀体上密封端面的高度差不超过 0.25~1.05mm.

HT高温型: 将盘形弹簧垫片装到套筒上端，并使盘形弹簧的大端朝上。装入隔垫并保证套筒的上端面与阀体上密封端面的高度差不超过表9中所列间隙值。

移去所有部件，重新装配阀座，并装配垫片(14)。

先导平衡型阀芯的装配见DOCN "先导平衡型阀芯说明书"。

必须在阀体外部将阀芯装入套筒内。之后通过控制阀杆将阀芯和套筒组件装入阀体，要保证套筒完全接触阀座。

如果需要，将适配套和隔垫装好。

将垫片 (8) 装入，将不带填料的阀盖套入阀杆。

按照填料的相关使用说明书装配填料组件。

紧固螺母 (4)，扭矩不要超过表5所示数据。

将执行机构安装到阀门上。

重新设定阀门。

Install the valve seat (6) into the valve body without gasket (14), and install the sleeve (9) onto the valve seat.

STD standard type: ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body does not exceed -0.05~0.45mm

AG additional gasket type: put the gasket (14) and the spacer to ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body does not exceed 0.25~1.05mm

HT high temperature type: install the disc spring gasket on the upper end of the sleeve with the big end of the disc spring facing up. Install the spacer and ensure that the height difference between the upper end face of the sleeve and the upper sealing end face of the valve body does not exceed the clearance value listed in Table 9.

Remove all components, refit seat, and assemble gasket (14).

For the assembly of the pilot balance valve core, please refer to docn "instructions for pilot balance valve core".

The valve element must be installed into the sleeve outside the valve body.

After that, the valve core and sleeve assembly are installed into the valve body through the control valve rod to ensure that the sleeve completely contacts the valve seat.

If necessary, install the matching and spacer.

Install the gasket (8) and the bonnet without packing into the stem.

Assemble the packing assembly in accordance with the packing instructions.

Tighten the nut (4) to a torque not to exceed the data shown in Table 5.

Install the actuator to the valve.

Reset the valve.

表7、HT高温型检查尺寸 Table 7. Inspection dimensions of HT high temperature type

DC1624 系列阀门的检查尺寸 X Inspection dimension X of dc1624 series valve						
压力等级Pressure rating	ANSI 150-1500		ANSI 150-300	ANSI 600-1500	ANSI 150-300	ANSI 600-1500
阀芯尺寸Valve core size	6"	8"	10"		12"	
X	1.4-1.8	1.7-2.1	1.5-1.9	1.9-2.3	16-2	2.2-2.6
压力等级Pressure rating	ANSI 150-1500					
阀芯尺寸Pressure rating	14"	16"	20"	24"		
X	2.7-3.1	3.1-3.5	3.6-4	3.8-4.2		

DC1620系列调节阀
DC1620 series regulating valve

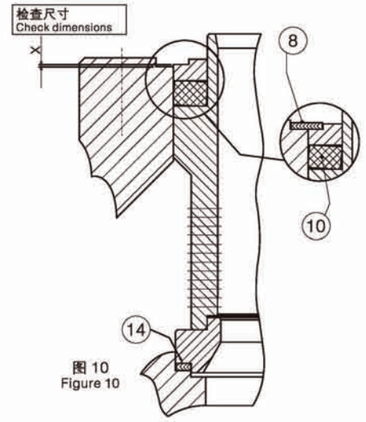

图 10
Figure 10

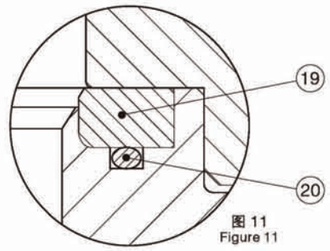

图 11
Figure 11

表8 Table8

零件号Part number	零件名称Part name
19	软密封环Soft sealing
20	O型圈 O-ring

表9、HT高温型检查尺寸 Table9. Inspection dimensions of HT high temperature type

DC1629 系列阀门的检查尺寸 X Inspection dimension X of dc1624 series valve						
压力等级Pressure rating	ANSI 150-1500		ANSI 300	ANSI 600-1500	ANSI 300	ANSI 600-1500
阀芯尺寸Valve core size	6"	8"	10"		12"	
X	0.8-1.2	1.1-1.5	0.9-1.3	1.3-1.7	1-1.4	1.6-2
压力等级Pressure rating	ANSI 150-1500					
阀芯尺寸Pressure rating	14"	16"	20"	24"		
X	2.1-2.5	2.5-2.9	3-3.4	3.2-3.6		

阀门的设定 - 带气动薄膜执行机构 Valve setting - with pneumatic diaphragm actuator

阀门出厂前都经过工厂设定并提供测试报告。但无论如何，建议在阀门投入运行之前再次检查设定。

可以用一个压力表和一个空气减压阀(输出在0~35-40 psi之间可调)。将减压阀接到气源管线上，并将输出接到执行机构上。

压力表测试执行机构中的压力。

然后按照如下步骤操作，对应“气开”和“气关”两种模式：

All valves are set by the factory before delivery and test report is provided. In any case, it is recommended to check the setting again before putting the valve into operation.

A pressure gauge and an air pressure reducing valve can be used (the output can be adjusted between 0-35-40 psi). Connect the pressure reducing valve to the air supply line and connect the output to the actuator.

The pressure gauge tests the pressure in the actuator.

Then follow the steps below, corresponding to the two modes of "gas on" and "gas off":

1、阀门配“气关”型执行机构 1-X-281系列 Valve with "air close" actuator 1-x-281 series

调节减压阀增加执行机构的压力，直到阀芯(5)到达行程终端停止(接触阀座)。

检查压力应是15 psi。若有必要，旋转执行机构的弹簧调节螺套，直到达到所需值。

检查行程指针应指到行程指示板的 "0" 位。否则，调节行程指示板。

慢慢减小气压直到行程指针走完额定行程。这时气压应为 3 psi (+/-误差范围)。

如果阀芯行程小于额定值，检查阀杆与执行机构推杆的连接器，若有必要，要相互调整一下。

Adjust the pressure reducing valve to increase the pressure of the actuator until the valve element (5) reaches the end of travel and stops (contacting the valve seat).

The check pressure should be 15 psi. If necessary, turn the spring adjusting screw of the actuator until the required value is reached.

Check that the travel pointer points to the "0" position of the travel indicator board. Otherwise, adjust the travel indicator.

Slowly reduce the air pressure until the travel pointer has completed the rated travel. The air pressure should be 3 psi (+ / - error range).

If the valve core stroke is less than the rated value, check the connector between the valve rod and the actuator push rod, and adjust each other if necessary.

2、阀门配“气开”型执行机构 1-X-282系列 Valve with "air open" actuator 1-x-282 series

(以 6 - 30 psi 弹簧范围为例)(take 6-30 psi spring range as an example)

调节减压阀增加输出压力，直到阀芯开始动作。

检查压力表，应为6psi。

否则调节弹簧负载螺钉和减压阀。

检查行程指针应指到行程指示板的 "0" 位。否则，调节行程指示板。

增加气压直到阀芯完成额定行程。这时压力表应显示 30 psi (+/-误差范围)。

如果阀芯行程小于额定值，检查阀杆与执行机构推杆的连接器，若有必要，要相互调整一下。

Adjust the pressure reducing valve to increase the output pressure until the valve core starts to act.

Check the pressure gauge, it should be 6 psi.

Otherwise adjust the spring-loaded screw and the pressure reducing valve.

Check that the travel pointer points to the "0" position of the travel indicator board. Otherwise, adjust the travel indicator.

Increase the air pressure until the valve core finishes the rated stroke. The pressure gauge should show 30 psi (+ / - error range).

If the valve core stroke is less than the rated value, check the connector between the valve rod and the actuator push rod, and adjust each other if necessary.

DC1620系列调节阀
DC1620 series regulating valve

平衡型阀芯
Balanced spool

在安装之前，彻底清理垫片的密封面。
Clean the gasket sealing surface thoroughly before installation.

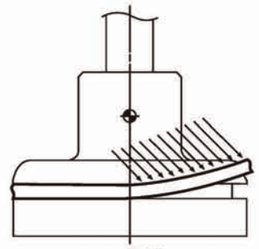
图 12
Figure 12

1、“S型”平衡密封环(图15)
"S" balanced seal ring (Figure 15)

在阀芯上部倒角出涂润滑脂。

对于密封环处流向为介质从阀芯上部进入的，密封环的开口端必须朝上。

否则，对于流向为介质从阀芯侧面进入的，密封环的开口端必须朝下。

将密封环倾斜并将一端置入密封槽内，然后用两手轻轻将密封环完全置入密封槽内。(见图12).

为了安装方便，允许将密封环加热到100℃以内。

Apply grease to the upper chamfer of valve element.

For the flow direction at the sealing ring is that the medium enters from the upper part of the valve core, the open end of the sealing ring must face upward.

Otherwise, if the flow direction is medium entering from the side of the valve core, the open end of the sealing ring must face down.

Tilt the seal ring and place one end into the seal groove, then gently put the seal ring into the seal groove with both hands. (see Figure 12)

For installation convenience, it is allowed to heat the sealing ring to within 100 ℃.

2、“E型”平衡密封环(图17)
"E-type" balanced seal ring (Figure 17)

在阀芯上部倒角出涂润滑脂。

将O型环 (51) 装入适当的密封槽内。

密封环 (52) 装在阀芯密封槽内的O型环之上，见图 17。

Apply grease to the upper chamfer of valve element.

Install the O-ring (51) into a suitable seal groove.

The sealing ring (52) is installed on the O-ring in the valve core sealing groove, as shown in Figure 17.

3、“C型”及“D型”平衡密封环(图13及14)
"type C" and "type D" balance seal rings (figures 13 and 14)

将第一个杆密封环 (49) 装入底部密封槽内。

中间密封槽内密封环的装配，按照如下顺序：

1、加强环(46) 或 (48)

2、第一个密封环(47)，注意开口与加强环的开口成90° 角。

3、第二个密封环(47)，注意开口与第一个密封环开口成180° 角。
将第二个杆密封环 (49) 装入上部的密封槽内。

警告!!!: 密封环的撑开度适于正好装配即可，过度拉伸变形可能导致密封环破坏。

Install the first rod seal ring (49) into the bottom seal groove.

The assembly of the sealing ring in the middle sealing groove shall be in the following order:

1,Stiffening ring (46) or (48)

2,The first sealing ring (47), note that the opening is 90° to the opening of the reinforcing ring.

3,The second seal ring (47), note that the opening is 180° from the opening of the first seal ring.

Install the second rod seal ring (49) into the upper seal groove.

Warning!!!: the opening of the seal ring is suitable for just assembling. Over stretching and deformation may cause damage to the seal ring.

4、“R型”平衡密封环(图16)
"R-type" balanced seal ring (Figure 16)

4.1、阀内件尺寸最大2” Trim size 2 "max

首先装配阀座和套筒，将配好法兰(111)的阀芯组件装入套筒内，放入垫圈和环形螺母(113)，此时先不装C型金属密封环。

检查套筒顶部到环形螺母顶部尺寸 (尺寸 A).

将C型金属环开口端向上装配好，重复检查套筒顶部到环形螺母顶部尺寸 (尺寸 B).

如果 A-B 的差值在表10所示数值范围内，紧固环形螺母并弯曲垫圈 (114)的边缘。

First, assemble the valve seat and sleeve, install the valve element assembly with flange (111) into the sleeve, put the washer and ring nut (113), and then do not install the C-type metal seal ring.

Check the sleeve top to ring nut top dimension (dimension a)

Fit the open end of the C-ring upwards and recheck the dimension (dimension b) from the top of the sleeve to the top of the ring nut

If the difference between A-B is within the values shown in table 10, tighten the ring nut and bend the edge of the washer (114).

4.2、阀内件尺寸3” 及以上 Trim size 3 "and above

首先装配阀座和套筒，将配好法兰(111)的阀芯组件装入套筒内，此时先不装C型金属密封环。

检查套筒顶部到法兰顶部尺寸 (尺寸 A).

将C型金属环开口端向上装配好，重复检查套筒顶部到法兰顶部尺寸 (尺寸 B).

如果 A-B 的差值在表10所示数值范围内，紧固螺母 (112)，并弯曲垫圈 (114)。

First, assemble the valve seat and sleeve, install the valve element assembly with flange (111) into the sleeve, and then install the C-type metal seal ring.

Check sleeve top to flange top dimension (dimension a)

Fit the open end of the C-ring upwards and recheck the dimension (dimension b) from the top of the sleeve to the top of the flange

If the difference between A-B is within the values shown in table 10, tighten the nut (112) and bend the washer (114).

表10 Table10

阀内件尺寸 Trim size	1 1/2"-2"	3"-8"	10"-24"
A-B	1.2-1.7mm	2.4-3.4mm	3.6-5.1mm

DC1620系列调节阀
DC1620 series regulating valve

表11 Table11

零件号 Part number	零件名称 Part name	零件号 Part number	零件名称 Part name
32	密封环 Sealing ring	52	密封环 Sealing ring
46	支撑环 Support ring	110	密封环 Sealing ring
47	密封环 Sealing ring	111	阀芯法兰 Valve element flange
48	密封环 Sealing ring	112	螺栓 Bolt
49	导向环 Guide ring	113	环形螺母 Ring nut
51	O型圈 O-ring	114	垫圈 Washer

"D" 型密封环
"D" type sealing ring

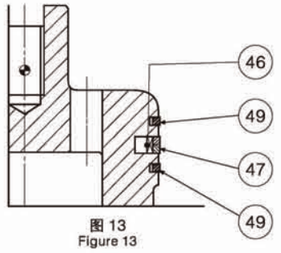

图 13
Figure 13

"C" 型密封环
"C" type sealing ring

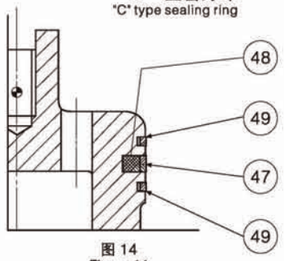

图 14
Figure 14

"S" 型密封环
"S" type sealing ring

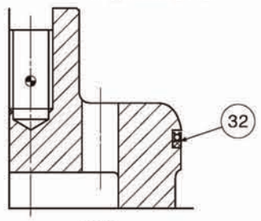

图 15
Figure 15

"R" 型密封环
"R" type sealing ring

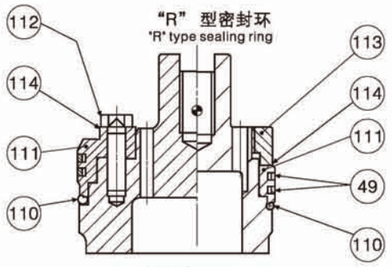

图 16
Figure 16

"E" 型密封环
"E" type sealing ring

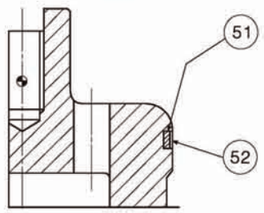

图 17
Figure 17

DC1220系列高压多级涡流调节阀
DC1220 series high pressure multistage eddy current regulating valve

1.0、拆卸与更换 Removal and replacement

1.1、拆卸原则 Disassembly principle

◆清洁场地、工器具及专用工具
◆检查吊具、绳索完好情况
◆准备纸箱、纸板或布垫
◆敲打或振动工件时：一要轻，二要对称，三要用铜棒或木锤，严禁敲打密封面
◆起吊时：一要垂直，二要缓慢，三要观察，严禁歪拉硬拽
◆分类放置工件，防止磕碰，保护好密封面或密封件
◆有配装、定位、方向的工件要做好标识
◆不清楚内部结构的工件不强拆
◆受损伤的填料、密封件等易损件严禁再用
◆做好防尘、防锈、防丢失工作

◆Clean the site, tools and special tools
◆Check the sling and rope for intactness
◆Prepare cartons, cardboard or cloth pads
◆When striking or vibrating the workpiece: first, it should be light, second, it should be symmetrical, third, it should use copper bar or wooden hammer, and it is strictly prohibited to knock the sealing surface
◆When lifting: first, it should be vertical, second, it should be slow, third, it should be observed, and it is strictly forbidden to pull and pull hard
◆Place workpieces by category to prevent bumping and protect the sealing surface or seal
◆The workpiece with fitting, positioning and direction shall be marked
◆Parts with unclear internal structure are not forced to be disassembled
◆Damaged packing, seal and other vulnerable parts are forbidden to be reused
◆Do a good job in dust prevention, rust prevention and loss prevention

1.2、DC1220系列高压多级涡流调节阀的拆卸（阀门结构见图18）
Disassembly of dc1220 series high pressure multistage eddy current regulating valve (see Figure 18 for valve structure)

1、拆卸并移去阀门执行机构。
2、旋下填料压盖螺母
3、取下填料压盖
4、上拉、下压并旋转阀杆，使其与填料松动
5、旋下阀盖螺母
6、垂直缓慢提起阀盖至脱离阀杆
7、取出阀盖下密封垫片
8、手握阀杆垂直向上缓慢抽出多级阀芯(阀杆与多级阀芯为整体一件)
9、敲打压套外圆或上端面，松动后再抽出(压套、上阀座、阀座均为螺纹连接)
10、取出阀座密封垫片

1. Remove and remove the valve actuator.
2. Unscrew the gland nut
3. Remove the packing gland
4. Pull up, press down, and rotate the stem to loosen it from the packing
5. Unscrew the bonnet nut
6. Slowly lift the bonnet vertically out of the stem
7. Take out the sealing gasket under the valve cover
8. Hold the valve rod vertically and slowly pull out the multi-stage valve core (the valve rod and the multi-stage valve core are one piece)
9. Knock the outer circle or upper end face of the pressing sleeve, and then pull it out after loosening (the pressing sleeve, upper valve seat and valve seat are all threaded connections)
10. Take out the seat gasket

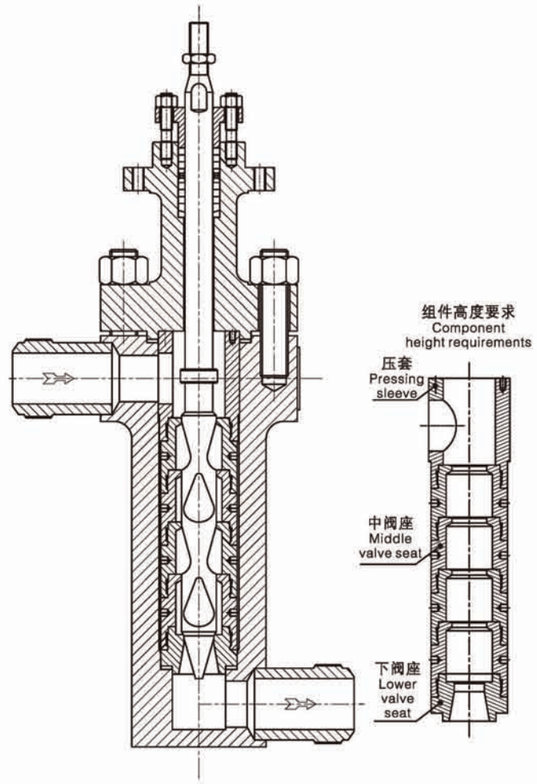

图18 多级涡流Z型调节阀
Figure 18 multi stage eddy current Z-type regulating valve

DC1220系列高压多级涡流调节阀
DC1220 series high pressure multistage eddy current regulating valve

1.3、填料的拆卸与更换（见图19）Removal and replacement of packing (see Figure 19)

1、用专用钩具钩出填料和填料垫（填料破损不易再用）
2、更换时待阀盖套入阀杆装入阀体后进行，各填料套入阀杆并用填料压盖压入填料孔
3、填料为PTFE时的装配须序是：下填料、中填料、上填料
4、填料为柔性石墨时的装配须序是：填料垫、柔性石墨
5、高压阀门的填料装配须序是：填料垫、下组柔性石墨、隔环、上组柔性石墨

1. Hook out the packing and packing pad with a special hook (it is not easy to reuse the damaged packing)
2. During replacement, after the valve cover is sleeved into the valve stem and installed into the valve body, each packing is sleeved into the valve stem and pressed into the packing hole with the packing gland
3. When the packing is PTFE, the assembly sequence shall be: lower packing, middle packing and upper packing
4. When the packing is flexible graphite, the assembly sequence shall be: packing pad, flexible graphite
5. The packing assembly sequence of high pressure valve shall be: packing pad, lower group of flexible graphite, spacer ring and upper group of flexible graphite

1.4、阀座、上阀座、压套的拆卸与更换（见图20）
Disassembly and replacement of valve seat, upper valve seat and pressing sleeve (see Figure 20)

1、多级阀座竖直装夹在台虎钳上，装夹时垫上铜皮或木块，以免夹伤工件
2、夹紧上阀座4，用钩形扳手旋下压套
3、夹紧上阀座3，用钩形扳手旋下上阀座4
4、夹紧上阀座2，用钩形扳手旋下上阀座3
5、夹紧上阀座1，用钩形扳手旋下上阀座2
6、夹紧阀座，用钩形扳手旋下上阀座1
7、更换时装配方法与拆卸相同，由下而上，须序反之

1. The multi-stage valve seat is vertically clamped on the vise, and copper skin or wood block is padded during the clamping to avoid damaging the workpiece
2. Clamp the upper valve seat 4 and screw off the pressing sleeve with a hook wrench
3. Clamp the upper valve seat 3 and screw off the upper valve seat 4 with a hook wrench
4. Clamp the upper valve seat 2 and screw off the upper valve seat 3 with a hook wrench
5. Clamp the upper valve seat 1 and screw off the upper valve seat 2 with a hook wrench
6. Clamp the valve seat and screw off the upper valve seat 1 with a hook wrench
7. The replacement method is the same as disassembly, from the bottom to the top, and vice versa

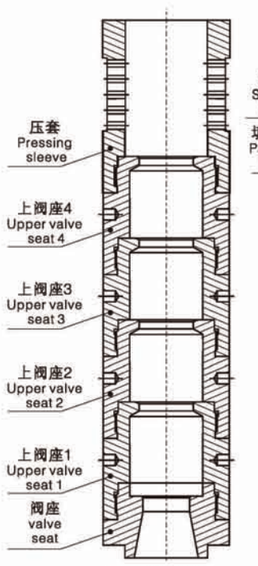

图20 多级阀座
Figure 20 multi stage valve seat

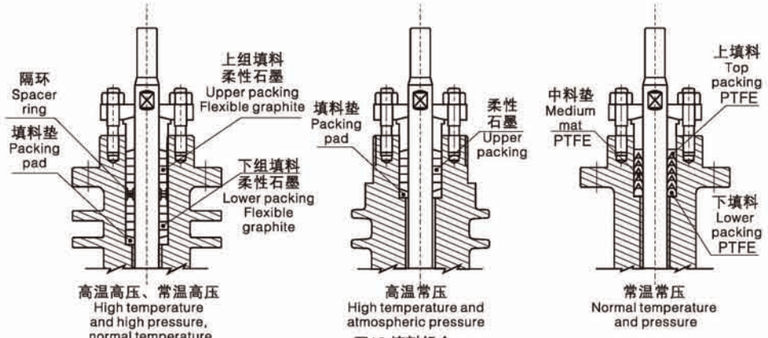

图19 填料组合
Figure 19 packing combination

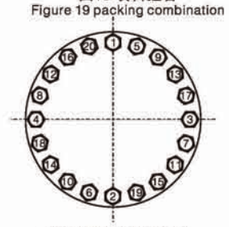

图21 螺母紧固次序图
Figure 21 tightening sequence of nuts

DC1220系列高压多级涡流调节阀
DC1220 series high pressure multistage eddy current regulating valve

2.0、工厂装配 Factory assembly

2.1、装配原则 Assembly principle

◆清洁场地、工器具及专用工具
◆检查零部件数量与材质是否符合图纸要求
◆检查密封件、标准件等主要尺寸是否符合图纸要求
◆检查吊具、绳索完好情况
◆准备纸箱、纸板或布垫
◆清洗零部件，风干后装配
◆分类放置工件，防止磕碰，保护好密封面或密封件
◆隔日待装做好防尘、防锈、防丢失工作
◆敲打或振动工件时：一要轻，二要对称，三要用铜棒或木锤，严禁敲打密封面
◆吊装时：一要垂直，二要缓慢，三要观察，严禁歪拉硬拽

◆Clean the site, tools and special tools
◆Check whether the quantity and material of parts meet the drawing requirements
◆Check whether the main dimensions of seals, standard parts, etc. meet the requirements of drawings
◆Check the sling and rope for intactness
◆Prepare cartons, cardboard or cloth pads
◆Clean parts and assemble after air drying
◆Place workpieces by category to prevent bumping and protect the sealing surface or seal
◆To be installed every other day to prevent dust, rust and loss
◆When striking or vibrating the workpiece: first, it should be light, second, it should be symmetrical, third, it should use copper bar or wooden hammer, and it is strictly prohibited to knock the sealing surface
◆When hoisting: first, it should be vertical, second, it should be slow, third, it should be observed, and it is strictly forbidden to pull or pull hard

2.2、DC1220系列高压多级涡流调节阀的装配次序及要求（阀门结构见图18）
Assembly sequence and requirements of dc1220 series high pressure multi-stage eddy current regulating valve (see Figure 18 for valve structure)

1、多级阀座部装，要求与1.4条相同
2、阀体放置专用安装台上
3、阀座密封垫片，居中放置阀座孔
4、多级阀座部件，阀座密封面涂抹研磨膏
5、阀芯杆，密封面涂抹研磨膏
6、阀盖下密封垫片，居中放置槽中
7、中法兰螺柱，出头高度要一致，并符合图纸要求
8、阀盖，检查安装方向是否正确，检查阀杆是否居中填料孔
9、中法兰螺母，对称轻拧（研磨密封面压紧用）
10、密封面研磨，上拉下压、旋转阀杆，碰撞、研磨密封面，持续时间30-60min
11、拆卸并清洗阀座、上阀座、压套、阀芯杆工件，检查密封面磨合情况，反复进行直至符合要求为止
12、重复装配至阀盖
13、填料垫、柔性石墨填料、隔环，要求与1.3条相同
14、填料压盖螺柱
15、填料压盖
16、填料压盖螺母，轻拧即可，待压力试验时拧紧
17、中法兰螺母，对称拧紧至要求为止（先后次序见图18，紧固力矩见表13），检查阀盖与阀体间隙是否一致
18、压力试验：符合GB/T 4213—2008要求
19、执行机构，检查阀杆动作是否灵活，有无卡涩现象，阀门开启行程是否满足设计要求
20、密封试验：符合GB/T 4213—2008、ASME B16.104
21、拆卸执行机构
22、油漆
23、出厂调试：主要性能指标符合GB/T 4213—2008要求

1.Multi stage valve seat assembly, the requirements are the same as 1.4
2.The valve body is placed on a special mounting platform
3.Seat gasket, center seat hole
4.Apply grinding paste to the sealing surface of multi-stage valve seat
5.Apply grinding paste to valve core rod and sealing surface
6.The sealing gasket under the valve cover shall be placed in the groove in the middle
7.The height of the middle flange stud and the head shall be the same and meet the requirements of the drawing
8.Valve cover, check whether the installation direction is correct, and check whether the valve rod is in the middle of the packing hole
9.Middle flange nut, tighten symmetrically and lightly (for grinding sealing surface and pressing)
10.Grind the sealing surface, pull up and down, rotate the valve rod, collide and grind the sealing surface for 30-60min
11.Disassemble and clean the valve seat, upper valve seat, pressing sleeve and valve core rod, check the running in condition of sealing surface, and repeat until it meets the requirements
12. Reassembly to bonnet
13. Packing pad, flexible graphite packing, spacer ring, the requirements are the same as 1.3
14. Packing gland stud
15. Packing gland
16. The gland nut can be screwed lightly and tightened during pressure test
17.Tighten the middle flange nuts symmetrically until required (see Fig. 18 for sequence and table 13 for tightening torque). Check whether the clearance between the bonnet and the valve body is consistent

DC1220系列高压多级涡流调节阀
DC1220 series high pressure multistage eddy current regulating valve

18. Pressure test: meet the requirements of GB / T 4213–2008
19. Actuator, check whether the action of the valve rod is flexible, whether there is jamming, and whether the opening stroke of the valve meets the design requirements
20. Sealing test: in accordance with GB / T 4213–2008 and ASME b16.104
21. Dismantle the actuator
22. Paint
23. Factory commissioning: the main performance indexes meet the requirements of GB / T 4213–2008

表12 Table12

单个吊环螺钉最大起吊重量 Maximum lifting weight of single eyebolt							
吊环螺钉规格 Specification of eyebolt	M8	M10	M12	M16	M20	M24	M30
单个吊环螺钉最大起吊重量(kg) Maximum lifting weight of single eyebolt (kg)	160	250	400	630	1000	1600	2500

表13 Table13

螺柱紧固力矩表 Tightening torque table of studs							
螺柱规格 Stud specification	扳手规格 Wrench specifications	紧固力矩(Nm) Tightening torque (nm)		螺柱规格 Stud specification	扳手规格 Wrench specifications	紧固力矩(Nm) Tightening torque (nm)	
		最小 Minimum	最大 Maximum			最小 Minimum	最大 Maximum
M12	19	20	30	M30	46	250	530
M14	22	45	50	M33	50	340	720
M16	24	30	80	M36x3	55	470	980
M18	27	100	110	M39x3	60	480	1270
M20	30	130	150	M42x3	65	850	1600
M24	36	170	260	M45x3	70	680	2000
M27	41	250	390				

DC1220系列高压多级涡流调节阀
DC1220 series high pressure multistage eddy current regulating valve

3.0、场地装配 Site assembly

3.1、装配原则 Assembly principle

◆清洁场地、工器具及专用工具
◆检查吊具、绳索完好情况
◆检查紧固件丝口完好情况
◆准备相同数量和规格的填料、密封件等易损件
◆清洗零部件，检查完好状况，不能修复的要及时更换
◆分类放置工件，防止磕碰，保护好密封面或密封件
◆清洁阀门内腔、进出口流道中杂物及粉尘
◆敲打或振动工件时：一要轻，二要对称，三要用铜棒或木锤，严禁敲打密封面
◆吊装时：一要垂直，二要缓慢，三要观察，严禁歪拉硬拽

◆Clean the site, tools and special tools
◆Check the sling and rope for intactness
◆Check the integrity of fastener screw
◆Prepare the same quantity and specification of packing, sealing parts and other vulnerable parts
◆Clean the parts and check whether they are in good condition. If they cannot be repaired, replace them in time
◆Place workpieces by category to prevent bumping and protect the sealing surface or seal
◆Clean the sundries and dust in the valve inner cavity, inlet and outlet flow channels
◆When striking or vibrating the workpiece: first, it should be light, second, it should be symmetrical, third, it should use copper bar or wooden hammer, and it is strictly prohibited to knock the sealing surface
◆When hoisting: first, it should be vertical, second, it should be slow, third, it should be observed, and it is strictly forbidden to pull or pull hard

3.2、装配次序及要求 Assembly sequence and requirements

1、多级阀座部装配要求与1.4条相同
2、阀座密封垫片，居中放置阀座孔
3、多级阀座部件，竖向最多小孔中心线正对进口流道
4、阀盖下密封垫片，居中放置槽中
5、阀盖，检查安装方向是否正确，检查阀杆是否居中填料孔
6、填料垫、柔性石墨填料、隔环，要求与1.3条相同
7、填料压盖螺柱
8、填料压盖
9、填料压盖螺母，轻拧即可，待介质通过时拧紧
10、中法兰螺母，对称拧紧至要求为止（先后次序见图18，紧固力矩见表13），检查阀盖与阀体间隙是否一致
11、执行机构，检查阀杆动作是否灵活，有无卡涩现象，阀门开启行程是否满足设计要求
12、阀门调试，主要性能指标符合GB/T 4213—2008要求
13、开启调节阀前后管线上的关断阀，常温介质缓慢开启，高温介质间歇开启，让阀门逐渐升温，按标准升温速率100℃/小时控制，升温过程中，不得操作调节阀
14、检查阀门的外漏情况，当关断阀开启后，要及时检查并处理，做到连接法兰或焊缝、中腔法兰、填料压盖、阀体、阀盖等处无渗漏

1. The assembly requirements of multi–stage valve seat are the same as those of clause 1.4
2. Seat gasket, center seat hole
3. Multi stage valve seat components, with the center line of the largest vertical hole facing the inlet flow channel
4. The sealing gasket under the valve cover shall be placed in the groove in the middle
5. Valve cover, check whether the installation direction is correct, and check whether the valve stem is centered on the packing hole
6. Packing pad, flexible graphite packing, spacer ring, the requirements are the same as 1.3
7. Packing gland stud
8. Packing gland
9. The gland nut can be screwed lightly until the medium passes through
10. Tighten the middle flange nuts symmetrically until required (see Fig. 18 for sequence and table 13 for tightening torque). Check whether the clearance between the bonnet and the valve body is consistent
11. Actuator, check whether the action of the valve rod is flexible, whether there is jamming, and whether the opening stroke of the valve meets the design requirements
12. The main performance indexes of valve commissioning shall meet the requirements of GB / T 4213–2008
13. Open the shut–off valve on the pipeline before and after the regulating valve, slowly open the medium at normal temperature, and intermittently open the medium at high temperature, so as to gradually heat up the valve, and control it according to the standard heating rate of 100 ℃ / hour. During the heating up process, do not operate the regulating valve
14. Check the leakage of the valve. When the shut–off valve is opened, check and deal with it in time to ensure that there is no leakage at the connecting flange or weld joint, middle cavity flange, packing gland, valve body, valve cover, etc

DC1820系列高压调节阀
DC1820 series high pressure regulating valve

1.0、拆卸与更换 Disassembly and replacement

1.1、拆卸原则 Disassembly principle

◆清洁场地、工器具及专用工具
◆检查吊具、绳索完好情况
◆准备纸箱、纸板或布垫
◆敲打或振动工件时：一要轻，二要对称，三要用铜棒或木锤，严禁敲打密封面
◆起吊时：一要垂直，二要缓慢，三要观察，严禁歪拉硬拽
◆分类放置工件，防止磕碰，保护好密封面或密封件
◆有配装、定位、方向的工件要做好标识
◆不清楚内部结构的工件不强拆
◆受损伤的填料、密封件等易损件严禁再用
◆做好防尘、防锈、防丢失工作

◆Clean the site, tools and special tools
◆Check the sling and rope for intactness
◆Prepare cartons, cardboard or cloth pads
◆When striking or vibrating the workpiece: first, it should be light, second, it should be symmetrical, third, it should use copper bar or wooden hammer, and it is strictly prohibited to knock the sealing surface
◆When lifting: first, it should be vertical, second, it should be slow, third, it should be observed, and it is strictly forbidden to pull and pull hard
◆Place workpieces by category to prevent bumping and protect the sealing surface or seal
◆The workpiece with fitting, positioning and direction shall be marked
◆Parts with unclear internal structure are not forced to be disassembled
◆Damaged packing, seal and other vulnerable parts are forbidden to be reused
◆Do a good job in dust prevention, rust prevention and loss prevention

1.2、DC1820系列高压调节阀的拆卸（阀门结构见图22）
Disassembly of dc1820 series high pressure regulating valve (see Figure 22 for valve structure)

1、拆卸并移去阀门执行机构。
2、旋下填料压板螺母
3、拆下填料压板
4、取出填料压套
5、上拉、下压并旋转阀杆，使其与填料松动
6、旋下阀盖螺母
7、垂直缓慢吊起阀盖至脱离阀杆
8、取出阀盖下、多级套筒上的密封垫片
9、手握阀杆垂直向上缓慢抽出阀芯，大口径阀芯用吊具
10、敲打多级套筒外圆或上端面，松动后再抽出，大口径套筒用吊具
11、敲打阀座端面，松动后再取出，注意敲打时勿损坏密封面
12、取出阀座密封垫片

1. Remove and remove the valve actuator.
2. Unscrew the gland plate nut
3. Remove the packing press plate
4. Take out the packing sleeve
5. Pull up, press down, and rotate the stem to loosen it from the packing
6. Unscrew the bonnet nut
7. Slowly lift the bonnet vertically until it disengages from the stem
8. Take out the sealing gasket under the valve cover and on the multi-stage sleeve
9. Hold the valve rod vertically and slowly pull out the valve core, and use the sling for large-diameter valve core
10. Knock the outer circle or upper end face of the multi-stage sleeve, and then pull it out when it is loose. Use the sling for the large caliber sleeve
11. Knock the end face of the valve seat and take it out after loosening. Pay attention not to damage the sealing surface when knocking
12. Take out the seat gasket

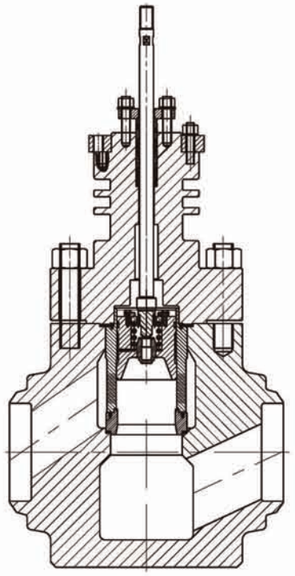

图22 高压调节阀
Figure 22 high pressure regulating valve

1.3、阀芯上D型密封环等零件的拆卸与更换
Disassembly and replacement of D-type sealing ring and other parts on valve core

1、竖直平放阀芯部件，双手食指和母指捏住导向环开口处，轻微向外撑开直至脱离凹槽，向上取出
2、密封环与支撑环拆卸方法同上
3、更换时先装导向环，后装支撑环，再装密封环，注意各环切口错开180度，切勿在同一直线上
4、装配方法与拆卸相同，须序反之
5、阀芯部件装入套筒时由下至上逐一压入，在环的四周入槽后方可挤压

DC1820系列高压调节阀
DC1820 series high pressure regulating valve

1. Place the valve element vertically and horizontally, hold the opening of the guide ring with both index fingers and mother fingers, slightly open it outwards until it is out of the groove, and take it out upward
2. The disassembly method of seal ring and support ring is the same as above
3. When replacing, install the guide ring first, then the support ring, and then the sealing ring. Pay attention to the staggered 180 degrees of each ring cut, and do not be in the same straight line
4. The assembly method is the same as disassembly, and the sequence must be reversed
5. When the valve element components are installed into the sleeve, press them in one by one from the bottom to the top, and then squeeze them after entering the groove around the ring

1.4、阀杆的拆卸与更换 Disassembly and replacement of valve rod

1、用内磨头打磨机磨削阀杆与阀芯的点焊处，或用车床车削
2、阀芯水平装夹在台虎钳上，旋出阀杆，装夹时阀芯外圆垫上铜皮或木块，以免夹伤工件
3、更换阀杆时，装配与拆卸方法相同，须序反之，阀杆拧紧后点焊
1. Grinding the spot welding of valve rod and valve core with internal grinding head grinder or turning with lathe
2. Install the valve core horizontally on the vise, screw out the valve stem, and pad the outer circle of the valve core with copper skin or wood block to avoid damaging the workpiece
3. When replacing the valve stem, the assembly method is the same as the disassembly method, and the sequence must be reversed. After tightening the valve stem, spot welding is required

1.5、填料的拆卸与更换（见图23）Removal and replacement of packing (see Figure 23)

1、用专用钩具钩出填料和填料垫（填料破损不易再用）
2、更换时待阀盖套入阀杆装入阀体后进行，各填料套入阀杆并用填料压盖压入填料孔
3、填料为PTFE时的装配须序是：下填料、中填料、上填料
4、填料为柔性石墨时的装配须序是：填料垫、柔性石墨
5、高压阀门的填料装配须序是：填料垫、下组柔性石墨、隔环、上组柔性石墨
1. Hook out the packing and packing pad with a special hook (it is not easy to reuse the damaged packing)
2. During replacement, after the valve cover is sleeved into the valve stem and installed into the valve body, each packing is sleeved into the valve stem and pressed into the packing hole with the packing gland
3. When the packing is PTFE, the assembly sequence shall be: lower packing, middle packing and upper packing
4. When the packing is flexible graphite, the assembly sequence shall be: packing pad, flexible graphite
5. The packing assembly sequence of high pressure valve shall be: packing pad, lower group of flexible graphite, spacer ring and upper group of flexible graphite

1.6、先导阀芯部件的拆卸与更换（见图24）
Disassembly and replacement of pilot valve element components (see Figure 24)

1、用磨光机磨削阀芯压盖与阀芯的点焊处
2、用手握住阀杆或用机床压下先导阀芯弹簧
3、旋出阀芯压盖
4、缓慢松懈弹簧至其自由高度
5、取出阀芯压盖
6、取出先导阀芯
7、取出先导弹簧
8、更换时反其行之，装配之前要配对研磨先导阀芯的密封面
1. Grinding the spot welding between the valve core cover and the valve core with a grinder
2. Hold the stem by hand or press down the spring of the pilot valve element with the machine tool
3. Screw out the valve core gland
4. Slowly loosen the spring to its free height
5. Take out the valve core gland
6. Take out the pilot valve element
7. Take out the pilot spring
8. When replacing, it is necessary to grind the sealing surface of the pilot valve core before assembly

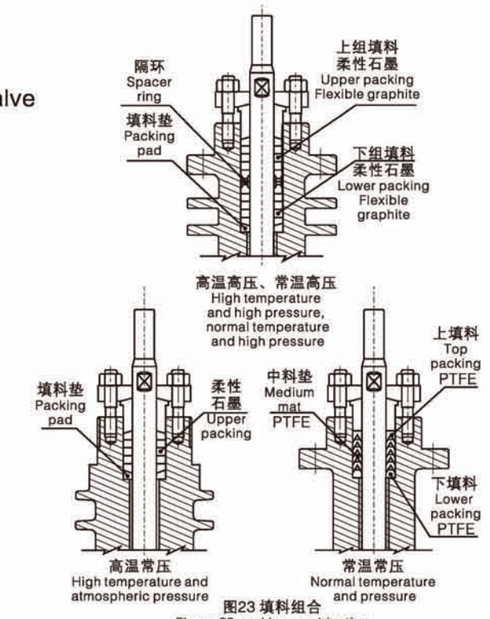

图23 填料组合
Figure 23 packing combination

DC1820系列高压调节阀
DC1820 series high pressure regulating valve

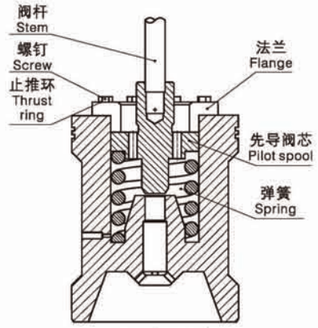

图24 先导阀芯
Figure 24 pilot valve element

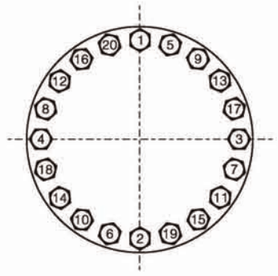

图25 螺母紧固次序图
Figure 25 tightening sequence of nuts

2.0、工厂装配 Factory assembly

2.1、装配原则 Assembly principle

◆清洁场地、工器具及专用工具
◆检查零部件数量与材质是否符合图纸要求
◆检查密封件、标准件等主要尺寸是否符合图纸要求
◆检查吊具、绳索完好情况
◆准备纸箱、纸板或布垫
◆清洗零部件，风干后装配
◆分类放置工件，防止磕碰，保护好密封面或密封件
◆隔日待装做好防尘、防锈、防丢失工作
◆敲打或振动工件时：一要轻，二要对称，三要用铜棒或木锤，严禁敲打密封面
◆吊装时：一要垂直，二要缓慢，三要观察，严禁歪拉硬拽

◆Clean the site, tools and special tools
◆Check whether the quantity and material of parts meet the drawing requirements
◆Check whether the main dimensions of seals, standard parts, etc. meet the requirements of drawings
◆Check the sling and rope for intactness
◆Prepare cartons, cardboard or cloth pads
◆Clean parts and assemble after air drying
◆Place workpieces by category to prevent bumping and protect the sealing surface or seal
◆To be installed every other day to prevent dust, rust and loss
◆When striking or vibrating the workpiece: first, it should be light, second, it should be symmetrical, third, it should use copper bar or wooden hammer, and it is strictly prohibited to knock the sealing surface
◆When hoisting: first, it should be vertical, second, it should be slow, third, it should be observed, and it is strictly forbidden to pull or pull hard

2.2、DC1820系列高压调节阀的装配次序及要求（阀门结构见图22）
Assembly sequence and requirements of dc1820 series high pressure regulating valve (see Figure 22 for valve structure)

1、阀杆旋入阀芯，拧紧点焊
先导阀芯部装，阀芯、先导阀芯弹簧、先导阀芯、阀芯压盖，要求与1.6条相同
2、阀体水平放置地面
3、阀座密封垫片，居中放置阀座孔
4、阀座，密封面涂抹研磨膏
5、套筒
6、阀芯部件，密封面涂抹研磨膏（研磨工序装配时阀芯部件可不安装D型密封环等零件）
7、阀盖下、套筒上的密封垫片，居中放置槽中
8、中法兰螺柱，出头高度要一致，并符合图纸要求
9、阀盖，检查安装方向是否正确，检查阀杆是否居中填料孔
10、中法兰螺母，对称轻拧（研磨密封面压紧用）
11、密封面研磨，上拉下压、旋转阀杆，碰撞、研磨密封面，持续时间30-60min
12、拆卸并清洗阀座、阀芯部件、多级套筒工件，检查密封面磨合情况，反复进行直至符合要求为止
13、阀芯部装：导向环、支撑环、密封环，要求与1.3条相同
14、重复装配至阀盖
15、填料垫、柔性石墨填料、隔环，要求与1.5条相同
16、填料压板螺柱
17、填料压套
18、填料压板
19、填料压板螺母，轻拧即可，待压力试验时拧紧
20、中法兰螺母，对称拧紧至要求为止（先后次序见图22，紧固力矩见表13），检查阀盖与阀体间隙是否一致
21、压力试验：符合GB/T 4213—2008要求

DC1820系列高压调节阀
DC1820 series high pressure regulating valve

22、执行机构，检查阀杆动作是否灵活，有无卡涩现象，阀门开启行程是否满足设计要求
23、密封试验：符合GB/T 4213—2008、ASME B16.104
24、拆卸执行机构
25、油漆
26、出厂调试：主要性能指标符合GB/T 4213—2008要求

1. Screw the valve rod into the valve core and tighten the spot welding
The requirements for the installation of pilot valve element, valve element, pilot valve element spring, pilot valve element and valve element gland are the same as those in article 1.6
2. The valve body is placed horizontally on the ground
3. Seat gasket, center seat hole
4. Apply grinding paste to valve seat and sealing surface
5. Sleeve
6. The valve core parts and sealing surface shall be coated with grinding paste (during the assembly of grinding process, the valve core parts may not be equipped with D type sealing ring and other parts)
7. The sealing gasket under the valve cover and on the sleeve shall be placed in the groove in the middle
8. The height of the middle flange stud and the head shall be the same and meet the requirements of the drawing
9. Valve cover, check whether the installation direction is correct, and check whether the valve stem is centered on the packing hole
10. Middle flange nut, tighten symmetrically and lightly (for grinding sealing surface and pressing)
11. Grind the sealing surface, pull up and down, rotate the valve rod, collide and grind the sealing surface for 30–60min
12. Disassemble and clean the valve seat, valve core parts and multi-stage sleeve workpieces, check the running in of the sealing surface, and repeat until it meets the requirements
13. Valve core assembly: guide ring, support ring and sealing ring, the requirements are the same as 1.3
14. Reassembly to bonnet
15. Packing pad, flexible graphite packing, spacer ring, the requirements are the same as 1.5
16. Packing press plate stud
17. Packing sleeve
18. Packing press plate
19. Screw down the nut of packing pressing plate lightly, and then screw it down during pressure test
20. Tighten the middle flange nuts symmetrically until required (see Fig. 22 for sequence and table 13 for tightening torque). Check whether the clearance between the bonnet and the valve body is consistent
21. Pressure test: meet the requirements of GB / T 4213–2008
22. Actuator, check whether the valve stem acts flexibly, whether there is jamming, and whether the valve opening stroke meets the design requirements
23. Sealing test: in accordance with GB / T 4213–2008 and ASME b16.104
24. Dismantle the actuator
25. Paint
26. Factory commissioning: the main performance indexes meet the requirements of GB / T 4213–2008

2.3、先导阀芯高压调节阀的装配次序及要求与2.2条相同
The assembly sequence and requirements of high pressure regulating valve with pilot valve core are the same as those in article 2.2

3.0、场地装配 Site assembly

3.1、装配原则 Assembly principle

◆清洁场地、工器具及专用工具
◆检查吊具、绳索完好情况
◆检查紧固件丝口完好情况
◆准备相同数量和规格的填料、密封件等易损件
◆清洗零部件，检查完好状况，不能修复的要及时更换
◆分类放置工件，防止磕碰，保护好密封面或密封件
◆清洁阀门内腔、进出口流道中杂物及粉尘
◆敲打或振动工件时：一要轻，二要对称，三要用铜棒或木锤，严禁敲打密封面
◆吊装时：一要垂直，二要缓慢，三要观察，严禁歪拉硬拽

◆ Clean the site, tools and special tools
◆ Check the sling and rope for intactness
◆ Check the integrity of fastener screw
◆ Prepare the same quantity and specification of packing, sealing parts and other vulnerable parts
◆ Clean the parts and check whether they are in good condition. If they cannot be repaired, replace them in time
◆ Place workpieces by category to prevent bumping and protect the sealing surface or seal
◆ Clean the sundries and dust in the valve inner cavity, inlet and outlet flow channels
◆ When striking or vibrating the workpiece: first, it should be light, second, it should be symmetrical, third, it should use copper bar or wooden hammer, and it is strictly prohibited to knock the sealing surface
◆ When hoisting: first, it should be vertical, second, it should be slow, third, it should be observed, and it is strictly forbidden to pull or pull hard

DC1820系列高压调节阀
DC1820 series high pressure regulating valve

3.2、装配次序及要求 Assembly sequence and requirements

1、阀杆旋入阀芯，拧紧点焊
2、阀芯部装：导向环、支撑环、密封环，要求与2.2条相同
先导阀芯部装：阀芯、先导阀芯弹簧、先导阀芯、阀芯压盖，要求与2.2条相同
3、阀座密封垫片，居中放置阀座孔
4、阀座
5、套筒，竖向最多小孔中心线正对进出口流道
6、阀芯部件：D型密封环按2.2条要求
先导阀芯部件，按2.3条要求
7、阀盖下、套筒上的密封垫片，居中放置槽中
8、阀盖，检查安装方向是否正确，检查阀杆是否居中填料孔
9、填料垫、柔性石墨填料、隔环，要求与8.5条相同
10、填料压板螺柱
11、填料压套
12、填料压板
13、填料压板螺母，轻拧即可，待介质通过时拧紧
14、中法兰螺母，对称拧紧至要求为止（先后次序见图25，紧固力矩见表13），检查阀盖与阀体间隙是否一致
15、执行机构，检查阀杆动作是否灵活，有无卡涩现象，阀门开启行程是否满足设计要求
16、阀门调试，主要性能指标符合GB/T 4213—2008要求
17、开启调节阀前后管线上的关断阀，常温介质缓慢开启，高温介质间歇开启，让阀门逐渐升温，按标准升温速率100℃/小时控制，升温过程中，不得操作调节阀
18、检查阀门的外漏情况，当关断阀开启后，要及时检查并处理，做到连接法兰或焊缝、中腔法兰、填料压盖、阀体、阀盖等处无渗漏

1. Screw the valve rod into the valve core and tighten the spot welding
2. Valve core assembly: guide ring, support ring and sealing ring, the requirements are the same as those in 2.2
Installation of pilot valve core: valve core, pilot valve core spring, pilot valve core and valve core gland, the requirements are the same as those of article 2.2
3. Seat gasket, center seat hole
4. Valve seat
5. Sleeve, the center line of the vertical most small holes is facing the inlet and outlet flow channels
6. Valve element parts: D-type sealing ring according to 2.2
Pilot valve core components, as per 2.3
7. The sealing gasket under the valve cover and on the sleeve shall be placed in the groove in the middle
8. Valve cover, check whether the installation direction is correct, and check whether the valve rod is in the middle of the packing hole
9. Packing pad, flexible graphite packing, spacer ring, the requirements are the same as 8.5
10. Packing press plate stud
11. Packing sleeve
12. Packing press plate
13. The nut of the packing pressing plate can be screwed lightly until the medium passes
14. Tighten the middle flange nuts symmetrically until required (see Fig. 25 for sequence and table 13 for tightening torque). Check whether the clearance between the bonnet and the valve body is consistent
15. Actuator, check whether the action of the valve rod is flexible, whether there is jamming, and whether the opening stroke of the valve meets the design requirements
16. The main performance indexes of valve commissioning shall meet the requirements of GB / T 4213-2008
17. Open the shut-off valve on the pipeline before and after the regulating valve, slowly open the medium at normal temperature, and intermittently open the medium at high temperature, so that the valve gradually heats up, and control according to the standard heating rate of 100 ℃ / hour. During the heating process, do not operate the regulating valve
18. Check the leakage of the valve. When the shut-off valve is opened, check and deal with it in time to ensure that there is no leakage at the connecting flange or weld joint, middle cavity flange, packing gland, valve body, valve cover, etc

调节阀故障排查及检修
Troubleshooting and maintenance of control valve

4.1、调节阀一般故障产生的原因及检查维修方法
The causes of the general failure of the control valve and the inspection and maintenance methods

表14 气动阀门 Table14 Pneumatic valves

序号 No.	故障现象 Fault phenomenon	产生原因 Causes	检查维修方法 Inspection and maintenance methods
1	阀没有动作 Valve does not act	1.气源故障，供气管路严重漏气 2.输入信号消失 3.定位器，转换器故障 4.薄膜破裂，弹簧断裂 5.阀杆，阀芯卡死等 1. The air supply fails and the air supply pipeline leaks seriously 2. Input signal disappears 3. Positioner, converter failure 4. Rupture of film and spring 5. The valve rod and valve core are stuck, etc	检修外接气源设备、管路及接头 排查信号输出—转换器—定位器 修理或更换定位器、转换器 更换薄膜、弹簧 拆卸阀体，清除杂物或修理阀内件 Maintenance of external air source equipment, pipelines and joints Troubleshooting signal output converter positioner Repair or replace positioner and converter Replace the film and spring Remove the valve body, remove sundries or repair the valve trim
2	阀动作迟缓 Slow valve movement	1.气源压力低 2.膜片，活塞环漏气 3.填料太紧，阀杆变形 4.阀内有泥浆或粘性大的介质产生堵塞或结焦现象 1. Low air source pressure 2. Air leakage of diaphragm and piston ring 3. The packing is too tight, and the valve rod is deformed 4. The valve is blocked or coking due to mud or viscous medium	检查气源压力，定位器性能 更换膜片，活塞环密封圈 调整螺母压紧力，修复或更换阀杆 拆卸阀体，检查清洗排除 Check the air supply pressure and positioner performance Replace diaphragm and piston ring seal ring Adjust the nut pressing force, repair or replace the valve rod Remove the valve body, check and clean it
3	阀不能全关 Valve cannot be fully closed	1.输入信号有问题 2.膜室气压不足 3.工况压差大于设计压差 4.阀座，阀芯之间有杂物 1. There is a problem with the input signal 2. Insufficient air pressure in membrane chamber 3. The working condition pressure difference is greater than the design pressure difference 4. Sundries between valve seat and valve core	重新调整输入信号 检查减压阀压力设定 更换执行器规格 拆卸阀体，检查清洗排除 Readjust the input signal Check the pressure setting of the pressure reducing valve Replace actuator specifications Remove the valve body, check and clean it
4	阀关闭时泄漏大 Large leakage when the valve is closed	1.阀芯，阀座密封面损伤 2.阀座松动，密封垫片冲坏 3.阀座，阀芯之间有杂物 1. The sealing surface of valve core and valve seat is damaged 2. The valve seat is loose and the sealing gasket is damaged 3. sundries between valve seat and valve core	研磨修理或更换 拆卸重装并更换密封垫片 拆卸阀体，检查清洗排除 Grinding repair or replacement Remove and refit and replace the sealing gasket Remove the valve body, check and clean it
5	阀振动 Valve vibration	1.定位器调整不好 2.支撑不稳 3.阀开度太小或流向不对 4.填料太紧 5.阀芯与导向套间隙太大 6.附近有振动源 1. The positioner is not adjusted well 2. Unstable support 3. The valve opening is too small or the flow direction is wrong 4. Packing is too tight 5. The gap between valve core and guide sleeve is too large 6. Vibration source nearby	重新调整定位器 加固支撑 更换小Cv值阀内件或改变流向 调整螺母压紧力 更换阀芯或导向件 采取减压、减振措施消除 Readjust the positioner Reinforced support Replace small CV valve trim or change flow direction Adjust the nut pressing force Replace the valve element or guide Take measures to reduce pressure and reduce vibration
6	填料泄漏 Packing leakage	1.填料未压紧 2.填料材质与介质不匹配 3.阀杆变形毛糙 4.填料压盖变形 1. Packing is not compacted 2. The filler material does not match the medium 3. The valve rod is deformed and rough 4. Deformation of packing gland	压紧填料 更换填料 修理或更换阀杆 更换填料压盖 Compact packing Replace packing Repair or replace the valve stem Replace packing gland
7	阀体垫片渗漏 Leakage of valve body gasket	1.拧紧力矩不足 2.密封垫片损坏 3.密封垫片上、下的密封面损坏 1. Insufficient tightening torque 2. The sealing gasket is damaged 3. The upper and lower sealing surfaces of the sealing gasket are damaged	加大预紧力重新拧紧 更换密封垫片 修理密封面 Increase the preload and retighten Replace sealing gasket Repair sealing surface

调节阀故障排查及检修
Troubleshooting and maintenance of control valve

表15 电动阀门 Table15 Electric valve

序号 No.	故障现象 Fault phenomenon	产生原因 Causes	检查维修方法 Inspection and maintenance methods
1	电机不动作 Motor does not operate	1.电源没输入 2.断线或接线脱入 3.电源电压不同、偏低 4.电容器被击穿 5.输入信号不同 6.热保护动作（环境温度高，使用频率高） 1. No power input 2. Disconnection or disconnection of wiring 3. Different and low power supply voltage 4. The capacitor is broken down 5. Different input signals 6. Thermal protection action (high ambient temperature, high frequency of use)	拨通电源 改换电线或接好电线 用仪器检查电压 更换电容器 选择输入信号 改善通风散热条件，降低使用频率或灵敏度 Power on Change or connect wires Check voltage with instrument Replace the capacitor Select input signal Improve ventilation and heat dissipation conditions, reduce frequency or sensitivity
2	阀不动作 Valve does not operate	1.阀芯与套筒或压笼卡死 2.阀芯脱落、阀杆弯曲或折断 1. The valve core is stuck with the sleeve or press cage 2. The valve core falls off, the valve rod is bent or broken	拆卸修理 更换阀杆或销钉 Disassembly and repair Replace stem or pin
3	自动调节过程中停止 Stop during automatic adjustment	1.过大负荷下超载启动 2.热保护动作 3.阀体进入异物 4.填料压盖过紧 1. Overload startup under excessive load 2. Thermal protection action 3. Foreign matter entering the valve body 4. Packing gland is too tight	检查阀门排除负荷 检查阀门排除负荷 拆卸阀门检查 调整螺母压紧力 Check the valve to remove the load Check the valve to remove the load Disassembly valve inspection Adjust the nut pressing force
4	不发开度信号 No opening signal	开度信号线接触不良或断开 No opening signal	检查开度信号线连接情况 Check the connection of the opening signal line
5	开度信号达不到全闭 Opening signal fails to reach full close	电位器安装不正确 Potentiometer installed incorrectly	检查电位器安装情况 Check the installation of potentiometer
6	到达极限位置电机不停止转动 The motor does not stop rotating when reaching the limit position	1.限位开关极限位置设定不正确 2.限位开关安装不正确 1. The limit position of limit switch is set incorrectly 2. Incorrect installation of limit switch	重新调整 重新安装 Readjustment Reinstall
7	调节灵敏度降低，电机转矩减少 Reduce the adjustment sensitivity and motor torque	电压偏低 电压等级不同 Low voltage Different voltage levels	测量电压 选择电压 Measuring voltage Select voltage
8	阀振荡 Valve oscillation	1.支撑不稳 2.阀开度太小或流向不对 3.填料太紧 4.阀芯与导向套间隙太大 5.附近有振动源 1. Unstable support 2. The valve opening is too small or the flow direction is wrong 3. Packing is too tight 4. The gap between valve core and guide sleeve is too large 5. Vibration source nearby	加固支撑 更换小Cv值阀内件或改变流向 调整填料压紧力 更换阀芯或导向件 采取减压、减振措施消除 Reinforced support Replace small CV valve trim or change flow direction Adjust the packing pressing force Replace the valve element or guide Take measures to reduce pressure and reduce vibration
9	阀动作迟缓 Slow valve movement	1.填料太紧，阀杆变形 2.阀内有泥浆或粘性大的介质产生堵 塞或结焦现象 1. The packing is too tight, and the valve rod is deformed 2. The valve is blocked or coking due to mud or viscous medium	调整螺母压紧力，修复或更换阀杆 拆卸阀体，检查清洗排除 Adjust the nut pressing force, repair or replace the valve rod Remove the valve body, check and clean it
10	阀关闭时泄漏大 Large leakage when the valve is closed	1.阀芯，阀座密封面损伤 2.阀座松动，密封垫片冲坏 3.阀座，阀芯之间有杂物 1. The sealing surface of valve core and valve seat is damaged 2. The valve seat is loose and the sealing gasket is damaged 3. Sundries between valve seat and valve core	研磨修理或更换 拆卸重装并更换密封垫片 拆卸阀体，检查清洗排除 Grinding repair or replacement Remove and refit and replace the sealing gasket Remove the valve body, check and clean it

调节阀故障排查及检修
Troubleshooting and maintenance of control valve

序号 No.	故障现象 Fault phenomenon	产生原因 Causes	检查维修方法 Inspection and maintenance methods
11	填料泄漏 Packing leakage	1.填料未压紧 2.填料材质与介质不匹配 3.阀杆变形毛糙 4.填料压盖变形 1. Packing is not compacted 2. The filler material does not match the medium 3. The valve rod is deformed and rough 4. Deformation of packing gland	压紧填料 更换填料 修理或更换阀杆 更换填料压盖 Compact packing Replace packing Repair or replace the valve stem Replace packing gland
12	阀体垫片渗漏 Leakage of valve body gasket	1.拧紧力矩不足 2.密封垫片损坏 3.密封垫片上、下的密封面损坏 1. Insufficient tightening torque 2. The sealing gasket is damaged 3. The upper and lower sealing surfaces of the sealing gasket are damaged	加大拧紧力重新拧紧 更换密封垫片 修理密封面 Increase the tightening force and retighten Replace sealing gasket Repair sealing surface

4.2、阀门易损件 Vulnerable parts of valve

◆密封垫片、填料，可随机配送
◆阀芯、阀座、阀杆、多级套筒、导向环、支撑环、密封环、先导弹簧、先导阀芯等件因其价格较贵，检修更换时需向厂方购买
◆Sealing gasket and packing can be delivered randomly
◆Valve element, valve seat, valve rod, multi-stage sleeve, guide ring, support ring, seal ring, pilot spring, pilot valve element and other parts are expensive, so they need to be purchased from the manufacturer when repairing and replacing

4.3、运输与储存 Transportation and storage

◆运输前检查包装箱是否整齐、牢固、无破损，各种标志是否完整、正确、清晰
◆装卸时应轻装、轻放，合理捆扎，严禁抛滑和撞击，确保货物安全运输无损伤
◆运输期间应做好货物的防雨、防盗工作，并经常检查绳索的完好情况
◆贮存环境要求，温度5～40℃、相对湿度不大于90%、空气中不应含有腐蚀性物质
◆按包装箱箭头标记放置，严禁歪斜和倒置
◆做好五防工作，防雨、防潮、防锈、防尘、防盗
◆产品包装自出厂发货之日起，保护有效期限为一年
◆Before transportation, check whether the packing box is neat, firm and free of damage, and whether all kinds of marks are complete, correct and clear
◆During loading and unloading, the goods shall be packed and handled with care and tied reasonably. It is strictly prohibited to throw, slide and impact, so as to ensure the safe transportation of goods without damage
◆ During transportation, the goods shall be protected against rain and theft, and the rope shall be checked regularly
◆ Requirements for storage environment: temperature 5-40 ℃, relative humidity no more than 90%, no corrosive substances in the air
◆ Place according to the arrow mark of the packing box, and do not tilt or invert
◆ Do a good job of five prevention, rain proof, moisture-proof, rust proof, dust-proof and anti-theft
◆ The product packaging shall be valid for one year from the date of delivery

4.4、开箱与检查 Unpacking and inspection

◆平稳起吊，小心搬运
◆按合同条款箱验收
◆管理好装配单、图纸、说明书、合格证等随机文件
◆保管好备品配件、专用工器具等随机物品
◆仔细阅读并严格按《安装、使用及维护说明书》进行操作
◆有疑问及时与厂家联系
◆Lift steadily and handle carefully
◆ Box acceptance according to contract terms
◆Manage the assembly list, drawings, instructions, certificates and other random documents
◆Take good care of spare parts, special tools and instruments and other random items
◆Read carefully and operate in strict accordance with the installation, use and maintenance instructions
◆Contact the manufacturer in time in case of any questions