

# Documentation

Reducing device with DSH and quick-opening function

具备减温及快开功能减压阀

## 使用说明书

Flowtec Armaturen Ltd.

**BOMAFA Armaturen GmbH**

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## 1. Description of the pressure device 压力装置说明

### 1.1 Intended purpose 概论

The intended use of the device is the through-flow of the medium in compliance with the specified operating conditions.

The pressure device is designed, built and tested in accordance with the pressure-equipment directive 97/23/EG, according to the AD-2000 system of rules.

本装置可平稳运行于特定的操作条件，并保证满足设计工况。本装置根据压力容器规范 97/23/EG 设计，制造和测试，并遵守 AD-2000 标准体系。

### 1.2 Information on the pressure device 本设备资料

See valve data sheet. 详见阀门数据表。

### 1.3 Marking-of the valves 阀门分类

All relevant data concerning the valve is located on the valve's rating plate.

所有有关阀门类别的信息标示在阀门上（铭牌）。

### 1.4 Scope of delivery 供货范围

This is in accordance with the order. 依照订单。

## 2. Classification of the defined use 阀门的分类描述

Please consult section 7 onwards. 详见第 7 点。

## 3. Transport and storage 运输和存储

Valves are supplied ready to be installed. Any spindles or openings which require welding are protected with plastic caps.

阀门安装使用之前，其焊接的进口和出口处需用塑胶盖加以保护。

If these protective covers are found damaged on receipt of a valve, it is absolutely necessary that the interior of the housing be examined for dirt. Any dirt found should be removed carefully – without damaging the movable interior parts.

阀门安装前其保护装置必须完好无损，如果发现保护装置有损坏，则必须仔细检查阀体内部是否有杂物，并在不损坏内部部件的前提下彻底清楚内部杂物。

In order to rule out damage during loading, off-loading or transport, valves must only be moved by hand or with suitable cranes or elevators. Do NOT use handwheels or (the actuator's) eyebolts as lifting points.

Protective covers used in transport should be left in place until the valve is installed.

为了保证在运输装卸过程中阀门不致损坏，阀门必须用人工、合适的起重机械或者电梯搬运。

严禁通过手轮或者（执行机构）上的吊环螺栓将阀门悬在空中。在运输途中必须使用保护罩，阀门安装前将保护装置去掉。

Please consult the dimensional drawing for information regarding the correct positioning of the lifting accessories. 请检查确认接口位置及尺寸符合图纸要求。

All BOMAF-valves are protected by paint complying with the operating conditions` requirements. Please ensure that this protective paint is not damaged during transport.

The transport eyebolts on the actuator must only be used for transporting the actuator.

所有的 BOMAF 阀门的表面涂漆都满足运行环境要求。请注意在运输中阀门的保护涂层不受损坏。请注意执行机构上的运输吊环螺栓只能用于吊装执行机构。

All valves have to be stored in a dry and sheltered place. In particular the area around the gland and stuffing box and the spindle should be kept free of dirt.

所有的阀门应存储于干燥遮蔽的环境内。密封接头、填料盒处及阀杆处应注意防止杂质侵入。

## 4. Assembly 装配

## 4.1 General information

The operating and maintenance instructions are divided into two parts. The 1<sup>st</sup> part (section 1-6) concerns general information, and the 2<sup>nd</sup> part (section 7-11) concerns information particular to specific valves. Should any difficulties arise which you cannot solve with this manual, please consult BOMAF directly for further information.

使用及维护说明分成两部份，1、常规说明（1-6点），2、阀门特殊说明（7-11点）。如果某些疑难问题本使用维护手册无法解答，请咨询 BOMAF 公司以获得更多信息。

This operating manual conforms to the relevant EN safety standards as well as to the German national rules and regulations.

Should the valve be used outside Germany, the operator must ensure that the valve conforms to the relevant national regulations..

BOMAF reserves the right to make technical alterations and improvements at any time.

The service personnel should be trained in accordance with this operating manual.

本使用维护手册符合相关 EN 安全标准及德国相关规则标准体系。如阀门在德国外使用，操作者必须遵从当地规范标准体系。德国 BOMAF 公司随时持有技术改进及变更权利。本设备操作人员必须按照本使用手册内容进行培训。

## 4.2 Limits to application 使用限制

The valves may be used only in accordance with the instructions stipulated in this manual and within the parameters and ranges of application agreed upon in the sales contract. The deployment of the valves should comply to the media included in the data sheet.

阀门必须依照本手册说明的规定进行使用，其参数以及应用范围应完全依照销售合同的规定。阀门使用的介质应对应数据表中的介质。

## 4.3 Hazard notes 危险提示

Any kind of work on the valves may only be undertaken upon issuance of a special work order.

Any kind of dismantling work may only be undertaken when the valve is depressurized.

Before beginning works on the valve ensure it has cooled to room temperature.

Appropriate safety measures must first be met if the valve is to be worked on while still hot.

Be careful when opening and dismantling the valve as medium remains may still escape, even after the system has been depressurized.

每种阀门的使用都遵从自己独特的运行规则。

所有阀门的拆卸工作必须在阀门完全减压、温度降至室温后进行，必须建立高温作业时必须的安全守则。

在打开及拆卸阀门时要当心，以防系统降压后还有残余的介质流出。

Adjustments to the valve may only be effected when pressure has been lowered in order to prevent the valve from deploying unexpectedly

After any works or adjustments always check to ensure that the valve and all its seals operate correctly.

为防止阀门误动作，必须在压力降低后才能进行相关调整。

在日常阀门运作中需经常检查阀门的运行状况及密封度。

## 4.4 Safety-relevant terms 相关安全条款

In this manual, the signal terms **DANGER**, **WARNING**, **ATTENTION** and **NOTICE** are used to designate particular dangers or exceptional information to which particular attention should be paid.

在本手册中，标示：危险、警告、注意和提示是针对于在特别危险或特殊状况下做的特别标示。

**DANGER** means that – in case of non-observance – there may be danger to life, and / or risks of considerable damage to property.

危险：一旦违章操作，将会危害生命，或者造将成财产损失。

**WARNING** means that – in case of non-observance – persons may be seriously injured, and / or risks of damage to property.

警告：一旦违章操作，可能会受到严重伤害，或者造将成财产损失。



**ATTENTION** means that – in case of non-observance – persons may be injured, and / or risks of damage to property.

注意：一旦违章操作，可能会受到伤害，或者造成财产损失。

**NOTICE** means that special attention is drawn to technical issues.

提示：是指在技术文件中应当特别注意。

In order to avoid any kind of failure which in turn may – directly or indirectly – cause personal injury or damage to property, it is also imperative that all other instructions and technical data relating to transport, operation and maintenance instructions (found in operating manuals, product information as well as on the valve itself) are observed, including those that are not especially marked or emphasized.

为避免造成任何形式的直接或间接故障造成的人员损伤或财产损失，必须遵循包括运输、操作以及维修说明中的规程和技术数据（在操作手册、产品说明及阀门本体上），即使这些数据没有特别标出或强调。

#### 4.5 Qualified personnel 操作人员资格

Qualified personnel are those persons familiar with the array, arrangement, commissioning and operation of the product who are suitably qualified in terms of their technical expertise and their job description. The guidelines of the plant's health and safety regulations should be upheld.

称职的人员，具备部署、安排、初装等能力，掌握产品各种性能技术水平，能够处理突发事件，可靠保证产品运行。应严格遵守工厂的健康及安全手册。

#### 4.6 Installation resp. assembly 安装及装配

BOMAF A-valves are supplied with pre-adjusted actuators. The valve spindle is closed. Protective covers must only be removed shortly before the valve is welded or flanged into the pipe system.

BOMAF A 阀门内的执行器在供货时已经过校准。阀杆被密封。只有当阀门被焊接或法兰安装与管道系统前不久才能将保护罩移除。

In addition to the general installation manual, the following instructions should be observed :

- Remove covers, present.
- Ensure sufficient space for operation, maintenance and disassembly of the valve.
- Valves (except those supplied with a supporting bracket) should not be treated as fix point, but rather supported by the pipe system.
- Protect the valve from dirt – especially during building activities.

除了安装手册上的要求外，还应遵循以下说明：

- 如果存在封口，移除它。
- 确保现场阀门操作、维护、分解时有足够的空间。
- 不要将阀门用做定位点-它支撑于管道系统。
- 防止杂质进入阀门，特别是土建施工时。

The fitting position has to be in accordance with the valve data sheet. Mind the direction of flow, as marked on the valve.

固定位置应按照阀门数据表，请注意标注在阀体上的流向。

Any necessary technical support should be arranged for by the operator or the assembling company. 所需技术支持须经操作者或安装公司进行安排。

#### **ATTENTION ! 注意!**

All pipes have to be cleaned before initiating the valve. Otherwise the tightness of seat cannot be guaranteed. 所有的管道在阀门初始使用前必须被清理干净，否则，将无法保证阀座的密封。

#### **ATTENTION !! 注意!**



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We emphasize that a fine-meshed dirt trap should be installed in front of the inlet nozzle of injection control valves or nozzle-injection control valves, in order to avoid damages to, or blocking of, the perforations in the control elements. 我们强调安装时阀门入口喷嘴、调节阀喷嘴前安装过滤筛，以避免阀门控制部件损坏或堵塞。

**ATTENTION !! 注意!**

We wish to point out that down-times of longer than 3 weeks can lead to malfunctions in the valve. 我们指出，当阀门被闲置一段时间后（长于3周时间）可能会导致故障。

#### 4.7 Tightening moments 紧固件

Please consult the parts list and parts list drawing for information on the tightening torques for screws. A min. and max. tightening torque is indicated on valves with Belleville springs at the screw joint of the gland plate. After commissioning (and once the system has reached operating temperature) the max. tightening torque will need to be re-adjusted. During operation, torque should not under-run the min. tightening torque.

螺栓的紧固力矩，请参照零部件清单和图纸。靠近阀门的密封面通过盘形弹簧锁紧，该锁紧力矩有其最大和最小值。阀门出厂后以最大力矩将其锁紧，经过调试（一旦系统达到工作温度）拧紧扭矩将需要重新调整。在运行操作过程中，扭矩不得低于最小拧紧力矩。

#### 4.8 Welding 焊接

Instructions for welding the valve into the piping system, its heat treatment, cleaning and testing must be observed. Do not affix welding cables (antipole) to the valve!

Check valve and welding ends for damages.

阀门与管道系统的焊接方式，应该考虑热处理，阀门清洁及测试说明。避免由于极性原因将焊条粘附在阀门上，检查阀门及焊缝是否有损坏。

The valve should be fit into the piping system, adjusted and supported in such a way that it can be welded on without any stress between valve and piping. Protect the valve's interior from damage and dirt.

阀门必须以最合适的方式与管道系统连接，焊接前充分调整接口部分以保证无任何部件受压。这样才能保护阀门内部无损坏和进入杂质。

During welding, take special care that no debris enters the pipe system – the steam or water flow might wash them into the valve where they might damage the sealing faces of seat and cone. The weld seam has to be laid carefully in order to prevent the seating's hard-facing from annealing.

Should a heat treatment be necessary, please ensure that the operating temperature is not exceeded.

焊接期间，特别注意不要使杂质进入管道系统，蒸汽和水等介质会将其带入阀门导致阀座损坏，焊接后焊缝处应小心平放，防止接口开裂，并进行必要的热处理，焊接位置时需注意不要超温，以防止阀座的防护过热脱落。

Before welding, the welding ends of valve and pipe have to be cleaned carefully.

Welding is to be done by qualified welders only, using suitable welding equipment and state-of-the-art techniques.

请注意焊接前，充分清洁阀门焊接端部和管道端部。焊接需由专业焊工，用匹配的焊接工具及最新技术按焊接要求进行焊接。

**ATTENTION 注意!**

In the event that the valve's interior parts have to be dismantled, for example as a consequence of welding debris having entered the interior, then the dismantling and assembly, as well as all necessary adjustments, must only be undertaken by - or under the supervision of - a member of BOMAF's personnel. Otherwise, the warranty claim becomes obsolete. 在焊接时，应将阀门内部部件取出，避免焊渣进入阀体内部，拆除、拆卸及必要的调整必须在 BOMAF 的专业人员监督下或亲自由他们完成。否则，所有的保证条款将不生效。

#### 4.9 Flanges 法兰

Before fitting the valve ensure the connecting pipe system is clean. When all necessary gaskets have been put in place, seal the connections by progressively tightening the screws (heeding the correct tightening moments) on opposite sides of the flange.

在安装阀门之前，需检查管道系统的清洁度。当所需垫圈安装就位后，拧紧接头（注意正确的拧紧力矩）。

The gaskets between the flanges must be centred.  
法兰间的垫圈应置中。

#### 5. Initiations 初装

##### ATTENTION! 注意!

**During commissioning, the performance test must be effected under normal operating conditions in order to ensure safe operations. 为安全起见，在试车期间，请在设计工况条件下就进行性能测试。**

**When undertaking the first functional test, please ensure that the nozzle-injection control valve contains water in order to avoid any damages to the valve. 在进行首次测试时，请注意喷水调节阀在管道有水的前提下开启以防损坏。**

**The guarantee is only valid if the commissioning is undertaken by qualified BOMAF-personnel. 保证条款在 BOMAF 合格操作人员初始试用后生效。**

Before commissioning, check all information concerning medium, pressure, temperature and direction of flow against the layout plan of the pipe system.

TRB 700 must be observed.

Bear in mind that any residues inside the pipe systems and valves (dirt, welding beads, etc.) may eventually cause leakages.

试车前，检查流体介质、压力、温度和流向等数据，并且和管道系统的相关参数做比较，留意 TRB 700。以免残渣（杂质、焊渣等等）遗留在阀门管道系统及阀门中，可能造成阀门泄露。

**The warm-up bypass should not lead to an unwanted increase of the outlet temperature!  
预热旁路应注意不要引发输出温度升温过快。**

Steam conditioning valves which are furnished with a pre-heater bypass pipe from the inlet to the outlet must be adjusted using the control valve located in the warm-up bypass. Ensure that only sufficient flow is bypassed so as to reach the specified outlet temperature. This is necessary in order to avoid automated engagement of the injection control valve responsible for cooling the hot steam.

从入口至出口的预热旁路上的蒸汽阀应由预热旁路控制阀调节。必须控制很少的流量经过旁路以保证出口温度不会过高。为了避免喷水阀自动启动操作时有效冷却热蒸汽，这样做是非常必要的。

Before commissioning, check the actuator's performance ("OPENED" – „CLOSED“) while the system is de-pressurized. Make sure that the actuator reaches the necessary stroke and the proper closing position.

试车前，检查执行机构的开关位置。确认执行机构在施加所需力矩时阀门处于完全关闭状态。

It goes without saying that any screws and nuts that had been slackened before starting the work must be tightened again (heed the tightening moments – check the parts list drawing).

在工作前所有松的螺丝和螺母都应紧固（关于紧固力矩详见部件明细图）。

When the medium enters the valve, the stuffing box packing and cover gaskets have to be checked for tightness immediately and – if need be – tightened (heed the tightening moments).

当阀门内有介质存在时，需即刻检查填料箱及压盖垫片的密封性，如有需要应将其拧紧（注意紧固力矩）。

## 5.1 **Danger !! 危险**

Before initiating a new plant (or reopening a plant after repair or modification work), make **completely** sure that :

- all assembly and installation work has been properly finished!
- commissioning is done by *qualified personnel* (see section 4.3)!
- the valve is in the correct operating position!
- all protective guards have been re-attached or repaired!

在新建电厂（或者在维修改造电厂后重建时），要明确以下几点：

- 所有的装配和安装工作按照特定秩序完成！
- 必须在有经验的专业资格人员的指导下安装完成（详见：4.3）！
- 阀门必须在正常运行状态下！
- 必须配套保护装置和维修装置！

## 6. **Inspection- and maintenance works 检查和维护工作**

### 6.1 **Functional characteristics 功能特性**

See point 8 (detailed for each valve type). 见 8 点（各阀门型号明细）。

### 6.2 **Maintenance 维护**

At regular intervals all screws and nuts should be examined for firm tightening (for tightening moments, check the parts list drawing).

Leakages detected at spindle, flange or cover gaskets may easily be eliminated by tightening the screw connection immediately.

See remarks under section 4.7 regarding the tightening torques of the packing.

The valves should be maintained regularly by suitably qualified personnel. The operator should determine the maintenance intervals according to the operating conditions.

在运行期间，所有螺栓和螺帽必须定期检查确保拧紧（紧固件、详见部件图）

发现阀杆、法兰、衬垫泄露时，只需立即简单的拧紧联接处的螺栓。

紧固力矩详见包装 4.7 点下的注示。

阀门的维护必须由专业的工程师完成，根据运行工况，由工程师来确定维护计划。

#### 6.2.1 **Lubrication for electronic actuators 执行机构润滑油**

If need be, the lubricating points located in the upper part of the bonnet should be lubricated every 4 weeks (approx.).

All common types of roller bearing grease may be used as a lubricant.

Since we are unaware of the frequency of actuator use, we recommend using automatic lubricators.

阀帽上的润滑油大约可以使用四个星期，所有通用型号的润滑油均可以使用。由于我们无法统计执行机构的动作频率，我们建议使用自动添加润滑油罐。

#### 6.2.2 **Dismantling 拆卸**

Before pressurized valve parts can be dismantled, the valve must be in a depressurized condition and cooled down to ambient temperature.

This depressurized condition must be maintained through appropriate safety precautions until all works have been finished.

阀门受压部件拆卸前，阀门必须充分减压并冷却至室温，减压过程必须按照规范操作直到达到所需状态。

**ATTENTION ! 注意!**

**IN CASE OF NON-OBSERVANCE : DANGER OF ACCIDENT !**

**如果不遵守规则操作将存在事故危险!**





Upon dismantling, inspect the valve internals for marks and furrows on the spindle and on the seat bush. The results should be logged and remedial action initiated.

**In order to maintain the warranty claim, it is necessary that an annual inspection of the valves be undertaken by our specialized service personnel.**

**This warranty claim does NOT include wearing parts.**

在拆卸时, 检查阀门运行轨迹, 并标注及记录阀座周围不规则的划痕。根据记录结果进行有针对性的矫正。

为了保证阀门正常使用, 质保期内每年由我方服务工程师进行现场检查使用情况。

质量保证不包含易损件的更换。

BOMAF does not guarantee the perfect performance of the valve if the installation commissioning or dismantling of a valve is undertaken without any BOMAF specialist being present. **在初始试车时, 安装(装配)或拆卸阀门过程中如果没有 BOMAF 专业人员在场的情况下, BOMAF 将不保证阀门良好的性能/运行。**

We recommend that any kind of valve-related works – on both BOMAF products as well as on those of other manufacturers – is expertly and reliably undertaken by BOMAF personnel.

我们建议德国 BOMAF 产品的各项相关检查工作, 最好在德国工程师专家的指导下进行, 这样更可靠。

### 6.3 Assembly 组装

Before you start, examine the valve and its interior parts for cleanliness and intactness. When all work has been finished, check all screw connections for tightness. Ensure the proper functioning of the valve before re-commissioning. 在开始安装前, 检查阀门内部部件是否干净, 完整无损。当装配工作完成, 检查螺栓连接是否紧固。至此可以保证阀门组装工作圆满完成。

**Any self-locking nuts removed during dismantling should be replaced with new ones.**

在拆卸时, 注意更换螺丝的自锁螺帽。

### 6.4 Special tools 专用工具

For flawless installation and maintenance work, we recommend the use of:

- a special tool for removing the pressure ring and accessing the seat bush.
- a mounting bush and a clamping fixture to ensure the correct position of the control spindle and its packing.
- a mounting device to pre-stress the spring washer package for safety valves.

对于完美的安装和维修工作, 我们建议使用:

- 采用特殊工具取出压环和阀座。
- 一个安装衬套和夹具, 以确保控制阀杆正确的位置及组装。
- 一固定装置, 预应力的安全阀弹簧垫圈组件。

### 6.5 Spare and wearing parts 备件和易损件

- The following spares should be stored and kept ready at the plant: seat bush, control spindle, base ring, pack ring, sealing and packing materials. For further details (e.g. order numbers) please consult the spare part list in the annex of this manual.

以下备件应存放并保持工厂备用: 阀座衬套, 控制阀杆, 底座密封环, 填料, 密封和包装材料。为了了解详细情况(如订单号), 请参考在本手册的附件备件清单。

- Manufactured parts are sealed or packaged and should be stored in a dry and sheltered place.
- 所供产品已经密封与包装。这些部件请存于干燥庇荫场所。
- Sealing and packing material must be stored according to manufacturer's instructions.
- 密封及填料材料必须按照制造厂说明保存。
- O-rings should conform to DIN 3771 parts 1 – 4 as well as DIN 7716.
- O 型圈, 详见 DIN3771 第 1-4 部分以及 DIN7716
- Elastomers include wiper rings, rod gaskets and piston gaskets.
- 人造橡胶(清洁环、活塞环)

**Additional storage instructions: 附加说明:**

**Temperature:** Storing temperature should be between 0°C and 25°C, otherwise the material may harden, and its shelf and working life will be reduced. In heated storage rooms, the heating elements and supply pipes must be covered to protect stored parts from direct heat. The distance between the sources of heat and the stored parts must be at least 1 (one) meter.

**温度:** 保存温度应该在 0 度到 25 度之间, 否则材料可能会变硬, 储存和工作寿命会缩短。如室温过高, 发热体、照明灯不能直接照射, 货物和热源距离必须保持在最少一米。

**Humidity:** On account of condensation possibly developing, do not use humid storage rooms. The most favourable relative humidity is < 65%.

**湿度:** 湿气太大可能有水雾产生, 避免贮存在湿气太重的环境, 最好空气湿度小于 65%。

**Lighting:** The elastomere products have to be protected from direct insolation and strong artificial light with a high ultraviolet fraction. Therefore, the windows of the storage rooms have to be painted either red or orange (but never blue!).

**照明:** 人造橡胶产品要避免日光曝晒、强光照射和高紫外线的照射。再者, 贮储库窗户涂上红色或橙色(不能用蓝色)。

**Ozone:** To avoid cracking and embrittlement, the elastomere products have to be protected from ozone. The storage room must not have any ozone-producing equipment (e.g., fluorescent light sources, mercury vapour discharge lamps, electric motors etc.).

**臭氧:** 人造塑胶产品必须加以防护(以免裂开或变脆), 贮藏室不能有制氧设备,(荧光灯、水银灯、电动机等等)。

**Oxygen:** In order to protect them from drafts, store the elastomere products in airtight receptacles. Oxygen causes cracks and embrittlement!

**氧气:** 为防止产品变质, 将弹性产品存放于密封容器中。氧气会导致裂缝和变脆!

**Limited storage life:** If these prerequisites are guaranteed, the storage time is 2 (two) years.

**储存期限:** 如果遵守以上条件, 贮存期限为两年。

## 7. **Applicable documents for scope of delivery 供货范围的相关文件**

See section 8 onwards. 详见第 8 部分

## 8. Functional characteristics

for

**Reducing valve with DSH and quick-opening function**

**具备减温及快开功能减压阀的功能特性**

**TAG-NO 位号:**


**740-M-0108A, ITEM-NO: 01.1**


**740-M-0108B, ITEM-NO: 02.1**


**740-M-0108C, ITEM-NO: 03.1**

**740-M-0108D, ITEM-NO: 04.1**

**BOMAF Armaturen GmbH**

 Hohensteinstraße 52  
44866 Bochum (Germany)

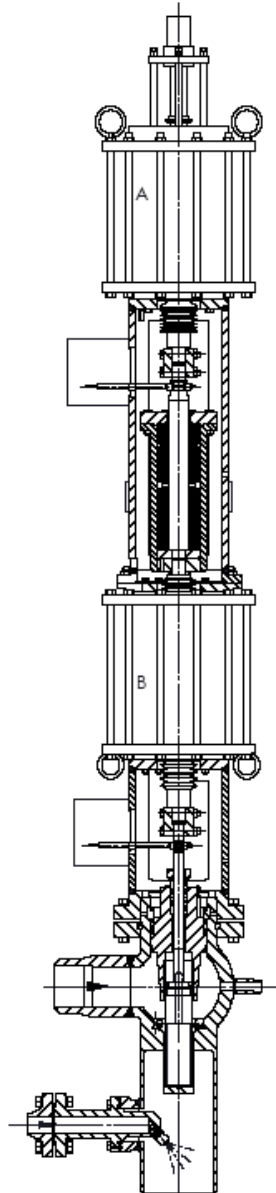
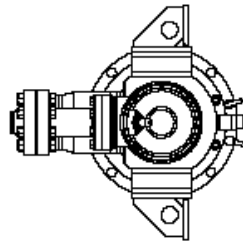
 +49 (0) 2327 / 992-0  
+49 (0) 2327 / 314-3

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**BOMAF<sup>®</sup>**

**8.1 Reducing valve with DSH and quick-opening function**  
具备减温及快开功能的减压阀





## 8.2 Introduction 绪论

The reducing valve with superheated steam cooling is a steam-converting for the pressure reduction with mass flow regulation and simultaneous cooling of the steam.

带有过热蒸汽冷却的减压阀是通过大流量蒸汽进行调节，在减压的同时将蒸汽冷却。

All functions are carried out from a valve

所有的功能由同一个阀门实现。

Proportioning is done according to their constructional conception – i.e. either by installing a perforated spindle, a perforated bush or a flat topped control spindle with a perforated bush.

其分配比例的配置是根据阀门固有的特性 – 即：安装带笼罩的阀杆，通过笼罩上的小孔或者上端的孔板控制其流量。

The mass flow regulation of the steam depends on the control characteristic of the perforated spindle and/or perforated bush and the spindle stroke.

蒸汽的质量流量调节取决于带小孔阀杆（笼罩）的调节特性和/或笼罩级数及阀杆行程。

The steam is cooled by the cooling water metered from the injecting control valve into the binary nozzles of the cooler.

蒸汽是被从喷水调节阀冷却水喷嘴中注入的冷却水而冷却的。



### 8.3 Description of the System and Components 系统及其部件说明

Reducing valve with desuperheating and quick-opening function  
带减温和快开功能的减压阀

The valve shown above principally consists of the valve body, the self-sealing cover gate, the seat bush (perforated bush), the control spindle, the bonnet and the actuator.

阀门的主要组成部件有阀体、自密封阀盖、阀座衬套（开孔笼罩）、控制阀杆、底座和执行机构。

The design of the valve body is angular. This body as well the in- and outlet connection piece are made of forged steel. The dimensions of the welding seem to be fitted conform to those of the pipe work to which it is to be connected.

阀体设计是采用角型，阀体的进出口联接件采用锻钢。联接件尺寸根据管道连接尺寸来确定。

The self-sealing cover gate, which is housed within the packing box in the upper cylindrical part of the body, is responsible for sealing the unit against the atmosphere.

自密封阀盖是覆盖在填料盒上部的一个圆柱形部分，是密封外部大气环境的一个单元。

The 4-split ring that is housed in the ring groove locks the cover gate in place. This cover gate is guided by two rings. The lower ring rests on the upper part of the cover gate while the upper ring is supported by the 4-split ring. Situated between two rings is the compression moulded cover gasket. Static pressure, acting on the gate's end face increases the sealing force.

由独立分列的 4 块环形压片压紧锁住阀盖。此阀盖由两个环形圈起密封作用。位于阀盖上部较低位置的密封环由 4 块环形压片顶住。在两个环之间的是被压紧的密封盖。静态压力下，在阀门的端面能增加密封力。

The packing area consists of the following components : The bottom ring (which also acts as the control spindle's guide element), the packing rings (the upper and lower of which serve as chamber rings and thus prevent the graphite rings from being eliminated through the existing annular passage), the pack ring as well as the stuffing box gland. The contact areas of the pack ring and the stuffing box gland are reciprocally crowned.

密封区域由下列部分组成：底部环（同时作为阀杆定位导向环），密封环（上下 2 个密封环组成封闭的腔室，这样可以防止中间石墨垫圈溢出），填料盒中的密封填料。密封环和填料盒的接触面相互作用以便压紧。

Impermeability inside the packing area is achieved by tightening the hexagonal nuts on the packing box gland (cf. tightening torque on the parts list drawing and remarks at section 4.7).

密封和填料区域的压紧由上面的六角螺杆实现（拧紧力矩参见零部件表和 4.7 部分的注释）。

The replaceable seat bush (perforated bush) is held in place by a pressure ring which is prevented from twisting.

可更换的阀座衬套（带孔节流套）应由密封圈固定以防变形。

The control spindle has a 30 ° bevel as seating face. The sealing face is adequately ground to match the seat bush.

控制阀杆与阀座接触面处有 30° 倾角坡口。其密封面经研磨使其与阀座完全匹配。

The 1st bonnet is by means of double studs and hexagon nuts with the flange screwed together at the body neck. Above the 1st bonnet is arranged the actuator B, that is firm through studs and hexagon nuts combined. The 2nd bonnet is by means of studs screwed together at the actuator B. Above the 2nd bonnet is arranged the actuator A, that is firm through studs and hexagonal nuts combined.



第一个阀帽是由柱头螺栓和六角螺母一起双重作用将阀体颈部的法兰拧紧。在上述第一个阀帽上方安装执行机构 B，通过螺栓和六角螺母共同固定。第二个阀头通过螺栓和六角螺母安装在执行机构 B 上方，其上方通过螺栓和六角螺母拧紧安装执行机构 A。

To connect the spindle and the actuator a coupling element is provisioned.

阀杆和执行机构预先已经连接好。

The cooling water injection is arranged in the low pressure part of the valve. The flanges are sealed by a gasket, and screwed with bolts and hexagonal nut.

冷却水的注入是设计在阀门的低压部分。法兰由密封垫片密封，并用螺栓和六角螺母拧紧。

The cooling water is sprayed fine passing the nozzle and will be injected into the steam flow.

冷却水通过喷嘴精确喷入蒸汽流中。

The injection of water takes place in steam flow direction.

注入的水与蒸汽流动方向相同。

The distance between valve and temperature sensor is to be inferred from the attached drawing.

该阀和温度传感器之间的距离可从附图中推断。

## 8.4 Function 功能

The steam flows in direction of the arrow into the valve body through the inlet connection piece. The control spindle is – as shown in the sectional drawing – the valve spindle is closed. Thus the steam is shut off to the low pressure room.

蒸汽从入口连接管道按阀体箭头方向流入阀体，如同在剖面图所示，此时阀杆是关闭的。因此蒸汽被切断不能进入低压腔。

When the (variable speed) actuator acts in opening direction, medium flows about the seat bush and the control spindle.

当执行器（变速）向开启方向动作时时，蒸汽介质流向阀座笼罩和阀杆。

When the stroke is small, first of all, medium streams through the clearance between control spindle and seat bush passing the profile section cleared by the control spindle.

刚开始时，执行器开启一个很小的行程，蒸汽介质通过阀杆和阀座侧面之间的缝隙进入阀体。

With increasing spindle lift opening, the medium passes through the free throttling cross-sections of the seat bush.

随着控制阀杆的提升，蒸汽流仍旧侧向自然流入控制阀座笼罩截面处。

The gradual pressure dismantling occurs through the free throttle cross sections of the seat bush in the low pressure part.

介质的压力在阀门笼罩内逐级降低。

In the seat bush (hole bush) the steam is split in many single streams, so that through this an additional noise-diminishing effect is achieved.

在阀座笼罩中（带孔笼罩）蒸汽被分割成许多独立的单流束，因此，通过这一个附加的装置实现了减噪的效果。

The superheated steam cooling occurs on the low pressure side by means of a nozzle injection. Highly atomised injection water is injected by the nozzle to the cooling in the steam stream.

通过一个喷嘴注入冷却水使过热蒸汽在低压侧进行冷却。由喷嘴注入的经过高度雾化后的冷却水冷却蒸汽流。

## 8.5 Method of operation 操作程序

Reducing station with quick-opening devices is used to safeguard the steam network downstream of the turbine. They are arranged as a by-pass to the turbine and let off to the steam network in the shortest possible time the steam volume upstream of the machine in the event of quick-action shut-



down of the turbine. Since the steam is taken over by reducing station within the space of 1 second, pressure or temperature variations are excluded.

带快开装置的减压站是用来保护汽轮机下游蒸汽管网的安全。起着汽机旁路的功能。如果发生事故工况汽机突然停机时，在尽可能短的时间内释放上游大量的蒸汽量。蒸汽在 1 秒内通过减压站释放到下游管网，避免了压力或温度的波动。

The reducing station with quick-action opening is equipped with two separate drives, A and B. Drive A is used for regulating the valve whereas drive B is used as a locking device respectively as a release of the valve spindle.

带快开功能的减压装置由两套分立的执行机构 A 和 B 构成，执行机构 A 用于调节阀门，而执行机构 B 被用于在紧急状况开启时锁定阀杆位置。

The compressed air drive B and the spring cylinder are used for fast opening of the valve. If it is intended to regulate by means of the reducing station, the compressed air drive B is pressure-released to start with. This is effected via the two 3-way solenoid valves arranged at the side of the compressed air cylinder. They permit passage from the compressed air cylinder to atmosphere.

压缩空气驱动执行器 B 使弹簧快速将阀门打开，如果需要调整减压装置时，压缩空气驱动执行器 B 开始排气。该功能可通过安装在压缩空气气缸侧的两位三通电磁实现。它们将压缩空气从气缸排入大气。

Using regulating drive A the reducing station can be operated in the same way as a standard reduction valve. After completion of the regulation process the reducing station is closed and the solenoid valves at compressed air cylinder B are closed against atmosphere. Now compressed air is let into the compressed air cylinder B with pressure. This results in blocking the regulating spindle, by pressing the latter onto the valve seat. Regulating drive A remains functional, i.e. the load states arriving from the turbine are imposed on it via a load-dependent controlled variable.

采用调节驱动器 A 可以以同样的方式像操作其他标准减压阀一样操作减压装置。完成调节过程后，减压阀是关闭的，而且压缩空气气缸 B 的电磁阀也对大气呈关闭状态。压缩空气不断进入气缸 B 增大压力导致阀杆锁定在阀座上。调节驱动器 A 仍然工作，也就是从汽轮机转移过来的流量完全等量切换到减压阀上。

Since the regulating spindle is kept in the closed position by the compressed air cylinder B, it is necessary to store the path for the regulating drive A in a spring. The stored spring path corresponds exactly to the valve stroke which would have been executed by the regulating spindle in the normal way. In the event of fast opening the pressure in the compressed air cylinder B is let off to atmosphere by an appropriate circuit on the solenoid valves.

由于调节阀杆被压缩空气气缸 B 保存在关闭位置，因此调节驱动器 A 的行程必须储存在弹簧里的。弹簧的存储行程完全对应阀门行程，将以正常的方式由执行器的阀杆调控。在快速打开时，执行器 B 通过相关的电磁阀动作将气缸中的压缩空气排空。

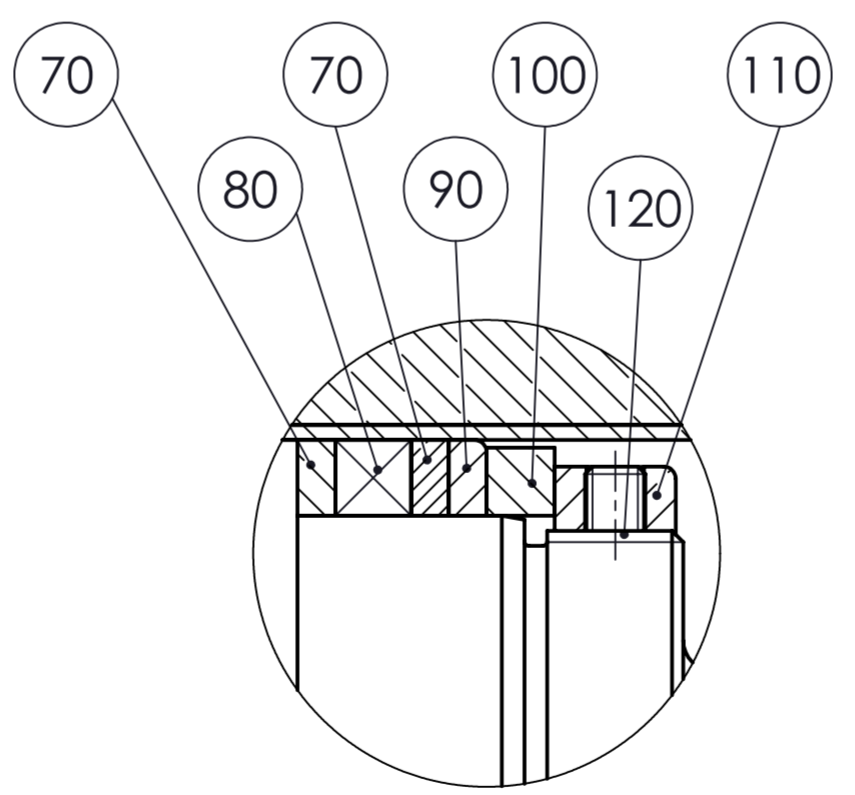
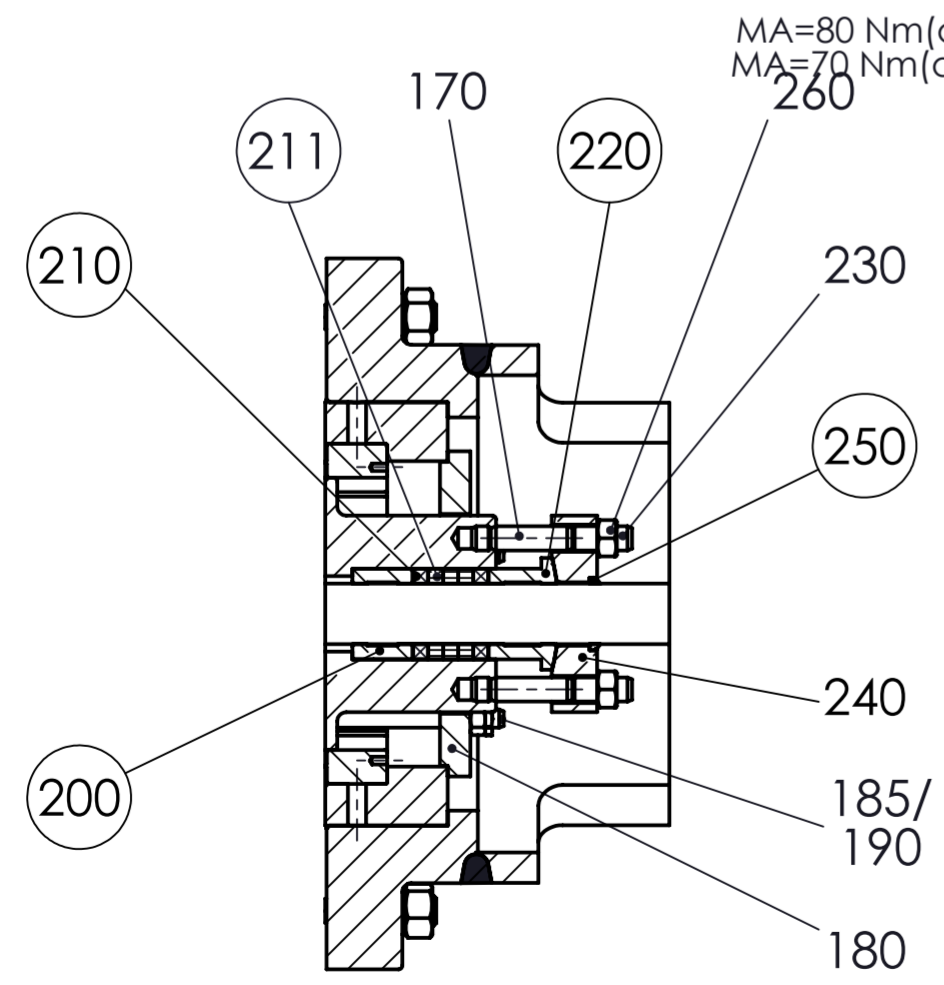
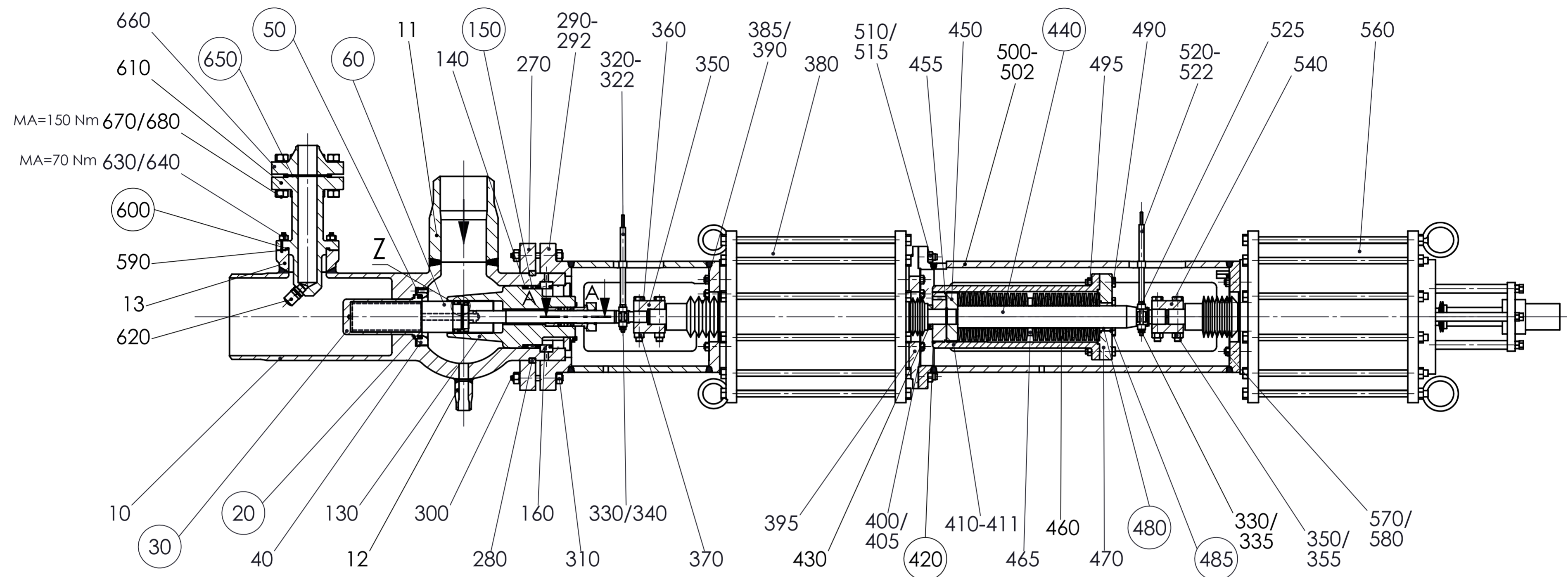
The spring in the spring cylinder which is in a state of more or less pronounced compression lifts the regulating spindle off from the valve seat. In doing so, the regulating spindle opens, within less than a second, to the pre-set spindle stroke, which was imposed on the reducing station by the regulating drive A at the time of switching off the turbine.

在弹簧柱中处于压缩状态的弹簧提起阀杆，使阀杆离开阀座。由此，调节阀杆打开，在一秒时间内到达预设位置，即当汽轮机跳车时，利用调节执行器 A 完成减压装置的调节。

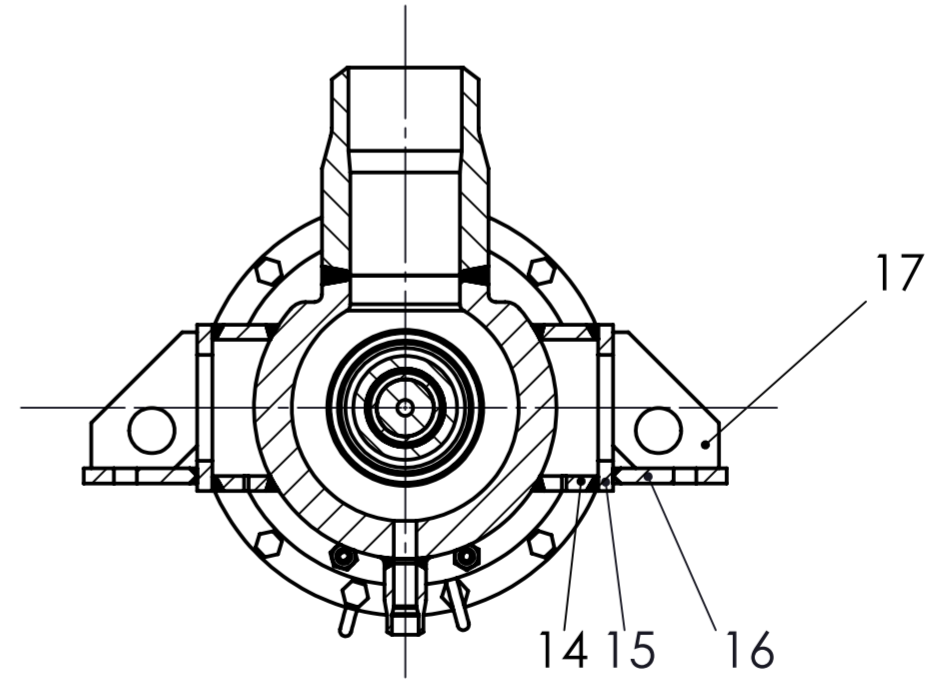
Following the fast opening, further control can be exerted immediately by means of the regulating drive A.

阀门快开后，接下来的控制可立即由驱动器 A 的调节完成。





MA = 87 Nm (assembly spindle)



TAG-NO:  
740-M-0108A, ITEM-NO: 01.1  
740-M-0108B, ITEM-NO: 02.1  
740-M-0108C, ITEM-NO: 03.1  
740-M-0108D, ITEM-NO: 04.1

○ - vorgeschlagene Ersatzteile  
spare parts

Comm. No. 28.845/01		TAG-No. -		Article No. 033940	
		Material:		QS-Inspection to DIN of ISO 9001	
		Weight: 2212.99 kg			
At this drawing we reserve the legal copyrights. Without our previous approval this drawing is not allowed to be duplicated or to make accessible to third parties. Also any other improper use is strictly forbidden to the receiver as well as to third parties.		Plotting scale: 1:10		Designation: <b>Reduzierventil mit Schnellöffnung</b> <i>reducing valve with quick-opening function</i>	
		Date	Name		
		Proc.	Meng		
CAD: Measures without tolerance regarding to DIN ISO 2768 middle information		Test.		Drawing-No.: <b>R4629</b>	
		16.12.2009 Kozub		sheet 1 of 1	



# BOMAF<sup>®</sup>

M1320 5.0

CLIENT PART LIST

Date 24.06.2010 Page 1

Article  
033940/R00

Definition  
REDUCING VALVE WITH DSH AND QUICK-OPENING  
DN 150/300 PN 420/063

Drawing-No.  
R4629  
Order-No.  
01/28.845/01-09

```

=====
Article      Pos.      Quantity  Definition      Drawing-No.
=====

```

REDUCING VALVE WITH DSH QUICK-OPENING FUNCTION  
DN 150/300 PN 420/063

TAG-NO: 740-M-0108A, ITEM-NO: 01.1  
740-M-0108B, ITEM-NO: 02.1  
740-M-0108C, ITEM-NO: 03.1  
740-M-0108D, ITEM-NO: 04.1

PIECES: 4

POS. 260 - MA = 80 NM (MONTAGE)  
260 - MA = 70 NM (BETRIEB)  
POS. 640 - MA = 70 NM  
POS. 680 - MA = 150 NM

STROKE: 90 MM

ACTUATOR: FA. ASFA  
TYPE: PZ 16C-2X450/56X95E  
PNEUMATIC- CYLINDER B

-----  
TYPE: PZ 16C-2X450/56X95D  
PNEUMATIC- CYLINDER A

Article	Pos.	Quantity	Definition	Drawing-No.
033925	10	1,000	QUANT. BODY PART 10	SW0R4629-1 1.7383/3.1
033926	11	1,000	QUANT. INLET CONNECTION PIECE PART 11	SW0R4629-1 1.7383/3.1
033927	12	1,000	QUANT. DRAIN CONNECTION PIECE PART 12	SW0R4629-1 1.7335/3.1
033928	13	1,000	QUANT. BODY-DOME	SW0R4629-1 1.7383/3.1
030579	14	2,000	QUANT. BRACKET PART 13	SW1R4491-1 BL2/2 1.7383/3.1
030580	15	2,000	QUANT. BRACKET PART 14	SW1R4491-1 BL2/2 1.7380
030581	16	4,000	QUANT. BRACKET PART 15	SW1R4491-1 BL2/2 1.7380
030582	17	2,000	QUANT. BRACKET PART 16	SW1R4491-1 BL2/2 1.7380
000538	20	1,000	QUANT. SPIRAL-WOUND GASKET	
033930	30	1,000	QUANT. SEAT BUSH	SW2R4629-3 1.4923/3.1
501953	31	1,000	QUANT. CONTROL CHARACTERISTIC	SW2R4629-3 A=067,15
033941	40	1,000	QUANT. PRESSURE RING	SW3R4629-4 1.7383/3.1
051894	50	1,000	QUANT. HEXAGON SOCKET SET SCREW WITH CUP POINT	
030602	60	1,000	QUANT. CONTROL SPINDLE	SW2R4491-3 1.4923/3.1
501953	61	1,000	QUANT. CONTROL CHARACTERISTIC	SW2R4491-3 A=046,45
024328	70	2,000	QUANT. PACKING RING	
010646	80	1,000	QUANT. PACKING RING	
024342	90	1,000	QUANT. RING	SW4R4229-3 1.7383/3.1
025143	100	1,000	QUANT. RING	SW4R4229-12 1.7383/3.1
030683	110	1,000	QUANT. THREADED RING	SW4R4491-6
051679	120	1,000	QUANT. HEXAGON SOCKET SET SCREW WITH CUP POINT	
030593	130	1,000	QUANT. INSERT	SW2R4491-5 1.7383/3.1



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CLIENT PART LIST

Date 24.06.2010 Page 2

Article  
033940/R00

Definition  
REDUCING VALVE WITH DSH AND QUICK-OPENING  
DN 150/300 PN 420/063

Drawing-No.  
R4629  
Order-No.  
01/28.845/01-09

Article	Pos.	Quantity	Definition	Drawing-No.
008848	140	2,000	QUANT. RING	SW4R2982-13 1.7383/3.1
012962	150	1,000	QUANT. COVER GASKET	
004021	160	1,000	QUANT. SPLIT RING	SW4R1746-7 1.7383/3.2
015512	170	4,000	QUANT. STUD	1.7709
015513	180	1,000	QUANT. CENTERING PLATE	SW4R3744-8 REV.1 1.7335
000435	185	4,000	QUANT. SELF LOCKING COUNTER NUT	
000442	190	4,000	QUANT. HEXAGON NUT	1.7258
024463	200	1,000	QUANT. BASE RING	SW4R4239-3 1.4122/3.1
012963	210	2,000	QUANT. PACKING RING	
012964	211	3,000	QUANT. PACKING RING	
024464	220	1,000	QUANT. PACK RING	SW4R4239-4 1.4122/3.1
012939	230	2,000	QUANT. STUD	1.7709/3.2
014622	240	1,000	QUANT. GLAND PLATE	SW4R3744-9 REV.1 1.7335/3.1
024507	250	1,000	QUANT. WIPING RING	
000443	260	2,000	QUANT. HEXAGON NUT	1.7258
004775	270	1,000	QUANT. FLANGE	SW4R1746-5 1.7335/3.1
004017	280	1,000	QUANT. SPLIT RING	SW4R1746-6 1.7335/3.2
028621	290	1,000	QUANT. BONNET - FLANGE I. PART A	SW1R4430-7 1.7335/3.1
028622	291	1,000	QUANT. BONNET - PIPE I. PART B	SW1R4430-7 1.0421
028623	292	1,000	QUANT. BONNET - PLATE I. PART C	SW1R4430-7 1.0037
000253	300	8,000	QUANT. DOUBLE END STUDS	1.7709/3.2
000723	310	16,000	QUANT. HEXAGON NUT	1.7258/3.1
030684	320	1,000	QUANT. LEVER I. PART A	SW4R4491-7 1.0037
030685	321	2,000	QUANT. LEVER I. PART B	SW4R4491-7 1.0037
030686	322	1,000	QUANT. LEVER I. PART C	SW4R4491-7 1.0037 / 1.0460
000197	330	2,000	QUANT. HEXAGON HEAD BOLT	
000692	335	2,000	QUANT. FEATHER RING	
000471	340	2,000	QUANT. HEXAGON NUT	
026969	350	1,000	QUANT. COUPLING	SW4R4332-10 1.0037
000144	360	4,000	QUANT. HEXAGON HEAD BOLT	
000474	370	4,000	QUANT. HEXAGON NUT	
020615	380	1,000	QUANT. PNEUMATIC CYLINDER -B- FA. ASFA	
009007	385	8,000	QUANT. STUD	



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CLIENT PART LIST

Date 24.06.2010 Page 3

Article  
033940/R00

Definition  
REDUCING VALVE WITH DSH AND QUICK-OPENING  
DN 150/300 PN 420/063

Drawing-No.  
R4629  
Order-No.  
01/28.845/01-09

Article	Pos.	Quantity	Definition	Drawing-No.
000473	390	8,000	QUANT. HEXAGON NUT	
013077	395	1,000	QUANT. FLANGE	SW3R3667-3A 1.0037
009007	400	8,000	QUANT. STUD	
000473	405	8,000	QUANT. HEXAGON NUT	
030690	410	1,000	QUANT. SPRING CYLINDER PART A	SW3R4491-9 REV.1 1.7335
030691	411	1,000	QUANT. SPRING CYLINDER PART B	SW3R4491-9 REV.1 1.7335
000410	420	4,000	QUANT. HEXAGON SOCKET SET SCREW WITH FLAT POINT	
013101	430	1,000	QUANT. HEXAGON NUT	SW4R2755-11 1.0037
030692	440	1,000	QUANT. SPRING SPINDLE	SW3R4491-10 1.4057
030693	450	1,000	QUANT. SPRING COLLAR	SW4R4491-11 1.0460
000410	455	2,000	QUANT. HEXAGON SOCKET SET SCREW WITH FLAT POINT	
030706	460	1,000	QUANT. SPRING WASHER COLUMN	
027799	465	1,000	QUANT. RING	1.8159/3.1 SW4R4361-15 1.0037
020566	470	1,000	QUANT. COVER	SW3R4038-12 1.0037
013107	480	1,000	QUANT. BUSH	SW4R3673-18 1.4122
000179	490	8,000	QUANT. HEXAGON HEAD BOLT	
000473	495	8,000	QUANT. HEXAGON NUT	
030697	500	1,000	QUANT. BONNET - FLANGE II. PART A	SW1R4491-12 1.0037
030698	501	1,000	QUANT. BONNET - PIPE II. PART B	SW1R4491-12 1.0421
030699	502	1,000	QUANT. BONNET - PLATE II. PART C	SW1R4491-12 1.0037
006005	510	8,000	QUANT. STUD	
000474	515	8,000	QUANT. HEXAGON NUT	
030687	520	1,000	QUANT. LEVER II. PART A	SW4R4491-8 1.0037
030688	521	2,000	QUANT. LEVER II. PART B	SW4R4491-8 1.0037
030689	522	1,000	QUANT. LEVER II. PART C	SW4R4491-8 1.0037 / 1.0460
000199	525	2,000	QUANT. HEXAGON HEAD BOLT	
000692	530	2,000	QUANT. FEATHER RING	
000471	535	2,000	QUANT. HEXAGON NUT	
020542	540	1,000	QUANT. COUPLING	SW4R4038-8 1.0037
000144	550	4,000	QUANT. HEXAGON HEAD BOLT	
000474	555	4,000	QUANT. HEXAGON NUT	
020616	560	1,000	QUANT. PNEUMATIC CYLINDER -A- FA. ASFA	
009007	570	8,000	QUANT. STUD	
000473	580	8,000	QUANT. HEXAGON NUT	



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CLIENT PART LIST

Date 24.06.2010 Page 4

Article  
033940/R00

Definition  
REDUCING VALVE WITH DSH AND QUICK-OPENING  
DN 150/300 PN 420/063

Drawing-No.  
R4629  
Order-No.  
01/28.845/01-09

Article	Pos.	Quantity	Definition	Drawing-No.
025873	590	1,000	QUANT. CYLINDRICAL PIN	C4R4300-2 1.4301/A2
000538	600	1,000	QUANT. SPIRAL-WOUND GASKET	
033929	610	1,000	QUANT. NOZZLE BRACKET	SW2R4629-2 1.7335/3.1
033947	620	1,000	QUANT. NOZZLE	1.4541/3.1
028535	630	8,000	QUANT. DOUBLE END STUDS	1.7258/AD2000-W7
002088	640	8,000	QUANT. HEXAGON NUT	1.7258/AD2000-W7
028036	650	1,000	QUANT. GROOVED GASKET	
030006	660	1,000	QUANT. FLANGE	1.5415/3.2
100974	670	8,000	QUANT. DOUBLE END STUDS	1.7709/3.2
000725	680	16,000	QUANT. HEXAGON NUT	1.7258/3.1
002485	690	1,000	QUANT. STROKE INDICATOR SCALE	
005390	700	2,000	QUANT. CROSS RECESSED RAISED CHEESE HEAD SCREW	
005278	710	1,000	QUANT. TYPE PLATE	
050472	720	4,000	QUANT. ROUND HEAD GROOVED PIN	



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CLIENT SPARE PART LIST

Date 24.06.2010 Page 1

Article  
030940/R00

Definition  
REDUCING VALVE WITH DSH AND QUICK-OPENING  
DN 150/300 PN 420/063

Drawing-No.  
R4629  
Order-No.  
01/28.845/01-09

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Article      Pos.      Quantity  Definition      Drawing-No.
=====

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REDUCING VALVE WITH DSH QUICK-OPENING FUNCTION
DN 150/300 PN 420/63
TAG-NO: 740-M-0108A, ITEM-NO: 01.1
        740-M-0108B, ITEM-NO: 02.1
        740-M-0108C, ITEM-NO: 03.1
        740-M-0108D, ITEM-NO: 04.1

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PIECES: 4

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POS. 260 - MA = 80 NM (MONTAGE)
        260 - MA = 70 NM (BETRIEB)
POS. 640 - MA = 70 NM
POS. 680 - MA = 150 NM

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STROKE: 90 MM

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ACTUATOR: FA. ASFA
TYPE: PZ 16C-2X450/56X95E
PNEUMATIC- CYLINDER B
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TYPE: PZ 16C-2X450/56X95D
PNEUMATIC- CYLINDER A

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000538	20	1,000 QUANT.	SPIRAL-WOUND GASKET	
033930	30	1,000 QUANT.	SEAT BUSH	SW3R4592-2 1.4923
051894	50	1,000 QUANT.	HEXAGON SOCKET SET SCREW WITH CUP POINT	
030602	60	1,000 QUANT.	CONTROL SPINDLE	SW2R4491-3 1.4923
024328	70	2,000 QUANT.	PACKING RING	
010646	80	1,000 QUANT.	PACKING RING	
024342	90	1,000 QUANT.	RING	SW4R4229-3 1.7380
025143	100	1,000 QUANT.	RING	SW4R4229-12 1.7383
030683	110	1,000 QUANT.	THREADED RING	SW4R4491-6 1.7383
051679	120	1,000 QUANT.	HEXAGON SOCKET SET SCREW WITH CUP POINT	
012962	150	1,000 QUANT.	COVER GASKET	
024463	200	1,000 QUANT.	BASE RING	SW4R4239-3 1.4122
012963	210	2,000 QUANT.	PACKING RING	
012964	211	3,000 QUANT.	PACKING RING	
024464	220	1,000 QUANT.	PACK RING	SW4R4239-4 1.4122
024507	250	1,000 QUANT.	WIPING RING	
000410	420	4,000 QUANT.	HEXAGON SOCKET SET SCREW WITH FLAT POINT	
030692	440	1,000 QUANT.	SPRING SPINDLE	SW3R4491-10 1.4057
013107	480	1,000 QUANT.	BUSH	SW4R3673-18 1.4122
000410	485	1,000 QUANT.	HEXAGON SOCKET SET SCREW	
000538	600	1,000 QUANT.	SPIRAL-WOUND GASKET	



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CLIENT SPARE PART LIST

Date 24.06.2010 Page 2

Article  
030940/R00

Definition  
REDUCING VALVE WITH DSH AND QUICK-OPENING  
DN 150/300 PN 420/063

Drawing-No.  
R4629  
Order-No.  
01/28.845/01-09

Article	Pos.	Quantity	Definition	Drawing-No.
032349	611	1,000	QUANT. NOZZLE	
021897	640	1,000	QUANT. GASKET	1.4404/3.1

11.

Actuators documents  
执行机构使用说明书  
for  
减压阀  
Reducing Valve  
740-M-0108A,B,C,D

**BOMAFa-Com.-No.: 28.845/2010**


**asfa-Com.-No.: H-10181-KA**


**Contract No.: E05037-740-PO-0757-009A/B/C**

**Flowtec Armaturen Ltd. (Sichuan Petrol Chemical)**

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Flowtec Armaturen Ltd. (Sichuan Petrol Chemical)

Pneumatic control system for one Reducing Valve 740-M-0108A,B,C,D (with quick-opening and locking function) 带快开和锁定功能的减压阀 (位号: 740-M-0108A, B, C, D) 其气动控制系统  
BOMAFA-Comm.-No. 28.845  
asfa-Comm.-No. H-10181-KA

Date: 2010-08-05

DOCUMENTATION 使用说明书

- 11. Contents 目录
- 11.1 Functional description 功能介绍
- 11.2 Instructions for commissioning and maintenance 调试与维护
- 11.3 Pneumatic control system 气动控制系统  
Drawing No. 3L 11938/A 系统框图  
Client parts list 用户部件清单
- 11.4 Pneumatic cylinder (actuator A) 执行机构A气缸  
Drawing No. 0L 11825 气缸结构图  
Type PZ16C-2x450/56x95D 型号  
Client parts lists 气缸部件清单
- 11.5 Pneumatic cylinder (actuator B) 执行机构B气缸  
Drawing No. 0L 11824 气缸结构图  
Type PZ16C-2x450/56x95E 型号  
Client parts lists 气缸部件清单
- 11.6 Data sheets for components 执行机构各组件数据表

# 11.1

## Functional description

执行机构功能介绍

740-M-0108A,B,C,D

## 气动控制系统的组件及功能介绍

### 11.1 Functional description and components of the pneumatic control system

Pneumatic control system for one Reducing Valve 740-M-0108A,B,C,D (with quick-opening and locking function) 编号为740-M-0108A,B,C,D减压阀的气动控制系统（带快开锁定功能）  
Drawing No. 3L 11938/A 图纸编号3L 11938/A

The pneumatic control system for the Reducing Valve 740-M-0108A,B,C,D consists mainly of the following subassemblies: 编号740-M-0108A,B,C,D的减压阀（双头A阀、B阀）气动控制系统由下列部件组成：

- 1.) 2 pieces air supply station (item 10 and item 11) consisting of filter, pressure reducing valve and gauge. (B阀上有) 两台供气站（部件编号10和11），集成了过滤器、减压阀和测量仪表。
- 2.) 1 piece double-acting electro-pneumatic positioner (item 20) for the purpose of the simulation of the steam flow across the turbine with 2 pieces volume booster (item 25).  
(B阀) 一台双向动作的电气定位器（部件编号20），带有两台增容器（部件编号25）实现模拟透平蒸汽流量的目的。
- 3.) 1 piece position transmitter (item 22) for the feedback signal (4 to 20 mA). The position transmitter is mounted at the pneumatic actuator (item 91).
- 4.) 2 pieces pneumatically operating 2/2 way valves (item 31) for the purpose of locking of the Reducing Valve 740-M-0108A,B,C,D. (A阀) 两台两位两通气动操控阀（部件编号31），用于锁定减压阀（A阀）740-M-0108A,B,C,D。
- 5.) 2 pieces pressure gauges (item 32). (A阀) 两只压力表（部件编号32）
- 6.) 1 piece double-acting pneumatic cylinder PZ16C-2x450/56x95D (item 91) for the purpose of the simulation of the steam flow across the turbine. (A阀) 一台双动作气缸PZ16C-2x450/56x95D（部件编号91），用于模拟通过透平蒸汽流
- 7.) 2 pieces air supply station (item 40 and item 41) consisting of filter, pressure reducing valve and gauge. (B阀) 两套供气站（部件编号40、41），集成了过滤器、减压阀和测量仪表。
- 8.) 1 piece non return valve (item 42). 一台逆止阀（部件编号42）
- 9.) 1 piece air pressure tank NG 500 ltr. (delivered by Flowtec China). The tank is designed for two complete strokes of the Reducing Valve 740-M-0108A,B,C,D.  
一套高压气罐（由中国福罗泰公司交付）。高压气罐设计满足减压阀740-M-0108A,B,C,D完成两个行程所需。
- 10.) 1 piece single-acting electro-pneumatic positioner (item 50) for the purpose of controlling and quick-opening the Reducing Valve 740-M-0108A,B,C,D with 1 piece volume booster (item 55). 一套单动作电气定位器（部件编号50），带一台增量器（部件编号55）完成减压阀(B阀)740-M-0108A,B,C,D快开与控制。
- 11.) 1 piece position transmitter (item 52) for the feedback signal (4 to 20 mA). The position transmitter is mounted at the pneumatic actuator (item 90).  
一台阀位变送器（部件编号52）反馈阀位信号（4 to 20 mA）。阀位变送器安装在B气动执行机构上（部件编号90）
- 12.) 2 pieces electrically operating 3/2 way solenoid valve (item 60) with silencer (item 61) as pilot operation for the purpose of quick-opening of the Reducing Valve 740-M-0108A,B,C,D. 两台两位三通电磁阀（部件编号60），佩带消音器（部件编号61），用于减压阀（B阀）740-M-0108A,B,C,D快开先导作用。
- 13.) 2 pieces pneumatically operating 3/2 way valve (item 70) with silencer (item 75) for the purpose of quick-opening of the Reducing Valve 740-M-0108A,B,C,D.  
两台两位三通气动阀（部件编号70），佩带消音器（部件编号75），用于减压阀（B阀）740-M-0108A,B,C,D快开作用。
- 14.) 1 piece single-acting pneumatic cylinder PZ16C-2x450/56x95E (item 90) for the purpose of controlling and quick-opening the Reducing Valve 740-M-0108A,B,C,D.  
一套单动作气缸PZ16C-2x450/56x95E（部件编号90）用于减压阀（B阀）740-M-0108A,B,C,D快开控制。

## Description of the control system 控制系统说明

The existing pressure air is filtered in the air supply stations (item 10, item 11, item 40 and item 41) and the pressure is reduced to 5.0 bar (g). This filtered pressure air is distributed to the electro-pneumatic positioners (item 20 and item 50), to the volume boosters (item 25 and item 55), to the pneumatically operating 2/2 way valves (item 31; valves for locking) and to the electrically operating 3/2 way solenoid valves (item 60; pilot valves for quick-opening).

供气站（部件编号10、11、40、41等）中的现有压力空气经过过滤后减压至5巴（约5公斤/平方厘米）。经过过滤的减压空气通过管线直接分配到电气定位器（部件编号20、50等）、增量器（部件编号25、55等）、两位两通气控阀（部件编号31；锁定阀）、两位三通电磁阀（部件编号60；快开先导阀）。

### Important: 特别强调

The positioners requires dry, oil-free instrument air to guarantee fault-free operation:

- Solids content  $\leq 30 \mu\text{m}$  气源固体含量 30  $\mu$  阀门定位器需要干燥、无油仪表气源才能保证操作正常无故障。
- Pressure dew point  $20^\circ\text{C}$  below ambient temperature 物体露点温度要在环境温度20度之下。

When working on the compressed air network, ensure that any contamination such as water, oil, swarf, solder residues etc. is removed by blowing out.

整个压缩空气工作网在运行时必须确保运行之前像水、油、切屑、焊渣等等之类的物质从网中清除干净。

The Reducing Valve 740-M-0108A,B,C,D is provided with two separate pneumatic actuators - actuator A (item 91) and actuator B (item 90). Actuator A (item 91) is a double-acting pneumatic cylinder PZ16C-2x450/56x95D and actuator B (item 90) is a single-acting pneumatic cylinder PZ16C-2x400/56x95E. Each of the actuators is provided with an electro-pneumatic positioner (item 20 and item 50). The actuator B (item 90) is directly connected to the valve plug. The spindles of actuator A (item 91) and actuator B (item 90) are separated. The spindle of actuator B (item 90) is connected to a spring. The spring is stressed if the positions of actuator A (item 91) and actuator B (item 90) are different. A gap always exist between spindles of actuator A (item 91) and actuator B (item 90) except when air is vented out from actuator B (in case Steam Turbine trip). When air is vented out from actuator B (item 90), the spring will lift the spindle of actuator B (item 90), open the valve and close the gap between the two spindles of actuator A (item 91) and actuator B (item 90). The position of the spindle of actuator A (item 91) is governed by the follow through mode and dependent on the amount of steam flow across the turbine and the position of actuator B (item 90).

减压阀740-M-0108A,B,C,D拥有两套分立的气动执行机构A（部件编号91）和B（部件编号90）执行机构A是一个双动作气缸结构PZ16C-2x450/56x95D，执行机构B是一个单动作气缸结构PZ16C-2x400/56x95E。

每一个执行机构都由一台电气定位器控制（部件编号20、50）。执行机构B（部件编号90）直接连接阀塞。执行机构A（部件编号91）的阀杆与执行机构B（部件编号90）的阀杆连接一根弹簧。如果执行机构A与执行机构B的阀位不同弹簧将受力。除非执行机构B失气（透平跳车时）执行机构A的阀杆与执行机构B始终存在一个间隙。当执行机构B失气时弹簧将提升执行机构B的阀杆，打开阀门，同时执行机构A和B之间的缝隙也被闭合了。执行机构A的阀杆位置始终跟踪保持着根据执行机构B的位置加上透平蒸汽流量（换算出的阀门开度值）之和的状态。

Refer to pneumatic control system diagram (drawing No. 3L 11938/A) of the Reducing Valve 740-M-0108A,B,C,D for detail of the instrument components: 参照减压阀740-M-0108A,B,C,D气动控制系统框图（编号3L 11938/A图例）详细仪表部件介绍

item 部件编号	Description 分项说明
31	2/2 way pneumatically operating valves. These are lock valves, which requires minimum 4 bar(g) of instrument air to energize. When energizes, the port opens to allow instrument air to pass through and when de-energizes air is blocked.
60	3/2 way electrically operated solenoid valves - when energizes, the port opens to allow instrument air to pass through and when de-energizes air is vented out from the valve. These valves are used to supply air pressure to energize the pneumatically operating valves (item 70) and vent the air pressure to de-energize the same.
70	3/2 way pneumatically operating valves. Requires minimum 4 bar(g) of instrument air to energize. When energizes, the port opens to allow instrument air to pass through and when de-energizes air is vented out from the valve. These valves are used for quick opening function.

31 两位两通气控阀。这是锁定阀，它们需要至少4巴（公斤）的仪表气源来加电。当加电时，气孔被打开仪表气源进入阀门，然后断电时空气被锁定。

60 两位三通电磁阀，当阀门加电时，气孔打开容许仪表气源通过，当失电时气体被排出阀门。这些阀门被用来给气控阀（部件编号70）供气加电或者放气断电。

70 两位三通气控阀，需要至少4巴（公斤）的仪表气源来加电，当加电时，气孔打开容许仪表气源通过，当失电时气体通过阀门排出，这些阀门被用来实现快开功能。

在蒸汽透平启动状态、正常操作和部分负荷操作时，利用电气定位器执行机构B通过控制减压阀 740-M-0108A,B,C,D 的开度对蒸汽管道通过的蒸汽进行减压。同样执行机构B在透平跳车时对减压阀740-M-0108A,B,C,D履行快开作用。减压阀740-M-0108A,B,C,D在正常工况时通常是关闭的。执行机构A跟踪通过透平的蒸汽流量和与执行机构A阀杆之间产生间隙的执行机构B的位置。执行机构A和B之间的弹簧是受力状态。间隙的大小取决于通过透平的蒸汽流量总量和执行机构B的位置（实际开度）。如果当蒸汽器压力低于设定值，透平已经达到极限时，那么执行机构B就开始控制蒸汽器压力了。



执行机构在蒸汽透平起机状态、正常工况操作和部分负荷操作的情形：

Start up, normal operation and partial load operation of the Steam Turbine:

The actuator B (item 90) is used to control the opening of the Reducing Valve 740-M-0108A,B,C,D during pressure letdown process based on the pressure of the steam header through electro-pneumatic positioner (item 50) during start up, normal operation and partial load operation of the Steam Turbine. It also serves to effect the quick-opening of the Reducing Valve 740-M-0108A,B,C,D in case of turbine trip. The Reducing Valve 740-M-0108A,B,C,D is normally closed during normal operation. Actuator A (item 91) tracks steam flow through the turbine as well as the position of actuator B (item 90) its spindle creating gap against spindle of actuator A (item 91). The spring at spindle of Actuator B (item 90) is stressed. The gap is based on the amount of steam flow across the turbine and the position of actuator B (item 90). In the event that the steam header pressure drops below the set point and the turbine is already limited, then actuator B (item 90) will act to supply and control the steam header pressure.

**Remark:** With the actuator B (item 90) can be controlled only, when also the electro-pneumatic positioner (item 20) of the actuator A (item 91) is admitted with a signal (20 to 4 mA; 20 mA = 0% (closed); 4 mA = 100% (open)). 注意：只有当执行机构A的电气定位器被确认给有信号（20 to 4 mA）时（20 mA = 0% (关); 4 mA = 100% (开)）执行机构B才能被控制。

That means: The electro-pneumatic positioner (item 20) gets a signal of for example 12 mA (= 50 % of the stroke of the valve), then also the actuator B (item 90) can be control only to a maximum of 50 % because the gap between the two Actuators is only so large.

这就意味着：例如（比方说）执行机构A的电气定位器（部件编号20）得到一个12 mA (= 50% 阀门行程)信号，那么执行机构B最大只能控制打开到50%，因为两个执行机构（阀杆）之间的间隙只有这么大。

Under this pressure letdown process, both electrically operating 3/2 way solenoid valves (item 60; pilot valves for quick-opening) and pneumatically operating 3/2 way valves (item 70) are energized. With the energized valves, air signal from electro-pneumatic positioner (item 50) can go through to actuator B (item 90) for control function of the Reducing Valve 740-M-0108A,B,C,D. 在这个减压过程中，两位三通电磁阀（部件编号60，快开先导阀）和两位三通的气控阀（部件编号70）都是加电状态。在阀门通电状态下来自电气定位器（部件编号50）空气信号可以通过执行机构B实现对减压阀740-M-0108A,B,C,D的控制功能。

Also, if there is no air supply failure, the pneumatically operating 2/2 way valves (item 31) are energized. With the energized valves, air signal from electro-pneumatic positioner (item 20) can go through to actuator A (item 91) for the simulation of the steam flow across the turbine. 同样只要不断气源供气，两位两通的气控阀（部件编号31）始终处于加电状态。在阀门通电的情况下，来自电气定位器（部件编号20）的空气信号可以通过执行机构A，模拟通过透平的蒸汽流量。

Steam Turbine Trip (quick-opening of the Reducing Valve 740-M-0108A,B,C,D):

透平跳车（减压阀740-M-0108A,B,C,D快开过程）

When the Steam Turbine trips, both electrically operating 3/2 way solenoid valves (item 60; pilot valves for quick-opening) are de-energized and air pressure is vented out from pneumatically operating 3/2 way valves (item 70). As a result, the pneumatically operating 3/2 way valves (item 70) get de-energized and consequently vented out air pressure from actuator B (item 90) to the atmosphere. The stressed spring then lifts the spindle of actuator B (item 90), opens the Reducing Valve 740-M-0108A,B,C,D and closes the gap between the two spindles admitting the tracked amount of steam to the steam header. By this quick opening action, the Reducing Valve 740-M-0108A,B,C,D can react and open within 0.5 seconds to that spindle stroke having been adjusted before by the actuator A (item 91). After quick-opening, further control can be effected immediately with the help of actuator A (item 91).

After some time delay, both electrically operating 3/2 way solenoid valves (item 60; pilot valves for quick-opening) will be re-energized giving air pressure to re-energized the pneumatically operating 3/2 way valves (item 70). Consequently, air vents at pneumatically operating 3/2 way valves (item 70) get closed and air signal from electro-pneumatic positioner (item 50) goes to actuator B (item 90). Actuator B (item 90) is now back to control the steam pressure. Actuator A (item 91) remains operating with the follow through mode.

当透平跳车时，两个两位三通的气控阀（部件编号60快开先导阀）被断电，两位三通的气控阀（部件编号70）排气。结果两位三通的气控阀（部件编号70）失电因此执行机构B排气到大气中。然后受力的弹簧提升执行机构B的阀杆打开减压阀740-M-0108A,B,C,D，弥合两个阀杆之间根据跟踪蒸汽流量换算出来的间隙。通过这个快开动作，减压阀740-M-0108A,B,C,D可以在0.5秒钟之内响应并达到动作之前执行机构A的阀杆已经修正过的阀位。快开之后，阀门的未来控制就立刻借助于执行机构A来完成。

在一段延时之后两台两位三通的气控阀（部件编号60快开先导阀）重新加电充气去重启两位三通的气控阀（部件编号70），因此，两位三通的气控阀（部件编号70）气孔被关闭来自电气定位器的空气信号进入执行机构B。执行机构B返回控制蒸汽压力状态，执行机构A仍然残留着保持的工作模式。

Further adjustments on the pneumatic cylinders of the Reducing Valve 740-M-0108A,B,C,D are effected as follows: 减压阀740-M-0108A,B,C,D更多的气缸调节动作参考下面内容

Locking of the Reducing Valve 740-M-0108A,B,C,D (air supply failure): 减压阀740-M-0108A,B,C,D的锁定(气源失气状态):

In case of an air supply failure first the Reducing Valve 740-M-0108A,B,C,D can be driven with the pressurized air in the air pressure tank for another two strokes. The pressurized air in the tank can not leak out because there is one non return valve (item 42) in the main air supply piping. 首先万一减压阀740-M-0108A,B,C,D的一台气源供应站失效另一台气源供应站可以驱动减压阀完成两个行程。由于有一台止回阀(部件编号42)安装在气源的主管线上,气罐里面的压缩空气不会泄露。

If the air pressure falls below about 4 bar(g) the 2/2 way pneumatically operating valves (item 31) are no further activated. As a result the Reducing Valve 740-M-0108A,B,C,D is blocked in his last position. 如果气压低于4巴(公斤)两位两通的气控阀(部件编号31)就不会启动。这样减压阀740-M-0108A,B,C,D就被锁定在它最后的位置。

Opening of the Reducing Valve 740-M-0108A,B,C,D (signal failure at the electro-pneumatic positioner (item 20) and air pressure normal): 打开减压阀740-M-0108A,B,C,D的动作(电气定位器信号故障,气压正常状态下)

When a signal failure at the electro-pneumatic positioner (item 20) occurs (that means, the input signal for the positioner is lower then 4 mA (20 mA = 0% (closed); 4 mA = 100% (open)), the actuator A (item 91) is admitted only in the direction "OPEN" with pressurized air through the electro-pneumatic positioner (item 20) and the actuator A (item 91) opens with the help of the pressurized air. The Reducing Valve 740-M-0108A,B,C,D can be controlled with the actuator B (item 90) normally more further, but if there is a turbine trip, the valve opens always to 100%.

This opening function can be carried out up to the date until no pressurized air is in the tank. After that there is not any possibility to drive the actuator A (item 91) into open direction.

这个打开功能只要气罐中压缩空气还有就可以完成。除此之外没有任何可能驱动执行机构A去进入打开状态。

Reference regarding maintenance and commissioning is made to the attached operation & maintenance instructions. 有关维护和调试的内容全部集成在后面的操作和维修指南中。

当电气定位器(部件编号20)故障信号发生时(那就是说,给定位器输入的信号低于4 mA (20 mA = 0% (全关); 4 mA = 100% (全开)),执行机构A被设置只能通过电气定位器(部件编号20)的压缩空气打开,然后执行机构A借助压缩空气打开阀门。通常不久减压阀740-M-0108A,B,C,D可以被执行机构B控制,但是如果透平跳车,这时阀门的开启度是100%。

# 11.2

## Instructions of commissioning and maintenance

调试与维护说明  
740-M-0108A,B,C,D

# 执行机构气缸的调试与维护

## Commissioning and Maintenance of Pneumatic Cylinders

### 1. General 总则

In order to guarantee efficient operation of the cylinders it is important to take note of the operating instructions supplied with the unit or the information given in the data sheets when undertaking repairs. During assembly and installation the internal parts must be kept clean.

当执行维修工作时为了保证气缸的高效能运作一定要重视这份随机提供的操作说明以及数据表中的参考信息。在装配和安装时必须保持内部器件的洁净。

### 2. Installation 安装

#### 2.1 Mounting Position 安装位置

In general the mounting position of pneumatic cylinders is optional.

一般来讲气缸的安装位置是可以选择的。

#### 2.2 Installation 安装

特别注意安装时要被彻底清洁。气缸安装必须是无应力状态，特别是没有径向力，防止过早出现磨损及功能故障。

During installation particular attention must be paid to cleanness. The cylinders must be installed free of tension, and in particular be free of radial forces, to prevent functional faults and premature wear arising.

The pipe connections and thread depths are suitable for all standard connections. The spot faces are designed so that connections with sealing edges or O-ring seals may be used. The thread must not rest on the floor of the bore. 管道连接和纵向线路必须符合标准水平。设计的孔口平面是为了采用密封唇口或者O型密封圈相连接。管线不能支撑在地井表面上。

Sealing agents such as hemp and putty must not be used, since they can cause contamination and subsequent functional faults. 棕榈和油灰不能当做密封替代物，因为它们会造成污染和继发性功能故障。

Before installation pipework must be free of dirt, swarf, sand, chips, etc.. Cleaning rags should not be used. The pipes should be laid with slight tension.

在管道安装前必须清理干净灰尘、切屑、碎片、沙砾等等。不能用清洁布清理。管道放置只能轻微受力。

### 3. Commissioning 调试

For initiation sufficient dry and oil-free instrument air supply and pressure have to be available. The corresponding values are indicated in the data sheets.

**Any activities, for example maintenance and inspection at the pneumatic cylinders may be only executed by our specialists.**

**In the case initiation, maintenance and inspection activities of the pneumatic cylinders are executed without our personnel being present, we do in no case grant for the faultless operating of the pneumatic cylinders.**

开始进入的仪表气源必须是干燥无油的，供气和压力可适用。对应的阀门在数据表中有标示。

一切活动，如维护和检测气缸的工作只能由我们宝马阀的特指人员进行。

假如开始的时候，气缸的调试和检测没有我们的人员在场就执行，我们将不会保证气缸的操作无故障。



## 4. Maintenance 维护

Particularly after commissioning of a new system the cylinders should be checked at frequent intervals for correct function and for leakage. Leakages are inadmissible.

**To ensure the guarantee, it is necessary to take an inspection to the pneumatic cylinders once a year by our specialists.**

**There does not exist any guarantee for the general wearing parts.**

特别强调，当一套新的气缸系统经过调试后应该定期进行正常功能检测和泄漏检查。泄漏是不能容许的。为了保证质量，有必要每年由我们的特种人员对气缸进行一次检测。对于常规的易损件我们不承保。

## 5. Storage 存储

It is recommended to store the cylinders in a dry, dampfree place. The storage area must be free of corrosive substances and vapours.

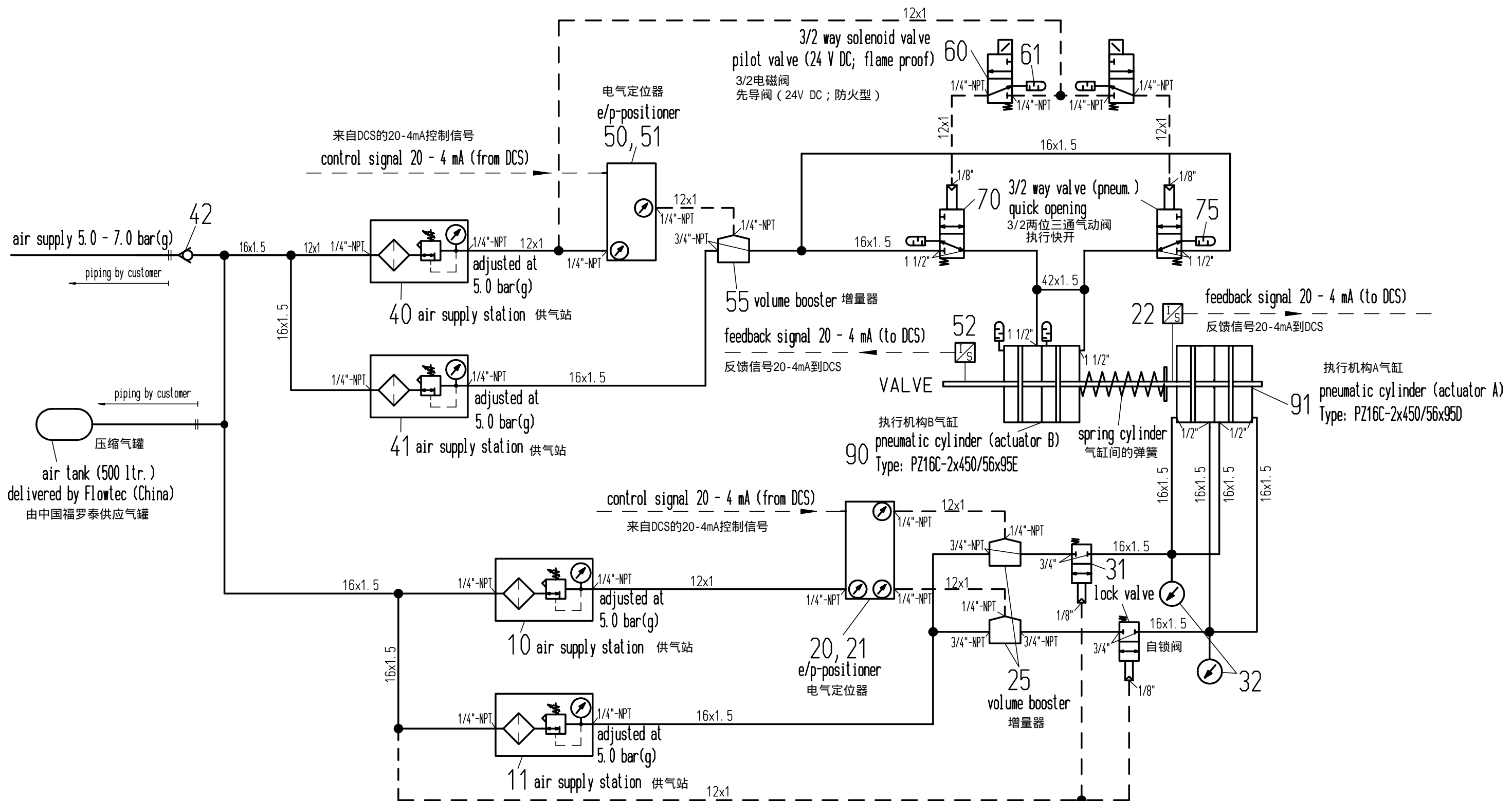
气缸建议存放在干燥不潮湿的地方。存储的地方无腐蚀性物质或气体。

# 11.3

## Pneumatic control system

740-M-0108A,B,C,D

气 动 控 制 系 统



presentation of the valves: currentless and depressurized  
 阀门供货类型：无源减压阀

Drawing may be changed only in CAD!

A		several changes (avtuator stroke, ...)	07.01.2010	Codr. /Hess
Rev.	Text			Date Name
Comm. No.	AKZ No.		Article No. 908524	
		Material:		Quality Assurance System acc. DIN EN ISO 9001
		Weight: kg		
This drawing remains our property and has to be treated as confidential. You will be liable to prosecution and for damages in case of duplications, leaving to other persons etc. We refer to the relevant provisions of the copyright legal protection law which is valid at present.		Scale:		Text: <b>Pneumatic Control System</b> for Reducing Valve 740-M-0108A, B (Sichuan)
		Date	Name	
		Prep. 16.10.2009	Codr. /Hess	
		Check. 16.10.2009	Hess	
CAD: C: 00016661. SZN		Measured without Tolerance Statement acc. to DIN 7168 middle		Drawing No.: <b>3L 11938 / A</b>

**Client Parts List**

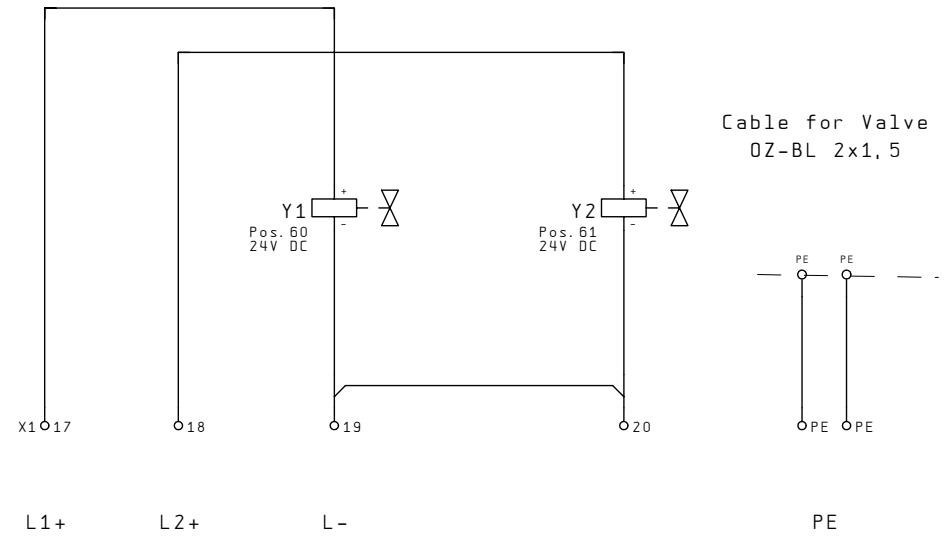
**Pneumatic control system for reducing valve** Drawing-No. 3L 11938/A  
 减压阀的气动控制系统 系统框图编号：No.3L11938/A

Article 物件代号	Item 部件编号	Qty 数量	Definition 物件名称	Drawing/Ref. no. 框图编号
907.564	10	1	Air filter regulator 空气过滤调节器	
907.564	11	1	Air filter regulator 空气过滤调节器	
907.331	20	1	Electro-pneumatic positioner DVC6010 (double acting) 电气定位器DVC6010 (双动作)	
908.238	21	1	Mounting kit for positioner 定位器配套件	
908.424	22	1	Position transmitter 4211 阀位变送器4211型	
905.703	25	2	Volume booster 增量器	
908.018	31	2	2/2 way valve (pneumatically) G 3/4" 两位三通气控阀	
013112	32	2	Pressure gauge 1/4" 压力表	
907.564	40	1	Air filter regulator 空气过滤调节器	
907.564	41	1	Air filter regulator 空气过滤调节器	
907.328	42	1	Non return valve G 3/4" 止回阀	
907.331	50	1	Electro-pneumatic positioner DVC6010 (single acting) 电气定位器DVC6010 (单动作)	
908.238	51	1	Mounting kit for positioner 定位器配套件	
908.424	52	1	Position transmitter 4211 阀位变送器 4211型	
905.703	55	1	Volume booster 增量器	
908.019-1	60	2	3/2 way solenoid valve (24 V DC) 两位三通电磁阀	
907.224	61	2	Silencer G 1/4" 消音器	
907.221	70	2	3/2 way valve (pneumatically) G 1 1/2" 两位三通气控阀	
013310	75	2	Silencer G 1 1/2" 消音器	
908.283-4	90	1	Pneumatic cylinder PZ16C-2x450/56x95E B气缸	0L 11824
908.284-4	91	1	Pneumatic cylinder PZ16C-2x450/56x95D A气缸	0L 11825









3/2 way solenoid valve  
pilot valve (24V DC, flame proof)

1

3

			Datum	28.07.10	Pneumatic Control System	Lieferfirma:	Benennung:		= R01
			Bearb.	BRA			Valve 控制阀网 www.CV3000.com		+ S01
			Gepr.		Sichuan Petrol Chemical (China)				
Anderung	Datum	Name	Ausg.	02.08.10				Kom.-Nr.:	Firenzezeichnungsnummer
								26474	28.845 / 01-04
									Bl. 2
									3 Bl.

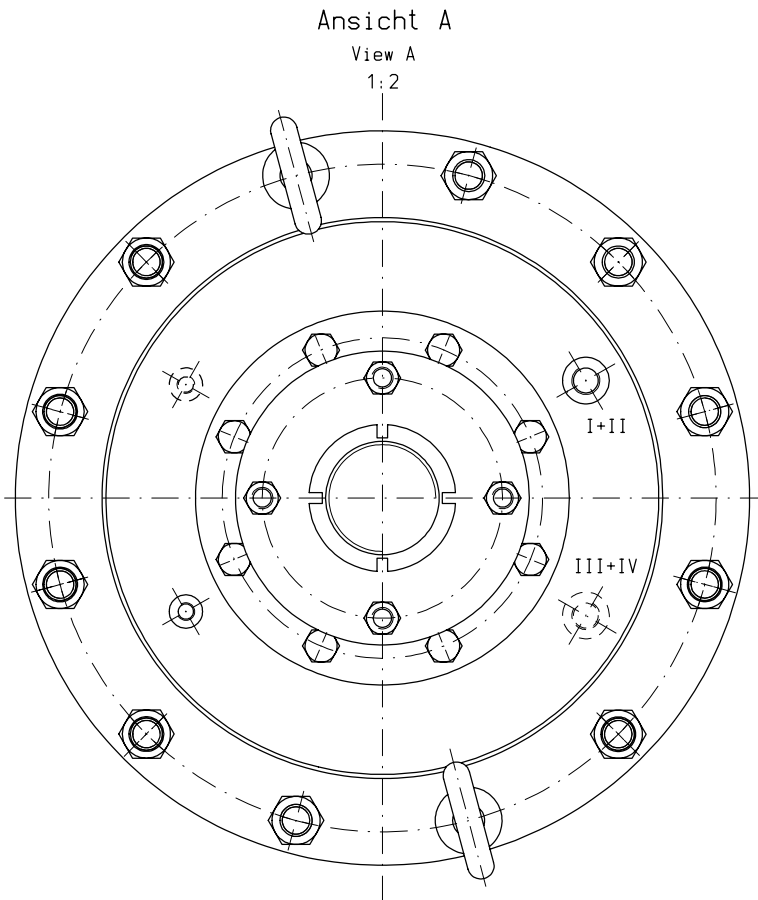
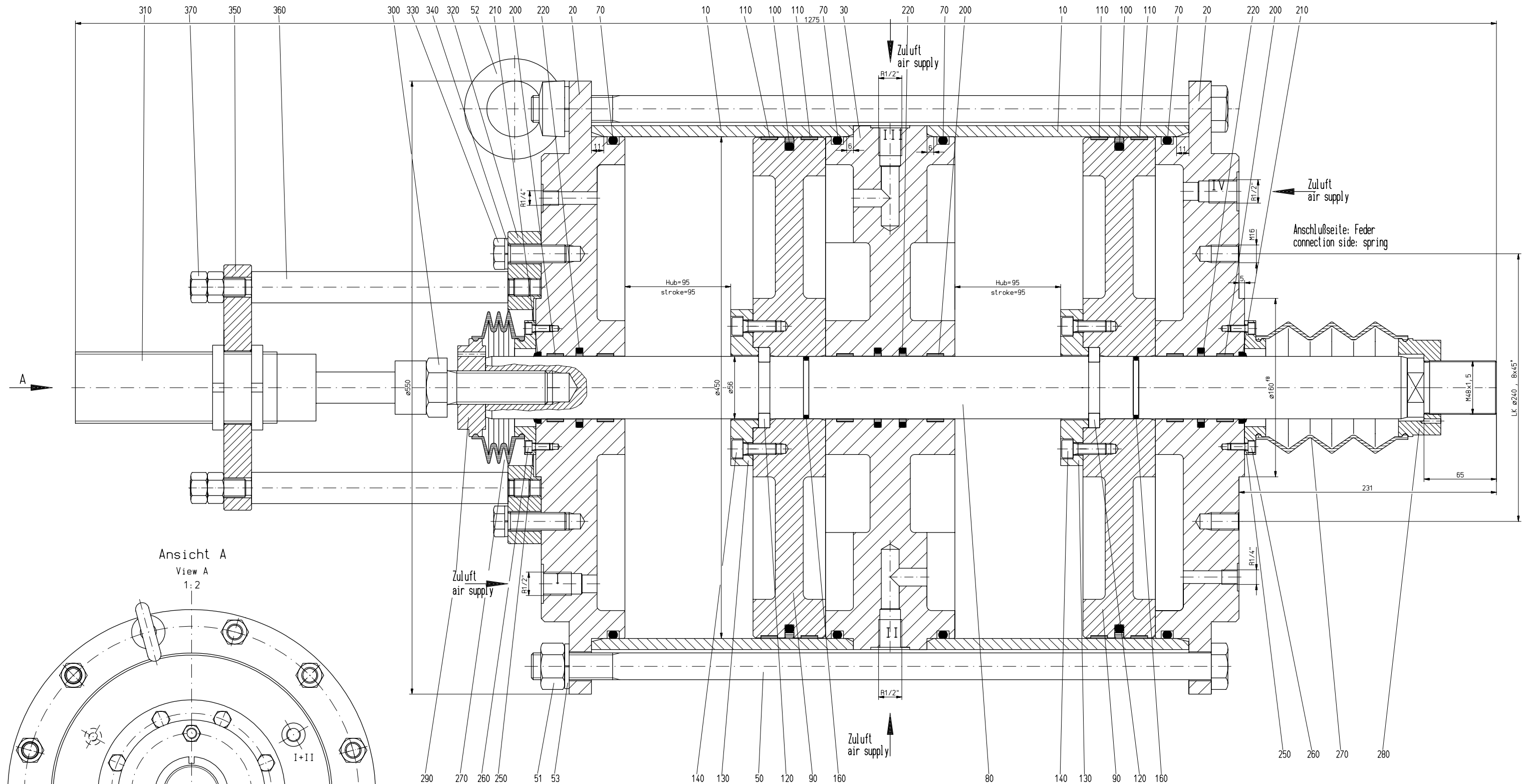


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Terminal strip designation <b>=A01+S01-X1</b>	Cable designation																										
	Cable type																										
	Connection	+	-	+	-		+	-			+	-	+	-			+	-			+	+	-	-			
	Desti-nation	-P0.50	-P0.50	-P0.50	-P0.50	SCHIRM	-P0.52	-P0.52	-P0.52 res.	-P0.52 res.	SCHIRM	-POS.20	-POS.20	-POS.20	-POS.20	SCHIRM	-POS.22	-POS.22	-POS.22 res.	-POS.22 res.	SCHIRM	-Y1	-Y2	-Y1	-Y2	-PE	-PE
	Terminal name																										
	J u m p e r																										
	Terminal number	1	2	3	4	SC	5	6	7	8	SC	9	10	11	12	SC	13	14	15	16	SC	17	18	19	20	PE	PE
	Connection																										
	Desti-nation																										
	Cable designation	Cable type																									
Function																											

+S02/1

# 11.4

## Pneumatic cylinder (actuator A) 执行机构A气缸 740-M-0108A,B,C,D



Rev.	Änderung	AKZ Nr.	Artik.Nr.	90634	Bearb./Gepr.	
Form. Nr.		Verkatoff:	Ers. f.:	Ers. d.:		
		Gewicht:	kg	05-Überprüfung nach DIN ISO 9001		
		Maßstab:	1:1,2			
An dieser Zeichnung behalten wir uns alle Rechte (insb. Urheberrechte) vor. Ohne unsere vorherige schriftliche Genehmigung darf diese Zeichnung weder vervielfältigt noch in irgendeiner Weise verbreitet werden. Sie darf nicht durch den Kopierer oder in irgendeiner anderen Weise weiterverbreitet werden.		Datum:	08.01.2008	Gezeichnet:		
		Gepr.:	08.01.2008	Bezeichnung:	Pneumatikzylinder	
		DIN:	C:00015599.S2H			PZ16C-2x450/56x950
		Blatt:		Zeichnung Nr.:	0L 11825 /	
				DIN 7169	Blatt	

Client Parts List

Pneumatic Cylinder PZ16C-2x450/56x95D Drawing-No. 0L 11825

执行机构A气缸

系统框图编号:No. 0L11825

Article 物件代号	Item 部件编号	Qty 数量	Definition 物件名称	Drawing/Ref. no. 框图编号
908.006	10	2	Cylinder tube 缸管	3L 10857 1.0037
905.540	20	2	Cylinder head 缸盖	1L 10867 1.0037
905.541	30	1	Intermediate plate 中间隔板	1L 10868 1.0037
907.316	50	12	Hexagon bolt DIN 931 六角螺栓	8.8
000476	51	10	Hexagon nut DIN 934 六角螺母	8
905.526	52	2	Lifting eye nut DIN 582 吊环螺母	1.0401
000696	53	12	Spring washer DIN 127 弹簧垫片	1.0970
905.527	70	4	O-ring O型圈	
908.288	80	1	Piston rod 活塞杆	2L 11829 1.0503
905.543	90	2	Piston 活塞	3L 10870 1.0570
905.544	100	2	Piston seal 活塞密封圈	
905.531	110	4	Piston guide ring 活塞导向环	
905.532	120	2	Split ring 开口环	4L 10862 1.5415
905.533	130	2	Washer 垫片	4L 10863 1.0570
000485	140	12	Socket head cap screw DIN 912 套头螺丝	8.8
901.745	160	2	O-ring O型圈	
905.534	200	6	Rod guide strip (活塞)导杆导轨	
901.410	210	2	Scraper 刮片	
900.817	220	4	Piston rod seal 活塞杆密封	
905.535	250	2	Washer 垫片	4L 10864 1.0570
000523	260	8	Socket head cap screw DIN 912 套头螺丝	8.8

## Client Parts List

### Pneumatic Cylinder PZ16C-2x450/56x95D Drawing-No. 0L 11825

Article	Item	Qty	Definition	Drawing/Ref. no.
907.322	270	2	Rubber bellows 橡胶伸缩管	
905.537	280	1	Lower washer 低层垫片	3L 10865 1.0570
905.545	290	1	Upper washer 上层垫片	3L 10871 1.0570
905.546	300	1	Hexagon bolt DIN 931 六角螺栓	8.8
907.313	310	1	Dashing vessel 美观导管	
905.549	320	1	Flange 法兰	2L 10872 1.0037
905.548	330	8	Hexagon bolt DIN 931 六角螺栓	8.8
004093	340	8	Spring washer DIN 127 弹簧垫圈	1.0970
907.319	350	1	Flange 法兰	3L 11460 1.0037
907.314	360	4	Stud bolt 双头螺柱	3L 11459 1.0503
000473	370	8	Hexagon nut DIN 934 六角螺母	8

## Client Spare Parts List

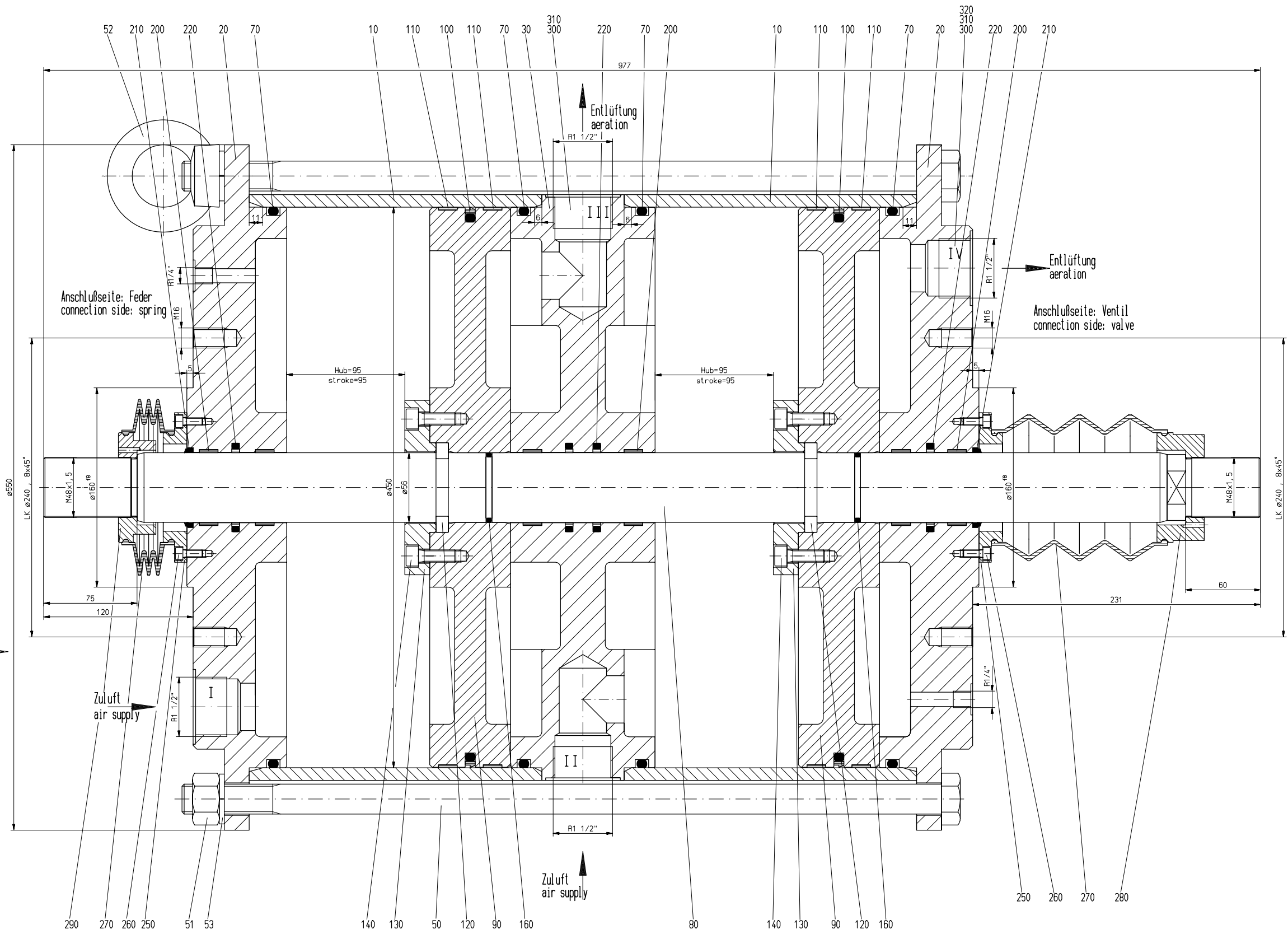
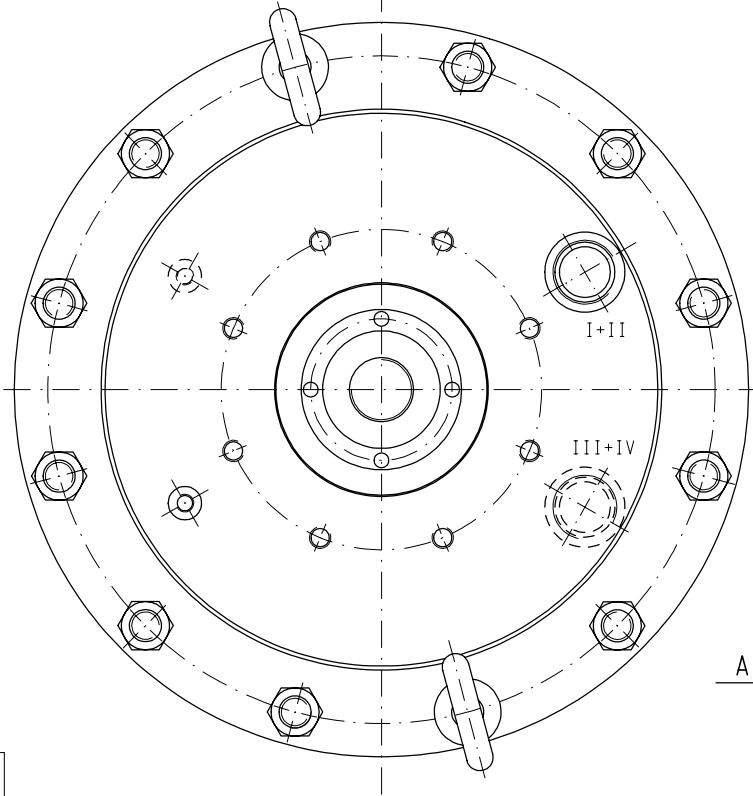
### Pneumatic Cylinder PZ16C-2x450/56x95D Drawing-No. 0L 11825

Article	Item	Qty	Definition	Drawing/Ref. no.
905.527	70	4	O-ring O型圈	
905.544	100	2	Piston seal 活塞密封圈	
905.531	110	4	Piston guide ring 活塞导向环	
901.745	160	2	O-ring O型圈	
905.534	200	6	Rod guide strip (活塞) 导杆导轨	
901.410	210	2	Scraper 刮片	
900.817	220	4	Piston rod seal 活塞杆密封	
907.322	270	2	Rubber bellows 橡胶伸缩管	

# 11.5

## Pneumatic cylinder (actuator B) 执行机构B气缸 740-M-0108A,B,C,D

Ansicht A  
View A  
1:2





Client Parts List

Pneumatic Cylinder PZ16C-2x450/56x95E Drawing-No. 0L 11824

执行机构B气缸

系统框图编号: No. 0L11824

Article 物件代号	Item 部件编号	Qty 数量	Definition 物件名称	Drawing/Ref. no. 框图编号
908.006	10	2	Cylinder tube 缸管	3L 10857 1.0037
905.524	20	2	Cylinder head 缸盖	1L 10858 1.0037
905.525	30	1	Intermediate plate 中间隔板	1L 10859 1.0037
907.316	50	12	Hexagon bolt DIN 931 六角螺栓	8.8
000476	51	10	Hexagon nut DIN 934 六角螺母	8
905.526	52	2	Lifting eye nut DIN 582 吊环螺母	1.0401
000696	53	12	Spring washer DIN 127 弹簧垫圈	1.0970
905.527	70	4	O-ring O型圈	
908.287	80	1	Piston rod 活塞杆	2L 11828 1.0503
905.529	90	2	Piston 活塞	3L 10861 1.0570
905.530	100	2	Piston seal 活塞密封圈	
905.531	110	4	Piston guide ring 活塞导向环	
905.532	120	2	Split ring 开口环	4L 10862 1.5415
905.533	130	2	Washer 垫片	4L 10863 1.0570
000485	140	12	Socket head cap screw DIN 912 套头螺丝	8.8
901.745	160	2	O-ring O型圈	
905.534	200	6	Rod guide strip (活塞) 导杆导轨	
901.410	210	2	Scraper 刮片	
900.817	220	4	Piston rod seal 活塞杆密封	
905.535	250	2	Washer 垫片	4L 10864 1.0570
000523	260	8	Socket head cap screw DIN 912 套头螺丝	8.8

**Client Parts List**  
**Pneumatic Cylinder PZ16C-2x450/56x95E Drawing-No. 0L 11824**

Article	Item	Qty	Definition	Drawing/Ref. no.
907.322	270	2	Rubber bellows 橡胶伸缩管	
905.537	280	1	Lower washer 低层垫片	3L 10865 1.0570
905.538	290	1	Upper washer 上层垫片	3L 10866 1.0570
013310	300	2	Silencer 消音器	
013311	310	3	Double nipple DIN 2950 双向短接管	
905.539	320	1	Angle DIN 2987 角铁	

### Client Spare Parts List

**Pneumatic Cylinder PZ16C-2x450/56x95E Drawing-No. 0L 11824**

B气缸 编号PZ16C-2x450/56x95E 图纸编号No. 0L 11824

Article 物件代号	Item 部件编号	Qty 数量	Definition 物件名称	Drawing/Ref. no.
905.527	70	4	O-ring O型圈	
905.530	100	2	Piston seal 活塞密封圈	
905.531	110	4	Piston guide ring 活塞导向环	
901.745	160	2	O-ring O型圈	
905.534	200	6	Rod guide strip (活塞)导杆导轨	
901.410	210	2	Scraper 刮片	
900.817	220	4	Piston rod seal 活塞杆密封	
907.322	270	2	Rubber bellows 橡胶伸缩管	