真空压力比例阀 Proportional Vacuum Regulator

QKL-B4HV

产品特色 Features

- 体积小 Compact
- 精度高 High Precision
- 灵敏度高 High Sensitivity
- 正压/真空双应用平台
  Positive & Vacuum Dual-Range Platform

产业应用 Industrial application

- 半导体与电子制程 Semiconductor & Electronics
- 自动化设备与机械手臂 Automation & Robotics
- 包装与贴合制程 Packaging & Lamination
- 检测与实验设备 Testing & Laboratory Equipment

产品叙述 Product Description

QKL-B4HV 为专为真空应用所开发的压力比例阀，有-1~0bar 真空压力范围、-1~6 bar 与-1~9 bar 之联成压范围供选择，可精准调节并稳定控制真空压力，确保制程条件一致且具高度重复性。

该采用闭回路控制架构，实时回授实际压力并自动修正输出，有效降低真空压力波动对制程所造成的影响。相较于传统真空阀搭配机械式调整方式，QKL-B4HV 能提供更高的控制精度与系统稳定性，特别适合对真空度要求严谨的自动化与精密制程应用。

支持多种控制讯号，包括 0–10 V、4–20 mA 及 RS485(Modbus)，可轻松整合至 PLC 或工业控制系统。广泛应用于半导体、电子、自动化设备、包装贴合及检测与实验设备等真空应用场景，是设备开发与系统升级的理想真空压力控制解决方案。

QKL-B4HV is a proportional pressure regulator designed for vacuum applications, offering -1 to 0 bar vacuum pressure, as well as compound pressure ranges of -1 to 6 bar and -1 to 9 bar. It provides precise and stable vacuum pressure control to ensure consistent and repeatable process conditions.

With a closed-loop control architecture and real-time pressure feedback, QKL-B4HV automatically corrects output to minimize pressure fluctuations. Supporting 0–10 V, 4–20 mA, and RS485 (Modbus) control signals, it integrates easily with PLCs and industrial control systems and is suitable for semiconductor, electronics, automation, packaging, and laboratory vacuum applications.

All our products have CE, SGS, RoHS certification with ISO13485 quality system.

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产品规格 Specifications

系列 Type	QKL-B4HV	QKL-B4HV-P6	QKL-B4HV-P9
输入讯号 Input Signal	0-10V / 4-20mA / RS485		
输出压力 Output Range	-1~0 bar(-100~0 kPa)	-1~6 bar	-1~9 bar
监控信号 Monitor Output	0-10V / 4-20mA / RS485		
工作电源 Supply	DC24V (≦14W)		
响应时间 Response	200 msec		
介质 Medium	真空 Vacuum		
重复精度 Repeatability	±0.25% F.S.		
迟滞 Hysteresis	±0.25% F.S.		
线性度 Linearity	±0.25% F.S.		
综合精度 Accuracy	±0.25% F.S.		
灵敏度 Sensitive	±0.25% F.S.		
流量 Max. Flow Rate	90 L/min @1bar		
使用温度范围 Temp. Range(Operating)	-196 ~ 70 °C (-320 ~ 158 °F)		
牙口 Port Size	1/8"PT		
底座材质 Manifold Material	铝合金 Aluminum		
固定架材质 Mounting Bracket Material	镀锌钢板 Galvanized Steel		
电气连接 Electrical Connection	M12 电气端子(2m) M12 Connector(2m)		
防护等级 Ingress Protection	IP 65		
重量 Weight	800 g		

型号选择 Ordering Code

QKL – □ – □ – □ – □ – □ – □

系列 Type

B4HV	内部回授 Internal Feedback	1/8"PT

输入讯号 Input Signal

*E	0 – 10 V
A	4 – 20 mA
R	RS485 Modbus

监控讯号 Monitor Output

C	0 – 10 V
A	4 – 20 mA
R	RS485 Modbus

固定架 Mounting Bracket

M	M type

压力范围 Pressure Range

–	-1~0 bar (-100~0 kPa)
P6	-1 ~ 6 bar
P9	-1 ~ 9 bar

显示单位 Display Unit

S	kPa
U	bar

*若控制讯号选择 0-10V，请留意最小的驱动电流为 3mA。

For Command Signal type 0-10V, the minimum driving current is 3mA.

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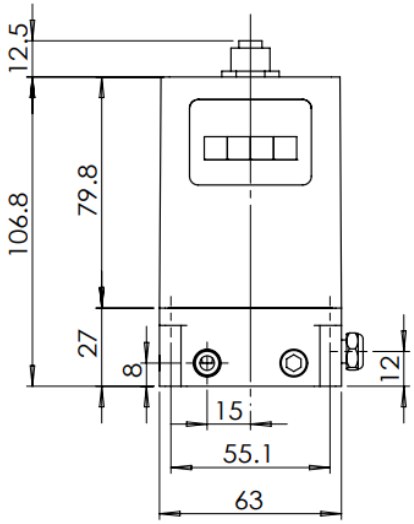
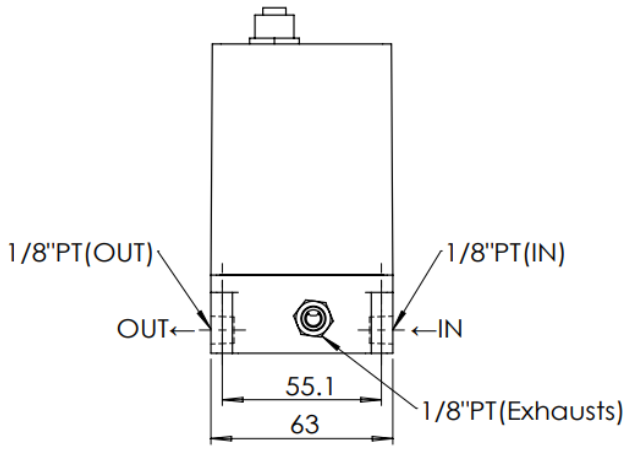
QKL-B4HV

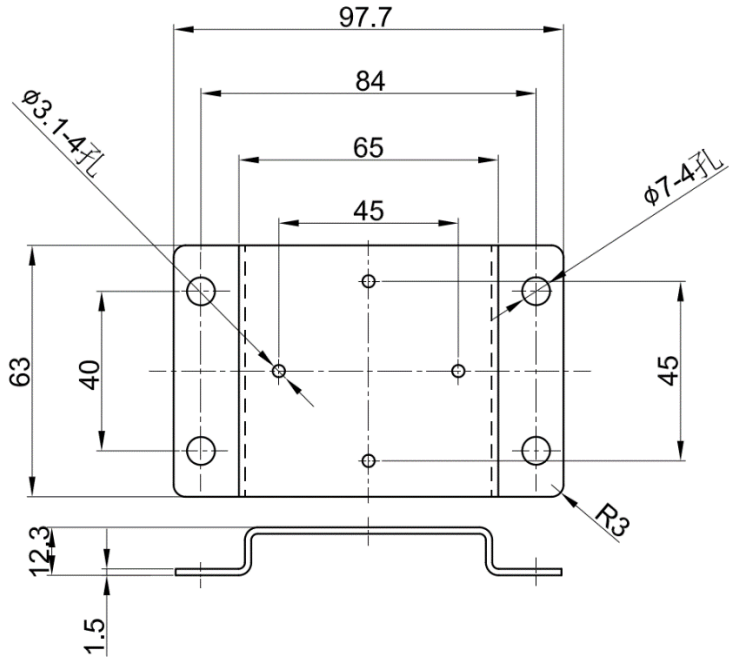
外观尺寸 Overall Dimension

◆ QKL-B4H





◆ 固定架 M 型 Bracket M Type



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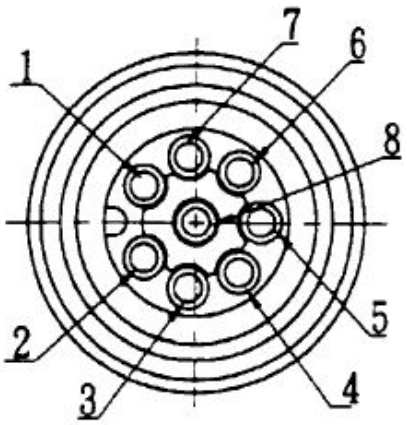
QKL-B4HV

接线方式 Wiring Description



※此接线图为线材公座俯视图

The wiring diagram shows from top view

编号 No.	颜色 Color	功能 Function	
1	蓝色 Blue	电源(-)	24V DC Power (-)
2	棕色 Brown	电源(+)	24V DC Power (+)
3	黑色 Black	监控输出(+)	Monitor output (+)
4	白色 White	模拟讯号(+)	0-10 V Command (+) 4-20 mA Command (+)
5	灰色 Gray		RS485(D-)
6	-		-
7	紫色 purple	模拟讯号(-) 监控输出(-)	Command (-) Monitor output (-)
8	红色 Red		RS485(D+)

警告：当安置完成信号线后,切勿旋转拉扯插头,以避免内部传感器受到损害,造成产品功能异常或故障。

Warning: Do not rotate the connection socket when connected, to avoid damage to the internal sensor.

产品注意事项

安装

比例阀可安装任意方向，低压控制建议垂直安装。该阀后端需有至少40cc以上之容积，避免比例阀压力控制不稳定。

配管前的处置

配管前请进行空气吹拭(气流冲洗)或清洗，以去除管内的切削粉、切削油、杂物等。
止泄带的缠法：配管及接头锁紧时，不要让配管螺牙的切削粉、止泄带进入阀内部。使用止泄带时，留下螺牙1.5-2 牙距的位置进行缠绕。

使用环境注意事项

1. 请勿在腐蚀性气体、化学药品、海水环境或附着上述物质的场所使用
2. 水、水蒸气、灰尘等会附着本体的场所，容易从排气孔、电磁阀排气孔、内藏调压阀的排气孔进入本体内部，水分与灰尘等进入，是造成故障的原因之一。
3. 日光照射的场合，请用保护罩等遮蔽。
4. 周围有热源的场合，请遮断辐射热。
5. 会附着水滴、油及焊渣的场所，请采取适当的保护对策。

使用流体供给源注意事项

1. 适用于压缩空气、氧气、氢气、氮气、氩气…等惰性气体。
2. 压缩空气中内含化学药品、有机溶剂的合成油、盐分、腐蚀性气体等时，是造成作动不良的原因，请避免使用。
3. 当流体为氧气时，就伴随着重大、通常情况下难以考虑到的危险性。但是，可以对故障灾害和经济损失进行风险管理和控制。因此，请接收具有安全资格的专家的支持，请由具备充足知识和经验的人员进行操作。
4. 氧气是可以助燃的气体。摩擦生热、静电释放等都可能造成起火，并使金属盒密封材料发生燃烧。因此，请安装合适的过滤器，以防止金属屑和尘埃的侵入。
5. 在靠近本产品的供给侧，请安装空气过滤器。过滤精度应选 5 μm 以下。
6. 含大量冷凝水的压缩空气是造成本产品或其他气动组件动作不良的原因。请设置后冷却器、空气干燥器、冷凝水收集器等进行对策。
7. 由空压机产生的碳粉多的话，会附着在本产品内部，成为动作不良的原因。
8. 对于可能会发生意外的场合，请考虑火灾、爆炸，设计终止氧气供应的回路，实施安全措施。
9. 本产品的排气通口，请根据氧气排放场所的具体情况做适当的排气配置。
10. 本产品不能用作紧急关闭装置。应在系统中安装冗余安全系统，以防止严重伤害或生命损失。

保固

自出厂起 12 个月以内为保固期限,请务必遵守使用注意事项,因人为因素造成的产品不良,则本公司对本保修不承担任何责任。

Product Precautions

Installation

The valve can be mounted in any position. For very low pressure control, works best when mounted upright.
And Ensure a minimum closed end volume of 40c.c. to allow proper functioning.

Preparation Before Piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

Wrapping of Sealant Tape

When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealing material do not get inside the piping. When sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Operating Environment

1. Do not operate in locations having an atmosphere of corrosive gases, chemicals, sea water, or where there will be contact with the same.
2. In locations where the body is exposed to water, steam, dust, etc., there is a possibility that moisture or dust could enter the body through the EXH port, solenoid valve EXH port and/or built-in regulator EXH port, thereby causing problems.
3. In locations which receive direct sunlight, provide a protective cover etc.
4. In locations near heat sources, block off any radiated heat.
5. Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.

Air Supply

1. Compressed air, nitrogen, oxygen or argon can be used as a fluid.
2. Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, etc., as this can cause damage or malfunction.
3. If oxygen is used as the fluid, it can lead to serious and unforeseen risks. However, it is possible to manage and control the risk of hazards and economic loss. In order to use the product safely, it should only be handled by personnel with appropriate knowledge, with support from a suitably qualified specialist.
4. Oxygen gas increases the susceptibility of substances to burning; Oxygen gas can be ignited by frictional heat and static electricity. If oxygen is ignited, the metal and seal materials burn. Therefore, flush the piping thoroughly and mount a suitable filter to prevent foreign matter such as metal powder and dust from entering the product.
5. Take safety measures by installing safety devices (e.g. a circuit that stops the supply of oxygen gas) to prevent fire and explosion in the event of failure, taking flameproof safety standards into consideration.
6. Since there are some exhaust ports on the product, connect the piping in order to exhaust oxygen. Do not block the exhaust port.

Warranty

KaoLu Enterprise Co., Ltd. products are warranted to the original purchaser only against defects in material or workmanship for 6 months from the date of manufacture. The extent of KaoLu's liability under this warranty is limited to repair or replacement of the defective unit at KaoLu's option. KaoLu shall have no liability under this warranty where improper installation or filtration occurred.