

# 壓力比例閥 Proportional Pressure Regulator

QKL-B1T /QKL-B3-1/QKL-B3-A



## 產品特色 Features

- ◆ 體積小 Compact
- ◆ 精度高 High Precision
- ◆ 靈敏度高 High Sensitivity
- ◆ 廣泛的壓力範圍 Wide Pressure Range

## 產業應用 Industrial application

- ◆ 雷射切割 Laser Cutter
- ◆ 洩漏測試 Leak Tester
- ◆ 張力控制 Tension Control
- ◆ 吹瓶機產品成型 PET bottle molding machine
- ◆ 多段壓力控制 Multi-Stage Pressure Control

## 產品敘述 Product Description

此壓力比例閥為一個閉迴路設計，係由兩個電磁閥、壓力傳感器以及電子迴路控制所組成。根據類比訊號的輸入，由一端電磁閥用來控制進氣量，與另一端電磁閥來控制排氣量，再透過壓力傳感器測得壓力並回饋於電子迴路控制，以達到精確的壓力控制。該比例閥適用於隨時需要精準調控壓力變化與隨時監控壓力值的產業。

我們的比例閥輸入信號提供了 0-10VDC(電壓) 與 4-20mA(電流) 及 RS485 ModBus 通訊選擇；監控輸出則有 1-5V、0-10V 及 4-20mA 的選擇。該壓力比例閥不僅能自行校正達到壓力穩定外，還能有參數可回饋到機台上做監控，排除壓力值不準或壓差造成的震盪問題。

This series is a complete closed loop servo system consisting of two solenoid valves, an internal pressure transducer, and electronic controls. Based on analog signal, the pressure is controlled by two solenoid valves to maintain precise pressure; one valve functions as inlet control, the other as exhaust. The pressure output is measured by an internal or an external feedback pressure transducer that provides a feedback signal to the electronic controls. The regulator is suitable for industries that require precise pressure changes at any time and monitor pressure values.

Available with 3 selections of input signal: 0-10VDC, 4-20mA, or RS485 Modbus. Monitor signal can be chosen from 1-5V, 0-10V, or 4-20mA.

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

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### 產品規格 Specifications

系列 Type	B1T			B3-1		B3-A(經濟型)
輸入訊號 Input Signal	0-10V / 4-20mA / RS485					0-10V / 4-20mA
輸出壓力 Output Range	0-2bar (29 psi)	0-4bar (58 psi)	0-8bar (116psi)	0-4bar (58 psi)	0-8bar (116psi)	0-8bar (116 psi)
*建議最大入氣壓力 *Suggesting Supply Pressure Max	3bar (43 psi)	5bar (73 psi)	9bar (131 psi)	5bar (73 psi)	9bar (131 psi)	9bar (131 psi)
監控信號 Monitor Output	1-5V / 0-10V / 4-20mA / RS485					0-10V / 4-20mA
工作電源 Power Supply	DC24V (≤4W)					
響應時間 Response	0.8S					
介質 Medium	潔淨壓縮空氣或搭配 5μm 過濾器 Clean compressed air or with 5 μm filter					
重複精度 Repeatability	±0.1% F.S.			±0.25% F.S.		±0.5% F.S.
遲滯 Hysteresis	±0.2% F.S.			±0.25% F.S.		±0.5% F.S.
線性度 Linearity	±0.3% F.S.			±0.3% F.S.		±0.5% F.S.
綜合精度 Accuracy	±0.3% F.S.			±0.3% F.S.		±0.5% F.S.
流量 Flow Rate	4L/min @2bar	7L/min @4bar	13L/min @8bar	525L/min @4bar	1050L/min @8bar	1050L/min @8bar
使用溫度範圍 Temp. Range(Operating)	0-70°C ( 32-158 °F)					
牙口 Port Size	PT 1/8"			G1/4"		
底座材質 Manifold Material	鋁合金 Aluminum					
接液材質 Wetted Materials	鋁合金、不鏽鋼、丁晴橡膠 Aluminum, Stainless steel, NBR					
固定架材質 Mounting Bracket Material	鍍鋅鋼板 Galvanized Steel					
電氣連接 Electrical Connection	M12 電氣端子(2m) M12 Connector(2m)					
防護等級 Ingress Protection	IP 65					
閥體操作次數 Life Cycle	10 億次以上 Over 1 Billion Times					
重量 Weight	420 g			550 g		430 g

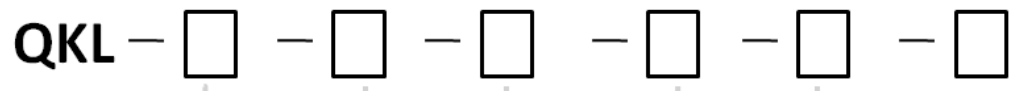
\*若入氣源會大於建議最大入氣壓力，請與業務洽詢，確認最合適的使用方式。

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## QKL-B1T /QKL-B3-1/QKL-B3-A

### 型號選擇 Ordering Code



#### 系列 Type

B1T	小流量/內部迴授	PT 1/8"
	Low flow with internal feedback	
B3-1	大流量/內部迴授	G 1/4"
	High flow with internal feedback	
*B3-A	大流量/內部迴授	G 1/4"
	High flow with internal feedback	

#### 監控訊號

##### Monitor Output

C	0 - 10 V
A	4 - 20 mA
D	1-5 V
R	RS485 Modbus

#### 壓力&流量

##### Pressure and Flow

##### For B1T

P2	0 - 2 bar 4 LPM
P4	0 - 4 bar 7 LPM
P8	0 - 8 bar 13 LPM

#### 顯示單位

##### Display Unit

S	psi
U	bar

#### 輸入訊號

##### Input Signal

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

##### For B3-1

P4	0 - 4 bar 525 LPM
P8	0 - 8 bar 1050 LPM

#### 固定架

##### Mounting Bracket

M	M type
L	L type

##### For B3A

P8	0 - 8 bar 1050 LPM
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\*B3-A 為經濟型，僅 8bar。該系列沒有 RS485 modbus 通訊功能，也沒有 1-5V 監控信號輸出選項。  
B3-A is an economic type, only with 8 bar. B3-A does not have RS485 modbus interface and does not have 1-5V monitor output.

\*\*若控制訊號選擇 0-10V，請留意最小的驅動電流為 3mA。  
For Command Signal type 0-10V, the minimum driving current is 3mA.

※ 如需訂製特殊壓力範圍請洽詢本公司。Please consult us for customized pressure range.

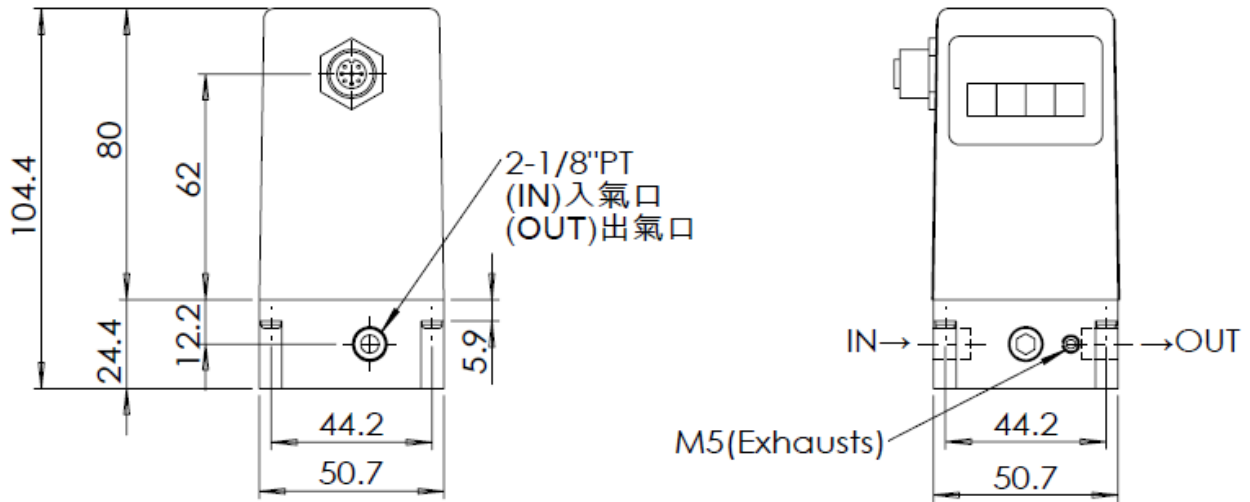
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## QKL-B1T /QKL-B3-1/QKL-B3-A

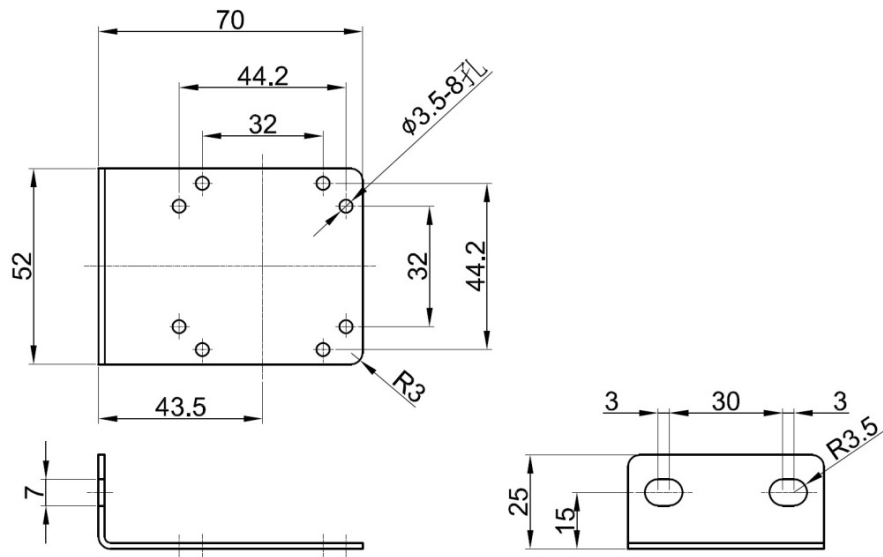


### 外觀尺寸 Overall Dimension

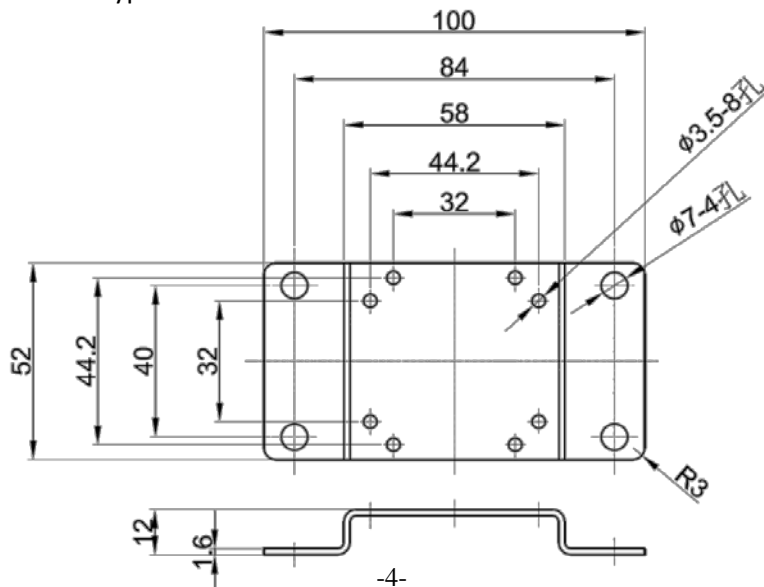
#### ◆QKL-B1T



#### ◆固定架 L 型 Bracket L Type



#### ◆固定架 M 型 Bracket M Type



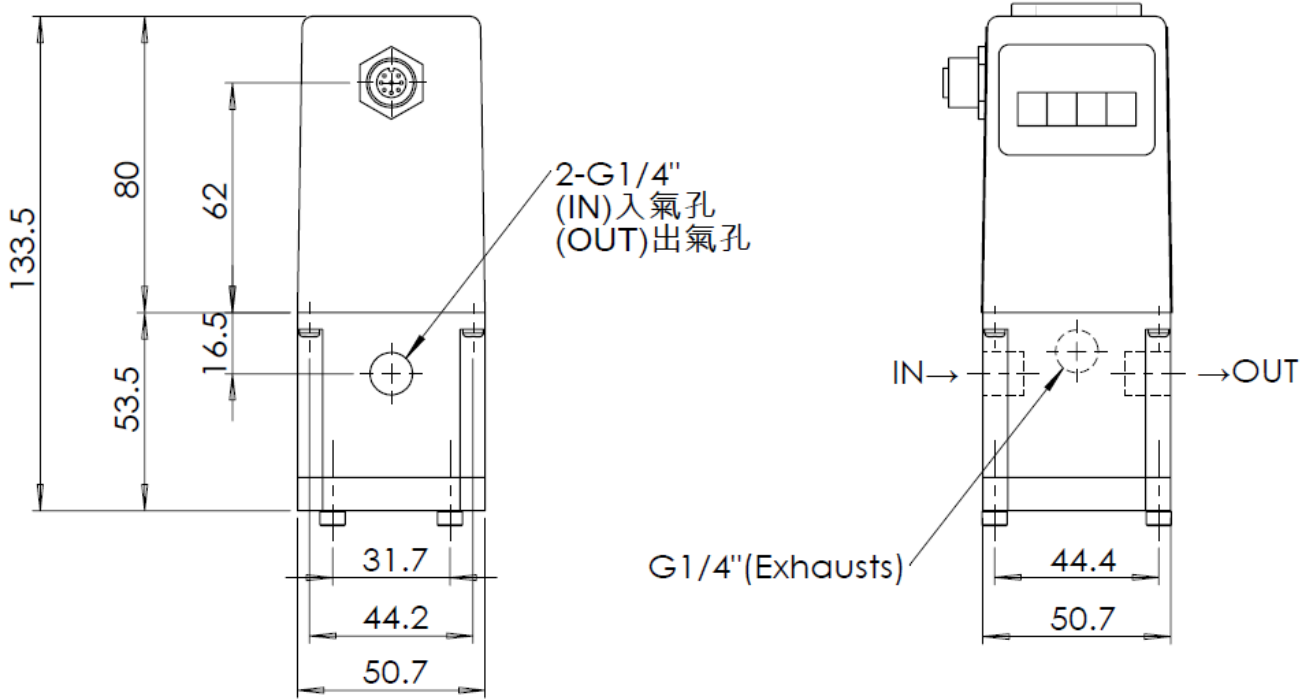
# 壓力比例閥 Proportional Pressure Regulator



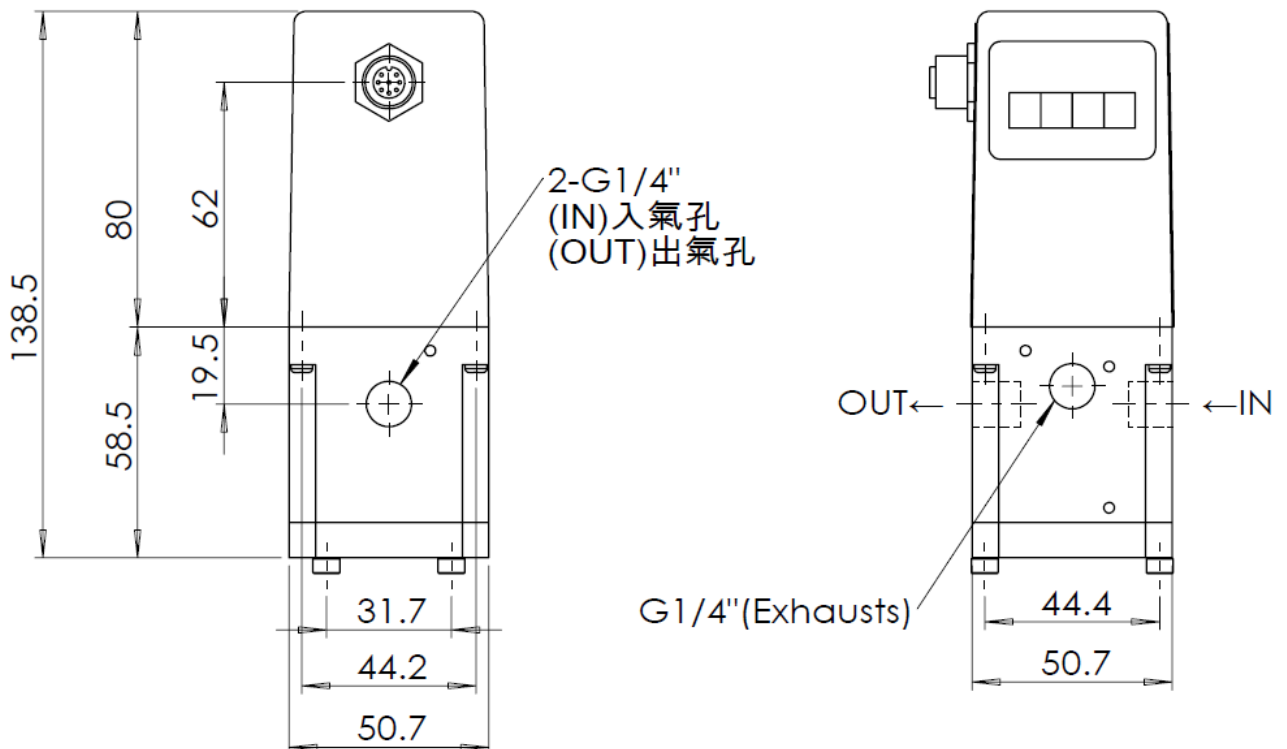
## QKL-B1T /QKL-B3-1/QKL-B3-A

### 外觀尺寸 Overall Dimension

#### ◆QKL-B3-1



#### ◆QKL-B3-A

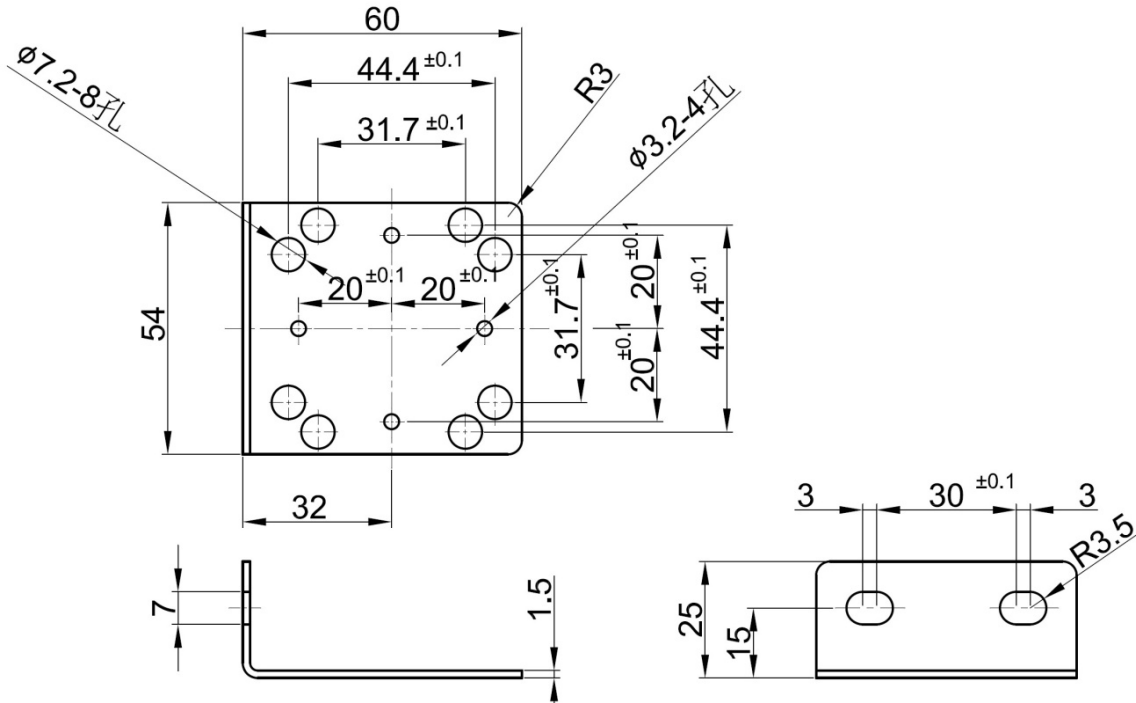


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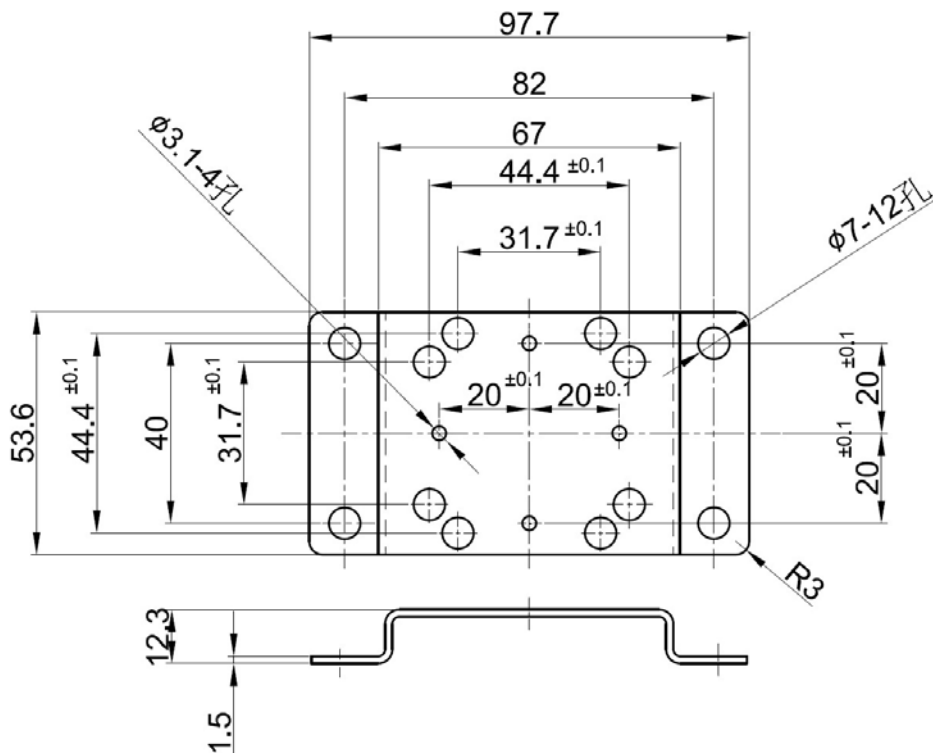


## QKL-B1T /QKL-B3-1/QKL-B3-A

### ◆固定架 L 型 Bracket L Type



### ◆固定架 M 型 Bracket M Type

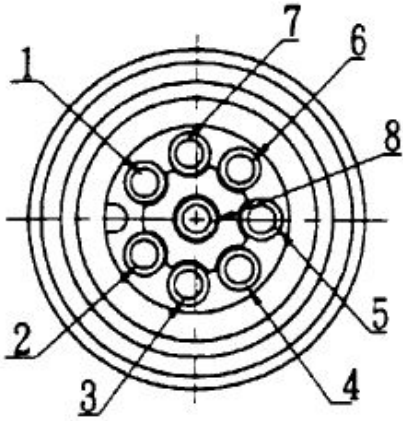


# 壓力比例閥 Proportional Pressure Regulator



## QKL-B1T /QKL-B3-1/QKL-B3-A

### 接線方式 Wiring Description



※此接線圖為線材公座俯視圖

The wiring diagram shows from top view

編號 No.	顏色 Color	功能 Function
1	藍色 Blue	電源(-) 24V DC Power (-)
		類比訊號(-) Command (-)
		監控輸出(-) Output monitor (-)
2	棕色 Brown	電源(+) 24V DC Power (+)
3	黑色 Black	監控輸出(+) Monitor output (+)
4	白色 White	0-5 V Command (+)
		類比訊號(+) 0-10 V Command (+)
		4-20 mA Command (+)
5	灰色 Gray	RS485(D-)
6	-	-
7	-	-
8	紅色 Red	RS485(D+)



警告: 當安置完成信號線後,切勿旋轉拉扯插頭,以避免內部傳感器受到損害,造成產品功能異常或故障。

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

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## 產品注意事項



### 安裝

比例閥可安裝任意方向，低壓控制建議垂直安裝。該閥後端需有至少40cc以上之容積，避免比例閥壓力控制不穩定。



### 配管前的處置

配管前請進行空氣吹拭(氣流沖洗)或清洗，以去除管內的切削粉、切削油、雜物等。  
止洩帶的纏法:配管及接頭鎖緊時，不要讓配管螺牙的切削粉、止洩帶進入閥內部。  
使用止洩帶時，留下螺牙 1.5-2 牙距的位置進行纏繞。



### 使用環境注意事項

1. 請勿在腐蝕性氣體、化學藥品、海水環境或附著上述物質的場所使用。
2. 水、水蒸氣、灰塵等會附著本體的場所，容易從排氣孔、電磁閥排氣孔、內藏調壓閥的排氣孔進入本體內部，水分與灰塵等進入，是造成故障的原因之一。
3. 日光照射的場合，請用保護罩等遮蔽。
4. 周圍有熱源的場合，請遮斷輻射熱。
5. 會附著水滴、油及焊渣的場所，請採取適當的保護對策。



### 使用流體供給源注意事項

1. 適用於壓縮空氣、氧氣、氫氣、氮氣、氬氣...等惰性氣體。
2. 壓縮空氣中內含化學藥品、有機溶劑的合成油、鹽分、腐蝕性氣體等時，是造成作動不良的原因，請避免使用。
3. 當流體為氧氣時，就伴隨著重大、通常情況下難以考慮到的危險性。但是，可以對故障災害和經濟損失進行風險管理和控制。因此，請接收具有安全資格的專家的支持，請由具備充足知識和經驗的人員進行操作。
4. 氧氣是可以助燃的氣體。摩擦生熱、靜電釋放等都可能造成起火，並使金屬盒密封材料發生燃燒。因此，請安裝合適的過濾器，以防止金屬屑和塵埃的侵入。
5. 在靠近本產品的氣源供給來源，請安裝空氣過濾器。過濾精度應選 5 μm 以下。
6. 含大量冷凝水的壓縮空氣是造成本產品或其他氣動元件動作不良的原因。請設置後冷卻器、空氣乾燥器、冷凝水收集器等進行對策。
7. 若空壓機產生的碳粉多的話，會附著在本產品內部，成為動作不良的原因。
8. 對於可能會發生意外的場合，請考慮火災、爆炸，設計終止氧氣供應的迴路，實施安全措施。
9. 本產品的排氣通口，請根據氧氣排放場所的具體情況做適當的排氣配置。
10. 本產品不能用作緊急關閉裝置。應在系統中安裝冗余安全系統，以防止嚴重傷害或生命損失。



### 保固

自出廠起一年以內為保固期限，請務必遵守使用注意事項。因人為因素造成的產品不良，則本公司對本保修不承擔任何責任。



# 壓力比例閥 Proportional Pressure Regulator

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## 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 Ent. Co. Ltd. products are warranted to the original purchaser only against defects in material or workmanship for 1year 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.