

# 真空壓力比例閥 Proportional Vacuum Regulator

## QKL-HS1V、HS2V



QKL-HS1V、QKL-HS2V 是一款三通電子壓力比例閥。它係由電磁閥、壓力傳感器、精細研磨的閥芯和及電子迴路控制所組成。該系列具有流量大、壓力切換時間極快、精度高的特點。使用我們自行開發的內部軟體，可以自定義控制參數，允許用戶建立獨特的壓力曲線，且它可用於模擬和數字命令信號。

QKL-HS1V. QKL-HS2V are 3-way electronic vacuum regulators. It consists of proportional solenoid, pressure transducer, intelligent electronics, and a refined spool. It features high flow rate, extremely fast pressure switching time, high accuracy. Using the powerful in-house software, the control parameter can be customized that allows user to build unique pressure profile. It is available with analogue and digital command signal.

### 型號選擇 Ordering Code

QKL - □ - □ - □ - □ - □

#### 系列 Type

HS1V	內部迴授	1/4"PT
	Internal Feedback	
HS2V	內部迴授	1/2"PT
	Internal Feedback	

#### 輸入訊號 Input Signal

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

#### 本體材質 Body Material

A	Aluminum
B	Brass

#### 監控訊號 Monitor Output

C	0 - 10 V
A	4 - 20 mA

#### 壓力範圍 Pressure Range

-	-101~0 kPa(-1~0 Bar)
P1	-101~101kPa(-1~1 Bar)

\*控制訊號選擇 0-10V，請留意最小的驅動電流為 50mA。

For Command Signal type 0-10V, the minimum driving current is 50mA.

\*\*若電源線長度會超過 2 米長，控制訊號建議選擇 4-20mA 電流控制或 RS485-Modbus 數位控制方式。

For cable length >2meter, please select current loop or RS485-modbus input signal.

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### 產品規格 Specifications

系列 Type	QKL-HS1V	QKL-HS2V	
閥門類型 Valve Type	3 口 2 位直動式驅動 3/2 Directly actuated seating valve		
材料 Materials	本體黃銅或鋁合金、軸心不鏽鋼 Body brass or Aluminum, Mandrel stainless steel		
密封圈 Seals	全氟橡膠 FFKM		
接液材質 Wetted Materials	鋁合金、黃銅、不鏽鋼、氟橡膠 Aluminum, Brass, Stainless steel, VITON		
固定架材質 Mounting Bracket Material	鍍鋅鋼板 Galvanized Steel		
口徑 Port	PT 1/4"	PT 1/2"	
輸出壓力 Output Pressure	-101~0 kPa(-1~0 bar) / -101~101 kPa(-1~1 bar)		
工作電源 Power Supply	DC24V ±10% (≤40W)		
輸入訊號 Input Signal	0-10V / 4-20mA/ RS485		
監控信號 Monitor Output	0-10V / 4-20mA		
流量 Flow Rate (ANR)	500 NI/min @1 bar	900 NI/min @1 bar	
介質 Medium	真空 Vacuum		
建議過濾器 Recommended Filter	50 μm		
安裝方向 Mounting Position	電磁鐵不得朝下 Magnet must not face downwards		
防護等級 IP Degree of protection	IP 54		
重量 Weight	1.2 kg(本體鋁合金 Body Aluminum)	2 kg(本體鋁合金 Body Aluminum)	
環境溫度 Ambient Temperature	0 – 60 °C	遲滯 Hysteresis	< 0.1 % FS
介質溫度 Temperature of medium	0 – 60 °C	最小移動量 Response Sensitivity	< 0.1 % FS
操作溫度 Operating Temperature	0 – 60 °C	線性 Linearity	< 0.1 % FS
溫度飄移 Temperature Drift	< 1 % / 10K	重覆性 Repeatability	< 0.1 % FS
長期飄移 Long-term Drift	< 1 % FS/年 Year		

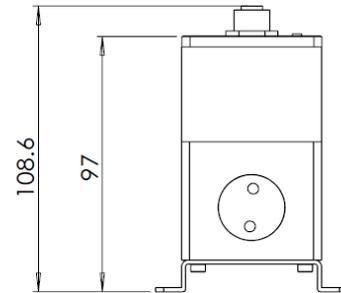
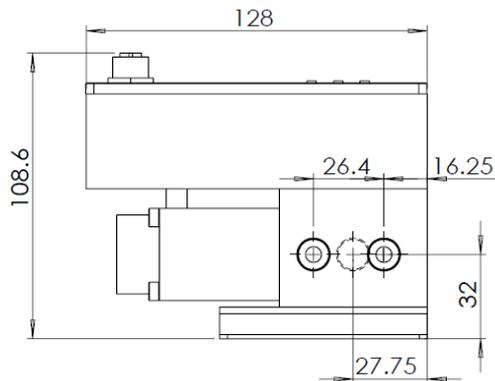
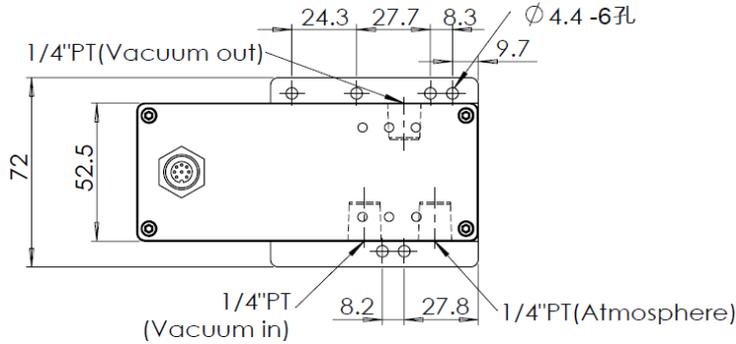
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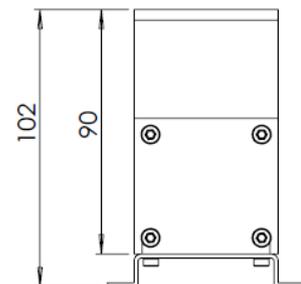
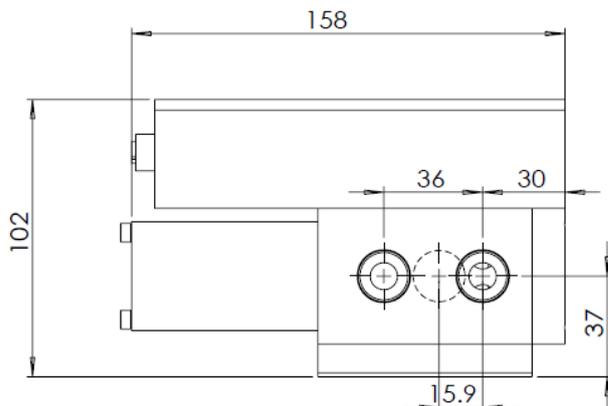
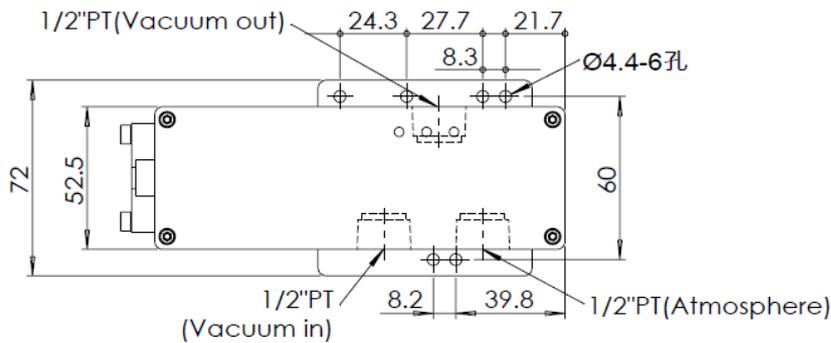
## QKL-HS1V、HS2V

### 外觀尺寸 Overall Dimension

#### QKL-HS1V



#### QKL-HS2V



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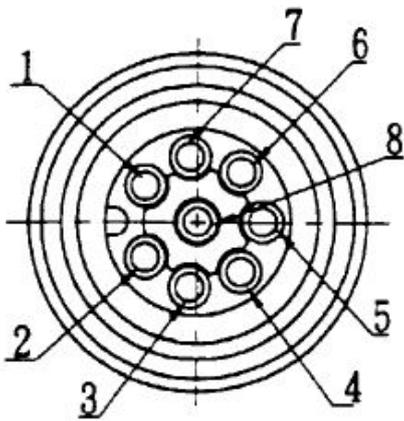


## QKL-HS1V、HS2V

### 指示燈狀態 Indicator LED Status

	<p><b>電源供應燈 Power Supplying Light:</b> 亮燈表示 DC24 電源正常供給。 LED on is power DC 24V normally supplied.</p>
	<p><b>壓力到點指示燈 Pressure Light:</b> 亮燈表示輸出壓力到達設定值。 LED on means setting pressure reach the set value.</p>
	<p><b>Error 錯誤指示燈 Error Light :</b></p> <ol style="list-style-type: none"> <li>燈號慢閃爍-供給電壓超過 DC30V 或低於 DC20V LED flashing slowly - The supply voltage exceed DC30V or lower than DC20V.</li> <li>燈號快閃爍-閥體溫度超過 70°C LED flashing fast - The temperature of valve body is over 70°C.</li> <li>燈號持續亮燈-未供給入氣壓或入氣壓力供給不足。 LED stays on - Air pressure inlet is not supplied or insufficient.</li> </ol>

### 接線方式 Wiring Description



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

※此接線圖為線材公座俯視圖  
The wiring diagram shows from top view.

若控制選擇數位訊號(RS-485),可另外訂製錯誤訊息輸出(24V)功能。  
HS1V and HS2V can be customized with error output signal(24V)



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.

### 產品注意事項

#### 安裝和操作產品前請仔細閱讀操作手冊

忽視操作手冊中的安全說明會導致產品故障或給操作員帶來嚴重風險。

#### 產品的連接、安裝、操作、維護和拆卸只能由專業人員進行

#### 加壓系統

1. 壓力管路和螺紋連接必須針對閥門的輸入壓力和輸出壓力進行充分設計。
2. 在對系統加壓之前，確保壓力管線正確連接到輸入和輸出。
3. 關閉壓力供應，釋放殘餘壓力，並在更換或維護閥門前拆下所有壓力連接。

#### 爆炸危險

1. 請不要在有易燃氣體、閥桿或灰塵的房間內操作閥門。
2. 請勿將調節閥用於易燃易爆氣體的壓力控制。

#### 閥門電子元件損壞風險，為避免損壞閥門，請遵守以下注意事項：

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，本公司對本保修不承擔任何責任。

#### 如進氣壓力大於額定壓力 10bar，這有可能造內部傳感器的永久破壞。請遵照標籤上額定壓力來操作比例閥

僅在技術規範中規定的允許壓力範圍內操作閥門。

#### 電子放電可能會損壞敏感的微電子元件

1. 如果沒有足夠的靜電放電 (ESD) 保護，請勿觸摸閥門的電氣連接。
2. 在打開電子設備外殼之前，請遵循 ESD 保護說明。

#### EMC 互補操作必須滿足以下條件：

1. 將螢幕連接、插頭和設備櫃連續接地。
2. 將閥體和外殼連接到保護接地導體 (設備接地導體)。

## QKL-HS1V、HS2V

### 有損壞閥門的風險

為避免損壞閥門，請遵守以下注意事項：

1. 在內置位置，閥門磁鐵不得朝下。
2. 正確擰緊壓力管路與閥門之間的連接，否則產生的碎屑可能會損壞閥門。
3. 注意強磁場，以免發生故障。
4. 確保壓力供應系統至少配備50  $\mu\text{m}$  過濾器。
5. 含有冷凝物的流體可能會導致閥門故障。確保壓力供應系統配備空氣乾燥器、後冷卻器和油和水提取器。

### 由於輸入壓力小於或等於給定設定值或閥門在沒有輸入壓力的情況下操作，磁鐵過度加熱可能導致傳感器系統精度下降和電子元件壽命縮短

1. 確保閥門的進氣壓力始終比設定值高至少1bar。
2. 先開啟輸入壓力，再開啟設定值。設定值變更時請勿打開和關閉輸入壓力。
3. 在關閉輸入壓力之前，請務必先歸零設定值。

### 注意

如果任何標籤或序列號被更改、變得難以辨認或被移除，則保修無效。

### 注意

請勿在控制信號線的旁邊放置高壓電線、伺服馬達電纜或變頻器。

### 注意

技術數據如有更改，恕不另行通知。設計可能與實際產品不同。



## Product Precautions



### **Read the operating manual carefully before installing and operating the product**

Ignoring the safety instructions in the operating manual may result in malfunction of the product or a serious risk for the operator.



### **Connection, installation, operation, maintenance and dismantling of the product may only be carried out by qualified personnel**



### **Pressurized systems**

1. Pressure lines and screw connections must be adequately designed for the input pressure and output pressure of the valve.
2. Ensure that the pressure lines are connected properly to the input and output, before pressurizing the system.
3. Turn off the pressure supply, release the residual pressure, and remove all pressure connections before replacing or maintenance of the valve.



### **Danger of explosion**

1. Do not operate the valve in rooms with flammable gases, steams or dust.
2. Do not use the control valve for the pressure control of flammable or explosive gases.



### **Risk of damage to the valve electronics**

To avoid damages to the valve, please comply with the following notes:

1. Overvoltage may damage the electronics. Before turning on the valve, check the electrical connections and the supplied voltages carefully. Pay attention to the specified supply voltage range.
2. Lay the wires of the communication system and I/O device separately from power lines and servo motor cables.
3. Make sure the cables are adequately insulated. Use only cables that are suitable for the power consumption and ambient conditions of the valve.
4. Avoid repeatedly bending or stretching the cables or damaging the valve's housing.



### **Operating pressures greater than 10 bar of the stated pressure range may cause permanent damage to the sensor of the valve**

Operate the valve only in the permissible pressure range, as specified in the technical specifications.



### **Electronic discharge may damage sensitive microelectronic components**

1. Do not touch the electrical connections of the valve without sufficient electrostatic discharge (ESD) protection.
2. Follow the ESD protection instructions before opening the housing of the electronics.



### **The following conditions must be met for EMC compliant operation**

1. Connect the shield connection, the plug and the equipment cabinet to ground accordingly.
2. Connect the valve body and the housing to the protective earth conductor (equipment grounding conductor).

## QKL-HS1V、HS2V



### Risk of damage to the valve

To avoid damages to the valve please comply with the following notes:

1. In built-in position the valve magnet must not face downwards.
2. Tighten the connection between pressure lines and the valve correctly, otherwise resulting chips may damage the valve.
3. Pay attention to strong magnetic fields in order to avoid malfunctions.
4. Make sure that the pressure supply system is at least equipped with 50 µm filters.
5. Fluids containing condensate may cause malfunctions of the valve. Make sure that the pressure supply system is equipped with an air dryer, after cooler and an oil and water extractor.



### Excessive heating of the magnet, due to the input pressure being less than or equal to the given set value or if the valve is operated without input pressure, may cause a decreasing accuracy of the sensor system and a shortened lifetime of the electronic components

1. Make sure that the valve is always pressurized with at least 1 bar more input pressure than the set value.
2. Switch on the input pressure first then enable the set value. Do not turn the input pressure on and off while the set value is activated.
3. Always switch off the set value before switching off the input pressure.



### NOTICE

Warranty void if any label or serial number is changed, made illegible or removed.



### NOTICE

Do not run control cables next to high-voltage lines, servo-motor cables, inverters...etc.



### NOTICE

Technical data are subject to changes without further notice. Design may vary from the actual product.