



KING GATE

QUALITY · SATISFACTION · TECHNOLOGY

CRYOGENIC VALVES

Bronze and Stainless Steel 超低溫冷凍閥



CRYOGENIC VALVES

CHARACTERISTIC EXPLANATION · 超低溫冷凍閥-產品特點說明

超低溫的定義：

"超低溫"指的是與正常氣溫有極大落差的操作環境溫度。各家對於"超低溫"的定義略有不同，通常情況下只要是溫度低於 -50°F / 45°C 都可稱為"超低溫"。閘閥和球型閥的閥蓋皆設計有足夠長度的加長型閥頸，加上閥體與填料函之間的氣化空間設計，不但可以讓填料函周圍的溫度接近常溫，也可以避免上半部零件結冰更可維持填料函在柔軟、有彈性狀態時具有的最佳密封效果。

A DEFINITION OF CRYOGENIC SERVICE:

"Cryogenic Service" refers to service condition where temperatures are significantly below normal atmospheric temperatures. Definitions vary, but often any temperature below -50°F / 45°C is considered cryogenic. The bonnet of gate and globe valves is of the extended type with sufficient length and a vapor space between body and stuffing box in order to maintain the gland packing sufficiently near ambient temperature to prevent icing of the top works and keep the packing soft and pliable for optimum sealing characteristics.

產品應用：

在生產、運輸和儲存液化瓦斯如氧氣，氮氣，氬氣，天然氣，氫氣，氦氣(溫度低於 -425°F (-254°C))等，由於目前一些技術上的問題，僅某些部份能被普遍化的使用。金口專為超低溫環境所研發的加長型閥蓋超低溫冷凍閥，提供最安全可靠的操作性能包含使用於液態天然瓦斯(LNG)設備和接收站以及液態瓦斯的輸送系統，也包含供給液態氫氣和氧氣給航太地面裝備設施。

APPLICATIONS:

The production, transport and storage of liquefied gases such as oxygen, nitrogen, argon, natural gas, hydrogen or helium (down to -425°F (-254°C)), to mention only some of the more commonly used, presents several technical problems. KING GATE specially-adapted extended bonnet valves offer safe and efficient service including LNG liquifaction plants and receiving terminals as well as cargo systems of LNG and aerospace ground support facilities for liquid, hydrogen and oxygen.

操作原理：

除了止回閥之外，所有閥門的加長閥蓋，設計有足夠長度的氣柱；讓心桿密封填料函只與汽化的水汽接觸，不和管路內的低溫液態瓦斯接觸，用來保證閥門在超低溫環境時之作動功能的正常。

PRINCIPLE OF OPERATION:

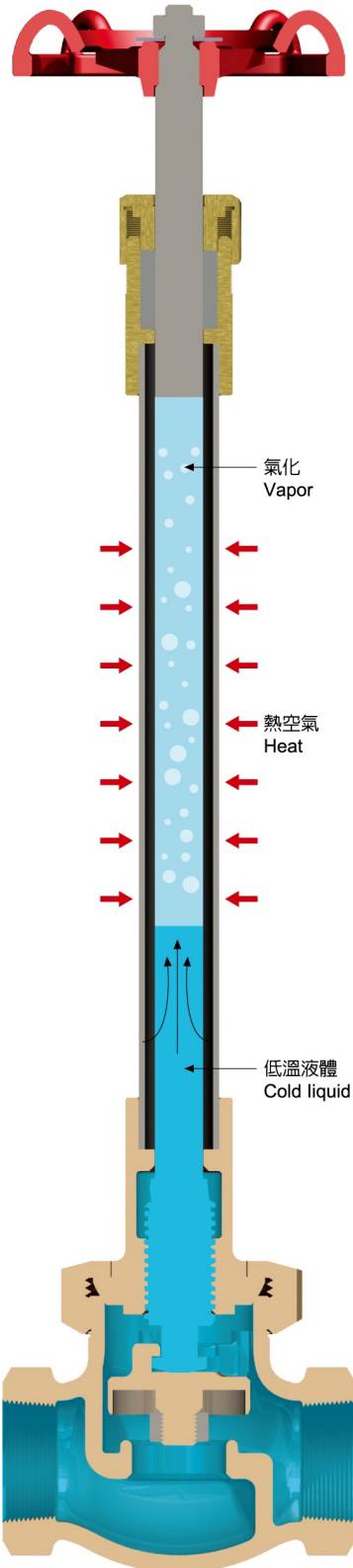
All valves except check valves are supplied with extended bonnet with a sufficient gas column length, usually specified by the user, to keep the stem seal packings exposed only to vapor and not the cold liquid to ensure functional integrity.

液化瓦斯的溫度：

類 型	沸 點		液體密度	類 型	沸 點		液體密度
	0°C	0°F			0°C	0°F	
天 然 氣	-168	-270	26	空 氣	-194.4	-318	57.87
甲 烷	-161.5	-258	26.20	氮 氣	-195.8	-320	50.45
氧 氣	-182.9	-296	71.20	氫 氣	-252.7	-423	4.43
氬 氣	-185.9	-303	87.40	氦 氣	-268.9	-452	7.82
二 氧 化 碳	-78.5	-109	50.60	絕 對 零 度	-273.16	-460	—

TEMPERATURES OF LIQUIFIED GASES:

TYPE	BOILING POINT		LIQUID DENSITY	TYPE	BOILING POINT		LIQUID DENSITY
	0°C	0°F			0°C	0°F	
Natural gas (LNG)	-168	-270	26	Air	-194.4	-318	57.87
Methane (CH ₄)	-161.5	-258	26.20	Nitrogen (N ₂)	-195.8	-320	50.45
Oxygen (O ₂)	-182.9	-296	71.20	Hydrogen (H ₂)	-252.7	-423	4.43
Argon (A)	-185.9	-303	87.40	Helium (He)	-268.9	-452	7.82
Carbon Dioxide (CO ₂)	-78.5	-109	50.60	Absolute Zero	-273.16	-460	—





CRYOGENIC VALVES

KING GATE'S DESIGN & CHARACTERISTIC · 超低溫冷凍閥-金口的設計與特徵

設計上，金口產品設計符合下列標準：

· MSS SP80 · ASME B16.34 · API 598 · BS 6364，可依照客戶特殊要求生產製作。

DESIGN / KING GATE VALVES ARE DESIGNED TO COMPLY WITH THE REQUIREMENTS OF

· MSS SP80 · ASME B16.34 · API 598 · BS 6364 and special customer requirements as applicable.

品質上，金口取得ISO 9001: 2000品質管理系統認證：

金口產品應用範圍廣泛；可選擇材料多樣。並且我們擁有完善的生產技術及研發團隊，隨時可以提供足夠的專業諮詢及售後服務和解決客戶閥門應用上的任何疑難雜症。

QUALITY, KING GATE IS ISO 9001: 2000 APPROVED :

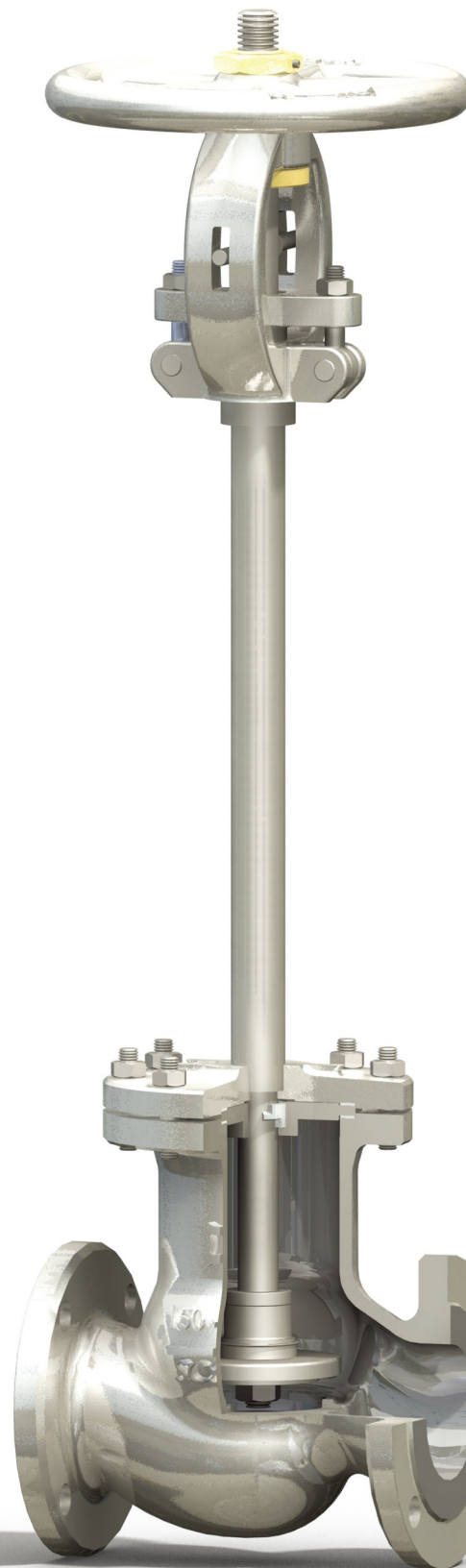
KING GATE Valves manufactures for a wide range of applications and in a comprehensive range of materials. In addition to our manufacturing capability, KING GATE Valves also has full design capability. Our highly skilled engineering team is always available to provide users and engineering contractors with the solution to difficult or unusual valve applications.

特徵：

- 閥體和閥蓋~選用鑄造的青銅或奧氏田鐵系不銹鋼，具有良好的耐衝擊，熱損耗小，抗腐蝕等特性。
- 閥桿~閥桿為一體式，具有良好的同心度和強度。閥桿填料函行進接觸的部分經過了特殊鏡面加工，以確保其密封性。
- 填料~採用複合材料；選用V型的四氟乙烯材質填料 以氣柱空間阻絕氣體，保護填料函免於凍結。防火設計會追加第二道石墨材質填料函。
- 墊片~體蓋密封墊片選用適用於氧氣和超低溫條件的材料 (V#7020/GYLON3500/渦捲型石墨墊圈)
- 密封面~
 - A. 軟密封~閥門夾持軟性密封件；採用聚氯三氟乙烯PCTFE材質，取其低溫狀況下變形率低；及良好的機械性能，擁有絕佳的密封效果，絕無洩漏疑慮，並且容易拆卸更換。
 - B. 金屬密封~金屬製的閥門及閥座密封面；各自堆焊一層奧氏田鐵合金層，取其硬度高耐磨/耐腐蝕優點，經過特殊鏡面加工程序，可以有效防止兩者變形和磨損，具有良好密封效果。
- 閥蓋加長~除了標準長度外，可以依照客戶要求製作指定的長度。
- 洩壓孔~在閥體的閥門上開一小孔，避免低溫流體在閥腔內因汽化或蒸發現象產生的異常壓力升高。
- 焊接~焊接工作依照訂訂的標準工作程序及檢驗程序製造，必須經由具有證照及資深經驗技師施工。
- 接續口~青銅閥-螺紋口 / 套焊口 / 套焊口銀焊不銹鋼短管
不銹鋼閥-法蘭口 / 對焊口 / 套焊口 (軟性密封座建議選購加焊不銹鋼短管型式)
- 潔淨~使用於氧氣或超低溫管路的冷凍閥必須在無塵室內進行去油污/洗淨/測試/包裝等作業程序；以確保閥腔內無汙染

FEATURES:

- Body and bonnet~Bronze casting or Austenitic stainless steel investment castings used for bodies and bonnets offer excellent impact strength, minimal heat loss and protection against corrosion.
- Stem~A one-piece stem design is used to assure positive alignment and strength. The portion of stem through the packing chamber is "Mirror-finished" to assure packing sealing.
- Packing~Chevron PTFE or other plastic packing protected from freezing by a column of insulating gas. For fire safe operation a secondary packing is provided using graphite.
- Gaskets~Bonnet or cap gasket where required are selected for oxygen compatibility and cryogenic service required.(V# 7020, GYLON3500 or Spiral wound/ SS Graphite)
- Seating faces~Globe valves have self-centering disc design and retained with a lock nut, Globe valves are available with PCTFE (Kel-F) seat provides a virtually bubble tight seal and is replaceable. Alternative Stellite 6 metal to metal seat is used to prevent seizing and galling.
- Extension~Valves with other than standard extension length are available on special order.
- Vent holes~Provided in gate valve wedges e, to prevent excessive pressure build-up due to boil off or vaporization of Cryogenic liquid.
- Welding~Welds are performed by qualified welders.
- Valve ends~Bronze valves with Thread, Silver Brazed Socket or with stainless steel pipe nipples brazed in Stainless Steel valves with Flange, Butt weld, socket weld (Pipe nipple extensions are recommended for soft seat welded end valves.)
- Cleaning~All valves specified for oxygen or cryogenic service are specially processed and thoroughly degreased, cleaned and sealed in our own clean room to prevent contamination.



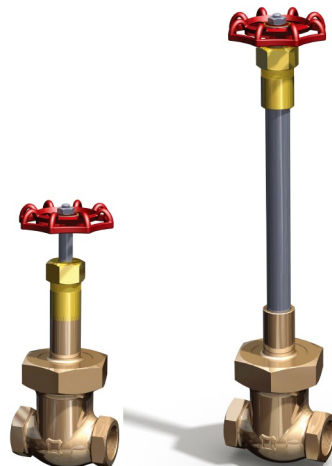


CRYOGENIC VALVES

INTRODUCTION OF PRODUCTS · 超低溫冷凍閥諸元簡介



- Class 200/Class 300
- CRYOGENIC BRONZE GLOBE VALVE
- Threaded/Sil Braze Tube or with stainless steel pipe nipples brazed
- Bronze ASTM B61
- 1/4"~3"



- Class 200/Class 300
- CRYOGENIC BRONZE GATE VALVE
- Threaded/Sil Braze Tube or with stainless steel pipe nipples brazed
- Bronze ASTM B61
- 1/2"~3"



- Class 800
- CRYOGENIC FORGE STAINLESS STEEL GLOBE/GATE VALVE
- Flanged/Butt Weld/Socket Weld or with stainless steel pipe nipples welded
- F304/F316/F316L
- 1/2"~2"



- Class 150/Class 300
- CRYOGENIC STAINLESS STEEL GLOBE VALVE
- Flanged/Butt Weld/Socket Weld or with stainless steel pipe nipples welded
- CF8/CF8M/CF3M
- 1/2"~16"



- Class 150/Class 300/JIS 10K/JIS 20K
- CRYOGENIC STAINLESS STEEL GATE VALVE
- CF8/CF8M/CF3M
- 1/2"~24"
- Flanged/Butt Weld



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