开维喜阀门集团
Kaiweixi valve group
https://www.kaiweixi.com
E-mail：sales@kaiweixi.com

Q61F 加长焊接三片式球阀

Q61F Extended Butt-Weld Three-Piece Ball Valve

使用说明书

开维喜阀门集团有限公司

Kaiweixi Valve Group Co., Ltd.

地址：中国 浙江省温州市瓯北街道三桥工业区林下路 1 号　电话：0577-67038872　传真：0577-67198981　邮编：325100

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Q61F 加长焊接三片式球阀

型号：Q61F　　规格： DN15-DN100
公称压力：PN16　　适用介质：水、食品、饮料及卫生级系统
适用温度：≤120℃　　阀体材质：不锈钢
连接方式：焊接　　驱动方式：气动、电动、手动
其他参数：制造标准按 GB/T12237

Q61F Extended Butt-Weld Three-Piece Ball Valve

Model:Q61F　　Specifications: DN15-DN100
Nominal Pressure:PN16　　Applicable Media: Water, food, beverage, and hygienic systems
Applicable Temperature: ≤120℃　　Body Material: stainless steel
End Connection :welded　　Operation:Manual, pneumatic, electric
Other Parameters: Manufacturing standard according to GB/T12237.

Q61F 加长焊接三片式球阀概述

Q61F 加长焊接三片式球阀是一种采用加长阀颈设计、对焊连接与三段式结构的特种球阀。阀体采用锻钢锻造，通过三段式螺栓连接，其阀盖部分显著加长，两端为对焊接口。阀门通过加长阀杆驱动球体实现 90 度启闭，密封副采用 PTFE 或金属材料。该设计专为需要隔离阀腔热量、防止填料冻结或便于在保温/保冷层外操作的苛刻工况设计，广泛应用于液化气体、高温介质、深冷及需要外加隔热层的石油化工与能源管道系统。

Q61F Extended Butt-Weld Three-Piece Ball Valve Overview

The Q61F Extended Butt-Weld Three-Piece Ball Valve is a specialized ball valve featuring an extended neck design, butt-weld ends, and a three-piece bolted construction. The valve body is forged from steel and consists of three sections connected by bolts, with a notably extended bonnet section and butt-weld ends at both sides. The valve is operated via an extended stem, which drives the ball through a 90-degree rotation for opening and closing, utilizing sealing pairs made of PTFE or metal materials.This design is specifically engineered for demanding applications that require isolation of the valve cavity from heat, prevention of packing freeze-up, or ease of operation outside insulation or cryogenic layers. It is widely used in pipeline systems handling liquefied gases, high-temperature media, cryogenic fluids, and in petrochemical and energy industries where external insulation or heat tracing is necessary.

Q61F 加长焊接三片式球阀产品图
Q61F Extended Butt-Weld Three-Piece Ball Valve Product Image

Q61F 加长焊接三片式球阀特点

1.加长阀颈特殊设计：显著延长的阀盖结构能有效隔离管道主介质温度，保护阀杆填料与操作机构，适用于深冷、高温或需外加伴热/保冷层的工况。

2.对焊连接零泄漏：两端采用对焊接口，与管道永久焊接，从根本上杜绝了法兰连接处的潜在泄漏点，安全性高。

3.三片式结构维护便捷：阀体三段式螺栓连接，无需切割管道即可拆卸中段进行内部检修或更换密封件，极大简化了维护流程。

4.适应极端温度工况：加长设计使关键操作部件远离主流体，结合适用的密封材料，可靠适用于-196° C 至+200° C 以上的宽温域。

5.紧凑高压性能可靠：锻钢阀体确保高压强度，整体结构紧凑。加长设计不削弱承压能力，是极端温度压力并存工况下的理想选择。

Q61F Extended Butt-Weld Three-Piece Ball Valve Features

1. Extended Neck Design: The significantly elongated bonnet structure effectively isolates the valve stem packing and actuation mechanism from the temperature of the main pipeline fluid. This makes it ideal for cryogenic, high-temperature, or applications requiring external heat tracing or insulation.

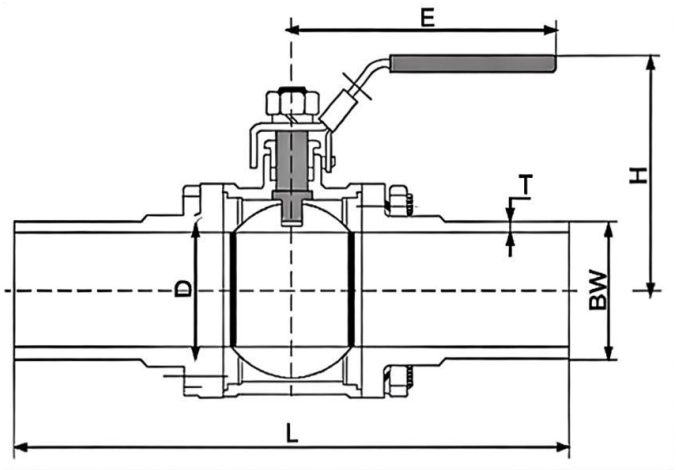
2. Butt-Weld Connection for Zero Leakage: Featuring butt-weld ends for permanent, integral welding to

the pipeline. This design fundamentally eliminates potential leak points associated with flanged connections, ensuring high safety.

3. Three-Piece Construction for Easy Maintenance: The three-piece bolted body design allows for internal inspection, maintenance, or seal replacement by simply removing the center section, without cutting the pipeline. This greatly simplifies the maintenance process and reduces downtime.

4. Suitability for Extreme Temperatures: The extended neck design distances critical operating components from the main fluid stream. Combined with appropriate sealing materials, it can reliably operate across a wide temperature range, from -196°C to over +200°C.

5. Compact, High-Pressure & Reliable Performance: The forged steel body ensures high-pressure strength and structural integrity within a compact footprint. The extended design does not compromise pressure-bearing capacity, making this valve an ideal choice for demanding applications involving simultaneous extreme temperatures and high pressure.



Q61F 加长焊接三片式球阀结构图

Q61F Extended Butt-Weld Three-Piece Ball Valve Structure Diagram

零部件名称材料表

Parts Name Material List

序号NO.	名称 Name	材料 Material
1	阀体 body	碳钢、不锈钢 carbon steel, stainless steel
2	球体 ball	不锈钢 stainless steel
3	密封垫 seal gasket	PTFE
4	填料 packing	PTFE
5	阀杆 stem	1CR13

性能规范表 Performance Specification		
公称压力 Nominal Pressure	1.6	Mpa
强度试验压力 Shell Test	2.4	
密封试验压力 Seal Test	1.76	

适用温度 Suitable Temp.	120	℃

外形尺寸标准要求

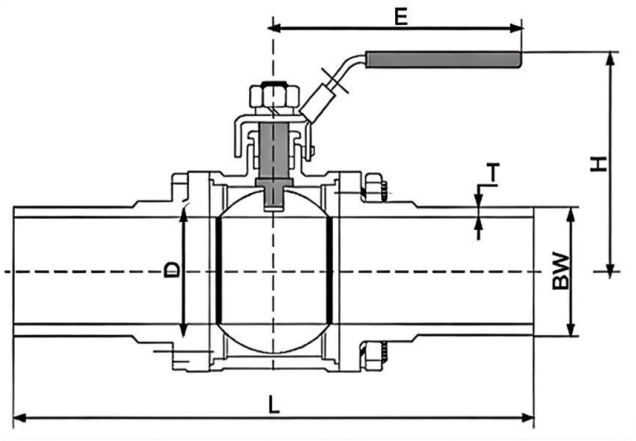
1、阀门的结构长度按 GB/T12221 的标准

2、连接法兰按 GB9113 的标准

Dimensions Standard Requirements

1. The structural length of the valve shall conform to the standard GB/T12221.

2. The connecting flange shall conform to the standard GB9113.



Q61F 加长焊接三片式球阀外形图

Q61F Extended Butt-Weld Three-Piece Ball Valve View Drawing

Q61F 加长焊接三片式球阀外形尺寸表

Q61F Extended Butt-Weld Three-Piece Ball Valve Dimensions Table

DN	SIZE	L	BW	E	H	D	T
15	1/2″	135	10.2	122.9	58.0	12.70	1.24
20	3/4″	135	15.8	122.9	61.0	19.05	1.65
25	1″	152	22.1	144.9	68.0	25.40	1.65
32	1-1/4″	157	28.5	144.9	73.5	31.80	1.65
40	1-1/2″	190	34.8	188.9	84.5	38.10	1.65
50	2″	204	47.5	188.9	93.2	50.80	1.65
65	2-1/2″	254	60.2	255.3	131.8	63.50	1.65
80	3″	280	72.9	260.8	140.0	76.20	1.65
100	4″	306	97.4	322.2	173.6	101.6	1.65

Q61F 加长焊接三片式球阀安装、使用与维护说明

安装指南

1. 安装前准备：核对阀门型号、压力等级、对焊端规格及加长阀颈尺寸是否符合管道系统与保温/保冷层设计。清洁阀门内腔及管道坡口，确保无杂质。

2. 对焊连接操作：焊接必须由合格焊工按评定的工艺规程执行。阀门应处于全开位置。焊接时需对加长阀颈及阀体采取分段、持续有效的强制冷却措施，防止内部密封件及填料因焊接高温受损。

3. 加长阀颈方向与保温：安装时需确保加长阀颈方向符合设计要求（通常垂直于管道），以便于操作和未来保温/保冷层施工。阀颈部分应在管道主保温/保冷层之外。

4. 三片式结构注意事项：安装焊接过程中，严禁拆卸阀门的三段式连接螺栓。需确保阀门在组对和焊接时不受扭曲力，防止内部组件错位。

5. 系统压力测试：焊接安装后参与管道系统压力试验。试验压力需符合设计规范，试验后检查焊缝、阀体及阀杆填料处有无泄漏。

使用操作

1. 启闭操作：通过加长阀杆顶部的操作机构（手动或执行器）进行平稳的 90 度旋转操作。加长杆操作力矩可能略有增加，操作到位后即停止。

2. 状态确认：通过执行器反馈或加长杆顶部的指示器判断阀门开关状态。在保冷/保温层覆盖后，需依赖外部指示装置。

3. 极端温度工况操作：用于深冷或高温介质时，首次操作或长期静止后启闭应缓慢进行，使阀杆及填料函区域温度均匀变化，避免热冲击。

4. 注意事项：严禁借助加长阀杆作为杠杆进行强行操作。若感觉扭矩异常，应停止操作，检查是否因内部结冰（深冷工况）或填料过紧导致。

维护保养

1. 定期检查：定期检查对焊焊缝区域有无异常，检查阀杆填料处有无泄漏。检查加长阀颈外部防护层是否完好。

2. 在线维护（利用三片式结构）：若需检修内部，可在系统完全泄压并恢复至常温后，仅拆卸中段阀体两端的连接螺栓进行维护，无需切割管道。

3. 阀杆与填料维护：加长阀颈设计使填料维护相对便捷。若填料处泄漏，可在系统泄压后，于阀杆顶部进行压紧或更换。更换填料需注意选用适合工作温度的型号。

4. 密封系统内部检修：拆卸中段阀体后，检查球体与阀座密封面。用于深冷工况时，需重点检查密封材料是否因低温收缩而失效；用于高温工况时，检查是否因高温老化。

5. 长期停用：阀门应处于全开或全关位置。对于深冷工况，应排空阀内液体并用干燥氮气吹扫；对于高温工况，应确保内部干燥。对加长阀杆外露部分涂抹合适保护剂。重新启用前需进行功能与压力测试。

Q61F Extended Butt-Weld Three-Piece Ball Valve Installation, Operation & Maintenance Instructions

Installation Guide

1. Pre-Installation Preparation: Verify that the valve model, pressure rating, butt-weld end specifications, and extended neck dimensions comply with the piping system and insulation/cryogenic lining design. Thoroughly clean the valve inner cavity and pipe bevels to ensure they are free from contaminants.

2. Butt-Weld Connection Procedure: Welding must be performed by a qualified welder strictly in accordance with qualified Welding Procedure Specifications (WPS). The valve must be in the fully OPEN position. During welding, implement staged and continuous effective forced cooling measures (e.g., using heat sink compounds or specialized cooling jackets) on the extended neck and valve body to prevent damage to internal seals and stem packing from welding heat transfer.

3. Extended Neck Orientation & Insulation: Ensure the extended neck is oriented as per design requirements (typically perpendicular to the pipeline) to facilitate operation and future insulation/cryogenic lining work. The extended neck section must remain outside the main pipeline insulation/cryogenic envelope.

4. Precautions for Three-Piece Structure: It is strictly forbidden to disassemble the bolts connecting the three pieces of the valve during installation and welding. Ensure the valve is not subjected to twisting forces during alignment and welding to prevent internal component misalignment.

5. System Pressure Testing: After welding and installation, the valve shall participate in the piping system pressure test. The test pressure must comply with design codes. Following the test, inspect all welds, the valve body, and the stem packing area for any leakage.

Operation

1. Opening/Closing Operation: Operate the valve via a smooth 90-degree rotation using the actuation mechanism (manual or automated) at the top of the extended stem. Note that operating torque may be slightly higher due to the extended stem. Cease operation once the fully open or closed position is reached.

2. Position Indication: Determine the valve status (open/closed) via actuator feedback or the position indicator at the top of the extended stem. Once covered by insulation/cryogenic lining, reliance on this external indication is essential.

3. Operation Under Extreme Temperatures: For cryogenic or high-temperature service, perform the initial operation or operation after prolonged stagnation slowly and gradually. This allows for uniform temperature change in the stem and packing area, avoiding thermal shock.

4. Precautions: Never use the extended stem as a lever to force operation. If abnormal torque is detected, stop operation immediately and investigate potential causes such as internal ice formation (in cryogenic service) or over-tightened packing.

Maintenance

1. Periodic Inspection: Regularly inspect butt-weld areas for abnormalities and the stem packing for leaks. Check the external protective coating/condition of the extended neck.

2. In-Line Maintenance (Utilizing Three-Piece Design): For internal inspection/maintenance, after the system is completely depressurized and restored to ambient temperature, only the bolts connecting the center body section need to be removed. This allows for maintenance without cutting the pipeline.

3. Stem & Packing Maintenance: The extended neck design facilitates relatively easier packing maintenance. If leakage occurs at the packing, the gland can be tightened or the packing replaced at the top of the stem after system depressurization. When replacing packing, ensure the selected type is suitable for the service temperature.

4. Internal Seal System Inspection: After removing the center body section, inspect the ball and seat sealing surfaces. For cryogenic service, pay special attention to potential seal failure due to low-temperature contraction. For high-temperature service, check for degradation due to thermal aging.

5. Long-Term Storage/Out-of-Service: The valve should be stored in either the fully open or fully closed position. For cryogenic service applications, drain any residual liquid and purge the valve with dry nitrogen. For high-temperature service, ensure the interior is dry. Apply a suitable protective agent to the exposed sections of the extended stem. Conduct functional and pressure tests before returning the valve to service.

非常感谢您的阅读！

Thank you very much for reading!

开维喜阀门集团有限公司

地址：浙江省温州市永嘉县瓯北街道三桥工业区林下路 1 号

电话：+86 18967796135

网址：https://www.kaiweixi.com

E-mail：yannie@kaiweixi.com

Kaiweixi Valve Group Co., Ltd

Address: No.1 Linxia Road, Sanqiao Industrial Zone, Oubei Street, Yongjia County, Wenzhou City, Zhejiang Province

Phone: +86 18967796135

URL: https://www.kaiweixi.com

E-mail：yannie@kaiweixi.com