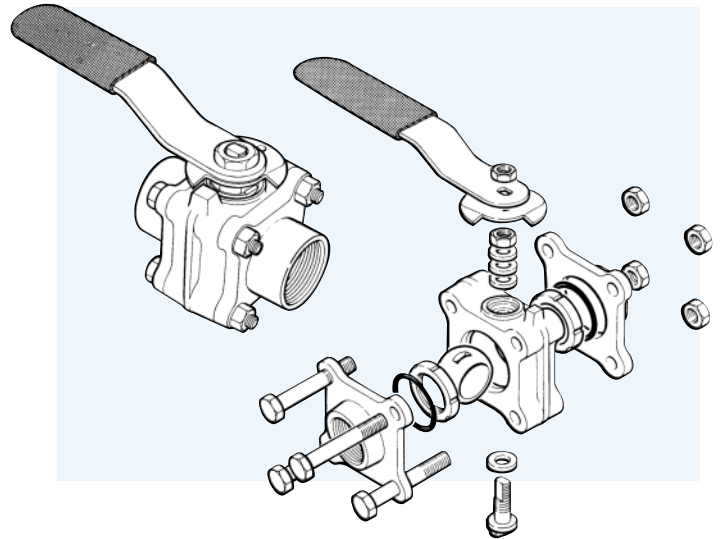


Valves

Ball, Globe, Non-return & Actuators

Ball Valves & Extended Spindles

The installation of ball valves is recommended for positive isolation in CO₂ pipework systems. A range of high pressure ball valves is available, suitable for use with liquid and gaseous carbon dioxide, with screwed, socket weld or flanged end connections. The valves are designed for easy maintenance: the internal seats and seals in the three piece valves can be replaced without unscrewing the ball valve from the pipework, merely by withdrawing the four body bolts. The valves are supplied degreased for CO₂ service.



Specification

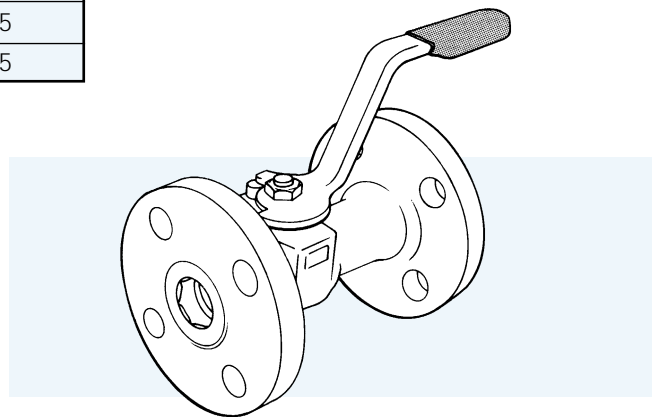
Screwed and socket weld ball valves				
End fitting		Max operating pressure (bar)		Part No.
Rc ¹ / ₂		103		2223.2702
Rc ³ / ₄		69		2223.2801
Rc1		69		2223.2901
Rc1 ¹ / ₂		69		2223.3001
Socket weld female (in n.b.)	³ / ₄	69		2223.2802
	1	69		2223.2902
	1 ¹ / ₂	69		2223.3009
Materials	Body and end fittings	Carbon steel		
	Valve ball and stem	Stainless steel		
	Seats and seals	PTFE		
All socket weld ball valves are supplied fitted with rubber seats and seals. The PTFE seats and seals are attached loose. After welding, discard the rubber seats and seals and replace them with those of PTFE (instructions supplied).				
Dimensions and weights for screwed and socket weld ball valves				
Valve size (in)	Length (body) (mm)	Width (body) (mm)	Length (body and handle) (mm)	Unpacked weight (kg)
¹ / ₂	67	45	141	0.67
³ / ₄	73	52	144	0.9
1	95	62	194	1.6
1 ¹ / ₂	116	80	236	2.7

Part Numbers

Spare parts available for screwed and socket weld ball valves		
Valve size	Seats and seals Part No.	Body bolts Part No.
Rc $\frac{1}{2}$	2223.2704	2223.2706
Rc $\frac{3}{4}$	2223.2805	2223.2806
$\frac{3}{4}$ in socket weld	2223.2805	2223.2806
Rc1	2223.2903	2223.2904
1 in socket weld	2223.2903	2223.2904
Rc $\frac{1}{2}$	2223.3004	2223.3005
$\frac{1}{2}$ in socket weld	2223.3004	2223.3005

Flanged Ball Valve

The flanged ball valves have flanges machined to BS 1560 /ANSI Class 300, and contain PTFE seats and seals suitable for a maximum operating pressure of 50 bar.



Specification

Dimensions and weights for flanged ball valves					
Valve size (in)	Length (body) (mm)	Length (body and handle) (mm)	Unpacked weight (kg)	Valve Part No.	Spare seats and seals Part No.
1	165	222	4.3	2223.2906	2223.2908
$\frac{1}{2}$	190	253	7.3	2223.3002	2223.3003

Extended Spindles

When a ball valve is located beneath insulation, an extended spindle is required to operate the valve. These extended spindles are purpose-made to fit each type and size of ball valve held in stock, with shafts designed to protrude above 100 mm of insulation.

The units are of cadmium-plated steel. The shaft casing is welded onto the holding plate. The inner spindle moves freely inside the shaft casing and is lubricated by a special low-temperature grease.

Part Numbers

Extended spindles			
Size (in)	To fit ball valve		Extended spindle Part No.
	Screwed	Socket weld	
$\frac{1}{2}$	2223.2702	-	2223.2708
$\frac{3}{4}$	2223.2801	2223.2802	2223.2708
1	2223.2901	2223.2902	2223.2907
$1\frac{1}{2}$	2223.3001	2223.3009	2223.3007
$1\frac{1}{2}$	* flanged special		2223.3008

*On a bulk storage tank, fitted with inner and outer liquid $1\frac{1}{2}$ in flanged ball valves a special extended spindle is recommended. These special items use a 'Tommy bar' to

turn the shaft spindle, which incorporates a feature to allow the installation of a chain and padlock to lock the valves open.

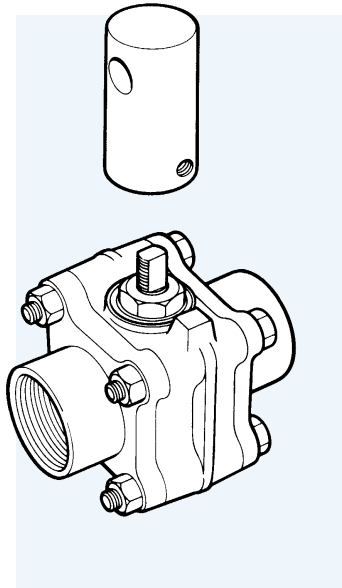
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Spindle Bush

When a ball valve is fitted to a pipeline which is covered by up to 40 mm of insulation, the spindle bush can be used to extend the ball valve shaft clear of the insulation. A 'Tommy bar' is required to operate the valve which, when withdrawn, will reduce the chance of unauthorised tampering. The spindle bush is made of brass.

Part Numbers

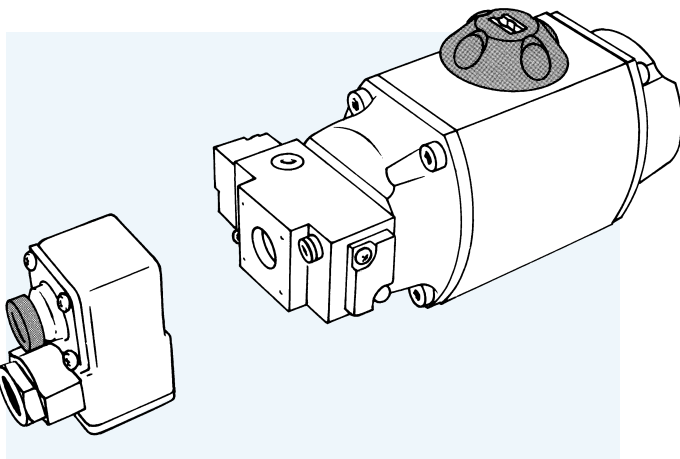
Spindle bush	
Ball valve size (in)	Spindle bush Part No.
3/4	2223.2807
1	2223.2905
1 1/2	2223.3006



Pneumatic Actuators for Automatic Operation of Ball Valves

Solenoid operated pneumatic actuators allow the automatic opening or closing of ball valves. When linked to a control device, such as the low temperature cut off pneumatic actuators, allow the rapid instigation or isolation of CO₂ supplies.

Pneumatic actuators can be supplied for all sizes of ball valve which have PTFE seats and seals. The solenoid valve coil is supplied separately. Standard voltages available are 24 V DC or 24 V, 50 V, 110 V or 230 V AC. Please specify ball valve size and electrical voltage when ordering.



Specification

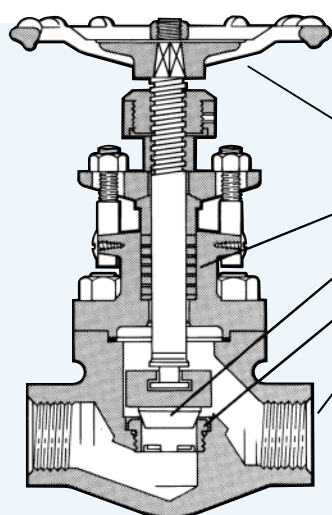
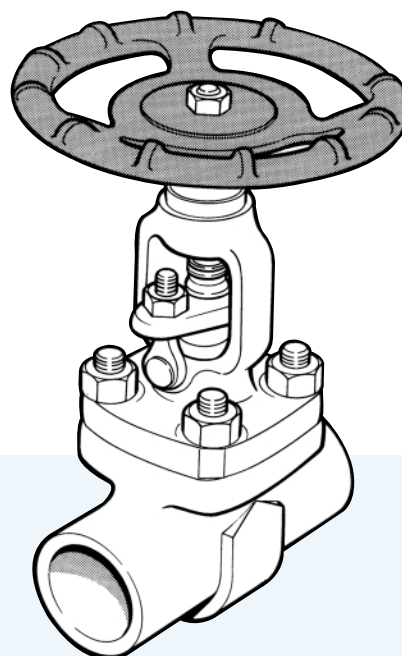
Pneumatic actuator		
Weatherproof actuator, for 1/2 in, 3/4 in and 1 in ball valves (excludes coil and mounting kit) – Part No. 2223.4610		
Control air or gas supply	G ¹ / ₄	
Dimensions	Length (mm)	225
	Width (mm)	76
	Height (mm)	150
Unpacked weight (kg)	1.7	
Coil for actuator solenoid valve		
	24 V AC	Part No. 2223.4613
	50 V AC	Part No. 2223.4614
	110 V AC	Part No. 2223.4615
	230 V AC	Part No. 2223.4616
Mounting kit – to connect actuator to ball valve		
1/2 in kit for ball valve	Part No. 2223.4617	
2223.2702		
3/4 in kit for ball valves	Part No. 2223.4618	
2223.2801 and 2223.2802		
1 in kit for ball valves	Part No. 2223.4619	
2223.2901 and 2223.2902		

These kits are not suitable for mounting actuators on valves used in insulated pipelines. Air Liquide UK can supply kits incorporating extended spindles for such applications.

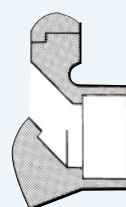
Globe Valves

Globe valves are recommended when a variable or throttled CO₂ flow is required and for pipework locations which are difficult to fully isolate. (When simple on/off control is required, ball valves are preferred.) However, Air Liquide UK Limited recommend the use of globe valves for the first (inner) valve connected to a storage vessel.

The globe valves in stock are bolted bonnet type with back seating plugs, which allows the internal gland packings to be changed without isolating or depressurising the pipework. The globe valves are available with either screwed or socket weld female connections.



Threaded type connections



Socket weld type connections

Handwheel
Gland packing
Plug
Seat
Screwed port

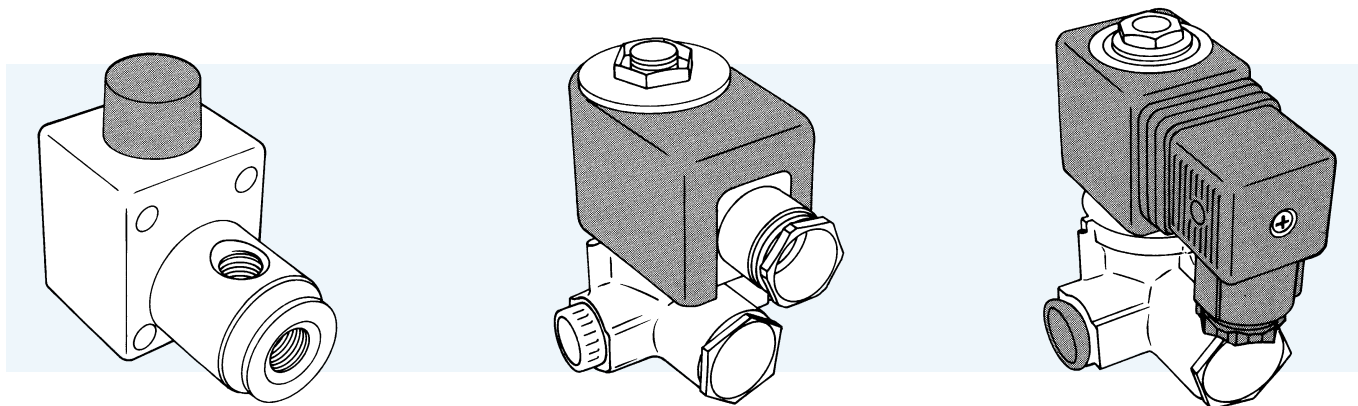
Socket weld port

Specification

Globe valves				
Maximum operating pressure (bar)	138			
Materials	Body	Forged steel		
	Stem	Stainless steel		
	Plug and seat	Carbon steel		
	Gland packing	Flexible graphite		
Valve size	1/2 in	3/4 in	1 in	1 1/2 in
Threaded ports (Rc)	2223.3501	2223.3701	2223.3901	2223.4201
Socket weld ports (in n.b.)	-	2223.3801	2223.4001	2223.4301
Length, port-to-port (mm)	83	95	114	171
Height, valve open port to handwheel (mm)	157	160	176	229
Unpacked weight (kg)	1.8	2	3	4.5
Spares				
Valve gland packing	2223.3502	2223.3703	2223.3903	2223.4203
Valve plug and seat	-	-	2223.3905	2223.4208

Solenoid Valves

For the automatic activation of small bore liquid CO₂ systems, high pressure solenoid valves are recommended. These valves are normally closed (open when energised, closed when de-energised) and are for indoor use only. The solenoid valve bodies are brass and the internal parts are stainless steel.



Specification

Solenoid valves			
Threaded ports (female)	1/8 in NPT/API	1/4 in NPT/API	1/4 in NPT/API
Internal orifice diameter (mm)	1.2	6.4	6.4
Inlet	Horizontal	Horizontal	Horizontal
Outlet	Vertical	Horizontal	Horizontal
Max differential pressure (bar)	69	86	86
Supply voltage 50 Hz	230 V AC	50 V AC	24 V AC
Dimensions	Height (mm)	72	81
	Width (mm)	42	51
	Length (mm)	55	63
Unpacked weight (kg)	0.5	0.6	0.6
Part No.	2223.4601	2223.4602	2223.4504
Fittings to connect solenoid valves to pipework			
	Threaded end connection for valve		
Connection end of fitting	1/8 in NPT/API male Part No.	1/4 in NPT/API male Part No.	
3/8 in o.d. compression fitting	2222.0707	2222.0709	
G1/4A Cone	2222.2005	2222.2026	
R1/2	-	2222.2027	

Non-Return Valves

Non-return valves ensure that the flow of carbon dioxide gas is only in one direction. The valves prevent any blow back of gas, or product, upstream of the valve.

Specification

Non-return valve (high pressure)		
Threads		Rc ¹ / ₄
Max operating pressure (bar)		103
Min operating pressure (bar)		0.2
Length (mm)		102
Material	Body and spring:	Stainless steel
	Seals:	PTFE
Part No.		2223.2501

This non-return valve can be used with CO₂ or with more corrosive gases such as amine.

Specification

Non return valve (low pressure)		
Threads		G ³ / ₈
Max operating pressure (bar)		3.5
Min operating pressure (bar)		0.2
Length (mm)		88
Material	Body:	Delrin
	Spring:	Stainless steel
	Seals:	Rubber
Part No.		2230.0704

This non-return valve can be used with CO₂ or with more corrosive gases such as amine.

