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AYAM
CFBM
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4.1 Cryogenic Ball valves

Ball valve is the ideal valve for perfect sealing requirements, for tie ins, maintenance isolations, line closure etc. AMPO Valves is the reference in cryogenic ball valves due to our experience, quality and customer satisfaction ratio. As a result of more than 30 years manufacturing cryogenic top entry, split body and end entry cryogenic ball valves, zero leak quality class has been achieved. Around 25.000 cryogenic tests have been carried out at our testing facilities and in total, more than 250.000 cryogenic ball valves have been manufactured.

Materials, Ampo Standard Sealing Design...

Having our own foundry, AMPO Foundry, and considering our long experience we have had the option of testing all kind of alternative materials, which gives the security that the ones used in AMPO Valves are the best ones and special designs have been prepared and tested for each material.

CASTING PIECES:

ASTM A 351 Gr CF8
ASTM A 351 Gr CF8M
ASTM A 351 Gr CF3
ASTM A 351 Gr CF3M
ASTM A 351 Gr CF8C

STEM MATERIALS:

ASTM A 479 Gr 304
ASTM A 479 Gr 304L
ASTM A 479 Gr 316
ASTM A 479 Gr 316L
ASTM A 564 TYPE 630 H1150D
NITRONIC 50[®]
MONEL K-500[®]

SEAT MATERIALS:

PCTFE
RPTFE
VESPEL SP-21[®]

SEAT GASKET MATERIALS:

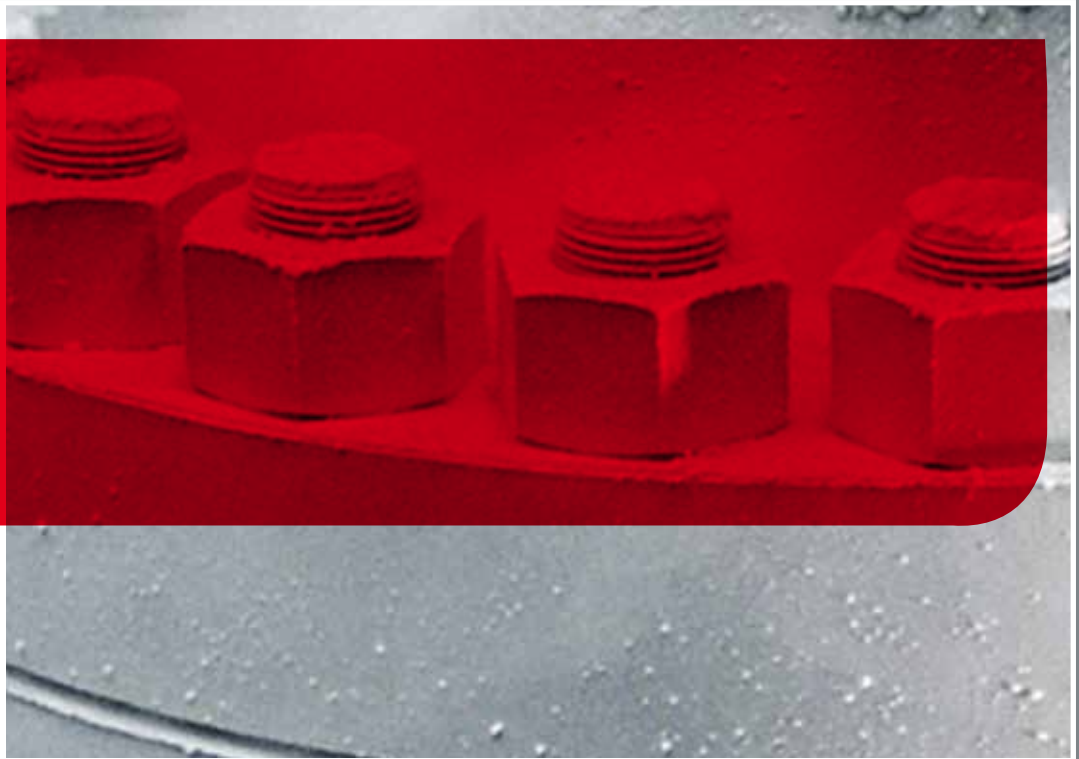
PCTFE
PTFE
Graphite

Any kind of bolting material required by each specification and each process condition.

Ampo standard sealing design

A small hole of 3mm diameter is drilled on one of the seat rings or on the ball. This hole is usually in the upstream side and the cavity pressure is relieved in case of overpressure, through that. Thus, closure in both directions has to be achieved in the downstream seat and that is the key point of designs developed by AMPO Valves.

The simplicity of the relieving system and the reliability of the sealing device makes this design to be the one chosen by the majority of the end users.



Double block and single bleed valves:

Upstream seal is a unidirectional floating seat ring that closes in the preferential direction and relieves the cavity if an overpressure is achieved inside. Downstream seat is a tight shut off seat that ensures the closure in both directions.

This kind of valves has a preferred direction where a double block is achieved and the bleed is carried out always through the upstream seat avoiding external devices.

When the valve is closed, the drain installed at the bottom of the valve can be opened in order to check that the upstream seat is closing correctly.

External vent double block valves:

If a double block seal is required in order to allow the leak detection through a drain connection and a simple relief device is preferred, this design fulfils both conditions. Upstream and downstream seats are bidirectional so a double seal is achieved in both directions.

In case of overpressure, the fluid is relieved through a relief valve or shut of valve installed to the main valve bonnet. When the valve is closed, the secondary valve is closed and the drain has to be opened. Thus, it is assured that the first seal is closing and any work can be carried out in safe conditions.

Self relieving seat design:

In that case, each seat closes in its direction. The common standard double block and bleed design has been translated to cryogenic temperatures. For cavity relieves, the floating seat ring is displaced forwards the ball and the cavity is connected to the line. Usually, one of the seat rings floats at smaller pressure for conducting the flow to its side.

4.1.1. Cryogenic Top Entry - Ball Valves

Top entry cryogenic ball valves are basically used in liquefaction plants, LNG receiving terminals, transportation, chemical plants and other installations where low temperature service is needed and high security measures are required. The top entry design makes the valve maintainable at site and inline so normally, these valves are butt welded valves and consequently potential external leak points are dramatically reduced.

All internal pieces can be removed and replaced keeping the valve in line so the maintenance of the valves is one of the key points for the selection of this design type.

4.1.1.1

FLOATING TYPE CRYOGENIC TOP ENTRY BALL VALVE

Seal element is static and shut off is produced by line pressure acting to the ball, pushing it against the seating ring.

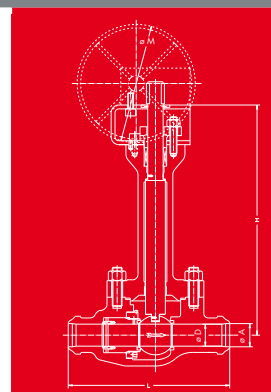
Standards: API, BS, MSS, ASME, ASTM, DIN

Classes: 150 lbs up to 2500 lbs

Sizes: 1/2" up to 6"

Construction: Extended bonnet (Gas column). Bolted bonnet. Full and reduced bore. Flanged, butt weld ends and both. Manual and actuated (pneumatic/electric/hydraulic). Fire safe. Soft and metal seats.

Temperature: Down to -196°



RATING

150#

300# - 2500#

Standard valve designs. If any alternative is required check it with AMPO VALVES

UP TO SIZE

6"

2"

EXAMPLE



4.1.1.2

TRUNNION TYPE CRYOGENIC TOP ENTRY BALL VALVE

Ball is static and sealing element is dynamic. Shut off is produced by a combination of pushing seat ring against ball by means of driving nuts and line pressure effect.

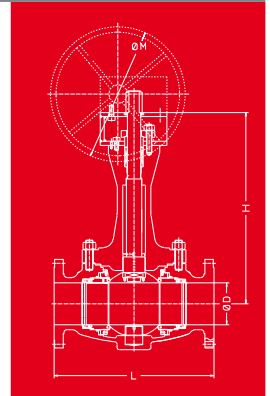
Standards: API, BS, MSS, ASME, ASTM, DIN

Classes: 150 lbs up to 2500 lbs

Sizes: 3" up to 56"

Construction: Extended bonnet (Gas column). Bolted bonnet. Full and reduced bore. Flanged, butt weld ends and both. Manual and actuated (pneumatic/electric/hydraulic). Fire safe. Soft and metal seats.

Temperature: Down to -196°



RATING	SIZE
150#	8" - 56"
300# - 900#	3" - 48"
1500# - 2500#	3" - 36"

Standard valve designs. If any alternative is required check it with AMPO VALVES

EXAMPLES



4.1.2. Cryogenic Split Body - Ball Valves

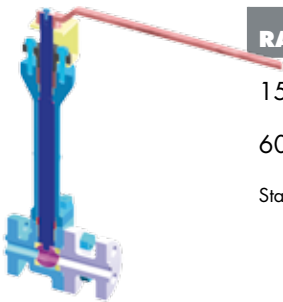
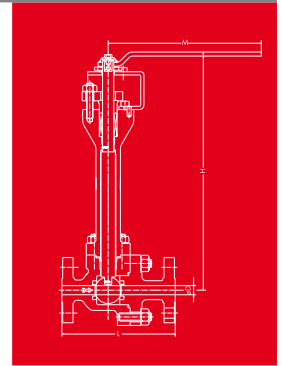
Split body cryogenic ball valves are basically used in Liquefaction plants, LNG receiving terminals, transportation, chemical plants and other installations where low temperature service is needed. Maintenance works inside valve can not be carried out while valves are installed so these valves use to be flanged end valves.

All internal pieces can be removed and replaced very easily once the valve has been taken out from line.

4.1.2.1

FLOATING TYPE CRYOGENIC SPLIT BODY BALL VALVE

Standards:	API, BS, MSS, ASME, ASTM, DIN
Classes:	150 lbs up to 2500 lbs
Sizes:	1/2" up to 4"
Construction:	Extended bonnet (Gas column). Bolted bonnet. Full and reduced bore. Flanged ends. Manual and actuated (pneumatic/electric/hydraulic). Fire safe. Soft seats.
Temperature:	Down to -196°



RATING

150# - 300#

600# - 2500#

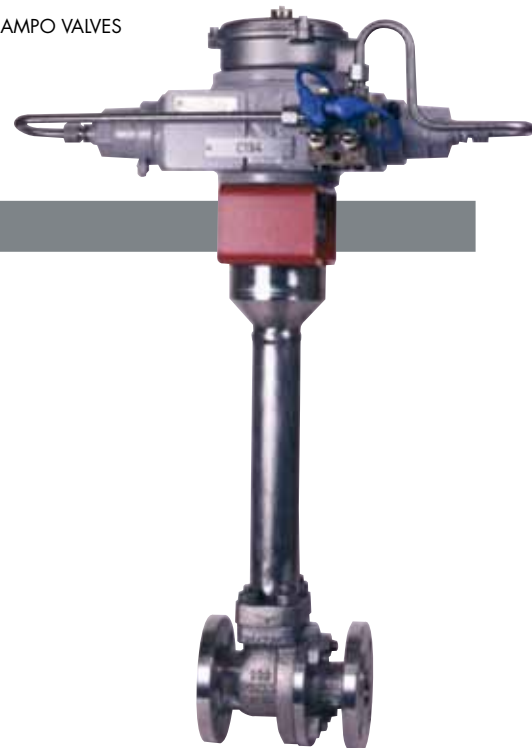
Standard valve designs. If any alternative is required check it with AMPO VALVES

UP TO SIZE

4"

1 1/2"

EXAMPLE



4.1.2.2

TRUNNION TYPE CRYOGENIC SPLIT BODY BALL VALVE

Ball is static and sealing element is dynamic. Shut off is produced by a combination of pushing seat ring against ball by means of driving nuts and line pressure effect.

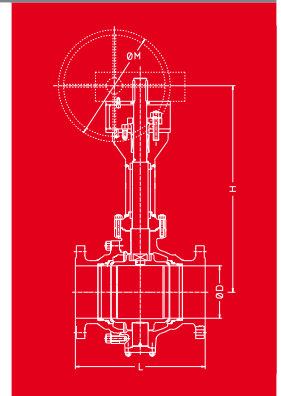
Standards: API, BS, MSS, ASME, ASTM, DIN

Classes: 150 lbs up to 2500 lbs

Sizes: 2" up to 56"

Construction: Extended bonnet (Gas column). Bolted bonnet. Full and reduced bore. Flanged ends. Manual and actuated (pneumatic/electric/hydraulic). Fire safe. Soft seats.

Temperature: Down to -196°



RATING

150# - 300#

300# - 900#

1500# - 2500#

SIZE

6" - 56"

2" - 48"

2" - 36"

Standard valve designs. If any alternative is required check it with AMPO VALVES

EXAMPLE



4.1.3. Cryogenic End Entry - Ball Valves

End entry cryogenic ball valves are basically used in Liquefaction plants, LNG receiving terminals, transportation, chemical plants and other installations where low temperature service is needed. Maintenance works inside valve can not be carried out while valves are installed so these valves use to be flanged end valves.

One of the flanges of the split body valves is avoided so one possible leak point is eliminated and a very compacted design is achieved.

4.1.3.1

FLOATING TYPE CRYOGENIC END ENTRY BALL VALVE

Seal element is static and shut off is produced by line pressure acting to the ball, pushing it against the seating ring.

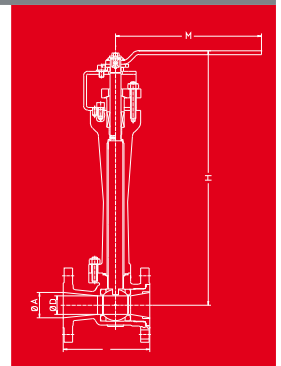
Standards: API, BS, MSS, ASME, ASTM

Classes: 150 lbs up to 2500 lbs

Sizes: 1/2" up to 6"

Construction: Extended bonnet (Gas column). Bolted bonnet. Floating Type. Full and reduced bore. Flanged ends. Manual and actuated (pneumatic/electric/hydraulic). Fire safe. Soft seats.

Temperature: Down to -196°



RATING

150# - 300#

600# - 2500#

UP TO SIZE

6"

3"

Standard valve designs. If any alternative is required check it with AMPO VALVES

EXAMPLE

