



4.2 Cryogenic Gate valves

During the experience of more than 30 years designing and manufacturing cryogenic gate valves, the design and production have reached a great reliability and a perfect sealing quality. The production range has been increased step by step up to 72 inch valves and the manufacturing of small valves is still very competitive due to process improvements and productivity achieved by AMPO Valves.

All gate valves manufactured by AMPO Valves are rising stem type, outside screw and yoke design and flexible wedge design. Apart from that all the rest design parameters can be adapted to the customer requirements by our engineering teams. That flexibility allows us being the reference in very special applications and special valve requirements.

Valve range and alternatives:

Gate valve range goes from 150# up to 2500# and from 2" up to 72" and can be bolted bonnet (BB) or pressure seal design (PS) depending on pressure ratings and project specifications.

Body minimum wall thickness can be defined by API 600 standard, by ASME B.16.34 standard or by ISO 12516.

Sealing system:

Standard cryogenic gate valves normally have a 3mm vent hole on the wedge upstream side that relieves the cavity in case of overpressure. Thus, standard cryogenic gate valves are unidirectional valves. Pressure deforms the flexible wedge and it is introduced through the upstream seat and cavity vent to the internal cavity. Inside, pushes the wedge downstream face against the seat and gets the closure.

If bidirectional cryogenic valves are required, external relief system shall be used. In that case, the vent hole is avoided and downstream seat makes the seal in each direction. Cavity is vented in case of overpressure through a relief valve connected to the valve bonnet inside cavity and besides the packing.

On cryogenic gate valves, the back seat is integral with the bonnet. The conical back seat plug is integral with the stem and seals when the valve is in the fully open position. This allows re-packing of the gland under full service conditions.



Design and construction:

The design and construction of the cryogenic range of AMPO Valves, is based on the requirements and codes of practice of the American and British Petroleum, Petrochemical and Power Industries.

The standards and codes used are from the following institutions:

- API American Petroleum Institute.
- ASME American Society of Mechanical Engineers.
- ASTM American Society for Testing Materials.
- BSI British Standards Institution.
- MSS Manufacturers Standardization Society.

Gate valves are designed to comply with the following standards:

- BS1414.
- API 600.
- ASME B16.10.
- ASME B16.25.
- ASME B16.5.
- ASME B16.47.
- ASME B.16.34.
- BS 6364.
- ASME VIII.



Materials:

Our own foundry allows us controlling the whole process of the high quality austenitic stainless steel valves for bodies, bonnets, etc. For stem materials, apart from the common stainless steel laminated or forged material such as Gr304, 304L, 316, 316L, 347, 347L etc. high performance stainless steel material are used, such as S17400, NITRONIC 50®, MONEL K500®, etc.

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.®

Valve wedge is normally hard faced by a stellite6 overlay and body seat is a integrated seat but any kind of combination can be manufactured. Any kind of bolting material required by each specification and each process condition.

GATE VALVES

Standards: API, BS, MSS, ASME, ASTM

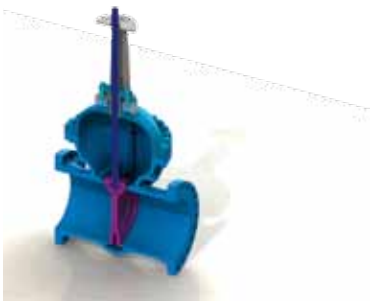
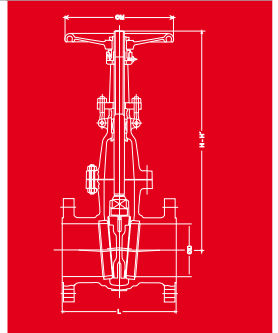
Classes: 150 lbs up to 2500 lbs

Sizes: 2" up to 72"

Construction: Bolted bonnet and Pressure seal. Extended bonnet (Gas column). Flanged and butt weld ends. Manual and motor-operated. Metal seats.

Temperature: Down to -196°

BOLTED BONNET



EXAMPLE

