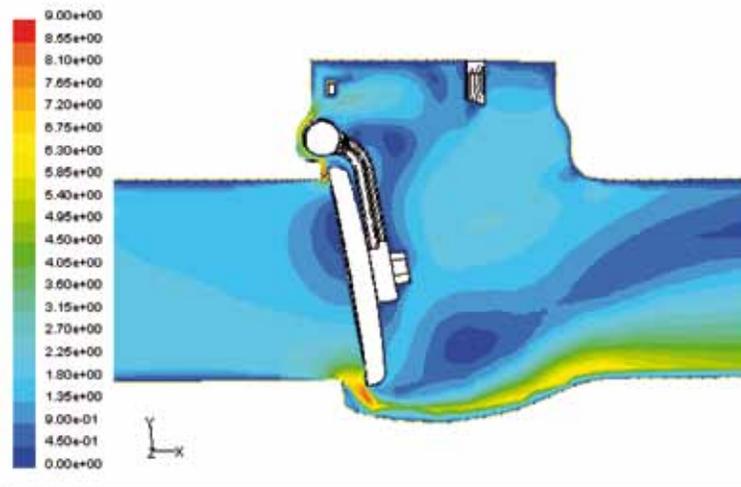


## 4.4 Cryogenic Check valves

Check valves are normally used in systems involving rapid and frequent flow reversals, pulsation or excessively turbulent flow should be avoided. These valves are suitable for low to moderate velocity LNG, water, oil, or other liquid service, and can only be used in horizontal pipe runs with the cover straight up.

Check valves are used to prevent flow reversal in piping systems. They are suitable for horizontal or vertical (flow up through valve only) piping runs. In order to guarantee the perfect operability, the standard design of AMPO Valves has a stop integrated on the cover.

Swing check valves have low pressure drop and are best suitable for moderate velocity applications. Either too low line velocity or too high velocity can damage valve internals and shorten valve life.



### Valve range and alternatives:

Cryogenic check valve range goes from 150# up to 2500# and from ½" up to 60" and can be bolted bonnet (BB) or pressure seal design (PS) depending on pressure ratings and project specifications.

At customer's request valves can be swing check type or piston check type.



### **Design and construction:**

As standard, swing check valves are designed with internal hinge but external hinge swing check valves are available with an optional outside gearbox, counterweight or damper. This feature can be used to make smoother or assist closing of the check valve disc depending on orientation. By the use of a counterweight for counterbalancing the disc, the valve can be opened at lower flow rates.

Apart from that, gear operated swing check valves are also manufactured. This kind of valve works as a common swing check valve but when a reverse flow is required by plant process, it can be operated and opened by mean of the handwheel. It is commonly used in LNG vessel discharge lines in order to make easier carrier cooling downs.

The standards and codes used are from the following institutions:

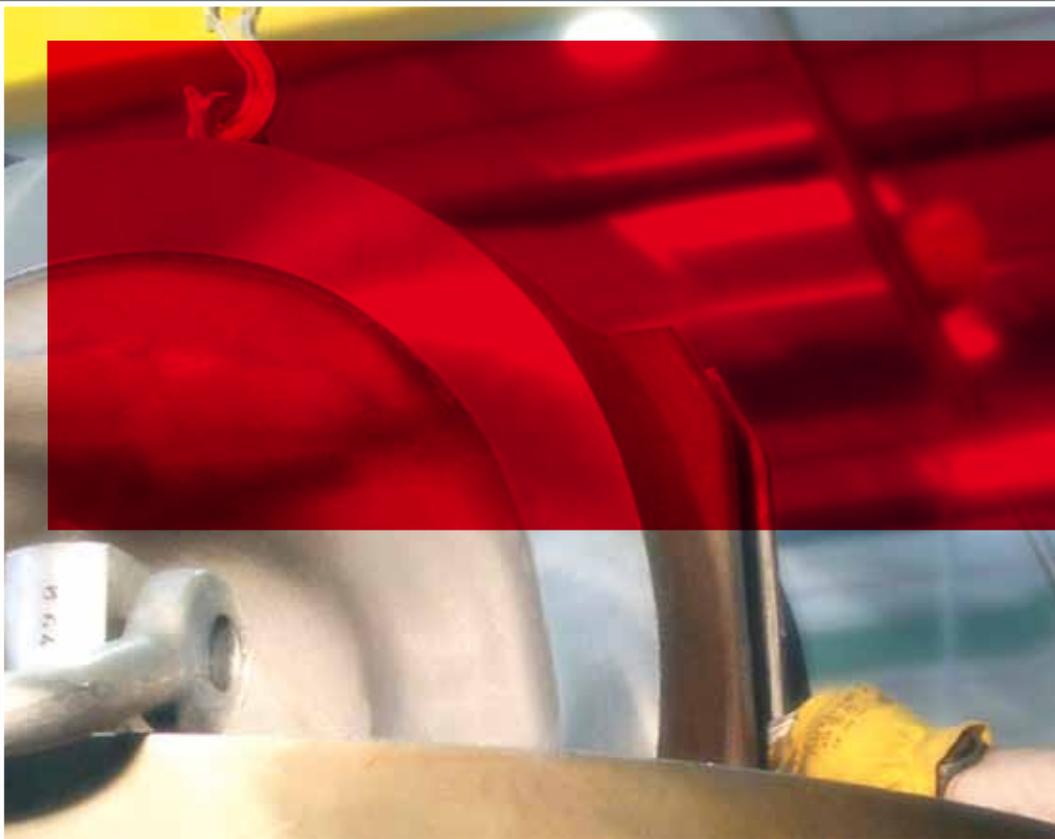
API American Petroleum Institute.

ASME American Society of Mechanical Engineers.

ASTM American Society for Testing Materials.

BSI British Standards Institution.

MSS Manufacturers Standardization Society.



Check valves are designed to comply with the following standards:

BS1868.

API 600.

ASME B16.10.

ASME B16.25.

ASME B16.5.

ASME B16.47.

ASME B.16.34.

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 spindle and other internal 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<sup>®</sup>, MONEL K500<sup>®</sup>, etc.

Valve disc is normally hard faced by a stellite 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.

## CHECK VALVES

**Standards:**

API, BS, MSS, ASME, ASTM

**Classes:**

150 lbs up to 2500 lbs

**Sizes:**

1/2" up to 60"

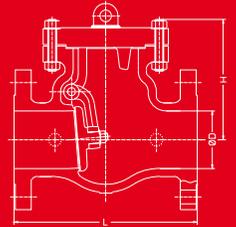
**Construction:**

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

