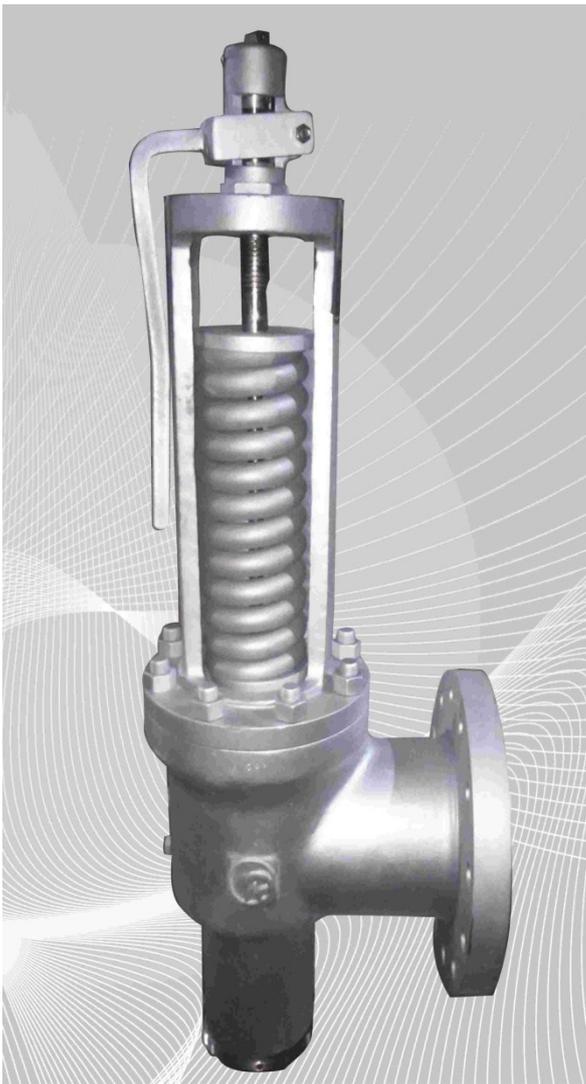


RT-PSV-SERIES SAFETY RELIEF VALVES



RT-PSV-SERIES

SAFETY RELIEF VALVE

We at **PLANET** as an ongoing commitment to customer are always in the process of continual improvement and the further development of our systems and processes towards meeting ISO 9001:2008 and exceeding customer expectations.

Valve Testing Facilities

As a minimum set standard for ensuring high reliability, we conduct minimum following tests :

- All pressure containing items are hydrostatically tested
- Each PSV seat leakage is tested and recorded
- Each PSV functionally tested and results are recorded.

In addition, gas, packing emission, cryogenic and advanced functional testing can be arranged on request.

Material testing facilities

- Non-destructive examination by radiography, ultrasonics, magnetic particle and liquid penetrant.
- Chemical analysis by computer controlled direct reading emission spectrometer.
- Mechanical testing for tensile properties at ambient and elevated temperatures, bend and hardness testing.
- Charpy testing at ambient, elevated and sub-zero temperatures.

PLANET operates quality programmes to cover the full scope of their activities. Comprehensive quality systems have been developed to serve the power, oil and gas, petrochemical and chemical industries, pipelines, thermal and nuclear power plants, Pharmaceuticals, sugar refineries and pulp mills.

Our quality program complies to various standards :

- ASME Section I
- ASME Section VIII
- API RP 520
- API STD 526
- API STD 527
- API STD 2000
- ASME B B16.5
- ASME B16.34

The effects of exceeding safe pressure levels in an unprotected pressure vessel or system can have disastrous effects on both plant and personnel. Safety device should be used to protect any pressurized system from the effects of exceeding its design pressure limit. Thus the primary function of a safety device is to safeguard life and property.

The most reliable Safety Relief Valves should be considered for the protection of process, personnel and equipments. **PLANET** Safety Relief Valves are reliable, efficient, simple in construction, easy to maintain and unique in design.

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SAFETY RELIEF VALVE

A safety device is designed to automatically discharge the accumulation of fluid from any pressure containing system, preventing a predetermined safe pressure being exceeded, and protecting plant and personnel.

Spring Loaded Safety Valves or Safety Relief Valves are the most commonly used relieving safety device. These are broadly categorized as :

Safety Valve : An automatic pressure relieving device actuated by the static upstream pressure and characterized by rapid full opening or pop action. Mainly used in vapor and steam services for safeguarding the process vessels.



Relief Valve : An automatic pressure relieving device actuated by the static upstream pressure, which opens in proportion to the increase in the upstream pressure above the opening set pressure and primarily used in Liquid Services.

Safety Relief Valve : An automatic pressure actuated relieving device suitable to act as both safety valve as well as relief valve.

PLANET Safety Valves meet the requirements of API as well as ASME standards. While designing the process parameters are studied thoroughly and a suitable valve is proposed based on the process requirement and safety.

PLANET Safety Relief Valves are designed in Conventional, Balanced Bellow, Pilot Operated or even Dead Weight Type depending of the process requirements and application its serving thereof.

These are designed as Full Lift Full Nozzle as well as Semi Nozzle for large size valves.

As a standard, nozzles are made of SS316 or any superior corrosive resistant material to meet process requirements and applications.

FEATURES

■ Design :

PLANET offers both Semi Nozzle as well as Full nozzle full lift design. These are simple in construction, change in set pressure is easy and easy to maintain. Manual levers are provided, if demanded, for ease of maintenance.

■ Metallic Seating :

PLANET Safety Relief Valves are manufactured with metal to metal seating and still offer maximum tightness against leakage due to precision finish. The nozzles and discs are lapped to a high degree of flatness.

■ Polymeric Sealing :

Polymer sealing is provided to achieve better seating against higher requirements of seat tightness and /or process designers recommendation.

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SAFETY RELIEF VALVE

■ **Blow Down Ring :**

The reseating pressure ie Blow Down can be adjusted very easily with the help of Blow Down Ring. If the process demands very precise Blow Down for certain costly or corrosive fluids, Special Double Blow Down Design can be offered.

■ **Over Pressure and Blow Down :**

PLANET Safety Valves achieve their full rated capacity at 10% or 3 psi over pressure and blow down, which most pressure vessel codes allow for vapors and gases and 21% for Liquid Services. However, better values on Blow Down can be offered with special Double Blow Down design.

■ **Balanced Bellow Design :**

Balanced bellow designs can be provided in case of the designer suggests or the process demands due to back pressure as per the code or process requirements.

■ **Pilot Operated Design :**

PO-PSV can be provided in case of the process designer suggests or the process demands due to high back pressure as per the code or process requirements.

■ **Tamper - Resistant Adjustment :**

Cap and adjusting screw discourage on-field tampering of the pressure setting.

■ **Wide set range for various applications :**

Design is compatible for various set pressures between 300 mBarg to 450 Barg for various applications and process requirements.

■ **Accurate low pressure regulation :**

Special designed large bore and semi nozzle Safety Relief Valves are designed to meet specific requirements in various segments like Power, Refineries and other Industrial segments.

■ **Easy Maintenance :**

Unique design facilitates easy and fast maintenance & inspection of Nozzle, Disk, Stem and other parts.

■ **Appropriate material range :**

Variety of material is available to suit corrosive solvents stored in vessels and for various utility gases. Also, available with NACE compatible material for sour gas applications.

■ **Special applications :**

Our competent and well equipped design team can develop solutions for various applications and process requirements based on the demand of our customers.

MATERIAL OF CONSTRUCTION

Body & Bonnet ⇒ CS-A216 Gr.WCB(Standard), CF8, CF8M, CF3, CF3M, WC6, WC9, LCB, LCC, Monel, Inconel or any other material on request

Nozzle, Disc and Stem ⇒ St St316 (standard), 316L, Monel, Inconel or any other material on request

Spring: Carbon Steel IS4454 Gr.II / III, H12, EN47, SS302, SS316, Inconel X750 or any other material on request

Seals: Polymeric sealing suitable to process fluid

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SIZING AND SELECTION

PLANET design team follows the following formulae to design the Safety Relief Valves

■ Liquid :

$$A = \frac{Q * \sqrt{G}}{27.2 * K_p * K_w * K_v * \sqrt{\Delta P}}$$

Where,

Q = Relieving Capacity in USGPM

G = Specific Gravity wrt Water=1.0

K_p = Relieving Capacity vs lift correction factor for liquid

K_w = Correction factor due to back pressure for bellow valves = 1.0

K_v = Capacity correction factor due to viscosity

ΔP = Differential Pressure in psi

■ Vapors :

$$A = \frac{W * \sqrt{TZ}}{C * K * P_1 * K_b * \sqrt{M}}$$

Where,

W = Relieving Capacity in lb/Hr

T = Abs Temp of Fluid @ Inlet in °F + 460

C = Flow Constant determined by ratio of Specific Heats
(C_p/C_v), if k is unknown C=315

P₁ = Upstream Pressure (set pressure + over pressure + atm pressure)

M = Molecular Weight of gas / vapor

Z = Compressibility Factor or Gas / Vapor, if unknown Z=1

K = Coefficient of discharge = 0.975

K_b = 1, if the back pressure < 40% of set pressure

■ Steam :

$$A = \frac{W}{51.5 * P_1 * K * K_n * K_{sh}}$$

Where,

W = Relieving Capacity in lb/Hr

P₁ = Upstream Pressure (set pressure + over pressure + atm pressure)

K = Coefficient of discharge = 0.975

K_n = Correction Factor for Saturated Steam at set pres > 1,500 psia

K_{sh} = Correction Factor due to degree of Superheat of Steam

Our experienced team Application Engineers ensure the best selection based on the provided process data and application explained by the process designer.

Various Options and Accessories Available

- Manual Lever : Plain or Packed
- Test Gag
- Open Bonnet for High Temperature
- Semi Nozzle for Large Bore
- Water Seals for Vacuum and / or Seat Cooling Operation