

# SAFETY RELIEF VALVES

**MODEL : FDI - SRV - 703**

## INDEX

- ◆ Introduction
- ◆ Pressure Relief Valve
- ◆ Pressure Safety Valve
- ◆ Features
- ◆ Product General Specification
- ◆ Standard and Certifications
- ◆ Order Guide & Recommended Spares



# INTRODUCTION

## PRESSURE RELIEF VALVE

A pressure relief valve characterized by gradual opening or closing generally proportional to the increase or decrease in pressure. Pressure Relief valves are spring loaded pressure relief devices. At the set pressure, the inlet pressure force overcomes the spring force and the valve disc begins to lift off the seat.

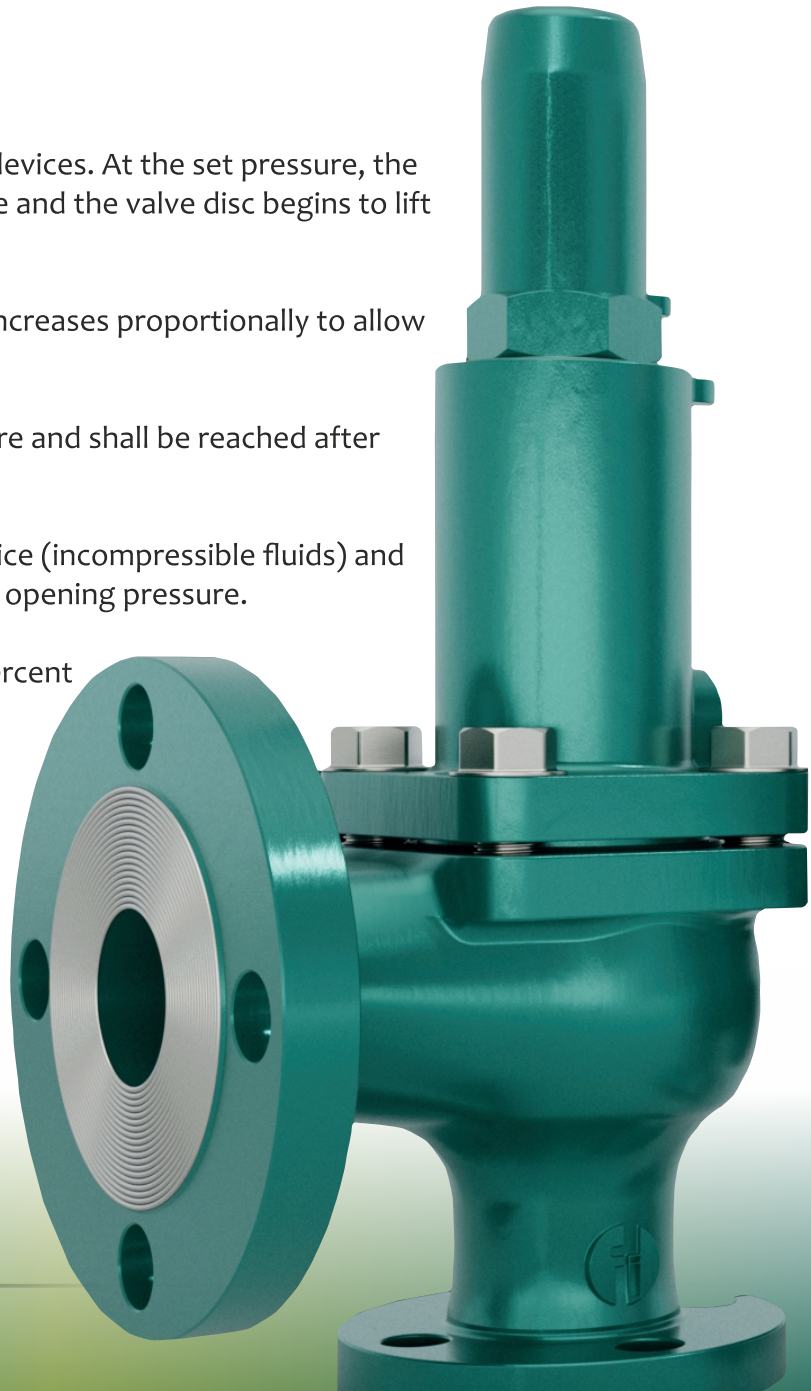
It is normally used for incompressible fluids. As inlet pressure increases, the lift of the disc increases proportionally to allow an increase in the flow. The closing pressure is less than the set pressure and shall be reached after the blowdown phase is complete.

These devices are used primarily for liquid service (incompressible fluids) and open in proportion to increasing pressure over opening pressure. Relief capacities are usually rated at 10 or 25 percent overpressure, depending on the application.

Oil and gas production facilities handle gas and liquids under pressure conditions where the improper use or failure of certain components may cause an overpressure of various facility components. Economic considerations do not allow the facility engineer to design all components to withstand the maximum pressure to which they may be exposed. To provide a safe yet economic design, pressure relieving devices are used.

### How are they different from others:

- 1 Relief valves are spring loaded pressure relief devices. At the set pressure, the inlet pressure force overcomes the spring force and the valve disc begins to lift off the seat.
- 2 As inlet pressure increases, the lift of the disc increases proportionally to allow an increase in the flow.
- 3 The closing pressure is less than the set pressure and shall be reached after the blowdown phase is complete.
- 4 These devices are used primarily for liquid service (incompressible fluids) and open in proportion to increasing pressure over opening pressure.
- 5 Relief capacities are usually rated at 10 or 25 percent overpressure, depending on the application.



# INTRODUCTION

## HOW THEY WORK

- 1 Reduce the downstream pressure to a constant level whenever it exceeds a Threshold.
- 2 Maintain sustained pressures down- or upstream from the valve.
- 3 Reduce the peaks or pressure pulses to protect equipment installed downstream

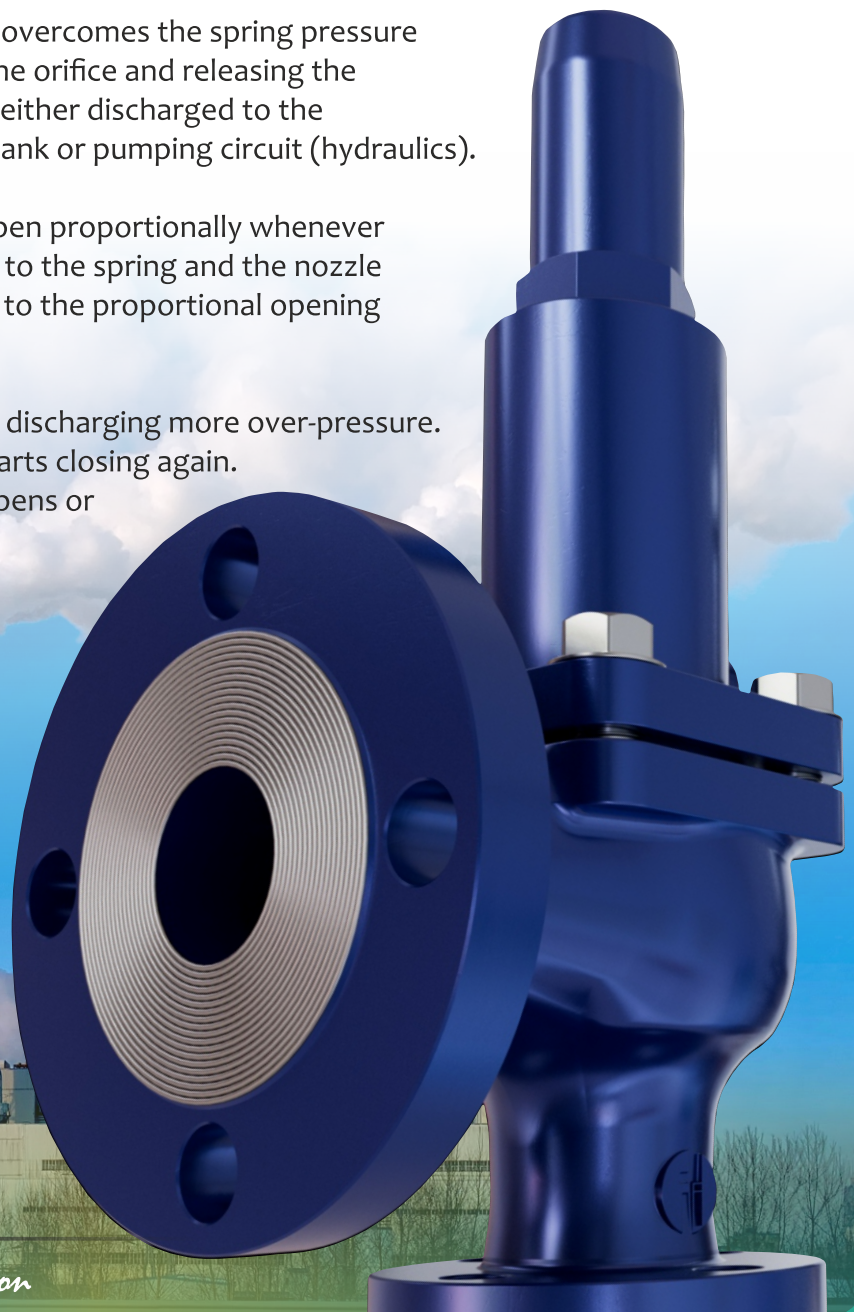
In most cases, a pressure relief valve consists of three parts: a diaphragm/ball, spring-loaded mechanism, and a nozzle. The orifice is closed using diaphragm or ball by a spring-loaded mechanism, which is placed in the valve's housing.

For adjustable pressure relief valves, the spring-loaded mechanism can be adjusted which directly alters the pressure on the spring mechanism. Increasing the pressure on the spring directly increases the set pressure limit, which is the point at which the valve starts to open and vice versa for decreasing the pressure on the spring. If there is no adjustability, a relief valve set-pressure is specified by the manufacturer.

Once the set pressure is reached, the pressure overcomes the spring pressure and pushes the diaphragm/ball back opening the orifice and releasing the excess pressure. Depending on the media, it is either discharged to the atmosphere (i.e. compressed air) or back to a tank or pumping circuit (hydraulics).

Due to the simple spring-loaded action, they open proportionally whenever they pass the set pressure. The disc connected to the spring and the nozzle have the same diameter (Figure 2) which leads to the proportional opening characteristic.

As pressure increases, the valve opens further, discharging more over-pressure. When the inlet pressure decreases the valve starts closing again. Often there is a tolerance on when the valve opens or closes compared to the set pressure.



# INTRODUCTION

## PRESSURE SAFETY VALVE

A pressure Safety valve characterized by rapid opening or closing and normally used to relieve compressible fluids. Safety valves are spring loaded pressure relief devices, but they are designed to provide full opening with minimum over pressure. Static pressure and the kinetic energy of the gas or vapor are utilized to overcome the spring force on the disk as it lifts, resulting in a popping action.

These devices are used primarily for steam and air services (compressible fluids) and provide rapid full opening or pop action with little over pressure. The primary function of a safety valve is to protect property and life. Because a safety valve is often the last device to prevent catastrophic failure under pressure conditions, it is important that the valve works at all times i.e. it must be 100% reliable.

Safety valves should be installed wherever the maximum allowable working pressure of a system or pressure containing vessel is likely to be exceeded, in particular under fault conditions due to the failure of another piece of equipment in the system.

### Pressure excess can be generated in a number of different ways including:

- ◆ Failure of a cooling system allowing vapour or fluid to expand
- ◆ Compressed air or electrical power failure to control Instrumentation
- ◆ Plant fires
- ◆ During the start-up conditions of a plant

## NEED OF SAFETY VALVE

If a steam system is subjected to excess pressure, it may result in damage to equipment, and process interruption. This may lead to product spoilage, and, if an environment becomes hazardous it might cause injury to employees. This type of overpressure may occur due to equipment malfunction – a failure in a cooling system for example, or, if there is a power cut or a fire. There are many situations that may lead to excess pressure but with a safety valve in place, the pressure is released securely.

### EXAMPLES OF APPLICATIONS INCLUDE:

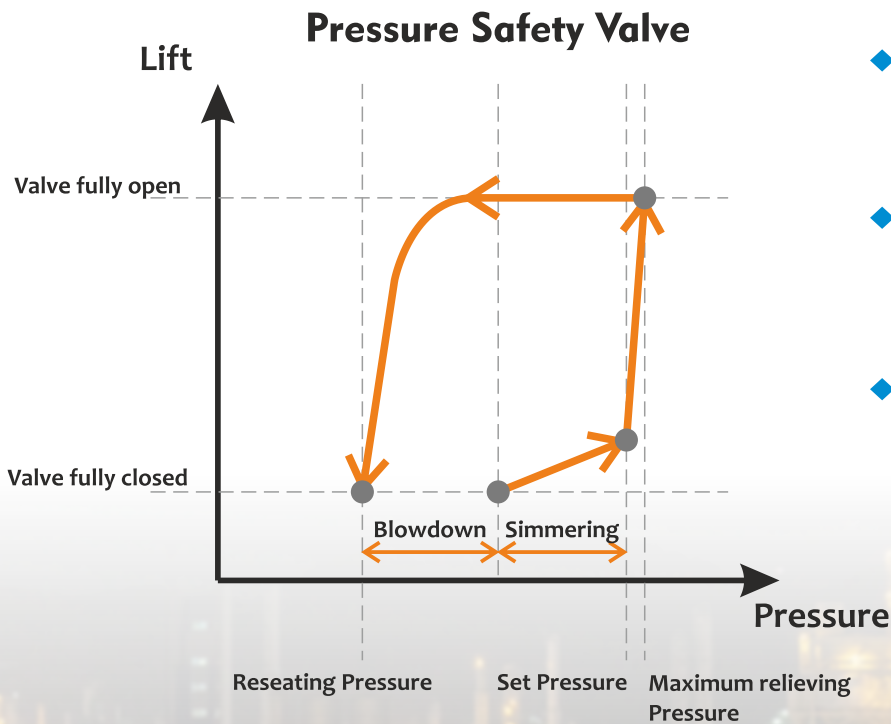
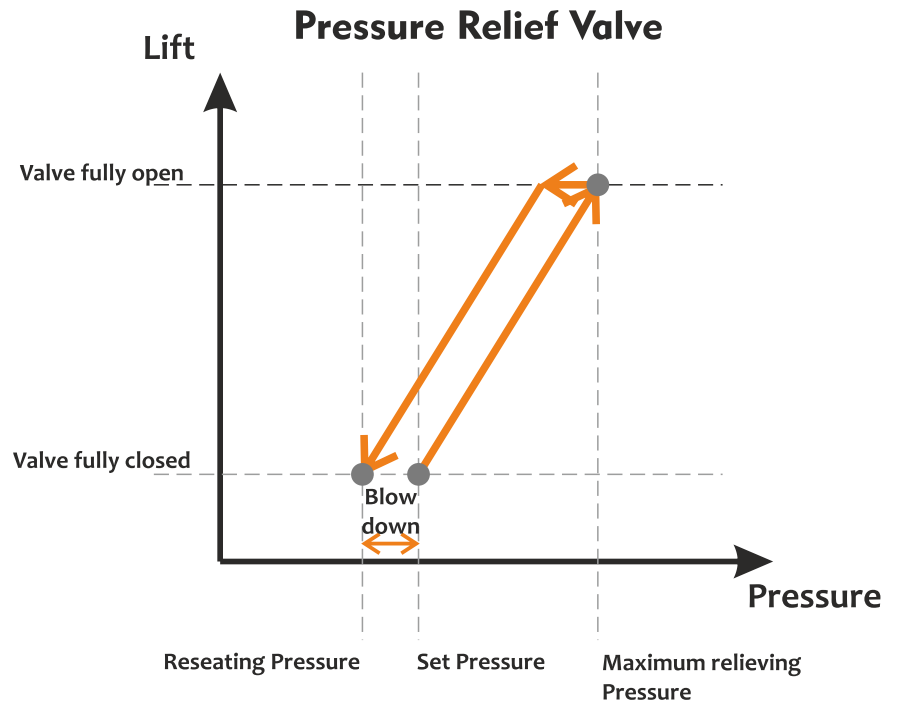
- ◆ Steam boilers
- ◆ Steam processing equipment
- ◆ Air service
- ◆ Autoclaves
- ◆ Chemical plants
- ◆ Food and beverage production
- ◆ Heat Exchangers
- ◆ Heating and ventilation systems
- ◆ Pharmaceutical production
- ◆ Pulp and paper mills
- ◆ Refineries



# INTRODUCTION

## VISUAL INTERPRETATION

- ◆ Pressure relief valve characterized by gradual opening or closing generally proportional to the increase or decrease in pressure.
- ◆ Pressure Relief valves are spring loaded pressure relief devices.
- ◆ At the set pressure, the inlet pressure force overcomes the spring force and the valve disc begins to lift off the seat.



- ◆ A pressure Safety valve characterized by rapid opening or closing and normally used to relieve compressible fluids.
- ◆ Safety valves are spring loaded pressure relief devices, but they are designed to provide full opening with minimum over pressure.
- ◆ Static pressure and the kinetic energy of the gas or vapor are utilized to overcome the spring force on the disc as it lifts, resulting in a popping action.

# FEATURES

Designed for maximum security and performance, we offer a wide range of safety valves to suit your requirements. We understand that the protection of employees is the most important requirement in the plant environment and so we ensure our safety valves are manufactured for secure, long-lasting protection against excess pressure. Designed to be compact, we offer a variety of body materials, features and sizes, so whatever the application, you can be sure that your people, process and equipment are safeguarded with safety valves from Fidicon Devices India.

## ◆ **High Capacity & Performance:**

Full compliance with ASME SEC VIII Div.1 standard 526, 520 & 527. Designed on concepts of safety, high performance, interchangeability and simplicity.

## ◆ **Simplified design for Built-in-Safety:**

Fool-proof design with few parts for build-in safety.  
Two-point guided nozzle for improved alignment.  
Arrangement for draining.

## ◆ **Trouble free operation:**

Designed to API 526 Std the nozzle, self-aligning top guided disc & Piston are made from stainless steel from different grades providing sufficient difference of hardness to prevent seizing or galling. Self-aligned disc is designed to withstand high & low temperature without leakage due to non-uniform thermal expansion.

It is a metal to metal seated valves; these valves are carefully lapped & mirror polished. This lapping together with the disc design assures excellent tightness & easy maintenance.

## ◆ **Designed for Interchangeability:**

Valve configuration can be changed from metal to metal to soft seat by simply changing the trim sub-assembly.



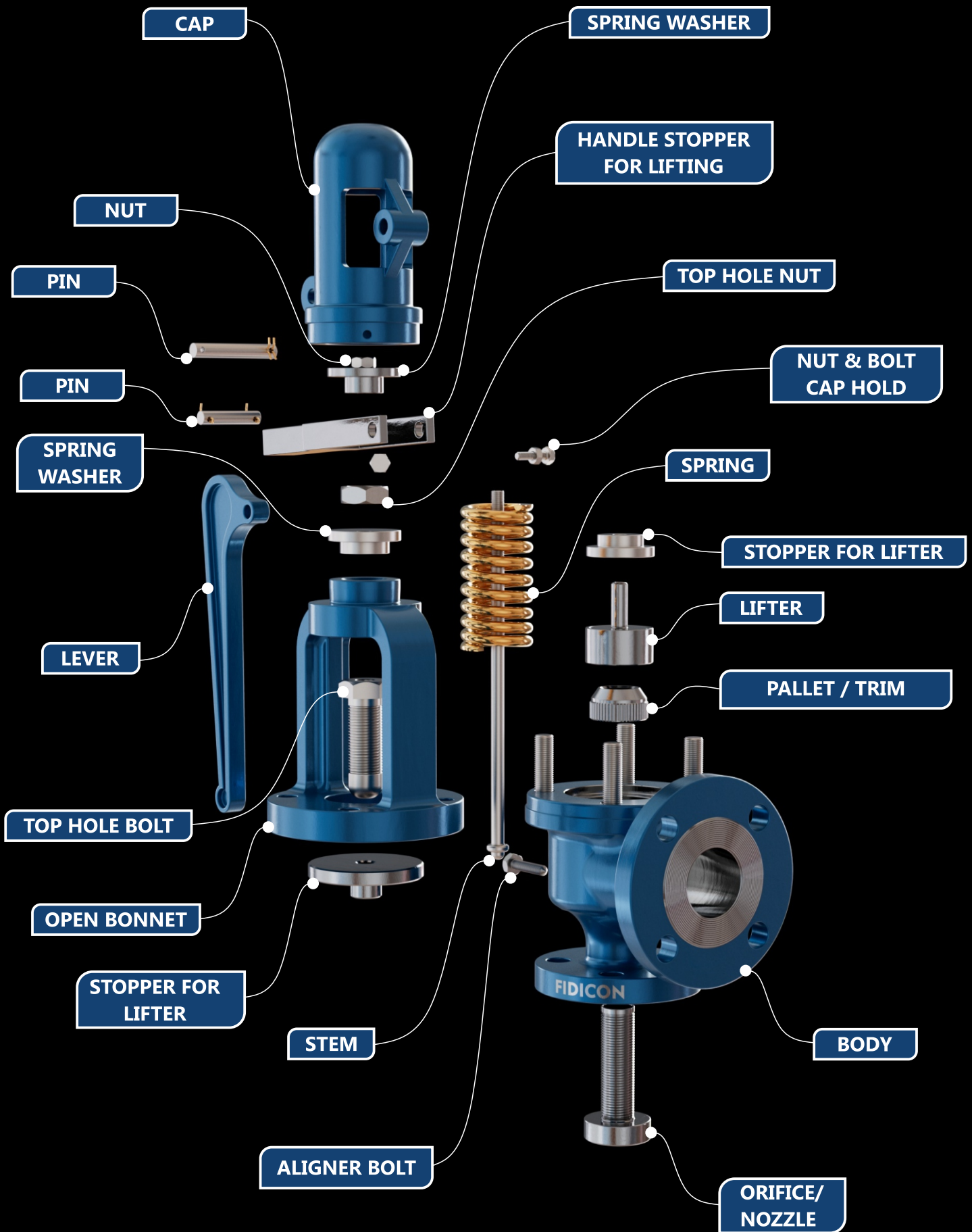


IMAGE : SAFETY RELIEF VALVE  
 FDI - SRV - 703  
 PRESSURE RELIEF VALVE  
 OPEN BONNET

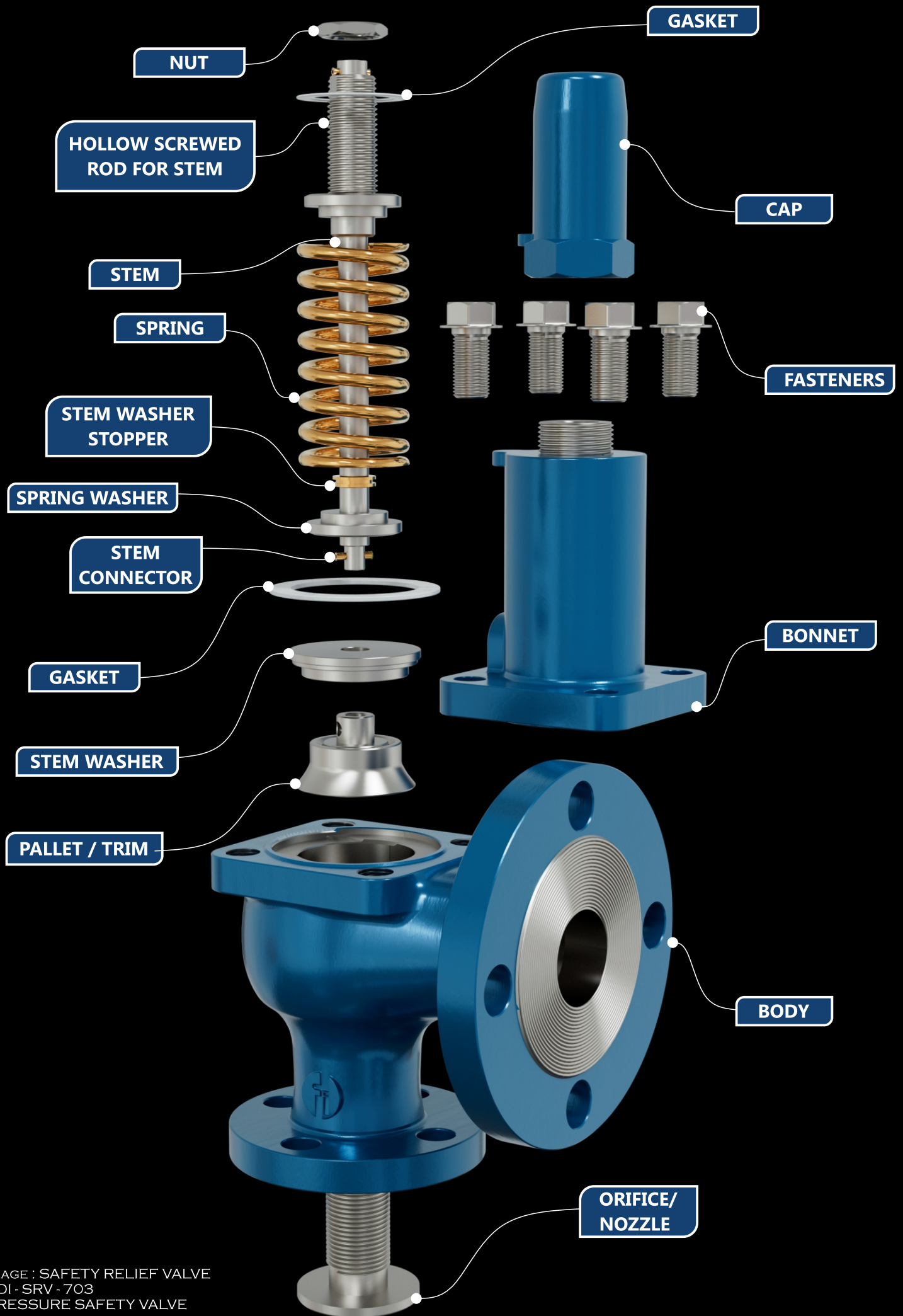


IMAGE : SAFETY RELIEF VALVE  
FDI - SRV - 703  
PRESSURE SAFETY VALVE



# PRODUCT GENERAL SPECIFICATIONS

## ◆ Model No.

FDI- SRV - 703  
SAFETY RELIEF VALVE

## ◆ Material of Construction:

ASTM A216 GR. WCB (CS), SS 304, SS 316, Hastelloy C, Aluminum, Forged Steel ASTM A105, PTFE, etc. as per Standards and Customer Request.

## ◆ Pressure Setting:

as per customer requirements.

## ◆ Construction:

Corrosion Resistant Construction  
Cast Body / Manufactured Smooth Surface.

## ◆ Available Sizes:

1/2" to 24"+ and different sizes as per customer request.

## ◆ Connection Type:

Flanged ANSI B 16.5 #150, #300, #600, #900, #1500, #2500, Threaded and other as per customer requirements.

## ◆ Product Sizing:

Design / Vent Sizing are as per:

API 520, API 526, API 527

## ◆ Other Types:

Pressure Relief Valve, Pressure Safety Valve, Open Bonnet/Closed Bonnet, etc.

Contact Sales Team for More Information.

## PRODUCT TESTING

### We offer Following Product Tests,

- ◆ Dimensional Checks
- ◆ Air Leakage Test
- ◆ Performance Test, F.A.T etc.
- ◆ Other Test as per API Std.

## RECOMMENDED DISPOSAL

- ◆ Give it back to us & we will take care of recycling & possible disposal.
- ◆ User can dis-assemble the product in multiple stage
- ◆ The above may be handed over (state pollution board), authorized re-cycler item-wise.



# DESIGN & STANDARD CODES

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## American Petroleum Institute (API)

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- ◆ **API Standard 520 Part I** – Sizing and Selection of Pressure-relieving Devices in Refineries
- ◆ **API Standard 520 Part II** – Installation of Pressure-relieving Devices in Refineries
- ◆ **API Standard 521** - Guide for Pressure-relieving and De-pressuring Systems
- ◆ **API Std 526** - Flanged Steel Pressure Relief Valves
- ◆ **API Std 527** - Seat Tightness of Pressure Relief Valves
- ◆ **API Standard 2000** - Venting Atmospheric and Low-pressure Storage Tanks
- ◆ **API Guide for Inspection of Refinery Equipment Chapter XVI** - Pressure Relieving Devices

## American Society of Mechanical Engineers (ASME)

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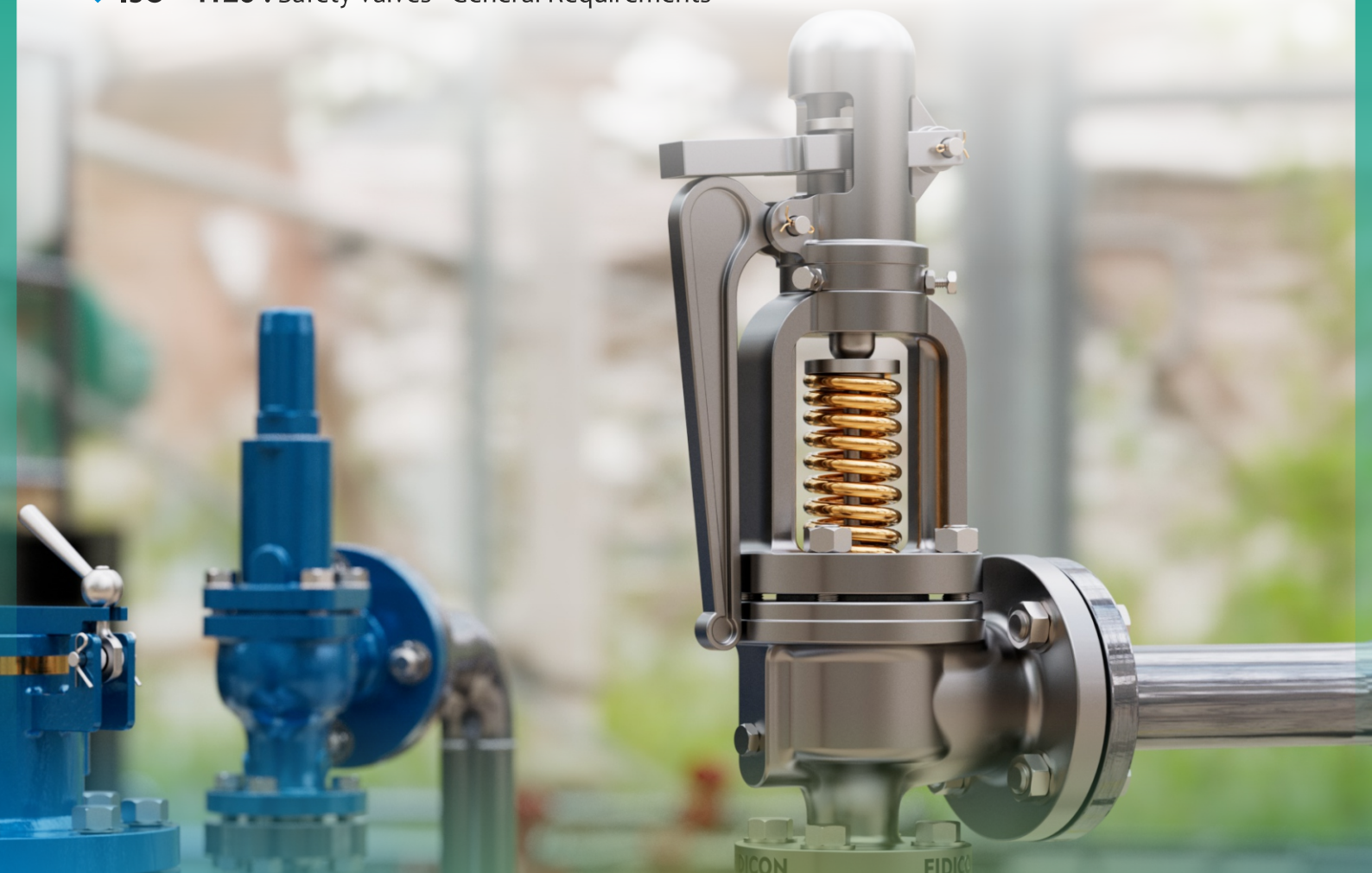
### ASME Boiler & Pressure Vessel Code

- ◆ **Section I** - Power Boilers
- ◆ **Section II** - Materials
- ◆ **Section IV** - Heating Boilers
- ◆ **Section VII** - Care of Power Boilers
- ◆ **Section VIII** - Pressure Vessels
- ◆ **Section IX** - Welding and Brazing Qualification

## International Organization for Standardization (ISO)

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- ◆ **ISO - 4126** : Safety Valves - General Requirements





## ENQUIRY SPECIFICATIONS:

- [1] Service Media Details.
- [2] Tank Volume, Type, MOC of Tank, Dimensions for Fire Exposure.
- [3] Pump Flow ( In-Charge, Discharge Flow Rate )
- [4] Product Design Condition ( Normal Vent / Fire )
- [5] N<sub>2</sub> Blanketing System Available ( If Yes, Flowrate / No )
- [6] System Operating and Design Pressure.
- [7] System Operating and Design Temperature.
- [8] Set Pressure Requirements
- [9] Material Specifications ( Body, Internal )

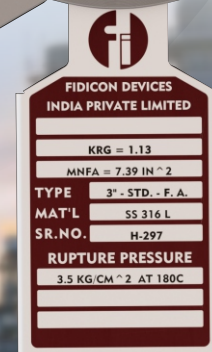
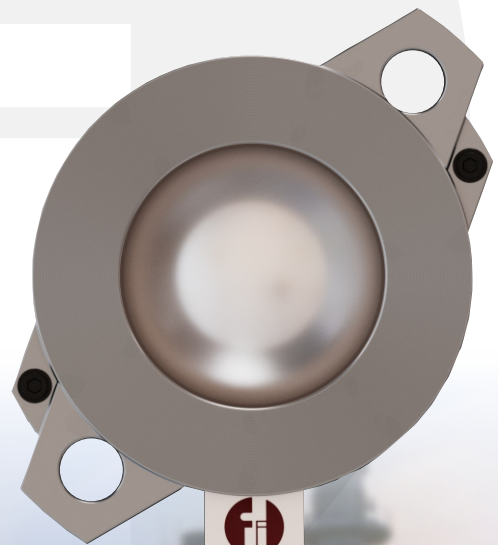


## RECOMMENDED SPARES

- [1] Stem
- [2] Spring
- [3] Lever
- [4] Spring Washer
- [5] Orifice

## OTHER RANGE OF PRODUCTS

- [1] Flame Arrester
- [2] Breather Valve
- [3] Level Indicators
- [4] Rotameters
- [5] Emergency Relief Valve
- [6] Gauge Hatch
- [7] Strainers
- [8] Pressure Reducing Valve
- [9] Safety Relief Valve
- [10] Flowmeters
- [11] Level Switches
- [12] Pressure Reducing Station
- [13] Level Gauge, etc.



### Any Query?

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