

High Efficiency POSV Accessories

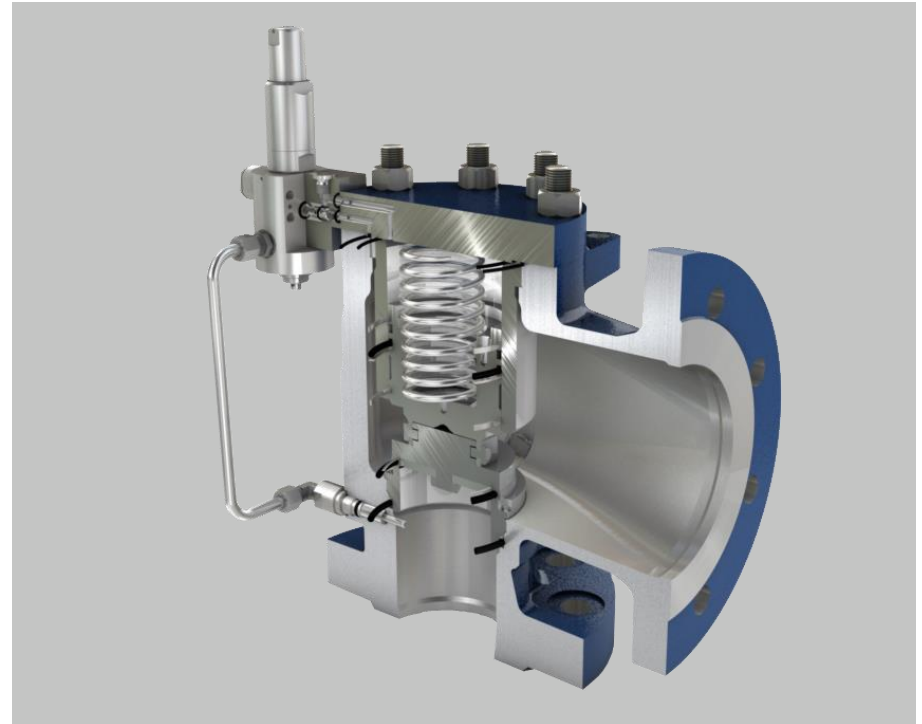


Objectives of this Presentation. Knowledge to learn.

1. [Objectives](#) | 2. [Main Valve design](#) | 3. [Backflow Preventer](#) | 4. [Connections](#) | 5. [Manual Blowdown](#) | 6. [Remote Sensing & Supply Filter](#) | 7. [Test Gag & Lifting Device](#) | 8. [Summary](#)

The aim of the presentation is to consolidate and extend existing knowledge. Especially the status regarding Accessories and Options at the start of the LESER POSV shall be presented.

- The scope of the product range regarding Options is understood
- Specifics of feasible connections are understood
- New Option Codes are understood

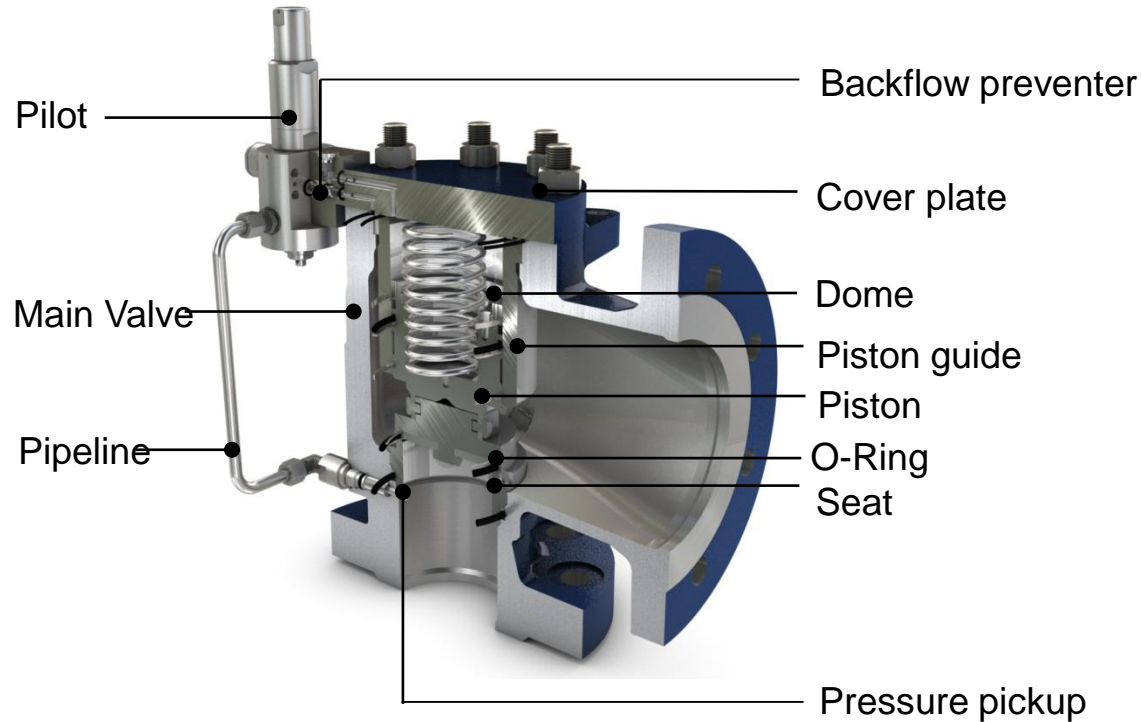


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Design and Function. Design of Main Valve.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary

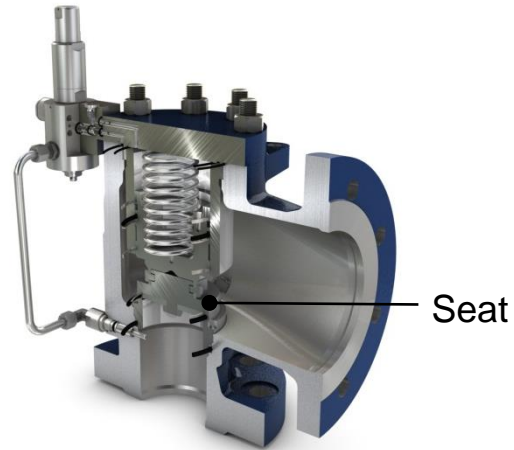


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Design and Function. Seat Designs: API Standard Orifices and Extra Orifices.

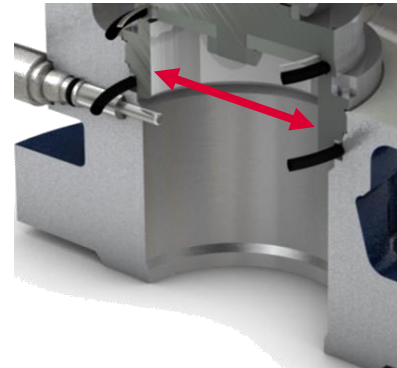
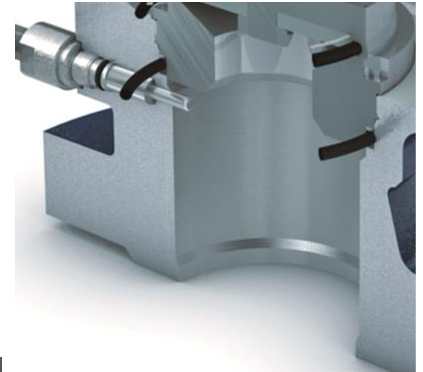
1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary



Seat inner diameter

Maximum = Extra Orifice
Smaller = acc. API 526 Orifice

API Standard Orifice



Extra Orifice

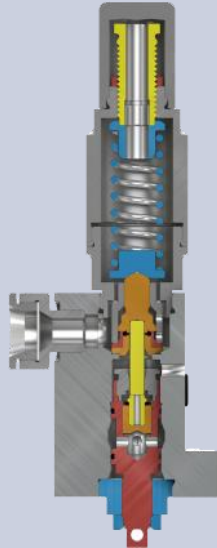
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Design and Function. Pilot Design.

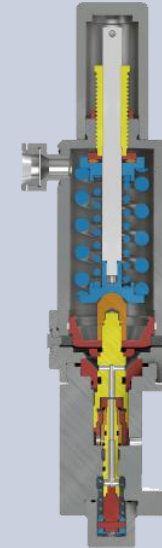
1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary

Pop Action



Pilot with full lift characteristic, opens within 1%

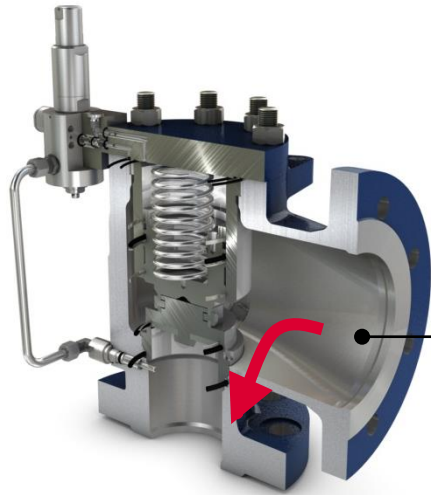
Modulate Action



Modulating like proportional spring loaded safety valve

Design and Function. Backflow Preventer.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary



Back pressure > pressure at valve inlet

Backflow Preventer	Application
<p>A backflow preventer is always considered when there is danger of a return flow of the medium into the system.</p>	<ul style="list-style-type: none">▪ Vacuum at inlet, atmospheric pressure at outlet▪ Pressure fluctuation at inlet, operation at different pressure levels lower than back pressure▪ Pressure fluctuation at outlet, blow off in outlet line e.g. flare line

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Design and Function. Backflow Preventer.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary

Operational mode (inactive) convent. operation:

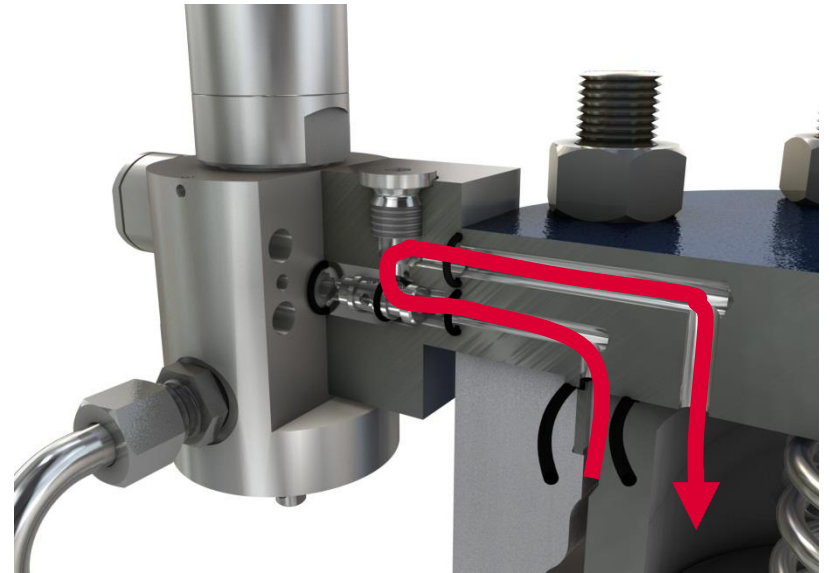
right-hand stop

Operational mode (active) backflow prevention:

left-hand stop

Principle of 3/2-way directional valves:

- The respective operational modes only allow flow in one direction.
- The sealing O-Ring is available in FKM, EPDM as well as FFKM.
- Backflow ratio of up to 70% of set pressure is possible.

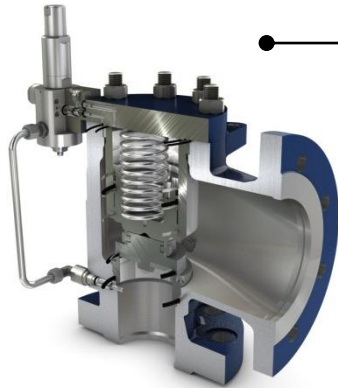


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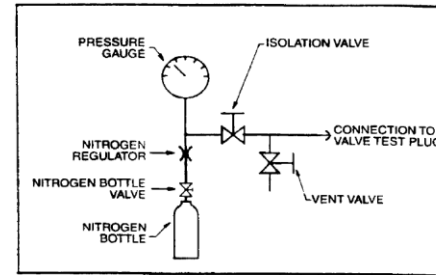
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Design and Function. Field Test Connection (FTC).

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary



● Routine test of setting of pilot valve is necessary – maintenance aspect, recommended at least once per year.



TYPICAL FIELD TEST ARRANGEMENT

Field Test Connections	Additional equipment
<p>Test of set pressure and mobility – IN-SITU. POSV does not have to be dismantled.</p>	<p>For the test the following further equipment is required:</p> <ul style="list-style-type: none">▪ Test media supply (Nitrogen flask)▪ Test manometer▪ Pressure regulating valve▪ Shut-off valve▪ Pressure reducing valve

Design and Function. Field Test Connection (FTC).

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. **Connections** | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary

Principle of a 3/2-way directional valves:

- The respective operational modes only allow flow in one direction
- Set pressure can be compared to data on information plate.
- The mobility of the main valve piston is also tested.
- Connection 3/8" NPT for external source
- **CAUTION: POSV is activated!**

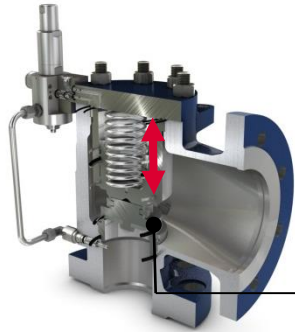


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Design and Function. Manual Blowdown.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. **Manual Blowdown** | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary



Lifting of valve (as with lever of safety valve) to test mobility

Manual Blowdown	Application
<p>Test if piston moves vertically in opening direction.</p> <p>CAUTION: Media discharge!</p>	<ul style="list-style-type: none">▪ Corrosive media▪ Fluid media with tendency to corrode stainless steel▪ Particle loaded media▪ In an emergency the system can be vented

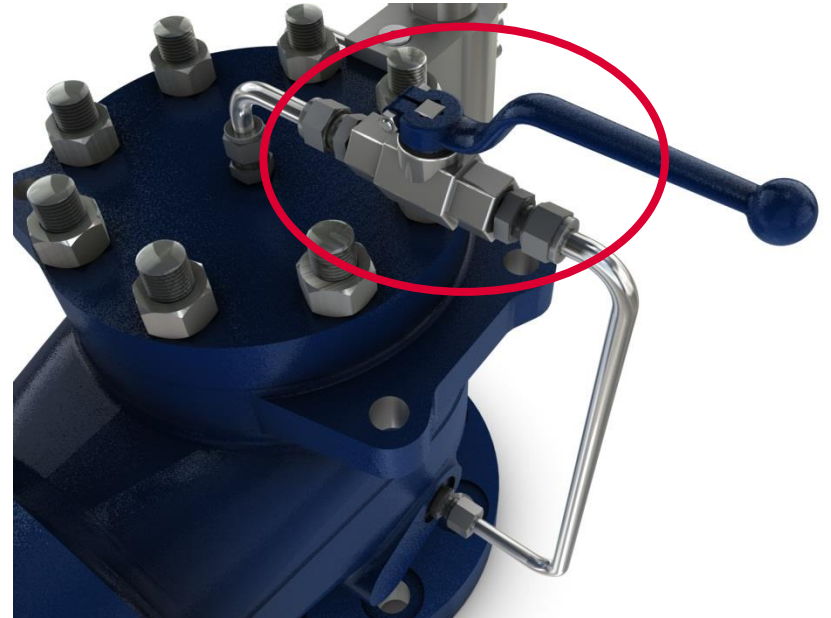
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Design and Function. Manual Blowdown.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. **Manual Blowdown** | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary

- The ball valve can be opened if required. The connection is made via a NPT 1/8" pipe which is suitable up to PN500.
- A feedback of the dome volume into the connection for the drain hole is possible.
- Standard NPT-fittings are used.

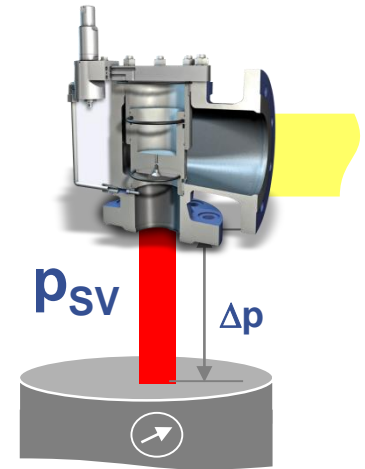


Design and Function. Remote Sensing.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary



Pressure loss
at inlet > 3%



Remote Sensing	Application
<p>Pressure loss at inlet too high.</p>	<ul style="list-style-type: none">▪ Extra Orifice flow diameter causes high pressure loss for small nominal size of inlet pipe▪ Customary layout in levels for safety devices (e.g. petrochemical industry in US) leads to long pipeline lengths▪ Old plants were not constructed considering inlet pressure loss.

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Design and Function. Remote Sensing.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary

The Remote Sensing package includes:

- 1) Locking screw for main valve at remote sensing position
- 2) NPT 3/8" with connection for outer pipe diameter
 - a) 12mm or
 - b) 1/2"

The customer is responsible for the piping.

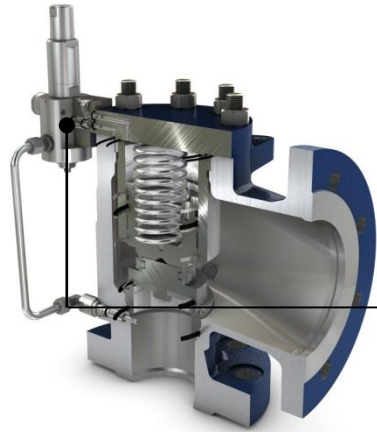


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Design and Function. Pilot Supply Filter.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary



Contaminated media

Pilot Supply Filter	Application
<p>Also operating conditions with contaminated media can be controlled with a pilot supply filter.</p>	<ul style="list-style-type: none">▪ High particle load▪ Heavy contamination of media▪ Lifetime of “thimble filter” of pilot is not long enough

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Design and Function. Pilot Supply Filter.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary

- The filter area of the pilot supply filter is sufficient to significantly enhance the lifetime.
- Area Pilot Supply Filter = 270x area filter at pilot valve inlet
- The filter element can be reused after cleaning.
- All parts are made of stainless steel
- Filter unit can also be used for high pressure version (up to 426bar)
- Filter element is standard with mesh size 25µm
- Filter can be used for liquid and gaseous media

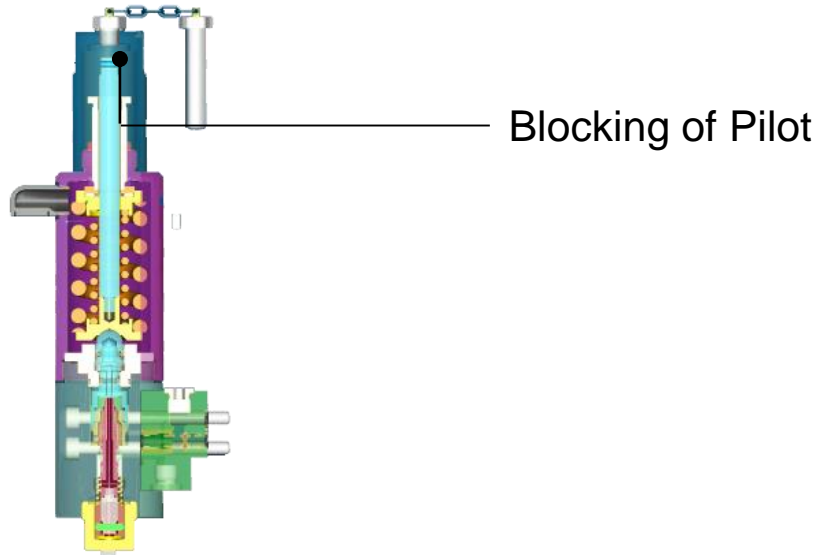


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Design and Function. Test Gag.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. **Test Gag & Lifting Device** | 8. Summary



Test Gag	Application
Hydrostatic testing of vessel.	<ul style="list-style-type: none">Hydrostatic testing in fully assembled plant

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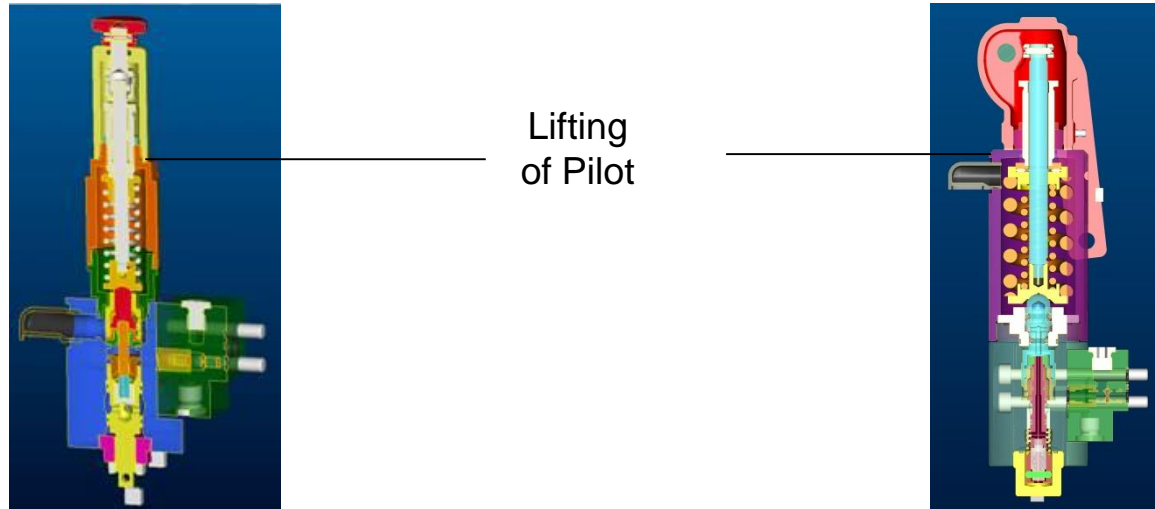
Design and Function. Test Gag.

1. [Objectives](#) | 2. [Main Valve design](#) | 3. [Backflow Preventer](#) | 4. [Connections](#) | 5. [Manual Blowdown](#) | 6. [Remote Sensing & Supply Filter](#) | 7. **Test Gag & Lifting Device** | 8. [Summary](#)

- The lifting device size 0 for Series 810 and lifting device size 1 for **Series 820** means that the design of the Test Gag is different. The structure blocks the pilot so that it cannot operate.
- **Series 810**: A combination of Test Gag and Pilot Lifting Device is not possible, because the lifting device uses the cap of the cover structurally.

Design and Function. Pilot Lifting Device.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. **Test Gag & Lifting Device** | 8. Summary



Pilot Lifting Device	Application
Manual lifting of pilot to routinely check the mobility and set pressure.	<ul style="list-style-type: none">▪ Test mobility esp. when media is contaminated▪ Requirement of standard▪ Emergency relief of system

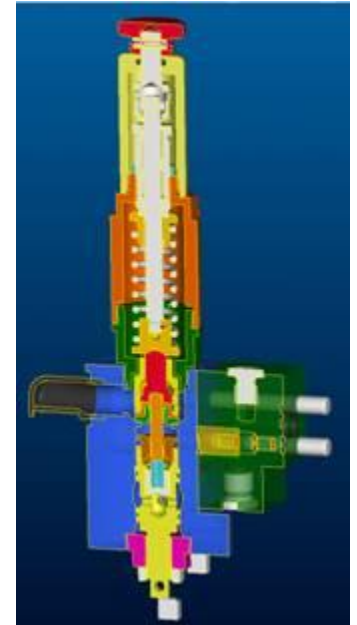
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Design and Function. Pilot Lifting Device.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary

- The lifting device **size 0 for Series 810** and lifting device **size 1 for Series 820** means that the design of the Pilot Lifting Device is different. Lifting device size 0 acc. modular design principle as button lifting device. Lifting device size 1 as lever lifting device.
- Lifting capacity up from 75 % of set pressure respectively 102 bar. The smaller value applies.
- **Series 810:** A combination of Test Gag and Pilot Lifting Device is not possible, because the lifting device uses the cap of the cover structurally.



Series 810

Design and Function – Summary. Pilot Operated Safety Valve.

1. Objectives | 2. Main Valve design | 3. Backflow Preventer | 4. Connections | 5. Manual Blowdown | 6. Remote Sensing & Supply Filter | 7. Test Gag & Lifting Device | 8. Summary

- Design: API 526 Orifice or Extra Orifice design
- Funktion: Series 820 Modulate Action and Series 810 Pop Action
- Needle valve for high pressures
- Nozzle model for POSV > CL600 inlet flange class
- Explosive Decompression:
 - FKM-ED conform design
 - FFKM-ED conform design
- Temperature area:
 - FKM-cold, -48°C medium temp. for ambient temperature up to -16°C
 - FKM-cold, -48°C medium temp. for ambient temperature up to -48
- **Sealing concept:**
 - O-Ring disc
 - Sealing plate
 - Metal disc (stainless steel disc, stellited disc)
- **Accessories:**
 - Backflow Preventer (standard)
 - Field Test Connection (R26)
 - Manual Blowdown (R24, R27)
 - Remote Sensing (R28)
 - Pilot Supply Filter (R30)
 - Test Gag (R33)
 - Pilot Lifting Device (R25)
 - Carbon Steel Disc (R71)
 - Sealing Plate (I39 / R67)
 - Nozzle (R69)
 - Needle Valve (R4A)

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Thank you for your attention.

