



Relief Valves

Medium Pressure, High Pressure, and NPT Inlet Options to 75,000 psi

RVP/PRVP and RVS/PRVS Series



Principle of Operation:

Parker Autoclave Engineers relief valves are designed to open proportionally to increasing pressure. Therefore, they are not recommended for applications requiring immediate full valve flow at set pressure and should not be considered a "Safety Valve". Full flow of relief valve is defined as 110% of set pressure.

RVP Metal Seat Relief Valve:

Series RVP relief valves provide reliable venting of gases or liquids for set pressures from 3,000 psi (205 bar) minimum to 75,000 psi (5170 bar). The standard temperature range for all models is -423° to 400°F (-252° to 204°C). A high temperature option to 750°F (399°C) is also available.

These precision valves are designed for pressure gas systems, cryogenic systems, petrochemical applications and other special systems. Capable of handling air, gases, steam, vapor and liquids, they are however, not recommended for steam boiler applications nor are they ASME code stampable (K-Factors are not available).

RVS Soft Seat Relief Valve:

Series RVS relief valves utilize a PEEK soft seat design for reliable venting of gases at set pressures from 1,500 psi (103 bar) to 20,000 psi (1380 bar). The operating temperature range is -50° to 400°F (-46° to 204°C).

The soft seat design provides bubble tight sealing, repeatable pop-off, and reseal. Additionally, soft seat valves provide a higher cycle life than metal seat relief valves.

These precision valves are designed for gases and liquid systems where zero leakage is critical.

They are not recommended for liquefied gases which produce gas at cryogenic temperatures below -50°F upon relief.



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Relief Valves: Pressures to 75,000 psi (5170 bar)

Features and Benefits:

Material:

Standard models of Relief Valves are constructed of UNS S31600, 316 cold worked stainless steel with selected components made of anti-galling stainless steel material for optimum economy and ruggedness.

Connections:

Cone and Thread versions (RVP & RVS Series):

Models 5, 10, and 20RVS Series = SF562C 9/16" Medium Pressure Cone & Thread Connection

Models 5, 10, 15, and 20RVP = SF562C 9/16" Medium Pressure Cone & Thread Connection

Models 30, 45, and 60 RVP = F375C 3/8" High Pressure Cone & Thread Connection

Model 75RVP = F312C150 5/16" Ultra-High Pressure Cone & Thread Connection

NPT Inlet Versions (PRVP & PRVS Series):

Models 5, 10 and 15 PRVS and PRVP Series = 1/2" NPT

The outlet connection on all models is a female 3/4" NPT. While adapters to other sizes and connection types are available, they must be sized for specific flow requirements. Outlet pressure cannot exceed 500 psi (35 bar) in all pressure ranges.

Orifice Sizes:

Orifice diameters range from .062 (1.57mm) to .312" (7.92mm). (See chart on page 5 for list of valve orifice options)

Full Lift for Full Flow:

These relief valves are designed to open as a function of increasing system pressure. Proper spring selection assures repeatability of opening, full lift and flow, and reseal pressures.

Reliability and Long Service Life:

Materials engineering and stringent quality control procedures combine to assure the highest quality, reliability and service life. Each valve is preset and factory sealed to ensure proper valve operation. Note: Mount as far from Pump Outlet as possible to avoid premature relief and extend valve life.

Setpoint Accuracy:

Setpoint Accuracy is $\pm 3\%$.

Re-Seal Pressure: 85% of set pressure

High Set Pressure Capability:

Unique seat construction plus over-the-nozzle guiding and proper selection of materials permits standard set pressures to 75,000 psi. (5170 bar).

Dependable Shut-Off:

Series RVP/PRVP relief valves are designed to provide shut-off of liquids and gases under pressure to commercial tightness standards. Series RVS/PRVS relief valves are designed to provide bubble tight shut off of gases and liquids.

Fewer Parts, Ease of Maintenance:

Engineered to perform with fewer basic components, both RVP/PRVP and RVS/PRVS valves facilitate minimum stocking of spare parts and ease of maintenance. The combined angle seat in the RVP/PRVP series eliminates the need for lapping in rework.

Special Requirements:

Most models available with CE Mark/PED Approval (PRVP and PRVS are exception) to Category IV. SOG (NACE MR0175) option available upon request.



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Relief Valves: Pressures to 75,000 psi (5170 bar)

Options:

Parker Autoclave Engineers can supply various options on special order. A high temperature option is also available for temperatures to 750°F (399°C) for RVP or PRVP models. To specify high temperature option: Add suffix “HT” for 750°F (399°C) high temperature option.

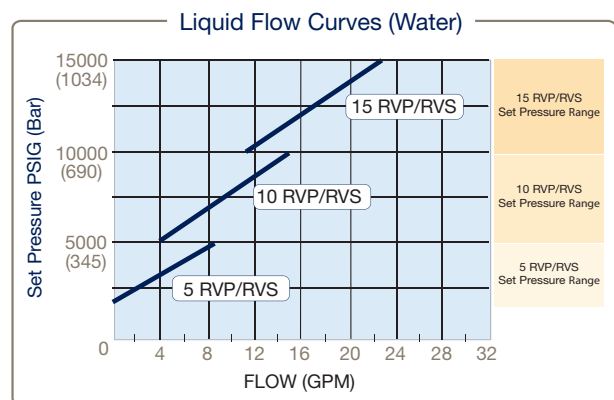
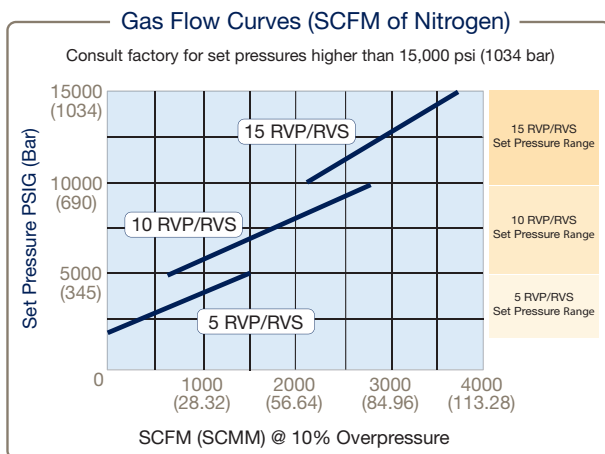
Note: Pressure rating for elevated temperature based on derating curves. (See Technical Brochure).

Caution:

1. AE relief valves are preset and factory sealed. Warranty is voided if seal is broken by customer.
2. Maximum system operating pressure should not exceed 90% of relief valve set pressure. **Operating pressures in excess may cause weepage resulting in damage to the plug and seat.**
3. Relief Valves are not to be used as Pressure regulators, RVP has limited actuation life dependent on pressure.

Ordering Instructions:

To permit prompt and correct responses to your order, we will require the following information: quantity, valve catalog number, service requirements (liquid, gas & vapor), set pressure (PSIG - bar), and service temperature range.



All models are designed primarily for thermal expansion or low volume relief applications at high pressures where flow is not critical.

Note: Curves on this page are based on capacities of valves only and do not take tubing into account.

Caution should be exercised in proper selection of medium pressure tubing based on actual operating conditions. Two series available: 15,000 (1035 bar) and 20,000 (1380 bar).



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Relief Valves: Pressures to 75,000 psi (5170 bar)

Relief Valve Dimensions and Details:

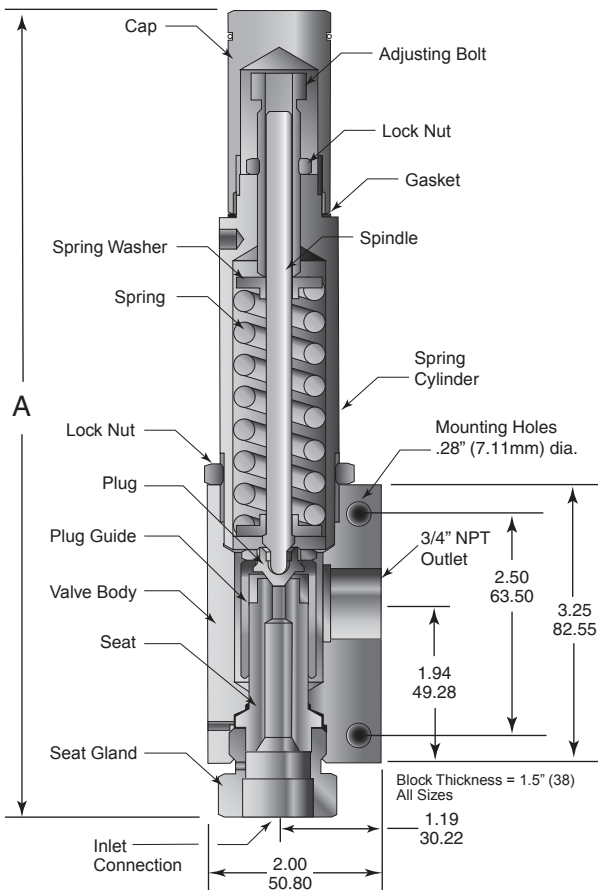


Figure 1
RVP/PRVP Series (Metal Seat)

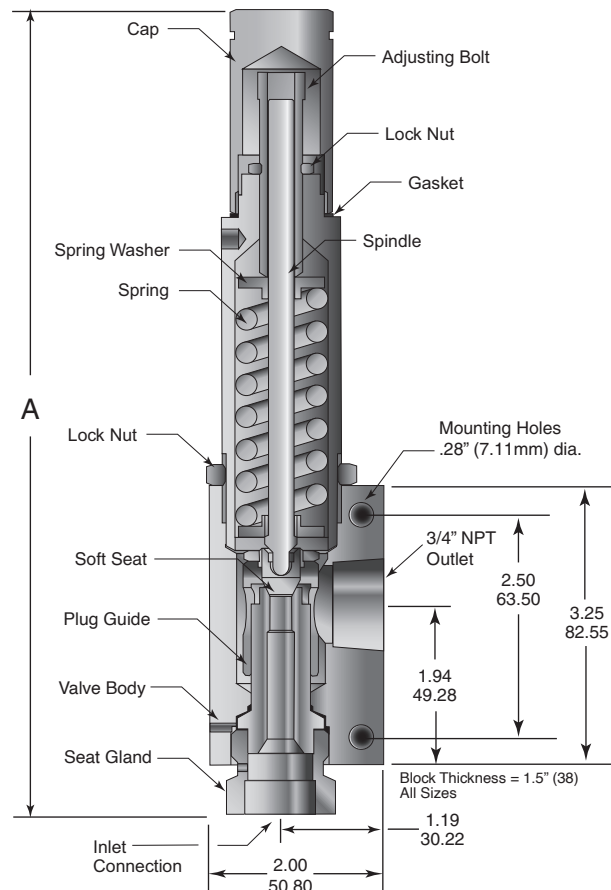


Figure 2
RVS/PRVS Series (Soft Seat)

Note: For "A" dimension please reference the "Ordering and Specifications" table on Page 5.

Relief Valves: Pressures to 75,000 psi (5170 bar)

Ordering and Specifications:

FIGURE 1: RVP & PRVP Metal Seat Series Relief Valve (PRVP is NPT Inlet version)

| Catalog Number* | Connection Size and Type | | Orifice Diameter Inches (mm) | Pressure Rating psi (bar) @ 100°F (38°C) | | | Dimension Inches (mm) "A" | Repair Kit ¹ |
|-----------------|--------------------------|-------------------|------------------------------|------------------------------------------|-----------------|-----------------------|------------------------------|-------------------------|
| | Inlet Connection | Outlet Connection | | Minimum Setting | Maximum Setting | Maximum Back Pressure | | |
| 5PRVP8072 | 1/2" FNPT | 3/4 FNPT | 0.312 (7.92) | 3,000 (210) | 5,000 (345) | 500 (35) | 10.47 (266) | R5PRVP |
| 10PRVP8072 | 1/2" FNPT | 3/4 FNPT | 0.250 (6.35) | 5,000 (345) | 10,000 (690) | 500 (35) | 10.47 (266) | R10PRVP |
| 15PRVP8072 | 1/2" FNPT | 3/4 FNPT | 0.188 (4.78) | 10,000 (690) | 15,000 (1035) | 500 (35) | 10.47 (266) | R15PRVP |
| 5RVP9072 | SF562CX (9/16" MP) | 3/4 FNPT | 0.312 (7.92) | 3,000 (210) | 5,000 (345) | 500 (35) | 9.40 (238) | R5RVP |
| 10RVP9072 | SF562CX (9/16" MP) | 3/4 FNPT | 0.250 (6.35) | 5,000 (345) | 10,000 (690) | 500 (35) | 9.40 (238) | R10RVP |
| 15RVP9072 | SF562CX (9/16" MP) | 3/4 FNPT | 0.188 (4.78) | 10,000 (690) | 15,000 (1035) | 500 (35) | 9.40 (238) | R15RVP |
| 20RVP9072 | SF562CX (9/16" MP) | 3/4 FNPT | 0.156 (3.96) | 15,000 (1035) | 20,000 (1380) | 500 (35) | 9.40 (238) | R20RVP |
| 30RVP6072 | F375C (3/8" HP) | 3/4 FNPT | 0.125 (3.18) | 15,000 (1035) | 30,000 (2070) | 500 (35) | 9.52 (241) | R30RVP |
| 45RVP9072 | F562C (9/16" HP) | 3/4 FNPT | 0.093 (2.36) | 25,000 (1725) | 45,000 (3100) | 500 (35) | 9.52 (241) | R45RVP |
| 60RVP6072 | F375C (3/8" HP) | 3/4 FNPT | 0.078 (1.98) | 30,000 (2070) | 60,000 (4140) | 500 (35) | 9.52 (241) | R60RVP |
| 75RVP5072 | F312C150 (5/16" UHP) | 3/4 FNPT | 0.062 (1.57) | 37,000 (2550) | 75,000 (5170) | 500 (35) | 9.83 (249) | R75RVP |

FIGURE 2: RVS & PRVS Soft Seat Series Relief Valve (PRVS is NPT Inlet version)

| Catalog Number* | Connection Size and Type | | Orifice Diameter Inches (mm) | Pressure Rating psi (bar) @ 100°F (38°C) | | | Dimension Inches (mm) "A" | Repair Kit ¹ |
|-----------------|--------------------------|-------------------|------------------------------|------------------------------------------|-----------------|-----------------------|------------------------------|-------------------------|
| | Inlet Connection | Outlet Connection | | Minimum Setting | Maximum Setting | Maximum Back Pressure | | |
| 5PRVS8072 | 1/2" FNPT | 3/4 FNPT | 0.312 (7.92) | 1,500 (103) | 5,000 (345) | 500 (35) | 10.47 (266) | R5PRVS |
| 10PRVS8072 | 1/2" FNPT | 3/4 FNPT | 0.250 (6.35) | 5,000 (345) | 10,000 (690) | 500 (35) | 10.47 (266) | R10PRVS |
| 15PRVS8072 | 1/2" FNPT | 3/4 FNPT | 0.188 (4.78) | 10,000 (690) | 15,000 (1035) | 500 (35) | 10.47 (266) | R15PRVS |
| 5RVS9072 | SF562CX (9/16" MP) | 3/4 FNPT | 0.312 (7.92) | 1,500 (105) | 5,000 (345) | 500 (35) | 9.40 (238.76) | R5RVS |
| 10RVS9072 | SF562CX (9/16" MP) | 3/4 FNPT | 0.250 (6.35) | 5,000 (345) | 10,000 (690) | 500 (35) | 9.40 (238.76) | R10RVS |
| 20RVS9072 | SF562CX (9/16" MP) | 3/4 FNPT | 0.156 (3.96) | 10,000 (690) | 20,000 (1378) | 500 (35) | 9.40 (238.76) | R20RVS |

* Maximum pressure rating based on the lowest rating of any component. Actual working pressure may be determined by tubing pressure rating, if lower. Note: For pressure rating see selection chart.

¹ Include suffix from original valve for correct options

| Suffix | Relief Valve Options (add as suffix to Catalog number listed above) |
|--------|-------------------------------------------------------------------------------------------|
| HT | High Temperature Spring to 750°F (399°C) (RVP or PRVP Series only) |
| K | Antivibration Gland Fitting (Cone & Thread Connections) |
| HYG | Modified for use with Hydrogen/Helium |
| CE | CE Mark/PED Category IV (not available with PRVP or PRVS models) |
| SOG | Materials used are NACE Capable & Hardness verified (Maximum pressure reduction possible) |
| 2507 | UNS S32750 2507 Super Duplex Wetted Materials |
| HC | UNS N10276 Hastelloy C-276 Wetted Materials |
| IN625 | UNS N06625 Inconel 625 Wetted Materials |

(See "Technical Brochure" for Pressure/Temperature effect on temperatures above ambient.)

Note: use of optional material only changes "wetted parts" to selected material. Items like collars and glands remain CW 316/316L SS. Use **-SOG** (Includes hardness check for NACE) or **-AP** suffix

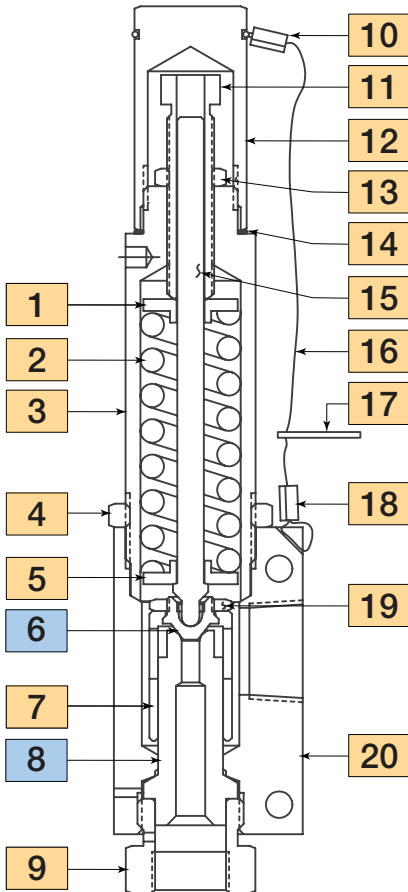


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Relief Valves: Pressures to 75,000 psi (5170 bar)

Cone and Thread Version: RVP Series



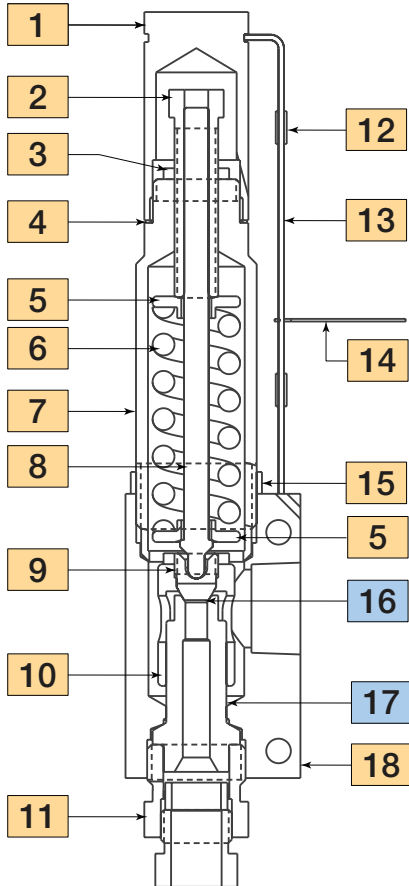
Material of Construction:

| Item # | Description | Material |
|--------|-------------------|------------------|
| 1 | Spring Washer | 316 SS |
| 2 | Spring | 316 SS |
| 3 | Spring Cylinder | 316 SS |
| 4 | Lock Nut | 316 SS |
| 5 | Spring Washer | 316 SS |
| 6 | Plug | 316 SS |
| 7 | Plug Guide | Nitronic 60 |
| 8 | Seat | 316 SS |
| 9 | Seat Gland | 316 SS |
| 10 | Splicing Sleeve | - |
| 11 | Adjusting Bolt | Nitronic 60 |
| 12 | Cap | 316 SS |
| 13 | Lock Nut | 316 SS |
| 14 | Gasket | 302/304 Annealed |
| 15 | Spindle | 316 SS |
| 16 | Cable, 1/16" Dia. | 300 Series SS |
| 17 | Nameplate | 300 Series SS |
| 18 | Splicing Sleeve | - |
| 19 | Lock Nut | 316 SS |
| 20 | Valve Body | 316 SS |

Typical spare parts found in Repair Kits listed on page 5

Relief Valves: Pressures to 75,000 psi (5170 bar)

Cone and Thread Version: RVS Series



Material of Construction:

| Item # | Description | Material |
|--------|-----------------|-----------------|
| 1 | Cap | 300 Series SS |
| 2 | Adjusting Bolt | Nitronic 60 |
| 3 | Lock Nut | 316 SS |
| 4 | Gasket | 304 SS Annealed |
| 5 | Spring Washer | 316 SS |
| 6 | Spring | 316 SS |
| 7 | Spring Cylinder | 316 SS |
| 8 | Spindle | 316 SS |
| 9 | Plug Gland | 316 SS |
| 10 | Plug Guide | Nitronic 60 |
| 11 | Seat Gland | 316 SS |
| 12 | Splicing Sleeve | 316 SS |
| 13 | Cable | 316 SS |
| 14 | Nameplate | 304 SS |
| 15 | Lock Nut | 316 SS |
| 16 | Soft Seal | Arlon 1260 |
| 17 | Seat | 316 SS |
| 18 | Body | 304 SS |

Typical spare parts found in Repair Kits listed on page 5

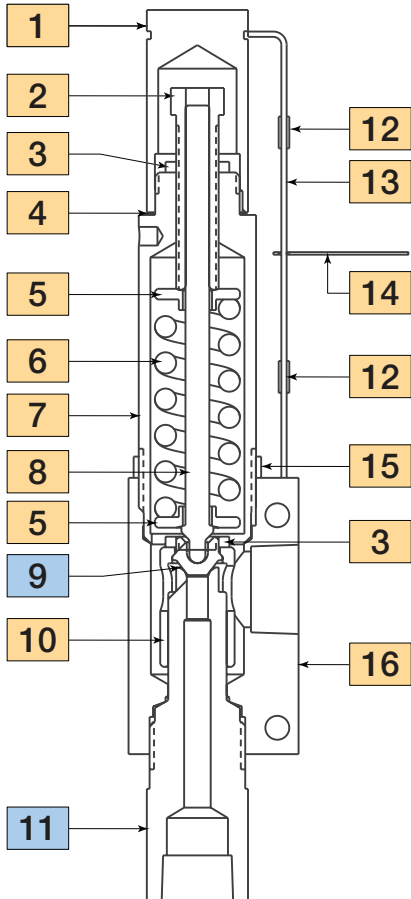


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Relief Valves: Pressures to 75,000 psi (5170 bar)

NPT Version: PRVP Series



Material of Construction:

| Item # | Description | Material |
|--------|-----------------|-----------------|
| 1 | Cap | 316 SS |
| 2 | Adjusting Bolt | Nitronic 60 |
| 3 | Lock Nut | 316 SS |
| 4 | Gasket | 304 SS Annealed |
| 5 | Spring Washer | 316 SS |
| 6 | Spring | 316 SS |
| 7 | Spring Cylinder | 316 SS |
| 8 | Spindle | 316 SS |
| 9 | Plug | 316 SS |
| 10 | Plug Guide | Nitronic 60 |
| 11 | Seat Gland | 316 SS |
| 12 | Splicing Sleeve | 316 SS |
| 13 | Cable | 316 SS |
| 14 | Nameplate | 304 SS |
| 15 | Lock Nut | 316 SS |
| 16 | Valve Body | 316 SS |

Typical spare parts found in Repair Kits listed on page 5.

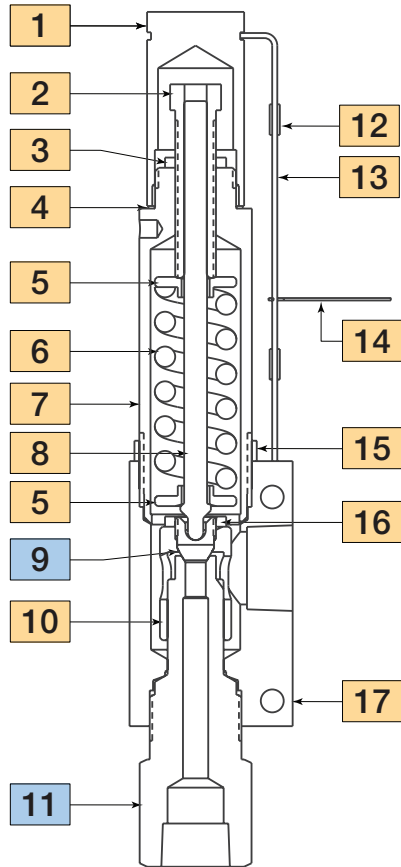


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Relief Valves: Pressures to 75,000 psi (5170 bar)

NPT Version: PRVS Series



Material of Construction:

| Item # | Description | Material |
|--------|-----------------|-----------------|
| 1 | Cap | 316 SS |
| 2 | Adjusting Bolt | Nitronic 60 |
| 3 | Lock Nut | 316 SS |
| 4 | Gasket | 304 SS Annealed |
| 5 | Spring Washer | 316 SS |
| 6 | Spring | 316 SS |
| 7 | Spring Cylinder | 316 SS |
| 8 | Spindle | 316 SS |
| 9 | Soft Seat | Arlon 1263 |
| 10 | Plug Guide | Nitronic 60 |
| 11 | Seat | 316 SS |
| 12 | Splicing Sleeve | 316 SS |
| 13 | Cable | 316 SS |
| 14 | Nameplate | 304 SS |
| 15 | Lock Nut | 316 SS |
| 16 | Lock Nut | 316 SS |
| 17 | Body | 316 SS |

Typical spare parts found in Repair Kits listed on page 5.