



AUSTRAL - POWERFLO
SOLUTIONS

POWERFLO SAFETY & RELIEF VALVES

Fig. 1990 CARBON STEEL
Fig. 3990 STAINLESS STEEL
COMPLIES WITH AS1271-2003



POWERFLO Safety Valves are engineered and manufactured to meet the most exacting requirements of industry for positive and dependable operation.

Users of **POWERFLO** Safety Relief Valves benefit by the accumulated experience of more than three-quarters of a century of development, engineering, manufacturing and field experience in safety and relief valve design for the protection of all types of pressure vessels and systems.

The purpose of a safety valve or relief valve is protection of personnel, plant and production. To perform this basic function a safety or relief valve must be designed to open automatically at a predetermined set pressure, must be sized to provide full pressure relief of the pressure system on which it is installed and must ensure positive closing and tightness after operation. A **POWERFLO** Safety Relief Valve will provide this basic function.

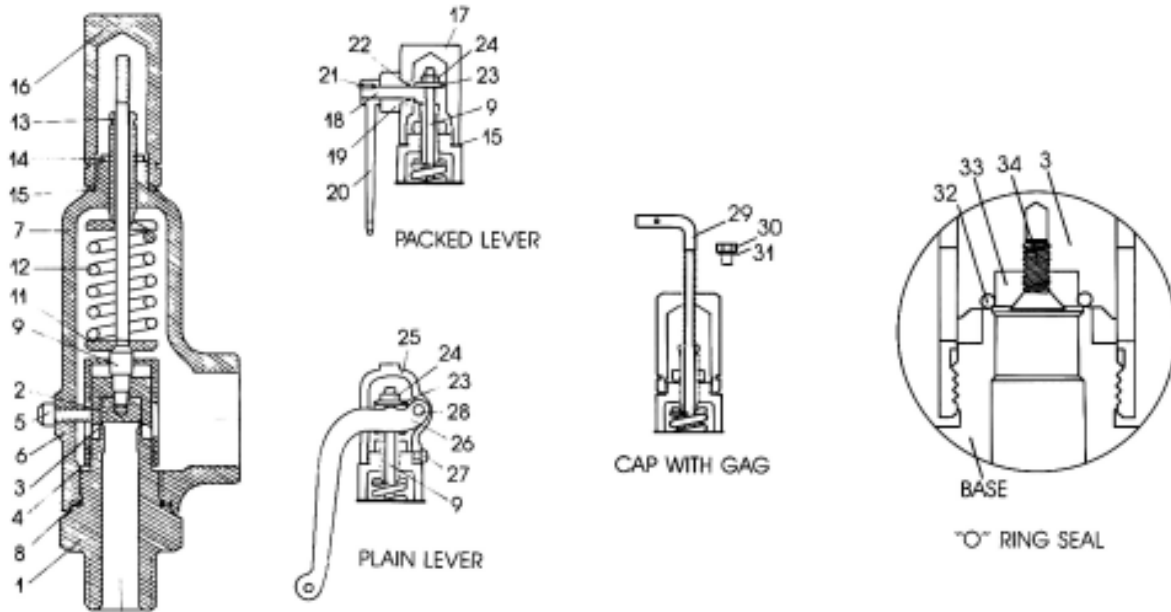
- The standard valve type is designed for general purpose thermal and pressure relief of liquids, gases and steam.
- Materials Lists - refer page 2.
- Optional 'O' Ring seat seal available in a wide range of 'O' Ring materials.
- Inlet sizes available are 15mm, 20mm and 25mm NPT or BSPT. Flanged inlet and outlet available.
- Maximum pressure setting is 13,790kPa
- Maximum service temperatures for:

| | | |
|------|----------------|----------------|
| 1990 | 316 Spring | 343°C |
| 1990 | Inconel Spring | 204°C to 426°C |
| 3990 | 316 Spring | 343°C |
| 3990 | Inconel Spring | 343°C to 593°C |
- Plain screwed cap is standard with optional plain or packed lifting lever.
- Every valve is individually tested and set to a precise relieving pressure and all manufacturing operations are controlled by comprehensive Q.A. Procedures.
- Whilst designed in accordance with A.S.M.E. Code section VIII, all valves fully meet the requirements of AS 1271.

**Fully manufactured
in Australia**

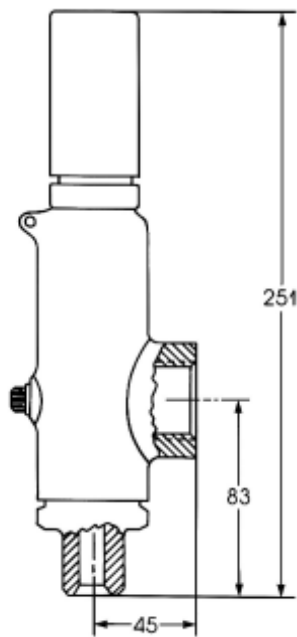
POWERFLO Safety Relief Valves are manufactured to Australian Standards, under a Quality Management System certified as complying to ISO 9001:2008.

PARTS AND MATERIALS



| | 1990 | 3990 |
|----|---------------------|------------------------------------|
| 1 | Base | ASTM A479 Type 316 Stainless Steel |
| 2 | Disc | 316 Stainless Steel |
| 3 | Disc Holder | Monel 400 |
| 4 | Guide | 316 Stainless Steel |
| 5 | Guide Pin | 304 Stainless Steel |
| 6 | Guide Pin Gasket | 316 Stainless Steel or Monel 400 |
| 7 | Bonnet | ASME SA216 Grade WCC Carbon Steel |
| 8 | Bonnet Gasket | 316 Stainless Steel or Monel 400 |
| 9 | Spindle | 316 Stainless Steel |
| 11 | Spring Washer | 316 Stainless Steel |
| 12 | Spring 1990c | 316 Stainless Steel |
| | 1990t | Inconel X750 |
| 13 | Adjusting Screw | 316 Stainless Steel |
| 14 | Adj Screw Locknut | 316 Stainless Steel |
| 15 | Cap Gasket | 316 Stainless Steel or Monel 400 |
| 16 | Screwed Cap | 316 Stainless Steel |
| 17 | Packed Cap | 316 Stainless Steel |
| 18 | Cam Shaft | 316 Stainless Steel |
| 19 | Bushing | 316 Stainless Steel |
| 20 | Lever | 316 Stainless Steel |
| 21 | Grub Screw | 304 Stainless Steel |
| 22 | O Ring | Nitrile (Buna N) |
| 23 | Release Nut | 316 Stainless Steel |
| 24 | Release Lock Nut | 316 Stainless Steel |
| 25 | Plain Lever Cap | 316 Stainless Steel |
| 26 | Lifting Lever | 316 Stainless Steel |
| 27 | Cap Screw | 316 Stainless Steel |
| 28 | Lever Pin | 316 Stainless Steel |
| 29 | Gag Bolt | 304 Stainless Steel |
| 30 | Sealing Plug | 304 Stainless Steel |
| 31 | Sealing Plug Gasket | 304 Stainless Steel |
| 32 | O Ring | Teflon/Viton/Nitrile |
| 33 | O Ring Retainer | 316 Stainless Steel |
| 34 | Retainer lock Screw | 304 Stainless Steel |

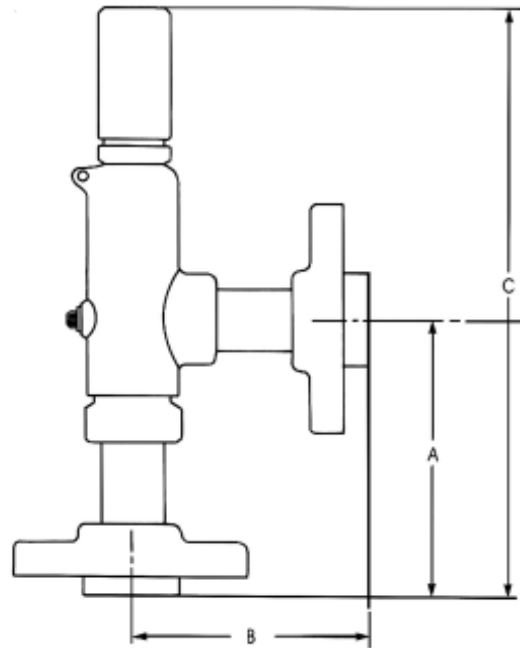
DIMENSIONS AND WEIGHTS



Screwed

| | |
|---------------|------------|
| Inlet Male | 15-20-25mm |
| Outlet Female | 25mm |
| Thread | NPT or BSP |
| Weight | 2.3kg |

Also available in Female Inlet 15-20-25 NPT



Flanged

| ANSI Class up to 600lb | | | |
|------------------------|-----|-----|-----|
| INLET | A | B | C |
| 15mm | 152 | 124 | 321 |
| 20mm | 159 | 124 | 327 |
| 25mm | 165 | 124 | 333 |

Note: Other face to face dimensions available to special order. 900 and 1500 lb also available on request.

ORIFICE AREA = 71mm²

**COEFFICIENT OF DISCHARGE (α) = 0.825
(VAPOURS, GASES AND STEAM)**

VALVE CAPACITIES

| SET PRESS kPa | WATER L/sec 10% OP | FREE AIR @ 15°C L/sec 10% OP | SAT STEAM kg/h 10% OP | NAT. GAS L/sec 10% OP |
|------------------|--------------------------|---------------------------------------|-----------------------------|-----------------------------|
| 103 | 0.7 | 25.5 | 69 | 33.0 |
| 138 | 0.8 | 29.3 | 80 | 38.2 |
| 207 | 1.0 | 37.3 | 101 | 48.6 |
| 276 | 1.1 | 46.3 | 124 | 59.9 |
| 345 | 1.3 | 54.7 | 148 | 70.8 |
| 414 | 1.4 | 63.2 | 171 | 82.1 |
| 483 | 1.5 | 72.2 | 195 | 93.4 |
| 552 | 1.6 | 80.7 | 218 | 104.8 |
| 621 | 1.7 | 89.2 | 241 | 115.6 |
| 690 | 1.8 | 98.2 | 264 | 127.0 |
| 827 | 2.0 | 115.2 | 311 | 149.6 |
| 965 | 2.1 | 132.6 | 357 | 171.8 |
| 1103 | 2.3 | 149.6 | 404 | 194.4 |
| 1241 | 2.5 | 167.1 | 451 | 216.6 |
| 1379 | 2.6 | 184.5 | 498 | 238.8 |
| 1517 | 2.7 | 201.5 | 544 | 261.5 |
| 1655 | 2.8 | 219.0 | 591 | 283.6 |
| 1793 | 3.0 | 236.5 | 637 | 306.3 |
| 1931 | 3.0 | 253.4 | 684 | 328.5 |
| 2069 | 3.2 | 270.9 | 731 | 351.1 |
| 2206 | 3.3 | 287.9 | 777 | 373.3 |

| SET PRESS kPa | WATER L/sec 10% OP | FREE AIR @ 15°C L/sec 10% OP | SAT STEAM kg/h 10% OP | NAT. GAS L/sec 10% OP |
|------------------|--------------------------|---------------------------------------|-----------------------------|-----------------------------|
| 2344 | 3.3 | 305.4 | 824 | 396.0 |
| 2482 | 3.5 | 322.8 | 870 | 418.2 |
| 2620 | 3.5 | 339.8 | 917 | 440.8 |
| 2758 | 3.7 | 357.3 | 964 | 463.0 |
| 2896 | 3.7 | 374.7 | 1010 | 485.6 |
| 3034 | 3.8 | 391.7 | 1057 | 507.8 |
| 3172 | 3.9 | 409.2 | 1104 | 530.5 |
| 3310 | 4.0 | 426.2 | 1150 | 552.7 |
| 3448 | 4.1 | 443.6 | 1197 | 575.3 |
| 4137 | 4.5 | 530.0 | 1430 | 687.2 |
| 4827 | 4.9 | 616.4 | 1663 | 799.0 |
| 5516 | 5.2 | 702.7 | 1896 | 911.3 |
| 6206 | 5.5 | 789.1 | 2130 | 1023.2 |
| 6895 | 5.8 | 876.0 | 2363 | 1135.1 |
| 7585 | 6.0 | 962.3 | 2596 | 1247.4 |
| 8274 | 6.3 | 1048.7 | 2829 | 1359.2 |
| 8964 | 6.6 | 1135.1 | 3062 | 1471.1 |
| 9653 | 6.8 | 1221.4 | 3295 | 1583.4 |
| 10343 | 7.1 | 1307.8 | 3545 | 1695.3 |
| 13790 | 8.2 | 1504.1 | 4902 | 2255.5 |

OPTIONAL 'O' RING SEAT SEAL

Design

With the **POWERFLO** 'O' ring seat seal design, the spring seat load is absorbed by a metal-to-metal seat, and tightness is obtained by using an 'O' ring of suitable material as a resilient seal.

Tightness

The **POWERFLO** 'O' ring seat seal valves are bubble tight at 95% of set pressures over 689 kPa.

| Percent of set pressure (popping pressure) at which the valve will be bubble tight on air | |
|---|-------------------------|
| Set Pressure kPa | Percent of Set Pressure |
| 34 kPa to 200 kPa | 90% |
| 201 kPa to 340 kPa | 92% |
| 341 kPa to 689 kPa | 94% |
| 689 kPa to max. rating of valve | 95% |

The **POWERFLO** 'O' ring seat seals provide positive closure at service pressures closer to the set pressure than is possible with metal-to-metal seats assuring continuous, trouble free service and complete valve tightness after numerous 'pops'.

Whenever conditions require maximum tightness, the **POWERFLO** 'O' ring seat seal valve should be specified.

'O' rings may be used up to the maximum rated pressure of the SRV. Temperature limits will apply depending on 'O' ring material.

Closeness of Operating Pressure to Set Pressure

Where the operating pressure is too close to the set pressure, seat tightness can be maintained at relatively higher operating pressures with the use of the **POWERFLO** 'O' ring seat seal than is possible with metal seating surfaces in a safety relief valve.

Compressor Discharge Service

Mechanical vibration, inherent in compressor discharge service, and pressure waves from positive displacement pistons lift the disc with each stroke of the valve. This action causes flat metal-to-metal seats to rub together and become damaged. Soft seats provide an additional sealing barrier against leakage.

Corrosive Services

In some services corrosion of the seating surfaces is the cause of valve leakage. In this type of service the **POWERFLO** 'O' ring seat seal, if the proper 'O' ring material is selected, will protect the metal seat on the nozzle against contact of the corrosive fluid thereby maintaining greater tightness under this service condition.

Foreign Matter and Slurry Service

Many times foreign material such as pipe scale, welding beads, sand or dust particles, etc, will destroy the metal-to-metal seating surfaces in a valve of this type when it is open and flowing. The **POWERFLO** 'O' ring seat seal will absorb the impact of these foreign particles with minimal damage. If, however, the valve closes on this type of foreign material or if it is embedded in the resilient 'O' ring, then the valve tightness will be impaired, but it will only be necessary to change the 'O' ring to stop the leakage.

Hot Water Heating Boiler Service

When a safety relief valve opens, hot water flashes into steam at the seating surfaces; solid particles which float to the water surface are driven against the seating surfaces at steam velocities. **POWERFLO** 'O' ring seat seal valves can withstand this type of service and remain tight to a greater degree than metal-to-metal seat valves.

POWERFLO uses proven quality PTFE 'O' ring seats for this service, at recommended temperature applications, between 121°C and 260°C (below 121°C, Teflon is not resilient and leakage may occur). Should damage occur, however, it is much simpler and less expensive to replace the 'O' ring than maintain metal-to-metal seats.

Safety relief valve leakage, which is aggravated by any of the causes given, is usually costly. In many cases, expensive product is lost and maintenance costs increased. **POWERFLO** 'O' ring seat seal valves are designed to eliminate leakage in troublesome applications and reduce overall costs.



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