# Anderson Greenwood™ 4020HV Pressure and Vacuum Relief Valve

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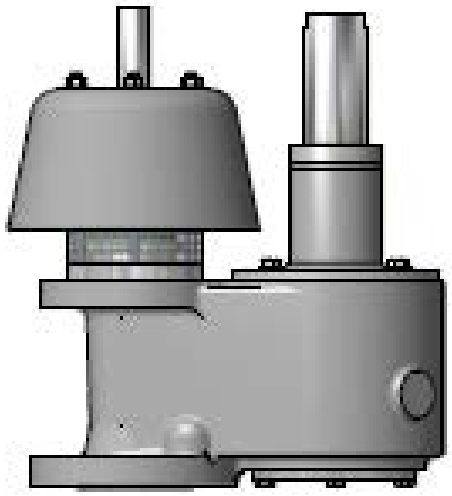

***Figure 1.*** *Type 4020HV Pressure and Vacuum Relief Valve*

**WARNING**

**Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.**

**Anderson Greenwood Pressure Relief Valve must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations and Emerson Pressure Management.**

**The relief valve must be isolated from tank pressure before servicing. All gas/vapour must be blocked and pressure safety vented. Wear appropriate protective clothing and breathing apparatus if hazardous gas/vapours are present. Use appropriate lifting equipment where required. nly a qualified person shall install or service this equipment.**

## Introduction

### Scope of the Manual

This manual provides specifications, installation, adjustment, maintenance instructions and parts ordering information for the Type 4020HV Pressure and Vacuum Relief Valve (PVRV).

## Specifications

This section lists the specifications for the Type 4020HV Pressure and Vacuum Relief Valve. Specification is stamped on the nameplate attached to the emergency relief vent.

**Valve Sizes**

2, 3, 4, 6, 8, 10 and 12 in. /
DN 50, 80, 100, 150, 200, 250 and 300

**Pallet Designs**

**VLP:** For very low pressure or vacuums

**LP:** For low pressure or vacuums

**HP:** For use up to the high pressure or vacuums

**Pressure Pallet Ranges**(1)

See Table 2

**Equivalent Weights for Pressure Settings**

See Table 6

1. The pressure/temperature limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.

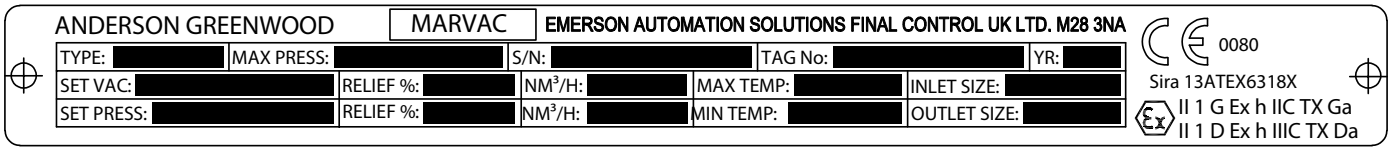


***Figure 2**. Type 4020HV ATEX Nameplate*

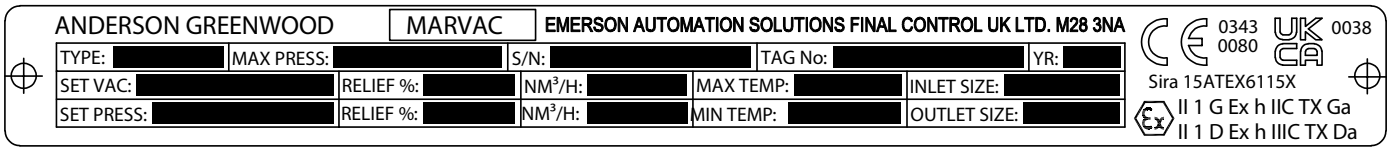


***Figure 3**. Type 4020HV PED/PED(S)R and ATEX Nameplate*

## Product Description

The Anderson Greenwood Type 4020HV PVRV is employed in gas/vapour service applications for low pressure storage tanks, vessels or applications requiring combined low pressure and vacuum protection with high capacity flow requirements. This product helps to prevent damage to the tank and also prevents the tank's contents from escaping, ensuring the safety of personnel and the surrounding environment.

Pressure/Vacuum valves are designed to limit the maximum pressure or vacuum that can exist in a tank due to inflow or outflow of the tank contents or due to changes in temperature as a result of environmental conditions.

The Anderson Greenwood Type 4020HV PVRV consists of a common inlet connection with two separate seats, pressure and vacuum. The vacuum seat draws atmospheric pressure into the tank being protected and the pressure seat discharges directly to atmosphere.

- For ease of maintenance, both pressure and vacuum seats are removable.
- PTFE coated internals are supplied as an all-weather option.

## Principle of Operation

The Anderson Greenwood Type 4020HV PVRV is a direct acting vent valve with a weight loaded pallet on the pressure side and a spring-loaded pallet on the vacuum side to keep the valve closed. When tank pressure or vacuum acting on the seat sealing area equals the opposing force acting on the pallet, the valve is on the threshold of opening. Any further increase in pressure will cause the pressure pallet to lift allowing the contents of the tank to vent through the valve (out-breathing). Any further increase in vacuum will cause the vacuum pallet to begin to lift thus breaking the vacuum by allowing atmospheric air to be drawn into the tank (inbreathing).

In order for the valve to open and achieve its design lift, an overpressure will be required. The Type 4020HV PVRV has been designed to achieve this design lift and rated capacity within 10% overpressure. Set pressures are adjusted by varying the weight on the pallet and vacuum settings are adjusted by altering the compression on the vacuum setting spring.

## Set Pressure and Vacuum Verification

If the pressure or vacuum settings are to be verified prior to installation, it is recommended that a test rig with a suitable accumulator be used having the following general features:

- Connection to the accumulator tank should ensure a negligible pressure drop between the accumulator and the test valve.
- Observed pressure shall be measured in the accumulator tank.
- The flange on which the valve is mounted shall be level.
- The valve should be tested using clean air or nitrogen.

Remove valve from shipping container and remove all packaging. Check that the set pressure/vacuum, the rated capacities and other details on the nameplate are correct.

### Set Pressure Verification

For set pressure verification, the test apparatus needs to limit the maximum flow rate into the accumulator such that a pressure drop measured in the accumulator can be observed when the valve set pressure is reached.

1. Ensure that the test rig is clean and fasten the valve securely to the test flange.
2. Check nameplate for required set pressure.
3. Increase the inlet pressure slowly until the pallet assembly can be seen to be gently lifting and reseating on the seat. The inlet pressure at this point is the adjusted set pressure and should coincide with the point at which no further rise in inlet pressure is observed. Repeat a further two times to ensure repeatability.

### Set Pressure Adjustment (See Figure 12)

**CAUTION**

**Whenever the weather hood is removed and refitted, ensure correct engagement of the pallet stem in the weather hood guide tube (key P2).**

The valve has been factory set to the required setting; however, if it is necessary to make a set pressure adjustment this can be done as follows:

1. Remove nuts (key P9) and washers (key P8) then remove weather hood (key P1).
2. The set pressure can be increased or reduced by adding or removing lead weights which can be supplied in various settings.
3. Refit weather hood (key 1) and secure using nuts (key 9) and washers (key 8).
4. Repeat set pressure verification as per Set Pressure Verification section and repeat adjustment, if required.

If it is not possible to verify the set pressure on a test rig, the required setting can be verified by measuring the combined weight of the pallet and installed weights. Refer to Table 6 for combined weight and equivalent set pressures.

### Vacuum Setting Verification

For verification of the vacuum setting, the flow rate out of the accumulator should be limited such that when the vacuum setting is reached, the point at which atmospheric pressure is admitted to the accumulator can be observed.

1. Ensure that the test rig is clean and fasten the valve securely to the test flange.
2. Check nameplate for required vacuum setting.
3. Establish a steady flow out of the test vessel to increase the inlet vacuum slowly. The adjusted vacuum setting is the vacuum at which no further rise is observed. Repeat a further two times to ensure repeatability.

### Vacuum Setting Adjustment (See Figure 12)

The valve has been factory set to the required setting, however, if it is necessary to make a set pressure adjustment this can be done as follows:

1. Remove cap (key V21) and release locknut (key V19).
2. The vacuum setting can be increased or reduced using adjusting screw (key V17). Turning adjusting screw clockwise will increase vacuum setting and anticlockwise will decrease vacuum setting. After adjustment, secure adjusting screw (key V17) using locknut (key V19), ensure cap gasket (key V20) is in place and refit cap (key V21).
3. Repeat vacuum setting verification as per Vacuum Setting Verification section and repeat adjustment if required.

## Installation

**⚠ WARNING**

**Personal injury, property damage, equipment damage or leakage due to escaping steam or bursting of pressure containing parts may result if this equipment is over pressured or is installed where service conditions could exceed the limits given in the specifications or where conditions exceed any ratings of the adjacent piping or piping connections.**

**To avoid such injury or damage, provide pressure-relieving or pressure-limiting device.**

The mating connection to the tank should be flat machined horizontal flange and should be thoroughly cleaned to remove all foreign matter which could lead to valve leakage if trapped between the valve seat and the pallet. The bore diameter of the tank connection nozzle should be at least equal to the inlet bore of the valve connection. For correct valve operation there shall be no external loads applied to the valve body.

Fit an inlet gasket to the mating flange ensuring it does not obstruct the flow path and install the valve. Ensure that the main axis of the valve is perpendicular. Flange bolting should be tightened uniformly to ensure a good seal.

**Note**

**The valve connection flange will have a combination of plain through holes, tapped through holes and blind tapped holes. The thread form of the tapped holes can be found from Table 1.**

For valves of aluminium construction, appropriate flat face flanges should be used and a full face gasket fitted.

**Note**

**Storage tank inlet piping configurations should conform to recognised standards. Different configurations will develop different inlet pressure losses when the valve is flowing. This should be taken into consideration when sizing the valve for the application.**

It is recommended that the external surfaces of carbon steel valves are painted immediately after installation.

## Maintenance

**⚠ WARNING**

**The relief valve must be isolated from tank pressure before servicing or removing. All gas/vapour must be blocked and pressure safely vented. Wear appropriate protective clothing and breathing apparatus if hazardous gas/ vapours are present.**

Regular inspection should be carried out to ensure that the pressure and vacuum ports are free from debris and that nothing preventing the correct operation of the valve is present. Maintenance should be performed at regular intervals and should be carried out by suitably qualified personnel in an appropriately equipped workshop. Alternatively; the valve should be returned to the manufacturer or suitably authorised agent for service/repair. During transport to the workshop the valve should be kept vertical to prevent damage to the internals.

***Table 1.*** *Inlet Flange Thread Forms*

| SIZE | IMPERIAL ANSI 125, 150 | METRIC PN10 | METRIC PN16 |
|---|---|---|---|
| 2 in. | 5/8 – 11 UNC | M16 x 2 | M16 x 2 |
| 3 in. | 5/8 – 11 UNC | M16 x 2 | M16 x 2 |
| 4 in. | 5/8 – 11 UNC | M16 x 2 | M16 x 2 |
| 6 in. | 3/4 – 10 UNC | M20 x 2.5 | M20 x 2.5 |
| 8 in. | 3/4 – 10 UNC | M20 x 2.5 | M20 x 2.5 |
| 10 in. | 7/8 – 9 UNC | M20 x 2.5 | M24 x 3 |
| 12 in. | 7/8 – 9 UNC | M20 x 2.5 | M24 x 3 |

## Valve Disassembly

**CAUTION**

**During disassembly it is important to identify the pressure and vacuum pallets and weight assemblies so that on reassembly they are returned to the correct seat.**

Before the valve is disassembled it should be thoroughly cleaned to remove potential hazards from process contamination.

### Pressure Side (See Figure 12)

1. Remove nuts (key P9), washers (key P8), weather hood (key P1) and bird screen (key P5).
2. Lift out pressure pallet assembly (key P10) complete with pressure setting weights (key for higher set valves, remove some of the lead before lifting out the pallet assembly).
3. Remove seat (key P3) complete with guide posts (key P4) by removing cap screws (key P6). Remove seat O-ring (key P7).
4. Identify pallet assembly, weights and seat as pressure side parts.

### Vacuum Side (See Figure 12)

1. Remove cap (key V21), cap gasket (key V20) and release locknut (key V19).
2. Remove all load from spring (key V15) by removing adjusting screw (key V17) complete with locknut (key V19).
3. Remove hex set screws (key V10), washers (key V9) and lift spring casing (key V2) clear of stem (key V14).
4. Remove upper spring plate (key V16). For valves 6 in. and larger, recover skid ring (key V18) which is fitted between the adjusting screw and upper spring plate.
5. Remove spring (key V15) and stem (key V14) complete with lower spring plate (key V13).
6. Remove shroud (key V5), ball (key V12) then lift out vacuum pallet assembly (key V11).
7. Remove seat (key V3) complete with vacuum posts (key V4) by removing cap screws (key V6).
8. Remove seat O-ring (key V7).
9. Identify pallet assembly and seat as vacuum side parts.
10. If required, unscrew hex set screws (key V24), remove mesh plate (key V23) and recover vacuum mesh (key V22).

### Vacuum Pallet (See Figure 4)

1. Remove nut (key 8) and washer where used (key 7) to release pivot point (key 9) from assembly.
2. Separate pallet disc (key 6), diaphragm (key 5), diaphragm plate (key 4), disc (key 3), pallet (key 2) and support plate (key 1).
3. Remove pivot point gasket (key 10).

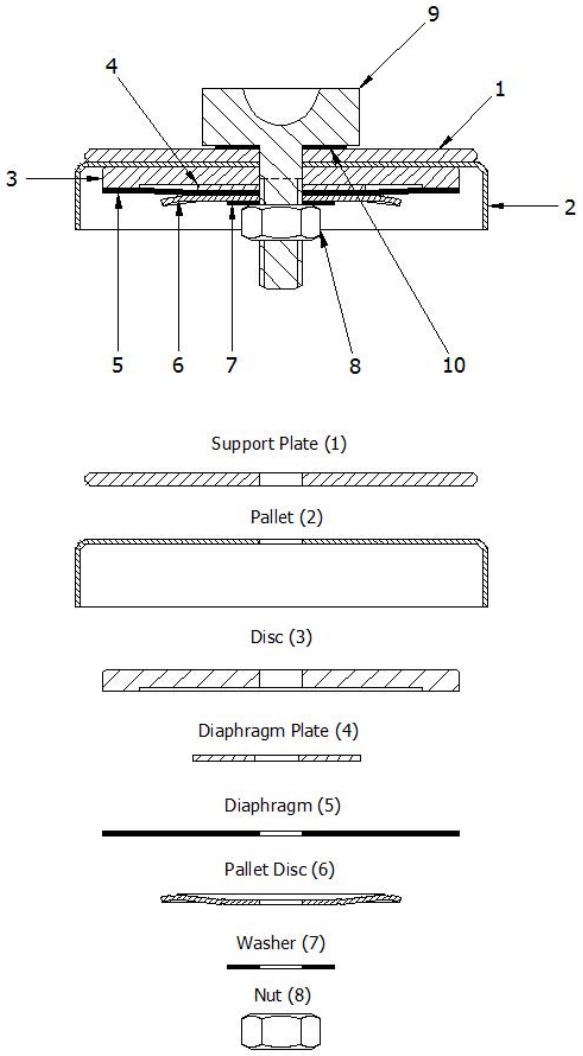


***Figure 4.*** *Vacuum Pallet Assembly*

**Note**

**Washer Item (key 7) not fitted to 2 and 3 in. / DN 50 and 80 sizes.**

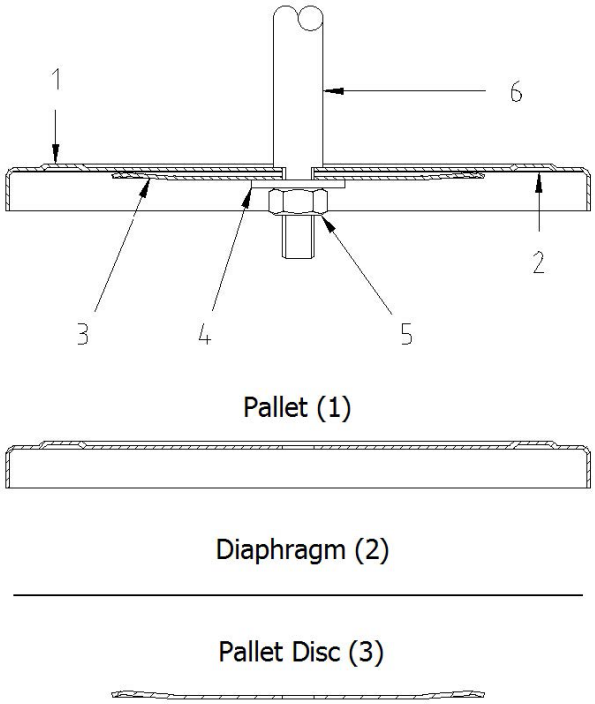


***Figure 5.*** *VLP/LP Pressure Pallet 2, 3, 4 in.*

**Note**

**Washer Item (key 4) not fitted to 2 and 3 in. / DN 50 and 80 sizes**

## Pressure Pallet (See Figures 5, 6 and 7)

**Note**

**The pressure pallet construction will depend on size and pressure setting. The VLP and LP have a similar construction whereas the HP as a significant disc for strength. Refer to Table 2 for pressure pallet ranges.**

### *VLP/LP Pressure Pallet for 2, 3, 4 in. / DN 50, 80, 100*

1. Remove nut (key 5), washer where used (key 4), to release stem (key 6) from assembly.
2. Separate pallet disc (key 3), diaphragm (key 2), pallet (key 1) and any weights taking care to identify weights removed to help reassembly.

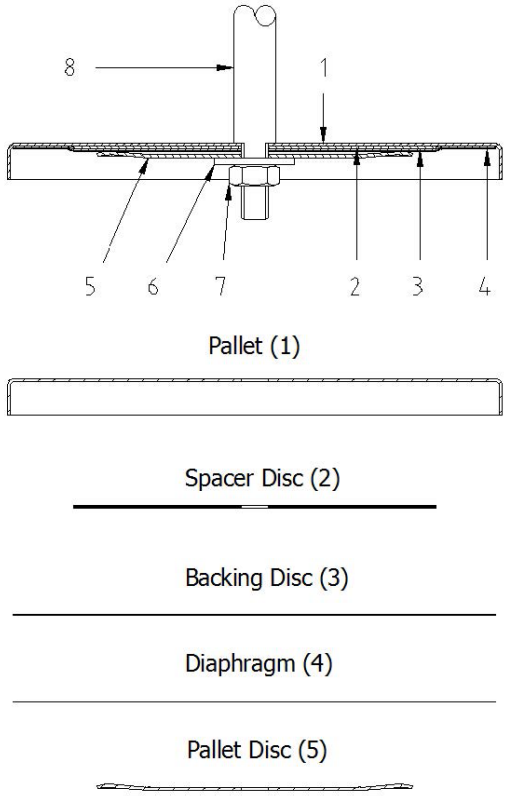


***Figure 6.*** *VLP/LP Pressure Pallet 6, 8, 10, 12 in.*

## *VLP/LP Pressure Pallet for 6, 8, 10, 12 in. / DN 150, 200, 250, 300*

1. Remove nut (key 7), and washer (key 6), to release stem (key 8) from assembly.
2. Separate pallet disc (key 5), diaphragm (key 4), backing disc (key 3), spacer disc (key 2), pallet (key 1) and any weights taking care to identify weights removed to help reassembly.

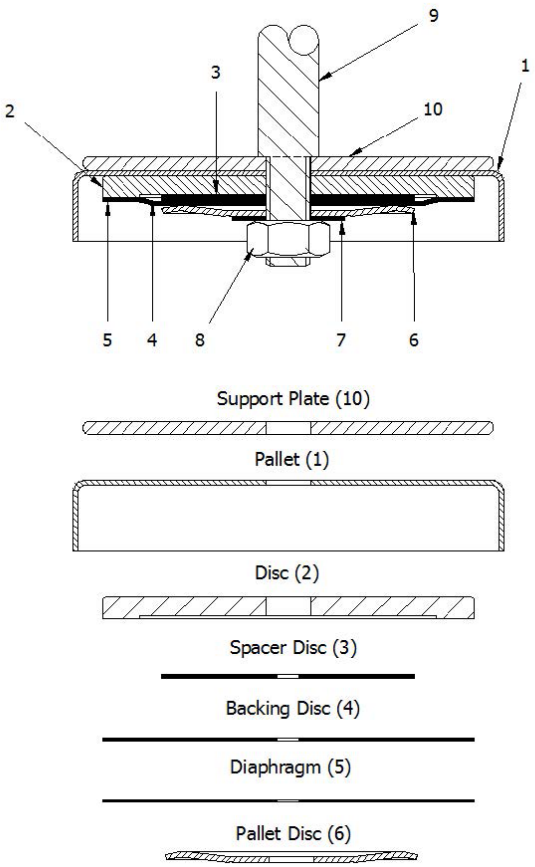


***Figure 7.*** *HP Pressure Pallet*

**Note**

**Washer item (key 7) not fitted to 2 and 3 in. / DN 50 and 80 sizes and support plate (key 10) used on 8, 10 and 12 in. / DN 200, 250 and 300 only.**

## *HP Pressure Pallet*

1. Remove nut (key 8), washer, where used (key 7), to release stem (key 9) from assembly.
2. Separate pallet disc (key 6), diaphragm (key 5), backing disc (key 4), spacer disc (key 3), disc (key 2), pallet (key 1), support plate where fitted (key 10) and any weights taking care to identify weights removed to help reassembly.

***Table 2.*** *Pressure Pallet Ranges*

| NOMINAL SIZE, in. / DN | TRIM MATERIAL | VLP PALLET | | LP PALLET | | HP PALLET | |
|---|---|---|---|---|---|---|---|
| | | Minimum | Maximum | Minimum | Maximum | Minimum | Maximum |
| 2 / 50 | Aluminium | 1.2 | 2.4 | 2.4 | 7.0 | 7.0 | 100 |
| | 316 SST | 2.5 | 5.6 | 5.6 | 14.0 | 14.0 | 100 |
| 3 / 80 | Aluminium | 1.1 | 1.6 | 1.6 | 7.0 | 7.0 | 100 |
| | 316 SST | 2.5 | 3.7 | 3.7 | 14.0 | 14.0 | 100 |
| 4 / 100 | Aluminium | 1.1 | 1.5 | 1.5 | 7.0 | 7.0 | 100 |
| | 316 SST | 2.5 | 3.4 | 3.4 | 14.0 | 14.0 | 100 |
| 6 / 150 | Aluminium | 1.1 | 1.9 | 1.9 | 7.0 | 7.0 | 100 |
| | 316 SST | 2.5 | 4.2 | 4.2 | 14.0 | 14.0 | 100 |
| 8 / 200 | Aluminium | 1.1 | 2.2 | 2.2 | 13 | 13 | 100 |
| | 316 SST | 2.5 | 4.5 | 4.5 | 20 | 20 | 100 |
| 10 / 250 | Aluminium | 1.1 | 2.1 | 2.1 | 13 | 13 | 100 |
| | 316 SST | 2.5 | 4.3 | 4.3 | 22 | 22 | 100 |
| 12 / 300 | Aluminium | 1.1 | 2.0 | 2.0 | 13 | 13 | 100 |
| | 316 SST | 2.5 | 4.1 | 4.1 | 24 | 24 | 100 |

***Table 3.*** *Seat Lap Band Widths*

| VALVE SIZE, in. / DN | NOMINAL WIDTH, mm | MAXIMUM WIDTH, mm |
|---|---|---|
| 2 / 50 | 1.0 | 1.5 |
| 3 / 80 | 1.0 | 1.5 |
| 4 / 100 | 1.2 | 1.8 |
| 6 / 150 | 1.5 | 1.8 |
| 8 / 200 | 1.5 | 2.2 |
| 10 / 250 | 2.0 | 3 |
| 12 / 300 | 2.0 | 3 |

## Valve Refurbishment

With valve in component parts thoroughly clean all surfaces with a suitable solvent and check for wear, corrosion or other forms of damage. Particular attention should be given to the sealing face of the valve seat.

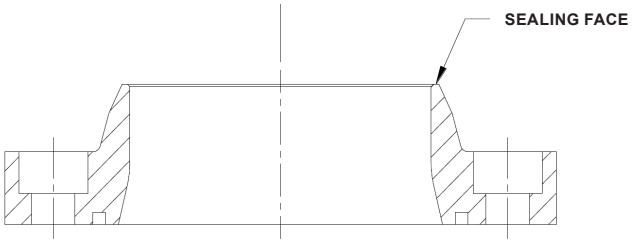


***Figure 8.*** *Sealing Face of Valve Seat*

Slight damage can be removed by lapping the seat face (key removing guide or vacuum posts); however, care should be taken not to increase the width of the seat face beyond those given in Table 3. If successive refurbishments or severe damage requires the seat to be re-machined, consult the factory for approved dimensions.

Discard and replace any damaged parts plus all soft goods including:

- O-rings
- Diaphragms
- Backing Discs
- Spacer Discs
- Gaskets
- Skid Ring (if fitted)

Also discard and replace the pallet disc.

## Valve Re-assembly

Check identification to ensure pressure and vacuum components are returned to respective seats.

Pallets should be identified during disassembly; however, they can also be identified by thickness and length (see Tables 4 and 5).

### Pressure Pallet

#### *VLP/LP Pressure Pallet 2, 3, 4 in. / DN 50, 80, 100 (see Figure 4)*

Assemble pallet (key 1), diaphragm (key 2), and pallet disc (key 3), to stem (key 6) and secure using washer if fitted (key 4) and nut (key 5).

#### *VLP/LP Pressure Pallet 6, 8, 10, 12 in. / DN 150, 200, 250, 300 (see Figure 5)*

Assemble pallet (key 1), spacer disc (key 2), backing disc (key 3), diaphragm (key 4), and pallet disc (key 5), to stem (key 8) and secure using washer (key 6) and nut (key 7).

#### *HP Pressure Pallet (see Figure 6)*

Assemble support plate, where used (key 10), pallet (key 1), disc (key 2), spacer disc (key 3), backing disc (key 4), diaphragm (key 5), and pallet disc (key 6), to stem (key 9) and secure using washer if fitted (key 7) and nut (key 8).

### Vacuum Pallet (see Figure 4)

Assemble pivot point gasket (key 10), support plate (key 1), pallet (key 2), disc (key 3), diaphragm plate (key 4), diaphragm (key 5), and pallet disc (key 6), to pivot point (key 9) and secure using washer if fitted (key 7) and nut (key 8).

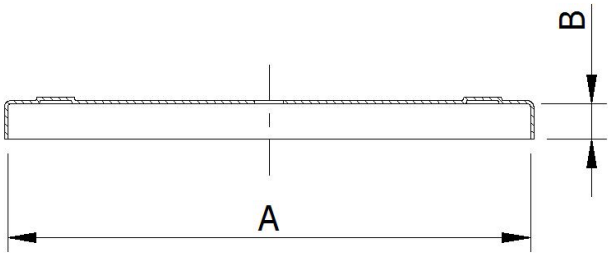


***Figure 9.*** *VLP/LP Pressure Pallet 2, 3, 4 in. / DN 50, 80, 100*

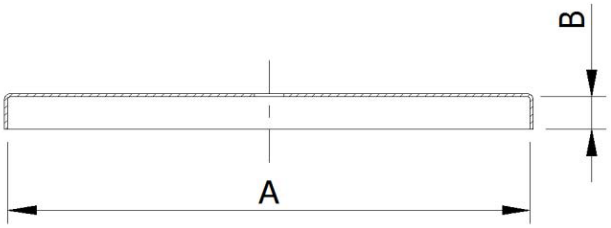


***Figure 10.*** *VLP/LP Pressure Pallet 6, 8, 10, 12 in. / DN 150, 200, 250, 300*

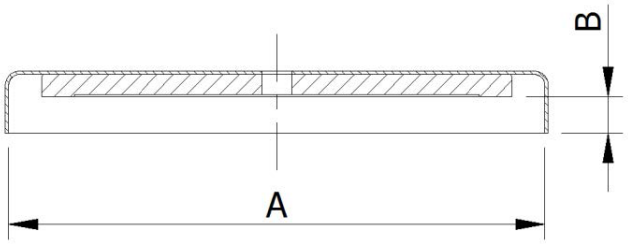


***Figure 11.*** *HP Pressure Pallet*

***Table 4.*** *Pallet Thickness*

| PALLET MATERIAL THICKNESS, mm | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2 in. | 3 in. | 4 in. | 6 in. | 8 in. | 10 in. | 12 in. |
| HP | 1.0 | 1.0 | 1.0 | 1.5 | 1.5 | 1.5 | 1.5 |
| LP | 1.0 | 1.0 | 1.0 | 1.5 | 1.5 | 1.5 | 1.5 |
| VLP | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |

***Table 5.*** *Pallet Lengths*

| SIZE, in. / DN | DIMENSIONS | | | |
|---|---|---|---|---|
| | PRESSURE PALLET | | VACUUM PALLET | |
| | A, mm | B, mm | A, mm | B, mm |
| 2 / 50 | 77 | 5 | 77 | 8 |
| 3 / 80 | 112 | 7.5 | 112 | 12 |
| 4 / 100 | 147 | 10 | 147 | 16 |
| 6 / 150 | 221 | 15 | 221 | 24 |
| 8 / 200 | 294 | 20 | 294 | 32 |
| 10 / 250 | 368 | 25 | 368 | 40 |
| 12 / 300 | 441 | 30 | 441 | 48 |

If required, PTFE tape can be applied to stem threads and locking compound used to secure the nut.

## Vacuum Side (see Figure 12)

1. If previously removed, assemble vacuum mesh (key V22), mesh plate (key V23) and secure using hex set screws (key V24).
2. Reassemble vacuum posts (key V4), if removed, and seat O-ring (key V7) to seat (key V3).
3. Secure seat to body (key V1) using cap screws (key V6) ensuring that seat O-ring is not dislodged during assembly.
4. Reinstall vacuum pallet as identified during valve disassembly ensuring the pallet slides easily between the vacuum posts.
5. Place ball (key V12) in socket of pivot point (key 8, Figure 4). Assemble shroud (key V5) which should be installed over the vacuum posts (key V4).
6. Reinstall vacuum pallet as identified during valve disassembly ensuring the pallet slides easily between the vacuum posts.
7. Place ball (key V12) in socket of pivot point (key 8, Figure 4). Assemble shroud (key V5) which should be installed over the vacuum posts (key V4).
8. Assemble casing O-ring (key V8) to casing (key V2) and assemble over stem (key V14) securing with washers (key V9) and hex set screws (key V10).
9. Assemble adjusting screw (key V17) over stem (key V14) and screw into casing (key V2).
10. Apply nominal load to spring and secure using locknut (key V19) Assemble cap gasket (key V20) and cap (key V21).

## Pressure Side (see Figure 12)

1. Reassemble guide posts (key P4) if removed, and seat O-ring (key P7) to seat (key P3).
2. Secure seat to body (key V1) using cap screws (key P6) ensuring that seat O-ring is not dislodged during assembly.
3. Reinstall pressure pallet as identified during valve disassembly ensuring the pallet slides easily between the guide posts.
4. Return pressure setting weights again as identified during disassembly.
5. Assemble bird screen (key P5). Weatherhood (key P1) and secure using washers (key P8) and nuts (key P9).

**CAUTION**

**Whenever the weatherhood is removed and re-fitted, ensure correct engagement of the pallet stem.**

## Testing Set Pressure and Vacuum

The pressure and vacuum settings should be checked and if necessary adjusted as described in Set Pressure and Vacuum Verification section.

***Table 6.*** *Equivalent Weights for Pressure Settings*

| INLET SIZE, in. / DN | 2 / 50 | | 3 / 80 | | 4 / 100 | | 6 / 150 | | 8 / 200 | | 10 / 250 | | 12 / 300 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MEAN SEALING AREA, $in.^2$ / $mm^2$ | 4.53 / 2923 | | 9.971 / 6433 | | 17.603 / 11,357 | | 39.662 / 25,588 | | 69.829 / 45,051 | | 109.563 / 70,686 | | 156.894 / 101,222 | |
| SETTING, mbar | lb | oz | lb | oz | lb | oz | lb | oz | lb | oz | lb | oz | lb | oz |
| 1 | 0 | 1.1 | 0 | 2.3 | 0 | 4.1 | 0 | 9.2 | 1 | 0.2 | 1 | 9.4 | 2 | 4.4 |
| 2 | 0 | 2.1 | 0 | 4.6 | 0 | 8.2 | 1 | 2.4 | 2 | 0.4 | 3 | 2.9 | 4 | 8.9 |
| 3 | 0 | 3.2 | 0 | 6.9 | 0 | 12.3 | 1 | 11.6 | 3 | 0.6 | 4 | 12.3 | 6 | 13.3 |
| 4 | 0 | 4.2 | 0 | 9.3 | 1 | 0.4 | 2 | 4.8 | 4 | 0.9 | 6 | 5.8 | 9 | 1.7 |
| 5 | 0 | 5.3 | 0 | 11.6 | 1 | 4.4 | 2 | 14.0 | 5 | 1.1 | 7 | 15.2 | 11 | 6.2 |
| 6 | 0 | 6.3 | 0 | 13.9 | 1 | 8.5 | 3 | 7.3 | 6 | 1.3 | 9 | 8.7 | 13 | 10.6 |
| 7 | 0 | 7.4 | 1 | 0.2 | 1 | 12.6 | 4 | 0.5 | 7 | 1.5 | 11 | 2.1 | 15 | 15.0 |
| 8 | 0 | 8.4 | 1 | 2.5 | 2 | 0.7 | 4 | 9.7 | 8 | 1.7 | 12 | 11.5 | 18 | 3.5 |
| 9 | 0 | 9.5 | 1 | 4.8 | 2 | 4.8 | 5 | 2.9 | 9 | 1.9 | 14 | 5.0 | 20 | 7.9 |
| 10 | 0 | 10.5 | 1 | 7.2 | 2 | 8.9 | 5 | 12.1 | 10 | 2.2 | 15 | 14.4 | 22 | 12.3 |
| 12 | 0 | 12.6 | 1 | 11.8 | 3 | 1.1 | 6 | 14.5 | 12 | 2.6 | 19 | 1.3 | 27 | 5.2 |
| 14 | 0 | 14.7 | 2 | 0.4 | 3 | 9.2 | 8 | 0.9 | 14 | 3.0 | 22 | 4.2 | 31 | 14.1 |
| 16 | 1 | 0.8 | 2 | 5.0 | 4 | 1.4 | 9 | 3.4 | 16 | 3.5 | 25 | 7.1 | 36 | 6.9 |
| 18 | 1 | 2.9 | 2 | 9.7 | 4 | 9.6 | 10 | 5.8 | 18 | 3.9 | 28 | 10.0 | 40 | 15.8 |
| 20 | 1 | 5.0 | 2 | 14.3 | 5 | 1.8 | 11 | 8.2 | 20 | 4.3 | 31 | 12.9 | 45 | 8.7 |
| 22 | 1 | 7.1 | 3 | 2.9 | 5 | 9.9 | 12 | 10.6 | 22 | 4.8 | 34 | 15.7 | 50 | 1.5 |
| 24 | 1 | 9.2 | 3 | 7.6 | 6 | 2.1 | 13 | 13.1 | 24 | 5.2 | 38 | 2.6 | 54 | 10.4 |
| 26 | 1 | 11.3 | 3 | 12.2 | 6 | 10.3 | 14 | 15.5 | 26 | 5.6 | 41 | 5.5 | 59 | 3.3 |
| 28 | 1 | 13.5 | 4 | 0.8 | 7 | 2.5 | 16 | 1.9 | 28 | 6.0 | 44 | 8.4 | 63 | 12.2 |
| 30 | 1 | 15.6 | 4 | 5.5 | 7 | 10.6 | 17 | 4.3 | 30 | 6.5 | 47 | 11.3 | 68 | 5.0 |
| 32 | 2 | 1.7 | 4 | 10.1 | 8 | 2.8 | 18 | 6.7 | 32 | 6.9 | 50 | 14.2 | 72 | 13.9 |
| 34 | 2 | 3.8 | 4 | 14.7 | 8 | 11.0 | 19 | 9.2 | 34 | 7.3 | 54 | 1.1 | 77 | 6.8 |
| 36 | 2 | 5.9 | 5 | 3.4 | 9 | 3.2 | 20 | 11.6 | 36 | 7.8 | 57 | 3.9 | 81 | 15.6 |
| 38 | 2 | 8.0 | 5 | 8.0 | 9 | 11.3 | 21 | 14.0 | 38 | 8.2 | 60 | 6.8 | 86 | 8.5 |
| 40 | 2 | 10.1 | 5 | 12.6 | 10 | 3.5 | 23 | 0.4 | 40 | 8.6 | 63 | 9.7 | 91 | 1.4 |
| 42 | 2 | 12.2 | 6 | 1.2 | 10 | 11.7 | 24 | 2.8 | 42 | 9.1 | 66 | 12.6 | 95 | 10.2 |
| 44 | 2 | 14.3 | 6 | 5.9 | 11 | 3.9 | 25 | 5.2 | 44 | 9.5 | 69 | 15.5 | 100 | 3.1 |
| 46 | 3 | 0.4 | 6 | 10.5 | 11 | 12.0 | 26 | 7.7 | 46 | 9.9 | 73 | 2.4 | 104 | 12.0 |
| 48 | 3 | 2.5 | 6 | 15.1 | 12 | 4.2 | 27 | 10.1 | 48 | 10.4 | 76 | 5.3 | 109 | 4.8 |
| 50 | 3 | 4.6 | 7 | 3.8 | 12 | 12.4 | 28 | 12.5 | 50 | 10.8 | 79 | 8.1 | 113 | 13.7 |

***Table 6.*** *Equivalent Weights for Pressure Settings (continued)*

| INLET SIZE, in. / DN | 2 / 50 | | 3 / 80 | | 4 / 100 | | 6 / 150 | | 8 / 200 | | 10 / 250 | | 12 / 300 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MEAN SEALING AREA, $in.^2$ / $mm^2$ | 4.53 / 2923 | | 9.971 / 6433 | | 17.603 / 11,357 | | 39.662 / 25,588 | | 69.829 / 45,051 | | 109.563 / 70,686 | | 156.894 / 101,222 | |
| SETTING, mbar | lb | oz | lb | oz | lb | oz | lb | oz | lb | oz | lb | oz | lb | oz |
| 50 | 3 | 4.6 | 7 | 3.8 | 12 | 12.4 | 28 | 12.5 | 50 | 10.8 | 79 | 8.1 | 113 | 13.7 |
| 52 | 3 | 6.7 | 7 | 8.4 | 13 | 4.6 | 29 | 14.9 | 52 | 11.2 | 82 | 11.0 | 118 | 6.6 |
| 54 | 3 | 8.8 | 7 | 13.0 | 13 | 12.7 | 31 | 1.4 | 54 | 11.6 | 85 | 13.9 | 122 | 15.4 |
| 56 | 3 | 10.9 | 8 | 1.7 | 14 | 4.9 | 32 | 3.8 | 56 | 12.1 | 89 | 0.8 | 127 | 8.3 |
| 58 | 3 | 13.0 | 8 | 6.3 | 14 | 13.1 | 33 | 6.2 | 58 | 12.5 | 92 | 3.7 | 132 | 1.2 |
| 60 | 3 | 15.1 | 8 | 10.9 | 15 | 5.3 | 34 | 8.6 | 60 | 12.9 | 95 | 6.6 | 136 | 10.0 |
| 62 | 4 | 1.2 | 8 | 15.6 | 15 | 13.4 | 35 | 11.0 | 62 | 13.4 | 98 | 9.5 | 141 | 2.9 |
| 64 | 4 | 3.3 | 9 | 4.2 | 16 | 5.6 | 36 | 13.5 | 64 | 13.8 | 101 | 12.3 | 145 | 11.8 |
| 66 | 4 | 5.4 | 9 | 8.8 | 16 | 13.8 | 37 | 15.9 | 66 | 14.2 | 104 | 15.2 | 150 | 4.6 |
| 68 | 4 | 7.5 | 9 | 13.5 | 17 | 6.0 | 39 | 2.3 | 68 | 14.7 | 108 | 2.1 | 154 | 13.5 |
| 70 | 4 | 9.6 | 10 | 2.1 | 17 | 14.1 | 40 | 4.7 | 70 | 15.1 | 111 | 5.0 | 159 | 6.4 |
| 72 | 4 | 11.7 | 10 | 6.7 | 18 | 6.3 | 41 | 7.1 | 72 | 15.5 | 114 | 7.9 | 163 | 15.2 |
| 74 | 4 | 13.8 | 10 | 11.3 | 18 | 14.5 | 42 | 9.6 | 74 | 16.0 | 117 | 10.8 | 168 | 8.1 |
| 76 | 4 | 15.9 | 10 | 16.0 | 19 | 6.7 | 43 | 12.0 | 77 | 0.4 | 120 | 13.7 | 173 | 1.0 |
| 78 | 5 | 2.1 | 11 | 4.6 | 19 | 14.8 | 44 | 14.4 | 79 | 0.8 | 124 | 0.5 | 177 | 9.9 |
| 80 | 5 | 4.2 | 11 | 9.2 | 20 | 7.0 | 46 | 0.8 | 81 | 1.3 | 127 | 3.4 | 182 | 2.7 |
| 82 | 5 | 6.3 | 11 | 13.9 | 20 | 15.2 | 47 | 3.2 | 83 | 1.7 | 130 | 6.3 | 186 | 11.6 |
| 84 | 5 | 8.4 | 12 | 2.5 | 21 | 7.4 | 48 | 5.7 | 85 | 2.1 | 133 | 9.2 | 191 | 4.5 |
| 86 | 5 | 10.5 | 12 | 7.1 | 21 | 15.5 | 49 | 8.1 | 87 | 2.6 | 136 | 12.1 | 195 | 13.3 |
| 88 | 5 | 12.6 | 12 | 11.8 | 22 | 7.7 | 50 | 10.5 | 89 | 3.0 | 139 | 15.0 | 200 | 6.2 |
| 90 | 5 | 14.7 | 13 | 0.4 | 22 | 15.9 | 51 | 12.9 | 91 | 3.4 | 143 | 1.9 | 204 | 15.1 |
| 92 | 6 | 0.8 | 13 | 5.0 | 23 | 8.1 | 52 | 15.4 | 93 | 3.8 | 146 | 4.7 | 209 | 7.9 |
| 94 | 6 | 2.9 | 13 | 9.7 | 24 | 0.3 | 54 | 1.8 | 95 | 4.3 | 149 | 7.6 | 214 | 0.8 |
| 96 | 6 | 5.0 | 13 | 14.3 | 24 | 8.4 | 55 | 4.2 | 97 | 4.7 | 152 | 10.5 | 218 | 9.7 |
| 98 | 6 | 7.1 | 14 | 2.9 | 25 | 0.6 | 56 | 6.6 | 99 | 5.1 | 155 | 13.4 | 223 | 2.5 |
| 100 | 6 | 9.2 | 14 | 7.5 | 25 | 8.8 | 57 | 9.0 | 101 | 5.6 | 159 | 0.3 | 227 | 11.4 |

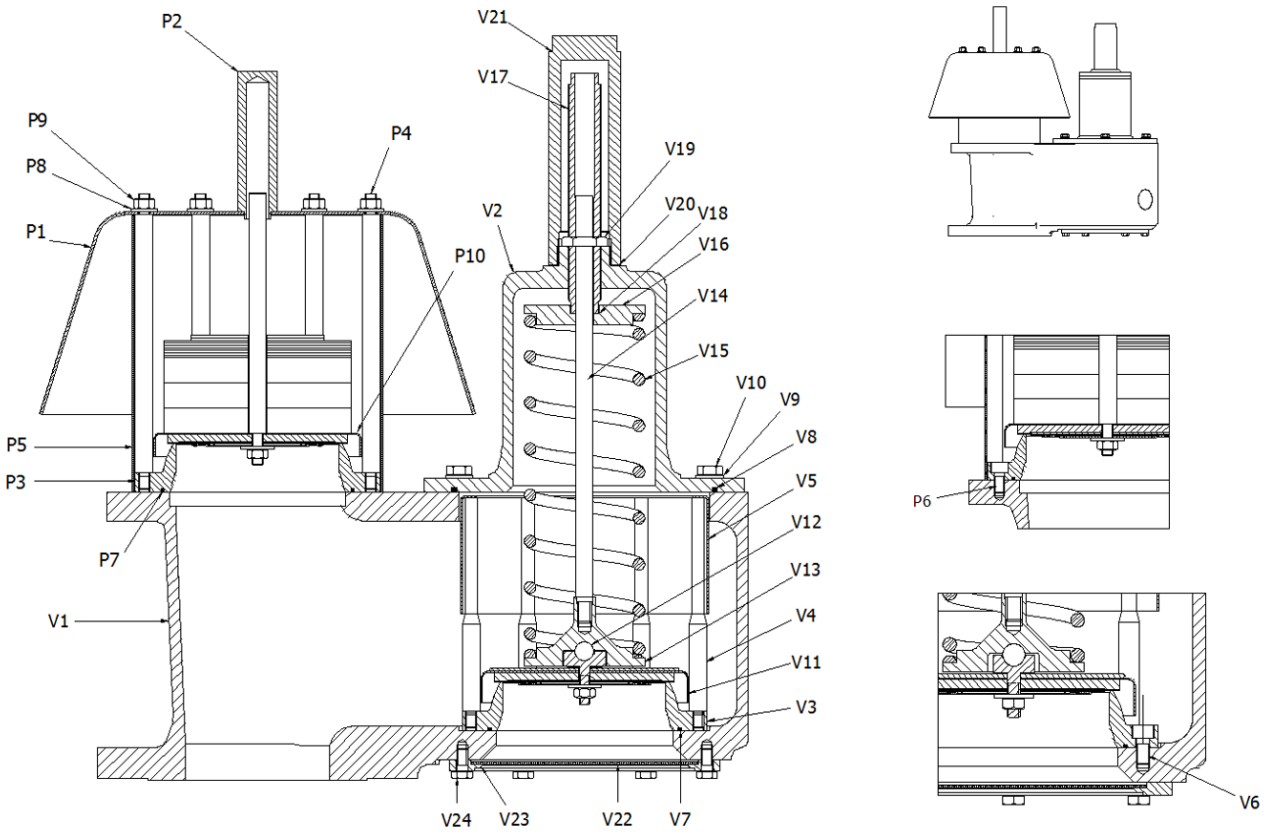


***Figure 12.*** *Valve General Assembly*

## Parts Ordering

When corresponding with your local Sales Office about this pressure and vacuum relief valve, include the type number, serial number and other information stamped on the nameplate.

When ordering replacement parts, reference the number of each needed part and specify the eight character part number as found in the Table 7.

## Parts List

| Key | Description |
|---|---|
| P1 | Weatherhood |
| P2 | Guide Tube |
| P3 | Pressure Seat |
| P4 | Guide Post |
| P5 | Bird Screen |
| P6 | Cap Screw |
| P7 | Seat O-ring |
| P8 | Washer |
| P9 | Nut |
| V1 | Vacuum Seat Body |
| V2 | Vacuum Spring Casing |
| V3 | Vacuum Seat |
| V4 | Vacuum Post |
| V5 | Shroud |
| V6 | Cap Screw |
| V7 | Seat O-ring |
| V8 | Casing O-ring |
| V9 | Casing Washer |
| V10 | Casing Hex Set Screw |
| V11 | Vacuum Pallet Assembly |
| V12 | Ball |
| V13 | Lower Spring Plate |
| V14 | Stem |
| V15 | Vacuum Compression Spring |
| V16 | Upper Spring Plate |
| V17 | Vacuum Adjusting Screw |
| V18 | Skid Ring (key 6 in. and Larger) |
| V19 | Locknut |
| V20 | Cap Gasket |
| V21 | Vacuum Cap |
| V22 | Vacuum Mesh |
| V23 | Mesh Plate |
| V24 | Mesh Plate Hex Set Screw |

***Table 7.*** *Replacement Parts*

| DESCRIPTION | USAGE | MATERIAL | NOMINAL SIZE, in. / DN | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2 / 50 | 3 / 80 | 4 / 100 | 6 / 150 | 8 / 200 | 10 / 250 | 12 / 300 |
| Pallet Disc | Very Low Pressure | Stainless Steel | 11183378 | 11183398 | 11183420 | 11183439 | 11183457 | 11183475 | 11183493 |
| | Low Pressure | | 11182941 | 11182943 | 11182945 | 11182946 | 11183009 | 11183092 | 11183133 |
| | High Pressure | | | | | | | | |
| | Spring Loaded | | | | | | | | |
| Diapraghm | Very Low Pressure | PFA | 11183880 | 11183882 | 11183884 | 11183266 | - - - - | - - - - | - - - - |
| | | Polytetrafluoroethylene (PTFE) | 11183257 | 11183260 | 11183263 | 11183267 | 11183271 | 11183275 | 11183279 |
| | Low Pressure | PFA | 11183881 | 11183883 | 11183885 | 11411605 | - - - - | - - - - | - - - - |
| | | PTFE | 11183258 | 11183261 | 11183264 | 11411606 | 11411607 | 11411612 | 11411614 |
| | High Pressure | PTFE | 11183259 | 11183262 | 11183265 | 11183269 | 11183273 | 11183277 | 11183281 |
| | Spring Loaded <200 mbar | PTFE | 11281485 | 11280622 | 11281490 | 11281493 | 11281496 | 11281498 | 11281500 |
| | Spring Loaded >200 mbar | PTFE | 11281489 | 11280624 | 11281492 | 11281495 | 11281497 | 11280837 | 11281502 |
| Backing Disc | Very Low Pressure | General Service Gasket | - - - - | - - - - | - - - - | 11183856 | 11183886 | 11183887 | 11183888 |
| | Low Pressure | | - - - - | - - - - | - - - - | 11411623 | 11411631 | 11411634 | 11411636 |
| | High Pressure | | 11183282 | 11183284 | 11183285 | 11183286 | 11183287 | 11183288 | 11183289 |
| Spacer Disc | Very Low Pressure | General Service Gasket | - - - - | - - - - | - - - - | 11183857 | 11183889 | 11183890 | 11183891 |
| | Low Pressure | | - - - - | - - - - | - - - - | 11183294 | 11183295 | 11183296 | 11183297 |
| | High Pressure | | 11183290 | 11183292 | 11183293 | | | | |
| Gasket | Cap | General Service Gasket | 11411641 | | | 11411646 | | 11411649 | |
| | Pivot Point | | 11272778 | | | 11405355 | 11272733 | | |
| O-ring | Seat | Fluorocarbon | 11183351 | 11183354 | 11183320 | 11180110 | 11183326 | 11182024 | 11180089 |
| | | Nitrile (NBR) | 11183350 | 11183353 | 11183319 | 11180109 | 11183325 | 11182023 | 11180088 |
| | | PTFE | 11183349 | 11183352 | 11183318 | 11180108 | 11183324 | 11182022 | 11180087 |
| | Cover | Fluorocarbon | 11183314 | 11183317 | 11183323 | 11183326 | 11183334 | 11183337 | 11183340 |
| | | Nitrile (NBR) | 11183313 | 11183316 | 11183322 | 11183325 | 11183333 | 11183336 | 11183339 |
| | | PTFE | 11183312 | 11183315 | 11183321 | 11183324 | 11183332 | 11183335 | 11183338 |
| Skid Ring | - - - - | PTFE | - - - - | - - - - | - - - - | 11405352 | 11272734 | 11275612 | |

# Type 4020HV

Outside North America Only


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