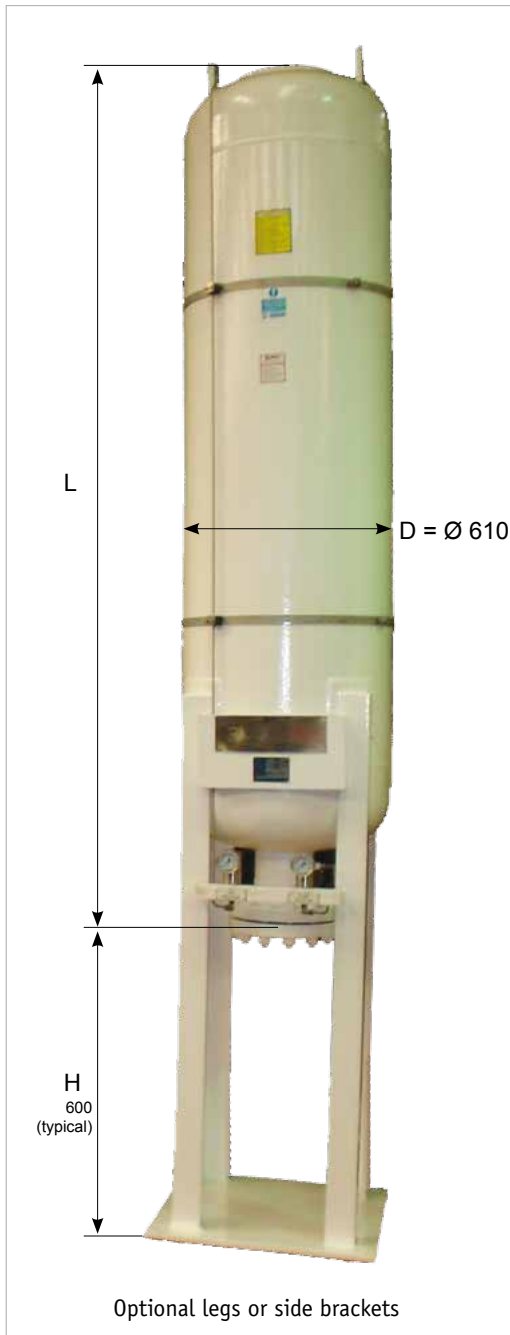


# Large Volume Alleviators



## Specification

Fawcett Christie Alleviators are designed to control surge by providing an elastomer bladder precharged with nitrogen, contained in a steel shell.

The pressure surge, partially dampened by the orifices in the alleviator fluid port, enters the shell, where the remaining kinetic energy is dissipated by compressing the nitrogen gas within the bladder.

Fawcett Christie Alleviators are totally enclosed and as the only moving part is the bladder, little maintenance is required.

## Capabilities

Carbon or Stainless Steel construction. Design pressures up to 34.5 bar. Optional separator materials.

## Pressure

Design pressures up to 34.5 bar. Pressure tested and witnessed by independent inspection authority if required.

## Approvals

Vessels approved to PED 97/23/EC CE marked, PD5500, ASME VIII Div 1 'U' Coded or design only in accordance with ASME V III Div 1.

## Design

Legs are an optional extra but recommended for units over 227 litres. Where fitted H=600 mm nom (or to suit application). Side bracket options are also available as an alternative to legs.

## Fluid End Flange

Optional fluid end flange construction (typically 4", 6" or 8" NB).

## Finish

One coat primer paint, special custom paint specification can be quoted.

## Model Numbers for Large Volume Alleviators



154 0 0A S7 03 4

### Gas Volume

098 = 98 litres  
154 = 154 litres  
227 = 227 litres  
286 = 286 litres  
460 = 460 litres

### Bladder Material

0 = Nitrile Standard  
3 = High Aromatic Nitrile  
+ = other

### Gas End Connections

0A = standard 1/4" BSP gas valve + other international connections available, including permanent charging set connections c/w pressure gauge.

### Alleviator Type

S1 = 6" 300lb rf flange oil service  
S2 = 8" 300lb rf flange oil service  
S3 = 10" 300lb rf flange oil service  
S4 = 6" 300lb rf flange internally lined for water service  
S5 = 8" 300lb rf flange internally lined for water service  
S6 = 10" 300lb rf flange internally lined for water service  
S7 = 6" 300lb rf flange all stainless steel vessel  
S8 = 8" 300lb rf flange all stainless steel vessel  
S9 = 10" 300lb rf flange all stainless steel vessel  
+ = many other options available

For further information please contact head office.

### Design Pressure

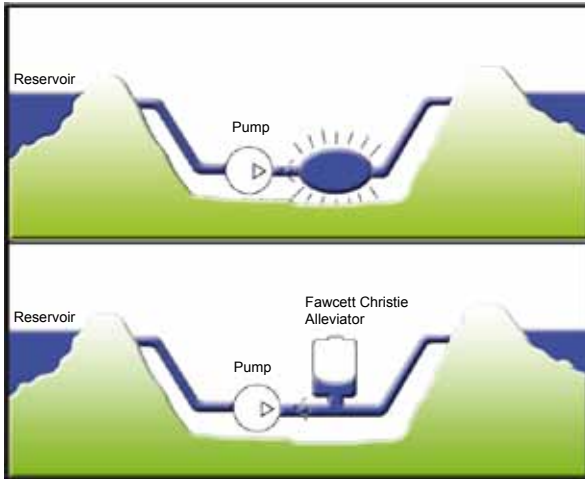
03 = 34.5 bar  
02 = 20 bar + others

### Design Code

4 = ASME VIII Div 1 'U' Stamped  
M = ASME VIII Div 1 Not 'U' Stamped  
R = PD5500 cat1  
S = PD5500 cat 2

The following details are nominal only and are provided as a guideline

| D = 610 mm |         |              |
|------------|---------|--------------|
| Volume     | L       | Weight (dry) |
| 98         | 930 mm  | 175 kg       |
| 154        | 1130 mm | 200 kg       |
| 227        | 1400 mm | 250 kg       |
| 286        | 1660 mm | 310 kg       |
| 375        | 2130 mm | 405 kg       |
| 460        | 2600 mm | 465 kg       |

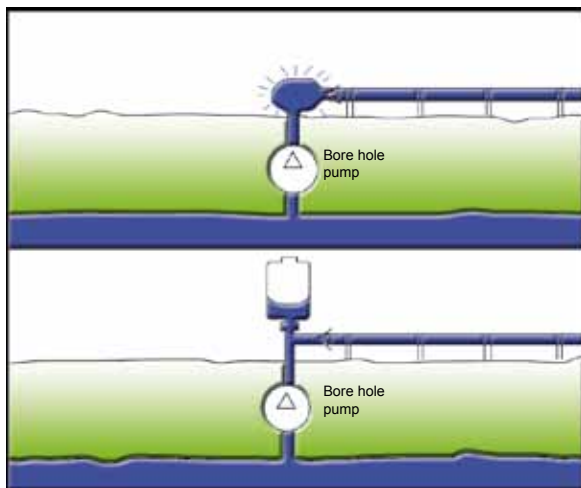


## Applications

### Pump Shutdown

Upon pump shutdown, the flow of fluid continues along the pipeline creating the possibility of column separation. After stopping, the fluid column will attempt to run back down the pipeline into the check valve causing damaging shock pressures.

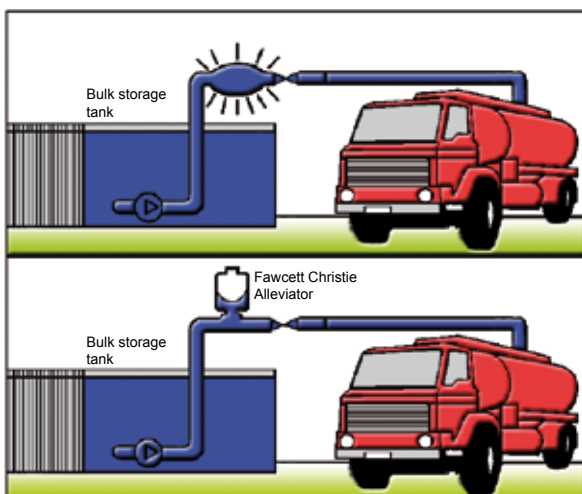
A Fawcett Christie Alleviator installed in the downstream side of the check valve will, on sensing any decrease in pressure due to column separation, force stored fluid back in.



### Pump Start Up

On pump start up fluid between the pump and check valve is forced against the valve which is held shut by the pipeline static head condition. Surge pressure greater than the pump shut off thereafter can be generated.

With a Fawcett Christie Alleviator installed on that leg, the pump discharge is initially accepted and the pressure is allowed to rise gradually allowing time for frictional and static head condition to be overcome.



### Valve Closure

As a valve is closed a pressure wave is generated that propagates at the speed of sound along the column of fluid until it reaches the originating pump. The wave is then reflected back to the valve, causing increased line pressure of as much as 100%, resulting in blown out pump seals, weakened pipe fittings and possible burst pipes.

By installing a Fawcett Christie Alleviator adjacent to the valve, the quick rise in pressure is cushioned by the compression of the gas and flow is controlled, thus stabilising the system.