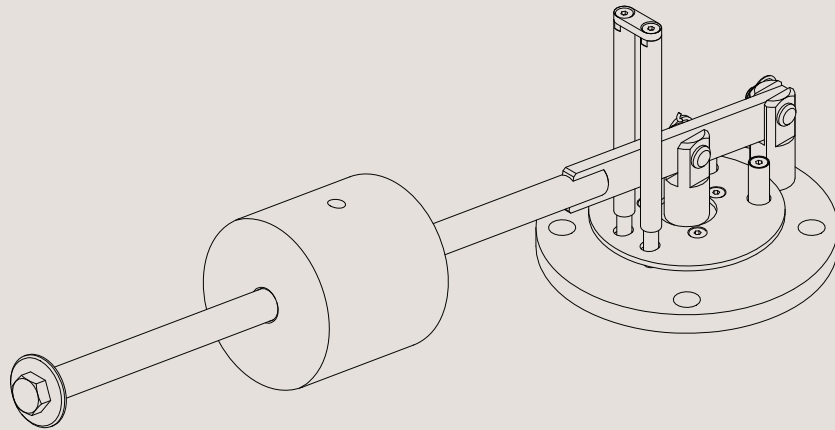




# Instruction Manual

## Alfa Laval SB Pressure Relief Valve



ESE02961-EN2      2016-06

Original manual



The information herein is correct at the time of issue but may be subject to change without prior notice

<b>1. EC Declaration of Conformity</b> .....	<b>4</b>
<b>2. Safety</b> .....	<b>5</b>
2.1. Important information .....	5
2.2. Warning signs .....	5
2.3. Safety precautions .....	6
<b>3. Installation</b> .....	<b>7</b>
3.1. Unpacking/delivery .....	7
3.2. General installation .....	7
3.3. Valve assembly .....	8
3.4. Welding procedures for welding flange .....	9
3.5. Installation of valve and accessories .....	11
3.6. Recycling information .....	12
<b>4. Operation</b> .....	<b>13</b>
4.1. Operation .....	13
4.2. Discharge capacity .....	14
4.3. Recommended cleaning .....	15
<b>5. Maintenance</b> .....	<b>16</b>
5.1. General maintenance .....	16
<b>6. Technical Data</b> .....	<b>17</b>
6.1. Technical data .....	17
<b>7. Parts List and Service Kits</b> .....	<b>20</b>
7.1. Pressure Relief Valve .....	20
7.2. Force Opener .....	22

# 1 EC Declaration of Conformity

Revision of Declaration of Conformity: 2015-06-02

The Designated Company

Alfa Laval Kolding A/S

Company Name

Albuen 31, DK-6000 Kolding, Denmark

Address

+45 79 32 22 00

Phone No.

hereby declares that

Valve

Designation

SB Pressure Relief Valve

Type

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- Pressure Equipment Directive 2014/68/EU of the European Community, Category IV
- Pressure Equipment Directive 2014/68/EU of the European Community, Fluida Group II
- EN 4126-1

The person authorised to compile the technical file is the signer of this document

Global Product Quality Manager  
Pumps, Valves, Fittings and Tank Equipment

Title

Lars Kruse Andersen

Name

Kolding

Place

2016-06-15

Date



Signature



*Unsafe practices and other important information are emphasised in this manual.  
Warnings are emphasised by means of special symbols.*

---

### 2.1 Important information

---

**Always read the manual before using the valve!**

**WARNING**

Indicates that special procedures must be followed to avoid serious personal injury.

**CAUTION**

Indicates that special procedures must be followed to avoid damage to the valve.

**NOTE**

Indicates important information to simplify or clarify procedures.

---

### 2.2 Warning signs

---

General warning:



Caustic agents:



## 2 Safety

---

All warnings in the manual are summarised on this page.

Pay special attention to the instructions below to avoid serious personal injury and damage to the valve.

---

### 2.3 Safety precautions

---

#### Installation:

**Always** read the technical data thoroughly (see chapter 6 Technical Data.)

**Never** touch the moving parts if the actuator for force opening is supplied with compressed air.

**Never** dismantle the valve or actuator for force opening when under pressure.

**Never** dismantle the valve when it is hot.



#### Operation:

**Never** dismantle the valve or actuator for force opening when under pressure.

**Never** dismantle the valve when it is hot.

**Always** read the technical data thoroughly (see chapter 6 Technical Data)

**Never** touch the moving parts or actuator for force opening when supplied with compressed air.

**Never** cover or in any way restrict the valve, must be able to work unobstructed at all time.



**Always** handle lye and acid with great care.



#### Maintenance:

**Always** read the technical data thoroughly (see chapter 6 Technical Data)

**Never** service the valve when it is hot.

**Never** service the valve or actuator when under pressure.

**Never** put your fingers between the valve and actuator for force opening.

**Never** touch the moving parts if the actuator for force opening is supplied with compressed air.



#### Transportation:

**Always** ensure that all bolt connections are disconnected before attempting to remove the valve from the installation.

**Always** drain liquid out of valves before transportation.

**Always** ensure sufficient fixing of the valve during transportation.

---

*The instruction manual is part of delivery. Study the instructions carefully.  
The items refer to the Parts List and Service Kits section.*

---

### 3.1 Unpacking/delivery

---

#### Step 1

##### CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

#### Check the delivery for:

1. Valve seat and disc
  2. Lever and weight
  3. Bearing pins, washers and locking rings
  4. Flange gasket (placed in valve seat)
  5. Actuator for force opening (option)
  6. Splash guard (option)
  7. Proximity sensor (option)
- 

#### Step 2

Remove any packing materials from the valve/valve parts.  
Inspect the valve/valve parts for visible transport damage.  
Avoid damaging the valve/valve parts.

---

### 3.2 General installation

---

#### Step 1



**Always** read the technical data thoroughly.

See chapter 6 Technical Data



**Always** release compressed air from the actuator for force opening after use.

##### CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

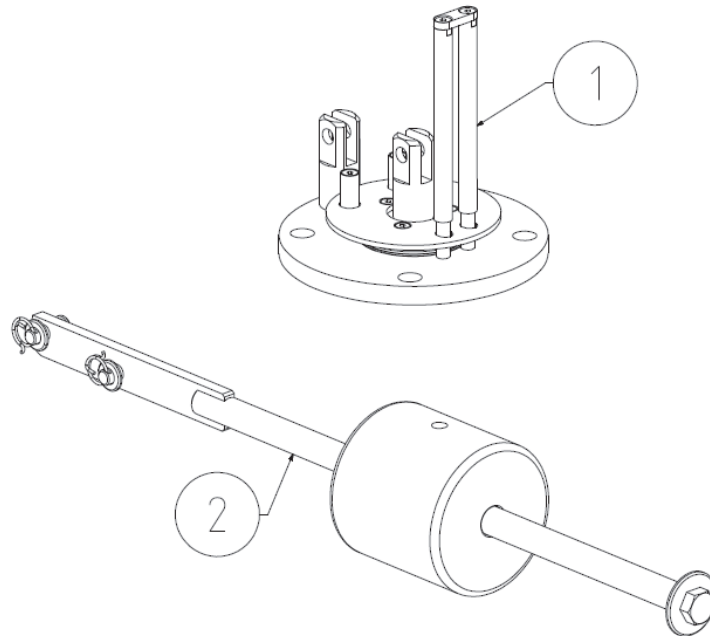
---

### 3 Installation

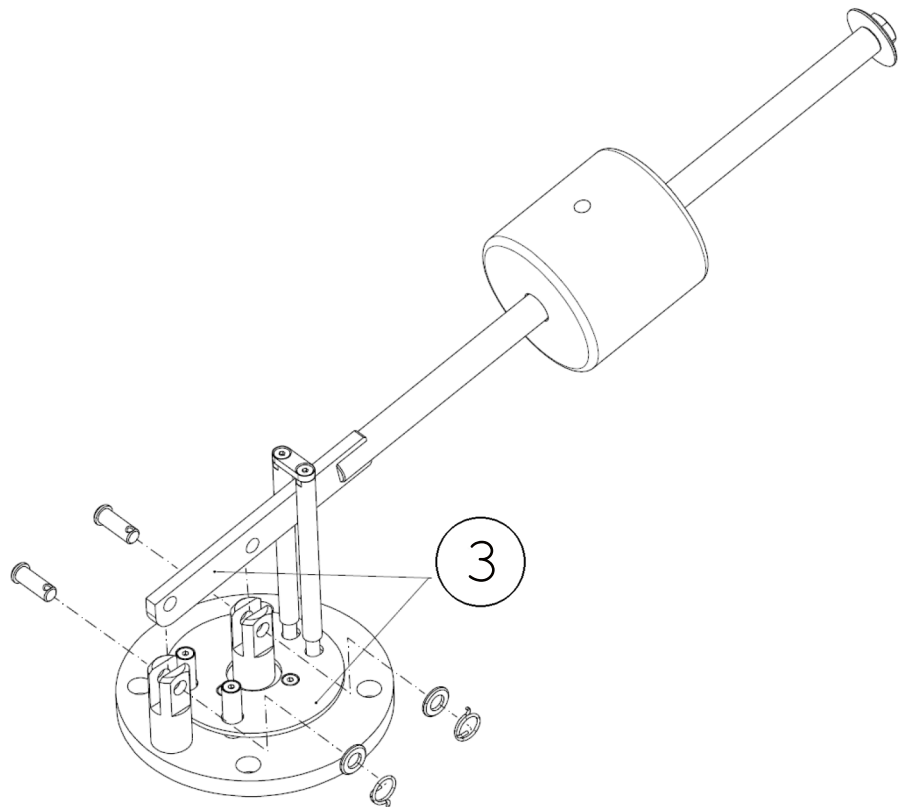
The lever and weight are to be assembled with valve seat and disc.  
Make sure the serial number engraved on the disc matches the serial number engraved on the lever.

#### 3.3 Valve assembly

- Pos. 1. Valve seat and disc
- Pos. 2. Lever and weight



- Pos 3. Serial number



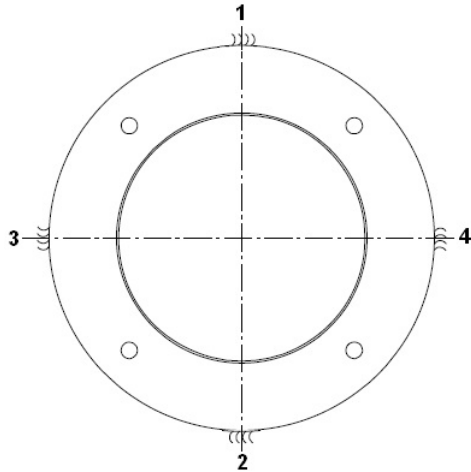


The lever and weight are to be assembled with valve seat and disc.  
Make sure the serial number engraved on the disc matches the serial number engraved on the lever.

#### 3.4 Welding procedures for welding flange

##### Step 1

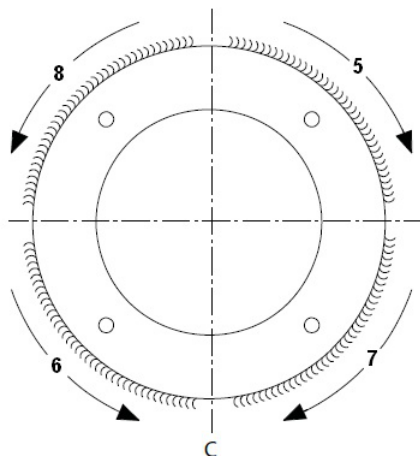
Spot weld from outside



##### Step 2

Weld the following sections first from the outside then from the inside, and cool with air between each section.

Spot weld from inside



### 3 Installation

---

*The lever and weight are to be assembled with valve seat and disc.*

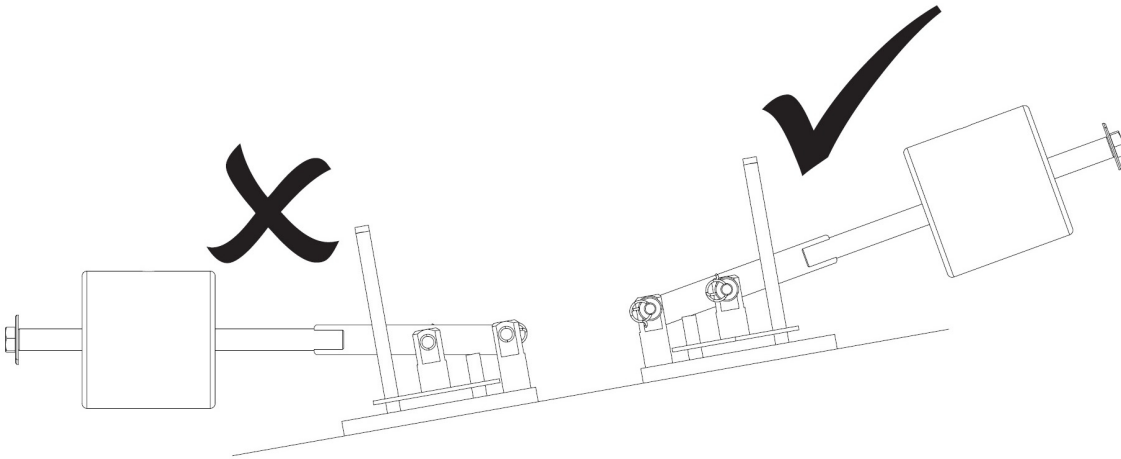
*Make sure the serial number engraved on the disc matches the serial number engraved on the lever.*

---

#### Step 3

- Ensure that the surface flatness tolerance equals  $\pm 0.2$ .
- Grind and polish the welding flange.

The valve should be seated horizontally. An inclination of max.  $10^\circ$  is acceptable but the lever must then point upwards.



The valve is to be fitted with M16 bolts.

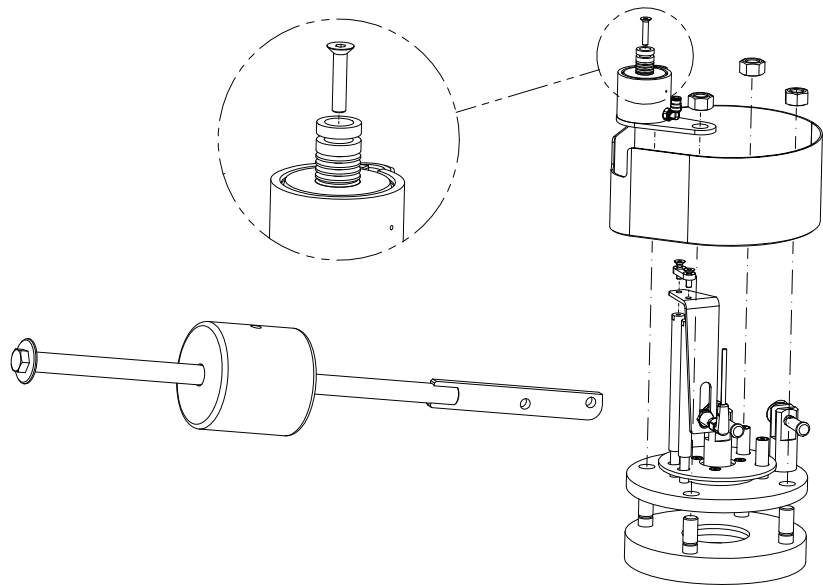
The options Splash guard and Force opener are also to be fitted with M16 bolts. The Proximity sensor is to be fitted by the valve's M6 screws.

#### 3.5 Installation of valve and accessories

##### Options

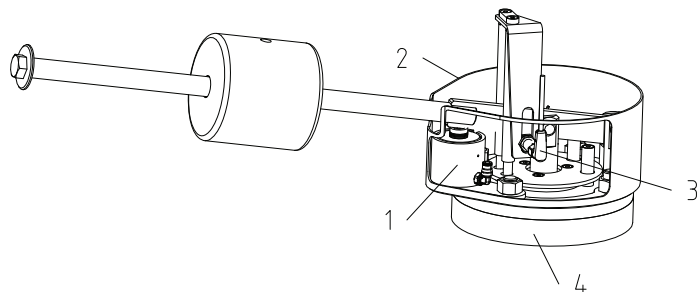
1. Force opener\*
2. Splash guard
3. Proximity sensor
4. Welding flange

\*The force opener is delivered with a spacer kit. Adjust the spacer kit to a recommended gap of 2-4 mm (0.08" - 0.16") between piston and lever.



##### Tightening torques for bolts:

M16	218 Nm
M6	11 Nm



## 3 Installation

---

*The valve is to be fitted with M16 bolts.*

*The options Splash guard and Force opener are also to be fitted with M16 bolts. The Proximity sensor is to be fitted by the valve's M6 screws.*

---

### 3.6 Recycling information

---

#### Unpacking

- Packing material consists of wood, plastics, cardboard boxes and, in some cases, metal straps.
- Wood and cardboard boxes can be reused, recycled or used for energy recovery.
- Plastics should be recycled or burnt at an authorised waste incineration plant.
- Metal straps should be sent for material recycling.

#### Maintenance

- All metal parts should be sent for material recycling.
- Worn out or defective electronic parts should be sent to a licensed handler for material recycling.

#### Scrapping

- At the end of use, the equipment should be recycled according to relevant local regulations. As well as the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company.
-

The valve is delivered with counterweight locked by welding to an individual opening pressure to suit the tank design data.

### 4.1 Operation



**Never** cover or in any way restrict the valve, it must be able to work unobstructed at all times.

Alfa Laval cannot be held responsible for incorrect operation.

The safety valve is not intended for pressure regulation; a large number of activations can damage the equipment.

Operating range	
Nominal size	Opening
75 mm (3")	0.2 - 3.5 bar (2.9 - 50.8 psi)
100 mm (4")	0.2 - 2.5 bar (2.9 - 36.3 psi)
150 mm (6")	0.4 - 1.5 bar (5.8 - 21.8 psi)
Opening and Closing Characteristics	
Set pressure	Preset opening pressure
Reset pressure	Closing pressure after discharge

Reset pressure = Set pressure x 0.9                      if   Set pressure > 1.0 bar (14.5 psi)

Reset pressure = Set pressure - 0.15 bar (2.17 psi)    if   Set pressure < 1.0 bar (14.5 psi)

Alfa Laval recommends an operating pressure of min. 10% lower than the set pressure value.

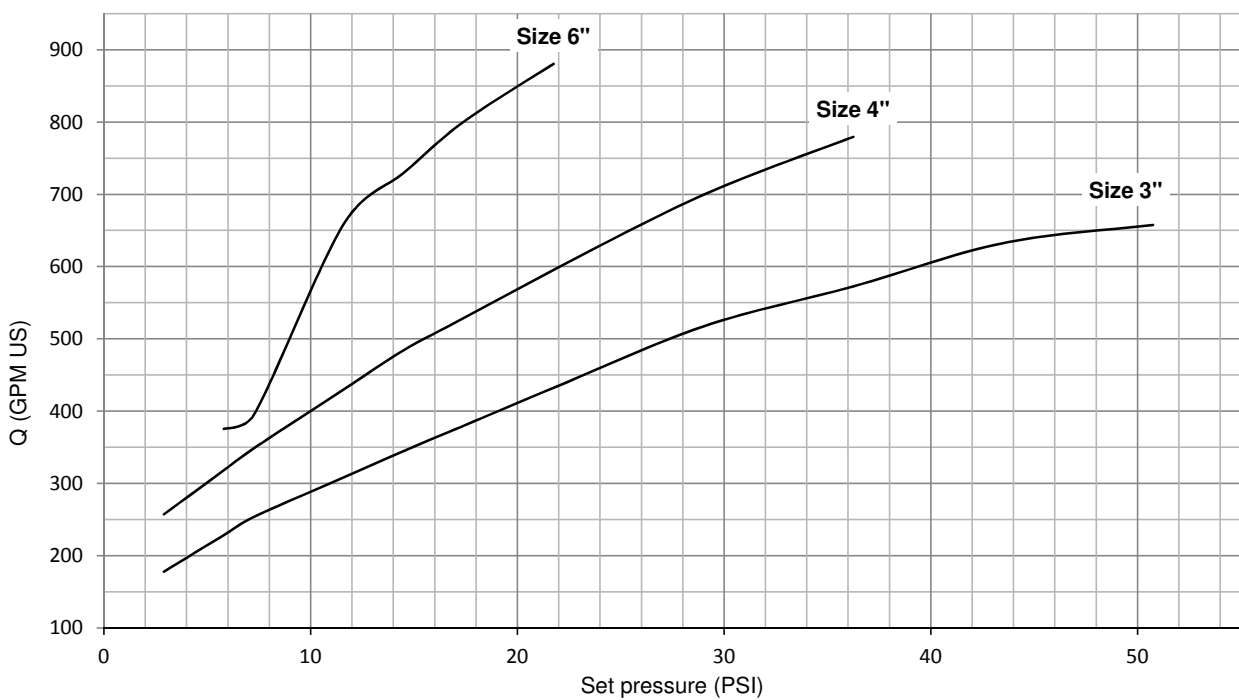
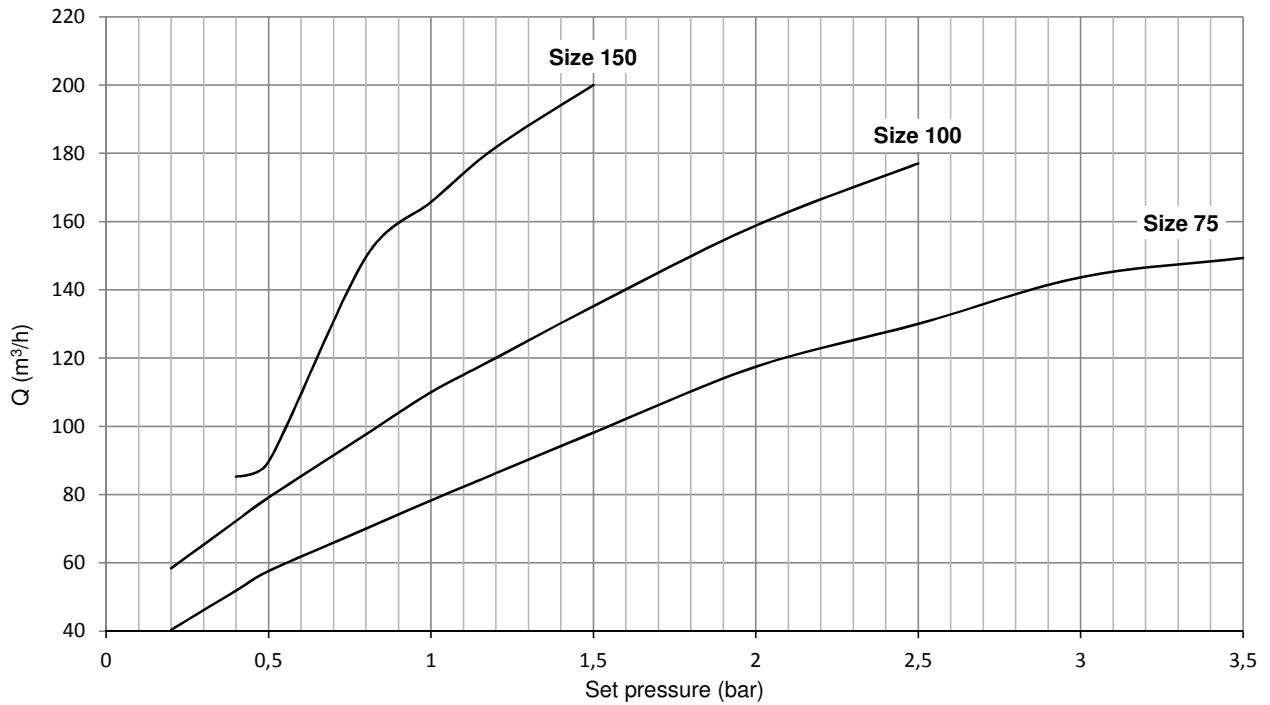
## 4 Operation

The valve is delivered with counterweight locked by welding to an individual opening pressure to suit the tank design data.

### 4.2 Discharge capacity

In accordance with EN 4126-1  
Capacity measured at:

$\Delta P = 10\%$  Set pressure  $\geq 1$  bar (14.5 psi)  
 $\Delta P = 0.1 \times$  Set pressure  $< 1$  bar (14.5 psi)



The valve is delivered with counterweight locked by welding to an individual opening pressure to suit the tank design data.

---

---

### 4.3 Recommended cleaning

---



**Always** handle lye and acid with great care.

**Caustic hazard!**



**Always** use  
rubber gloves!



**Always** use  
protective goggles!

It is important that the valve seat is kept clean.

Assuming the valve is operating normally, the valve disc is satisfactorily cleaned during the tank cleaning cycle as part of the tank.

**It is recommended that the valve is supplied with the option of Force opener and Splash guard.**

Force opener

For opening of valve during tank cleaning cycle for complete valve seat cleaning.

Splash guard

For containing CIP fluid spray from the tank cleaning cycle.

---

## 5 Maintenance

---

The valve is delivered with counterweight locked by welding to an individual opening pressure to suit the tank design data.

---

### 5.1 General maintenance

---

#### Step 1



**Always** read the technical data thoroughly.  
See chapter 6 Technical Data

---

#### Step 2



**Never** service the valve when it is hot.



**Never** service the valve with the valve or actuator under pressure.

**Atmospheric pressure required!**

**Burning hazard!**



#### Step 3



**Never** put your fingers between the valve and actuator for force opening.

**Cutting hazard!**



#### Step 4



**Never** touch the moving parts if the actuator for force opening is supplied with compressed air.

**Moving parts!**



---

**Below are some guidelines for maintenance and lubrication intervals.**

#### Valve

To ensure the valve operates correctly, test of function at regular intervals is required.  
Intervals are dependent on operation conditions and should be specified by the user or local regulations.

Alfa Laval recommend intervals of once every 6-12 months.  
O-ring and flange gasket replacement every 2-5 years.

To ensure correct mounting of O-ring, the O-ring should be lubricated with soapy water. Do not use grease, oil or equivalent.

#### Actuator for force opening

Disassemble, clean and lubricate the actuator every 2-5 years.  
O-ring replacement every 2-5 years.

---



*It is important to observe the technical data during installation, operation and maintenance.  
All personnel should be informed about the technical data.*

### 6.1 Technical data

The Pressure Relief Valve is used to minimise the risk of damage to tanks due to liquid overfilling.  
The Pressure Relief Valve is delivered with counterweight set and locked to suit customer requirements regarding opening pressure.  
When the pressure in the tank exceeds the preset opening value, the valve relieves the excess pressure.  
The valve can be equipped with a force opener.

#### Valve data

Operation range	
Nominal size	Set pressure range
75 mm (3")	0.2 - 3.5 bar (2.9 - 50.8 psi)
100 mm (4")	0.2 - 2.5 bar (2.9 - 36.3 psi)
150 mm (6")	0.4 - 1.5 bar (5.80 - 21.8 psi)
Materials	
Product wetted steel parts	EN 1.4404 (AISI 316L) with 3.1 cert.
Product wetted steel surfaces	Surface roughness Ra<0.8 µm (<32 µ")
Product wetted seals	EPDM

#### Actuator data

Actuator for force opening	
Max. air supply	10 bar (145 psi)
Min. air supply	5 bar (72.5 psi)
Noise	
Noise of actuator	75 dB(A)

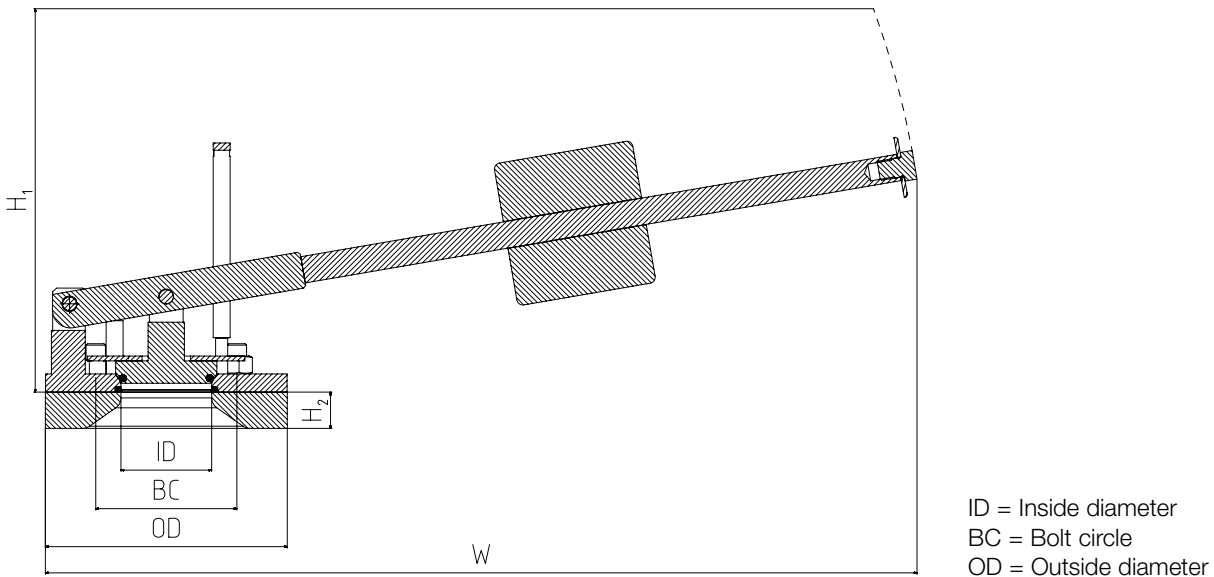
## 6 Technical Data

*It is important to observe the technical data during installation, operation and maintenance.  
All personnel should be informed about the technical data.*

### Weight

Nominal size	Set pressure range	Weight
75 mm (3")	0.2 -0.3 bar (2.9-4.35 psi)	10.8 kg
	0.4 bar (5.8 psi)	12.8 kg
	0.5 -0.6 bar (7.3-8.7 psi)	14.8 kg
	0.5 -0.6 bar (7.3-8.7 psi)	14.8 kg
	0.7-1.0 bar (10.2-14.5 psi)	18.8 kg
	1.1-1.3 bar (16-18.9 psi)	20.8 kg
	1.4-2.1 bar (20.3-30.5 psi)	24.8 kg
	2.2-2.9 bar (32-42 psi)	29.8 kg
	3.0-3.5 bar (43.5-50.8 psi)	38.8 kg
100 mm (4")	0.2 -0.3 bar (2.9-4.35 psi)	12.9 kg
	0.4-0.7 bar (5.8-10.2 psi)	14.9 kg
	0.8-1.4 bar (11.6-20.3 psi)	24.9 kg
	1.5-1.8 bar (21.8-26.1 psi)	29.9 kg
	1.9-2.5 bar (27.6-36.3 psi)	38.9 kg
150 mm (6")	0.4-0.8 bar (5.8-11.6 psi)	41.5 kg
	0.9-1.2 bar (13.1-17.4 psi)	50.5 kg
	1.3-1.5 bar (18.9-21.8 psi)	62.5 kg

### Interface requirements



### Interface requirements (mm)

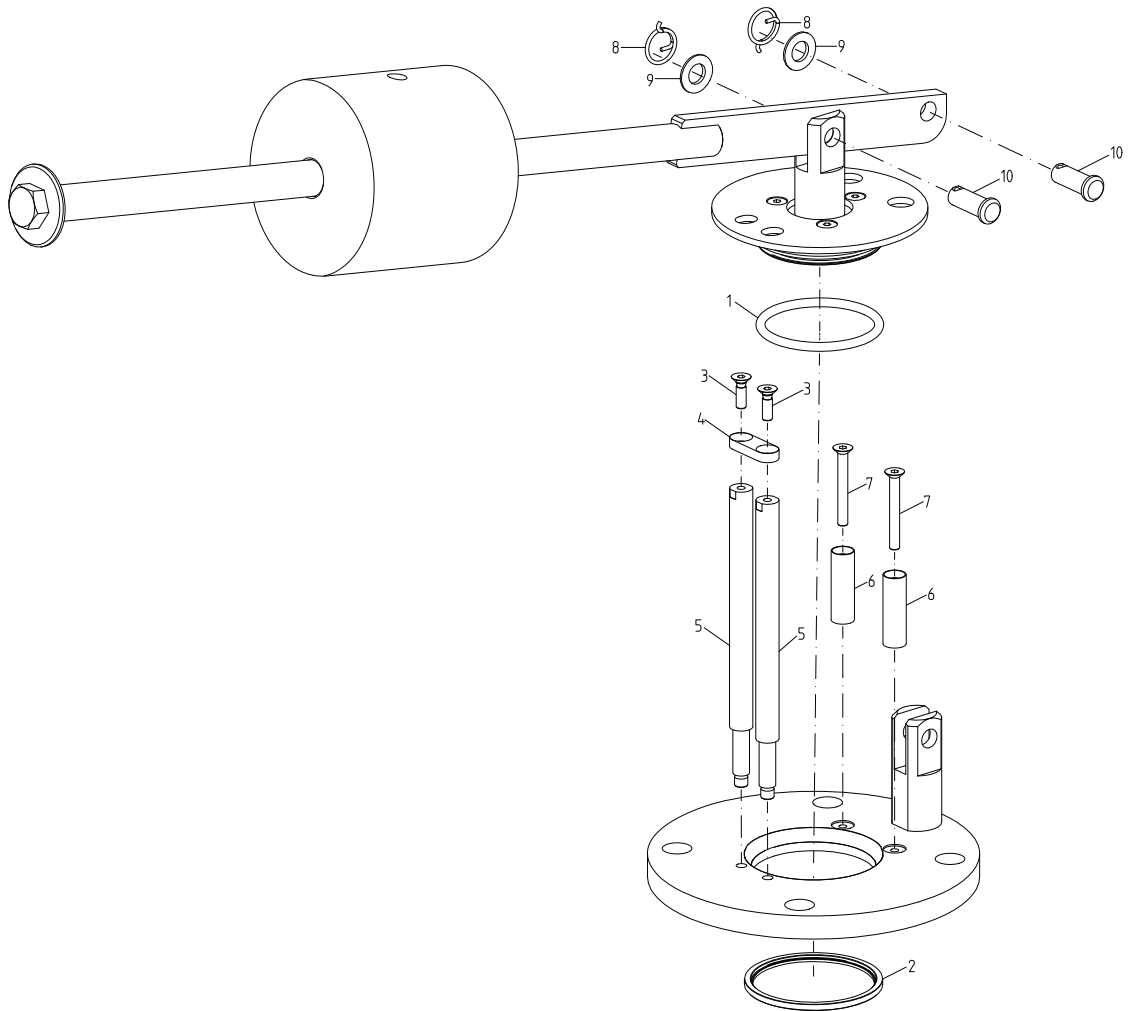
Nominal size	ID	BC	OD	Bolts	H1	H2	W
75 (3")	75 (2.95")	165 (6.5 ")	200 (7.87")	4xM16	375 (14.76")	30 (1.18")	740 (29.13")
100 (4")	100 (3.94")	165 (6.5 ")	200 (7.87")	4xM16	375 (14.76")	30 (1.18")	740 (29.13")
150 (6")	150 (5.91")	230 (9.06")	270 (10.63")	8xM16	430 (16.93")	30 (1.18")	1050 (41.34")



## 7 Parts List and Service Kits

*It is important to observe the technical data during installation, operation and maintenance.  
All personnel should be informed about the technical data.*

### 7.1 Pressure Relief Valve



## 7 Parts List and Service Kits

*It is important to observe the technical data during installation, operation and maintenance.  
All personnel should be informed about the technical data.*

### Parts list

Pos.	Qty	Denomination
1	1	O-ring, EPDM
2	1	Gasket, EPDM
3 □	2	Screw
4 □	1	P.R.V. guide stop Ø150/6"
4 □	1	P.R.V. guide stop Ø75/3"-Ø100/4"
5 □	2	P.R.V. guide pin
6 □	2	P.R.V. guide pin small
7 □	2	Screw
8 ♦	2	Locking ring
9 ♦	2	Washer
10 ♦	2	Bearing tap

### Service kits

#### Denomination

#### Assembly kits for Ø75 to Ø150

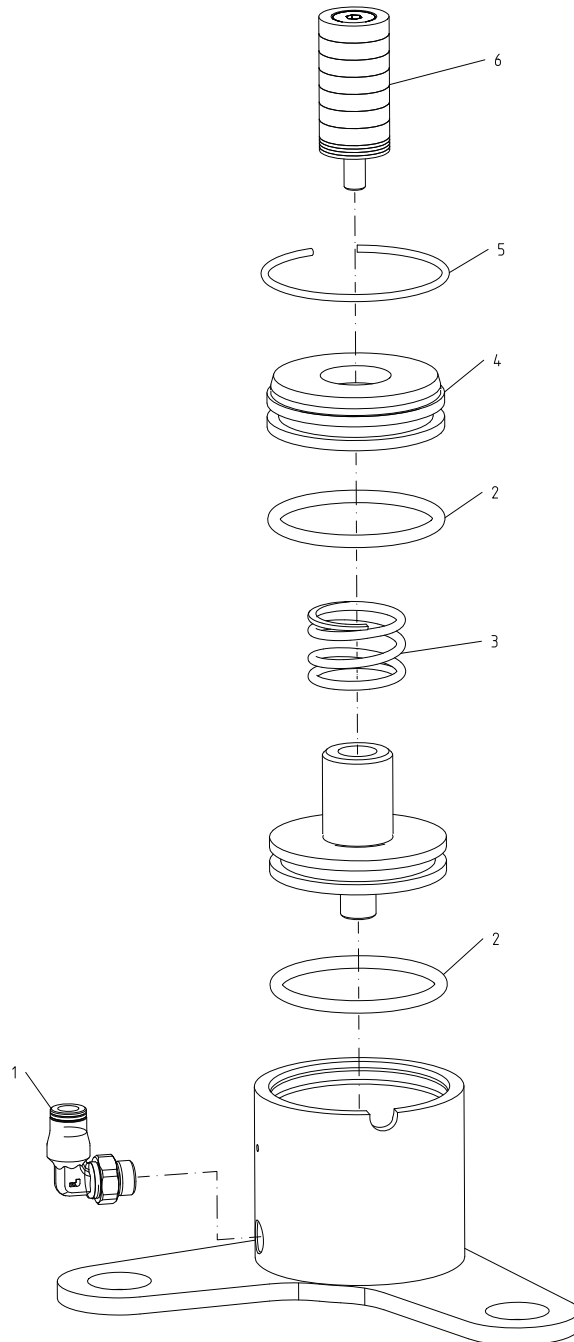
□	Assembly kit, PRV .....	9615145904
♦	Assembly kit, PRV .....	9615145808

Parts marked with □♦ are included in the assembly kits.

## 7 Parts List and Service Kits

*It is important to observe the technical data during installation, operation and maintenance.  
All personnel should be informed about the technical data.*

### 7.2 Force Opener



## 7 Parts List and Service Kits

---

*It is important to observe the technical data during installation, operation and maintenance.  
All personnel should be informed about the technical data.*

---

### Parts list

Pos.	Qty	Denomination
1	1	Air fitting
2	2	O-ring, NBR
3 ○	1	Spring
4 ○	1	Force opener cover
5 ○	1	Locking ring
6 ○	1	Spacer kit

### Service kits

#### Denomination

---

#### Assembly kits for Ø75 to Ø150

○ **Assembly Kit, force opener** ..... **9615146201**

Parts marked with □●○ are included in the assembly kits.

---

**How to contact Alfa Laval**

Contact details for all countries are continually updated on our website.

Please visit [www.alfalaval.com](http://www.alfalaval.com) to access the information directly.

© Alfa Laval Corporate AB

This document and its contents is owned by Alfa Laval Corporate AB and protected by laws governing intellectual property and thereto related rights. It is the responsibility of the user of this document to comply with all applicable intellectual property laws. Without limiting any rights related to this document, no part of this document may be copied, reproduced or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the expressed permission of Alfa Laval Corporate AB. Alfa Laval Corporate AB will enforce its rights related to this document to the fullest extent of the law, including the seeking of criminal prosecution.