



# SSV SL-022

## Safety Shut-off Valve

These shut-off valves are designed for transmission and distribution networks, as well as commercial and industrial use.

### KEY BENEFITS

- » High accuracy shut-off
- » Low pressure loss
- » Operating temperature up to -20°C
- » Easy maintenance
- » Approved by German DVGW

### DESCRIPTION

These models, designed for both high and low shut-off, automatically interrupt the gas flow when the outlet pressure of the regulator is outside the range of acceptable values.

### Technical Features

Inlet pressure range	Pu: up to 101.2 bar
OPSO* range	Pdso: 20 mbar – 60.0 bar
UPSO* range	Pdsu: 5 mbar – 20.0 bar
Accuracy class	AG 1 to AG 30
Operating temperature	-20°C to +60°C
Ambient temperature	-30°C to +60°C (body material)
Acceptable gases	Natural gas, propane, butane, air, nitrogen and all non-corrosive gases.

\* OPSO/UPSO: Over- and under-pressure shut-off

### Connections

Sizes	DN 25, 50, 80
Orifice diameter (mm)	Ø 28, 40, 65
Body lengths	See table
Flanges	PN16, 25, 40 ANSI 150, 300, 600

### Materials

Body	EN-GJS-400-15, GS21 Mn5 N
Actuator SSV	Steel, zinc coated / Al Mg Si F 28
Orifice	Brass, steel, zinc coated/Stainless steel
Internal parts	Brass, Steel, zinc coated/Stainless steel
Seals / O-Rings	NBR rubber/Viton
Diaphragm	NBR rubber/NBR rubber, reinforced fabric

## SAFETY SHUT-OFF VALVE TYPE SL-022

### Selecting the SSV

SSV	Pumax / Orifice - ø	Design
SL-IZN.1	101.2 bar	SSV for over-pressure shut-off (Command range Wdo 35 mbar – 60 bar)
SL-IZM.1		
SL-IZH.1		
SSV 022	16 bar	SSV for over-pressure and under-pressure shut-off Command range Wdo 0.035 bar - 1.7 bar – Wdu 0.01 bar - 0.22 bar
DN 25	Orifice Ø 28 mm	Flange
DN 50	Orifice Ø 40 mm	
DN 80	Orifice Ø 65 mm	
PN 16	Flanges according to DIN, PN 16, PN 40 with Form C seal Flanges according to ANSI 150, 300, and 600 RF	
PN 40		
ANSI 150		
ANSI 300		

\* with protection of safety relief valve, type 285 D

→ Device designation example: Safety shut-off valve, type SL-IZM.1, DN 50, PN 16

## SSV TYPE SL

### Design and Function

The SL-IZ type of safety shut-off valves are designed to automatically interrupt the gas flow in the gas pressure regulating systems as soon as the pressure in the system to be protected reaches an upper response pressure (over-pressure).

The devices consist of a control unit **1**, which pneumatically controls a switching unit **2**, and releases a flap valve **3**. The switching unit and the control unit are mounted on the actuator body **4**.

The pressure to be monitored is transmitted to a diaphragm measuring unit **5**; connection "A" measures the connection.

The response pressure is controlled by the force of the setting spring **6** at the top of the measuring unit. Use the setting screw **7** to adjust the response pressure.

Turn the setting screw **7** clockwise to increase the response pressure, or counter-clockwise to reduce it.

When the set response pressure is exceeded, the diaphragm unit **5** is raised and an overflow volume is released through the nozzle **8**.

The resulting increase in pressure acts on the switching diaphragm **9**.

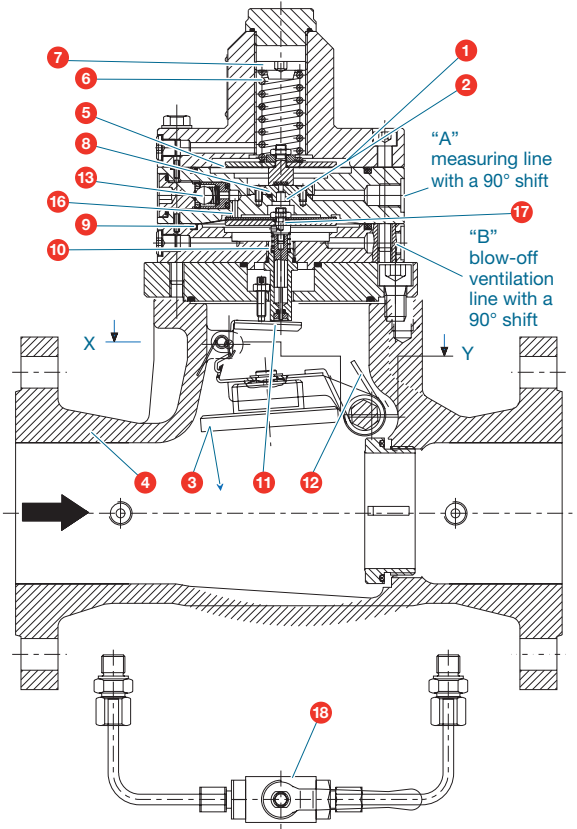
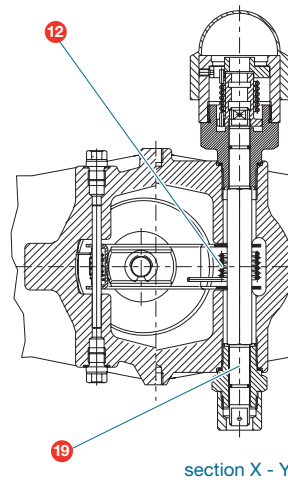
The switching diaphragm acts against the force of a weak cylindrical coil spring **10**, or against the friction force of a locking unit.

When pressure acts on the switching unit, the detent **11** is released and the flap valve **3** is closed by the force of one or more (ANSI 300 and higher) torsion springs **12\***.

Tightness is guaranteed even at a very low operating pressure due to the dimensions of the closing springs.

Use the manipulation valve **18** to compensate for the pressure at the valve flap.

A special tool (spring tension spanner) is required to assemble the torsion spring (12).



### Diaphragm Break Protection

The safety shut-off valves meet all requirements of the DIN 3381 standard, June 1984 Edition. According to this standard, devices must have a unit that closes the SSV control unit **1** in case the diaphragm is damaged **5**.

For this reason, these types of safety shut-off valves are equipped with an over-pressure valve **13** in the control unit **1**. If the comparator diaphragm **5** is damaged, gas flows to the top of the diaphragm.

Pressure builds up, thereby opening the over-pressure valve **13**. In addition, the switching process is triggered by the overflowing volume, which flows through the bore **16**.

The pressure in the switching unit **2** is further decreased by means of a small bore **17**, which is located in the switching unit.

The gas is discharged through the blow-off/ventilation connection "B".

This connection also carries gas if the existing control pressure (e.g., pressure test) is above the set response pressure.

\* A special tool (spring tension spanner) is required to assemble the torsion spring (12).

### SPRING RANGE AND ACCURACY CLASS AG

#### Type SL-IZN.1, M.1, H.1

Type	Spring range Wdso (bar)	Spring Number	Colour	Wire Ø mm	Range) Wdso (bar)	Accuracy Class
SL-IZN.1	0.035 – 0.25	955-202-36	red	1.8	0.035 – 0.1	AG10
	0.2 - 0.8	955-202-37	green	2.5	>0.1 – 0.8	AG 5
SL-IZM.1	0.6 – 6.6	955-202-38	yellow	3.6	0.6 – 6.6	AG 5
SL-IZH.1	3.5 – 10.5	955-201-68	black	6.0	3.5 – 10.5	AG 2.5
	10.5 – 21.0	955-201-69	grey	7.0	>10.5 – 60.0	AG 1
	18.0 – 60.0	955-202-84	yellow	10.0		

## SSV TYPE 022

For over-pressure and under-pressure shut-off

### Description

The SSV 022 is a new and improved version of the tried and tested SSV for upper and lower shut-off of the 133/233 series.

It is mounted on the valve body by means of an adapter and can be turned 90°.

Due to the SSV cap ⑨ which is equipped with a diaphragm, it is not necessary to install a ventilation line from the SSV into the open.

### Function

The pressure to be monitored Pa is transmitted to the external connection ⑨ of the SSV-022.

When the set Pso / Psu switching pressure is exceeded or falls below the limit, the valve rod ② is released and pushed against the release lever ③ of the SSV valve disk arm due to the force of the closing spring.

The resulting force of the torsion spring ④ turns the valve disk arm and the valve disk ⑤ around the reset shaft ⑥ against the nozzle ⑦ and closes the SSV.

### Technical Data

Pressure stage	PN 16, ANSI 150
Nominal width	DN 25, 50, 80
Model	Flange in DIN and ANSI
Pe max	16 bar
Wdo	0.04 bar to 1.7 bar
Wdu	0.01 bar to 0.22 bar

### Construction

Body	EN-GJS-400-15
Measuring unit:	Al Mg Si 1 F 28
SSV-Body	Hot-pressed brass
Interior parts	Steel, brass, aluminium, perbunan
Operating temperature	-20°C to +60°C
Ambient temperature	-30°C to +60°C
Connection Po - pulse:	G 1/4"

### Spring Ranges/Shut-off Pressure Groups

Spring Range Pso/Spring-No./Colour			OPSO Range/Accuracy Class AG	
40 – 60 mbar	955-200-22	red	40 mbar – 400 mbar	AG 10
50 – 120 mbar	955-200-23	blue	40 mbar – 400 mbar	AG 10
100 – 450 mbar	955-200-24	green	40 mbar – 400 mbar	AG 10
350 – 1000 mbar	955-203-41	black	> 0.4 bar – 1.0 bar	AG 5
800 – 1700 mbar	955-203-42	yellow	> 1.0 bar – 1.7 bar	AG 2.5

Spring Range Pso/Spring-No./Colour			UPSO Range/Accuracy Class AG	
10 – 50 mbar	955-200-32	red	10 mbar – 20 mbar	AG 30
40 – 120 mbar	955-203-51	yellow	> 20 mbar – 220 mbar	AG 15
100 – 220 mbar	955-203-52	brown		

## PRESSURE LOSS OF THE SAFETY SHUT-OFF VALVE TYPE SL - 022

These types of safety shut-off valves have very low pressure loss.

Use the following formula to calculate the pressure loss:

$$\Delta p (P \text{ inlet} - P \text{ outlet}) = \left( \frac{Q}{C_g} \right)^2 \times \frac{1}{P_{i \text{ abs}}} = [\text{bar}]$$

Q = Flow rate (m³/h Natural gas)

Cg = Flow constant (see table)

### Example

Inlet pressure Pu = 3.0 bar

Flow rate Q = 500 m³/h Natural gas

$$\Delta p = \left( \frac{500}{2600} \right)^2 \times \frac{1}{4} = 0.0092 \text{ bar}$$

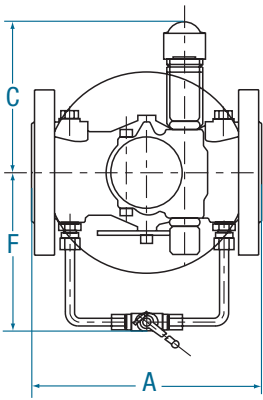
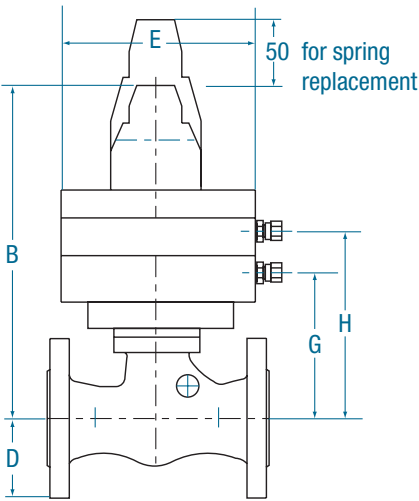
DN	25	50	80
Cg	600	2600	5100

**Note:** The max. velocity of SL - 022 is 70 m/s.

DIMENSIONS AND WEIGHTS

Safety Shut-off Valve, Type SL-IZN.1, M.1, H.1

DN		A		B		C	D					E	F		G	H
	Orifice	PN 16, 40 ANSI 150	ANSI 300, 500, 600	SL-IZ		PN 40	PN 16	PN 40	ANSI 150	ANSI 300, 400	ANSI 600	SL-IZ N.1, M.1, H.1			I	
				N.1 M.1	H.1								<PN 40	>PN 40		
25	28	160	230	240	280	105	57.5	57.5	54.0	62.0	62.0	140	PN 16 =110	150	105	135
50	40	230	300	245	285	110	82.5	82.5	76.0	82.5	82.5	140	110	110	108	135
80	65	310	380	285	330	145	100.0	100.0	95.5	105.0	105.0	155	145	145	154	181



SSV Type SL

## Safety Shut-off Valve, Type SL

DN	Reset Shaft		Weight in kg	
	Shaft Ø	Spanner Size SW (mm)	PN 16 / PN 40 ANSI 150	PN 63 ANSI 300 / 600
25	8	square 6	11	17
50	8	square 6	16	20
80	11.8	two-edged 9	26	39

## Installation Position

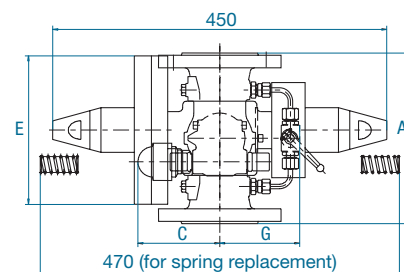
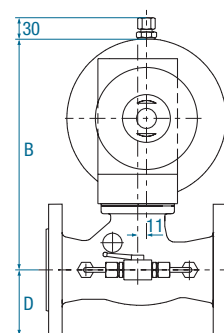
- » DN 25 and DN 50 = no restriction.
- » DN 80 ≤ PN 40 = for a vertical installation, the flow direction must be upwards (weight of the SSV flap has an opening effect), and an additional spring is required.
- DN 80 > PN 40 = no restriction.

## Safety Shut-off Valve, Type SSV 022

Nominal Width	A	B	C	D	E	F	G	Weight/ Kg)
DN 25	160	252	177	57.5	145	287	88	11
DN 50	230	255	180	82.5	150	290	91	15
DN 80	310	310	236	100	180	345	147	25

## Installation Position

- » DN 25 and DN 50 = no restriction.
- » DN 80 PN 40 = for a vertical installation (flow direction upwards), an additional spring is required. For all other positions, there are no restrictions.
- DN 80 > PN 40 = no restriction.



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