

# S100

## Slam Shut Valve Nominal Diameter DN50, DN80 & DN100



### Applications

- Industrial
- Commercial

### Brief information

**Operation:** The S100 Slam Shut Valve protects gas installations against dangerous overpressure conditions and is normally fitted on the inlet side of the regulator.

An impulse pipe connects the diaphragm chamber to the outlet side of the regulator. When the pressure increases above a predetermined value the trigger mechanism actuates and the valve slams shut.

The S100 incorporates a visual valve position indicator. Resetting can only be achieved manually and an automatic integral vent valve ensures safe resetting procedures and eliminates costly by-pass systems. The S100 can be mounted in any orientation. The unit can be specified with the reset mechanism on either side of the body.

The Series 100 Slam Shut Valve has been designed to meet the requirements of BGES/V9 and DIN3381.

**Approvals:** The S100 has been approved to module B + D of the PED 97/23/EC by BSI Notified body No. 0086). It is classified as Category IV equipment and a safety accessory.

#### Technical Data:

Maximum inlet pressure:	19 bar (275 psig)
Maximum trip pressure:	6 bar (87 psig)

**Servicing:** The S100 has been designed for ease of access, inspection and servicing of all internal components. A standard soft spares kit is available for all sizes.

DN50 Low & Medium Pressure	reference number SK109-01
DN50 High Pressure	reference number SK109-02
DN80 Low & Medium Pressure	reference number SK111-01
DN80 High Pressure	reference number SK111-02
DN100 Low & Medium Pressure	reference number SK112-01
DN100 High Pressure	reference number SK112-02

### Main features

- Sizes DN50, DN80 & DN100 (for DN150 & DN200 see J98)
- Temperature range -20°C to +80°C
- Flanged connections to BS EN 1092-2 NP16 and impulse tapping connection to Rc1/4 unless otherwise requested.
- External impulse
- Spring loaded
- Full Bore Design
- Very low pressure drop
- Visual Indicator

### Options

- Micro switch for remote indication

# S100: Slam Shut Valve

## 1. Introduction

The Series 100 SLAM SHUT VALVE is an extremely high integrity device ensuring positive operation to the closed position in the event of control equipment failure.

At the heart of the system is the ball bearing latch mechanism which has been well proven over the last two decades and is now the accepted standard against which other pressure operated security devices are judged.

This mechanism provides predictable repeatability set point for any pressure within extremely close tolerances and is unaffected by the mounting position of the valve.

In service the valve disc assembly is retained in the open position well away from the main gas flow. The bore of the valve is therefore completely uninterrupted resulting in low pressure losses and equally as important, minimal affect from gas turbulence on the valve assembly.

Among its innovative design features are automatic pressure equalising valve, valve position indicator and in line servicing of all components including the valve seat.

The Series 100 valve is preset to a desired safe pressure limit which will safeguard the down stream system or equipment and is automatically operated whenever this pressure limit is sensed. Re-arming is carried out manually.

Remote indication of operation - The Series 100 Slam Shut can be provided with a switching device which will give remote indication of operation.

## 2. Trip Mechanism

### Mechanism - valve open

As all operating components are spring loaded and latching mechanisms positively located the Series 100 Slam Shut is completely unaffected by vibration or external forces. Actuation can only be achieved via sensed pressure reaching the set point.

Remote indication of operation - The Series 100 Slam Shut can be provided with a switching device which will give remote indication of operation.

In the trip mechanism a spring loaded shaft (A) acts downwards on a series of ball bearings (B) tending to force them radially outwards.

The bearings are held against the shaft by the bearing cage (C) which is connected to the pressure sensing diaphragm (D). Diaphragm and bearing cage are spring loaded via the pressure setting springs (E). The valve disc assembly (F) is retained in the open position via the spring clip (G) which locates in a recess in the shaft (A). The valve disc assembly is spring loaded to the closed position thus forcing the spring clip against the recess.

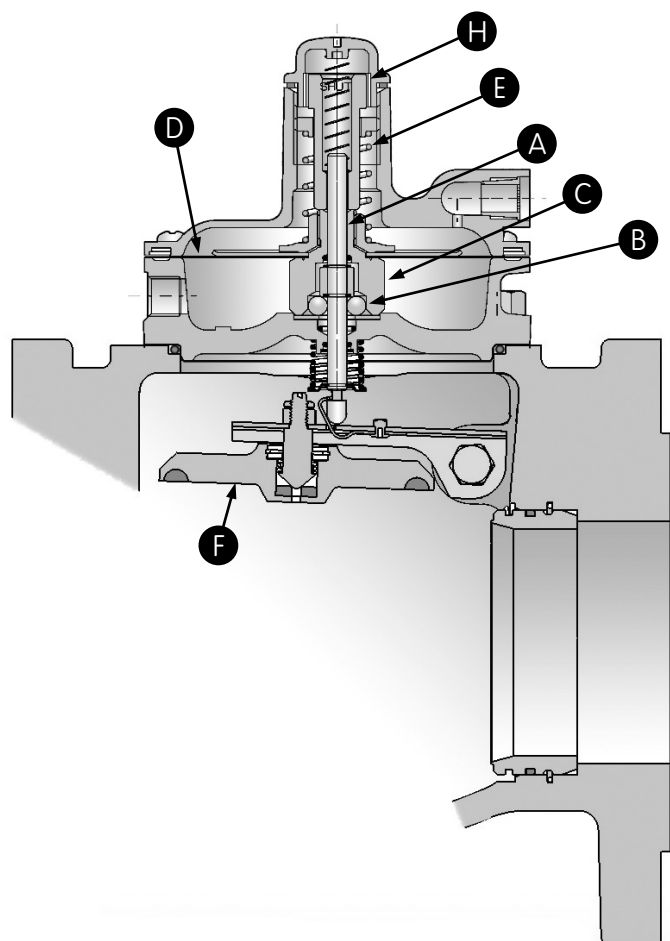
### Valve Operation

As the sense pressure reaches the desired trip point it acts against the pressure sensing diaphragm and pressure setting spring.

The bearing cage is lifted allowing the ball bearings to move radially outwards against the bearing cage taper to a point where the shoulder diameter on the spring loaded shaft is free to pass through the bearings (TRIP POINT).

As the shaft moves through the bearings it releases the spring clip (G) thereby allowing the valve disc assembly to operate to the closed position.

A valve position indicator (H) indicates that the valve has moved to the closed position.



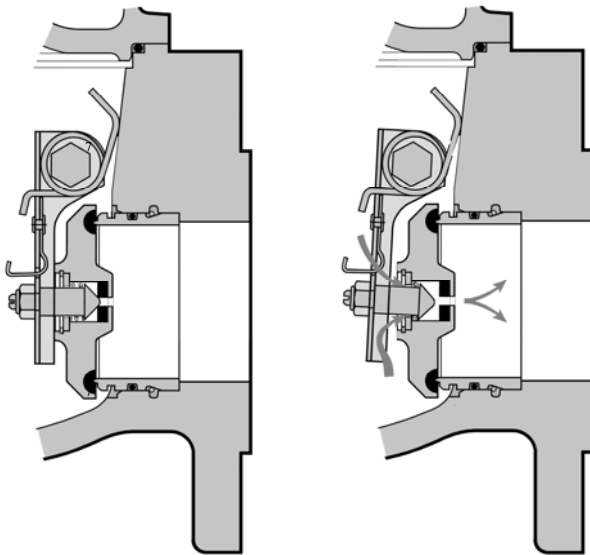
# S100: Slam Shut Valve

## 3. Integral Pressure Equalising Valve

In the closed position pressure acts upon the valve ensuring positive lock up forces.

In order to re-arm the valve this pressure must first be equalised across the valve if damage to the mechanism is to be avoided.

In the Series 100 Slam Shut this is AUTOMATICALLY achieved when the re-arming procedure is undertaken. When the re-arming shaft is rotated a small valve incorporated into the main valve is opened allowing pressure to pass downstream. This device eliminates costly by-passes and potential damage due to neglect in carrying out equalising procedures.



## 4. In-Line Servicing

All components have been designed such that complete servicing of the valve can be carried out with the body installed in the pipework.

## 5. Mounting Position

As all components in the valve are positively biased and located the valve can be installed in any position including inverted. However care the breather hole.

The actuating head is designed to be rotated to allow the breather vent to be positioned downwards to prevent moisture ingress.

$$\Delta P = \left( \frac{Q \sqrt{G}}{25 C_v} \right)^2 \frac{1}{P_i}$$

Q = m<sup>3</sup>/hr, cubic meters per hour at 1.01 bar abs. and 15.5°C (288°K)

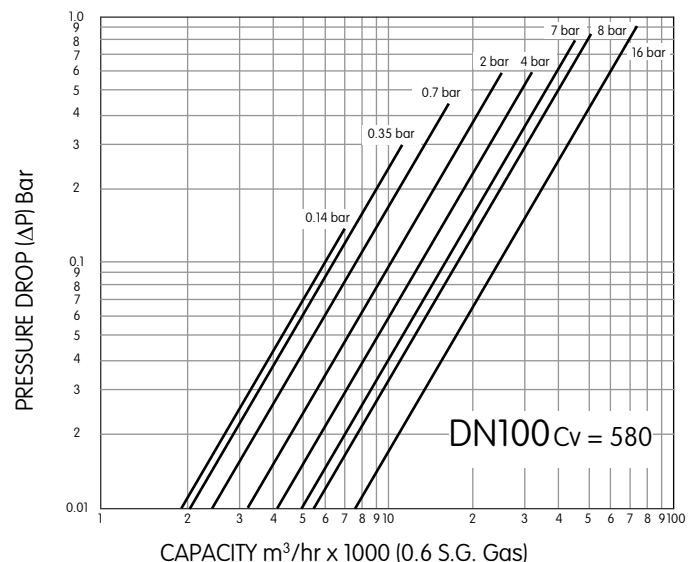
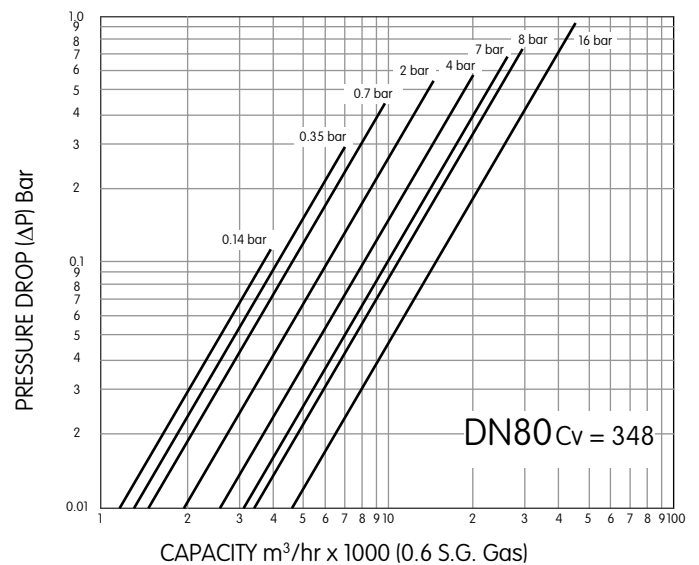
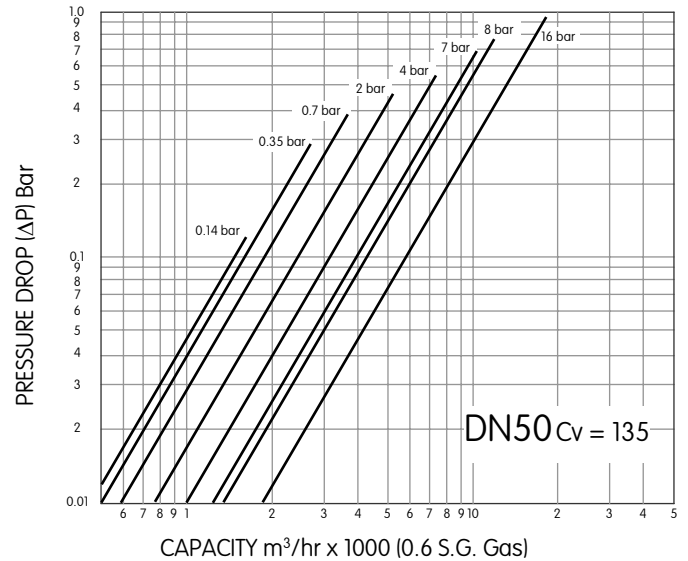
C<sub>v</sub> = Valve Coefficient

P<sub>i</sub> = Inlet Pressure, bar abs.

G = Specific Gravity of Gas (Air = 1)

ΔP = Pressure drop across valve, bar (P<sub>i</sub>-P<sub>o</sub>)

## Capacity



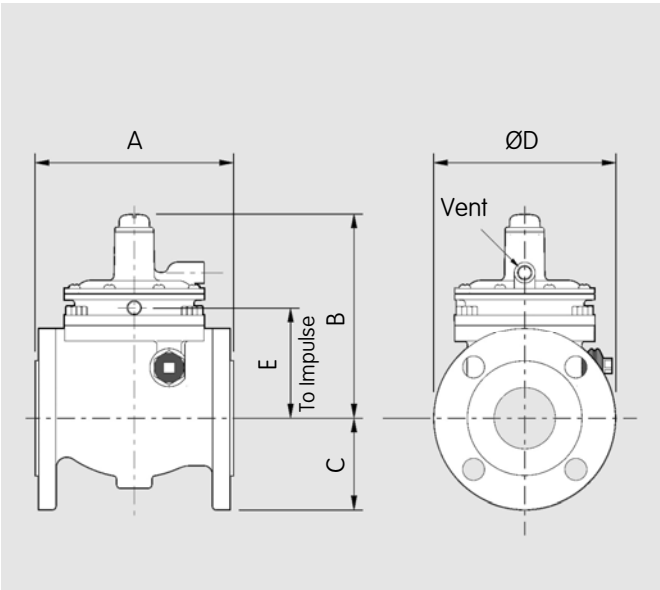
# S100: Slam Shut Valve

Dimensions and Weights						
Size	A	B	C	D	E	Weight (Kg)
50	180	187	83	166	101	13
80	220	200	100	200	114	17
100	270	226	110	220	140	24

Micro Switch

A micro switch is available to enable remote indication of trip off. It is suitable for all types and sizes of S100 in place of the top cap. The switch can be specified with the slam shut valve, or can be purchased later as a conversion kit.

Conversion Kit Part Number: S1MS02



Trip Off Pressures								
Low Pressure			Medium Pressure			High Pressure		
Part Number Colour Code	mbar	"wg/Psig	Part Number Colour Code	mbar	Psig	Part Number Colour Code	bar	Psig
J10009-011 -	18 – 35	7 – 14"wg	J10009-015 Orange / Yellow	561 – 975	8 – 14	J10009-014 Purple	1 – 1.8	14 - 26
J10009-012 Light Blue	35 – 70	14 – 28"wg	J10009-016 Orange / Dark Green	976 - 1400	14 - 20	J10009-015 Orange / Yellow	1.7 – 3.5	24 - 51
J10009-013 Red / Brown	71 – 140	1 – 2 PSI				J10009-016 Orange / Dark Green	2.5 - 6	36 - 87
J10009-014 Purple	141– 200	2 – 3 PSI						
J10009-015 Orange / Yellow	201 – 350	3 – 5 PSI						
J10009-016 Orange / Dark Green	351 - 560	5 – 8 PSI						

Material Specifications	
A summary of the material specification for the S100 is given for reference. All material has been selected to provide maximum durability and reliability in service.	
Components	Specification
Body	Nodular Iron
Valve Seat	Stainless Steel
Actuating Mechanism	Aluminium Alloy
Sensing Diaphragm, Valve Discs and 'O' rings	Nitrile (Buna)
Loading Springs	Carbon Steel, Zinc Plated and Passivated
Mechanism Springs	Stainless Steel Wire

**Quality:**  
Elster Jeavons is committed to a programme of continuous quality enhancement. All equipment designed and manufactured by the Elster-Instromet group benefits from the group's quality assurance standards which are approved to EN ISO9001:2008.