Seetru Limited

Seetru are Bristol-based manufacturers of safety relief and other special purpose ancillary valves for a wide range of compressed air, industrial gas, refrigerants, powder, steam, liquid and liquefied gas applications. Seetru change-over valves offer increased plant and process efficiency.

Seetru liquid level gauges are primarily of two types, sight gauges and magnetic float bypass gauges. Many of the gauges are direct reading though most have optional electronic remote reading systems and computer interfaces.

SEETRU

Seetru *Safety Relief Valves*

For Hydrogen Applications

HYDROGEN

SeetruLimited
That's Safety!

Edition 4 (18.1.2024)

Seetru Limited

Solution for the Hydrogen Industry

Safety Relief Valves and Change Over Valves

Suitable for the following applications:

- Hydrogen generation- electrolyser
- Hydrogen fuel cells
- Hydrogen compressors and pumps
- Hydrogen fuelling systems
- Hydrogen storage
- Pressure vessels,receivers and piping systems containing hydrogen
- Hydrogen transportation

The Seetru range of safety valves for compressed air and gas are compact, highly efficient and incorporate the exclusive Tutchtite– seal technology for repeatable bubble-tight sealing performance: designed for applications including air/gas compressors, specialist gas plants, chemical equipment and piping, pressure vessels, thermal relief and medical gases etc.

These valves meet important international standards which include: ISO-4126-1 &-7 and ASME BPVC VIII.1 & XIII design codes as well as type test approvals from TÜV and the National Board. These products comply with the requirements of the European Pressure Equipment Directive (PED) and are available with both the CE mark as well as the UV stamp, and have wide international approvals such as the EAC (TR CU) customs union certification and declaration and the Canadian CRN. Seetru products are fully compliant with the requirements of the UK Pressure Equipment (Safety) Regulations and come with the UKCA mark.

CE UKCA CRN EAC

Change-over valves (sometimes referred to as selector valves or three-way valves) enables the switching of flow from one safety valve to another. Typically used where plant shutdown is impossible or undesirable for process, engineering or commercial reasons. With change-over valves it is possible to switch over between parallel safety valves without interrupting operation, so that maintenance work can be carried out on each safety valve in turn. Seetru change-over valves in combination with our safety valves provide the best solution for plant safety and efficiency. Seetru products are widely recognised for their exceptional quality and reliability.

Table of contents

Enclosed Discharge Safety Relief Valves

for compressed Air & Gas *hydrogen*

Seetru Limited

Type 636 / 631

Safety valves with bronze body <
Enclosed discharge valve with threaded connections <

Example Applications

- Air / gas compressors
- Pressure vessels
- Pneumatic systems
- Medical gases
- Technical gases

Specifications

- Inlet connections: 3/8” to 2” (depending on bore size)
- Temperature:-40°C to +200°C (depending on seal material)
- Pressure range: 0.32 to 55.2 bar (depending on bore size)

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- ASME BPVC VIII.1 & XIII (UV)
- CRN
- EAC

Materials of Construction

Component	Material	Grade
Inlet	Brass	CW614N
	Stainless Steel	1.4401 (316)
Body	Bronze	CC491K SB-62 C83600
Internal parts	Brass	CW614N
	Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)

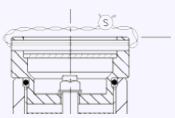
Seal Materials

Seal Material	Temperature Range
Viton® (FKM)	-15°C to +200°C
Nitrile (NBR)	-40°C to +120°C

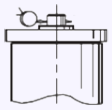
Standard seal materials shown, others are available.

Easing Gear / Lifting Gear Options

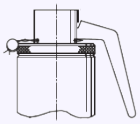
- **Standard option**:
Rota-lift, twist type
(not gas tight)



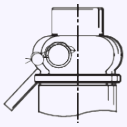
- **Other Options:**



Sealed Cap (gas tight cap)



Unsealed lever (not gas tight)



Sealed lever (gas tight)

Technical information by bore size

Bore size	9.5/10mm			13.7mm			17mm			20mm			25mm		
Inlet Size	3/8"	1/2"	3/4"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	1"	1 1/4"	1 1/2"	1 1/4"	1 1/2"	2"
Outlet Size	3/4"			1"			1 1/2"			2"			2"		
Flow Area	70.9mm² (above 1.55 bar)			147.7mm²			227mm²			314mm²			490.4mm²		
H - Height (Rota-lift cap version)	102mm (up to 33 bar) 116mm (33-55.2 bar)			143mm (up to 35 bar) 172.5mm (35-49 bar)			204mm			227mm			252mm		
TÜV alloted outflow coefficient	0.78			0.71			0.74 (1.0 to 2.4 bar) 0.84 (2.4 to 35.0 bar)			0.76 (3.0 to 22.0 bar) 0.80 (22.0 to 35.0 bar)			0.85		
NB Certified rated slope (ASME)	1.74 scfm/psia			3.47 scfm/psia			5.60 scfm/psia			7.77 scfm/psia			12.26 scfm/psia		
Weight (approximate) Kg	0.8			1.1			3.6			4.0			5.1		
Set Pressure range - PED (CE) bar	0.48 to 55.2			0.32 to 49.0			1.0 to 35.0			3.0 to 35.0			5.65 to 30.0		
Set Pressure range - ASME (UV) psi	22.5 to 800.4			20.3 to 710.5			34.8 to 507.5			43.5 to 507.5			82.0 to 435.0		
Relieving pressure/fully open pressure	**Set Pressure +10%**														
Reseating pressure	**Set Pressure -10%** (0.3 bar minimum)														

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.
Stable operation on flows down to 50% of valve rated capacity.

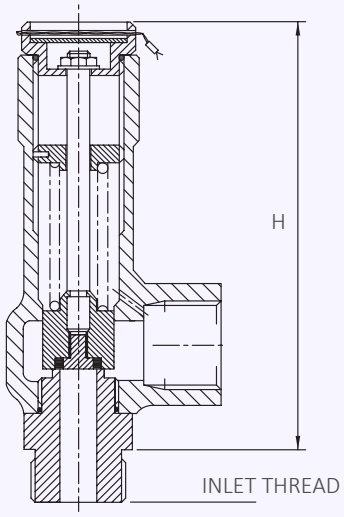
Standard Thread Connection Types

- BSP Parallel male thread
- BSP Taper male thread
- NPT male thread

Standard Outlet Connection Types

- BSP Parallel female thread
- NPT female thread

Valves with Rota-lift Easing Gear



Valve Selection Guide

Approval Required	Valve type	Select Bore	Inlet Size	Thread Type	Outlet Thread Type	Easing Gear	Seal Material
PED (CE)	636 (Brass inlet)	Select bore size from above table	Select inlet size from above table	Select Inlet thread type	Select Outlet thread type	Select easing gear/top fitting	Viton® (FKM)
	656 (St. Steel inlet						Nitrile (NRB)
PED (CE), ASME (UV) & CR	631 (Brass inlet)						
	651 (St. Steel inlet						Other

EAC marking available upon request
***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	CE/PED	636	20	1 1/2"	BSP Taper	BSP parallel	Rota-lift	Viton	10.5 bar
	Approval	Valve Type	Bore = 20mm	Inlet Size	Inlet Thread Type	Outlet Thread Type	Easing Gear	Seal	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour
Type 636/656: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		9.5mm	13.7mm	17mm	20mm	25mm
bar	psi	Nm³/Hour	Nm³/Hour	Nm³/Hour	Nm³/Hour	Nm³/Hour
0.32	4.64		114.2			
0.48	6.96	48.9	124.5			
1	14.5	76.9	164.9	241.8		
2	29	121.0	229.1	367.6		
3	43.5	162.4	307.5	560.2	701.4	
4	58	203.8	385.9	703.0	880.3	
5	72.5	245.3	464.3	845.9	1059.2	
5.65	81.93	272.2	515.3	938.7	1175.5	2054.3
6	87	286.7	542.7	988.7	1238.2	2163.7
7	101.5	328.1	621.2	1131.6	1417.0	2476.4
8	116	369.5	699.6	1274.5	1596.0	2789.0
9	130.5	410.9	778.0	1417.3	1774.9	3101.7
10	145	452.4	856.4	1560.2	1953.8	3414.3
15	217.5	659.5	1248.5	2274.5	2848.2	4977.5
20	290	866.6	1640.6	2988.7	3742.8	6540.7
25	362.5	1073.8	2032.7	3703.0	4881.2	8103.9
30	435	1280.9	2424.8	4417.3	5823.0	9667.1
35	507.5	1488.1	2816.9	5131.6	6764.6	
40	580	1695.2	3209.0			
45	652.5	1902.3	3601.1			
49	710.5	2068.0	3914.8			
50	725	2109.4				
55.2	800.4	2324.8				

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with ASME BPVC.XIII, AIR at 60°F and 14.7 psia/scfm. SCFM
Type 631/651: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		9.5mm	13.7mm	17mm	20mm	25mm
psi	bar	SCFM	SCFM	SCFM	SCFM	SCFM
20.3	1.40		131.9			
22.5	2.50	68.7	139.4			
30	2.07	81.5	165.5			
34.8	2.80	90.6	183.8	296.7		
40	2.76	100.4	203.7	328.7		
43.5	3.00	106.9	217.0	350.2	486.0	
50	3.45	119.2	241.8	390.3	541.5	
82	5.66	179.3	363.9	587.3	814.9	1285.8
100	6.90	213.2	432.6	698.1	968.7	1528.4
150	10.34	307.2	623.4	1006.1	1395.9	2202.6
200	13.79	401.2	814.2	1314.0	1823.2	2876.8
250	17.24	495.3	1005.0	1621.9	2250.4	3550.8
300	20.69	589.3	1195.8	1929.8	2677.6	4224.9
350	24.14	683.3	1386.6	2237.8	3104.9	4899.1
400	27.59	777.4	1577.4	2545.7	3532.2	5573.3
435	30.00	843.2	1711.0	2761.2	3831.2	6045.2
450	31.03	871.4	1768.2	2853.6	3959.3	
500	34.48	965.4	1959.0	3161.5	4386.6	
507.5	35.00	979.5	1987.6	3207.7	4450.7	
550	37.93	1059.4	2149.8			
600	41.38	1153.4	2340.6			
650	44.83	1247.5	2531.4			
700	48.28	1341.5	2722.2			
710.5	49.00	1361.3	2762.3			
750	51.72	1435.5				
800.4	55.20	1530.3				

For any intermediate pressures/flows please contact Seetru

Enclosed Discharge Safety Relief Valves

for compressed Air & Gas *hydrogen*

Seetru Limited

Type 646 / 641

Safety valves with Stainless Steel body <
Enclosed discharge valve with threaded connections <

Example Applications

- Air / gas compressors
- Pressure vessels
- Pneumatic systems
- Medical gases
- Technical gases

Specifications

- Inlet connections: 3/8” to 2” (depending on bore size)
- Temperature:-40°C to +200°C (depending on seal material)
- Pressure range: 0.32 to 55.2 bar (depending on bore size)

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- ASME BPVC VIII.1 & XIII (UV)
- CRN
- EAC

Materials of Construction

Component	Material	Grade
Inlet	Stainless Steel	1.4401 (316)
Body	Stainless Steel	1.4408 (316)
Internal Parts	Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)

Seal Materials

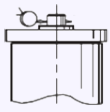
Seal Material	Temperature Range
Viton® (FKM)	-15°C to +200°C
Nitrile (NBR)	-40°C to +120°C

Standard seal materials shown, others are available.

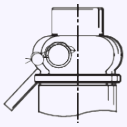
Easing Gear / Lifting Gear Options

- **Standard option**: Rota-lift cap, twist type (not gas tight)

- Other Options:



Sealed Cap (gas tight cap)



Sealed lever (gas tight)

Technical information by bore size

Bore size	9.5/10mm			13.7mm			17mm			20mm			25mm		
Inlet Size	3/8"	1/2"	3/4"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	1"	1 1/4"	1 1/2"	1 1/4"	1 1/2"	2"
Outlet Size	3/4"			1"			1 1/2"			2"			2"		
Flow Area	70.9mm² (above 1.55 bar)			147.7mm²			227mm²			314mm²			490.4mm²		
H - Height (Rota-lift cap version)	116mm			143mm (up to 35 bar) 172.5mm (35-49 bar)			211mm			227mm			252mm		
TÜV alloted outflow coefficient	0.78			0.71			0.74 (1.0 to 2.4 bar) 0.84 (2.4 to 35.0 bar)			0.76 (3.0 to 22.0 bar) 0.80 (22.0 to 35.0 bar)			0.85		
NB Certified rated slope (ASME)	1.74 scfm/psia			3.47 scfm/psia			5.60 scfm/psia			7.77 scfm/psia			12.26 scfm/psia		
Weight (approximate) Kg	0.8			1.1			3.6			4.0			5.1		
Set Pressure range - PED (CE) bar	0.48 to 55.2			0.32 to 49.0			1.0 to 35.0			3.0 to 35.0			5.65 to 30.0		
Set Pressure range - ASME (UV) psi	22.5 to 800.4			20.3 to 710.5			34.8 to 507.5			43.5 to 507.5			82.0 to 435.0		
Relieving pressure/fully open pressure	**Set Pressure +10%**														
Reseating pressure	**Set Pressure -10%**														

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.
Stable operation on flows down to 50% of valve rated capacity.

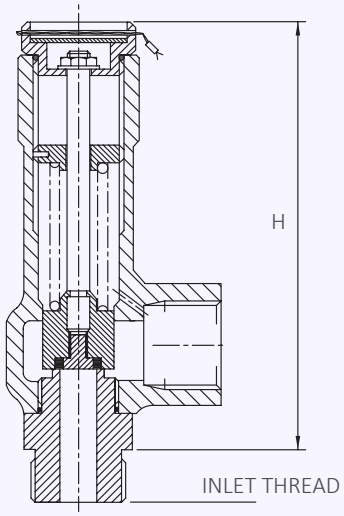
Standard Thread Connection Types

- BSP Parallel male thread
- BSP Taper male thread
- NPT male thread

Standard Outlet Connection Types

- BSP Parallel female thread
- NPT female thread

Valves with Rota-lift Easing Gear



Valve Selection Guide

Approval Required	Valve type	Select Bore	Inlet Size	Inlet Thread Type	Outlet Thread Type	Easing Gear	Seal Material
PED (CE)	646	Select bore size from above table	Select inlet size from above table	Select Inlet thread type	Select Outlet thread type	Select easing gear/top fitting	Viton® (FKM)
PED (CE), ASME (UV) & CRN	641						Nitrile (NRB)
							Other

EAC marking available upon request
***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	PED, ASME & CRN	641	20	1 1/2"	BSP Taper	BSP parallel	Rota-lift	Viton	10.5 bar
	Approval	Valve Type	Bore = 20mm	Inlet Size	Inlet Thread Type	Outlet Thread Type	Easing Gear	Seal	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour
Type 646: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		9.5mm	13.7mm	17mm	20mm	25mm
bar	psi	Nm³/Hour	Nm³/Hour	Nm³/Hour	Nm³/Hour	Nm³/Hour
0.32	4.64		114.2			
0.48	6.96	48.9	124.5			
1	14.5	76.9	164.9	241.8		
2	29	121.0	229.1	367.6		
3	43.5	162.4	307.5	560.2	701.4	
4	58	203.8	385.9	703.0	880.3	
5	72.5	245.3	464.3	845.9	1059.2	
5.65	81.93	272.2	515.3	938.7	1175.5	2054.3
6	87	286.7	542.7	988.7	1238.2	2163.7
7	101.5	328.1	621.2	1131.6	1417.0	2476.4
8	116	369.5	699.6	1274.5	1596.0	2789.0
9	130.5	410.9	778.0	1417.3	1774.9	3101.7
10	145	452.4	856.4	1560.2	1953.8	3414.3
15	217.5	659.5	1248.5	2274.5	2848.2	4977.5
20	290	866.6	1640.6	2988.7	3742.8	6540.7
25	362.5	1073.8	2032.7	3703.0	4881.2	8103.9
30	435	1280.9	2424.8	4417.3	5823.0	9667.1
35	507.5	1488.1	2816.9	5131.6	6764.6	
40	580	1695.2	3209.0			
45	652.5	1902.3	3601.1			
49	710.5	2068.0	3914.8			
50	725	2109.4				
55.2	800.4	2324.8				

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with ASME BPVC.XIII, AIR at 60°F and 14.7 psia/scfm. SCFM
Type 641: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		9.5mm	13.7mm	17mm	20mm	25mm
psi	bar	SCFM	SCFM	SCFM	SCFM	SCFM
20.3	1.40		131.9			
22.5	2.50	68.7	139.4			
30	2.07	81.5	165.5			
34.8	2.80	90.6	183.8	296.7		
40	2.76	100.4	203.7	328.7		
43.5	3.00	106.9	217.0	350.2	486.0	
50	3.45	119.2	241.8	390.3	541.5	
82	5.66	179.3	363.9	587.3	814.9	1285.8
100	6.90	213.2	432.6	698.1	968.7	1528.4
150	10.34	307.2	623.4	1006.1	1395.9	2202.6
200	13.79	401.2	814.2	1314.0	1823.2	2876.8
250	17.24	495.3	1005.0	1621.9	2250.4	3550.8
300	20.69	589.3	1195.8	1929.8	2677.6	4224.9
350	24.14	683.3	1386.6	2237.8	3104.9	4899.1
400	27.59	777.4	1577.4	2545.7	3532.2	5573.3
435	30.00	843.2	1711.0	2761.2	3831.2	6045.2
450	31.03	871.4	1768.2	2853.6	3959.3	
500	34.48	965.4	1959.0	3161.5	4386.6	
507.5	35.00	979.5	1987.6	3207.7	4450.7	
550	37.93	1059.4	2149.8			
600	41.38	1153.4	2340.6			
650	44.83	1247.5	2531.4			
700	48.28	1341.5	2722.2			
710.5	49.00	1361.3	2762.3			
750	51.72	1435.5				
800.4	55.20	1530.3				

For any intermediate pressures/flows please contact Seetru

Enclosed Discharge Safety Relief Valves

for compressed air or gases | *steam* | *cryogenics & liquefied gases* | *hydrogen*

Seetru Limited

Type 936 Threaded

Safety valves made with brass inlets<
Enclosed discharge valve with threaded connections<
Metal to metal sealing<

Example Applications

- Air / gas compressors
- Pressure vessels
- Medical gases/Technical gases
- Thermal relief
- Steam systems

Specifications

- Inlet connections: 1/2” to 2” threaded connections (depending on valve bore size) (for flanged connections see 946 Flanged datasheet).
- Temperature range:-196°C to +250°C (depending on body o’ring material)
- Pressure range: 0.3 to 28.0 bar (depending on valve bore size)

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- EAC
- Leak tightness at 90% set pressure to API 527 and in accordance with EN ISO 4126-1
- Materials meet the requirements of BAM (Germany) for oxygen service

CE UKCA EAC

Materials of Construction

Component	Material	Grade
Inlet	Brass	CZ132 / CW602N
Outlet Body (10mm bore valve)	Bronze	SB-62 C8360
Outlet Body (15, 20 & 25mm bore valves)	Stainless Steel	1.4408 (316)
Spring	Stainless Steel	1.4310 (302)
Disc	Stainless Steel	1.4401 (316)

Seal Materials

This valve using metal to metal sealing. There is a choice of o’ring used for the sealed cap/lever.

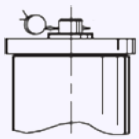
O'ring material	Temperature Range
Viton® (FKM)	-20°C to +250°C
Nitrile (NBR)	-196°C to +150°C
Silicone	-50°C to +250°C
PTFE	-196°C to +250°C
EPDM	-40°C to +150°C

-196°C is only suitable for sealed cap/sealed lever valves

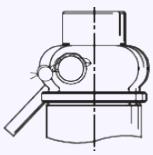
Standard seal materials shown, others are available.

Easing Gear / Lifting Gear / Top Fitting Options

- Sealed Cap (gas tight cap)

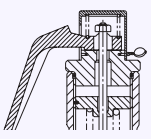


- Sealed lever (gas tight)



- Rota-lift (not gas tight)

- Open Lever (not gas tight)

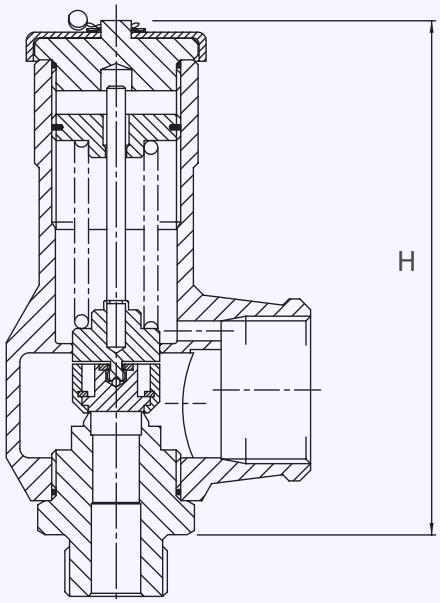


Technical information by bore size

Bore size	10mm (93610)			15mm (93615)			20mm (93620)			25mm (93625)			
Inlet Size	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	1"	1 1/4"	1 1/2"	1"	1 1/4"	1 1/2"	2"
Outlet Size	1"			1 1/2"			2"			2"			
Flow Area	78.5mm²			177mm²			314mm²			491mm²			
H - Height (Sealed Lever version)	114mm			168mm			141mm			225mm			
TÜV alloted outflow coefficient	0.83 (above 3.0 bar)			0.74 (above 3.0 bar)			0.8 (above 4.0 bar)			0.8 (above 4.0 bar)			
Weight (approximate) Kg	1.0			2.1			3.5			4.2			
Set Pressure range - PED (CE) bar	0.3 to 28.0			0.3 to 28.0			0.3 to 28.0			0.3 to 20.0			
Relieving pressure/fully open pressure	**Set pressure +10%** (0.1 bar below 1.0 bar)												
Reseating pressure	**Set pressure -10%** (0.3 bar below 3.0 bar)												

- TÜV alloted outflow coefficients for pressures above 3.0/4.0 bar, for lower pressures please see the flow rate tables or contact Seetru.
- Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.
- Stable operation on flows down to 50% of valve rated capacity.
- Leak tightness at 90% set pressure to API 527 and in accordance with EN ISO 4126-1

Valve Drawing



Standard INLET Connection Types

- BSP parallel male thread
- BSP taper male thread
- NPT male thread
- BSP parallel female thread (limited option)

Standard OUTLET Connection Types

- BSP parallel female thread

Valve Selection Guide

Valve type	Select Bore	Inlet Size	Inlet Thread Type	Top Fitting	O'ring material (for cap)	Set pressure
936	Select bore size from above table	Select inlet size from above table	Select Inlet Thread type	Select easing gear/top fitting	See table	Set pressure from available range

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	936	15	1"	BSP parallel	Rota Lift	Viton	17.5 bar
	Valve Type	Bore = 15mm	Inlet Size	Inlet Thread Type	Top Fitting	O'ring	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour
Type 936: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		10mm	15mm	20mm	25mm	
bar	psi	Nm³/Hour	Nm³/Hour	Nm³/Hour	Nm³/Hour	
0.3	4.35	39	76	174	220	
0.5	7.25	56	104	238	304	
1	14.5	84	155	354	458	
2	29	135	270	554	838	
3	43.5	191	384	738	1154	
4	58	240	482	926	1448	
5	72.5	289	580	1115	1742	
6	87.00	338	678	1303	2036	
7	101.5	386	776	1491	2330	
8	116	425	874	1679	2625	
9	130.5	484	972	1868	2919	
10	145	533	1070	2056	3213	
15	217.5	777	1560	2998	4685	
20	290	1021	2049	3939	5848	
25	362.5	1266	2539	4881		
28	406	1412	2833	5446		

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with TÜV, STEAM. Kg/hour
Type 936: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		10mm	15mm	20mm	25mm	
bar	psi	Kg/hour of Steam	Kg/hour of Steam	Kg/hour of Steam	Kg/hour of Steam	
0.3	4.35	32.5	63.3	145.3	182.3	
0.5	7.25	44.5	82.5	188.7	242.2	
1	14.5	66.1	121.7	278.4	361.9	
2	29	106.2	213.4	437.8	663.0	
3	43.5	149	299	576	901	
4	58	186	373	718	1122	
5	72.5	222	446	860	1343	
6	87.00	259	520	1000	1563	
7	101.5	295	592	1142	1784	
8	116	332	666	1283	2004	
9	130.5	368	738	1423	2224	
10	145	405	812	1563	2442	
15	217.5	585	1174	2261	3533	
20	290	765	1535	2957	4389	
25	362.5	947	1900	3655		
28	406	1055	2116	4078		

For any intermediate pressures/flows please contact Seetru

Type 946 Threaded

Safety valves made from Stainless Steel <
Enclosed discharge valve with threaded connections <
Metal to metal sealing <

Example Applications

- Air / gas compressors
- Pressure vessels
- Medical gases/Technical gases
- Refrigeration (including ammonia)
- Thermal relief
- Steam systems
- Hydrogen

Specifications

- Inlet connections: 1/2” to 2” threaded connections (depending on valve bore size) *For flanged connections see datasheet 946 Flanged
- Temperature range: -50°C to +250°C (depending on body o’ring material)
- Pressure range: 0.3 to 28.0 bar (depending on valve bore size)

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- EAC
- Leak tightness at 90% set pressure to API 527 and in accordance with EN ISO 4126-1

Materials of Construction

Component	Material	Grade
Inlet	Stainless Steel	1.4401 (316)
Body	Stainless Steel	1.4408 (316)
Internal Parts	Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)
Disc	Stainless Steel	AISI 440B

Seal Materials

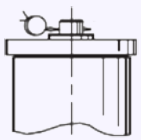
This valve using metal to metal sealing. There is a choice of o’ring used for the sealed cap/lever.

O’ring material – Top cap	Temperature Range
Viton® (FKM)	-20°C to +250°C
Nitrile (NBR)	-30°C to +150°C
Silicone	-50°C to +250°C
EPDM	-40°C to +150°C

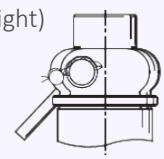
Standard seal materials shown, others are available.

Easing Gear / Lifting Gear / Top Fitting Options

- Sealed Cap (gas tight cap)



- Sealed lever (gas tight)



- Rota-lift (not gas tight)

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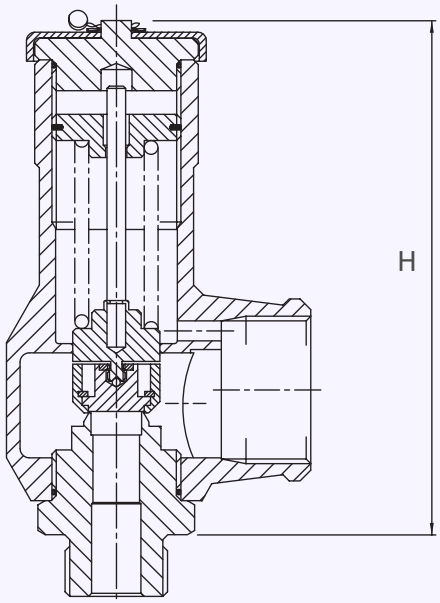
Technical information by bore size

Bore size	10mm (94610)			15mm (94615)			20mm (94620)			25mm (94625)			
Inlet Size	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	1"	1 1/4"	1 1/2"	1"	1 1/4"	1 1/2"	2"
Outlet Size	1"			1 1/2"			2"			2"			
Flow Area	78.5mm²			177mm²			314mm²			491mm²			
H - Height (Sealed Lever version)	114mm			168mm			141mm			225mm			
TÜV alloted outflow coefficient	0.83 (above 3.0 bar)			0.74 (above 3.0 bar)			0.8 (above 4.0 bar)			0.8 (above 4.0 bar)			
Weight (approximate) Kg	1.0			2.1			3.5			4.2			
Set Pressure range - PED (CE) bar	0.3 to 28.0			0.3 to 28.0			0.3 to 28.0			0.3 to 20.0			
Relieving pressure/fully open pressure	**Set pressure +10%** (0.1 bar below 1.0 bar)												
Reseating pressure	**Set pressure -10%** (0.3 bar below 3.0 bar)												

- TÜV alloted outflow coefficients for pressures above 3.0/4.0 bar, for lower pressures please see the flow rate tables or contact Seetru.
- Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.
- Stable operation on flows down to 50% of valve rated capacity. Leak tightness at 90% set pressure to API 527 and in accordance with EN ISO 4126-1

Valve Drawing



Standard INLET Connection Types

- BSP parallel male thread
- BSP taper male thread
- NPT male thread
- BSP parallel female thread (limited option)

Standard OUTLET Connection Types

- BSP parallel female thread

Valve Selection Guide

Valve type	Select Bore	Inlet Size	Inlet Thread Type	Top Fitting	O'ring material (for cap)	Set pressure
946	Select bore size from above table	Select inlet size from above table	Select Inlet Thread type	Select easing gear/top fitting	See table	Set pressure from available range

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	946	15	1"	BSP parallel	Sealed Lever	Viton	17.5 bar
	Valve Type	Bore = 15mm	Inlet Size	Inlet Thread Type	Top Fitting	O'ring	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour
Type 946: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)			
		10mm	15mm	20mm	25mm
bar	psi	Nm³/Hour	Nm³/Hour	Nm³/Hour	Nm³/Hour
0.3	4.35	39	76	174	220
0.5	7.25	56	104	238	304
1	14.5	84	155	354	458
2	29	135	270	554	838
3	43.5	191	384	738	1154
4	58	240	482	926	1448
5	72.5	289	580	1115	1742
6	87.00	338	678	1303	2036
7	101.5	386	776	1491	2330
8	116	425	874	1679	2625
9	130.5	484	972	1868	2919
10	145	533	1070	2056	3213
15	217.5	777	1560	2998	4685
20	290	1021	2049	3939	5848
25	362.5	1266	2539	4881	
28	406	1412	2833	5446	

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with TÜV, STEAM. Kg/hour
Type 946: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)			
		10mm	15mm	20mm	25mm
bar	psi	Kg/hour of Steam	Kg/hour of Steam	Kg/hour of Steam	Kg/hour of Steam
0.3	4.35	32.5	63.3	145.3	182.3
0.5	7.25	44.5	82.5	188.7	242.2
1	14.5	66.1	121.7	278.4	361.9
2	29	106.2	213.4	437.8	663.0
3	43.5	149	299	576	901
4	58	186	373	718	1122
5	72.5	222	446	860	1343
6	87.00	259	520	1000	1563
7	101.5	295	592	1142	1784
8	116	332	666	1283	2004
9	130.5	368	738	1423	2224
10	145	405	812	1563	2442
15	217.5	585	1174	2261	3533
20	290	765	1535	2957	4389
25	362.5	947	1900	3655	
28	406	1055	2116	4078	

For any intermediate pressures/flows please contact Seetru

Enclosed Discharge Safety Relief Valves

for compressed air & gas | *hydrogen*

Seetru Limited

Safety valves made with a Brass or Stainless Steel body and Stainless Steel inlets <
Enclosed discharge valve with threaded connections <
Elastomer rubber sealing <

Type 33020 / 34020 / 34320

Example Applications

- Air / gas compressors
- Pressure vessels
- Pneumatic systems
- Medical gases/Technical gases
- Hydrogen (with 316 stainless steel inlet)

Specifications

- Inlet connections: 3/8” to 1/2” threaded inlet connections
- Temperature range:-40°C to +200°C
  (depending on body rubber seal material)
- Pressure range: 55.0 to 103.4 bar

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- EAC

Materials of Construction

Component	Valve Type	Material	Grade
Inlet	33020	Stainless Steel	1.4305 (303)
	34020	Stainless Steel	1.4305 (303)
	34320	Stainless Steel	1.4401 (316)
Body	33020	Brass	CZ132
	34020	Stainless Steel	1.4408 (316)
	34320	Stainless Steel	1.4408 (316)
Spring	All	Stainless Steel	302

Drawing showing all component materials available upon request.

Seal Materials

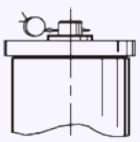
This valve using metal to metal sealing. There is a choice of o’ring used for the sealed cap/lever.

O’ring material – Top cap	Temperature Range
Viton® (FKM)	-15°C to +200°C
Nitrile (NBR)	-40°C to +120°C

Standard seal materials shown, others are available.

Top fitting

Sealed Cap (gas tight cap)



THESE VALVES SHOULD ONLY BE TESTED FOR SET PRESSURE ON LIQUID PRIOR TO FINAL INSTALLATION. VALVES THAT ARE TESTED ON AIR & FULLY LIFTED WILL CAUSE DAMAGE TO THE SEALING FACE.

Technical information by bore size

Bore size	7.14mm (33020)		7.14mm (34020)		7.14mm (34320)	
Inlet Size	3/8"	1/2"	3/8"	1/2"	3/8"	1/2"
Outlet Size	1/2"		1/2"		1/2"	
Flow Area	40.04mm²		40.04mm²		40.04mm²	
H - Height	96mm		96mm		96mm	
TÜV alloted outflow coefficient	0.67		0.67		0.67	
Weight (approximate) Kg	0.8		0.8		0.8	
Set Pressure range - PED (CE) bar	55.0 to 103.4 bar		55.0 to 103.4 bar		55.0 to 103.4 bar	
Relieving pressure/fully open pressure	**Set pressure +10%**					
Reseating pressure	**Set pressure -15%**					

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.

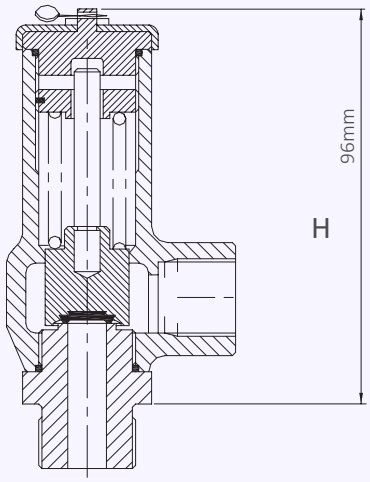
Standard INLET Connection Types

- BSP parallel male thread
- BSP taper male thread
- NPT male thread

Standard OUTLET Connection Types

- BSP parallel female thread
- NPT female thread

Valve Drawing



Valve Selection Guide

Valve type	Inlet Size	Inlet Thread Type	Outlet Thread Type	Seal Material	Set pressure
33020, 34020 or 34320 (see materials)	Select inlet size from above table	Select Inlet Thread type	Select Oulet Thread type	See table	Set pressure from available range

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	33020	1/2"	NPT	NPT	Viton	100 bar
	Valve Type	Inlet Size	Inlet Thread Type	Outlet Thread Type	Seal Material	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour

Type 33020, 34020 & 34320: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		7.14mm				
bar	psi	Nm³/Hour				
55	797.5	1124.0				
60	870	1224.5				
65	942.5	1325.0				
70	1015	1425.5				
75	1087.5	1526.0				
80	1160	1626.5				
85	1,232.50	1727.0				
90	1305	1827.5				
95	1377.5	1928.0				
100	1450	2028.5				
103.4	1499.3	2096.9				

For any intermediate pressures/flows please contact Seetru

Enclosed Discharge Safety Relief Valves

for compressed air & gas | *hydrogen*

Seetru Limited

Safety valves made with a Brass or Stainless Steel body and Stainless Steel inlets <
Enclosed discharge valve with threaded connections <
Elastomer rubber sealing <

Type 33110 / 34110 / 34410

Example Applications

- Air / gas compressors
- Pressure vessels
- Pneumatic systems
- Medical gases/Technical gases
- Hydrogen (with 316 stainless steel inlet)

Specifications

- Inlet connections: 3/8” to 1/2” threaded inlet connections
- Temperature range:-40°C to +200°C
  (depending on body rubber seal material)
- Pressure range: 27 to 36 & 48.3 to 241.3 bar

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- EAC

CE UKCA EAC

Materials of Construction

Component	Valve Type	Material	Grade
Inlet	33110	Stainless Steel	303
	34110	Stainless Steel	303
	34410	Stainless Steel	316
Body	33110	Brass	CZ122
	34110	Stainless Steel	316
	34410	Stainless Steel	316
Spring	All	Stainless Steel	302

Drawing showing all component materials available upon request.

Seal Materials

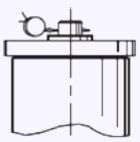
This valve using metal to metal sealing. There is a choice of o’ring used for the sealed cap/lever.

O’ring material – Top cap	Temperature Range
Viton® (FKM)	-15°C to +200°C
Nitrile (NBR)	-40°C to +120°C

Standard seal materials shown, others are available.

Top fitting

Sealed Cap (gas tight cap)



THESE VALVES SHOULD ONLY BE TESTED FOR SET PRESSURE ON LIQUID PRIOR TO FINAL INSTALLATION. VALVES THAT ARE TESTED ON AIR & FULLY LIFTED WILL CAUSE DAMAGE TO THE SEALING FACE.

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Technical information by bore size

Bore size	3.66mm (33110)		3.66mm (34110)		3.66mm (34410)	
Inlet Size	3/8"	1/2"	3/8"	1/2"	3/8"	1/2"
Outlet Size	3/8"	1/2"	3/8"	1/2"	3/8"	1/2"
Flow Area	10.52mm²		10.52mm²		10.52mm²	
H - Height	92mm		92mm		92mm	
TÜV alloted outflow coefficient	0.73		0.73		0.73	
Weight (approximate) Kg	0.8		0.8		0.8	
Set Pressure range - PED (CE) bar	27 to 36 & 48.3 to 241.3 bar		27 to 36 & 48.3 to 241.3 bar		27 to 36 & 48.3 to 241.3 bar	
Relieving pressure/fully open pressure	**Set pressure +10%**					
Reseating pressure	**Set pressure -10%**					

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.

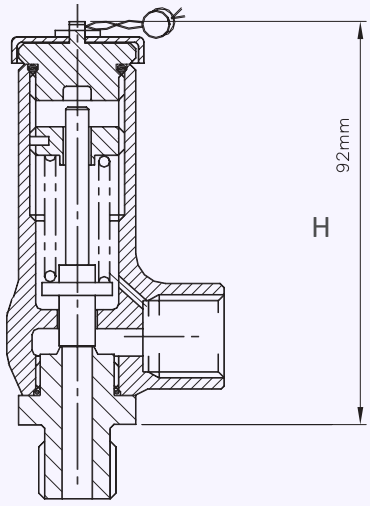
Standard INLET Connection Types

- BSP parallel male thread
- BSP taper male thread
- NPT male thread

Standard OUTLET Connection Types

- BSP parallel female thread
- NPT female thread

Valve Drawing



Valve Selection Guide

Valve type	Inlet Size	Inlet Thread Type	Outlet Thread Type	Seal Material	Set pressure
33110, 34110 or 34410 (see materials)	Select inlet size from above table	Select Inlet Thread type	Select Oulet Thread type	See table	Set pressure from available range

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	33110	1/2"	BSP parallel	BSP parallel	Viton	100 bar
	Valve Type	Inlet Size	Inlet Thread Type	Outlet Thread Type	Seal Material	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour

Type 33110, 34110 and 34410: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		3.66mm				
bar	psi	Nm³/Hour				
27	391.5	160.7				
30	435	177.9				
33	478.5	195.2				
36	522	212.5				
48	696	281.5				
50	725	293.0				
60	870.00	350.6				
70	1015	408.1				
80	1160	456.7				
90	1305	523.2				
100	1450	580.8				
150	2175	868.5				
200	2900	1156.2				
241	3494.5	1392.1				

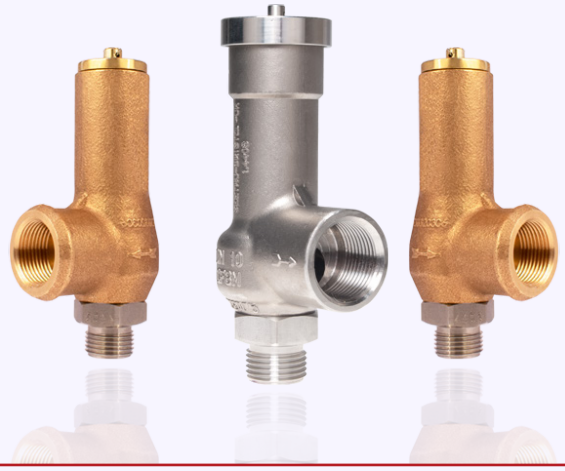
For any intermediate pressures/flows please contact Seetru

Type 329

Safety valves with either Bronze or Stainless Steel body <
Enclosed discharge valve with threaded connections <

Example Applications

- Air/Gas systems
- Natural Gas
- CNG/LNG
- Pressure vessels
- Medical gases
- Technical Gases
- CO2 refrigeration
- Ammonia refrigeration (Stainless steel)
- Cryogenic applications
- Liquefied gases



Specifications

- Inlet connections: 3/8” to 3/4”
- Temperature range:-196°C to +70°C
- Pressure range: 53.0 to 370.0 bar

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- ASME BPVC VIII.1 & XIII (UV)
- EAC
- CRN

Materials of Construction

Component	Material	Grade
Inlet	Stainless Steel	1.4401 (316)
Body	Bronze	C83600
	Stainless Steel	1.4408 (316)
Internal Parts	Brass	BS EN 12164 CW614N
	Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)

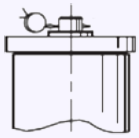
Seal Materials

Seal Material	Temperature Range
PTFE (up to 202 bar) PPS (202 to 370 bar)	-196°C to +70°C

Standard seal materials shown, others are available.

Top Fitting Options

- Standard Option
Sealed Cap (gas tight cap)

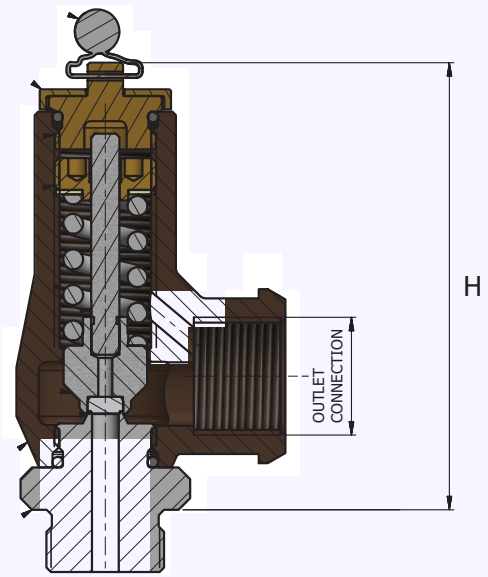


Technical information by bore size

Bore size	6mm		
Inlet Size	3/8"	1/2"	3/4"
Outlet Size	3/4"		
Flow Area	28.2mm²		
H - Height	100mm (53.0 to 240.0 bar) 114mm (240.0 to 370.0 bar)		
TÜV alloted outflow coefficient	0.77		
NB Certified rated slope (ASME)	0.7scfm/psia		
Weight (approximate) Kg	0.8		
Set Pressure range - PED (CE) bar	53.0 to 370.0		
Set Pressure range - ASME (UV) psi	768.5 to 5365.0		
Relieving pressure/fully open pressure	**Set pressure +10%**		
Reseating pressure	**Set pressure -15%**		

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.

Valve drawing



Standard Thread Connection Types

- BSP Parallel male thread
- BSP Taper male thread
- NPT male thread

Standard Outlet Connection Types

- BSP Parallel female thread
- NPT female thread

Valve Selection Guide

Valve Type	Body Material	Approval Required	Select Bore	Inlet Size	Inlet Thread Type	Outlet Thread Type	Easing Gear	Seal Material
329	Stainless Steel Bronze	**PED (CE)** **PED (CE), ASME (UV, NB), CRN**	6mm	Select inlet size from above table	Select Inlet thread type	Select Outlet thread type	Sealed cap	PTFE

EAC marking available upon request

Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time

Example of Valve Selection Process

Example Selection	Bronze	329	PED (CE)	6	1/2"	NPT	NPT	Sealed Cap	PTFE	175 bar
	Body Material	Valve Type	Approval	Bore = 6mm	Inlet Size	Inlet Thread Type	Outlet Thread Type	Top Fitting	Seal	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour
Type 329: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		6mm				
bar	psi	Nm³/Hour				
53	768.5	879.6				
60	870.0	993.8				
70	1015.0	1156.9				
80	1160.0	1320.0				
90	1305.0	1483.1				
100	1450.0	1646.3				
150	2175.0	2461.9				
200	2900.0	3277.5				
250	3625.0	4093.1				
300	4350.0	4908.7				
350	5075.0	5724.4				
370	5365.0	6050.6				

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with ASME BPVC.XIII, AIR at 60°F and 14.7 psia/scfm. SCFM
Type 329: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		6mm				
psi	bar	SCFM				
768.5	53	602				
870	60	680				
913.5	63	714				
1203.5	83	937				
1305	90	1015				
1450	100	1127				
2175	150	1685				
2900	200	2243				
2929	202	2266				
3480	240	2690				
3625	250	2802				
4350	300	3360				
5075	350	3918				
5365	370	4141				

For any intermediate pressures/flows please contact Seetru

Enclosed Discharge Safety Relief Valves

for compressed air & gas | *hydrogen*

Seetru Limited

Type B4605 / B6605 / 359

Safety valves made from Stainless Steel <
Enclosed discharge valve with threaded connections <

Example Applications

- Air/Gas compressors
- Natural Gas
- Pressure vessels
- Medical gases
- Technical Gases
- Hydrogen production/generation

Specifications

- Inlet connections: 3/8” and 1/2”
- Temperature range:
  - 0°C to 200°C (with 1.4057 (431) stainless steel inlet)
  - -50°C to 150°C (with 1.4401 (316) stainless steel inlet)
- Pressure range: 35.0 to 500.0 bar

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- ASME BPVC VIII.1 & XIII (UV)
- EAC
- CRN

Materials of Construction

Component	Material	Grade
Inlet	Stainless Steel	1.4057 (431)
		1.4401 (316)
Body	Stainless Steel	1.4408 (316)
Internal Parts	Stainless Steel	1.4305 (303)
Spring	Stainless Steel	1.4310 (302)

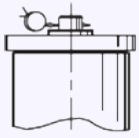
Inlet Seat Material

This valve seals using a metal ball design	
Seal Material	Temperature Range
Stainless steel 1.4057 (431)	0°C to +200°C
Stainless steel 1.4401 (316)	-50C to +150°C

Standard seal materials shown, others are available.

Top Fitting Options

- Standard Option
Sealed Cap (gas tight cap)

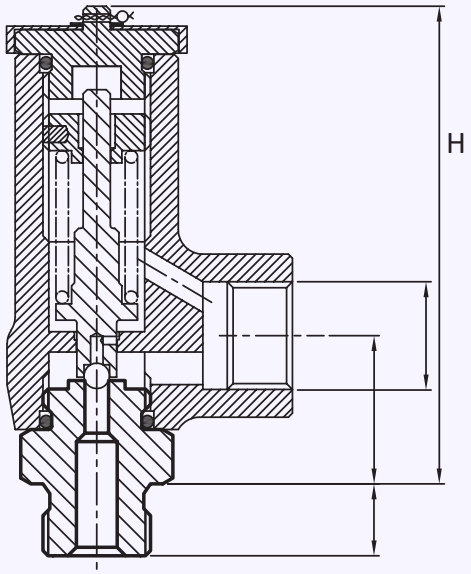


Technical information by bore size

Bore size	4.6mm	
Inlet Size	3/8"	1/2"
Outlet Size	1/2"	
Flow Area	16.6mm²	
H - Height	96mm	
TÜV alloted outflow coefficient	0.402	
NB Certified rated slope (ASME)	0.34 scfm/psia	
Weight (approximate) Kg	0.8	
Set Pressure range - PED (CE) bar	35.0 to 500.0	
Set Pressure range - ASME (UV) psi	507.5 to 7250.0	
Relieving pressure/fully open pressure	**Set pressure +10%**	
Reseating pressure	**Set pressure -10%**	

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced

Valve drawing



IMPORTANT NOTE:
These valves should only be tested for set pressure on liquid prior to final installation. Valves that are tested on air & fully lifted will cause damage to the sealing face.

Standard Thread Connection Types

- BSP Parallel male thread
- BSP Taper male thread
- NPT male thread

Standard Outlet Connection Types

- BSP Parallel female thread
- NPT female thread

Valve Selection Guide

Valve Type	Inlet Material	Approval Required (Avaialble for both Inlet materials)	Select Bore	Inlet Size	Inlet Thread Type	Outlet Thread Type	Easing Gear	Seal Material
B6605	Stainless Steel 1.4057 (431)	PED (CE)	4.66mm	Select inlet size from above table	Select Inlet thread type	Select Outlet thread type	Sealed cap	Metal ball seal
B4405	Stainless Steel 1.4401 (316)	PED (CE)						
B6105	Stainless Steel 1.4057 (431)	PED (CE), ASME (UV, NB), CRN						
B4105	Stainless Steel 1.4401 (316)	PED (CE), ASME (UV, NB), CRN						

EAC marking available upon request
***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	1.4057 (431)	359	PED (CE)	4.66	1/2"	BSP taper	BSP	Sealed Cap	Ball Seal	385 bar
	Inlet Material	Valve Type	Approval	Bore = 4.6mm	Inlet Size	Inlet Thread Type	Outlet Thread Type	Top Fitting	Seal	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour
Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		4.6mm				
bar	psi	Nm³/Hour				
35	507.5	179.8				
50	725.0	254.9				
100	1450.0	505.2				
150	2175.0	755.5				
200	2900.0	1005.8				
250	3625.0	1256.0				
300	4350.0	1506.3				
350	5075.0	1756.6				
400	5800.0	2006.9				
450	6525.0	2257.2				
500	7250.0	2507.5				

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance ASME section VIII Div I, AIR at 60°F and 14.7 psia/scfm. SCFM
Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		4.6mm				
psi	bar	SCFM				
507.5	35	195				
725	50	276				
1450	100	547				
2175	150	818				
2900	200	1090				
3625	250	1361				
4350	300	1632				
5075	350	1903				
5800	400	2174				
6525	450	2445				
7250	500	2716				

For any intermediate pressures/flows please contact Seetru

Enclosed Discharge Safety Relief Valves

for compressed air or gases | *cryogenic & liquefied gas* | *steam* | *refrigeration* | *hydrogen*

Seetru Limited

Type
94605 / 946H5 / 95605 / 956H5

Safety valves made from stainles steel <
Enclosed discharge with threaded connections <

Example Applications

- Air/Gas Compression
- Air/Gas Boosters
- Natural Gas
- Pressure Vessels
- Hydrogen Production
- Hydrogen Storage

Specifications

- **Inlet Connections**
  - ½" NPT, BSP & BSPT
  - 9/16" Cone & Thread
  - 3/4" Cone & Thread
- **Outlet Connections**
  - ½" NPT & BSP
  - ¾" NPT & BSP
  - 1" NPT & BSP
- **Temperature Range**
  - 0° to 300°C as standard
  - -196°C to 300°C H_2 option
- **Pressure Range**
  - 35.0 to 515 bar (9*605)
  - 35.0 to 1100 bar (9*6H5)

*Maximum set pressure for steam is 85 bar

Materials of Construction

Component	Valve Type 2nd Digit	Material	Grade
Seat	4	Stainless	1.4057
	5		S20910
Body	4 & 5	Stainless	1.4401
Disc	4	Stainless	1.4057
	5	Ceramic	
Spring	4 & 5	Stainless	1.4401
Gaskets	4 & 5	PTFE	

For Hydrogen applications above 515 bar, a ceramic disc is required, use type 956H5

Key Features

- Compact and space saving design
- Designed and built for repeatable operation
- Advanced sealing technology with super-lapped hard-faced seat and disc, designed to offer robust high-performance sealing
- Orientable gas-tight packed lever option (9*6H5 only)
- Simple and robust design with three moving parts
- Maintenance friendly design
- All wrought construction with no castings
- Designed with Hydrogen embrittlement resistant materials (H_2 option)

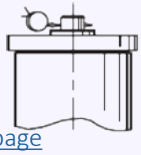
Approvals

- BS EN ISO 4126-1
- PED 2014/68/EU
  - Module B – TÜV Rheinland
  - Module D – LRQA Deutschland
- PE(S)R 2016 (UKCA)
  - Module B – TÜV UK
  - Module D – LRQA UK
- Seat tightness better than API 527

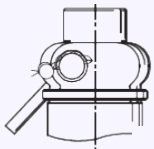
EAC marking available upon request

Top Fitting Options

- Sealed Cap (gas tight cap)

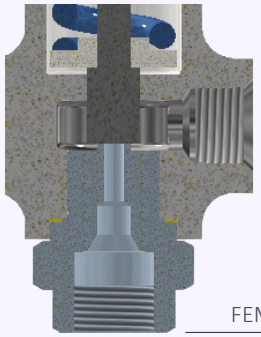


- Sealed lever (gas tight)



Technical information by bore size

Model No.	9*605		9*6H5		
Bore	4.6				
Inlet	1/2"	9/16"	1/2"	9/16"	3/4"
Outlet	1/2"		1/2"	3/4"	1"
Flow Area	16.6				
Height H	158		202		
Kdr	0.78				
Weight	1.5 kg		2.8 kg		



FEMALE CONE & THREAD INLET

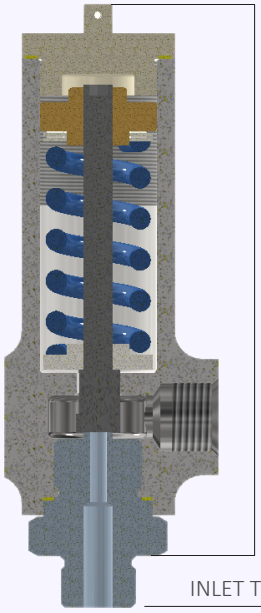
Standard INLET Connection Types

- BSP (male) max 515 bar
- BSPT (male) max 515 bar
- NPT (male) max 1034 bar
- Cone & Thread (female) max 1100 bar

Standard OUTLET Connection Types

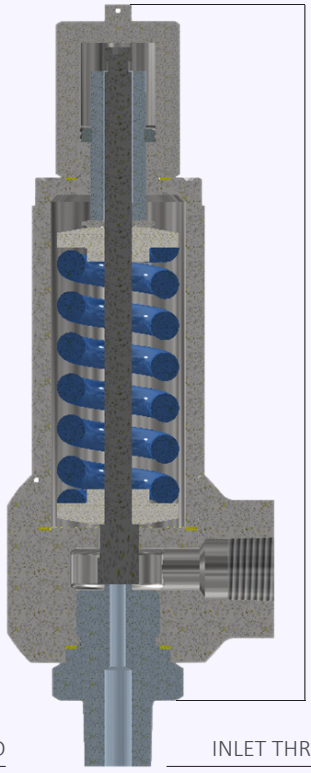
- BSP (female)
- NPT (female)

9*605



INLET THREAD

9*6H5



INLET THREAD

Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.

Valve Selection Guide - Type 94605, 946H5, 95605 & 956H5

Valve type	H_2 or low temperature valve type 2nd digit		Inlet Size	Inlet Connection	Outlet Size	Outlet Connection	Easing Lever (Sealed Lever)
	Yes	No					
9*605	5	4	9/16" & 3/4"	C&T	1/2"	NPT, BSP	9*6H5 only
			1/2"	NPT, BSP, BSPT			
9*6H5			1/2"		1/2", 3/4", 1"		
			9/16" & 3/4"	C&T			

Example of Valve Selection Process for Order Code 956H5F1297

Example Selection	Approval	Materials from above Table	Bore	Inlet Size	Inlet Thread	Outlet Size	Outlet Thread	Duty	Set Pressure
	PED and UKCA (ASME in process)	5 = Body=1.4401, Seat=S20910, Disc=Ceramic	4.6mm	1/2"	NPT	3/4"	NPT	Hydrogen	1000 bar

Capacity Table -Per EN 4126-7 and at 10% Overpressure

Type 94605 / 946H5 / 95605 / 956H5: Flow rates at 10% above the set pressure.

Set Pressure		Flow of Air		
bar	psi	kg/s	Nm³/hr	scfm
35	507.5	0.121	336.8	209.4
50	725	0.171	477.5	296.9
75	1087.5	0.256	711.9	442.6
100	1450	0.340	946.3	588.4
150	2175	0.508	1415.2	879.9
200	2900	0.676	1884.0	1171.4
250	3625	0.844	2352.9	1462.9
300	4350	1.013	2821.7	1754.4
350	5075	1.181	3290.6	2045.9
400	5800	1.349	3759.4	2337.4
450	6525	1.518	4228.3	2628.9
500	7250	1.686	4697.1	2920.5
550	7975	1.854	5166.0	3212.0
600	8700	2.022	5634.8	3503.5
650	9425	2.191	6103.7	3795.0
700	10150	2.359	6572.5	4086.5
750	10875	2.527	7041.4	4378.0
800	11600	2.695	7510.2	4669.5
850	12325	2.864	7979.1	4961.0
900	13050	3.032	8447.9	5252.5
950	13775	3.200	8916.8	5544.0
1000	14500	3.369	9385.6	5835.5
1050	15225	3.537	9854.4	6127.0
1100	15950	3.705	10323.3	6418.6

Set Pressure		Flow of Hydrogen		
bar	psi	kg/s	Nm³/hr	scfm
35	507.5	0.03	1258.83	782.68
50	725	0.04	1774.51	1103.31
75	1087.5	0.07	2621.46	1629.91
100	1450	0.09	3453.31	2147.11
150	2175	0.13	5074.04	3154.80
200	2900	0.17	6641.10	4129.13
250	3625	0.20	8158.40	5072.52
300	4350	0.24	9629.46	5987.16
350	5075	0.28	11057.42	6875.00
400	5800	0.31	12445.12	7737.81
450	6525	0.35	13795.13	8577.18
500	7250	0.38	15109.78	9394.57
550	7975	0.41	16391.19	10191.29
600	8700	0.44	17641.29	10968.55
650	9425	0.47	18861.85	11727.44
700	10150	0.50	20054.50	12468.97
750	10875	0.53	21220.73	13194.08
800	11600	0.56	22361.91	13903.61
850	12325	0.59	23479.32	14598.37
900	13050	0.62	24574.12	15279.07
950	13775	0.64	25647.41	15946.39
1000	14500	0.67	26700.20	16600.97
1050	15225	0.69	27733.43	17243.38
1100	15950	0.72	28747.98	17874.18

Enclosed Discharge Safety Relief Valves

for compressed air or gases | *steam* | *refrigeration* | *hydrogen*

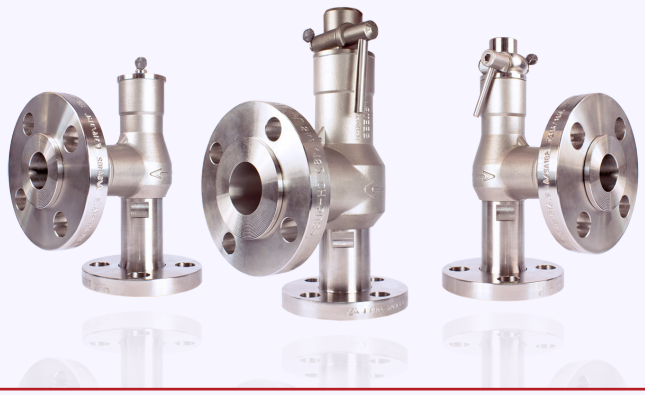
Seetru Limited

Type 946 Flanged

Safety valves made from Stainless Steel <
Enclosed discharge valve with flanged connections <
Metal to metal sealing <

Example Applications

- Air / gas compressors
- Pressure vessels
- Medical gases/Technical gases
- Refrigeration (including ammonia)
- Thermal relief
- Steam systems
- Hydrogen



Specifications

- Inlet connections: DN15 (1/2), DN20 (3/4") or DN25 (1") flange – DIN EN1092 and ANSI flanges are available
- Temperature range:-50°C to +250°C (depending on body o'ring material)
- Pressure range: 0.3 to 28.0 bar

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- EAC
- Leak tightness at 90% set pressure to API 527 and in accordance with EN ISO 4126-1

CE UKCA EAC

Materials of Construction

Component	Material	Grade
Inlet & Outlet Flanges	Stainless Steel	1.4401 (316)
Body	Stainless Steel	1.4408 (316)
Internal Parts	Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)
Disc	Stainless Steel	AISI 440B

Seal Materials

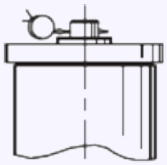
This valve using metal to metal sealing. There is a choice of o'ring used for the sealed cap/lever.

O'ring material – Top cap	Temperature Range
Viton® (FKM)	-20°C to +250°C
Nitrile (NBR)	-30°C to +150°C
Silicone	-50°C to +250°C
EPDM	-40°C to +150°C

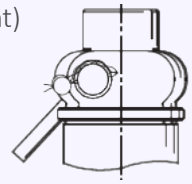
Standard seal materials shown, others are available.

Easing Gear / Lifting Gear / Top Fitting Options

- Sealed Cap (gas tight cap)



- Sealed lever (gas tight)



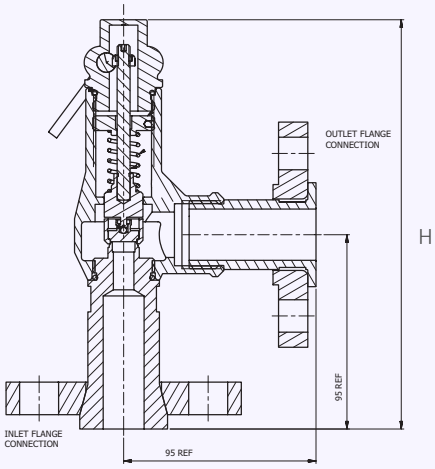
Technical information by bore size

Bore size	10mm (94610)			15mm (94615)
Inlet Size	DN15 (1/2")	DN20 (3/4")	DN25 (1")	DN25 (1")
Outlet Size	DN25 (1")			DN40 (1 1/2")
Flow Area	78.5mm²			177mm²
H - Height (Sealed Lever version)	200mm			253mm
TÜV alloted outflow coefficient	0.83 (above 3.0 bar)			0.74 (above 3.0 bar)
Weight (approximate) Kg	3.0			5.3
Set Pressure range - PED (CE) bar	0.3 to 28.0			0.3 to 28.0
Relieving pressure/fully open pressure	**Set pressure +10% (0.1 bar below 1.0 bar)**			
Reseating pressure	**Set pressure -10% (0.3 bar below 3.0 bar)**			

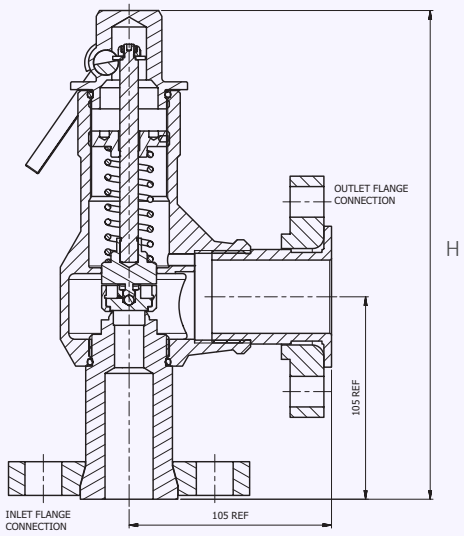
- TÜV alloted outflow coefficients for pressures above 3.0 bar, for lower pressures please see the flow rate tables or contact Seetru.
- Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.
- Stable operation on flows down to 50% of valve rated capacity.
- Leak tightness at 90% set pressure to API 527 and in accordance with EN ISO 4126-1.

Valve Drawing

10mm bore – 94610



15mm bore – 94615



Standard INLET Connection Types

- DIN EN1092 Flange PN16, PN25 or PN40
- ASME Flange CL150, CL300 or CL600

Standard OUTLET Connection Types

- DIN EN1092 Flange PN16, PN25 or PN40
- ASME Flange CL150 or CL300

Valve Selection Guide

Valve type	Select Bore	Inlet Size	Inlet Flange Type	Outlet Flange Type	Easing Gear	O'ring material (for cap)
946	Select bore size from above table	Select inlet size from above table	Select Inlet Flange type	Select Outlet Flange type	Select easing gear/top fitting	See table

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	946	10	DN20	DIN EN1092 Flange PN16	DIN EN1092 Flange PN16	Sealed Lever	Viton	10.5 bar	16.2 bar
	Valve Type	Bore = 10mm	Inlet Size	Inlet Flange Type	Outlet Flange Type	Top Fitting	O'ring	Set Pressure	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour
Type 946: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		10mm	15mm			
bar	psi	Nm³/Hour	Nm³/Hour			
0.3	4.35	39	76			
0.5	7.25	56	104			
1	14.5	84	155			
2	29	135	270			
3	43.5	191	384			
4	58	240	482			
5	72.5	289	580			
6	87.00	338	678			
7	101.5	386	776			
8	116	425	874			
9	130.5	484	972			
10	145	533	1070			
15	217.5	777	1560			
20	290	1021	2049			
25	362.5	1266	2539			
28	406	1412	2833			

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with TÜV, STEAM. Kg/hour
Type 946: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)				
		10mm	15mm			
bar	psi	Kg/hour of Steam	Kg/hour of Steam			
0.3	4.35	32.5	63.3			
0.5	7.25	44.5	82.5			
1	14.5	66.1	121.7			
2	29	106.2	213.4			
3	43.5	149	299			
4	58	186	373			
5	72.5	222	446			
6	87.00	259	520			
7	101.5	295	592			
8	116	332	666			
9	130.5	368	738			
10	145	405	812			
15	217.5	585	1174			
20	290	765	1535			
25	362.5	947	1900			
28	406	1055	2116			

For any intermediate pressures/flows please contact Seetru

Enclosed Discharge Safety Relief Valves

for compressed air & gas | *hydrogen*

Seetru Limited

Type 64613 / 64113 Flanged

Safety valves with Stainless Steel body <
Enclosed discharge valve with flanged connections <

Example Applications

- Air / gas compressors
- Pressure vessels
- Pneumatic systems
- Medical gases
- Technical gases

Specifications

- Inlet connections: DN20 (3/4”) or DN25 (1”) DIN or ANSI flanges
- Temperature:-40°C to +200°C (depending on seal material)
- Pressure range: 0.32 to 49.0 bar

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- ASME BPVC VIII.1 & XIII (UV)
- CRN
- EAC

Materials of Construction

Component	Material	Grade
Inlet	Stainless Steel	1.4401 (316)
Body	Stainless Steel	1.4408 (316)
Internal parts	Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)

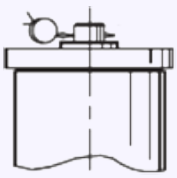
Seal Materials

Seal Material	Temperature Range
Viton® (FKM)	-15°C to +200°C
Nitrile (NBR)	-40°C to +120°C

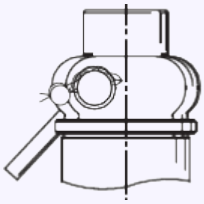
Standard seal materials shown, others are available.

Easing Gear / Lifting Gear Options

Standard Option: Sealed Cap (gas tight cap)



Other Option: Sealed lever (gas tight)

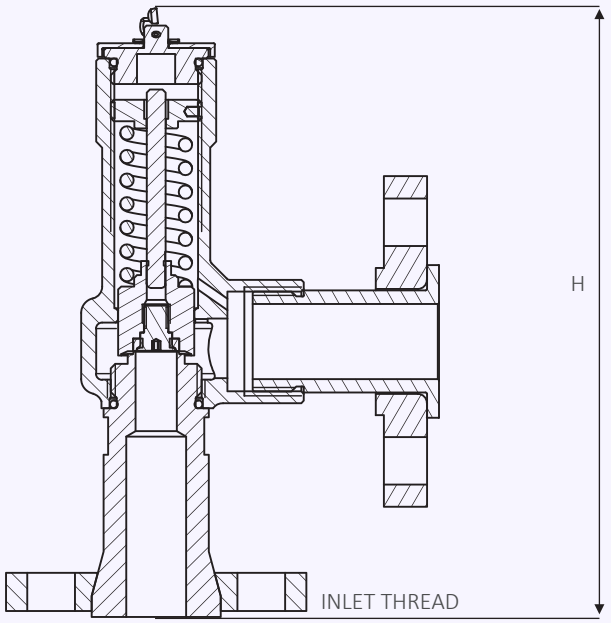


Technical information by bore size

Bore size	13.7mm	
Inlet Size	DN20 (3/4")	DN25 (1")
Outlet Size	DN25 (1")	
Flow Area	147.4mm²	
H - Height (Sealed cap version)	197mm (up to 35 bar) 226mm (35-49 bar)	
TÜV alloted outflow coefficient	0.71	
NB Certified rated slope (ASME)	3.47 scfm/psia	
Weight (approximate) Kg	3.2	
Set Pressure range - PED (CE) bar	0.32 to 49.0	
Set Pressure range - ASME (UV) psi	20.3 to 710.5	
Relieving pressure/fully open pressure	Set pressure +10% (0.3 bar below 1.4 bar)	
Reseating pressure	Set pressure-10% (0.3 bar minimum)	

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced. Stable operation on flows down to 50% of valve rated capacity.

Valve Drawing



Standard Thread Connection Types

- DIN EN1092 Flange PN16, PN25 or PN40
- ASME Flange CL150, CL300 or CL600

Standard Outlet Connection Types

- DIN EN1092 Flange PN16, PN25 or PN40
- ASME Flange CL150, CL300 or CL600

Valve Selection Guide

Approval Required	Valve type	Inlet Size	Inlet Flange Type	Outlet Flange Type	Easing Gear	Seal Material
PED (CE)	64613	Select inlet size from above table	Select Inlet flange type	Select Outlet flange type	Select easing gear/top fitting	Viton® (FKM)
PED (CE), ASME (UV) & CRN	64113					Nitrile (NBR)
						Other

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	PED, ASME & CRN	64113	DN20	DIN EN1092 Flange PN16	DIN EN1092 Flange PN16	Sealed Cap	Viton	3.5 bar
	Approval	Valve Type	Inlet Size	Inlet Flange Type	Outlet Flange Type	Easing Gear	Seal	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour

Type 64613: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)
		13.7mm
bar	psi	Nm³/Hour
0.32	4.64	114.2
0.48	6.96	124.5
1	14.5	164.9
2	29	229.1
3	43.5	307.5
4	58	385.9
5	72.5	464.3
5.65	81.93	515.3
6	87	542.7
7	101.5	621.2
8	116	699.6
9	130.5	778.0
10	145	856.4
15	217.5	1248.5
20	290	1640.6
25	362.5	2032.7
30	435	2424.8
35	507.5	2816.9
40	580	3209.0
45	652.5	3601.1
49	710.5	3914.8

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with ASME BPVC.XIII, AIR at 60°F and 14.7 psia/scfm. SCFM

Type 64113: Flow rates at 10% above the set pressure

Set Pressure		Bore Size (D0)
		13.7mm
psi	bar	SCFM
20.3	1.40	131.9
22.5	2.50	139.4
30	2.07	165.5
34.8	2.80	183.8
40	2.76	203.7
43.5	3.00	217.0
50	3.45	241.8
82	5.66	363.9
100	6.90	432.6
150	10.34	623.4
200	13.79	814.2
250	17.24	1005.0
300	20.69	1195.8
350	24.14	1386.6
400	27.59	1577.4
435	30.00	1711.0
450	31.03	1768.2
500	34.48	1959.0
507.5	35.00	1987.6
550	37.93	2149.8
600	41.38	2340.6
650	44.83	2531.4
700	48.28	2722.2
710.5	49.00	2762.3

For any intermediate pressures/flows please contact Seetru

Change-Over Valves

Seetru Limited

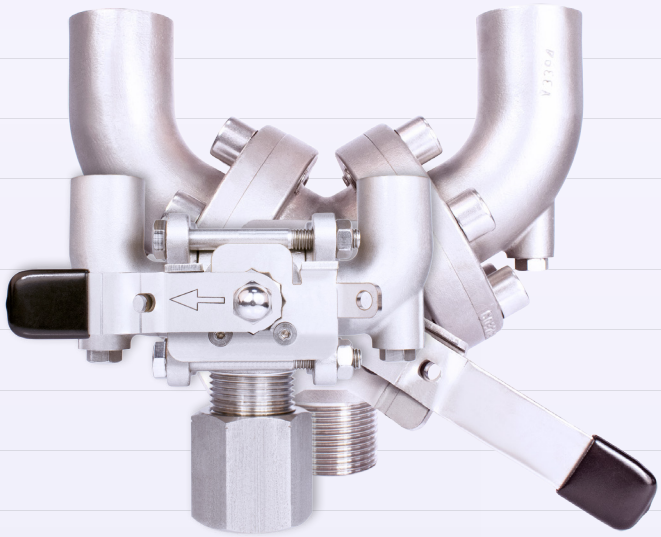
for compressed air or gases | *cryogenic & liquefied gas* | *refrigeration* | *hydrogen*

COV10 / COV13 / COV30

Solutions for plant and process efficiency

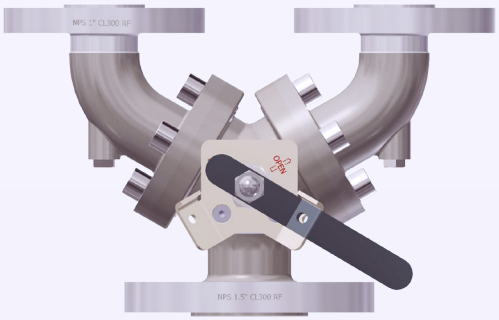
Change-over valves (sometimes referred to as selector valves or three-way valves) enables the switching of flow from one safety valve to another. Typically used where plant shutdown is impossible or undesirable for process, engineering or commercial reasons. With change-over valves it is possible to switch over between parallel safety valves without interrupting operation, so that maintenance work can be carried out on each safety valve in turn. Seetru change-over valves in combination with our safety valves provide the best solution for plant safety and efficiency. Seetru products are widely recognised for their exceptional quality and reliability.

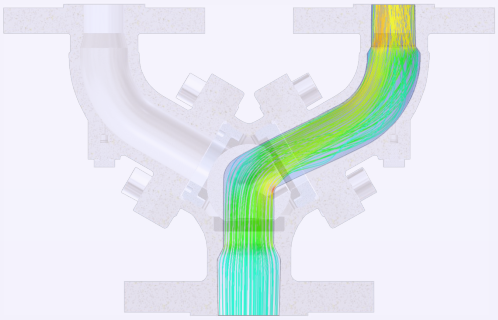
Features



- Patented Design
- Lubricant Free Operation
- Can be fitted with a Bursting Disc
- Lockable handle (optional padlock available)
- Designed for ease of maintenance
- Option to degrease for Oxygen service
- Impossible to isolate both safety valves
- Adjustable Spindle Gland
- Robust Construction
- Compact and easy to use design
- Designed in accordance with BS EN 378
- Pressure drops with 10.0mm for COV10 bore SRV & 18.0mm for COV30 (in accordance with BS EN 13136)
- Ventable outlets for safe removal of Safety Valves
- Seat leakage EV 12266-1 Rate A
- Available with a wide range of fittings and adaptors
- Optimised using Computational Fluid Dynamics (CFD)

Fluid Mahcanics

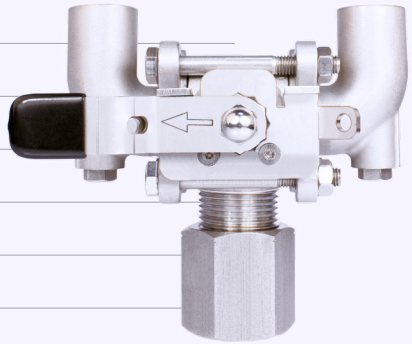




The Seetru Change-Over Valves were designed and developed using Computational Fluid Dynamics (CFD) in order to simulate and optimise the flow of the fluids through the valve.

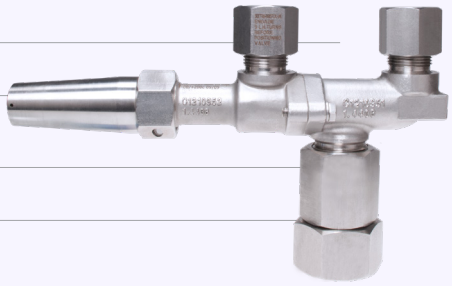
Specifications: COV10

System Connections	½” to 1” BSP, BSPT & NPT
Valve Connectiond	½” NPT or 3/4” BSP (with or without orientators)
Change-Over Valve Kv	10.0 (Cv= 11.5)
Materials of Construction	Stainless Steel
Seat Materials	25% Carbon filled P.T.F.E.
Temperature Range	-196°C to +200°C
Max Design Pressure	75 bar
Material Certifiation	BS EN ISO10204 3.1 Pressure Retaining Parts (Optional Extra)
Safety Valve Orifice Size	Up to 10mm (Full Lift Type)
Maximum Safety Valve Set Pressure	75 bar



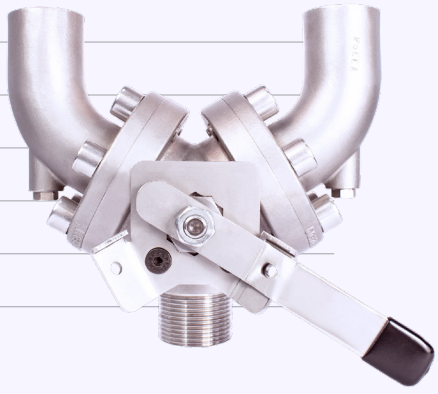
Specifications: COV13

System Connections	Please contact Seetru for information
Valve Connections	Please contact Seetru for information
Materials of Construction	Stainless Steel with Mild Steel or Stainless Steel Internals
Seat Materials	Elastomer P.T.F.E
Maxium Safety valve Set Pressure	65.0 bar
Temperature Range	-30 °C to 200 °C (subject to seal material)



Specifications: COV30

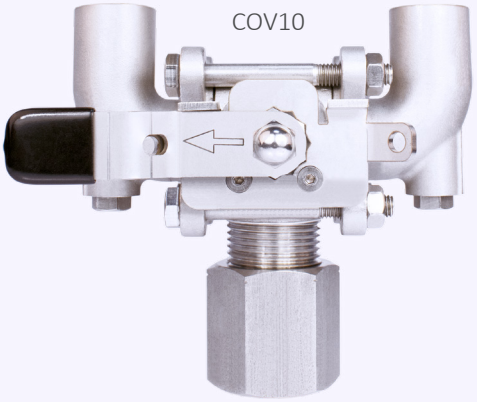
System Connections	1” to 1-1/2” BSP, BSPT, NPT, CL150 to CL600 & PN16 to PN100
Valve Connections	¾” to 1” BSP, BSPT, NPT (with or without orientators), CL150 to CL600 & PN16 to PN100
Change-Over Valve Kv	30
Materials of Construction	CF8M/316/1.4401
Seat Materials	25% Carbon filled P.T.F.E.
Temperature Range	-196°C to +200°C
Max Design Pressure	CL600 or PN100
Material Certifiation	BS EN ISO10204 3.1 Pressure Retaining Parts (Optional Extra)
Safety Valve Orifice Size	Up to 18mm (Full Lift Type)
Maximum Safety Valve Set Pressure	100 bar



Operation Instructions: COV10 / COV30

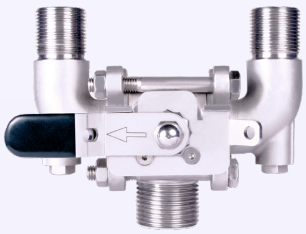
1	Unlock handle if locking device fitted (recommended).
2	Starting in a motion away from the duty SRV, rotate handle through 180° (COV10) or 120° (COV10), either clockwise or anticlockwise dependent uponstart starting position.
3	Once fully rotated, lock in position if locking device fitted (recommended).
4	If the now standby SRV is to be remove: with caution, un-tighten vent nut of standby Change-over arm by 1 to 2 revolutions to exhaust trapped fluid from change-over arm.
5	Once trapped fluid has de-pressurised, re-tighten vent plug with a tightening torque of 3.0 Nm.
6	Remove the standby SRV.
7	The user may plug the vacant outlet if desired, however sufficient safety procedures (for example Lock out Tag out) must be in place to prevent inadv inadvertent change over, thus rendering the system un-protected against excessive pressure. If the outlet is plugged, vent arm of pressure, as previously described, prior to removal.

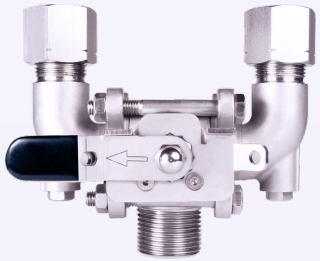
COV10

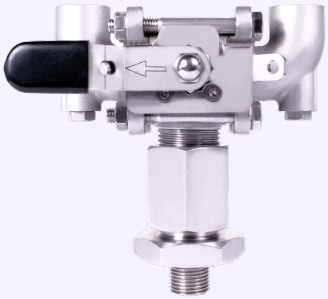


COV30

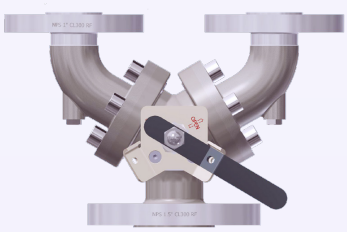
Fittings, Adaptors and Connections







The Seetru COV30 Flanged Change-Over Valve



- The Seetru COV10 and COV30 Change-Over Valves can be supplied with a range of fittings and adaptors to provide compatibility with a large variety of systems.
- The COV30 is also available with flanged connections (A or PN).

Valves from Stock: Same-Day-Despatch

Our products are recognised globally for their exceptional quality and reliability, and in recent years Seetru have worked hard to maximise the efficiency of our manufacturing processes, to ensure that we are able to meet demands for supply and distribution. We now hold a large variety of safety valves in stock, allowing customers to purchase certain quantities from our website, and see them despatched on the same day.

Seetru offer atmospheric discharge safety valves and pipped discharge safety valves in brass / bronze or stainless steel. The Seetru LGS® range of pressure relief valves (for liquid, steam, and gasses) are available in bronze construction, with open-lever and sealed-cap options. These valves can be fitted with PTFE or EPDM seals, with both types having the WRAS approval- for installation on public water supply systems.

Seetru also operate a standardised three-day-despatch delivery service, which covers the entire range of valves we manufacture.

Safety Valve Testing Equipment: The Seetru Quicktester™

This compact, lightweight and portable design is very robust and able to meet the demands of a busy maintenance workshop or mobile operation. The Seetru Quicktester™ can be used with plant generated air supplies or with mobile bottled gas. This test-bench can be supplied with a range of adaptors allowing connection between 1/4” to 1” BSP as standard, additional adaptors are available increasing the connection sizes up to 2” BSP. The Quicktester™ is also available with NPT connection adaptors upon request. It is suitable for use with a wide range of elastomer sealed valves

Liquid Level Gauges

There are many industrial applications that require the monitoring of the liquid level in tanks. While the function of a level gauge is relatively simple, there are a variety of options available. The suitability and robustness of construction materials play a role in determining which gauge is required, as do the operating temperature and pressure requirements. Seetru liquid level gauges are primarily of two types, sight gauges and magnetic float by-pass gauges. Many of the Seetru gauges are direct reading though most have optional electronic remote reading systems and computer interfaces. The range includes the Quickmount, Seemag and CPI gauges for industrial and chemical applications and the Seeflex and Seemag for marine applications.

Seetru Limited, Albion Dockside Works, Bristol, BS1 6UT, England.