

## T 8088 EN

### Type 3588 Cryogenic Valve

ANSI version



#### Application

Globe, angle or Y-pattern valve for cryogenic applications  
Manual control and on/off service

<b>Valve size</b>	<b>NPS 1 to 6</b>
<b>Pressure rating</b>	<b>Class 150 to 600</b>
<b>Temperature range</b>	<b>-425 to +149 °F · -254 to +65 °C</b>

#### Special features

The Type 3588 Cryogenic Valve is specially designed to meet the requirements of cryogenic applications.

- Globe, angle-style or Y-pattern valve body
- Top-entry design with bolted valve bonnet
- Installation in vacuum-insulated pipelines, air separation plants, liquefaction process plants and peripheral plants made possible by a cover plate on the cryogenic extension bonnet
- Valve maintenance possible without removing it from the pipeline
- Top entry through the cryogenic extension bonnet allows easy access to the seat, plug and bellows after removal of the actuator
- The  $C_v$  coefficients can be modified in wide ranges by replacing the seat and valve plug

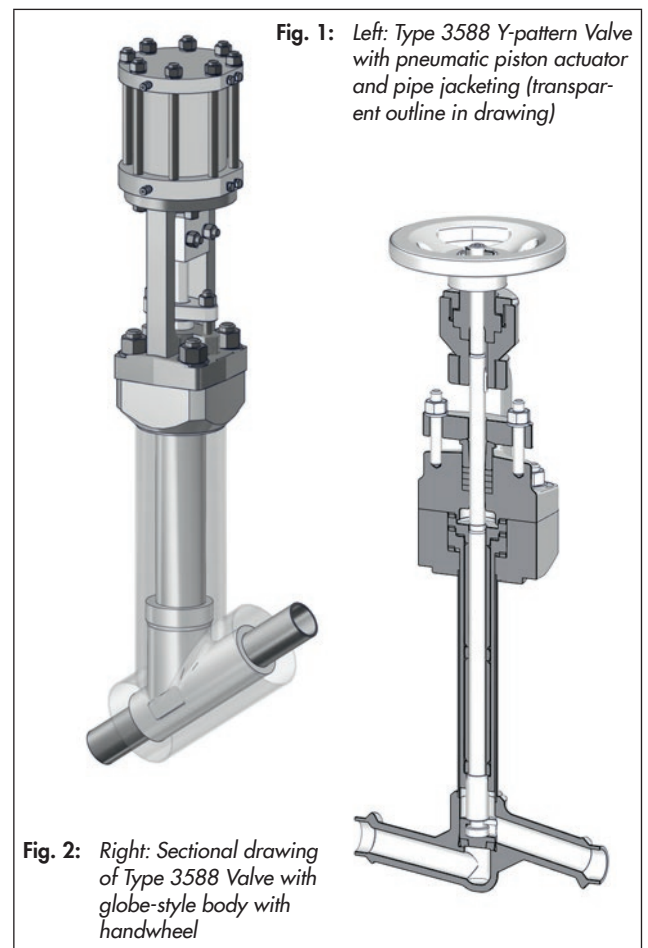
#### Versions

**Standard version** · Temperature range from -320 to +149 °F (-196 to +65 °C) · Stem sealed by metal bellows and adjustable PTFE packing with packing flange · Handwheel

- **Type 3588-1** · With Type 3271 Pneumatic Actuator, 175v2 to 2800 cm<sup>2</sup> effective diaphragm area

Further versions:

- Temperature range from -320 to -425 °F (-196 to -254 °C)
- Temperatures above 149 °F (65 °C) · On request
- Free of oil and grease for oxygen service
- Version for ultrapure gas
- Pipe jacketing for installation in vacuum-insulated plant components
- Welding-neck ends on request
- Pneumatic actuator with additional handwheel
- Pneumatic piston actuator



### Principle of operation

The medium flows through the cryogenic valve in the direction indicated by the arrow. The position of the valve plug in relation to the seat determines the flow rate.

The metal bellows seal guarantees that the medium has no direct contact with the packing. The packing to seal the stem to the atmosphere is self-adjusting.

The test connection allows the packing to be monitored for leakage.

### Installation

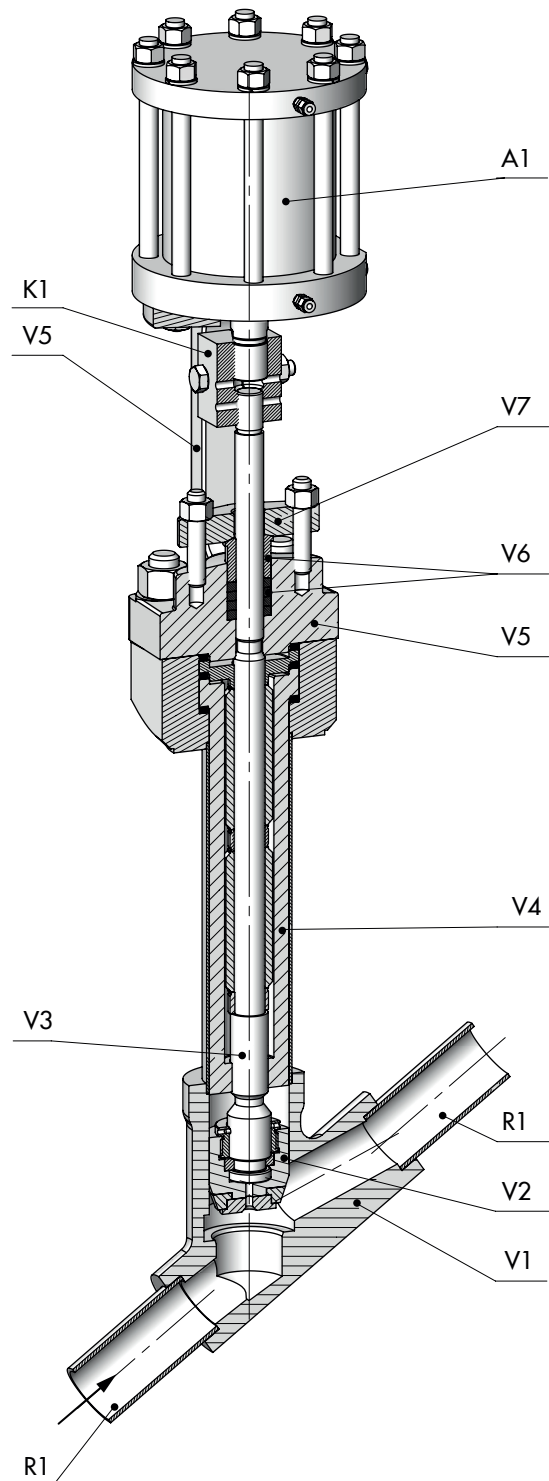
We recommend mounting the valve at an angle between 15 and 25° to the horizontal plane. Contact SAMSON for smaller mounting angles as additional measures are required in this case. Bracket or support: see Mounting and Operating Instructions ► EB 8088.

The medium must flow through the valve in the direction indicated by the arrow on the valve body.

### Fail-safe position

A valve fitted with a pneumatic actuator with springs moves to a fail-safe position when the supply air fails depending on how the springs are arranged in the pneumatic actuator (see Data Sheet ► T 8310-1 for details):

- **Actuator stem extends (FA):** when the air supply fails, the spring force moves the stem downward causing the valve to close.
- **Actuator stem retracts (FE):** when the air supply fails, the spring force moves the stem upwards causing the valve to open.



#### Legend

A1	Pneumatic piston actuator
K1	Stem connector
R1	Welding-neck ends or welding ends
V1	Valve body
V2	Plug (assembly)
V3	Plug stem
V4	Bellows seal (assembly)
V5	Bonnet with yoke
V6	Packing and packing follower
V7	Packing gland

**Fig. 3:** Type 3588 Valve with Y-pattern body (Class 150/300) with pneumatic piston actuator

**Table 1:** Technical data for Type 3588 Cryogenic Valve

Version	ANSI		
	Globe valve	Y-pattern valve	Angle valve
Valve size	NPS ½ to 6	NPS ½ to 6	NPS ½ to 6
Pressure rating	Class 150 to 600	Class 150 to 600	Class 150 to 600
Type of connection	Welding ends: Socket weld ends NPS 1 to 2 Welding ends: Butt weld ends ASME B16.25 for NPS 3 to 6		Welding ends: Butt weld ends ASME B16.25
Seat-plug seal	Metal seal · Soft seal · High-performance metal seal		
Characteristic	Open/Close		
Temperature range	-321 to +149 °F (-196 to +65 °C) · Up to -425 °F (-254 °C) on request		
Leakage class	According to API 598		
Conformity	CE · EAC		

**Table 2:** Materials

Body style	Globe valve	Y-pattern valve	Angle valve
Valve body	A 351 CF8 · A 182 316L		
Seat <sup>1)</sup>	A182 316L		
Plug <sup>1)</sup>	Metal seal	A182 316L	
	Soft seal	KEL-F	
Packing	PTFE		
Cryogenic extension bonnet, metal bellows, bushings, plug stem	A182 316L		

<sup>1)</sup> Seats and plugs without soft seal also with Stellite® facing

**Table 3:**  $C_v$  coefficients

Valve	NPS	½			¾			1			1½			2			3			4			6		
	Class	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600
<b>Globe valve (see Fig. 4 and Fig. 5)</b>																									
$C_v$		6			10			14			31			38			87			153			345		
<b>Angle valve (see Fig. 6)</b>																									
$C_v$		8			13			19			44			78			175			312			702		
<b>Y-pattern valve (see Fig. 7)</b>																									
$C_v$		9			14			22			49			87			189			336			756		

**Table 4:** Dimensions and weights of Type 3588 Valves · Dimensions in mm · Weights in kg

Valve	NPS	½			¾			1			1½			2			3			4			6					
	Class	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600			
<b>Globe valve (see Fig. 4 and Fig. 5)</b>																												
A		152	165		178	190		203	216		229	241		267	292		318	356		356	432		444	559				
B		534			534			534			534			534			534			534			687					
C		750			750			750			800			800			750			965			1086					
∅ D		100	150		150	200		150	200		200	250		200	250		400	500		400	500		500	600				
E		441			441			441			441			441			441			441			551					
∅ MD		200			200			200			200			200			300			300			400					
L		On request			On request			On request			On request			On request			On request			On request			On request					
Weight	Vacuum-jacketed	10	On request		12	On request		16	On request		26	On request		32	On request		52	On request		75	On request		145	On request				
	Removable	9	11		10	13		14	18		23	30		29	39		48	77		69	125		136	210				
	Not removable	7	8.5		9	12		11	14		18	25		25	34		41	65		59	110		124	190				
	With vacuum can cuff	10	12		12	14		16	19		26	31		32	41		52	79		75	129		145	217				
<b>Angle valve (see Fig. 6)</b>																												
A		57	76	83	64	89	95	70	102	108	83	114	121	102	133	146	121	159	178	146	178	216	203	222	279			
B		534			534			534			534			534			534			534			687					
C		750			750			750			800			800			750			965			1086					
∅ D		100	150		150	200		150	200		200	250		200	250		400	500		400	500		500	600				
E		441			441			441			441			441			On request			On req.			On request			On req.		
∅ MD		On request			On request			On request			On request			On request			On request			On request			On request					
L		On request			On request			On request			On request			On request			On request			On request			On request					
Weight	With vacuum can cuff	11	13		13	15		18	21		32	38		35	45		56	85		83	142		161	241				
<b>Y-pattern valve (see Fig. 7)</b>																												
A		On request			On request			On request			On request			On request			On request			On request			On request					
B		On request			On request			On request			On request			On request			On request			On request			On request					
C		On request			On request			On request			On request			On request			On request			On request			On request					
∅ D		On request			On request			On request			On request			On request			On request			On request			On request					
E		441			441			441			441			441			441			441			551					
∅ MD		200			200			200			200			200			300			300			400					
L		On request			On request			On request			On request			On request			On request			On request			On request					
Weight	Vacuum-jacketed	11	On request		13	On request		18	On request		32	On request		35	On request		56	On request		83	On request		161	On request				
	With vacuum can cuff	11	13		13	15		18	21		32	38		35	45		56	85		83	142		161	241				

Dimensions and weights for Type 3271 Pneumatic Actuators: see Data Sheet ▶ T 8310-1

Dimensional drawings

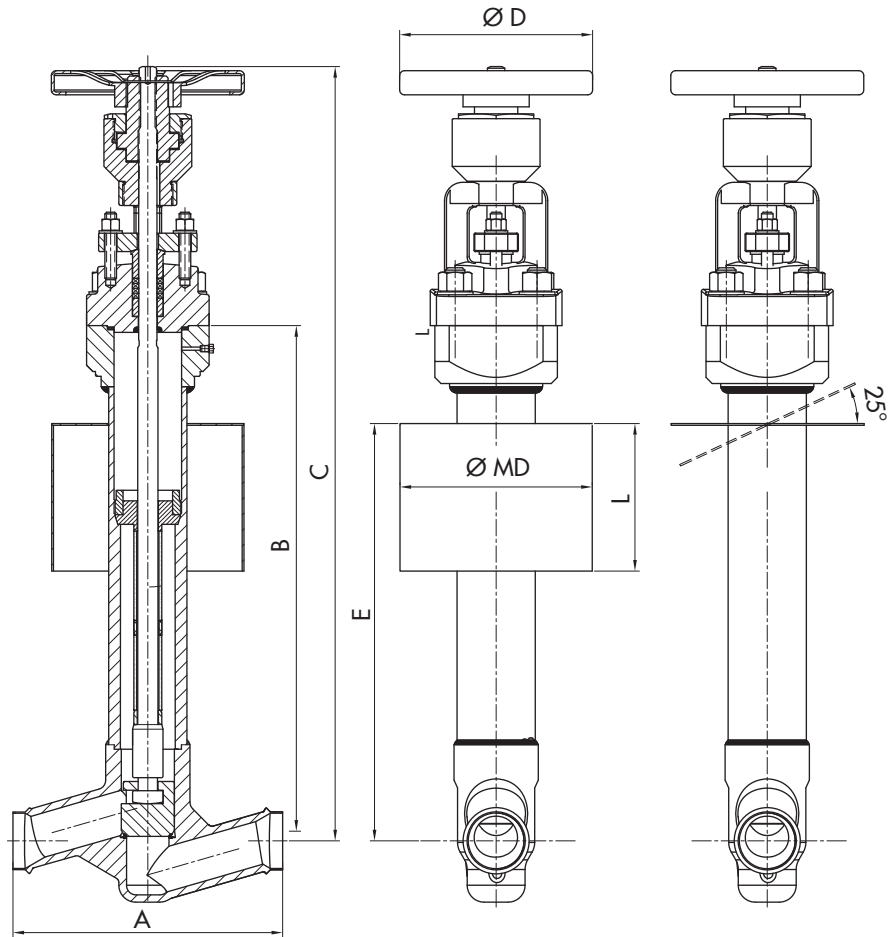


Fig. 4: Type 3588 Valve with globe-style body, NPS 1/2 to 2 · Cryogenic version (right)

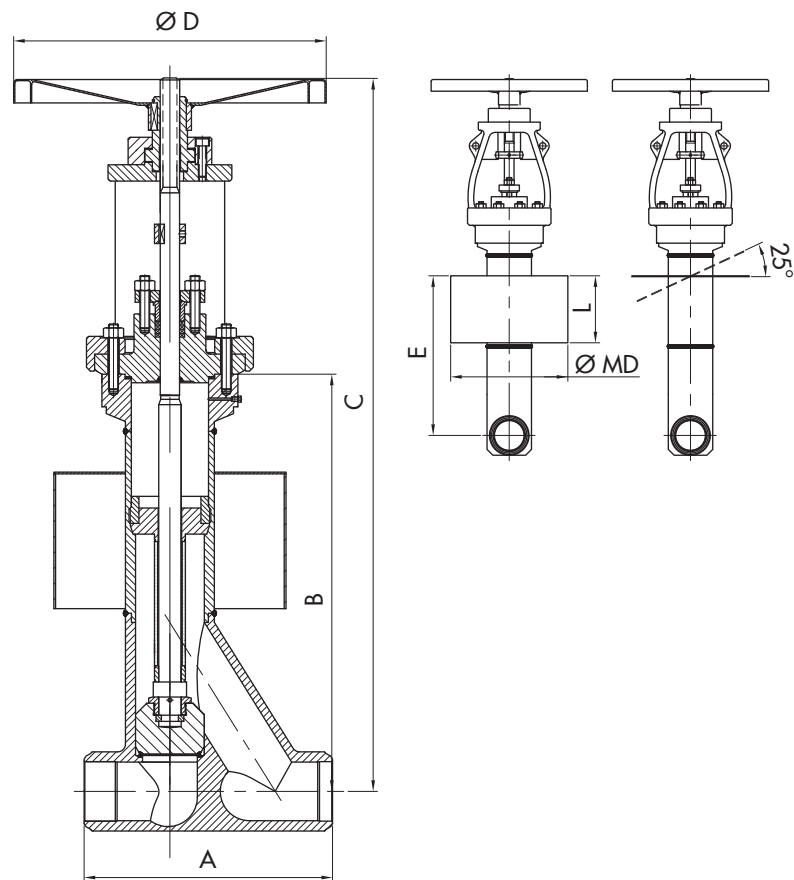


Fig. 5: Type 3588 Valve with globe-style body, NPS 3 to 6 · Cryogenic version (right)

Dimensional drawings

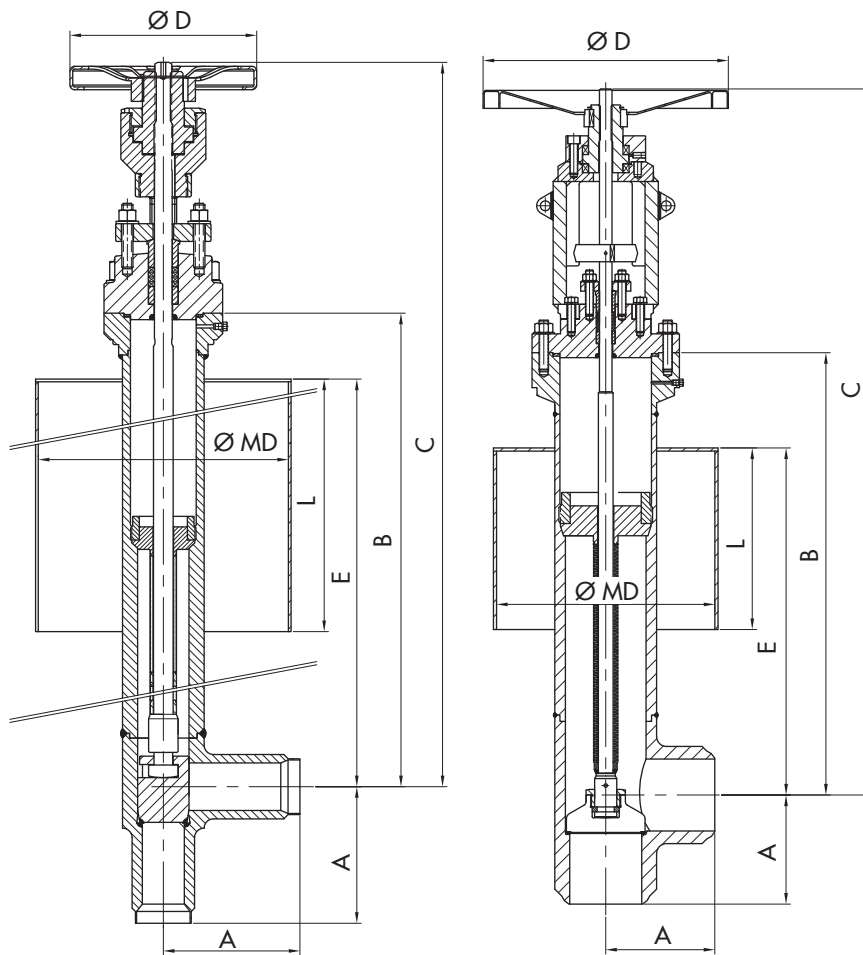


Fig. 6: Type 3588 Valve with angle body · NPS 1/2 to 2 (left) · NPS 3 to 6 (right)

Dimensional drawings

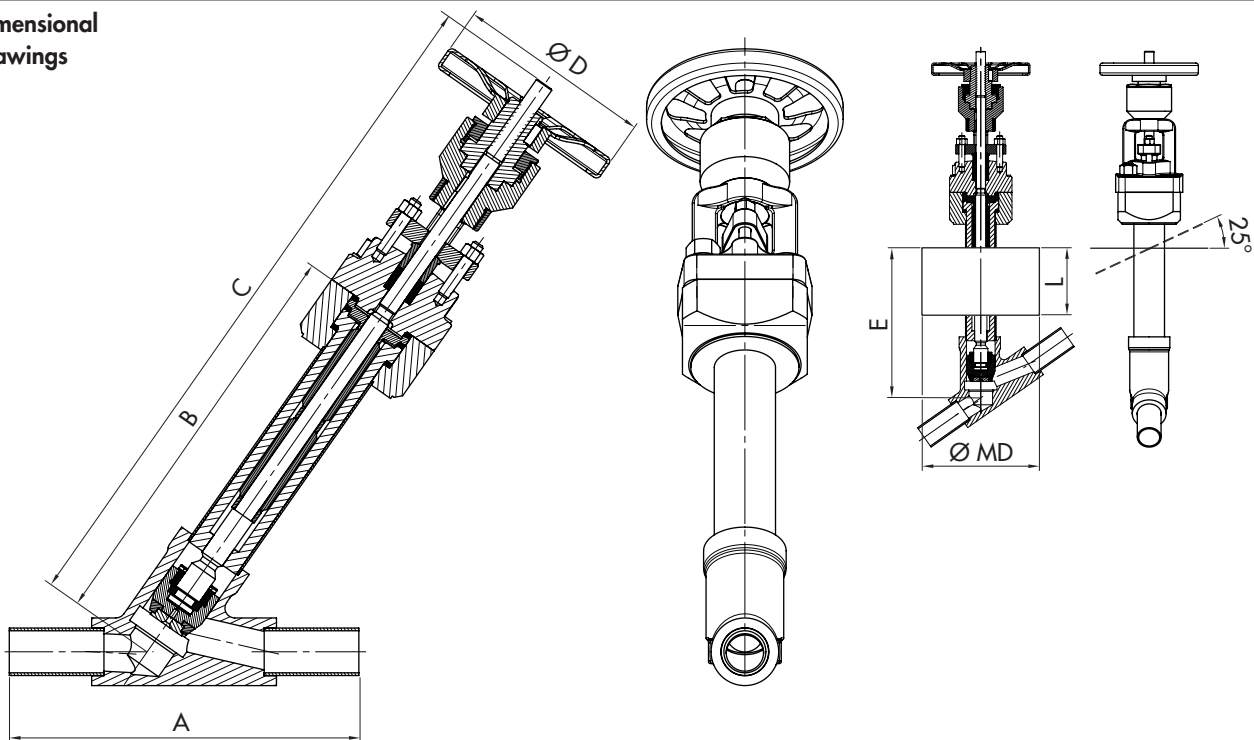


Fig. 7: Type 3588 Valve with Y-pattern body · Cryogenic version (right)



**The following specifications are required on ordering:**

Type 3588 Valve	Globe, Y-pattern or angle-style valve body
Valve size	NPS ...
Pressure rating	Class ...
Flow coefficient	C <sub>v</sub> ...
Body material	Refer to Table 2
Port	Welding ends according to Table 1, welding-neck ends on request
	Pipe size
	Height
	Cover plate