DATA SHEET

T 9910 EN

Type 3358 Ball Valve

ANSI version

Application

Tight-closing ball valve made of steel suitable for use for on/off applications in various industries and with a wide variety of process media.

Nominal size	**NPS 1 to 6**
Pressure rating	**Class 150 and 300**
Temperatures	**–29 to +220 °C**

Special features

Type 3358 Ball Valve in combination with

- Pneumatic or electric part-turn actuator
- Lever

Body made of

- Cast steel A216 WCC
- Cast stainless steel A351 CF8M

Face-to-face dimensions according to ASME/ANSI B16.10 (latest edition).

The ball valve complies with leakage requirements according to API 598, API 6D.

With mounting flange according to DIN EN ISO 5211 for mounting a pneumatic or electric quarter-turn actuator. It is possible to mount the actuator directly on valves with Class 150 pressure rating.

The pneumatic or electric valve assemblies can be equipped with various accessories, such as positioners, limit switches, solenoid valves and other devices.

Options

– With **shaft extension**

– Square drive shaft **offset by 45°**

Fig. 1: *Type 3358 Ball Valve with lever*

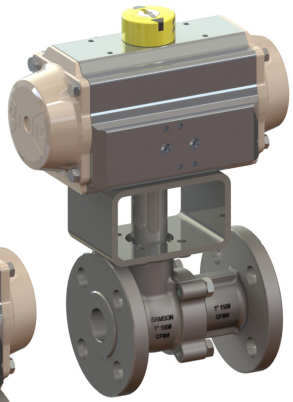

Fig. 2: *Type 3358 Ball Valve with mounting flange and pneumatic part-turn actuator*

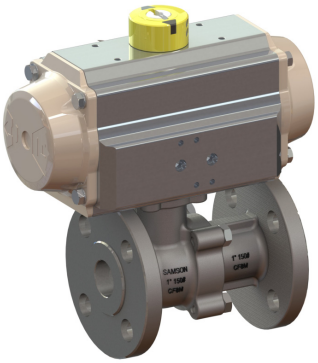

Fig. 3: *Type 3358 Ball Valve with directly mounted pneumatic part-turn actuator*

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Design and principle of operation

The Type 3358 Ball Valve is suitable for both directions of flow with an unobstructed, straight-through flow path (full bore).

The ball (3) rotates around a shaft (5) and has a cylindrical passage. The opening angle of the ball (3) determines the flow rate across the free area between the body (1 and 2) and the ball channel. The seat of the ball (3) is sealed by exchangeable seat rings (4).

The shaft (5) of the **standard version** is sealed by O-rings (6) (see Fig. 4 and Fig. 6).

The shaft (5) of the **fire-safe version** is sealed by a graphite packing (11 to 16) (see Fig. 5 and Fig. 7).

The open end of the shaft (5) is fitted with a lever. Optionally, a pneumatic or electric part-turn actuator can be mounted on the valve.

Fail-safe position

The valve assembly fitted with a corresponding pneumatic or electric actuator can assume one of two fail-safe positions that become effective after the supply air or electrical power fails depending on the actuator version.

- **Fail-close valve**: the ball valve closes upon failure of the air supply/electrical power.
- **Fail-open valve**: the ball valve opens upon failure of the air supply/electrical power.

When the ball valve is combined with a lever, the valve assembly does not automatically move to a fail-safe position.

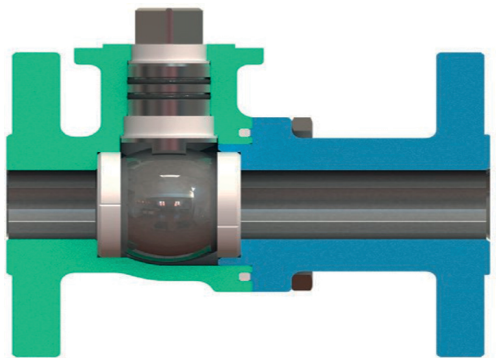


Fig. 4: *Sectional view of the standard version*

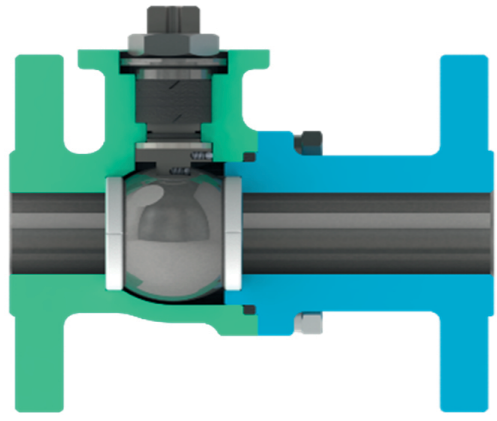
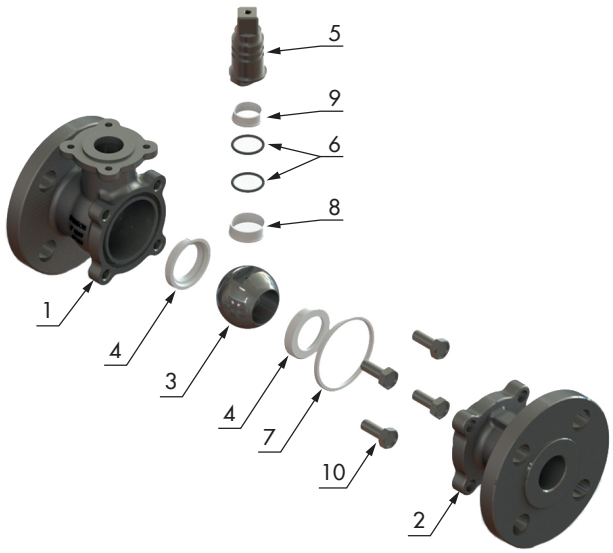
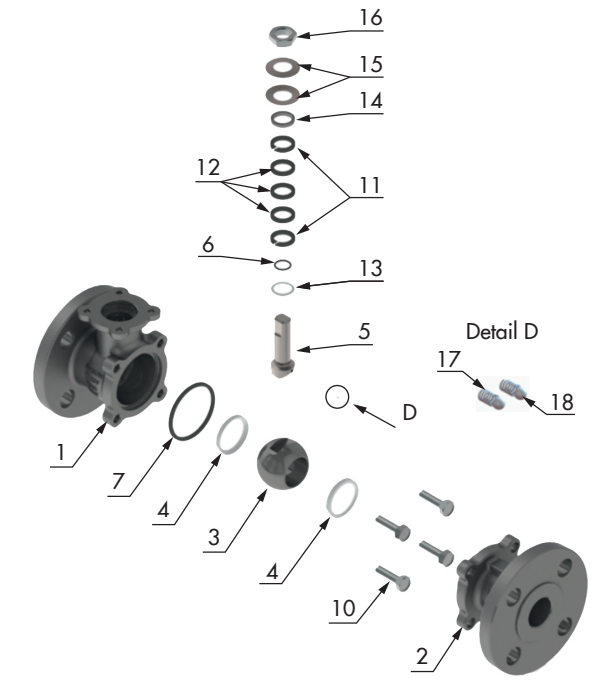


Fig. 5: *Sectional view of the fire-safe version*



1	Body	6	O-ring
2	Adapter	7	Body gasket
3	Ball	8	Bearing (bottom)
4	Seat ring	9	Bearing (top)
5	Shaft	10	Body screw

Fig. 6: *Exploded diagram of the standard version*



1	Body	11	Braided graphite packing ring
2	Adapter	12	Graphite packing ring
3	Ball	13	Thrust washer
4	Seat ring	14	Gland
5	Shaft	15	Spring washer
6	O-ring	16	Lock nut
7	Body gasket	17	Anti-static spring
10	Body screw	18	Anti-static ball

Fig. 7: *Exploded diagram of the fire-safe version*

Table 1: *Technical data of Type 3358 Ball Valve*

Nominal size **NPS**	**1 to 6**	
Material	**Cast stainless steel A351 CF8M**	**Cast steel A216 WCC**
Pressure rating	Class 150/300	
Type of end connections Flanges	ASME B16.5	
Face-to-face dimension	ASME B16.10, API 6D	
Design and manufacturing	API 6D, BS EN ISO 17292	
Conformity	IBR (Indian Boiler Regulations)	
Temperature range · Permissible operating pressures in Table 4		
Standard version	–29 to +220 °C (–20 to 428 °F)	
Leakage class		
According to API 598/API 6D	Tight Shut Off	

Table 2: *Materials [1] for standard version*

Body and adapter (1 and 2)	**A351 CF8M**	**A216 WCC**
Ball	A182 F316/F316L	
Seat rings	TFM 1600/RPTFE	
Shaft	A479 SS316/SS316L/A182 F51/A564 17-4PH	
Shaft seal (O-rings)	FKM	
Bearing	PTFE/CFT	
Body gasket	PTFE/graphite	

[1] Other materials on request

Table 3: *Materials [1] for fire-safe version*

Body and adapter (1 and 2)	**A351 CF8M**	**A216 WCC**
Ball	A182 F316/F316L	
Seat rings	RPTFE	
Shaft	A479 SS316/SS316L/A182 F51/A564 17-4PH	
Shaft seal (O-rings)	FKM	
Thrust washer	GFT	
Packing	Graphite	
Body gasket	Graphite	

[1] Other materials on request

Table 4: *Pressure/temperature rating · All pressure stated in bar*

Nominal size	**Temperature in °C**					
NPS	**–29**	**0**	**50**	**100**	**150**	**220**
1	40	40	40	36	30	16
1½	40	40	40	36	27	13
2	40	40	40	36	27	13
3	40	40	40	34	25	12
4	31.5	31.5	31.5	28	23	10
6	23	23	23	20	20	7

Table 5: *C_V and K_{VS} coefficients*

Flow coefficients: C_V in US gallons/min and K_{VS} in m³/h

Nominal size **NPS**	**1**	**1½**	**2**	**3**	**4**	**6**
C_V	36	101	281	351	743	1800
K_{VS}	31	87.1	242.2	302.6	640.5	1551.6

Table 6: *Torques and initial breakaway torques [1] in Nm*

NPS	Class	BTO [2]	RUN [3]	ETO [4]	BTC [5]	ETC [6]
1	150	20	10	14	16	18
	300	24	12	17	19	22
1½	150	38	19	27	30	34
	300	40	20	28	32	36
2	150	62	31	43	50	56
	300	70	35	49	56	63
3	150	100	50	70	80	90
	300	145	73	102	116	131
4	150	180	90	126	144	162
	300	230	115	161	184	207
6	150	430	215	301	344	387
	300	520	260	364	416	468

1) The specified torques are based on measurements to open ball valve at a pressure drop across the valve measured with water at room temperature and after the ball valve has remained in the same position for one day. Temperature, pressure, process medium as well as how often the ball valve is moved and how long it remains in the same position have a considerable effect on the actual torques. This must be taken into account when selecting the actuator. The specified torques do not include a safety factor.
2) BTO: Break to open
3) RUN: Running
4) ETO: End to open
5) BTC: Break to close
6) ETC: End to close

Table 7: *Max. permissible torque [1] for shaft and ball in Nm*

			Material		
NPS	Class 150 / Class 300		A182 F316	A182 F51	A564 17-4PH
1	Floating ball		32	70	114
1½			65	144	231
2			65	144	231
3			116	255	411
4			245	538	867
6			455	998	1608

1) To be taken into account when sizing an electric or pneumatic part-turn actuator for mounting on the Type 3358 Ball Valve.

Table 8: *Dimensions for Type 3358 Ball Valve · Without actuator · Dimensions in inch and mm · See Fig. 8 and Fig. 9*

Nominal size		NPS	1	1½	2	3	4	6
FTF	Class 150	in	5	6.5	7.01	7.99	9.02	15.51
		mm	127	165	178	203	229	394
	Class 300	in	6.5	7.48	8.5	11.14	12.01	15.87
		mm	165	190	216	283	305	403
ØD	Class 150	in	4.33	4.92	5.91	7.48	9.06	11.02
		mm	110	125	150	190	230	280
	Class 300	in	4.92	6.1	6.5	8.27	10	12.52
		mm	125	155	165	210	254	318
ØK	Class 150	in	3.13	3.88	4.75	6	7.5	9.5
		mm	79.4	98.6	120.6	152.4	190.5	241.3
	Class 300	in	3.5	4.5	5	6.62	7.88	10.62
		mm	88.9	114.3	127	168.1	200.2	269.7
N x Ø	Class 150	in	4x 0.63	4x 0.63	4x 0.75	4x 0.75	8x 0.75	8x 0.87
		mm	4x 16	4x 16	4x 19	4x 19	8x 19	8x 22.2
	Class 300	in	4x 0.75	4x 0.87	8x 0.75	8x 0.87	8x 0.87	12x 0.87
		mm	4x 19	4x 22.2	8x 19	8x 22.2	8x 22.2	12x 22.2
SQ (standard version)	Class 150	in	0.55	0.67	0.67	0.87	0.87	1.42
		mm	14	17	17	22	22	36
	Class 300	in	0.55	0.67	0.67	0.87	0.87	1.42
		mm	14	17	17	22	22	36
SQ (fire-safe version)	Class 150	in	0.55	0.67	0.67	0.87	1.06	1.42
		mm	14	17	17	22	27	36
	Class 300	in	0.55	0.67	0.67	0.87	1.06	1.42
		mm	14	17	17	22	27	36
H	Class 150	in	2.56	3.01	3.33	5.06	6.63	8.35
		mm	65	76.5	84.5	128.5	168.5	212
	Class 300	in	2.22	2.62	2.95	4.59	6.12	7.72
		mm	56.5	66.5	75	116.5	155.5	196
E		in	0.57	0.71	0.71	0.98	0.98	1.14
		mm	14.5	18	18	25	25	29
G		in	0.65	0.78	0.78	0.98	1.2	1.57
		mm	16.5	19.5	19.5	25	30.5	40
F according to DIN EN ISO 5211			F05	F07	F07	F10	F10	F14

Table 9: *Weights for the standard version of Type 3358 Ball Valve · Without actuator · Weights in lbs and kg*

Nominal size		NPS	1	1½	2	3	4	6
Weight	Class 150	lbs	6.6	12.6	20.1	44.1	63.9	143.3
		kg	3	5.7	9.1	20	29	65
	Class 300	lbs	9.3	16.8	30.9	63.1	93.7	189.6
		kg	4.2	7.6	14	28.6	42.5	86

Dimensional drawings

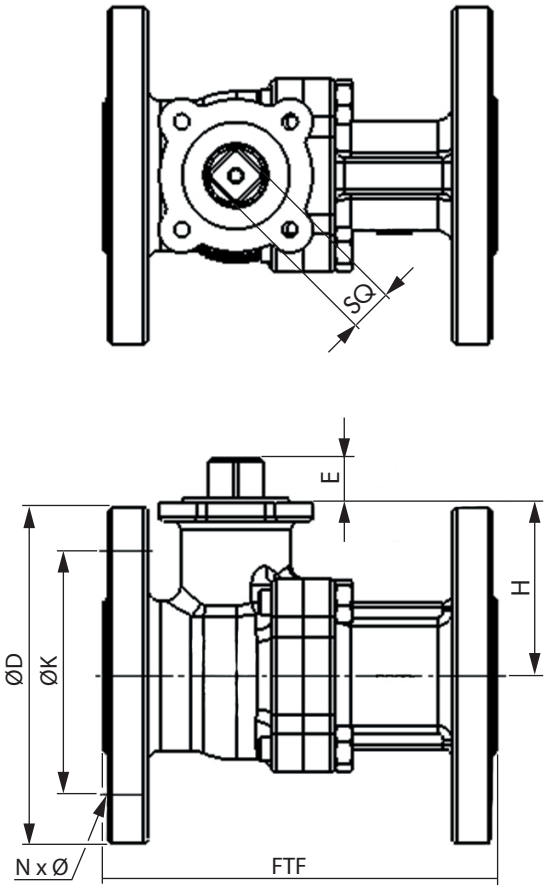


Fig. 8: *Standard version*

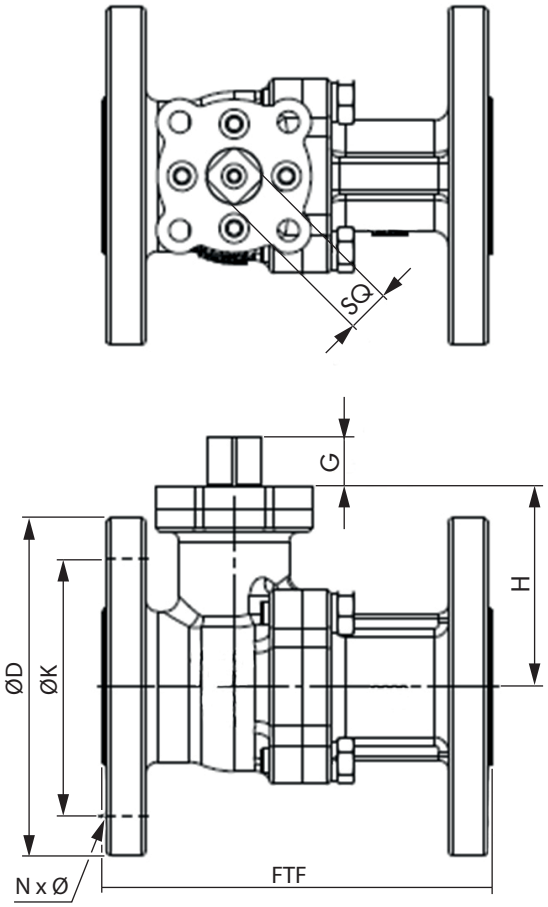


Fig. 9: *Fire-safe version*

Ordering text

Nominal size	NPS …
Pressure rating	Class …
Body material	See Table 2 and Table 3
Lever	Yes/No
Actuator	Type … Pneumatic Part-turn Actuator Type … Electric Part-turn Actuator
Fail-safe position	Fail-close, fail-close or NO fail-safe position
Valve accessories	Positioner, limit switch, supply pressure regulator, solenoid valve, pneumatic lock-up valve etc.