



TEROFOX VALVES INTEGRATED CORPORATION

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PNEUMATIC ACTUATOR



ACT-C201601-M(d)

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COMPANY PROFILE

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We are a Taiwanese Valves Manufacturer based in Taichung City, Taiwan. Our dedicated team of Engineers and Quality Assurance personnel is working on our behalf at all points of manufacturing. Therefore we are able to work closely, making sure that all our customers' needs and concerns are consistently and professionally monitored on ongoing basis. There are two production lines both between Taichung, Taiwan and Zhongshan, China. We also own a production factory with a foundry (certificated by EU PED Equipment Pressure of TÜV Germany & ISO 9001:2000 of DNV GL Assurance.)

Terofox provides one stop service in diversity of valves' procurement and ODM & OEM manufacturing, all our products and quality management procedures are in accordance with ISO 9001. Our wide range of products includes:

- API 608 Floating stainless steel ball valve
- API 6D Trunnion ball valves.
- API 594 Dual plate check valves.
- Concentric butterfly valves (pins and pinless / PTFE lining)

But our main focus is our "Special Product Line" in Taiwan that includes

- Sanitary Valves & components.
- BS6364 Cryogenic Valves: Used in the transmission of extreme low temperature services.
- Special Alloy Valves: Some of the Materials we offer are Alloy 20, Monel, Hastelloy, Duplex/ Super Duplex Stainless Steel, Titanium and more.
- Dead-man Return Ball Valves: Spring Return Handle that decreases the Torque for easier use.
- Fugitive Emission ISO15848-1 certified : Safety is a trend nowadays, our low emission valve meets ISO15848-1 for eliminating fugitive emission.
- API607 6th Edition / ISO10497:2010 Fire Safe Approval ball valves - Flange Ball valves (TF-20FS, TF-20DFS), Trunnion Mounted Ball Valve (TF-40, TF-44) and high performance Ball Valve (EB-321DFS), Wafer Type Ball Valve (TF-10MFS).

In order to satisfy variety of requirements, we have applied for certificates such as ISO 9001, CE (PED 97/23/EC), API607 6th Edition Fire Safe Approved for floating and trunnion mounted ball valve, ABS PDA certificate, TA-Luft, ISO15848 for Fugitive Emission applications, AD-2000, as well as foundry approvals: DNV, BV, LR certifications.

Our mission is to assist our customers in obtaining the best possible solutions to their requirements and needs, at the most advantageous prices, without compromising on delivery or quality. With this in mind, we believe in developing long terms relationships, based on mutual trust and honesty

PRODUCT SCOPE

API 607 Fire Safe Ball Valve
API 608 Metal Ball Valve
BS 6364 Cryogenic Ball Valve
ISO 15848 Fugitive Emission Valve
High Pressure Ball Valve
V-port Control Ball Valve
Automation Control Ball Valve
Multi-way Ball Valve

Sanitary Ball Valve
API 6D Trunnion Mounted Ball Valve
API 594 Dual Plate Check Valve
API 600 Gate, Globe & Check Valve
API 602 Gate, Globe & Check Valve
API 603 Gate, Globe & Check Valve
API 609 Resilient Seated Butterfly Valve
High Performance Butterfly Valve



MODEL REFERENCE

Rack & pinion actuators are suitable for quarter turn valves: Ball valves and Butterfly valves. Here you can see all the Terofox models which with pneumatic actuator. Actually, as long as Terofox products you required are with ISO5211 mounting pad, we would be able to assemble pneumatic actuator for you

INDUSTRIAL BALL VALVES

EB Series : 1-pc / 2-pc / 3-pc design screwed end ball valves
TF Series : 1-pc / 2-pc design flanged end ball valves



MULTI-WAY BALL VALVES

MW Series : Screwed end multi-way ball valves
MWF Series : Flanged end multi-way ball valves



SANITARY BALL VALVES

ST Series : 2-pc / 3-pc sanitary ball valves
STM Series : Multi-way sanitary ball valves



HIGH PRESSURE BALL VALVES

HPV Series : 1-pc / 2-pc / 3-pc design high pressure ball valves



CONCENTRIC BUTTERFLY VALVES

BFV-7 Series : Wafer / Lug / Double flange type concentric butterfly valves



HIGH PERFORMANCE BUTTERFLY VALVES

BFV-8 Series : Double Offset butterfly valves
BFV-9 Series : Triple-Offset butterfly valves



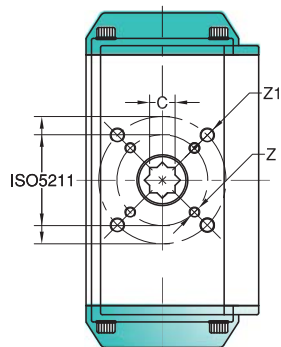
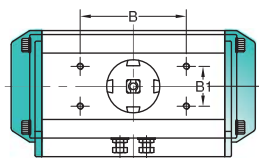
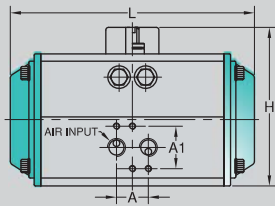
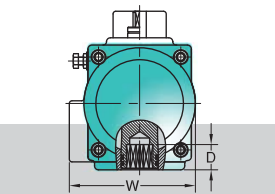
PNEUMATIC INFORMATION

In order to smooth the operation of valves and enhance the overall efficiency, TEROFOX uses Pneumatic Actuators with light weight and high mechanical performance Aluminum Alloy as the standard material.

By strict quality control, TEROFOX Pneumatic Actuators, rating IP67 based on IEC 60529, are capable to operate 1,000,000 times and perform excellently even at outdoors.

Based on the working condition requirements, TEROFOX are able to offer options suit for a wide temperature range, such as high temperature from -15°C to +150°C, and low temperature from -35°C to +80°C.

APPEARANCE & DIMENSIONS



Model		L	H	W	D	Air Input	Ax A1(*)	Bx B1(*)
Double Acting	Spring Return							
TDA-012		122	80	65	14	G 1/4"	24x32	80x30
TDA-020	TSR-X-020	147	92	71.5	14			
TDA-035	TSR-X-035	168	107.5	83	18			
TDA-050	TSR-X-050	184	119.5	95	18			
TDA-075	TSR-X-075	204	128.7	103	21			
TDA-110	TSR-X-110	262	136.5	108.5	21			
TDA-160	TSR-X-160	268	153	121.5	26			
TDA-255	TSR-X-255	301	175	142	26			
TDA-435	TSR-X-435	390	192	152	31			
TDA-665	TSR-X-665	458	217	174	31			
TDA-1000	TSR-X-1000	525	260	206	40			
TDA-1200	TSR-X-1200	532	285	226	40			

* Interface design reference VDI/VDE 3845.

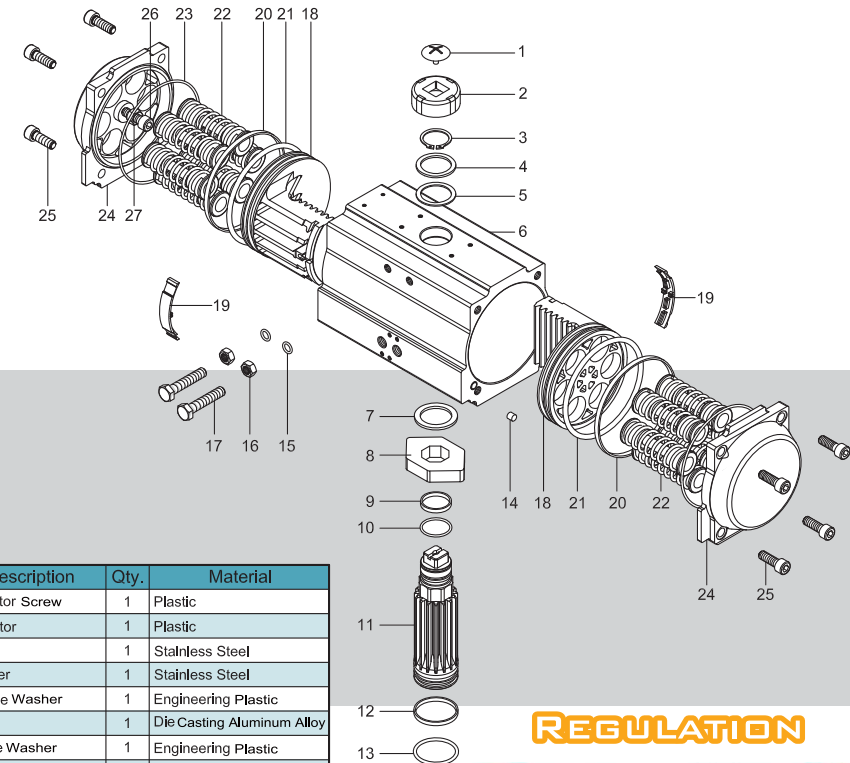
Unit : mm

Model		C	ISO 5211	Z	Z1
Double Acting	Spring Return				
TDA-012		11	F03 / F05	M5D8	M6D10
TDA-020	TSR-X-020	11	F03 / F05	M5D8	M6D10
TDA-035	TSR-X-035	14	F05 / F07	M6D10	M8D13
TDA-050	TSR-X-050	14	F05 / F07	M6D10	M8D13
TDA-075	TSR-X-075	17	F05 / F07	M6D10	M8D13
TDA-110	TSR-X-110	17	F05 / F07	M6D10	M8D13
TDA-160	TSR-X-160	22	F07 / F10	M8D13	M10D16
TDA-255	TSR-X-255	22	F07 / F10	M8D13	M10D16
TDA-435	TSR-X-435	27	F10 / F12	M10D16	M12D20
TDA-665	TSR-X-665	27	F10 / F12	M10D16	M12D20
	TSR-X-1000	36	F12	M12D20	
	TSR-X-1200	36	F12	M12D20	
TDA-1000		36	F14	M16D25	
TDA-1200		36	F14	M16D25	

* Dimensions for ISO 5211 Direct Mounted Pad

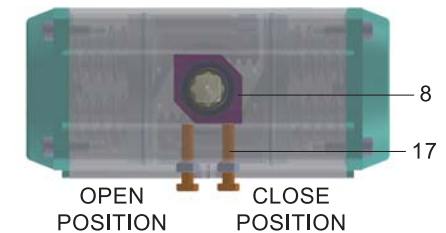
Unit:mm

PARTNAME

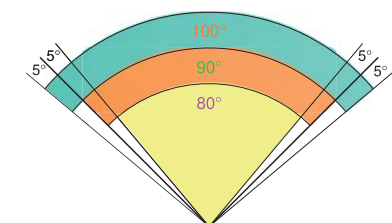


NO.	Description	Qty.	Material
1	Indicator Screw	1	Plastic
2	Indicator	1	Plastic
3	Circlip	1	Stainless Steel
4	Washer	1	Stainless Steel
5	Outside Washer	1	Engineering Plastic
6	Body	1	Die-Casting Aluminum Alloy
7	Inside Washer	1	Engineering Plastic
8	Cam	1	Alloy Steel
9	Bearing (Pinion Top)	1	Engineering Plastic
10	O-ring (Pinion Top)	1	NBR
11	Pinion	1	Alloy Steel
12	Bearing (Pinion Bottom)	1	Engineering Plastic
13	O-ring (Pinion Bottom)	1	NBR
14	Plug	2	NBR
15	O-ring (Adjust Screw)	2	NBR
16	Nut (Adjust Screw)	2	Stainless Steel
17	Adjust Screw	2	Stainless Steel
18	Piston	2	Cast Aluminum/Casting
19	Guide (Piston)	2	Engineering Plastic
20	Bearing (Piston)	2	Engineering Plastic
21	O-ring (Piston)	2	NBR
22	Spring	0-12	Spring Steel
23	O-ring (End Cap)	2	NBR
24	End Cap	2	Cast Aluminum
25	Cap Screw	8	Stainless Steel
26	Stop Screw	2	Stainless Steel
27	Nut (Stop Screw)	2	Stainless Steel

REGULATION



TRAVEL ADJUSTMENT RANGE



THE PRINCIPLE OF OPERATION

There are two ways to operate the Pneumatic Actuators:

1) DA: Double Acting Operation 2) SR: Spring Return Operation

For Double Acting Operation Actuator, pistons are lifted by Air Pressure so that it can do two-way movements to open and close pneumatic actuators.

The deciding factor to choose pneumatic actuators is the torque requirement.

When it comes to the Spring Return Operation Actuator, it only provides a single-way movement which is driven by air. If air stops pushing the piston, the piston will return to the original position by springs. Under some safety-sensitive situations, the actuator will require pistons going back to the original position when losing air supply. Therefore, the spring-return -cylinder will be a good choice.

Hole A and Hole B are two air inputs. Hole A is directly connected to the center area, and Hole B is linked to the side area.

The drive of cylinder results from gear rotations caused by the movement of pistons when Air goes through A or B holes.

Generally, the type of pneumatic actuators are divided to CCW(Counter-Clockwise) and CW(Clockwise) types.

COUNTER-CLOCKWISE TYPE

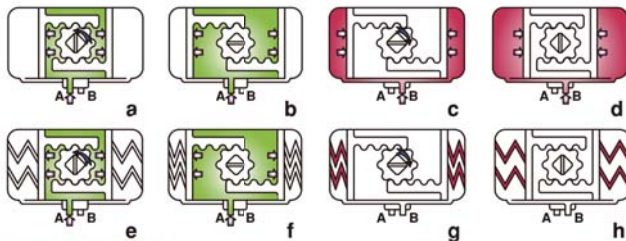
Double Acting (a~d)

As air goes through hole A, the piston moves outwardly and the stem will provide counter-clockwise rotation ($0^\circ \rightarrow 90^\circ$);

When air passes by hole B, the piston shift inwardly, the stem will rotate clockwise direction ($90^\circ \rightarrow 0^\circ$)

Spring Return (e~h)

Due to air input from Hole A, the piston turns outwardly to squeeze the spring and make the stem rotate counter-clockwise ($0^\circ \rightarrow 90^\circ$) direction. When air supply stop, the spring will be released automatically to make the plunger backward in clockwise direction.



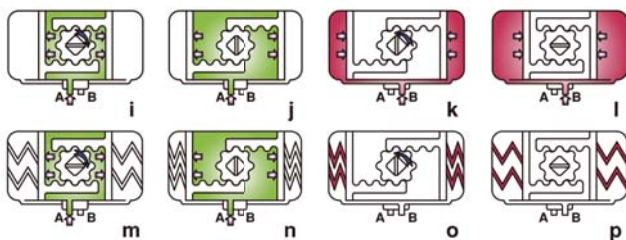
CLOCKWISE TYPE

Double Acting (i~l)

In the condition of Air input from A, the piston shifts outwardly to give counter-clockwise type directive ($90^\circ \rightarrow 0^\circ$). On the contrary, air input from B, the piston moves inwardly to supply clockwise directive ($0^\circ \rightarrow 90^\circ$).

Spring Return (m~p)

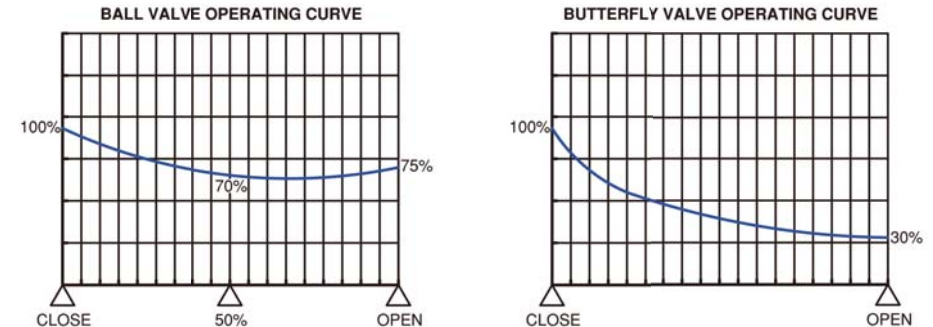
Air input from A, the piston moves outwardly and presses the spring to supply counter-clockwise directive ($90^\circ \rightarrow 0^\circ$). As air input disappears, spring releases automatically to push piston move inwardly and offer clockwise directive ($0^\circ \rightarrow 90^\circ$).



HOW TO ORDER

OPERATED TORQUE OF VALVE

The following chart displays the relation between torque and valve operation journey.



According to the charts, the Break-to-Open torque value of the valve is the most important criterion when selecting a suitable actuator.

Based on this concept, Terofox automation valves equipped with our actuators are following this principle.

In considerations of the decreased cylinder output and the increased valve torque as time goes by, we suggest customers to add 30% safety factor (50% safety factor for multi-way valves) to assure the automation valves will perform nicely in the pipeline system and provide an excellent service life.

TORQUE OF PNEUMATIC ACTUATOR

Double Acting Actuator switches on and off by air supply. Hence, the stabilized air supply can offer steady output.

The output torque of Spring Return Actuator decreased when springs move in the journey; therefore, the selection of Pneumatic Actuator requires consideration of the torque when open by air supply and close by spring return active.

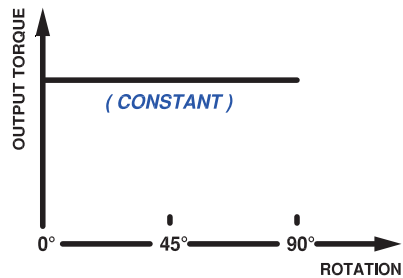
OPERATION CONDITIONS

1. Operation media
Dry or lubricated air, the non-corrosive gases or oil.
2. Air supply pressure
Suggest used 4 to 7 Bar
3. Operating temperature
Standard type : -20°C to $+80^\circ\text{C}$
Low temperature type : -35°C to $+80^\circ\text{C}$
High temperature type : -15°C to $+150^\circ\text{C}$
4. Travel adjustment
Adjustment range of $\pm 5^\circ$ for the rotation at 0° and 90°
5. Application
Either indoor or outdoor
6. Highest pressure
Suggest used input pressure less than 8 Bar

OUTPUT TORQUE

DOUBLE ACTING ACTUATORS (DA)

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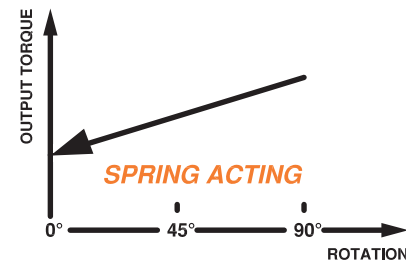
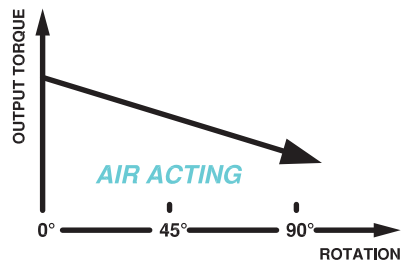


Under stable input air supply pressure, the output torque values are fixed.

Model	3 Bar	4 Bar	5 Bar	5.5 Bar	6 Bar	7 Bar	8 Bar
TDA-007	5	6	8	8	9	11	12
TDA-012	7	10	12	13	14	17	19
TDA-020	12	16	20	22	24	28	32
TDA-035	22	29	36	40	44	51	58
TDA-050	30	40	50	55	60	70	80
TDA-075	47	63	78	86	94	110	125
TDA-110	68	90	113	124	135	158	181
TDA-160	99	132	165	182	198	231	264
TDA-255	150	200	251	276	301	351	401
TDA-435	256	342	427	470	513	598	684
TDA-665	399	532	665	731	798	931	1064
TDA-1000	638	851	1064	1170	1277	1490	1702
TDA-1200	798	1064	1330	1463	1596	1862	2128

UNIT : N.M

SPRING RETURN ACTUATORS (SR)



As the air is supplied to the SR actuator, springs get compressed and generate elastic potential energy. The stored potential energy impacts the rebounding energy of springs and reduces the output torques. As springs return to positions, the accumulated elastic potential energy gradually releases and this reduces the rebounding force of springs, torques decrease as the springs return.

Model	Spring Return	Air Pressure															
		3 Bar		4 Bar		5 Bar		5.5 Bar		6 Bar		7 Bar		8 Bar			
		90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°
TSR-	V	6.2	4.3	7.6	5.7	10.9	8.5										
	VI	7.4	5.0	8.9	6.5	12.9	9.8										
	VII	8.6	5.9	10.3	7.3	14.0	10.4										
	VIII	9.9	6.7	11.6	8.2	15.2	11.6	17.2	14.1								
	IX	11.1	7.6	12.9	9.1	16.4	12.9	18.6	15.5	20.8	17.7						
	X	12.4	8.5	14.2	10.0	17.7	13.8	19.9	16.8	22.0	18.9	24.1	21.0				
	XI	13.6	9.3	15.4	11.2	18.9	14.8	21.1	17.9	23.2	20.1	25.3	22.2	27.4	24.3		
TSR-	V	14.8	10.2			9.7	4.2	11.8	6.7	13.8	9.1	17.8	12.2	21.8	17.1		
	VI	10.4	6.8	15.0	11.4	22.3	14.9										
	VII	12.5	8.2	16.6	12.9	24.4	16.6	28.3	23.9								
	VIII	14.6	9.6	18.2	14.2	26.5	19.8	29.2	23.4	32.8	27.0	40.1	34.3				
	IX	16.7	10.9	19.9	15.1	28.2	21.4	31.3	24.3	34.9	28.7	42.0	35.8				
	X	18.8	12.3			30.4	22.8	33.4	26.4	36.4	30.2	44.0	37.8	44.7	37.4		
	XI	20.9	13.7			32.5	24.2	35.5	27.8	38.5	31.6	46.1	39.9	46.8	39.5		
TSR-	V	22.9	15.0			34.6	26.0	37.6	29.2	40.6	32.2	48.2	40.8	47.9	40.6		
	VI	25.0	16.4			36.7	27.4	39.7	30.6	42.7	33.2	50.3	42.9	49.0	41.7		
	VII	14.5	10.5	19.4	15.5	29.5	25.7										
	VIII	17.4	12.7	21.6	17.7	31.6	27.8	35.7	31.8	39.7	35.9	47.8	43.9	51.8	47.9		
	IX	20.3	14.8	23.7	19.8	33.7	29.9	37.8	33.9	41.8	37.9	49.9	46.0	53.9	50.0		
	X	23.2	16.9	26.8	21.9	35.8	32.0	39.9	36.0	43.9	40.0	51.9	48.0	55.9	52.0		
	XI	26.1	19.0			37.9	34.1	41.9	38.0	45.9	42.0	53.9	50.0	56.9	53.0		
TSR-	V	29.0	21.1			40.0	36.1	44.0	40.1	48.0	44.1	56.0	52.1	59.0	55.1		
	VI	31.9	23.2			42.1	38.2	46.1	42.2	50.1	46.2	58.1	54.2	61.0	57.1		
	XII	34.7	25.3			44.2	40.3	48.2	44.3	52.2	48.3	60.2	56.3	63.2	59.3		

MODEL		Spring Return		AIR PRESSURE															
				3 bar		4 bar		5 bar		5.5 bar		6 bar		7 bar		8 bar			
		90°	0°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°		
TSR	V	23.0	15.8	31.1	24.0	46.8	39.7												
	VI	27.6	19.0	28.0	19.3	43.7	35.1	59.4	50.7										
	VII	32.2	22.1	24.8	14.8	40.5	30.5	56.2	46.2										
	VIII	36.8	25.3	21.7	10.1	37.4	25.8	53.1	41.5	61.0	49.4	68.8	57.2	84.5	72.9				
	IX	41.4	28.5			34.2	21.3	49.9	37.0	57.8	44.8	65.6	52.6	81.2	68.3				
	X	46.0	31.6			31.0	16.6	46.7	32.3	54.6	40.2	62.4	48.0	78.1	63.7	93.8	79.3		
	XI	50.6	34.8					43.6	27.7	51.5	35.6	59.3	43.4	75.0	59.1	90.6	74.8		
TSR	V	55.2	38.0					40.4	23.2	48.3	31.1	56.1	38.9	71.7	54.5	87.4	70.2		
	VI	34.4	23.3	44.2	33.2	66.8	55.9												
	VII	41.2	28.0	39.6	26.4	62.2	49.0	84.8	71.6										
	VIII	48.1	32.7	34.9	19.4	57.5	42.1	80.2	64.7										
	IX	55.0	37.3	31.3	12.6	52.9	35.2	75.5	57.9	86.8	69.2	98.1	80.5	120.7	103.0				
	X	61.9	42.0			48.2	28.4	70.9	51.0	82.2	62.3	93.5	73.6	116.0	96.1				
	XI	68.7	46.7			43.6	21.5	66.2	44.1	77.5	55.4	88.8	66.7	111.3	89.2	134.0	111.8		
TSR	V	75.6	51.4					61.5	37.2	72.8	48.6	84.1	59.9	106.6	82.4	129.2	105.0		
	VI	82.5	56.0					56.8	30.4	68.1	41.7	79.4	53.0	101.9	75.5	124.5	98.1		
	V	49.2	31.6	67.5	49.9	100.6	83.0												
	VI	59.1	38.0	61.1	40.0	94.2	73.2	127.3	106.2										
	VII	68.9	44.3	54.9	30.3	87.9	63.4	121.0	96.4										
	VIII	78.7	50.6	48.5	20.4	81.6	53.5	114.7	86.5	131.2	103.1	147.7	119.6	180.8	152.7				
	IX	88.6	56.9			75.3	43.7	108.4	76.8	125.0	93.3	141.5	109.8	174.5	142.9				
TSR	V	98.4	63.3			68.9	33.4	102.0	66.5	118.6	83.1	135.1	99.6	168.2	132.6	201.2	165.7		
	VI	108.3	69.6					95.7	57.0	112.2	73.6	128.7	90.1	161.8	123.1	194.8	156.2		
	VII	118.1	75.9					89.4	47.5	106.0	64.1	122.5	80.6	155.5	113.6	188.6	146.7		
	V	79	52	98	72	148	122												
	VI	94	63	88	56	138	107	188	157										
	VII	110	73	77	40	127	90	178	141										
	VIII	125	84	67	25	117	75	167	125	192	151	217	176	268	226				
TSR	IX	141	94			107	59	157	109	182	134	207	159	257	210				
	X	157	105			96	44	146	94	171	119	196	144	247	194	297	245		
	XI	173	115					136	78	161	103	186	128	236	178	286	228		
	XII	188	125					125	63	151	88	176	113	226	163	276	213		
	V	129	86	171	127	256	213												
	VI	155	103	154	102	239	187	325	273										
	VII	181	120	137	76	222	162	308	247										
TSR	VIII	206	137	120	50	205	136	291	221	334	264	376	307	462	392				
	IX	232	155			187	110	273	196	316	239	358	281	444	367				
	X	258	172			170	84	256	169	299	212	341	255	427	340	512	426		
	XI	284	189					238	143	281	186	324	229	409	314	495	400		
	XII	310	206					221	118	264	161	307	203	392	289	478	374		
	V	208	140	259	191	392	324												
	VI	250	168	232	149	365	282	498	415										
TSR	VII	292	196	203	107	336	240	469	373										
	VIII	333	223	176	66	309	199	442	237	509	351	575	465	708	598				
	IX	375	251			280	157	413	290	480	357	546	423	679	556				
	X	417	279			253	115	386	248	453	315	519	381	652	514	785	647		
	XI	458	307					358	207	425	274	491	340	624	473	757	606		
	XII	500	335					330	165	397	232	463	298	596	431	729	564		
	TSR	V	309	200	438	329	651	542											
VI		371	240	398	267	811	480	824	693										
VII		433	280	358	205	571	418	784	631										
VIII		495	320	318	143	531	356	744	569	851	676	957	782	1169	995				
IX		557	360			491	295	704	507	811	614	917	720	1130	933				
X		618	400			451	233	664	446	771	552	877	658	1090	871	1302	1084		
XI		680	440					624	384	731	491	837	597	1050	809	1263	1022		
TSR	V	742	480					584	322	691	429	797	535	1010	748	1223	960		
	VI	380	275	523	418	789	684												
	VII	456	330	468	342	734	608	1000	874										
	VIII	532	385	413	266	679	532	945	798										
	IX	608	440	358	190	624	456	890	722	1023	855	1156	988	1422	1254				
	X	684	495			569	380	835	646	968	779	1101	912	1367	1178				
	XI	760	550			514	304	780	570	913	703	1046	836	1312	1102	1578	1368		
TSR	XI	836	605					725	494	858	627	991	760	1257	1026	1523	1292		
	XI	912	660					670	418	803	551	936	684	1202	950	1468	1216		

ACCESSORIES

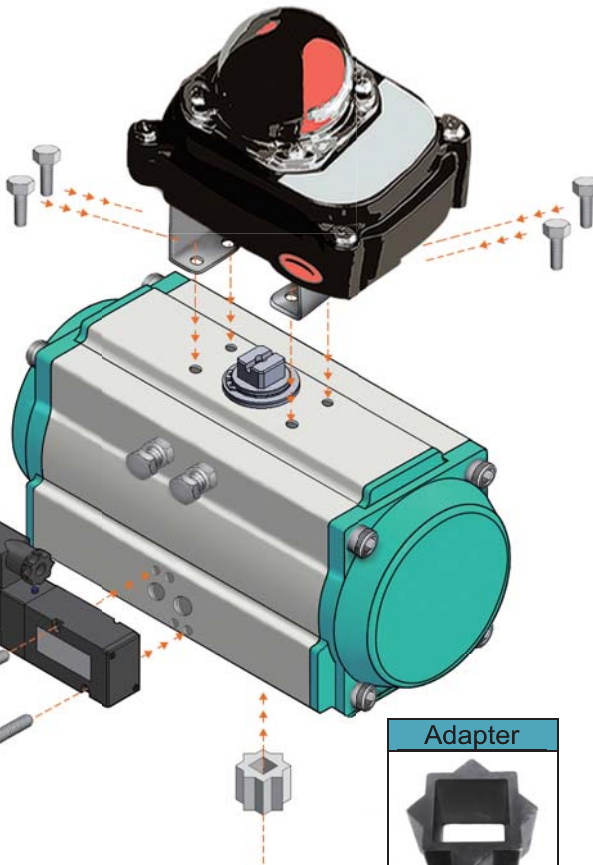
11

TFLSB



Information	
Body	Die-cast aluminum with Polyester power coating.
Sensor	2SPDT
Operating Temp	-20°C ~80°C
Weather Proof	IP 65
Cable Entry	1/2" NPT
Advanced Options	
Sensor	4SPDT / 2DPDT / Inductive sensors
ATEX	Ex d IIB
Weather Proof	IP 66

Standardized screw holes and ISO5211 mounted pad design enable customers to assemble valves and actuator easily by using only a wrench and a few bolts. The VDI/VDE 3845 standard screw holes is also designed for a easy installation of the Solenoid and the bracket of the Limited Switch Box.



TFSV



Information	
Body	Anodized Aluminum
Operating Temp	-5°C ~80°C
Weather Proof	IP65
Air Input	1/4" BSPP
General Options	
Function	3/2 NC or 5/2
Voltage	DC 24V / AC 220V
Advanced Options	
ATEX	Ex d IIC / Ex m IIC / Ex ia IIC
Weather Proof	IP66
Voltage	DC 12V / 48V AC 110V / 120V / 240V

Adapter



Insert Type	
9 to 11	17 to 19
9 to 14	17 to 22
9 to 17	17 to 27
11 to 14	19 to 22
11 to 17	19 to 27
11 to 19	19 to 36
14 to 17	22 to 27
14 to 19	22 to 36
14 to 22	27 to 36

SOLENOID VALVE OPTION

HOW TO ORDER

TFSV

A

B

C

D

E

A.Type	
Code	Description
(BLANK)	Single Coil
B	Double Coil

B.Material	
Code	Description
(BLANK)	Aluminum
.S	SS316

C.Coil	
Code	Description
(BLANK)	General
EXm	Encapsulation
EXd	Flameproof
EXi	Intrinsic Safety
Exd.S	Flameproof (SS316)

D.Functions	
Code	Description
3/2NC	3 way and 2 positions
5/2	5 way and 2 positions

E.Voltage	
Code	Description
DC12V	DC12V
DC24V	DC24V
DC48V	DC48V
AC110V	AC110V
AC120V	AC120V
AC220V	AC220V
AC240V	AC240V

Coil Selection					
Body Type	-	EXm	EXd	EXi	Exd.S
Single Coil	TFSV	✓	✓	✓	✓
	TFSV.S	✓	✓	✓	✓
Double Coil	TFSVB	✓	✓	✓	✓
	TFSVB.S	✓	✓	✓	✓

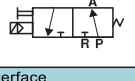
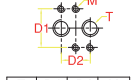
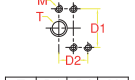
Coil Comparison Chart						
Discription		-	EXm	EXd	EXi	Exd.S
		General	Explosion Proof	Explosion Proof	Explosion Proof	Stainless Steel Explosion Proof
Explosion Protection	Marking	-	Ex mb IIC T5	Ex d IIC T6	Ex ia IIC T6	Ex d IIC T6
	Property	-	Encapsulation	Flameproof	Intrinsic Safety	Flameproof
Weather Protection	IP65	✓			✓	
	IP66		✓	✓		✓
DC	12V			✓		✓
	24V	✓	✓	✓	✓	✓
	48V			✓		✓
AC 50/60Hz	110V		✓	✓		✓
	120V			✓		✓
	220V	✓	✓	✓		✓
	240V			✓		✓



• TFSV 5/2 DC24V



• TFSVB.S EXd.S 5/2 DC24V

5/2 TYPE	3/2 NC TYPE
Pneumatic Type	
	
Solenoid Function	
	
Namua Interface	
	
T D1 D2 M G1/4" 32 24 M5	T D1 D2 M G1/4" 32 24 M5

LIMIT SWITCH BOX OPTION

HOW TO ORDER

TFLSB
A
B

A. Model	
Code	Description
(BLANK)	General Type
-EX	Ex certified
-EX.S	Ex certified. SS shell.

B. Limit Switch	
Code	Description
(BLANK)	2*SPDT
4	4*SPDT
2D	2*DPDT
P+F.Ex	Inductive Sensors (Ex ia)
P+F	Inductive Sensors

Model Selection			
Discription	TFLSB	TFLSB-EX	TFLSB-EX.S
	General	Explosion Proof	Explosion Proof
Body Material	Aluminum	Aluminum	SS316
Temperature Range	-20°C~80°C	-20°C~50°C	-20°C~50°C
Terminal Strip	8 points	8 points	8 points
Cable Entry	1/2" NPT	3/4" NPT	3/4" NPT
Enclosure	IP65	IP66	IP66
Explosion Protection	-	Ex d IIB T6	Ex d IIB T6
Limit Switch Selection			
2*SPDT	✓	✓	✓
4*SPDT	✓	✓	✓
2*DPDT	✓	✓	✓
Inductive Sensors Ex ia IIC T6	-	✓	✓
Inductive Sensors	-	✓	✓


TFLSB

Mechanical Switches

Inductive Sensors

TFLSB-EX

TFLSB-EX.S

OTHERS



• POSITIONER

Signals offer help to control and position
Output Torque : 7.35 ~ 3430 N.M
Type of Positioner : Rotary or Linear
Stroke : Rotary: 0° ~ 90°
Linear: 10~150mm



• GEAR OPERATOR

Output Torque : 250 ~ 8000 N.M



• ELECTRIC ACTUATOR

Output Torque : 7.35 ~ 3430 N.M
Weather proof : IP 67
Standard voltage : 100VAC ~ 120VAC
200VAC ~ 250VAC



• STROKE-YOKE PNEUMATIC

Actuator for high torque
Output Torque : DA Excess 240,000 N.M
SR Excess 110,000 N.M
Working pressure : 4 ~ 6 bar



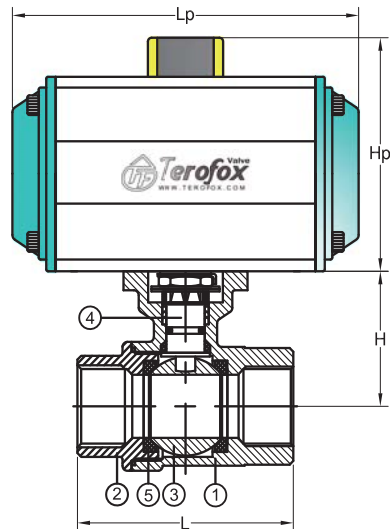
PRODUCT

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EB-210DDA EB-210DSR

SIZE : 1/4"~2"(DN8~DN50)

2-pc design full bore ball valve,
blow-out-proof stem & anti-static
design, ISO 5211 direct-mounted
pad for actuator.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	WCB / CF8 / CF8M / 1.0619 / 1.4308 / 1.4408
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	1000 PSI (PN 63)
Connections	BSPT / BSPP / NPT / ISO 228-1 / ISO 7-1
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size	L	H	DA Model	Lp	Hp	SR Model	Lp	Hp
DN 8 1/4"	65.3	37.0	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 10 3/8"	65.3	37.0	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 15 1/2"	65.3	37.0	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 20 3/4"	77.3	45.0	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN 25 1"	88.7	53.5	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN 32 1-1/4"	102.4	59.0	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN 40 1-1/2"	109.0	74.8	TDA-050	184.0	119.5	TSR-X-110	262.0	136.5
DN 50 2"	125.3	83.5	TDA-050	184.0	119.5	TSR-XI-110	262.0	136.5

AGC01AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

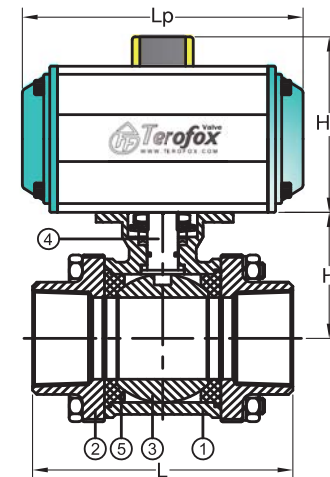
16

EB-310DDA EB-310DSR

SIZE : 1/4"~4"(DN8~DN100)

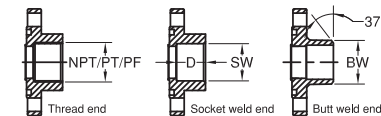
3-pc design full bore ball valve,
blow-out-proof stem & anti-static
design, ISO5211 direct-mounted
pad for actuator.

Option : ISO15848-1 Fugitive Emission is available.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	WCB / CF8 / CF8M / 1.0619 / 1.4308 / 1.4408
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	1/4"~2" : 1000 PSI (PN 63) 2-1/2"~4" : 800 PSI (PN 40)
Connections	BSPT / BSPP / NPT / ISO 228-1 / ISO 7-1 / Socket weld / Butt weld
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket



Size	L	H	SW	D	BW	DA Model	Lp	Hp	SR Model	Lp	Hp
DN 8 1/4"	63.5	37.0	14.2	10.0	13.7	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 10 3/8"	63.5	37.0	17.5	10.0	17.1	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 15 1/2"	63.5	37.0	21.8	10.0	21.3	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 20 3/4"	72.5	45.0	27.4	13.0	26.7	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN 25 1"	81.0	53.5	34.1	13.0	33.4	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN 32 1-1/4"	94.5	59.0	42.7	13.0	42.2	TDA-020	147.0	92.0	TSR-XI-050	184.0	119.5
DN 40 1-1/2"	108.0	74.8	49.0	13.0	48.3	TDA-035	168.0	107.5	TSR-XI-075	204.0	128.7
DN 50 2"	121.5	83.5	61.2	16.0	60.3	TDA-050	184.0	119.5	TSR-XI-110	262.0	136.5
DN 65 2-1/2"	157.5	108.8	77.0	16.0	73.0	TDA-075	204.0	128.7	TSR-X-255	301.0	175.0
DN 80 3"	190.0	118.3	90.2	16.0	88.9	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN 100 4"	225.0	153.8	115.3	22.0	114.3	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0

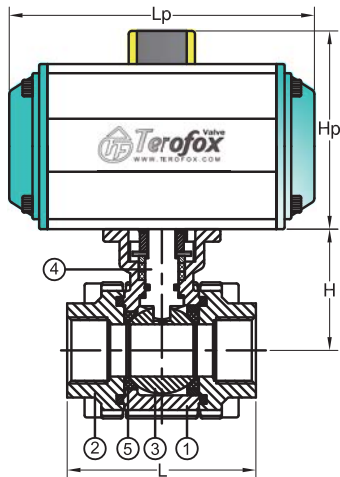
AGC01AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

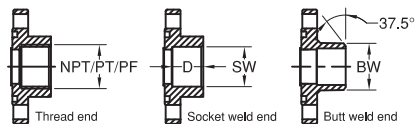
EB-821DDA EB-821DSR

SIZE : 1/4"~4"(DN8~DN100)

3-pc high performance full bore ball valve,
blow-out-proof stem & anti-static device.
ISO5211 direct-mounted pad for actuator.
Option : API 607 6th edition fire safe approved.



L = Thread and socket weld end
L1 = Butt weld end



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	WCB / CF8 / CF8M / 1.0619 / 1.4308 / 1.4408
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	2000 PSI (PN 140)
Connections	BSPT / BSPP / NPT / ISO 228-1 / ISO 7-1 / Socket weld / Butt weld
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size	L	L1	H	SW	D	BW	DA Model	Lp	Hp	SR Model	Lp	Hp
DN 8 1/4"	65.0	70.0	37.5	14.2	10.0	13.8	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN 10 3/8"	65.0	70.0	37.5	17.6	10.0	17.3	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN 15 1/2"	75.0	75.0	37.5	21.8	13.0	21.7	TDA-020	147.0	92.0	TSR-XI-035	168.0	107.5
DN 20 3/4"	80.0	90.0	52.0	27.2	13.0	27.2	TDA-035	168.0	107.5	TSR-XI-050	184.0	119.5
DN 25 1"	90.0	100.0	60.0	33.9	15.0	34.0	TDA-035	168.0	107.5	TSR-XI-075	204.0	128.7
DN 32 1-1/4"	110.0	110.0	72.0	42.7	15.0	42.7	TDA-050	184.0	119.5	TSR-X-110	262.0	136.5
DN 40 1-1/2"	120.0	125.0	76.0	48.8	16.0	48.6	TDA-075	204.0	128.7	TSR-XI-160	268.0	153.0
DN 50 2"	140.0	150.0	93.0	61.2	17.0	60.5	TDA-075	204.0	128.7	TSR-X-255	301.0	175.0

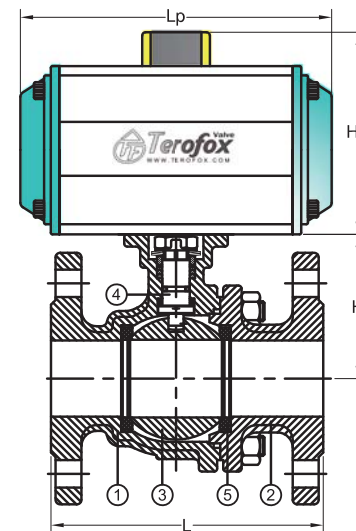
AGC01AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

TF-20DDA TF-20DSR

SIZE : 1/2"~6"(DN15~DN150)

2-pc full bore ball valve, split body design. Blow-out-proof stem & anti-static design. ISO 5211 direct-mounted pad for actuator.
Option : API 607 6th edition fire safe approved.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	WCB / CF8 / CF8M / 1.0619 / 1.4308 / 1.4408
Seat Material	RTFE
Temperature	-20°C to 180°C (-4°F to 356°F)
Pressure	Class 150/300, PN 16/40
Connections	RF Flange end (ASME B16.5 / EN 1092-1)
Valve Design	ASME B16.34 / EN 12516-1
Face to Face	ASME B16.10 / DIN 3202(1)
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

(1) 1/2" ~ 4" DIN 3202 F4 ; 5" ~ 6" DIN3202 F5.

Size	L	H	DA Model	Lp	Hp	SR Model	Lp	Hp
DN 15 1/2"	ASME B16.34 / DIN 3202	48.0	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 20 3/4"		53.5	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN 25 1"		64.0	TDA-020	147.0	92.0	TSR-XI-035	168.0	107.5
DN 32 1-1/4"		71.0	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN 40 1-1/2"		76.0	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN 50 2"		84.5	TDA-035	168.0	107.5	TSR-X-110	262.0	136.5
DN 65 2-1/2"		106.8	TDA-075	204.0	128.7	TSR-X-160	268.0	153.0
DN 80 3"		116.0	TDA-075	204.0	128.7	TSR-X-255	301.0	175.0
DN 100 4"		154.5	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN 125 5"		194.0	TDA-435	390.0	192.0	TSR-X-665	458.0	217.0
DN 150 6"		213.0	TDA-435	390.0	192.0	TSR-X-665	458.0	217.0

AGC01AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

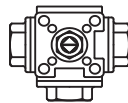
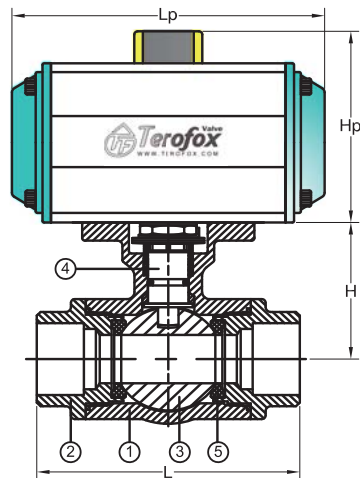
MW-305DDA MW-305DSR

SIZE : 1/4"~2"(DN8~DN50)

3 way T / L-port standard bore ball valve,
four seat supported.

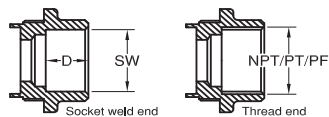
Blow-out-proof stem, Anti-static device.

ISO 5211 direct-mounted pad for actuator.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	CF8M / 1.4408
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	1000 PSI (PN 63)
Direction	L / T port
Connections	BSPT / BSPP / NPT / ISO 228-1 / ISO 7-1 / Socket weld
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket



Size		L	H	SW	D	DA Model	Lp	Hp	SR Model	Lp	Hp
DN 8	1/4"	75.7	38.2	14.2	9.7	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 10	3/8"	75.7	38.2	17.5	9.7	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 15	1/2"	75.7	38.2	21.8	9.7	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 20	3/4"	86.6	45.2	27.4	12.7	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN 25	1"	102.4	56.5	34.1	12.7	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN 32	1-1/4"	118.2	61.9	42.7	12.7	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN 40	1-1/2"	125.8	78.3	49.0	12.7	TDA-035	168.0	107.5	TSR-X-110	262.0	136.5
DN 50	2"	149.0	87.4	61.2	15.8	TDA-110	262.0	136.5	TSR-X-255	301.0	175.0

AGF21AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

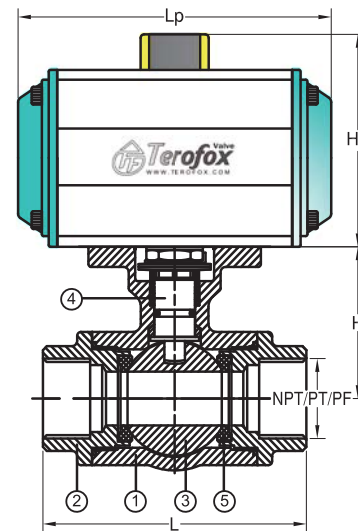
MW-316DDA MW-316DSR

SIZE : 1/4"~1-1/2"(DN8~DN40)

3-way T / L-port full bore ball valve,
four seat supported.

Blow-out-proof stem & anti-static device,

ISO 5211 direct-mounted pad for actuator.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	CF8M / 1.4408
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	1000 PSI (PN 63)
Direction	L / T port
Connections	BSPT / BSPP / NPT / ISO 228-1 / ISO 7-1
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size		L	H	DA Model	Lp	Hp	SR Model	Lp	Hp
DN 8	1/4"	75.7	38.2	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 10	3/8"	75.7	38.2	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN 15	1/2"	85.0	45.2	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN 20	3/4"	98.1	56.5	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN 25	1"	112.6	61.9	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN 32	1-1/4"	125.0	78.3	TDA-035	168.0	107.5	TSR-X-110	262.0	136.5
DN 40	1-1/2"	141.0	87.4	TDA-110	262.0	136.5	TSR-X-255	301.0	175.0

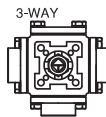
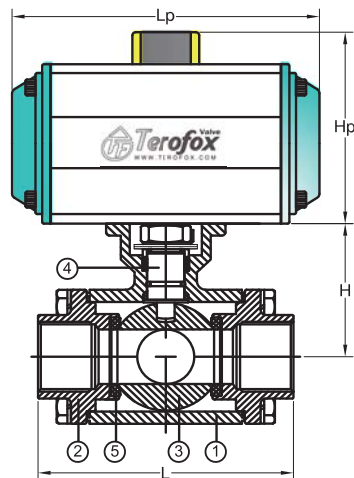
AGF21AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

MW-310DDA MW-310DSR

SIZE : 1/2"~4"(DN15~DN100)

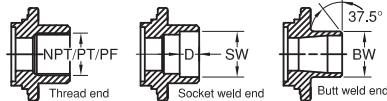
3-way T/L port full bore ball valve, four seat supported. Blow-out-proof stem & anti-static device. ISO 5211 direct-mounted pad for actuator.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	CF8M / 1.4408
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	1/4" ~ 2" : 1000 PSI (PN 63) 2-1/2" ~ 4" : 800 PSI (PN 40)
Direction	L / T port
Connections	BSPT / BSPP / NPT / ISO 228-1 / ISO 7-1 / Socket weld / Butt weld
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

L = THREAD AND SOCKET WELD
L1=BUTT WELD



Size	L	L1	H	SW	D	DA Model	Lp	Hp	SR Model	Lp	Hp
DN15 1/2"	96.0	96.0	47.8	21.8	10.0	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN20 3/4"	107.0	107.0	58.2	27.4	13.0	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN25 1"	126.0	130.0	64.0	34.1	13.0	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN32 1-1/4"	133.0	133.0	79.0	42.7	13.0	TDA-075	204.0	128.7	TSR-X-160	268.0	153.0
DN40 1-1/2"	151.0	151.0	88.5	49.0	13.0	TDA-075	204.0	128.7	TSR-X-255	301.0	175.0
DN50 2"	166.0	166.0	105.8	61.2	16.0	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN65 2-1/2"	175.0	194.0	117.3	77.0	16.0	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0
DN80 3"	210.0	207.2	128.0	90.2	16.0	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0
DN100 4"	285.6	-	159.0	115.3	22.0	TDA-435	390.0	192.0	TSR-X-1000	525.0	260.0

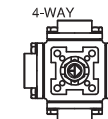
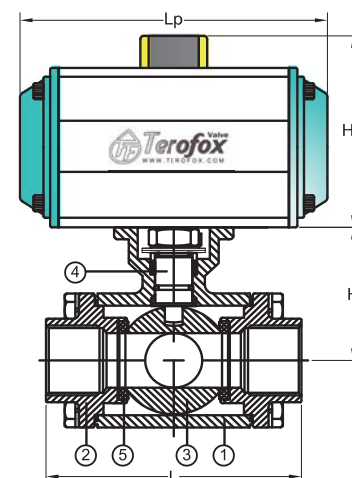
AGF21AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

MW-410DDA MW-410DSR

SIZE : 1/2"~4"(DN15~DN100)

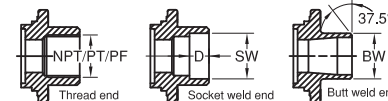
4-way T/L/X port full bore ball valve, four seat supported. Blow-out-proof stem & anti-static device. ISO 5211 direct-mounted pad for actuator.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	CF8M / 1.4408
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	1/4" ~ 2" : 1000 PSI (PN 63) 2-1/2" ~ 4" : 800 PSI (PN 40)
Direction	L / T / X port
Connections	BSPT / BSPP / NPT / ISO 228-1 / ISO 7-1 / Socket weld / Butt weld
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

L = THREAD AND SOCKET WELD
L1=BUTT WELD



Size	L	L1	H	SW	D	DA Model	Lp	Hp	SR Model	Lp	Hp
DN15 1/2"	96.0	96.0	47.8	21.8	10.0	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN20 3/4"	107.0	107.0	58.2	27.4	13.0	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN25 1"	126.0	130.0	64.0	34.1	13.0	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN32 1-1/4"	133.0	133.0	79.0	42.7	13.0	TDA-075	204.0	128.7	TSR-X-160	268.0	153.0
DN40 1-1/2"	151.0	151.0	88.5	49.0	13.0	TDA-075	204.0	128.7	TSR-X-255	301.0	175.0
DN50 2"	166.0	166.0	105.8	61.2	16.0	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN65 2-1/2"	175.0	194.0	117.3	77.0	16.0	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0
DN80 3"	210.0	207.2	128.0	90.2	16.0	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0
DN100 4"	285.6	-	159.0	115.3	22.0	TDA-435	390.0	192.0	TSR-X-1000	525.0	260.0

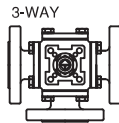
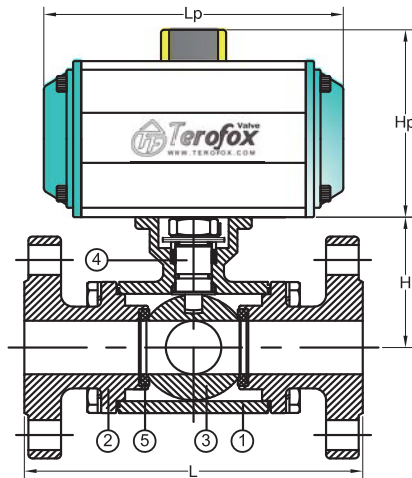
AGF21AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

MWF-810DDA MWF-810DSR

SIZE : 1/2"~6"(DN15~DN150)

3-way T/L port full bore ball valve, four seat supported. Blow-out-proof stem & anti-static device. ISO 5211 direct-mounted pad for actuator.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	WCB / CF8 / CF8M / 1.0619 / 1.4308 / 1.4408
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	Class 150, PN 16/40, JIS 10K
Direction	L / T port
Connections	RF Flange end (ASME B16.5, EN1092-1, JIS B2220)
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size	LCL150	LPN16	LPN40	L10K	H	DA Model	Lp	Hp	SR Model	Lp	Hp
DN15 1/2"	147.4	158.0	158.0	147.4	47.8	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN20 3/4"	155.8	169.0	169.0	155.8	58.2	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN25 1"	168.8	185.0	185.0	168.8	64.0	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN32 1-1/4"	197.9	195.0	195.0	197.9	79.0	TDA-075	204.0	128.7	TSR-X-160	268.0	153.0
DN40 1-1/2"	221.4	232.0	232.0	218.8	88.5	TDA-075	204.0	128.7	TSR-X-255	301.0	175.0
DN50 2"	244.6	253.0	253.0	244.6	105.8	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN65 2-1/2"	270.0	270.0	270.0	270.0	117.3	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0
DN80 3"	292.2	292.2	301.0	292.2	128.0	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0
DN100 4"	368.0	360.0	360.0	368.0	159.0	TDA-435	390.0	192.0	TSR-X-1000	525.0	260.0
DN125 5"	420.0	416.0	424.0	420.0	210.0	TDA-665	458.0	217.0	TSR-X-1200	532.0	285.0
DN150 6"	479.4	472.6	492.6	479.4	239.0	TDA-1000	525.0	260.0	-	-	-

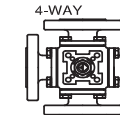
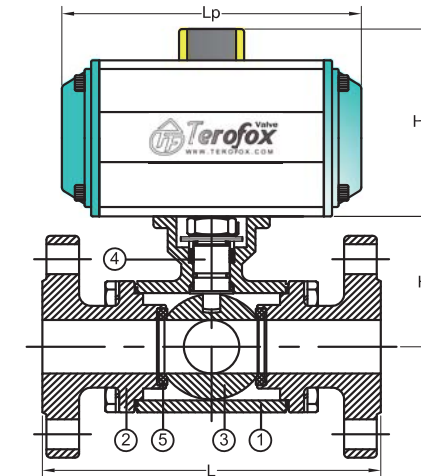
AGF21AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

MWF-410DDA MWF-410DSR

SIZE : 1/2"~6"(DN15~DN150)

4-way T/L/X port full bore ball valve, four seat supported. Blow-out-proof stem & anti-static device. ISO 5211 direct-mounted pad for actuator.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	WCB / CF8 / CF8M / 1.0619 / 1.4308 / 1.4408
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	Class 150, PN 16/40, JIS 10K
Direction	L / T / X port
Connections	RF Flange end (ASME B16.5, EN1092-1, JIS B2220)
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size	LCL150	LPN16	LPN40	L10K	H	DA Model	Lp	Hp	SR Model	Lp	Hp
DN15 1/2"	147.4	158.0	158.0	147.4	47.8	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN20 3/4"	155.8	169.0	169.0	155.8	58.2	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN25 1"	168.8	185.0	185.0	168.8	64.0	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN32 1-1/4"	197.9	195.0	195.0	197.9	79.0	TDA-075	204.0	128.7	TSR-X-160	268.0	153.0
DN40 1-1/2"	221.4	232.0	232.0	218.8	88.5	TDA-075	204.0	128.7	TSR-X-255	301.0	175.0
DN50 2"	244.6	253.0	253.0	244.6	105.8	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN65 2-1/2"	270.0	270.0	270.0	270.0	117.3	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0
DN80 3"	292.2	292.2	301.0	292.2	128.0	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0
DN100 4"	368.0	360.0	360.0	368.0	159.0	TDA-435	390.0	192.0	TSR-X-1000	525.0	260.0
DN125 5"	420.0	416.0	424.0	420.0	210.0	TDA-665	458.0	217.0	TSR-X-1200	532.0	285.0
DN150 6"	479.4	472.6	492.6	479.4	239.0	TDA-1000	525.0	260.0	-	-	-

AGF21AA-P001 Pneumatic actuator is deployed with air fluid.

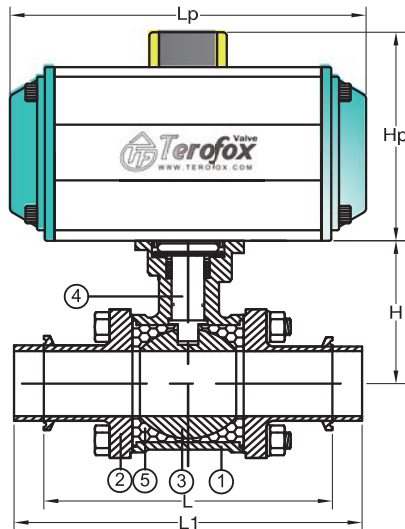
Unit : mm.

ST-810DDA ST-810DSR

CAVITY FILLED PTFE SEAT

SIZE : 1/2"~4"(DN15~DN100)

3-pc sanitary ball valve, standard bore,
investment casting, inside polish $\leq$ Ra0.6 ,
ISO 5211 direct-mounted pad for actuator.



L = T-clamp and tube weld end
L1 = Long tube weld end

Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Cavity filled seat

Specification	
Body Material	CF8M / CF3M
Seat Material	Cavity filled PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	Body : 1000 PSI End cap : 200 PSI
Connections	T-clamp / Tube weld (ASME / DIN 11850 / ISO 1127)
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size	L	L1	H	DA Model	Lp	Hp	SR Model	Lp	Hp
DN15 1/2"	89.0	137.0	37.0	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN20 3/4"	101.0	147.0	47.0	TDA-020	147.0	92.0	TSR-XI-035	168.0	107.5
DN25 1"	114.0	168.0	57.2	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN32 1-1/4"	124.0	-	62.5	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN40 1-1/2"	140.0	186.0	78.2	TDA-050	184.0	119.5	TSR-X-110	262.0	136.5
DN50 2"	156.0	223.0	86.2	TDA-075	204.0	128.7	TSR-X-160	268.0	153.0
DN65 2-1/2"	197.0	250.4	109.2	TDA-110	262.0	136.5	TSR-X-255	301.0	175.0
DN80 3"	229.0	302.0	116.2	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN100 4"	241.0	317.5	133.5	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0

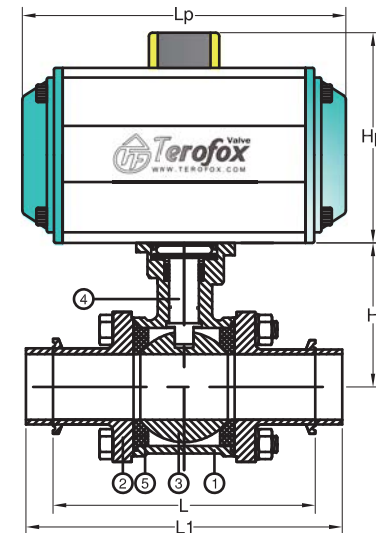
AGC01AA-Z001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

ST-810DDA ST-810DSR

SIZE : 1/2"~4"(DN15~DN100)

3-pc sanitary ball valve, standard bore,
investment casting, inside polish $\leq$ Ra0.6 ,
ISO 5211 direct-mounted pad for actuator.



L = T-clamp and tube weld end
L1 = Long tube weld end

Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	CF8M / CF3M
Seat Material	PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	Body : 1000 PSI End cap : 200 PSI
Connections	T-clamp / Tube weld (ASME / DIN 11850 / ISO 1127)
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size	L	L1	H	DA Model	Lp	Hp	SR Model	Lp	Hp
DN15 1/2"	89.0	137.0	37.0	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN20 3/4"	101.0	147.0	47.0	TDA-020	147.0	92.0	TSR-XI-035	168.0	107.5
DN25 1"	114.0	168.0	57.2	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN32 1-1/4"	124.0	-	62.5	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN40 1-1/2"	140.0	186.0	78.2	TDA-050	184.0	119.5	TSR-X-110	262.0	136.5
DN50 2"	156.0	223.0	86.2	TDA-075	204.0	128.7	TSR-X-160	268.0	153.0
DN65 2-1/2"	197.0	250.4	109.2	TDA-110	262.0	136.5	TSR-X-255	301.0	175.0
DN80 3"	229.0	302.0	116.2	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN100 4"	241.0	317.5	133.5	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0

AGC01AA-Z001 Pneumatic actuator is deployed with air fluid.

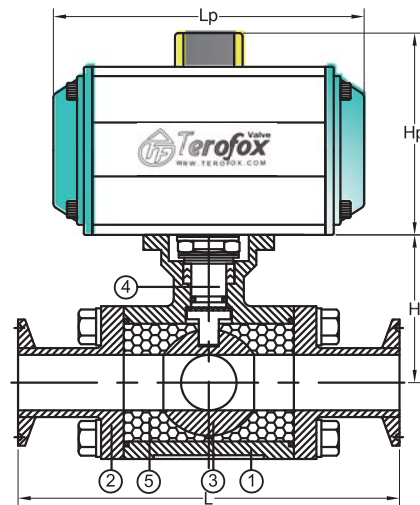
Unit : mm.

STM-310DDA STM-310DSR

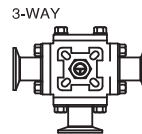
CAVITY FILLED PTFE SEAT

SIZE : 1/2"~4"(DN15~DN100)

3-way T/L port sanitary ball valve, standard bore, investment casting, inside polish $\leq$ Ra0.6, ISO 5211 direct-mounted pad for actuator.



L = T-clamp and tube end end



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Cavity filled seat

Specification	
Body Material	CF8M / CF3M
Seat Material	Cavity filled PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	Body : 1000 PSI End cap : 200 PSI
Connections	T-clamp / Tube weld (ASME / DIN 11850 / ISO 1127)
Direction	T / L port
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size	L	H	DA Model	Lp	Hp	SR Model	Lp	Hp	
DN15	1/2"	118.0	44.5	TDA-020	147.0	92.0	TSR-X-035	168.0	107.5
DN20	3/4"	127.0	48.0	TDA-020	147.0	92.0	TSR-XI-035	168.0	107.5
DN25	1"	152.4	59.0	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN40	1-1/2"	175.0	72.0	TDA-050	184.0	119.5	TSR-X-160	268.0	153.0
DN50	2"	190.0	82.0	TDA-110	262.0	136.5	TSR-X-435	390.0	192.0
DN65	2-1/2"	228.0	100.0	TDA-160	268.0	153.0	TSR-XI-435	390.0	192.0
DN80	3"	260.0	125.5	TDA-435	390.0	192.0	TSR-X-1000	525.0	260.0
DN100	4"RP	318.0	132.5	TDA-435	390.0	192.0	TSR-X-1000	525.0	260.0

AGC01AA-2001 Pneumatic actuator is deployed with air fluid.

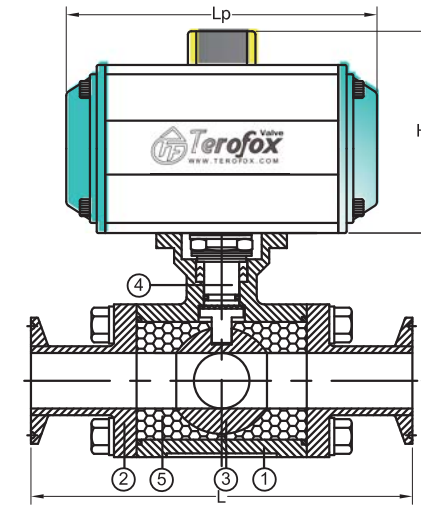
Unit : mm.

STM-410DDA STM-410DSR

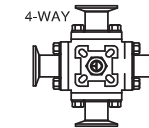
CAVITY FILLED PTFE SEAT

SIZE : 1/2"~4"(DN15~DN100)

4-way T/L/X port sanitary ball valve, standard bore, investment casting, inside polish $\leq$ Ra0.6, ISO 5211 direct-mounted pad for actuator.



L = T-clamp and tube end end



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Cavity filled seat

Specification	
Body Material	CF8M / CF3M
Seat Material	Cavity filled PTFE
Temperature	-20°C to 160°C (-4°F to 320°F)
Pressure	Body : 1000 PSI End cap : 200 PSI
Connections	T-clamp / Tube weld (ASME / DIN 11850 / ISO 1127)
Direction	T / L / X port
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size		L	H	DA Model	Lp	Hp	SR Model	Lp	Hp
DN15	1/2"	118.0	44.5	TDA-020	147.0	92.0	TSR-X-035	168.0	107.5
DN20	3/4"	127.0	48.0	TDA-020	147.0	92.0	TSR-XI-035	168.0	107.5
DN25	1"	152.4	59.0	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN40	1-1/2"	175.0	72.0	TDA-050	184.0	119.5	TSR-X-160	268.0	153.0
DN50	2"	190.0	82.0	TDA-110	262.0	136.5	TSR-X-435	390.0	192.0
DN65	2-1/2"	228.0	100.0	TDA-160	268.0	153.0	TSR-XI-435	390.0	192.0
DN80	3"	260.0	125.5	TDA-435	390.0	192.0	TSR-X-1000	525.0	260.0
DN100	4"RP	318.0	132.5	TDA-435	390.0	192.0	TSR-X-1000	525.0	260.0

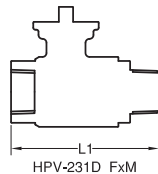
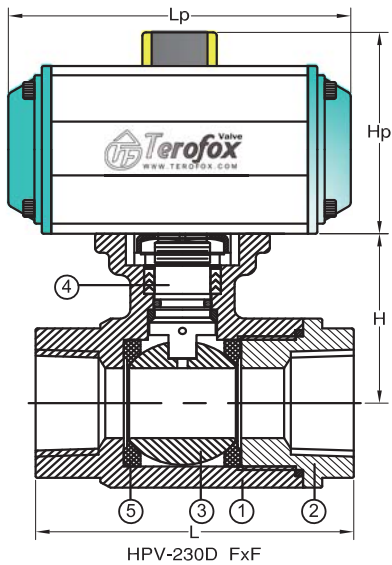
AGC01AA-2001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

HPV-230DDA HPV-230DSR

SIZE : 1/4"~2"(DN8~DN50)

2-pc design full bore high pressure ball valve, blow-out-proof stem, investment casting. ISO5211 direct-mounted pad for actuator.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	WCB / CF8 / CF8M / 1.0619 / 1.4308 / 1.4408
Seat Material	PEEK / DELRIN
Pressure	3000 PSI (PN 210)
Temperature	PEEK : -20°C to 260°C (-4°F to 500°F) DELIN : -20°C to 80°C (-4°F to 176°F)
Connections	BSPT / BSP / NPT / ISO 228-1 / ISO 7-1 / Socket weld
Valve Design	ASME B16.34
Face to Face	Manufacture standard
Valve Test	API 598
Actuator	Double acting pneumatic actuator / Spring return pneumatic actuator
Accessories Option	Limit switch box / Solenoid valve / Bracket

Size		L	L1	H	DA Model	Lp	Hp	SR Model	Lp	Hp
DN8	1/4"	75.0	88.9	72.0	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN10	3/8"	75.0	88.9	72.0	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN15	1/2"	75.0	92.0	72.0	TDA-020	147.0	92.0	TSR-XI-035	168.0	107.5
DN20	3/4"	81.0	99.0	75.0	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN25	1"	91.0	113.0	87.0	TDA-035	168.0	107.5	TSR-X-075	204.0	128.7
DN32	1-1/4"	110.0	127.1	93.0	TDA-050	184.0	119.5	TSR-X-110	262.0	136.5
DN40	1-1/2"	121.0	141.0	114.0	TDA-050	184.0	119.5	TSR-X-160	268.0	153.0
DN50	2"RP	145.0	155.0	114.0	TDA-050	184.0	119.5	TSR-X-160	268.0	153.0

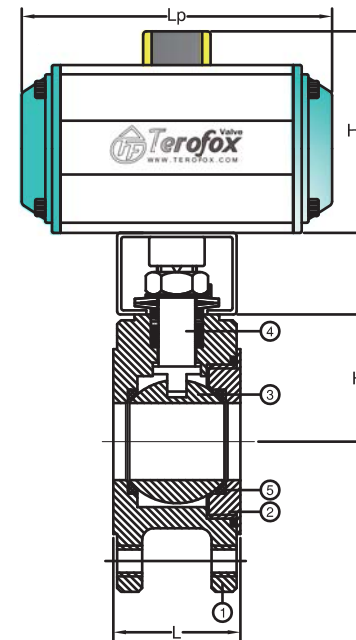
AGC01AA-M001 Pneumatic actuator is deployed with air fluid.

Unit : mm.

TF-10DA TF-10SR

SIZE : 1/2"~6"(DN15~DN150)

1-pc full bore ball valve, compact body (wafer type), blow-out-proof stem & anti-static design ISO 5211 mounted pad on top body.



Part Name	
1	Body
2	Cap
3	Ball
4	Stem
5	Seat

Specification	
Body Material	WCB / CF8 / CF8M / 1.0619 / 1.4308 / 1.4408
Seat Material	RTFE
Temperature	-20°C to 180°C (-4°F to 356°F)
Pressure	Class 150, PN 16
Connections	RF Flange end (ASME B16.5 / EN 1092-1)
Valve Design	ASME B16.34 / EN 12516-1
Face to Face	Manufacture standard
Valve Test	API 598 / EN12266-1
Actuator	Double acting pneumatic actuator + Bracket / Spring return pneumatic actuator + Bracket
Accessories Option	Limit switch box / Solenoid valve

Size	LCL150	LPN16	H	DA Model	Lp	Hp	SR Model	Lp	Hp	
DN15	1/2"	35.0	36.0	32.0	TDA-012	122.0	80.0	TSR-X-020	147.0	92.0
DN20	3/4"	38.0	40.0	38.0	TDA-012	122.0	80.0	TSR-X-035	168.0	107.5
DN25	1"	42.0	44.0	42.0	TDA-020	147.0	92.0	TSR-X-050	184.0	119.5
DN32	1-1/4"	54.0	54.0	50.0	TDA-020	147.0	92.0	TSR-XI-050	184.0	119.5
DN40	1-1/2"	62.0	62.0	54.0	TDA-035	168.0	107.5	TSR-X-110	262.0	136.5
DN50	2"	80.0	80.0	62.0	TDA-050	184.0	119.5	TSR-X-110	262.0	136.5
DN65	2-1/2"	101.0	101.0	82.0	TDA-075	204.0	128.7	TSR-XI-160	268.0	153.0
DN80	3"	118.0	118.0	91.0	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN100	4"	153.0	150.0	107.0	TDA-160	268.0	153.0	TSR-X-435	390.0	192.0
DN150	6"	202.0	202.0	130.0	TDA-255	301.0	175.0	TSR-X-665	458.0	217.0

AGC01AA-P001 Pneumatic actuator is deployed with air fluid.

Unit : mm.