

**550G M-TRIM
560G M-TRIM**

KOSO

**MULTI-TURN CAGE GUIDED
CONTROL VALVE**



Standard Specifications

Gain Competitive Edge with **KOSO**

KOSO is a leading industrial customized control valve manufacturer with strong in-house R&D capabilities. Committed to delivering high-quality, ISO-9001 certified valve systems, KOSO offers a wide range of products designed to meet evolving industry needs.

For more information visit us at
www.koso.co.jp | www.koso.co.in

20

Plants
Worldwide

1M+

Valves Installed
Worldwide



60+

Years of Experience



100,000+

Severe Service Valves
Installed Worldwide



2

Wholly
Owned Foundries
In India & China





Table Of Content

Overview	4
Key Features & Benefits	4
Design Features	4
Product Specifications	5
Standard Specification	6
Body & Trim Sectional View	7
Cv Value - 550G M-Trim Globe / 560G M-Trim Angle Valve Pressure Class 150#, 300#, 600#	8
Cv Value - 550G M-Trim Globe / 560G M-Trim Angle Pressure Class 900#, 1500#	9
Cv Value - 550G M-Trim Globe / 560G M-Trim Angle Pressure Class 900#, 1500#	10
Dimension Details - 550G M-Trim Globe / 560G M-Trim Angle Valve - Pressure Class 150#, 300#, 600#	11
Dimension Details - 550G M-Trim Globe / 560G M-Trim Angle Valve - Pressure Class 900#, 1500#, 2500#	11

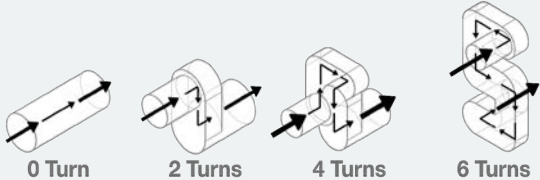
► Overview

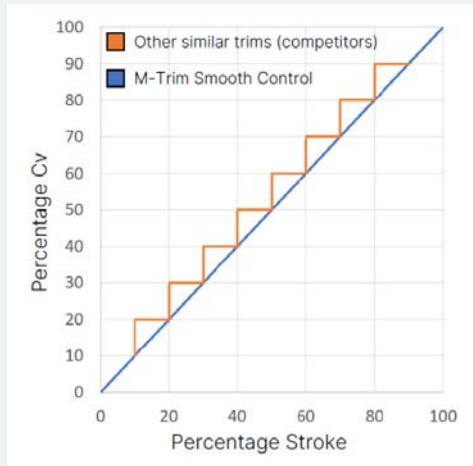
The 550G M-TRIM (Globe) / 560G M-TRIM (Angle) series control valves use a patented, high-pressure, anti-cavitation, low noise multi-stage drilled hole trim with fine control which is necessary in severe service control valve applications. The configuration features up to six stages of pressure reduction which reduces the trim outlet velocity and kinetic energy to a safe level. The design can be customized to provide the required number of stages and capacity required for any specific application. The M-trim offers superior flexibility and it is available in both over the plug and under the plug configurations.

► Key Features & Benefits

Quick Change Trim	The quick-change trim design has a clamped-in seat ring using valve bonnet. It allows the trim parts to be removed and re-installed while the valve body is still in the pipeline. This results in quicker maintenance and inspection.
Anti - Cavitation Trim	Anti-cavitation design eliminates the potential for premature damage to the valve internals in liquid applications, while eliminating the potential for excessive noise in gaseous applications.
Characterization	Inherently characterized trims are available with Linear, Equal percentage & Modified Equal percentage. Special Cv options are available on request.
Low Noise Design	Multi-stage, multi-path trim design reduces noise by lowering energy of the fluid jets leaving the valve trim and creating a higher frequency noise which is harder to pass through the walls of the valve and piping.
Fine Flow Control	M-TRIM cages are characterized to provide fine flow control and high rangeability. Further customization can be made to meet specific application requirements.

► Design Features

Trim Stages	One to six stages of pressure drop in a single cage.  0 Turn 2 Turns 4 Turns 6 Turns
No Line of Sight from Inlet to the Plug	The trim has a flow path with bends which prevents solid particles from directly hitting the plug and causing damage as seen in other designs. The 90-degree bends prevent high velocity particles from hitting the plug with full momentum. 

Discrete Flow Passage Design	Each individual flow passage is separate and distinct, ensuring the required number of pressure drop stages is provided at all valve travels. This is better than other nested cage trims which have a gap between the cages. At low travel, cages with a gap will take a large pressure drop across the inner cage and the outer cage will act as a high capacity, low pressure drop diffuser.
Smooth Flow Characteristic	M-Trim provides a smooth flow characteristic due to overlapping rows of holes through the full stroke. This eliminates the issue of stepped response which is experienced in other conventional trims. 

► Product specifications

Design Standard & Material Standard	- Valve design - ASME B16.34 - Flange design - ASME B16.5 & ASME B16.47 - Butt weld end connection - ASME B16.25 - Socket weld end connection - ASME B16.11 - Material comply to ASME, ASTM, EN or Custom standards
Industry Served	Power, Oil & Gas, FPSO, Onshore, Offshore, LNG, Fertilizer, Steel, Refinery, Petrochemical
Quality Standard Compliance	- Integrated management system with ISO 9001 & API Spec Q1 - PED/CE as per 2014/68/EU & ATEX 2014/34/EU
Type of Actuation	Pneumatic actuator, Hydraulic actuator, Electrical actuator
Key Applications	Anti-surge valve, Cryogenic valve, High temperature valve, Condensate extraction pump minimum recirculation valve, Gas to flare valve
Certification	IBR, SIL, PED/CE Marking, ATEX, CRN, TRCU

► Standard Specification

► 550G M-Trim Globe / 560G M-Trim Angle Multi - Turn Cage Guided Control Valve

Series	550G M-Trim Globe / 560G M-Trim Angle
Body Size	1" ~ 24" (DN25 ~ DN600) (For higher sizes, consult with factory)
Plug Form	Unbalanced & Pressure Balanced
Characteristics	Linear, EQ%, Modified EQ%
Trim Material & Treatment	300 Series, 400 Series, 17-4 PH, Alloy steels, Duplex SS, Alloy 625, Alloy 825, Monel, Hastelloy C, Special Hardening treatment - Stellite overlay, (Stellite Seat - SS / Stellite Face - SF)
Body Rating	8 ASME Class 150, 300, 600, 900, 1500, 2500 & 4500 (EN Class, PN Class consult with factory)
Body Connections	Flanged (RF, FF, RTJ), Weld ends (Socket weld end : 2" and below, Butt weld end : 3" and above.)
Face to Face Dimension	ISA / KOSO Standard / Special (Consult with factory)
Body & Bonnet Material	WCB, WCC, WC6, WC9, C5, C12A, LCC, LCB, CF8, CF8M, CF3M, CF8C, Duplex SS, Alloy 625, Alloy 825, Monel, Hastelloy C and Copper alloy Steels, & Cladding on body internal.
NACE (as applicable)	NACE MR0175, NACE MR0103
Bonnet Types	Standard type: -17 °C ~ +230 °C, Fin-Extension type: -45 °C ~ -17 °C, -45 °C under -17 °C or over +230 °C, Long-Extension type: -196 °C ~ -45 °C, Option: Bellow seal bonnet. (Note : The allowable operating pressure-temperature limitation for each)
Gland Packing	TFE V-ring, TFE carbon fiber, Grafoil and more
Gaskets	Spiral wound metal, with Grafoil or TFE filler
Leakage Class	Class IV , V , VI ANSI FCI 70-2, MSS-SP-61
Special Testing Requirements (Optional upon request)	FE Prototype testing as per ISO 15848-1, Class A,B,C, FE Production testing as per ISO 15848-2, Class A,B,C, CV testing, Helium leak testing, High pressure testing, Low temperature testing, Cryogenic testing, Vacuum testing, Dynamic response testing (DRT).
Marking	As per KOSO Standard practices / MSS-SP-25
Options	Forging Body/Bonnet, Steam jacketing, Silencer, Expanders/Diffuser and baffles.

► Body & Trim Sectional View

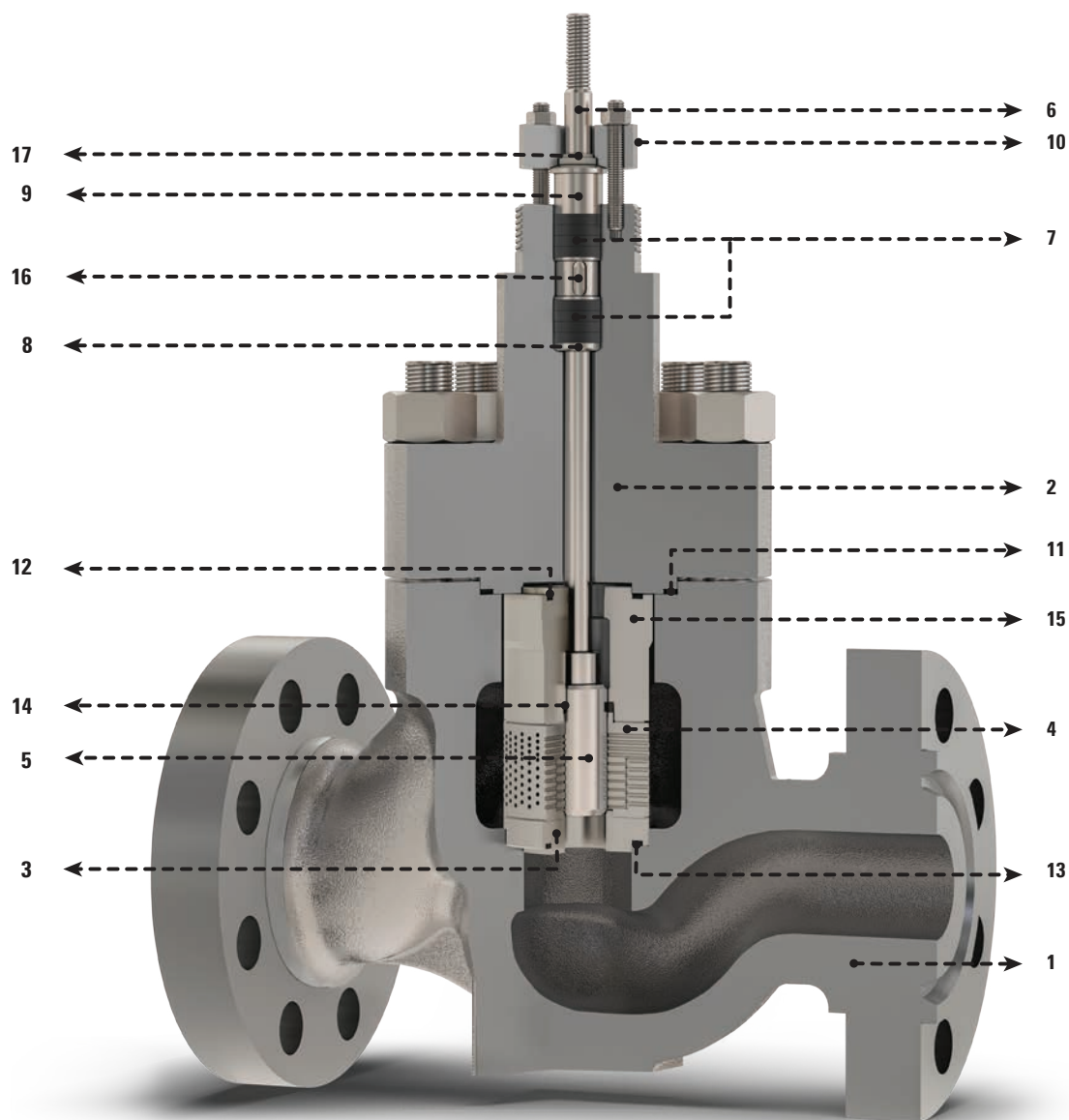


Figure 1: 550G M-Trim- Globe Valve Sectional View

SR.NO.	LABEL
1	BODY
2	BONNET
3	SEAT RING
4	M - TRIM CAGE
5	PLUG
6	STEM
7	GLAND PACKING
8	PACKING SEAT
9	GLAND RING

SR.NO.	LABEL
10	GLAND FLANGE
11	BODY - BONNET GASKET
12	PRESSURE BALANCE GASKET
13	SEAT GASKET
14	BALANCE SEAL
15	BALANCE CYLINDER
16	LANTERN RING
17	WIPER

► **Table 1 : Cv Value - 550G M-Trim Globe / 560G M-Trim Angle Valve Pressure Class 150#, 300#, 600#**

Nominal Valve Size, mm	Nominal Trim Size, mm	Travel, mm	550G-M (Globe)							560G-M (Angle)						
			2 Turns				0-2 Turns		0-4 Turns	2 Turns				0-2 Turns		0-4 Turns
			Linear		Mod EQ%		Mod EQ%		Mod EQ%	Linear		Mod EQ%		Mod EQ%		Mod EQ%
			To Close	To Open	To Close	To Open	To Close	To Open	To Close	To Close	To Open	To Close	To Open	To Close	To Open	To Close
25	18	25	3.93	4.33	3.14	3.46	4.73	5.41	4.74	4.32	4.86	3.33	3.72	5.45	6.58	5.47
	31		8.27	9.37	6.62	7.5	11.3	13.1	11.3	8.59	9.84	6.77	7.73	12.2	14.4	12.2
40	31	25	8.27	9.37	6.62	7.5	11.3	13.1	11.3	8.59	9.84	6.77	7.73	12.2	14.4	12.2
	40		11.3	10.8	9.07	8.62	15.9	16.2	16	11.6	11	9.21	8.73	16.7	17	16.8
	50		14.6	15.4	11.7	12.3	22.2	23.3	21.4	14.9	15.6	11.8	12.4	23.1	24.3	22.1
50	50	30	18.2	22.7	14.6	18.2	27.9	32.6	26.8	18.6	23.6	14.8	18.6	29.6	35.4	28.3
	62		22.9	23.8	18.4	19	35.4	35.9	33.2	23.3	24.2	18.5	19.2	36.8	37.3	34.4
80	62	40	30.1	39.9	24.1	31.9	46.4	56.3	44	31	41.9	24.5	32.9	49.7	62.5	46.7
	75		43.4	46.9	34.7	37.5	62.6	69.1	59	44.6	48.3	35.3	38.2	66.2	74	62
	90		47.3	53.4	37.9	42.7	73	81.1	69	48	54.4	38.2	43.2	75.7	84.8	71.2
100	90	50	64.6	69.5	51.7	55.6	90.7	103	86.2	66.4	71.8	52.6	56.8	95.8	111	90.6
	115		77.1	72.4	61.7	57.9	121	113	115	78.3	73.3	62.3	58.4	125	116	119
150	115	60	90.5	116	72.4	92.6	137	171	131	92.3	120	73.3	94.5	144	184	136
	140		122	120	97.3	95.9	186	185	177	124	122	98.3	96.9	193	192	183
	160		133	130	106	104	212	203	192	134	132	107	105	218	208	197
200	160	80	219	226	176	181	329	332	316	226	233	179	184	353	357	337
	180		232	231	186	185	353	350	338	237	236	188	188	371	368	354
	205		280	279	224	223	429	426	411	286	284	227	226	449	445	428
250	205	90	309	314	247	251	467	485	449	316	322	250	255	492	514	471
	245		341	336	273	269	525	522	499	345	340	275	271	541	538	513
300	245	100	448	443	358	354	672	679	644	458	453	364	359	708	717	676
	300		568	561	454	449	866	882	829	577	570	459	453	900	918	858
350	300	130	713	711	570	569	1070	1090	1030	732	729	580	578	1130	1150	1080
	335		726	724	581	579	1110	1130	1070	738	736	587	585	1160	1180	1110
400	335	150	798	917	638	733	1230	1390	1190	814	942	647	746	1290	1480	1240
	360		914	929	731	743	1420	1430	1380	932	949	740	753	1490	1510	1440
450	360	150	914	929	731	743	1420	1430	1380	932	949	740	753	1490	1510	1440
	400		926	942	741	754	1470	1480	1420	939	955	747	760	1520	1530	1470



Note: The given Cv are for standard valve and trim combinations. KOSO has done extensive developments and tests for extended Cv ranges. Please contact us for custom Cv ranges.

► **Table 2 : Cv Value - 550G M-Trim Globe / 560G M-Trim Angle Pressure Class 900#, 1500#**

Nominal Valve Size, mm	Nominal Trim Size, mm	Travel, mm	550G-M (Globe)							560G-M (Angle)						
			2 Turns				0-2 Turns		0-4 Turns	2 Turns				0-2 Turns		0-4 Turns
			Linear		Mod EQ%		Mod EQ%		Mod EQ%	Linear		Mod EQ%		Mod EQ%		Mod EQ%
			To Close	To Open	To Close	To Open	To Close	To Open	To Close	To Close	To Open	To Close	To Open	To Close	To Open	To Close
25	18	20	3.26	3.76	2.61	3.01	4.04	4.6	3.74	3.47	4.1	2.71	3.17	4.47	5.25	4.07
40	31	40	12.3	13.4	9.85	10.7	16.1	15.2	15.8	13.4	14.9	10.4	11.5	18.9	17.4	18.4
	40		17.5	16.8	14	13.4	24.2	23.8	23.5	18.6	17.7	14.6	13.9	27.3	26.7	26.3
50	31	40	12.3	13.4	9.85	10.7	16.1	15.2	15.8	13.4	14.9	10.4	11.5	18.9	17.5	18.4
	40		17.5	16.8	14	13.4	24.2	23.8	23.5	18.6	17.7	14.6	13.9	27.3	26.7	26.3
	50		23.8	24.2	19	19.4	34.4	34.6	33.5	24.8	25.3	19.6	19.9	37.8	38	36.6
80	50	50	28.8	34.3	23	27.4	40.3	41.7	39.3	30.6	37.6	23.9	29	46	48.1	44.6
	62		36.8	43.9	29.4	35.2	52.7	60.1	51.1	38.3	46.7	30.2	36.5	57.6	67.8	55.5
	75		53.1	57.4	42.5	45.9	73.7	81.4	70.6	55.3	60.1	43.6	47.3	79.8	89.9	75.9
100	62	70	49.2	59.7	39.4	47.8	64.7	65.1	64.8	53.2	67.2	41.3	51.3	74.6	75.1	74.7
	75		71.8	73.8	57.4	59	96.2	95.7	94.3	77.3	79.9	60.1	62	111	110	108
	90		79.8	87.4	63.9	69.9	116	123	112	83.3	92	65.6	72.2	128	137	123
150	90	90	105	114	84.1	91	141	140	139	113	125	88.2	96.2	164	161	160
	115		133	165	107	132	191	226	185	139	176	110	137	210	260	202
	140		181	177	145	142	264	263	257	187	183	148	145	286	285	277
200	140	120	232	261	185	208	325	343	317	246	282	193	219	369	397	358
	160		312	318	250	255	431	436	423	333	341	260	266	492	498	479
	180		334	334	268	268	486	480	474	350	350	275	275	537	529	521
250	160	140	351	359	280	287	449	449	448	381	391	295	303	518	519	517
	180		393	438	315	350	539	570	526	419	474	328	368	612	659	593
	205		462	466	369	373	657	668	639	486	491	381	386	734	748	709
300	180	220	536	572	429	458	569	571	569	608	662	463	500	657	660	656
	205		648	648	518	519	742	742	740	720	721	553	554	857	858	854
	245		860	852	688	681	1060	1060	1060	941	930	727	720	1230	1230	1230



Note: The given Cv are for standard valve and trim combinations. KOSO has done extensive developments and tests for extended Cv ranges. Please contact us for custom Cv ranges.

► **Table 3 : Cv Value - 550G M-Trim Globe / 560G M-Trim Angle Pressure Class 900#, 1500#**

Nominal Valve Size, mm	Nominal Trim Size, mm	Travel, mm	550G-M (Globe)							560G-M (Angle)						
			2 Turns				0-2 Turns		0-4 Turns	2 Turns				0-2 Turns		0-4 Turns
			Linear		Mod EQ%		Mod EQ%		Mod EQ%	Linear		Mod EQ%		Mod EQ%		Mod EQ%
			To Close	To Open	To Close	To Open	To Close	To Open	To Close	To Close	To Open	To Close	To Open	To Close	To Open	To Close
40	18	40	5.02	4.78	4.02	3.82	4.67	4.65	4.58	5.9	5.53	4.43	4.18	5.36	5.33	5.23
	31		12.3	13.4	9.85	10.7	15.2	15.3	15.1	13.4	14.9	10.4	11.5	17.4	17.6	17.4
50	31	40	12.3	13.4	9.85	10.7	15.2	17.1	15	13.4	14.9	10.4	11.5	17.4	20.7	17.2
	40		17.5	16.8	14	13.4	24.2	23.8	23.5	18.6	17.7	14.6	13.9	27.3	26.7	26.3
80	40	60	23.6	22.7	18.9	18.1	26.1	26.5	26	26.5	25.1	20.3	19.3	30.1	30.6	29.9
	50		33.1	38.6	26.5	30.9	40.6	41.5	40	36.1	43.5	28	33.2	46.5	47.9	45.5
	62		43.9	44.4	35.1	35.6	61.9	61.7	60.3	46.6	47.3	36.5	37	70.4	70.1	68.1
100	50	70	36.7	42	29.4	33.6	41.4	41.7	41.1	40.9	48.6	31.4	36.7	47.7	48.1	47.1
	62		49.2	59.7	39.4	47.8	64.7	65	63.9	53.2	67.2	41.3	51.3	74.6	74.9	73.4
	75		71.8	73.8	57.4	59	96.2	95.7	93.6	77.3	79.9	60.1	62	111	110	107
150	75	110	95	96.4	76	77.1	96	95.8	95.6	109	111	82.7	84.2	111	110	110
	90		121	129	97.2	103	139	140	139	135	146	104	111	161	162	160
	115		157	151	126	120	220	214	214	167	159	131	125	251	241	241
200	90	110	121	129	97.2	103	139	140	137	135	146	104	111	160	162	158
	115		157	191	126	153	219	230	214	167	210	131	162	249	265	241
	140		215	211	172	169	306	304	298	226	222	177	175	342	340	331
250	115	170	212	244	170	195	230	231	229	240	287	183	215	266	267	264
	140		296	326	237	260	344	344	343	328	370	252	282	398	398	396
	160		398	406	318	325	450	450	448	443	456	340	349	520	520	517
300	160	200	438	450	351	360	450	451	450	502	520	381	393	520	522	520
	180		508	548	406	438	572	570	569	568	625	435	475	662	659	657
	205		609	607	487	486	744	743	742	669	666	516	514	860	859	857

Note:

1. The 2T, Mod EQ% valves have 80% of the cage capacity of the 2T, Linear valves
2. The 0-2T trim is 2 turns from 0% to 60% of travel and drilled holes from 60% to 100% of travel
3. The 0-4T trim is 4 turns from 0% to 10% of travel, 2 turns from 10% to 60% of travel and drilled holes from 60% to 100% of travel.



Note: The given Cv are for standard valve and trim combinations. KOSO has done extensive developments and tests for extended Cv ranges. Please contact us for custom Cv ranges.

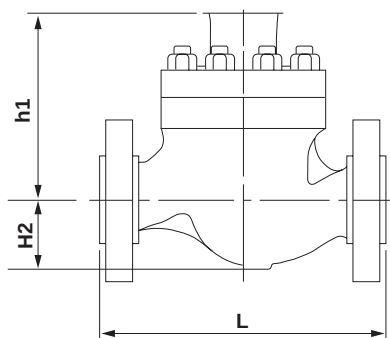
► **Table 4 : Dimension details - 550G M-Trim Globe / 560G M-Trim Angle Valve - Pressure Class 150#, 300#, 600#**

Body Size	Face to Face: L							H2	Standard Bonnet	Fin Extension
in	ASME 150# RF	ASME 300# RF	ASME 600# RF	ASME 300# BW/SW	ASME 300# RTJ	ASME 600# BW	ASME 600# RTJ		h1	h1
1	184	197	210	210	210	210	210	47	157	257
1 1/2	222	235	251	251	248	251	251	60	175	325
2	254	267	286	286	283	286	289	70	196	346
3	298	317	337	317	333	337	340	98	201	351
4	352	368	394	368	384	394	397	113	275	425
6	451	473	508	473	489	508	511	144	305	455
8	543	568	610	568	584	610	613	185	365	515
10	673	708	752	708	724	752	756	225	420	570
12	737	775	819	775	791	819	822	260	480	630
14	889	927	972	927	943	972	975	320	625	775
16	1016	1057	1108	1057	1073	1108	1111	370	720	870
18	1140	1181	1239	1181	1197	1239	1242	420	815	965

► **Table 5 : Dimension details - 550G M-Trim Globe / 560G M-Trim Angle Valve - Pressure Class 900#, 1500#, 2500#**

Body Size	Face to Face: L						H2			Standard Bonnet	Fin Extension
in	ASME 900# BW/RF	ASME 900# RTJ	ASME 1500# BW/RF	ASME 1500# RTJ	ASME 2500# BW/RF	ASME 2500# RTJ	ASME 900#	ASME 1500#	ASME 2500#	h1	h1
1 1/2	333	333	333	333	447	450	72	72	76	260	405
2	375	378	375	378	437	440	93	93	90	280	430
3	440	443	460	463	498	505	125	125	130	350	500
4	510	513	530	533	566	575	132	132	140	420	570
6	715	718	770	776	820	833	199	199	250	450	600
8	854	857	911	920	1279	1295	226	226	340	560	710
10	1251	1254	1327	1336	1778	1800	330	330	456	615	765
12	1311	1314	1400	1416	1422	TBA	450	450	485	840	990
14	1828	TBA	1828	TBA	2137	TBA	680	680	540	610	760

All dimensions are in mm



Note: Above dimensions are approximate and subjected to change during the detailed engineering.

Precision. Innovation. Trust.

NIHON KOSO CO.,Ltd.

1-16-7 Nihombashi, Chuo-ku, Tokyo, Japan | 103-0027 | +81-03-5202-4300
www.koso.co.jp

KOSO INDIA PRIVATE LIMITED

H-33 & 34, MIDC, Ambad, Nashik, Maharashtra, India | 422010 | +91-253-2408701
www.koso.co.in

WORLDWIDE LOCATIONS

Japan | United States of America | United Kingdom | India | South Korea |
Singapore | Italy | Saudi Arabia | Oman | United Arab Emirates | China

KOSO

Our Creativity Is Our Pride

We reserve the right to technical improvements, changes and corrections. The information given in this document only contains general descriptions and / or performance features which may not always specifically reflect those described or which may undergo modification in the course of further development of products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.