

Series GM control valves Globe-Omega, multistage trim

The series GM, Omega trim valves are most suitable for high pressure drop of both compressible and incompressible fluids as it enables the flow velocity to be controlled through the multistage Omega trim. Also, series GM range of valves combines high integrity features, such as 2 or 3 dimensional flow path multistage trim, a high flow capacity and a wide range of 'OMEGA' trim designs. This means it is ideally suited to meet the various severe service process control requirements that are demanded from a wide range of industry related applications. The 'OMEGA' trim design is a multi-passages, multi-turns punched disk stack trim. There are 2~32 turns designs available depending on pressure drop and potential for cavitation. The fluid passages through the flow passage generated by the Omega multistage trim. The pressure drop is apportioned across the stacks of letdown so that the pressure drop progressively reduces as it passes through the steps of the trim. This gives excellent resistance to cavitation on high pressure drop applications. For very high pressure drop applications the Omega trim, plug and seat insert would be standard manufactured from hardened stainless steel, stellite stainless steel, and optionally solid tungsten carbide or glass metallic. Standard valves are equipped with VD spring diaphragm actuators or VC Cylinder actuators with ND9000® intelligent valve controllers for precise flow control, extended operational life and performance monitoring on-line.

Construction

- Various construction design available with a range of different end styles and connections
- The Omega standard balanced trim design is based on 2 or 3 dimensional multistage cage and balanced plug.
- The multistage trim shape defines the flow path through the valve and flow characteristics of the valve (linear, equal percentage, modified equal percentage or others), standard trim characteristic is linear.
- The balancing holes are located in the top of the plug. This trim is specially suited to high pressure drop application and is used in the majority of control applications.
- Wide variety of trims with different Cv and characteristics
- Both metal and soft seat available depending from the application
- Option for bellows seal for toxic or other application where no leak is allowed
- Wide material selection for different applications
- Many end connection styles available for different applications
- Extension bonnet design for wide temperature range



Wide range of applications

- Suitable for gas, liquid and steam
- Temperature limits -30...+260 °C with standard bonnet construction. Over +260 °C and under -30 °C with extension bonnet
- Large variation of trim designs for multi-turns and passages for low-noise, and anti-cavitation applications
- Wide range of applicable noise control components, silencers, attenuate plates
- Inherently characterized trim offered in Linear, and optionally Equal Percentage and Modified %.
- Large range of Cv per body size allowing for wide applicable in process conditions
- Clamped cage for heavy duty guiding on severe service applications
- High integrity cage guiding system
- Double packing available

Benefits of 'OMEGA' trim applications

- Quick change trim and top entry construction for easy in-line maintenance
- Valve assembly is easy and self guiding
- All trim components removable from the top side for easy maintenance
- Prolonged trim and valve life time
- Effective noise control
- Reduction of cavitation damage and pipe fatigue
- Stable process control
- Faster start-up, reduced system managing cost
- ND9000 digital valve controller with online diagnostics enables performance follow up and predictive maintenance
- Efficient asset management with Metso FieldCare open architecture software and excellent networking capabilities

Omega quick change, Pilot balanced trim

Pilot balanced trim construction is designed with a special pilot plug & seat built-in the main plug. The design gives excellent seat tightness to leakage on high pressure drop and high temperature applications. The design applicable TSO (Tight Shut Off, seat leakage class V) requirement in high temperature services.

Safety and quality

- Rugged one piece body structure to minimize the leak paths and makes the valve insensitive to pipe stress
- Strictly tested to ensure specified performance with quality assurance systems in according to ISO 9001

Applications for 'OMEGA' trim

Severe services in power plant

- Flow control for main & start-up feed pump recirculation
- Main & booster feed water control
- Condensate booster pump recirculation
- Deaerator level control
- Turbine by-pass & steam generator blow down
- Auxiliary steam shoot blower control
- Boiler start-up main steam spray
- Pressurizer & POSRV
- Chemical & Volume Control System (CVCS) letdown
- HP coolant injection
- Atmospheric steam dump
- Atmospheric venting silencer

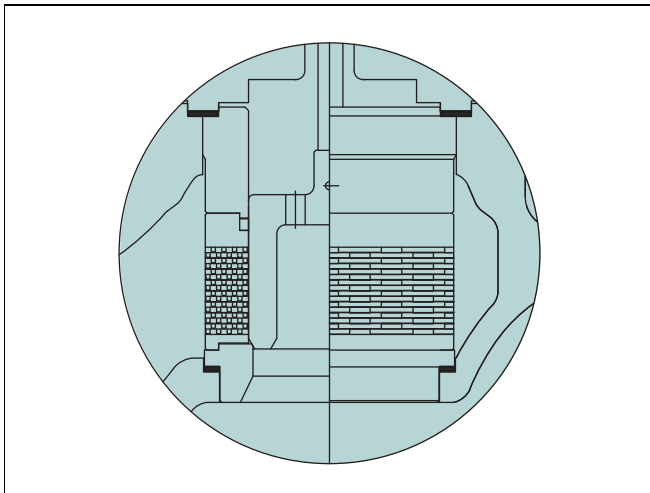
Accurate control & performance

- ND9000 digital valve controller for auto-calibration and accurate control
- Accurate and sensitive diaphragm and cylinder actuators
- Stable flow control with high rangeability
- Low-noise, anti-cavitation control and erosion resistant trims
- Streamline flow passage to secure capacity

Severe services in oil & gas plant

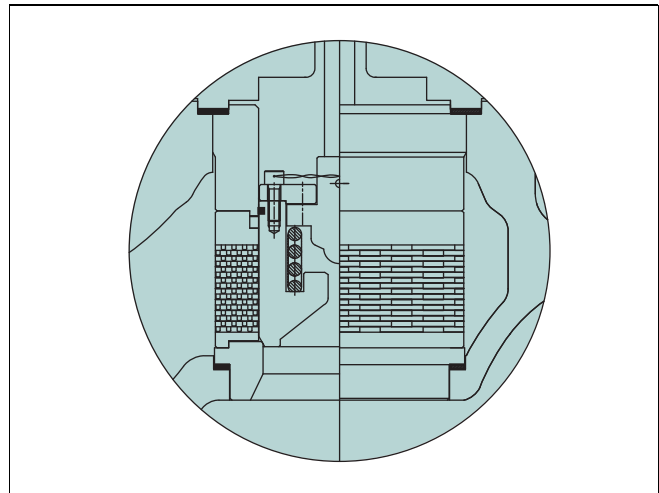
- Compressor anti-surge, kick back & recycle
- Pump minimum flow & recirculation
- Blow down discharge to vent flare
- Reactor de-pressurization
- Turbo expander by-pass
- Gas injection lift control
- Gas storage pressure letdown
- Gas flow regulation
- Pipeline anti-surge
- Heavy oil letdown
- Ethylene letdown
- Steam vent to atmosphere
- Well head choke valves

Different trim designs



Omega quick change, Standard balanced trim

The Omega standard balanced trim design is based on 2 or 3 dimensional multistage cage and balanced plug. The multistage trim shape defines the flow path through the valve and flow characteristics of the valve (linear, equal percentage, modified equal percentage or others), standard trim characteristic is linear. The balancing holes are located in the top of the plug. This trim is specially suited to high pressure drop application and is used in the majority of control applications.



Omega quick change, Pilot balanced trim

Pilot balanced trim construction is designed with a special pilot plug & seat built-in the main plug. The design gives excellent seat tightness to leakage on high pressure drop and high temperature applications. The design applicable TSO (Tight Shut Off, seat leakage class V) requirement in high temperature services.

GM Application guide.

Temperature range & seat leakage class with different bonnet & seat applications

Valve Size DN / Inch	ASME Rating	Seat Type	Temperature Range (°C)		Seat Leakage class (ANSI B 16.104)	
			Standard Bonnet	Extension Bonnet	Standard	Optional
25 / 1 ~ 400 / 16	150~ 600	Metal Seat	-30 ~ +260	-198 ~ +425	IV**	V
		Soft Seat	-30 ~ +232	-198 ~ +232	VI**	V
25 / 1~ 400 / 16	900~ 1500	Metal Seat	-30 ~ +260	-198 ~ +593	IV*	V
25 / 1~ 400 / 16	2500	Metal Seat	-30 ~ +260	-198 ~ +593	IV*	V

* Leakage class will be IV for metal seat with soft seal, but class III for metal seat with metal or graphite seals
 ** Leakage class will be V for soft seat with soft seal
 Optional Class V is available by using pilot trim option or as a special option for metal seat with soft seal up to 4" size

Seal ring applications

Seal Ring Application	Temp. Range (°C)	Sign
Spring Energized (PTFE + Graphite)	-40 ~ +260	G
Spring Energized(PTFE + Graphite) with back-up ring(1500CL over)		*
Graphite	-198 ~ +593	F
Metal Seal	-198 ~ +593	M
Spring Energized (PTFE)	-198 ~ +232	T
Spring Energized(PTFE) with back-up ring(1500CL and higher)		*

*Please contact Metso Automation.

Temperature range with different body and stud/nut materials

Body, Bonnet Material	Stud, Nut Material	Temp. Range (°C)	Sign
Carbon steel (WCB, A105)	ASTM A193-B7 STUD ASTM A194-2H NUT	-30 ~ +425	A
Stainless steel (CF3, CF8,CF3M, CF8M)	ASTM A193-B7 STUD ASTM A194-2H NUT	-46 ~ +538	A
	ASTM A193-B8 STUD ASTM A194-8 NUT	-198 ~ +538	B
Cr.Mo. Steel (WC6, F11, WC9, F22, C12A, F91)	ASTM A193-B16 STUD ASTM A194-4 NUT	-30 ~ +593	*

*Please contact Metso Automation.

Trim materials

GM, Trim				Temp. Range (°C)	Sign
Plug	Stem	Seat	Disk		
420 J2	17-4PH + HCr	420 J2	420 J2	-30 ~ +425	P2XBCS1P2X
Inconel 625, 718, 750				-198 ~ +645	*

*Please contact Metso Automation.

Gasket applications

Body, Bonnet Material	Gasket Material	Temp. Range (°C)	Sign
Carbon steel WCB,A105	S/W (Spiral Wound) 316SS + Graphite	-30 ~ +425	S
Stainless steel CF8,CF8M,CF3,CF3M	S/W (Spiral Wound) 316SS + Graphite	-198 ~ +425	S
	S/W (Spiral Wound) 316SS + PTFE	-198 ~ +232	L
Cr.Mo. Steel WC6,WC9,F22, C12A,F91	S/W (Spiral Wound) 316SS + Graphite + Non Asbestos	-30 ~ +593	H
	S/W (Spiral Wound) 316SS+ Graphite + Mica (special Hi-Temp. max 950)		*

*Please contact Metso Automation.

Packing Applications

Packing Applications	Temp. Range (°C)	Sign
PTFE V-Ring	-198 ~ +232	T
Graphite with Mold + Braided	-198 ~ +400	F
PTFE + Carbon Fiber(Braided TEF + Graphite)	-198 ~ +260	G
Hi-Graphite with Mold + Braided	-198 ~ +593	*
RTFE V-Ring	-40 ~ +260	*
RTFE V-Ring + Metal	-40 ~ +350	*

*Please contact Metso Automation.

Flow direction

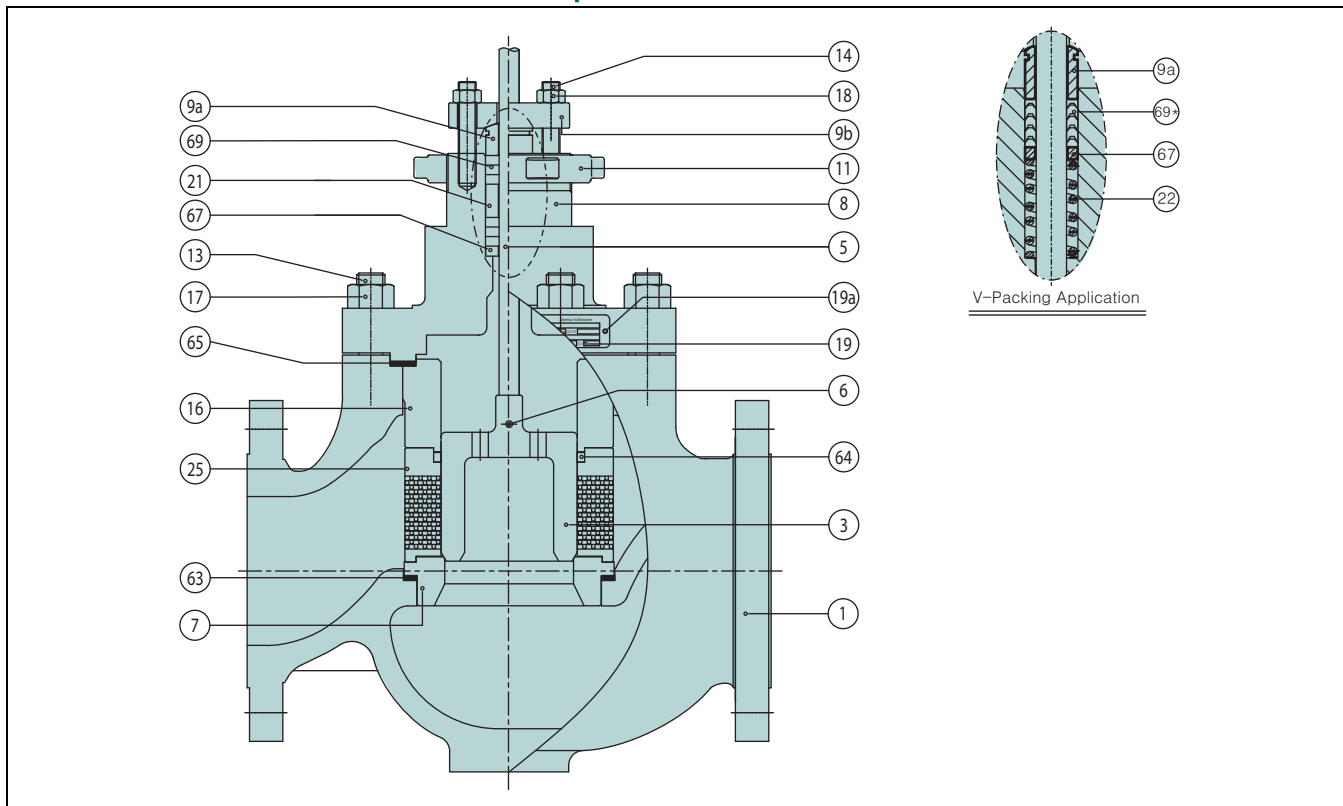
	Flow to Open	Flow to Close
GM (Multistage Trim)		o
Pilot Plug Trim	o	

Rated Cv and Trim Table (Globe single seated, OMEGA trim type, Series GM)

20. Sign	TRIM TYPE	21. Sign	Trim characteristic	22. Sign	Description	RATED Cv										
						Body Size										
						1" (Srk)	1-1/2" (Srk)	2" (Srk)	3" (Srk)	4" (Srk)	6" (Srk)	8" (Srk)	10" (Srk)	12" (Srk)	14" (Srk)	16" (Srk)
A P	Standard (Balanced) Pilot balanced type	L Q	Linear Quick opening	FC 1A 2A 3A	Full capacity	7 (30)	16 (30)	26 (40)	54 (50)	84 (50)	146 (60)	252 (80)	384 (90)	560 (120)	770 (140)	1020 (160)
					1-Step reduction	3 (30)	8 (30)	12 (40)	28 (50)	52 (50)	90 (60)	156 (80)	234 (90)	340 (120)	470 (140)	624 (160)
					2-Step reduction	1.6 (30)	4 (30)	6 (40)	14 (50)	26 (50)	45 (60)	78 (80)	116 (90)	170 (120)	234 (140)	310 (160)
	E M	Equal % Modified EQ%	FC 1A 2A 3A	Full capacity	5 (30)	10 (30)	18 (40)	38 (50)	60 (50)	104 (60)	176 (80)	268 (90)	390 (120)	540 (140)	710 (160)	
				1-Step reduction	2.5 (30)	6 (30)	11 (40)	24 (50)	36 (50)	64 (60)	108 (80)	164 (90)	236 (120)	328 (140)	430 (160)	
				2-Step reduction	1.2 (30)	3 (30)	5 (40)	12 (50)	18 (50)	32 (60)	54 (80)	82 (90)	118 (120)	164 (140)	214 (160)	
Y	Special Trim Type	Y	Special	YY	Special	0.6 (30)	1.5 (30)	2 (40)	6 (50)	9 (50)	16 (60)	27 (80)	40 (90)	60 (120)	82 (140)	106 (160)
					Contact Metso Automation for Cv details											

* Optional rated Cv to meet to specific Cv are available (up to 24"), please contact Metso Automation.
 * Rated Cv is applied differently depending on the trim type & trim characteristic.
 * (Srk) means the valve stroke.
 * FC : Full Capacity 1A : 1-Step reduction 2A : 2-Step reduction 3A : 3-Step reduction

Components and materials



Body materials : Carbon steel or alloy steel

Part no.	Description	Material
1	Body	A216 WCB / Alloy steel available
3	Plug	420(J2) stainless steel
5	Stem	17-4PH + HCr
6	Plug Pin	316 stainless steel
7	Seat Ring	420(J2) stainless steel
8	Bonnet	A216 WCB / Alloy steel available
9a	Gland	304 stainless steel
9b	Gland Flange	A351 CF8
11	Yoke Nut	A351 CF8
13	Stud	A193 Gr.B7
14	Stud	A193 Gr.B8
16	Cage Guide	420(J2) stainless steel
17	Hexagon Nut	A194 Gr.2H
18	Hexagon Nut	A194 Gr.8
19	Identification Plate	304 stainless steel
19a	Rivet	304 stainless steel
21	Lantern Ring	304 stainless steel
22	Packing Spring	304 stainless steel
25	Disk Stack	420(J2) stainless steel
63	Seat Gasket	S/W Gasket, 316 SS + Graphite
64	Seal Ring	PTFE + Graphite
65	Body Gasket	S/W Gasket, 316 SS + Graphite
67	Packing Spacer	304 stainless steel
69*	V-Ring Set	PTFE
69	Packing Ring	PTFE + Carbon Fiber, Graphite

- Note.
1. Plug/Seat Hard Facing (Cobalt based alloy) & Soft Seat are available
 2. Materials description
 316 SS: ASTM A276 TP316 or JIS 316 St. Steel
 410 SS: ASTM A276 TP410 or JIS 410 St. Steel
 420(J2) SS: ASTM A276 TP420 or JIS 420J2 St. Steel
 440C SS: ASTM A276 TP440C or JIS 440C St. Steel
 17-4PH: ASTM A564 630 (H1 100) or JIS 630 (H1 100) St. Steel
 3. Optional materials to meet to requirements of NACE MR 01-75 are available
 4. Above standard materials to be applicable depending on specific service conditions, other optional materials to consult Metso Automation.

Body materials : Stainless steel

Part no.	Description	Material
1	Body	A351 CF8M
3	Plug	420(J2) stainless steel
5	Stem	17-4PH + HCr
6	Plug Pin	316 stainless steel
7	Seat Ring	420(J2) stainless steel
8	Bonnet	A351 CF8M
9a	Gland	304 stainless steel
9b	Gland Flange	A351 CF8
11	Yoke Nut	A351 CF8
13	Stud	A193 Gr.B8(M)
14	Stud	A193 Gr.B8(M)
16	Cage Guide	420(J2) stainless steel
17	Hexagon Nut	A194 Gr.8(M)
18	Hexagon Nut	A194 Gr.8
19	Identification Plate	304 stainless steel
19a	Rivet	304 stainless steel
21	Lantern Ring	304 stainless steel
22	Packing Spring	304 stainless steel
25	Disk Stack	420(J2) stainless steel
63	Seat Gasket	S/W Gasket, 316 SS + Graphite
64	Seal Ring	PTFE + Graphite
65	Body Gasket	S/W Gasket, 316 SS + Graphite
67	Packing Spacer	304 stainless steel
69*	V-Ring Set	PTFE
69	Packing Ring	PTFE + Carbon Fiber, Graphite

- Note.
1. Plug/Seat Hard Facing (Cobalt based alloy) & Soft Seat are available
 2. Materials description
 316 SS: ASTM A276 TP316 or JIS 316 St. Steel
 420(J2) SS: ASTM A276 TP420 or JIS 420J2 St. Steel
 3. Above standard materials to be applicable depending on specific service conditions, other optional materials to consult Metso Automation.
 4. Cryogenic application: ASTM A320 B8M & 8M for Studs (13) and Nuts (17)
 5. Optional materials to meet to requirements of NACE MR 01-75 are available

GM Allowable Pressure Drops

Actuator (VDD / VDR / VCC)

Unit : bar

Valve Size		Travel		Rated Cv	Actuator	VD, Air To Open (Reverse)			VD, Air To Close (Direct)			VC, Double Act.	
Inch	mm	Inch	mm	Omega	Size	Spring Range	Supply Press.	Allow.Pr. Drops	Spring Range	Supply Press.	Allow.Pr. Drops	Supply Press.	Allow.Pr. Drops
				Linear									
1"	25	0.8	20	7	#25 (VD)	0.4 ~ 2.1	2.4	16	0.4 ~ 2.1	2.4	68		
						0.8 ~ 2.6	3.2	32	0.8 ~ 2.6	3.2	95		
					#29 (VD)	0.8 ~ 2.6	3.2	45	0.8 ~ 2.6	3.2	136		
					#37 (VD)	0.8 ~ 2.6	3.2	70	0.8 ~ 2.6	3.2	220		
					#30 (VC)							5.0	450
1-1/2"	40	0.8	20	16	#25 (VD)	0.4 ~ 2.1	2.4	7	0.4 ~ 2.1	2.4	30		
						0.8 ~ 2.6	3.2	14	0.8 ~ 2.6	3.2	42		
					#29 (VD)	0.8 ~ 2.6	3.2	20	0.8 ~ 2.6	3.2	60		
					#37 (VD)	0.8 ~ 2.6	3.2	32	0.8 ~ 2.6	3.2	100		
					#30 (VC)						5.0	360	
2"	50	1.6	40	26	#29 (VD)	0.8 ~ 2.6	3.2	40	0.8 ~ 2.6	3.2	48		
					#37 (VD)	0.8 ~ 2.6	3.2	75	0.8 ~ 2.6	3.2	78		
					#48 (VD)	0.8 ~ 2.6	3.2	130	0.8 ~ 2.6	3.2	145		
					#55 (VD)	0.8 ~ 2.6	3.2	175	0.8 ~ 2.6	3.2	210		
3"	80	2	50	54	#37 (VD)	0.8 ~ 2.6	3.2	52	0.8 ~ 2.6	3.2	68		
					#48 (VD)	0.8 ~ 2.6	3.2	105	0.8 ~ 2.6	3.2	118		
					#55 (VD)	0.8 ~ 2.6	3.2	140	0.8 ~ 2.6	3.2	160		
4"	100	2	50	84	#37 (VD)	0.8 ~ 2.6	3.2	36	0.8 ~ 2.6	3.2	56		
					#48 (VD)	0.8 ~ 2.6	3.2	63	0.8 ~ 2.6	3.2	100		
					#55 (VD)	0.8 ~ 2.6	3.2	105	0.8 ~ 2.6	3.2	145		
6"	150	2.4	60	146	#48 (VD)	0.8 ~ 2.6	3.2	52	0.8 ~ 2.6	3.2	64		
					#55 (VD)	0.8 ~ 2.6	3.2	75	0.8 ~ 2.6	3.2	86		
					#30 (VC)						5.0	180	
8"	200	3	80	252	#48 (VD)	0.8 ~ 2.6	3.2	38	0.8 ~ 2.6	3.2	45		
					#55 (VD)	0.8 ~ 2.6	3.2	54	0.8 ~ 2.6	3.2	62		
					#30 (VC)						5.0	110	
10"	250	3.5	90	384	#55 (VD)	0.8 ~ 2.6	3.2	30	0.8 ~ 2.6	3.2	48		
					#30 (VC)						5.0	90	
					#40 (VC)						5.0	150	
					#50 (VC)						5.0	200	
12"	300	4.7	120	560	#30 (VC)							5.0	65
					#40 (VC)						5.0	110	
					#50 (VC)						5.0	150	
14"	350	5.5	140	770	#30 (VC)							5.0	25
					#40 (VC)						5.0	40	
					#50 (VC)						5.0	64	
16"	400	6.3	160	1020	#30 (VC)							5.0	23
					#40 (VC)						5.0	36	
					#50 (VC)						5.0	58	

NOTE

1. VDD: Fail open, air to close (Direct) Multi-Spring Diaphragm Actuator
2. VDR: Fail close, air to open (Reverse) Multi-Spring Diaphragm Actuator
3. VCC: Springless double acting cylinder actuator
4. See actuator bulletin 6DA20En for more information about the actuators.

GM, Ratings & End Connetions

Valve Size DN / Inch	GM, ASME Ratings										
	Class 150 ~ 600				Class 900 ~ 1500				Class 2500		
	RF	RTJ	SW	BW	RF	RTJ	SW	BW	RF	RTJ	BW
25 / 1	O	O	O	O	O	O	O	O	O	O	O
40 / 1-1/2	O	O	O	O	O	O	O	O	O	O	O
50 / 2	O	O	O	O	O	O	O	O	O	O	O
80 / 3	O	O	O	O	O	O	O	O	O	O	O
100 / 4	O	O	O	O	O	O	O	O	O	O	O
150 / 6	O	O	O	O	O	O	O	O	O	O	O
200 / 8	O	O	O	O	O	O	O	O	O	O	O
250 / 10	O	O	O	O	O	O	O	O	O	O	O
300 / 12	O	O	O	O	O	O	O	O	O	O	O
350 / 14	O	O	O	O	O	O	O	O	O	O	O
400 / 16	O	O	O	O	O	O	O	O	O	O	O

*Note 1. RF : Raised Face Flange RTJ : Ring Joint SW : Socket Weld BW : Butt Weld
 2. ASME class 2500# & 4500# ratings are available for sizes(up to 24"), special trims for severe service applications are available.

GM Series Cv vs Travel

ANSI Class : 150# ~ 2500#

Size : 1" ~ 16"

Flow Characteristic: LINEAR

Valve Travel [%]							10	20	30	40	50	60	70	80	90	100	
F _L							1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Valve Size		Orifice Dia.			Travel		Rated Cv										
Inch	mm	Sign	Inch	mm	Inch	mm											
1	25	FC	1A	36.0	1.2	30	0.69	1.37	2.06	2.75	3.43	4.12	4.80	5.49	6.18	7.0	
		1A					0.29	0.59	0.88	1.18	1.47	1.76	2.06	2.35	2.65	3.0	
		2A					0.16	0.31	0.47	0.63	0.78	0.94	1.10	1.25	1.41	1.6	
		3A					0.08	0.16	0.24	0.31	0.39	0.47	0.55	0.63	0.71	0.8	
1-1/2	40	FC	1A	48.0	1.2	30	1.57	3.14	4.71	6.28	7.84	9.41	10.98	12.55	14.12	16.0	
		1A					0.79	1.57	2.35	3.14	3.92	4.71	5.49	6.27	7.06	8.0	
		2A					0.39	0.78	1.18	1.57	1.96	2.35	2.74	3.14	3.53	4.0	
		3A					0.20	0.39	0.59	0.78	0.98	1.18	1.37	1.57	1.76	2.0	
2	50	FC	1A	64.0	1.6	40	2.55	5.10	7.65	10.20	12.75	15.29	17.84	20.39	22.94	26.0	
		1A					1.18	2.35	3.53	4.71	5.88	7.06	8.23	9.41	10.59	12.0	
		2A					0.59	1.18	1.77	2.35	2.94	3.53	4.12	4.71	5.29	6.0	
		3A					0.29	0.59	0.88	1.18	1.47	1.76	2.06	2.35	2.65	3.0	
3	80	FC	1A	89.0	2.0	50	5.3	10.6	15.9	21.2	26.5	31.8	37.1	42.3	47.6	54	
		1A					2.7	5.5	8.2	11.0	13.7	16.5	19.2	22.0	24.7	28	
		2A					1.4	2.7	4.1	5.5	6.9	8.2	9.6	11.0	12.4	14	
		3A					0.7	1.4	2.1	2.7	3.4	4.1	4.8	5.5	6.2	7	
4	100	FC	1A	111.5	2.0	50	8.2	16.5	24.7	32.9	41.2	49.4	57.6	65.9	74.1	84	
		1A					5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9	52	
		2A					2.6	5.1	7.6	10.2	12.7	15.3	17.8	20.4	22.9	26	
		3A					1.4	2.7	4.1	5.5	6.9	8.2	9.6	11.0	12.4	14	
6	150	FC	1A	131.5	2.4	60	14.3	28.6	43.0	57.3	71.6	85.9	100.2	114.5	128.8	146	
		1A					8.8	17.7	26.5	35.3	44.1	52.9	61.8	70.6	79.4	90	
		2A					4.4	8.8	13.2	17.6	22.1	26.5	30.9	35.3	39.7	45	
		3A					2.2	4.3	6.5	8.6	10.8	12.9	15.1	17.3	19.4	22	
8	200	FC	1A	176.0	3.1	80	24.7	49.4	74.1	98.8	123.5	148.2	172.9	197.6	222.3	252	
		1A					15.3	30.6	45.9	61.2	76.5	91.8	107.0	122.3	137.6	156	
		2A					7.7	15.3	22.9	30.6	38.2	45.9	53.5	61.2	68.8	78	
		3A					3.9	7.8	11.8	15.7	19.6	23.5	27.4	31.4	35.3	40	
10	250	FC	1A	214.2	3.5	90	37.7	75.3	113.0	150.6	188.2	225.9	263.5	301.1	338.8	384	
		1A					23.0	45.9	68.8	91.8	114.7	137.6	160.6	183.5	206.4	234	
		2A					11.4	22.8	34.1	45.5	56.9	68.2	79.6	91.0	102.3	116	
		3A					5.7	11.4	17.1	22.7	28.4	34.1	39.8	45.5	51.2	58	
12	300	FC	1A	265.0	4.7	120	55.0	109.9	164.8	219.6	274.5	329.4	384.3	439.2	494.0	560	
		1A					33.4	66.7	100.0	133.3	166.7	200.0	233.3	266.6	299.9	340	
		2A					16.7	33.4	50.0	66.7	83.3	100.0	116.7	133.3	150.0	170	
		3A					8.2	16.5	24.7	32.9	41.2	49.4	57.6	65.9	74.1	84	
14	350	FC	1A	315.5	5.5	140	75.6	151.1	226.5	302.0	377.5	452.9	528.4	603.8	679.3	770	
		1A					46.1	92.2	138.3	184.3	230.4	276.5	322.5	368.6	414.6	470	
		2A					23.0	45.9	68.8	91.8	114.7	137.6	160.6	183.5	206.4	234	
		3A					11.4	22.8	34.1	45.5	56.9	68.2	79.6	91.0	102.3	116	
16	400	FC	1A	358.0	6.3	160	100.0	200.1	300.1	400.0	500.0	600.0	699.9	799.9	899.8	1020	
		1A					61.2	122.4	183.6	244.7	305.9	367.0	428.2	489.3	550.5	624	
		2A					30.4	60.8	91.2	121.6	152.0	182.3	212.7	243.1	273.5	310	
		3A					15.1	30.2	45.3	60.4	75.5	90.6	105.7	120.8	135.9	154	

NOTE

c_v: Valve flow coefficient

F_L: Liquid pressure recovery factor

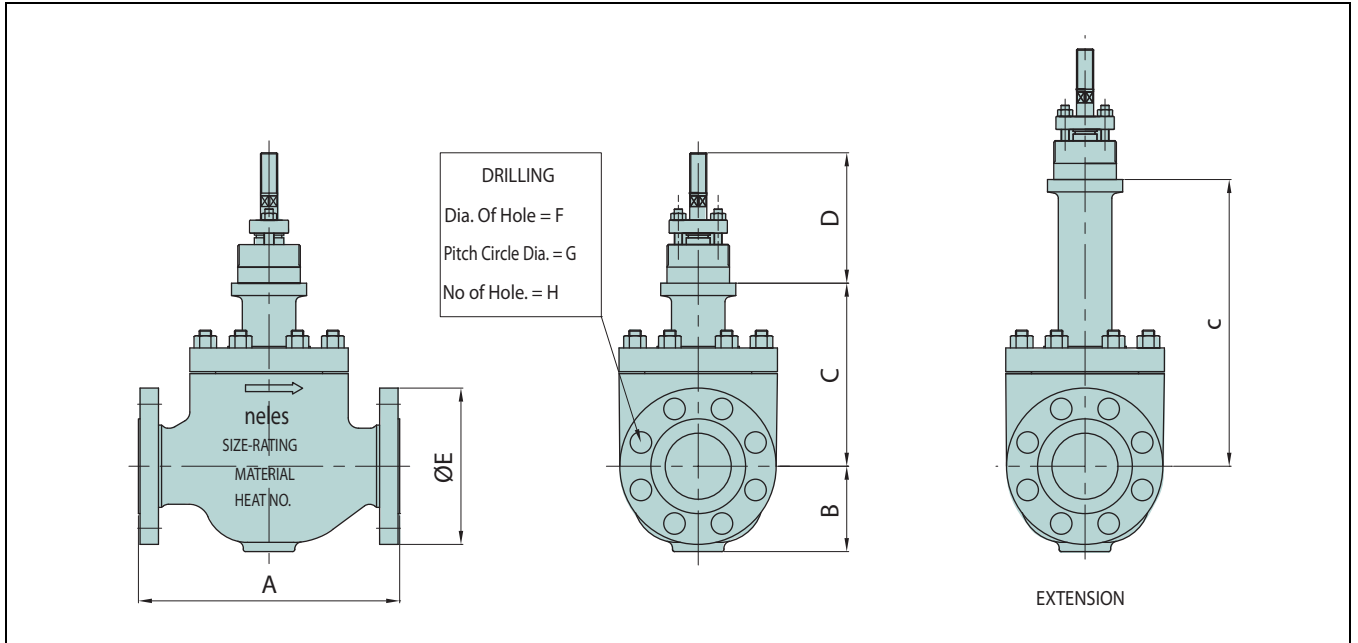
FC: Full Capacity

1A: 1-Step reduction

2A: 2-Step reduction

3A: 3-Step reduction

Valve dimensions



150 # / 300 # / 600 #

(UNIT: mm)

Dimension Size	A			B			C		D	E			F			G			H			Weight (kg)		
	150#	300#	600#	150#	300#	600#	STD	EXT	COMMON	150#	300#	600#	150#	300#	600#	150#	300#	600#	150#	300#	600#	150#	300#	600#
1"	184	197	210	54	62	62	142	250	110	110	125	125	15.9	19.1	19.1	79.4	88.9	88.9	4	4	4	14	15	23
1-1/2"	222	235	251	65	78	78	161	295	110	125	155	155	15.9	22.2	22.2	98.4	114.3	114.3	4	4	4	26	27	31
2"	254	267	286	83	83	83	178	295	110	150	165	165	19.1	19.1	19.1	120.7	127	127	4	8	8	30	32	40
3"	298	318	337	109	109	120	222	330	115	190	210	210	19.1	22.2	22.2	152.4	168.3	168.3	4	8	8	65	67	72
4"	352	368	394	135	135	135	248	380	140	230	255	275	19.1	22.2	25.4	190.5	200	215.9	8	8	8	100	103	112
6"	451	473	508	170	170	178	340	430	150	280	320	355	22.2	22.2	28.6	241.3	269.9	292.1	8	12	12	185	195	240
8"	543	568	610	230	230	230	451	490	150	345	380	420	22.2	25.4	31.8	298.5	330.2	349.2	8	12	12	363	385	443
10"	673	708	752	275	275	275	488	600	150	405	445	510	25.4	28.6	34.9	362	387.4	431.8	12	16	16	552	595	681
12"	737	775	819	350	350	350	543	660	150	485	520	560	25.4	31.8	34.9	431.8	450.8	489	12	16	20	905	955	1020
14"	889	927	972	385	385	385	616	740	210	535	585	605	28.6	31.8	38.1	476.3	514.4	527	12	20	20	1170	1230	1311
16"	1016	1057	1108	440	440	440	692	820	220	595	650	685	28.6	34.9	41.3	539.8	571.5	603.2	16	20	20	1380	1460	1587

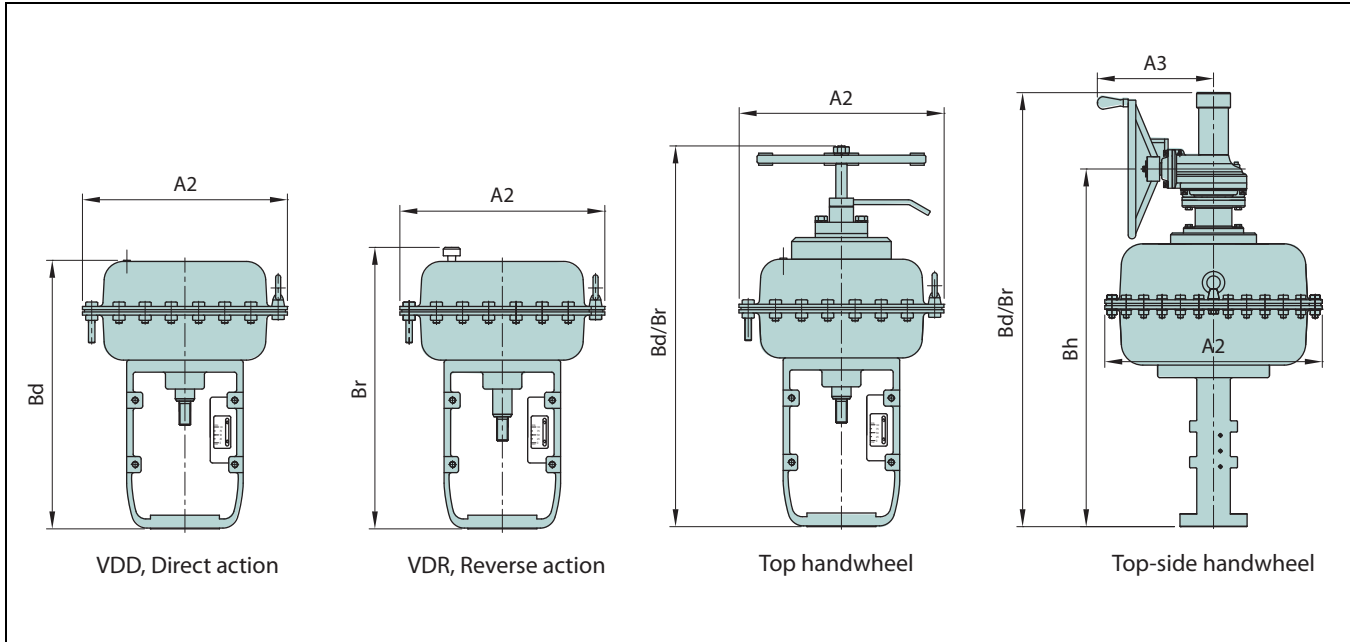
900 # / 1500 #

(UNIT: mm)

Dimension Size	A		B		C		D	E		F		G		H		Weight (kg)	
	900#	1500#	900#	1500#	STD	EXT	COMMON	900#	1500#	900#	1500#	900#	1500#	900#	1500#	900#	1500#
1"	292	292	83	83	229	330	110	150	150	25.4	25.4	101.6	101.6	4	4	44	46
1-1/2"	333	333	100	100	278	380	110	180	180	28.6	28.6	123.8	123.8	4	4	63	63
2"	375	375	108	108	300	400	110	215	215	25.4	25.4	165.1	165.1	8	8	67	67
3"	441	460	135	135	330	430	115	240	265	25.4	31.8	190.5	203.2	8	8	150	163
4"	511	530	182	182	350	450	150	290	310	31.8	34.9	235	241.3	8	8	244	255
6"	714	768	198	198	393	500	150	380	395	31.8	38.1	317.5	317.5	12	12	530	540
8"	914	972	245	245	480	600	150	470	485	38.1	44.5	393.7	393.7	12	12	698	821
10"	991	1067	307	307	518	650	150	545	585	38.1	50.8	469.9	482.6	16	12	955	1137
12"	1130	1219	385	385	680	800	150	610	675	38.1	54	533.4	571.5	20	16	1180	1240
14"	1257	1257	420	420	770	920	210	640	750	41.3	60.3	558.8	635	20	16	1387	1477
16"	1422	1422	450	470	850	1050	220	705	825	44.5	66.7	616	704.8	20	16	1601	1721

Actuator dimensions

VD Diaphragm actuators



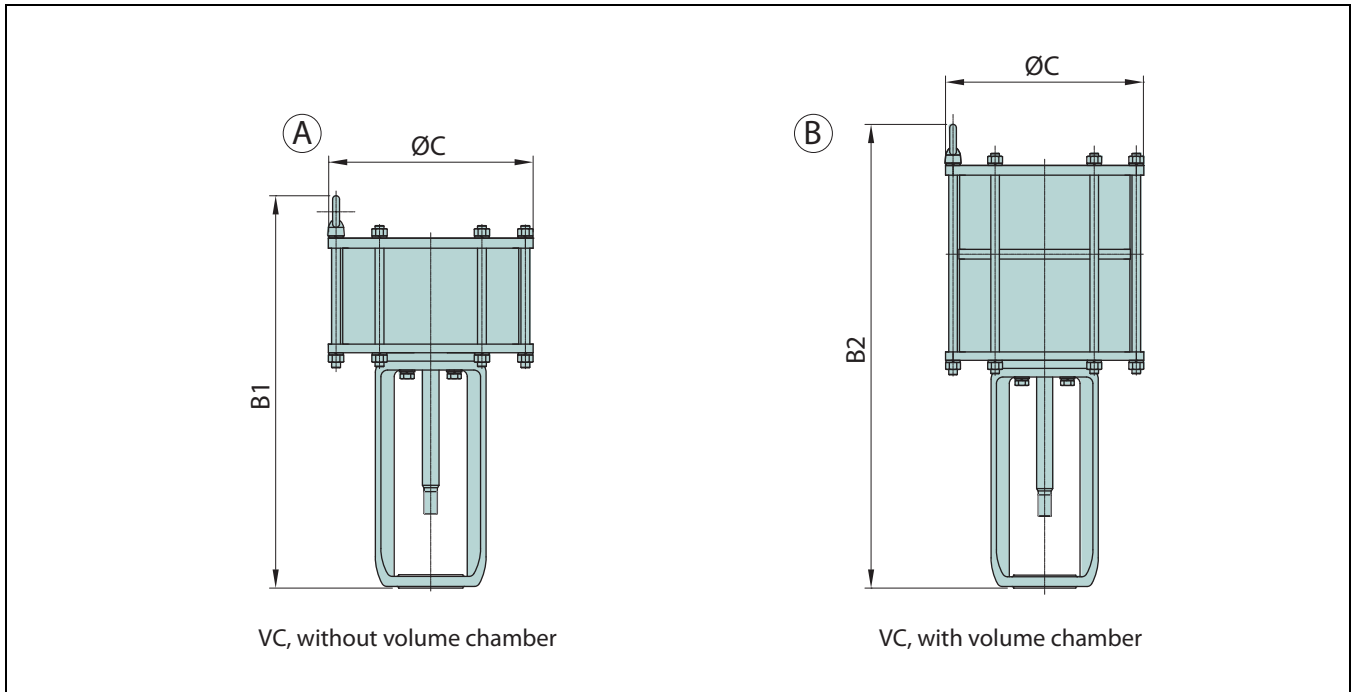
(UNIT: mm)

Dimension Size	Without handwheel				With handwheel					
	A2	Bd	Br	Weight (kg)	A2	Bd	Br	A3	Bh	Weight (kg)
#25	255	333	358	10	255	473	440	-	-	13
#29	295	370	397	19	295	576	529	-	-	25
#37	375	450	475	37	375	660	614	-	-	46
#48	486	632	654	92	486	1053	1053	335	847	112
#55	566	675	700	116	566	1106	1106	335	915	145

NOTE:
 1. "Br" refers to reverse acting actuator, VDR
 2. "Bd" refers to direct acting actuator, VDD

Actuator dimensions

VC actuators without handwheel



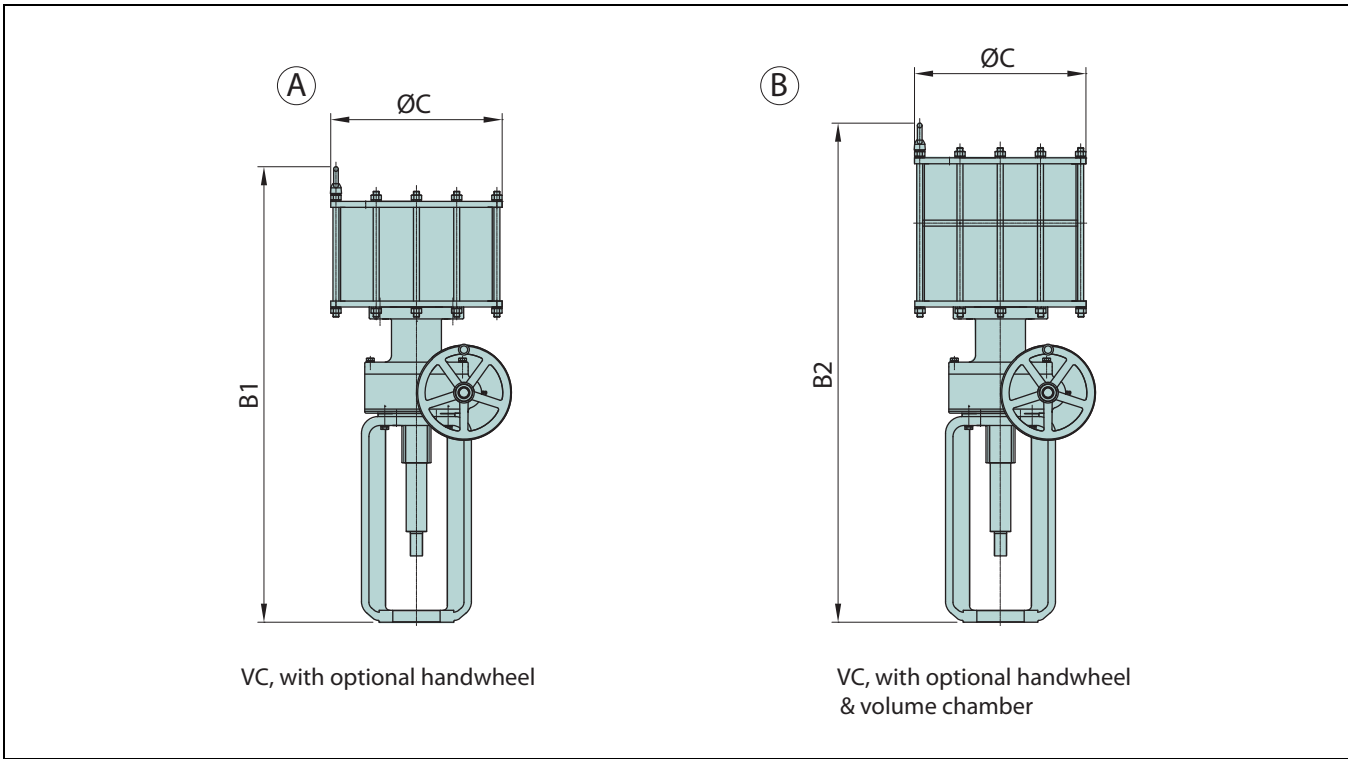
(UNIT: mm)

Stroke	#30				#40					#50				
	B1	Ø C	Weight (kg)		Stroke	B1	Ø C	Weight (kg)		Stroke	B1	Ø C	Weight (kg)	
	B2		A	B		A		B	A		B			
40	590	Ø 370	92	116	40	625	Ø 460	118	149	40	625	Ø 560	150	188
	680					920					920			
50	610	Ø 370	97	122	50	645	Ø 460	123	156	50	645	Ø 560	156	195
	700					940					940			
70	650	Ø 370	102	128	70	685	Ø 460	127	160	70	685	Ø 560	162	202
	740					950					950			
80	670	Ø 370	107	134	80	705	Ø 460	132	166	80	705	Ø 560	168	210
	760					970					970			
100	710	Ø 370	113	141	100	745	Ø 460	135	170	100	745	Ø 560	175	218
	800					1010					1010			
120	750	Ø 370	119	147	120	785	Ø 460	139	175	120	785	Ø 560	181	226
	840					1030					1030			
150	845	Ø 370	119	147	150	845	Ø 460	144	181	150	845	Ø 560	188	233
	1090					1090					1090			
160	865	Ø 370	119	147	160	865	Ø 460	148	186	160	865	Ø 560	195	242
	1110					1110					1110			
170	885	Ø 370	119	147	170	885	Ø 460	155	194	170	885	Ø 560	202	250
	1130					1130					1130			
180	905	Ø 370	119	147	180	905	Ø 460	159	199	180	905	Ø 560	209	259
	1150					1150					1150			

NOTE:
 B1 : without volume chamber
 B2 : with volume chamber

Actuator dimensions

VC actuators with handwheel



(UNIT: mm)

Stroke	#30				Stroke	#40				Stroke	#50						
	B1	B2	Weight (kg)			B1	B2	Ø C	Weight (kg)		B1	B2	Ø C	Weight (kg)			
			(A)	(B)					(A)					(B)	(A)	(B)	
40	910	1020	Ø 370	120	144	40	1080	1210	Ø 460	158	189	40	1080	1210	Ø 560	190	228
	1020			125	150		163			196	1090		1230			196	235
50	920	1040	Ø 370	130	156	50	1110	1270	Ø 460	167	200	50	1110	1270	Ø 560	202	242
	1080						1290						172				
70	940	1080	Ø 370	141	169	70	1140	1330	Ø 460	175	210	70	1140	1330	Ø 560	215	258
	1100						1160						179				
80	950	1100	Ø 370	147	175	80	1190	1430	Ø 460	184	221	80	1190	1430	Ø 560	228	273
	1120						1200						188				
100	970	1140	Ø 370	188	226	100	1220	1470	Ø 460	195	234	100	1220	1470	Ø 560	242	290
	1180						1220						199				
120	990	1180	Ø 370	199	239	120	1220	1490	Ø 460	199	239	120	1220	1490	Ø 560	249	299
	1180						1220						199				

NOTE:
 B1 : without volume chamber
 B2 : with volume chamber

HOW TO ORDER

Globe single seated, OMEGA trim type, Series GM

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
GM	02	H	Z	A	J2	X	P2	X	BC	S1	P2	X	S	F	G	S	A	X	A	L	FC

VALVE CONSTRUCTIONS

1.	VALVE SERIES			
GM	Globe single seated, OMEGA trim type			
2.	BODY SIZE			
01	1" / DN 25	1H	1-1/2" / DN 40	
02	2" / DN 50	03	3" / DN 80	
04	4" / DN 100	06	6" / DN 150	
08	8" / DN 200	10	10" / DN 250	
12	12" / DN 300	14	14" / DN 350	
16	16" / DN 400	YY	Special	
3.	PRESSURE RATING			
C	ASME class 150	D	ASME class 300	
F	ASME class 600	G	ASME class 900	
H	ASME class 1500	I	ASME class 2500	
A	ASME class 4500	Y	Special	
4.	END CONNECTION			
W	Flanged RF, ASME B16.5			
V	Socket welding, ASME B16.11			
Q	Butt welding, ASME B16.25			
Z	Ring joint flange, ASME B16.5			
Y	Special			
5.	BONNET CONSTRUCTION			
	Bonnet type	Actuator Connection		
A	Standard	Standard actuator size		
B	Standard	Applicable for VD_48/55 (3",4" only)		
E	Extension	Standard actuator size		
F	Extension	Applicable for VD_48/55 (3",4" only)		
Y	Special	Special		
6.	BODY & BONNET MATERIAL			
J2	A216 WCB	S4	A351 CF8	
S6	A351 CF8M	S9	A351 CF3	
S1	A351 CF3M	YY	Special	
7.	BEARINGS (TRUNNION / THRUST BEARING)			
X	Not applicable		Y	Special

TRIM CONSTRUCTIONS

8.	PLUG MATERIAL			
P2	420(J2) SS			
YY	Special			
9.	PLUG APPLICATION			
X	Not applicable		A	Cobalt based alloy
C	Hard chrome		D	Cobalt based alloy + HCr
Y	Special			

10.	STEM MATERIAL			
BC	17-4PH + HCr			
YY	Special			
11.	SEAT TYPE			
S1	Single metal seat			
YY	Special			
12.	SEAT / DISK MATERIAL			
	Seat	Disk Stack	Cage Guide	
P2	420(J2) SS	420(J2) SS	420(J2) SS	
YY	Special	Special	Special	
13.	SEAT APPLICATION			
X	Not applicable			
A	Cobalt based alloy			
Y	Special			

OTHERS

14.	PACKING TYPE			
S	Standard	Y	Special	
15.	PACKING MATERIAL			
T	PTFE V-ring	G	PTFE + Carbon fiber	
F	Graphite	Y	Special	
16.	SEALS MATERIAL			
G	PTFE + Graphite	T	PTFE	
F	Graphite	M	Metal	
X	Not applicable			
17.	GASKET MATERIAL			
S	Standard, S/W gasket type, 316 SS + Graphite			
H	S/W gasket type, 316 SS + Graphite for high temp.			
L	S/W gasket type, 316 SS + PTFE			
Y	Special			
18.	STUD / NUT MATERIAL			
A	A193 B7 / A194 2H			
B	A193 B8 / A194 8			
Y	Special			
19.	OPTIONS			
X	Not applicable		Y	Special

TRIM TYPE & RATED Cv

20. Sign	TRIM TYPE	21. Sign	Trim characteristic	22. Sign	Description	RATED Cv												
						Body Size												
						1" (Srk)	1-1/2" (Srk)	2" (Srk)	3" (Srk)	4" (Srk)	6" (Srk)	8" (Srk)	10" (Srk)	12" (Srk)	14" (Srk)	16" (Srk)		
A P	Standard (Balanced) Pilot balanced type	L Q	Linear Quick opening	FC	Full capacity	7 (30)	16 (30)	26 (40)	54 (50)	84 (50)	146 (60)	252 (80)	384 (90)	560 (120)	770 (140)	1020 (160)		
				1A	1-Step reduction	3 (30)	8 (30)	12 (40)	28 (50)	52 (50)	90 (60)	156 (80)	234 (90)	340 (120)	470 (140)	624 (160)		
				2A	2-Step reduction	1.6 (30)	4 (30)	6 (40)	14 (50)	26 (50)	45 (60)	78 (80)	116 (90)	170 (120)	234 (140)	310 (160)		
				3A	3-Step reduction	0.8 (30)	2 (30)	3 (40)	7 (50)	14 (50)	22 (60)	40 (80)	58 (90)	84 (120)	116 (140)	154 (160)		
				E M	Equal % Modified EQ%	FC	Full capacity	5 (30)	10 (30)	18 (40)	38 (50)	60 (50)	104 (60)	176 (80)	268 (90)	390 (120)	540 (140)	710 (160)
						1A	1-Step reduction	2.5 (30)	6 (30)	11 (40)	24 (50)	36 (50)	64 (60)	108 (80)	164 (90)	236 (120)	328 (140)	430 (160)
2A	2-Step reduction	1.2 (30)	3 (30)			5 (40)	12 (50)	18 (50)	32 (60)	54 (80)	82 (90)	118 (120)	164 (140)	214 (160)				
		3A	3-Step reduction	0.6 (30)	1.5 (30)	2 (40)	6 (50)	9 (50)	16 (60)	27 (80)	40 (90)	60 (120)	82 (140)	106 (160)				
Y	Special Trim Type	Y	Special	YY	Special	Contact Metso Automation for Cv details												

* Optional rated Cv to meet to specific Cv are available (up to 24"), please contact Metso Automation.

* Rated Cv is applied differently depending on the trim type & trim characteristic.

* (Srk) means the valve stroke.

* FC : Full Capacity 1A : 1-Step reduction 2A : 2-Step reduction 3A : 3-Step reduction

Subject to change without prior notice.

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www.metso.com/valves

