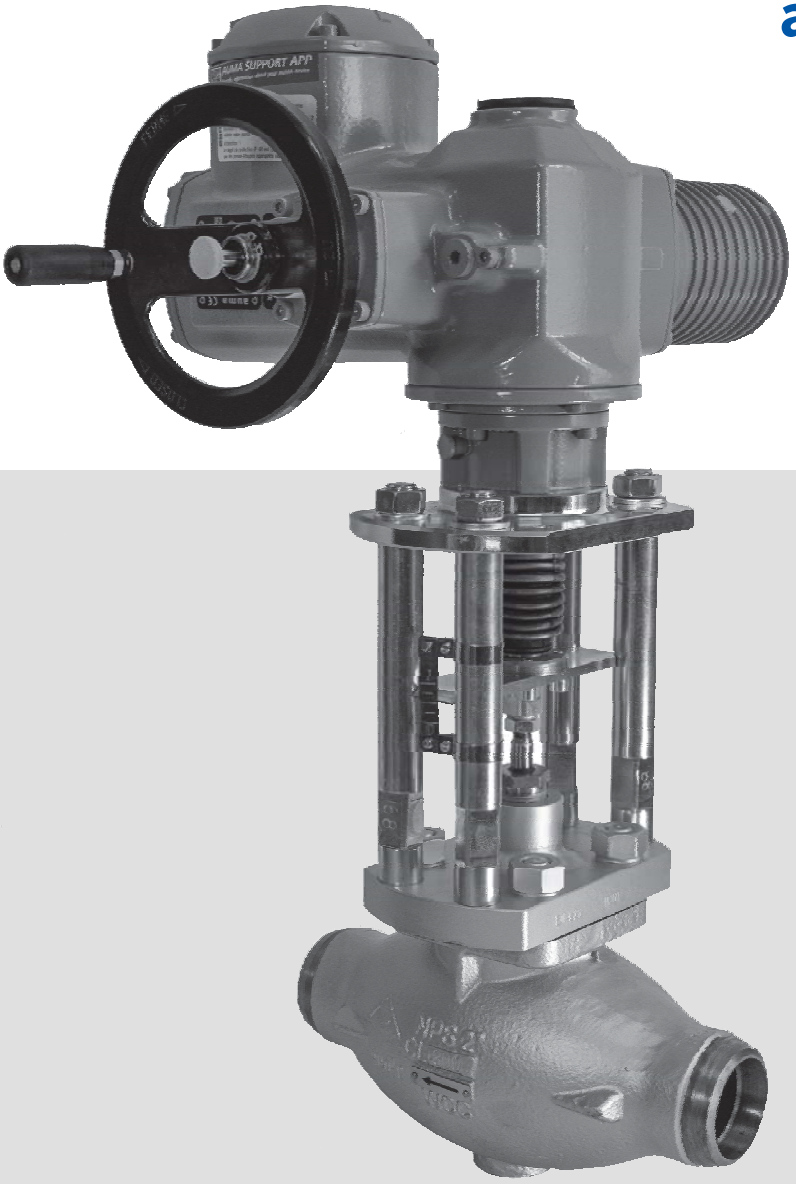
LRQA CERTIFIED
ISO 9001 · ISO 14001
ISO 45001

LDM®

02 - 09.4
05.20.GB

CONTROL AND SHUT-OFF VALVES IN SEISMIC VERSION

300 line
acc. to ANSI/ASME



POWER THROUGH IDEAS
www.ldmvalves.com

300 line

CV / SV 320 SP (Ex)
CV / SV 330 SP (Ex)

single-seated,
control (shut-off) valve

CV 322 SP (Ex)
CV 332 SP (Ex)

single-seated,
control valve with
pressure-balanced plug

Control (shut-off) **CV / SV 300 line in seismic version** are designed for regulation and shut-off of process liquid flow, for which seismic resistance of the device is required. The valves meet the conditions of **seismic resistance** in the sense of maintaining mechanical integrity and functionality after a seismic event with a response spectrum of up to 30 $m.s^{-2}$ in all directions, in the band 0 to 33 Hz. Thus, they meet the requirements of **seismic classification 1b of fittings for nuclear energy according to OTT 87/91** and in non-nuclear applications meet the conditions for use in earthquake-prone areas with a maximum intensity of up to 9 degrees of the international scale EMS-98, or MSK-64 (9 bal).
In Ex proof version meet the requirements II 1/2G IIC T6...T1 Ga/Gb acc. to ČSN EN ISO 80079-36 (9/2016) and ČSN EN 1127-1 ed.2 (1/2012).
The selected materials correspond to the recommendations acc. to ČSN EN 12516-1 (8/2015). The maximal permissible operating pressures in behaviour with types of material and temperature are specified in the table on page 24 of this catalogue.

Control

hand wheel
seismically resistant electromechanical actuators **Auma**, or other manufacturers

Application

CV / SV 3xx SP - heating, ventilation, power generation and chemical processing industries
CV / SV 3xx SPEx - gas and chemical industries

Process media

iquids, gases and vapours without abrasive particles
e.g. water, steam, air and other media compatible with material of the valve inner parts

To ensure a reliable regulation, the producers recommends to pipe a strainer in front of the valve into pipeline or ensure in any other way that process medium does not contain abrasive particles or impurities

Installation

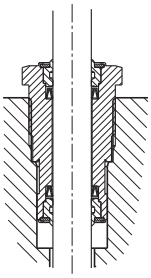
The valve can be installed in any position except position when the actuator is under the valve body. The valve is to be piped the way so that the direction of medium flow will coincide with the arrows on the body.

It is necessary to protect the actuator from excessive heat from the pipeline at medium **temperatures** above **150 °C (300 °F)**, e.g. by appropriately insulating the pipeline and valve and tilting the actuator from the vertical axis. Detailed informations are given in the instruction for installation and service.

Packings

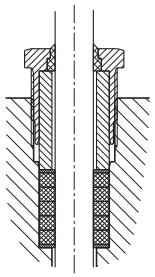
DRSpack® (PTFE)

DRSpack® (Direct Radial Sealing Pack) is a packing with high tightness at both low and high operating pressure values.
It is the most used type of packing suitable for temperatures ranging from 0 °C to 260 °C. The pH range is from 0 to 14. The packing enables using of actuators with low linear force. The design enables an easy change of the whole packing. The average service life of DRSpack® is more than 500 000 cycles.



Graphite

This type of packing can be used for media **with temperature up to 550°C (1020 °F)** and pH range: 0 to 14. Packing can be "sealed up" either by screwing the packing screw in or adding another sealing ring. In regard of intensive frictional forces, graphite packing is suitable for actuators with a sufficient linear force.

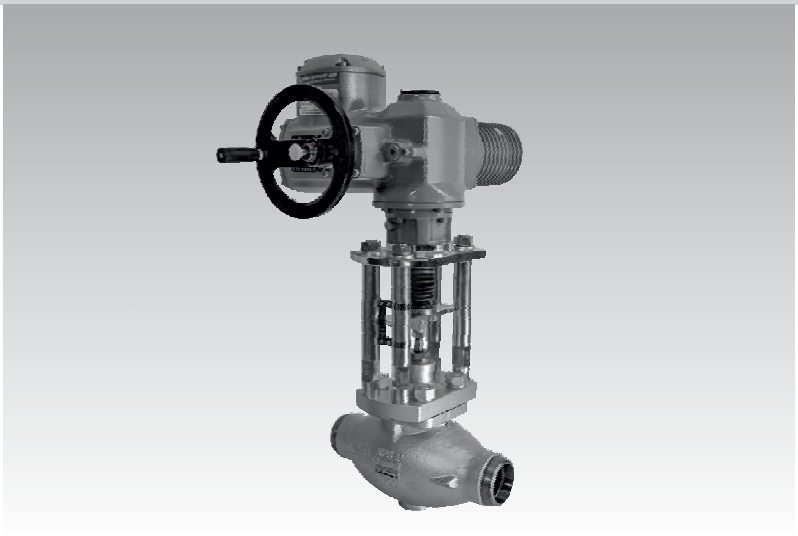


Principles for plug type selection

V-ported plugs should not to be used in supercritical differential pressures with inlet pressure p ≧ 0,4 MPa and for regulation of saturated steam. In these cases we recommend to use a perforated plug. The perforated plug should be also used always when cavitation may occur due to a high differential pressure value or valve ports erosion caused by high speed of process medium flow. If the parabolic plug is used (because of small Kvs) for supercritical differential pressures, it is necessary to close both plug and seat with a hard metal overlay, i.e. stellited trim.

Rangeability

Rangeability is the ratio of the biggest value of flow coefficient to the smallest value. In fact it is the ratio (under the same conditions) of highest regulated flow rate value to its lowest value. The lowest or minimal regulated flow rate is always higher than 0.



CV/SV 3x0 SP

Control and shut-off valves in seismic version

NPS 1/2" - 16", Class 150, 300 and 600

Technical data

Series		CV / SV 320 (Ex)	CV / SV 330 (Ex)
Type of valve		**Two-way, single-seated, control (shut-off) valve**	
Nominal size range		NPS 1/2" - 16"	
Nominal pressure		Class 300 and 600 (Class 150, 300 and 600 (weld ended)	
Body material		Cast steel A216 WCB, A217 WC6	Stainless steel A351 CF8M
Seat material:	NPS 1/2" - 2"	1.4028	1.4571
DIN W.Nr./+ČSN	NPS 3" - 16"	1.4027	1.4581
Plug material:	NPS 1/2" - 2"	1.4021	1.4571
DIN W.Nr./+ČSN	NPS 3" - 16"	1.4027	1.4581
Stem material		1.4923	1.4980
Operating temperature range		-50 to 550 °C (-58 to 1020 °F) - (the negative temperature requirement must be specified in the order)	
Face to face dimensions		Acc. to ISA-75.08.01-2002 (R2007) for version with flanges	
		Acc. to ISA-75.08.03-2001 (R2007) for weld ends - version Socket Weld	
		Acc. to ISA - 75.08.05-2002 (R2007) for weld ends - version Butt Weld	
Connection flanges		Acc. to ČSN EN 1092-1+A1 (7/2013)	
Flange faces		Type B1 (raised-faced) or Type B2 (plain face) or Type F (female), or Type D (groove) acc. to ČSN EN 1092-1+A1 (7/2013)	
Weld ends		Weld ends acc. to ČSN EN 12627-2 (8/2000)	
Type of plug		V-ported, contoured, perforated	
Flow characteristic		Linear, equal-percentage, LDMspline®, parabolic, on - off	
Kvs value		0.01 to 1600 m^3/h	
Leakage rate		Class III. acc. to ČSN-EN 1349 (7/2010) (<0.1% Kvs) for c. valves with metal-metal seat sealing	
		Class IV. acc. to ČSN-EN 1349 (7/2010) (<0.01% Kvs) for shut off valve	
		Class IV. acc. to ČSN EN 1349 (7/2010) (<0.01% Kvs) pro uzavírací ventil	
Leakage rate for Ex version		CV 3xx class IV. acc. to ANSI/FCI 70-2-2013 (< 0.01% Kvs); SV 3xx step C acc. to ISO 5208:2008	
Rangeability r		50 : 1	
Packing		DRSpack® (PTFE) t_{max} = 260 °C (500°F), Expanded graphite t_{max} = 550 °C (1020°F), Bellows (DN15-150) t_{max} = 550°C (1020°F)	
Seismic resistance		0 to 33 Hz, 30 $m.s^{-2}$	

Cv (Kvs) values and differential pressures Δp_{max} [MPa], [psi] of valves NPS ½" - 16" with countoured and V-ported plugs flow direction below plug) with electro-mechanic actuators

Δp_{max} value is the valve max. differential pressure when max open - close function is always guaranteed.
Differential pressure must not exceed 2,0 MPa (290 psi) for valves Class 150 and 5,0 MPa (750 psi) for valves Class 300. In regard of service life of seat and plug, it is recommended so that permanent differential pressure would not exceed 1.6 MPa / 232 psi. Otherwise it is suitable to use perforated plug (Δp up to 4,0 MPa / 580 psi) or sealing surfaces of seat and plug with a hard metal overlay (Δp up to 2,5 MPa / 363 psi).

For further information on actuating, see actuators' catalogue sheets			Actuating (actuating)										Auma		Auma		Auma		Hand wheel	
			Marking in valve specification No.										EA...		EA...		EA...		Rxx	
			Linear force										5 kN		7.5 kN		10 kN			
			Kvs [m³/h] Cv [US galon/min]										Δp_{max} [MPa] [psi] packing		Δp_{max} [MPa] [psi] packing		Δp_{max} [MPa] [psi] packing		Δp_{max} [MPa] [psi] packing	
NPS	H[mm]	Ds[mm]	1	2	3	4	5	6	7	8	9		graphite	PTFE	graphite	PTFE	graphite	PTFE	graphite	PTFE
½"	16	3	---	---	---	---	---	---	---	0.16[3] **0.18[3]**	0.1...0.01[3] **0.116...0.012[3]**		10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		6	---	---	---	---	---	---	0.25[1] **0.29[1]**	---	---	---	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		8	---	---	---	1.0[1] **1.16**	0.63[1] **0.73**	0.4[1] **0.46**	---	---	---	---	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		12	---	2.5[1] **2.89**	1.6[1] **1.85**	---	---	---	---	---	---	---	6.42 **905**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		15	4.0[1] **4.62[1]**	---	---	---	---	---	---	---	---	---	8.91 **1293**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
1"		3	---	---	---	---	---	---	---	---	---	0.16...0.01[3] **0.18...0.012[3]**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		6	---	---	---	---	---	---	---	---	0.25[1] **0.29[1]**	---	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		8	---	---	---	---	---	1.0[1] **1.16[1]**	0.63[1] **0.73[1]**	0.4[1] **0.46[1]**	---	---	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		12	---	---	---	2.5[1] **2.89[1]**	1.6[1] **1.85[1]**	---	---	---	---	---	6.42 **905**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		15	---	---	4.0[1] **4.62[1]**	---	---	---	---	---	---	---	8.91 **1293**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		20	---	6.3[2] **7.28[2]**	---	---	---	---	---	---	---	---	4.33 **628**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		25	10.0 **11.6**	6.3[4] **7.28[4]**	4.0[4] **4.62[4]**	---	---	---	---	---	---	---	2.59 **376**	6.48 **940**	7.16 **1038**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
1½"		6	---	---	---	---	---	---	---	---	---	0.25[1] **0.29[1]**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		8	---	---	---	---	---	---	---	1.0[1] **1.16[1]**	0.63[1] **0.73[1]**	0.4[1] **0.46[1]**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		12	---	---	---	---	---	2.5[1] **2.89[1]**	1.6[1] **1.85[1]**	---	---	---	6.42 **905**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		15	---	---	---	---	4.0[1] **4.62[1]**	---	---	---	---	---	8.91 **1293**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		20	---	---	---	6.3[2] **7.28[2]**	---	---	---	---	---	---	4.33 **628**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
		40	25 **28,9**	16 **18.5**	10 **11.6**	6.3[4] **7.28[4]**	4.0[4] **4.62[4]**	---	---	---	---	---	0.90 **131**	2.42 **350**	2.68 **388**	4.19 **608**	4.45 **646**	5.97 **866**	4.45 **646**	5.97 **866**
2"	20	50	40 **46.2**	25 **28,9**	16 **18.5**	10 **11.6**	6.3[4] **7.28[4]**	---	---	---	---	---	0.50 **72**	1.40 **240**	1.56 **226**	2.47 **358**	2.63 **381**	3.53 **512**	2.63 **381**	3.53 **512**

the table continues on the next page

[1] parabolic plug
[2] V-ported plug with linear characteristic, parabolic plug with equal-percentage and LDMspline®
[3] valve with micro-throttling trim. Execution with Kvs = 0,16; 0,1; 0,063; 0,04; 0,025; 0,016; 0,01
(Cv = 0,18; 0,11; 0,073; 0,046; 0,029; 0,018; 0,011)
[4] V-ported plug with linear characterictic only

For further information on actuating, see actuators' catalogue sheets			**Actuating (actuating)**					**Auma**		**Auma**		**Auma**		**Auma**		**Auma**		**Hand wheel**	
			Marking in valve spec. No.					**EA...**		**EA...**		**EA...**		**EA...**		**EA...**		**Rxx**	
			Linear force					7.5 kN		10 kN		15 kN		20 kN		32 kN			
			Kvs [m³ /h]					**Δp_{max}** [MPa] **[psi]**		**Δp_{max}** [MPa] **[psi]**		**Δp_{max}** [MPa] **[psi]**		**Δp_{max}** [MPa] **[psi]**		**Δp_{max}** [MPa] **[psi]**			
			Cv [US galon/min]					packing		packing		packing		packing		packing		packing	
NPS	**H[mm]**	**Ds[mm]**	**1**	**2**	**3**	**4**	**5**	graphite	PTFE	graphite	PTFE	graphite	PTFE	graphite	PTFE	graphite	PTFE	graphite	PTFE
3"	**40**	**80**	100 **116**	63 **72.8**	40 **46.2**	25 **28.9**	16 **18.5**	0.28 **41**	0.73 **106**	0.73 **106**	1.18 **171**	1.63 **236**	2.08 **302**	2.53 **367**	2.98 **432**	---	---	1.81 **263**	2.26 **328**
4"		**100**	160 **185**	100 **116**	63 **72.8**	40 **46.2**	25 **28.9**	0.16 **23**	0.45 **65**	0.45 **65**	0.74 **108**	1.03 **150**	1.32 **192**	1.62 **234**	1.91 **277**	---	---	1.15 **167**	1.44 **209**
6"		**150**	360 **416**	250 **289**	160 **185**	100 **116**	63 **72.8**	0.05 **7**	0.18 **26**	0.18 **26**	0.31 **45**	0.44 **64**	0.58 **83**	0.71 **103**	0.84 **122**	---	---	0.50 **72**	0.63 **91**
8"	**80**	**100**	---	---	250 **289**	160 **185**	100 **116**	---	---	---	---	0.85 **124**	1.19 **173**	1.44 **210**	1.79 **259**	2.87 **416**	3.21 **465**	3.81 **553**	4.15 **602**
		150	---	400 **462**	---	---	---	---	---	---	---	0.36 **52**	0.51 **74**	0.62 **91**	0.78 **113**	1.27 **183**	1.42 **206**	1.69 **245**	1.85 **268**
		200	**570** 659	---	---	---	---	---	---	---	---	**0.19** 27	**0.28** 40	**0.34** 49	**0.43** 62	**0.70** 102	**0.79** 115	**0.95** 137	**1.03** 150
10"	**80**	**150**	---	---	400 **462**	250 **289**	160 **185**	---	---	---	---	0.21 **31**	0.39 **56**	0.48 **70**	0.66 **96**	1.13 **164**	1.31 **190**	1.56 **227**	1.74 **252**
		200	---	630 **728**	---	---	---	---	---	---	---	0.11 **15**	0.20 **30**	0.26 **37**	0.36 **52**	0.62 **91**	0.72 **105**	0.87 **126**	0.97 **141**
		230	800 **925**	---	---	---	---	---	---	---	---	0.07 **11**	0.15 **21**	0.19 **27**	0.26 **38**	0.47 **68**	0.54 **79**	0.65 **95**	0.73 **106**
12"	**80**	**150**	---	---	---	400 **462**	250 **289**	---	---	---	---	0.21 **31**	0.39 **56**	0.48 **70**	0.66 **96**	1.13 **164**	1.31 **190**	1.56 **227**	1.74 **252**
		200	---	---	630 **728**	---	---	---	---	---	---	0.11 **15**	0.20 **30**	0.26 **37**	0.36 **52**	0.62 **91**	0.72 **105**	0.87 **126**	0.97 **141**
		230	---	800 **925**	---	---	---	---	---	---	---	0.07 **11**	0.15 **21**	0.19 **27**	0.26 **38**	0.47 **68**	0.54 **79**	0.65 **95**	0.73 **106**
		250	1000 **1160**	---	---	---	---	---	---	---	---	0.06 **8**	0.12 **18**	0.16 **23**	0.22 **32**	0.39 **57**	0.46 **66**	0.55 **80**	0.61 **89**
16"	**100**	**150**	---	---	---	400 **462**	250 **289**	---	---	---	---	0.21 **31**	0.39 **56**	0.48 **70**	0.66 **96**	1.13 **164**	1.31 **190**	1.56 **227**	1.74 **252**
		200	---	---	630 **728**	---	---	---	---	---	---	0.11 **15**	0.20 **30**	0.26 **37**	0.36 **52**	0.62 **91**	0.72 **105**	0.87 **126**	0.97 **141**
		250	---	1000 **1160**	---	---	---	---	---	---	---	0.06 **8**	0.12 **18**	0.16 **23**	0.22 **32**	0.39 **57**	0.46 **66**	0.55 **80**	0.61 **89**
		330	1600 **1850**	---	---	---	---	---	---	---	---	0.02 **4**	0.06 **9**	0.08 **12**	0.12 **17**	0.22 **32**	0.25 **37**	0.31 **45**	0.35 **50**

Cv (Kvs) values and differential pressures Δp_{max} [MPa], [psi] of valves NPS ½" - 16" with perforated plugs (flow direction above plug) for electro-mechanical actuators

Δp_{max} value is the valve max. differential pressure when max open - close function is always guaranteed. Differential pressure must not exceed 2,0 MPa (290 psi) for valves Class 150 and 5,0 MPa (750 psi) for valves Class 300. In regard of service life of seat and plug, it is recommended so that permanent differential pressure of the valves with perforated plug is limited to max. 4,0 MPa / 580 psi.

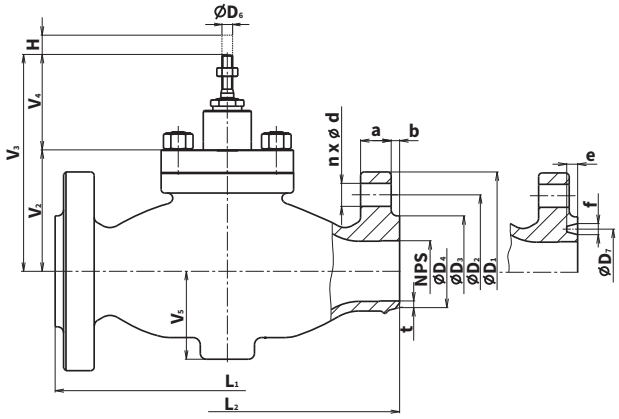
For further information on actuating, see actuators' catalogue sheets			**Actuating (actuating)**					**Auma**		**Auma**		**Auma**		**Auma**		**Auma**		**Auma**		**Hand wheel**	
			Marking in valve spec. No.					**EA...**		**EA...**		**EA...**		**EA...**		**EA...**		**EA...**		**Rxx**	
			Linear force					5 kN		7.5 kN		10 kN		15 kN		20 kN		32 kN			
			Kvs [m³ /h]					Δp_{max} [MPa] **[psi]**		Δp_{max} [MPa] **[psi]**		Δp_{max} [MPa] **[psi]**		Δp_{max} [MPa] **[psi]**		Δp_{max} [MPa] **[psi]**		Δp_{max} [MPa] **[psi]**			
			Cv [US galon/min]					packing		packing		packing		packing		packing		packing		packing	
NPS	**H[mm]**	**Ds[mm]**	**1**	**2**	**3**	**4**	**5**	graphite	PTFE	graphite	PTFE	graphite	PTFE	graphite	PTFE	graphite	PTFE	graphite	PTFE	graphite	PTFE
1"	**16**	**25**	---	6.3 **7.28**	4.0 **4.62**	2.5[5] **2.89**[5]	1.6[5] **1.85**[5]	2.59 **376**	6.48 **940**	7.16 **1038**	10.0 **1450**	10.0 **1450**	10.0 **1450**	---	---	---	---	---	---	10 **1450**	10 **1450**
1½'		**40**	---	16 **18.5**	10 **11.6**	6.3 **7.28**	4.0 **4.62**	0.90 **131**	2.42 **350**	2.68 **388**	4.19 **608**	4.45 **646**	5.97 **866**	---	---	---	---	---	---	4.45 **646**	5.97 **866**
2"	**20**	**50**	---	25 **28.9**	16 **18.5**	10 **11.6**	6.3 **7.28**	0.50 **72**	1.40 **204**	1.56 **226**	2.47 **358**	2.63 **381**	3.53 **512**	4.75 **689**	5.66 **821**	---	---	---	---	2.63 **381**	3.53 **512**
3"	**40**	**80**	---	63 **72.8**	40 **46.2**	25 **28.9**	16 **18.5**	---	---	0.28 **41**	0.73 **106**	0.73 **106**	1.18 **171**	1.63 **236**	2.08 **302**	2.53 **367**	2.98 **432**	---	---	1.81 **263**	2.26 **328**
4"		**100**	---	100 **116**	63 **72.8**	40 **46.2**	25 **28.9**	---	---	0.16 **23**	0.45 **65**	0.45 **65**	0.74 **108**	1.03 **150**	1.32 **192**	1.62 **234**	1.91 **277**	---	---	1.15 **167**	1.44 **209**
6"		**150**	---	250 **289**	160 **185**	100 **116**	63 **72.8**	---	---	0.05 **7**	0.18 **26**	0.18 **26**	0.31 **45**	0.44 **64**	0.58 **83**	0.71 **103**	0.84 **122**	---	---	0.50 **72**	0.63 **91**
8"	**80**	**200**	---	400 **462**	250 **289**	160 **185**	100 **116**	---	---	---	---	---	---	0.19 **27**	0.28 **40**	0.34 **49**	0.43 **62**	0.70 **102**	0.79 **115**	0.95 **137**	1.03 **150**
10"		**230**	---	630 **728**	400 **462**	250 **289**	160 **185**	---	---	---	---	---	---	0.07 **11**	0.15 **21**	0.19 **27**	0.26 **38**	0.47 **68**	0.54 **79**	0.65 **95**	0.73 **106**
12"		**250**	---	800 **925**	630 **728**	400 **462**	250 **289**	---	---	---	---	---	---	0.06 **8**	0.12 **18**	0.16 **23**	0.22 **32**	0.39 **57**	0.46 **66**	0.55 **80**	0.61 **89**
16"	**100**	**330**	---	1000 **1160**	630 **728**	400 **462**	250 **289**	---	---	---	---	---	---	0.02 **4**	0.06 **9**	0.08 **12**	0.12 **17**	0.22 **32**	0.25 **37**	0.31 **45**	0.35 **50**

[5] linear characteristic only

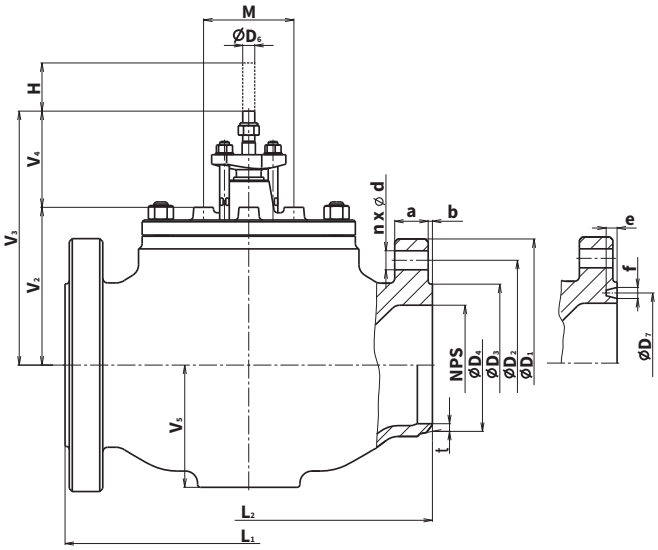
Dimensions and weights of valves CV / SV 320 SP (Ex) CV / SV 330 SP (Ex) with flanges and weld ends, NPS ½" - 16"

NPS	H [mm] [inch]	V_2 [mm] [inch]	V_3 [mm] [inch]	V_4 [mm] [inch]	$ØD_5$ [mm] [inch]	M [mm] [inch]	$ØD_6$ [mm]	V_5 [mm] [inch]	m_1 weight of version with flanges kg	m_2 weight of version with flanges kg	Class 300 L_1 RF [mm] [inch]	Class 300 L_1 RTJ [mm] [inch]	Class 300 L_1 LFF SFF LGF SGF [mm] [inch]	Class 600 L_1 RF [mm] [inch]	Class 600 L_1 RTJ [mm] [inch]	Class 600 L_1 LFF SFF LGF SGF [mm] [inch]	Class 150 - 600 L_2 BTW [mm] [inch]
½"	16 **0.63**	63 **2.480**	152 **5.984**	89 **3.504**	65 **2.559**	---	M10x1	47 **1.85**	7	5	190 **7.5**	201 **7.91**	200 **7.87**	203 **8.0**	202 **7.95**	200 **7.87**	203 **8.0**
1"		73 **2.874**	162 **6.378**					52 **2.047**	9	6	197 **7.75**	210 **8.25**	207 **8.15**	210 **8.25**	210 **8.25**	207 **8.15**	210 **8.25**
1½"								52 **2.047**	15	8	235 **9.25**	248 **9.76**	245 **9.64**	251 **9.88**	251 **9.88**	248 **9.76**	251 **9.88**
2"	20 **0.787**	104 **4.094**	193 **7.598**					73 **2.874**	20	13	267 **10.5**	283 **11.14**	277 **10.9**	286 **11.25**	289 **11.38**	283 **11.14**	286 **11.25**
3"	40 **1.575**	139 **5.472**	245 **9.646**	106 **4.173**			M16x1,5	105 **4.133**	41	28	318 **12.5**	332 **33.22**	328 **12.91**	337 **13.25**	340 **13.38**	334 **13.15**	337 **13.25**
4"								105 **4.133**	67	37	368 **14.5**	384 **15.12**	378 **14.88**	394 **15.5**	397 **15.63**	391 **15.39**	394 **15.5**
6"		179 **7.047**	281 **11.063**	102 **4.016**				134 **5.275**	160	105	473 **18.62**	489 **19.25**	483 **19.01**	508 **20.0**	511 **20.12**	505 **19.88**	508 **20.0**
8"	80 **3.15**	262 **10.314**	422 **16.614**	160 **6.299**	---	150 **5.905**	M20x1,5	203 **7.992**	280	200	568 **22.38**	584 **22.99**	578 **22.75**	610 **24.0**	613 **24.13**	607 **60.72**	610 **24.0**
10"		346 **13.622**	506 **19.921**					253 **9.961**	540	370	708 **27.88**	724 **28.5**	718 **28.27**	752 **29.62**	755 **29.72**	749 **29.49**	752 **29.62**
12"		395 **15.551**	555 **21.85**					296 **11.654**	680	520	775 **30.5**	791 **31.14**	785 **30.91**	819 **32.25**	822 **32.36**	816 **32.13**	819 **32.25**
16"	100 **3.937**	512 **20.157**	672 **26.457**					382 **15.039**	1380	1130	1057 **41.62**	1073 **42.24**	1067 **42.01**	1108 **43.62**	1111 **43.74**	1105 **43.5**	1108 **43.62**

NPS	RF Class 300 $ØD_1$ [mm] [inch]	$ØD_2$ [mm] [inch]	$ØD_3$ [mm] [inch]	d [mm] [inch]	n	a [mm] [inch]	b [mm] [inch]	RF Class 600 $ØD_1$ [mm] [inch]	$ØD_2$ [mm] [inch]	$ØD_3$ [mm] [inch]	d [mm] [inch]	n	a [mm] [inch]	b [mm] [inch]	RTJ Class 300 a 600 $ØD_7$ [mm] [inch]	e [mm] [inch]	f [mm] [inch]	Groove Number
½"	95 **3.75**	66.7 **2.62**	34.9 **1.38**	15.9 **5/8"**	4	12.7 **0.5**	2 **0.06**	95 **3.75**	66.7 **2.62**	34,9 **1.38**	15.9 **5/8"**	4	14.3 **0.56**	7 **0.25**	34.14 **1.344**	5.54 **0.219**	7.14 **0.281**	R11
1"	125 **4.88**	88.9 **3.5**	50.8 **2.0**	19.1 **¾**		15.9 **0.62**		125 **4.88**	88.9 **3.5**	50,8 **2.0**	19.1 **¾**		17.5 **0.69**		50.8 **2.0**	6.35 **0.25**	8.74 **0.344**	R16
1½"	155 **6.12**	114.3 **4.5**	73 **2.88**	22.3 **7/8"**		19.1 **0.75**		155 **6.12**	114.3 **4.5**	73 **2.88**	22.3 **7/8"**		22.3 **0.88**		68.27 **2.688**	6.35 **0.25**	8.74 **0.344**	R20
2"	165 **6.5**	127 **5.0**	92.1 **3.62**	19.1 **¾**	8	20.7 0.81		165 **6.5**	127 **5.0**	92.1 **3.62**	19.1 **¾**	8	25.4 **1.0**		82.55 **3.25**	7.92 **0.312**	11.91 **0.469**	R23
3"	210 **8.25**	168.3 **6.62**	127 **5.0**	22.3 **7/8"**		27 1.06		210 **8.25**	168.3 **6.62**	127 **5.0**	22.3 **7/8"**		31.8 **1.25**		117.48 **4.625**	7.92 **0.312**	11.91 **0.469**	R30
4"	255 **10**	200 **7.88**	157.2 **6.19**	22.3 **7/8"**		30.2 1.19		275 **10.75**	215.9 **8.5**	157.2 **6.19**	25.4 **1"**		38.1 **1.5**		149.23 **5.875**	7.92 **0.312**	11.91 **0.469**	R37
6"	320 **12.5**	269.9 **10.62**	215.9 **8.5**	22.3 **7/8"**	12	35 **1.38**		355 **14.0**	292.1 **11.5**	215.9 **8.5**	28.6 **1 1/8"**	12	47.7 **1.88**		211.12 **8.312**	7.92 **0.312**	11.91 **0.469**	R45
8"	380 **15**	330.2 **13.0**	269.9 **10.62**	25.4 **1"**		39.7 **1.56**		420 **16.5**	349.2 **13.75**	269.9 **10.62**	31.8 **1 1/4"**		55.6 **2.19**		269.9 **10.625**	7.92 **0.312**	11.91 **0.469**	R49
10"	445 **17.52**	387.4 **15.25**	323.8 **12.75**	28.6 **1 1/8"**	16	46.1 **1.82**		510 **20.08**	431.8 **17**	323.8 **12.75**	34.9 **1 3/8"**	16	63.5 **2.5**		323.85 **12.75**	7.92 **0.312**	11.91 **0.469**	R53
12"	520 **20.47**	450.8 **17.75**	381 **15**	31.8 **1 1/4"**	16	49.3 **1.94**		560 **22.05**	489 **19.25**	381 **15**	34.9 **1 3/8"**	20	66.7 **2.63**		381 **15**	7.92 **0.312**	11.91 **0.469**	R57
16"	650 **25.59**	571.5 **22.5**	469.9 **18.5**	34.9 **1 3/8"**	20	55.6 **2.19**		685 **26.97**	603.2 **23.75**	469.9 **18.5**	41.3 **1 5/8"**	20	76.2 **3**		469.9 **18.5**	7.92 **0.312**	11.91 **0.469**	R65



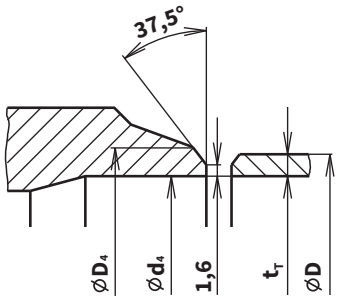
NPS ½' - 6"



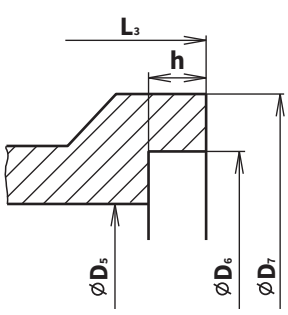
NPS 8"- 16"

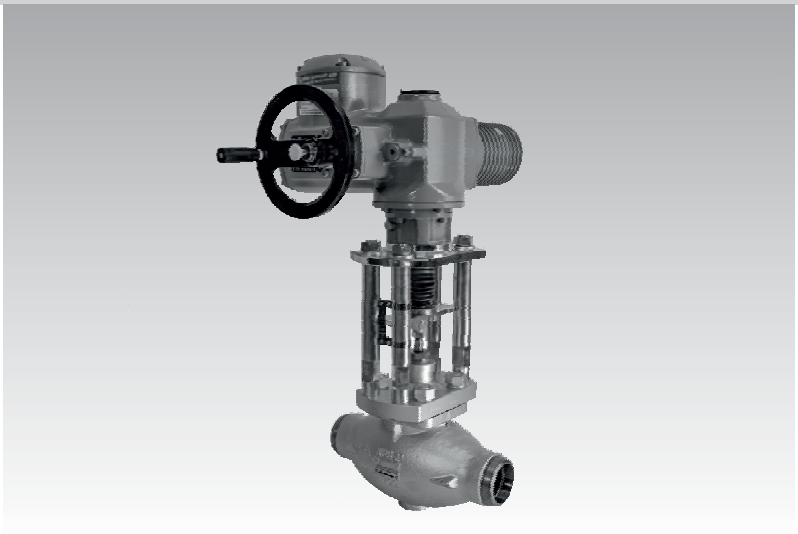
NPS	Dimensions of weld ends for pipes **ASME B36.10M** [mm] **[inch]** ØD4	ØD	tT Sch. No. 40	tT Sch. No. 80	tT Sch. No. 100	ØD4 max	ØD4 min
½'	22 **0.866**	21.3 **0.839**	2.8 **0.109**	3.9 **0.154**	---	30 **1.181**	13 **0.512**
1"	35 **1.378**	33.4 **1.315**	3.4 **0.133**	4.6 **0.179**	---	40 **1.575**	23 **0.906**
1½'	50 **1.969**	48.3 **1.66**	3.7 **0.14**	5.1 **0.191**	---	57 **2.244**	35 **1.378**
2"	62 **2.44**	60.3 **2.375**	3.9 **0.154**	5.5 **0.218**	---	67 **2.638**	43 **1.693**
3"	91 **3.583**	88.9 **3.5**	5.5 **0.216**	7.6 **0.3**	---	100 **3.937**	72 **2.835**
4"	117 **4.606**	114.3 **4.5**	6.0 **0,237**	8.6 **0.337**	---	128 **5.039**	92 **3.622**
6"	172 **6.772**	168.3 **6.625**	7.1 **0,28**	11.0 **0.432**	---	188 **7.402**	136 **5.354**
8"	223 **8.78**	219.1 **8.625**	8.2 **0.322**	12.7 **0.5**	15.1 **0.594**	228 **8.976**	178 **7.008**
10"	278 **10.945**	273.0 **10.748**	9.3 **0.366**	15.1 **0.594**	18.3 **0.72**	278 **10.945**	229 **9.016**
12"	329 **12.953**	323.9 **12.752**	10.3 **0.406**	17.5 **0.689**	21.4 **0.843**	329 **12.953**	281 **11.063**
16"	413 **16.26**	406.4 **16.0**	12.7 **0.5**	21.4 **0.843**	26.2 **1.031**	426 **16.772**	345 **13.583**

t-wall thickness of weld ends: $t = [D_4 - (D - 2 * t_T)] / 2$



NPS	Dimensions of weld ends for pipes **ASME B16.11** [mm] **[inch]** SW Class 150 and 300 ØD5	ØD6	ØD7	L3	h	SW Class 600 ØD5	ØD6	ØD7	L3	h
½'	15 **0.59**	22 **0.87**	33 **1.3**	206 **8.11**	9.5 **0.37**	12 **0.47**	22 **0.87**	35 **1.38**	206 **8.11**	9.5 **0.37**
1"	26 **1.02**	34,1 **1.34**	47 **1.85**	210 **8.27**	12.5 **0.49**	21 **0.83**	34.1 **1.34**	51 **2.01**	210 **8.27**	12.5 **0.49**
1½'	41 **1.61**	49 **1.93**	62 **2.44**	251 **9.88**	12.5 **0.49**	34 **1.34**	49 **1.93**	67 **2.64**	251 **9.88**	12.5 **0.49**
2"	52 **2.05**	61,4 **2.42**	76 **2.99**	286 **11.26**	16 **0.63**	43 **1.69**	61.4 **2.42**	84 **3.31**	286 **11.26**	16 **0.63**





CV 3x2 SP

Pressure balanced control and shut-off valves in sesmic version

NPS 1/2" - 16",
Class 150, 300 and 600

Technical data

Series		**CV 322 (Ex)**	**CV 332 (Ex)**
Type of valve		**Two-way, single-seated, control (shut-off) valve with pressure balanced plug**	
Nominal size range		NPS 1" - 16"	
Nominal pressure		Class 300 and 600 (Class 150, 300 and 600 (weld ended)	
Body material		Cast steel A216 WCB, A217 WC6	Stainless steel A351 CF8M
Seat material:	NPS 1/2" - 2"	1.4028	1.4571
DIN W.Nr./+ČSN	NPS 3" - 16"	1.4027	1.4581
Plug material:	NPS 1/2" - 2"	1.4021	1.4571
DIN W.Nr./+ČSN	NPS 3" - 16"	1.4027	1.4581
Stem material		1.4923	1.4980
Operating temperature range		-50 to 550 °C (-58 to 1020 °F) - (the negative temperature requirement must be specified in the order)	
Face to face dimensions		Acc. to ISA-75.08.01-2002 (R2007) for version with flanges Acc. to ISA-75.08.03-2001 (R2007) for weld ends - version Socket Weld Acc. to ISA - 75.08.05-2002 (R2007) for weld ends - version Butt Weld	
Connection flanges		Acc. to ASME B16.5-2013	
Flange faces		RF (Raised Face), RTJ (Ring Joint Face), LFF (Large Female Face), SFF (Small Female Face), LGF (Large Groove Face), SGF (Small Groove Face)	
Weld ends		Butt Weld 1/2" - 16" acc. to ASME B16.25-2012; Socket Weld 1/2" - 2" acc. to ASME B16.11-2011	
Type of plug		V-ported, contoured, perforated	
Flow characteristic		Linear, equal-percentage, LDMspline®, parabolic	
Kvs value		1,6 to 1600 m^3 /h (1,85 to 1850 US galon/min)	
Leakage rate		Class III. acc. to ANSI/FCI 70-2-2013 (<0,1% Cv) for control valves with metal-metal seat sealing Class IV. acc. to ANSI/FCI 70-2-2013 (<0.01% Cv) for control valves with metal-PTFE sealing	
Leakage rate for Ex version		Class IV. acc. to ANSI/FCI 70-2-2013 (<0.01% Cv)	
Rangeability r		50 : 1	
Packing		DRSpack® (PTFE) t_{max} = 260 °C (500°F), Expanded graphite t_{max} = 550 °C (1020°F), Bellows (DN15-150) t_{max} = 550°C (1020°F)	
Seismic resistance		0 to 33 Hz, 30 $m.s^{-2}$	

Cv (Kvs) values and differential pressures Δp_{max} [MPa], [psi] of pressure balanced valves NPS 1" - 16" with electro-mechanic actuators

Δp_{max} value is the valve max. differential pressure when max open - close function is always guaranteed.
Differential pressure must not exceed 2,0 MPa (290 psi) for valves Class 150 and 5,0 MPa (750 psi) for valves Class 300. In regard of service life of seat and plug, it is recommended so that permanent differential pressure would not exceed 1.6 MPa / 232 psi. Otherwise it is suitable to use perforated plug (Δp up to 4,0 MPa / 580 psi) or sealing surfaces of seat and plug with a hard metal overlay (Δp up to 2,5 MPa / 363 psi).

For further information on actuating, see actuators' catalogue sheets ***) max. NPS 12"**			**Actuating (actuating)**					**Auma**		**Auma**		**Auma**		**Hand wheel**	
			Marking in valve spec. No.					**EA...**		**EA...**		**EA...**		**Rxx**	
			Linear force					5 kN		15 kN		20 kN			
			Kvs [m³/h] **Cv [US galon/min]**					**Δp_{max}** [MPa] **[psi]** packing		**Δp_{max}** [MPa] **[psi]** packing		**Δp_{max}** [MPa] **[psi]** packing		**Δp_{max}** [MPa] **[psi]** packing	
NPS	**H[mm]**	**Ds[mm]**	**1**	**2**	**3**	**4**	**5**	graphite	PTFE	graphite	PTFE	graphite	PTFE	graphite	PTFE
1"	**16**	**25**	10 **11.6**	6.3[5] **7.28**[5]	4.0[5] **4.62**[5]	2.5[5] **2.89**[5]	1.6[5] **1.85**[5]	10 **1450**	10 **1450**	---	---	---	---	10 **1450**	10 **1450**
1½'		**40**	25 **28.9**	16 **18.5**	10 **11.6**	6.3[5] **7.28**[5]	4.0[5] **4.62**[5]	10 **1450**	10 **1450**	---	---	---	---	10 **1450**	10 **1450**
2"	**20**	**50**	40 **46.2**	25 **28.9**	16 **18.5**	10 **11.6**	6.3[5] **7.28**[5]	10 **1450**	10 **1450**	---	---	---	---	10 **1450**	10 **1450**
3"	**40**	**80**	100 **116**	63 **72.8**	40 **46.2**	25 **28.9**	16 **18.5**	10 **1450**	10 **1450**	---	---	---	---	10 **1450**	10 **1450**
4"		**100**	160 **185**	100 **116**	63 **72.8**	40 **46.2**	25 **28.9**	10 **1450**	10 **1450**	---	---	---	---	10 **1450**	10 **1450**
6"		**150**	360 **416**	250 **289**	160 **185**	100 **116**	63 **72.8**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	---	---	10 **1450**	10 **1450**
8"	**80**	**200**	570 **659**	400 **462**	250 **289**	160 **185**	100 **116**	---	---	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**	10 **1450**
10"		**230**	800 **925**	630 **728**	400 **462**	250 **289**	160 **185**	---	---	---	---	10 **1450**	10 **1450**	10 **1450**	10 **1450**
12"		**250**	1000 **1160**	800 **925**	630 **728**	400 **462**	250 **289**	---	---	---	---	10 **1450**	10 **1450**	10 **1450**	10 **1450**
16"	**100**	**330**	1600 **1850**	1000 **1160**	630 **728**	400 **462**	250 **289**	---	---	---	---	10 **1450**	10 **1450**	10 **1450**	10 **1450**

[5] linear characteristic only

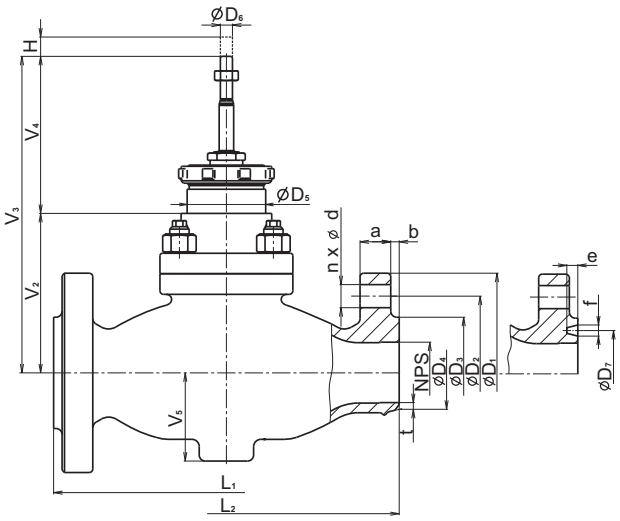
Max. differential pressures specified in table apply to PTFE and graphite packing.
Perforated plug available only with Cv (Kvs) values in shadowed frames with the following restrictions:
- perforated plug with Kvs value acc. to column No. 2 available with linear or parabolic characteristic only

Dimensions and weights of valves CV 320 SP (Ex) and CV 330 SP (Ex) with flanges and weld ends, NPS 1" - 16"

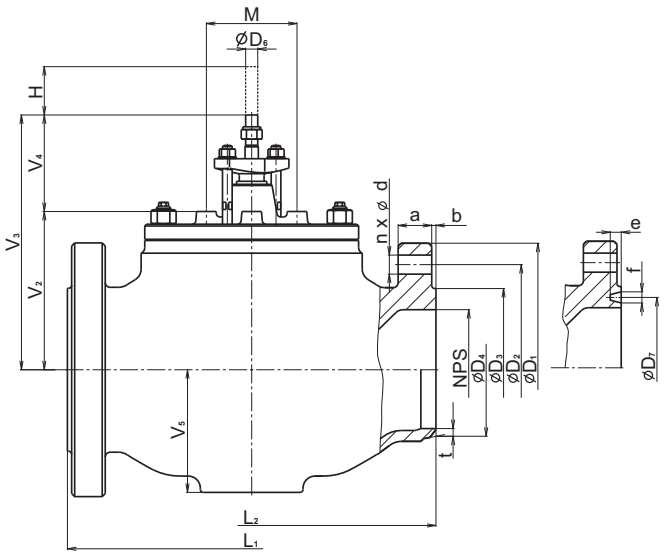
NPS	H [mm] [inch]	V_2 [mm] [inch]	V_3 [mm] [inch]	V_4 [mm] [inch]	$ØD_5$ [mm] [inch]	M [mm] [inch]	$ØD_6$ [mm]	V_5 [mm] [inch]	m_1 weight of version with flanges kg	m_2 weight of version with flanges kg	Class 300 L_1 RF [mm] [inch]	Class 300 L_1 RTJ [mm] [inch]	Class 300 L_1 LFF SFF LGF SGF [mm] [inch]	Class 600 L_1 RF [mm] [inch]	Class 600 L_1 RTJ [mm] [inch]	Class 600 L_1 LFF SFF LGF SGF [mm] [inch]	Class 150 - 600 L_2 BTW [mm] [inch]
1"	16 **0.63**	73 **2.874**	162 **6.378**	89 **3.504**	65 **2.559**	---	M10x1	52 **2.047**	9.5	6.5	197 **7.75**	210 **8.25**	207 **8.15**	210 **8.25**	210 **8.25**	207 **8.15**	210 **8.25**
1½"								52 **2.047**	5.5	8.5	235 **9.25**	248 **9.76**	245 **9.64**	251 **9.88**	251 **9.88**	248 **9.76**	251 **9.88**
2"	20 **0.787**	104 **4.094**	193 **7.598**					73 **2.874**	21	14	267 **10.5**	283 **11.14**	277 **10.9**	286 **11.25**	289 **11.38**	283 **11.14**	286 **11.25**
3"	40 **1.575**	139 **5.472**	245 **9.646**	106 **4.173**			M16x1,5	105 **4.133**	43	30	318 **12.5**	332 **33.22**	328 **12.91**	337 **13.25**	340 **13.38**	334 **13.15**	337 **13.25**
4"		139 **5.472**	245 **9.646**	106 **4.173**				105 **4.133**	69	39	368 **14.5**	384 **15.12**	378 **14.88**	394 **15.5**	397 **15.63**	391 **15.39**	394 **15.5**
6"		179 **7.047**	281 **11.063**	102 **4.016**				134 **5.275**	163	108	473 **18.62**	489 **19.25**	483 **19.01**	508 **20.0**	511 **20.12**	505 **19.88**	508 **20.0**
8"	80(63[1]) **3.15 (2.48)**[1]	262 **10.314**	422 **16.614**	160 **6.299**	---	150 **5.905**	M20x1,5	203 **7.992**	292	212	568 **22.38**	584 **22.99**	578 **22.75**	610 **24.0**	613 **24.13**	607 **60.72**	610 **24.0**
10"	80 **3.15**	346 **13.622**	506 **19.921**					253 **9.961**	555	385	708 **27.88**	724 **28.5**	718 **28.27**	752 **29.62**	755 **29.72**	749 **29.49**	752 **29.62**
12"	80 **3.15**	395 **15.551**	555 **21.85**					296 **11.654**	706	546	775 **30.5**	791 **31.14**	785 **30.91**	819 **32.25**	822 **32.36**	816 **32.13**	819 **32.25**
16"	100 **3.937**	512 **20.157**	672 **26.457**					382 **15.039**	1423	1173	1057 **41.62**	1073 **42.24**	1067 **42.01**	1108 **43.62**	1111 **43.74**	1105 **43.5**	1108 **43.62**

1) NPS 8" balanced by graphite - travel = 63 mm (2,48 inch)

NPS	RF Class 300 $ØD_1$ [mm] [inch]	$ØD_2$ [mm] [inch]	$ØD_3$ [mm] [inch]	d [mm] [inch]	n	a [mm] [inch]	b [mm] [inch]	RF Class 600 $ØD_1$ [mm] [inch]	$ØD_2$ [mm] [inch]	$ØD_3$ [mm] [inch]	d [mm] [inch]	n	a [mm] [inch]	b [mm] [inch]	RTJ Class 300 a 600 $ØD_7$ [mm] [inch]	e [mm] [inch]	f [mm] [inch]	Groove Number
1"	125 **4.88**	88.9 **3.5**	50.8 **2.0**	19.1 **¾**	4	15.9 **0.62**	2 **0.06**	125 **4.88**	88.9 **3.5**	50,8 **2.0**	19.1 **¾**	4	17.5 **0.69**	7 **0.25**	50.8 **2.0**	6.35 **0.25**	8.74 **0.344**	R16
1½"	155 **6.12**	114.3 **4.5**	73 **2.88**	22.3 **7/8"**		19.1 **0.75**		155 **6.12**	114.3 **4.5**	73 **2.88**	22.3 **7/8"**		22.3 **0.88**		68.27 **2.688**	6.35 **0.25**	8.74 **0.344**	R20
2"	165 **6.5**	127 **5.0**	92.1 **3.62**	19.1 **¾**	8	20.7 0.81		165 **6.5**	127 **5.0**	92.1 **3.62**	19.1 **¾**	8	25.4 **1.0**		82.55 **3.25**	7.92 **0.312**	11.91 **0.469**	R23
3"	210 **8.25**	168.3 **6.62**	127 **5.0**	22.3 **7/8"**		27 1.06		210 **8.25**	168.3 **6.62**	127 **5.0**	22.3 **7/8"**		31.8 **1.25**		117.48 **4.625**	7.92 **0.312**	11.91 **0.469**	R30
4"	255 **10**	200 **7.88**	157.2 **6.19**	22.3 **7/8"**		30.2 1.19		275 **10.75**	215.9 **8.5**	157.2 **6.19**	25.4 **1"**		38.1 **1.5**		149.23 **5.875**	7.92 **0.312**	11.91 **0.469**	R37
6"	320 **12.5**	269.9 **10.62**	215.9 **8.5**	22.3 **7/8"**	12	35 **1.38**		355 **14.0**	292.1 **11.5**	215.9 **8.5**	28.6 **1 1/8"**	12	47.7 **1.88**		211.12 **8.312**	7.92 **0.312**	11.91 **0.469**	R45
8"	380 **15**	330.2 **13.0**	269.9 **10.62**	25.4 **1"**	12	39.7 **1.56**		420 **16.5**	349.2 **13.75**	269.9 **10.62**	31.8 **1 1/4"**	12	55.6 **2.19**		269.9 **10.625**	7.92 **0.312**	11.91 **0.469**	R49
10"	445 **17.52**	387.4 **15.25**	323.8 **12.75**	28.6 **1 1/8"**	16	46.1 **1.82**		510 **20.08**	431.8 **17**	323.8 **12.75**	34.9 **1 3/8"**	16	63.5 **2.5**		323.85 **12.75**	7.92 **0.312**	11.91 **0.469**	R53
12"	520 **20.47**	450.8 **17.75**	381 **15**	31.8 **1 1/4"**	16	49.3 **1.94**		560 **22.05**	489 **19.25**	381 **15**	34.9 **1 3/8"**	20	66.7 **2.63**		381 **15**	7.92 **0.312**	11.91 **0.469**	R57
16"	650 **25.59**	571.5 **22.5**	469.9 **18.5**	34.9 **1 3/8"**	20	55.6 **2.19**		685 **26.97**	603.2 **23.75**	469.9 **18.5**	41.3 **1 5/8"**	20	76.2 **3**		469.9 **18.5**	7.92 **0.312**	11.91 **0.469**	R65



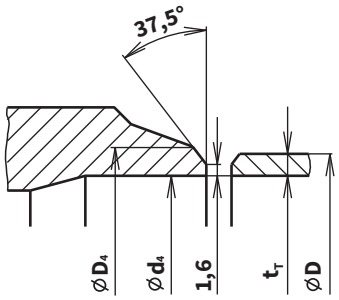
NPS 1" - 6"



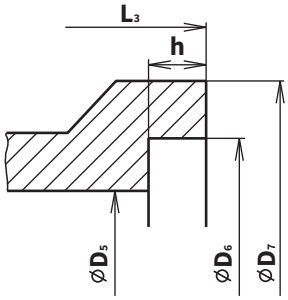
NPS 8" - 16"

NPS	Dimensions of weld ends for pipes **ASME B36.10M** [mm] **[inch]** $ØD_4$	$ØD$	t_T Sch. No. 40	t_T Sch. No. 80	t_T Sch. No. 100	$ØD_{4\,max}$	$ØD_{4\,min}$
1"	35 **1.378**	33.4 **1.315**	3.4 **0.133**	4.6 **0.179**	---	40 **1.575**	23 **0.906**
1½'	50 **1.969**	48.3 **1.66**	3.7 **0.14**	5.1 **0.191**	---	57 **2.244**	35 **1.378**
2"	62 **2.44**	60.3 **2.375**	3.9 **0.154**	5.5 **0.218**	---	67 **2.638**	43 **1.693**
3"	91 **3.583**	88.9 **3.5**	5.5 **0.216**	7.6 **0.3**	---	100 **3.937**	72 **2.835**
4"	117 **4.606**	114.3 **4.5**	6.0 **0,237**	8.6 **0.337**	---	128 **5.039**	92 **3.622**
6"	172 **6.772**	168.3 **6.625**	7.1 **0,28**	11.0 **0.432**	---	188 **7.402**	136 **5.354**
8"	223 **8.78**	219.1 **8.625**	8.2 **0.322**	12.7 **0.5**	15.1 **0.594**	228 **8.976**	178 **7.008**
10"	278 **10.945**	273.0 **10.748**	9.3 **0.366**	15.1 **0.594**	18.3 **0.72**	278 **10.945**	229 **9.016**
12"	329 **12.953**	323.9 **12.752**	10.3 **0.406**	17.5 **0.689**	21.4 **0.843**	329 **12.953**	281 **11.063**
16"	413 **16.26**	406.4 **16.0**	12.7 **0.5**	21.4 **0.843**	26.2 **1.031**	426 **16.772**	345 **13.583**

t-wall thickness of weld ends: $t = [D_4 - (D - 2 * t_T)] / 2$



NPS	Dimensions of weld ends for pipes **ASME B16.11** [mm] **[inch]** SW Class 150 a 300 $ØD_5$	$ØD_6$	$ØD_7$	L_3	h	SW Class 600 $ØD_5$	$ØD_6$	$ØD_7$	L_3	h
1"	26 **1.02**	34,1 **1.34**	47 **1.85**	210 **8.27**	12.5 **0.49**	21 **0.83**	34.1 **1.34**	51 **2.01**	210 **8.27**	12.5 **0.49**
1½'	41 **1.61**	49 **1.93**	62 **2.44**	251 **9.88**	12.5 **0.49**	34 **1.34**	49 **1.93**	67 **2.64**	251 **9.88**	12.5 **0.49**
2"	52 **2.05**	61,4 **2.42**	76 **2.99**	286 **11.26**	16 **0.63**	43 **1.69**	61.4 **2.42**	84 **3.31**	286 **11.26**	16 **0.63**



Valve complete specification No. for ordering CV/SV3x0 SP (Ex), CV3x2 SP (Ex)

		XX	X X X	X X X	X X X X	X X	XXX	/	XXX	-	XXX	XXXX
1. Valve	Control valve	**CV**										
	Shut-Off valve	**SV**										
2. Series	Valves made of steel		**3 2**									
	Valves made of stainless steel		**3 3**									
	Straight-throgh		**0**									
	Straight-throgh with pressure balanced plug		**2**									
3. Actuating *)	Electric actuator			**E X X**								
	Hand wheel			**R X X**								
4. Connection	Flange RF (Raised Face)				**1**							
	Flange RTJ (Ring Joint Face)				**2**							
	Flange LFF (Large Female Face)				**3**							
	Flange SFF (Small Female Face)				**4**							
	Flange LGF (Large Groove Face)				**5**							
	Flange SGF (Small Groove Face)				**6**							
	Weld ends BW (Butt Welding)				**7**							
	Weld ends SW (Socket Welding)				**8**							
5. Body material	Cast steel A216 WCB (-29 to 425°C); (-20 to 800°F) [5]				**1**							
[5] Negative temperature requirement must be specified in the order	CrMo steel A217 WC6 (-29 to 550°C); (-20 to 1020°F) [5]				**7**							
	Stainless steel A351 CF8M (-50 to 550°C); (-58 to 1020°F) [5]				**8**							
	Other material on request				**9**							
6. Seat sealing	Metal - metal				**1**							
[2] DN 1" - 16"; t_{max} = 260°C (500°F)	Soft sealing (metal - PTFE) [2]				**2**							
	Hard metal overlay on sealilng surfaces				**3**							
	Balanced by graphite, metal-metal [3]				**5**							
[3] DN 3" - 16"	Balanced by graphit, hard metal overlay [4]				**7**							
[4] DN 1" a 1/2" - 16"	Hard metal overlay on sealilng surfaces of RV 3x2, a plug with metal sealing cuff				**8**							
7. Packing	DRSpack® (PTFE)				**3**							
[1] NPS 1/2" - 6" only	Expanded graphite				**5**							
	Bellows [1]				**7**							
	Bellows with safety packing PTFE [1]				**8**							
	Bellows with safety packing Graphite [1]				**9**							
8. Flow characteristic	Linear					**L**						
	Equal-percentage					**R**						
	LDMspline®					**S**						
	On-off					**U**						
	Parabolic					**P**						
	Linear - perforated plug					**D**						
	Equal-percentage - perforated plug					**Q**						
	Parabolic - perforated plug					**Z**						
9. Cvs	Column no. acc. to Kvs (Cv) value table					**X**						
10. Nominal pressure	Class 150 (weld ends only)						**150**					
	Class 300						**300**					
	Class 600						**600**					
11. Max. operating temperature °C (°F)	Acc. to version 260 - 550°C (500 - 1020°F)								**XXX**			
12. Nominal size	DN (NPS)										**XXX**	
13. Execution	Seismically resistant											**SP**
	Seismically resistant, non-explosive											**SPEx**

DN	NPS
015	**½"**
020	**¾"**
025	**1"**
032	**1¼"**
040	**1½"**
050	**2"**

DN	NPS
065	**2½"**
080	**3"**
100	**4"**
125	**5"**
150	**6"**
200	**8"**
250	**10"**

Temp. °C	Temp. °F
260	**500**
300	**570**
315	**600**
400	**750**
425	**800**
500	**930**
550	**1020**

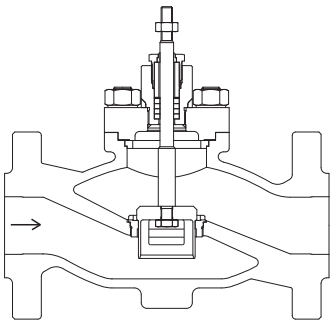
Ordering example of flanged execution:
CV320 ENC 2135 L1 300/400-080

Ordering example of weld ends execution:
CV320 ENC 7135 L1 300/400-080, weld ends size Ø 88,9 x 5,5

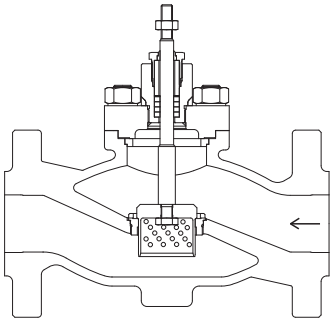
*) For marking of actuators in specification code, refer to table on page No. 24 of this catalogue

Valves CV / SV 3x0 SP (Ex)

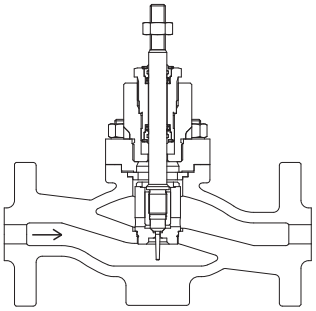
Section of valve with V-ported plug



Section of valve with perforated plug

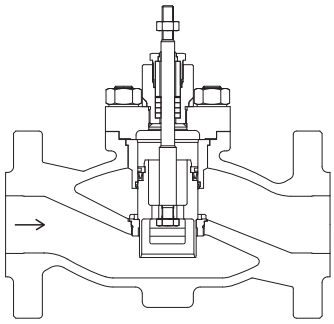


Section of valve with micro-throttling system

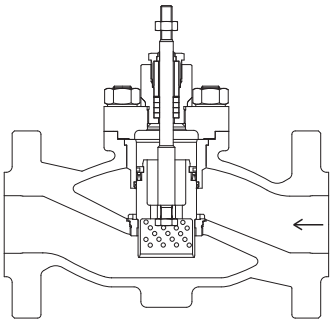


Valves CV 3x2 SP (Ex)

Section of pressure-balanced valve with V-ported plug



Section of pressure-balanced valve with perforated plug



Electric actuators

Auma

SA 07.2, SA Ex 07.2, SAR 07.2, SAR Ex 07.2, SA 07.6, SA Ex 07.6, SAR 07.6, SAR Ex 07.6

marking in type number:
EAA, EAB, EAC, EAD
EAE, EAF, EAG, EAH

Technical data

Type	SA 07.2	SA Ex 07.2	SAR 07.2	SAR Ex 07.2	SA 07.6	SA Ex 07.6	SAR 07.6	SAR Ex 07.6
Marking in valve spec. No.	**EAA**	**EAB**	**EAC**	**EAD**	**EAE**	**EAF**	**EAG**	**EAH**
Voltage	3-phase ~ 380 or 400 V AC (1-phase ~ 230 V AC cannot be used - high weight)							
Frequency	50 Hz							
Power consumption	see specification table							
Control	3 - position control or with signal 4 - 20 mA							
Nominal force	10 Nm~5 kN; 15 Nm~7,5 kN; 20 Nm~10 kN				30 Nm~15 kN; 40 Nm~20 kN			
Travel	acc. to used valve 16, 25, 40 mm				acc. to used valve 40, 80 mm			
Enclosure	IP 68							
Process medium max. temp.	acc. to used valve							
Ambient temperatrure range	-40 to 80°C	-20 to 60°C	-40 to 60°C	-20 to 60°C	-40 to 80°C	-20 to 60°C	-40 to 60°C	-20 to 60°C
Ambient humidity range	100 %							
Weight - single-phase	25 - 62 kg				25 - 62kg			
- three-phase	20 - 33 kg				21 - 33 kg			

→ **Note:** Specifications and technical data are for information only.
Detailed technical informations can be found in producer's data sheet or on the webside **www.auma.com**

Specification of Auma actuators

		SA	X	XX	07.X
Type		**SA**			
Duty	control		**R**		
	ON - OFF				
Version	standard				
	non-explozive			**Ex**	
Actuator size					**07.2**
					07.6

Output shaft type A (thread TR 16x4 LH, connection flange F07) ... for CV 3xx NPS ½" - 6"

Output speed [ot/min]	Tripping torgue	SA 07.2 / SA Ex 07.2	SAR 07.2 / SAREx 07.2	Motor power [kW]	SA 07.2 S2-15min	SA Ex 07.2 S2-15min	SAR 07.2 S4-25%	SAR Ex 07.2 S4-25%
4					0,02	0,02	0,02	0,02
5,6					0,02	0,02	0,02	0,02
8					0,04	0,04	0,04	0,04
11		10-30 Nm	15-30 Nm		0,04	0,04	0,04	0,04
16					0,06	0,06	0,06	0,06
22					0,06	0,06	0,06	0,06
32					0,10	0,10	0,10	0,10
45					0,10	0,10	0,10	0,10

Output shaft type A (thread TR 20x4 LH, flange F10) ... for CV 3xx DN 3" - 16"

Output speed [ot/min]	Tripping torgue	SA 07.6 / SA Ex 07.6	SAR 07.6 / SAREx 07.6	Motor power [kW]	SA 07.6 S2-15min	SA Ex 07.6 S2-15min	SAR 07.6 S4-25%	SAR Ex 07.6 S4-25%
4					0,03	0,03	0,03	0,03
5,6					0,03	0,03	0,03	0,03
8					0,06	0,06	0,06	0,06
11		20-60 Nm	30-60 Nm		0,06	0,06	0,06	0,06
16					0,12	0,12	0,12	0,12
22					0,12	0,12	0,12	0,12
32					0,20	0,20	0,20	0,20
45					0,20	0,20	0,20	0,20

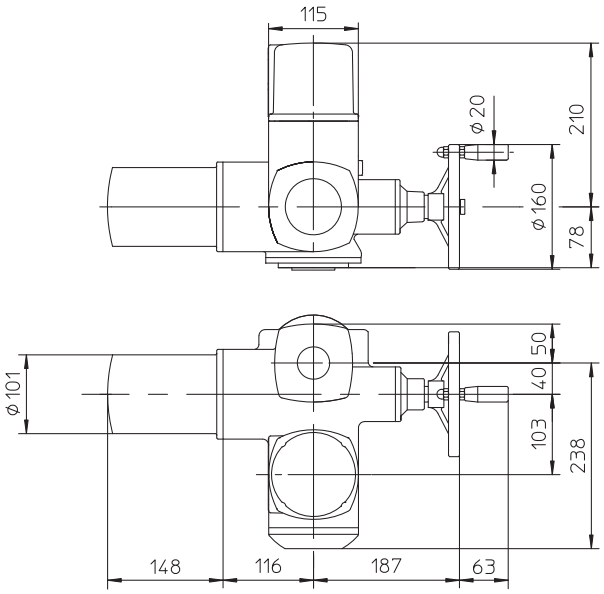
Accessories

→ 2 TANDEM switches
→ Gearing for signalisation of position
→ Mechanical position indicator
→ Potentiometer 1x200 Ω
→ Electronic position transmitter RWG (potentiometer included), 4 - 20 mA, 2-wire
→ Electronic position transmitter RWG (potentiometer included), 4 - 20 mA, 3/4-wire
→ Inductive position transmitter IWG, 4 - 20 mA
→ MATIC - or continuous control (specification of accessories acc. to catalogue of producer: IP 67; -25 to +70°C; ...), weight + 7 kg
→ AUMATIC - or continuous control (specification of accessories acc. to catalogue of producer: IP 68; -25 to +70°C; ...), weight + 7kg

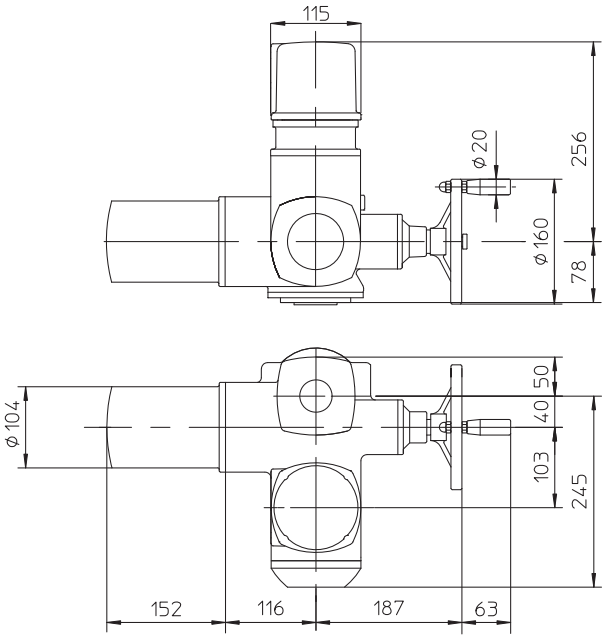
Other accessories acc. to catalogue of producer of actuators.

Dimensions of actuators Auma series 07.2 and 07.6

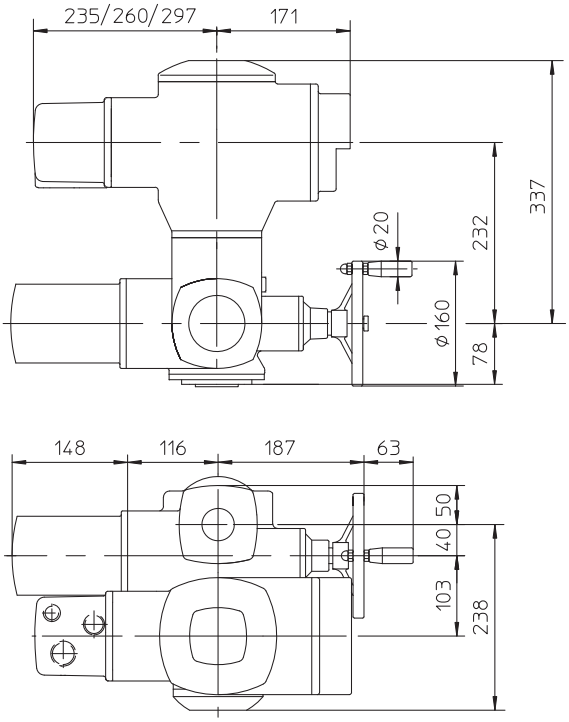
Normal version



Version Ex norm



Version MATIC



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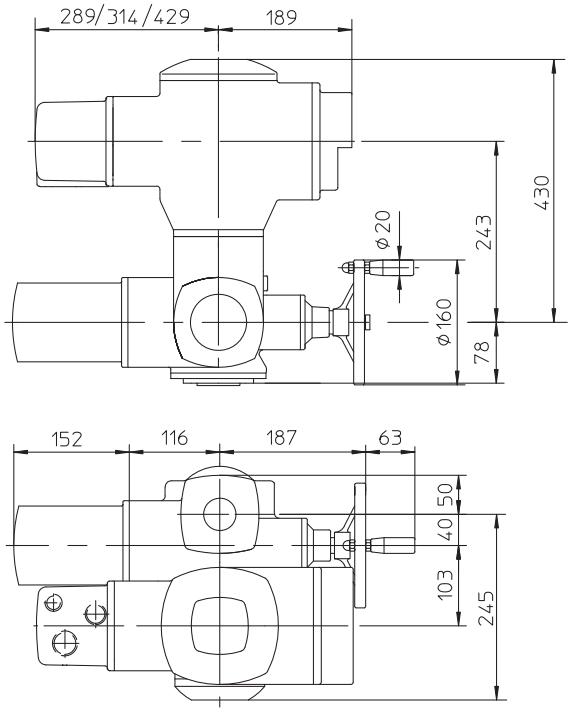
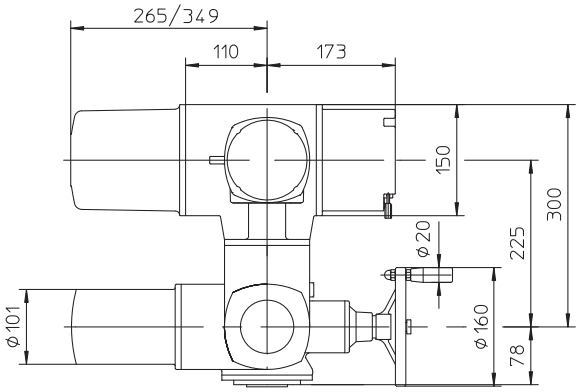
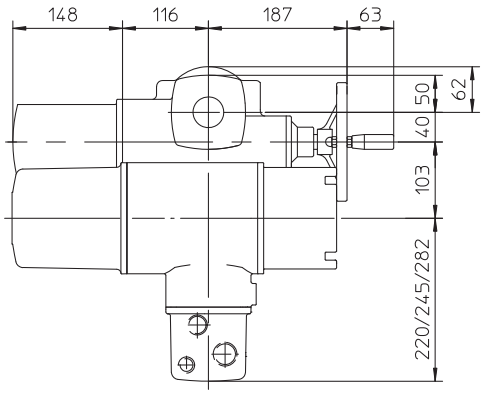
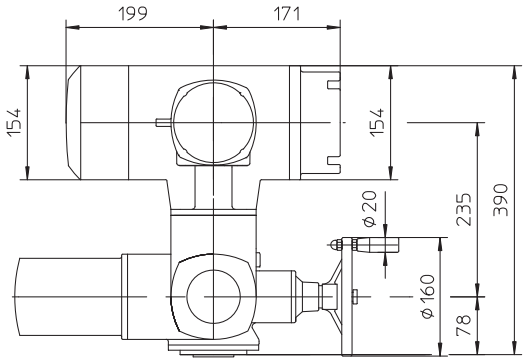


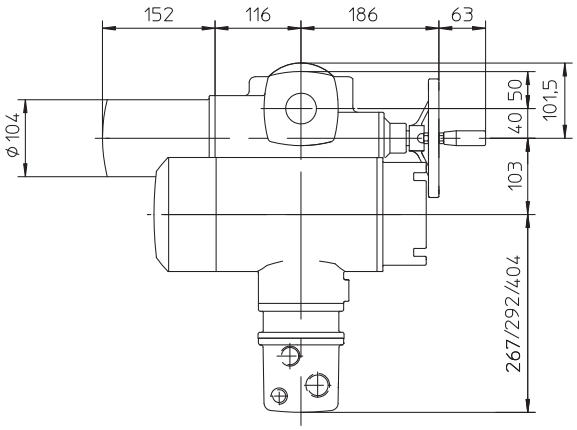
Version with AUMATIC

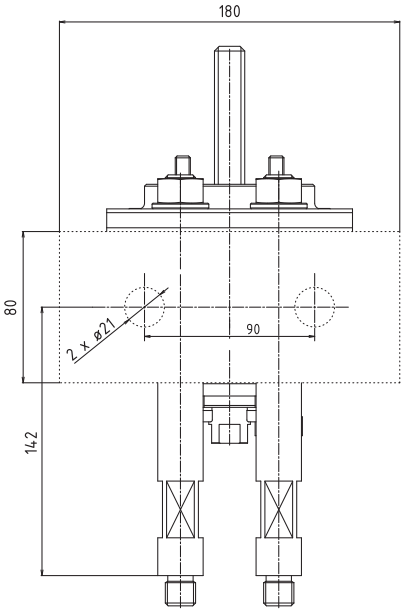


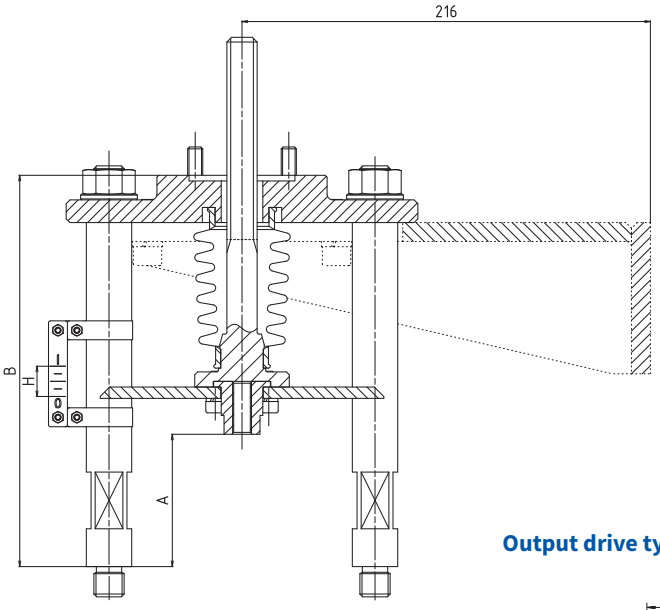


Version Ex AUMATIC

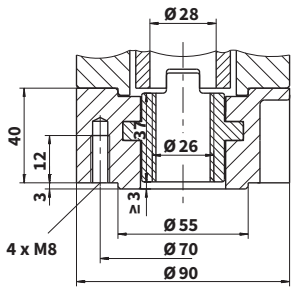








Output drive type A, F07



For valves	Number of columns	A	B	Weight [kg]
CV 3xx NPS 1/2"- 2"	4	149	295	6 kg (+ 6 kg console)
CV 3xx NPS 3"- 6"	4	141	295	8 kg
CV 3xx NPS 8"- 16"	4	141	323	15 kg

console requiered for NPS 1/2"- 1" - all versions AUMA SAR 07.2 max. 33kg
(Norm, Matic, Aumatic, Ex), with exception NPS 1" AUMA SAR 07.2 Norm max. 24,3kg

Electric actuators
Auma

SA 10.2, SA Ex 10.2
SAR 10.2, SAR Ex 10.2

marking in type number:
EAI, EAJ, EAK, EAL

Technical data

Type	SA 10.2	SA Ex 10.2	SAR 10.2	SAR Ex 10.2
Marking in valve spec. No.	**EAI**	**EAL**	**EAJ**	**EAK**
Voltage	3-phase ~ 380 or 400 V AC (1-phase ~ 230 V AC not applicable - high weight)			
Frequency	50 Hz			
Power consumption	see specification table			
Control	3 - point or with signal 4 - 20 mA			
Nominal force	80 Nm ~ 21,6 kN; 100 Nm ~ 27 kN; 120 Nm ~ 32 kN			
Travel	80, 100 mm			
Enclosure	IP 68			
Process medium max. temp.	acc. to used valve			
Ambient temperatrure range	-40 to 80 °C	-20 to 60 °C	-40 to 60 °C	-20 to 60 °C
Ambient humidity range	100 %			
Weight	22 to 47 kg			
Vibration resistance acc. to EN 60068-2-6	AUMA NORM: 2g, 10-200Hz; AUMA MATIC: 1g, 10-200Hz; AUMATIC: 1g, 10-200Hz			

→ **Note:** Specifications and technical data are for information only.
Detailed technical informations can be found in producer's data sheet or on the webside **www.auma.com**

Specification of Auma actuators

		SA	X	XX	10.2
Type		**SA**			
Duty	control		**R**		
	ON - OFF				
Version	standard				
	non-explosive			**Ex**	
Actuator size					**10.2**

Output drive shaft type A (thread TR 36x6 LH, flange F10) ... for CV 3xx NPS 8" - 16"

Output speed [ot/min]	Tripping torgue SA 10.2 SA Ex 10.2	Tripping torgue SAR 10.2 SAR Ex 10.2	Motor power [kW] SA 10.2 S2-15min	SA Ex 10.2 S2-15min	SAR 10.2 S4-25%	SAR Ex 10.2 S4-25%
4	40-120 Nm	60-120 Nm	0,06	0,09	0,09	0,09
5,6			0,06	0,09	0,09	0,09
8			0,12	0,18	0,18	0,18
11			0,12	0,18	0,18	0,18
16			0,25	0,37	0,37	0,37
22			0,25	0,37	0,37	0,37
32			0,40	0,75	0,75	0,75
45			0,40	0,75	0,75	0,75

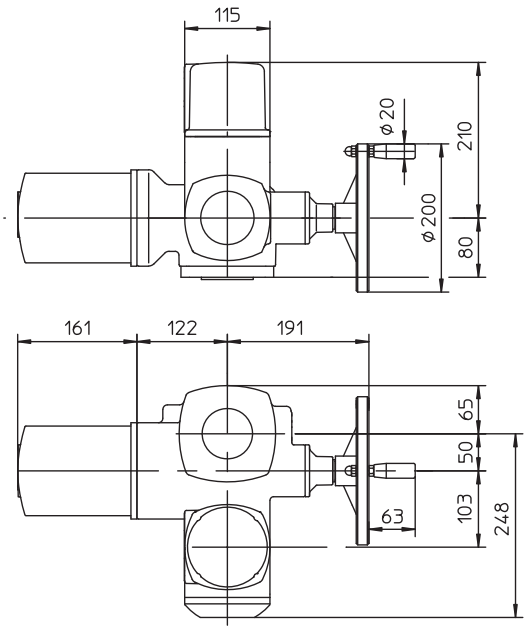
Accessories

- → 2 TANDEM switches
- → Gearing for signalisation of position
- → Mechanical position indicator
- → Potentiometer 1x200 Ω
- → Electronic position transmitter RWG (potentiometer included), 4 - 20 mA, 2-wire
- → Electronic position transmitter RWG (potentiometer included), 4 - 20 mA, 3/4-wire
- → Inductive position transmitter IWG, 4 - 20 mA
- → MATIC - or continuous control (specification of accessories acc. to catalogue of producer: IP 67; -25 to +70°C; ...), weight + 7 kg
- → AUMATIC - or continuous control (specification of accessories acc. to catalogue of producer: IP 68; -25 to +70°C; ...), weight + 7kg

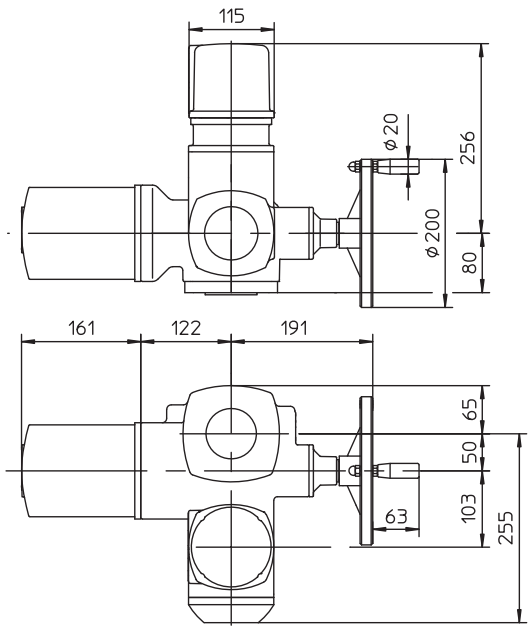
Other accessories acc. to catalogue of producer of actuators.

Dimensions of actuators Auma series 10

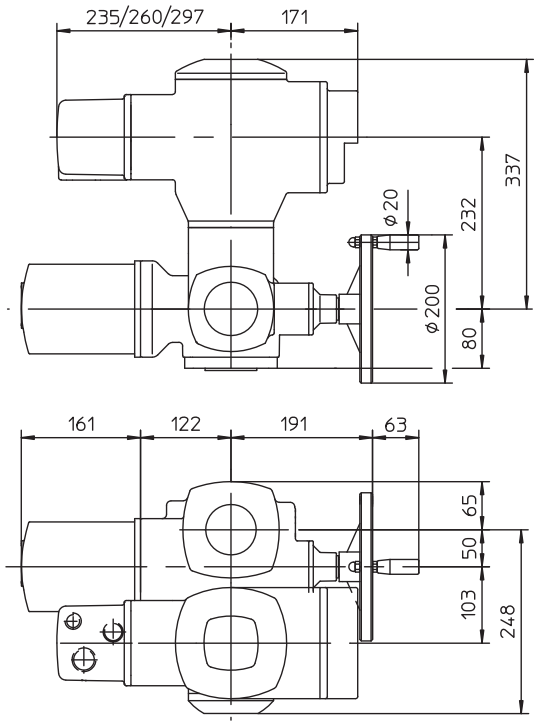
Normal version



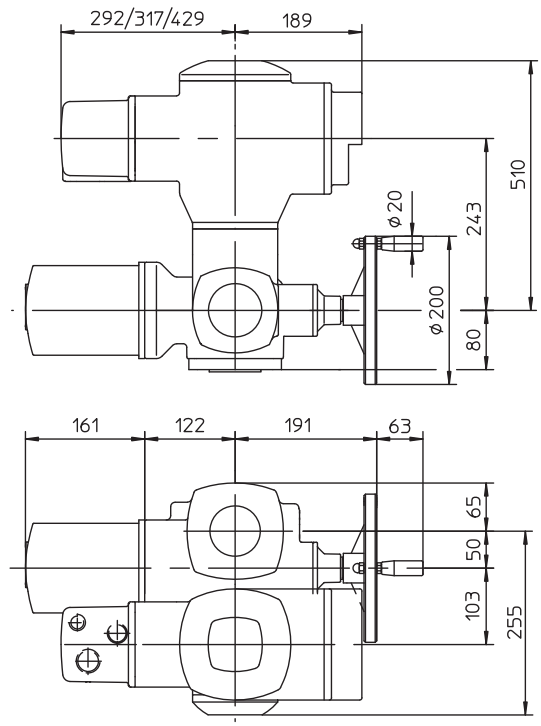
Ex norm version



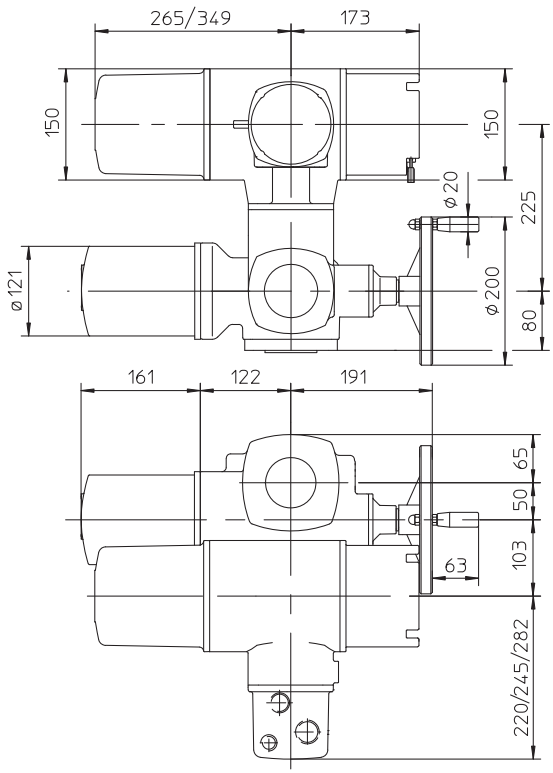
Version with MATIC



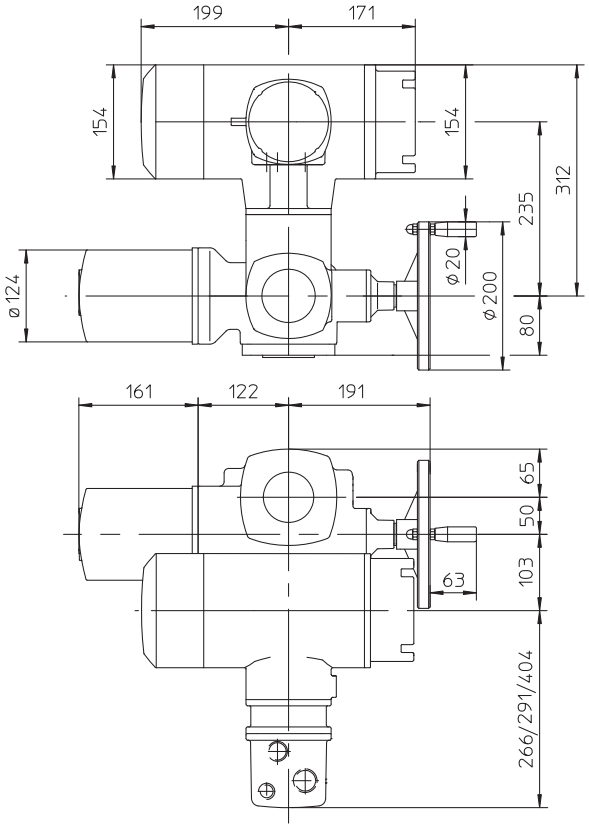
Version with Ex MATIC



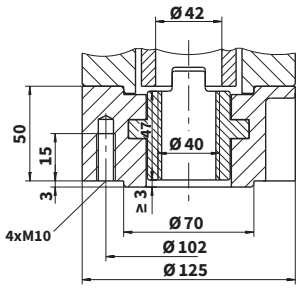
Version AUMATIC



Version Ex AUMATIC

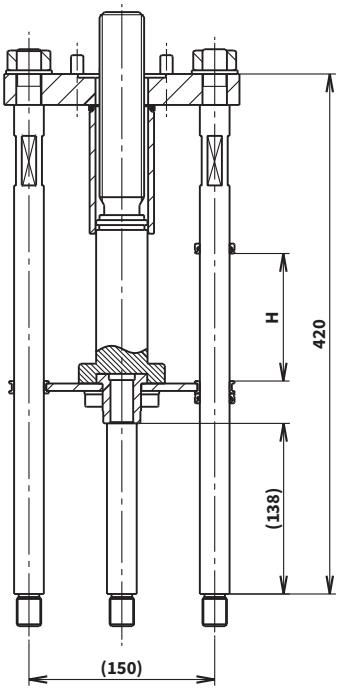


Output drive shaft A, F10

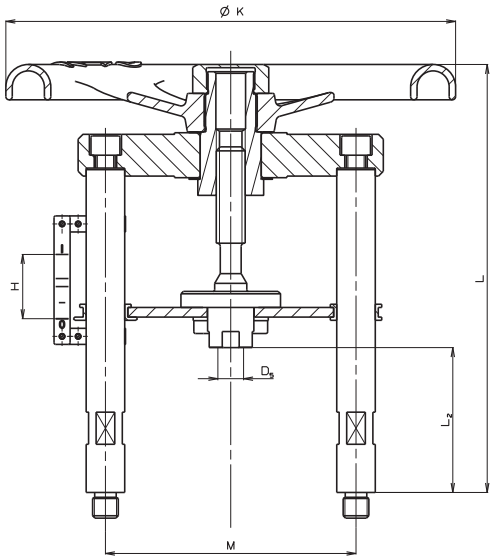


Attachment yoke NPS 8" - 16"

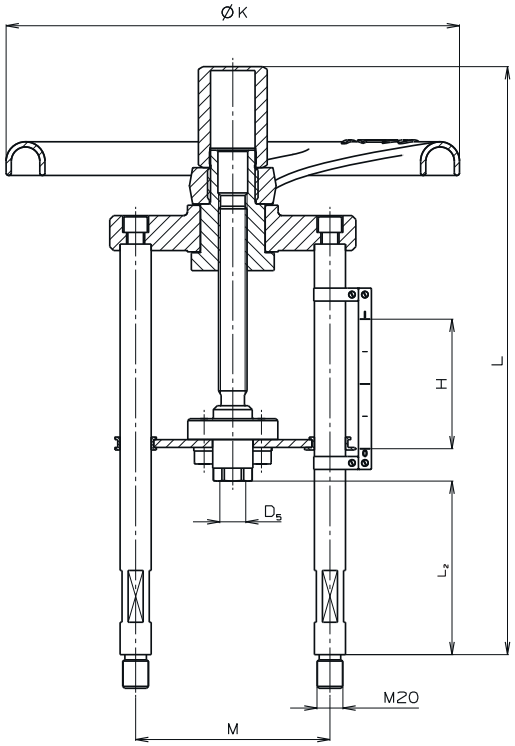
Connection A, F10, Tr36x6-LH



Hand wheels for CV / SV 3x0 SP and CV 3x2 SP



Hand wheel actuating of valves NPS ½" - 6"



Hand wheel actuating of valves NPS 8" - 16"

Dimensions of hand wheels

NPS	Marking	H [mm] [inch]	L [mm] [inch]	L_2 [mm] [inch]	øK [mm] [inch]	M [mm] [inch]	øD_5 [mm] [inch]	m kg	Ordering number (part list number)
½"	R16	16 **0,63**	209 **8,228**	70 **2,756**	160 **6,299**	140 **5,512**	M10x1	7	S900 0256
1"									
1½"									
2"	R20	20 **0,787**	235 **9,252**		195 **7,677**			12	S900 0257
3"	R28	40 **1,575**	267 **10,512**	90 **3,543**	280 **11,024**	156 **6,142**	M16x1,5	14,5	S900 0258
4"									
6"	R35		323 **12,717**		350 **13,78**			15	S900 0259
8"		80 **3,15**	454 **17,874**	134 **5,276**		150 **5,906**	M20x1,5		S900 0141
10"									
12"									
16"		100 **3,94**							S900 0235

Actuator marking in valve specification No.

Electric actuator Auma SA 07.2	**EAA**	NPS 1/2"- 2"
Electric actuator Auma SA Ex 07.2	**EAB**	NPS 1/2"- 2"
Electric actuator Auma SAR 07.2	**EAC**	NPS 1/2"- 2"
Electric actuator Auma SAR Ex 07.2	**EAD**	NPS 1/2"- 2"
Electric actuator Auma SA 07.6	**EAE**	NPS 3"- 6"
Electric actuator Auma SA Ex 07.6	**EAF**	NPS 3"- 6"
Electric actuator Auma SAR 07.6	**EAG**	NPS 3"- 6"
Electric actuator Auma SAR Ex 07.6	**EAH**	NPS 3"- 6"
Electric actuator Auma SA 10.2	**EAI**	NPS 8"- 16"
Electric actuator Auma SAR 10.2	**EAJ**	NPS 8"- 16"
Electric actuator Auma SAR Ex 10.2	**EAK**	NPS 8"- 16"
Electric actuator Auma SA Ex 10.2	**EAL**	NPS 8"- 16"
Hand wheel for NPS ½" - 1½"	**R16**	
Hand wheel for NPS 2"	**R20**	
Hand wheel for NPS 3" - 4"	**R28**	
Hand wheel for NPS 6" - 16"	**R35**	

Maximal permissible operating pressures according to ASME B16.34-2013 [MPa]

Material	Class	Teperature [°C]																
		RT [1]	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538	550
A216 WCB	150	1.96	1.92	1.77	1.58	1.38	1.21	1.02	0.93	0.84	0.74	0.65	0.55	---	---	---	---	---
	300	5.11	5.01	4.66	4.51	4.38	4.19	3.98	3.87	3.76	3.64	3.47	2.88	---	---	---	---	---
	600	10.21	10.02	9.32	9.02	8.76	8.39	7.96	7.74	7.51	7.27	6.94	5.75	---	---	---	---	---
A217 WC 6[2]	150	1.98	1.95	1.77	1.58	1.38	1.21	1.02	0.93	0.84	0.74	0.65	0.55	0.46	0.37	0.28	0.14	0.14
	300	5.17	5.17	5.15	4.97	4.80	4.63	4.29	4.14	4.03	3.89	3.65	3.52	3.37	3.17	2.57	1.49	1.27
	600	10.34	10.34	10.30	9.95	9.56	9.27	8.57	8.26	8.04	7.76	7.33	7.00	6.77	6.34	5.15	2.98	2.54
A351 CF8M[3]	150	1.90	1.84	1.62	1.48	1.37	1.21	1.02	0.93	0.84	0.74	0.65	0.55	0.46	0.37	0.28	0.14	0.14
	300	4.96	4.81	4.22	3.85	3.57	3.34	3.16	3.09	3.03	2.99	2.94	2.91	2.88	2.87	2.82	2.52	2.50
	600	9.93	9.62	8.44	7.70	7.13	6.68	6.32	6.18	6.07	5.98	5.89	5.83	5.77	5.73	5.65	5.00	4.98

[1] -29°C to 38°C

[2] Normalized annealed material only. The deliberate addition of any element which is not listed in ASTM A 217 is inadmissible, with the exception of Ca and Mg for deoxidation.

[3] With a temperature above 540°C (1004°F) use only when the carbon content is ≥ 0,04%.

Maximal permissible operating pressures according to ASME B16.34-2013 [psig]

Material	Class	Temperature [°F]														
		RT [1]	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050
A216 WCB	150	285	260	230	200	170	140	125	110	95	80	---	---	---	---	---
	300	740	680	655	635	605	570	550	530	505	410	---	---	---	---	---
	600	1480	1360	1310	1265	1205	1135	1100	1060	1015	825	---	---	---	---	---
A217 WC6[2]	150	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20
	300	750	750	720	695	665	605	590	570	530	510	485	450	320	215	145
	600	1500	1500	1445	1385	1330	1210	1175	1135	1065	1015	975	900	640	430	290
A351 CF8M[3]	150	275	235	215	195	170	140	125	110	95	80	65	50	35	20	20
	300	720	620	560	515	480	450	440	435	425	420	420	415	385	365	360
	600	1440	1240	1120	1025	955	900	885	870	855	845	835	830	775	725	720

[1] -20°F to 100°F

[2] Normalized annealed material only. The deliberate addition of any element which is not listed in ASTM A 217 is inadmissible, with the exception of Ca and Mg for deoxidation.

[3] With a temperature above 540°C (1004°F) use only when the carbon content is ≥ 0,04%.

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