

**Technical data Part-turn gearboxes and primary reduction gearings, version with worm wheel made of spheroidal cast iron**

**GS 50.3 – GS 125.3/VZ  
GS 160.3 – GS 250.3/GZ  
Spheroidal cast iron**

**Application**

Manual operation and motor operation of valves (e.g. butterfly valves and ball valves).  
For special applications, please consult AUMA.

**Worm gearboxes GS 50.3 – GS 125.3 with primary reduction gearings VZ 2.3 – VZ 4.3**

Valve			Gearboxes						
Max. valve torque <sup>1)</sup>  in Nm up to	Valve attachment		Gearbox/ prim. red. gearing	Reduction ratio	Factor <sup>2)</sup>	Turns for 90°	Input shaft <sup>3)</sup>  mm	Max. input torques <sup>4)</sup>  in Nm	Weight <sup>5)</sup>  GS+VZ kg
	Flange acc. to EN ISO 5211	Max. shaft diameter in mm							
500	F07 <sup>6)</sup> F10	38	<b>GS 50.3</b>	51:1	16.7	12.75	16	30	7.0
1,000	F10 <sup>6)</sup> F12	50	<b>GS 63.3</b>	51:1	16.7	12.75	20	60	12
2,000	F12 <sup>6)</sup> F14	60	<b>GS 80.3</b>	53:1	18.2	13.25	20	110	16
4,000	F14 <sup>6)</sup> F16	80	<b>GS 100.3</b>	52:1	18.7	13	30/(20)	214	33
			<b>GS 100.3/ VZ 2.3</b>	126:1	42.8	31.5	20	93	39
			<b>GS 100.3/ VZ 3.3</b>	160:1	54	40	20	74	39
			<b>GS 100.3/ VZ 4.3</b>	208:1	70.7	52	20	57	39
8,000	F16 <sup>6)</sup> F25	90	<b>GS 125.3</b>	52:1	19.2	13	30	417	40
			<b>GS 125.3/ VZ 2.3</b>	126:1	44	31.5	30/(20)	182	46
			<b>GS 125.3/ VZ 3.3</b>	160:1	56	40	30/(20)	143	46
			<b>GS 125.3/ VZ 4.3</b>	208:1	72.7	52	20	110	46

Gearboxes/ prim. red. gearing	Possible combinations with multi-turn actuators												Multi-turn actuator  Actuator for max. input torque	Flange <sup>3)</sup> for mounting of multi-turn actuator		Max. weight <sup>8)</sup>  GS+VZ+SA max. kg
	Operating times for 50 Hz <sup>7)</sup> in seconds for 90° at actuator speed in rpm													EN ISO 5210	DIN 3210	
	4	5,6	8	11	16	22	32	45	63	90	125	180				
<b>GS 50.3</b>	192	137	96	70	48	35	24	17	— <sup>9)</sup>	— <sup>9)</sup>	—	—	<b>SA 07.1 SA 07.2</b>	(F07) F10	— G0	27.1
<b>GS 63.3</b>	192	137	96	70	48	35	24	17	— <sup>9)</sup>	— <sup>9)</sup>	—	—	<b>SA 07.5 SA 07.6</b>	(F07) F10	— G0	33.1
<b>GS 80.3</b>	199	142	100	72	50	36	25	18	— <sup>9)</sup>	— <sup>9)</sup>	—	—	<b>SA 10.1 SA 10.2</b>	(F07) F10	— G0	41.4
<b>GS 100.3</b>	195	140	98	71	49	35	24	17	— <sup>9)</sup>	— <sup>9)</sup>	—	—	<b>SA 14.1 SA 14.2</b>	(F10) F14	(G0) G1/2	85.1
<b>GS 100.3/ VZ 2.3</b>	472	337	236	172	118	86	59	42	30	21	— <sup>9)</sup>	— <sup>9)</sup>	<b>SA 10.1 SA 10.2</b>	F10	G0	65.4
<b>GS 100.3/ VZ 3.3</b>	600	429	300	218	150	109	75	53	38	27	19	— <sup>9)</sup>	<b>SA 10.1 SA 10.2</b>	F10	G0	65.4
<b>GS 100.3/ VZ 4.3</b>	780	557	390	284	195	142	98	69	50	35	25	17 <sup>10)</sup>	<b>SA 07.5 SA 07.6</b>	F10	G0	60.1
<b>GS 125.3</b>	195	140	98	71	49	35	24	17	— <sup>9)</sup>	— <sup>9)</sup>	—	—	<b>SA 14.5 SA 14.6</b>	F14	G1/2	98.1
<b>GS 125.3/ VZ 2.3</b>	472	338	236	172	118	86	59	42	30	21	— <sup>9)</sup>	— <sup>9)</sup>	<b>SA 14.1 SA 14.2</b>	(F10) F14	(G0) G1/2	99.1
<b>GS 125.3/ VZ 3.3</b>	600	429	300	218	150	109	75	53	38	27	19	— <sup>9)</sup>	<b>SA 14.1 SA 14.2</b>	(F10) F14	(G0) G1/2	99.1
<b>GS 125.3/ VZ 4.3</b>	780	557	390	284	195	142	98	69	50	35	25	17 <sup>10)</sup>	<b>SA 10.1 SA 10.2</b>	F10	G0	72.4

- 1) For ball valve applications, sizing up to 80 % of the maximum permissible valve torque
- 2) Conversion factor from output torque to input torque to determine the actuator size
- 3) Depending on the required input torque
- 4) In new condition approx. 15 % higher input torque required
- 5) With coupling (without bore) and grease filling in the gear housing
- 6) Observe the maximum torques of the mounting flanges in accordance with EN ISO 5211.
- 7) Standard values at 50 Hz; at 60 Hz, the indicated operating time is reduced by 17 %.
- 8) With coupling (without bore) and grease filling in the gear housing, multi-turn actuator AUMA NORM with 3-phase AC motor, standard electrical connection, output drive type B3 and handwheel
- 9) Only possible for worm wheel made of bronze, multi-turn version without end stop
- 10) Observe max. output torque of the multi-turn actuator.

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**GS 50.3 – GS 125.3/VZ  
GS 160.3 – GS 250.3/GZ  
Spheroidal cast iron**

**Technical data Part-turn gearboxes and primary reduction gearings, version with worm wheel made of spheroidal cast iron**

**Worm gearboxes GS 160.3 – GS 250.3 with primary reduction gearings GZ 160.3 – GZ 250.3**

Valve			Gearboxes						
Max. valve torque <sup>1)</sup>  in Nm up to	Valve attachment		Gearbox/ prim.red. gearing	Reduction gearing	Factor <sup>2)</sup>	Turns for 90°	Input shaft <sup>3)</sup>  mm	Max. input torques <sup>4)</sup>  in Nm	Weight <sup>5)</sup>  GS+GZ max. kg
	Flange acc. to EN ISO 5211	Max. shaft diameter in mm							
14,000	F25 <sup>6)</sup> F30	100	GS 160.3	54:1	21	13.5	30	667	80
			GS 160.3/ GZ 4:1	218:1	76	54.5	30/(20)	184	91
			GS 160.3/ GZ 8:1	442:1	155	110.5	20	90	91
28,000	F30 <sup>6)</sup> F35	125	GS 200.3	53:1	20.7	13.25	40	1,353	140
			GS 200.3/ GZ 4:1	214:1	75	53.5	30	373	160
			GS 200.3/ GZ 8:1	434:1	152	108.5	30/(20)	184	160
			GS 200.3/ GZ 16:1	864:1	268	216	20	104	170
56,000	F35 <sup>6)</sup> F40	160	GS 250.3	52:1	20.3	13	50	2,759	273
			GS 250.3/ GZ 4:1	210:1	74	52.5	40/(30)	757	296
			GS 250.3/ GZ 8:1	411:1	144	103	30	389	296
			GS 250.3/ GZ 16:1	848:1	263	212	30/(20)	213	308

Gearbox/ prim.red. gearing	Possible combinations with multi-turn actuators												Multi-turn actuator  Actuator for max. input torque	Flange <sup>3)</sup> for mounting to multi-turn actuator		Max. Weight <sup>8)</sup>  GS+GZ+SA max. kg
	Operating times for 50 Hz <sup>7)</sup> in seconds for 90° at actuator speed in rpm													EN ISO 5210	DIN 3210	
	4	5,6	8	11	16	22	32	45	63	90	125	180				
GS 160.3	203	145	102	74	51	37	25	18	– <sup>9)</sup>	– <sup>9)</sup>	–	–	SA 16.1 SA 16.2	(F14) F16	(G1/2) G3	168.4
GS 160.3/ GZ 4:1	818	584	409	297	204	149	102	73	52	36	26	18	SA 14.1 SA 14.2	(F10) F14	(G0) G1/2	144.1
GS 160.3/ GZ 8:1	–	–	829	603	414	301	207	147	105	74	53	37	SA 10.1 SA 10.2	F10	G0	117.4
GS 200.3	199	142	100	72	50	36	25	18	– <sup>9)</sup>	– <sup>9)</sup>	–	–	SA 25.1	(F16) F25	(G3) –	305.1
GS 200.3/ GZ 4:1	803	573	401	292	201	146	100	71	51	36	26	18	SA 14.5 SA 14.6	F14	G1/2	218.1
GS 200.3/ GZ 8:1	–	–	814	592	407	296	203	145	103	72	52	36	SA 14.1 SA 14.2	(F10) F14	(G0) G1/2	213.1
GS 200.3/ GZ 16:1	–	–	–	–	810	589	405	288	206	144	104	72 <sup>10)</sup>	SA 10.1 SA 10.2	F10	G0	196.4
GS 250.3	195	140	98	71	49	35	24	– <sup>9)</sup>	– <sup>9)</sup>	–	–	–	SA 30.1	(F25) F30	– –	541.6
GS 250.3/ GZ 4:1	788	563	394	286	197	143	98	70	50	35	25	– <sup>9)</sup>	SA 16.1 SA 16.2	(F14) F16	(G1/2) G3	389.1
GS 250.3/ GZ 8:1	–	–	773	562	386	281	193	137	98	69	49	34	SA 14.5 SA 14.6	F14	G1/2	354.1
GS 250.3/ GZ 16:1	–	–	–	–	795	578	398	283	202	141	102	71 <sup>10)</sup>	SA 14.1 SA 14.2	(F10) F14	(G0) G1/2	361.1

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5) With coupling (without bore) and grease filling in the gear housing

6) Observe the maximum torques of the mounting flanges in accordance with EN ISO 5211.

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8) With coupling (without bore) and grease filling in the gear housing, multi-turn actuator AUMA NORM with 3-phase AC motor, standard electrical connection, output drive type B3 and handwheel

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<b>Features and functions</b>	
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Version	Standard: Clockwise RR, counterclockwise LL, option: RL or LR
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Housing material	Standard: cast iron (GJL-250), option: spheroidal cast iron (GJS-400-15)
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Self-locking	The gearboxes are self-locking when at stand-still under normal service conditions; strong vibration may cancel the self-locking effect. While in motion, safe breaking is not guaranteed. If this is required, a separate brake must be used.
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End stops	Positive for both end positions by travelling nut, sensitive adjustment
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Strength of end stop	Guaranteed strength of end stop (in Nm) for input side operation																																						
<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <th style="width: 10%;">Type</th> <th style="width: 10%;">GS 50.3</th> <th style="width: 10%;">GS 63.3</th> <th style="width: 10%;">GS 80.3</th> <th colspan="3" style="width: 20%;">GS 100.3</th> <th colspan="3" style="width: 20%;">GS 125.3</th> </tr> <tr> <td>Prim.red.gearing</td> <td>–</td> <td>–</td> <td>–</td> <td>VZ 2.3</td> <td>VZ 3.3</td> <td>VZ 4.3</td> <td>VZ 2.3</td> <td>VZ 3.3</td> <td>VZ 4.3</td> </tr> <tr> <td>Nm</td> <td>250<sup>11)</sup></td> <td>450</td> <td>450</td> <td colspan="3">500</td> <td colspan="3">250<sup>11)</sup></td> </tr> </table>		Type	GS 50.3	GS 63.3	GS 80.3	GS 100.3			GS 125.3			Prim.red.gearing	–	–	–	VZ 2.3	VZ 3.3	VZ 4.3	VZ 2.3	VZ 3.3	VZ 4.3	Nm	250 <sup>11)</sup>	450	450	500			250 <sup>11)</sup>										
Type	GS 50.3	GS 63.3	GS 80.3	GS 100.3			GS 125.3																																
Prim.red.gearing	–	–	–	VZ 2.3	VZ 3.3	VZ 4.3	VZ 2.3	VZ 3.3	VZ 4.3																														
Nm	250 <sup>11)</sup>	450	450	500			250 <sup>11)</sup>																																
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Type	GS 160.3			GS 200.3			GS 250.3																																
Prim.red.gearing	GZ 160.3			GZ 200.3			GZ 250.3																																
Reduction ratio	4:1	8:1	4:1	8:1	16:1	4:1	8:1	16:1																															
Nm	500	450	500			500																																	

Swing angle GS 50.3 – GS 125.3	Standard: Fixed swing angle between 10° and max. 100°; set in the factory to 92° unless ordered otherwise. Options: Adjustable in steps: 10° – 35°, 35° – 60°, 60° – 80°, 80° – 100°, 100° – 125°, 125° – 150°, 150° – 170°, 170° – 190° Swing angle > 190°, see Technical data with worm wheel made of bronze
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Swing angle GS 160.3 – GS 250.3	Standard: Adjustable 80° – 100°; set in the factory to 92° unless ordered otherwise. Options: Adjustable in steps: 0° – 20°, 20° – 40°, 40° – 60°, 60° – 80°, 90° – 110°; 110° – 130°, 130° – 150°, 150° – 170°, 170° – 190° Swing angle > 190°, see Technical data with worm wheel made of bronze
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Mechanical position indicator	Standard: Pointer cover for continuous position indication Options: Sealed pointer cover for horizontal outdoor installation <sup>12)</sup> Protection cover for buried service instead of pointer cover Sealed pointer cover with air vent <sup>12)</sup> , not for GS 50.3
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Input shaft	Cylindrical with parallel key according to DIN 6885.1 (refer to tables page 1 and page 2)
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<b>Operation</b>	
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Motor operation	With electric multi-turn actuator, directly or through primary reduction gearing VZ/GZ Flanges for mounting of multi-turn actuator (refer to tables page 1 and page 2).
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Type of duty	Short-time duty S2 - 15 min (open-close duty) Push-to-run operation permissible, max. 10 steps in one direction and max. of 30 starts per hour
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Manual operation	Via handwheel in aluminium, directly or through primary reduction gearing VZ/GZ Available handwheel diameters, selection according to the output torque:																																			
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Type	GS 50.3	GS 63.3	GS 80.3	GS 100.3			GS 125.3																													
Prim.red.gearing	–	–	–	–	VZ 2.3	VZ 3.3	VZ 4.3	–	VZ 2.3	VZ 3.3	VZ 4.3																									
Handwheel Ø mm	160 200 250	250 315	315 400	400 500	315 400	315 400	250 315	500 630 800	400 500	400 500	315 400																									
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Type	GS 160.3			GS 200.3			GS 250.3																													
Prim.red.gearing	–	GZ 160.3			–	GZ 200.3			–	GZ 250.3																										
Handwheel Ø mm	630 800	400	315	–	500 630	400	315	–	800	500 630	400																									
Standard: Without ball handle Options: - With ball handle - Handwheel material GJL-200																																				

<b>Primary reduction gearing</b>	
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Primary reduction gearing	- Types VZ and GZ as planetary gear with various reduction ratios for reducing the input torques (refer to tables page 1 and page 2). - Combination with GK bevel gearbox directly on GS or on GS with VZ/GZ possible
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<b>Valve attachment</b>	
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Valve attachment	Dimensions according to EN ISO 5211 (refer to tables page 1 and page 2): Observe the maximum torques of the mounting flanges in accordance with EN ISO 5211. Standard: GS 50.3 – GS 125.3: without spigot GS 160.3 – GS 250.3: with spigot Options: GS 50.3 – GS 125.3: with spigot GS 160.3 – GS 250.3: without spigot
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Splined coupling for connection to the valve shaft	Standard: Without bore or pilot bore from GS 160.3 Worm gearbox can be repositioned 4 x 90° on coupling Options: Machined with bore and keyway, square bore or bore with two-flats including grub screw for fixing to valve shaft
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11) Not qualified in accordance with AWWA  
12) For gas applications with sealed pointer cover, an air vent in the pointer cover or venting keyways in the valve mounting flange must be provided.

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GS 160.3 – GS 250.3/GZ  
Spheroidal cast iron**

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**Service conditions**

Mounting position	Any position				
Enclosure protection according to EN 60529 <sup>13)</sup>	Standard:	IP 68-3, dust and water tight up to max. 3 m head of water			
	Options <sup>14)</sup> :	IP 68-6, dust and water tight up to max. 6 m head of water IP 68-10, dust and water tight up to max. 10 m head of water IP 68-20, dust and water tight up to max. 20 m head of water			
Corrosion protection	Standard:	KN Suitable for installation in industrial units, in water or power plants with a low pollutant concentration			
	Options:	KS Suitable for installation in occasionally or permanently aggressive atmosphere with a moderate pollutant concentration (e.g. in wastewater treatment plants, chemical industry) KX Suitable for installation in extremely aggressive atmosphere with high humidity and high pollutant concentration			
Paint	Standard:	GS 50.3 – GS 125.3: Two component iron mica combination GS 160.3 – GS 250.3: Primer coating			
	Option:	GS 160.3 – GS 250.3: Two component iron-mica combination			
Colour	Standard:	AUMA silver-grey (similar to RAL 7037) if finish painted			
	Option:	Other colours on request			
Ambient temperature	Standard:	-40 °C to +80 °C			
	Options:	-60 °C to +60 °C, version EL -0 °C to +120 °C, version H			
Lifetime	Lifetime for 90° rotary movement				
	<b>Gearbox size</b>	GS 50.3/ GS 63.3	GS 80.3/ GS 100.3/VZ	GS 125.3/VZ – GS 200.3/GZ	GS 250.3/GZ
	<b>No. of cycles<sup>15)</sup> for max. torque</b>	10,000	5,000	2,500	1,000

**Accessories**

Valve position indicators	WSG valve position indicator for signalling intermediate and end positions for precise and low-backlash feedback of swing angles ranging from 82° – 98° (refer to separate data sheet)
	WGD valve position indicator for signalling intermediate and end positions for swing angles > 180° (refer to separate data sheet)
Limit switching device	WSH limit switching device for manually operated valves. For signalling intermediate and end positions (refer to separate data sheet)

**Special features for use in potentially explosive atmospheres**

Explosion protection according to ATEX 94/9/EC	Standard:	II2G c IIC T4 II2D c T130 °C							
	Options:	II2G c IIC T3 II2D c T190 °C IM2 c							
Type of duty <sup>16)</sup>	Short-time duty S2 - 15 min, maximum of 3 cycles (OPEN-CLOSE-OPEN); 90° with the following average output torques								
	<b>Gearbox size</b>	GS 50.3	GS 63.3	GS 80.3	GS 100.3	GS 125.3	GS 160.3	GS 200.3	GS 250.3
	<b>Average output torque in Nm</b>	250	500	1,000	2,000	4,000	8,000	16,000	32,000
	then cooling down to ambient temperature								
Ambient temperature	Standard:	-40 °C to +60 °C (II2G c IIC T4; II2D c T130 °C)							
	Options:	-50 °C to +60 °C (II2G c IIC T4; II2D c T130 °C) -60 °C to +60 °C (II2G c IIC T4; II2D c T130 °C) -40 °C to +40 °C (II2G c IIC T4; II2D c T130 °C) -40 °C to +80 °C (II2G c IIC T3; II2D c T190 °C) 0 °C to +120 °C (II2G c IIC T3; II2D c T190 °C) -20 °C to +40 °C (IM2 c)							
Output speeds	Standard:	50 Hz, refer to tables on pages 1 and 2							
	Option:	60 Hz with adapted output speed of the multi-turn actuator							

**Further information**

EU directives	ATEX directive: (94/9/EC) Machinery directive: (2006/42/EC)
Reference documents	Product description Part-turn gearboxes GS 50.3 – GS 250.3/GS 315 – GS 500 Dimension sheets GS 50.3 – GS 125.3, GS 160.3 – GS 250.3 Technical data SA, SAR, WSG, WGD, WSH
Lever gearboxes	Refer to separate documents

<sup>13)</sup> Refer to information sheet "Enclosure protection IP 68 (submersible) for worm gearboxes and primary reduction gearings".

<sup>14)</sup> Not available for GS 50.3

<sup>15)</sup> Number of cycles according to standard EN 15714-2

<sup>16)</sup> The type of duty must not be exceeded.

We reserve the right to alter data according to improvements made. Previous documents become invalid with the issue of this document.