

Technical data Part-turn gearboxes for open-close duty

General information

Worm gearboxes for motor or manual operation of valves (e.g. butterfly valves, ball and plug valves). Specific sizing is required for special applications e.g. dampers or gas diverters. Special applications on request.

Valve			Gearbox						
Max. valve torque	Valve attachment		Type	Reduction ratio	Factor ¹⁾	Turns for 90°	Input shaft ²⁾	Max. input torques	Weight ³⁾
to [Nm]	Flange according to EN ISO 5211	Max. Shaft diameter [mm]					[mm]	[Nm]	GS + GZ approx. [kg]
90,000	F40/F48	200	GS 315	53:1	23.9	13.25	60	3,766	520
			GS 315 GZ 30.1 – 4:1 ⁴⁾	212:1	81	53	40	1,111	630
			GS 315 GZ 30.1 – 8:1	424:1	162	106	30/40	556	
			GS 315 GZ 30.1 – 16:1	848:1	325	212	30/40	277	
			GS 315 GZ 30.1 – 32:1	1,696:1	650	424	20	138	
63,000			GS 315 GZ 30.1 – 40:1 ⁴⁾	2,120:1	813	530	20	78	
180,000	F48/F60	250	GS 400	54:1	24.3	13.5	80	7,407	980
125,000			GS 400 GZ 35.1 – 4:1 ⁴⁾	216:1	82	54	50	1,528	1,100
125,000			GS 400 GZ 35.1 – 6:1 ⁴⁾	324:1	123	81	40	1,016	
180,000			GS 400 GZ 35.1 – 8:1	432:1	165	108	40	1,091	
64,000			GS 400 GZ 35.1 – 8:1 ⁴⁾	432:1	165	108	30	388	
180,000			GS 400 GZ 35.1 – 16:1	864:1	331	216	30	544	
			GS 400 GZ 35.1 – 32:1	1,728:1	661	432		272	
360,000			F60	315	GS 500	52:1	23.4	13	100
250,000	GS 500 GZ 40.1 – 8:1 ⁴⁾	416:1			145	104	40	1,724	2,000
360,000	GS 500 GZ 40.1 – 16:1	832:1			318	208	40	1,132	
	GS 500 GZ 40.1 – 32:1	1,664:1			636	416	30	566	
250,000	GS 500 GZ 40.1 – 45:1 ⁴⁾	2,340:1			809	585		309	
360,000	GS 500 GZ 16.1 (4:1) + GZ 40.1 (16:1) – 64:1	3,328:1			1,147	832		314	2,030

- 1) Conversion factor from output torque to input torque for actuator size definition For new gearboxes, input torques increased by 15 % are required due to lower efficiency.
- 2) Depending on the required input torque.
- 3) Specified weight includes coupling (without bore) and grease filling in the gear housing and the smallest flange size
- 4) Special reduction ration on request.

Type	Reduction ratio	Possible combinations with multi-turn actuators								Multi-turn actuator	Input mounting flange for mounting multi-turn actuator		Max. weight ¹⁾
		Operating time for 50 Hz ²⁾ in seconds at 90° for multi-turn actuator speed in rpm								Actuator for max. input torque	EN ISO 5210	DIN 3210	GS+GZ+SA [kg]
		16	22	32	45	63	90	125	180				
GS 315	53:1	50	36	25	— ³⁾	— ³⁾	— ³⁾	—	—	SA 30.1	F30	—	919
GS 315 GZ 30.1 – 4:1 ⁴⁾	212:1	199	145	99	71	50	35	25 ³⁾	— ³⁾	SA 16.2	F16	G3	857
GS 315 GZ 30.1 – 8:1	424:1	398	289	199	141	101	71	51	35	SA 14.6	F14	G1/2	828
GS 315 GZ 30.1 – 16:1	848:1	795	578	398	283	202	141	102	71	SA 14.2	F14	G1/2	823

We reserve the right to alter data according to improvements made. Previous documents become invalid with the issue of this document. For further information on the product, refer to www.auma.com.

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		Possible combinations with multi-turn actuators								Multi-turn actuator	Input mounting flange for mounting multi-turn actuator		Max. weight ¹⁾
Type	Reduction ratio	Operating time for 50 Hz ²⁾ in seconds at 90° for multi-turn actuator speed in rpm								Actuator for max. input torque	EN ISO 5210	DIN 3210	GS+GZ+SA [kg]
		16	22	32	45	63	90	125	180				
GS 315 GZ 30.1 – 32:1	1,696:1	–	–	795	565	404	283	204	141	SA 10.2	F10	G0	800
GS 315 GZ 30.1 – 40:1 ⁴⁾	2,120:1	–	–	–	707	505	353	254	177	SA 10.2	F10	G0	800
GS 400	54:1	51	37	– ³⁾	– ³⁾	– ³⁾	– ³⁾	–	–	SA 35.1	F35	–	1,405
GS 400 GZ 35.1 – 4:1 ⁴⁾	216:1	203	147	101	72	51	36	–	–	SA 25.1	F25	G4	1,260
GS 400 GZ 35.1 – 6:1 ⁴⁾	324:1	304	221	152	108	77	54	39	27	SA 16.2	F16	G3	1,183
GS 400 GZ 35.1 – 8:1	432:1	405	295	203	144	103	72	52	36	SA 16.2	F16	G3	1,183
GS 400 GZ 35.1 – 8:1 ⁴⁾	432:1	405	295	203	144	103	72	52	36	SA 14.6	F14	G1/2	1,153
GS 400 GZ 35.1 – 16:1	864:1	810	589	405	288	206	144	104	72	SA 14.6	F14	G1/2	1,153
GS 400 GZ 35.1 – 32:1	1,728:1	–	–	810	576	411	288	207	144	SA 14.2	F14	G1/2	1,148
GS 500	52:1	49	35	– ³⁾	– ³⁾	– ³⁾	– ³⁾	–	–	SA 40.1	F40	–	2,380
GS 500 GZ 40.1 – 8:1 ⁴⁾	416:1	390	284	195	139	99	69	50	35	SA 25.1	F25	–	2,160
GS 500 GZ 40.1 – 16:1	832:1	780	567	390	277	198	139	100	69	SA 16.2	F16	G3	2,083
GS 500 GZ 40.1 – 32:1	1,664:1	–	–	780	555	396	277	200	139	SA 14.6	F14	G1/2	2,053
GS 500 GZ 40.1 – 45:1 ⁴⁾	2,340:1	–	–	–	780	557	390	281	195	SA 14.6	F14	G1/2	2,053
GS 500 GZ 16.1 (4:1) + GZ 40.1 (16:1) – 64:1	3,328:1	–	–	–	–	792	555	399	277	SA 14.2	F14	G1/2	2,048

- 1) Specified weight contains coupling (without bore) and grease filling in the gear housing, multi-turn actuator with 3-phase AC motor, standard electrical connection, output drive type B3 and handwheel.
- 2) Standard values at 50 Hz; at 60 Hz, the indicated operating time is reduced by 17 %.
- 3) Refer to Technical Data GS 315 – GS 500 for modulating duty and shorter operating times; heed maximum valve torque.
- 4) Special reduction ration on request.

Features and functions

Worm wheel material	For open-close duty: Spheroidal cast iron	
Version	Standard:	Clockwise rotation RR, counterclockwise rotation LL
	Option:	RL or LR
Housing material	Standard:	Cast iron (GJL-250)
	Option:	Spheroidal cast iron (GJS-400-15)
Self-locking	The gearboxes are self-locking when at standstill under normal service conditions; strong vibration may cancel the self-locking effect. While in motion, safe braking is not guaranteed. If this is required, a separate brake must be used.	
End stops	Positive for both end positions by travelling nut, sensitive adjustment	

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Features and functions											
Strength of end stop	Guaranteed strength of end stop (in Nm) for input side operation according to AWWA										
	Type	GS 315			GS 400			GS 500			
	Primary reduction gearing	GZ 30.1			GZ 35.1			GZ 40.1		GZ 40.1	GZ 16.1
	Reduction ratio	8:1	16:1	32:1	8:1	16:1	32:1	16:1	32:1	16:1	4:1
	[Nm]	450		250	450			450		450	
Strength of end stop for special reduction ratios	Guaranteed strength of end stop (in Nm) for input side operation										
	Type	GS 315			GS 400			GS 500			
	Primary reduction gearing	GZ 30.1			GZ 35.1			GZ 40.1			
	Reduction ratio	4:1	16:1	40:1	4:1	6:1	8:1	8:1	45:1		
	[Nm]	450		250	450			450		500	
Swing angle GS 315 – GS 500	Standard:	Adjustable 0 ° – 135 °; set in the factory to 92° unless ordered otherwise.									
	Options:	Swing angle > 100°, multi-turn without end stops, refer to Technical data GS 315 – GS 500 for modulating duty and shorter operating times									
Mechanical position indicator	Standard:	Pointer cover for continuous position indication									
	Options:	- Sealed pointer cover for horizontal outdoor installation - Protection cover instead of pointer cover for buried service For gas applications with sealed pointer cover, an air vent valve in the pointer cover or venting keyways in the valve mounting flange must be provided.									
Input shaft	Cylindrical with parallel key according to DIN 6885-1 (refer to table on page 1)										

Operation										
Motor operation	- With electric multi-turn actuator, directly or through GZ primary reduction gearing - Input mounting flanges for multi-turn actuator (refer to table page 2)									
Type of duty	Short-time duty S2 - 15 min (open-close duty)									
Manual operation	Available handwheel diameters (according to EN 12570), selection according to output torque:									
	Type	GS 315								
	Primary reduction gearing	–	GZ 30.1							
	Reduction ratio	53:1	212:1	424:1	848:1	1,696:1	2,120:1			
	Handwheel Ø [mm]	–	–	800	500/830	400	400			
	Type	GS 400								
	Primary reduction gearing	–	GZ 35.1							
	Reduction ratio	54:1	216:1	324:1	432:1	432:1	864:1	1,728:1		
	Handwheel Ø [mm]	–	–	–	–	800	800	500/630		
	Type	GS 500								
	Primary reduction gearing	–	GZ 40.1						GZ 16.1 + GZ 40.1	
	Reduction ratio	52:1	416:1	832:1	1,664:1	2,340:1	3,328:1			
	Handwheel Ø [mm]	–	–	–	800	800	500/630			
	Standard:	- Handwheel made of aluminium - Handwheel with ball handle								
	Options:	- Handwheel made of GJL-200 - Handwheel lockable - WSH limit switching device for signalling position and end positions								

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Primary reduction gearing				
Primary reduction gearing	- Type GZ as coaxial spur gear with various reduction ratios for reducing the input torques (refer to table page 1). - Combination with GK bevel gearbox directly on GS or on GS with GZ possible (90° deflection of input shaft)			
Valve attachment				
Valve attachment	Dimensions according to EN ISO 5211: The maximum torques of mounting flanges according to EN ISO 5211 are to be met.			
	Standard:	With spigot		
Splined coupling for connection to the valve shaft	Standard:	- With pilot bore - Worm gearbox can be mounted at 4 x 90° increments on coupling		
	Options:	Finish machining with bore and keyway, square bore or two-flat with grub screw for secure fixing to valve shaft.		
Limit sensing for signalling position and end positions				
Valve position indicators	- WSG valve position indicator (hall sensors) for position and end position signalling to ensure precise and low-backlash feedback for swing angles ranging between 82° and 98°. - WGD valve position indicator (counter gear mechanism) for position and end position signalling for swing angles > 180°			
Service conditions				
Mounting position	Any position			
Ambient temperature	Standard:	–40 °C to +80 °C		
	Options:	–60 °C to +60 °C 0 °C to +120 °C		
Enclosure protection according to EN 60529	Standard:	IP68, dust-tight and water-tight up to max. 8 m head of water		
	Options:	IP68-20, dust-tight 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 use in areas with high salinity, almost permanent condensation, and high pollution.	
		KX	Suitable for use in areas with extremely high salinity, permanent condensation, and high pollution.	
Paint	Standard:	Primer coated		
	Option:	Two-component iron-mica combination		
Colour	Standard:	AUMA silver-grey (similar to RAL 7037)		
	Option:	Available colours on request		
Lifetime	Lifetime for 90° rotary movement			
	Type	GS 315	GS 400	GS 500
	Number of cycles for max. torque	2,500	1,200	1,200
	AUMA worm gearboxes meet or exceed the lifetime requirements of EN 15714-2. Detailed information can be provided on request.			

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Special features for use in potentially explosive atmospheres in accordance with ATEX 2014/34/EU

Explosion protection in accordance with ATEX 2014/34/EU	Standard:	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T130°C Db
	Options:	II 2G Ex h IIC T3 Gb II 2D Ex h IIIC T190°C Db I M2 Ex h I Mb
Applied standards	EN ISO 80079-36:2016-12 EN ISO 80079-37:2016-12	
Type of duty	Standard:	Maximum 3 cycles (OPEN - CLOSE - OPEN) in accordance with AUMA load spectrum (90° part-turn movement) and maximum permissible input speeds or with mean constant output torques according to technical data.
Ambient temperature	Standard:	–40 °C to +60 °C
	Options:	–50 °C to +60 °C –60 °C to +60 °C

Further information

EU Directives	Machinery Directive: (2006/42/EC)
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