Technical data Lever gearboxes for modulating duty and shorter operating times

Valve		Gearbox						
Max. valve torque		Gearbox/primary reduction gearing	Reduction ratio	Factor[1]	Turns for 90°	Input shaft[2]	Max. input torques	Weight[3]
to [Nm]	Modulating torque[4] to [Nm]					[mm]	[Nm]	GF + VZ/GZ [kg]
350	125	GF 50.3	51:1	17.9	12.75	16	20	10
700	250	GF 63.3	51:1	17.3	12.75	20	41	23
1,400	500	GF 80.3	53:1	19.3	13.25	20	73	29
2,800	1,000	GF 100.3	52:1	20.2	13	30/(20)	139	58
		GF 100.3/ VZ 2.3	126:1	44.4	31.5	20	63	64
		GF 100.3/ VZ 3.3	160:1	55.5	40	20	50	64
		GF 100.3/ VZ 4.3	208:1	77	52	20	37	64
5,600	2,000	GF 125.3	52:1	20.8	13	30	269	89
		GF 125.3/ VZ 2.3	126:1	45.4	31.5	30/(20)	123	95
		GF 125.3/ VZ 3.3	160:1	57.9	40	30/(20)	97	95
		GF 125.3/ VZ 4.3	208:1	77	52	20	73	95
11,250	4,000	GF 160.3	54:1	22.7	13.5	30	496	139
		GF 160.3/ GZ 160.3 - 4:1	218:1	83	54.5	30/(20)	136	150
		GF 160.3/ GZ 160.3 - 8:1	442:1	167	110.5	20	68	150
22,500	8,000	GF 200.3	53:1	22.3	13.25	40	1,009	258
		GF 200.3/ GZ 200.3 - 4:1	214:1	81.3	53.5	30	277	278
		GF 200.3/ GZ 200.3 - 8:1	434:1	165	108.5	30/(20)	137	278
		GF 200.3/ GZ 200.3 - 16:1	864:1	308	216	20	73	288
45,000	16,000	GF 250.3	52:1	21.9	13	50	2,060	467
		GF 250.3/ GZ 250.3 - 4:1	210:1	80	52.5	40/(30)	563	490
		GF 250.3/ GZ 250.3 - 8:1	411:1	156	109	30	289	490
		GF 250.3/ GZ 250.3 - 16:1	848:1	305	212	30/(20)	148	502

1) – 4) Refer to notes on page 3.

Technical data Lever gearboxes for modulating duty and shorter operating times

		Possible combinations with multi-turn actuators												Multi-turn actuator	Input mounting flange for mounting multi-turn actuator		Max. weight[5]
Gearbox/primary reduction gearing	Reduct. ratio	Operating time for 50 Hz[6] in seconds for 90° at actuator output speed in rpm												Actuator for max. input torque			
		4	5.6	8	11	16	22	32	45	63	90	125	180		EN ISO 5210	DIN 3210	GF+VZ/ GZ+SA [kg]
GF 50.3	51:1	191	137	96	70	48	35	24	17	12[7]	9[7]	6[7]	4[7]	SAR 07.2	F07 F10	G0	30.1
GF 63.3	51:1	191	137	96	70	48	35	24	17	12[7]	9[7]	6[7]	4[7]	SAR 07.6	F07 F10	G0	44.1
GF 80.3	53:1	199	142	99	72	50	36	25	18	13[7]	9[7]	6[7]	4[7]	SAR 10.2	F07 F10	G0	54.4
GF 100.3	52:1	195	139	98	71	49	35	24	17	12[7]	9[7]	6[7]	4[7]	SAR 14.2	F10 F14	G0 G1/2	110.1
GF 100.3/ VZ 2.3	126:1	473	338	236	172	118	86	59	42	30	21	15[7]	11[7]	SAR 10.2	F10	G0	89.4
GF 100.3/ VZ 3.3	160:1	600	429	300	218	150	109	75	53	38	27	19	13[7]	SAR 07.6	F10	G0	85.1
GF 100.3/ VZ 4.3	208:1	780	557	390	284	195	142	98	69	50	35	25	17[7]	SAR 07.6	F10	G0	85.1
GF 125.3	52:1	195	139	98	71	49	35	24	17	12[7]	9[7]	6[7]	4[7]	SAR 14.6	F14	G1/2	147.1
GF 125.3/ VZ 2.3	126:1	473	338	236	172	118	86	59	42	30	21	15[7]	11[7]	SAR 14.2	F10 F14	G0 G1/2	147.1
GF 125.3/ VZ 3.3	160:1	600	429	300	218	150	109	75	53	38	27	19	13[7]	SAR 10.2	F10	G0	120.4
GF 125.3/ VZ 4.3	208:1	780	557	390	284	195	142	98	69	50	35	25	17[7]	SAR 10.2	F10	G0	120.4
GF 160.3	54:1	203	145	101	74	51	37	25	18	13[7]	9[7]	6[7]	5[7]	SAR 14.6	F14	G1/2	197.1
GF 160.3/ GZ 160.3 - 4:1	218:1	818	584	409	297	204	149	102	73	52	36	26	18	SAR 14.2	F10 F14	G0 G1/2	202.1
GF 160.3/ GZ 160.3 - 8:1	442:1	–	–	829	603	414	301	207	147	105	74	53	37	SAR 10.2	F10	G0	175.4
GF 200.3	53:1	199	142	99	72	50	36	25	18	13[7]	9[7]	–	–	SAR 25.1	F16 F25	G3 –	413.1
GF 200.3/ GZ 200.3 - 4:1	214:1	803	573	401	292	201	146	100	71	51	36	26	18	SAR 14.6	F14	G1/2	336.1
GF 200.3/ GZ 200.3 - 8:1	434:1	–	–	814	592	407	296	203	145	103	72	52	36	SAR 14.2	F10 F14	G0 G1/2	330.1
GF 200.3/ GZ 200.3 - 16:1	864:1	–	–	–	–	810	589	405	288	206	144	104	72[7]	SAR 10.2	F10	G0	313.4
GF 250.3	52:1	195	149	98	71	49	35	24	17[7]	12[7]	9[7]	–	–	SAR 30.1	F25 F30	–	665.6
GF 250.3/ GZ 250.3 - 4:1	210:1	788	563	394	286	197	143	98	70	50	35	25	18[7]	SAR 16.2	F14 F16	G1/2 G3	578.4
GF 250.3/ GZ 250.3 - 8:1	411:1	–	–	771	560	385	280	193	137	98	69	49	34	SAR 14.6	F14	G1/2	548.1
GF 250.3/ GZ 250.3 - 16:1	848:1	–	–	–	–	795	578	398	283	202	141	102	71	SAR 14.2	F10 F14	G0 G1/2	554.1

5) – 7) Refer to notes on page 3.

Technical data Lever gearboxes for modulating duty and shorter operating times

General information
For motor or manual operation of valves (e.g. butterfly valves, ball and plug valves), particularly suited for modulating duty and shorter operating times. Specific sizing is required for special applications e.g. dampers or gas diverters. For special applications, please consult AUMA.

Notes to table on pages 1 + 2	
1) Factor	Conversion factor from output torque to input torque to determine the actuator size For new gearboxes, input torques increased by 15 % are required due to lower efficiency.
2) Input shaft	Depending on the required input torque
3) Weight	Specified weight includes coupling (without bore) and grease filling in the gear housing
4) Max. valve torque for modulating torque	Modulating torque = permissible, average torque for modulating duty
5) Max. weight	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.
6) Operating time for 50 Hz	Standard values at 50 Hz; at 60 Hz, the indicated operating time is reduced by 17 %.
7)	Multi-turn version without end stop is recommended. Not feasible for modulating duty.

Features and functions		
Worm wheel material	Bronze	
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	
Strength of end stop	Guaranteed strength of end stop (in Nm) for input side operation according to AWWA	
Swing angle GF 50.3 – GF 125.3	Standard:	Fixed swing angle between 10° and max. 100°; set in the factory to 92° unless ordered otherwise.
	Options:	Adjustable in steps of: 10° – 35°, 35° – 60°, 60° – 80°, 80° – 100°, 100° – 125°, 125° – 150°, 150° – 170°, 170° – 190° Swing angle > 190°, multi-turn version without end stops, GFD version, specific sizing required
Swing angle GF 160.3 – GF 250.3	Standard:	Adjustable 80° – 100°; set in the factory to 92° unless ordered otherwise.
	Options:	Adjustable in steps of: 0° – 20°, 20° – 40°, 40° – 60°, 60° – 80°, 90° – 110°, 110° – 130°, 130° – 150°, 150° – 170°, 170° – 190° Swing angle > 190°, multi-turn version without end stops, GFD version, specific sizing required
Mechanical position indicator	Standard:	No position indicator (protection cover)
	Option:	Pointer cover instead of protection cover for continuous position indication
Input shaft	Cylindrical with parallel key according to DIN 6885-1 (refer to table on page 1)	

Type	GF 50.3	GF 63.3	GF 80.3	GF 100.3			GF 125.3		
Primary reduction gearing	–	–	–	VZ 2.3	VZ 3.3	VZ 4.3	VZ 2.3	VZ 3.3	VZ 4.3
[Nm]	250	450	450	500		250	500		250

Type	GF 160.3		GF 200.3			GF 250.3		
Primary reduction 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		

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

Technical data Lever gearboxes for modulating duty and shorter operating times

Operation

Motor operation

- With electric multi-turn actuator, directly or through VZ/GZ primary reduction gearing
- Input mounting flanges for multi-turn actuator (refer to table page 1)

Type of duty

- Intermittent duty S4 - 25 % (modulating duty)

Manual operation

Available handwheel diameters (according to EN 12570), selection according to output torque:

Type	GF 50.3	GF 63.3	GF 80.3	GF 100.3				GF 125.3			
Primary reduction 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		250 315	500 630 800	400 500		315 400

Type	GF160.3			GF 200.3				GF 250.3			
Primary reduction 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:

- Handwheel made of aluminium
- Handwheel with ball handle

Option:

- Handwheel made of GJL-200
- Handwheel lockable
- WSH for signalling position and end positions

Primary reduction gearing

Primary reduction gearing

- VZ and GZ types as planetary gears with various reduction ratios for reducing the input torques (refer to table page 1).
- Combination with GK bevel gearbox directly on GF or on GF with VZ/GZ possible (90° deflection of input shaft)

Base and lever

Base	Made of spheroidal cast iron; for mounting to base, 4 holes for fastening screws are available.
Lever	Made of spheroidal cast iron; with 2 or 3 bores for fixing lever arrangement. Considering the environmental conditions, the lever may be mounted to the output shaft in any desired position.
Ball joints	Two ball joints matching the lever, as an option including lock nuts and 2 welding nuts; suitable for pipe according to dimension sheet

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:	IP68-8, dust and water tight up to max. 8 m head of water	
	Options:	IP68-20, 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 industrial units, in water or power plants with a low pollutant concentration as well as for installation in occasionally or permanently aggressive atmospheres with a moderate pollutant concentration (e.g. wastewater treatments plants, chemical industry)
		KX	Suitable for installation in extremely aggressive atmospheres with high humidity and high pollutant concentration
Paint	Standard:	GF 50.3 – GF 125.3: Two-component iron-mica combination GF 160.3 – GF 250.3: primer coated	
	Option:	GF 160.3 – GF 250.3: Two-component iron-mica combination	

Technical data Lever gearboxes for modulating duty and shorter operating times

Colour	Standard:	AUMA silver-grey (similar to RAL 7037)
	Option:	Other colours are possible on request.
Lifetime	Modulating duty: 2.5 million modulating steps The lifetime depends on the load and the number of starts. A high starting frequency will rarely improve the modulating accuracy. To reach the longest possible maintenance and fault-free operating time, the number of starts per hour chosen should be as low as permissible for the process.	

Accessories	
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°

Special features for use in potentially explosive atmospheres		
Explosion protection in accordance with 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	Standard:	Intermittent duty S4 - 25 % with modulating torque and max. input speed 45 rpm or 11 rpm for GF 200.3 and GF 250.3, refer to table on page 1.
	Exception:	GF 200.3 with modulating torque up to 4,800 Nm
	Option:	GFD multi-turn version, specific sizing required; please contact AUMA.
Ambient temperature	Standard:	–40 °C to +40 °C (II2G c IIC T4; II2D c T130 °C) –40 °C to +60 °C (II2G c IIC T4; II2D c T130 °C) -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)
	Options:	–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)

Further information	
EU Directives	ATEX Directive: (94/9/EC) Machinery Directive: (2006/42/EC)
Reference documents	Product description Electric actuators for industrial valve automation Dimensions GF 50.3 – GF 125.3, GF 160.3 – GF 250.3 Dimensions Ball joints Technical data SA 07.2 – SA 16.2 with 3-phase AC motors Technical data SAR 07.2 – SAR 16.2 with 3-phase AC motors Technical data WSG 90.1 Technical data WGD 90.1