

Technical data Multi-turn gearboxes

Valve				Gearbox							
Max. valve torque		Valve attachment		Gearbox	Reduction ratio	Max. input torques		Factor ¹⁾	Input shaft ²⁾		Weight ³⁾ [kg]
Nominal torque [Nm]	Modulating torque ⁴⁾ [Nm]	Standard EN ISO 5210	Option DIN 3210			Nominal torque [Nm]	Modulating torque [Nm]		Standard [mm]	Option [mm]	
120	60	F10	G0	GST 10.1	1:1	135	66	0.9	20	–	14
					1.4:1	95	46	1.3	20	–	
					2:1	67	33	1.8	20	–	
250	120	F14	G1/2	GST 14.1	1.4:1	198	92	1.3	30	–	26
					2:1	139	66	1.8	20	30	
					2.8:1	99	48	2.5	20	30	
					4:1 ⁵⁾	70	35	3.6	20	–	
500	200	F14	G1/2	GST 14.5	2:1	278	111	1.8	30	–	26
250					2:1 ⁵⁾	140	111	1.8	20	–	
500					2.8:1	198	80	2.5	30	–	
350					2.8:1 ⁵⁾	140	80	2.5	20	–	
500					4:1	139	50	3.6	20	–	
1,000	400	F16	G3	GST 16.1	2.8:1	397	160	2.5	30	–	40
350	350				2.8:1 ⁵⁾	140	140	2.5	20	–	
1,000	400				4:1	278	111	3.6	30	–	
500	400				4:1 ⁵⁾	140	111	3.6	20	–	
1,000	400				5.6:1	198	80	5.0	30	–	
700	400				5.6:1 ⁵⁾	140	80	5.0	20	–	
2,000	800	F25	G4	GST 25.1	4:1	556	222	3.6	30	40	82
					5.6:1	397	160	5.0	30	40	
					8:1	278	111	7.2	30	40	
3,000	1,600	F30	G5	GST 30.1	3.28:1 ⁵⁾	1,020	552	2.95	40	–	115
4,000					5.6:1	794	320	5.0	40	–	
2,800					5.6:1 ⁵⁾	560	320	5.0	30	–	
4,000					8:1	556	222	7.2	30	40	
4,000	–	F35	G6	GST 35.1	11:1	404	162	9.9	30	40	195
8,000					7:1 ⁵⁾	1,270	–	6.3	50	–	
8,000					8:1	1,111	–	7.2	40	50	
4,030					8:1 ⁵⁾	560	–	7.2	30	–	
8,000					9.25:1 ⁵⁾	965	–	8.3	40	–	
8,000					11:1	808	–	9.9	40	50	
5,540					11:1 ⁵⁾	560	–	9.9	30	–	
8,000	16:1	556	–	14.4	40	50					
11,500	–	F40	G7	GST 40.1	8:1 ⁵⁾	1,600	–	7.2	50	–	255
16,000					11:1	1,616	–	9.9	50	–	
10,900					11:1 ⁵⁾	1,100	–	9.9	40	–	
12,900					14.33:1 ⁵⁾	1,000	–	12.9	40	–	
16,000					16:1	1,111	–	14.4	40	50	
16,000					22:1	808	–	19.8	40	50	

1) – 5) Refer to notes on page 3.

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Possible combinations with multi-turn actuators					
Gearbox	Reduction ratio	Suitable AUMA multi-turn actuator ⁵⁾	Input mounting flange for mounting multi-turn actuator		Permissible actuator weight
			EN ISO 5210	DIN 3210	
					Max. [kg]
GST 10.1	1:1	SA 10.2/SAR 10.2 SA 14.2/SAR 14.2	F10 F14	G0 G1/2	40 80
	1.4:1	SA 10.2/SAR 10.2	F10	G0	40
	2:1	SA 07.6/SAR 07.6 SA 10.2/SAR 10.2	F10	G0	40
	1.4:1	SA 14.2/SAR 14.2	F14	G1/2	80
GST 14.1	2:1	SA 10.2/SAR 10.2 SA 14.2/SAR 14.2	F10 F14	G0 G1/2	40 80
	2.8:1	SA 10.2/SAR 10.2	F10	G0	40
	4:1 ⁵⁾	SA 10.2/SAR 10.2	F10	G0	40
	2:1	SA 14.2/SAR 14.2 SA 14.6	F14	G1/2	80
GST 14.5	2:1 ⁵⁾	SA 14.2	F14	G1/2	80
	2.8:1	SA 14.2/SAR 14.2	F14	G1/2	80
	2.8:1 ⁵⁾	SA 14.2	F14	G1/2	80
	4:1	SA 10.2/SAR 10.2 SA 14.2/SAR 14.2	F10 F14	G0 G1/2	40 80
GST 16.1	2.8:1	SA 14.6/SAR 14.6	F14	G1/2	80
	2.8:1 ⁵⁾	SA 14.2/SAR 14.2	F14	G1/2	80
	4:1	SA 14.2/SAR 14.2 SA 14.6/SAR 14.6	F14	G1/2	80
	4:1 ⁵⁾	SA 14.2/SAR 14.2	F14	G1/2	80
	5.6:1	SA 14.2/SAR 14.2	F14	G1/2	80
	5.6:1 ⁵⁾	SA 14.2/SAR 14.2	F14	G1/2	80
GST 25.1	4:1	SA 14.6/SAR 14.6 SA 16.2/SAR 16.2	F14 F16	G1/2 G3	80 160
	5.6:1	SA 14.6/SAR 14.6	F14	G1/2	80
	8:1	SA 14.2/SAR 14.2 SA 14.6	F14	G1/2	80
	3.28:1 ⁵⁾	SA 16.2/SAR 16.2	F16	G3	160
GST 30.1	5.6:1	SA 16.2/SAR 16.2	F16	G3	160
	5.6:1 ⁵⁾	SA 16.2/SAR 16.2	F16	G3	160
	8:1	SA 14.6/SAR 14.6 SA 16.1	F14 F16	G1/2 G3	80 160
	11:1	SA 14.6/SAR 14.6	F14	G1/2	80
	7:1 ⁵⁾	SA 16.2 SA 25.1	F16 F25	G3 G4	160 300
GST 35.1	8:1	SA 16.2 SA 25.1	F16 F25	G3 G4	160 300
	8:1 ⁵⁾	SA 16.2 SA 25.1	F16 F25	G3 G4	160 300
	9.25:1 ⁵⁾	SA 16.2 SA 25.1	F16 F25	G3 G4	160 300
	11:1	SA 16.2	F16	G3	160
	11:1 ⁵⁾	SA 16.2 SA 25.1	F16 F25	G3 G4	160 300
	16:1	SA 14.6 SA 16.2	F14 F16	G1/2 G3	80 160
	8:1 ⁵⁾	SA 25.1	F25	G4	300
	11:1	SA 25.1	F25	G4	300
GST 40.1	11:1 ⁵⁾	SA 16.2 SA 25.1	F16 F25	G3 G4	160 300
	14.33:1 ⁵⁾	SA 16.2	F16	G3	160
	16:1	SA 16.2 SA 25.1	F16 F25	G3 G4	160 300
	22:1	SA 16.2	F16	G3	160

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General information

For motor or manual operation of valves (e.g. gate valves and globe valves).

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) Special reduction ratio	On request
6) Multi-turn actuator flange	Standard flange according to EN ISO 5210

Features and functions

Type of duty	<ul style="list-style-type: none"> Short-time duty S2 - 15 min (open-close duty) Intermittent duty S4 - 25 % (modulating duty)
Direction of rotation	Standard: Clockwise rotation at input shaft results in clockwise rotation at output drive
	Option: GST 10.1 – GST 30.1: Reversal of direction of rotation by reversing gearbox GW 14.1
Stages	Single stage: GST 10.1 – GST 16.1
	Double stage: GST 25.1 – GST 40.1
Input shaft	For standard reduction ratio, the input shaft is made of stainless steel.
	Exception: GST 16.1: 5.6:1
	GST 40.1: 22:1 and 16:1
	Standard: Cylindrical with parallel key according to DIN 6885-1 (refer to table on page 1)
	Option: Square: <ul style="list-style-type: none"> conical (DIN 3233) cylindrical
With respect to size, please contact AUMA	

Operation

Motor operation	<ul style="list-style-type: none"> Directly via electric multi-turn actuator Input mounting flanges for multi-turn actuator (refer to table page 2) 																																																					
Manual operation	Available handwheel diameters according to EN 12570, selection according to output torque:																																																					
	<table border="1"> <thead> <tr> <th>Type</th> <th colspan="4">GST 10.1</th> <th colspan="4">GST 14.1</th> <th colspan="3">GST 14.5</th> <th colspan="4">GST 16.1</th> </tr> </thead> <tbody> <tr> <td>Reduction ratio</td> <td>1:1</td> <td>1.4:1</td> <td>2:1</td> <td>1.4:1</td> <td>2:1</td> <td>2.8:1</td> <td>4:1</td> <td>2:1</td> <td>2.8:1</td> <td>4:1</td> <td>2.8:1</td> <td>4:1</td> <td>5.6:1</td> <td>2.8:1</td> <td>4:1</td> <td>5.6:1</td> </tr> <tr> <td>Handwheel Ø [mm]</td> <td colspan="4">200</td> <td colspan="4">315</td> <td colspan="3">250</td> <td colspan="4">315</td> <td colspan="2">400</td> <td colspan="2">315</td> </tr> </tbody> </table>	Type	GST 10.1				GST 14.1				GST 14.5			GST 16.1				Reduction ratio	1:1	1.4:1	2:1	1.4:1	2:1	2.8:1	4:1	2:1	2.8:1	4:1	2.8:1	4:1	5.6:1	2.8:1	4:1	5.6:1	Handwheel Ø [mm]	200				315				250			315				400		315	
	Type	GST 10.1				GST 14.1				GST 14.5			GST 16.1																																									
	Reduction ratio	1:1	1.4:1	2:1	1.4:1	2:1	2.8:1	4:1	2:1	2.8:1	4:1	2.8:1	4:1	5.6:1	2.8:1	4:1	5.6:1																																					
	Handwheel Ø [mm]	200				315				250			315				400		315																																			
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	Type	GST 25.1				GST 30.1				GST 35.1																																												
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	Handwheel Ø [mm]	500				500				500																																												
	<table border="1"> <thead> <tr> <th>Type</th> <th colspan="5">GST 40.1</th> </tr> </thead> <tbody> <tr> <td>Reduction ratio</td> <td>11:1</td> <td>16:1</td> <td>22:1</td> <td>8:1</td> <td>14.33:1</td> </tr> <tr> <td>Handwheel Ø [mm]</td> <td colspan="5">500</td> </tr> </tbody> </table>	Type	GST 40.1					Reduction ratio	11:1	16:1	22:1	8:1	14.33:1	Handwheel Ø [mm]	500																																							
Type	GST 40.1																																																					
Reduction ratio	11:1	16:1	22:1	8:1	14.33:1																																																	
Handwheel Ø [mm]	500																																																					
Standard:	<ul style="list-style-type: none"> Handwheel made of aluminium Handwheel with ball handle 																																																					
Options:	<ul style="list-style-type: none"> Handwheel made of GJL-200 Handwheel lockable WSH for signalling position and end positions 																																																					

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Valve attachment	
Valve attachment	A, B1, B2, B3, B4 according to EN ISO 5210 A, B, D, E according to DIN 3210 C according to DIN 3338 Special output drive types: AF, AK, AG, IB1, IB3, IB4

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: IP68-10, dust and water tight up to max. 10 m head of water 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	Two-component iron-mica combination
Colour	Standard: AUMA silver-grey (similar to RAL 7037)
	Option: Other colours are possible on request.
Lifetime	Open-close duty: Operations (OPEN - CLOSE - OPEN) with 30 turns per stroke
	GST 10.1: 20,000 operations
	GST 14.1 – GST 16.1: 15,000 operations
	GST 25.1 – GST 40.1: 10,000 operations
	GST 35.1 – GST 40.1: 5,000 operations
	AUMA multi-turn gearboxes meet or exceed the lifetime requirements of EN 15714-2. Detailed information can be provided on request.
	Modulating duty:
GST 10.1: 5.0 million modulating steps	
GST 14.1 – GST 16.1: 3.5 million modulating steps	
GST 25.1 – GST 30.1: 2.5 million modulating steps	
The lifetime for modulating duty 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	
Reversing gearbox	<ul style="list-style-type: none"> GW reversing gearbox for reversal of rotation direction for manual and motor operation

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

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Type of duty	Open-close duty:	Short-time duty S2 - 15 min with the following average output torques:												
	Type	GST 10.1			GST 14.1			GST 14.5			GST 16.1			
	Reduction ratio	1:1	1.4:1	2:1	1.4:1	2:1	2.8:1	2:1	2.8:1	4:1	2.8:1	4:1	5.5:1	
	Average output torque in [Nm]	60			125			150	150	250	300			
	Type	GST 25.1			GST 30.1			GST 35.1			GST 40.1			
	Reduction ratio	4:1	5.6:1	8:1	5.6:1	8:1	11:1	8:1	11:1	16:1	11:1	16:1	22:1	
Average output torque in [Nm]	1,000			2,000			4,000			8,000				
	Modulating duty:	Intermittent duty S4 – 25 % with modulating torque												
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) –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 GST 10.1 – GST 40.1 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 WSH 10.2 – WSH 16.2 Technical data GW 14.1