

## Technical data Part-turn gearboxes for open-close duty

Valve			Gearbox						
Max. valve torque <sup>1)</sup>	Valve attachment		Gearbox/primary reduction gearing	Reduction ratio	Factor <sup>2)</sup>	Turns for 90°	Input shaft <sup>3)</sup>	Max. input torques	Weight <sup>4)</sup>
to [Nm]	Flange according to EN ISO 5211	Max. shaft diameter [mm]					[mm]	[Nm]	GS + VZ/GZ [kg]
500	F07 F10	38	GS 50.3	51:1	16.7	12.75	16	30	7.0
1,000	F10 F12	50	GS 63.3	51:1	16.7	12.75	20	60	12
750	F10 F12	50	GS 63.3 <sup>5)</sup>	82:1	17	20.5	20	44	12
2,000	F12 F14	60	GS 80.3	53:1	18.2	13.25	20	110	16
1,500	F12 F14	60	GS 80.3 <sup>5)</sup>	82:1	17	20.5	20	88	16
4,000	F14 F16	80	GS 100.3	52:1	18.7	13	30/(20)	214	33
			GS 100.3/ VZ 2.3	126:1	42.8	31.5	20	93	39
			GS 100.3/ VZ 3.3	160:1	54	40	20	74	39
			GS 100.3/ VZ 4.3	208:1	70.7	52	20	57	39
2,800	F14 F16	80	GS 100.3 <sup>5)</sup>	107:1	22.6	26.8	30/(20)	124	33
8,000	F16 F25	90	GS 125.3	52:1	19.2	13	30	417	40
			GS 125.3/ VZ 2.3	126:1	44	31.5	30/(20)	182	46
			GS 125.3/ VZ 3.3	160:1	56	40	30/(20)	143	46
			GS 125.3/ VZ 4.3	208:1	72.7	52	20	110	46
14,000	F25 F30	100	GS 160.3	54:1	21	13.5	30	667	80
			GS 160.3/ GZ 160.3 - 4:1	218:1	76	54.5	30/(20)	184	91
			GS 160.3/ GZ 160.3 - 8:1	442:1	155	110.5	20	90	91
14,000	F25 F30	100	GS 160.3/ GZ 160.3 - 16:1 <sup>5)</sup>	880:1	276	220	20	51	100
28,000	F30 F35	125	GS 200.3	53:1	20.7	13.25	40	1,353	140
			GS 200.3/ GZ 200.3 - 4:1	214:1	75	53.5	30	373	160
			GS 200.3/ GZ 200.3 - 8:1	434:1	152	108.5	30/(20)	184	160
			GS 200.3/ GZ 200.3 - 16:1	864:1	268	216	20	104	170
28,000	F30 F35	125	GS 200.3/ GZ 200.3 - 32:1 <sup>5)</sup>	1,752:1	552	438	20	51	170
56,000	F35 F40	160	GS 250.3	52:1	20.3	13	50	2,759	273
			GS 250.3/ GZ 250.3 - 4:1	210:1	74	52.5	40/(30)	757	296
			GS 250.3/ GZ 250.3 - 8:1	411:1	144	103	30	389	296
			GS 250.3/ GZ 250.3 - 16:1	848:1	263	212	30/(20)	213	308
56,000	F35 F40	160	GS 250.3/ GZ 250.3 - 32:1 <sup>5)</sup>	1,718:1	533	430	20	105	308

1) – 5) Refer to notes on page 3.

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Gearbox/primary reduction gearing	Reduct. ratio	Possible combinations with multi-turn actuators												Multi-turn actuator	Input mounting flange <sup>3)</sup> for mounting multi-turn actuator		Max. weight <sup>6)</sup>		
		Operating time for 50 Hz <sup>7)</sup> in seconds for 90° at actuator output speed in rpm													Actuator for max. input torque	EN ISO 5210		DIN 3210	GS+VZ/GZ+SA [kg]
		4	5.6	8	11	16	22	32	45	63	90	125	180						
GS 50.3	51:1	191	137	96	70	48	35	24	17	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	SA 07.2	F07 F10	– G0	27.1		
GS 63.3	51:1	191	137	96	70	48	35	24	17	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	SA 07.6	F07 F10	– G0	33.1		
GS 63.3 <sup>5)</sup>	82:1	308	220	154	112	77	56	38	27	–	–	–	–	SA 07.6	F07 F10	– G0	33.1		
GS 80.3	53:1	199	142	99	72	50	36	25	18	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	SA 10.2	F07 F10	– G0	41.4		
GS 80.3 <sup>5)</sup>	82:1	308	220	154	112	77	56	38	27	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	SA 10.2	F07 F10	– G0	41.4		
GS 100.3	52:1	195	149	98	71	49	35	24	17	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	SA 14.2	F10 F14	G0 G1/2	85.1		
GS 100.3/ VZ 2.3	126:1	473	338	236	172	118	86	59	42	30	21	– <sup>8)</sup>	– <sup>8)</sup>	SA 10.2	F10	G0	65.4		
GS 100.3/ VZ 3.3	160:1	600	429	300	218	150	109	75	53	38	27	19	– <sup>8)</sup>	SA 10.2	F10	G0	65.4		
GS 100.3/ VZ 4.3	208:1	780	557	390	284	195	142	98	69	50	35	25	17 <sup>9)</sup>	SA 07.6	F10	G0	60.1		
GS 100.3 <sup>5)</sup>	107:1	401	287	201	146	100	73	50	36	–	–	–	–	SA 14.2	F10 F14	G0 G1/2	85.1		
GS 125.3	52:1	195	149	98	71	49	35	24	17	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	SA 14.6	F14	G1/2	98.1		
GS 125.3/ VZ 2.3	126:1	473	338	236	172	118	86	59	42	30	21	– <sup>8)</sup>	– <sup>8)</sup>	SA 14.2	F10 F14	G0 G1/2	99.1		
GS 125.3/ VZ 3.3	160:1	600	429	300	218	150	109	75	53	38	27	19	– <sup>8)</sup>	SA 14.2	F10 F14	G0 G1/2	99.1		
GS 125.3/ VZ 4.3	208:1	780	557	390	284	195	142	98	69	50	35	25	17 <sup>9)</sup>	SA 10.2	F10	G0	72.4		
GS 160.3	54:1	203	145	104	74	51	37	25	18	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	SA 16.2	F14 F16	G1/2 G3	168.4		
GS 160.3/ GZ 160.3 - 4:1	218:1	818	584	409	297	204	149	102	73	52	36	26	18	SA 14.2	F10 F14	G0 G1/2	144.1		
GS 160.3/ GZ 160.3 - 8:1	442:1	–	–	829	603	414	301	207	147	105	74	53	37	SA 10.2	F10	G0	117.4		
GS 160.3/ GZ 160.3 - 16:1 <sup>5)</sup>	880:1	–	–	–	–	825	600	413	293	210	147	106	73 <sup>9)</sup>	SA 07.6	F10	G0	121.1		
GS 200.3	53:1	199	142	99	72	50	36	25	18	– <sup>8)</sup>	– <sup>8)</sup>	–	–	SA 25.1	F16 F25	G3 –	305.1		
GS 200.3/ GZ 200.3 - 4:1	214:1	803	573	401	292	201	146	100	71	51	36	26	18	SA 14.6	F14	G1/2	218.1		
GS 200.3/ GZ 200.3 - 8:1	434:1	–	–	814	592	407	296	203	145	103	72	52	36	SA 14.2	F10 F14	G0 G1/2	213.1		
GS 200.3/ GZ 200.3 - 16:1	864:1	–	–	–	–	810	589	405	288	206	144	104	72 <sup>9)</sup>	SA 10.2	F10	G0	196.4		
GS 200.3/ GZ 200.3 - 32:1 <sup>5)</sup>	1,752:1	–	–	–	–	–	–	821	584	417	292	210	146	SA 07.6	F10	G0	191.1		
GS 250.3	52:1	195	149	98	71	49	35	24	– <sup>8)</sup>	– <sup>8)</sup>	– <sup>8)</sup>	–	–	SA 30.1	F25 F30	–	541.6		
GS 250.3/ GZ 250.3 - 4:1	210:1	788	563	394	286	197	143	98	70	50	35	25	– <sup>8)</sup>	SA 16.2	F14 F16	G1/2 G3	389.1		
GS 250.3/ GZ 250.3 - 8:1	411:1	–	–	771	560	385	280	193	137	98	69	49	34	SA 14.6	F14	G1/2	354.1		
GS 250.3/ GZ 250.3 - 16:1	848:1	–	–	–	–	795	578	398	283	202	141	102	71 <sup>9)</sup>	SA 14.2	F10 F14	G0 G1/2	361.1		
GS 250.3/ GZ 250.3 - 32:1 <sup>5)</sup>	1,718:1	–	–	–	–	–	–	805	573	409	286	206	143	SA 10.2	F10	G0	334.4		

3) – 9) Refer to notes on page 3.

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**Technical data Part-turn gearboxes for open-close duty**

**General information**

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. For special applications, please consult AUMA.

**Notes to table on pages 1 + 2**

1) Max. valve torque	For ball valve applications, sizing up to 80 % of the maximum permissible valve torque
2) 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.
3) Input shaft	Depending on the required input torque
4) Weight	Specified weight includes coupling (without bore) and grease filling in the gear housing
5) Special reduction ratio	On request
6) 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
7) Operating time for 50 Hz	Standard values at 50 Hz; at 60 Hz, the indicated operating time is reduced by 17 %.
8)	Refer to Technical Data GS 50.3 – GS 250.3 for modulating duty and shorter operating times; heed maximum valve torque
9)	Observe max. output torque of multi-turn actuator

**Features and functions**

Worm wheel material	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										
Strength of end stop	Guaranteed strength of end stop (in Nm) for input side operation										
	Type	GS 50.3	GS 63.3	GS 80.3	GS 100.3			GS 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		
	Type	GS 160.3		GS 200.3			GS 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					
Strength of end stop for special reduction ratios	Guaranteed strength of end stop (in Nm) for input side operation										
	Type	GS 160.3 - 54:1		GS 200.3 - 53:1			GS 250.3 - 52:1				
	Primary reduction gearing	GZ 160.3		GZ 200.3			GZ 250.3				
	Reduction ratio	16:1		32:1			32:1				
	[Nm]	250		250			250				
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 of: 10° – 35°, 35° – 60°, 60° – 80°, 80° – 100°, 100° – 125°, 125° – 150°, 150° – 170°, 170° – 190° Swing angle > 190°, refer to Technical data GS 50.3 – GS 250.3 for modulating duty and shorter operating times									

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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 of: 0° – 20°, 20° – 40°, 40° – 60°, 60° – 80°, 90° – 110°, 110° – 130°, 130° – 150°, 150° – 170°, 170° – 190°  Swing angle > 190°, refer to Technical data GS 50.3 – GS 250.3 for modulating duty and shorter operating times
Mechanical position indicator	Standard:	Pointer cover for continuous position indication
	Options:	<ul style="list-style-type: none"> <li>Sealed pointer cover for horizontal outdoor installation (not available for GS 50.3)</li> <li>Protection cover instead of pointer cover for buried service</li> <li>Sealed pointer cover with air vent, not available for GS 50.3</li> </ul> <p>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.</p>
Input shaft	Cylindrical with parallel key according to DIN 6885-1 (refer to table on page 1)	

<b>Operation</b>																																																																																																																														
Motor operation	<ul style="list-style-type: none"> <li>With electric multi-turn actuator, directly or through VZ/GZ primary reduction gearing</li> <li>Input mounting flanges for multi-turn actuator (refer to table page 2)</li> </ul>																																																																																																																													
Type of duty	<ul style="list-style-type: none"> <li>Short-time duty S2 - 15 min (open-close duty)</li> </ul>																																																																																																																													
Manual operation	<p>Available handwheel diameters according to EN 12570, selection according to output torque:</p> <table border="1"> <thead> <tr> <th>Type</th> <th colspan="2">GS 50.3</th> <th colspan="2">GS 63.3</th> <th colspan="2">GS 80.3</th> <th colspan="4">GS 100.3</th> </tr> </thead> <tbody> <tr> <td>Primary reduction gearing</td> <td colspan="2">–</td> <td colspan="2">–</td> <td colspan="2">–</td> <td colspan="2">–</td> <td>VZ 2.3</td> <td>VZ 3.3</td> <td>VZ 4.3</td> </tr> <tr> <td>Reduction ratio</td> <td>51:1</td> <td>51:1</td> <td>82:1</td> <td>53:1</td> <td>82:1</td> <td>82:1</td> <td>107:1</td> <td>126:1</td> <td>160:1</td> <td>280:1</td> </tr> <tr> <td>Handwheel Ø [mm]</td> <td>160 200 250</td> <td>250 315</td> <td>250</td> <td>315 400</td> <td>315</td> <td>400 500</td> <td>400</td> <td colspan="2">315 400</td> <td>250 315</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Type</th> <th colspan="4">GS 125.3</th> <th colspan="4">GS 160.3</th> </tr> </thead> <tbody> <tr> <td>Primary reduction gearing</td> <td>–</td> <td>VZ 2.3</td> <td>VZ 3.3</td> <td>VZ 4.3</td> <td>–</td> <td colspan="3">GZ 160.3</td> </tr> <tr> <td>Reduction ratio</td> <td>52:1</td> <td>126:1</td> <td>160:1</td> <td>208:1</td> <td>54:1</td> <td>218:1</td> <td>442:1</td> <td>880:1</td> </tr> <tr> <td>Handwheel Ø [mm]</td> <td>500 630 800</td> <td colspan="2">400 500</td> <td>315 400</td> <td>630 800</td> <td>400</td> <td>315</td> <td>250</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Type</th> <th colspan="5">GS 200.3</th> <th colspan="5">GS 250.3</th> </tr> </thead> <tbody> <tr> <td>Primary reduction gearing</td> <td>–</td> <td colspan="4">GZ 200.3</td> <td>–</td> <td colspan="4">GZ 250.3</td> </tr> <tr> <td>Reduction ratio</td> <td>52:1</td> <td>214:1</td> <td>434:1</td> <td>864:1</td> <td>1,752:1</td> <td>52:1</td> <td>210:1</td> <td>411:1</td> <td>848:1</td> <td>1 718:1</td> </tr> <tr> <td>Handwheel Ø [mm]</td> <td>–</td> <td>500 630</td> <td>400</td> <td>315</td> <td>250</td> <td>–</td> <td>800</td> <td>500 630</td> <td>400</td> <td>315</td> </tr> </tbody> </table> <p>Standard:</p> <ul style="list-style-type: none"> <li>Handwheel made of aluminium</li> <li>Handwheel with ball handle</li> </ul> <p>Options:</p> <ul style="list-style-type: none"> <li>Handwheel made of GJL-200</li> <li>Handwheel lockable</li> <li>WSH for signalling position and end positions</li> </ul>	Type	GS 50.3		GS 63.3		GS 80.3		GS 100.3				Primary reduction gearing	–		–		–		–		VZ 2.3	VZ 3.3	VZ 4.3	Reduction ratio	51:1	51:1	82:1	53:1	82:1	82:1	107:1	126:1	160:1	280:1	Handwheel Ø [mm]	160 200 250	250 315	250	315 400	315	400 500	400	315 400		250 315	Type	GS 125.3				GS 160.3				Primary reduction gearing	–	VZ 2.3	VZ 3.3	VZ 4.3	–	GZ 160.3			Reduction ratio	52:1	126:1	160:1	208:1	54:1	218:1	442:1	880:1	Handwheel Ø [mm]	500 630 800	400 500		315 400	630 800	400	315	250	Type	GS 200.3					GS 250.3					Primary reduction gearing	–	GZ 200.3				–	GZ 250.3				Reduction ratio	52:1	214:1	434:1	864:1	1,752:1	52:1	210:1	411:1	848:1	1 718:1	Handwheel Ø [mm]	–	500 630	400	315	250	–	800	500 630	400	315
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<b>Primary reduction gearing</b>	
Primary reduction gearing	<ul style="list-style-type: none"> <li>VZ and GZ types as planetary gears with various reduction ratios for reducing the input torques (refer to table page 1).</li> <li>Combination with GK bevel gearbox directly on GS or on GS with VZ/GZ possible (90° deflection of input shaft)</li> </ul>

<b>Valve attachment</b>	
Valve attachment	Dimensions according to EN ISO 5211: The maximum torques according to EN ISO 5211 mounting flanges are to be met.
	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
Splined coupling for connection to the valve shaft	Standard: <ul style="list-style-type: none"> <li>Without bore or pilot bore from GS 160.3</li> <li>Worm gearbox can be mounted at 4 x 90° increments on coupling</li> </ul>
	Options: Finish machining with bore and keyway, square bore or two-flat with grub screw for secure fixing to valve shaft.

<b>Service conditions</b>											
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 Option: 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: <table border="1"> <tr> <td>KS</td> <td>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)</td> </tr> <tr> <td>KX</td> <td>Suitable for installation in extremely aggressive atmospheres with high humidity and high pollutant concentration</td> </tr> </table>	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						
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Paint	Two-component iron-mica combination										
Colour	Standard: AUMA silver-grey (similar to RAL 7037) Option: Other colours are possible on request.										
Lifetime	Lifetime for 90° swing movement <table border="1"> <thead> <tr> <th>Gearbox size</th> <th>GS 50.3/ GS 63.3</th> <th>GS 80.3/ GS100.3/VZ</th> <th>GS 125.3/VZ – GS 200.3/GZ</th> <th>GS 250.3/GZ</th> </tr> </thead> <tbody> <tr> <td>Number of cycles for max. torque</td> <td>10,000</td> <td>5,000</td> <td>2,500</td> <td>1,000</td> </tr> </tbody> </table> AUMA worm gearboxes meet or even exceed the lifetime requirements of EN 15714-2. Detailed information can be provided on request.	Gearbox size	GS 50.3/ GS 63.3	GS 80.3/ GS100.3/VZ	GS 125.3/VZ – GS 200.3/GZ	GS 250.3/GZ	Number of cycles for max. torque	10,000	5,000	2,500	1,000
Gearbox size	GS 50.3/ GS 63.3	GS 80.3/ GS100.3/VZ	GS 125.3/VZ – GS 200.3/GZ	GS 250.3/GZ							
Number of cycles for max. torque	10,000	5,000	2,500	1,000							

<b>Limit sensing for signalling position and end positions</b>	
Valve position indicators	<ul style="list-style-type: none"> <li>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°.</li> <li>WGD valve position indicator (counter gear mechanism) for position and end position signalling for swing angles &gt; 180°</li> </ul>

<b>Special features for use in potentially explosive atmospheres</b>	
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

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

**Technical data Part-turn gearboxes for open-close duty**

Type of duty	Short-time duty S2 – 15 min., max. 3 cycles (OPEN - CLOSE - OPEN) 90°, with the following average output torques								
	Gearbox size	GS 50.3	GS 63.3	GS 80.3	GS 100.3	GS 125.3	GS 160.3	GS 200.3	GS 250.3
	Average output torque [Nm]	250	500	1,000	2,000	4,000	8,000	16,000	32,000
Operation mode for special reduction ratios									
	Gearbox size	GS 63.3	GS 80.3	GS 100.3	GS 160.3 GZ 16.1	GS 200.3 GZ 32:1	GS 250.3 GZ 32.1		
	Average output torque [Nm]	375	750	1,400	8,000	16,000	32,000		
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)							

<b>Further information</b>	
EU Directives	ATEX Directive: (94/9/EC) Machinery Directive: (2006/42/EC)
Reference documents	Product description Electric actuators for industrial valve automation Dimensions GS 50.3 – GS 125.3, GS 160.3 – GS 250.3 Technical data SA 07.2 – SA 16.2 with 3-phase AC motors Technical data WSG 90.1 Technical data WGD 90.1 Technical data WSH 10.2 – WSH 16.2
Lever gearboxes	Refer to separate documents