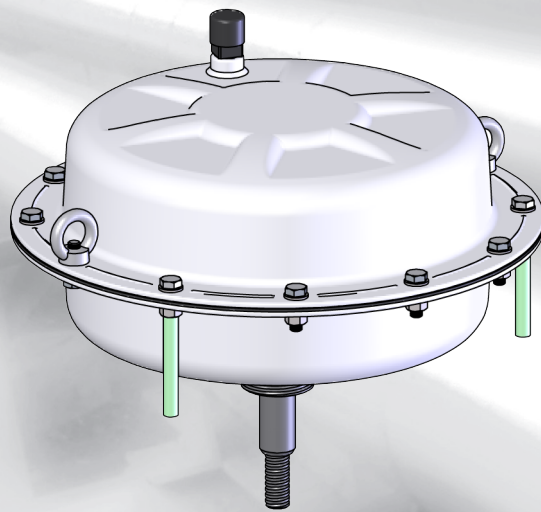


Assembly Instructions
FlowAct IG
IG 253, IG 503, IG 701

Training Instructions, for internal use only !



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General

The following instructions are designed to assist in assembling as required on Flowserve FlowAct IG actuators. This instruction does not include specific product design data. These are located at the corresponding data sheet, calculation sheet, dimension sheet in the documentation. Procure the documents before you start if this appears necessary. In Assembling Instructions can not be dealt with every conceivable situation and installation options. It is expressly permitted only qualified staff to work at FlowAct actuators who are educated and trained at actuators and accessories. Review this bulletin prior to assemble the actuator.

Modifying this product, substituting non-factory parts other than outlined could drastically affect performance and be hazardous to personnel and equipment. This manual should be used in conjunction with applicable local and national laws.

 WARNING Failure to keep hands, hair, and clothing away from all moving parts when operating the actuator can cause serious injury.

Apply appropriate personal protective equipment when working on the actuator to prevent hazards arising from the operation. Protect yourself against scalds, cuts by protective clothing, gloves and eye protection.

Actuators are provided for oil and grease-less service or oxygen service may only assembled in clean rooms (ISO 14644 - ISO 8, US FED STD 209E - M 6.5, or equivalent) and in accordance with the Flowserve Control Valves - Work Instruction T 007.

Pneumatic multi spring actuator - FlowAct order code

FlowAct				Order code							
				I	G	503	B	FY	O	Z	B
Actuator design	internal air supply			I							
Yoke design	Multi-function yoke for GS only			G							
Actuator size (cm ² / inch ²)	250	38.75	Stroke (mm / inch)	20	0.79	253					
	500	77.50		20, 40	0.79, 1.57	503					
	700	108.50		20, 40, 60	0.79, 1.57, 2.36	701					
Color	white, powder coated					B					
Spring range (bar / psi)	Actuator size			253		503		701			
	0,2 - 1,0	2.9 - 14.5	Actuator force (N / lbs)	500	112	1 000	225	1 400	315	AD	
	0,5 - 1,9	7.3 - 27.6		1 250	281	2 500	562	3 500	787	BL	
	1,0 - 2,4	14.5 - 34.8		2 500	562	5 000	1 124	7 000	1 574	DY	
	1,5 - 2,7 ¹⁾	21.8 - 39.2		3 750	843	7 500	1 686	10 500	2 360	VC	
	1,5 - 3,8	21.8 - 55.1		3 750	843	7 500	1 686	10 500	2 360	VI	
	2,0 - 4,8	29.0 - 69.6		5 000	1 124	10 000	2 248	14 000	3 147	FY	
	2,3 - 3,4 ²⁾	33.4 - 49.3		-	-	-	-	16 100	3 619	TD	
Handwheel	without									O	
	side-mounted									S	
Safety position at air failure	spring to open									A	
	spring to close									Z	
Stroke (mm / inch)	20	0.79									A
	40	1.57									B
	60	2.36									C

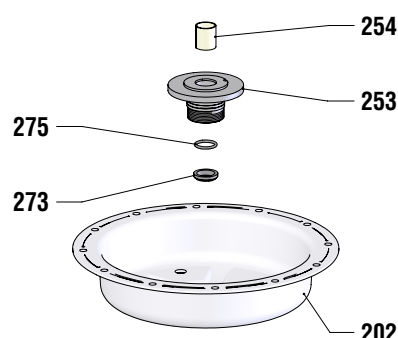
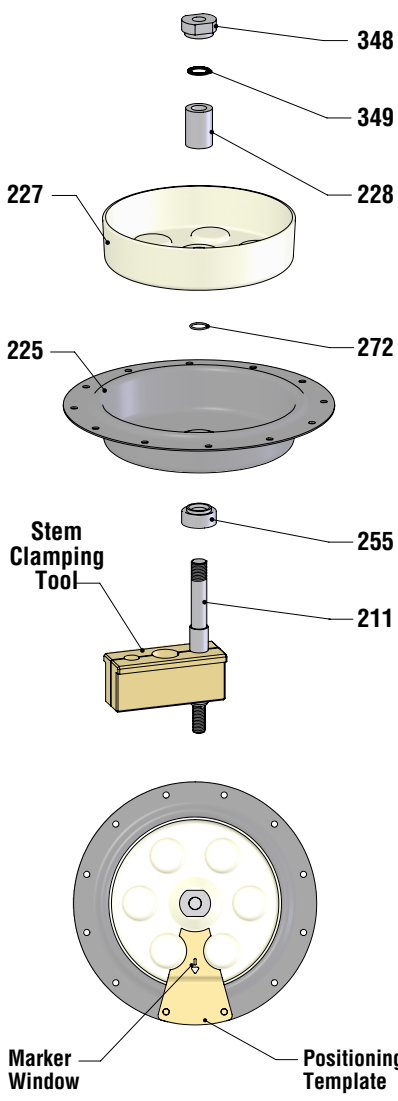
¹⁾ Stroke 20, 40 mm / 0.79, 1.57 inch only !
²⁾ Stroke 20 mm / 0.79 inch only !

FlowAct "IG"

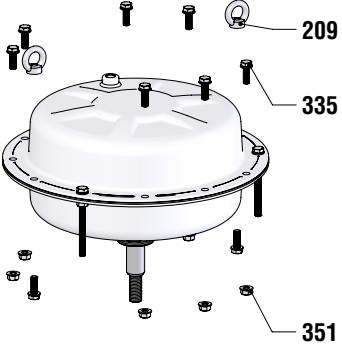
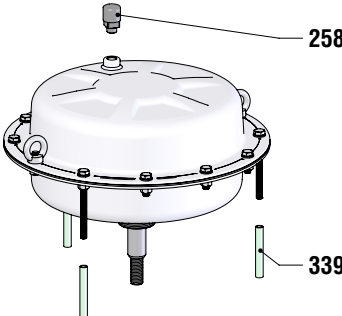
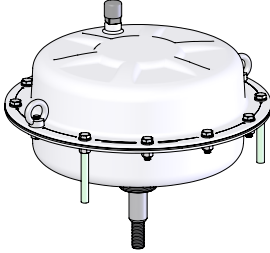
Assembling instruction for

FlowAct order code: IGxxx BxxOZx

Actuator Type	Multi spring 253, 503, 701
Hand wheel	Without
Safety position	Spring to close
Stroke	20, 40, 60

Step	Image	Instruction
1		<ul style="list-style-type: none"> Place the bottom diaphragm casing (202) in the Special Tool The air connection should be on your side. Install the O-ring (275) and scraper-ring (273) into the guide bush (253). Firstly press-in the pre-assembled guide bush into the diaphragm casing, secondly press-in the plain bearing (254) into the guide bush.
2		<ul style="list-style-type: none"> Fix the actuator stem (211) into the Special Tool. Lubricate the O-ring (272) with a suitable lubricant. (See Page 13, Table A3) Lower the thrust washer (255) diaphragm (225) O-ring (272) diaphragm plate (227) spacer bush (228) lock washer (349) onto the actuator stem. Lubricate the thread of the stem (211) with a suitable lubricant. (See Page 13, Table A3) Install and finger tighten the special nut (348). The diaphragm plate should be positioned to the diaphragm with the aid of the Positioning Template. Turn clockwise the special nut (348) with the Special Tool using a suitable torque wrench. (See Page 13, Table A1) Mark the position with a felt-tip pen.

Step	Image	Instruction
3		<ul style="list-style-type: none"> • Lubricate the actuator stem with a suitable lubricant. (See Page 13, Table A3) • Lower the pre-assembled diaphragm-stem unit into the bottom diaphragm casing. <p>Be careful not to score the stem.</p> <p>Positioning the diaphragm-stem unit such that the air connection and the mark match.</p> <ul style="list-style-type: none"> • Install the actuator springs (229). <p>The springs have to be aligned. (See Page 13, Table 04)</p> <ul style="list-style-type: none"> • Install the spring adjusting plate (326). <p>Positioning the spring adjusting plate such that the drilling, mark and air connection match.</p> <ul style="list-style-type: none"> • Install the distance plate (231). • Install the upper diaphragm casing (203). <p>Positioning the upper diaphragm casing such that the drilling, mark and air connections match.</p>
4		<ul style="list-style-type: none"> • Lubricate the threads of the hexagon bolts (336) with a suitable lubricant. (See Page 13, Table A3) <p>⚠ Improper handling of this procedure may result in bodily injury !</p> <ul style="list-style-type: none"> • Preload the springs with the Special Tool. <p>In the field service can used 3 threaded rods in 8.8 quality (ISO 898-1) or higher as well as washers and nuts alternatively. (Dimension M8 x 150 mm)</p> <ul style="list-style-type: none"> • Install and finger tighten the Washers (337), hexagon bolts (336) and hexagon nuts (351). • Tighten the nuts (351) in two steps - <ul style="list-style-type: none"> 30 % 60 % - using a crosswise pattern. (See Page 13, Table A2)

Step	Image	Instruction
5		<ul style="list-style-type: none"> • Lubricate the threads of the hexagon bolts (335) with a suitable lubricant. (See Page 13, Table A3) • Install and finger tighten the hexagon bolts (335) and hexagon nuts (351). • Install and finger tighten the hexagon bolts (335) and ring nuts (209). • Tighten the nuts (351) in four steps - <ul style="list-style-type: none"> 30 % 60 % 100 % and all around 100 % - using a crosswise pattern. (See Page 13, Table A2)
6		<ul style="list-style-type: none"> • Install the vent plug (258). • Install the plastic pipe (339).
7		<ul style="list-style-type: none"> • Mark and store the pre-assembled actuator body for further use.

Space for personal notes

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FlowAct “IG”

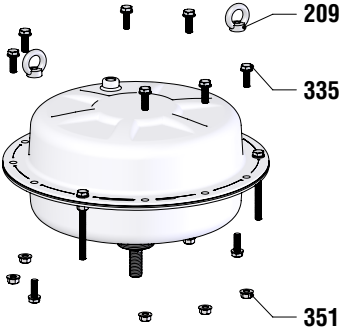
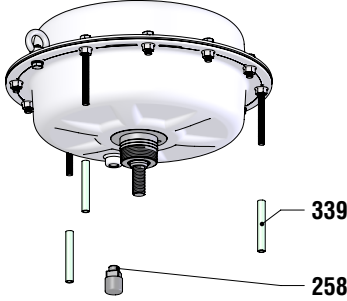
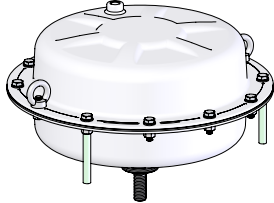
Assembling instruction for

FlowAct order code: IGxxx BxxOAx

Actuator Type	Multi spring 253, 503, 701
Hand wheel	Without
Safety position	Spring to open
Stroke	20, 40, 60

Step	Image	Instruction
1		<ul style="list-style-type: none"> Place the bottom diaphragm casing (202) in the Special Tool The air connection should be on your side. Install the O-ring (275) and scraper-ring (273) into the guide bush (253). Firstly press-in the pre-assembled guide bush into the diaphragm casing, secondly press-in the plain bearing (254) into the guide bush.
2		<ul style="list-style-type: none"> Fix the actuator stem (211) into the Special Tool. Lubricate the O-ring (272) with a suitable lubricant. (See Page 13, Table A3) Lower the spacer bush (228) diaphragm plate (227) diaphragm (225) O-ring (272) thrust washer (255) lock washer (349) onto the actuator stem. Lubricate the thread of the stem (211) with a suitable lubricant. (See Page 13, Table A3) Install and finger tighten the special nut (348). The diaphragm plate should be positioned to the diaphragm with the aid of the Positioning Template. Turn clockwise the special nut (348) with the Special Tool using a suitable torque wrench. (See Page 13, Table A1) Mark the position with a felt-tip pen.

Step	Image	Instruction
3		<ul style="list-style-type: none"> • Install the spring adjusting plate (326). <p>Positioning the spring adjusting plate such that the drilling, mark and air connection match.</p> <ul style="list-style-type: none"> • Install the actuator springs (229). <p>The springs have to be aligned. (See Page 13, Table 04)</p> <ul style="list-style-type: none"> • Lubricate the actuator stem with a suitable lubricant. (See Page 13, Table A3) • Lower the pre-assembled diaphragm-stem unit into the bottom diaphragm casing. <p>Be careful not to score the stem.</p> <p>Positioning the diaphragm-stem unit such that the air connection and the mark match.</p> <ul style="list-style-type: none"> • Install the upper diaphragm casing (203). <p>Positioning the upper diaphragm casing such that the drilling, mark and air connections match.</p>
4		<ul style="list-style-type: none"> • Lubricate the threads of the hexagon bolts (336) with a suitable lubricant. (See Page 13, Table A3) <p>! Improper handling of this procedure may result in bodily injury !</p> <ul style="list-style-type: none"> • Preload the springs with the Special Tool. <p>In the field service can used threaded rods in 8.8 quality (ISO 898-1) or higher as well as washers and nuts alternatively. (Dimension M8 x 150 mm)</p> <ul style="list-style-type: none"> • Install and finger tighten the washers (337), hexagon bolts (336) and hexagon nuts (351). • Tighten the nuts (351) in two steps - <ul style="list-style-type: none"> 30 % 60 % - using a crosswise pattern. (See Page 13, Table A2)

Step	Image	Instruction
5	 <p>The diagram shows an exploded view of the actuator body. Label 209 points to a ring nut, 335 points to a hexagon bolt, and 351 points to a hexagon nut. The actuator body is shown with several bolts and nuts already partially installed.</p>	<ul style="list-style-type: none"> • Lubricate the threads of the hexagon bolts (335) with a suitable lubricant. (See Page 13, Table A3) • Install and finger tighten the hexagon bolts (335) and hexagon nuts (351). • Install and finger tighten the hexagon bolts (335) and ring nuts (209). • Tighten the nuts (351) in four steps - <ul style="list-style-type: none"> 30 % 60 % 100 % and all around 100 % <p>- using a crosswise pattern. (See Page 13, Table A2)</p>
6	 <p>The diagram shows an exploded view of the actuator body. Label 258 points to a vent plug and 339 points to a plastic pipe. The actuator body is shown with several bolts and nuts already installed.</p>	<ul style="list-style-type: none"> • Install the vent plug (258). • Install the plastic pipe (339).
7	 <p>The diagram shows an exploded view of the actuator body. The actuator body is shown with several bolts and nuts already installed.</p>	<ul style="list-style-type: none"> • Mark and store the pre-assembled actuator body for further use.

Space for personal notes

A large grid area for personal notes, consisting of 20 columns and 30 rows of small squares. The grid is empty and occupies the majority of the page below the header.

Table A1 - Imperial Units Torque Requirements for SPECIAL NUT (348) per actuator size			
Unit	IG 253	IG 503	IG 701
ft lb	33 ft lb	81 ft lb	

Table A2 - Imperial Units Torque Requirements for CASING BOLTING (335 + 351 and 336 + 351, 209) per actuator size			
Unit	IG 253	IG 503	IG 701
ft lb	15 ft lb		

Table A3 - Imperial Units Lubricants / release agents for the ACTUATOR in ambient temperature			
Use for parts which are not influenced by the medium and the medium temperature.	application	Standard use	Oxygen use
		- 40 °F to + 158 °F (- 40 °C to + 70 °C)	- 40 °F to + 158 °F (- 40 °C to + 70 °C)
	for stem guiding, O-ring's	Dow Corning Molykote 55 O-Ring ¹⁾	DuPont Krytox GPL 206 ¹⁾
	for threads of the diaphragm casing bolting for the thread of the actuator lock nut	Fastorq A/G ¹⁾	

¹⁾ or equivalent

Table A1 - Metric Units Torque Requirements for SPECIAL NUT (348) per actuator size			
Unit	IG 253	IG 503	IG 701
Nm	45 Nm	110 Nm	

Table A2 - Metric Units Torque Requirements for CASING BOLTING (335 + 351 and 336 + 351, 209) per actuator size			
Unit	IG 253	IG 503	IG 701
Nm	20 Nm		

Table A3 - Metric Units Lubricants / release agents for the ACTUATOR in ambient temperature			
Use for parts which are not influenced by the medium and the medium temperature.	application	Standard use	Oxygen use
		- 40 °F to + 158 °F (- 40 °C to + 70 °C)	- 40 °F to + 158 °F (- 40 °C to + 70 °C)
	for stem guiding, O-ring's	Klüber Unisilikon L250L ¹⁾	Klüberalfa YV 93-1202 ¹⁾
	for threads of the diaphragm casing bolting for the thread of the actuator lock nut	Klüberpaste 46 MR 401 ¹⁾	

¹⁾ or equivalent

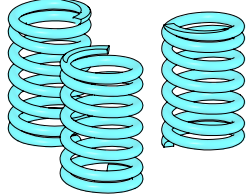
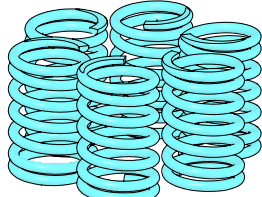
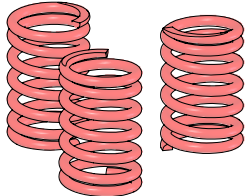

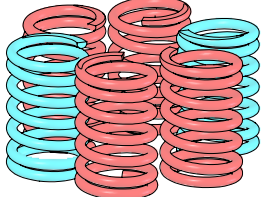
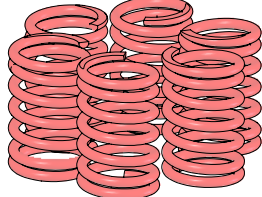
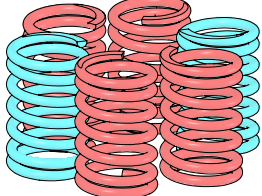
Table 04 Orientation instruction for **ACTUATOR SPRINGS**

- The surface respectively the edges of the spring ends should be aligned to the actuator center.

If these will ignored the spring may touch the actuators body and rub in rare cases.

Table 05

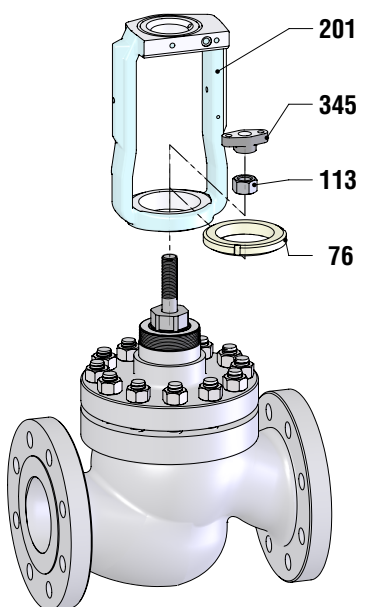
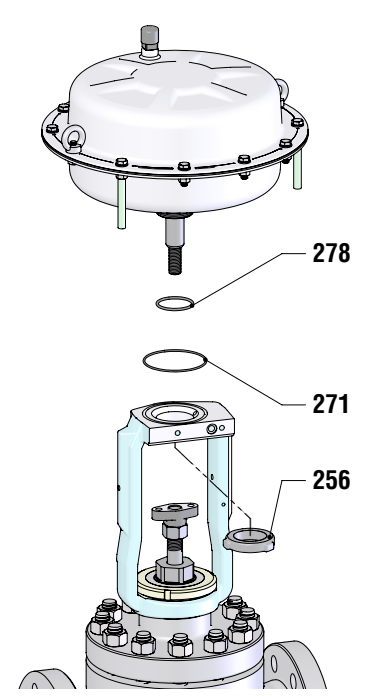
FlowAct IG - Spring packages

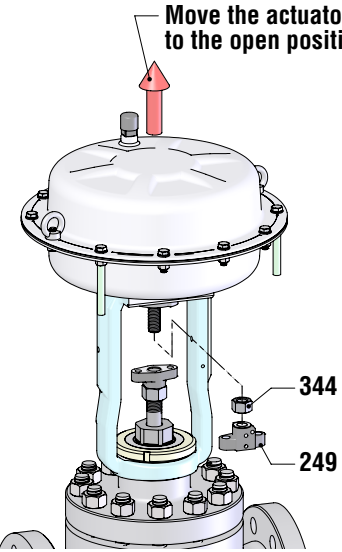
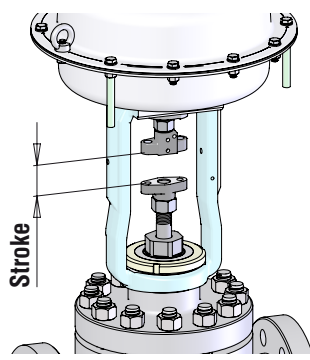
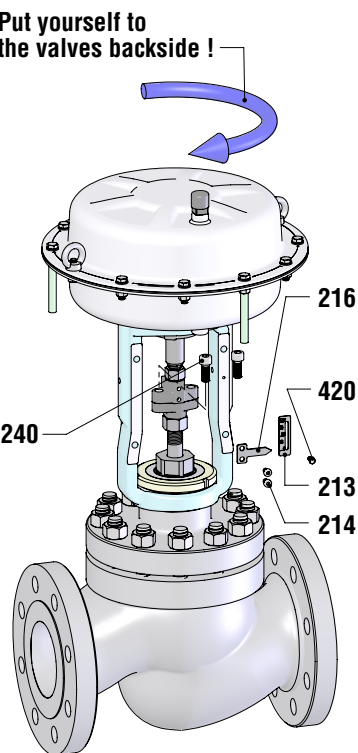
Spring range		Actuator size / Stroke						Spring				Spring arrangement
		IG 253		IG 503		IG 701		Colour	Pcs.	Colour	Pcs.	
		0.787 in. 20 mm	0.787	1.574	0.787	1.574	2.362					
psig	bar		20	40	20	40	60					
3 - 15	0,2 - 1,0	•	•	•	-	•	•	blue	3	-	-	
7 - 28	0,5 - 1,9	•	•	•	-	•	•	blue	6	-	-	
15 - 35	1,0 - 2,4	•	•	•	-	•	•	red	3	-	-	
22 - 39	1,5 - 2,7	•	•	•	-	•	•	silver	6	-	-	
22 - 55	1,5 - 3,8	•	•	•	-	•	•	blue	2	red	4	
29 - 70	2,0 - 4,8	•	•	•	-	•	•	red	6	-	-	
33 - 49	2,3 - 3,4	-	-	-	•	-	-	blue	2	red	4	

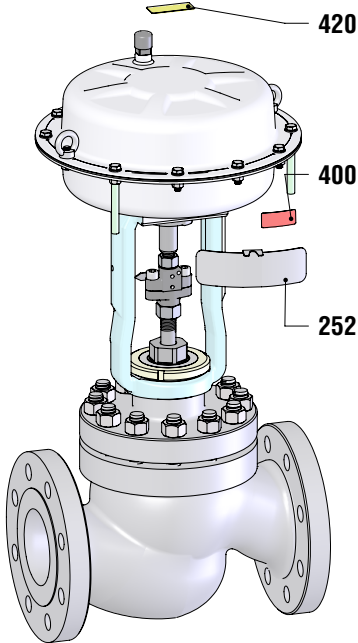
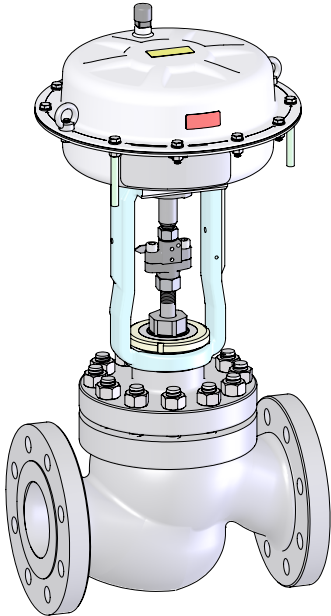
FlowAct “IG”

Assembling instruction for
Valtek GS with FlowAct

<i>Actuator Type</i>	Multi spring 253, 503, 701
<i>Hand wheel</i>	Without
<i>Safety position</i>	Spring to close
<i>Stroke</i>	20, 40, 60

Step	Image	Instruction
1		<ul style="list-style-type: none"> • Fix the valve on the assembly table. • Lubricate all threads with a suitable, approved lubricant. (See Page 41, Table VA3) • Mount the yoke (201), valve locknut (76) onto the bonnet. • Finger tighten and fix the valve locknut clockwise. (See Page 41, Table VA1) <p>The legs of the yoke should be parallel to the flow direction.</p> <ul style="list-style-type: none"> • Mount the lock nut (113) and valve coupling (345) onto the valve stem. (See Page 41, Table VA2) <p>The valve stem should placed one turn under the upper edge of the valve coupling.</p>
2		<ul style="list-style-type: none"> • Lubricate the O-rings (278, 271) with a suitable lubricant. (See Page 41, Table VA3) • Install the O-ring (278) onto the pre-assembled actuator body. • Install the O-ring (271) onto the yoke. • Lower the actuator body into the yoke. <p>Be careful not to score the actuator stem</p> <ul style="list-style-type: none"> • Install, finger tighten and fix the actuator lock nut (256). (See Page 41, Table VA1)

Step	Image	Instruction																	
3		<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> • Connect the actuator with the air supply (less than 87 psig resp. 6 bar) and move it to the open position. • Mount the lock nut (344) and actuator coupling (249) onto the actuator stem. 																	
4		<ul style="list-style-type: none"> • Justify the plug against the seat. • Adjust the distance between the valve coupling (345) and the actuator coupling (249) with the aid of an adapter in stroke height. <table border="1" data-bbox="742 1064 1428 1187"> <thead> <tr> <th></th> <th colspan="2">Size</th> <th colspan="2">Stroke</th> </tr> </thead> <tbody> <tr> <td>1/2" - 2"</td> <td>15 - 50</td> <td>0.787 ^{+0.02} in.</td> <td>20 ^{+0.5} mm</td> </tr> <tr> <td>3" - 4"</td> <td>65 - 100</td> <td>1.574 ^{+0.02} in.</td> <td>40 ^{+0.5} mm</td> </tr> <tr> <td>6"</td> <td>125 - 150</td> <td>2.362 ^{+0.03} in.</td> <td>60 ^{+0.8} mm</td> </tr> </tbody> </table>		Size		Stroke		1/2" - 2"	15 - 50	0.787 ^{+0.02} in.	20 ^{+0.5} mm	3" - 4"	65 - 100	1.574 ^{+0.02} in.	40 ^{+0.5} mm	6"	125 - 150	2.362 ^{+0.03} in.	60 ^{+0.8} mm
	Size		Stroke																
1/2" - 2"	15 - 50	0.787 ^{+0.02} in.	20 ^{+0.5} mm																
3" - 4"	65 - 100	1.574 ^{+0.02} in.	40 ^{+0.5} mm																
6"	125 - 150	2.362 ^{+0.03} in.	60 ^{+0.8} mm																
5	<p>Put yourself to the valves backside !</p> 	<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> • Disconnect the air supply so that it move to the close position. • Mount the cap screws (240) • Lock the lock nuts (113, 344). Secure the upper coupling (249) against turn unwanted with a wrench. (See Page 41, Table VA2) • Install the stroke indicator (216) with the cap screws (214) and fix it. (See Page 41, Table VA2) • Install the stroke indicator scale (213) and fix it with the hex screw (420) (See Page 41, Table VA2). The stroke indicator scale should be adjusted in conjunction with the zero mark to the stroke indicator. • Perform three full strokes and check if the stroke indicator scale correspond with the end positions. 																	

Step	Image	Instruction
6		<ul style="list-style-type: none"> • Remove one hexagon bolt (336, 351) and install the serial plate (252). • Tighten the nut (336, 351). (See Page 13, Table A2) • De-grease the adhesive surface and stick on the warning label (420) and the brand-name label (400)
7		<ul style="list-style-type: none"> • The valve is ready for the mounting of the accessories. • Refer to the relevant manufacturer's user instruction for information regarding other ancillary equipment.

Space for personal notes

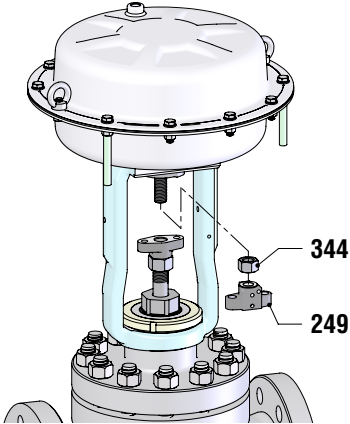
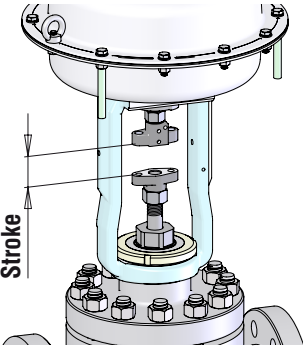
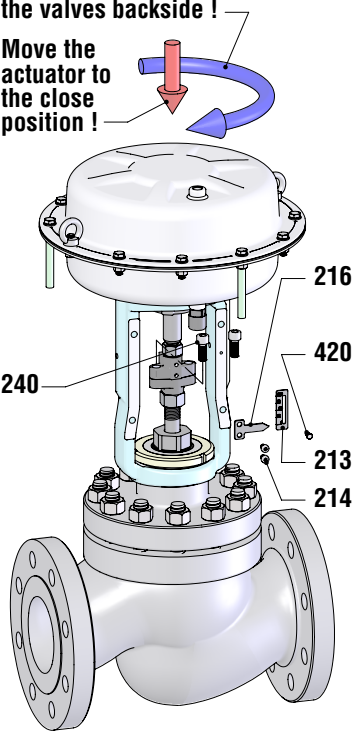
A large grid area for personal notes, consisting of 20 columns and 30 rows of small squares. The grid is empty and occupies the majority of the page below the header.

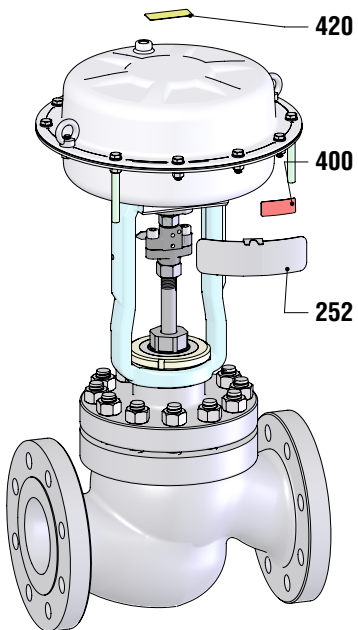
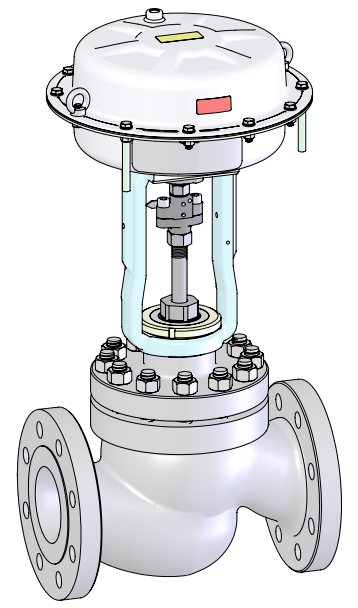
FlowAct "IG"

Assembling instruction for
Valtek GS with FlowAct

Actuator Type	Multi spring 253, 503, 701
Hand wheel	Without
Safety position	Spring to open
Stroke	20, 40, 60

Step	Image	Instruction
1		<ul style="list-style-type: none"> Fix the valve on the assembly table. Lubricate all threads with a suitable, approved lubricant. (See Page 41, Table VA3) Mount the yoke (201), valve lock nut (76) onto the bonnet. Finger tighten and fix the valve lock nut clockwise. (See Page 41, Table VA1) <p>The legs of the yoke should be parallel to the flow direction.</p> <ul style="list-style-type: none"> Mount the lock nut (113) and valve coupling (345) onto the valve stem. <p>The valve stem should placed one turn under the upper edge of the valve coupling.</p>
2		<ul style="list-style-type: none"> Lubricate the O-rings (278, 271) with a suitable lubricant. (See Page 41, Table VA3) Install the O-ring (278) onto the pre-assembled actuator body. Install the gasket (277) and screw plug (279) onto the yoke and tighten it clockwise. (See Page 41, Table VA2) Install the O-ring (271) onto the yoke. Lower the actuator body into the yoke. <p>Be careful not to score the actuator stem</p> <ul style="list-style-type: none"> Install, finger tighten and fix the actuator lock nut (256). (See Page 41, Table VA1)

Step	Image	Instruction																
3		<ul style="list-style-type: none"> Mount the lock nut (344) and actuator coupling (249) onto the actuator stem. 																
4		<ul style="list-style-type: none"> Justify the plug against the seat. Adjust the distance between the valve coupling (345) and the actuator coupling (249) with the aid of an adapter in stroke height. <table border="1" data-bbox="743 1003 1426 1124"> <thead> <tr> <th colspan="2">Size</th> <th colspan="2">Stroke</th> </tr> </thead> <tbody> <tr> <td>1/2" - 2"</td> <td>15 - 50</td> <td>0.787 ^{+0.02} in.</td> <td>20 ^{+0.5} mm</td> </tr> <tr> <td>3" - 4"</td> <td>65 - 100</td> <td>1.574 ^{+0.02} in.</td> <td>40 ^{+0.5} mm</td> </tr> <tr> <td>6"</td> <td>125 - 150</td> <td>2.362 ^{+0.03} in.</td> <td>60 ^{+0.8} mm</td> </tr> </tbody> </table>	Size		Stroke		1/2" - 2"	15 - 50	0.787 ^{+0.02} in.	20 ^{+0.5} mm	3" - 4"	65 - 100	1.574 ^{+0.02} in.	40 ^{+0.5} mm	6"	125 - 150	2.362 ^{+0.03} in.	60 ^{+0.8} mm
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5	<p>Put yourself to the valves backside !</p> <p>Move the actuator to the close position !</p> 	<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> Connect the actuator with the air supply (less than 87 psig resp. 6 bar) so it move to the close position. Mount the cap screws (240) (See Page 41, Table VA2) Lock the lock nuts (113, 344). Secure the upper coupling (249) against turn unwanted with a wrench. (See Page 41, Table VA2) Install the stroke indicator (216) with the cap screws (214) and fix it. (See Page 41, Table VA2) Install the stroke indicator scale (213) and fix it with the hex screw (420) (See Page 41, Table VA2). The stroke indicator scale should be adjusted in conjunction with the zero mark to the stroke indicator. Perform three full strokes and check if the stroke indicator scale correspond with the end positions. 																

Step	Image	Instruction
6		<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> • Disconnect the air supply so that it move to the open position. • Remove one hexagon bolt (335, 351) and install the serial plate (252). • Tighten the nut (335, 351). (See Page 13, Table A2) • De-grease the adhesive surface and stick on the warning label (420) and the brand-name label (400)
7		<ul style="list-style-type: none"> • The valve is ready for the mounting of the accessories. • Refer to the relevant manufacturer's user instruction for information regarding other ancillary equipment.

Space for personal notes

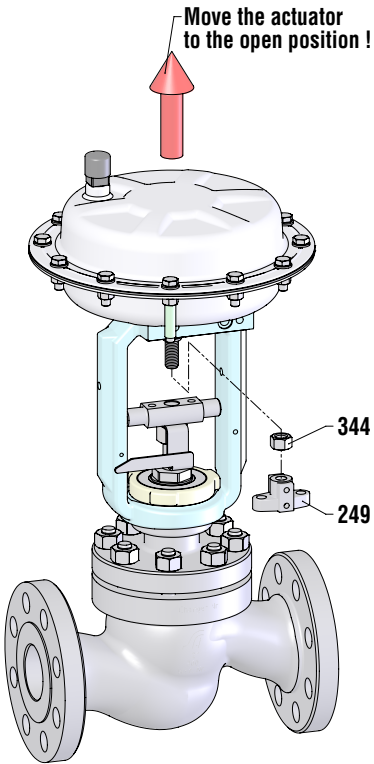
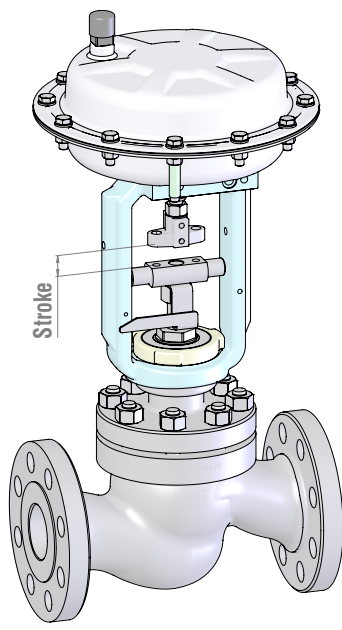
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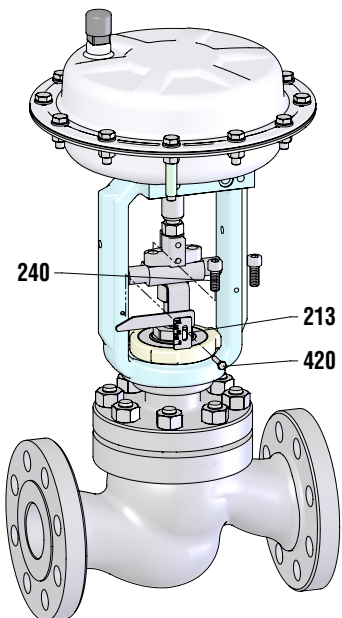
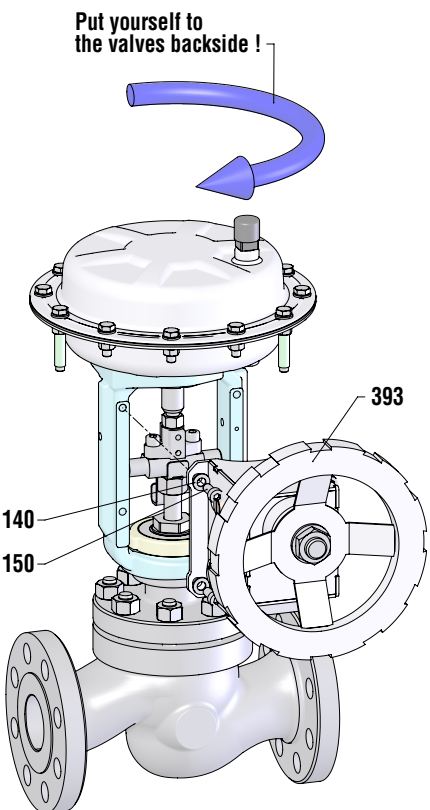
FlowAct "IG"

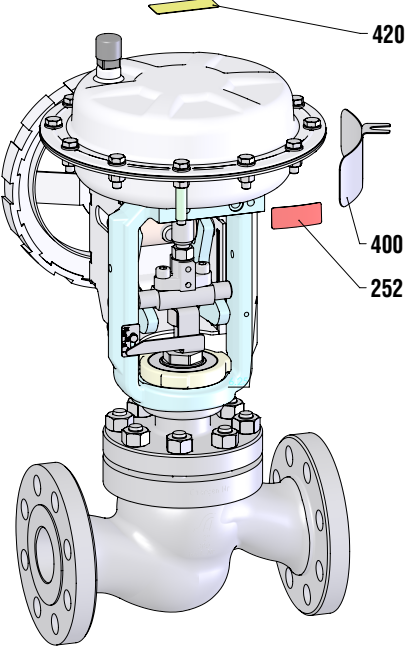
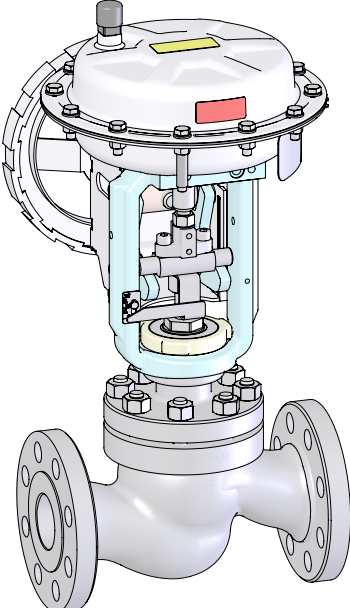
Assembling instruction for
Valtek GS with FlowAct

Actuator Type	Multi spring 253
Hand wheel	Side mounted
Safety position	Spring to close
Stroke	20

Step	Image	Instruction
1		<ul style="list-style-type: none"> Fix the valve on the assembly table. Lubricate all threads with a suitable, approved lubricant. (See Page 41, Table VA3) Mount the yoke (201), valve lock nut (76) onto the bonnet. Finger tighten and fix the valve lock nut clockwise. (See Page 41, Table VA1) <p>The legs of the yoke should be parallel to the flow direction.</p> <ul style="list-style-type: none"> Mount the lock nut (113), stroke indicator (216) and valve coupling (345) onto the valve stem. <p>The valve stem should placed one turn under the upper edge of the valve coupling.</p>
2		<ul style="list-style-type: none"> Lubricate the O-rings (278, 271) with a suitable lubricant. (See Page 41, Table VA3) Install the O-ring (278) onto the pre-assembled actuator body. Install the O-ring (271) onto the yoke. Lower the actuator body into the yoke. <p>Be careful not to score the actuator stem</p> <ul style="list-style-type: none"> Align the actuator in such a manner that the vent plug are left behind and the ribs of the actuator about parallel to the flow as shown. Install, finger tighten and fix the actuator lock nut (256). (See Page 41, Table VA1)

Step	Image	Instruction								
3		<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> • Connect the actuator with the air supply (less than 87 psig resp. 6 bar) and move it to the open position. <p>Danger of crushing ! Keep hands away from all moving parts.</p> <ul style="list-style-type: none"> • Mount the lock nut (344) and actuator coupling (249) onto the actuator stem. 								
4		<ul style="list-style-type: none"> • Justify the plug against the seat. • Adjust the distance between the valve coupling (345) and the actuator coupling (249) with the aid of an adapter in stroke height. <table border="1" data-bbox="742 1635 1428 1702"> <thead> <tr> <th colspan="2">Size</th> <th colspan="2">Stroke</th> </tr> </thead> <tbody> <tr> <td>1/2" - 2"</td> <td>15 - 50</td> <td>0.787 ^{+0.02} in.</td> <td>20 ^{+0.5} mm</td> </tr> </tbody> </table>	Size		Stroke		1/2" - 2"	15 - 50	0.787 ^{+0.02} in.	20 ^{+0.5} mm
Size		Stroke								
1/2" - 2"	15 - 50	0.787 ^{+0.02} in.	20 ^{+0.5} mm							

Step	Image	Instruction
5		<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> • Disconnect the air supply so that it move to the close position. • Mount the cap screws (240). (See Page 41, Table VA2) • Lock the lock nuts (113, 344). Secure the upper coupling (249) against turn unwanted with a wrench. (See Page 41, Table VA2) • Install the stroke indicator scale (213) and fix it with the hex screw (420) (See Page 41, Table VA2). The stroke indicator scale should be adjusted in conjunction with the zero mark to the stroke indicator. • Perform three full strokes and check if the stroke indicator scale correspond with the end positions.
6	 <p>Put yourself to the valves backside !</p>	<ul style="list-style-type: none"> • Move the lever arms of the manual handwheel into the neutral position (393). • Positioning the manual handwheel on the yoke and connect them with the plain washers (140) and hex screws (150). Lock the lock nuts (140). • Perform one full stroke and check if its move smoothly.

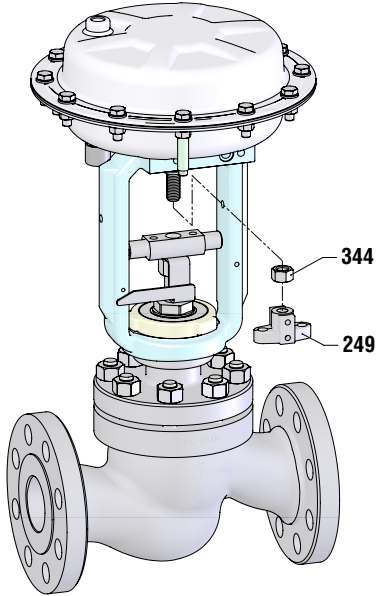
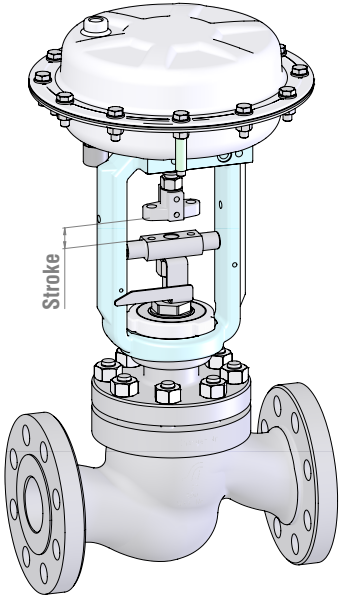
Step	Image	Instruction
7		<ul style="list-style-type: none"> • Remove one hexagon bolt (336, 351) and install the serial plate (252). • Tighten the nut (336, 351). (See Page 13, Table A2) • De-grease the adhesive surface and stick on the warning label (420) and the brand-name label (400)
8		<ul style="list-style-type: none"> • The valve is ready for the mounting of the accessories. • Refer to the relevant manufacturer's user instruction for information regarding other ancillary equipment.

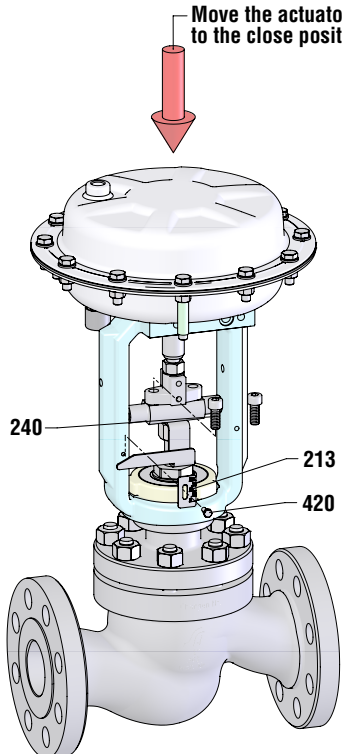
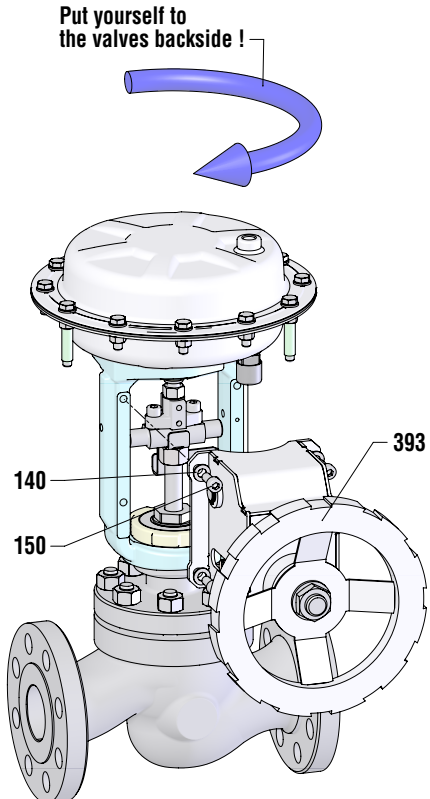
FlowAct "IG"

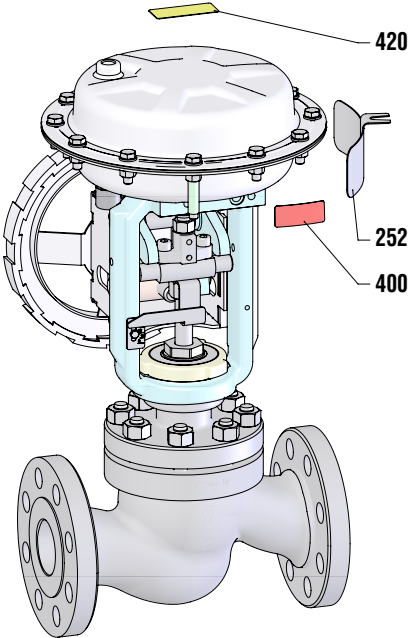
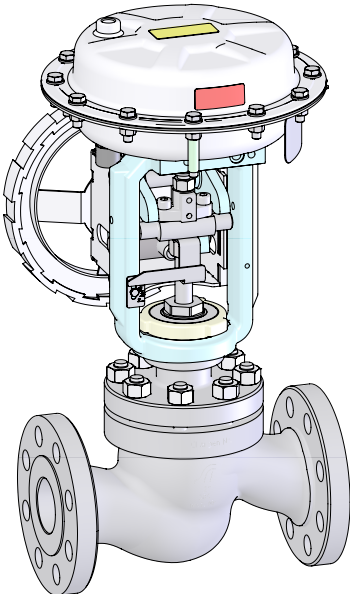
Assembling instruction for
Valtek GS with FlowAct

Actuator Type	Multi spring 253
Hand wheel	Side mounted
Safety position	Spring to open
Stroke	20

Step	Image	Instruction
1		<ul style="list-style-type: none"> Fix the valve on the assembly table. Lubricate all threads with a suitable, approved lubricant. (See Page 41, Table VA3) Mount the yoke (201), valve lock nut (76) onto the bonnet. Finger tighten and fix the valve lock nut clockwise. (See Page 41, Table VA1) <p>The legs of the yoke should be parallel to the flow direction.</p> <ul style="list-style-type: none"> Mount the lock nut (113), stroke indicator (216) and valve coupling (345) onto the valve stem. <p>The valve stem should placed one turn under the upper edge of the valve coupling.</p>
2		<ul style="list-style-type: none"> Lubricate the O-rings (278, 271) with a suitable lubricant. (See Page 41, Table VA3) Install the O-ring (278) onto the pre-assembled actuator body. Install the gasket (277) and screw plug (279) onto the yoke and tighten it clockwise. (See Page 41, Table VA2) Install the O-ring (271) onto the yoke. Lower the actuator body into the yoke. <p>Be careful not to score the actuator stem</p> <ul style="list-style-type: none"> Align the actuator in such a manner that the vent plug are left behind and the ribs of the actuator about parallel to the flow as shown. Install, finger tighten and fix the actuator lock nut (256). (See Page 41, Table VA1)

Step	Image	Instruction								
3		<ul style="list-style-type: none"> Mount the lock nut (344) and actuator coupling (249) onto the actuator stem. 								
4		<ul style="list-style-type: none"> Justify the plug against the seat. Adjust the distance between the valve coupling (345) and the actuator coupling (249) with the aid of an adapter in stroke height. <table border="1" data-bbox="743 1637 1426 1697"> <thead> <tr> <th colspan="2">Size</th> <th colspan="2">Stroke</th> </tr> </thead> <tbody> <tr> <td>1/2" - 2"</td> <td>15 - 50</td> <td>0.787^{+0.02} in.</td> <td>20^{+0.5} mm</td> </tr> </tbody> </table>	Size		Stroke		1/2" - 2"	15 - 50	0.787 ^{+0.02} in.	20 ^{+0.5} mm
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1/2" - 2"	15 - 50	0.787 ^{+0.02} in.	20 ^{+0.5} mm							

Step	Image	Instruction
5	 <p>Move the actuator to the close position.</p>	<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> • Connect the actuator with the air supply (less than 87 psig resp. 6 bar) and move it to the close position. • Mount the cap screws (240) • Lock the lock nuts (113, 344). Secure the upper coupling (249) against turn unwanted with a wrench. (See Page 41, Table VA2) • Install the stroke indicator scale (213) and fix it with the hex screw (420) (See Page 41, Table VA2). The stroke indicator scale should be adjusted in conjunction with the zero mark to the stroke indicator. • Perform three full strokes and check if the stroke indicator scale correspond with the end positions.
6	 <p>Put yourself to the valves backside !</p>	<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> • Disconnect the air supply so that it move to the open position. • Move the lever arms of the manual handwheel into the neutral position (393). • Positioning the manual handwheel on the yoke and connect them with the plain washers (140) and hex screws (150). • Perform one full stroke and check if its move smoothly.

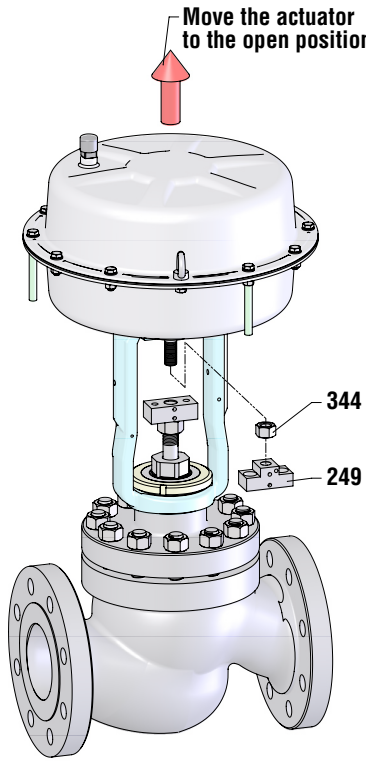
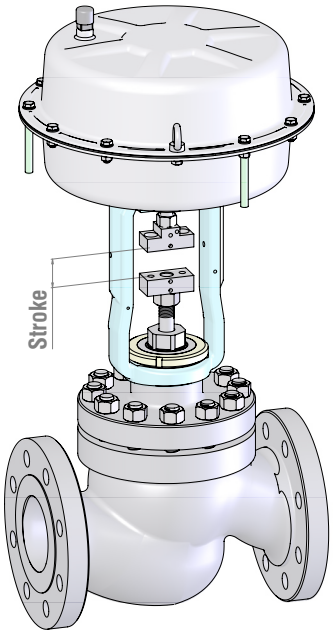
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7		<ul style="list-style-type: none"> • Remove one hexagon bolt (336, 351) and install the serial plate (252). • Tighten the nut (336, 351) (See Page 13, Table A2) • De-grease the adhesive surface and stick on the warning label (420) and the brand-name label (400)
8		<ul style="list-style-type: none"> • The valve is ready for the mounting of the accessories. • Refer to the relevant manufacturer's user instruction for information regarding other ancillary equipment.

FlowAct “IG”

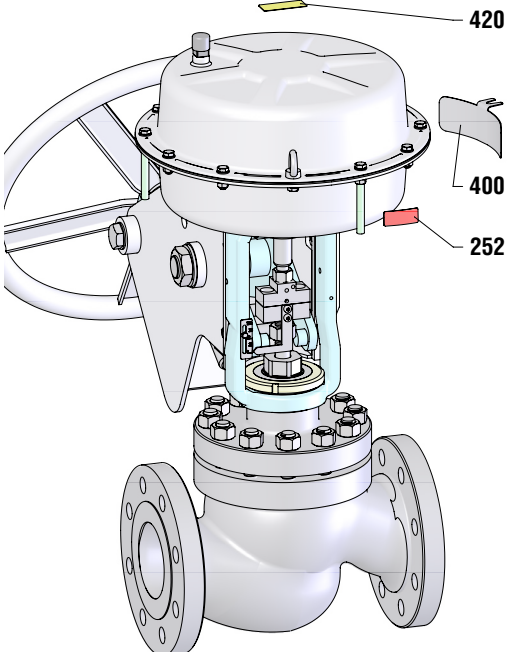
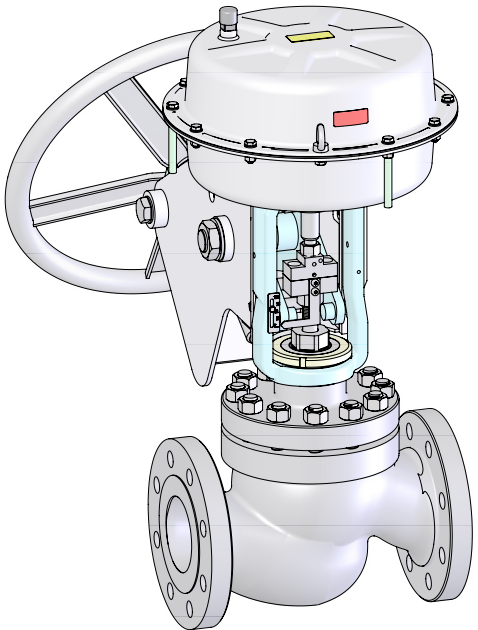
Assembling instruction for
Valtek GS with FlowAct

Actuator Type	Multi spring 503, 701
Hand wheel	Side mounted
Safety position	Spring to close
Stroke	20, 40, 60

Step	Image	Instruction
1		<ul style="list-style-type: none"> • Fix the valve on the assembly table. • Lubricate all threads with a suitable, approved lubricant. (See Page 41, Table VA3) • Mount the yoke (201), valve locknut (76) onto the bonnet. • Finger tighten and fix the valve locknut clockwise. (See Page 41, Table VA1) <p>The legs of the yoke should be parallel to the flow direction.</p> <ul style="list-style-type: none"> • Mount the lock nut (113) and valve coupling (345) onto the valve stem. (See Page 41, Table VA2) <p>The valve stem should be placed one turn under the upper edge of the valve coupling.</p>
2		<ul style="list-style-type: none"> • Lubricate the O-rings (278, 271) with a suitable lubricant. (See Page 41, Table VA3) • Install the O-ring (278) onto the pre-assembled actuator body. • Install the O-ring (271) onto the yoke. • Lower the actuator body into the yoke. <p>Be careful not to score the actuator stem.</p> <ul style="list-style-type: none"> • Align the actuator in such a manner that the vent plug are left behind and the ribs of the actuator about parallel to the flow as shown. • Install, finger tighten and fix the actuator lock nut (256). (See Page 41, Table VA1)

Step	Image	Instruction																
3		<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> • Connect the actuator with the air supply (less than 87 psig resp. 6 bar) and move it to the open position. • Mount the lock nut (344) and actuator coupling (249) onto the actuator stem. 																
4		<ul style="list-style-type: none"> • Justify the plug against the seat. • Adjust the distance between the valve coupling (345) and the actuator coupling (249) with the aid of an adapter in stroke height. <table border="1" data-bbox="778 1608 1422 1729"> <thead> <tr> <th></th> <th>Size</th> <th colspan="2">Stroke</th> </tr> </thead> <tbody> <tr> <td>1/2" - 2"</td> <td>15 - 50</td> <td>0.787^{+0.02} in.</td> <td>20^{+0.5} mm</td> </tr> <tr> <td>3" - 4"</td> <td>65 - 100</td> <td>1.574^{+0.02} in.</td> <td>40^{+0.5} mm</td> </tr> <tr> <td>6"</td> <td>125 - 150</td> <td>2.362^{+0.03} in.</td> <td>60^{+0.8} mm</td> </tr> </tbody> </table>		Size	Stroke		1/2" - 2"	15 - 50	0.787 ^{+0.02} in.	20 ^{+0.5} mm	3" - 4"	65 - 100	1.574 ^{+0.02} in.	40 ^{+0.5} mm	6"	125 - 150	2.362 ^{+0.03} in.	60 ^{+0.8} mm
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Step	Image	Instruction
5		<p>⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul style="list-style-type: none"> • Disconnect the air supply so that it move to the close position. • Mount the cap screws (240) • Lock the lock nuts (113, 344). Secure the upper coupling (249) against turn unwanted with a wrench. (See Page 41, Table VA2) • Install the stroke indicator scale (213) and fix it with the hex screw (420) (See Page 41, Table VA2). The stroke indicator scale should be adjusted in conjunction with the zero mark to the stroke indicator. • Perform three full strokes and check if the stroke indicator scale correspond with the end positions.
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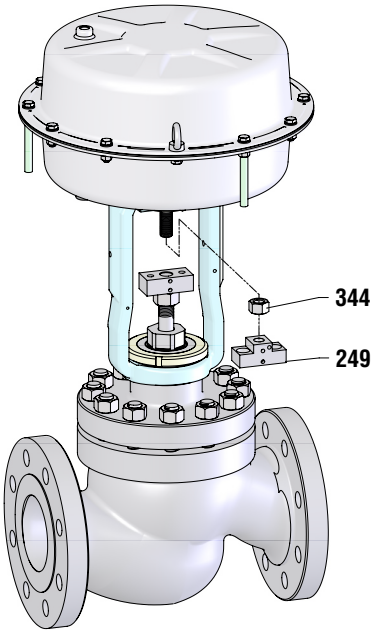
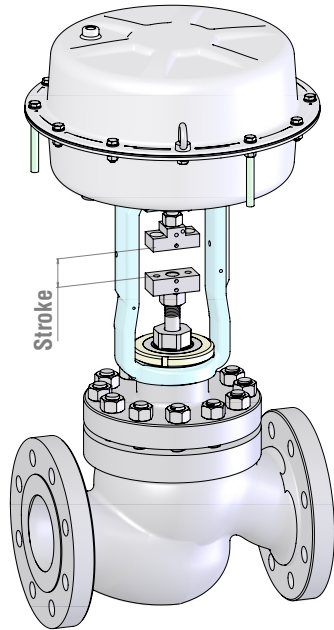
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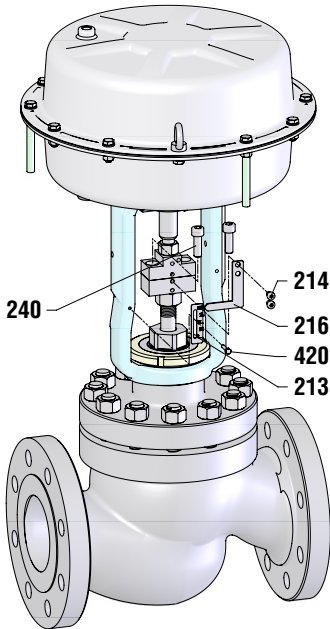
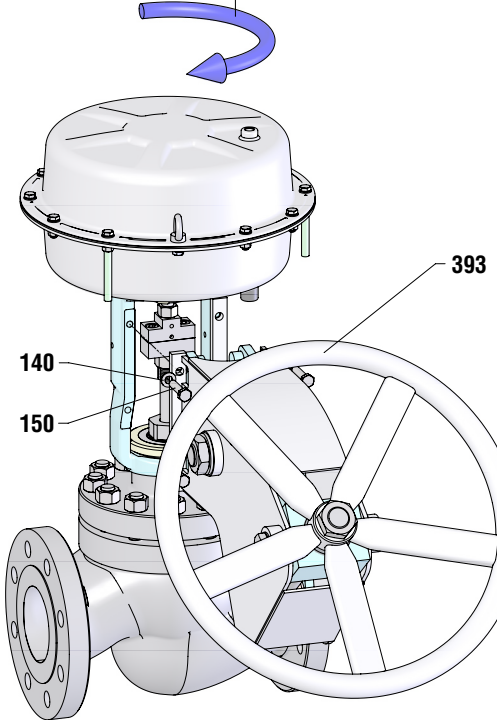
FlowAct “IG”

Assembling instruction for
Valtek GS with FlowAct

Actuator Type	Multi spring 503, 701
Hand wheel	Side mounted
Safety position	Spring to open
Stroke	20, 40, 60

Step	Image	Instruction
1		<ul style="list-style-type: none"> Fix the valve on the assembly table. Lubricate all threads with a suitable, approved lubricant. (See Page 41, Table VA3) Mount the yoke (201), valve lock nut (76) onto the bonnet. Finger tighten and fix the valve lock nut clockwise. (See Page 41, Table VA1) <p>The legs of the yoke should be parallel to the flow direction.</p> <ul style="list-style-type: none"> Mount the lock nut (113) and valve coupling (345) onto the valve stem. <p>The valve stem should be placed one turn under the upper edge of the valve coupling.</p>
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3		<ul style="list-style-type: none"> Mount the lock nut (344) and actuator coupling (249) onto the actuator stem. 																
4		<ul style="list-style-type: none"> Justify the plug against the seat. Adjust the distance between the valve coupling (345) and the actuator coupling (249) with the aid of an adapter in stroke height. <table border="1" data-bbox="778 1608 1422 1729"> <thead> <tr> <th colspan="2">Size</th> <th colspan="2">Stroke</th> </tr> </thead> <tbody> <tr> <td>1/2" - 2"</td> <td>15 - 50</td> <td>0.787^{+0.02} in.</td> <td>20^{+0.5} mm</td> </tr> <tr> <td>3" - 4"</td> <td>65 - 100</td> <td>1.574^{+0.02} in.</td> <td>40^{+0.5} mm</td> </tr> <tr> <td>6"</td> <td>125 - 150</td> <td>2.362^{+0.03} in.</td> <td>60^{+0.8} mm</td> </tr> </tbody> </table>	Size		Stroke		1/2" - 2"	15 - 50	0.787 ^{+0.02} in.	20 ^{+0.5} mm	3" - 4"	65 - 100	1.574 ^{+0.02} in.	40 ^{+0.5} mm	6"	125 - 150	2.362 ^{+0.03} in.	60 ^{+0.8} mm
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6"	125 - 150	2.362 ^{+0.03} in.	60 ^{+0.8} mm															

Step	Image	Instruction
5	<p data-bbox="470 315 711 365">Move the actuator to the close position !</p> 	<p data-bbox="783 304 1469 371">⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul data-bbox="783 416 1469 1099" style="list-style-type: none"> • Connect the actuator with the air supply (less than 87 psig resp. 6 bar) and move it to the close position. • Mount the cap screws (240) • Lock the lock nuts (113, 344). Secure the upper coupling (249) against turn unwanted with a wrench. (See Page 41, Table VA2) • Install the stroke indicator scale (213) and fix it with the hex screw (420) (See Page 41, Table VA2). The stroke indicator scale should be adjusted in conjunction with the zero mark to the stroke indicator. • Perform three full strokes and check if the stroke indicator scale correspond with the end positions.
6	<p data-bbox="264 1178 472 1227">Put yourself to the valves backside !</p> 	<p data-bbox="783 1290 1469 1357">⚠ CRUSHING HAZARD ! Do not work between the yoke legs while the valve is in operation.</p> <ul data-bbox="783 1402 1469 1850" style="list-style-type: none"> • Disconnect the air supply so that it move to the open position. • Move the lever arms of the manual handwheel into the neutral position (393) • Positioning the manual handwheel on the yoke and connect them with the plain washers (140) and hex screws (150). • Perform one full stroke and check if its move smoothly.

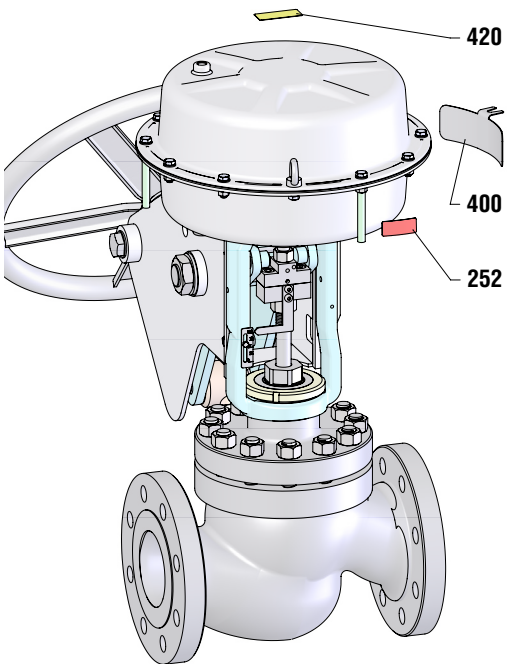
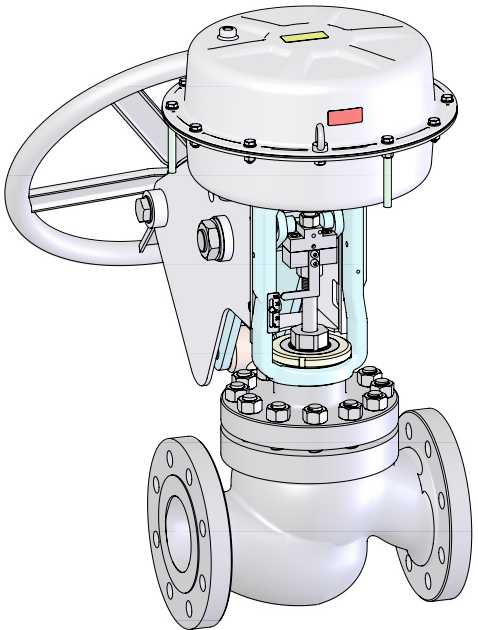
Step	Image	Instruction
7		<ul style="list-style-type: none"> • Remove one hexagon bolt (336, 351) and install the serial plate (252). • Tighten the nut (336, 351). (See Page 13, Table A2) • De-grease the adhesive surface and stick on the warning label (420) and the brand-name label (400)
8		<ul style="list-style-type: none"> • The valve is ready for the mounting of the accessories. • Refer to the relevant manufacturer's user instruction for information regarding other ancillary equipment.

Table VA1 - Imperial Units Torque Requirements for VALVE / ACTUATOR LOCK NUT (5.10, 5.11) per actuator size			
Unit	IG 253	IG 503	IG 701
ft lb	Tighten the lock nuts clockwise with a rounded chisel and a 3.5 lbs. hammer before occurs the kickback effect.		

Table VA2 - Imperial Units Torque Requirements for COUPLING PARTS (5.1, 5.2, 5.3, 5.4, 5.5, 5.8, 5.20) per actuator size			
Unit	IG 253	IG 503	IG 701
ft lb	Tighten the subordinate bolting properly by hand in accordance with the relevant technical standards.		

Table VA3 - Imperial Units Lubricants / release agents for the VALVE / ACTUATOR in ambient temperature			
Used for parts which are not influenced by the medium and the medium temperature	application	Standard use	Oxygen use
	for O-ring's	- 40 °F to + 158 °F (- 40 °C to + 70 °C)	- 40 °F to + 158 °F (- 40 °C to + 70 °C)
	for threads of the coupling parts	Dow Corning Molykote 55 O-Ring ¹⁾	DuPont Krytox GPL 206 ¹⁾
	for the thread of the stroke indicator bolting	Fastorq A/G ¹⁾	

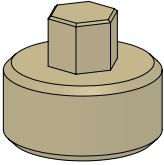
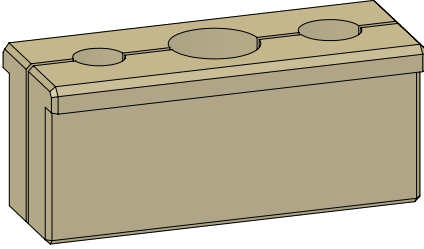
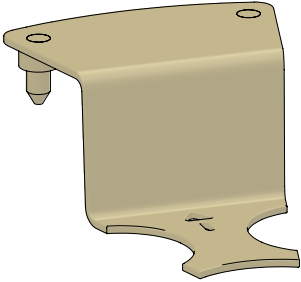

¹⁾ or equivalent

Table VA1 - Metric Units Torque Requirements for VALVE / ACTUATOR LOCK NUT (5.10, 5.11) per actuator size			
Unit	IG 253	IG 503	IG 701
Nm	Tighten the lock nuts clockwise with a rounded chisel and a 1.5 kg hammer before occurs the kickback effect.		

Table VA2 - Metric Units Torque Requirements for COUPLING PARTS (5.1, 5.2, 5.3, 5.4, 5.5, 5.8, 5.20) per actuator size			
Unit	IG 253	IG 503	IG 701
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Table VA3 - Metric Units Lubricants / release agents for the VALVE / ACTUATOR in ambient temperature			
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	for O-ring's	- 40 °F to + 158 °F (- 40 °C to + 70 °C)	- 40 °F to + 158 °F (- 40 °C to + 70 °C)
	for threads of the coupling parts	Klüber Unisilikon L250L ¹⁾	Klüberalfa YV 93-1202 ¹⁾
	for the thread of the stroke indicator bolting	Klüberpaste 46 MR 401 ¹⁾	

¹⁾ or equivalent

Table ST1 Special Tool	Use
	<p>Socket Spanner for SPECIAL NUT (348)</p> <p>Necessary tool for assembling and disassembling.</p> <p>For actuator type IG 253 Part # 327 589 For actuator type IG 503 + 701 Part # 327 590</p>
	<p>Stem Clamping Tool for ACTUATOR STEM (211)</p> <p>Essential tool for assembling and disassembling.</p> <p>For all actuators Part # 152 183</p>
	<p>Positioning Template for DIAPHRAGM (225) and PLATE (227)</p> <p>Essential tool for assembling.</p> <p>For actuator type IG 253 Part # 327 576 For actuator type IG 503 Part # 327 575 For actuator type IG 701 Part # 327 573</p>
<p>Drawing not shown</p>	<p>Press and Pre-loading Tool for GUIDE BUSH and SPRINGs (229)</p> <p>Necessary tool for assembling and disassembling.</p> <p>For all actuators Part # See spare parts catalog</p>
	<p>Positioning Adapter for COUPLING (345, 249)</p> <p>Essential tool for assembling.</p> <p>For stroke 0.787 in., 20 mm Part # 327 626 For stroke 1.574 in., 40 mm Part # 327 626 For stroke 2.362 in., 60 mm Part # 327 627</p>

Parts List

M = Diaphragm Kit
E = Gasket Kit

Item #		Part	Mat.	Spare Parts
WW	EU			
345	5.1	Valve Coupling ¹⁾	A182	
113	5.2	Lock Nut ¹⁾	A2-70	
249	5.3	Actuator Coupling ²⁾	A182	
344	5.4	Lock Nut ²⁾	A2-70	
240	5.5	Socket Head Screw ²⁾	A2-70	
216	5.6	Stroke Indicator ²⁾	SS	
213	5.7	Stroke Scale ²⁾	SS	
420	5.8	Hexagon Bolt ²⁾	A2-70	
201	5.9	Yoke	A536	
277	5.41	Gasket ¹⁾	AFM 30	
279	5.40	Screw Plug ¹⁾	A2-70	
76	5.10	Valve Locknut ¹⁾	1.4308	
256	5.11	Actuator Locknut	1.4308	
214	5.20	Socket Head Screw ²⁾	A2-70	
202	6.1	Diaphragm Casing	1.0322	
203	6.2	Diaphragm Casing	1.0322	
335	6.3.1	Hexagon Bolt - short	A2-70	
336	6.3.2	Hexagon Bolt - long	A2-70	
351	6.4	Hexagon Nut	A2-70	
337	6.5	Plain Washer	A2	
209	6.6	Ring Nut	C15	
253	6.8.1	Guide Bush ³⁾	1.0736	
254	6.8.2	Plain Bearing (ISO 3547-4) ³⁾	P1	
275	6.10	O-Ring	NBR 70	E
273	6.11	Scraper Ring	NBR 90	E
211	6.12	Stem	A479	
228	6.13	Spacer Bush	1.0308	
227	6.15	Diaphragm Plate	1.0332	
225	6.16	Diaphragm	NBR 50	M
272	6.17	O-Ring	NBR 70	M
255	6.18	Thrust Washer	1.0736	
349	6.19	Lock Washer	C75	M
348	6.20	Special Nut	1.0736	
229	6.21	Actuator Spring	1.7102	
231	6.22	Distance Plate	PA6	
326	6.23	Spring Adjusting Plate	1.0330	
339	6.25	Protection Sleeve	VMQ	
258	6.26	Vent Plug	PA	
271	6.50	O-Ring	NBR 70	E
278	6.51	O-Ring	NBR 70	E
252	7.1	Serial Plate ⁴⁾	SS	
420	7.3	Warning Label ⁴⁾	PP	
400	7.9	Brand-name Label ⁴⁾	PP	

¹⁾ see page 21 ²⁾ see page 22

³⁾ see page 9 ⁴⁾ see page 23

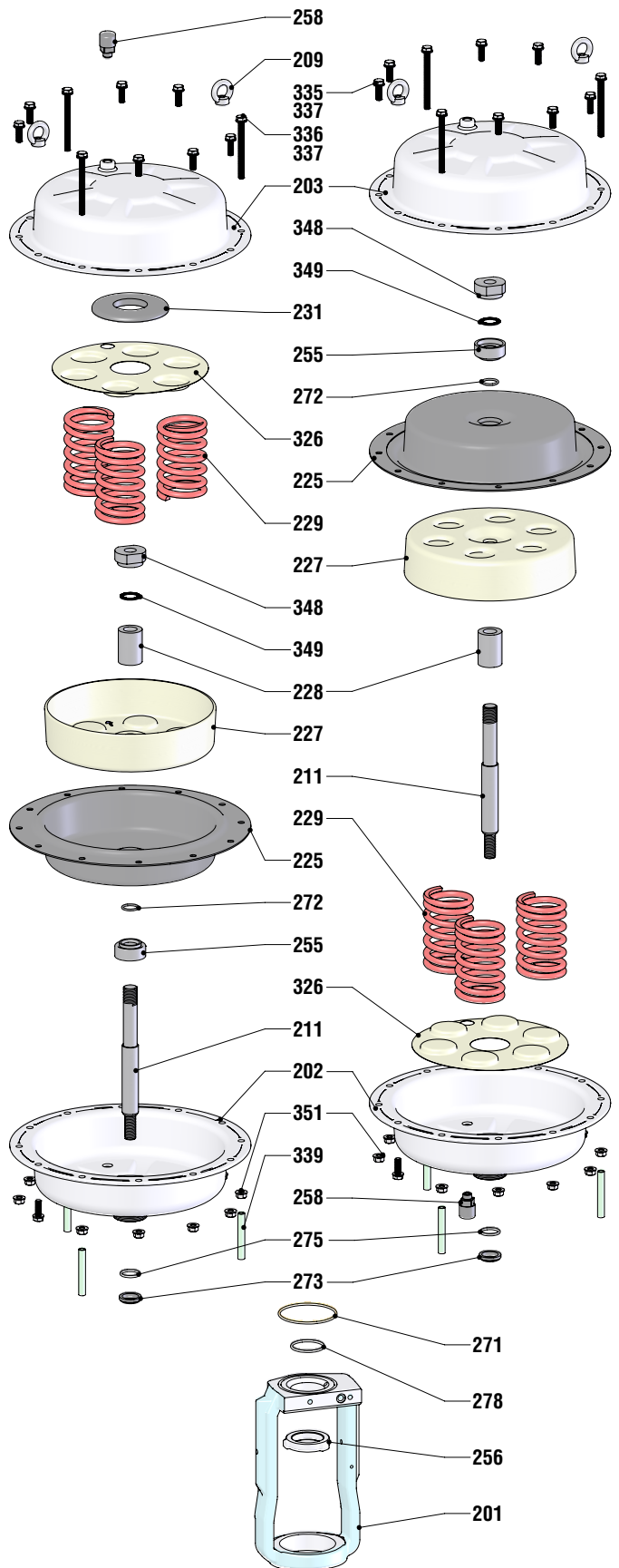


Figure xx: Complete actuator parts (left - spring close, right - spring opens)



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