



MATÉRIEL CONCERNÉ – CONCERNED EQUIPMENT – BETROFFENES MATERIAL

ALL BUTTERFLY VALVES

MAINTENANCE AND REPAIR INSTRUCTIONS

MATÉRIEL CONCERNÉ – CONCERNED EQUIPMENT – BETROFFENES MATERIAL**ALL BUTTERFLY VALVES****MAINTENANCE****1. Valve**

The parts likely to wear out and which have to be replaced are the following:

- Butterfly shaft tightening device
- Butterfly shaft guiding bushings
- Butterfly tightening lining or joint (CFEM and CFEJ type valves)

If present, check the stuffing box tightness once a month.

If a leakage is detected, slightly tighten the stuffing box gland.

If the leakage continues, change the stuffing box packing.

WARNING:

During the mounting/disassembling of the valve, the operations must be respected step by step, to prevent injuries and material damages.

All parts included in the repair kits have to be replaced.

Valve closing and opening operations can be realized only when access between the disc and the valve body is safe.

1.1. Butterfly shaft barrel or stuffing box**1.1.1 Valves assembled with stuffing box (graphite rings for HF & HFI type valve, PTFE rings for CF type valves), see parts list page 6**

Unscrew the screws TAG 1.14 and remove them with washer TAG 1.15 and yoke TAG 1.26.

Unscrew the nuts TAG 1.23 and remove washer TAG 1.24 and packing flange TAG 1.21. Remove the two spring washers TAG 1.24a and the gland TAG 1.09 out of the valve body.

With a pointed rod or a pointed little hook remove the rings TAG 1.17. Clean the bore of the stuffing box and assemble new packing rings.

Grease the shaft with high temperature resistant grease at the gland TAG 1.09 place. Use grease type RAINEX E-Z BREAK MARKAL RX695.

Reassemble the gland TAG 1.09, the spring washers TAG 1.24a, and the packing flange TAG 1.21. Screw the screws TAG 1.23.

Check the tightness in service.

Procedure to verify the stuffing box

The shaft tightness of the valves assembled in our workshop is tested and the initial screwing of the stuffing box is adjusted to optimise the necessary torque on the shaft.

The rings TAG 1.17 ensure the tightness on the butterfly shaft.

It is necessary after the mounting of the valve on the pipe and after a few hours of running to control the rate of the ring compression by checking the dimensions « E » between the gland TAG 1.09 and the flange TAG 1.21.

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The adjustment of these dimensions is done with the screws TAG 1.23. Check regularly these dimensions after 100.000 cycles or 1500 hours of running.

Table of the dimensions « E »:

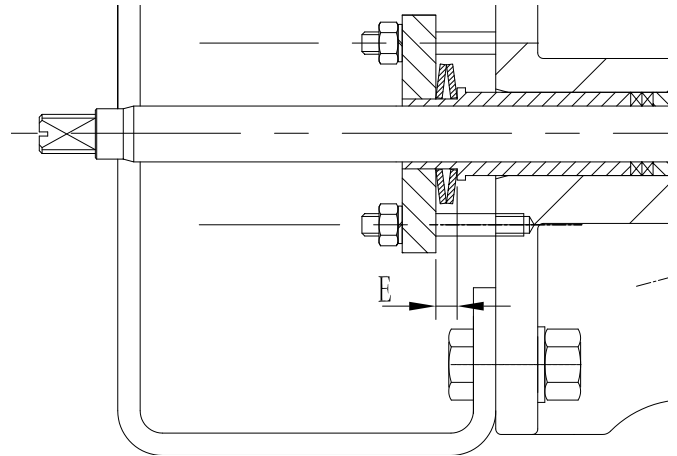
Stuffing box joint size 15-25: E=5,4mm

Stuffing box joint size 20-30: E=6,4mm

Stuffing box joint size 25-35 : E=7,8mm

Stuffing box joint size 30-45 : E=8,0mm

To check this dimensions use standard key.



1.1.2 Valves assembled with barrel (CF and CFEJ type, see CFEJ parts list page7)

1.1.2.1 Rear barrel TAG 1.10.

Unscrew and remove the screws TAG 1.10.11 and the washer TAG 1.10.10.

Remove the flange TAG 1.10.12 and the spacer TAG 1.10.9.

Unscrew the screws, remove the washer and the shaft stop TAG 1.10.8.

Pull the rear barrel TAG 1.10 out of the valve body.

Replace the old barrel by a new one with new joints and bushing.

The barrel is assembled with one shaft joint TAG 1.10.4, a barrel joint TAG 1.10.5, a scraper joint TAG 1.10.6 and a bushing TAG 1.10.7.

Push the barrel into the valve body and reassemble the parts in reverse order of there over disassembling.

Verify the free motion between the shaft stop and the flange. These parts must not be in contact. This free clearance must be under 0,5mm.

Check the tightness in service.

1.1.2.2 Front barrel TAG 1.10.

Remove the yoke if necessary.

Unscrew and remove the screws TAG 1.10.2 and the washer TAG 1.10.3.

Pull the front barrel TAG 1.10 out the valve body.

Replace the old barrel by a new one with new joints and bushing.

The barrel is assembled with one shaft joint TAG 1.10.4, a barrel joint TAG 1.10.5, a scraper joint TAG 1.10.6 and a bushing TAG1.10.7.

Push the barrel into the valve body and reassemble the parts in reverse order of there over disassembling.

Check the tightness in service.

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1.2. Butterfly tightening lining (for CFEM type)

To replace the butterfly tightening lining it is necessary to remove the valve from the pipe and the actuator from the valve.

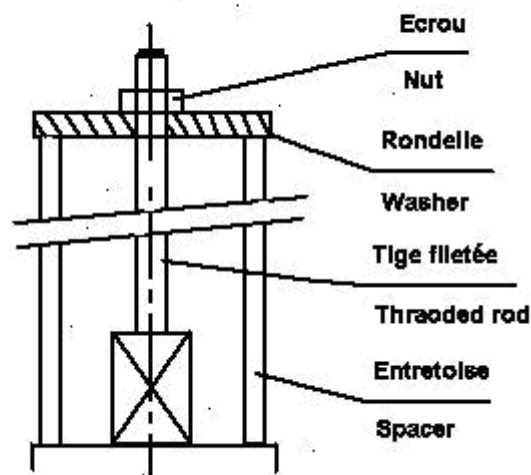
1.2.1 Actuator removal

Unscrew the screws assembling the actuator/yoke on the valve.
Pull the complete actuator to remove it from the valve body.

1.2.2 Lining replacement (see CFEM parts list page 8)

Open the butterfly.
Pull down the cover TAG 1.27.
Extract the shaft TAG 1.03 with a hub extractor or the extractor tool or with a hard plastic hammer.
For DN200 to DN500 valve, unthreaded the nut and extract the ½ shaft first.
Remove the butterfly disc TAG 1.02 with a hammer and disassemble the lining TAG 1.26 with a screw driver or a crowbar.

Upper shaft extraction tool (DN 650 to 1000)



1.2.3 Lining reassembling

Before reassembling, check that the bushings have not been damaged during dismantling. Replace them if necessary.
In order to facilitate the lining assembling in the valve body, it is advisable to wet it with silicone grease or soapy water.
Deform the lining to insert its lower part in the body and take care to place rightly the shaft passage into its housing (see picture below).
Compress laterally the lining to insert the upper shaft passage.

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With a mallet, press the lining against the valve body. Make sure that the lining contact is properly carried out with the valve body.

1.2.4 Butterfly reassembling

Insert the disc sideways, place the lower shaft bore into its housing. Make turn the butterfly round in order to center the butterfly shaft bores with the shafts housings in the lining. Check the centring.
To facilitate the disc insertion in the lining, it is advisable to wet it with soapy water.

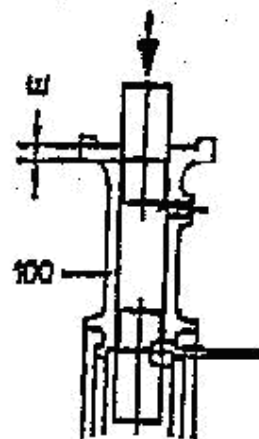
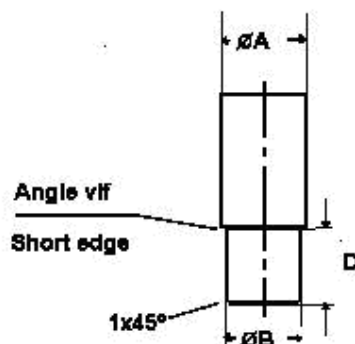


1.3. Guiding bushings

Proceed as the point 1.2.2 to replace new bushing.

Place a brass rod against the old bushing. This rod diameter will be a little smaller than the bushing outside diameter. Drive out the bushing by hammering on the rod. Set a new bushing.

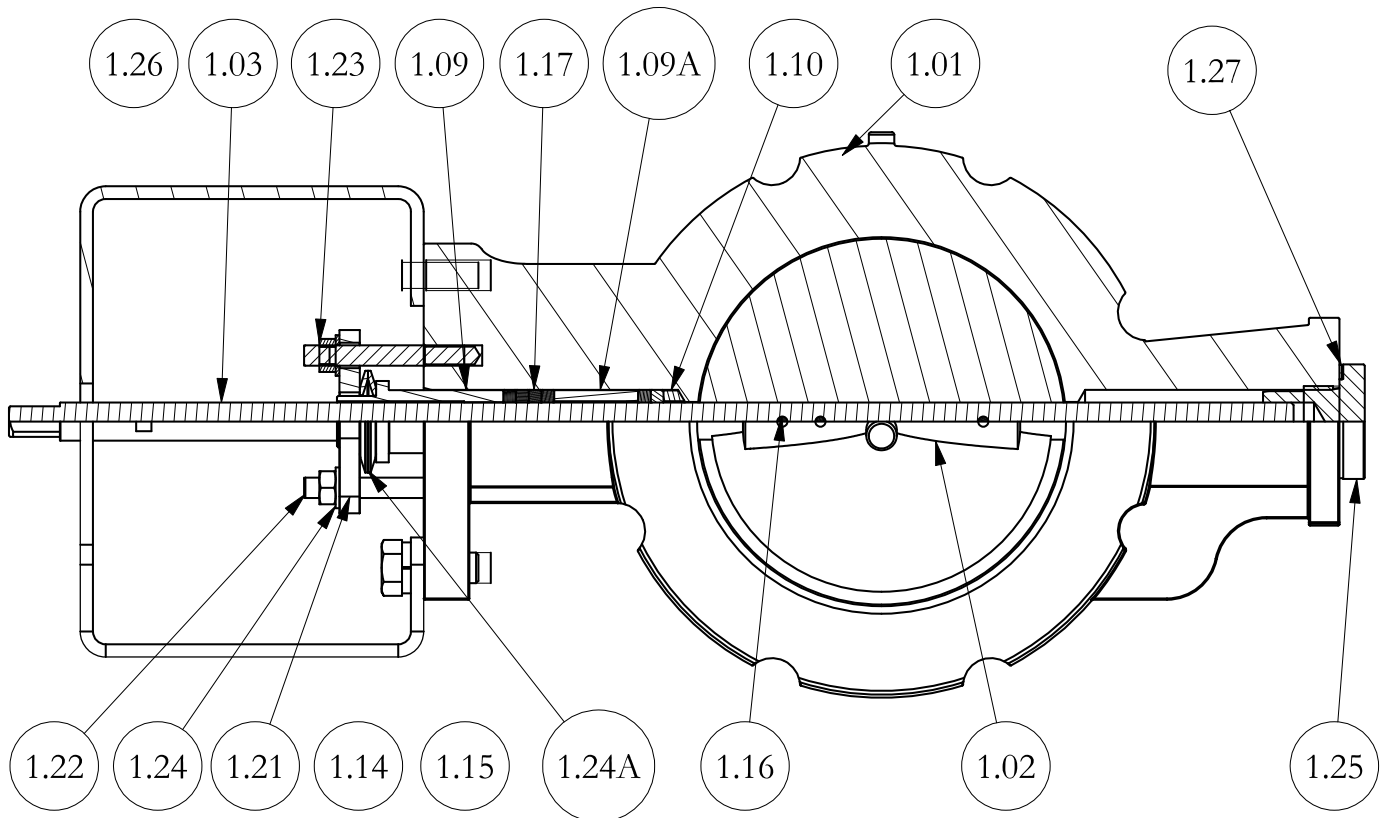
Mounting Tool for bearing



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VALVES TYPE 34100, 34102 & 34000 HF/CF

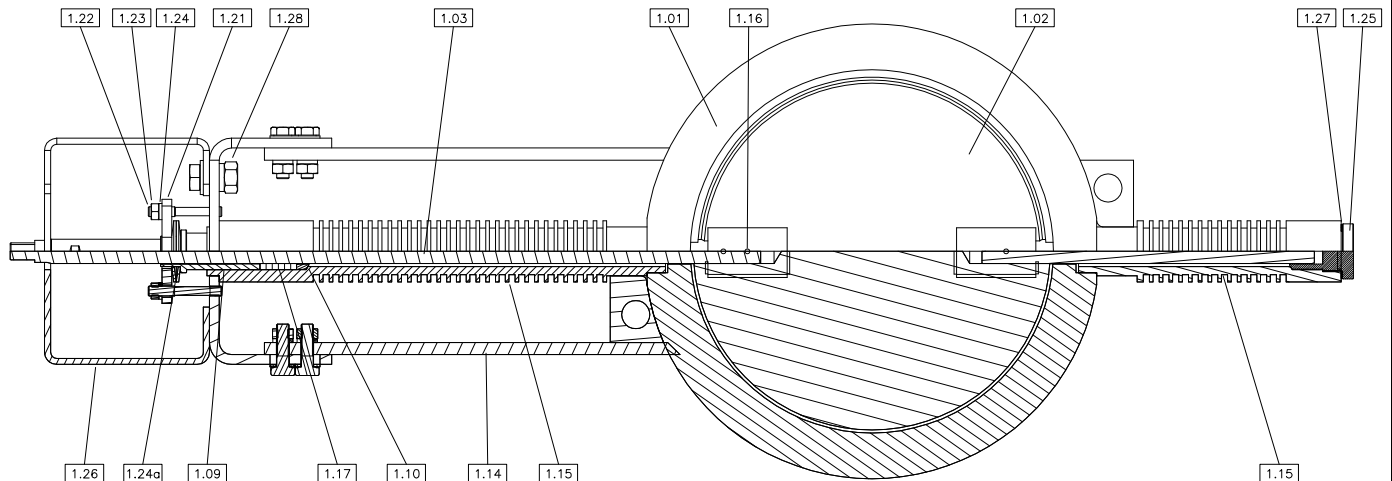


Tag	Qty	Label	Material	Spare
1.01	1	VALVE BODY	Cast Iron	
1.02	1	BUTTERFLY	Cast Iron	
1.03	1	SHAFT	AISI 304L	
1.09	1	GLAND	Cast Iron	*
1.09A	1	STAY	Cast Iron	
1.10	1	BOTTOM WASHER	AISI 304L	
1.14	2	SCREW	Class 8.8	
1.15	2	SPRING WASHER	Class 8.8	
1.16	3	PIN	Steel	
1.17	6	PACKING RINGS	PTFE Graphite	*
1.21	1	PACKING FLANGE	Galvanized steel	
1.22	2	STUD BOLT	AISI 304L	
1.23	2	NUT	Class 8.8	
1.24	2	WASHER	Class 8.8	
1.24c	2	SPRING WAHSER	Steel	*
1.25	1	CAP	Cast Iron	
1.26	1	SPACER	Galvanized steel	

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VALVES TYPE 34100, 34102 HFI

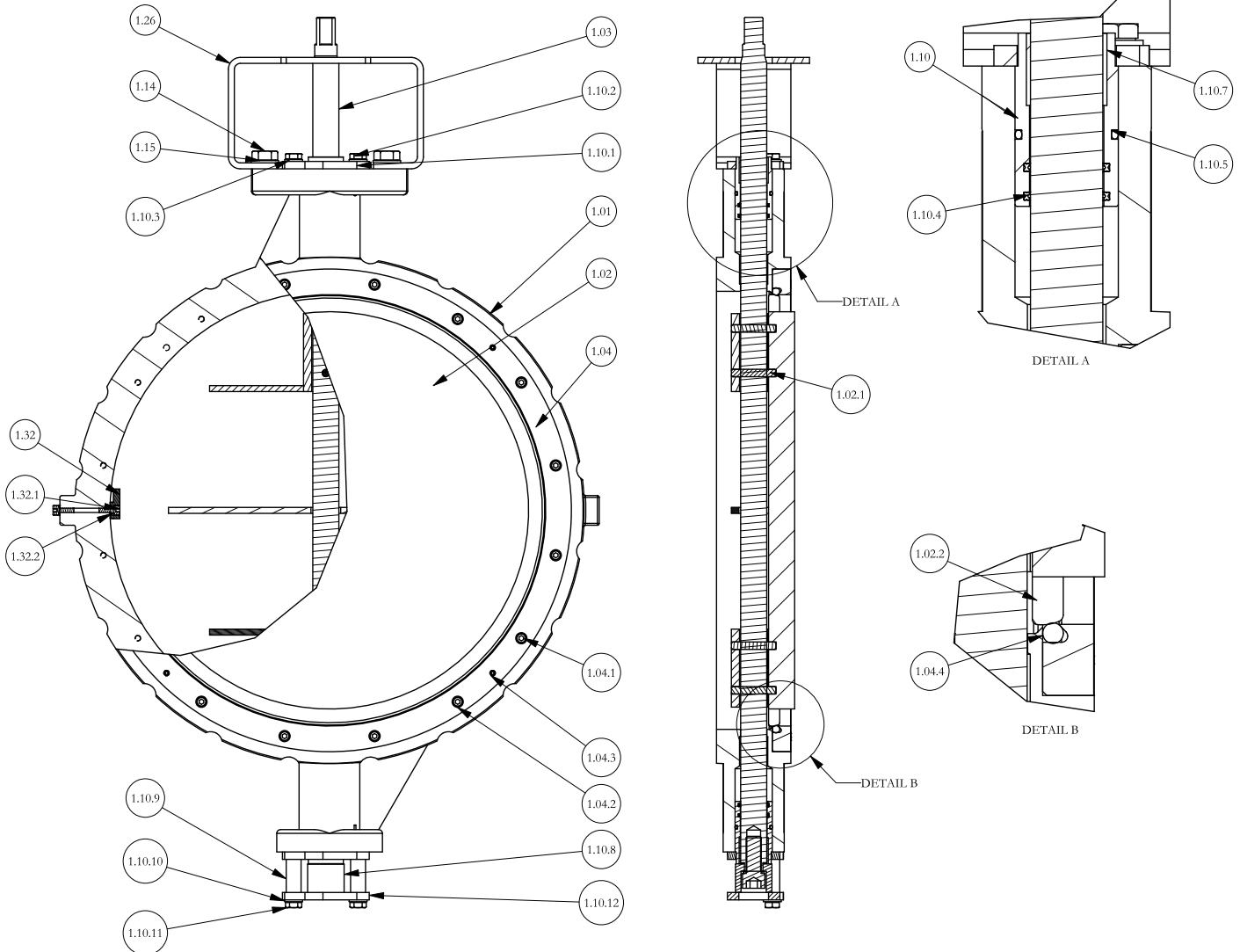


Tag	Qty	Label	Material	Spare
1.01	1	VALVE BODY	AISI 304L or 310S	
1.02	1	BUTTERFLY	AISI 304L or 310S	
1.03	1	SHAFT	AISI 304L or 310S	
1.09	1	GLAND	Cast Iron	*
1.09A	1	STAY	Cast Iron	
1.10	1	BOTTOM WASHER	AISI 304L	
1.14	2	SCREW	Class 8.8	
1.15	2	SPRING WASHER	Class 8.8	
1.16	3	PIN	Steel	
1.17	6	PACKING RINGS	PTFE Graphite	*
1.21	1	PACKING FLANGE	Galvanized steel	
1.22	2	STUD BOLT	AISI 304L	
1.23	2	NUT	Class 8.8	
1.24	2	WASHER	Class 8.8	
1.24a	2	SPRING WAHSER	Steel	*
1.25	1	CAP	Cast Iron	
1.26	1	SPACER	Galvanized steel	
1.27	1	GASKET	Graphite	*
1.28	2	SCREW	Class 8.8	

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VALVES TYPE 34100 CFEJ

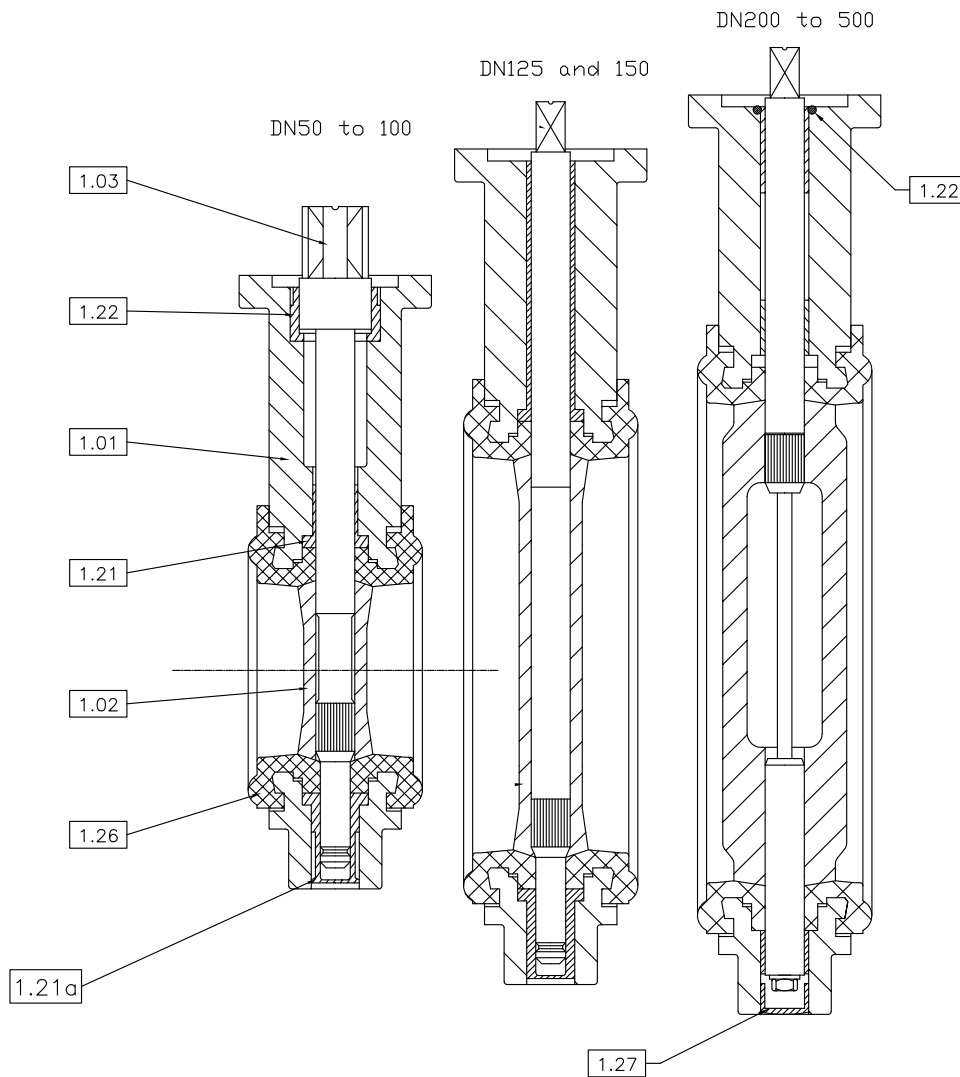


Tag	Qty	Label	Material	Spare	Tag	Qty	Label	Material	Spare
1.01	1	VALVE BODY	Cast Iron		1.10.4	4	SHAFT JOINT	Viton	*
1.02	1	BUTTERFLY	Cast Iron/steel		1.10.5	2	BARREL JOINT	Viton	*
1.02.1	4	PIN	AISI 304		1.10.8	1	SHAFT STOP	AISI 420	
1.02.2	1	BUTTERFLY PROFIL	AISI 304		1.10.7	2	BUSHING	PTFE + Brass	*
1.03	1	SHAFT	AISI 304		1.10.9	2	STOP SPACER	AISI 420	
1.04	1	JOINT FLANGE	Steel		1.10.10	1	WASHER	Class 8.8	
1.04.1	X	SCREW	AISI 304		1.10.11	1	SCREW	Class 8.8	
1.04.2	X	WASHER	AISI 304		1.10.12	1	FLANGE	Galvanized Steel	
1.04.3	X	FLANGE REMOVAL SCREW	Class 8.8		1.14	2	SCREW	Class 8.8	
1.04.4	1	SEAT O'RING	Viton	*	1.15	2	SPRING WASHER	Class 8.8	
1.10	2	BARREL	AISI 304	*	1.26	1	SPACER	Galvanized Steel	
1.10.1	2	BARREL FLANGE	Galvanized Steel		1.32	1	BUTTERFLY STOP	AISI 304	
1.10.2	4	SCREW	Class 8.8		1.32.1	2	SCREW	AISI 304	
1.10.3	4	WASHER	Class 8.8		1.32.2	1	STOP O'RING	Viton	

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VALVES TYPE 34100 CFEM



Tag	Qty	Label	Material	Spare
1.01	1	VALVE BODY	Cast Iron	
1.02	1	BUTTERFLY	Cast Iron/stainless steel	
1.03	1	SHAFT	Stainless steel	
1.21A	1	REAR BEARING AND CAPS	Plastic	
1.21	1	FRONT BEARING		
1.22	1	JOINT « W » RING		
1.26	1	SEALING	NBR/VITON/EPDM	
1.27	1	CAP		

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See electrical actuator instruction manual.

3. Actuator (if pneumatic, brand “AUTOMATIC VALVE REALISATION”)

The parts likely to wear out and which have to be replaced are the following

- Actuator diaphragm
- Coupling swivel
- Lever shaft guiding bushings

3.1. Actuator diaphragm replacement

Loosen the blocking nuts TAG 2.11 left-hand threaded, and TAG 2.12 right-hand threaded. Turn counter clockwise the coupling TAG 2.10 to separate the actuator stem TAG 2.07 from the swivel coupling TAG 2.13.

Loosen the cap TAG 2.35 and the nut of the stop screw TAG 2.34 until the screw is free of the actuator stem.

Unscrew the assembling screws TAG 2.38 to remove the upper diaphragm box TAG 2.01.

Remove the assembly diaphragm-plate-actuator stem. Immobilize the actuator stem in a vice with smooth clamping jaws, unscrew the nut TAG 2.08.

Remove the disk TAG 2.04, remove the diaphragm, replace it by a new one, reassemble disk TAG 2.04 and nut TAG 2.08 with news “3O” rings TAG 2.54.

Screw and block strongly the nut TAG 2.08 on the actuator stem. Remount the assembly diaphragm-plate-stem into the actuator.

Remount the upper diaphragm box, tighten the screws TAG 2.38.

Supply the actuator with 0,4 or 1,1 or 1 3 or 1,7 bars air pressure (see the valve technical data and the spring type), screw TAG 2.35 until it touches the actuator stem.

The stop screw has to be adjusted so that the actuator stem begins to move when the signal is higher than with 0,4 or 1,1 or 1 3 or 1,7 bars.

Couple the actuator stem with the swivel TAG 2.13 and screw the coupling TAG 2.10 till the lever TAG 2.20 has a 45° angle with horizontal.

To facilitate the stem-swivel coupling, supply the actuator with air and make vary the pressure to obtain the right stem position.

Adjust the lower stop screw TAG 2.36 in casing TAG 2.14 at full air signal to obtain a 85° to 90° lever motion.

Check the zero and travel adjustment of the positioner.

3.2. Coupling swivel TAG 2.13

The coupling swivel has to be replaced when a short actuator stem travel entails no butterfly lever rotation.

Unscrew the nuts TAG 2.32 of the lever axis TAG 2.29.

Push the axis TAG 2.29 to the back bearing on valve body side till it is out of the swivel bore.

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Unscrew the swivel without loosening the lower blocking nut TAG 2.12.

Remount a new swivel, tighten it against the nut TAG 2.12, couple the swivel into the lever axis, and tighten the lever axis nut TAG 2.32.

3.3. Shaft guiding bushings TAG 2.19 and 2.17 replacement

2.3.1 Bushing TAG 2.19 in rear plate 2.18

To replace the rear bushing it is necessary to remove the complete actuator from the valve body.

Unscrew the screws TAG 2.42. Remove the rear plate TAG 2.18 from the casing TAG 2.14.

Place a rod against the bushing. This rod diameter will be little smaller than bushing outside diameter. Drive out the bushing by hammering onto the rod. Place a new bushing.

Reassemble the actuator.

2.3.2. Bushing TAG 2.17 in front plate TAG 2.16

To replace the front bushing it is necessary to remove the positioner or the limit switches box from the front plate TAG 2.16

Unscrew the assembling screws TAG 2.42, remove the front plate TAG 2.16, drive out the bushing, drive in a new bushing as in point 2.3.1.

Remount the front plate onto the casing and accessories.

Supply actuator to check the actuator complete motion.

If necessary, adjust closing and opening positions.

To remove the bushing, proceed as:

Brace the bearing at the diameter on a lathe in 3 smooth clamping jaws, make run true, bore the bushing to remove it : be careful not to enlarge the bushing bore.

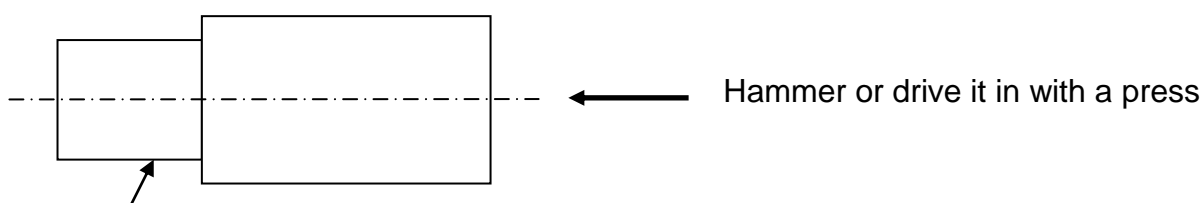
Replace by a new bushing. For this operation use a rod as drawn there-under.

Drive in the bushing by hammering straight on the tool, till it is level.

N.B.: Never hammer directly on the bushing ; it would bend.

If possible, it is preferable to carry on this operation with a small press.

Bushing driving tool (Material : brass)



Brushing place

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The actuator of these valves operates with a pneumatic signal. To define the actuator type mounted with the valve, look the valve TAG on the drawing “general parts list” delivered with the documentation with regards of the table in annex “air mini-maxi pressure supply”.

The butterfly has to be closed when the signal is 0,4 or 1,1 or 1,3 or 1,7 bars and full opened when the signal 2,4 or 4 bars for air fail closing valves and the reverse for air fail opening valves.

The actuator stem has to begin to move up to 0,4 or 1,1 or 1,3 or 1,7 bars.

Adjust return spring TAG 2.06 tension with the stop TAG 2.34 screwed in the upper diaphragm case TAG 2.01 so as the actuator stem begins to move when the air signal is higher than 0,4 or 1,1 or 1,3 or 1,7 bars.

When the actuator is equipped with an internal stop TAG 2.44, the high position of the actuator is not adjustable. Put the stop TAG 2.34 just in contact with the actuator stem.

3.4.1. Air fail closing valves

When the actuator is adjusted with mini air supply or with the no adjustable stop, screw or unscrew the coupling TAG 2.10 till the butterfly is closed. The butterfly must be just in contact with the butterfly stop welded or screwed into the body.

Block the nuts TAG 2.11 and 2.12.

Supply then actuator with different air supply between the mini and maxi of the spring range till the butterfly is opened horizontal. Adjust the lower stop TAG 2.36 in casing TAG 2.14., to bring it in contact with the swivel TAG 2.13.

3.4.2. Air fail opening valves

Supply the actuator with air at maxi air pressure of the spring range, screw or unscrew the coupling TAG 2.10 till the butterfly is closed at this signal value.

Tighten the locking nuts TAG 2.11 and TAG 2.12.

Adjust the lower stop screw TAG 2.36 in casing TAG 2.14 bottom to bring it in contact with the swivel coupling TAG 2.13.

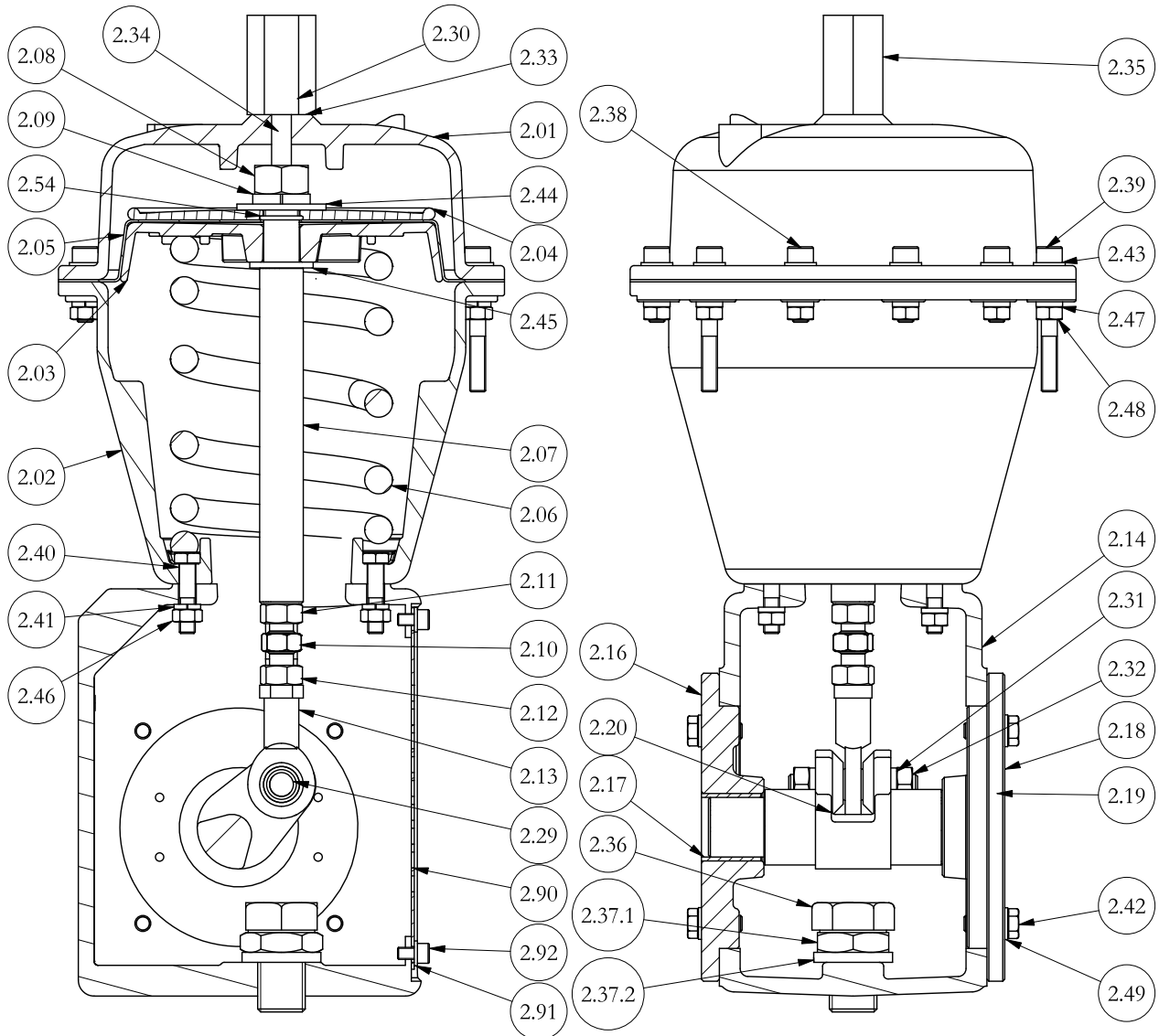
Adjust the top stop screw TAG 2.34 as the butterfly is opened quite horizontal when there is not any air supply onto the actuator.

N.B.

Sometimes it could be difficult to obtain a 100 % opening of the butterfly. It is not embarrassing because 95 % of maximum flow is obtained at 85 degrees opening, and maximum valve flow is capability is always higher than required maximum flow.

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Tag	Qty	Label	Material	Tag	Qty	Label	Material
2.01	1	Diaphragm Casing	Aluminium	2.20	1	Actuator Crank Shaft	Cast Iron
2.02	1	Spring Casing	Aluminium	2.29	1	Lever Shaft	Class 8.8
2.03	1	Diaphragm Plate	Aluminium	2.33	1	Cap O'ring	NBR
2.04	1	Plate	Aluminium	2.39	3	Long Screws	Class 8.8
2.05	1	Diaphragm	Aluminium	2.40	6	Spring Casing Screws	Class 8.8
2.06	1	Spring	Steel	2.41	6	Spring Casing Washers	Class 8.8
2.07	1	Actuator Rod	AISI 420	2.42	8	Side Plate Screws	Class 8.8
2.08	1	Nut	Class 8.8	2.43	12	Washers	Class 8.8
2.09	1	Spring Washer	Class 8.8	2.44	1	Large Washer	Class 8.8
2.10	1	Coupling Screw Right/Left	AISI 304	2.45	1	Washer	Class 8.8
2.11	1	Left-handed Nut	Class 8.8	2.46	6	Spring Casing Nuts	Class 8.8
2.12	1	Right-handed Nut	Class 8.8	2.47	12	Spring Washers	Class 8.8
2.13	1	Swivel	DIN 12240-4	2.48	12	Nuts	Class 8.8
2.14	1	Actuator Casing	Cast Iron	2.49	8	Side Plate Washers	Class 8.8
2.16	1	Front Side Plate	Cast Iron	2.54	2	Diaphragm O'ring	NBR
2.17	1	Front Bushing	PTFE	2.90	1	Protection	Aluminium
2.18	1	Rear Side Plate	Cast Iron	2.91	2	Washers	Class 8.8
2.19	1	Rear Bushing	PTFE	2.92	2	Screws	Class 8.8

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Once a week unscrew the drain at reducer lower part to drain the impurities sticking in the filter. Do it pressure reducer supplied with upstream air pressure.

When the air pressure reducer is out of work, replace it by a new one.
The output signal of the new air pressure reducer will be adjusted as following:

Actuator type	Output signal
6225MK30	2,4 bar
6225MK45	3,6 bar
6225MK75	4,5 bar
6280MK60	2,4 bar
6280MK100	3,9 bar
6280MK150	4,5 bar
6350MK140	2,4 bar
6350MK300	4,5 bar
6430MK300	2,4 bar
6430MK600	4,5 bar

4.2. Electro-pneumatic positioner (for VPR control valves)

When the electro-pneumatic positioner does not work, check the fault finding chart. If it is necessary to replace an important part involving a complete positioner adjustment after replacement, preferably replace the positioner by a new one. It will be cheaper.

When a new positioner is assembled on a valve it has to be adjusted with valve operation.

4.2.1. Positioner adjustment**4.2.1.1. Zero adjustment**

Supply the positioner with air at actuator operation pressure range. Supply the positioner with a 4 mA signal. The butterfly has to be closed (air fail closing valve) or opened (air fail opening valve). If it is not turn clockwise slowly the zero adjusting screw until the butterfly is closed (AFC) or opened (AFO).

Increase then slowly the input signal until the butterfly opens (AFC) or closes (AFO). If the signal for moving the butterfly is higher than 4,5 mA lightly unscrew the zero adjustment screw until obtain acceptable value (between 4 and 4,5 mA).

4.2.1.2. Butterfly rotation angle adjusting

When the zero of the positioner is adjusted, the span has to be adjusted.

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Supply positioner with a 20 mA signal.

The butterfly has to rotate 85 – 90 degrees between 4 and 20 mA.

If the rotation is lower than 85 degrees, turn the span screw until full rotation angle is obtained.

If full rotation angle is obtained above 19,5 mA turn the span screw to decrease butterfly rotation.

After having adjusted span, check the zero adjustment at 4 mA.

4.3. Three way solenoid valve (for shut-off and VPS valves)

When the three way solenoid valve is out of work replace it by a new one. Connect it to actuator with air flow in right direction.

Idem concerning the quick exhaust valve.

4.4. End of motion switch

When the end of motion switch is out of work, replace it by a new one.

Cable right the new end of motion switch, and adjust the actuation fingers to obtain the signal at right position.