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ASSEMBLY PROCEDURES - 80mm Bottom Valve Non-Pressure Compensated

Tooling required

Rubber mallet
Loctite Blue
EP2 grease
Bench vice with aluminium jaws
Ring spanner 13mm
Ring spanner 22mm
Ring spanner 27mm

Assembly Jigs required

80mm BOV actuator spanner/main piston spanner
Combined 80/100mm* BOV assembly jig
(* 80mm version is assembled using the four inner holes on spindle plate)

Testing Jigs required

Outlet flange testing jig TEST FL 150 (shell & seat tightness 50kPa)
Outlet flange testing jig TEST FL 124/150 (shell & seat tightness 50kPa)
Main flange testing jig TEST FL 150/190 (shell tightness 20kPa)
Main flange testing jig TEST FL 190 (shell tightness 20kPa)

ASSEMBLY PROCEDURE

Actuator Assembly

1 Fit BS114 o-ring (#9) into top of the actuator housing (#7). Fit BS114 o-ring (#9) into the M36 plug (#10) followed by (#11) M36 plug PTFE bush.
2 Screw the M36 plug into the top of the actuator housing
3 Secure the 80mm BOV spanner into the bench vice (with aluminium jaws). Fit the actuator housing into the 80mm BOV spanner, use ring spanner 27mm to tighten the M36 plug. Do not over-tighten.
4 Remove the actuator housing from the spanner
5 Fit BS224 Viton encapsulated o-ring (#8) onto the top groove of the piston (#13) and then the Viton o-ring (#14) to the bottom groove
6 Insert the piston rod (#12&13) into the actuator housing, tap the back of the piston with the rubber mallet to ensure it is all the way in
7 Fit the 3.0 x 50.0 Viton o-ring (#16) onto the M54 plug (#15)
8 Screw the M54 plug (#15) into the actuator housing (#7). Secure the actuator housing into the 80mm BOV spanner and tighten with the ring spanner 22mm
9 Fit the 1/8" BSP elbow air fitting to the M54 plug and tighten with ring spanner 13mm
10 Test complete acuator with air to ensure the o-rings on the piston are sealing properly. Submerge the actuator in water - stream of bubbles through the exhaust hole means the seals are not sealing properly
11 Fit BS224 Viton encapsulated o-ring (#8) on the top of the actuator housing
12 Apply a small amount of EP2 grease onto the thread of the complete actuator, insert into glandbox (#5), use the 80mm BOV spanner to tighten the actuator into the gland box, tap the spanner gently with the rubber mallet. Do not overtighten or force - this will cause the threads to seize.

Main piston assembly

13 Fit o-ring (#18) to main piston (#19) groove

Fitment and assembly of main body; main piston, spring and cage

14 Fit the main flange of the bottom valve over the four legs of the "80/100 BOV assembly jig", secure it to the jig using 2 x washer and 2 x nuts on two opposing jig legs.
15 Place the main piston (with the main piston rod facing upwards) onto the sealing area between the four bottom valve cage legs.
16 Place the Spring (#21) over the main piston rod (#17) of the main piston.
17 Place the spring retainer (#20) directly ontop of the spring, ensure the four cage leg holes are directly above the slots of the spring retainer.
18 Fit the top half of the "80/100 BOV assembly jig" to the main flange of the bottom valve with the remaining 2 x nuts.
19 Ensure the polypropylene spacer is fitted over the centre of the cage, while holding the parts in place, close the jig by turning the handle clockwise until the slots of the cage fit over the four valve legs.
20 Turn the cage in a clockwise direction to lock the cage into place.
21 Release the jig by turning the handle anti-clockwise and remove the jig off the bottom jig.
22 Remove the bottom valve from the jig.

TESTING PROCEDURES - 100mm Bottom Valve Non-Pressure Compensated

1 Test the opening/closing function of the main piston 4 - 5 cycles at 600kPa

2 Fit and secure the "TEST FL 124/150" jig to the "TEST FL 150" jig with washers and nuts, secure the outlet flange of the bottom valve to the "TEST FL 124/150" jig with washers and nuts, ensure nuts are fully - and securely fastened to the jig

3 Insure the main piston is in the close position
4 Test the Seat tightness at 50kPa for 5 minutes
5 Check for leaks
a - all welding and shear off groove
b - external sealing area - main piston/main body sealing area
c - actuator/gland box

6 Fit and secure the "TEST FL 150/190" jig to the "TEST FL 190" jig with washers and nuts, secure the main flange of the bottom valve to the "TEST FL 150/190" jig with washers and nuts, ensure nuts are - fully and securely fastened to the jig
7 Insure main piston is in the close position
8 Test the Seat tightness at 20kPa for 5 minutes
9 Check for leaks
a - interal sealing area - main piston/main body sealing area

As per EN12266-1:2012 and EN122662:2012 testing regulations Table A.5 and Annex B.1. acceptance criteria:

"A"	No visually detectable leaks for the duration of the test
"B.1.3."	Move obturator between open and closed positions

ASSEMBLY & TESTING PROCEDURES

80mm Bottom Valve Non-Pressure Compensated
















1 - 12 Actuator assembly

13 Main piston assembly





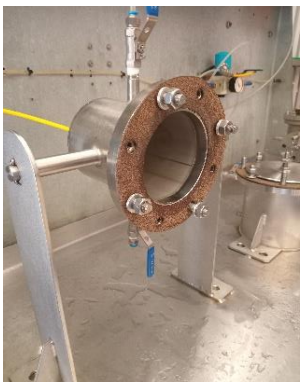






14 - 22 Main body, main piston, spring and cage assembly

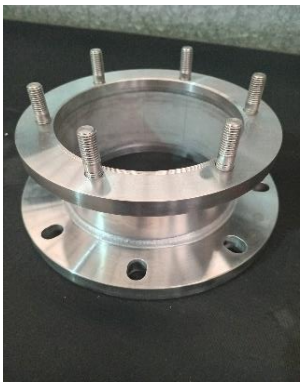

Operability testing opening/closing of main piston







Test 1: Seat tightness @ 50kPa






Test 2: Seat tightness @ 20kPa