Neles Easyflow™
JT series angle stem tank bottom ball valve 1” - 6” (DN25 - DN150)

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Installation, maintenance and operating instructions



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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1. GENERAL

1.1 SCOPE OF THE MANUAL

This instruction manual contains important information regarding the installation, operation and maintenance of Neles Easyflow™ JT Series Angle Stem Tank Bottom Ball Valves. Please read these instructions carefully and save them for future reference.

WARNING:

THE USE OF THE VALVE IS APPLICATION SPECIFIC. BE SURE THAT THE VALVE IS SUITABLE FOR ITS INTENDED SERVICE. IF YOU HAVE ANY QUESTIONS CONCERNING THE USE, APPLICATION OR COMPATIBILITY OF THE VALVE WITH THE INTENDED SERVICE, CONTACT VALMET FOR MORE INFORMATION.

1.2 VALVE MARKINGS

The valve has a label plate attached to the valve body. The label plate markings identify the size, materials of construction, pressure rating, month and year of construction, and a unique serial number for the valve

1.3 SAFETY PRECAUTIONS

WARNING:

DO NOT EXCEED THE VALVE PERFORMANCE LIMITATIONS!

EXCEEDING THE PRESSURE OR TEMPERATURE LIMITATIONS MARKED ON THE VALVE LABEL PLATE MAY CAUSE DAMAGE AND LEAD TO UNCONTROLLED PRESSURE RELEASE. DAMAGE OR PERSONAL INJURY MAY RESULT.

WARNING:

SEAT AND BODY RATINGS!

THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE SEAT AND BODY RATINGS. READ THE LABEL PLATE AND CHECK BOTH RATINGS. SOME SEAT MATERIALS HAVE PRESSURE RATINGS THAT ARE LESS THAN THE BODY RATING. ALL OF THE BODY AND SEAT RATINGS ARE DEPENDENT ON VALVE TYPE AND SEAT MATERIAL. DO NOT EXCEED THESE RATINGS!

WARNING:

BEWARE OF BALL MOVEMENT!

KEEP HANDS, OTHER PARTS OF THE BODY, TOOLS AND OTHER OBJECTS OUT OF THE OPEN FLOW PORT. LEAVE NO FOREIGN OBJECTS INSIDE THE PIPELINE. WHEN THE VALVE IS ACTUATED, THE BALL FUNCTIONS AS A CUTTING DEVICE. DISCONNECT ANY PNEUMATIC SUPPLY LINES, ANY ELECTRICAL POWER SOURCES AND MAKE SURE SPRINGS IN SPRING-RETURN ACTUATORS ARE IN THE FULL EXTENDED/ RELAXED STATE BEFORE PERFORMING ANY VALVE MAINTENANCE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY!

WARNING:

WHEN HANDLING THE VALVE OR VALVE/ACTUATOR ASSEMBLY, TAKE ITS WEIGHT INTO ACCOUNT!

NEVER LIFT THE VALVE OR VALVE/ACTUATOR ASSEMBLY BY THE ACTUATOR, POSITIONER, LIMIT SWITCH OR THEIR PIPING. PLACE LIFTING DEVICES SECURELY AROUND THE VALVE BODY. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN DAMAGE OR PERSONAL INJURY FROM FALLING PARTS (SEE FIGURE 1).

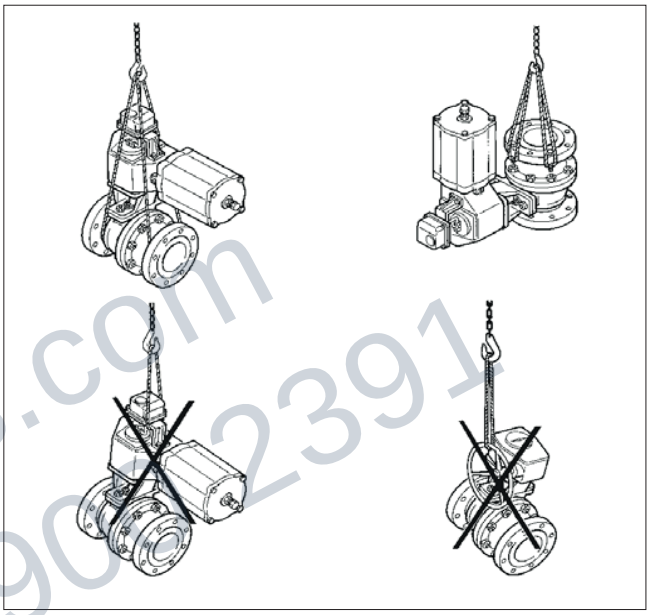


Figure 1. Lifting of the valve

2. TRANSPORTATION AND STORAGE

Check the valve and the accompanying devices for any damage that may have occurred during transport.

Store the valve carefully. Storage indoors in a cool, dry place.

Do not remove the flow port protectors until installing the valve.

Move the valve to its intended location just before installation.

If the valve(s) are to be stored for a long duration, follow the recommendations of IMO-S1.

3. INSTALLATION

3.1 GENERAL

The valve has different size flanges on each end. The larger flange mounts to the tank or vessel, and the smaller flange connects to the downstream pipe.

Remove the flow port protectors and check that the valve is clean inside. Clean valve if necessary.

Flush the pipeline carefully before installing the valve. Foreign objects, such as sand or pieces of welding electrodes, will damage the ball and seats.

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3.2 INSTALLING IN THE PIPELINE

WARNING:

THE VALVE SHOULD BE TIGHTENED BETWEEN FLANGES USING FASTENERS COMPATIBLE WITH THE APPLICATION, AND IN COMPLIANCE WITH APPLICABLE PIPING CODES AND STANDARDS. CENTER THE VALVE AND FLANGE GASKETS CAREFULLY BETWEEN FLANGES. DO NOT ATTEMPT TO CORRECT PIPELINE MISALIGNMENT BY MEANS OF FLANGE BOLTING!

The valve may be installed in any position and offers tight shut-off in either flow direction.

Refer to Section 4, **MAINTENANCE** for stem seal adjustment. If there is seepage past the stem seal upon installation, it means the valve may have been subject to wide temperature variations in shipment. Leak-tight performance will be restored by a simple stem seal adjustment described in the **MAINTENANCE** section.

3.3 VALVE INSULATION

Neles Easyflow™ ball valves do not require insulation. If desired, the valve may be insulated; however, the insulation must not continue above the upper level of the valve. See **Figure 2**.

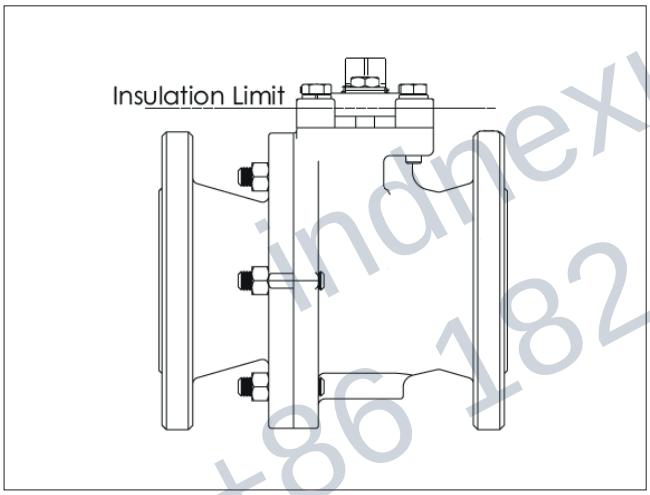


Figure 2. Insulation of the valve

3.4 ACTUATOR

WARNING:

WHEN INSTALLING THE ACTUATOR ON THE VALVE, MAKE SURE THAT THE VALVE ASSEMBLY FUNCTIONS PROPERLY. INFORMATION ON ACTUATOR INSTALLATION IS GIVEN IN SECTION 7 OR IN THE SEPARATE ACTUATOR INSTRUCTIONS.

The actuator should be installed in a manner that allows plenty of room for its removal.

The actuator must not touch the pipeline or tank because vibration may interfere with its operation.

3.5 COMMISSIONING

Ensure that there is no dirt or foreign objects left inside the valve or pipeline. Flush the pipeline carefully. Make sure that the valve is fully open when flushing.

Ensure that all nuts, fittings, and cables are properly fastened.

If so equipped, check that the actuator positioner and/ or switch(s) are correctly adjusted. Actuator adjustment is explained in Section 7.8. To adjust any accompanying device(s) refer to the separate control equipment instruction manuals.

4. MAINTENANCE

4.1 GENERAL

Although Neles Easyflow™ valves are designed to work under severe conditions, proper preventative maintenance can significantly help to prevent unplanned downtime and reduce the total cost of ownership. Valmet recommends inspecting valves at least every five (5) years. The inspection and maintenance frequency depends on the actual application and process condition. Routine maintenance consists of tightening the gland flange bolts (item 16 in **Exploded view**) periodically to compensate for stem seal wear.

Always loosen and tighten fasterners with the appropriate wrench to avoid damaging the valve, handle, linkage, actuator, fittings or flats.

Overhaul maintenance consists of replacing seats and seals. These parts may be obtained from Valmet or an Authorized Valmet Distributor.

WARNING:

FOR YOUR SAFETY, IT IS IMPORTANT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO REMOVAL OF THE VALVE FROM THE PIPELINE OR BEFORE ANY DISASSEMBLY:

1. BE SURE YOU KNOW WHAT FLUID IS IN THE PIPELINE. IF THERE IS ANY DOUBT, DOUBLE-CHECK WITH THE PROPER SUPERVISOR.
2. WEAR ANY PERSONAL PROTECTIVE EQUIPMENT (PROTECTIVE CLOTHING OR EQUIPMENT) REQUIRED WHEN WORKING WITH THE FLUID INVOLVED.
3. DEPRESSURIZE THE PIPELINE AND CYCLE THE VALVE AS FOLLOWS:
   - A. PLACE THE VALVE IN THE OPEN POSITION AND DRAIN THE PIPELINE.
   - B. CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE PIPELINE
   - C. AFTER REMOVAL AND BEFORE DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES.

4.2 ACTUATED VALVE

It is generally most convenient to detach the actuator and its auxiliary devices before removing the valve from the pipeline. If the valve package is small or if it is difficult to access, it may be more practical to remove the entire assembly.

NOTE: To ensure proper reassembly, observe the position of the actuator and positioner/limit switch with respect to the valve before detaching the actuator.

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WARNING:

ALWAYS DISCONNECT THE ACTUATOR FROM ITS POWER SOURCE, PNEUMATIC, HYDRAULIC OR ELECTRICAL, BEFORE ATTEMPTING TO REMOVE IT FROM THE VALVE!

WARNING:

DO NOT REMOVE A SPRING-RETURN ACTUATOR UNLESS A STOP-SCREW IS CARRYING THE SPRING FORCE!

1. Detach the air supply, electrical supply, hydraulic supply and control signal cables or pipes from their connectors.
2. Remove the actuator mounting bracket screws.
3. Lift the actuator straight up in line with the valve stem until the connection between actuator drive and valve stem is completely disengaged.
4. Place actuator in a safe location to avoid damage or personal injury.

4.3 VALVE DISASSEMBLY

NOTE: It is good practice to replace all seats and seals any time a valve is disassembled.

NOTE: Always use original OEM parts to make sure that the valve functions properly.

Numbers in ( ) refer to items shown in the exploded views

SIZES DN25 TO DN80 WITH SINGLE PIECE BODY CONSTRUCTION

1. Follow the steps in all the **WARNING** sections above before performing any work on the valve.
2. Open the valve.
3. Place the valve on a bench or other suitable working space.
4. Secure pipe side flange to working surface to prevent movement during disassembly.
5. Insert metal pins (not provided) into holes on the end piece (2). Place a metal bar (not provided) between the pins and turn insert counter-clockwise to remove.
6. Lift body gasket (17), body O-ring (18), and seat (4) from valve.
7. Close ball (3) by rotating stem (5) and lift ball (3) from body.
8. Remove lower seat (4) from valve body, being careful not to scratch the body sealing surface behind the seat.
9. Remove gland nuts (16), gland flange (14), disc spring (13), top stem seal retainer (10), stem seal (9), and bottom stem seal retainer (8). Use caution to prevent denting or scratching the sealing surface inside the packing bore.
10. Push stem (5) into valve body and carefully remove. Avoid denting or scratching the sealing surface on the stem.
11. Remove stem seal (7) from body and stem thrust washer (8) from stem.

SIZES DN100 AND DN150 WITH TWO-PIECE BODY CONSTRUCTION

12. Follow the steps in all the WARNING sections above before performing any work on the valve.
13. Open the valve.
14. Place the valve on a bench or other suitable working space.
15. Secure tank side flange to working surface to prevent movement during disassembly.
16. Remove body bolts (15).
17. Lift body adapter (2), body seal (6), body gasket (7), and seat (4) from valve.
18. Close ball (3) by rotating stem (5) and lift ball (3) from body.
19. Remove lower seat (4) from valve body, being careful not to scratch the body sealing surface behind the seat.
20. Remove gland flange bolts (16), gland flange (14), disc spring (13), top seal retainer (12), stem seal (11), and bottom stem seal retainer (10). Use caution to prevent denting or scratching the sealing surface inside the packing bore.
21. Push stem (5) into valve body and carefully remove. Avoid denting or scratching the sealing surface on the stem.
22. Remove bottom stem seal (9) from the body, and stem thrust washer (8) from the stem.

4.4 CHECKING PARTS

1. Clean all disassembled parts.
2. Check the stem (5) and ball (3) for damage. Pay particular attention to the sealing areas.
3. Check all sealing and gasket surfaces on the body and body adapter.
4. Replace any damaged parts.
5. Replace any fastener where the threads are damaged or have been heated, stretched or corroded.
6. Replace any parts that have cracks, gouges or pits that will affect sealing.

NOTE: When ordering spare parts, always include the following information:

a. Valve model number from name plate
b. If the valve is serialized – the serial number (stamped on the valve body or name plate)
c. From exploded view, the ballooned part number, part name and quantity required.

4.5 VALVE ASSEMBLY

Numbers in ( ) refer to items shown in the exploded views

It is advisable to replace seats and seals if complete disassembly and reassembly become necessary.

SIZES DN25 TO DN80 WITH SINGLE PIECE BODY CONSTRUCTION

1. Clean all valve components, if not previously done.
2. Inspect all components for damage before assembling the valve. Look for damage to the sealing areas on the ball, stem, and body
3. With a brush, clean threads on end piece (2) and matching threads in body (1) of foreign material such as paint, thread locker, grime and commodity. Before installing ball (3), seats (4), body gasket (17) and body O-ring (18), install the end piece (2) into the body by hand and ensure it smoothly turns all the way into the body. When fully installed, use a pencil or felt tip marker to mark the position of the end piece as shown. Count the number of turns to remove the end piece.

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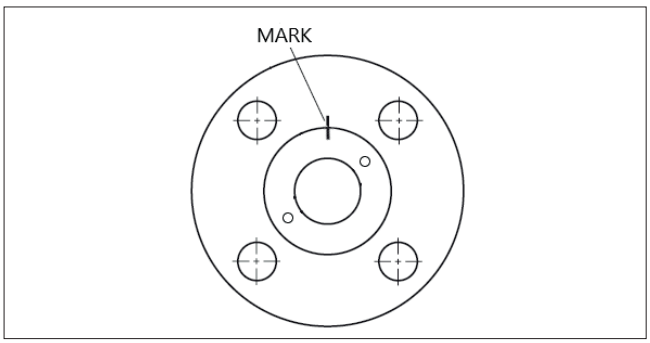


Figure 3. Marking the end piece position

4. Re-inspect all components for damage to the sealing areas, stem (5), body (1), and end piece (2). Replace any damaged parts.
5. Carefully clean and polish the ball (3) sealing surface: It should be free of all scratches and grooves.
6. If the ball is slightly damaged, it may be possible to smooth the sealing surface with crocus cloth or equivalent. If deep scratches are present, replace the ball.
7. With the body cavity facing up, insert one valve seat (4) into the body (1) to below the stem bore. Tilt the seat into place so the proper surface will be in contact with the ball.
8. Place stem thrust washer (6) over stem (5) and gently press into place against shoulder on stem.
9. Insert the stem (5) into the body (1), being careful not to scratch the stem sealing surface; and press it gently up into the stem bore until resistance is felt from the thrust washer (6).
10. Holding stem (5) in place from the bottom, insert stem seal (7), bottom stem seal retainer (8), stem seal (9), top stem seal retainer (10) with o-rings (11) and (12), disc springs (13) (see figure for proper orientation), gland flange (14), and gland flange nuts (16).
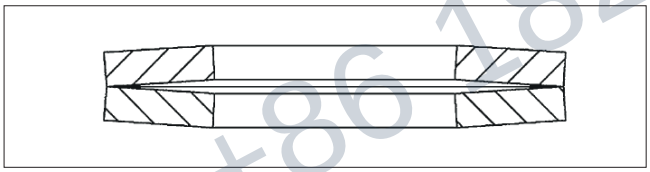


Figure 4. Proper Disc Spring Arrangement (uncompressed)

11. Tighten gland flange nuts (16) evenly until stem seal (9) is compressed and then tighten an additional ¼ turn. Visually inspect to ensure gland flange (14) is level with top of actuator mounting flange.
12. Rotate the stem (5) so the ball drive is in the closed position. Place the ball (3) into the body cavity by partially rotating and sliding the ball onto the stem (5) and against the seat (4). Make certain the stem is roughly in the middle of the ball slot.
13. Place the second seat (4) into the end piece (2) in the correct orientation so the proper surface contacts the ball.
14. Insert the body seal (6) and body gasket (7) into the body (1).
15. Carefully place the body gasket (17) and body O-ring (18) on top of the body (1). Carefully rotate the end piece (2) into the body (1). Tighten the end piece (2) the number of turns required for removal and align the marks.
16. Operate valve to verify smooth operation during opening and closing.

If the actuator was removed reinstall and set the actuator stops as described in the ACTUATOR MOUNTING INSTRUCTIONS Section.

SIZES DN100 AND DN150 WITH TWO-PIECE BODY CONSTRUCTION

1. Clean all valve components, if not previously done.
2. Inspect all components for damage before assembling the valve. Look for damage to the sealing areas on the ball, stem, and body
3. With a brush, clean body bolts (15) of foreign material such as paint, thread locker, grime and commodity. Inspect the threads for damage or defect with appropriate ring or plug gage. Repair any out-of-tolerance threads or replace in-kind.
4. Re-inspect all components for damage to the sealing areas, stem (5), body (1), and body adapter (2). Replace any damaged parts.
5. Carefully clean and polish the ball (3) sealing surface: It should be free of all scratches and grooves.
6. If the ball is slightly damaged, it may be possible to smooth the sealing surface with crocus cloth or equivalent. If deep scratches are present, replace the ball.
7. With the body cavity facing up, insert one valve seat (4) into the body (1) to below the stem bore. Tilt the seat into place so the proper surface will be in contact with the ball.
8. Place stem thrust washer (8) over stem (5) and gently press into place against shoulder on stem (5).
9. Insert the stem (5) into the body (1), being careful not to scratch the stem sealing surface; and press it gently up into the stem bore until resistance is felt from the thrust washer (8).
10. Holding stem (5) in place from the bottom, insert bottom stem seal (9), bottom stem seal retainer (10), stem seal (11), top stem seal retainer (12), disc springs (13) (see figure for proper orientation), gland flange (14), and gland flange bolts (15).
11. Tighten gland flange bolts (15) evenly until stem seal (11) is compressed and then tighten an additional ¼ turn. Visually inspect to ensure gland flange (14) is level with top of actuator mounting flange.
12. Rotate the stem (5) so the ball drive is in the closed position. Place the ball (3) into the body cavity by partially rotating and sliding the ball onto the stem (5) and against the seat (4). Make certain the stem is roughly in the middle of the ball slot.
13. Place the second seat (4) into the body adapter (2) in the correct orientation so the proper surface contacts the ball.
14. Insert the body seal (6) and body gasket (7) into the body (1).
15. Carefully place the body adapter (2) on top of the body (1) and loosely install the body bolts (15). Tighten the body bolts in an alternating sequence across the body, gradually increasing the tightening torque in multiple steps to 75 Nm.
16. Operate valve to verify smooth operation during opening and closing.
17. If the actuator was removed reinstall and set the actuator stops as described in the ACTUATOR MOUNTING INSTRUCTIONS Section.

Table 1		
Body Nut Tightening Torque, N.m		
Stud Size	Garbon steel Grade B7	Stainless steel Grade B8M
1/4 - 20 UNC	15	12
5/16 - 18 UNC	30	25
3/8 - 16 UNC	50	40
7/16 - 14 UNC	75	65
1/2 - 13 UNC	120	100
9/16 - 12 UNC	160	150
5/8 - 11 UNC	230	200
3/4 - 10 UNC	400	370
7/8 - 9 UNC	650	500

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4.6 TESTING THE VALVE

WARNING:

WHEN PRESSURE TESTING, EXERCISE CAUTION AND MAKE SURE ALL EQUIPMENT USED IS IN GOOD WORKING CONDITION AND APPROPRIATE FOR THE INTENDED PRESSURE.

If the valve is to be tested prior to returning to service, make sure the test pressures are in accordance with an applicable standard.

When testing the valve for external tightness, keep the ball in the half open position.

If testing for seat tightness, please contact Valmet for advice.

WARNING:

WHEN PERFORMING ANY TESTS, NEVER EXCEED THE MAXIMUM OPERATING PRESSURE OR MAXIMUM SHUT-OFF PRESSURE LISTED ON THE IDENTIFICATION PLATE

5. ACTUATOR

WARNING:

BEFORE INSTALLING THE VALVE AND ACTUATOR, BE SURE THAT THE INDICATOR POINTER ON TOP OF THE ACTUATOR IS CORRECTLY INDICATING THE VALVE POSITION. FAILURE TO ASSEMBLE THESE PRODUCTS TO INDICATE CORRECT VALVE POSITION COULD RESULT IN DAMAGE OR PERSONAL INJURY.

CAUTION: When installing or servicing a valve/ actuator assembly, the best practice is to remove the entire assembly from service.

CAUTION: An actuator should be remounted on the valve from which it was removed. The actuator must be checked and readjusted for proper open and close position each time it is remounted.

WARNING:

THE VALVE BODY AND MOUNTING INTERFACE HAS BEEN DESIGNED TO SUPPORT THE WEIGHT AND OPERATION OF NELES ACTUATORS AND RECOMMENDED ACCESSORIES. USE OF THIS INTERFACE TO SUPPORT ADDITIONAL EQUIPMENT SUCH AS PEOPLE, LADDERS, ETC. MAY RESULT IN THE FAILURE OF THE VALVE OR ACTUATOR AND MAY CAUSE PERSONAL INJURY.

WARNING:

BEWARE OF BALL MOVEMENT!

KEEP HANDS, OTHER PARTS OF THE BODY, TOOLS AND OTHER OBJECTS OUT OF THE OPEN FLOW PORT. LEAVE NO FOREIGN OBJECTS INSIDE THE VALVE OR PIPELINE. WHEN THE VALVE IS OPERATED, THE BALL FUNCTIONS AS A CUTTING DEVICE.

5.1 ACTUATOR MOUNTING INSTRUCTIONS

1. When a spring-return actuator is being mounted, the valve should be in the closed position for spring-to-close operation or in the open position for the spring-to-open operation. When an electric or double-acting pneumatic actuator is being mounted, the valve position should correspond to the indicated actuator position.
2. Assemble actuator onto the valve, ensuring full engagement between the stem and actuator drive, and the actuator fully contacts the mounting face on the valve.
3. Tighten actuator mounting screws to the torque listed in Table below.

CAUTION: Do not exceed the tightening torque. Applying excessive tightening torque can damage the aluminum threads in the actuator body.

Torque to Aluminum Body Actuators	
Bolt Size	**No Lubrication to Screws**
mm	**N.m**
M6	6.8
M8	14.9
M10	30
M12	52
M16	122
M20	230

4. Cycle actuator and verify proper ball position in both open and closed positions. Adjust the actuator travel stops as necessary.

6. SERVICE / SPARE PART

We recommend that valves be directed to Valmet service centers for maintenance. The service centers are equipped to provide rapid turn-around at a reasonable cost and offer new valve warranty with all reconditioned valves.

NOTE: When sending goods to the service center for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. Include the material safety datasheet(s) (MSDS) for all media flowing through the valve. Valves sent to the service center without MSDS datasheet(s) will not be accepted.

For further information on spare parts and service or assistance visit our web-site at **www.neles.com/products**.

NOTE: When ordering spare parts, always include the following information:

a. Valve model number from name plate
b. If the valve is serialized – the serial number (stamped on the valve body or name plate),
c. From exploded view, the ballooned part number, part name and quantity required.

7. WELDING WARNING

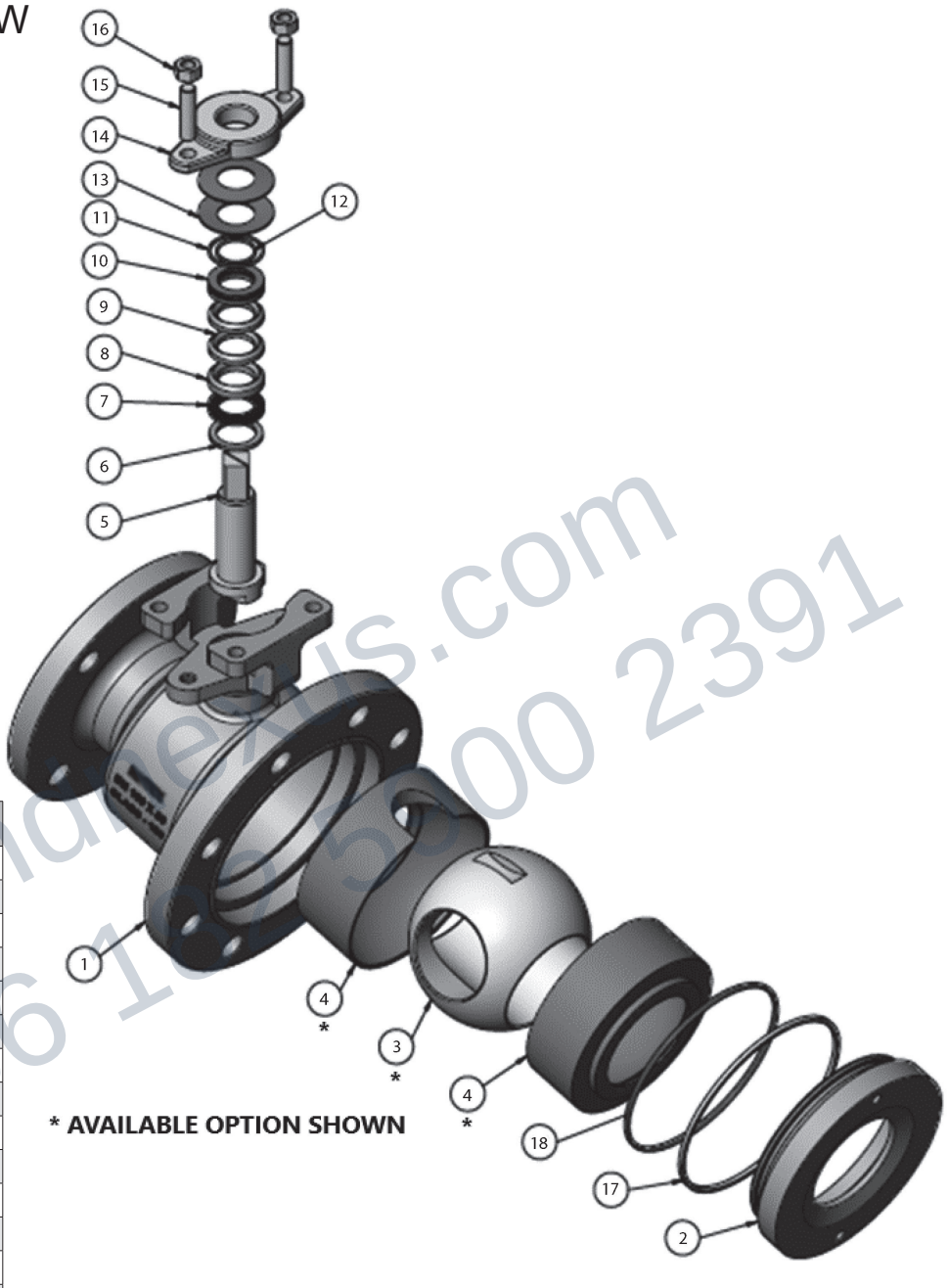
WARNING:

WELDING AND/OR GRINDING OF STAINLESS STEEL AND OTHER ALLOY STEELS CONTAINING CHROMIUM METAL MAY CAUSE THE RELEASE HEXAVALENT CHROMIUM. HEXAVALENT CHROMIUM, CHROMIUM(VI) OR CR(VI), IS KNOWN TO CAUSE CANCER. BE SURE TO USE ALL APPROPRIATE PPE WHEN WELDING METALS CONTAINING CHROMIUM. IF YOU HAVE ANY QUESTIONS CONSULT YOUR SUPERVISOR.

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8. EXPLODED VIEW

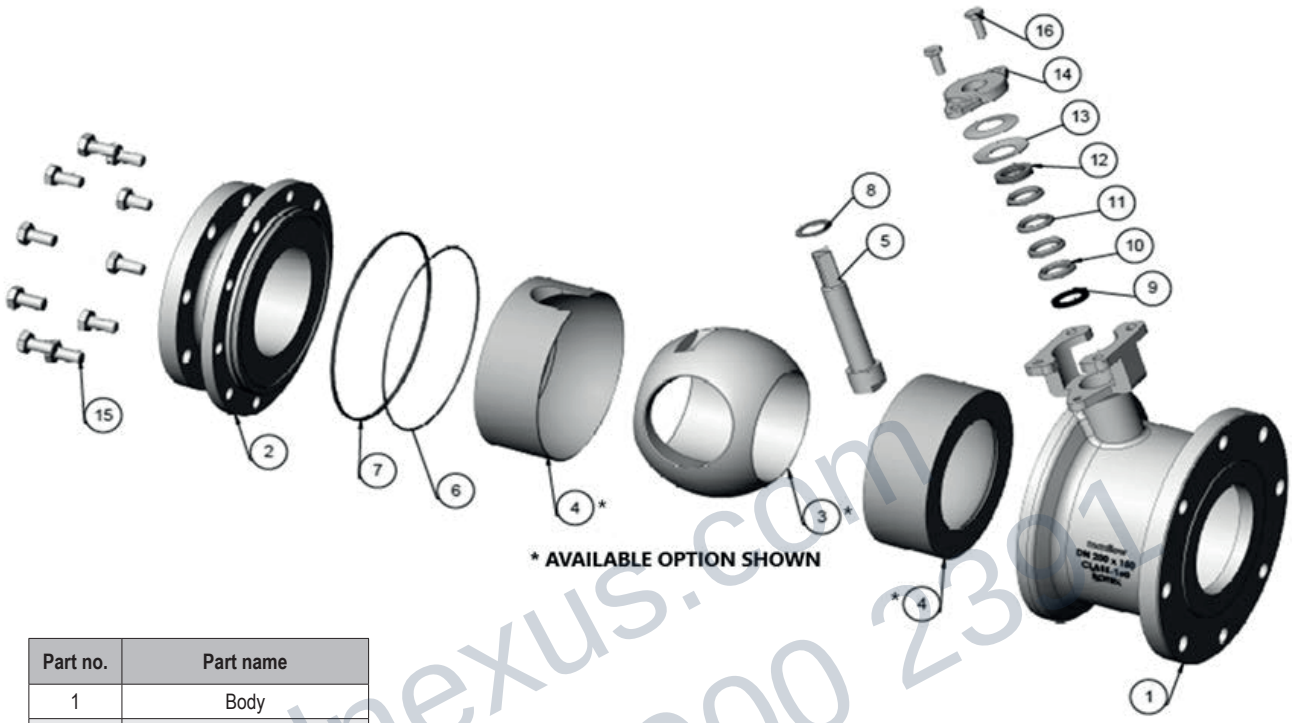
EXPLODED VIEW DN25 TO DN80



Part no.	Part name
1	Body
2	End piece
3	Ball
#4	Seat
5	Stem
#6	Stem thrust washer
#7	Stem seal
#8	Bottom stem seal retainer
#9	V-ring stem seal
#10	Top stem seal retainer
#11	Outer O-ring stem seal
#12	Inner O-ring stem seal
#13	Disc spring
14	Gland flange
15	Gland stud
16	Gland nut
#17	Body gasket
#18	Body O-ring
# These items form the spare part set	

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EXPLODED VIEW
DN100 AND DN150



Part no.	Part name
1	Body
2	Body adaptor
3	Ball
#4	Seat
5	Stem
#6	Body seal
#7	Body gasket
#8	Stem thrust washer
#8	Bottom stem seal
#8	Bottom stem seal retainer
#11	Stem seal
#12	Top stem seal retainer
#13	Disc spring
14	Gland flange
15	Body bolt
16	Gland flange bolt
# These items form the spare part set	

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9. TYPE CODE

NELES EASYFLOW™ JT SERIES ANGLE STEM TANK BOTTOM VALVE

1.		2.	3.	4.	5.	6.	7.	8.	9.
50		JT	15	22	36	36	ZG	53	Q

1. sign	Size, DN (NPS ref.)
25	25x50 (1x2)
40	40x50 (1 1/2x2)
50	50x80 (2x3))
80	80x100 (3x4)
100	100x150 (4x6)
150	150x200 (6x8)

2. sign	Series
JT	JT series

3. sign	Flange/rating
15	ASME Class 150

4. sign	Body material
22	Carbon Steel (WCB)
36	Stainless Steel (CF8M)

5. sign	Ball material
36	316 Stainless Steel

6. sign	Stem material
36	316 stainless steel
43	17-4PH stainless steel

7. sign	Seat and Seal Materials
ZG	TFM™ 1600 / Graphite

8. sign	O-Ring Material
53	Fluoroelastomer (FKM)

9. sign	Options
-	Blank, standard option
Q	Cavity filler seat
T	T-port ball

Note: Options can be combined (e.g. Q, T, QT)

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NOTE: As the use of the valve is application specific, a number of factors should be taken into account when selecting a valve for a given application. Therefore, some of the applications in which the valves are used are outside the scope of this document.

If you have any questions concerning the use, application or compatibility of the valve with the intended service, contact nearest Valmet sales office for more information.

General safety warnings

Lifting

1. Always use a lifting plan created by a qualified person to lift this equipment. Lifting guidance is provided in this IMO (Installation, Maintenance and Operation manual) to assist in lifting plan development. Think about the center of gravity (CG) of the equipment being lifted. Make sure the CG is always under the central lifting point.
2. Valves may be equipped with lifting threads on the body or on the flanges. These are intended to be used with the lifting plan.
3. Use only correct and approved lifting devices. Ensure that lifting devices and straps are securely attached to the equipment prior to lifting.
4. Check, that lifting devices are not damaged and in good condition with a valid check stamp prior to use.
5. Workers must be trained for lifting and handling valves.
6. Never lift an assembly by the instrumentation (solenoid, positioner, limit switch, etc.) or by the instrumentation piping. Straps and lifting devices should be fitted to prevent damage to instrumentation and instrumentation piping. Failure to follow the lifting guidance provided may result in damage and personal injury from falling objects.

Work activities on the valve

1. Wear your personal safety equipment. Personal safety equipment includes but is not limited to protective shoes, protective clothing, safety glasses, helmet, hearing protection and working gloves.
2. Always follow the local safety instructions in addition to the Valmet instructions. If Valmet instructions conflict with local safety instructions, stop work and contact Valmet for more information.
3. Before beginning service on the equipment, make sure that the actuator is disconnected from any kind of power source (pneumatic, hydraulic, and/or electric), and no stored energy is applied on the actuator (compressed spring, compressed air volumes, etc.). Do not attempt to remove a spring return actuator unless the stop screw is carrying the spring force.

4. Make sure that there is a LOTOTO (Lock Out / Tag Out / Try Out) procedure in place for the system in which the valve is installed and strictly follow it.
5. Always make sure that the pipeline is depressurized and in ambient temperature condition before maintenance work is started.
6. Keep hands and other body parts out of the flow port when the valve is being serviced and the actuator is connected to the valve. There is a high risk of serious injury to hands and/ or fingers due to malfunction if the valve suddenly starts to operate.
7. Beware of Trim (Disc, Ball or Plug) movement even when the valve is disassembled. Trim may move simply due to the weight of the part or change in position of the valve. Keep hands or other body parts away from locations where they may be injured by movement of the trim. Do not leave objects near or in the valve port which may fall in and need to be retrieved.

General disclaimers

Receiving, handling and unpacking.

1. Respect the safety warnings above!
2. Valves are critical components for pipelines to control high pressure fluids and must therefore be handled with care.
3. Store valves and equipment in a dry and protected area until the equipment is installed.
4. Do not exceed the maximum storage temperatures given in the IMO (installation, maintenance, and operating instructions).
5. Keep the original packaging on the valve as long as possible to avoid environmental contamination by dust, water, dirt, etc.
6. Remove the valve endcaps just before mounting into the pipeline.
7. FOR YOUR SAFETY IT IS IMPORTANT TO FOLLOW THESE PRECAUTIONS BEFORE REMOVAL OF THE VALVE FROM THE PIPELINE OR ANY DISASSEMBLY:
   - Be sure you know what flow medium is in the pipeline. If there is any doubt, confirm with the proper supervisor.
   - Wear any personal protective equipment (PPE) required for working with the flow medium involved in addition to any other PPE normally required.
   - Depressurize the pipeline, bring to ambient temperature, and drain the pipeline flow medium.
   - Cycle the valve to relieve any residual pressure in the body cavity.
   - After removal but before disassembly, cycle the valve again until no evidence of trapped pressure remains.
   - The valves with offset shaft (Butterfly, eccentric rotary plug) have greater trim area on one side of the shaft. This will cause the valve to open when pressurized from the preferred direction without a locking handle or an actuator installed.
   - WARNING: DO NOT PRESSURIZE THE ECCENTRIC VALVE WITHOUT A HANDLE OR AN ACTUATOR MOUNTED ON IT!
   - WARNING: DO NOT REMOVE A HANDLE OR AN ACTUATOR FROM AN ECCENTRIC VALVE WHILE PRESSURIZED!
   - Before installing the eccentric valve in or remove it from the pipeline, cycle the valve closed. Eccentric valves must be in the closed position to bring the trim within the face to face of the valve. Failure to follow these instructions will cause damage to the valve and may result in personal injury.

Operating

8. The identification plate (ID-plate, type plate, nameplate, or engraved markings) on the valve gives the information of max. process conditions to the valve.
9. (For soft seats) The practical and safe use of this product is determined by both the temperature and pressure ratings of the seat and body. Read the identification plate and check both ratings. This product is available with a variety of seat materials. Some seat materials have pressure ratings that are lower than the body ratings. All body and seat ratings are dependent on the valve type, size and material of the body and seat. Never exceed the marked rating.
10. Temperatures and pressures must never exceed values marked on the valve. Exceeding these values may cause uncontrolled release of pressure and process medium. Damage or personal injury may result.
11. The operating torque of the valve may rise over time due to wear, particles or other damage of the seat. Never exceed the actuator torque preset values (air supply, position). Application of excessive torque may cause damage to the valve.
12. Valmet valves typically are designed to be used in atmospheric conditions. Do not use valves under external pressurized conditions unless specifically designed and explicitly marked for this service.
13. Avoid Pressure shocks or water hammer. Systems with high pressure valves should be equipped with a bypass to reduce the differential pressure before opening the valve to avoid pressure shock.
14. Avoid thermal shock. High temperature, Low temperature and cryogenic valves should be operated in a way that limits the rate of increase or decrease in temperature. The valve should be thermally stabilized before being pressurized.
15. Materials of the valve are carefully selected for the process conditions. Changes to the process media can have a major impact on function and safety of the valve. Always confirm the materials are suitable for the service prior to installation.
16. As the use of the valve is application specific, several factors should be considered when selecting a valve for a given application. Therefore, some situations in which the valves are used are outside the scope of this manual.
17. It is the end user's responsibility to confirm compatibility of the valve materials with the intended service, however if you have questions concerning the use, application, or compatibility of the valve for the intended service, contact Valmet for more information.
18. Never use a valve with enriched or pure oxygen if the valve is not explicitly designed and cleaned for oxygen. Selected materials and design have a major impact on the safety to operate the valve with oxygen.
19. Valves intended for use in or with explosive atmospheres must be equipped with a grounding device and marked according ATEX (or equivalent international standards).
20. Manual handles are available for specific butterfly valve sizes and maximum line pressures. Do not operate a valve with a handle or wrench outside the size and pressure limits stated in the IMO. High line pressure may create a large enough force to pull the handle from the operator's hands. Damage or personal injury may result.

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Maintenance

21. Respect the safety warnings above!
22. Plan service and maintenance actions, that spare parts, lifting devices and service personnel is available.
23. Maintain the valve within the recommended minimum maintenance intervals or within the recommended maximum operating cycles.
24. Always make sure that the valve and the pipeline is depressurized before starting any kind of maintenance work at a valve.
25. Always check the position of the valve before starting maintenance work. Follow the Lock out /tag out (LOTO) rules at the site before starting any maintenance activity.
    - See IMO for the correct stem position.
    - Consider that the positioner may give the wrong signals.
26. Sealing materials (soft sealing parts) should be changed when the valve is in maintenance. Always use original equipment manufacturers (OEM) spare parts to ensure proper performance of the repaired valve.
27. All pressure containing parts must be inspected visually for damage or corrosion. Damaged parts must be replaced.
28. Valve pressure retaining parts and all internals must be inspected for corrosion or erosion which may result in reduced wall thickness on pressure retaining parts. Damaged pressure retaining parts must be replaced with original equipment manufacturer's (OEM) replacement parts or repaired to factory specifications by an authorized Valmet service partner in order to maintain the warranty.
29. Do not use sharp tools, grinding machines, or files to work on functional surfaces such as sealing, seating or bearing surfaces as this can damage these surfaces.
30. Check the condition of sealing surfaces on the seats, trim (disc, ball, plug, etc.), body and body cap. Replace parts if there are significant wear, scratches, or damage.
31. Check the wear of bearings and bearing contact surfaces on the shaft and replace damaged parts if necessary.
32. Do not weld on pressure retaining parts without an ASME and PED qualified procedure and personnel.
33. Pressure retaining parts of valves in high temperature applications must be carefully examined for the effects of material creep and fatigue.
34. Make sure that the valve is positioned in the correct flow direction into the pipeline.
35. If the valves are marked to be suitable for explosive atmospheres, the correct function of the discharging device must be tested before returning to service.
36. Always work in a clean environment. Avoid getting particles inside the valve due to machining, grinding, or welding nearby.
37. Never store a valve in maintenance without flow port protection.
38. When pressure testing valve seats, never exceed the maximum operating pressure of the system or the maximum shut- off pressure marked on the valve identification plate.
39. Actuator mounting and unmounting:
    - Before installing the actuator on to the valve, be sure the actuator is properly indicating the valve position. Failure to assemble these to indicate correct valve position may result in damage or personal injury.
    - When installing or removing a linkage kit, best practice is to remove the entire linkage assembly, including couplings which may fall off the valve during lifting or when position changes.
    - Mounting sets have been designed to support the weight of the Valmet actuator and recommended accessories either as is or with additional actuator support. Use of the linkage to support additional equipment or additional weight such as people, ladders, etc. may result in equipment damage or personal injury.
40. The valve should be installed between flanges using appropriate gaskets and fasteners that are compatible with the application, and in compliance with applicable piping codes and standards. Center the gaskets carefully when fitting the valve between the flanges. Do not attempt to correct pipeline misalignment by means of the flange bolting.
41. Repairs on valves for special service like Oxygen, Chlorine, and Peroxide, have special requirements.
    - Parts must be cleaned appropriate to the service and protected from contamination prior to assembly.
    - Assembly areas and tools must be clean and dry to prevent contamination of the parts during assembly.
    - Test equipment must be clean and dry to prevent contamination during testing. This includes the test equipment internals that may allow particles or other contamination into the test medium during the test.
    - Lubrication shall be used only if specifically required in the instructions. Where lubrication is required, the lubricant must be approved for the service by the end user.

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