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.
Addresses and phone numbers are printed on the back cover.
SAVE THESE INSTRUCTIONS!

Subject to change without notice.
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1 GENERAL

1.1 Scope of the manual

This manual provides the essential information on the use of soft seated W1 Series ball valves. For further information on actuators and other instruments, which are covered only briefly, please refer to separate manuals on their installation, use and maintenance.

NOTE:
As the use of the valve is application-specific, a number of factors should be taken into account when selecting the application. Therefore, some of the situations in which the valves are used are outside the scope of this manual. If you have any questions concerning the use or application of the valve, contact Metso’s Automation business for more information.

1.2 Valve description

The Neles W1 Series valve has been designed to meet the requirements of UOP 671 and, with a Neles B1C double acting actuator complete with accessories, provides the ideal for the control of organic chlorides.

W1 Series valves are full bore wafer style ball valves. Valves have two-piece bodies with bolted body joint, one-piece ball and stem with the ball supported by the seats.

All Inconel construction is used for its compatibility with the highly corrosive organic chloride. Teflon seats are provided to provide the bubble shut off required by the UOP specification.

Construction details are indicated in the type code in the identification plate. For more information about the type code, see Section 14.

1.3 Valve markings

The identification plate (Fig. 2) has been attached to the valve body.

Identification plates have the following markings:
1. Body material
2. Trim material
3. Seat material
4. Maximum operating temperature
5. Minimum operating temperature
6. Maximum shut-off pressure differential
7. Type designation
8. Valve manufacturing parts list no.
1.4 Technical specifications
Body rating: ASME Class 300
Dimensions: see Section 13

1.5 Valve certifications
A tightness certificate and an EN/DIN 50049 3.1 B certificate for the valve body and bonnet can be granted on request.

1.6 CE marking
The valve meets the requirements of the European Directive 97/23/EC relating to pressure equipment, and has been marked according to the Directive (where applicable).

1.7 Recycling and disposal
Most valve parts can be recycled if sorted according to material. Most parts have material marking. A material list is supplied with the valve. In addition, separate recycling and disposal instructions are available from the manufacturer. A valve can also be returned to the manufacturer for recycling and disposal against a fee.

1.8 Safety precautions

**CAUTION:**
Do not exceed the valve performance limitations!
Exceeding the limitations marked on the valve may cause damage and lead to uncontrolled pressure release. Damage or personal injury may result.

**CAUTION:**
Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!
Dismantling or removing a pressurized valve will result in uncontrolled pressure release. Always isolate the relevant part of the pipeline, release the pressure from the valve and remove the medium before dismantling the valve.
Be aware of the type of medium involved. Protect people and the environment from any harmful or poisonous substances.
Make sure that no medium can enter the pipeline during valve maintenance.
Failure to do this may result in damage or personal injury.

**CAUTION:**
Beware of the ball movement!
Keep hands, 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. Close and detach the actuator pressure supply pipeline for valve maintenance.
Failure to do this may result in damage or personal injury.

**CAUTION:**
Beware of noise emission!
The valve may produce noise in the pipeline. The noise level depends on the application. It can be measured or calculated using the Metso Nelprof computer program. Observe the relevant work environment regulations on noise emission.

**CAUTION:**
Beware of extreme temperatures!
The valve body may be very hot or very cold during use. Protect people against cold injuries or burns.

**CAUTION:**
When handling the valve or the valve package, bear in mind its weight!
Never lift the valve or valve package by the actuator, positioner, limit switch or their piping.
Place the lifting ropes securely around the valve body.
Damage or personal injury may result from falling parts.
2 RECEIPT OF VALVE
1. Check that the valve and the additional equipment have not been damaged during transportation.
2. Valves are packed with desiccant to aid in keeping the interior dry. Do not activate the valve before removing all desiccant.
3. Do not remove the protection plates fastened to the valves until the valves are to be mounted in the pipeline.

3 PUTTING INTO OPERATION
The shaft packing may leak after being stored a long time. Tighten the packing uniformly by both nuts before installing the valve. Do not overtighten.

4 CLEANING OF PIPELINE
Before mounting valves, clean and dry the interior surfaces of all pipes to remove all impurities, sand, water, welding electrodes, etc. Check for and remove, any material lodged in the lines or flange surfaces.

5 MOUNTING OF VALVES IN PIPELINE
1. The valves can be mounted in any convenient position, preferably with access to packing gland nuts, positioner if included, and actuator housing cover plate, for future inspections. Avoid mounting the valve in such a position that the shaft is downwards, because in case of possible leakage in the shaft packing, the flowing fluid would run over the actuator. If convenient, mounting with valve shaft horizontal is preferred.
2. Be sure that flange gaskets are suitable for the conditions.
3. Do not attempt to correct pipe misalignments by means of flange bolts. Be sure that no pipe-induced stress in the valve is not excessive. Ref. ASME B31.1 Para. 135.

6 MAINTENANCE OF VALVE
6.1 General

CAUTION:
Observe the safety precautions mentioned in Section 1.8 before servicing!

CAUTION:
When handling the valve or the valve package as a whole, bear in mind the weight of the valve or the entire package.

NOTE:
Always use original spare parts to make sure that the valve functions as intended.

NOTE:
If you choose to send the valve to the manufacturer for servicing, do not dismantle it. Instead, clean the valve carefully of all medium and inform the manufacturer of any dangerous medium involved.

6.2 Replacing of shaft packing
Do not attempt to add or change packing while valve is pressurized. Change or add packing if it has hardened or it will not seal by reasonable tightening. If you disassemble the valve, check the condition of the shaft packing.

The actuator does not need to be removed. After loosening the gland nuts and lifting up the bushing, the packing can be removed by means of a hooked wire or a special tool for this purpose. There are four packing rings. Avoid placing PTFE with cuts at the same position as the body split. Install graphite ribbon per the manufacturer's instructions.

6.3 Disassembling of valve
It may be necessary to disassemble the valve for maintenance, e.g. due to the following:

☐ If the valve leaks in the closed position and the leakage cannot be stopped by reversing the valve.
☐ The ball is stuck or moves stiffly.
☐ The interior of the body needs to be cleaned.

6.3.1 Instructions for disassembly of valve

OPTION 1
1. Remove the valve with actuator from the pipeline and place it on a level surface.
2. In the fully open and closed positions of the valve, some line fluid stays in the space between the body and the ball. Turn the valve shaft to make the fluid run out. It is most important to empty the valve if the medium is poisonous or corrosive. Empty the valve before storing or shipping.
3. Remove the actuator mounting screws. Pull the actu-
ator away from the shaft either with a removing tool or by hand.

4. Remove the brackets that mount the operator. Before opening the valve, obtain a clean wood or cardboard surface on which to place the disassembled parts. Do not put ball on cement or metal surface.

5. Loosen the nuts of the packing gland. Pull the gland away from the stud bolts to clear them.

6. Remove the bolts that fasten the body halves together. Lift the loosened body half carefully. Take care not to let it hit the ball as it is lifted clear.

**OPTION 2**

1. Remove the actuator from the valve, maintaining all air and electrical connections possible, and supporting the actuator in position so that it can not "swing" or rotate with the ball when the actuator mounting screws are removed.

2. Remove the actuator mounting screws. Remove the pipe flange bolting. Pull the valve away from the actuator either with a removing tool, or by hand.

3. In the fully-opened and closed position of the valve, some line fluid stays in the space between the body and the ball. Turn the valve shaft to make the fluid run out. It is most important to empty the valve if the medium is poisonous or corrosive. Empty the valve before storing or shipping.

4. Before opening the valve, obtain a clean wood or cardboard surface on which to place the disassembled parts. Do not put on a cement or metal surface.

### 6.4 Maintenance of disassembled valve

1. Clean all dirty parts carefully. If necessary, use suitable solvents.

2. Check whether the sealing surface of the ball or seats are damaged. If only the seats are damaged, the valve can be put in operating order by replacing the seats. Minor scratches or flashes in the ball surface or in the seats can be smoothed with a fine emery cloth.

3. Check the condition of the shaft packing.

4. Handle the valve parts with care to prevent bumping, especially the surface of the ball. If the sealing surfaces of the ball are damaged, the ball and seats may be replaced or may be repaired at Neles. If sent to the factory, reassemble the valve for shipment. Pack in a manner so that more damage cannot occur in shipment.

### 6.5 Assembly of valve

1. Lay out parts to be assembled. Check against order form and parts lists for item number, tag number, parts and accessories.

2. Trial fit pieces, visually check for defects, finish, etc. Remove all traces of dirt with solvent and wash with soap and water.

3. Assemble valve.

**Note:** No lubricant of any kind is permitted.

4. Use 2 mm PTFE cord 71.2 mm (2.8") long on body joint.

### 7 MOUNTING OF ACTUATOR ON BALL VALVE

1. Clean the valve shaft and the actuator shaft bore. File away possible sharp edges that might hamper fitting. Lubricate the shaft bore of the actuator with pure nickel Molykote® to make the mounting easier and to prevent possible rusting.

2. If an intermediate bushing is required between the actuator bore and the valve shaft, install the bushing in the actuator bore.

3. There are two keyways in the actuator bore. The valve shaft has a keyway parallel to the ball flow port. See assembly drawing. For a cylinder actuator, choose the actuator keyway that establishes that the piston is in its upper position (outer end of the cylinder) when the valve is closed. In a valve with a screw operator, choose the actuator keyway that establishes a closed valve position when the handwheel is turned fully clockwise to its stop.

4. Fasten the actuator brackets loosely to the valve. Do not tighten them. Lubricate the screw threads with pure nickel Molykote before insertion.

5. Check by eye that the actuator is in a straight position to the valve. Tighten all fastening screws and nuts carefully.

6. Check that the actuator stop screws of open and closed positions are correctly adjusted.

7. Check that the stop screw in the end of the cylinder actuator is tight. To leakproof the screw, use non-hardening sealer, e.g. "Loctite 76" on the entire threaded portion of the screw.

### 8 VALVE TESTING

1. With actuator mounted and the ball in the closed position, conduct a seat leakage test in both directions. ISO 5200 Rate A test with 6 bar air.

**Note:**

Body shell test acc. to ASME Class 300.
9 PACKAGING

1. Valves which have been tested and accepted to this specification are to be left in the full-open position and protected immediately as follows:
   Plastic covers with desiccant attached to the interior surface (See para. 4 and para. 7 below) are to be attached to the valve ends with sealing tape in a manner which will insure that no dirt or moisture can enter the valve. The valve ends are to be overwrapped with poly film and the film is to be securely taped to the valve body in a manner which will prevent the entry of dirt or moisture. Note: Use extreme care to insure that the poly film barriers are not damaged in storage or handling.

2. Valves and valve-actuator assemblies which are to be packaged for storage are to be handled and packaged in a manner which will insure that the poly film is not damaged, and will not be damaged provided the box/crate remains intact and undamaged.

3. Mark the exterior of each box/crate with the following notation:

   "CONTENTS DRY-PACKED. KEEP DRY - DO NOT WET"

4. Desiccant is to be purchased in 5 gram packages and delivered in a dry serviceable condition. The 5 gram packages are to be packed in air-tight containers with humidity indicator cards.

5. At time of use, the 5 gram packages needed for use within a 4-hour period are to be removed from the air-tight container, and the container is to be resealed immediately. At the time of removal, check the humidity card. Do not use desiccant if the humidity card indicates moisture present.

6. Use extreme care in handling loose desiccant packages to insure they do not come in contact with water or high humidity.

7. Tape (1) desiccant package to the interior surface of each flange protection disc in a manner which will not interfere with attaching the protection disc to the full-open valve and will not stop the free flow of air to the desiccant. i.e. tape must not cover more than 1/8" of the package ends.

10 TOOLS

In addition to standard tools, the following special tools are needed.

- For removal of the actuator:
  - extractor

11 ORDERING SPARE PARTS

When ordering spare parts, always include the following information:

- type code, sales order number, serial number (stamped on a valve body)
- number of the parts list, part number, name of the part and quantity required

This information can be found from the identification plate or documents.
### Parts List

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<th>Item</th>
<th>Qty</th>
<th>Description</th>
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<td>Body female</td>
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<td>1</td>
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The pressure rating of the valve body is ASME Class 300.

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The table above shows the dimensions in mm for each type of valve body, along with the weight in kg.

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<td>CONSTRUCTION AND APPLICATION</td>
<td>SIZE</td>
<td>BODY MATERIAL</td>
<td>BALL AND STEM MATERIAL</td>
<td>SEAT TYPE AND MATERIAL</td>
<td>GASKET AND PACKING MATERIAL</td>
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