

# Masoneilan

a Baker Hughes business

## 73000 Series

Sweep Angle Control Valves

Models XX-73471

Instruction Manual (Rev.A)



**THESE INSTRUCTIONS PROVIDE THE CUSTOMER/OPERATOR WITH IMPORTANT PROJECT-SPECIFIC REFERENCE INFORMATION IN ADDITION TO THE CUSTOMER/OPERATOR'S NORMAL OPERATION AND MAINTENANCE PROCEDURES. SINCE OPERATION AND MAINTENANCE PHILOSOPHIES VARY, BAKER HUGHES COMPANY (AND ITS SUBSIDIARIES AND AFFILIATES) DOES NOT ATTEMPT TO DICTATE SPECIFIC PROCEDURES, BUT TO PROVIDE BASIC LIMITATIONS AND REQUIREMENTS CREATED BY THE TYPE OF EQUIPMENT PROVIDED.**

**THESE INSTRUCTIONS ASSUME THAT OPERATORS ALREADY HAVE A GENERAL UNDERSTANDING OF THE REQUIREMENTS FOR SAFE OPERATION OF MECHANICAL AND ELECTRICAL EQUIPMENT IN POTENTIALLY HAZARDOUS ENVIRONMENTS. THEREFORE, THESE INSTRUCTIONS SHOULD BE INTERPRETED AND APPLIED IN CONJUNCTION WITH THE SAFETY RULES AND REGULATIONS APPLICABLE AT THE SITE AND THE PARTICULAR REQUIREMENTS FOR OPERATION OF OTHER EQUIPMENT AT THE SITE.**

**THESE INSTRUCTIONS DO NOT PURPORT TO COVER ALL DETAILS OR VARIATIONS IN EQUIPMENT NOR TO PROVIDE FOR EVERY POSSIBLE CONTINGENCY TO BE MET IN CONNECTION WITH INSTALLATION, OPERATION OR MAINTENANCE. SHOULD FURTHER INFORMATION BE DESIRED OR SHOULD PARTICULAR PROBLEMS ARISE WHICH ARE NOT COVERED SUFFICIENTLY FOR THE CUSTOMER/OPERATOR'S PURPOSES THE MATTER SHOULD BE REFERRED TO BAKER HUGHES.**

**THE RIGHTS, OBLIGATIONS AND LIABILITIES OF BAKER HUGHES AND THE CUSTOMER/OPERATOR ARE STRICTLY LIMITED TO THOSE EXPRESSLY PROVIDED IN THE CONTRACT RELATING TO THE SUPPLY OF THE EQUIPMENT. NO ADDITIONAL REPRESENTATIONS OR WARRANTIES BY BAKER HUGHES REGARDING THE EQUIPMENT OR ITS USE ARE GIVEN OR IMPLIED BY THE ISSUE OF THESE INSTRUCTIONS.**

**THESE INSTRUCTIONS ARE FURNISHED TO THE CUSTOMER/OPERATOR SOLELY TO ASSIST IN THE INSTALLATION, TESTING, OPERATION, AND/OR MAINTENANCE OF THE EQUIPMENT DESCRIBED. THIS DOCUMENT SHALL NOT BE REPRODUCED IN WHOLE OR IN PART WITHOUT THE WRITTEN APPROVAL OF BAKER HUGHES.**

# Table of Contents

|  |          |
|--|----------|
| <b>Safety Information</b> .....              | <b>2</b> |
| <b>About this Manual</b> .....               | <b>2</b> |
| <b>1. Installation</b> .....                 | <b>3</b> |
| <b>2. Maintenance</b> .....                  | <b>3</b> |
| 2.1. Disassembly.....                        | 3        |
| 2.2. Polishing the Valve Seat .....          | 3        |
| 2.3. Reassembly .....                        | 3        |
| 2.4. Packing Box .....                       | 4        |
| <b>3. Drawing and Parts References</b> ..... | <b>5</b> |

## Safety Information

### Important - Please read before installation

These instructions contain **DANGER**, **WARNING**, and **CAUTION** labels, where necessary, to alert you to safety related or other important information. Read the instructions carefully before installing and maintaining your control valve. **DANGER** and **WARNING** hazards are related to personal injury. **CAUTION** hazards involve equipment or property damage. Operation of damaged equipment can, under certain operational conditions, result in degraded process system performance that can lead to injury or death. Total compliance with all **DANGER**, **WARNING**, and **CAUTION** notices is required for safe operation.



This is the safety alert symbol. It alerts you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



When used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, could result in property damage.

**Note: Indicates important facts and conditions.**

## About this Manual

- The information in this manual is subject to change without prior notice.
- The information contained in this manual, in whole or part, shall not be transcribed or copied without Baker Hughes's written permission.
- Please report any errors or questions about the information in this manual to your local supplier.
- These instructions are written specifically for the **Masoneilan™ 73000 Series** control valve, and do not apply for other valves outside of this product line.

## Useful Life Period

The current estimated useful life period for the 73000 Series control valve is 25+ years. To maximize the useful life of the product, it is essential to conduct annual inspections, routine maintenance and ensure proper installation to avoid any unintended stresses on the product. The specific operating conditions will also impact the useful life of the product. Consult the factory for guidance on specific applications if required prior to installation.

## Warranty

Items sold by Baker Hughes are warranted to be free from defects in materials and workmanship for a period of one year from the date of shipment provided said items are used according to Baker Hughes recommended usages. Baker Hughes reserves the right to discontinue manufacture of any product or change product materials, design or specifications without notice.

### **Note: Prior to installation:**

- The valve must be installed, put into service and maintained by qualified and competent professionals who have undergone suitable training.
- All surrounding pipe lines must be thoroughly flushed to ensure all entrained debris has been removed from the system.
- Under certain operating conditions, the use of damaged equipment could cause a degradation of the performance of the system which may lead to personal injury or death.
- Changes to specifications, structure, and components used may not lead to the revision of this manual unless such changes affect the function and performance of the product.

# 1. Installation

Prior to installing the valve, clean the pipeline of all foreign matter such as dirt, spatters (welding chips), scale, oil or grease. Install the valve in the pipeline so that the fluid flows in the direction indicated by the flow arrows attached to the body, or the fluid flows from "IN" toward "OUT" marked at the connection point.

When securing the lower flange to the pipeline, press the seat ring against the body until it touches the flange surface of the pipeline. The lower flange and the pipeline pinch the seat ring and the pipeline's gasket which is prepared in advance, and tighten the pipeline bolts rigidly.

If the valve is installed in a horizontal position, be sure to take the support from the yoke or other part of the actuator.

In case of the extension type bonnet, do not apply insulation to the extended portion.

Provide the required air tubing for the signal pressure and air supply, and the electrical wiring to the positioner. Make sure no air leaks from the air pipeline.

## 2. Maintenance

When the control valve needs to be disassembled for inspection, cleaning or polishing the valve seat, follow the procedures described below.

It explains the following procedure as an example of the attached drawing (MNS-148001).

### 2.1. Disassembly

Shut off all air supplies, disconnect the tubing for the air supply and the positioner signal pressure, and the air tubing from the volume tank.

To disassemble the valve, it must be removed from the piping. Bring a chain block over the valve to remove it from the piping for disassembly and reinstall it after reassembly.

- 1) Run a strong rope through the actuator yoke and remove the valve retaining bolts from the piping while slightly pulling the valve upward.

If the valve is installed in a horizontal position, also run a rope around the body so that no lopsided force is exerted on the valve, when disconnecting the valve from the pipeline.

- 2) Seat ring (12) and gasket (11) can be taken apart, after the valve body is removed from the pipeline. At this time, pay attention not to be damaged with the seat ring.
- 3) Remove the positioner linkage from the split clamp (18) which connects the piston rod (19) of actuator and the plug (13) of the body side.
- 4) Loosen the nut (16) or bolt (26) of the split clamp (18) in order to remove the split clamp (18).

Take the record on the depth of insertion of the stem and the position of the split clamp so that they can be reassembled to the same dimension.

- 5) Remove the seat ring (12) first from the bottom of the body. The actuator can also be removed by loosening the drive nut (5) which connects the body (10) and the yoke (14). However, in case of the stud and nut type connection that connects the yoke to the body by the stud (23) and nut (24), loosen the nut (24) to remove the actuator from the body. Remove the packing flange (3) and the packing follower

(4), after loosening and removing the stud nut (2) which have tightened the packing flange. In the case of keeping connecting the valve body and the yoke, the packing flange can be passed through the space between the bottom end of the piston rod and the upper end of plug. If the space is narrow, it can be extended by pushing down the plug or raising the piston rod by hand-wheel operation.

- 6) Dismantle the plug (13) from the bottom of the body (10).

**Note: The disassembly is completed by dismantling the packings (6), packing spacer (8), lantern ring (9) and guide bushing (7).**

- 7) Inspect for any damages to each component parts.

**Note: As the assembly procedure for packing box may vary with the type of valve, please refer to the respective assembly drawings.**

### 2.2. Polishing the Valve Seat

When the valve seat needs polishing, install the seat ring (12) and plug (13) from the bottom of the body (10), attaching them tentatively to the body hand-tight, lightly press the plug (13) against the seat side from the bottom of the body (10), hold the plug with a wrench applied to the wrench holder, and polish the seating surface. Do not polish the seating surface too hard, otherwise it may be damaged. When polishing the seating surface, apply a fine-grain, quality abrasive to it. Thoroughly clean the seating surface prior to reinstallation.

### 2.3. Reassembly

Reassemble the valve according to the following procedure after having completed the necessary maintenance.

Please note that new packings and gaskets should be prepared for re-assembly.

- 1) Clean all the gasket surfaces of the body and the seat ring.
- 2) Set the guide bushing (7) toward the packing box bottom of the body (10).
- 3) Insert the plug (13) from the bottom of the body (10). Set the seat ring without the gasket. Stand up the body.
- 4) Install the packings (6), packing spacer (8), and lantern ring (9), leaded by the stem of plug (13) and yet the amount of packings and the order of packings are specified by each valve. When installing the packings which have the cut ends, they have to be staggered 120 degrees with respect to each other.
- 5) Regarding the installation of the packing follower (4) and of packing flange (3), follow the reverse of the disassembly procedure. Refer to the section 3-1 – point 5.
- 6) Mount the actuator on the body. At this time, follow the reverse of the disassembly procedure. Refer to the section 3-1 - point 5.
- 7) Move down the piston until it stops whether by applying air pressure in the upper part of the actuator piston or by hand-wheel operation.
- 8) Couple the piston rod (19) to the plug (13) with the split clamp (18). When coupling, confirm that the threads of piston rod and plug are completely engaged with each split clamp. It will be useful that you were marking before disassembling. Lightly tighten the nut (16) or bolt (26) of split clamp at the position being completely engaged.

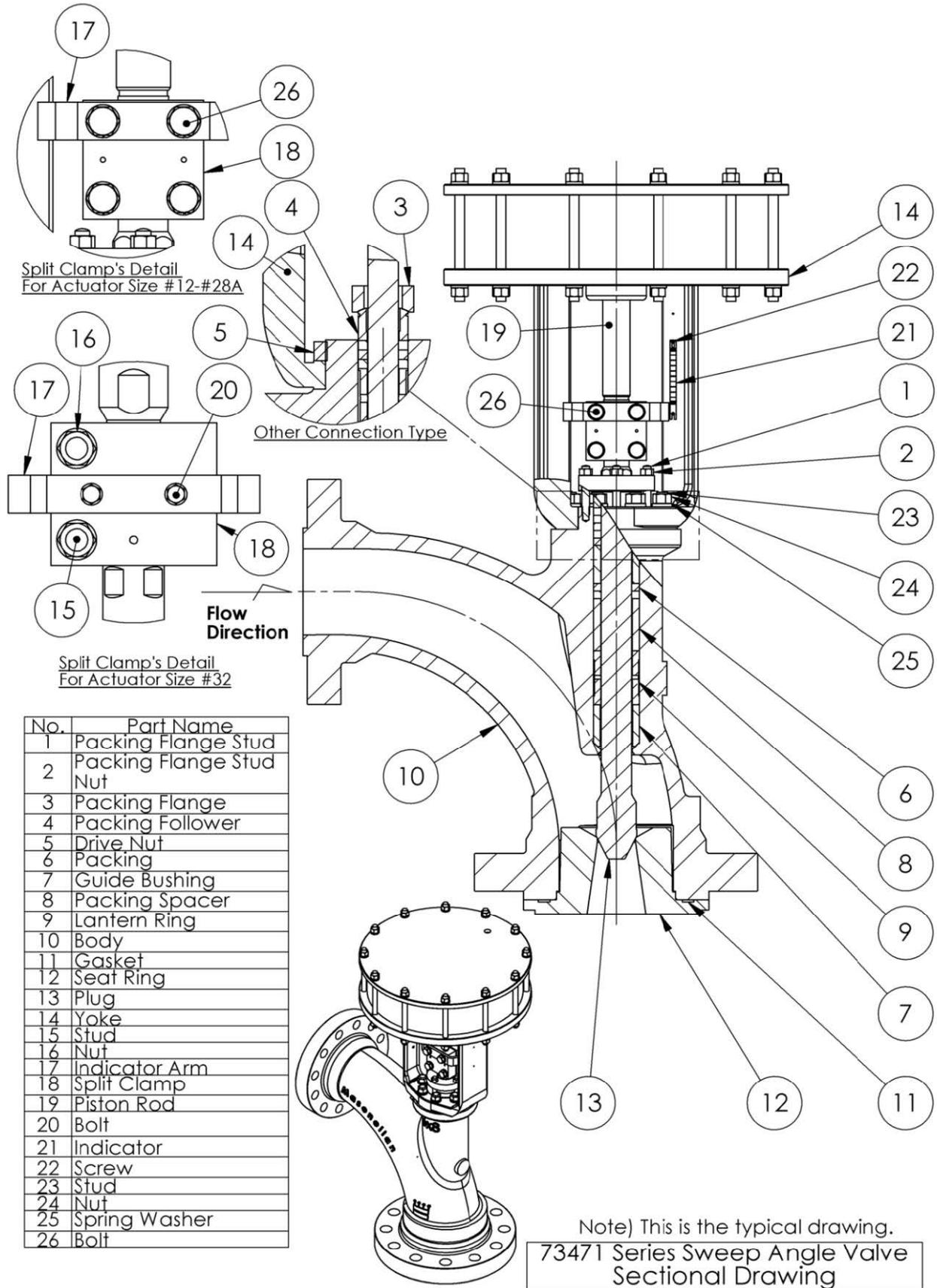
- 9) Raise the plug whether by applying air pressure to the piston bottom of the actuator or by hand-wheel operation. At that time, the plug is kept away from the seating surface. And then rotate the plug at a half turn counterclockwise in order to get completely the seating force. You can use the record made at the time of disassembly to provide the seating clearance.
- 10) Tighten the nut (16) or bolt (26) of the split clamp.
- 11) Connect the linkage of positioner to the split clamp (18).
- 12) Install the body to the pipeline per installation procedures. Do not forget to install gasket between the seat ring and the body at this time.
- 13) Reinstall all the air tubing and electric wiring. With the above, re-assembly is completed, but you must confirm the valve function by checking the valve actuation, valve opening, etc. prior to start-up.

## 2.4. Packing box

Maintenance of the packing box is a routine work.

The sealing performance of packing is kept by compression of packing. Compression is obtained by evenly tightening the packing flange stud nut (2) for the packing flange (3), but pay attention to that it may disturb smooth actuation of valve when tightened too much. New packings are necessary when leak does not stop even if complete compression made.

### 3. Drawing and Parts References

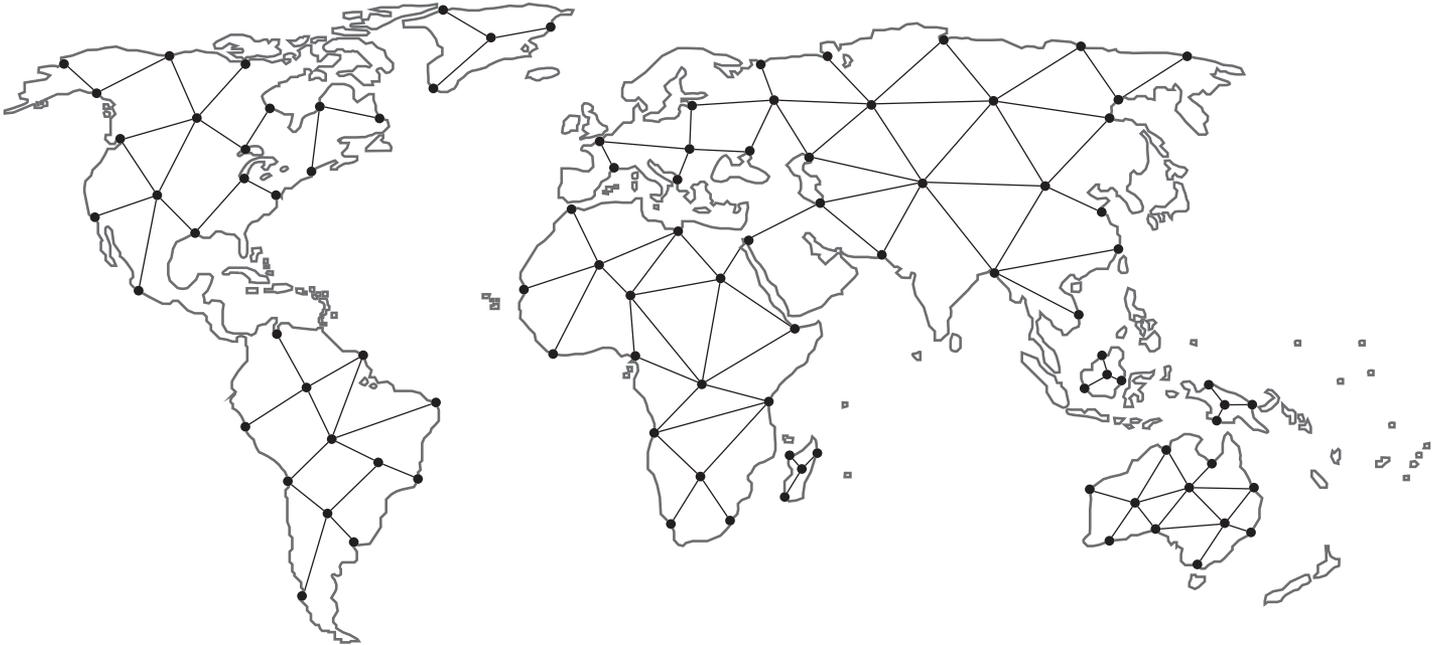


| No. | Part Name               |
|-----|-------------------------|
| 1   | Packing Flange Stud     |
| 2   | Packing Flange Stud Nut |
| 3   | Packing Flange          |
| 4   | Packing Follower        |
| 5   | Drive Nut               |
| 6   | Packing                 |
| 7   | Guide Bushing           |
| 8   | Packing Spacer          |
| 9   | Lantern Ring            |
| 10  | Body                    |
| 11  | Gasket                  |
| 12  | Seat Ring               |
| 13  | Plug                    |
| 14  | Yoke                    |
| 15  | Stud                    |
| 16  | Nut                     |
| 17  | Indicator Arm           |
| 18  | Split Clamp             |
| 19  | Piston Rod              |
| 20  | Bolt                    |
| 21  | Indicator               |
| 22  | Screw                   |
| 23  | Stud                    |
| 24  | Nut                     |
| 25  | Spring Washer           |
| 26  | Bolt                    |

Note) This is the typical drawing.  
**73471 Series Sweep Angle Valve**  
**Sectional Drawing**  
 DWG. No. : MNS-148001

# Find the nearest local Channel Partner in your area:

[valves.bakerhughes.com/contact-us](https://valves.bakerhughes.com/contact-us)



## Tech Field Support & Warranty:

Phone: +1-866-827-5378

[valvesupport@bakerhughes.com](mailto:valvesupport@bakerhughes.com)

[valves.bakerhughes.com](https://valves.bakerhughes.com)

Copyright 2020 Baker Hughes Company. All rights reserved. Baker Hughes provides this information on an "as is" basis for general information purposes. Baker Hughes does not make any representation as to the accuracy or completeness of the information and makes no warranties of any kind, specific, implied or oral, to the fullest extent permissible by law, including those of merchantability and fitness for a particular purpose or use. Baker Hughes hereby disclaims any and all liability for any direct, indirect, consequential or special damages, claims for lost profits, or third party claims arising from the use of the information, whether a claim is asserted in contract, tort, or otherwise. Baker Hughes reserves the right to make changes in specifications and features shown herein, or discontinue the product described at any time without notice or obligation. Contact your Baker Hughes representative for the most current information. The Baker Hughes logo and Masoneilan are trademarks of Baker Hughes Company. Other company names and product names used in this document are the registered trademarks or trademarks of their respective owners.

**Baker Hughes** 