Quality, Health, Safety and Environment Policy

Our objectives are simple – no accidents, no occupational illness or work related accidents, no negative environmental impact and optimizing and continuously improving customer satisfaction wherever we operate.

Mariestad, February 28 2008

Tony Mann

What does this mean?

In our daily work to develop, sell, deliver and maintain our products this means to act as soon as we recognize a risk for:

- Delivery of products with insufficient technical quality
- Giving incorrect information
- Not complying with laws an regulations concerning our operation
- Causing negative environmental impact
- Causing occupational illness or accidents
- Not be able to keep promises on delivery terms (product and information)

To act, here means to point out the risk and to make sure we take a balanced decision to prevent what is undesired.

(This policy includes all that is traditionally covered in separate policies for quality, health, safety and environment)
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1  Introduction

1.1  Intended use
This guide is for the use of Swivel Joints in hose lines and loading arms or other flexible piping connections. They are protecting hoses against torsion and are responsible for the degrees of freedom of loading arms.

All Mann-Tek products are designed for trouble free operation in a wide range of applications and operating conditions. Reliable and safe operation is dependent upon the correct installation and handling of the equipment. Regular and appropriate maintenance is essential to ensure both safety and reliability over the life of the equipment. Take care that the product is only used inside the limits of the following product specification.

Product specification

Product name:  Swivel Joint 8" double ball race
Connection: Flange 8" ANSI B16.5 R49 600 lbs
Diameter: 419 mm / 16 ½ inch
Length: 438 mm / 17 ¼ inch
Material: EN 10272-1.4404 / ASTM A479 – S31603 (316L)
Material flange: EN 10222-1.4401 / ASTM A182 – F316L
Working pressure: 80 bar / 1160 psi
Max test pressure: 135 bar / 1960 psi
Temperature range: -58ºC to +140ºC / -72ºF to +284ºF
Max axial load: 7.5 t (73.5 kN) / 7.4 long ton (16500 lbf)

Identification plate

Article no: D1301304406W
Size: DN200 – 8"
WP: 80 bar
Mtrl: SS
Seal: PTFE

1.4  Scope of delivery
1 pcs  Swivel Joint
Gaskets and bolts to mount the swivel joint into the application is not part of the delivery
2 Safety notes

Before you install any Mann-Tek equipment it is essential to check that the material and performance specifications are acceptable for your specific application. The pressure ratings and primary materials of the construction are clearly indicated on the identification plate of each Mann-Tek product. A drawing showing the materials of construction relating to each individual component is available upon request. The technical department at Mann Teknik AB is always happy to provide guidance on material suitability. Our data is taken from published chemical resistance information as well as our own application experiences. Specification checks should always be carried out before the product is supplied, but if unsure, ask! Especially if you are using the products outside the specified temperature range, ask for confirmation regarding your application.

Do not assume that a Mann-Tek product supplied for one specific application automatically will be suitable for other similar applications. Many variables affect the performance of materials. If you wish to use a Mann-Tek product for a different application than the one originally specified, check with Mann Teknik AB to ensure compatibility before installation. Please remember, the application details should include all media transferred through the coupling. Not just the primary transferred media. As with all equipment, a check should be made to ensure that the installation fulfills the requirements of applicable prevailing industry, local, national and international standards. Particular attention should be paid to pressure ratings, safety factors and the position of upstream and downstream affiliated closures.

3 Transport and storage

The product may only be transported or stored when absolutely clean. Suitable sealing must be used for the openings to ensure no damage occurs to the surfaces/sealed areas. The seals may only be removed by trained personnel. The storage location must guarantee adequate protection from corrosion or extreme temperatures.

3.1 Delivery Check

- Check for any transportation damage. If so report this immediately to the forwarder.
- Check that the products and quantities are in accordance with the delivery note.

3.2 Complaints / Return of goods

- If returning goods please contact Mann Teknik AB to receive a Complaint Report form.
- Complete the form with as much details as possible.
- Return the goods with the Complaint Report attached on the outside of the package!
3.3 Returning Used Product

- If returning *used* goods please contact Mann Teknik AB to receive a Complaint Report form.
- Complete the form with as much details as possible.
- Rip this page out and fill in the Certificate of Decontamination.
- Return the goods with the Complaint Report **and** the Certificate of Decontamination attached on the outside of the package!

3.4 Sample of Complaint Report

### REPAIR SERVICE

To comply with Health & Safety Regulations, all returned valves must be accompanied by a **Certificate of Cleanliness** and a Data Sheet for the last product carried (even the cleaner).

### CERTIFICATE OF DECONTAMINATION

We certify that the following couplings/valves have been cleaned prior to despatch and are free of any harmful substances:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Part no</th>
<th>Serial No</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

YES   NO

| Free of all liquid |  |  |
|--------------------| | |

| Air blown |  |  |
|-----------| | |

| Couplings/Valve dismantled |  |  |
|-----------------------------| | |

| Data sheet of last product attached |  |  |
|-------------------------------------| | |

The last known product the coupling/valve was in contact with:


Media Cast Number:


Company Name/Address (Stamp): Signature of Supervisor:


4 Installation

4.1 Initial operation

The correct installation of all Mann-Tek products is essential to ensure safe and satisfactory operation. Checks should be made to ensure that the fitting of Mann-Tek products does not interfere with the correct operation of affiliated equipment (i.e., isolation valve, excess flow valves, etc). Before securing the flange or thread connection to mating equipment (i.e., hose, loading arm, storage tank) ensure that no foreign objects, dirt, grit, etc. are present in the coupling.

All flange and thread connections should be made without imparting excessive strain to the equipment and pressure checked at least to 1.5 times the maximum application working pressure prior to use. All gaskets and sealing materials used to make the permanent connection should be of suitable material and able to operate at least up to the maximum parameters of the Mann-Tek equipment.

Each Mann-Tek product is designed to take reasonable axial loads associated with good handling practice but is not designed to accept continuous excessive load values associated with maladjustment or poor installation. Continuous excessive strain will equate to increased component wear and possibly premature failure if not corrected.

When Mann-Tek equipment is used with hoses, attention should be paid to hose length to ensure correct handling characteristics. The hose assembly should be designed such that the minimum hose length is supported by the coupling or the operator. Hoses should be of sufficient length to ensure operation well within the stipulated hose minimum bend radius up to the maximum operation envelope. Also ensure that the flow velocity do not exceed 5.25 m/s due to static electricity.

Once all the above elements are satisfactory, a function check should be carried out to prove the system. The hose unit or coupler should connect and disconnect without physical interference or difficulty. Please remember that the higher the static pressure, the greater the effort to make a connection. The Mann-Tek technical department is happy to advice on this subject at the specification stage.

4.2 Installation

When installing Mann-Tek equipment to new pipe work, tanks, etc. ensure the system is free from debris that may be transferred through the coupling. Where the hose or loading arm assembly is the primary static dissipation or earth route, the electrical continuity value of the assembly shall be checked to ensure regulatory compliance. Special attention should be paid to the balancing of loading arms. The weight of the coupling plus transfer media should be taken into account at the specification stage. It is usual for loading arm balance settings to account of weight variations due to differences in the full / empty cycle.
The loading arm should be set to balance in the condition present at the time or connection. For example, should the loading arm be empty at the time of connection then it should be balanced in the empty condition.

The Mann-Tek product can be installed directly in the product line and is ready for use after removing the transport protection. The installation is as follows:

a. Remove the packaging and the tread/flange protection
b. Check the coupling for damages before mounting.
c. To prevent damages during mounting a suitable wrench should be used for the intended nut flats on the coupling (threaded connection) or the bolts (flanged connection).
d. Ensure that the product line is empty and all valves are closed before you connect the coupling into the line.
e. Tightening torque\(^1\) for bolts:

<table>
<thead>
<tr>
<th>Metric</th>
<th>Inch</th>
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<tbody>
<tr>
<td>Size</td>
<td>Size</td>
</tr>
<tr>
<td>M8</td>
<td>8.8</td>
</tr>
<tr>
<td>M10</td>
<td>24</td>
</tr>
<tr>
<td>M12</td>
<td>50</td>
</tr>
<tr>
<td>M16</td>
<td>85</td>
</tr>
<tr>
<td>M20</td>
<td>1/2 -13 UNC</td>
</tr>
<tr>
<td>M22</td>
<td>5/8 -11 UNC</td>
</tr>
<tr>
<td>M24</td>
<td>3/4 -10 UNC</td>
</tr>
<tr>
<td></td>
<td>7/8 -9 UNC</td>
</tr>
<tr>
<td></td>
<td>1 -8 UNC</td>
</tr>
<tr>
<td></td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>410</td>
</tr>
<tr>
<td></td>
<td>550</td>
</tr>
<tr>
<td></td>
<td>700</td>
</tr>
</tbody>
</table>

f. Bolt tightening sequence.

The start-up may take place only when the Mann-Tek product has been mounted as instructed and the necessary function tests and leak tests have been conducted by the approved authorities.

\(^1\) The torque forces recommended bases on a thread friction coefficient \(\mu=0,14\) and a standard flat seal according to EN 1514-1
5 Operation

5.1 General notes
Operators are obliged to provide qualified and trained personnel familiar with the handling of supply pipes, safety couplings, any fluid being pumped as well as its danger potential. Such staff must also be familiar with the applicable safety regulations and the regulations of the employer’s liability association.

5.2 Daily visual inspection
All couplings should be briefly inspected at the start of each day’s operation. Check that the swivel joint rotates freely. On the first operation, check for leakage and smooth operation. Check for dirt, seal damage and any obvious physical damage (such as impacts, etc.).

5.3 Cleaning
Check the seal of the connections before every cleaning. In case the coupling is used for materials that harden, stick, etc., the coupling has to be cleaned of residues after every use. Before dismantling, the coupling always has to be cleaned with a suitable cleaning agent (regardless of the product carried).

5.5 Disassembly
When the swivel joint should go into service there is a danger that the fluid will spurt out. Special protective measures such as personal protection equipment must therefore be adopted. Always ensure system is cleaned in the proper manner. After cleaning, remove any residue from the cleaning agent.

How to disassemble:
a. Wear suitable personal safety equipment.
b. Make sure that the coupling is depressurized and empty.
c. Clean coupling before disassembly (use cleaning agent suitable for the pumped fluid).
d. Unscrew swivel joint with a fitting wrench.

5.6 Improper use
The equipment should never be used in the case of visible damage or where there is prior knowledge of damage that may lead to malfunction.

5.7 Maintenance / repair
Maintenance should be done regularly; at least once in the year. Maintenance and repair of the equipment may be carried out only by Mann Teknik AB or by companies/technicians authorized by Mann Teknik AB (see paragraph 6).
5.8 Miscellaneous
The operator is solely responsible for the installation, operation, and maintenance of the coupling. Mann Teknik AB accepts no responsibility for damages due to faulty installation, faulty handling, as well as negligent or incorrect maintenance.

6 Maintenance and repair

6.1 General information
Maintenance tasks may be performed only by trained personnel from an authorised professional workshop. All measures necessary for inspection, maintenance and repair must be carried out in accordance with the national regulations of the country where the system is installed.

6.2 Assembly using the example of 8\" size

Positioning housing halves
1. Swivel half outer
2. Main gasket
3. Dust protection
4. Swivel half inner
5. Ball race
6. Bolt (grub screw) and nut

The balls are greased with a low temperature synthetic grease.

1. Unscrew nut and bolt (pos 6)
2. Remove all balls from groove (148 pcs). Rotate the swivel halves (pos 1 and 4) to each other; this will make it easier that the balls will come out. Take care that all balls are removed.
3. Take both halves apart.
4. Check main gasket (pos 2) and dust protection (pos 3) and replace them if necessary. Be aware of the correct mounting direction of the main gasket.
5. Reassemble both swivel halves.
6. Fit all balls into the ball races. Use appropriate grease for your application. You can fill it through the fitting holes by using a grease cartridge. If you are unsure, ask at Mann Teknik AB for a recommendation.
7. Close the fitting holes with the bolt and counter it with the nut. Attention! Screw in the bolts that the balls are not blocked. Try to rotate the swivel halves to check it.

6.3 Pressure and tightness test
The following test parameters are in accordance with EN12266 and EN14432:

- Shell strength test: 135 bar stop time 1 min.
- Shell tightness test: 6 bar +/- 1 bar air stop time 1 min.
# 7 Applicable documents

AD Guideline; Forms B0, B1 and HP 0
Material standards EN 10272, EN10222, ASTM A182
Test standards EN12266, EN14432
Flange standard ANSI B16.5

**For use in Germany:**
Facts sheet T 002 (7/2005) BGI 572 of BG Chemie

**For use in other countries:**
Respective national requirements and guidelines