

CUSTOMER: _____	TB-NIIGATA	SPECIFICATION NO. No.6CC711-053
LOCATION: _____		INQUIRY/ORDER NO. _____

PRESSURE BALANCED TYPE
(NPB series)

INSTRUCTION MANUAL

 **TB Global Technologies Ltd.**

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REV.	DESCRIPTION	DATE	APPR'D	CHK'D	CHK'D	PREP'D	CHK'D
			ENGINEERING DEPARTMENT				

INSTRUCTION MANUAL OF PRESSURE BALANCED TYPE TB-NIIGATA • SWIVEL JOINTS
(NPB series)

This manual explains how to use the Pressure Balanced Type TB-NIIGATA • SWIVEL JOINT of NPB series.

You can expect long life of TB-NIIGATA • SWIVEL JOINT if you handle it correctly.

⚠ 1. Instruction for use

1-1. Working Pressure

The pressure of the fluid flowing in the swivel joint shall be less than value shown in “Table 1 Maximum Working Pressure”.

(That is Maximum Working Pressure of the main body joint. Consequently, The Maximum Working Pressure is different depending on connected pipes and flanges etc.)

When manufacturing specification is supplied, the pressure shall be less than the value shown in the specification.

Table 1 Maximum Working Pressure

Nominal size	3B	4B	5B
Maximum Working Pressure	25MPa	25MPa	21MPa

1-2. Styles

The movement of the piping is accordingly limited in swivel direction. The style shall be carefully selected taking the movement of the piping into consideration.

1-3. Welding

When a swivel joint is attached to the piping by welding, observe “4. Instructions for welding”.

1-4. Lubrication

- (1) Bearing, seal parts, and sealing surface must be always coated with lubrication grease to maintain smooth rotation of the swivel joint as well as to maintain perfect sealing function.
- (2) Use the Swivel joint as delivered because it is lubricated with grease before the shipment.

- (3) Supply grease at a suitable time by use condition.
- (4) Use manual grease gun when grease is supplied. Use the lithium base extreme pressure multi-purpose type grease.

We recommend : EPNOC AP (N)2 : JX Nippon Oil & Energy (Our standard grease)

1-5. Life of seal part

Usually, Swivel Joints generates small leak showing exudation or drip from relief fitting by progress of a wear seal part, or swelling or shrinkage by cause of the chemical influence by a fluid in the swivel joint.

The life of the packing finishes at this point and shall be replaced with a new one. The replacement shall be made according to "3. Disassembly & Reassembly of Swivel Joints".

1-6. Rotation

Swivel joint is not rotary joint. Therefore it is not suitable to use at place of the continuous rotation.

However, it may be rotated under not very severe conditions.

1-7. Moment Load

The moment load is one of the important matters that influence the life of the Swivel Joints.

Also even the influence by the vibration etc. at the time of the misalignment, operation of piping think by the distance from the bearing of the weight thing and joint that are attached to piping and please pay attention sufficient on the occasion of the design.

1-8. Storage and initial use

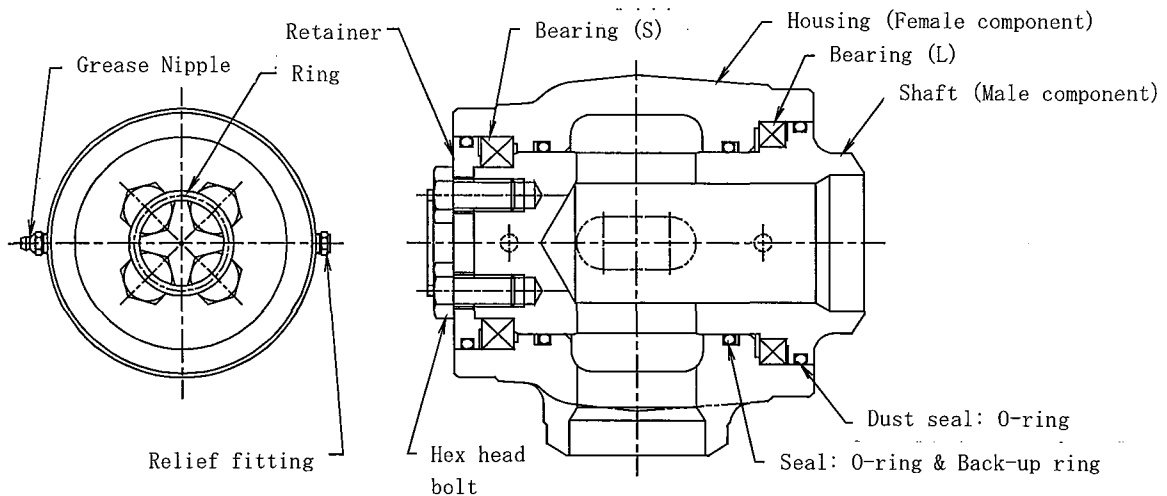
At initial usage of a stored swivel joint after delivery, the movement of joint may be tight. In this case, it must be rotated several times before use until it swings smoothly.

All above are the instructions for general use of Swivel Joint. Please contact your dealer for more information.

2. Structure of Swivel Joint

An example of structure of the Swivel Joint is shown below.

It features smooth rotation with shaft (male component), housing (female component) and double ball bearing and effective seal by o-ring and back-up ring seals against inner fluid.



3. Disassembly & Reassembly of Swivel Joints

3-1. Disassembly of Swivel Joints

(1) Removal of retainer

Cut off the spot welding part that is fixing ring with grinder, and then remove the ring. Next, remove hex head bolt with socket wrench. Then retainer is removed.

If the retainer is hard to remove, insert two rods, of which diameter is same as the bolt hole, into the hole and then draw it out slowly while tilting slightly.

(2) Removal of shaft

Fix the housing. By hitting an edge part of shaft slightly with hammer, shaft is extracted.


⚠ Caution

Do not damage to sealing surface of swivel joint or give other damage.

Pay attention sufficiently and pull out the shaft.

(3) Removal of ball bearing

Remove the retainer side bearing (small size) by hitting from shaft side with a rod slightly. Also remove the bearing (large size) from the shaft.


 Caution

Do not damage to Swivel Joint body and bearing.

Pay attention sufficiently and pull out ball bearing.

(4) Removal of seal

Remove o-ring and back-up ring with scriber etc.

 Caution


Do not damage to sealing surface of Swivel Joints.

If sealing surface of swivel joint is even slightly damaged, it may cause leakage.


3-2. Inspection of components

(1) Cleaning

Oil, dirt and attachment on the removed parts must be cleaned using suitable cleaner.

 Warning: Danger

Make sufficient ventilation when cleaner is used.

 Caution

Do not lose disassembled small parts.

Take care not to damage sealing surface of swivel joint and facing surface of bearing.

(2) Seal parts

Replace o-ring and back-up ring to new rings on every time of disassembled swivel joint.

(3) Bearing

If any corrosion, scratches, deformation and stiff adhering substance are found, replace to new bearing by all means. Defective bearing will prevent smooth rotation of Swivel Joints.

(4) Sealing surface

Inspect sealing surfaces for scratches, corrosion and stiff adhering substance. Small defect may be removed with thin sandpaper (#600 or more).

(5) retainer, etc.

Inspect retainer for scratches, corrosion and stiff adhering substance. Small defect can be removed with thin sandpaper (#600 or more). Also inspect threads of bolt, grease nipple, relief fitting. If damage is found, they should be replaced with new ones.

3-3. Reassembly

Reassembly is to be made in the opposite order of disassembly. Take enough care not to include foreign particles attached on bearing part as well as on sealing part.

(1) Lubrication with grease

In advance, apply grease uniformly thinly on the o-ring, back-up ring, sealing surface of shaft and bearing facing surface of swivel joint. Also apply grease to the bearing.

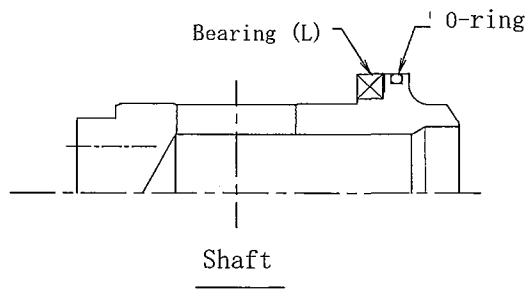
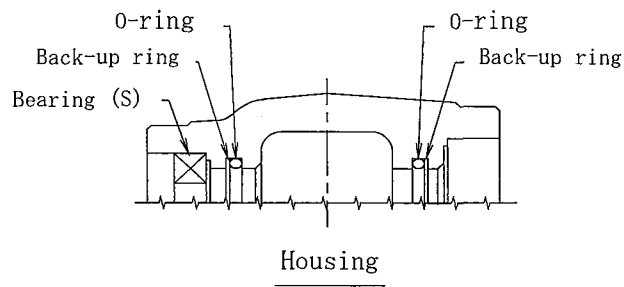
(2) Grease


Use the lithium base extreme pressure multi-purpose type grease.

We recommend : EPNOC AP(N)2 : JX Nippon Oil & Energy (Our Standard Grease)

(3) Mounting of sealing and bearing

Fit the seal and the dust seal without damage at the groove of the housing and the shaft. Mount the bearing (small size) to the housing, and the bearing (large size) to the shaft.



 Caution

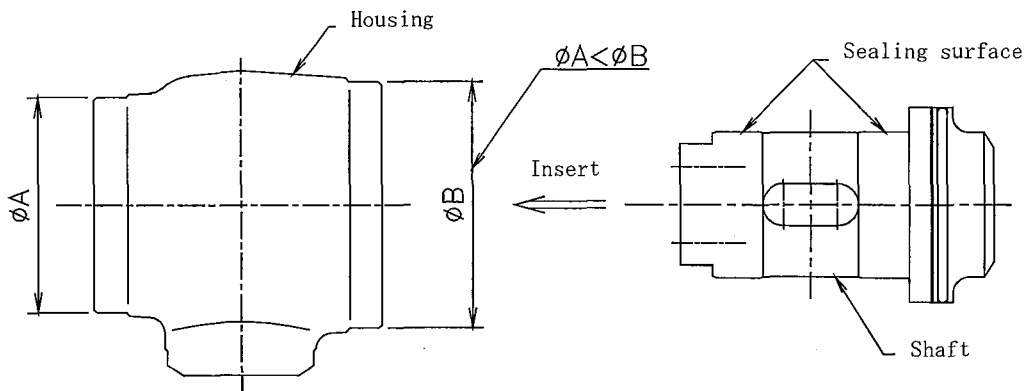
Avoid protrusion of the seal.

(4) Insertion of shaft

Fix the housing and insert the shaft from the direction where outside diameter is larger.

⚠ Caution

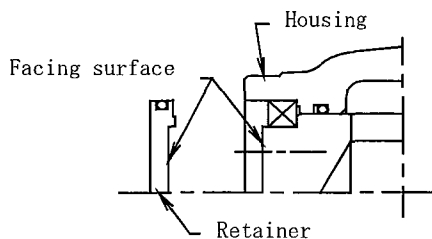
Pay attention sufficiently not to damage sealing surface of the shaft.
Avoid protrusion of the seal.



(5) Mounting retainer

Apply the herme seal to the housing and facing surface of the retainer. Then mount the retainer and screw the hex head bolt with socket wrench.

Attach the ring to the head on the hex head bolt. Fix it by spot welding.

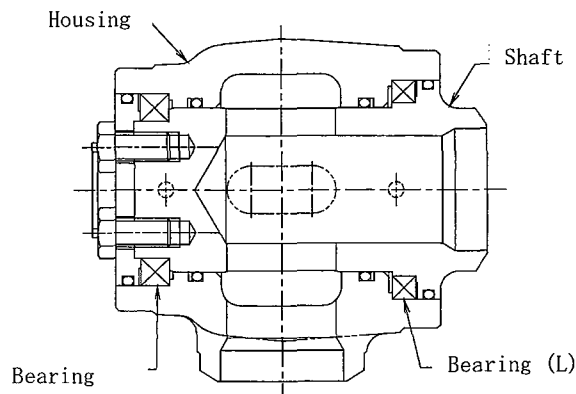


⚠ Caution

Prevent the body of swivel joint from high temperature when do spot welding.

(6) Supply of grease

- ①Screw grease nipple into the lubrication hole.
- ②Fill grease slowly into grease nipple by manual grease gun while rotating slowly.
- ③When grease comes out from relief fitting hole, stop supplying grease.
- ④Screw relief fitting into the discharge hole.



Amount of grease per one bearing (Small size) (As a guide)

Nominal size	3B	4B	5B
Amount of grease cm ³	3.0	4.5	10.0

Amount of grease per one bearing (Large size) (As a guide)

Nominal size	3B	4B	5B
Amount of grease cm ³	7.5	11.5	22.5

3-4. Confirm that swivel joint rotates smoothly after completion of reassembly.

4. Instructions for welding

Pay attention to the followings when swivel joint is welded to piping.

4.1 Disassemble swivel joint before welding.


This is necessary to protect seal parts from excess heat and to prevent degradation of grease.

Disassembly shall be made according to "3. Assembly and disassembly of Swivel Joints"

4.2 Pipe and swivel joint body are tentatively mounted and welded to confirm neither eccentricity nor tilt exists and then open up full welding

- (1) During welding bind up wet cloth etc. to prevent heating up of the swivel joint body over 80°C.
- (2) Take care not to damage machined surface of the swivel joint during welding work.
Cover the finished surface not to be attached with spatter of welding.

- (3) After completion of welding, clean the bearing part and sealing surface of the swivel joint with cleaner.

 Warning: Danger

Make sufficient ventilation when cleaner is used.

- 4.3 Assembly of swivel joint shall be made according to “3. Disassembly & Reassembly of Swivel Joints”.