Hydraulic Non-Leak Coupler

Model BGA/BGB  Model BNP/BNS
Model BGC/BGD  Model BJP/BJS
Model BGP/BGS  Model BFP/BFS
Model BBP/BBS

After mounting the coupler at the outgoing side (plug), it holds the pressure as it is disconnected from incoming side (socket). The actuator can be separated from the hydraulic source, holding the pressure by itself.

What is Non-leak coupler?

Non-leak coupler has non-leak mechanism and allows both couplers (plug and socket) to be disconnected during the state of supplying pressure. The actuator can be separated from the hydraulic source, holding the pressure by itself.

Non-leak auto coupler with pilot check valve has non-leak function and pilot check valve. Pilot check valve makes a smooth connection and disconnection of coupler with no reacting force, since it can hold the pressure at fixture side even when the supply of pressure is stopped with coupler connected condition.

Note: 1. Supplying/Not Supplying of hydraulic pressure to the socket side of the coupler during connected or disconnected condition depends on the model of Auto Coupler. Please refer to each page for detail if necessary.
Advantages

**Cut Off Unwanted Circuit Loops**

The installation of rotary joint for work clamp circuit or coupler at the side of machinery is unnecessary because it is operated with aligning mechanism.

**Energy Saving**

Hydraulic pressure is needed when exchanging workpiece. After disconnection, hydraulic source can be shut off.

<table>
<thead>
<tr>
<th>Model</th>
<th>Classification</th>
<th>Operating Pressure Range</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pilot Check Valve</strong></td>
<td>Non-Leak Coupler with Pilot Check Valve</td>
<td>1～7MPa</td>
<td>Screw Mounted (Space-Saving)</td>
</tr>
<tr>
<td>Model BGA/BGB</td>
<td></td>
<td></td>
<td>Bolt Mounted</td>
</tr>
<tr>
<td>Model BGC/BGD</td>
<td></td>
<td>1～7MPa / 7～25MPa</td>
<td>Low Pressing Force (with Pilot Check Valve) with Air Blow Function</td>
</tr>
<tr>
<td>Model BGP/BGS</td>
<td></td>
<td>1～7MPa</td>
<td></td>
</tr>
<tr>
<td>Model BBP/BBS</td>
<td></td>
<td>5～25MPa</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Supplying Pressure Cut Off</strong></th>
<th>Non-Leak Coupler</th>
<th>Operating Pressure Range</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model BNP/BNS</td>
<td></td>
<td>1～7MPa / 7～25MPa</td>
<td>Screw Mounted (Space-Saving)</td>
</tr>
<tr>
<td>Model BJP/BJS</td>
<td></td>
<td>1～7MPa / 7～30MPa</td>
<td>Bolt Mounted</td>
</tr>
<tr>
<td>Model BFP/BFS</td>
<td></td>
<td>1～7MPa</td>
<td>Supplying Pressure Cut Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>with Air Blow Function</td>
</tr>
</tbody>
</table>
Non-Leak Coupler with Pilot Check Valve

Model BGA/BGB

Introduction

Pilot check valve makes a smooth connection and disconnection of coupler with no reacting force. It can hold the pressure at fixture side even when the supply of pressure is stopped with coupler connected conditions.

Features

- Smooth connection and disconnection
- No reacting force
- Pressure at fixture side held even when pressure supply stopped

Action Description (at 7MPa)

**Lock Operation**

- **BGA (Fixture Side)**: 0MPa
- **BGB (Hydraulic Pressure Source Side)**: 0MPa

Connection Completion

1. First, supply hydraulic pressure to pilot port B and then open the check valve BGA side.
2. After that, supply the hydraulic pressure to fixture circuit P(R).
3. After the completion of lock (pressure raising) for fixture circuit, stop the hydraulic supply to pilot port B.
4. After cutting off the hydraulic pressure to fixture circuit P(R), disconnect.

**Release Operation**

- **BGA (Fixture Side)**: 7MPa
- **BGB (Hydraulic Pressure Source Side)**: 0MPa

Connection Completion

Supply the hydraulic pressure to the pilot port B, then open the check valve at the BGA side.

After the completion of release (oil pressure released) for fixture circuit, stop the hydraulic supply to pilot port B.

Notes:

1. Configuration of parts shown in this simplified drawing is different from that of an actual product.
2. Conditions of internal parts may be different from this drawing depending on connecting status, etc.
BGA is smaller in size than our previous product, which makes it possible to place it in smaller spaces.

※ These drawings above show the eight hydraulic pressure source side couplers each of our previous model BGP/BGS and the new model BGA/BGB on the rotary table.

Model No. Indication

**BG A 022 0 - 0M**

1 Style

A : Fixture Side (Outgoing Side)
B : Hydraulic Pressure Source Side (Incoming Side)

2 Design No.

0 : Revision Number

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fixture Side</th>
<th>Operating Pressure (MPa)</th>
<th>Withstanding Pressure (MPa)</th>
<th>Min. Passage Area (mm²)</th>
<th>Offset Tolerance (mm)</th>
<th>Angular Deviation (°)</th>
<th>Operating Temperature (°C)</th>
<th>Usable Fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGA0220-0M</td>
<td>BGA0220-0M</td>
<td>1.0~7.0</td>
<td>10.5</td>
<td>11.0</td>
<td>±1</td>
<td>0.3</td>
<td>0~70</td>
<td>General Hydraulic Oil Equivalent to ISO VG-32</td>
</tr>
</tbody>
</table>

Pilot Pressure: Holding Pressure P / 5.1 + 0.5 or more

Spring Force when Connecting (kN)

| Reaction Force when Pressurized (kN) at 7 MPa | 1.18 |
| at P MPa | 0.154 × P + 0.1 |

Note: ※1. P : holding force (MPa)

Circuit Symbol

※ Filter is placed at front and back of check valve at the BGA side.

Flow Rate - Pressure Loss Characteristic Graph

The fluid used on this data is general hydraulic oil equivalent to ISO VG-32 (30~40°C).

<table>
<thead>
<tr>
<th>Pressure Loss (MPa)</th>
<th>Flow Rate (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>5.0</td>
</tr>
<tr>
<td>1.0</td>
<td>7.9</td>
</tr>
<tr>
<td>2.0</td>
<td>12.2</td>
</tr>
<tr>
<td>3.0</td>
<td>15.4</td>
</tr>
</tbody>
</table>

Pressure Loss (MPa) vs Flow Rate (l/min) Graph
**External Dimensions**

**BGA Machining Dimension for Mounting Hole**
- φ 18 or less
- Fixture Circuit: A
  - φ 23.5
  - M25 × 1.5 Screw

**BGA0220-0M**
- 4-φ2.8 Depth 2.3
- (Hole for Mounting Jig)

**BGB Machining Dimension for Mounting Hole**
- Fixure Circuit: B(R)
  - φ 24.4H7 +0.001
  - M24 × 1.5 Screw

**BGB0220-0M**
- φ 24.4H7 +0.001
- φ 8 or less

**Note:**
1. In the case that there is stopper, please follow the ★connection dimension in the drawing.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Mass (kg)</th>
<th>Mounting Jig Model No.</th>
<th>Tightening Torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGA0220-0M</td>
<td>0.1</td>
<td>ZZB0010</td>
<td>25</td>
</tr>
<tr>
<td>BGB0220-0M</td>
<td>0.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Accessory: Mounting Jig

BGA/BGB is mounted with this mounting jig.

Tightening Torque: 25N•m

Model No. Indication

ZZB0010

Cautions (BGA/BGB)

1. Please do not connect or disconnect while pressurizing each port of the socket sides.

2. Take precautionary measures not to produce back pressure in ports B and P(R) of the socket sides when pressure supply is stopped.

   (less than 0.2MPa is available)

3. Perform air bleeding of the circuit sufficiently prior to operation. (Oil drip amount can increase.)

4. Ensure there are no foreign materials or chips while connecting.

   (Cover the surface to ensure that foreign materials and chips do not stick to the surface.)

5. Exceeding allowable offset will cause damage on to the internal parts.

6. Remove burrs from the cross section area of each hydraulic port after machining.

7. When pressing up to the connection-limit, use the force higher than the reaction force, but lower than 2.5kN.

8. Please install Accumulator (JSS), if there are any chances of pressure dropping during the holding condition.
Non-Leak Coupler with Pilot Check Valve
Model BGC/BGD

- **Feature**
  Pilot check valve makes a smooth connection and disconnection of coupler with no reacting force. It can hold the pressure at fixture side even when the supply of pressure is stopped with coupler connected conditions. BGD (hydraulic pressure source side) has air blow function.

- **Action Description (at 7MPa)**

  **Lock Operation**
  - **BGC (Fixture Side)**
  - **BGD (Hydraulic Pressure Source Side)**
  - **Air Blow**
  - **Connection Completion**
  - **A Port (Fixture Circuit)**
  - **B Port (Pilot Port)**
  - **P(R) (Fixture Circuit)**
  - **0 → 7MPa**
  - **7MPa**
  - **Lock Action Completed**
  - **Holding Hydraulic Pressure**

  Please make a connection as of each port at BGD side under the condition where the hydraulic pressure is stopped. Air blow cleans the connection area.

  1. First, supply hydraulic pressure to pilot port B and then open the check valve BGC side.
  2. After that, supply the hydraulic pressure to fixture circuit P(R).

  After the completion of lock (pressure raising) for fixture circuit, stop the hydraulic supply to pilot port B.

  After cutting off the hydraulic pressure to fixture circuit P(R), disconnect.

  **Release Operation**
  - **BGC (Fixture Side)**
  - **BGD (Hydraulic Pressure Source Side)**
  - **Air Blow**
  - **Connection Completion**
  - **A Port (Fixture Circuit)**
  - **B Port (Pilot Port)**
  - **P(R) (Fixture Circuit)**
  - **7 → 0MPa**
  - **0MPa**
  - **Release Action Completed**
  - **0MPa**

  Please make a connection as of each port at BGD side under the condition where the hydraulic pressure is stopped. Air blow cleans the connection area.

  Supply the hydraulic pressure to the pilot port B, then open the check valve at the BGC side.

  After the completion of release (oil pressure released) for fixture circuit, stop the hydraulic supply to pilot port B.

**Notes:**
1. Configuration of parts shown in this simplified drawing is different from that of an actual product.
2. Conditions of internal parts may be different from this drawing depending on connecting status etc.
3. The check valve has been installed in the BGD side to prevent excessive oil spouting at the operation failure (pressurize under the disconnected condition, etc).
Model No. Indication

**BG D 221 - 0 G2**

1. **Style**
   - C: Plug (Fixture Side)
   - D: Socket (Hydraulic Pressure Source Side)

2. **Pressure Code (Operating Pressure Range)**
   - 2: 1.0~7.0 MPa
   - 5: 7.0~25.0 MPa

3. **Design No.**
   - 1: Revision Number
   - G2: When D is chosen

4. **Piping Method**
   - Blank: When C is chosen

---

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fixture Side</th>
<th>BG221-0</th>
<th>BG251-0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pressure Source Side</td>
<td>BGD221-0G2</td>
<td>BGD251-0G2</td>
</tr>
<tr>
<td>Operating Pressure</td>
<td>MPa</td>
<td>1.0~7.0</td>
<td>7.0~25.0</td>
</tr>
<tr>
<td>Withstanding Pressure</td>
<td>MPa</td>
<td>10.5</td>
<td>37.5</td>
</tr>
<tr>
<td>Min. Passage Area</td>
<td>mm²</td>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td>Offset Tolerance</td>
<td>mm</td>
<td>±1</td>
<td></td>
</tr>
<tr>
<td>Angular Deviation</td>
<td>DEG.</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>°C</td>
<td>0~70</td>
<td></td>
</tr>
<tr>
<td>Usable Fluid</td>
<td></td>
<td>General Hydraulic Oil Equivalent to ISO- VG-32</td>
<td></td>
</tr>
<tr>
<td>Pilot Pressure</td>
<td>MPa</td>
<td>Holding Pressure P / 4.5 + 0.5 or more</td>
<td></td>
</tr>
<tr>
<td>Spring Force when Connecting</td>
<td>kN</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Reaction Force when Pressurized</td>
<td>kN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Pressure</td>
<td>at 25 MPa</td>
<td>—</td>
<td>3.17</td>
</tr>
<tr>
<td>at 7 MPa</td>
<td>0.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at P MPa</td>
<td>0.1227 x P + 0.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 1. P: Holding Pressure (MPa)

---

Flow Rate - Pressure Loss Characteristic Graph

The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30~40°C).

<table>
<thead>
<tr>
<th>Pressure Loss (MPa)</th>
<th>Flow Rate (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>4.9</td>
</tr>
<tr>
<td>1.0</td>
<td>7.9</td>
</tr>
<tr>
<td>2.0</td>
<td>12.1</td>
</tr>
<tr>
<td>3.0</td>
<td>16.0</td>
</tr>
</tbody>
</table>

---

Circuit Symbol

- Filter is placed at front and back of check valve at the BGC side. The check valve of the BGD side does not have non-leak function.

---

Air Sequence Valve
- BWD

Hydraulic Coupler
- BGA/BGD
- BGP/BGS
- BBD/BNB
- BBP/BJS
- BFP/BFS

Auto Coupler
- JVA/JVB
- JVC/JVD
- JVE/JVF
- JNA/INB
- JNC/JND
- JLP/JLS

Rotary Joint
- JR

Hydraulic Valve
- BK
- BEO
- BT
- BLS/BLG
- BLB
- JSS/J5
- JKA/JKB
- BMA/BMG
- AU/AU-M
- BU
- BP/JPB
- BX
- BFP/BSP
- BH
- BC

Hydraulic Non-Leak Coupler
- CV
- CK
- CP/CPB
- CPC/CQC
- CB
- CC
- AB/AB-V
- AC/AC-V
Non-Leak Coupler with Pilot Check Valve

**External Dimensions**

**BGC221-0**
- Plug
- *This drawing shows BGC221-0.*

**BGD221-0G2**
- Socket

**Model No.** | **Mass (kg)** | **Mounting Bolt Size** | **Tightening Torque (N-m)**
---|---|---|---
BGC221-0 | 0.25 | M5×0.8 | 6.3
BGC251-0 | 0.25 | M5×0.8 | 6.3
BGD221-0G2 | 0.45 | M5×0.8 | 6.3
BGD251-0G2 | 0.45 | M5×0.8 | 6.3

**Note:**
1. In the case that there is a stopper, please follow the ★connection dimension in the drawing.
System Circuit Diagram (Example)

### Double Action Circuit

- **Lock**
- **Release**
- **Pallet**
- **Table**

**BG C Plug Side**

**BG Socket Side**

1. **Solenoid Valve for Controlling Pilot**
2. **Solenoid Valve for Controlling Hydraulic Fixture Circuit**

### Single Action Circuit

- **Lock**
- **Pallet**
- **Table**

**BG C Plug Side**

**BG Socket Side**

1. **Solenoid Valve for Controlling Pilot**
2. **Solenoid Valve for Controlling Hydraulic Fixture Circuit**

### Controlling Double Action Circuit

Apply a three-position (center position, ABT connection) solenoid valve for controlling the hydraulic fixture circuit. When connecting or disconnecting BGC/BGD, use the center position to shut off the hydraulic pressure supply. This minimizes the reaction force at BGC/BGD part. In addition, when there is a possibility that back pressure is generated at the T port due to the system, install a check valve for preventing back flow having a cracking pressure of 0.04 MPa or less in the position. (Otherwise, oil leakage from the tip of the socket or malfunction of the pilot may occur.)

### Lock Operation Procedure

1. In the connected condition, supply hydraulic pressure to the pilot circuit and open the check valve of the plug. (Operate Valve 1)
2. Supply the lock side circuit of the hydraulic fixture actuator with hydraulic pressure. (Operate Valve 1)
3. After finishing pressurization, shut off the hydraulic pressure supply to the pilot circuit. (Operate Valve 1)
4. After shutting off the hydraulic pressure to all actuators, disconnect BGC/BGD. (Operate Valve Center Position)

### Release Operation Procedure

1. In the connected condition, supply hydraulic pressure to the pilot circuit and open the check valve of the plug. (Operate Valve 1)
2. Supply the release side circuit of the hydraulic fixture actuator with hydraulic pressure. (Operate Valve 2)

### Cautions (BGC/BGD)

1. Since pressurizing reaction force is produced during pressure supply to port P, it is necessary to add another lock mechanism.
2. When a connection limit stopper is added, keep the connection setting dimension ★ in the drawing.
3. The check valve provided in the socket side fixture circuit P(R) to open automatically at the connection is not of non-leakage type.
   
   The valve is for preventing significant oil blowing out due to incorrect operation (pressurizing in the disconnected condition).
   
   Do not pressurize under the disconnected condition for the normal control.
4. Please do not connect or disconnect while pressurizing each port of BGD.
5. Take precautionary measures not to produce back pressure in ports B and P(R) of BGD sides when pressure supply is stopped.
6. Do not connect in the condition that chips or coolant are left on the end surface.
7. Provide piping and oil passage holes with sufficient flushing. Note that no filter is provided to the socket side.
8. When pressing up to the connection limit, the force should be higher than the reaction force and lower than 6.0kN.
9. In the condition that pressurization of port P is finished, pilot pressure supply to port B does not result in check valve opening.
10. The main purpose of air blowing function is to clean the top face of the socket side.
**Feature**

Pilot check valve makes a smooth connection and disconnection of coupler with no reacting force. It can hold the pressure at fixture side even when the supply of pressure is stopped with coupler connected conditions.

**Action Description (at 7MPa)**

**Lock Operation**

1. First, supply hydraulic pressure to pilot port B and then open the check valve BGP side.
2. After that, supply the hydraulic pressure to fixture circuit P(R).
3. After the completion of release (oil pressure released) for fixture circuit, stop the hydraulic supply to pilot port B.

**Release Operation**

1. Please make a connection as of each port at BGS side under the condition where the hydraulic pressure is stopped.
2. Supply the hydraulic pressure to the pilot port B, then open the check valve at the BGP side.
3. After the completion of release (oil pressure released) for fixture circuit, stop the hydraulic supply to pilot port B.

**Notes:**

1. Configuration of parts shown in this simplified drawing is different from that of an actual product.
2. Conditions of internal parts may be different from this drawing depending on connecting status etc.
3. Since the socket side is not provided with a check valve, pressurization (due to incorrect operation etc.) of the fixture circuit in the separate condition results in oil blowout.
Model No. Indication

**BG P 22 1 - 0**

**1** Style

- P : Plug (Fixture Side)
- S : Socket (Hydraulic Pressure Source Side)

**2** Design No.

- 1 : Revision Number

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fixture Side</th>
<th>Pressure Source Side</th>
<th>Operating Pressure</th>
<th>Withstanding Pressure</th>
<th>Min. Passage Area</th>
<th>Offset Tolerance</th>
<th>Angular Deviation (Offset Tolerance)</th>
<th>Operating Temperature (°C)</th>
<th>Usable Fluid</th>
<th>Pilot Pressure when Connecting</th>
<th>Holding Pressure P / 3.8 + 0.4 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGP221-0</td>
<td>BGS221-0</td>
<td></td>
<td>1.0 ~ 7.0</td>
<td>10.5</td>
<td>11.0</td>
<td>±1</td>
<td>0.3</td>
<td>0 ~ 70</td>
<td>General Hydraulic Oil Equivalent to ISO- VG-32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Spring Force when Connecting: kN
- Reaction Force when Pressurized: kN

<table>
<thead>
<tr>
<th>Pressure Loss (MPa)</th>
<th>Flow Rate (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>4.2</td>
</tr>
<tr>
<td>1.0</td>
<td>7.8</td>
</tr>
<tr>
<td>2.0</td>
<td>12.1</td>
</tr>
<tr>
<td>3.0</td>
<td>16.4</td>
</tr>
</tbody>
</table>

Circuit Symbol

- BGP Fixture Side
- BGS Hydraulic Pressure Source Side
- Pilot Port
- B Port
- Ingoing Side
- P(R) Port
- Outgoing Side A Port
- Filter is placed at front and back of check valve at the BGP side. BGS side has no check valve.

Flow Rate - Pressure Loss Characteristic Graph

The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30~40°C).

<table>
<thead>
<tr>
<th>Pressure Loss (MPa)</th>
<th>Flow Rate (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>4.2</td>
</tr>
<tr>
<td>1.0</td>
<td>7.8</td>
</tr>
<tr>
<td>2.0</td>
<td>12.1</td>
</tr>
<tr>
<td>3.0</td>
<td>16.4</td>
</tr>
</tbody>
</table>
**External Dimensions**

![Diagram of Non-Leak Coupler with Pilot Check Valve](image)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Mass (kg)</th>
<th>Mounting Bolt Size</th>
<th>Tightening Torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGP221-0</td>
<td>0.25</td>
<td>M5×0.8</td>
<td>6.3</td>
</tr>
<tr>
<td>BGS221-0</td>
<td>0.22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 1. In the case that there is stopper, please follow the ★connection dimension in the drawing.
### System Circuit Diagram (Example)

#### Double Action Circuit

- **Lock**
- **Release**
- **Pallet**
- **BGP Plug Side**
- **BGS Socket Side**
- **Table**
- **Solenoid Valve for Controlling Pilot**
- **Solenoid Valve for Controlling Hydraulic Fixture Circuit**

### Controlling Double Action Circuit

Apply a three-position (center position, A/B connection) solenoid valve for controlling the hydraulic fixture circuit. When connecting or disconnecting BGP/BGS, use the center position to shut off the hydraulic pressure supply. This minimizes the reaction force at BGP/BGS part. In addition, when there is a possibility that back pressure is generated at the T port due to the system, install a check valve for preventing back flow having a cracking pressure of 0.04 MPa or less in the position with ★. (Otherwise, oil leakage from the tip of the socket or malfunction of the pilot may occur.)

#### Lock Operation Procedure

1. In the connected condition, supply hydraulic pressure to the pilot circuit and open the check valve of the plug. (Operate Valve 1.)
2. Supply the lock side circuit of the hydraulic fixture actuator with hydraulic pressure. (Operate Valve 2.)
3. After finishing pressurization, shut off the hydraulic pressure supply to the pilot circuit. (Operate Valve 3.)
4. After shutting off the hydraulic pressure to all actuators, disconnect BGP/BGS. (Operate Valve 4. Center Position)

#### Release Operation Procedure

1. In the connected condition, supply hydraulic pressure to the pilot circuit and open the check valve of the plug. (Operate Valve 1.)
2. Supply the release side circuit of the hydraulic fixture actuator with hydraulic pressure. (Operate Valve 2.)

### Single Action Circuit

- **Lock**
- **Release**
- **Pallet**
- **BGP Plug Side**
- **BGS Socket Side**
- **Table**
- **Solenoid Valve for Controlling Pilot**
- **Solenoid Valve for Controlling Hydraulic Fixture Circuit**

### Controlling Single Action Circuit

When connecting or disconnecting BGP/BGS, shut off the hydraulic pressure supply to the hydraulic fixture circuit. This minimizes the reaction force at BGP/BGS part. In addition, when there is a possibility that back pressure is generated at the T port due to the system, install a check valve for preventing back flow having a cracking pressure of 0.04 MPa or less in the position with ★. (Otherwise, oil leakage from the tip of the socket or malfunction of the pilot may occur.)

1. Select a device that can normally release at pressure less than the cracking pressure.

#### Lock Operation Procedure

1. In the connected condition, supply hydraulic pressure to the pilot circuit and open the check valve of the plug. (Operate Valve 1.)
2. Supply each actuator circuit of the hydraulic fixtures with hydraulic pressure. (Operate Valve 2.)
3. After finishing pressurization, shut off the hydraulic pressure supply to the pilot circuit. (Operate Valve 3.)
4. After shutting off the hydraulic pressure supply to all the actuators, disconnect BGP/BGS. (Operate Valve 4.)

#### Release Operation Procedure

1. The release operation can be performed by supplying the pilot circuit with hydraulic pressure after connection. (Individual release can be performed by supplying each actuator with hydraulic pressure in advance after the connection.)

### Cautions (BGP/BGS)

1. Since pressurizing reaction force is produced during pressure supply to port P, it is necessary to add another lock mechanism.
2. When a connection limit stopper is added, keep the connection setting dimension ★ in the drawing.
3. Since BGS side doesn’t have check valve, does not supply pressure with couplers disconnected.
4. Take precautionary measures not to produce back pressure in ports B and P(R) of the socket sides when pressure supply is stopped.
5. Do not connect in the condition that chips or coolant are left on the end surface.
6. (Cover the surface to ensure that foreign materials and chips do not stick to the surface.)
7. Remove burrs from the cross section area of each hydraulic port after machining
8. When pressing up to the connection limit, use the force higher than the reaction force and lower than 4.0kN.
9. In the condition that pressurization of port P is finished, pilot pressure supply to port B does not result in check valve opening.
Low Pressing Force Non-Leak Coupler with Pilot Check Valve

Model BBP/BBS

● Feature
Non-leak auto coupler requires a small amount of pressing force for any operating pressure. Suitable for simplification of connecting equipment because load to fixture side is small.

● Model No. Indication

\[
\text{BB } \begin{array}{c} P \end{array} 500 - 0 \begin{array}{c} G \end{array}
\]

1 Style

\[
P \quad : \quad \text{Plug (Fixture Side)}
\]

\[
S \quad : \quad \text{Socket (Hydraulic Pressure Source Side)}
\]

2 Design No.

\[
0 \quad : \quad \text{Revision Number}
\]

3 Piping Method

Blank : Standard Model

\[
G \quad : \quad \text{Gasket Option (only BBP selectable)}
\]

● Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fixture Side</th>
<th>BBP500-0</th>
<th>BBP500-0G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Source Side</td>
<td>BBS500-0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Pressure MPa</td>
<td>5.0 ~ 25.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withstanding Pressure MPa</td>
<td>37.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. Passage Area mm²</td>
<td>11.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset Tolerance mm</td>
<td>±1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot Air Pressure MPa</td>
<td>0.4 or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 25 MPa</td>
<td>0.3 or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 14 MPa</td>
<td>0.2 or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 7 MPa</td>
<td>0.25 or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressing Force Required when Connecting kN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature °C</td>
<td>0 ~ 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usable Fluid</td>
<td>General Hydraulic Oil Equivalent to ISO-VG-32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

● Circuit Symbol

\[
\text{Air Blow}
\]

\[
\text{Incoming Side}
\]

\[
\text{P(R) Port}
\]

\[
\text{Outgoing Side}
\]

\[
\text{A Port}
\]

\[
\text{BBS}
\]

\[
\text{Hydraulic Pressure Source Side}
\]

\[
\text{BBP}
\]

\[
\text{Fixture Side}
\]

\[
\text{※ A filter is built in each port of plug.}
\]

● Flow Rate - Pressure Loss Characteristic Graph

The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30 ~ 40°C).

<table>
<thead>
<tr>
<th>Pressure Loss (MPa)</th>
<th>Flow Rate (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>5.9</td>
</tr>
<tr>
<td>1.0</td>
<td>9.5</td>
</tr>
<tr>
<td>1.5</td>
<td>12.1</td>
</tr>
<tr>
<td>2.0</td>
<td>14.2</td>
</tr>
<tr>
<td>2.5</td>
<td>16.3</td>
</tr>
<tr>
<td>3.0</td>
<td>18.0</td>
</tr>
</tbody>
</table>
### Action Description

#### Lock Operation

- **Air Blow Circuit**
  - 0MPa
  - Hydraulic Circuit
  - Air Pilot Circuit
- Pressing
- **BBS Socket (Hydraulic Pressure Source Side)**
- **BPP Plug (Fixture Side)**
- To Actuator

#### Release Operation

- **Air Blow Circuit**
  - 0MPa
  - Hydraulic Circuit
  - Air Pilot Circuit
- Pressing
- **BBS Socket (Hydraulic Pressure Source Side)**
- **BPP Plug (Fixture Side)**
- (Holding Hydraulic Pressure)

---

#### Operation Sequence

<table>
<thead>
<tr>
<th>When locking</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connect the socket and plug while supplying air to the air blow circuit.</td>
<td></td>
</tr>
<tr>
<td>Stop the air blow after the connection.</td>
<td>Check valve at plug side open.</td>
</tr>
<tr>
<td>Supply air to the air pilot circuit.</td>
<td>Reaction force created by hydraulic pressure isn’t applied on each mounting surface of socket and plug due to the ball lock mechanism. (The pressing force is always required.)</td>
</tr>
<tr>
<td>Supply oil to the hydraulic circuit. The hydraulic pressure is supplied to the coupler. (plug)</td>
<td></td>
</tr>
<tr>
<td>After finishing hydraulic pressurization of plug side, stop air supply to the air port circuit with the hydraulic pressure supplied.</td>
<td>Check valve at plug side is closed.</td>
</tr>
<tr>
<td>Stop the hydraulic oil supply to hydraulic circuit.</td>
<td>The hydraulic pressure at plug side is held.</td>
</tr>
<tr>
<td>Separate socket from plug. The hydraulic pressure (plug) is held.</td>
<td>Always stop the hydraulic oil supply prior to the disconnection. Please choose the proper tank port type valve when using a modular (integrated) directional control valve.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>When releasing</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connect the socket and plug while supplying air blow circuit.</td>
<td></td>
</tr>
<tr>
<td>Stop the air blow after the connection.</td>
<td>Hydraulic pressure of the plug side is maintained since the check valve is closed.</td>
</tr>
<tr>
<td>Supply air to the air pilot circuit. The plug side pressure is released.</td>
<td>Check valve at plug side open.</td>
</tr>
<tr>
<td>Stop air supply to the air pilot circuit.</td>
<td></td>
</tr>
</tbody>
</table>
Low Pressing Force Non-Leak Coupler with Pilot Check Valve

model BBP/BBS

External Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Mass (kg)</th>
<th>Mounting Bolt Size</th>
<th>Tightening Torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBP500-0</td>
<td>1.1</td>
<td>M6×1</td>
<td>10</td>
</tr>
<tr>
<td>BBP500-0G</td>
<td>1.1</td>
<td>M6×1</td>
<td>10</td>
</tr>
<tr>
<td>BBSS500-0</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cautions (BBP/BBS)

1. Roughness of mounting surface for G option should be 6.3S.
2. Pressing force on connecting is higher than 0.25kN and lower than 4kN.
3. When using multiple couplers, position accuracy in the stroke direction for machining φ 6 spring pin hole of each plug should be within ±0.1.
4. When there is any possibility of chip adhesion on the ball lock slot of BBP, install an adhesion preventive cover or an external air blow nozzle.
5. Do not use the coupler with the connecting surface of the socket faced upward, otherwise contaminants (chips, etc.) will accumulate or enter.
6. Since the socket side has no check valve, do not supply hydraulic pressure except when the connection finished.
7. Since the ball lock mechanism is not for maintaining the connection condition, pressing force is always required.
8. When using two sets of BBP/BBS auto couplers with independent air pilot check lines, make sure the check valve of clamping is open on the hydraulic return line until the pressure is at zero. This will prevent excess pressure build up in the auto coupler.
   Once the pressure is maintained at zero, activate the other air pilot to provide hydraulic pressure for retracting or unclamping.
9. Sufficiently perform flushing of piping and fitting to be connected to prevent foreign substances such as chips from entering the circuit, since a filter is not built in the P(R) port.
10. If a modular (integrated) type directional control valve is applied and hydraulic power source is commonly used by other circuit as shown above, back pressure may be generated at the tank port and oil may flow out of the end of BBS500 being disconnected depending on the control method.
   To prevent oil from flowing out, provide a check valve (cracking pressure less than 0.04 MPa) at the tank port.
   (However, when a single action cylinder is used, ensure that normal release can be achieved even at a cracking pressure of 0.04MPa.)
Non-Leak Coupler
Model BNP/BNS

Feature
Non-leak auto coupler equipped with aligning mechanism to enable connection and disconnection under pressurized condition. It is suitable for saving space in multiple connection because of its screwed end design.

Action Description

1. When connection is completed
The check valves inside both the plug and socket are opened, and the fluid supply from the socket side pressurizes the plug side. Because a reaction force is active at this time, an appropriate pressing force (holding force) is necessary.

2. During Disconnection
When the socket (in the fluid supply condition) moves back, the check valve inside the plug closes first to maintain the fluid pressure.

3. Disconnected
The check valve which is inside the socket on the fluid supply side is closed. (Reaction force is fully activated until BNS valve closes, and it gradually decreases until each end separates.)
Model No. Indication

BNP 220 - 0A

1 Style

P : Plug (Fixture Side)
S : Socket (Hydraulic Pressure Source Side)

2 Pressure Code (Operating Pressure Range)

2 : 1.0 ~ 7.0 MPa
S : 7.0 ~ 25.0 MPa

3 Design No.

0 : Revision Number

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fixture Side</th>
<th>BNP220-0A</th>
<th>BNP250-0A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pressure Source Side</td>
<td>BNS220-0A</td>
<td>BNS250-0A</td>
</tr>
<tr>
<td>Operating Pressure</td>
<td>MPa</td>
<td>1.0 ~ 7.0</td>
<td>7.0 ~ 25.0</td>
</tr>
<tr>
<td>Withstanding Pressure</td>
<td>MPa</td>
<td>10.5</td>
<td>37.5</td>
</tr>
<tr>
<td>Min. Passage Area</td>
<td>mm²</td>
<td>11.0</td>
<td></td>
</tr>
<tr>
<td>Offset Tolerance</td>
<td>mm</td>
<td>±1</td>
<td></td>
</tr>
<tr>
<td>Angular Deviation (Offset Tolerance)</td>
<td>DEG</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>℃</td>
<td>0 ~ 70</td>
<td></td>
</tr>
<tr>
<td>Usable Fluid</td>
<td></td>
<td>General Hydraulic Oil Equivalent to ISO-VG-32</td>
<td></td>
</tr>
<tr>
<td>Reaction Force</td>
<td>kN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 25 MPa</td>
<td></td>
<td>—</td>
<td>3.23</td>
</tr>
<tr>
<td>at 7 MPa</td>
<td></td>
<td>1.02</td>
<td></td>
</tr>
<tr>
<td>at P MPa</td>
<td></td>
<td>0.1227 x P + 0.16</td>
<td></td>
</tr>
</tbody>
</table>

Circuit Symbol

BNS (Socket)  
Hydraulic Pressure Source Side

BNP (Plug)  
Fixture Side

* Installing filter on both sides of each check valve.

Flow Rate - Pressure Loss Characteristic Graph

The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30 ~ 40℃).
Non-Leak Coupler

**External Dimensions**

![Diagram of external dimensions]

- **Machining Dimension for Mounting Hole**
  - BNP/BNS Common
  - M27 × 1.5 Screw

- **Connection Setting Dimension**
  - BNP2-Ø-0A Plug
  - Ø 29.8
  - Ø 33 × Hexagon 30

- **BNP2-Ø-0A Socket**
  - Ø 25.2
  - Ø 33 × Hexagon 30

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Mass (kg)</th>
<th>Thread Size</th>
<th>Tightening Torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNP220-0A</td>
<td>0.22</td>
<td>M27 × 1.5</td>
<td>10</td>
</tr>
<tr>
<td>BNP250-0A</td>
<td>0.22</td>
<td>M27 × 1.5</td>
<td>10</td>
</tr>
<tr>
<td>BNS220-0A</td>
<td>0.28</td>
<td>M27 × 1.5</td>
<td>10</td>
</tr>
<tr>
<td>BNS250-0A</td>
<td>0.28</td>
<td>M27 × 1.5</td>
<td>10</td>
</tr>
</tbody>
</table>

**Cautions (BNP/BNS)**

1. When using multiple couplers, please install stopper to be set as a ★ marked set length.
2. In the pressurized condition, please note that reaction force is also applied during connection/disconnection operation.
3. Perform air bleeding of the circuit sufficiently prior to operation. (Oil drip amount can increase.)
4. Do not connect them in a condition where chips or coolant adhere to the end surfaces.
   (Cover the surface to ensure that foreign materials and chips do not stick to the surface.)
5. Make sure to use Ø 33 × Hex.30 part for installation and removal.
6. Use BNS socket on the hydraulic pressure source side and BNP plug on the fixture side.
7. When pressing up to the connection limit, use the force higher than the reaction force and lower than 6.0kN.
<table>
<thead>
<tr>
<th>High-Power Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatic Series</td>
</tr>
<tr>
<td>Hydraulic Series</td>
</tr>
<tr>
<td>Valve / Coupler</td>
</tr>
<tr>
<td>Hydraulic Unit</td>
</tr>
<tr>
<td>Manual Operation</td>
</tr>
<tr>
<td>Accessories</td>
</tr>
<tr>
<td>Caution / Others</td>
</tr>
</tbody>
</table>

### Air Sequence Valve
- BWD

### Hydraulic Non-Leak Coupler
- BGA/RGB
- BGC/RGD
- BGP/RGB
- BPP/RGB
- BNP/BNP
- BNP/BSP
- BPP/BSP

### Auto Coupler
- JVA/JVB
- JVC/JVD
- JVE/JVF
- JMA/JNB
- JNC/JND
- JLP/JLS

### Rotary Joint
- JR

### Hydraulic Valve
- BK
- BEO
- BT
- BLS/BLG
- BLB
- JSS/JS
- JKA/JKB
- BMA/BMG
- AU/AU-M
- BU
- BP/JPB
- BK
- BEP/BSP
- BH
- BC

### Air Hydraulic Unit
- CV
- CK
- CP/CPB
- CPC/CQC
- CB
- CC
- AB/AB-V
- AC/AC-V
Non-Leak Coupler
Model BJP/BJS

Feature
Non-leak auto coupler equipped with aligning mechanism to enable connection and disconnection under pressurized condition. BJP (hydraulic pressure side) has an air blow function.

Action Description

1. Before Connection
Supplies air to remove chips adhered around the connection port by air blow.
Stop the air blow after the connection.

2. Connection Completion
Supply hydraulic pressure to operate an actuator. Pressing force should be more than the reaction force.

3. Disconnection
The disconnection is performed under pressurized condition to maintain the pressure.

Connection Considering Pressing Force

Connection Downward

Connection Using Lock Pin
(Built in the synchronized hydraulic cylinder.)

Connection Using Bracket
(Built in the hydraulic cylinder and spring.)
Model No. Indication

BJ P220 - 0

1 Style
P : Plug (Fixture Side)
S : Socket (Hydraulic Pressure Source Side)

2 Port Size
2 : Rc1/4 Thread
3 : Rc3/8 Thread

3 Pressure Code (Operating Pressure Range)
2 : 1.0 ~ 7.0 MPa
5 : 7.0 ~ 30.0 MPa

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fixture Side</th>
<th>BJP220-0</th>
<th>BJP250-0</th>
<th>BJP321-0</th>
<th>BJP351-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulically Pressure Source Side</td>
<td>BJ5220-0</td>
<td>BJ5250-0</td>
<td>BJ5321-0</td>
<td>BJ5351-0</td>
<td></td>
</tr>
<tr>
<td>Operating Pressure (MPa)</td>
<td>1.0~7.0</td>
<td>7.0~30.0</td>
<td>1.0~7.0</td>
<td>7.0~30.0</td>
<td></td>
</tr>
<tr>
<td>Withstanding Pressure (MPa)</td>
<td>10.5</td>
<td>37.5</td>
<td>10.5</td>
<td>37.5</td>
<td></td>
</tr>
<tr>
<td>Min. Passage Area (mm²)</td>
<td>10.3</td>
<td>40</td>
<td>29.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset Tolerance (mm)</td>
<td>±1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angular Tolerance ± Offset Tolerance (DEG.)</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature (°C)</td>
<td>0~70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usable Fluid</td>
<td>General Hydraulic Oil Equivalent to ISO-VG-32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reaction Force (kN)</th>
<th>Operating Pressure (MPa)</th>
<th>25</th>
<th>7</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>at 25 MPa</td>
<td>-</td>
<td>2.09</td>
<td>-</td>
<td>3.99</td>
</tr>
<tr>
<td>at 7 MPa</td>
<td>0.68</td>
<td>-</td>
<td>1.22</td>
<td>-</td>
</tr>
<tr>
<td>at P MPa</td>
<td>0.0785 × P + 0.13</td>
<td>0.154 × P + 0.14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Circuit Symbol

Air Blow

Incoming Side
P(R) Port

BJS (Socket)
Hydraulic Pressure Source Side

Outgoing Side
A Port

BJS (Plug)
Fixture Side

Filters are built in each side of the port and connection side.

Flow Rate - Pressure Loss Characteristic Graph

The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30~40°C).

<table>
<thead>
<tr>
<th>Pressure Loss (MPa)</th>
<th>Flow Rate (L/min)</th>
<th>Flow Rate Loss (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BJP220-0</td>
<td>BJP250-0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>5.2</td>
<td>11.0</td>
</tr>
<tr>
<td>1.0</td>
<td>8.4</td>
<td>17.6</td>
</tr>
<tr>
<td>1.5</td>
<td>11.4</td>
<td>24.2</td>
</tr>
<tr>
<td>2.0</td>
<td>13.5</td>
<td>28.6</td>
</tr>
<tr>
<td>2.5</td>
<td>15.6</td>
<td>33.0</td>
</tr>
<tr>
<td>3.0</td>
<td>17.7</td>
<td>37.4</td>
</tr>
</tbody>
</table>
**External Dimensions (BJ□2□0-0□)**

- **BJS2□0-0 (Socket)**
  - PiR Port
    - Rc1/4 Screw
  - Air Blow Port
    - Rc1/8 Screw
  - Dimensions: 15 x 58

- **BJP2□0-0 (Plug)**
  - Connection Completion Dimension
  - Stroke: 8 x 60
  - 2-M6 x 1 x 90 Bolt (Included)
  - 2-φ6 x 12 Spring Pin (Included)
  - 4-M6 x 1 x 40 Bolt (Included)

- **BJP2□0-0A (Plug)**
  - The area where it is not described, is same as BJP2□0-0.

- **BJP2□0-0B (Plug)**
  - The area where it is not described, is same as BJP2□0-0.

- **BJP2□0-0G (Plug)**
  - The area where it is not described, is same as BJP2□0-0.

### Model Code Table

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Mass (kg)</th>
<th>Mounting bolt size</th>
<th>Tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BJP2□0-0</td>
<td>0.8</td>
<td>M6 x 1</td>
<td>10</td>
</tr>
<tr>
<td>BJS2□0-0</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**External Dimensions (BJ3□1-0□)**

- **BJS3□1-0 (Socket)**
- **Air Blow Port**
  - Rc1/8 Screw
  - 0.3, 25, 15, 20, 25, 3
- **P(R) Port**
  - Rc3/8 Screw
  - 19, 56.5
- **Connection Completion Dimension Stroke**
  - 8, 60
- **2-M8×1.25×90 Bolt (Included)**
- **2-Φ6×12 Spring Pin (Included)**
- **4-M8×1.25×50 Bolt (Included)**

---

**BJP3□1-0G (Plug)**

- The area where it is not described, is same as BJS3□1-0.

- **A Port**
  - O-ring 1BPT10 (included)
  - φ8 or less

---

**Cautions (BJP/BJS)**

1. Roughness of mounting surface (O-ring seal surface) should be 6.35 or better.
2. Pressing force for connection should be more than the reaction force and less than 6kN (for BJS□2) or 9kN (for BJS□3).
3. When using multiple couplers, position accuracy in the stroke direction for machining Φ6 spring pin hole of each plug should be within ±0.1.
4. After mounting, perform air bleeding sufficiently. Failure to do so may affect an amount of spillage (oil drip).
5. Minimize the disconnection speed to prevent the pressure value right after the disconnection and the amount of spillage (oil drip) from being affected. (It may change depending on the operating condition)
6. Do not use the coupler with the connecting surface of BJS. Otherwise foreign substances (chips and so on) may accumulate or enter.

---

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Mass (kg)</th>
<th>Mounting Bolt Size</th>
<th>Tightening Torque (N.m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BJS3□1-0G</td>
<td>1.1</td>
<td>M8×1.25</td>
<td>25</td>
</tr>
<tr>
<td>BJS3□1-0</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Non-Leak Coupler

**Model BFP/BFS**

**Feature**
Non-leak auto coupler equipped with aligning mechanism to enable connection and disconnection under pressurized condition.

**Action Description**

1. **When connection is completed**
   The check valves inside both BFP and BFS are opened, and the fluid supply from BFS side pressurizes BFP side. Because a reaction force is active at this time, an appropriate pressing force (holding force) is necessary.

2. **During Disconnecting**
   When BFS (in the fluid supply condition) moves back, the check valve inside BFP closes first to maintain the fluid pressure.

3. **Disconnected Condition**
   The check valve which is inside BFS on the fluid supply side is closed. (Reaction force is fully activated until BFS valve closes, and it gradually decreases until each end separates.)
Model No. Indication

BF P 220 - 0

1 Style

P : Plug (Fixture Side)
S : Socket (Hydraulic Pressure Source Side)

2 Pressure Code (Operating Pressure Range)

2 : 1.0 ~ 7.0 MPa

3 Design No.

0 : Revision Number

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fixture Side</th>
<th>Pressure Source Side</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BFP220-0</td>
<td>BFS220-0</td>
</tr>
<tr>
<td>Operating Pressure</td>
<td>MPa</td>
<td>1.0~7.0</td>
</tr>
<tr>
<td>Withstanding Pressure</td>
<td>MPa</td>
<td>10.5</td>
</tr>
<tr>
<td>Min. Passage Area</td>
<td>mm²</td>
<td>11</td>
</tr>
<tr>
<td>Offset Tolerance</td>
<td>mm</td>
<td>±1</td>
</tr>
<tr>
<td>Angular Deviation (Offset Tolerance)</td>
<td>DEG.</td>
<td>0.3</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>°C</td>
<td>0~70</td>
</tr>
<tr>
<td>Usable Fluid</td>
<td>General Hydraulic Oil Equivalent to ISO-VG-32</td>
<td></td>
</tr>
</tbody>
</table>
| Reaction Force when Pressurized | kN | at 7 MPa: 1.02  
| | | at P MPa: 0.1227 × P + 0.16 |

Circuit Symbol

Fixture Circuit: P(R)  
BFS (Socket)  
Hydraulic Pressure Source Side  
BFP (Plug)  
Fixture Side

※ Filter is placed at front and back of check valve.

Flow Rate - Pressure Loss Characteristic Graph

The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30~40°C).

<table>
<thead>
<tr>
<th>Pressure Loss (MPa)</th>
<th>Flow Rate (ℓ/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>4.1</td>
</tr>
<tr>
<td>1.0</td>
<td>7.4</td>
</tr>
<tr>
<td>2.0</td>
<td>11.5</td>
</tr>
<tr>
<td>3.0</td>
<td>15.6</td>
</tr>
</tbody>
</table>
### External Dimensions

**BFP220-0**
- Plug
- 4-MS × 0.8 × 12 Bolt (Included) (Bolt Hole: 2-MS × 1 Hole for Jack Bolt)

**BFS220-0**
- Socket
- 2-MS × 0.8 × 20 Bolt (Included) (Bolt Hole: 2-MS × 1 Hole for Jack Bolt)

### BFP Machining Dimension for Mounting Hole
- Ø 6.4
- 4-MS × 0.8 Thread Depth: 10

### BFS Machining Dimension for Mounting Hole
- Ø 6.4
- 4-MS × 0.8 Thread Depth: 12

### Cautions (BFP/BFS)

1. When using multiple couplers, please install stopper to be set as a ★ marked set length.
2. In the pressurized condition, please note that reaction force is also applied during connection/disconnection operation.
3. Perform air bleeding of the circuit sufficiently prior to operation. (Oil drip amount can increase.)
4. Do not connect them in a condition where chips or coolant adhere to the end surfaces.
   (Cover the surface to ensure that foreign materials and chips do not stick to the surface.)
5. Use BFS socket on the hydraulic pressure source side and BFP plug on the fixture side.
6. When pressing up to the connection limit, use the force higher than the reaction force and lower than 4.0kN.
7. Use all attached bolts with hex holes (strength division 12.9) and tighten the body with torque as shown in the table.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Mass (kg)</th>
<th>Mounting Bolt</th>
<th>Tightening Torque (N-m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BFP220-0</td>
<td>0.25</td>
<td>MS × 0.8</td>
<td>6.3</td>
</tr>
<tr>
<td>BFS220-0</td>
<td>0.30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MEMO

| MEMO |

| MEMO |

<table>
<thead>
<tr>
<th>High-Power Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatic Series</td>
</tr>
<tr>
<td>Hydraulic Series</td>
</tr>
<tr>
<td>Valve / Coupler</td>
</tr>
<tr>
<td>Hydraulic Unit</td>
</tr>
<tr>
<td>Manual Operation</td>
</tr>
<tr>
<td>Accessories</td>
</tr>
<tr>
<td>Cautions / Others</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Air Sequence Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>BWD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydraulic Non-Leak Coupler</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGA/RGB</td>
</tr>
<tr>
<td>BGC/RGD</td>
</tr>
<tr>
<td>BGP/BGS</td>
</tr>
<tr>
<td>BPP/BPS</td>
</tr>
<tr>
<td>BNP/BNP</td>
</tr>
<tr>
<td>BPF/BPS</td>
</tr>
<tr>
<td>BPF/BNPS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Auto Coupler</th>
</tr>
</thead>
<tbody>
<tr>
<td>JWAA/JVB</td>
</tr>
<tr>
<td>JWCA/JVD</td>
</tr>
<tr>
<td>JWEC/JVF</td>
</tr>
<tr>
<td>JMA/INB</td>
</tr>
<tr>
<td>JNC/IND</td>
</tr>
<tr>
<td>JLP/KL5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rotary Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td>JR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydraulic Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>BK</td>
</tr>
<tr>
<td>BEO</td>
</tr>
<tr>
<td>BT</td>
</tr>
<tr>
<td>BLS/BLG</td>
</tr>
<tr>
<td>BLB</td>
</tr>
<tr>
<td>JSS/J5</td>
</tr>
<tr>
<td>JKA/JKB</td>
</tr>
<tr>
<td>BMA/BMG</td>
</tr>
<tr>
<td>AU/AU-M</td>
</tr>
<tr>
<td>BU</td>
</tr>
<tr>
<td>BP/JPB</td>
</tr>
<tr>
<td>BX</td>
</tr>
<tr>
<td>BEP/BSP</td>
</tr>
<tr>
<td>BH</td>
</tr>
<tr>
<td>BC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Air Hydraulic Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV</td>
</tr>
<tr>
<td>CK</td>
</tr>
<tr>
<td>CP/CPE</td>
</tr>
<tr>
<td>CPC/CQC</td>
</tr>
<tr>
<td>CB</td>
</tr>
<tr>
<td>CC</td>
</tr>
<tr>
<td>AB/AB-V</td>
</tr>
<tr>
<td>AC/AC-V</td>
</tr>
</tbody>
</table>
Cautions

Installation Notes (For Hydraulic Series)

1) Check the Usable Fluid
   - Please use the appropriate fluid by referring to the Hydraulic Fluid List.

2) Procedure before Piping
   - The pipeline, piping connector and fixture circuits should be cleaned by thorough flushing.
   - The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
   - There is no filter provided with Kosmek’s product except for a part of valves which prevents foreign materials and contaminants from getting into the circuit.

3) Applying Sealing Tape
   - Wrap with tape 1 to 2 times following the screw direction.
   - Pieces of the sealing tape can lead to oil leakage and malfunction.
   - In order to prevent a foreign substance from going into the product during the piping work, it should be carefully cleaned before working.

4) Air Bleeding of the Hydraulic Circuit
   - If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.
     ① Reduce hydraulic pressure to less than 2MPa.
     ② Loosen the cap nut of pipe fitting closest to the clamp by one full turn.
     ③ Wiggle the pipeline to loosen the outlet of pipe fitting.
       Hydraulic fluid mixed with air comes out.

     ④ Tighten the cap nut after bleeding.
     ⑤ It is more effective to bleed air at the highest point inside the circuit or at the end of the circuit.
       (Set an air bleeding valve at the highest point inside the circuit.)

5) Checking Looseness and Retightening
   - At the beginning of the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

Hydraulic Fluid List

<table>
<thead>
<tr>
<th>ISO Viscosity Grade</th>
<th>ISO VG 32</th>
<th>ISO VG 46</th>
<th>ISO VG 68</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maker</td>
<td>Anti-Wear Hydraulic Oil</td>
<td>Multi-Purpose Hydraulic Oil</td>
<td>ISO VG 22</td>
</tr>
<tr>
<td>Showa Shell Sekiyu</td>
<td>Tellus S2 M 32</td>
<td>Morina S2 B 32</td>
<td>ISO VG 32</td>
</tr>
<tr>
<td>Idemitsu Kosan</td>
<td>Daphne Hydraulic Fluid 32</td>
<td>Daphne Super Multi Oil 32</td>
<td>ISO VG 46</td>
</tr>
<tr>
<td>JX Nippon Oil &amp; Energy</td>
<td>Super Hyrando 32</td>
<td>Super Mulpus DX 32</td>
<td>ISO VG 68</td>
</tr>
<tr>
<td>Cosmo Oil</td>
<td>Cosmo Hydro AW32</td>
<td>Cosmo New Mighty Super 32</td>
<td></td>
</tr>
<tr>
<td>ExxonMobil</td>
<td>Mobil DYE 24</td>
<td>Mobil DYE 24 Light</td>
<td></td>
</tr>
<tr>
<td>Matsumura Oil</td>
<td>Hydol AW-32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Castrol</td>
<td>Hyspin AWS 32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.
**Notes on Hydraulic Cylinder Speed Control Unit**

Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

- **Flow Control Circuit for Single Acting Cylinder**
  For spring return single acting cylinders, restricting flow during release can extremely slow down or disrupt release action. The preferred method is to control the flow during the lock action using a valve that has free-flow in the release direction. It is also preferred to provide a flow control valve at each actuator.

  Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)

- **Flow Control Circuit for Double Acting Cylinder**
  Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system. However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.

  Refer to P.75 for speed adjustment of LKE.
  For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

  **[Meter-out Circuit] (Except LKE/TMA/TLA)**

  ![Flow Control at the Release Side](image)

  **[Meter-in Circuit] (LKE/TMA/TLA must be controlled with meter-in.)**

  ![Flow Control Valve (Any location is OK)](image)

  In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.
  1. Single acting components should not be used in the same flow control circuit as the double acting components. The release action of the single acting cylinders may become erratic or very slow.

  Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.
  - Separate the control circuit.

  ![Flow Control Valve](image)

  - Reduce the influence of double acting cylinder control unit. However, due to the back pressure in tank line, single action cylinder is activated after double action cylinder works.

  ![Flow Control Valve](image)

  2. In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve or pressure switches for clamping detection. If the back pressure is more than the set pressure then the system will not work as it is designed to.
Cautions

- **Notes on Handling**
  1. It should be handled by qualified personnel.
  2. The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
  3. Do not handle or remove the machine unless the safety protocols are ensured.
  4. The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
  5. Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
  6. After stopping the machine, do not remove until the temperature cools down.
  7. Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

- **Maintenance and Inspection**
  1. Removal of the Machine and Shut-off of Pressure Source
  2. Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
  3. Make sure there is no abnormality in the bolts and respective parts before restarting.

- Regularly clean the area around the piston rod and plunger.
  - If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage and air leaks.

- Please clean out the reference surface regularly (taper reference surface and seating surface) of locating machine. (VS/VT/VFL/VFM/VFJ/VFK/WVS/VWK/VX/VXF)
  - Location products, except VX/VXF model, can remove contaminants with cleaning functions. When installing pallets makes sure there is no thick sludge like substances on pallets.

- Continuous use with dirt on components will lead to locating functions not work properly, leaking and malfunction.

- If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.

- Regularly tighten nuts, bolts, pins, cylinders and pipe line to ensure proper use.

- Make sure the hydraulic fluid has not deteriorated.

- Make sure there is smooth action and no abnormal noise.
  - Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

- The products should be stored in the cool and dark place without direct sunshine or moisture.

- Please contact us for overhaul and repair.
● Warranty

1) Warranty Period
● The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope
● If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.

   Defects or failures caused by the following are not covered.

1. If the stipulated maintenance and inspection are not carried out.
2. If the product is used while it is not suitable for use based on the operator’s judgment, resulting in defect.
3. If it is used or handled in an inappropriate way by the operator.
   (Including damage caused by the misconduct of the third party.)
4. If the defect is caused by reasons other than our responsibility.
5. If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
6. Other caused by natural disasters or calamities not attributable to our company.
7. Parts or replacement expenses due to parts consumption and deterioration.
   (Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.
Sales Offices

Sales Offices across the World

<table>
<thead>
<tr>
<th>Location</th>
<th>TEL.</th>
<th>FAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>+81-78-991-5162</td>
<td>+81-78-991-8787</td>
</tr>
<tr>
<td>KOSMEK LTD.</td>
<td>1-5, 2-chome, Murotan, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>+1-630-620-7650</td>
<td>+1-630-620-9015</td>
</tr>
<tr>
<td>KOSMEK (USA) LTD.</td>
<td>650 Springer Drive, Lombard, IL 60148 USA</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>+52-442-161-2347</td>
<td></td>
</tr>
<tr>
<td>KOSMEK USA Mexico Office</td>
<td>Blvd Jurica la Campana 1040, B Colonia Punta Juriquilla Queretaro, QRO 76230 Mexico</td>
<td></td>
</tr>
<tr>
<td>EUROPE</td>
<td>+43-463-287587</td>
<td>+43-463-287587-20</td>
</tr>
<tr>
<td>KOSMEK EUROPE GmbH</td>
<td>Schleppenplatz 2 9020 Klagenfurt am Wörthersee Austria</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>+86-21-54253000</td>
<td>+86-21-54253709</td>
</tr>
<tr>
<td>KOSMEK (CHINA) LTD.</td>
<td>Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai 200125, China</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>+91-9880561695</td>
<td></td>
</tr>
<tr>
<td>KOSMEK LTD. - INDIA</td>
<td>F 203, Level-2, First Floor, Prestige Center Point, Cunningham Road, Bangalore -560052 India</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>+66-2-300-5132</td>
<td>+66-2-300-5133</td>
</tr>
<tr>
<td>Thailand Representative Office</td>
<td>67 Soi 58, RAMA 9 Rd., Suanluang, Suanluang, Bangkok 10250, Thailand</td>
<td></td>
</tr>
<tr>
<td>Taiwan</td>
<td>+886-2-82261860</td>
<td>+886-2-82261890</td>
</tr>
<tr>
<td>Full Life Trading Co., Ltd.</td>
<td>16F-4, No.2, Jian Ba Rd, Zhonghe District, New Taipei City Taiwan 23511</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>+63-2-310-7286</td>
<td>+63-2-310-7286</td>
</tr>
<tr>
<td>G.E.T. Inc, Phil.</td>
<td>Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>+62-21-5818632</td>
<td>+62-21-5814857</td>
</tr>
<tr>
<td>P.T PANDU HYDRO PNEUMATICS</td>
<td>Ruko Green Garden Blok Z-Ⅱ No.51 Rt.005 Rw.008 Kedoya Utara-Kebon Jeruk Jakarta Barat 11520 Indonesia</td>
<td></td>
</tr>
</tbody>
</table>

Sales Offices in Japan

<table>
<thead>
<tr>
<th>Office</th>
<th>TEL.</th>
<th>FAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office</td>
<td>078-991-5115</td>
<td>078-991-8787</td>
</tr>
<tr>
<td>Osaka Sales Office</td>
<td>048-652-8839</td>
<td>048-652-8828</td>
</tr>
<tr>
<td>Overseas Sales</td>
<td>048-652-8839</td>
<td>048-652-8828</td>
</tr>
<tr>
<td>Tokyo Sales Office</td>
<td>0566-74-8778</td>
<td>0566-74-8808</td>
</tr>
<tr>
<td>Nagoya Sales Office</td>
<td>029-433-0424</td>
<td>029-433-0426</td>
</tr>
<tr>
<td>Fukuoka Sales Office</td>
<td>092-433-0424</td>
<td>092-433-0426</td>
</tr>
</tbody>
</table>

FOR FURTHER INFORMATION ON UNLISTED SPECIFICATIONS AND SIZES, PLEASE CALL US.

SPECIFICATIONS IN THIS CATALOG ARE SUBJECT TO CHANGE WITHOUT NOTICE.
Global Network

Overseas Affiliates and Sales Offices
Distributors

Canada
U.S.A.

Europe

Asia

Brazil

Mexico

Japan
China
Taiwan
Philippines
Thailand

India

Singapore
Malaysia
Indonesia

FOR FURTHER INFORMATION ON UNLISTED SPECIFICATIONS AND SIZES, PLEASE CALL US.

SPECIFICATIONS IN THIS CATALOG ARE SUBJECT TO CHANGE WITHOUT NOTICE.