Hydraulic

Non-Leak Coupler

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

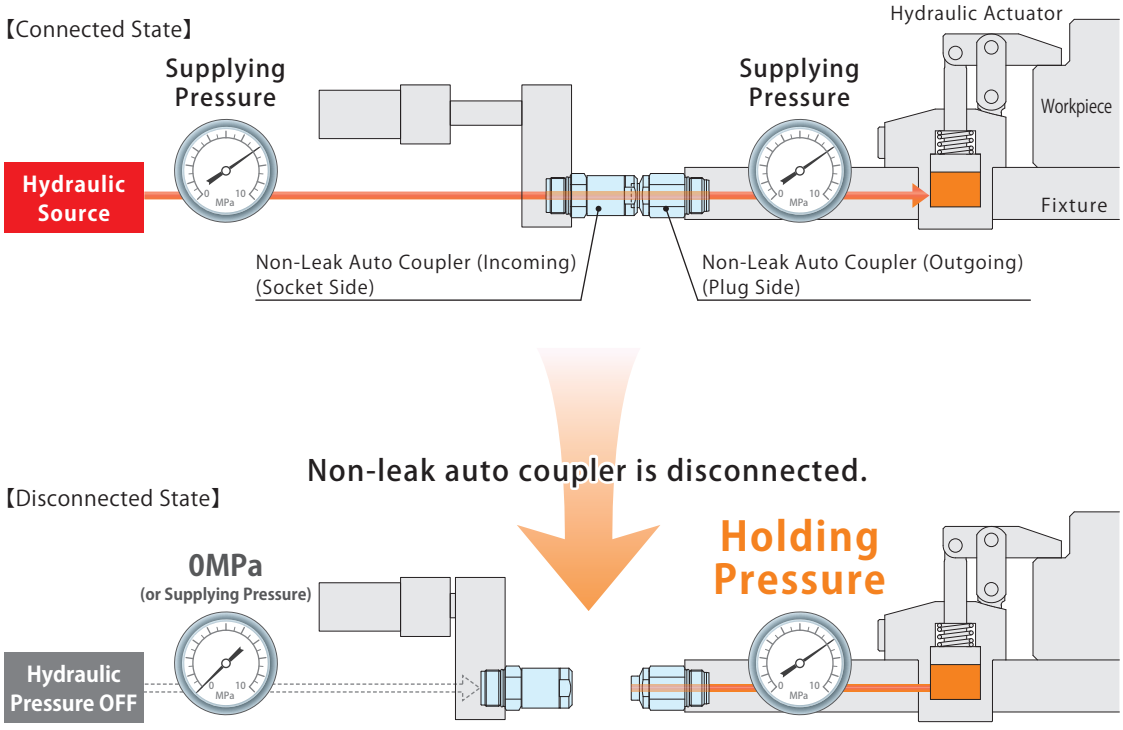
After mounting the coupler at the outgoing side (plug), it holds the pressure as it is disconnected from incoming side (socket)

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 the Auto coupler. Please refer to each page in detail if necessary.

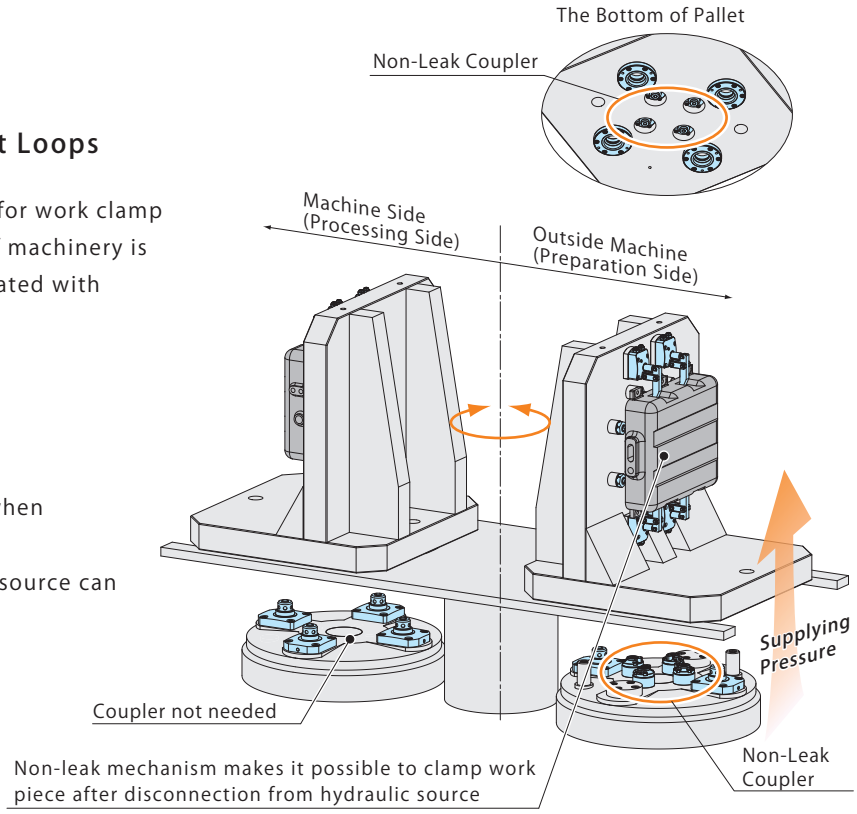
Advantages

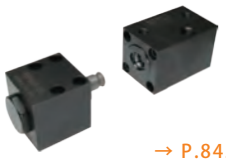
Cut Off Unwanted Circuit Loops

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 work piece.
After disconnection, hydraulic source can be shut off.



	Model BGA/BGB	Model BGC/BGD	Model BGP/BGS	Model BBP/BBS
Pilot Check Valve	 → P.833	 → P.837	 → P.841	 → P.845
Classification	Non-Leak Coupler with Pilot Check Valve	Non-Leak Coupler with Pilot Check Valve	Non-Leak Coupler with Pilot Check Valve	Low Pressing Force Non-Leak Coupler with Pilot Check Valve
Operating Pressure Range	1～7MPa	1～7MPa / 7～25MPa	1～7MPa	5～25MPa
Features	Screw Mounted (Space-Saving)	Bolt Mounted		
	Low Pressing Force (with Pilot Check Valve)			
		with Air Blow Function		with Air Blow Function

	Model BNP/BNS	Model BJP/BJS	Model BFP/BFS
Supplying Pressure Cut Off	 → P.849	 → P.853	 → P.857
Classification	Non-Leak Coupler	Non-Leak Coupler	Non-Leak Coupler
Operating Pressure Range	1～7MPa / 7～25MPa	1～7MPa / 7～30MPa	1～7MPa
Features	Screw Mounted (Space-Saving)	Bolt Mounted	
	Supplying Pressure Cut Off		
		with Air Blow Function	

PAT.

Non-Leak Coupler

with Pilot Check Valve

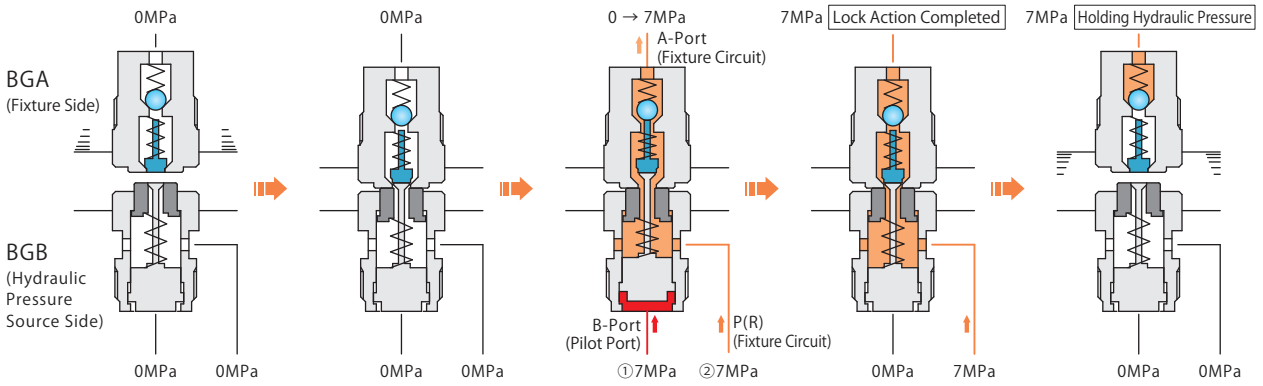
Model **BGA/BGB**

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



Please make a connection as of each port at BGB side under the condition where the hydraulic pressure is stopped.

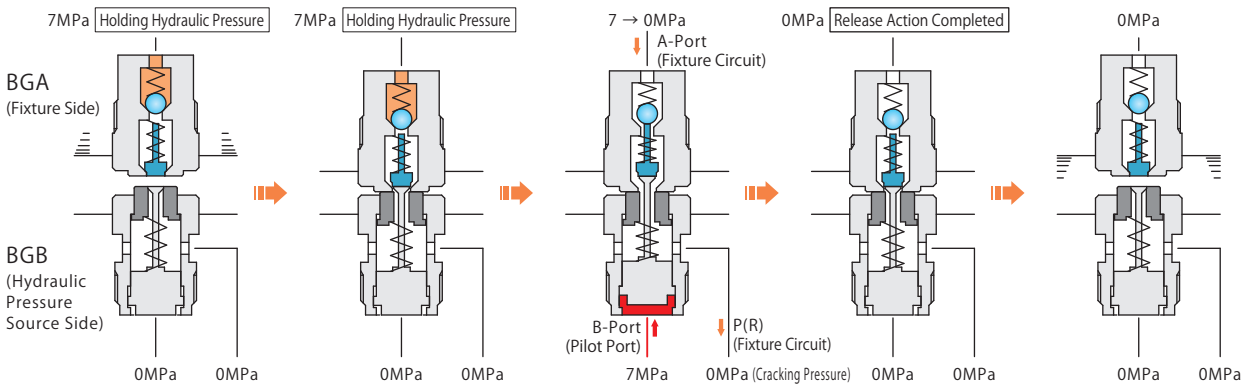
Connection Completion

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).

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, disconnect.

Release Operation



Please make a connection as of each port at BGB side under the condition where the hydraulic pressure is stopped.

Connection Completion

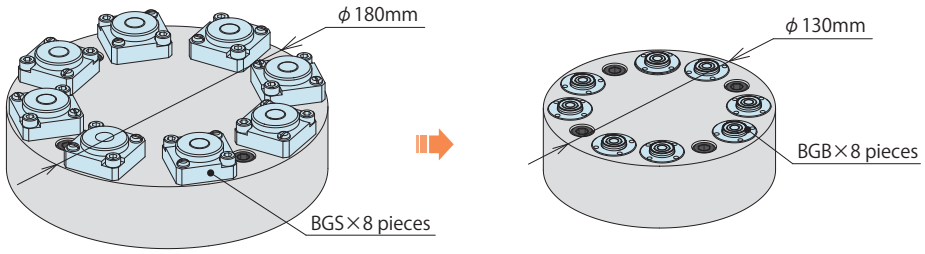
Supply the hydraulic pressure to the pilot port B, then open the check valve at the BGA side.

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.



※ This drawing above shows that our previous products BGP/BGS coupler at the hydraulic source and new product BGA/BGB are on the rotary table.

Model No. Indication

BG A 022 0 - 0M

1 2

1 Style

A : Fixture Side (Outgoing Side)

B : Hydraulic Pressure Source Side (Incoming Side)

2 Design No.

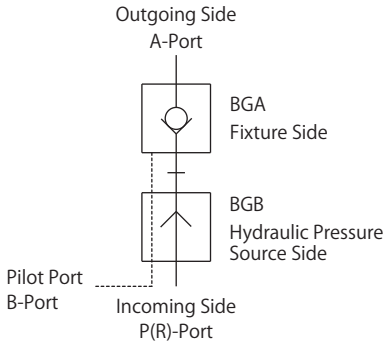
0 : Revision Number

Specifications

Model No.	Fixture Side	BGA0220-0M
	Hydraulic Pressure Source Side	BGB0220-0M
Operating Pressure	MPa	1.0～7.0
Withstanding Pressure	MPa	10.5
Min. Passage Area	mm^2	11.0
Offset Tolerance	mm	±1
Angular Deviation (Offset Tolerance)	DEG.	0.3
Operating Temperature	℃	0～70
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32
Pilot Pressure ※1	MPa	Holding Pressure P / 5.1 + 0.5 or more
Spring Force when Connecting	kN	0.1
Reaction Force when Pressurized (Operating Pressure)	at 7 MPa	1.18
kN	at P MPa	0.154 × P + 0.1

Note ※1. P : holding force (MPa)

Circuit Symbol

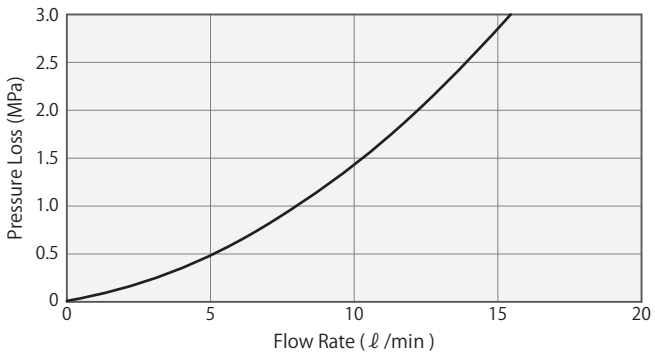


※ Filter is placed at front and back of check valve at the BGA side.

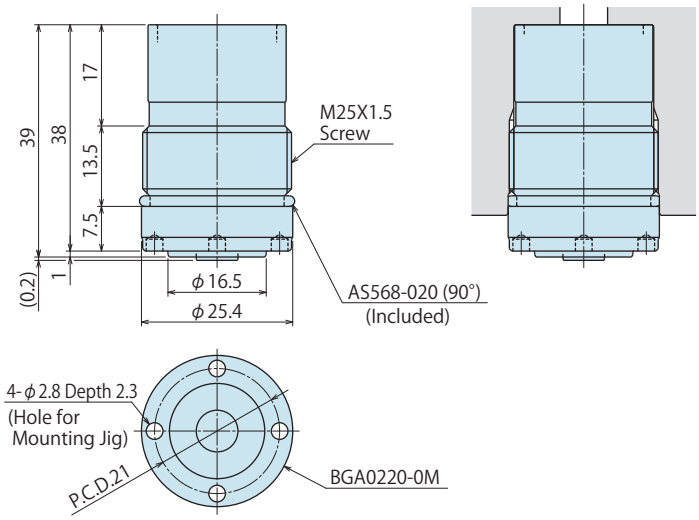
Flow Rate - Pressure Loss Characteristic Graph

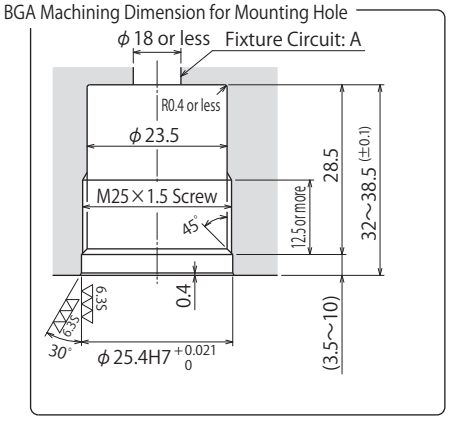
The fluid used on this data is normal hydraulic oil corresponding to ISO-VG-32 (30～40℃).

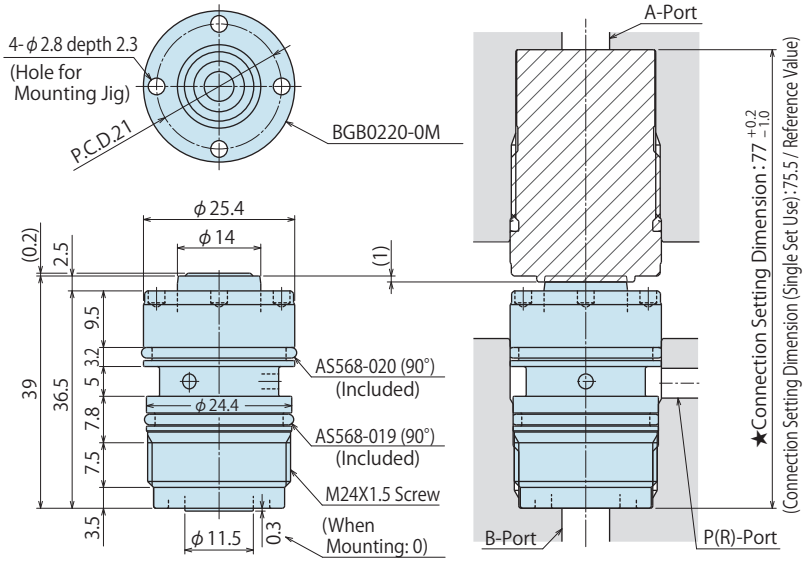
Pressure Loss (MPa)	Flow Rate (ℓ/min)
0	0
0.5	5.0
1.0	7.9
2.0	12.2
3.0	15.4

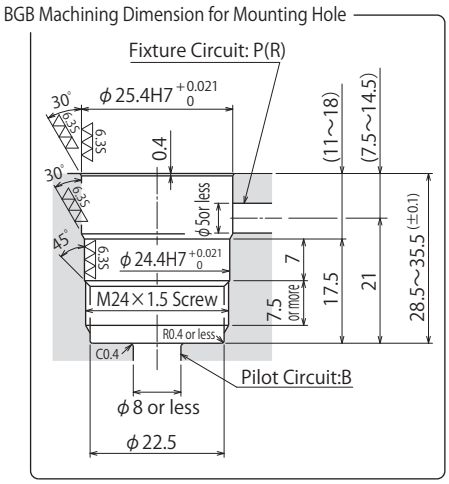


External Dimensions









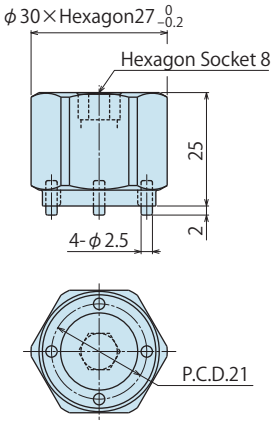
Note

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

Model No.	Mass (kg)	Mounting fixture model No.	Tightening torque (N·m)
BGA0220-0M	0.1	ZZB0010	25
BGB0220-0M	0.1		

Options: Mounting Jig

BGA/BGB is mounted with this mounting jig.
Tightening Torque: 25N·m



Model No. Indication

ZZB0010

Design No.
(Revision Number)

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 & chips do not stick to the surface.)
5. If the allowed tolerance is exceeded, the damage to internal parts may occur.
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.

PAT.

Non-Leak Coupler

with Pilot Check Valve

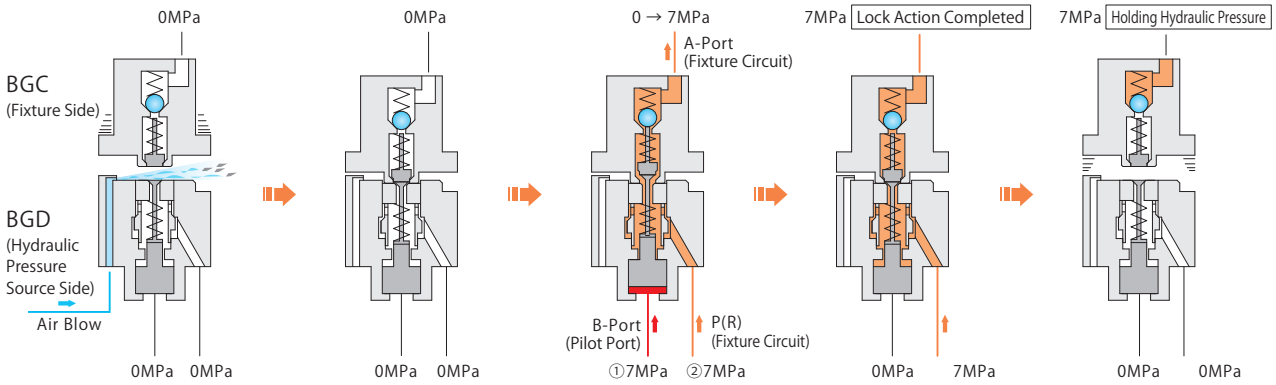
Model BGC/BGD

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 pressuresource side) has air blow function.

Action Description (at 7MPa)

Lock Operation



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.

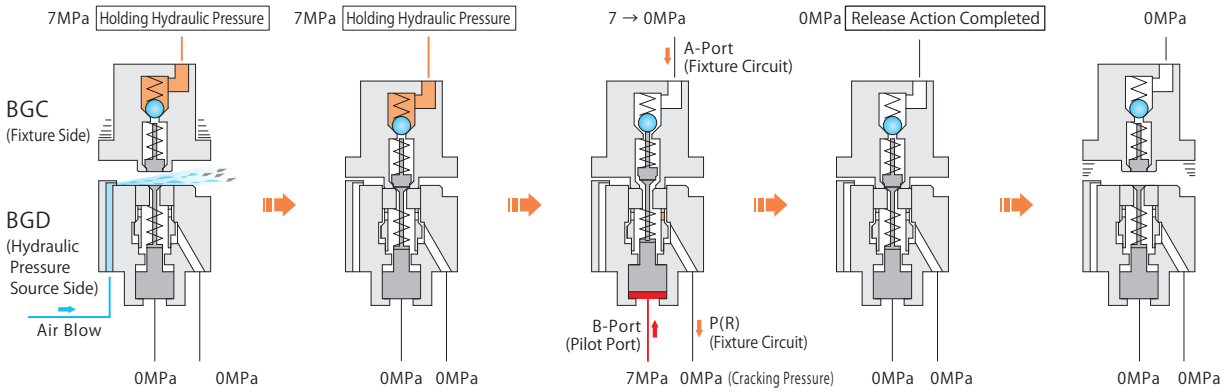
Connection Completion

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, disconnect.

Release Operation



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.

Connection Completion

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)

Model No. Indication

BG D 2 2 1 - 0 G2
1 2 3 4

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

4 Piping Method

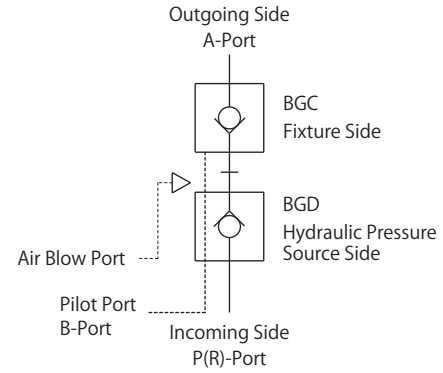
Blank : 1 When C is chosen
G2 : 1 When D is chosen

Specifications

Model No.	Fixture Side	BGC221-0	BGC251-0
	Pressure Source Side	BGD221-0G2	BGD251-0G2
Operating Pressure MPa		1.0~7.0	7.0~25.0
Withstanding Pressure MPa		10.5	37.5
Min. Passage Area mm^2		10.2	
Offset Tolerance mm		±1	
Angular Deviation (Offset Tolerance) DEG.		0.3	
Operating Temperature ℃		0~70	
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32	
Pilot Pressure ※1 MPa		Holding Pressure P / 4.5 + 0.5 or more	
Spring Force when Connecting kN		0.1	
Reaction Force when Pressurized kN	Operating Pressure at 25 MPa	—	3.17
	Operating Pressure at 7 MPa	0.96	
	Operating Pressure at P MPa	0.1227 × P + 0.1	

Note ※1. P : Holding Pressure (MPa)

Circuit Symbol

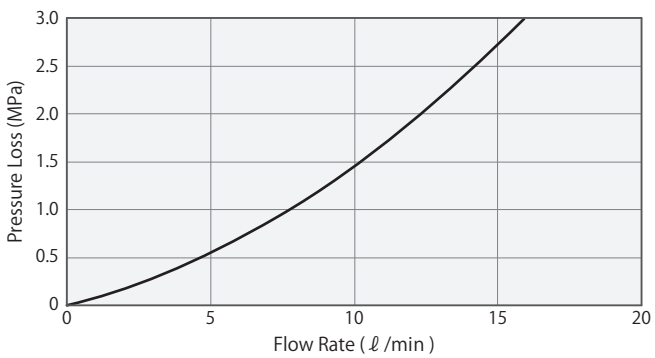


※ Filter is placed at front and back of check valve at the BGC side.
The check valve of the BGD side does not have non-leak function.

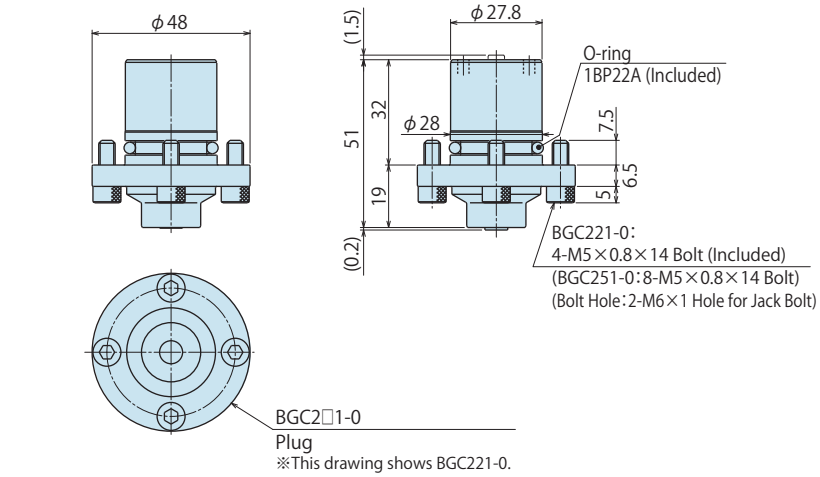
Flow Rate - Pressure Loss Characteristic Graph

The fluid used on this data is normal hydraulic oil corresponding to ISO-VG-32 (30~40℃).

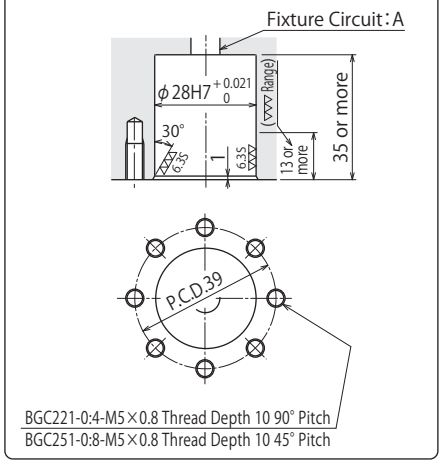
Pressure Loss (MPa)	Flow Rate (ℓ/min)
0	0
0.5	4.9
1.0	7.9
2.0	12.1
3.0	16.0

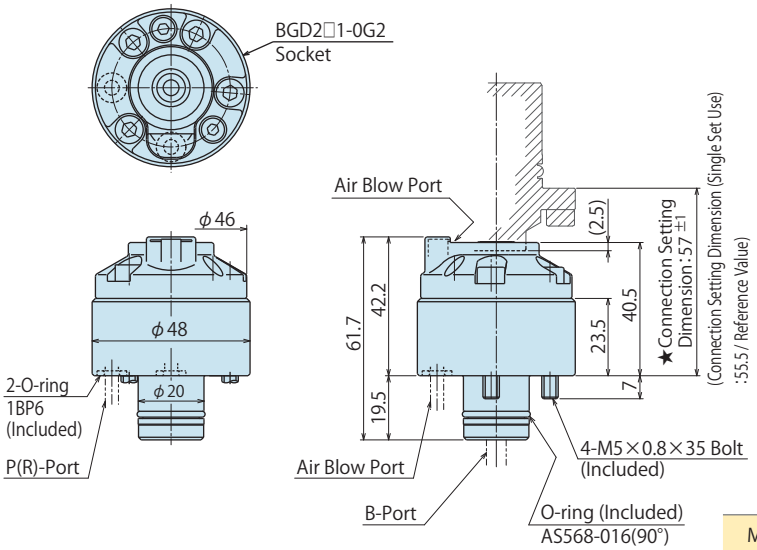


External Dimensions

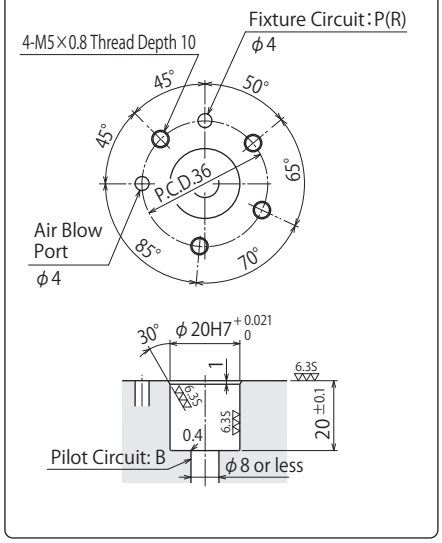


BGC Machining Dimension for Mounting Hole





BGD Machining Dimension for Mounting Hole

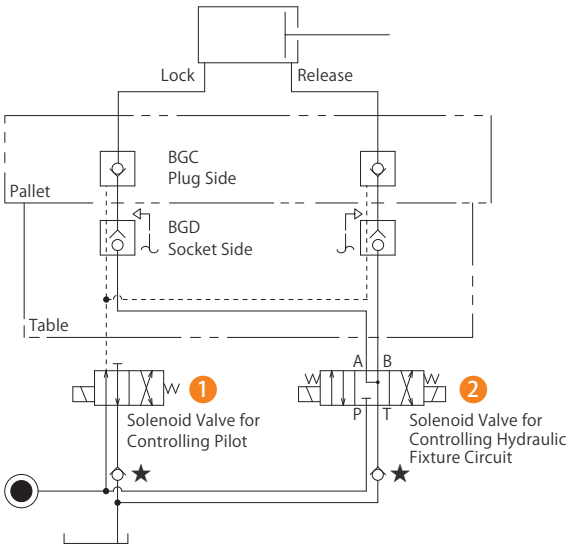


Model No.	Mass (kg)	Mounting Bolt Size	Tightening Torque (N·m)
BGC221-0	0.25	M5×0.8	6.3
BGC251-0	0.25		
BGD221-0G2	0.45		
BGD251-0G2	0.45		

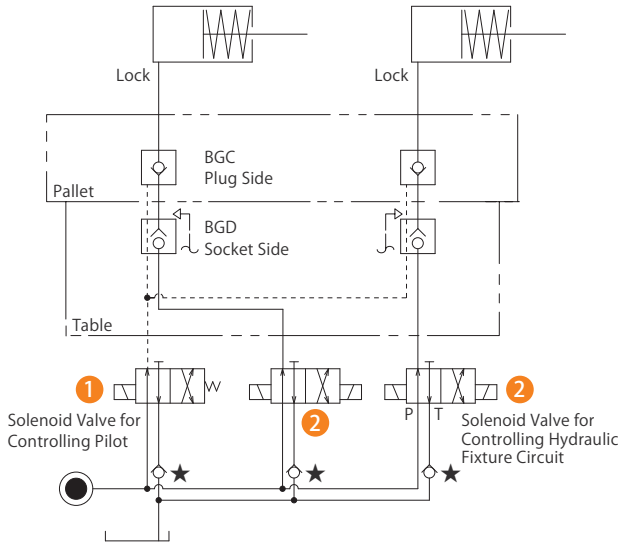
Note 1. In the case that there is stopper, please follow the ★connection dimension in the drawing.

System Circuit Diagram (Example)

Double Action Circuit



Single Action 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.
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. (Valve 1 operation)
2. Supply the lock side circuit of the hydraulic fixture actuator with hydraulic pressure. (Valve 2 operation)
3. After finishing pressurization, shut off the hydraulic pressure supply to the pilot circuit. (Valve 1 operation)
4. After shutting off the hydraulic pressure to all actuators, disconnect BGC/BGD. (Valve 2 operation：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. (Valve 1 operation)
2. ly the release side circuit of the hydraulic fixture actuator with hydraulic pressure. (Valve 2 operation)

Controlling Single Action Circuit

When connecting or disconnecting BGC/BGD, shut off the hydraulic pressure supply to the hydraulic fixture circuit.
When connecting or disconnecting BGC/BGD, use the center position to shut off the hydraulic pressure supply.
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 the device that can normally release at a pressure equal to or 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. (Valve 1 operation)
2. Supply each actuator circuit of the hydraulic fixtures with hydraulic pressure. (Valve 2 operation)
3. After finishing pressurization, shut off the hydraulic pressure supply to the pilot circuit. (Valve 1 operation)
4. After shutting off the hydraulic pressure supply to all the actuators, disconnect BGC/BGD. (Valve 2 operation)

Release Operation Procedure

1. The release operation can be performed only 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 (BGC/BGD)

1. Since pressurizing reaction force is produced during pressure supply to port P, it is necessary to add a 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 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, use the force 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.

PAT.

Non-Leak Coupler

with Pilot Check Valve

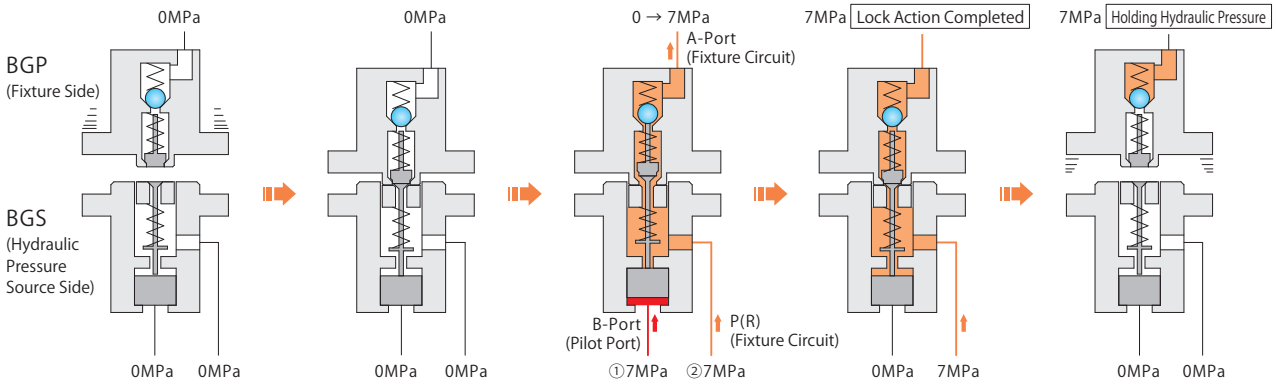
Model **BGP/BGS**

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



Please make a connection as of each port at BGS side under the condition where the hydraulic pressure is stopped.

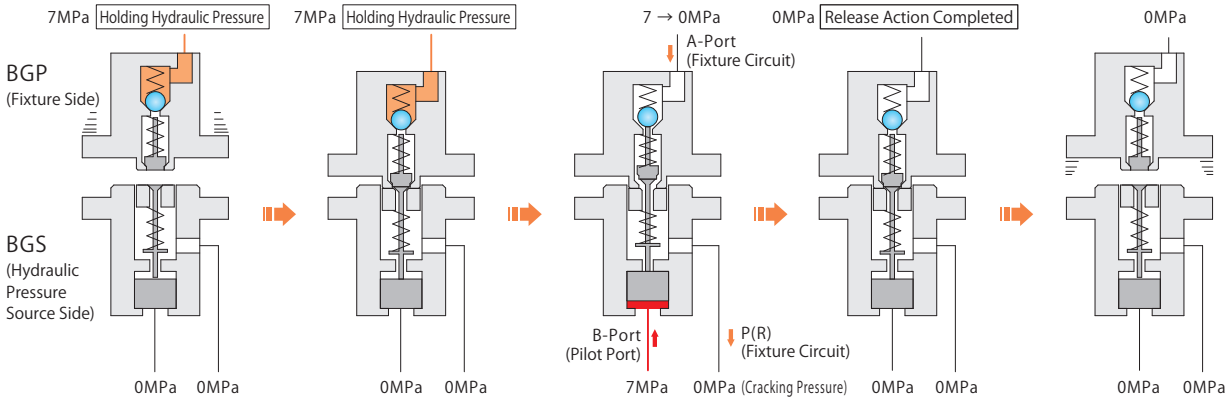
Connection Completion

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).

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

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

Release Operation



Please make a connection as of each port at BGS side under the condition where the hydraulic pressure is stopped.

Connection Completion

Supply the hydraulic pressure to the pilot port B, then open the check valve at the BGP 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. 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 2

1 Style

P : Plug (Fixture Side)

S : Socket (Hydraulic Pressure Source Side)

2 Design No.

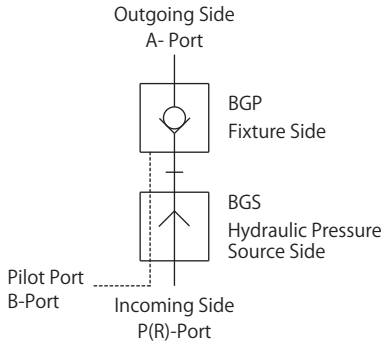
1 : Revision Number

Specifications

Model No.	Fixture Side	BGP221-0
	Pressure Source Side	BGS221-0
Operating Pressure	MPa	1.0 ~ 7.0
Withstanding Pressure	MPa	10.5
Min. Passage Area	mm^2	11.0
Offset Tolerance	mm	±1
Angular Deviation (Offset Tolerance)	DEG.	0.3
Operating Temperature	℃	0~70
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32
Pilot Pressure ※1	MPa	Holding Pressure P / 3.8 + 0.4 or more
Spring Force when Connecting	kN	0.07
Reaction Force when Pressurized kN (Operating Pressure)	at 7 MPa	0.93
	at P MPa	0.1227 × P + 0.07

Note ※1. P : Holding Pressure (MPa)

Circuit Symbol

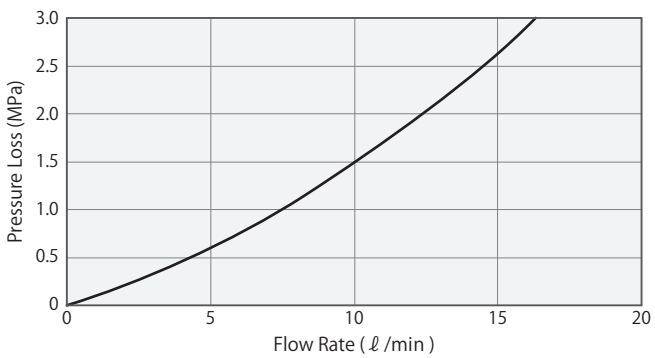


※ Filter is placed at front and back of check valve at the BGP side.
BGS side has no check valve.

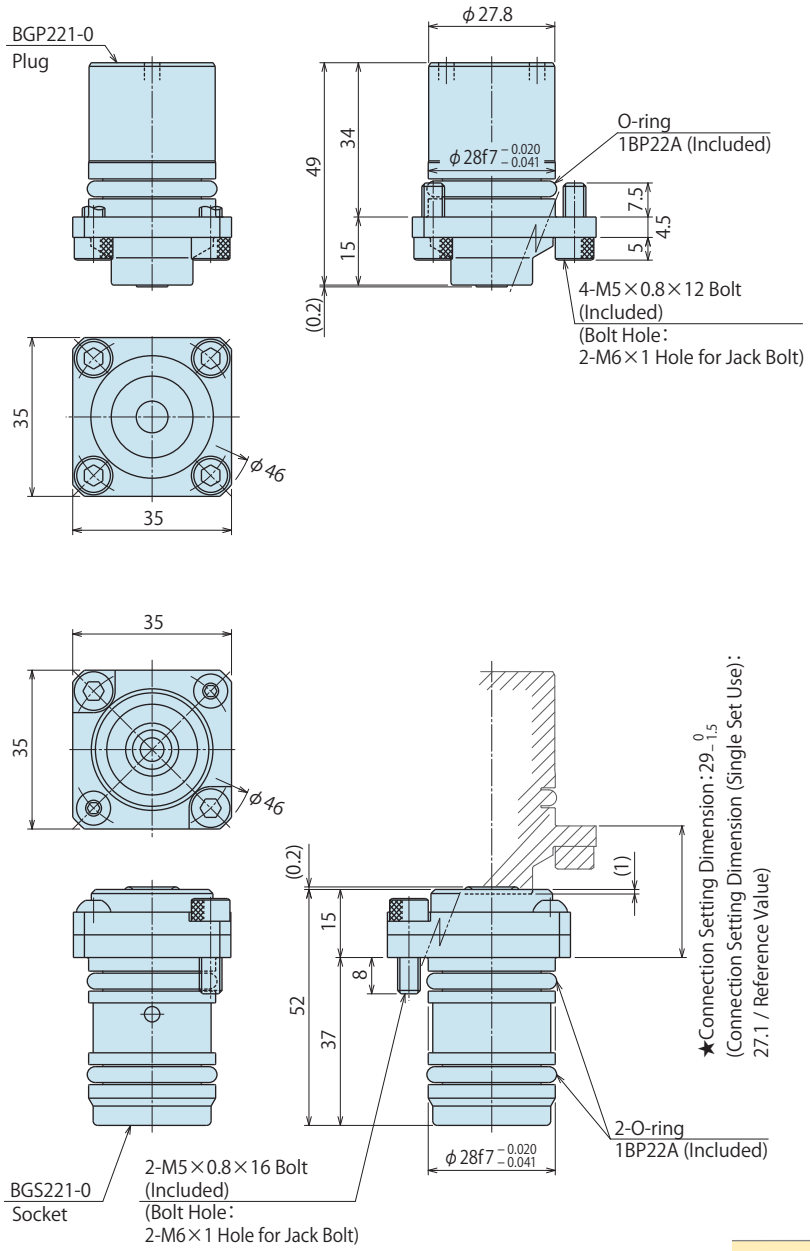
Flow Rate - Pressure Loss Characteristic Graph

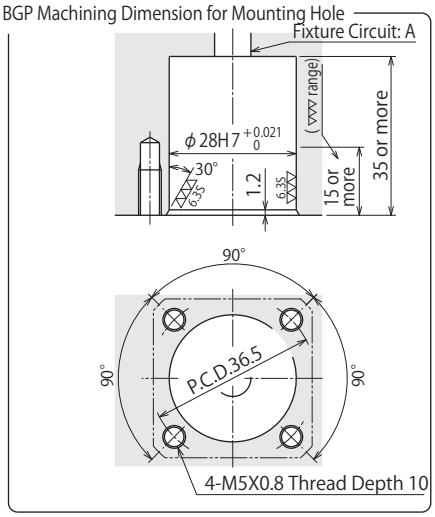
The fluid used on this data is normal hydraulic oil corresponding to ISO-VG-32 (30~40℃).

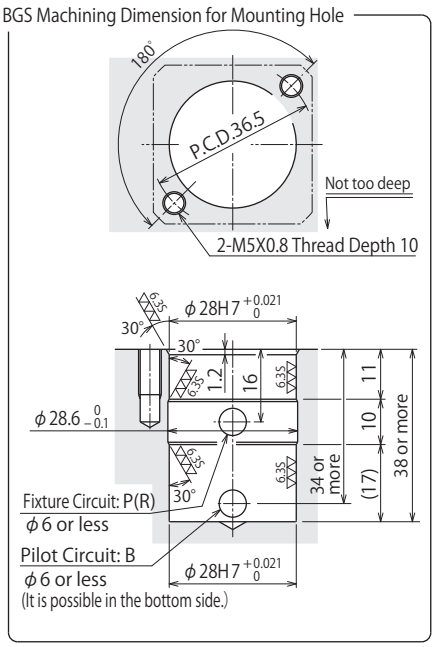
Pressure Loss (MPa)	Flow Rate (ℓ/min)
0	0
0.5	4.2
1.0	7.8
2.0	12.1
3.0	16.4



External Dimensions





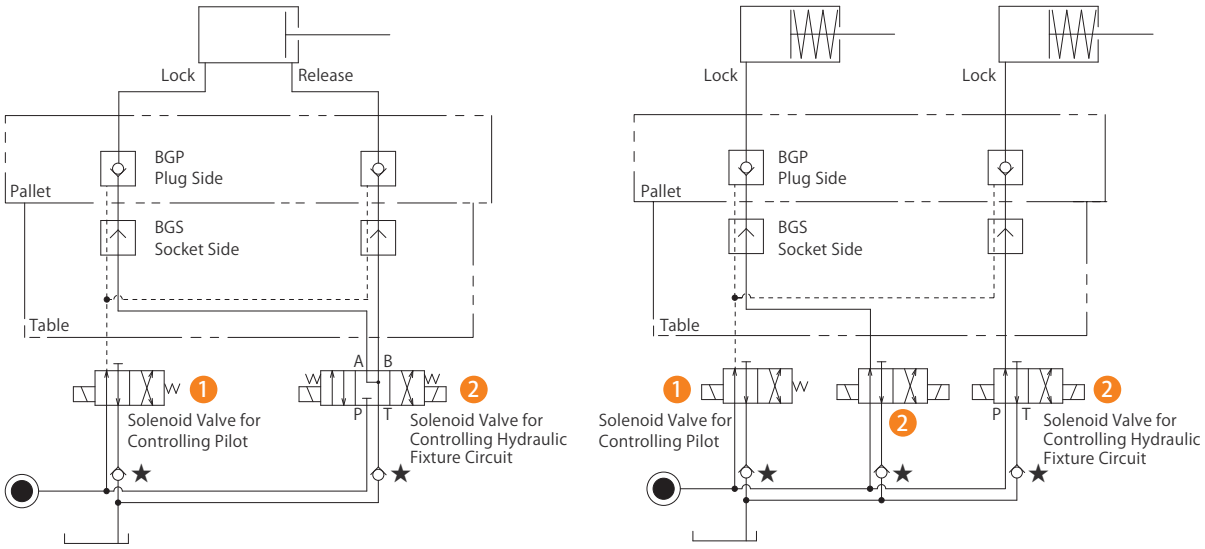


Model No.	Mass (kg)	Mounting Bolt Size	Tightening Torque (N·m)
BGP221-0	0.25	M5×0.8	6.3
BGS221-0	0.22		

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

System Circuit Diagram (Example)

Double Action Circuit	Single Action 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 BGP/BGS, use the center position to shut off the hydraulic pressure supply.
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. (Valve 1 operation)
2. Supply the lock side circuit of the hydraulic fixture actuator with hydraulic pressure. (Valve 2 operation)
3. After finishing pressurization, shut off the hydraulic pressure supply to the pilot circuit. (Valve 1 operation)
4. After shutting off the hydraulic pressure to all actuators, disconnect BGP/BGS. (Valve 2 operation：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. (Valve 1 operation)
2. Supply the release side circuit of the hydraulic fixture actuator with hydraulic pressure. (Valve 2 operation)

Controlling Single Action Circuit

When connecting or disconnecting BGP/BGS, shut off the hydraulic pressure supply to the hydraulic fixture circuit.
When connecting or disconnecting BGP/BGS, use the center position to shut off the hydraulic pressure supply.
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 the device that can normally release at a pressure equal to or 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. (Valve 1 operation)
2. Supply each actuator circuit of the hydraulic fixtures with hydraulic pressure. (Valve 2 operation)
3. After finishing pressurization, shut off the hydraulic pressure supply to the pilot circuit. (Valve 1 operation)
4. After shutting off the hydraulic pressure supply to all the actuators, disconnect BGP/BGS the auto coupler. (Valve 2 operation)

Release Operation Procedure

1. The release operation can be performed only 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 a 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, please do 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.
(Cover the surface to ensure that foreign materials and chips do not stick to the surface .)
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 and lower than 4.0kN.
8. In the condition that pressurization of port P is finished, pilot pressure supply to port B does not result in check valve opening.

PAT.

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

BB P 50 0 - 0 G

1 2 3

1 Style

P : Plug (Fixture Side)

S : Socket (Hydraulic Pressure Source Side)

2 Design No.

0 : Revision Number

3 Piping Method

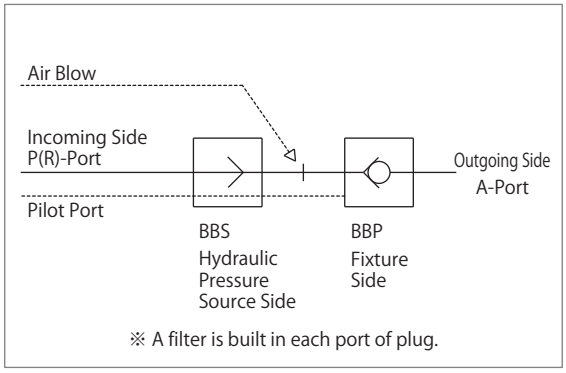
Blank : Standard Model

G : Gasket Option (only BBP selectable)

Specifications

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

Circuit Symbol

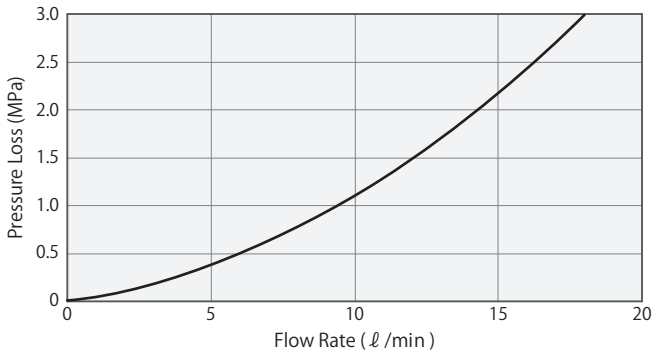


※ A filter is built in each port of plug.

Flow Rate - Pressure Loss Characteristic Graph

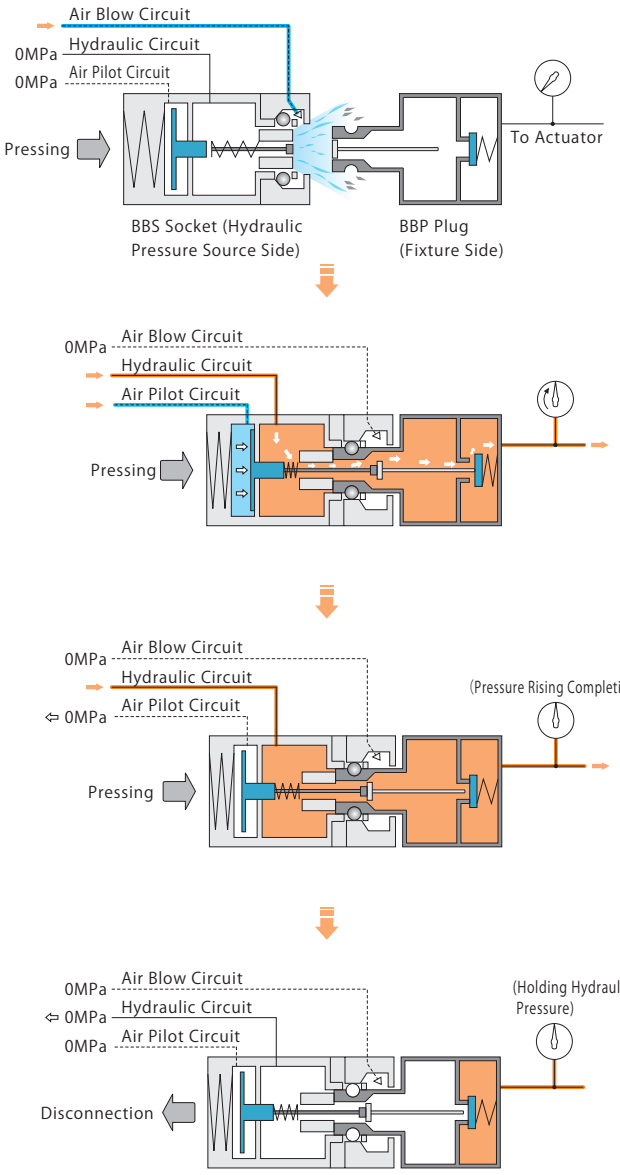
The fluid used on this data is normal hydraulic oil corresponding to ISO-VG-32 (30~40℃).

Pressure Loss (MPa)	Flow Rate (ℓ/min)
0	0
0.5	5.9
1.0	9.5
1.5	12.1
2.0	14.2
2.5	16.3
3.0	18.0

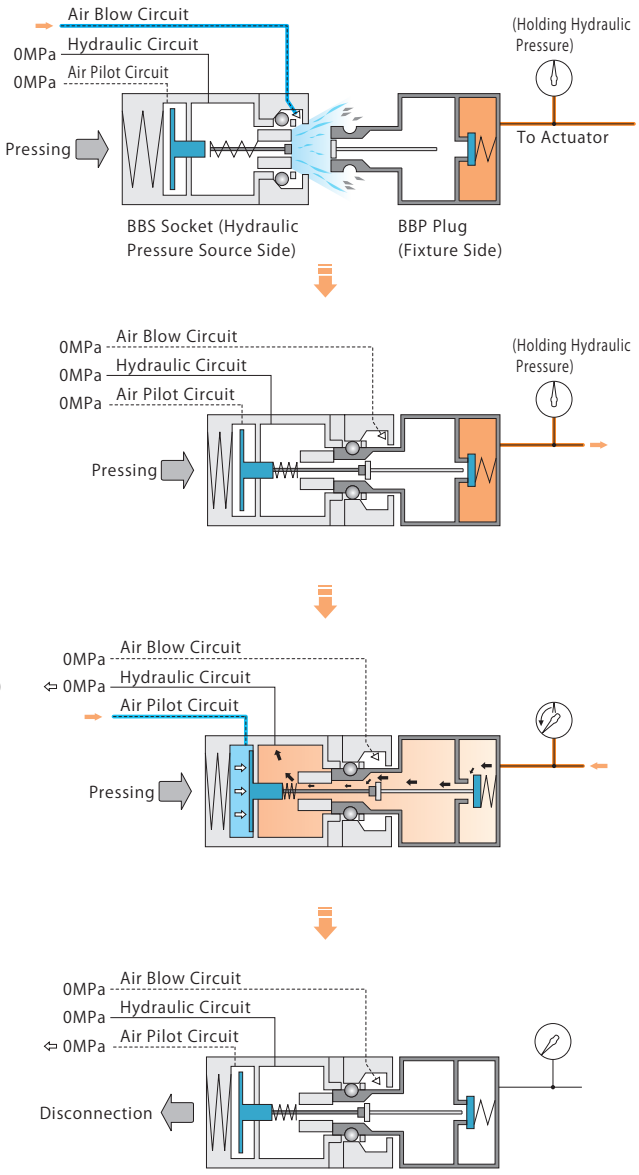


Action Description

Lock Operation

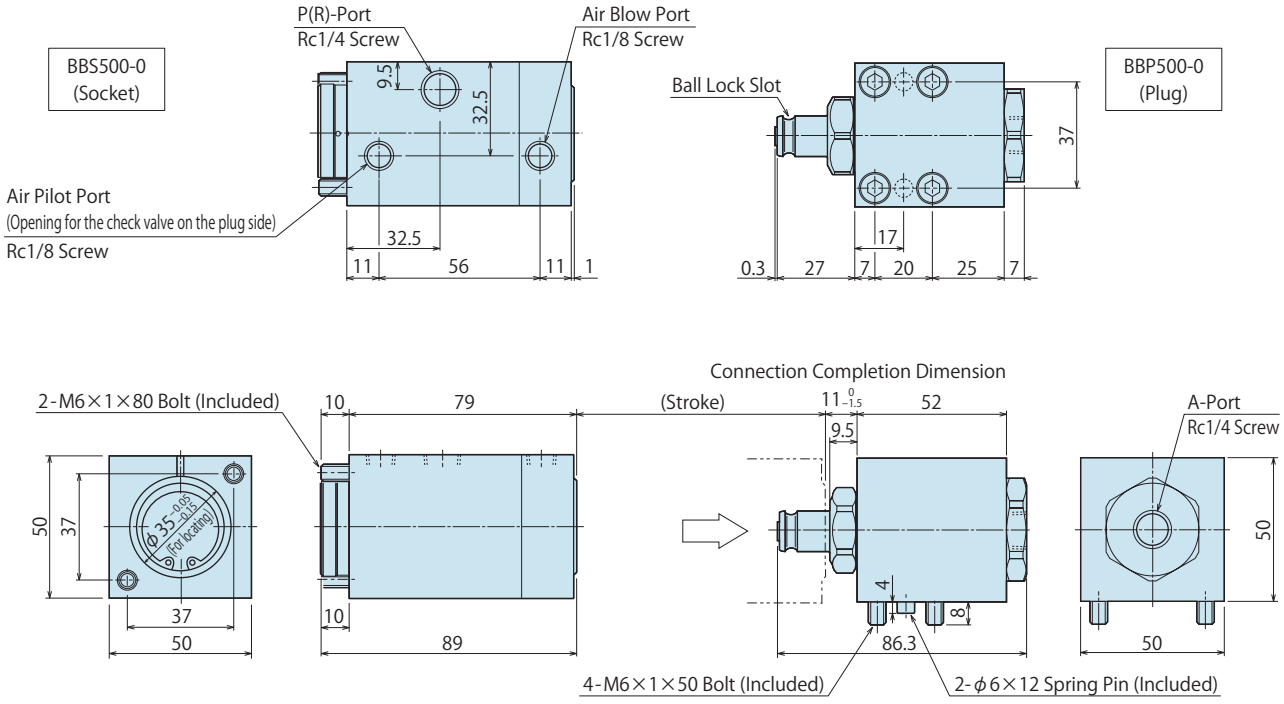


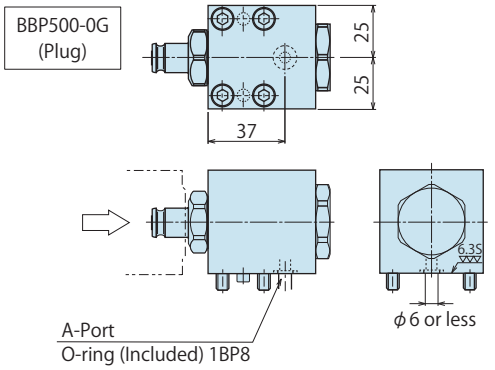
Release Operation



	Operation Sequence	Remarks
When locking	Connect the socket and plug while supplying air blow circuit.	
	Stop the air blow after the connection.	
	Supply air to the air pilot circuit.	Check valve at plug side open.
	Supply oil to the hydraulic circuit. The hydraulic pressure is supplied to the coupler. (plug)	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.)
	After finishing hydraulic pressurization of plug side, stop air supply to the air port circuit with the hydraulic pressure supplied.	Check valve at plug side is closed.
	Stop the hydraulic oil supply to hydraulic circuit.	The hydraulic pressure at plug side is held.
	Separate socket from plug. The hydraulic pressure (plug) is held.	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.
When releasing	Connect the socket and plug while supplying air blow circuit.	
	Stop the air blow after the connection.	Hydraulic pressure of the plug side is maintained since the check valve is closed.
	supply air to the air pilot circuit. The plug side pressure is released.	check valve at plug side open.
	Stop air supply to the air pilot circuit.	
	Disconnect socket and plug.	

External Dimensions





Model No.	Mass (kg)	Mounting Bolt Size	Tightening Torque (N·m)
BBP500-0	1.1	M6×1	10
BBP500-0G	1.1		
BBS500-0	1.4		

Cautions (BBP/BBS)

1. Roughness of mounting surface for G option should be 6.3S.
2. Pressing force on connecting is higher that 0.25kN and lower that 4kN.
3. Tolerance of position in the stroke direction for machining spring-pin hole φ6 of each plug should be within ±0.1, when using numerous couplers.
4. When there is any possibilities of chip adhesion on the ball lock groove of BBP, provide with an adhesion preventive cover or an external air blow nozzle.
5. Do not use the coupler with the connecting surface of the socket upward.
   Otherwise foreign substances (chips and so on) may 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, the 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, backpressure 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.)

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

Air Sequence Valve
BWD

Hydraulic Non-Leak Coupler
BGA/BGB
BGC/BGD
BGP/BGS
BBP/BBS
BNP/BNS
BJP/BJS
BFP/BFS

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

Rotary Joint
JR

Hydraulic Valve
BK
BEQ
BT
BLS/BLG
BLB
JSS/JS
JKA/JKB
BM/BMG
AU/AU-M
BU
BP/JPB
BX
BEP/BSP
BH
BC

Air Hydraulic Unit
CV
CK
CP
CS
CB
CC
AB/AB-V
AC/AC-V

PAT.

Non-Leak Coupler

Model BNP/BNS

Feature

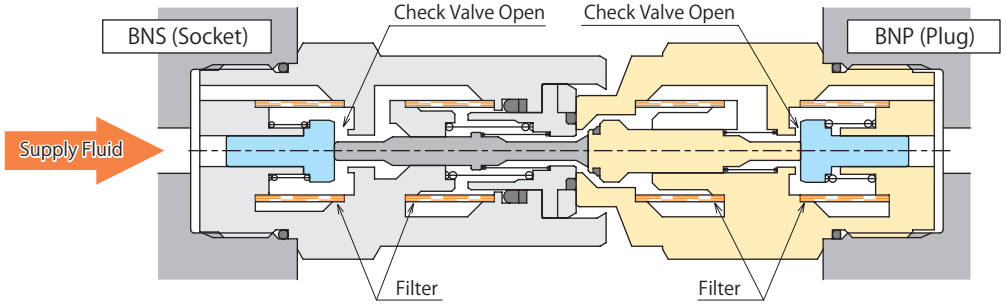
Non-leak auto coupler equipped with aligning mechanism to enable connection and disconnection under a pressurized condition.

It is suitable for saving space in multiple connection because of its screwed end design.

Action Description

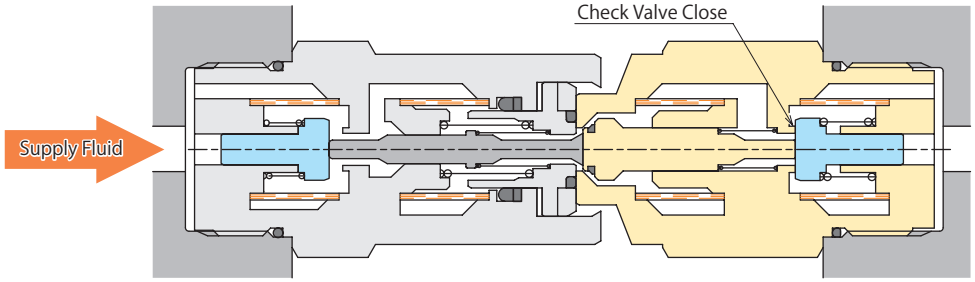
1. When connection is completed

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.



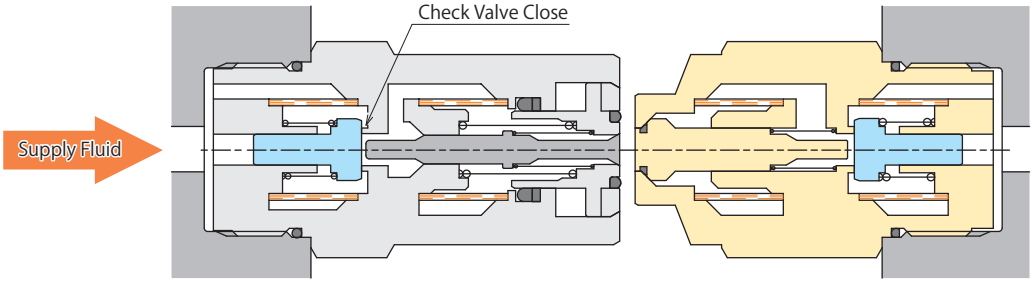
2. During disconnecting

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



3. Disconnection

The check valve which is inside the socket on the fluid supply side is closed.
(Reaction force acts 100% until the valve of socket closes. After the check valve of socket closed, it decreases gradually until both tips separates.)



Model No. Indication

BN P 2 2 0 - 0A

1 2 3

1 Style

P : Plug (Fixture Side)

S : 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.

0 : Revision Number

Specifications

Model No.			BNP220-0A	BNP250-0A
		Pressure Source Side	BNS220-0A	BNS250-0A
Operating Pressure		MPa	1.0~7.0	7.0~25.0
Withstanding Pressure		MPa	10.5	37.5
Min. Passage Area		mm^2	11.0	
Offset Tolerance		mm	±1	
Angular Deviation (Offset Tolerance)		DEG.	0.3	
Operating Temperature		℃	0~70	
Usable Fluid			General Hydraulic Oil Equivalent to ISO-VG-32	
Reaction Force kN	Operating Pressure	at 25 MPa	—	3.23
		at 7 MPa	1.02	
		at P MPa	0.1227 × P + 0.16	

Circuit Symbol

BNS (Socket) Hydraulic Pressure Source Side

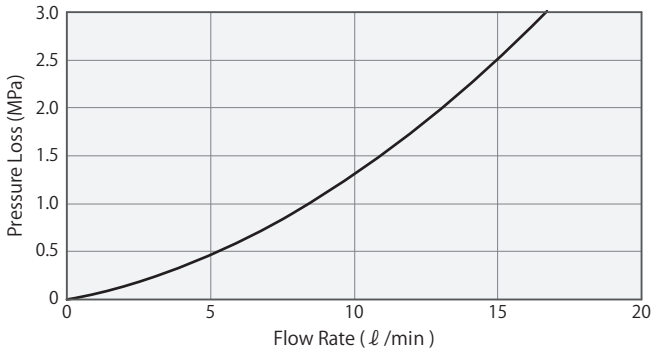
BNP (Plug) Fixture Side

※ Installing filter on both sides of each check valve.

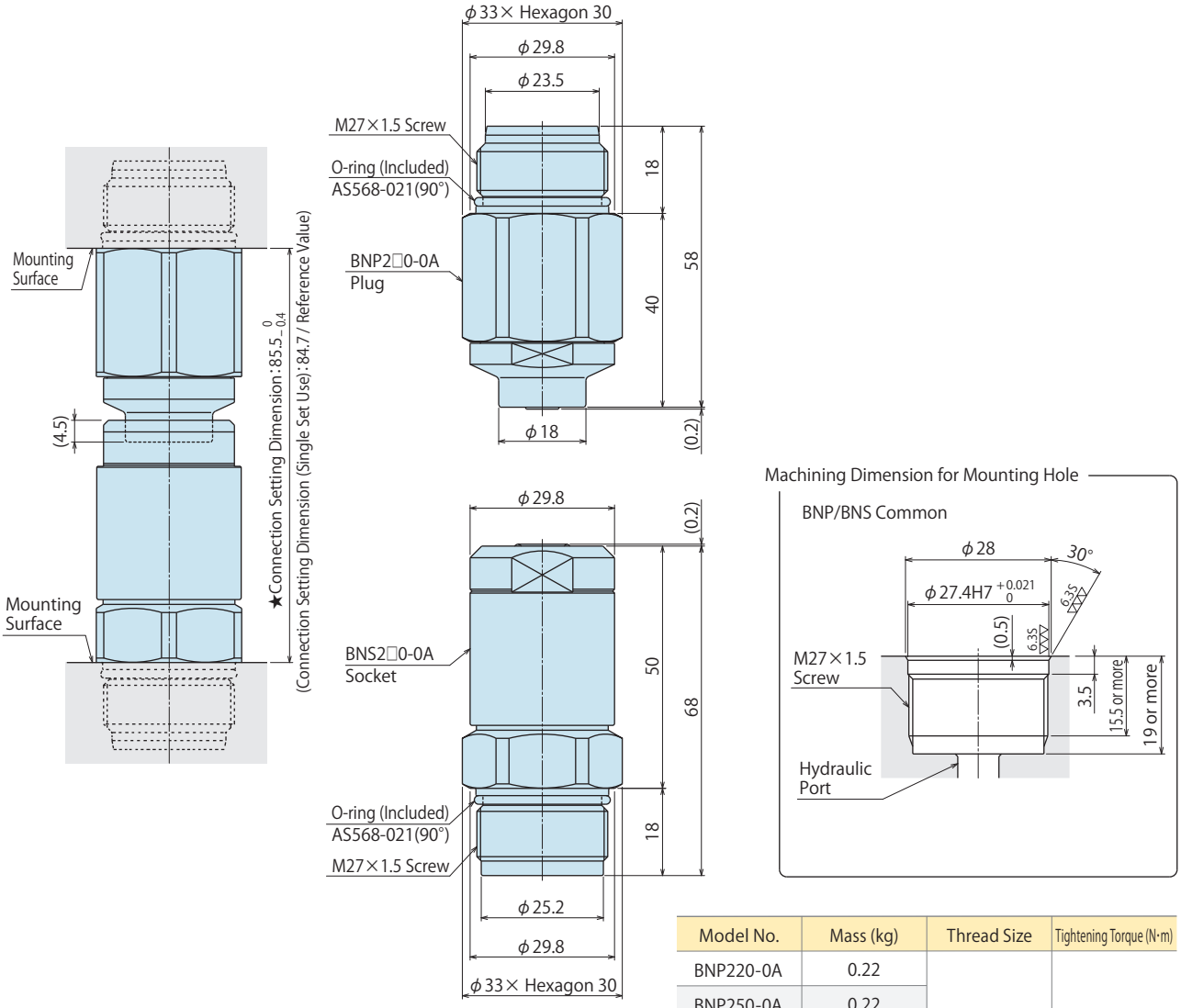
Flow Rate - Pressure Loss Characteristic Graph

The fluid used on this data is normal hydraulic oil corresponding to ISO-VG-32 (30~40℃).

Pressure Loss (MPa)	Flow Rate (ℓ/min)
0	0
0.5	5.3
1.0	8.5
1.5	10.9
2.0	13.0
2.5	14.9
3.0	16.7



External Dimensions



Model No.	Mass (kg)	Thread Size	Tightening Torque (N·m)
BNP220-0A	0.22	M27×1.5	10
BNP250-0A	0.22		
BNS220-0A	0.28		
BNS250-0A	0.28		

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 notice that reaction force would cause connection 1 removal action.
3. Perform air bleeding of the circuit sufficiently prior to operation. (Oil drip amount can increase.)
4. Do not connect the joint in a condition where chips or coolant adhere to the end surfaces.
   (Cover the surface to ensure that foreign materials & chips do not stick to the surface.)
5. Install and remove with ϕ33×HEX.30 part without fail.
6. Use socket on hydraulic pressure source side and plug on fixture side.
7. When pressing up to the connection limit, use the force higher than the reaction force and lower than 6.0kN.

MEMO

PAT.

Non-Leak Coupler

Model BJP/BJS

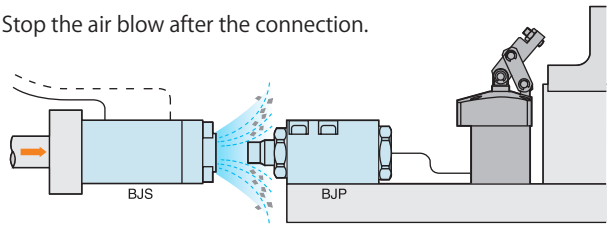
Feature

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

Action Description

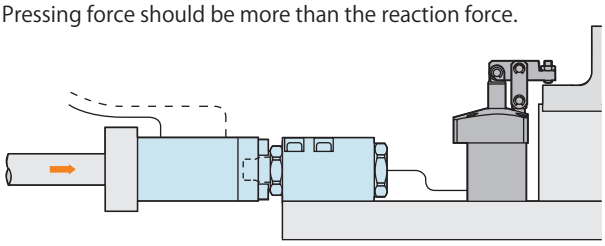
1. Before Connection

Supply air to remove chips adhered around the connection port by air blow.
Stop the air blow after the connection.



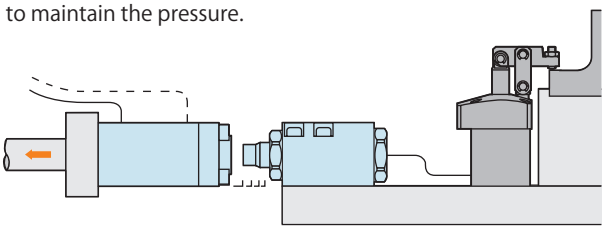
2. Connection Completion

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



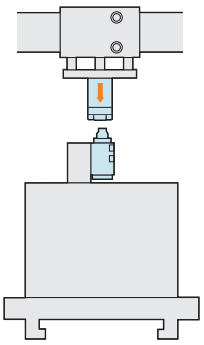
3. Disconnection

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

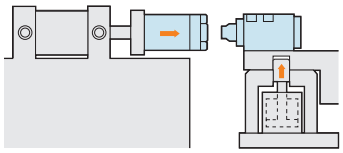


Connection Considering Pressing Force

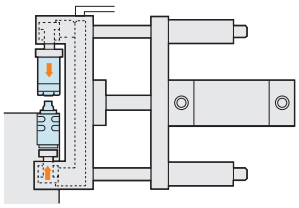
Connection Downward



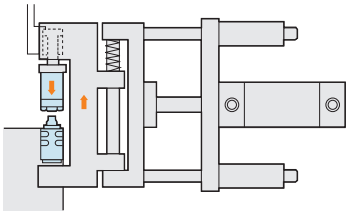
Connection Using Lock Pin



Connection Using Bracket
(Synchronized hydraulic cylinder built in)



Connection Using Bracket
(Hydraulic cylinder and spring built in)



Model No. Indication

BJ P 2 2 0 - 0 □

1 2 3 4 5

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

4 Design No. (Revision Number)

0 : 2 When 2 (Rc1/4 Thread) is chosen.

1 : 2 When 3 (Rc3/8 Thread) is chosen.

5 Piping Method

Blank : Standard Model (BJP/BJS selectable)

A : Top Surface Piping Option (only BJP selectable)

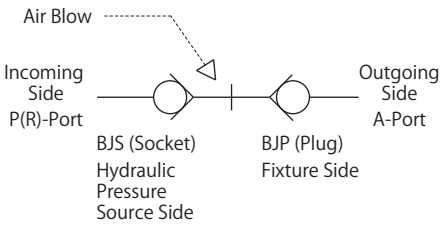
B : Side Surface Piping Option (only BJP selectable)

G : Gasket Option (only BJP selectable)

Specifications

Model No.	Fixture Side	BJP220-0□	BJP250-0□	BJP321-0□	BJP351-0□
	Hydraulic Pressure Source Side	BJS220-0	BJS250-0	BJS321-0	BJS351-0
Operating Pressure MPa		1.0~7.0	7.0~30.0	1.0~7.0	7.0~30.0
Withstanding Pressure MPa		10.5	37.5	10.5	37.5
Min. Passage Area mm²		10.3		40	29
Offset Tolerance mm		±1			
Angular Deviation (Offset Tolerance) DEG.		0.5			
Operating Temperature ℃		0~70			
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32			
Reaction Force kN (Operating Pressure)	at 25 MPa	—	2.09	—	3.99
	at 7 MPa	0.68		1.22	
	at P MPa	0.0785 × P + 0.13		0.154 × P + 0.14	

Circuit Symbol

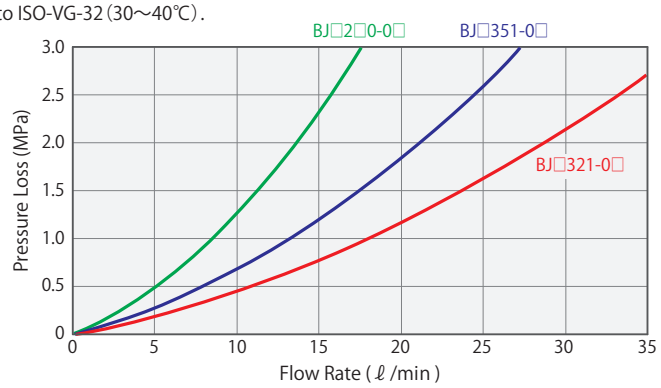


※ Filters are built on each side of the port and connection side.

Flow Rate - Pressure Loss Characteristic Graph

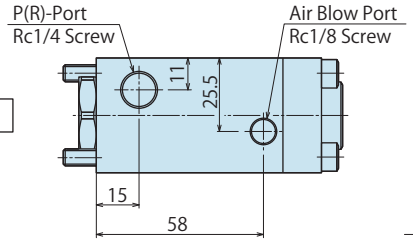
The fluid used on this data is normal hydraulic oil corresponding to ISO-VG-32 (30~40℃).

Pressure Loss (MPa)	Flow Rate (ℓ/min) BJP2□0-0□ BJS2□0-0	BJP321-0□ BJS321-0	BJP351-0□ BJS351-0
0	0	0	0
0.5	5.2	11.0	8.1
1.0	8.4	17.6	13.1
1.5	11.4	24.2	17.7
2.0	13.5	28.6	21.0
2.5	15.6	33.0	24.2
3.0	17.7	37.4	27.4

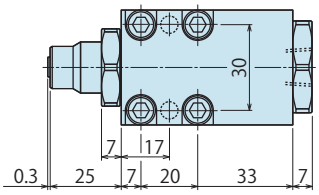


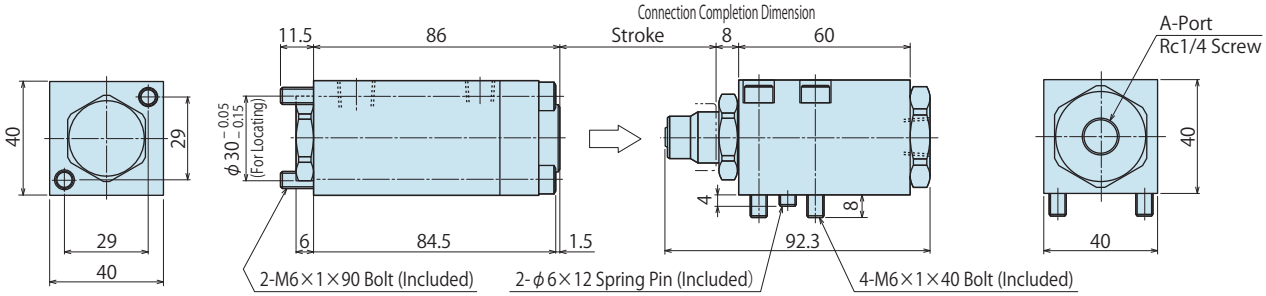
External Dimensions (BJ□2□0-0□)

BJS2□0-0 (Socket)



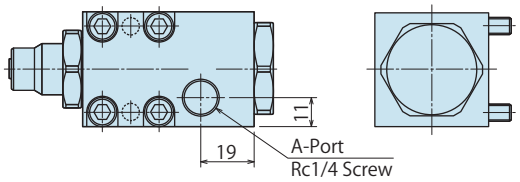
BJP2□0-0 (Plug)





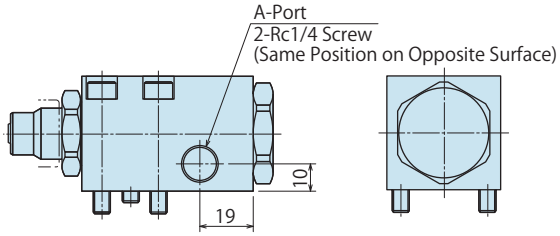
BJP2□0-0A (Plug)

※The area where it is not described, is same as BJP2□0-0.



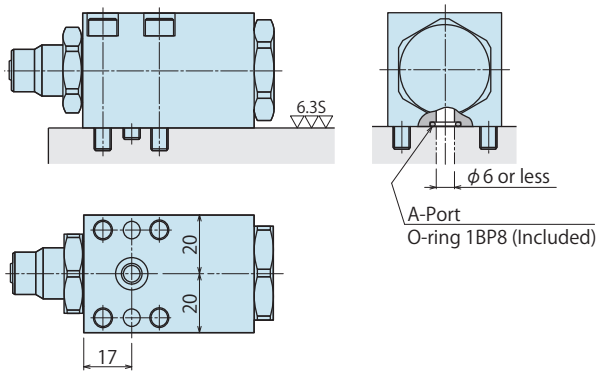
BJP2□0-0B (Plug)

※The area where it is not described, is same as BJP2□0-0.



BJP2□0-0G (Plug)

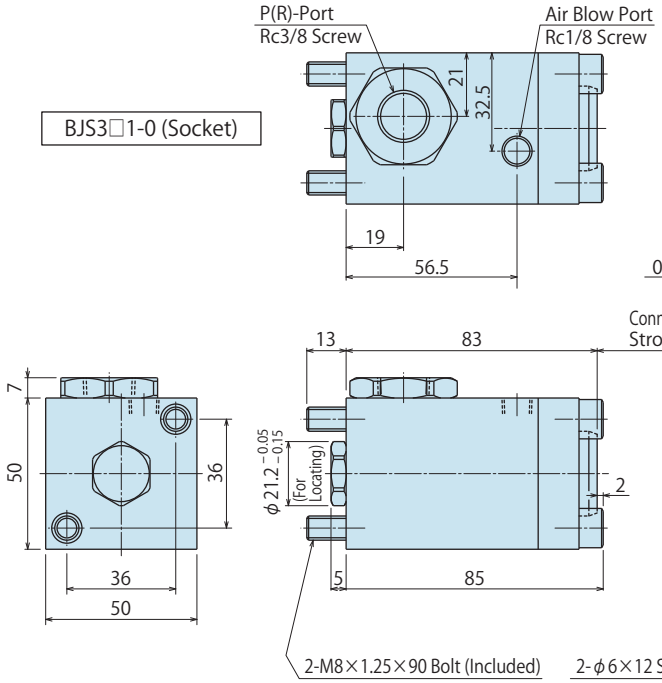
※The area where it is not described, is same as BJP2□0-0.



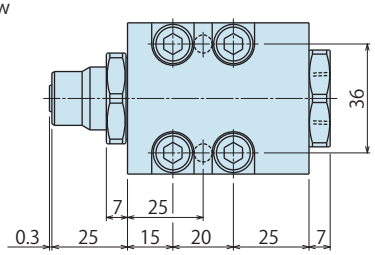
Model Code	Mass (kg)	Mounting bolt size	Tightening torque (N·m)
BJP2□0-0□	0.8	M6×1	10
BJS2□0-0	0.9		

External Dimensions (BJ□3□1-0□)

BJS3□1-0 (Socket)

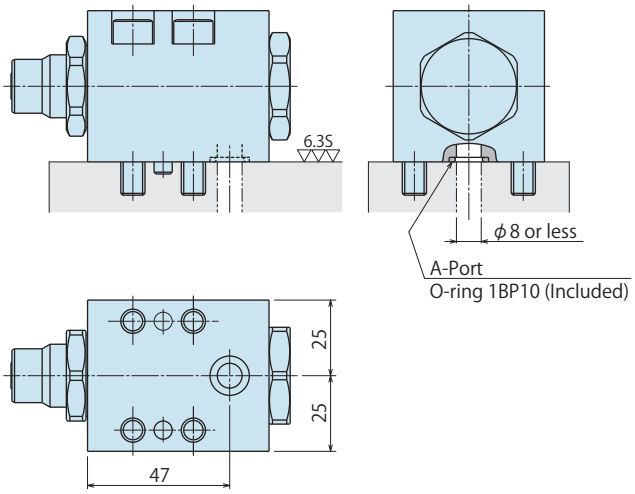


BJP3□1-0 (Plug)



BJP3□1-0G (Plug)

※The area where it is not described, is same as BJP3□1-0.



Model Code	Mass (kg)	Mounting Bolt Size	Tightening Torque (N·m)
BJP3□0-0□	1.1	M8×1.25	25
BJS3□0-0	1.4		

Cautions (BJP/BJS)

1. Roughness of mounting surface (O-ring seal surface) should be 6.3S or better.
2. Pressing force for connection should be more than the reaction force and less than 6kN (for BJ□2) or 9kN (for BJ□3).
3. Tolerance of position in the stroke direction for machining spring-pin hole ϕ6 of each plug should be within±0.1, when using numerous couplers.
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.

Non-Leak Coupler

Model BFP/BFS

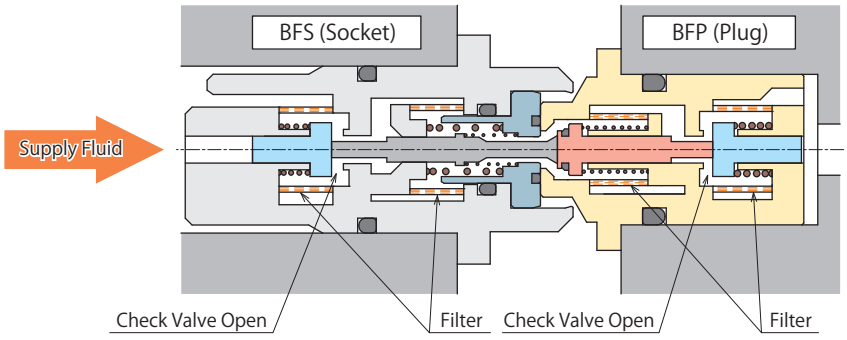
Feature

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

Action Description

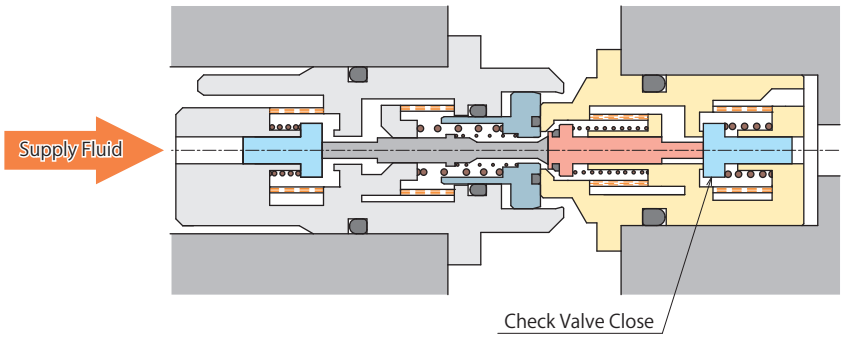
1.When connection is completed

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.



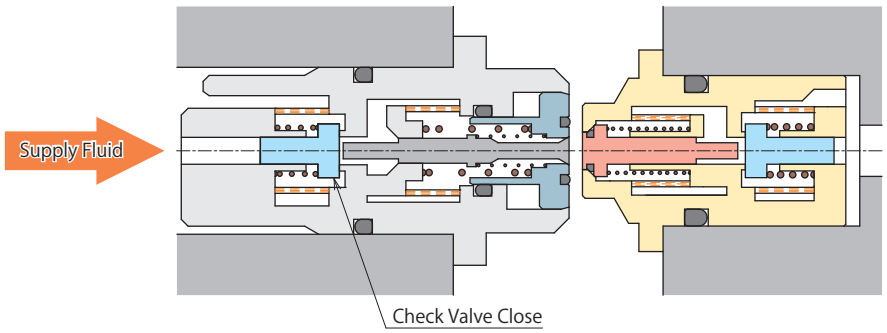
2.During Disconnecting

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 acts 100% until the valve of socket closes. After the check valve of socket closed, it decreases gradually until both tips separates.)



Model No. Indication

BF P 2 2 0 - 0

1 2 3

1 Style

P : Plug (Fixture Side)

S : Socket (Hydraulic Pressure Source Side)

2 Pressure Code (Operating Pressure Range)

2 : 1.0 ~ 7.0 MPa

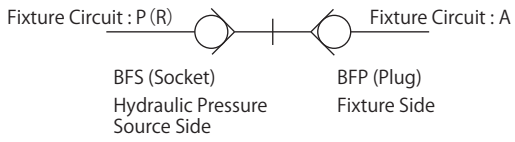
3 Design No.

0 : Revision Number

Specifications

Model No.	Fixture Side		BFP220-0
	Pressure Source Side		BFS220-0
Operating Pressure		MPa	1.0~7.0
Withstanding Pressure		MPa	10.5
Min. Passage Area		mm^2	11
Offset Tolerance		mm	±1
Angular Deviation (Offset Tolerance)		DEG.	0.3
Operating Temperature		℃	0~70
Usable Fluid			General Hydraulic Oil Equivalent to ISO-VG-32
Reaction Force when Pressurized kN	Operating Pressure	at 7 MPa	1.02
		at P MPa	0.1227 × P + 0.16

Circuit Symbol

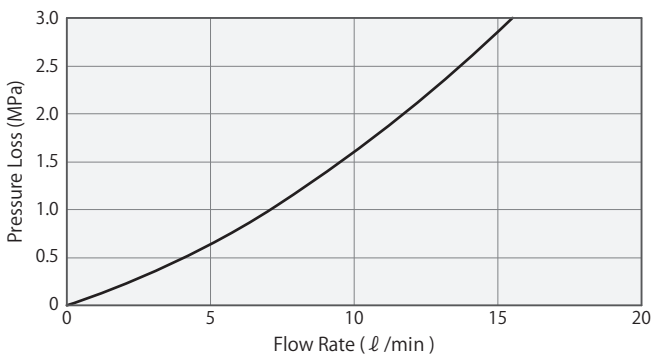


※ Filter is placed at front and back of check valve.

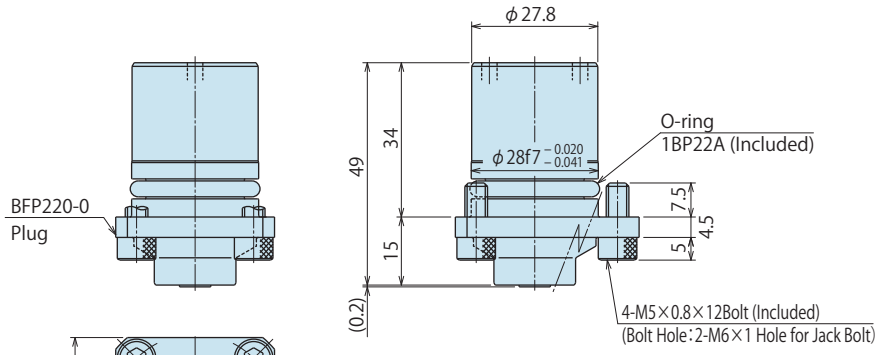
Flow Rate - Pressure Loss Characteristic Graph

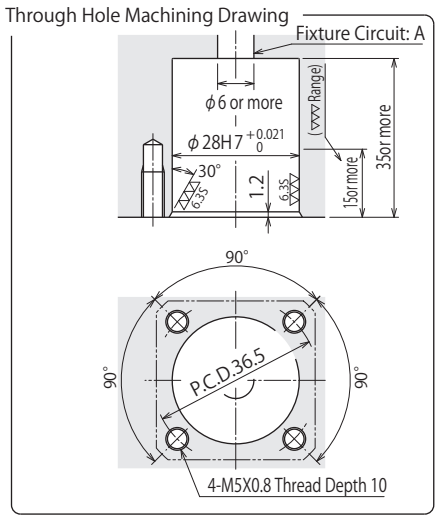
The fluid used on this data is normal hydraulic oil corresponding to ISO-VG-32 (30~40℃).

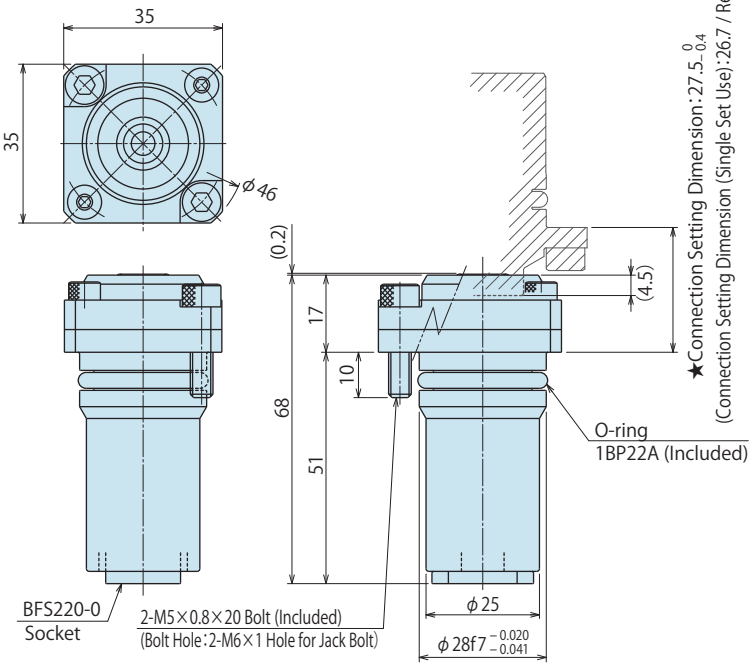
Pressure Loss (MPa)	Flow Rate (ℓ/min) (ℓ/min)
0	0
0.5	4.1
1.0	7.4
2.0	11.5
3.0	15.6

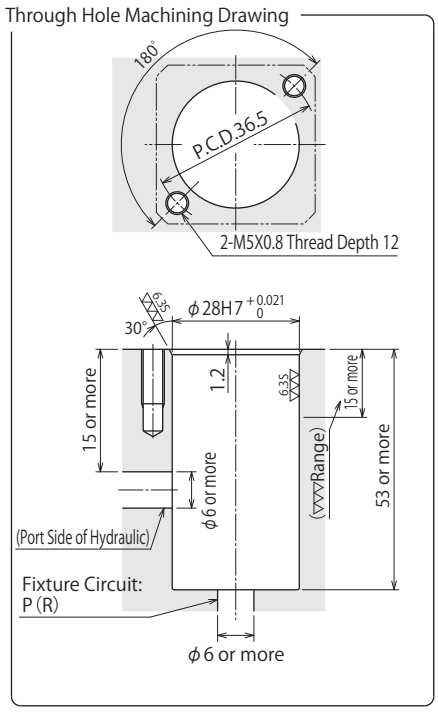


External Dimensions









Model No.	Mass (kg)	Mounting Bolt	Tightening Torque(N·m)
BFP220-0	0.25	M5×0.8	6.3
BFS220-0	0.30		

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 notice that reaction force would cause connection 1 removal action.
3. Perform air bleeding of the circuit sufficiently prior to operation. (Oil drip amount can increase.)
4. Do not connect the joint in a condition where chips or coolant adhere to the end surfaces.
   (Cover the surface to ensure that foreign materials & chips do not stick to the surface.)
5. Use socket on hydraulic pressure source side and plug on 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.

MEMO

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.

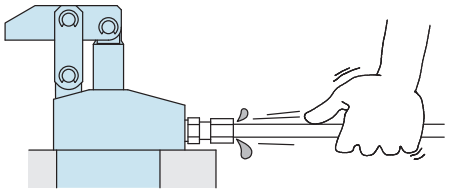
3) Applying Sealing Tape

- 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.

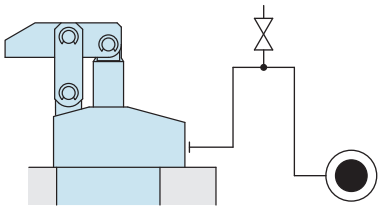
4) Air Bleeding of the Hydraulic Circuit

- 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

ISO Viscosity Grade ISO-VG-32

Maker	Anti-Wear Hydraulic Oil	Multi-Purpose Hydraulic Oil
Showa Shell Sekiyu	Tellus S2 M 32	Morlina S2 B 32
Idemitsu Kosan	Daphne Hydraulic Fluid 32	Daphne Super Multi Oil 32
JX Nippon Oil & Energy	Super Hyrando 32	Super Mulpus DX 32
Cosmo Oil	Cosmo Hydro AW32	Cosmo New Mighty Super 32
ExxonMobil	Mobil DTE 24	Mobil DTE 24 Light
Matsumura Oil	Hydol AW-32	
Castrol	Hyspin AWS 32	

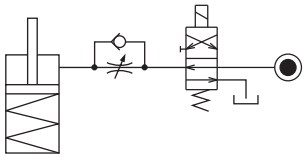
Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

Notes on Hydraulic Cylinder Speed Control Unit

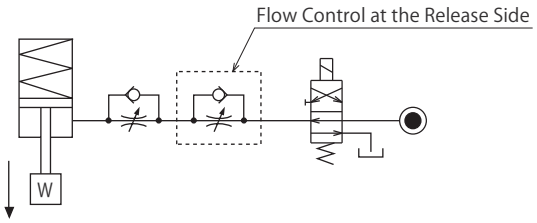
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

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.



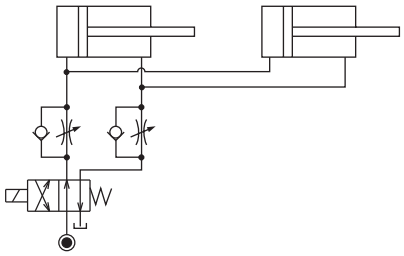
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



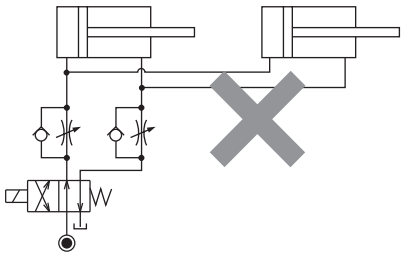
Flow Control Circuit for Double Acting Cylinder

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.47 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)

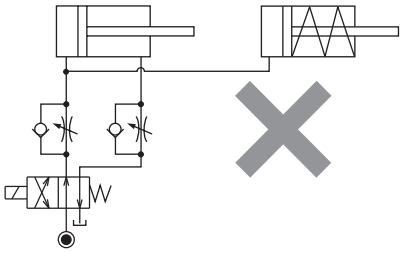


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



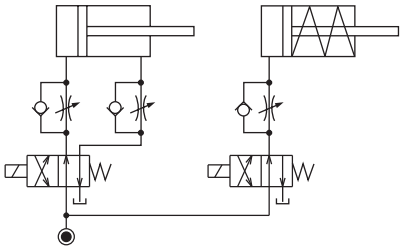
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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.

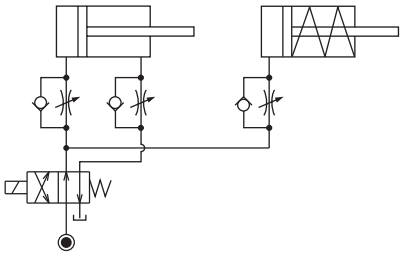


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

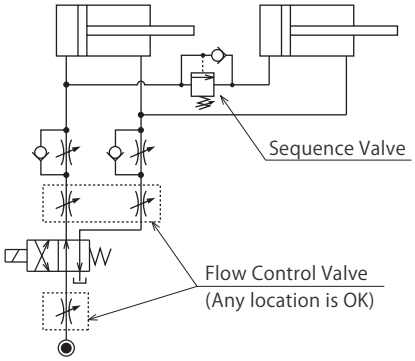
○ Separate the control circuit.



○ 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.



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.



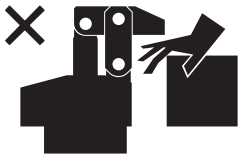
Cautions

Notes on Handling

1) It should be handled by qualified personnel.
- The hydraulic machine and air compressor should be handled and maintained by qualified personnel.

2) Do not handle or remove the machine unless the safety protocols are ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
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 After stopping the machine, do not remove until the temperature cools down.
④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch clamps (cylinder) while clamps (cylinder) is working. Otherwise, your hands may be injured due to clinching.

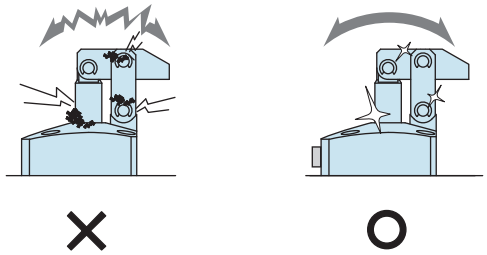


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

Maintenance and Inspection

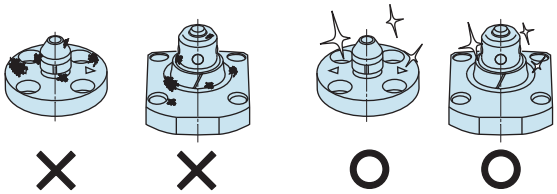
1) Removal of the Machine and Shut-off of Pressure Source
- Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
- Make sure there is no abnormality in the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

2) 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.



3) Please clean out the reference surface regularly (taper reference surface and seating surface) of locating machine .(VS/VT/VL/VM/VJ/VK/WVS/WM/WK/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.



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

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

6) Make sure the hydraulic fluid has not deteriorated.

7) 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.

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

9) 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 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

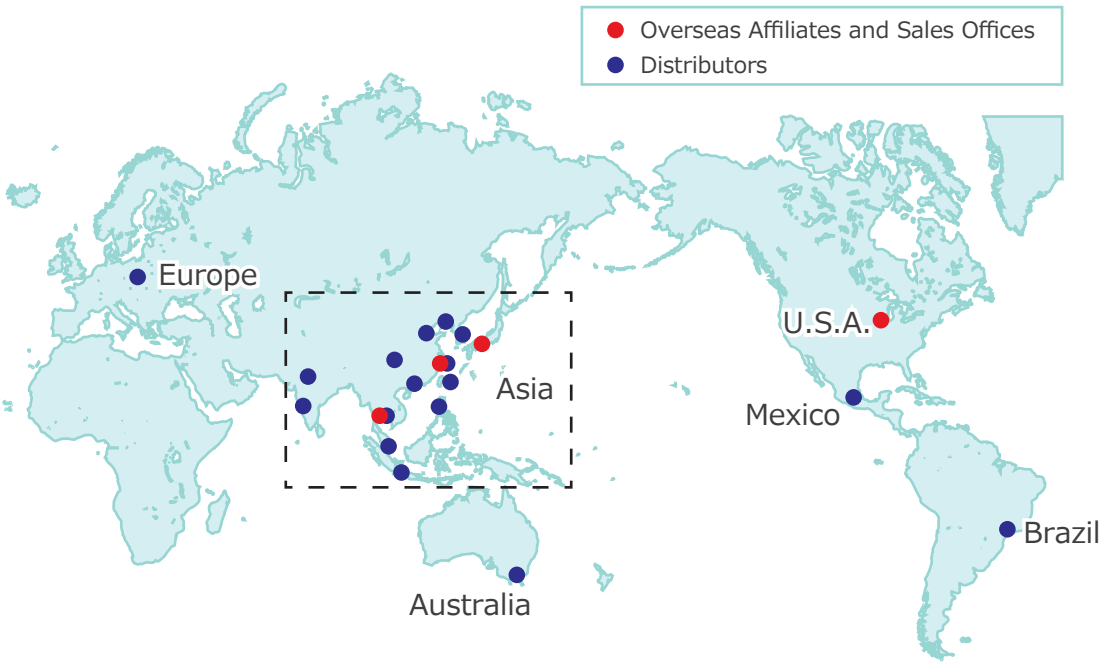
Sales Offices across the World

Japan Overseas Sales	**TEL. +81-78-991-5162**	FAX. +81-78-991-8787 KOSMEK LTD. 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241 〒651-2241　兵庫県神戸市西区室谷2丁目1番5号
USA KOSMEK（USA）LTD.	**TEL. +1-630-241-3465**	FAX. +1-630-241-3834 1441 Branding Avenue, Suite 110, Downers Grove, IL 60515 USA
China KOSMEK（CHINA）LTD. 考世美(上海)貿易有限公司	**TEL.+86-21-54253000**	FAX.+86-21-54253709 21/F, Orient International Technology Building, No.58, Xiangchen Rd, Pudong Shanghai 200122., P.R.China 中国上海市浦东新区向城路58号东方国际科技大厦21F室 200122
Thailand Thailand Representative Office	**TEL. +66-2-715-3450**	FAX. +66-2-715-3453 67 Soi 58, RAMA 9 Rd., Suanluang, Suanluang, Bangkok 10250, Thailand
Taiwan (Taiwan Exclusive Distributor) Full Life Trading Co., Ltd. 盈生貿易有限公司	**TEL. +886-2-82261860**	FAX. +886-2-82261890 16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511 台湾新北市中和區建八路2號 16F－4（遠東世紀廣場）
Philippines (Philippines Exclusive Distributor) G.E.T. Inc, Phil.	**TEL.+63-2-310-7286**	FAX. +63-2-310-7286 Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427
Europe (Europe Exclusive Distributor) KOS-MECH GmbH	**TEL. +43-463-287587-10**	FAX. +43-463-287587-20 Schleppeplatz 2 9020 Klagenfurt Austria
Indonesia (Indonesia Exclusive Distributor) P.T PANDU HYDRO PNEUMATICS	**TEL. +62-21-5818632**	FAX. +62-21-5814857 Ruko Green Garden Blok Z-Ⅱ No.51 Rt.005 Rw.008 Kedoya Utara-Kebon Jeruk Jakarta Barat 11520 Indonesia

Sales Offices in Japan

Head Office Osaka Sales Office Overseas Sales	**TEL.078-991-5115**	FAX.078-991-8787 〒651-2241　兵庫県神戸市西区室谷2丁目1番5号
Tokyo Sales Office	**TEL.048-652-8839**	FAX.048-652-8828 〒331-0815　埼玉県さいたま市北区大成町4丁目81番地
Nagoya Sales Office	**TEL.0566-74-8778**	FAX.0566-74-8808 〒446-0076　愛知県安城市美園町2丁目10番地1
Fukuoka Sales Office	**TEL.092-433-0424**	FAX.092-433-0426 〒812-0006　福岡県福岡市博多区上牟田1丁目8-10-101

Global Network



Asia Detailed Map

KOSMEK
Harmony in Innovation

- FOR FURTHER INFORMATION ON UNLISTED SPECIFICATIONS AND SIZES, PLEASE CALL US.
- SPECIFICATIONS IN THIS CATALOG ARE SUBJECT TO CHANGE WITHOUT NOTICE.

ISO 9001
JQA-QMA10823
KOSMEK HEAD OFFICE
JAB
CM009