Hydraulic Oil/Air/Coolant

Auto Coupler

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

Coupler for Connecting Fluid Circuit

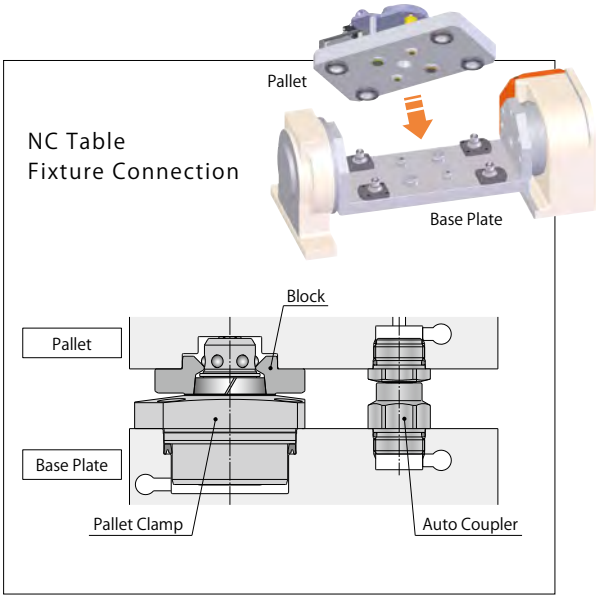
Compact / Applicable to a lot of fluid and flow.

What is Auto Coupler?

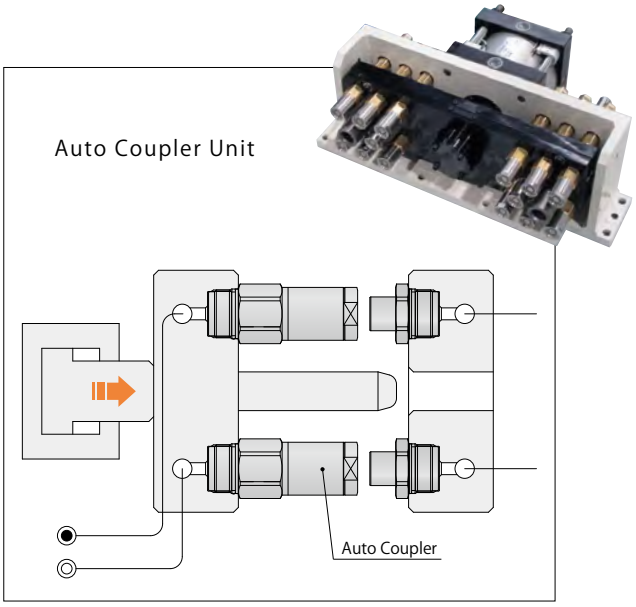
Auto coupler is designed to connect a variety of flow circuits, is suitable for automation and fits in small spaces.
We can offer based on your requirement.

※ Auto coupler doesn't have non-leak mechanism.
In case of you need non-leak function, please refer to P.1015.

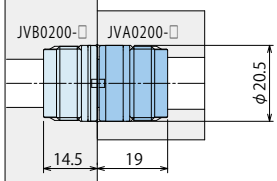
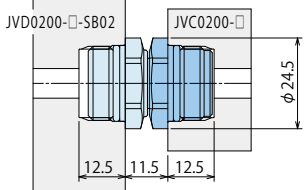
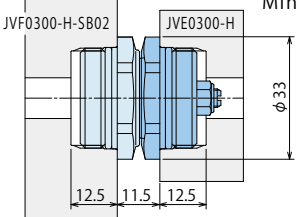
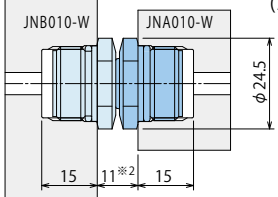
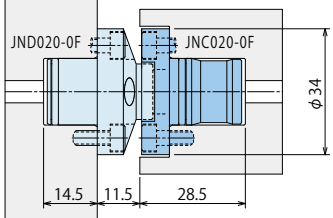
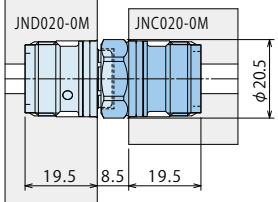
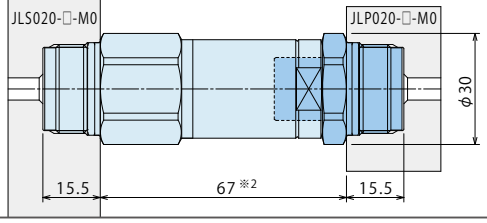
Application Examples



Connecting from the Pallet Bottom



Connecting from Outside

Model No.	Operating Pressure Range	Usable Fluid	Comparison of Auto Coupler Connected Condition Dimension ※ The drawing below shows that the shortest dimension combination of socket and plug in the connected condition for each model
Model **JVA/JVB** → P.1047	7MPa or less	Air / General Hydraulic Oil / Coolant	Min. Passage Area : 12.6mm² 
Model **JVC/JVD** → P.1051	7MPa or less	Air / General Hydraulic Oil / Coolant	Min. Passage Area : 12.6mm² 
Model **JVE/JVF** → P.1055	1MPa or less	Air / Coolant	Min. Passage Area : 29.0mm² 
Model **JNA/JNB** → P.1059	1MPa or less	Air	Min. Passage Area : 8.8mm² (At Eccentricity : 7.4mm²) 
Model **JNC/JND** → P.1063	25MPa or less	Air / General Hydraulic Oil	Min. Passage Area : 10.3mm²  Min. Passage Area : 10.3mm² 
Model **JLP/JLS** → P.1067	3.5MPa or less 25MPa or less ※ it differs depending on the product's material	Air / General Hydraulic Oil / Coolant	Min. Passage Area※1 : 29.0mm² 

※1. Minimum passage of JLP/JLS area differs depending on size.
※2. It shows the connecting dimension on multiple connection.
1. Please refer to each page for detail.

Auto Coupler

Model JVA/JVB

For Oil/Air/Coolant
(Operating Pressure Range: lower than 7MPa)

What is Auto Coupler?

Auto coupler, which is designed to connect a variety of flow circuits, is suitable for automation and fits in small spaces.
We offer them based on your requirement.

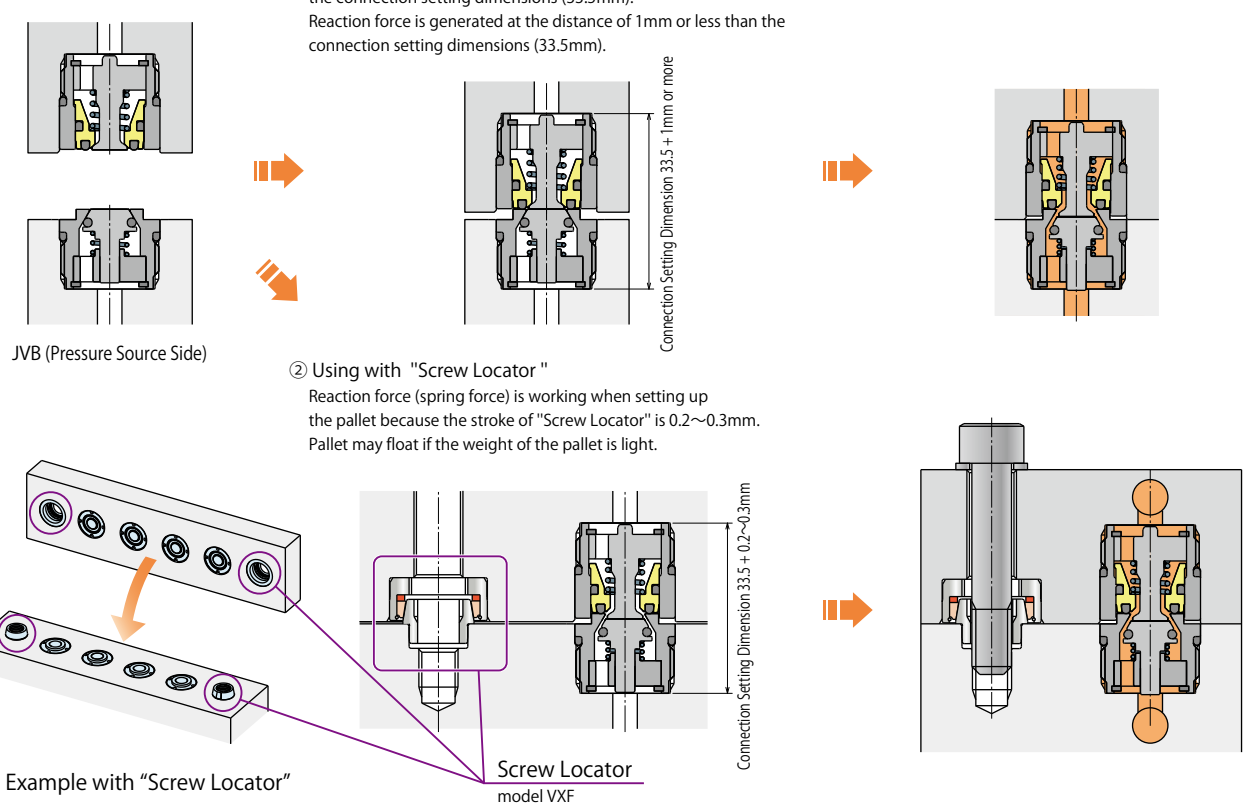
※ Auto coupler does not have non-leak mechanism.
In case you need non-leak function, please refer to 'Non-Leak Coupler' on P.1015.

JVA/JVB Feature

It is suitable for connecting and disconnecting the hydraulic circuit on changeover of fixture pallets and tombstones.
Threaded auto coupler can be used with "Screw Locator (VXF)".

Action Description

Disconnected State	In the Process of Connecting (During Pallet Setting)	Connected State
JVA (Fixture Side)	① Using without "Screw Locator" Reaction force is not generated at the distance of 1mm or further than the connection setting dimensions (33.5mm). Reaction force is generated at the distance of 1mm or less than the connection setting dimensions (33.5mm).	The reaction force is created by both spring and the supply pressure.
JVB (Pressure Source Side)	② Using with "Screw Locator" Reaction force (spring force) is working when setting up the pallet because the stroke of "Screw Locator" is 0.2~0.3mm. Pallet may float if the weight of the pallet is light.	



Model No. Indication

JV **B** 020 **0** - **W**

1 2 3

1 Style

A : O-ring side of Connection Surface (Fixture Side)

B : Metal Side of Connection Surface (Pressure Source Side)

2 Design No.

0 : Revision Number

3 Material

W : Stainless Steel, Brass, NBR
(Recommended Fluid : General Hydraulic Oil / Air)

H : Stainless Steel, Brass, Fluor Rubber
(Recommended Fluid : Coolant)

Specifications

Model No.	Fixture Side	JVA0200-□
	Pressure Source Side	JVB0200-□
Max. Operating Pressure MPa		7.0
Withstanding Pressure MPa		10.5
Min. Passage Area mm²		12.6
Offset Tolerance mm		±0.5
Angular Deviation (Tolerance) DEG.		0.3
Operating Temperature ℃		0 ~ 70
Usable Fluid	3 Material W	General Hydraulic Oil Equivalent to ISO-VG-32・Air
	3 Material H	Coolant
Reaction Force kN	Operating Pressure at 7 MPa	1.12
	Operating Pressure at 1 MPa	0.19
	Operating Pressure at P MPa	0.154 × P + 0.04
Mass g	JVA	30
	JVB	24

Circuit Symbol

JVA (Outgoing Side / Fixture Side)

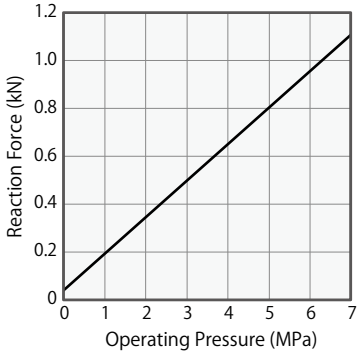
JVB (Incoming Side / Pressure Source Side)

※ Zero oil leak out of JVA in disconnected state

Supply Pressure-Reaction Force Graph

The graph shows the relationship between the reaction force and the supply pressure after the completion of connection of JVA/JVB.

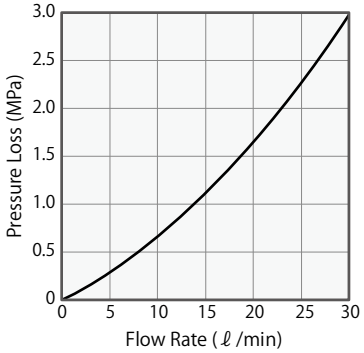
Operating Pressure (MPa)	Reaction Force (kN)
0	0.04
1	0.19
2	0.35
3	0.50
4	0.66
5	0.81
6	0.96
7	1.12



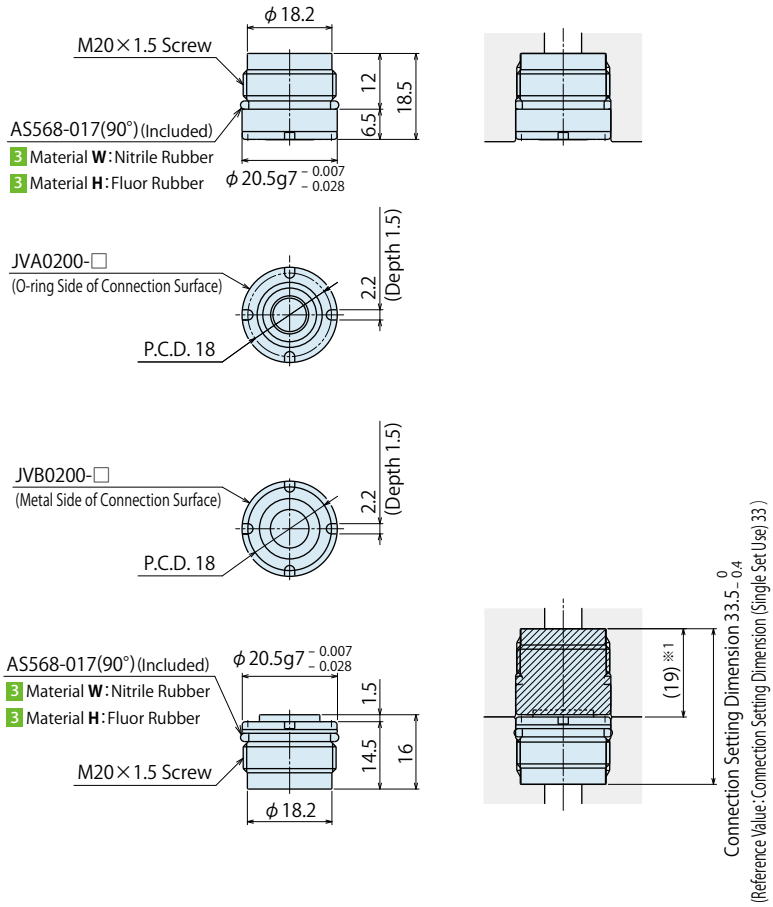
Flow Rate - Pressure Loss Characteristic Graph

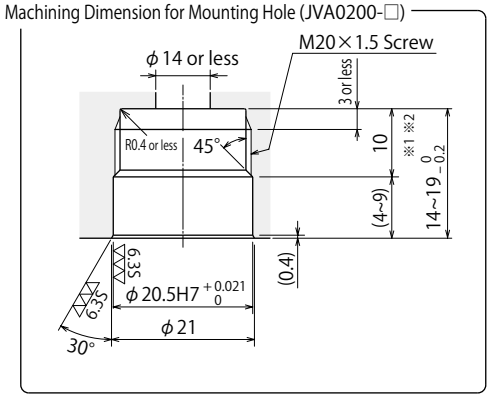
The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30~40℃).

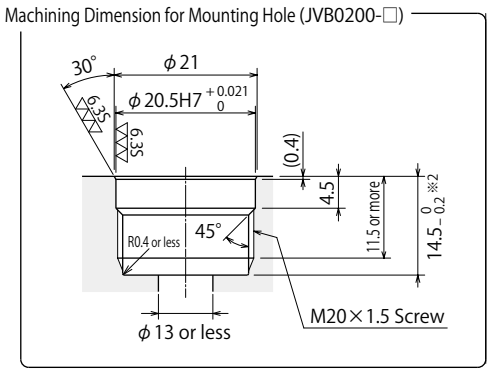
Flow Rate (ℓ/min)	Pressure Loss (MPa)
0	0
5	0.29
10	0.66
15	1.12
20	1.64
25	2.27
30	2.98



External Dimensions（JVA/JVB）







Model No.	Thread Size	Tightening Torque (N·m)
JVA0200-□ **JVB0200-□**	M20×1.5	16

Notes :

1. When ※1 dimension is 19mm, clearance between base plate and pallet is 0mm.
   When ※1 dimension is 14mm, clearance between base plate and pallet is 5mm.
2. For the tolerance of ※2, when using with the pallet clamp (Lift-Up Stroke 1mm) and it is required to prevent the force of spring in JV, the tolerance of each machining depth should be ±0.05mm.
   (Connection Set Length：33.5±0.10mm)
3. Mounting Jig (Model ZZJ0020) or equivalent is required when installing and removing JVA/JVB.
   Mounting Jig (Model ZZJ0020) is not included with JVA/JVB. Please order separately.

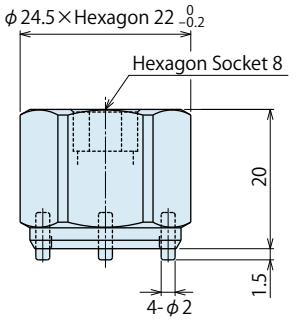
Accessary：Mounting Jig for JVA/JVB

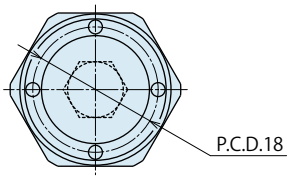
JVA/JVB is mounted with this mounting jig.
Tightening Torque：16N･m

Model No. indication

ZZJ0020

Design No.
(Revision Number)





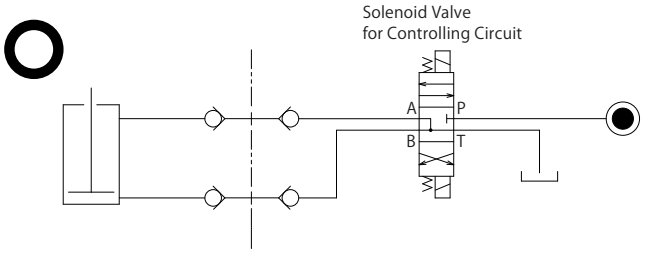
Note :

1. Mounting Jig (Model ZZJ0020) or equivalent is required when installing and removing JVA/JVB. Please determine the number of jigs required when ordering.

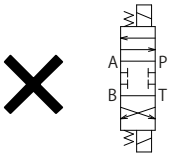
Cautions (JVA/JVB)

1. Do not connect or disconnect when the auto coupler has received the pressure from the source.
   (Please refer to Circuit Reference.)
2. Drain out air within the circuit before use (When usable fluid is oil).
3. Do not connect in the condition that foreign substances such as chips adhered on the connecting surfaces.
   Completely remove the adhering chips or coolant by air blow etc.
4. Load applied on a fixture side actuator in the separate condition may result in oil flowing out from the end of auto coupler.
5. Exceeding allowable offset will cause damage on to the internal parts. It is recommended to install guide pins.
6. When pressing up to the connection limit, the force should be higher than the reaction force and lower than 3.0kN
7. Use Mounting Jig (Model ZZJ0020) or equivalent for installation and removal.

Circuit Reference



Use a three position (center position, ABT connection) solenoid valve for controlling circuit, and stop supplying hydraulic (or air) pressure with the center position when connecting/ disconnecting JVA/JVB.



Do not connect or disconnect when the auto coupler has received the pressure from the source.

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
BMA/BMG
AU/AU-M
BU
BP/JPB
BX
BEP/BSP
BH
BC

Air Hydraulic Unit
CV
CK
CP/CPB
CPC/CQC
CB
CC
AB/AB-V
AC/AC-V

Auto Coupler

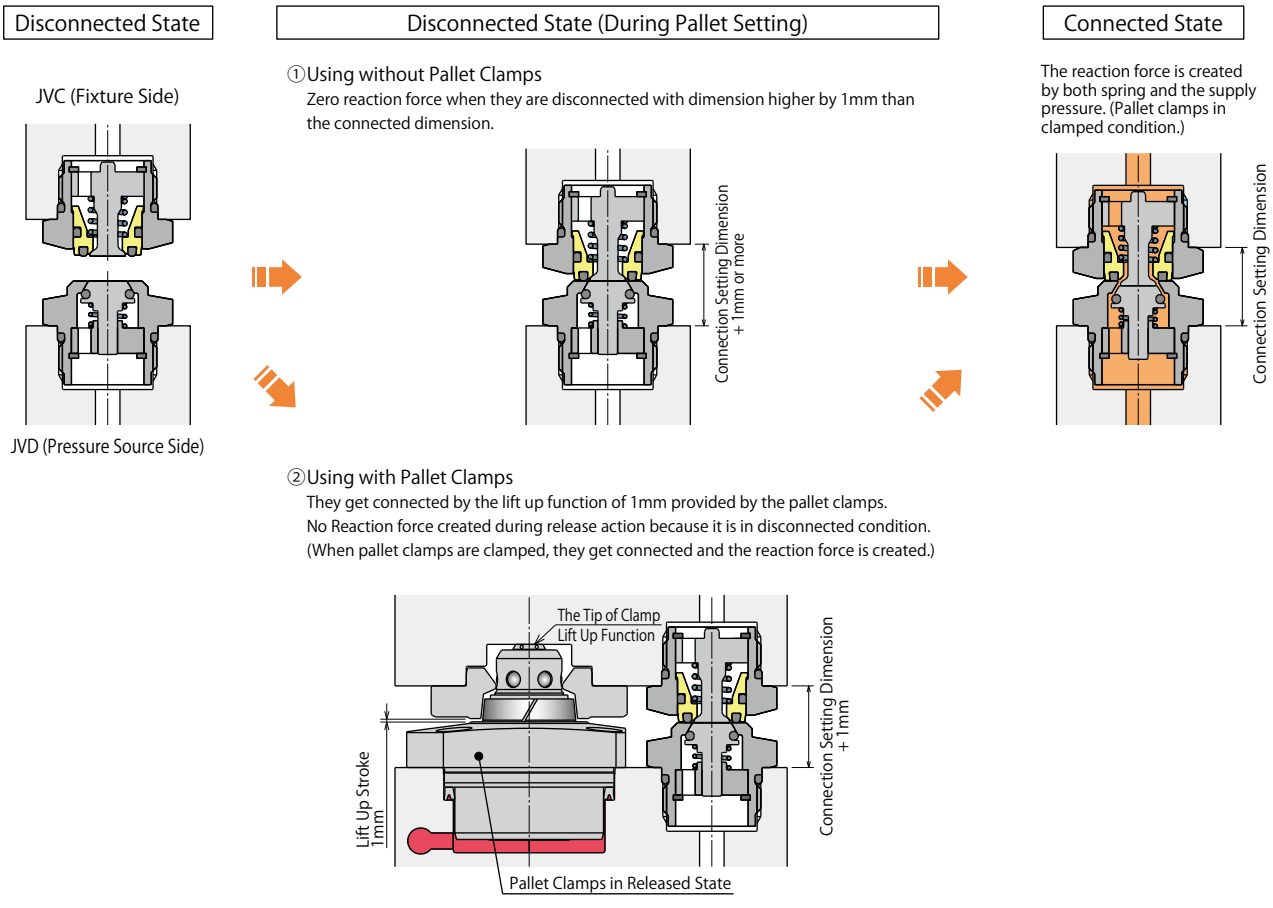
Model JVC/JVD

For Oil/Air/Coolant
(Operating Pressure Range: lower than 7MPa)

Feature

It is suitable for connecting and disconnecting the hydraulic circuit on changeover of fixture pallets and tombstones. It can be used easily together with pallet clamps (VS/WVS) and no reaction force is found when setting the pallet together with pallet clamp.

Action Description



Model No. Indication

JV D 020 0 - W - S B10
1 2 3 4 5

1 Style

C : O-ring side of Connection Surface (Fixture Side)
D : Metal Side of Connection Surface (Pressure Source Side)

2 Design No.

0 : Revision Number

3 Material

W : Stainless Steel, Brass, NBR
(Recommended Fluid : General Hydraulic Oil / Air)
H : Stainless Steel, Brass, Fluor Rubber
(Recommended Fluid : Coolant)

4 Accommodate Clamp Model

Blank : 1 C selected
S : 1 D selected and used together with VS, WVS or without pallet clamps
T : 1 D selected and used together with VT
※ Please contact us when you select T.

5 Pallet Clamp Block Model

Blank : 1 C selected
B02 : VSB020
B06 : VSB060
B10 : VSB100
J01 : —
J02 : VSJ020
J06 : VSJ060
J10 : VSJ100

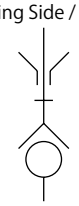
1 D selected
(In the case of not using together with pallet clamps, please select model from connection setting dimension.)

Specifications

Model No.	Fixture Side	JVC0200-□						
	Pressure Source Side	JVD0200 -□-SJ01	JVD0200 -□-SB02	JVD0200 -□-SJ02	JVD0200 -□-SB06	JVD0200 -□-SJ06	JVD0200 -□-SB10	JVD0200 -□-SJ10
Max. Operating Pressure MPa		7.0						
Withstanding Pressure MPa		10.5						
Min. Passage Area mm²		12.6						
Offset Tolerance mm		±0.5						
Angular Deviation (Offset Tolerance) DEG.		0.3						
Operating Temperature ℃		0 ~ 70						
Usable Fluid	3 Material W	General Hydraulic Fluid Equivalent to ISO VS 32・Air						
	3 Material H	Coolant						
Reaction Force kN (Operating Pressure)	at 7 MPa	1.12						
	at 1 MPa	0.19						
	at P MPa	0.154 × P + 0.04						
Mass g	JVC	34						
	JVD	50	28	53	33	60	41	65
Accommodate Clamp Model	VS	–	VS0020 / VS0040		VS0060		VS0100	
	WVS	–	WVS0040		WVS0060		WVS0100	
Pallet Clamp Block Model		–	VSB020	VSJ020	VSB060	VSJ060	VSB100	VSJ100

Circuit Symbol

JVC (Outgoing Side / Fixture Side)



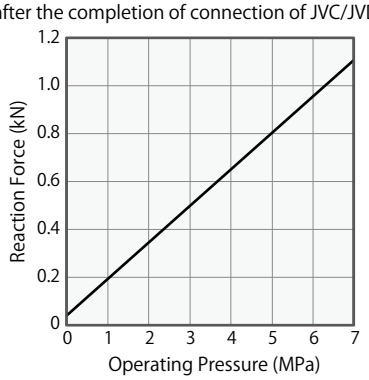
JVD (Incoming Side / Pressure Source Side)

※ Zero oil leak out of JVC in disconnected state

Supply Pressure-Reaction Force Graph

The graph shows the relationship between the reaction force and the supply pressure after the completion of connection of JVC/JVD.

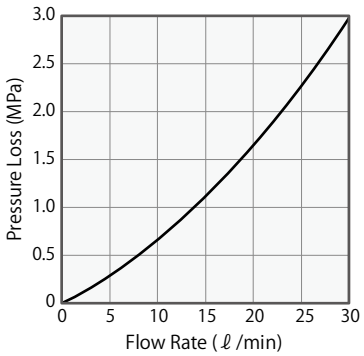
Operating Pressure (MPa)	Reaction Force (kN)
0	0.04
1	0.19
2	0.35
3	0.50
4	0.66
5	0.81
6	0.96
7	1.12



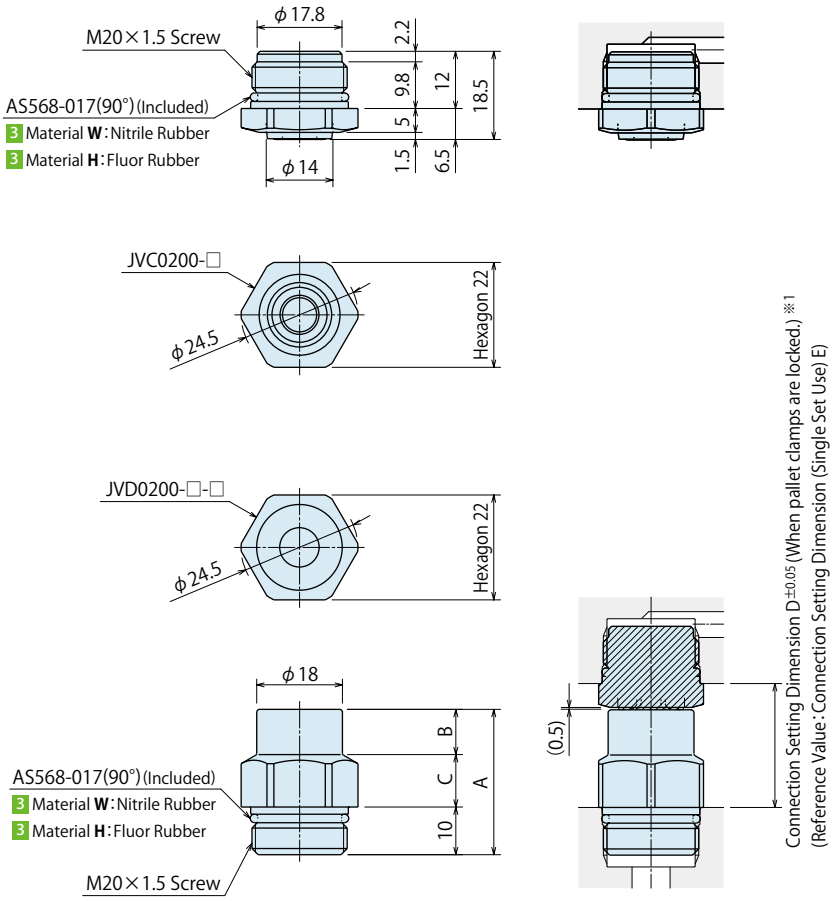
Flow Rate - Pressure Loss Characteristic Graph

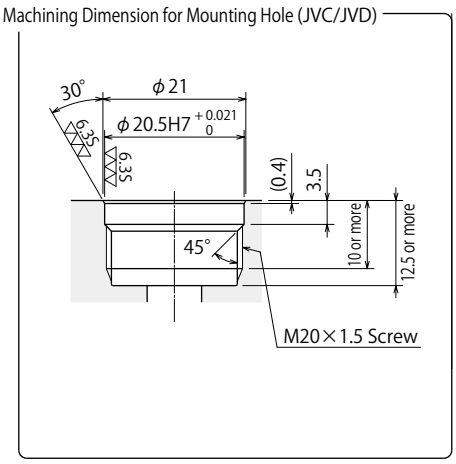
The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30~40℃).

Flow Rate (ℓ/min)	Pressure Loss (MPa)
0	0
5	0.29
10	0.66
15	1.12
20	1.64
25	2.27
30	2.98



External Dimensions (JVC/JVD)





Model No.	Thread Size	Tightening Torque (N·m)
JV□0200-□-□	M20×1.5	25

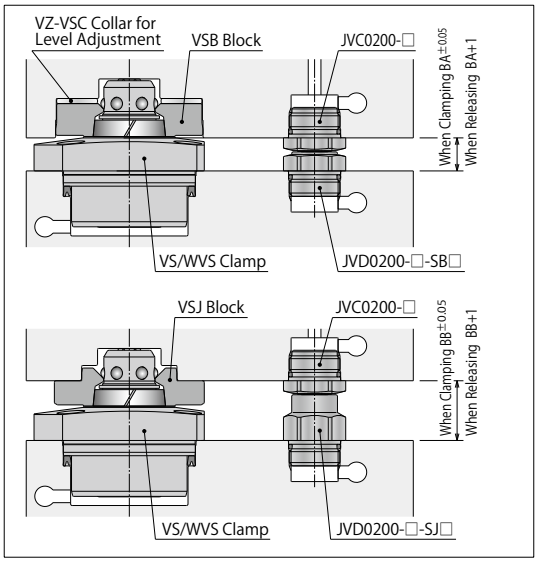
Dimensions (mm)

Model No. Fixture Side	JVC0200-□						
Model No. Pressure Source Side	**JVD0200 -□-SJ01**	**JVD0200 -□-SB02**	**JVD0200 -□-SJ02**	**JVD0200 -□-SB06**	**JVD0200 -□-SJ06**	**JVD0200 -□-SB10**	**JVD0200 -□-SJ10**
A	21.5	16	24.5	17.5	28	20	30.5
B	1	1	3.5	1	7	1	9.5
C	10.5	5	11	6.5	11	9	11
D	17	11.5	20	13	23.5	15.5	26
E	16.5	11	19.5	12.5	23	15	25.5

The Connected Condition Dimension Using the Pallet Clamps (mm)

A Combination Clamps Model		VS0020/VS0040 WVS0040	VS0060 WVS0060	VS0100 WVS0100
When VSB Block is used	BA	11.5	13	15.5
When VSJ Block is used	BB	20	23.5	26

The Connected Condition Dimension when Used in Combination with Pallet Clamps

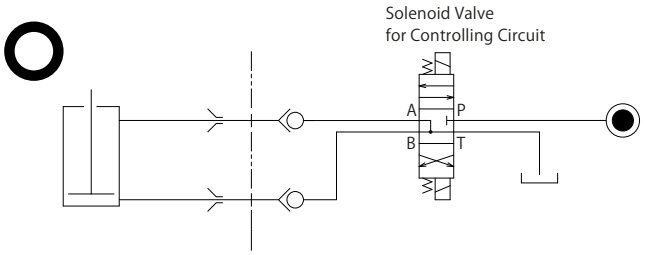


Cautions (JVC/JVD)

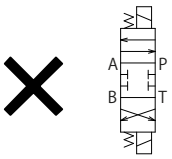
1. Do not connect or disconnect when the auto coupler has received the pressure from the source. (Please refer to Circuit Reference.)
2. Drain out air within the circuit before use (When usable fluid is oil).
3. Do not connect in the condition that foreign substances such as chips adhered on the connecting surfaces. Completely remove the adhering chips or coolant by air blow etc.
4. Load applied on a fixture side actuator in the separate condition may result in oil flowing out from the end of auto coupler.
5. Exceeding allowable offset will cause damage on to the internal parts. It is recommended to install guide pins.
6. It is recommended to use VS/WVS series as pallet clamp to ensure stabilized setting with 1mm lift-up stroke. When using JVC/JVD with pallet clamps other than corresponding models, the connection dimensions※1 of JVC/JVD should be $D^{\pm 0.05}$, or consider using JNA/JNB, JNC/JND.
7. The connection dimensions BA and BB are different when using the collar for level adjustment (VZ-VS1). The connection dimensions※1 of JVC/JVD should be $D^{\pm 0.05}$.
8. When pressing up to the connection limit, the force should be higher than the reaction force and lower than 4.0kN.

※1. The connection setting dimension $D^{\pm 0.05}$ indicates the tolerance when using JVC/JVD with pallet clamps and reducing the reaction force of the auto coupler to zero during pallet setting (when releasing pallet clamps). For any other conditions, the connection setting dimention should be $D\ {}^{0}_{-0.4}$.

Circuit Reference



Use a three position (center position, ABT connection) solenoid valve for controlling circuit, and stop supplying hydraulic (or air) pressure with the center position when connecting/disconnecting JVC/JVD.



Do not connect or disconnect when the auto coupler has received the pressure from the source.

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
BMA/BMG
AU/AU-M
BU
BP/JPB
BX
BEP/BSP
BH
BC
Air Hydraulic Unit
CV
CK
CP/CPB
CPC/CQC
CB
CC
AB/AB-V
AC/AC-V

Auto Coupler

Model JVE/JVF

For Air/Coolant
(Operating Pressure Range: lower than 1MPa)

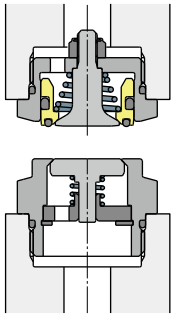
Feature

It is suitable for connecting and disconnecting the flow circuit on changeover of fixture pallets and tombstones.
It can be used easily together with pallet clamps (VS/WVS) and no reaction force is found when setting the pallet together with pallet clamp.

Action Description

Disconnected State	Disconnected State (During Pallet Setting)	Connected State

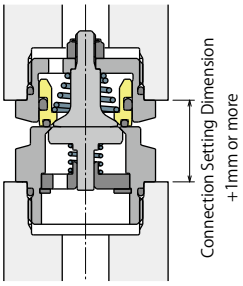
JVE (Fixture Side)



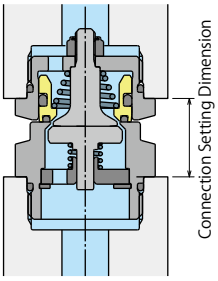
JVF (Pressure Source Side)

①Using without Pallet Clamps

Zero reaction force when they are disconnected with dimension higher by 1mm than the connected dimension.

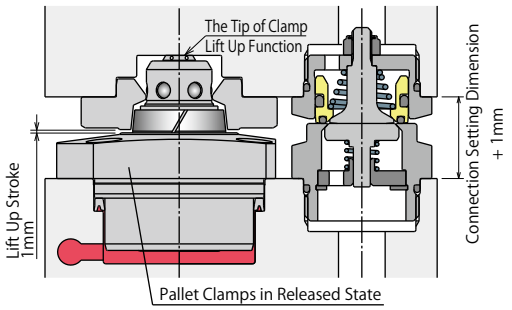


The reaction force is created by both spring and the supply pressure. (Pallet clamps in clamped condition.)



②Using with Pallet Clamps

They get connected by the lift up function of 1mm provided by the pallet clamps.
No Reaction force created during release action because it is in disconnected condition.
(When pallet clamps are clamped, they get connected and the reaction force is created.)



Model No. Indication

JV **F** 030 **0** - **H** - **S** **B10**

1 2 3 4 5

1 Style

E : O-ring side of Connection Surface (Fixture Side)

F : Metal Side of Connection Surface (Pressure Source Side)

2 Design No.

0 : Revision Number

3 Material

H : Stainless Steel, Brass, Fluor Rubber

4 Accommodate Pallet Clamp Model

Blank : 1 E selected

S : 1 F selected and used together with VS, WVS or without pallet clamps

T : 1 F selected and used together with VT

※ Please contact us when you select T.

5 Pallet Clamp Block Model

Blank : 1 E selected

B02 : VSB020
B06 : VSB060
B10 : VSB100
J01 : —
J02 : VSJ020
J06 : VSJ060
J10 : VSJ100

1 F selected

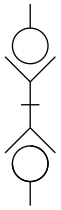
(In the case of not using together with pallet clamps, please select model from connection setting dimension.)

Specifications

Model No.	Fixture side	JVE0300-H						
	Pressure Source Side	JVF0300-H-SJ01	JVF0300-H-SB02	JVF0300-H-SJ02	JVF0300-H-SB06	JVF0300-H-SJ06	JVF0300-H-SB10	JVF0300-H-SJ10
Max. Operating Pressure MPa		1.0						
Withstanding Pressure MPa		1.5						
Min. Passage Area mm^2		29.0						
Offset Tolerance mm		±0.5						
Angular Deviation (Offset Tolerance) DEG.		0.3						
Operating Temperature ℃		0 ~ 70						
Usable Fluid		Coolant or Air						
Reaction Force kN (Operating Pressure)	at 1.0 MPa	0.44						
	at 0.4 MPa	0.21						
	at P MPa	0.380 × P + 0.06						
Mass g	JVE	61						
	JVF	90	49	96	58	111	73	122
Accommodate Pallet Clamp Model	VS	–	VS0020 / VS0040		VS0060		VS0100	
	WVS	–	WVS0040		WVS0060		WVS0100	
Pallet Clamp Block Model		–	VSB020	VSJ020	VSB060	VSJ060	VSB100	VSJ100

Circuit Symbol

JVE (Outgoing Side / Fixture Side)

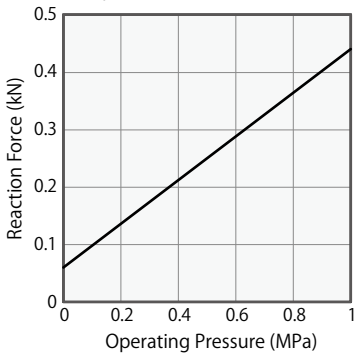


JVF (Incoming Side / Pressure Source Side)

Supply Pressure - Reaction Force Graph

The graph shows the relationship between the reaction force and the supply pressure after the completion of connection of JVE/JVF.

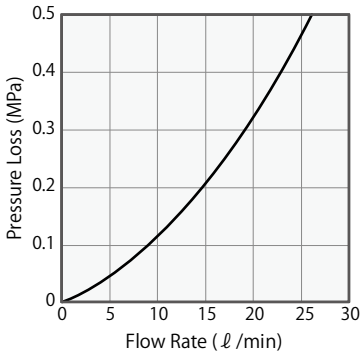
Operating Pressure (MPa)	Reaction Force (kN)
0	0.06
0.1	0.10
0.2	0.14
0.3	0.17
0.4	0.21
0.5	0.25
0.6	0.29
0.7	0.33
0.8	0.36
0.9	0.40
1.0	0.44



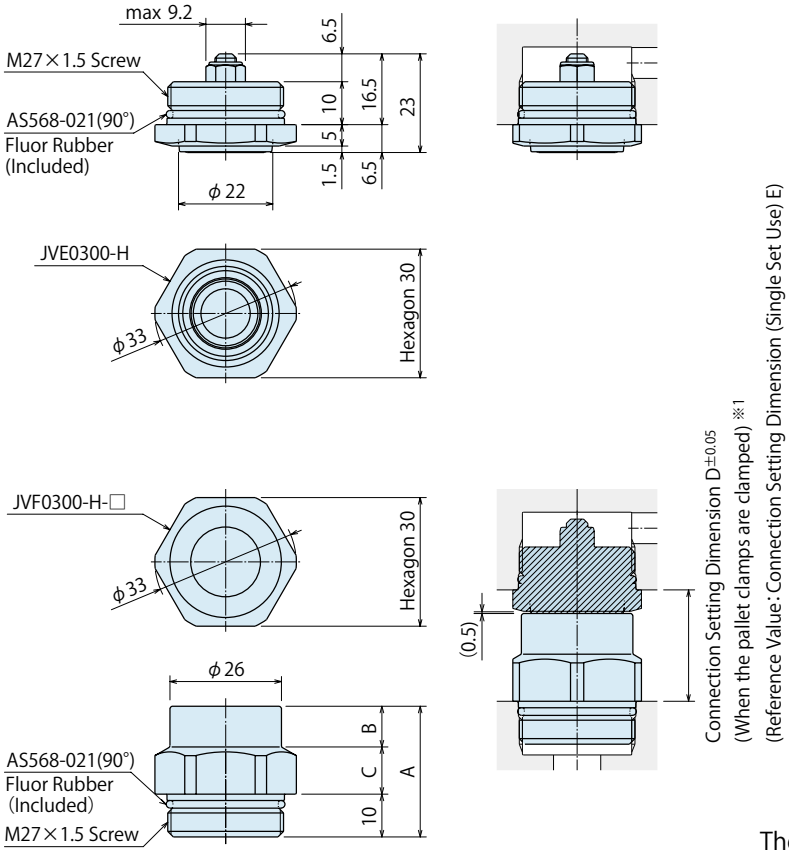
Flow Rate - Pressure Loss Characteristic Graph

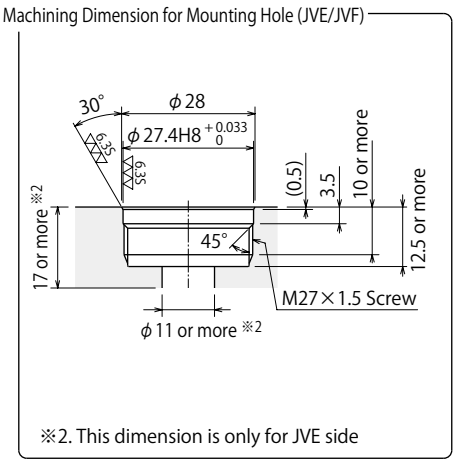
Fluid to be used on this data is water.

Flow Rate (ℓ /min)	Pressure Loss (MPa)
0	0
5	0.05
10	0.12
15	0.21
20	0.33
25	0.48



External Dimensions (JVE/JVF)





Model No.	Thread Size	Tightening Torque(N·m)
JV□0300-H-□	M27×1.5	40

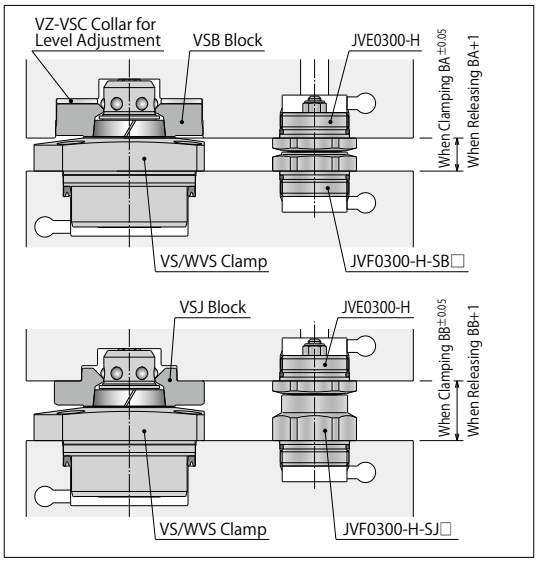
Dimensions (mm)

Model No. Fixture Side	JVE0300-H						
Model No. Pressure Source Side	JVF0300 -H-SJ01	JVF0300 -H-SB02	JVF0300 -H-SJ02	JVF0300 -H-SB06	JVF0300 -H-SJ06	JVF0300 -H-SB10	JVF0300 -H-SJ10
A	21.5	16	24.5	17.5	28	20	30.5
B	1	1	3.5	1	7	1	9.5
C	10.5	5	11	6.5	11	9	11
D	17	11.5	20	13	23.5	15.5	26
E	16.5	11	19.5	12.5	23	15	25.5

The Connected Condition Dimension Using the Pallet Clamps (mm)

A combination clamps model		VS0020/VS0040 WVS0040	VS0060 WVS0060	VS0100 WVS0100
When VSB Block is used	BA	11.5	13	15.5
When VSJ Block is used	BB	20	23.5	26

The Connected Condition Dimension when Used in Combination with Pallet Clamps



Cautions (JVE/JVF)

1. Make sure to supply fluid after connection is completed.
2. Since each check valve is a metal seal, there will be slight fluid leak if pressurized while disconnected.
3. Do not connect in the condition that foreign substances such as chips adhere on the connecting surfaces. Completely remove the adhering chips or coolant by air blow etc.
4. Exceeding allowable offset will cause damage on to the internal parts. (It is recommended to install guide pins when not using pallet clamps.)
5. It is recommended to use VS/WVS series as pallet clamp to ensure stabilized setting with 1mm lift-up stroke. When using JVE/JVF with pallet clamps other than corresponding models, the connection dimensions※1 of JVE/JVF should be $D^{\pm 0.05}$, or consider using JNA/JNB, JNC/JND.
6. The connection dimensions BA and BB are different when using the collar for level adjustment (VZ-VS1). The connection dimensions※1 of JVE/JVF should be $D^{\pm 0.05}$.
7. When pressing up to the connection limit, the force should be higher than the reaction force and lower than 4.0kN.

※1. The connection setting dimension $D^{\pm 0.05}$ indicates the tolerance when using JVE/JVF with pallet clamps and reducing the reaction force of the auto coupler to zero during pallet setting (when releasing pallet clamps). For any other conditions, the connection setting dimention should be $D\,{}^{0}_{-0.4}$.

Auto Coupler

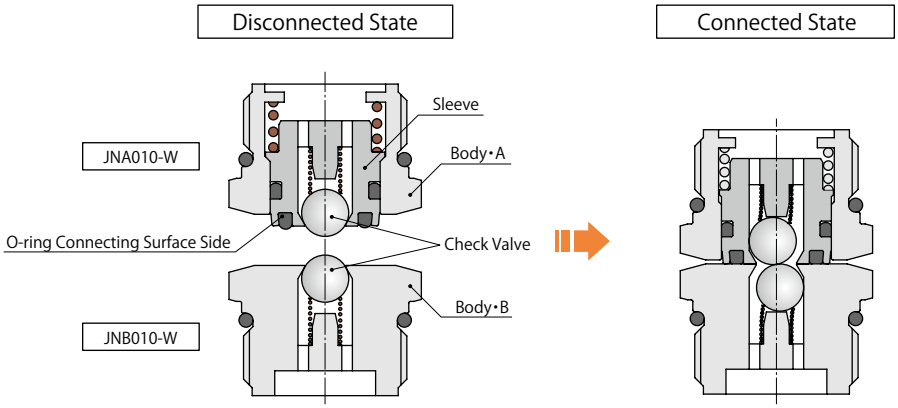
Model JNA/JNB

For Air
(Operating Pressure Range: lower than 1MPa)

Feature

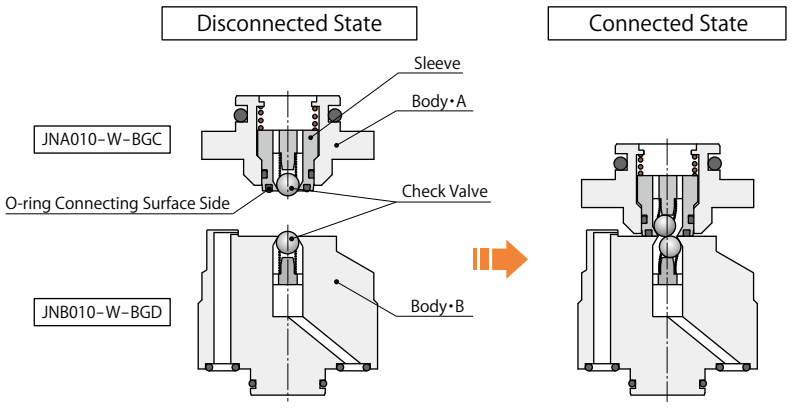
It is designed to prevent cutting chips and coolant from entering check valve during separation.
Compactly designed manifold model and BGC/BGD combination model are available.

Action Description (Manifold Model)

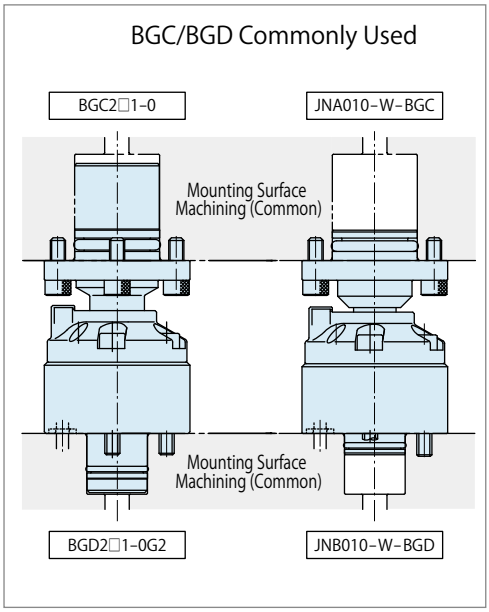


① When JNA closely contacts with JNB, one check valve presses the other to make the valves open.
② At this time, the O-ring on the end surface of the sleeve prevents external air leakage.

Action Description (BGC/BGD Combination Model)



① When JNA closely contacts with JNB, one check valve presses the other to make the valves open.
② At this time, the O-ring on the end surface of the sleeve prevents external air leakage.



Model No. Indication

JN B 01 0 - W - ☐

1 2 3 4

1 Style

A : O-ring side of Connection Surface (Fixture Side)

B : Metal Side of Connection Surface (Pressure Source Side)

2 Design No.

0 : Revision Number

3 Material

W : Stainless Steel, Brass, NBR

4 Combination Coupler Model No.

Blank : Manifold Model (Standard)

BGC : 1 In the case that when A is selected and BGC is used together

BGD : 1 In the case that when B is selected and BGD is used together

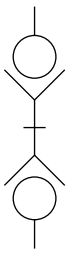
Specifications

Model No.		Fixture Side	JNA010-W☐
		Pressure Source Side	JNB010-W☐
Max. Operating Pressure		MPa	1.0
Withstanding Pressure		MPa	1.5
Min. Passage Area		mm²	8.8 (At eccentricity: 7.4)
Offset Tolerance		mm	±1
Angular Deviation (Offset Tolerance)		DEG.	0.3
Operating Temperature		℃	0 ~ 70
Usable Fluid			Air
Reaction Force kN	Operating Pressure	at 0.5 MPa	0.12
		at 0.2 MPa	0.07
		at P MPa	0.154 × P + 0.04
Mass g		JNA010-W	35
		JNB010-W	40
		JNA010-W-BGC	150
		JNB010-W-BGD	450

Circuit Symbol (Manifold Model)

JNA010-W / JNB010-W

JNA010-W (Outgoing Side / Fixture Side)

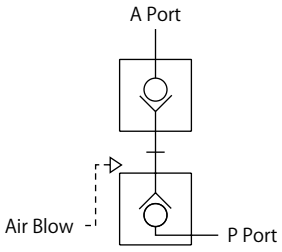


JNB010-W (Incoming Side / Pressure Source Side)

Circuit Symbol (BGC/BGD Combination Model)

JNA010-W-BGC / JNB010-W-BGD

JNA010-W-BGC (Outgoing Side / Fixture Side)

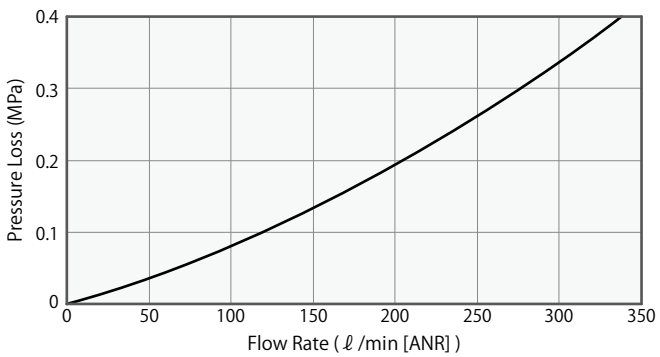


JNB010-W-BGD (Incoming Side / Pressure Source Side)

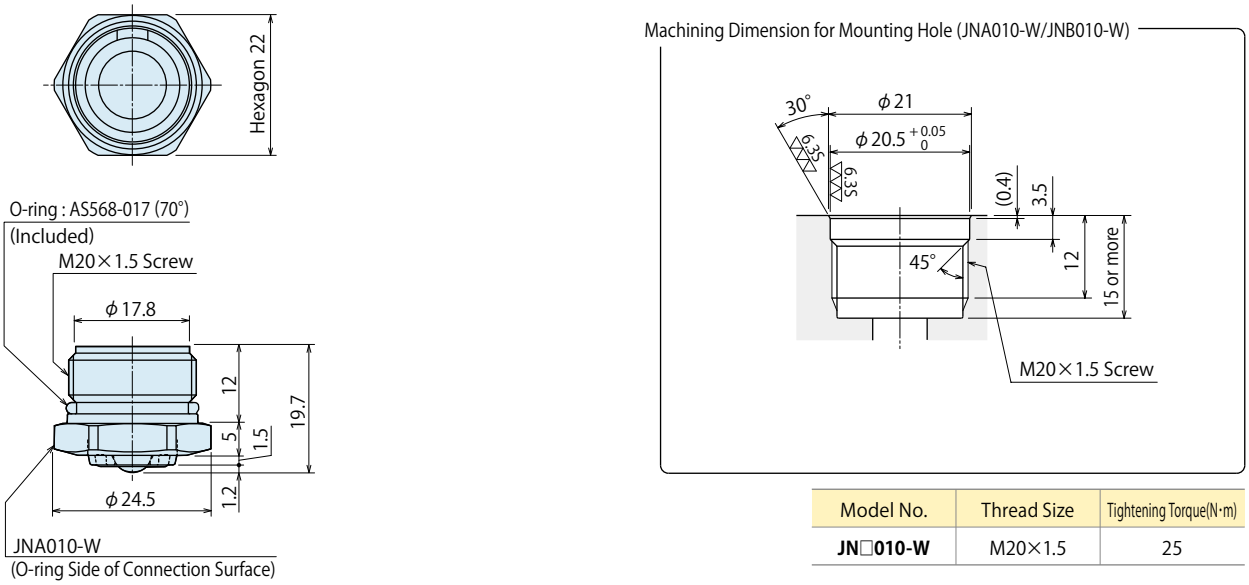
Flow Rate - Pressure Loss Characteristic Graph

Fluid to be used on this data is air (temperature is 25℃) with min. passage area 8.8mm².

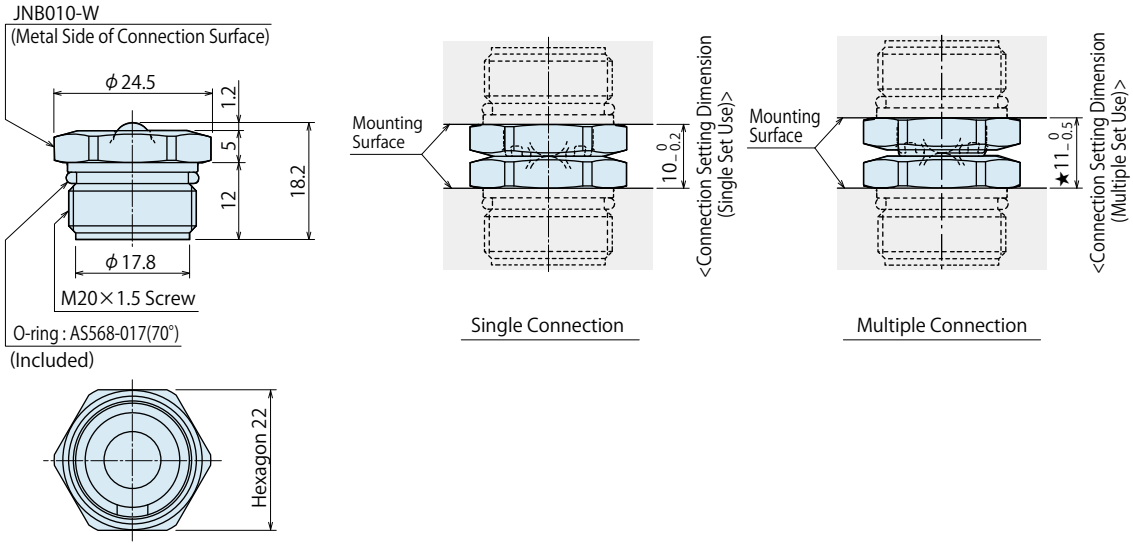
Flow Rate (ℓ/min [ANR])	Pressure Loss (MPa)
0	0
85	0.05
125	0.10
165	0.15
200	0.20
235	0.25
270	0.30
305	0.35
345	0.40



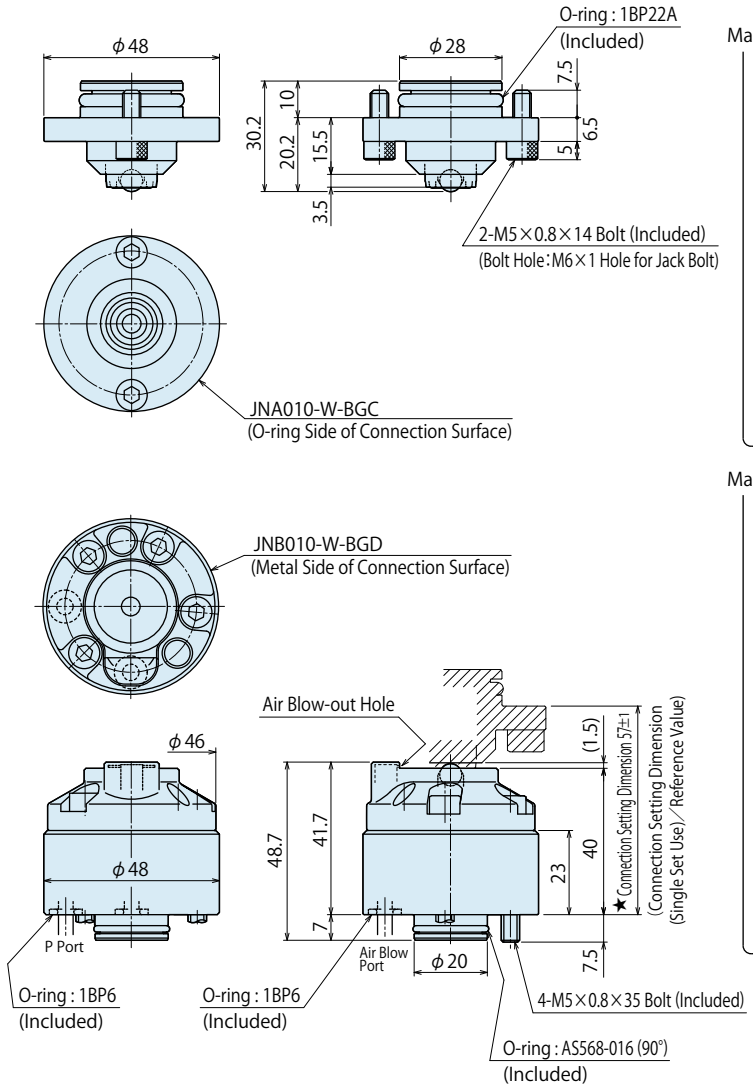
External Dimensions (JNA010-W/JNB010-W)



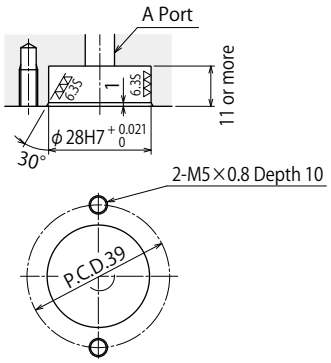
Model No.	Thread Size	Tightening Torque(N·m)
JN□010-W	M20×1.5	25



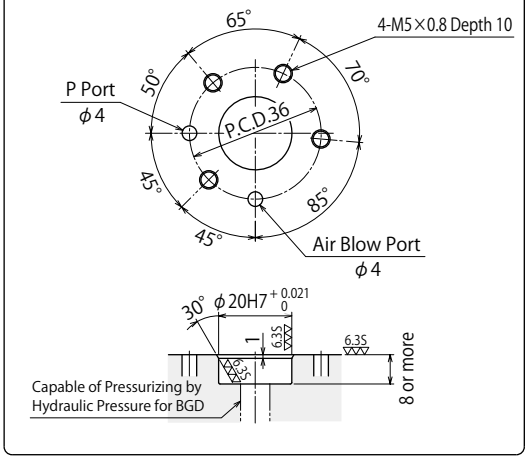
External Dimensions（JNA010-W-BGC/JNB010-W-BGD）



Machining Dimension for Mounting Hole (JNA010-W-BGC)



Machining Dimension for Mounting Hole (JNB010-W-BGD)



Model No.	Mounting Bolt	Tightening Torque(N·m)
JN□010-W-BG□	M5×0.8	6.3

Cautions (JNA/JNB)

<Cautions (common)>

1. Since each check valve is a metal seal, there will be slight fluid leak if pressurized while disconnected.
2. When one side is pressurized in the separate condition and if connection work is attempted, air is discharged outside before the O-ring seal surface opening the check valve.
3. Do not connect in the condition that foreign substances such as chips adhere on the connecting surfaces.
4. When an additional connection limit stopper is present or multiple sets of the coupler are used, apply connection setting dimensions ★ shown in the drawing.
5. When pressing the coupler to the connection limit,
   the pressing force should be between the reaction force and 1.0 kN for JNA010-W/JNB010-W,
   and between the reaction force and 2.0 kN for JNA010-W-BGC/JNB010-W-BGD.

<Caution only for JNA010-W/JNB010-W>

1. When chips or coolant adhere on the connecting surface, perform connection after providing a cover or completely removing them by air blow etc.

<Caution only for JNA010-W-BGC/JNB010-W-BGD>

1. Do not attempt to connect in the condition that chips or coolant adhere on the connecting end surface.

Auto Coupler

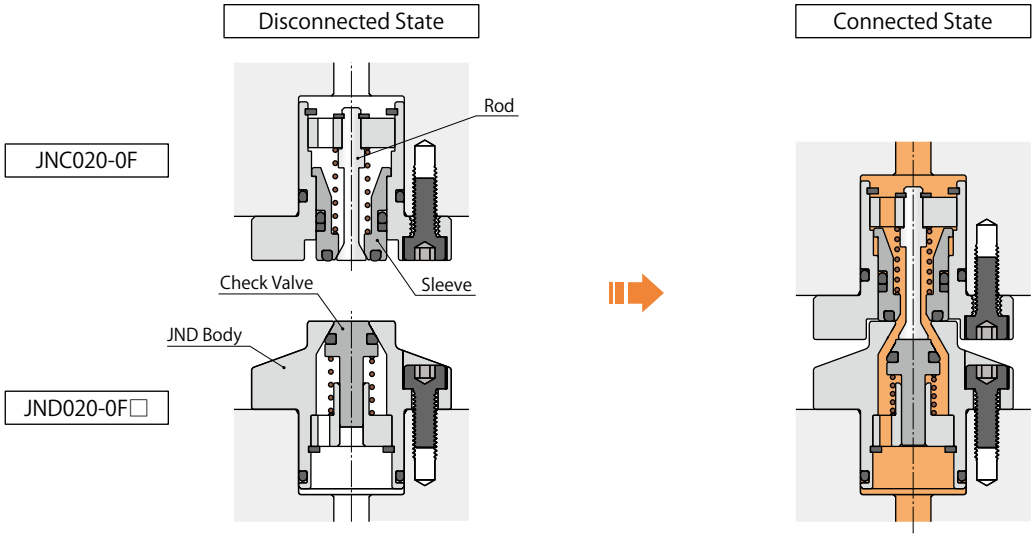
Model JNC/JND

For Oil/Air
(Operating Pressure Range: lower than 25MPa)

Feature

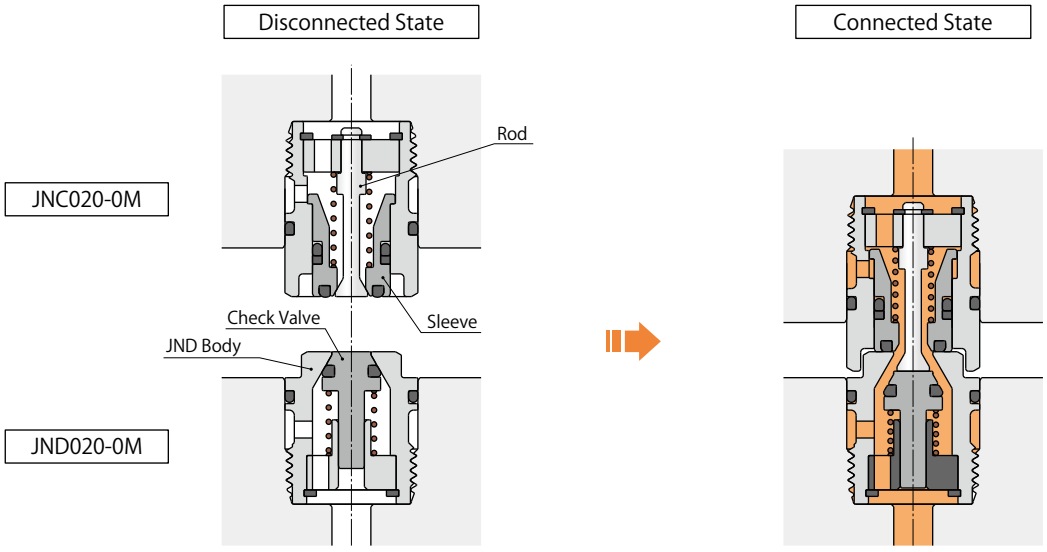
Hydraulic and air auto coupler suitable for attaching/detaching to fluid circuit when replacing fixture pallets or tombstones.
Compactly designed manifold option and flange option commonly used with pallet clamp are available.

Action Description (Flange Option)



When JNC is closely in contact with JND, the body presses against the sleeve and the rod presses against check valve then the valve will open.

Action Description (Manifold Option)



When JNC is closely in contact with JND, the body presses against the sleeve and the rod presses against check valve then the valve will open.

Model No. Indication

JN D 02 0 - 0 F ☐
1 2 3 4

1 Style

C : O-ring side of Connection Surface (Fixture Side)
D : Metal Side of Connection Surface (Pressure Source Side)

2 Design No.

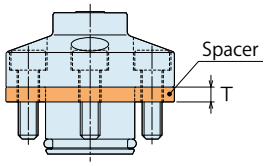
0 : Product Number

3 Mounting Method

F : Flange Option (Easy to use together with pallet clamps)
M : Manifold Option

4 Spacer Thickness ※ Specify only when selecting JND Flange Option.

Blank : No Spacer (Standard)
05 : T = 0.5mm
15 : T = 1.5mm
40 : T = 4.0mm
65 : T = 6.5mm
80 : T = 8.0mm
0D : Spacer Block (Refer to the external dimension.) ※1



Notes :
※1. 0D : please refer to external dimension about spacer thickness.
1. Spacer thickness varies depending on the pallet clamps used with this joint.

Specifications

Model No.		Fixture Side / Pressure Source Side	JNC020-0F / JND020-0F☐	JNC020-0M / JND020-0M
Max. Operating Pressure	MPa		25.0	
Withstanding Pressure	MPa		37.5	
Min. Passage Area	mm²		10.3	
Offset Tolerance	mm		±0.5	±0.4
Angular Deviation (Offset Tolerance)	DEG.		0.3	
Operating Temperature	℃		0 ~ 70	
Usable Fluid			General Hydraulic Oil Equivalent to ISO VS 32・Air	
Reaction Force	kN	Operating Pressure at 25 MPa	2.86	
		Operating Pressure at 7 MPa	0.82	
		Operating Pressure at P MPa	0.113 × P + 0.03	
Mass	kg	JNC	0.07	0.05
		JND	Refer to External Dimensions	0.05

Circuit Symbol

JNC (Outgoing Side / Fixture Side)

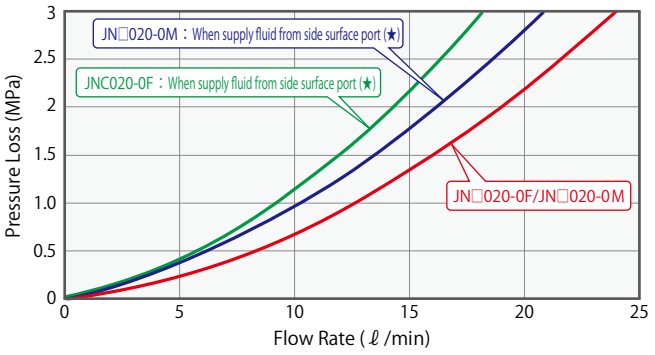
JND (Incoming Side / Pressure Source Side)

※ Zero oil leak out of JNC in disconnected state

Flow Rate - Pressure Loss Characteristic Graph

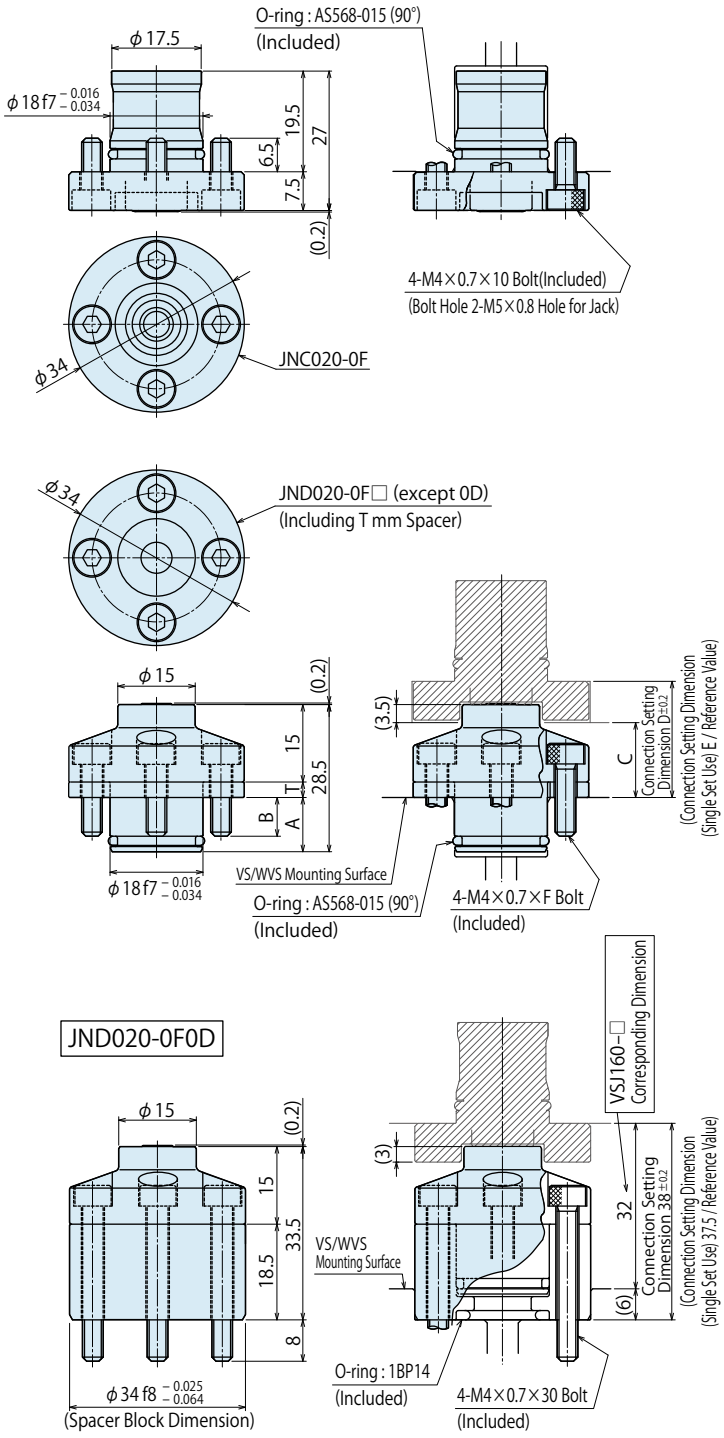
The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30~40℃).

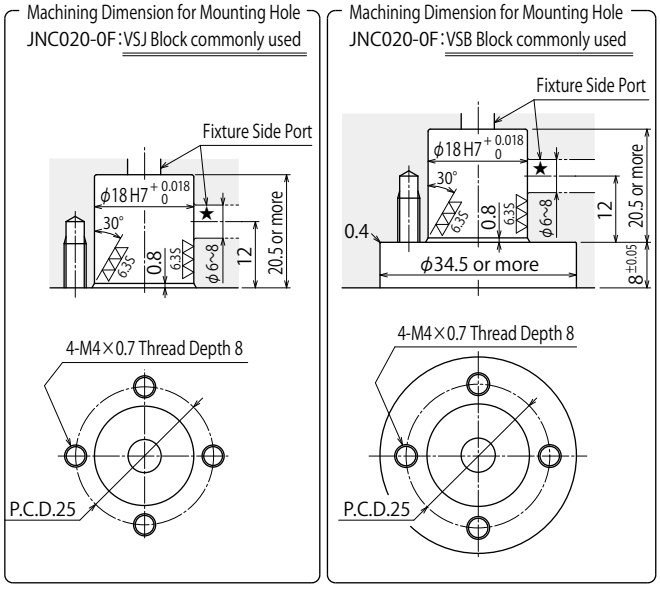
Pressure Loss (MPa)	Flow Rate (ℓ/min) JN☐020-0F / JN☐020-0M	When supply fluid from side port (★). JN☐020-0F	JNC020-0M
0	0	0	0
0.5	8.5	5.6	6.5
1.0	12.6	9.2	10.2
1.5	15.8	12.0	13.5
2.0	19.2	14.3	16.0
2.5	21.5	16.5	18.5
3.0	24.0	18.2	21.0

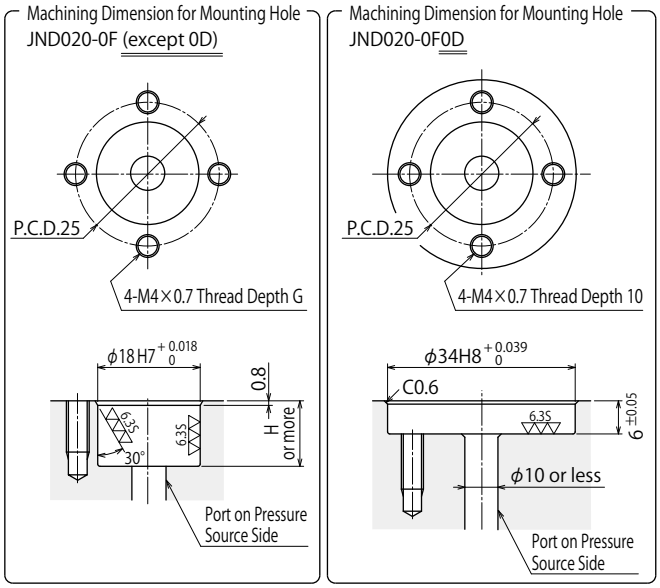


Note : 1. Refer to the external dimensions for the position of the side surface port (★).

External Dimensions (JNC020-0F/JND020-0F□)







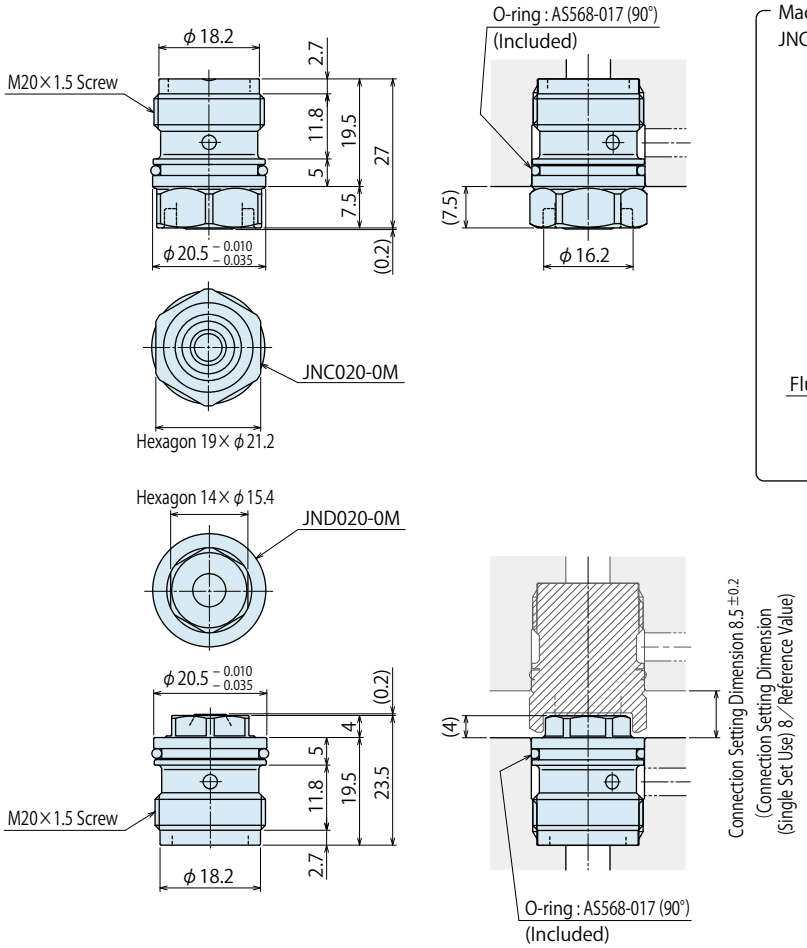
Model No.	Mounting Bolt	Tightening Torque(N·m)
JN□020-0F□	M4×0.7	3

Dimensions (Spacer Thickness Selection Table)

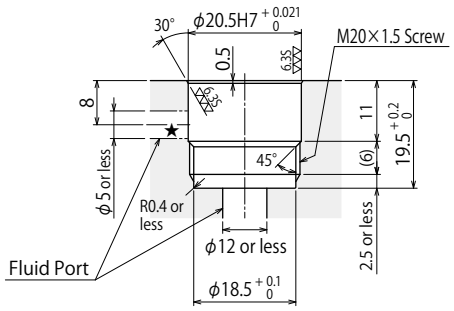
(mm)

JND Model		JND020 -0F	JND020 -0F05	JND020 -0F15	JND020 -0F40		JND020 -0F65	JND020 -0F80	JND020 -0F0D
Pallet Clamp Model	VS	VS0020/VS0040		VS0060		VS0100		VS0160	
	WVS	WVS0040		WVS0060		WVS0100		WVS0160	
Pallet Clamp Block Model	VSB	VSB020	–	VSB060	–	VSB100	–	VSB160	–
	VSJ	–	VSJ020	–	VSJ060	–	VSJ100	–	VSJ160
T		0 (No spacer)	0.5	1.5	4		6.5	8	Refer to the Drawing Above
A		13.5	13	12	9.5		7	5.5	
B		6.5	6	7	6.5		6	8.5	
C		11.5	–	13	–	15.5	–	19.5	
D		19.5	20	21	23.5		26	27.5	
E		19	19.5	20.5	23		25.5	27	
F		10	10	12	14		16	20	
G		8	8	9	8		8	10	
H		14.5	14	13	10.5		8	6.5	
Mass	kg	0.08	0.08	0.09	0.11		0.12	0.13	0.17

External Dimensions (JNC020-0M/JND020-0M)



Machining Dimension for Mounting Hole
JNC020-0M/JND020-0M (Common)



Model No.	Thread Size	Tightening Torque(N·m)
JN□020-0M	M20×1.5	40

Cautions (JNC/JND)

<Cautions (Common)>

1. Do not connect or disconnect in the pressurized (pressure remaining) condition.
2. Perform air bleeding of the circuit sufficiently prior to operation (when using hydraulic pressure).
3. Do not connect in the condition that foreign substances such as chips adhere on the connecting surfaces.
   (Completely remove the adhering chips or coolant by air blow etc.)
4. During the connection process, note that maximum 0.03 kN of spring force acts even if circuit pressure is zero.
5. Load applied on a jig side actuator in the separate condition may result in oil flowing out from the end of JNC (when using hydraulic pressure).
6. When pressing up to the connection limit,
   the pressing force should be higher than reaction force and lower than 5.0kN for JN□020-0F,
   and higher than reaction force and lower than 4.0kN for JN□020-0M
7. When using the port with ★mark, flow characteristics are deteriorated. (Please refer to the [Flow rate - pressure loss characteristic graph].)

<JNC020-0F/JND020-0F□ : Cautions for Flange Option>

1. If using without pallet clamps, select the standard JNC020-0F/JND020-0F.
2. When supplying hydraulic/air pressure in the connected condition, keep the pallet clamps in the locked condition (when using VS/WVS together).
3. Contact us for the combination use of VSB and VSJ.

<JNC020-0M/JND020-0M : Caution for Manifold Option>

1. The area of hexagonal head for tightening is small because of compact design. Surely apply a tool to the hexagonal head.

Auto Coupler

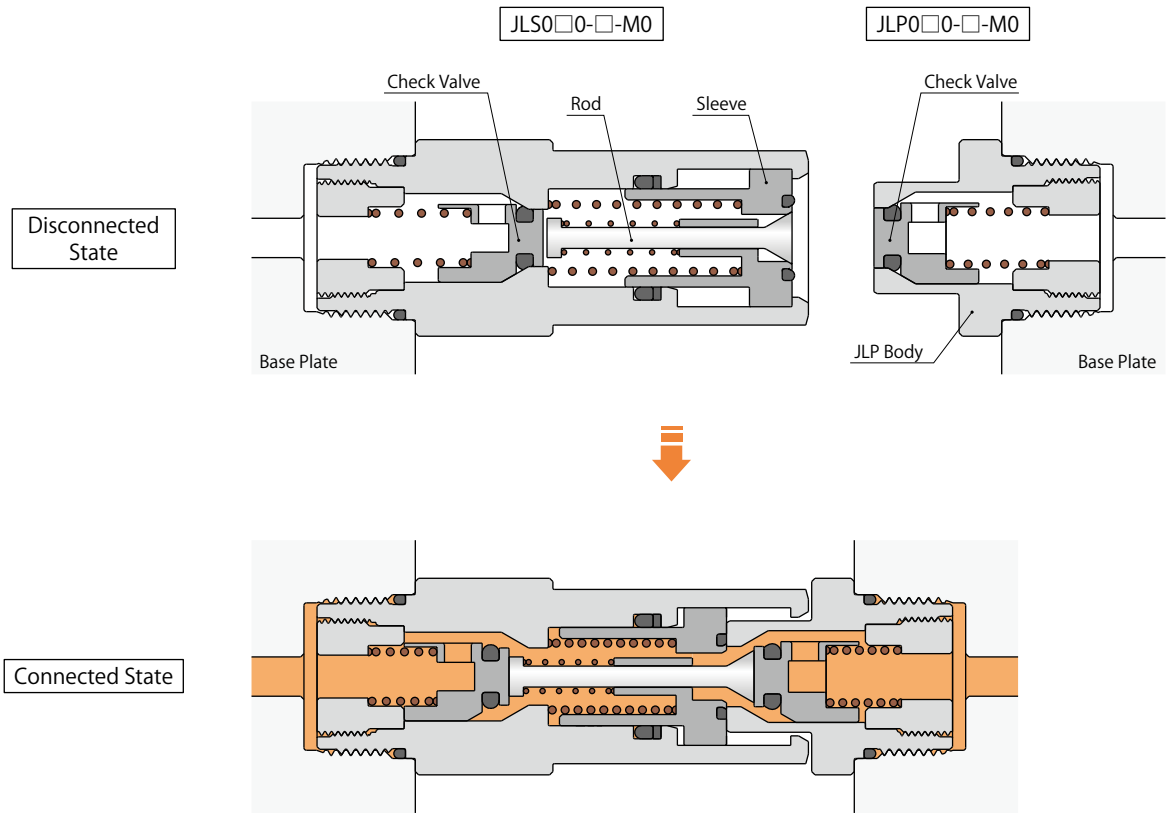
Model JLP/JLS

For Oil/Air/Coolant
(Operating Pressure Range:
lower than 3.5MPa/lower than 25MPa)

Feature

Auto joint with check valve is to be used in a hydraulic/air circuit or for coolant. Suitable for automation.

Action Description



When JLS is closely in contact with JLP, the body presses against the sleeve and the rod presses against check valve then the valve will open.

Model No. Indication

JL P 0 2 0 - W - M 0

1 2 3 4 5

1 Style

P : Plug Side

S : Socket Side

2 Body Size ※1

2 : Min. Passage Area 29mm²

3 : Min. Passage Area 50mm²

4 : Min. Passage Area 102mm²

3 Design No.

0 : Revision Number

4 Material

W : Stainless Steel, Brass, NBR (Recommended Fluid : Air)

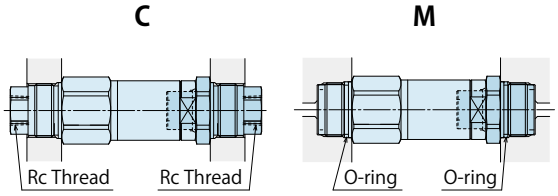
H : Stainless Steel, Brass, Fluor Rubber (Recommended Fluid : Coolant)

O : Steel, NBR (Recommended Fluid: General Hydraulic Oil)

5 Piping Method ※2

C : Connector Option

M : Manifold Option (O-ring Seal)



Notes :

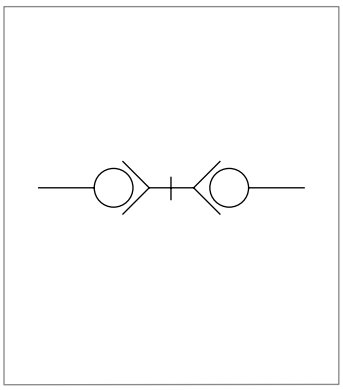
※1. Please contact us in the case that it is combined with different body size. However, it is recommended to use the same dimension from the point of view the maintenance and management of the spare item.

※2. Different piping method, C and M can be combined for use.

Specifications

Model No.		Plug Side	JLP020-□-□0	JLP030-□-□0	JLP040-□-□0
		Socket Side	JLS020-□-□0	JLS030-□-□0	JLS040-□-□0
Min. Passage Area mm²			29	50	102
Offset Tolerance mm			±0.5	±0.5	±0.8
Angular Deviation (Offset Tolerance) DEG.			0.5		
Max. Operating Pressure MPa	4	Material W	3.5		
	4	Material H	3.5		
	4	Material O	25		
Operating Temperature ℃	4	Material W/O	0～80		
	4	Material H	0～120		
Reaction Force kN	Operating Pressure	at 3.5 MPa	0.64	0.84	1.47
		at 25.0MPa	3.95	5.16	9.64
		at P MPa	0.154 × P + 0.10	0.201 × P + 0.13	0.380 × P + 0.14
Mass			Refer to External Dimensions		

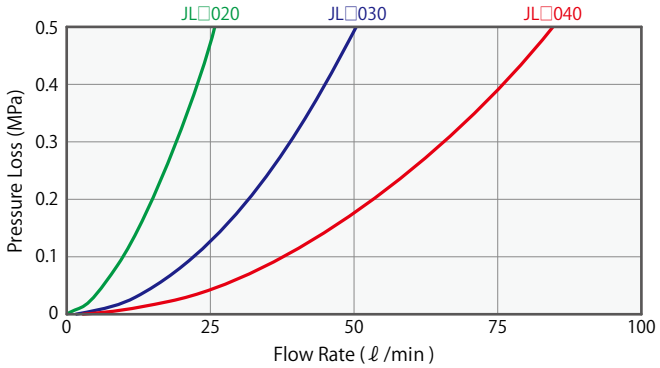
Circuit Symbol



Flow Rate—Pressure Loss Characteristic Graph

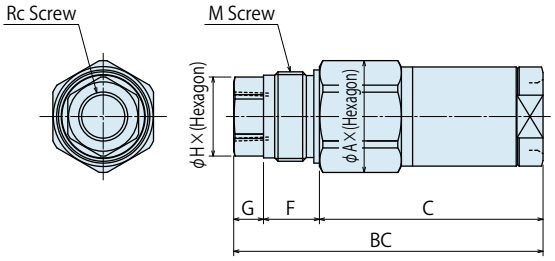
Fluid to be used on this data is water (temperature is 20℃).

Pressure Loss (MPa)	Flow Rate (ℓ /min)		
	JL□020	JL□030	JL□040
0	0	0	0
0.1	10.0	21.8	37.7
0.2	14.0	31.1	52.2
0.3	19.0	38.1	65.2
0.4	22.0	44.0	74.1
0.5	26.0	50.0	85.0

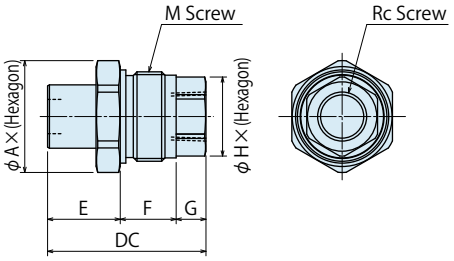


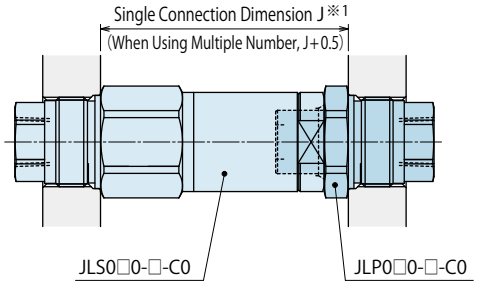
External Dimensions (JLP/JLS)

JLS0□0-□-C0

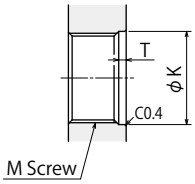


JLP0□0-□-C0



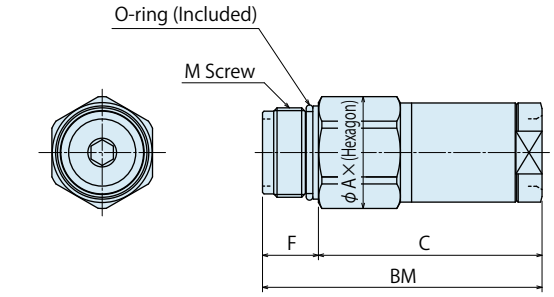


Machining Dimension for Mounting Hole
JLS0□0-□-C0/JLP0□0-□-C0 Common Items

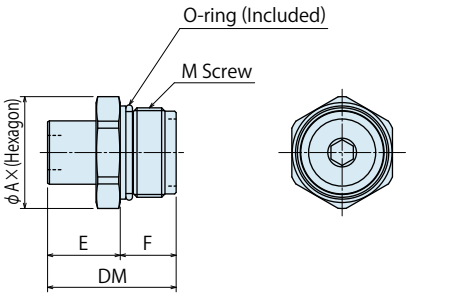


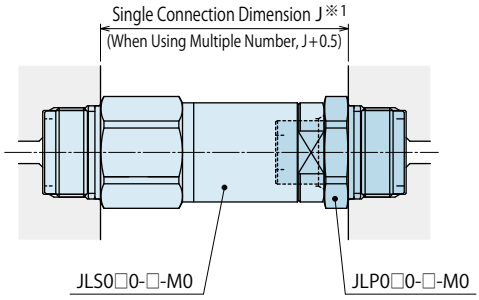
Model No.	Thread Size (M Screw)	Tightening Torque (N·m)	
		when choosing Material W/H	when choosing Material O
JL□020-□-C0	M24×1.5	25	100
JL□030-□-C0	M27×1.5	40	100
JL□040-□-C0	M33×1.5	63	180

JLS0□0-□-M0

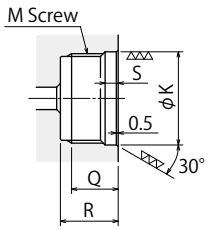


JLP0□0-□-M0





Machining Dimension for Mounting Hole
JLS0□0-□-M0/JLP0□0-□-M0 Common Items



Model No.	Thread Size (M Screw)	Tightening Torque (N·m)	
		when choosing Material W/H	when choosing Material O
JL□020-□-M0	M24×1.5	25	100
JL□030-□-M0	M27×1.5	40	100
JL□040-□-M0	M33×1.5	63	180

Dimensions

(mm)

Model No.	JLP	JLP020	JLP030	JLP040
	JLS	JLS020	JLS030	JLS040
A×(Hexagon)		φ30×(27)	φ33×(30)	φ40×(36)
BC		83	92.5	107
BM		75	81.5	94
C		60	65.5	76
DC		42.5	48.5	57.5
DM		34.5	37.5	44.5
E		19.5	21.5	26.5
F		15	16	18
G		8	11	13
H×(Hexagon)		φ21.2×(19)	φ24.5×(22)	φ30×(27)
J		66.5	72	84.5
K		φ25H8 $^{+0.033}_{0}$	φ28H8 $^{+0.033}_{0}$	φ34H8 $^{+0.039}_{0}$
M		M24×1.5	M27×1.5	M33×1.5
Q		12.5 or more	13.5 or more	15.5 or more
R		15.5 or more	16.5 or more	18.5 or more
S		3.5	3.5	3.5
T		2	2	2
Rc Screw		Rc1/4	Rc3/8	Rc1/2

Note :

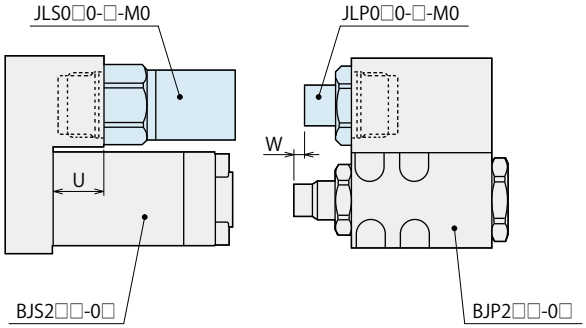
※1. When using multiple number, provide a stopper for connection dimension to be within +0.5mm of single connection dimension.

Mass

(kg)

Material		When W / H is chosen	When O is chosen
Piping Option C selected	JLS020-□-C0	0.26	0.25
	JLP020-□-C0	0.09	0.09
	JLS030-□-C0	0.36	0.35
	JLP030-□-C0	0.13	0.13
	JLS040-□-C0	0.60	0.57
	JLP040-□-C0	0.26	0.26
Piping Option M selected	JLS020-□-M0	0.25	0.24
	JLP020-□-M0	0.08	0.08
	JLS030-□-M0	0.34	0.33
	JLP030-□-M0	0.11	0.11
	JLS040-□-M0	0.56	0.53
	JLP040-□-M0	0.22	0.22

Combination Sample



(mm)

Model No.	JLP / JLS	JLP020-□-M0 / JLS020-□-M0	JLP030-□-M0 / JLS030-□-M0
U		27.5	22
W		5.5	3.5

Note

1. Additionally equip the air blow for JL□ (measure for cutting powder).

Cautions (JLP/JLS)

<Cautions (common)>

1. Do not connect or disconnect in the pressurized (pressure remaining) condition.
2. Perform air bleeding of the circuit sufficiently prior to operation (when using hydraulic pressure).
3. Do not connect in the condition that foreign substances such as chips adhere on the connecting surfaces.
   (Completely remove the adhering chips or coolant by air blow etc.)
4. Prevent foreign substances (chips or seal tape) from entering the circuit.
5. When using water or air as fluid, consider rust prevention of manifold blocks and pipe fittings.
6. When reaching the connection limit, the holding pressure
   should be higher than reaction pressure and lower than 4.0kN for JL□020-W/H-□0, higher than reaction force and lower than 6.0kN for JL□020-O-□0.
   should be higher than reaction pressure and lower than 5.0kN for JL□030-W/H-□0, higher than reaction force and lower than 9.0kN for JL□030-O-□0.
   should be higher than reaction pressure and lower than 7.0kN for JL□040-W/H-□0, higher than reaction force and lower than 12.0kN for JL□040-O-□0.
7. Please contact us if a larger passage area is needed than the one demonstrated.

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
BMA/BMG
AU/AU-M
BU
BP/JPB
BX
BEP/BSP
BH
BC
Air Hydraulic Unit
CV
CK
CP/CPB
CPC/CQC
CB
CC
AB/AB-V
AC/AC-V

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.

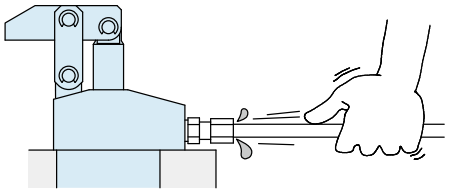
3) Applying Sealing Tape

- 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.

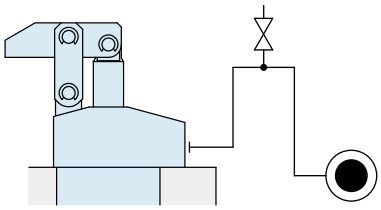
4) Air Bleeding of the Hydraulic Circuit

- 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	

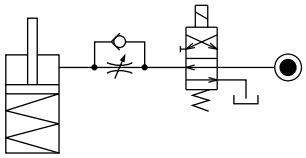
Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

Notes on Hydraulic Cylinder Speed Control Unit

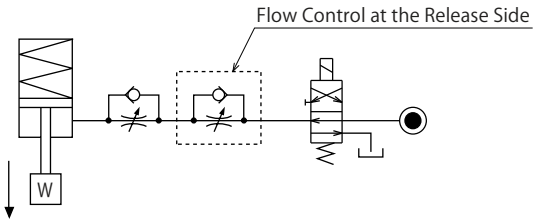
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

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.



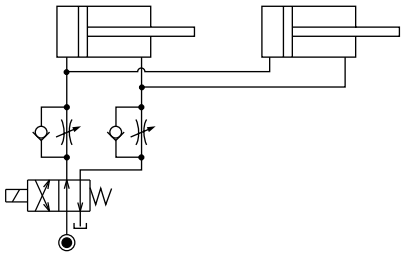
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



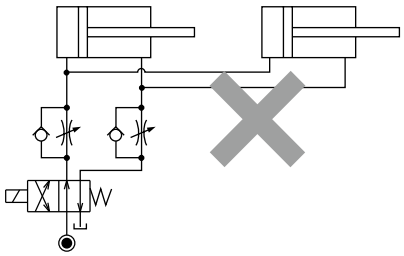
Flow Control Circuit for Double Acting Cylinder

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.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)

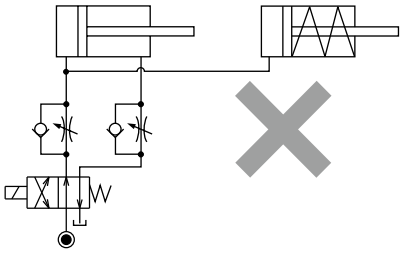


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



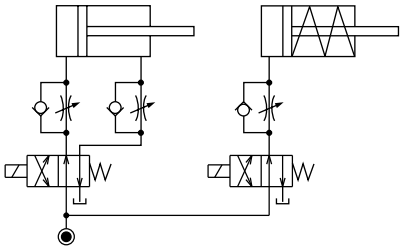
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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.

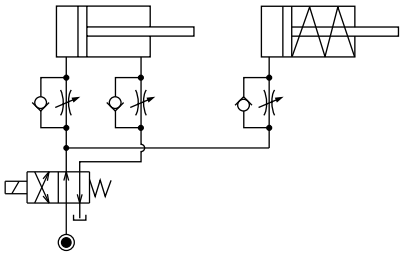


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

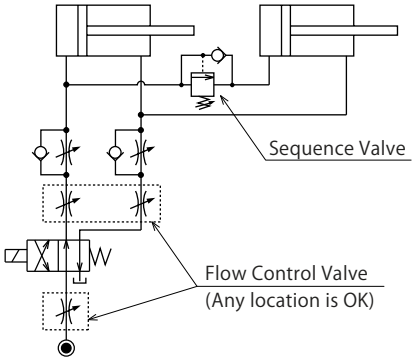
○ Separate the control circuit.



○ 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.



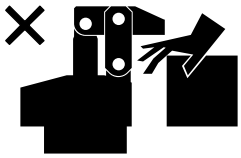
Cautions

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 clamp (cylinder) while clamp (cylinder) is working. Otherwise, your hands may be injured due to clinching.

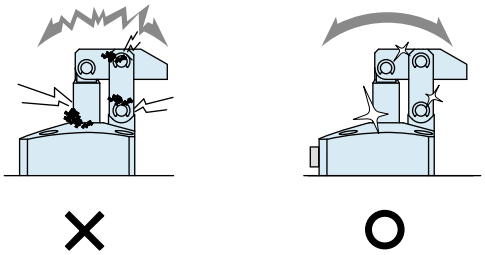


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

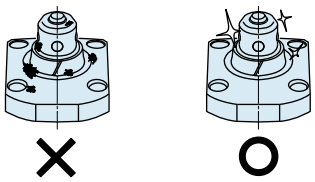
Maintenance and Inspection

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/VFL/VFM/VFJ/VFK/WVS/VWM/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.



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
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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

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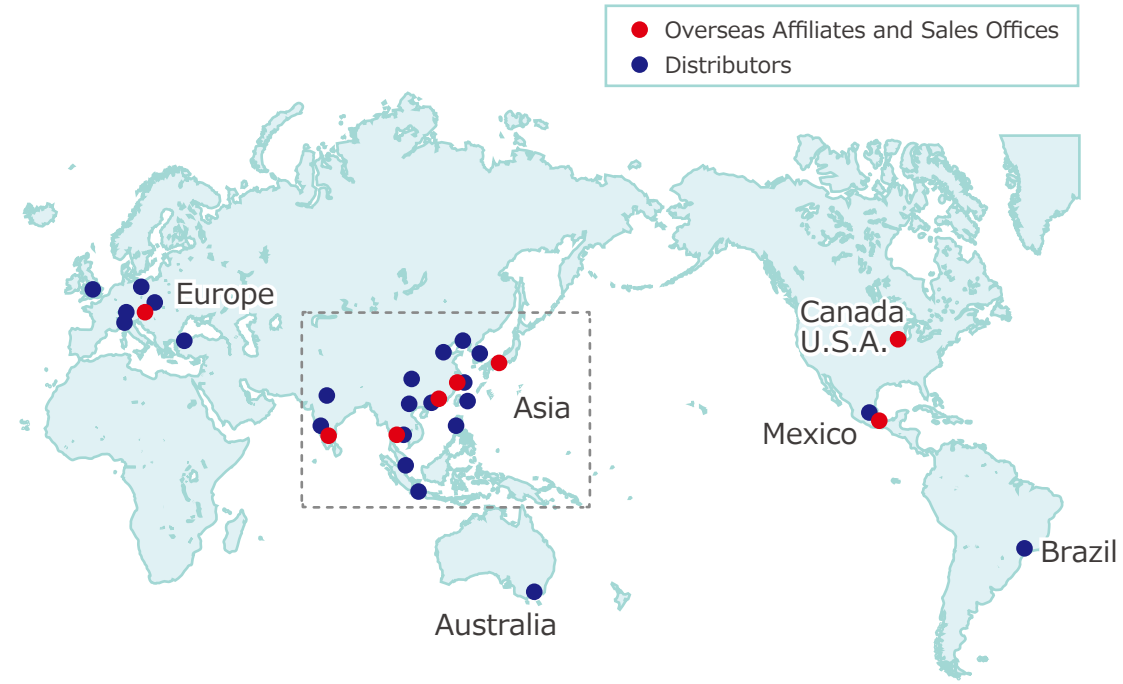
Nagoya Sales Office	**TEL.0566-74-8778**	FAX.0566-74-8808 〒446-0076　愛知県安城市美園町2丁目10番地1
Fukuoka Sales Office	**TEL.092-433-0424**	FAX.092-433-0426 〒812-0006　福岡県福岡市博多区上牟田1丁目8-10-101

Global Network



Asia Detailed Map

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