NIIGATA

SWIVEL JOINTS

TB Global Technologies Ltd.

Notice : Tokyo Boeki Machinery Ltd. and Tokyo Boeki Engineering Ltd. merged on April 1, 2021 to become TB Global Technologies Ltd.

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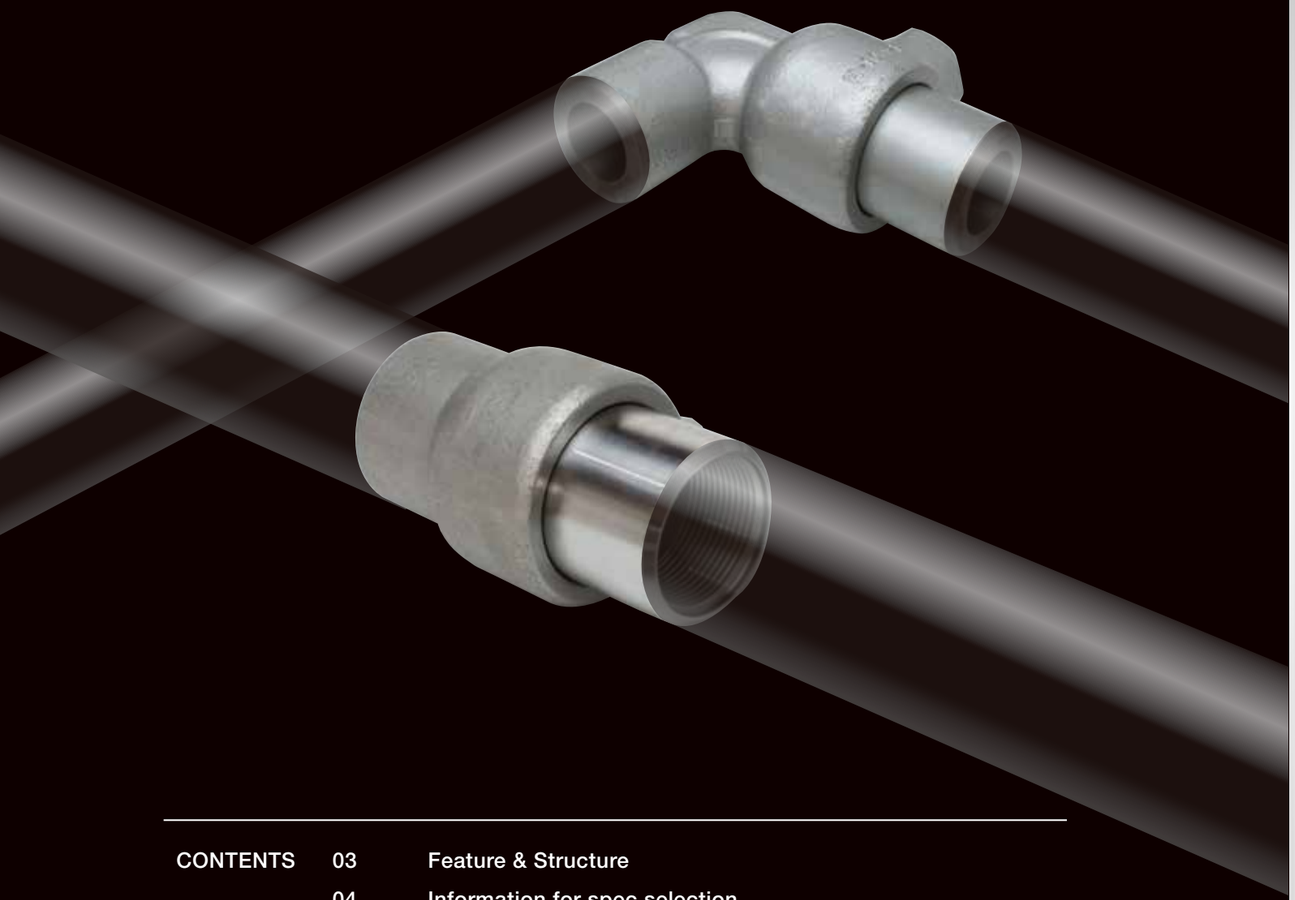
Flexible 360 degree rotation

NIIGATA CHIKSAN SWIVEL JOINTS allow complicated movement of pipe line



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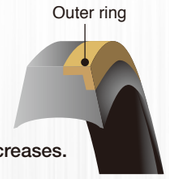
NIIGATA CHIKSAN SWIVEL JOINTS

Feature

- Flexible 360° rotation
- 9 kinds of standard styles
- Max. operating pressure 34 MPa

Special packing



- Designed for reducing the rotational resistance and sealing from low pressure to high pressure with low frictional force.
- Considering wear resistance and low compression set, it performs reliable sealing function for a long time.
- Since the cross-sectional shape is trapezoidal, it dose not twist.
- When pressure is applied to the packing in the axial direction, the surface pressure of the sealing surface increases. Therefore, sealing performance further improves by Self-sealing mechanism.
- Outer ring is attached to prevent damage caused by extrusion to the gap between the joint .

Grease retainer ring

- Owing to the special lip shape, dust and rainwater will not enter the ball bearing from the atmosphere.
- This special shape provides less wear and deformation for long time use.

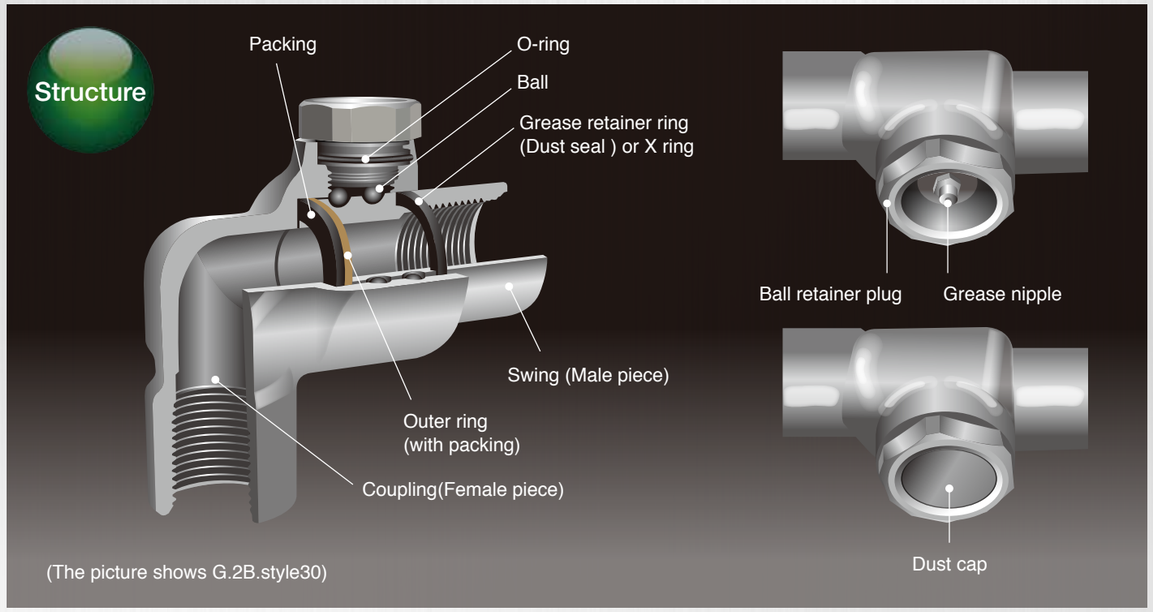
X-ring（for BD/BDR）

- X-shaped cross section does not twist during rotation under pressure. It has wear resistance, long service life and sealing function both external and internal pressure.
- Excellent sealing function is performed even under non-pressure by proper interference. Owing to self-sealing mechanism, the surface pressure with the joint surface increases by fluid pressure.

Ball retainer ring

- By incorporating the O ring, the dust and rainwater are certainly prevented entering the ball bearing part from the atmosphere.

Structure



(The picture shows G.2B.style30)

Information for spec selection

SWIVEL JOINTS

Please check the following information before order.

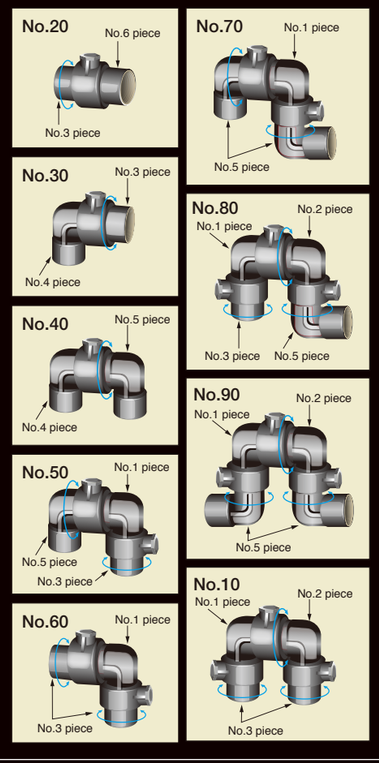
1 Color code

Green (G)
Blue (B)
Stainless (STT)
N style (N)
BD, BDR
Silver (S)
SN style (SN)
Orange (SH)
NHB
NSB
NPB
NSB

2 Size

Nominal Dia.(Inch)
3/8
1/2
3/4
1
1-1/4
1-1/2
2
2-1/2
3
4
5
6
8
10
12

3 Style No.



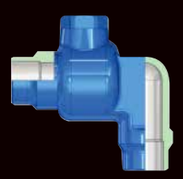
4 Packing (Seal material)

Materials	Code	Temp.Range	Main applicable fluid
NBR(Buna N)	00	-10℃～ +80℃	Industrial water, Sea water, Bunker C, Lubricant oil, Air, Cement, Hydraulic oil(water/petro), etc.NBR
NBR(Buna N Aromatic Resistance)	55	-10℃～ +60℃	Crude oil(-10 ～ +60℃), Gasoline, Jet fuel, Bunker A, LPG, CO2, etc.
EPT	6X	-35℃～ +60℃	Ammonia, etc.
FPM	HH	-7℃～ +125℃	Crude oil(+61 ～ +120℃), Hydraulic oil(ester phosphate), Sulphur acid(80 ～ 120%), etc.
PTFE + SST Spring	AD	-50℃～ +200℃	Steam, Ethyl alcohol, Chemical, Food service, etc.

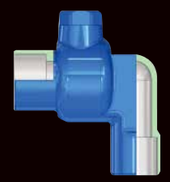
5 Connection

①Rc

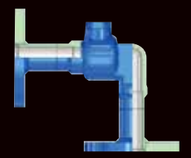
②BE(Bevel end)



③BO(Bore end)



④Flange (JIS5K・JIS10K・JIS20K・ANSI150lb・JPI150lb・ASME・ASTEM)



You can choose FF(Flat face) or RF(Raised face)

Quick reference chart

SWIVEL JOINTS

Niigata Chiksan Swivel Joint

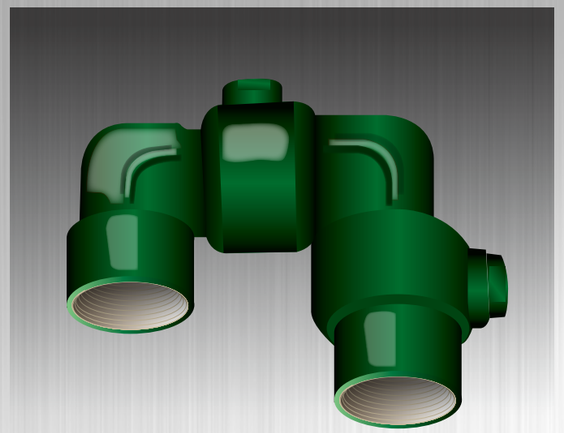
Model	1 Color code	Material (JIS)	2 Nominal Dia (※NPS)	5 End Connections			Max.Press (MPa)
				Threaded (THRD)	Flanged (FL)	Welded (WELD)	Operation
Low Pressure	Green(G)	FCD500	3/8～4	○	-	-	2.06
	Blue(B)	S30C/S40C AISI 1040	3/8～4	○	○	○	3.43
		S40C	5～12	-	○	○	
	Stainless(SST)	SUS316	3/8～2	○	○	○	2.06
			2-1/2～4	△	○	○	
			5～12	-	○	○	
	Type N(N)	S30C	2-1/2～4	-	○	○	3.43
		SF490A	6～12	-	○	○	2.06
	BD・BDR	S40C	2-1/2～12	-	○	○	3.43
High Pressure	Silver(S)	S40C	3/8～1	○	○	○	20.59
			1-1/4～2-1/2	○	○	○	10.3
	Silver(SN)		3～4	-	○	○	
Extra High Pressure	Orange(SH)	S40C	3/8～2	○	○	○	34.32
			2-1/2～5	-	○	○	20.59

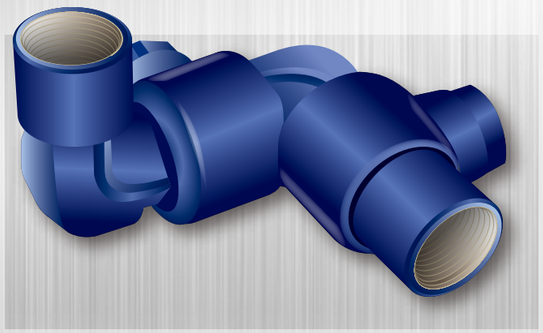
Original of TOKYO BOEKI ENGINEERING Niigata Swivel Joint

Extra High Pressure Balance	NHB	S25C	1	△	○	○	37.27
	NSB	S40C	1-1/4～6	△	○	○	39.23
	NPB	S35C	3～5	-	○	○	3,4 : 25 5 : 21
Sanitary	NS	SUS316	1S～4S	IDF/ISO Ferrule, Union, Plain End			0.98

※△・・・Thread adapters are welded on the ends.
※Other specifications are available on a made-to-order basis.
※NPS・・・Normal Pipe Size

●Female thread("RC"in JIS) is applied to all thread connection.(especially, fluid and temperature)
●Main material of swivel joints are shown in the table above.
Material of flanges and pipes are not necessarily the same. Contact our sales representatives for more details.
●Other specifications are available upon request.





Low Pressure Swivel Joints

Green Blue

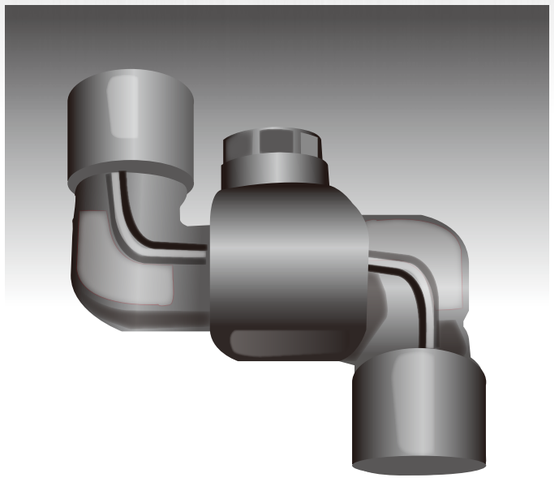
Low pressure swivel joints are used in various kinds of installations for operations. They are widely used in making up loading racks and flexible lines for handling all types of materials. The larger sizes find extensive use in all-metal loading and unloading lines, such as dock risers, and on manifold jumper lines.

Applicable Industries:

Iron, Steel, Petrochemical, Oil Refinery, Chemicals, Automobile, Machine Tools, Foods, Marine Loading / Unloading, Construction, Water / Treatment Hose Neck (prevent twist), pipe line of water or lubricant and others.

Color Code	Green (G)
Material (JIS)	FCD500
Nominal Dia.	3/8 - 4
Max. operating press.	2.06MPa
End Connection	THRD

Color Code	Blue (B)	
Material (JIS)	S30C / S40C /AISI1040	
Nominal Dia.	3/8 - 4	5 - 12
Max. operating press.	3.43MPa	
End Connection	THRD / FL / WELD	FL / WELD



Low Pressure Swivel Joints

Stainless

Stainless steel swivel joints are mainly used for cryogenic service and corrosive substances.

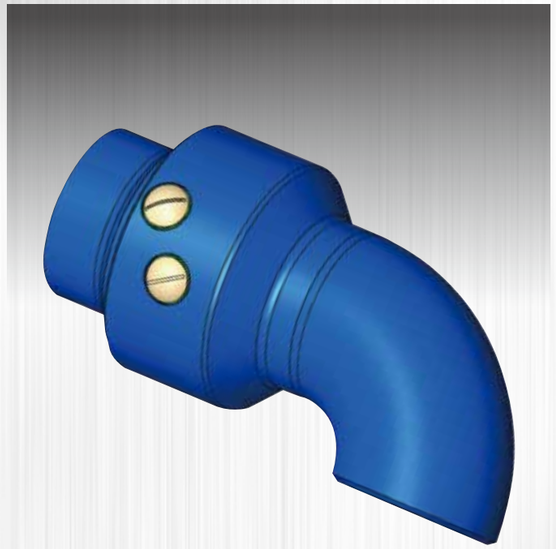
Additional Option :

Snap-in ball races for resistance against heavy load

Applicable Industries:

Iron, Steel, Petrochemical, Oil Refinery, Chemicals, Foods, Marine Loading / Unloading, Water / Drainage Treatment and others.

Color Code	Stainless (SST)	
Material (JIS)	SUS316	
Nominal Dia.	3/8 - 4	5 - 12
Max. operating press.	2.06MPa	
End Connection	THRD / FL / WELD	FL / WELD



Low Pressure Swivel Joints

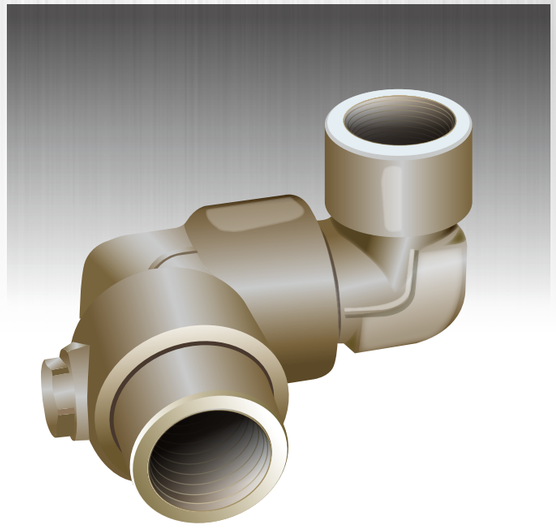
Type N

Type N swivel joints have a standard elbow design to minimize turbulence flow and cavitation. They are widely used in making up suction hoses, and for handling all material loading and unloading lines. Applications include dog-leg on vertical plane for gas fuel services.

Applicable Industries:

Petrochemical, Oil Refinery, Industrial machinery, many others.

Color Code	Type N (N)	
Material (JIS)	S30C	SF490A
Nominal Dia.	2-1/2 - 4	6 - 12
Max. operating press.	3.43MPa	2.06MPa
End Connection	FL / WELD	FL / WELD



High Pressure Swivel Joints

Silver (S)

High pressure swivel joints are applied to wide variety of industries as below:
They are widely used for high pressure hydraulic, air and cooling lines including others for absorption of vibration, deformation in piping system.

Applicable Industries:

Oil Drilling, Iron, Die-Cast Machine, Plastic Molding Machine, Industrial Machine, Mining, Aircraft, Various Oil Pressure Machines and Others.

Color Code	Silver	
Material (JIS)	S40C	
Nominal Dia.	3/8 - 1	1-1/4 - 2-1/2
Max. operating press.	20.59MPa	10.30MPa
End Connection	THRD / FL / WELD	

High Pressure Swivel Joints

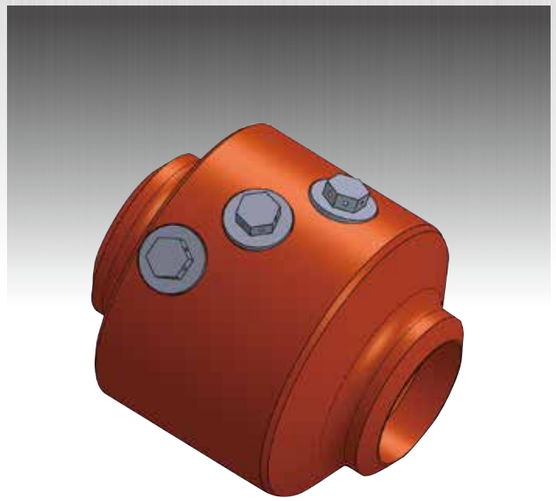
Type SN (SN)

High pressure swivel joints are applied to wide variety of industries as below:
They are widely used for high pressure hydraulic, air and cooling lines including others for absorption of vibration, deformation in piping system.

Applicable Industries:

Oil Drilling, Iron, Die-Cast Machine, Plastic Molding Machine, Industrial Machine, Mining, Aircraft, Various Oil Pressure Machines and Others.

Color Code	Type SN (SN)
Material (JIS)	S40C
Nominal Dia.	3 - 4
Max. operating press.	10.30MPa
End Connection	FL / WELD



High Pressure Swivel Joints

Orange (SH)

Extra High Pressure swivel joints are designed and built for extreme heavy duty where extreme pressure and high load are encountered.
2-1/2B - 5B have triple ball race and specially designed.

Applicable Industries:

Oil Drilling, Iron, Various Industrial Machines and others.

Color Code	Orange (SH)	
Material (JIS)	S40C	
Nominal Dia.	3/8 - 2	2-1/2 - 5
Max. operating press.	34.32MPa	20.59MPa
End Connection	THRD / FL / WELD	FL / WELD

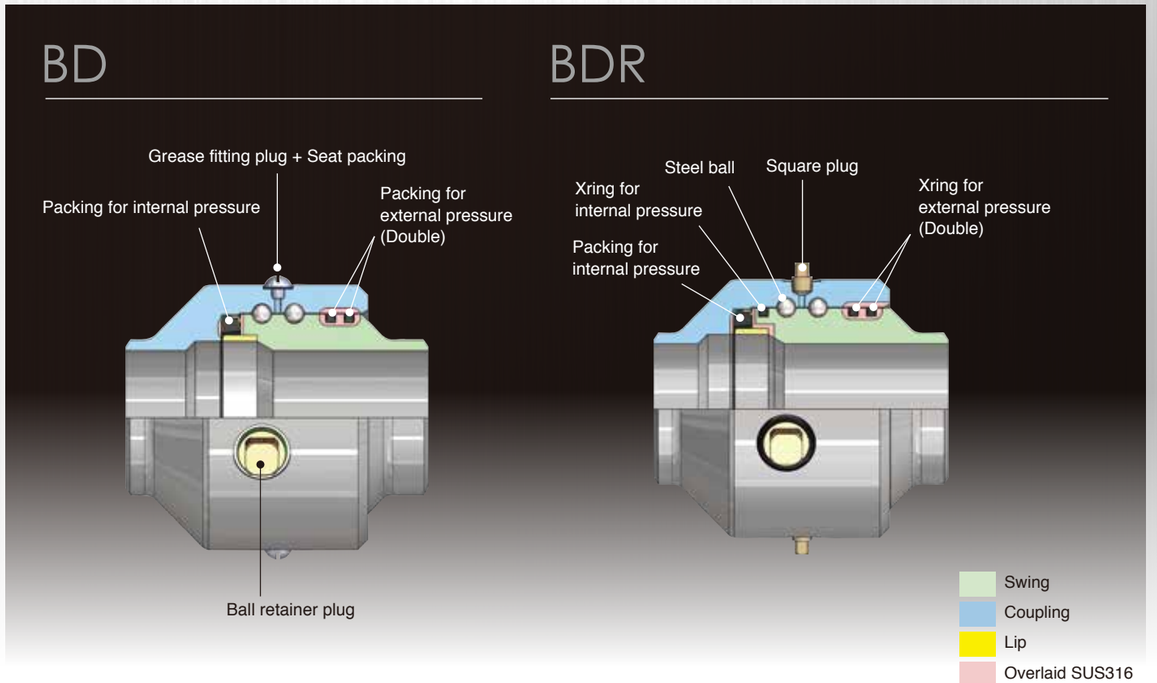
Double-seal type(BD.BDR) swivel joints are mainly used for drain piping systems for floating roof tanks.
They have special double or triple-seal, structure to withstand external pressure.
Overlaid SUS316 is applied to sealing surface to prevent corrosion.
BDR was improved from BD as long service life type.

Feature of BDR

1 Double seal structure
・Added X ring for external pressure.

2 Improvement of material（Packing, O-ring）
・Improved packing and X ring material to prevent compression set.

3 Improved durability
・As a countermeasure against corrosion, overlaid SUS316 at the coupling tip end was extended.
*During maintenance and assemble, corrosion at the coupling may cause X-rings damage.
・Added overlaid SUS316 at the lip part.
・Overlaid SUS316 at the surface of packing was extended.

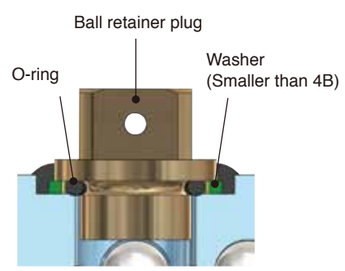


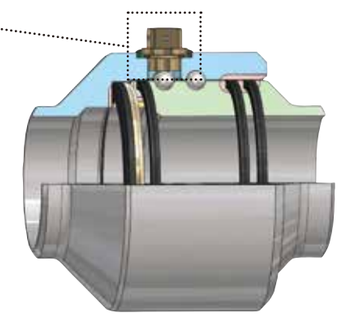
■BD・BDR

Size	2-1/2 ～ 12
Max working press(internal)	3.43MPa
Max working press(external)	0.25MPa
Connection	Flange
Material	S40C

Sealing surface (Packing & Xring)：Overlaid SUS316

■Detail part of ball retainer plug





Super high pressure balanced swivel joint (NSB・NPB)

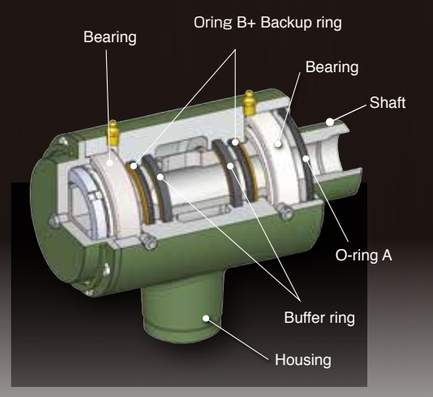
SWIVEL JOINTS

NSB・NPB have pressure-balanced structure which enable them to withstand water hammer and vibration under high operating pressure.

Feature

1. **Double seal structure (Buffer ring + O-ring) ※Only NHB・NSB**
2. **Buffer ring prevents impact pressure from being transmitted directly to the seal (O-ring B) ※Only NHB・NPB**
3. **O-ring A prevents contamination from the outside**
4. **O-ring B with backup ring of PTFE prevents the extrusion of O-ring**

NSB

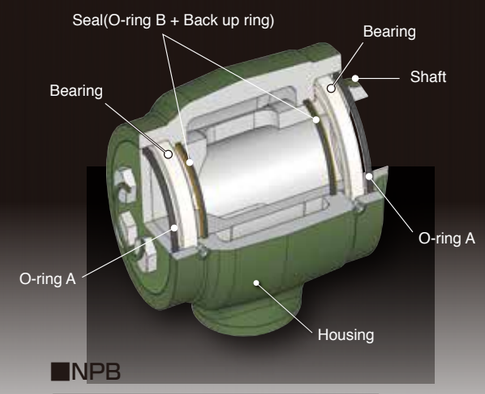


NPB

Weight ratio down to about 50% maximum

※Our conventional weight ratio

●Low cost・compact・short delivery time compared to NSB



■NHB・NSB

Size	1～4(1：NHB)
Max working press	37.27MPa(1) 39.23MPa(1-1/4～4)
Connection	Flange・Welding
Material	S40C

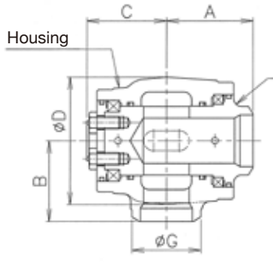
■NPB

Size	3～5
Max working press	25.0MPa(3,4) 21MPa(5)
Connection	Flange・Welding
Material	S35C

■NPB・NSB Dimension table

Model / Dimension	3		4	
	#30/#40		#30/#40	
	NSB	NPB	NSB	NPB
A	180	112	200	130
B	145	105	180	130
C	124.5	103	148	120
D	180	166	220	218
E	256.2	188.2	301.6	231.6
F	76.2	76.2	101.6	101.6
G	89.1	89.1	114.3	114.3

#30



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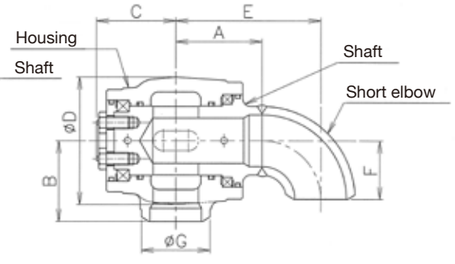


Sanitary Swivel Joints (NS)

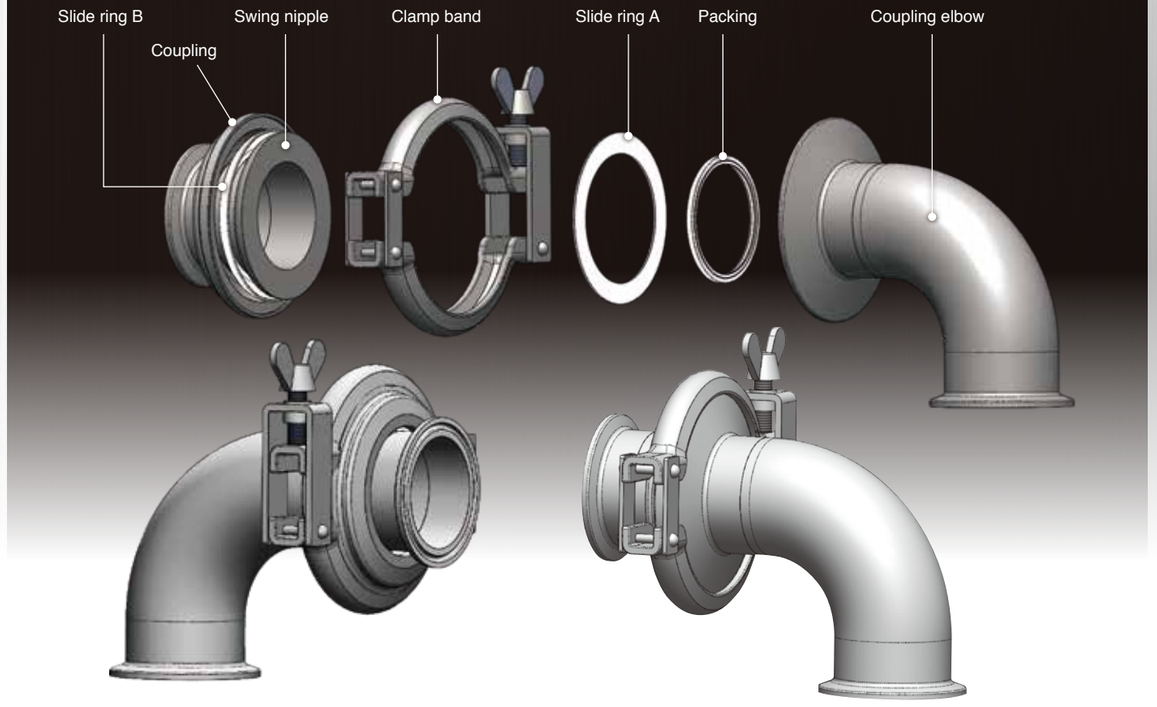
SWIVEL JOINTS

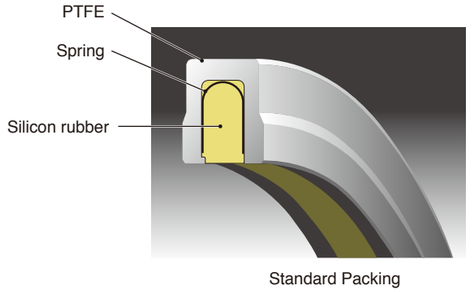
Niigata Sanitary swivel joints are perfectly suitable for applications which have strict sanitary requirements such as food and chemical industries where frequent pipe cleaning is essential. Sanitary joints allow smooth liquid flow. They have simple structures that make it easy to assemble / disassemble, and mount / dismount without tools.

Features

1. **Easy Handling and Maintenance** — Sanitary joints are easily assembled and disassembled by tighten and loosen clamp band by hand.
2. **Smooth Fluid Flow** — Flat shape in side of swivel joint. Using Sweep Elbow. It prevents fluid accumulation by the packing shape and allows smooth fluid flow.
3. **Compact & Light weight**
4. **Buffing (#400)**

NS





Standard Packing

■Specifications

Nominal Dia. (NPS)	1S・1-1/2S・2S・2-1/2S・3S・4S
Style	#20・#30・#40
Material	Body: SUS316 Packing: PTFE + Silicon rubber ※Non-silicon type (OFS) is available upon request.
Connection	IDF / ISO Ferrule ※Union and Plain (welded) ends are also available.
Max. Press.	0.98MPa
Temp. range	-10～+150℃

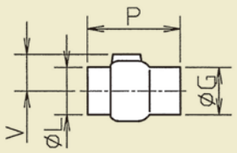
※Non-lubricated type

DIMENSIONS

Standard dimensions of Niigata swivel joints are listed below.
If a special dimension is required, consult our sales representatives.

Type 1　Threaded ends / Bored or beveled for welding

No.20



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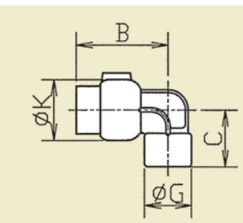

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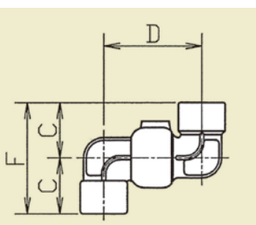

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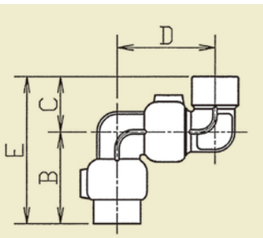

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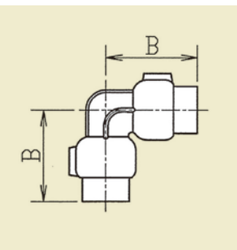

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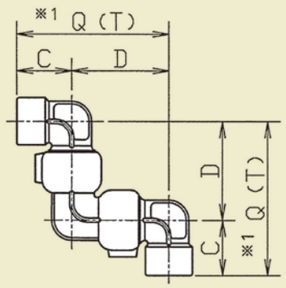

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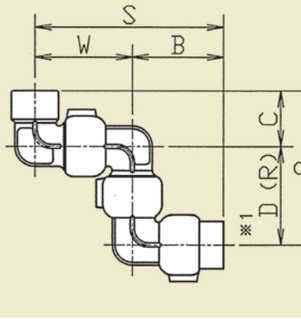
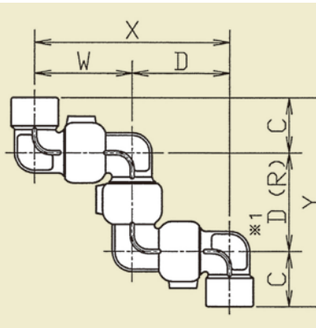
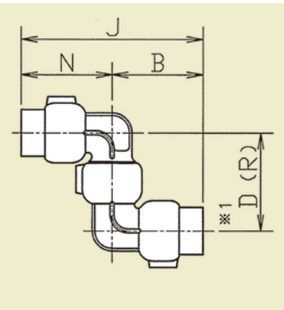


No.90



No.10



※1 For Blue(B), Silver(S) and Orange(SH), please refer "R" and "T" dimension.

■Green (G) Threaded ends

(unit : mm)

NPS \ Dim.	B	C	D	E	F	G	K	L	P	Q	V
3/8、1/2	75.4	42.9	66.7	118.3	85.8	28.6	38.1	26.7	88.9	109.6	30.5
3/4、1	98.4	63.5	92.1	161.9	127.0	41.3	57.2	41.0	114.3	155.6	46.1
1-1/4、1-1/2	113.5	76.2	108.7	189.7	152.4	58.7	73.0	56.0	126.2	184.9	53.5
2	145.3	87.3	155.6	232.6	174.6	74.6	95.3	74.6	146.8	242.9	65.0
2-1/2、3	174.6	117.5	192.1	292.1	235.0	101.6	125.4	101.6	166.7	202.5	78.4
4	193.7	127.0	231.8	320.7	254.0	127.0	159.0	127.8	182.6	358.8	91.2

■Blue (B) Threaded ends / Bored or beveled for welding

(unit : mm)

NPS \ Dim.	B	C	D	E	F	G	J	K	L	N	P	Q	R	S	T	V	W	X	Y
3/8、1/2	75.4	42.9	66.7	118.3	85.8	28.6	154.8	38.1	26.7	79.4	88.9	109.6	66.7	146.1	109.6	30.5	70.7	137.4	152.5
3/4、1	98.4	63.5	92.1	161.9	127.0	41.3	204.8	57.2	41.0	106.4	114.3	155.6	92.1	198.4	155.6	46.1	100.0	192.1	219.1
1-1/4、1-1/2	113.5	76.2	108.7	189.7	152.4	58.7	241.3	73.0	56.0	127.8	126.2	184.9	108.7	236.5	184.9	53.5	123.0	231.7	261.1
2	145.3	87.3	155.6	232.6	174.6	74.6	290.6	95.3	74.6	145.3	146.8	242.9	155.6	300.9	242.9	65.0	155.6	311.2	330.2
2-1/2、3	174.6	117.5	192.1	292.1	235.0	101.6	349.2	125.4	101.6	174.6	166.7	320.0	202.5	366.7	309.6	78.4	192.1	384.2	437.5
4	193.7	127.0	231.8	320.7	254.0	127.0	387.4	159.0	127.8	193.7	182.6	358.8	231.8	425.5	358.8	91.2	231.8	463.6	485.8

※Pipe schedule 40

■Stainless (SST) Threaded ends / Bored or beveled for welding

(unit : mm)

NPS \ Dim.	B	C	D	E	F	G	J	K	L	N	P	Q	S	V	W	X	Y
3/8、1/2	75.4	42.9	66.7	118.3	85.8	28.6	154.8	38.1	26.7	79.4	88.9	109.6	146.1	30.5	70.7	137.4	152.5
3/4、1	98.4	63.5	92.1	161.9	127.0	41.3	204.8	57.2	41.0	106.4	114.3	155.6	198.4	46.1	100.0	192.1	219.1
1-1/4、1-1/2	113.5	76.2	108.7	189.7	152.4	58.7	241.3	73.0	56.0	127.8	126.2	184.9	236.5	53.5	123.0	231.7	261.1
2	145.3	87.3	155.6	232.6	174.6	74.6	290.6	95.3	74.6	145.3	146.8	242.9	300.9	65.0	155.6	311.2	330.2

※Pipe schedule 40

■Silver (S) Threaded ends / Bored or beveled for welding

(unit : mm)

NPS \ Dim.	B	C	D	E	F	G	J	K	L	N	P	Q	R	S	T	V	W	X	Y
3/8、1/2	71.4	49.2	73.0	120.6	98.4	31.8	150.0	46.8	32.0	78.6	84.1	122.2	73.0	151.6	122.2	33.2	80.2	153.2	171.4
3/4、1	108.7	63.5	107.2	172.2	127.0	44.5	217.4	61.9	44.5	108.7	118.3	170.7	107.2	215.9	170.7	47.7	107.2	214.4	234.2
1-1/4、1-1/2	113.5	76.2	108.7	189.7	152.4	58.7	241.3	73.0	55.9	127.8	126.2	184.9	108.7	236.5	184.9	53.5	123.0	231.7	261.1
2	144.5	98.4	149.2	242.9	196.8	79.4	304.8	104.8	80.8	160.3	160.3	250.8	152.4	309.6	247.6	67.6	165.1	314.3	349.2
2-1/2	146.1	108.0	161.9	254.1	216.0	92.0	309.6	126.0	92.0	163.5	158.9	284.5	176.5	325.5	269.9	80.0	179.4	341.3	392.5

※Pipe schedule 160

■Orange (SH) Threaded ends / Beveled for welding Sch160

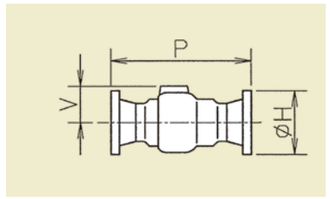
(unit : mm)

NPS \ Dim.	B	C	D	E	F	G	J	K	L	N	P	Q	R	S	T	V	W	X	Y
3/8、1/2	108.7	63.5	107.2	172.2	127.0	44.5	217.4	61.9	44.5	108.7	118.3	170.7	107.2	215.9	170.7	47.6	107.2	214.4	234.2
3/4、1	113.5	76.2	108.7	189.7	152.4	58.7	241.3	73.0	56.0	127.8	126.2	184.9	108.7	236.5	184.9	53.4	123.0	231.7	261.1
1-1/4、1-1/2	144.5	98.4	149.2	242.9	196.8	79.4	304.8	104.8	80.8	160.3	160.4	250.4	152.0	309.6	247.6	67.6	165.1	314.3	348.8
2	146.1	108.0	161.9	254.1	216.0	92.0	309.6	126.0	94.8	163.5	158.8	284.5	176.5	325.5	269.9	80.0	179.4	341.3	392.5

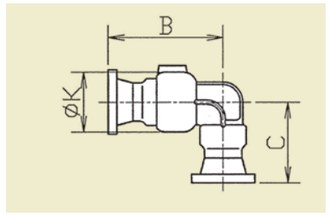
DIMENSIONS

Type 1　Flanged ends

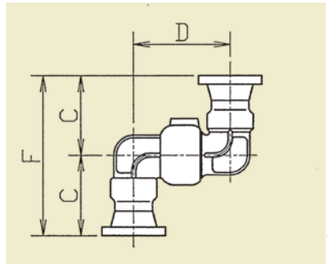
No.20



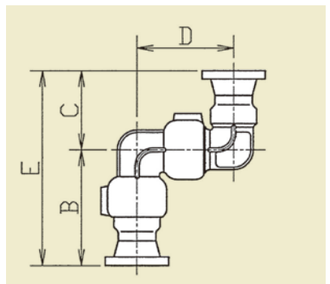
No.30



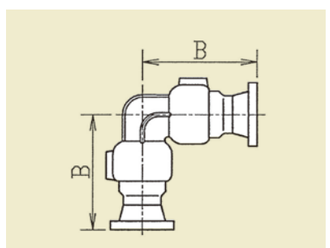
No.40



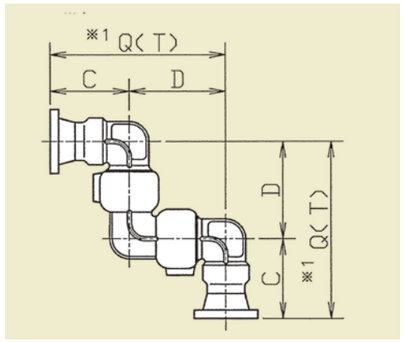
No.50



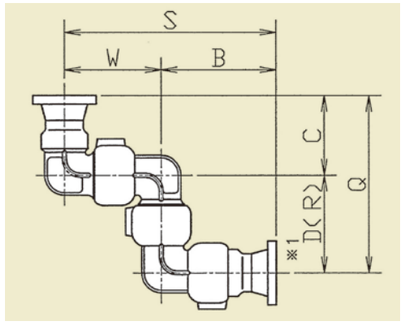
No.60



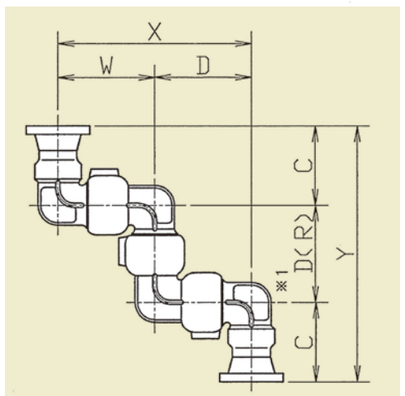
No.70



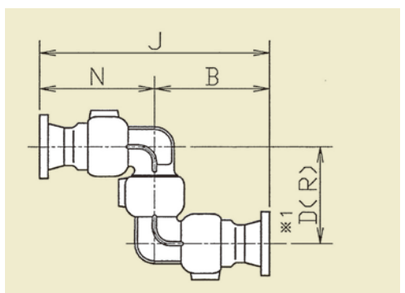
No.80



No.90



No.10



※1 For Blue(B), Silver(S) and Orange(SH), please refer "R" and "T" dimension.

※2 "H" dimensions of Silver and Orange show outside dimeters of JIS21MPa SHA・SHB flange. Other dimensions show that of JPI150Lb.

■Blue (B) Flanged ends

(unit : mm)

NPS \ Dim.	B	C	D	E	F	H	J	K	N	P	Q	R	S	T	V	W	X	Y
3/8	123.0	90.5	66.7	213.5	181.0	–	250.0	38.1	127.0	184.1	157.2	66.7	193.7	157.2	30.5	70.7	137.4	247.7
1/2	123.0	90.5	66.7	213.5	181.0	89.0	250.0	38.1	127.0	184.1	157.2	66.7	193.7	157.2	30.5	70.7	137.4	247.7
3/4	150.8	115.9	92.1	266.7	231.8	99.0	309.6	57.2	158.8	219.1	208.0	92.1	250.8	208.0	46.1	100.0	192.1	323.9
1	154.0	119.1	92.1	273.1	238.2	108.0	316.0	57.2	162.0	225.5	211.2	92.1	254.0	211.2	46.1	100.0	192.1	330.3
1-1/4	170.7	133.4	108.7	304.1	266.8	117.0	355.7	73.0	185.0	240.6	242.1	108.7	293.7	242.1	53.5	123.0	231.7	375.5
1-1/2	175.4	138.1	108.7	313.5	276.2	127.0	365.1	73.0	189.7	250.0	246.8	108.7	298.4	246.8	53.5	123.0	231.7	384.9
2	208.8	150.8	155.6	359.6	301.6	152.0	417.6	95.3	208.8	273.8	306.4	155.6	364.4	306.4	65.0	155.6	311.2	457.2
2-1/2	244.5	187.4	192.1	431.9	374.8	178.0	489.0	125.4	244.5	306.5	389.9	202.5	436.6	379.5	78.4	192.1	384.2	577.3
3	244.5	187.4	192.1	431.9	374.8	190.0	489.0	125.4	244.5	306.5	389.9	202.5	436.6	379.5	78.4	192.1	384.2	577.3
4	269.9	203.2	231.8	473.1	406.4	229.0	539.8	159.0	269.9	335.0	435.0	231.8	501.7	435.0	91.2	231.8	463.6	638.2

※Pipe schedule 40

■Stainless (SST) Flanged ends

(unit : mm)

NPS \ Dim.	B	C	D	E	F	H	J	K	N	P	Q	S	V	W	X	Y
3/8	123.0	90.5	66.7	213.5	181.0	–	250.0	38.1	127.0	184.1	157.2	193.7	30.5	70.7	137.4	247.7
1/2	123.0	90.5	66.7	213.5	181.0	89.0	250.0	38.1	127.0	184.1	157.2	193.7	30.5	70.7	137.4	247.7
3/4	150.8	115.9	92.1	266.7	231.8	99.0	309.6	57.2	158.8	219.1	208.0	250.8	46.1	100.0	192.1	323.9
1	154.0	119.1	92.1	273.1	238.2	108.0	316.0	57.2	162.0	225.5	211.2	254.0	46.1	100.0	192.1	330.3
1-1/4	170.7	133.4	108.7	304.1	266.8	117.0	355.7	73.0	185.0	240.6	242.1	293.7	53.5	123.0	231.7	375.5
1-1/2	175.4	138.1	108.7	313.5	276.2	127.0	365.1	73.0	189.7	250.0	246.8	298.4	53.5	123.0	231.7	384.9
2	208.8	150.8	155.6	359.6	301.6	152.0	417.6	95.3	208.8	273.8	306.4	364.4	65.0	155.6	311.2	457.2

※Pipe schedule 40

■Silver (S) Flanged ends JIS21MPa

(unit : mm)

NPS \ Dim.	B	C	D	E	F	H	J	K	N	P	Q	R	S	T	V	W	X	Y
1/2	119.0	96.8	73.0	215.8	193.6	63.0	245.2	46.8	126.2	179.3	169.8	73.0	199.2	169.8	33.2	80.2	153.2	266.6
3/4	161.1	115.9	107.2	277.0	231.8	68.0	322.2	61.9	161.1	223.1	223.1	107.2	268.3	223.1	47.7	107.2	214.4	339.0
1	164.3	119.1	107.2	283.4	238.2	80.0	328.6	61.9	164.3	229.5	226.3	107.2	271.5	226.3	47.7	107.2	214.4	345.4
1-1/4	170.7	133.4	108.7	304.1	266.8	90.0	355.7	73.0	185.0	240.6	242.1	108.7	293.7	242.1	53.5	123.0	231.7	375.5
1-1/2	175.4	138.1	108.7	313.5	276.2	100.0	365.1	73.0	189.7	250.0	246.8	108.7	298.4	246.8	53.5	123.0	231.7	384.9
2	208.0	161.9	149.2	369.9	323.8	112.0	431.8	104.8	223.8	287.3	314.3	152.4	373.1	311.1	67.6	165.1	314.3	476.2
2-1/2	226.1	188.0	161.9	414.1	376.0	140.0	469.6	126.0	243.5	318.9	364.5	176.5	405.5	349.9	80.0	179.4	341.3	552.5

※Pipe schedule 160

■Orange (SH) Beveled for welding Sch160

(unit : mm)

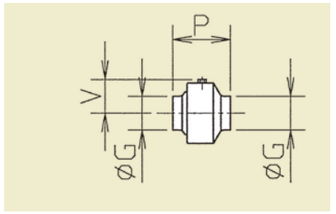
NPS \ Dim.	B	C	D	E	F	H	J	K	N	P	Q	R	S	T	V	W	X	Y
1/2	157.9	112.7	107.2	270.6	225.4	63.0	315.8	61.9	157.9	216.7	219.9	107.2	265.1	219.9	47.6	107.2	214.4	332.6
3/4	167.5	130.2	108.7	297.7	260.4	68.0	349.3	73.0	181.8	234.2	238.9	108.7	290.5	238.9	53.4	123.0	231.7	369.1
1	170.7	133.4	108.7	304.1	266.8	80.0	355.7	73.0	185.0	240.6	242.1	108.7	293.7	242.1	53.4	123.0	231.7	375.5
1-1/4	203.3	157.2	149.2	360.5	314.4	90.0	422.4	104.8	219.1	278.0	309.2	152.0	368.4	306.4	67.6	165.1	314.3	466.4
1-1/2	208.0	161.9	149.2	369.9	323.8	100.0	431.8	104.8	223.8	287.4	313.9	152.0	373.1	311.1	67.6	165.1	314.3	475.8
2	211.2	173.1	161.9	384.3	346.2	112.0	439.8	126.0	228.6	289.0	349.6	176.5	390.6	335.0	80.0	179.4	341.3	522.7

※Pipe schedule 160

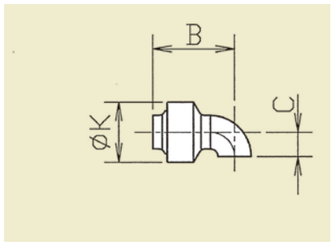
DIMENSIONS

Type 2　Beveled for Welding

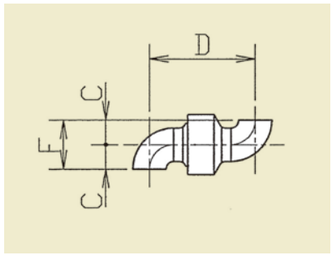
No.20



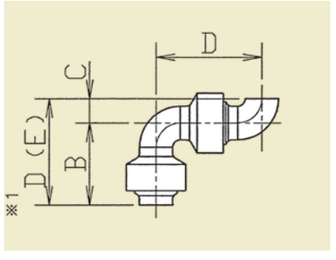
No.30



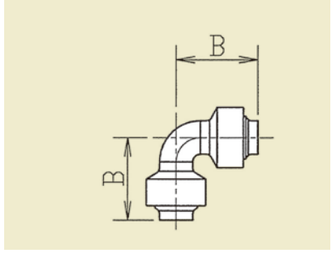
No.40



No.50



No.60



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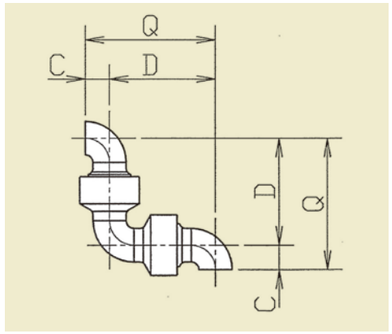
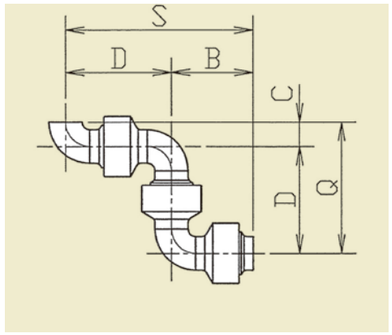


No.80



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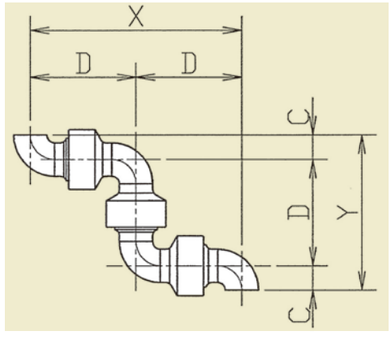
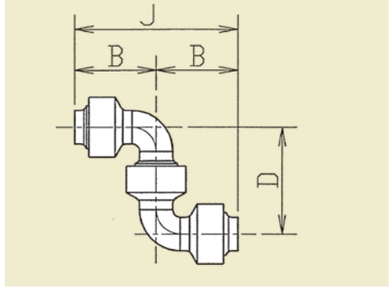


No.10



※1 For Orange(SH), please refer "E" dimension.
※2 The shapes of Type SN are different from the above.

■Blue (B) Beveled for welding Sch40

(unit : mm)

NPS \ Dim.	B	C	D	F	G	J	K	P	Q	S	X	Y
5	295.9	127.0	422.9	254.0	139.8	591.8	220.0	168.9	549.9	718.8	845.8	676.9
6	315.9	152.4	468.3	304.8	165.2	631.8	239.7	163.5	620.7	784.2	936.6	773.1
8	387.4	203.2	590.6	406.4	216.3	774.8	286.8	184.2	793.8	978.0	1181.2	997.0
10	501.7	254.0	755.7	508.0	267.4	1003.4	338.2	247.7	1009.7	1257.4	1511.4	1263.7
12	577.9	304.8	882.7	609.6	318.5	1155.8	403.2	273.1	1187.5	1460.6	1765.4	1492.3

■Stainless (SST) Beveled for welding Sch40

(unit : mm)

NPS \ Dim.	B	C	D	F	G	J	K	P	Q	S	V	X	Y
2-1/2	213.3	63.5	276.8	127.0	76.3	426.6	130.0	149.8	340.3	490.1	70.1	553.6	403.8
3	226.0	76.2	302.2	152.4	89.1	452.0	130.0	149.8	378.4	528.2	70.1	604.4	454.6
4	254.2	101.6	355.8	203.2	114.3	508.4	155.0	152.6	457.4	610.0	83.3	711.6	559.0
5	295.9	127.0	422.9	254.0	139.8	591.8	220.0	168.9	549.9	718.8	–	845.8	676.9
6	315.9	152.4	468.3	304.8	165.2	631.8	240.0	163.5	620.7	784.2	–	936.6	773.1
8	387.4	203.2	590.6	406.4	216.3	774.8	290.0	184.2	793.8	978.0	–	1181.2	997.0
10	501.7	254.0	755.7	508.0	267.4	1003.4	338.2	247.7	1009.7	1257.4	–	1511.4	1263.7
12	577.9	304.8	882.7	609.6	318.5	1155.8	403.2	273.1	1187.5	1460.6	–	1765.4	1492.3

■Type N (N) Beveled for welding Sch40

(unit : mm)

NPS \ Dim.	B	C	D	F	G	J	K	P	Q	S	V	X	Y
2-1/2	213.3	63.5	276.8	127.0	76.3	426.6	128.0	149.8	340.3	490.1	70.1	553.6	403.8
3	226.0	76.2	302.2	152.4	89.1	452.0	128.0	149.8	378.4	528.2	70.1	604.4	454.6
4	254.2	101.6	355.8	203.2	114.3	508.4	155.0	152.6	457.4	610.0	83.3	711.6	559.0
6	295.7	152.4	448.1	304.8	165.2	591.4	216.0	143.3	600.5	743.8	109.8	896.2	752.9
8	346.5	203.2	549.7	406.4	216.3	693.0	265.0	143.3	752.9	896.2	133.7	1099.4	956.1
10	436.9	254.0	690.9	508.0	267.4	873.8	320.0	182.9	944.9	1127.8	165.2	1381.8	1198.9
12	487.7	304.8	792.5	609.6	318.5	975.4	372.0	182.9	1097.3	1280.2	190.4	1585.0	1402.1

■Type SN (SN) Beveled for welding Sch160

(unit : mm)

NPS \ Dim.	B	C	D	F	G	J	K	P	Q	S	V	X	Y
3	230.7	76.2	306.9	152.4	89.1	461.4	160.0	154.5	383.1	537.6	89.7	613.8	459.3
4	267.6	101.6	369.2	203.2	114.3	535.2	195.0	166.0	470.8	636.8	106.8	738.4	572.4

■Orange (SH) Beveled for welding Sch160

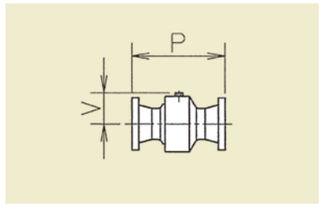
(unit : mm)

NPS \ Dim.	B	C	D	E	F	G	J	K	P	Q	S	V	X	Y
2-1/2	256.0	63.5	321.1	319.5	127.0	76.3	512.0	160.0	190.9	384.6	577.1	90.7	642.2	448.1
3	268.7	76.2	346.5	344.9	152.4	89.1	537.4	160.0	190.9	422.7	615.2	89.7	693.0	498.9
4	320.3	101.6	423.5	421.9	203.2	114.3	640.6	195.0	217.1	525.1	743.8	100.0	847.0	626.7
5	353.9	127.0	482.5	480.9	254.0	139.8	707.8	230.0	225.3	609.5	836.4	124.6	965.0	736.5

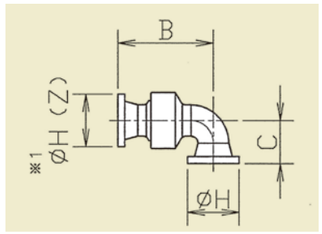
DIMENSIONS

Type 2　Flanged Ends

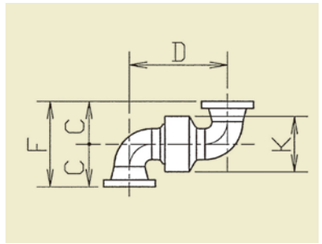
No.20



No.30



No.40



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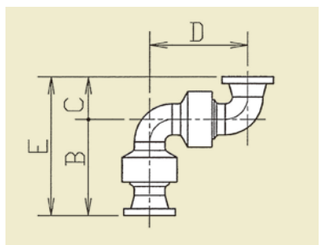

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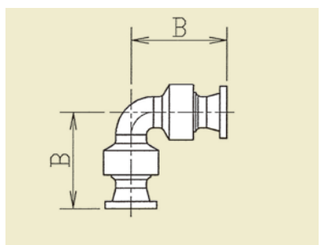
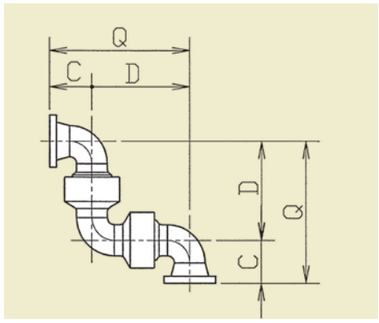


No.70



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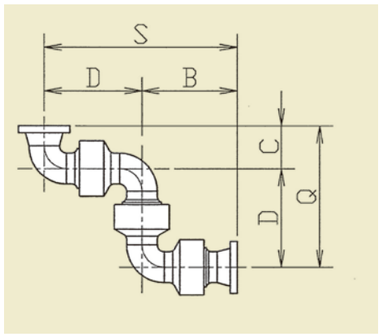

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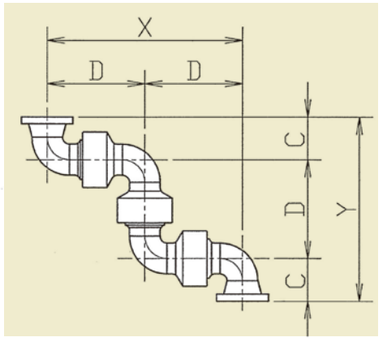

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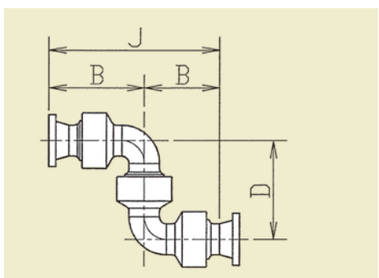


※1 For BD・BDR, please refer "Z" dimension.
※2 The shapes of Type SN are different from the above.
※3 "H (Z)" dimensions of Silver, SN and Orange show outside dimeters of JIS21MPa SHA・SHB flange. Other dimensions as how that of JPI150Lb.

■Blue (B) Flanged ends

(unit : mm)

NPS \ Dim.	B	C	D	E	F	H	J	K	P	Q	S	X	Y
5	384.8	215.9	422.9	600.7	431.8	254.0	769.6	220.0	346.7	638.8	807.7	845.8	854.7
6	404.8	241.3	468.3	646.1	482.6	279.0	809.6	239.7	341.3	709.6	873.1	936.6	950.9
8	489.0	304.8	590.6	793.8	609.6	343.0	978.0	286.8	387.4	895.4	1079.6	1181.2	1200.2
10	603.3	355.6	755.7	958.9	711.2	406.0	1206.6	338.2	450.9	1111.3	1359.0	1511.4	1466.9
12	692.2	419.1	882.7	1111.3	838.2	483.0	1384.4	403.2	501.7	1301.8	1574.9	1765.4	1720.9

※Pipe schedule 40

■Stainless (SST) Flanged ends

(unit : mm)

NPS \ Dim.	B	C	D	E	F	H	J	K	P	Q	S	V	X	Y
2-1/2	283.2	133.4	276.8	416.6	266.8	178.0	566.4	130.0	289.6	410.2	560.0	70.1	553.6	543.6
3	295.9	146.1	302.2	442.0	292.2	190.0	591.8	130.0	289.6	448.3	598.1	70.1	604.4	594.4
4	330.4	177.8	355.8	508.2	355.6	229.0	660.8	155.0	305.0	533.6	686.2	83.3	711.6	711.4
5	384.8	215.9	422.9	600.7	431.8	254.0	769.6	220.0	346.7	638.8	807.7	–	845.8	854.7
6	404.8	241.3	468.3	646.1	482.6	279.0	809.6	240.0	341.3	709.6	873.1	–	936.6	950.9
8	489.0	304.8	590.6	793.8	609.6	343.0	978.0	290.0	387.4	895.4	1079.6	–	1181.2	1200.2
10	603.3	355.6	755.7	958.9	711.2	406.0	1206.6	338.2	450.9	1111.3	1359.0	–	1511.4	1466.9
12	692.2	419.1	882.7	1111.3	838.2	483.0	1384.4	403.2	501.7	1301.8	1574.9	–	1765.4	1720.9

※Pipe schedule 40

■TypeN (N) Flanged ends

(unit : mm)

NPS \ Dim.	B	C	D	E	F	H	J	K	P	Q	S	V	X	Y
2-1/2	283.2	133.4	276.8	416.6	266.8	178.0	566.4	128.0	289.6	410.2	560.0	70.1	553.6	543.6
3	295.9	146.1	302.2	442.0	292.2	190.0	591.8	128.0	289.6	448.3	598.1	70.1	604.4	594.4
4	330.4	177.8	355.8	508.2	355.6	229.0	660.8	155.0	305.0	533.6	686.2	83.3	711.6	711.4
6	384.6	241.3	448.1	625.9	482.6	279.0	769.2	216.0	321.1	689.4	832.7	109.8	896.2	930.7
8	448.1	304.8	549.7	752.9	609.6	343.0	896.2	265.0	346.5	854.5	997.8	133.7	1099.4	1159.3
10	538.5	355.6	690.9	894.1	711.2	406.0	1077.0	320.0	386.1	1046.5	1229.4	165.2	1381.8	1402.1
12	602.0	419.1	792.5	1021.1	838.2	483.0	1204.0	372.0	411.5	1211.6	1394.5	190.4	1585.0	1630.7

※Pipe schedule 40

■BD・BDR Flanged ends

(unit : mm)

NPS \ Dim.	B	C	D	F	H	K	P	V	Z
2-1/2	283.2	133.4	276.8	266.8	178.0	130.0	289.6	77.1	178.0
3	295.9	146.1	302.2	292.2	190.0	130.0	289.6	77.1	190.0
4	330.4	177.8	355.8	355.6	229.0	155.0	305.0	90.3	229.0
6	404.8	241.3	468.3	482.6	279.0	240.0	341.3	130.8	279.0
8	489.0	304.8	590.6	609.6	343.0	295.0	387.4	157.0	343.0
10	603.3	355.6	755.7	711.2	406.0	344.0	450.9	182.6	406.0
12	692.2	419.1	882.7	838.2	483.0	403.0	501.7	212.0	483.0

※Pipe schedule 40

■BD・BDR Different size flanged ends (Style No.30)

(unit : mm)

NPS \ Dim.	B	C	H	K	Z
3×2-1/2	283.2	133.4	178.0	130.0	190.0
4×3	295.9	146.1	190.0	130.0	229.0
6×4	330.4	177.8	229.0	155.0	279.0
8×6	404.8	241.3	279.0	240.0	343.0
10×8	489.0	304.8	343.0	295.0	406.0
12×10	603.3	355.6	406.0	344.0	483.0
14×12	692.2	419.1	483.0	403.0	535.0

※Pipe schedule 40

■Type SN (SN) Flanged ends JIS21MPa

(unit : mm)

NPS \ Dim.	B	C	D	E	F	H	J	P	Q	S	V	X	Y
3	315.7	161.2	306.9	476.9	322.4	155.0	631.4	324.5	468.1	622.6	106.8	613.8	629.3

※NPS 4 flanges are out of JIS standards, but available upon request.
※Pipe schedule 160

■Orange (SH) Flanged ends JIS21MPa

(unit : mm)

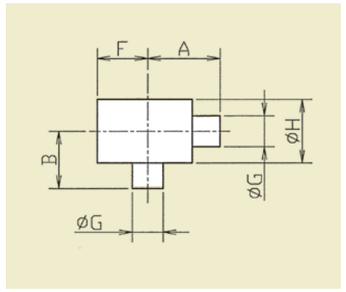
NPS \ Dim.	B	C	D	E	F	H	J	K	P	Q	S	V	X	Y
2-1/2	337.6	145.1	321.1	482.7	290.2	140.0	675.2	160.0	354.1	466.2	658.7	90.7	642.2	611.3
3	355.3	162.8	346.5	518.1	325.6	155.0	710.6	160.0	364.1	509.3	701.8	89.7	693.0	672.1

※NPS 4 & 5 flanges are out of JIS standards, but available upon request.
※Pipe schedule 160

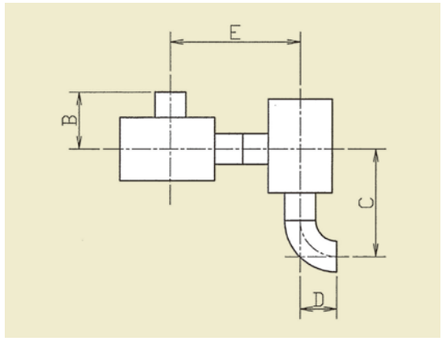
DIMENSIONS

Super High Pressure Balanced Type

No.30



No.70



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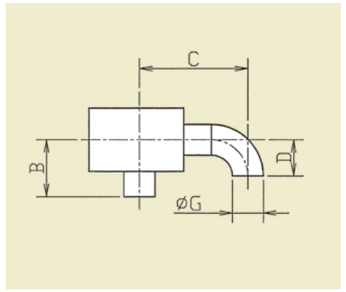

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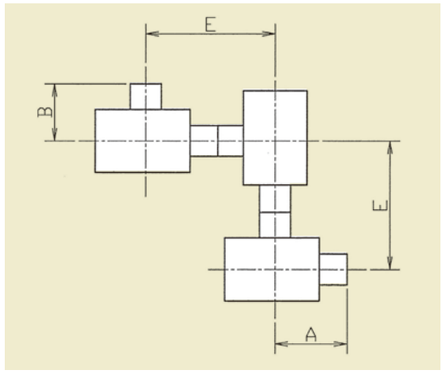

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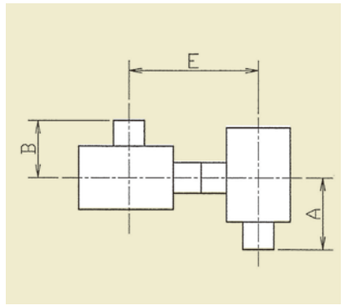

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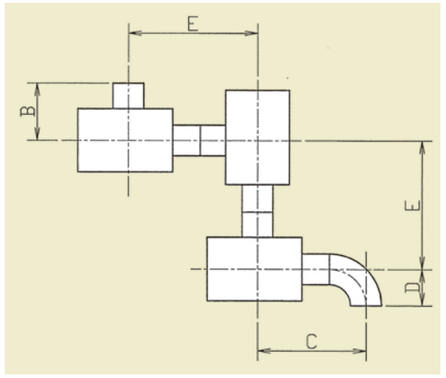
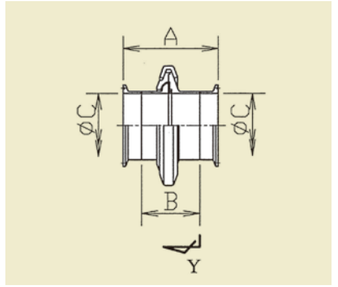


Sanitary Type

No.20



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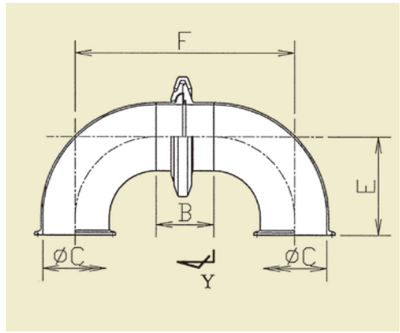

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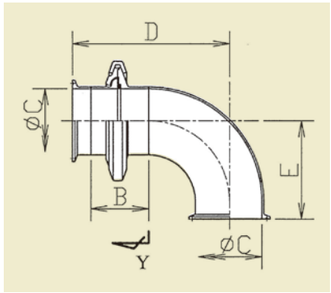
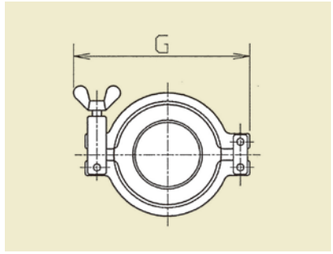
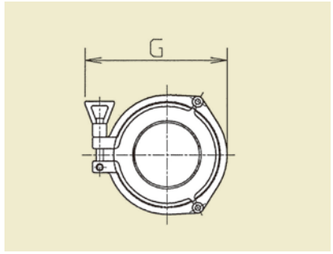


CLAMP BANDS

NPS:1～2S



NPS:2-1/2～4S



■NSB Beveled for welding Sch160 (unit : mm)

NPS \ Dim.	A	B	C	D	E	F	G	H
1	80.0	65.0	118.1	38.1	145.0	55.0	34.0	75.0
1-1/4	113.0	85.0	160.6	47.6	198.0	79.0	42.7	100.0
1-1/2	113.0	90.0	170.2	57.2	203.0	79.0	48.6	100.0
2	145.0	120.0	195.8	50.8	265.0	107.5	60.5	130.0
2-1/2	177.0	135.0	240.5	63.5	312.0	122.0	76.3	160.0
3	180.0	145.0	256.2	76.2	325.0	124.5	89.1	180.0
4	200.0	180.0	301.6	101.6	380.0	148.0	114.3	220.0

■NPB Beveled for welding Sch160 (unit : mm)

NPS \ Dim.	A	B	C	D	E	F	G	H
3	112.0	105.0	188.2	76.2	217.0	103.0	89.1	166.0
4	130.0	130.0	231.6	101.6	260.0	120.0	114.3	218.0
5	177.0	153.0	304.0	127.0	330.0	162.0	139.8	247.0

■Sanitary (unit : mm)

NPS \ Dim.	A	B	C	D	E	F	G
1S	87.0	46.0	23.0	101.5	55.0	116.0	112.5
1-1/2S	92.5	51.5	35.7	122.0	70.0	151.5	134.5
2S	92.5	51.5	47.8	134.0	82.0	175.5	148.5
2-1/2S	105.5	64.5	59.5	170.0	105.0	234.5	146.0
3S	105.5	64.5	72.3	175.0	110.0	244.5	159.5
4S	111.5	70.5	97.6	224.4	160.0	337.3	198.0

WEIGHTS LIST

■Green (G) Threaded ends

(unit : kg)

NPS \ Style#	20	30	40	50	60	70
3/8	0.4	0.5	0.6	0.8	0.7	0.9
1/2	0.4	0.5	0.5	0.8	0.7	0.8
3/4	1.1	1.3	1.5	2.1	1.9	2.3
1	0.9	1.2	1.4	1.9	1.7	2.1
1-1/4	1.8	2.4	2.9	3.6	3.2	4.1
1-1/2	1.5	2.2	2.6	3.4	3.0	3.8
2	3.1	4.1	5.1	7.2	6.2	8.1
2-1/2	6.1	8.0	10.0	13.0	11.1	15.0
3	4.8	6.8	8.9	11.7	9.6	13.8
4	6.9	9.6	12.6	17.0	14.1	20.0

■Blue (B) Threaded ends / Bored or beveled for welding

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
3/8	0.5	0.5	0.6	0.9	0.8	1.0	1.2	1.3	1.1
1/2	0.4	0.4	0.6	0.9	0.7	1.0	1.2	1.3	1.0
3/4	1.2	1.5	1.8	2.3	2.0	2.7	3.3	3.6	2.9
1	1.0	1.2	1.5	2.1	1.8	2.4	3.0	3.4	2.7
1-1/4	1.9	2.4	3.1	4.2	3.5	4.9	6.0	6.7	5.3
1-1/2	1.7	2.1	2.8	3.9	3.2	4.5	5.7	6.3	5.0
2	3.4	4.8	6.0	8.0	6.8	9.3	11.5	12.8	10.3
2-1/2	7.0	12.2	18.2	20.7	14.7	26.6	28.9	34.9	23.0
3	5.6	9.4	13.9	17.7	13.2	22.1	25.9	30.4	21.5
4	7.6	10.7	14.4	19.5	15.8	23.3	28.7	32.4	24.9

■Blue (B) Flanged ends JPI150

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
1/2	1.4	1.4	1.6	1.9	1.7	2.0	2.2	2.3	2.0
3/4	2.6	2.9	3.2	3.7	3.4	4.1	4.7	5.0	4.3
1	3.2	3.5	3.8	4.3	4.0	4.7	5.3	5.6	5.0
1-1/4	4.8	5.3	6.0	7.1	6.4	7.8	8.9	9.6	8.2
1-1/2	5.4	6.0	6.6	7.7	7.0	8.3	9.5	10.1	8.8
2	8.4	9.9	11.2	13.2	11.9	14.5	16.7	18.0	15.4
2-1/2	15.0	20.2	25.8	28.7	23.1	34.4	37.0	42.7	31.4
3	15.9	19.9	24.2	27.9	23.5	32.2	36.2	40.5	31.8
4	21.8	25.0	28.7	33.8	30.1	37.4	42.9	46.6	39.2
5	38.1	42.4	46.7	67.1	62.8	71.4	91.8	96.1	87.5
6	43.1	49.7	56.3	77.6	71.0	84.2	105.5	112.1	98.9
8	66.4	79.8	93.2	123.8	110.4	137.2	167.8	181.2	154.4
10	100.9	124.5	148.1	199.0	175.4	222.6	273.5	297.1	249.9
12	154.7	192.2	229.7	307.0	269.5	344.5	421.8	459.3	384.3

■Blue (B) Beveled for welding Sch40

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
5	20.4	24.7	29.0	49.4	45.1	53.7	74.1	78.4	69.8
6	21.3	27.9	34.5	55.8	49.2	62.4	83.7	90.3	77.1
8	30.6	44.0	57.4	88.0	74.6	101.4	132.0	145.4	118.6
10	50.9	74.5	98.1	149.0	125.4	172.6	223.5	247.1	199.9
12	77.3	114.8	152.3	229.6	192.1	267.1	344.4	381.9	306.9

■Stainless (SST) Threaded ends / Bored or beveled for welding

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
3/8	0.4	0.5	0.6	0.8	0.7	1.0	1.2	1.3	1.0
1/2	0.4	0.5	0.6	0.8	0.7	0.9	1.1	1.2	1.0
3/4	1.2	1.5	1.8	2.5	2.2	2.9	3.5	3.9	3.1
1	1.0	1.3	1.6	2.4	2.0	2.7	3.3	3.7	3.0
1-1/4	2.0	2.6	3.3	4.3	3.6	5.1	6.1	6.8	5.3
1-1/2	1.7	2.4	3.0	4.0	3.4	4.7	5.8	6.4	5.1
2	3.5	4.7	6.1	8.4	7.0	9.8	11.9	13.3	10.5

※The above is the case for Threaded ends

■Stainless (SST) Beveled for welding Sch40

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
2-1/2	6.4	7.3	8.2	14.6	13.7	15.6	22.0	22.9	21.0
3	5.5	6.9	8.2	13.7	12.4	15.1	20.6	22.0	19.2
4	7.1	9.7	12.3	19.4	16.8	22.0	29.1	31.7	26.5
5	20.7	25.1	29.4	50.1	45.8	54.5	75.2	79.5	70.8
6	22.7	29.4	36.1	58.8	52.1	65.5	88.2	94.9	81.5
8	31.2	44.8	58.3	89.5	76.0	103.1	134.3	147.8	120.7
10	51.7	75.5	99.3	151.0	127.2	174.8	226.5	250.3	202.7
12	78.6	116.5	154.4	233.0	195.1	270.9	349.5	387.4	311.6

■Stainless (SST) Flanged ends JPI150

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
1/2	1.4	1.5	1.6	1.8	1.7	1.9	2.1	2.2	2.0
3/4	2.6	2.9	3.2	3.9	3.6	4.3	4.9	5.3	4.5
1	3.3	3.5	3.8	4.6	4.2	4.9	5.6	5.9	5.2
1-1/4	4.9	5.3	6.0	7.2	6.5	7.9	8.9	9.6	8.2
1-1/2	5.5	6.1	6.8	7.9	7.1	8.6	9.6	10.3	8.8
2	8.6	10.0	11.4	13.5	12.2	14.8	17.0	18.3	15.7
2-1/2	14.6	15.6	16.5	22.9	22.0	23.8	30.2	31.1	29.3
3	15.5	16.8	18.2	23.7	22.3	25.1	30.6	31.9	29.2
4	21.2	23.8	26.3	33.4	30.9	36.0	43.1	45.7	40.5
5	38.5	42.9	47.3	68.0	63.6	72.3	93.0	97.4	88.7
6	44.7	51.4	58.1	80.8	74.1	87.5	110.2	116.9	103.5
8	67.4	80.9	94.5	125.7	112.1	139.2	170.4	184.0	156.9
10	102.2	126.0	149.8	201.5	177.7	225.3	277.0	300.8	253.2
12	156.8	194.7	232.6	311.2	273.3	349.1	427.7	465.6	389.8

■Type N (N) Flanged ends JPI150

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
2-1/2	14.5	15.4	16.3	22.6	21.7	23.5	29.8	30.7	28.9
3	15.2	16.5	17.9	23.2	21.8	24.5	29.8	31.2	28.5
4	20.7	23.3	25.8	32.6	30.1	35.2	42.0	44.6	39.4
6	37.0	43.6	50.3	65.5	58.8	72.1	87.3	93.9	80.7
8	55.9	69.3	82.7	102.8	89.4	116.2	136.3	149.7	122.9
10	83.8	107.4	131.0	164.8	141.2	188.4	222.2	245.8	198.6
12	121.6	159.1	196.6	240.8	203.3	278.3	322.5	360.0	185.0

■Type N (N) Beveled for welding Sch40

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
2-1/2	6.3	7.2	8.1	14.4	13.5	15.3	21.6	22.5	20.7
3	5.3	6.7	8.0	13.3	12.0	14.7	20.0	21.3	18.6
4	6.8	9.4	11.9	18.7	16.2	21.3	28.1	30.6	25.5
6	15.2	21.8	28.5	43.7	37.0	50.3	65.5	72.1	58.9
8	20.1	33.5	46.9	67.0	53.6	80.4	100.5	113.9	87.1
10	33.8	57.4	81.0	114.8	91.2	138.4	172.2	195.8	148.6
12	44.2	81.7	119.2	163.4	125.9	200.9	245.1	282.6	207.6

■BDR Flanged ends JPI150

(unit : kg)

NPS \ Style#	20	30	40
2-1/2	15.1	16.0	16.9
3	16.2	17.6	19.0
4	22.0	24.6	27.2
6	45.6	52.2	58.9
8	72.4	85.8	99.2
10	106.5	130.1	153.7
12	158.1	195.6	233.1

NPS \ Style#	30 異径
3×2-1/2	16.9
4×3	18.6
6×4	26.9
8×6	56.0
10×8	88.1
12×10	136.7
14×12	193.3

■BD Flanged ends JPI150

(unit : kg)

NPS \ Style#	20	30	40
2-1/2	14.8	15.7	17.5
3	16.6	17.9	20.6
4	22.0	24.5	29.6
6	44.5	51.0	64.1
8	68.0	81.3	107.8
10	107.0	130.3	177.0
12	155.2	192.2	266.3

NPS \ Style#	30 異径
3×2-1/2	16.8
4×3	20.3
6×4	28.4
8×6	58.3
10×8	88.9
12×10	141.3
14×12	199.7

■Silver (S) Threaded ends / Bored or beveled for welding

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
3/8	0.6	0.8	1.0	1.3	1.1	1.5	1.9	2.1	1.7
1/2	0.6	0.7	0.9	1.3	1.1	1.5	1.8	2.0	1.6
3/4	1.4	1.8	2.2	3.1	2.7	3.4	4.3	4.6	3.9
1	1.3	1.6	2.0	2.9	2.5	3.2	4.1	4.4	3.8
1-1/4	1.9	2.4	3.1	4.2	3.5	4.9	6.0	6.7	5.3
1-1/2	1.7	2.1	2.8	3.9	3.2	4.5	5.7	6.3	5.0
2	4.8	6.4	8.3	11.1	9.2	13.0	16.4	18.3	14.5
2-1/2	6.2	8.6	12.2	16.0	12.4	19.6	24.2	27.8	20.6

※The above is the case for Threaded ends

■Silver (S) Flanged ends SHA/SHB

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
1/2	1.9	2.0	2.2	2.6	2.4	2.8	3.1	3.3	2.9
3/4	3.0	3.4	3.8	4.7	4.3	5.0	5.9	6.2	5.5
1	4.0	4.3	4.7	5.5	5.2	5.9	6.8	7.1	6.4
1-1/4	5.4	5.9	6.5	7.6	6.9	8.2	9.4	10.0	8.7
1-1/2	6.6	7.2	7.8	8.9	8.3	9.5	10.7	11.3	10.1
2	11.1	12.9	15.0	17.5	15.4	19.6	22.8	24.9	20.7
2-1/2	18.2	21.4	25.7	28.8	24.5	33.0	37.0	41.2	32.7

■Type SN (SN) Beveled for welding Sch160

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
3	11.2	13.8	16.4	27.6	25.0	30.1	41.3	43.9	38.8
4	18.4	23.8	29.2	47.6	42.2	52.9	71.3	76.7	66.0

■Type SN (SN) Flanged ends SHA/SHB

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
3	25.6	28.2	30.8	42.0	39.4	44.5	55.7	58.3	53.2

WEIGHTS LIST

■Orange (SH) Threaded ends / Beveled for welding Sch160

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
3/8	1.7	2.3	2.8	3.7	3.2	4.2	5.2	5.7	4.8
1/2	1.7	2.3	2.7	3.7	3.2	4.2	5.2	5.7	4.7
3/4	2.3	3.6	4.5	5.6	4.6	6.6	7.9	8.9	6.9
1	2.6	3.5	4.4	5.5	4.5	6.5	7.8	8.8	6.8
1-1/4	6.6	8.8	11.5	14.6	11.9	17.2	21.4	24.1	18.8
1-1/2	6.5	8.6	11.3	14.4	11.7	17.1	21.3	24.0	18.6
2	8.7	12.6	18.6	23.2	17.2	29.3	34.1	40.2	28.1

※The above is the case for Threaded Ends
※NPS 3/4B : Sch80

■Orange (SH) Beveled for welding Sch160

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
2-1/2	15.8	17.4	18.9	34.7	33.2	36.3	52.1	53.6	50.5
3	16.3	18.9	21.4	37.7	35.2	40.3	56.6	59.1	54.0
4	29.0	34.4	39.7	68.7	63.4	74.1	103.1	108.4	97.7
5	39.7	49.4	59.1	98.8	89.1	108.5	148.2	157.9	138.5

※The above is the case for Short elbow types

■Orange (SH) Flanged ends SHA/SHB

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
1/2	3.0	3.5	4.0	4.9	4.5	5.4	6.5	6.9	6.0
3/4	4.1	5.1	6.0	7.1	6.2	8.1	9.4	10.4	8.5
1	5.0	5.9	6.9	8.0	7.0	8.9	10.3	11.2	9.3
1-1/4	9.8	12.1	14.9	17.9	15.1	20.6	24.7	27.5	22.0
1-1/2	10.9	13.1	15.8	18.9	16.2	21.5	25.7	28.4	23.0
2	15.0	18.8	24.9	29.5	23.4	35.6	40.4	46.5	34.3

■Orange (SH) Flanged ends SHA/SHB

(unit : kg)

NPS \ Style#	20	30	40	50	60	70	80	90	10
2-1/2	27.5	29.0	30.6	46.4	44.8	47.9	63.7	65.3	62.2
3	30.7	33.3	35.8	52.1	49.6	54.7	71.0	73.6	68.4

※The above is the case for Short elbow types

■NSB Beveled for welding Sch160

(unit : kg)

NPS \ Style#	20	40	50	70	80	90
1-1/4	7.8	8.2	15.6	16.0	23.4	23.8
1-1/2	8.0	8.7	16.0	16.7	24.0	24.7
2	17.9	18.8	35.8	36.7	53.7	54.6
2-1/2	31.0	32.6	62.0	63.6	93.0	94.6
3	40.0	42.6	80.0	82.6	120.0	122.6
4	66.9	72.3	133.8	139.2	200.7	206.1

■NSB Flanged ends SHA/SHB

(unit : kg)

NPS \ Style#	20	40	50	70	80	90
1-1/4	11.0	11.4	18.8	19.2	26.6	27.0
1-1/2	12.6	13.3	20.6	21.3	28.6	29.3
2	24.0	24.9	41.9	42.8	59.8	60.7
2-1/2	42.7	44.2	73.7	75.2	104.7	106.2
3	54.4	57.0	94.4	97.0	134.4	137.0

■NPB Beveled for welding Sch160

(unit : kg)

NPS \ Style#	30	40
3	20.4	23.0
4	37.1	42.5
5	70.7	80.3

■Sanitary

(unit : kg)

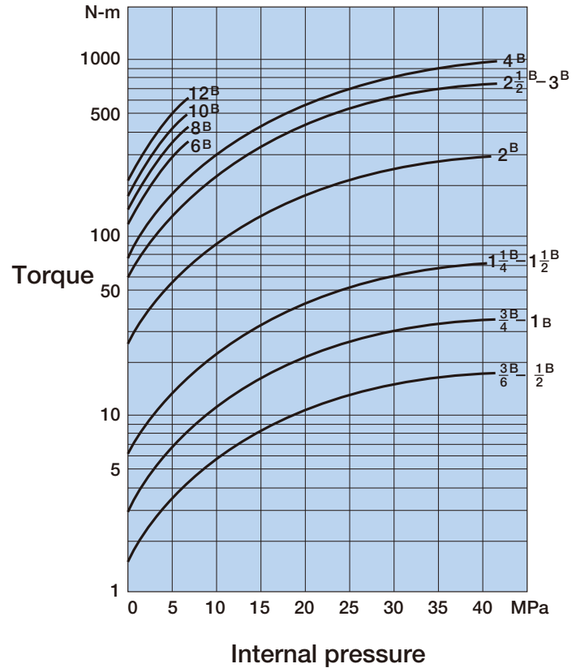
NPS \ Style#	20	30	40
1S	0.7	0.8	0.9
1-1/2S	0.8	1.0	1.1
2S	1.1	1.4	1.6
2-1/2S	1.7	2.2	2.6
3S	2.0	2.5	3.0
4S	3.6	4.6	5.6

PACKING UNITS

NO	MAIN APPLICABLE FLUID	℃	CODE
1	Crude oil	-10～+60	55
		+61～+120	HH
2	Gasoline	-10～+60	55
3	Jet fuel (JET-A1, JP4, JP5)	-10～+60	55
4	Naphtha	-10～+60	55
5	Bunker A	-10～+60	55
6	Bunker B, C	-10～+80	00
7	Diesel (Gas oil)	-10～+60	55
8	Kerosene	-10～+60	55
9	Lubricating oil	-10～+80	00
10	Hydraulic oil (Ester phosphate)	-7～+125	HH
11	Hydraulic oil (Water)	-10～+80	00
12	Hydraulic oil (Petro)	-10～+80	00
13	Distilled water	0～+80	00
14	Industrial water	0～+80	00
15	Sea water	0～+100	HH
16	Drilling mud	～+80	00
17	Steam	+100～+200	AD
18	Air (Compressed air)	-10～+80	00
19	Oxygen (Gas, Max.2.94MPa)	-10～+80	00
20	Nitrogen (Gas)	-10～+80	00
21	Natural gas	-10～+71	00
22	Carbon dioxide (CO_2)	-10～+60	55
23	Liquefied petroleum gas (LPG)	-10～+60	55
24	Ethyl alcohol (Ethanol)	-29～+76	AD
25	Methyl alcohol (Methanol)	-29～+62	AD、6X
26	Sulfuric acid (80～120%)	0～+37	HH
27	Sodium hydroxide (Caustic soda, 0～73%)	0～+60	55
28	Ammonia (Anhydrous)	-29～+60	6X

INTERNAL PRESSURE & SWIVEL TORQUE

The following torque curves can be used for estimating various size of Niigata swivel joints at different pressure ratings for normal applications.
When torque is critical, consult our sales representatives.



LUBRICANTS (GREASE)

SERVICE	GREACE	RAMARK
For low pressure	Multi-purpose type	+15℃～ +80℃
For high pressure	Extreme pressure multi-purpose type	+15℃～ +80℃
For high temperature	Resist high temperature type	+80℃～ +175℃
	Resist high temperature type (CHIKSAN#240)	+176℃～
For low temperature	Silicon	～ -14℃
For EPT	Silicon	for 6X Packing

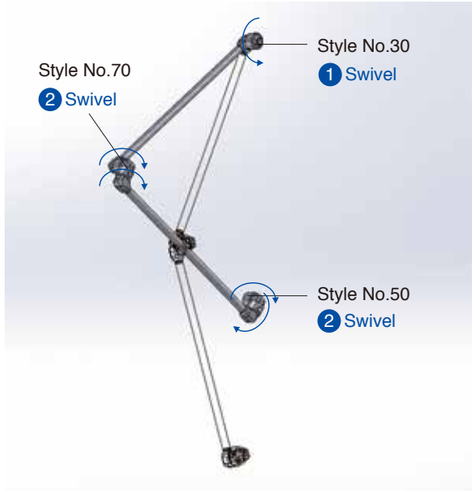
※Other types of grease are available for chemical, oxygen, or food service etc.

Style No.30-70-50 Combination

This swivel combination is generally used for absorption of swing motion and mechanical vibration in vertical dog-leg piping.
In case alignment of piping system and the operating condition are severe, style No.50-40-80 assembly assure trouble -free performance.

Applications

Descaling header of rolling mill, injection molding machine, die-cast machine,industrial machine, platen presses, aircraft hydraulic and pneumatic lines and others.

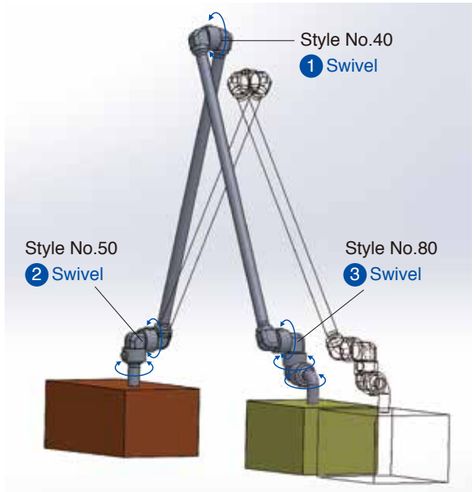


Style No.50-40-80 Combination

This combination allows adequate freedom of movement to compensate for any normal motion of a vessel, within operating range, as it rides in the water.
The unit, when attached to barge or tanker manifold, is self-supporting and needs no tending during transfer operations.
This combination is the principal design of Chiksan Marine Loading Arms.

Applications

Marine loading arms for crude oil, gasses, petroleum products, chemical and cryogenic products



Style No.70-40-80 Combination

This joint combination smoothly absorbs all kinds of displacement in either of 3 axes (X, Y and Z) direction.
Piping Direction: Vertical to Horizontal, Horizontal to vertical

Applications

Willow system

※Except for BD, BDR
As for BD, BDR, Please contact our sales representatives.

1 Working pressure

The pressure of the fluid flowing in the swivel joint shall be less than the value shown in "Appendix 1 Maximum Working Pressure".When manufacturing specification is supplied, the pressure shall be less than the shown value in the specification.

2 Style

The ball bearing part of the swivel joint is fabricated with high precision.
The movement of the piping is accordingly limited in swivel direction.

3 Lubrication

(1) Ball bearing part and sealing part must always be coated with lubrication grease to maintain smooth rotation of the swivel joint as well as to maintain perfect sealing function.
(2) The swivel joint is injected with grease prior to shipment.
(3) Frequency of lubrication
In case of normal use swivel joint must be lubricated under maintenance.
In case it is continuously rotated or used at high temperature, the swivel joint shall be periodically inspected for lubrication and supplied with grease if necessary.
I) Remove the ball retainer plug of the swivel joint and visually check for change in color, hardening, deterioration and decrease of grease. Supply grease when at least one of above changes is recognized.
ii) Guideline of inspection frequency (lubrication frequency)
Recommendation:
for use in continuous rotation: every three months
for use at high temperature: every month
Please establish the inspection frequency depending on the actual usage.
iii) Supply grease according to “8. (6) Supply of grease”.

4 Packing

During long use of a swivel joint sealing function of the packing is gradually degraded to cause a small leak showing exudation or drip. The life of the packing finishes at this point and shall be replaced with a new one. Depending on circumstances the whole swivel joint must be replaced.

5 Rotation

Swivel joint is not rotary joint and is therefore not suitable to be rotated continuously.
However, it may be rotated under non-severe conditions.

6 Moment Load

The moment load is one of the important matter that influences the life of the Swivel Joints.
Also even the influence by the vibration etc. at the time of the misalignment, operation of piping think by the distance from the bearing of the weight thing and joint that are attached to piping and please pay attention sufficient on the occasion of the design.

7 Storage and initial use

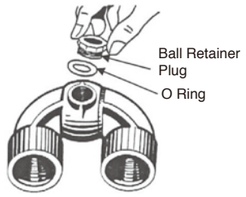
In case of handling of solidifying liquid, the swivel joint shall not be rotated if it has already been solidified. Otherwise the solid may be dragged in and damage the packing which may cause degradation of the seal. Packing chamber of the swivel joint shall be fully cleaned not to keep solid residue inside.

8 Disassembly and reassembly

Disassembly

(1) Removal of ball retainer plug

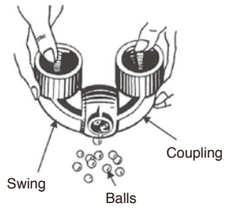
I) In case of screw type ball retainer plug, pull out cotter pin or wire, and then remove ball retainer plug and O-ring by using spanner or flathead screwdriver.
ii) In case of snap ring type ball retainer plug, remove the snap ring by using plier and then take out ball retainer plug by picking at the center of ball retainer plug with a scriber etc. and tilting the joint slightly.



(2)Removal of ball

Make the holes of ball retainer plug upside down and rotate swing to let balls inside roll out. When it is difficult to rotate the swing, then rotate the coupling instead to take out the balls. If the swivel joint is hard to rotate, pour white gasoline etc. to loosen the tightened part.

Danger	When white gasoline etc. is applied, make sufficient ventilation and take enough care not to cause fire.



(3)Disassembly

After taking out all balls swivel joint can be separated to coupling and swing.

Caution	Take care not to damage ball race and sealing surface of swivel joint.

(4)Removal of packing

Caution	Avoid using scriber or similar tools to remove packing. If sealing surface of swivel joint is even slightly damaged, it may cause leakage.

(5)Removal of grease retainer ring and dust seal

Caution	Take care not to damage sealing surface of swivel joint.

Inspection of removed parts

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

Danger	Make sufficient ventilation when cleaner is used.
Caution	Take care not to damage sealing surface and ball race surface.

(2)Ball race and sealing surface

Inspect ball race for crack, brine ling, corrosion etc. Very small defect may be removed using fine (more than #600 grade) sandpaper.
If the defect is hard to remove with sandpaper, that whole swivel joint shall be replaced.

Reassembly

When swivel joint is reassembled after disassembly and inspection, all parts except for the main body of swivel joint shall be replaced with new ones. Reassembly is to be made in the opposite order of disassembly. Take enough care not to include foreign particles attached on ball bearing part as well as on sealing part.

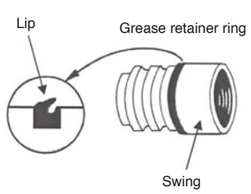
Application		Grease
General use	Low pressure	Multi-purpose type
	High pressure Extra high pressure	Extreme pressure Multi-purpose type
High temperature		Resist high temperature type
Other than those above		Silicon grease, etc.

(1)Lubrication with grease

Apply suitable grease for the application thin and uniform on the packing, grease retainer ring, ball race and sealing surface.

(2)Mounting of grease retainer ring or dust seal

The grease retainer ring shall be fitted to the ring groove carefully making the direction of the lip as shown in the diagram.
The dust seal shall be adjusted with its length and then fitted in the ring groove.

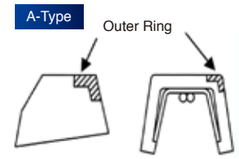


Caution	Grease retainer ring shall not be stretched too much.

8 Disassembly and reassembly

(3)Insertion of packing

Be sure that outer ring (metal ring) is attached to thecircumference of the packing.
The outer ring is necessary to prevent the packing from protruding to the ball race side.
I) A-Type When packing is inserted, make sure that the outer ring faces to the near side(ball race side).
ii) B-Type The packing is allowed to face to either side.



(4)Insertion of ball

I) Firmly, fix the coupling. It makes it easier to mount the swing on the coupling.

Danger	Avoid labored mounting or protrusion of grease retainer ring.

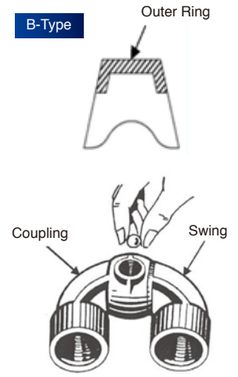
ii) Insert swing so that coupling aligns with ball race of the swing.

Danger	Avoid inserting the swing too far.

iii) First prepare two balls for compressing the packing.
iv) Insert a ball by tapping with a rod that makes it easier to insert the next ball.

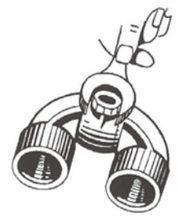
Danger	When tapping with a rod, take care not to damage the insertion hole.

v) Necessary number of balls shall be surely inserted to fill each ball race full.
When the last ball is tapped with a rod, the first ball comes out.
Check whether all necessary balls are inserted in each ball race.
As for number of steel balls refer to "Appendix 2 Size and number of steel balls per swivel"



(5)Mounting of ball retainer plug

I) Screwed type ball retainer plug
Fit O-ring first and then screw ball retainer plug into the body.
For high pressure swivel joint use a cotter pin or wire to prevent loosening.
ii) Rubber ball retainer plug
Insert ball retainer plug and fit snap ring by using plier.



(6)Supply of grease

I) Screw grease nipple into the lubrication hole. In case there are two lubrication holes diagonally on the circumference of swivel, attach grease nipple on a lubrication hole while keeping another hole open.
Use grease nipple suitable for the lubrication hole.
Size of thread of grease nipple:
・NF1/4 : Green, Blue, SST, type N (2-1/2" to 4"), Silver, type SN, Orange (3/8" to 2")
・R1/8 : type N (6" to 12"), Orange(2-1/2" to 5")
ii) Fill a small amount of grease slowly into grease nipple by manual grease gun while keeping the swing rotating slowly.
As for filling amount of grease refer to "Appendix 3 Filling amount of grease afterdisassembly and reassembly of swivel joint".
iii) Every stroke of grease gun discharge excess grease by pushing the ball at the top of the grease nipple.
iv) In case swivel joint becomes hard to rotate during lubrication, too much grease may have been filled.
Push the ball at the top of grease nipple to discharge excess grease.
v) When grease comes out from dust seal part or nipple hole, stop supplying grease.
vi) Rotate swivel joint several times after lubrication, push ball of grease nipple or dismount grease nipple to discharge excess grease and release pressure of grease in the swivel joint.
vii) Screw grease nipple or grease fitting plug into the nipple hole.

Danger	Take care not to fill too much grease. If grease pressure remains, the packing may be deformed to cause leakage as well as disturbance of rotation.

9 Instructions for welding

Instructions for welding

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

(1)Disassemble swivel joint before welding.

This is necessary to protect packing and grease retainer ring from excess heat and to prevent degradation of grease.

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

i)During welding bind up wet cloth etc. to prevent heating up of the ball race part over 80°C.
ii)Take care not to damage machined surface of the swivel joint during welding work. Cover the finished surface not to be attached with spatter of welding.
iii)After completion of welding clean the ball race part, packing, sealing surface of dust seal with cleaner.

Danger	Make sufficient ventilation when cleaner is used.

10 Mounting position

To prevent leaking from the connection part with hose or pipe, please install swivel joint at the centering position.

Ordering Information

1	Color code
2	Size (Nominal Dia)
3	Style No
4	Working pressure
5	Kind of fluid
6	Temperature of fluid
7	Material of packing
8-1	End connection (Threaded / Flange / Welded)
8-2	Standard of flange (JIS10K / JIS20K / JIS21MPa / JPI/ANSI150Lb / ASME / ASTM)
9	Existing drawings
10	Required documents

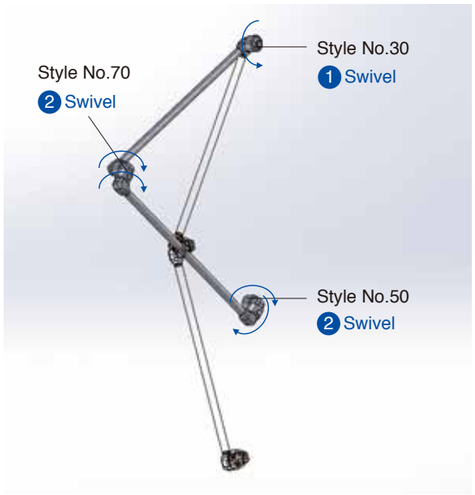
The following information is required when we export.

We are strictly prohibited from exporting for using nuclear weapon or military applications.

1	End user
2	Usage
3	Trade term

Any other special requirements

Pipe line assembly of swivel joint



According to the condition of use, we suggest pipe line ASS'Y by selecting style No and pipe length.
The existing drawings are required for our proposal.

How NIIGATA Chiksan swivel joint are used

Loading Arm for tank lorry

01

Roof Drainage System

02

Hydraulic Pipe line

03

Swivel Joint connects with flexible hose

04

Float Suction Skimmer

05

NSB.4B Style #50—#40—#50 ASS'Y

06