# Pearl

Pearl Rotary Joint

## Rotary Joint

## NC Series

CATALOG



### NC Series



### **Features**

Can be used in a high-temperature range (max. 180°C).

As a carbon bearing is used, greasing is not required.

Low mechanical seal wear allows stable operation for a long time.

### **Table of Contents**

-eatures	P1
Service Conditions	P2
Structures and Materials	P2
Dimensions	P3
NCL (Simplex, Thread Connection)	P3
NCLF (Simplex, Flange Connection)	P4
NC (Duplex, Stationary IP, Thread Connection)	P5
NCF (Duplex, Stationary IP, Flange Connection)	P6
Masses	P7
Flow Rate	P7
Dynamic Torque	P9
Accessories	P10
Flange Connection – Dimensions on the Roll Side	P11
Model Names and Types	P12
nternal Pipe	P12
Precautions on Selection	P13
Maintenance	P14
Product Order	P14
Product Warranty	P15

The contents are subject to change without notice.



### **Service Conditions**

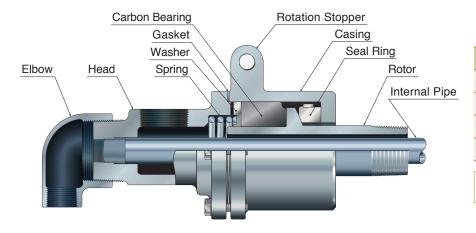
					Max.	
Sei	ries	Fluid	Size	Pressure (MPa)	Rotation Speed (min <sup>-1</sup> )	Temperature (°C)
NC		Saturated Steam /	15A~40A	1.47	300	180
		Thermal Oil	50A~80A	1.47	100	180

Note) The pressure upper limit is 1.0 MPa when using saturated steam.

### **Structures and Materials**

A mechanical seal consists of a combination of carbon and carbon steel for the sphere section, and a combination of carbon and cast iron for the plane section.

### NC



### Materials of Main Components (Standard Specification)

Part Name	Material
Rotor	Carbon Steel
Casing	Cast Iron
Head	Cast Iron
Seal Ring	Carbon

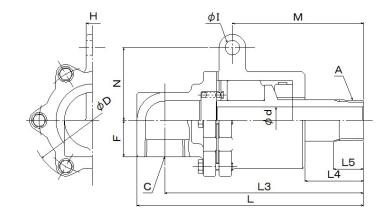
Heat-resistant paint is applied to external parts.

Note) Component materials are indicated on product drawings.

Contact our sales representative for requests for product drawings.

### NCL

Simplex, Thread Connection

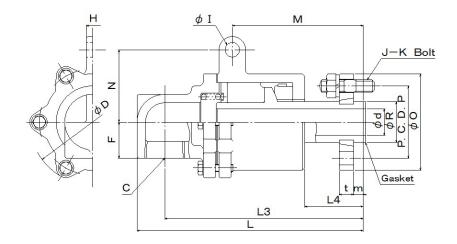


													(mm)
Size	Α	С	F	D	М	N	Н	- 1	L	L3	L4	L5	d
15A	R1/2	Rc1/2	25	92	95	50	10	12	162	142	41	20	12
20A	R3/4	Rc3/4	25	92	100	50	10	12	167	147	46	20	17
25A	R1	Rc1	30	104	109	60	10	12	188	165	49	25	22
32A	R1¼	Rc1¼	35	119	114	65	10	12	208	180	54	25	30
40A	R1½	Rc1½	40	144	138	80	16	15	246	214	58	25	35
50A	R2	Rc2	50	166	144	90	15	15	269	229	59	30	48
65A	R2½	Rc2½	55	188	166	100	20	18	306	256	71	37	60
80A	R3	Rc3	62	219	205	110	20	18	365	310	80	40	72



### NCLF

Simplex, Flange Connection

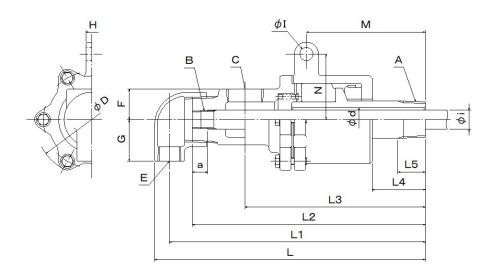


(mm)

Size	С	F	D	М	N	н		-	L3	L4	d		Fla	nge			J-K
Size		Г		IVI	IN	П	_ '		LS	L4	u	R	Р	0	t	m	J-K
15A	Rc1/2	25	92	107	50	10	12	174	154	53	14	25 <sup>-0.1</sup> <sub>-0.2</sub>	54	74	13	9	4-M10
20A	Rc3/4	25	92	100	50	10	12	167	147	46	17	26 -0.1	54	74	13	8	4-M10
25A	Rc1	30	104	109	60	10	12	188	165	49	22	34 -0.2	60	80	12	8	4-M10
32A	Rc1¼	35	119	114	65	10	12	208	180	54	30	42 -0.1	75	96	14	10	4-M10
40A	Rc1½	40	144	138	80	16	15	246	214	58	35	48 -0.2	75	96	14	10	4-M10
50A	Rc2	50	166	144	90	15	15	269	229	59	48	60 -0.2	95	120	14	12	4-M12
65A	Rc2½	55	188	166	100	20	18	306	256	71	60	75 <sup>-0.2</sup> <sub>-0.3</sub>	110	136	16	16	4-M12
80A	Rc3	62	219	205	110	20	18	365	310	80	72	90 -0.1	125	154	20	22	6-M12

NC

Duplex, Stationary IP, Thread Connection



(mm)

C:	_		_	F	_	D	N.A	N	н	_		L1	L2	L3	1.4	L5		d	Inte	ernal P	ipe
Size	Α	С	E		G	<u> </u>	М	N			L	L1	L2	L3	L4	Lo	а	a	Size	i	В
15A	R1/2	Rc1/2	Rc1/2	25	33	92	95	50	10	12	214	201	180	142	41	20	13	12	6A	10.5	R1/8
20A	D3 //	Pc3/4	Rc1/2	25	33	92	100	50	10	12	219	206	185	147	46	20	13	17	6A	10.5	R1/8
207	113/4	1103/4	TICT/2	23		<i>J_</i>	100			12	217		103	147	70		15	' '	8A	13.8	R1/4
25A	R1	Rc1	Rc1/2	20	20	104	109	60	10	12	247	234	213	165	49	25	14	22	8A	13.8	R1/4
25A	NI	KC1	NC1/2	20	30	104	109	00	10	12	241	234	213	105	49	23	14	22	10A	17.3	R3/8
32A	R11/4	Rc1	Rc1/2	35	38	110	114	65	10	12	257	244	223	173	54	25	20	30	10A	17.3	R3/8
JZA	N1/4	KC1	NC1/2	33	30	119	114	05	10	12	231	244	223	173	54	23	20	30	15A	21.7	R1/2
40A	D1 1/2	Dc11/	Rc3/4	12	12	144	138	80	16	15	305	289	264	209	50	25	20	35	15A	21.7	R1/2
40A	K1/2	NC 1 /4	NC3/4	42	43	144	136	80	10	13	303	209	204	209	56	23	20	33	20A	27.2	R3/4
50A	R2	Rc1½	Rc1	50	51	166	144	90	15	15	329	308	280	220	59	30	25	48	20A	27.2	R3/4
50A	NZ	NC 1 /2	KC I	50	51	100	144	90	15	15	329	308	200	220	39	30	25	40	25A	34.0	R1
																			25A	34.0	R1
65A	R2½	Rc2	Rc1½	55	62	188	166	100	20	18	386	356	319	252	71	37	23	60	32A	42.7	R1¼
																			40A	48.6	R1½
																			25A	34.0	R1
904	R3	De2 1/	Rc2	62	72	219	205	110	20	10	162	126	205	300	80	40	25	72	32A	42.7	R1¼
80A	KS	Rc2 ½	RC2	62	12	219	205	110	20	18	403	426	383	300	80	40	25	12	40A	48.6	R1½
																			50A	60.5	R2

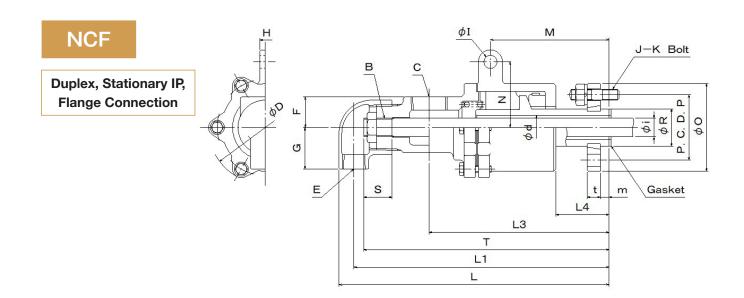
Note 1) 50A to 80A are shipped with connecting port C facing downward.

2) If the standard specification is selected, the direction of thread B is the same as that of thread A.

(If A is right-hand thread, B is also right-hand thread. If A is left-hand thread, B is also left-hand thread.)

Upon request, we can produce products in which the thread directions of threads A and B are different from each other.

NC Series



(mm)

0:		_	_	_	_	N/A					1.4			-1			Flar	nge			J-K		Intern	nal Pip	е	
Size	С	E		G	D	IVI	N	н	'		L1	L3	L4	a	ı	R	Р	0	t	m	J-K	Size	i	В	S	Т
15A	Rc1/2	Rc1/2	25	33	92	107	50	10	12	226	213	154	53	14	25	-0.1 -0.2	54	74	13	9	4-M10	6A	10.5	G1/8	24	203
204		D 4 /0														-0 1						6A	10.5	G1/8		
20A	Rc3/4	Rc1/2	25	33	92	100	50	10	12	219	206	147	46	17	26	-0.2	54	74	13	8	4-M10	8A	13.8	G1/4	24	196
254		D 4 /0														-0.2						8A	13.8	G1/4	24	223
25A	Rc1	Rc1/2	28	38	104	109	60	10	12	24'/	234	165	49	22	34	-0.3	60	80	12	8	4-M10	10A	17.3	G3/8	26	225
																-0 1						10A	17.3	G3/8	32	235
32A	Rc1	Rc1/2	35	38	119	114	65	10	12	257	244	173	54	30	42	-0.2	75	96	14	10	4-M10	15A	21.7	G1/2	32	235
404																-0.2						15A	21.7	G1/2	32	276
40A	Rc11/4	Rc3/4	42	43	144	138	80	16	15	305	289	209	58	35	48	-0.3	'/5	96	14	10	4-M10	20A	27.2	G3/4	33	277
																-0.2						20A	27.2	G3/4	38	293
50A	Rc1½	Rc1	50	51	166	144	90	15	15	329	308	220	59	48	60	-0.3	95	120	14	12	4-M12	25A	34.0	G1	39	294
																						25A	34.0	G1	37	333
65A	Rc2	Rc1½	55	62	188	166	100	20	18	386	356	252	71	60	75	-0.2 -0.3	110	136	16	16	4-M12	32A	42.7	G1¼	38	334
																						40A	48.6	G1½	40	336
																						25A	34.0	G1		
804	Rc2 ½	Rc2	62	72	219	205	110	20	18	463	426	300	80	72	90	-0.1	125	154	20	22	6-M12	32A	42.7	G1¼	40	400
OUA	1102 /2	NCZ	02	12	219	203	. 10	20	10	+03	-720	300	00	12		-0.2	123	134			0 11112	40A	48.6	G1½		<u> </u>
																						50A	60.5	G2	42	402

Note 1) 50A to 80A are shipped with connecting port C facing downward.

2) B is a right-hand thread.



### Masses

### Masses of NC Series

(kg)

Туре	15A	20A	25A	32A	40A	50A	65A	80A
NCL	1.7	1.7	2.9	3.7	6.5	10.3	13.0	20.5
NCLF	2.1	2.1	3.3	4.3	7.1	11.1	14.2	22.5
NC	2.0	2.0	3.4	4.0	6.8	10.8	14.0	22.0
NCF	2.4	2.4	3.8	4.6	7.5	11.6	15.2	24.0

Flow Rate

The maximum flow velocity in the product is about 3 m/s when the fluid is water, and about 30 m/s when the fluid is steam. Tables 1 and 2 show guidelines for the maximum flow rates calculated based on the above flow velocity.

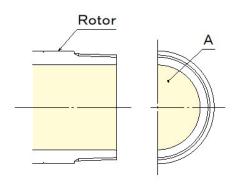
Water Flow Rate (Simplex) =  $A \times 3 \times 3600/10000$ 

Flow Rate of Saturated Steam (Simplex) = A×30×(Density of saturated steam)×3600/10000

### ■ Table 1 Flow Rate (Simplex)

Туре	Size	Flow Passage Area	Water Flow Rate		Flow Rate	of Saturated	Steam (kg/h)	
		A (Note1)	(m³/h)	0.1MPa	0.2MPa	0.4MPa	0.6MPa	0.8MPa
NCL	15A	1.13	1.22	13.9	20.3	32.7	44.9	56.9
NCLF	15A	1.54	1.66	18.9	27.6	44.5	61.1	77.5
	20A	2.27	2.45	27.8	40.6	65.6	90.1	114
	25A	3.80	4.11	46.6	68.1	110	151	191
N.O.	32A	7.07	7.63	86.6	127	204	280	356
NCL NCLF	40A	9.62	10.4	118	172	278	382	484
NCLF	50A	18.1	19.5	222	324	523	718	911
	65A	28.3	30.5	346	506	817	1120	1420
	80A	40.7	44.0	499	729	1180	1620	2050

Note 1) A = (Minimum flow passage area)





Water Flow Rate (Duplex)= (B or C) x3x3600/10000 (Note 4)

Flow Rate of Saturated Steam (Duplex)=Bx30x(Density of saturated steam) x3600/10000 (Note 5)

### Table 2 Flow Rate (Duplex)

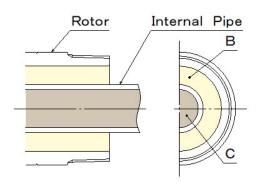
Туре	Size		sage Area	Water Flow Rate		Flow Rate	of Saturated	Steam (kg/h)	
		B (Note2)	C (Note3)	(m³/h)	0.1MPa	0.2MPa	0.4MPa	0.6MPa	0.8MPa
NC	15A-6A	0.265	0.332	0.286	3.25	4.75	7.66	10.5	13.3
NCF	15A-6A	0.674	0.332	0.358	8.25	12.1	19.5	26.7	33.9
	20A-6A	1.40	0.332	0.358	17.2	25.1	40.6	55.7	70.7
	20A-8A	0.774	0.694	0.749	9.48	13.9	22.4	30.7	39.0
	25A-8A	2.31	0.694	0.749	28.2	41.3	66.7	91.5	116
	25A-10A	1.45	1.19	1.28	17.8	26.0	41.9	57.6	73.0
	32A-10A	4.72	1.19	1.28	57.8	84.5	136	187	238
	32A-15A	3.37	1.94	2.09	41.3	60.3	97.4	134	170
	40A-15A	5.92	1.94	2.09	72.5	106	171	235	298
N.C	40A-20A	3.81	3.53	3.81	46.7	68.2	110	151	192
NC NCF	50A-20A	12.3	3.53	3.81	150	220	355	487	619
IVC	50A-25A	9.02	5.73	6.18	110	161	261	358	454
	65A-25A	19.2	5.73	6.18	235	344	555	762	966
	65A-32A	14.0	10.0	10.8	171	250	403	554	703
	65A-40A	9.72	13.6	10.5	119	174	281	386	490
	80A-25A	31.6	5.73	6.19	387	566	915	1260	1590
	80A-32A	26.4	10.0	10.8	323	473	763	1050	1330
	80A-40A	22.2	13.6	14.7	271	397	641	879	1120
	80A-50A	12.0	21.6	12.9	147	214	346	475	603

Note 2) B = A - (Internal pipe section area)

Note 3) C = (Internal pipe flow passage area)

Note 4) B or C, whichever is smaller

Note 5) The flow rate of saturated steam (duplex) is calculated based on the flow passage area of B.

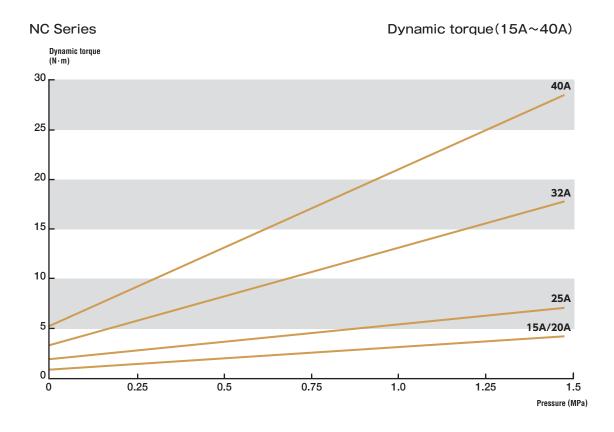


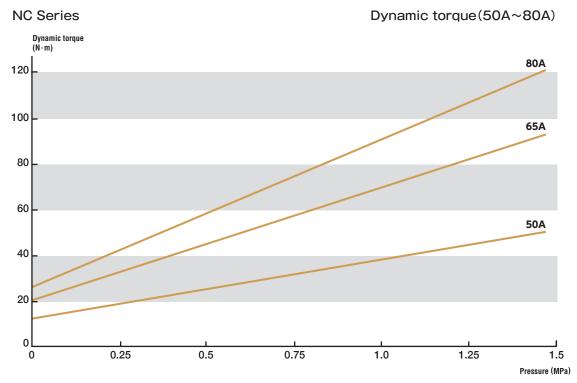
 Internal pipe outer diameters and thickness are based on the values of "internal pipe dimensions" in the table shown on the right.
 If an internal pipe with a different thickness is used, the water flow rate (for duplex) varies.

### Internal Pipe Dimensions (SUS304)

Size	Outer Dia. ×Thickness
6A	φ10.5×2.0
8A	φ13.8×2.2
10A	φ17.3×2.5
15A	φ21.7×3.0
20A	φ27.2×3.0
25A	φ34.0×3.5
32A	φ42.7×3.5
40A	φ48.6×3.5
50A	φ60.5×4.0

### **Dynamic Torque**





Note 1) Dynamic torque varies depending on product storage conditions, storage period, or fluid types.

- 2) Starting torque is larger than dynamic torque. Although starting torque is even larger when wringing occurs, it does not indicate any fault.
- 3) Data are typical values measured based on in-house test standards. They are not guaranteed values.



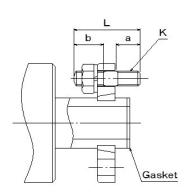
### **Accessories**

1) A product installed with a flange is supplied with a gasket (copper jacket) and four sets of a stud bolt (SS400), a hex. nut (SS400), and a spring washer (SWRH) for up to 65A or six sets thereof for 80A.

(mm)

### Accessories (Flange Connection)

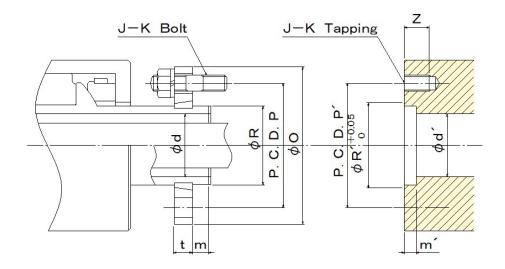
			Gaske	t		Stud	Bolt			Spring
Type	Size	Outer Dia.	Inner Dia.	Thick- ness	K	L	а	b	Hex. Nut	Washer
	15A	24	16	3.2						
	20A	25.5	18	2	M10	45	15	20	M10 type1	M10 No.2
	25A	33.5	24	3						
NCLF	32A	41.5	32	3	M10	48	15	20	M10 + 1001	M10 No 2
NCF	40A	47.5	38	3	14110	40	15	20	M10 type1	M10 No.2
	50A	59	49	3						
	65A	74.5	62	3	M12	58	18	27	M12 type1	M12 No.2
	80A	89	74	3.2						



2) A duplex, stationary IP, flange connection product (NCF) is supplied with a lock nut (right-hand thread, SS400) used for securing the internal pipe.



### Flange Connection - Dimensions on the Roll Side (Reference Values)



(mm)

### Flange Dimensions

Size	d	ı	R	Р	0	t	m
15A	14	25	-0.1 -0.2	54	74	13	9
20A	17	26	-0.1 -0.2	54	74	13	8
25A	22	34	-0.2 -0.3	60	80	12	8
32A	30	42	-0.1 -0.2	75	96	14	10
40A	35	48	-0.2 -0.3	75	96	14	10
50A	48	60	-0.2 -0.3	95	120	14	12
65A	60	75	-0.2 -0.3	110	136	16	16
80A	72	90	-0.1 -0.2	125	154	20	22

### Dimensions on the Roll Side

(mm)

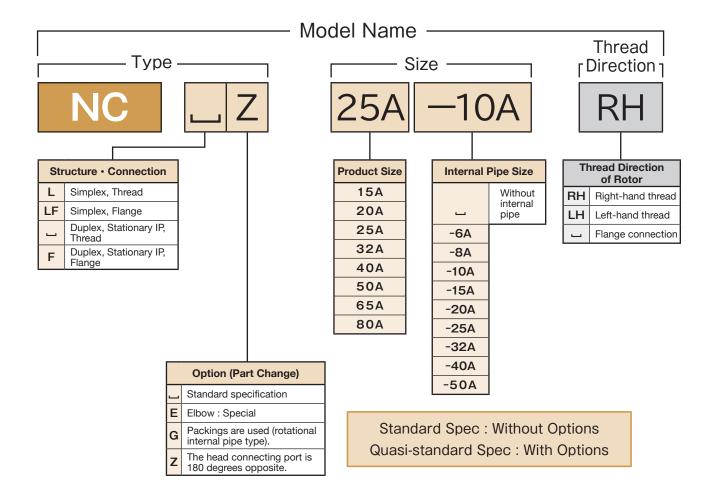
Size	d'	R'	P'	m'	Z	J-K
15A	14	25	54	8	16	4-M10
20A	17	26	54	7	16	4-M10
25A	22	34	60	7	16	4-M10
32A	30	42	75	9	16	4-M10
40A	35	48	75	9	16	4-M10
50A	48	60	95	11	19	4-M12
65A	60	75	110	15	19	4-M12
80A	72	90	125	21	19	6-M12

 $Note) \ Roll \ side \ dimension \ d' \ is \ a \ standard \ dimension. \ If \ the \ maximum \ outer \ diameter \ of \ an \ internal \ pipe \ is \ larger \ than \ d',$ 

it cannot be inserted into a roll. Determine dimension d' by considering the maximum outer diameter of the internal pipe.



### **Model Names and Types**



Note 1) "" indicates a space. A model name is indicated without spaces.

- 2) If two or more option (part change) codes are selected, they are indicated in alphabetical order.
- 3) The selection of two or more options resulting in a long model name is indicated as type

"ONC
"" to denote a customized product for administrative reasons.

("

"indicates a four-digit number allocated to each model.)

If you have any questions, contact our sales representative.

### **Internal Pipe**

### Product Size and Internal Pipe Size

Product Size	15A	20A	25A	32A	40A	50A	65A	80A
Internal Pipe Size	6A	6A/8A	8A/10A	10A/15A	15A/20A	20A/25A	25A/32A/40A	25A/32A/40A/50A



### **Precautions on Selection**

- 1. Select a product whose operating conditions are within the service conditions (listed in the table on page 2).
- 2. An installation thread must be tightened when a roll is operated. Select a left-hand thread for a roll that rotates clockwise when viewed from the product installation side, and select a right-hand one for a roll that rotates counterclockwise.
- 3. Select an option as necessary.
  - 1) See "Model Names and Types" (page 12) for the types of options.
  - 2) If option code Z is selected, the direction of the head connecting port is opposite from that of the standard specification.
- 4. A rotary joint with mechanical seals is not suitable for operation with no rotation, intermittent rotation, or low-rotation speed (a few rotations per minute), and fluid leakage may occur. Consider the use of a swivel joint with elastic seals.
- 5. Operation under conditions where both pressure and rotation speed are close to the max. values or long-time dry operation (operation without fluid flow) reduces product lifetime.
- 6. The product cannot be used for liquid containing solid particles (slurry) or pulverulent body.
- 7. The product cannot be used for fluid that causes corrosion on it.
- 8. The product is not designed according to the general design rules for safety and hygiene of food processing machinery (JIS B 9650). Consult with us when considering the use of the product in food-related facilities.
- 9. Depending on the fluid used, the product may subject to restrictions due to national laws or local regulations.

As for customized products, we can produce products with modifications that are not included in the options. If you have any questions or wish to purchase customized products, contact our sales representative.

### **Maintenance**

### 1) Greasing

As a carbon bearing is used for the NC series, greasing is not required.

### 2) Replacement of consumables

You can use the product for an extended period of time by replacing consumables.

Contact us for replacement. We carry it out according to our repair program.

Depending on the products, expenses for purchasing new products may be lower than repair expenses.

Contact us for more information.

### **Product Order**

Please provide the following information.

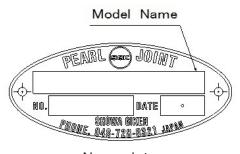
### 1) When ordering our product you are currently using

- 1 Model name (indicated on the product's nameplate)
- When ordering our product with an internal pipe The drawing number if you have a product drawing we provided. The tip shape and dimensions of the internal pipe if you don't have the product drawing.

### 2) When newly ordering our products

- ① Model name (see page12.)
- ② The tip shape and dimensions of an internal pipe for a product ordered with it
- 3 Related information
  - · The name of equipment to which our product is installed
  - · The name of the fluid used
  - · Fluid pressure and temperature, and roll rotation speed
  - · Roll rotation direction viewed from the product installation side
  - · Roll connection method
  - · Service environment
  - · Requests, etc.

If you have any questions, contact our sales representative.



Nameplate



### **Product Warranty**

If a malfunction occurs during the warranty period, contact us or the distributor and send the product to us. Be sure to carefully pack the product for protection before sending it. After receiving the product, we will confirm the malfunction. If the malfunction was clearly caused by the materials of product components or the manufacturing method, we will repair the product in question or replace it with a new one free of charge.

### **Product Warranty Provision**

### 1. Warranty Period

### < New products >

One (1) year and six (6) months after shipment (from the manufacturing date) or one (1) year after installation, whichever comes first.

### < Repaired products >

Six (6) months after shipment (from the manufacturing date).

### 2. We charge a fee for repairs in any of the following cases.

- 1 Failure after the warranty period has expired
- 2 Failure caused by use of the product deviating from the service conditions
- ③ Failure caused by misuse (improper storage, installation, pipe laying, operation or maintenance, etc.)
- 4) Failure caused by fluid contaminants or foreign objects in the fluid
- 5 Failure caused by relocation, transport, or falling of the product after delivery
- 6 Failure caused by disassembly, repair, or modification done by personnel other than our service personnel
- 7) Failure of the product attributed to using materials or according to standards specified by the customer
- 8 Failure of the product attributed to using materials provided by the customer
- 9 Failure caused due to unavoidable acts of nature such as fires or other natural disasters

### 3. Scope of Responsibility

Our responsibility shall be limited to repairs, replacements, or transport expenses covered by this product warranty provision. Expenses or damages caused by said failures above shall not be covered.

### 4. Applicable Regions

This product warranty provision shall be applicable to products installed in Japan.

### 5. Another Agreement

If another product warranty agreement is made separately with us and clearly states that said agreement shall have priority over this product warranty provision, this provision shall not be applicable.

### 6. This product warranty provision shall not restrict the customer's legal rights.

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