

Pearl

Pearl Rotary Joint

Rotary Joint

NC Series

CATALOG

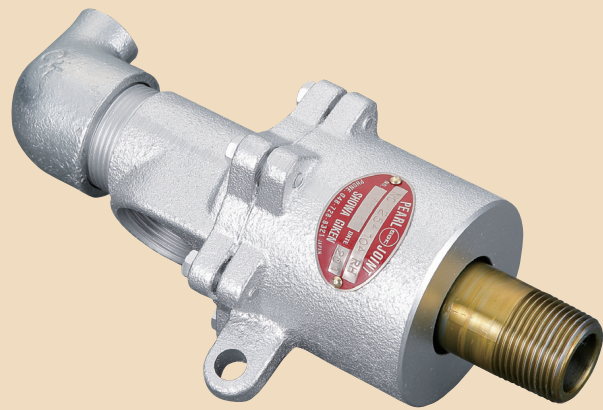


PEARL (SGK) JOINT

株式会社昭和技研工業

SHOWA GIKEN INDUSTRIAL CO., LTD.

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.

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The contents are subject to change without notice.

Service Conditions

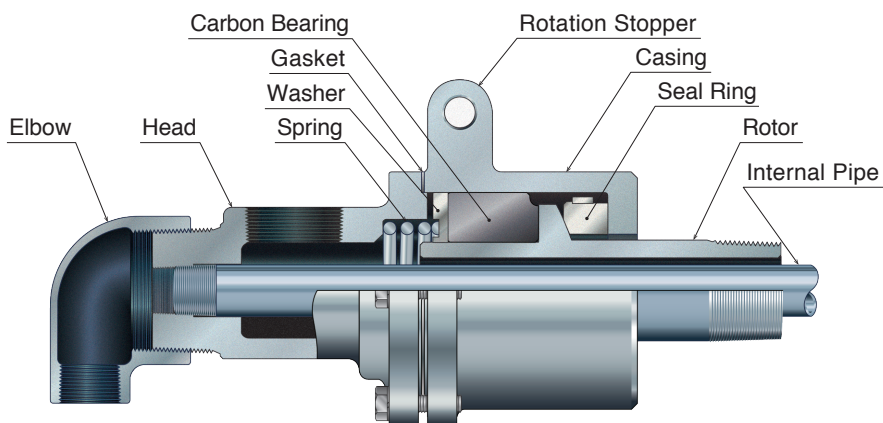
Series	Fluid	Size	Max.		
			Pressure (MPa)	Rotation Speed (min ⁻¹)	Temperature (°C)
	Saturated Steam / Thermal Oil	15A~40A	1.47	300	180
		50A~80A		100	

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

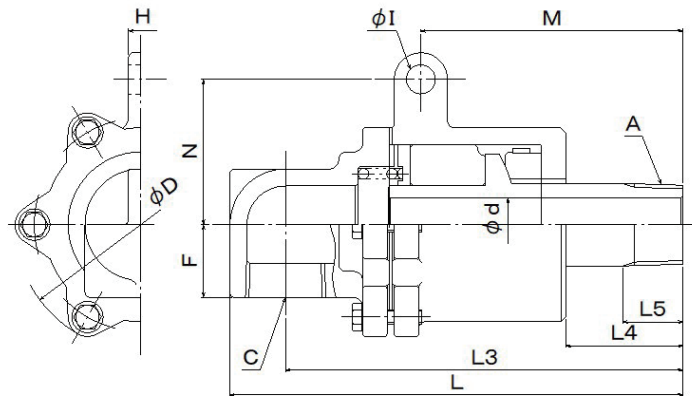
Heat-resistant paint is applied to external parts.

Note) Component materials are indicated on product drawings.

Contact our sales representative for requests for product drawings.

NCL

Simplex, Thread Connection

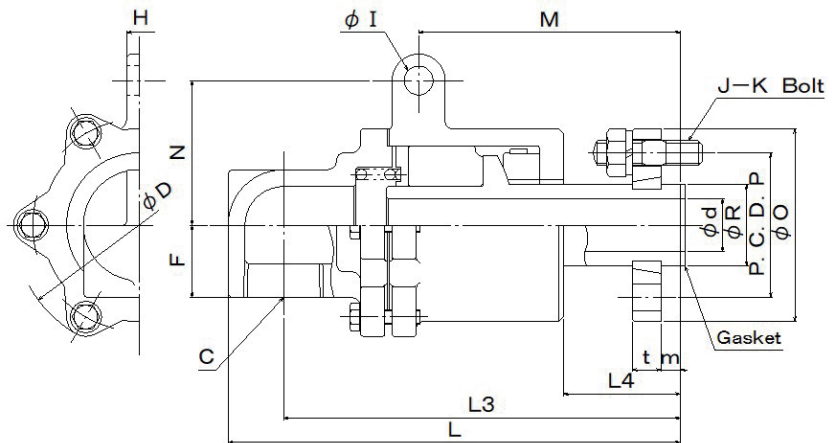


(mm)

Size	A	C	F	D	M	N	H	I	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

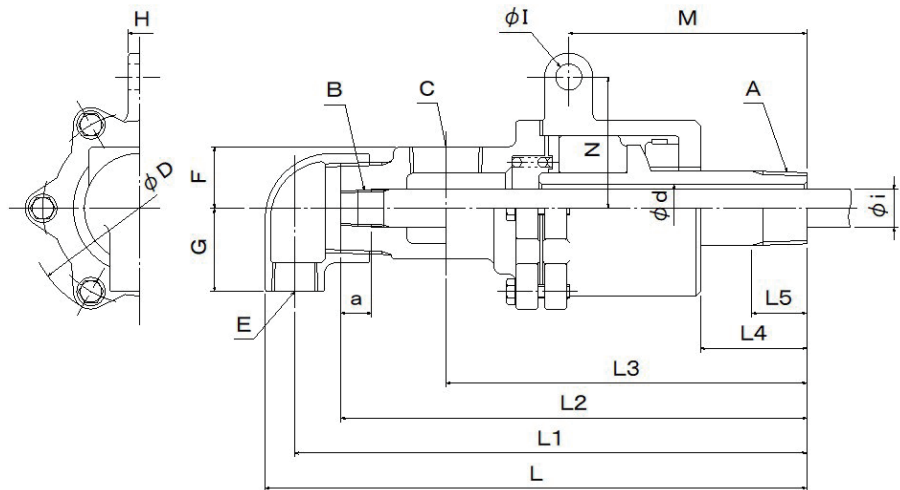


(mm)

Size	C	F	D	M	N	H	I	L	L3	L4	d	Flange					J-K
												R	P	O	t	m	
15A	Rc1/2	25	92	107	50	10	12	174	154	53	14	25 ^{-0.1} _{-0.2}	54	74	13	9	4-M10
20A	Rc3/4	25	92	100	50	10	12	167	147	46	17	26 ^{-0.1} _{-0.2}	54	74	13	8	4-M10
25A	Rc1	30	104	109	60	10	12	188	165	49	22	34 ^{-0.2} _{-0.3}	60	80	12	8	4-M10
32A	Rc1¼	35	119	114	65	10	12	208	180	54	30	42 ^{-0.1} _{-0.2}	75	96	14	10	4-M10
40A	Rc1½	40	144	138	80	16	15	246	214	58	35	48 ^{-0.2} _{-0.3}	75	96	14	10	4-M10
50A	Rc2	50	166	144	90	15	15	269	229	59	48	60 ^{-0.2} _{-0.3}	95	120	14	12	4-M12
65A	Rc2½	55	188	166	100	20	18	306	256	71	60	75 ^{-0.2} _{-0.3}	110	136	16	16	4-M12
80A	Rc3	62	219	205	110	20	18	365	310	80	72	90 ^{-0.1} _{-0.2}	125	154	20	22	6-M12

NC

**Duplex, Stationary IP,
Thread Connection**



Size	A	C	E	F	G	D	M	N	H	I	L	L1	L2	L3	L4	L5	a	d	Internal Pipe		
																			Size	i	B
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	R3/4	Rc3/4	Rc1/2	25	33	92	100	50	10	12	219	206	185	147	46	20	13	17	6A	10.5	R1/8
																			8A	13.8	R1/4
25A	R1	Rc1	Rc1/2	28	38	104	109	60	10	12	247	234	213	165	49	25	14	22	8A	13.8	R1/4
																			10A	17.3	R3/8
32A	R1¼	Rc1	Rc1/2	35	38	119	114	65	10	12	257	244	223	173	54	25	20	30	10A	17.3	R3/8
																			15A	21.7	R1/2
40A	R1½	Rc1¼	Rc3/4	42	43	144	138	80	16	15	305	289	264	209	58	25	20	35	15A	21.7	R1/2
																			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
																			25A	34.0	R1
65A	R2½	Rc2	Rc1½	55	62	188	166	100	20	18	386	356	319	252	71	37	23	60	25A	34.0	R1
																			32A	42.7	R1¼
																			40A	48.6	R1½
80A	R3	Rc2½	Rc2	62	72	219	205	110	20	18	463	426	385	300	80	40	25	72	25A	34.0	R1
																			32A	42.7	R1¼
																			40A	48.6	R1½
																			50A	60.5	R2

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

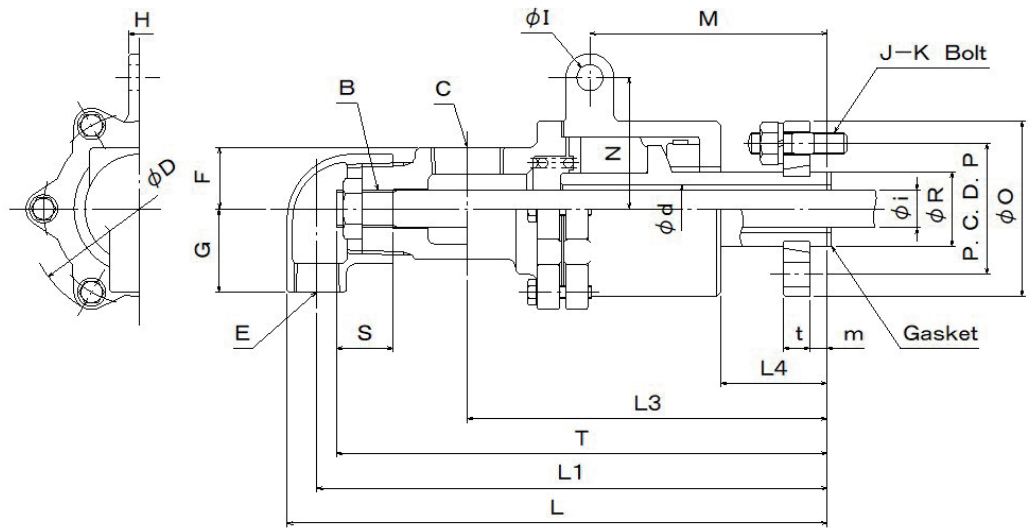
2) If the standard specification is selected, the direction of thread B is the same as that of thread A.

(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.

NCF

Duplex, Stationary IP,
Flange Connection



(mm)

Size	C	E	F	G	D	M	N	H	I	L	L1	L3	L4	d	Flange					J-K	Internal Pipe					
															R	P	O	t	m		Size	i	B	S	T	
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
20A	Rc3/4	Rc1/2	25	33	92	100	50	10	12	219	206	147	46	17	26	-0.1 -0.2	54	74	13	8	4-M10	6A	10.5	G1/8	24	196
																						8A	13.8	G1/4		
25A	Rc1	Rc1/2	28	38	104	109	60	10	12	247	234	165	49	22	34	-0.2 -0.3	60	80	12	8	4-M10	8A	13.8	G1/4	24	223
																						10A	17.3	G3/8	26	225
32A	Rc1	Rc1/2	35	38	119	114	65	10	12	257	244	173	54	30	42	-0.1 -0.2	75	96	14	10	4-M10	10A	17.3	G3/8	32	235
																						15A	21.7	G1/2	32	235
40A	Rc1 1/4	Rc3/4	42	43	144	138	80	16	15	305	289	209	58	35	48	-0.2 -0.3	75	96	14	10	4-M10	15A	21.7	G1/2	32	276
																						20A	27.2	G3/4	33	277
50A	Rc1 1/2	Rc1	50	51	166	144	90	15	15	329	308	220	59	48	60	-0.2 -0.3	95	120	14	12	4-M12	20A	27.2	G3/4	38	293
																						25A	34.0	G1	39	294
65A	Rc2	Rc1 1/2	55	62	188	166	100	20	18	386	356	252	71	60	75	-0.2 -0.3	110	136	16	16	4-M12	25A	34.0	G1	37	333
																						32A	42.7	G1 1/4	38	334
																						40A	48.6	G1 1/2	40	336
80A	Rc2 1/2	Rc2	62	72	219	205	110	20	18	463	426	300	80	72	90	-0.1 -0.2	125	154	20	22	6-M12	25A	34.0	G1	40	400
																						32A	42.7	G1 1/4		
																						40A	48.6	G1 1/2		
																						50A	60.5	G2		

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)

Type	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.

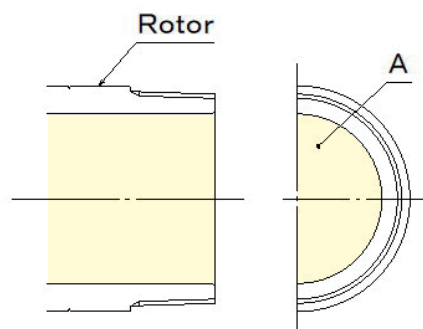
Water Flow Rate (Simplex) = $A \times 3 \times 3600 / 10000$

Flow Rate of Saturated Steam (Simplex) = $A \times 30 \times (\text{Density of saturated steam}) \times 3600 / 10000$

Table 1 Flow Rate (Simplex)

Type	Size	Flow Passage Area (cm ²)	Water Flow Rate (m ³ /h)	Flow Rate of Saturated Steam (kg/h)				
		A (Note1)		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
NCL NCLF	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
	32A	7.07	7.63	86.6	127	204	280	356
	40A	9.62	10.4	118	172	278	382	484
	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) × 3 × 3600 / 10000 (Note 4)

Flow Rate of Saturated Steam (Duplex) = B × 30 × (Density of saturated steam) × 3600 / 10000 (Note 5)

Table 2 Flow Rate (Duplex)

Type	Size	Flow Passage Area (cm ²)		Water Flow Rate (m ³ /h)	Flow Rate of Saturated Steam (kg/h)				
		B (Note2)	C (Note3)		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
NC NCF	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
	40A-20A	3.81	3.53	3.81	46.7	68.2	110	151	192
	50A-20A	12.3	3.53	3.81	150	220	355	487	619
	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	

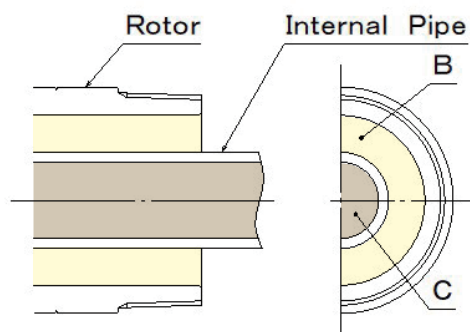
Note 2) B = A - (Internal pipe section area)

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 Dimensions (SUS304)

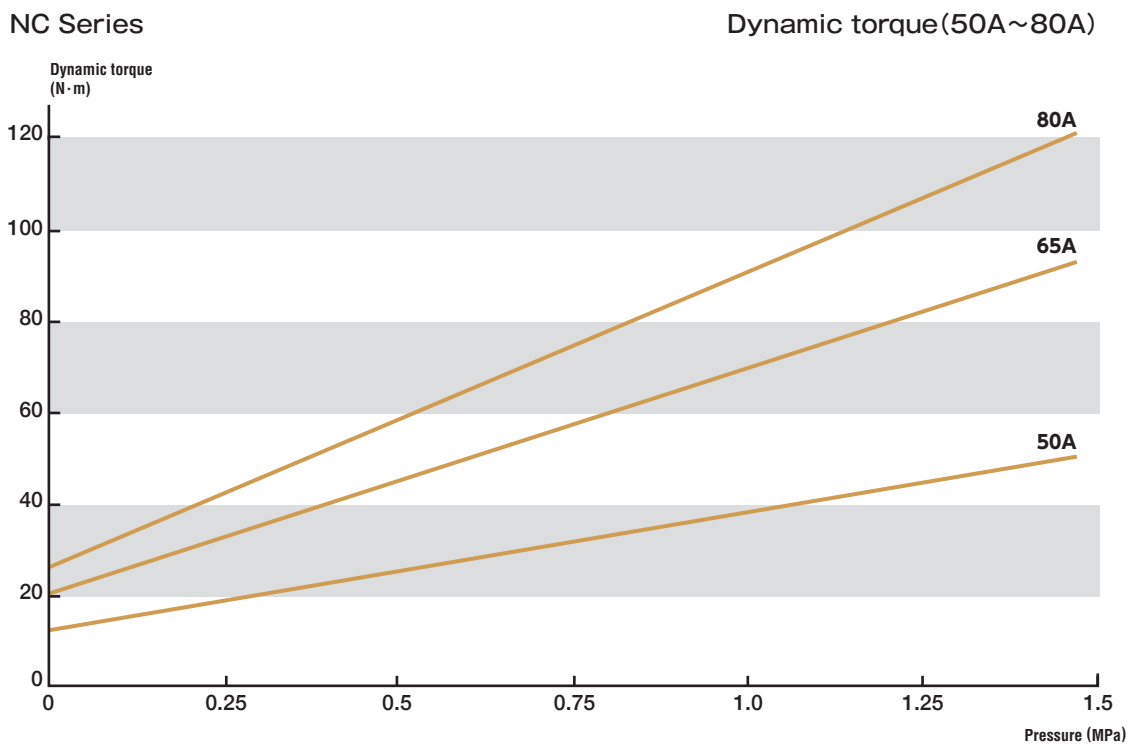
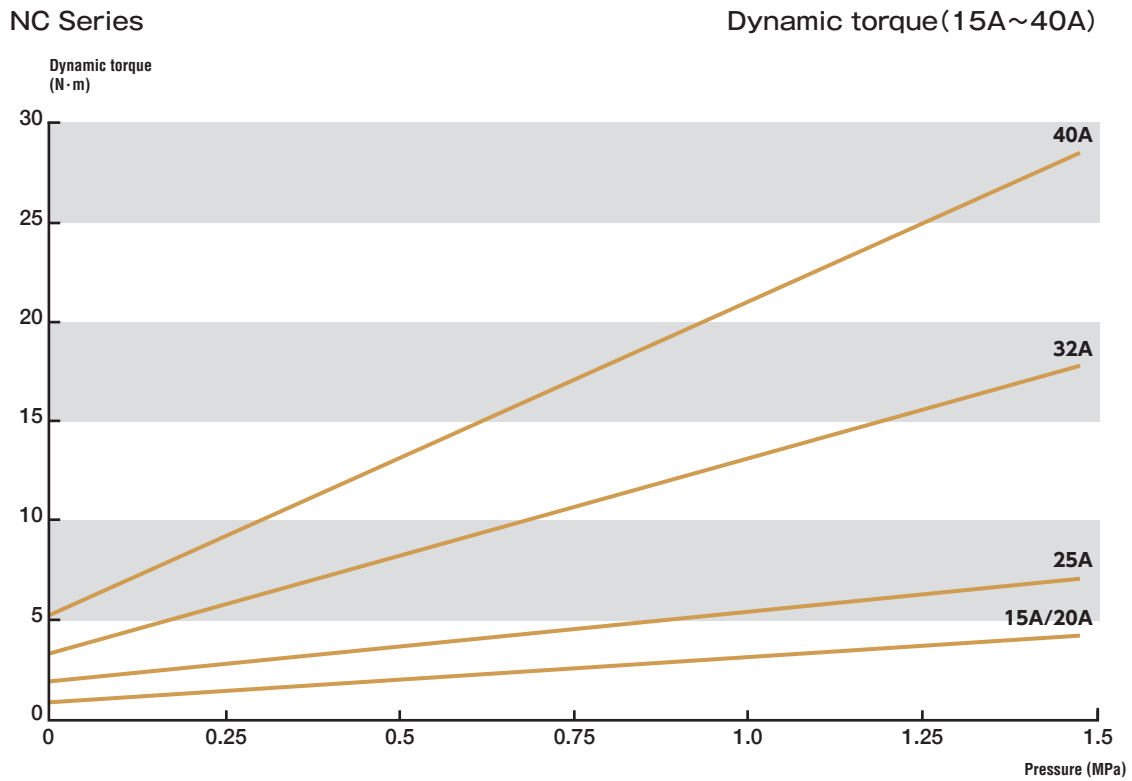


Size	Outer Dia. × Thickness
6A	φ10.5 × 2.0
8A	φ13.8 × 2.2
10A	φ17.3 × 2.5
15A	φ21.7 × 3.0
20A	φ27.2 × 3.0
25A	φ34.0 × 3.5
32A	φ42.7 × 3.5
40A	φ48.6 × 3.5
50A	φ60.5 × 4.0

* 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.

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.

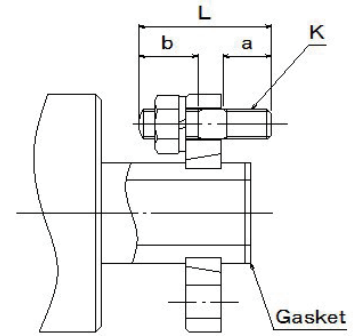
Accessories

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.

Accessories (Flange Connection)

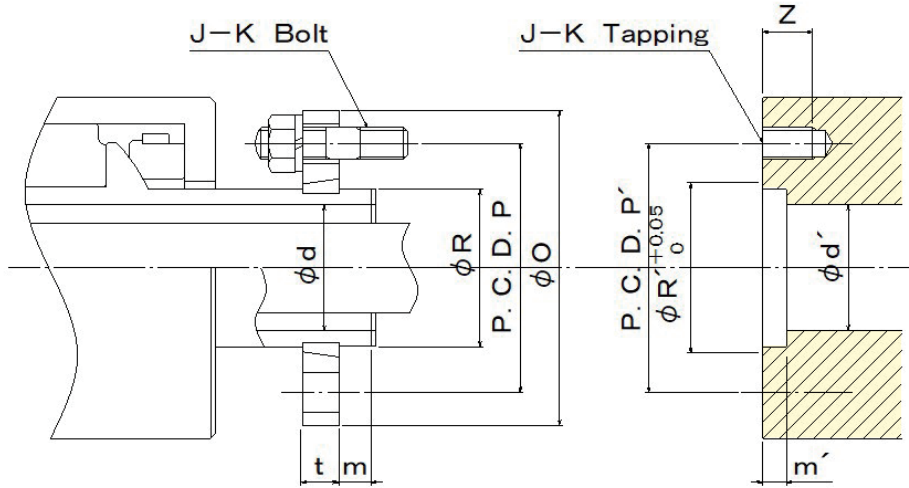
(mm)

Type	Size	Gasket			Stud Bolt				Hex. Nut	Spring Washer
		Outer Dia.	Inner Dia.	Thick-ness	K	L	a	b		
NCLF NCF	15A	24	16	3.2	M10	45	15	20	M10 type1	M10 No.2
	20A	25.5	18	2						
	25A	33.5	24	3						
	32A	41.5	32	3	M10	48	15	20	M10 type1	M10 No.2
	40A	47.5	38	3						
	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)



Flange Dimensions

(mm)

Size	d	R	P	O	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

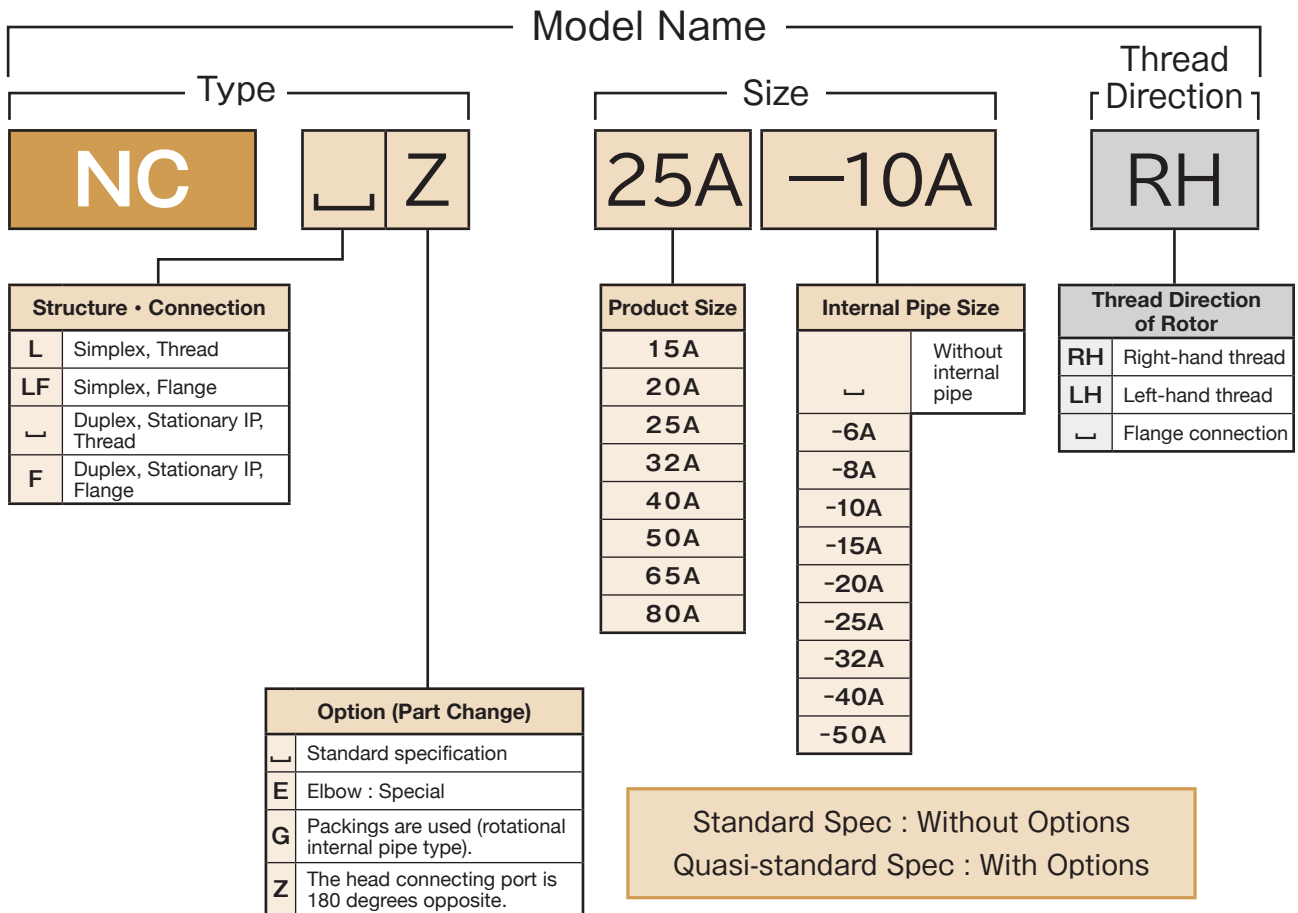
Dimensions on the Roll Side

(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. NC series is not suitable for non-rotating, intermittent rotating, or low-speed rotating (several rotations per minute) operation. Fluid leakage may result. Please consider the use of our OPM series or swivel joint.
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.

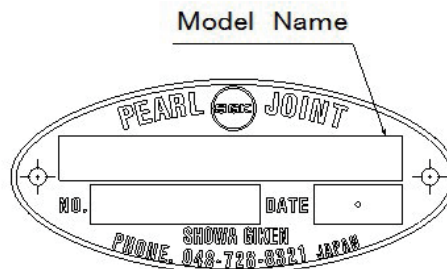
Contact us for more information.

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)
- ② 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.



Nameplate

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.

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.
Contact our sales representative if you install and use our products outside 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.

PEARL  JOINT
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