DEVELOP YOUR ORIGINALITY THROUGH UNIVERSAL JOINTS

KYOWA *JAPAN*

http://www.kyowa-uj.com

KYOWA KOGYO CO.,LTD.

Prime Minister's award-making Japan Award | Aichi Quality | IT economy Practice certified Company | ISO self-sailed Manifesto | New technology and new product award for Small Business

ISO 9001
ISO 14001

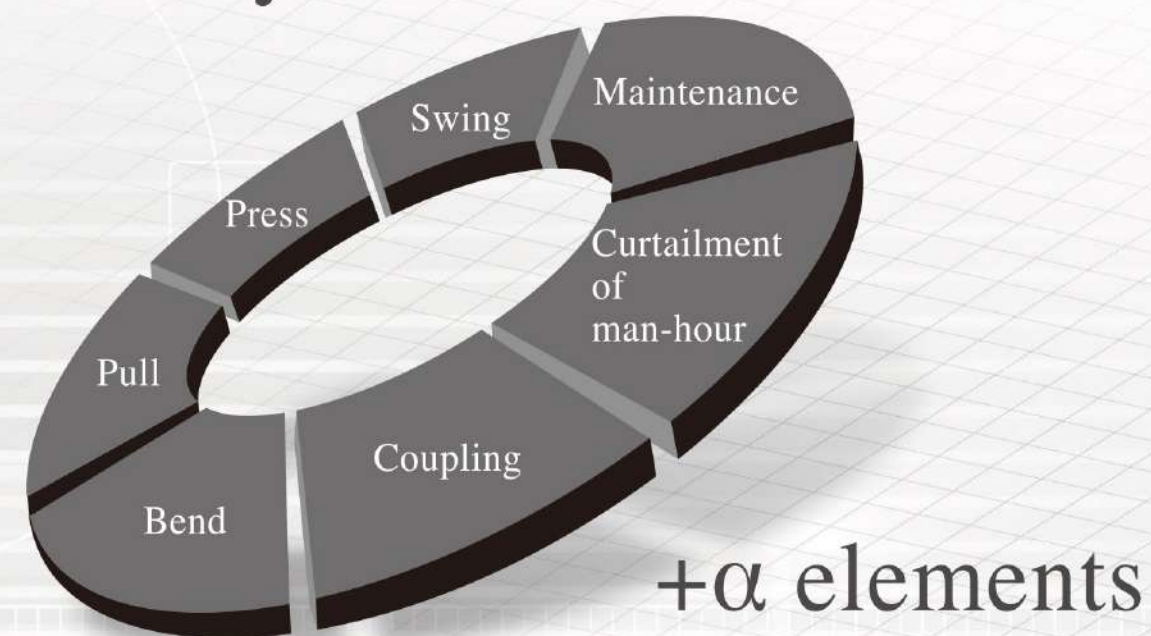Raw Material Industry Technology Award | Nagoya City Industrial Grand Prix | Aichi Environmental Award | Japan Mechanical Society Tokai Branch Award | 300 of Japan's Vibrant Monozukuri (Manufacturing) SMEs

Inquiry counter

KYOWA KOGYO CO.,LTD.

Universal Joint

S/N/F/C/K series

Develop your originality through universal joints

Universal Joints have "variety function"

» Not only rotation

- Swing
- Maintenance
- Press
- Curtailment of man-hour
- Pull
- Coupling
- Bend

+α elements

KYOWA Universal Joints supply you with special value as functional products. Our products not only transmit rotation power but can respond widely requests and needs that is "press, pull, bend, swing, coupling, maintenance, curtailment of man-hour" by realization of low price, this is why own high reliability by unique method of manufacturing, ease of use by standardization of processing specification and rationalization of manufacturing system.

Fundamental principles of KYOWA is doing utmost to develop applications of the universal joints

1. **Constantly, standing on the contact of originality.**
2. **Supply the suitable quality.**
3. **The value satisfies for all users.**

NKS
NEW KYOWA SYSTEM

» **Real-time Assurance of Quality**
» **Cost improvement "0・1/2・2"**
» **Unlimited reductions in production lead time**

KYOWA is attending to human resource development faithfully through practicing "NKS" to maintaining the formidable competitiveness in S・E・Q・C・D as a company of MONOZUKURI

KYOWA Universal Joint
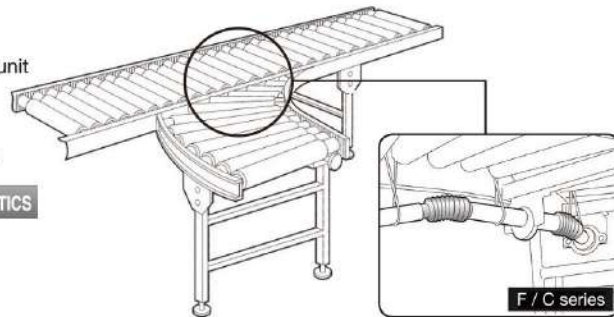
Hey, Mr. Universal Joint. Where do you working?

Develop your originality through universal joints

Roller conveyer

USE
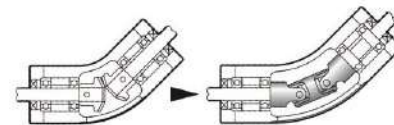Driving roller of curve unit

AIM
Simple driving system

REQUIRED CHARACTERISTICS
· Maintenance-free
· Wide & high angle

F / C series

Substitute for bevel gear
By using universal joint, the system will be compact totally and the precise machining of the case may not be necessary in comparison with the gears. The speed fluctuation may not be possible.

Autograph
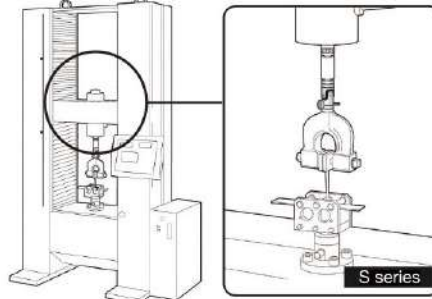Computer controlled high-precision universal testing machines

USE
Centering mechanism of holding tool

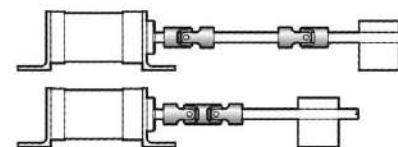**AIM**
Usable for pulling, pushing

REQUIRED CHARACTERISTICS
· Smooth motion
· Small angular play
· High strength

S series

Function of adjust the centering
Not only for rotation the connecting as shown will result in smooth motion without any troublesome centering. Of course the rotation will be acceptable.
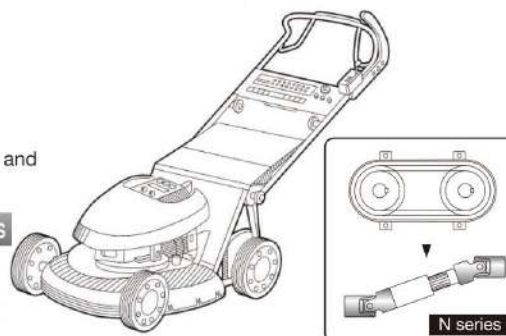
Self-propelled lawn mower

USE
Driving shaft

AIM
Realization of lightweight and compact design.

REQUIRED CHARACTERISTICS
· Compact
· Durability
· Maintenance-free

N series

Shaft drive
The dynamic connection between belt and pulley with pulley cover is still the traditional way until our new design is developed. Our advanced universal joints with shaft drive provide compact design and free maintenance for the transmission power.
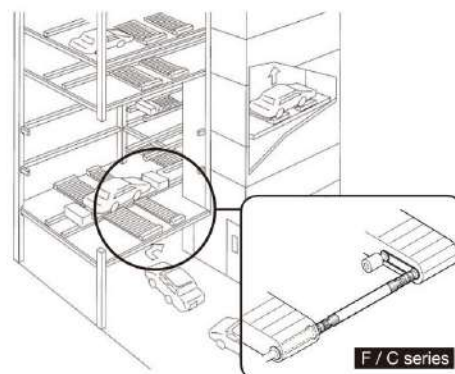
Multistory parking garage

USE
· Substitute for coupling
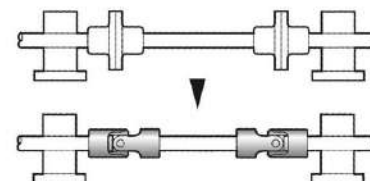· Driving roller

AIM
Shortening the assembling time at site.

REQUIRED CHARACTERISTICS
· Maintenance-free
· Durability

F / C series

Substitute for coupling
This is another application. Comparing to coupling, universal joint, even with rough centering, will realize smooth assembling with less process.
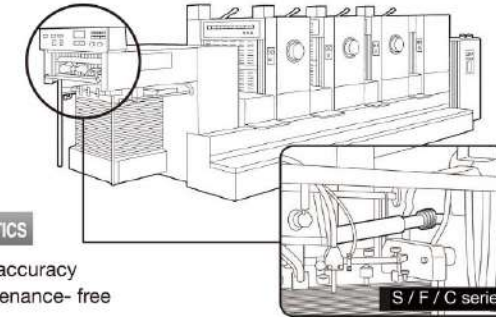
Printing machine

USE
Driving paper feeder

AIM
Responding to various kinds of the work.

REQUIRED CHARACTERISTICS
· Durability · High accuracy
· Safety · Maintenance- free

S / F / C series

Changing angle during rotation
If the mechanism is expandable at the intermediate or the one side end, a motion as shown below Figure is possible
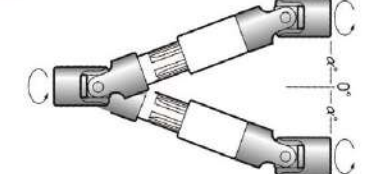
Backhoe

USE
Control lever

AIM
Flexibility realization of compact operation package.

REQUIRED CHARACTERISTICS
· Compact
· High durability
· Better touch
· Low cost
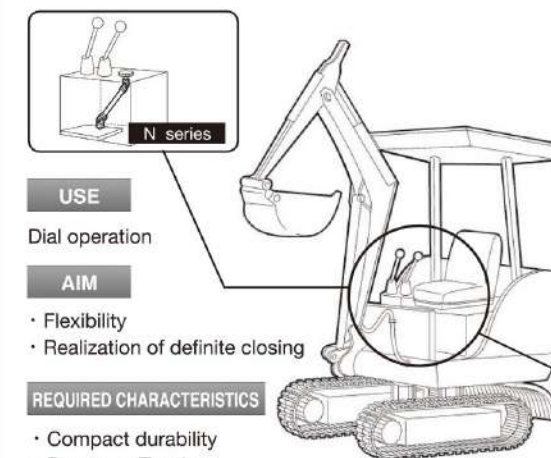
USE
Dial operation

AIM
· Flexibility
· Realization of definite closing

REQUIRED CHARACTERISTICS
· Compact durability
· Better · Touch

N series

New applications in new fields
Apart from conventional use, by a free imagination for pushing, pulling, bending, swinging and etc., universal joint is a functional component with new value.

N series
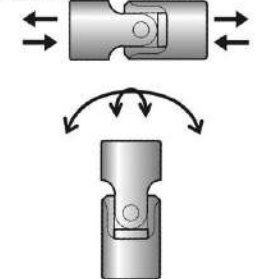
Just fitting to every machines transmitting rotation with various angle.

Multiple spindle screw machines

USE **AIM**
Driving drills | Narrow pitch is possible by compact design.

REQUIRED CHARACTERISTICS
· High rotation accuracy · Compact · Durability
· Small angular play · High strength

FS series
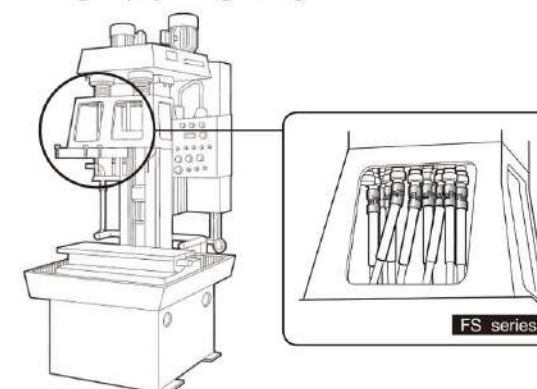
Sheet leveller

USE **AIM**
Driving roller | · Fitting facility · Compact design

REQUIRED CHARACTERISTICS
High accuracy · Compact · Durability · High strength

FS series

CONTENTS

1. Technical information

2. Series guidance

S series   high-accuracy, KYOWA standard "koma" type / single joint   SC type / SD type / SP type   P.3～10

The ultimate universal joint, "*koma*" type. This quality totally, realizing high accuracy, high toughness and high durability by compact design, is world-class.

Characteristics

- Inner diameter ø3~ø50
- The measure and specification are origin of KYOWA
- You can use our products directly without additional process
  Because we develop pin-connecting type and keyway-connecting type
- Joint which are suitable for specification of mating spindle
- Joint made by KYOWA is compact, high communicative competence.
- The material of joints is SCM415 and products have been heated treating.
- Please use in enough lubricating atmosphere to use products more longer.

N series   general purpose, a popular edition of "*koma*" type / single joint   NC type / ND type   P.11～14

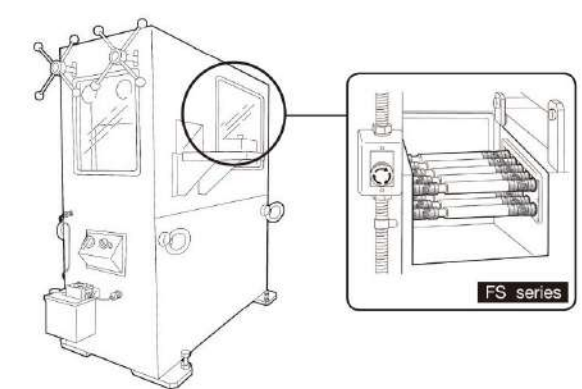The joint of NC type is a popular edition keeping the durability of SC type.
It has rather large clearance than one of SC type, so it is suitable in "rough" condition & structure.

Characteristics

- Inner diameter ø6~ø30
- The measure and specification are origin of KYOWA
- Joint made by KYOWA is compact, high communicative competence.
- N series joints have a surface coated with a film of manganese phosphate.
- The material of joints is the same one of S series, and heated treating.
- The application range is diversity, and you can purchase for a low price.
- Please use in enough lubricating atmosphere to use products more longer.

2. Series guidance

F series   compact cross type joint, non-lubricating type, and a popular edition   FJ type / FP type   P.15～16

F series is non-lubricating & maintenance-free joint type. So you need not to fear the dispersion of oil, and it is tolerant of the dust atmosphere. You can use it on continuous-driving and high-rotational-speed.

Characteristics

- Inner diameter ø16~ø40
- Joint made by KYOWA is compact, high communicative competence.
- All the F series joints include needle bearings.
- This joint is able to be driven continuously and maintenance-free.
- Additionally process to driving yoke itself can be made, because its yoke haven't been heated treating.

C series   compact cross type joint, non-lubricating type, correspondence type of mass-production   CF type / CD type / CP type   P.17～18

C series joint based on F series is correspondence type of mass-production. It is compact cross type joint with needle bearings and it consists of "Cold Forged Yoke". You can use it for, including agriculture machine of every kind, multipurpose working machine.

Characteristics

- Inner diameter ø14~ø25
- The needs, which hopes lot-production and continuous manufacturing, is so suitable
- The manufacturing method is be to eliminate waste of materials and man-hour.
- Joint made by KYOWA is compact, high communicative competence.
- All the f series joints include needle bearings.
- This joint is able to be driven continuously and maintenance-free.
- It is possible to respond dedicated design, so please use with freely idea.

K series   industrial propeller shaft type   KC type / KD type / KP type   P.19

Characteristics

- Allowable torque 400~4,000 (N·m)
- All the K series joints include needle bearings.
- This joint is able to be driven continuously.

3. Confirmation of specification (in case that you hope to designate dedicated products)

We receive the requests you designate. Please use the replica (copy) of confirmation of specification noted (P.20). Please inquire after writing each item of confirmation. Then, if you have drawing plan or sketch or blueprint etc, please tell us.

Thank you. We hope that "Develop your originality through universal joints".

P.20

1. Operating angle / refractive angle

In the case that you use a joint, single joint only itself, on the condition product is loaded torque continuously or / and on and off, please assuage using angle as if its angle is less than the value on diagram below, substituting twin type joint or one of containing intermediate shaft etc.

	Single	Twin	Containing intermediate shaft
S / N series	30°	60° (one side 30°)	60° (one side 30°)
F / C series	25°	50° (one side 25°)	50° (one side 25°)
K series	15°	30° (one side 15°)	30° (one side 15°)

Operating angle : α
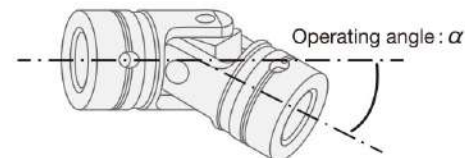
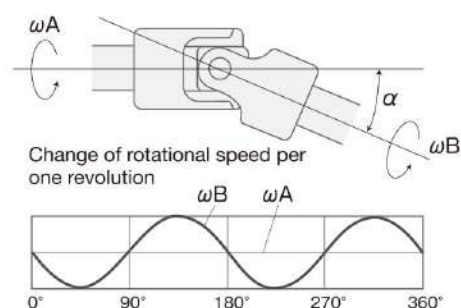## 2. About change (fluctuation) of angular velocity

A nonuniform motion, as we say unequal running, which is repeating accelerating and decelerating between input shaft and output shaft (one cycle = one-half revolution) is caused by rotation of single joint on the condition that it attaches to other machines with some angle.

Relationship between input shaft and output shaft

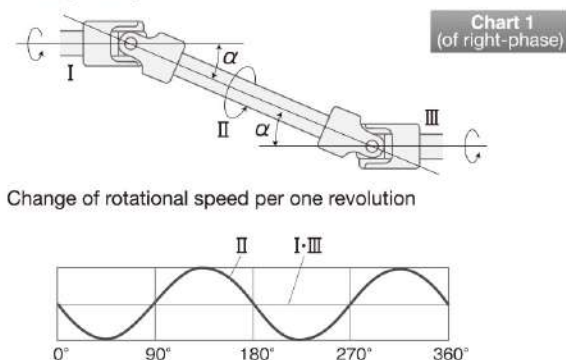α = Operating angle
θ = Arbitrary rotation angle

$$\omega B = \frac{\cos \alpha}{1 - \sin^2\theta\sin^2\alpha} \, \omega A$$

Change of rotational speed per one revolution
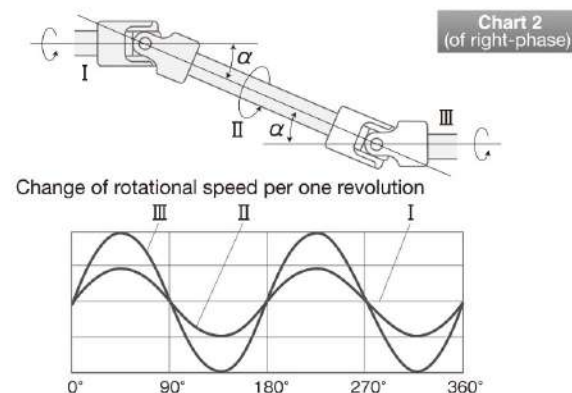
3. A phase of binate joints

1	○ Right-phase (a phase is exact.)	2	× Error-phase (a phase is not exact.)

Setting like "chart 1", relationship between Ⅰ and Ⅱ is constant velocity due to offset pulsatary motion

Chart 1 (of right-phase)

Change of rotational speed per one revolution

Setting like "chart 2", pulsatiry motion amplifies between Ⅱ and Ⅲ.

Chart 2 (of right-phase)

Change of rotational speed per one revolution

4. Cautions on designing and attaching

1. To absorb axial power that an error over than tolerant arise caused by machine assembly or machine structure , please provide adjustment mechanism which is able to absorb and escape the power on the connecting spindle including joint.
2. Without the adjustment mechanism, it is possible that joint is damaged early due not to be smooth rotation.
3. Please don't load joints with the heavy tensile loads and the heavy compressive loads as much as possible.
4. A joint fixing as near as possible to the bearing (joint) to prevent vibration.
5. Universal joints should be installed by uniform loads and angle.

Joint fixing
Telescopic motion
Joint fixing
Keyway
Joint fixing
Joint fixing
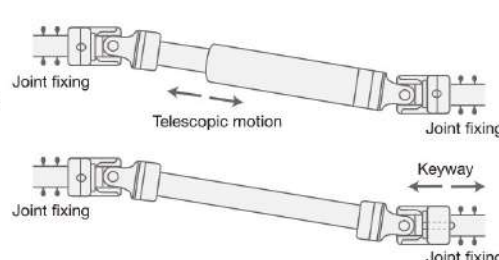
5. To make assembly work easy

Universal joints of KYOWA have knock pin holes to connect with the spindle. As knock pin holes are made precisely by the dedicated machine, it is convenient for you to have a simple jig for drilling the hole of spindle to use them constantly and many times. Please design and produce that tolerant of mating spindle is to "H8" extent.

≪Merit≫
1. Stnadardization of assembly work
2. Changing assembly work to light and simple work
3. Avoiding of mistake during assembly work
4. Creating interchangeability in joints

Drill bush or body quenching
Reaming
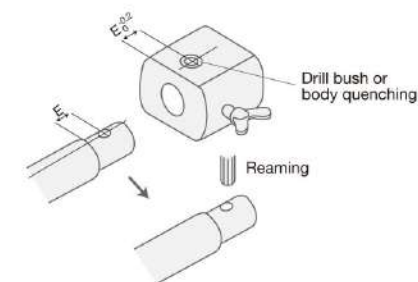
6. Heavy duty set pin

1. Equipped with a part of type listed in this catalog. (type of SC / SD / NC / ND)
2. Heavy duty set pin has steps and effective part is indicated right-side-chart.
3. It doesn't matter that center of pin hole in which the pin drives has a little deviation, the tolerant should be designed and produced within to H8 extent.
4. Material of heavy duty set pin is "SCM415" heated treating and polished finishing (tolerant : m6).

Path of insertion
Thick side
Effective part
Step
Thin side
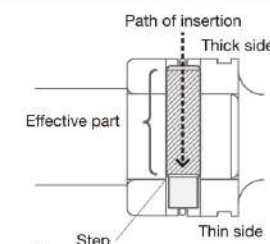
7. Powerful set pin (having an effect on both sides)

In the case of repeating forward and reverse rotation and stopping frequently, and loaded mechanical shock repeatedly, please use this powerful set pin because it is possible the pin outstrips in this condition.
★ If you use powerful set pin, please tell us that effect ,adding [-E] to product number.

(For example)
SC-08-00A-E / NC-08-00A-E / SP-10-00A-E

Effective part = mostly overall length
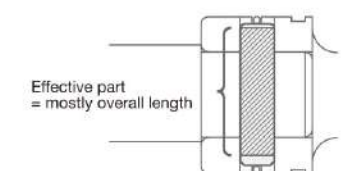
8. A way to use ring spring / Cautions on use

On the following conditions, the effect of spring is able to lost.
1. Attching and detaching ring spring already set on.
2. Many times have taken when ring spring remain holding the periphery edge of joint.
3. Ring spring is distorted by struck by hammer etc.
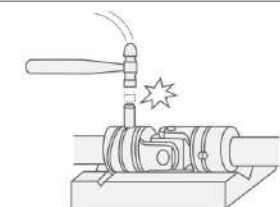
9. 〔S/N series〕 about lubricating maintenance of origin "koma" joint of KYOWA

Please use joint in lubricated condition and lubricated satisfyingly in the beginning before using and assembly work. The joint worn a rubber cover sealed grease is effective on the condition that circumstance and atmosphere are unable and hard to perform maintenance because of high-degree, danger and dust.
In general doing lubrication like this. (below chart)
And the more enough-lubrication, the expectation of joint life is longer.

	Material	Freezing resistance	Heat resistance
Rubber cover	NBR	-20°C	100°C
Dedicated one	CR	-40°C	130°C
Grease	OS grease	-5°C	120°C

(Permissible substitute)

First lubrication / lubrication on a regular basic		Enforced lubrication / constantly lubrication	
Low-speed rotation	Grease application	High-speed rotation	Jetting lubrication
Low torque	Dripping lubricating-oil	High torque	Spraying lubrication
Low angle	Filling up grease (into rubber cover)	High angle	Dripping oil bath

★ Especially, enforced and constantly lubrication is necessary that you use joint on the condition that a calculation conditional variable is near to the allowable conditional variable. (noted P.22)

SC type
High-accuracy, KYOWA standard "koma" type / single joint

The ultimate universal joint, "koma" type. This quality totally, realizing high accuracy, high toughness and high durability by compact design, is world-class.

Structure of SC type

① Driving yoke
② Center block
③ Driving pin
④ Driving half pin
⑤ Rivet
⑥ Plug
⑦ Rigid felt
⑧ Heavy duty set pin
⑨ Ring spring

★1 SC-03,04,05 don't contain ⑥&⑦
★2 Please don't break up to keep the property.
★3 No additional process can be made because products have done heat treating.

Product number of SC type

| S | C | – | 1 | 2 | – | 3 | 3 | A |

Series
S series

Size (spindle hole)
ø03～ø50

Rubber cover
A: Without rubber cover
C: With rubber cover

Part combination
C: Single type
D: Twin type
P: Containing intermediate shaft type

Shape of spindle hole of joints on both sides
0: KYOWA standard round hole
3: With new JIS keyway
8: With previous JIS keyway
9: Quick changing type

Details

★ Please take a good look at "P.22" noted method of select

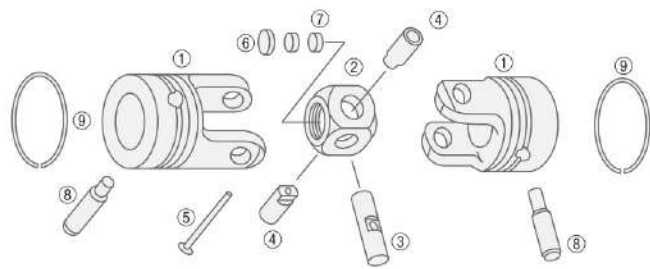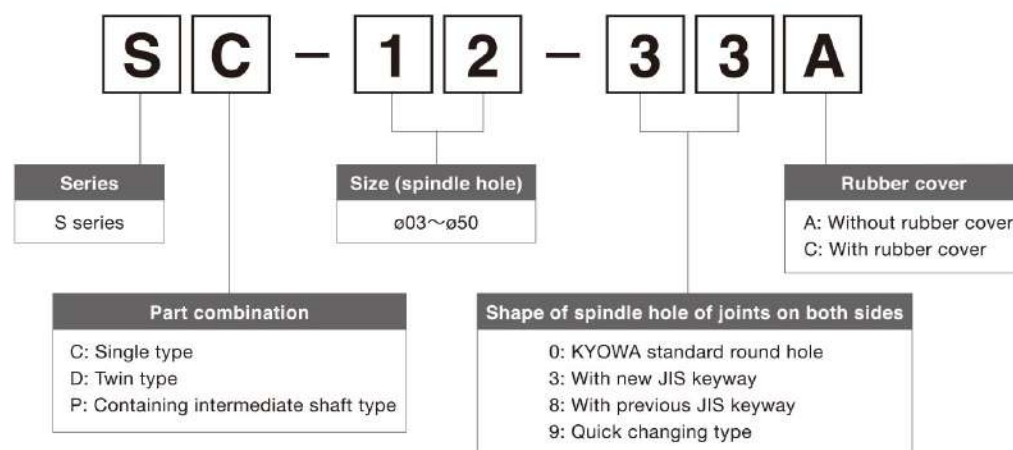|	Operating angle (°)	Allowable rotational speed (min⁻¹)	Allowable torque (N·m)	Allowable conditional variable (N·m)	Static breakdown torque (N)	Static tensile rupture torque (N)	Moment of inertia (kg.cm²)	Mass (g)
SC-03	30	4,000	0.13	8,000	0.4	680	0.001	5
SC-04	30	3,300	0.96	13,000	2.9	1,200	0.003	8
SC-05	30	2,800	3.23	21,000	9.8	2,000	0.007	12
SC-06	30	2,500	5.3	32,000	16	5,300	0.015	15
SC-08	30	2,200	11.6	48,000	35	7,840	0.044	30
SC-10	30	2,000	27.4	80,000	83	13,000	0.13	55
SC-12	30	1,800	46	121,000	140	23,000	0.35	110
SC-14	30	1,600	66	151,000	200	26,000	0.67	155
SC-16	30	1,400	102	200,000	310	39,000	1.5	260
SC-18	30	1,200	132	232,000	400	44,000	2.3	345
SC-20	30	1,000	175	273,000	530	52,000	3.6	465
SC-22	30	900	251	344,000	760	68,000	5.9	630
SC-25	30	800	330	406,000	1,000	81,000	9.7	790
SC-30	30	700	495	531,000	1,500	100,000	20	1,160
SC-35	30	600	792	711,000	2,400	140,000	41	2,255
SC-40	30	500	1,188	918,000	3,600	180,000	77	2,730
SC-45	30	400	1,584	1,150,000	4,800	220,000	130	4,350
SC-50	30	300	1,914	1,400,000	5,800	280,000	220	5,200

SC-**-00A (Both sides: standard) ø3～50

Accessory
● Heavy duty set pin (2pcs.)
● Ring spring (2pcs.)

Without: SC-08-00A With: SC-08-00C
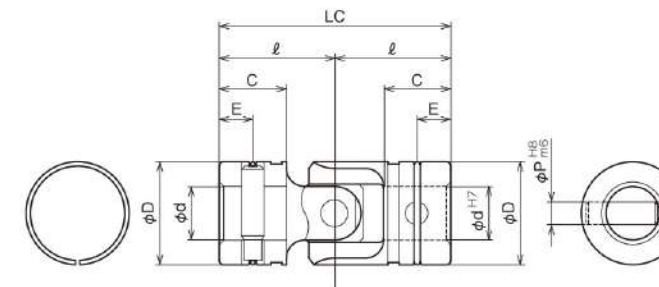
GBC**-00

● SC-08～30 is possible to wear a rubber cover (sealed grease) with the dedicated rubber cover
● SC-35～50 with the dedicated rubber cover

SC-**-03A (One side: standard, another side new JIS keyway) ø10～50

Accessory
● Heavy duty set pin (1pcs.)
● Ring spring (1pcs.)

2-Miso
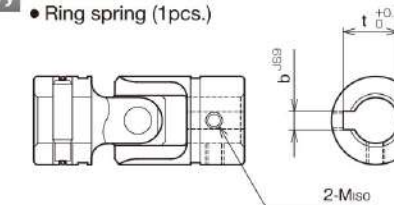
SC-**-33A (Both sides: new JIS keyways) ø10～50

Accessory: Needless

2-Miso

SC-**-08A (One side: standard, another side previous JIS keyway) ø10～50

Accessory
● Heavy duty set pin (1pcs.)
● Ring spring (2pcs.)

2-Miso
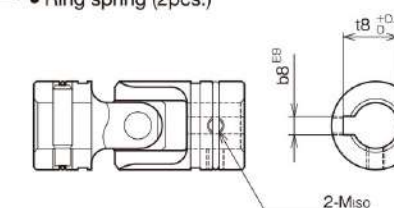
SC-**-88A (Both sides: previous JIS keyways) ø10～50

Accessory ● Ring spring (2pcs.)

2-Miso
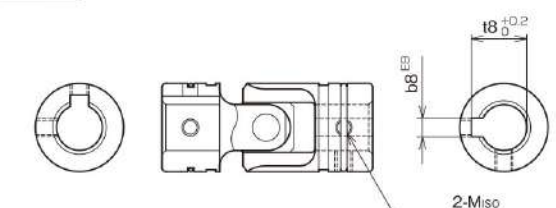
Measure of SC type

	φd	φD	LC	ℓ	C	E	Pin		New JIS keyway		Previous JIS keyway		Screw		KC
							φP	L	b	t	b8	t8	M	Pitch	
SC-03	3	6	26	13	9	2.5	1	5.0	—	—	—	—	—	—	—
SC-04	4	8	24	12	7	4	1.5	6.8	—	—	—	—	—	—	—
SC-05	5	10	30	15	9	5	2	8.7	—	—	—	—	—	—	—
SC-06	6	12	31	15.5	9	4.5	3	10.0	—	—	—	—	3	0.5	—
SC-08	8	15	36	18	10	5	3.5	12.5	—	—	—	—	3	0.5	25
SC-10	10	19	42	21	12	6	4.5	16.5	3	11.4	4	11.5	5	0.8	32
SC-12	12	23	52	26	15	7.5	5	20.5	4	13.8	4	13.5	5	0.8	35
SC-14	14	26	59	29.5	17	8.5	5.8	23.0	5	16.3	5	16	6	1.0	40
SC-16	16	30	74	37	22	11	6.5	26.5	5	18.3	5	18	6	1.0	46
SC-18	18	33	81	40.5	23.5	11.75	7	28.5	6	20.8	5	20	6	1.0	52
SC-20	20	36	87	43.5	25	12.5	8	31.5	6	22.8	5	22	6	1.0	58
SC-22	22	40	94	47	27	13.5	9	34.5	6	24.8	7	25	6	1.0	62
SC-25	25	44	105	52.5	30	15	10	38.5	8	28.3	7	28	8	1.25	68
SC-30	30	51	122	61	35	17.5	11.5	44.0	8	33.3	7	33	8	1.25	82
SC-35	35	59	140	70	40	20	13	52.0	10	38.3	10	38.5	10	1.5	90
SC-40	40	67	157	78.5	45	22.5	14.5	60.0	12	43.3	10	43.5	10	1.5	100
SC-45	45	75	176	88	50	25	16	68.0	14	48.8	12	48.5	10	1.5	110
SC-50	50	83	191	95.5	55	27.5	17.5	76.0	14	53.8	12	53.5	10	1.5	120

SP type
High-accuracy, KYOWA standard "koma" type / contain a intermediate shaft.

SP type contains the intermediate shaft which is able to expand & contract. So anywhere rough layout, it is just fit. It help you to need not to adjust the center of fellow machines. As a result, you can cut down on something and man-hour.

Structure of SP type

① Spline spindle
② Sleeve
③ Pin
④ Connecting spindle

★ 1　Please confirm the structure of joints on both sides (P.3)
★ 2　Please don't break up to keep the property.
★ 3　Only parts of intermediate shaft & itself are not sold.

Product number of SP type

S P － 2 0 － 8 8 A － 0 0

Series	S series
Size (spindle hole)	ø08～ø50
Rubber cover	A: Without rubber cover / C: With rubber cover

Part combination
C: Single type
D: Twin type
P: Containing intermediateshaft type

Shape of spindle hole of joints on both sides
0: KYOWA standard round hole
3: With new JIS keyway
8: With previous JIS keyway
9: Quick changing type

00 means KYOWA standard (5 variety in P.6)
★ If you designate the products of original structure, this number is not 00. (for example 12,35,89 etc..)

Details

* Please take a good look at "P.22" noted method of select

	Operating angle (per one side) (°)	Allowable rotational speed (min⁻¹)	Allowable torque (N·m)	Allowable conditional variable	Static breakdown torque (N·m)	Static tensile rupture torque (N)	Moment of inertia (kg.cm²)	Mass (g)
SP-08	30	2,200	11.6	48,000	35	7,840	0.044	182
SP-10	30	2,000	27.4	80,000	83	13,000	0.13	236
SP-12	30	1,800	46	121,000	140	23,000	0.35	532
SP-14	30	1,600	66	151,000	200	26,000	0.67	632
SP-16	30	1,400	102	200,000	310	39,000	1.5	1,226
SP-18	30	1,200	132	232,000	400	44,000	2.3	1,416
SP-20	30	1,000	175	273,000	530	52,000	3.6	2,017
SP-22	30	900	251	344,000	760	68,000	5.9	2,610
SP-25	30	800	330	406,000	1,000	81,000	9.7	3,467
SP-30	30	700	495	531,000	1,500	100,000	20	5,137
SP-35	30	600	792	711,000	2,400	140,000	41	8,755
SP-40	30	500	1,188	918,000	3,600	180,000	77	11,395
SP-45	30	400	1,584	1,150,000	4,800	220,000	130	17,019
SP-50	30	300	1,914	1,400,000	5,800	280,000	220	21,660

SP-**-00A-00　ø8～50

Accessory • Heavy duty set pin (2pcs.)　• Ring spring (2pcs.)

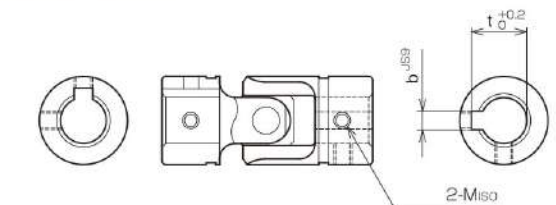### SP-**-03A-00 (One side: standard, another side new JIS keyway)　ø8～50

Accessory • Heavy duty set pin (1pcs.)　• Rring spring (1pcs.)



SP-**-33A-00 (Both sides: new JIS keyways)　ø8～50

Accessory: Needless

### SP-**-08A-00 (One side: standard, another side previous JIS keyway)　ø8～50

Accessory • Heavy duty set pin (1pcs.)　• Ring spring (2pcs.)

SP-**-88A-00 (Both sides: previous JIS keyways)　ø8～50
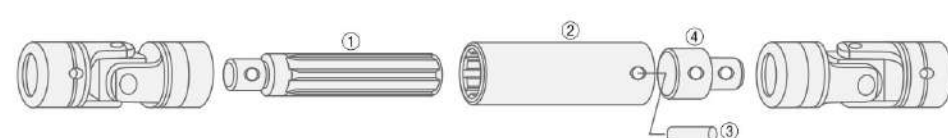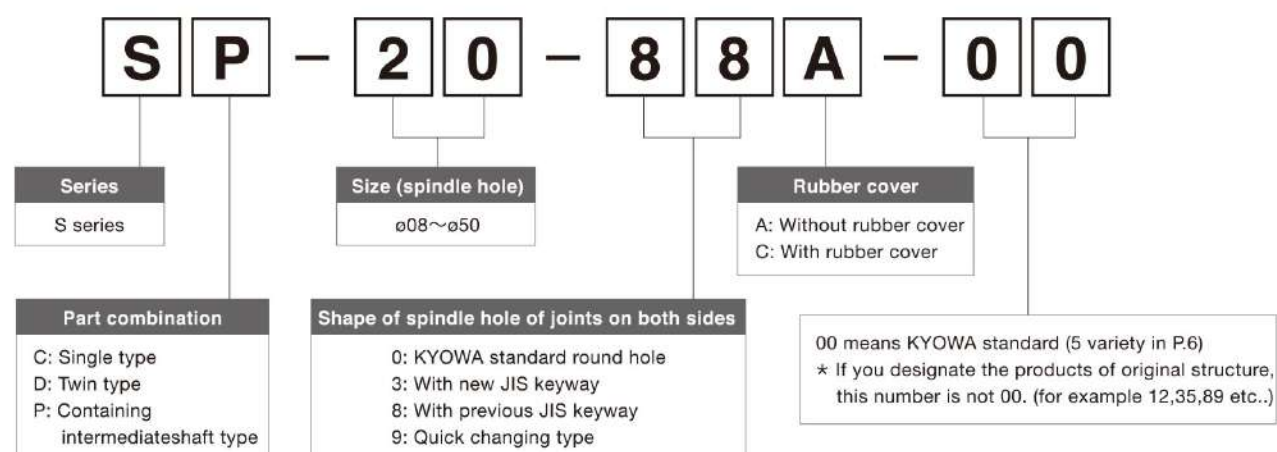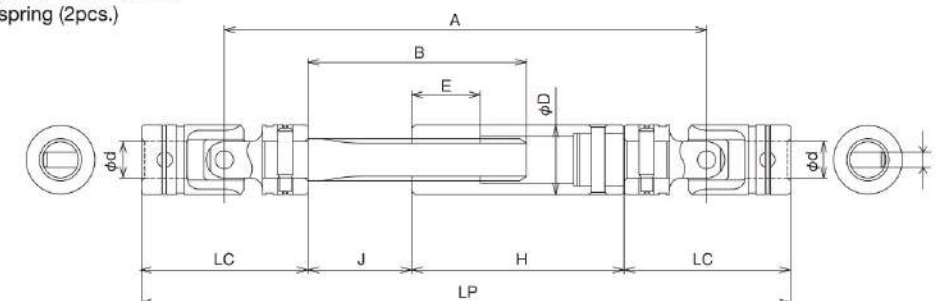
Accessory • Ring spring (2pcs.)

Measure of SP type

	ød	øD	LP	Telescopic motion	A	B	H	J	LC	E	P	New JIS keyway		Previous JIS keyway		Screw	
												b	t	b8	t8	M	Pitch
SP-08-□□A	8	17	163	+19 / -11	127	65	65	26	36	20	3.5	—	—	—	—	3	0.5
SP-10-□□A	10	19	177	+17 / -13	135	65	65	28	42	25	4.5	3	11.4	4	11.5	5	0.8
SP-12-□□A	12	23	225	+16 / -16	173	88	89	32	52	40	5	4	13.8	4	13.5	5	0.8
SP-14-□□A	14	26	240	+14 / -18	181	87	89	33	59	40	5.8	5	16.3	5	16	6	1.0
SP-16-□□A	16	30	308	+35 / -23	234	115	120	40	74	40	6.5	5	18.3	5	18	6	1.0
SP-18-□□A	18	33	327	+30 / -26	246	115	120	45	81	40	7	6	20.8	5	20	6	1.0
SP-20-□□A	20	36	344	+33 / -27	257	118	125	45	87	40	8	6	22.8	5	22	6	1.0
SP-22-□□A	22	40	360	+28 / -30	266	115	125	47	94	40	9	6	24.8	7	25	6	1.0
SP-25-□□A	25	44	405	+38 / -32	300	133	145	50	105	45	10	8	28.3	7	28	8	1.25
SP-30-□□A	30	51	464	+35 / -40	342	145	160	60	122	50	11.5	8	33.3	7	33	8	1.25
SP-35-□□A	35	55	515	+35 / -45	375	150	170	65	140	50	13	10	38.3	10	38.5	10	1.5
SP-40-□□A	40	65	574	+35 / -50	417	165	190	70	157	60	14.5	12	43.3	10	43.5	10	1.5
SP-45-□□A	45	75	637	+35 / -55	461	180	210	75	176	70	16	14	48.8	12	48.5	10	1.5
SP-50-□□A	50	83	697	+35 / -60	506	200	230	85	191	80	17.5	14	53.8	12	53.5	10	1.5

* You can request of us to design & layout & manufacture your designated products other than KYOWA standard ones.
Please contact us, before writing the specification (P.20) for KYOWA sales contact.
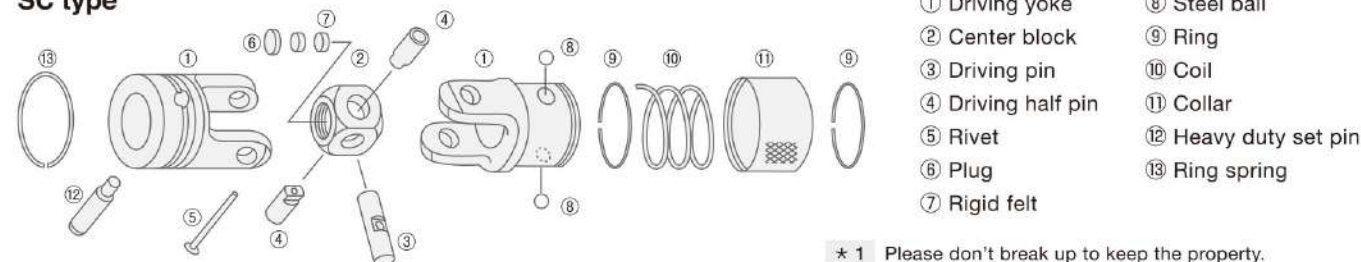
SC / SP type
High-accuracy, KYOWA standard "koma" type / quick changing joint

The joint of S series is more useful.
With no tools, only one action can attach the joints to other machines.

Structure of SC / SP type

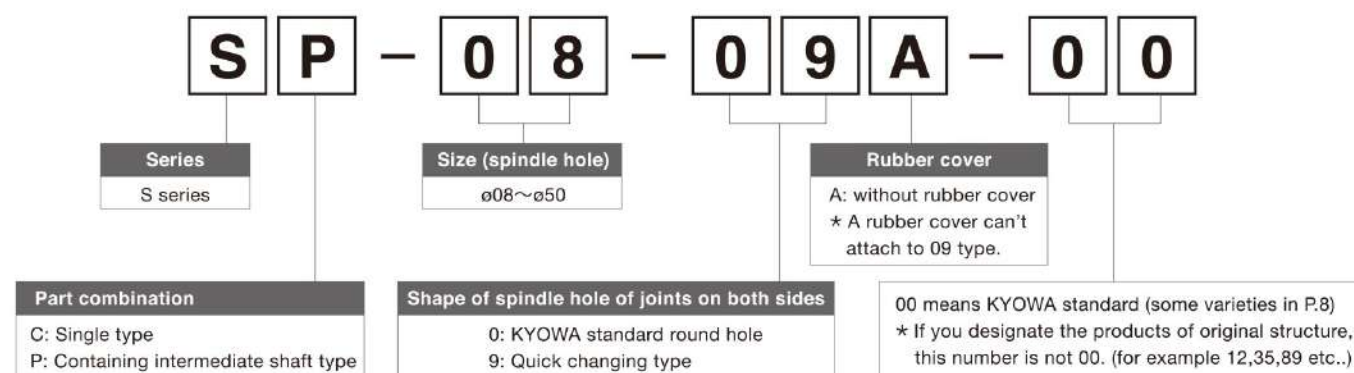### SC type

① Driving yoke
② Center block
③ Driving pin
④ Driving half pin
⑤ Rivet
⑥ Plug
⑦ Rigid felt
⑧ Steel ball
⑨ Ring
⑩ Coil
⑪ Collar
⑫ Heavy duty set pin
⑬ Ring spring

★ 1 Please don't break up to keep the property.

★ 2 No additional process can be made because products have done heat treating.

SP type
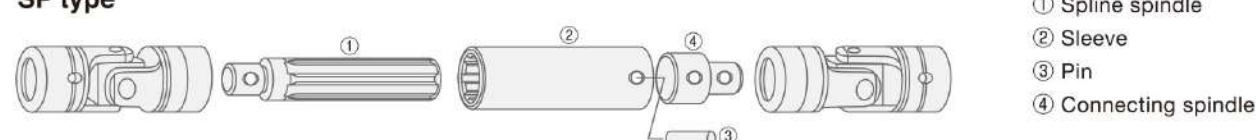
① Spline spindle
② Sleeve
③ Pin
④ Connecting spindle

★ 1 Please don't break up to keep the property.

★ 2 Only parts of intermediate shaft & itself are not sold.

Product number of SC / SP type

S P - 0 8 - 0 9 A - 0 0

Series	
S series	

Size (spindle hole)
ø08～ø50

Rubber cover
A: without rubber cover
★ A rubber cover can't attach to 09 type.

Part combination
C: Single type
P: Containing intermediate shaft type

Shape of spindle hole of joints on both sides
0: KYOWA standard round hole
9: Quick changing type

00 means KYOWA standard (some varieties in P.8)
★ If you designate the products of original structure, this number is not 00. (for example 12,35,89 etc..)

Details

★ Please take a good look at "P.22" noted method of select

	Operating angle of SC (°)	Operating angle of SP (per one side) (°)	Allowable rotational speed (min⁻¹)	Allowable torque (N·m)	Allowable conditional variable	Static breakdown torque (N·m)	Static tensile rupture torque (N)	Moment of inertia (kg.cm³)	Mass of SC (g)	Mass of SP (g)
S※-08	30	30	2,200	11.6	48,000	35	7,840	0.044	30	182
S※-10	30	30	2,000	27.4	80,000	83	13,000	0.13	55	236
S※-12	30	30	1,800	46	121,000	140	23,000	0.35	110	532
S※-14	30	30	1,600	66	151,000	200	26,000	0.67	155	632
S※-16	30	30	1,400	102	200,000	310	39,000	1.5	260	1,226
S※-18	30	30	1,200	132	232,000	400	44,000	2.3	345	1,416
S※-20	30	30	1,000	175	273,000	530	52,000	3.6	465	2,017
S※-22	30	30	900	251	344,000	760	68,000	5.9	630	2,610
S※-25	30	30	800	330	406,000	1,000	81,000	9.7	790	3,467
S※-30	30	30	700	495	531,000	1,500	100,000	20	1,160	5,137

SC-✲✲-09A　　ø8～30

Accessory
● Heavy duty set pin (1pcs.)
● Ring spring (1pcs.)

★ A rubber cover can't attach to this type.
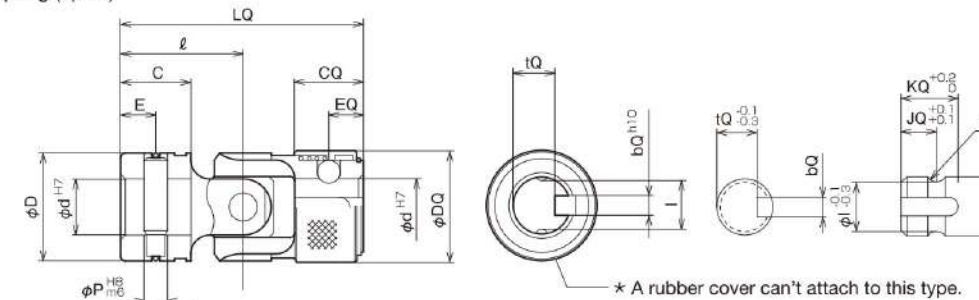
Measure of SC type

	φd	φD	LQ	ℓ	C	E	P	DQ	CQ	EQ	I	R	JQ	bQ	tQ	KQ
SC-08-09A	8	15	38	18	10	5	3.5	19	12	4	6.56	2	8	3	5.8	10
SC-10-09A	10	19	42	21	12	6	4.5	21.5	12	4	9.06	2	8	4	7.5	9
SC-12-09A	12	23	52	26	15	7.5	5	23.8	15	7.5	10.48	2.4	7.5	4	8.8	12
SC-14-09A	14	26	59	29.5	17	8.5	5.8	29	17	8.5	11.88	2.8	8.5	5	10.3	14
SC-16-09A	16	30	74	37	22	11	6.5	35	22	11	13.3	3.2	11	5	12.3	18
SC-18-09A	18	33	81	40.5	23.5	11.75	7	38	23.5	11.75	15.3	3.2	11.75	5	14.5	21
SC-20-09A	20	36	87	43.5	25	12.5	8	42	25	12.5	17.12	4	12.5	6	16.0	23
SC-22-09A	22	40	94	47	27	13.5	9	44	27	13.5	19.12	4	13.5	6	17.8	25
SC-25-09A	25	44	105	52.5	30	15	10	49	30	15	21.54	4.4	15	7	21.0	28
SC-30-09A	30	51	122	61	35	17.5	11.5	56	35	17.5	26.95	4.8	17.5	7	25.3	30

SP-✲✲-09A-00 (One side: standard, another side: quick changing)　ø8～30

Accessory
● Heavy duty set pin (1pcs.)
● Ring spring (1pcs.)

★ A rubber cover can't attach to this type.
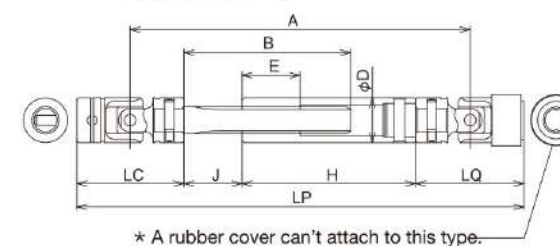
SP-✲✲-99A-00 (Both sides: quick changing)　ø8～30

Accessory: Needless

★ A rubber cover can't attach to this type.
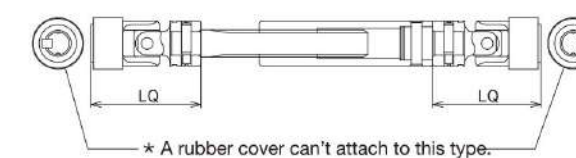
★ Please confirm the detail of specification of joints on both sides at upper "Measure"

Measure of SP type

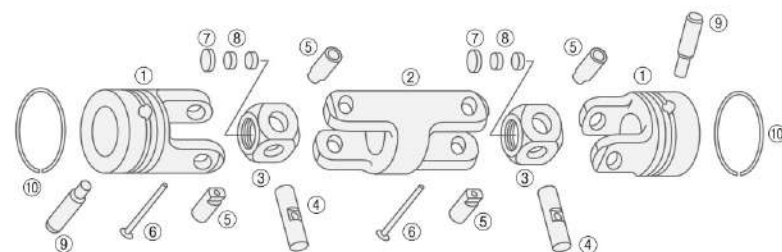|	φd	φD	LP	Telescopic motion	A	B	H	J	LC	LQ	E
SP-08-09A	8	17	167	+17 / -13	129	65	65	28	36	38	20
SP-08-99A	8	17	169	+17 / -13	129	65	65	28	—	38	20
SP-10-□□A	10	19	177	+17 / -13	135	65	65	28	42	42	25
SP-12-□□A	12	23	225	+16 / -16	173	88	89	32	52	52	40
SP-14-□□A	14	26	240	+14 / -18	181	87	89	33	59	59	40
SP-16-□□A	16	30	308	+35 / -23	234	115	120	40	74	74	40
SP-18-□□A	18	33	327	+30 / -26	246	115	120	45	81	81	40
SP-20-□□A	20	36	344	+33 / -27	257	118	125	45	87	87	40
SP-22-□□A	22	40	360	+28 / -30	266	115	125	47	94	94	40
SP-25-□□A	25	44	405	+38 / -32	300	133	145	50	105	105	45
SP-30-□□A	30	51	464	+35 / -40	342	145	160	60	122	122	50

★ You can request of us to design & layout & manufacture your designated products other than KYOWA standard ones.
Please contact us, before writing the specification (P.20) for KYOWA sales contact.

SD type

High-accuracy, KYOWA standard "koma" type / Twin type (one product contains twin joint and other parts.)

The ultimate universal joint, "koma" type. This quality totally realizing high accuracy, high toughness and high durability by compact design is world-class.
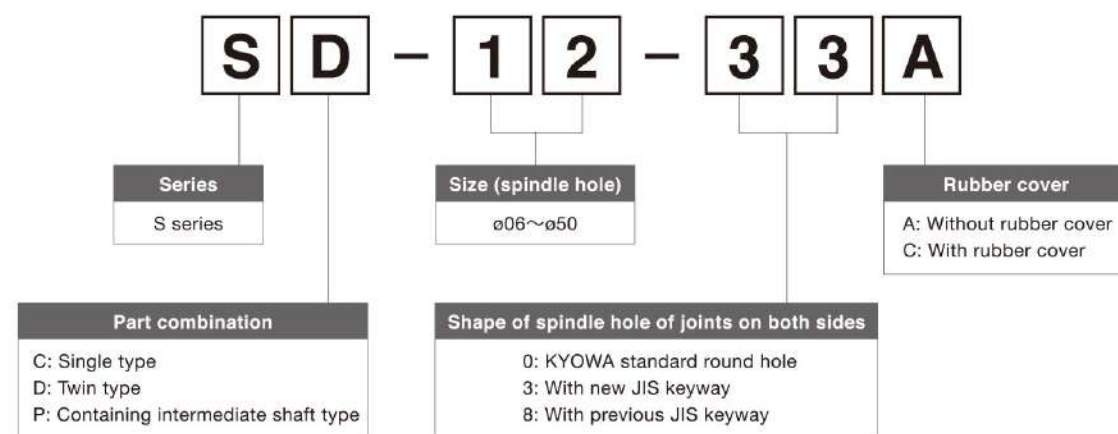
Structure of SD type

SD type

① Driving yoke
② Double yoke
③ Center block
④ Driving pin
⑤ Driving half pin
⑥ Rivet
⑦ Plug
⑧ Rigid felt
⑨ Heavy duty set pin
⑩ Ring spring

★1 Please don't break up to keep the property.

★2 No additional process can be made because products have done heat treating.

Product number of SD type

S D – 1 2 – 3 3 A

Series
S series

Size (spindle hole)
ø06～ø50

Rubber cover
A: Without rubber cover
C: With rubber cover

Part combination
C: Single type
D: Twin type
P: Containing intermediate shaft type

Shape of spindle hole of joints on both sides
0: KYOWA standard round hole
3: With new JIS keyway
8: With previous JIS keyway

Details

★ Please take a good look at "P.22" noted method of select

|	Operating angle (per one side) (°)	Allowable rotational speed (min⁻¹)	Allowable torque (N·m)	Allowable conditional variable	Static breakdown torque (N)	Static tensile rupture torque (N)	Moment of inertia (kg.cm²)	Mass (g)
SD-06	30	2,500	3.96	32,000	12	5,300	0.029	30
SD-08	30	2,200	8.58	48,000	26	7,840	0.069	50
SD-10	30	2,000	20.1	80,000	61	13,000	0.21	95
SD-12	30	1,800	33	121,000	100	23,000	0.55	180
SD-14	30	1,600	46	151,000	140	26,000	1.0	250
SD-16	30	1,400	76	200,000	230	39,000	2.3	410
SD-18	30	1,200	96	232,000	290	44,000	3.7	550
SD-20	30	1,000	129	273,000	390	52,000	5.7	690
SD-22	30	900	185	344,000	560	68,000	9.1	940
SD-25	30	800	248	406,000	750	81,000	15	1,240
SD-30	30	700	363	531,000	1,100	100,000	31	1,775
SD-35	30	600	594	711,000	1,800	140,000	75	3,180
SD-40	30	500	891	918,000	2,700	180,000	120	4,150
SD-45	30	400	1,155	1,150,000	3,500	220,000	210	6,225
SD-50	30	300	1,419	1,400,000	4,300	280,000	340	7,750

Twin type realizes twice effect of SC type within saving space. The effect is as follows.

1. In the case you use single type now, you hope more operating angle.
2. Now, you use joint for coupling, you hope to absorb the deflection caused by fellow spindles rotation.
3. In the case that, single joint is affected by some torque continuously or on & off, you hope absorbing operating angle.
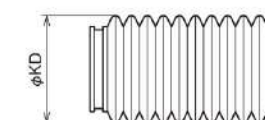
SD-**-00A ø6～50

Accessory
- Heavy duty set pin (2pcs.)
- Ring spring (2pcs.)
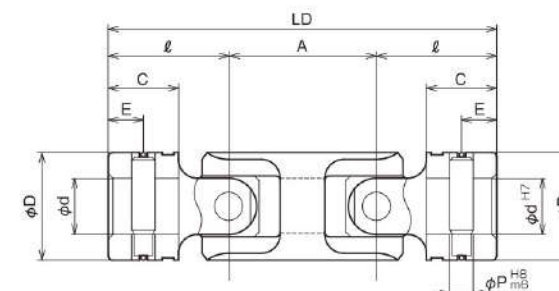
GBD**-00

- SD-08～30 able to wear a rubber cover (sealed grease)
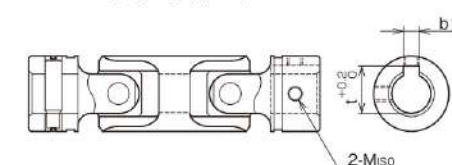- SD-35～50 with the dedicated rubber cover

Without: SD-08-00A With: SD-08-00C

SD-**-03A (One side: standard, another side new JIS keyway) ø10～50

Accessory
- Heavy duty set pin (1pcs.)
- Ring spring (1pcs.)

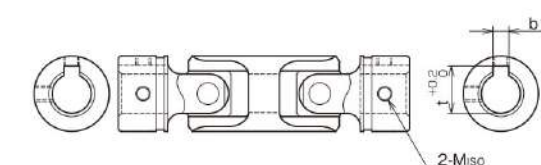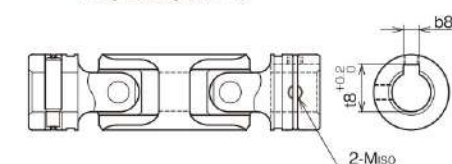### SD-**-33A (Both sides: new JIS keyways) ø10～50

Accessory: Needless

SD-**-08A (One side: standard, another side previous JIS keyway) ø10～50

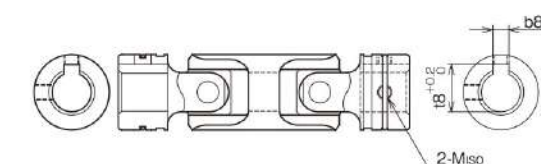**Accessory**
- Heavy duty set pin (1pcs.)
- Ring spring (2pcs.)

SD-**-88A (Both sides: previous JIS keyways) ø10～50
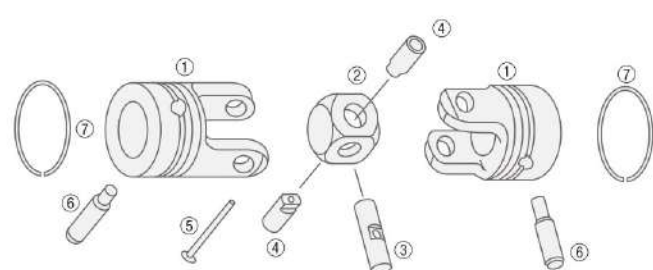
Accessory
- Ring spring (2pcs.)

Measure of SD type

	φd	φD	LD	A	ℓ	C	E	Pin φP	Pin L	New JIS keyway b	New JIS keyway t	Previous JIS keyway b8	Previous JIS keyway t8	Screw M	Screw Pitch	KD
SD-06	6	12	49.5	18.5	15.5	9	4.5	3	10	—	—	—	—	3	0.5	—
SD-08	8	15	58	22	18	10	5	3.5	12.5	—	—	—	—	3	0.5	26
SD-10	10	19	67.5	25.5	21	12	6	4.5	16.5	3	11.4	4	11.5	5	0.8	32
SD-12	12	23	83	31	26	15	7.5	5	20.5	4	13.8	4	13.5	5	0.8	36
SD-14	14	26	94.5	35.5	29.5	17	8.5	5.8	23	5	16.3	5	16	6	1.0	40
SD-16	16	30	117.5	43.5	37	22	11	6.5	26.5	5	18.3	5	18	6	1.0	46
SD-18	18	33	129	48	40.5	23.5	11.75	7	28.5	6	20.8	5	20	6	1.0	52
SD-20	20	36	139	52	43.5	25	12.5	8	31.5	6	22.8	5	22	6	1.0	58
SD-22	22	40	150	56	47	27	13.5	9	34.5	6	24.8	7	25	6	1.0	62
SD-25	25	44	168	63	52.5	30	15	10	38.5	8	28.3	7	28	8	1.25	68
SD-30	30	51	195	73	61	35	17.5	11.5	44	8	33.3	7	33	8	1.25	82
SD-35	35	59	224	84	70	40	20	13	52	10	38.3	10	38.5	10	1.5	90
SD-40	40	67	251	94	78.5	45	22.5	14.5	60	12	43.3	10	43.5	10	1.5	100
SD-45	45	75	282	106	88	50	25	16	68	14	48.8	12	48.5	10	1.5	110
SD-50	50	83	304	113	95.5	55	27.5	17.5	76	14	53.8	12	53.5	10	1.5	120

NC type
General purpose, a popular edition of "*koma*" type / single joint

The joint of NC type is a popular edition keeping the durability of SC type. It has rather large clearance than one of SC type, so it is suitable in "rough" condition & structure.

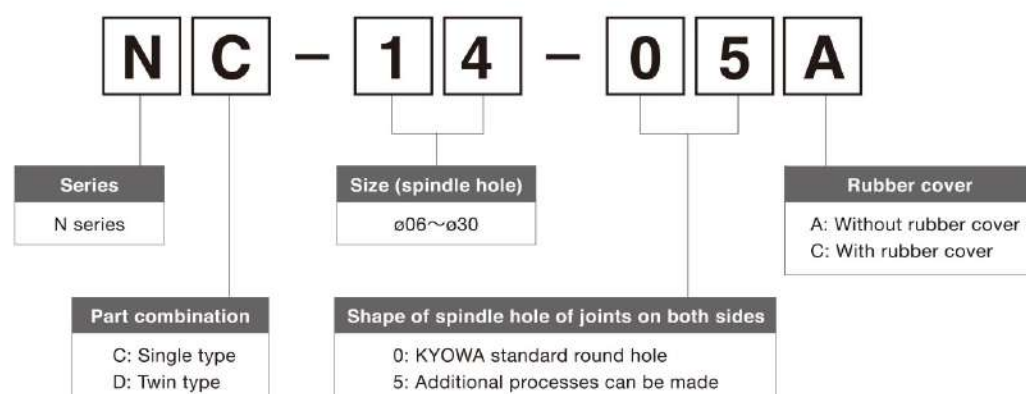## Structure of NC type

① Driving yoke
② Center block
③ Driving pin
④ Driving half pin
⑤ Rivet
⑥ Heavy duty set pin
⑦ Ring spring

★1 Please don't break up to keep the property.

★2 No additional process can be made because products have done heat treating.

Product number of NC type

N C – 1 4 – 0 5 A

Series	
N series	

Part combination
C: Single type
D: Twin type

Size (spindle hole)
ø06～ø30

Shape of spindle hole of joints on both sides
0: KYOWA standard round hole
5: Additional processes can be made

Rubber cover
A: Without rubber cover
C: With rubber cover

Details
★ Please take a good look at "P.22" noted method of select

	Operating angle (°)	Allowable rotational speed (min⁻¹)	Allowable torque (N·m)	Allowable conditional variable	Static breakdown torque (N·m)	Static tensile rupture torque (N)	Moment of inertia (kg.cm²)	Mass (g)
NC-06	30	1,800	5.3	28,000	16	5,300	0.015	15
NC-08	30	1,500	11.6	42,000	35	7,840	0.044	30
NC-10	30	1,300	27.4	70,000	83	13,000	0.13	55
NC-12	30	1,100	46	106,000	140	23,000	0.35	110
NC-14	30	1,000	66	133,000	200	26,000	0.67	155
NC-16	30	900	102	175,000	310	39,000	1.5	260
NC-18	30	800	132	203,000	400	44,000	2.3	345
NC-20	30	700	175	239,000	530	52,000	3.6	465
NC-22	30	650	251	302,000	760	68,000	5.9	630
NC-25	30	600	330	356,000	1,000	81,000	9.7	790
NC-30	30	550	495	465,000	1,500	100,000	20	1,160

NC-**-00A   ø6～30

Accessory
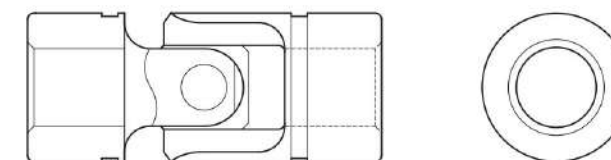• Heavy duty set pin (2pcs.)
• Ring spring (2pcs.)
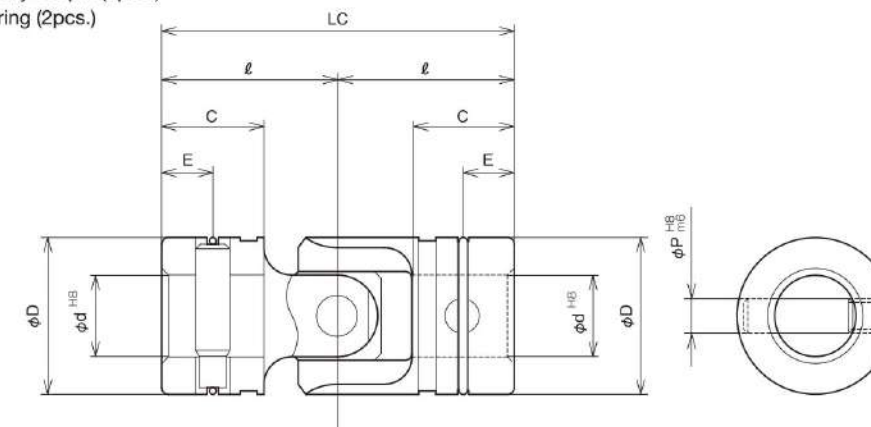
NC-**-05A (One side: standard, another side: one that is additional processes can be made)   ø6～30

Accessory: Needless
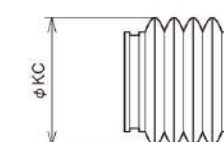
★ This product is not applicable to "Details" (P.11) because of the joint contained have not done heat treating(No.5 joint) Please use it to the extent that human operates it by one's hand.

GBC**-00   ø8～30

• NC-08～30 able to wear a rubber cover (sealed grease)

Without: NC-14-00A With: NC-14-00C

Measure of NC type

	φd	φD	LC	ℓ	C	E	Pin φP	Pin L	KC
NC-06	6	12	31	15.5	9	4.5	3	10	—
NC-08	8	15	36	18	10	5	3.5	12.5	25
NC-10	10	20	42	21	12	6	4.5	16.5	32
NC-12	12	23	52	26	15	7.5	5	20.5	35
NC-14	14	26	59	29.5	17	8.5	5.8	23	40
NC-16	16	30	74	37	22	11	6.5	26.5	46
NC-18	18	33	81	40.5	23.5	11.75	7	28.5	52
NC-20	20	36	87	43.5	25	12.5	8	31.5	58
NC-22	22	40	94	47	27	13.5	9	34.5	62
NC-25	25	44	105	52.5	30	15	10	38.5	68
NC-30	30	51	122	61	35	17.5	11.5	44	82

ND type

General purpose, a popular edition of "*koma*" type / Twin type

The joint of NC type is a popular edition keeping the durability of SC type. It has rather large clearance than one of SC type, so it is suitable in "rough" condition & structure.

Structure of NC type

① Driving yoke
② Double yoke
③ Center block
④ Driving pin
⑤ Driving half pin
⑥ Rivet
⑦ Heavy duty set pin
⑧ Ring spring

★ 1 Please don't break up to keep the property.

★ 2 No additional process can be made because products have done heat treating.

Product number of ND type

N D – 1 4 – 0 5 A

Series	N series

Size (spindle hole)	ø06～ø30

Rubber cover	A: Without rubber cover / C: With rubber cover

Part combination	C: Single type / D: Twin type

Shape of spindle hole of joints on both sides	0: KYOWA standard round hole / 5: Additional processes can be made

Twin type realizes twice effect of NC type within saving space. The effect is as follows.

1. In the case you use single type now, you hope more operating angle.
2. Now, you use joint for coupling, you hope to absorb the deflection caused by fellow spindles rotation.
3. In the case that, single joint is affected by some torque continuously or on & off, you hope absorbing operating angle.

ND-✱✱-00A   ø6～30

Accessory • Heavy duty set pin (2pcs.)
• Ring spring (2pcs.)

ND-✱✱-05A (One side: standard, another side: one that is additional processes can be made)   ø6～30

Accessory: Needless

★ This product is not applicable to "Details" (P.13) because of the joint contained have not done heat treating (No.5 joint) Please use it to the extent that human operates it by one's hand.

GBD✱✱-00   ø8～30

• ND-08～30 is possible to wear a rubber cover (sealed grease)
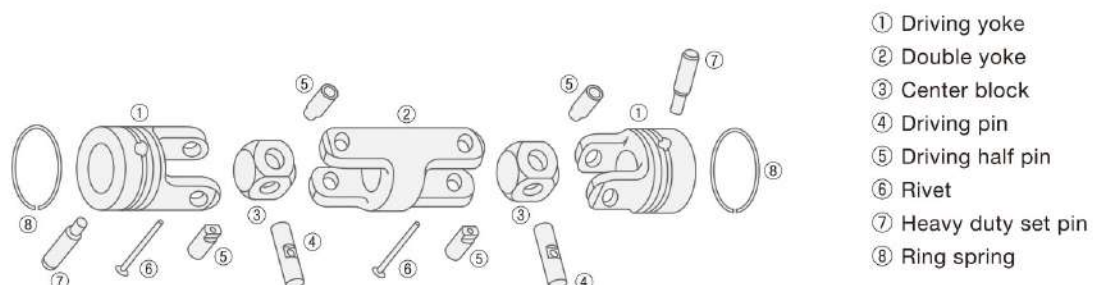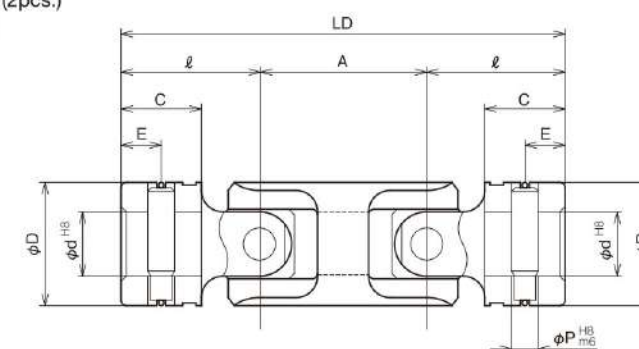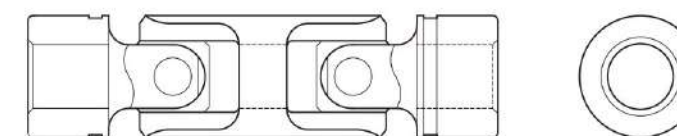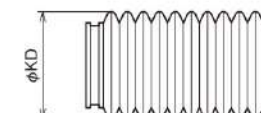
Without: ND-14-00A With: ND-14-00C

Details

★ Please take a good look at "P.22" noted method of select

	Operating angle (per one side) (°)	Allowable rotational speed (min⁻¹)	Allowable torque (N·m)	Allowable conditional variable	Static breakdown torque (N·m)	Static tensile rupture torque (N)	Moment of inertia (kg.cm²)	Mass (g)
ND-06	30	1,800	3.96	28,000	12	5,300	0.029	30
ND-08	30	1,500	8.58	42,000	26	7,840	0.069	50
ND-10	30	1,300	20.1	70,000	61	13,000	0.21	95
ND-12	30	1,100	33	106,000	100	23,000	0.55	180
ND-14	30	1,000	46	133,000	140	26,000	1.0	250
ND-16	30	900	76	175,000	230	39,000	2.3	410
ND-18	30	800	96	203,000	290	44,000	3.7	550
ND-20	30	700	129	239,000	390	52,000	5.7	690
ND-22	30	650	185	302,000	560	68,000	9.1	940
ND-25	30	600	248	356,000	750	81,000	15	1,240
ND-30	30	550	363	465,000	1,100	100,000	31	1,775

Measure of ND type

|	ød	øD	LD	A	ℓ	C	E	Pin		KD
								øP	L	
ND-06	6	12	49.5	18.5	15.5	9	4.5	3	10	—
ND-08	8	15	58	22	18	10	5	3.5	12.5	26
ND-10	10	20	67.5	25.5	21	12	6	4.5	16.5	32
ND-12	12	23	83	31	26	15	7.5	5	20.5	36
ND-14	14	26	94.5	35.5	29.5	17	8.5	5.8	23	40
ND-16	16	30	117.5	43.5	37	22	11	6.5	26.5	46
ND-18	18	33	129	48	40.5	23.5	11.75	7	28.5	52
ND-20	20	36	139	52	43.5	25	12.5	8	31.5	58
ND-22	22	40	150	56	47	27	13.5	9	34.5	62
ND-25	25	44	168	63	52.5	30	15	10	38.5	68
ND-30	30	51	195	73	61	35	17.5	11.5	44	82

FJ / FP type

F series is compact cross type joint, non-lubricating type, and a popular edition

F series is non-lubricating & maintenance-free joint type. So you need not to fear the dispersion of oil, and it is tolerant of the dust atmosphere. You can use it on continuous-driving and high-rotational-speed.
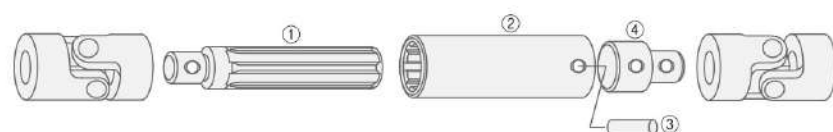
Structure of FJ type

FJ type
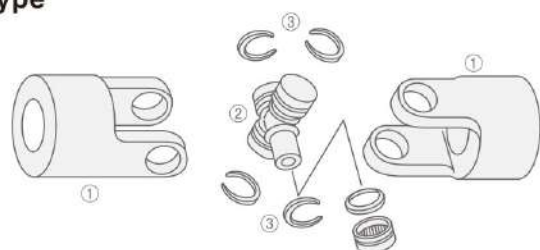
① Driving yoke
② Cross kit
③ Snap ring

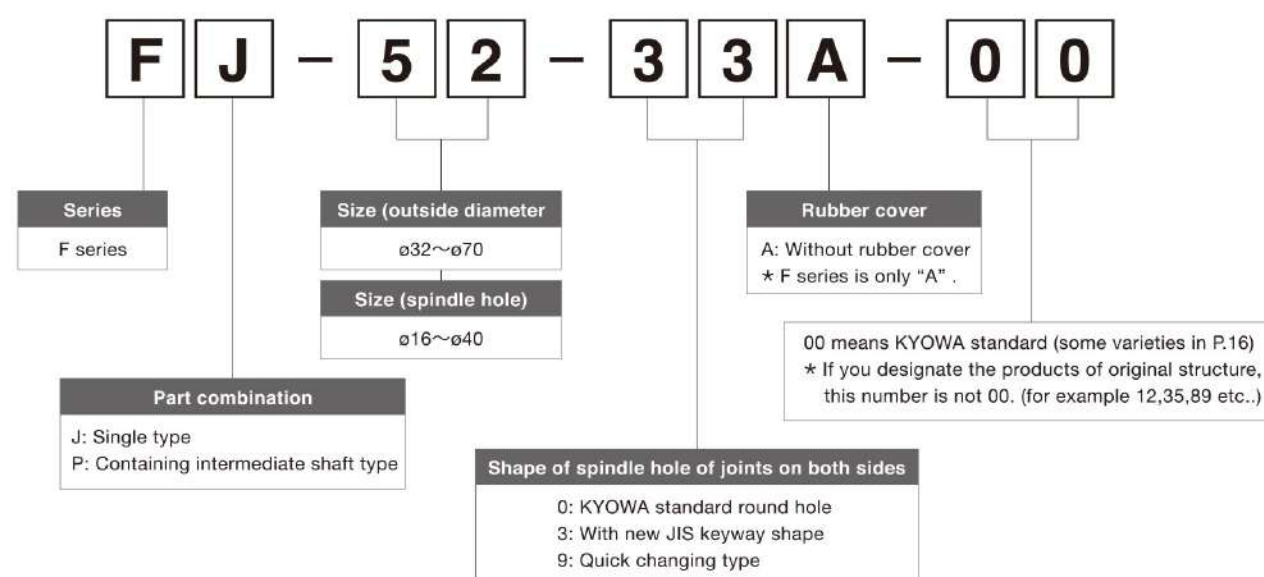★ 1 Please don't break up to keep the property.

FP type

① Spline spindle
② Sleeve
③ Pin
④ Connecting spindle

★ 1 Please don't break up to keep the property.
★ 2 Only parts of intermediate shaft & itself are not sold

Product number of F series

FJ – 5 2 – 3 3 A – 0 0

Series
F series

Size (outside diameter)
ø32～ø70

Size (spindle hole)
ø16～ø40

Part combination
J: Single type
P: Containing intermediate shaft type

Shape of spindle hole of joints on both sides
0: KYOWA standard round hole
3: With new JIS keyway shape
9: Quick changing type

Rubber cover
A: Without rubber cover
★ F series is only "A".

00 means KYOWA standard (some varieties in P.16)
★ If you designate the products of original structure, this number is not 00. (for example 12,35,89 etc..)

Details

★ Please take a good look at "P.21" noted method of select

	Operating angle (°)	Allowable rotational speed (min⁻¹)	Allowable torque (N·m)	Static breakdown torque (N·m)	Moment of inertia (kg.cm²)	Mass of FJ (g)	Mass of FP (g)
F※-32	25	5,000	29	110	1.5	250	1,500
F※-42	25	5,000	78	310	5.2	600	1,930
F※-52	25	5,000	140	580	18	1,100	3,700
F※-59	25	5,000	240	960	40	1,500	5,200
F※-70	25	3,500	340	1,300	77	2,700	10,200

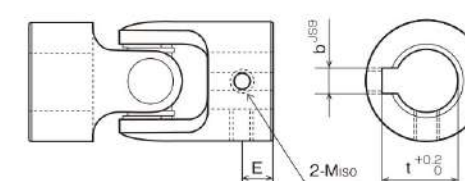Additionally process to driving yoke itself can be made, because its yoke haven't been heated treating.

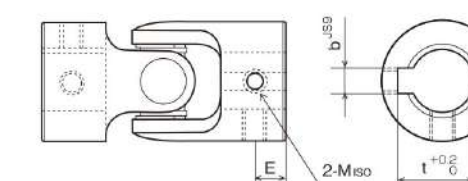**FJ-✳✳-00A**
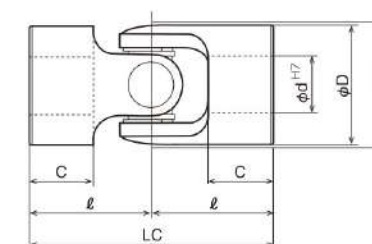
FJ-✳✳-09A (One side: standard, another side: quick changing)
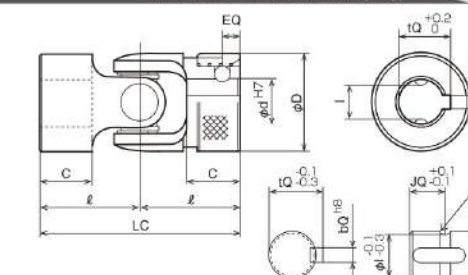
**FJ-✳✳-03A** (One side: standard, another side new JIS keyway)

FJ-✳✳-33A (Both sides: new JIS keyways)

Measure of FJ type

	φd	φD	LC	ℓ	C	E	New JIS keyway		Screw		EQ	I	R	JQ	bQ	tQ	Turning circle SW
							b	t	M	Pitch							
FJ-32	16	32	65	32.5	18	9	5	18.3	6	1.0	8	13.3	3.2	10	5	18	33
FJ-42	20	42	86	43	23	11	6	22.8	8	1.25	5	18.3	3.2	15	5	23.1	43
FJ-52	25	52	108	54	30	14	8	28.3	8	1.25	10	22.53	4.4	20	7	28	53
FJ-59	30	59	140	70	40	20	8	33.3	8	1.25	11	26.95	4.8	29	7	33	61
FJ-70	40	70	160	80	45	22	12	43.3	12	1.75	12	37.36	5.2	33	10	43.4	70

FP-✳✳-00A-00
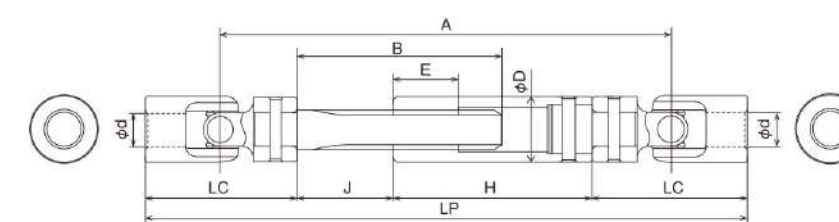
FP-✳✳-33A-00

FP-✳✳-99A-00

★ You can combine freely other than that above. (one side : someone another side: anyone)

Measure of FP type

|	φd	φD	LP	Telescopic motion	A	B	H	J	LC	E	New JIS keyway		Screw	
											b	t	M	Pitch
FP-32-□□A	16	26	290	+37 -21	225	117	110	50	65	30	5	18.3	6	1.0
FP-42-□□A	20	30	340	+34 -26	254	117	125	43	86	40	6	22.8	8	1.25
FP-52-□□A	25	40	400	+16 -34	292	120	125	59	108	50	8	28.3	8	1.25
FP-59-□□A	30	44	495	+20 -45	355	135	150	65	140	50	8	33.3	8	1.25
FP-70-□□A	40	60	570	+20 -50	410	155	175	75	160	60	12	43.3	12	1.75

★ You can request of us to design & layout & manufacture your designated products other than KYOWA standard ones.
Please contact us, before writing the specification (P.20) for KYOWA sales contact.

CF / CD / CP type

C series is compact cross type joint, non-lubricating type, correspondence type of mass-production.

C series joint based on F series is correspondence type of mass-production. It is compact cross type joint with needle bearings and it consists of "Cold Forged Yoke". You can use it for, including agriculture machine of every kind, multipurpose working machine.
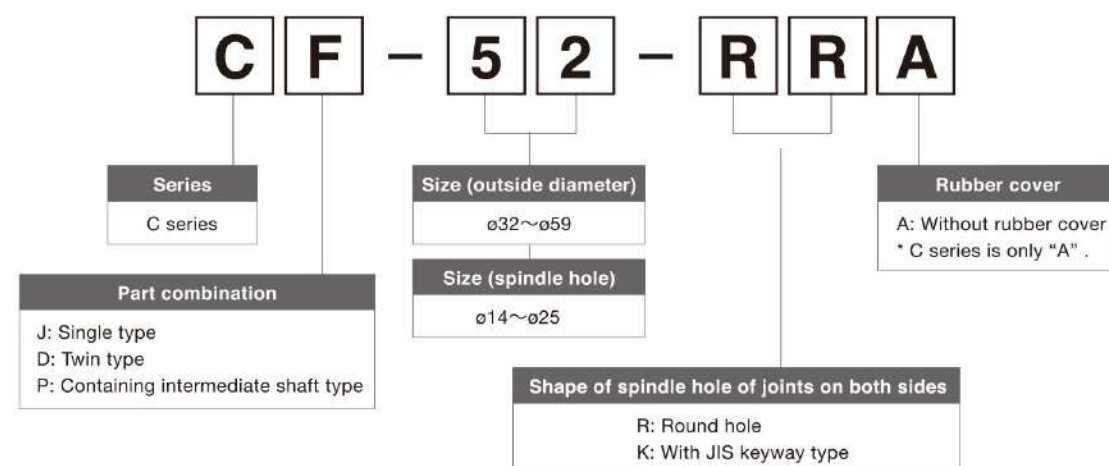
Structure of CF type
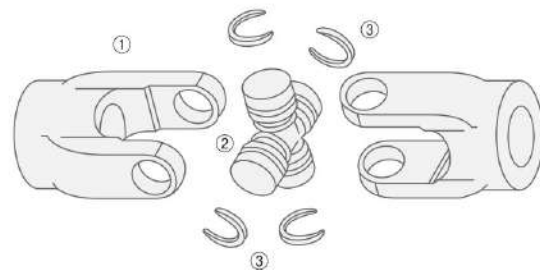
① Driving yoke
② Cross kit
③ Snap ring

★ 1　Please don't break up to keep the property.

Product number of C series

C F － 5 2 － R R A

Series
C series

Part combination
J: Single type
D: Twin type
P: Containing intermediate shaft type

Size (outside diameter)
ø32～ø59

Size (spindle hole)
ø14～ø25

Shape of spindle hole of joints on both sides
R: Round hole
K: With JIS keyway type

| Rubber cover |
|---|
| A: Without rubber cover |
| * C series is only "A" . |

Details (CF / CD)

★ Please take a good look at "P.21" noted method of select

	Operating angle (°)	Allowable rotational speed (min⁻¹)	Allowable torque (N·m)	Static breakdown torque (N·m)
CF-32	20	5,000	29	110
CF-42	20	5,000	78	310
CF-52	20	5,000	140	580
CF-59	20	5,000	240	960
CD-32	One side 20	5,000	29	110
CD-42	One side 20	5,000	78	310
CD-52	One side 20	5,000	140	580
CD-59	One side 20	5,000	240	960

CF-✳✳-RRA-00 (Single type)
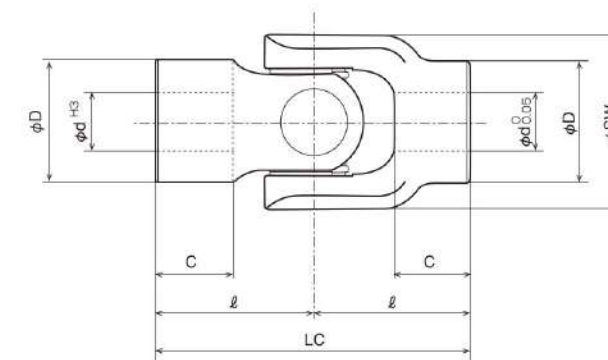
CD-✳✳-RRA-00 (Twin type)
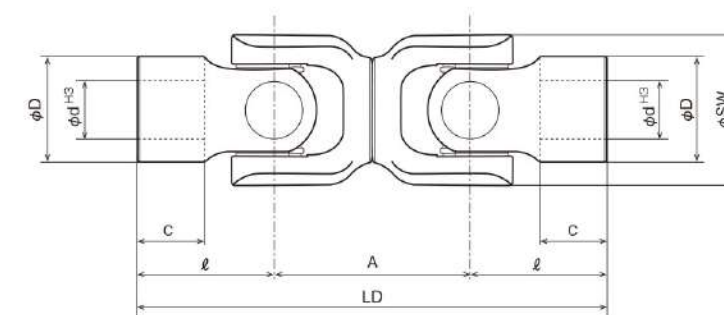
Measure of C series

|	φd	φD	LC	LD	A	ℓ	C	Turning circle SW
C✳-32-RRA-00	14	25	60	115	55	30	15	33
C✳-42-RRA-00	16	32.5	76	147	71	38	18	43
C✳-52-RRA-00	20	36.5	94	162	68	47	23	53
C✳-59-RRA-00	25	42.5	104	184	80	52	25	61

CP-✳✳- (Containing intermediate shaft type)

★ You can request of us to design & layout & manufacture your designated products about "CP" (contains intermediate shaft). Please contact us, light-heatedly.
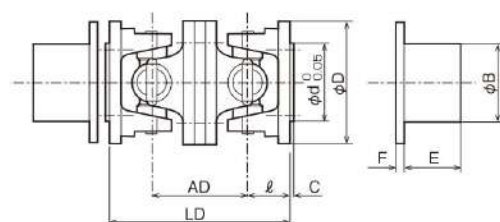
KC / KD / KP type
K series is industrial propeller shaft type.

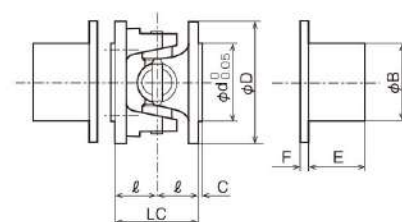## KP-**-FFA-00 (Containing intermediate shaft type)

★ Please purchase a mating flange separately.
★ The spindle hole of a mating flange is not processed.
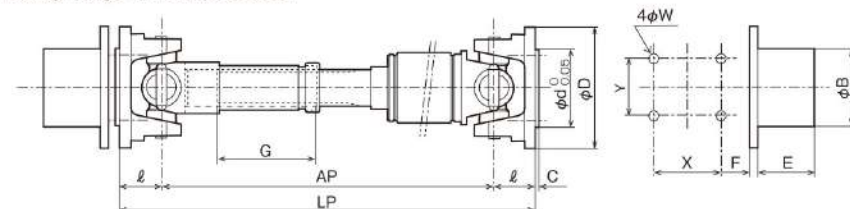
KD-**-FFA-00 (Twin type)

KC-**-FFA-00 (Single type)

	Operating angle (°)	Allowable torque (N·m)	LP	Telescopic motion	LD	LC	AP	AD	φd	φD	C	ℓ	G	W	X	Y	Mating flange		
																	φB	E	F
K*-04-FFA-00	15	400	353	+20 -20	156	73	280	83	60.2	97	1.5	36.5	80	10.2	61	51	55	45	10
K*-09-FFA-00	15	900	442	+20 -20	194	92	350	102	85	134	3	46	115	12.2	86.5	72.5	78	65	15
K*-20-FFA-00	15	2,000	624	+20 -20	298	144	480	154	90	176	5	72	135	14.2	118	75	98	85	15
K*-40-FFA-00	15	4,000	601	+20 -20	—	—	450	—	90	206	4.5	75.5	140	16.2	134	104.7	120	130	20
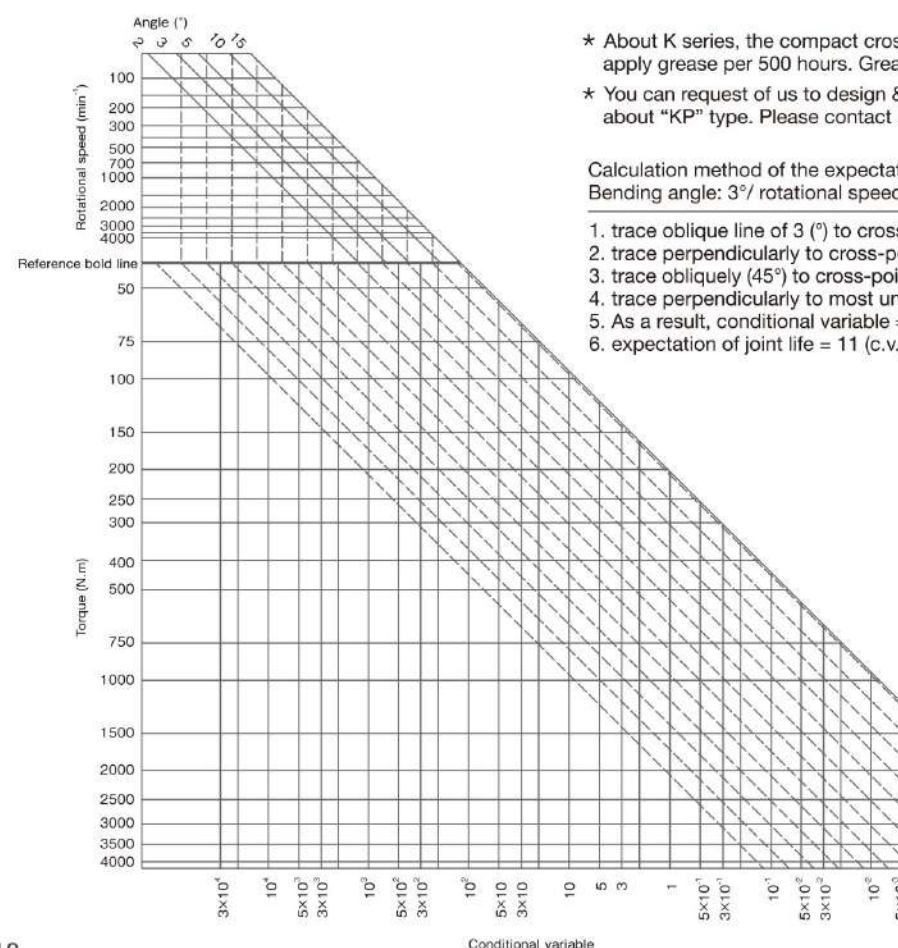
★ About K series, the compact cross contain grease nipple on a part of itself. Please apply grease per 500 hours. Grease: "nigutaito-LA-DX3N" (permissible substitute)
★ You can request of us to design & layout & manufacture your designated products about "KP" type. Please contact us, light-heatedly.

Calculation method of the expectation of joint life of KP-09 joint 《for example》
Bending angle: 3°/ rotational speed: 2,000 (min⁻¹) / torque: 250 (N·m)

1. trace oblique line of 3 (°) to cross-point with transverse line of 2,000 (min⁻¹)
2. trace perpendicularly to cross-point with reference bold line from "1.point".
3. trace obliquely (45°) to cross-point with transverse line of 250(N·m) from "2.point".
4. trace perpendicularly to most under line of conditional variable.
5. As a result, conditional variable = 11.
6. expectation of joint life = 11 (c.v.) ×4,170 (constant of size) = about 45,870 hours.

Expectation of joint life
= Conditional variable × Constant of size

Product number	Constant of size
KP-04	200
KP-09	4,170
KP-20	184,410
KP-40	194,410

F / C Series   Calculation formula & reference materials

▶ Let's & Please select "universal joint"

1. Confirm your operating angle. Is OK that it is less than allowable operating angle on details? (P.15/17)

2. Culculate the allowable conational value.

Rotational speed (min⁻¹)		Using angle (°)		Calculation conditional value		Allowable conditional value
	×		=		<	18,000

3. Confirm your using torque. Is O.K. that it is less than allowable torque on details? (P.15/17)

4. Culculate the expectation of joint life.

《Calculation formula of the expectation of joint life》

$$EL = \frac{1.5 \times 10^6}{N \times \alpha} \times \left(\frac{C}{P} \right)^3$$

$$P = \frac{T \times 10^3}{\cos\alpha \times \ell}$$

EL = The expectation of life (h)
N = Number of rotation (min⁻¹)
α = Angle (°)
C = Load rating of needle bearings (N)
P = Load of needle bearings loaded (N)
T = Spindle torque (N·m)
ℓ = Length of force application point of cross kit's torque (mm)

Product number	C (N)	ℓ (mm)
F/C*-32	2,700	22.15
F/C*-42	3,200	29.3
F/C*-52	5,600	35.3
F/C*-59	6,400	41.4
F/C*-70	7,000	47.5

▶ Example of select

Case, operating angle = 10 °/ rotational speed = 700 min⁻¹ / transfer torque = 30 N·m

1. Confirm the operating angle, O.K. (C series / less than 20°, F series / less than 25°)

2. Confirm the allowable conditional value.

Rotational speed (min⁻¹)		Using angle (°)		Calculation conditional value		Allowable conditional value
700	×	10	=	7,000	<	18,000

3. Confirm your using torque. Is O.K. that it is less than allowable torque on details? (P.15/17)

4. Culculate the expectation of joint life.

《Sample of calculation》
How long is the expectation of life of 【FJ-42-00A】?
N = 700 (min⁻¹)   α = 10 (°)   T = 30 (N·m)

$$P = \frac{30 \times 10^3}{\cos 10° \times 29.3} \fallingdotseq 1.040N$$

$$EL = \frac{1.5 \times 10^6}{700 \times 10} \times \left(\frac{3,200}{1,040} \right)^3 \fallingdotseq 6,200h$$

Confirmation of specification
* When you contact us about products, please write this replica (copy)

Basis information		
1	**Overview of Facility** (You are going to put joints in some facility)	
2	**A part used joint**	
3	**[New design] or [maintenance]** → { KYOWA / Made by another company (name of maker) please choice & mark ⬭	

Condition of use	* Please write condition in each case, if it is put in a part moving irregularly.		
4	Case1	Rotational torque (N·m)	Rotational speed (min⁻¹)	Operating angle (°)
	Case2	Rotational torque (N·m)	Rotational speed (min⁻¹)	Operating angle (°)
	Case3	Rotational torque (N·m)	Rotational speed (min⁻¹)	Operating angle (°)

The others / details / special report			
5	**Length / one of telescopic motion**	(mm) + / −	6	**Limitation of turning circle**	Non / less than (mm)
7	**Joint specification of driving side**	Inner diameter ø	Width of key way	Depth of key way
8	**Joint specification of driven side**	Inner diameter ø	Width of key way	Depth of key way
9	**Rapid starting/ stopping**	Non / (day, hour, minute / times)	10	**Frequency of forward and reverse rotation**	Non / (day, hour, minute / times)
11	**Frequency of the impact**	Non / (day, hour, minute / times)	12	**Others factor of high load**	Non / (day, hour, minute / times)
13	**Time-of-use**	(hour / day)	14	**Tensile & compression load**	Non / (N·m)
15	**Way of lubrication**	Grease application / Drip of lube oil / Jet-lubrication / Spray-lubrication / Others ( )		
16	**Atmosphere**	Ambient temperature ℃ / Dust and a sort of one ( )		

Concern of need (Write provisional plan & schedule & situation now stands)	
17	**Quantity per one facility**	
18	**Need (quantity) & span per year**	
19	**Others requests**	

Written date	Name of your company	Name of section / person in charge
/ /		

TEL / FAX	E-mail
- - / - -	@

Confirm the a plan (blue-printed sheet)

Type of plan :   /   (sheets)

Confirm above specification and following matters (disclaimers), please sign or affix a seal of person in charge.

Disclaimers / Points to be checked

In the case that using condition is not clear, please write [not clear], and please use below allowable conditional value.
When using over allowable value (even for only 1 article), we can't assure our products.
The balance of parts of intermediate shaft are decided based on our standard by KYOWA KOGYO. It is possible that designated dimension don't realized about parts of intermediate shaft. Especially, in the case that designate of width of telescopic motion is nothing, we apply KYOWA standard one. We kindly ask your for understanding.
Besides, S / N series joints need to be lubricated on a regular basic, we ask you a favor of using in enough-lubricating atmosphere.

S / N Series　Calculation formula & reference materials

⬌ Let's & Please select "universal joint"

1. Confirm your operating angle. (the allowable operating angle of S / N series joint =) $α<30°$

2. Culculate the calculation conditional variable.

Using angle (°)		Rotational speed (min⁻¹)		Transfer torque (N·m)		Calculation conditional variable
	×		×		=	

3. Confirm calculation conditional value, and Select the product type & size.
(the product's calculation conditional variable) < Allowable conditional variable, by conditional variable on details?
(P.03/05/07/09/11/13)

Calculation conditional variable		Allowable conditional variable
	<	

4. Next, check allowable rotational speed.

Angle (°)	Less than 5°	10°	15°	20°	25°	30°
Coefficient of angle	1.00	1.05	1.18	1.43	1.82	2.50

Rotational speed (min⁻¹)		Coefficient of angle		Calculation rotational speed (min⁻¹)		Allowable rotational speed (min⁻¹)
	×		=		<	

5. Confirm the conditional variable.

	Use condition		Allowable condition
Angle(°)		<	
Conditional variable		<	
Rotational speed (min⁻¹)		<	
Torque (N·m)		<	

⬌ Example of select

Case, operating angle = 15 °/ rotational speed = 800 min⁻¹ / transfer torque = 10 N·m

1. Confirm your operating angle. – O.K. (all joint of S / N series =) $α<30°$

2. Culculate the calculation conditional variable.

Using angle (°)		Rotational speed (min⁻¹)		Transfer torque (N·m)		Calculation conditional variable
15	×	800	×	10	=	120,000

3. Confirm calculation conditional value. Now, for example, select 【SC-12】 type by conditional variable on details (P.3)

Calculation conditional variable		Allowable conditional variable
120,000	<	121,000

4. Next, check allowable rotational speed of 【SC-12】 type. Now, $α=15°$ So, the coefficient of angle is "1.18".

Angle (°)	Less than 5°	10°	15°	20°	25°	30°
Coefficient of angle	1.00	1.05	1.18	1.43	1.82	2.50

Rotational speed (min⁻¹)		Coefficient of angle		Calculation rotational speed (min⁻¹)		Allowable rotational speed (min⁻¹)
800	×	1.18	=	944	<	1,800min⁻¹

5. Arrange above dates, like this. In the case, select 【SC-12】 type joint (in enough-lubricating atmosphere.)

	Use condition		Allowable condition
Angle(°)	15°	<	30°
Conditional variable	120,000	<	121,000
Rotational speed (min⁻¹)	800 min⁻¹ × 1.18	<	1,800 min⁻¹
Torque (N·m)	10 N·m	<	46 N·m