

Universal Joints

Keywayed / Tapped

Features: Shaft does not require pin hole machining, and keyway alone can tighten it.

Universal Joints – Keywayed / Tapped

UNKA (Single)

UNKW (Double)

Rubber Cover CSC (For Single)

Operating Temperature: -20~100°C

JIS B1454 C Type (UNKA)
JIS B1454 CC Type (UNKW)

Type	Material	Notes
Single	UNKA	SCM415 Alloy Steel (JIS) (Carburized)
Double	UNKW	SCM415 Alloy Steel (JIS) (Carburized)
Rubber Cover	CSC	NBR Nitrile Rubber

Universal Joints

Part Number	Type	d	D	Single		Double		ℓ	C	E	b	t	M (Coarse)
				L	LD	A							
UNKA (Single)	10	19	42	67.5	25.5	21	12	6	3	1.4	M5		
	12	23	52	83	31	26	15	7.5	4	1.8	M5		
	14	26	59	94.5	35.5	29.5	17	8.5	5	2.3	M6		
UNKW (Double)	16	30	74	117.5	43.5	37	22	11	5	2.3	M6		
	20	36	87	139	52	43.5	25	12.5	6	2.8	M6		

Part Number	Type	d	UNKA, UNKW			UNKA				UNKW			
			Condition Variable	Allowable Rotational Speed (r/min)	Allowable Operating Angle (°)	Static Tensile Failure Load (N)	Allowable Torque (N-m)	Static Failure Torque (N-m)	GD ² (Kg-cm ²)	Mass (g)	Allowable Torque (N-m)	Static Failure Torque (N-m)	GD ² (Kg-cm ²)
UNKA (Single)	10	80000	2000	30 (*)	13000	27.4	83	0.13	55	20.1	61	0.21	95
	12	121000	1800		23000	46	140	0.35	110	33	100	0.55	180
	14	151000	1600		26000	66	200	0.67	155	46	140	1	250
UNKW (Double)	16	200000	1400	39000	102	310	1.5	260	76	230	2.3	410	
	20	273000	1000	52000	175	530	3.6	465	129	390	5.7	690	

* For Double Type, Allowable Operating Angle (°) applies to each end.

Rubber Covers

Part Number	Type	d	KC
CSC (Single)	10	32	
	12	35	
	14	40	
	16	46	
	20	58	

Part Number Example: UNKA16 CSC12

Selecting Method

(1) Conditional Variables (Formula)

Calculation Condition Variable = $\frac{\text{Rotational Speed (r/min)}}{\text{Angle (°)}} \times \text{Torque (N-m)}$

Calculation Condition Variable < Allowable Condition Variable

(2) Rotational Speed (r/min)

Rotational Speed x Angle Factor < Allowable Speed

Angle Factor Table

Angle	5° or Less	10°	15°	20°	25°	30°
Angle Coefficient	1.00	1.05	1.18	1.43	1.82	2.50

N-Couplings / Chain Couplings

Features: Easy to tighten the shaft by nut alone, able to handle thrust load.

N Couplings

RoHS 10

CPN

Material: 1045 Carbon Steel or Equivalent
Surface Treatment: Manganese Phosphate Coating

Part Number	Type	d	S	D	ℓ	ℓ ₁	ℓ ₂	L	Shaft Insert. Depth (mm)		Tightening Torque (N-m)	Moment of Inertia GD ² (Kg-m ²)	Allow. Torque (N-m)	Max. Allow. Thrust (N)	Mass (g)
									Stan. a ₁	Min. a ₂					
6	CPN	12	13	20.5	5.5	5.5	21.5	10.25	7.5	11.8	4.24 x 10 ⁻⁸	7.8	833	13	
7	CPN	14	15	20.5	5.5	5.5	21.9	10.25	7.5	12.7	5.25 x 10 ⁻⁷	8.8	981	17.5	
8	CPN	14	15	21	6	6	23	10.5	7.5	13.7	8.25 x 10 ⁻⁷	9.8	1128	18	
9	CPN	17	18.5	23.5	6.5	7	25.5	11.75	8.5	15.7	1.98 x 10 ⁻⁶	11.8	1520	30	
10	CPN	17	18.5	25.4	7	7.5	27.4	12.7	9.2	19.6	2.08 x 10 ⁻⁶	15.7	1804	30	
11	CPN	19	21	29	8	9	31	14.5	10.5	24.5	3.75 x 10 ⁻⁶	19.6	1912	43	
12	CPN	19	21	30	8	9	32	15	11	29.4	3.75 x 10 ⁻⁶	37.3	2010	41	
14	CPN	22	24.6	34	9	10	36	17	12.5	34.3	7.50 x 10 ⁻⁶	41.2	2442	60	
15	CPN	23	25	37.5	9.5	11.5	39.5	18.75	14	39.2	1.00 x 10 ⁻⁵	49.0	2942	75	
16	CPN	24	26	39	10	12	41	19.5	14.5	49.0	1.45 x 10 ⁻⁵	54.9	3275	100	
17	CPN	26	28.5	41	11	12.5	43	20.5	15	53.9	1.93 x 10 ⁻⁵	60.8	3687	115	
18	CPN	27	30	43	12	12.5	45	21.5	15.5	58.8	2.48 x 10 ⁻⁵	68.6	3942	130	
19	CPN	29	32	45	12	13.5	47	22.5	16.5	63.7	3.25 x 10 ⁻⁵	75.5	4364	150	
20	CPN	30	32.5	48	13	14.5	50	24	17.5	68.6	3.50 x 10 ⁻⁵	88.2	4952	160	
22	CPN	32	35	50	14	15	52	25	18	78.4	5.00 x 10 ⁻⁵	103	5491	190	
24	CPN	35	38.5	52	14	16	54	26	19	83.3	7.25 x 10 ⁻⁵	123	6080	230	
25	CPN	36	40	55	15	17	57	27.5	20	88.2	9.00 x 10 ⁻⁵	157	7159	260	
30	CPN	41	45	63	17	17	65	31.5	23	127	8.75 x 10 ⁻⁵	177	11768	350	
35	CPN	46	51	69	19	19	71	34.5	25	167	1.55 x 10 ⁻⁴	206	11768	480	

Details of the Product

- Keyless – Locking by Friction:
 - Allows high-accuracy mounting with no backlash.
 - Easy phase matching.
 - No machining for keyway contributes to total cost savings.
- High Torque Transmission / High Thrust Load Capacity: Allows combined load of torque and thrust.
- Easy Locking with a Nut: easy to mount where space is limited. Requires no space in axial direction.
- Keywayed shafts can be used. (15~20% less allowable torque)

Precautions for Use

- Tightening torque control is required. (A torque wrench is recommended.)
- Replace the Teflon tape on the threads for reuse.
- Use shafts with h7 tolerance and 8S or better surface roughness.
- Shaft Insertion Depth Standard a₁(in the table) is recommended.
- Minimum a₂ is required.

Part Number Example: CPN10

Features: Dual row roller chains and sprockets construction has excellent torque transmission efficiency.

Chain Couplings

(1) Chain + (3) Main Body

(2) Case

Operating Temperature -10~60°C

Name	Type	Material			Accessories
Set (1+2+3)	CPN	(1) Chain	(2) Case	(3) Main Body	
Chain (1)	CHE	Steel	—	1045 Carbon Steel or Equivalent (Spurs are Induction Hardened)	Set Screw
Case (2)	BHE	—	Aluminum Diecast	—	Set Screw

Chain (1) (No. = 3512) (No. 4012-6022)

Set (1+2+3)

Shaft Bore Specifications (New JIS Key + Tap)

For shaft bores marked with *, the set screw locations are as shown.

Set

Part Number	Type	No.	d ₁ , d ₂ (d ₁ ≤ d ₂)		Mass (Kg)	D	E	F	G	L ₁	ℓ ₁	ℓ ₂	C	Maximum Rotational Speed (r/min)	Allowable Torque (N · m) at less than 50 rpm
			d ₁	d ₂											
CPC (1+2+3)	3012	14* 16*	0.6	69	25	26.5	45	64.8	29.8	16	10.2	250	100		
	4012	14 15 16 17 18 19 20 22*	0.9	77	33	36	62	79.4	36	17	14.4	250	218		
	4014	17 18 19 20 22 24 25 28* 30*	1.2	84	43	45	69	79.4	36	17	14.4	200	296		
	4016	19 20 22 24 25 28 30 32	1.7	92	48	51	77	87.4	40	23	14.4	200	386		
	5014	20 22 24 25 28 30 32 35	2.3	101	53	56	86	99.7	45	24	18.1	150	563		
	5016	22 24 25 28 30 32 35 38 40	3.1	111	60	63	96	99.7	45	24	18.1	150	735		
	5018	30 32 35 38 40 42 45	3.8	122	70	73	106	99.7	45	24	18.1	150	931		
	6018	40 42 45 48 50 55	7.0	142	85	88	127	123.5	56	28	22.8	100	1,754		
	6022	48 50 55	11.7	168	110	115	152	123.5	56	28	22.8	100	2,372		

Part Number Example: CPC4012 - 14 - 16

(1+2+3 Set) CPC4012 - 14 - 16

(1 Chain Only) CHE3512

(2 Case Only) BHE6022

Separate Item

Part Number	Type	No.	Chain Only					Mass (Kg)
			# of Links	P	H	H1	B	
CHE (1 Case Only)	3012	12	9.525	8.1	8.1	23.85	5.72	0.1
	4012	12	12.70	10.41	12.06	32.78	7.90	0.2
	4014	14	12.70	10.41	12.06	32.78	7.90	0.2
	4016	16	12.70	10.41	12.06	32.78	7.90	0.3
	5014	14	15.875	13.01	15.08	41.45	9.54	0.4
	5016	16	15.875	13.01	15.08	41.45	9.54	0.5
	5018	18	15.875	13.01	15.08	41.45	9.54	0.6
	6018	18	19.05	15.64	18.09	52.30	12.7	1.0
	6022	22	19.05	15.64	18.09	52.30	12.7	1.3

Part Number	Type	No.	Case Only		Mass (Kg)
			D	L	
BHE (1 Case Only)	3012	69	63	0.3	
	4012	77	72	0.3	
	4014	84	75	0.4	
	4016	92	75	0.4	
	5014	101	85	0.5	
	5016	111	85	0.6	
	5018	122	85	0.8	
	6018	142	106	1.2	
6022	168	117	1.8		

Keyway Dimensions

Shaft Bore Dia. d ₁ , d ₂	Keyway b ₂ x t ₂	Set Screw M
14-17	5 x 2.3	6
18-22	6 x 2.8	6
24-30	8 x 3.3	8
32-38	10 x 3.3	8
40-42	12 x 3.3	8
45-50	14 x 3.8	10
55	16 x 4.3	12

Tolerable Misalignments

- Angular α=0.5° or less
- Lateral ε= Less than 1% of chain pitch