

# FJ Series Selection table

Item Name	Allowable rotating speed (min <sup>-1</sup> )	Allowable operating angle(°)	Allowable torque(N.m)	Static breaking torque(N.m)	GD <sup>2</sup> (kg.cm <sup>2</sup> )	Weight (g)
<b>FJ-32</b>	5000	25	29	110	1.5	250
<b>FJ-42</b>	5000	25	78	310	5.2	600
<b>FJ-52</b>	5000	25	140	580	18	1100
<b>FJ-59</b>	5000	25	240	960	40	1500
<b>FJ-70</b>	3500	25	340	1300	77	2700

Relation between rotating speed and angle

$$\text{Rotating speed}(\text{min}^{-1}) \times \text{Angle}(\text{°}) < 18000$$

Calculation formula of life expectancy

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

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

LH = Life expectancy (H)

N = Rotating speed (min<sup>-1</sup>)

$\alpha$  = Angle (°)

C = Load rating of needle bearing (N)

P = Load imposed on needle bearing (N)

T = Shaft torque (N.m)

$\ell$  = Distance between points of torque application of cross kit (mm)

## Calculation example

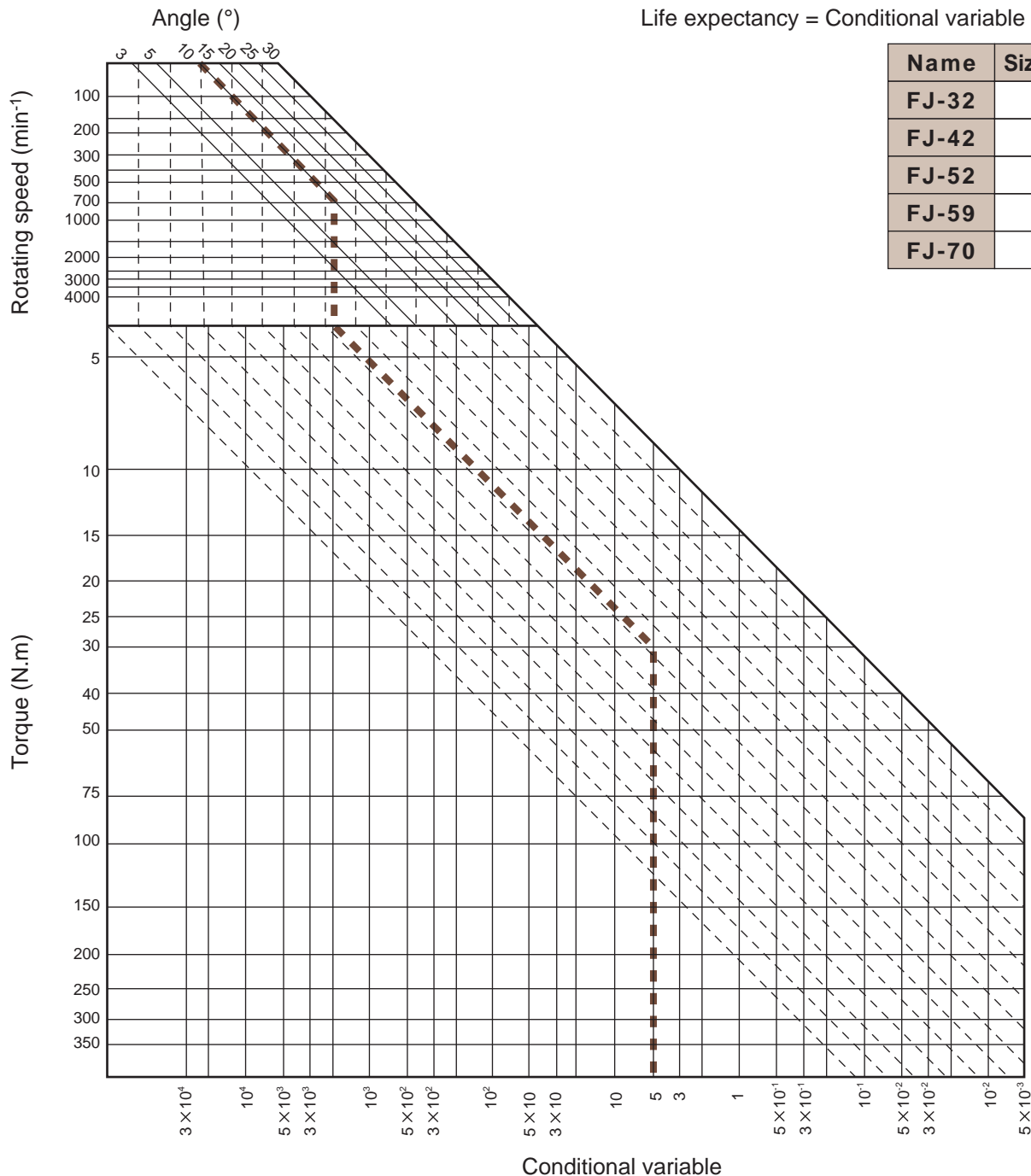
Life of the FJ-42 type under the following conditions, rotating speed 700 min<sup>-1</sup>, angle 10°, and torque 30 N.m, is calculated below.

$$P = \frac{30 \times 10^3}{\cos 10^\circ \times 29.3} \approx 1040 \text{ N}$$

$$LH = \frac{1.5 \times 10^6}{700 \times 10} \times \left(\frac{3200}{1040}\right)^3 \approx 6200 \text{ h}$$

Name	C(N)	$\ell$ (mm)
<b>FJ-32</b>	2700	22.15
<b>FJ-42</b>	3200	29.3
<b>FJ-52</b>	5600	35.3
<b>FJ-59</b>	6400	41.4
<b>FJ-70</b>	7000	47.5

Note : NBR (butadiene acrylonitrile rubber) is used for oil seal. Consider secular deterioration which occurs irrespective of calculated life expectancy.



Life expectancy = Conditional variable  $\times$  Size constant

Name	Size constant
FJ-32	319
FJ-42	1236
FJ-52	11587
FJ-59	27900
FJ-70	55140

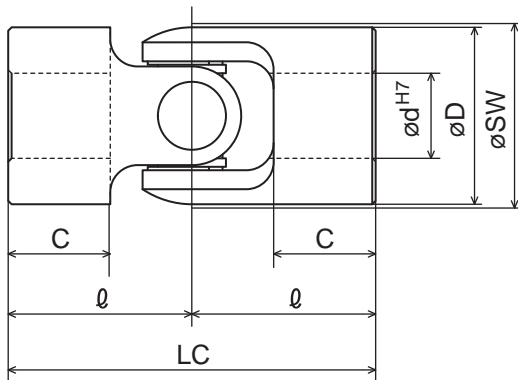
### Example

The life expectancy of type FJ-42 under the following condition, refraction angle 10°, rotating speed 700 min<sup>-1</sup>, torque 30 N.m is obtained as follows.

Descend along the slanting line of 10° to the point where it intersects with the cross line of 700 min<sup>-1</sup>. From the intersection, vertically descend to the basic heavy line. From the rating line, descend along a 45° slanting line to the point where it intersects the cross line of 30 N.m. Then vertically descend from the intersection to the conditional variable line to get approx. 5. Multiplying size factor 1236 will result in a 6180 hours life expectancy.

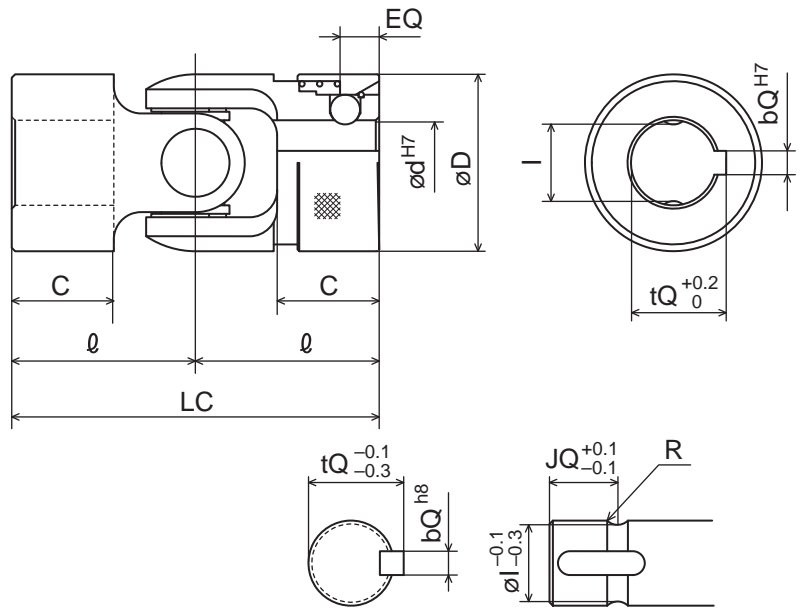
# FJ General purpose small cross type

FJ-\*\*-00A



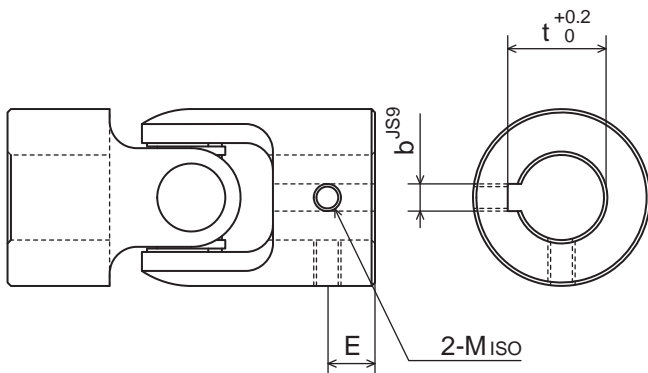
FJ-\*\*-09A

(Quick change type)

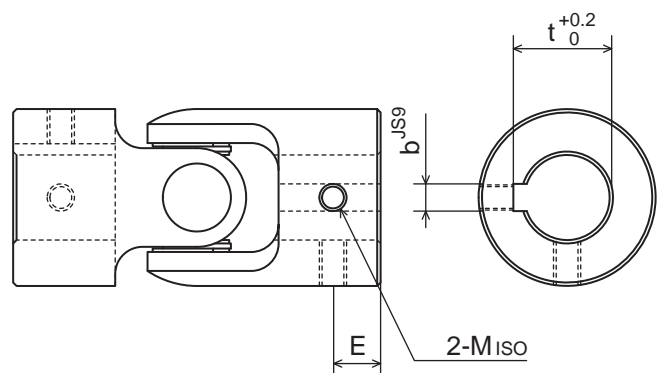


Refer to opposite shaft.

FJ-\*\*-03A (New JIS key)



FJ-\*\*-33A (New JIS key)

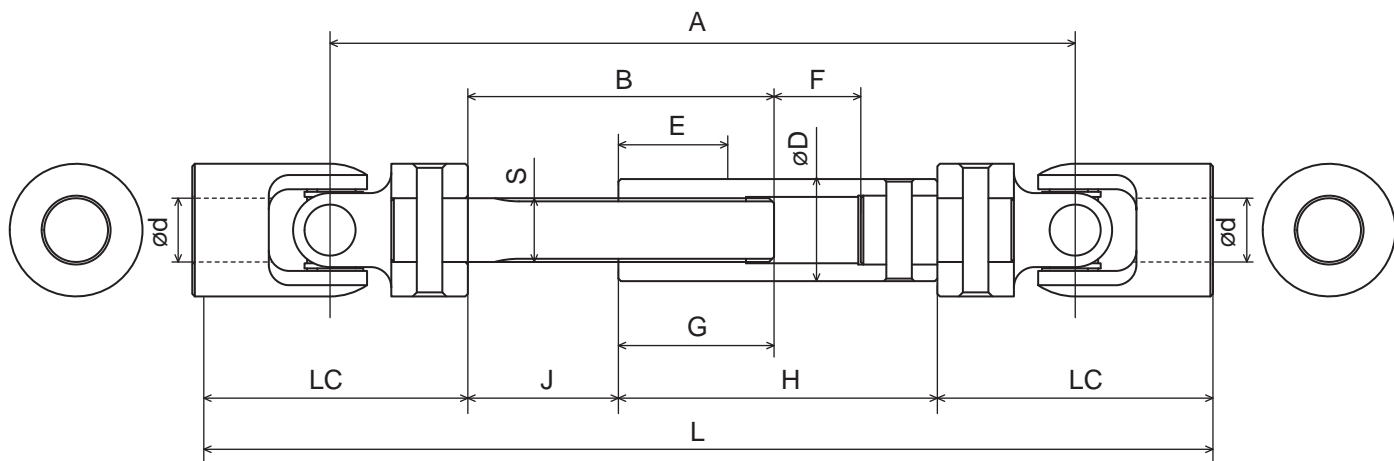


Dimension Name	d	D	LC	l	C	E	b	t	M	EQ	I	R	JQ	bQ	tQ	Rotational diameter SW
FJ-32-**-A	16	32	65	32.5	18	9	5	18.3	6	8	13.3	3.2	10	5	18	33
FJ-42-**-A	20	42	86	43	23	11	6	22.8	8	8	18.3	3.2	15	5	23.1	43
FJ-52-**-A	25	52	108	54	30	14	8	28.3	8	10	22.53	4.4	20	7	28	53
FJ-59-**-A	30	59	140	70	40	20	8	33.3	8	11	26.95	4.8	29	7	33	61
FJ-70-**-A	40	70	160	80	45	22	12	43.3	12	12	37.36	5.2	33	10	43.4	70

Non-hardening of drive yoke body allows additional processing.

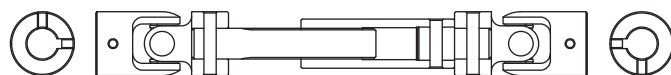
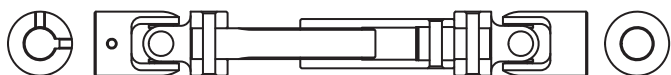
# FP TYPE With intermediate spline

## FP-\*\*-00A



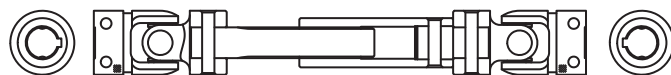
## FP-\*\*-03A (New JIS key)

## FP-\*\*-33A (New JIS key)



## FP-\*\*-39A

## FP-\*\*-99A



AS per out of standard items, inquire us with detailed specification or show us a schematic drawing.

Dimension Name	d	L	Telescopic section	A	B	Involute spline item S	E	LC	D	F	G	H	J
FP-32-**-A	16	290	+37 -21	225	117	INVOLUTE Diameter=17 m=1.0 z=15	30	65	26	21	67	110	50
FP-42-**-A	20	340	+34 -26	254	117	INVOLUTE Diameter=20 m=1.0 z=18	40	86	30	26	74	125	43
FP-52-**-A	25	400	+16 -34	292	120	INVOLUTE Diameter=25 m=1.25 z=18	50	108	40	34	61	125	59
FP-59-**-A	30	495	+20 -45	355	135	INVOLUTE Diameter=30 m=1.667 z=16	50	140	44	45	70	150	65
FP-70-**-A	40	570	+20 -50	410	155	INVOLUTE Diameter=40 m=1.667 z=22	60	160	60	50	80	175	75