

Bottom Roller Bearings for Textile Machinery

These are needle roller bearings that support the bottom rollers (fluted rollers) on fine spinning machines, roving frames or drawing frames. **Type FRIS** is applied to a fine spinning machine and a roving frame, and **Type FR** applied to a drawing frame.

Types and construction

Bottom roller bearing **FRIS** is used to support the bottom rollers of a fine spinning machine and a roving frame. The outer ring outer profile of this bearing type is spherical, which can allow, to some extent, mounting error in the bottom rollers. On the other hand, the inner ring is provided with a rib at its both ends and a clearance between the outer ring and each inner ring rib is minimized. Furthermore, the rib outer surface is knurled to prevent invasion of cotton pieces into the bearing.

These bottom roller bearings are classified into internationally interchangeable **A-series** bearings with bearing fixing saddle (to fix a bearing to a support stand) and **B-series** bearings adaptable to the dimensions of JIS Fluted Rollers.

A-series bearings are further classified into one bearing type (suffix **SA**) wherein inner ring and outer ring are separable from one another according to saddle type and another bearing type (suffix **SB**) wherein inner ring and outer ring are non-separable. Of course, these bearings can also be supplied without saddle.

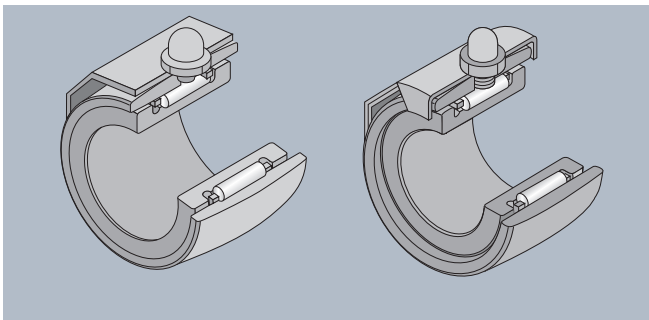


Fig. 1 Type FRIS · SA

Fig. 2 Type FRIS · SB

On the other hand, **B-series** bearings are further classified into bearing type with grease nipple (suffix **N**), bearing type with knock pin on its outer ring (suffix **P**) and bearing type with knock hole on its outer ring (suffix **W**) (latter two types-classified by the fixing method applied).

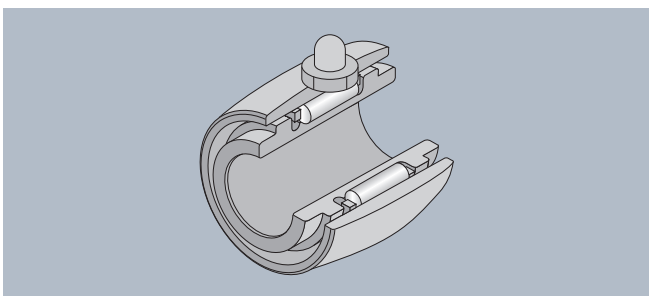


Fig.3 Type FRIS

These bearings can be supplied with saddle thereon on request, similarly to **A-series**.

Type **FR** is used to support the rollers of a drawing frame. This bearing type is composed of two drawn cup type needle roller bearings which are configured in a housing. These have no inner ring and use a shaft as the direct raceway surface. Synthetic rubber seal is fitted in the both ends of the housing. This bearing type is fixed to a support stand with knock pins press-fitted in the housing. The knock pin is provided with an grease hole to enable grease replenishing.

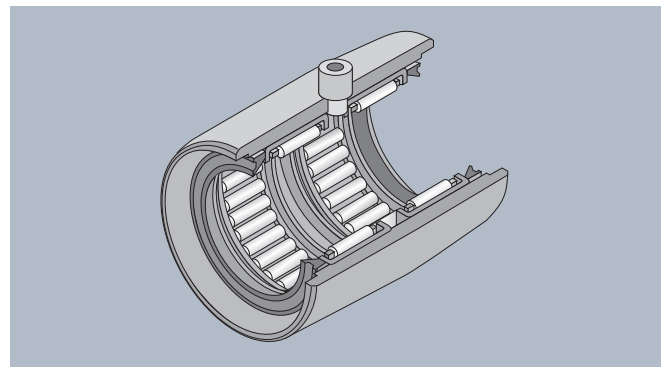


Fig. 4 Type FR

Composition of bearing number

The bearing number comprises type code, dimension code [diameter (*d* or *F_w*)] and a suffix.

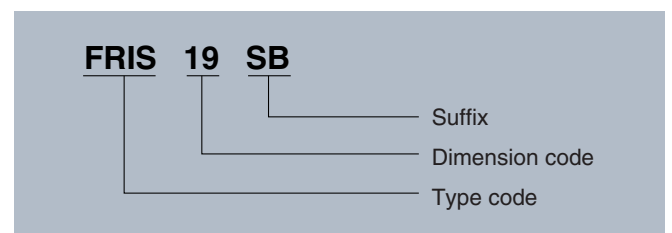


Fig.5

Bearing fits

Table 1 shows bearing fits on/in shaft and housing.

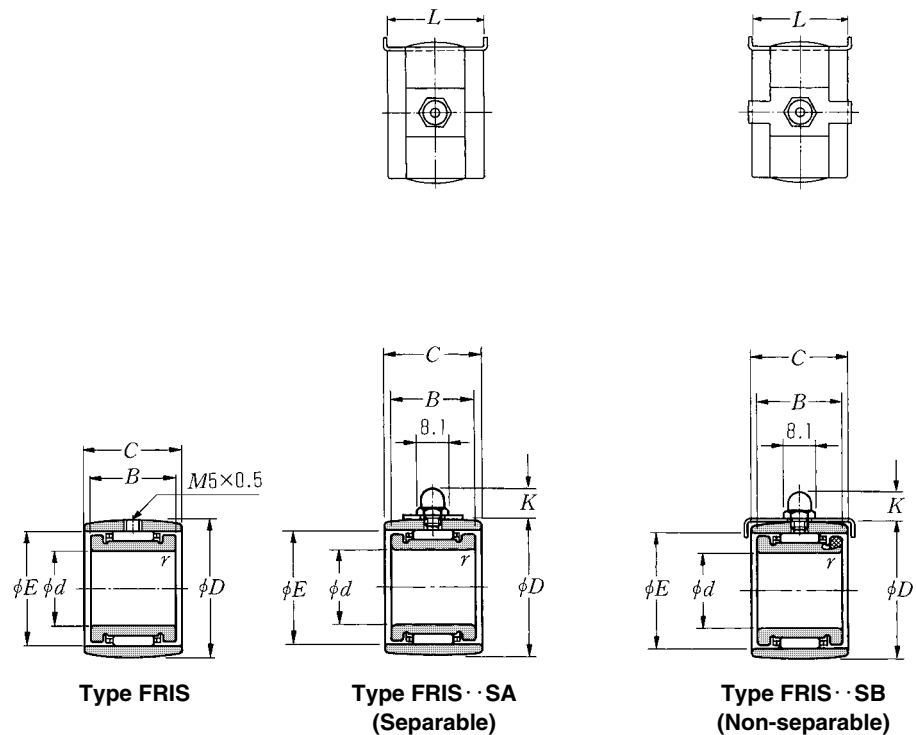
Table 1 Bearing fits

| Bearing type | Shaft | | Housing (stand) |
|--------------|---------------|--------------|-----------------|
| | Screwed joint | Spline joint | |
| FRIS | g5 (g6) | j5 (j6) | H10 |
| FR | h5 (h6) | | H10 |

Precautions for mounting

- (1) For the shaft shoulder dimensions of the Type FRIS, refer to the dimensions d_1 and G in the relevant dimension table. To be able to prevent entanglement with fly and avoid adverse effect onto spinning quality, it is necessary to promptly remove entangling fly without stopping the machine. In this context, the conditions that must be satisfied to allow the bearing to fully develop its functions and maintain spinning quality by provide sufficiently deep and wide shaft shoulder.
- (2) To axially position the bottom roller connected to the machine, use a thrust bearing on the gear end side so that axial movement of the bottom roller is positively prevented.
- (3) When rinsing the bottom roller with cleaning liquid such as light oil, be careful not to allow the cleaning liquid to enter the bearing.
- (4) When installing the bearing to a stand, position the outer ring to the middle of the inner ring width.
- (5) Carefully install the bottom roller so that its runout is not greater than 0.05 mm.

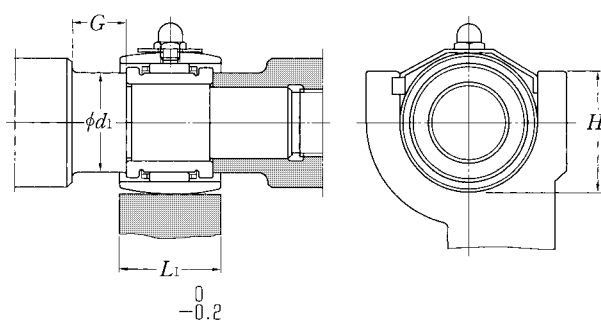
Type FRIS Series A (For fine spinning machine/ roving frame)



d 16.5~25mm

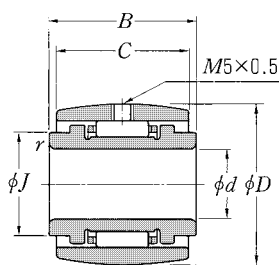
| d | Boundary dimensions | | | | | | | Basic load ratings | | | |
|--------------|---------------------|--------------|--------------|------|-------------------------|------|------|--------------------|----------|----------------|----------|
| | D | B | C | E | r_s min ¹⁾ | L | K | dynamic N | static | dynamic kgf | static |
| $0_{-0.010}$ | mm | $0_{-0.050}$ | $0_{-0.120}$ | | | | | C_r | C_{or} | C_r | C_{or} |
| 16.5 | 28 $0_{-0.020}$ | 19 | 22 | 23.5 | 0.3 | 22.2 | 7.7 | 10 200 | 14 600 | 1 040 | 1 480 |
| 19 | 32 $0_{-0.025}$ | 20 | 23 | 27 | 0.3 | 22.2 | 7.7 | 11 800 | 18 500 | 1 200 | 1 880 |
| | 36 | 22 | 25 | 29 | 0.3 | 22.2 | 9.8 | 12 700 | 17 600 | 1 300 | 1 800 |
| 22 | 42 $0_{-0.025}$ | 25 | 29 | 35 | 0.3 | 26.4 | 10.2 | 19 500 | 25 300 | 1 980 | 2 580 |
| 25 | 45 $0_{-0.025}$ | 25 | 29 | 37 | 0.3 | 26.4 | 10.2 | 21 300 | 29 100 | 2 170 | 2 970 |

Note 1) Allowable minimum chamfer dimension r .

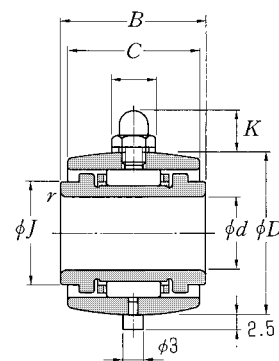


| Bearing numbers | | | Abutment dimensions | | | | Mass |
|-----------------|---------------------|------------|---------------------|-------|-----|-------|--|
| bearing | bearing with saddle | | mm | | | | kg bearing with saddle (approx.) |
| | Type SA | Type SB | L_1 | d_1 | G | H | |
| FRIS16.5 | FRIS16.5SA | FRIS16.5SB | 22 | 21 | 13 | 24~26 | 0.059 |
| FRIS19 | FRIS19SA | FRIS19SB | 22 | 24 | 15 | 27~29 | 0.081 |
| FRIS19-5 | FRIS19-5SA | FRIS19-5SB | 22 | 26 | 15 | 30~32 | 0.120 |
| FRIS22-2 | FRIS22-2SA | — | 26 | 30 | 15 | 35~37 | 0.208 |
| FRIS25 | FRIS25SA | — | 26 | 33 | 15 | 37~39 | 0.226 |

Type FRIS Series B (For fine spinning machine/ roving frame)



Type FRIS



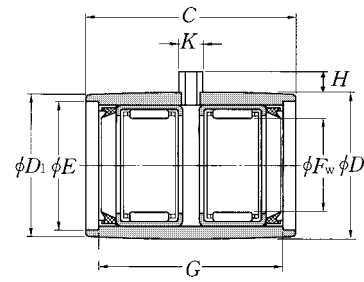
Type FRIS · NP
(With grease nipple/knock pin)²⁾

d 15~25mm

| Boundary dimensions | | | | | | | | Basic load ratings | | | | Bearing numbers | | Mass (approx.) kg Type FRIS · NP |
|---------------------|--------|--------|-------|----|----------------------------------|-----|----------------|--------------------|--------|-----------|----------------|-----------------|----------------|--|
| d 0 -0.010 | D | mm | | | | | | N | kgf | Type FRIS | Type FRIS · NP | | | |
| | | B | C | J | r _s min ¹⁾ | K | C _r | | | | | C _{or} | C _r | C _{or} |
| 15 | 28 | 0 | 24 | 22 | 22 | 0.3 | 7.7 | 10 200 | 14 600 | 1 040 | 1 480 | FRIS15 | — | 0.070 |
| | | -0.020 | | | | | | | | | | | | |
| 15.875 | 30 | 0 | 25.4 | 22 | 22 | 0.3 | 7.1 | 10 200 | 14 600 | 1 040 | 1 480 | FRIS15.87 | FRIS15.87NP | 0.082 |
| 16 | 28 | 0 | 26 | 22 | 22 | 0.3 | 7.7 | 10 200 | 14 600 | 1 040 | 1 480 | FRIS16 | FRIS16NP | 0.083 |
| | | -0.020 | | | | | | | | | | | | |
| 16 | 30 | 0 | 26 | 22 | 22 | 0.3 | 7.1 | 10 200 | 14 600 | 1 040 | 1 480 | FRIS16-2 | FRIS16-2NP | 0.098 |
| | | -0.020 | | | | | | | | | | | | |
| 18 | 31.750 | 0 | 24 | 23 | 24 | 0.3 | 7.7 | 11 800 | 18 500 | 1 200 | 1 880 | FRIS18 | FRIS18NP | 0.083 |
| | | -0.025 | | | | | | | | | | | | |
| 18 | 32 | 0 | 26 | 23 | 24 | 0.3 | 7.7 | 11 800 | 18 500 | 1 200 | 1 880 | FRIS18-2 | FRIS18-2NP | 0.088 |
| | | -0.025 | | | | | | | | | | | | |
| 19.050 | 31.750 | 0 | 23.81 | 23 | 24 | 0.3 | 7.7 | 11 800 | 18 500 | 1 200 | 1 880 | FRIS19.05 | — | 0.078 |
| | | -0.025 | | | | | | | | | | | | |
| 19.050 | 34 | 0 | 25.4 | 23 | 26 | 0.3 | 7.7 | 12 700 | 17 600 | 1 300 | 1 800 | FRIS19.05-1 | FRIS19.05-1NP | 0.098 |
| | | -0.025 | | | | | | | | | | | | |
| 20 | 34 | 0 | 24 | 23 | 26 | 0.3 | 7.7 | 12 700 | 17 600 | 1 300 | 1 800 | FRIS20-2 | FRIS20-2NP | 0.089 |
| | | -0.025 | | | | | | | | | | | | |
| | | 0 | | | | | | | | | | | | |
| -0.025 | | | | | | | | | | | | | | |
| 20 | 36 | 0 | 26 | 23 | 26 | 0.3 | 7.1 | 12 700 | 17 600 | 1 300 | 1 800 | — | FRIS20-7NP | 0.125 |
| | | -0.025 | | | | | | | | | | | | |
| 22 | 40 | 0 | 26 | 24 | 30 | 0.6 | 7.1 | 16 200 | 22 300 | 1 650 | 2 280 | FRIS22-1 | FRIS22-1NP | 0.154 |
| | | -0.025 | | | | | | | | | | | | |
| 22.225 | 40 | 0 | 25.4 | 24 | 30 | 0.6 | 7.1 | 16 200 | 22 300 | 1 650 | 2 280 | FRIS22.22 | FRIS22.22NP | 0.145 |
| 25 | 42 | 0 | 26 | 24 | 32 | 0.6 | 7.1 | 16 000 | 22 500 | 1 640 | 2 290 | FRIS25-1 | FRIS25-1NP | 0.154 |
| | | -0.025 | | | | | | | | | | | | |
| 25 | 44 | 0 | 26 | 24 | 34 | 0.6 | 7.1 | 17 200 | 25 100 | 1 750 | 2 560 | FRIS25-2 | FRIS25-2NP | 0.174 |
| | | -0.025 | | | | | | | | | | | | |

Note 1) Allowable minimum chamfer dimension r.
2) Example of bearing with grease nipple: Ex. FRIS 18N
Bearing with knock pin only: Ex. FRIS 15.87P

Type FR
(Drawing frame)



Type FR

F_w 17.462~22mm

| F_w | Boundary dimensions | | | | | | | Basic load ratings | | | | Bearing numbers | Mass kg (approx.) |
|-----------------------------------|---------------------|--------------|------|-------|------|------|-------|--------------------|--------|----------------|--------|-------------------|-------------------------|
| | D -0.050 | C -0.20 | E | G | H | K | D_1 | dynamic N | static | dynamic kgf | static | | |
| 17.462 +0.053 +0.010 | 26.5 | 46 | 24 | 31 | 5 | 5 | 26 | 10 200 | 16 600 | 1 040 | 1 690 | FR17.46P | 0.066 |
| | 26.5 | 47.6 | 24.6 | 42.86 | 4.76 | 4.76 | 26 | 14 400 | 25 900 | 1 470 | 2 640 | FR17.46-1P | 0.075 |
| | 26.5 | 52.38 | 24.6 | 42.86 | 4.76 | 4.76 | 26 | 14 400 | 25 900 | 1 470 | 2 640 | FR17.46-2P | 0.082 |
| | 26.988 | 41.28 | 24 | 31 | 5 | 5 | 26.5 | 10 200 | 16 600 | 1 040 | 1 690 | FR17.46-3P | 0.068 |
| 19.050 +0.053 +0.020 | 31.750 | 52.38 | 28 | 42.86 | 4.76 | 4.76 | 31.2 | 16 700 | 25 800 | 1 700 | 2 630 | FR19.05P | 0.134 |
| 22 +0.053 +0.020 | 34 | 46 | 28 | 43 | 4.76 | 4.76 | 33.5 | 23 400 | 44 000 | 2 380 | 4 500 | FR22P | 0.150 |

Tensioner Pulleys for Textile Machinery

These pulleys are used to guide and tension the tapes and belts driving the spindles of a fine spinning machine, a roving frame, a false twister, etc.

A pulley drawn precisely from steel plate by precision deep drawing is press-fitted in the outer ring of shaft bearing in place of inner ring.

Types and construction

Single-row or double-row ball bearing is built in this pulley, which is internally pre-filled with lithium soap base grease. Grease is replenished through a grease hole which is internally provided in the stud. Two different mounting methods are available as follows for these pulleys; one method is to bolt a pulley to the roller carrier of machine with holder bolt using a special-purposed holder (Type code: **JF** · **S**) and another method is to bolt directly a pulley to machine frame using the bolting hole drilled in the stud and a corresponding hexagon head bolt. A knock pin press-fitted in the stud end face is to lock the bolt after tightened.

When a pulley is directly bolted to machine frame, provide the hexagon head bolt center with a grease through-hole for grease replenishing and screw a grease nipple in its end face.

In mounting a double-row ball bearing type tension pulley, insert the stud directly into machine frame and tighten it with nut, without using the special-purposed holder. Replenish grease using the box nut.

Composition of pulley number

The pulley number of a given NTN tension pulley consists of a type code (**JPU** · **S**), dimension code [pulley outside diameter (*D*)] and a suffix. A pulley having a special holder is marked with the holder number of that holder added to the suffix.

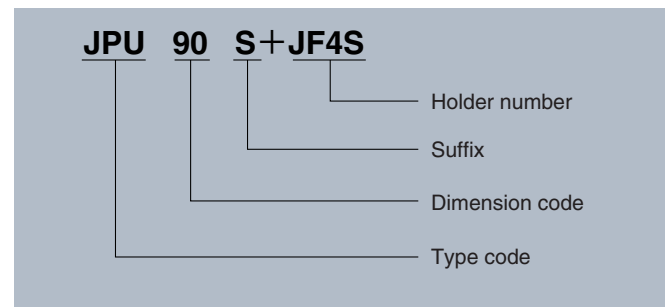
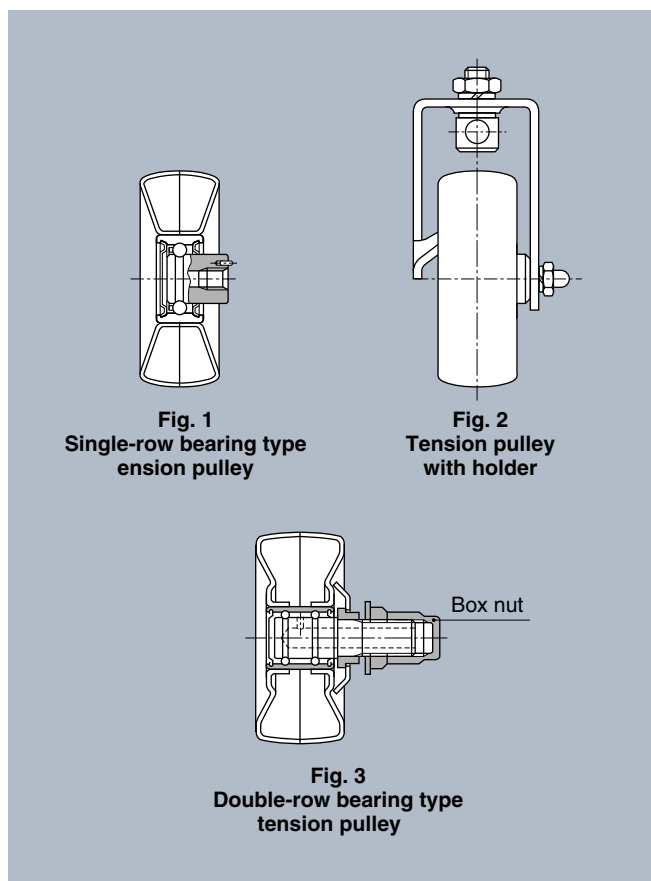
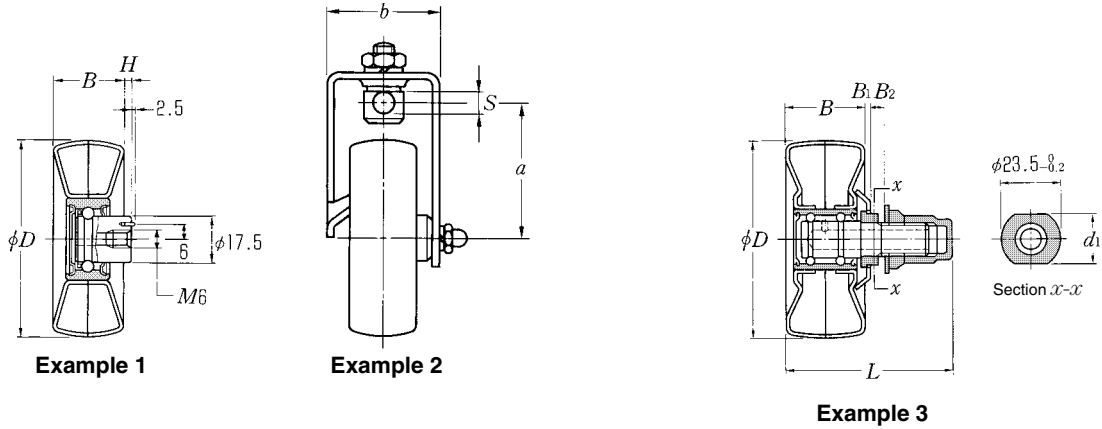


Fig. 4





D 60~100mm

| Boundary dimensions | | | | | | | | | | Bearing numbers | Sample number | Mass kg (approx.) |
|---------------------|----|----------------|-----|-----------------------------|----|----|------|-----------|----------------|-----------------|---------------|-------------------------|
| D | B | B ₁ | H | mm | | | | | | | | |
| | | | | d ₁ 0 -0.3 | a | b | S | L | B ₂ | | | |
| 60 | 25 | — | 3.5 | — | — | — | — | — | — | JPU60S | 1 | 0.140 |
| | 25 | — | 3.5 | — | — | — | — | — | — | JPU70S | 1 | 0.160 |
| 70 | 25 | — | 3.5 | — | 48 | 39 | 10.2 | — | — | JPU70S+JF1S | 2 | 0.235 |
| | 30 | 2 | — | 21 | — | — | — | 67 ~ 71 | 5~9 | JPU70-2S | 3 | 0.245 |
| | 32 | — | — | — | — | — | — | — | — | JPU70-1S | 1 | 0.175 |
| | 32 | — | — | — | 48 | 46 | 10.2 | — | — | JPU70-1S+JF2S | 2 | 0.250 |
| 90 | 25 | — | 3.5 | — | — | — | — | — | — | JPU90S | 1 | 0.215 |
| | 25 | — | 3.5 | — | 58 | 39 | 10.2 | — | — | JPU90S+JF3S | 2 | 0.300 |
| | 32 | — | — | — | — | — | — | — | — | JPU90-1S | 1 | 0.230 |
| | 32 | — | — | — | 58 | 46 | 10.2 | — | — | JPU90-1S+JF4S | 2 | 0.320 |
| | 32 | 3.5 | — | 21 | — | — | — | 70.5~74.5 | 5~9 | JPU90-9S | 3 | 0.325 |
| | 45 | 3.5 | — | 21 | — | — | — | 83.5~87.5 | 5~9 | JPU90-10S | 3 | 0.380 |
| 100 | 32 | 3.5 | — | 21 | — | — | — | 70.5~74.5 | 5~9 | JPU100-14S | 3 | 0.290 |
| | 40 | 3.5 | — | 21 | — | — | — | 78.5~82.5 | 5~9 | JPU100-12S | 3 | 0.390 |

