Sumitomo Drive Technologies

IB Series PE Type

Planetary Gear Reducer for Servo Motor

Sumitomo Heavy Industries, Ltd.

No.Z1001E-2

IB Series PE Type

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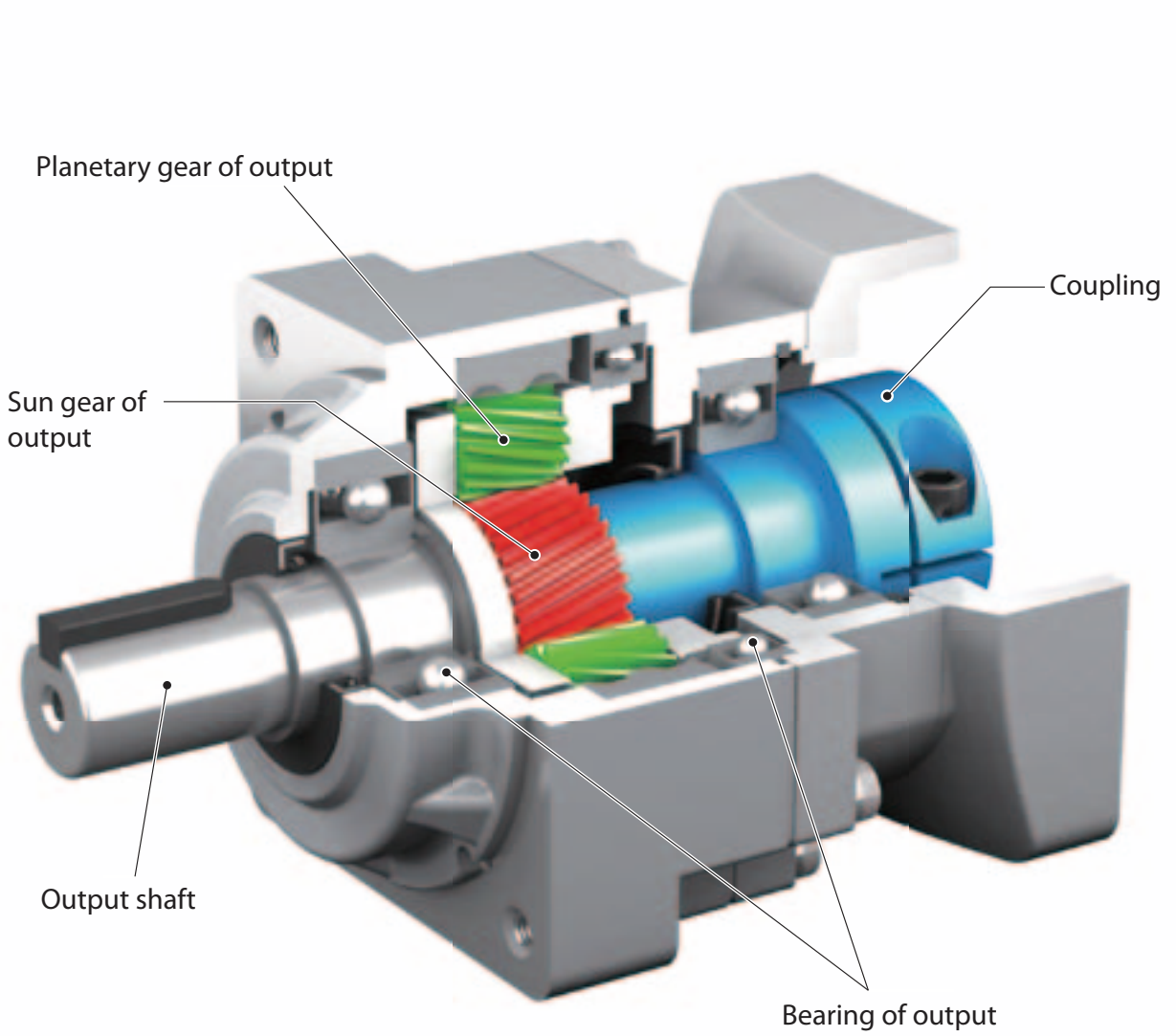
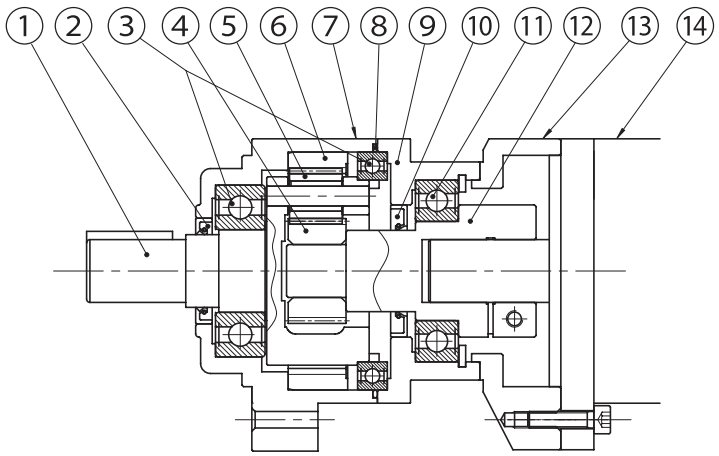
Structure





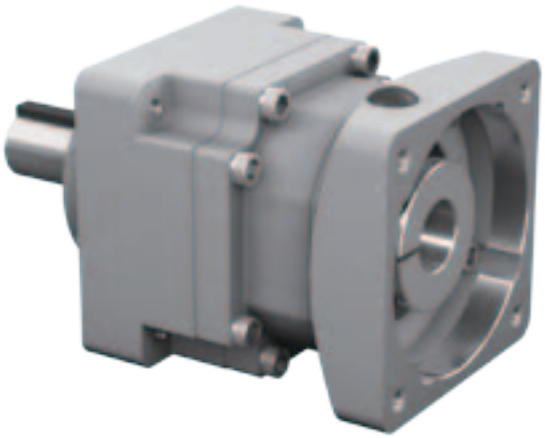
Major Parts

Number	Part Name
1	Output Shaft
2	Oil Seal
3	Bearing of Output
4	Sun Gear of Output
5	Planetary Gear of Output
6	Internal Gear
7	Case
8	O-ring
9	Joint Cover
10	Oil Seal
11	Input Shaft Bearing
12	Coupling
13	Adaptor Plate
14	Motor (Provided by Customers)

Fig. 1 Single stage type (e.g. ANFX-PE15W)

Specifications

- Backlash 15 minutes
- Rated torque 2.3–91.0Nm
- Motor capacity 50 W–5.0 kW
- Reduction ratios 3, 5, 9, 15, 20, 25, 35, 45, 81
- Input speed 6000 r/m
- Reduction method Planetary gear mechanism (helical gear)



Features

- Economical type that has superior cost performance (compared to our previous model).
- Input Speed 6000r/min is available.
- Reduction ratio of 3 (compared to our previous model) added.
- Compatible with Major Servo Motor Manufacturers
- We can meet your requests for quick delivery.

Applications

- Packaging equipment (pillow packaging equipment, case packing machine, caser)
- Inter-process conveying loader
- FA equipment related
- Woodworking machine (router and panel saw)
- Dispenser
- Cardboard folding machine & caser

MOTION CONTROL DRIVES (MCD) Product Lineup

Planetary gear reducer for servo motors IB series

P1 type
Highly rigid and compact

Motor capacity	50 W–5.0 kW
Reduction ratio	3.7–81
Backlash	3 min./15 min.

P2 type
Large capacity helical gear

Motor capacity	0.5–37 kW
Reduction ratio	4–100
Backlash	3 min.

PK1 type
Right angle

Motor capacity	0.2–5.0 kW
Reduction ratio	6–243
Backlash	6/15 min.

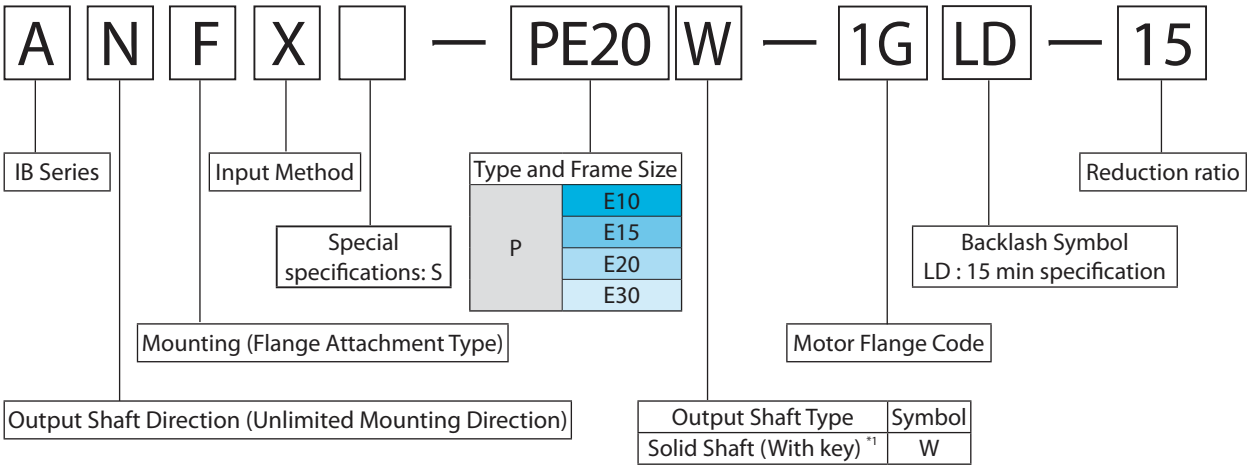
Cyclo reducer for servo motors

Low backlash series
Standard series

Motor capacity	0.2–9.0 kW
Reduction ratio	6–87
Backlash	6 min. (Low backlash series)

Nomenclature and Standard Specification

Nomenclature



Reduction ratio (Actual reduction ratio)	Single stage type			Double stage type					
	3	5	9	15	20	25	35	45	81

Standard Specification

Backlash	Initial backlash setting is 15-minute.
Efficiency *2	90% or more at rated output torque (with reduction ratio 3, 5, 9)
Noise Level *3	70dB (A) 0.5m
Lubrication system	Grease lubrication The unit is filled with grease at the time of shipping. It is ready for immediate use.
Reduction system	Planetary gear mechanism (helical gear) Single stage type (Reduction Ratio: 3, 5, 9) Double stage type (Reduction Ratio: 15, 20, 25, 35, 45, 81)
Output shaft rotation direction	Same direction as the rotation direction of input gear.
Material	Internal gear and gear: Chrome-Molybdenum Steel Case, joint cover, Adapter plate: Aluminum alloy Output and input shaft: S45C
Mounting location	Indoor (without dust and water)
Ambient temperature	0–40°C Consult us when the operation condition exceeds the above and when special grease is necessary such as food manufacturing machine.
Ambient humidity	85% or less. There should be no condensation.
Altitude	1000 m or below
Ambient atmosphere	There should be no corrosive gases, explosive gases, or vapor. Must be a dust-free, well-ventilated location.
Mounting angle	All angles possible (no limitation)
Paint	Case: electrodeposition coating Output shaft comes with rustproof treatment at the time of shipping.
Actual reduction ratio	Integer reduction ratio
Surface temperature of the reducer	80°C or below. Consult us when operating continuously.

Note: 1. When the output shaft key is not necessary, please remove it during operation.
2. The efficiency varies depending upon the input speed, load torque, grease temperature, and reduction ratio.
3. This is a reference value. Varies depending on models and mounting condition.

Selection Table 1 (Frame Size Combination Table for Each Motor Rated Speed)

Rated Motor Speed 3000 r/min

Servo Motor Capacity (W)	Reduction ratio								
	3	5	9	15	20	25	35	45	81
50				PE10			●□		●□
100			●□		●□	●□		●□	●□
150									
200		●□		PE15			●□		
400	●□		●□						
550									
600				PE20					
750			●□						
1000									
1500				PE30					
2000									
2500									
3000			●□						
4000		●□							
5000									

Rated Motor Speed 2000 r/min

Servo Motor Capacity (W)	Reduction ratio								
	3	5	9	15	20	25	35	45	81
50		PE10							●□
100									●□
150				PE15					
200								●□	
400									
550									
600		PE20							
750				PE30		●□			
1000									
1500	●□								
2000									
2500									
3000	●□								
4000									
5000									

Note: 1. Refer to Selection Table 2 (on pages 6-12) for frame size combination for each servo motor manufacturer.
2. Refer to Selection Table 3 (on pages 14, 15) for rated torque, allowable maximum input speed, allowable peak torque, and allowable radial load for each frame size.
3. ▭ In the case of using a combination of , make a selection after checking the no load running torques.
4. Refer to Selection Table 3 (on page 14) for allowable peak torque at startup for combinations marked □.
5. Regarding combinations marked ●, limit the average load torque so that it is no more than the rated torque in Selection Table 3 (on page 14).

No load running torque (N·m)

Frame Size	Reduction Ratio								
	3	5	9	15	20	25	35	45	81
PE10	0.05	0.04	0.03	0.10			0.07	-	-
PE15	0.17	0.10	0.05	0.15			0.11		
PE20	0.25	0.20	0.07	0.21			0.15		
PE30	0.70	0.40	0.13	0.40			0.30		

Note: 1. Torque necessary at the input side to rotate the reducer at no load condition.
2. This is the representative value when the ambient temperature is 20°C.

Selection Table 2 (Frame Size Combination Table for Each Servo Motor Manufacturers)

1. FANUC CORPORATION

Motor flanges for Fanuc motor will be launched in 2020.
please contact us.

βis Series βis200V Model (Rated speed: 3000–2000 r/min) … Applies to torque at rated speed

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	βis0.2/5000	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ●	PE15 △	PE15 ▲●	2D
100	βis0.3/5000	3000	PE10	PE10	PE10 ●	PE10	PE10 ●	PE10 ●	PE15	PE15 ●	PE20 ●	2D
130	βis0.4/5000	3000	PE10	PE10	PE15	PE15	PE15	PE15	PE15	PE20	PE30	2H
350	βis0.5/6000	3000	PE10	PE15	PE15	PE15	PE15	PE15	PE20	PE30		2H
500	βis1/6000	3000	PE15	PE15	PE20	PE20	PE20	PE20	PE30	PE30		KH
500	βis2/4000	3000	PE15	PE15	PE20 □	PE20	PE20	PE20	PE30	PE30		2J
750	βis4/4000	3000	PE15 □	PE15 □	PE20 ●	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		0V
1200	βis8/3000	2000	PE20	PE20	PE30	PE30						7X
1400	βis12/2000	2000	PE20 ●	PE20 ●	PE30	PE30						8P
1800	βis12/3000	2000	PE20 ●	PE30	PE30							8P
2500	βis22/2000	2000	PE30	PE30 □								0X
3000	βis22/3000	2000	PE30									0X
3000	βis30/2000	2000	PE30 □									0X

βis Series βis400V Model (Rated speed: 3000–2000 r/min) … Applies to torque at rated speed

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
500	βis2/4000HV	3000	PE15	PE15	PE20 □	PE20	PE20	PE20	PE30	PE30		2J
750	βis4/4000HV	3000	PE15 □	PE15 □	PE20 ●	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		0V
1200	βis8/3000HV	2000	PE20	PE20	PE30	PE30						7X
1800	βis12/3000HV	2000	PE20 ●	PE30	PE30							8P
2500	βis22/2000HV	2000	PE30	PE30 □								0X
3000	βis22/3000HV	2000	PE30									0X
3000	βis30/2000HV	2000	PE30 □									0X

βiS Series βisc200V Model (Rated speed: 3000–2000 r/min) … Applies to torque at rated speed

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
500	βisc2/4000	3000	PE15	PE15	PE20 □	PE20	PE20	PE20	PE30	PE30		2J
750	βisc4/4000	3000	PE15 □	PE15 □	PE20 ●	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		0V
1200	βisc8/3000	2000	PE20	PE20	PE30	PE30						7X
1400	βisc12/2000	2000	PE20 ●	PE20 ●	PE30	PE30						8P

Note: 1. Refer to Selection Table 3 (on pages 14, 15) for rated torque, allowable maximum input speed, allowable peak torque, and allowable radial load for each frame size.
2. In the case of using a combination of △, make a selection after checking the no load running torques in the Selection Table 1 (on page 5).
3. Refer to Selection Table 3 (on page 14) for allowable peak torque at startup for combinations marked □.
4. Regarding combinations marked ●, limit the average load torque so that it is no more than the rated torque in Selection Table 3 (on page 14).
5. For straight shafts only.

Selection Table 2 (Frame Size Combination Table for Each Servo Motor Manufacturers)

2. YASKAWA Electric Corporation

Σ-7 Series SGM7J Model (Rated speed: 3000 r/min)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	SGM7J-A5**A2*	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ● □	PE15 △	PE15 △ ● □	KC
100	SGM7J-01**A2*	3000	PE10	PE10	PE10 ● □	PE10 □	PE10 ● □	PE10 ● □	PE15	PE15 ● □	PE20 ● □	KC
150	SGM7J-C2**A2*	3000	PE10	PE10	PE15	PE15	PE15	PE15	PE15 □	PE20	PE30	KD
200	SGM7J-02**A2*	3000	PE10	PE10 ● □	PE15	PE15	PE15	PE15	PE15 ● □	PE20	PE30 □	2R
400	SGM7J-04**A2*	3000	PE10 ● □	PE15	PE15 ● □	PE15 □	PE15 □	PE15 □	PE20 □	PE30		2R
600	SGM7J-06**A2*	3000	PE15	PE15	PE20	PE20	PE20	PE20	PE30	PE30		KH
750	SGM7J-08**A2*	3000	PE15 □	PE15 □	PE20 ● □	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		1G

Σ-7 Series SGM7A Model (Rated speed: 3000 r/min)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	SGM7A-A5**A2*	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ● □	PE15 △	PE15 △ ● □	KC
100	SGM7A-01**A2*	3000	PE10	PE10	PE10 ● □	PE10 □	PE10 ● □	PE10 ● □	PE15	PE15 ● □	PE20 ● □	KC
150	SGM7A-C2**A2*	3000	PE10	PE10	PE15	PE15	PE15	PE15	PE15 □	PE20	PE30	KD
200	SGM7A-02**A2*	3000	PE10	PE10 ● □	PE15	PE15	PE15	PE15	PE15 ● □	PE20	PE30 □	2R
400	SGM7A-04**A2*	3000	PE10 ● □	PE15	PE15 ● □	PE15 □	PE15 □	PE15 □	PE20 □	PE30		2R
600	SGM7A-06**A2*	3000	PE15	PE15	PE20	PE20	PE20	PE20	PE30	PE30		KH
750	SGM7A-08**A2*	3000	PE15 □	PE15 □	PE20 ● □	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		1G
1000	SGM7A-10**A2*	3000	PE20	PE20	PE30	PE30	PE30	PE30 □				KK
1500	SGM7A-15**A2*	3000	PE20	PE20	PE30	PE30						1L
2000	SGM7A-20**A2*	3000	PE20	PE30	PE30	PE30						1L
2500	SGM7A-25**A2*	3000	PE30	PE30	PE30							1L
3000	SGM7A-30**A2*	3000	PE30	PE30	PE30 ● □							1T
4000	SGM7A-40**A2*	3000	PE30	PE30 ● □								1T
5000	SGM7A-50**A2*	3000	PE30									1T

Σ-V Series SGMJV Model (Rated speed: 3000 r/min)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	SGMJV-A5**A2*	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ● □	PE15 △	PE15 △ ● □	KC
100	SGMJV-01**A2*	3000	PE10	PE10	PE10 ● □	PE10 □	PE10 ● □	PE10 ● □	PE15	PE15 ● □	PE20 ● □	KC
150	SGMJV-C2**A2*	3000	PE10	PE10	PE15	PE15	PE15	PE15	PE15 □	PE20	PE30	KD
200	SGMJV-02**A2*	3000	PE10	PE10 ● □	PE15	PE15	PE15	PE15	PE15 ● □	PE20	PE30 □	2R
400	SGMJV-04**A2*	3000	PE10 ● □	PE15	PE15 ● □	PE15 □	PE15 □	PE15 □	PE20 □	PE30		2R
600	SGMJV-06**A2*	3000	PE15	PE15	PE20	PE20	PE20	PE20	PE30	PE30		KH
750	SGMJV-08**A2*	3000	PE15 □	PE15 □	PE20 ● □	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		1G

Σ-V Series SGMAV model (Rated speed: 3000 r/min)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	SGMAV-A5**A2*	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ● □	PE15 △	PE15 △ ● □	KC
100	SGMAV-01**A2*	3000	PE10	PE10	PE10 ● □	PE10	PE10 ● □	PE10 ● □	PE15	PE15 ● □	PE20 ● □	KC
150	SGMAV-C2**A2*	3000	PE10	PE10	PE15	PE15	PE15	PE15	PE15	PE20	PE30	KD
200	SGMAV-02**A2*	3000	PE10	PE10 ● □	PE15	PE15	PE15	PE15	PE15 ● □	PE20	PE30	2R
400	SGMAV-04**A2*	3000	PE10 ● □	PE15	PE15 ● □	PE15	PE15	PE15	PE20	PE30		2R
550	SGMAV-06**A2*	3000	PE15	PE15	PE20	PE20	PE20	PE20	PE30	PE30		KH
750	SGMAV-08**A2*	3000	PE15	PE15	PE20 ● □	PE20	PE20	PE20	PE30	PE30		1G
1000	SGMAV-10**A2*	3000	PE20	PE20	PE30	PE30	PE30	PE30				KK

Note: 1. Refer to Selection Table 3 (on pages 14, 15) for rated torque, allowable maximum input speed, allowable peak torque, and allowable radial load for each frame size.
2. In the case of using a combination of △, make a selection after checking the no load running torques in the Selection Table 1 (on page 5).
3. Refer to Selection Table 3 (on page 14) for allowable peak torque at startup for combinations marked □.
4. Regarding combinations marked ●, limit the average load torque so that it is no more than the rated torque in Selection Table 3 (on page 14).

Selection Table 2 (Frame Size Combination Table for Each Servo Motor Manufacturers)

3. Mitsubishi Electric Corporation

MELSERVO-J4
HG-KR Series (Rated Motor Speed 3000 r/min)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	HG-KR053	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ● □	PE15 △	PE15 ● □	KC
100	HG-KR13	3000	PE10	PE10	PE10 ● □	PE10 □	PE10 ● □	PE10 ● □	PE15	PE15 ● □	PE20 ● □	KC
200	HG-KR23	3000	PE10	PE10 ● □	PE15	PE15	PE15	PE15	PE15 ●	PE20	PE30 □	2R
400	HG-KR43	3000	PE10 ● □	PE15	PE15 ●	PE15	PE15 ●	PE15 ●	PE20 □	PE30		2R
750	HG-KR73	3000	PE15	PE15	PE20 ● □	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		1G

MELSERVO-J4
HG-MR Series (Rated Motor Speed 3000 r/min)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	HG-MR053	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ● □	PE15 △	PE15 ● □	KC
100	HG-MR13	3000	PE10	PE10	PE10 ● □	PE10	PE10 ● □	PE10 ● □	PE15	PE15 ● □	PE20 ● □	KC
200	HG-MR23	3000	PE10	PE10 ● □	PE15	PE15	PE15	PE15	PE15 ● □	PE20	PE30	2R
400	HG-MR43	3000	PE10 ● □	PE15	PE15 ● □	PE15	PE15 ●	PE15 ●	PE20	PE30		2R
750	HG-MR73	3000	PE15	PE15	PE20 ● □	PE20	PE20	PE20	PE30	PE30		1G

MELSERVO-JN
HF-KN Series (Rated Motor Speed 3000 r/min)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	HF-KN053	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ● □	PE15 △	PE15 ● □	KC
100	HF-KN13	3000	PE10	PE10	PE10 ● □	PE10	PE10 ● □	PE10 ● □	PE15	PE15 ● □	PE20 ● □	KC
200	HF-KN23	3000	PE10	PE10 ● □	PE15	PE15	PE15	PE15	PE15 ● □	PE20	PE30	2R
400	HF-KN43	3000	PE10 ● □	PE15	PE15 ●	PE15	PE15 ●	PE15 ●	PE20	PE30		2R

MELSERVO-J3
HF-KP Series (Rated Motor Speed 3000 r/min)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	HF-KP053	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ● □	PE15 △	PE15 ● □	KC
100	HF-KP13	3000	PE10	PE10	PE10 ● □	PE10 □	PE10 ● □	PE10 ● □	PE15	PE15 ● □	PE20 ● □	KC
200	HF-KP23	3000	PE10	PE10 ● □	PE15	PE15	PE15	PE15	PE15 ● □	PE20	PE30 □	2R
400	HF-KP43	3000	PE10 ● □	PE15	PE15 ● □	PE15 □	PE15 ● □	PE15 ● □	PE20 □	PE30		2R
750	HF-KP73	3000	PE15 □	PE15 □	PE20 ● □	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		1G

MELSERVO-J3
HF-MP Series (Rated Motor Speed 3000 r/min)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	HF-MP053	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ● □	PE15 △	PE15 ● □	KC
100	HF-MP13	3000	PE10	PE10	PE10 ● □	PE10	PE10 ● □	PE10 ● □	PE15	PE15 ● □	PE20 ● □	KC
200	HF-MP23	3000	PE10	PE10 ● □	PE15	PE15	PE15	PE15	PE15 ● □	PE20	PE30	2R
400	HF-MP43	3000	PE10 ● □	PE15	PE15 ● □	PE15	PE15 ●	PE15 ●	PE20	PE30		2R
750	HF-MP73	3000	PE15	PE15	PE20 ● □	PE20	PE20	PE20	PE30	PE30		1G

Note: 1. Refer to Selection Table 3 (on pages 14, 15) for rated torque, allowable maximum input speed, allowable peak torque, and allowable radial load for each frame size.
2. In the case of using a combination of △, make a selection after checking the no load running torques in the Selection Table 1 (on page 5).
3. Refer to Selection Table 3 (on page 14) for allowable peak torque at startup for combinations marked □.
4. Regarding combinations marked ●, limit the average load torque so that it is no more than the rated torque in Selection Table 3 (on page 14).

Selection Table 2 (Frame Size Combination Table for Each Servo Motor Manufacturers)

4. Panasonic Corporation

MINAS A6 Series MSMF (Rated Motor Speed 3000 r/min, AC200V)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	MSMF5AZL1	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ●□	PE15 △	PE15 △●□	KA
100	MSMF012L1	3000	PE10	PE10	PE10 ●□	PE10	PE10 ●□	PE10 ●□	PE15	PE15 ●□	PE20 ●□	KA
200	MSMF022L1	3000	PE10	PE10 ●□	PE15	PE15	PE15	PE15	PE15 ●□	PE20	PE30	2L
400	MSMF042L1	3000	PE10 ●□	PE15	PE15 ●□	PE15	PE15	PE15	PE20	PE30		2P
750	MSMF082L1	3000	PE15	PE15	PE20 ●□	PE20	PE20	PE20	PE30	PE30		7S
1000	MSMF092L1	3000	PE20	PE20	PE30	PE30	PE30	PE30				7S

MINAS A6 Series MSMF (Rated Motor Speed 3000 r/min, AC200V, IP67 motor)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
1000	MSMF102L1	3000	PE20	PE20	PE30	PE30	PE30	PE30 ●□				7B
1500	MSMF152L1	3000	PE20	PE20 ●	PE30	PE30						7B
2000	MSMF202L1	3000	PE20 ●	PE30	PE30	PE30 ●						7B
3000	MSMF302L1	3000	PE30	PE30	PE30 ●□							1S
4000	MSMF402L1	3000	PE30	PE30 ●□								7Z
5000	MSMF502L1	3000	PE30 ●									7Z

MINAS A5 Family Series MSMD (Rated Motor Speed 3000 r/min, AC100V)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	MSMD5AZ	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ●□	PE15 △	PE15 △●□	KA
100	MSMD011	3000	PE10	PE10	PE10 ●□	PE10	PE10 ●□	PE10 ●□	PE15	PE15 ●□	PE20 ●	KA
200	MSMD021	3000	PE10	PE10 ●□	PE15	PE15	PE15	PE15	PE15 ●□	PE20	PE30	2L
400	MSMD041	3000	PE10 ●□	PE15	PE15 ●□	PE15	PE15 ●	PE15 ●	PE20	PE30		2P

MINAS A5 Family Series MSMD (Rated Motor Speed 3000 r/min, AC200V)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	MSMD5AZ	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ●□	PE15 △	PE15 △●□	KA
100	MSMD012	3000	PE10	PE10	PE10 ●□	PE10	PE10 ●□	PE10 ●□	PE15	PE15 ●□	PE20 ●□	KA
200	MSMD022	3000	PE10	PE10 ●□	PE15	PE15	PE15	PE15	PE15 ●□	PE20	PE30	2L
400	MSMD042	3000	PE10 ●□	PE15	PE15 ●□	PE15	PE15 ●	PE15 ●	PE20	PE30		2P
750	MSMD082	3000	PE15	PE15	PE20 ●□	PE20	PE20	PE20	PE30	PE30		7S

Note: 1. Refer to Selection Table 3 (on pages 14, 15) for rated torque, allowable maximum input speed, allowable peak torque, and allowable radial load for each frame size.
2. In the case of using a combination of △, make a selection after checking the no load running torques in the Selection Table 1 (on page 5).
3. Refer to Selection Table 3 (on page 14) for allowable peak torque at startup for combinations marked □.
4. Regarding combinations marked ●, limit the average load torque so that it is no more than the rated torque in Selection Table 3 (on page 14).

Selection Table 2 (Frame Size Combination Table for Each Servo Motor Manufacturers)

4. Panasonic Corporation

MINAS A5 Family Series MSME (Rated Motor Speed 3000 r/min, AC200V)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	MSME5AZ	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ●□	PE15 △	PE15 △●□	KA
100	MSME012	3000	PE10	PE10	PE10 ●□	PE10	PE10 ●□	PE10 ●□	PE15	PE15 ●□	PE20 ●□	KA
200	MSME022	3000	PE10	PE10 ●□	PE15	PE15	PE15	PE15	PE15 ●□	PE20	PE30	2L
400	MSME042	3000	PE10 ●□	PE15	PE15 ●□	PE15	PE15 ●	PE15 ●	PE20	PE30		2P
750	MSME082	3000	PE15	PE15	PE20 ●□	PE20	PE20	PE20	PE30	PE30		7S
1000	MSME102	3000	PE20	PE20	PE30	PE30	PE30	PE30				7B
1500	MSME152	3000	PE20	PE20	PE30	PE30						7B
2000	MSME202	3000	PE20	PE30	PE30	PE30						7B
3000	MSME302	3000	PE30	PE30	PE30 ●□							1S
4000	MSME402	3000	PE30	PE30 ●□								7Z
5000	MSME502	3000	PE30									7Z

Note: 1. Refer to Selection Table 3 (on pages 14, 15) for rated torque, allowable maximum input speed, allowable peak torque, and allowable radial load for each frame size.
2. In the case of using a combination of △, make a selection after checking the no load running torques in the Selection Table 1 (on page 5).
3. Refer to Selection Table 3 (on page 14) for allowable peak torque at startup for combinations marked □.
4. Regarding combinations marked ●, limit the average load torque so that it is no more than the rated torque in Selection Table 3 (on page 14).

Selection Table 2 (Frame Size Combination Table for Each Servo Motor Manufacturers)

5. KEYENCE CORPORATION

SV2 Series （Rated Motor Speed 3000 r/min）

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	SV2-M005A □	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ●	PE15 △	PE15 ● △	KC
100	SV2-M010A □	3000	PE10	PE10	PE10 ●	PE10 □	PE10 ●	PE10 ●	PE15	PE15 ●	PE20 □	KC
200	SV2-M020A □	3000	PE10	PE10 ●	PE15	PE15	PE15	PE15	PE15 ●	PE20	PE30 □	2R
400	SV2-M040A □	3000	PE10 ●	PE15	PE15 ●	PE15 □	PE15 □	PE15 □	PE20	PE30		2R
750	SV2-M075A □	3000	PE15	PE15 □	PE20 ●	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		1G

Note: 1. Refer to Selection Table 3 (on pages 14, 15) for rated torque, allowable maximum input speed, allowable peak torque, and allowable radial load for each frame size.
2. In the case of using a combination of △, make a selection after checking the no load running torques in the Selection Table 1 (on page 5).
3. Refer to Selection Table 3 (on page 14) for allowable peak torque at startup for combinations marked □.
4. Regarding combinations marked ●, limit the average load torque so that it is no more than the rated torque in Selection Table 3 (on page 14).

Selection Table 2 (Frame Size Combination Table for Each Servo Motor Manufacturers)

6. OMRON Corporation

1S Series R88M-1L (Rated Motor Speed 3000 r/min, AC400V)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
750	1L75030C	3000	PE15	PE15	PE20 ●	PE20	PE20	PE20	PE30	PE30		7B
1000	1L1K030C	3000	PE20	PE20	PE30	PE30	PE30	PE30				7B
1500	1L1K530C	3000	PE20	PE20	PE30	PE30						7B
2000	1L2K030C	3000	PE20	PE30	PE30	PE30						7B
3000	1L3K030C	3000	PE30	PE30	PE30 ●							KQ

1S Series R88M-1M (Rated Motor Speed 3000 r/min, AC200V)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
100	1M10030T	3000	PE10	PE10	PE10 ●	PE10 □	PE10 ●	PE10 ●	PE15	PE15 ●	PE20 ●	KC
200	1M20030T	3000	PE10	PE10 ●	PE15	PE15	PE15	PE15	PE15 ●	PE20	PE30 □	2L
400	1M40030T	3000	PE10 ●	PE15	PE15 ●	PE15 □	PE15 □	PE15 □	PE20 □	PE30		2P
750	1M75030T	3000	PE15	PE15 □	PE20 ●	PE20 □	PE20 □	PE20 □	PE30 □	PE30 □		7S

G5 Series R88M-K (Rated Motor Speed 3000 r/min, AC200V)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	K05030H/T	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ●	PE15 △	PE15 △●	KC
100	K10030H/T	3000	PE10	PE10	PE10 ●	PE10	PE10 ●	PE10 ●	PE15	PE15 ●	PE20 ●	KC
200	K20030H/T	3000	PE10	PE10 ●	PE15	PE15	PE15	PE15	PE15 ●	PE20	PE30	2L
400	K40030H/T	3000	PE10 ●	PE15	PE15 ●	PE15	PE15 ●	PE15 ●	PE20	PE30		2P
750	K75030H/T	3000	PE15	PE15	PE20 ●	PE20	PE20	PE20	PE30	PE30		7S
1000	K1K030H/T	3000	PE20	PE20	PE30	PE30	PE30	PE30				7B
1500	K1K530H/T	3000	PE20	PE20	PE30	PE30						7B
2000	K2K030H/T	3000	PE20	PE30	PE30	PE30						7B
3000	K3K030H/T	3000	PE30	PE30	PE30 ●							1S
4000	K4K030H/T	3000	PE30	PE30 ●								7Z
5000	K5K030H/T	3000	PE30									7Z

G Series R88M-G (Rated Motor Speed 3000 r/min, AC200V)

Servo Motor Capacity (W)	Nomenclature of Servo Motor		Reduction Ratio									Motor flange code
	Type	Rated Speed [r/min]	3	5	9	15	20	25	35	45	81	
50	G05030H/T	3000	PE10	PE10	PE10	PE10	PE10	PE10	PE10 ●	PE15 △	PE15 △●	KC
100	G10030H/T	3000	PE10	PE10	PE10 ●	PE10	PE10 ●	PE10 ●	PE15	PE15 ●	PE20 ●	KC
200	G20030H/T	3000	PE10	PE10 ●	PE15	PE15	PE15	PE15	PE15 ●	PE20	PE30	2L
400	G40030H/T	3000	PE10 ●	PE15	PE15 ●	PE15	PE15 ●	PE15 ●	PE20	PE30		2P
750	G75030H/T	3000	PE15	PE15	PE20 ●	PE20	PE20	PE20	PE30	PE30		7S
1000	G1K030T	3000	PE20	PE20	PE30	PE30	PE30	PE30				7V
1500	G1K530T	3000	PE20	PE20	PE30	PE30						7B
2000	G2K030T	3000	PE20	PE30	PE30	PE30						7B
3000	G3K030T	3000	PE30	PE30	PE30 ●							1S
4000	G4K030T	3000	PE30	PE30 ●								7Z
5000	G5K030T	3000	PE30									7Z

Note: 1. Refer to Selection Table 3 (on pages 14, 15) for rated torque, allowable maximum input speed, allowable peak torque, and allowable radial load for each frame size.
2. In the case of using a combination of △, make a selection after checking the no load running torques in the Selection Table 1 (on page 5).
3. Refer to Selection Table 3 (on page 14) for allowable peak torque at startup for combinations marked □.
4. Regarding combinations marked ●, limit the average load torque so that it is no more than the rated torque in Selection Table 3 (on page 14).

Selection Table 3 (Rating Table)

Table 1 Rating Table

Frame Size	Reduction Ratio	Rated Torque (N·m) Note: 1 Input Speed (r/min)		Allowable Peak Torque at Startup and Stop Note: 2, 4 Peak torque (N·m)	Allowable Maximum Note: 3 Input Speed (r/min)
		3000	2000		
PE10	3	3.4	3.4	10.0	6000
	5	2.8	2.8	8.5	
	9	2.3	2.3	7.2	
	15	4.0	4.0	12.0	
	20	5.0	5.0	15.0	
	25	6.2	6.2	19.0	
	35	3.8	3.8	11.5	
PE15	3	6.8	6.8	20.5	6000
	5	11.5	11.5	34.0	
	9	9.7	9.7	29.0	
	15	16.0	16.0	48.5	
	20	21.0	21.0	63.0	
	25	26.0	26.0	79.0	
	35	15.5	15.5	46.5	
	45	9.5	9.5	28.5	
	81	9.7	9.7	29.0	
PE20	3	18.0	18.0	54.5	6000
	5	23.5	23.5	70.5	
	9	18.0	18.0	54.5	
	15	30.0	30.0	91.0	
	20	40.5	40.5	120.0	
	25	50.5	50.5	150.0	
	35	37.0	37.0	110.0	
	45	28.0	28.0	85.0	
	81	17.5	17.5	53.5	
PE30	3	44.0	44.0	130.0	6000
	5	56.5	56.5	170.0	
	9	73.5	73.5	220.0	
	15	91.0	91.0	270.0	
	20	78.0	78.0	235.0	
	25	65.0	65.0	195.0	
	35	71.0	71.0	210.0	
	45	91.0	91.0	270.0	
	81	43.0	43.0	130.0	

Note: 1. Rated torque is the allowable value of the average load torque at the output shaft. The rated torque for the input speed of 2000 r/min or less is the same as the rated torque of 2000 r/min.
2. Maximum allowable torque when startup and stop during operation cycle.
3. Maximum allowable input speed when not under constant operation condition.
4. Some values are not allowable depending on the input shaft diameter.

Selection Table 3 (External Load)

Table 2 External Load

Input Speed (r/min)		3000		2000	
Frame Size	Reduction Ratio	Radial load Note: 1 (N)	Axial Load Note: 2 (N)	Radial load Note: 1 (N)	Axial Load Note: 2 (N)
PE10	3	390	195	450	225
	5	490	245	560	280
	9	585	290	670	335
	15	780	390	880	440
	20	800	400	910	455
	25	880	440	880	440
	35	880	440	880	440
PE15	3	780	390	900	450
	5	980	490	1120	560
	9	1180	585	1340	670
	15	1470	735	1670	830
	20	1570	785	1790	895
	25	1670	830	1670	830
	35	1670	830	1900	950
	45	1670	830	1670	830
	81	1670	830	1670	830
PE20	3	880	440	1010	505
	5	1080	535	1230	615
	9	1470	735	1680	840
	15	1760	880	2020	1010
	20	1910	955	2180	1090
	25	2060	1030	2060	1030
	35	2060	1030	2340	1170
	45	2060	1030	2060	1030
	81	2060	1030	2060	1030
PE30	3	1370	685	1570	785
	5	1670	830	1900	950
	9	1960	980	2240	1120
	15	2350	1180	2650	1320
	20	2500	1250	2650	1320
	25	2650	1320	2650	1320
	35	3430	1715	3430	1715
	45	3520	1760	3520	1760
	81	3530	1765	3530	1765

Note: 1. Radial load is the value applied to the middle of the output shaft (at axial load). (Axial Load: o N)
2. Axial load is the value applied to the center of the output shaft (at radial load). (Radial load: o N)

*Multiply radial load locating factor to the value in the above table when the radial load is applied to locations other than the middle of the output shaft.

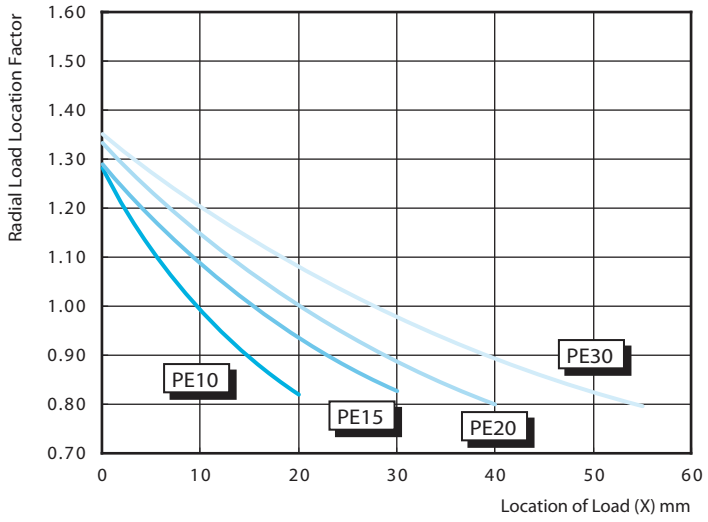


Fig.2 Radial Load Location Factor

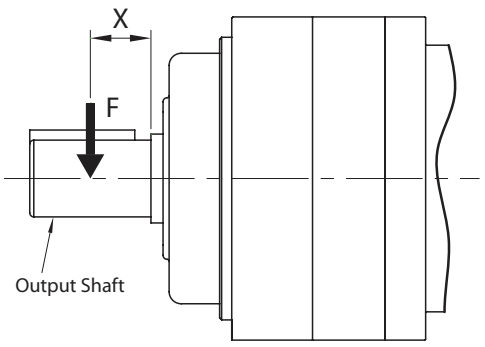
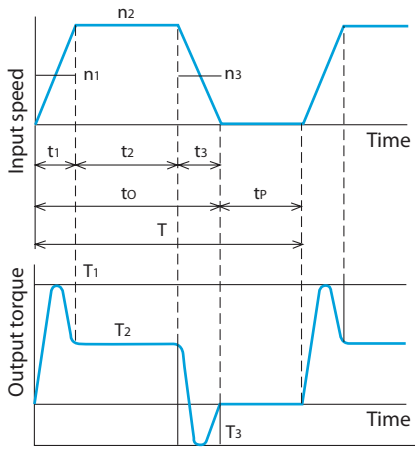


Fig.3 Radial Load Location

Selection Procedure

Flow Chart and Formula of Selection

Fig. 4 Load Pattern



n1: Average input speed at acceleration
when as in Fig 4: $n_1 = \frac{n_2}{2}$ (r/min)

n2: Input speed at normal operation

n3: Average input speed at deceleration
when as in Fig 4: $n_1 = n_3 = \frac{n_2}{2}$ (r/min)

t1 : Acceleration time [s]
t2 : Steady operation time [s]
t3 : Deceleration time [s]
to : Operation time [s]
tp : Stop time [s]
T : Operation cycle [s]
T1 : Starting peak torque [Nm]
T2 : Steady operation torque [Nm]
T3 : Stopping peak torque [Nm]

Selection Procedure

Calculation in Load Condition of Fig. 4

- Average input speed $n_E = \frac{t_1 n_1 t_2 n_2 t_3 n_3 \, t_n n_n}{t_o}$ Formula 1 n=4,5,6

- Average output torque $T_E = \left(\frac{t_1 \cdot n_1 \cdot T_1^{10/3} + t_2 \cdot n_2 \cdot T_2^{10/3} + t_3 \cdot n_3 \cdot T_3^{10/3} + t_n \cdot n_n \cdot T_n^{10/3}}{t_o \cdot n_E} \right)^{0.3} \times Fs_2$ ···· Formula 2 n=4,5,6·····

(Table 3)

- Allowable rating output torque at average input speed

* The rated torque for the assumed frame number and reduction ratio, at an input speed near the average input speed in Selection Table 3 (Rating Table) on page 14 is the allowable torque.
* If the average input speed does not match the Selection Table input speed, and the rated torque differs according whether the average input speed is above or below the Selection Table input speed, use the value of the rated torque which corresponds to the higher speed.
* The rated torque for the input speed of 2000 r/min or less is the same as the rated torque of 2000 r/min.

Table 3 Fs2 Load factor

Loading condition	Fs_2
Uniform load	1
Moderate shock	1–1.2
Severe shock	1.4–1.6

Example of Selection

Evaluate ANFX-ANFX-PE30W-7VLD-15 for following specification.

Specification:

T_A:	Acceleration peak torque	100N•m	t_A :	Acceleration time	0.2s
T_R :	Normal running torque	30N•m	t_R :	Normal running time	5.0s
T_B :	Peak torque at breaking	80N•m	t_B :	Deceleration time	0.2s
n_A :	Average input speed during acceleration	1500r/min	t_P :	Stop time	3.0s
n_R :	Input speed with normal running	3000 r/min	t_O :	Standstill time	5.4s
n_B :	Average input speed during deceleration	1500r/min	T :	Single cycle time	8.4s

Application is assumed to have almost no load.

Calculation:

Average input speed $n_E = \frac{0.2 \times 1500 + 5.0 \times 3000 + 0.2 \times 1500}{5.4} = 2889$ (r/min)

Average output torque $T_E = \left(\frac{0.2 \times 1500 \times 100^{10/3} + 5.0 \times 3000 \times 30^{10/3} + 0.2 \times 1500 \times 80^{10/3}}{5.4 \times 2889} \right)^{0.3} \times 1 = 39.6$N•m

- Allowable rating output torque at average input speed

T_{OE}=91.0 (value at 3000r/min) ≧ 39.6 → Select ANFX-PE30W-7VLD-15 temporarily

- Check Average output torque 39.6 < 91.0·····OK

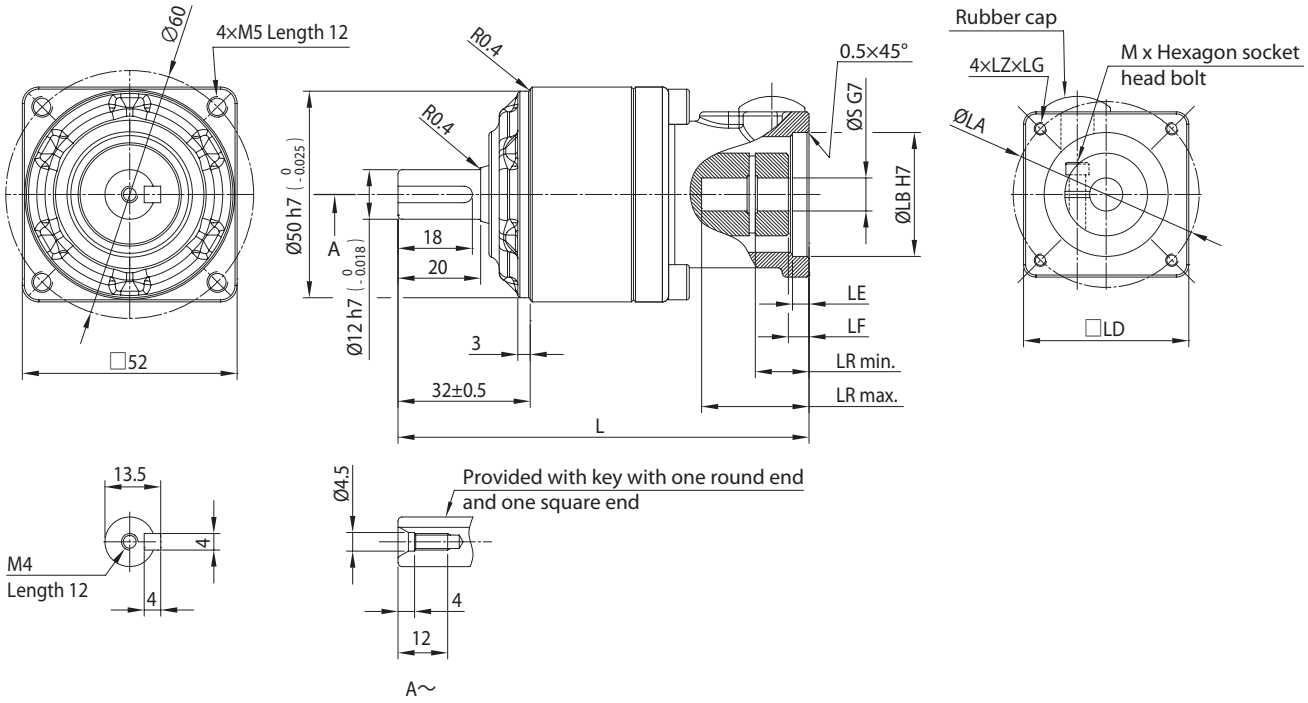
- Evaluate maximum input speed 3000 r/min < 6000 r/min
- Evaluate peak torque at acceleration and deceleration 100N•m < 270N•m

Selection Table 3 (Rating Table) Page 14

ANFX-PE30W-7VLD-15 is selected by the process above.

Dimension Drawings

Frame Size PE10
Reduction Ratio 3, 5, 9

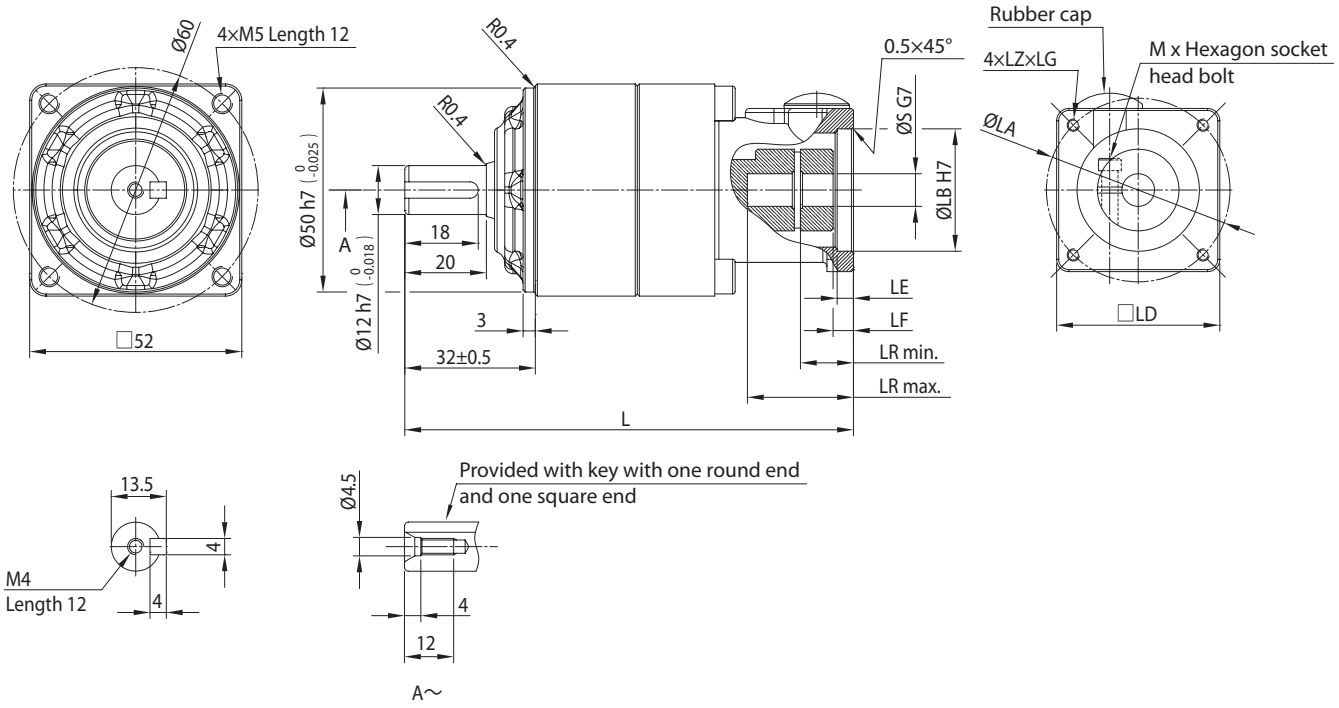


Motor Flange Code	Dimension														Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
KA	99.5	45	30	40	4	5	6.5	Through hole	M3	26	13	8	M3	0.55	KA
KC	99.5	46	30	40	4	5	6.5	Through hole	M4	26	13	8	M3	0.55	KC
KD	98.5	46	30	60	4	5	8	Blind hole	M4	26	13	8	M3	0.72	KD
2H Note:3	98.5	70	50	60	5	5	10	Blind hole	M5	26	13	9	M3	0.72	2H
2D Note:3	102.5	46	30	40	6	8	8	Blind hole	M4	26	16	8	M3	0.72	2D
2L	104.5	70	50	60	4	7	8.5	Through hole	M4	31	17	11	M5	0.72	2L
2P	104.5	70	50	60	4	7	8.5	Through hole	M4	31	17	14	M4	0.71	2P
2R	104.5	70	50	60	4	7	8.5	Through hole	M5	31	17	14	M4	0.72	2R

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE10
Reduction Ratio: 15, 20, 25, 35

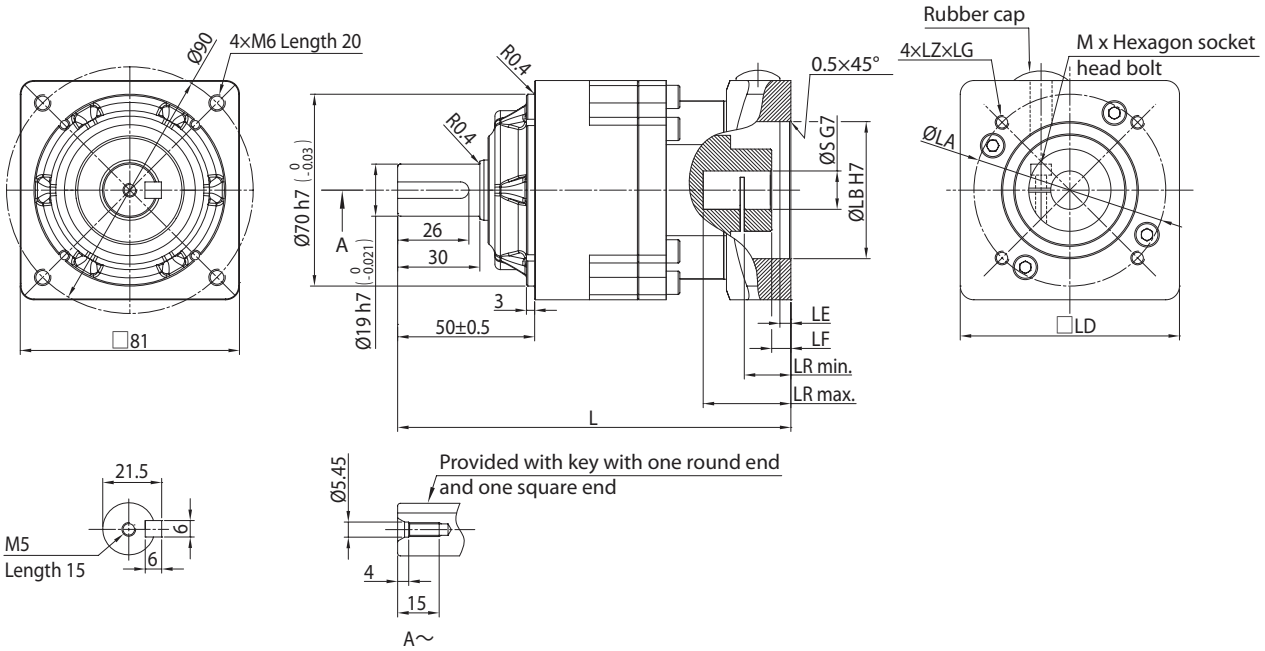


Motor Flange Code	Dimension													Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
KA	110	45	30	40	4	5	6.5	Through hole	M3	26	13	8	M3	0.70	KA
KC	110	46	30	40	4	5	6.5	Through hole	M4	26	13	8	M3	0.70	KC
2D Note:3	113	46	30	40	6	8	8	Blind hole	M4	26	16	8	M3	0.72	2D

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE15
Reduction Ratio 3, 5, 9

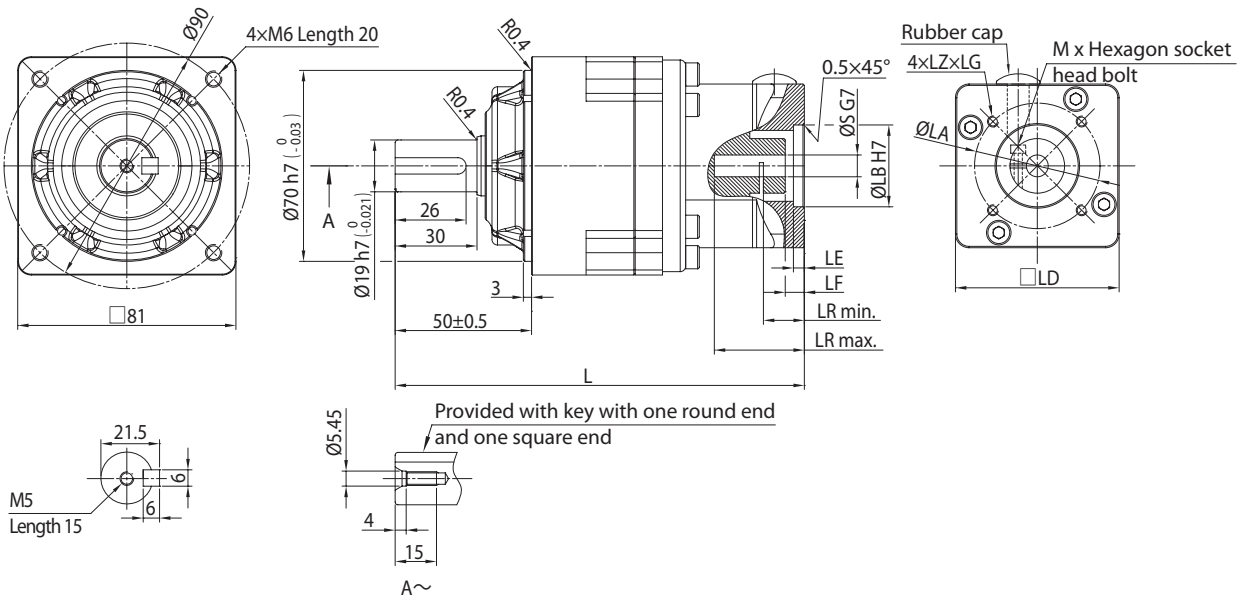


Motor Flange Code	Dimension														Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
KD	139.5	46	30	60	4	7	8	Blind hole	M4	26	15	8	M3	1.7	KD
2H Note:4	139.5	70	50	60	5	7	10	Blind hole	M5	26	15	9	M3	1.7	2H
2L	139.5	70	50	60	4	7	10	Blind hole	M4	31	17	11	M5	1.7	2L
2P	139.5	70	50	60	4	7	10	Blind hole	M4	31	17	14	M5	1.7	2P
2R	139.5	70	50	60	4	7	10	Blind hole	M5	31	17	14	M5	1.7	2R
KH	143.5	70	50	80	7	7	10	Blind hole	M5	31	17	14	M5	2.1	KH
7S	143.5	90	70	80	7.5	7.5	10	Blind hole	M5	41	20.5	19	M6	2.1	7S
1G	143.5	90	70	80	7.5	7.5	10	Blind hole	M6	41	20.5	19	M6	2.1	1G
2J Note:4	151	100	80	90	15	15	12	Blind hole	M6	33	28	10	M6	2.5	2J
0V Note:3 Note:4	151	100	80	90	15	15	12	Blind hole	M6	31	27	14	M5	2.5	0V
7B	160.5	115	95	100	10	24.5	16	Blind hole	M8	56	37.5	19	M6	3.9	7B

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Tolerance of coupling for motor flange code "0V" is over tolerance (+0.012–+0.023).
4. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE15
Reduction Ratio: 15, 20, 25, 35

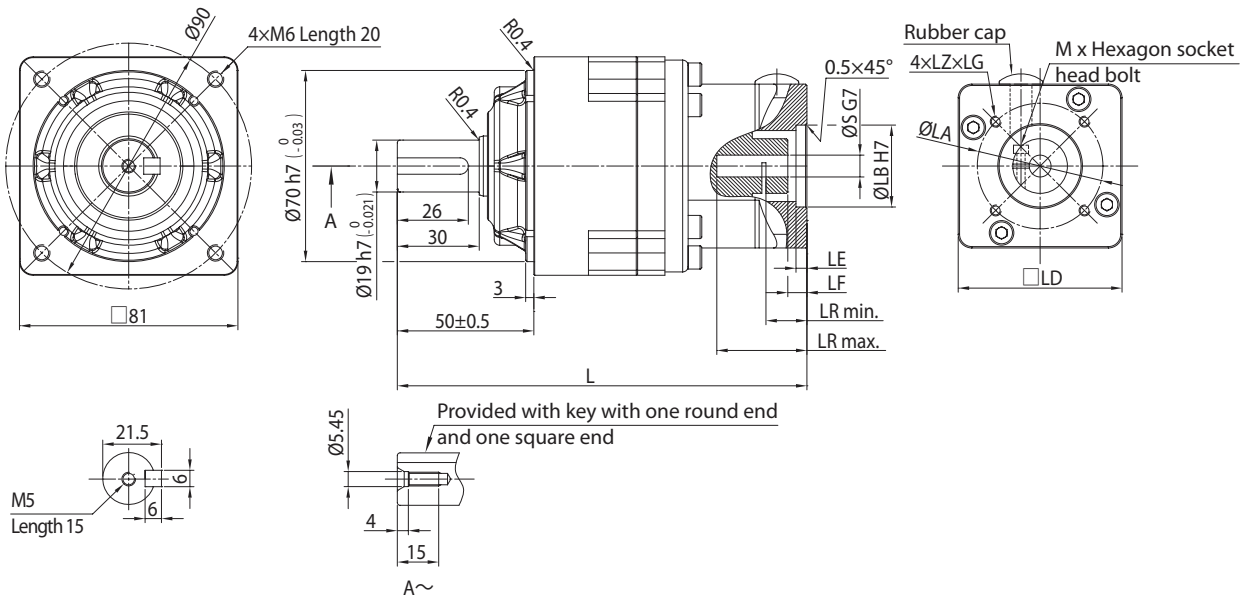


Motor Flange Code	Dimension														Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
KA	150	45	30	40	4	5	6	Blind hole	M3	26	13	8	M3	2.0	KA
KC	150	46	30	40	4	5	8	Blind hole	M4	26	13	8	M3	2.0	KC
KD	150	46	30	60	4	7	8	Blind hole	M4	26	15	8	M3	2.1	KD
2H Note:3	150	70	50	60	5	7	10	Blind hole	M5	26	15	9	M3	2.1	2H
2L	150	70	50	60	4	7	10	Blind hole	M4	31	17	11	M5	2.1	2L
2P	150	70	50	60	4	7	10	Blind hole	M4	31	17	14	M5	2.1	2P
2R	150	70	50	60	4	7	10	Blind hole	M5	31	17	14	M5	2.1	2R
2D Note:3	153	46	30	40	6	8	8	Blind hole	M4	26	16	8	M3	2.0	2D

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE15
Reduction Ratio 45, 81

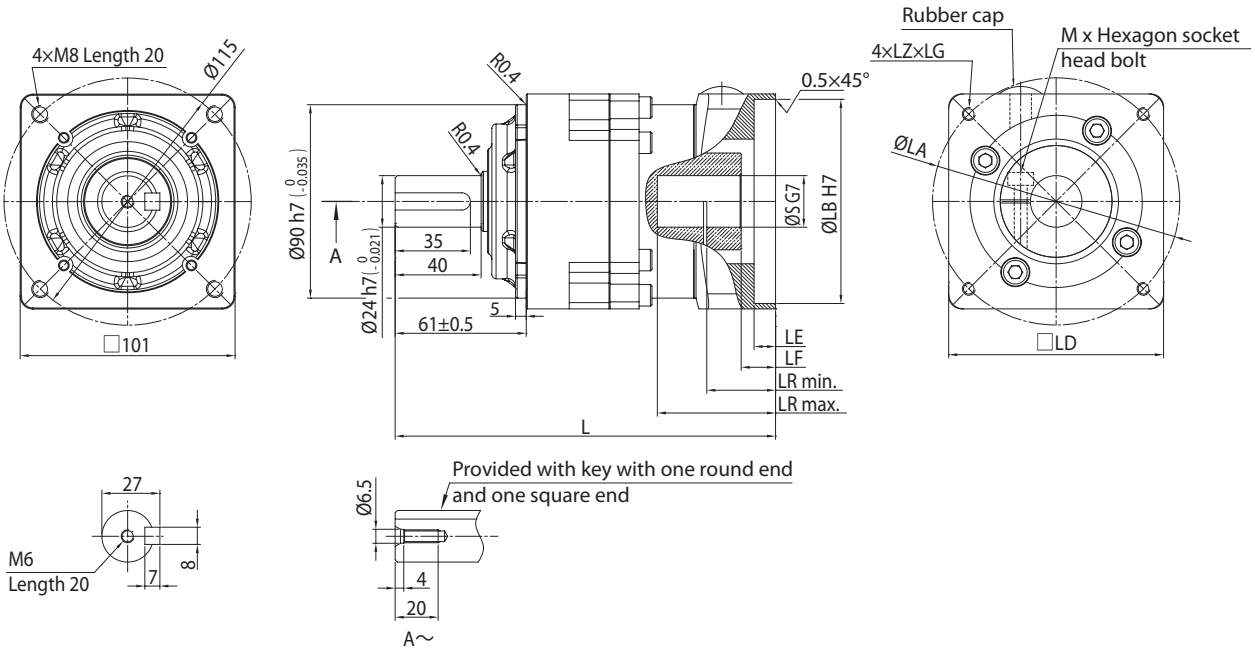


Motor Flange Code	Dimension														Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
KA	142	45	30	40	4	5	6	Blind hole	M3	26	13	8	M3	1.7	KA
KC	142	46	30	40	4	5	8	Blind hole	M4	26	13	8	M3	1.7	KC
2D Note:3	145	46	30	40	6	8	8	Blind hole	M4	26	16	8	M3	1.7	2D

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE20
Reduction Ratio 3, 5

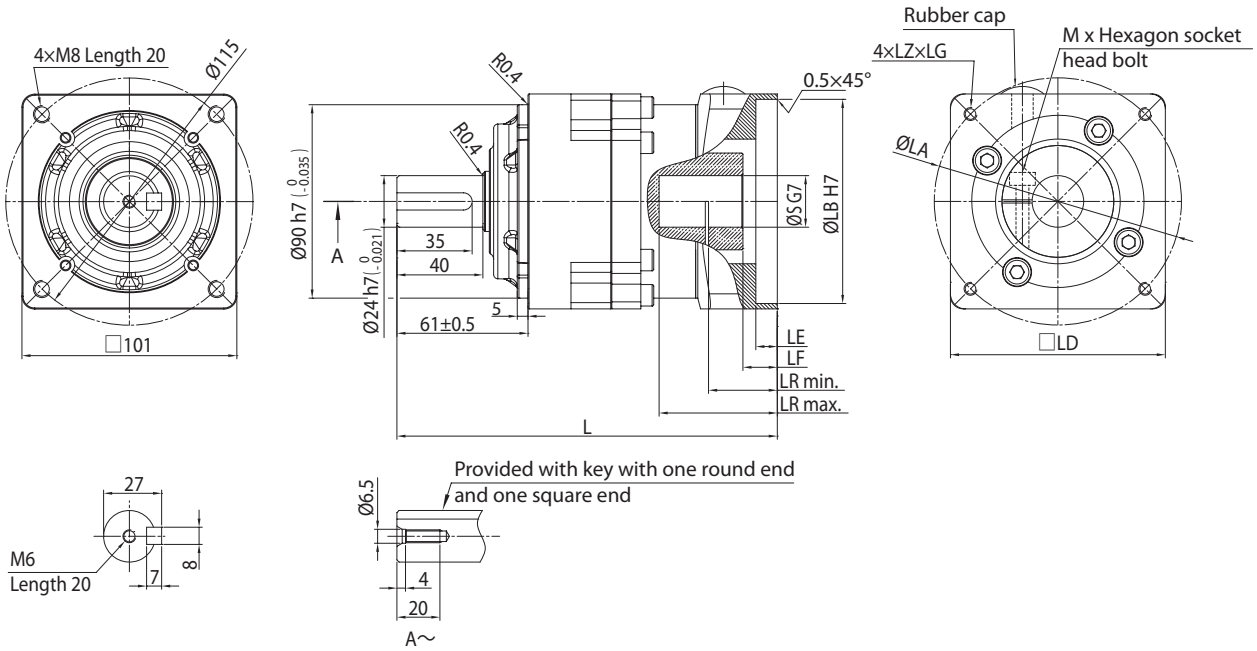


Motor Flange Code	Dimension													Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
7S	177	90	70	90	10	16	12	Blind hole	M5	56	32	19	M6	3.9	7S
KK	177	90	70	90	10	16	12	Blind hole	M6	56	32	19	M6	3.9	KK
7V	177	100	80	90	10	16	12	Blind hole	M6	56	32	19	M6	3.9	7V
7B	177	115	95	100	10	16	16	Blind hole	M8	56	32	19	M6	3.9	7B
1L	177	115	95	100	10	16	12	Blind hole	M6	56	32	24	M6	3.9	1L
7X Note:3	177	145	110	130	15.5	15.5	16	Blind hole	M8	56	32	19	M6	4.5	7X
8P Note:3	177	145	110	130	15.5	15.5	16	Blind hole	M8	56	32	24	M6	4.5	8P

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE20
Reduction Ratio 9

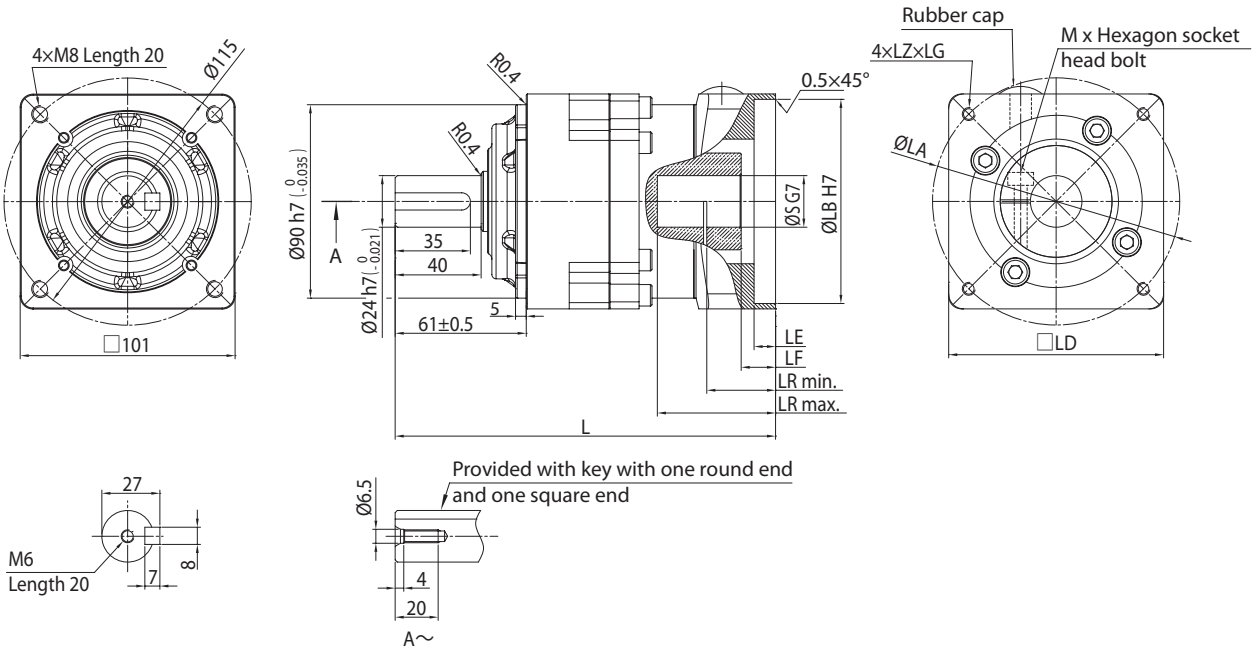


Motor Flange Code	Dimension														Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
KH	158.5	70	50	80	7	7	10	Blind hole	M5	31	17	14	M5	3.4	KH
7S	158.5	90	70	80	7.5	7.5	10	Blind hole	M5	41	20.5	19	M6	3.4	7S
1G	158.5	90	70	80	7.5	7.5	10	Blind hole	M6	41	20.5	19	M6	3.4	1G
2J Note:4	166	100	80	90	15	15	12	Blind hole	M6	33	28	10	M6	3.4	2J
0V Note:3 Note:4	166	100	80	90	15	15	12	Blind hole	M6	31	27	14	M5	3.4	0V
7B	175.5	115	95	100	10	24.5	16	Blind hole	M8	56	37.5	19	M6	3.4	7B

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Tolerance of coupling for motor flange code "0V" is over tolerance (+0.012–+0.023).
4. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE20
Reduction Ratio 15, 20, 25

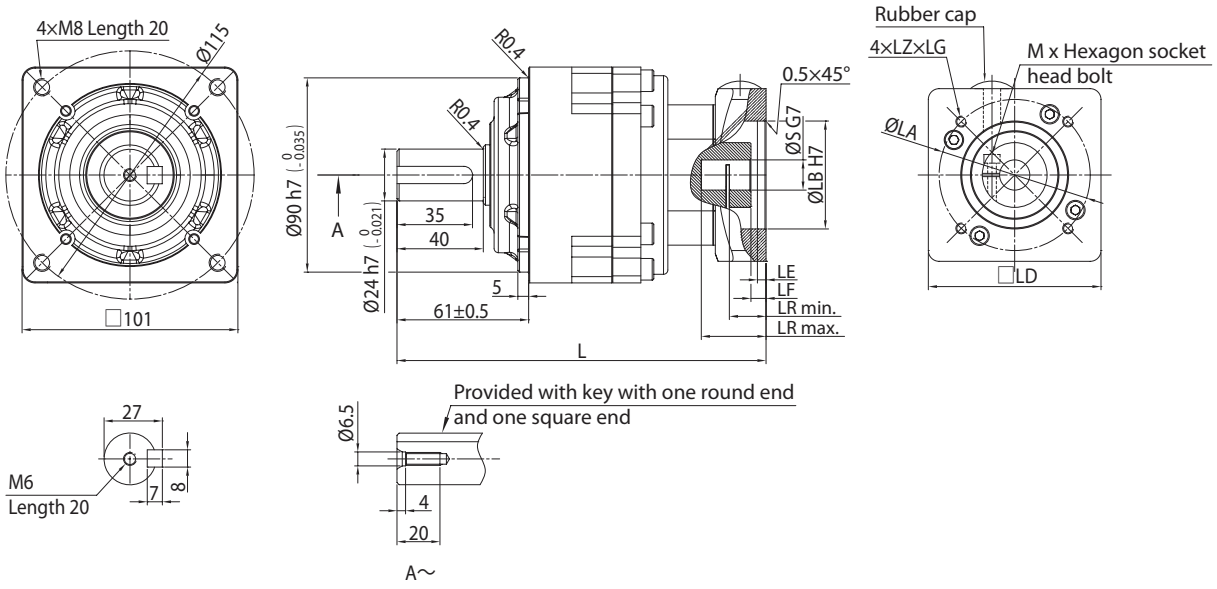


Motor Flange Code	Dimension													Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
KH	171	70	50	80	7	7	10	Blind hole	M5	31	17	14	M5	3.8	KH
7S	171	90	70	80	7.5	7.5	10	Blind hole	M5	41	20.5	19	M6	3.8	7S
1G	171	90	70	80	7.5	7.5	10	Blind hole	M6	41	20.5	19	M6	3.8	1G
2J Note:4	178.5	100	80	90	15	15	12	Blind hole	M6	33	28	10	M6	3.8	2J
0V Note:3 Note:4	178.5	100	80	90	15	15	12	Blind hole	M6	31	27	14	M5	3.8	0V
7B	188	115	95	100	10	24.5	16	Blind hole	M8	56	37.5	19	M6	3.8	7B

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Tolerance of coupling for motor flange code "0V" is over tolerance (+0.012–+0.023).
4. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE20
Reduction Ratio 35, 45

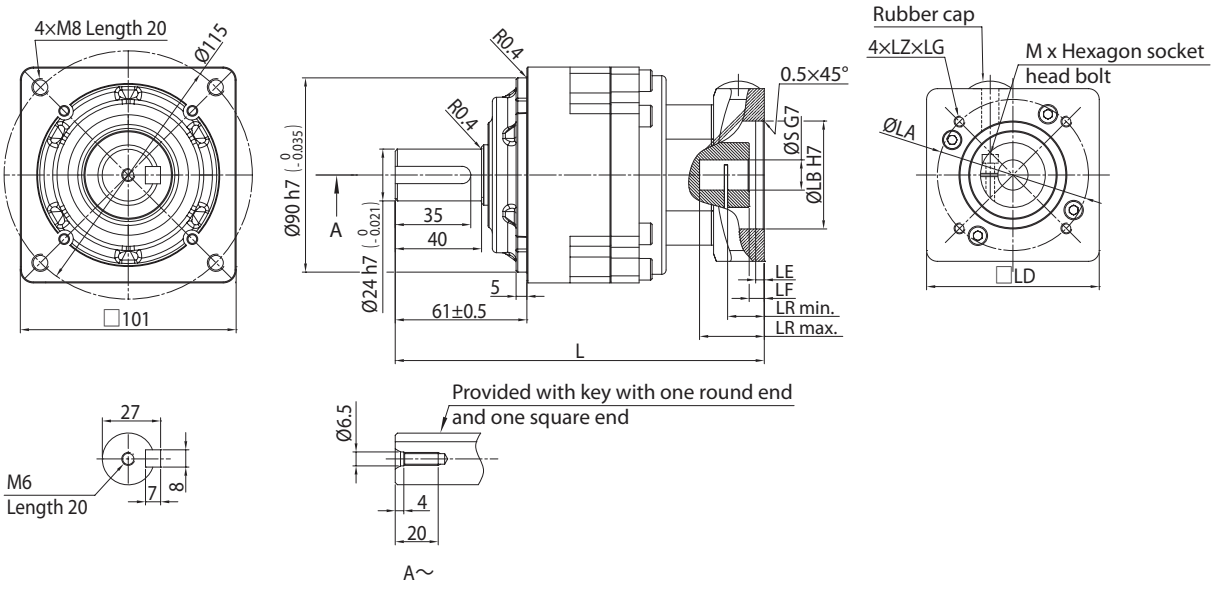


Motor Flange Code	Dimension														Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
KD	165	46	30	60	4	7	8	Blind hole	M4	26	15	8	M3	3.2	KD
2H Note:3	165	70	50	60	5	7	10	Blind hole	M5	26	15	9	M3	3.2	2H
2L	165	70	50	60	4	7	10	Blind hole	M4	31	17	11	M5	3.2	2L
2P	165	70	50	60	4	7	10	Blind hole	M4	31	17	14	M5	3.2	2P
2R	165	70	50	60	4	7	10	Blind hole	M5	31	17	14	M5	3.2	2R

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE20
Reduction Ratio 81

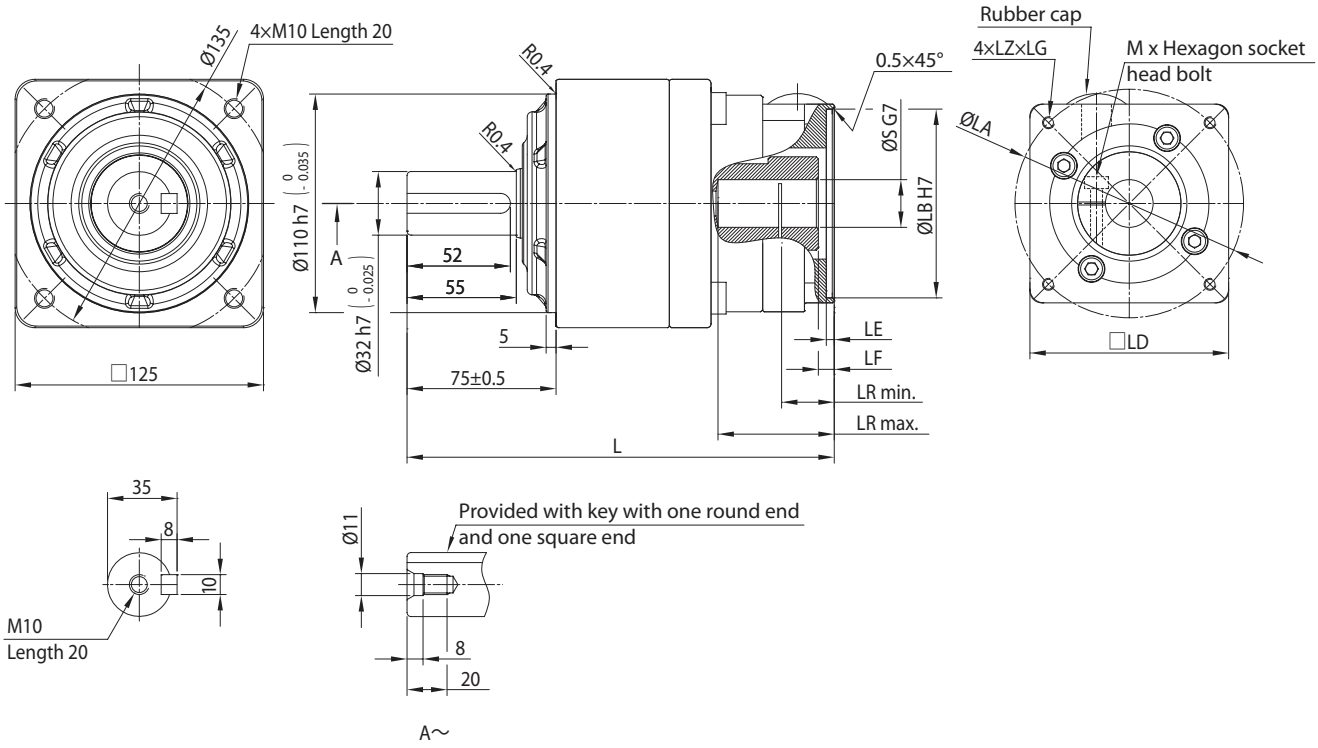


Motor Flange Code	Dimension													Motor Flange Code
	L	LA	LB	LD	LE	LF	LG		LZ	LR		S	M	Mass [kg]	
								Thread hole shape		max	min				
KA	158	45	30	40	4	5	6	Blind hole	M3	26	13	8	M3	3.0	KA
KC	158	46	30	40	4	5	8	Blind hole	M4	26	13	8	M3	3.0	KC
2D Note:3	161	46	30	40	6	8	8	Blind hole	M4	29	16	8	M3	3.1	2D

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE30
Reduction Ratio 3, 5

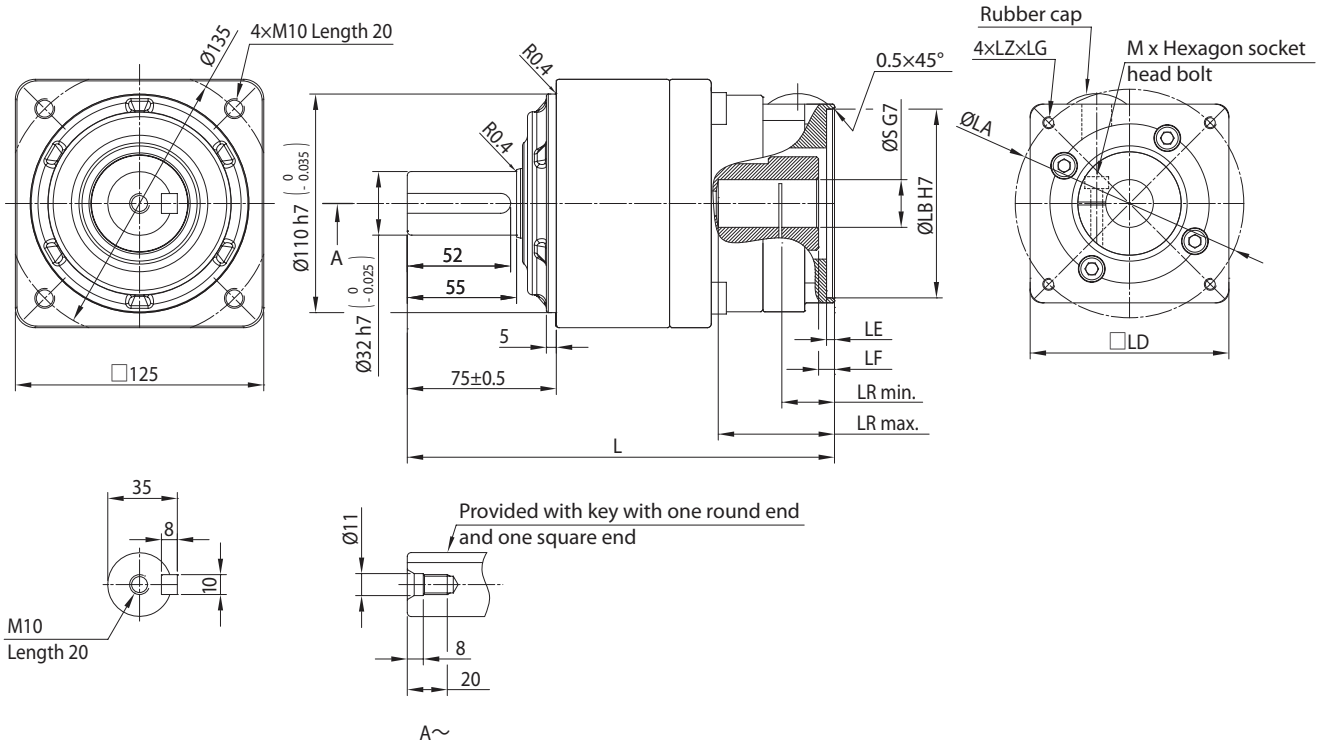


Motor Flange Code	Dimension													Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
7B	215	115	95	100	4	8	15	Blind hole	M8	56	26.5	19	M6	11.5	7B
1L	215	115	95	100	4	8	15	Blind hole	M6	56	26.5	24	M6	11.5	1L
1S	215	145	110	120	7	8	17	Through hole	M8	56	26	22	M8	12.0	1S
KQ	215	145	110	130	7	8	18	Through hole	M8	56	26	22	M8	12.0	KQ
7Z	225	145	110	130	7	10	20	Through hole	M8	66	29.5	24	M8	13.0	7Z
1T	225	145	110	130	7	10	20	Through hole	M8	66	29.5	28	M8	12.0	1T
8P Note:3	227	145	110	130	15	20	18	Through hole	M8	56	38.5	24	M6	13.0	8P
0X Note:3	240	200	114.3	174	15	15	20	Through hole	M12	80	34	35	M8	15.0	0X

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE30
Reduction Ratio 9

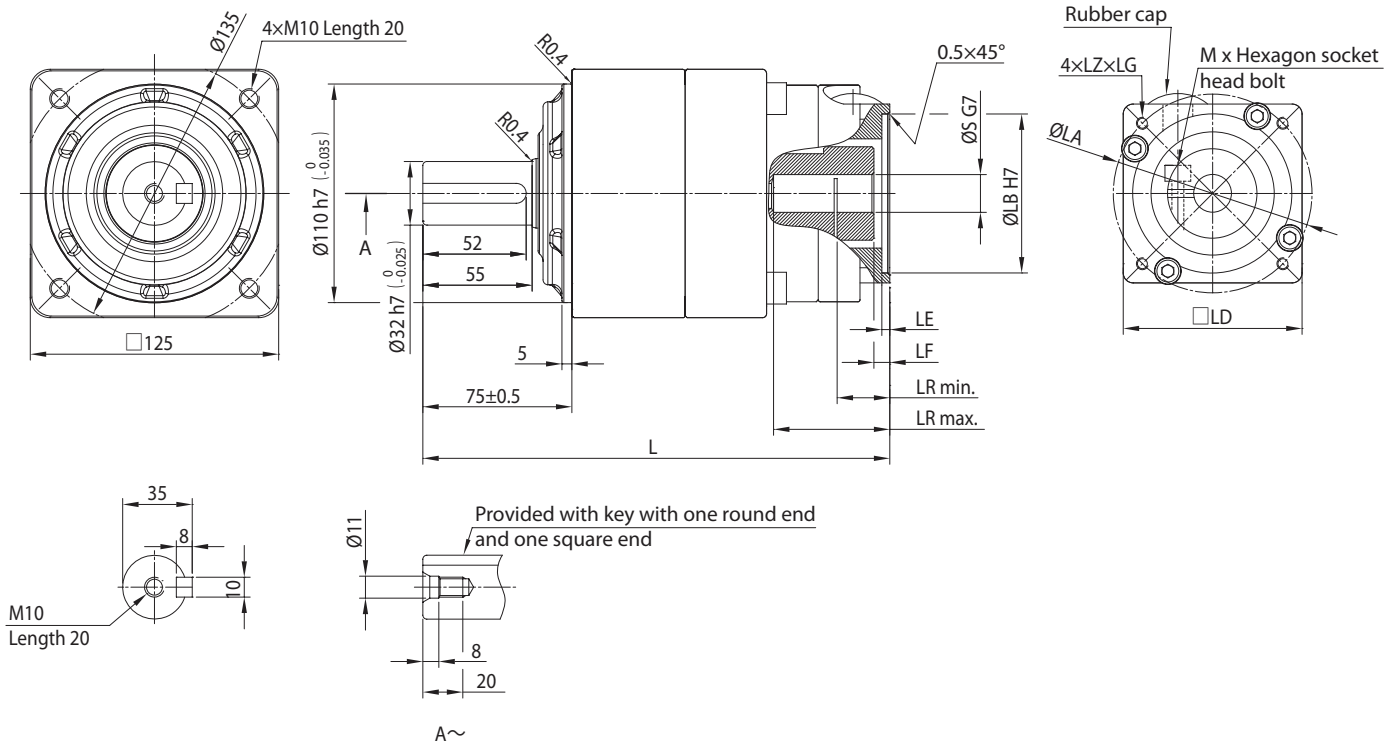


Motor Flange Code	Dimension													Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
7S	215	90	70	90	4	8	12	Blind hole	M5	56	26.5	19	M6	11.0	7S
KK	215	90	70	90	7	8	12	Blind hole	M6	56	26.5	19	M6	11.0	KK
7V	215	100	80	90	4	8	12	Blind hole	M6	56	26.5	19	M6	11.0	7V
7B	215	115	95	100	4	8	15	Blind hole	M8	56	26.5	19	M6	11.0	7B
1L	215	115	95	100	4	8	15	Blind hole	M6	56	26.5	24	M6	11.0	1L
1S Note:3	215	145	110	120	7	8	17	Through hole	M8	56	26	22	M8	12.0	1S
KQ	215	145	110	130	7	8	18	Through hole	M8	56	26	22	M8	12.0	KQ
1T Note:3	225	145	110	130	7	10	20	Through hole	M8	66	29.5	28	M8	12.0	1T
7X Note:3	227	145	110	130	15	20	18	Through hole	M8	56	38.5	19	M6	12.0	7X
8P Note:3	227	145	110	130	15	20	18	Through hole	M8	56	38.5	24	M6	12.0	8P

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE30
Reduction Ratio 15, 20, 25

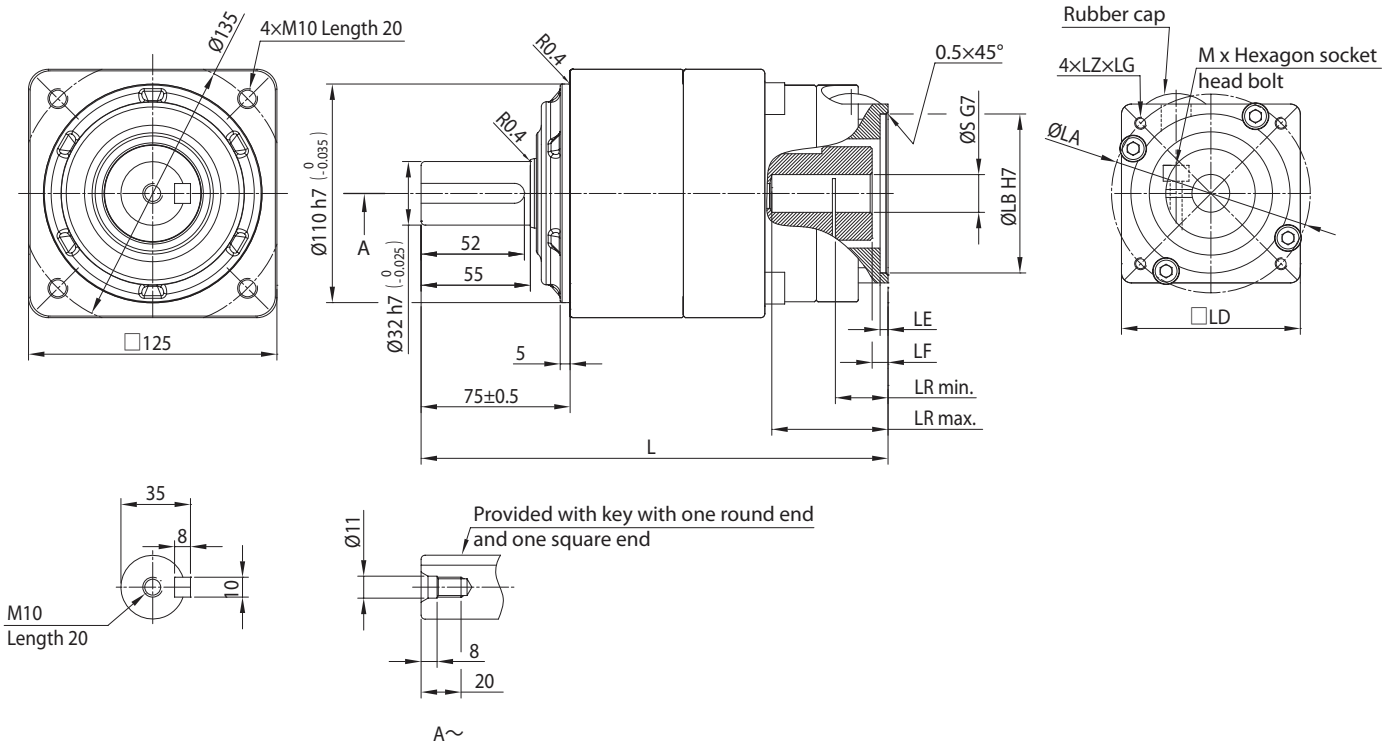


Motor Flange Code	Dimension														Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max	LR min	S	M	Mass [kg]	
7S	235	90	70	90	4	8	12	Blind hole	M5	56	26.5	19	M6	12.0	7S
KK	235	90	70	90	7	8	12	Blind hole	M6	56	26.5	19	M6	12.0	KK
7V	235	100	80	90	4	8	12	Blind hole	M6	56	26.5	19	M6	12.0	7V
7B	235	115	95	100	4	8	15	Blind hole	M8	56	26.5	19	M6	12.0	7B
1L	235	115	95	100	4	8	15	Blind hole	M6	56	26.5	24	M6	12.0	1L
7X Note:3	247	145	110	130	15	20	18	Through hole	M8	56	38.5	19	M6	12.0	7X
8P Note:3	247	145	110	130	15	20	18	Through hole	M8	56	38.5	24	M6	12.0	8P

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE30
Reduction Ratio 35

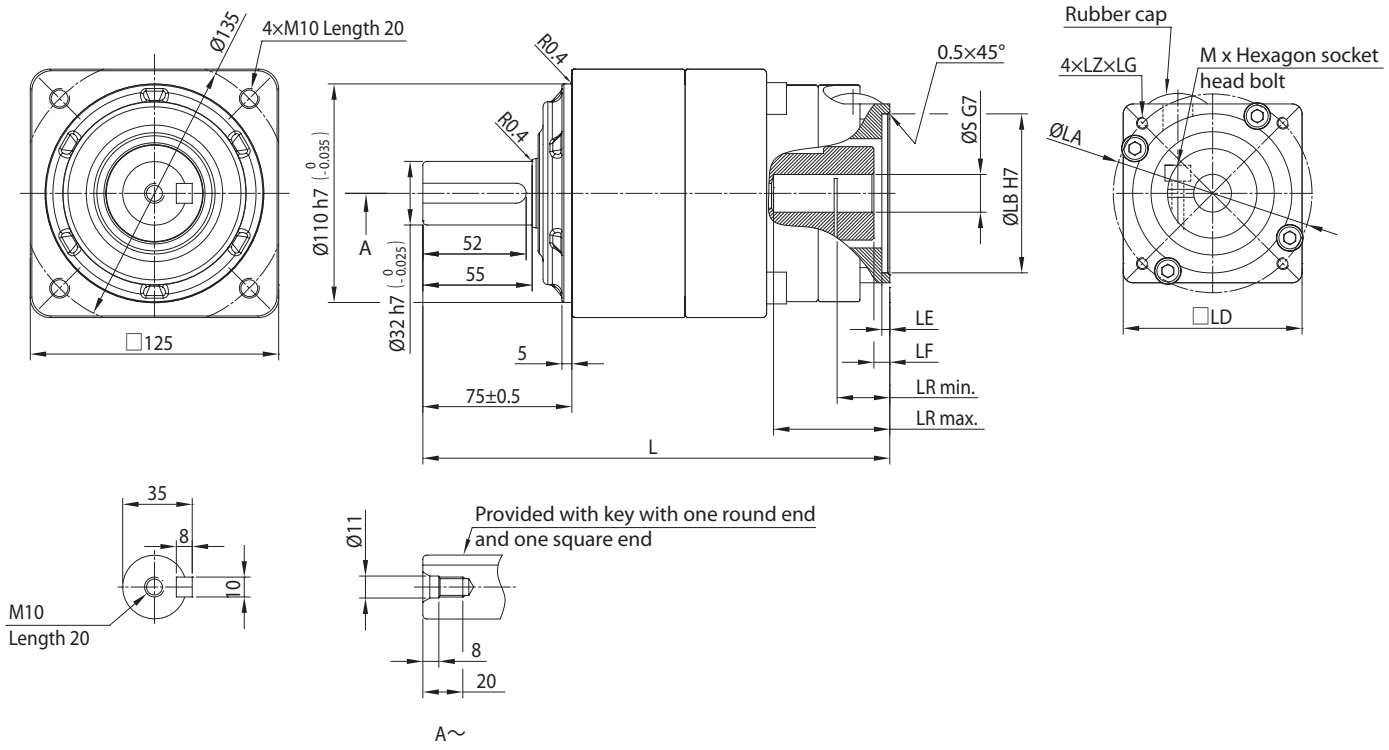


Motor Flange Code	Dimension													Motor Flange Code
	L	LA	LB	LD	LE	LF	LG		LZ	LR		S	M	Mass [kg]	
								Thread hole shape		max	min				
KH	210	70	50	80	7	7	10	Blind hole	M5	31	17	14	M5	7.2	KH
7S	210	90	70	80	7.5	7.5	10	Blind hole	M5	41	20.5	19	M6	7.2	7S
1G	210	90	70	80	7.5	7.5	10	Blind hole	M6	41	20.5	19	M6	7.2	1G
2J Note:3	217.5	100	80	90	15	15	12	Blind hole	M6	33	28	10	M6	7.2	2J
0V Note:3 Note:4	217.5	100	80	90	15	15	12	Blind hole	M6	31	27	14	M5	7.2	0V
7B	227	115	95	100	10	24.5	16	Blind hole	M8	56	37.5	19	M6	7.2	7B

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Tolerance of coupling for motor flange code "0V" is over tolerance (+0.012–+0.023).
4. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Dimension Drawings

Frame Size PE30
Reduction Ratio 45, 81



Motor Flange Code	Dimension														Motor Flange Code
	L	LA	LB	LD	LE	LF	LG	Thread hole shape	LZ	LR max.	LR min.	S	M	Mass [kg]	
KD	210	46	30	60	4	7	8	Blind hole	M4	26	15	8	M3	7.2	KD
2H Note:4	210	70	50	60	5	7	10	Blind hole	M5	26	15	9	M3	7.2	2H
2L	210	70	50	60	4	7	10	Blind hole	M4	31	17	11	M5	7.2	2L
2P	210	70	50	60	4	7	10	Blind hole	M4	31	17	14	M5	7.2	2P
2R	210	70	50	60	4	7	10	Blind hole	M5	31	17	14	M5	7.2	2R
KH	235	70	50	80	4	8	10	Blind hole	M5	41	18	14	M5	7.2	KH
7S	235	90	70	80	4	8	10	Blind hole	M5	41	26.5	19	M6	12.0	7S
1G	235	90	70	80	4	8	12	Blind hole	M6	41	26.5	19	M6	12.0	1G
7B	235	115	95	100	4	8	15	Blind hole	M8	56	26.5	19	M6	12.0	7B
2J Note:4	242	100	80	100	10	15	12	Blind hole	M6	33	27	10	M6	13.0	2J
0V Note:3 Note:4	242	100	80	100	10	15	12	Blind hole	M6	31	27	14	M5	13.0	0V

Note: 1. Dimension of shaft end key: Dimension tolerance conforms to JIS B 1301-1996 "Parallel Key."
2. Dimensions and mass shown in the above figures are subject to change without prior notification.
3. Tolerance of coupling for motor flange code "0V" is over tolerance (+0.012–+0.023).
4. Motor flanges for Fanuc motor will be launched in 2020.
Please contact us.

Moment of Inertia (at Motor Shaft)

Table 4 Moment of Inertia (at Motor Shaft)

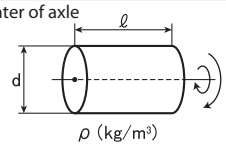
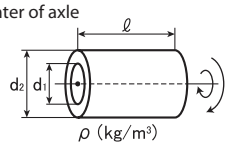
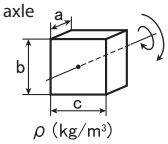
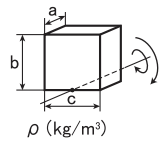
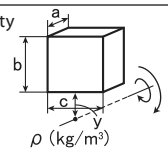
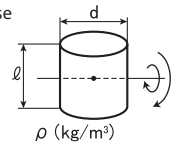
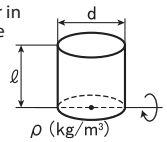
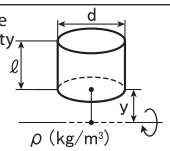
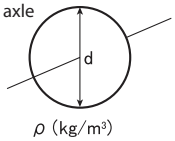
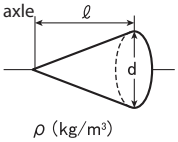
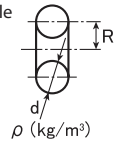
Unit: $\times 10^{-4} kg \cdot m^2$

Frame Size	Input shaft hollow (mm)	Motor Flange Code	Reduction Ratio								
			3	5	9	15	20	25	35	45	81
PE10	8	KA, KC, KD, 2D *	0.145	0.118	0.0350	0.0350	0.0340	0.0325	0.0300		
	9	2H *									
	11	2L									
	14	2P, 2R									
PE15	8	KA, KC, KD, 2D *			0.275	0.300	0.294	0.288	0.262	0.0285	0.0270
	9	2H *		0.713							
	10	2J *	0.913								
	11	2L			0.275	0.300	0.294	0.288	0.262		
	14	2P, 2R, KH, 0V *	0.913	0.713							
	19	1G, 7B, 7S									
PE20	8	KA, KC, KD, 2D *								0.256	0.0300
	9	2H *							0.269		
	10	2J *			0.600	0.650	0.640	0.630			
	11	2L								0.256	
	14	2P, 2R, KH, 0V *			0.650	0.700	0.690	0.680	0.269		
	19	KK, 1G, 7B, 7S, 7V, 7X *	2.43	1.85							
	24	1L, 8P *									
PE30	8	KD									0.240
	9	2H *								0.450	
	10	2J *							0.470		
	11	2L									0.240
	14	2P, 2R, KH, 0V *							0.470	0.450	
	19	KK, 1G, 7B, 7S, 7V, 7X *		3.50	2.81	2.80	1.91	1.88	0.900	0.850	
	22	1S, KQ	5.50								
	24	1L, 7Z, 8P *	5.78	3.75		2.80					
	28	1T									
	35	0X *	8.70	6.25							

Note: Motor flanges for Fanuc motor indicated by * will be launched in 2020.
Please contact us.

Formula to Calculate Moment of Inertia

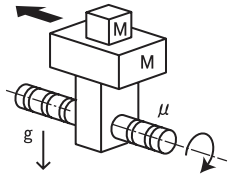
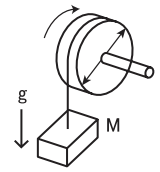
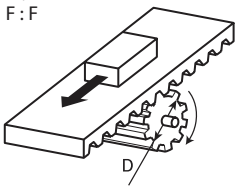
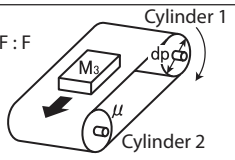
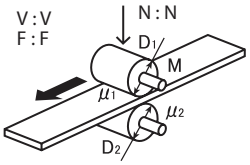
• Formula to Calculate Moment of Inertia

Location of rotation	Shape	Mass M [kg]	Moment of Inertia J [kgm^2]
Center of axle 	Cylinder	$\frac{1}{4}\cdot\pi\cdot d^2\cdot\ell\cdot\rho$	$\frac{1}{32}\cdot\pi\cdot d^4\cdot\ell\cdot\rho$
Center of axle 	Cylinder hollow	$\frac{1}{4}\cdot\pi\cdot(d_1^2-d_2^2)\cdot\ell\cdot\rho$	$\frac{1}{32}\cdot\pi\cdot(d_1^4-d_2^4)\cdot\ell\cdot\rho$
Center of axle 	Rectangular solid	$a\cdot b\cdot c\cdot\rho$	$\frac{a\cdot b\cdot c}{12}\cdot(b^2+c^2)\cdot\rho$
Off center 	Rectangular solid	$a\cdot b\cdot c\cdot\rho$	$\frac{a\cdot b\cdot c}{12}\cdot(4b^2+c^2)\cdot\rho$
Eccentricity 	Rectangular solid	$a\cdot b\cdot c\cdot\rho$	$\frac{a\cdot b\cdot c}{12}\cdot(4b^2+c^2+12b\cdot y+12y^2)\cdot\rho$
Transverse center 	Cylinder	$\frac{1}{4}\cdot\pi\cdot d^2\cdot\ell\cdot\rho$	$\frac{\pi\cdot d^2\cdot\ell}{192}\cdot(4\ell+3d^2)\cdot\rho$
Off center in transverse direction 	Cylinder	$\frac{1}{4}\cdot\pi\cdot d^2\cdot\ell\cdot\rho$	$\frac{\pi\cdot d^2\cdot\ell}{192}\cdot(16\ell^2+3d^2)\cdot\rho$
Transverse eccentricity 	Cylinder	$\frac{1}{4}\cdot\pi\cdot d^2\cdot\ell\cdot\rho$	$\frac{\pi\cdot d^2\cdot\ell}{192}\cdot(16\ell^2+3d^2+48y\cdot\ell+48y^2)\cdot\rho$
Center of axle 	Sphere	$\frac{1}{6}\cdot\pi\cdot d^2\cdot\rho$	$\frac{1}{60}\cdot\pi\cdot d^5\cdot\rho$
Center of axle 	Cone	$\frac{1}{12}\cdot\pi\cdot d^2\cdot\ell\cdot\rho$	$\frac{1}{160}\cdot\pi\cdot d^4\cdot\ell\cdot\rho$
Center of axle 	Torus	$\frac{1}{2}\cdot\pi^2\cdot R\cdot d^2\cdot\rho$	$\frac{\pi^2\cdot R\cdot d^2}{8}\cdot(4R^2+\frac{3d^2}{4})\cdot\rho$

Dimension: d、ℓ、a、b、c、y、R (m)
Density : ρ (kg/m³)

Formula for Calculation of Moment of Inertia, Load Torque, and Acceleration Torque

• Formula for Calculation of Moment of Inertia, Load Torque, and Acceleration Torque

Specification	Diagram	Load moment of Inertia J [kg·m²]	Load torque of reducer output shaft T [N·m]	Acceleration torque of reducer output shaft T_S [N·m]	Relation Ship of Output Speed and Speed N [r/min]
Object in linear motion	V: V F: F  J_B: Inertia of ball screw [kg·m²]	$M(\frac{P}{2\pi})^2+J_B$	$\frac{P}{2\pi}(\mu \cdot M \cdot g+F)$	$\frac{2\pi \cdot N \cdot J_L}{60ta}$	$\frac{V}{P}$
		M : Mass of load [kg] P : Pitch of ball screw [m]	μ: Friction coefficient of ball screw g : Gravity acceleration [9.8m/sec²] F : External force [N]	J_L : Load inertia converted to output shaft of the reducer [kg·m²] N : Speed [r/min] t_a : Acceleration time [sec]	V : Acceleration [m/min] P : Pitch of ball screw [m]
Hoisting object with a pulley	 J=J₁+J₂ J₁: Inertia of drum [kg·m²] J₂: Inertia of object [kg·m²]	$\frac{M_1 \cdot D^2}{8}+\frac{M_2 \cdot D^2}{4}$	$F \cdot \frac{D}{2}$	$\frac{2\pi \cdot N \cdot J_L}{60ta}$	$\frac{V}{\pi \cdot D}$
		M_1: Mass of cylinder [kg] M_2: Mass of suspended object [kg] D : Diameter of drum [m]	F: External load [N] = M_2·g g: Gravity acceleration [9.8m/sec²]	J_L : Load inertia converted to output shaft of the reducer [kg·m²] N : Speed [r/min] t_a : Acceleration time [sec]	V : Acceleration [m/min] D : Drum diameter [m]
Transfer by rack or pinion	V : V F : F  	$\frac{M \cdot D^2}{4}$	$F \cdot \frac{D}{2}+F_\ell$	$\frac{2\pi \cdot N \cdot J_L}{60ta}$	$\frac{V}{R}$
		M : Mass of rack [kg] D : PCD of pinion [m]	F : External force [N] g : Gravity acceleration [9.8m/sec²] F_ℓ: Contact loss [N·m]	J_L : Load inertia converted to output shaft of the reducer [kg·m²] N : Speed [r/min] t_a : Acceleration time [sec]	V : Velocity [m/min] R = π dp or Zp·Lp dp : P,C,D(m) Zp : Teeth number Lp : Pitch
Transfer by belt conveyer	F : F  J=J₁+J₂+J₃+J₄ J₁ : Inertia of cylinder 1 [kg·m²] J₂ : Inertia of cylinder 2 [kg·m²] J₃ : Inertia of substance [kg·m²] J₄ : Inertia of belt [kg·m²]	$\frac{M_1 \cdot D_1^2}{8}+\frac{M_2 \cdot D_2^2}{8} \cdot \frac{D_1^2}{D_2^2}+\frac{M_3 \cdot D_1^2}{4}+\frac{M_4 \cdot D_1^2}{4}$	$\frac{1}{2}D(F+\mu \cdot M_3 \cdot g)$	$\frac{2\pi \cdot N \cdot J_L}{60ta}$	$\frac{V}{D_1}$
		M_1 : Mass of cylinder 1 [kg] M_2 : Mass of cylinder 2 [kg] M_3 : Mass of object [kg] M_4 : Mass of belt [kg] D_1 : Diameter of cylinder 1 [m] D_2 : Diameter of cylinder 2 [m]	F : External force [N] g : Gravity acceleration [9.8m/sec²]	J_L : Load inertia converted to output shaft of the reducer [kg·m²] N : Speed [r/min] t_a : Acceleration time [sec]	V : Velocity [m/min] D_1 : Diameter of cylinder 1 [m]
Transfer by roll feed	V : V F : F N : N  J_1 : Inertia of roller 1 [kg·m²] J_2 : Inertia of roller 2 [kg·m²]	$J_1+(\frac{D_1}{D_2})^2 \cdot J_2+\frac{M \cdot D_1^2}{4}$	$\frac{D(F+N \cdot \mu_1+Mg \cdot \mu_2)}{2}$	$\frac{2\pi \cdot N \cdot J_L}{60ta}$	$\frac{N}{\pi \cdot D_1}$
		D_1 : Diameter of roll 1 [m] D_2 : Diameter of roll 2 [m] M : Equivalent mass of work [kg]	F : Tension [N] g : Gravity acceleration [9.8m/sec²] N : Welding force [N]	J_L : Load inertia converted to output shaft of the reducer [kg·m²] N : Speed [r/min] t_a : Acceleration time [sec]	V : Velocity [m/min] D_1 : Roll diameter [m]

Note: 1. Calculate inertia and make additions when using additional apparatus for each drive part.
2. Calculate each element for frictional force and convert to frictional force at output shaft of reducer if necessary.
3. Calculate each element for external force and convert to external torque at output shaft of reducer if necessary.

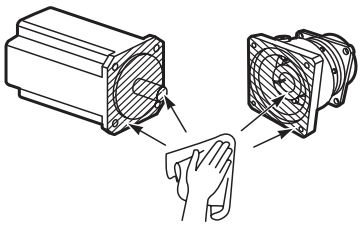
Motor Attachment Procedure

Either straight type, shaft with keyway, or D shaft may be attached to the motor shaft, because special coupling is used for shaft connection part of reducer and motor.
Follow the process below from (1) through (8) for assembly.
(Remove key while assembly for shaft with keyway.)

(1) Remove anti-corrosive agent and oil on the motor shaft.
(2) Place reducer on an appropriate worktable with coupling ③ on the top side.
(3) Remove fitting ① of the setting hole of the reducer unit.
(4) Match the location by turning by hand to tighten tightening bolt of the coupling into setting hole ① of the reducer unit
(5) Insert motor shaft into the center hole of the coupling ③, press in vertically and fit the pilot part of the adaptor plate ④ and motor.
(6) Tighten motor and adaptor plate ④ with motor attachment bolt.
(7) Using a torque wrench bolt, tighten coupling tightening bolt ② with tightening torque shown in Table 5 through the setting hole.
(8) Replace the fitting ① of the setting hole of the reducer unit.

Table 5 Tightening torque of bolt

Motor flange code	Coupling hole diameter mm	Tightening bolt	Tightening torque Nm
KA, KC, KD, 2D *	8	M3	1.67
2H *	9	M3	1.67
2J *	10	M6	8.83
2L	11	M5	7.35
2P, 2R	14	M4	3.92
		M5	7.35
KH, 0V *	14	M5	7.35
1G, 7B, 7S, 7V, KK, 7X *	19	M6	8.83
1S, KQ	22	M8	21.6
1L, 8P *	24	M6	8.83
7Z	24	M8	21.6
1T	28	M8	21.6
0X *	35	M8	21.6



Note: Motor flanges for Fanuc motor indicated by ∗ will be launched in 2020.
Please contact us.

Make sure that the selected torque can allow peak torque at start and stop in your operation cycle using the following formula.

$$\frac{\text{Peak torque at start or stop}}{\text{Reduction ratio}} \leqq \text{Allowable transmission torque}$$

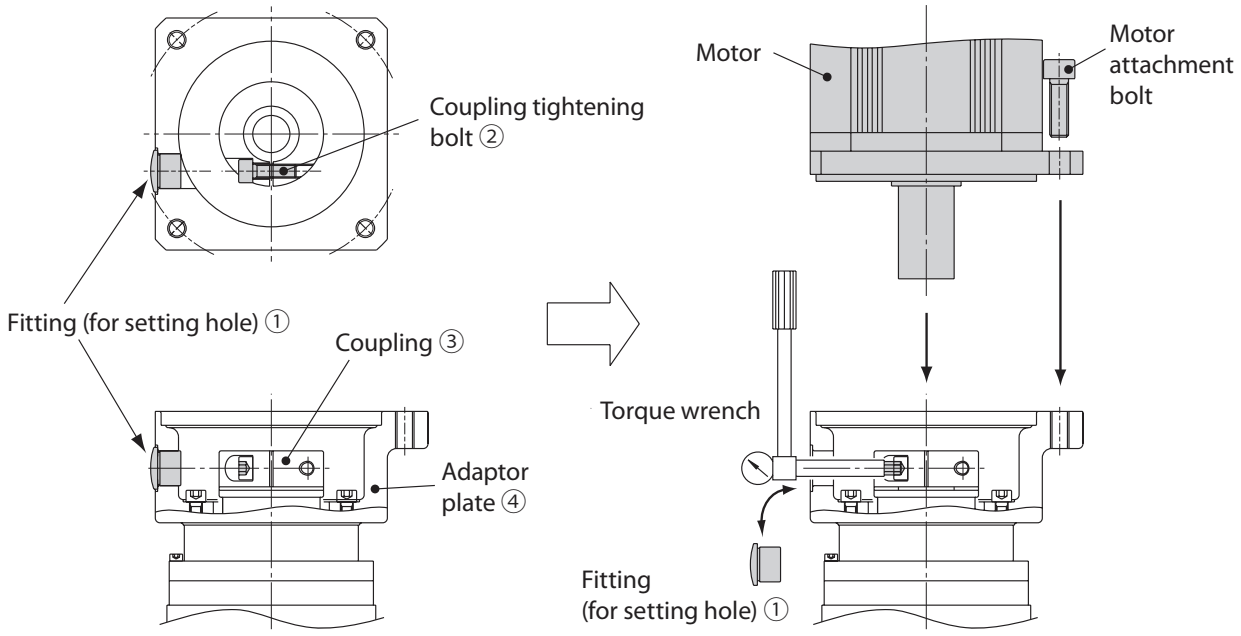


Fig. 5 Assembling Diagram

Warranty and Safety Precautions

Warranty Period	The warranty period for the Products shall be 18 months after the commencement of delivery or 18 months after the shipment of the Products from the seller's works or 12 months from the Products coming into operation, whichever comes first.
Warranty Condition	In the event that any problem or damage to the Product arises during the "Warranty Period" from defects in the Product whenever the Product is properly installed and combined with the Buyer's equipment or machines, maintained as specified in the maintenance manual, and properly operated under the conditions described in the catalog or as otherwise agree upon in writing between the Seller and the Buyer or its customers; the Seller will provide, at its sole discretion, appropriate repair or replacement of the Product without charge at a designted facility, except as stipulated in the "Warranty Exclusions" as described below. However, if the Product is installed or integrated into the Buyer's equipment or machines, the Seller shall not reimburse the cost of: removal or re-installation of the Product or other incidental costs related thereto, any lost opportunity, any profit loss or other incidental or consequential losses or damages incurred by the Buyer or its customers.
Warranty Exclusions	Notwithstanding the above warranty, the warranty as set forth herein shall not apply to any problem or damage to the Product that is caused by: 1. installation, connection, combination or integration of the Product in or to the other equipment or machine that is rendered by any person or entity other than the Seller; 2. insufficient maintenance or improper operation by the Buyer or its customers, such that the Product is not maintained in accordance with the maintenance manual provided or designated by the Seller; 3. improper use or operation of the Product by the Buyer or its customers that is not informed to the Seller, including, without limitation, the Buyer's or its customers, operation of the Product not in conformity with the specifications, or use of lubricating oil in the Product that is not recommended by the Seller; 4. any problem or damage on any equipment or machine to which the Product is installed, connected or combined or on any specifications particular to the Buyer or its customers; 5. any changes, modifications, improvements or alterations to the Product or those functions that are rendered on the Product by any person or entity other than the Seller; 6. any parts in the Product that are supplied or designated by the Buyer or its customers; 7. earthquake, fire, flood, sea-breeze, gas, thunder, acts of God or any other reasons beyond the control of the Seller; 8. normal wear and tear, or deterioration of the Products, parts, such as bearings, oil-seals; 9. any other troubles, problems or damage to the Product that are not attributable to the Seller.

⚠ SAFETY PRECAUTIONS

- Observe the safety rules for the installation site and equipment strictly
  (Industrial safety and health law, technical standard for electric facilities, extension rules, plant explosion guidelines, building standards law, etc). Read the maintenance manual carefully before use. Request a copy from the distributor of the Product
- Read the maintenance manual carefully before use.
  Request a copy from the distributor of the Product or our Sales Department if the maintenance manual is not handy.
  A copy of maintenance manual should always reach the actua user of the Product.
- Select a sufficient product for the usage condition and application.
- Install protective equipment on the machine side when the machine is used for applications which may cause loss of human life or significant loss in facility, such as use for human transportation or elevators.
- Install an oil pan or other preventive devices in case of oil leakage due to failure or termination of service life when the machine is used for food processing equipment, clean room, or other applications that are sensitive to oil.

Worldwide Locations

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