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## Sumitomo Drive Technologies



# PARAMAX®

## SEB Series Extruder Drives

Specifications, dimensions, and other items are subject to change without prior notice.

 Sumitomo Heavy Industries Gearbox Co., Ltd.

Headquarter 16-1, Wakihama 4-chome, Kaizuka-shi, Osaka 597-8555, Japan

## No.Y0301E-1.0.1

EA04

 Sumitomo Heavy Industries Gearbox Co., Ltd.

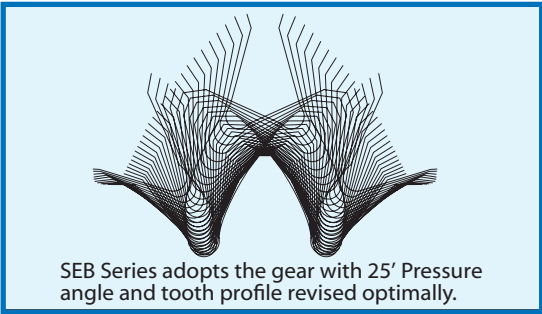
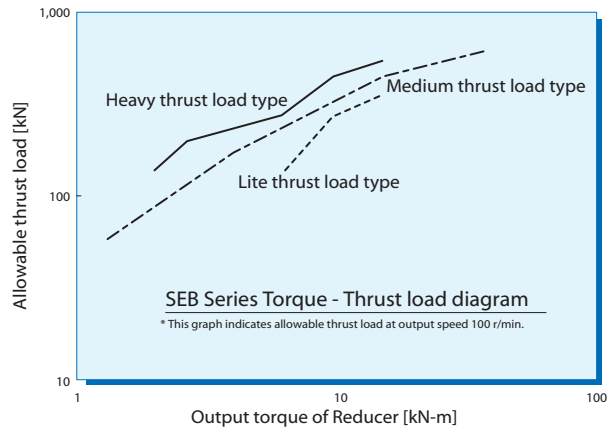
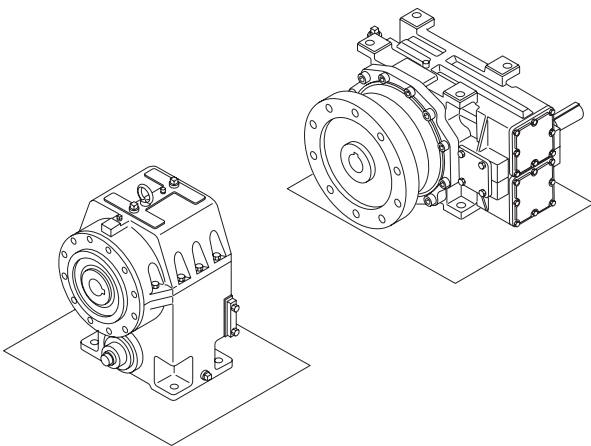
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# Features

## Extruder Drives

### SEB Series

Rated Torque 1.3~36kN-m



- 1 Short term Delivery
- 2 Adequate Models
- 3 Powerful and Compact
- 4 Long Life
- 5 Balanced Design
- 6 Low Noise

- The SEB series performed the lineup of three types according to axial load for the first time throughout the industrial.
  - Lite thrust load type
    - Medium thrust load type
    - Heavy thrust load type

# Inverters & Motors for SEB Series

The inverter with high output, high function and high performance and the motor exclusively used for the inverter can realize operation with stable high torque, stable speed and good maintenance.

## inverter



### HF-430α Series 5.5kW~55kW 200V/400V class

- Sensorless vector control method ( In sensorless operation, speed change ratio;  $\pm 0.5\%$  )
- High torque is realized : torque **200%** at start and torque 150 or more during operation in 0.5Hz.
- Standard in the world  
Conformed to the overseas standard (CE/UL/C-UL)
- Overtorque can be detected (continuous operation) is possible in 6Hz - 60Hz.  
Because of the multi-functional output ( open collector output ), you can set torque in the 0-200% range.

## motor



### 3-Phase motor for Inverter Drive 0.4kW-75kW (Foot-mount type) 0.1kW-75kW (Flange-mount type)

- Constant torque operation (continuous operation) is available.  
Basis frequency : 60Hz (In 60Hz or more, constant output operation is done.)  
Maximum frequency : 80Hz - 120Hz (This is changed depending on capacity.)
- Because of a fully closed motor, maintenance is excellent.

## Table of Contents

● Features .....	1.2	● Thermal Rating.....	8
● Nomenclature.....	3	● Allowable Axial Load.....	9
● Standard Specifications .....	3	● With Spherical roller bearing .....	9
● Lubrication.....	4	● Allowable Radial Load on High Speed Shaft .	10
● Check .....	4	● Dimensions.....	11
● Painting.....	4	● Data sheet for order and inquiry .....	17
● Selection Procedure .....	5	● Dimension Range of Output Shaft Bore and Specification of Bearing Case.....	17
● Supplementary Data.....	6	● Options.....	19
● Rating Table.....	7		
● Exact Reduction Ratio .....	7		



# Nomenclature , Standard Specifications

## Nomenclature



Series	Size (Rating Output Torque kN·m [kgf·m] Approximate)	Number of Gear Stages	Type of Thrust Bearing	Shaft Arrangement	Reduction Ratio
SEB	004 ( 1.3 [ 129])	P2 (Double Reduction)	H Heavy Thrust Type		8~18
	005 ( 1.9 [ 197])				
	010 ( 2.6 [ 260])				
	020 ( 3.8 [ 390])		M Medium Thrust Type		
	030 ( 6.1 [ 620])				
	040 ( 9.5 [ 970])				
	050 ( 14.7 [ 1500])		T Lite Thrust Type		
	060 ( 22.6 [ 2300])				
070 ( 36.3 [ 3700])					

Note1. The shaft arrangement of lite thrust type is only RLWR.

## Standard Specifications

### 1. Gear

	Helical Gear
Material	Alloy steel
Heat Treatment	Carburizing
Finishing	Grinding
Hardness	HRC58~62

- 2. Bearings      Shafts supported on taper roller, spherical roller and deep groove ball bearings of ample capacity for radial loads.
- 3. Hollow Shaft      Hollow shafts are manufactured from chrome molybdenum steel to withstand the increased thrust loads.
- 4. Housing      Housings are manufactured from high quality cast iron and designed to maximize rigidity and durability.
- 5. Seal      Machined surfaces of housing and covers are finished to a close tolerance and are completely sealed with liquid packing. Oil seals with dust lips are used on rotating shafts.

# Lubrication, Inspection, Painting

## Lubrication

The oil bath lubrication method is used for all models.  
Forced lubrication is used when additional cooling required.

### Lubricant

The table on the right shows appropriate viscosity of oil based on ISO and AGMA for respective ambient temperatures. When the ambient temperature is lower than -10°C or higher than +50°C, a heating or cooling unit is usually necessary.

### Lubricant viscosity

	Ambient temperature		
	-10°C~ +15°C	0°C~30°C	+10°C~ +50°C
ISO*	VG100	VG150	VG220
AGMA	3EP	4EP	5EP

\*ISO: Kinetic viscosity (cSt) at 40°C

### Recommended Lubricants

	Brand	ARAL	BP	CASTROL	CH EVRON	ELF	EXXONMOB I L	FINA	GULF	SHELL	SUNOCO	TEXACO	TOTAL	WINTER-SHALL	
Gear oil	ISO VG100 AGMA 3EP	DEGOL BG100	EN ERGOL GR-XP-100	ALPHA SP100	NL GEAR COM- POUND 100	REDUC- TELF SP100	SPARTAN EP100	MOBIL- GEAR 627	GIRAN 100	EP LUBRI- CANT HD100	OMARA 100	SUNEP 1055 ISO100	MEROPA 100	CARTER EP100	WIOLAN IT100
	ISO VG220 AGMA 5EP	DEGOL BG220	EN ERGOL GR-XP-220	ALPHA SP220	NL GEAR COM- POUND 220	REDUC- TELF SP220	SPARTAN EP220	MOBIL- GEAR 630	GIRAN 220	EP LUBRI- CANT HD220	OMARA 220	SUNEP 1070 ISO220	MEROPA 220	CARTER EP220	WIOLAN IT220
	ISO VG320 AGMA 6EP	DEGOL BG320	EN ERGOL GR-XP-320	ALPHA SP320	NL GEAR COM- POUND 320	REDUC- TELF SP320	SPARTAN EP320	MOBIL- GEAR 632	GIRAN 320	EP LUBRI- CANT HD320	OMARA 320	SUNEP 1070 ISO320	MEROPA 320	CARTER EP320	WIOLAN IT320

## Inspection

All SEB-Drives are operated running-in with enough and inspected before shipment about other than order specifications. For example, reducer are checked whether have error parts by rotation CW and CCW and no load operation for some hours. Then they are checked about following items.

1. Temperature of oil
2. Temperature rise at part of bearings
3. Noise
4. Tooth contact
5. Rotation speed (Reduction ratio)
6. Vibration

## Painting

### Specification of Painting

Surface Conditioning : Shot blast ( Before machining, After washing )

Inner Painting : 1 layer of modified alkyd resin

Outer Painting : [Undercoating] 1 layer of modified alkyd resin

[Final coating] 1 layer of middle oiliness (alkyd resin) phthalate resin enamel paint

Paint color : Mansel 6.5PB 3.6/8.2

# Selection of Drive

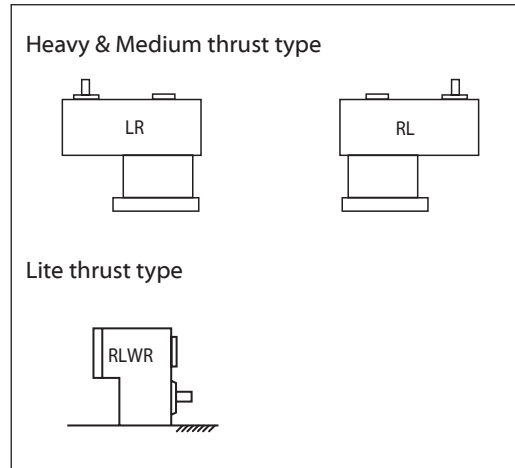
## The way to select extruder drive

In the case of selecting the extruder drive, show us the following matter.

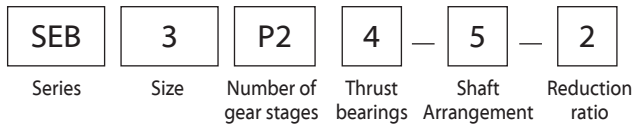
### ● Operating condition

Raw material	
Actual transmission power or motor power	kW
Input speed	r/min
Screw speed (Low Speed Shaft)	r/min
Direction of rotation	
Thrust load (Maximum)	kN[kgf]
Shaft arrangement	
Ambient temperature	°C
Overhung member (High speed shaft)	
Actual radial load (High speed shaft)	kN[kgf]

### Shaft arrangement



### 1) Selection Procedure



			Reference						
1	Service factor (S.F)	S.F=1.25 (In the case that the load fluctuation is large when the material like rubber is used, S.F=1.5)							
2	Reduction ratio and Input speed	Reduction Ratio $i = \frac{\text{Input Speed}}{\text{Output speed}}$ Exact Reduction Ratio $i \theta$ Select from "Exact Reduction Ratio" Input speed = Output speed $\times$ Exact Reduction Ratio	P.7 "Exact Reduction Ratio" The input speed should be less than 1800r/min.						
3	Decision of Size	Equivalent Transmission Power = $\frac{\text{Actual transmission power or Motor power}}{\text{Rated Transmission Power}} \times \text{Service factor}$ Select the size of reducer that will satisfy the above.	P.7 "Mechanical power rating"						
4	Check of Thrust load	Thrust load $\leq$ Allowable thrust load Select the type of thrust bearing that will satisfy the above.	P.9 "Allowable thrust load"						
5	Select of Shaft arrangement	Select the shaft arrangement from RL, LR, RLWR. (It is only RLWR that lite thrust type is selected.)	P.12~16 "Dimensions"						
6	Check of Thermal rating	Actual transmission power or Motor power $\leq$ Thermal rating ...OK	P.8 "Thermal rating"						
7	Check of Overhung load	Overhung factor <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>Overhung member</td> <td>Overhung factor</td> </tr> <tr> <td>V-belt</td> <td>1.5</td> </tr> <tr> <td>Flat belt</td> <td>2.5</td> </tr> </table> Equivalent radial load = Actual radial load $\times$ Overhung factor Equivalent radial load $\leq$ Allowable radial load ...OK	Overhung member	Overhung factor	V-belt	1.5	Flat belt	2.5	P.10 "High speed shaft allowable radial load"
Overhung member	Overhung factor								
V-belt	1.5								
Flat belt	2.5								

# Selection of Drive

## 2) Example of selection

Operating condition	
Raw material	: Plastic
*Actual transmission power	: 22kW
Input speed	: Approx. 1000r/min
Screw speed	: 100r/min
*Thrust load	: 150kN[15,300kgf]
Shaft arrangement	: RL
Ambient temperature	: 40°C
*Maximum transmission power	: 22kW×150%=33kW
Overhung member	: V-belt
	: Overhung factor
*Actual radial load	: 4.5kN [460kgf]

\* : Refer to Supplementary data

Selection	
1. Determine service factor.....	SF=1.25
2. Determine unit size.....	Size 020
·Check the size with reduction ratio=10 at the input speed of 1000r/min	
·Equivalent transmission power =22kW×1.25=27.5kW<42.7kW	
3. Check the thrust load ...	MediumThrust type
·Thrust load =150kN<165kN	
[15,300kgf<16,900kgf]	
4. Check the thermal rating	
·Actual transmission power =22kW<29kW	
5. Check the overhung load	
·Actual radial load =4.5kN×1.5=6.75kN<7.2kN	
	[460kgf] [688kgf] <730kgf]
With that, the model SEB020P2M-RL-10 is selected.	

## Supplementary Materials

### 1. How to calculate thrust load

Extruder machine makes thrust load produce by rotation of screw. How to calculate the thrust load is the following.

$$F = p \cdot \frac{\pi \cdot d^2}{4000} \quad [F = p \cdot \frac{\pi \cdot d^2}{400}]$$

F: Thrust load (kN) [kgf]  
 p: Pressure (cm<sup>2</sup>) MPa[kgf/cm<sup>2</sup>]  
 d: Diameter of screw (mm)

### 2. Rating life of thrust spherical roller bearing and allowable thrust load

#### Rating life

How to calculate rating life of bearing (Lh) is the following.

$$L_h = \left( \frac{C}{F} \right)^{\frac{10}{3}} \cdot \frac{33.3 \times 500}{n_2} \quad (h)$$

#### Allowable thrust load

How to calculate allowable thrust load (P) is the following.

$$P = \left( \frac{33.3}{n_2} \right)^{\frac{3}{10}} \cdot \left( \frac{500}{L_h} \right)^{\frac{3}{10}} \cdot C \quad (kN)$$

"Allowable thrust load" written in Page 9 assumes that rating life is Lh=4000(h).

n<sup>2</sup> : Low speed shaft speed (r/min)

C : Basic dynamic rated load (kN)

F : Thrust load (kN)

Note) Only if consult us about the model size 004, because it uses taper roller bearing.

### 3. Radial load by V-belt drive

On many speed reducers for extruders, a V-belt is used to drive the input shaft. This drive generates a radial load. Therefore, be sure to check the radial load. The following is a single expression to obtain the radial load generated by a V-belt.

$$R = \frac{9.56 \times Q}{n_1} \cdot \frac{2000}{D} \cdot f \cdot 1.5 \quad [R = \frac{975 \times Q}{n_1} \cdot \frac{2000}{D} \cdot f \cdot 1.5]$$

R : Radial load (kN) (kgf)

Q : Actual transmission power or motor power (kW)

n<sub>1</sub> : Input speed (r/min)

D : High speed shaft V-pulley diameter (mm)

f : Compensation factor

f	Pulley ratio
1.00	1~1.1
1.03	1.2~1.6
1.05	1.7~2.5

# Rating Table•Reduction ratio

## Mechanical Power Rating (kW)

Double Stage type

AGMA Service factor =1.0

Normal reduction ratio	Input speed r/min	Output speed r/min	Size of reducer											
			Heavy thrust type & Medium thrust type										Lite thrust type	
			004	005	010	020	030	040	050	060	070	030	040	050
8	1800	225	29	46.4	58.8	85.2	140	230	347	561	847			
	1500	188	24	38.8	50.5	73.1	117	192	290	470	710			
	1200	150	20	31.2	41.8	60.6	94.3	154	234	378	571			
	1000	125	16	26	35.1	52	78.9	129	195	316	478			
	900	113	15	23	31.6	47.6	71.1	116	176	285	432			
	750	94	12	19	26	40.8	59.5	97.8	147	239	361			
10	1800	180	23	36.5	48.3	70.1	114	188	273	456	708	114	188	259
	1500	150	19	30.5	41.1	60.1	96.2	158	229	382	593	96.2	158	226
	1200	120	15	24	33	49.8	77.3	127	184	307	477	77.3	127	184
	1000	100	13	20	27	42.7	64.6	106	154	257	399	64.6	106	154
	900	90	11	18	24	39.1	58.3	95.8	139	232	360	58.3	95.8	139
	750	75	9.8	15	20	33.2	48.7	80.1	116	194	301	48.7	80.1	116
12.5	1800	144	18	28	38.7	57.6	89.9	145	222	366	547	89.9	145	222
	1500	120	15	24	32.3	49.4	75.2	121	185	306	458	75.2	121	185
	1200	96	12	19	26	41	60.4	97.5	149	246	368	60.4	97.5	149
	1000	80	10	16	21	34.7	50.5	81.5	124	206	308	50.5	81.5	124
	900	72	9.4	14	19	31.3	45.5	73.5	112	186	278	45.5	73.5	112
	750	60	7.9	12	16	26	38	61.4	94.2	155	232	38	61.4	94.2
16	1800	113	15	23								72.2	116	170
	1500	94	12	19								60.3	97.8	142
	1200	75	10	15								48.4	78.5	114
	1000	63	8.4	13								40.5	65.6	95.8
	900	56	7.6	11								36.5	59.2	86.3
	750	47	6.3	9.8								30.5	49.4	72.2
18	1800	100			25	41.1	65	95.9	140	222	368			
	1500	83			21	34.4	54.3	80.2	117	185	308			
	1200	67			17	27	43.6	64.4	94.3	149	247			
	1000	56			14	23	36.4	53.8	78.8	124	207			
	900	50			12	20	32.8	48.5	71.1	112	186			
	750	42			10	17	27	40.5	59.4	94.1	156			

Note1. When input speed is not shown in the table, find it by the interpolation method.

Note2. When input speed (N) is lower than 750r/min, find the mechanical power rating (PN) according to the following formula.

$$PN=P(750) \times N/750$$

Note3. Consult us when input speed is over 1800 r/min.

Note4. Heavy-thrust types were set as size 005-050.

## Exact Reduction Ratio

Nominal reduction ratio	Size of Reducer											
	Heavy thrust type & Medium thrust type										Lite thrust type	
	004	005	010	020	030	040	050	060	070	030	040	050
8	7.882	7.718	7.725	7.616	8.118	7.778	7.956	7.875	8.033			
10	10.134	9.853	9.861	9.722	9.944	9.528	10.156	9.750	9.665	9.944	9.528	10.156
12.5	12.699	12.574	12.585	12.407	12.785	12.485	12.594	12.206	12.600	12.785	12.485	12.594
16	15.765	15.546								15.997	15.556	16.504
18				17.997	17.503	17.243	17.750	18.789	18.640	17.647		

Note1. Other ratio type that is not indicated in the table can be manufactured. Consult us.

Note2. Heavy-thrust types were set as size 005-050.



# Thermal Rating•Allowable Axial Load

## Thermal Rating (kW)

### 1) Thermal Rating : Pt

Normal reduction ratio	Input speed r/min	Output speed r/min	Size of reducer											
			Heavy thrust type & Medium thrust type										Lite thrust type	
			004	005	010	020	030	040	050	060	070	030	040	050
8	1800	225	13	32	41	47	60	86	115	178	238			
	1500	188	14	33	42	49	62	89	120	185	249			
	1200	150	15	33	41	48	62	89	122	187	255			
	1000	125	15	32	40	47	61	88	121	185	254			
	900	113	15	32	39	46	60	87	119	182	252			
10	1800	180	13	31	39	46	58	84	113	173	235	27	45	61
	1500	150	14	31	39	46	59	85	115	177	242	31	52	71
	1200	120	14	30	38	45	58	85	115	176	244	34	57	78
	1000	100	14	29	37	44	57	83	112	173	241	35	59	80
	900	90	14	29	36	43	56	81	110	170	238	35	59	80
12.5	1800	144	13	30	39	45	57	82	112	171	230	29	49	66
	1500	120	13	30	38	45	57	82	113	172	233	32	54	73
	1200	96	13	29	37	43	56	80	111	169	231	34	56	77
	1000	80	13	28	35	42	54	78	108	165	226	34	57	78
	900	72	12	27	34	40	52	76	106	161	222	34	56	78
16	1800	113	12	28								28	48	65
	1500	94	12	27								30	51	69
	1200	75	12	26								31	52	71
	1000	63	11	25								31	52	71
	900	56	11	24								30	51	70
18	1800	100			34	40	51	73	103	159	219			
	1500	83			33	39	51	72	102	158	219			
	1200	67			31	37	49	70	99	153	215			
	1000	56			30	36	47	67	95	148	209			
	900	50			29	35	46	65	93	144	205			
	750	42			27	33	43	62	88	137	196			

### 2) Increase thermal rating with cooling-pipe : Ptp

Normal reduction ratio	Input speed r/min	Output speed r/min	Size of reducer											
			Heavy thrust type & Medium thrust type										Lite thrust type	
			004	005	010	020	030	040	050	060	070	030	040	050
Increase thermal rating: Ptp					23	30	36	53	93	101	114			79
Qty of Necessary cooling water (l/min)					5	6	6	7	11	9	9			6

Note1. The values in the table indicate under that operation is continuous and the ambient temperature is 40°C or less.

Note2. When input speed is not shown in the table, find it by the interpolation method.

Note3. Heavy-thrust types were set as size 005-050.

Note4. The value Ptp is under temperature of coolant 20°C

Note5. Thermal rating with cooling-pipe is calculated by Pt+Ptp.

## Output torque - Allowable thrust load

Allowable thrust load is under the output speed 100r/min.

SIZE	SEB004	005	010	020	030	040	050	060	070
Output torque (kN·m [kgf·m])	1.3[129]	1.9[197]	2.6[260]	3.8[390]	6.1[620]	9.5[970]	14.7[1500]	22.6[2300]	36.3[3700]
Heavy thrust		135.4 [13800]	194.2 [19800]	225.6 [23000]	269.8 [27500]	426.7 [43500]	532.7 [54300]		
Medium thrust	57.9 [5900]	86.3 [8800]	110.9 [11300]	165.8 [16900]	225.6 [23000]	310.0 [31600]	434.6 [44300]	511.1 [52100]	588.6 [60000]
Lite thrust					135.4 [13800]	265.9 [27100]	345.3 [35200]		

# Allowable Axial Load

## Allowable thrust load(kN)[kgf]

### 1) Heavy thrust type [H]

Output speed r/min	Size of reducer								
	004	005	010	020	030	040	050	060	070
250		103.0[10500]	148.1[15100]	171.7[17500]	205.0[20900]	329.6[33600]	405.2[41300]		
200		109.9[11200]	157.9[16100]	183.4[18700]	218.8[22300]	352.2[35900]	432.6[44100]		
160		117.7[12000]	168.7[17200]	196.2[20000]	234.5[23900]	376.7[38400]	463.0[47200]		
125		126.5[12900]	182.5[18600]	210.9[21500]	252.1[25700]	406.1[41400]	498.3[50800]		
100		135.4[13800]	194.2[19800]	225.6[23000]	269.8[27500]	426.7[43500]	532.7[54300]		
80		144.2[14700]	208.0[21200]	241.3[24600]	288.4[29400]	426.7[43500]	570.0[58100]		
63		155.0[15800]	223.7[22800]	259.0[26400]	310.0[31600]	426.7[43500]	612.1[62400]		
≤50		166.8[17000]	239.4[24400]	277.6[28300]	332.6[33900]	426.7[43500]	656.3[66900]		

### 2) Medium thrust type [M]

Output speed r/min	Size of reducer								
	004	005	010	020	030	040	050	060	70
250	45.1[4600]	65.7[6700]	83.4[8500]	125.6[12800]	171.1[17500]	235.4[24000]	329.6[33600]	388.5[39600]	447.3[45600]
200	48.1[4900]	69.7[7100]	89.3[9100]	134.4[13700]	183.4[18700]	252.1[25700]	352.2[35900]	415.0[42300]	477.7[48700]
160	50.0[5100]	74.6[7600]	96.1[9800]	144.2[14700]	196.2[20000]	269.8[27500]	376.7[38400]	444.4[45300]	511.1[52100]
125	54.0[5500]	80.4[8200]	103.0[10500]	155.0[15800]	210.9[21500]	290.4[29600]	406.1[41400]	478.7[48800]	550.3[56100]
100	57.9[5900]	86.3[8800]	110.9[11300]	165.8[16900]	225.6[23000]	310.0[31600]	434.6[44300]	511.1[52100]	588.6[60000]
80	61.8[6300]	92.2[9400]	118.7[12100]	177.6[18100]	241.3[24600]	331.6[33800]	464.0[47300]	547.4[55800]	629.8[64200]
63	67.7[6900]	99.1[10100]	126.5[12900]	190.3[19400]	259.0[26400]	357.1[36400]	499.3[50900]	587.6[59900]	676.9[69000]
≤50	72.6[7400]	105.9[10800]	136.4[13900]	204.0[20800]	277.6[28300]	382.6[39000]	534.6[54500]	629.8[64200]	725.0[73900]

### 3) Lite thrust type [T]

Output speed r/min	Size of reducer								
	004	005	010	020	030	040	050	060	070
250					103.0[10500]	202.1[20600]	261.9[26700]		
200					109.9[11200]	215.8[22000]	280.6[28600]		
160					117.7[12000]	230.5[23500]	299.2[30500]		
125					126.5[12900]	248.2[25300]	322.7[32900]		
100					135.4[13800]	265.9[27100]	345.3[35200]		
80					144.2[14700]	284.5[29000]	368.9[37600]		
63					155.0[15800]	305.1[31100]	396.3[40400]		
≤50					166.8[17000]	327.7[33400]	424.8[43300]		

Note1. Allowable thrust load is as rating-life 40,000hr.

Note2. Consult us in the case that output speed is out of the table.

Note3. Consult us in the case that output shaft is applied excessive radial load.

## Type with thrust spherical roller bearing

1-3 kinds of thrust spherical roller bearings were prepared for every size of reducer and load volume. Select them by thrust load. However bearing for size 004 is taper roller bearing.

Thrust spherical roller bearing		Size of reducer								
		004	005	010	020	030	040	050	060	070
Bearing No.	Heavy thrust type		29418E 702 [71,600]	29422E 1,010 [103,000]	29424E 1,170 [119,300]	29428E 1,399 [142,700]	29436E 2,251 [229,500]	29440E 2,762 [281,600]		
	Medium thrust type	30315D 214 [21,900]	29414E 448 [45,700]	29416E 574 [58,600]	29420E 862 [87,900]	29424E 1,170 [119,300]	29430E 1,609 [164,100]	29436E 2,251 [229,500]	29448E 2,651 [270,300]	29452E 3,051 [311,100]
	Lite thrust type					29418E 702 [71,600]	29426E 1,379 [140,600]	29432E 1,789 [182,400]		

# Allowable Radial Load on High Speed Shaft

## Allowable radial load of high-speed shaft (kN)[kgf]

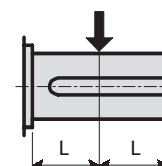
Normal reduction ratio	Input speed r/min	Size of reducer									Lite thrust type		
		Heavy thrust type & Medium thrust type											
		004	005	010	020	030	040	050	060	070	030	040	050
8	1800	4.6 [470]	5.7 [580]	6.8 [690]	8.1 [830]	11.1 [1130]	12.7 [1290]	16.0 [1630]	18.6 [1900]	37.4 [3810]			
	1500	4.6 [470]	6.1 [620]	6.6 [670]	7.8 [800]	11.1 [1130]	12.7 [1290]	15.9 [1620]	18.5 [1890]	37.3 [3800]			
	1200	4.6 [470]	6.6 [670]	6.4 [650]	7.6 [770]	11.1 [1130]	12.7 [1290]	15.9 [1620]	18.5 [1890]	37.2 [3790]			
	1000	4.6 [470]	7.0 [710]	6.4 [650]	7.4 [750]	11.1 [1130]	12.7 [1290]	15.9 [1620]	18.4 [1880]	37.2 [3790]			
	900	4.6 [470]	7.0 [710]	6.4 [650]	7.3 [740]	11.1 [1130]	12.7 [1290]	15.8 [1610]	18.4 [1880]	37.1 [3780]			
	750	4.6 [470]	7.0 [710]	6.4 [650]	7.0 [710]	11.1 [1130]	12.7 [1290]	15.8 [1610]	18.4 [1880]	37.1 [3780]			
10	1800	4.6 [470]	6.0 [610]	6.6 [670]	7.8 [800]	11.3 [1150]	13.1 [1340]	16.8 [1710]	20.0 [2040]	38.7 [3940]	5.7 [580]	*	*
	1500	4.6 [470]	6.4 [650]	6.5 [660]	7.7 [780]	11.3 [1150]	13.1 [1340]	16.7 [1700]	20.0 [2040]	38.7 [3940]	5.7 [580]	3.5 [360]	*
	1200	4.6 [470]	6.9 [700]	6.5 [660]	7.4 [750]	11.3 [1150]	13.1 [1340]	16.7 [1700]	20.0 [2040]	38.7 [3940]	5.7 [580]	5.8 [590]	2.8 [290]
	1000	4.6 [470]	7.1 [720]	6.5 [660]	7.2 [730]	11.3 [1150]	13.1 [1340]	16.7 [1700]	19.9 [2030]	38.6 [3930]	5.6 [570]	7.4 [750]	6.3 [640]
	900	4.6 [470]	7.1 [720]	6.5 [660]	7.1 [720]	11.3 [1150]	13.1 [1340]	16.7 [1700]	19.9 [2030]	38.6 [3930]	5.6 [570]	7.9 [810]	7.5 [760]
	750	4.6 [470]	7.1 [720]	6.5 [660]	6.9 [700]	11.3 [1150]	13.1 [1340]	16.7 [1700]	19.9 [2030]	38.6 [3930]	5.6 [570]	9.2 [940]	9.1 [930]
12.5	1800	4.7 [480]	6.6 [670]	6.6 [670]	7.7 [780]	11.5 [1170]	15.7 [1600]	17.3 [1760]	27.1 [2760]	48.1 [4900]	5.9 [600]	4.6 [470]	3.6 [370]
	1500	4.7 [480]	7.0 [710]	6.6 [670]	7.4 [750]	11.5 [1170]	15.7 [1600]	17.3 [1760]	27.1 [2760]	51.4 [5240]	5.9 [600]	6.1 [620]	5.9 [600]
	1200	4.7 [480]	7.2 [730]	6.6 [670]	7.2 [730]	11.5 [1170]	15.7 [1600]	17.3 [1760]	27.1 [2760]	51.9 [5290]	5.9 [600]	7.8 [800]	8.4 [860]
	1000	4.7 [480]	7.2 [730]	6.6 [670]	7.1 [720]	11.5 [1170]	15.7 [1600]	17.3 [1760]	27.1 [2760]	51.9 [5290]	5.9 [600]	9.4 [960]	10.6 [1080]
	900	4.7 [480]	7.2 [730]	6.6 [670]	7.1 [720]	11.5 [1170]	15.7 [1600]	17.3 [1760]	27.0 [2750]	51.8 [5280]	5.9 [600]	10.1 [1030]	11.6 [1180]
	750	4.7 [480]	7.2 [730]	6.6 [670]	7.1 [720]	11.5 [1170]	15.7 [1600]	17.3 [1760]	27.0 [2750]	51.8 [5280]	5.9 [600]	11.4 [1160]	13.2 [1350]
16	1800	4.7 [480]	6.8 [690]								6.0 [610]	6.2 [630]	5.8 [590]
	1500	4.7 [480]	7.2 [730]								6.0 [610]	7.7 [780]	8.0 [820]
	1200	4.7 [480]	7.2 [730]								6.0 [610]	9.5 [970]	10.7 [1090]
	1000	4.7 [480]	7.2 [730]								6.0 [610]	11.1 [1130]	12.9 [1310]
	900	4.7 [480]	7.2 [730]								6.0 [610]	11.8 [1200]	13.8 [1410]
	750	4.7 [480]	7.2 [730]								6.0 [610]	12.9 [1320]	15.5 [1580]
18	1800			6.8 [690]	7.3 [740]	11.8 [1200]	16.2 [1650]	18.1 [1850]	28.5 [2910]	50.9 [5190]			
	1500			6.8 [690]	7.3 [740]	11.8 [1200]	16.2 [1650]	18.1 [1850]	28.5 [2910]	53.4 [5440]			
	1200			6.8 [690]	7.3 [740]	11.8 [1200]	16.2 [1650]	18.1 [1850]	28.5 [2910]	53.4 [5440]			
	1000			6.8 [690]	7.3 [740]	11.8 [1200]	16.2 [1650]	18.1 [1850]	28.5 [2910]	53.3 [5430]			
	900			6.8 [690]	7.3 [740]	11.7 [1190]	16.2 [1650]	18.1 [1850]	28.5 [2910]	53.3 [5430]			
	750			6.8 [690]	7.3 [740]	11.7 [1190]	16.2 [1650]	18.1 [1850]	28.5 [2910]	53.3 [5430]			

Note1. The value of allowable radial load is in the case that radial load apply on center of the shaft.

In the case that the spot applied radial load is not center of the shaft, consult us.

Note2. Consult us about value at "\*".

Note3. Heavy-thrust types were set as size 005-050.



# Dimension

## Drawing & Dimension List

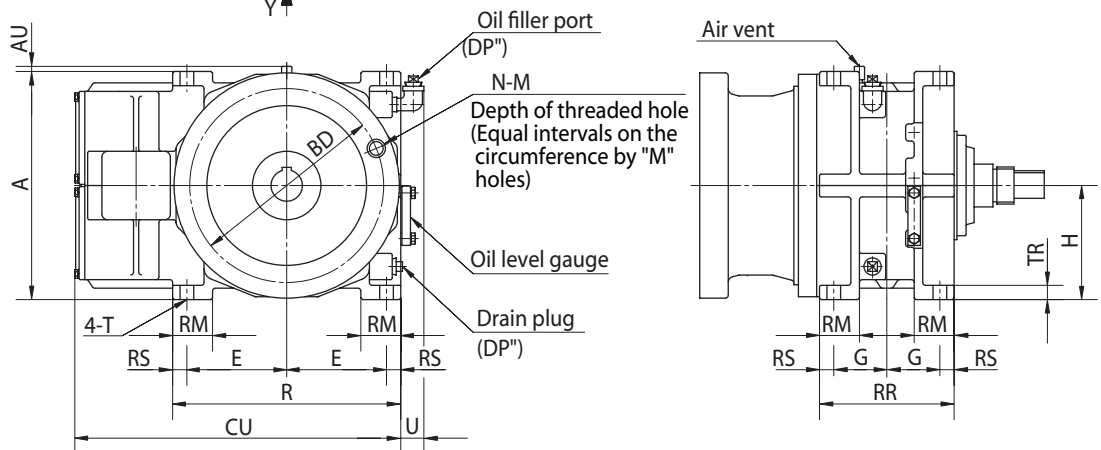
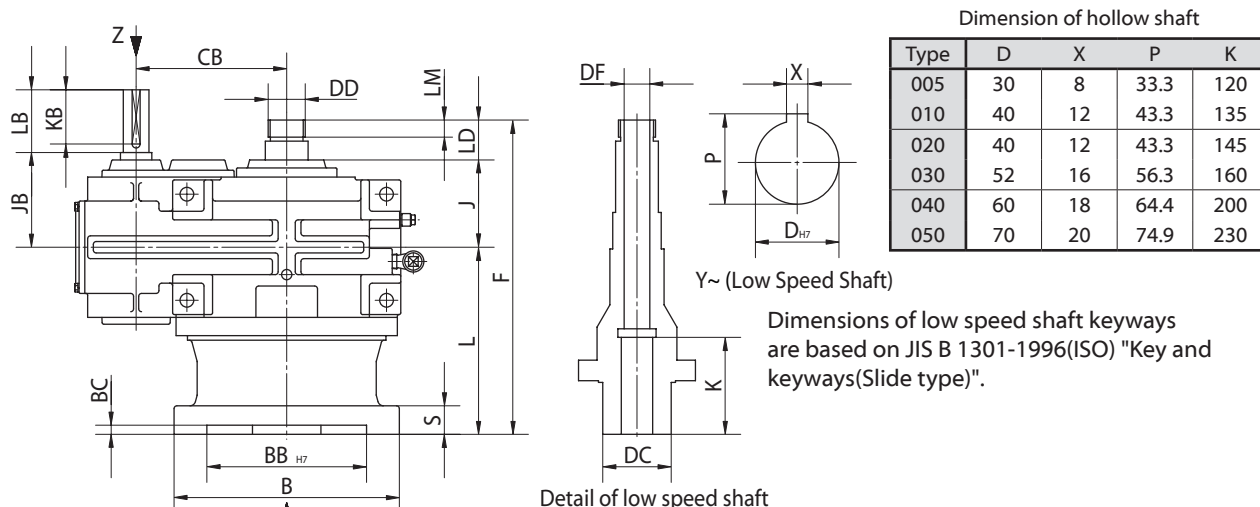
"O" shows the size which can be manufactured. ( ) shows the page listed drawing and dimension.

	004	005	010	020	030	040	050	060	070
H Heavy thrust type		○ (P12)	○ (P12)	○ (P12)	○ (P12)	○ (P12)	○ (P12)		
M Medium thrust type	○ (P13)	○ (P14)	○ (P14)	○ (P14)	○ (P14)	○ (P14)	○ (P14)	○ (P15)	○ (P15)
T Lite thrust type					○ (P16)	○ (P16)	○ (P16)		

Note1. The shaft arrangement of lite thrust type is only RLWR.

# SEB 005~050 Dimension & Drawing

## SEB 005~050 Heavy thrust

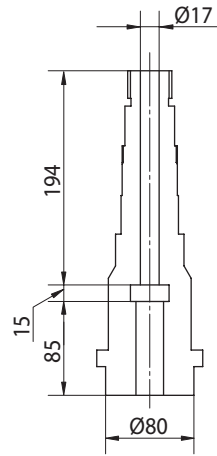
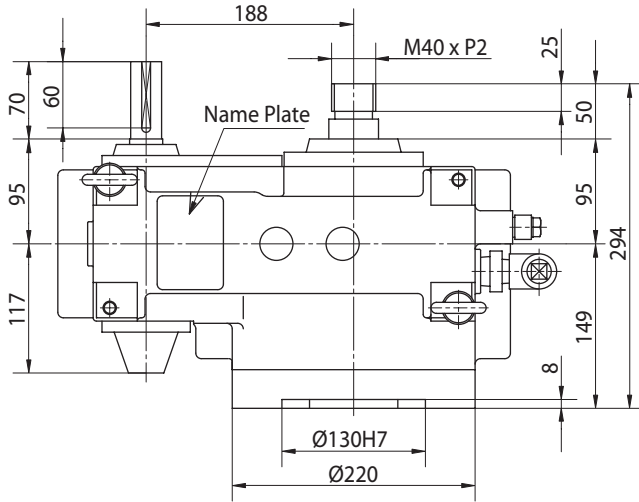


Type	A	B	BB	BC	BD	AU	CB	E	F	G	H	J	JB	L	N	M	m	S	R	RM
005	290	280	200	10	240	7	201	125	391	68	145	108	113	223	8	M20	40	43	280	45
010	340	330	230	10	280	0	207	145	450	75	170	130	125	260	10	M20	40	43	330	57
020	370	360	260	10	310	0	227	160	477	85	185	130	145	282	8	M24	50	50	360	60
030	400	395	280	15	340	0	264	175	551	93	200	153	166	328	10	M24	50	50	400	70
040	480	475	360	15	420	-5	306	220	640	110	240	170	180	380	10	M30	50	50	490	73
050	560	540	400	15	470	-5	358	250	715	130	280	195	203	425	12	M30	55	55	560	95

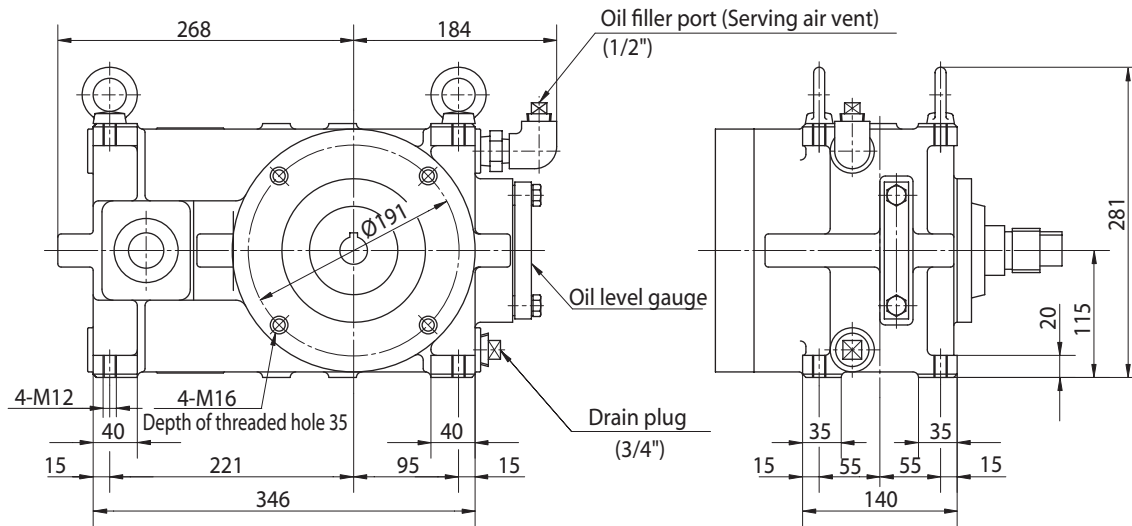
Type	RR	RS	CU	U	T	TR	Low Speed Shaft					High speed shaft							DP	Weight (kg)	Oil Qty (L)	
							DC	DD	LM	DF	LD	DB	XB	YB	PB	ZB	Zm	LB				KB
005	166	15	425	40	15	15	80	M55xP2	25	28.5	60	30k6	8	7	4	M10	22	80	70	3/4	115	3
010	190	20	460	40	19	20	100	M60xP2	25	33	60	35k6	10	8	5	M12	28	80	70	3/4	175	6
020	210	20	505	40	19	20	110	M65xP2	30	33	65	40k6	12	8	5	M16	36	110	95	3/4	220	8
030	236	25	575	40	24	25	120	M65xP2	30	33	70	45k6	14	9	5.5	M16	36	110	95	3/4	300	10
040	270	25	670	50	24	25	150	M85xP2	35	45	90	50k6	14	9	5.5	M16	36	110	95	1	450	18
050	320	30	770	50	28	30	170	M90xP2	30	55	95	55m6	16	10	6	M20	42	110	95	1	630	27

# Dimension & Drawing SEB 004

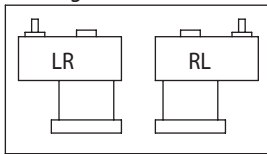
## SEB 004 Medium thrust type



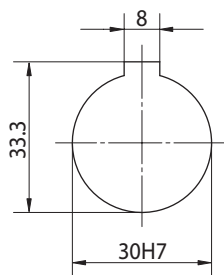
Detail of low speed shaft



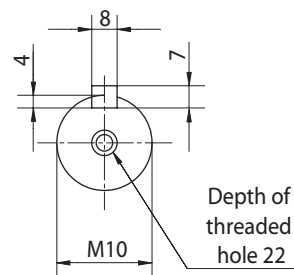
Shaft arrangement (See from above)



Weight	56 [kg]
Oil Qty	2 [L]



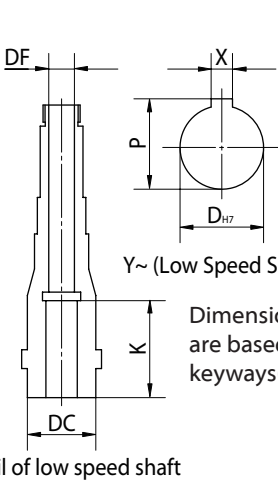
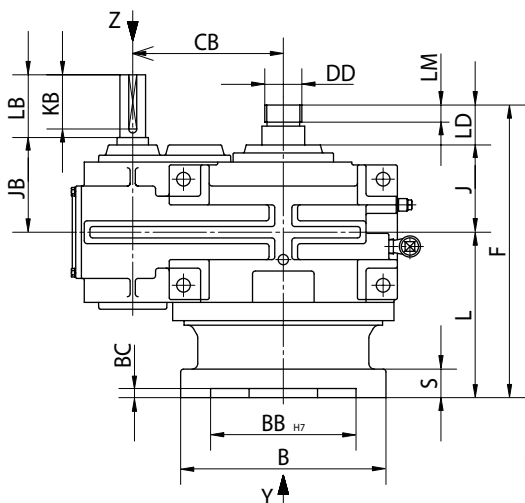
Dimensions of low speed shaft keyways are based on JIS B 1301-1996(ISO) "Key and keyways(Slide type)".



Dimensions of high speed shaft keyways are based on JIS B 1301-1996(ISO) "Key and keyways (Fastening type)".

# SEB 005~050 Dimension & Drawing

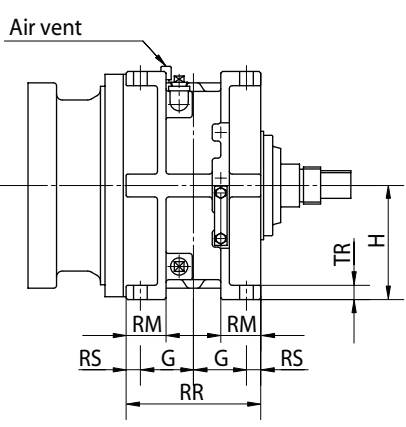
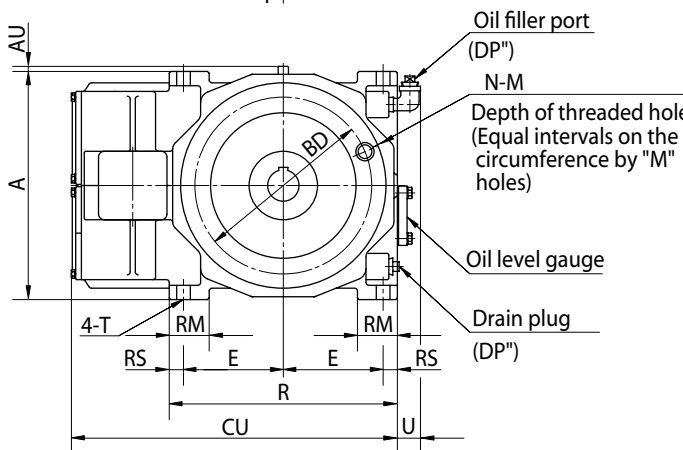
## SEB 005~050 Medium thrust type



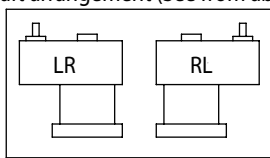
Dimension of hollow shaft

Type	D	X	P	K
005	30	8	33.3	120
010	40	12	43.3	135
020	40	12	43.3	145
030	52	16	56.3	160
040	60	18	64.4	200
050	70	20	74.9	230

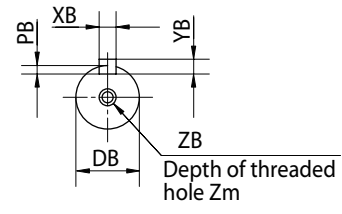
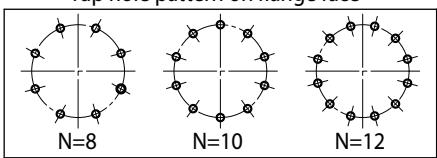
Dimensions of low speed shaft keyways are based on JIS B 1301-1996(ISO) "Key and keyways(Slide type)".



Shaft arrangement (See from above)



Tap hole pattern on flange face



Z~ (High Speed Shaft)

Dimensions of high speed shaft keyways are based on JIS B 1301-1996(ISO) "Key and keyways (Fastening type)".

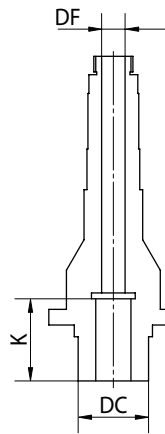
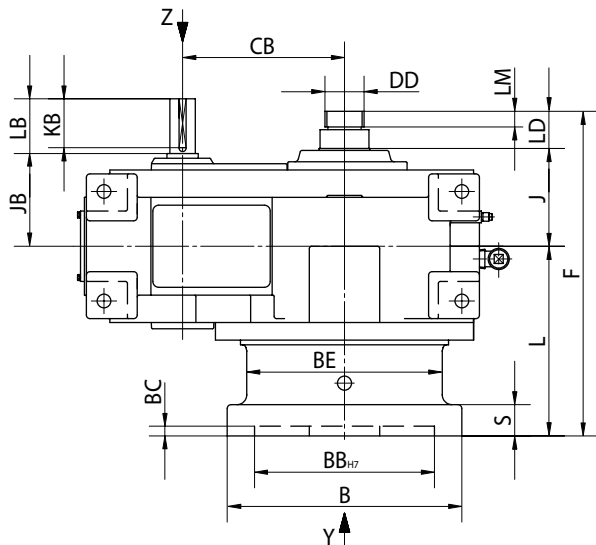
(Unit : mm)

Type	A	B	BB	BC	BD	AU	CB	E	F	G	H	J	JB	L	N	M	m	S	R	RM
005	290	250	170	10	210	7	201	125	363	68	145	108	113	195	8	M16	35	40	280	45
010	340	270	190	10	230	0	207	145	405	75	170	130	125	215	10	M16	35	40	330	57
020	370	300	220	10	260	0	227	160	439	85	185	130	145	244	10	M20	40	43	360	60
030	400	360	260	15	310	0	264	175	513	93	200	153	166	290	8	M24	50	50	400	70
040	480	420	310	15	370	-5	306	220	591	110	240	170	180	331	12	M24	50	50	490	73
050	560	475	360	15	420	-5	358	250	674	130	280	195	203	384	10	M30	50	50	560	95

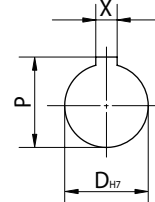
Type	RR	RS	CU	U	T	TR	Low Speed Shaft					High speed shaft						DP	Weight (kg)	Oil Qty (L)		
							DC	DD	LM	DF	LD	DB	XB	YB	PB	ZB	Zm				LB	KB
005	166	15	425	40	15	15	80	M55xP2	25	28.5	60	30k6	8	7	4	M10	22	80	70	3/4	105	3
010	190	20	460	40	19	20	100	M60xP2	25	33	60	35k6	10	8	5	M12	28	80	70	3/4	155	6
020	210	20	505	40	19	20	110	M65xP2	30	33	65	40k6	12	8	5	M16	36	110	95	3/4	195	8
030	236	25	575	40	24	25	120	M65xP2	30	33	70	45k6	14	9	5.5	M16	36	110	95	3/4	280	10
040	270	25	670	50	24	25	150	M85xP2	35	45	90	50k6	14	9	5.5	M16	36	110	95	1	390	18
050	320	30	770	50	28	30	170	M90xP2	30	55	95	55m6	16	10	6	M20	42	110	95	1	570	27

# Dimension & Drawing SEB 060-070

## SEB 060-070 Medium thrust type



Detail of low speed shaft

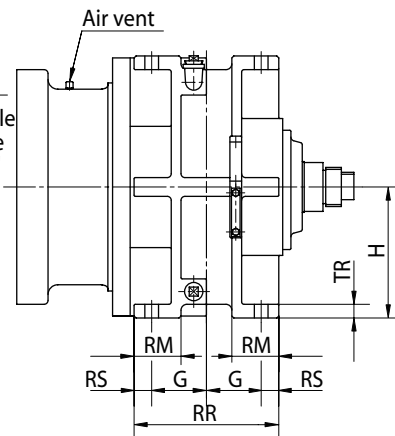
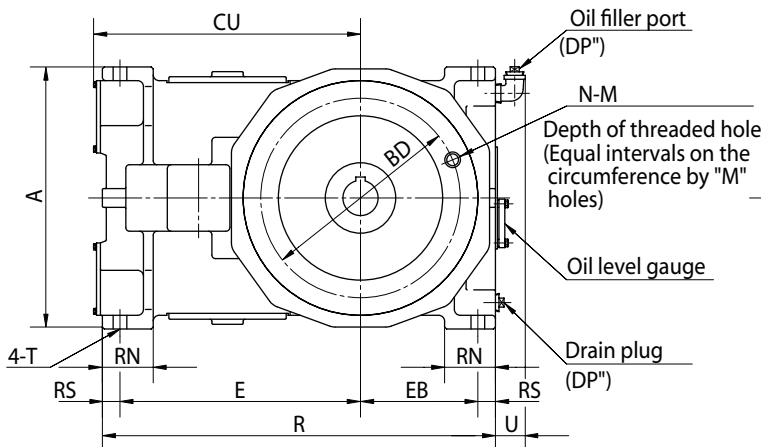


Y~ (Low Speed Shaft)

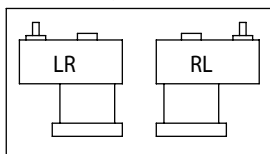
Dimensions of low speed shaft keyways are based on JIS B 1301-1996(ISO) "Key and keyways(Slide type)".

Dimension of hollow shaft

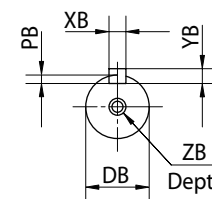
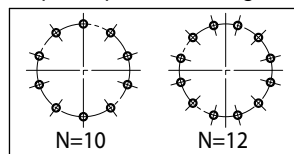
Type	D	X	P	K
060	90	24	98.5	210
070	120	32	127.4	250



Shaft arrangement (See from above)



Tap hole pattern on flange face



Z~ (High Speed Shaft)

Dimensions of high speed shaft keyways are based on JIS B 1301-1996(ISO) "Key and keyways (Fastening type)".

(Unit : mm)

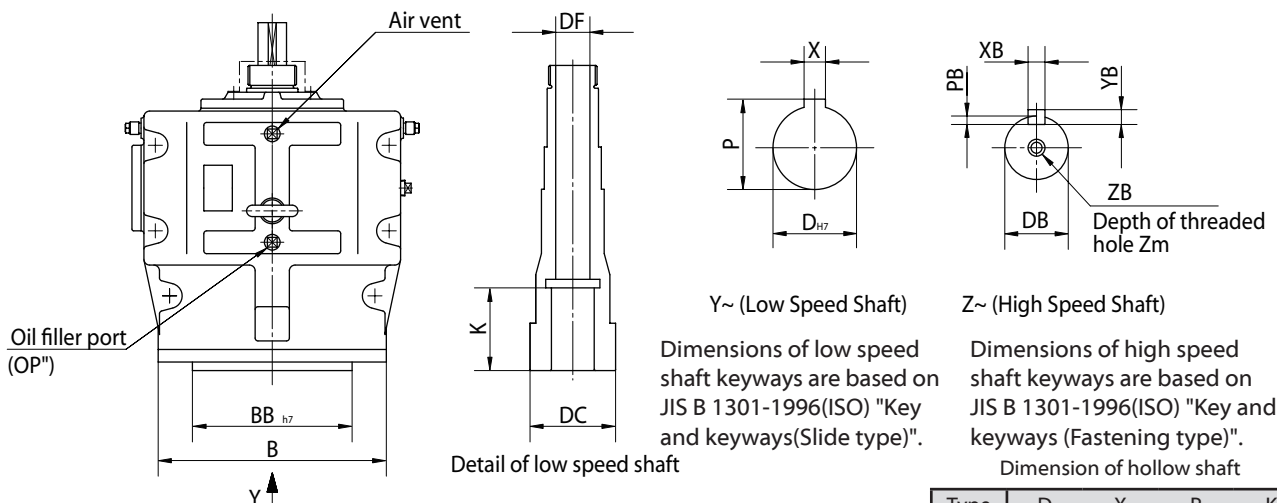
Type	A	B	BB	BC	BD	BE	CB	E	EB	F	G	H	J	JB	L	N	M	m	S	R	RM	RN
060	670	600	460	15	530	500	414	615	300	830	140	335	250	237	485	12	M30	80	80	1005	120	130
070	800	670	525	15	600	540	482	715	345	919	160	400	284	269	540	10	M36	80	80	1170	130	140

Type	RR	RS	CU	U	T	TR	Low Speed Shaft					High speed shaft					DP	Weight (kg)	Oil Qty (L)			
							DC	DD	LM	DF	LD	DB	XB	YB	PB	ZB				Zm	LB	KB
060	370	45	685	79	35	35	180	M100xP2	40	60	95	65m6	18	11	7	M20	42	140	125	11/4	1150	60
070	430	55	795	79	42	40	220	M120xP2	50	80	95	75m6	20	12	7.5	M20	42	140	125	11/4	1700	75

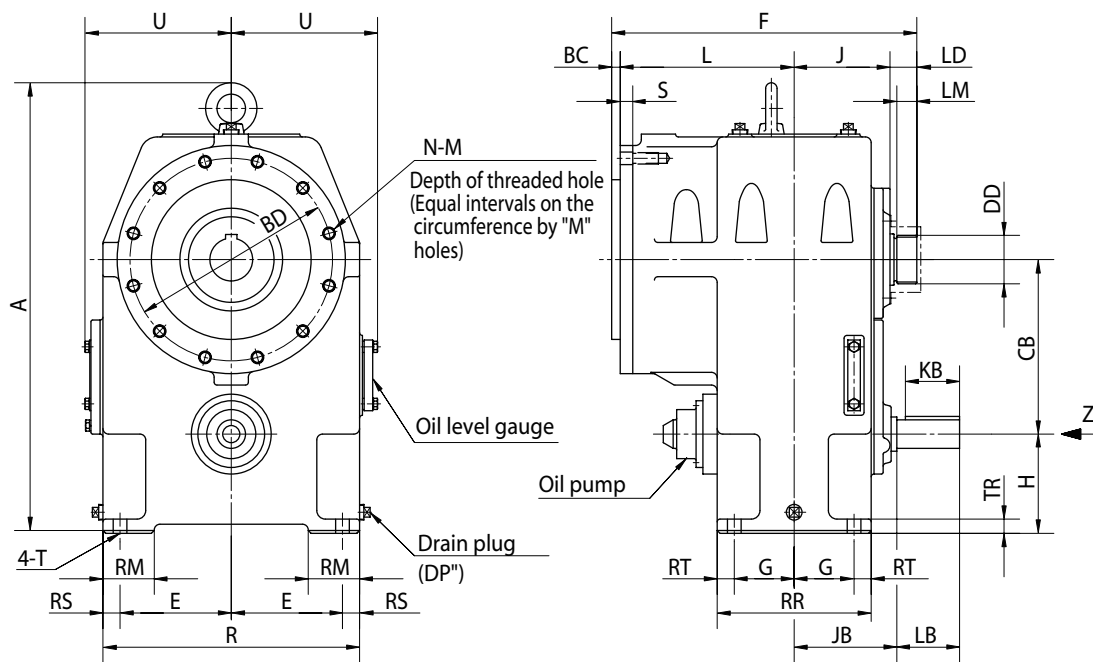


# SEB 030~050 Dimension & Drawing

## SEB 030~050 Lite thrust type



Type	D	X	P	K
030	55	15	60.5	116
040	75	20	81.5	145
050	90	24	98.5	260



(Unit : mm)

Type	A	B	BB	BC	BD	CB	E	F	G	H	J	JB	L	N	M	m	S	R	RM	RR	RS
030	600	315	220	15	280	264	155	430	87.5	96	150	167	220	12	M16	30	18	370	90	236	30
040	790	400	280	15	355	306	195	535	105	174	168	180	305	12	M20	45	22	450	90	270	30
050	915	450	300	15	375	358	220	593	115	212	190	198	340	12	M24	50	23	520	120	310	40

Type	RT	U	T	TR	OP	Low Speed Shaft					High speed shaft						DP	Weight (kg)	Oil Qty (L)		
						DC	DD	LM	DF	LD	DB	XB	YB	PB	ZB	Zm				LB	KB
030	30.5	216.5	24	25	3/4	110	M60xP4	35	40	45	40k6	12	8	5	M16	36	110	95	3/4	220	12
040	30	256.5	24	25	3/4	150	M85xP4	35	60	47	50k6	14	9	5.5	M16	36	110	95	3/4	340	25
050	40	292.5	35	30	3/4	180	M90xP4	35	60	48	50m6	16	10	6	M20	42	110	95	1	500	35

## Data sheet for order and inquiry

In the case of selecting the extruder drive, show us the following matter.

### 1. Operating condition

Raw material	
Actual transmission power or motor power	kW
Input speed	r/min
Screw speed (Low Speed Shaft)	r/min
Direction of rotation	
Thrust load (Maximum)	N [kgf]
Shaft arrangement	
Ambient temperature	°C
Overhung member (High speed shaft)	N [kgf]
Actual radial load (High speed shaft)	N [kgf]

### 2. The dimension of hollow shaft and flange (In the case that the dimension are different from standard type)

Hollow shaft					Tapped hole of flange				Spigot joint of flange			Screw of shaft-end				
D*	X	P	LI	K	BD	N	M	m	BB*	B1	S	LD	DD	LM	DE	LE

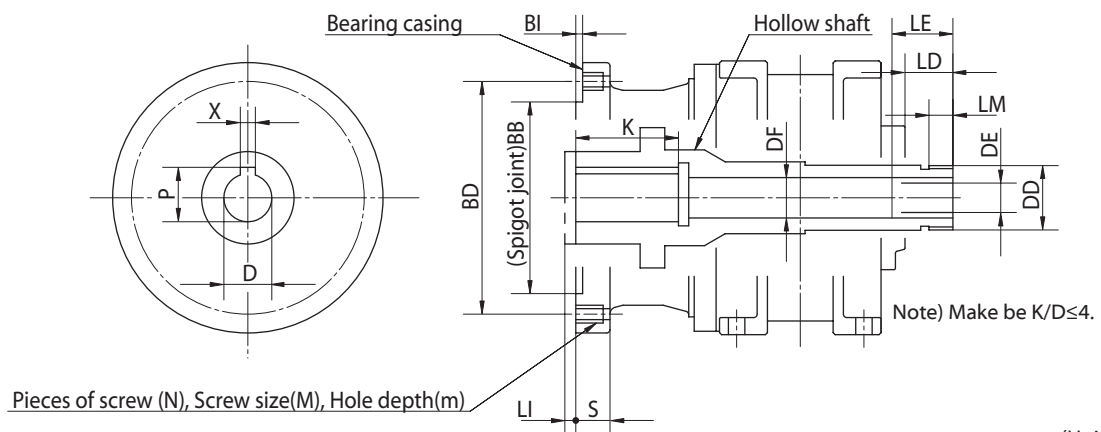
Note1. Order the tolerance about part of "\*".

Note2. Because to consider material of key is needed, check strength of hollow shaft key on customer own.

## Type with hollow shaft and bearing casing which have dimension other than standard.

Hollow shaft and bearing casing can be designed and manufactured according to customers request within the dimension in the following table. In the case needed the dimension over them, consult us.

### 1. The dimension range of heavy thrust type

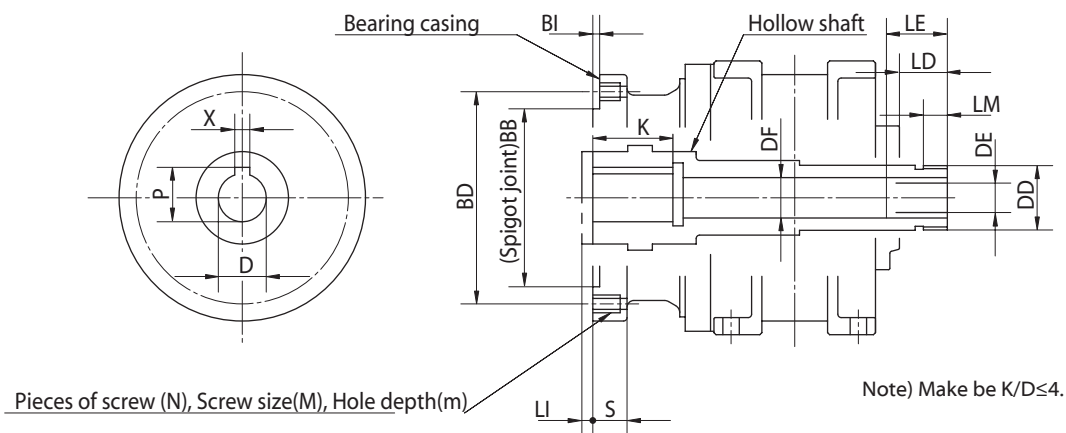


(Unit : mm)

Size	D	X	LI (MAX)	K (MAX)	S (MAX)	Internal spigot joint BB (MIN)	External spigot joint BB (MIN)	LD (MAX)	DF	DE (MAX)	LE	DD (MAX)
005	30~42	8~12	20	120+LI	43	176	190	60	28.5	28.5	73	60
010	35~50	10~14	20	135+LI	43	216	230	60	33	33	73	65
020	35~55	10~16	20	145+LI	50	241	255	65	33	33	78	70
030	35~60	10~18	20	160+LI	50	256	272	70	33	33	83	75
040	48~75	14~20	20	200+LI	50	318	340	90	45	45	103	90
050	58~90	16~25	20	230+LI	55	358	380	95	55	55	108	100

# The Dimension Range of Reducer

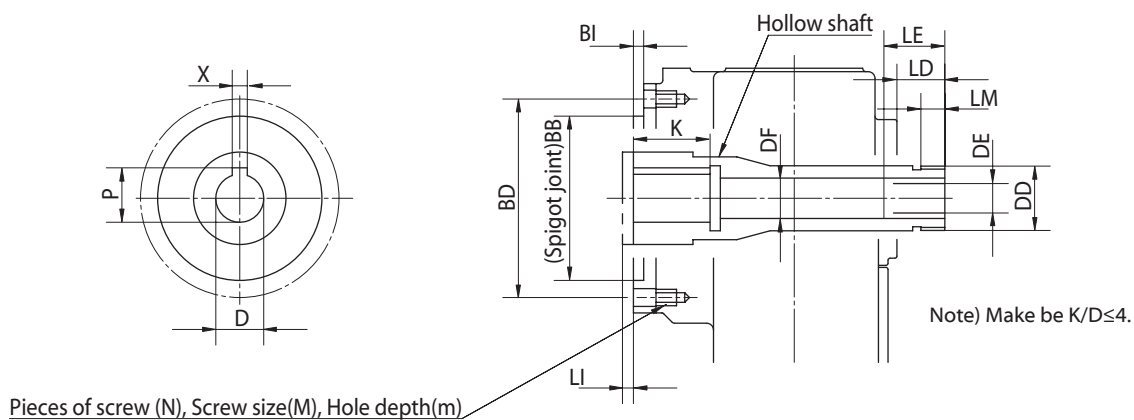
## 2. The dimension range of medium thrust type



(Unit : mm)

Size	D	X	LI (MAX)	K (MAX)	S (MAX)	Internal spigot joint BB (MIN)	External spigot joint BB (MIN)	LD (MAX)	DF	DE (MAX)	LE	DD (MAX)
004	20~38	6~10	20	95+LI	35	110	120	50	17	17	60	45
005	30~36	8~10	20	120+LI	40	166	180	60	28.5	28.5	73	60
010	35~42	10~12	20	135+LI	40	186	200	60	33	33	73	65
020	35~46	10~14	20	145+LI	43	221	235	65	33	33	78	70
030	35~52	10~16	20	160+LI	50	251	267	70	33	33	83	75
040	48~60	14~18	20	200+LI	50	308	330	90	45	45	103	90
050	58~72	16~20	20	230+LI	50	358	380	95	55	55	108	100
060	63~100	18~28	20	270+LI	80	370	400	95	60	60	138	100
070	83~120	25~32	20	320+LI	80	450	480	95	80	80	138	120

## 3. The dimension range of lite thrust type

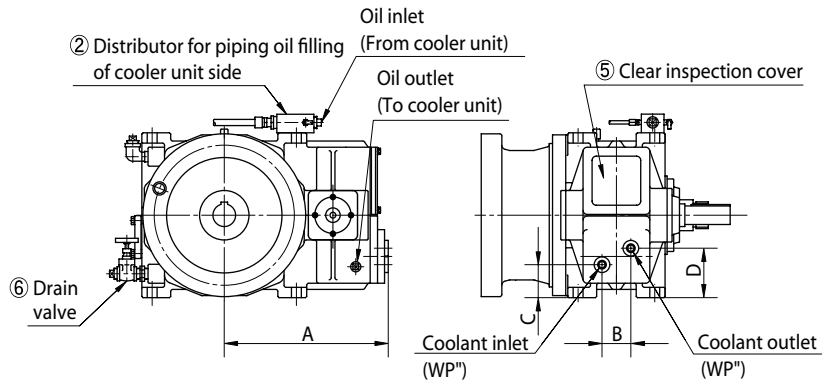
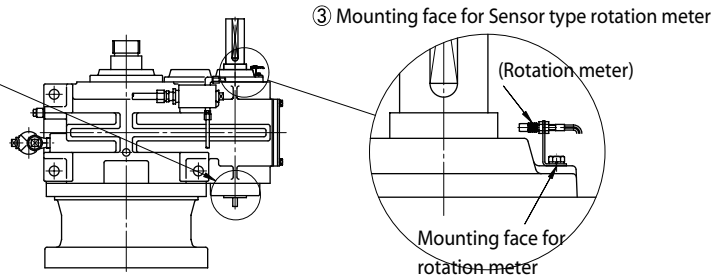
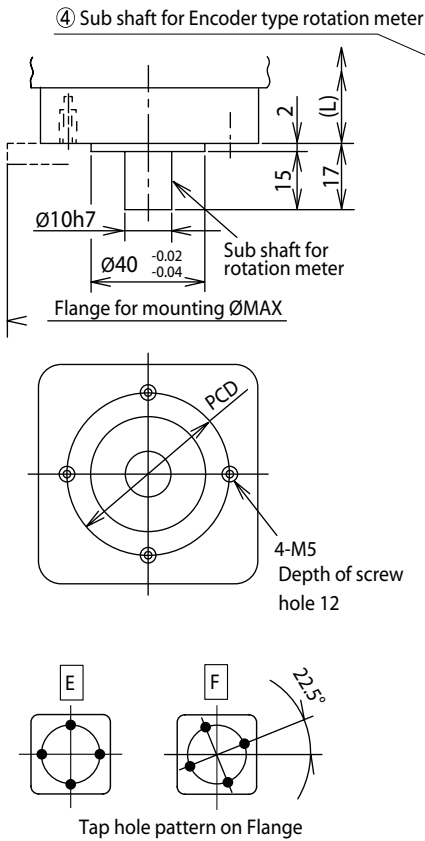


(Unit : mm)

Size	D	X	LI (MAX)	K (MAX)	S (MAX)	Internal spigot joint BB (MIN)	External spigot joint BB (MIN)	LD (MAX)	DF	DE (MAX)	LE	DD (MAX)
030	42~55	12~16	20	120+LI	33	135	146	45	40	40	83	75
040	62~75	18~20	20	150+LI	37	185	202	47	60	60	103	90
050	62~95	18~25	20	260+LI	38	215	232	48	60	60	108	100

# Options

- ① Cooling Pipe
- ② Oil cooler unit
- ③ Mounting face for Sensor type rotation meter
- ④ Sub shaft for Encoder type rotation meter
- ⑤ Clear inspection cover
- ⑥ Drain valve



Size	L	Tap hole pattern on Flange	PCD	Flange for mounting ØMAX
004	96	E	70	85
005	113	F	85	120
010	128	F	85	110
020	139	E	85	120
030	151	E	85	130
040	161	E	85	120
050	177	E	85	140
060	218	E	85	140
070	239	E	85	170

① Dimension of cooling pipe

Size	WP	A	B	C	D
010	3/8	321	70	68	108
020	1/2	348	70	77	117
030	1/2	398	70	80	120
040	1/2	449	70	96	136
050	1/2	514	70	112	152

## Warranty

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 Case that any problems, troubles or damages on the Products arise due to the defects in the Products during the above "Warranty Period" , although the Products are appropriately and properly installed in, connected or combined to the equipment or machines, or maintained in accordance with the maintenance manual and are properly operated under the conditions as described in the catalogue or otherwise as agreed upon in writing between the Seller and the Buyer or its customers, the Seller will provide, at its sole discretion, appropriate repair or replacement on the Products free of charge, except as stipulated in the "Exception for Warranty" as described below. However, in the event that the Products is installed in, connected or combined to or integrated into the equipment or machines, the Seller shall not reimburse the costs for removal or re-installation of the Products or other incidental costs related thereto and any lost opportunity, loss of profit or any other incidental or consequential losses or damages incurred by the Buyer or its customers.
Exception for Warranty	Notwithstanding the above warranty, the warranty as set forth herein shall not be applied to the problems, troubles or damages on the Products which are caused by: <ol style="list-style-type: none"> <li>1. installations, connections, combinations or integration of the Products in or to the other equipment or machines, which are rendered by any person or entity other than the Seller,</li> <li>2. the insufficient maintenance or improper operation by the Buyer or its customers, such that the Product is not appropriately maintained in accordance with the maintenance manual provided or designated by the Seller,</li> <li>3. the improper use or operation of the Products by the Buyer or its customers which are not informed to the Seller, including, without limitation, the Buyer's or its customers' operation of the Products not in conformity with the specifications, or use of the lubrication oil in the Products which is not recommended by the Seller,</li> <li>4. troubles, problems or damages on any equipment or machines in or to which the Products are installed, connected or combined or installed, or any specifications particular to the Buyer or its customers.</li> </ol>



## SAFETY PRECAUTIONS

- Strictly observe the safety rules for the installation place and the equipment to use. (Industrial Safety and Health Law, Technical Standard for Electric Facilities, Extension Rules, Plant Explosion Guidelines, Building Standards Law, etc.)
- Carefully read the maintenance manual before use. If the maintenance manual is not on hand, make a request for one to the distributor at which you purchased the product or to our sales department. The maintenance manual should be sent to the actual user.
- Select an appropriate product that matches the operating environment and usage.
- Install a protective equipment on the machine side when the machine is used for transportation of passengers or for elevators, escalators, and dumbwaiters.
- When the machine is used for food processing equipment and others that are susceptible to oil, install an oil pan or other damage preventive devices in case of oil leakage due to failure or termination of service life.



