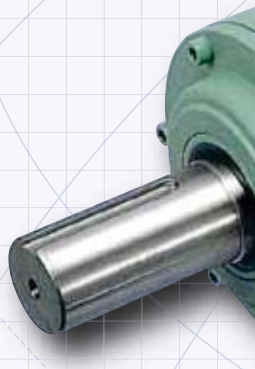
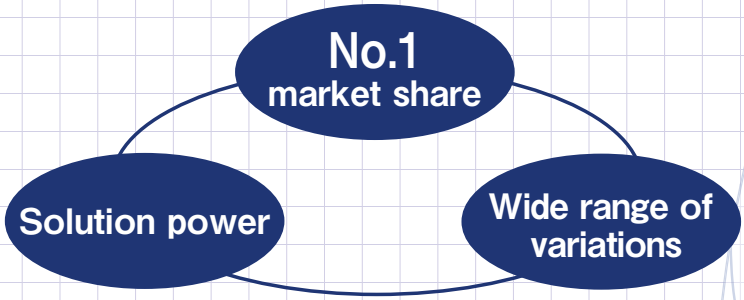
Innovation in Motion
TSUBAKI

TSUBAKI
Miter Gear Box

TSUBAKI's Miter Gear Box plays important roles around the world

TSUBAKI's Miter Gear Box has been used for a wide range of applications and in various specifications since it was launched in 1966.
The type ED and type ARA Gear Box are available in various special specifications besides the standard model.





Top market share supported by reliability, results, and track record

TSUBAKI's Miter Gear Box has received recognition for its reliability, results, and track record, from customers in various fields, and has achieved top market share in the Gear Box field.

Wide variations

The type ED & type ARA are available in a wide range of standard models and semi-standard models. (Refer to the Model list in p.9.)

Type ED

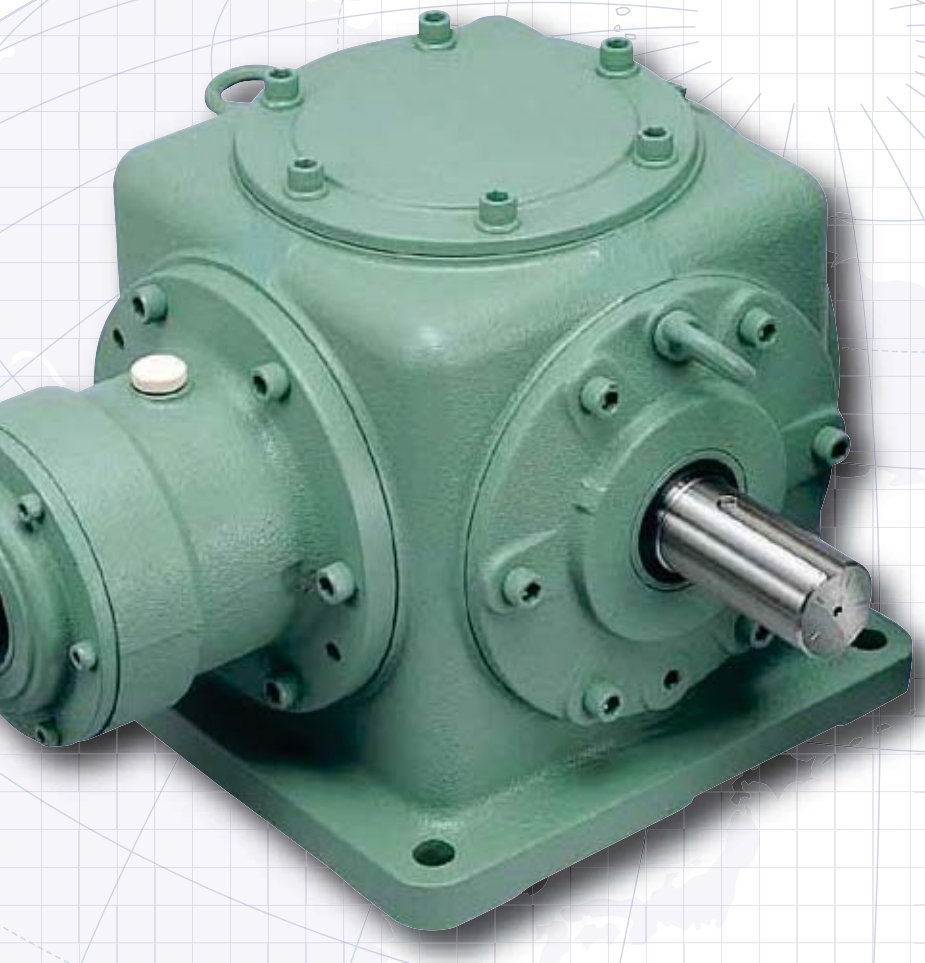
Speed ratio : 1:1, 1.5:1, 2:1, 2.5:1, 3:1
Size : 10 sizes
Shaft arrangement : 42 types
Casing material : FC (Gray cast iron)
FCD (Ductile cast iron)
* ED2 uses ADC (Aluminum die-casting)

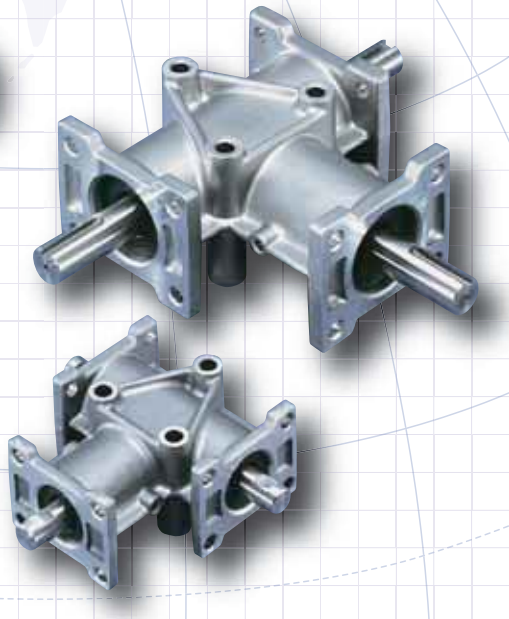
Type ARA

Speed ratio : 1:1, 2:1
Size : 3 sizes
Shaft arrangement : 3 types
Casing material : ADC (Aluminum die-casting)

Solution power

We can propose the optimum specification for every application including various special specifications.



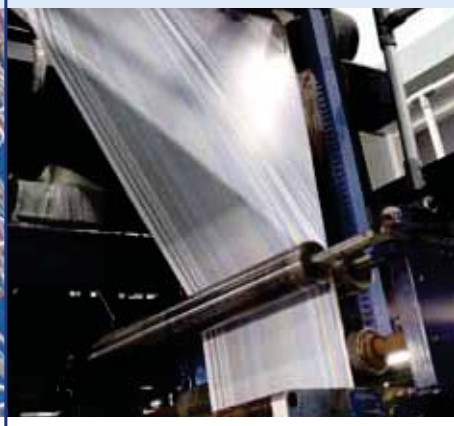
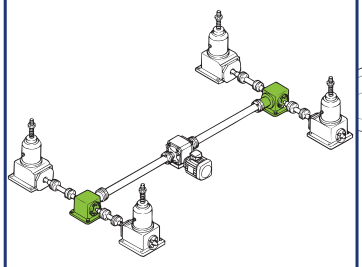
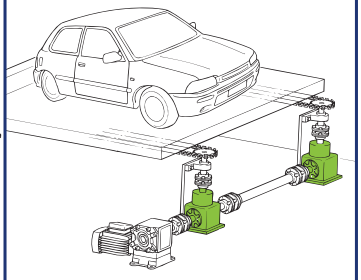
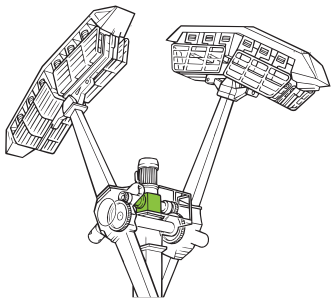
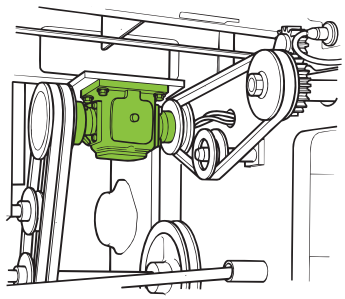


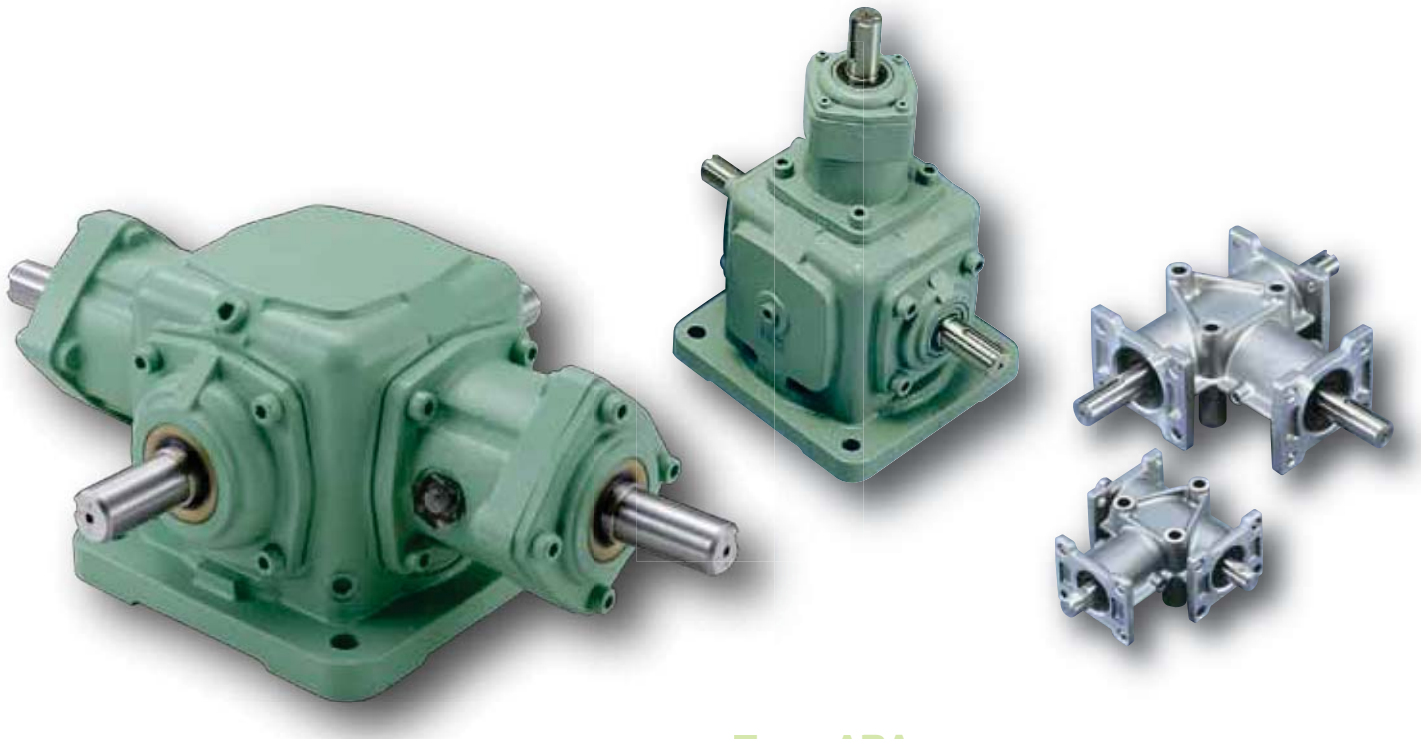
CONTENTS

We can propose the optimum specification for every application.

The type ED and type ARA are available in standard models with a wide range of variations in terms of size, shaft arrangement, speed ratio, and material. Furthermore, with various special specifications, they play important roles in a wide range of applications such as entertainment facilities, chemical plants, food machinery.

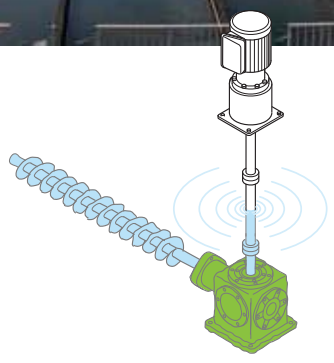
Type ED

Type ED			
Hoisting equipment	**Multistory parking structure for transporting pallets**	**Entertainment facility**	**Paper folding machine**
			
			
Motive power is distributed to the right and left sides, and is input to the jack.	Motive power is input from the cross shaft (orthogonal shaft), and the lateral shaft is set as the output shaft. Two units are coupled and synchronized.	Motive power is input from the cross shaft using the lateral dual shaft, and the opposing lateral shaft is rotated in the reverse direction.	Motive power is input to the cross shaft using a ceiling-mounted construction, then motive power is distributed to the pulleys of another cross shaft and lateral shaft, and they are driven at the same time.
Merit Driven with one motor unit, synchronization is easy and hoisting is possible while keeping a horizontal state.	**Merit** Driven with one motor unit, plural units can be synchronized.	**Merit** Using the lateral dual shaft, rotation is possible in different directions with one motor unit.	**Merit** Layout can be freely designed. (Please indicate type of mounting.)



Type ARA

Scraper in water

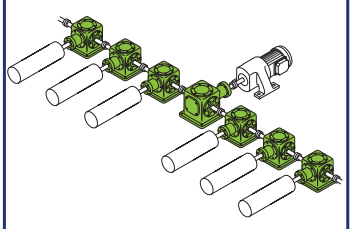


The screw in the water is driven by motive power from the unit on the ground.

Merit

It is possible to use the gear box in water. Harmonization with the environment can be promoted with water lubrication.

Iron- and steel-making machine



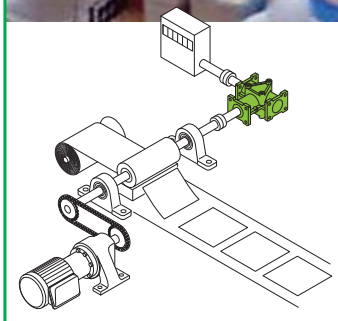
Motive power is distributed to the right and left sides, as well as to plural shafts, and the line shaft is driven.

Merit

Synchronized operation can be achieved easily by driving with one motor unit. A compact equipment design can be achieved.

Type ARA

Food packaging machine

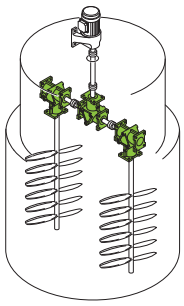


Packaging quantity is counted by linking the rotary cutter with the counter drive for the number of film sheets.

Merit

Space savings are possible by linking with the compact ARA Gear Box. Besides, when using the ARA Gear Box, which has excellent corrosion resistance, it is possible to prevent the generation of rust.

Agitator



The agitator is driven by distributing motive power to the right and left sides.

Merit

One motor unit can drive two shafts. Using the ARA Gear Box, which has excellent corrosion resistance, it is possible to prevent the generation of rust.

MEMO

Type ED

C O N T E N T S

Type ED

Features, structure, functions

Features

Wide range of variations

The optimum model can be selected from a wide range.
We can also respond to various special specifications for all market needs.

High quality

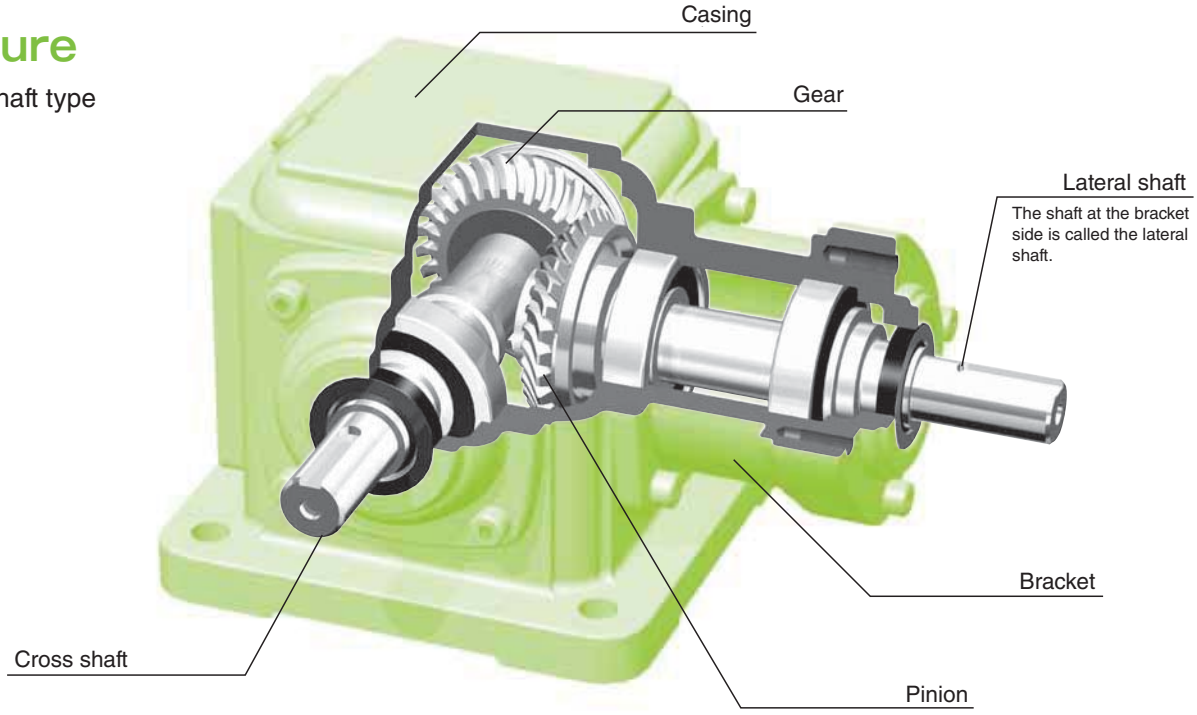
Because it adopts high-precision spiral bevel gears that comply with AGMA standards, many high-level functions such as high efficiency and high transmission capacity can be obtained.

Prompt delivery

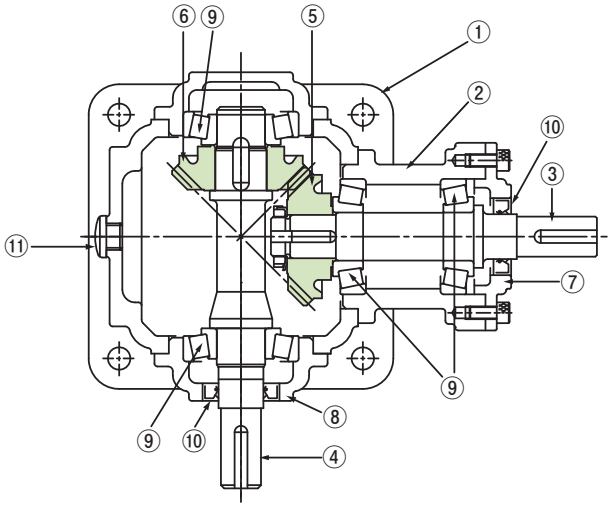
A wide range of standard and semi-standard models is available. (Refer to the Model list in p.9.)

Structure

Horizontal shaft type



ED6M-1-L-O-Y Internal structure

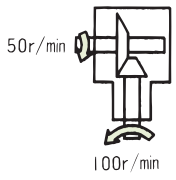
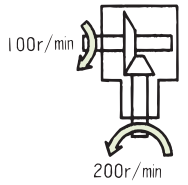


① Casing
② Bracket
③ Lateral shaft
④ Cross shaft
⑤ Pinion
⑥ Gear
⑦ Input seal support
⑧ Output bearing support
⑨ Taper roller bearing
(Sizes 2 & 4 use ball bearing.)
⑩ Oil seal
⑪ Oil gauge

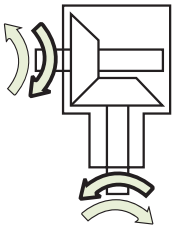
Note 1) Sizes 2 & 4 are not provided with an oil gauge.

1. Input is possible from both of lateral and cross shafts.
However, with the exception of the model with a speed ratio of 1:1, transmission from the lateral shaft to the cross shaft reduces speed, and transmission from the cross shaft to the lateral shaft increases speed.

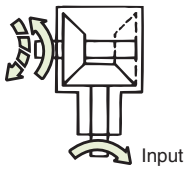
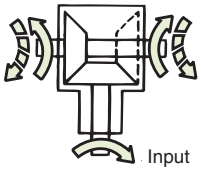
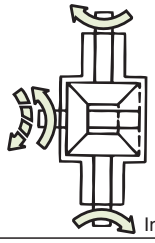
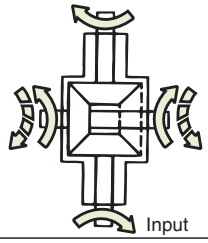
2. Rotational directions of input shaft for right-handed rotation and left-handed rotation are both possible.

Input from lateral shaft, output from cross shaft	Input from cross shaft, output from lateral shaft
 [Speed reduction] Input from lateral shaft at 100 rpm, output from cross shaft at 50 rpm	 [Speed increase] Input from cross shaft at 100 rpm, output from lateral shaft at 200 rpm

* This schema explains the rotational speed of the output shaft when an input is made at 100 rpm for a unit with a speed ratio of 2:1.
* Transmission capacity tables (pp.17 to 20) describe values for inputs from the lateral shaft and outputs from the cross shaft.



3. Regarding lateral single-shaft type, lateral dual-shaft type

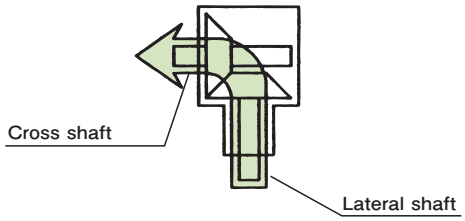
Lateral single-shaft type		Lateral dual-shaft type	
Dual shaft	Triple shaft	Triple shaft	Quad shaft
			

* When the mounted position of the gear is reversed (dotted line in Fig.), the direction of rotation is changed.

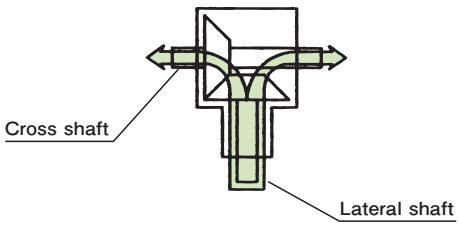
Function

As a basic function…

1. The direction for transmitting force is changed 90°.

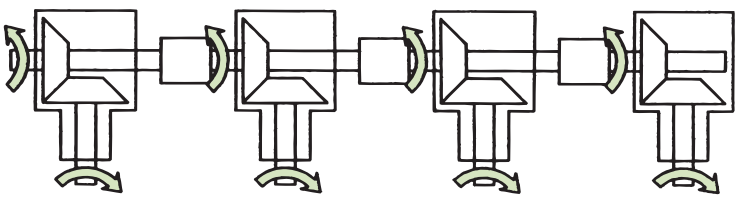


2. The direction for transmitting force is changed by 90°, and force is distributed to the right and left sides (upper and lower sides).

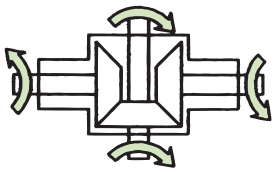


Example of application…

3. Miter Gear Boxes are arranged in one line to couple their cross shafts for inputs, and lateral shafts are rotated.



4. Motive power is input from the cross shaft using the lateral dual shaft, and the opposing lateral shaft is rotated in the reverse direction.



Type ED

Model list

Model list

1. Lateral single-shaft type

○ : Standard item △ : Semi-standard item

Size \ Speed ratio / Material	M (1 : 1)		B15 (1.5 : 1)		B20 (2 : 1)		B25 (2.5 : 1)		B30 (3 : 1)	
	FC	FCD	FC	FCD	FC	FCD	FC	FCD	FC	FCD
2	○ (ADC)	—	—	—	—	—	—	—	—	—
4	○	△	—	—	○	△	—	—	—	—
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
10	○	○	○	○	○	○	○	○	○	○
12	○	○	○	○	○	○	○	○	○	○
16	○	△	—	—	○	△	—	—	—	—
20	○	—	—	—	○	—	—	—	—	—
25	○	—	—	—	○	—	—	—	—	—

2. Lateral dual-shaft type

Size \ Speed ratio / Material	M (1:1)	B15 (1.5:1)	B20 (2:1)	B25 (2.5:1)	B30 (3:1)
	FC				
2	※△ (ADC)	—	—	—	—
4	○	—	○	—	—
6	○	○	○	○	○
7	○	○	○	○	○
8	○	○	○	○	○
10	○	○	○	○	○
12	○	○	○	○	○
16	△	—	△	—	—
20	△	—	△	—	—
25	△	—	△	—	—

Note 1) ADC (Aluminum die-casting), FC (Gray cast iron), FCD (Ductile cast iron)

Note 2) For the lateral dual-shaft type of size 2, shaft arrangements of 1-1-UD (-O), 1-1-U (-O), 1-1-D (-O), U-D-LR (-O), U-D-R (-O), and U-D-L (-O) can be manufactured.

Note 3) For FCD, shaft arrangements of 1-LR (-O), 1-R (-O), and 1-L (-O) of the size in the table above can be manufactured.

Type ED
Standard specification

Standard specification

Gear box	Speed reduction method	Spiral bevel gear
	Lubrication method	Sizes 2 & 4: Grease lubrication Sizes 6 to 25: Oil lubrication
	Specification of key	New JIS regular class JIS B1301-1976 The key is attached at delivery.
	Casing material	Size 2: ADC Sizes 4 to 25: FC (FCD is optional.)
	Sealing structure	Single oil seal
	Painting specification	Paint color: Munsell 2.5G6/3
		Undercoat: Lacquer-type undercoat paint Finish coating: Acrylic lacquer-type paint
	Corrosion-resistant specification	Corrosion-resistant period: six months under indoor storage conditions (after shipment from the factory)
		Outside corrosion-resistant treatment: Application of corrosion-preventive oil Inside corrosion-resistant treatment: Sealing after enclosing lubrication oil
Ambient conditions	Installation site	Indoor
	Ambient temperature	–10°C to 50°C
	Humidity	95% or less
	Altitude	1,000 m or lower
	Atmosphere	There shall be no corrosive or explosive gas, vapor, and dew condensation, and there shall be minimal dust.
Type of mounting		Floor (Y), Ceiling (T), Wall (K1, K2, K3, K4)

Note 1) ADC (Aluminum die-casting), FC (Gray cast iron), FCD (Ductile cast iron)

Type ED

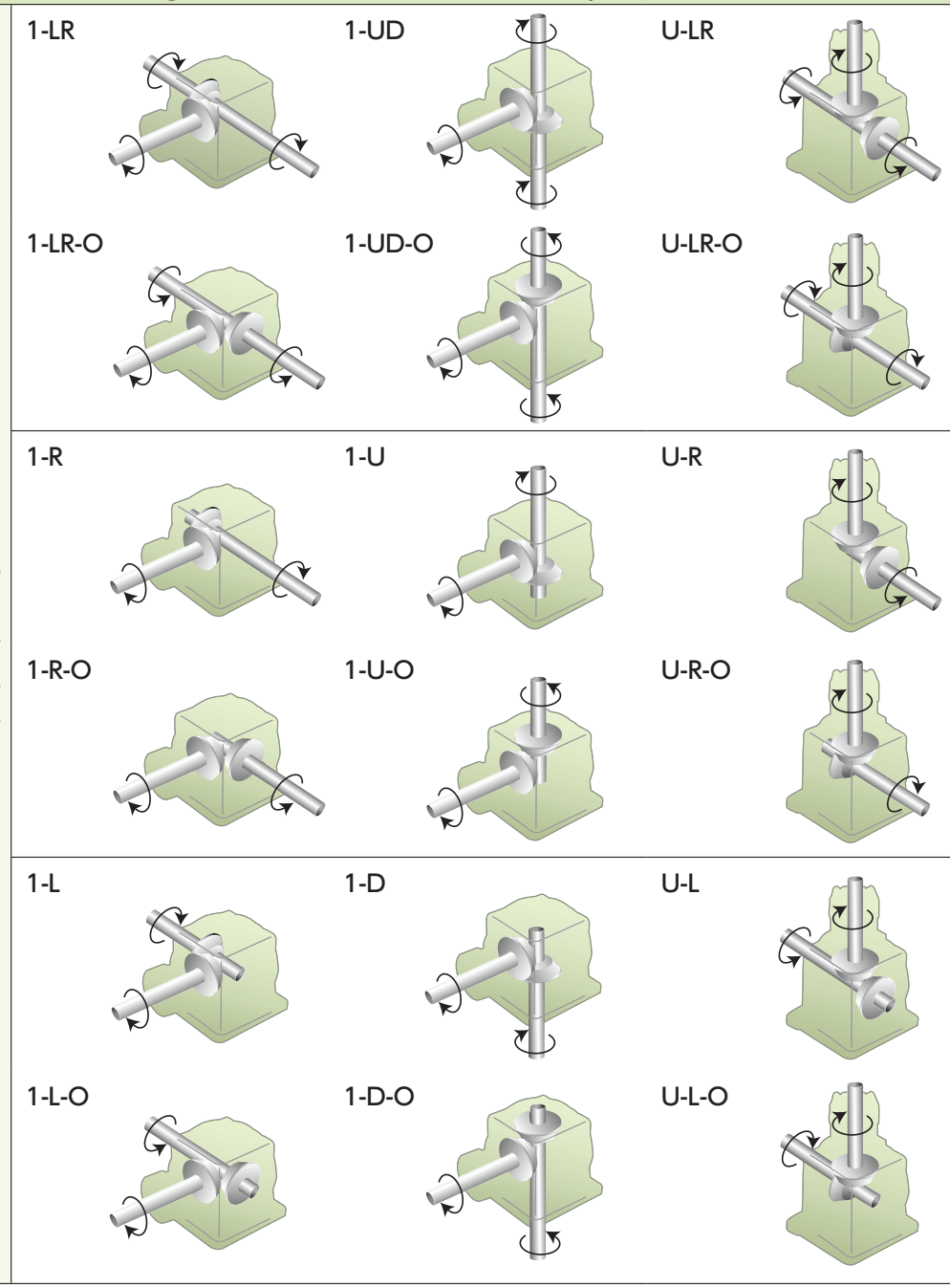
Indication of model number

Shaft arrangement • Rotational relationship

Lateral single-shaft type **ED 6 M - 1-LR - Y**

Lateral dual-shaft type **ED 10 B20 - 1-1-UD - T**

Size	Speed ratio	Shaft arrangement • Rotational relationship
2 4 6 7 8 10 12 16 20 25	M (1 : 1) B15 (1.5:1) B20 (2 : 1) B25 (2.5 : 1) B30 (3 : 1)	Lateral single-shaft type



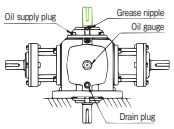
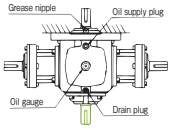
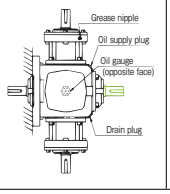
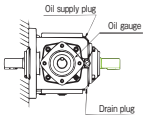
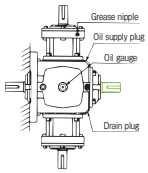
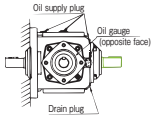
・ The shaft arrangements described to the right have the same rotational relationships. However, note that the positions of plug, oil gauge, and name plate differ.
U-LR=U-LR-O, U-R=U-L-O, U-L=U-R-O, D-LR=D-LR-O, D-R=D-L-O, D-L=D-R-O, 1-1-LR=1-1-LR-O, 1-1-R=1-1-L-O, 1-1-L=1-1-R-O, U-D-LR=U-D-LR-O,
U-D-R=U-D-L-O, U-D-L=U-D-R-O

Type of mounting

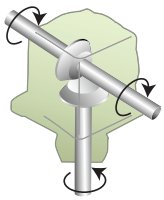
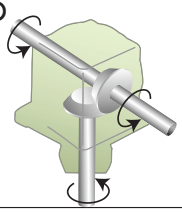
For mounting by each shaft arrangement, refer to pp.13, 14.

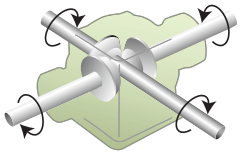
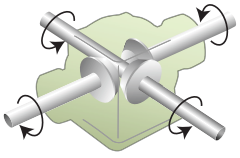
Lateral dual-shaft type

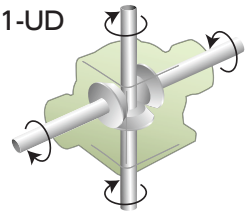
Shaft arrangement
1-1-UD(-O)
1-1-U(-O)
1-1-D(-O)

Floor mount	Ceiling mount	Wall mount			
Y	T	K1	K2	K3	K4
					

Lateral dual-shaft type

D-LR

D-LR-O


1-1-LR

1-1-LR-O


1-1-UD

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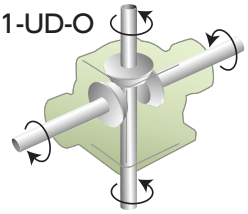

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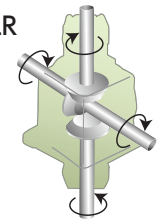
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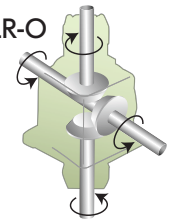
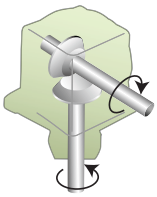
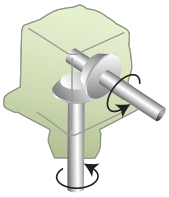


D-R

D-R-O


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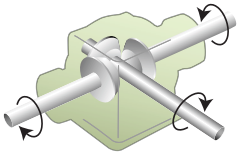
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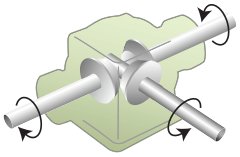

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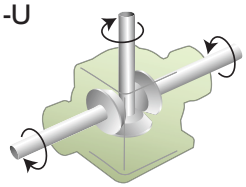
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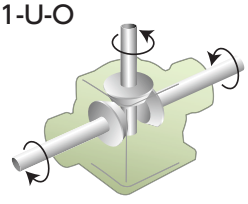

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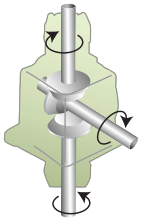
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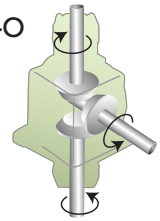

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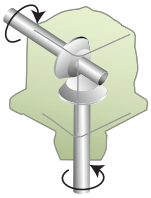
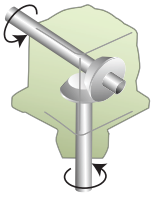

D-L-O


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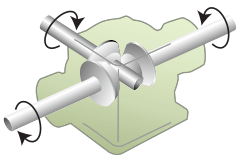
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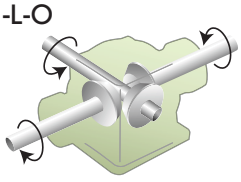

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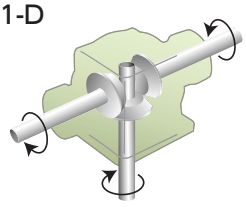
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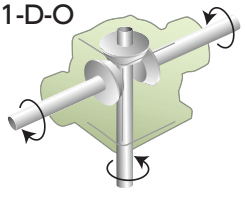
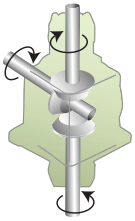


U-D-L

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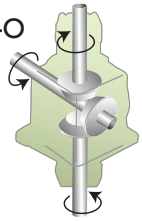
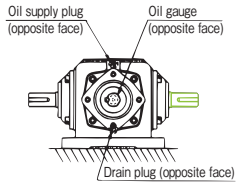
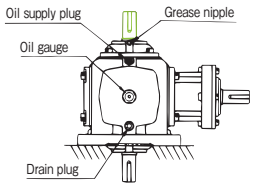
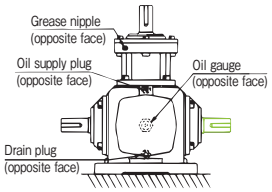
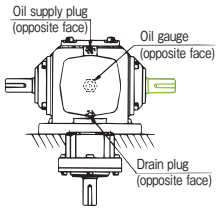
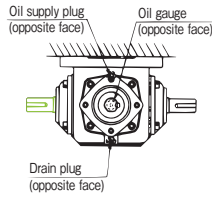
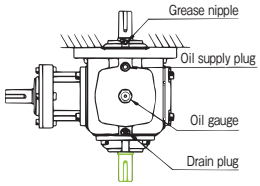
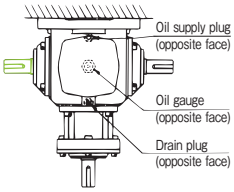
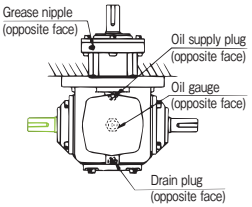
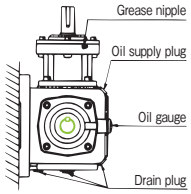
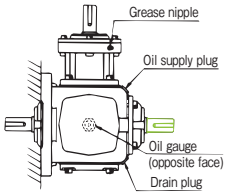
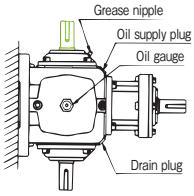
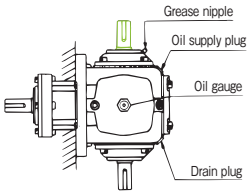
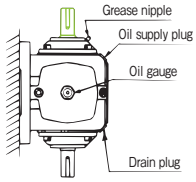
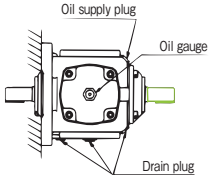
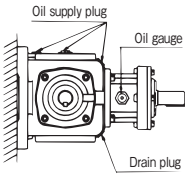
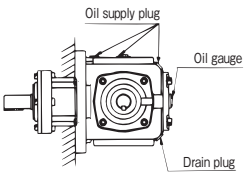
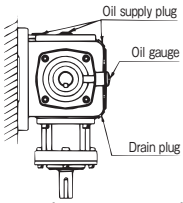
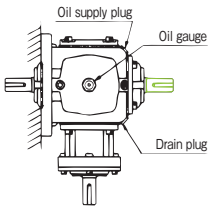
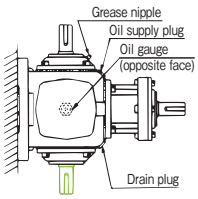
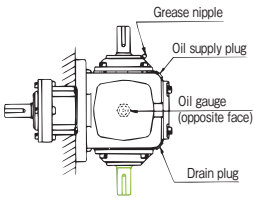
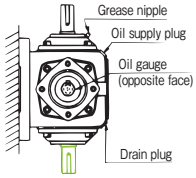
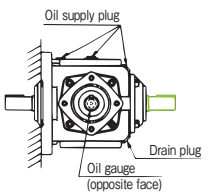
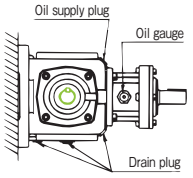
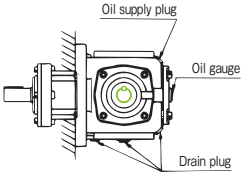


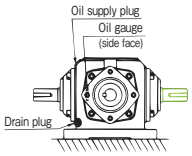
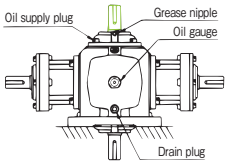
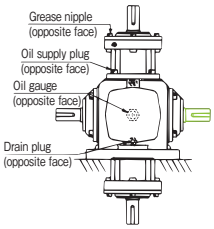
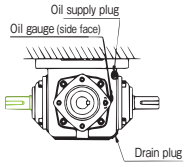
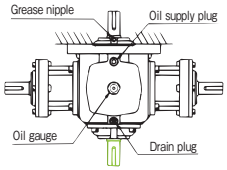
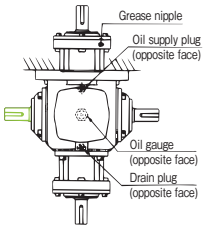
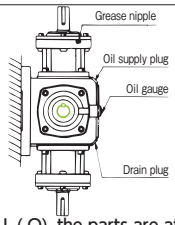
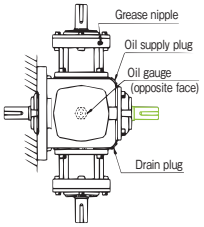
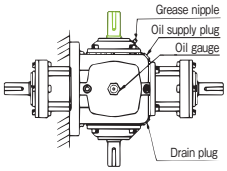
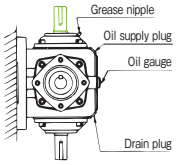
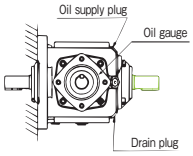
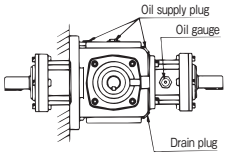
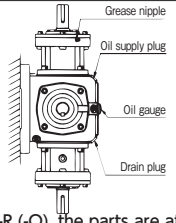
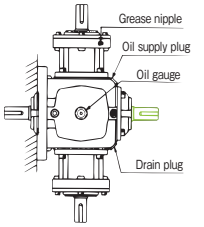
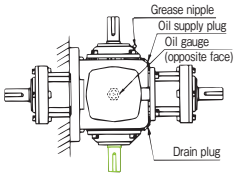
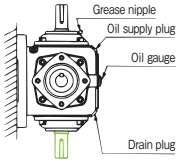
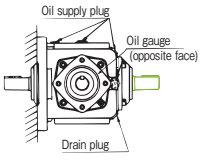
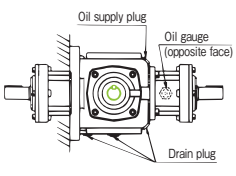
Type ED
Indication of model number
Type of mounting

Lateral single-shaft type
Type of mounting • Position of each plug

Type of mounting \ Shaft arrangement		1-LR(-O) 1-R(-O) 1-L(-O)	1-UD(-O) 1-U(-O) 1-D(-O)	U-LR(-O) U-R(-O) U-L(-O)	D-LR(-O) D-R(-O) D-L(-O)
Floor mount	Y				
Ceiling mount	T				
Wall mount	K1	 For 1-L (-O), the parts are at the opposite side of the cross shaft.			
	K2			 For U-R (-O), the parts are at the opposite side of the cross shaft.	 For D-R (-O), the parts are at the opposite side of the cross shaft.
	K3	 For 1-R (-O), the parts are at the opposite side of the cross shaft.			
	K4			 For U-L (-O), the parts are at the opposite side of the cross shaft.	 For D-L (-O), the parts are at the opposite side of the cross shaft.

Note 1) Sizes 2 & 4 are not provided with oil gauge and grease nipple. They can be mounted in any direction.
Note 2) For sizes 6 to 25, floor mount (Y) is the standard. In the cases of ceiling mount (T) and wall mount (K1, K2, K3, K4), the positions of the oil gauge, plug, and grease nipple differ.

Lateral dual-shaft type
Type of mounting • Position of each plug

Type of mounting \ Shaft arrangement		1-1-LR(-O) 1-1-R(-O) 1-1-L(-O)	1-1-UD(-O) 1-1-U(-O) 1-1-D(-O)	U-D-LR(-O) U-D-R(-O) U-D-L(-O)
Floor mount	Y			
Ceiling mount	T			
Wall mount	K1	 For 1-1-L (-O), the parts are at the opposite side of the cross shaft.		
	K2			 For U-D-R (-O), the parts are at the opposite side of the cross shaft.
	K3	 For 1-1-R (-O), the parts are at the opposite side of the cross shaft.		
	K4			 For U-D-L (-O), the parts are at the opposite side of the cross shaft.

Note 3) These are for sizes 6 to 16. The positions of the oil gauge and plug differ for sizes 20 & 25.
Furthermore, a pressure vent is mounted for size 12 or larger. For the mounting position, refer to the dimensional drawings (pp.45 to 54).

Type ED
Selection

Selection conditions

1. Machine and equipment used, layout
2. Operating conditions
3. Ambient atmosphere
4. Others (option, special specification, etc.)

1. Machine and equipment used, layout
2. Operating conditions

- Description of prime mover
- Load torque N•m {kgf•m} or transmission kW
- Operating time: ( ) hrs/day Continuous • Intermittent
- Starting and stopping frequency: ( ) times/hr
- Input rotational speed: Regular ( ) rpm
  Max. ( ) rpm
- Direction of input shaft: Lateral shaft • Cross shaft
- Speed ratio: 1 : 1, 1.5 : 1, 2 : 1, 2.5 : 1, 3 : 1
- Characteristics of load :
  Uniform load • Load with some shock • Load with large shock

3. Ambient atmosphere

- Usage environment : Indoors • Outdoors • Near a furnace • Inside a refrigerator • Others ( )
- Ambient temperature : Regular ( ) ° C • High temperature ( ) ° C • Low temperature ( ) ° C
- Ambient atmosphere: Salt damage • Dust • Acid • Others ( )

4. Others

- Option (pp.66 to 68), Special specification (pp.69 to 72), etc.

*** Also use the Check sheet for selecting the specification (p.78).**

Selection procedure

Make the selection according to the following procedure, considering conditions.

1. Decision on service factor

All transmission capacity tables in the catalog show values with the service factor set at 1.0. Depending on service conditions, decide the service factor using the Service factor table in Table 1.

Table 1 Service factor

Characteristics of load \ Operating time	2 hrs	10 hrs	24 hrs
Uniform load	1.00 (1.00)	1.00 (1.25)	1.25 (1.50)
Load with some shock	1.00 (1.25)	1.25 (1.50)	1.50 (1.75)
Load with large shock	1.25 (1.50)	1.50 (1.75)	1.75 (2.00)

Note 1) When frequency of starting and stopping is not less than 10 times an hour, or the prime mover is a multi-cylinder engine, use the values in ( ).
Note 2) The service factors above are general guidelines. Make a decision considering service conditions.

2. Decision on corrected torque or corrected kW

Decide corrected torque or corrected kW considering the service factor.

Corrected torque or Corrected kW =
(Load torque or transmission kW applied to the Miter Gear Box) × Service factor (Table 1)

3. Decision on size

For the rotational speed used, select the size that satisfies corrected torque or corrected kW from the transmission capacity tables. Furthermore, check whether the peak torque at starting and stopping is kept to within 200% of the transmission capacity of the selected size.

4. Confirmation of radial load

When driving is performed at a state with sprocket, gear, or pulley, etc. mounted on the lateral shaft and/or cross shaft, confirm the radial load using the following formula.

■ Formula for confirming radial load

$$\text{Allowable radial load} \geqq \frac{T \times f \times Lf}{R}$$

(Allowable radial load: p.64)

T = Corrected torque N·m{kgf·m}
f = O.H.L. factor (Table 2)
Lf = Operating position factor (Table 3)
R = Pitch circle radius of sprocket, pulley, etc. m

When the formula at the left side is not satisfied as a result of confirming the radial load, it is necessary to increase "R," namely the pitch circle radius of the sprocket, pulley, etc.

Table2 O.H.L. factor (f)

Chain	1.00
Gear	1.25
Toothed belt	1.25
V-belt • Strong toothed belt	1.50

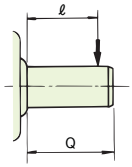


Table 3 Operating position factor (Lf)

When load is applied to the center of the shaft or inside	$\ell \leqq \frac{Q}{2}$	Lf = 1
When load is applied to the outside rather than the center of the shaft	$\ell > \frac{Q}{2}$	$Lf = \frac{2\ell}{Q}$

Q = Length of output shaft end ℓ = Operating position of radial load

Note) If radial load and axial load are to be applied at the same time, please consult our company.

5. Decision on shaft arrangement • rotational relationship, type of mounting – Decision on model number

- Shaft arrangement • Rotational relationship
  Select from Shaft arrangement • Rotational relationship (pp.11 to 12). (Pay attention to rotational direction of the shaft.)
- Type of mounting
  Select from Type of mounting (pp.13 to 14). (Sizes 2 & 4 are lubricated with grease, and there is no limit to the mounting direction.)

Decide model number on the basis of the conditions above.

6. Investigation/study of options, special specifications, etc.

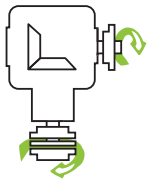
Because we also manufacture options (pp.66 to 68) as well as standard items and items with special specifications (pp.69 to 72), please consult our company.

Type ED
Example of selection

Example 1 of selection

■ General selection

Usage layout



Operating conditions
- Motive power is input from the lateral shaft by directly coupling a general-purpose motor (15 kW × 4P × 60 Hz).
- For the cross shaft side, a sprocket with a Pitch Circle Diameter (P.C.D.) of 100 mm is mounted.
- It is operated at a load transmission in kW of 10 kW.
- Operating time is 10 hrs/day under a load with some shock.
  Start-stop: Intermittent operation 12 times/hr
- Speed ratio is 1:1.

Ambient atmosphere
- Indoor, 30° C constant, ordinary atmosphere (no dust, etc.)

Option
- None (The standard item can be used.)

①Decision on service factor

From Table 1, the service factor becomes 1.50 under the operating condition above (load with some shock, 10 hrs/day, and starting and stopping 12 times/hr).

②Decision on corrected kW

Corrected kW = 10 kW (load transmission kW) × 1.5.
(service factor) = 15 kW
So, the corrected kW becomes 15 kW.

③Decision on size

For the size that satisfies the corrected kW = 15 kW, inputted rotational speed of 1,750 rpm, ED6M is selected from the transmission capacity tables.

④Confirmation of radial load

(It is assumed that the radial load is applied at the center of the cross shaft.)
With a chain transmission, the O.H.L. factor f =1.0 from Table 2, and the operating position factor Lf = 1 because the radial load is applied to the shaft center.
From the formula for confirming radial load and service conditions,

$$\text{Radial load} = \frac{\frac{9550 \times 15}{1750} \times 1.0 \times 1.0}{\frac{100}{2 \times 1000}} = 1637\text{N}$$

From the Allowable radial load of the ED6M's cross shaft = 2,303 N > 1,637N, it can be used within the allowable value.

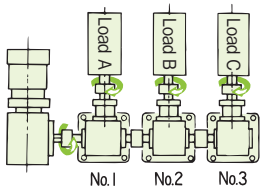
⑤Decision on model number

Decide model number from shaft arrangement, rotational relationship, and type of mounting for usage layout.
ED6M-1-R-Y can be selected.
* Check direction of rotation.

Example 2 of selection

■ Line shaft drive

Usage layout



Operating conditions
- All loads A, B, and C are used at a uniform load of 245 N•m (25 kgf•m), and operating time is 8 hrs/day.
- Input rotational speed is 300 rpm, and speed ratio is 1:1 for all loads.

Ambient atmosphere
- Indoor, 30° C constant, ordinary atmosphere (no dust, etc.)

Option
- None (The standard item can be used.)

*** Precautions for selecting line shaft drive**
In the case of line shaft drive, the load applied to the gear and the load applied to the line shaft (cross shaft) differ. Therefore, it is necessary to select each individually.
For the allowable torsional transmission capacity of the cross shaft alone (allowable torque of the cross shaft), refer to p.63.

①Decision on service factor

From Table 1, the service factor is 1.0 under the operating conditions above (uniform load, 8 hrs/day).

②Selection of each Miter Gear Box

(1) Miter Gear Box No.1
- The gear drives only load A.
  →Transmission capacity of 245 N•m × 1.0 = 245 N•m or more is required.
- The cross shaft drives loads A, B, and C.
  →Cross shaft torque of (245 N•m + 245 N•m + 245 N•m) × 1.0 = 735 N•m or more is required. So, ED10M is selected from the transmission capacity tables and allowable torque of cross shaft.

(ED10M Transmission capacity: 513 N•m > 245 N•m,
Allowable torque of cross shaft: 891 N•m > 735 N•m)

(2) Miter Gear Box No. 2
- The gear drives only load B.
  →Transmission capacity of 245 N•m × 1.0 = 245 N•m or more is required.
- The cross shaft drives loads B and C.
  →Cross shaft torque of (245 N•m + 245 N•m) × 1.0 = 490 N•m or more is required. So, ED8M is selected from the transmission capacity tables (pp.17 to 18) and allowable torque of the cross shaft (p.63).

(ED8M Transmission capacity: 331 N•m > 245 N•m,
Allowable torque of cross shaft: 627 N•m > 490 N•m)

(3) Miter Gear Box No.3
- Both gear and cross shaft drive only load C.
  →Transmission capacity as well as cross shaft torque of 245 N•m × 1.0 = 245 N•m or more is required.
  So, ED8M is selected from the transmission capacity tables (pp.17 to 18) and allowable torque of cross shaft (p.63).

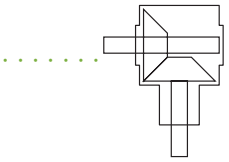
(ED8M Transmission capacity: 331 N•m > 245 N•m,
Allowable torque of cross shaft: 627 N•m > 245 N•m)

③Decision on model number

Decide model number from shaft arrangement, rotational relationship, and type of mounting for usage layout (pp.11 to 14).
No.1 ED10M-1-LR-O-Y
No.2 ED8M-1-LR-O-Y
No.3 ED8M-1-R-O-Y can be selected.
* Check direction of rotation.

Type ED

Lateral single-shaft type
Transmission capacity table



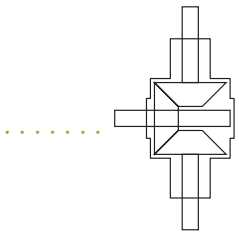
Speed ratio	Rotational speed of lateral shaft r/min	ED2			ED4			ED6			ED7			ED8		
		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque	
			N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}
1 : 1	3000	3.41	10.6	{1.08}	7.71	24.0	{2.45}	22.8	71.1	{ 7.25}	–	–	–	–	–	–
	2000	2.43	11.3	{1.16}	5.96	27.9	{2.84}	18.6	87.0	{ 8.87}	27.1	105	{12.9}	57.3	268	{27.3}
	1750	2.15	11.5	{1.17}	5.61	30.0	{3.06}	17.1	91.1	{ 9.30}	24.8	132	{13.5}	52.3	279	{28.5}
	1450	1.79	11.6	{1.18}	4.94	31.9	{3.25}	14.9	96.0	{ 9.80}	22.0	142	{14.5}	45.6	294	{30.0}
	1150	1.43	11.7	{1.19}	4.19	34.1	{3.48}	12.7	103	{10.5 }	18.4	150	{15.3}	37.5	305	{31.1}
	870	1.12	12.1	{1.23}	3.46	37.2	{3.80}	10.5	113	{11.5 }	15.2	164	{16.7}	29.0	312	{31.8}
	580	0.74	12.1	{1.23}	2.45	39.5	{4.03}	7.35	119	{12.1 }	11.4	184	{18.8}	19.8	319	{32.6}
	300	0.39	12.3	{1.26}	1.30	40.5	{4.13}	3.93	123	{12.5 }	6.35	198	{20.2}	10.6	331	{33.8}
	100	0.13	12.7	{1.30}	0.44	41.9	{4.28}	1.36	127	{13.0 }	2.20	206	{21.0}	3.70	346	{35.3}
	10	0.01	13.0	{1.33}	0.04	43.0	{4.39}	0.14	132	{13.5 }	0.22	214	{21.8}	0.38	361	{36.8}
1.5 : 1	3000	–	–	–	–	–	–	19.7	92.1	{ 9.39}	–	–	–	–	–	–
	2000	–	–	–	–	–	–	14.9	105	{10.7 }	19.2	135	{13.7}	25.8	181	{18.5}
	1750	–	–	–	–	–	–	13.7	110	{11.2 }	17.4	139	{14.2}	22.7	182	{18.6}
	1450	–	–	–	–	–	–	12.1	117	{11.9 }	15.0	145	{14.8}	19.1	185	{18.9}
	1150	–	–	–	–	–	–	9.96	122	{12.4 }	12.0	147	{15.0}	15.4	188	{19.2}
	870	–	–	–	–	–	–	7.66	123	{12.6 }	9.30	150	{15.3}	11.8	191	{19.5}
	580	–	–	–	–	–	–	5.23	126	{12.9 }	6.32	153	{15.6}	8.14	197	{20.1}
	300	–	–	–	–	–	–	2.77	129	{13.2 }	3.35	157	{16.0}	4.34	203	{20.7}
	100	–	–	–	–	–	–	0.95	134	{13.7 }	1.16	163	{16.6}	1.49	210	{21.4}
	10	–	–	–	–	–	–	0.09	139	{14.2 }	0.12	169	{17.2}	0.15	218	{22.2}
2 : 1	3000	–	–	–	5.56	34.6	{3.53}	15.6	97.3	{ 9.92}	–	–	–	–	–	–
	2000	–	–	–	4.30	40.2	{4.10}	10.7	100	{10.2 }	14.2	133	{13.5}	18.9	176	{18.0}
	1750	–	–	–	3.97	42.4	{4.33}	9.44	101	{10.3 }	12.7	135	{13.8}	16.9	180	{18.4}
	1450	–	–	–	3.32	42.8	{4.37}	7.90	102	{10.4 }	10.6	137	{14.0}	14.0	180	{18.4}
	1150	–	–	–	2.67	43.4	{4.43}	6.39	104	{10.6 }	8.55	139	{14.2}	11.3	183	{18.7}
	870	–	–	–	2.04	43.8	{4.47}	4.88	105	{10.7 }	6.56	141	{14.4}	8.70	187	{19.1}
	580	–	–	–	1.38	44.4	{4.53}	3.34	108	{11.0 }	4.47	144	{14.7}	5.92	191	{19.5}
	300	–	–	–	0.72	45.5	{4.64}	1.76	110	{11.2 }	2.37	148	{15.1}	3.14	196	{20.0}
	100	–	–	–	0.24	46.6	{4.76}	0.60	114	{11.6 }	0.81	152	{15.5}	1.08	202	{20.6}
	10	–	–	–	0.02	48.5	{4.95}	0.06	116	{11.8 }	0.08	157	{16.0}	0.11	209	{21.3}
2.5 : 1	3000	–	–	–	–	–	–	11.7	91.1	{ 9.29}	–	–	–	–	–	–
	2000	–	–	–	–	–	–	8.00	93.5	{ 9.53}	9.40	110	{11.2}	15.2	177	{18.1}
	1750	–	–	–	–	–	–	7.13	95.3	{ 9.72}	8.36	112	{11.4}	13.5	180	{18.4}
	1450	–	–	–	–	–	–	5.97	96.2	{ 9.82}	6.99	113	{11.5}	11.4	184	{18.8}
	1150	–	–	–	–	–	–	4.78	97.2	{ 9.92}	5.64	115	{11.7}	9.11	185	{18.9}
	870	–	–	–	–	–	–	3.68	99.0	{10.1 }	4.30	116	{11.8}	7.00	188	{19.2}
	580	–	–	–	–	–	–	2.48	100	{10.2 }	2.92	118	{12.0}	4.76	192	{19.6}
	300	–	–	–	–	–	–	1.32	102	{10.5 }	1.55	121	{12.3}	2.53	197	{20.1}
	100	–	–	–	–	–	–	0.44	104	{10.7 }	0.52	123	{12.6}	0.86	203	{20.7}
	10	–	–	–	–	–	–	0.04	107	{11.0 }	0.05	126	{12.9}	0.08	208	{21.2}
3 : 1	3000	–	–	–	–	–	–	9.59	89.7	{ 9.14}	–	–	–	–	–	–
	2000	–	–	–	–	–	–	6.56	92.0	{ 9.38}	7.30	102	{10.4}	10.9	152	{15.6}
	1750	–	–	–	–	–	–	5.78	92.7	{ 9.46}	6.48	104	{10.6}	9.78	157	{16.0}
	1450	–	–	–	–	–	–	4.84	93.6	{ 9.55}	5.42	105	{10.7}	8.20	159	{16.2}
	1150	–	–	–	–	–	–	3.88	94.8	{ 9.67}	4.34	106	{10.8}	6.55	160	{16.3}
	870	–	–	–	–	–	–	2.97	95.9	{ 9.79}	3.34	108	{11.0}	5.04	163	{16.6}
	580	–	–	–	–	–	–	2.02	97.6	{ 9.96}	2.25	109	{11.1}	3.42	166	{16.9}
	300	–	–	–	–	–	–	1.07	100	{10.2 }	1.18	111	{11.3}	1.80	169	{17.2}
	100	–	–	–	–	–	–	0.36	102	{10.4 }	0.40	115	{11.7}	0.61	173	{17.7}
	10	–	–	–	–	–	–	0.03	104	{10.6 }	0.04	118	{12.0}	0.06	179	{18.3}

Note 1) When it is used between the respective rotational speeds, calculate the values by interpolation.
Note 2) When rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.
Note 3) When it is used at a rotational speed of ▭, it corresponds to the specification of oil lubrication. Refer to the item on special specification.
Note 4) When it is used at a rotational speed of ▭, it may correspond to the specification of forced lubrication. In such a case, please consult our company.
In the case of a rotational speed between a rotational speed of ▭ and a lower rotational speed, also please consult our company.

Speed ratio	Rotational speed of lateral shaft r/min	ED10			ED12			ED16			ED20			ED25		
		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque	
			N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}
1 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	79.0	358	{36.5}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	74.6	399	{40.7}	109.6	586	{59.8}	–	–	–	–	–	–	–	–	–
	1450	65.3	421	{43.0}	96.0	619	{63.2}	163	1019	{104 }	–	–	–	–	–	–
	1150	55.7	453	{46.2}	81.8	665	{67.9}	139	1098	{112 }	234	1842	{188}	–	–	–
	870	44.6	479	{48.9}	67.5	726	{74.1}	114	1186	{121 }	193	2009	{205}	335	3489	{356}
	580	30.6	493	{50.3}	49.7	802	{81.8}	85.9	1343	{137 }	145	2274	{232}	252	3940	{402}
	300	16.4	513	{52.3}	26.8	835	{85.2}	54.1	1637	{167 }	90.8	2744	{280}	159	4792	{489}
	100	5.72	535	{54.6}	9.36	875	{89.3}	20.3	1842	{188 }	35.3	3205	{327}	60.0	5439	{555}
	10	0.59	561	{57.2}	0.98	919	{93.8}	2.14	1940	{198 }	3.53	3205	{327}	6.30	5713	{583}
1.5 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	49.5	336	{34.3}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	46.0	368	{37.6}	65.9	528	{53.9}	–	–	–	–	–	–	–	–	–
	1450	38.7	374	{38.2}	58.3	564	{57.6}	–	–	–	–	–	–	–	–	–
	1150	31.2	380	{38.8}	49.2	601	{61.3}	–	–	–	–	–	–	–	–	–
	870	24.1	389	{39.7}	40.7	656	{66.9}	–	–	–	–	–	–	–	–	–
	580	16.4	396	{40.4}	28.9	699	{71.3}	–	–	–	–	–	–	–	–	–
	300	8.78	411	{41.9}	15.5	724	{73.9}	–	–	–	–	–	–	–	–	–
	100	3.04	426	{43.5}	5.37	754	{76.9}	–	–	–	–	–	–	–	–	–
	10	0.31	443	{45.2}	0.56	785	{80.1}	–	–	–	–	–	–	–	–	–
2 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	32.0	290	{29.6}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	28.2	302	{30.8}	48.3	516	{52.7}	87.7	908	{ 92.7}	–	–	–	–	–	–
	1450	23.6	305	{31.1}	40.0	516	{52.7}	73.7	921	{ 94.0}	126	1578	{161}	–	–	–
	1150	19.0	309	{31.5}	31.7	516	{52.7}	59.5	938	{ 95.7}	102	1607	{164}	199	3146	{321}
	870	14.6	315	{32.1}	24.0	516	{52.7}	46.0	958	{ 97.8}	79.0	1646	{168}	155	3224	{329}
	580	10.0	322	{32.9}	16.3	524	{53.5}	31.3	980	{100 }	54.2	1695	{173}	107	3332	{340}
	300	5.33	332	{33.9}	8.71	543	{55.4}	16.7	1009	{103 }	29.0	1754	{179}	57.5	3479	{355}
	100	1.84	344	{35.1}	3.01	563	{57.4}	5.84	1058	{108 }	10.1	1833	{187}	20.1	3646	{372}
	10	0.19	357	{36.4}	0.31	586	{59.8}	0.60	1098	{112 }	1.06	1921	{196}	2.11	3822	{390}
2.5 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	24.3	275	{28.1}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	21.7	290	{29.6}	37.4	500	{51.0}	–	–	–	–	–	–	–	–	–
	1450	18.2	293	{29.9}	31.4	507	{51.7}	–	–	–	–	–	–	–	–	–
	1150	14.7	298	{30.4}	25.3	514	{52.4}	–	–	–	–	–	–	–	–	–
	870	11.2	302	{30.8}	19.5	523	{53.4}	–	–	–	–	–	–	–	–	–
	580	7.68	310	{31.6}	13.3	535	{54.6}	–	–	–	–	–	–	–	–	–
	300	4.06	317	{32.3}	7.08	552	{56.3}	–	–	–	–	–	–	–	–	–
	100	1.40	326	{33.3}	2.43	568	{58.0}	–	–	–	–	–	–	–	–	–
	10	0.14	336	{34.3}	0.25	588	{60.1}	–	–	–	–	–	–	–	–	–
3 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	18.6	252	{25.8}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	16.8	270	{27.5}	28.2	452	{46.1}	–	–	–	–	–	–	–	–	–
	1450	14.0	270	{27.6}	23.6	458	{46.7}	–	–	–	–	–	–	–	–	–
	1150	11.3	275	{28.1}	19.0	464	{47.3}	–	–	–	–	–	–	–	–	–
	870	8.66	279	{28.5}	14.6	469	{47.9}	–	–	–	–	–	–	–	–	–
	580	5.89	285	{29.1}	9.92	480	{49.0}	–	–	–	–	–	–	–	–	–
	300	3.11	291	{29.7}	5.29	495	{50.5}	–	–	–	–	–	–	–	–	–
	100	1.07	300	{30.6}	1.82	510	{52.0}	–	–	–	–	–	–	–	–	–
	10	0.11	308	{31.4}	0.18	527	{53.8}	–	–	–	–	–	–	–	–	–

Type ED

Lateral dual-shaft type
Transmission capacity table



Speed ratio	Rotational speed of lateral shaft r/min	ED2			ED4			ED6			ED7			ED8		
		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque	
			N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}
1 : 1	3000	2.38	7.42	{0.75}	5.39	16.8	{1.71}	15.9	49.7	{5.07}	–	–	–	–	–	–
	2000	1.70	7.91	{0.81}	4.17	19.5	{1.99}	13.0	60.9	{6.21}	18.9	73.5	{ 7.50}	40.1	187	{19.1}
	1750	1.50	8.05	{0.81}	3.92	21.0	{2.14}	11.9	63.7	{6.50}	17.3	92.4	{ 9.42}	36.6	195	{19.9}
	1450	1.25	8.12	{0.82}	3.45	22.3	{2.27}	10.4	67.2	{6.85}	15.4	99.4	{10.1 }	31.9	205	{21.0}
	1150	1.00	8.19	{0.83}	2.93	23.8	{2.43}	8.89	72.1	{7.35}	12.8	105	{10.7 }	26.2	213	{21.7}
	870	0.78	8.47	{0.86}	2.42	26.0	{2.65}	7.35	79.1	{8.07}	10.6	114	{11.7 }	20.3	218	{22.2}
	580	0.51	8.47	{0.86}	1.71	27.6	{2.82}	5.14	83.3	{8.50}	7.98	128	{13.1 }	13.8	223	{22.7}
	300	0.27	8.61	{0.88}	0.91	28.3	{2.89}	2.75	86.1	{8.78}	4.44	138	{14.1 }	7.42	231	{23.6}
	100	0.09	8.89	{0.91}	0.30	29.3	{2.99}	0.95	88.9	{9.07}	1.54	144	{14.7 }	2.59	242	{24.7}
	10	0.01	9.10	{0.93}	0.02	30.1	{3.07}	0.09	92.4	{9.42}	0.15	149	{15.2 }	0.26	252	{25.7}
1.5 : 1	3000	–	–	–	–	–	–	13.7	64.4	{6.57}	–	–	–	–	–	–
	2000	–	–	–	–	–	–	10.4	73.5	{7.50}	13.4	94.5	{ 9.64}	18.0	126	{12.9}
	1750	–	–	–	–	–	–	9.59	77.0	{7.85}	12.1	97.3	{ 9.92}	15.8	127	{13.0}
	1450	–	–	–	–	–	–	8.47	81.9	{8.35}	10.5	101	{10.3 }	13.3	129	{13.2}
	1150	–	–	–	–	–	–	6.97	85.4	{8.71}	8.4	102	{10.5 }	10.7	131	{13.4}
	870	–	–	–	–	–	–	5.36	86.1	{8.78}	6.51	105	{10.7 }	8.26	133	{13.6}
	580	–	–	–	–	–	–	3.66	88.2	{9.00}	4.42	107	{10.9 }	5.69	137	{14.0}
	300	–	–	–	–	–	–	1.93	90.3	{9.21}	2.34	109	{11.2 }	3.03	142	{14.5}
	100	–	–	–	–	–	–	0.66	93.8	{9.57}	0.81	114	{11.6 }	1.04	147	{15.0}
	10	–	–	–	–	–	–	0.06	97.3	{9.92}	0.08	118	{12.0 }	0.10	152	{15.5}
2 : 1	3000	–	–	–	3.89	24.2	{2.47}	10.9	68.1	{6.95}	–	–	–	–	–	–
	2000	–	–	–	3.01	28.1	{2.87}	7.49	70.0	{7.14}	9.94	93.1	{ 9.5 }	13.2	123	{12.5}
	1750	–	–	–	2.77	29.6	{3.02}	6.60	70.7	{7.21}	8.89	94.5	{ 9.64}	11.8	126	{12.8}
	1450	–	–	–	2.32	29.9	{3.05}	5.53	71.4	{7.28}	7.42	95.9	{ 9.78}	9.80	126	{12.8}
	1150	–	–	–	1.86	30.3	{3.10}	4.47	72.8	{7.42}	5.98	97.3	{ 9.92}	7.91	128	{13.0}
	870	–	–	–	1.42	30.6	{3.12}	3.41	73.5	{7.5}	4.59	98.7	{10.0 }	6.09	130	{13.3}
	580	–	–	–	0.96	31.0	{3.17}	2.33	75.6	{7.71}	3.12	100	{10.2 }	4.14	133	{13.6}
	300	–	–	–	0.50	31.8	{3.25}	1.23	77.0	{7.85}	1.65	103	{10.5 }	2.19	137	{14.0}
	100	–	–	–	0.16	32.6	{3.32}	0.42	79.8	{8.14}	0.56	106	{10.8 }	0.75	141	{14.4}
	10	–	–	–	0.01	33.9	{3.46}	0.04	81.2	{8.28}	0.05	109	{11.2 }	0.07	146	{14.9}
2.5 : 1	3000	–	–	–	–	–	–	8.19	63.7	{6.5}	–	–	–	–	–	–
	2000	–	–	–	–	–	–	5.60	65.4	{6.67}	6.58	77.0	{7.85}	10.6	123	{12.6}
	1750	–	–	–	–	–	–	4.99	66.7	{6.8}	5.85	78.4	{8.00}	9.45	126	{12.8}
	1450	–	–	–	–	–	–	4.17	67.3	{6.87}	4.89	79.1	{8.07}	7.98	128	{13.1}
	1150	–	–	–	–	–	–	3.34	68.0	{6.94}	3.94	80.5	{8.21}	6.37	129	{13.2}
	870	–	–	–	–	–	–	2.57	69.3	{7.07}	3.01	81.2	{8.28}	4.9	131	{13.4}
	580	–	–	–	–	–	–	1.73	70.0	{7.14}	2.04	82.6	{8.42}	3.33	134	{13.7}
	300	–	–	–	–	–	–	0.92	71.4	{7.28}	1.08	84.7	{8.64}	1.77	137	{14.0}
	100	–	–	–	–	–	–	0.30	72.8	{7.42}	0.36	86.1	{8.78}	0.60	142	{14.5}
	10	–	–	–	–	–	–	0.02	74.9	{7.64}	0.03	88.2	{9.00}	0.05	145	{14.8}
3 : 1	3000	–	–	–	–	–	–	6.71	62.7	{6.4}	–	–	–	–	–	–
	2000	–	–	–	–	–	–	4.59	64.4	{6.57}	5.11	71.4	{7.28}	7.63	106	{10.8}
	1750	–	–	–	–	–	–	4.04	64.8	{6.62}	4.53	72.8	{7.42}	6.84	109	{11.2}
	1450	–	–	–	–	–	–	3.38	65.5	{6.68}	3.79	73.5	{7.50}	5.74	111	{11.3}
	1150	–	–	–	–	–	–	2.71	66.3	{6.77}	3.03	74.2	{7.57}	4.58	112	{11.4}
	870	–	–	–	–	–	–	2.07	67.1	{6.85}	2.33	75.6	{7.71}	3.52	114	{11.6}
	580	–	–	–	–	–	–	1.41	68.3	{6.97}	1.57	76.3	{7.78}	2.39	116	{11.8}
	300	–	–	–	–	–	–	0.74	70.0	{7.14}	0.82	77.7	{7.92}	1.26	118	{12.0}
	100	–	–	–	–	–	–	0.25	71.4	{7.28}	0.28	80.5	{8.21}	0.42	121	{12.3}
	10	–	–	–	–	–	–	0.02	72.8	{7.42}	0.02	82.6	{8.42}	0.04	125	{12.7}

Note 1) When it is used between respective rotational speeds, calculate the values by interpolation.
Note 2) When rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.
Note 3) When it is used at a rotational speed of ▭, it corresponds to the specification of oil lubrication. Refer to the item on special specification.
Note 4) When it is used at a rotational speed of ▭, it may correspond to the specification of forced lubrication. In such a case, please consult our company.
In the case of a rotational speed between a rotational speed of ▭ and a lower rotational speed, also please consult our company.

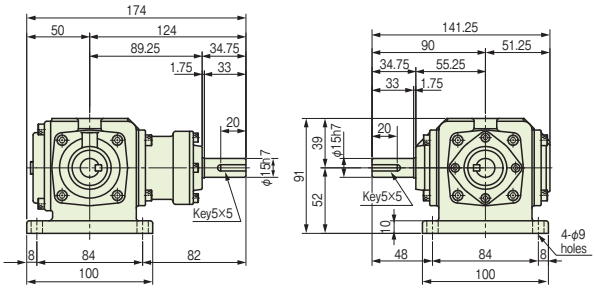
Speed ratio	Rotational speed of lateral shaft r/min	ED10			ED12			ED16			ED20			ED25		
		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque		Input kW	Cross shaft torque	
			N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}		N·m	{kgf·m}
1 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	55.3	250	{25.5}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	52.2	279	{28.5}	76.7	410	{41.8}	–	–	–	–	–	–	–	–	–
	1450	45.7	294	{30.0}	67.2	433	{44.2}	114	713	{72.8}	–	–	–	–	–	–
	1150	38.9	317	{32.3}	57.2	465	{47.5}	97.3	769	{78.4}	164	1289	{132}	–	–	–
	870	31.2	335	{34.2}	47.2	508	{51.8}	79.8	830	{84.7}	135	1406	{144}	235	2442	{249}
	580	21.4	345	{35.2}	34.7	561	{57.2}	60.1	940	{95.9}	102	1592	{162}	176	2758	{281}
	300	11.4	359	{36.6}	18.7	584	{59.6}	37.9	1146	{117}	63.6	1921	{196}	111	3354	{342}
	100	4.00	374	{38.2}	6.55	612	{62.5}	14.2	1289	{132}	24.7	2244	{229}	42.0	3807	{389}
	10	0.41	392	{40.0}	0.68	643	{65.6}	1.50	1358	{139}	2.47	2244	{229}	4.41	3999	{408}
1.5 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	34.6	235	{24.0}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	32.2	257	{26.2}	46.1	369	{37.7}	–	–	–	–	–	–	–	–	–
	1450	27.0	261	{26.7}	40.8	394	{40.2}	–	–	–	–	–	–	–	–	–
	1150	21.8	266	{27.1}	34.4	420	{42.9}	–	–	–	–	–	–	–	–	–
	870	16.8	272	{27.7}	28.4	459	{46.8}	–	–	–	–	–	–	–	–	–
	580	11.4	277	{28.2}	20.2	489	{49.9}	–	–	–	–	–	–	–	–	–
	300	6.14	287	{29.3}	10.8	506	{51.7}	–	–	–	–	–	–	–	–	–
	100	2.12	298	{30.4}	3.75	527	{53.8}	–	–	–	–	–	–	–	–	–
	10	0.21	310	{31.6}	0.39	549	{56.0}	–	–	–	–	–	–	–	–	–
2 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	22.4	203	{20.7}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	19.7	211	{21.5}	33.8	361	{36.8}	61.4	636	{64.9}	–	–	–	–	–	–
	1450	16.5	213	{21.7}	28.0	361	{36.8}	51.6	645	{65.8}	88.2	1105	{113}	–	–	–
	1150	13.3	216	{22.0}	22.1	361	{36.8}	41.7	657	{67.0}	71.4	1125	{115}	139	2202	{225}
	870	10.2	220	{22.5}	16.8	361	{36.8}	32.2	671	{68.5}	55.3	1152	{118}	109	2257	{230}
	580	7.00	225	{23.0}	11.4	366	{37.4}	21.9	686	{70.0}	37.9	1187	{121}	74.9	2332	{238}
	300	3.73	232	{23.7}	6.09	380	{38.7}	11.7	706	{72.1}	20.3	1228	{125}	40.3	2435	{249}
	100	1.28	240	{24.5}	2.10	394	{40.2}	4.09	741	{75.6}	7.07	1283	{131}	14.1	2552	{260}
	10	0.13	249	{25.5}	0.21	410	{41.8}	0.42	769	{78.4}	0.74	1345	{137}	1.48	2675	{273}
2.5 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	17.0	192	{19.6}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	15.1	203	{20.7}	26.1	350	{35.7}	–	–	–	–	–	–	–	–	–
	1450	12.7	205	{20.9}	21.9	354	{36.2}	–	–	–	–	–	–	–	–	–
	1150	10.2	208	{21.2}	17.7	359	{36.7}	–	–	–	–	–	–	–	–	–
	870	7.84	211	{21.5}	13.6	366	{37.3}	–	–	–	–	–	–	–	–	–
	580	5.37	217	{22.1}	9.31	374	{38.2}	–	–	–	–	–	–	–	–	–
	300	2.84	221	{22.6}	4.95	386	{39.4}	–	–	–	–	–	–	–	–	–
	100	0.98	228	{23.2}	1.70	397	{40.5}	–	–	–	–	–	–	–	–	–
	10	0.09	235	{24 }	0.17	411	{42.0}	–	–	–	–	–	–	–	–	–
3 : 1	3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2000	13.0	176	{18.0}	–	–	–	–	–	–	–	–	–	–	–	–
	1750	11.7	189	{19.2}	19.7	316	{32.2}	–	–	–	–	–	–	–	–	–
	1450	9.8	189	{19.2}	16.5	320	{32.7}	–	–	–	–	–	–	–	–	–
	1150	7.91	192	{19.6}	13.3	324	{33.1}	–	–	–	–	–	–	–	–	–
	870	6.06	195	{19.9}	10.2	328	{33.5}	–	–	–	–	–	–	–	–	–
	580	4.12	199	{20.3}	6.94	336	{34.2}	–	–	–	–	–	–	–	–	–
	300	2.17	203	{20.7}	3.70	346	{35.3}	–	–	–	–	–	–	–	–	–
	100	0.74	210	{21.4}	1.27	357	{36.4}	–	–	–	–	–	–	–	–	–
	10	0.07	215	{22.0}	0.12	368	{37.6}	–	–	–	–	–	–	–	–	–

ED2 Lateral single-shaft type

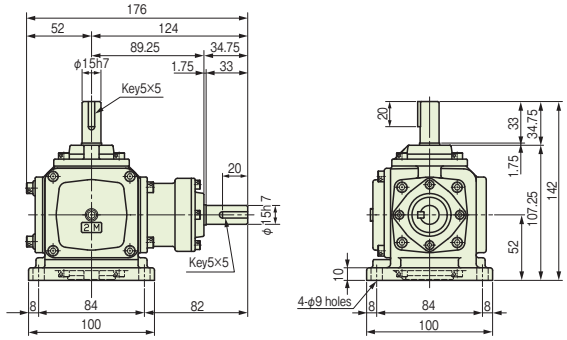
■Speed ratio : M (1 : 1) ■Type of mounting : Y (Free mounting direction)

Dimensional drawing

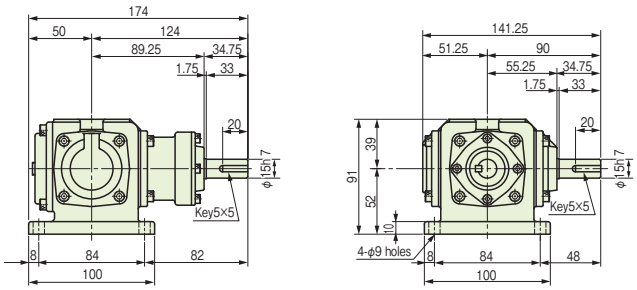
1-L, 1-L-O



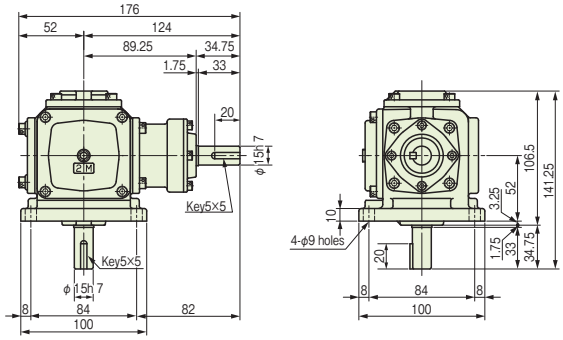
1-U, 1-U-O



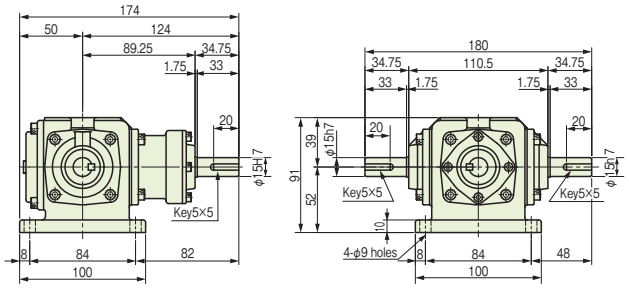
1-R, 1-R-O



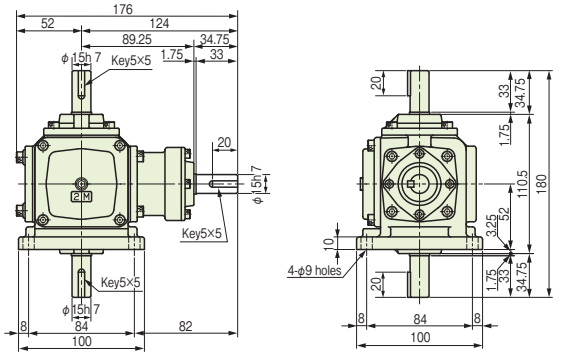
1-D, 1-D-O



1-LR, 1-LR-O



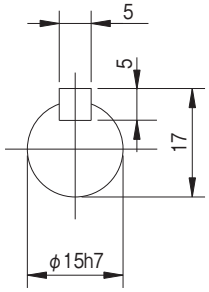
1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1 Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED2	3000	3.41	10.6 {1.08}	127 { 13.0}	117 {12.0}
	2000	2.43	11.3 {1.16}	186 { 19.0}	176 {18.0}
	1750	2.15	11.5 {1.17}	216 { 22.0}	196 {20.0}
	1450	1.79	11.6 {1.18}	265 { 27.0}	216 {22.0}
	1150	1.43	11.7 {1.19}	323 { 33.0}	235 {24.0}
	870	1.12	12.1 {1.23}	402 { 41.0}	255 {26.0}
	580	0.74	12.1 {1.23}	549 { 56.0}	314 {32.0}
	300	0.39	12.3 {1.26}	696 { 71.0}	392 {40.0}
	100	0.13	12.7 {1.30}	980 {100 }	588 {60.0}
	10	0.01	13.0 {1.33}	980 {100 }	588 {60.0}

Shaft end detail of lateral shaft, cross shaft



Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

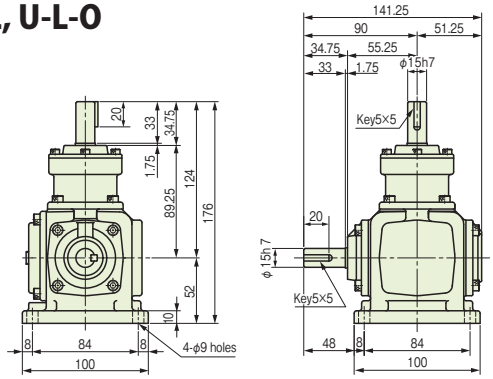
Note 2) When it is used at a rotational speed of ▭, it corresponds to the specification of oil lubrication. Refer to the item on special specification (p.69).

Note 3) For the operating position of radial load, refer to the item on Selection (p.15).

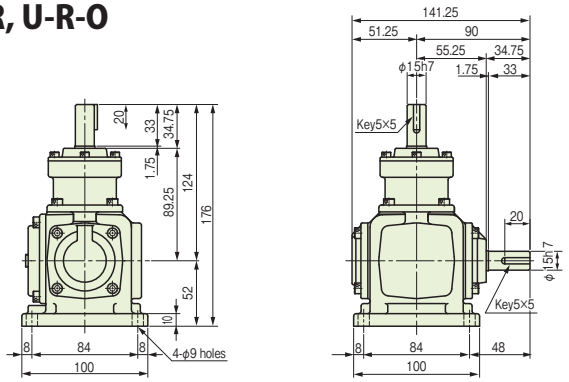
Approximate mass : 2.0kg　　Grease lubrication : 150g

* Phase of key groove does not always match.

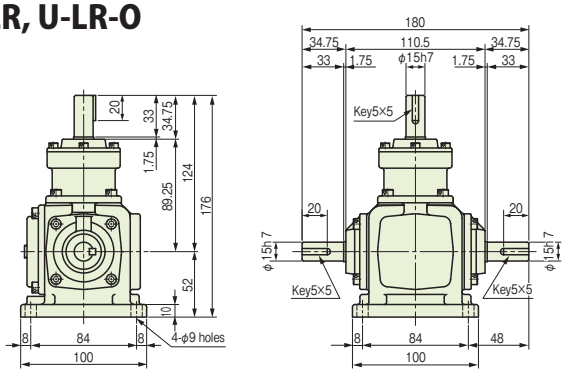
U-L, U-L-O



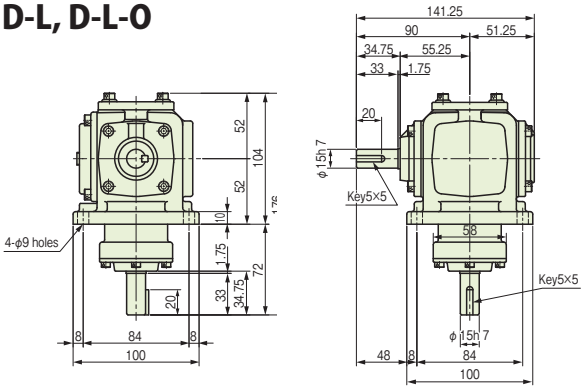
U-R, U-R-O



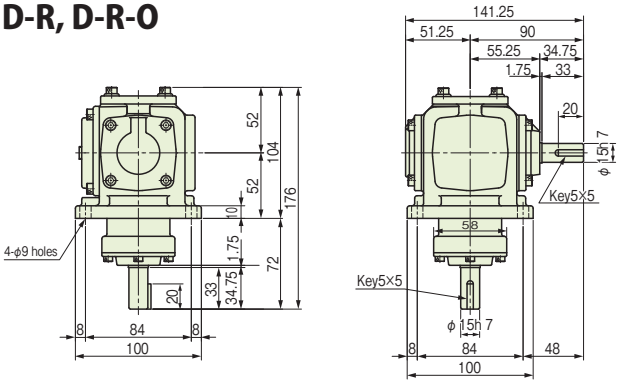
U-LR, U-LR-O



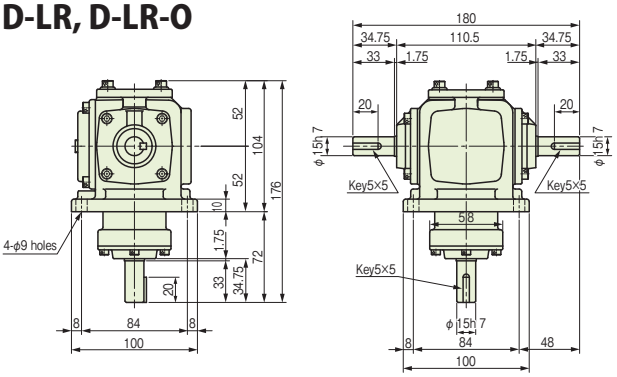
D-L, D-L-O



D-R, D-R-O



D-LR, D-LR-O



ED2 Lateral dual-shaft type

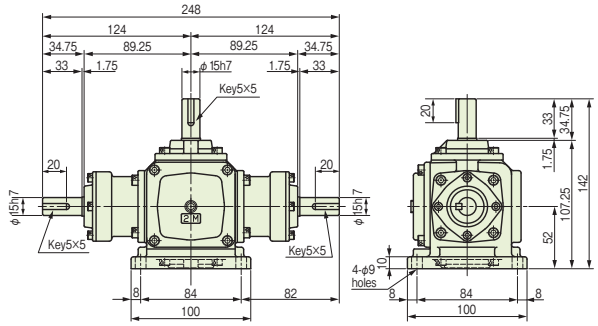
■Speed ratio : M (1 : 1) ■Type of mounting : Y (Free mounting direction)

Approximate mass : 2.6kg
Grease lubrication : 180g

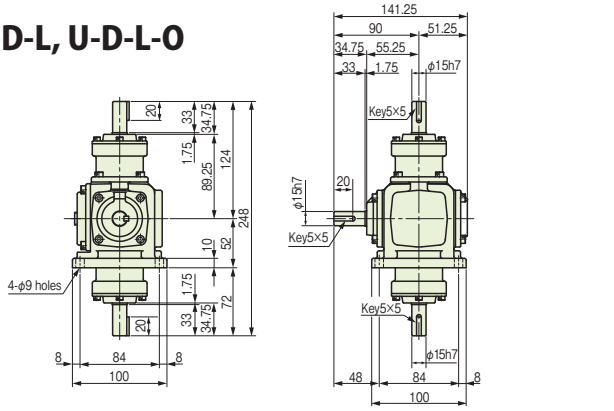
Dimensional drawing

* Phase of key groove does not always match.

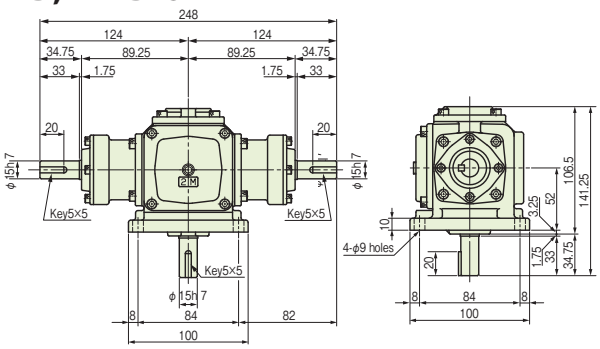
1-1-U, 1-1-U-O



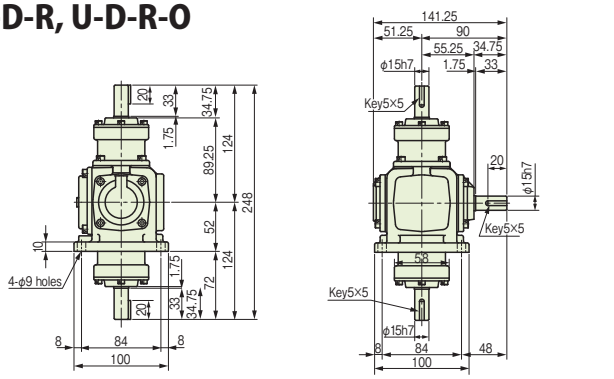
U-D-L, U-D-L-O



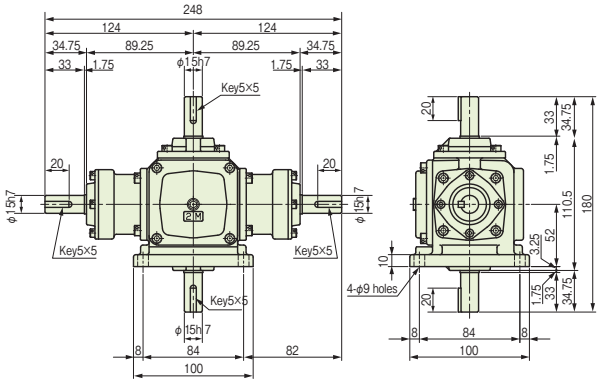
1-1-D, 1-1-D-O



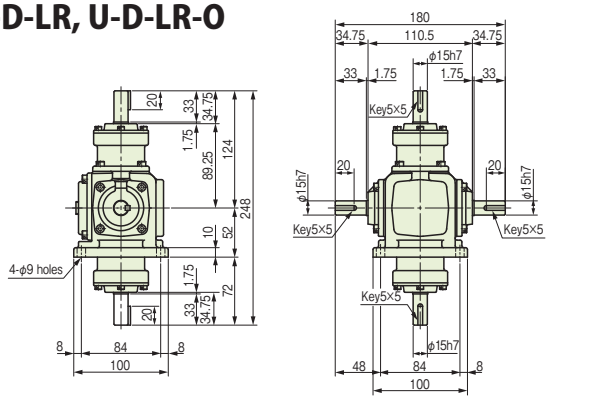
U-D-R, U-D-R-O



1-1-UD, 1-1-UD-O



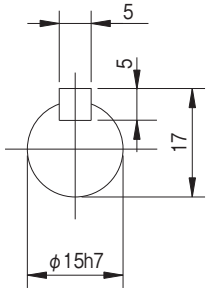
U-D-LR, U-D-LR-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1				
		Input kW	Cross shaft torque		Allowable radial load N {kgf}	
			N·m	{kgf·m}	Lateral shaft	Cross shaft
ED2	3000	2.38	7.42	{0.75}	127 { 13.0}	117 {12.0}
	2000	1.70	7.91	{0.81}	186 { 19.0}	176 {18.0}
	1750	1.50	8.05	{0.81}	216 { 22.0}	196 {20.0}
	1450	1.25	8.12	{0.82}	265 { 27.0}	216 {22.0}
	1150	1.00	8.19	{0.83}	323 { 33.0}	235 {24.0}
	870	0.78	8.47	{0.86}	402 { 41.0}	255 {26.0}
	580	0.51	8.47	{0.86}	549 { 56.0}	314 {32.0}
	300	0.27	8.61	{0.88}	696 { 71.0}	392 {40.0}
	100	0.09	8.89	{0.91}	980 {100 }	588 {60.0}
	10	0.01	9.10	{0.93}	980 {100 }	588 {60.0}

Shaft end detail of lateral shaft, cross shaft



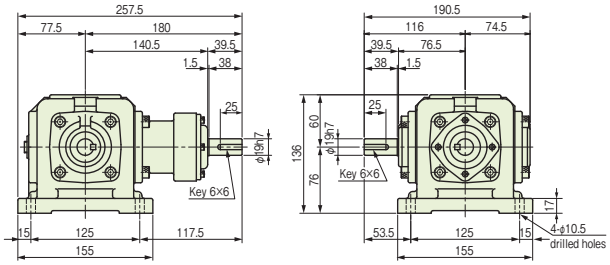
Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.
Note 2) When it is used at a rotational speed of ▭, it corresponds to the specification of oil lubrication. Refer to the item on special specification (p.69).
Note 3) For the operating position of radial load, refer to the item on Selection (p.15).

ED4 Lateral single-shaft type

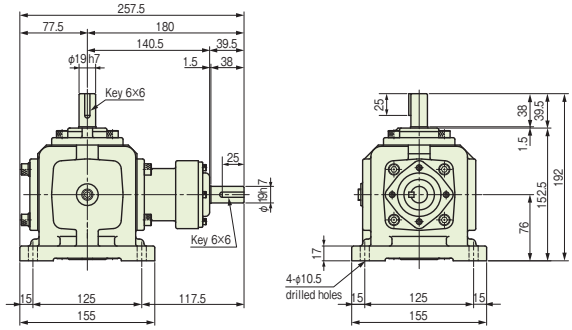
■Speed ratio : M (1 : 1), B20 (2 : 1) ■Type of mounting : Y (Free mounting direction)

Dimensional drawing

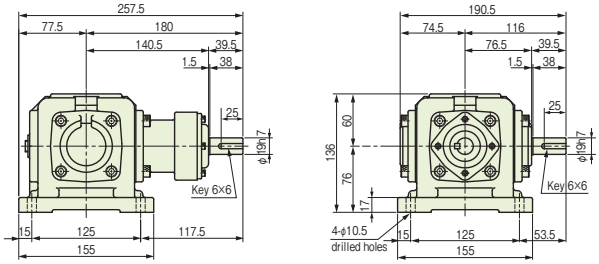
1-L, 1-L-O



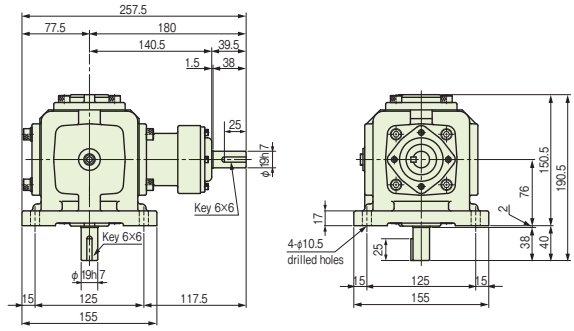
1-U, 1-U-O



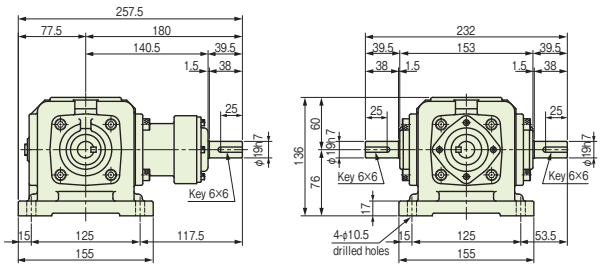
1-R, 1-R-O



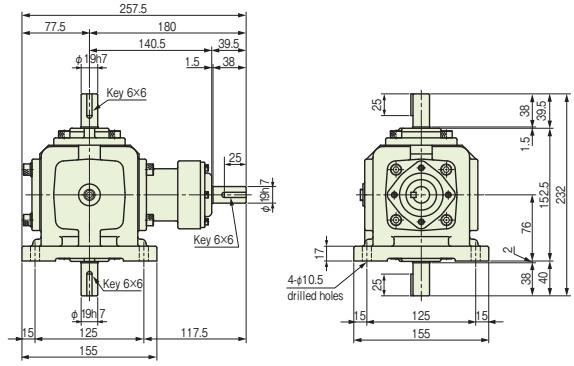
1-D, 1-D-O



1-LR, 1-LR-O



1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1				B20 Speed ratio 2 : 1			
		Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED4	3000	7.71	24.0 {2.45}	647 { 66.0}	764 { 78.0}	5.56	34.6 {3.53}	686 { 70.0}	1569 {160}
	2000	5.96	27.9 {2.84}	745 { 76.0}	862 { 88.0}	4.30	40.2 {4.10}	833 { 85.0}	1765 {180}
	1750	5.61	30.0 {3.06}	784 { 80.0}	902 { 92.0}	3.97	42.4 {4.33}	1078 {110 }	1960 {200}
	1450	4.94	31.9 {3.25}	833 { 85.0}	951 { 97.0}	3.32	42.8 {4.37}	1078 {110 }	1960 {200}
	1150	4.19	34.1 {3.48}	882 { 90.0}	1029 {105 }	2.67	43.4 {4.43}	1078 {110 }	1960 {200}
	870	3.46	37.2 {3.80}	960 { 98.0}	1127 {115 }	2.04	43.8 {4.47}	1078 {110 }	1960 {200}
	580	2.45	39.5 {4.03}	1078 {110 }	1323 {135 }	1.38	44.4 {4.53}	1078 {110 }	1960 {200}
	300	1.30	40.5 {4.13}	1519 {155 }	1960 {200 }	0.72	45.5 {4.64}	1078 {110 }	1960 {200}
	100	0.44	41.9 {4.28}	1911 {195 }	1960 {200 }	0.24	46.6 {4.76}	1078 {110 }	1960 {200}
	10	0.04	43.0 {4.39}	1911 {195 }	1960 {200 }	0.02	48.5 {4.95}	1078 {110 }	1960 {200}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

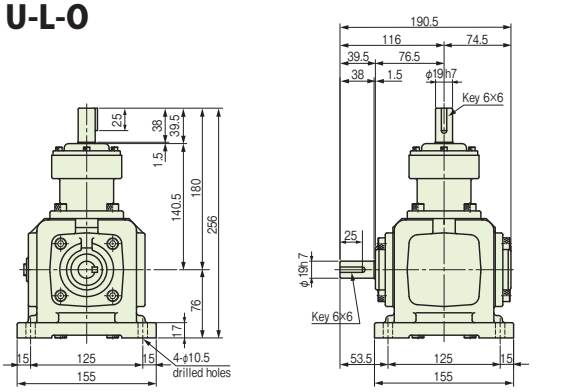
Note 2) When it is used at a rotational speed of ▭, it corresponds to the specification of oil lubrication. Refer to the item on special specification (p.69).

Note 3) For the operating position of radial load, refer to the item on Selection (p.15).

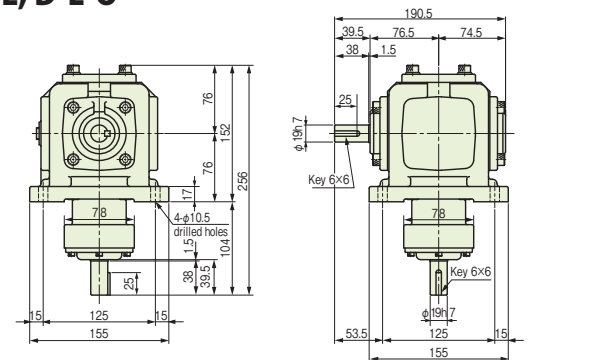
Approximate mass : 10kg　　Grease lubrication : 350g

* Dimensional drawings correspond to the shaft diameter size of the speed ratio: M (1:1).
Because shaft diameter size differs depending on speed ratio, confirm with the following detail drawings.

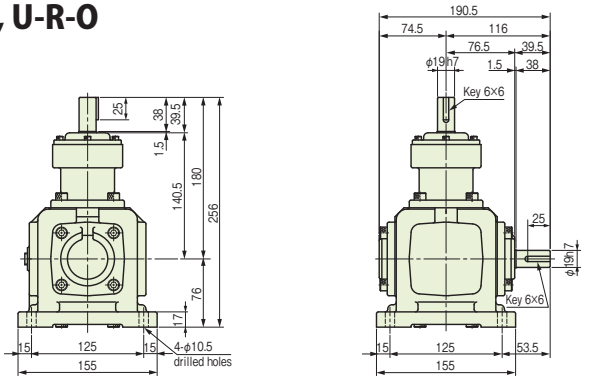
U-L, U-L-O



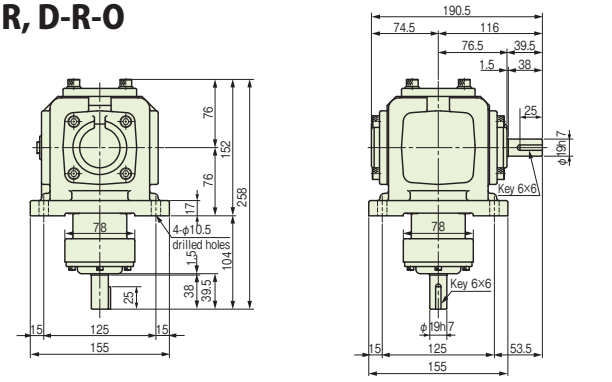
D-L, D-L-O



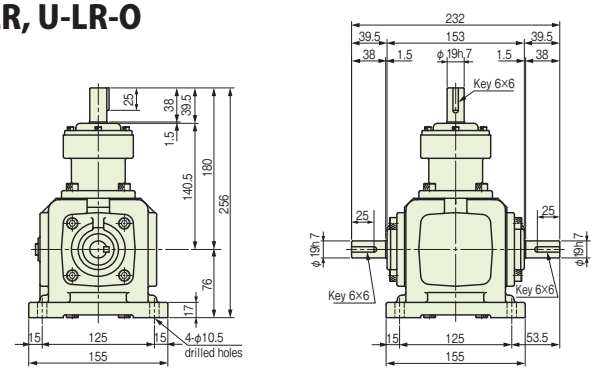
U-R, U-R-O



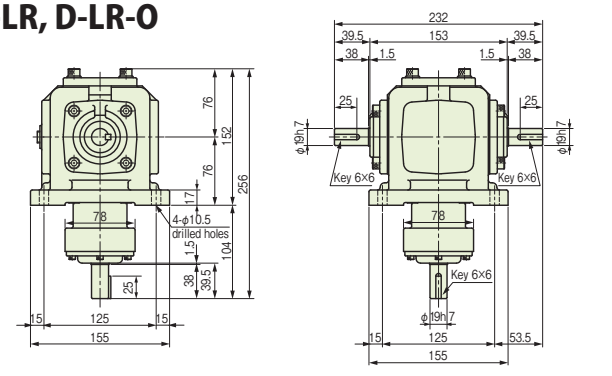
D-R, D-R-O



U-LR, U-LR-O

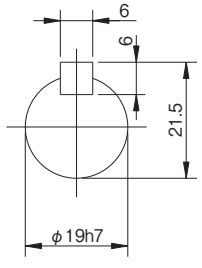


D-LR, D-LR-O

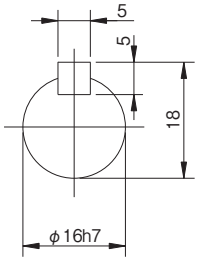


Shaft end detail of lateral shaft, cross shaft

4M Lateral shaft, Cross shaft, 4B Cross shaft



4B Lateral shaft

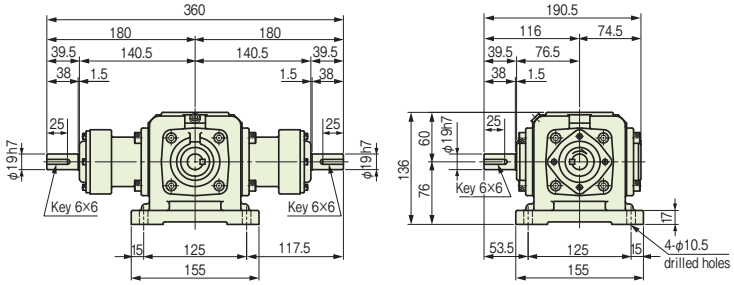


ED4 Lateral dual-shaft type

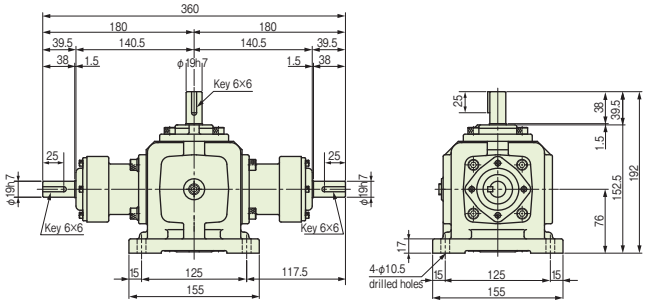
■Speed ratio : M (1 : 1), B20 (2 : 1) ■Type of mounting : Y (Free mounting direction)

Dimensional drawing

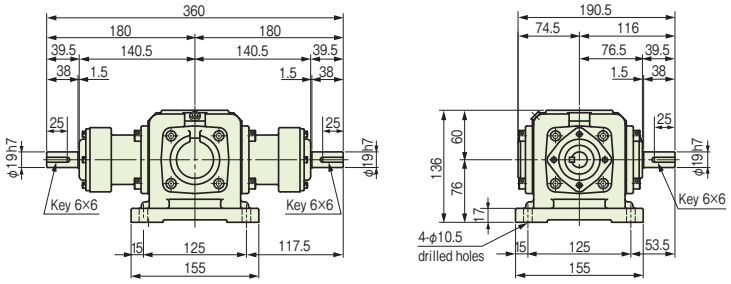
1-1-L, 1-1-L-0



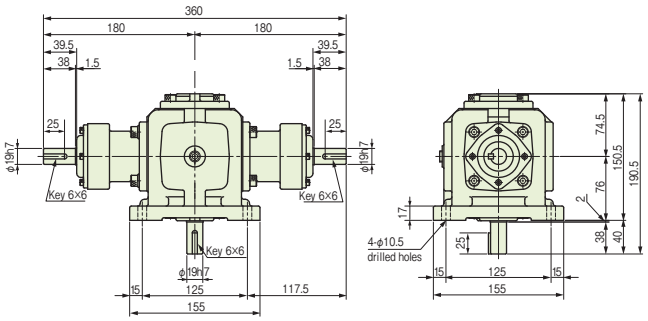
1-1-U, 1-1-U-0



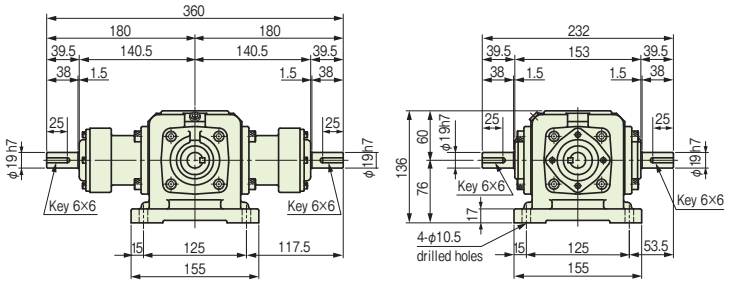
1-1-R, 1-1-R-0



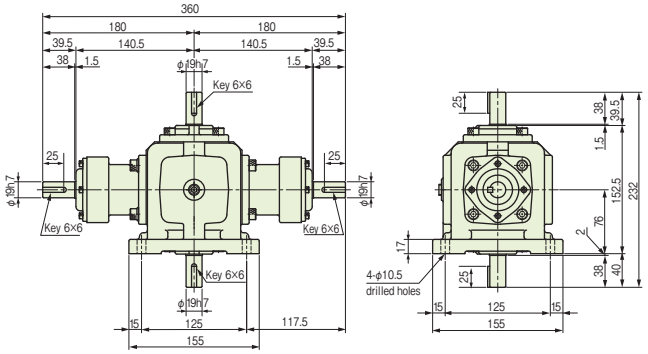
1-1-D, 1-1-D-0



1-1-LR, 1-1-LR-0



1-1-UD, 1-1-UD-0



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1				B20 Speed ratio 2 : 1			
		Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED4	3000	5.39	16.8 {1.71}	647 { 66.0}	764 { 78.0}	3.89	24.2 {2.47}	686 { 70.0}	1569 {160}
	2000	4.17	19.5 {1.99}	745 { 76.0}	862 { 88.0}	3.01	28.1 {2.87}	833 { 85.0}	1765 {180}
	1750	3.92	21.0 {2.14}	784 { 80.0}	902 { 92.0}	2.77	29.6 {3.02}	1078 {110 }	1960 {200}
	1450	3.45	22.3 {2.27}	833 { 85.0}	951 { 97.0}	2.32	29.9 {3.05}	1078 {110 }	1960 {200}
	1150	2.93	23.8 {2.43}	882 { 90.0}	1029 {105 }	1.86	30.3 {3.10}	1078 {110 }	1960 {200}
	870	2.42	26.0 {2.65}	960 { 98.0}	1127 {115 }	1.42	30.6 {3.12}	1078 {110 }	1960 {200}
	580	1.71	27.6 {2.82}	1078 {110 }	1323 {135 }	0.96	31.0 {3.17}	1078 {110 }	1960 {200}
	300	0.91	28.3 {2.89}	1519 {155 }	1960 {200 }	0.50	31.8 {3.25}	1078 {110 }	1960 {200}
	100	0.30	29.3 {2.99}	1911 {195 }	1960 {200 }	0.16	32.6 {3.32}	1078 {110 }	1960 {200}
	10	0.02	30.1 {3.07}	1911 {195 }	1960 {200 }	0.01	33.9 {3.46}	1078 {110 }	1960 {200}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

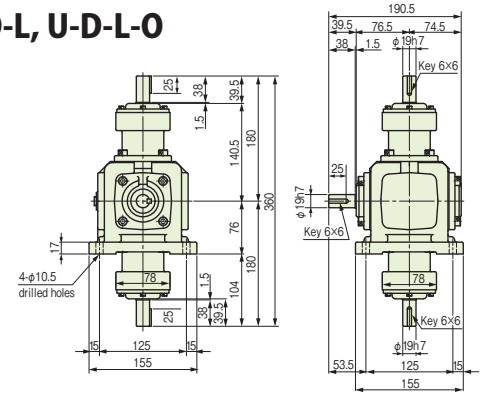
Note 2) When it is used at a rotational speed of ▭, it corresponds to the specification of oil lubrication. Refer to the item on special specification (p.69).

Note 3) For the operating position of radial load, refer to the item on Selection (p.15).

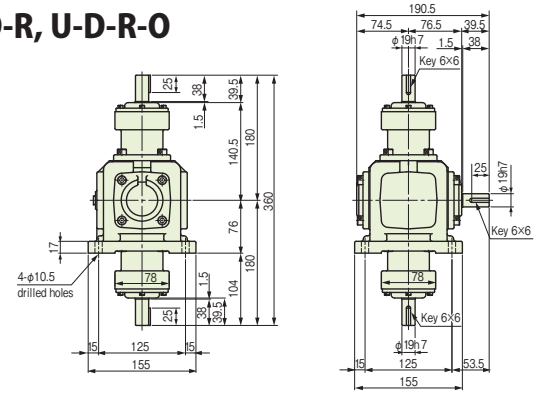
Approximate mass : 12.5kg　　Grease lubrication : 450g

* Dimensional drawings correspond to the shaft diameter size of the speed ratio: M (1:1).
Because shaft diameter size differs depending on speed ratio, confirm with the following detail drawings.

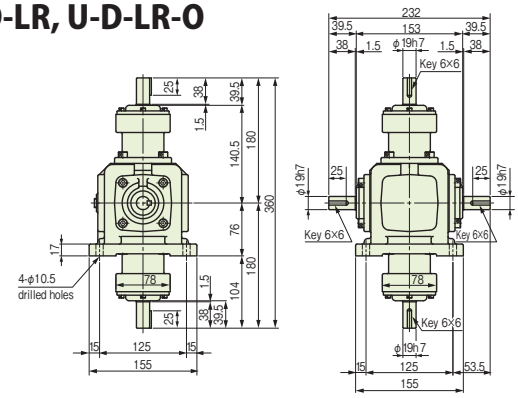
U-D-L, U-D-L-O



U-D-R, U-D-R-O

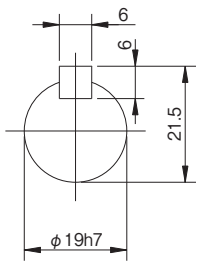


U-D-LR, U-D-LR-O

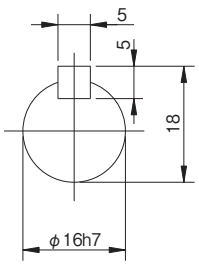


Shaft end detail of lateral shaft, cross shaft

4M Lateral shaft, Cross shaft, 4B Cross shaft



4B Lateral shaft

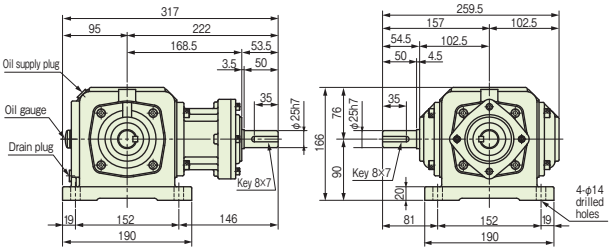


ED6 Lateral single-shaft type

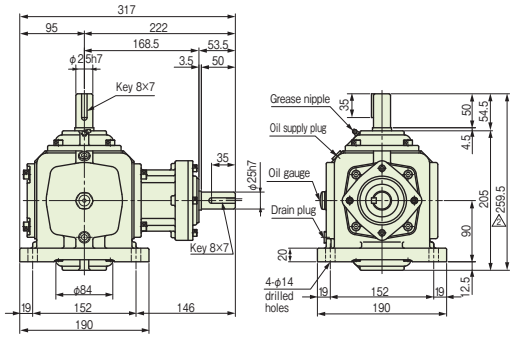
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

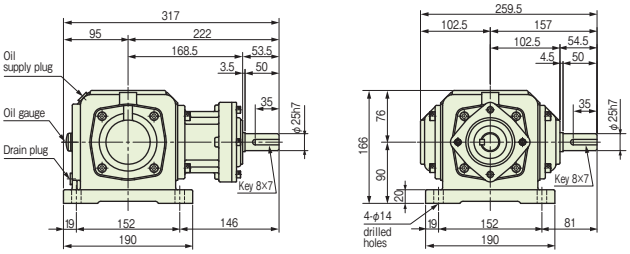
1-L, 1-L-O



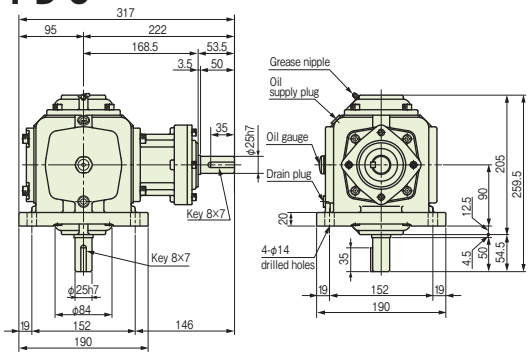
1-U, 1-U-O



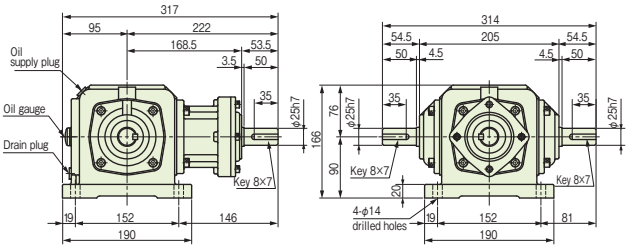
1-R, 1-R-O



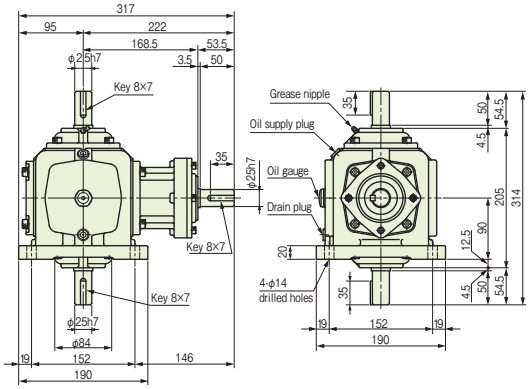
1-D, 1-D-O



1-LR, 1-LR-O



1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1				B15 Speed ratio 1.5 : 1				B20 Speed ratio 2 : 1			
		Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED6	3000	22.8	71.1 { 7.25}	1520 {155}	1912 {195}	19.7	92.1 { 9.39}	1274 {130}	2255 {230}	15.6	97.3 { 9.92}	1274 {130}	2255 {230}
	2000	18.6	87.0 { 8.87}	1716 {175}	2157 {220}	14.9	105 {10.7 }	1814 {185}	2500 {255}	10.7	100 {10.2 }	1814 {185}	2500 {255}
	1750	17.1	91.1 { 9.30}	1813 {185}	2303 {235}	13.7	110 {11.2 }	2205 {225}	2744 {280}	9.44	101 {10.3 }	2205 {225}	2744 {280}
	1450	14.9	96.0 { 9.80}	1911 {195}	2450 {250}	12.1	117 {11.9 }	2548 {260}	2842 {290}	7.90	102 {10.4 }	2548 {260}	2842 {290}
	1150	12.7	103 {10.5 }	2058 {210}	2597 {265}	9.96	122 {12.4 }	3038 {310}	3087 {315}	6.39	104 {10.6 }	3038 {310}	3087 {315}
	870	10.5	113 {11.5 }	2205 {225}	2842 {290}	7.66	123 {12.6 }	3430 {350}	3332 {340}	4.88	105 {10.7 }	3430 {350}	3332 {340}
	580	7.35	119 {12.1 }	2499 {255}	3185 {325}	5.23	126 {12.9 }	3430 {350}	3528 {360}	3.34	108 {11.0 }	3430 {350}	3528 {360}
	300	3.93	123 {12.5 }	3430 {350}	3528 {360}	2.77	129 {13.2 }	3430 {350}	3528 {360}	1.76	110 {11.2 }	3430 {350}	3528 {360}
	100	1.36	127 {13.0 }	3430 {350}	3528 {360}	0.95	134 {13.7 }	3430 {350}	3528 {360}	0.60	114 {11.6 }	3430 {350}	3528 {360}
	10	0.14	132 {13.5 }	3430 {350}	3528 {360}	0.09	139 {14.2 }	3430 {350}	3528 {360}	0.06	116 {11.8 }	3430 {350}	3528 {360}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of ▭, the specification with forced lubrication might be necessary. In such a case, please consult our company.

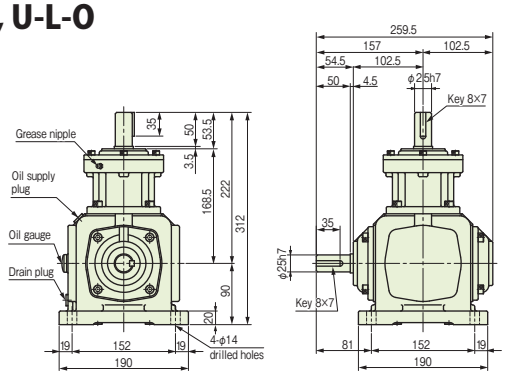
Note 3) In the case of a rotational speed between a rotational speed of ▭ and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

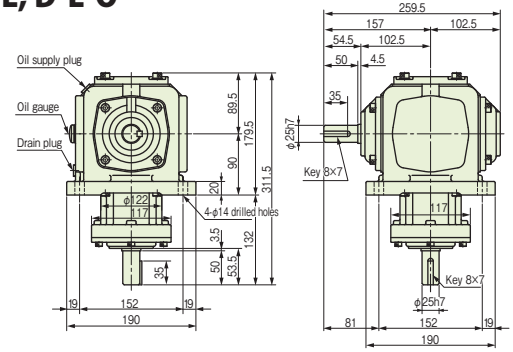
Approximate mass : 21kg　　Approximate oil quantity : 0.95L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

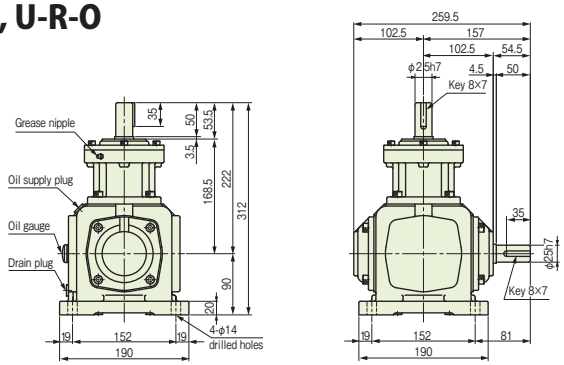
U-L, U-L-O



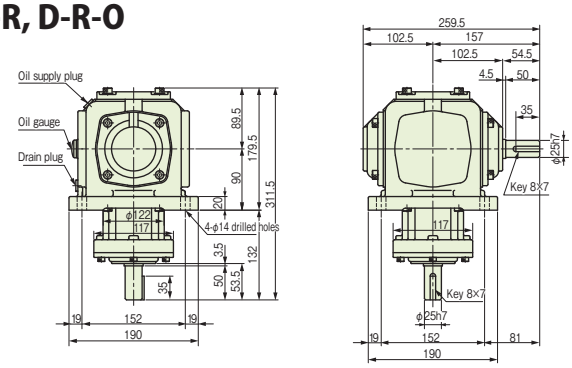
D-L, D-L-O



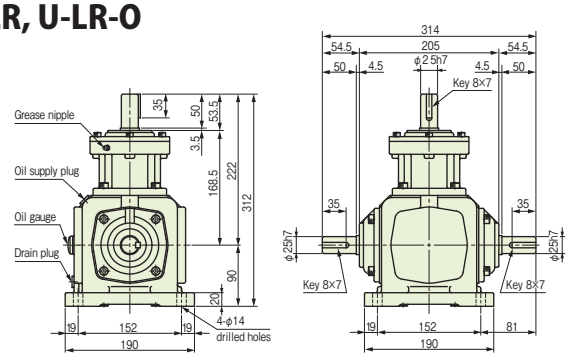
U-R, U-R-O



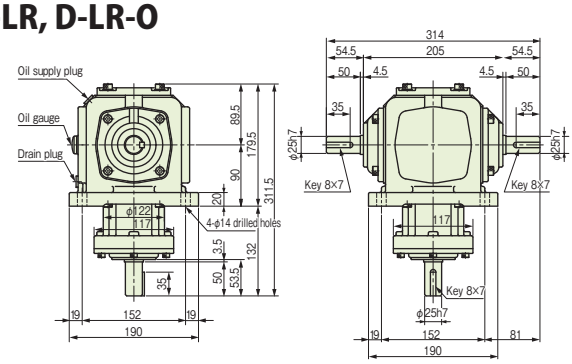
D-R, D-R-O



U-LR, U-LR-O

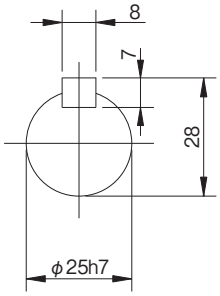


D-LR, D-LR-O



B25 Speed ratio 2.5 : 1					B30 Speed ratio 3 : 1				
Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft
11.7	91.1	{9.29}	1274 {130}	2255 {230}	9.59	89.7	{9.14}	1274 {130}	2255 {230}
8.00	93.5	{9.53}	1814 {185}	2500 {255}	6.56	92.0	{9.38}	1814 {185}	2500 {255}
7.13	95.3	{9.72}	2205 {225}	2744 {280}	5.78	92.7	{9.46}	2205 {225}	2744 {280}
5.97	96.2	{9.82}	2548 {260}	2842 {290}	4.84	93.6	{9.55}	2548 {260}	2842 {290}
4.78	97.2	{9.92}	3038 {310}	3087 {315}	3.88	94.8	{9.67}	3038 {310}	3087 {315}
3.68	99.0	{10.1}	3430 {350}	3332 {340}	2.97	95.9	{9.79}	3430 {350}	3332 {340}
2.48	100	{10.2}	3430 {350}	3528 {360}	2.02	97.6	{9.96}	3430 {350}	3528 {360}
1.32	102	{10.5}	3430 {350}	3528 {360}	1.07	100	{10.2}	3430 {350}	3528 {360}
0.44	104	{10.7}	3430 {350}	3528 {360}	0.36	102	{10.4}	3430 {350}	3528 {360}
0.04	107	{11.0}	3430 {350}	3528 {360}	0.03	104	{10.6}	3430 {350}	3528 {360}

Shaft end detail of lateral shaft, cross shaft

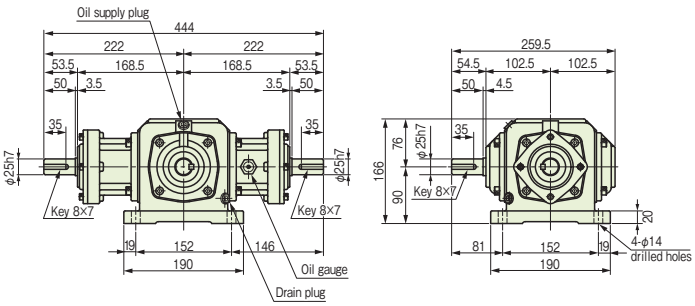


ED6 Lateral dual-shaft type

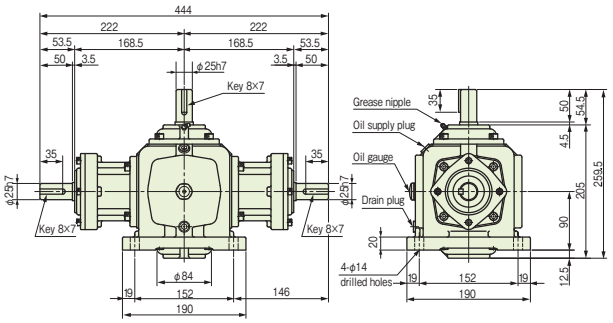
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

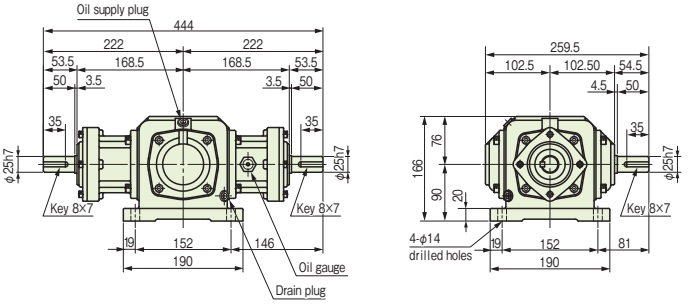
1-1-L, 1-1-L-0



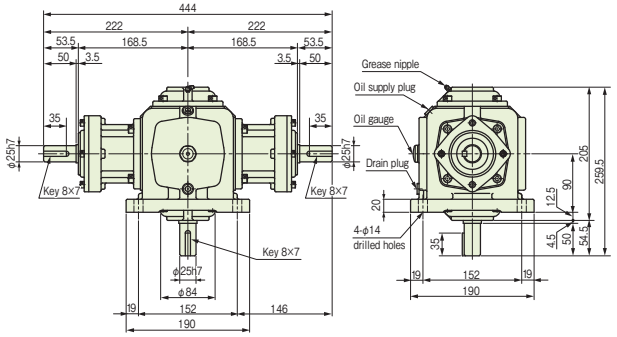
1-1-U, 1-1-U-0



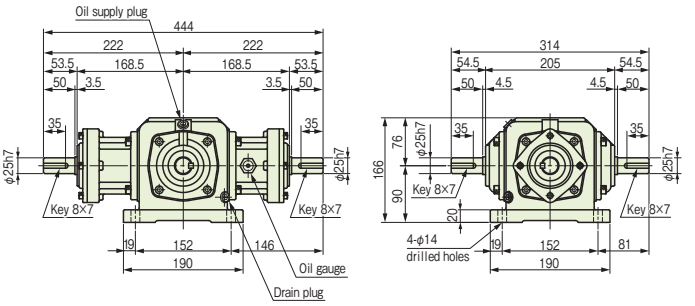
1-1-R, 1-1-R-0



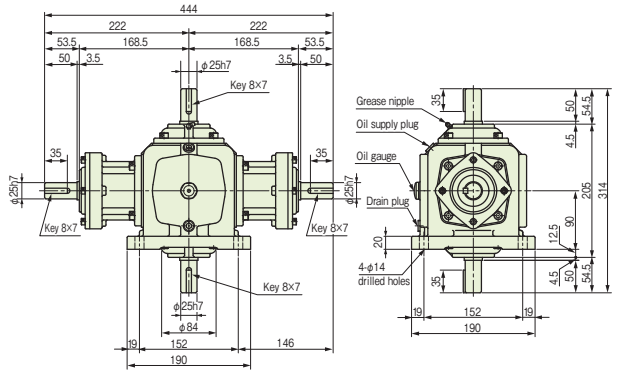
1-1-D, 1-1-D-0



1-1-LR, 1-1-LR-0



1-1-UD, 1-1-UD-0



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1					B15 Speed ratio 1.5 : 1					B20 Speed ratio 2 : 1				
		Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED6	3000	15.9	49.7	{5.07}	1520 {155}	1912 {195}	13.7	64.4	{6.57}	1274 {130}	2255 {230}	10.9	68.1	{6.95}	1274 {130}	2255 {230}
	2000	13.0	60.9	{6.21}	1716 {175}	2157 {220}	10.4	73.5	{7.50}	1814 {185}	2500 {255}	7.49	70.0	{7.14}	1814 {185}	2500 {255}
	1750	11.9	63.7	{6.50}	1813 {185}	2303 {235}	9.59	77.0	{7.85}	2205 {225}	2744 {280}	6.6	70.7	{7.21}	2205 {225}	2744 {280}
	1450	10.4	67.2	{6.85}	1911 {195}	2450 {250}	8.47	81.9	{8.35}	2548 {260}	2842 {290}	5.53	71.4	{7.28}	2548 {260}	2842 {290}
	1150	8.89	72.1	{7.35}	2058 {210}	2597 {265}	6.97	85.4	{8.71}	3038 {310}	3087 {315}	4.47	72.8	{7.42}	3038 {310}	3087 {315}
	870	7.35	79.1	{8.07}	2205 {225}	2842 {290}	5.36	86.1	{8.78}	3430 {350}	3332 {340}	3.41	73.5	{7.50}	3430 {350}	3332 {340}
	580	5.14	83.3	{8.50}	2499 {255}	3185 {325}	3.66	88.2	{9.00}	3430 {350}	3528 {360}	2.33	75.6	{7.71}	3430 {350}	3528 {360}
	300	2.75	86.1	{8.78}	3430 {350}	3528 {360}	1.93	90.3	{9.21}	3430 {350}	3528 {360}	1.23	77.0	{7.85}	3430 {350}	3528 {360}
	100	0.95	88.9	{9.07}	3430 {350}	3528 {360}	0.66	93.8	{9.57}	3430 {350}	3528 {360}	0.42	79.8	{8.14}	3430 {350}	3528 {360}
	10	0.09	92.4	{9.42}	3430 {350}	3528 {360}	0.06	97.3	{9.92}	3430 {350}	3528 {360}	0.04	81.2	{8.28}	3430 {350}	3528 {360}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

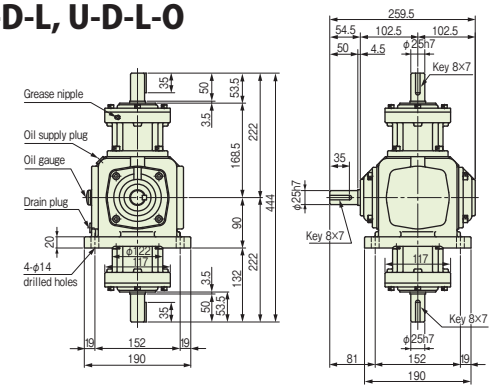
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

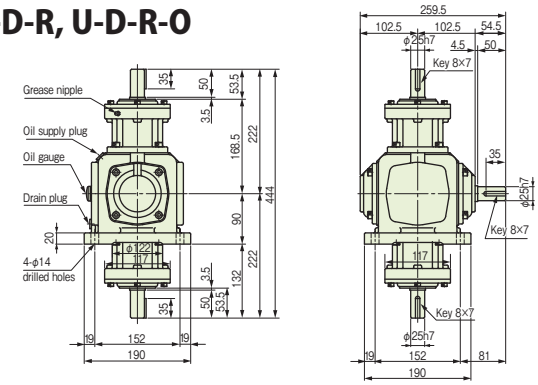
Approximate mass : 27kg　　Approximate oil quantity : 1.0L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

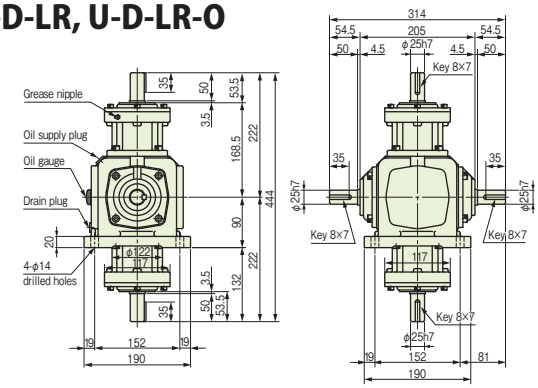
U-D-L, U-D-L-O



U-D-R, U-D-R-O

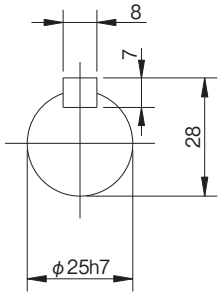


U-D-LR, U-D-LR-O



B25 Speed ratio 2.5 : 1							B30 Speed ratio 3 : 1						
Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
	N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
8.19	63.7	{6.50}	1274	{130}	2255	{230}	6.71	62.7	{6.4 }	1274	{130}	2255	{230}
5.60	65.4	{6.67}	1814	{185}	2500	{255}	4.59	64.4	{6.57}	1814	{185}	2500	{255}
4.99	66.7	{6.80}	2205	{225}	2744	{280}	4.04	64.8	{6.62}	2205	{225}	2744	{280}
4.17	67.3	{6.87}	2548	{260}	2842	{290}	3.38	65.5	{6.68}	2548	{260}	2842	{290}
3.34	68.0	{6.94}	3038	{310}	3087	{315}	2.71	66.3	{6.77}	3038	{310}	3087	{315}
2.57	69.3	{7.07}	3430	{350}	3332	{340}	2.07	67.1	{6.85}	3430	{350}	3332	{340}
1.73	70.0	{7.14}	3430	{350}	3528	{360}	1.41	68.3	{6.97}	3430	{350}	3528	{360}
0.92	71.4	{7.28}	3430	{350}	3528	{360}	0.74	70.0	{7.14}	3430	{350}	3528	{360}
0.30	72.8	{7.42}	3430	{350}	3528	{360}	0.25	71.4	{7.28}	3430	{350}	3528	{360}
0.02	74.9	{7.64}	3430	{350}	3528	{360}	0.02	72.8	{7.42}	3430	{350}	3528	{360}

Shaft end detail of lateral shaft, cross shaft

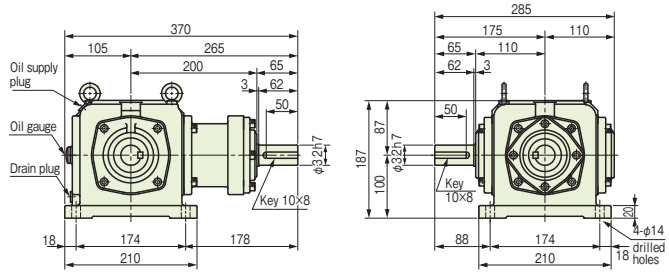


ED7 Lateral single-shaft type

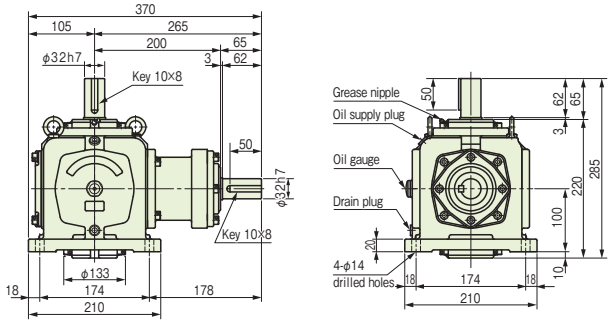
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

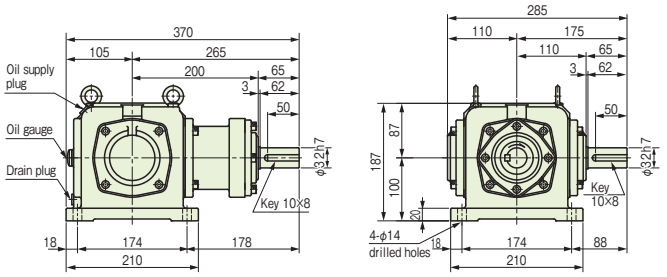
1-L, 1-L-O



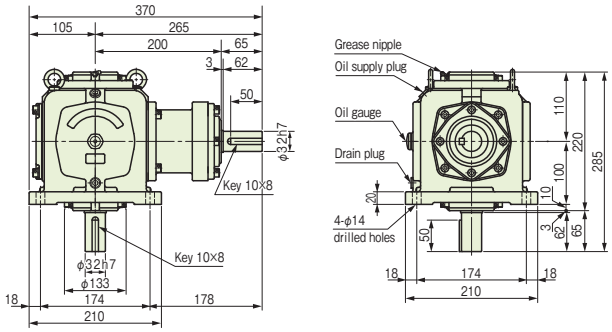
1-U, 1-U-O



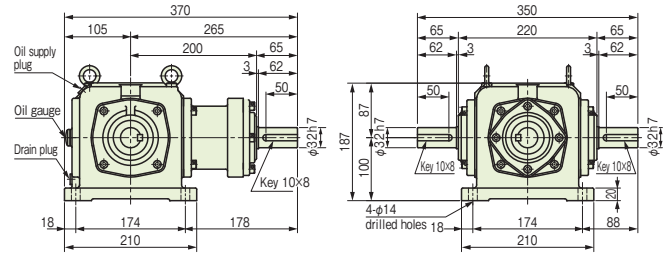
1-R, 1-R-O



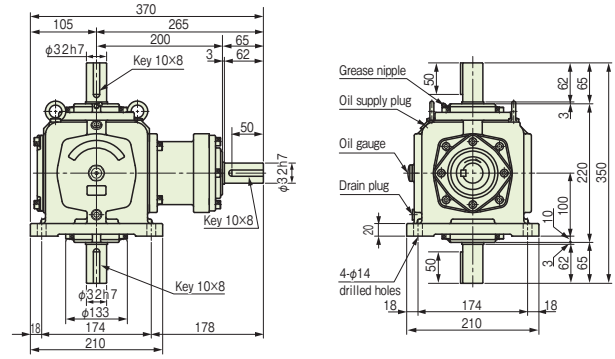
1-D, 1-D-O



1-LR, 1-LR-O



1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1							B15 Speed ratio 1.5 : 1							B20 Speed ratio 2 : 1						
		Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
			N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
ED7	3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2000	27.1	105	{12.9}	2010	{300}	2500	{310}	19.2	135	{13.7}	2696	{275}	4756	{485}	14.2	133	{13.5}	2696	{275}	4756	{485}
	1750	24.8	132	{13.5}	2156	{220}	2842	{290}	17.4	139	{14.2}	3038	{310}	4998	{510}	12.7	135	{13.8}	3038	{310}	4998	{510}
	1450	22.0	142	{14.5}	2450	{250}	3136	{320}	15.0	145	{14.8}	3430	{350}	5390	{550}	10.6	137	{14.0}	3430	{350}	5390	{550}
	1150	18.4	150	{15.3}	2744	{280}	3234	{330}	12.0	147	{15.0}	4067	{415}	5978	{610}	8.55	139	{14.2}	4067	{415}	5978	{610}
	870	15.2	164	{16.7}	2989	{305}	3381	{345}	9.30	150	{15.3}	4753	{485}	6076	{620}	6.56	141	{14.4}	4753	{485}	6076	{620}
	580	11.4	184	{18.8}	3381	{345}	3822	{390}	6.32	153	{15.6}	5096	{520}	6174	{630}	4.47	144	{14.7}	5096	{520}	6174	{630}
	300	6.35	198	{20.2}	4410	{450}	5537	{565}	3.35	157	{16.0}	5096	{520}	6272	{640}	2.37	148	{15.1}	5096	{520}	6272	{640}
	100	2.20	206	{21.0}	5096	{520}	6272	{640}	1.16	163	{16.6}	5096	{520}	6272	{640}	0.81	152	{15.5}	5096	{520}	6272	{640}
	10	0.22	214	{21.8}	5096	{520}	6272	{640}	0.12	169	{17.2}	5096	{520}	6272	{640}	0.08	157	{16.0}	5096	{520}	6272	{640}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of ▭, the specification with forced lubrication might be necessary. In such a case, please consult our company.

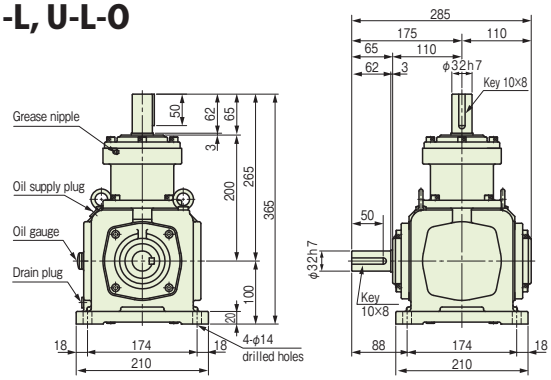
Note 3) In the case of a rotational speed between a rotational speed of ▭ and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

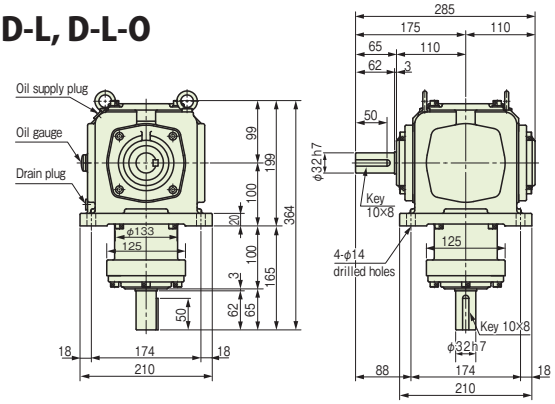
Approximate mass : 32kg　　Approximate oil quantity : 1.5L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.
* Dimensional drawings correspond to the shaft diameter size of the speed ratio: M (1:1). Because the shaft diameter size differs depending on the speed ratio, confirm with the following detail drawings.

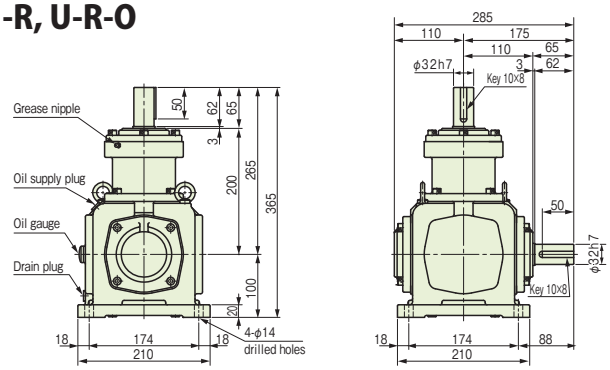
U-L, U-L-O



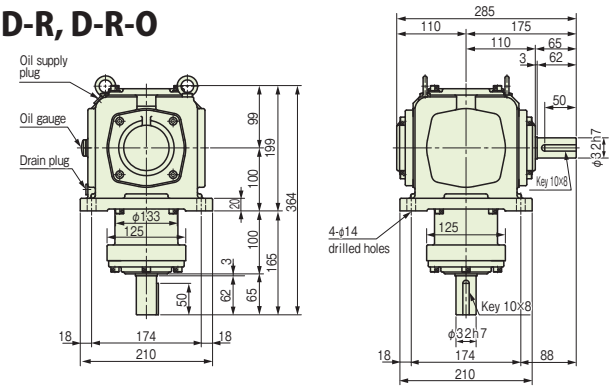
D-L, D-L-O



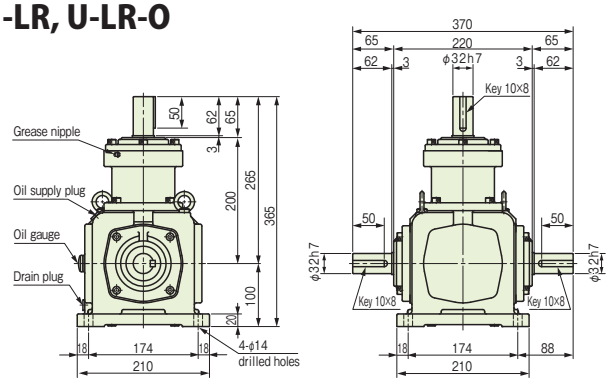
U-R, U-R-O



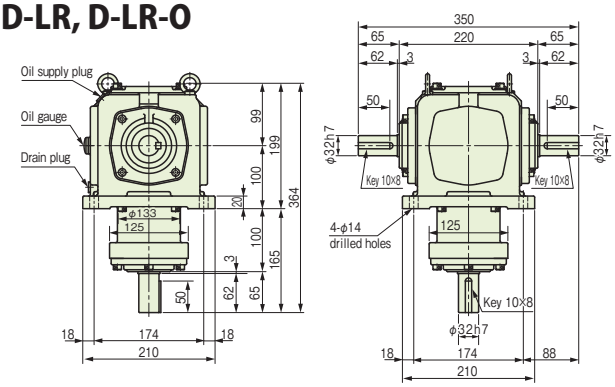
D-R, D-R-O



U-LR, U-LR-O



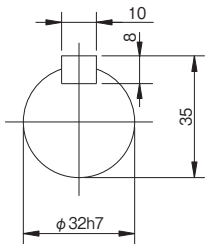
D-LR, D-LR-O



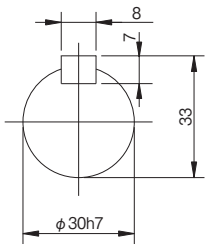
B25 Speed ratio 2.5 : 1							B30 Speed ratio 3 : 1						
Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
	N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
—	—	—	—	—	—	—	—	—	—	—	—	—	—
9.40	110	{11.2}	2696	{275}	4756	{485}	7.30	102	{10.4}	2696	{275}	4756	{485}
8.36	112	{11.4}	3038	{310}	4998	{510}	6.48	104	{10.6}	3038	{310}	4998	{510}
6.99	113	{11.5}	3430	{350}	5390	{550}	5.42	105	{10.7}	3430	{350}	5390	{550}
5.64	115	{11.7}	4067	{415}	5978	{610}	4.34	106	{10.8}	4067	{415}	5978	{610}
4.30	116	{11.8}	4753	{485}	6076	{620}	3.34	108	{11.0}	4753	{485}	6076	{620}
2.92	118	{12.0}	5096	{520}	6174	{630}	2.25	109	{11.1}	5096	{520}	6174	{630}
1.55	121	{12.3}	5096	{520}	6272	{640}	1.18	111	{11.3}	5096	{520}	6272	{640}
0.52	123	{12.6}	5096	{520}	6272	{640}	0.40	115	{11.7}	5096	{520}	6272	{640}
0.05	126	{12.9}	5096	{520}	6272	{640}	0.04	118	{12.0}	5096	{520}	6272	{640}

Shaft end detail of lateral shaft, cross shaft

7M Lateral shaft, Cross shaft
7B15 Lateral shaft
7B15, 20, 25, 30 Cross shaft



7B20, 25, 30
Lateral shaft

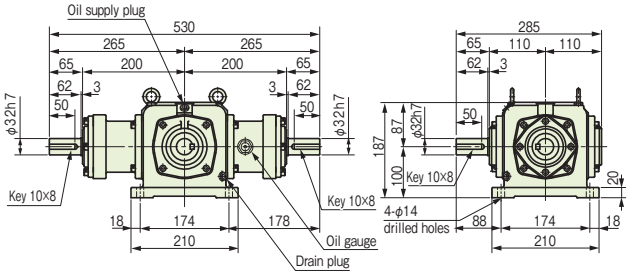


ED7 Lateral dual-shaft type

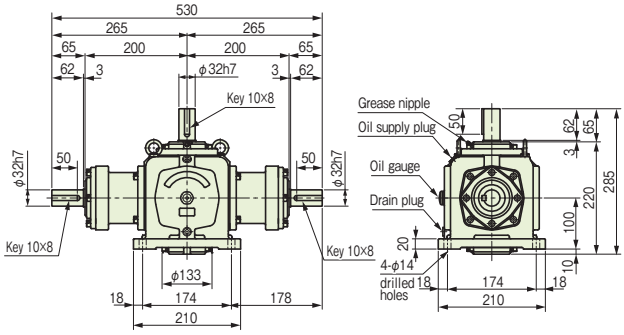
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

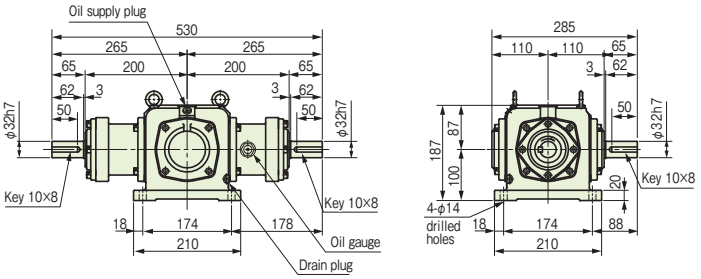
1-1-L, 1-1-L-O



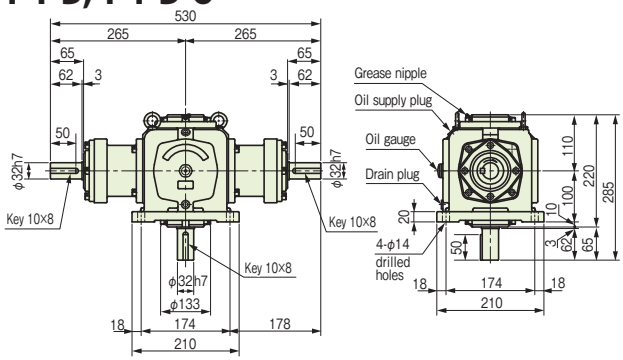
1-1-U, 1-1-U-O



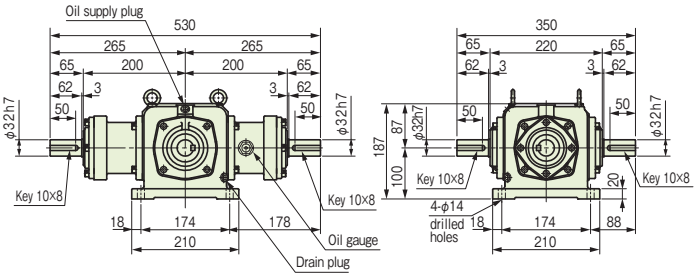
1-1-R, 1-1-R-O



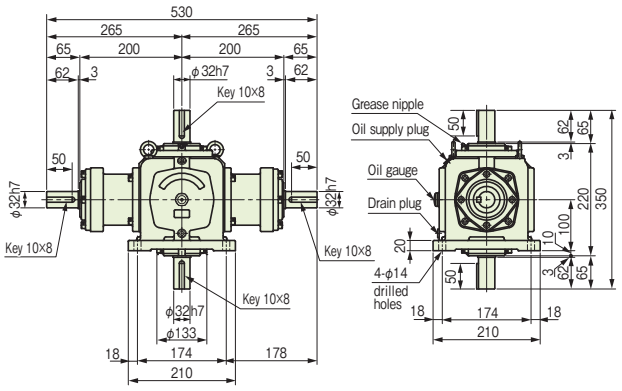
1-1-D, 1-1-D-O



1-1-LR, 1-1-LR-O



1-1-UD, 1-1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1							B15 Speed ratio 1.5 : 1							B20 Speed ratio 2 : 1						
		Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
			N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
ED7	3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2000	18.9	73.5	{ 7.5 }	2010	{300}	2500	{310}	13.4	94.5	{ 9.64}	2696	{275}	4756	{485}	9.94	93.1	{ 9.5 }	2696	{275}	4756	{485}
	1750	17.3	92.4	{ 9.42}	2156	{220}	2842	{290}	12.1	97.3	{ 9.92}	3038	{310}	4998	{510}	8.89	94.5	{ 9.64}	3038	{310}	4998	{510}
	1450	15.4	99.4	{10.1 }	2450	{250}	3136	{320}	10.5	101	{10.3 }	3430	{350}	5390	{550}	7.42	95.9	{ 9.78}	3430	{350}	5390	{550}
	1150	12.8	105	{10.7 }	2744	{280}	3234	{330}	8.4	102	{10.5 }	4067	{415}	5978	{610}	5.98	97.3	{ 9.92}	4067	{415}	5978	{610}
	870	10.6	114	{11.7 }	2989	{305}	3381	{345}	6.51	105	{10.7 }	4753	{485}	6076	{620}	4.59	98.7	{10.0 }	4753	{485}	6076	{620}
	580	7.98	128	{13.1 }	3381	{345}	3822	{390}	4.42	107	{10.9 }	5096	{520}	6174	{630}	3.12	100	{10.2 }	5096	{520}	6174	{630}
	300	4.44	138	{14.1 }	4410	{450}	5537	{565}	2.34	109	{11.2 }	5096	{520}	6272	{640}	1.65	103	{10.5 }	5096	{520}	6272	{640}
	100	1.54	144	{14.7 }	5096	{520}	6272	{640}	0.81	114	{11.6 }	5096	{520}	6272	{640}	0.56	106	{10.8 }	5096	{520}	6272	{640}
	10	0.15	149	{15.2 }	5096	{520}	6272	{640}	0.08	118	{12.0 }	5096	{520}	6272	{640}	0.05	109	{11.2 }	5096	{520}	6272	{640}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

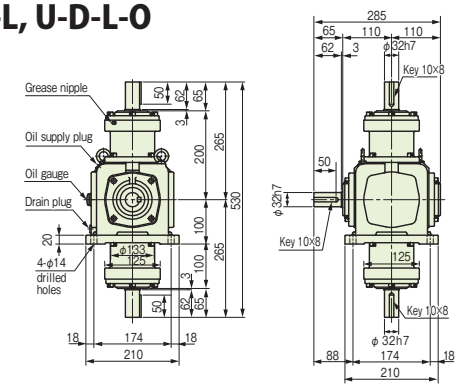
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

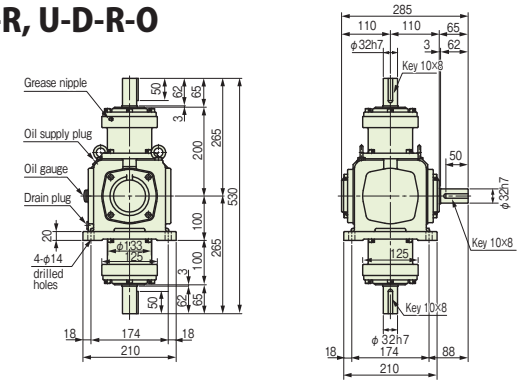
Approximate mass : 41kg　　Approximate oil quantity : 1.6L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.
* Dimensional drawings correspond to the shaft diameter size of the speed ratio: M (1:1). Because the shaft diameter size differs depending on the speed ratio, confirm with the following detail drawings.

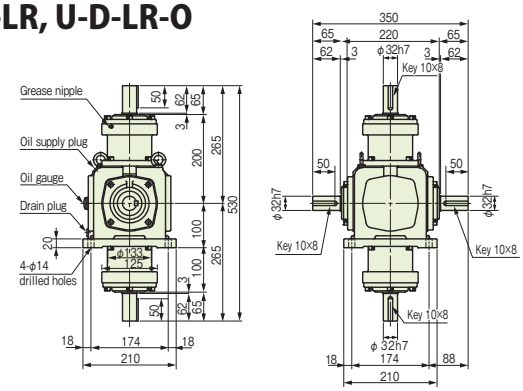
U-D-L, U-D-L-O



U-D-R, U-D-R-O



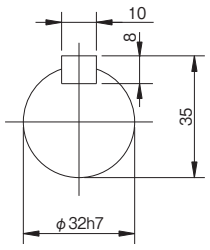
U-D-LR, U-D-LR-O



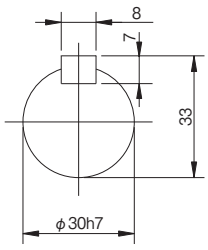
B25 Speed ratio 2.5 : 1							B30 Speed ratio 3 : 1						
Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
	N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
—	—	—	—	—	—	—	—	—	—	—	—	—	—
6.58	77.0	{7.85}	2696	{275}	4756	{485}	5.11	71.4	{7.28}	2696	{275}	4756	{485}
5.85	78.4	{8.00}	3038	{310}	4998	{510}	4.53	72.8	{7.42}	3038	{310}	4998	{510}
4.89	79.1	{8.07}	3430	{350}	5390	{550}	3.79	73.5	{7.50}	3430	{350}	5390	{550}
3.94	80.5	{8.21}	4067	{415}	5978	{610}	3.03	74.2	{7.57}	4067	{415}	5978	{610}
3.01	81.2	{8.28}	4753	{485}	6076	{620}	2.33	75.6	{7.71}	4753	{485}	6076	{620}
2.04	82.6	{8.42}	5096	{520}	6174	{630}	1.57	76.3	{7.78}	5096	{520}	6174	{630}
1.08	84.7	{8.64}	5096	{520}	6272	{640}	0.82	77.7	{7.92}	5096	{520}	6272	{640}
0.36	86.1	{8.78}	5096	{520}	6272	{640}	0.28	80.5	{8.21}	5096	{520}	6272	{640}
0.03	88.2	{9.00}	5096	{520}	6272	{640}	0.02	82.6	{8.42}	5096	{520}	6272	{640}

Shaft end detail of lateral shaft, cross shaft

7M Lateral shaft, Cross shaft
7B15 Lateral shaft
7B15, 20, 25, 30 Cross shaft



7B20, 25, 30 Lateral shaft

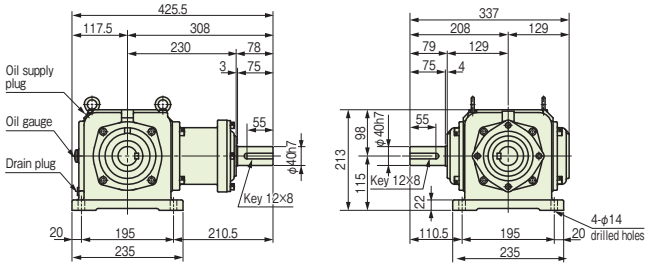


ED8 Lateral single-shaft type

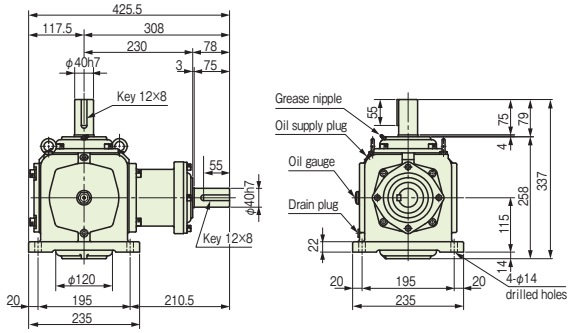
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

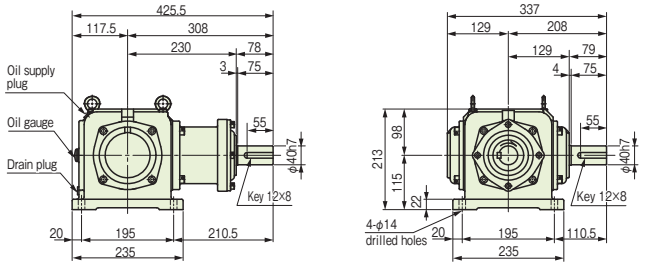
1-L, 1-L-O



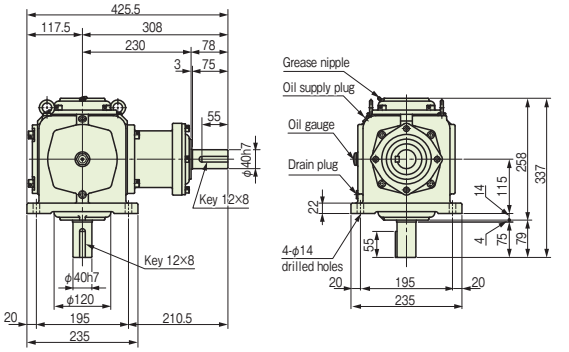
1-U, 1-U-O



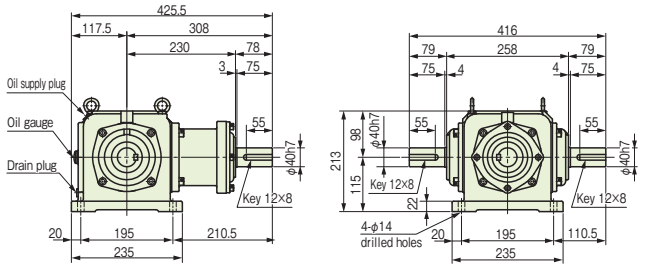
1-R, 1-R-O



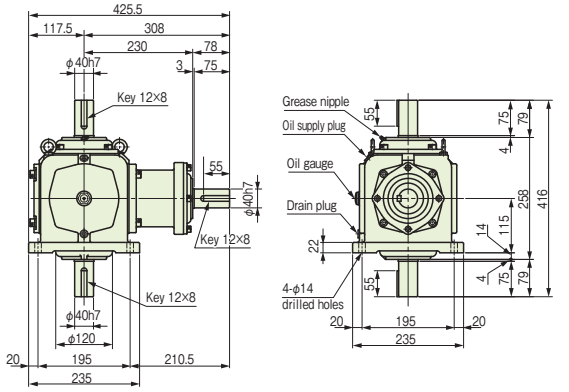
1-D, 1-D-O



1-LR, 1-LR-O



1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1							B15 Speed ratio 1.5 : 1							B20 Speed ratio 2 : 1						
		Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
			N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
ED8	3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2000	57.3	268	{27.3}	2941	{300}	3040	{310}	25.8	181	{18.5}	3432	{350}	6864	{700}	18.9	176	{18.0}	3432	{350}	6864	{700}
	1750	52.3	279	{28.5}	3087	{315}	3234	{330}	22.7	182	{18.6}	3822	{390}	7252	{740}	16.9	180	{18.4}	3822	{390}	7252	{740}
	1450	45.6	294	{30.0}	3234	{330}	3381	{345}	19.1	185	{18.9}	4361	{445}	7987	{815}	14.0	180	{18.4}	4361	{445}	7987	{815}
	1150	37.5	305	{31.1}	3479	{355}	3626	{370}	15.4	188	{19.2}	5096	{520}	8820	{900}	11.3	183	{18.7}	5096	{520}	8820	{900}
	870	29.0	312	{31.8}	3773	{385}	3969	{405}	11.8	191	{19.5}	6076	{620}	8820	{900}	8.70	187	{19.1}	6076	{620}	8820	{900}
	580	19.8	319	{32.6}	4263	{435}	4459	{455}	8.14	197	{20.1}	7644	{780}	8820	{900}	5.92	191	{19.5}	7644	{780}	8820	{900}
	300	10.6	331	{33.8}	5243	{535}	6958	{710}	4.34	203	{20.7}	8428	{860}	8820	{900}	3.14	196	{20.0}	8428	{860}	8820	{900}
	100	3.70	346	{35.3}	8428	{860}	8820	{900}	1.49	210	{21.4}	8428	{860}	8820	{900}	1.08	202	{20.6}	8428	{860}	8820	{900}
	10	0.38	361	{36.8}	8428	{860}	8820	{900}	0.15	218	{22.2}	8428	{860}	8820	{900}	0.11	209	{21.3}	8428	{860}	8820	{900}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

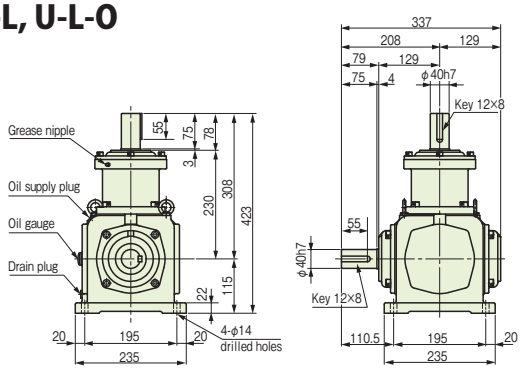
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

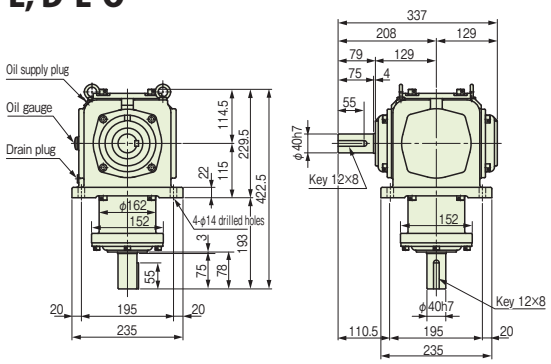
Approximate mass : 49kg　　Approximate oil quantity : 1.9L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

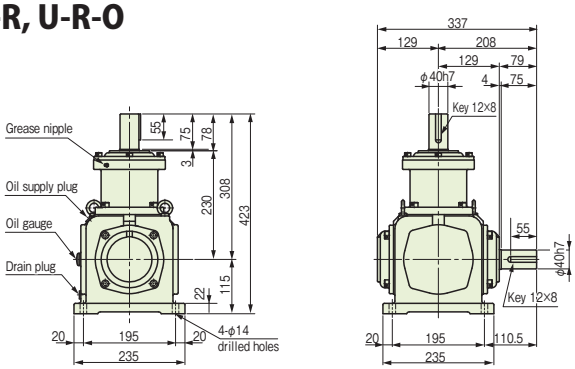
U-L, U-L-O



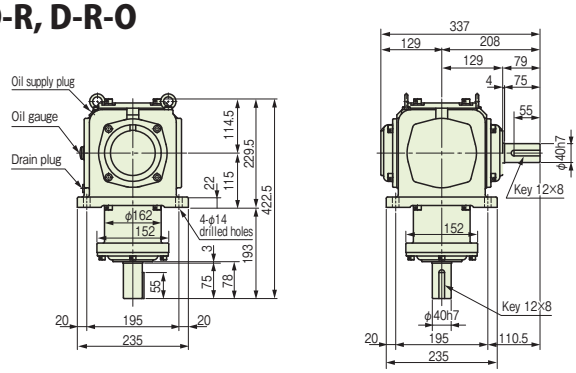
D-L, D-L-O



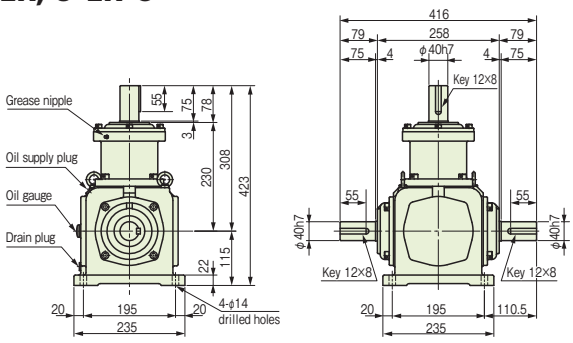
U-R, U-R-O



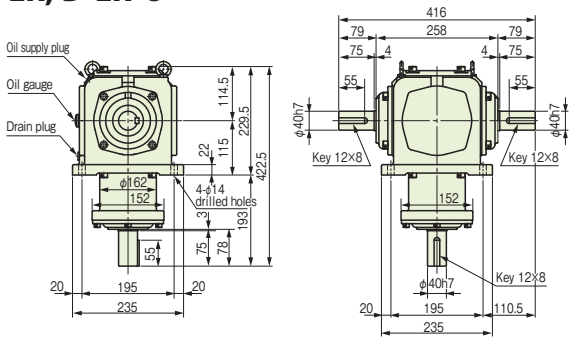
D-R, D-R-O



U-LR, U-LR-O

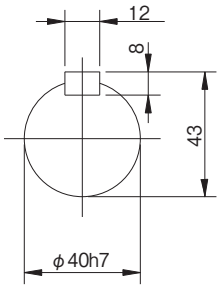


D-LR, D-LR-O



B25 Speed ratio 2.5 : 1							B30 Speed ratio 3 : 1						
Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
	N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
—	—	—	—	—	—	—	—	—	—	—	—	—	—
15.2	177	{18.1}	3432	{350}	6864	{700}	10.9	152	{15.6}	3432	{350}	6864	{700}
13.5	180	{18.4}	3822	{390}	7252	{740}	9.78	157	{16.0}	3822	{390}	7252	{740}
11.4	184	{18.8}	4361	{445}	7987	{815}	8.20	159	{16.2}	4361	{445}	7987	{815}
9.11	185	{18.9}	5096	{520}	8820	{900}	6.55	160	{16.3}	5096	{520}	8820	{900}
7.00	188	{19.2}	6076	{620}	8820	{900}	5.04	163	{16.6}	6076	{620}	8820	{900}
4.76	192	{19.6}	7644	{780}	8820	{900}	3.42	166	{16.9}	7644	{780}	8820	{900}
2.53	197	{20.1}	8428	{860}	8820	{900}	1.80	169	{17.2}	8428	{860}	8820	{900}
0.86	203	{20.7}	8428	{860}	8820	{900}	0.61	173	{17.7}	8428	{860}	8820	{900}
0.08	208	{21.2}	8428	{860}	8820	{900}	0.06	179	{18.3}	8428	{860}	8820	{900}

Shaft end detail of lateral shaft, cross shaft

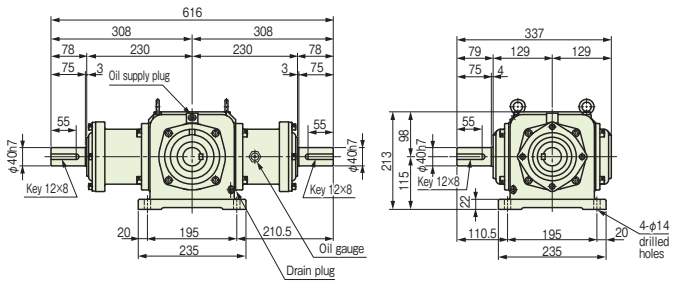


ED8 Lateral dual-shaft type

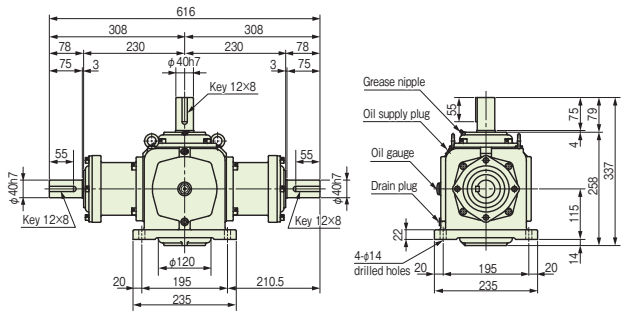
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

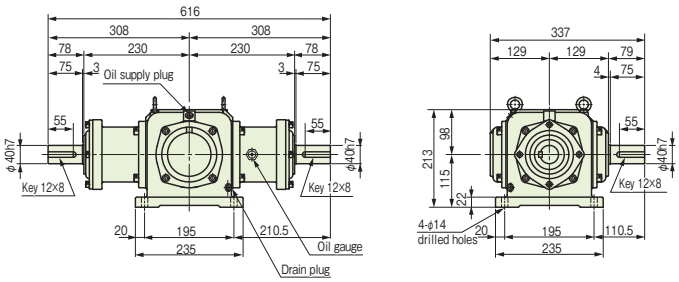
1-1-L, 1-1-L-O



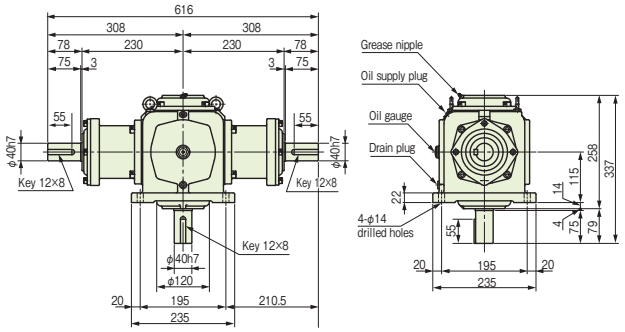
1-1-U, 1-1-U-O



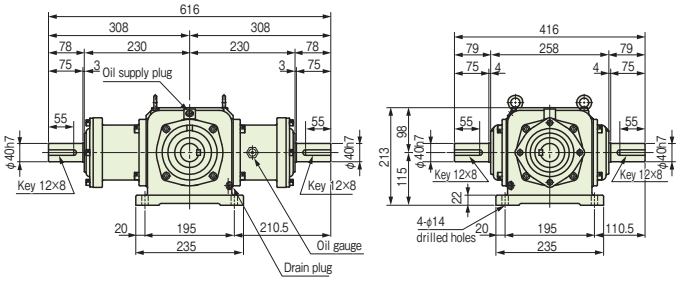
1-1-R, 1-1-R-O



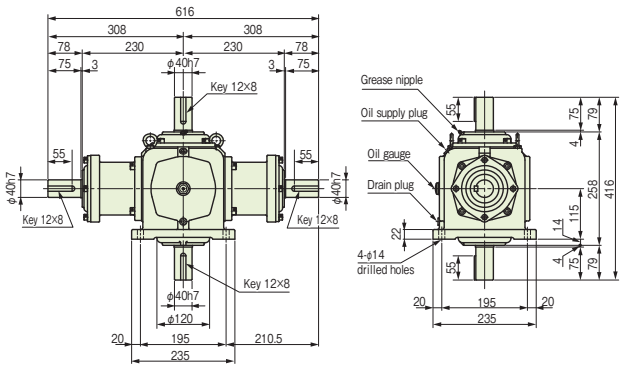
1-1-D, 1-1-D-O



1-1-LR, 1-1-LR-O



1-1-UD, 1-1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1							B15 Speed ratio 1.5 : 1							B20 Speed ratio 2 : 1						
		Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
			N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
ED8	3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2000	40.1	187	{19.1}	2941	{300}	3040	{310}	18.0	126	{12.9}	3432	{350}	6864	{700}	13.2	123	{12.5}	3432	{350}	6864	{700}
	1750	36.6	195	{19.9}	3087	{315}	3234	{330}	15.8	127	{13.0}	3822	{390}	7252	{740}	11.8	126	{12.8}	3822	{390}	7252	{740}
	1450	31.9	205	{21 }	3234	{330}	3381	{345}	13.3	129	{13.2}	4361	{445}	7987	{815}	9.80	126	{12.8}	4361	{445}	7987	{815}
	1150	26.2	213	{21.7}	3479	{355}	3626	{370}	10.7	131	{13.4}	5096	{520}	8820	{900}	7.91	128	{13.0}	5096	{520}	8820	{900}
	870	20.3	218	{22.2}	3773	{385}	3969	{405}	8.26	133	{13.6}	6076	{620}	8820	{900}	6.09	130	{13.3}	6076	{620}	8820	{900}
	580	13.8	223	{22.7}	4263	{435}	4459	{455}	5.69	137	{14.0}	7644	{780}	8820	{900}	4.14	133	{13.6}	7644	{780}	8820	{900}
	300	7.42	231	{23.6}	5243	{535}	6958	{710}	3.03	142	{14.5}	8428	{860}	8820	{900}	2.19	137	{14.0}	8428	{860}	8820	{900}
	100	2.59	242	{24.7}	8428	{860}	8820	{900}	1.04	147	{15 }	8428	{860}	8820	{900}	0.75	141	{14.4}	8428	{860}	8820	{900}
	10	0.26	252	{25.7}	8428	{860}	8820	{900}	0.10	152	{15.5}	8428	{860}	8820	{900}	0.07	146	{14.9}	8428	{860}	8820	{900}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

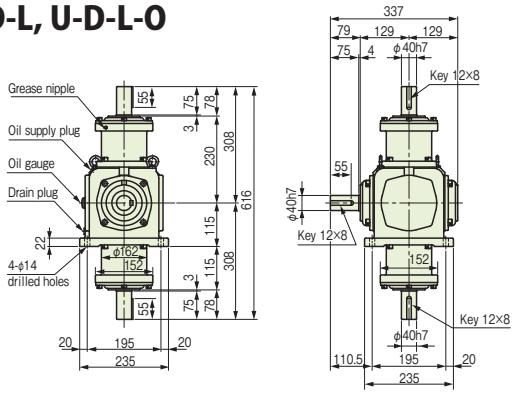
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

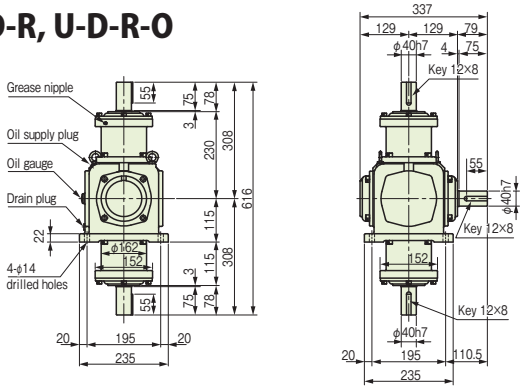
Approximate mass : 62kg　　Approximate oil quantity : 2.1L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

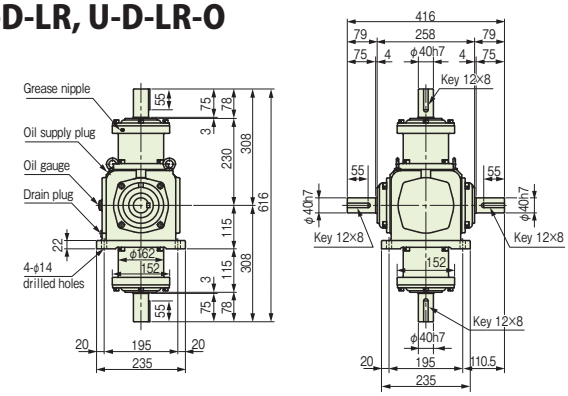
U-D-L, U-D-L-O



U-D-R, U-D-R-O

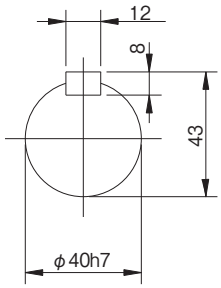


U-D-LR, U-D-LR-O



B25 Speed ratio 2.5 : 1							B30 Speed ratio 3 : 1						
Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
	N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
—	—	—	—	—	—	—	—	—	—	—	—	—	—
10.6	123	{12.6}	3432	{350}	6864	{700}	7.63	106	{10.8}	3432	{350}	6864	{700}
9.45	126	{12.8}	3822	{390}	7252	{740}	6.84	109	{11.2}	3822	{390}	7252	{740}
7.98	128	{13.1}	4361	{445}	7987	{815}	5.74	111	{11.3}	4361	{445}	7987	{815}
6.37	129	{13.2}	5096	{520}	8820	{900}	4.58	112	{11.4}	5096	{520}	8820	{900}
4.9	131	{13.4}	6076	{620}	8820	{900}	3.52	114	{11.6}	6076	{620}	8820	{900}
3.33	134	{13.7}	7644	{780}	8820	{900}	2.39	116	{11.8}	7644	{780}	8820	{900}
1.77	137	{14.0}	8428	{860}	8820	{900}	1.26	118	{12.0}	8428	{860}	8820	{900}
0.6	142	{14.5}	8428	{860}	8820	{900}	0.42	121	{12.3}	8428	{860}	8820	{900}
0.05	145	{14.8}	8428	{860}	8820	{900}	0.04	125	{12.7}	8428	{860}	8820	{900}

Shaft end detail of lateral shaft, cross shaft

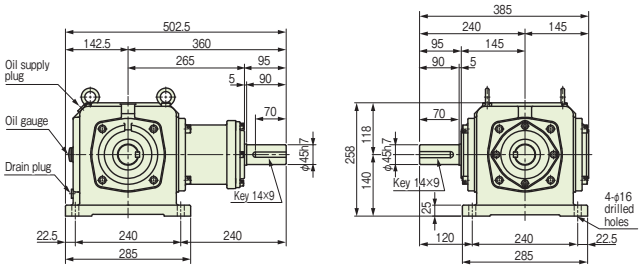


ED10 Lateral single-shaft type

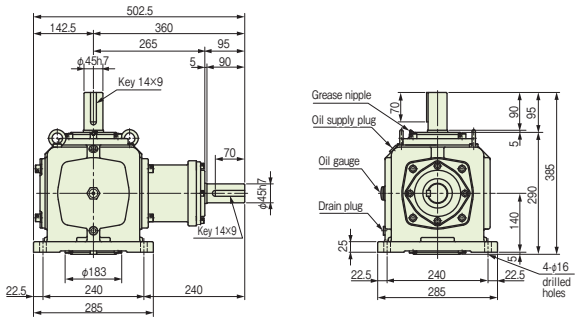
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

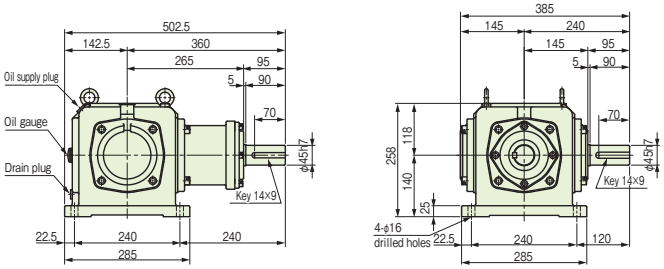
1-L, 1-L-O



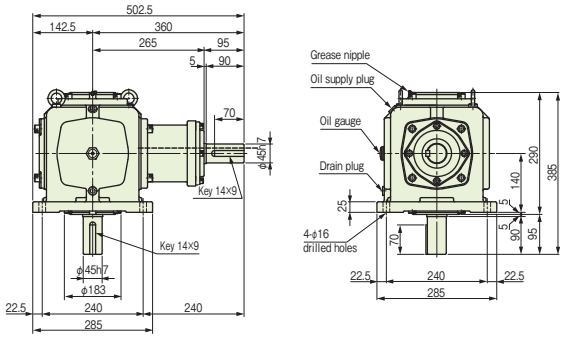
1-U, 1-U-O



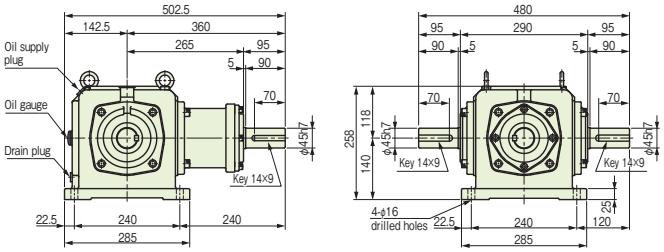
1-R, 1-R-O



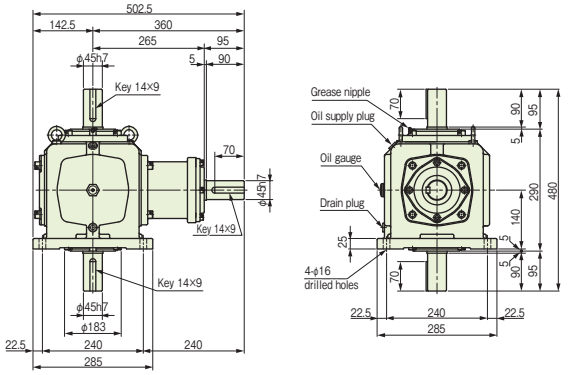
1-D, 1-D-O



1-LR, 1-LR-O



1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1					B15 Speed ratio 1.5 : 1					B20 Speed ratio 2 : 1				
		Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED10	3000	—	—	—	— —	— —	—	—	—	— —	— —	—	—	—	— —	— —
	2000	79.0	358	{36.5}	3677 { 375}	4069 { 415}	49.5	336	{34.3}	4167 { 425}	7845 { 800}	32.0	290	{29.6}	4167 { 425}	7845 { 800}
	1750	74.6	399	{40.7}	3969 { 405}	4263 { 435}	46.0	368	{37.6}	4459 { 455}	8232 { 840}	28.2	302	{30.8}	4459 { 455}	8232 { 840}
	1450	65.3	421	{43.0}	4165 { 425}	4508 { 460}	38.7	374	{38.2}	5194 { 530}	9212 { 940}	23.6	305	{31.1}	5194 { 530}	9212 { 940}
	1150	55.7	453	{46.2}	4459 { 455}	4851 { 495}	31.2	380	{38.8}	6174 { 630}	10486 {1070}	19.0	309	{31.5}	6174 { 630}	10486 {1070}
	870	44.6	479	{48.9}	4851 { 495}	5292 { 540}	24.1	389	{39.7}	7448 { 760}	11760 {1200}	14.6	315	{32.1}	7448 { 760}	11760 {1200}
	580	30.6	493	{50.3}	5488 { 560}	5880 { 600}	16.4	396	{40.4}	9555 { 975}	11760 {1200}	10.0	322	{32.9}	9555 { 975}	11760 {1200}
	300	16.4	513	{52.3}	9713 { 685}	7987 { 815}	8.78	411	{41.9}	9996 {1020}	11760 {1200}	5.33	332	{33.9}	9996 {1020}	11760 {1200}
	100	5.72	535	{54.6}	9996 {1020}	11760 {1200}	3.04	426	{43.5}	9996 {1020}	11760 {1200}	1.84	344	{35.1}	9996 {1020}	11760 {1200}
	10	0.59	561	{57.2}	9996 {1020}	11760 {1200}	0.31	443	{45.2}	9996 {1020}	11760 {1200}	0.19	357	{36.4}	9996 {102|0	11760 {1200}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of ▭, the specification with forced lubrication might be necessary. In such a case, please consult our company.

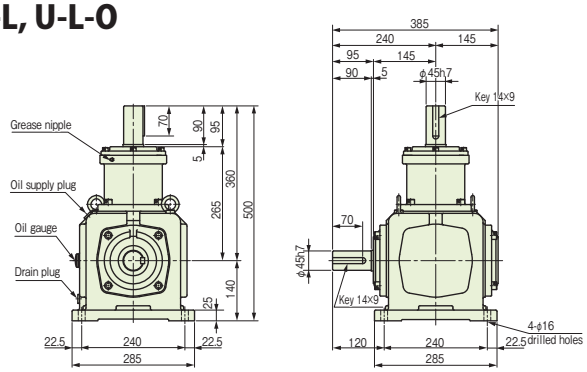
Note 3) In the case of a rotational speed between a rotational speed of ▭ and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

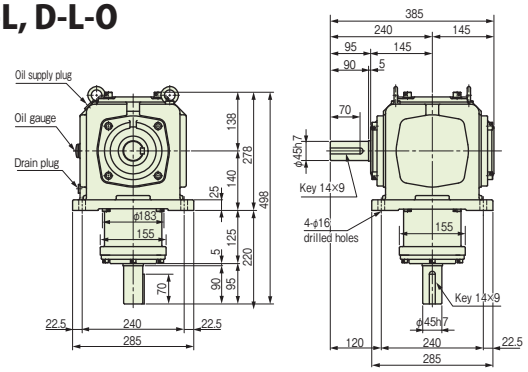
Approximate mass : 78kg　　Approximate oil quantity : 3.5L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

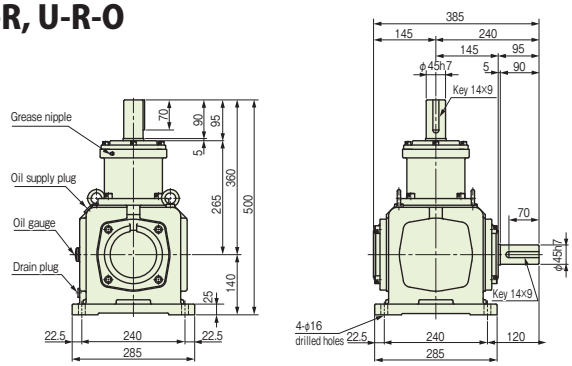
U-L, U-L-O



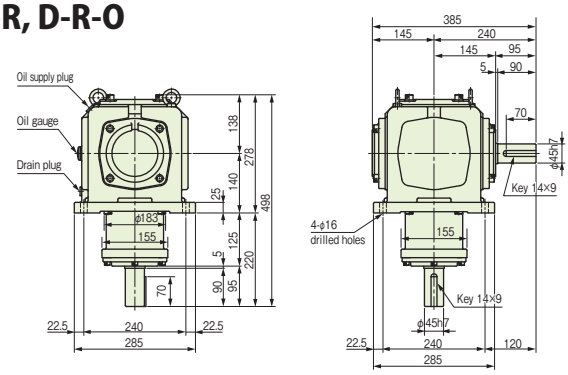
D-L, D-L-O



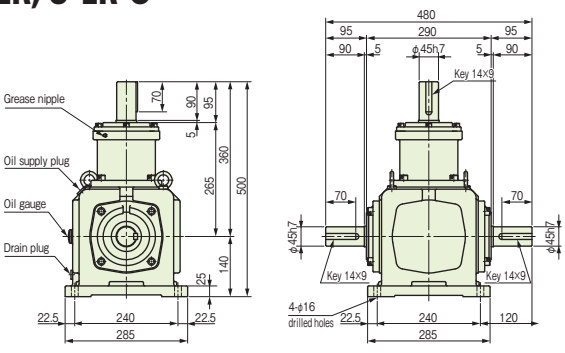
U-R, U-R-O



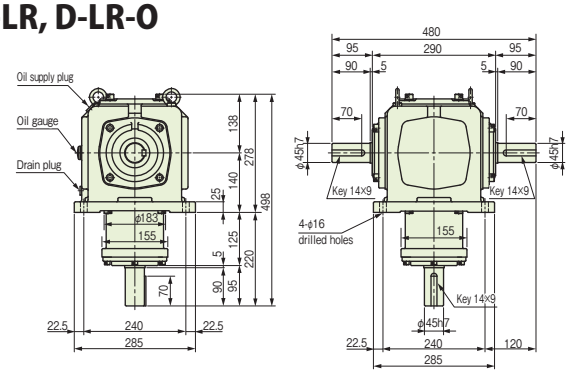
D-R, D-R-O



U-LR, U-LR-O

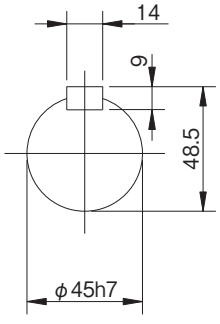


D-LR, D-LR-O



B25 Speed ratio 2.5 : 1							B30 Speed ratio 3 : 1						
Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
	N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
—	—	—	—	—	—	—	—	—	—	—	—	—	—
24.3	275	{28.1}	4167	{425}	7845	{800}	18.6	252	{25.8}	4167	{425}	7845	{800}
21.7	290	{29.6}	4459	{455}	8232	{840}	16.8	270	{27.5}	4459	{455}	8232	{840}
18.2	293	{29.9}	5194	{530}	9212	{940}	14.0	270	{27.6}	5194	{530}	9212	{940}
14.7	298	{30.4}	6174	{630}	10486	{1070}	11.3	275	{28.1}	6174	{630}	10486	{1070}
11.2	302	{30.8}	7448	{760}	11760	{1200}	8.66	279	{28.5}	7448	{760}	11760	{1200}
7.68	310	{31.6}	9555	{975}	11760	{1200}	5.89	285	{29.1}	9555	{975}	11760	{1200}
4.06	317	{32.3}	9996	{1020}	11760	{1200}	3.11	291	{29.7}	9996	{1020}	11760	{1200}
1.40	326	{33.3}	9996	{1020}	11760	{1200}	1.07	300	{30.6}	9996	{1020}	11760	{1200}
0.14	336	{34.3}	9996	{1020}	11760	{1200}	0.11	308	{31.4}	9996	{1020}	11760	{1200}

Shaft end detail of lateral shaft, cross shaft

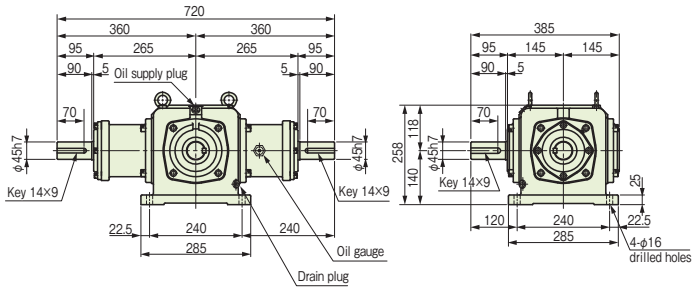


ED10 Lateral dual-shaft type

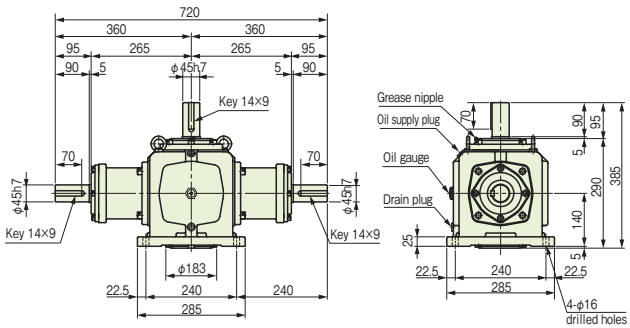
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

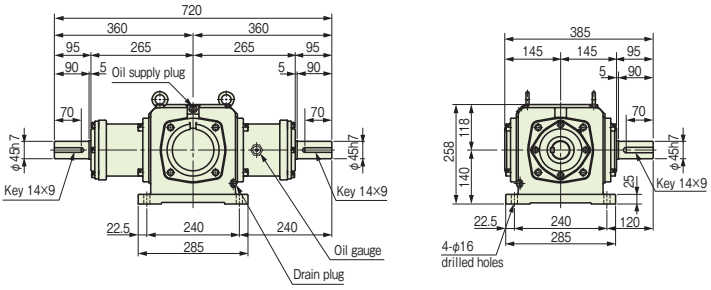
1-1-L, 1-1-L-O



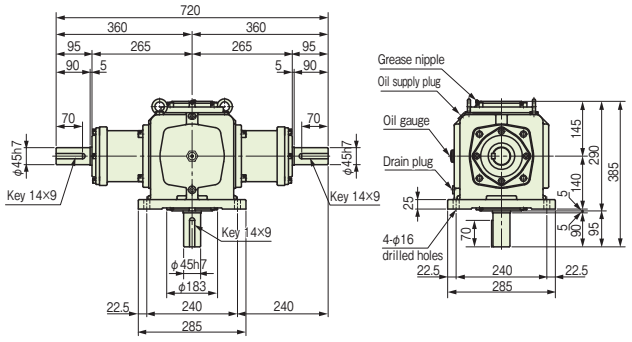
1-1-U, 1-1-U-O



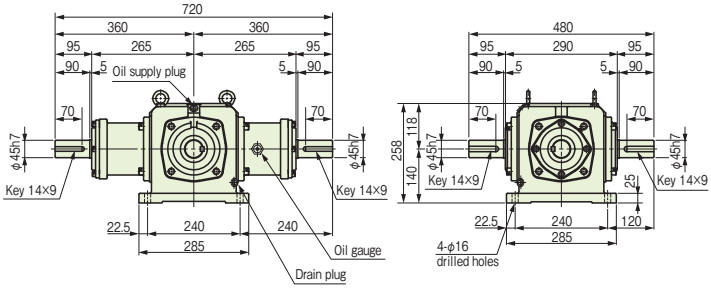
1-1-R, 1-1-R-O



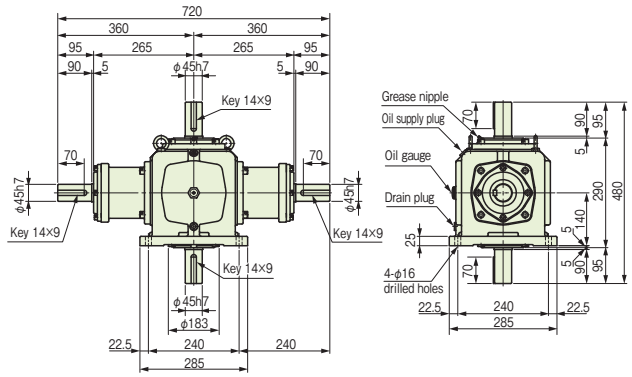
1-1-D, 1-1-D-O



1-1-LR, 1-1-LR-O



1-1-UD, 1-1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1					B15 Speed ratio 1.5 : 1					B20 Speed ratio 2 : 1				
		Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED10	3000	—	—	—	— —	— —	—	—	—	— —	— —	—	—	—	— —	— —
	2000	55.3	250	{25.5}	3677 { 375}	4069 { 415}	34.6	235	{24.0}	4167 { 425}	7845 { 800}	22.4	203	{20.7}	4167 { 425}	7845 { 800}
	1750	52.2	279	{28.5}	3969 { 405}	4263 { 435}	32.2	257	{26.2}	4459 { 455}	8232 { 840}	19.7	211	{21.5}	4459 { 455}	8232 { 840}
	1450	45.7	294	{30.0}	4165 { 425}	4508 { 460}	27.0	261	{26.7}	5194 { 530}	9212 { 940}	16.5	213	{21.7}	5194 { 530}	9212 { 940}
	1150	38.9	317	{32.3}	4459 { 455}	4851 { 495}	21.8	266	{27.1}	6174 { 630}	10486 {1070}	13.3	216	{22.0}	6174 { 630}	10486 {1070}
	870	31.2	335	{34.2}	4851 { 495}	5292 { 540}	16.8	272	{27.7}	7448 { 760}	11760 {1200}	10.2	220	{22.5}	7448 { 760}	11760 {1200}
	580	21.4	345	{35.2}	5488 { 560}	5880 { 600}	11.4	277	{28.2}	9555 { 975}	11760 {1200}	7.00	225	{23.0}	9555 { 975}	11760 {1200}
	300	11.4	359	{36.6}	9713 { 685}	7987 { 815}	6.14	287	{29.3}	9996 {1020}	11760 {1200}	3.73	232	{23.7}	9996 {1020}	11760 {1200}
	100	4.00	374	{38.2}	9996 {1020}	11760 {1200}	2.12	298	{30.4}	9996 {1020}	11760 {1200}	1.28	240	{24.5}	9996 {1020}	11760 {1200}
	10	0.41	392	{40.0}	9996 {1020}	11760 {1200}	0.21	310	{31.6}	9996 {1020}	11760 {1200}	0.13	249	{25.5}	9996 {102|0}	11760 {1200}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

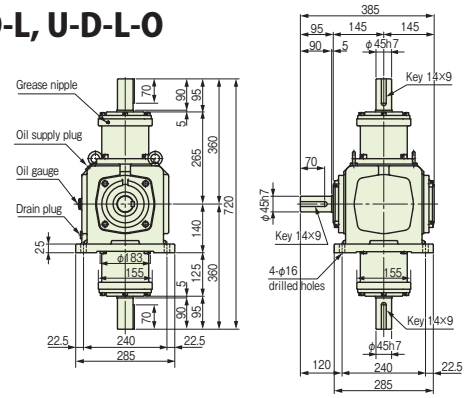
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

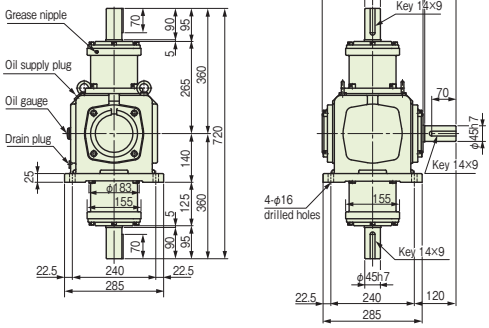
Approximate mass : 100kg　　Approximate oil quantity : 3.7L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

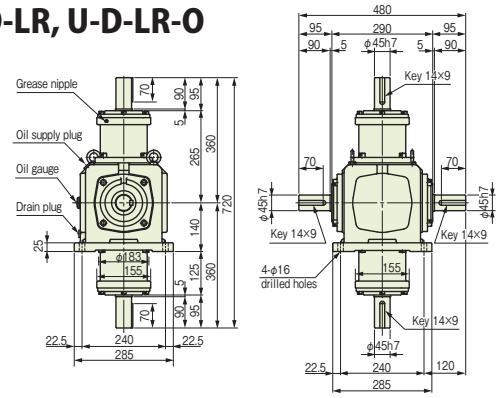
U-D-L, U-D-L-O



U-D-R, U-D-R-O

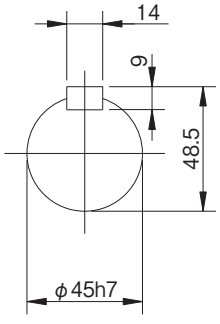


U-D-LR, U-D-LR-O



B25 Speed ratio 2.5 : 1							B30 Speed ratio 3 : 1						
Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
	N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
—	—	—	—	—	—	—	—	—	—	—	—	—	—
17.0	192	{19.6}	4167	{425}	7845	{800}	13.0	176	{18.0}	4167	{425}	7845	{800}
15.1	203	{20.7}	4459	{455}	8232	{840}	11.7	189	{19.2}	4459	{455}	8232	{840}
12.7	205	{20.9}	5194	{530}	9212	{940}	9.80	189	{19.2}	5194	{530}	9212	{940}
10.2	208	{21.2}	6174	{630}	10486	{1070}	7.91	192	{19.6}	6174	{630}	10486	{1070}
7.84	211	{21.5}	7448	{760}	11760	{1200}	6.06	195	{19.9}	7448	{760}	11760	{1200}
5.37	217	{22.1}	9555	{975}	11760	{1200}	4.12	199	{20.3}	9555	{975}	11760	{1200}
2.84	221	{22.6}	9996	{1020}	11760	{1200}	2.17	203	{20.7}	9996	{1020}	11760	{1200}
0.98	228	{23.2}	9996	{1020}	11760	{1200}	0.74	210	{21.4}	9996	{1020}	11760	{1200}
0.09	235	{24.0}	9996	{1020}	11760	{1200}	0.07	215	{22.0}	9996	{1020}	11760	{1200}

Shaft end detail of lateral shaft, cross shaft

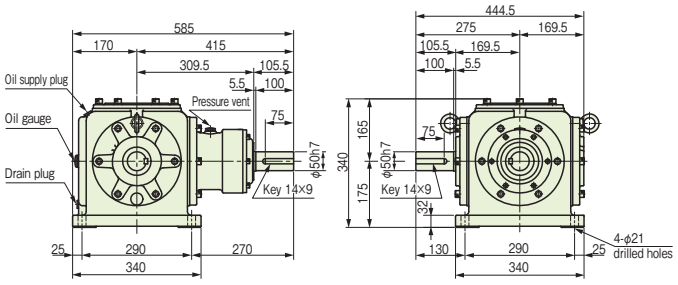


ED12 Lateral single-shaft type

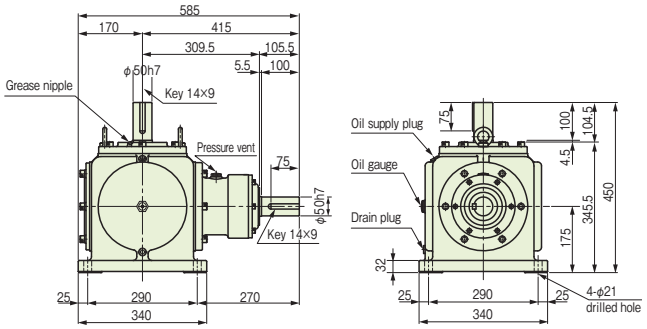
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

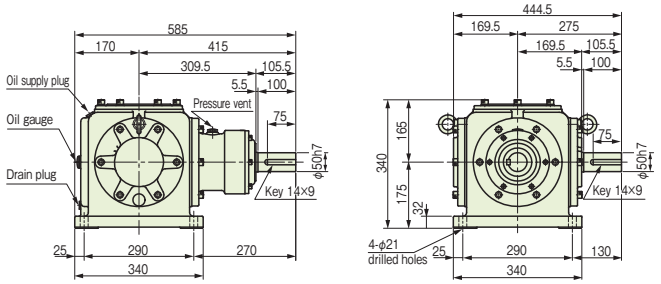
1-L, 1-L-O



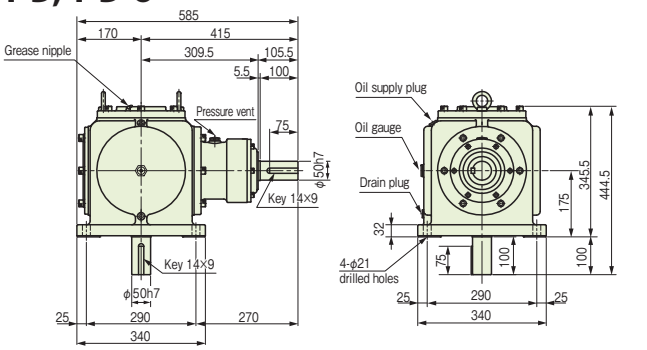
1-U, 1-U-O



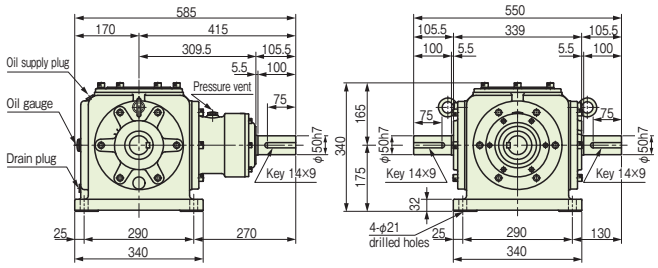
1-R, 1-R-O



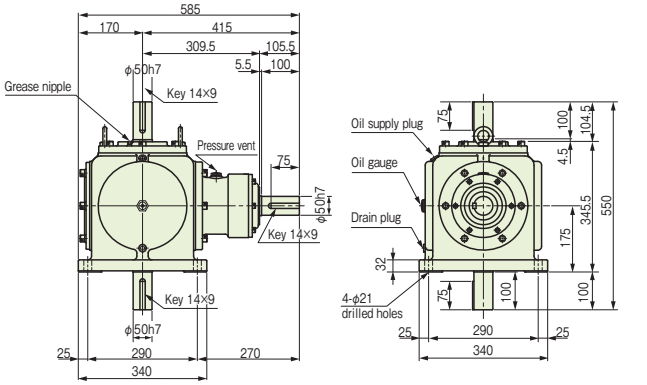
1-D, 1-D-O



1-LR, 1-LR-O



1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1					B15 Speed ratio 1.5 : 1					B20 Speed ratio 2 : 1				
		Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED12	3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	1750	109.6	586	{59.8}	4851 {495}	5341 {545}	65.9	528	{53.9}	5096 {520}	9212 {940}	48.3	516	{52.7}	5096 {520}	9212 {940}
	1450	96.0	619	{63.2}	5096 {520}	5586 {570}	58.3	564	{57.6}	5978 {610}	10486 {1070}	40.0	516	{52.7}	5978 {610}	10486 {1070}
	1150	81.8	665	{67.9}	5488 {560}	6076 {620}	49.2	601	{61.3}	7252 {740}	12151 {1240}	31.7	516	{52.7}	7252 {740}	12151 {1240}
	870	67.5	726	{74.1}	5880 {600}	6566 {670}	40.7	656	{66.9}	8869 {905}	14504 {1480}	24.0	516	{52.7}	8869 {905}	14504 {1480}
	580	49.7	802	{81.8}	6713 {685}	7301 {745}	28.9	699	{71.3}	11466 {1170}	14504 {1480}	16.3	524	{53.5}	11466 {1170}	14504 {1480}
	300	26.8	835	{85.2}	8232 {840}	9065 {925}	15.5	724	{73.9}	11858 {1210}	14504 {1480}	8.71	543	{55.4}	11858 {1210}	14504 {1480}
	100	9.36	875	{89.3}	11368 {1160}	12593 {1285}	5.37	754	{76.9}	11858 {1210}	14504 {1480}	3.01	563	{57.4}	11858 {1210}	14504 {1480}
	10	0.98	919	{93.8}	11858 {1210}	14504 {1480}	0.56	785	{80.1}	11858 {1210}	14504 {1480}	0.31	586	{59.8}	11858 {1210}	14504 {1480}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

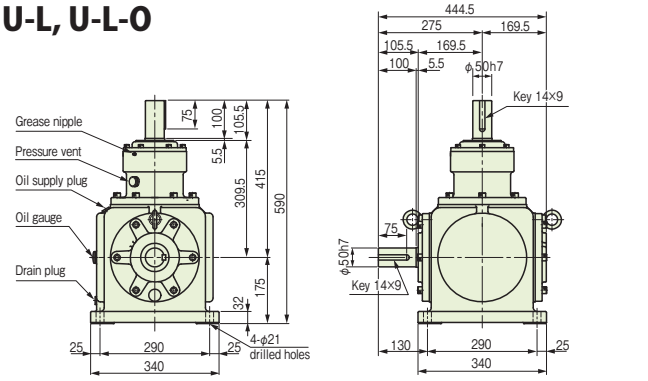
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

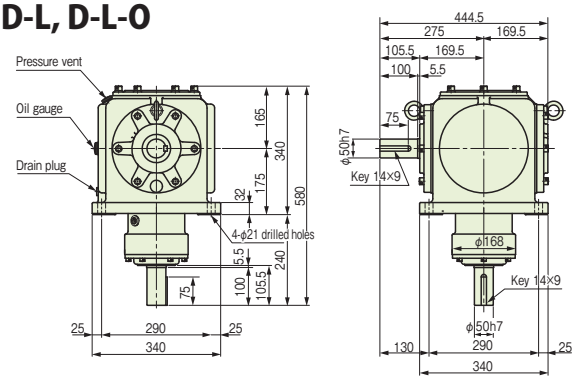
Approximate mass : 124kg　　Approximate oil quantity : 7.0L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

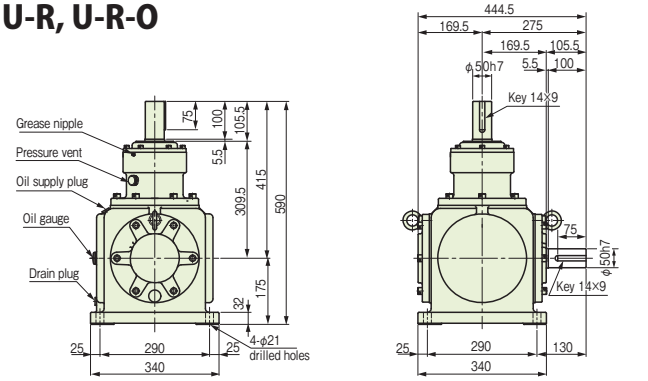
U-L, U-L-O



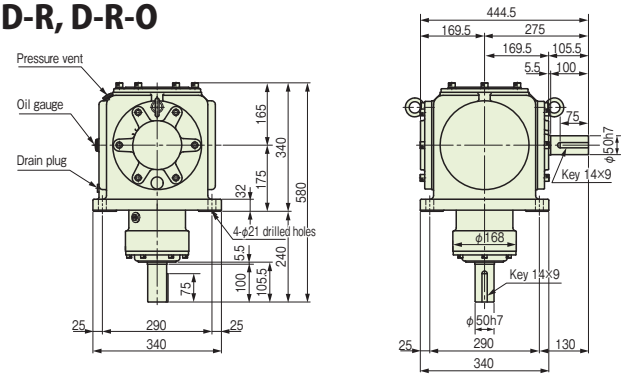
D-L, D-L-O



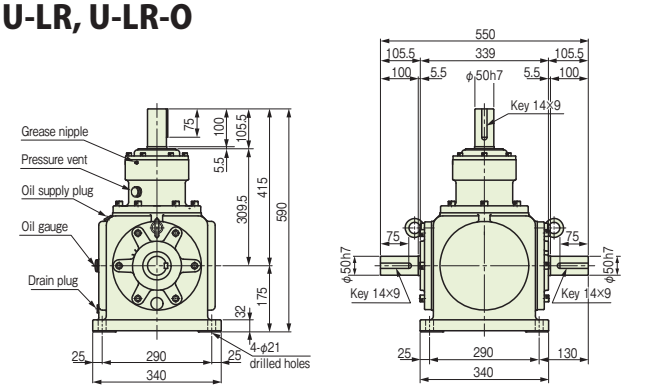
U-R, U-R-O



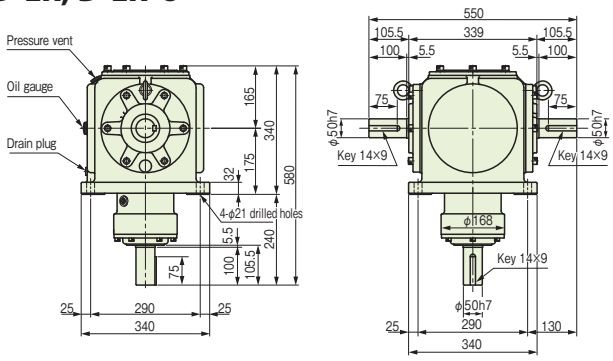
D-R, D-R-O



U-LR, U-LR-O

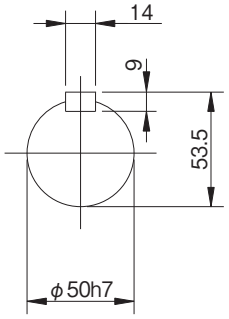


D-LR, D-LR-O



B25 Speed ratio 2.5 : 1							B30 Speed ratio 3 : 1						
Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
	N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
37.4	500	{51.0}	5096	{520}	9212	{940}	28.2	452	{46.1}	5096	{520}	9212	{940}
31.4	507	{51.7}	5978	{610}	10486	{1070}	23.6	458	{46.7}	5978	{610}	10486	{1070}
25.3	514	{52.4}	7252	{740}	12151	{1240}	19.0	464	{47.3}	7252	{740}	12151	{1240}
19.5	523	{53.4}	8869	{905}	14504	{1480}	14.6	469	{47.9}	8869	{905}	14504	{1480}
13.3	535	{54.6}	11466	{1170}	14504	{1480}	9.92	480	{49.0}	11466	{1170}	14504	{1480}
7.08	552	{56.3}	11858	{1210}	14504	{1480}	5.29	495	{50.5}	11858	{1210}	14504	{1480}
2.43	568	{58.0}	11858	{1210}	14504	{1480}	1.82	510	{52.0}	11858	{1210}	14504	{1480}
0.25	588	{60.1}	11858	{1210}	14504	{1480}	0.18	527	{53.8}	11858	{1210}	14504	{1480}

Shaft end detail of lateral shaft, cross shaft

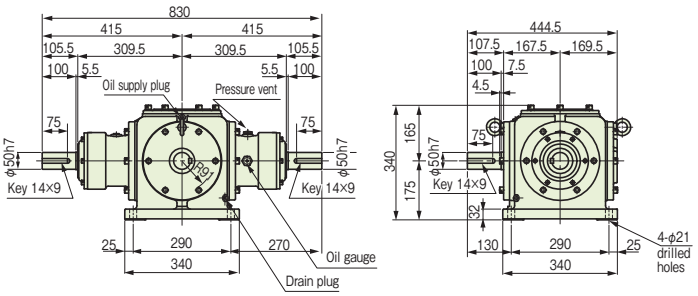


ED12 Lateral dual-shaft type

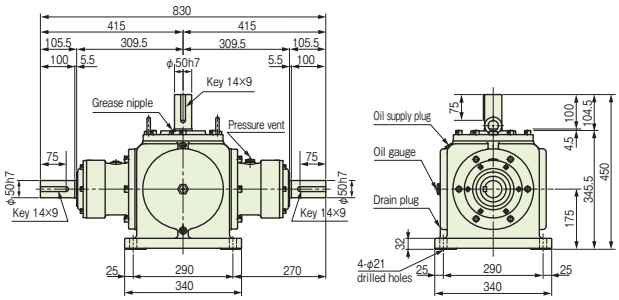
■Speed ratio : M (1:1) , B15 (1.5:1) , B20 (2:1) , B25 (2.5:1) , B30 (3:1)　■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

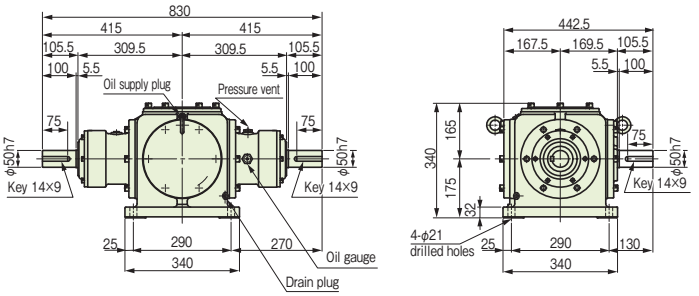
1-1-L, 1-1-L-0



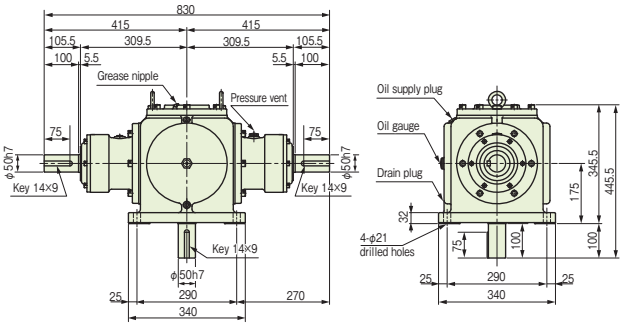
1-1-U, 1-1-U-0



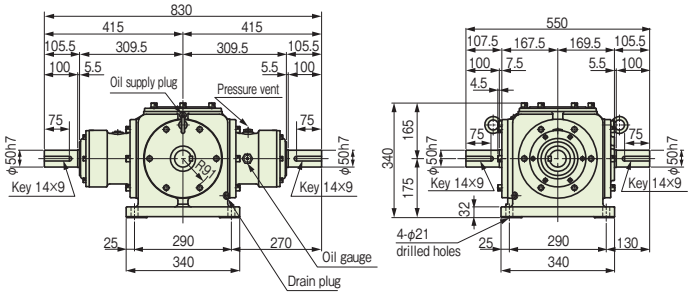
1-1-R, 1-1-R-0



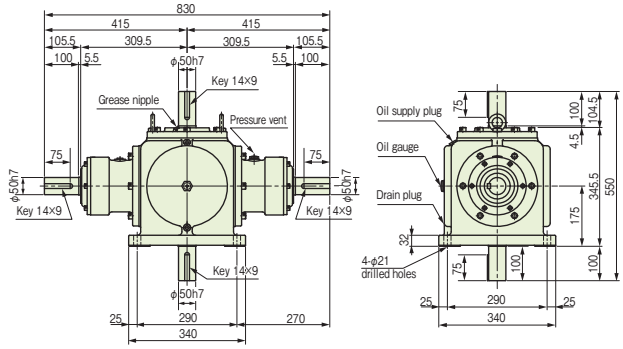
1-1-D, 1-1-D-0



1-1-LR, 1-1-LR-0



1-1-UD, 1-1-UD-0



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1					B15 Speed ratio 1.5 : 1					B20 Speed ratio 2 : 1				
		Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED12	3000	—	—	—	— —	— —	—	—	—	— —	— —	—	—	—	— —	— —
	2000	—	—	—	— —	— —	—	—	—	— —	— —	—	—	—	— —	— —
	1750	76.7	410	{41.8}	4851 { 495}	5341 { 545}	46.1	369	{37.7}	5096 { 520}	9212 { 940}	33.8	361	{36.8}	5096 { 520}	9212 { 940}
	1450	67.2	433	{44.2}	5096 { 520}	5586 { 570}	40.8	394	{40.2}	5978 { 610}	10486 {1070}	28.0	361	{36.8}	5978 { 610}	10486 {1070}
	1150	57.2	465	{47.5}	5488 { 560}	6076 { 620}	34.4	420	{42.9}	7252 { 740}	12151 {1240}	22.1	361	{36.8}	7252 { 740}	12151 {1240}
	870	47.2	508	{51.8}	5880 { 600}	6566 { 670}	28.4	459	{46.8}	8869 { 905}	14504 {1480}	16.8	361	{36.8}	8869 { 905}	14504 {1480}
	580	34.7	561	{57.2}	6713 { 685}	7301 { 745}	20.2	489	{49.9}	11466 {1170}	14504 {1480}	11.4	366	{37.4}	11466 {1170}	14504 {1480}
	300	18.7	584	{59.6}	8232 { 840}	9065 { 925}	10.8	506	{51.7}	11858 {1210}	14504 {1480}	6.09	380	{38.7}	11858 {1210}	14504 {1480}
	100	6.55	612	{62.5}	11368 {1160}	12593 {1285}	3.75	527	{53.8}	11858 {1210}	14504 {1480}	2.10	394	{40.2}	11858 {1210}	14504 {1480}
	10	0.68	643	{65.6}	11858 {1210}	14504 {1480}	0.39	549	{56.0}	11858 {1210}	14504 {1480}	0.21	410	{41.8}	11858 {1210}	14504 {1480}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

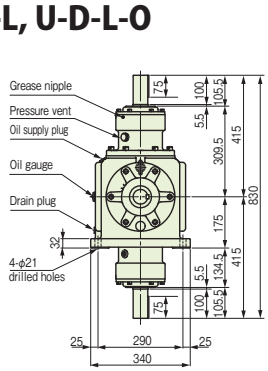
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

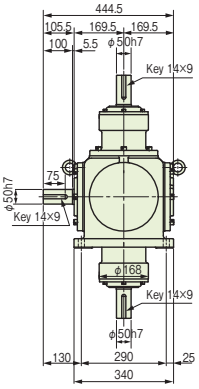
Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

Approximate mass : 159kg　　Approximate oil quantity : 7.4L

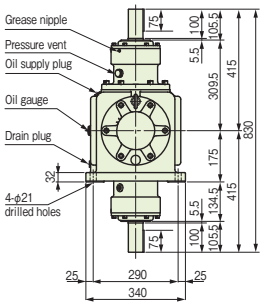
* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

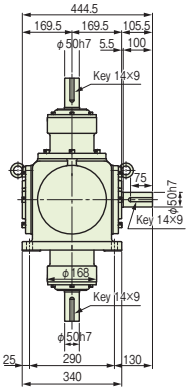
U-D-L, U-D-L-O



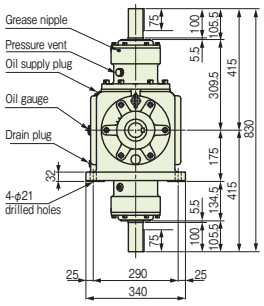


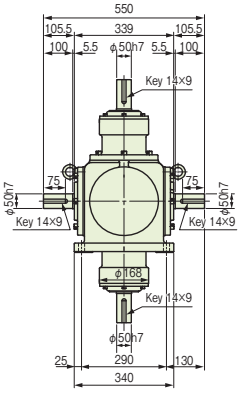
U-D-R, U-D-R-O





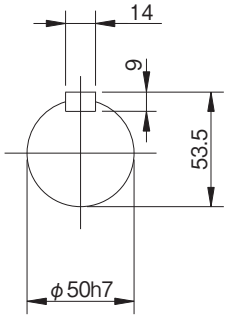
U-D-LR, U-D-LR-O





B25 Speed ratio 2.5 : 1							B30 Speed ratio 3 : 1						
Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
	N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
26.1	350	{35.7}	5096	{520}	9212	{940}	19.7	316	{32.2}	5096	{520}	9212	{940}
21.9	354	{36.2}	5978	{610}	10486	{1070}	16.5	320	{32.7}	5978	{610}	10486	{1070}
17.7	359	{36.7}	7252	{740}	12151	{1240}	13.3	324	{33.1}	7252	{740}	12151	{1240}
13.6	366	{37.3}	8869	{905}	14504	{1480}	10.2	328	{33.5}	8869	{905}	14504	{1480}
9.31	374	{38.2}	11466	{1170}	14504	{1480}	6.94	336	{34.2}	11466	{1170}	14504	{1480}
4.95	386	{39.4}	11858	{1210}	14504	{1480}	3.70	346	{35.3}	11858	{1210}	14504	{1480}
1.70	397	{40.5}	11858	{1210}	14504	{1480}	1.27	357	{36.4}	11858	{1210}	14504	{1480}
0.17	411	{42.0}	11858	{1210}	14504	{1480}	0.12	368	{37.6}	11858	{1210}	14504	{1480}

Shaft end detail of lateral shaft, cross shaft

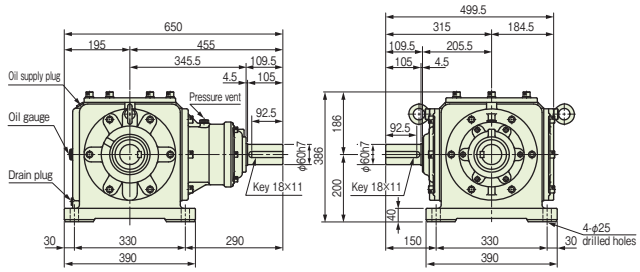


ED16 Lateral single-shaft type

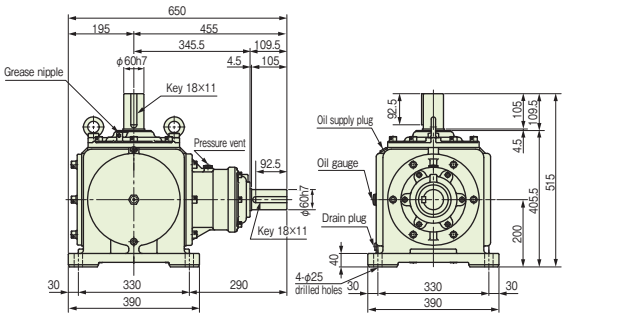
■Speed ratio : M (1 : 1), B20 (2 : 1) ■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

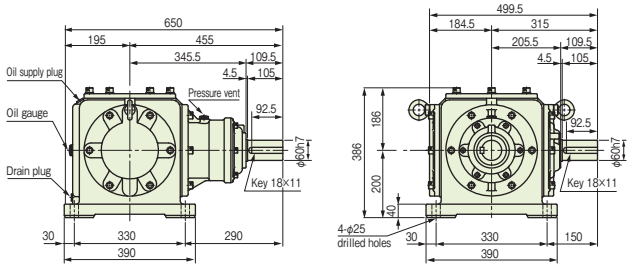
1-L, 1-L-O



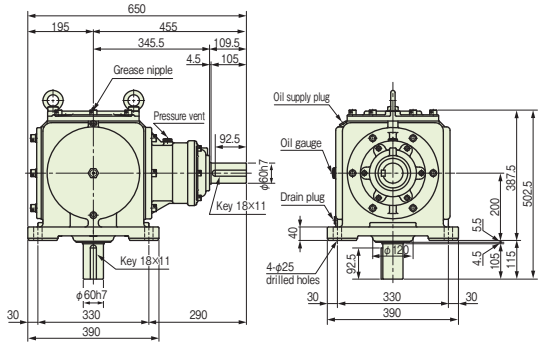
1-U, 1-U-O



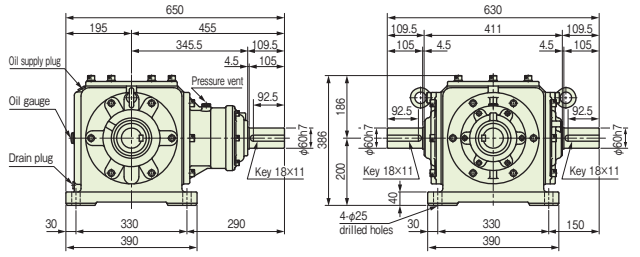
1-R, 1-R-O



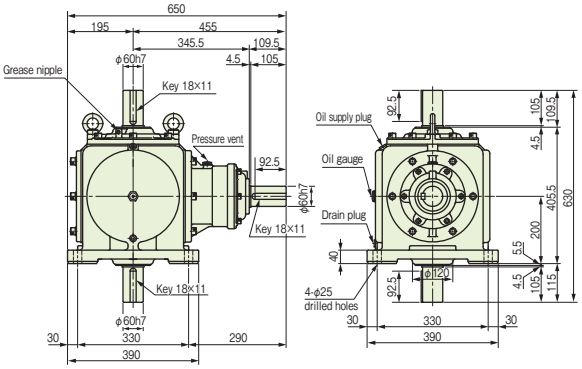
1-D, 1-D-O



1-LR, 1-LR-O



1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1				B20 Speed ratio 2 : 1			
		Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}	Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED16	3000	—	— —	— —	— —	—	— —	— —	— —
	2000	—	— —	— —	— —	—	— —	— —	— —
	1750	—	— —	— —	— —	87.7	908 {92.7}	5439 {555}	10339 {1055}
	1450	163	1091 {104}	10633 {1085}	10976 {1120}	73.7	921 {94.0}	5978 {610}	12152 {1240}
	1150	139	1098 {112}	11368 {1160}	11760 {1200}	59.5	938 {95.7}	6419 {655}	13083 {1335}
	870	114	1186 {121}	12446 {1270}	12740 {1300}	46.0	958 {97.8}	6958 {710}	14210 {1450}
	580	85.9	1343 {137}	14014 {1430}	14504 {1480}	31.3	980 {100}	7840 {800}	16072 {1640}
	300	54.1	1637 {167}	17150 {1750}	17640 {1800}	16.7	1009 {103}	9604 {980}	19600 {2000}
	100	20.3	1842 {188}	22540 {2300}	22540 {2300}	5.84	1058 {108}	13328 {1360}	22540 {2300}
	10	2.14	1940 {198}	22540 {2300}	22540 {2300}	0.60	1098 {112}	22540 {2300}	22540 {2300}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

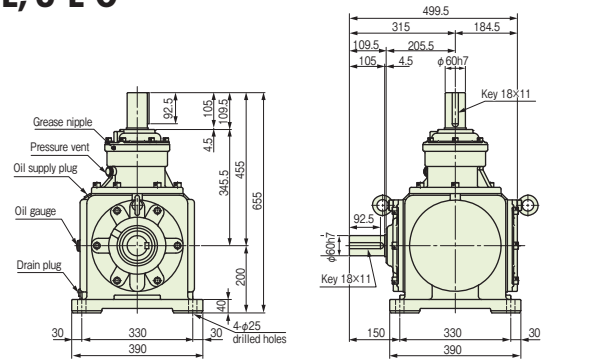
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

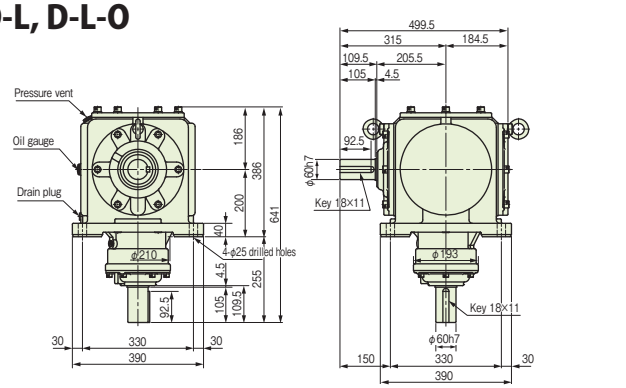
Approximate mass : 188kg Approximate oil quantity : 10L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y. * Phase of the key groove does not always match.

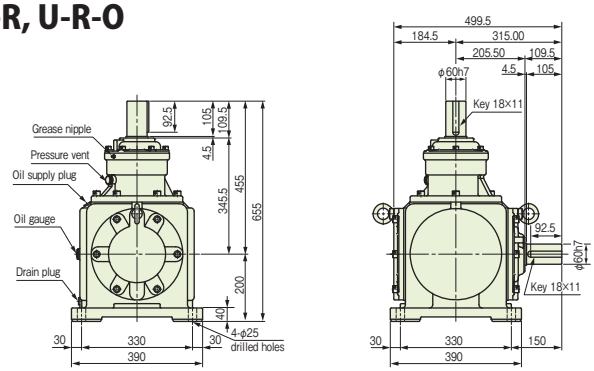
U-L, U-L-O



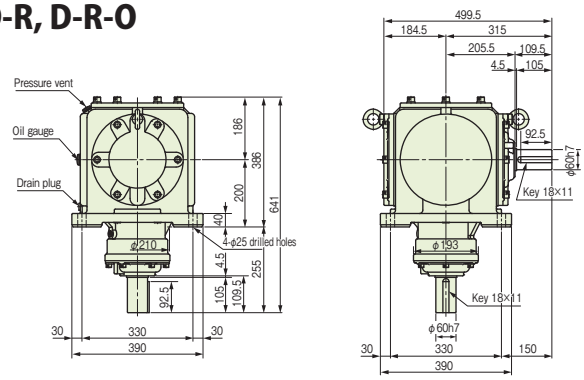
D-L, D-L-O



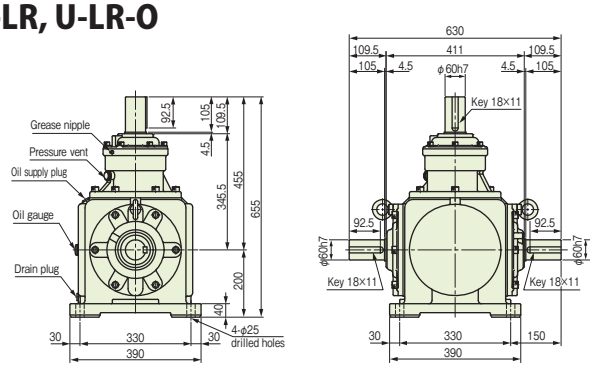
U-R, U-R-O



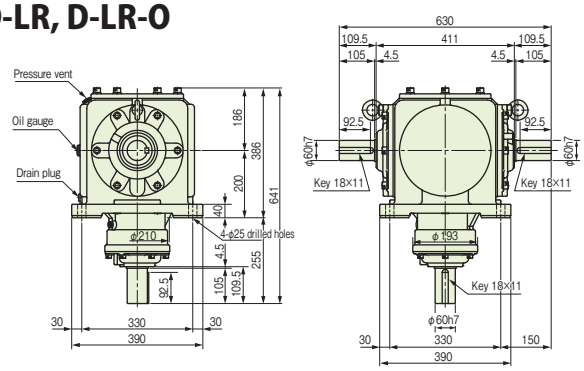
D-R, D-R-O



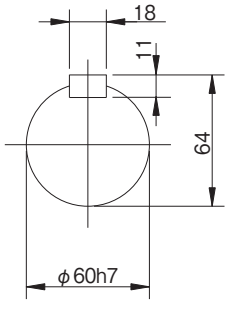
U-LR, U-LR-O



D-LR, D-LR-O



Shaft end detail of lateral shaft, cross shaft

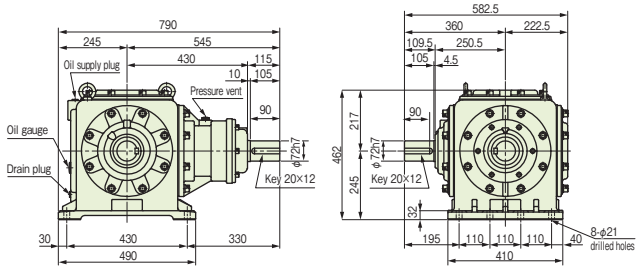


ED20 Lateral single-shaft type

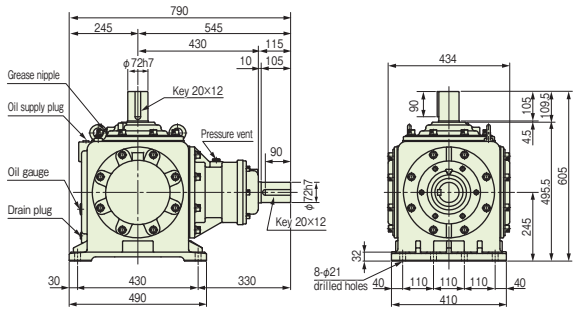
■Speed ratio : M (1 : 1), B20 (2 : 1) ■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

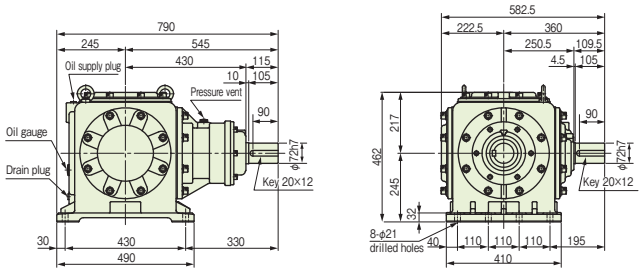
1-L, 1-L-O



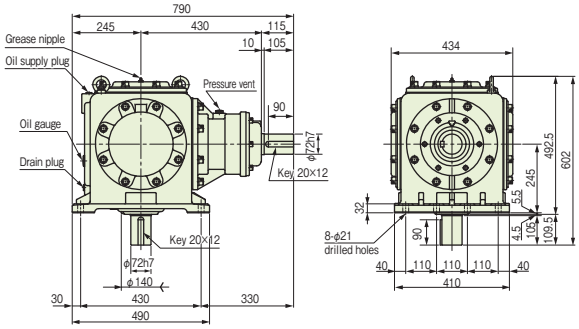
1-U, 1-U-O



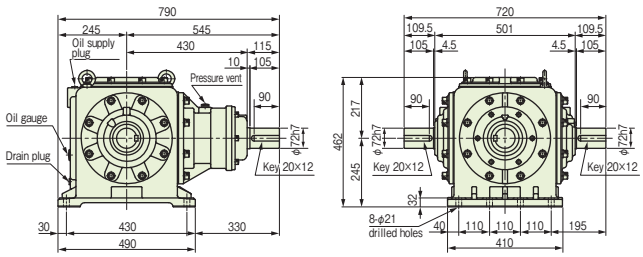
1-R, 1-R-O



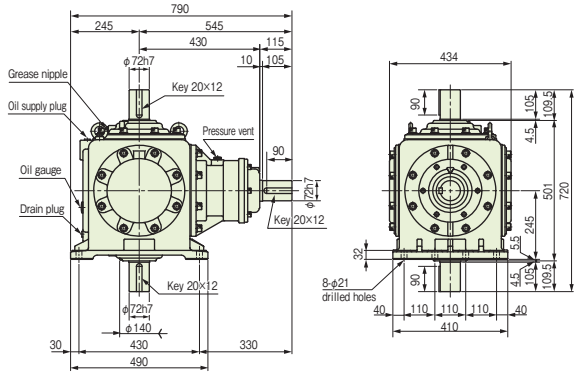
1-D, 1-D-O



1-LR, 1-LR-O



1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1							B20 Speed ratio 2 : 1						
		Input kW	Cross shaft torque		Allowable radial load N {kgf}				Input kW	Cross shaft torque		Allowable radial load N {kgf}			
			N·m	{kgf·m}	Lateral shaft		Cross shaft			N·m	{kgf·m}	Lateral shaft		Cross shaft	
ED20	3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	1750	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	1450	—	—	—	—	—	—	—	126	1578	{161}	7693	{785}	14602	{1490}
	1150	234	1842	{188}	15386	{1570}	15680	{1600}	102	1607	{164}	8771	{895}	17934	{1830}
	870	193	2009	{205}	16660	{1700}	17150	{1750}	79.0	1646	{168}	9506	{970}	19453	{1985}
	580	145	2274	{232}	18816	{1920}	19404	{1980}	54.2	1695	{173}	10780	{1100}	22001	{2245}
	300	90.8	2744	{280}	23422	{2390}	24108	{2460}	29.0	1754	{179}	13132	{1340}	27342	{2790}
	100	35.3	3205	{327}	28420	{2900}	32928	{3360}	10.1	1833	{187}	18228	{1860}	33320	{3400}
	10	3.53	3205	{327}	28420	{2900}	33320	{3400}	1.06	1921	{196}	28420	{2900}	33320	{3400}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

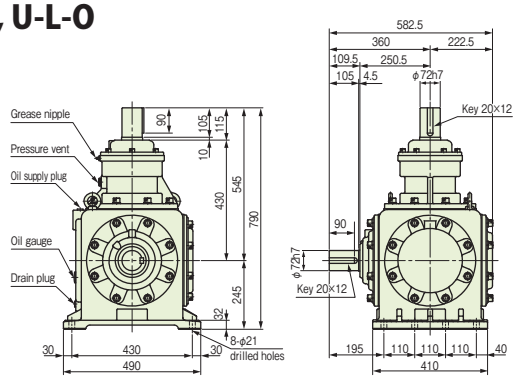
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

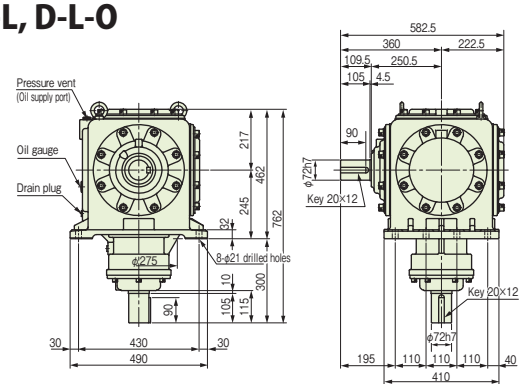
Approximate mass : 297kg　　Approximate oil quantity : 11L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

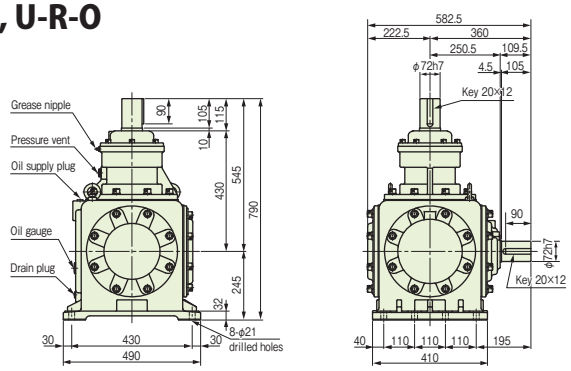
U-L, U-L-O



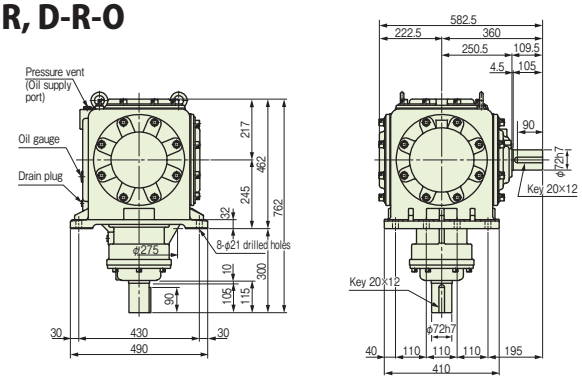
D-L, D-L-O



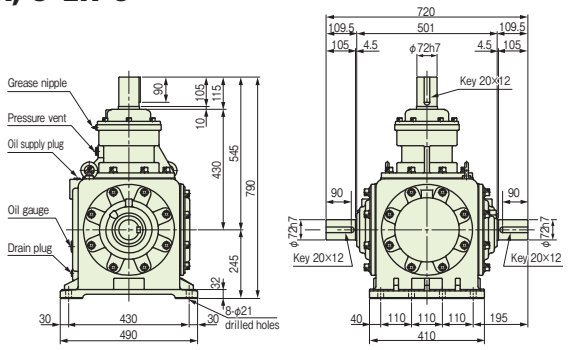
U-R, U-R-O



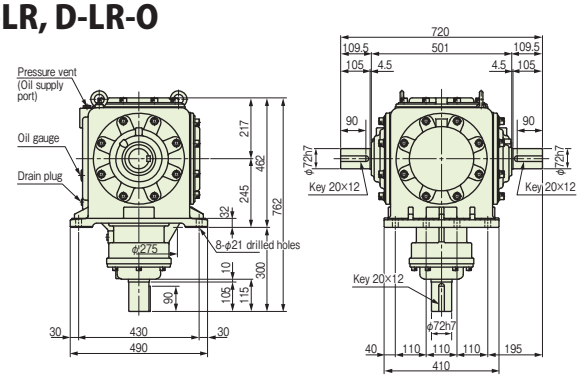
D-R, D-R-O



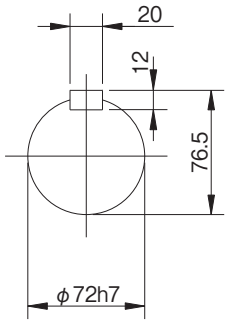
U-LR, U-LR-O



D-LR, D-LR-O



Shaft end detail of lateral shaft, cross shaft

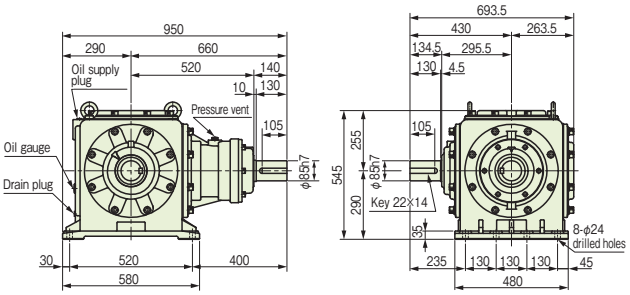


ED25 Lateral single-shaft type

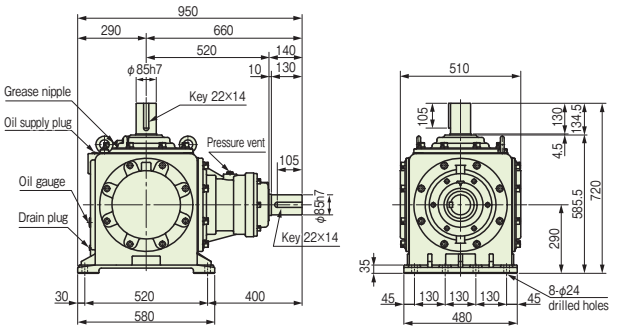
■Speed ratio : M (1 : 1), B20 (2 : 1) ■Type of mounting : Y (T, K1, K2, K3, K4)

Dimensional drawing

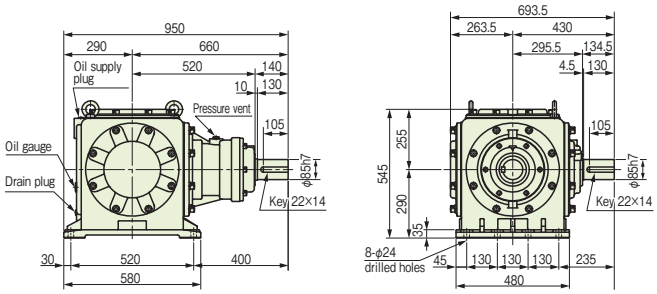
1-L, 1-L-O



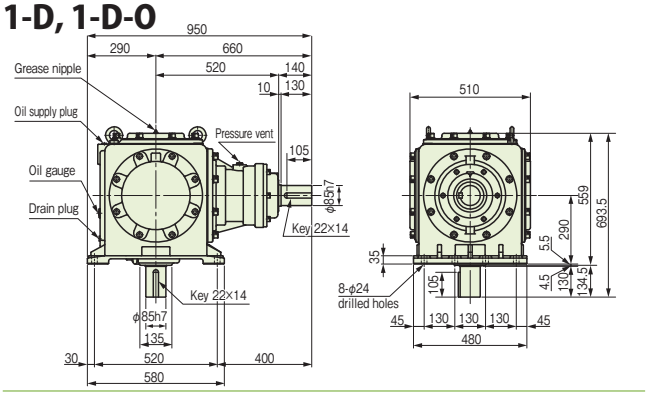
1-U, 1-U-O



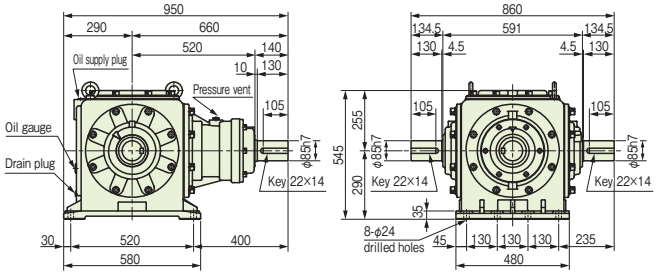
1-R, 1-R-O



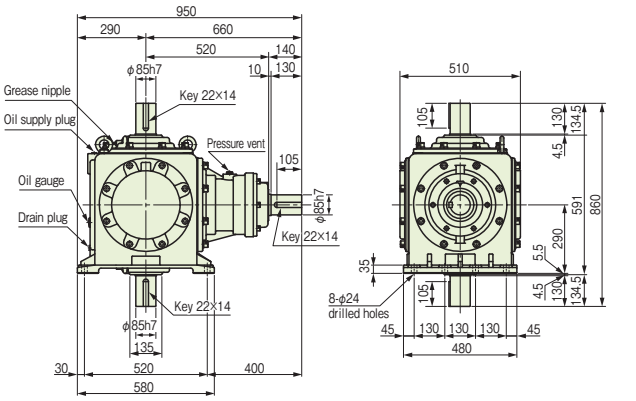
1-D, 1-D-O



1-LR, 1-LR-O



1-UD, 1-UD-O



Transmission capacity table

Size	Rotational speed of lateral shaft rpm r/min	M Speed ratio 1 : 1					B20 Speed ratio 2 : 1				
		Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft	Input kW	Cross shaft torque N·m {kgf·m}		Allowable radial load N {kgf} Lateral shaft	Cross shaft
ED25	3000	—	—	—	— —	— —	—	—	—	— —	— —
	2000	—	—	—	— —	— —	—	—	—	— —	— —
	1750	—	—	—	— —	— —	—	—	—	— —	— —
	1450	—	—	—	— —	— —	—	—	—	— —	— —
	1150	—	—	—	— —	— —	199	3146	{321}	12985 {1325}	24647 {2515}
	870	335	3489	{356}	24794 {2530}	25480 {2600}	155	3224	{329}	13573 {1385}	29400 {3000}
	580	252	3940	{402}	28028 {2860}	28910 {2950}	107	3332	{340}	15680 {1600}	33222 {3390}
	300	159	4792	{489}	34300 {3500}	35280 {3600}	57.5	3479	{355}	19159 {1955}	40474 {4130}
	100	60.0	5439	{555}	39200 {4000}	49000 {5000}	20.1	3646	{372}	26656 {2720}	49000 {5000}
	10	6.30	5713	{583}	39200 {4000}	49000 {5000}	2.11	3822	{390}	39200 {4000}	49000 {5000}

Note 1) For a case between the respective rotational speeds of the lateral shaft, calculate the values by interpolation. Furthermore, when the rotational speed of the lateral shaft is less than 10 rpm, use it with the torque at 10 rpm.

Note 2) When it is used under conditions exceeding the rotational speed of [ ], the specification with forced lubrication might be necessary. In such a case, please consult our company.

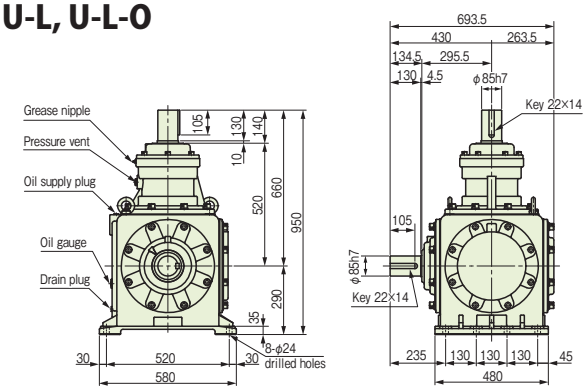
Note 3) In the case of a rotational speed between a rotational speed of [ ] and a lower rotational speed, also please consult our company.

Note 4) For the operating position of radial load, refer to the item on Selection (p.15).

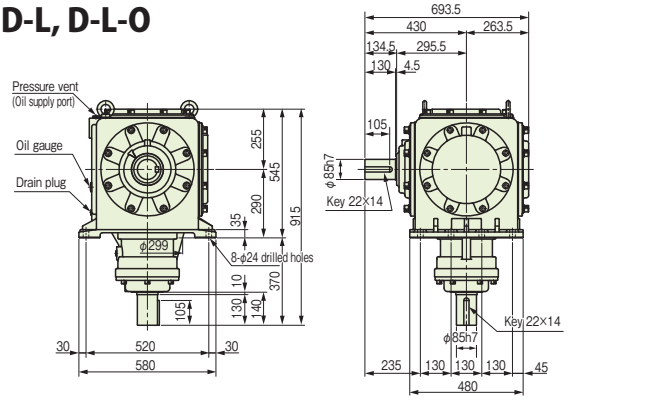
Approximate mass : 488kg　　Approximate oil quantity : 18L

* Positions of each plug, oil gauge, and grease nipple correspond to mounting type Y.　* Phase of the key groove does not always match.

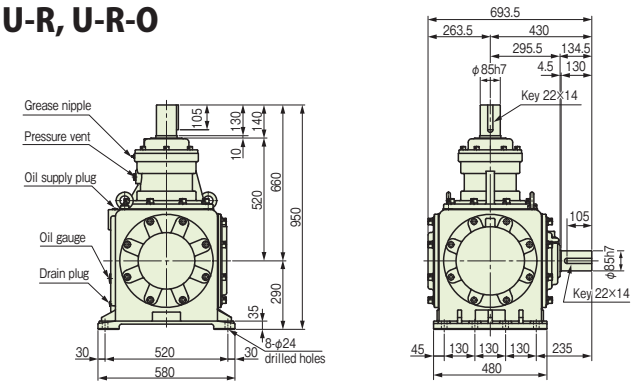
U-L, U-L-O



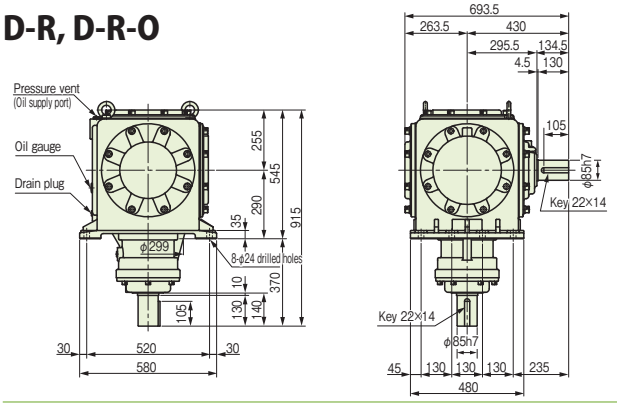
D-L, D-L-O



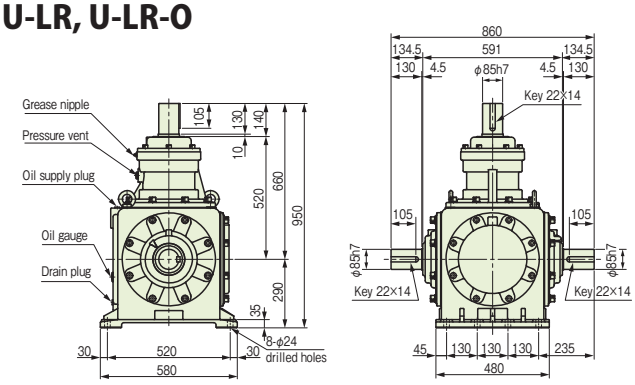
U-R, U-R-O



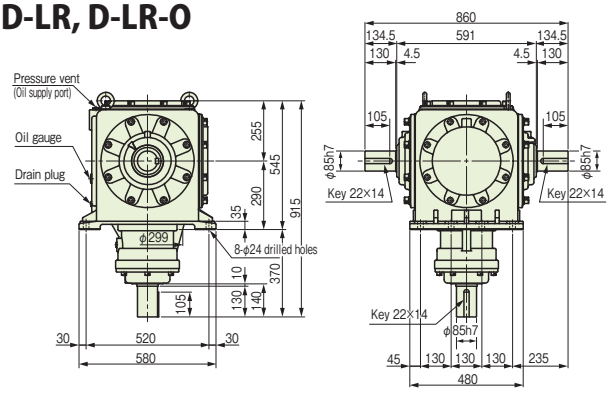
D-R, D-R-O



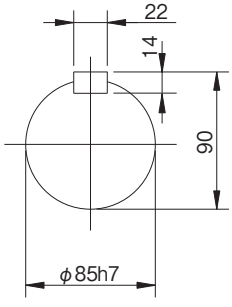
U-LR, U-LR-O



D-LR, D-LR-O



Shaft end detail of lateral shaft, cross shaft



MEMO

Type ARA

C O N T E N T S

Type ARA
Features, Model list, Standard specification

Features

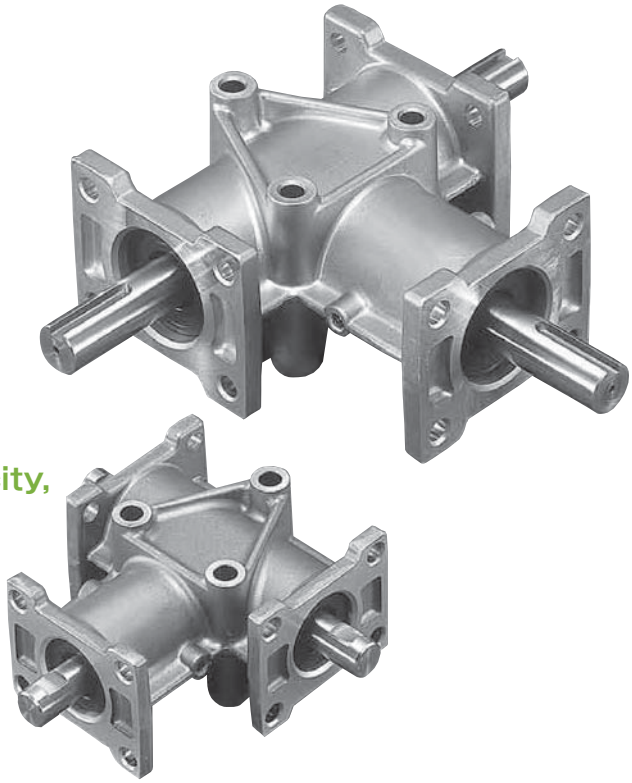
Compact, lightweight, fine
Aluminum die-casting (ADC) is adopted for the casing.

Corrosion resistance
Stainless steel (SUS304) which has excellent corrosion resistance is adopted for the shaft material.

Universal mounting
It can be mounted in all directions, and mounting is also easy.

High efficiency, high transmission capacity, low noise, low vibratio
Because a high-precision spiral bevel gear is adopted, high performance can be obtained over a wide range.

Quick delivery
All models are in stock.



Model list

○ : Standard item

ARA \ Speed ratio	1 : 1	2 : 1
3	○	○
5	○	○
6	○	○

Standard specification

Gear box	Speed reduction system	Spiral bevel gear
	Lubrication system	Grease lubrication
	Specification of key	New JIS regular class, JIS B1301-1976 Parallel key (Size 3 is D cut.)
	Material of casing	ADC (Aluminum die-casting)
	Structure of seal	Single oil seal
	Painting specification	No painting
Ambient conditions	Installation site	Indoor
	Ambient temperature	–10° C to 50° C
	Humidity	95% or less
	Altitude	1,000 m or lower
	Atmosphere	There shall be no corrosive or explosive gas, vapor, or dew condensation, and there shall be minimal dust.
Type of mounting		Free mounting direction

Type ARA
Indication of model number, Selection

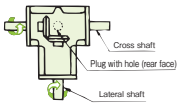
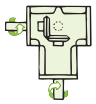
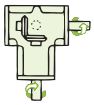
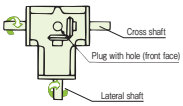
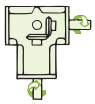
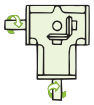
Indication of model number

ARA 3 10 LR

- ARA — Type
- 3 — Size
- 10 — Speed ratio
- LR — Shaft arrangement • Rotational relationship

Speed ratio: 10 = 1 : 1, 20 = 2 : 1

Shaft arrangement • Rotational relationship

	LR type	SN type	SF type
Plug with hole in the rear face A			
Plug with hole in the front face B			

1. Input is possible from both lateral shaft and cross shaft. Furthermore, rotational direction of the input shaft in both right and left directions is possible.
2. In the case of a speed ratio of 2:1, driving from the lateral shaft to cross shaft reduces speed, and when motive power is input from the cross shaft, it increases speed.
3. A and B are identical products.

Selection

Selection conditions

① Load torque or transmission kW ② Rotational speed at input ③ Speed ratio ④ Characteristics of load ⑤ Frequency of start-stop

Selection procedure

Make the selection according to the following procedure, considering conditions.

1. Decision on service factor

All transmission capacity tables in the catalog show values with the service factor set at 1.0. Depending on service conditions, decide the service factor using the Service factor table on Table 1.

Table 1 Service factor

Characteristics of load \ Operating time	2 hrs	10 hrs	24 hrs
Uniform load	1.00 (1.00)	1.00 (1.25)	1.25 (1.50)
Load with some shock	1.00 (1.25)	1.25 (1.50)	1.50 (1.75)
Load with large shock	1.25 (1.50)	1.50 (1.75)	1.75 (2.00)

Note 1) When frequency of starting and stopping is not less than 10 times an hour, or the prime mover is a multi-cylinder engine, use the values in ( ).
Note 2) The service factors above are general guidelines. Make a decision considering service conditions.

2. Decision on corrected torque or corrected kW

Decide corrected torque or corrected kW considering the service factor (Table 1).

Corrected torque or Corrected kW = (Load torque or transmission kW applied to ARA Gear Box) × Service factor (Table 1)

3. Decision of model

- For the rotational speed used, select the size that satisfies corrected torque or corrected kW, from the transmission capacity table (P.59). Furthermore, check whether the peak torque at starting and stopping is kept to within 200% of the transmission capacity of the selected size.
- For the shaft arrangement and rotational relationship, decide the suitable model number from the Shaft arrangement • Rotational relationship above.

4. Confirmation of radial load

When driving is performed in a state with sprocket, gear, or pulley, etc. mounted on the lateral shaft and/or cross shaft, confirm the radial load with the following formula.

■ **Formula for confirming radial load**

$$\text{Allowable radial load} \geqq \frac{T \times f \times Lf}{R}$$

(Allowable radial load → p.64)

T = Corrected torque N•m {kgf•m}
f = O.H.L. factor (Table 2)
Lf = Operating position factor (Table 3)
R = Pitch circle radius of sprocket, pulley, etc. m

Note) If the formula above is not satisfied as a result of confirming the radial load, it is necessary to increase "R," namely the pitch circle radius of the sprocket, pulley, etc.

Table 2 O.H.L. factor (f)

Chain	1.00
Gear	1.25
Toothed belt	1.25
V-belt, Strong toothed belt	1.50

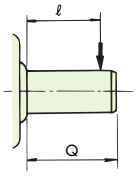


Table 3 Operating position factor (Lf)

When load is applied to the centerof shaft or inside	$\ell \leqq \frac{Q}{2}$	Lf = 1
When load is applied to outside rather than the center of the shaft	$\ell > \frac{Q}{2}$	$Lf = \frac{2\ell}{Q}$

Q = Length of output shaft end
ℓ = Operating position of radial load
Note) If radial load and axial load are applied at the same time, please consult our company.

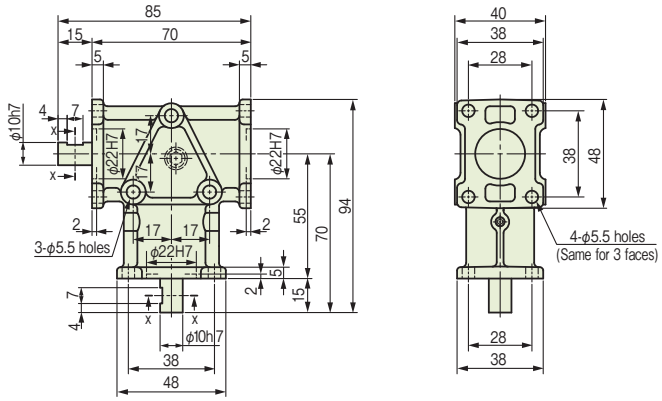
Type ARA
Transmission capacity table, Dimensional drawing

ARA3

■Speed ratio: 10 (1 : 1) 20 (2 : 1) ■Type of mounting: Free mounting direction

Rotational speed of lateral shaft rpm r/min	1 : 1			2 : 1		
	Input kW	Cross shaft torque N·m	{kgf·m}	Input kW	Cross shaft torque N·m	{kgf·m}
3600	0.52	1.37	{0.14}	0.28	1.37	{0.14}
2750	0.45	1.47	{0.15}	0.24	1.56	{0.16}
1900	0.37	1.76	{0.18}	0.18	1.66	{0.17}
1750	0.36	1.96	{0.20}	0.17	1.76	{0.18}
1450	0.31	1.96	{0.20}	0.14	1.76	{0.18}
1150	0.28	2.25	{0.23}	0.11	1.76	{0.18}
870	0.24	2.55	{0.26}	0.08	1.76	{0.18}
580	0.18	2.94	{0.30}	0.05	1.76	{0.18}
400	0.14	3.23	{0.33}	0.04	1.76	{0.18}
300	0.12	3.72	{0.38}	0.03	1.76	{0.18}
200	0.08	3.72	{0.38}	0.02	1.76	{0.18}
150	0.06	3.72	{0.38}	0.014	1.76	{0.18}
100	0.04	3.72	{0.38}	0.010	1.76	{0.18}
50	0.02	3.72	{0.38}	0.005	1.76	{0.18}

SN

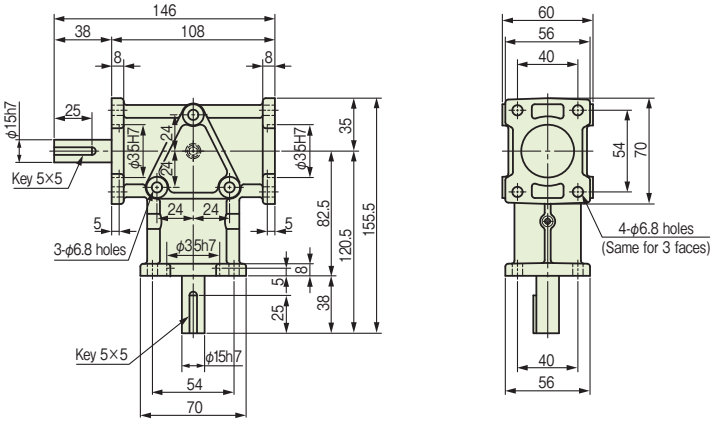


ARA5

■Speed ratio: 10 (1 : 1) 20 (2 : 1) ■Type of mounting: Free mounting direction

Rotational speed of lateral shaft rpm r/min	1 : 1			2 : 1		
	Input kW	Cross shaft torque N·m	{kgf·m}	Input kW	Cross shaft torque N·m	{kgf·m}
3600	2.11	5.49	{0.56}	1.35	6.95	{0.71}
2750	1.82	6.17	{0.63}	1.03	6.95	{0.71}
1900	1.45	7.15	{0.73}	0.71	6.95	{0.71}
1750	1.34	7.15	{0.73}	0.66	6.95	{0.71}
1450	1.11	7.15	{0.73}	0.55	6.95	{0.71}
1150	0.88	7.15	{0.73}	0.43	6.95	{0.71}
870	0.66	7.15	{0.73}	0.33	6.95	{0.71}
580	0.44	7.15	{0.73}	0.22	6.95	{0.71}
400	0.30	7.15	{0.73}	0.15	6.95	{0.71}
300	0.23	7.15	{0.73}	0.11	6.95	{0.71}
200	0.15	7.15	{0.73}	0.075	6.95	{0.71}
150	0.11	7.15	{0.73}	0.056	6.95	{0.71}
100	0.08	7.15	{0.73}	0.038	6.95	{0.71}
50	0.04	7.15	{0.73}	0.018	6.95	{0.71}

SN

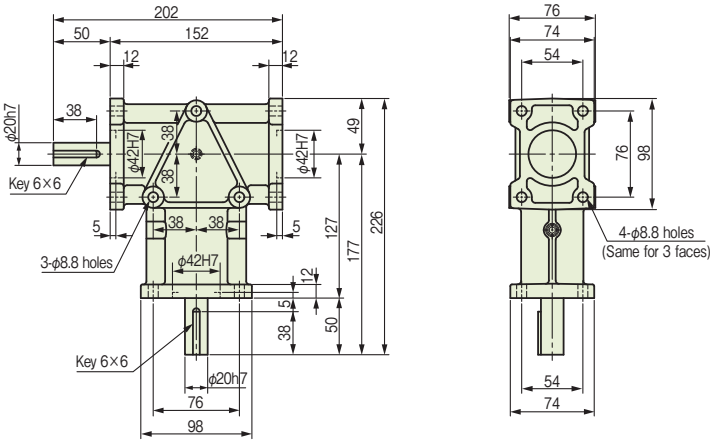


ARA6

■Speed ratio: 10 (1 : 1) 20 (2 : 1) ■Type of mounting: Free mounting direction

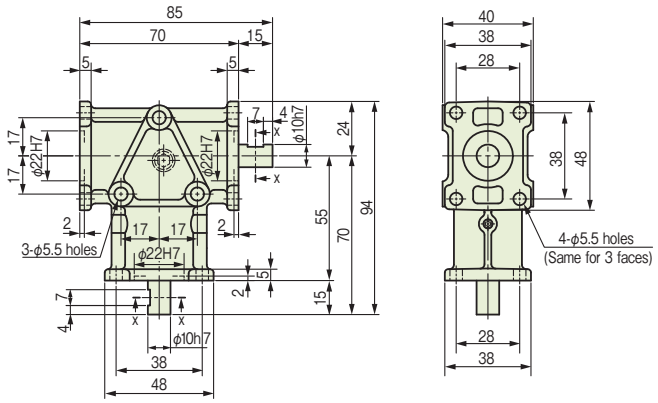
Rotational speed of lateral shaft rpm r/min	1 : 1			2 : 1		
	Input kW	Cross shaft torque N·m	{kgf·m}	Input kW	Cross shaft torque N·m	{kgf·m}
3600	3.15	8.13	{0.83}	1.81	9.41	{0.96}
2750	2.75	9.31	{0.95}	1.58	10.78	{1.10}
1900	2.26	11.07	{1.13}	1.22	11.96	{1.22}
1750	2.19	11.66	{1.19}	1.12	11.96	{1.22}
1450	1.92	12.25	{1.25}	0.94	11.96	{1.22}
1150	1.73	14.01	{1.43}	0.74	11.96	{1.22}
870	1.47	15.78	{1.61}	0.56	11.96	{1.22}
580	1.10	17.74	{1.81}	0.37	11.96	{1.22}
400	0.76	17.74	{1.81}	0.26	11.96	{1.22}
300	0.57	17.74	{1.81}	0.19	11.96	{1.22}
200	0.38	17.74	{1.81}	0.13	11.96	{1.22}
150	0.28	17.74	{1.81}	0.10	11.96	{1.22}
100	0.19	17.74	{1.81}	0.064	11.96	{1.22}
50	0.095	17.74	{1.81}	0.032	11.96	{1.22}

SN

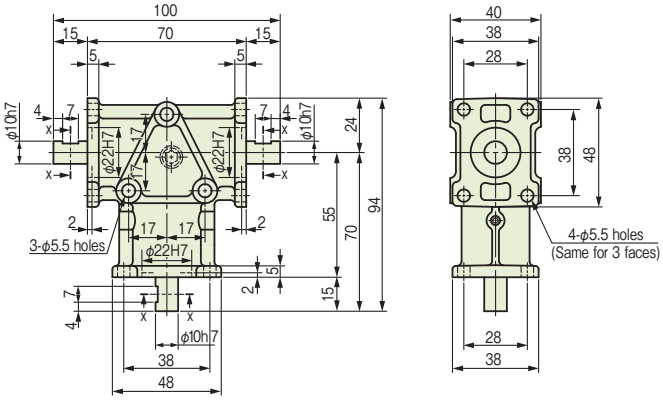


Approximate mass: 0.4 kg

SF

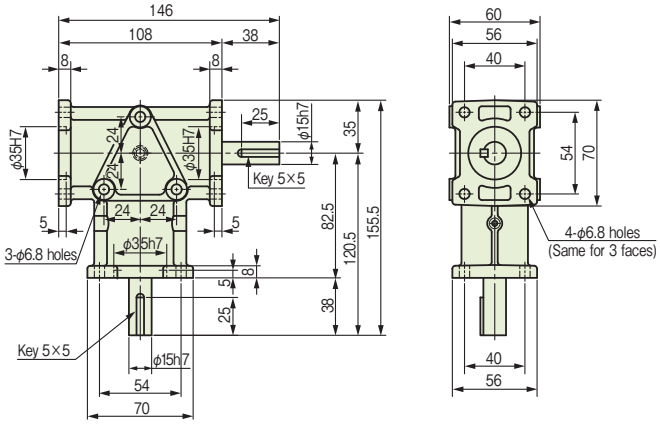


LR



Approximate mass: 1.3 kg

SF



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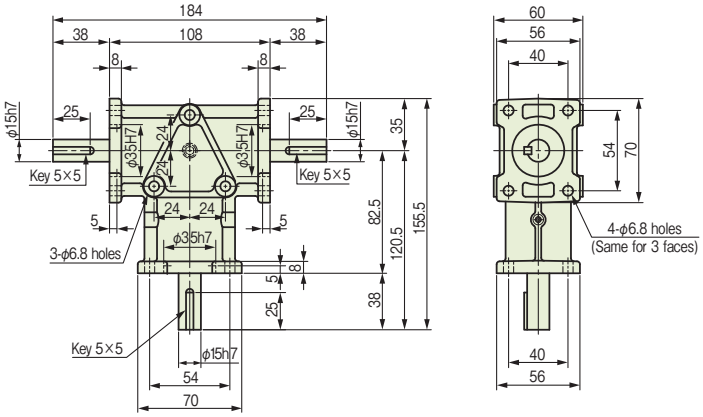
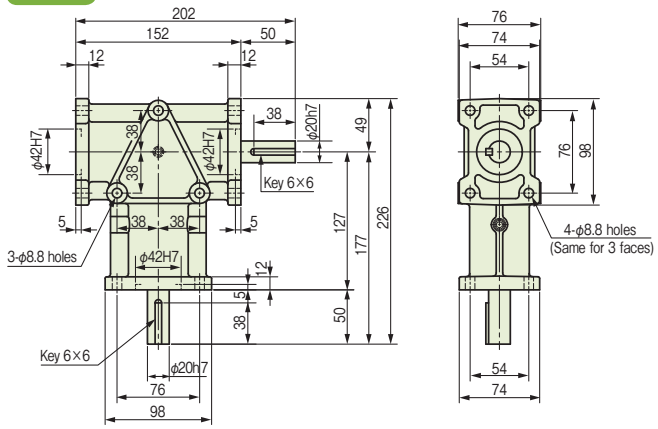
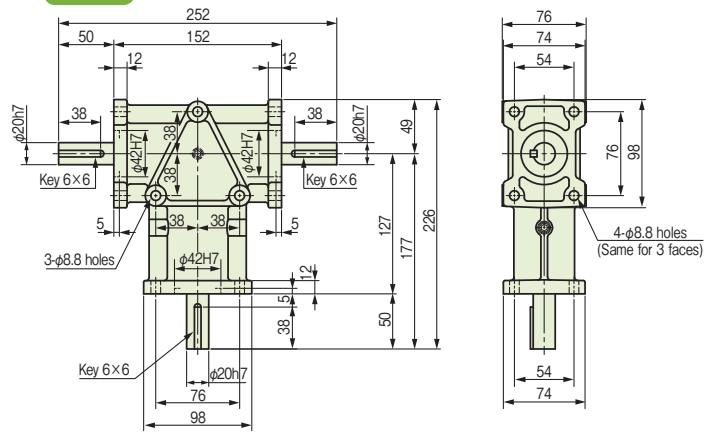


Approximate mass: 3.1 kg

SF



LR



MEMO

Technical document

C O N T E N T S

Technical data

1. Efficiency

The type ED and type ARA maintain high levels of efficiency because they adopt a high-precision spiral bevel gear.
① ED2 to ED12: 98% ② ED16 to ED25: 95% ③ ARA3 to ARA6: 98%
However, it varies depending on rotational speed, ambient temperature, and load factor.

2. Backlash

Denotes the total value of the mechanical clearance that can be measured in the rotational direction on the cross shaft when the lateral shaft is fixed.

2-1. Type ED

Unit:Angle°

ED \ Speed ratio	1 : 1	1.5 : 1	2 : 1	2.5 : 1	3 : 1
2	0.20 ~ 1.51	–	–	–	–
4	0.15 ~ 1.16	–	0.12 ~ 0.65	–	–
6	0.19 ~ 1.00	0.17 ~ 0.85	0.17 ~ 0.59	0.09 ~ 0.51	0.09 ~ 0.51
7	0.24 ~ 0.94	0.17 ~ 0.79	0.15 ~ 0.50	0.17 ~ 0.53	0.08 ~ 0.45
8	0.19 ~ 0.82	0.14 ~ 0.70	0.12 ~ 0.45	0.14 ~ 0.47	0.07 ~ 0.40
10	0.18 ~ 0.75	0.16 ~ 0.65	0.11 ~ 0.58	0.12 ~ 0.42	0.12 ~ 0.42
12	0.16 ~ 0.65	0.13 ~ 0.57	0.12 ~ 0.53	0.13 ~ 0.40	0.10 ~ 0.37
16	0.16 ~ 0.66	–	0.12 ~ 0.51	–	–
20	0.16 ~ 0.60	–	0.09 ~ 0.43	–	–
25	0.15 ~ 0.53	–	0.09 ~ 0.38	–	–

Note) When positional accuracy is required, a product with a "low-backlash specification" can be manufactured. (Refer to p.72.)

2-2. Type ARA

Unit:Angle°

ARA \ Speed ratio	10 (1 : 1)	20 (2 : 1)
3	0.31 ~ 1.97	0.31 ~ 1.75
5	0.24 ~ 1.42	0.19 ~ 1.15
6	0.18 ~ 1.16	0.16 ~ 0.94

3. Moment of inertia {GD²} converted to lateral shaft

3-1. Type ED

Lateral single-shaft type

Unit:kg•m² {kgf•m²}

ED \ Speed ratio	1 : 1	1.5 : 1	2 : 1	2.5 : 1	3 : 1
2	0.05×10^{-3} $\{0.20 \times 10^{-3}\}$	–	–	–	–
4	0.15×10^{-3} $\{0.60 \times 10^{-3}\}$	–	0.12×10^{-3} $\{0.48 \times 10^{-3}\}$	–	–
6	1.40×10^{-3} $\{5.60 \times 10^{-3}\}$	0.90×10^{-3} $\{3.60 \times 10^{-3}\}$	0.67×10^{-3} $\{2.68 \times 10^{-3}\}$	0.58×10^{-3} $\{2.32 \times 10^{-3}\}$	0.50×10^{-3} $\{2.00 \times 10^{-3}\}$
7	3.50×10^{-3} $\{14.0 \times 10^{-3}\}$	1.70×10^{-3} $\{6.80 \times 10^{-3}\}$	1.40×10^{-3} $\{5.60 \times 10^{-3}\}$	1.10×10^{-3} $\{4.40 \times 10^{-3}\}$	0.93×10^{-3} $\{3.72 \times 10^{-3}\}$
8	4.80×10^{-3} $\{19.2 \times 10^{-3}\}$	4.30×10^{-3} $\{17.2 \times 10^{-3}\}$	3.50×10^{-3} $\{14.0 \times 10^{-3}\}$	3.20×10^{-3} $\{12.8 \times 10^{-3}\}$	2.90×10^{-3} $\{11.6 \times 10^{-3}\}$
10	23.0×10^{-3} $\{92.0 \times 10^{-3}\}$	9.60×10^{-3} $\{38.4 \times 10^{-3}\}$	6.80×10^{-3} $\{27.2 \times 10^{-3}\}$	5.70×10^{-3} $\{22.8 \times 10^{-3}\}$	4.60×10^{-3} $\{18.4 \times 10^{-3}\}$
12	25.0×10^{-3} $\{100 \times 10^{-3}\}$	22.0×10^{-3} $\{88.0 \times 10^{-3}\}$	14.0×10^{-3} $\{56.0 \times 10^{-3}\}$	13.0×10^{-3} $\{52.0 \times 10^{-3}\}$	11.0×10^{-3} $\{44.0 \times 10^{-3}\}$
16	85.0×10^{-3} $\{340 \times 10^{-3}\}$	–	37.0×10^{-3} $\{148 \times 10^{-3}\}$	–	–
20	255×10^{-3} $\{1020 \times 10^{-3}\}$	–	76.0×10^{-3} $\{304 \times 10^{-3}\}$	–	–
25	733×10^{-3} $\{2932 \times 10^{-3}\}$	–	217×10^{-3} $\{868 \times 10^{-3}\}$	–	–

Lateral dual-shaft type

Unit:kg•m² {kgf•m²}

ED \ Speedratio	1 : 1	1.5 : 1	2 : 1	2.5 : 1	3 : 1
2	0.08×10^{-3} $\{0.32 \times 10^{-3}\}$	–	–	–	–
4	0.23×10^{-3} $\{0.92 \times 10^{-3}\}$	–	0.18×10^{-3} $\{0.72 \times 10^{-3}\}$	–	–
6	2.00×10^{-3} $\{8.00 \times 10^{-3}\}$	1.40×10^{-3} $\{5.60 \times 10^{-3}\}$	1.10×10^{-3} $\{4.40 \times 10^{-3}\}$	0.94×10^{-3} $\{37.6 \times 10^{-3}\}$	0.83×10^{-3} $\{3.32 \times 10^{-3}\}$
7	5.30×10^{-3} $\{21.2 \times 10^{-3}\}$	2.50×10^{-3} $\{10.0 \times 10^{-3}\}$	2.20×10^{-3} $\{8.80 \times 10^{-3}\}$	1.70×10^{-3} $\{6.80 \times 10^{-3}\}$	1.60×10^{-3} $\{6.40 \times 10^{-3}\}$
8	7.10×10^{-3} $\{28.4 \times 10^{-3}\}$	6.40×10^{-3} $\{25.6 \times 10^{-3}\}$	5.50×10^{-3} $\{22.0 \times 10^{-3}\}$	5.40×10^{-3} $\{21.6 \times 10^{-3}\}$	5.00×10^{-3} $\{20.0 \times 10^{-3}\}$
10	38.0×10^{-3} $\{152 \times 10^{-3}\}$	14.0×10^{-3} $\{56.0 \times 10^{-3}\}$	11.0×10^{-3} $\{44.0 \times 10^{-3}\}$	9.10×10^{-3} $\{36.4 \times 10^{-3}\}$	7.80×10^{-3} $\{31.2 \times 10^{-3}\}$
12	130×10^{-3} $\{520 \times 10^{-3}\}$	33.0×10^{-3} $\{132 \times 10^{-3}\}$	21.0×10^{-3} $\{84.0 \times 10^{-3}\}$	20.0×10^{-3} $\{80.0 \times 10^{-3}\}$	19.0×10^{-3} $\{76.0 \times 10^{-3}\}$
16	–	–	–	–	–
20	–	–	–	–	–
25	–	–	–	–	–

3-2. Type ARA

Unit:kg•m² {kgf•m²}

ARA \ Speed ratio	10 (1 : 1)	20 (2 : 1)
3	0.45×10^{-5} $\{1.80 \times 10^{-5}\}$	0.28×10^{-5} $\{1.10 \times 10^{-5}\}$
5	3.70×10^{-5} $\{14.8 \times 10^{-5}\}$	2.10×10^{-5} $\{8.20 \times 10^{-5}\}$
6	22.0×10^{-5} $\{87.0 \times 10^{-5}\}$	13.0×10^{-5} $\{51.0 \times 10^{-5}\}$

4. Allowable torque of cross shaft

Denotes the allowable torsional transmission capacity of only the cross shaft (allowable torque of cross shaft).
In the case of a line shaft drive, it is necessary to confirm the torque applied to the cross shaft. (Refer to Example 2 on selection on p.16.)

Unit:N•m {kgf•m}

ED	2	4	6	7	8	10	12	16	20	25
Allowable torque of only the cross shaft	32.0 {3.30}	66.0 {6.80}	152 {15.6}	320 {32.7}	627 {64.0}	891 {91.0}	1225 {125}	2116 {216}	3626 {370}	6017 {614}

Note) By adopting a special material for the shaft, allowable torque can increased. (Refer to p.70.)

5. Allowable radial load

Radial load denotes the load in the vertical direction applied to the shaft. It is absolutely necessary for this to be confirmed during the investigation/study of the Miter Gear Box and ARA Gear Box.
(Refer to P.15 for the type ED, and P.58 for type ARA.) When it exceeds the allowable value, please consult our company.

5-1. Type ED

Unit:N {kgf}

ED / Speed ratio	Rotational speed of lateral shaft rpm r/min	2		4		6		7		8		10		12		16		20		25	
		Lateral shaft	Cross shaft	Lateral shaft	Cross shaft	Lateral shaft	Cross shaft	Lateral shaft	Cross shaft	Lateral shaft	Cross shaft	Lateral shaft	Cross shaft	Lateral shaft	Cross shaft	Lateral shaft	Cross shaft	Lateral shaft	Cross shaft	Lateral shaft	Cross shaft
1 : 1	3000	127	117	647	764	1520	1912	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		{13.0}	{12.0}	{66.0}	{78.0}	{155}	{195}	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2000	186	176	745	862	1716	2157	2010	2500	2941	3040	3677	4069	—	—	—	—	—	—	—	—
		{19.0}	{18.0}	{76.0}	{88.0}	{175}	{220}	{300}	{310}	{300}	{310}	{375}	{415}	—	—	—	—	—	—	—	—
	1750	216	196	784	902	1813	2303	2156	2842	3087	3234	3969	4263	4851	5341	—	—	—	—	—	—
		{22.0}	{20.0}	{80.0}	{92.0}	{185}	{235}	{220}	{290}	{315}	{330}	{ 405}	{ 435}	{ 495}	{ 545}	—	—	—	—	—	—
	1450	265	216	833	951	1911	2450	2450	3136	3234	3381	4165	4508	5096	5586	10633	10976	—	—	—	—
		{27.0}	{22.0}	{85.0}	{97.0}	{195}	{250}	{250}	{320}	{330}	{345}	{ 425}	{ 460}	{ 520}	{ 570}	{1085}	{1120}	—	—	—	—
	1150	323	235	882	1029	2058	2597	2744	3234	3479	3626	4459	4851	5488	6076	11368	11760	15386	15680	—	—
		{33.0}	{24.0}	{90.0}	{105}	{210}	{265}	{280}	{330}	{355}	{370}	{ 455}	{ 495}	{ 560}	{ 620}	{1160}	{1200}	{1570}	{1600}	—	—
	870	402	255	960	1127	2205	2842	2989	3381	3773	3969	4851	5292	5880	6566	12446	12740	16660	17150	24794	25480
		{41.0}	{26.0}	{98.0}	{115}	{225}	{290}	{305}	{345}	{385}	{405}	{ 495}	{ 540}	{ 600}	{ 670}	{1270}	{1300}	{1700}	{1750}	{2530}	{2600}
	580	549	314	1078	1323	2499	3185	3381	3822	4263	4459	5488	5880	6713	7301	14014	14504	18816	19404	28028	28910
		{56.0}	{32.0}	{110}	{135}	{255}	{325}	{345}	{390}	{435}	{455}	{ 560}	{ 600}	{ 685}	{ 745}	{1430}	{1480}	{1920}	{1980}	{2860}	{2950}
	300	696	392	1519	1960	3430	3528	4410	5537	5243	6958	9713	7987	8232	9065	17150	17640	23422	24108	34300	35280
		{71.0}	{40.0}	{155}	{200}	{350}	{360}	{450}	{565}	{535}	{710}	{ 685}	{ 815}	{ 840}	{ 925}	{1750}	{1800}	{2390}	{2460}	{3500}	{3600}
	100	980	588	1911	1960	3430	3528	5096	6272	8428	8820	9996	11760	11368	12593	22540	22540	28420	32928	39200	49000
		{100}	{60.0}	{195}	{200}	{350}	{360}	{520}	{640}	{860}	{900}	{1020}	{1200}	{1160}	{1285}	{2300}	{2300}	{2900}	{3360}	{4000}	{5000}
	10	980	588	1911	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	22540	22540	28420	33320	39200	49000
		{100}	{60.0}	{195}	{200}	{350}	{360}	{520}	{640}	{860}	{900}	{1020}	{1200}	{1210}	{1480}	{2300}	{2300}	{2900}	{3400}	{4000}	{5000}
1.5 : 1 2 : 1 2.5 : 1 3 : 1	3000	—	—	686	1569	1274	2255	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		—	—	{70.0}	{160}	{130}	{230}	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2000	—	—	833	1765	1814	2500	2696	4756	3432	6864	4167	7845	—	—	—	—	—	—	—	—
		—	—	{85.0}	{180}	{185}	{255}	{275}	{485}	{350}	{700}	{425}	{800}	—	—	—	—	—	—	—	—
	1750	—	—	1078	1960	2205	2744	3038	4998	3822	7252	4459	8232	5096	9212	5439	10339	—	—	—	—
		—	—	{110}	{200}	{225}	{280}	{310}	{510}	{390}	{740}	{ 455}	{ 840}	{ 520}	{ 940}	{ 555}	{1055}	—	—	—	—
	1450	—	—	1078	1960	2548	2842	3430	5390	4361	7987	5194	9212	5978	10486	5978	12152	7693	14602	—	—
		—	—	{110}	{200}	{260}	{290}	{350}	{550}	{445}	{815}	{ 530}	{ 940}	{ 610}	{1070}	{ 610}	{1240}	{ 785}	{1490}	—	—
	1150	—	—	1078	1960	3038	3087	4067	5978	5096	8820	6174	10486	7252	12151	6419	13083	8771	17934	12985	24647
		—	—	{110}	{200}	{310}	{315}	{415}	{610}	{520}	{900}	{ 630}	{1070}	{ 740}	{1240}	{ 655}	{1335}	{895}	{1830}	{1325}	{2515}
	870	—	—	1078	1960	3430	3332	4753	6076	6076	8820	7448	11760	8869	14504	6958	14210	9506	19453	13573	29400
		—	—	{110}	{200}	{350}	{340}	{485}	{620}	{620}	{900}	{ 760}	{1200}	{ 905}	{1480}	{ 710}	{1450}	{970}	{1985}	{1385}	{3000}
	580	—	—	1078	1960	3430	3528	5096	6174	7644	8820	9555	11760	11466	14504	7840	16072	10780	22001	15680	33222
		—	—	{110}	{200}	{350}	{360}	{520}	{630}	{780}	{900}	{ 975}	{1200}	{1170}	{1480}	{ 800}	{1640}	{1100}	{2245}	{1600}	{3390}
	300	—	—	1078	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	9604	19600	13132	27342	19159	40474
		—	—	{110}	{200}	{350}	{360}	{520}	{640}	{860}	{900}	{1020}	{1200}	{1210}	{1480}	{ 980}	{2000}	{1340}	{2790}	{1955}	{4130}
	100	—	—	1078	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	13328	22540	18228	33320	26656	49000
		—	—	{110}	{200}	{350}	{360}	{520}	{640}	{860}	{900}	{1020}	{1200}	{1210}	{1480}	{1360}	{2300}	{1860}	{3400}	{2720}	{5000}
	10	—	—	1078	1960	3430	3528	5096	6272	8428	8820	9996	11760	11858	14504	22540	22540	28420	33320	39200	49000
		—	—	{110}	{200}	{350}	{360}	{520}	{640}	{860}	{900}	{1020}	{1200}	{1210}	{1480}	{2300}	{2300}	{2900}	{3400}	{4000}	{5000}

Note 1) These are the values at shaft center of the lateral shaft and cross shaft.
Note 2) When it is used between the respective rotational speeds, calculate the values by interpolation.

5-2. Type ARA

Unit:N {kgf}

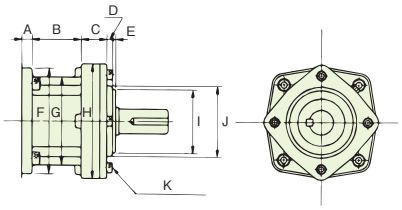
ARA / Speed ratio	3	5	6
1 : 1、2 : 1	108 {11.0}	216 {22.0}	441 {45.0}

Note 1) These are the values at shaft center of the lateral shaft and cross shaft.
Note 2) When it is used between the respective rotational speeds, calculate the values by interpolation.

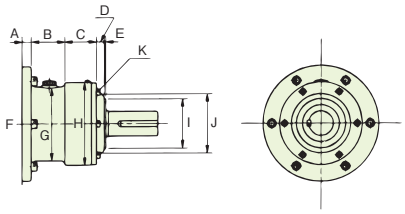
Technical data

6. Detailed dimensions of bracket part

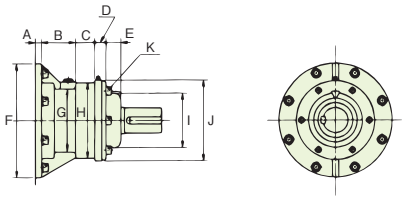
ED2 ~ 10



ED12 ~ 16



ED20 ~ 25



Unit: mm

ED	A	B	C	D	E	F	G	H	I	J	K
2	5	22	26	7	—	60	50	58	—	36	4-M4 hex socket head cap bolts PCD 48
4	8	34.5	31.5	8	—	82	60	78	—	50	4-M4 hex socket head cap bolts PCD 62
6	10	49	26	6	3	108	90	117	65	72	4-M8 hex socket head cap bolts PCD 95
7	12	57.5	35	8	3	125	100	124	70	80	4-M8 hex socket head cap bolts PCD 100
8	15	78	29	8	4	145	120	152	85	105	4-M8 hex socket head cap bolts PCD 130
10	15	94.5	30	10	—	165	135	154	—	110	4-M8 hex socket head cap bolts PCD 130
12	18	73	58	16	3	232	150	168	100	120	6-M8 hex socket head cap bolts PCD 148
16	18	107	30	25	10	272	180	193	105	140	6-M10 hex socket head cap bolts PCD 170
20	17.5	152	32	41	2	325	215	230	125	155	6-M12 hex socket head cap bolts PCD 195
25	20	179.5	50	47	3	395	250	270	140	190	6-M14 hex socket head cap bolts PCD 230

Option

1. Material of casing and bracket : FCD (ductile cast iron)

Depending on service conditions, it is possible to change the material of the casing and bracket from standard FC (gray cast iron) to FCD (ductile cast iron).
The transmission capacity, dimensions, and shape are the same as standard items.
For applicable models, refer to the Model list (p.9).
Furthermore, ED2M is aluminum die-cast (ADC).

2. Lateral shaft, cross shaft : Specification of former JIS key

When the former JIS key (JIS B 1301-1959 parallel key, class 2) is needed, it can be handled by manufacturing a new shaft.

3. Changing individual plug positions

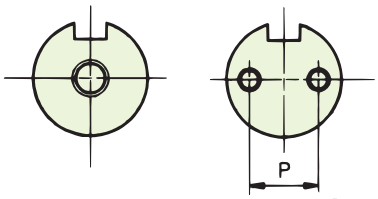
The position of each plug for the oil gauge, pressure vent, drain plug, etc. can be changed to an arbitrary position with additional processing of the casing.

4. Tapping at shaft end

When the end plate is used for retaining the sprocket or gear mounted on the lateral shaft or cross shaft, tapping at the shaft end is processed. Dimensions of tapping at the shaft end are as follows.

ED	TYPE	No. of taps	Size	Dept (L)	Pitch (P)
2	Ⅰ	1	M6	12	—
4	Ⅰ	1	M6	12	—
6	Ⅰ	1	M8	12	—
7	Ⅰ	1	M8	12	—
8*	Ⅱ (Ⅰ)	2 (1)	M8 (M12)	12 (22)	20 (—)
10*	Ⅱ (Ⅰ)	2 (1)	M8 (M12)	12 (22)	22 (—)
12*	Ⅱ (Ⅰ)	2 (1)	M10 (M12)	15 (22)	26 (—)
16	Ⅱ	2	M10	15	36
20	Ⅱ	2	M12	18	44
25	Ⅱ	2	M12	18	54

Note) *Pay attention because tapping at the lateral shaft for ED8B20/25, 30, ED10B25/30, ED12B25/30 is TYPE Ⅰ, and at the cross shaft is TYPE Ⅱ.



5. Lateral shaft, cross shaft : Specification of hard chrome plating

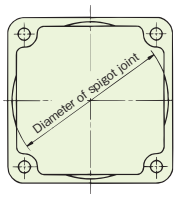
By applying hard chrome plating to the lateral shaft and cross shaft, corrosion resistance and abrasion resistance at the oil seal part can be improved.
(Partial plating specification is applied to the oil seal part.)

Option

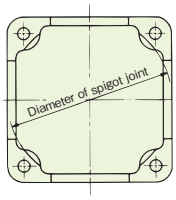
6. Spigot joint processing at the bottom face of casing

This applies if spigot joint processing at the bottom face of the casing is necessary to perform centering with the mating part at installation.
The Miter Gear Box side becomes the female spigot joint.

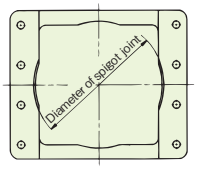
ED2



ED4 ~ 16



ED20 , 25

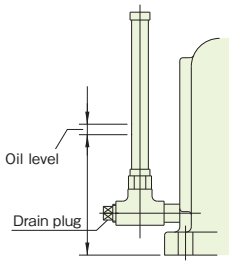


Unit: mm

ED	Dimension of female spigot joint	
	Diameter of spigot joint	Depth of spigot joint mm
2	ϕ 94H8	3
4	ϕ 155H8	5
6	ϕ 190H8	5
7	ϕ 220H8	5
8	ϕ 250H8	5
10	ϕ 305H8	5
12	ϕ 370H8	7
16	ϕ 420H8	7
20	ϕ 360H8	10
25	ϕ 430H8	10

7. Various oil gauges

To check the oil level, a rising-sun (hinomaru) type gauge is mounted as standard. However, various oil gauges are available upon request.



7-1. Vertical type oil gauge

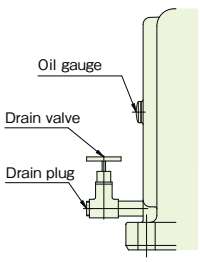
A visible gauge is mounted for confirming the oil level during operation.
However, it is for indoor use.

7-2. Metallic oil gauge

An oil gauge made of resin, which is the standard specification, can be changed to a metallic oil gauge.

8. Drain valve

A drain valve is attached for effectiveness of draining oil when changing oil or installing piping, etc.



9. Inspection cover　Mounting

It is possible to mount an inspection cover for easy check at maintenance and inspection.
Although the material of the inspection cover is FC (gray cast iron), a cover made of transparent acryl can be manufactured upon request.

10. Various painting specifications

When non-standard painting is required, special painting in accordance with the ambient atmosphere can be provided upon request.

Kind of painting		Painting specification		Weather resistance	Water resistance	Acid resistance	Alkali resistance	Use
Classification	Painting system	Common name						
Standard	Indoor standard	Under coating	Lacquer system primer	—	—	△	△	Standard painting specification
		Finish coating	Acryl lacquer system					
Semi-standard	Outdoor standard	Under coating	Lacquer system primer	△	△	△	△	Outdoor standard painting specification
		Finish coating	Phthalic acid resin system paint (Alkyd resin paint)					
	Waterproof standard	Under coating	Special modified epoxy	○	◎	○	◎	Waterproof standard painting specification
		Finish coating	Two-pack type urethane resin paint					
Special painting	Long-oil phthalic acid resin system	Under coating	Long-oil alkyd resin system anti-corrosive paint	○	○	△	△	Ships, bridges, coastal zone, outdoor humid atmosphere
		Finish coating	Long-oil alkyd resin system top coat paint					
	Phenol resin system	Under coating	Anti-corrosive paint JIS K 5623 class 2	○	○	◎	△	Indoor and outdoor chemical plant area and floating parts where acid is used
		Finish coating	Phenol resin system acid resistant paint					
	Chlorinated rubber	Under coating	Epoxy resin system primer	◎	○	○	○	Ships, bridges, coastal zone, outdoor humid atmosphere, corrosive gas
		Intermediate coating	Chlorinated rubber system intermediate coating paint					
		Finish coating	Chlorinated rubber system top coat paint					
	Heat-resistant type	Under coating	Heat-resistant special alkyd resin under coating	○	×	×	×	Painting that endures a constant 100° C, and an instantaneous maximum temperature of 150° C
		Finish coating	Heat-resistant special alkyd resin finish coating					
	Epoxy resin system	Under coating	Epoxy resin system primer	○	◎	○	◎	Excellent seawater resistance and chemical resistance
		Finish coating	Epoxy resin system top coat paint					
	Tar epoxy	Under coating	Organic zinc rich primer	×	◎	◎	◎	Excellent chemical resistance, oil resistance, seawater resistance, and water resistance
		Finish coating	Tar epoxy resin paint JIS K 5664 class 1					

Note) For details of use, please consult our company. ◎…Suitable (notably excellent) ○…Suitable △…Pay attention for selection ×…Not suitable

11. Special corrosion-preventative specification

When long-term corrosion prevention that is superior to standard corrosion prevention or corrosion prevention for export products is necessary, we can respond to requests. So, please consult our company.
(Period of standard rust-preventative specification is six months after shipment from our factory under indoor storage conditions.)

Special specification

1. Responding to high rotational speeds

When the type ED is used at high rotational speeds, our company applies a special specification to prevent heat generation.

Note) For high rotational speeds, service range and transmission capacity are limited depending on operating time, operation cycle, ambient temperature, and load condition. Therefore, please consult our company.

1- 1. ED2 & 4 Oil lubricating specification

The standard item adopts the grease lubrication method. However, if either one of the rotational speed of input shaft or rotational speed of output shaft exceeds 1,750 rpm during use, the temperature of the gear box sometimes exceeds the allowable temperature, depending on operating time, load, etc. In such a case, it is necessary to adopt the oil lubrication method. By adopting the oil lubrication method, it is possible to have an input rotational speed up to 3,000 rpm.
For the transmission capacity, refer to the section on ▭ in the transmission capacity tables (pp.17 to 20).

1-2. ED6 to 25 Auxiliary cooling specification

When the gear box is used at a rotational speed of ▭ sections of the transmission capacity tables (pp.17 to 20), the temperature of the gear box sometimes exceeds the allowable temperature depending on operating time, load, etc. in the case of the standard specification (oil lubrication method). With such a case, an auxiliary cooling specification, such as forced lubrication method, fan mounting method, fin attachment method is necessary.

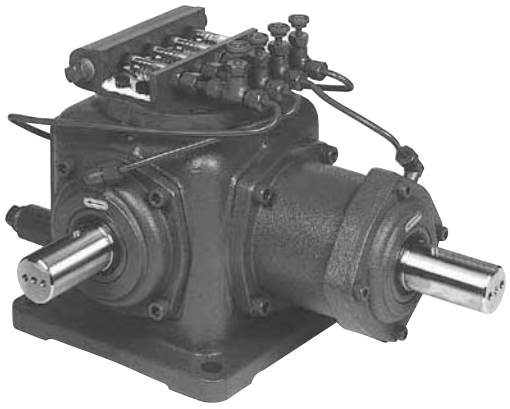
Auxiliary cooling specification 1 Forced lubrication method

Temperature rise is suppressed by forcibly lubricating the gear and bearings.
In the transmission capacity table (pp.17 to 20), the forced lubrication method is recommended when the gearbox is used at a rotational speed of ▭ .

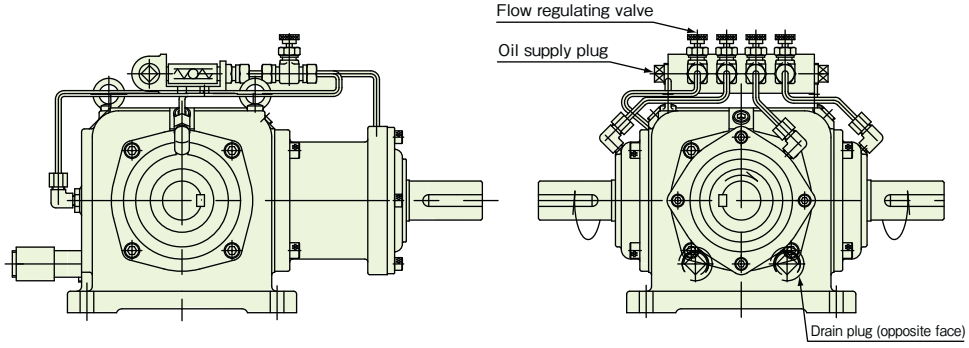
(1)Approximate oiling quantity and tank capacity

ED	Oiling quantity (L/min)		
	Gear part	Bearing part	Total
6	0.8	0.3	2
7	1	0.5	3
8	1	0.5	3
10	1.5	0.7	4.3
12	2	1	6
16	2.5	1	6.5
20	3	1.5	9
25	4	1.5	10

Note 1) The tank capacity above is a rough guideline, and it should be decided considering pipe length, etc.
Note 2) A forced lubrication device will be prepared because it is required for the forced lubrication method.



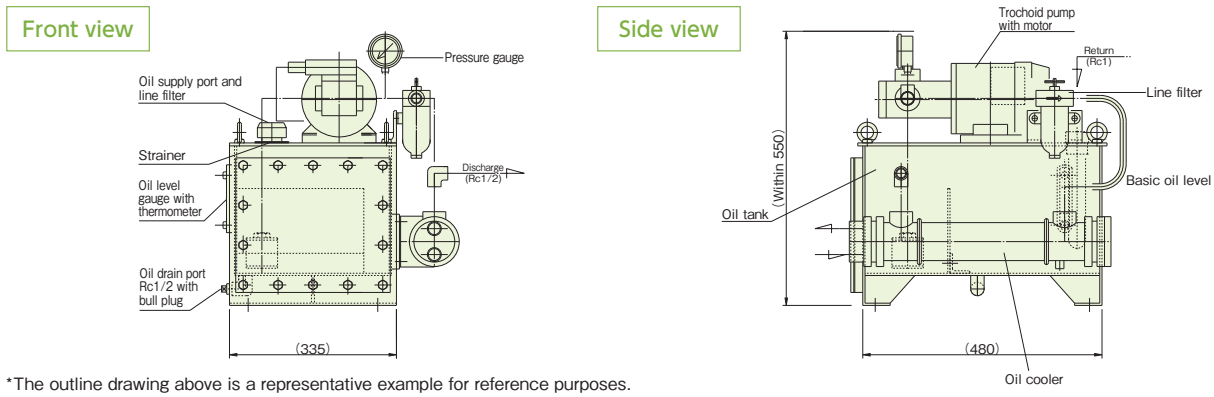
(2)Outline drawing for reference



Note) For detailed specification and dimensions, please consult our company.

(3)Forced lubrication device

It can be used when the type ED is operated with the forced lubrication method.
Regarding the forced lubrication device, please consult a specialized manufacturer.



*The outline drawing above is a representative example for reference purposes.

Auxiliary cooling specification 2 Fan mounting method

Mounting a cooling fan suppresses heat generation in the gear box.
However, it cannot be used when the rotational speed is low and with the dual-shaft type cross shaft.

Auxiliary cooling specification 3 Fin attachment method

Cooling is assisted by attaching fins to the surface of the gear box casing. However, the method cannot be used in an atmosphere with poor ventilation characteristics, etc.

2. Responding to a special atmosphere

When the gear box is used in a special environmental atmosphere outside the range described in the catalog, it is necessary to adopt special specifications. Respective specifications in a special environmental atmosphere are as follows.

2- 1. Heat-resistant, cold-resistant specification

When ambient temperature is below −10° C or above 50° C, the service range is sometimes limited depending on operating time, load, operating condition, etc. Oil seal, oil, casing, bracket, shaft material, etc. selected are changed as needed.

2-2. Special material specification of lateral shaft, cross shaft

It is possible to change the shaft material depending on service conditions and ambient atmosphere.

(1) Shaft material SCM440 Specification with refined material

When it is required to increase torsional strength and/or bending strength of the shaft compared to the standard material (S45C), the material can be changed to the refined material of SCM440.
For models ED4B20, ED6B20/25/30, ED7B20/25/30, ED8B20/25/30, ED10B25/30, and ED12B25/30, the standard material used for the lateral shaft is a carburized and quenched material of SCM415.

(2) Shaft material of stainless steel specification

When the usage environment is a poor atmosphere with the generation of corrosion, rust should be avoided, so it is possible to change the shaft material to stainless steel.
However, it cannot be manufactured for models ED4B20, ED6B20/25/30, ED7B20/25/30, ED8B20/25/30, ED10B25/30, and ED12B25/30.

2-3. Casing and bracket material with steel plate specification

The casing and bracket can be manufactured with steel plates (SS400) having the same main dimensions (shaft diameter, shaft length, height of the shaft center, mounting pitch, etc.) as the standard item.

Special specification

3. Responding to special layout

3- 1. Large size

When the gear box is used under conditions exceeding the transmission capacity (pp.17 to 20), a larger size than ED25 can be manufactured. The transmission capacity of ED28M is described below. For specification, dimensions, etc., please consult our company.
Moreover, as an even larger size can also be manufactured, please consult our company.

■ ED28M　Transmission capacity (for reference)

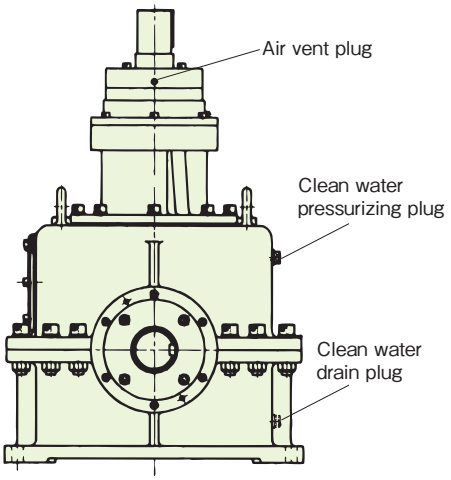
ED28M (1 : 1) \ Rotational speed of lateral shaft rpm r/min		870	580	300	100	10
Input kW		—	563	308	109	11.8
Cross shaft torque	N・m	—	8820	9314	9954	10689
	{kgf・m}	—	{899}	{949}	{1015}	{1089}

When it is used at a rotational speed of ▭, it becomes the auxiliary cooling specification (refer to pp.69 to 70).

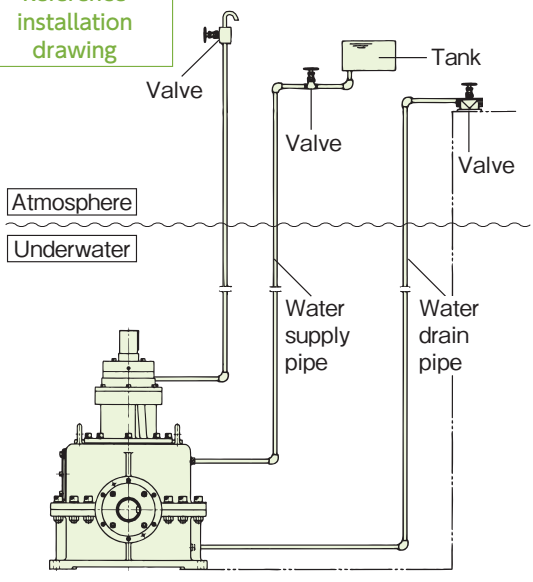
3-2. Underwater specification

It is possible to use it under water (scraper in water, low-speed conveyer in water, etc.).
Although oil lubrication is usually adopted, harmony with the environment can be promoted by adopting water lubrication.
Furthermore, in the case of water lubrication, separate piping, pump, valve, etc. are required.
For detailed specification, dimensions, etc., please consult our company.

Reference drawing (specification of water lubrication)



Reference installation drawing



4. Responding to high-precision specification

4- 1. Specification with low backlash

When positional accuracy is requested, a gear box with a low backlash specification can be manufactured.

(For backlash with standard items, refer to Technical data, 2. Backlash in p.63.)

It denotes the total value of the mechanical clearance that can be measured in the rotational direction on the cross shaft when the lateral shaft is fixed.

Unit: Angle°

Speed ratio / ED	1 : 1	1.5 : 1	2 : 1	2.5 : 1	3 : 1
2	0.18 ~ 0.42	—	—	—	—
4	0.14 ~ 0.32	—	0.11 ~ 0.26	—	—
6	0.17 ~ 0.29	0.16 ~ 0.27	0.15 ~ 0.27	0.08 ~ 0.19	0.08 ~ 0.18
7	0.21 ~ 0.34	0.15 ~ 0.27	0.13 ~ 0.23	0.15 ~ 0.26	0.08 ~ 0.18
8	0.17 ~ 0.27	0.13 ~ 0.23	0.11 ~ 0.20	0.12 ~ 0.21	0.06 ~ 0.14
10	0.16 ~ 0.25	0.15 ~ 0.23	0.11 ~ 0.20	0.11 ~ 0.18	0.11 ~ 0.19
12	0.14 ~ 0.22	0.12 ~ 0.19	0.11 ~ 0.18	0.12 ~ 0.19	0.09 ~ 0.15
16	0.14 ~ 0.24	—	0.11 ~ 0.17	—	—
20	0.14 ~ 0.22	—	0.09 ~ 0.13	—	—
25	0.14 ~ 0.21	—	0.08 ~ 0.12	—	—

4-2. Lateral shaft, cross shaft Specification of keyless shaft

When the lateral shaft and cross shaft are used with a fastener other than key fastening, such as power lock fitting (friction fastener), a keyless shaft can be manufactured.
The basic dimensions are same as those of the outline dimensional drawings in the catalog.

5. Others Special specification

5- 1. ED6 or larger Specification of grease lubrication

Regarding a gear box of ED6 or larger, it is possible to change the lubrication method to the specification of grease lubrication (NIGTITE LMS No.000) due to a mounting layout issue, etc.
Because a detailed investigation/study becomes necessary depending on size, rotational speed, etc., please consult our company.

5-2. Lateral shaft • Cross shaft Special dimensions

When shaft dimensions other than the standard dimensions are necessary, please consult our company.

5-3. Special speed ratio

When a speed ratio other than the standard speed ratios (1:1, 1.5:1, 2:1, 2.5:1, 3:1) is required, please consult our company.

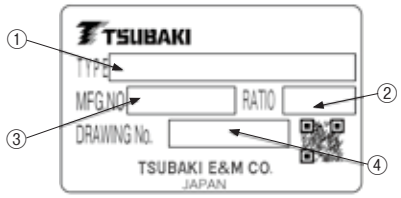
Handling

This section describes general matters related to handling.
For details, refer to the "Instruction manual" attached to the product.

1. At use

(1) Before installation, check whether the specification described on the name plate is the requested specification.
Note) In particular, check whether the mounting model is the same from the positions of the oil gauge and each plug. Also check the rotational relationship at the same time. (There is no oil gauge on ED2, 4, and the ARA Gear Box, because they are of the grease lubrication type.)
(2) Check for any damage caused during transportation in the external appearance of the product.
(3) Check for loose bolts.

■ How to view the name plate



① TYPE (Model No.)
② RATIO (Reduction ratio)
③ MFG.No. (Manufacturing No.)
④ DRAWING No. (Drawing No.)

2. Installation

2-1. Ambient conditions

Install the product at a place with good ventilation and minimal dust, low humidity, and with an ambient temperature of −10° C to 50° C. Avoid use at a place with corrosive liquid or gas, and a place with flammable or explosive materials. Furthermore, when used out of doors, etc., attach a cover, etc. to avoid direct contact with raindrops, etc.

2-2. Transportation

During transportation, be sure to use the eyebolt or hanging metal fitting at the upper face of the casing, but never hang wires, etc. at the lateral shaft and cross shaft. This will shorten the life and/or cause trouble, due to the eccentricity of shafts, etc.

Note) There is no eyebolt on ED2, 4, 6, and the type ARA.

2-3. Installation

At installation, securely fasten the product at a strong, flat place. Mount the Miter Gear Box carefully so that its mounting surface makes close contact with the base plane and no vibration, etc. is generated. For the mounting angle, although there are no limitations for ED2, 4, and the type ARA, ED6 to 16 shall be ± 5° or less, and ED20, 25 shall be ± 2° or less. When mounting the type ARA, use the three mounting holes at the center or the four mounting holes at the flange face.

< Recommended size of installation bolt >

ED	2	4	6	7	8	10	12	16	20	25
Bolt	M8	M8	M12	M12	M12	M14	M18	M20	M18	M20

Note 1) Mounting direction of ED2, 4 can be chosen freely. However, for ED6 to 25, avoid a mounting direction other than that indicated at order placement. (If the Example of mounting is to be changed, please consult our company because positions of oil gauge, grease nipple, etc. are changed.)
Note 2) It is necessary to attach the pressure vent for ED12 or larger. In such a case, replace the plug having a hole at the designated position with the attached pressure vent after completing installation.

2-4. Coupling

- When mounting a pulley, sprocket, and coupling on the lateral shaft and cross shaft of the type ED, as well as the type ARA, pay attention not to bend the shaft and not to damage bearing, oil seal, etc.
- Center accurately. Eccentricity of shaft and radial load of more than the allowable limit will shorten the life of the gear, bearing, and shaft, and cause noise and vibration.
- When a coupling is used, mount it as precisely as possible within the allowable centering range recommended by each manufacturer. Our company has many kinds of optimum flexible coupling.

3. Lubrication

3-1. Preface

At shipment, NIGTITE LMS No.000 of NIPPON GREASE CO., LTD. is enclosed in ED2 & 4, Shell Omala S2G150 of Showa Shell Sekiyu K.K. is enclosed in ED6 to 25, and grease (Mobilux EP0) is enclosed in the type ARA. Do not use another lubricant.

However, regarding ED6 or larger, be sure to check the oil level with the oil gauge after mounting is completed. If the oil level cannot be checked with the oil gauge, supply lubricant of the same brand until it can be checked.

* When the rotational speed of the lateral shaft is less than 200 rpm, or when the gear box is used at an ambient temperature between 35° C and 50° C, it cannot be used with the specification of the enclosed lubricant. In this case it is necessary to change the specification of the lubricant.

Refer to table of Recommended lubricants (p.74, Table 1) and change to the corresponding lubricant.
(For ED2, 4, and ARA, do not change the lubricant.)

3- 2. Replacing lubricant

- For ED2 & 4, replacing lubricant is basically not required because the lubricant used is grease. However, replacing grease at the target of 20,000 hrs. can increase life. At replacement, use the grease described on p.73 item 3-1, in an amount of approx. 150 g for ED2, and approx. 350 g for ED4.
- For ED6 to 25, replace with new oil 500 hrs. after starting operation for the 1st time. The purpose is to clean initial abrasion powder, etc. generated when running in (warming up) each part. It also improves performance and life. At the second time and thereafter, replace with new lubricant at the target of after 2,500 hrs. or six months, whichever is earlier, depending on operating conditions. (However, if the product is operated continuously for a long time and/or in a high-temperature atmosphere, or in an environment with humidity or corrosive gas, it is necessary to shorten the oil replacement interval.)
- Select from recommended lubricants in the following Table 1, referring to rotational speed and ambient temperature.
- In the case of the ARA Gear Box, replacing lubricant is basically not required due to grease lubrication.
- In the case of the forced lubrication specification, refer to the special-purpose "Instruction manual."

Table 1 Recommended lubricant

Rotational speed of lateral shaft rpm r/min	Name of maker	Ambient temperature	
		-10° C to 35° C	35° C to 50° C
1750 ~ 200	Industrial gear oil, class 2	ISO VG150	ISO VG 220
	Showa Shell Sekiyu	Shell Omala S2G150	Shell Omala S2G220
	Idemitsu Kosan	Daphne Super Gear Oil 150	Daphne Super Gear Oil 220
	Exxon Mobil	Mobilgear 600XP-150	Mobilgear 600XP-220
	COSMO OIL	Cosmo Gear Oil SE150	Cosmo Gear Oil SE220
	JX Nippon Oil & Energy	BONNOC M150	BONNOC M220

Rotational speed of lateral shaft rpm r/min	Name of maker	Ambient temperature	
		− 10° C ~ 35° C	35° C ~ 50° C
Less than 200	Industrial gear oil, class 2	ISO VG 220	ISO VG 320
	Showa Shell Sekiyu	Shell Omala S2G220	Shell Omala S2G320
	Idemitsu Kosan	Daphne Super Gear Oil 220	Daphne Super Gear Oil 320
	Exxon Mobil	Mobilgear 600XP-220	Mobilgear 600XP-320
	COSMO OIL	Cosmo Gear Oil SE220	Cosmo Gear Oil SE320
	JX Nippon Oil & Energy	BONNOC M220	BONNOC M320

Table 2 Approximate oil quantity

Unit:L

ED	6	7	8	10	12	16	20	25
Lateral single-shaft type	0.95	1.5	1.9	3.5	7	10	11	18
Lateral dual-shaft type	1.0	1.6	2.1	3.7	7.4	—	—	—

3- 3. Supplying grease (For gear boxes with shaft arrangement of shaft oriented in the vertical direction, for ED6 or larger)

- When a bearing is positioned above the oil level, it is not sufficiently lubricated by splashes of oil alone. Therefore, the following grease is enclosed in this bearing part at shipment.
  Exxon Mobil Mobilux EP2
- Because it is necessary to supply grease to this bearing periodically (approx. every 1,000 hrs), replace the stop plug with the attached grease nipple at the designated position of the Type of mounting (pp.13, 14), and supply grease.

Note) A grease nipple is attached to products with all kinds of shaft arrangement at shipment.

Table 3 Recommended grease

メーカ名	Brand
Showa Shell Sekiyu	Alvania EP2
Idemitsu Kosan	Daphne Eponex SR2
Exxon Mobil	Mobilux EP2
COSMO OIL	Cosmo Dynamax No.2
JX Nippon Oil & Energy	EPNOC Grease AP2

Table 4 Recommended amount of grease

Unit:g

ED	6	7	8	10	12	16	20	25
Lateral shaft	22	35	70	100	170	270	370	640
Output bearing support Ⅰ	3	7	12	17	20	55	90	150
Output bearing support Ⅱ	6	9	12	17	20	70	85	135

3- 4. Inspecting and replacing oil seal

- Oil seals also wear and have a useful life, and can cause an oil leakage. When they are used under notably severe conditions (severe environmental conditions such as high temperature, high rotational speeds, outdoors), there is a possibility of life being shortened. Perform periodic inspection, and if there is an oil leakage, promptly replace the oil seal. When replacing an oil seal, be sure to use an oil seal of same type and material. (Using an oil seal of a different material may cause an oil leakage.) Furthermore, when replacing oil seals, refer to the catalogs of oil seal manufacturers.
- When starting operation for the first time, surplus grease sometimes exudes that has been filled up to the lip of the oil seal at assembly. However, this does not indicate that the functions of the gear box are impaired.

Handling

4. Operation

4- 1. Prestart inspection

When installation is completed, inspect the following points before starting operation.

- Whether rotational relationships are correct.
- Whether coupling with the driven shaft is correct.
- Whether there is a loose mounting bolt, tightening bolt, etc.

4- 2. Test operation

Before starting regular operation, carry out a no-load operation to check whether rotational relationships are correct, and that there is no abnormal vibration, noise, heat generation, etc. Then, apply a load gradually.

4- 3. Regular operation

After starting operation, check the following items.

- Whether there is abnormal vibration, noise, heat generation, etc.
- Whether shock and/or overload is applied.

Note) Slight heat generation may occur during the first two or three days after starting operation. However, if the surface temperature of the casing exceeds 93℃, insufficient or too much lubricant, installation failure, etc. should be considered. Therefore, check each part.

5. Daily inspection, maintenance

5- 1. At maintenance

- For maintenance, wear suitable clothes for work and suitable protective gear (safety glasses, gloves, safety shoes, etc.).
- Tidy up the surrounding area and carry out work so as not to cause a secondary accident.
- Be sure to turn off the power supply, and carry out work with the machine completely stopped. Also, make be sure that the power supply cannot be turned on accidentally.
- The type ED and type ARA are hot during operation, and there is a risk of a burn if they are touched directly. So, be careful.

5- 2. Daily inspection

Perform regular maintenance according to the following procedure, while paying attention to operating condition, using the necessary measuring instruments.
Be sure to perform daily inspection according to the following table. If daily inspection is neglected, trouble may be caused.

Inspection item	Contents of inspection
Noise	Whether noise is greater than usual. Whether abnormal sound is generated.
Vibration	Whether there is abnormal vibration. Also, whether a rapid change occurs.
Surface temperature	Whether it is abnormally high. Also, whether there is a rapid increase.
Oil level,	In a stopped state, whether oil level is at the specified position.
Installation bolt	Whether installation bolts are loose.
Chain, belt	Whether anything is loose.
Dirtiness of lubricant	Whether there is any dirt due to abrasion powder, etc.
Leakage of lubricant	Whether an oil leakage is generated at each joint, oil seal part, or cover of reduction gear.
Pressure vent	Whether the air vent hole is choked.

If any trouble is observed at daily inspection, take measures according to “10. Handling method at generation of trouble.” If normal operation cannot be recovered despite taking countermeasures, please inform the vendor.

6. Disassembling, assembling

- Never disassemble the product.
- In this machine, tooth contact adjustment and bearing adjustment are carried out to maximize performance.
- If disassembly is necessary, please inform our company.

7. Parts list

ED	Bearing size and quantity	Oil seal and quantity	Plug size	Oil gauge	Grease nipple
2	6203R SH Lateral 2 pcs Cross 2 pcs	D16.28.7 Lateral 1 pc Cross 1/2 pc	1／8″	—	—
4	6304R SH Lateral 2 pcs Cross 2 pcs	DM20.35.10 (※ DM17.35.8) Lateral 1 pc Cross 1/2 pc	1／4″	—	—
6	30306 Lateral 2 pcs Cross 2 pcs	DM28.48.11 (※ DM26.48.11) Lateral 1 pc Cross 1/2 pc	3／8″	3／8″	A-M6F (Bracket part) B-M6F
7	30307 Lateral 2 pcs Cross 2 pcs	DM35.52.11 (※ DM32.52.11) Lateral 1 pc Cross 1/2 pc	3／8″	3／8″	
8	30309 Lateral 2 pcs Cross 2 pcs	DM42.65.12 Lateral 1 pc Cross 1/2 pc	3／8″	3／8″	

ED	Bearing size and quantity	Oil seal and quantity	Plug size	Oil gauge	Grease nipple
10	30310 Lateral 2 pcs Cross 2 pcs	DM48.70.12 Lateral 1 pc Cross 1/2 pc	1／2″	1／2″	A-M6F (Bracket part)
12	30312 Lateral 2 pcs 30311 Cross 2 pcs	DM52.75.12 Lateral 1 pc Cross 1/2 pc	1／2″	1／2″	B-M6F
16	32314 Lateral 2 pcs Cross 2 pcs	DM65.88.12 Lateral 1 pc Cross 1/2 pc	1／2″	1／2″	A-PT 1／8″
20	32316 Lateral 2 pcs Cross 2 pcs個	DM75.100.13 Lateral 1 pc Cross 1/2 pc	1／2″	VAB	A-PT 1／4″
25	32319 Lateral 2 pcs Cross 2 pcs	DM90.115.13 Lateral 1 pc Cross 1/2 pc	1／2″	VAB	

Note 1) Quantity of bearings, oil seals
- Lateral 2 pcs denotes the quantity used for the lateral part. So, in the lateral dual-shaft type, 2 pcs × 2 positions = 4 pcs are necessary.
- Cross 1/2 pc denotes one piece at a single shaft, and 2 pcs at double shafts.
- For 4B, 6B, 7B, an oil seal with the mark * is used for the lateral shaft side, and an oil seal without the mark * is used for the cross shaft side.

Note 2) Sizes 20, 25 for the oil gauge are model Nos. of Koho Kosan.

8. Recombination of shaft arrangement

Models of the Miter Gear Box that can be recombined with common parts are as follows. For recombination of shaft arrangement, please consult our company.

Basic shaft arrangement	→	Shaft arrangement that can be recombined
1-LR	→	1-LR-O
1-R	→	1-L-O
1-L	→	1-R-O

Basic shaft arrangement	→	Shaft arrangement that can be recombined
1-UD	→	1-UD-O, D-LR, D-LR-O, U-LR, U-LR-O
1-U	→	1-D-O, D-R, D-L-O, U-L, U-R-O
1-D	→	1-U-O, D-L, D-R-O, U-LR, U-L-O

9. Storage

If reduction gears are not to going be used soon, store them while paying attention to the following points.

9-1. Storage area

Store them at a clean, dry place indoors.
Do not store them outdoors, or at places with humidity, dust, sharp temperature changes, corrosive gas, etc.

9-2. Posture during storage

Packing and shipping in accordance with the type of mounting (mounting form) are performed at shipment. Store products by keeping the same mounting arrangement (relationship of top & bottom sides, etc.). In the case of special installation, there is a risk that grease at a bearing will mix with lubricant and dissolve out.

9-3. Storage period

- The storage period should be within six months.
- If the storage period is six months or more, a special rustproof specification is required. In such a case, please consult our company.
- In the case of export items, a rustproof specification for export is necessary. In such a case, please consult our company.

9-4. Usage after storage

- Nonmetallic portions such as oil seal, oil gauge, oil supply plug easily deteriorate under environmental influences such as temperature, ultraviolet rays. In such a case, after storage for a long time, check them before starting operation and replace items where deterioration is observed with new items.
- When starting operation, check for abnormal sound, vibration, and/or heat generation. If any trouble is observed, please inform the vendor promptly.

Handling

10. Method of handling trouble

If any trouble is caused, refer to the following table, and take suitable measures at an early stage.

Contents of trouble	Cause	Countermeasure
Temperature has increased.	Overload operation	Decrease load or use larger gear box.
	Contamination, deterioration of lubricant	Replace with new lubricant.
	Insufficient or excessive lubricant	Fill with the correct amount of lubricant.
	Nonconformity of oil type	Replace with recommended lubricant.
	Ambient temperature is high.	Provide a cooling device or change the position of the gear box.
	Pressure vent is not attached.	Attach a pressure vent.
	Nonconformity of centering	Align the center with equipment precisely.
Noise has increased. Vibration has increased.	Overload operation	Decrease load or use larger gear box.
	Contamination, deterioration of lubricant	Replace with new lubricant.
	Insufficient or excessive lubricant	Fill with the correct amount of lubricant.
	Nonconformity of oil type	Replace with recommended lubricant.
	Damage to bearing	Replace bearing with a new one.
	Loose tightening bolt	Perform retightening.
	Nonconformity of centering	Align the center with equipment precisely.
Lubricant leaks.	Damaged, deteriorated oil seal	Replace oil seal with a new one.
	Nonconformity of tightening each plug	Retighten.
	Pressure vent is not attached.	Attach a pressure vent.
	Excessive lubricant	Fill with the correct amount of lubricant.

* If another trouble has occurred, please consult our company.

Confirmation sheet for selected specification

When making an inquiry with regard to selection of Miter Gear Box, ARA Gear Box, please let us know the following.

Machine to be used	Name of equipment	
	Contents of equipment	
	Layout	Please enter details in the following columns. (Shaft arrangement, rotational direction, mounting direction, coupling method of shaft, and others)
Operating conditions	Description of prime mover	Motor, servomotor, engine, others（ ）
	Load torque or transmission kW	（ ）kW or（ ）N・m
	Operating time	（ ）hrs/day, continuous・intermittent
	Frequency of start-stop	（ ）times/hr
	Rotational speed at input	Regular（ ）rpm・Maximum（ ）rpm
	Direction of input shaft	Lateral shaft・Cross shaft
	Speed ratio of gear box	1：1、1.5：1、2：1、2.5：1、3：1、（ ）：1
	Load characteristics	Uniform load・Load with extent shock・Load with large shock
Atmosphere where used	Usage environment	Indoor・Outdoor・Near a furnace・Inside a freezer・Others（ ）
	Ambient temperature	Regular（ ℃）・High temperature（ ℃）・Low temperature（ ℃）
	Ambient atmosphere	Salt damage・Dust・Acid・Others（ ）
Others	Option (pp.66 to 68)	Tapping at shaft end・Material of casing bracket: FCD・Others（ ）
	Special specification (pp.69 to 72)	
Outline drawing of equipment		

MEMO

Warranty

1. Warranty period, free of charge

Our company's warranty period, free of charge, is 18 months after shipment from our factory, or 12 months after starting use (including after incorporating our company's product into the customer's equipment), whichever is shorter.

2. Warranty range

Regarding a failure of our company's products during the warranty period, free of charge in case correct installation, usage, maintenance and control according to the "Instruction manual" are performed, the failed portions shall be replaced or repaired free of charge. However, the target of the warranty shall only be our company's products; therefore, the following expenses shall be outside the scope of the warranty.

(1) Expenses required for dismounting and mounting our company's products from/to the customer's equipment, and expenses for work related to them.
(2) Expenses required for transporting the customer's equipment to the repair shop, etc.
(3) Customer's lost profits associated with failure and/or repair, as well as other losses.

3. Warranty for a fee

If any trouble is caused due to the following items, in spite of it occurring during the warranty period, free of charge, we will undertake investigation and repair for a fee.

(1) If the customer has not correctly installed our company's products in accordance with the "Instruction manual"
(2) Customer's maintenance and control was not sufficient, and handling was not correct
(3) In case a failure occurs due to defective coupling of our company's products with other equipment
(4) If the structure of our company's products has been changed, such as modification by the customer.
(5) If the products were repaired by a firm/factory, other than our company or a factory designated by our company
(6) If our company's products were used under conditions other than the correct operating environment in accordance with the "Instruction manual"
(7) If a failure is generated due to force majeure such as an accident or due to an illegal act by a third party
(8) If a failure of our company's products is generated secondarily due to any defect in the customer's equipment
(9) If a failure is generated due to a part/component supplied by the customer that was incorporated in our product, or due to a part/component used as designated by the customer, etc.
(10) If consumable parts such as bearings, oil seals that were incorporated in our company's products run out, become worn, or deteriorate
(11) In addition, any damage generated due to a cause that is outside our company's responsibility

⚠ Precautions for safety

(General)

- Comply with safety regulations for the place of installation and the equipment used.
  ("Ordinance on Industrial Safety and Hygiene," "Guide book of electrical equipment," "Building Standards Act," etc.)
- Before use, read the "Instruction manual" thoroughly, and use the products correctly.
  If the "Instruction manual" is not found, request the vendor or our company to provide it.
  Be sure to deliver the "Instruction manual" to the end user.

(Selection)

- Select a product that is suitable for the usage environment and application.
- When our company's products are used for equipment that transports people or hoisting equipment, provide a safety device at the equipment side for safety purposes.
- Use an explosion-proof motor in an explosive atmosphere. Furthermore, use an explosion-proof motor with a specification that conforms to hazardous places.
- When an explosion-proof motor is driven by an inverter, the only combination of motor and inverter allowed is in the ratio of 1:1. Be sure to operate it with the indicated specialized inverter. Moreover, because the inverter has a non-explosion-proof structure, be sure to install it at a place where there is no explosive gas.
- When the motor is driven by a 400 V class inverter, install a suppression filter or reactor at the inverter side, or use a motor of a reinforced insulation type.
- For equipment in which oil contamination should not occur, such as food-processing machinery, attach a loss prevention device such as an oil pan in case of accidental oil leakage caused by failure, end of useful life, etc.

⚠ Caution	**This catalog mainly refers to the selection of models. For actual usage, read the "Instruction manual" thoroughly before use, and use products correctly.**

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Distributed by:

Catalog No.985K555 ©2015/2 TSUBAKIMOTO CHAIN CO.Printed in Japan (K) 1,000