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# Sumitomo Drive Technologies

## Always on the Move

# HEDCON<sup>®</sup>

## Worm Gear Reducer



CW11

 Sumitomo Heavy Industries Gearbox Co., Ltd.

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

No. W0101E-4.0.1

No. W0101E-4

# *Extremely High Performance*

## *Worm Gear Reducer HEDCON*

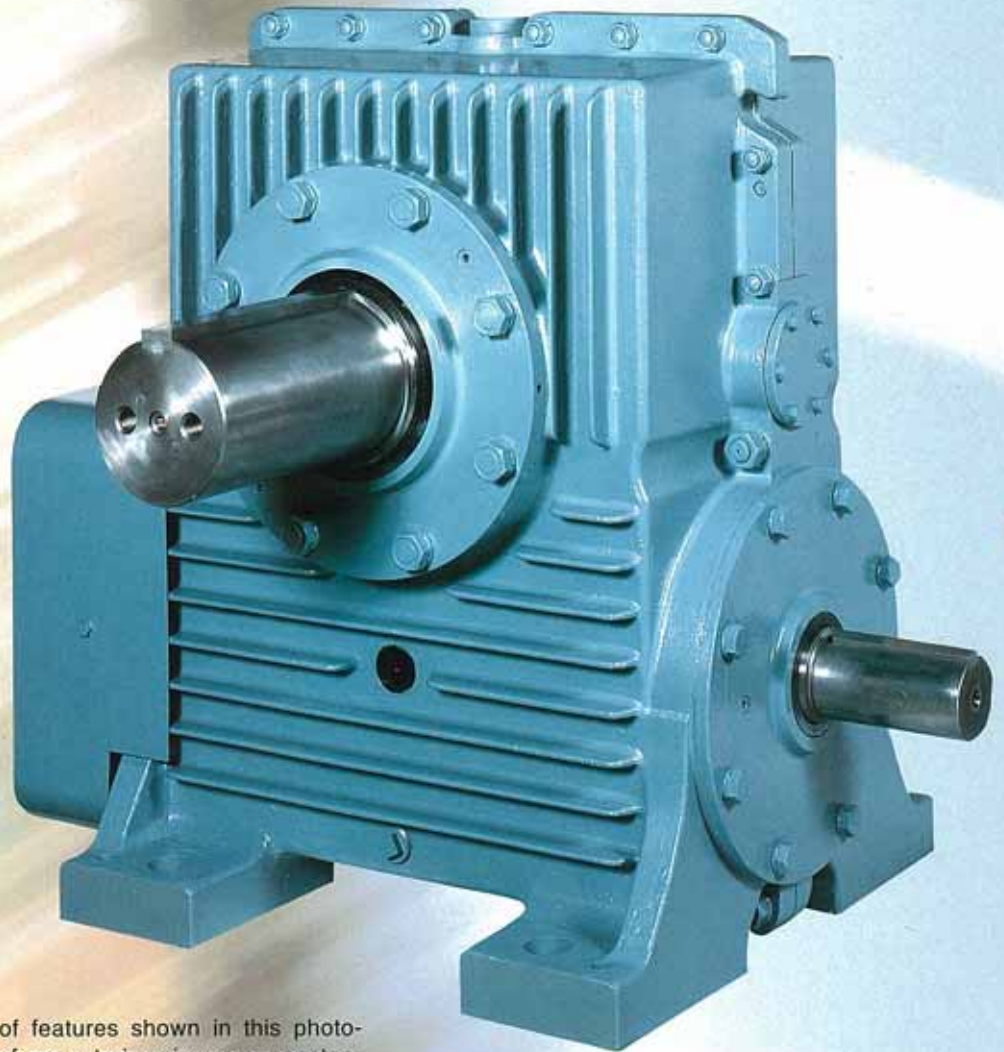
- Ever since introduction to the market, Worm Gear Reducer HEDCON has steadily been growing in sales with its high power and performance well recognized by users.
- HEDCON has become a still higher performance worm gear reducer with increased mechanical power rating.

CB400 1/50

● Allowable continuous output torque :  
7859kgf.m (at input of 200rpm)

● Dynamic efficiency :  
90% (at input of 200rpm)

HEDCON clears these high values with  
much in reserve.



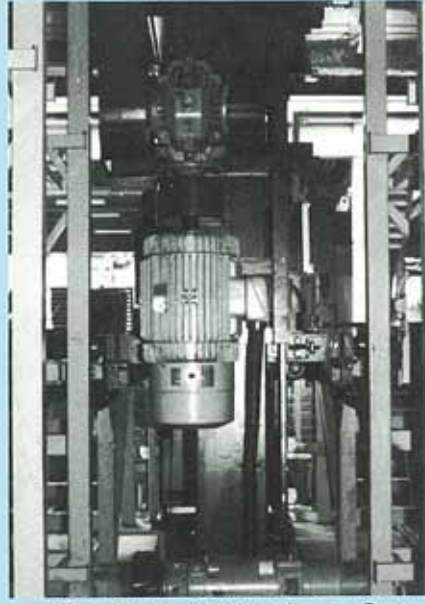
Some of features shown in this photograph of an exterior view are nonstandard specifications.

HEDCON is a registered tradename of SUMITOMO HEAVY INDUSTRIES, LTD.

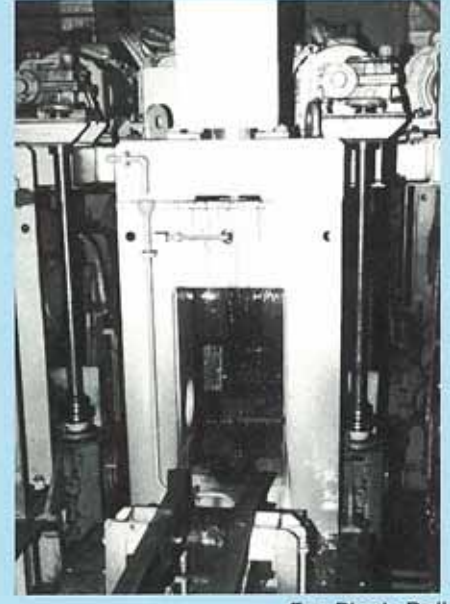
# Examples of Application



For Filter Press



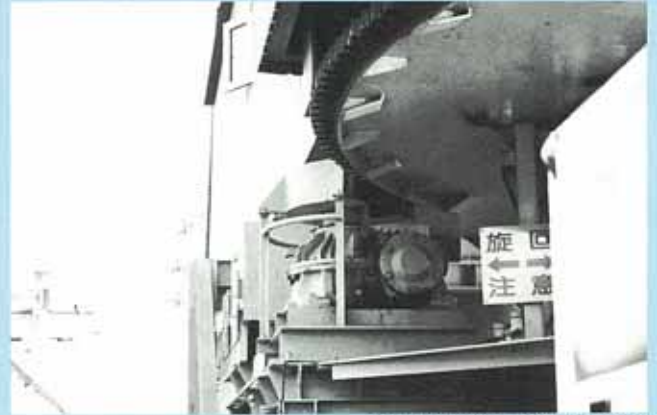
For Automatic Warehouse System



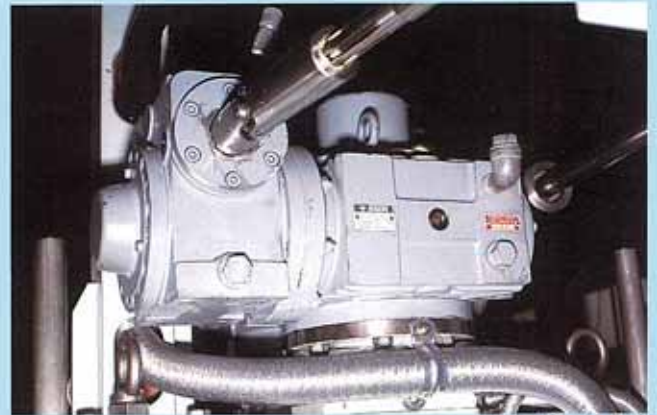
For Pinch Roll



For Concrete Mixer



For Rotation of Unloader



For Steel Belt



For Filter Dryer



For Belt Press

# Energy – Saving Worm Gear Reducer

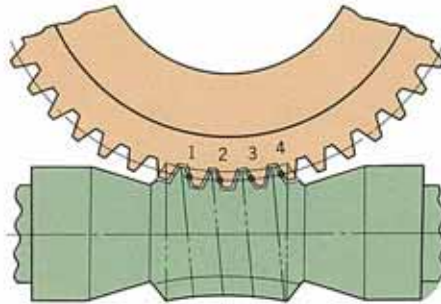
## Features

### 1. Larger Load Capacity

#### ● Completely meshed worm teeth

With the hourglass worm, all teeth on the worm mesh effectively with the wheel. This allows for a larger contact area at all times which in turn results in the lowering of surface pressure on the worm tooth surface, thereby allowing a greater margin in terms of load capacity.

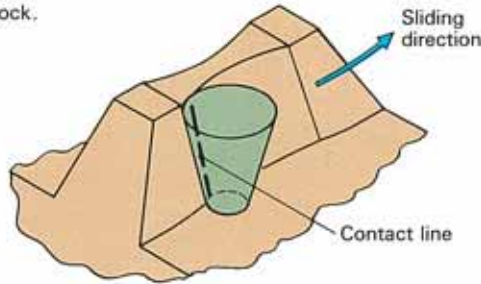
All teeth on the worm effectively engage with the wheel.



#### ● Gearing of teeth

The contact line of the worm and wheel runs in the direction of the length of the tooth and tooth surfaces interlock in the direction of the tooth line. This increases the relative curvature radius and reduces surface pressure.

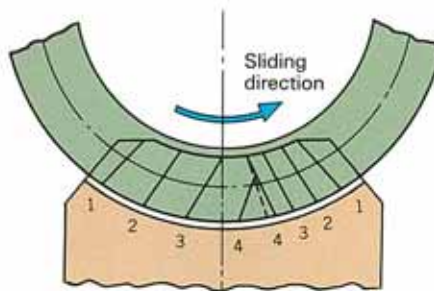
The teeth of the worm and wheel interlock.



#### ● Dual contact

The characteristics of dual contact are incorporated, allowing each wheel surface to have two contact lines simultaneously. This brings about the same effect as the increased number of teeth in mesh which will further contribute to increasing load capacity.

The wheel tooth surface consists of primary and secondary tooth surfaces, thereby providing a larger mesh area.



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The Winner



Worm Gear Reducer HEDCON is a hourglass shaped worm gear reducer developed and produced by Sumitomo Heavy Industries, Ltd., with its vast experience and proven capacity as a manufacturer of gear reducers.

of the 1981 The Society of  
Mechanical Engineers



#### ● Accurately ground worm gears

The worm gears with precision ground finish have smooth surface texture and precision tooth profile. These high quality worm gears assure endurance against large loads without destruction of the lubricant film.

#### ● Highly rigid worm shaft

The worm shaft is designed to have sufficient rigidity so that it will not adversely affect the the favorable mesh characteristics described above, due to bending, flexing, etc.

### 2. High Efficiency

#### ● Large sliding angle

The large angle (sliding angle) between the contact line and the direction of the slide, along with the large relative curvature radius, leads to the smooth diffusion of lubricant film on the tooth surfaces. This is another basis of high efficiency.

#### ● Small mesh friction coefficient

The precision ground finish of the worm minimizes the friction coefficient for high efficiency.

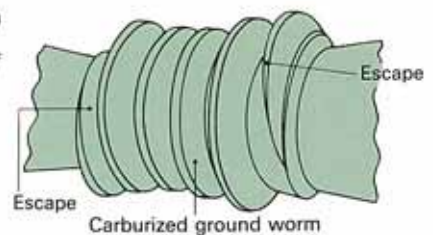
### 3. Long Life

The worm is made of high quality carburized Cr–Mo steel while phosphor bronze centrifugal casting of high wear and seizure resistance is used for the wheel. This, combined with the various high efficiency factors, results in a worm gear of unmatched long life.

### 4. Silent and Smooth Mesh

The increased number of teeth in mesh, precision tooth profile and special provision to eliminate shock at meshing all contribute to quiet, vibration–free operation without fluctuations in rotation.

Precision ground finish worm with a relief provided on the top of the tooth line.



### 5. Wide Range of Reduction Ratios

High efficiency makes it possible to provide high reduction ratios of 1/80 and 1/100 even with a single reduction gear box. Gear reducers with even such a higher reduction ratio of 1/10000 can easily be supplied if two stages are used.

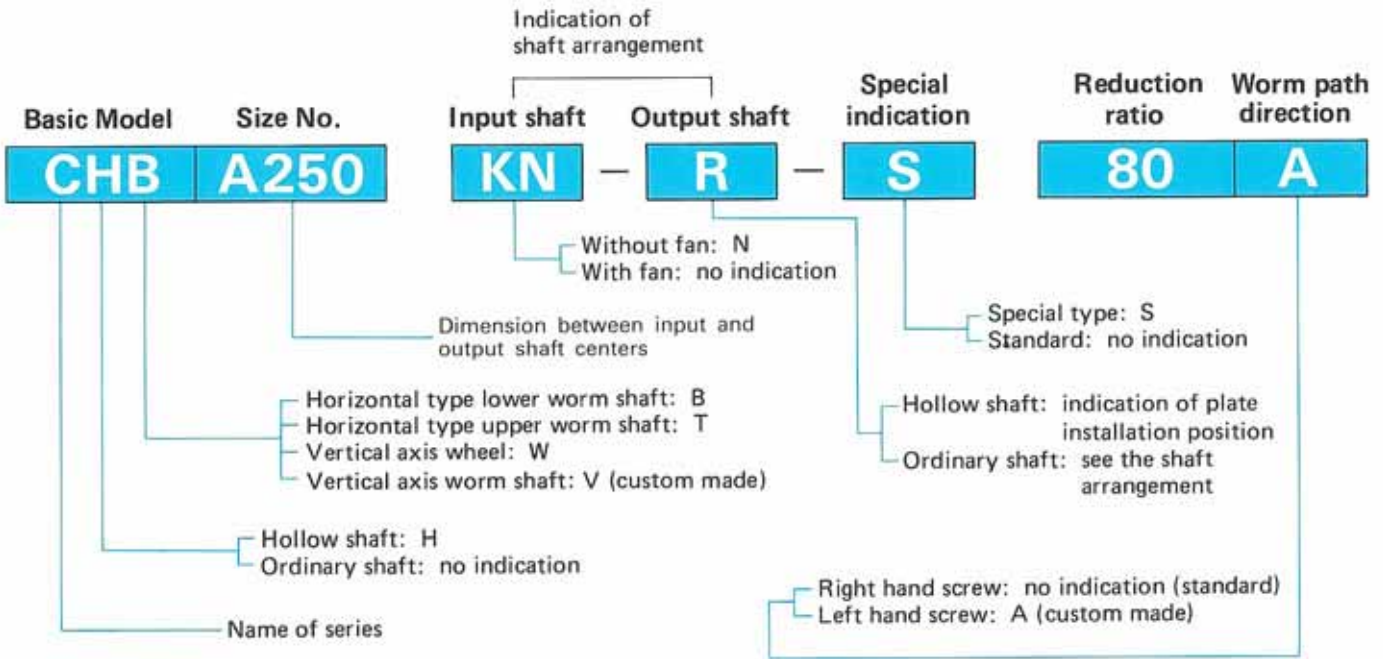
### 6. Compact, Lightweight Design

The HEDCON worm gear reducers give high rating values and are extremely compact in design for their load capacity.

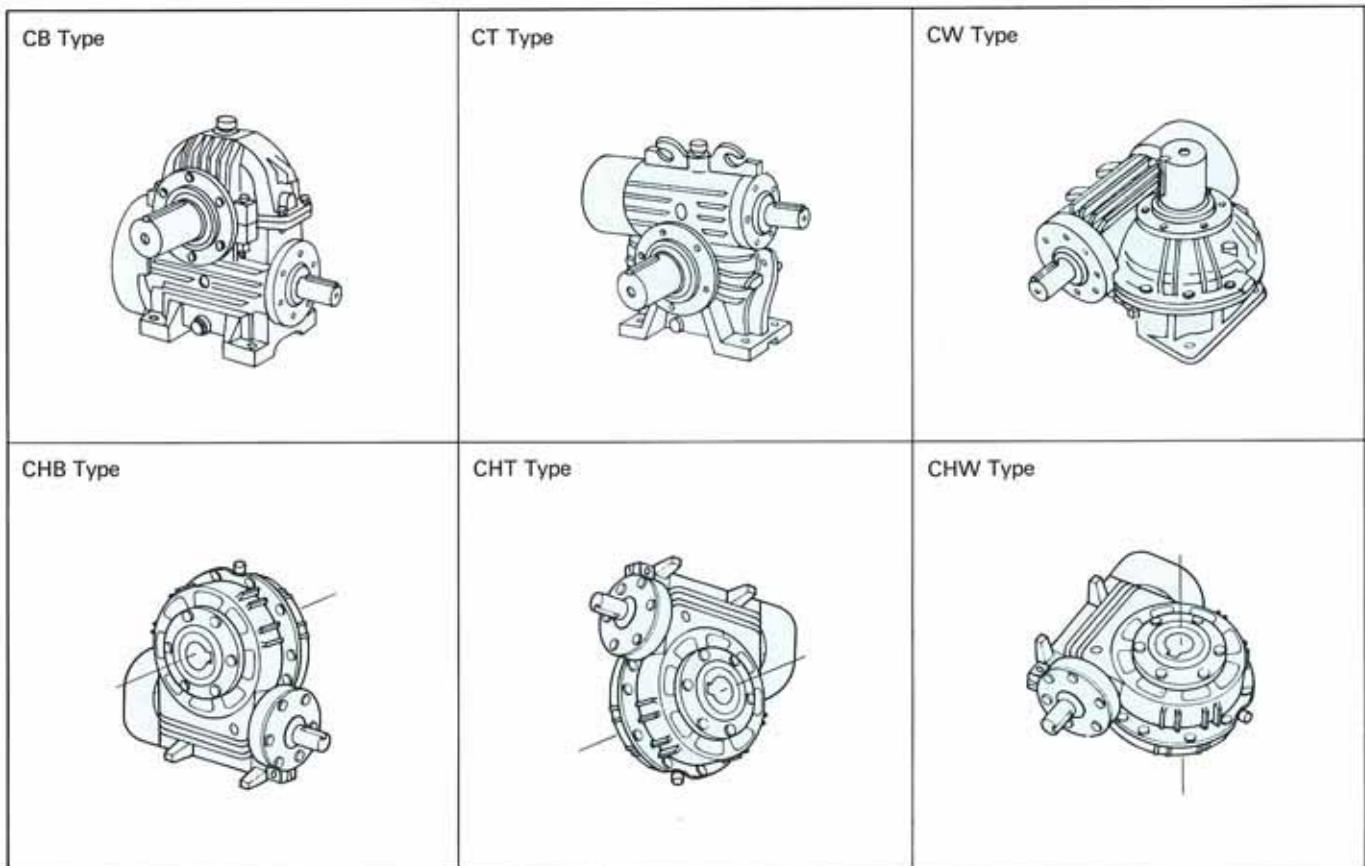
### 7. Energy Saving

The HEDCON worm gear reducers feature the highest level of efficiency. Thus, their energy saving effect is particularly great in long hours of operation.





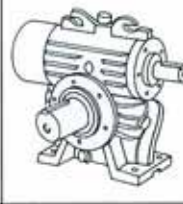







# Model Descriptions



## ● Basic Models



● Indication of Shaft Arrangement (Example of CB, CT, CW Type)

CB Type						
CT Type						
Single input shaft	K (KN) -R	K (KN) -L	K (KN) -B	K (KN) -R	K (KN) -L	K (KN) -B
Double input shaft	B (BN) -R	B (BN) -L	B (BN) -B	B (BN) -R	B (BN) -L	B (BN) -B
CW Type						
Single input shaft	K (KN) -RU	K (KN) -RD	K (KN) -LU	K (KN) -LD	K (KN) -RB	K (KN) -LB
Double input shaft	B (BN) -RU	B (BN) -RD	B (BN) -LU	B (BN) -LD	B (BN) -RB	B (BN) -LB

Shaft arrangement indication R refers to an arrangement where the low speed shaft is positioned on the right – hand side, as viewed from the high speed shaft (worm shaft) side, with the legs on the horizontal plane. Similarly, letters L, U, D and B indicate the low speed shaft on the left – hand side, upwards, downwards, and on both side, respectively.

● Indication of plate installation position (Example of CH Type)



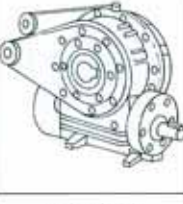









CHB Type						
CHT Type						
Single input shaft	K (KN) -R	K (KN) -L	K (KN) -B	K (KN) -R	K (KN) -L	K (KN) -B
Double input shaft	B (BN) -R	B (BN) -L	B (BN) -B	B (BN) -R	B (BN) -L	B (BN) -B
CHW Type						
Single input shaft	K (KN) -RU	K (KN) -RD	K (KN) -RB	K (KN) -LU	K (KN) -LD	K (KN) -LB
Double input shaft	B (BN) -RU	B (BN) -RD	B (BN) -RB	B (BN) -LU	B (BN) -LD	B (BN) -LB

Plate installation position code R indicates that the plate installed on either CHB, T or W type is positioned on the right – hand side, as viewed from the high speed shaft (worm shaft) side. Likewise, code letters L, U, D and B indicate that the plate is positioned on the left – hand side, upwards, downwards, and on both sides, respectively.

● Indication Examples

- CB-A100 K-R 50
- CW-A100 KN-RU-S 20
- CHT-A250 KN-S 10A

● Items in the special indication Column “S”

- Special housing  
(special shape, steel plate type; etc.)
- Multi-reduction type
- Direct coupled motor
- With extra gear box
- Others

# Selection

The HEDCON worm gear reducer is basically designed to operate for 10 hours per day under uniform load (U). Consequently, when selecting the size of the HEDCON, proceed as follows :

### (a) Selection of size

Obtain load characteristics by machine from Table 5, service factor  $f_1$  from the daily operating hours in Table 1, and start-up frequency factor  $f_2$  from the start-up frequency per hour from Table 2. Based on these data, determine the equivalent transmission capacity.

$$\text{Equivalent transmission capacity} = \text{Actual transmission power} \times f_1 \times f_2$$

Next, obtain the size that satisfies

$$\text{Equivalent transmission capacity} \leq \text{Mechanical power rating}$$

(Table 6 on page 9, 10 and Table 7 on page 11)

### (b) Check on thermal capacity

Calculate the equivalent heat capacity from a temperature correction factor  $f_3$  which is determined based on the ambient temperature in Table 3.

$$\text{Equivalent heat capacity} = \text{Actual transmission power} \times f_3$$

next, check

$$\text{Equivalent heat capacity} \leq \text{Thermal power rating}$$

(Table 8 on Page 12, 13 and Table 9 on page 14)

The thermal power rating has been calculated, using an oil temperature of 100°C for the specified oil.

### (C) Check on allowable radial load

In case a gear, chain sprocket, etc. are connected to the low speed shaft, check the following formula, using a service factor  $f_1$  and connection factor  $f_4$  as shown in Table 4.

$$\text{Actual radial load} \times f_1 \times f_4 \leq \text{Allowable radial load}$$

(Table 10 and 11 on page 15)

● Table 1 Service Factor  $f_1$

Prime mover	Duration of service	Load characteristics		
		Uniform U	Moderate shock M	Heavy shock H
Electric motor	Intermittent 2 hours/day	0.90	1.00	1.20
Turbine	Up to 10 hours/day	1.00	1.20	1.30
Hydraulic motor	24 hours/day	1.20	1.30	1.50

Note 1 ● In case  $f_1 > 1.00$  is used, control the peak load to maximum 200% and the start-up frequency to less than 1 per hours.

● Table 2 Starting Frequency Factor  $f_2$

Start-up frequency per hour (No. of times) Note 2)		
Less than 1	2 ~ 4	5 ~ 9
1	1.07	1.13

Note 2 ● Calculate the start-up frequency for the unit with a brake by multiplying the actual frequency value by 2.  
● Contact Sumitomo if the start-up torque exceeds 200% of the rated torque.

● Table3 Temperature Correction Factor  $f_3$

Ambient temperature °C	Unit with fan
30 or less	1.00
30 - 40	1.17
40 - 50	1.40

● Table4 Connection Factor  $f_4$

Sprocket (single row)	1
Sprocket (double row)	1.25
Gear	1.25
V-belt	1.50
Plain belt	2.50

## Example of Selection

### Application to an agitator (for liquid/solid mixture)

- Input power ..... 18.5kW, 1500rpm electric motor
- Operating time ..... Continuous 10 hours per day
- Start-up frequency ..... Less than 1 time/hour
- Reduction ratio ..... 1/50
- Ambient temperature 40°C

### Selection procedures

- (1) From Table 5, agitator (for liquid/solid mixture) ... M
- (2) From Table 1,  $f_1 = 1.2$
- (3) From Table 2,  $f_2 = 1.0$
- (4) Equivalent transmission capacity =  $1.8 \times 1.2 \times 1.0 = 22.2\text{kW}$
- (5) From Table 6, size A100  
Allowable input power  $28.0 > 22.2\text{kW}$  OK
- (6) Check on thermal capacity  
From Table 3,  $f_3 = 1.17$
- (7) Equivalent heat capacity =  $18.5 \times 1.17 = 21.6\text{kW}$
- (8) From Table 8, size A200  
Thermal power rating  $22.8\text{kW} > 21.6\text{kW}$   
Based on the above, size A200 is selected.



• Load Characteristics According to Machines Table 5 (Accordance with AGMA 420-04, Dec. 1975)

Application	Load Classification	Application	Load Classification	Application	Load Classification	Application	Load Classification
<b>Agitator</b>		<b>Dredges</b>		<b>Tools</b>		<b>Mills</b>	
Pure liquids . . . . . U		Cable Reels . . . . . M		Main Drives . . . . . M		Calenders . . . . . 1.50	
Liquids (variable density) M		Conveyors . . . . . M		Auxiliary Drives . . . U		Extruders . . . . . 1.50	
Liquids and solids . . . . M		Cutter Head Drives . . . H		<b>Metal Mills</b>		(a) Variable Speed	
<b>Blowers</b>		Jig Drives . . . . . H		Draw Bench Carriage		Drive . . . . SF=1.50	
Centrifugal . . . . . U		Maneuvering Winches . . M		and Main Drive . . . . . M		(b) Fixed Speed	
Lobe . . . . . M		Pumps . . . . . H		Pinch, Dryer and		Drive . . . . SF=1.75	
Vane . . . . . U		Screen Drive . . . . . M		Scrubber Rolls,		<b>Printing Presses</b> . . . . . *	
<b>Brewing and Distilling</b>		Stackers . . . . . M		Reversing Slitters . . . . M		<b>Pumps</b>	
Bottling Machine . . . . . U		Utility Winches . . . . . M		Table Conveyors		Centrifugal . . . . . U	
Brew Kettles, Cont. Duty U		<b>Elevators</b>		Non-Reversing		Proportioning . . . . . M	
Cookers-Cont. Duty . . . U		Bucket-Uniform Load . . U		Group Drives . . . . . M		Receiprocating	
Mash Tubs-Cont. Duty . . U		Bucket-Heavy Load . . . M		Individual Drives . . . H		Single Acting, 3 or	
Scale Hopper, Frequent		Bucket-Cont . . . . . U		Reversing . . . . . *		more cylinder . . . . M	
Starts . . . . . M		Centrifugal Discahrge . . U		Wire Drawing and		Double Acting 2 or	
<b>Can Filling Machines</b> . . . U		Escalators . . . . . U		Flattening Machine . . M		more cylinders . . . . M	
<b>Sugar refiner</b>		Freight . . . . . M		Wire Winding Machine M		Rotary –	
Cane knife . . . . . 1.5		Gravity Discharge . . . . U		<b>Mills Rotary Type</b>		Gear Type . . . . . U	
Crusher . . . . . 1.5		*Man Lifts		Ball and Rod		Lobe, Vane . . . . . U	
Mill . . . . . 2.0		*Passenger		Spur Ring Gear . . . . 2.00		<b>Rubber Industry</b>	
<b>Car Dumpers</b> . . . . . H		<b>*Extruders (Plastic)</b>		Helical Ring Gear . . . 1.50		Intensive Internal Mixers	
<b>Car Pullers</b> . . . . . M		Film . . . . . U		Direct Connected . . . 2.00		(a) Batch	
<b>Clay Working Machinery</b>		Sheet . . . . . U		Cement Kilns . . . . . M		Mixers . . . . . 1.75	
Brick Press . . . . . H		Coating . . . . . U		Dryers and Coolers . . . M		(b) Continuous	
Briquette Machine . . . . H		Rods . . . . . U		Pebble . . . . . M		Mixers . . . . . 1.50	
Clay Working Machinery M		Pipe . . . . . U		Plain and Wedge Bar . . M		Mixing Mill – 2 smooth	
Pug Mill . . . . . M		Tubing . . . . . U		Tumbling Barrels . . . . H		rolls . . . . . 1.50	
<b>Compressor</b>		Blow Molders . . . . . M		<b>Mixers</b>		(if corrugated rolls are	
Centrifugal . . . . . U		Pre-plasticizers . . . . M		Concrete Mixers, Cont . . M		used, then use the same	
Lobe . . . . . M		<b>Fans</b>		Concrete Mixers,		service factors that are	
Reciprocating,		Centrifugal . . . . . U		Intermittent . . . . . M		used for a Cracker Warmer)	
Multi-Cylinder . . . . . M		Cooling Towers Induced		Constant Density . . . . U		Batch Drop Mill – 2	
Reciprocating,		Draft . . . . . *		Variable Density . . . . M		smooth rolls . . . . . 1.50	
Single-Cylinder . . . . . H		Induced Draft . . . . . M		<b>Oil Industry</b>		Cracker Warmer – 2	
<b>Conveyors-Uniformly</b>		Large (Mine, etc.) . . . . M		Chillers . . . . . M		Roll; 1 corrugated	
<b>Loaded or Fed</b>		Large (Industrial) . . . . M		Oil Well Dumping . . . . *		roll . . . . . 1.75	
Apron . . . . . U		Light (Small Diameter) U		Paraffin Filter Press . . M		Cracker corrugated	
Assembly . . . . . U		<b>Feeders</b>		Rotary Kilms . . . . . M		roll . . . . . 2.00	
Belt . . . . . U		Apron . . . . . M		<b>Paper Mills (See Note 1)</b>		Holding, Fee and	
Bucket . . . . . U		Belt . . . . . M		Agitator (Mixer) . . . . M		Blend Mill – 2	
Chain . . . . . U		Disc . . . . . U		Agitator for Pure		roll . . . . . 1.25	
Flight . . . . . U		Reciprocating . . . . . H		Liquors . . . . . U		Refiner – 2 roll . . . . 1.50	
Oven . . . . . U		Screw . . . . . M		Barking Drums . . . . . H		Calenders . . . . . 1.50	
Screw . . . . . U		<b>Food Industry</b>		Barkers-Mechanical . . . H		<b>Sand Muller</b> . . . . . M	
<b>Conveyors-Heavy Duty</b>		Belt Slicer . . . . . M		Beater . . . . . M		<b>Sewage Disposal</b>	
<b>not Uniformly Fed</b>		Cereal Cooker . . . . . U		Breaker Stack . . . . . U		<b>Equipment</b>	
Apron . . . . . M		Dough Mixer . . . . . M		Calender . . . . . U		Bar Screens . . . . . U	
Assembly . . . . . M		Meat Grinders . . . . . M		Chipper . . . . . H		Chemical Feeders . . . . U	
Belt . . . . . M		<b>Generators (Not Welding) . . U</b>		Chip Feeder . . . . . M		Collectors . . . . . U	
Bucket . . . . . M		<b>Hammer Mills</b> . . . . . H		Coating Rolls . . . . . U		Dewatering Screws . . . M	
Flight . . . . . M		<b>Hoists</b>		Dryers		Scum Breakers . . . . . M	
Oven . . . . . M		Heavy . . . . . H		Paper Machine . . . . . U		Slow or Rapid Mixers . . M	
Receiprocating . . . . . H		Medium Duty . . . . . M		Conveyor Type . . . . . U		Thickners . . . . . M	
Screw . . . . . M		Skip Hoist . . . . . M		Kiln Drive . . . . . M		Vacuum Filters . . . . . M	
Shaker . . . . . H		<b>Laundry</b>		Pulper . . . . . SF=2.00		<b>Screens</b>	
<b>Cranes</b>		Washers, Reversing . . . M		<b>Screens</b>		Air Washing . . . . . U	
Main Hoist . . . . . U		Tumblers . . . . . M		Chip . . . . . M		Rotary-Stone or Gravel M	
Bridge Travel . . . . . *		<b>Line Shafts</b>		Rotary . . . . . M		Traveling Water Intake U	
Trolley Travel . . . . . *		Driving Processing		Thickner		<b>Slab Pusher</b> . . . . . M	
<b>Dry Dock Cranes</b>		Equipment . . . . . M		(AC Motor) . . . . . M		<b>Stokers</b> . . . . . U	
Main Hoist . . . . . 1.00		Light . . . . . U		(DC Motor) . . . . . U		<b>Textile Industry</b>	
Auxiliary Hoist . . . . . 1.00		Other Line Shaft . . . . U		<b>Plastic Industry</b>		Batchers . . . . . M	
Room, (Luffing) . . . . . 1.00		<b>Lumber Industry</b> . . . . . *		Intensive Internal Mixers		Calenders . . . . . M	
Rotating, (Swing or		<b>Machine Tools</b>		(a) Batch Mixers . . . 1.75		Cards . . . . . M	
Slew) . . . . . 1.25		Bending Roll . . . . . M		(b) Continuous Mixers		Dry Cans . . . . . M	
Tracking,		Punch Press-Gear Driven H		. . . . . 1.50		Dryers . . . . . M	
(Drive Wheels) . . . . . 1.50		Notching Press-Belt		Batch Drop Mill –2		Dyeing Machinery . . . . M	
<b>Crusher</b>		Driven . . . . . *		smooth rolls . . . . 1.25		Knitting Machines . . . . *	
Ore . . . . . H		Plate Planers . . . . . H		Continuous Feed,		Looms . . . . . M	
Stone . . . . . H		Tapping Machine . . . . H		Holding & Blend		Wangles . . . . . M	
Sugar . . . . . 1.50		Other Machine		Mill . . . . . 1.25		Nappers . . . . . M	
				Compounding		Pads . . . . . M	

U: Uniform load M: Moderate shock load H: Heavy shock load

Note 1 – Service factors for paper mill applications are applied to the name plate rating of the electric drive motor at the motor rated base speed. \* Refer to factory.

The selection method above is valid for specifications of continuous operation. Contact Sumitomo in case a load characteristics curve is given or for specifications of intermittent operation. Selection can be made with more rigid selection criteria.

# EFFICIENCY AND SELF-LOCKING

## (a) Checking for efficiency

Determine the required input power by checking the efficiencies as follows.

### ① Running efficiency

Running efficiency is calculated by the following formula.

$$\eta_n = \frac{T_2 \cdot N_1}{974 \cdot P_1 \cdot Z} \times 100 (\%)$$

$\eta_n$  : Running efficiency (%)

$N_1$  : Input speed (rpm)

$P_1$  : Input mechanical power rating (kW)

$T_2$  : Output torque rating (kgf-m)

(Refer to P.13-18, Tables10-12)

$Z$  : Exact reduction ratio

\*  $\eta_n$  values shown in table 6 are based on the catalog rating with the unit at normal operating temperature and with an approved lubricant.

If the reducer is required to operate extreme under load, please consult Sumitomo Heavy Industries, LTD. PTC Division.

### ② Starting efficiency

If the reducer is required to start under load, consideration must be given to the starting efficiency, which would be less than the running efficiency.

The starting efficiency depends on the lead angle shown in table 6 and can be found from Figure 4.

### ③ Backdriving efficiency

If the reducer is driven from the worm wheel shaft, check the backdriving efficiency calculated by the following formula.

$$\eta'_n \doteq \left( 2 - \frac{100}{\eta_n} \right) \times 100 (\%)$$

$$\eta'_s \doteq \left( 2 - \frac{100}{\eta_s} \right) \times 100 (\%)$$

$\eta'_n$  : Backdriving running efficiency (%)

$\eta'_s$  : Backdriving starting efficiency (%)

$\eta_n$  : Running efficiency (%)

$\eta_s$  : Starting efficiency (%)

## (b) Check for self-locking

A worm gear reducer may not be driven from the worm wheel shaft if the backdriving efficiency is less than 0%.

It is called SELF-LOCKING. The backdriving efficiency must be checked for applications which require self-locking or for applications which prevent self-locking, as shown below.

### ① Applications which require self-locking

When applications require self-locking, select a HEDCON ratio above 40 : 1.

The reducer will be considered irreversible at stand-still, but self-locking in its actual operating environment cannot be completely assumed.

For complete assurance of irreversibility, a suitable brake must be used.

(Example applications : Winch drive, elevator)

### ② Applications which prevent self-locking

When applications, such as a crane drive, require a brake on the input shaft to decelerate a high inertial load, select a HEDCON ratio of 20 : 1 or less.

A reducer with self-locking ratios will be locked up during deceleration and impose a severe shock load at such applications.

Figure 4 Start-up efficiency  $\eta_s$

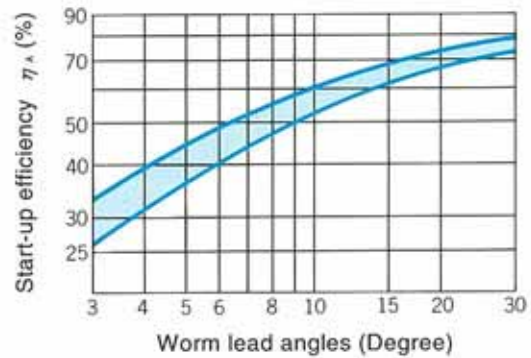


Table 6 Worm lead angles

(Unit : Degree)

Nominal reduction ratio \ Size	A100	A125	A150	A175	A200	A225	A250	280	320	360	400
5	21.2	22.4	22.1	23.2	23.6	24.0	23.8				
6	18.7	19.5	19.9	20.2	20.6	20.5	20.9				
8	16.1	16.9	17.2	17.6	17.9	18.2	18.5				
10	14.0	14.7	15.0	15.3	15.6	15.4	16.1	16.5	17.0	17.5	18.0
12	12.5	12.5	12.7	12.9	13.2	13.7	14.0				
16	10.8	10.9	11.1	11.3	11.5	11.4	11.6				
20	9.3	9.4	9.6	9.8	9.9	9.8	10.0	10.5	10.8	11.1	11.5
25	7.9	8.1	8.2	8.4	8.5	8.4	8.6				
30	7.0	7.1	7.3	7.4	7.5	7.6	7.8	8.0	8.2	8.4	8.7
40	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.5	6.7	6.9	7.1
50	4.9	5.0	5.1	5.1	5.2	5.3	5.4	5.5	5.7	5.9	6.0
60	4.3	4.4	4.5	4.5	4.6	4.7	4.8	4.9	5.0		5.3
80	3.5	3.6	3.6	3.7	3.8	3.8	3.9	4.0	4.1	4.2	4.3
100	3.0	3.1	3.1	3.2	3.2	3.3	3.3				

# Allowable Radial Load

Refer to page 7 for selection method.

## ● Table 10 Allowable Radial Load on Low Speed Shaft (Standard Type)

Refer to Table 11 for reinforced type.

(Unit: kgf)

Low speed shaft rpm \ Size	A100	A125	A150	A175	A200	A225	A250	280	320	360	400
15rpm or less	1100	1800	2100	2800	3100	3500	4000	7600	9000	10500	12000
20	1100	1800	2100	2800	3100	3500	4000	7600	9000	10500	12000
25	1100	1800	2100	2800	3100	3500	4000	7600	9000	10300	12000
30	1100	1800	2100	2800	3100	3500	4000	7600	9000	9500	10900
35	1100	1800	2100	2800	3100	3500	4000	7400	8900	8600	9700
40	1100	1800	2100	2800	3100	3500	4000	7000	8400	7800	8800
50	1100	1800	2100	2800	3100	3500	4000	6400	7700	6600	7400
60	1100	1800	2100	2800	3100	3500	4000	5800	7100	6300	7000
80	1100	1800	2100	2600	3100	3500	4000	5100	6500	5800	6400
100	1100	1700	2000	2400	3100	3500	3800	4700	6100	5400	6000
125	1100	1600	1800	2300	3000	3500	3600	4400	5700	5100	5700
150	1100	1500	1700	2100	2800	3500	3400	4200	5400	4800	5400
200	1000	1400	1600	2000	2600	3500	3100	3900	5000	4500	5100
250	1000	1300	1500	1800	2400	3200	2900	3700	4700	4300	4900
300	900	1200	1400	1700	2300	3100	2700	3500	4400	4200	4800

- Note. ● The figures in this table are based on the loading position being at the center of the shaft extension.  
 ● Contact Sumitomo when an exterior thrust force is exerted on the shaft.

## ● Table 11 Allowable Radial Load on Low Speed Shaft (Reinforced Type)

(Unit: kgf)

Low speed shaft rpm \ Size	A100	A125	A150	A175	A200	A225	A250
15rpm or less	1400	2100	2900	3800	4600	5700	6500
20	1400	2100	2900	3800	4600	5700	6200
25	1400	2100	2900	3700	4600	5700	5800
30	1400	2100	2800	3500	4500	5700	5500
35	1400	2100	2600	3300	4300	5700	5200
40	1400	2100	2500	3200	4200	5600	5000
50	1400	2100	2400	3000	3900	5200	4700
60	1400	2000	2200		3700	5000	4400
80	1300				3400	4600	4100
100	1300					4300	
125						4000	
150						3800	
200							
250							
300							

- Note. ● Sizes 280 through 400 are standard with reinforced for overhung load.  
 ● Load values in the blank columns can be applied with those in standard type (Table 10).  
 ● Contact Sumitomo when further reinforcement is required.

● Table 12 GD<sup>2</sup> (Single Extension Ordinary Shaft Equipped with Fan)

(Unit: kgf-m<sup>2</sup>)

Nominal reduction ratio \ Size	A100	A125	A150	A175	A200	A225	250	280	320	360	400
5	0.0121	0.0295	0.0690	0.143	0.251	0.468	0.795				
6	0.0110	0.0259	0.0611	0.124	0.217	0.405	0.698				
8	0.00971	0.0223	0.0520	0.105	0.181	0.243	0.599				
10	0.00874	0.0200	0.0469	0.0927	0.139	0.292	0.531	1.48	2.34	3.61	6.37
12	0.00829	0.0179	0.0423	0.0839	0.130	0.270	0.490				
16	0.00758	0.0167	0.0387	0.0773	0.128	0.246	0.444				
20	0.00718	0.0154	0.0357	0.0713	0.118	0.226	0.411	1.27	1.97	3.03	5.38
25	0.00695	0.0147	0.0341	0.0693	0.111	0.214	0.393				
30	0.00683	0.0142	0.0330	0.0652	0.1080	0.210	0.382	1.20	1.85	2.83	5.05
40	0.00633	0.0130	0.0306	0.0603	0.0993	0.193	0.354	1.16	1.78	2.71	4.85
50	0.00623	0.0127	0.0298	0.0588	0.0966	0.189	0.347	1.14	1.75	2.67	4.79
60	0.00616	0.0125	0.0293	0.0578	0.0946	0.186	0.342	1.12	1.72		4.70
80	0.00605	0.0122	0.0286	0.0563	0.0921	0.181	0.335	1.10	1.68	2.56	4.60
100	0.00598	0.0120	0.0282	0.0556	0.0905	0.178	0.331				
<b>GD<sup>2</sup> (for Fan)</b>	<b>0.00134</b>	<b>0.0013</b>	<b>0.0040</b>	<b>0.0094</b>	<b>0.0234</b>	<b>0.032</b>	<b>0.054</b>	<b>0.0780</b>	<b>0.117</b>	<b>0.308</b>	<b>0.560</b>

Note. ● Obtain the GD<sup>2</sup> value for the model without cooling fan by subtracting GD<sup>2</sup> of fan from GD<sup>2</sup> shown in the table.  
● Contact Sumitomo for GD<sup>2</sup> of other types.

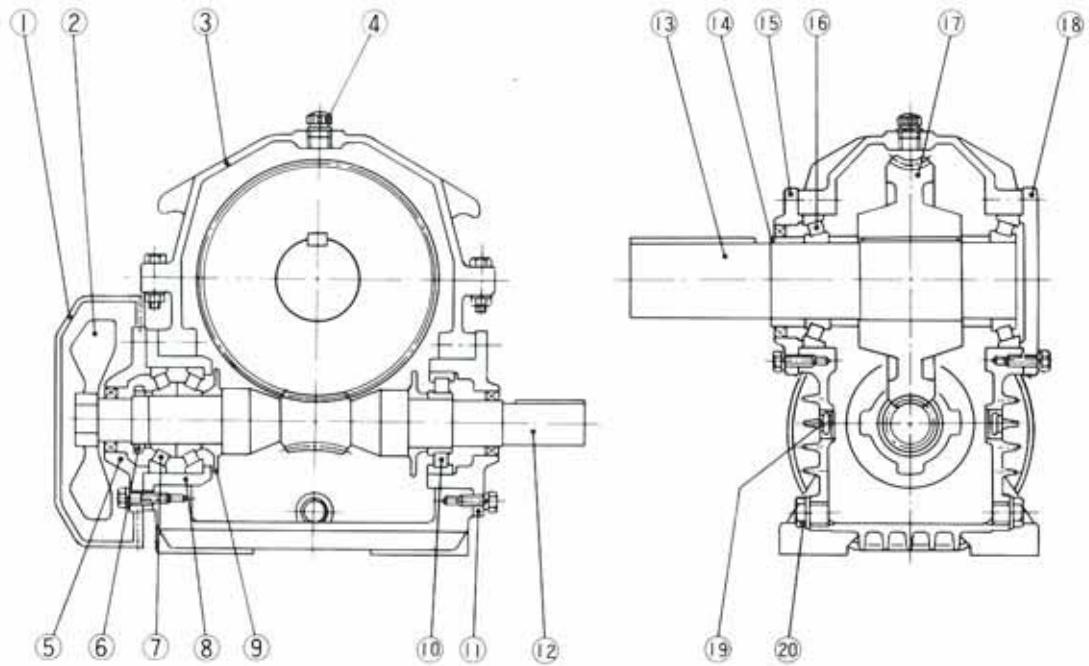
## Lubrication

Use a polyglycol synthetic oil for lubrication to ensure the full high performance of the HEDCON worm gear reducers.

Oil Brand	Input speed (rpm)	
	Lower than 500	500 ~ 1800
Shell Oil	TIVELA Oil SA (460EP)	TIVELA Oil SA (150EP)
NOK Kluber	Syntheso HT460	Syntheso HT150
Japan Energy Co.	JOMO Reductus SHT220	JOMO Reductus SHT460

- Grease lubrication may be used for some bearings when input rpms are low.
- Oil quantity is indicated in dimensional drawings on pages 19~22.
- Fill oil prior to use because oil is removed at the time of shipment.

# Construction



Note: • This is a model construction based on the CB type.  
 • This only shows an example of the basic structures and may differ according to type or size.

## • Table of Main Parts

No.	Parts name	No.	Parts name	No.	Parts name	No.	Parts name
1	fan cover	6	nut for bearing	11	bearing cago (2)	16	taper roller bearing
2	fan	7	taper roller bearing	12	worm shaft	17	worm wheel
3	housing	8	bearing cago (1)	13	wheel shaft	18	output shaft cover (2)
4	oiling plug	9	oil fringer plate	14	collar	19	oil gauge
5	worm shaft cover	10	cylindrical roller bearing	15	output shaft cover (1)	20	oil drain plug

# Mechanical Power Rating · Thermal Power Rating

Mechanical Power Rating, Thermal Power Rating for size A100-A225 Reduction ratio 5-12

Size			A100				A125				A150				A175				A200				A225			
Nominal reduction ratio	Input shaft rpm	Nominal output shaft rpm	Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating	
			Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m
5	Actual reduction ratio		5.17				4.86				5.14				4.88				4.88				4.89			
	1800	360	30.2	81	18.2	48	59.0	149	30.3	75	94.3	252	44.4	117	151.9	385	63.4	158	218.4	554	85.1	212	307.3	782	110.1	275
	1500	300	26.1	84	16.5	52	49.4	150	27.4	82	81.3	261	40.2	128	131.0	400	57.4	173	190.7	582	77.0	232	265.0	811	99.6	301
	1200	240	21.8	87	14.6	58	39.6	150	24.2	91	67.0	269	35.6	142	109.4	418	50.7	192	159.2	608	68.1	258	221.3	848	88.1	335
	1000	200	18.9	91	13.2	63	33.0	150	21.9	99	55.8	269	32.2	154	94.6	433	45.9	209	137.5	631	61.6	281	191.0	880	79.7	365
	750	150	15.0	96	11.2	72	24.8	150	18.7	113	42.0	269	27.5	175	75.2	459	39.2	238	109.4	668	52.6	320	151.8	932	68.1	416
	500	100	10.9	104	9.0	86	16.6	150	15.0	135	28.1	269	22.0	210	54.6	498	31.4	285	79.3	725	42.1	383	110.1	1011	54.4	499
	300	60	6.9	109	6.8	107	10.0	150	11.3	169	16.9	269	16.6	263	36.4	551	23.7	358	53.0	803	31.8	481	69.7	1061	41.1	625
	200	40	4.6	109	5.4	128	6.7	150	9.0	202	11.4	269	13.3	314	26.5	598	18.9	427	38.5	871	25.4	574	46.7	1061	32.9	747
6	Actual reduction ratio		6.40				6.17				6.17				6.17				6.14				6.43			
	1800	300	25.3	83	16.9	55	48.7	155	28.0	88	81.2	259	41.9	132	125.1	400	58.8	185	182.7	582	79.0	248	245.1	817	100.7	330
	1500	250	21.9	86	15.3	60	42.0	161	25.4	96	70.0	269	37.9	144	107.9	415	53.2	202	157.6	603	71.4	271	211.4	847	91.1	361
	1200	200	18.3	90	13.6	67	35.2	168	22.4	107	58.5	281	33.5	160	90.1	433	47.0	225	131.6	631	63.2	301	176.5	886	80.6	401
	1000	167	15.8	94	12.3	72	30.4	174	20.3	116	50.6	291	30.3	174	77.9	450	42.5	244	113.6	654	57.1	327	152.4	919	72.9	437
	750	125	12.6	99	10.5	82	24.2	185	17.3	132	40.3	309	25.9	197	62.0	476	36.3	278	90.4	693	48.8	373	121.2	973	62.2	498
	500	83	9.2	108	8.4	98	17.6	200	13.9	158	29.2	335	20.7	236	45.0	516	29.1	333	65.6	752	39.0	446	87.9	1055	49.8	569
	300	50	6.1	119	6.3	123	11.0	207	10.5	197	17.7	335	15.6	296	27.5	523	21.9	417	41.7	793	29.5	559	58.7	1169	37.6	747
	200	33	4.3	126	5.1	147	7.4	207	8.4	236	11.9	335	12.5	353	18.4	523	17.6	498	28.0	793	23.6	668	42.7	1268	30.1	892
8	Actual reduction ratio		8.25				7.80				7.80				7.80				7.80				7.83			
	1800	225	20.5	87	15.4	65	40.1	161	25.7	102	66.9	268	38.4	153	103.1	414	53.9	214	150.0	604	72.3	287	208.2	842	93.6	373
	1500	188	17.8	90	13.9	70	34.6	167	23.3	111	57.7	278	34.7	167	88.9	430	48.8	234	129.3	626	65.4	314	179.5	873	84.6	408
	1200	150	14.9	94	12.3	78	29.0	174	20.6	123	48.3	291	30.7	184	74.3	449	43.1	259	108.0	655	57.9	348	149.9	913	74.9	453
	1000	125	12.9	97	11.1	84	25.1	181	18.6	134	41.7	302	27.8	200	64.2	466	39.0	282	93.4	679	52.3	379	129.4	947	67.7	493
	750	94	10.3	103	9.5	96	20.0	191	15.9	152	33.2	320	23.7	228	51.1	494	33.3	321	74.3	719	44.7	431	103.0	1003	57.8	561
	500	63	7.5	112	7.6	114	14.5	208	12.7	182	24.1	347	19.0	272	37.1	535	26.7	384	53.9	780	35.8	516	74.7	1088	46.2	672
	300	38	5.0	124	5.7	143	9.7	230	9.6	227	16.2	384	14.3	341	24.8	593	20.1	480	36.1	864	27.0	646	50.0	1205	34.9	841
	200	25	3.6	134	4.6	170	7.1	249	7.7	271	11.8	417	11.5	406	18.1	643	16.1	572	26.2	937	21.6	771	36.4	1307	27.9	1004
10	Actual reduction ratio		10.3				9.75				9.75				9.75				9.75				10.3			
	1800	180	21.0	110	14.0	73	33.4	166	23.5	116	55.6	278	35.0	173	85.7	428	49.2	243	123.6	618	66.0	326	182.4	960	83.6	434
	1500	150	18.5	116	12.7	79	28.9	172	21.2	126	48.0	288	31.7	189	73.9	444	44.5	265	107.6	647	59.7	356	160.2	1014	75.7	474
	1200	120	15.8	124	11.2	88	24.2	180	18.8	140	40.2	301	28.0	209	61.8	465	39.3	294	89.8	677	52.8	396	136.8	1085	66.9	527
	1000	100	13.9	131	10.1	95	20.9	187	17.0	151	34.8	312	25.4	227	53.5	482	35.6	319	77.7	702	47.7	430	120.4	1146	60.5	573
	750	75	11.2	141	8.6	108	16.7	198	14.5	172	27.7	331	21.6	258	42.6	510	30.4	363	61.9	744	40.8	488	98.6	1249	51.7	652
	500	50	8.0	149	6.9	129	12.1	215	11.6	206	20.1	359	17.3	308	31.0	554	24.3	434	42.8	768	32.6	584	74.6	1410	41.3	779
	300	30	4.8	149	5.2	161	7.7	227	8.8	257	13.5	397	13.1	385	20.0	591	18.4	543	25.9	768	24.6	730	50.9	1591	31.2	975
	200	20	3.3	149	4.2	191	5.2	227	7.0	305	9.8	431	10.5	459	13.4	591	14.7	647	17.4	768	19.7	871	34.2	1591	25.0	1162
12	Actual reduction ratio		12.3				12.7				12.7				12.7				12.7				12.3			
	1800	150	18.5	115	12.9	80	28.1	180	20.8	133	48.8	314	31.1	198	75.2	485	43.6	279	99.6	643	58.5	374	157.5	986	77.1	476
	1500	125	16.3	122	11.7	87	24.7	190	18.8	144	42.9	332	28.1	216	66.0	512	39.5	304	87.5	679	52.9	408	138.3	1041	69.7	520
	1200	100	14.0	130	10.3	96	21.2	203	16.7	159	36.8	355	24.9	239	56.5	547	34.9	336	74.7	726	46.8	452	118.0	1113	61.7	578
	1000	83	11.9	133	9.3	104	18.6	214	15.1	173	32.4	375	22.5	259	49.8	578	31.6	365	65.9	767	42.4	491	104.0	1176	55.8	628
	750	63	9.0	133	8.0	118	15.3	233	12.9	196	26.6	408	19.2	294	38.6	595	27.0	415	54.0	835	36.2	558	85.2	1282	47.6	713
	500	42	6.0	133	6.4	141	10.3	233	10.3	234	18.2	418	15.4	351	25.9	595	21.6	495	37.5	865	28.9	667	59.5	1334	38.1	853
	300	25	3.7	133	4.8	175	6.2	233	7.8	292	11.1	418	11.6	438	15.7	595	16.3	618	22.7	865	21.8	832	36.0	1334	28.8	1065
	200	17	2.5	133	3.9	208	4.2	233	6.2	347	7.4	418	9.3	521	10.6	595	13.0	736	15.3	865	17.5	991	24.2	1334	23.0	1269

Mechanical Power Rating, Thermal Power Rating for size A250-400 Reduction ratio 5-12

A250				280				320				360				400				Size		
Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Input shaft rpm	Nominal output shaft rpm	Nominal reduction ratio
Allowable input power kW	Allowable continuous output torque kgf m	Allowable input power kW	Allowable continuous output torque kgf m	Allowable input power kW	Allowable continuous output torque kgf m	Allowable input power kW	Allowable continuous output torque kgf m	Allowable input power kW	Allowable continuous output torque kgf m	Allowable input power kW	Allowable continuous output torque kgf m	Allowable input power kW	Allowable continuous output torque kgf m	Allowable input power kW	Allowable continuous output torque kgf m	Allowable input power kW	Allowable continuous output torque kgf m	Allowable input power kW	Allowable continuous output torque kgf m			
5.11																				Actual reduction ratio		
398.1	1059	137.0	357	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800	360	5
343.7	1100	123.9	391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500	300	
286.9	1150	109.6	435	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1200	240	
247.7	1193	99.2	474	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	200	
196.7	1264	84.6	541	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	750	150	
142.6	1370	67.7	649	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500	100	
88.1	1404	51.1	814	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	60	
59.0	1404	40.9	973	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	40	
6.43																				Actual reduction ratio		
329.8	1100	127.0	416	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800	300	6
284.4	1141	114.9	455	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500	250	
237.4	1193	101.6	506	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1200	200	
205.0	1237	91.9	551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	167	
162.9	1310	78.4	628	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	750	125	
118.1	1421	62.8	753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500	83	
78.9	1574	47.4	944	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	50	
57.3	1707	37.9	1127	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	33	
7.83																				Actual reduction ratio		
280.1	1134	118.0	470	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800	225	8
241.5	1176	106.7	514	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500	188	
201.6	1230	94.4	571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1200	150	
174.0	1275	85.4	622	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	125	
138.4	1351	72.9	709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	750	94	
100.4	1465	58.3	849	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500	63	
67.1	1623	44.0	1063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	38	
48.8	1760	35.2	1269	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	25	
9.80				9.80				9.80				9.80				9.83				Actual reduction ratio		
232.8	1173	107.6	534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800	180	10
200.7	1216	97.3	584	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500	150	
167.5	1272	86.1	649	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1200	120	
144.6	1319	77.8	706	164.8	1514	92.4	835	239.9	2210	113.3	1019	316.9	2925	133.1	1189	431.2	3999	150.3	1335	1000	100	
115.1	1397	66.5	804	130.7	1604	89.4	1087	190.2	2341	110.1	1339	258.5	3189	130.1	1579	351.6	4362	147.9	1796	750	75	
83.6	1515	53.2	962	94.5	1739	81.3	1492	137.5	2539	100.5	1846	191.5	3546	119.0	2189	257.0	4787	135.9	2507	500	50	
54.8	1646	40.1	1203	63.0	1927	69.2	2116	91.5	2812	85.5	2621	127.4	3928	101.2	3111	170.9	5302	115.4	3566	300	30	
36.8	1646	32.1	1435	45.7	2089	60.0	2742	66.3	3050	73.9	3395	92.3	4260	87.3	4024	123.8	5750	99.4	4605	200	20	
12.3																				Actual reduction ratio		
201.6	1263	97.2	600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800	150	12
177.0	1334	87.9	656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500	125	
151.1	1426	77.7	729	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1200	100	
132.9	1506	70.3	793	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	83	
108.9	1642	60.0	902	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	750	63	
82.4	1854	48.0	1078	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500	42	
50.9	1892	36.3	1347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	25	
34.2	1892	29.0	1605	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	17	

# Mechanical Power Rating · Thermal Power Rating

Note. ● Units with marked   reduction ratios are standard products.

Mechanical Power Rating, Thermal Power Rating for size A100-A225 Reduction ratio 16-40

Size			A100				A125				A150				A175				A200				A225			
Nominal reduction ratio	Input shaft rpm	Nominal output shaft rpm	Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating	
			Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m
16	Actual reduction ratio		15.5				15.7				15.7				15.7				15.7				16.3			
	1800	113	15.7	121	11.5	88	24.1	189	18.7	146	40.9	323	27.9	219	63.0	498	39.2	307	83.5	661	52.6	413	123.8	1023	66.7	545
	1500	94	13.8	128	10.4	96	21.2	199	16.9	159	36.0	341	25.3	238	55.3	526	35.5	335	73.3	698	47.6	450	108.7	1081	60.3	595
	1200	75	11.7	136	9.2	106	18.2	213	15.0	175	30.9	365	22.3	263	47.4	563	31.4	371	62.6	746	42.1	499	92.8	1156	53.3	660
	1000	63	10.2	141	8.3	115	16.0	225	13.5	190	27.2	385	20.2	285	41.8	594	28.4	402	55.2	788	38.1	541	81.8	1221	48.3	716
	750	47	8.1	149	7.1	130	13.1	245	11.6	216	22.3	420	17.3	324	34.3	648	24.2	457	45.3	859	32.5	615	67.1	1331	41.2	814
	500	31	5.8	158	5.7	155	9.9	277	9.2	257	16.3	456	13.8	386	26.0	731	19.4	545	34.3	970	26.0	734	50.9	1502	33.0	971
	300	19	3.5	158	4.3	193	6.2	282	7.0	320	9.9	456	10.4	481	15.9	737	14.6	679	22.4	1043	19.6	915	34.1	1664	24.9	1211
200	13	2.4	158	3.4	229	4.2	282	5.6	380	6.7	456	8.3	571	10.7	737	11.7	807	15.1	1043	15.7	1088	23.0	1664	19.9	1440	
20	Actual reduction ratio		19.5				19.5				19.5				19.5				19.5				20.5			
	1800	90	13.2	127	10.2	97	20.5	197	16.6	159	34.2	332	24.8	239	52.5	512	34.8	336	69.6	678	46.7	451	102.4	1051	58.8	596
	1500	75	11.4	131	9.2	105	18.0	208	15.0	173	30.1	350	22.4	260	46.2	540	31.5	366	61.0	716	42.2	493	89.8	1110	53.2	651
	1200	60	9.1	131	8.1	116	15.4	223	13.3	191	25.8	375	19.8	287	39.5	578	27.9	405	52.2	766	37.4	545	76.8	1187	47.1	723
	1000	50	7.6	131	7.4	126	13.6	235	12.0	207	22.7	396	17.9	311	34.9	610	25.2	439	46.0	809	33.8	592	67.7	1253	42.6	784
	750	38	5.8	131	6.3	143	11.2	256	10.3	235	18.7	431	15.3	353	28.6	665	21.5	499	37.8	882	28.9	672	55.6	1366	36.3	890
	500	25	3.9	131	5.0	170	8.5	289	8.2	280	13.6	468	12.3	421	21.7	751	17.2	594	28.6	996	23.1	801	42.1	1542	29.1	1062
	300	15	2.4	131	3.8	211	5.2	293	6.2	348	8.3	468	9.3	523	14.0	795	13.0	739	20.2	1157	17.4	997	25.7	1546	22.0	1322
200	10	1.6	131	3.0	250	3.5	293	5.0	412	5.6	468	7.4	621	9.4	795	10.4	877	13.6	1157	13.9	1184	17.3	1546	17.6	1570	
25	Actual reduction ratio		24.5				24.5				24.5				24.5				24.5				25.5			
	1800	72	11.1	132	8.9	105	17.2	205	14.5	172	28.3	340	21.7	259	43.4	524	30.5	364	57.5	695	40.9	489	85.2	1075	51.7	643
	1500	60	9.8	139	8.0	114	15.2	217	13.1	187	24.9	359	19.6	281	38.2	554	27.5	397	50.4	734	37.0	534	74.7	1135	46.7	703
	1200	48	8.2	145	7.1	126	13.0	232	11.6	207	21.3	384	17.4	311	32.7	592	24.4	439	43.2	785	32.7	591	63.9	1214	41.3	779
	1000	40	7.1	150	6.4	136	11.5	245	10.5	224	18.8	406	15.7	337	28.9	625	22.0	476	38.1	829	29.6	641	56.4	1282	37.4	846
	750	30	5.4	152	5.5	154	9.4	267	9.0	254	15.5	442	13.4	382	23.7	682	18.8	540	31.3	904	25.2	728	46.3	1397	31.9	960
	500	20	3.7	152	4.4	183	7.2	301	7.2	302	11.8	499	10.7	455	18.0	770	15.1	643	23.7	1020	20.2	867	35.2	1578	25.5	1143
	300	12	2.2	152	3.3	227	4.6	320	5.4	375	8.2	571	8.1	564	12.8	897	11.4	798	16.8	1189	15.2	1077	22.6	1664	19.3	1421
200	8.0	1.5	152	2.7	268	3.1	320	4.3	443	2.5	571	6.5	668	8.9	925	9.1	946	12.1	1271	12.2	1277	15.2	1664	15.4	1685	
30	Actual reduction ratio		29.5				29.5				29.5				29.5				29.5				29.5			
	1800	60	9.7	136	7.9	110	15.0	211	12.9	182	24.3	346	19.3	273	37.2	534	27.1	386	49.2	708	36.4	518	75.4	1090	47.1	672
	1500	50	8.5	142	7.2	120	13.2	223	11.7	198	21.4	366	17.5	297	32.7	564	24.5	420	43.2	748	32.9	566	66.1	1151	42.6	735
	1200	40	7.1	149	6.3	132	11.3	239	10.3	218	18.3	391	15.5	329	28.1	603	21.7	464	37.0	799	29.1	626	56.6	1231	37.7	814
	1000	33	6.2	154	5.7	143	10.0	252	9.4	237	16.2	413	14.0	356	24.7	637	19.6	503	32.6	844	26.3	679	49.9	1300	34.1	884
	750	25	4.9	164	4.9	162	8.2	274	8.0	268	13.3	450	11.9	404	20.3	694	16.8	571	26.8	920	22.5	770	41.0	1417	29.1	1002
	500	17	3.6	177	3.9	193	6.2	310	6.4	318	10.1	508	9.5	480	15.5	784	13.4	679	20.4	1039	18.0	916	31.2	1600	23.3	1194
	300	10	2.3	187	3.0	238	3.9	320	4.8	394	6.9	571	7.2	594	11.0	913	10.1	841	14.5	1211	13.6	1136	19.7	1664	17.6	1481
200	6.7	1.6	187	2.4	281	2.7	320	3.9	465	4.7	571	5.8	702	7.5	925	8.1	995	10.3	1271	10.9	1345	13.4	1664	14.1	1754	
40	Actual reduction ratio		40				40				40				40				40				40			
	1800	45	7.7	141	6.5	118	11.8	220	10.5	195	19.0	356	15.7	293	29.0	549	22.1	414	38.2	727	29.6	558	58.5	1120	38.4	724
	1500	38	6.7	149	5.8	128	10.4	232	9.5	212	16.7	376	14.2	319	25.5	580	20.0	451	33.6	768	26.8	609	51.3	1183	34.7	793
	1200	30	5.6	155	5.2	142	8.9	248	8.4	234	14.3	402	12.6	353	21.8	620	17.7	499	28.8	821	23.7	674	43.9	1265	30.7	878
	1000	25	4.8	158	4.7	153	7.9	262	7.6	254	12.6	425	11.4	383	19.3	655	16.0	541	25.4	868	21.5	731	38.8	1336	27.8	952
	750	19	3.6	158	4.0	173	6.5	286	6.5	287	10.4	463	9.7	433	15.9	714	13.7	613	20.9	946	18.3	828	31.9	1456	23.7	1080
	500	13	2.5	158	3.2	205	4.9	320	5.2	340	7.7	507	7.8	514	12.0	797	10.9	728	15.9	1068	14.7	984	23.9	1619	19.0	1283
	300	7.5	1.5	158	2.4	253	3.0	320	3.9	420	4.8	517	5.9	634	7.8	855	8.2	899	10.8	1184	11.1	1216	14.6	1621	14.3	1588
200	5.0	1.0	158	1.9	297	2.0	320	3.1	494	3.3	517	4.7	747	5.3	855	6.6	1060	7.3	1184	8.9	1435	9.9	1621	11.5	1875	



Mechanical Power Rating, Thermal Power Rating for size A250-400 Reduction ratio 16-40

A250		280				320				360				400				Size					
Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Input shaft rpm	Nominal output shaft rpm	Nominal reduction ratio	
Allowable input power kW	Allowable continuous output torque kgf.m	Allowable input power kW	Allowable continuous output torque kgf.m	Allowable input power kW	Allowable continuous output torque kgf.m	Allowable input power kW	Allowable continuous output torque kgf.m	Allowable input power kW	Allowable continuous output torque kgf.m	Allowable input power kW	Allowable continuous output torque kgf.m	Allowable input power kW	Allowable continuous output torque kgf.m	Allowable input power kW	Allowable continuous output torque kgf.m	Allowable input power kW	Allowable continuous output torque kgf.m	Allowable input power kW	Allowable continuous output torque kgf.m				
<b>16.3</b>																			Actual reduction ratio				
158.4	1310	84.1	687	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1800	113	16	
139.0	1384	76.0	750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1500	94		
118.7	1480	67.3	834	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1200	75		
104.5	1563	60.8	906	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1000	63		
85.7	1704	51.9	1029	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	750	47		
64.9	1924	41.6	1229	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	500	31		
40.8	1993	31.4	1533	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	300	19		
27.4	1993	25.1	1824	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	200	13		
<b>20.5</b>																			Actual reduction ratio				
130.9	1345	74.2	752	147.7	1464	*	*	—	—	—	—	—	—	—	—	—	—	—	—	1800	90	20	
114.8	1420	67.1	822	129.2	1548	70.2	806	186.1	2235	*	*	244.8	2945	*	*	—	—	—	—	—	1500		75
98.0	1519	59.3	914	110.0	1655	72.4	1067	158.3	2391	89.2	1307	208.0	3151	105.4	1531	283.9	4309	120.0	1720	1200	60		
86.4	1604	53.7	992	96.6	1749	71.8	1284	139.0	2526	89.5	1598	182.5	3329	106.3	1891	249.0	4553	121.9	2153	1000	50		
70.9	1748	45.8	1126	78.9	1906	67.6	1624	113.4	2754	86.7	2088	148.9	3629	103.6	2493	203.0	4965	119.4	2871	750	38		
53.7	1974	36.7	1344	59.5	2153	59.9	2165	85.5	3110	78.9	2864	112.1	4099	94.4	3437	152.8	5607	109.2	3981	500	25		
33.7	2042	27.7	1674	41.8	2509	50.0	3000	60.0	3624	67.0	4047	78.6	4777	80.1	4859	107.1	6535	92.5	5632	300	15		
22.7	2042	22.1	1989	31.6	2832	42.8	3840	45.4	4091	57.5	5189	59.4	5393	69.0	6265	80.9	7378	79.5	7248	200	10		
<b>25.5</b>																			Actual reduction ratio				
108.9	1375	65.1	811	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1800	72	25	
95.5	1453	58.9	888	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1500	60		
81.5	1553	52.1	986	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1200	48		
71.9	1640	47.1	1070	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1000	40		
59.0	1788	40.2	1215	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	750	30		
44.8	2019	32.2	1448	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	500	20		
27.6	2042	24.3	1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	300	12		
18.6	2042	19.5	2136	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	200	8.0		
<b>29.5</b>																			Actual reduction ratio				
96.4	1394	59.4	848	106.7	1547	*	*	—	—	—	—	—	—	—	—	—	—	—	—	1800	60	30	
84.4	1473	53.8	928	93.0	1635	57.4	962	133.9	2362	*	*	176.0	3110	*	*	—	—	—	—	—	1500		50
72.1	1575	47.5	1031	79.1	1749	57.4	1239	113.6	2526	77.0	1660	149.2	3327	92.3	1972	203.5	4552	106.3	2241	1200	40		
63.6	1663	43.0	1118	69.4	1847	56.2	1475	99.7	2669	75.6	1988	130.7	3515	92.9	2436	178.2	4809	107.6	2805	1000	33		
52.2	1813	36.7	1269	56.7	2014	52.9	1869	81.3	2910	71.3	2532	106.5	3833	90.2	3208	145.1	5244	105.1	3735	750	25		
39.6	2042	29.4	1512	42.7	2275	46.9	2493	61.3	3286	63.2	3384	80.2	4329	82.0	4411	109.2	5922	95.8	5165	500	17		
24.1	2042	22.2	1878	30.1	2651	39.1	3451	43.0	3829	52.6	4681	56.3	5045	68.4	6125	76.6	6902	80.9	7283	300	10		
16.3	2042	17.7	2225	22.8	2992	33.5	4411	32.6	4323	45.0	5975	42.6	5696	58.3	7802	57.9	7793	69.5	9351	200	6.7		
<b>40</b>																			Actual reduction ratio				
74.7	1432	48.4	914	84.3	1599	*	*	—	—	—	—	—	—	—	—	—	—	—	—	1800	45	40	
65.3	1512	43.8	1003	73.3	1690	47.2	1027	105.5	2440	*	*	138.5	3213	*	*	—	—	—	—	—	1500		38
55.9	1617	38.7	1112	62.2	1807	47.2	1332	89.3	2610	63.3	1784	117.1	3437	82.0	2303	159.6	4701	97.7	2713	1200	30		
49.3	1708	35.1	1207	54.5	1909	46.2	1590	78.2	2758	62.2	2144	102.5	3631	80.8	2789	139.6	4967	98.7	3396	1000	25		
40.5	1861	29.9	1368	44.5	2081	43.5	2020	63.8	3007	58.7	2738	83.4	3959	76.4	3583	113.5	5416	96.1	4515	750	19		
29.2	1990	23.9	1627	33.6	2350	38.6	2696	48.1	3396	52.0	3664	62.8	4471	67.8	4807	85.4	6117	86.1	6135	500	13		
17.8	1990	18.1	2015	23.7	2739	32.1	3728	33.8	3957	43.2	5066	44.1	5211	56.2	6639	59.9	7129	71.1	8459	300	7.5		
12.1	1990	14.5	2381	18.0	3092	27.6	4758	25.6	4468	37.0	6458	33.4	5884	47.9	8448	45.4	8050	60.4	10733	200	5		

● Units marked with \* require forced cooling.

# Mechanical Power Rating · Thermal Power Rating

Note: ● Units with marked   reduction ratios are standard products.

Mechanical Power Rating, Thermal Power Rating for size A100-A225 Reduction ratio 50-100

Size			A100				A125				A150				A175				A200				A225				
Nominal reduction ratio	Input shaft rpm	Nominal output shaft rpm	Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		
			Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	
50	Actual reduction ratio			50				50				50				50				50							
	1800	36		6.5	145	5.5	122	10.0	225	9.0	202	15.8	362	13.4	304	24.2	559	18.8	430	31.9	740	25.2	580	48.6	1140	32.7	754
	1500	30		5.7	153	5.0	133	8.8	238	8.1	220	13.9	383	12.1	331	21.3	590	17.0	469	28.0	782	22.8	633	42.7	1204	29.6	824
	1200	24		4.8	160	4.4	146	7.5	255	7.2	243	11.9	409	10.7	366	18.2	631	15.0	519	24.0	836	20.2	701	36.5	1287	26.2	914
	1000	20		4.2	166	4.0	158	6.6	269	6.5	263	10.5	432	9.7	397	16.1	667	13.6	562	21.2	883	18.3	760	32.3	1359	23.7	991
	750	15		3.3	176	3.4	179	5.5	293	5.5	297	8.7	471	8.3	449	13.2	727	11.6	636	17.4	963	15.6	860	26.5	1482	20.2	1123
	500	10		2.4	187	2.7	212	4.0	320	4.4	351	6.3	508	6.6	532	9.8	797	9.3	754	13.2	1082	12.5	1020	19.0	1567	16.2	1332
	300	6		1.5	187	2.0	260	2.5	320	3.3	432	4.3	556	5.0	654	6.5	863	7.0	929	8.9	1190	9.4	1259	11.6	1567	12.2	1645
200	4		1.0	187	1.6	305	1.7	320	2.7	507	3.0	571	4.0	769	4.4	863	5.6	1093	6.5	1270	7.5	1481	7.9	1567	9.8	1937	
60	Actual reduction ratio			60				60				60				60				60							
	1800	30		5.6	147	4.8	124	8.7	229	7.8	205	13.7	367	11.7	310	20.9	567	16.4	438	27.5	751	22.0	592	41.9	1155	28.5	770
	1500	25		4.9	155	4.3	135	7.6	242	7.1	224	12.1	388	10.6	338	18.4	598	14.8	478	24.2	793	19.9	646	36.8	1220	25.7	843
	1200	20		4.2	165	3.8	149	6.5	259	6.2	247	10.3	415	9.3	373	15.7	640	13.1	529	20.7	848	17.6	716	31.5	1304	22.8	934
	1000	17		3.7	171	3.5	161	5.8	274	5.7	267	9.1	438	8.4	405	13.9	676	11.8	574	18.3	895	15.9	776	27.8	1378	20.6	1013
	750	13		2.9	181	3.0	182	4.8	298	4.8	302	7.4	467	7.2	457	11.4	732	10.1	649	15.0	976	13.6	879	22.8	1493	17.6	1147
	500	8.3		2.1	187	2.4	215	3.5	320	3.9	357	5.4	503	5.8	541	8.3	789	8.1	768	11.2	1074	10.9	1041	16.6	1610	14.1	1360
	300	5.0		1.3	187	1.8	263	2.1	320	2.9	438	3.6	550	4.4	664	5.6	864	6.1	944	7.6	1178	8.2	1280	10.6	1664	10.6	1675
200	3.3		0.9	187	1.4	307	1.5	320	2.3	512	2.6	571	3.5	778	4.1	924	4.9	1108	5.5	1263	6.6	1504	7.2	1664	8.5	1969	
80	Actual reduction ratio			80				80				80				80				80							
	1800	23		4.5	151	3.8	124	7.0	235	6.2	206	11.0	375	9.3	312	16.7	578	13.0	443	21.9	765	17.4	598	33.3	1177	22.6	780
	1500	19		4.0	159	3.4	135	6.1	248	5.6	225	9.6	396	8.4	341	14.6	610	11.7	484	19.3	808	15.8	655	22.2	1244	20.4	855
	1200	15		3.4	168	3.0	149	5.3	265	5.0	249	8.1	417	7.4	377	12.5	653	10.4	536	16.5	864	13.9	726	25.0	1330	18.1	949
	1000	13		2.9	174	2.7	162	4.7	280	4.5	270	7.1	431	6.7	409	10.9	677	9.4	581	14.5	913	12.6	787	21.7	1378	16.3	1029
	750	9.4		2.4	184	2.3	182	3.8	305	3.8	304	5.6	455	5.7	462	8.7	714	8.0	657	11.8	977	10.8	891	17.3	1454	13.9	1165
	500	6.3		1.6	187	1.9	215	2.7	320	3.1	359	4.1	488	4.6	545	6.4	768	6.4	775	8.6	1053	8.6	1053	12.6	1562	11.2	1378
	300	3.8		1.0	187	1.4	262	1.7	320	2.3	438	2.8	531	3.5	666	4.3	837	4.8	949	5.8	1151	6.5	1290	8.3	1664	8.4	1691
200	2.5		0.7	187	1.1	305	1.2	320	1.9	510	2.0	565	2.8	777	3.1	892	3.9	1109	4.3	1230	5.2	1509	5.7	1664	6.7	1979	
100	Actual reduction ratio			100				100				100				100				100							
	1800	18		3.8	152	3.1	122	5.9	239	5.1	203	9.3	379	7.6	308	14.1	586	10.7	437	18.5	776	14.4	592	28.0	1194	18.7	772
	1500	15		3.3	158	2.8	133	5.2	252	4.6	222	8.0	392	6.9	337	12.3	616	9.7	479	16.2	820	13.0	649	24.2	1245	16.9	848
	1200	12		2.8	164	2.5	147	4.5	270	4.1	246	6.7	409	6.1	373	10.3	642	8.6	531	13.8	874	11.5	721	20.2	1298	14.9	943
	1000	10		2.4	170	2.3	159	4.0	285	3.7	266	5.8	423	5.5	405	8.9	664	7.8	576	12.0	905	10.4	782	17.5	1342	13.5	1024
	750	7.5		1.9	178	1.9	179	3.2	304	3.2	300	4.6	445	4.7	457	7.1	699	6.6	651	9.6	954	8.9	884	14.0	1412	11.5	1159
	500	5.0		1.4	187	1.5	211	2.3	320	2.5	353	3.4	476	3.8	538	5.2	750	5.3	767	7.0	1025	7.1	1044	10.2	1513	9.2	1368
	300	3.0		0.9	187	1.2	256	1.4	320	1.9	430	2.3	516	2.9	655	3.5	814	4.0	936	4.7	1116	5.4	1274	6.8	1642	7.0	1673
200	2.0		0.6	187	0.9	297	1.0	320	1.5	499	1.6	548	2.3	762	2.6	866	3.2	1090	3.5	1189	4.3	1486	4.8	1664	5.6	1952	

Mechanical Power Rating, Thermal Power Rating for size A250-400 Reduction ratio 50-100

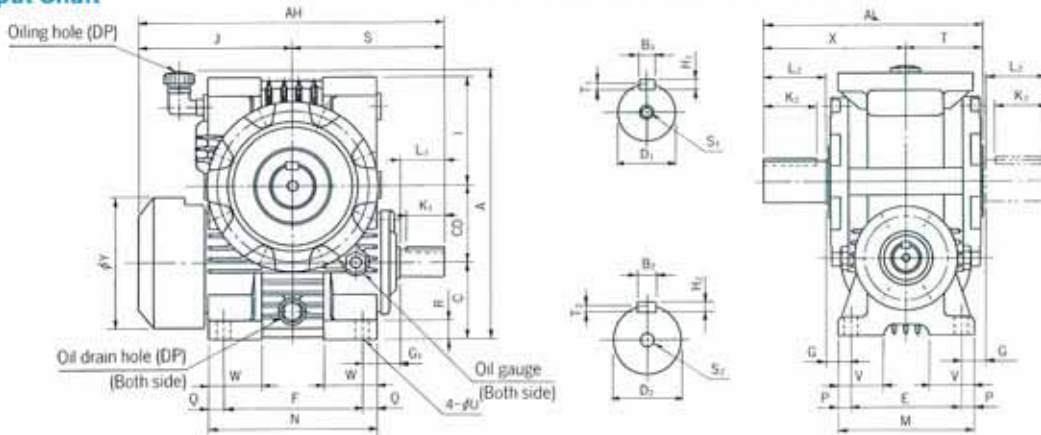
A250		280				320				360				400				Size				
																		Input shaft rpm	Nominal output shaft rpm	Nominal reduction ratio		
Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating		Mechanical power rating		Thermal power rating				
Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Allowable input power kW	Allowable continuous output torque kgf·m	Input shaft rpm	Nominal output shaft rpm	Nominal reduction ratio		
50		50				50				50				50				Actual reduction ratio				
62.0	1457	41.2	951	69.8	1636	*	*	—	—	—	—	—	—	—	—	—	—	1800	36	50		
54.3	1539	37.3	1044	60.5	1729	39.8	1062	87.0	2497	*	*	114.2	3287	*	*	—	—	1500	30			
46.5	1645	33.0	1158	51.2	1849	39.8	1388	73.5	2671	53.4	1858	96.3	3516	69.2	2397	131.2	4809	87.3	3002		1200	24
41.0	1737	29.8	1256	44.9	1954	39.0	1662	64.3	2822	52.4	2242	84.1	3715	68.2	2917	114.5	5081	86.3	3689		1000	20
33.7	1894	25.5	1424	36.6	2130	36.7	2117	52.4	3077	49.5	2873	68.4	4050	64.5	3762	93.1	5540	81.9	4793		750	15
24.5	2042	20.4	1691	27.6	2405	32.5	2828	39.5	3475	43.9	3849	51.5	4574	57.2	5055	69.9	6257	72.6	6458		500	10
15.0	2042	15.4	2089	19.0	2732	27.1	3908	26.9	3914	36.5	5320	36.2	5331	47.4	6982	48.1	7149	60.0	8906		300	6
10.2	2042	12.3	2463	12.8	2732	23.3	4981	18.1	3914	31.2	6774	24.9	5460	40.4	8876	32.3	7149	51.0	11293		200	4
60		60				60				60				60				Actual reduction ratio				
53.4	1476	35.9	972	60.4	1663	*	*	—	—	—	—	—	—	—	—	—	—	1800	30	60		
46.7	1559	32.5	1068	52.2	1757	34.7	1076	75.0	2538	*	*	—	—	—	—	—	—	1500	25			
40.0	1667	28.7	1185	44.2	1879	34.7	1418	63.3	2715	46.5	1897	—	—	—	—	112.7	4885	76.0	3056		1200	20
35.3	1760	26.0	1286	38.7	1985	33.9	1703	55.3	2868	45.7	2297	—	—	—	—	98.3	5162	75.1	3778		1000	17
28.9	1910	22.2	1457	31.5	2165	32.0	2174	45.0	3127	43.1	2952	—	—	—	—	79.8	5628	71.3	4930		750	13
20.9	2042	17.7	1728	23.8	2445	28.3	2906	33.9	3531	38.2	3961	—	—	—	—	59.9	6357	63.2	6657		500	8.3
12.8	2042	13.4	2130	16.8	2849	23.6	4014	23.9	4115	31.8	5473	—	—	—	—	42.1	7408	52.2	9183		300	5.0
8.7	2042	10.7	2505	12.8	3214	20.2	5110	18.2	4646	27.2	6962	—	—	—	—	31.9	8365	44.4	11637		200	3.3
80		80				80				80				80				Actual reduction ratio				
42.3	1504	28.5	987	48.3	1701	*	*	—	—	—	—	—	—	—	—	—	—	1800	23	80		
37.1	1589	25.7	1084	41.5	1798	27.5	1070	59.6	2596	*	*	78.2	3414	*	*	—	—	1500	19			
31.7	1699	22.8	1205	35.0	1923	27.5	1433	50.1	2777	36.9	1915	65.4	3653	47.8	2462	89.0	4994	60.3	3070		1200	15
27.6	1765	20.6	1308	30.6	2031	26.9	1733	43.7	2933	36.2	2339	57.0	3859	47.1	3041	77.4	5277	59.6	3841		1000	13
22.0	1862	17.6	1481	24.9	2214	25.3	2224	35.5	3198	34.2	3024	46.2	4207	44.5	3967	62.7	5754	56.6	5058		750	9.4
16.0	2002	14.1	1754	18.8	2501	22.5	2979	26.8	3612	30.3	4070	34.8	4752	39.5	5360	47.1	6498	50.1	6862		500	6.3
10.1	2042	10.6	2153	13.3	2914	18.7	4112	18.9	4109	25.2	5622	24.5	5538	32.7	7405	33.1	7574	41.4	9474		300	3.8
6.9	2042	8.5	2523	10.2	3290	16.1	5225	14.2	4695	21.5	7142	18.0	6049	27.9	9395	23.2	7889	35.2	11995		200	2.5
100																		Actual reduction ratio				
35.5	1524	23.5	979	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1800	18	100		
30.9	1600	21.3	1077	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1500	15			
25.8	1668	18.8	1200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1200	12			
22.3	1725	17.0	1303	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1000	10			
17.8	1817	14.5	1475	—	—	—	—	—	—	—	—	—	—	—	—	—	—	750	7.5			
13.0	1947	11.6	1744	—	—	—	—	—	—	—	—	—	—	—	—	—	—	500	5.0			
8.4	2042	8.8	2134	—	—	—	—	—	—	—	—	—	—	—	—	—	—	300	3.0			
5.8	2042	7.0	2492	—	—	—	—	—	—	—	—	—	—	—	—	—	—	200	2.0			

● Units marked with \* require forced cooling.

# Dimensions

## CB Type Standard Gear Reducer With Fan, Single Input Shaft

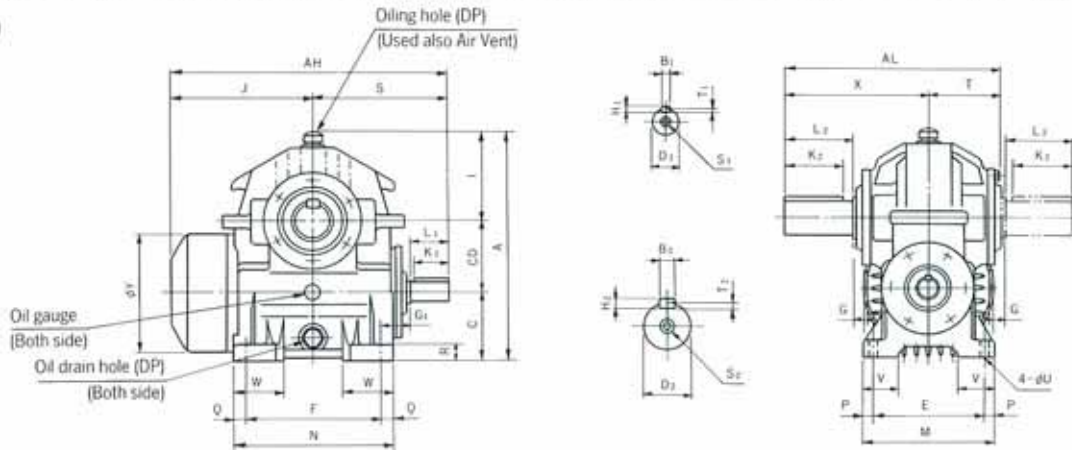
### Size A100 ~ A175



- Note. 1. High/low speed shaft dimensions : Tolerance js6 (JIS B 0401-1965)  
 2. Key and key groove : JIS B 1301-1976 parallel key, precision grade.  
 3. Oil quantity and weight are approximate.  
 4. This dimensional drawing is subject to change without notice.  
 5. Standard paint color : Munsell 10B5/3

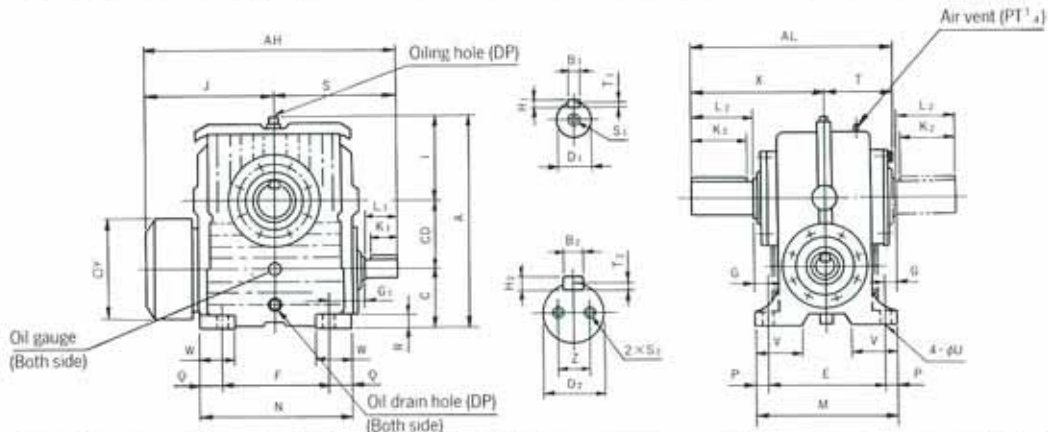
Model	A	AH	AL	C	CD	E	F	G	G <sub>1</sub>	I	J	M	N	P	Q	R	S	T	U	V	W	X	Y	Input Shaft							Output Shaft							DP	Oil quantity (l)	Weight (kg)
																								D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	K <sub>2</sub>	B <sub>2</sub>	H <sub>2</sub>	T <sub>2</sub>	S <sub>2</sub>			
CB-A100	352	398	289	100	100	145	180	32.5	50	145	200	180	220	17.5	20	25	198	102	18	60	70	187	171	35	58	50	10	8	5	M10 <sub>x20</sub>	55	82	70	16	10	6	M16 <sub>x20</sub>	1/2	1.5	66
CB-A125	423	480	352	125	125	155	210	47.5	60	165	233	200	270	22.5	30	30	247	122	22	70	100	230	225	40	82	70	12	8	5	M12 <sub>x24</sub>	65	105	90	18	11	7	M16 <sub>x20</sub>	1/2	3.0	98
CB-A150	489	566	436	140	150	195	285	52.5	75	190	284	240	335	22.5	25	35	282	146	22	65	105	290	252	45	82	70	14	9	5.5	M12 <sub>x24</sub>	80	140	125	22	14	9	M16 <sub>x20</sub>	1/2	4.5	170
CB-A175	549	625	515	160	175	225	340	62.5	55	210	318	275	400	25	30	40	307	170	26	80	115	345	252	50	82	70	14	9	5.5	M12 <sub>x24</sub>	90	170	155	25	14	9	M20 <sub>x33</sub>	3/4	7.5	250

### Size A200 ~ A250



Model	A	AH	AL	C	CD	E	F	G	G <sub>1</sub>	I	J	M	N	P	Q	R	S	T	U	V	W	X	Y	Input shaft							Output shaft							DP	Oil quantity (l)	Weight (kg)
																								D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	K <sub>2</sub>	B <sub>2</sub>	H <sub>2</sub>	T <sub>2</sub>	S <sub>2</sub>			
CB-A200	615	665	586	180	200	300	350	40	75	235	333	360	420	30	35	45	332	186	26	90	125	400	318	55	82	70	16	10	6	M16 <sub>x24</sub>	100	210	190	28	16	10	M20 <sub>x33</sub>	1	10.5	270
CB-A225	680	760	622	200	225	330	400	45	80	255	375	400	470	35	35	50	385	202	33	100	135	420	365	60	105	90	18	11	7	M16 <sub>x24</sub>	110	210	190	28	16	10	M20 <sub>x33</sub>	1	14	380
CB-A250	750	830	663	225	250	360	450	50	85	275	415	430	530	35	40	55	415	223	33	100	145	440	385	65	105	90	18	11	7	M16 <sub>x24</sub>	120	210	195	32	18	11	M20 <sub>x33</sub>	1	17.5	510

### Size 280 ~ 400

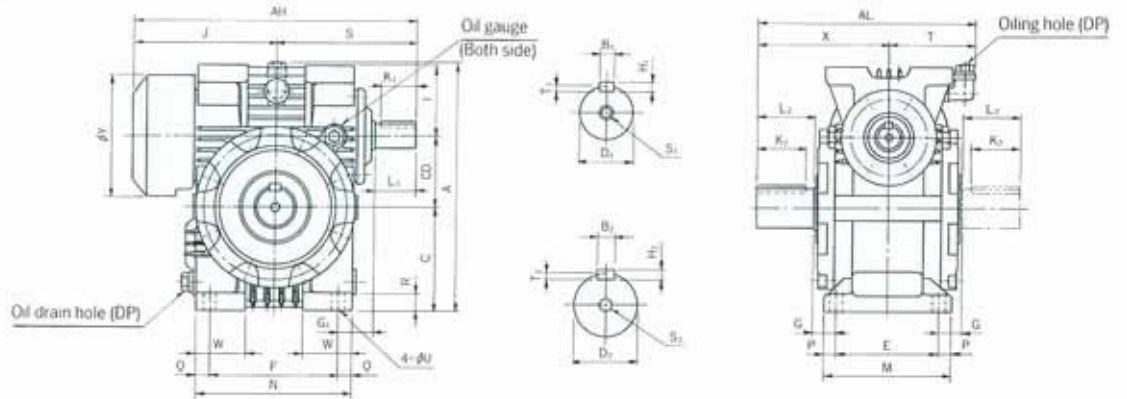


Model	A	AH	AL	C	CD	E	F	G	G <sub>1</sub>	I	J	M	N	P	Q	R	S	T	U	V	W	X	Y	Input shaft							Output shaft							DP	Oil quantity (l)	Weight (kg)	
																								D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	K <sub>2</sub>	B <sub>2</sub>	H <sub>2</sub>	T <sub>2</sub>	S <sub>2</sub>				Z
CB-280	873	1000	817	250	280	560	440	10	150	343	500	640	650	40	105	55	500	277	39	220	150	540	485	80	130	115	22	14	9	M16 <sub>x24</sub>	140	250	250	36	20	12	M20 <sub>x33</sub>	80	1	35	850
CB-320	980	1105	917	280	320	600	510	15	160	380	560	700	740	50	115	65	545	302	45	250	170	615	525	90	130	115	25	14	9	M16 <sub>x24</sub>	160	300	300	40	22	13	M20 <sub>x33</sub>	100	1	48	1270
CB-360	1093	1220	950	315	360	640	560	10	180	418	595	760	820	60	130	70	625	320	52	270	205	630	545	100	165	145	28	16	10	M16 <sub>x24</sub>	180	300	300	45	25	15	M20 <sub>x33</sub>	100	1	55	1700
CB-400	1208	1310	1097	355	400	730	600	15	195	453	650	870	890	70	145	80	660	367	62	315	240	730	625	110	165	145	28	16	10	M20 <sub>x33</sub>	200	350	350	45	25	15	M20 <sub>x33</sub>	125	1	80	2300

# Dimensions

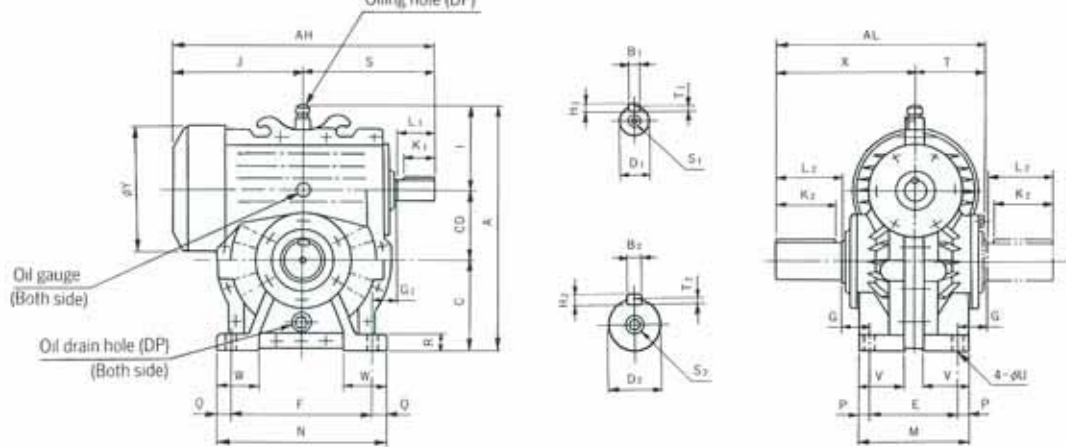
## CT Type Standard Gear Reducer With Fan, Single Input Shaft

### Size A100 ~ A175



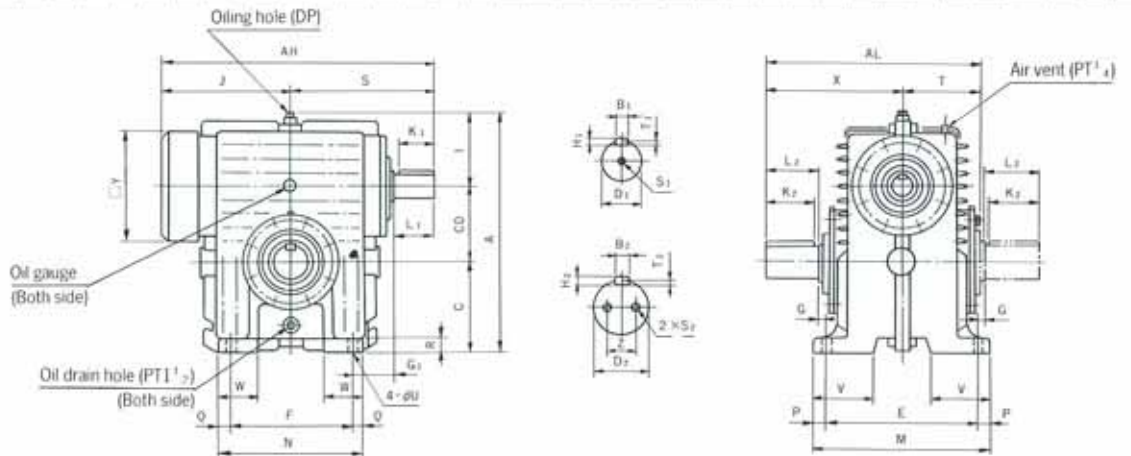
Model	A	AH	AL	C	CD	E	F	G	G <sub>1</sub>	I	J	M	N	P	Q	R	S	T	U	V	W	X	Y	Input Shaft							Output Shaft							DP	Oil quantity (ℓ)	Weight (kg)
																								D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	K <sub>2</sub>	B <sub>2</sub>	H <sub>2</sub>	T <sub>2</sub>	S <sub>2</sub>			
CT-A100	349	398	309	145	100	145	180	325	50	100	200	180	220	175	20	25	198	122	18	70	187	171	35	58	50	10	8	5	M10 ×20f	55	82	70	16	10	6	M10 ×25f	1/2	2.9	66	
CT-A125	416	480	357	165	125	155	210	475	60	125	233	200	270	225	30	30	247	127	22	100	230	225	40	82	70	12	8	5	M12 ×24f	65	105	90	18	11	7	M10 ×25f	1/2	5.0	98	
CT-A150	483	566	437	190	150	195	285	525	75	140	284	240	335	225	25	35	282	147	22	105	290	252	45	82	70	14	9	5.5	M12 ×24f	80	140	125	22	14	9	M10 ×25f	1/2	9.0	176	
CT-A175	545	625	515	210	175	225	340	625	55	160	318	275	400	25	30	40	307	170	26	115	345	252	50	82	70	14	9	5.5	M12 ×24f	90	170	155	25	14	9	M20 ×33f	3/4	13.0	250	

### Size A200 ~ A250



Model	A	AH	AL	C	CD	E	F	G	G <sub>1</sub>	I	J	M	N	P	Q	R	S	T	U	V	W	X	Y	Input shaft							Output shaft							DP	Oil quantity (ℓ)	Weight (kg)
																								D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	K <sub>2</sub>	B <sub>2</sub>	H <sub>2</sub>	T <sub>2</sub>	S <sub>2</sub>			
CT-A200	660	665	586	245	200	240	390	70	55	215	333	300	460	30	35	45	332	186	26	125	120	400	318	55	82	70	16	10	6	M15 ×24f	100	210	190	28	16	10	M20 ×33f	1	19.5	275
CT-A225	725	760	622	270	225	270	430	75	65	230	375	340	500	35	35	50	385	202	33	125	130	420	365	60	105	90	18	11	7	M16 ×29f	110	210	190	28	16	10	M20 ×33f	1	30	385
CT-A250	783	830	663	290	250	300	460	80	80	243	415	370	540	35	40	55	415	223	33	130	140	440	385	65	105	90	18	11	7	M16 ×29f	120	210	195	32	18	11	M20 ×33f	1	38	492

### Size 280 ~ 400



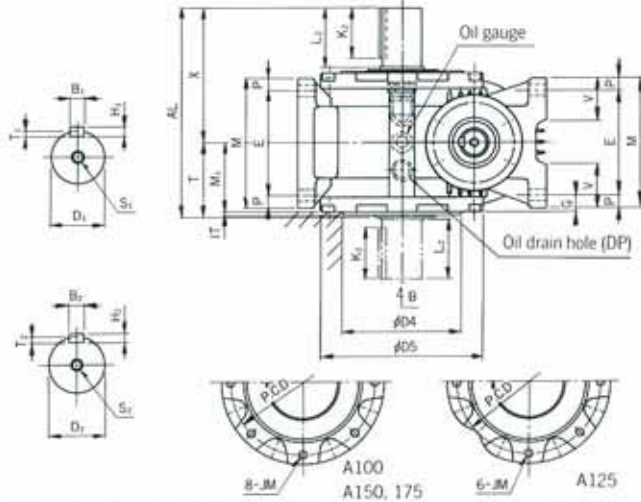
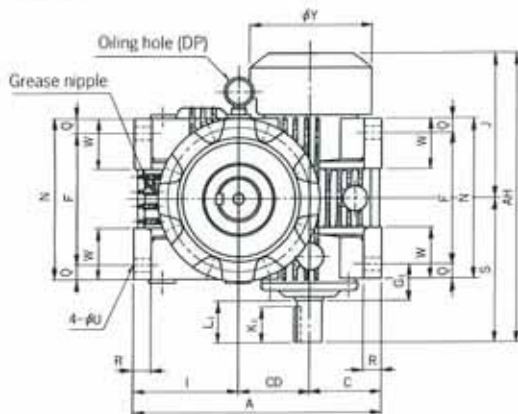
Model	A	AH	AL	C	CD	E	F	G	G <sub>1</sub>	I	J	M	N	P	Q	R	S	T	U	V	W	X	Y	Input shaft							Output shaft							DP	Oil quantity (ℓ)	Weight (kg)	
																								D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	K <sub>2</sub>	B <sub>2</sub>	H <sub>2</sub>	T <sub>2</sub>	S <sub>2</sub>				Z
CT-280	873	1000	817	335	280	360	560	100	140	258	500	640	540	40	40	55	500	277	39	220	150	540	485	80	130	115	22	14	9	M16 ×29f	140	250	250	36	20	12	M20 ×40f	80	1	100	850
CT-320	995	1105	917	380	320	390	590	110	160	285	560	700	620	55	55	65	545	302	45	250	170	615	525	90	130	115	25	14	9	M16 ×29f	160	300	300	40	22	13	M24 ×51f	100	1	140	1250
CT-360	1093	1220	950	425	360	440	640	120	180	308	595	760	686	60	63	70	625	320	52	290	183	630	545	100	165	145	28	16	10	M16 ×29f	180	300	300	45	25	15	M24 ×51f	100	1	175	1700
CT-400	1208	1310	1097	470	400	480	730	130	195	338	650	870	760	70	80	80	660	367	62	315	220	730	625	110	165	145	28	16	10	M20 ×33f	200	350	350	45	25	15	M30 ×64f	125	1	275	2270

# Dimensions

## CW Type Standard Gear Reducer With Fan, Single Input Shaft

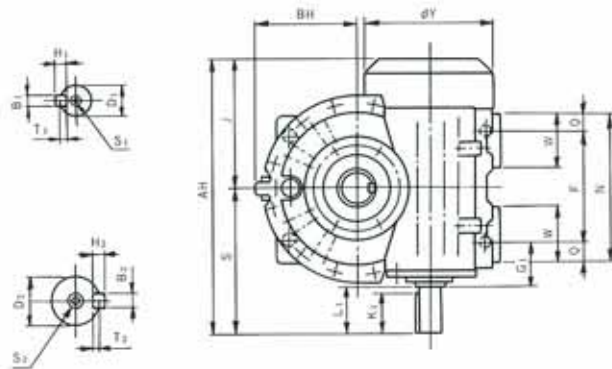
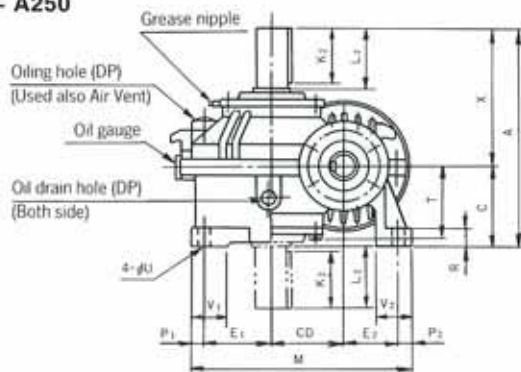
### Size A100 ~ A175

- Note. 1. High/low speed shaft dimensions : Tolerance js6 (JIS B 0401-1965)  
 2. Key and key groove : JIS B 1301-1976 parallel key, precision grade.  
 3. Oil quantity and weight are approximate.  
 4. This dimensional drawing is subject to change without notice.  
 5. Standard paint color : Munsell 10B5/3



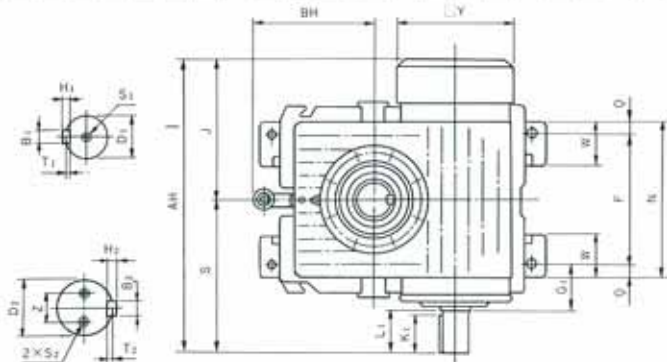
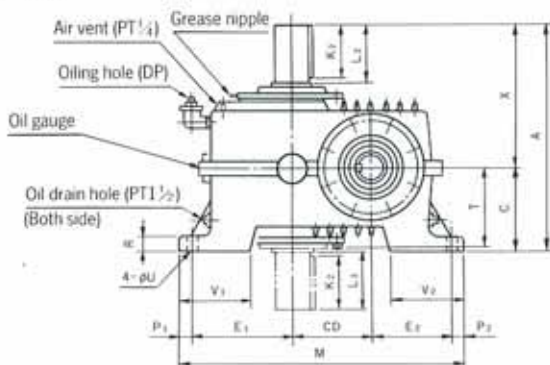
Model	A	AH	AL	C	CD	D4	D5	E	F	G	G <sub>1</sub>	I	IT	J	JM	M	MI	N	P	PCD	Q	R	S	T	U	V	W	X	Y	Input Shaft					Output Shaft					DP	Oil quan- ty (l)	Weig- ht (kg)				
																														D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	K <sub>2</sub>				B <sub>2</sub>	H <sub>2</sub>	T <sub>2</sub>	S <sub>2</sub>
CW-A100	345	398	289	100	100	165	225	145	180	225	50	145	5	200	M12 x 20	180	95	220	175	200	20	25	198	102	18	60	70	87	171	35	58	50	10	8	5	M10 x 20	55	82	70	16	10	6	M16 x 20	1/2	2.6	66
CW-A125	415	480	352	125	125	205	275	155	210	275	60	165	5	233	M12 x 25	200	105	270	225	250	30	30	247	122	22	70	100	230	225	40	82	70	12	8	5	M12 x 24	65	105	90	18	11	7	M16 x 20	1/2	4.5	98
CW-A150	480	566	436	140	150	260	330	195	285	275	57.5	190	5	284	M12 x 25	240	125	335	225	300	25	35	282	146	22	65	105	290	252	45	82	70	14	9	5.5	M12 x 24	80	140	125	22	14	9	M16 x 20	1/2	8.1	176
CW-A175	545	625	515	160	175	300	380	225	340	325	55	210	6	318	M16 x 35	275	145	400	25	350	30	40	307	170	26	100	115	345	252	50	82	70	14	9	5.5	M12 x 24	90	170	155	25	14	9	M20 x 30	3/4	12.0	250

### Size A200 ~ A250



Model	A	AH	BH	C	CD	E <sub>1</sub>	E <sub>2</sub>	F	G <sub>1</sub>	J	M	N	P <sub>1</sub>	P <sub>2</sub>	Q	R	S	T	U	V <sub>1</sub>	V <sub>2</sub>	W	X	Y	Input shaft					Output shaft					DP	Oil quan- ty (l)	Weig- ht (kg)				
																									D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	K <sub>2</sub>				B <sub>2</sub>	H <sub>2</sub>	T <sub>2</sub>	S <sub>2</sub>
CW-A200	590	665	245	190	200	160	150	340	80	333	580	410	35	35	35	45	332	186	26	110	100	130	400	318	55	82	70	16	10	6	M16 x 20	100	210	190	28	16	10	M20 x 30	1	11	295
CW-A225	630	760	280	210	225	190	165	380	90	375	670	480	50	40	50	385	202	33	130	110	150	420	365	60	105	90	18	11	7	M16 x 20	110	210	190	28	16	10	M20 x 30	1	20	405	
CW-A250	670	830	300	230	250	210	180	430	95	415	750	540	65	45	55	415	223	33	140	120	160	440	385	65	105	90	18	11	7	M16 x 20	120	210	195	32	18	11	M20 x 30	1	28	540	

### Size 280 ~ 400



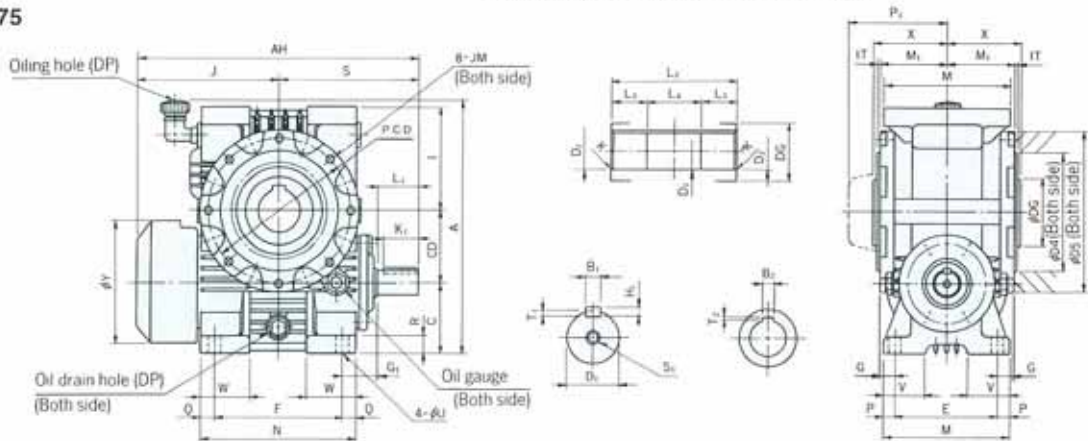
Model	A	AH	BH	C	CD	E <sub>1</sub>	E <sub>2</sub>	F	G <sub>1</sub>	J	M	N	P <sub>1</sub>	P <sub>2</sub>	Q	R	S	T	U	V <sub>1</sub>	V <sub>2</sub>	W	X	Y	Input shaft					Output shaft					DP	Oil quan- ty (l)	Weig- ht (kg)					
																									D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	K <sub>2</sub>				B <sub>2</sub>	H <sub>2</sub>	T <sub>2</sub>	S <sub>2</sub>	Z
CW-280	830	1000	365	290	280	360	265	460	140	500	985	540	40	40	40	55	500	277	39	250	250	150	540	485	80	130	115	22	14	9	M16 x 20	140	250	250	36	20	12	M20 x 40	80	1 1/2	65	890
CW-320	935	1105	402	320	320	392.5	297.5	510	160	560	1120	620	55	55	55	65	545	302	45	270	270	170	615	525	90	130	115	25	14	9	M16 x 20	160	300	300	40	22	13	M24 x 51	100	1 1/2	95	1270
CW-360	960	1220	455	330	360	430	320	560	180	595	1230	695	60	60	67.5	70	625	320	52	320	320	187	630	545	100	165	145	28	16	10	M16 x 20	180	300	300	45	25	15	M24 x 51	100	1 1/2	120	1730
CW-400	1105	1310	495	375	400	485	370	600	195	650	1395	772	70	70	86	80	660	367	62	335	335	226	730	625	110	165	145	28	16	10	M20 x 33	200	350	350	45	25	15	M30 x 64	125	1 1/2	175	2330

# Dimensions

## CHB Type Standard Gear Reducer With Fan, Single Input Shaft

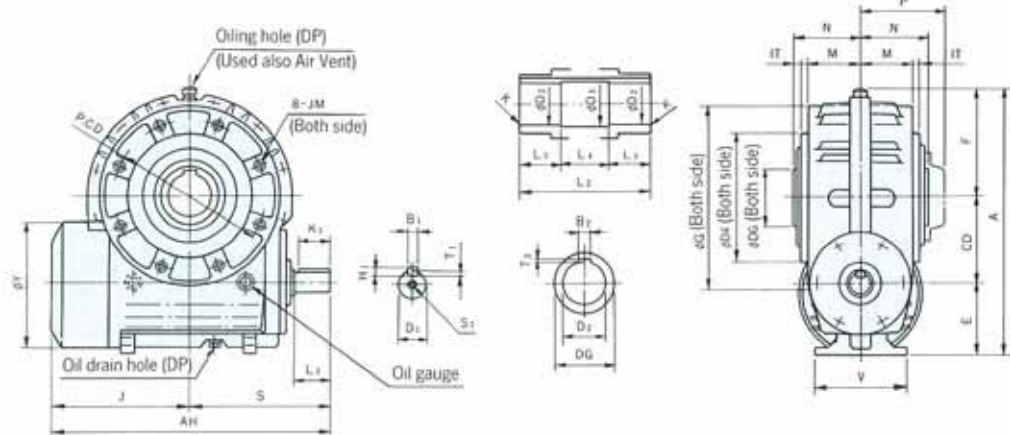
- Note. 1. High/low speed shaft dimensions : Tolerance js6/H7 (JIS B 0401-1965)  
 D<sub>s</sub> dimensions : Tolerance h8 (JIS B 0401-1965)  
 2. Key and key groove : JIS B 1301-1976 parallel key, precision grade.  
 3. Oil quantity and weight are approximate.  
 4. This dimensional drawing is subject to change without notice.  
 5. Standard paint color : Munsell 10B5/3

### Size A100 - A175



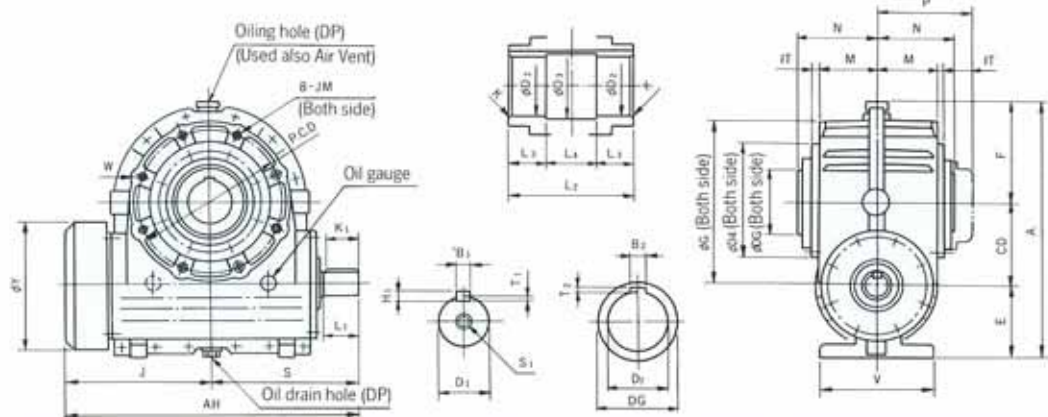
Model	A	AH	C	CD	D <sub>s</sub>	D <sub>s</sub>	E	F	G	G <sub>1</sub>	I	IT	J	JM	M	M <sub>1</sub>	N	P	P <sub>1</sub>	PCD	Q	R	S	U	V	W	X	Y	Input Shaft								Output Shaft								DP	Oil quantity (ℓ)	Weight (kg)
																													D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	DG	B <sub>2</sub>	T <sub>2</sub>	D <sub>3</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	K			
CHB-A100	352	398	100	100	165	225	145	180	225	50	145	4	200	M12 x13f	180	95	220	175	139	200	20	25	198	18	60	70	105	171	35	58	50	10	8	5	M10 x20f	60	95	18	4.4	61	210	60	90	C3	1/2	1.5	61
CHB-A125	423	480	125	125	205	275	155	210	275	60	165	5	233	M12 x25f	200	105	270	225	153	250	30	30	247	22	70	100	115	225	40	82	70	12	8	5	M12 x24f	65	100	18	4.4	66	230	70	90	C3	1/2	3.0	84
CHB-A150	489	566	140	150	260	330	195	285	275	57.5	190	5	284	M12 x29f	240	125	335	225	170	300	25	35	282	22	65	105	135	252	45	82	70	14	9	5.5	M12 x24f	75	105	20	4.9	76	270	80	110	C3	1/2	4.5	163
CHB-A175	549	625	160	175	300	380	225	340	325	55	210	6	318	M16 x33f	275	145	400	25	186	350	30	40	307	26	100	115	145	252	50	82	70	14	9	5.5	M12 x24f	80	115	22	5.4	81	290	85	120	C3	3/4	7.5	224

### Size A200 - A250



Model	A	AH	CD	E	F	G	D <sub>s</sub>	IT	PCD	JM	J	M	N	P	S	V	Y	Input shaft								Output shaft								DP	Oil quantity (ℓ)	Weight (kg)
																		D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	DG	B <sub>2</sub>	T <sub>2</sub>	D <sub>3</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	K			
CHB-A200	620	665	200	175	245	385	280	16	340	M16 x28f	333	125	160	210	332	200	318	55	82	70	16	10	6	M16 x29f	95	140	25	5.4	96	320	95	130	C4	1	7	250
CHB-A225	685	760	225	190	279	440	330	17	390	M20 x35f	375	140	175	230	385	230	365	60	105	90	18	11	7	M16 x29f	110	160	28	6.4	111	350	105	140	C4	1	10	350
CHB-A250	745	830	250	200	295	485	370	18	430	M20 x38f	415	155	190	250	415	260	385	65	105	90	18	11	7	M16 x29f	125	180	32	7.4	126	380	115	150	C4	1	13	450

### Size 280 - 400



Model	A	AH	CD	E	F	G	I	IT	PCD	JM	J	M	N	P	S	V	W	Y	Input shaft								Output shaft								DP	Oil quantity (ℓ)	Weight (kg)
																			D <sub>1</sub>	L <sub>1</sub>	K <sub>1</sub>	B <sub>1</sub>	H <sub>1</sub>	T <sub>1</sub>	S <sub>1</sub>	D <sub>2</sub>	DG	B <sub>2</sub>	T <sub>2</sub>	D <sub>3</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	K			
CHB-280	868	1000	280	250	338	550	400	24	490	M24 x50f	500	195	260	320	500	380	30	440	80	130	115	22	14	9	M16 x29f	140	220	36	8.4	141	520	120	280	C4	1	22	660
CHB-320	983	1105	320	280	383	630	480	24	580	M24 x50f	560	210	280	340	545	400	35	480	90	130	115	25	14	9	M16 x29f	160	250	40	9.4	161	560	140	280	C4	1	31	1040
CHB-360	1083	1220	360	305	418	695	515	26	640	M30 x50f	595	230	300	370	625	400	35	530	100	165	145	28	16	10	M16 x29f	180	280	45	10.4	181	600	150	300	C5	1	39	1450
CHB-400	1193	1310	400	340	453	775	575	30	710	M30 x50f	650	265	345	415	660	480	40	600	110	165	145	28	16	10	M20 x33f	200	300	45	10.4	201	690	165	360	C5	1	58	2040