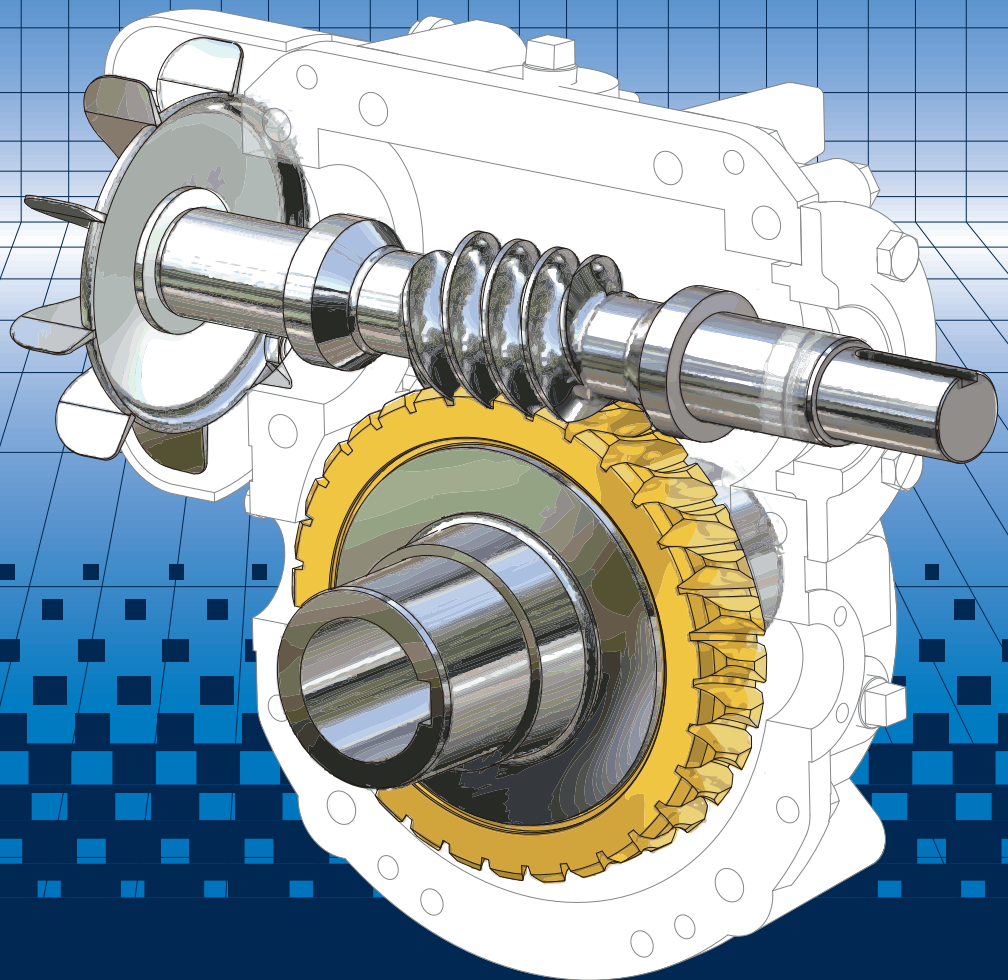


MHI HASEG NIEMANN WORM GEAR UNIT WORM GEAR SET



MHI HASEG CO., LTD.



MHI HASEG NIEMANN WORM GEAR UNIT WORM GEAR SET

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MHI HASEG High-Efficiency Worm Gear Units Save Cost, Space and Energy, Eliminate Design, Assembly and Maintenance Problems.

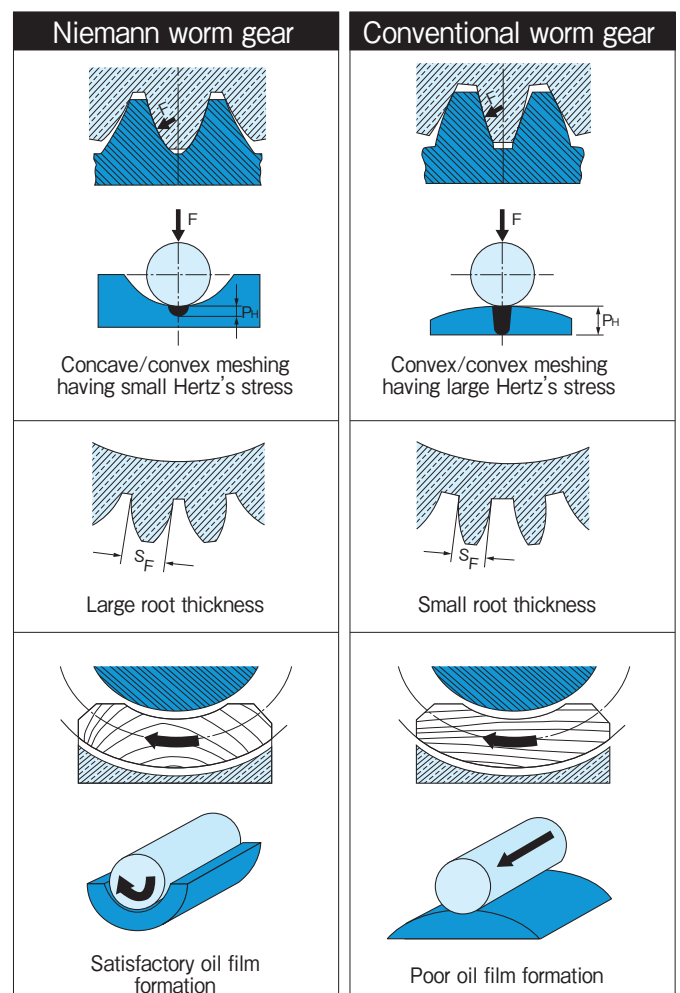
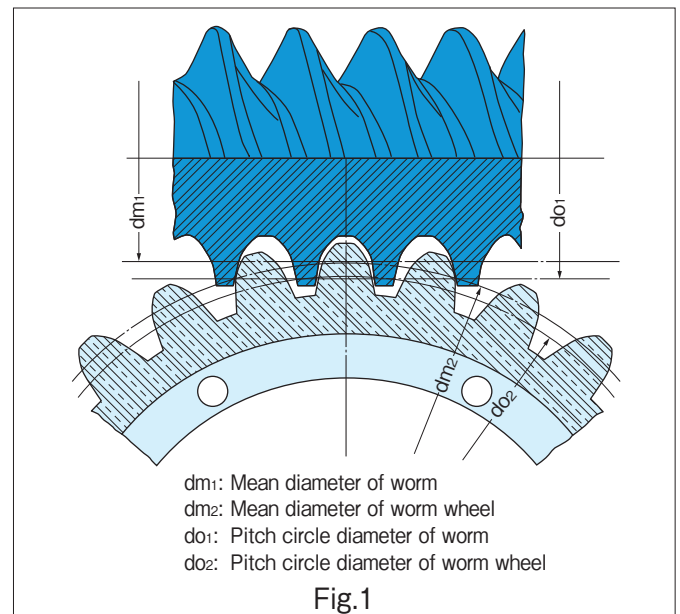
- Proven Niemann configuration has been further improved.
- Easy handling of cylindrical worm.
- New models give Series even wider range.

Unique Niemann Tooth Profile Raises Transmission Efficiency

The MHI HASEG Worm Gear Unit features a unique Niemann tooth profile. The worm is cylindrical and its tooth profile is a special concave (longitudinal cross-section). Correspondingly, the worm wheel tooth profile is a conjugate convex. The intermeshing pitch line is near the tooth tip, forming a profile shifted gear. This configuration reduces power transmission loss, thus enhancing efficiency.

Features

1. The worm and worm wheel mesh with each other on concave and convex surfaces. This increases the relative radius of curvature and reduces stress on the tooth surface, thus raising relative transmission capacity.
2. Worm wheel tooth thickness can be increased without weakening worm strength, giving the teeth higher bending strength.
3. The line of simultaneous contact between worm and worm wheel forms a nearly 90° angle in the direction of motion, facilitating the formation of a lubricating oil film between the teeth surfaces, for higher transmission efficiency. This film also reduces abrasion, resulting in longer tooth life.
4. The excellent performance characteristics of MHI HASEG worm gears are available in a wide range of worm gear units, all offering superior efficiency and reliability.
5. An easy handling cylindrical worm is employed for quick, simple assembly and maintenance. Separate worm gear sets (worm and worm wheel) are available for specific applications.



1. Selection of Worm Gear Unit

1-1 Selection of reduction gear ratio

The reduction gear ratio is determined from the required speed for the input and output shafts.

1) Select a standard nominal reduction gear ratio from the tables (pgs. 13-20). Note that those in stock are advantageous in terms of delivery time and price.

2) Check the required speed for actual use by using the actual reduction gear ratio shown in the output torque tables (pgs. 13-20).

If the standard reduction gear ratio of the unit or gear set shown in the tables is not suitable for the intended application, consult MHI HASEG or an MHI HASEG agent.

1-2. Selection of unit type

Select the most suitable unit from the tables of external dimensions (pgs. 21-45).

Note that any unit ordered with dimensions different from those given in the tables will be regarded as a special order unit.

The direction of rotation of input and output shafts in the tables shows the MHI HASEG standard "lead right hand," or right hand helix. Standard installation is horizontally on the floor.

1-3. Selection of size

The capacity of the worm gear unit must satisfy one of the following two formulas which represent the relation between the required equivalent output torque (or equivalent input power) and the allowable continuous output torque (or nominal input power) of the unit.

The equivalent output torque or input power is calculated by multiplying the required output torque or required input power by an appropriate service factor.

$$\text{Equivalent output torque (T}_{2E}\text{Nm)} = \text{Service factor (f)} \times \text{Required output torque (T}_2\text{Nm)} \leq \text{Allowable continuous output torque (T}_{2N}\text{Nm)}$$

$$\text{Equivalent input power (N}_{1E}\text{kW)} = \text{Service factor (f)} \times \text{Required input power (N}_1\text{kW)} \leq \text{Nominal input power (N}_{1N}\text{kW)}$$

Service factor (f) — Select either f_M or f_T , whichever is larger.

Calculate f_M and f_T follows:

$$f_M \text{ (correction factor for mechanical effects)} = f_1 \cdot f_2$$

f_1 coefficient of operating conditions and time

Load (nature) \ Duration of service hr/day	1/2 hr. or less	2 hrs. or less	10 hrs. or less	16 hrs. or less	24 hrs. or less
Uniform	0.8	0.9	1.0	1.1	1.2
Moderate shock	0.9	1.0	1.2	1.3	1.4
Heavy shock	1.0	1.2	1.3	1.4	1.5

(These values can be applied to the loads of prime movers such as electric motors, hydraulic motors, and turbines. They generally can not

be applied to the loads of internal combustion engines, however, please consult MHI HASEG for confirmation.

f_2 coefficient of starting frequency

Start per hour		
to 10	above 10 to 100	above 100 to 500
1	1.1	1.2

$$f_T \text{ (correction factor for thermal effects)} = f_3 \cdot f_4 \cdot f_5$$

f_3 coefficient of loadtime factor and ambient temperature

Ambient temperature Loadtime factor rate	20°C	30°C	40°C	50°C
100%	1.0	1.2	1.4	1.7
60%	0.9	1.0	1.2	1.4
20%	0.6	0.7	0.8	1.0

$$\text{Loadtime factor rate (\%)} = \frac{\text{Loaded operating time (mins./hr.)}}{60} \times 100$$

f_4 coefficient of worm gear unit's types and sizes

Type Size	SUHW SEUH SCUH	SHVW SEHV SCHV	SOHW SEOH SCOH	SUHA SEUA SCUA	SHVA SEHA SCHA	SOHA SEOA SCOA
65 ~ 99	1	1	1	1	1	1
100 ~ 250	1	1.1	1.2	1.3	1.4	1.5
280 ~ 400	1	—	1.3	1.4	1.5	1.6
450, 500	1	—	—	—	—	—

f_5 coefficient of heat transfer with and without cooling fan

For the standard worm gear unit or equivalent unit, use the value $f_5 = 1$ regardless of type, size, and speed.

For separate worm gear sets without cooling fan, use coefficient from following table.

Worm speed n_1 (min ⁻¹) Size	1800	1500	1000	750	500	300
65 ~ 99	1	1	1	1	1	1
100 ~ 225	1.4	1.45	1.65	1.65	1.5	1.3
250 ~ 500	1.5	1.6	1.9	1.95	1.8	1.6

Required output torque (T_2)
Necessary output torque for the output shaft of the worm gear unit
Required input power (N_1)
Power applied to the input shaft of the worm gear unit

- Give due consideration to efficiency, lubrication, and overhang load.
- Standard service life is 25,000 hrs. (mean value), on the condition that the proper unit for the load is selected.

Allowable continuous output torque (T_{2N})
Nominal input power (N_{1N})

- These values are determined from the input power and output Torque tables.
- The maximum output torque value (T_{2max}) can not be used as the basis for selecting the unit, but it shows the allowable torque for peak load during normal continuous operation.
- Starting input torque is permissible up to 2.5 times the torque value calculated from the nominal input power value (N_{1N}), when the number of starts per hour is 10 or less.

Refer to page 11 as to selection procedures.

2. Important Items to Consider

2-1. Efficiency

A. Operating Efficiency η

Operating efficiency of the MHI HASEG worm gear unit and worm gear set is calculated by the following formula:

$$\eta = \frac{T_{2N} \cdot n_2}{N_{1N} \cdot 9550} \times 100(\%)$$

T_{2N} : allowable continuous output torque

n_2 : actual output shaft speed

N_{1N} : nominal input power

These values can be obtained from the tables on pgs. 13-20.

B. Reversing Efficiency η'

When worm gear unit and worm gear set are driven from output shaft and worm wheel, the efficiency is calculated by the following formula:

$$\eta' = \left(2 - \frac{100}{\eta} \right) \times 100$$

C. Starting Efficiency η_A

At startup, a larger torque value is required than during normal operation. Be sure to check starting efficiency when determining required driving power.

Approximate starting efficiency (η_A) can be obtained from table 1 of worm lead angle and fig. 2 of starting efficiency. In case of extended shutdown (over two minutes) under loaded condition, efficiency decreases to 70% of the determined value.

Determination of the above two efficiencies is under the condition that the worm gear unit drives the machine under full load. In addition, operation must be correctly carried out, in conformity with operating instructions, with regard to running-in operation, tooth bearing, roller bearings, lubrication, etc.

2-2. Self-locking Properties

A. Mechanical Braking Necessity

A worm gear unit with a lead angle less than 5° when stationary, can not be operated by applying power at the worm wheel. This type of worm gear is known as a "gear having self-locking characteristic when stationary." This type of gear may start to rotate when subjected to slight shock or vibration if operated only with steady or light loads, and consequently will lose its self-locking function as a brake.

B. Danger Due to Self-locking

To cite an example, in the case of travelling cranes or other large machines which have extremely large kinetic energy due to large inertial mass and velocity, the self-locking function can be a danger.

In these cases, observe the following:

- 1) Do not bring the machine to a sudden stop, causing an abnormal load.
- 2) Use a gear unit with a lead angle above 10° .
- 3) When mounting a brake mechanism on the worm shaft, the braking torque (T_B) must satisfy the following formula:

$$T_B \leq \frac{T_{2MAX} \cdot \eta'_A}{i \cdot 100} \text{ (Nm)}$$

T_{2max} : allowable max. output torque (daNm) at min. Speed

i : actual reduction gear ratio

η'_A : reversing starting efficiency

$$\eta'_A = \left(2 - \frac{100}{\eta_A} \right) \times 100$$

Fig. 2 Starting efficiency η_A

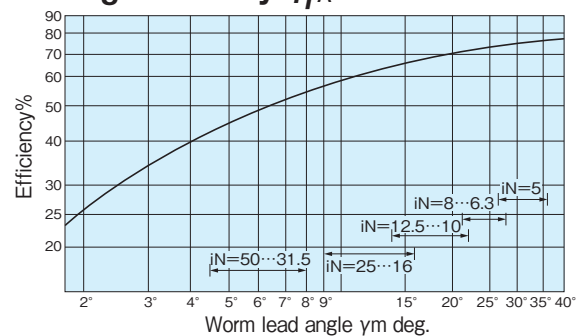


Table 1 Worm lead angle γ_m (degrees)

Size E iN nominal gear ratio	65	80	100	125	160	200	225	250	280	320	360	400	450	500
5	27.0	27.3	30.4	30.6	33.1	32.3	—	34.0	—	—	—	—	—	—
6.3	22.1	22.4	25.2	25.3	27.5	26.8	32.3	28.4	—	—	—	—	—	—
8	21.5	22.1	22.4	25.2	25.3	27.5	26.8	26.8	—	—	—	—	—	—
10	15.7	16.5	17.2	17.9	18.6	20.1	17.7	19.7	18.1	21.2	21.7	22.1	28.3	25.9
12.5	—	—	15.3	15.9	16.2	17.4	20.1	17.7	19.7	18.1	21.2	21.7	22.1	—
16	10.6	11.2	11.7	12.1	12.7	13.7	12.0	13.4	12.3	14.5	14.8	15.1	—	—
20	10.9	10.6	11.2	11.7	12.1	12.7	12.1	13.7	12.1	13.4	12.9	14.5	14.8	15.1
25	8.7	9.5	9.9	10.3	10.8	11.0	11.3	11.8	12.1	12.0	13.4	12.3	12.9	—
31.5	5.4	5.7	5.9	6.1	6.4	7.0	6.1	6.8	6.2	7.4	7.5	7.7	7.8	7.9
40	5.5	5.4	5.7	5.9	6.1	6.4	6.1	7.0	6.1	6.8	6.5	7.4	7.5	7.7
50	4.4	4.8	5.0	5.2	5.4	5.5	5.7	6.0	6.1	6.1	6.8	6.2	6.5	5.5

Note: The lead angle of size 99 worm is the same as that of 100 mm worm.

2-3. Lubrication

In general, immersed or splashed lubrication is employed for MHI HASEG worm gear units. The lubricating oil is the specified polyglycols synthetic oil. As worm gears are subject to more severe condition than other types of gears, carefully observe the operating instructions with regard to types of lubricating oil and their viscosities. In some cases, special specifications will be

necessary according to speed requirements, e.g., high speed units with forced lubrication systems or low speed units requiring greasing systems for some of the bearings. Rotational speeds requiring forced lubrication are indicated by asterisks in the input power and output torque tables. Contact MHI HASEG or an MHI HASEG agent for further information about lubrication methods.

Lubricant selection table

Single stage worm gear unit & worm gear set

iN: Nominal reduction gear ratio

n₁: Worm shaft speed (min⁻¹)

Size		65	80	99 100	125	160	200	225	250	280	320	360	400	450	500
i N	n ₁ (min ⁻¹)														
5 6.3	1800								●	—	—	—	—	—	—
	1500									—	—	—	—	—	—
	1000									—	—	—	—	—	—
	750									—	—	—	—	—	—
	500									—	—	—	—	—	—
	300									—	—	—	—	—	—
	150									—	—	—	—	—	—
8 10 16 31.5	1800									●	●	●	●	●	●
	1500												●	●	●
	1000														
	750														
	500														
	300														
	150														
12.5	1800										●	●	●	●	●
	1500													●	●
	1000														
	750														
	500														
	300														
	150														
20 40	1800											●	●	●	●
	1500														●
	1000														
	750														
	500														
	300														
	150														
25 50	1800												●	●	●
	1500														●
	1000														
	750														
	500														
	300														
	150														

●	Forced lubrication KLÜBERSYNTH GH6-220	} Immerse the worm shaft in the oil up to its rotation center.
■	Immersed or splashed lubrication KLÜBERSYNTH GH6-220	
□	Immersed or splashed lubrication KLÜBERSYNTH GH6-460	

Note: Sold by NOK Ltd. or KLÜBER

Double stage worm gear (unit)

SEUH · SEHV · SEOH · SEUA · SEHA · SEOA

iN: Nominal reduction gear ratio n₁: Worm shaft speed (min⁻¹)

Size		100	125	160	200	225	250	280	320	360	400	450	500
iN	n ₁ (min ⁻¹)												
63 80 125 160 200 250	1800												
	1500												
	1000												
	750												
	500												
	300												
	150												
100	1800												
	1500												
	1000												
	750												
	500												
	300												
	150												

SCUH · SCHV · SCUA · SCHA

iN: Nominal reduction gear ratio n₁: Worm shaft speed (min⁻¹)

Size		100	125	160	200	225	250	280	320	360	400	450	500
iN	n ₁ (min ⁻¹)												
315 1000	1800												
	1500												
	1000												
	750												
	500												
	300												
	150												
630 1250 1600	1800												
	1500												
	1000												
	750												
	500												
	300												
	150												

SCOH · SCOA

iN: Nominal reduction gear ratio n₁: Worm shaft speed (min⁻¹)

Size		100	125	160	200	225	250	280	320	360	400
iN	n ₁ (min ⁻¹)										
315 1000	1800										
	1500										
	1000										
	750										
	500										
	300										
	150										
630 1250 1600	1800										
	1500										
	1000										
	750										
	500										
	300										
	150										

Immersed or splashed lubrication KLÜBERSYNTH GH6-220
Immersed or splashed lubrication KLÜBERSYNTH GH6-460
Immersed or splashed lubrication Front stage KLÜBERSYNTH GH6-220
Rear stage KLÜBERSYNTH GH6-460

Note: For SEOA types 280 to 400 and for double stage worm gear types (exclusive of SCOH types 100 to 225 and SCOA types 125 to 225), each unit type oil case is divided into front and rear cases. Therefore, carefully observe the classification of lubricating oil usage and supply.

2-4. Moment of inertia: J (values with respect to input shaft)

(Unit: kg-m²)

Type	Size			Nominal reduction gear ratio iN	Size												Type
	65	80	99		100	125	160	200	225	250	280	320	360	400	450	500	
SUHA SHVA SOHA SUHW SHVW SOHW	0.00020	0.00050	0.00150	5	0.00225	0.00750	0.01875	0.0550	—	0.1425	—	—	—	—	—	—	SUHA SHVA SOHA SUHW SHVW SOHW
	0.00015	0.00050	0.00125	6.3	0.00200	0.00650	0.01525	0.0475	0.0775	0.1125	—	—	—	—	—	—	
	0.00013	0.00025	0.00100	8	0.00175	0.00525	0.01175	0.0350	0.0575	0.0850	—	—	—	—	—	—	
	0.00010	0.00023	0.00075	10	0.00150	0.00500	0.01175	0.0350	0.0550	0.0825	0.1475	0.2275	0.3450	0.4850	0.8400	1.1550	
	—	—	0.00075	12.5	0.00150	0.00475	0.01100	0.0325	0.0525	0.0775	0.1325	0.2075	0.3125	0.4325	0.7450	—	
	0.00008	0.00020	0.00075	16	0.00150	0.00500	0.01075	0.0300	0.0500	0.0750	0.1275	0.1975	0.2950	0.4100	—	—	
	0.00005	0.00013	0.00050	20	0.00125	0.00400	0.00925	0.0275	0.0450	0.0625	0.1125	0.1700	0.2500	0.3325	0.5975	0.8575	
	0.00005	0.00010	0.00050	25	0.00125	0.00400	0.00875	0.0275	0.0600	0.1075	0.1600	0.2350	0.3200	0.5550	0.5550	—	
	0.00005	0.00015	0.00050	31.5	0.00125	0.00425	0.00925	0.0275	0.0475	0.0675	0.1175	0.1750	0.2575	0.3625	0.6175	0.8775	
	0.00003	0.00010	0.00050	40	0.00100	0.00350	0.00825	0.0240	0.0375	0.0575	0.1025	0.1525	0.2200	0.2950	0.5250	0.7525	
	0.00003	0.00008	0.00050	50	0.00100	0.00350	0.00775	0.0235	0.0375	0.0550	0.0950	0.1450	0.2100	0.2875	0.4975	0.7925	
				63	0.00030	0.00110	0.00275	0.0075	0.0103	0.0128	0.0275	0.0350	0.0750	0.0875	0.2150	0.2525	SEUA SEHA SEOA SEUH SEHV SEOH
				80	0.00023	0.00083	0.00220	0.0050	0.0073	0.0085	0.0193	0.0250	0.0550	0.0650	0.1475	0.1650	
				100	0.00058	0.00170	0.00425	0.0110	0.0143	0.0195	0.0425	0.0550	0.1075	0.1300	0.3000	0.3600	
				125	0.00030	0.00110	0.00275	0.0075	0.0103	0.0128	0.0275	0.0350	0.0750	0.0875	0.2150	0.2525	
				160	0.00023	0.00083	0.00200	0.0050	0.0073	0.0085	0.0193	0.0250	0.0550	0.0650	0.1475	0.1650	
				200	0.00018	0.00550	0.00150	0.0035	0.0045	0.0055	0.0115	0.0153	0.0325	0.0400	0.0975	0.1150	
				250	0.00018	0.00550	0.00150	0.0035	0.0045	0.0055	0.0115	0.0153	0.0325	0.0400	0.0975	0.1150	
				315	0.00010	0.00013	0.00025	0.0008	0.0010	0.0035	0.0043	0.0090	0.0095	0.0225	0.0248	0.0650	SCUA SCHA SCOA SCUH SCHV SCOH
				630	0.00005	0.00005	0.00013	0.0005	0.0008	0.0023	0.0025	0.0058	0.0060	0.0150	0.0155	0.0400	
				1000	0.00005	0.00005	0.00015	0.0005	0.0008	0.0020	0.0023	0.0058	0.0055	0.0150	0.0163	0.0400	
				1250	0.00003	0.00003	0.00010	0.0008	0.0008	0.0020	0.0020	0.0050	0.0048	0.0133	0.0128	0.0350	
				1600	0.00003	0.00003	0.00008	0.0005	0.0005	0.0018	0.0020	0.0045	0.0048	0.0125	0.0128	0.0325	

2-5. Overhang Load

The allowable overhang load on the output shaft can be calculated from the following formula using the output speed and output shaft torque. However, these figures can not be applied to units on which thrust load is being exerted, nor to units with hollow shafts. In these cases, contact MHI HASEG for clarification.

For standard specification units

$$F_R = f_L \times R$$

F_R = allowable overhang load (N)
 f_L = coefficient of output shaft speed (from table 2)
 R = basic overhang load (N) (from table 3)

For special specification units (units reinforced against overhang load)

$$F_{R'} = f_L \times R'$$

$F_{R'}$ = allowable overhang load for unit with reinforcement specification (N)
 f_L = coefficient of output shaft speed (from table 2)
 R' = basic overhang load for unit with reinforcement specification (N) (from table 3)

- Note
- 1) Overhang load acting point is regarded as intermediate point, i.e., $L_2/2$ (see fig.3)
 - 2) When output shaft is thinner than standard shaft or when it is subject to impact load, consult MHI HASEG.
 - 3) When the unit has an output shaft at both ends, the allowable overhang load of each shaft is $F_R/2$ or $F_{R'}/2$.

Example:

A unit having size 125, output shaft speed 20 min^{-1} , and output torque $T_2160\text{daNm}$. The allowable overhang load (F_R) for the unit is as follows:
 For standard specification unit:
 $f_L = 0.75$ $R = 10000$ $\therefore F_R = 0.75 \times 10000 = 7500\text{ (N)}$
 For reinforced specification unit:
 $f_L = 0.75$ $R' = 19500$ $\therefore F_{R'} = 0.75 \times 19500 = 14625\text{ (N)}$

Table 2 Coefficient of output shaft speed

Output shaft speed (min ⁻¹)	Coefficient (f _L)
6.3	1
8	0.95
10	0.9
12.5	0.85
16	0.8
20	0.75
25	0.7
31.5	0.66
40	0.62
50	0.58
63	0.54
80	0.5
100	0.47
125	0.44
160	0.41
200	0.38
250	0.35
315	0.32

Fig. 3 Overhang load acting point

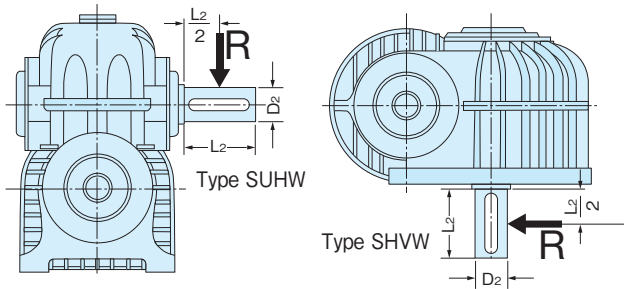


Table 3 Basic load table (not applicable to hollow shaft type)

Size 65			Size 80			Size 99			Size 100			Size 125		
Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N
180	5300	Reinforcement impractical	280	6600	Reinforcement impractical	355	7800	Reinforcement impractical	560	9100	16200	800	10600	21000
200	5300		315	6600		400	7800		630	9100	16200	900	10600	21000
224	5200		355	6500		450	7800		710	9000	16000	1000	10500	20800
250	5100		400	6400		500	7700		800	8900	15700	1120	10400	20600
280	5000		450	6300		560	7500		900	8800	15400	1250	10300	20300
315	4800		500	6100		630	7300		1000	8600	15000	1400	10200	19900
355	4600		560	5900		710	7000		1120	8400	14200	1600	10000	19500
400	4400		630	5700		800	6700		1250	8100	13300	1800	9800	18900
450	4100		710	5400		900	6400		1400	7700	12300	2000	9500	17700
500	3600		800	5000		1000	6000		1600	6900	10800	2240	9000	16100
560	2000		900	3800		1120	5500		1800	5900	8800	2500	8200	13800
630	0		1000	0		1250	4700		2000	4000	4600	2800	6500	10500
						1400	2500		2240	0	0	3150	2800	5000
						1600	0					3550	0	0

Size 160			Size 200			Size 225			Size 250			Size 280		
Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N
1400	14100	32000	2500	18200	47000	3150	20800	56000	4500	24000	68000	5600	26500	83000
1600	14100	32000	2800	18200	47000	3550	20800	56000	5000	24000	68000	6300	26500	83000
1800	14000	31600	3150	18000	46500	4000	20600	55000	5600	23800	67500	7100	26300	82500
2000	13800	31200	3550	17700	45500	4500	20300	54000	6300	23500	66500	8000	26000	81500
2240	13600	30200	4000	17400	44000	5000	20000	52500	7100	23000	65000	9000	25700	80000
2500	13300	29000	4500	17000	42500	5600	19500	51000	8000	22500	63500	10000	25400	78500
2800	13000	27800	5000	16600	40500	6300	19000	49000	9000	22000	61500	11200	25000	76500
3150	12500	26500	5600	16100	38000	7100	18500	46500	10000	21300	59000	12500	24600	74000
3550	12000	24300	6300	15400	35500	8000	17800	44000	11200	20600	55500	14000	24000	71000
4000	10900	21600	7100	14000	31500	9000	16700	41000	12500	19400	49500	16000	23000	65500
4500	9400	17300	8000	12300	26000	10000	15500	37500	14000	17500	43000	18000	21000	58000
5000	5000	9000	9000	7000	15000	11200	13800	31000	16000	14800	33000	20000	19000	49000
5500	0	0	10000	0	0	12500	8000	20000	18000	8000	18000	22400	13000	34000
						14000	0	0	20000	0	0	25000	0	0

Size 320			Size 360			Size 400			Size 450		Size 500	
Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Reinforced spec R' N	Output torque T ₂ Nm	Standard spec R N	Output torque T ₂ Nm	Standard spec R N
7100	29500	100000	9000	33000	119000	12500	38000	142000	18000	168000	22400	195000
8000	29500	100000	10000	33000	119000	14000	38000	142000	20000	168000	25000	195000
9000	29500	99000	11200	33000	117000	16000	37700	140000	22400	166000	28000	193000
10000	29200	98000	12500	32800	115000	18000	37300	138000	25000	164000	31500	191000
11200	28800	96000	14000	32400	112000	20000	36800	135000	28000	162000	35500	188000
12500	28300	94000	16000	32000	109000	22400	36200	131000	31500	159000	40000	185000
14000	27800	91000	18000	31500	106000	25000	35600	127000	35500	156000	45000	182000
16000	27200	88000	20000	30800	103000	28000	34800	122000	40000	152000	50000	178000
18000	26500	84000	22400	29800	98000	31500	34000	117000	45000	145000	56000	174000
20000	25300	78000	25000	28300	93000	35500	32000	110000	50000	134000	63000	168000
22400	23800	70000	28000	26500	85000	40000	30000	98000	56000	120000	71000	158000
25000	21500	60000	31500	24800	74000	45000	26500	82000	63000	103000	80000	139000
28000	17500	44000	35500	20000	55000	50000	17000	57000	71000	60000	90000	116000
31500	8000	19000	40000	8000	21000	56000	0	0	80000	0	100000	65000
35500	0	0	45000	0	0						112000	0

3. Unit Size Selection Procedures

A. Service Conditions

- Driver: Conveyor (fluctuating load, medium impact)
- Prime mover: Electric motor (5.5 kW, 1,500 min⁻¹) coupled directly to input shaft
- Reduction gear ratio: $i_N = 31.5$
- Required input power: 5.5 kW
- Maximum output torque: $T_{2MAX} = 1800 \text{ Nm}$
- Operating hours/day: 16
- Number of starts/hour: 30
- Loadtime factor rate: 50% (30 minutes)
- Ambient temperature: 40°C
- Desired type of unit: SUHW

B. Selection Procedures

1) Determine service factors

Service factors are determined from the above conditions as follows:

$$f_1 = 1.3 \quad f_2 = 1.1 \quad f_3 = 1.2 \quad f_4 = 1.0 \quad f_5 = 1.0$$

$$f_M = 1.3 \times 1.1 = 1.43$$

$$f_T = 1.2 \times 1.0 \times 1.0 = 1.2$$

$$\therefore f = 1.43 \quad (f_M > f_T)$$

2) Determine equivalent input power (N_{1E} kW)

$$N_{1E} = f \times N_1$$

$$= 1.43 \times 5.5$$

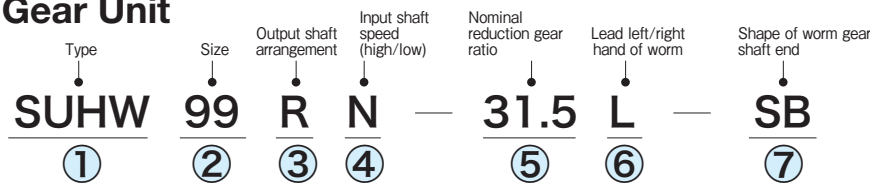
$$= 7.865 \text{ kW}$$

3) Determine size

From the input power and output torque tables, we see that SUHW125 with reduction gear ratio 31.5 has nominal input power of 9.4 kW at input shaft speed of 1,500 min⁻¹, and this value is larger than the equivalent input power (N_{1E}), thus unit size 125 satisfies the conditions.

4. Worm Gear Model Identification and Inquiry Specifications for Gear Units and Gear Sets

Gear Unit



① Type

Enter the type you want in the inquiry specification.

② Size

Enter the size you want.

③ Output shaft arrangement

Enter the arrangement you want, referring to the gear unit dimensions (pgs. 21-38)

④ Input shaft speed (high/low)

When input shaft speed is extremely low, certain bearings require a grease lubrication system. Therefore, enter the N symbol only when the required unit satisfies the following conditions:

- SUHW, SEUH types
with size 280, 320, 360, 400, 450, and 500, output shaft speed $n_2 \leq 300 \text{ min}^{-1}$
- SOHA type
with size 280, 320, 360, and 400, input shaft speed $n_1 \leq 300 \text{ min}^{-1}$

⑤ Nominal reduction gear ratio

Enter the reduction gear ratio you want.

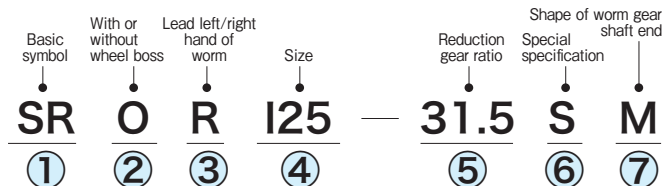
⑥ Lead left/right hand (helix) of worm

Specify only for the lead left hand or left hand helix (special specification) you want. Do not specify for right hand helix worm (standard specification).

⑦ Shape of worm gear shaft end

Enter this symbol when you want a single-stage worm gear unit with output shaft at both ends (special specification). Do not specify for units with one-end output shafts (standard specification).

Gear Set



① Basic symbol

Enter SR regardless of type.

② With or without wheel boss

With wheel boss: M
Without wheel boss: O

③ Lead left/right hand of worm

Lead right hand (standard spec): R
Lead left hand (special spec): L

④ Size

Distance between worm center and worm wheel center.

⑤ Reduction gear ratio

Standard reduction gear ratio: indicate nominal reduction gear ratio
Special reduction gear ratio: indicate actual reduction gear ratio

⑥ Special specification

Special specifications only are indicated by the letter S.

⑦ Shape of worm gear shaft end

Unfinished worm shaft end is indicated by the letter M.

5. Cautions for Separate Usage of Worm Gear Set

5-1. Gear Case

A. Machining Process Accuracy

Inaccuracy of the finished gear case causes incorrect meshing of the worm and worm wheel, resulting in lowered performance and durability of the worm gear set. Therefore, strictly observe the case tolerances listed below. Particularly when the reduction gear ratio is small, we recommend that the case should be processed as accurately as the process permits. Since tolerances of both center distance and perpendicularity or squareness vary with gear set size, determine the tolerance from table 4 according to your gear set size.

Fig. 4 Tolerance of center distance

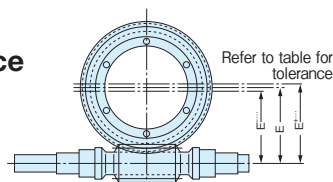


Fig.5 Tolerance of perpendicularity

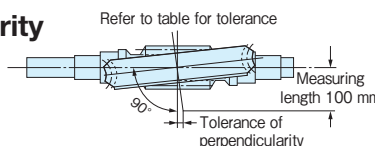


Table 4 Tolerances of center distance and perpendicularity

Size E	Center distance tolerance	Perpendicularity tolerance
65	± 0.023	± 0.016
80	± 0.025	± 0.016
100	± 0.028	± 0.018
125	± 0.032	± 0.018
160	± 0.036	± 0.020
200	± 0.040	± 0.020
225	± 0.040	± 0.020
250	± 0.045	± 0.022
280	± 0.045	± 0.022
320	± 0.050	± 0.022
360	± 0.050	± 0.022
400	± 0.056	± 0.025
450	± 0.056	± 0.025
500	± 0.063	± 0.025

B. Inspection Window

1. In order to achieve correct worm gear meshing, the actual tooth bearing must be checked at assembly. To accomplish this, install inspection windows in suitable locations in the case to allow observation of tooth bearing condition.
2. Inspection windows will also facilitate checking of tooth bearing during periodic inspections.

C. Types of Bearings and Methods of Support

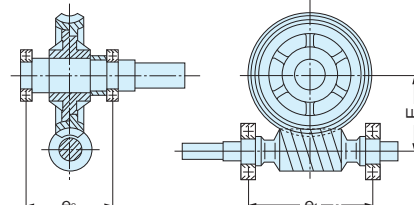
1. Bearings used in worm gear set applications should, in principle, be rolling bearings.
2. The structure of the bearings and their support must be capable of simultaneously bearing radial load and axial load (thrust), because the bearings which support the input and output shafts are subject to both loads. Pay particular attention to the large amount of thrust applied in the direction of the worm axis.
3. Bearings employed in the worm shaft are generally tapered roller bearings or angular type bearings, since they must bear a large axial load as well as a radial load.

Note: For cautions concerning assembly of worm gear set, including adjustment of worm gear set tooth bearings, refer to the separate operating instructions.

4. Bearings and their supports must have specific structures such that the output shaft has minimum play in the direction of its shaft axis, and tooth bearings are adjustable for correct meshing. For further information concerning calculation of forces acting on bearings, contact MHI HASEG or an MHI HASEG agent.

D. Distances (e_1 , e_2) of Bearings

Fig. 6 Distances of worm shaft and output shaft bearings



1. The worm shaft is designed to provide a relatively small diameter to attain a large lead angle and high efficiency. Therefore, the distance e_1 between the bearings should be minimal so as to reduce the radial deflection of the worm tooth. Standard values for the distance are as follows: $e_1=1.7E$ (when $E=65$) to $e_1=1.3E$ (when $E=500$)
2. On the other hand, the radial stresses generated at the bearings increase when the distance e_2 between the bearings which support the output shaft is too small. Therefore, pay close attention to the distance e_2 , which requires at least the following values (greater values are recommended): $e_2=1.25E$ (when $E=65$) to $e_2=0.9E$ (when $E=500$)

5.2. Design of Wheel Boss and Reamer Bolt

(for size 125 or larger standard worm gear set) (See fig. 7)

1. With regard to the worm wheel boss, perform combined cut of the outside diameter and edge surface of the part into which the worm rim is inserted and the inside diameter of the hole into which the output shaft is inserted at one time, so as to minimize boss run-out as much as possible. (Allowable run-out should be within 0.015 mm.)
2. Machine the outside diameter (D_3) of the boss within tolerance h7. (Class 7 JIS) (The tolerance of the inside diameter of the rim is K7.)
3. Machine the outside diameter of the reamer bolt which is used to connect the boss with the rim to within tolerance K6.
4. Use the following materials for the reamer bolt and nut.
Reamer bolt: JIS B1051-1976 Strength class 8.8 or more
Nut: JIS B1052-1976 Strength class 8 or more
5. Securely lock bolt and nut to prevent spontaneous unscrewing. (See fig.7)
6. Standard tightening torque for reamer bolts is shown in the table below. (See table 5.)

Fig. 7 (for MHI HASEG worm gear unit)

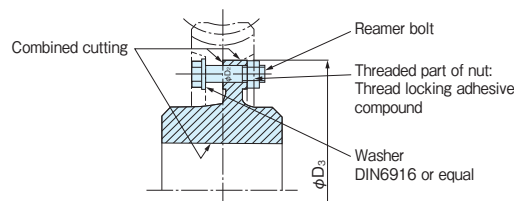


Table 5 Standard tightening torque for reamer bolt

Nominal diameter of reamer bolt	M12	M16	M20
Tightening torque (Nm)	80	195	380

JIS: Japanese Industrial Standards

Single Stage Worm Gear (Unit) & Gear Set

Input Power, Output Torque Table (1)

iN	Size		65			80			99			100			125			160			200			
	n ₁	n _{2N}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	
5	i		5.2			4.8			4.8			4.8			4.8			4.8			4.8			
	1800	360	4.2	110	215	6.9	165	365	11	270	710	23	555	1000	37	900	1700	61.5	1500	3250	89.5	2150	4500	
	1500	300	3.75	118	235	6.2	180	405	10	295	790	20.5	600	1100	33.5	980	1900	55	1600	3650	83.5	2450	5750	
	1000	200	2.9	135	285	4.8	205	490	7.9	345	980	16	700	1350	26.5	1150	2400	45	1950	4600	69	3000	7350	
	750	150	2.5	155	325	4.05	235	570	6.9	395	1100	13.5	795	1550	22.5	1300	2750	39	2250	5400	60	3500	8650	
	500	100	2.1	190	370	3.25	280	660	5.3	455	1250	11	985	1800	17.5	1500	3250	31.5	2750	5800	48.5	4250	10500	
	300	60	1.6	240	420	2.55	355	750	4	560	1450	7.9	1150	1900	12.5	1800	3900	20.5	3000	6150	34.5	5000	12000	
6.3	i		6.25			6.25			6.25			6.25			6.25			6.25			6.25			
	1800	286	3.75	110	225	6.1	190	380	9.9	315	730	19	595	1050	31	975	1800	56	1750	3450	81	2550	5150	
	1500	238	3.35	125	250	5.4	200	425	9	340	820	18	685	1150	30	1100	2000	50	1900	3850	75.5	2850	6050	
	1000	159	2.55	140	300	4.2	235	520	7	390	1000	14	805	1450	23.5	1350	2500	40.5	2300	4850	62	3500	7750	
	750	119	2.25	160	335	3.55	260	580	6	445	1150	12	915	1600	20	1500	2850	35	2650	5600	53.5	4050	9050	
	500	79.5	1.85	195	380	2.9	315	660	4.7	520	1300	9.75	1100	1900	15.5	1750	3400	26.5	3000	6500	43.5	4900	11000	
	300	47.5	1.45	255	430	2.25	400	760	3.55	640	1450	6.95	1300	2150	10.5	2000	3900	18.5	3500	6500	32	6050	12000	
8	i		7.75			8.25			8.25			8.25			8.25			8.5			8.25			
	1800	225	3.4	130	230	5.3	220	390	8.2	340	700	14	590	1050	24.5	1000	1850	42.5	1800	3550	74.5	3100	6150	
	1500	188	3.1	140	250	4.75	235	430	7.4	365	780	13.5	675	1150	23.5	1150	2050	41	2100	3950	72.5	3600	6350	
	1000	125	2.35	160	300	3.7	275	520	6	440	930	12	885	1400	20.5	1550	2250	36.5	2800	4700	63	4700	6750	
	750	94	2.05	185	330	3.15	310	580	5.1	500	1050	10.5	1050	1550	18.5	1850	2300	31	3200	4850	54.5	5450	7200	
	500	62.5	1.7	230	370	2.6	375	660	4.1	590	1200	7.75	1150	1700	13	1950	2400	23.5	3600	4900	40	6000	7700	
	300	37.5	1.35	300	415	2	470	740	3.1	730	1400	5	1200	1800	8.4	2050	2600	15.5	4000	5300	27	6600	8200	
10	i		10.33			10.33			10.33			10.33			10.33			10.33			10.33			
	1800	180	2.65	130	230	4.4	220	410	6.9	350	740	12	620	1050	20.5	1050	1800	36	1850	3400	61	3100	6200	
	1500	150	2.4	145	250	3.9	235	460	6.3	390	820	11.5	715	1150	19.5	1200	2000	35	2150	3800	59	3650	6950	
	1000	100	1.85	165	295	3	275	550	5	450	1000	10	930	1400	17.5	1600	2500	29.5	2700	4750	50.5	4650	8750	
	750	75	1.6	190	330	2.65	310	610	4.3	510	1150	8.95	1100	1600	15.5	1900	2850	25.5	3100	5500	43.5	5400	10000	
	500	50	1.3	230	370	2.1	370	690	3.45	610	1300	6.85	1250	1850	11.5	2100	3350	19	3500	6500	30.5	5650	10500	
	300	30	1.05	300	410	1.65	475	780	2.55	740	1450	4.65	1400	2100	7.85	2400	3900	13	4000	6500	21	6500	11000	
12.5	i								12.33			12.33			12.33			12.33			12.67			
	1800	144							6	360	680	10	605	1000	17	1050	1800	30	1800	3350	49	3050	6100	
	1500	120							5.4	385	760	9.55	690	1100	16.5	1200	2000	29	2100	3750	47.5	3600	6800	
	1000	80							4.3	460	920	8.25	900	1350	14.5	1600	2450	25.5	2800	4650	43	4850	8600	
	750	60							3.8	540	1000	7.2	1050	1500	13	1900	2800	22.5	3300	5350	37.5	5600	9950	
	500	40							3.05	630	1150	5.1	1100	1750	9.8	2150	3300	17.5	3800	6400	26.5	6000	11500	
	300	24							2.3	770	1350	3.25	1150	1900	6.3	2250	3800	11.5	4100	6500	18.5	6800	12000	
16	i		15.5			15.5			15.5			15.5			15.5			15.5			15.5			
	1800	113	1.95	140	240	3.1	230	425	5.15	380	780	9.35	695	1100	15.5	1150	1900	28	2100	3600	48	3600	6550	
	1500	94	1.75	150	265	2.8	250	470	4.7	415	870	8.9	795	1200	15	1350	2100	26.5	2400	4000	46	4150	7350	
	1000	62.5	1.35	175	315	2.2	290	570	3.65	480	1050	7.8	1050	1450	13	1750	2600	21.5	2900	5000	37	5000	9250	
	750	47	1.2	200	345	1.9	325	640	3.2	550	1150	6.45	1150	1650	10.5	1900	3000	18.5	3300	5750	30.5	5500	10500	
	500	31	1	245	380	1.6	400	720	2.55	650	1350	4.85	1300	1900	8.2	2200	3500	13.5	3600	6500	22	6050	11500	
	300	18.5	0.8	315	425	1.2	495	820	1.9	770	1450	3.3	1450	2200	5.65	2500	3900	9.5	4200	6500	16.5	7200	12000	

Blue columns indicate gear sets (units) in stock, having the reduction gear ratio corresponding to the column.

Units with* mark in the N_{1N} column require forced lubrication system.

iN: Nominal reduction gear ratio i: Actual reduction gear ratio n_i: Input shaft speed (min⁻¹)
n_{2N}: Nominal output shaft speed (min⁻¹) N_{1N}: Nominal input power (kW)
T_{2N}: Allowable continuous output torque (Nm) T_{2max}: Allowable maximum output torque (Nm)

	225			250			280			320			360			400			450			500		
	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}
				4.8																				
				155 *	3750	6150																		
				150	4450	8800																		
				130	5800	13000																		
				115	6650	15500																		
				90.5	7900	19000																		
				66.5	9700	21000																		
	5.8			6.25																				
	110	3150	6400	130 *	4100	6950																		
	105	3700	8100	128	4850	10000																		
	97	5150	10500	120	6800	13500																		
	85	6000	12000	105	7850	16000																		
	61.5	6550	13500	79.5	9000	20000																		
	44.5	7800	14500	55.5	10500	22000																		
	7.25			8.25																				
	95	3450	7250	110	4550	9900																		
	93	4050	8550	105	5400	11500																		
	85	5600	11000	99.5	7450	15000																		
	76	6700	13000	91.5	9150	15500																		
	55.5	7250	15000	70.5	10500	16000																		
	40.5	8800	16000	50	12500	17000																		
	10.67			10.33			10.67			10.33			10.33			10.33			9.75			10.25		
	65.5	3450	6850	87	4450	8250	101 *	5300	9000	150 *	7750	12500	190 *	9850	16500	235 *	12000	21500	280 *	13500	29500	290 *	14500	34000
	64	4050	7950	84.5	5200	10500	99	6250	13000	145	9150	18000	185	11500	21500	230 *	14500	24500	275 *	16500	33500	285 *	17500	38500
	58	5500	10000	78	7200	13500	90.5	8650	17000	135	12500	26500	175	16000	35500	215	20000	46000	260	23000	57000	270	25000	69500
	52	6700	12000	71.5	8850	16000	82.5	10500	20500	125	15500	31500	160	20000	42500	200	25000	55000	245	29000	59000	255	31500	83500
	41	7850	15500	56.5	10500	20000	71	13500	25000	105	20000	35000	135	25000	46000	170	31500	61500	215	38500	66000	230	42500	105000
	29	9100	16500	39.5	12000	22000	47	15000	30000	71.5	22000	37500	92	28000	49000	115	36500	65500	150	44500	76000	175	54000	120000
	12			12.33			12			12.67			12.33			11.67			12.33					
	65.5	3900	8000	75.5	4550	9400	105	6350	12500	125 *	7700	13500	175 *	10500	19000	230 *	13000	25000	265 *	16000	30500			
	63.5	4550	9000	73.5	5350	11000	100	7450	16000	120	9100	19500	170	12500	26500	225	15500	30000	260 *	19000	34500			
	57	6150	10500	67.5	7400	14000	93	10000	20500	110	12500	26000	160	17500	35000	210	22000	49500	240	26500	63000			
	51.5	7400	11000	61.5	9050	16500	87	12500	23000	105	15500	31000	145	21500	36000	195	27000	51000	225	33000	65000			
	42.5	9100	11500	50.5	11000	20000	70	15000	24000	90.5	20500	38500	130	28500	40000	155	32000	53000	190	41500	68000			
	27	9700	12500	35	12500	22000	47.5	17000	25500	60	22500	39000	86.5	32000	44000	110	37500	58000	135	48500	76000			
	16			15.5			16			15.5			15.5			15.5								
	52	4000	7450	69.5	5200	9200	81 *	6200	9500	125 *	9250	14000	155 *	11500	18000	195 *	14500	23500						
	50.5	4650	8400	67.5	6100	11500	79	7250	14000	120	10500	20500	150	13500	24000	190 *	17000	27500						
	45.5	6300	10500	61.5	8350	14500	72	10000	18000	110	15000	28000	140	19000	38000	175	24000	49000						
	40.5	7500	12500	56.5	10000	17000	67	12500	21500	100	18500	33000	125	23000	45000	155	28000	58500						
	28.5	7850	15000	42.5	11500	21000	52	14500	26500	77.5	21000	38500	100	27000	49000	120	32000	67000						
	21.5	10000	16500	29	13000	22000	35	16000	30000	51	23000	39000	69.5	31500	49000	81.5	37000	67000						

Values obtained with the use of MHI HASEG specified synthetic lubricating oil.

Consult MHI HASEG for ratings using lubricating oils other than MHI HASEG specified lubricating oil.

Single Stage Worm Gear (Unit) & Gear Set

Input Power, Output Torque Table (2)

iN	Size		65			80			99			100			125			160			200			
	n ₁	n _{2N}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	
20	i		20.5			20.5			20.5			20.5			20.5			20.5			20.5			
	1800	90	1.65	160	245	2.65	260	405	4.2	415	770	7.35	725	950	12.5	1250	1900	22.5	2250	3800	37.5	3750	6750	
	1500	75	1.55	180	265	2.45	285	440	3.9	455	840	7	820	1000	12	1450	1950	21	2550	3950	36.5	4300	7000	
	1000	50	1.25	210	310	1.95	330	530	3.15	540	1000	5.3	935	1050	9.3	1650	2100	17	3000	4200	30	5350	7500	
	750	37.5	1.1	240	335	1.75	380	580	2.8	630	1150	4.15	975	1150	7.65	1800	2150	13.5	3150	4350	24	5750	7700	
	500	25	0.84	270	375	1.35	460	650	2.15	710	1250	2.95	1000	1250	5.55	1950	2400	10	3600	4800	17.5	6300	8400	
	300	15	0.56	290	405	0.94	490	730	1.55	820	1300	1.9	1100	1300	3.55	2050	2600	6.7	3950	5200	11.5	6800	9100	
25	i		25.5			25.5			24.5			24.5			25.5			24.5			25.5			
	1800	72	1.2	135	245	2.05	240	410	3.75	400	700	5.65	655	800	9.2	1100	1550	17.5	2050	3100	27.5	3350	6100	
	1500	60	1.15	155	265	1.95	275	430	3.25	445	770	5.35	745	850	8.4	1200	1600	16.5	2350	3200	26.5	3900	6450	
	1000	40	0.96	195	285	1.65	340	475	2.65	540	920	3.85	800	950	6	1300	1700	12.5	2650	3400	22	4850	6850	
	750	30	0.8	210	305	1.4	380	530	2.25	590	1000	3	835	1000	4.7	1350	1850	9.85	2750	3650	18	5250	7050	
	500	20	0.6	225	325	1.1	435	580	1.75	670	1050	2.15	880	1050	3.3	1450	2050	7	2900	4100	12.5	5600	7600	
	300	12	0.42	255	345	0.73	465	620	1.3	800	1100	1.35	925	1100	2.15	1550	2200	4.45	3050	4400	8.15	5900	8000	
31.5	i		31			31			31			31			30			31			31			
	1800	57.1	1.1	145	250	1.8	240	450	2.9	400	820	5.85	800	1150	10	1350	2000	17.5	2400	3800	28.5	4000	6950	
	1500	47.5	1	160	275	1.6	260	490	2.65	430	900	5.5	905	1250	9.4	1500	2250	15	2550	4200	26	4350	7750	
	1000	32	0.84	185	335	1.3	305	580	2.15	510	1100	4.25	1050	1550	7.4	1750	2750	12	3000	5250	20.5	5250	9800	
	750	24	0.7	205	360	1.15	340	650	1.85	570	1250	3.7	1200	1750	6.25	2000	3150	10.5	3400	6050	17.5	5850	11500	
	500	16	0.59	250	400	0.95	410	750	1.5	670	1400	2.7	1300	2000	4.65	2200	3650	7.5	3700	6500	12.5	6200	12000	
	300	9.5	0.49	325	450	0.75	510	840	1.15	810	1450	1.9	1500	2300	3.2	2500	3900	5.15	4200	6500	8.65	7200	12000	
40	i		41			41			41			41			41			41			41			
	1800	45	1.05	180	255	1.6	275	430	2.45	440	800	4.6	825	1050	8	1450	2050	14.5	2600	4000	24	4450	7100	
	1500	37.5	0.94	190	275	1.45	300	470	2.3	485	880	4.3	935	1100	7.4	1600	2150	13	2900	4300	22.5	5000	7750	
	1000	25	0.73	215	325	1.15	345	550	1.9	590	1050	3.15	1000	1150	5.5	1800	2250	10.5	3400	4600	17.5	5800	8250	
	750	18.5	0.63	250	350	1	390	600	1.65	670	1150	2.45	1050	1200	4.5	1950	2350	8.5	3700	4750	14.5	6300	8550	
	500	12.5	0.52	285	390	0.81	455	680	1.3	730	1300	1.75	1100	1300	3.25	2100	2500	6	3900	5000	10.5	6800	9100	
	300	7.5	0.35	305	420	0.62	530	740	0.95	860	1400	1.1	1150	1400	2.15	2250	2800	4.05	4300	5700	6.9	7500	9500	
50	i		51			51			50			50			50			50			50			
	1800	36	0.78	155	265	1.25	270	440	2.1	440	720	3.5	745	850	5.9	1250	1650	11	2350	3400	18	3950	6400	
	1500	30	0.75	175	285	1.2	310	470	1.95	480	780	3.2	825	900	5.2	1350	1700	10.5	2700	3500	17.5	4550	6900	
	1000	20	0.61	210	305	1	360	510	1.6	570	940	2.25	870	950	3.65	1400	1800	7.6	2950	3700	13.5	5250	7350	
	750	15	0.52	225	325	0.88	405	540	1.4	640	1050	1.75	895	1050	2.85	1450	1950	5.8	3050	3800	10.5	5650	7600	
	500	10	0.4	245	345	0.68	455	610	1.05	700	1150	1.25	940	1150	2	1550	2200	4.1	3200	4400	7.85	6150	8100	
	300	6	0.295	295	360	0.49	510	630	0.81	860	1200	0.81	990	1200	1.35	1750	2400	2.65	3350	4700	5.05	6500	8300	

Blue columns indicate gear sets (units) in stock, having the reduction gear ratio corresponding to the column.
 Units with* mark in the N_{1N} column require forced lubrication system.

iN: Nominal reduction gear ratio i: Actual reduction gear ratio n₁: Input shaft speed (min⁻¹)
n_{2N}: Nominal output shaft speed (min⁻¹) N_{1N}: Nominal input power (kW)
T_{2N}: Allowable continuous output torque (Nm) T_{2max}: Allowable maximum output torque (Nm)

	225			250			280			320			360			400			450			500		
	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}
	19.5			20.5			19.5			20.5			19.5			20.5			20.5			20.5		
45	4200	7850		61.5	6150	9700	75	7000	12500	97	9550	18500	130 *	12000	18500	155 *	15500	25500	200 *	19500	34000	240 *	24000	44500
43.5	4900	8800		59.5	7150	10000	72.5	8150	15500	94	11000	20500	125	14000	27000	150	18000	37000	195	23000	44000	235 *	28500	51000
39	6600	11000		47	8450	10500	65	11000	20000	86	15500	22000	115	19500	38500	140	25000	43500	180	32500	55000	220	39500	67000
35	7950	13000		38	9100	11500	60	13500	24000	78	18500	24500	105	24000	45500	125	29500	45000	155	37500	60000	205	49000	77000
26.5	8900	15000		27.5	9900	13000	49	16500	29000	59	21000	28500	89.5	30500	49000	91.5	33000	49000	120	42500	66000	165	59500	80000
17.5	9800	16000		18	10500	14500	33.5	19000	30000	38	22500	31500	57.5	32500	49000	64	38500	55000	82.5	49500	73000	115	68000	85000
	26			25.5			25.5			25.5			24.5			25.5			26			25.5		
32.5	4050	6100		46.5	5700	8800	52.5	6450	10000	78.5	9600	16500	105	12500	20500	125 *	15000	27000	155 *	19000	32500	160 *	18500	35500
31.5	4700	6300		45	6600	9050	46	6800	11000	76	11000	17000	98.5	14000	22000	120	17500	38000	150	22500	42000	155 *	22000	40000
23.5	5300	7100		34.5	7650	9650	35	7700	12000	69	15000	19000	72	15500	24000	110	24500	40500	140	31000	47000	145	31000	71000
19	5700	8100		28	8250	10000	31	9200	13000	54.5	16000	22000	61.5	17500	26500	100	30000	41500	125	38000	55000	130	38500	85000
14	6200	9500		20.5	8950	11000	25	11000	14000	38.5	17000	24000	49	21000	29000	73	32500	48000	90.5	41000	57000	120	51500	105000
9.45	7000	10000		13.5	9800	12000	18	13000	15000	24.5	18000	26500	32.5	23000	32000	46.5	34000	54000	57.5	43500	60000	77.5	56500	120000
	32			31			32			31			31			31			32			33		
33.5	4750	7850		45.5	6300	10000	53.5 *	7500	10500	75.5 *	10500	15500	98 *	13500	19000	125 *	17500	25000	145 *	21000	34500	185 *	27500	45000
32	5450	8800		43.5	7300	12000	49.5	8500	14500	71	12000	22000	90.5	15500	26500	120 *	20500	30500	140 *	24500	39000	180 *	32000	51000
26	6650	11000		38.5	9700	15500	42	10500	19000	64.5	16000	30000	78.5	20000	40000	100	26000	52500	120	31500	73000	155	42000	95000
22.5	7750	13000		29.5	10000	18000	36.5	12500	22500	56	19000	35500	70	23500	47000	85	29000	62500	105	36500	87000	140	51500	110000
16	8300	16000		22.5	11500	22000	29.5	15000	28000	43	22000	39000	56	28500	49000	62.5	32000	67000	78.5	41500	92000	105	58000	120000
12	10000	16500		15.5	13000	22000	19.5	16500	30000	28	23500	39000	38	32000	49000	44	37500	67000	54.5	48000	92000	74	67500	120000
	40			41			39			41			39			41			41			41		
28.5	5000	8300		40	7450	10500	49.5	8450	13500	63.5	11500	20000	85.5 *	14500	20500	105 *	19500	28500	135 *	24500	37500	165 *	30500	47000
27	5800	9250		37.5	8400	11000	47.5	9800	16500	61.5	13500	23000	83.5	17500	29500	100	22500	41000	130	29000	48500	160 *	36000	56000
23.5	7600	11500		28	9400	12000	42.5	13500	21500	55	18500	25000	74	23500	40500	80.5	27000	48000	105	35000	62000	145	49500	76500
20.5	8800	13500		22.5	10000	12500	36	15000	25000	47.5	21000	26000	64	26500	47000	66	29500	49000	84.5	38000	66000	120	53000	82000
14.5	9500	16000		16.5	11000	14000	27.5	17000	30000	34.5	23000	30000	48.5	30500	49000	50	33500	55000	64	43000	72000	88.5	60000	86000
10	10500	16500		11	12000	15500	18.5	19500	30000	23	25000	34000	32	33500	49000	35	39000	60000	44.5	50000	79000	62	70000	92000
	52			50			51			50			49			51			52			51		
21	4850	6600		31	6800	9500	31.5	7000	10500	53	11500	17500	66.5	14500	22000	83.5 *	18500	29000	105 *	23500	35500	110 *	23500	37000
18.5	5150	6800		28	7400	9850	27.5	7400	11500	51	13500	18500	58.5	15500	23000	80.5	21500	41000	100	27500	46000	105 *	27500	41500
14	5750	7500		21	8300	10500	22	9000	13000	40.5	16000	21000	43	17000	25500	67.5	27500	44000	84.5	35500	49000	96	38500	74500
11	6200	8500		17	8900	11000	20.5	11000	14000	32.5	17000	23500	38.5	20500	29000	55	30000	45500	69	38500	58000	88.5	47000	89000
8.25	6750	10000		12	9700	12000	15	12000	15500	24	19000	26000	29.5	23500	32000	41	33500	52000	52	43500	63000	73	58500	110000
5.4	7300	10500		8.05	10500	13000	10	13500	17000	16	21000	29000	19.5	26000	36000	29	39500	56000	36	50000	67000	49.5	66000	120000

Values obtained with the use of MHI HASEG specified synthetic lubricating oil.

Consult MHI HASEG for ratings using lubricating oils other than MHI specified lubricating oil.

Double Stage Worm Gear (Unit) with Helical Gear

Input Power, Output Torque Table

iN	Size		100			125			160			200			225			250			280			
	n ₁	n _{2N}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	
63 $\left(\begin{smallmatrix} 3.15 \\ \times \\ 20 \end{smallmatrix}\right)$	i		66			66			64			65.1			61.9			65.1			61.9			
	1800	28.6	3.25	1000	1250	6.15	1900	2300	11.5	3450	4600	20	6100	8200	29	8500	14500	31.5	9700	13000	47.5	14000	26000	
	1500	24	2.85	1050	1300	5.25	1950	2450	10.5	3650	4850	17	6350	8800	25.5	8900	15000	27	10000	13500	44	15500	27000	
	1000	16	2	1100	1350	3.7	2050	2600	7.25	3900	5150	12.5	6750	9100	18.5	9700	16000	19	10500	14500	32.5	17000	29000	
	750	12	1.55	1100	1400	2.9	2100	2750	5.6	4000	5400	9.5	7000	9300	14.5	10000	16000	15	11000	15500	26.5	18500	30000	
	500	7.9	1.1	1150	1500	2	2150	2850	3.9	4150	5650	6.65	7250	9600	10	10500	16500	10.5	11500	16000	19	20000	30000	
	300	4.8	0.65	1150	1550	1.25	2200	3000	2.45	4250	5900	4.25	7600	9800	6.15	10500	16500	6.85	12500	16500	12.5	21000	30000	
80 $\left(\begin{smallmatrix} 4 \\ \times \\ 20 \end{smallmatrix}\right)$	i		84.2			84.2			80			83.1			79			83.1			79			
	1800	22.5	2.7	1050	1300	4.95	1950	2450	9.9	3700	4900	16.5	6400	8500	24.5	9000	15000	25.5	10000	13500	42.5	16000	28000	
	1500	19	2.25	1050	1350	4.25	2000	2600	8.45	3800	5100	14	6600	9000	20.5	9400	15500	22	10500	14000	37	16500	29000	
	1000	12.5	1.6	1100	1400	3	2100	2750	5.95	4000	5350	9.9	6950	9300	14.5	10000	16000	15.5	11000	15000	27	18000	30000	
	750	9.4	1.2	1100	1450	2.35	2150	2800	4.6	4100	5450	7.7	7150	9500	12	10500	16500	12.5	11500	16000	21.5	19000	30000	
	500	6.3	0.85	1150	1500	1.6	2200	2900	3.2	4200	5750	5.35	7400	9900	8	10500	16500	8.95	12500	16500	15.5	20500	30000	
	300	3.7	0.53	1150	1550	1	2250	3050	2	4300	5950	3.45	7800	10000	4.85	10500	16500	5.65	13000	16500	9.9	21500	30000	
100 $\left(\begin{smallmatrix} 2.5 \\ \times \\ 40 \end{smallmatrix}\right)$	i		101.6			101.6			100.6			100.6			97.4			99.8			95			
	1800	18	2.45	1050	1200	4.45	1950	2350	8.6	3750	4750	14.5	6350	8600	20.5	8800	13500	22.5	10000	13000	33.5	14000	25000	
	1500	15	2.05	1050	1250	3.85	2000	2450	7.24	3800	4900	12	6550	8800	18	9200	15000	19.5	10500	13500	30	15000	27000	
	1000	10	1.45	1100	1400	2.8	2150	2650	5.15	4050	5300	9.05	7100	9300	13	9800	16000	14.5	11500	14500	23	17000	30000	
	750	7.5	1.15	1150	1450	2.2	2250	2800	4.2	4300	5700	7.15	7450	9600	10.5	10500	16500	11.5	12000	15500	18	18000	30000	
	500	5	0.78	1150	1450	1.55	2300	2950	2.9	4450	5850	5.05	7800	9900	7.5	11000	16500	8	12500	16500	13.5	19500	30000	
	300	3	0.5	1200	1550	0.98	2400	3050	1.85	4600	6050	3.2	8100	10000	4.7	11500	16500	5.5	13500	17500	9.9	22000	30000	
125 $\left(\begin{smallmatrix} 3.15 \\ \times \\ 40 \end{smallmatrix}\right)$	i		131.9			131.9			127.9			130.1			127			130.1			123.8			
	1800	14.4	1.9	1050	1300	3.65	2050	2450	7	3850	4950	11.5	6600	9000	16.5	9300	15000	18.5	10500	13500	28.5	15500	28000	
	1500	12	1.65	1100	1350	3.2	2150	2550	5.95	3950	5100	10	6850	9200	14.5	9600	16000	15.5	11000	14500	24.5	16000	29000	
	1000	8	1.15	1150	1450	2.25	2250	2850	4.35	4250	5600	7.3	7400	9500	10	10000	16500	11.5	12000	15500	18.5	18000	30000	
	750	6	0.89	1150	1450	1.75	2300	2950	3.35	4400	5800	5.75	7700	9800	8.05	10500	16500	9.15	12500	16000	15	19000	30000	
	500	4	0.63	1200	1500	1.2	2350	3050	2.35	4500	5850	4.05	8000	10000	5.95	11500	16500	6.4	13000	17000	11	21000	30000	
	300	2.4	0.4	1200	1550	0.77	2400	3100	1.5	4650	6100	2.55	8300	10000	3.8	12000	16500	4.25	14000	17500	7.25	22500	30000	
160 $\left(\begin{smallmatrix} 4 \\ \times \\ 40 \end{smallmatrix}\right)$	i		168.3			168.3			160.1			166.2			162.1			166.2			158.1			
	1800	11.2	1.55	1100	1350	3	2150	2600	5.85	4000	5100	9.6	6950	9200	13.5	9700	16000	15	11000	14500	24	16500	29000	
	1500	9.4	1.3	1100	1400	2.55	2200	2750	5	4100	5400	8.4	7250	9400	11.5	10000	16500	13	11500	15000	20.5	17000	30000	
	1000	6.3	0.95	1150	1450	1.85	2300	2900	3.6	4400	5750	5.95	7650	9700	8.35	10500	16500	9.5	12500	16000	15.5	19000	30000	
	750	4.7	0.7	1150	1500	1.45	2350	3000	2.8	4500	5850	4.65	7900	10000	6.65	11000	16500	7.5	13000	16500	12.5	20000	30000	
	500	3.1	0.5	1200	1550	0.99	2400	3050	1.95	4600	6000	3.25	8100	10000	4.7	11500	16500	5.25	13500	17500	9.15	22000	30000	
	300	1.9	0.33	1250	1550	0.64	2450	3100	1.25	4650	6150	2.1	8400	10500	3.05	12000	16500	3.5	14500	18000	5.9	23000	30000	
200 $\left(\begin{smallmatrix} 5 \\ \times \\ 40 \end{smallmatrix}\right)$	i		209.1			209.1			199.1			210.9			200			205			195			
	1800	9.4	1.25	1100	1400	2.5	2200	2750	4.4	3750	5400	8	7300	9400	11.5	10000	16500	13	11500	15000	20.5	17500	30000	
	1500	7.5	1.1	1150	1450	2.15	2250	2850	3.9	3950	5700	6.9	7550	9600	10	10500	16500	11	12000	15500	18	18000	30000	
	1000	5	0.76	1150	1500	1.5	2300	2950	2.95	4450	5800	4.85	7850	9900	7.15	11000	16500	7.8	12500	16500	13.5	20000	30000	
	750	3.7	0.6	1200	1500	1.15	2350	3050	2.3	4550	5900	3.8	8100	10000	5.7	11500	16500	6.15	13000	17000	10.5	21000	30000	
	500	2.5	0.42	1200	1550	0.81	2400	3100	1.6	4650	6050	2.6	8200	10000	4.05	12000	16500	4.5	14000	18000	7.5	22000	30000	
	300	1.5	0.28	1250	1600	0.53	2450	3150	1.05	4750	6200	1.7	8500	10500	2.5	12000	16500	2.95	15000	18000	4.8	23000	30000	
250 $\left(\begin{smallmatrix} 5 \\ \times \\ 50 \end{smallmatrix}\right)$	i		255			255			242.9			257.1			260			250			255			
	1800	7.2	0.94	970	1150	1.6	1700	2350	3.25	3300	4600	5.9	6400	8200	6.5	7100	10000	9.5	10000	12500	12	13000	16500	
	1500	6	0.81	990	1200	1.4	1750	2400	2.75	3350	4700	5	6500	8400	5.55	7300	10500	8.2	10500	13000	10.5	13500	17000	
	1000	4	0.58	1050	1250	1	1850	2450	2	3600	4900	3.5	6700	8700	4	7800	11000	6.3	12000	14000	7.95	15500	18000	
	750	3	0.45	1050	1300	0.79	1900	2500	1.6	3750	5000	2.75	7000	9000	3.15	8100	11000	5	12500	14500	6.4	16500	18500	
	500	2	0.31	1050	1300	0.59	2050	2600	1.2	4000	5100	1.95	7300	9100	2.4	9000	11500	3.55	13000	15000	4.5	17000	19500	
	300	1.2	0.21	1100	1350	0.4	2150	2650	0.78	4200	5200	1.3	7700	9300	1.65	10000	12000	2.25	13500	15500	2.75	17000	20000	

Blue columns indicate gear sets (units) in stock, having the reduction gear ratio corresponding to the column.

() indicates the nominal reduction gear ratios of front stage helical gear and rear stage worm gear.

iN: Nominal reduction gear ratio i: Actual reduction gear ratio n_i: Input shaft speed (min⁻¹)
n_{2N}: Nominal output shaft speed (min⁻¹) N_{1N}: Nominal input power (kW)
T_{2N}: Allowable continuous output torque (Nm)
T_{2max}: Allowable maximum output torque (Nm)

	320			360			400			450			500		
	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}
	65.4			62.2			65.6			65.6			65.1		
64	20000	28000		88	26000	47000	100	32000	49000	130	41000	64500	180	56500	80000
56	21000	29500		77.5	27500	49000	90	34000	51000	115	43000	67000	160	61000	82000
39.5	22000	31500		57.5	30500	49000	67	38000	55000	86.5	49000	73000	120	68000	85000
31	23000	33000		46	32500	49000	53	40000	57000	69	52000	77000	92	69000	88000
21.5	24000	34500		34	36000	49000	38	42500	60000	49	55000	80000	62	69500	91000
13.5	24500	35500		21.5	37500	49000	23.5	43500	64000	30	55500	82500	37.5	70000	94000
	79.7			75.8			82			82			83.1		
55.5	21000	29000		76.5	27500	49000	86.5	34000	51000	110	44000	67500	155	62000	82000
47	21500	30500		67	29000	49000	76.5	36000	53000	98.5	46500	70000	135	65500	84000
34	23000	32500		49.5	32000	49000	56.5	40000	56500	73	51500	75000	95.5	68500	87000
26	23500	33500		39	33500	49000	44.5	41500	58500	57.5	54000	78000	72.5	69000	90000
18	24000	35000		28.5	36500	49000	30.5	43000	62000	39.5	55500	81000	48.5	69500	93000
11	24500	36000		18	38000	49000	19	44000	65000	24	56000	84000	29.5	70000	95000
	100.6			95.7			100.6			100.6			99.8		
47	21000	26000		62.5	26500	47000	66.5	30000	50000	84	38000	67000	120	53500	82000
40	21500	28000		56	28500	48000	58	31500	52500	74.5	40500	69000	105	56500	84000
29.5	23500	31500		39.5	30000	49000	44.5	36000	57000	56.5	46000	75000	79	64000	88500
23	24500	34000		31.5	32000	49000	36	39000	59500	46	50000	79000	64.5	69500	92000
16.5	26000	35500		23	34500	49000	27	43000	63500	34.5	56000	83000	45.5	73000	96000
10.5	27000	37500		16	40000	49000	17.5	46500	66000	23	61500	88000	29	77000	100000
	130.8			124.4			131.2			131.2			130.1		
38	22000	28500		51	28000	48000	53.5	31500	53500	70	41500	71000	98.5	58000	85000
33	23000	30000		44	29000	49000	48	34000	56000	62	44000	74000	86.5	61000	87000
23.5	24500	33500		31.5	31000	49000	37	39000	59500	47	49500	79000	65.5	69000	91000
18.5	25500	35000		25.5	33500	49000	29.5	41500	62000	38.5	54000	81500	51.5	72000	95000
13	26500	36500		19	37000	49000	21.5	45000	65500	28.5	60000	86000	36	75000	99000
8.25	27500	38000		13	41500	49000	13.5	47000	66500	18	62000	90000	22.5	78000	105000
	159.4			151.7			164			164			166.2		
32.5	23000	30000		43.5	29000	49000	47.5	35000	56000	60.5	44500	74000	82.5	62000	87500
28	23500	32000		37.5	30000	49000	42	37000	58000	53	47000	76000	73.5	66000	90000
20	25000	35000		27.5	33000	49000	31	41000	61500	40	53000	81000	53.5	72000	94000
15.5	26000	36000		22	34500	49000	25	43500	64000	33	57500	84000	41.5	74000	98000
11	27000	37500		16	38000	49000	18	46500	66000	23.5	61000	88000	29	77000	100000
6.85	27500	38500		11	42500	49000	11.5	48500	67000	14.5	63000	92000	18	79000	105000
	207.4			197.3			209.6			209.6			202.7		
26.5	24000	32500		34.5	30000	49000	40	37500	58500	51	48000	77000	72.5	66000	90000
23	25000	34000		30.5	31500	49000	35	39500	60000	45	50500	79000	64	70000	92000
16	26000	35500		22.5	34500	49000	25.5	43000	64000	33.5	56500	84000	45	73000	97000
12.5	27000	37000		18	37000	49000	20.5	45500	66000	27	60000	86000	35	75500	100000
8.65	27500	38000		13.5	41000	49000	14.5	47000	66500	18.5	62000	90000	24	77500	105000
5.4	28000	39000		8.95	44000	49000	9.25	49500	67000	12	65000	92000	15	80000	105000
	252.9			247.9			260.7			265.8			252.2		
18.5	20000	28000		23	25000	34500	33	37500	54500	40.5	47500	66000	58.5	63500	120000
16	21000	29500		20	26000	36000	29	39500	56000	36	50000	68000	51	66000	120000
11.5	22000	31500		14.5	28500	38000	20	41000	59000	24.5	51500	70000	35.5	68500	120000
8.95	23000	32500		12	30500	39500	15.5	42000	61000	19	53000	72000	27.5	70000	120000
6.35	24000	33000		8.5	32000	40500	11	43000	63500	13.5	54500	74000	19	73000	120000
4.15	25500	34000		5.25	32500	42000	7	45000	66000	8.6	57000	76500	12	75000	120000

Values obtained with the use of MHI HASEG specified synthetic lubricating oil.
Consult MHI HASEG for ratings using lubricating oils other than MHI HASEG specified lubricating oil.

Double Stage Worm Gear (Unit)

Input Power, Output Torque Table

iN	Size		100 (65)			125 (65)			160 (80)			200 (100)			225 (100)			250 (125)			280 (125)			
	n ₁	n _{2N}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	
315 ($\frac{10}{31.5}$)	i		320			310			320			320			331			320			331			
	1800	5.7	1.15	1400	2300	2.15	2600	3900	3.45	4450	6500	5.85	7700	12000	6.7	9000	16500	9.1	12000	22000	10.5	14500	30000	
	1500	4.7	1.05	1550	2300	1.95	2800	3900	3.2	4900	6500	5.35	8400	12000	6.3	10000	16500	8.5	13500	22000	10	17000	30000	
	1000	3.2	0.75	1600	2300	1.45	3100	3900	2.5	5600	6500	4.15	9650	12000	4.9	11500	16500	7.3	17000	22000	8.8	21000	30000	
	750	2.4	0.6	1650	2300	1.15	3200	3900	2.05	6000	6500	3.45	10500	12000	4.05	12500	16500	6.5	20000	22000	7.5	23500	30000	
	500	1.6	0.43	1700	2300	0.82	3250	3900	1.5	6300	6500	2.5	11000	12000	3.25	14500	16500	4.7	21000	22000	5.2	24000	30000	
	300	0.95	0.28	1700	2300	0.53	3300	3900	0.96	6400	6500	1.6	11000	12000	2.15	15000	16500	2.95	21000	22000	3.3	24000	30000	
630 ($\frac{20}{31.5}$)	i		636			615			636			636			656			636			656			
	1800	2.8	0.71	1600	2300	1.4	3150	3900	2.35	5700	6500	3.85	9500	12000	4.2	10500	16500	7.25	18000	22000	7.85	20000	30000	
	1500	2.4	0.6	1600	2300	1.2	3200	3900	2.1	6000	6500	3.6	10500	12000	3.85	11500	16500	6.55	19500	22000	7.25	22000	30000	
	1000	1.6	0.43	1650	2300	0.85	3250	3900	1.55	6300	6500	2.6	11000	12000	3.05	13000	16500	4.85	21000	22000	5.4	24000	30000	
	750	1.2	0.33	1650	2300	0.67	3300	3900	1.2	6350	6500	2	11000	12000	2.7	15000	16500	3.75	21000	22000	4.15	24000	30000	
	500	0.6	0.24	1700	2300	0.48	3350	3900	0.85	6400	6500	1.4	11000	12000	1.9	15000	16500	2.6	21000	22000	2.9	24000	30000	
	300	0.48	0.16	1700	2300	0.31	3400	3900	0.55	6500	6500	0.89	11000	12000	1.25	15500	16500	1.7	21500	22000	1.85	24000	30000	
1000 ($\frac{31.5}{31.5}$)	i		961			930			961			961			992			930			960			
	1800	1.8	0.55	1650	2300	0.97	2900	3900	1.6	5200	6500	2.7	9000	12000	2.9	9950	16500	5.3	17500	22000	5.75	19500	30000	
	1500	1.5	0.47	1650	2300	0.85	3000	3900	1.45	5500	6500	2.4	9500	12000	2.6	10500	16500	4.6	18000	22000	5.2	21000	30000	
	1000	1.0	0.34	1700	2300	0.63	3200	3900	1.15	6300	6500	1.85	10500	12000	2.05	12000	16500	3.55	20000	22000	3.95	23000	30000	
	750	0.75	0.27	1700	2300	0.52	3350	3900	0.91	6400	6500	1.5	11000	12000	1.75	13000	16500	2.85	21000	22000	3.2	24000	30000	
	500	0.5	0.19	1750	2300	0.37	3400	3900	0.65	6500	6500	1.05	11000	12000	1.35	14500	16500	2	21000	22000	2.2	24000	30000	
	300	0.3	0.13	1750	2300	0.24	3400	3900	0.42	6500	6500	0.7	11000	12000	0.94	15500	16500	1.3	21500	22000	1.45	24000	30000	
1250 ($\frac{40}{31.5}$)	i		1271			1230			1271			1271			1312			1271			1312			
	1800	1.4	0.43	1650	2300	0.8	3100	3900	1.35	5600	6500	2.2	9500	12000	2.4	10500	16500	4.2	18500	22000	4.85	22000	30000	
	1500	1.2	0.38	1700	2300	0.7	3200	3900	1.25	6000	6500	2.1	10500	12000	2.25	11500	16500	3.85	20000	22000	4.3	23000	30000	
	1000	0.8	0.27	1700	2300	0.51	3300	3900	0.93	6400	6500	1.5	11000	12000	1.85	13500	16500	2.8	21000	22000	3.15	24000	30000	
	750	0.6	0.21	1750	2300	0.41	3400	3900	0.73	6500	6500	1.2	11000	12000	1.6	15000	16500	2.2	21000	22000	2.45	24000	30000	
	500	0.4	0.15	1750	2300	0.29	3400	3900	0.52	6500	6500	0.82	11000	12000	1.15	15500	16500	1.6	21500	22000	1.7	24000	30000	
	300	0.24	0.1	1750	2300	0.2	3400	3900	0.34	6500	6500	0.56	11000	12000	0.77	15500	16500	1	21500	22000	1.1	24000	30000	
1600 ($\frac{50}{31.5}$)	i		1581			1530			1581			1550			1600			1550			1600			
	1800	1.1	0.38	1700	2300	0.69	3100	3900	1.2	6000	6500	1.9	9500	12000	2.05	10500	16500	4	20500	22000	4.35	23000	30000	
	1500	0.93	0.32	1700	2300	0.61	3200	3900	1.1	6350	6500	1.75	10500	12000	1.9	11500	16500	3.45	21000	22000	3.85	24000	30000	
	1000	0.62	0.24	1750	2300	0.45	3400	3900	0.79	6500	6500	1.3	11000	12000	1.5	13000	16500	2.4	21000	22000	2.7	24000	30000	
	750	0.46	0.18	1750	2300	0.35	3400	3900	0.62	6500	6500	1	11000	12000	1.25	14000	16500	1.9	21500	22000	2.1	24000	30000	
	500	0.31	0.13	1750	2300	0.26	3400	3900	0.44	6500	6500	0.71	11000	12000	0.93	14500	16500	1.35	21500	22000	1.45	24000	30000	
	300	0.19	0.09	1750	2300	0.17	3400	3900	0.29	6500	6500	0.49	11500	12000	0.67	16000	16500	0.87	21500	22000	0.95	24000	30000	

Blue columns indicate gear sets (units) in stock, having the reduction gear ratio corresponding to the column.

< > indicates the size of front stage worm gear.

() indicates the nominal reduction gear ratios of front stage worm gear and rear stage worm gear.

iN: Nominal reduction gear ratio i: Actual reduction gear ratio n₁: Input shaft speed (min⁻¹)
n_{2N}: Nominal output shaft speed (min⁻¹) N_{1N}: Nominal input power (kW)
T_{2N}: Allowable continuous output torque (Nm)
T_{2max}: Allowable maximum output torque (Nm)

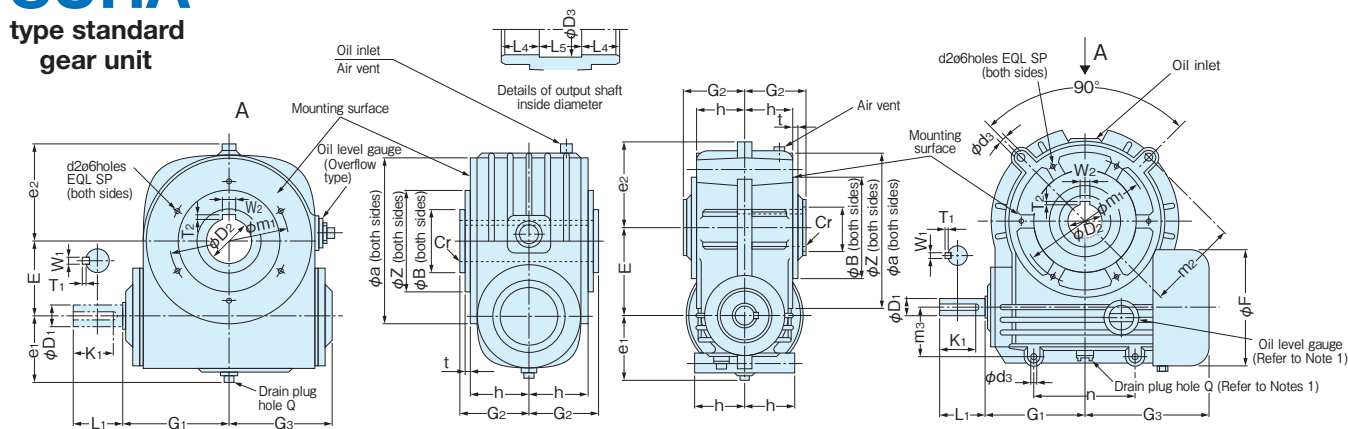
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	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}	N _{1N}	T _{2N}	T _{2max}
	320			320			320			331			341		
16.5	22000	39000		20.5	28000	49000	25.5	35000	67000	32.5	46000	92000	40.5	59000	120000
15	24500	39000		19.5	31500	49000	24.5	40000	67000	30.5	52000	92000	38	67000	120000
13	31000	39000		16.5	39500	49000	21.5	52000	67000	27	68000	92000	34.5	90000	120000
11.5	36000	39000		14	44000	49000	17	55000	67000	22	74000	92000	28	97500	120000
8.1	37500	39000		9.65	45000	49000	12	56000	67000	15.5	77000	92000	19.5	100000	120000
5.1	37500	39000		6	45000	49000	7.35	56000	67000	9.7	77000	92000	12	100000	120000
	636			636			636			656			677		
13.5	34000	39000		16.5	42500	49000	20.5	53000	67000	26	70000	92000	33.5	94000	120000
12	36000	39000		14.5	44000	49000	18	55000	67000	23	74000	92000	29	97500	120000
8.35	37500	39000		9.95	45000	49000	12	56000	67000	16	77000	92000	20	100000	120000
6.45	37500	39000		7.6	45000	49000	9.35	56000	67000	12.5	77000	92000	15.5	100000	120000
4.45	37500	39000		5.3	45000	49000	6.5	56500	67000	8.55	77500	92000	10.5	100000	120000
2.8	37500	39000		3.3	45000	49000	4.1	56500	67000	5.35	77500	92000	6.6	100000	120000
	961			961			961			992			1023		
8.25	29000	39000		9.9	35000	49000	14.5	52000	67000	16.5	61000	92000	26	100000	120000
7.5	31500	39000		8.75	37000	49000	12.5	54000	67000	14.5	65000	92000	22	100000	120000
5.9	36000	39000		6.8	42000	49000	8.85	56000	67000	11	72000	92000	14.5	100000	120000
4.75	37500	39000		5.6	45000	49000	6.9	56500	67000	9.05	77500	92000	11	100000	120000
3.3	37500	39000		3.9	45000	49000	4.75	56500	67000	6.25	77500	92000	7.75	100000	120000
2.1	37500	39000		2.45	45000	49000	3.05	57000	67000	3.95	78000	92000	4.9	100000	120000
	1271			1271			1271			1312			1353		
7.45	34000	39000		8.7	40000	49000	12	56000	67000	14	69000	92000	19.5	100000	120000
6.7	36000	39000		7.7	42000	49000	10	56000	67000	12.5	73000	92000	16.5	100000	120000
4.8	37500	39000		5.7	45000	49000	7.05	56500	67000	9.25	77500	92000	11	100000	120000
3.7	37500	39000		4.4	45000	49000	5.4	56500	67000	7.1	77500	92000	8.7	100000	120000
2.6	37500	39000		3.05	45000	49000	3.75	56500	67000	4.9	77500	92000	6	100000	120000
1.65	37500	39000		1.95	45000	49000	2.4	57000	67000	3.15	78000	92000	3.8	100000	120000
	1550			1550			1550			1600			1650		
6.7	36000	39000		8.3	45000	49000	10	56000	67000	13	74000	92000	16.5	100000	120000
5.9	37500	39000		7	45000	49000	8.6	56000	67000	11.5	77000	92000	14	100000	120000
4.1	37500	39000		4.85	45000	49000	6	56500	67000	7.85	77500	92000	9.6	100000	120000
3.15	37500	39000		3.7	45000	49000	4.6	56500	67000	6.05	77500	92000	7.4	100000	120000
2.2	37500	39000		2.6	45000	49000	3.25	57000	67000	4.25	78000	92000	5.1	100000	120000
1.4	37500	39000		1.65	45000	49000	2.05	57000	67000	2.7	78000	92000	3.25	100000	120000

Values obtained with the use of MHI HASEG specified synthetic lubricating oil.

Consult MHI HASEG for ratings using lubricating oils other than MHI specified lubricating oil.

SUHA
type standard
gear unit

Size 280~400



Size E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	T ₂	※ W ₂	B	r	E	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	Thread hole for mounting d ₂	d ₃	Z	t	Q	F	D ₃	L ₄	L ₅	weight kg	Q'ty of of ℓ
65	150	19k6	35	2.5	6	28	30H7	3.3	8	52	1.5	65	65	113	100	72	97	63	102	-	-	-	M 8P1.25 depth 15	-	80h8	3	Rp%	-	31	46	52	15	1
80	175	24k6	50	3	8	40	40H7	3.3	12	65	1.5	80	70	122	115	77	110	68	125	-	-	-	M 8P1.25 depth 15	-	100h8	3	Rp%	-	41	50	54	24	2
99	218	32m6	60	3	10	50	50H7	3.8	14	70	1.5	100	92	151	140	87	132	80	150	-	-	-	M10P1.5 depth 18	-	120h8	3	Rp½	-	52	57	60	35	3
280	540	65m6	105	4	18	90	140H7	8.4	36	200	1.5	280	165	300	325	180	390	150	470	295	130	380	M20P2.5 depth 35	26	385h8	15	Rp%	300	142	105	150	420	7
320	600	75m6	120	4.5	20	100	150H7	8.4	36	220	1.5	320	189	340	365	200	430	170	520	340	150	410	M20P2.5 depth 35	26	415h8	15	Rp%	366	152	115	170	570	9
360	690	80m6	140	5	22	125	160H7	9.4	40	240	1.5	360	189	390	410	225	480	190	600	380	165	500	M24P3 depth 45	33	440h8	15	Rp1	366	162	125	200	770	12
400	740	85m6	140	5	22	125	180H7	10.4	45	260	1.5	400	234	430	440	250	510	210	660	420	185	520	M24P3 depth 45	33	480h8	17	Rp1	456	182	130	240	1100	18

SUHA
type standard
gear unit

Technical drawing of the EQL SP pump assembly, showing front and side views with dimensions and labels.

Front View Dimensions and Labels:

- ☆ Oil inlet & Air vent
- G2, G2
- h, h
- t
- φB
- φZ
- φa
- Cr
- E
- g1
- h, h
- Oil level gauge

Side View Dimensions and Labels:

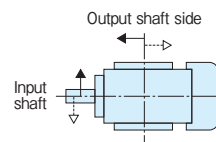
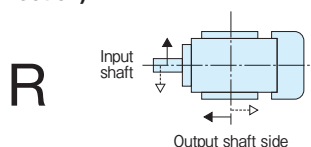
- d2ø6holes EQL SP (both sides)
- 90°
- φdc
- W2
- φm
- φD2
- (Oil inlet)
- m2
- φL
- φD1
- W1
- t
- m3
- K1
- φd3
- φb
- Drain plug hole Q (both sides)
- l
- G1
- n
- G3

Details of output shaft inside diameter:

- φD3
- L4, L5, L4

Size E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	T ₂	※ W ₂	B	r	E	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	Thread hole for mounting d ₂	d ₃	Z	t	Q	F	D ₄	D ₅	L ₄	L ₅	weight kg	Q'ty of of	
125	235	38m6	60	3	10	50	60H7	4.4	18	85	1.5	125	100	150	160	107	205	84	210	135	80	145	M12P1.75	depth 24	14	180h8	10	Rp½	202	25	62	70	74	66	1.5
160	300	42m6	70	3	12	56	85H7	5.4	22	120	1.5	160	116	180	195	120	245	95	270	170	95	165	M12P1.75	depth 24	18	230h8	10	Rp¾	225	25	87	75	90	110	2
200	365	48m6	80	3.5	14	70	95H7	5.4	25	130	1.5	200	135	220	242	140	295	115	320	210	110	250	M16P2	depth 28	18	255h8	12	Rp¾	270	40	97	85	110	200	3.5
225	414	55m6	95	4	16	80	105H7	6.4	28	150	1.5	225	174	246	285	160	340	130	360	235	145	280	M16P2	depth 28	22	280h8	12	Rp¾	330	40	107	95	130	245	6
250	475	60m6	105	4	18	90	125H7	7.4	32	170	1.5	250	154	270	298	160	360	135	420	265	125	315	M16P2	depth 28	22	315h8	12	Rp¾	300	40	127	95	130	300	6

haft arrangement (↓ A viewed direction)



21

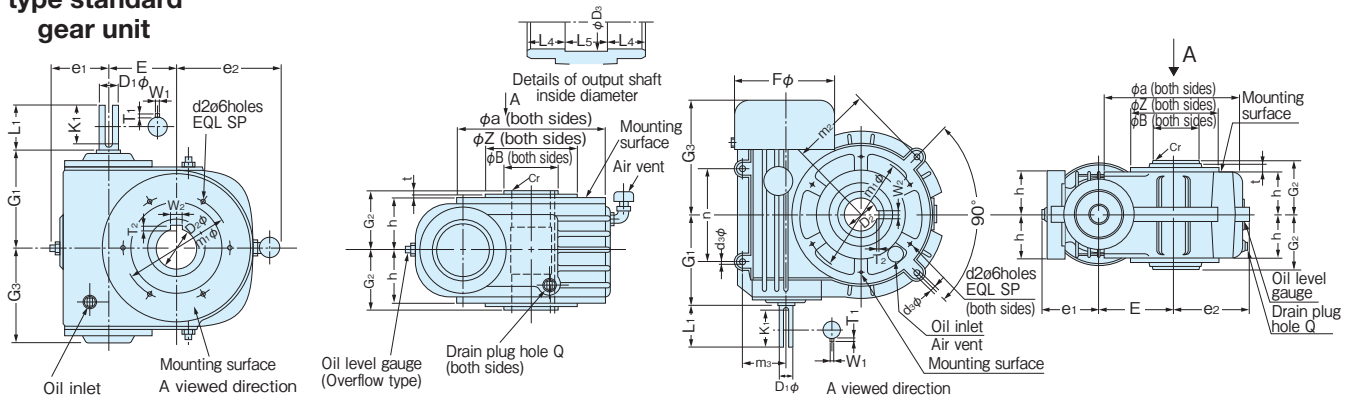
SHVA

type standard
gear unit

Size 65~99

Size 280~400

Worm shaft should be installed horizontally for this type.



(Unit: mm)

サイズ E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	T ₂	※ W ₂	B	r	E	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	Thread hole for mounting d ₂	d ₃	Z	t	Q	F	D ₃	L ₄	L ₅	weight kg	Q'ty of oil ℓ
65	150	19k6	35	2.5	6	28	30H7	3.3	8	52	1.5	65	65	131	100	72	97	63	102	-	-	-	M 8P1.25 depth 15	-	80h8	3	Rp¼	-	31	46	52	15	1
80	175	24k6	50	3	8	40	40H7	3.3	12	65	1.5	80	70	140	115	77	110	68	125	-	-	-	M 8P1.25 depth 15	-	100h8	3	Rp¼	-	41	50	54	24	1
99	218	32m6	60	3	10	50	50H7	3.8	14	70	1.5	100	92	176	140	87	132	80	150	-	-	-	M10P1.5 depth 18	-	120h8	3	Rp¼	-	52	57	60	35	2
280	540	65m6	105	4	18	90	140H7	8.4	36	200	1.5	280	165	310	325	180	390	150	470	295	130	380	M20P2.5 depth 35	26	385h8	15	Rp¾	300	142	105	150	420	19
320	600	75m6	120	4.5	20	100	150H7	8.4	36	220	1.5	320	189	340	365	200	430	170	520	340	150	410	M20P2.5 depth 35	26	415h8	15	Rp¾	366	152	115	170	570	28
360	690	80m6	140	5	22	125	160H7	9.4	40	240	1.5	360	189	390	410	225	480	190	600	380	165	500	M24P3 depth 45	33	440h8	15	Rp1	366	162	125	200	770	37
400	740	85m6	140	5	22	125	180H7	10.4	45	260	1.5	400	234	430	440	250	510	210	660	420	185	520	M24P3 depth 45	33	480h8	17	Rp1	456	182	130	240	1100	47

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

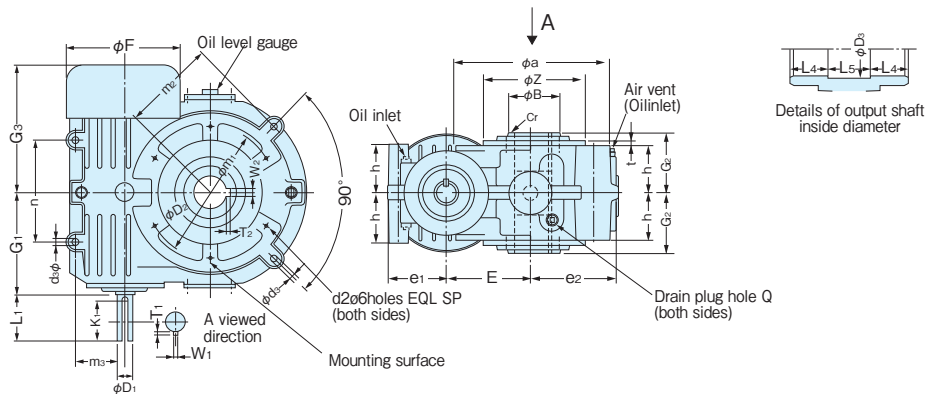
SHVA

type standard
gear unit

Size 125~250

Size 280~400

Worm shaft should be installed horizontally for this type.



(Unit: mm)

サイズ E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	T ₂	※ W ₂	B	r	E	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	Thread hole for mounting d ₂	d ₃	Z	t	Q	F	D ₃	L ₄	L ₅	weight kg	Q'ty of oil ℓ
125	235	38m6	60	3	10	50	60H7	4.4	18	85	1.5	125	100	150	160	107	205	84	210	135	80	145	M12P1.75 depth 24	14	180h8	10	Rp½	202	62	70	74	66	2.5
160	300	42m6	70	3	12	56	85H7	5.4	22	120	1.5	160	116	180	195	120	245	95	270	170	95	165	M12P1.75 depth 24	18	230h8	10	Rp¾	225	87	75	90	110	5
200	365	48m6	80	3.5	14	70	95H7	5.4	25	130	1.5	200	135	220	242	140	295	115	320	210	110	250	M16P2 depth 28	18	255h8	12	Rp¾	270	97	85	110	200	9
225	414	55m6	95	4	16	80	105H7	6.4	28	150	1.5	225	174	246	285	160	340	130	360	235	145	280	M16P2 depth 28	22	280h8	12	Rp¾	330	107	95	130	245	15
250	475	60m6	105	4	18	90	125H7	7.4	32	170	1.5	250	154	270	298	160	360	135	420	265	125	315	M16P2 depth 28	22	315h8	12	Rp¾	300	127	95	130	300	17

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)



Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

2. Since the head of the air vent bolt is projected on the mounting surfaces of sizes 65 through 99 within a range of m₂ dimensions, an adequate clearance or recess should be provided to avoid interference to the opposite mounting surface.

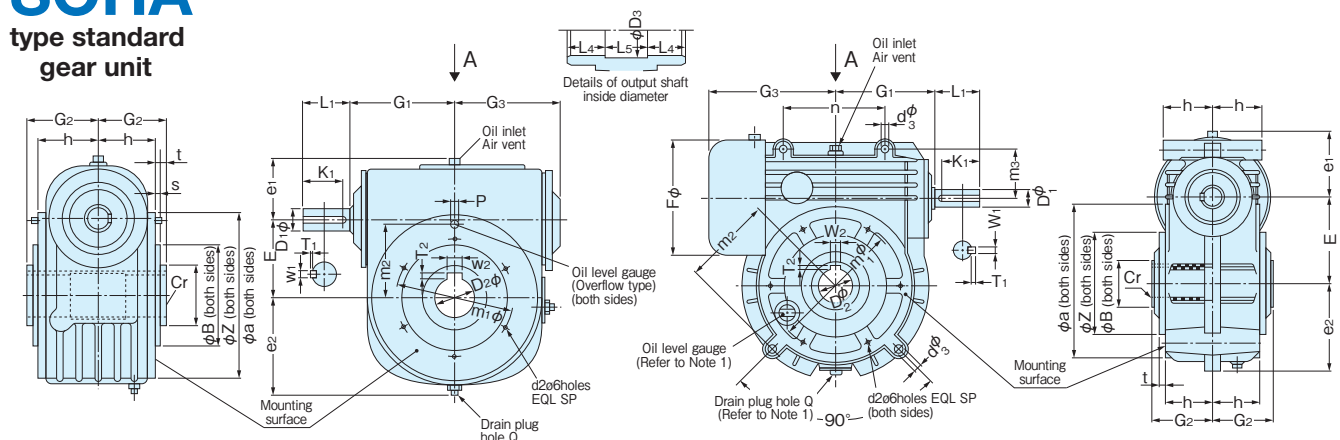
3. Worm shaft can not be installed vertically for the SHVA type.

Gear Unit Dimensions

SOHA type standard gear unit

Size 65~99

Size 280~400



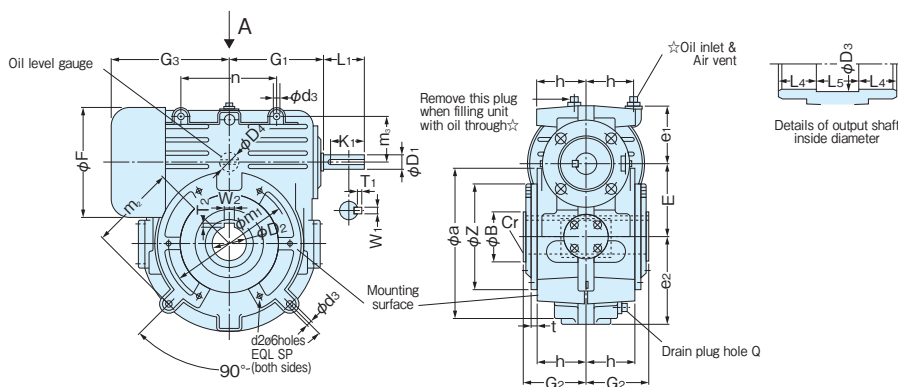
(Unit: mm)

Size E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	T ₂	※ W ₂	B	r	E	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	Thread hole for mounting d ₂	d ₃	Z	t	Q	F	D ₃	L ₄	L ₅	P	S	weight kg	Q'ty of oil ℓ
65	150	19k6	35	2.5	6	28	30H7	3.3	8	52	1.5	65	73	102	100	72	97	63	102	65	-	-	M 8P1.25 depth 15	-	80h8	3	Rp%	-	31	46	52	13	1	15	1.5
80	175	24k6	50	3	8	40	40H7	3.3	12	65	1.5	80	78	111	115	77	110	68	125	77.5	-	-	M 8P1.25 depth 15	-	100h8	3	Rp%	-	41	50	54	13	1	24	2
99	218	32m6	60	3	10	50	50H7	3.8	14	70	1.5	100	98	140	140	87	132	80	150	96	-	-	M10P1.5 depth 18	-	120h8	3	Rp½	-	52	57	60	16	1	35	3.5
280	540	65m6	105	4	18	90	140H7	8.4	36	200	1.5	280	165	310	325	180	390	150	470	295	130	380	M20P2.5 depth 35	26	385h8	15	Rp¼	300	142	105	150	-	-	420	10
320	600	75m6	120	4.5	20	100	150H7	8.4	36	220	1.5	320	189	340	365	200	430	170	520	340	150	410	M20P2.5 depth 35	26	415h8	15	Rp¼	366	152	115	170	-	-	570	15
360	690	80m6	140	5	22	125	160H7	9.4	40	240	1.5	360	189	390	410	225	480	190	600	380	165	500	M24P3 depth 45	33	440h8	15	Rp1	366	162	125	200	-	-	770	25
400	740	85m6	140	5	22	125	180H7	10.4	45	260	1.5	400	234	430	440	250	510	210	660	420	185	520	M24P3 depth 45	33	480h8	17	Rp1	456	182	130	240	-	-	1100	30

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

SOHA type standard gear unit

Size 125~250



(Unit: mm)

Size E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	T ₂	※ W ₂	B	Chamfer r	E	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	Thread hole for mounting d ₂	d ₃	Z	t	Q	F	D ₃	D ₄	L ₄	L ₅	weight kg	Q'ty of oil ℓ
125	235	38m6	60	3	10	50	60H7	4.4	18	85	1.5	125	100	150	160	107	205	84	210	135	80	145	M12P1.75 depth 24	14	180h8	10	Rp½	202	25	62	70	74	66	4
160	300	42m6	70	3	12	56	85H7	5.4	22	120	1.5	160	116	180	195	120	245	95	270	170	95	165	M12P1.75 depth 24	18	230h8	10	Rp¾	225	25	87	75	90	110	7.5
200	365	48m6	80	3.5	14	70	95H7	5.4	25	130	1.5	200	135	220	242	140	295	115	320	210	110	250	M16P2 depth 28	18	255h8	12	Rp¾	270	40	97	85	110	200	14.5
225	414	55m6	95	4	16	80	105H7	6.4	28	150	1.5	225	174	246	285	160	340	130	360	235	145	280	M16P2 depth 28	22	280h8	12	Rp¾	330	40	107	95	130	245	21
250	475	60m6	105	4	18	90	125H7	7.4	32	170	1.5	250	154	270	298	160	360	135	420	265	125	315	M16P2 depth 28	22	315h8	12	Rp¾	300	40	127	95	130	300	29.5

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)



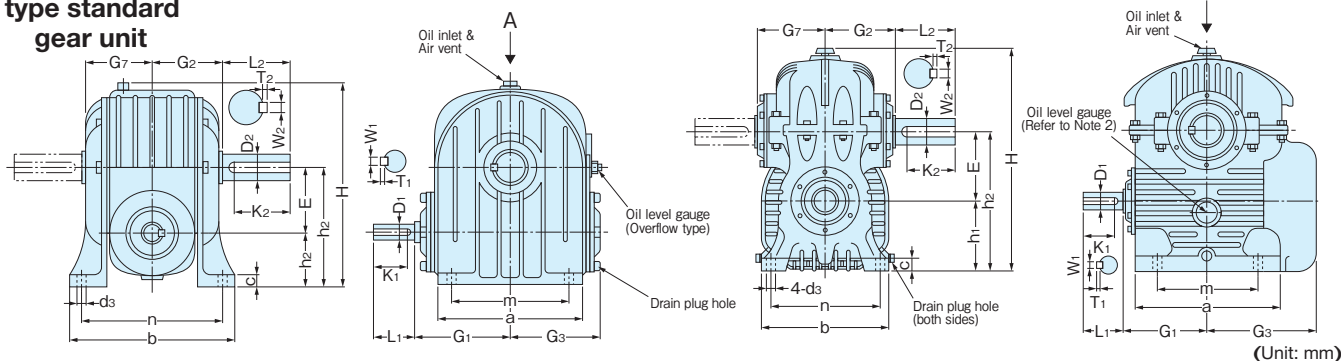
Note) 1. Oil level gauge and drain plug hole are located at the opposite side of the output shaft.
2. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

SUHW

type standard
gear unit

Size 65~99

Size 280~500



(Unit: mm)

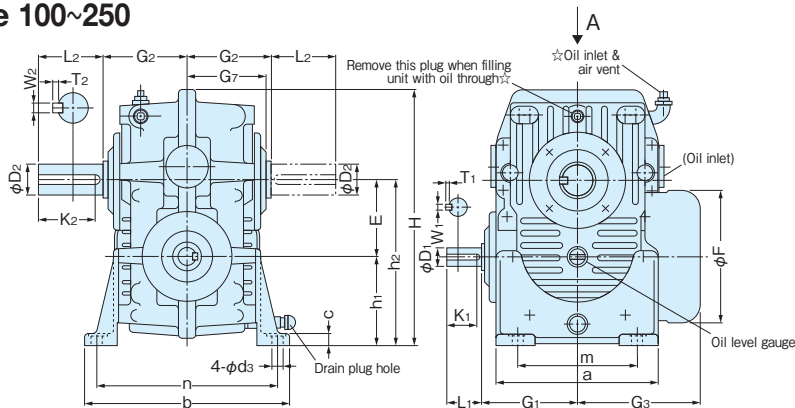
サイズ E	a	b	c	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	L ₂	T ₂	※ W ₂	K ₁	E	G ₁	G ₂	G ₃	G ₇	h ₁	h ₂	H	m	n	d ₃	weight kg	Q'ty of oil ℓ
65	147	180	12	19k6	35	2.5	6	28	32m6	60	3	10	50	65	100	77	97	70	55	120	233	115	150	14	17	1
80	175	200	15	24k6	50	3	8	40	38m6	60	3	10	50	80	115	85	110	81	65	145	267	140	170	14	25	1.5
99	218	230	15	32m6	60	3	10	50	48m6	80	3.5	14	70	100	140	100	132	95	80	180	331	175	190	14	38	3
280	570	460	50	65m6	105	4	18	90	110m6	180	6	28	160	280	325	240	390	235	250	530	854	420	400	26	530	27
320	640	530	50	75m6	120	4.5	20	100	120n6	210	7	32	190	320	365	255	430	250	280	600	949	470	445	33	690	40
360	730	580	55	80m6	140	5	22	125	130n6	210	7	32	190	360	410	270	480	265	300	660	1058	540	490	33	950	54
400	790	620	60	85m6	140	5	22	125	150n6	240	8	36	210	400	440	290	510	285	320	720	1148	620	530	33	1150	65
450	885	680	65	90m6	160	5	25	140	170n6	270	9	40	240	450	495	320	560	310	355	805	1290	700	580	39	1650	86
500	1015	750	80	95m6	160	5	25	140	190n6	310	10	45	280	500	550	360	700	350	400	900	1438	760	640	39	2300	135

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

SUHW

type standard
gear unit

Size 100~250

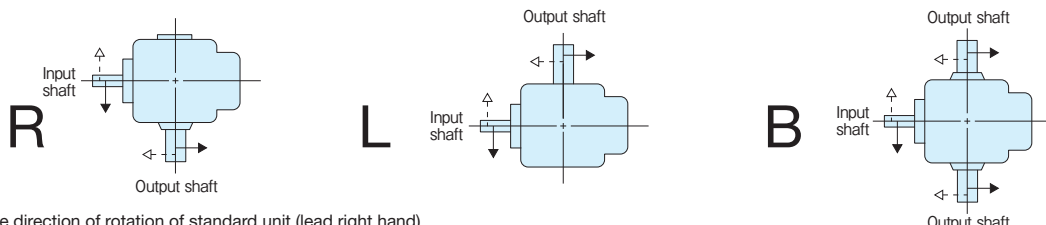


(Unit: mm)

サイズ E	a	b	c	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	L ₂	T ₂	※ W ₂	K ₂	E	G ₁	G ₂	G ₃	G ₇	h ₁	h ₂	H	m	n	d ₃	F	weight kg	Q'ty of oil ℓ
100	235	300	18	32m6	60	3	10	50	48m6	80	3.5	14	70	100	140	130	180	125	130	230	365	180	270	14	255	52	3
125	270	340	20	38m6	60	3	10	50	55m6	95	4	16	80	125	160	140	205	135	145	270	420	200	300	18	255	83	4
160	310	400	25	42m6	70	3	12	56	65m6	105	4	18	90	160	195	165	245	160	160	320	515	240	360	18	322	137	7
200	360	480	35	48m6	80	3.5	14	70	80m6	140	5	22	125	200	242	195	295	190	200	400	642	280	430	22	393	240	12
225	400	504	35	55m6	95	4	16	80	90m6	160	5	25	140	225	285	210	340	200	210	435	687	320	454	22	411	310	17
250	440	560	40	60m6	105	4	18	90	100m6	180	6	28	160	250	298	220	360	216	220	470	742	340	500	26	427	410	21

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

Shaft arrangement
(↓ A viewed direction)



Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

2. For sizes 100 and over, oil level gauge is installed on the opposite side of the output shaft end when the unit has an output shaft at only one end, and on the right hand case viewed from the input shaft side when the unit has an output shaft at both ends.

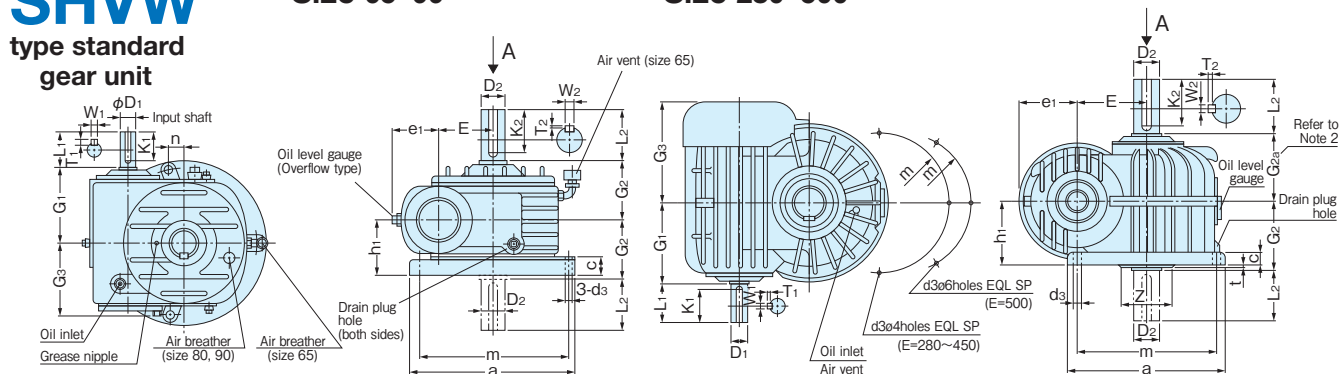
Gear Unit Dimensions

SHVW

type standard
gear unit

Size 65~99

Size 280~500



(Unit: mm)

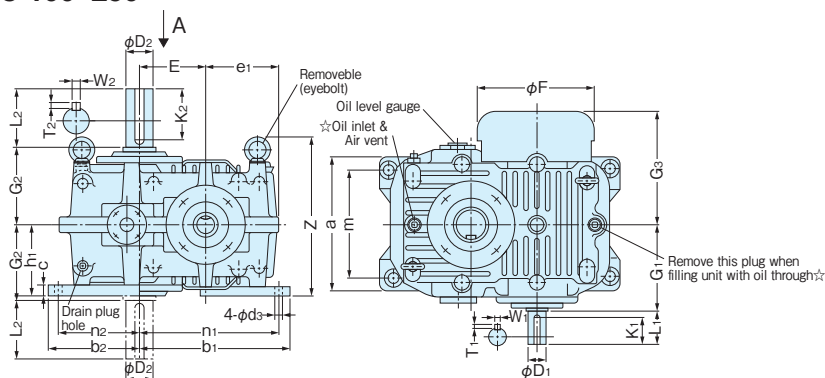
Size E	a	c	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	L ₂	T ₂	※ W ₂	K ₂	e ₁	E	Z	t	G ₁	G ₂	G ₃	h ₁	m	n	d ₃	weight kg	Q'ty of oil ℓ
65	225	25	19k6	35	2.5	6	28	32m6	60	3	10	50	65	65	-	-	100	77	97	75	200	17.5	14	17	1
80	240	25	24k6	50	3	8	40	38m6	60	3	10	50	70	80	-	-	115	85	110	80	215	18.5	14	25	1
99	300	30	32m6	60	3	10	50	48m6	80	3.5	14	70	92	100	-	-	140	100	132	95	275	24	14	38	2
280	700	45	65m6	105	4	18	90	110m6	180	6	28	160	212	280	-	-	325	240	390	230	640	-	26	530	34
320	760	50	75m6	120	4.5	20	100	120n6	210	7	32	190	235	320	230	2	365	255	430	250	700	-	26	690	45
360	880	55	80m6	140	5	22	125	130n6	210	7	32	190	235	360	250	2	410	270	480	260	805	-	33	950	60
400	950	60	85m6	140	5	22	125	150n6	240	8	36	210	235	400	385	21	440	290	510	265	875	-	33	1150	70
450	1070	65	90m6	160	5	25	140	170n6	270	9	40	240	267	450	-	-	495	320	595	315	990	-	39	1600	90
500	1180	75	95m6	160	5	25	140	190n6	310	10	45	280	267	500	415	2	550	390	660	375	1100	-	33	2100	120

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

SHVW

type standard
gear unit

Size 100~250

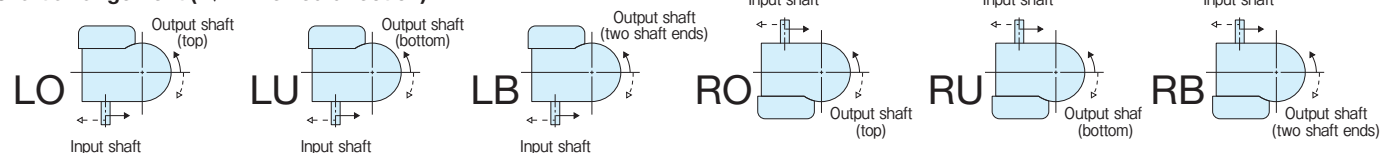


(Unit: mm)

Size E	a	b ₁	b ₂	c	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	L ₂	T ₂	※ W ₂	K ₂	E	e ₁	G ₁	G ₂	G ₃	h ₁	m	n ₁	n ₂	d ₃	Z	F	weight kg	Q'ty of oil ℓ
100	220	240	150	20	32m6	60	3	10	50	48m6	80	3.5	14	70	100	125	140	130	180	125	180	225	135	14	275	255	52	3.5
125	250	280	170	22.5	38m6	60	3	10	50	55m6	95	4	16	80	125	135	160	140	205	135	200	260	150	18	300	255	83	5
160	300	330	210	27.5	42m6	70	3	12	56	65m6	105	4	18	90	160	155	195	165	245	165	240	310	190	18	355	322	137	10
200	340	405	255	35	48m6	80	3.5	14	70	80m6	140	5	22	125	200	192	242	195	295	200	280	380	230	22	425	393	240	18.5
225	380	445	270	35	55m6	95	4	16	80	90m6	160	5	25	140	225	202	285	210	340	212	320	420	245	22	450	411	310	25
250	440	490	300	42.5	60m6	105	4	18	90	100m6	180	6	28	160	250	212	298	220	360	230	340	460	270	26	490	427	410	32

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)

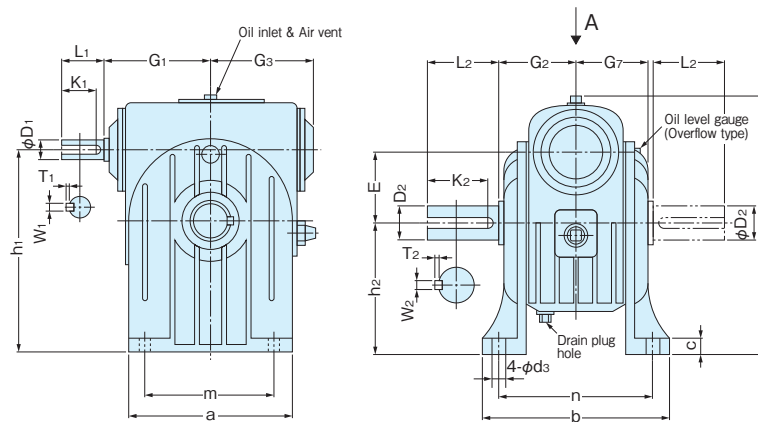


Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).
2. Dimensions G_{2a} is equal to G₂, except when E is 500 (G_{2a} is 290).

SOHW

type standard
gear unit

Size 65~99



(Unit: mm)

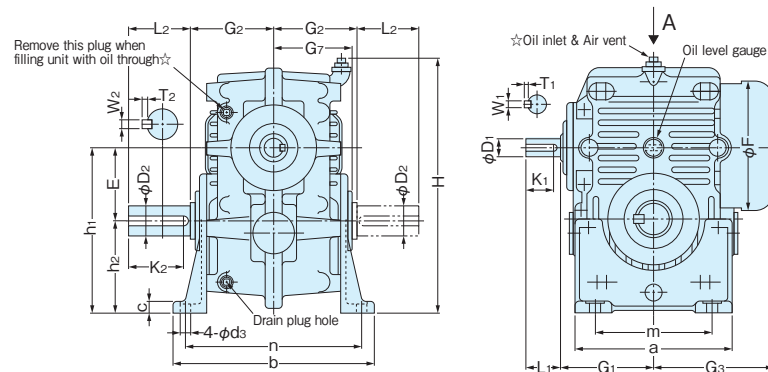
サイズ E	a	b	c	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	L ₂	T ₂	※ W ₂	K ₂	E	G ₁	G ₂	G ₃	h ₁	h ₂	H	m	n	d ₃	G ₇	F	weight kg	Q'ty of oil ℓ
65	147	180	12	19k6	35	2.5	6h9	28	32m6	60	3	10h9	50	65	100	77	97	185	120	260	115	150	14	70	-	17	1.5
80	175	200	15	24k6	50	3	8h9	40	38m6	60	3	10h9	50	80	115	85	110	225	145	305	140	170	14	81	-	25	2
99	218	230	15	32m6	60	3	10h9	50	48m6	80	3.5	14h9	70	100	140	100	132	280	180	380	175	190	14	95	-	38	3.5

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

SOHW

type standard
gear unit

Size 100~250

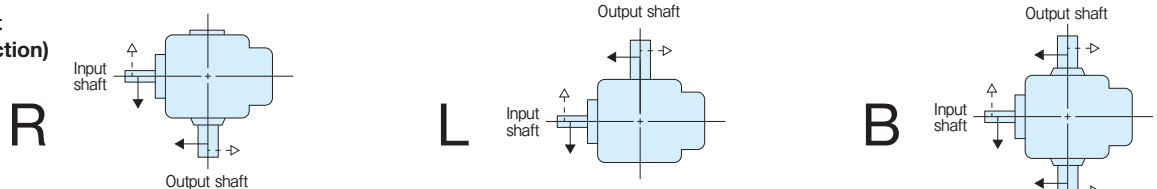


(Unit: mm)

サイズ E	a	b	c	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	L ₂	T ₂	※ W ₂	K ₂	E	G ₁	G ₂	G ₃	h ₁	h ₂	H	m	n	d ₃	G ₇	F	weight kg	Q'ty of oil ℓ
100	235	300	18	32m6	60	3	10	50	48m6	80	3.5	14	70	100	140	130	180	240	140	385	180	270	14	125	255	52	5
125	270	340	20	38m6	60	3	10	50	55m6	95	4	16	80	125	160	140	205	285	160	440	200	300	18	135	255	83	6.5
160	310	400	25	42m6	70	3	12	56	65m6	105	4	18	90	160	195	165	245	360	200	535	240	360	18	160	322	137	14.5
200	360	480	35	48m6	80	3.5	14	70	80m6	140	5	22	125	200	242	195	295	450	250	660	280	430	22	190	393	240	26
225	400	504	35	55m6	95	4	16	80	90m6	160	5	25	140	225	285	210	340	485	260	700	320	454	22	200	411	310	33
250	440	560	40	60m6	105	4	18	90	100m6	180	6	28	160	250	298	220	360	530	280	755	340	500	26	216	427	410	45

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)



Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

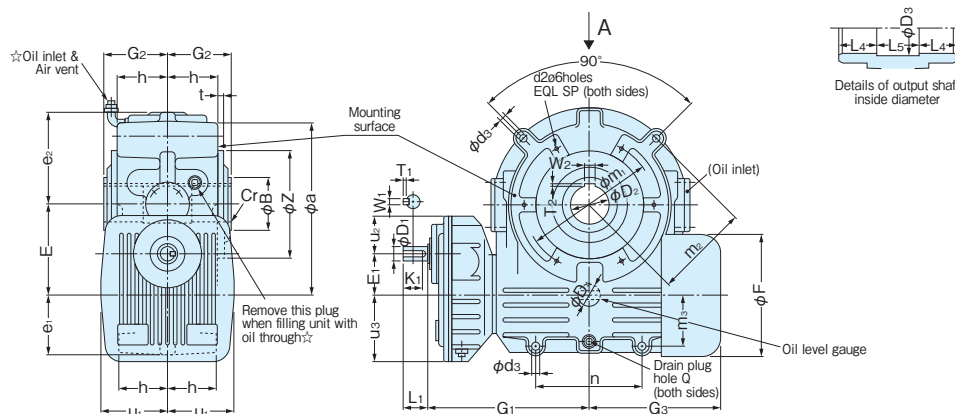
2. For sizes 100 and over, oil level gauges and oil inlet are located on the opposite side of the output shaft end, and on the right side when the unit has an output shaft at both ends (double shaft end spec) as viewed from the input shaft side.

Gear Unit Dimensions

SEUA

type standard
gear unit

Size 125~250



(Unit: mm)

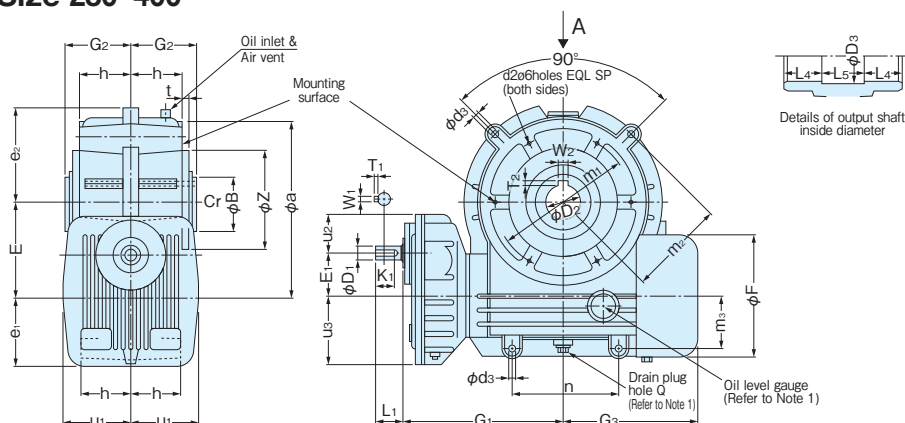
Size E	a	Reduction gear ratio iN=100										iN=63,80,125,160										iN=200,250										D ₂	Chamfer r	T ₂	W ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	u ₁	u ₂	u ₃	Z	t	B	F	Thread hole for mounting d _i	d _i	Q	D ₃	D ₄	L ₁	L ₂	weight kg	Q'ty of oil ℓ
		D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																																					
125	235	22k6	35	2.5	6	28	19k6	35	2.5	6	28	14k6	30	2	5	25	60H7	1.5	4.4	18	125	63	100	150	242	107	205	84	210	135	80	145	100	57	100	180h8	10	85	202	M12P1.75	depth 24	14	Rp1/2	62	25	70	74	75	2														
160	300	28m6	50	3	8	40	24k6	50	3	8	40	19k6	35	2.5	6	28	85H7	1.5	5.4	22	160	80	116	180	316	120	245	95	270	170	95	165	108	61	109	230h8	10	120	225	M12P1.75	depth 24	18	Rp3/4	87	25	75	90	122	3.5														
200	365	38m6	60	3	10	50	28m6	50	3	8	40	22k6	35	2.5	6	28	95H7	1.5	5.4	25	200	100	135	220	385	140	295	115	320	210	110	250	119	67	117	255h8	12	130	270	M16P2	depth 28	18	Rp3/4	97	40	85	110	223	5														
225	414	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	105H7	1.5	6.4	28	225	125	174	246	440	160	340	130	360	235	145	280	142	77	140	280h8	12	150	330	M16P2	depth 28	22	Rp3/4	107	40	95	130	275	9														
250	475	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	125H7	1.5	7.4	32	250	125	154	270	455	160	360	135	420	265	125	315	142	77	140	315h8	12	170	300	M16P2	depth 28	22	Rp3/4	127	40	95	130	330	9														

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

SEUA

type standard
gear unit

Size 280~400

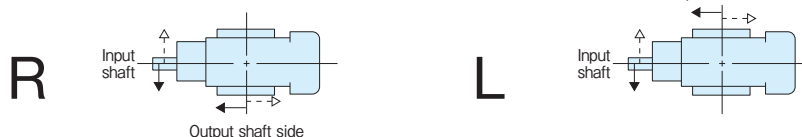


(Unit: mm)

Size E	a	Reduction gear ratio iN=100					iN=63, 80, 125, 160					iN=200, 250					D ₂	Chamfer r	T ₂	W ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	u ₁	u ₂	u ₃	Q	Thread hole for mounting d ₂	d ₁	Z	t	B	F	D ₃	D ₄	L ₁	L ₂	weight kg	Q'ty of ℓ
		D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																																
280	540	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	140H7	1.5	8.4	36	280	125	156	310	482	180	390	150	470	295	130	380	142	77	140	Rp3/4	M20P2.5	depth 35	26	385h8	14	200	300	142	105	150	450	10
320	600	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	150H7	1.5	8.4	36	320	160	189	340	555	200	430	170	520	340	150	410	175	97	173	Rp3/4	M20P2.5	depth 35	26	415h8	15	220	366	162	115	170	620	13
360	690	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	160H7	1.5	9.4	40	360	180	189	390	600	225	480	190	600	380	165	500	175	97	173	Rp1	M24P3	depth 45	33	440h8	15	240	366	162	125	200	820	16
400	740	80m6	140	5	22	125	60m6	105	4	18	90	48m6	80	3.5	14	70	180H7	1.5	10.4	45	400	200	234	430	691	250	510	210	660	420	185	520	211	115	211	Rp1	M24P3	depth 45	33	480h8	17	260	456	182	130	240	1200	26

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)



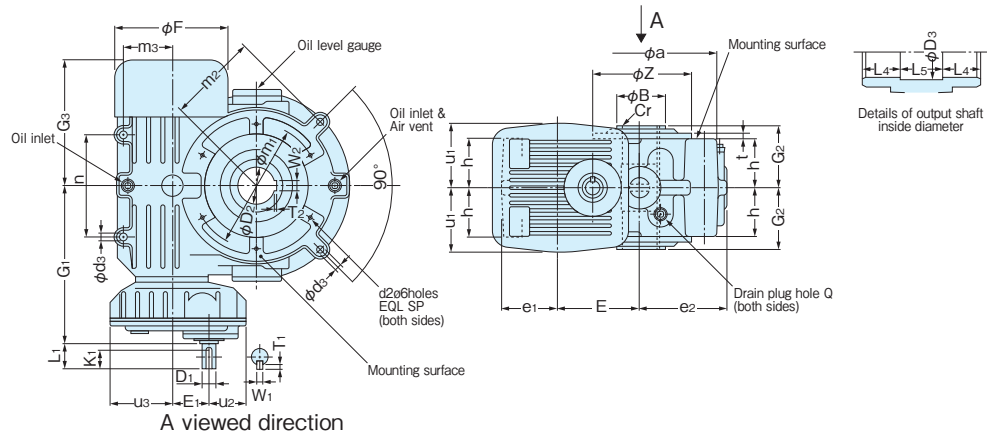
Note) 1. Oil level gauge and drain plug hole are located at the opposite side of the output shaft.
2. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

SEHA

type standard
gear unit

Size 125~250

Worm shaft should be installed horizontally for this type.



(Unit: mm)

Size E	a	Reduction gear ratio iN=100					iN=63, 80, 125, 160					iN=200, 250					D ₂	T ₂	W ₂	E	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	u ₁	Chamfer r	d ₃	Q	Thread hole for mounting d ₂	Z	t	B	F	E ₁	u ₁	D ₃	L ₁	L ₅	weight kg	Q'ty of oil ℓ	
		D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																															
125	235	22k6	35	2.5	6	28	19k6	35	2.5	6	28	14k6	30	2	5	25	60H7	4.4	18	125	100	150	242	107	205	84	210	135	80	145	100	1.5	14	Rp½	M12P1.75 depth 24	180h8	10	85	202	63	57	100	62	70	74	75	3.5
160	300	28m6	50	3	8	40	24k6	50	3	8	40	19k6	35	2.5	6	28	85H7	5.4	22	160	116	180	316	120	245	95	270	170	95	165	108	1.5	18	Rp¾	M12P1.75 depth 24	230h8	10	120	225	80	61	109	87	75	90	122	7
200	365	38m6	60	3	10	50	28m6	50	3	8	40	22k6	35	2.5	6	28	95H7	5.4	25	200	135	220	385	140	295	115	320	210	110	250	119	1.5	18	Rp¾	M16P2 depth 28	255h8	12	130	270	100	67	117	97	85	110	223	12
225	414	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	105H7	6.4	28	225	174	246	440	160	340	130	360	235	145	280	142	1.5	22	Rp¾	M16P2 depth 28	280h8	12	150	330	125	77	140	107	95	130	275	18.5
250	475	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	125H7	7.4	32	250	154	270	455	160	360	135	420	265	125	315	142	1.5	22	Rp¾	M16P2 depth 28	315h8	12	170	300	125	77	140	127	95	130	330	20.5

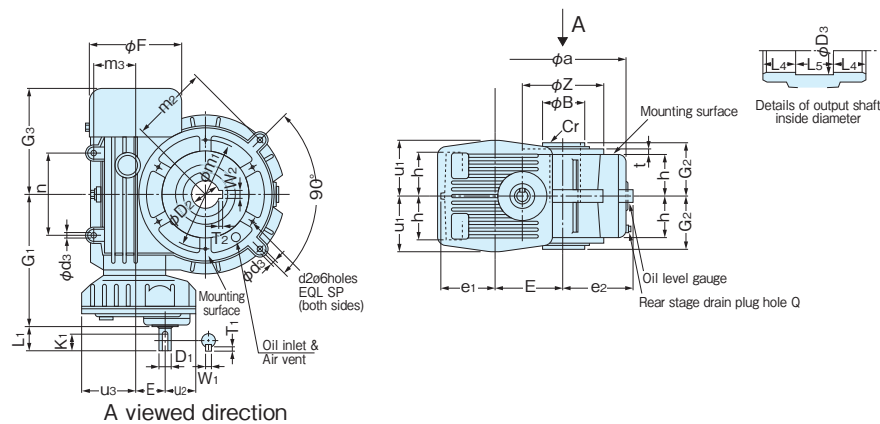
※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

SEHA

type standard
gear unit

Size 280~400

Worm shaft should be installed horizontally for this type.

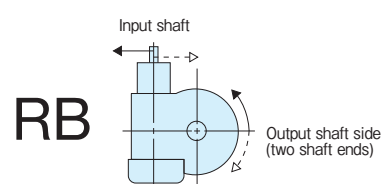
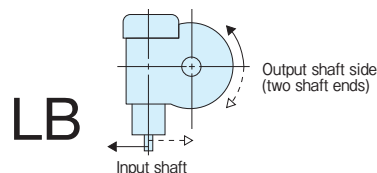


(Unit: mm)

Size E	a	Reduction gear ratio iN=100					iN=63, 80, 125, 160					iN=200, 250					D ₂	Chamfer r	T ₂	W ₂	E	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	m ₃	n	u ₁	u ₂	u ₃	Q	Thread hole for mounting d ₂										weight kg	Q'ty of oil ℓ
		D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																				d ₁	z	t	B	F	D ₃	L ₃	L ₅				
280	540	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	140H7	1.5	8.4	36	280	125	156	310	482	180	390	150	470	295	130	380	142	77	140	Rp¾	M20P2.5 depth 35	26	385h8	14	200	300	142	105	150	450	22.5
320	600	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	150H7	1.5	8.4	36	320	160	189	340	555	200	430	170	520	340	150	410	175	97	173	Rp¾	M20P2.5 depth 35	26	415h8	15	220	366	152	115	170	620	32
360	690	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	160H7	1.5	9.4	40	360	160	189	390	600	225	480	190	600	380	165	500	175	97	173	Rp1	M24P3 depth 45	33	440h8	15	240	366	162	125	200	820	41
400	740	80m6	140	5	22	125	60m6	105	4	18	90	48m6	80	3.5	14	70	180H7	1.5	10.4	45	400	200	234	430	691	250	510	210	660	420	185	520	211	115	211	Rp1	M24P3 depth 45	33	480h8	17	260	456	182	130	240	1200	55

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)

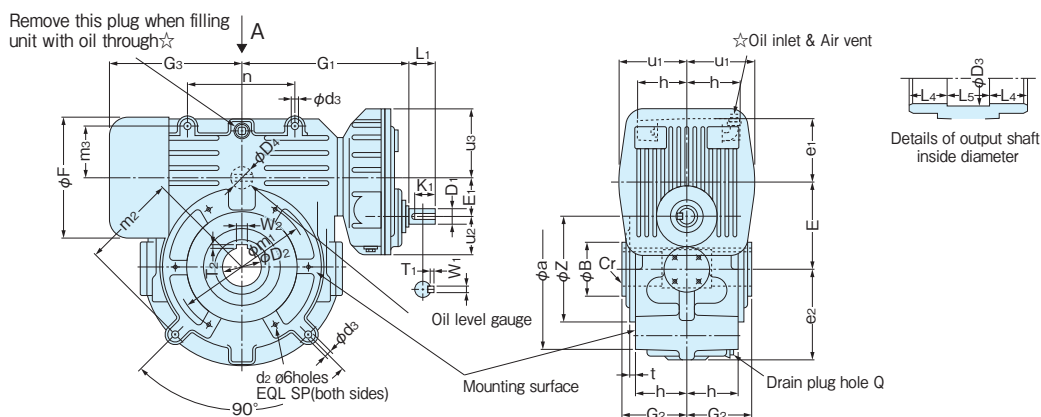


Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

Gear Unit Dimensions

SEOA type standard gear unit

Size 125~250



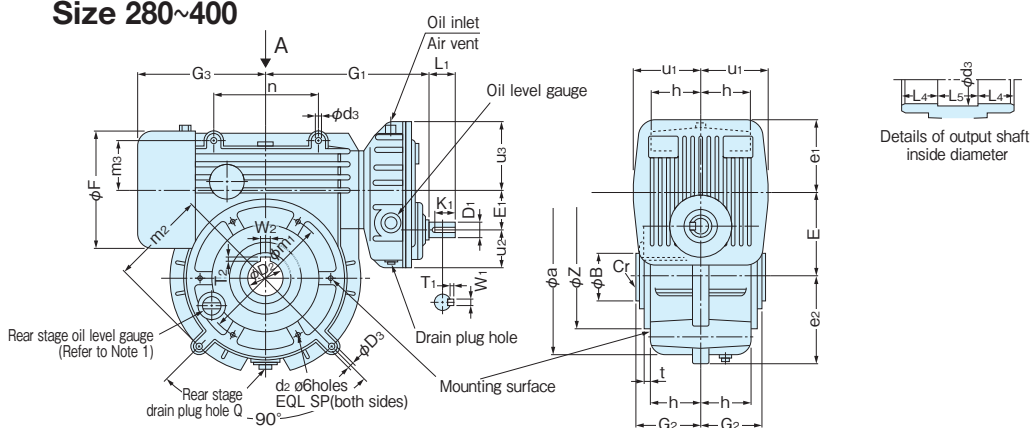
(Unit: mm)

Size E	a	Reduction gear ratio iN=100					iN=63,80,125,160					iN=200,250					D ₂	Chamfer r	T ₂	E	E ₁	e ₁	G ₁	G ₂	h	m ₁	m ₂	n	u ₁	u ₂	Q	Thread hole for mounting d ₂	d ₃	Z	t	B	F	D ₃	D ₄	L ₁	L ₂	weight kg	Qty of oil ℓ						
		D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																																	
125	235	22k6	35	2.5	6	28	19k6	35	2.5	6	28	14k6	30	2	5	25	60H7	1.5	4.4	18	125	63	100	150	242	107	205	84	210	135	80	145	100	57	100	Rp½	M12P1.75	depth 24	14	180h8	10	85	202	62	25	70	74	75	5
160	300	28m6	50	3	8	40	24k6	50	3	8	40	19k6	35	2.5	6	28	85H7	1.5	5.4	22	160	80	116	180	316	120	245	95	270	170	95	165	108	61	109	Rp¾	M12P1.7	depth 24	18	230h8	10	120	225	87	25	75	90	122	9.5
200	365	38m6	60	3	10	50	28m6	50	3	8	40	22k6	35	2.5	6	28	95H7	1.5	5.4	25	200	100	135	220	385	140	295	115	320	210	110	250	119	67	117	Rp¾	M16P2	depth 28	18	255h8	12	130	270	97	40	85	110	223	17.5
225	414	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	105H7	1.5	6.4	28	225	125	174	246	440	160	340	130	360	235	145	280	142	77	140	Rp¾	M16P2	depth 28	22	280h8	12	150	330	107	40	95	130	275	25
250	475	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	125H7	1.5	7.4	32	250	125	154	270	455	160	360	135	420	265	125	315	142	77	140	Rp¾	M16P2	depth 28	22	315h8	12	170	300	127	40	95	130	330	33

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

SEOA type standard gear unit

Size 280~400



(Unit: mm)

Size E	a	Reduction gear ratio iN=100					iN=63, 80, 125, 160					iN=200, 250					D ₂	Chamfer r	T ₂	W ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₃	h	m ₁	m ₂	n	U ₁	U ₂	Q	Thread hole for mounting d ₃	d ₃	Z	t	B	F	D ₃	L ₁	L ₂	weight kg	Q'ty of oil ℓ			
		D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																														D ₁	L ₁	T ₁
280	540	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	140H7	1.5	8.4	36	280	125	156	310	482	180	390	150	470	295	130	380	142	77	140	Rp¾	M20P2.5	depth 35	26	385h8	14	200	300	142	105	150	450	13
320	600	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	150H7	1.5	8.4	36	320	160	189	340	555	200	430	170	520	340	150	410	175	97	173	Rp¾	M20P2.5	depth 35	26	415h8	15	220	366	152	115	170	620	19
360	690	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	160H7	1.5	9.4	40	360	160	189	390	600	225	480	190	600	380	165	500	175	97	173	Rp1	M24P3	depth 45	33	440h8	15	240	366	162	125	200	820	29
400	740	80m6	140	5	22	125	60m6	105	4	18	90	48m6	80	3.5	14	70	180H7	1.5	10.4	45	400	200	234	430	691	250	510	210	660	420	185	520	211	115	211	Rp1	M24P3	depth 45	33	480h8	17	260	456	182	130	240	1200	37

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)

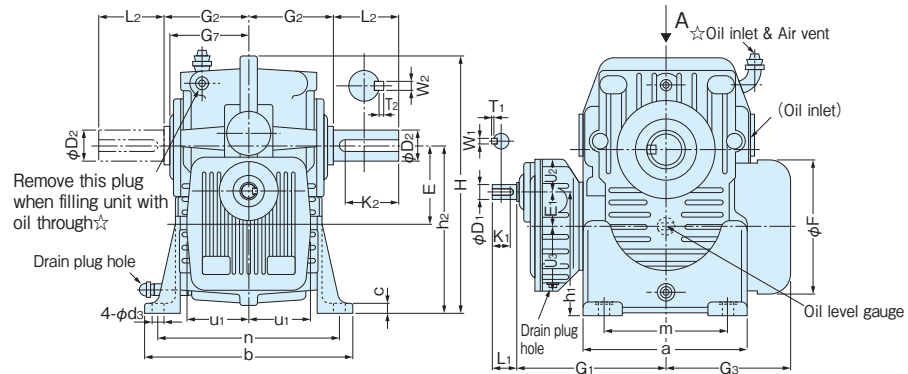


Note) 1. Oil level gauge and drain plug hole are located at the opposite side of the output shaft.
2. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

SEUH

type standard
gear unit

Size 100~250



(Unit: mm)

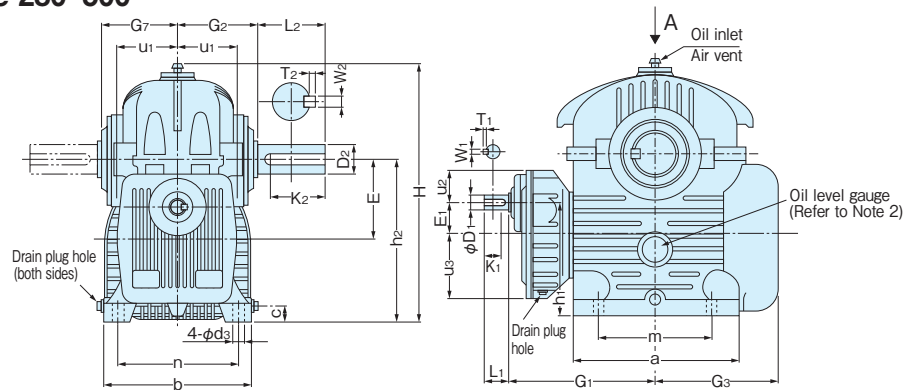
Size E	a	b	c	Reduction gear ratio iN=100					iN=63, 80, 125, 160					iN=200, 250					D ₂	L ₂	T ₂	W ₂	K ₂	E	E ₁	G ₁	G ₂	G ₃	G ₄	h ₁	h ₂	H	m	n	F	d ₃	u ₁	u ₂	u ₃	weight kg	Q'ty of oil ℓ
				D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																							
100	235	300	18	22k6	35	2.5	6	28	19k6	35	2.5	6	28	14k6	30	2	5	25	48m6	80	3.5	14	70	100	63	219.5	130	180	125	193	230	365	180	270	255	14	100	57	100	61	3.5
125	270	340	20	22k6	35	2.5	6	28	19k6	35	2.5	6	28	14k6	30	2	5	25	55m6	95	4	16	80	125	63	242	140	205	135	208	270	420	200	300	255	18	100	57	100	92	4.5
160	310	400	25	28m6	50	3	8	40	24k6	50	3	8	40	19k6	35	2.5	6	28	65m6	105	4	18	90	160	80	316	165	245	160	240	320	515	240	360	322	18	108	61	109	149	8.5
200	360	480	35	38m6	60	3	10	50	28m6	50	3	8	40	22k6	35	2.5	6	28	80m6	140	5	22	125	200	100	385	195	295	190	300	400	642	280	430	393	22	119	67	117	263	14.5
225	400	504	35	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	90m6	160	5	25	140	225	125	440	210	340	200	335	435	687	320	454	411	22	142	77	140	340	20
250	440	560	40	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	100m6	180	6	28	160	250	125	455	220	360	216	345	470	742	340	500	427	26	142	77	140	440	24

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

SEUH

type standard
gear unit

Size 280~500

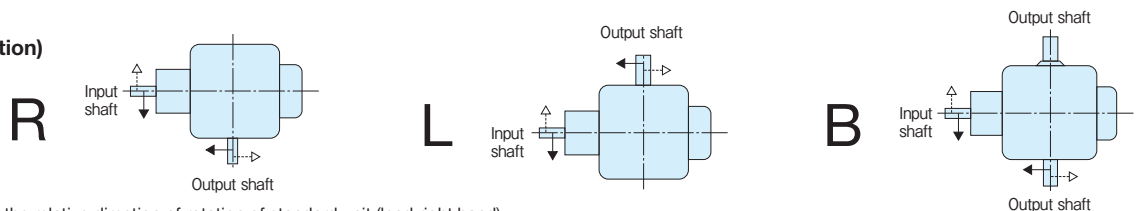


(Unit: mm)

Size E	a	b	c	Reduction gear ratio iN=100					iN=63, 80, 125, 160					iN=200, 250					D ₂	L ₂	T ₂	W ₂	K ₂	E	E ₁	G ₁	G ₂	G ₃	G ₄	h ₁	h ₂	H	m	n	d ₃	u ₁	u ₂	u ₃	weight kg	Q'ty of oil ℓ
				D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																						
280	570	460	50	48m6	80	3.5	14	70	38m6	80	3	10	50	28m6	50	3	8	40	110m6	180	6	28	160	280	125	482	240	390	235	375	530	854	420	400	26	142	77	140	575	30
320	640	530	50	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	120m6	210	7	32	190	320	160	555	255	430	250	440	600	949	470	445	33	175	97	173	735	44
360	730	580	55	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	130m6	210	7	32	190	360	160	600	270	480	265	460	660	1058	540	490	33	175	97	173	1030	58
400	790	620	60	80m6	140	5	22	125	60m6	105	4	18	90	48m6	80	3.5	14	70	150m6	240	8	36	210	400	200	691	290	510	285	520	720	1148	620	530	33	211	115	211	1230	73
450	885	680	65	80m6	140	5	22	125	60m6	105	4	18	90	48m6	80	3.5	14	70	170m6	270	9	40	240	450	200	741	320	560	310	555	805	1290	700	580	39	211	115	211	1800	96
500	1015	750	80	100m6	180	6	28	160	80m6	140	5	22	125	60m6	105	4	18	90	190m6	310	10	45	280	500	250	876	360	700	350	650	900	1438	760	640	39	260	133	259	2500	145

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)



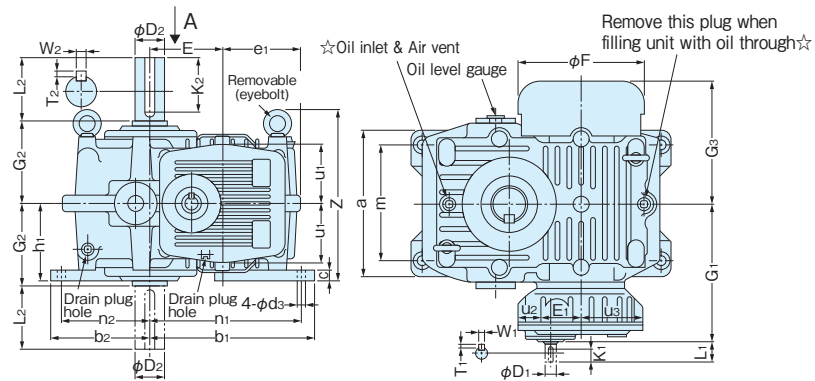
Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

2. Oil level gauge is installed on the opposite side of the output shaft end when the unit has an input shaft at only one end, and on the right hand case viewed from the input shaft side when the unit has an output shaft at both ends.

Gear Unit Dimensions

SEHV type standard gear unit

Size 100~250



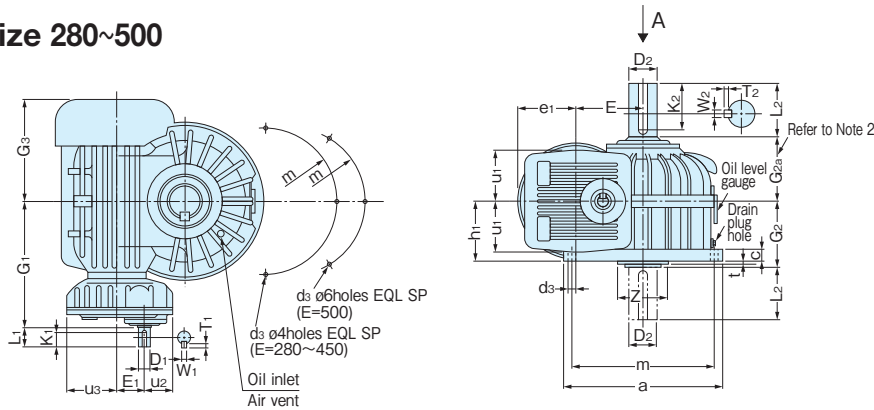
(Unit: mm)

Size E	a	b ₁	b ₂	c	Reduction gear ratio iN=100					iN=63, 80, 125, 160					iN=200, 250					D ₂	L ₂	T ₂	W ₂	K ₂	e ₁	E	E ₁	F	G ₁	G ₂	G ₃	h ₁	m	n ₁	n ₂	u ₁	Z	d ₁	u ₂	u ₃	weight kg	Q'ty of oil ℓ
					D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																							
100	220	240	150	20	22k6	35	2.5	6	28	19k6	35	2.5	6	28	14k6	30	2	5	25	48m6	80	3.5	14	70	125	100	63	255	219.5	130	180	125	180	225	135	100	275	14	57	100	61	4
125	250	280	170	22.5	22k6	35	2.5	6	28	19k6	35	2.5	6	28	14k6	30	2	5	25	55m6	95	4	16	80	135	125	63	255	242	140	205	135	200	260	150	100	300	18	57	100	92	6
160	300	330	210	27.5	28m6	50	3	8	40	24k6	50	3	8	40	19k6	35	2.5	6	28	65m6	105	4	18	90	155	160	80	322	316	165	245	165	240	310	190	108	355	18	61	109	149	12
200	340	405	255	35	38m6	60	3	10	50	28m6	50	3	8	40	22k6	35	2.5	6	28	80m6	140	5	22	125	192	200	100	393	385	195	295	200	280	380	230	119	425	22	67	117	263	21.5
225	380	445	270	35	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	90m6	160	5	25	140	202	225	125	411	440	210	340	212	320	420	245	142	450	22	77	140	340	28
250	440	490	300	42.5	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	100m6	180	6	28	160	212	250	125	427	455	220	360	230	340	460	270	142	490	26	77	140	440	36

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

SEHV type standard gear unit

Size 280~500

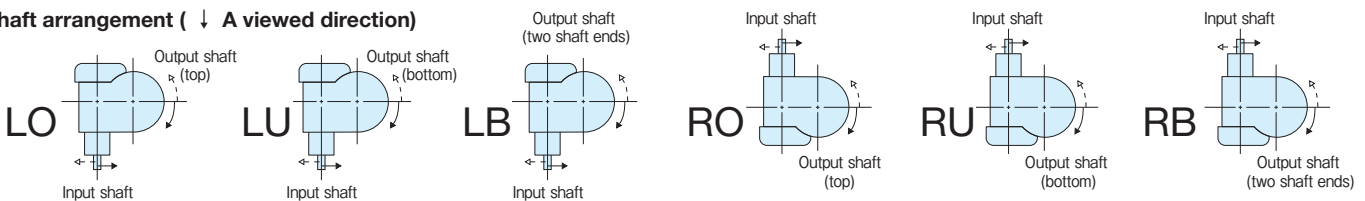


(Unit: mm)

Size E	a	c	Reduction gear ratio iN=100					iN=63, 80, 125, 160					iN=200, 250					D ₂	L ₂	T ₂	W ₂	K ₂	e ₁	E	E ₁	G ₁	G ₂	G ₃	h ₁	m	Z	t	d ₁	u ₁	u ₂	u ₃	weight kg	Q'ty of oil ℓ
			D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																					
280	700	45	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	110m6	180	6	28	160	212	280	125	482	240	390	230	640	-	-	26	142	77	140	575	37
320	760	50	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	120m6	210	7	32	190	235	320	160	555	255	430	250	700	230	2	26	175	97	173	735	49
360	880	55	65m6	105	4	18	90	48m6	80	3.5	14	70	38m6	60	3	10	50	130m6	210	7	32	190	235	360	160	600	270	480	260	805	250	2	33	175	97	173	1030	64
400	950	60	80m6	140	5	22	125	60m6	105	4	18	90	48m6	80	3.5	14	70	150m6	240	8	36	210	235	400	200	691	290	510	265	875	385	21	33	211	115	211	1230	78
450	1070	65	80m6	140	5	22	125	60m6	105	4	18	90	48m6	80	3.5	14	70	170m6	270	9	40	240	267	450	200	741	320	595	315	990	-	-	39	211	115	211	1750	98
500	1180	75	100m6	180	6	28	160	80m6	140	5	22	125	60m6	105	4	18	90	190m6	310	10	45	280	267	500	250	876	390	660	375	1100	415	2	33	260	133	259	2300	130

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)

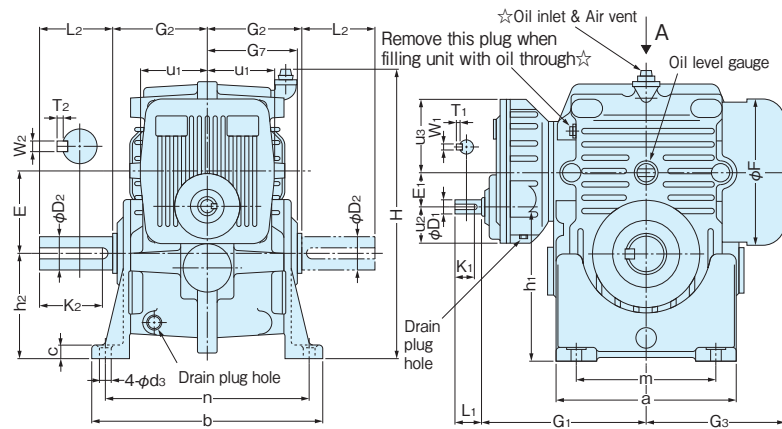


Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).
2. Dimensions G_{2a} is equal to G₂, except when E is 500 (G_{2a} is 290).

SEOH

type standard
gear unit

Size 100~250

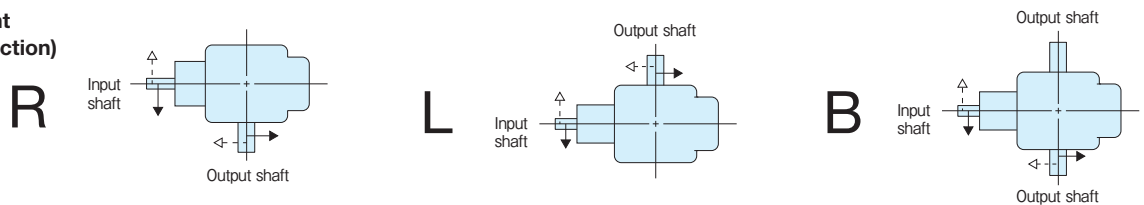


(Unit: mm)

Size E	a	b	c	Reduction gear ratio iN=100					iN=63, 80, 125, 160					iN=200, 250					D ₂	L ₂	T ₂	W ₂	K ₂	E ₁	E ₂	G ₁	G ₂	G ₃	G ₇	h ₁	h ₂	H	m	n	u ₁	u ₂	u ₃	d ₃	F	weight kg	Q'ty of oil ℓ
				D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁	D ₁	L ₁	T ₁	W ₁	K ₁																							
100	235	300	18	22k6	35	2.5	6	28	19k6	35	2.5	6	28	14k6	30	2	5	25	48m6	80	3.5	14	70	100	63	219.5	130	180	125	177	140	385	180	270	100	57	100	14	255	61	5.5
125	270	340	20	22k6	35	2.5	6	28	19k6	35	2.5	6	28	14k6	30	2	5	25	55m6	95	4	16	80	125	63	242	140	205	135	222	160	440	200	300	100	57	100	18	255	92	7
160	310	400	25	28m6	50	3	8	40	24k6	50	3	8	40	19k6	35	2.5	6	28	65m6	105	4	18	90	160	80	316	165	245	160	280	200	535	240	360	108	61	109	18	322	149	15.5
200	360	480	35	38m6	60	3	10	50	28m6	50	3	8	40	22k6	35	2.5	6	28	80m6	140	5	22	125	200	100	385	195	295	190	350	250	660	280	430	119	67	117	22	393	263	27.5
225	400	504	35	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	90m6	160	5	25	140	225	125	440	210	340	200	360	260	700	320	454	142	77	140	22	411	340	37
250	440	560	40	48m6	80	3.5	14	70	38m6	60	3	10	50	28m6	50	3	8	40	100m6	180	6	28	160	250	125	455	220	360	216	405	280	755	340	500	142	77	140	26	427	440	48

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)



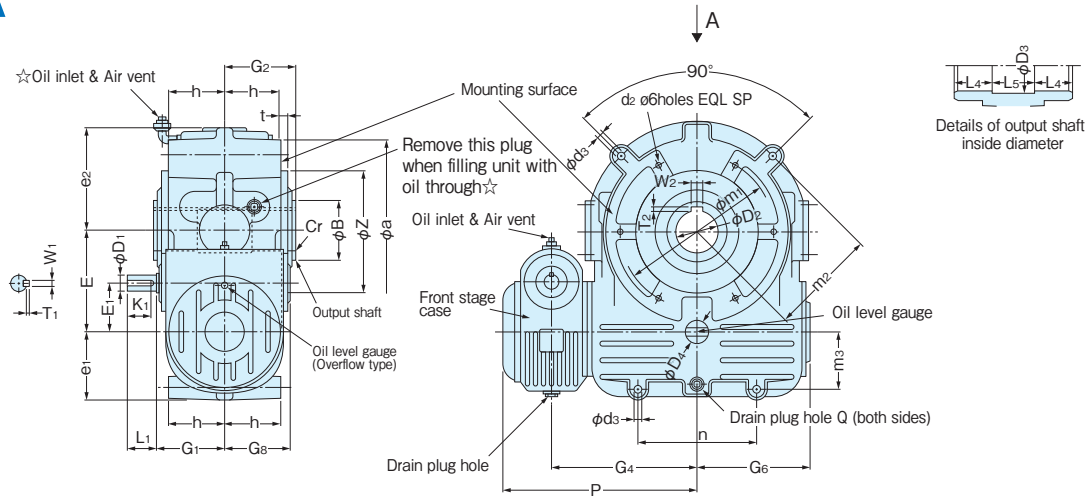
Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

2. Oil level gauge and oil inlet are located on the opposite side of the output shaft, and to the right side viewed from the input shaft side for double shaft end spec.

Gear Unit Dimensions

SCUA type standard gear unit

Size 125~250



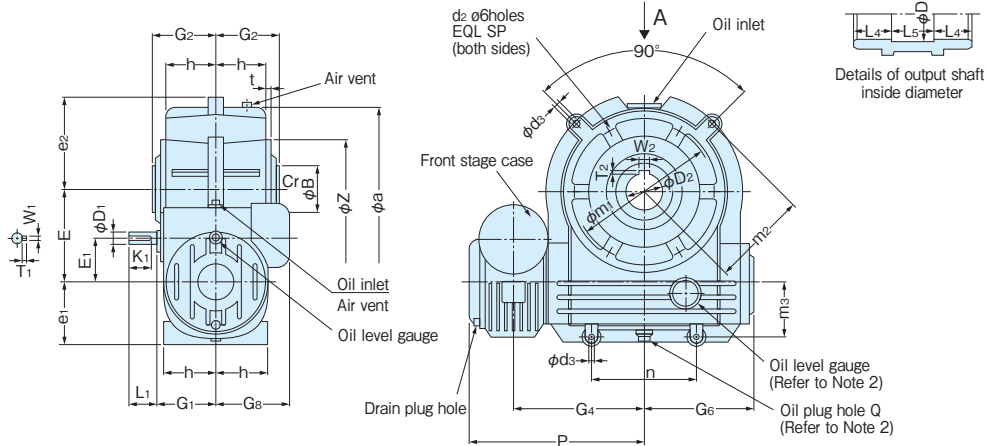
(Unit: mm)

Size E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	Chamfer r	T ₂	※ W ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₃	G ₄	G ₅	G ₆	B	h	m ₁	m ₂	m ₃	n	P	Q	Thread hole for mounting d ₂	d ₃	Z	t	D ₃	D ₄	L ₅	weight kg	Q'ty of oil ℓ	
125	235	19k6	35	2.5	6	28	60H7	1.5	4.4	18	125	65	100	150	100	107	208	156	98	85	84	210	135	80	145	278	Rp½	M12P1.75	depth 24	14	180h8	10	62	25	70	74	75	3
160	300	24m6	50	3	8	40	85H7	1.5	5.4	22	160	80	116	180	115	120	245	188	110	120	95	270	170	95	165	326	Rp¾	M12P1.75	depth 24	18	230h8	10	87	25	75	90	120	4.5
200	365	32m6	60	3	10	50	95H7	1.5	5.4	25	200	100	135	220	140	140	295	232	135	130	115	320	210	110	250	390	Rp¾	M16P2	depth 28	18	255h8	12	97	40	85	110	250	7
225	414	32m6	60	3	10	50	105H7	1.5	6.4	28	225	100	174	246	140	160	338	269	135	150	130	360	235	145	280	433	Rp¾	M16P2	depth 28	22	280h8	12	107	40	95	130	295	11.5
250	475	38m6	60	3	10	50	125H7	1.5	7.4	32	250	125	154	270	160	160	390	284	205	170	135	420	265	125	315	534	Rp¾	M16P2	depth 28	22	315h8	12	127	40	95	130	366	10

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

SCUA type standard gear unit

Size 280~400

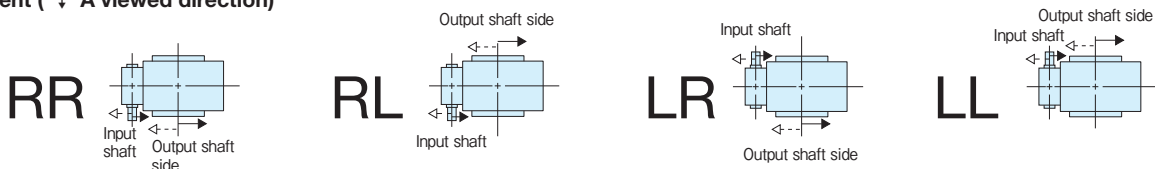


(Unit: mm)

Size E	a	D ₁	L ₁	T ₁	※W ₁	K ₁	D ₂	r	T ₂	※W ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₃	G ₄	G ₅	G ₆	B	h	m ₁	m ₂	m ₃	n	P	Q	Thread hole for mounting d _s	d ₃	Z	t	D ₃	D ₄	L ₅	weight kg	Q'ty of oil ℓ
280	540	38m6	60	3	10	50	140H7	1.5	8.4	36	280	125	165	310	160	180	417	320	205	200	150	470	295	130	380	561	Rp¾	M20P2.5	depth 35	26	385h8	14	142	105	150	485	15
320	600	42m6	70	3	12	56	150H7	1.5	8.4	36	320	160	195	340	195	200	465	355	245	220	170	520	340	150	410	623	Rp¾	M20P2.5	depth 35	26	415h8	15	152	115	170	660	21
360	690	42m6	70	3	12	56	160H7	1.5	9.4	40	360	160	195	390	195	225	510	400	245	240	190	600	380	165	500	668	Rp1	M24P3	depth 45	33	440h8	15	162	125	200	860	25
400	740	48m6	80	3.5	14	70	180H7	1.5	10.4	45	400	200	234	430	242	250	570	427	295	260	210	660	420	185	520	750	Rp1	M24P3	depth 45	33	480h8	17	182	130	240	1300	40

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)



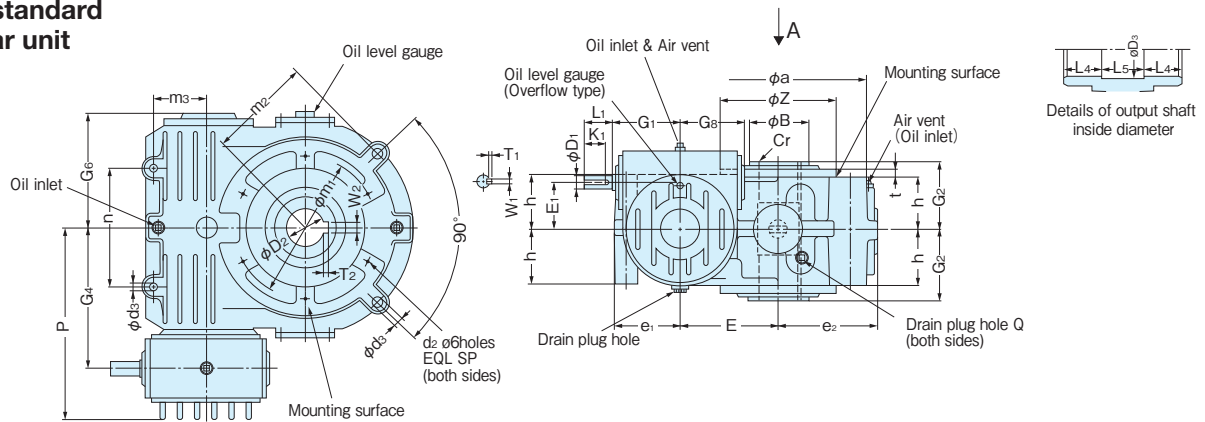
- Note) 1. External appearances of front stage cases may be different from those shown above according to sizes.
2. Oil level gauge and drain plug hole are located at the opposite side of the output shaft.
3. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

SCHA

type standard
gear unit

Size 125~250

Worm shaft should be installed horizontally for this type.



(Unit: mm)

Size E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	Chamfer r	T ₂	※ W ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₃	G ₄	G ₅	G ₆	G ₇	G ₈	B	h	m ₁	m ₂	m ₃	n	P	Q	Thread hole for mounting d ₂	d ₃	Z	t	D ₃	L ₄	L ₅	weight kg	Q'ty of oil ℓ
125	235	19k6	35	2.5	6	28	60H7	1.5	4.4	18	125	65	100	150	100	107	208	156	98	85	84	210	135	80	145	278	Rp½	M12P1.75	depth 24	14	180h8	10	62	70	74	75	3.5		
160	300	24m6	50	3	8	40	85H7	1.5	5.4	22	160	80	116	180	115	120	245	188	110	120	95	270	170	95	165	326	Rp¾	M12P1.75	depth 24	18	230h8	10	87	75	90	120	6		
200	365	32m6	60	3	10	50	95H7	1.5	5.4	25	200	100	135	220	140	140	295	232	135	130	115	320	210	110	250	390	Rp¾	M16P2	depth 28	18	255h8	12	97	85	110	250	10		
225	414	32m6	60	3	10	50	105H7	1.5	6.4	28	225	100	174	246	140	160	338	269	135	150	130	360	235	145	280	433	Rp¾	M16P2	depth 28	22	280h8	12	107	95	130	295	16		
250	475	38m6	60	3	10	50	125H7	1.5	7.4	32	250	125	154	270	160	160	390	284	205	170	135	420	265	125	315	534	Rp¾	M16P2	depth 28	22	315h8	12	127	95	130	366	21		

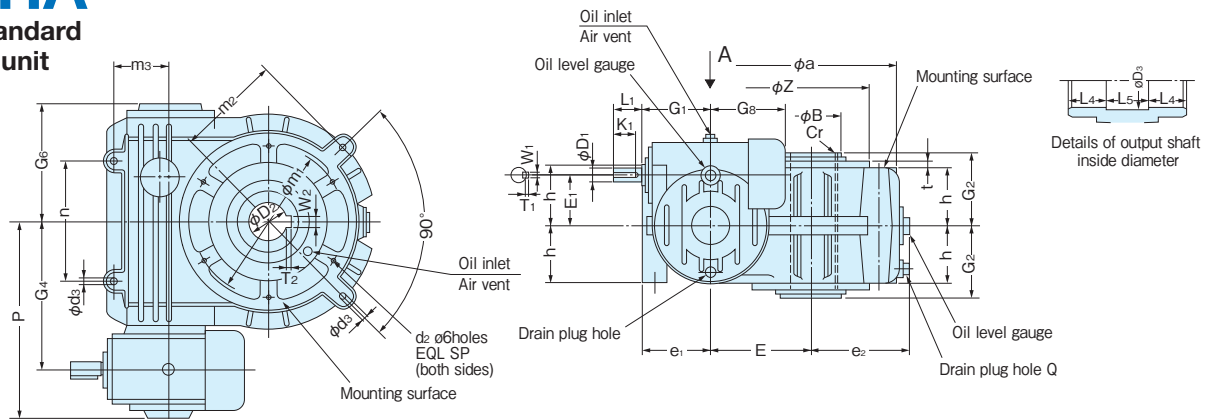
※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

SCHA

type standard
gear unit

Size 280~400

Worm shaft should be installed horizontally for this type.



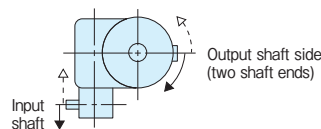
(Unit: mm)

Size E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	r	T ₂	※ W ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₃	G ₆	G ₈	B	Z	t	h	m ₁	m ₂	m ₃	n	P	Q	Thread hole for mounting d ₂	d ₃	D ₃	L ₄	L ₅	weight kg	Q'ty of oil ℓ	
280	540	38m6	60	3	10	50	140H7	1.5	8.4	36	280	125	165	310	160	180	417	320	205	200	385h8	14	150	470	295	130	380	561	Rp¾	M20P2.5	depth 35	26	142	105	150	485	25
320	600	42m6	70	3	12	56	150H7	1.5	8.4	36	320	160	189	340	195	200	465	355	245	220	415h8	15	170	520	340	150	410	623	Rp¾	M20P2.5	depth 35	26	152	115	170	660	38
360	690	42m6	70	3	12	56	160H7	1.5	9.4	40	360	160	189	390	195	225	510	400	245	240	440h8	15	190	600	380	165	500	668	Rp1	M24P3	depth 45	33	162	125	200	860	45
400	740	48m6	80	3.5	14	70	180H7	1.5	10.4	45	400	200	234	430	242	250	570	427	295	260	480h8	17	210	600	420	185	520	750	Rp1	M24P3	depth 45	33	182	130	240	1400	57

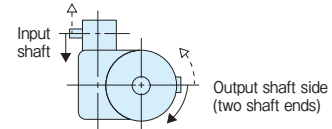
※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)

LLB



RRB

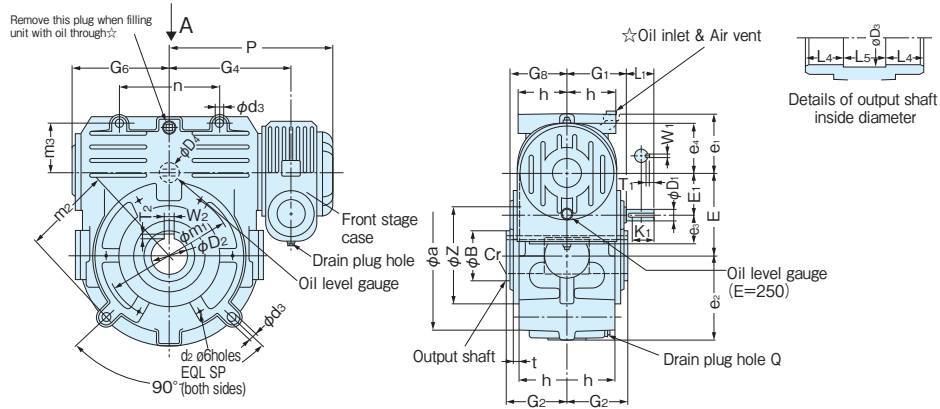


Note) 1. External appearances of front stage cases may be different from those shown above according to sizes.
2. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

Gear Unit Dimensions

SCOA type standard gear unit

Size 125~250



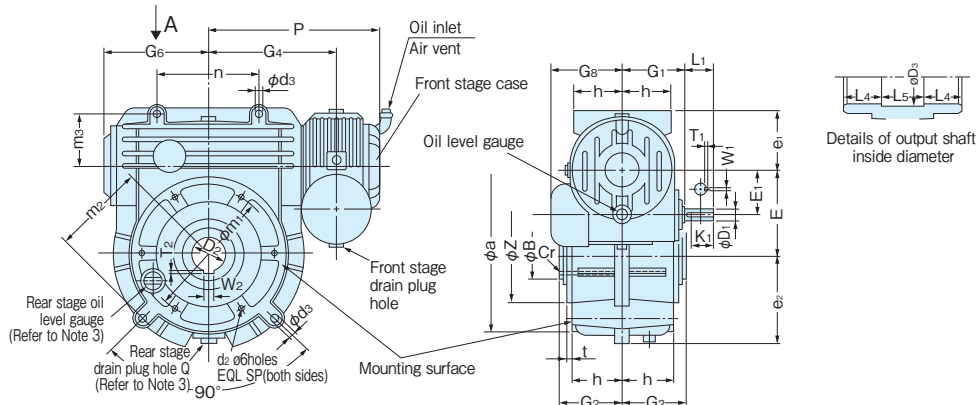
(Unit: mm)

Size E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	D ₃	D ₄	Chamfer r	T ₂	※ W ₂	E	E ₁	e ₁	e ₂	e ₃	e ₄	G ₁	G ₂	G ₃	G ₄	G ₅	G ₆	B	h	Z	t	P	m ₁	m ₂	m ₃	n	Q	Thread hole for mounting d ₂	d ₃	L ₄	L ₅	weight kg	Q'ty of oil ℓ
125	235	19k6	35	2.5	6	28	60H7	62	25	1.5	4.4	18	125	65	100	150	50	97	100	107	208	156	98	85	84	180h8	10	278	210	135	80	145	Rp½	M12P1.75	depth 24	14	70	74	75	5
160	300	24k6	50	3	8	40	85H7	87	25	1.5	5.4	22	160	80	116	180	55	106	115	120	245	188	110	120	95	230h8	10	326	270	170	95	165	Rp¾	M12P1.75	depth 24	18	75	90	120	9.5
200	365	32m6	60	3	10	50	95H7	97	40	1.5	5.4	25	200	100	135	220	75	133	140	140	295	232	135	130	115	255h8	12	390	320	210	110	250	Rp¾	M16P2	depth 28	18	85	110	250	17.5
225	414	32m6	60	3	10	50	105H7	107	40	1.5	6.4	28	225	100	174	246	75	133	140	160	338	269	135	150	130	280h8	12	433	360	235	145	280	Rp¾	M16P2	depth 28	22	95	130	295	25
250	475	38m6	60	3	10	50	125H7	127	40	1.5	7.4	32	250	125	154	270	100	150	160	160	390	284	205	170	135	315h8	12	534	420	265	125	315	Rp¾	M16P2	depth 28	22	95	130	366	30

※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

SCOA type standard gear unit

Size 280~400



(Unit: mm)

Size E	a	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	r	T ₂	※ W ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₃	G ₄	G ₅	G ₆	B	h	Z	t	P	m ₁	m ₂	m ₃	n	Q	Thread hole for mounting d ₂	d ₃	D ₃	L ₄	L ₅	weight kg	Q'ty of oil ℓ
280	540	38m6	60	3	10	50	140H7	1.5	8.4	36	280	125	225	310	160	180	417	320	205	200	150	385h8	14	561	470	295	130	380	Rp¾	M20P2.5	depth 35	26	142	105	150	460	12
320	600	42m6	70	3	12	56	150H7	1.5	8.4	36	320	160	274	340	195	200	465	355	245	220	170	415h8	15	623	520	340	150	410	Rp¾	M20P2.5	depth 35	26	152	115	170	650	17
360	690	42m6	70	3	12	56	160H7	1.5	9.4	40	360	160	274	390	195	225	510	400	245	240	190	440h8	15	668	600	380	165	500	Rp1	M24P3	depth 45	33	162	125	200	840	27
400	740	48m6	80	3.5	14	70	180H7	1.5	10.4	45	400	200	335	430	242	250	570	427	295	260	210	480h8	17	750	660	420	185	520	Rp1	M24P3	depth 45	33	182	130	240	1015	34

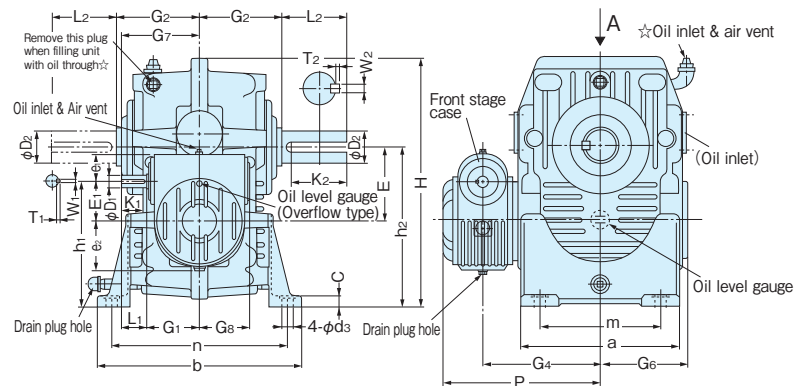
※ W₁ (h9, N9), W₂ (Js9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)



- Note) 1. External appearances of front stage cases may be different from those shown above according to sizes.
2. Arrow indicates the relative direction of rotation of standard unit (lead right hand).
3. Rear stage oil level gauge, drain plug hole and air vent are located on the opposite side of the mounting surface.

Size 100~250

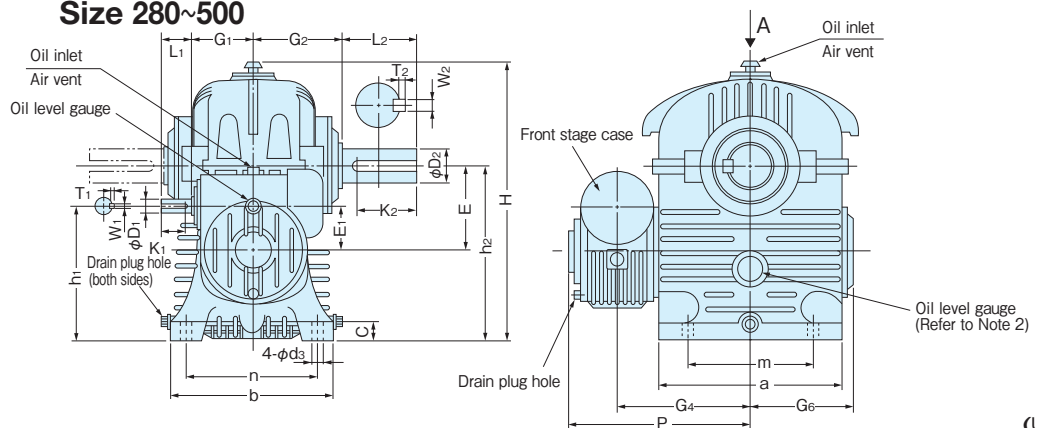


(Unit: mm)

Size E	a	b	c	D ₁	L ₁	T ₁	$\frac{W}{W_1}$	K ₁	D ₂	L ₂	T ₂	$\frac{W}{W_2}$	K ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₄	G ₅	G ₇	G ₈	P	h ₁	h ₂	H	m	n	d ₃	weight kg	Q'ty of oil ℓ
100	235	300	18	19k6	35	2.5	6	28	48m6	80	3.5	14	70	100	65	50	97	100	130	185	132	125	98	255	195	230	365	180	270	14	64	5
125	270	340	20	19k6	35	2.5	6	28	55m6	95	4	16	80	125	65	50	97	100	140	208	156	135	98	278	210	270	420	200	300	18	95	6.5
160	310	400	25	24k6	50	3	8	40	65m6	105	4	18	90	160	80	55	106	115	165	245	188	160	110	326	240	320	515	240	360	18	157	11
200	360	480	35	32m6	60	3	10	50	80m6	140	5	22	125	200	100	75	133	140	195	295	232	190	135	390	300	400	642	280	430	22	270	20
225	400	504	35	32m6	60	3	10	50	90m6	160	5	25	140	225	100	75	133	140	210	338	269	200	135	433	310	435	687	320	454	22	340	25
250	440	560	40	38m6	60	3	10	50	100m6	180	6	28	160	250	125	100	150	160	220	390	284	216	205	534	345	470	742	340	500	26	476	25

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

Size 280~500

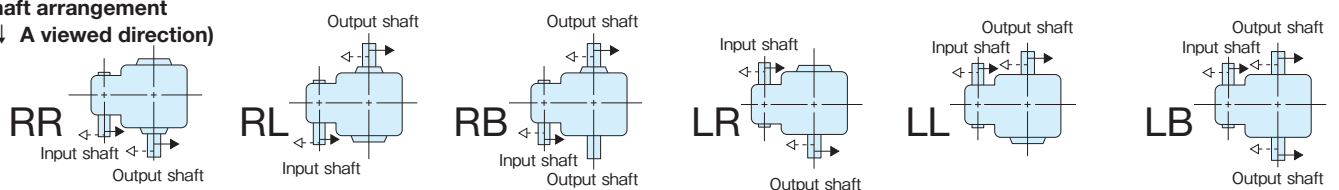


(Unit: mm)

Size E	a	b	c	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	L ₂	T ₂	※ W ₂	K ₂	E	E ₁	G ₁	G ₂	G ₄	G ₅	P	h ₁	h ₂	H	m	n	d ₃	weight kg	Qty of oil ℓ
280	570	460	50	38m6	60	3	10	50	110m6	180	6	28	160	280	125	160	240	417	320	561	375	530	854	420	400	26	590	42
320	640	530	50	42m6	70	3	12	56	120n6	210	7	32	190	320	160	195	255	465	345	623	440	600	949	470	445	33	790	60
360	730	580	55	42m6	70	3	12	56	130n6	210	7	32	190	360	160	195	270	510	400	668	460	660	1058	540	490	33	1050	82
400	790	620	60	48m6	80	3.5	14	70	150n6	240	8	36	210	400	200	242	290	570	425	750	520	720	1148	620	530	33	1325	100
450	885	680	65	48m6	80	3.5	14	70	170n6	270	9	40	240	450	200	242	320	622.5	493	803	555	805	1290	700	580	39	1825	130
500	1015	750	80	60m6	105	4	18	90	190n6	310	10	45	280	500	250	298	360	705	595	908	650	900	1438	760	640	39	2585	210

※ W_1 (h9, N9), W_2 (h9, N9) ...in accordance with JIS B1301-1976

Shaft arrangement
(↓ A viewed direction)



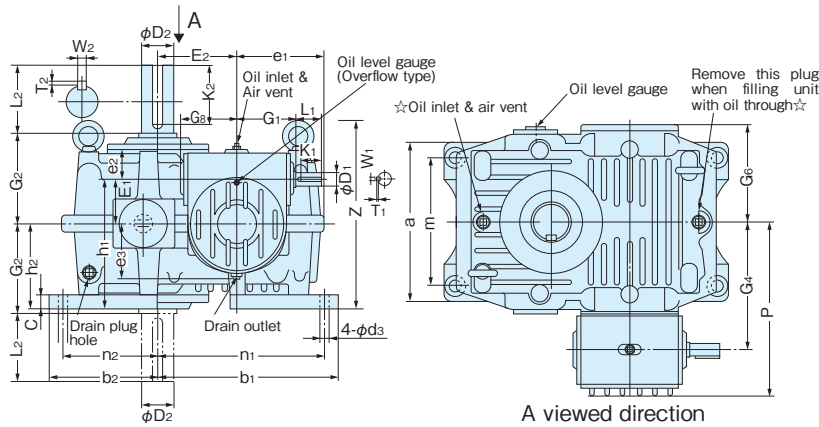
Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).
2. Oil level gauge is installed on the opposite side of the output shaft end when the unit has an input shaft at only one end, and on the right hand case viewed from the input shaft side when the unit has an output shaft at both ends.

Gear Unit Dimensions

SCHV type standard gear unit

Size 100~250



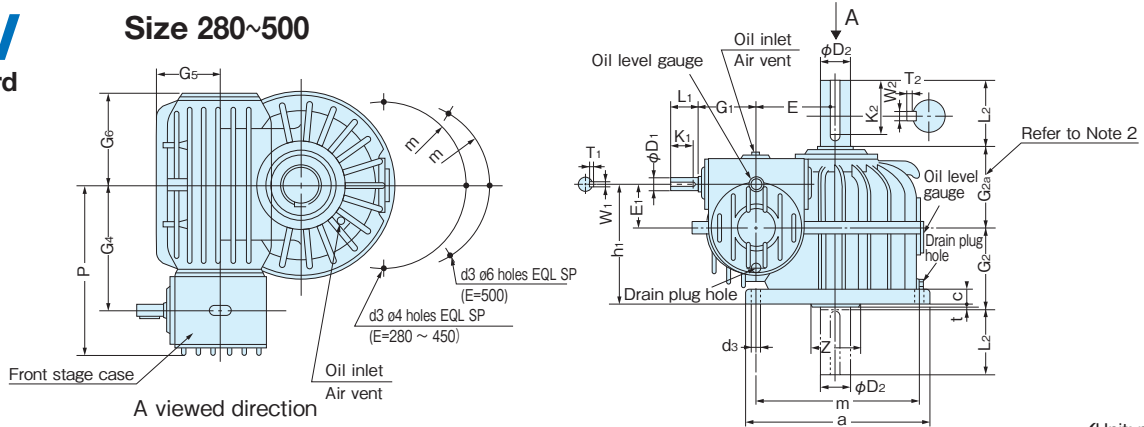
(Unit: mm)

Size E	a	b ₁	b ₂	C	D ₁	L ₁	K ₁	T ₁	※W ₁	D ₂	L ₂	K ₂	T ₂	※W ₂	E	E ₁	e ₁	e ₂	e ₃	G ₁	G ₂	G ₄	G ₆	G ₈	h ₁	h ₂	m	n ₁	n ₂	d ₃	Z	P	weight kg	Q'ty of oil l
100	220	240	150	20	19k6	35	28	2.5	6	48m6	80	70	3.5	14	100	65	125	50	97	100	130	185	132	98	190	125	180	225	135	14	275	255	64	4.5
125	250	280	170	22.5	19k6	35	28	2.5	6	55m6	95	80	4	16	125	65	135	50	97	100	140	208	156	98	200	135	200	260	150	18	300	278	95	6.5
160	300	330	210	27.5	24k6	50	40	3	8	65m6	105	90	4	18	160	80	155	55	106	115	165	245	188	110	245	165	240	310	190	18	355	326	157	14
200	340	405	255	35	32m6	60	50	3	10	80m6	140	125	5	22	200	100	192	75	133	140	195	295	232	135	300	200	280	380	230	22	425	390	270	25.5
225	380	445	270	35	32m6	60	50	3	10	90m6	160	140	5	25	225	100	202	75	133	140	210	338	269	135	312	212	320	420	245	22	450	433	340	32
250	440	490	300	42.5	38m6	60	50	3	10	100m6	180	160	6	28	250	125	212	100	150	160	220	390	284	205	355	230	340	460	270	26	490	534	476	36

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

SCHV type standard gear unit

Size 280~500

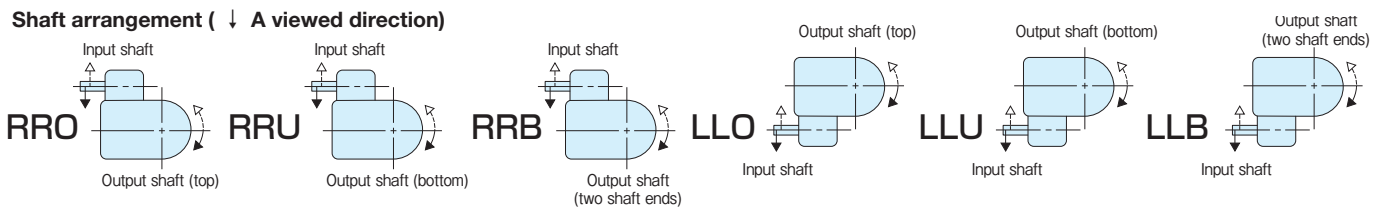


(Unit: mm)

Size E	a	c	D ₁	L ₁	T ₁	※W ₁	K ₁	D ₂	L ₂	T ₂	※W ₂	K ₂	E	E ₁	G ₁	G ₂	G ₄	G ₆	G ₈	h ₁	m	P	Z	t	d ₃	weight kg	Q'ty of oil l
280	700	45	38m6	60	3	10	50	110m6	180	6	28	160	280	125	160	240	417	205	320	355	640	561	-	-	26	590	38
320	760	50	42m6	70	3	12	56	120n6	210	7	32	190	320	160	195	255	465	220	345	410	700	623	230	2	26	790	52
360	880	55	42m6	70	3	12	56	130n6	210	7	32	190	360	160	195	270	510	230	400	420	805	668	250	2	33	1050	67
400	950	60	48m6	80	3.5	14	70	150n6	240	8	36	210	400	200	242	290	570	220	425	465	875	750	385	21	33	1325	81
450	1070	65	48m6	80	3.5	14	70	170n6	270	9	40	240	450	200	242	320	615	250	480	515	990	803	-	-	39	1825	101
500	1180	75	60m6	105	4	18	90	190n6	310	10	45	280	500	250	298	390	705	265	595	625	1100	908	415	2	33	2585	142

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)

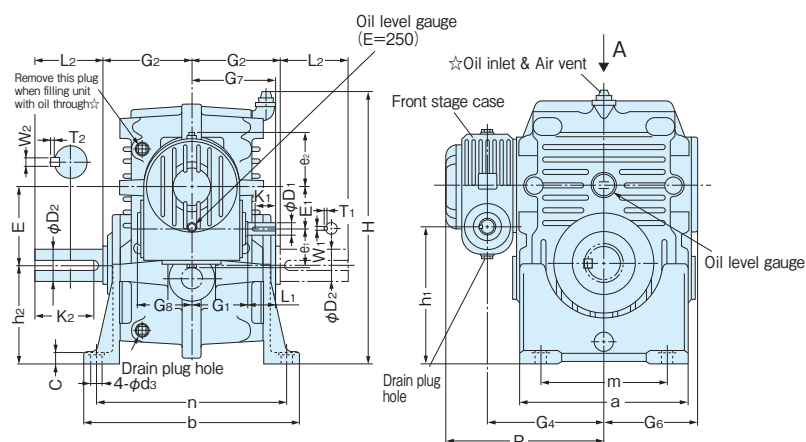


Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).
2. Dimensions G_{2a} is equal to G₂, except when E is 500 (G_{2a} is 290).

SCOH

type standard
gear unit

Size 100~250

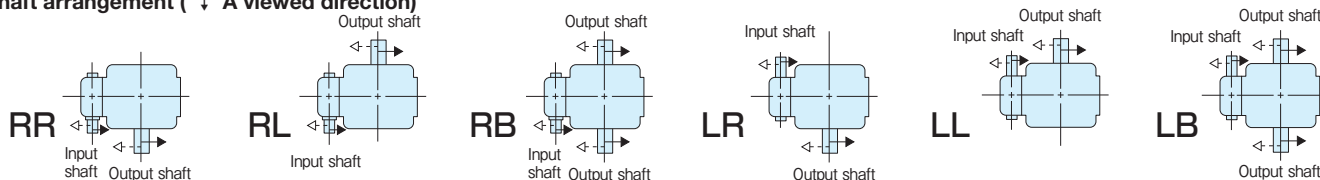


(Unit: mm)

Size E	a	b	c	D ₁	L ₁	T ₁	※ W ₁	K ₁	D ₂	L ₂	T ₂	※ W ₂	K ₂	E	E ₁	e ₁	e ₂	G ₁	G ₂	G ₄	G ₆	G ₇	G ₈	h ₁	h ₂	H	m	n	P	d ₃	weight kg	Q'ty of oil ℓ
100	235	300	18	19k6	35	2.5	6	28	48m6	80	3.5	14	70	100	65	50	97	100	130	185	132	125	98	175	140	385	180	270	255	14	64	7
125	270	340	20	19k6	35	2.5	6	28	55m6	95	4	16	80	125	65	50	97	100	140	208	156	135	98	220	160	440	200	300	278	18	95	8.5
160	310	400	25	24k6	50	3	8	40	65m6	105	4	18	90	160	80	55	106	115	165	245	188	160	110	280	200	535	240	360	326	18	157	16
200	360	480	35	32m6	60	3	10	50	80m6	140	5	22	125	200	100	75	133	140	195	295	232	190	135	350	250	660	280	430	390	22	270	29
225	400	504	35	32m6	60	3	10	50	90m6	160	5	25	140	225	100	75	133	140	210	338	269	200	135	385	260	700	320	454	433	22	340	36
250	440	560	40	38m6	60	3	10	50	100m6	180	6	28	160	250	125	100	150	160	220	390	284	216	205	405	280	755	340	500	534	26	476	46.5

※ W₁ (h9, N9), W₂ (h9, N9) ...in accordance with JIS B1301-1976

Shaft arrangement (↓ A viewed direction)

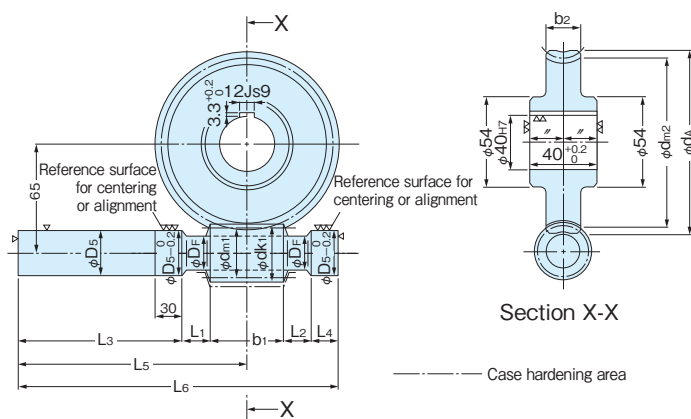


Note) 1. Arrow indicates the relative direction of rotation of standard unit (lead right hand).

2. Rear stage level gauge and oil inlet are located on the opposite side of the output shaft end, and on the right side viewed from the front stage for double shaft spec.

8. Gear Set Dimensions

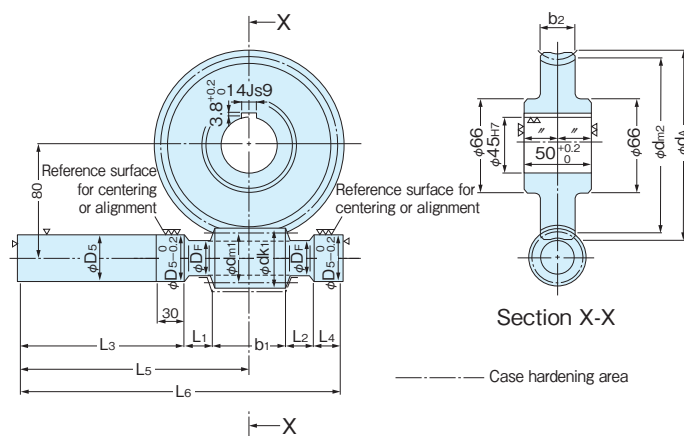
SRMR 65



(Unit: mm)

Nominal reduction gear ratio	Worm												Worm wheel				Weight kg (approx.)	
	No.of threads Z_1	d_{m1}	d_{k1}	b_1	D_F	D_5	L_1	L_2	L_3	L_4	L_5	L_6	No.of teeth Z_2	d_{a2}	b_2	d_a	Worm	Wheel
5	5	35.4	42	48	26.5	42	26	26	106	12.5	156	218.5	26	94.6	26	103	1.9	1.5
6.3	4	35.4	42	48	26.5	42	26	26	106	12.5	156	218.5	25	94.6	26	103	1.9	1.5
8	4	30.4	36	46	23	36	21	21	112	18.5	156	218.5	31	99.6	22	107	1.4	1.6
10	3	32	37.6	46	24.7	37.6	22	22	111	17.5	156	218.5	31	98	24	106	1.6	1.6
16	2	32	37.6	46	24.7	37.6	22	22	111	17.5	156	218.5	31	98	24	106	1.6	1.6
20	2	26	30.6	34	19.9	30.6	21	21	118	24.5	156	218.5	41	104	20	111	1.0	1.6
25	2	26	29.6	32	21	29.6	23	23	117	23.5	156	218.5	51	104	17	110	1.0	1.6
31.5	1	32	37.6	46	24.7	37.6	22	22	111	17.5	156	218.5	31	98	24	106	1.5	1.6
40	1	26	30.6	34	19.9	30.6	21	21	118	24.5	156	218.5	41	104	20	111	1.0	1.6
50	1	26	29.6	32	21	29.6	23	23	117	23.5	156	218.5	51	104	17	110	1.0	1.6

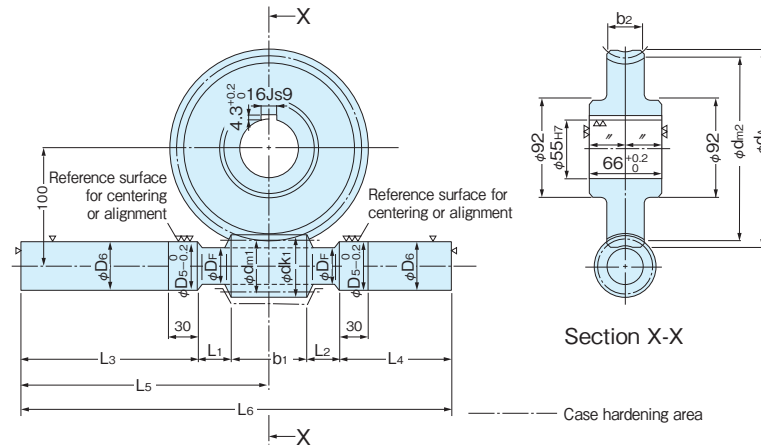
SRMR 80



(Unit: mm)

Nominal reduction gear ratio	Worm												Worm wheel				Weight kg (approx.)	
	No. of threads Z ₁	d _{m1}	d _{k1}	b ₁	D _F	D ₅	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	No. of teeth Z ₂	d _{m2}	b ₂	d _a	Worm	Wheel
5	5	43.6	52	60	33	52	32	32	119	13	181	256	24	116.4	31	127	3.3	2.6
6.3	4	43.6	52	60	33	52	32	32	119	13	181	256	25	116.4	31	127	3.3	2.6
8	4	35.4	42	56	26	42	24	24	129	23	181	256	33	124.6	27	133	2.3	2.7
10	3	38.4	46	50	29	46	28	28	128	22	181	256	31	121.6	28	131	2.6	2.7
16	2	38.4	46	50	29	46	28	28	128	22	181	256	31	121.6	28	131	2.6	2.7
20	2	32	37.6	46	24	37.6	24	24	134	28	181	256	41	128	24	136	1.8	2.7
25	2	30	34.6	38	23.5	34.6	27	27	135	29	181	256	51	130	21	137	1.6	2.7
31.5	1	38.4	46	50	29	46	28	28	128	22	181	256	31	121.6	28	131	2.6	2.7
40	1	32	37.6	46	24	37.6	24	24	134	28	181	256	41	128	24	136	1.8	2.7
50	1	30	34.6	38	23.5	34.6	27	27	135	29	181	256	51	130	21	137	1.6	2.7

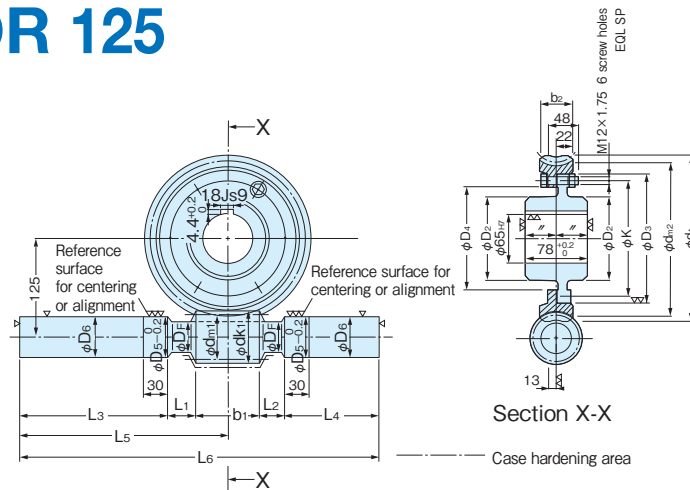
SRMR 100



(Unit: mm)

Nominal reduction gear ratio	Worm														Worm wheel			Weight kg (approx.)		
	No. of threads Z_1	d_{m1}	d_{k1}	b_1	D_F	D_5	L_1	L_2	L_3	L_4	L_5	L_6	D_6	No. of teeth Z_2	d_{m2}	b_2	d_A	Worm	Wheel	
5	5	49.4	60	78	37	55	34	34	187	107	260	440	54.5	24	150.6	37	164	7.7	5.7	
6.3	4	49.4	60	78	37	55	34	34	187	107	260	440	54.5	25	150.6	37	164	7.9	5.7	
8	4	43.6	52	72	33.4	55	41	41	183	103	260	440	54.5	33	156.4	34	166	6.0	5.8	
10	3	46.4	56	62	35	55	41	41	188	108	260	440	54.5	31	153.6	34	166	7.0	5.6	
12.5	3	44	52	66	34	55	41	41	186	106	260	440	54.5	37	156	34	166	6.1	5.8	
16	2	46.4	56	62	35	55	41	41	188	108	260	440	54.5	31	153.6	34	166	7.1	5.6	
20	2	38.4	46	58	29	55	42	42	189	109	260	440	54.5	41	161.6	30	171	5.1	5.7	
25	2	36.6	43	58	29	55	45	45	186	106	260	440	54.5	49	163.4	30	171	5.1	5.8	
31.5	1	46.4	56	62	35	55	41	41	188	108	260	440	54.5	31	153.6	34	166	7.4	5.6	
40	1	38.4	46	58	29	55	42	42	189	109	260	440	54.5	41	161.6	30	171	5.1	5.7	
50	1	36.6	43	58	29	55	45	45	186	106	260	440	54.5	50	163.4	30	171	5.4	5.8	

SRMR/SROR 125



(Unit: mm)

Nominal reduction gear ratio	Worm														Worm wheel							Wheel boss	Weight kg (approx.)		
	No. of threads Z_1	d_{m1}	d_{k1}	b_1	D_F	D_5	L_1	L_2	L_3	L_4	L_5	L_6	D_6	No. of teeth Z_2	d_{m2}	b_2	d_A	D_3	K	D_4	D_2	Worm	Wheel	Boss	
5	5	61.8	75	96	46	62	42	42	187	113	277	480	61.5	24	188.2	46	205	152	129	109	102	13.0	5.0	4.7	
6.3	4	61.8	75	96	46	62	42	42	187	113	277	480	61.5	25	188.2	46	205	152	129	109	102	13.0	5.0	4.7	
8	4	49.4	60	88	36.5	62	37	37	196	122	277	480	61.5	33	200.6	37	214	176	153	133	110	8.5	4.3	6.3	
10	3	57.6	70	72	42	62	45	45	196	122	277	480	61.5	31	192.4	42	208	158	135	115	110	11.8	5.2	5.5	
12.5	3	54.6	65	68	42	62	43	43	200	126	277	480	61.5	37	195.4	42	208	158	135	115	110	10.4	5.2	5.5	
16	2	57.6	70	72	42	62	45	45	196	122	277	480	61.5	31	192.4	42	208	158	135	115	110	12.0	5.2	5.5	
20	2	46.4	56	74	35	62	47	47	193	119	277	480	61.5	41	203.6	37	216	176	153	133	110	7.8	4.3	6.3	
25	2	44	52	58	34	62	47	47	201	127	277	480	61.5	51	206	32	216	176	153	133	110	7.5	4.3	6.3	
31.5	1	57.6	70	72	42	62	45	45	196	122	277	480	61.5	30	192.4	42	208	158	135	115	110	12.6	5.2	5.5	
40	1	46.4	56	74	35	62	47	47	193	119	277	480	61.5	41	203.6	37	216	176	153	133	110	7.9	4.3	6.3	
50	1	44	52	58	34	62	47	47	201	127	277	480	61.5	50	206	32	216	176	153	133	110	7.9	4.3	6.3	

SRMR/SROR 160



- Case hardening area

Nominal reduction gear ratio	Worm													Worm wheel							Weight kg (approx.)		
	No. of threads Z ₁	d _{m1}	d _{k1}	b ₁	D _F	D ₅	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	D ₆	No. of teeth Z ₂	d _{m2}	b ₂	d _a	D ₃	K	D ₄	Worm	Wheel	Boss
5	5	73	90	126	53	75	46	46	216	131	325	565	74	24	247	55	268	200	177	157	14.3	9.6	10
6.3	4	73	90	126	53	75	46	46	216	131	325	565	74	25	247	55	268	200	177	157	14.2	9.6	10
8	4	61.8	75	110	46	75	45	45	225	140	325	565	74	34	258.2	48	271	210	187	167	12.9	10.3	11
10	3	69.4	85	106	50.5	75	50	50	222	137	325	565	74	31	250.6	51	270	210	187	167	13.9	10.3	11
12.5	3	67	80	110	51.5	75	48	48	222	137	325	565	74	37	253	51	270	210	187	167	13.9	10.3	11
16	2	69.4	85	106	50.5	75	50	50	222	137	325	565	74	31	250.6	51	270	210	187	167	14.0	10.3	11
20	2	57.6	70	92	42.5	75	55	55	224	139	325	565	74	41	262.4	45	278	230	207	187	13.0	7.1	12
25	2	54.6	65	90	42	75	55	55	225	140	325	565	74	49	265.4	41	278	230	207	187	12.9	7.1	12
31.5	1	69.4	85	106	50.5	75	50	50	222	137	325	565	74	31	250.6	51	270	210	187	167	14.0	10.3	11
40	1	57.6	70	92	42.5	75	55	55	224	139	325	565	74	41	262.4	45	278	230	207	187	13.1	7.1	12
50	1	54.6	65	90	42	75	55	55	225	140	325	565	74	50	265.4	41	278	230	207	187	13.1	7.1	12

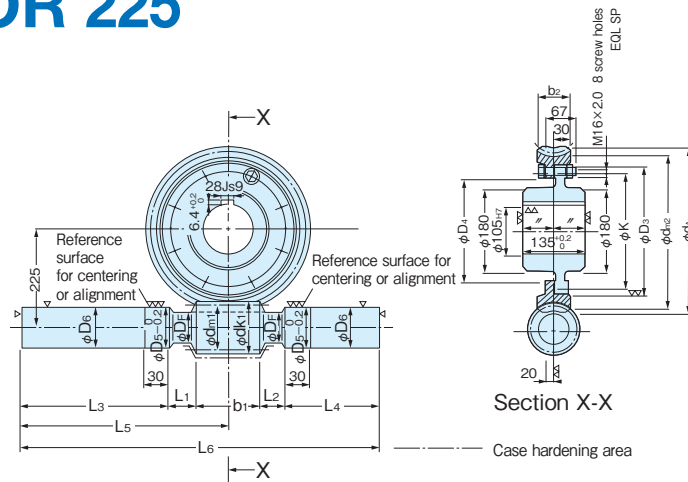
SRMR/SROR 200



Case hardening area

Nominal reduction gear ratio	Worm													Worm wheel							Weight kg (approx.)		
	No. of threads Z ₁	d _{m1}	d _{k1}	b ₁	D _F	D ₅	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	D ₆	No. of teeth Z ₂	d _{m2}	b ₂	d _A	D ₃	K	D ₄	Worm	Wheel	Boss
5	5	93.5	115	158	68	85	49	49	270	164	398	690	84	24	306.5	66	332	255	225	201	28.0	17.5	19.5
6.3	4	93.5	115	158	68	85	49	49	270	164	398	690	84	25	306.5	66	332	255	225	201	28.0	17.5	19.5
8	4	73	90	144	53	85	52	52	274	168	398	690	84	33	327	62	344	265	235	211	24.0	19.5	20.5
10	3	82	102	130	58	85	61	61	272	166	398	690	84	31	318	62	343	265	235	211	26.0	18	20.5
12.5	3	78.6	95	130	59	85	60	60	273	167	398	690	84	38	321.4	62	343	265	235	211	26.0	18.5	20.5
16	2	82	102	130	58	85	61	61	272	166	398	690	84	31	318	62	343	265	235	211	26.5	18	20.5
20	2	69.4	85	116	51	85	63	63	277	171	398	690	84	41	330.6	55	350	290	260	236	25.0	14.5	23
25	2	67	80	96	51	85	66	66	284	178	398	690	84	51	333	53	350	290	260	236	25.0	15	23
31.5	1	82	102	130	58	85	61	61	272	166	398	690	84	31	318	62	343	265	235	211	28.0	18	20.5
40	1	69.4	85	116	51	85	63	63	277	171	398	690	84	41	330.6	55	350	290	260	236	25.5	14.5	23
50	1	67	80	96	51	85	66	66	284	178	398	690	84	50	333	53	350	290	260	236	27.0	15	23

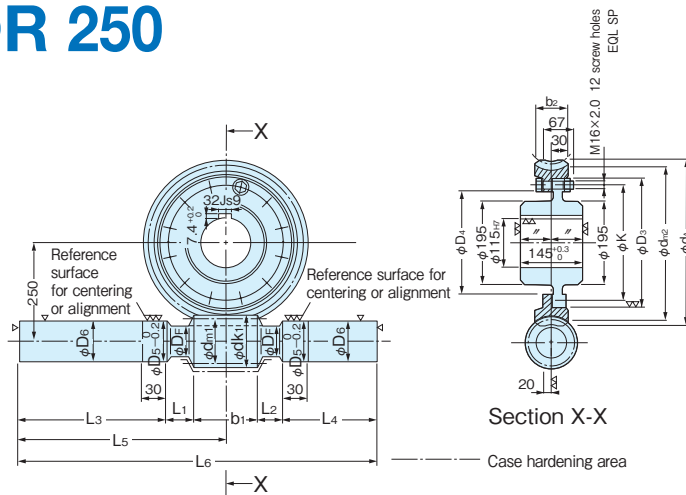
SRMR/SROR 225



(Unit: mm)

Nominal reduction gear ratio	Worm													Worm wheel								Weight kg (approx.)		
	No. of threads Z ₁	d _{m1}	d _{k1}	b ₁	D _F	D ₅	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	D ₆	No. of teeth Z ₂	d _{m2}	b ₂	d _A	D ₃	K	D ₄	Worm	Wheel	Boss	
6.3	5	93.5	115	164	68	95	58	58	276	174	416	730	94	29	356.5	69	378	290	260	236	37.5	24.5	28	
8	4	93.5	115	164	68	95	58	58	276	174	416	730	94	29	356.5	69	378	290	260	236	37.5	24.5	28	
10	3	99	120	146	74	95	67.5	67.5	275.5	173.5	416	730	94	32	351	69	377	290	260	236	39.0	23	28	
12.5	3	82	102	134	58	95	75.5	75.5	273.5	171.5	416	730	94	36	368	60	392	320	290	266	34.7	19	31	
16	2	99	120	146	74	95	67.5	67.5	275.5	173.5	416	730	94	32	351	69	377	290	260	236	39.0	23	28	
20	2	84	102	132	62.5	95	67	67	283	181	416	730	94	39	366	60	388	320	290	266	35.2	18	31	
25	2	70.8	85	114	54	95	69.5	69.5	289.5	187.5	416	730	94	52	379.2	50	397	340	310	286	33.8	15	33	
31.5	1	99	120	146	74	95	67.5	67.5	275.5	173.5	416	730	94	32	351	69	377	290	260	236	39.0	23	28	
40	1	84	102	132	62.5	95	67	67	283	181	416	730	94	40	366	60	388	320	290	266	35.7	18	31	
50	1	70.8	85	114	54	95	69.5	69.5	289.5	187.5	416	730	94	52	379.2	50	397	340	310	286	33.8	15	33	

SRMR/SROR 250



(Unit: mm)

Nominal reduction gear ratio	Worm													Worm wheel								Weight kg (approx.)		
	No. of threads Z ₁	d _{m1}	d _{k1}	b ₁	D _F	D ₅	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	D ₆	No. of teeth Z ₂	d _{m2}	b ₂	d _A	D ₃	K	D ₄	Worm	Wheel	Boss	
5	5	111	138	198	79.5	105	65	65	291	191	455	810	104	24	389	79	422	320	290	266	52.9	32.5	29	
6.3	4	111	138	198	79.5	105	65	65	291	191	455	810	104	25	389	79	422	320	290	266	52.9	32.5	29	
8	4	93.5	115	178	68	105	74	74	292	192	455	810	104	33	406.5	73	428	335	305	281	46.5	32.5	31	
10	3	105	130	150	75	105	79	79	301	201	455	810	104	31	395	73	428	335	305	281	50.5	27.5	31	
12.5	3	99	120	150	74	105	76	76	304	204	455	810	104	37	401	73	428	335	305	281	49.2	30	31	
16	2	105	130	150	75	105	79	79	301	201	455	810	104	31	395	73	428	335	305	281	50.5	27.5	31	
20	2	82	102	136	58	105	78	78	309	209	455	810	104	41	418	65	443	370	340	316	45.4	23	36	
25	2	78.6	95	124	59	105	77	77	316	216	455	810	104	51	421.4	64	443	370	340	316	45.3	24	36	
31.5	1	105	130	150	75	105	79	79	301	201	455	810	104	31	395	73	428	335	305	281	50.5	27.5	31	
40	1	82	102	136	58	105	78	78	309	209	455	810	104	41	418	65	443	370	340	316	45.4	23	36	
50	1	78.6	95	124	59	105	77	77	316	216	455	810	104	50	421.4	64	443	370	340	316	45.3	24	36	

SRMR/SROR 280



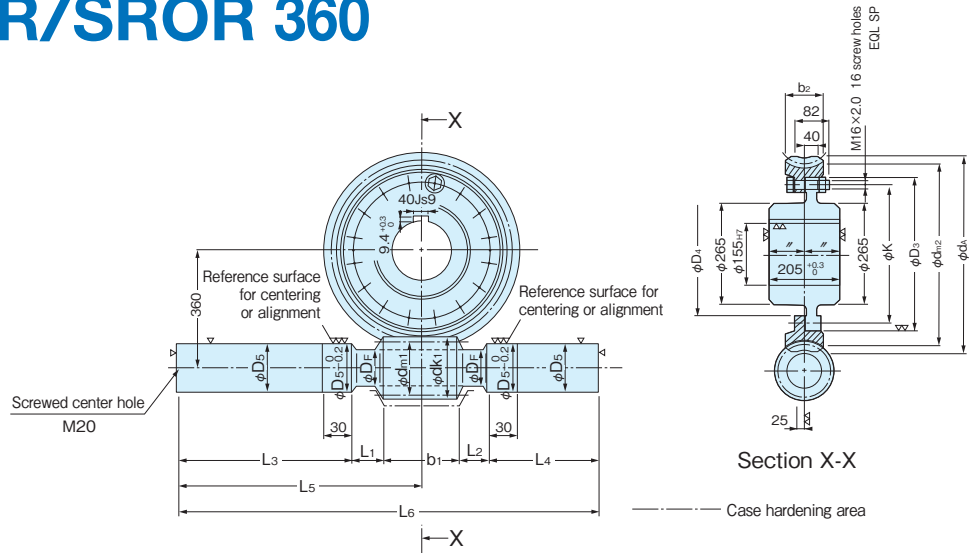
(Unit: mm)

SRMR/SROR 320



(Unit: mm)

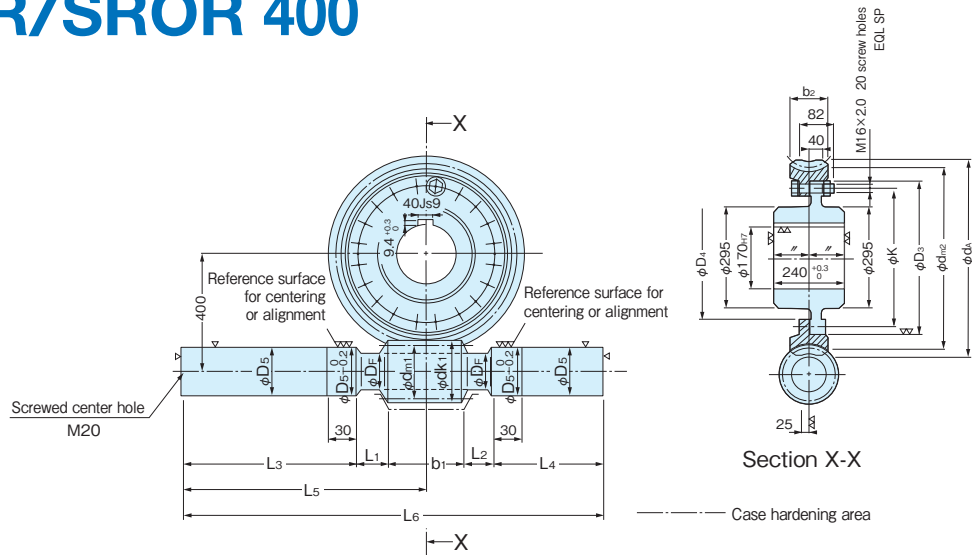
SRMR/SROR 360



(Unit: mm)

Nominal reduction gear ratio	Worm												Worm wheel							Weight kg (approx.)		
	No. of threads Z ₁	d _{m1}	d _{k1}	b ₁	D _F	D ₅	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	No. of teeth Z ₂	d _{m2}	b ₂	d _A	D ₃	K	D ₄	Worm	Wheel	Boss
10	3	136	172	256	94	125	77	80	367	265	572	1045	31	584	98	628	500	470	446			
12.5	3	124	156	218	86	125	72	75	391	289	572	1045	37	596	98	628	500	470	446			
16	2	136	172	238	94	125	67	70	386	284	572	1045	31	584	98	628	500	470	446			
20	2	127	156	228	93	125	52	55	406	304	572	1045	39	593	98	628	500	470	446			
25	2	105	130	180	75	125	57	60	425	323	572	1045	49	615	82	646	545	515	491			
31.5	1	136	172	204	94	125	52	55	418	316	572	1045	31	584	98	628	500	470	446			
40	1	127	156	200	93	125	52	55	420	318	572	1045	39	593	98	628	500	470	446			
50	1	105	130	170	75	125	62	65	425	323	572	1045	49	615	82	646	545	515	491			

SRMR/SROR 400

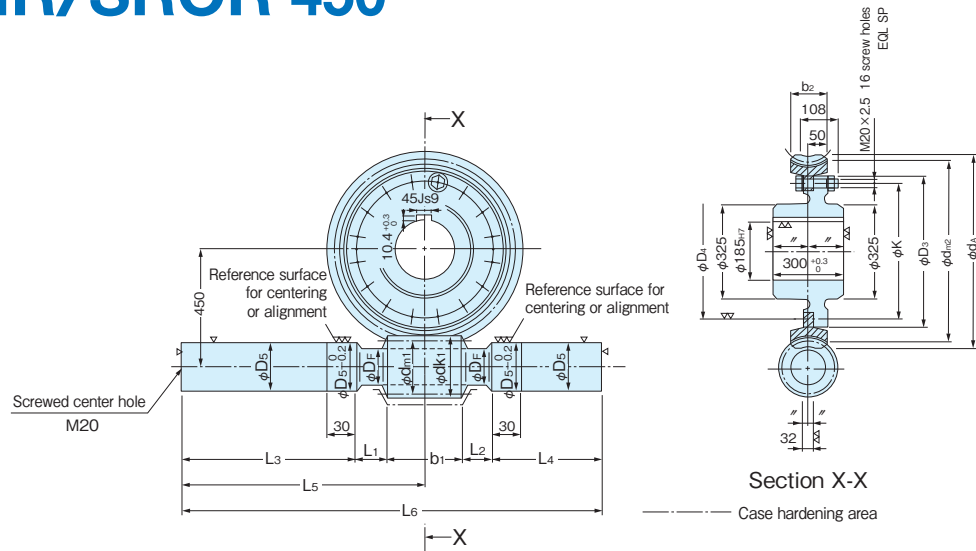


(Unit: mm)

Nominal reduction gear ratio	Worm												Worm wheel							Weight kg (approx.)		
	No. of threads Z ₁	d _{m1}	d _{k1}	b ₁	D _F	D ₅	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	No. of teeth Z ₂	d _{m2}	b ₂	d _A	D ₃	K	D ₄	Worm	Wheel	Boss
10	3	148	188	294	101	135	77	80	416	283	640	1150	31	652	107	705	565	535	511			
12.5	3	136	172	294	94	135	77	79.7	416	283.3	640	1150	35	664	107	705	565	535	511			
16	2	148	188	274	101	135	72	75	431	298	640	1150	31	652	107	705	565	535	511			
20	2	124	156	242	86	135	62	64.7	457	324.3	640	1150	41	676	95	715	605	575	551			
25	2	119	145	222	88	135	57	59.7	472	339.3	640	1150	51	681	95	715	605	575	551			
31.5	1	148	188	256	101	135	57	59	455	323	640	1150	31	652	107	705	565	535	511			
40	1	124	156	222	86	135	52	54.7	477	344.3	640	1150	41	676	95	715	605	575	551			
50	1	119	145	208	88	135	52	54.7	484	351.3	640	1150	51	681	95	715	605	575	551			

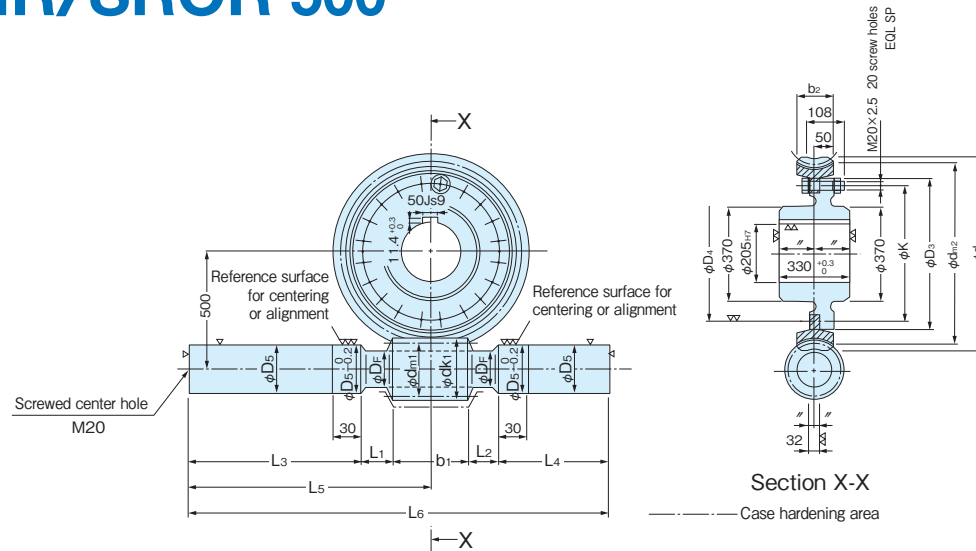
Gear Set Dimensions

SRMR/SROR 450



Nominal reduction gear ratio	Worm												Worm wheel							Weight kg (approx.)		
	No. of threads Z ₁	d _{m1}	d _{k1}	b ₁	D _F	D ₅	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	No. of teeth Z ₂	d _{m2}	b ₂	d _A	D ₃	K	D ₄	Worm	Wheel	Boss
10	4	141	175	288	101								39	759	105	802	675	634	600			
12.5	3	148	188	268	101								37	752	112	802	655	614	580			
20	2	136	172	270	94								41	764	105	808	675	634	600			
25	2	127	156	240	93								52	773	100	810	695	654	620			
31.5	1	160	204	282	108								32	740	120	790	630	589	555			
40	1	136	172	254	94								41	764	105	808	675	634	600			
50	1	127	156	226	93								52	773	100	810	695	654	620			

SRMR/SROR 500



Nominal reduction gear ratio	Worm												Worm wheel							Weight kg (approx.)		
	No. of threads Z ₁	d _{m1}	d _{k1}	b ₁	D _F	D ₅	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	No. of teeth Z ₂	d _{m2}	b ₂	d _A	D ₃	K	D ₄	Worm	Wheel	Boss
10	4	165	200	300	124								41	835	115	878	750	709	675			
20	2	148	188	308	101								41	852	115	902	750	709	675			
25	2	165	197	258	127								51	835	115	876	750	709	675			
31.5	1	172	220	306	118								33	828	130	888	710	669	635			
40	1	148	188	286	101								41	852	115	902	750	709	675			
50	1	165	197	240	127								51	835	115	876	750	709	675			

MEMO

MHI HASEG NIEMANN WORM GEAR UNIT WORM GEAR SET



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