

## Worldwide Locations

### U.S.A

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1453 Cornwall Road, Oakville, Canada ON L6J 7T5  
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### Mexico

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### Brazil

#### **Sumitomo Industrias Pesadas do Brasil Ltda. (SHIB)**

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Itu, Sao Paulo, Brasil  
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### Chile

#### **SM Cyclo de Chile, Ltda. (SMCH)**

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### Argentina

#### **SM Cyclo de Argentina S.A. (SMAR)**

Ing. Delpini, 2236 Area de Promocion el Triangulo,  
Partido Malvinas Argentinas Grand Bourg,  
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### Guatemala

#### **SM Cyclo de Guatemala Ensambladora, Ltda. (SMGT)**

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Bodega D-1 Delta Bárcenas en Villa Nueva, Guatemala  
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### Colombia

#### **SM Cyclo Colombia, S.A.S. (SMCO)**

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### Germany

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### Austria

#### **Sumitomo (SHI) Cyclo Drive Germany GmbH (SCG)**

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### Belgium

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#### **SM-Cyclo France SAS (SMFR)**

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### Italy

#### **SM-Cyclo Italy Srl (SMIT)**

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### Spain

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Bilbao-Vizcaya, Spain  
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### Sweden

#### **Sumitomo (SHI) Cyclo Drive Germany GmbH Sales Office Nordic BRO (SCG)**

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### Turkey

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### Korea

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### Philippines

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TEL (63)46-682-0580

### Vietnam

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### Malaysia

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### Indonesia

#### **PT. SM-Cyclo Indonesia (SMID)**

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### Australia

#### **Sumitomo (SHI) Hansen Australia Pty. Ltd. (SHAU)**

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### India

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### Japan

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## Sumitomo Drive Technologies



# HIGH SPEED GEAR

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

## Sumitomo Heavy Industries Gearbox Co., Ltd.

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

## No.K1001E-1.0

EH07 Printed 2018.06

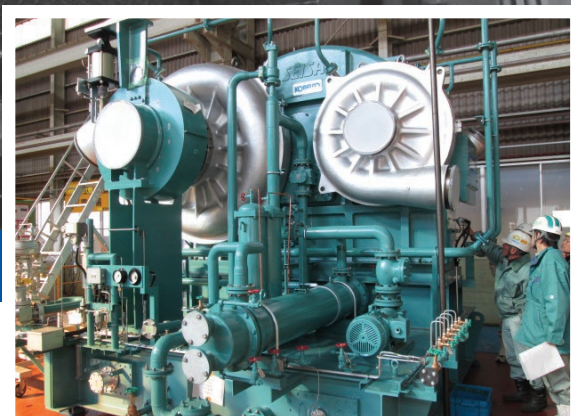
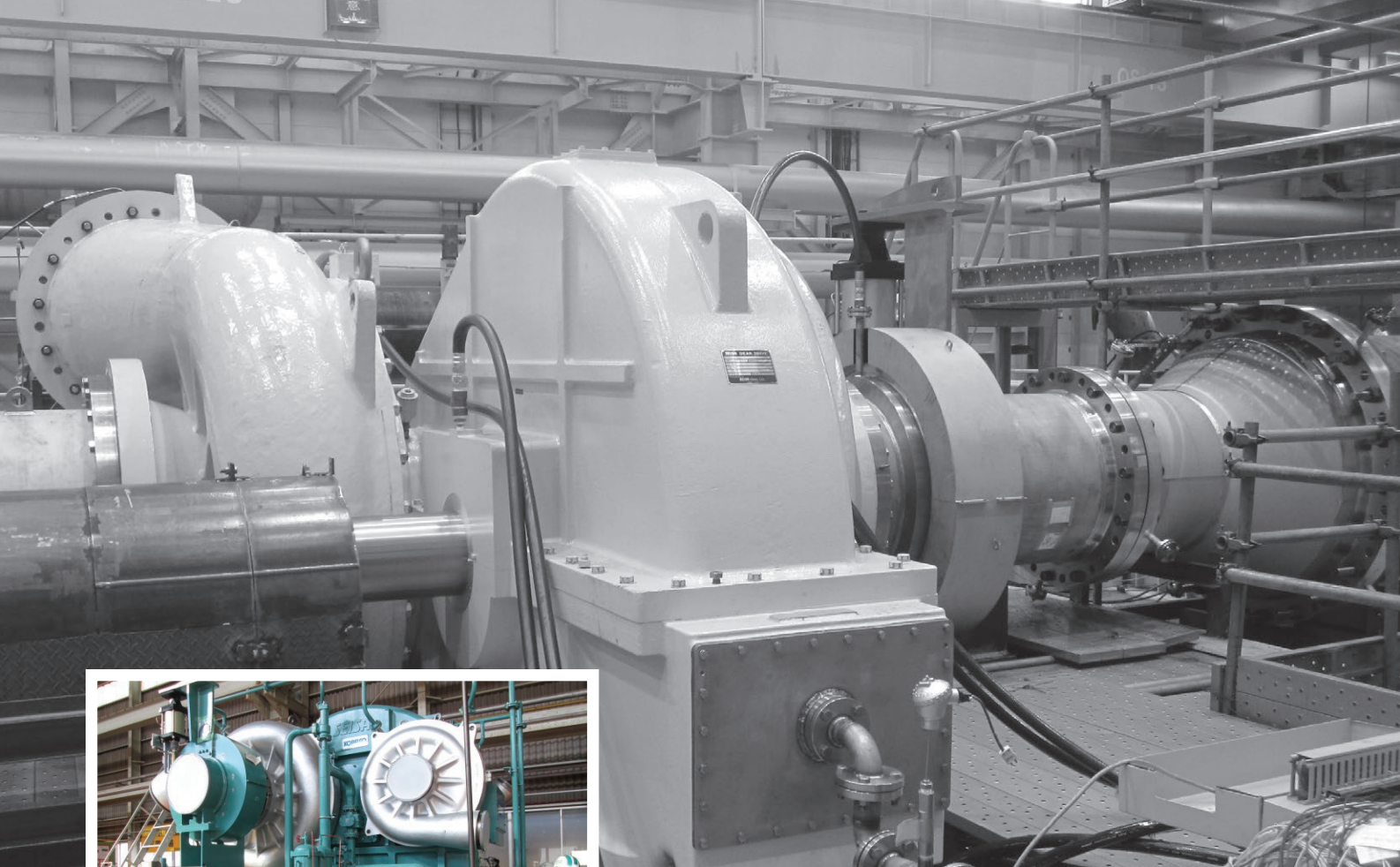
## Sumitomo Heavy Industries Gearbox Co., Ltd.

## No.K1001E-1



# N-Series High Speed Gear Units

The N-series high-speed gear units are products developed by Sumitomo through our extensive experience and state-of-the-art-technology



## Sumitomo: A leading transmission system manufacturer

Sumitomo Heavy Industries Gearbox Co., Ltd. was first established as a manufacturer of anchors and anchor chains in 1916, and further expanded their capabilities to the design and manufacture of a variety of gears. As an established gear manufacturer in Japan with a proven history of over 90 years, we have accumulated international-standard technologies and achieved remarkable success.

The rapid pace of technological innovation in recent years has raised the demand for highly efficient gear transmission systems in applications that require high-speed rotation and large torque transmission capabilities. We have designed their products to meet and exceed these complex requirements, in addition to optimizing size and weight properties.

As a result of their ingenuity and state-of-the-art engineering, our high quality products are trusted and used in various fields and applications around the world.

### Technical advantages

- Casing optimally designed using FEA for maximum rigidity and low noise
- Optimally designed for every application
- Cast-iron casing integrated with a bearing housing for excellent vibration damping characteristics and high rigidity
- Enhanced load capacity achieved through adoption of three kind of casings with the same center distance but different bearing spans
- Compatible with installation of any monitoring systems
- The turning device is a fully automatic ON/OFF system incorporating a rugged right-angle bevel drive and an SSS clutch

### High load capacity

- Tooth profile optimization and tooth trace correction
- Highly accurate bearing calculation using an FEM-based plain bearing calculation program based on extensive knowledge and expertise acquired over many years
- Adoption of newly developed multi-lobe bearings with excellent stability and load capacity
- Designed with optimum bearing spans to minimize shaft deformation
- Experience in manufacturing more than 7,200 high-speed gear units

### Design technology

The strength of our gear units can be evaluated according to ISO, DIN, API, AGMA, BS, and other domestic and international standards. The casing and many other parts are standardized to reduce manufacturing lead-time.

The N-series high-speed gear units are available in three different types of casings for applicability to a wide range of specifications, from low to high gear speed ratios.

We have developed new bearings with excellent vibration damping features and established a reliable method of analyzing stability to completely solve shaft and bearing vibration problems.

The single side cover design results in easier maintenance of the seals, pump-driven gears and SSS clutch.



# Single Stage Parallel Shaft Type High Speed Gearbox

Compact, high efficiency, low vibration and noise achieved by our accumulated experience and state-of-the-art technology

## TURNING DEVICE

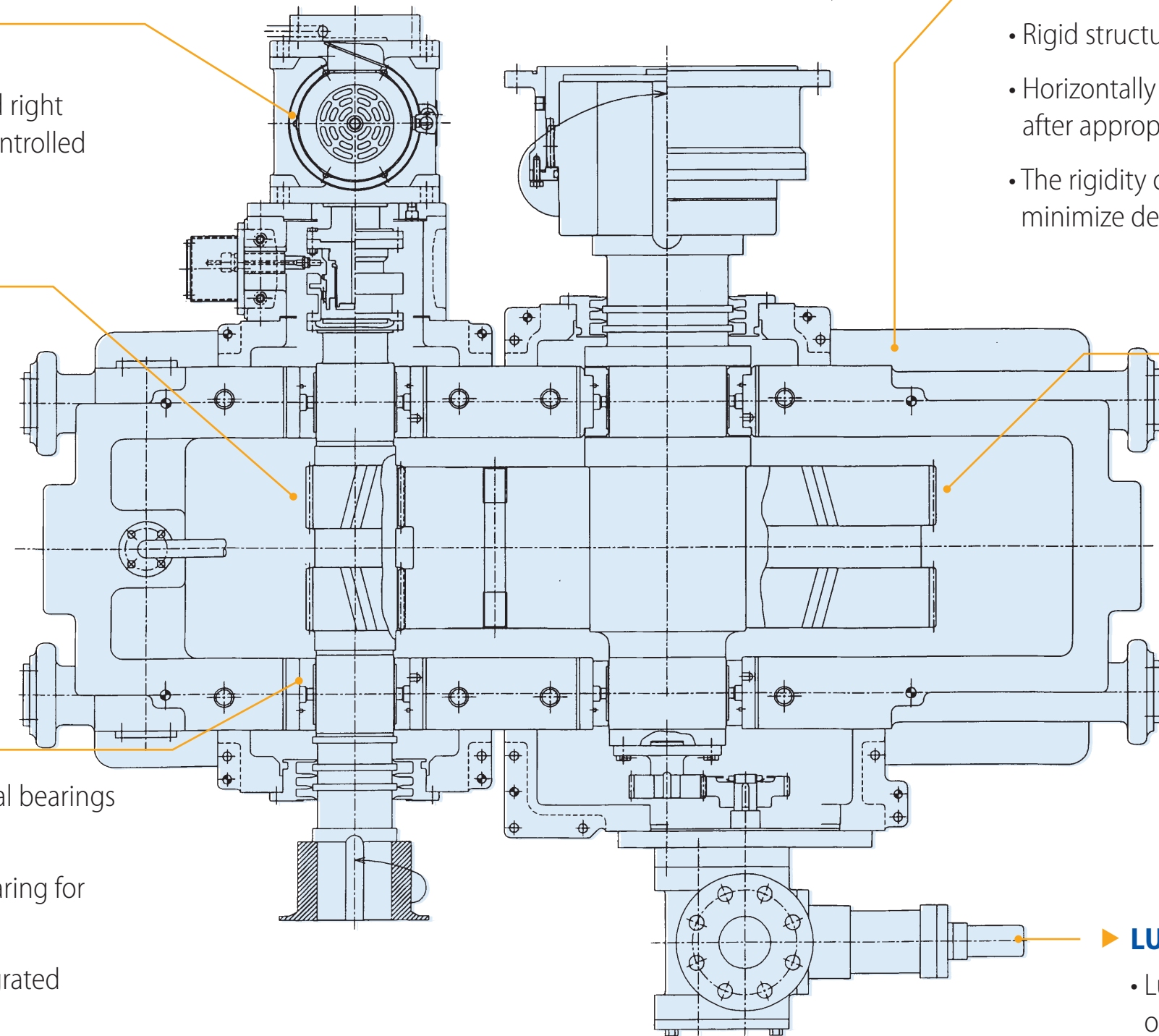
- Compact sized with high efficiency
- Turning device is driven by a rugged right angle reducer with automatically controlled SSS clutch

## PINION

- Made of forged special alloy steel.
- The pinion with integrated shaft is dynamically balanced with tooth profile modification and trace correction for optimum performance at high speed

## PLAIN BEARINGS

- Shafts are supported on plain journal bearings with pressurized oil supply
- Bearing design utilizes four lobe bearing for stable and high efficiency operation
- Taper-land thrust bearing with integrated journal bearing



## CASING

- Rigid structural cast iron casing for reduced noise level
- Horizontally split casing machined with high accuracy after appropriate stress relief
- The rigidity of the casing is studied with FEA to minimize deformation under stress

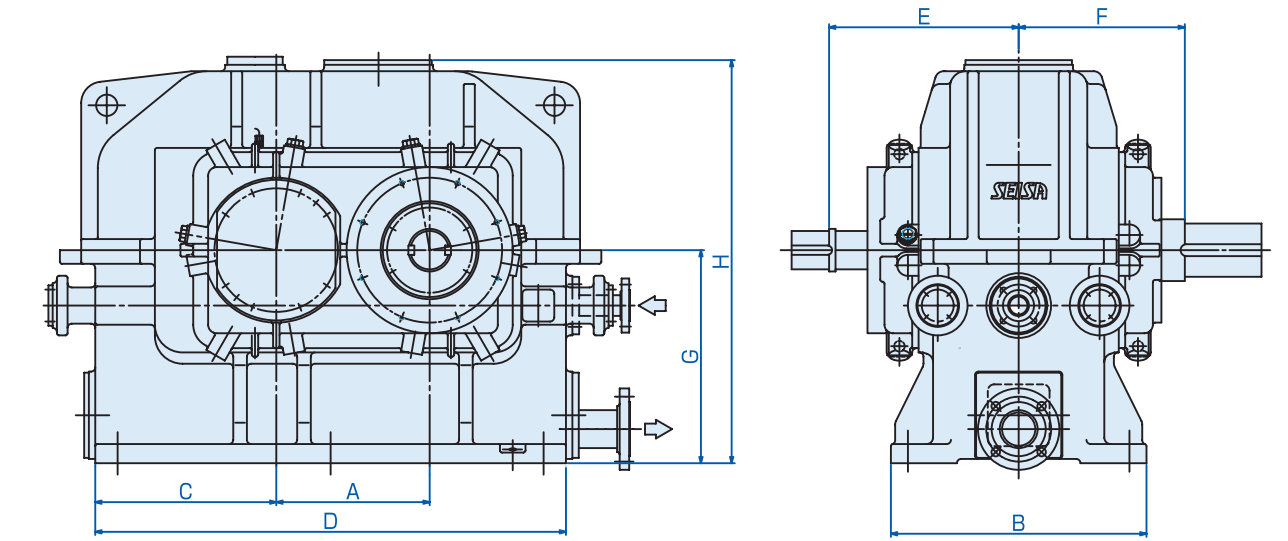
## LOW SPEED GEAR

- Made of forged special alloy steel and fixed to the low speed shaft by interference fitting (keyless) to minimize unbalance
- Tooth surfaces is carburized and finished by highly accurate grinding
- Dynamic balancing is also performed after assembling the gear to the shaft

## LUBRICATION OIL PUMP

- Lubrication oil pump driven by the gear fitted on the low speed shaft

DIMENSION (mm)



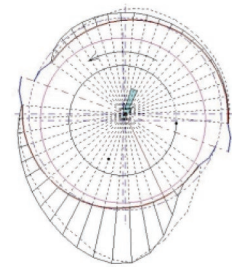
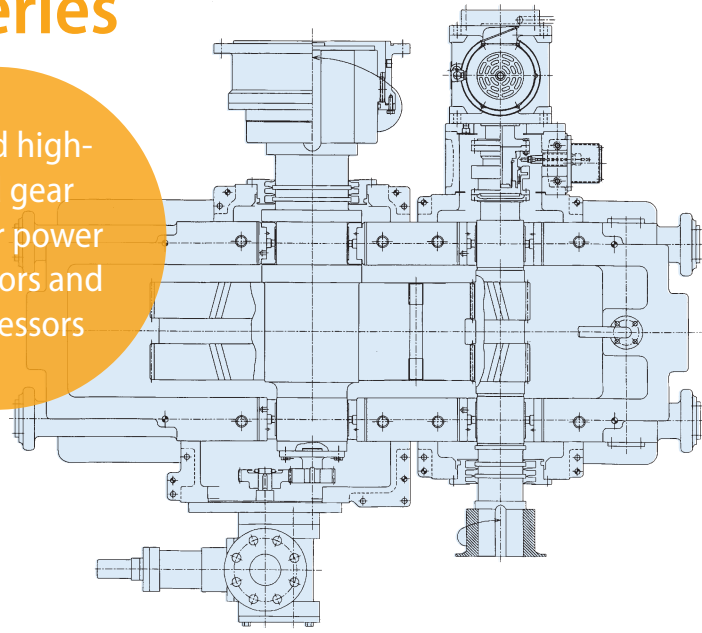
Series	Type	A		B	C	D	E	F	G	H	Weight kg
		Standard	Extended								
N	T1822			370			240	240		600	500
N	S1822			425			290	310			570
N	M1822	200		500	265	715	330	350	315		650
N	T2226			420			280	300		715	700
N	S2226			470			325	340	375		830
N	M2226	250		550	300	815	365	380		690	965
N	L2226			620	265		420	430	335	615	1180
C	L2226	200					340				830
N	T2630			420			295	315		775	880
N	S2630			475			340	370	400		1370
N	M2630	280		600	335	895	390	420		760	1490
N	L2630			670	300		450	460	375	690	1260
C	L2630	250					370				1140
N	T3033			480			320	340		855	1150
N	S3033			530			370	390			1425
N	M3033	320		630	375	995	430	445	450	825	1785
N	L3033			710	350		485	500		790	1980
C	L3033	280					405			785	1530
N	T3338			550			340	360		950	1560
N	S3338			600			385	415	500		1810
N	M3338	360		710	425	1105	450	475		925	2225
N	L3338			800	365		510	525	475	855	2570
C	L3338	320					430			850	2070
N	T3842			580			360	380		1040	1940
N	S3842			630			410	440	560		2235
N	M3842	400	420	730	500	1230	490	505		1020	2665
N	L3842			850	430		540	555	530	950	3040
C	L3842	360					460				2730
N	T4248			600			375	395	630	1160	2360
N	S4248			670			430	455			2820
N	M4248	450	480	750	540	1350	510	535	600	1100	3530
N	L4248			900	460		585	605	580	1055	4090
C	L4248	400					505				3530
N	T4853			670			400	420		1250	3100
N	S4853			710			450	480	670		3470
N	M4853	500	530	850	600	1475	560	585		1235	4610
N	L4853			950	500		645	665	630	1160	5270
C	L4853	450					565				4710
N	T5360			670			445	460		1420	4230
N	S5360			750			490	505	750		4570
N	M5360	560	600	900	670	1680	585	605		1380	5865
N	L5360			1060	560		690	710	710	1310	6820
N	T6067			710			455	475		1600	5200
N	S6067			800			510	530	850		6240
N	M6067	630	670	950	730	1835	620	650		1560	7690
N	L6067			1120	615		720	745	800	1470	8930
N	T6775			800			500	525		1780	7350
N	S6775			900			550	575	950		8020
N	M6775	710	750	1060	810	2050	675	700		1700	10100
N	L6775			1250	710		775	805	900	1610	11700
N	T7585			850			520	550		1965	9250
N	S7585			950			585	615	1060		11800
N	M7585	800	850	1120	900	2300	710	735		1915	12990
N	L7585			1320	790		865	890	1000	1820	15800
N	T8595			950			570	595		2205	14600
N	S8595			1060			640	675	1180		16200
N	M8595	900	950	1250	980	2600	770	810		2160	18700
N	L8595			1500	900		925	950	1060	1960	21300
N	T95A6			1060			610	640	1320	2450	19200
N	S95A6			1150			670	710			21800
N	M95A6	1000	1060	1400	1100	2850	820	870	1300	2380	25800
N	L95A6			1700	950		980	1015	1250	2230	29300



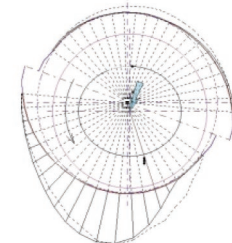
# N-series features low noise, low vibration and high efficiency!

## N-Series

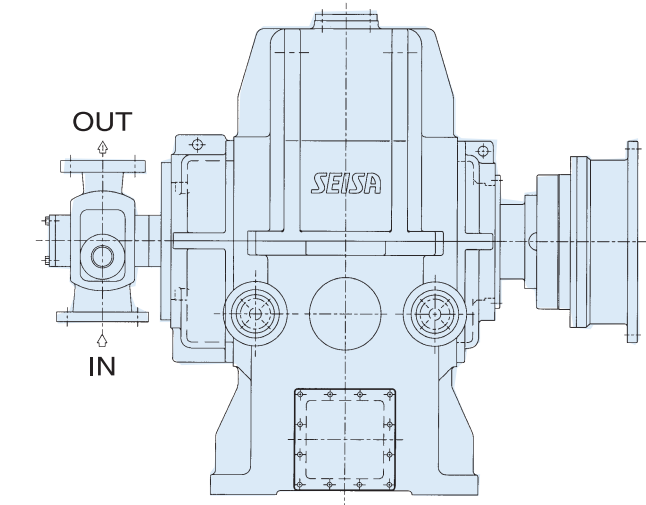
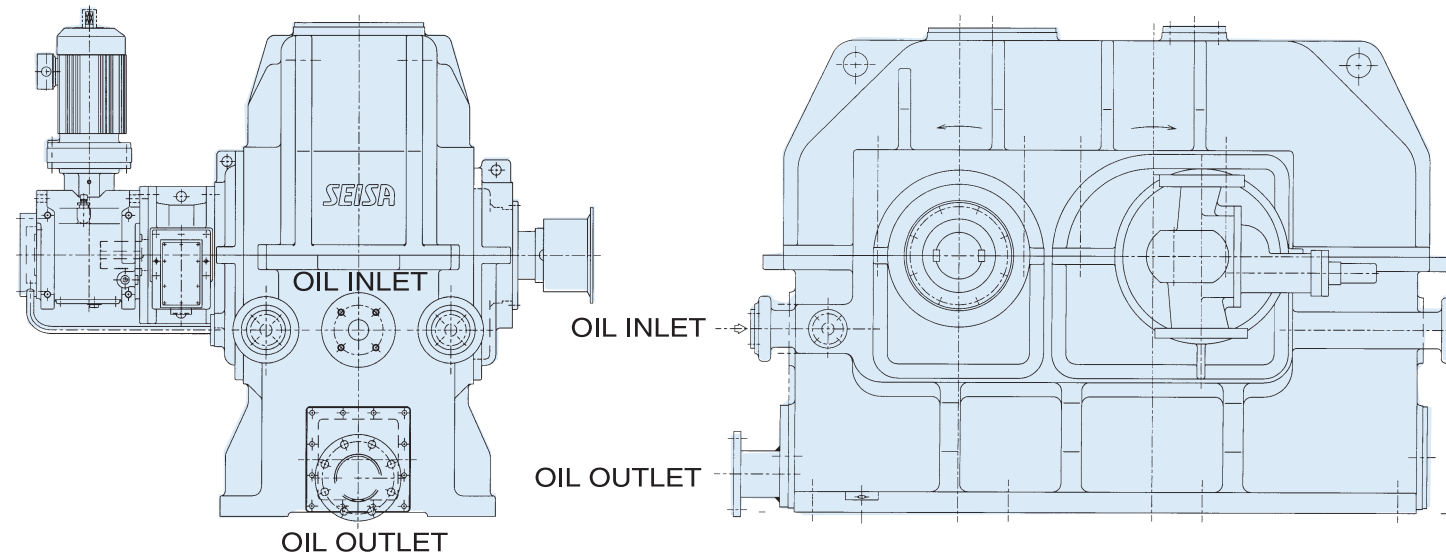
Rugged high-speed gear units for power generators and compressors



Newly developed offset cylindrical bearing



Newly developed four-lobe bearing

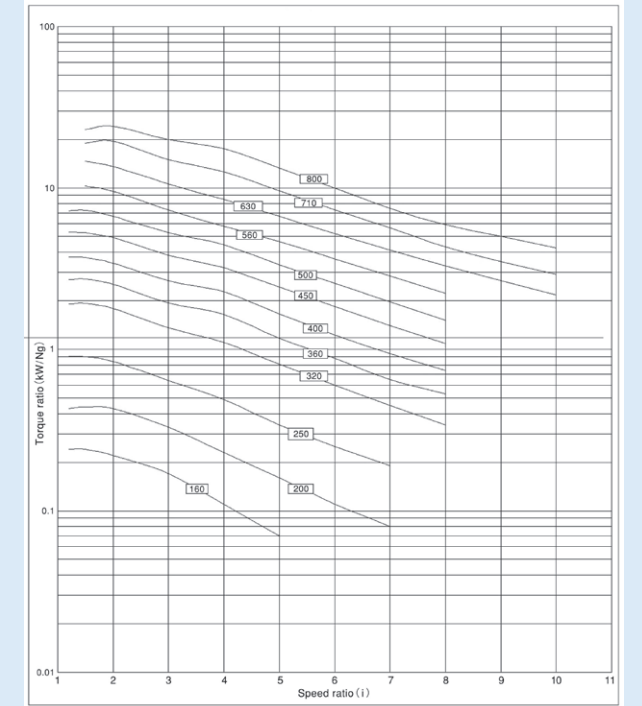


**N D M 4248 T**

### NOMENCLATURE

- T:** Turning device driven by a motor
- R:** Extended Center Distance
- O:** Other
- 4248:** Flame size
- T, S, M, L:** Casing type
- D:** Double Helical
- S:** Single Helical Series (N or C)

### MODEL SELECTION DIAGRAM WITH SERVICE FACTOR OF 1.4 FOR AP1613 APPLIED

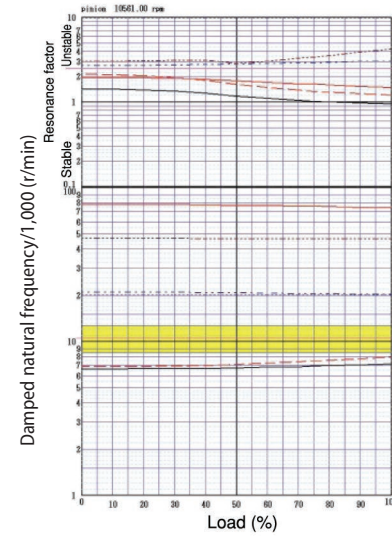
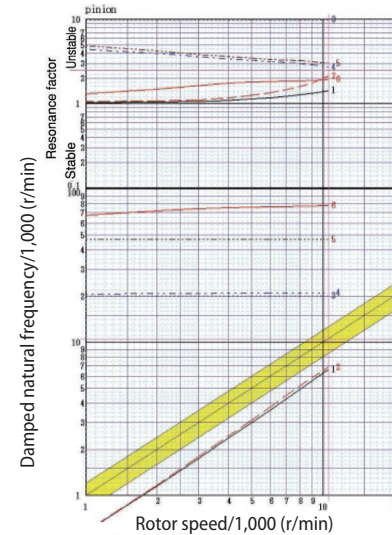


### STRUCTURAL ADVANTAGES

- Bearing cap-integrated casing with high rigidity and high-stability bearings with low noise  
**Noise ▶ Approx. 83 to 88 dB (A), reduced by approx. 5 db (A) compared to conventional models**
- Optimum bearing spans for higher transmitting horsepower
- Structural simplification for better maintainability of all measurement instruments

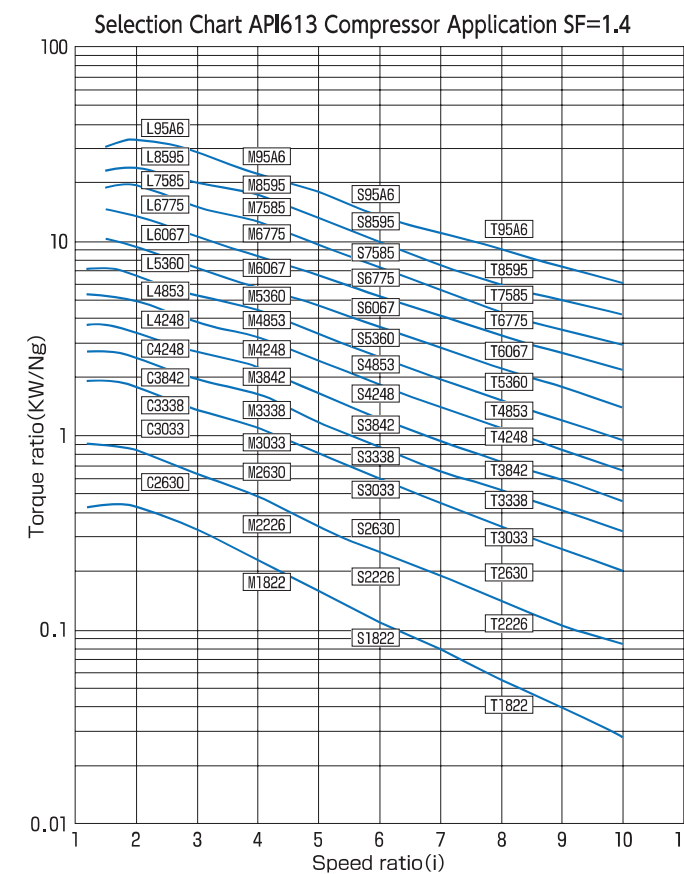
### ENHANCED LOAD CAPACITY

- Development of optimum strength calculation method (for gears and bearings)
- Form grinding for tooth profile optimization and tooth trace correction
- Newly developed bearing calculation method for optimum bearing designs
- Use of optimum bearings matching the specifications
- Optimum bearing spans for minimum shaft deflection
- Completely free of vibration problems thanks to the newly developed rotor stability method of analysis
- Selective use of different types of gears (helical or double helical gears) for higher efficiency
- As the result, **efficiency is increased by approx. 0.5% up to 98.5% to 99.0%**



New development of analysis or rotor stability

### MODEL SELECTION DIAGRAM WITH SERVICE FACTOR OF 1.4



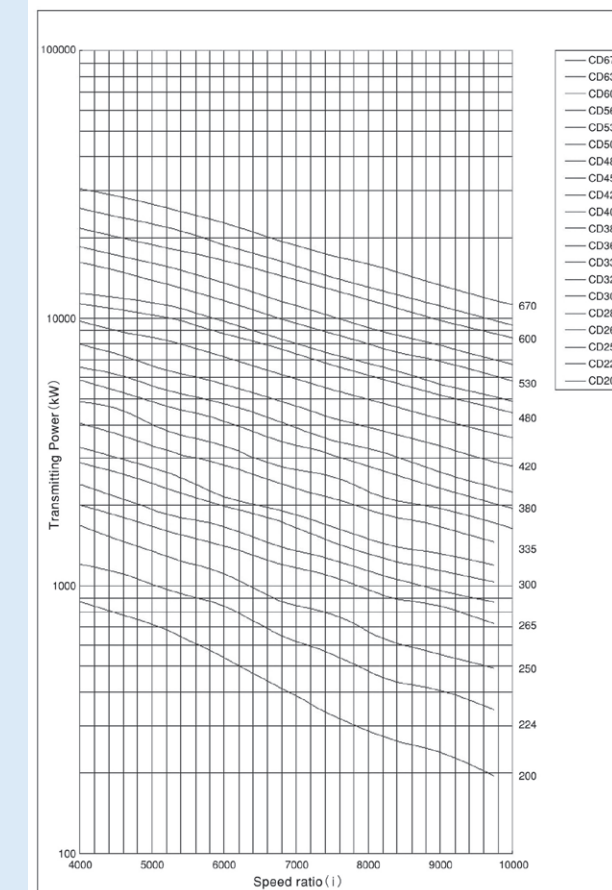
SF = Service factor  
**Torque ratio** = KW/Ng  
 KW = Transmitting power kW  
 Ng = Low speed shaft r/min  
 Np = High speed shaft r/min  
**Speed ratio i** = Np/Ng

### EXAMPLE

**KW** = 18863 kW  
**SF** = 1.4  
**Np** = 10681 r/min  
**Ng** = 4760 r/min  
**Torque ratio** = 18863/4760 = 3.96  
**Speed ratio** = 10681/4760 = 2.24  
**Selected model** = L4248

In case service factor of over 1.4 is required, select the model after calculating the torque ratio by KW/Ng x Service factor / 1.4

### TRANSMITTING POWER TABLE FOR GENERATOR AT 1500 r/min SF=1.1



### TRANSMITTING POWER TABLE FOR GENERATOR AT 1800 r/min SF=1.1

