



GEMENT MILL DRIVE COAL MILL DRIVE

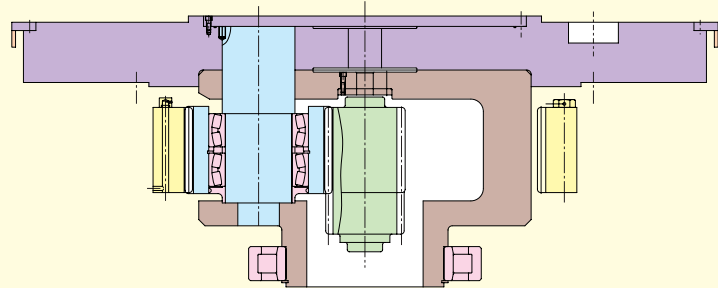


This gear reducer is the most suitable for driving a cement raw mill and clinker, a coal mill, a gypsum mill, a sand mill, a slag mill, etc..
 Seisa is one of world's leading companies for a gear reducer of a mill and have supplied more than 500 sets to world's customers which are highly evaluated.

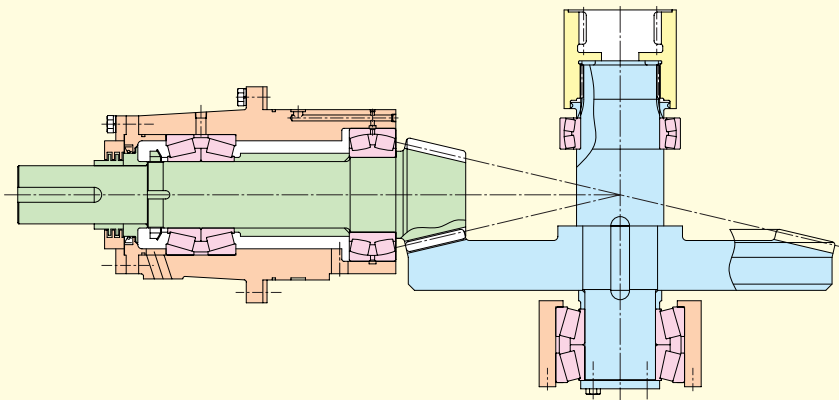
Features 1. High Reliability

Our vertical roller mill drives are standardized building block design as following block assemblies.
 Simple constructions and highest reliability.

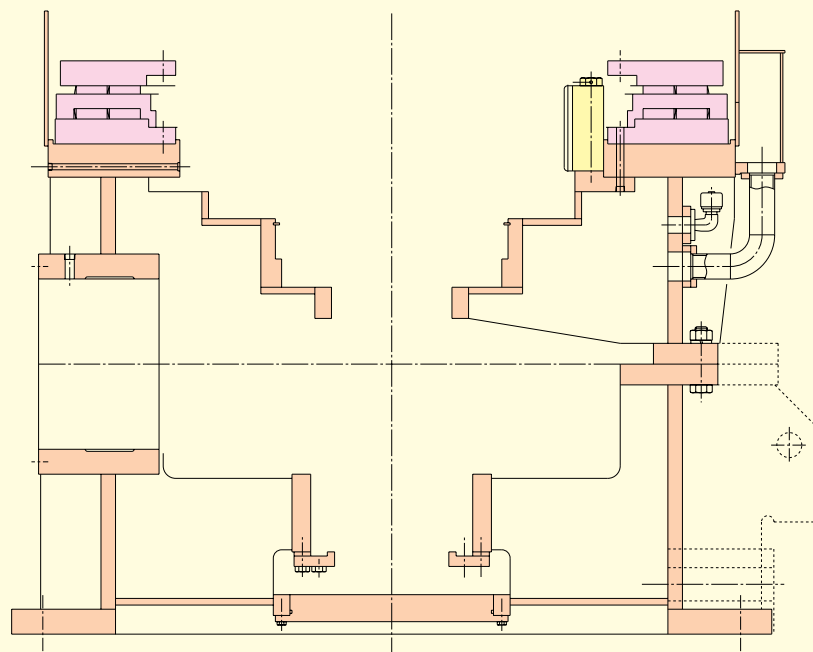
a. Output Flange & Planetary Gear Parts



b. Bevel Gears Parts



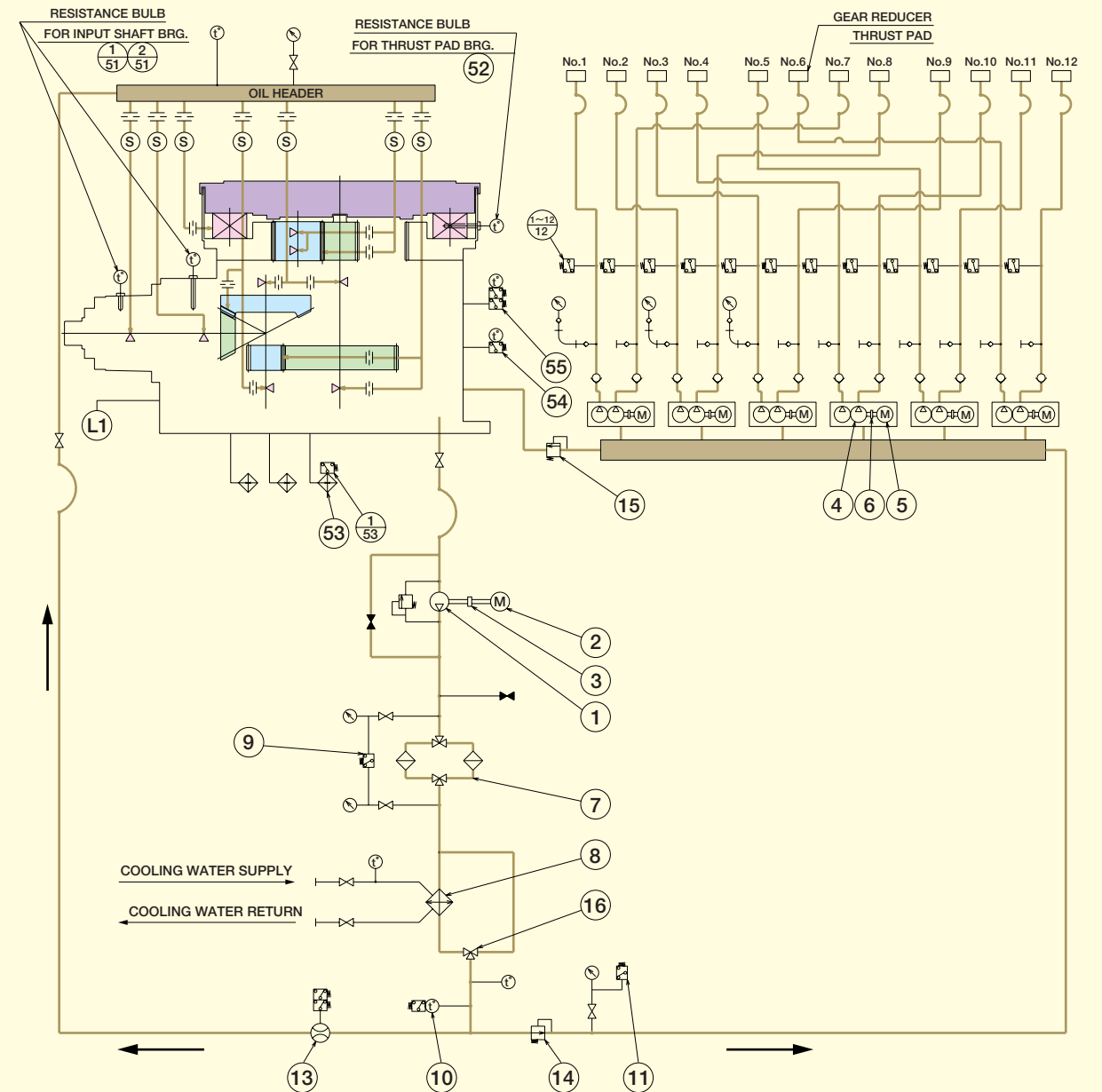
c. Thrust Bearing & casing Parts



Features 2. Saving Installation Cost

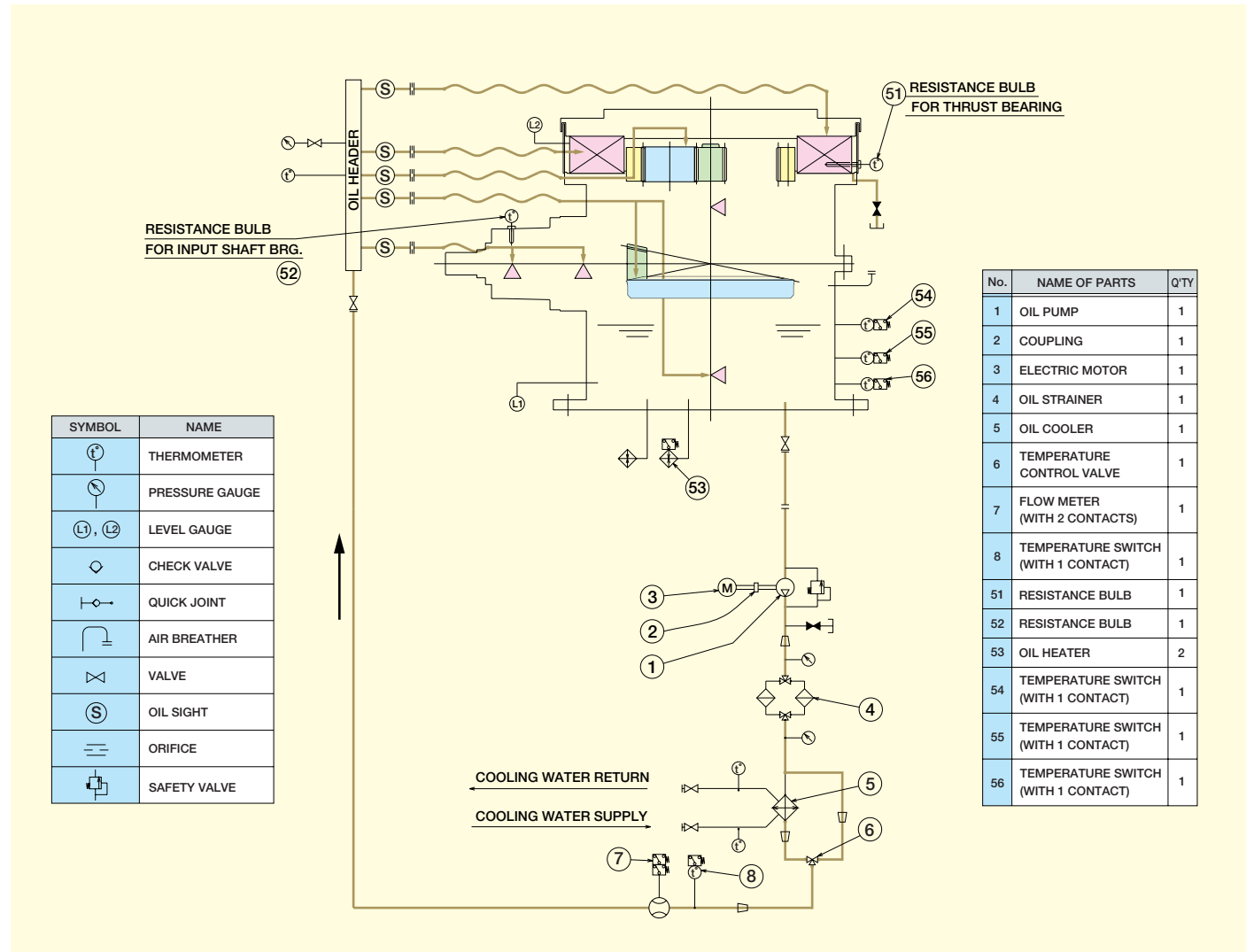
a. Since the lower casing is served as an oil tank, separate oil tank as well as pit at site is not needed.

Flow diagram for Hydro-static Thrust Bearing



No.	NAME OF PARTS	QTY	No.	NAME OF PARTS	QTY	No.	NAME OF PARTS	QTY	No.	NAME OF PARTS	QTY
1	OIL PUMP(L.P)	1	8	OIL COOLER	1	13	FLOW METER (WITH 2 CONTACTS)	1	52	RESISTANCE BULB	1
2	ELECTRIC MOTOR (L.P)	1	9	DIFFERENTIAL PRESS SWITCH (WITH 1 CONTACT)	1	14	PRESS. REDUCING VALVE	1	53	OIL HEATER	3
3	COUPLING	1	10	TEMPERATURE SWITCH (WITH 1 CONTACT)	1	15	SAFETY VALVE	1	54	SENSBEY	1
4	OIL PUMP(H.P)	6	11	PRESSURE SWITCH (WITH 1 CONTACT)	1	16	TEMP. CONTROL VALVE	1	55	TEMPERATURE SWITCH (WITH 1 CONTACT)	1
5	ELECTRIC MOTOR (H.P)	6	12	PRESSURE SWITCH (WITH 1 CONTACT)	12	1-51	RESISTANCE BULB	2	55	TEMPERATURE SWITCH (WITH 2 CONTACTS)	1
6	COUPLING	6				2-51					
7	OIL STRAINER	1									

Flow diagram for Hydro-dynamic Thrust Bearing or Antifriction Thrust Roller Bearing



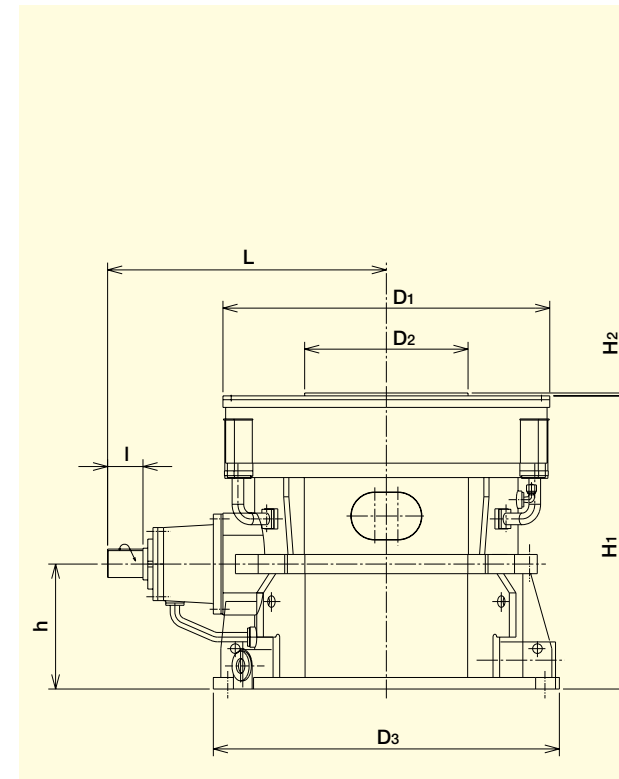
b. Because of compact size and light weight unit, a completely assembled unit is delivered to an actual site.

c. Adjustment of gear tooth contact, thrust bearings contacts and oil supply volume of each lubricating portion and flushing works are not required at the actual site, which make possible a short time installation at the site.

Features 3. Easy Maintenance

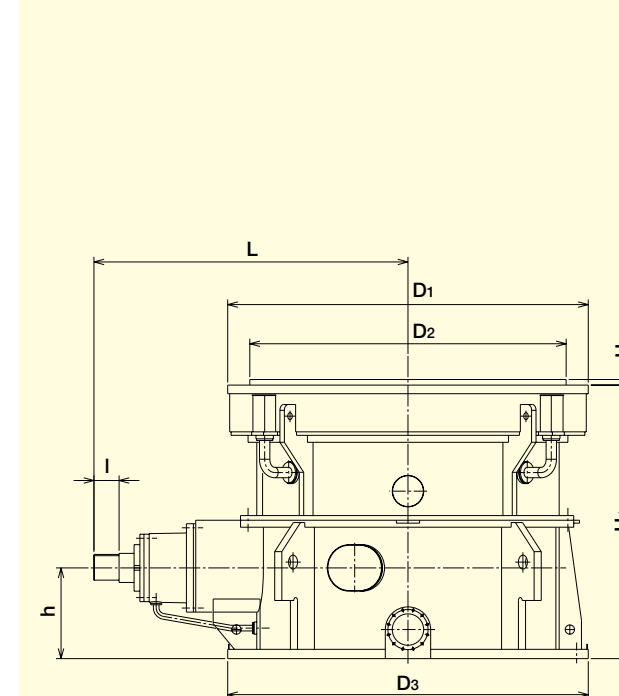
Maintenance is required mainly for check of lubrication.

Selection of Gear Unit & Dimension



Ratio below 1/28.5

TYPE	OUTPUT TORQUE ton · m	H ₁	D ₁	L	D ₃	h	H ₂	D ₂	I	MASS
		mm	mm	mm	mm	mm	mm	mm	mm	ton
BPN046V	2.8	880	1050	800	1100	450	10	650	100	2.1
BPN049V	3.15	920	1050	880	1100	470	10	650	100	2.3
BPN050V	3.55	1000	1050	1050	1100	530	10	650	112	2.7
BPN051V	4	1000	1050	1050	1100	530	10	650	112	3
BPN059V	5	1140	1200	1150	1250	610	10	800	127	3.8
BPN060V	5.6	1230	1250	1210	1250	610	10	850	140	4.7
BPN062V	6.3	1200	1180	1075	1400	610	40	850	140	4.8
BPN065V	8	1230	1250	1210	1250	610	10	850	140	5.3
BPN072V	10	1320	1450	1240	1500	630	10	900	140	6.5
BPN074V	11.2	1350	1500	1300	1500	650	10	950	140	7.5
BPN076V	12.5	1390	1500	1350	1600	650	10	1000	150	8.2
BPN079V	14	1440	1580	1400	1680	650	10	1100	160	9
BPN083V	16	1480	1650	1450	1800	650	15	1150	170	11
BPN085V	20	1525	1700	1450	1800	650	15	1200	180	12



Ratio over 1/28.5

TYPE	OUTPUT TORQUE ton · m	H ₁	D ₁	L	D ₃	h	H ₂	D ₂	I	MASS
		mm	mm	mm	mm	mm	mm	mm	mm	ton
BHP062V	10	1390	1360	1380	1480	580	10	980	127	6
BHP069V	12.5	1450	1400	1470	1650	600	10	1160	140	8
BHP079V	14	1450	1600	1500	1700	620	10	1200	140	9.5
BHP082V	16	1520	1680	1540	1750	620	10	1300	149	10.5
BHP087V	20	1635	1820	1600	1900	630	15	1500	162	12.5
BHP095V	25	1650	1900	1800	2000	650	15	1600	170	15
BHP106V	31.5	1800	2200	2080	2300	710	15	1700	170	21
BHP115V	40	1800	2200	2130	2300	710	15	1800	190	23
BHP127V	50	1980	2680	2200	2400	720	20	2100	198	33
BHP131V	63	2200	2700	2400	2550	740	20	2200	215	37
BHP133V	80	2230	2750	2500	2800	760	20	2540	215	45
BHP167V	90	2380	3100	2700	3000	780	20	2720	216	51
BHP170V	100	2510	3200	2850	3200	800	20	2750	236	56
BHP174V	125	2700	3450	3035	3400	820	20	2900	240	78
BHP192V	160	2930	3800	3320	3850	1000	20	3150	305	92
BHP198V	200	2960	3900	3400	3950	1000	20	3200	330	100

TYPE BPN & BHP

Gears

The design of gears is based on AGMA standards and all gears are designed with AGMA service factor **2.5** min.

Planetary Gearings

The basic tooth form for planetary gearings employed by us has a **25 deg.** pressure angle and 1.1 module addendum. As compared with a tooth form with a pressure angle 20 deg. generally used, this tooth form is **13%**, higher in strength and **18%**, higher in durability.

Sun pinion and Planet gears

Sun pinion and planet gears of Cr-Mo or Ni-Cr-Mo forged steel are precisely machined and tooth-grinding finished after carburized and hardened.

Internal gear

Internal gear made of carbon steel or Cr-Mo forged steel is gear shapering finished or ground after quenched and tempered.

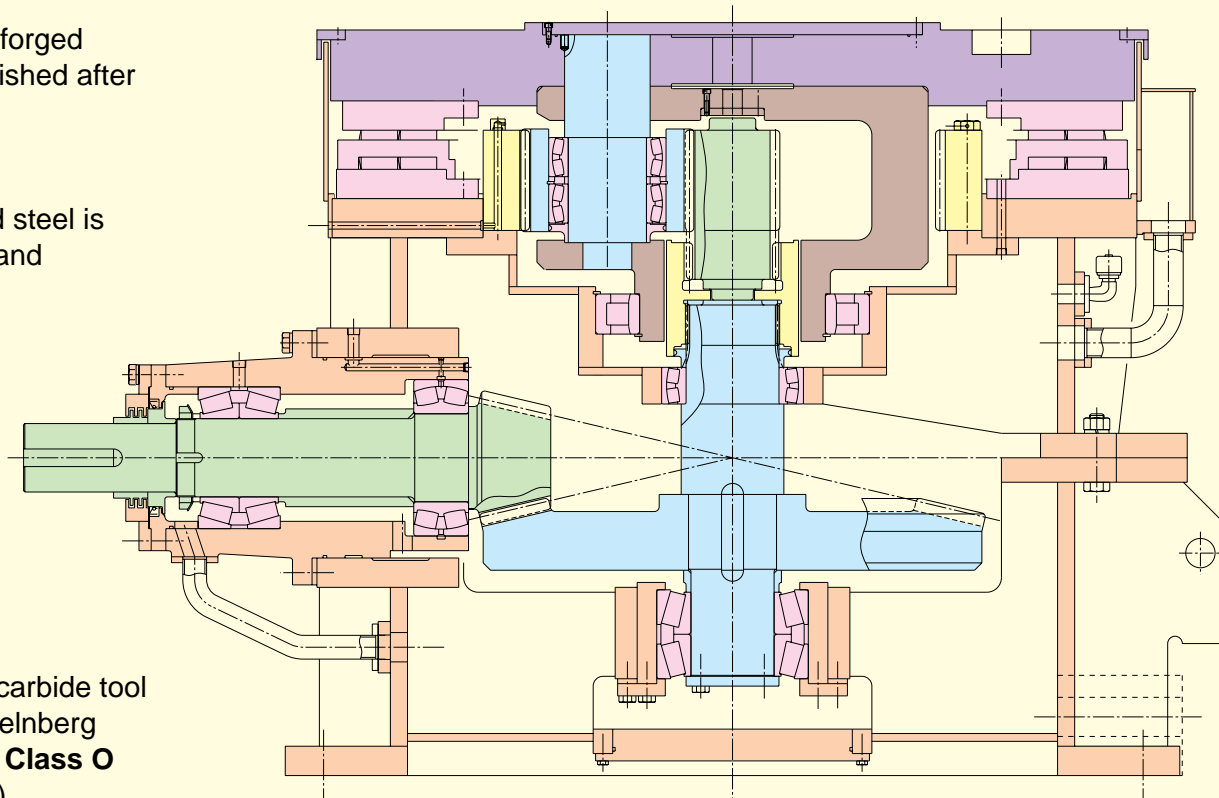
Spiral Bevel Gears

After carburized and hardened, the gear teeth are carbide tool cut finished by using special cutter blades on Klingelberg spiral bevel gear cutting machine to **JIS Accuracy Class O or 1** (equivalent to AGMA Class 12 or DIN Class 4).

Non-Destructive Check of Gears

1. Chemical composition and mechanical properties of materials are inspected by the mill sheet of first class steel maker.
2. After heat treatment, an ultrasonic inspection is performed to make sure that there are no internal defects in materials or no defects caused by heat treatment.
3. After tooth-grinding finished, subjected to a magnetic particle inspection is applied to surface-hardened gear teeth to make sure that there are no hair cracks and/or like on the surface.

TYPE BPN

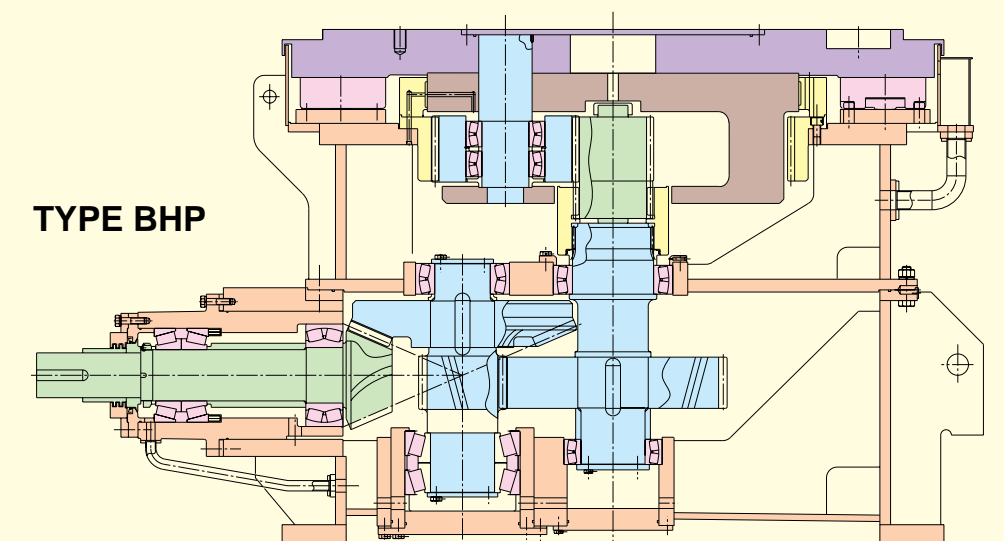


Thrust Bearing

- a. Hydro-dynamic thrust bearing for smaller size units:
For smaller size units, a hydro-dynamic thrust bearings are employed. The Mitchel type thrust pads with offset support have a special shape to supply lubricant oil well. The bearing contact comes only supporting points and entry-gap appears automatically.
- b. Antifriction thrust roller bearings for smaller size units:
For smaller size units, antifriction thrust roller bearings are employed. Antifriction thrust roller bearings with high quality brings easy maintenance.
- c. Hydro-static thrust bearings for larger size units:
A high pressure oil is fed to each sliding surface of thrust pad and required oil film thickness is kept by a hydro-static pressure. Since the high pressure oil is fed to each thrust pad independently, a certain oil volume is always kept to each pad and required oil film thickness is always kept under different thrust loads on each thrust pad

	Hydro dynamic Thrust Bearing	Hydro static Thrust Bearing	Antifriction Thrust roller bearing
Life time	Infinity in theory	Infinity in theory	Finite life
Cost	Small	Large	Small
Maintenance difficulty	Difficult on control of oil lubrication	Required high pressure oil unit	Easy to use
Rating capacity	Up to 700kW	Any range of capacity	Up to 1200kW

The gear reducer with ratio of over 1/28.5 consists of triple stage reduction of Bevel/Helical/Planetary type.





1800kW Bevel Planetary Gear Reducer for Vertical Type Roller Mill



3800kW Bevel Planetary Gear Reducer for Vertical Type Roller Mill



740kW Bevel Planetary Gear Reducer for Vertical Type Roller Mill



140kW Gear Reducer for Vertical Type Coal Mill



3300kW Bevel Helical Gear Reducer for Vertical Type Roller Mill

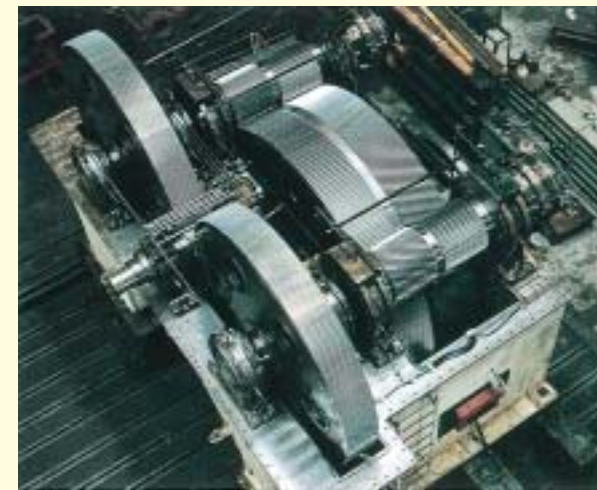
Actual supply records (Total 313 UNITS UNTIL 2001)



1500kW Planetary Gear Reducer for Cement Mill



6300kW Planetary Gear Reducer for Cement Mill

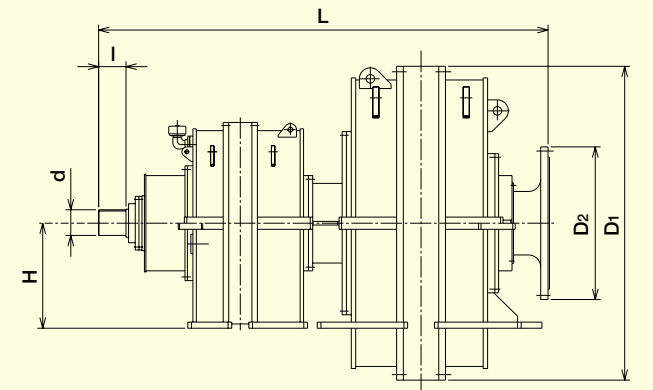
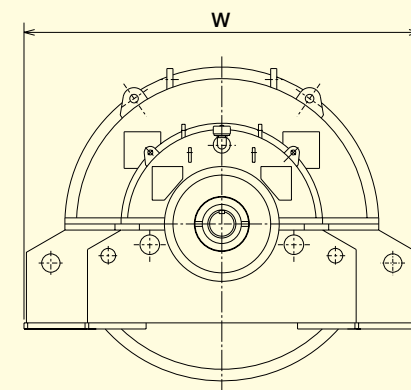


3700kW Symmetry Type Gear Reducer for Cement Mill



Inching Device for Cement Mill

Selection of Gear Unit & Dimension



TYPE	NOMINAL POWER (kW)	L	W	D ₁	I	D ₂	H	d	MASS (ton)
		mm	mm	mm	mm	mm	mm	mm	
DPP198H	2100	3680	2900	2300	200	1120	750	170	24.5
DPP214H	2650	3690	3000	2530	200	1250	800	190	32.0
DPP218H	3200	3800	3240	2570	224	1250	860	200	36.0
DPP243H	4000	4000	3540	2820	224	1400	950	210	49.0
DPP253H	4800	4134	3780	2950	280	1500	1000	230	60.0

TYPE	NOMINAL POWER (kW)	L	W	D ₁	I	D ₂	H	d	MASS (ton)
		mm	mm	mm	mm	mm	mm	mm	
DPP280H	5600	4420	3880	3220	280	1500	1100	230	72.0
DPP298H	6400	4700	4380	3440	280	1550	1150	240	82.0
DPP310S	7000	4950	4700	3610	305	1600	1150	260	94.0
DPP310H	7700	5150	5250	3610	305	1650	1200	270	105.0
DPP323H	8400	5290	5500	3750	305	1700	1300	280	112.0

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