

# **PREMIUM**

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## **PLANETARY GEAR UNITS**

**Modular Planetary Gearbox  
for Industrial Applications**



**PREMIUM**

## PREMIUM PLANETARY GEAR UNITS

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## PREMIUM PLANETARY GEAR UNITS

The Premium Planetary Gear Units are reliable drive components for the use of different industrial core sector :

- Sugar Mills
- Conveyor plants
- Fertilizer plants
- Coal & lignite mines
- Power plants
- Textile & Plastic
- Steel plants
- Sponge Iron plants
- Paper Machineries
- Mobile Hydraulic application

Planetary Gearboxes have much higher mechanical rating capacity compared to parallel shaft Gears. The power being transmitted gets equally distributed among three or five planets in each stage resulting in reduced induced stress which optimizes the size as well accommodates higher ratio.

### Significant advantages of Premium Planetary Gear Unit

- Compact design with optimum power density
- Long operating life
- Modular construction
- Interchangeability
- Less noise & vibration
- Ease of maintenance

### Description :

Premium Modular Planetary Gear Units covers nominal torque range between 55kNm. to 3600 kNm.

Foot and Flange mounting type planetary units are available with ring diameter upto 1930mm in double, triple and quadruple stage, depending upon ratio.

### Housings :

Heavily loaded housing parts are made out of spheroid graphite cast iron. Fabricated housings are also available on request.





## PREMIUM PLANETARY GEAR UNITS

### Gears & Pinions :

Sun & planet gears have spur gear teeth and are case-hardened and ground to precision grade accuracy with softer core provides improved wear and fatigue resistance.

Annulus gears are manufactured from high quality alloy steel, through hardened, nitriding depends on size & torque rating. Gear teeth are designed for long life fatigue resistance for the stated nominal torque.

### Bearing arrangement :

Planets and shafts are exclusively supported by amply sized antifriction roller bearings.

### Seals :

Input and output shafts have radial shaft seals. For special applications we provide seals with refillable labyrinth.

### Input Shaft :

Available features,

- Solid shaft with key
- Solid shaft with spline.
- Hollow with spline.

### Output Shaft :

Available features,

- Solid shaft with key.
- Solid shaft with external spline.
- Solid shaft with square end.
- Hollow shaft with internal spline.
- Hollow shaft with shrink disk.
- Hollow shaft with internal spline & bracket.

**Note: All internal and external spline available (as per DIN 5480) on request.**

### Lubrication :

The Gear units are provided with splash lubrication as a standard feature where in all parts to be lubricated are immersed in the oil.

In case, Gear unit requires force lubrication in condition of extreme ambient temperature or any other specific features, please refer to us.

The gear unit can be operated in any mounting position. In order to guarantee adequate lubrication; the mounting position must be stated.





## PREMIUM PLANETARY GEAR UNITS

### Direction of rotation :

The Gear Units are bi-directional refers to output shaft direction when viewing towards the shaft end face.

### Working temperature :

The working oil temperature of the planetary gears should range between +5°C to +90°C. Temperature falling outside this range could be accepted only if special lubricants, gaskets are used. For further information please contact us.

### Cooling :

Up to the limit of thermal capacity gear units are cooled by radiation and convection from the surface at the Housing/Casing.

### Operating condition :

The ambient temperatures must be known so that they can be taken into consideration while selecting the gear units for thermal conditions.

Where ambient temperatures are lower than -10°C. Please refer to us.

Environmental conditions such as salt water, salt-laden air, aggressive substances, dust, and mud falling or flying stones, excessive pressure, heavy vibrations and extreme shock loads must be disclosed.



### Delivery :

Premium Planetary Gear Units are supplied without oil. The Gear housing is protected against corrosion.

### Preservation :





Standard Preservation: up to 6 months with full of Oil and free run every alternate 20-25 days.

Long term: Up to 24 months full mineral Oil or synthetic oil on PAO basis is used ( PAO = American Petroleum base oil), and free run every after 20-25 days.

### Further notes :

For shaft mounted gear units with torque reaction arm, the connection of the torque reaction arm on the foundation must permit the gear unit to move corresponding to the displacement of the machine shaft at any time, without constraining forces acting on the gear unit. In case of foot mounted gear units with solid shaft the provided coupling between gear unit and prime mover must also be suitable for adequate misalignment.

### Explanation of symbols used in the dimensional drawings.

-  = Breather
-  = Oil drain
-  = Oil filler
-  = Oil sight glass

## PREMIUM PLANETARY GEAR UNITS

### Key to Symbols :

- $E_D$  = Operating Cycle per hours in %, e.g.  $E_D=80\%/h$ .
- $f_1$  = Factor for driven machine (Table 1)
- $f_2$  = Factor for prime mover (Table 2)
- $f_3$  = Peak torque factor (Table 3)
- $f_4$  = Thermal factor (Table 4)
- $f_5$  = Utilization factor (Table 5)
- $i$  = Actual Ratio.
- $i_N$  = Nominal Ratio.
- $i_s$  = Required ratio.
- $n_1$  = Input RPM
- $n_2$  = Output RPM
- $P_G$  = Required thermal capacity (kW)
- $P_{G1}$  = Thermal capacity (kW) for gear units without auxiliary cooling
- $P_N$  = Nominal power rating of gear unit (kW) see rating tables
- $P_r$  = Required power rating (kW)
- $P_1$  = Motor power of driven machine (kW)
- $P_2$  = Power Rating of driven machine (kW)
- $P_{START}$  = Starting power rating (kW)
- $t$  = Ambient temperature(c)
- $T_A$  = Max torque on input shaft, i.e peak operating starting or braking torque (Nm)
- $T_{2N}$  = Nominal output torque (Nm)
- $T_2$  = Torque of driven machine (Nm)
- $P_{2eq}$  = Equivalent power rating (kW)
- $T_{2eq}$  = Equivalent torque (Nm)

### Gearbox Nominal Torque Rating :

Gear unit sizes	Nominal torque ratings (Nm)
20	57000
22	83000
24	120000
28	200000
33	335000
38	450000
41	595000
44	745000
48	948000
52	1165000
55	1320000
57	1550000
66	2530000
76	3600000



## PREMIUM PLANETARY GEAR UNITS

### Load Classification by application, Service Factors

Table 1	Factor for driven machine			f1			
Driven Machines	Effective daily operating period under load in hours			Driven Machines	Effective daily operating period under load in hours		
	≤ 0.5	≥ 0.5-10	≥ 10		≤ 0.5	≥ 0.5-10	≥ 10
<b>Waste water treatment</b>				<b>Conveyors</b>			
Thickeners(central drive)	-	-	1.2	Bucket conveyors	-	1.2	1.5
Filter presses	1.0	1.3	1.5	Hauling winches	1.4	1.6	1.6
Flocculation apparata	0.8	1.0	1.3	Hoist	-	1.5	1.8
Aerator	-	1.8	2	Belt conveyors ≤ 150 kW	1.0	1.2	1.3
Ranking equipment	1.0	1.3	1.5	Belt conveyors ≥ 150 kW	1.1	1.3	1.4
Combined longitudinal and rotary rakes	1.0	1.3	1.5	Goods lifts*	-	1.2	1.5
Pre-thickeners	-	1.1	1.3	Passenger lifts*	-	1.5	1.8
Screw pumps	-	1.3	1.5	Apron conveyors	-	1.2	1.5
Water turbines	-	-	2.0	Escalators	-	1.2	1.4
<b>Pumps</b>				Rail traveling gears	-	1.5	-
Centrifugal pumps	1.0	1.2	1.3	<b>Frequency converters</b>	-	1.8	2.0
Positive displacement pumps				<b>Reciprocating compressors</b>	-	1.8	1.9
1 piston	1.3	1.4	1.8				
> 1 piston	1.2	1.4	1.5				
<b>Dredgers</b>				<b>Cranes **</b>			
Bucket conveyors	-	1.6	1.6	Slewing gears****	1.0	1.4	1.8
Dumping devices	-	1.3	1.5	Luffing gears	1.0	1.1	1.4
Carterpillar travelling gears	1.2	1.6	1.8	Traveling gears	1.1	1.6	2.0
<b>Bucket wheel excavators</b>				Hoisting gears	1.0	1.1	1.4
as pick -up	-	1.7	1.7	Derricking jib cranes	1.0	1.2	1.6
for primitive material	-	2.2	2.2	<b>Cooling towers</b>			
Cutter heads	-	2.2	2.2	Cooling tower fans	-	-	2.0
Traversing gears*	-	1.4	1.8	Blowers (axial & radial)	-	1.4	1.5
<b>Plate bending machines *</b>	-	1.0	1.0				
<b>Chemical industry</b>				<b>Food industry</b>			
Extruders	-	-	1.6	<b>Cane sugar production</b>			
Dough mills	-	1.8	1.8	Cane knives *	-	-	1.7
Rubber calenders	-	1.5	1.5	Cane mills	-	-	1.7
Cooling drum	-	1.3	1.4	<b>Beet sugar production</b>			
<b>Mixers for</b>				Beet cassettes macerators,	-	-	1.2
uniform media	1.0	1.3	1.4	Extraction plants, Mechanical			
non-uniform media	1.4	1.6	1.7	refrigerators, Juice boilers,	-	-	1.4
<b>Agitators for media with</b>				Sugar beet washing machines			
uniform density	1.0	1.3	1.5	Sugar beet cutters	-	-	1.5
non-uniform density	1.2	1.4	1.6				
non-uniform gas absorption	1.4	1.6	1.8	<b>Paper machines</b>			
Toasters	1.0	1.3	1.5	of all kind ***	-	1.8	2.0
Centrifuges	1.0	1.2	1.3	Pulper drives		On request	
<b>Metal working mills</b>				<b>Centrifugal compressors</b>	-	1.4	1.5
Plate Tilters	1.0	1.0	1.2				
Ingot pushers	1.0	1.2	1.2				



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**Load Classification by application, Service Factors**

Table 1		Factor for driven machine			f1			
Driven Machines	Effective daily operating period under load in hours			Driven Machines	Effective daily operating period under load in hours			
	≤ 0.5	≥ 0.5-10	≥ 10		≤ 0.5	≥ 0.5-10	≥ 10	
Winding machines	-	1.6	1.6	<b>Cableways</b> Material ropeways To-and fro system aerial ropeways T-bar lifts Continuous ropeways	-	1.3	1.4	
Cooling bed transfer frames	-	1.5	1.5		-	-	-	
Roller straighteners	-	1.6	1.6		-	-	-	
<b>Roller tables</b>								
Continuous	-	1.5	1.5		-	1.6	1.8	
intermittent	-	2.0	2.0		-	1.3	1.4	
Reversing tube mills	-	1.8	1.8		-	1.4	1.6	
<b>Shears</b>								
continuous *	-	1.5	1.5		<b>Cement industry</b> Concrete mixers Breakers * Rotary kilns Tube mills Separators Roll crushers	-	1.5	1.5
crank type *	1.0	1.0	1.0			-	1.2	1.4
Continuous casting drivers*	-	1.4	1.4	-		-	2.0	
<b>Rolls</b>				-		-	2.0	
Reversing blooming mills	-	2.5	2.5	-		-	2.0	
Reversing slabbing mills	-	2.5	2.5	-		1.6	1.6	
Reversing wire mills	-	1.8	1.8	-		-	2.0	
Reversing sheet mills	-	2.0	2.0					
Reversing plate mills	-	1.8	1.8					
Roll adjustment drives	0.9	1.0	-					

Table 2	Factor for prime mover	f2
Electric motors, hydraulic motors, turbines		1.0
Piston engines 4-6 cylinders cyclic variation 1:100 to 1:200		1.25
Piston engines 1-3 cylinders cyclic variation up to 1:100		1.5

Table 3	Peak torque factor				f3
	Load peaks per hour				
	1-5	6-30	31-100	> 100	
f3 Steady direction of load	0.5	0.65	0.7	0.85	
f3 Alternating direction of load	0.7	0.95	1.1	1.25	

Table 4	Thermal factor					f4
	Without auxiliary cooling					
Ambient Temp.	Operating cycle per hour (ED) in %					
	100	80	60	40	20	
10°C	1.14	1.20	1.32	1.54	2.04	
20°C	1.00	1.06	1.16	1.35	1.79	
30°C	0.87	0.93	1.00	1.18	1.56	
40°C	0.71	0.75	0.82	0.96	1.27	
50°C	0.55	0.58	0.84	0.74	0.98	

Table 5	Utilization factor							f5
30%	40%	50%	60%	70%	80%	90%	100%	
0.66	0.77	0.83	0.90	0.90	0.95	1.0	1.0	

Design for power rating of driven machine P2

\*Designed power corresponding to max. torque

\*\*Load can be exactly classified, for instance, according to FEM 1001

\*\*\*A check for thermal capacity is absolutely essential

\*\*\*\*Load can be exactly classified according to the slewing gear specification

The listed value of the factors are empirical. Prerequisite for their application is that the machinery and equipment mentioned correspond to generally accepted design and load specifications. In case of deviations from standard conditions, please refer to us.

For driven machines which are not listed in this table, please refer to us.

## PREMIUM PLANETARY GEAR UNITS

### Gearbox Selection Guidelines :

#### 1. Determination gear unit type and size

##### 1.1 Calculation of required transmission Ratio:

$$i_s = \frac{n_1}{n_2}$$

##### 1.2 Determine the nominal power rating:

$$P_N \geq P_r = P_2 \times f_1 \times f_2$$

For  $f_1$  refer Table 1 and for  $f_2$  refer Table 2,  
If  $P_2$  is not available, use  $P_1$  in place of  $P_2$   
in the complete selection process.

##### 1.3 Check for over dimensioning:

$$3.33 \times P_2 \geq P_N$$

##### 1.4 Check for maximum Torque e.g. Peak Operating-starting or breaking torque:

$$P_N \geq P_{START} = \frac{T_A \times n_1}{9550} \times f_3$$

For  $f_3$  refer Table 3  
Gear unit sizes and number of gear stages are  
given in rating tables depending on  $i_N$  and  $P_N$

##### 1.5 Check whether the actual ratio 'i' as per tables on page 22 is acceptable.

#### 2. Determination of gear unit thermal capacity $P_G$

##### 2.1 Gear Unit Utilization for the determination of the thermal capacity:

$$\text{Utilization in \%} = \frac{P_2}{P_N} \times 100$$

For factor  $f_5$  corresponding to Utilization % refer  
Table 5

##### 2.2 Adequate for gear units without auxiliary cooling:

$$P_2 \leq P_G = P_{G1} \times f_4 \times f_5$$

For  $f_4$  refer Table 4 and for  $f_5$  refer Table 5

##### 2.3 For higher thermal capacities, forced lubrication system is available on request.





### Calculation Example 1

#### Known Criteria

##### PRIME MOVER

Electric motor	:	$P_1 = 55\text{kW}$
Motor speed	:	$n_1 = 1500\text{ rpm}$
Max. starting torque	:	$T_A = 560\text{Nm}$

##### DRIVEN MACHINE

Agitator	:	$P_2 = 50\text{kW}$
Speed	:	$n_2 = 13.4\text{ rpm}$
Duty	:	24 h / day
Starts per hour	:	1
Operating cycle per hour	:	$E_D = 100\%$
Ambient temperature	:	40°C
Installation in a large hall		

#### 1. Selection of gear unit type

##### 1.1 Calculation of transmission ratio

$$i_s = \frac{n_1}{n_2} = \frac{1500}{13.4} = 111.9; i_N = 112$$

##### 1.2 Determination of gear unit type

**Type P3LA** selected (for actual ratio, see page 22)

#### 2. Determination of gear unit size

##### 2.1 Determination of the nominal gear unit power rating

$$P_N \geq P_r = P_2 \times f_1 \times f_2 = 50\text{ kW} \times 1.5 \times 1 = 75\text{ kW};$$

$$P_N = 82.5\text{ kW} > P_r = 75\text{ kW}$$

Selected from power rating table : **type P3LA.**

**Gear unit size 20**, with  $P_N = 82.5\text{ kW}$  (see page 10)

$$3.33 \times P_2 \geq P_N \quad 3.33 \times 50\text{ kW} = 166.4\text{ kW} > P_N = 82.5\text{ kW}$$

##### 2.2 Checking the starting power rating

$$P_N \geq P_{\text{START}} = \frac{T_A \times n_1}{9550} \times f_3 = \frac{560 \times 1500}{9550} \times 0.5 = 44\text{ kW};$$

$$P_N = 82.5\text{ kW} > P_{\text{START}} = 44\text{ kW}$$

#### 3. Determination of thermal capacity

##### 3.1 Gear unit utilization

$$\text{Utilization in \%} = \frac{P_2}{P_N} \times 100 = \frac{50}{82.5} \times 100 = 60\%$$

##### 3.2 Thermal capacity according to table for type P3LA (see page 10)

$$P_2 \leq P_G = P_{G1} \times f_4 \times f_5 = 51\text{ kW} \times 0.71 \times 0.9 = 32.5\text{ kW};$$

$$P_2 = 50\text{ kW} > P_G = 32.5\text{ kW}$$

Auxiliary cooling required. Please refer to us.

### Calculation Example 2

#### Known Criteria

##### PRIME MOVER

Electric motor	:	$P_1 = 90\text{ kW}$
Motor speed	:	$n_1 = 1000\text{ rpm}$
Max. starting torque	:	$T_A = 1330\text{ Nm}$

##### DRIVEN MACHINE

Sugar Mill	:	$P_2 = 80\text{kW}$
Speed	:	$n_2 = 2.5\text{ rpm}$
Duty	:	24 h / day
Starts per hour	:	1
Operating cycle per hour	:	$E_D = 100\%$
Ambient temperature	:	40°C
Installation in a large hall		

#### 1. Selection of gear unit type

##### 1.1 Calculation of transmission ratio

$$i_s = \frac{n_1}{n_2} = \frac{1000}{2.5} = 400; i_N = 400$$

##### 1.2 Determination of gear unit type

**Type P4LA** selected (for actual ratio, see page 22)

#### 2. Determination of gear unit size

##### 2.1 Determination of the nominal gear unit power rating

$$P_N \geq P_r = P_2 \times f_1 \times f_2 = 80\text{ kW} \times 1.7 \times 1 = 136\text{ kW};$$

$$P_N = 155\text{ kW} > P_r = 136\text{ kW}$$

Selected from power rating table : **type P4LA.**

**Gear unit size 41**, with  $P_N = 155\text{ kW}$  (see page 11)

$$3.33 \times P_2 \geq P_N \quad 3.33 \times 80\text{ kW} = 266.4\text{ kW} > P_N = 155\text{ kW}$$

##### 2.2 Checking the starting power rating

$$P_N \geq P_{\text{START}} = \frac{T_A \times n_1}{9550} \times f_3 = \frac{1330 \times 1000}{9550} \times 0.5 = 69.6\text{ kW};$$

$$P_N = 155\text{ kW} > P_{\text{START}} = 69.6\text{ kW}$$

#### 3. Determination of thermal capacity

##### 3.1 Gear unit utilization

$$\text{Utilization in \%} = \frac{P_2}{P_N} \times 100 = \frac{80}{155} \times 100 = 52\%$$

##### 3.2 Thermal capacity according to table for type P4LA (see page 11)

$$P_2 \leq P_G = P_{G1} \times f_4 \times f_5 = 164\text{ kW} \times 0.71 \times 0.83 = 96.6\text{ kW};$$

$$P_2 = 80\text{ kW} < P_G = 96.6\text{ kW}$$

No Auxiliary cooling required.

## PREMIUM PLANETARY GEAR UNITS

Nominal Power Rating  $P_N$  in kW

Type : P2LA, P2LF Two Stage Inline Planetary Gear Units

Size : 20 - 76

Nominal Ratio	Input Speed rpm	Nominal Output Speed	GEAR UNIT SIZES													
			20	22	24	28	33	38	41	44	48	52	55	57	66	76
			NOMINAL RATING IN kW													
16	1500	93.8	560	815	1156	1928	3288	4410	5735	7180	8998	11485	12838	14780	24542	34850
	1000	62.5	373	543	771	1285	2192	2940	3823	4787	5999	7657	8558	9853	16361	23233
	750	46.9	280	408	578	964	1644	2205	2868	3590	4499	5743	6419	7390	12271	17425
18	1500	83.3	506	737	1071	1785	2944	3912	5310	6648	8460	10210	11610	13704	20902	30228
	1000	55.6	337	491	714	1190	1963	2608	3540	4432	5640	6807	7740	9136	13935	20152
	750	41.7	253	369	536	893	1472	1956	2655	3324	4230	5105	5805	6852	10451	15114
20	1500	75.0	450	655	952	1586	2624	3490	4720	5910	7520	9123	10320	10320	18650	26950
	1000	50.0	300	437	635	1057	1749	2327	3147	3940	5013	6082	6880	8160	12433	17967
	750	37.5	225	328	476	793	1312	1745	2360	2955	3760	4562	5160	6120	9325	13475
22.5	1500	66.7	408	594	864	1451	2406	3198	4317	5405	6878	8353	9439	11142	17122	24802
	1000	44.4	272	396	576	967	1604	2132	2878	3603	4585	5569	6293	7428	11415	16535
	750	33.3	204	297	432	726	1203	1599	2159	2703	3439	4177	4720	5571	8561	12401
25	1500	60.0	365	531	772	1309	2174	2890	3894	4875	6204	7525	8513	9969	15564	22460
	1000	40.0	243	354	515	873	1449	1927	2596	3250	4136	5017	5676	6646	10376	14973
	750	30.0	183	266	386	655	1087	1445	1947	2438	3102	3763	4257	4985	7782	11230
28	1500	53.6	319	464	674	1159	1930	2567	3449	4318	5326	6574	7541	8709	13840	19895
	1000	35.7	213	309	449	773	1287	1711	2299	2879	3551	4383	5028	5806	9227	13263
	750	26.8	160	232	337	580	965	1284	1725	2159	2663	3287	3771	4355	6920	9948
31.5	1500	47.6	289	421	612	1002	1670	2224	2981	3732	4834	5814	6518	7904	11962	17290
	1000	31.7	193	281	408	668	1113	1483	1987	2488	3223	3876	4345	5269	7975	11527
	750	23.8	145	211	306	501	835	1112	1491	1866	2417	2907	3259	3952	5981	8645

Thermal Rating  $P_{G1}$  in kW \*

	Air Velocity m/s	GEAR UNIT SIZES													
		20	22	24	28	33	38	41	44	48	52	55	57	66	76
Small confined space	< 1.4	68	80	100	141	250	258	404	462	512	571	633	727	---	---
Large indoor space	≥ 1.4 - 3.7	98	118	149	210	364	402	595	720	823	946	1050	1253	1472	---
Outdoors	>3.7	119	145	184	261	448	504	741	915	1056	1224	1360	1646	2024	2270

\*Values apply to horizontal mounting position. For other mounting position please refer to us.



**PREMIUM PLANETARY GEAR UNITS**

Nominal Power Rating  $P_N$  in kW

Type : P3LA, P3LF Three Stage Inline Planetary Gear Units

Size : 20 - 76

Nominal Ratio	Input Speed rpm	Nominal Output Speed	GEAR UNIT SIZES													
			20	22	24	28	33	38	41	44	48	52	55	57	66	76
			NOMINAL RATING IN KW													
63	1500	23.8	143	204	300	492	824	1156	1462	1885	2290	2865	3209	3736	6200	8842
	1000	15.9	95	136	200	328	549	771	975	1257	1527	1910	2140	2491	4133	5895
	750	11.9	72	102	150	246	412	578	731	943	1145	1433	1605	1868	3100	4421
71	1500	21.1	129	185	268	448	744	997	1328	1658	2120	2570	2902	3460	5545	7820
	1000	14.1	86	123	179	299	496	665	885	1105	1413	1713	1935	2307	3697	5213
	750	10.6	65	93	134	224	372	499	664	829	1060	1285	1451	1730	2773	3910
80	1500	18.8	115	166	240	397	662	887	1182	1474	1885	2280	2580	3076	4950	6960
	1000	12.5	77	111	160	265	441	591	788	983	1257	1520	1720	2051	3300	4640
	750	9.4	58	83	120	199	331	444	591	737	943	1140	1290	1538	2475	3480
90	1500	16.7	102	146	212	353	588	789	1046	1310	1675	2034	2293	2734	4400	6196
	1000	11.1	68	97	141	235	392	526	697	873	1117	1356	1529	1823	2933	4131
	750	8.3	51	73	106	177	294	395	523	655	838	1017	1147	1367	2200	3098
100	1500	15.0	92.5	132	194	320	534	710	956	1200	1532	1861	2098	2500	4040	5672
	1000	10.0	62	88	129	213	356	473	637	800	1021	1241	1398	1667	2693	3781
	750	7.5	46	66	97	160	267	355	478	600	766	931	1049	1250	2020	2836
112	1500	13.4	82.5	120	172	286	478	640	862	1080	1382	1680	1892	2256	3645	5120
	1000	8.9	55	80	115	191	319	427	575	720	921	1120	1261	1504	2430	3413
	750	6.7	41	60	86	143	239	320	431	540	691	840	946	1128	1823	2560
125	1500	12.0	75	107	156	250	436	562	788	990	1248	1537	1730	2048	3334	4686
	1000	8.0	50	71	104	167	291	375	525	660	832	1025	1154	1365	2223	3124
	750	6.0	38	54	78	125	218	281	394	495	624	769	865	1024	1667	2343
140	1500	10.7	67	96	140	235	394	528	710	892	1120	1386	1561	1830	3007	4230
	1000	7.1	45	64	93	157	263	352	473	595	747	924	1040	1220	2005	2820
	750	5.4	34	48	70	118	197	264	355	446	560	693	780	915	1504	2115
160	1500	9.4	48.5	84	122	205	344	462	629	794	988	1230	1382	1620	2734	3750
	1000	6.3	32	56	81	137	229	308	419	529	659	820	922	1080	1823	2500
	750	4.7	24	42	61	103	172	231	315	397	494	615	691	810	1367	1875
180	1500	8.3	51	73	106	182	305	408	557	704	866	1090	1225	1414	2360	3324
	1000	5.6	34	49	71	121	203	272	371	469	577	727	816	943	1573	2216
	750	4.2	26	37	53	91	153	204	279	352	433	545	612	707	1180	1662
200	1500	7.5	46.5	67	96	165	276	370	482	605	745	942	1058	1218	1980	2875
	1000	5.0	31	45	64	110	184	247	321	403	497	628	706	812	1320	1917
	750	3.8	23	34	48	83	138	185	241	303	373	471	529	609	990	1438
225	1500	6.7	41.5	60	87	135	220	320	416	524	676	814	915	1102	1763	2486
	1000	4.4	28	40	58	90	147	213	277	349	451	543	610	735	1175	1657
	750	3.3	21	30	44	68	110	160	208	262	338	407	457	551	882	1243

Thermal Rating  $P_{G1}$  in kW \*

	Air Velocity m/s	GEAR UNIT SIZES													
		20	22	24	28	33	38	41	44	48	52	55	57	66	76
Small confined space	< 1.4	36	44	59	88	132	159	206	467	337	399	439	537	737	900
Large indoor space	≥ 1.4 - 3.7	51	61	82	119	178	216	283	364	462	545	600	737	1015	1252
Outdoors	>3.7	60	73	98	144	215	262	343	440	562	660	726	895	1235	1529

\*Values apply to horizontal mounting position. For other mounting position please refer to us.

### Nominal Power Rating $P_N$ in kW

Type : P4LA, P4LF Four Stage Inline Planetary Gear Units.

Size : 20 - 76

Nominal Ratio	Input Speed rpm	Nominal Output Speed	GEAR UNIT SIZES													
			20	22	24	28	33	38	41	44	48	52	55	57	66	76
			NOMINAL RATING IN kW													
250	1500	6.0	36	51	72	123	206	276	359	449	572	718	802	937	1580	2280
	1000	4.0	24	34	48	82	137	184	239	299	381	479	535	625	1053	1520
	750	3.0	18	25.5	36	62	103	138	180	225	286	359	401	469	790	1140
280	1500	5.4	31.5	46	67	112	186	250	332	416	530	649	726	867	1360	1974
	1000	3.6	21	31	45	75	124	167	221	277	353	433	484	578	907	1316
	750	2.7	16	23	33.5	56	93	125	166	208	265	325	363	434	680	987
315	1500	4.8	28	41	59.5	100	165	222	295	369	471	577	645	771	1208	1755
	1000	3.2	19	27	40	67	110	148	197	246	314	385	430	514	805	1170
	750	2.4	14	20.5	30	50	82.5	111	148	185	236	289	322	386	604	878
355	1500	4.2	25	36.5	53	88	147	197	262	328	418	513	573	685	1075	1560
	1000	2.8	17	24	35	59	98	131	175	219	279	342	382	457	717	1040
	750	2.1	13	18	26.5	44	73.5	99	131	164	209	257	287	343	538	780
400	1500	3.8	22	32.5	47	78	131	176	233	292	372	456	506	610	956	1387
	1000	2.5	15	22	31	52	87	117	155	195	248	304	337	407	637	925
	750	1.9	11	16	23.5	39	65.5	88	117	146	186	228	253	305	478	694
450	1500	3.3	20	29.5	42.5	71	119	159	212	265	337	414	463	553	874	1269
	1000	2.2	13	20	28	47	79	106	141	177	225	276	308	369	583	846
	750	1.7	10	15	21	35.5	59	80	106	133	169	207	231	277	437	635
500	1500	3.0	18.5	26.5	38.5	64.5	108	145	194	242	308	378	423	506	800	1161
	1000	2.0	12	18	26	43	72	96	129	161	205	252	282	337	533	774
	750	1.5	9.3	13	19	32	54	72	97	121	154	189	212	253	400	581
560	1500	2.7	16.5	24.5	35	58.5	98	132	177	222	280	346	387	460	731	1062
	1000	1.8	11	16	23	39	65	88	118	148	187	231	258	307	487	708
	750	1.3	8	12	17.5	29	49	66	89	111	140	173	194	230	366	531
630	1500	2.4	14.5	21.5	31.5	52	87.8	118	158	198	250	309	346	410	660	958
	1000	1.6	10	14	21	35	59	79	105	132	167	206	230	273	440	639
	750	1.2	7	11	16	26	44	59	79	99	125	155	173	205	330	479
710	1500	2.1	13	19	27	45.5	76.5	103	138	173	218	270	302	358	584	849
	1000	1.4	9	13	18	30	51	69	92	115	145	180	201	239	389	566
	750	1.1	6.5	9.5	13.5	23	38	52	69	87	109	135	151	179	292	425
800	1500	1.9	11.5	17	24.5	40.5	68.5	92	125	156	197	244	272	323	527	766
	1000	1.3	8	11	16	27	46	61	83	104	131	162	182	215	351	511
	750	0.9	6	8.5	12	20	34	46	62	78	99	122	136	162	264	383
900	1500	1.7	10	14.5	21	35.5	59.5	80.5	110	138	174	216	241	286	467	678
	1000	1.1	7	10	14	24	40	54	73	92	116	144	161	191	311	452
	750	0.8	5	7	10.5	18	30	40	55	69	87	108	121	143	234	339
1000	1500	1.5	9	13	19	32.5	54	72.5	99.5	125	156	195	218	256	421	612
	1000	1.0	6	9	13	22	36	48	66	83	104	130	145	171	281	408
	750	0.8	4.5	6.5	9.5	16	27	36	50	62	78	97	109	128	211	306
1100	1500	1.4	8	12	17.5	29	49	66	90	113	142	177	198	232	364	529
	1000	0.9	5	8	12	19	33	44	60	75	94	118	132	155	243	353
	750	0.7	4	6	9	15	25	33	45	57	71	88	99	116	182	265
1250	1500	1.2	7	10.5	15	26	43	58	80	100	124	157	175	203	322	468
	1000	0.8	5	7	10	17	29	39	53	67	82	104	117	135	215	312
	750	0.6	3.5	5	7.5	13	22	29	40	50	62	78	87	102	161	234
1400	1500	1.1	6.5	9.5	14	23.5	39	53	69	86.5	107	135	151	175	278	405
	1000	0.7	4	6	9	16	26	35	46	58	71	90	101	117	185	270
	750	0.5	3	5	7	12	20	27	35	43	53	68	76	88	139	203
1600	1500	0.9	6	8.5	12	18	30	43	57	74.5	93	108	131	159	241	350
	1000	0.6	4	6	8	12	20	29	38	50	62	72	87	106	161	233
	750	0.5	3	4	6	9	15	22	29	37	47	54	65	80	121	175

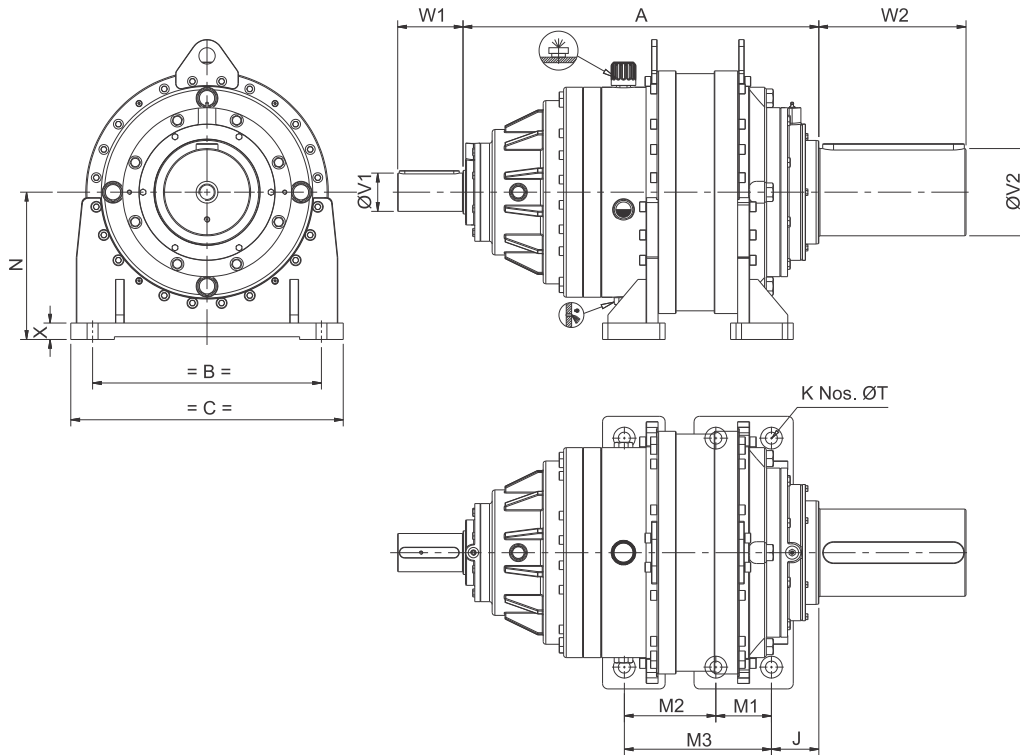
### Thermal Rating $P_{G1}$ in kW \*

	Air Velocity m/s	GEAR UNIT SIZES													
		20	22	24	28	33	38	41	44	48	52	55	57	66	76
Small confined space	< 1.4	22	25	34	50	77	89	122	152	191	228	251	319	418	520
Large indoor space	≥ 1.4 - 3,7	30	34	46	68	104	120	164	204	256	307	338	429	562	699
Outdoors	>3,7	36	41	55	82	125	143	196	245	308	369	406	516	676	840

\*Values apply to horizontal mounting position. For other mounting position please refer to us.

## PREMIUM PLANETARY GEAR UNITS

**Type : P2LF**  
**Two Stage Inline Foot Mounting Planetary Gear Units**  
**Size : 20 - 38**



### Dimensions

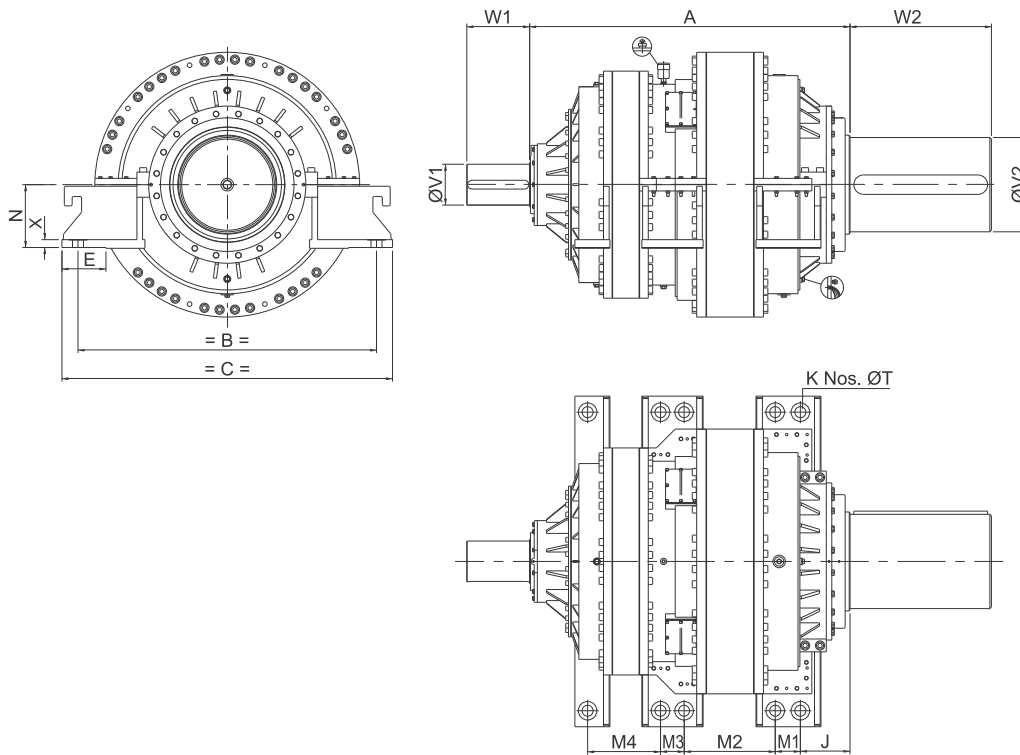
Gearbox Size	Shaft End Input Side		Shaft End Output Side		A	C	B	J	N	X	Foot Bolts Details					Oil Quantity (Liters)
	V1	W1	V2	W2							M1	M2	M3	T	K	
	mm	mm	mm	mm							mm	mm	mm	mm	Nos.	
20	75	120	160	270	694	570	470	94	305	30	-	-	300	26	4	15
22	85	140	180	300	765.5	670	540	100	335	30	-	-	320	26	4	19
24	95	160	200	310	857.5	690	600	101	360	30	-	-	350	26	4	30
28	100	180	240	410	968	830	730	162	420	30	160	245	-	26	6	40
33	120	210	280	470	1110	1020	850	157	490	40	210	252	-	34	6	65
38	130	210	300	470	1184	1130	960	159	560	40	230	290	-	34	6	93

- 1) Shaft diameter tolerance as per IS: 3688 : 2006
- 2) For shaft end V1 & V2 with parallel key according to IS: 2048 : 2003 and Threaded Centre hole in shaft ends as per DIN 332/1
- 3) Up to 160 tolerance h6 and > 160 tolerance g6
- 4) PTL can also supply gearbox with hollow input to suit Electric or Hydraulic motor flange



## PREMIUM PLANETARY GEAR UNITS

**Type : P2LF**  
**Two Stage Inline Foot Mounting Planetary Gear Units**  
**Size : 41 - 76**



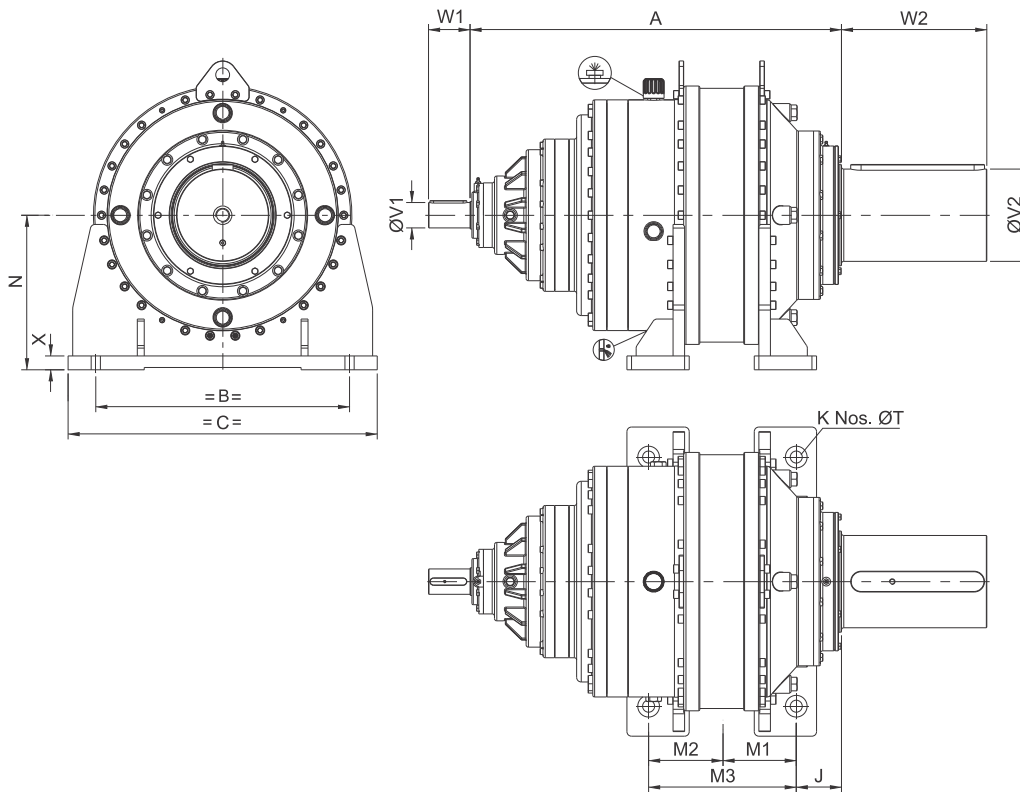
### Dimensions

Gearbox Size	Shaft End Input Side		Shaft End Output Side		A	C	E	B	J	N	X	Foot Bolts Details						Oil Quantity (Liters)
	V1	W1	V2	W2								M1	M2	M3	M4	T	K	
	mm	mm	mm	mm								mm	mm	mm	mm	mm	Nos.	
41	150	240	340	550	1361	1350	250	1200	180	300	40	160	375	-	380	45	08	136
44	160	280	360	550	1513	1470	250	1270	210	350	50	150	476	-	352	45	08	160
48	170	280	400	650	1593	1590	250	1390	219	350	50	150	438	-	440	45	08	210
52	180	280	420	650	1749	1672	250	1472	307.5	400	50	160	524	-	408	45	08	260
55	180	280	460	650	1770	1675	280	1472	297.5	400	50	160	544	-	418	45	08	270
57	220	380	480	650	1815	1807	280	1607	231	400	50	180	621	-	452	50	08	230
66	260	400	560	800	2039	2104	280	1900	337.5	400	50	180	600	160	450	50	10	345
76	280	450	630	800	2176	2365	280	2165	298	400	50	200	595	200	450	68	10	512

- 1) Shaft diameter tolerance as per IS: 3688 : 2006
- 2) For shaft end V1 & V2 with parallel key according to IS: 2048 : 2003 and Threaded Centre hole in shaft ends as per DIN 332/1
- 3) Up to 160 tolerance h6 and > 160 tolerance g6
- 4) PTL can also supply gearbox with hollow input to suit Electric or Hydraulic motor flange

## PREMIUM PLANETARY GEAR UNITS

**Type : P3LF**  
 Three Stage Inline Foot Mounting Planetary Gear Units  
 Size : 20 - 38



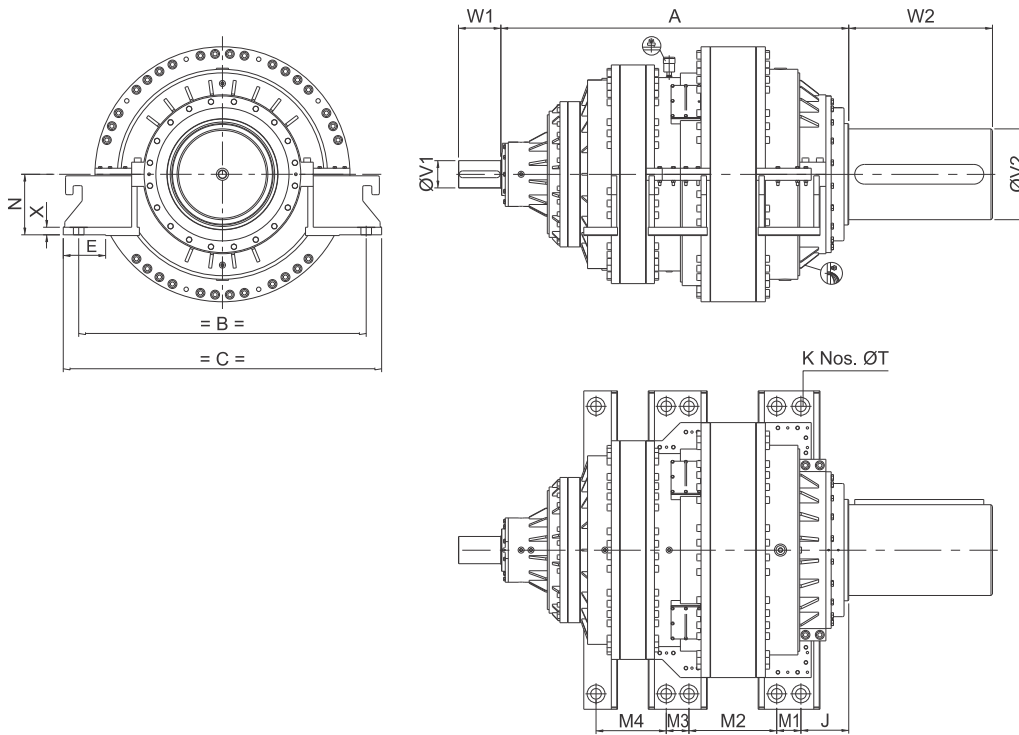
### Dimensions

Gearbox Size	Shaft End Input Side		Shaft End Output Side		A	C	B	J	N	X	Foot Bolts Details					Oil Quantity (Liters)
	V1	W1	V2	W2							M1	M2	M3	T	K	
	mm	mm	mm	mm							mm	mm	mm	mm	Nos.	
20	55	90	160	270	760	570	470	94	305	30	-	-	300	26	4	15
22	55	90	180	300	805.5	670	540	100	335	30	-	-	320	26	4	20
24	70	120	200	310	889.5	690	600	101	360	30	-	-	350	26	4	34
28	75	120	240	410	1075	830	730	162	420	30	160	245	-	26	6	45
33	85	140	280	470	1206	1020	850	157	490	40	210	252	-	34	6	70
38	95	160	300	470	1369.5	1130	960	159	560	40	230	290	-	34	6	95

- 1) Shaft diameter tolerance as per IS: 3688 : 2006
- 2) For shaft end V1 & V2 with parallel key according to IS: 2048 : 2003 and Threaded Centre hole in shaft ends as per DIN 332/1
- 3) Up to 160 tolerance h6 and > 160 tolerance g6
- 4) PTL can also supply gearbox with hollow input to suit Electric or Hydraulic motor flange

## PREMIUM PLANETARY GEAR UNITS

**Type : P3LF**  
**Three Stage Inline Foot Mounting Planetary Gear Units**  
**Size : 41 - 76**



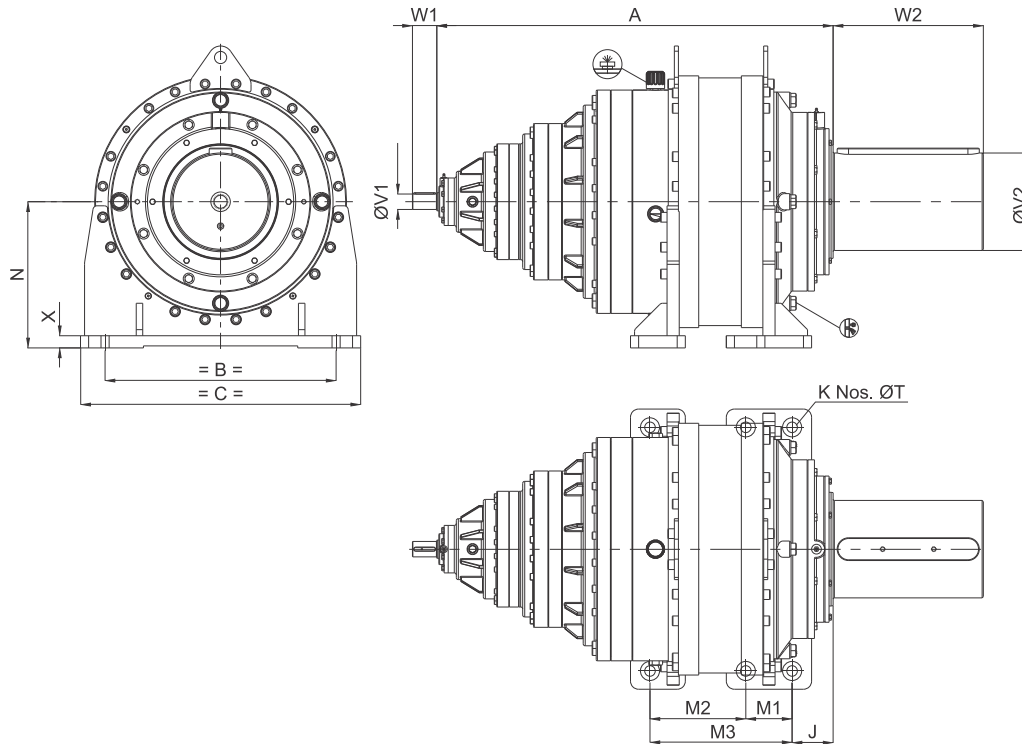
### Dimensions

Gearbox Size	Shaft End Input Side		Shaft End Output Side		A	C	E	B	J	N	X	Foot Bolts Details						Oil Quantity (Liters)
	V1	W1	V2	W2								M1	M2	M3	M4	T	K	
	mm	mm	mm	mm								mm	mm	mm	mm	mm	Nos.	
41	100	180	340	550	1502	1350	250	1200	180	300	40	160	375	-	380	45	08	138
44	110	180	360	550	1706	1470	250	1270	210	350	50	150	476	-	352	45	08	160
48	120	180	400	650	1793	1590	250	1390	219	350	50	150	438	-	440	45	08	235
52	130	210	420	650	1938	1672	250	1472	307.5	400	50	160	524	-	408	45	08	270
55	130	210	440	650	1958	1675	280	1475	297.5	400	50	160	544	-	418	45	08	???
57	150	240	480	650	2076	1807	280	1607	231	400	50	180	621	-	452	50	08	232
66	180	280	560	800	2370	2104	280	1900	337.5	400	50	180	600	160	450	50	10	351
76	190	340	630	800	2416	2365	280	2165	298	400	50	200	595	200	450	68	10	525

- 1) Shaft diameter tolerance as per IS: 3688 : 2006
- 2) For shaft end V1 & V2 with parallel key according to IS: 2048 : 2003 and Threaded Centre hole in shaft ends as per DIN 332/1
- 3) Up to 160 tolerance h6 and > 160 tolerance g6
- 4) PTL can also supply gearbox with hollow input to suit Electric or Hydraulic motor flange

## PREMIUM PLANETARY GEAR UNITS

**Type : P4LF**  
**Four Stage Inline Foot Mounting Planetary Gear Units**  
**Size : 20 - 38**



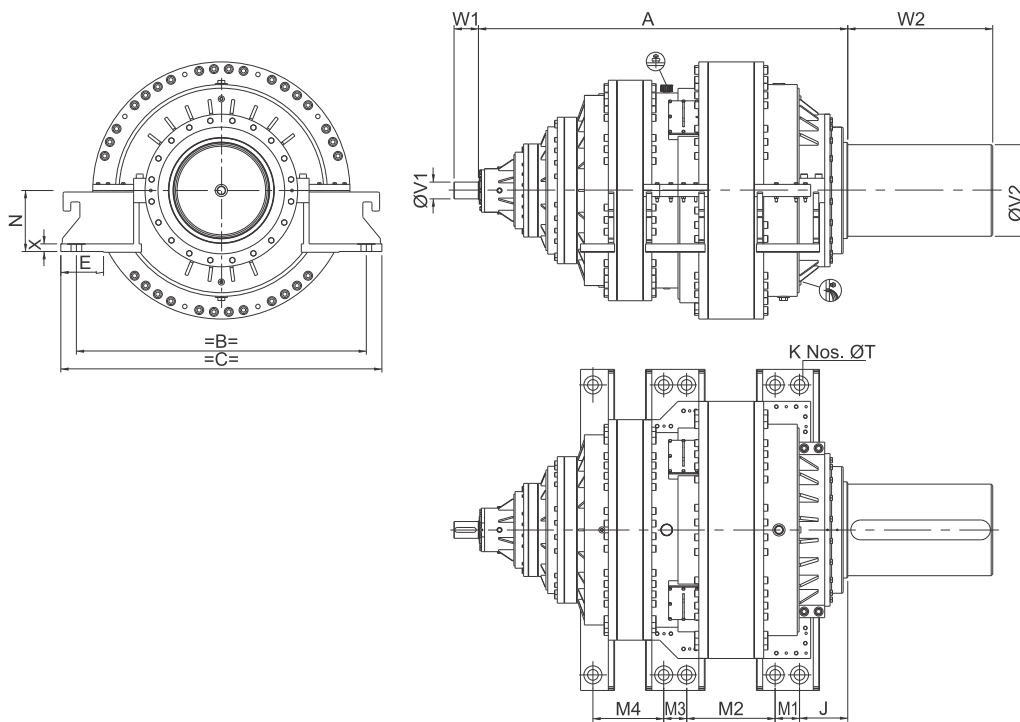
### Dimensions

Gearbox Size	Shaft End Input Side		Shaft End Output Side		A	C	B	J	N	X	Foot Bolts Details					Oil Quantity (Liters)
	V1	W1	V2	W2							M1	M2	M3	T	K	
	mm	mm	mm	mm							mm	mm	mm	mm	Nos.	
20	38	70	160	270	810.5	570	470	94	305	30	-	-	300	26	04	16
22	38	70	180	300	872.5	670	540	94	335	30	-	-	300	26	04	21
24	55	90	200	310	996	690	600	101	360	30	-	-	350	26	04	37
28	55	90	240	410	1187	830	730	162	420	30	160	245	-	26	06	50
33	60	120	280	470	1321	1020	850	157	490	40	210	252	-	34	06	76
38	70	120	300	470	1440	1130	960	159	560	40	230	290	-	34	06	99

- 1) Shaft diameter tolerance as per IS: 3688 : 2006
- 2) For shaft end V1 & V2 with parallel key according to IS: 2048 : 2003 and Threaded Centre hole in shaft ends as per DIN 332/1
- 3) Up to 160 tolerance h6 and > 160 tolerance g6
- 4) PTL can also supply gearbox with hollow input to suit Electric or Hydraulic motor flange

## PREMIUM PLANETARY GEAR UNITS

**Type : P4LF**  
**Four Stage Inline Foot Mounting Planetary Gear Units**  
**Size : 41 - 76**



### Dimensions

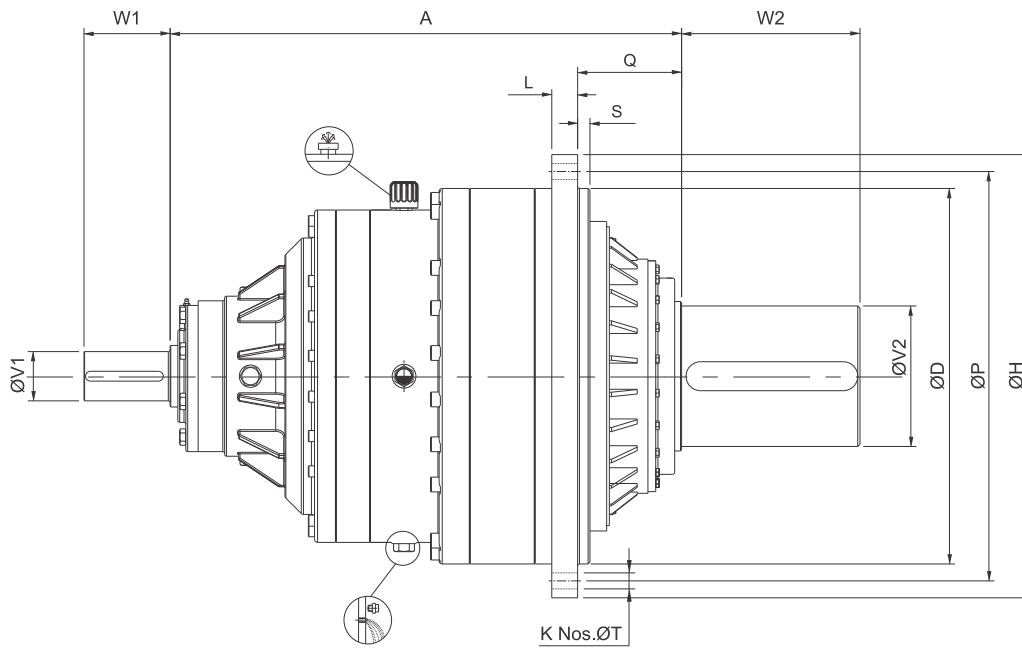
Gearbox Size	Shaft End Input Side		Shaft End Output Side		A	C	E	B	J	N	X	Foot Bolts						Oil Quantity (Liters)
	V1	W1	V2	W2								M1	M2	M3	M4	T	K	
	mm	mm	mm	mm								mm	mm	mm	mm	mm	Nos.	
41	70	120	340	550	1623	1350	250	1200	180	300	40	160	375	-	380	45	08	150
44	80	140	360	550	1718	1470	250	1270	210	350	50	150	476	-	352	45	08	170
48	90	160	400	650	1944	1590	250	1390	219	350	50	150	438	-	440	45	08	235
52	90	160	420	650	2094	1672	250	1472	307.5	400	50	160	524	-	408	45	08	260
55	90	160	450	650	2114	1675	280	1475	297.5	400	50	160	544	-	418	45	08	275
57	95	160	480	650	2135	1807	280	1607	231	400	50	180	621	-	452	50	08	290
66	110	160	560	800	2420	2104	280	1900	337.5	400	50	180	600	160	450	50	10	330
76	110	160	630	800	2535	2365	280	2165	298	400	50	200	595	200	450	68	10	480

- 1) Shaft diameter tolerance as per IS: 3688 : 2006
- 2) For shaft end V1 & V2 with parallel key according to IS: 2048 : 2003 and Threaded Centre hole in shaft ends as per DIN 332/1
- 3) Up to 160 tolerance h6 and > 160 tolerance g6
- 4) PTL can also supply gearbox with hollow input to suit Electric or Hydraulic motor flange



## PREMIUM PLANETARY GEAR UNITS

**Type : P2LA**  
**Two Stage Inline Flange Mounting Planetary Gear Units**  
**Size : 20 - 38**



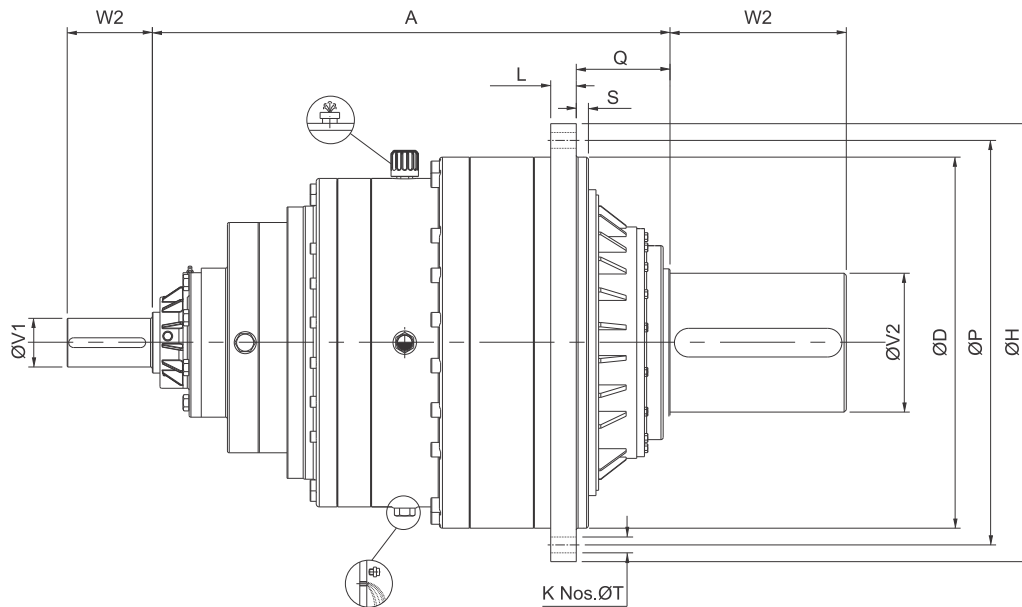
### Dimensions

Gearbox Size	Shaft End Input Side		Shaft End Output Side		L	H	D (h7)	A	P	Q	S	Flange Bolt		Oil Quantity (Liters)
	V1	W1	V2	W2								T	K	
	mm	mm	mm	mm								mm	Nos.	
20	75	120	160	270	39	610	500	694	560	140	12	26	20	15
22	85	140	180	300	39	660	550	765.5	610	152.5	12	26	24	19
24	95	160	200	310	42	740	610	857.5	665	160	12	26	32	30
28	100	180	240	410	50	865	720	968	800	207	12	33	24	40
33	120	210	280	470	55	980	840	1110	915	240	12	33	36	65
38	130	210	300	470	60	1140	960	1184	1050	250	24	39	32	93

- 1) Shaft diameter tolerance as per IS: 3688 : 2006
- 2) For shaft end V1 & V2 with parallel key according to IS: 2048 : 2003 and Threaded Centre hole in shaft ends as per DIN 332/1
- 3) Up to 160 tolerance h6 and > 160 tolerance g6
- 4) PTL can also supply gearbox with hollow input to suit Electric or Hydraulic motor flange

## PREMIUM PLANETARY GEAR UNITS

**Type : P3LA**  
**Three Stage Inline Flange Mounting Planetary Gear Units**  
**Size : 20 - 38**



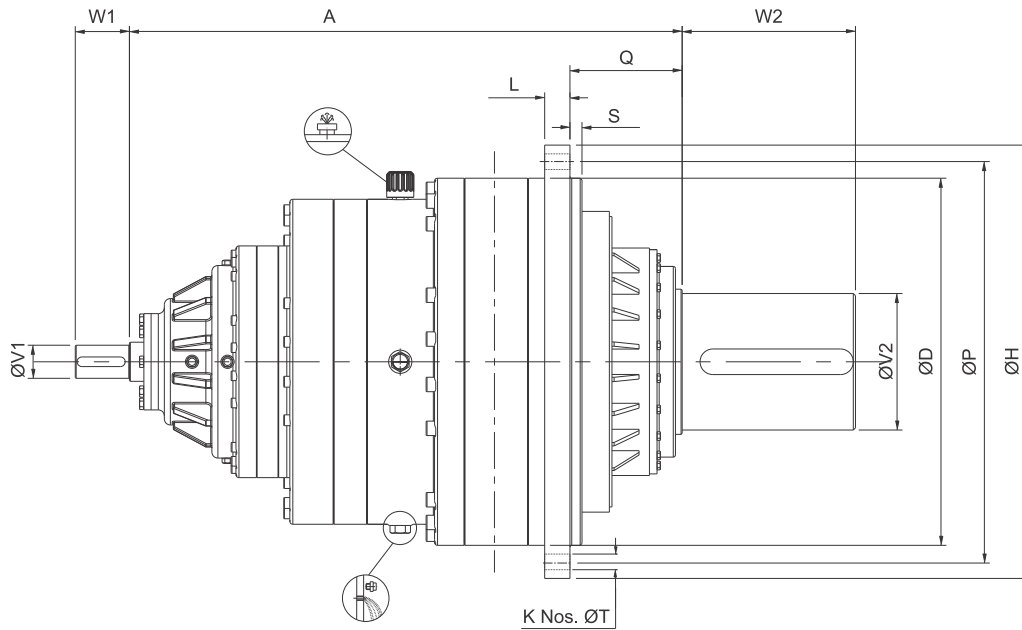
### Dimensions

Gearbox Size	Shaft End Input Side		Shaft End Output Side		L	H	D (h7)	A	P	Q	S	Flange Bolts		Oil Quantity (Liters)
	V1	W1	V2	W2								T	K	
	mm	mm	mm	mm								mm	Nos.	
20	55	90	160	270	39	610	500	760	560	140	12	26	20	15
22	55	90	180	300	39	660	550	805.5	610	152.5	12	26	24	20
24	70	120	200	310	42	740	610	889.5	665	160	12	26	32	34
28	75	120	240	410	50	865	720	1075	800	207	12	33	24	45
33	85	140	280	470	55	980	840	1206	915	240	12	33	36	70
38	95	160	300	470	60	1140	960	1369.5	1050	250	24	39	32	95

- 1) Shaft diameter tolerance as per IS: 3688 : 2006
- 2) For shaft end V1 & V2 with parallel key according to IS: 2048 : 2003 and Threaded Centre hole in shaft ends as per DIN 332/1
- 3) Up to 160 tolerance h6 and > 160 tolerance g6
- 4) PTL can also supply gearbox with hollow input to suit Electric or Hydraulic motor flange

## PREMIUM PLANETARY GEAR UNITS

**Type : P4LA**  
**Four Stage Inline Flange Mounting Planetary Gear Units**  
**Size : 20 - 38**



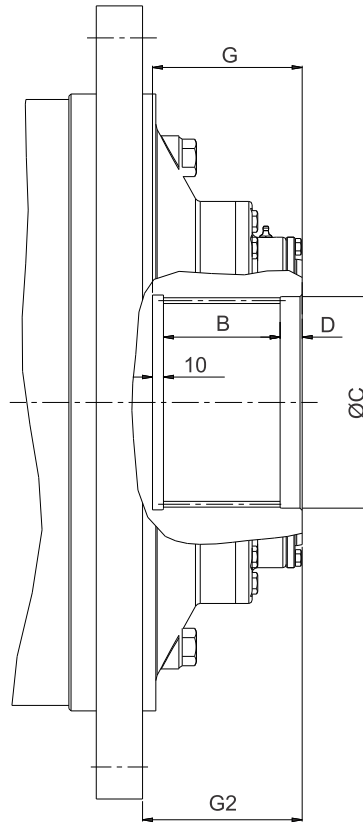
### Dimensions

Gearbox Size	Shaft End Input Side		Shaft End Output Side		L	H	D (h7)	A	P	Q	S	Flange Bolts		Oil Quantity (Liters)
	V1	W1	V2	W2								T	K	
	mm	mm	mm	mm								mm	Nos.	
20	38	70	160	270	39	610	500	810.5	560	140	12	26	20	16
22	38	70	180	300	39	660	550	872.5	610	152.5	12	26	24	21
24	55	90	200	310	42	740	610	996	665	160	12	26	32	37
28	55	90	240	410	50	865	720	1187	800	207	12	33	24	50
33	60	120	280	470	55	980	840	1321	915	240	12	33	36	76
38	70	120	300	470	60	1140	960	1440	1050	250	24	39	32	99

- 1) Shaft diameter tolerance as per IS: 3688 : 2006
- 2) For shaft end V1 & V2 with parallel key according to IS: 2048 : 2003 and Threaded Centre hole in shaft ends as per DIN 332/1
- 3) Up to 160 tolerance h6 and > 160 tolerance g6
- 4) PTL can also supply gearbox with hollow input to suit Electric or Hydraulic motor flange

## PREMIUM PLANETARY GEAR UNITS

**Type : Inline Flange Mounting Planetary Gear Units with Hollow Involute Spline**  
**Size : P2 - P3 - P4 Units**



### Dimensions

Model	Torque Rating T2N	Involute Spline	Face Width B	Centre Hole C (H7)	D	G	G2
	Nm	Spline as per DIN 5480	mm	mm	mm	mm	mm
20	57000	N 160 x 5 x 30 x 30 x 9H	96	152	20	126	130
22	83000	N 180 x 5 x 30 x 34x 9H	118	172	25	153	153
24	120000	N 200 x 5 x 30 x 38x 9H	133	182	25	168	160
28	200000	N 240 x 5 x 30 x 46x 9H	165	222	30	205	175
33	335000	N 280 x 8 x 30 x 34x 9H	180	262	40	230	205
38	450000	N 300 x 8 x 30 x 36x 9H	200	302	40	250	240

## PREMIUM PLANETARY GEAR UNITS

**TYPE : P2L, P2LF** **Actual Ratios** **SIZE : 20 - 76**

NOMINAL RATIO	GEAR UNIT SIZES													
	20	22	24	28	33	38	41	44	48	52	55	57	66	76
16	16.000	16.000	16.296	16.296	16.000	16.000	16.296	16.296	16.296	16.000	16.000	16.296	16.000	16.000
18	17.692	17.692	17.600	17.600	17.692	17.692	17.600	17.600	17.600	17.692	17.692	17.600	17.692	17.692
20	19.904	19.904	19.800	19.800	19.904	19.904	19.800	19.800	19.800	19.904	19.904	19.800	19.904	19.904
22.5	21.925	21.925	21.811	21.648	21.761	21.761	21.648	21.648	21.811	21.761	21.761	21.811	21.761	21.761
25	24.548	24.548	24.420	24.002	24.127	24.127	24.002	24.002	24.420	24.127	24.127	24.420	24.127	24.127
28	28.099	28.099	27.953	27.095	27.237	27.237	27.095	27.095	27.953	27.237	27.237	27.953	27.237	27.237
31.5	30.961	30.961	30.800	31.350	31.514	31.514	31.350	31.350	30.800	31.514	31.514	30.800	31.514	31.514

**TYPE : P3LA, P3LF** **SIZE : 20 - 76**

NOMINAL RATIO	GEAR UNIT SIZES													
	20	22	24	28	33	38	41	44	48	52	55	57	66	76
63	64.000	64.000	65.184	65.184	64.000	64.000	65.184	65.184	65.184	64.000	64.000	65.184	64.000	64.000
71	70.768	70.768	70.400	70.400	70.768	70.768	70.400	70.400	70.400	70.768	70.768	70.400	70.768	70.768
80	79.614	79.614	79.200	79.200	79.614	79.614	79.200	79.200	79.200	79.614	79.614	79.200	79.614	79.614
90	89.566	89.566	89.100	89.100	89.566	89.566	89.100	89.100	89.100	89.566	89.566	89.100	89.566	89.566
100	98.662	98.662	98.149	98.149	98.662	98.662	97.416	97.416	97.416	97.925	97.925	97.416	97.925	97.925
112	110.464	110.464	109.890	109.890	110.464	110.464	108.009	108.009	108.009	108.574	108.574	108.009	108.574	108.574
125	121.683	121.683	121.050	120.146	120.774	120.774	118.090	118.090	118.978	118.707	118.707	118.978	118.707	118.707
140	136.239	136.239	135.531	133.211	133.907	133.907	130.931	130.931	133.211	131.615	131.615	133.211	131.615	131.615
160	155.951	155.951	155.140	152.485	153.282	153.282	147.804	147.804	150.378	148.577	148.577	150.378	148.577	148.577
180	178.515	178.515	177.587	172.136	173.036	173.036	166.852	166.852	172.136	167.724	167.724	172.136	167.724	167.724
200	196.695	196.695	195.672	189.666	190.658	190.658	193.053	193.053	199.167	194.062	194.062	199.167	194.062	194.062
225	216.727	216.727	215.600	219.450	220.597	220.597	223.369	223.369	219.450	224.536	224.536	219.450	224.536	224.536

**TYPE : P4L, P4LF** **SIZE : 20 - 76**

NOMINAL RATIO	GEAR UNIT SIZES													
	20	22	24	28	33	38	41	44	48	52	55	57	66	76
250	256.000	256.000	260.736	260.736	256.000	256.000	260.736	260.736	260.736	256.000	256.000	260.736	256.000	256.000
280	283.072	283.072	281.600	281.600	283.072	283.072	281.600	281.600	281.600	283.072	283.072	281.600	283.072	283.072
315	318.456	318.456	316.800	316.800	318.456	318.456	316.800	316.800	316.800	318.456	318.456	316.800	318.456	318.456
355	358.263	358.263	356.400	356.400	358.263	358.263	356.400	356.400	356.400	358.263	358.263	356.400	358.263	358.263
400	403.046	403.046	400.950	400.950	403.046	403.046	400.950	400.950	400.950	403.046	403.046	400.950	403.046	403.046
450	443.977	443.977	441.669	441.669	443.977	443.977	441.669	441.669	441.669	443.977	443.977	441.669	440.663	440.663
500	489.066	489.066	486.523	486.523	489.066	489.066	482.891	482.891	482.891	485.415	485.415	482.891	481.792	481.792
560	538.733	538.733	535.932	531.931	534.712	534.712	527.961	527.961	531.931	530.721	530.721	531.931	526.759	526.759
630	603.181	603.181	600.045	595.566	598.679	598.679	591.120	591.120	595.566	594.210	594.210	595.566	583.932	583.932
710	690.452	690.452	698.131	681.735	685.299	685.299	676.646	676.646	681.735	680.183	680.183	681.735	659.306	659.306
800	773.050	773.050	769.030	763.290	767.280	767.280	750.087	750.087	755.728	754.008	754.008	755.728	730.864	730.864
900	884.899	884.899	880.297	873.726	878.294	878.294	846.908	846.908	853.277	851.335	851.335	853.277	825.204	825.204
1000	990.758	990.758	985.606	968.558	973.621	973.621	938.829	938.829	955.354	943.736	943.736	955.354	914.769	914.769
1100	1091.659	1091.659	1085.982	1067.393	1072.972	1072.972	1034.630	1034.630	1052.649	1039.848	1039.848	1052.649	1058.417	1058.417
1250	1249.605	1249.605	1243.107	1204.951	1211.249	1211.249	1167.966	1167.966	1204.951	1174.071	1174.071	1204.951	1195.037	1195.037
1400	1376.867	1376.867	1369.707	1327.665	1334.605	1334.605	1351.373	1351.373	1394.166	1358.437	1358.437	1394.166	1382.695	1382.695
1600	1517.089	1517.089	1509.200	1536.150	1544.180	1544.180	1563.581	1563.581	1536.150	1571.755	1571.755	1536.150	1599.822	1599.822



## PREMIUM PLANETARY GEAR UNITS

### Approved Lubricants

#### RECOMMENDED LUBRICANT

Premium Gear units are supplied without oil. Before operating it is essential to ensure that they are filled to correct oil levels as indicated by marking on dipsticks, with lubricants recommended by Premium. Overfilling can cause overheating and leakage.

Correct lubricant is most important and it should be noted that EP oils are recommended in all instances.













Lubricants listed are suitable for normal ambient temperatures and operating duties. All gear units are designed to operate under full load at maximum sump oil temperature of 95°C\*.

Where extreme conditions, are to be met, e.g. low temperature operation or unusual loading conditions, should be referred, with full details, to Premium for recommendations.

Recommended lubricants are based on information provided by oil suppliers and responsibility cannot be accepted for the quality or suitability of oil supplied, nor to any mechanical defect resulting from unsatisfactory lubrication due to the use of sub-standard oil.

#### Lubricant specification (CLP DIN 51517)

If the gear drive is started when the ambient temperature is below -7°C (20°F) use a lube oil heater.

Viscosity mm/s (cSt) at 40°C													TRIBOL		
	Bharat Petroleum	Indian Oil	Hindustan Petroleum	BP Energol	Castrol	SPARAN	Mobilgear	Shell Omala Oil	Cepsa Engranajes	Klüberoil GEM 1	Aral	Chevron Gear Compound	Tribo	Balmer Lawrie	Blasia
VG 460	Amocam Oil 460	Servomesh SP 460	Parthan EP-460	GR-XP 460	Alpha MW 460	Spartan EP 460	Mobilgear 634	Omala 460	HP 460	460	Degol BG 460	EP 460	Trebol 1100/460	Balmerol Protomac 460 SP	Blasia 460
VG 320	Amocam Oil 320	Servomesh SP 320	Parthan EP-320	GR-XP 320	Alpha MW 320	Spartan EP 320	Mobilgear 632	Omala 320	HP 320	320	Degol BG 320	EP 320	Trebol 1100/320	Balmerol Protomac 320 SP	Blasia 320
VG 220	Amocam Oil 220	Servomesh SP 220	Parthan EP-460	GR-XP 220	Alpha MW 220	Spartan 220	Mobilgear 930	Omala 220	HP 220	220	Degol BG 220	EP 220	Trebol 1100/220	Balmerol Protomac 220 SP	Blasia 220

Where ever other grades are required, the same will be intimated to customer through General Arrangement (GA) drawing.

\* As per ANSI/AGMA 6110-F97



## Product safety information

**General** - The following information is important in ensuring safety. It must be brought to the attention of personnel involved in the selection of Premium Transmission Limited power transmission equipment those responsible for the design of the machinery in which is to be incorporated and also involved in its installation, use and maintenance.

PREMIUM power transmission equipment will operate safely provided it is selected, installed, used and maintained properly. As with any power transmission equipment proper precautions must be taken as indicated in the following paragraphs, to ensure safety.

Potential Hazards - These are not necessary listed in any order of severity as the degree of danger varies in individual circumstances. It is important therefore that the list is studied in totality :-

### 1) Fire/Explosion

- (a) Oil mists and vapour are generated within gear units. It is therefore dangerous to use naked lights in the proximity of gearbox openings, due to the risk of fire explosion.
- (b) In the event of fire or serious overheating (over 300 °C), certain materials (rubber, plastics, etc.) may decompose and produce fumes. Care should be taken to avoid exposure to the fumes, and burned or overheated plastic/rubber materials should be handled with rubber gloves.

### 2) Guards

Rotating shafts and coupling must be guarded to eliminate the possibility of physical contact or entanglement of clothing. Guards should be of rigid construction and firmly secured.

### 3) Noise

High speed gearboxes and gearbox driven machinery may produce noise levels which are damaging to the hearing with prolonged exposure. Ear defenders should be provided for personnel in these circumstances. Reference should be made to the Department of Employment Code of Practice for reducing exposure of persons to noise.

### 4) Lifting

Where provided (on larger units) only the lifting points or eyebolts must be used for lifting operations (see maintenance manual or general arrangement drawing for lifting point positions). Failure to use the lifting points provided may result in personal injury and/or damage to the product or surrounding equipment. Keep clear of raised equipment.

### 5) Lubricants and Lubrication

- (a) Prolonged contact with lubricants can be detrimental to the skin. The manufacturer's instruction must be followed when handling lubricants.
- (b) The lubrication status of the equipment must be checked before commissioning. Read and carry out all instructions on the lubricant plate and in the installation and maintenance literature. Heed all warning tags. Failure to do so could result in mechanical damage and extreme cases risk of injury to personnel.

### 6) Electrical Equipment

Observe hazard warnings on electrical equipment and isolate power before working on the gearbox or associated equipment, in order to prevent the machinery being started.

### 7) Installation, Maintenance and Storage

- (a) In the event that equipment is to be held in storage, for a period exceeding 6 months, prior to installation or commissioning, Premium Transmission Limited must be consulted regarding special preservation requirements. Unless

otherwise agreed, equipment must be stored in a building protected from extremes of temperature and humidity to prevent deterioration. The rotating components (gear and shafts) must be turned a few revolutions once a month (to prevent bearings brinelling).

- (b) External gearbox components may be supplied with preservative materials applied, in the form of a "waxed" tape or wax film preservative. Gloves should be worn when removing these materials. The former can be removed manually, the latter using white spirit as a solvent. Preservatives applied to the internal parts of the gear units do not require removal prior to operation.
- (c) Installation must be performed in accordance with the manufacturer's instructions and be undertaken by suitably qualified personnel.
- (d) Before working on a gearbox or associated equipment, ensure that the load has been removed from the system to eliminate the possibility of any movement of the machinery and isolate power supply. Where necessary, provide mechanical means to ensure the machinery cannot move or rotate. Ensure removal of such devices after work is complete.
- (e) Ensure the proper maintenance of gearboxes in operation. Use only the correct tools and Premium Transmission Limited approved spare parts to repair and maintenance. Consult the Maintenance Manual before dismantling or performing maintenance work.

### 8) Hot Surfaces and Lubricants

- (a) During operation, gear units may become sufficiently hot to cause skin burns. Care must be taken to avoid accidental contact.
- (b) After extended running the lubricant in gear units and lubrication systems may reach temperatures sufficient to cause burns. Allow equipment to cool before servicing or performing adjustments.

### 9) Selection and Design

- (a) Where gear units provide a holdback facility, ensure that back-up system are provided. Failure of the holdback device would endanger personnel or result in damage.
- (b) The driving and driven equipment must be correctly selected to ensure that the complete machinery installation will perform satisfactorily, avoiding system critical speeds, system torsional vibration, etc.
- (c) The equipment must not be operated in an environment or at speeds, power, torques or with external loads beyond those for which it was designed.
- (d) As improvements in design are being made continually the contents of this catalogue are not to be regarded as binding in detail, and drawings and capacities are subject to alterations without notice.

The above guidance is based on the current state of knowledge and our best assessment of the potential hazards in the operation of the gear units. Any further information or clarification required may be obtained by telephoning or writing to:

### Premium Transmission Limited

'Premium House', Mumbai-Pune Road,  
Chinchwad, Pune - 411 019, India  
Tel. : (91-20) 66314100, Fax : (91-20) 27450287,  
Website : [www.premiumtransmission.com](http://www.premiumtransmission.com)

## PREMIUM PLANETARY GEAR UNITS

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