TABLE NO. 1 LOAD CLAS SIFICATION BY APPLICATIONS

Driven Machine	Type of Load
Agitators & mixers	
Pure Liquids, semi-liquids	*U*
Liquids and solids variable density	*M*
Liquids with variable density	*M*
Blowers	
Centrifugal, vane	*U*
Lobe	*M*
Brewing & distilling	
Bottle machinery	*U*
Brew kettle continuous duty	*U*
Cookers, scale hopper (frequent starts)	*M*
Cane filling Machinery	*U*
Cane knives	*M*
Clarifiers	*U*
Classifiers	*U*
Clay-working machinery	
brick press, briquette machine	*H*
Pug mill, clay-working machinery	*M*
Compressors	
Centrifugal	*U*
Lobe	*M*
Reciprocating multi-cylinder	*M*
Reciprocating single-cylinder	*H*
Conveyors - Uniformly loaded or fed	
Apron, Belt, Bucket, Screw	*U*
Conveyors - Heavy Duty - Not Uniformly fed	
Apron, Belt, Bucket, Screw	*M*
Reciprocating and shaker	*M*
Cranes	
Main Hoist	*M*
Bridge Travel	*
Crushers	
Ore, Stone	*H*
Sugar	*M*
Elevators	
Bucket-uniform load	*U*
Bucket-heavy load	*M*
Bucket-continuous load	*U*
Centrifugal discharge	*U*
Gravity discharge	*U*
Passenger lifts	*
Fans	
Centrifugal	*U*
Induced draft	*M*
Large (mine, industrial, etc.)	*M*
Light (small diameter)	*U*
Cooling Towers	*H*
Induced draft	*
forced draft	*
Feeders	
Apron	*M*
Belt	*M*
Disc.	*U*

Driven Machine	Type of Load
Reciprocating	*H*
Screw	*M*
Food Industry	
Beef slicer	*M*
Cereal cooker	*U*
Laundry machines	
Washers, tumblers	*M*
Line shaft	*M*
Mills	
Hammers	*H*
Ball kilns, pebbles	*M*
Rod tumbling barrels	*H*
Cement kilns	*M*
Dryers and coolers	*M*
Mixers	
Concrete mixers	*M*
Sugar industry	
Cane knives	*M* *
Crushers	*M* *
Mills	*H* *
Oil industry	
Chillers	*M*
Rotary kilns	*M*
Paper mill	
Bleacher conveyor press, winder	
Calendars, agitators, beater and pulper	*M*
Pumps	
Centrifugal	*U*
Reciprocating (three or more cylinders)	*M*
Gear, lobe type	*U*
Rubber & plastic industry	
Crackers	*H* *
Fixing mills	*H* *
Laboratory equipment	*M*
Refiners	*M* *
Sheeters	*M* *
Tubers and strainers	*M* *
Warming mills	*M* *
Tyre and Tube press	*M* *
Sand Mullers	*M*
Screens	
Air washing	*U*
Rotary-stone / gravel	*M*
Textile industry	
Batches	*M*
Calendars	*M*
Dyeing machinery	*M*
Spinners	*M*
Washers	*M*
Winders	*M*
Wire-drawing, Flattening machine	*M*
Wire Winding machine	*M*

* Should be selected on the basis of 24 hours / day service only

ENQUIRY

1. Type of prime mover, KW rating, speed R.P.M.
2. Required reduction ratio & Handing.
3. Type of driven machine, actual power required, designed speed R.P.M., peak and shock (give magnitude and duration where possible).
4. Type of drive employed between
   - (i) Prime mover and reducer.
   - (ii) Reducer and driven machine
5. No. of hours / day the gear unit will be in operation.
6. Ambient conditions, i.e., temperature, humidity.
7. Whether holdback required ? Specify direction of rot ation, if holdback is to be fitted.
8. Details of any external loads imposed on gear unit.
9. Give sketch of available space.

Explanation and use of ratings and service factors.

Gear unit selection is made by comparing actual loads with catalogue ratings. Catalogue ratings are based on a standard set of loading conditions whereas actual load conditions vary according to type of application. Service factors are therefore used to calculate an equivalent load to compare with catalogue ratings.

W Mechanical ratings and service factor (F_M)

Mechanical ratings measure capacity in terms of life and/or strength assuming 12 hr/day continuous running under uniform load conditions.
Catalogue ratings allow 100% overload at starting, breaking or momentarily during operatio ns up to 12 hours per day.

TABLE NO.2 Mechanical service factor (F_M)

Prime mover	Duration of service hrs per day	Load classification - driven machine		
		Uniform	Moderate Shock	Heavy Shock
Electinc motor, steam turbine or hydraulic motor	Under : 3	0.80	1.00	1.50
	3 to 10	1.00	1.25	1.75
	Over 10 to 24	1.25	1.50	2.00
Multi-cylinder internal combustion engine	Under : 3	1.00	1.25	1.75
	3 to 10	1.25	1.50	2.00
	Over 10 to 24	1.50	1.75	2.25
Single cylinder internal combustion engine	Under : 3	1.25	1.50	2.00
	3 to 10	1.50	1.75	2.25
	Over 10 to 24	1.75	2.00	2.50

- *For Units subject to frequent starts/stops and overloads, also applications where high inertia loads are involved e.g. crane travel drives, slewing motion etc.*

W Thermal ratings and Thermal service factor (F_T)

Thermal ratings measure a unit's ability to dissipate heat, if they are not exceeded, the lubricant may overheat and break down resulting in failure of gear unit.

Thermal ratings are affected by ambient temperature and not by mechanical considerations such as increased running time and shock loads.

Catalogue ratings are given on 20°C ambient temperature allowing for a lubricant temperature rise to 100°C during operation as the unit transmit power and generate heat.

Thermal ratings calculated with unit fan cooling.

Thermal service factor F_T (Table No. 3) is used to modify the actual load according to prevailing ambient temperature.

TABLE NO. 3
THERMAL SERVICE FACTOR (F_T)

Ambient Temp °C	10	20	30	40	50	60
Factor	0.87	1.00	1.16	1.35	1.62	1.97

If the ambient temperature is other than 20°C, divide the catalogue thermal rating by the factor from Table No. 3

EXAMPLE - 1

Worm reduction gear having input (worm) above the wheel required for belt conveyor where non-uniform material is fed on conveyor belt, operating for 8 hours per day. Speed required at conveyor shaft is 50 rpm. The gear unit is driven directly using coupling by 7.5 KW, 1500 rpm electric motor .

SOLUTION

STEP : 1 Ratio required = $\frac{\text{Input speed}}{\text{Output speed}} = \frac{1500}{50}$ = 30:1

STEP : 2 From Table No.1

Drive m/c - Belt conveyor

Material - Non uniform fed

Type of Load - Moderate shock (M)

\\ From Table No.2

Mechanical service factor (Fm) = 1.25 for 8 hr/day operation

STEP : 3 Input power = Motor Power x Fm
= 7.5 x 1.25
= 9.375 KW

\\ From catalogue - Rating at Input 1500 rpm, Ratio - 30:1

Gear unit size : 6 Ratio - 30:1

Input Power = 12.2 KW

\\ Gear unit type/size : 6 ER-O, Ratio - 30:1

EXAMPLE - 2

Worm reduction gear unit underdriven type is required to drive a bucket elevator heavily loaded, operating 24 hours per day at 29 rpm, transmitting 30 KW. The gear unit is directly driven using coupling by 1500 rpm of an electric motor. The ambient temperature is around 30°C on plant.

SOLUTION :

STEP : 1 Ratio required = $\frac{\text{Input speed}}{\text{Output speed}} = \frac{1500}{29}$ = 51.7:1

Nearest standard ratio available is 50:1

STEP : 2 From Table No. 1

Driven m/c - Bucket Elevator (Heavily Loaded)

Type of Load - Moderate shock (M),

From Table No. 2

Mechanical service factor (Fm) = 1.50 for 24 running hrs/day continuous

STEP : 3 Equivalent output power (Mechanical) = 30 x 1.5 = 45 KW

\\ Equivalent output torque (Mechanical) = $\frac{9550 \times 45}{29}$ = 14818.96 Nm

From catalogue.

Refer rating at input speed 1500 rpm, Ratio - 50:1

\\ Gear unit size 14, ratio 50:1 having output torque (Mechanical) = 16457.4 Nm
Input power (Mechanical) = 62 KW

STEP : 4 From Table No. 3 Thermal service factor (Ft) = 1.16
For an ambient temp. of 30°C

\\ Equivalent output power (Thermal) = 30 KW x 1.16
= 34.8 KW

\\ Equivalent output torque (Thermal) = $\frac{9550 \times 34.8}{29}$ = 11460 Nm.

STEP : 5 From catalogue, rating at input 1500 rpm Ratio - 50:1, for 14" size

Output torque (Thermal) = 10486.9 Nm, which is less than calculated equivalent

Output torque (Thermal) = 11460 Nm

\\ Higher gear unit size 17 ER-U, Ratio - 50 : 1 is to be selected where at input 1500 rpm Where, Output torque (Mechanical) = 29064 Nm and

Input power (Mechanical) = 110 KW

\\ Required Input power

$$= \frac{\text{Calculated equivalent output torque (Mech.) x Rated power (Mech.)}}{\text{Rated output torque (Mech.) x Fm}}$$

$$= \frac{14818.96 \times 41}{29064 \times 1.5} = 37.39 \text{ KW}$$

\\ Nearest standard motor having 37 KW at 1500 rpm can be selected for the application.

EXAMPLE - 3

Worm reduction gear (underdriven type) required to drive a clay-working machine for continuous 10 hours/day. The power required at clay-working machine is 5 KW at 50 rpm, ambient temperature is 40°C. Also suggest an electric motor power at 1500 rpm to drive the gear unit.

SOLUTION :

STEP : 1 Ratio required $= \frac{\text{Input speed}}{\text{Output speed}} = \frac{1500}{50} = 30:1$

STEP : 2 From Table No.1

Driven m/c - Clay-working machinery, Type of Load - Moderate shock (M),

\\ From Table No.2

Mechanical service factor (Fm) = 1.25 for 10 running hrs/day continuous

\\ From Table No.3

Thermal service factor (Ft) = 1.35 at 40°C ambient temp.

\\ The higher of the abovetwo service factor i.e. 1.35 is to be considered as a service factor.

STEP : 3 Equivalent output power = 5 KW x 1.35 = 6.75 KW

\\ Equivalent output torque $= \frac{9550 \times 6.75}{50} = 1289.25$ Nm

STEP : 4 From catalogue, Refer rating at Input speed 1500 rpm, Ratio - 30:1

Gear unfit size 6 ER-U, Ratio 50:1 having

Input power = 12.2 KW

Output torque = 1980.7 Nm

STEP : 5 Required Input power

$$= \frac{\text{Calculated equivalent output torque x Rated input power}}{\text{Rated output torque x Service factor}}$$

$$= \frac{1289.25 \times 12.2}{1980.7 \times 1.35} = 5.88 \text{ KW}$$

\\ Suggest nearest standard A.C. electric motor having 7.5 KW at 1500 rpm to drive gear unit size 6 ER-U, Ratio 30:1.

RATINGS AT INPUT SPEED 1500 R.P.M.

GEAR RATIO	OUTPUT SPEED R.P.M.	CAPACITY	SIZE OF UNIT				
			4	5	6	7	8
5	300	INPUT POWER KW	14.1	23.5	41	55	72
		OUTPUT TORQUE Nm	420.1	710.6	1253	1646.6	2177.4
7.5	200	INPUT POWER KW	10	18.2	27	43.2	58
		OUTPUT TORQUE Nm	444.1	820	1211.9	1935	2603
10	150	INPUT POWER KW	8.5	16.5	24	33.1	46
		OUTPUT TORQUE Nm	503.3	966.5	1444	1952.3	2753
15	100	INPUT POWER KW	7	12	21.5	30	40
		OUTPUT TORQUE Nm	568.2	986	1827.4	2580	3514.4
20	75	INPUT POWER KW	6.1	11.5	16.2	25.8	31.2
		OUTPUT TORQUE Nm	652.8	1205.2	1836.8	2814	3496.1
25	60	INPUT POWER KW	5	9	13	20	28
		OUTPUT TORQUE Nm	684.4	1218.3	1810.5	2706	3788.2
30	50	INPUT POWER KW	4.5	7.5	12.2	17	23
		OUTPUT TORQUE Nm	747.8	1217.6	1980.7	2760	3778
40	37.5	INPUT POWER KW	3.8	5.8	10.4	15	20
		OUTPUT TORQUE Nm	754.8	1168	2118.8	3132.4	4278.4
50	30	INPUT POWER KW	3	5	8.5	13	17
		OUTPUT TORQUE Nm	764	1257.4	2088.4	3228	4437.5
60	25	INPUT POWER KW	2.6	4.2	7	11	14
		OUTPUT TORQUE Nm	739.9	1171.2	2032.2	3193.5	4011
70	21.4	INPUT POWER KW	2.3	3.6	5.8	8.5	11.3
		OUTPUT TORQUE Nm	759.5	1124.6	1811.8	2769.1	3782

RATINGS AT INPUT SPEED 1000 R.P.M.

GEAR RATIO	OUTPUT SPEED R.P.M.	CAPACITY	SIZE OF UNIT				
			45		6	7	8
5	200	INPUT POWER KW	12.2	22.2	32.23	46.5	59.1
		OUTPUT TORQUE Nm	553.4	1022.9	1462	2087.2	2717.6
7.5	133	INPUT POWER KW	9.04	17	25	37	47.46
		OUTPUT TORQUE Nm	610.2	1147.4	1687.4	2497.4	3254.5
10	100	INPUT POWER KW	7.8	14.59	22.4	28.24	38.5
		OUTPUT TORQUE Nm	692.8	1295.8	2010.8	2481.2	3492.9
15	66.7	INPUT POWER KW	6.5	9.3	16.5	24.2	29.5
		OUTPUT TORQUE Nm	856.2	1225	2197.1	3187.7	3928.1
20	50	INPUT POWER KW	6.2	8.8	13	17.5	24.2
		OUTPUT TORQUE Nm	1065.8	1462.3	2185	2874.6	3882.6
25	40	INPUT POWER KW	5	7.1	10.2	15.6	21
		OUTPUT TORQUE Nm	1026.6	1440.9	2094.3	3203.1	4412.1
30	33.4	INPUT POWER KW	4.2	6.2	9	14.23	18.8
		OUTPUT TORQUE Nm	1008.8	1524.6	2187.4	3417.8	4569.1
40	25	INPUT POWER KW	3.72	4.9	7.8	11	14.5
		OUTPUT TORQUE Nm	1122.6	1516.2	2383.7	3445.6	4542
50	20	INPUT POWER KW	2.6	4.2	6.6	9.6	13
		OUTPUT TORQUE Nm	918.7	1544.2	2426.7	3529.7	4966
60	16.7	INPUT POWER KW	2.22	3.6	5.4	8.2	11
		OUTPUT TORQUE Nm	939.4	1482.3	2254.3	3423.1	4717.8
70	14.3	INPUT POWER KW	2.16	3.13	4.6	6.9	8.88
		OUTPUT TORQUE Nm	980.9	1463.2	2089	3317.8	4210.5

- The Ratings are based on service factor of 1, continuously transmitted for 12 hours/day with normal overload of 100% momentari ly for 15 seconds, 40% for 30 minutes, 25% for 2 hours.
- See Page No. 5 for actual service factor to nature of load and duration of operation.
- Ratios and output speeds are nominal. Exact ratios are listed on P age No. 16
- Higher rating can be obtained by using SYNTHETIC OIL, details on Page No. 18

RATINGS AT INPUT SPEED 750 R.P.M.

GEAR RATIO	OUTPUT SPEED R.P.M.	CAPACITY	SIZE OF UNIT				
			4	5	6	7	8
5	150	INPUT POWER KW	10.47	17	24.03	32.61	42.91
		OUTPUT TORQUE Nm	619.9	1014.2	1442.7	1964.1	2592.6
7.5	100	INPUT POWER KW	8.1	15.1	21.45	29.18	39.48
		OUTPUT TORQUE Nm	707.1	1333.9	1911.2	2600	3544.1
10	75	INPUT POWER KW	6.3	11.59	16.91	23.17	30.04
		OUTPUT TORQUE Nm	722	1338.5	1916.4	2723.14	3538.2
15	50	INPUT POWER KW	5.2	8	13.13	18.02	24.15
		OUTPUT TORQUE Nm	795	1333.7	2221.9	3118.3	4202.1
20	37.5	INPUT POWER KW	3.7	6.44	10	13.5	18
		OUTPUT TORQUE Nm	782.8	1387.5	2181	2993.5	4001.7
25	30	INPUT POWER KW	3.11	5.5	7.82	12.1	16.31
		OUTPUT TORQUE Nm	760.3	1267.6	2078.6	3270.2	4449.6
30	25	INPUT POWER KW	2.75	4.8	7.4	11.33	14.08
		OUTPUT TORQUE Nm	772.1	1420.3	2252.5	3492.7	4335.1
40	18.8	INPUT POWER KW	2.14	3.7	5.75	8.33	10.6
		OUTPUT TORQUE Nm	751.2	1336.5	2234.5	3228.6	4122.2
50	15	INPUT POWER KW	1.81	3.17	5.15	8	9.44
		OUTPUT TORQUE Nm	790.5	1374.4	2347.6	3739.3	4501.6
60	12.5	INPUT POWER KW	1.73	2.92	4.21	7	8.66
		OUTPUT TORQUE Nm	867.1	1470.2	2196.8	3632.1	4518.9
70	10.7	INPUT POWER KW	1.46	2.58	3.61	5.5	7
		OUTPUT TORQUE Nm	831.4	1538.2	2255.4	3475.5	4572

RATINGS AT INPUT SPEED 500 R.P.M.

GEAR RATIO	OUTPUT SPEED R.P.M.	CAPACITY	SIZE OF UNIT				
			4	5	6	7	8
5	100	INPUT POWER KW	7.65	12.36	16.8	24.2	31.34
		OUTPUT TORQUE Nm	674	1086	1476.1	2103.1	2723.6
7.5	66.7	INPUT POWER KW	5.5	10	14.4	21.5	28.65
		OUTPUT TORQUE Nm	722.4	1315.8	1882.4	2792.1	3765.7
10	50	INPUT POWER KW	4.6	8.67	12.6	6.7	23.3
		OUTPUT TORQUE Nm	790	1488.7	2158.7	2806	4125.4
15	33.3	INPUT POWER KW	3.72	6	9.7	13.4	18.12
		OUTPUT TORQUE Nm	925.8	1507.4	2439.7	3381.8	4413.3
20	25	INPUT POWER KW	3.1	5.2	7.55	10.5	13.3
		OUTPUT TORQUE Nm	1005.4	1696.4	2468.8	3425.4	4476
25	20	INPUT POWER KW	2.5	4.6	6.6	9.4	12.1
		OUTPUT TORQUE Nm	981.3	1838.5	2644.1	3779.3	5032.4
30	16.6	INPUT POWER KW	2	3.8	5.8	8	10.65
		OUTPUT TORQUE Nm	935.4	1748.9	2652.7	3649.7	5158.9
40	12.5	INPUT POWER KW	1.6	3.1	4.8	6.8	8.67
		OUTPUT TORQUE Nm	951	1807.1	2801.7	3979.5	5067.3
50	10	INPUT POWER KW	1.43	2.58	4	6.6	7.5
		OUTPUT TORQUE Nm	1002.4	1747	2765.7	4027.6	5386.2
60	8.33	INPUT POWER KW	1.27	2.12	3.2	5.15	6.25
		OUTPUT TORQUE Nm	975.5	1487.5	2557.1	4097.6	5015.8
70	7.14	INPUT POWER KW	1.1	1.8	2.85	4.14	5.55
		OUTPUT TORQUE Nm	978.4	1555.3	2470.2	3593.8	4973.6

- The Ratings are based on service factor of 1, continuously transmitted for 12 hours/day with normal overload of 100% momentari ly for 15 seconds, 40% for 30 minutes, 25% for 2 hours.
- See Page No. 5 for actual service factor to nature of load and duration of operation
- Ratios and output speeds are nominal. Exact ratios are listed on P age No. 16
- Higher rating can be obtained by using SYNTHETIC OIL, details on Page No. 18

RATINGS AT INPUT SPEED 1500 R.P.M.

GEAR RATIO	OUTPUT SPEED R.P.M.	CAPACITY	SIZE OF UNIT			
			10	12	14	17
5	300	INPUT MECH. POWER (KW)	123	196.3	274.3	*
		OUTPUT MECH. TORQUE (Nm)	3700.0	5493.6	8224.7	*
		INPUT THERMAL POWER (KW)	90	119.4	162	*
		OUTPUT THERMAL TORQUE (Nm)	2707.7	3776.85	4857	*
7.5	200	INPUT MECH. POWER (KW)	92	128	184	*
		OUTPUT MECH. TORQUE (Nm)	4129.4	5699.61	8279.6	*
		INPUT THERMAL POWER (KW)	76	108.6	150	*
		OUTPUT THERMAL TORQUE (Nm)	3411.3	4806.9	6674.7	*
10	150	INPUT MECH. POWER (KW)	65	110.5	162.4	320
		OUTPUT MECH. TORQUE (Nm)	3807.3	6557	9635.4	19354.6
		INPUT THERMAL POWER (KW)	62	98.7	141	200
		OUTPUT THERMAL TORQUE (Nm)	3631.5	6164.6	8358.1	12224
15	100	INPUT MECH. POWER (KW)	58	81	150	249
		OUTPUT MECH. TORQUE (Nm)	4985.1	7131.87	13349.4	21877
		INPUT THERMAL POWER (KW)	56	76	110	177
		OUTPUT THERMAL TORQUE (Nm)	4813.2	6670.8	9790.8	15720.5
20	75	INPUT MECH. POWER (KW)	55	75	123	216
		OUTPUT MECH. TORQUE (Nm)	6303.3	8619	14288.3	25028.6
		INPUT THERMAL POWER (KW)	48	63	94.3	160
		OUTPUT THERMAL TORQUE (Nm)	5500.8	7239.8	10954.8	18366
25	60	INPUT MECH. POWER (KW)	45	67.5	110	172
		OUTPUT MECH. TORQUE (Nm)	6303.0	9380.3	14695.4	24365.2
		INPUT THERMAL POWER (KW)	39	50	71.6	135
		OUTPUT THERMAL TORQUE (Nm)	5462.6	6948.4	9947.3	19124
30	50	INPUT MECH. POWER (KW)	40	56	92	158
		OUTPUT MECH. TORQUE (Nm)	6494.0	9339.1	14652.2	26556.6
		INPUT THERMAL POWER (KW)	32	45	61.2	121
		OUTPUT THERMAL TORQUE (Nm)	5195.2	7504.65	9761	20337
40	37.5	INPUT MECH. POWER (KW)	34	51	76	119
		OUTPUT MECH. TORQUE (Nm)	7359.9	10830.2	16137.4	26062.6
		INPUT THERMAL POWER (KW)	25	37	48	93
		OUTPUT THERMAL TORQUE (Nm)	5411.7	7857.8	10192.6	20131.4
50	30	INPUT MECH. POWER (KW)	28	44	62	110
		OUTPUT MECH. TORQUE (Nm)	7130.7	11404.1	16457.4	29064
		INPUT THERMAL POWER (KW)	22	31.3	39.5	81.6
		OUTPUT THERMAL TORQUE (Nm)	5602.7	8740.7	10486.9	21300.32
60	25	INPUT MECH. POWER (KW)	24	37	54.8	78
		OUTPUT MECH. TORQUE (Nm)	7242.7	11092.2	17520.6	25326.6
		INPUT THERMAL POWER (KW)	18	28	33.6	45.2
		OUTPUT THERMAL TORQUE (Nm)	5432.0	8397.4	10702.7	17712.6
70	21.4	INPUT MECH. POWER (KW)	21	32	46	75
		OUTPUT MECH. TORQUE (Nm)	7309.8	11207	16716.2	27445
		INPUT THERMAL POWER (KW)	20	22.5	28.4	57.3
		OUTPUT THERMAL TORQUE (Nm)	6961.7	7880.4	10320.1	20456.6

- The Ratings are based on service factor of 1, continuously transmitted for 12 hours/day with normal overload of 100% momentarily for 15 seconds, 40% for 30 minutes, 25% for 2 hours.
- See Page No. 5 for actual service factor to nature of load and duration of operation.
- Ratios and output speeds are nominal. Exact ratios are listed on Page No. 16.
- Higher rating can be obtained by using SYNTHETIC OIL, details on Page No. 18.

RATINGS AT INPUT SPEED 1000 R.P.M.

GEAR RATIO	OUTPUT SPEED R.P.M.	CAPACITY	SIZE OF UNIT			
			10	12	14	17
5	200	INPUT MECH. POWER (KW)	99.7	152.16	223	*
		OUTPUT MECH. TORQUE (Nm)	4570.2	6835.2	9717.3	*
		INPUT THERMAL POWER (KW)	70	100	154	*
		OUTPUT THERMAL TORQUE (Nm)	3208.8	4449.8	6710	*
7.5	133	INPUT MECH. POWER (KW)	72.4	110	152	*
		OUTPUT MECH. TORQUE (Nm)	4927.6	7361.4	9834.5	*
		INPUT THERMAL POWER (KW)	57	80	132	*
		OUTPUT THERMAL TORQUE (Nm)	3879.5	5353.3	8534.7	*
10	100	INPUT MECH. POWER (KW)	51	92	134	268
		OUTPUT MECH. TORQUE (Nm)	4480.9	8187.4	11301.1	24310
		INPUT THERMAL POWER (KW)	49	70	111	160.5
		OUTPUT THERMAL TORQUE (Nm)	4305.1	6229.3	9358.7	14101.53
15	66.7	INPUT MECH. POWER (KW)	45	68	125	220
		OUTPUT MECH. TORQUE (Nm)	5863.2	8882.9	15627.3	28979.3
		INPUT THERMAL POWER (KW)	41	60	96.6	139.3
		OUTPUT THERMAL TORQUE (Nm)	5342.0	7838.2	12076	18349.2
20	50	INPUT MECH. POWER (KW)	42	62	102	209.3
		OUTPUT MECH. TORQUE (Nm)	7139.6	10565.4	16628	35528
		INPUT THERMAL POWER (KW)	33	49	83.5	132
		OUTPUT THERMAL TORQUE (Nm)	5609.7	8358.	13298.4	21430.2
25	40	INPUT MECH. POWER (KW)	33	53	80	128
		OUTPUT MECH. TORQUE (Nm)	6775.7	11124.5	15921.6	27198
		INPUT THERMAL POWER (KW)	28	40	67	89
		OUTPUT THERMAL TORQUE (Nm)	5749.1	8529.8	13361.22	189114
30	33.4	INPUT MECH. POWER (KW)	30	48	72.7	120
		OUTPUT MECH. TORQUE (Nm)	7399.1	11883.8	17180.7	30973
		INPUT THERMAL POWER (KW)	24	35	58	80
		OUTPUT THERMAL TORQUE (Nm)	5919.3	65.2	13704.6	20419
40	25	INPUT MECH. POWER (KW)	26	42	60.2	80
		OUTPUT MECH. TORQUE (Nm)	8442.2	13380.8	18953	6281.6
		INPUT THERMAL POWER (KW)	18.5	30.5	36	62
		OUTPUT THERMAL TORQUE (Nm)	6007.0	9714.8	12135	20368.2
50	20	INPUT MECH. POWER (KW)	20.8	36	49	78
		OUTPUT MECH. TORQUE (Nm)	8243.6	13488.7	19280.5	31285.8
		INPUT THERMAL POWER (KW)	16	24	34.5	60
		OUTPUT THERMAL TORQUE (Nm)	6341.2	8986	13737	23779.5
60	16.7	INPUT MECH. POWER (KW)	17.5	30	39	72
		OUTPUT MECH. TORQUE (Nm)	8006.0	13292.5	18600	34174
		INPUT THERMAL POWER (KW)	13	22	25.8	50
		OUTPUT THERMAL TORQUE (Nm)	5947.3	9751.	12301.7	23446
70	14.3	INPUT MECH. POWER (KW)	14.5	32	34	62
		OUTPUT MECH. TORQUE (Nm)	7262.7	11207	17819.8	33538.5
		INPUT THERMAL POWER (KW)	12	19	21.6	43
		OUTPUT THERMAL TORQUE (Nm)	6010.5	9335.2	12027	23260.6

- The Ratings are based on service factor of 1, continuously transmitted for 12 hours/day with normal overload of 100% momentarily for 15 seconds, 40% for 30 minutes, 25% for 2 hours.
- See Page No. 5 for actual service factor to nature of load and duration of operation.
- Ratios and output speeds are nominal. Exact ratios are listed on Page No. 16
- Higher rating can be obtained by using SYNTHETIC OIL, details on Page No. 18

RATINGS AT INPUT SPEED 750 R.P.M.

GEAR RATIO	OUTPUT SPEED R.P.M.	CAPACITY	SIZE OF UNIT			
			10	12	14	17
5	150	INPUT MECH. POWER (KW)	105	146.12	200	*
		OUTPUT MECH. TORQUE (Nm)	6350.7	8884.3	12173.1	*
		INPUT THERMAL POWER (KW)	75	97.5	114	*
		OUTPUT THERMAL TORQUE (Nm)	4536.2	5897.1	6822.5	*
7.5	100	INPUT MECH. POWER (KW)	69.5	96.5	140	*
		OUTPUT MECH. TORQUE (Nm)	6239.1	8755	12827.2	*
		INPUT THERMAL POWER (KW)	50	85.5	130	*
		OUTPUT THERMAL TORQUE (Nm)	4488.5	7757	11794.3	*
10	75	INPUT MECH. POWER (KW)	53	72.6	105	171.16
		OUTPUT MECH. TORQUE (Nm)	6208.8	8689.7	12567.8	20922.6
		INPUT THERMAL POWER (KW)	45	65.3	86.75	137.5
		OUTPUT THERMAL TORQUE (Nm)	5271.6	7816	10273	16808
15	50	INPUT MECH. POWER (KW)	45	59	85	137.5
		OUTPUT MECH. TORQUE (Nm)	7735.5	10360.5	15261	25212
		INPUT THERMAL POWER (KW)	34	53.13	73	123.2
		OUTPUT THERMAL TORQUE (Nm)	5844.6	9336	13106.4	22590
20	37.5	INPUT MECH. POWER (KW)	38	46.86	62	101.65
		OUTPUT MECH. TORQUE (Nm)	8612.8	10979	14526.2	24074.8
		INPUT THERMAL POWER (KW)	27	42.88	58	88
		OUTPUT THERMAL TORQUE (Nm)	6119.6	10046.5	13441.3	20842
25	30	INPUT MECH. POWER (KW)	30	36	57	86.35
		OUTPUT MECH. TORQUE (Nm)	8308.5	10279.6	16512	25564
		INPUT THERMAL POWER (KW)	24	32	52	65
		OUTPUT THERMAL TORQUE (Nm)	6646.8	9168	15063.5	19243.3
30	25	INPUT MECH. POWER (KW)	23	33.73	45.11	72
		OUTPUT MECH. TORQUE (Nm)	7204.5	11341	15508.8	14027
		INPUT THERMAL POWER (KW)	21	31.25	41.25	68
		OUTPUT THERMAL TORQUE (Nm)	6578.0	10505	14181.8	23378.4
40	18.8	INPUT MECH. POWER (KW)	20	26.5	41.8	68.53
		OUTPUT MECH. TORQUE (Nm)	8330.9	10996.7	18897.8	30634.4
		INPUT THERMAL POWER (KW)	16	24	33	58
		OUTPUT THERMAL TORQUE (Nm)	6664.7	9997	14919.3	25927.2
50	15	INPUT MECH. POWER (KW)	18	23.2	32	52.05
		OUTPUT MECH. TORQUE (Nm)	8938.8	11225.7	17724.8	28167.7
		INPUT THERMAL POWER (KW)	15	21.45	22	48.75
		OUTPUT THERMAL TORQUE (Nm)	7449.0	10105.9	12185.8	26382
60	12.5	INPUT MECH. POWER (KW)	14	18.8	24.2	40.6
		OUTPUT MECH. TORQUE (Nm)	8347.3	10778.1	16085.3	26055.5
		INPUT THERMAL POWER (KW)	11	17	23	36
		OUTPUT THERMAL TORQUE (Nm)	6558.6	9741	15287.6	23103.4
		INPUT MECH. POWER (KW)	10	16.5	20.8	34.1
		OUTPUT MECH. TORQUE (Nm)	6693.9	11045	14851.6	24956.7
		INPUT THERMAL POWER (KW)	8	14.8	19.5	32
		OUTPUT THERMAL TORQUE (Nm)	5355.1	9775	13923.4	23419

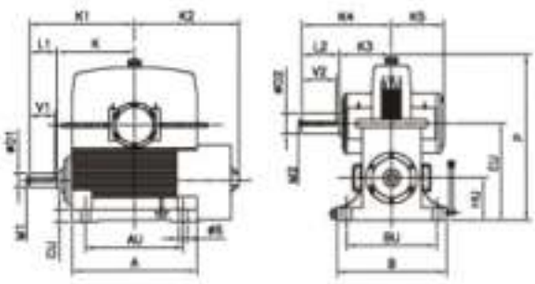
- The Ratings are based on service factor of 1, continuously transmitted for 12 hours/day with normal overload of 100% momentarily for 15 seconds, 40% for 30 minutes, 25% for 2 hours.
- See Page No. 5 for actual service factor to nature of load and duration of operation.
- Ratios and output speeds are nominal. Exact ratios are listed.
- Higher rating can be obtained by using SYNTHETIC OIL.

RATINGS AT INPUT SPEED 500 R.P.M.

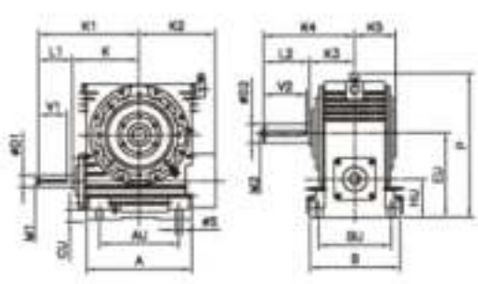
GEAR RATIO	OUTPUT SPEED R.P.M.	CAPACITY	SIZE OF UNIT			
			10	12	14	17
5	100	INPUT MECH. POWER (KW)	75	102.5	122	*
		OUTPUT MECH. TORQUE (Nm)	6732.8	9299.3	11068.5	*
		INPUT THERMAL POWER (KW)	40	49.2	57.5	*
		OUTPUT THERMAL TORQUE (Nm)	3590.8	4463.7	5213	*
7.5	66.7	INPUT MECH. POWER (KW)	47	56.6	95	*
		OUTPUT MECH. TORQUE (Nm)	6312	7617.7	12785.8	*
		INPUT THERMAL POWER (KW)	35	45.5	50.2	*
		OUTPUT THERMAL TORQUE (Nm)	4700.5	6121	6756.3	*
10	50	INPUT MECH. POWER (KW)	40	51.72	70.65	130.8
		OUTPUT MECH. TORQUE (Nm)	7138.3	9187	12549.6	23558.8
		INPUT THERMAL POWER (KW)	29	40	49.25	96.72
		OUTPUT THERMAL TORQUE (Nm)	5175.3	7105.2	8748.3	17420.5
15	33.3	INPUT MECH. POWER (KW)	30	42.56	58.8	102.36
		OUTPUT MECH. TORQUE (Nm)	7880.9	10985	15345.4	27300.6
		INPUT THERMAL POWER (KW)	24	33.45	37.31	80.6
		OUTPUT THERMAL TORQUE (Nm)	6304.7	8633.7	9737	21497
20	25	INPUT MECH. POWER (KW)	22	35.2	45.6	91.5
		OUTPUT MECH. TORQUE (Nm)	7395.6	11873.2	15677.3	31807.2
		INPUT THERMAL POWER (KW)	20	29.8	34.3	72.76
		OUTPUT THERMAL TORQUE (Nm)	6723.2	10051.7	11792.3	25292.8
25	20	INPUT MECH. POWER (KW)	18	29	41.2	82
		OUTPUT MECH. TORQUE (Nm)	7219.8	11922.7	17312.2	34652.2
		INPUT THERMAL POWER (KW)	15	24.17	30.55	64.5
		OUTPUT THERMAL TORQUE (Nm)	6016.5	9937	12837	27257
30	16.6	INPUT MECH. POWER (KW)	16	25.6	33.83	64.37
		OUTPUT MECH. TORQUE (Nm)	7548	12371.3	16737.7	32218
		INPUT THERMAL POWER (KW)	14	19	26.6	56.42
		OUTPUT THERMAL TORQUE (Nm)	6604.4	9181.8	13160.6	28239
40	12.5	INPUT MECH. POWER (KW)	15	23.3	31.5	66.7
		OUTPUT MECH. TORQUE (Nm)	8938.8	13885	19252.8	42805.4
		INPUT THERMAL POWER (KW)	12	17.2	20.52	47.35
		OUTPUT THERMAL TORQUE (Nm)	7151.0	10249.8	12541.8	30387.3
50	10	INPUT MECH. POWER (KW)	14	18.6	26.6	48
		OUTPUT MECH. TORQUE (Nm)	10027.5	13322.3	20068.4	36672
		INPUT THERMAL POWER (KW)	10	14.16	17.35	37.27
		OUTPUT THERMAL TORQUE (Nm)	7162.5	10142	13086.7	28474.3
60	8.33	INPUT MECH. POWER (KW)	10	15.7	20.7	38
		OUTPUT MECH. TORQUE (Nm)	8254.5	13139.6	18036	33981
		INPUT THERMAL POWER (KW)	8.5	12.5	15.6	33.25
		OUTPUT THERMAL TORQUE (Nm)	7016.3	10461.4	13532.4	29733.4
70	7.14	INPUT MECH. POWER (KW)	8.8	14.36	16.12	30
		OUTPUT MECH. TORQUE (Nm)	8592.3	13962.5	16170.8	30495.8
		INPUT THERMAL POWER (KW)	6.9	11.5	14.2	28.7
		OUTPUT THERMAL TORQUE (Nm)	6737.2	11228.6	14244.8	29174.3

- The Ratings are based on service factor of 1, continuously transmitted for 12 hours/day with normal overload of 100% momentarily for 15 seconds, 40% for 30 minutes, 25% for 2 hours.
- See Page No. 5 for actual service factor to nature of load and duration of operation.
- Ratios and output speeds are nominal. Exact ratios are listed on Page No. 16.
- Higher rating can be obtained by using SYNTHETIC OIL, details on Page No. 18.

ER-U



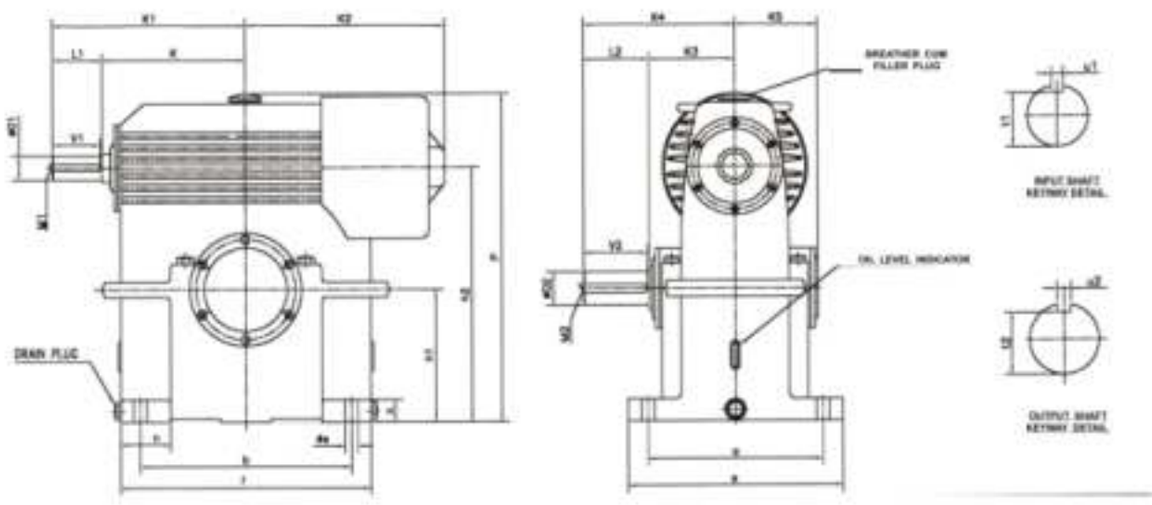
4, 5 & 10, 12, 14, 17 ER-U



6, 7 & 8 ER-U

SIZES	MOUNTING DETAILS									INPUT SHAFT DETAILS									OUTPUT SHAFT DETAILS								
	A	AU	B	BU	CU	?S	HU	EU	P	D1	L1	V1	M1	T1	W1	K	K1	K2	D2	L2	V2	M2	T2	W2	K3	K4	K5
4 ER-U	270	216	254	203.2	32	20.6	108	209.6	350	31.750 31.735	64	60	M12	28.042	7.925	165	229	240	44.450 44.435	89	85	M16	39.725	11.125	127	216	125
5 ER-U	320	248	280	222	32	20.6	114.3	241.3	410	38.100 38.085	70	65	M12	34.290	9.525	190	260	275	50.800 50.782	102	97	M16	45.974	12.700	146	248	135
6 ER-U	354	266	302	241	32	23	127	279.4	450	38.100 38.085	75	70	M12	34.290	9.525	204	279	300	57.150 57.135	113	110	M20	50.546	15.875	160	273	155
7 ER-U	400	306	340	265	36	23	146	323.8	524	44.450 44.435	89	85	M16	39.720	11.125	229	318	355	63.500 63.482	127	122	M20	56.896	15.875	171	298	160
8 ER-U	440	343	340	265	40	27	148	349.2	574	44.450 44.435	88	85	M16	39.720	11.125	254	342	370	69.850 69.832	140	135	M20	62.254	19.050	172	312	175
10 ER-U	590	432	430	330	50	33	171.5	425.5	730	57.150 57.135	90	85	M20	50.550	15.875	335	425	460	82.550 82.527	152	147	M20	73.152	22.225	223	375	200
12 ER-U	690	521	540	368	55	33	190.5	495.3	860	63.500 63.482	124	120	M20	56.896	15.875	371	495	505	95.250 95.227	170	165	M20	84.050	25.400	243	413	210
14 ER-U	820	597	560	432	65	33	216	571.6	970	76.200 76.182	149	145	M20	66.605	19.050	423	572	545	114.300 114.277	190	185	M24	101.143	31.750	293	483	215
17 ER-U	920	762	600	508	75	33	254	686.8	1186	82.550 82.527	180	175	M20	73.152	22.225	520	700	650	139.700 139.675	203	200	M30	124.485	38.100	343	546	300

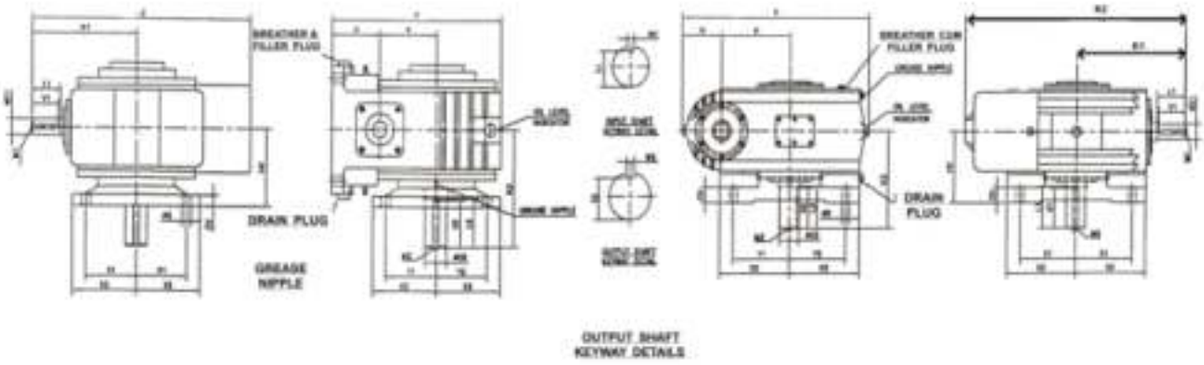
ER-O



SIZES	MOUNTING DETAILS									INPUT SHAFT DETAILS									OUTPUT SHAFT DETAILS								
	a	b	c	e	f	n	s	h1	h2	P	D1	L1	V1	M1	T1	W1	K	K1	K2	D2	L2	V2	M2	T2	W2	K3	K4	K5
8 ER-O	203	216	32	254	270	60	23	120.7	222.3	350	31.750 31.735	64	60	M12	28.042	7.925	165	229	240	44.450 50.800	89	85	M16	39.725	11.125	127	216	125
10 ER-O	222	248	32	280	320	60	23	146.1	273.1	410	38.100 38.085	70	65	M12	34.290	9.525	190	260	275	50.782 57.150	102	97	M16	45.974	12.700	146	248	135
12 ER-O	241	266	32	305	350	80	23	171.5	323.9	450	38.100 38.085	75	70	M12	34.290	9.525	204	279	300	57.135 63.500	113	110	M20	50.546	15.875	160	273	155
14 ER-O	267	305	36	320	400	90	27	196.9	374.7	524	44.450 44.435	89	85	M16	39.720	11.125	229	318	355	63.482 69.850	127	122	M20	56.896	15.875	171	298	160
17 ER-O	267	343	40	344	440	100	27	222.3	425.5	574	44.450 44.435	88	85	M16	39.720	11.125	254	342	370	69.832 82.550	140	135	M20	62.254	19.050	172	312	175
	330	432	50	430	580	110	33	273.1	527.1	730	57.150 57.135	90	85	M20	50.550	15.875	335	425	460	82.527 95.250	152	147	M20	73.152	22.225	223	375	200
	368	521	55	540	630	125	33	330.2	635.0	860	63.500 63.482	124	120	M20	56.896	15.875	371	495	505	95.227 114.300	170	165	M20	84.050	25.400	243	413	210
	432	597	65	560	770	150	33	381	736.6	970	76.200 76.182	149	145	M20	66.605	19.050	423	572	545	114.277 139.700	190	185	M24	101.143	31.750	293	483	215
	510	750	75	600	920	170	33	460	891.8	1146	82.550 82.527	180	175	M20	73.152	22.225	520	700	650	139.675	203	200	M30	124.485	38.100	343	546	300

Key & Keyways as per B.S. 46 (part-1)

ER-V



4, 5, 6, 7 & 8 ER-V

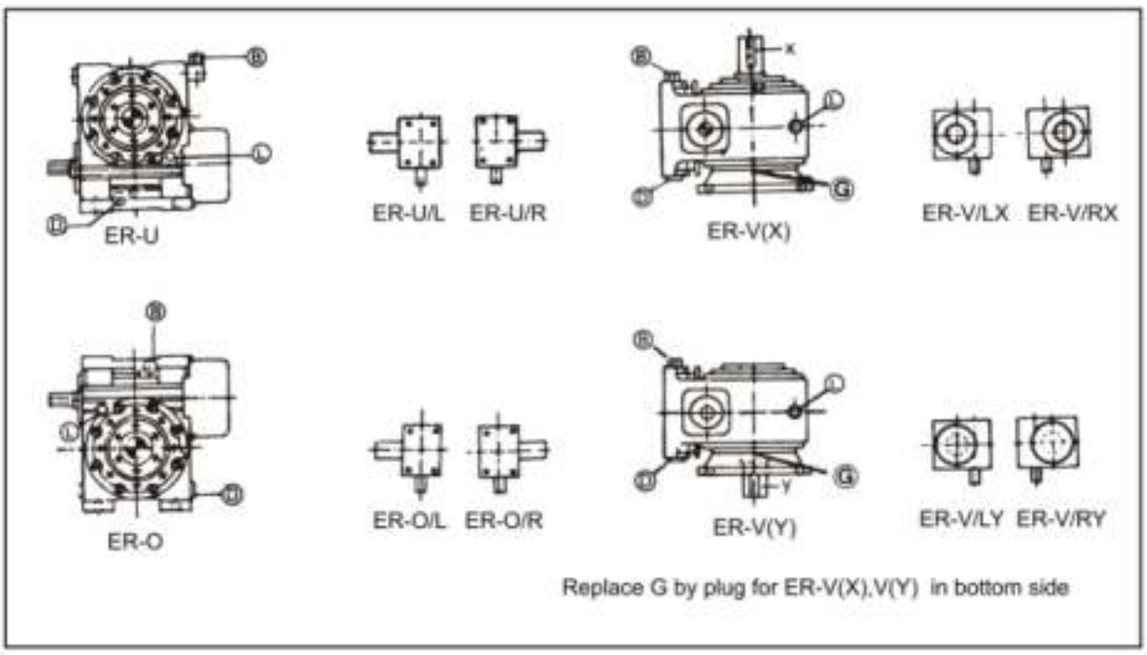
10, 12, 14, & 17 ER-V

SIZES	MOUNTING DETAILS										INPUT SHAFT DETAILS									OUTPUT SHAFT DETAILS						
	X1	X2	Y1	Y2	CV	IS	HV	H	K	P	D1	L1	V1	M1	T1	W1	K	K1	K2	D2	L2	V2	M2	T2	W2	K3
4 ER-V	114.3	140	114.3	114.3	20	18	171.5	108	101.6	325	31.750 31.735	64	60	M12	28.042	7.925	165	229	451	44.450 44.435	88	85	M16	39.725	11.125	216
5 ER-V	139.7	160	139.7	139.7	22	18	190.5	118	127	385	38.100 38.085	70	65	M12	34.290	9.525	190	260	514	50.800 50.782	102	97	M16	45.974	12.700	248
6 ER-V	152.4	170	152.4	152.4	25	23	209.6	127	152.4	450	38.100 38.085	75	70	M12	34.290	9.525	204	279	549	57.150 57.135	113	110	M20	50.546	15.875	273
7 ER-V	177.8	200	177.8	177.8	40	27	228.6	146	177.8	524	44.450 44.435	89	85	M16	39.720	11.125	229	318	623	63.500 63.482	127	122	M20	56.896	15.675	299
8 ER-V	203.2	220	203.2	203.2	40	27	241.3	146	203.2	574	44.450 44.435	88	85	M16	39.720	11.125	254	343	670	69.850 69.832	140	135	M20	62.254	19.050	311
10 ER-V	260.4	310	260.4	235.0	55	33	279.4	180	254	734	57.150 57.135	90	85	M20	50.550	15.875	335	425	803	82.550 82.527	152	147	M20	73.152	22.225	375
12 ER-V	317.5	310	317.5	266.7	60	33	304.8	175	304.8	830	63.500 63.482	124	120	M20	56.896	15.875	371	495	936	95.250 95.227	170	165	M20	84.050	25.400	413
14 ER-V	355.6	350	355.6	304.8	65	33	330.2	200	355.6	975	76.200 76.182	149	145	M20	68.605	19.050	423	572	1050	114.300 114.277	190	185	M24	101.143	31.750	483
17 ER-V	431.8	500	431.8	431.8	75	40	406.4	238	431.8	1190	82.550 82.527	180	175	M20	73.152	22.225	520	699	1328	139.700 139.675	203	200	M30	124.485	38.100	546

Key & Keyways as per B.S. 46 (part-1)

MOUNTING POSITIONS AND SHAFT HANDING :

B – Breather plug
D – Drain plug
L – Oil Level indicator
G – Grease Nipple



Actual Gear Ratio

Size	5	7.5	10	15	20	25	30	40	50	60	70
4	4.83	7.24	9.67	14.5	19.5	25	30	40	50	60	71
5	4.83	7.25	9.67	14.5	19.5	25	30	40	50	60	71
6	4.86	7.25	9.67	14.5	19.5	25	30	40	50	60	70
7	5.14	7.25	9.67	14.67	19.5	24.5	30	40	50	60	71
8	5.14	7.20	9.75	14.67	19.5	24.5	30	40	50	60	71
10	4.8	7.33	9.75	14.67	19.5	24.5	29.5	40	50	60	70
12	4.9	7.43	9.8	14.67	20.5	24.5	29.5	40	50	60	70
14	5.1	7.57	9.8	14.67	20.33	24.5	30.5	39	49	61	69
17	5.1	7.37	9.8	14.75	19.66	25.5	29.5	40	50	60	71

OVERHUNG LOADS :

Whenever a sprocket, gear, sheave or pulley is mounted on the output shaft, a calculation should be made to determine the overhung load in Newtons on the shaft, using the formula :

$$P = \frac{KW \times 9550 \times K}{N \times R}$$

Where, P = equivalent overhung load in Newtons
KW = power carried by shaft in Kilo Watts
N = r.p.m. of the shaft
R = pitch radius of sprocket, pinion, sheave or pulley in meter
K = factor

Overhung Member	K Factor
Sprocket	1.00
Spur Pinion	1.25
V-belt Sheave	1.50
Flat Belt Pulley	2.00

The calculated equivalent overhung load should be compared with the permissible values given in the table.

Maximum permissible overhung loads (Newtons) at centre of wheel shaft extention at 1500 r.p.m. Input Speed.

RATIO	BEARING NEAR SHAFT EXTENTION	SIZE OF UNIT								
		4	5	6	7	8	10	12	14	17
5	STD TRB	10454	12180	13636	15818	15900	19550	22310	34654	
	STD TRB+CRB	11720	15800	20963	22230	24225	29800	34650	50000	
7.5	STD TRB	11400	15090	16910	18900	19363	21000	27000	40500	
	STD TRB+CRB	13300	17600	24280	23450	26035	32000	36650	54975	
10	STD TRB	11120	16000	17636	19350	22335	31000	32909	49363	55000
	STD TRB+CRB	15593	19500	25450	25630	31400	33000	46636	69954	99000
15	STD TRB	10100	16620	17834	22300	24090	28000	33050	50875	63594
	STD TRB+CRB	16600*	20110*	26575*	27780*	32800	40000	55120	87089	130633
20	STD TRB	10252	15300	18014	23000	23800	26700	33000	52080	65100
	STD TRB+CRB	17481*	22800*	27220*	27980*	34600*	42000	57674*	92000*	138000*
25	STD TRB	10468	15545	18443	22250	24604	28000	32636	65270	78824
	STD TRB+CRB	17481*	24700*	27280*	29423*	35988*	47700	57004*	117068*	151025*
30	STD TRB	11061	15000	19816	21386	25520	29000	32800	67980	81576
	STD TRB+CRB	17914*	24400*	27468*	32373*	37769*	51000	57800*	127545*	172185*
40	STD TRB	12194	16618	22170	24035	29675	29000	31325	76726	88071
	STD TRB+CRB	18990*	25575*	30411*	37769*	41760*	50450	63272*	140745*	182968*
50	STD TRB	13165	17805	24133	25506	31078	31000	32080	83450	100148
	STD TRB+CRB	20126*	27366*	34335*	39710*	43812*	52700	63305*	154935*	185922*
60	STD TRB	13813	18830	25133	26880	32481	30000	34650	85535	102642
	STD TRB+CRB	20880*	29136*	37572*	42516*	45646*	53000	67630*	138050*	179465*
70	STD TRB	14513	19747	26389	29234	34100	26000	41580	86310	103572
		21474*	30269*	38357*	43066*	47696*	56045	70950*	143484*	186530*

* SPECIAL HEAT - TREATED SHAFT IS SUPPLIED

TRB = TAPER ROLLER BEARING
CRB = CYLINDRICAL ROLLER BEARING

Weight & Oil capacity

ER-U

Size	4	5	6	7	8	10	12	14	17
Net Weight (kgs.)	65	95	152	180	220	450	580	885	260
Gross Weight (Kgs.)	95	125	190	230	270	595	900	1140	1700
Oil Capacity (ltrs.)	2.5	4	5	9.5	11	20	25	36	60

ER-O

Size	4	5	6	7	8	10	12	14	17
Net Weight (kgs.)	72	105	165	195	237	480	660	940	1380
Gross Weight (Kgs.)	102	135	204	265	305	610	920	1180	1800
Oil Capacity (ltrs.)	3.8	5.1	8	13.5	18	22	27	38	95

ER-V

Size	4	5	6	7	8	10	12	14	17
Net Weight (kgs.)	73	105	166	200	250	440	660	870	1575
Gross Weight (Kgs.)	103	135	205	270	315	560	845	1120	2000
Oil Capacity (ltrs.)	3.5	4.0	5.7	8.5	18	20	29	43	106

* First filling of oil is not supplied with the gear unit.
* First change of oil should be made af ter 500 hrs. of operation.
* Subsequent oil change must be made after every 3000 hrs. of operation. The interval should not exceed 12 months.

RECOMMENDED LUBRICANTS

I MINERAL OIL :

Brand	Grade
International Brands	
British Petroleum	CS 320 or GR-XP320
Castrol	Alpha Zn 320 or Alpha Sp-320 or Tribol 1100/320 TGQA
Caltex	Meropa 320
Esso Petroleum	Teresso 320 or Spartan 320
Fuchs	Renolin CKC 320
Mobil Oil Co.	Mobil DTE Oil AA or Mobilgear 632
Shell	Vitera Oil 320 or Omela 320
Indian Brands	
Bharat Petroleum	Cabol 320
Balmer Lawrie Fuchs	Renolin CKC 320
Castrol	Alpha Zn 320 or Alpha Sp-320 or Tribol 1100/320 TGQA
Gulf	Gulf harmony 320 or Gulf EP 320
Hindustan Petroleum	Enklo 320 or Parthan EP 320
Indian Oil	Servomesh SP 320 or Servosystem 320
Veedol	Avalon 320

Recommended Grease : For low speed of operations.

Brand	Grade
Castrol	EPL 2
Indian Oil	SERVOGEM EP 2

II POLYGLYCOL BASED SYNTHETIC LUBRICANT

W USE OF POLYGLYCOL BASED SYNTHETIC LUBRICANT IS ALSO ADVISABLE TO IMPROVE THE TRANSMITTING CAPACITY (RATING) OF GEAR UNITS MIN. 20% AS COMPARED WITH USE OF MINERAL OIL AT SAME WORKING TEMPERATURE. THIS GEAR OIL SHOWS EXCELLENT NON-AGEING STABILITY WITH FAVOURABLE INFLUENCE ON EFFICIENCY.

Approved Synthetic Lubricants

Brand	Grade
Castrol	Tribol 800-220
Fuchs	Renolin PG 220

Special Note: Synthetic Lubricants must not be mixed with any other type of oil. The gear unit must be flushed while changing to or from this lubricant.

PRODUCT SAFETY INFORMATION

General

Gear units will operate safety provided that they are selected, installed, used and maintained property. As with any equipment consisting of rotating shafts and transmitting power, adequate guarding is necessary to elimiate the possibility of physical contact with rotating shafts or coupling.

Potential Hazards

The following points should be noted and brought to attention to the persons involved in the installation, use and maintenance of equipment.

1. For lifting of gearunit, eye-bolt s or lifting points (on larger unit s) should be used.
2. Check the grade and quantity of lubrication before commissioning. Read and carry out all instructions on lubricant plate and in the installation and maintenance manual literature.
3. Installation must be carried out in accordance with the manufacturer's instructions and undertaken by suitably qualified personnel.
4. Ensure proper maintenance of gearboxes in operation. USE ONLY GENUINE SPARES FOR GEARBOXES.
5. The oil level should be examined periodically, if required the oil should be topped & ensure marked oil level positively.
6. The operating speeds, transmitting power, generated torque or the external load must not exceed the design values.
7. The driving and the driven equipment must be correctly selected to ensure that the complete installation of the machinery will perform satisfactorily e.g. avoiding system critical speeds, system torsional vibration etc.