NAXON

TECHNICAL DESCRIPTION

Reduction Ratio (i) $\text{Ratio (i)} = \frac{\text{Input Speed (n1)}}{\text{Output Speed (n2)}}$

Generated Torque/ Gear motor Delivered Torque T_1 (Nm)

This is net torque delivered to output shaft while prime mover of capacity P (kw) coupled to gear drive.
- Efficiency is taken into consideration. - Calculation confirms to 10000 hrs of service life

Rated Torque/ Output Torque T_2 (Nm)

This is the torque output which gearbox can transmit safely.
- 10000 hrs of service life - values are derived from ISO DP6336

Model	Rated Torque T_2 (Nm)	O/P. Shaft
601	250	Ø20
602	575	Ø30
603	1,150	Ø40
604	2,100	Ø50
605	4,400	Ø60
606	6,000	Ø70
607	9,000	Ø80

Model	Rated Torque T_2 (Nm)	O/P. Shaft
608	17,000	Ø95
609	25,000	Ø120
610	35,000	Ø130
611	55,000	Ø150
612	80,000	Ø170
613	125,000	Ø200
614	185,000	Ø230

Required Torque T_{R2} (Nm)

It is a torque demanded/required by the end use application to get the work done.
It should always be less than T2 by service factor value S

$$T_{R2} = \frac{7123 \times P \times \eta}{n_2}$$

where P=Input Power (Hp)

$$T_{R2} = \frac{9550 \times P \times \eta}{n_2}$$

where P=Input Power (kW)

For 1 Stage η = 98%
For 2 Stage η = 92%

For 3 Stage η = 84%
For 4 Stage η = 82%

Selection Torque T_{S2} (Nm)

It is a final torque value calculated for selection of gearbox taking into consideration application required service factor S.

$T_{S2} = T_{R2} \times S. < T_2$

Input Power P_1 (kW)

It represents the input prime mover's power available for the gear drive. It is the combination of the output speed (n_2) and the relevant output torque (T_2).

Output Power P_2 (kW)

It is net power available at output shaft considering efficiencies of each stage of gear drive.

Life Index/ Load Cycle $n_2 .h$

It is the product of output speed of the gear drive and expected life of the gear drive in hours
e.g.: Output speed n_2 = 40 rpm Life required h = 12500 hours
$n_2 .h = 40 \times 12500 = 500\,000$

SERVICE FACTOR Sf

It is a number which is derived by taken into consideration
- Number of start and stops per hour - Type of Load (Uniform, Moderate, Heavy)
- Number of hours of work per day
It is gives general guideline to design engineer to select gear drive properly according to severity of application. Refer Table for details
Refer table for operation specific service factor selection table which covers industry specific application to prevent designer from selecting under rated gear drive. It also act as cross checking for analyzing previously calculated Service Factor.

Load Category	Usage / Day (Hours)	Number of starts / hour						
		2 to 5	6 to 9	10 to 15	16 to 30	31 to 60	61 to 120	120 to 250 & more
Uniform Load	3	0.8	0.9	0.9	1.0	1.1	1.1	1.2
	6	1.0	1.1	1.1	1.3	1.3	1.3	1.3
	12	1.25	1.3	1.3	1.5	1.5	1.5	1.5
	24	1.5	1.5	1.5	1.8	1.8	1.8	1.8
	Prime mover : Electric motor, Hydraulic Motor, Steam Turbine							

Load Category	Usage / Day (Hours)	Number of starts / hour						
		2 to 5	6 to 9	10 to 15	16 to 30	31 to 60	61 to 120	120 to 250 & more
Moderate Shock	3	1	1	1	1.3	1.3	1.3	1.3
	6	1.3	1.3	1.3	1.5	1.5	1.5	1.5
	12	1.5	1.5	1.5	1.8	1.8	1.8	1.8
	24	1.8	1.8	1.8	2.2	2.2	2.2	2.3
	Prime mover : Multi-Cylinder internal combustion engine							

Load Category	Usage / Day (Hours)	Number of starts / hour						
		2 to 5	6 to 9	10 to 15	16 to 30	31 to 60	61 to 120	120 to 250 & more
Heavy Shock	3	1.3	1.3	1.3	1.5	1.5	1.5	1.5
	6	1.5	1.5	1.5	1.8	1.8	1.8	1.8
	12	1.8	1.8	1.8	2.2	2.2	2.2	2.2
	24	2.2	2.2	2.2	2.5	2.5	2.5	2.5
	Prime mover : Single-Cylinder internal combustion engine							

THERMAL RATING PT (kW)

Values given in the table against different gear drive models are the limiting values of maximum mechanical power that can be transmitted by the gear drive without overheating (i.e. sump temperature not getting above 90-95 °C & Overall casing temperature not getting above 80-85 °C), which is necessary for the satisfactory working of gear drive for stipulated time frame. Values given in the tables are derived based on the following conditions:

- Lubrication system Splash - Mounting Horizontal - Input speed 1440 min-1 - Ambient temp. 30°C - Use Continuous - Max. oil temp. 90°C - Oil grade Vg220
Thermal rating value should not be taken into consideration in case of continuous duty for max. 1.5 hours followed by sufficient enough gap (1.5-2 hours) to bring gear drive back to an ambient temperature.

RADIAL & AXIAL LOAD FR & FA

Radial load FR

Permissible radial and axial load carrying capacity of the gear drive is based on the nominal bearing life chosen. When a sprocket, gear or pulley is mounted on the input or output side of the shaft, radial load (overhung load) will act on the shaft and consequently on the bearings.

For satisfactory operation of the reducer calculated overhung load on the shaft should not exceed the tabulated value (ref. Table no.4) for any specifigear drive.

$$OHL\ (N) = \frac{9{,}500{,}000 \times K \times kW}{(n_1/n_2) \times R}$$

kW Power transmitted by shaft (kW)
K Factor
n_1 Speed of Input shaft
n_2 Speed of Input shaft (rpm)
R Pitch radius of the sprocket, etc (mm)

Axial load/Thrust Load FA

No check or calculation is required if the axial load towards or away from the unit is 50% of the permissible overhung load. If the axial load on the unit exceeds considerably or there is combination of axial and radial load please contact us. Load on output shaft due to torque arm In case of shaft mounted gear drives there is provision of torque arm for stopping drive from rotating.

LUBRICATION

For the best performance of the enclosed industrial gear drives proper selection of the lubricating agent is indispensable. Unless otherwise specified gear drive are supplied without oil fill. Lubricant serves following purposes:

- Reduces friction· Reduces/ prevents wear . Carries away heat generated due to friction
- Protects against corrosion

There are three kinds of lubricants: Liquids (mineral/vegetable oils) Semi-solids (grease) Solids (graphite, molybdenum disulfide)

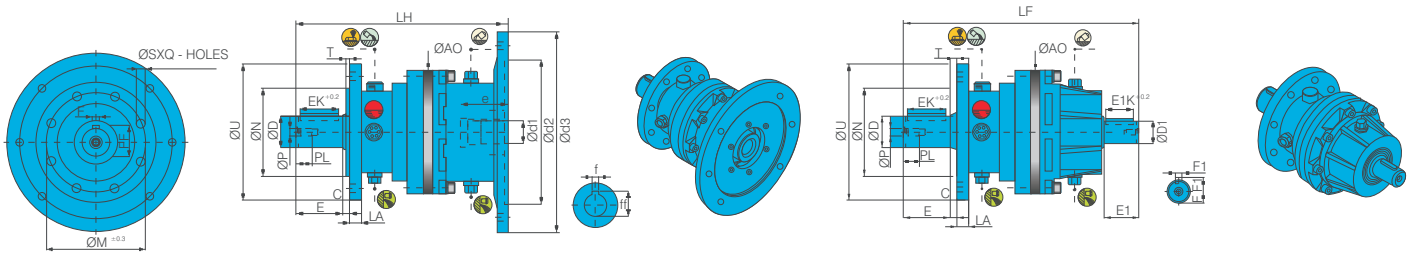
Lubricant should satisfy following constraints of the gear drive at different working conditions:

- Speed - Lesser the output speed more viscous the lubricant required. Higher speed necessitates use of synthetic based oils.
- Temperature - Higher the output speed higher the temperature lesser the viscosity grade of the lubricant required.
- Pressure - High pressure usually requires Synthetic base EP additives

OUR VALUABLE CUSTOMER

DIMENSIONAL DETAIL FOR FLANGE MOUNTED GEAR DRIVE

MODEL 601 - 606



DRAIN PLUG BREATHER PLUG OIL FILLER PLUG OIL LEVEL IIXII II IIXXII XXIIXX

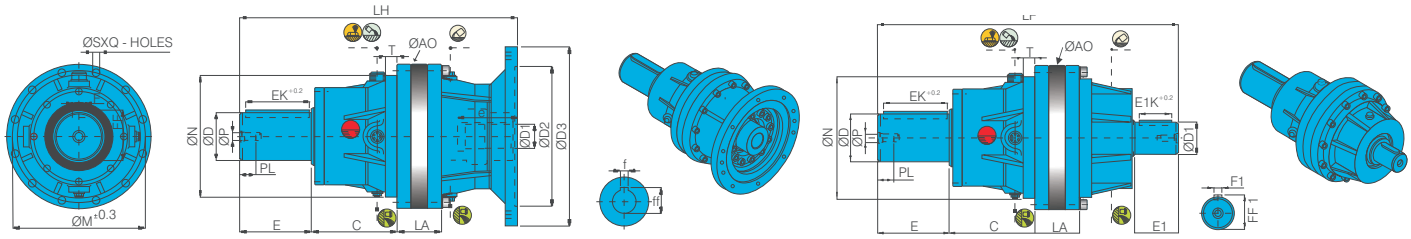
MODEL	DIMENTIONAL DETAILS FOR FOOT MOUNTED GEAR DRIVE																					
	C	ØD	ØD1	E	E1	EK	E1K	F	FF	F1	FF1	ØM	ØN	ØAO	ØU	LA	LH	LF	ØS	Q	T	ØP	PL
1601	5	20	15	30	25	20	18	6	22.5	5	17	100	80	100	120	10	172.5	185.0	9	4	3	M5	14
2601																	206.0	218.5					
3601																	239.5	252.0					
4601																	273.0	285.5					
1602	6	30	20	50	30	40	20	8	33	6	22.5	115	95	124	140	13	240	254	11	4	3	M8	20
2602																	281.5	295.5					
3602																	294.0	306.5					
4602																	327.5	340.0					
1603	9	40	28	60	45	50	30	12	43	8	31	140	110	155	170	15	273.5	304.0	11	8	5	M12	28
2603																	324.5	355.0					
3603																	366.5	380.5					
4603																	408.0	422.0					
1604	10	50	40	75	60	63	50	14	53.5	12	43	165	130	190	200	15	334.5	345.0	13	8	6	M12	30
2604																	385.5	404.0					
3604																	406.0	436.5					
4604																	457.0	487.5					
1605	12	60	40	90	60	70	50	18	64	12	43	215	160	230	250	17	378	414	13	8	6	M16	30
2605																	442.0	478.0					
3605																	498.0	512.5					
4605																	533.0	568.8					
1606	26.9	70	55	100	75	80	63	20	74.5	16	59	220	180	260	260	20	457.0	456.8	14	10	8	M16	32
2606																	536.8	565.8					
3606																	599.8	608.8					
4606																	663.8	672.8					

SR. NO.	HP	FS	Ød1	Ød2	Ød3	e	f	ff
1	0.16/0.25	63	Ø11	Ø95	Ø140	27.5	4	12.9
2	0.35/0.5	71	Ø14	Ø110	Ø160	35	5	16.3
3	0.75/1	80	Ø19	Ø130	Ø200	58	6	21.8
4	1.5/2	90	Ø24	Ø130	Ø200	61.5	8	27.3
5	3/4	100	Ø28	Ø180	Ø250	80	8	31.3
6	5	112	Ø28	Ø180	Ø250	80	8	31.3
7	7.5/10	132	Ø38	Ø230	Ø300	93	10	41.3
8	12.5/15/20	160	Ø42	Ø250	Ø350	115	12	45.3
9	25/30	180	Ø48	Ø250	Ø350	120	14	51.8
10	40	200	Ø55	Ø300	Ø400	-	-	-
11	50	225	Ø60	Ø350	Ø450	-	-	-

*(ABOVE DATA APPLICABLE FOR 4POLE, 1440RPM, B5 FLANGE MOUNTED MOTOR ONLY)

DIMENSIONAL DETAIL FOR FLANGE MOUNTED GEAR DRIVE

MODEL 607 - 610



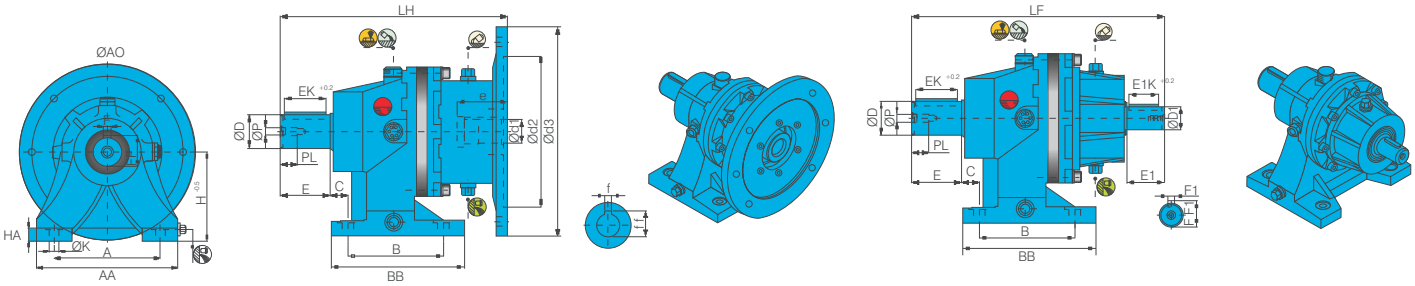
DRAIN PLUG BREATHER PLUG OIL FILLER PLUG OIL LEVEL IIXII II IIXXII XXIIXX

MODEL	DIMENTIONAL DETAILS FOR FOOT MOUNTED GEAR DRIVE																			
	C	ØD	ØD1	E	E1	EK	E1K	F	FF	F1	FF1	ØM	ØN	ØAO	LA	LH	LF	ØS	Q	T	ØP	PL
1607	141	80	60	120	80	90	63	22	85	20	65	265	230	280	94	500.0	540.0	18	8	40	M20	50
2607															186	592.0	632.0					
3607															179	620.0	656.5					
4607															179	684.5	720.5					
1608	160.5	95	70	135	100	110	80	25	110	20	80	290	265	320	107	603.0	626.5	18	12	19	M20	50
2608															214	710.0	733.6					
3608															214	733.0	764.0					
4608															214	814.0	844.5					
1609	201	120	80	180	113	160	80	32	127	22	85	330	305	360	105	703.0	743.2	18	12	25	M20	40
2609															239	837.0	877.2					
3609															234	844.5	924.5					
4609															234	976.5	1016.5					
1610	241.5	130	80	190	120	145	100	32	137	22	85	375	345	410	131.8	730.7	872.2	18	16	25	M16	45
2610															270	920.7	1012.6					
3610															267	1016.4	1037.6					
4610															267	1123.4	1145.4					

MODEL	RATIO RANGE	INPUT (FS)	MODEL	RATIO RANGE	INPUT (FS)
1601	3.55,3.95,4.5,5.31,6.6	63,71,80	1606	3.43,4.09,4.58,5.25,6.23,7.8	112,132,160
2601	12.6-43.5	63,71,80	2606	11.8-60.8	100,112,132
3601	44.7-287.5	63,71,80	3606	40.4-474.6	100,112,132
4601	158.8-1897	63,71,80	4606	146.5-3796	100,112
1602	3.68,4.11,4.69,5.54,6.9	80,90	1607	3.43,4.09,4.58,5.25,6.23,7.8	112,132,160
2602	13.54-47.6	63,71,80,90	2607	11.8-60.8	112,132,160
3602	48-314	63,71,80	3607	40.4-474.6	100,112,132
4602	170.7-2073	63,71,80	4507	138.4-3701	100,112,132
1603	3.63,4,4.5,5.2,6.25,8	90,100,112	1608	3.43,4.09,4.58,5.25,6.23,7.8	132,160,180
2603	13-55	80,90	2608	11.8-60.8	112,132,160
3603	47.4-364.3	63,71,80	3608	40.4-474.6	100,112,132
4603	174.5-2514	63,71,80	4608	138.4-3701	100,112,132
1604	3.43,4.09,4.58,5.25,6.23,7.8	100,112	1609	3.43,4.09,4.58,5.25,6.23,7.8	132,160,180
2604	12.5-62.4	100,112	2609	11.8-60.8	112,132,160
3604	45.8-430.6	80,90	3609	40.4-474.6	100,112,132
4604	162.7-2841.7	63,71,80	4609	138.4-3701	100,112,132
1605	3.43,4.09,4.58,5.25,6.23,7.8	100,112,132	1610	3.43,4.09,4.58,5.25,6.23,7.8	132,160,180
2605	11.8-60.8	100,112,132	2610	11.8-60.8	112,132,160
3605	60.7-486.7	100,112	3610	40.4-474.6	100,112,132
4605	223.5-3358	80,90	4610	138.4-3701	100,112,132

DIMENSIONAL DETAIL FOR FOOT MOUNTED GEAR DRIVE

MODEL 601 - 610



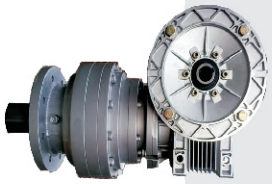
DRAIN PLUG BREATHER PLUG OIL FILLER PLUG OIL LEVEL IIXII II IIXXII XXIIXX

MODEL	DIMENTIONAL DETAILS FOR FOOT MOUNTED GEAR DRIVE																					
	A	AA	B	BB	C	ØD	ØD1	E	E1	EK	E1K	F	FF	F1	FF1	H	HA	ØAO	ØK	LH	LF	ØP	PL
1601	80	110	55	85	25	20	15	30	25	20	18	6	22.50	5	17	85	8	100	9	172.5	185.0	M5	14
2601																				206.0	218.5		
3601																				239.5	252.0		
4601																				273.0	285.5		
1602	125	170	100	135	20	30	20	50	30	40	20	8	33	6	22.5	100	12	124	13	240	254	M8	20
2602																				281.5	295.5		
3602																				294.0	306.5		
4602																				327.5	340.0		
1603	150	200	120	160	21	40	28	60	45	50	30	12	43	8	31	125	18	155	14	273.5	304.0	M12	28
2603																				324.5	355.0		
3603																				366.5	380.5		
3604																				408.0	422.0		
1604	190	240	120	165	25.7	50	40	75	60	63	50	14	53.5	12	43	130	18	195	14	334.5	345.0	M12	30
2604																				385.5	404.0		
3604																				406.0	436.5		
4604																				457.0	487.5		
1605	230	280	145	200	24	60	40	90	60	70	50	18	64	12	43	150	25	230	16	378	414	M16	30
2605																				442.0	478.0		
3605																				498.0	515.5		
4605																				533.0	568.8		
1606	230	300	170	230	31	70	55	100	75	80	63	20	74.5	16	59	160	20	260	18	457.0	456.8	M16	32
2606																				536.8	565.8		
3606																				599.8	608.85		
4606																				663.8	672.8		
1607	260	330	200	238	24	80	60	120	80	90	63	22	85	20	64.5	170	25	280	18	500.0	540.0	M16	50
2607																				592.0	632.0		
3607																				620.0	656.5		
4607																				684.5	720.5		
1608	320	400	180	255	49.5	95	70	135	100	110	80	25	110	20	80	200	26	320	22	602.0	626.5	M20	50
2608																				710.0	733.6		
3608																				733.0	764.0		
4608																				814.0	844.5		
1609	330	410	230	314	115	120	80	180	113	160	80	32	127	22	85	250	30	360	26	703.0	743.2	M20	40
2609																				837.0	877.2		
3609																				844.5	924.5		
4609																				976.5	1016.5		
1610	405	500	295	395	155	130	80	190	120	145	100	32	137	22	85	250	30	410	26	730.7	872.2	M24	50
2610																				920.7	1012.6		
3610																				1016.4	1037.6		
4610																				1123.4	1145.4		

BETTER TRANSMISSION...
GREATER RESULTS....

Planetary Gearbox

- Model- 601-615
- Ratio- 1:3.63 to 1:1,00,000
- Rated Torque- 12Kg.m to 60,000 Kg.m
- Input Power- 0.12kW to 315kW
- Mounting- Foot / Flange / Agitator
- Input- Hollow to suite 63Fs to 355Fs & Male Free Shaft



Worm Planetary

- Model- W25P1601-W150P4611
- Ratio- 1:26.6 to 1:10,000
- Rated Torque- 12Kg.m to 8,000 Kg.m
- Input Power- 0.12kW to 37kW
- Mounting- Foot / Flange
- Input- Hollow to suite 63Fs to 355Fs & Male Free Shaft

Bevel-Planetary

- Model- B70P1601-B240P4515 Ratio-
- 1:3.63 to 1:1,00,000
- Rated Torque- 12Kg.m to 60,000 Kg.m
- Input Power- 0.12kW to 315kW
- Mounting- Foot / Flange
- Input- Hollow to suite 63Fs to 355Fs & Male Free Shaft

Electric Winch

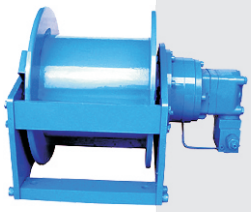
- Model- 0.5TEW - 20TEW
- Capcity- 500 Kg to 20,000 Kg
- Speed- 3 m/min - 25 m/min
- Wire Rope- Ø6 to Ø38 & L10m - 1000m
- Drum- Single / Double

FHP Geared Motor

- Power AC/DC : 25 Watts - 250 Watts
- Ratio : 3 : 1 - 300 : 1
- Mounting : Foot / flange type

Screw Jack

- Model- SJ25 - SJ190
- Capacity- 0.5 Ton to 100 Ton
- Stroke- 30mm to 4000mm
- Rotating and Translating Screw
- Trapazoidal and ACME thread



Winch Drive

- Model-WD1602 to WD4612
- Ratio- 1:40 to 1:1,000
- Rated Torque- 12Kg.m to 6,000 Kg.m
- Input Power- 0.12kW to 315kW
- Mounting- Body
- Input- Hollow to suite 63Fs to 355Fs & Male Free Shaft

Track Drive

- Model- TD160 - TD 415
- Ratio- 1:5.25 to 1:39.5
- Rated Torque- 100Kg.m to 4,000 Kg.m
- Face Seal for Longer Life
- Rigid Design
- Hydraulic Releasing Parking Break on Request

NAXON