Selection of Gear Box

For Good performance of Gear Box, The right selection is very important. The Gear Unit Selection is made by comparing actual transmitted loads with catalogue ratings are based on standard set of load conditions, which invariably changes for different conditions. Therefore service factor must be used to calculate a theoretical transmitted load or equivalent load, before comparing the same, apply the formula :

Equivalent Load = Actual Load x Service Factor

Mechanical Ratings & Service Factors :

Mechanical ratings measure capacity in terms of life and / or strength, assuming 10 hours per day continuous running under uniform load conditions, when lubricated with an approved oil and working at a maximum oil temperature of 100°C for normal application lubricant equivalent to ISO VG 320 should be used.

When a unit transmits less than catalogue rating, its life is increased. *If the running time is more than 8 hours per day,* a service factor from Table of Mechanical Service Factor ensure selection of a unit which transmits less than the catalogue rating, its life is thus increased consistent with the increased daily running time.

Catalogue ratings allow 100% overload at starting, braking or momentarily during operation, up to 10 times per day. The unit selected must therefore have a catalogue rating equal to, or greater than half the maximum overload.

If the unit is subjected to sustained overloads or to shock loads, these must be reflected in the chosen service factor. If overloads can be calculated or estimated then the actual loads should be used instead of a factor.

Thermal Ratings and Service Factors :

Thermal ratings measure the unit's ability to dissipate heat. If they are exceeded the lubricant may overheat and break down, with consequent life failure.

Both mechanical and thermal ratings are given on next page. Thermal ratings are effected by ambient temperature and not by mechanical consideration such as increased running time or shock loads. Catalogue ratings assume 20°C running temperature, the oil temperature then rising as the unit transmits power and generate heat.

If the ambient temperature is more than 20° C, a lower temperature rise is allowed therefore less power may be transmitted. Similarly in cooler temperatures the thermal ratings may be exceeded. When selecting unit use a service factor from Table of Thermal Service Factor to calculate equivalent loads.

For unit sizes 40 to 200, the relevant mechanical and thermal service factors are selected from tables and whichever is higher is applied to find out the equivalent output power and output torque. For unit size 200 to 350, mechanical service factor should be applied to mechanical ratings and thermal service factor should be applied to thermal ratings. Higher of these should be considered for selection of the unit.

Thermal ratings assume fan cooling which is standard feature of all AGNEE Speed Reduction Units.

For intermittent running with ample cooling time during rest periods, thermal ratings may be exceeded without overheating and since fan it ineffective, it can usually be removed.

Enquiries

It is recommended that as much as possible of the following information be given in the enquiry or order so that a check can be made and advice given on the most suitable size of AGNEE Worm Speed Reducer for any application.

1. Type of prime mover.
2. Horse-power of prime mover.
3. Output torque required from driven member.
4. Input speed of gear unit.
5. Output speed of gear unit.
6. Configuration of drive required and shaft disposition.
7. Total daily hours of running. If running is intermittent, details of duty cycle should be given.

When selecting units use the actual load transmitted and not the rating of the prime mover. Catalogue gives input power (H.P.), Being the power which the prime mover must provide to allow for losses in the gear unit. When unit transmit less than rated output torgue the input power is reduced, and although a gear unit is marginally less efficient at part load, a prorota reduction is usually sufficiently accurate to decide the capacity of the prime mover.

Mechanical Service Factor

Prime Mover	Duration of Service hours per day	Load Classification - Driven Machine		
		Uniform Shock	Moderate Shock	Heavy Shock
Electric Motor	Under 3	0.80	1.00	1.50
Steam Turbine	3 to 10	1.00	1.25	1.75
Hydraulic Motor	Over 10	1.25	1.50	2.00
Single Cylinder Internal Combustion Engine	Under 3	1.25	1.50	2.00
	3 to 10	1.50	1.75	2.25
	Over 10	1.75	2.00	2.50

Thermal Service Factor

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

Horse Power Rating

Nominal Ratio*	Input RPM	Output RPM	Maximum Prime Mover's Power in Horse Power														
			Models														
			30	40	50	60	75	85	100	125	150	175	200	250	300	350	430
5:1	1500	300	0.73	1.66	3.63	5.40	7.35	14.40	17.07	27.87	51.20	68.67	93.87	161.33	240.00	332.00	-
	1000	200	0.58	1.31	2.88	4.28	5.64	11.49	13.73	22.40	39.73	55.47	75.73	130.40	193.33	269.33	-
10:1	1500	150	0.58	1.40	2.51	3.47	5.09	8.39	11.15	21.20	30.80	42.53	55.07	77.87	141.25	190.00	397.50
	1000	100	0.45	1.10	1.96	2.72	4.00	6.59	8.81	16.80	24.27	33.60	43.47	65.60	118.93	160.00	337.33
15:1	1500	100	0.44	1.26	2.00	3.07	4.95	7.49	8.89	15.07	26.67	36.80	49.47	74.00	105.87	194.67	322.67
	1000	66.7	0.34	0.98	1.55	2.32	3.88	5.88	7.03	11.73	20.93	29.07	39.07	58.13	83.33	152.00	253.33
20:1	1500	75	0.40	0.87	1.87	3.07	3.69	5.55	7.75	13.87	21.20	28.67	39.20	70.40	110.00	157.33	274.67
	1000	50	0.32	0.68	1.47	2.32	2.88	4.35	6.12	10.96	16.80	22.53	30.80	55.47	86.67	123.33	214.67
25:1	1500	60	0.34	0.75	1.47	2.36	3.54	5.05	6.35	10.67	16.67	26.27	35.87	58.00	87.87	124.13	202.67
	1000	40	0.28	0.67	1.20	1.93	2.89	4.13	5.04	8.41	13.20	20.53	28.13	45.73	68.00	97.33	160.00
30:1	1500	50	0.29	0.69	1.25	1.95	3.08	4.67	5.67	9.93	15.73	21.60	28.80	49.20	79.07	112.53	197.33
	1000	33.3	0.23	0.61	0.99	1.55	2.43	3.68	4.51	7.73	11.76	16.40	22.67	38.67	61.87	88.13	154.67
40:1	1500	37.5	0.22	0.57	0.93	1.41	2.24	3.40	4.67	7.63	12.85	18.27	23.87	42.40	66.53	93.33	133.33
	1000	25	0.17	0.45	0.75	1.12	1.77	2.69	3.71	6.04	9.80	14.13	18.80	33.33	52.00	72.93	103.73
50:1	1500	30	0.15	0.41	0.71	1.09	1.75	2.55	3.57	6.32	10.41	15.87	20.93	35.47	53.87	77.20	145.33
	1000	20	0.12	0.30	0.55	0.87	1.37	2.03	2.84	5.00	8.21	12.41	16.40	27.77	42.13	59.20	104.40
60:1	1500	25	0.13	0.32	0.51	0.80	1.33	2.07	3.05	5.55	8.32	12.53	17.60	30.00	45.87	70.13	92.80
	1000	16.7	0.10	0.25	0.39	0.60	1.00	1.52	2.40	4.36	6.55	9.84	13.87	23.47	35.87	54.67	89.33
70:1	1500	21.4	0.12	0.27	0.47	0.71	1.08	1.57	2.64	4.53	7.13	10.33	14.53	24.67	39.60	58.40	98.93
	1000	14.3	0.09	0.22	0.34	0.56	0.81	1.28	2.08	3.56	5.61	8.09	11.32	19.33	30.80	45.33	19.33

* The Ratios mentioned above are nominal and the actual may very by upto ±10%

** The Model Nos. 50 to 85 are available in Adaptable Models.

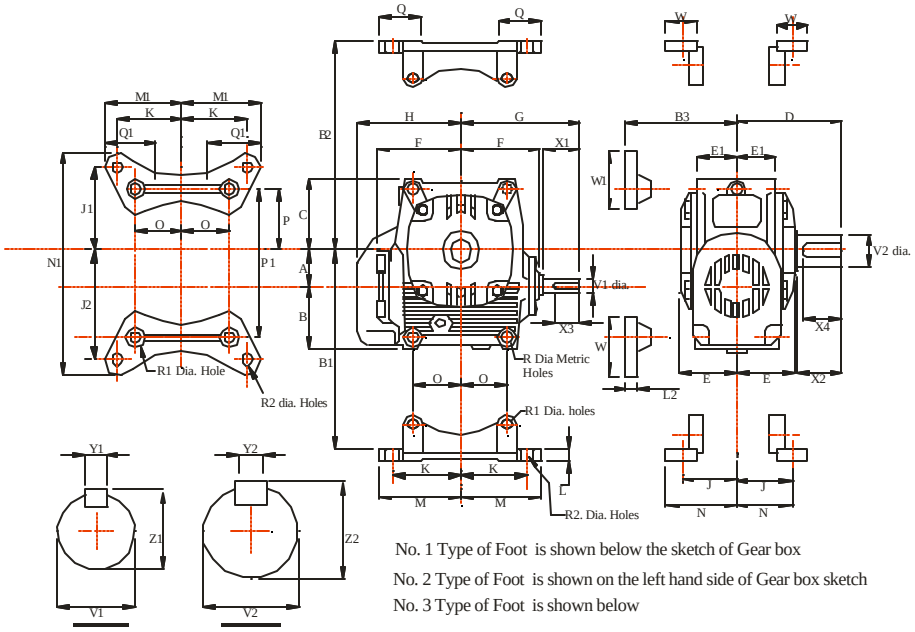
For Overdriven units in these sizes it is necessary to derate by 5% for all ratios upto 30 : 1 inclusive and by 15% for 35 : 1 and higher ratios.

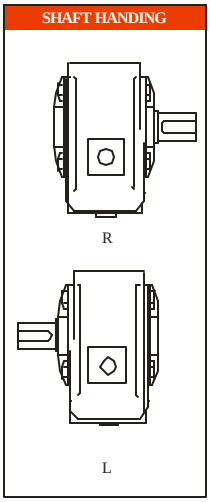
Worm Shaft and Worm Gear Wheel without Body are also available.

Dimension Details of Gear Boxes

AGNEE Single Reduction Speed Reducers - Adaptable Type

Sizes of AGNEE A40 to AGNEE A85





No. 1 Type of Foot is shown below the sketch of Gear box

No. 2 Type of Foot is shown on the left hand side of Gear box sketch

No. 3 Type of Foot is shown below

Principal Dimensions (mm)

BODY DIMENSIONS

SIZE	A	B	C	D	E	E1	F	G	H	R
40	41.3	50.8	57	98	49	37	71	110	89	8
50	50.8	58.7	71	117	59	43	86	133	111	8
60	60.3	68.3	84	140	68	51	98	159	130	10
75	73.0	77.8	103	168	81	64	119	191	154	10
85	85.7	90.6	116	200	98	76	133	219	175	12

SHAFT DIMENSIONS

SIZE	V1	V2	X1	X2	X3	X4	Y1	Y2	Z1	Z2
40	15.8	19.0	41	48	38	44	5.0	5.0	18.3	21.5
50	15.8	25.4	48	57	44	54	5.0	6.0	18.3	28.4
60	19.0	28.5	57	70	54	67	5.0	8.0	22.0	32.5
75	22.2	31.7	70	83	67	79	6.0	8.0	25.2	35.7
85	25.4	38.1	83	98	79	95	6.0	10.0	28.4	43.1

MOUNTING DIMENSIONS - NUMBER 1 FOOT

SIZE	B1	B2	E1	J	K	L	M	N	O	Q	R1	R2	W
40	60	66	37	49	58	14	70	89	39	38	8	8	22
50	69	82	43	57	76	14	91	111	50	49	8	8	29
60	84	100	51	68	87	17	103	130	60	54	10	10	32
75	95	120	64	82	106	21	124	154	76	60	10	10	35
85	109	135	76	96	119	22	138	175	85	67	12	12	38

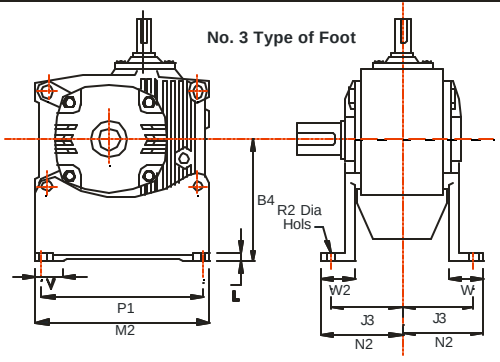
MOUNTING DIMENSIONS -NUMBER 2 FOOT

B3	J1	J2	K	L	M1	N1	O	P	P1	Q1	R1	R2	W1
63	65	100	58	14	71	191	39	47	130	40	8	8	46
69	82	120	76	14	89	229	50	60	158	51	8	8	52
82	95	139	87	17	103	267	60	71	188	57	10	10	59
98	114	161	106	21	124	311	76	89	225	65	10	10	65
114	128	188	119	22	138	356	85	100	260	73	12	12	73

NUMBER 3 FOOT

SIZE	B4	J3	L	P1	M2	N2	W2
40	102	65	11	130	152	38	32
50	127	72	14	159	191	49	38
60	146	84	17	187	220	54	41
75	173	102	19	226	260	60	48
85	194	116	21	260	298	67	49

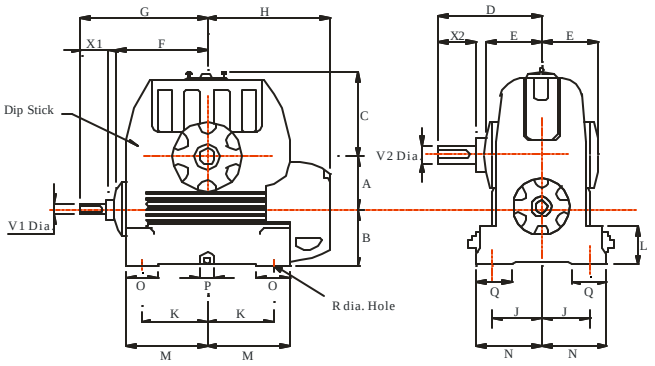
No. 3 Type of Foot

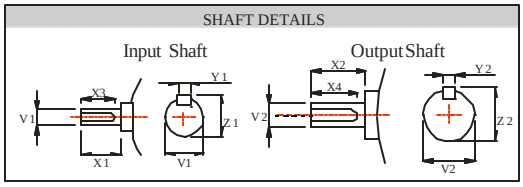


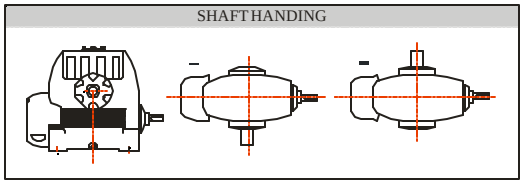
As Improvements in design are continually being made, this specification is not to be regarded as binding detail, and dimensions are subject to alteration without notice

AGNEE **Single Reduction Speed Reducers - Horizontal Type**

Sizes of AGNEE H100 to AGNEE H430





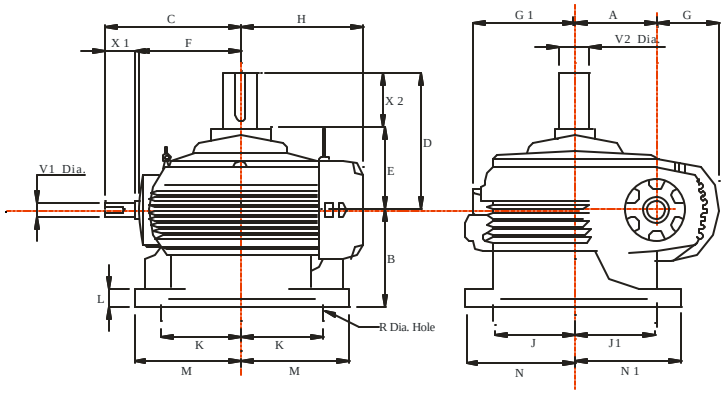


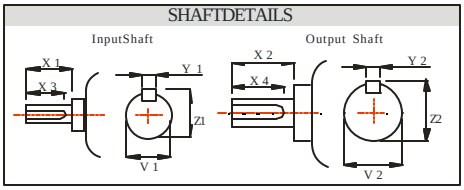
Principal Dimensions (mm)

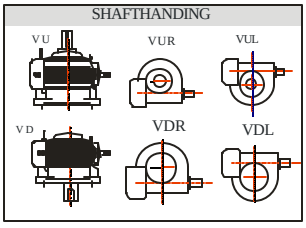
SIZE	BODY DIMENSIONS									MOUNTING DIMENSIONS									SHAFT DIMENSIONS									
	A	B	C	D	E	F	G	H		J	K	L	M	N	O	P	Q	R	V1	V2	X1	X2	X3	X4	Y1	Y2	Z1	Z2
100	101.6	104.0	137	216	121	159	229	222		101	108	44	140	127	64	-	76	20.6	31.8	44.5	67	89	54	83	8.0	10.0	35.8	49.5
125	127.0	114.3	159	248	133	184	260	254		111	123	54	164	137	70	-	83	20.6	38.1	50.8	73	102	73	95	10.0	12.0	43.1	56.8
150	152.4	127.0	184	273	140	200	279	270		120	133	64	179	149	76	-	89	23.8	38.1	57.1	76	114	73	114	10.0	16.0	43.1	65.1
175	177.8	146.1	210	298	151	229	318	305		133	152	70	208	162	89	-	98	23.8	44.4	63.5	86	127	83	114	12.0	16.0	50.4	71.5
200	203.2	146.1	235	311	159	251	343	307		133	171	76	230	171	102	-	102	27.0	44.4	69.8	89	140	83	127	12.0	19.1	50.4	79.3
250	254.0	171.5	292	375	194	311	425	378		165	215	51	298	200	127	64	200	31.8	57.2	82.5	121	152	89	143	16.0	22.0	65.2	93.5
300	304.8	190.5	343	413	216	368	495	441		184	260	57	356	222	152	76	222	34.9	63.5	95.2	124	171	89	162	16.0	25.4	71.5	107.9
350	355.6	215.9	394	483	254	425	572	521		215	298	64	413	260	178	89	260	41.3	76.2	114.3	149	191	146	210	19.1	32.8	85.7	130.3
430	431.8	254.0	489	546	305	514	699	629		254	381	76	502	298	191	127	298	41.3	82.5	139.7	181	203	152	222	22.0	38.2	93.5	158.7

AGNEE **Single Reduction Speed Reducers - Vertical Type**

Sizes of AGNEE V75 to AGNEE V430







Principal Dimensions (mm)

SIZE	BODY DIMENSIONS									MOUNTING DIMENSIONS								SHAFT DIMENSIONS									
	A	B	C	D	E	F	G	G1	H	J	J1	K	L	M	N	N1	R	V1	V2	X1	X2	X3	X4	Y1	Y2	Z1	Z2
75	73.0	110.0	195	184	92	115	77	100		97	97	87	20	103	116	116	13.5	22.2	31.7	70	82	60	70	6.0	8.0	25.2	35.7
100	101.6	171.5	229	216	121	159	111	152	222	114	114	114	32	140	140	140	20.6	31.8	44.5	67	89	54	83	8.0	10.0	35.8	49.5
125	127.0	190.5	260	248	133	184	124	178	254	140	139	139	32	165	165	165	20.6	38.1	50.8	73	102	73	95	10.0	12.0	43.1	56.8
150	152.4	209.5	279	273	140	200	133	197	270	152	152	152	38	184	184	184	23.8	38.1	57.1	76	114	73	114	10.0	16.0	43.1	65.2
175	177.8	228.6	318	298	151	229	143	222	305	177	177	177	38	210	210	210	23.8	44.4	63.5	86	127	83	114	12.0	16.0	50.4	71.5
200	203.2	241.3	343	311	159	251	149	254	307	203	203	203	44	238	238	238	27.0	44.4	69.8	89	140	83	127	12.0	19.1	50.4	79.3
250	254.0	279.4	425	375	194	311	160	298	378	260	260	260	51	311	299	273	31.8	57.2	82.5	121	152	89	143	16.0	22.0	65.2	93.5
300	304.8	304.8	495	413	216	368	177	356	441	317	317	317	57	368	368	305	34.9	63.5	95.2	124	171	89	162	16.0	25.4	71.5	107.9
350	355.6	330.2	572	483	254	425	203	413	521	355	355	355	64	425	413	362	41.3	76.2	114.3	149	191	146	210	19.1	31.8	85.7	130.3
430	431.8	406.4	699	546	305	514	241	502	629	431	431	431	76	502	502	502	41.3	82.5	139.7	181	203	152	222	22.3	38.2	93.5	158.7

As Improvements in design are continually being made, this specification is not to be regarded as binding detail, and dimensions are subject to alteration without notice

General

AGNEE Worm Speed Reduction Gear Boxes have liberal ribbing for increasing heat dissipation area, streamlined sump for carrying more oil and fan of ample size which is effective in both side of rotation.

Design Standards

Wherever applicable, British as well as Indian Design standards are used. Worm Shafts conform to case-hardening Alloy Steels, Worm Wheels conform to phosphorous - bronze as per BS 1400, While Gear Case conforms to C.I. Grade 20, IS 210.

Gear Case

Gear Case is of streamlined design, rugged in construction, made of close grain Cast Iron. It is completely air tight, dust proof and capable of being installed in open without any cover. The faces and bores are accurately bored and machined to last precision to ensure perfect alignment and interchangeability.

Worm & Worm Wheels

The Worm is made of case - hardening / alloy steel, duly hardened, ground and lapped and is integral with the shaft. Bearing journals are accurately ground. Worm Wheels is made of chill cast phosphorous bronze and tightly fitted with the C.I. Centres. Worm Wheels teeth are generated on precision hobbing machines and high accuracy hobs.

Bearings

The Worm and Worm Wheels are supported on Extra Heavy Duty Taper roller antifriction bearings of ample margin of safety to allow adequate journals as well as thrust loads. Overhung loads arising out of sprocket or pinion drive are case and bearing are designed for this duty. In case of heavy overhung loads, and extra roller bearing can be provided.

Wheel Shafts

The Worm wheel Shafts are made of high tensile carbon steel, duty hardened and ground. It is of large diameter of carry the torsional as well as the bending loads which may be induced by overhung drives.

Lubrication

Lubrication of Worm and worm wheels is by splash of oil from the sump. Thus, no special care is required except for the occasional oil topping of the oil to the required level. An oil filler cum breather plug is provided along with the drain plug and level plug. Oil seals of appropriate size are provided on all input and output shafts.

For very low input speed of below 50 RPM , and heavy loads in sizes above 350 mm, forced lubrication is required.

Cooling

Air cooling is effected by means of standard propylene or metal fans which direct air over the ribbed surface of the case. The fan is designed to operate in both the direction of rotation and is so arranged in conjunction with the ribbing of the case to allow maximum heat dissipation.

Overload Ratings

All the conponents of the Gear Unit are so designed that they can withstand
100% overload for 15 seconds
50% overload for one minute
40% overload for 15 minutes
25% overload for 1 hour

AGNEE TRANSMISSIONS (INDIA) PVT. LTD.

AN ISO 9001-2000 Company

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