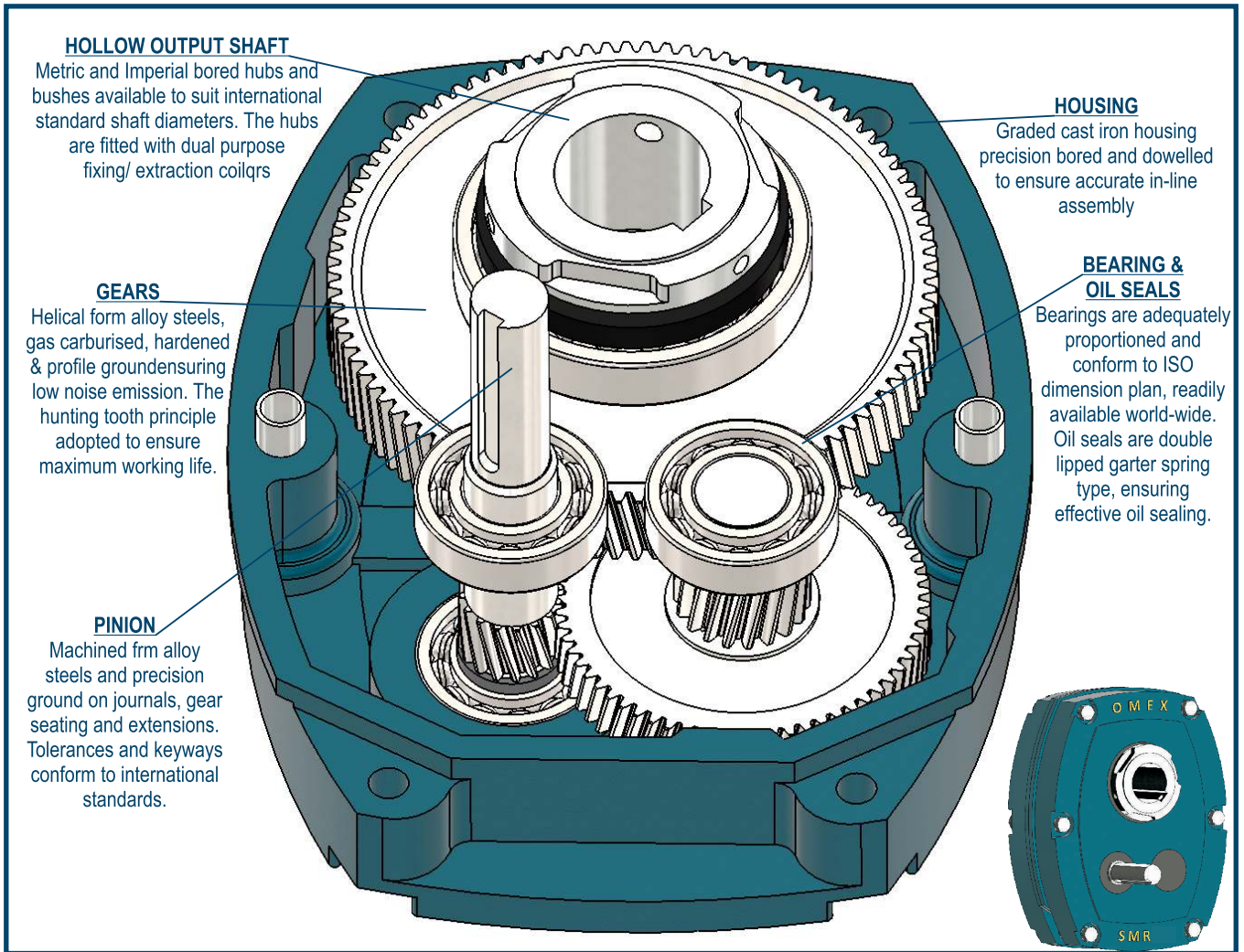


SMR Series | Shaft Mounted Reducer

Shaft Mounted Speed Reducer



The Omex Shaft Mounted Speed Reducer is metric in design throughout and conforms to I.S.O. preferences. A Shaft Mounted Speed Reducer provides a very convenient method of reducing speed, since it is mounted directly on the driven shaft instead of requiring foundations of its own. It eliminates (1) the use of one, and sometimes two, flexible couplings and (2) external belt take-up arrangements.

A torque-arm anchors the Reducer and provides quick, easy adjustment of

the V-Belt by means of its turnbuckle. The Omex Speed Reducer is manufactured in eight gear case sizes, designated by the letter B through to J. The eight sizes may have any one of three nominal gear ratios, 5:1, 13:1, and 20:1.

A very wide choice of final driven speed can be determined by the use of an appropriate input V-Belt drive. The units will normally be oil lubricated, but they are equally suitable for "lubricated for life" greases.

Shaft Mounted Speed Reducer

SELECTION PROCEDURE

- (a) Service Factor**
From Table 1 select the services factor applicable to the drive.
- (b) Design Power**
Multiply the absorbed power (or motor power if absorbed power not known) by the service factor chosen in step (a).
Note: Ensure that design power exceeds motor rated power
- (c) Peak Load**
Divide any peak load by two
- (d) Unit Selection**
Using the greater value of steps (b) and (c) refer to the Power Rating Tables on pages 5 & 6 and select the correct size of unit. The choice of single or double reduction gearbox will be operating speeds for each of the gearboxes may be observed in the Power Rating Tables. For other speeds CONSULT OMEX
Note: 5.1 Units require special selection when fitted with backstops CONSULT OMEX

Selection of Associated Drive for 1440 rev/min Electric Motors

- (e) Output Speed**
Refer to the Power Rating Table an under the appropriate gearbox size and ratio read down the column headed 'Output Speed' until an output speed equal or near to that required is found

TABLE 1 - SERVICE FACTORS

Types of Driven Machine	Operational Hours Per Day		
	Under 10	10 to 16	16 and over
Uniform Agitators and Mixers-liquid or semi-liquid Blowers -centrifugal Bottling Machines Conveyors and Elevafors - uniformly loaded Cookers Laundry Washing Machines -non-reversing Line Shafts Pumps - centrifugal and gear Wire Drawing Machines	1.0	1.12	1.25
Moderafe Shock Agitators and Mixers - variabile density Conveyors - not uniformiy loaded Cranes, travel motion and hoisting Drawbench Feeders - puisating load Hoists Kilns Laundry Tumblers Lifts Piston Pumps - with 3 or more cylinders Pulp and Paper Making Machinery Rubber Mixer. and Calenders Rotary Screens Textile Machinery	1.0	1.12	1.25
Heavy Shock Brick Presses Briquetting Machines Conveyors - reciprocating and shaker Crushers Feeders - reclprocating Hammer Mills Piston Pumps - 1 or 2 cylinders Rubber Masficators Vibrating Machines	1.6	1.8	2.0

- (f) Pulley Diameters**
Read across from the chosen output speed to obtain both driving and driven pulley pitch diameters and the appropriate number of belts.
- (g) Centre Distance**
Belt length and centre distance can be found by referring to page 3.

Selection of Associated Drive for Driving Speeds other than 1440 rev/min

- (h) Design Power**
Obtain from the Power Rating Tables the rated power of the gearbox at the required output speed and use it as the design power for the drive
- (i) Gearbox Input Shaft Speed**
Multiply the gearbox output speed by the exact gear ratio (found in Table 5 on page 3) to obtain the gearbox input shaft speed
- (j) Selection of V-Drive**
A Combination of pulleys can be chosen. It is advisable not to select a gearbox pulley smaller than that shown in drive tables for approximate speed required

EXAMPLE

A Shaft Mounted Speed Reducer is required for a uniformly loaded elevator which absorbs 3.6 kW at 48 rev/min. The prime mover is a 4 kW 1440 rev/min direct-on-line start electric motor A V-Belt drive is required between the motor and gearbox at approximately 600 mm centres running for up to 24 hours/day SOLUTION

- (a) Service Factor**
From Table I the service factor is 1.25
- (b) Design Power**
Select on a basis of absorbed power ensuring that the design power exceeds the basic motor power.
Design Power = 1.25 x 3.6 = 4.5 kW
- (c) Peak Load**
Assuming that a direct-on-line start can exert 240% of full load torque.
$$\text{Peak Load} = \frac{4 \times 240}{2 \times 100} = 4.8 \text{ kW}$$
- (d) Unit Selection**
Using 4.8 kW as the basis for selection (being the greater value of steps (b) and (c)). reference to the Power Rating Tables pages indicates that an E13 or E20 gear unit will transmit 5.18 kW at 48 rev/min.
- (e) Output Speed**
A cheaper belt drive will be obtained if the 20: 1 ratio gearbox is selected.
- (f) Pulley Diameters**
On the line giving the output speed of 48 rev /min, read across and note the driving and driven pulley pitch diameters together with the numbers of belts required. which for this case is 95 mm and 140 mm. using 2 SPZ Wedge Belts

Shaft Mounted Speed Reducer

DIMENSIONS - SHAFT MOUNTING SIZES B-J

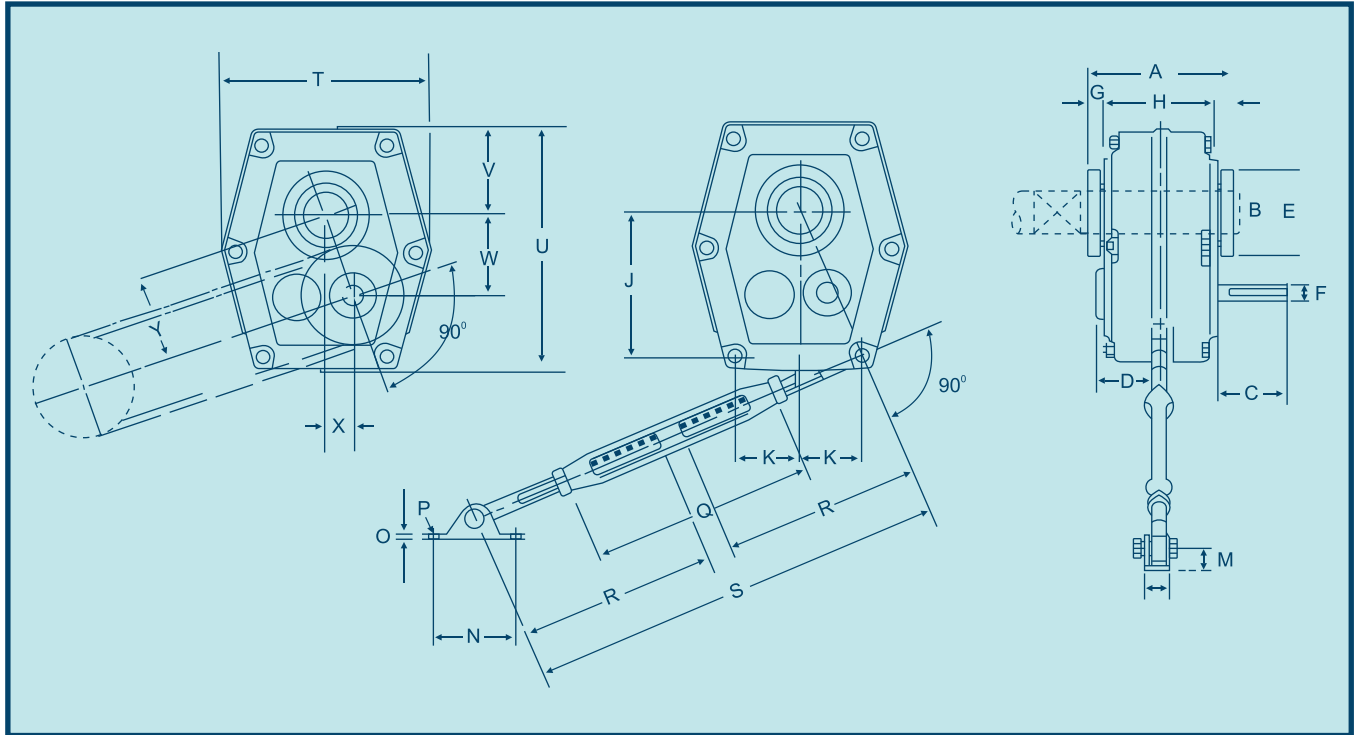


TABLE 4

SIZES	Approx. Mass Kg.		A	B	C	D	E	F	Input Shaft Keyway	G	H	J	K	L	M	N	O	P	Q	R	S*		T	U	V	W	X	Y
	Ratio 5	Ratios 13&20																			Min	Max						
B	15	16	134	See Table 6	63	59	80	19j6	6x3.5x50	15	104	131	55	24	20	65	5	10	200	300	600	750	186	226	81	75	25	79
C	21	22	142		72	65	90	22j6	6x3.5x56	17	108	156	59	24	20	65	5	10	200	300	600	750	218	270	96	90	31	95
D	30	32	152		77	68	100	25j6	8x4x63	17	118	188	76	28	24	75	5	12	216	350	700	850	258	328	117	110	37	116
E	41	46	170		85	76	115	28j6	8x4x70	20	130	222	90	28	24	75	5	12	216	350	700	850	278	377	129	125	43	133
F	53	58	189		90	87	130	32k6	10x5x70	20	149	242	98	34	30	100	6	16	216	375	750	900	317	414	143	141	50	150
G	82	92	212		105	110	145	42k6	12x5x90	20	172	277	110	34	30	100	6	16	216	375	750	900	365	468	162	156	56	166
H	133	144	242		116	115	170	48k6	14x5.5x100	26	190	330	88	70	50	121	17.5	16	222	375	750	900	434	550	195	189	62	200
J	194	208	257		135	119	200	55m6	16x6x110	30	197	424	102	70	50	121	17.5	16	222	375	750	900	542	700	254	255	75	266

All dimensions are subject to alteration without notice.

All dimensions are in millimetres.

• Permits 150mm adjustments to tighten V-Belts. By cutting off threaded end of rods, 'S' may be reduced by up to 300mm on sizes B & C, 350mm on D & E and 395mm on sizes F, G, H & J.

Keyways are British Standard and Indian Standard Metric.

**TABLE 5
EXACT GEAR RATIOS**

Nominal Ratio	B	C	D	E	F	G	H	J
5	5.05	5.05	5.047	5.047	5.047	5.047	5.047	5.047
13	13.984	13.596	13.589	13.589	13.589	13.589	13.589	13.589
20	20.997	20.466	20.456	20.456	20.456	20.456	20.456	20.456

Shaft Mounted Speed Reducer

TABLE 6

Reducer Size	Dimension 'B' (See Page 4)			
	Standard Hub Bore	Bush Bores for Standard Hub	Alternative Hub Bore	Bush Bores for Alternative Hub
B05 B13 B20	30	25 1"	40	35 1¼" 32
C05 C13 C20	40	35 1¼" 32 30	50	45 1¾" 42 1½" 38
D05 D13 D20	50	45 1¾" 42 1½" 40 1¼" 38	55	2"
E05 E13 E20	55	50 2" 45 1¾" 42 1½"	65	60 2¼"
F05 F13 F20	65	60 2¼" 55 50	75	70 2¾" 2½"
G05 G13 G20	75	70 2¾" 65 2½" 60 2¼"	85	80 3"
H05 H13 H20	85	80 3" 75 2¾" 70 2½"	100	95 3½" 90
J05 J13 J20	100	95 3½" 90	120	110 4½" 4"

All dimensions are subject to alteration without notice:

All dimensions are in millimetres unless otherwise stated.
 Metric hubs are bored to F7 limits.
 Inch hubs are bored to H7 limits.
 Shaft keyways must be to appropriate standard dimensions, i.e. to B.S. 4235/IS : 2048 for metric shafts and B.S. 46 for inch shafts.

OPTIONAL EXTRAS

1. Backstops

A backstop may be incorporated on applications where it is necessary to prevent reversal of rotation. It is quickly installed within the Reducer by simply removing a cover plate.

2. Vertical Shafts

Units suitable for mounting on vertical shafts can be supplied at extra charge. When ordering, please specify whether input shaft is upwards or downwards.

3. Reversing Duty

Shaft Mounted Speed Reducers suitable for reversing duty can be supplied to order

4. Flange Mounting

The Speed Reducer casing design is such that the Reducer can be bolted direct to supporting framework. This may permit designers to omit a bearing or plummer block but it does, of course, eliminate the easy belt adjustment feature characteristic of the shaft mounting version.

STANDARD KEYWAYS

Keyways for output hubs and bushes are machined in accordance with B.S. 4235/IS .2048 for metric shafts and B.S.. 46 for inch shafts.

Keys are supplied with reduction bushes, but not where the output hubs directly fit the shaft.

Reduction bushes maybe supplied with two separate keys for hub and shaft or a single stepped key, depending on the bush wall thickness.

The shaft keyway should be machined to suit the standard key size shown below regardless of the hub bore diameter.

TABLE 7

Shaft Diameter (mm)	Keysize	Shaft Diameter (inches)	Keysize
20	6 x 6	¾"	¾" x ¼"
25	8 x 7	1"	¼" x ¼"
30	8 x 7	1 ¼"	5/16" x ¼"
32	10 x 8	1½ "	3/8"x¼" "
35	10 x 8	1¾ "	7/12"x 5/16"
38	10 x 8	2"	½" x 5/16"
40	12 x 8	2 ¼"	5/8" x 7/16"
42	12 x 8	2½ "	5/8"x 7/16"
45	14 x 9	2¾ "	¾" x ½"
50	14 x 9	3"	7/8" x 5/8"
55	16 x 9	4"	1" x ¾"
60	18 x 11	4 ½"	1 ¼" x 7/8"
65	18 x 11		
70	20 x 12		
75	20 x 12		
80	22 x 14		
85	22 x 14		
90	25 x 14		
95	25 x 11		
100	28 x 16		
110	28 x 16		
120	<u>32 x 18</u>		

Power Rating (KW) Table For Double Reduction Smr Of Ratio 13:1 & 20:1

Output (rpm)	SMR							
	B13/B20	C13/C20	D13/D20	E13/E20	F13/F20	G13/G20	H13/H20	J13/J20
10	0.29	0.49	0.82	1.25	1.97	3.11	4.9	7.8
12	0.36	0.58	0.96	1.48	2.45	3.71	5.9	9.2
14	0.42	0.67	1.11	1.73	2.71	4.30	6.8	10.7
16	0.47	0.77	1.27	1.97	3.09	4.89	7.7	12.1
18	0.53	0.86	1.41	2.20	3.44	5.48	8.7	13.6
20	0.59	0.96	1.58	2.43	3.82	6.08	9.5	15.1
22	0.63	1.04	1.73	2.67	4.18	6.63	10.4	16.4
24	0.69	1.13	1.86	2.89	4.55	7.22	11.3	17.9
26	0.75	1.22	2.02	3.13	4.91	7.79	12.1	19.3
28	0.81	1.32	2.18	3.36	5.27	8.35	13.1	20.6
30	0.86	1.41	2.32	3.58	5.63	8.92	13.9	22.5
32	0.92	1.50	2.47	3.81	4.98	9.49	14.8	23.6
34	0.98	1.60	2.63	4.04	6.34	10.04	15.7	25.1
38	1.10	1.79	2.91	4.48	7.05	11.12	17.4	27.6
40	1.16	1.87	3.07	4.71	7.41	11.87	18.2	29.0
42	1.20	1.96	3.19	4.92	7.75	12.39	19.3	30.1
46	1.30	2.13	3.48	5.37	8.28	13.65	21.1	32.6
50	1.42	2.30	3.78	5.81	9.07	14.60	22.8	35.0
52	1.47	2.37	4.00	6.03	9.14	15.23	23.4	35.6
54	1.52	2.47	4.14	6.23	9.42	15.86	24.4	36.3
58	1.64	2.61	4.43	6.66	10.02	16.80	25.8	38.0
62	1.76	2.77	4.71	7.23	10.61	17.96	27.5	40.2
66	1.86	2.94	5.01	7.68	11.24	19.01	29.7	42.5
70	1.96	3.07	5.13	8.11	11.76	20.16	30.6	44.7
74	2.06	3.18	5.42	8.54	12.39	21.11	32.0	47.0
78	2.15	3.32	5.70	8.97	12.92	22.26	33.6	49.2
80	2.23	3.39	5.81	9.19	13.23	22.47	34.3	50.2
85	2.34	3.58	6.14	9.71	13.97	23.31	36.2	52.8
90	2.48	3.79	6.49	10.24	14.60	24.57	37.9	55.3
95	2.61	4.00	6.81	10.50	15.44	25.83	39.0	58.0
100	2.73	4.19	7.15	11.03	16.17	27.09	40.7	60.5
105	2.85	4.41	7.48	11.55	17.01			
110	2.98	4.62	7.81					
115	3.11							
Torque at 100rpm	277	468	783	1194	1881	2970	4680	7449

Power Rating (KW) Table For Single Reduction Smr Of Ratio 5:1

Output (rpm)	SMR Size							
	B5	C5	D5	E5	F5	G5	H5	J5
100	2.68	4.20	6.62	10.29	15.12	25.2	36.2	62.2
110	2.87	4.62	7.08	11.03	16.07	27.6	38.9	67.2
120	3.13	5.04	7.46	11.76	17.01	29.9	41.4	72.5
130	3.36	5.31	7.77	12.34	17.85	31.5	43.4	76.7
140	3.56	5.54	8.11	12.71	18.59	32.6	45.2	79.2
150	3.62	5.78	8.30	13.13	19.22	33.6	47.3	81.9
160	3.73	5.88	8.51	13.55	19.95	34.7	48.3	85.1
170	3.83	5.90	8.72	13.76	20.37	35.1	49.9	88.2
180	3.94	6.09	8.93	14.18	21.00	35.7	51.5	90.3
190	4.04	6.30	9.14	14.49	21.53	36.8	52.5	93.5
200	4.20	6.49	9.45	14.91	22.05	37.8	53.6	96.6
210	4.31	6.53	9.66	15.23	22.47	38.5	54.6	98.7
220	4.41	6.72	9.87	15.75	23.10	39.3	56.2	101.9
230	4.53	6.87	10.06	16.07	23.63	40.0	57.3	104.0
240	4.66	7.04	10.29	16.49	24.26	41.1	58.8	107.1
250	4.78	7.14	10.71	16.80	25.04	42.1	60.4	109.2
260	4.89	7.35	10.92	17.01	25.41	43.1	61.3	111.3
270	5.04	7.46	11.13	17.85	26.25	44.1	63.0	113.4
280	5.20	7.56	11.55	18.38	26.78	45.2	64.1	115.5
290	5.36	7.77	11.76	18.90	27.41	46.2	65.1	116.6
300	5.46	7.98	12.08	19.43	27.83	47.4	66.2	118.7
310	5.62	8.17	12.34	19.95	28.67	48.6	67.7	122.9
320	5.78	8.30	12.60	20.27	29.61	49.4	69.4	123.9
330	5.88	8.51	13.02	20.90	30.35	50.9	70.9	125.0
340	6.09	8.72	13.44	21.11	31.08	52.3	71.6	125.5
350	6.30	8.82	13.76	21.84	31.71	53.3	73.5	126.0
360	6.41	9.03	14.18	22.26	32.60	54.6	74.6	128.1
370	6.62	9.24	14.44	22.79	33.60	55.7	75.6	129.2
380	6.72	9.45	14.70	23.10	34.49	56.7	77.7	130.2
390	6.93	9.56	15.23	23.52	35.07	58.8	79.8	131.3
400	7.14	9.66	15.65	24.57	35.91	59.9	81.9	134.2
Torque at 100rpm	256	401	632	983	1444	2407	3457	5940



Dharam Power Transmission Equipments Pvt. Ltd.

Add : Plot No. 1492, 1481, Industrial Estates, HSIDC, Rai, Sonapat (HR)

Tel.: 0130 - 6453492, 6531492 Fax.: 2367897

e-mail : dharampower@gmail.com

www.omexgears.com