

Catalogue for *PLUS* series of E, F, G Models

Fenner Shaft Mounted Speed Reducer



Fenner *POWERTRAN*



Cable Winding Machine



Screw Conveyor



Conveyor Application in a Stone Crusher Plant



SMSR
Applications

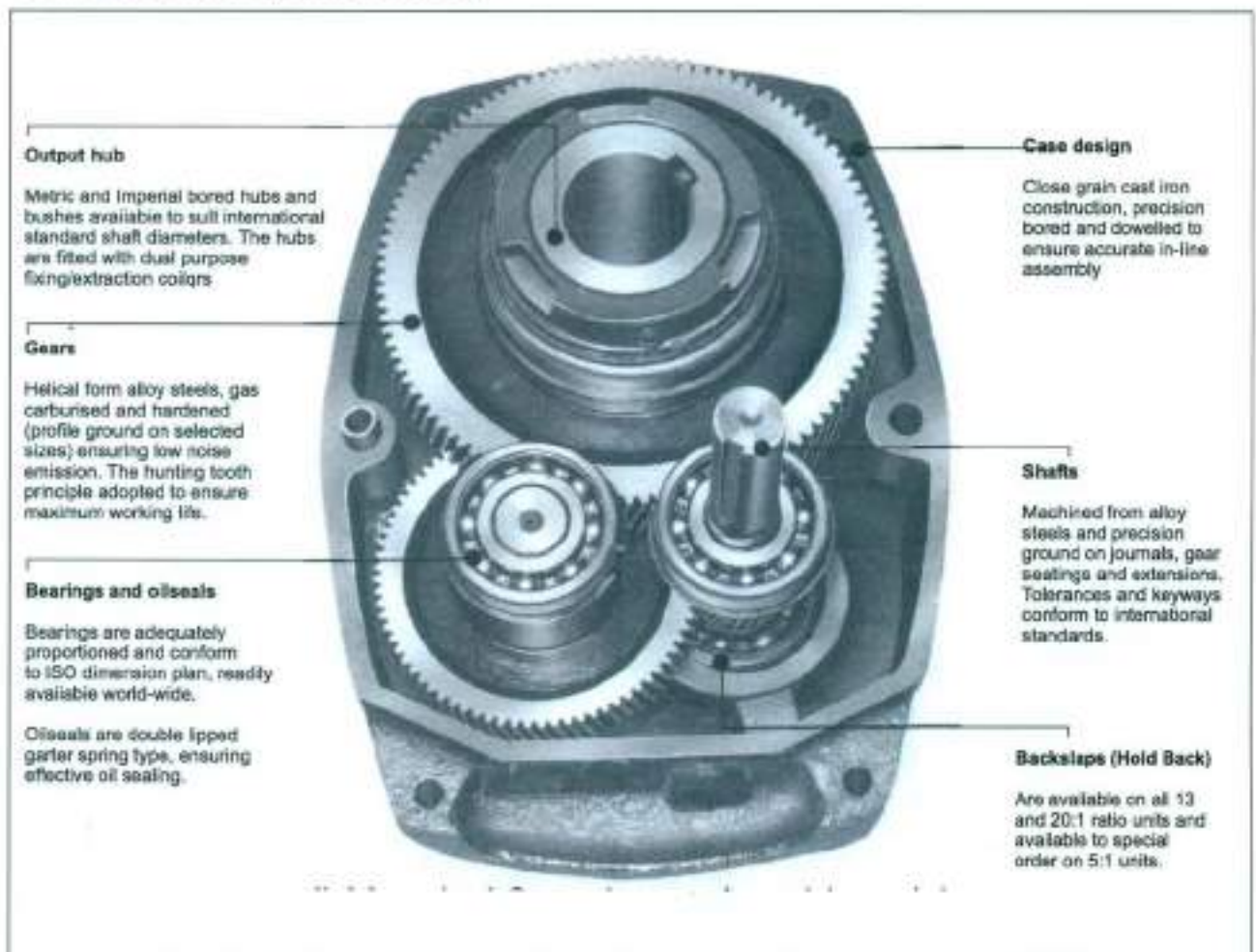


Hydro Testing Equipment



SMSR on a Conveyor Belt Drive

Shaft Mounted Speed Reducer



The Fenner 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-Belts by means of its turnbuckle. The Fenner Speed Reducer is manufactured in eight gear case sizes, designated by the letters B through to J. The eight sizes may have anyone 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 service 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 3 & 4. and select the correct size of unit. The choice of single or double reduction gearbox will be determined by the output speed required. The normal operating speeds for each of the gearboxes may be observed in the Power Rating Tables. For other speeds CONSULT FENNER.
Note: 5:1 units require special selection when fitted with backstops. Consult FENNER.

Selection of Associated Drive for 1440 rev/min Electric Motors

- (e) **Output Speed**
Refer to the Drive Selection Tables (pages 10 to 21) and 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.
- (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.

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 Elevators - uniformly loaded Cookers, Laundry Washing Machines, non- reversing Line Shafts, Pumps - centrifugal and gear,Wire Drawing Machines	1.0	1.12	1.25
Moderate Shock Agitators and Mixers Variable density Conveyors - not uniformly loaded, Cranes- travel, motion and hoisting, Draw bench, Feeders - pulsating 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	1.25	1.4	1.6
Heavy Shock Brick Presses, Briquetting Machines, Conveyors - reciprocating and shaker, Crushers, Feeders - reciprocating, Hammer Mills, Piston Pumps - 1 or 2 cylinders, Rubber Masticators, Vibrating Machines	1.6	1.8	2.0

- (g) **Centre Distance**
Belt length and centre distance can be found by referring to pages 30 of Drive Design Manual.

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 5) to obtain the gearbox input shaft speed
- (j) **Selection of V-Drive**
By referring to pages 28,29 & 30 of Fenner Drive Design Manual, a suitable belt drive can be chosen. It is advisable not to select a gearbox pulley smaller than that shown in the drive tables for the 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 the gearbox at approximately 600 mm centres running for upto 24 hours/day.

Solution

- (a) **Service Factor**
From Table 1 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 = $1.25 \times 3.6 = 4.5 \text{ kW}$
- (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. and by reference to page 17 in the Gearbox Drive Tables. 48 rev/min is obtainable.
- (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
- (g) By reference to the Wedge Belt catalogue, SPZ 1600 Belts can be selected to give 615 mm centres.

Note: Wedge Belt drives shown on pages 10 to 21 have been selected to give the most economical total drive package for the speed required. If it is necessary to design a special drive it is advisable not to select a gearbox pulley smaller than that shown in the drive tables for the approximate speed required.

SMSR PLUS SERIES

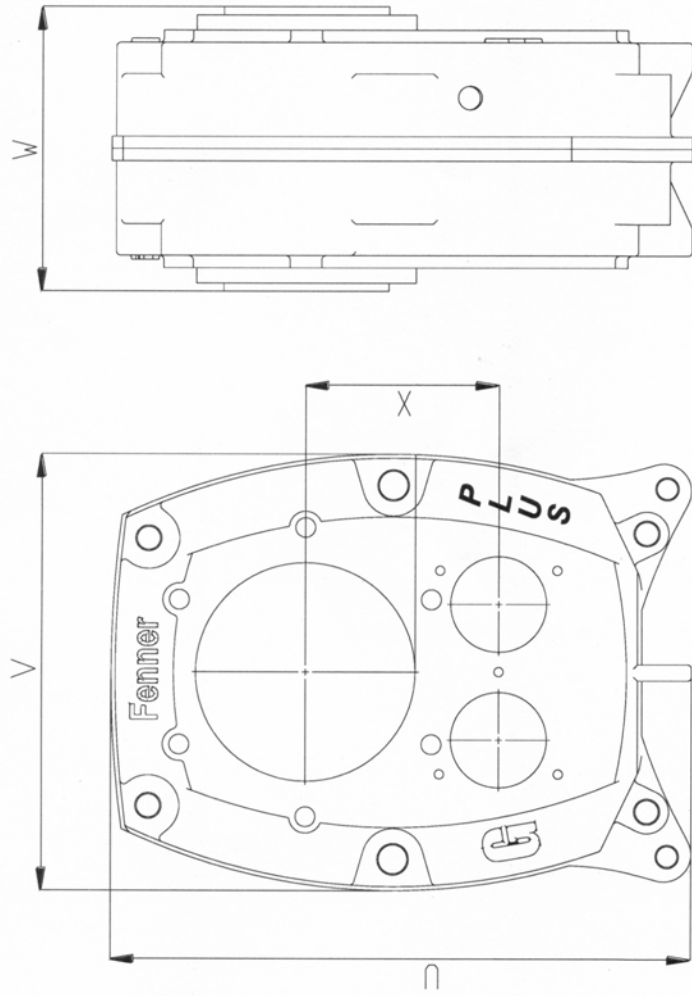


Salient Features of PLUS series SMSR :

- Improved Power rating
- Backstop removal and assembly made easy
- Separate provision for fixing the Torque arm without opening Casing assembly bolts
- Compact Design results in Improved performance of Equipment

SMSR PLUS SERIES

DIMENSIONAL DETAIL:



Size	U	V	W	X
E	337	261	173	110
F	387	287	195	126
G	422	320	214	141

SMSR PLUS SERIES

OUT PUT HUBS & BUSHES FOR 'PLUS' SERIES

Reducer Size	Standard Hub Bore	Bush Bores for Standard Hub	Alternative Hub Bore	Bush Bores for Alternative Hub
E05		50 2"		
E13	55	45 1 3/4"	65	60 2 1/4"
E20		42 1 1/2"		
F05		60 2 1/4"		70 2 3/4"
F13	65	55	75	2 1/4"
F20		50		
G05		70 2 3/4"		
G13	75	65 2 1/2"	85	80 3"
G20		60 2 1/4"		

POWER RATINGS :

SMSR G PLUS SERIES POWER RATINGS							
kW rating as per output RPM for ratio 5:1			kW rating as per output RPM for ratio 13&20:1				
OUTPUT T RPM	KW	OUTPUT RPM	KW	OUTPUT RPM	KW	OUTPUT RPM	
100	27.50	300	53.87	10	3.22	50	16.25
110	29.36	310	55.76	12	3.95	52	16.92
120	29.10	320	56.92	14	4.76	54	17.72
130	31.21	330	57.77	16	5.52	56	18.17
140	33.52	340	58.95	18	6.34	58	18.56
150	34.25	350	60.45	20	7.11	60	18.92
160	34.97	360	61.76	22	7.75	62	19.38
170	37.20	370	63.07	24	8.62	64	19.57
180	38.23			26	9.34	66	20.12
190	39.26			28	10.11	68	20.45
200	40.82			30	10.97	70	20.88
210	41.22			32	11.72	72	21.34
220	42.95			34	12.45	74	21.56
230	44.76			36	12.65	76	22.34
240	45.84			38	13.21	78	22.95
250	47.27			40	13.97	80	24.45
260	48.92			42	14.72	85	25.82
270	50.02			44	15.02	90	27.12
280	51.32			46	15.42	95	28.65
290	52.76			48	15.98	100	28.65
Torque @ 100 rpm - 2626 Nm			Torque @ 10 rpm - 3075 Nm				

POWER RATINGS :

SMSR F PLUS SERIES POWER RATINGS

kW rating as per output RPM for ratio 5:1				kW rating as per output RPM for ratio 13&20:1			
OUTPUT RPM	KW	OUTPUT RPM	KW	OUTPUT RPM	KW	OUTPUT RPM	KW
100	15.76	300	31.10	10	1.90	50	9.35
110	16.21	310	31.62	12	2.35	52	9.72
120	17.10	320	32.54	14	2.73	54	10.15
130	17.62	330	33.20	16	3.12	56	10.42
140	18.85	340	34.35	18	3.65	58	10.75
150	19.32	350	35.07	20	4.05	60	10.82
160	20.52	360	35.82	22	4.50	62	11.05
170	21.90	370	36.75	24	4.95	64	11.24
180	22.12			26	5.35	66	11.35
190	22.24			28	5.72	68	11.62
200	23.40			30	6.10	70	11.92
210	24.12			32	6.72	72	12.17
220	24.75			34	7.11	74	12.43
230	24.92			36	7.30	76	12.88
240	26.45			38	7.42	78	13.27
250	27.20			40	8.02	80	14.02
260	28.92			42	8.45	85	14.85
270	29.12			44	8.76	90	15.64
280	29.34			46	8.95	95	16.47
290	30.02			48	9.10	100	16.47
Torque @ 100 rpm - 1505 Nm				Torque @ 10 rpm - 1815 Nm			

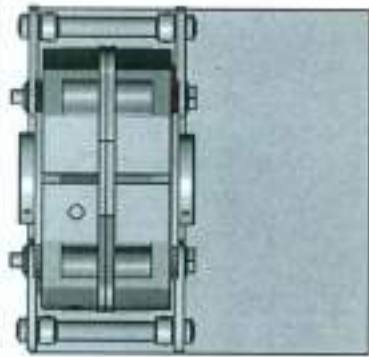
POWER RATINGS:

SMSR E PLUS SERIES POWER RATINGS

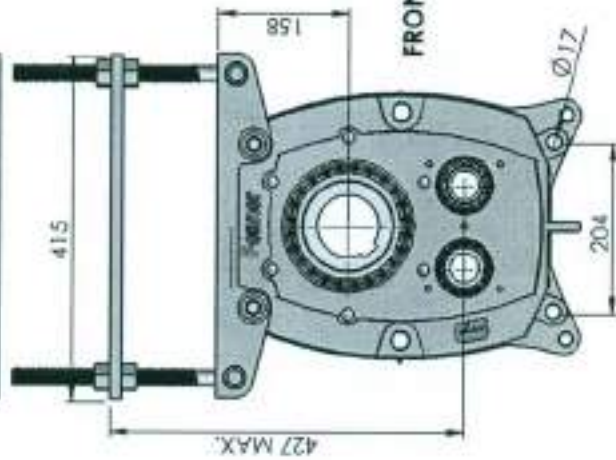
kW rating as per output RPM for ratio 5:1				kW rating as per output RPM for ratio 13&20:1			
OUTPUT RPM	KW	OUTPUT RPM	KW	OUTPUT RPM	KW	OUTPUT RPM	KW
100	10.78	300	21.27	10	1.27	50	6.37
110	11.25	310	21.96	12	1.52	52	6.62
120	11.95	320	22.27	14	1.76	54	6.96
130	12.12	330	23.13	16	2.14	56	7.12
140	12.97	340	23.75	18	2.45	58	7.27
150	13.25	350	24.17	20	2.72	60	7.35
160	13.92	360	24.82	22	3.02	62	7.42
170	14.27	370	25.16	24	3.27	64	7.67
180	14.80			26	3.45	66	7.82
190	15.42			28	3.97	68	7.97
200	15.87			30	4.12	70	8.10
210	16.82			32	4.36	72	8.25
220	16.20			34	4.72	74	8.46
230	17.88			36	4.97	76	8.57
240	18.27			38	5.10	78	8.92
250	18.50			40	5.47	80	9.57
260	19.12			42	5.65	85	10.12
270	19.75			44	5.97	90	10.67
280	20.12			46	6.10	95	11.12
290	20.75			48	6.22	100	11.12

Torque @ 100 rpm - 1030 Nm

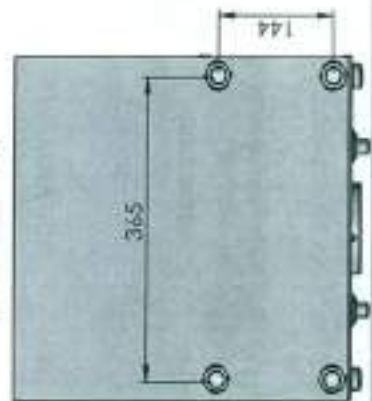
Torque @ 10 rpm -1212 Nm



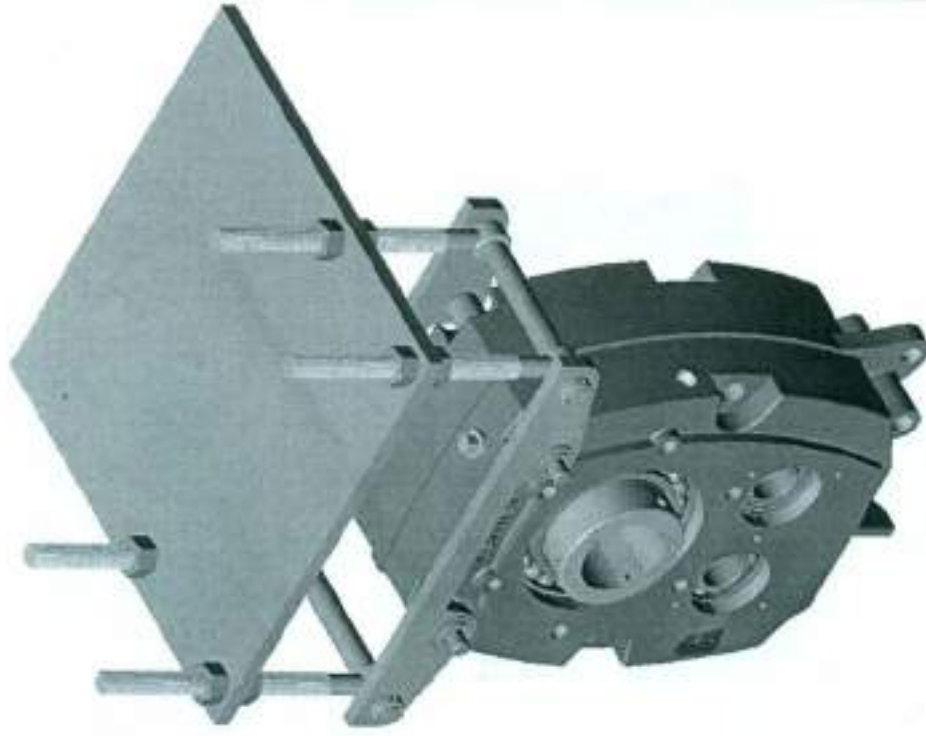
BOTTOM VIEW



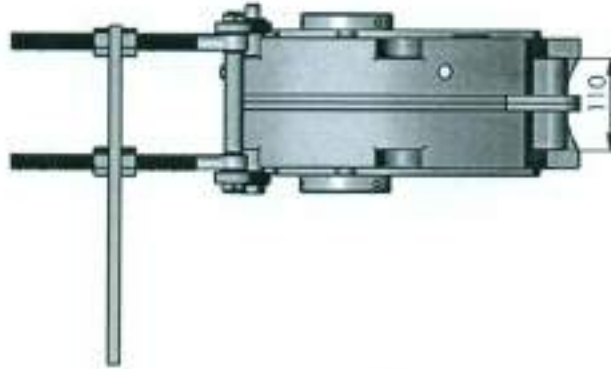
FRONT VIEW



PLAN VIEW



ISOMETRIC VIEW



SIDE VIEW

ENGINEERING DEPARTMENT
 SHANGHAI AIR INSTALLATION
 SHANGHAI
 CHINA



DESIGNER: CHEN DINGMING
 CHECKER: HUIYONG
 DATE: 2011.01.11

Motor mfg. assy
Fenner (India) Ltd.
 Engineering product division

NO.	DATE	DESCRIPTION	BY	CHKD.	APPD.	DATE	REVISION
1	11.08.13						
MATERIAL							
WEIGHT							

6301-G20-N-00

A3

REV. 1.01

Shaft Mounted Speed Reducer



BELT DRIVES - 1440 Rev/Min Motor

D 5 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
51	5.62	112	630	1SPA*
54	5.26	95	500	2SPZ
60	4.77	132	630	1SPA*
64	4.46	112	500	1SPA*
67	4.24	118	500	1SPA*
75	3.79	132	500	1SPA*
82	3.50	90	315	3SPZ
86	3.32	95	315	3SPZ
91	3.15	100	315	2SPA
101	2.81	112	315	2SPZ
107	2.67	150	400	1SPA*
113	2.52	125	315	2SPZ
120	2.39	132	315	2SPA
128	2.23	112	250	2SPA
136	2.12	118	250	2SPA
143	2.00	100	200	3SPZ
151	1.89	106	200	3SPA
159	1.80	100	180	3SPZ
163	1.75	180	315	1SPA*
171	1.67	150	250	2SPA
178	1.61	112	180	3SPZ
181	1.57	200	315	1SPA*
187	1.53	118	180	2SPA
190	1.50	100	150	3SPA
200	1.43	112	160	3SPZ
204	1.40	100	140	3SPA
209	1.36	132	180	2SPA
216	1.32	106	140	3SPA
222	1.29	140	180	2SPA
228	1.25	112	140	3SPZ
235	1.21	132	160	2SPA
242	1.18	106	125	3SPA
250	1.14	140	160	2SPA
255	1.12	100	112	4SPZ
266	1.07	140	150	2SPA
269	1.06	118	125	3SPA
285	1.00	140	140	2SPA
301	1.05	118	112	3SPA
306	1.07	150	140	2SPA
317	1.11	100	90	5SPZ
324	1.14	150	132	3SPA
337	1.18	200	170	2SPB
342	1.20	180	150	2SPA
346	1.21	160	132	3SPA
356	1.25	250	200	1SPA*
365	1.28	160	125	3SPZ
375	1.32	125	95	5SPZ
380	1.33	200	150	2SPA
387	1.36	160	118	3SPA
398	1.39	125	90	5SPZ

E 5 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
51	5.56	90	500	3SPZ
54	5.26	95	500	3SPZ
60	4.77	132	630	2SPA
63	4.50	140	630	1SPA*
68	4.20	150	630	1SPA*
73	3.94	160	630	1SPA*
80	3.57	112	400	2SPA
84	3.39	118	400	2SPA
89	3.20	125	400	2SPA
96	2.97	106	315	3SPA
101	2.81	112	315	3SPZ
107	2.67	150	400	2SPA
113	2.52	125	315	3SPZ
120	2.39	132	315	2SPA
127	2.25	140	315	2SPA
136	2.11	95	200	5SPZ
143	2.00	100	200	4SPA
151	1.89	95	180	5SPZ
160	1.79	112	200	4SPZ
168	1.70	106	180	4SPA
173	1.66	170	280	2SPB
178	1.60	125	200	3SPA
183	1.56	160	250	2SPA
189	1.51	106	160	4SPA
198	1.44	125	180	4SPZ
204	1.40	160	224	2SPB
209	1.36	132	180	3SPA
214	1.33	150	200	3SPA
223	1.28	125	160	3SPA
228	1.25	200	250	2SPA
235	1.21	132	160	3SPA
240	1.19	118	140	4SPA
250	1.14	140	160	4SPZ
254	1.12	160	180	2SPB
257	1.11	180	200	2SPA
266	1.07	140	150	3SPA
270	1.06	125	132	4SPA
285	1.00	125	125	5SPZ
301	1.05	118	112	5SPA
304	1.07	160	150	3SPA
317	1.11	200	180	2SPA
324	1.14	160	132	4SPA
336	1.18	200	170	2SPB
342	1.20	180	150	2SPA
356	1.25	212	170	2SPB
365	1.28	160	125	5SPZ
376	1.32	224	170	2SPB
380	1.33	200	150	3SPA
387	1.36	160	118	4SPA
396	1.39	250	180	2SPA

For other speeds - CONSULT FENNER

*Whilst one belt is adequate for power transmission, two belts can be used without overloading the gearbox bearings.

Shaft Mounted Speed Reducer



BELT DRIVES - 1440 Rev/Min Motor

F 5 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
50	5.71	140	800	3SPZ
57	5.00	100	500	3SPA
61	4.72	106	500	3SPA
68	4.21	95	400	5SPZ
73	3.94	160	630	2SPA
77	3.71	170	630	2SPB
82	3.50	180	630	2SPB
86	3.32	95	315	6SPZ
91	3.15	100	315	5SPZ
97	2.94	170	500	2SPB
103	2.78	180	500	2SPA
108	2.63	190	500	2SPB
113	2.62	125	315	4SPZ
121	2.35	170	400	2SPB
127	2.25	140	315	4SPZ
135	2.12	118	250	4SPA
143	2.00	125	250	5SPZ
151	1.89	132	250	4SPA
160	1.79	140	250	5SPZ
168	1.69	118	200	5SPA
173	1.65	170	280	2SPB
178	1.60	125	200	4SPA
181	1.56	160	250	2SPB
187	1.53	118	180	5SPA
192	1.49	212	315	2SPB
200	1.43	140	200	5SPZ
205	1.39	180	250	2SPB
215	1.32	160	212	3SPB
222	1.29	140	180	4SPA
226	1.26	250	315	2SPB
235	1.21	132	160	5SPA
242	1.18	190	224	2SPB
250	1.14	140	180	6SPZ
255	1.12	200	224	2SPB
267	1.07	150	160	4SPA
271	1.05	224	236	2SPB
285	1.00	224	224	2SPB
301	1.06	224	212	2SPB
304	1.07	180	150	4SPA
317	1.11	200	180	3SPA
324	1.14	150	132	5SPA
336	1.18	200	170	3SPB
342	1.20	180	150	4SPA
356	1.25	212	170	3SPB
360	1.26	315	250	2SPB
365	1.28	160	125	6SPA
376	1.32	224	170	3SPB
380	1.33	200	150	4SPA
387	1.36	180	118	6SPA
396	1.39	250	180	3SPA

G 5 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
51	5.62	112	630	3SPA
54	5.26	95	500	5SPZ
60	4.77	132	630	3SPA
63	4.50	140	630	4SPZ
67	4.24	118	500	4SPA
71	4.00	125	500	5SPZ
77	3.71	170	630	2SPB
84	3.39	118	400	5SPA
89	3.20	125	400	6SPZ
94	3.03	132	400	4SPA
101	2.81	224	630	2SPB
107	2.67	150	400	4SPA
114	2.50	160	400	2SPB
121	2.36	212	500	2SPB
127	2.25	140	315	5SPA
136	2.10	150	315	5SPA
143	2.00	200	400	3SPA
151	1.89	212	400	3SPB
160	1.79	140	250	6SPA
163	1.75	180	315	3SPB
168	1.69	236	400	2SPB
172	1.66	190	315	3SPB
178	1.60	250	400	2SPB
183	1.56	180	280	3SPB
190	1.50	236	355	3SPB
192	1.49	212	315	3SPB
200	1.43	140	200	6SPA
206	1.39	170	236	4SPB
214	1.33	150	200	6SPA
225	1.27	280	355	2SPB
228	1.25	200	250	3SPB
238	1.20	250	300	3SPC
242	1.18	200	236	3SPB
252	1.13	265	300	3SPC
256	1.11	212	236	3SPB
266	1.07	280	300	3SPC
270	1.06	212	224	3SPB
285	1.00	224	224	3SPB
301	1.05	236	224	3SPB
306	1.07	300	280	3SPC
317	1.11	200	180	4SPB
322	1.13	355	315	2SPB
336	1.18	200	170	5SPB
341	1.20	335	280	3SPC
355	1.24	224	180	4SPB
359	1.26	315	250	2SPB
374	1.31	236	180	4SPB
381	1.33	315	236	3SPB
396	1.39	250	180	5SPA
399	1.40	224	160	5SPB

For other speeds - CONSULT FENNER

Shaft Mounted Speed Reducer



BELT DRIVES - 1440 Rev/Min Motor

E 13 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
11	9.40	67	630	3SPZ
13	8.40	75	630	2SPZ
14	7.46	67	500	2SPZ
16	6.67	75	500	2SPZ
18	5.97	67	400	2SPZ
19	5.63	71	400	2SPZ
21	5.00	100	500	1SPA*
24	4.44	71	315	2SPZ
25	4.20	75	315	2SPZ
26	4.00	100	400	1SPA*
28	3.77	106	400	1SPA*
31	3.39	118	400	1SPA*
33	3.20	125	400	1SPA*
35	3.03	132	400	1SPA*
36	2.94	85	250	2SPZ
38	2.78	90	250	2SPZ
40	2.63	95	250	2SPZ
42	2.52	125	315	1SPA*
44	2.39	132	315	1SPA*
45	2.35	85	200	3SPZ
47	2.25	80	180	3SPZ
50	2.12	85	180	3SPZ
53	2.00	100	200	2SPA
55	1.89	95	180	3SPZ
56	1.89	108	200	2SPA
59	1.79	112	200	2SPA
60	1.75	180	315	1SPA*
62	1.70	108	180	2SPA
65	1.61	112	180	2SPA
66	1.60	100	160	3SPZ
69	1.53	118	180	2SPA
71	1.50	100	150	3SPA
73	1.44	125	180	3SPA
74	1.43	140	200	2SPA
76	1.39	180	250	2SPA
78	1.36	132	180	2SPA
79	1.34	112	150	3SPA
80	1.32	100	132	3SPA
82	1.29	140	180	2SPA
83	1.28	125	160	2SPA
85	1.25	200	250	1SPA*
87	1.21	132	160	2SPA
88	1.18	112	132	3SPA
90	1.18	170	200	2SPB
93	1.14	140	160	2SPA
95	1.12	125	140	3SPZ
99	1.07	140	150	2SPA
100	1.06	100	106	4SPA
101	1.05	95	100	5SPZ
106	1.00	112	112	4SPZ

E 20 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
10	7.04	71	500	2SPZ
11	6.25	80	500	2SPZ
12	5.97	67	400	1SPZ*
13	5.63	71	400	1SPZ*
14	5.00	80	400	1SPZ*
15	4.71	85	400	1SPZ*
16	4.44	90	400	1SPZ*
17	4.21	95	400	1SPZ*
18	4.00	100	400	1SPZ*
19	3.71	85	315	1SPZ*
20	3.52	71	250	2SPZ
21	3.32	95	315	1SPZ*
22	3.15	100	315	1SPZ*
23	3.12	80	250	2SPZ
24	2.99	67	200	2SPZ
25	2.82	71	200	2SPZ
26	2.67	75	200	2SPZ
28	2.54	71	180	2SPZ
29	2.40	75	180	2SPZ
30	2.35	65	200	2SPZ
31	2.25	80	180	2SPZ
33	2.13	75	160	3SPZ
34	2.09	67	140	3SPZ
35	2.00	80	160	2SPZ
37	1.88	85	160	2SPZ
38	1.87	67	125	3SPZ
39	1.79	112	200	1SPA*
40	1.75	180	315	1SPA*
42	1.69	118	200	1SPA*
43	1.65	85	140	3SPZ
44	1.60	125	200	1SPA*
45	1.56	160	250	1SPA*
46	1.53	118	180	2SPA
47	1.52	132	200	1SPA*
48	1.47	95	140	2SPZ
49	1.44	125	180	1SPA*
50	1.40	100	140	2SPZ
52	1.36	132	180	1SPA*
53	1.33	150	200	1SPA*
54	1.32	95	125	3SPZ
55	1.27	118	150	2SPA
56	1.25	100	125	2SPA
58	1.21	132	160	2SPA
59	1.20	150	180	1SPA*
60	1.18	106	125	2SPA
62	1.14	140	160	2SPZ
63	1.11	90	100	3SPZ
66	1.07	140	150	2SPA
67	1.06	106	112	2SPA
70	1.00	160	160	1SPA*

For other speeds - CONSULT FENNER

*Whilst one belt is adequate for power transmission, two belts can be used without overloading the gearbox bearings.

Shaft Mounted Speed Reducer



BELT DRIVES - 1440 Rev/Min Motor

F 13 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
10	10.67	75	800	3SPZ
11	9.40	67	630	3SPZ
13	8.40	75	630	3SPZ
14	7.48	67	500	2SPZ
15	7.04	71	500	2SPZ
17	6.30	100	630	1SPA*
19	5.60	112	630	1SPA*
21	5.04	125	630	1SPA*
24	4.44	90	400	2SPZ
25	4.24	118	500	1SPA*
26	4.00	125	500	1SPA*
28	3.79	132	500	1SPA*
30	3.57	140	500	1SPA*
32	3.33	150	500	1SPA*
34	3.15	100	315	2SPA
36	2.97	106	315	2SPA
38	2.81	112	315	2SPA
39	2.67	118	315	2SPA
40	2.63	190	500	2SPB
42	2.50	100	250	3SPZ
45	2.38	106	250	3SPA
47	2.25	140	315	2SPZ
48	2.22	180	400	1SPZ
50	2.12	118	250	2SPA
53	2.00	100	200	3SPA
55	1.89	132	250	2SPA
56	1.89	108	200	3SPA
58	1.80	100	180	4SPZ
60	1.75	180	315	2SPA
63	1.68	95	160	5SPZ
66	1.61	112	180	3SPA
68	1.56	160	250	2SPA
69	1.53	118	180	3SPA
71	1.50	100	150	4SPA
74	1.44	125	180	4SPZ
76	1.40	100	140	5SPZ
78	1.38	132	180	3SPA
80	1.32	160	212	2SPB
81	1.32	170	224	2SPB
83	1.28	125	160	3SPA
85	1.25	160	200	2SPA
88	1.21	132	160	3SPA
89	1.19	118	140	4SPA
90	1.18	170	200	2SPB
93	1.14	132	150	3SPA
95	1.12	118	132	4SPA
99	1.06	160	170	2SPB
100	1.06	118	125	4SPA
106	1.00	140	140	4SPZ
112	1.06	170	160	2SPB

For other speeds - CONSULT FENNER

F 20 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
10	7.04	71	500	2SPZ
11	6.67	75	500	2SPZ
12	5.97	67	400	2SPZ
13	5.63	71	400	2SPZ
14	5.00	80	400	2SPZ
15	4.70	67	315	2SPZ
16	4.44	71	315	2SPZ
17	4.20	75	315	2SPZ
18	4.00	100	400	1SPA*
19	3.77	106	400	1SPA*
20	3.57	112	400	1SPA*
21	3.39	118	400	1SPA*
22	3.20	125	400	1SPZ*
23	3.03	132	400	1SPA*
24	2.94	85	250	2SPZ
25	2.86	140	400	1SPZ*
26	2.67	118	315	1SPA
27	2.63	95	250	2SPZ
28	2.50	80	200	3SPZ
29	2.40	75	180	3SPZ
30	2.39	132	315	1SPA*
31	2.25	80	180	3SPZ
33	2.17	85	180	3SPZ
35	2.00	100	200	2SPA
36	1.97	160	315	1SPA*
37	1.88	85	160	3SPZ
39	1.79	112	200	2SPZ
40	1.75	80	140	4SPZ
42	1.70	106	180	2SPA
43	1.65	85	140	4SPZ
44	1.60	125	200	2SPZ
45	1.56	160	250	1SPA*
46	1.53	118	180	2SPA
47	1.50	100	150	3SPA
48	1.48	160	238	2SPB
49	1.43	112	160	2SPA
50	1.40	100	140	3SPZ
51	1.39	180	250	1SPA*
52	1.36	118	160	2SPA
53	1.32	100	132	3SPA
55	1.29	140	180	2SPZ
56	1.25	100	125	3SPA
58	1.21	132	160	2SPA
59	1.20	125	150	2SPA
60	1.18	106	125	3SPA
62	1.14	132	150	2SPA
63	1.11	106	118	3SPA
66	1.06	132	140	2SPA
67	1.05	112	118	3SPA
70	1.00	200	200	2SPA

*Whilst one belt is adequate for power transmission, two belts can be used without overloading the gearbox bearings.

Shaft Mounted Speed Reducer



BELT DRIVES - 1440 Rev/Min Motor

G 13 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
11	9.40	67	630	3SPZ
12	8.87	71	630	3SPZ
13	8.40	75	630	3SPZ
14	7.41	85	630	3SPZ
15	7.04	71	500	3SPZ
16	6.63	95	630	3SPZ
17	6.30	100	630	2SPA
18	5.88	85	500	3SPZ
19	5.62	112	630	3SPZ
20	5.28	95	500	3SPZ
21	5.00	80	400	3SPZ
22	4.77	132	630	2SPA
23	4.72	106	500	2SPA
24	4.48	112	500	2SPZ
25	4.21	95	400	3SPZ
27	4.00	125	500	2SPZ
28	3.77	106	400	2SPA
30	3.57	140	500	2SPZ
31	3.39	118	400	2SPA
33	3.20	125	400	2SPA
34	2.15	100	315	3SPA
36	2.97	106	315	3SPA
38	2.81	112	315	3SPZ
40	2.63	95	250	5SPZ
42	2.50	100	250	4SPZ
44	2.39	132	315	2SPA
45	2.36	106	250	3SPA
47	2.25	140	315	2SPA
50	2.11	95	200	5SPZ
53	2.00	100	200	4SPA
56	1.89	132	250	3SPA
57	1.85	170	315	2SPB
59	1.79	140	250	4SPZ
61	1.75	180	315	2SPA
63	1.69	118	200	4SPA
64	1.65	170	280	2SPB
66	1.60	125	200	5SPZ
70	1.53	118	180	4SPA
72	1.48	160	236	2SPB
74	1.43	140	200	3SPA
76	1.39	170	236	2SPB
80	1.33	150	200	3SPA
83	1.27	118	150	5SPA
85	1.24	180	224	2SPB
87	1.21	132	160	4SPA
90	1.18	180	212	2SPB
93	1.14	140	160	4SPA
95	1.11	180	200	3SPA
100	1.06	212	224	2SPB

G 20 : 1

Output Speed Rev/Min	Pulley Ratio	Pulley Dia (mm)		Number of Belts
		Motor	Gearbox	
10	7.04	71	500	2SPZ
11	6.25	80	500	2SPZ
12	5.97	67	400	3SPZ
13	5.33	75	400	3SPZ
14	5.00	80	400	2SPZ
15	4.71	85	400	2SPZ
16	4.44	90	400	2SPZ
17	4.21	95	400	2SPZ
18	4.00	100	400	2SPZ
19	3.71	85	315	32SPZ
20	3.57	112	400	2SPZ
21	3.33	150	500	2SPA
22	3.20	125	400	2SPZ
23	3.03	132	400	2SPA
24	2.94	85	250	3SPZ
25	2.78	90	250	3SPZ
26	2.67	150	400	1SPA*
27	2.63	95	250	3SPZ
28	2.52	125	315	2SPZ
30	2.36	106	250	3SPA
31	2.25	140	315	2SPZ
32	2.23	112	250	2SPA
33	2.12	118	250	2SPA
34	2.10	150	315	2SPA
35	2.00	100	200	3SPA
36	1.97	160	315	2SPA
37	1.89	95	180	4SPZ
39	1.80	100	180	4SPZ
40	1.75	180	315	2SPA
41	1.70	106	180	3SPA
42	1.67	150	250	2SPA
44	1.60	125	200	3SPZ
45	1.56	160	250	2SPA
47	1.50	100	150	4SPA
48	1.47	95	140	5SPZ
49	1.43	112	160	4SPZ
50	1.40	100	140	4SPA
51	1.39	180	250	2SPA
52	1.36	118	160	3SPA
53	1.33	150	200	2SPA
55	1.28	125	160	3SPA
56	1.25	160	140	2SPA
58	1.21	132	250	3SPA
59	1.20	125	160	3SPA
60	1.18	170	200	2SPB
62	1.14	132	150	3SPA
63	1.11	180	200	2SPA
66	1.07	140	150	3SPA
67	1.06	190	200	2SPB
70	1.00	180	180	2SPB

For other speeds - CONSULT FENNER

*When one belt is adequate for power transmission, two belts can be used without overloading the gearbox bearings.

Shaft Mounted Speed Reducer

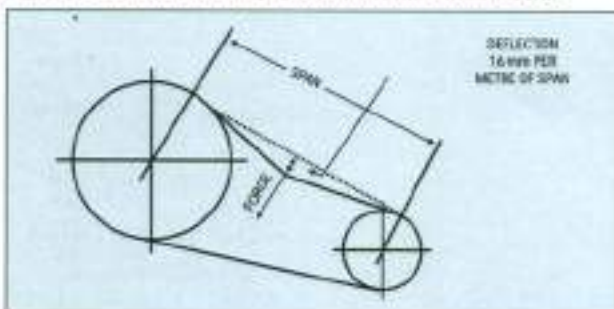
INSTALLATION & OPERATION OF BELT DRIVES USING FENNER BELT TENSION INDICATOR

Always use a matched set of belts.

Clean any oil and grease from pulleys; remove any rust or burrs from the grooves.

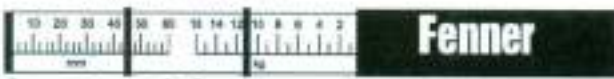
Reduce the centre distance until the belts can be put into the pulley grooves without forcing. See table for installation allowance. Make sure the pulleys are correctly aligned and that the shafts are parallel.

Place the belts into the pulley grooves and tension the drive.



FENNER BELT TENSION INDICATOR

The high performance and efficiency of Fenner Precision Built Wedge Belts require correct tension. We recommend using the Fenner Belt Tension Indicator.



METHOD OF BELT TENSIONING

1. Calculate the deflection distance in mm on a basis of 16mm per metre of span.
Centre Distance (m) x 16 = Deflection (mm).
2. Set the lower marker ring at the deflection distance required in mm on the lower scale.
3. Set the upper marker ring against the bottom edge of the tube.
4. Place the Belt Tension Indicator on top of the belt at the centre of span and apply a force at right angles to the belt deflecting it to the point where the lower marker ring is level with the top of the adjacent belt*.
5. Read off the force value indicated by the top edge of the upper marker ring.
6. Compare this force to the kgf value shown in the table opposite.
7. If a Fenner Belt Tension Indicator is not available, a spring balance and rule will suffice.

*Note: For single belt drives a straight edge should be placed across the two pulleys to act as a datum for measuring the amount of deflection.

If the measured force falls within the values given, the drive should be satisfactory. A measured force below the lower value indicates under-tensioning.

A new drive should be tensioned to the higher value to allow for the normal drop in tension during the running-in period. After the drive has been running for 30 minutes, the tension should be checked and re-adjusted to the higher value, if necessary.

INSTALLATION AND TAKE-UP ALLOWANCE TABLE

Belt Pitch Length	Installation Allowance				Take-up Allowance
	SPZ	SPA	SPB	SPC	
850 to 1180					15
1170 to 1500	20				20
1510 to 1830					25
1840 to 2170					30
2180 to 2830					40
2840 to 3500		25			50
3520 to 4180			30	50	60
4170 to 5140					70
5220 to 6150					85
6180 to 7420					105
7600 to 8390					125

All dimensions are in millimetres.

STORAGE

V-Belts should be stored in a dry stockroom, and contact with hot pipes and direct sunlight carefully avoided.

Where possible, handle the belts loosely in single (or triple) coils. Always avoid tying them tightly with thin string.

GUARDS

Where guards are necessary it is desirable to use the wire mesh type to permit adequate ventilation.

ONE SHOT TENSIONING

Fenner PB Belts are built right from the start to ensure totally precise inherent length, to stay matched during storage and on the drive. Now, after extensive field tests, our claim of genuine "one-shot" tensioning has been endorsed by satisfied customers all over the world on all belt sections.

Simply put the belts around the pulleys, set them to the appropriate tension value stated in the Tension Forces Table (using the Belt Tension Indicator as shown), run the drive under load for 30 minutes, stop the drive, check the tension, re-setting to catalogue value if necessary. On a properly designed drive for the application there will be no need for any further attention during the life of the drive.

POLY-F PLUS PB

TENSIONING FORCES

Belt Section	Force required to deflect belt 16mm per metre of span		
	Small Pulley Diameter (mm)	Newton (N)	Kilogramforce (kgf)
SPZ	56 to 95	10 to 15	1.0 to 1.5
	100 to 140	15 to 20	1.5 to 2.0
SPA	90 to 132	20 to 27	2.0 to 2.7
	140 to 200	28 to 35	2.8 to 3.5
SPB	160 to 224	35 to 50	3.5 to 5.1
	236 to 315	50 to 65	5.1 to 6.6
SPC	224 to 355	60 to 90	6.1 to 9.2
	375 to 560	90 to 120	9.2 to 12.2

Shaft Mounted Speed Reducer



LUBRICATION

IMPORTANT

The Shaft Mounted Speed Reducers are despatched without oil. They must be filled as instructed before running. Use high grade oil as shown on lubrication chart supplied attached to breather plug or alternative* grades stated below. Fill to level plug when Reducer is not running. Drain, flush and refill every six months of operation. Check oil level regularly. Positions of filler, breather and drain plug for different mounting positions are shown in Fig.4.

Normal operating positions are shown in Fig.4. Note that the Reducer is supplied with four plugs. After the Reducer has been mounted in its running position the

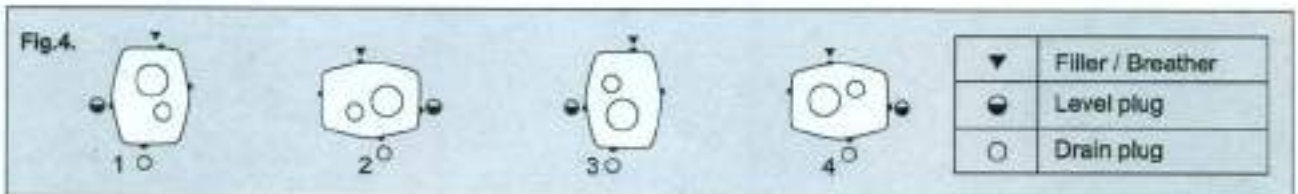
plugs must be located as shown in Fig.4 for the appropriate mounting position.

If the Reducer is not within 20° of one of the positions shown, the oil level plug cannot be safely used to check the oil level. This can be overcome by disconnecting the torque-arm and swinging the Reducer around to one of the positions shown.

Because of the many positions of the Reducer it may be necessary or desirable to make special adaptations using the plug holes in the Reducer with standard pipe fittings or oil level gauges.

CAUTION

Too much oil will cause over-heating. Too little oil will cause gear failure.



RECOMMENDED LUBRICANTS

	Ambient Temp °C	13 : 1 and 20 : 1 RATIO GEARBOXES			5 : 1 RATIO GEARBOX			
		0 - 20 rev / min	21 - 50 rev / min	51 - 120 rev / min	0 - 100 rev / min	101 - 200 rev / min	201 - 400 rev / min	
		BCDEFGHJ	BCDEFGHJ	BCDEFGHJ	BCDEFGHJ	BCDEFGHJ	BC	DEFGHJ
Bharat Petroleum (Amocam)	- 10 to + 5	220	220	150	100	100	100	68
	6 to 25	460	460	320	460	320	320	220
	26 to 40	680	680	680	800	680	680	460
Indian Oil (Servomesh)	- 10 to + 5	SP 68	SP 68	SP 68	SP 100	SP 100	SP 100	SP 68
	6 to 25	SP 220	SP 150	SP 100	SP 460	SP 320	SP 320	SP 220
	26 to 40	SP 460	SP 320	SP 320	SP 800	SP 680	SP 680	SP 460

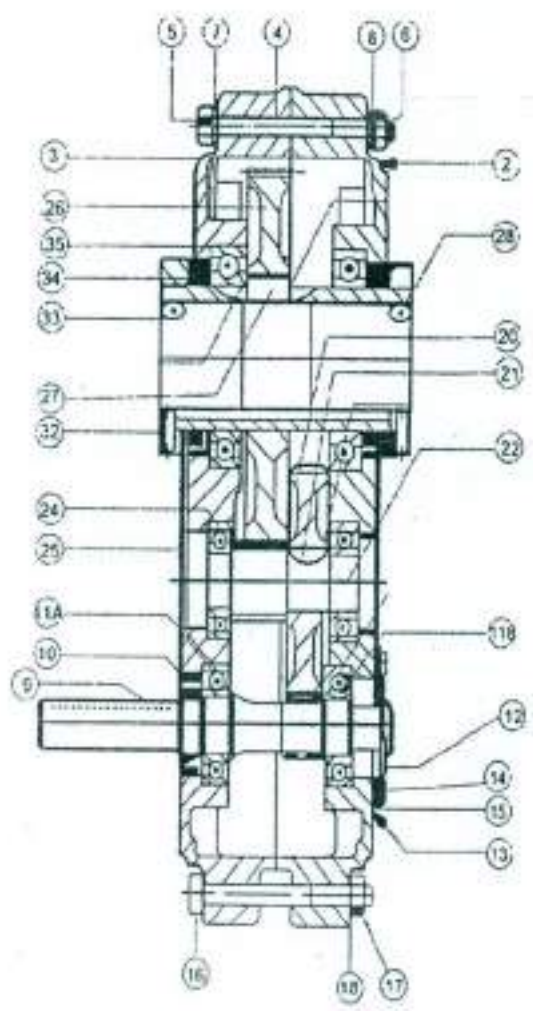
OIL QUANTITIES (Litres)

Unit size	Approximate Capacity - Litres							
	Mounting Position							
	20 : 1 & 13 : 1				5 : 1			
	1	2	3	4	1	2	3	4
B	0.3	0.5	0.4	0.5	0.4	0.4	0.4	0.5
C	0.5	0.7	0.6	0.7	0.6	0.7	0.6	0.8
D	0.8	1.5	1.2	1.3	1.0	1.4	1.2	1.5
E	1.7	2.0	1.8	1.6	1.9	2.0	1.8	1.9
F	2.3	2.5	2.5	2.5	2.6	2.5	2.5	2.6
G	3.0	4.3	3.4	3.9	3.3	4.1	3.3	4.6
H	4.5	7.0	5.0	6.8	4.8	7.1	5.0	7.1
J	7.5	14.0	11.0	13.0	9.3	18.0	12.0	18.0

Capacities shown are approximate

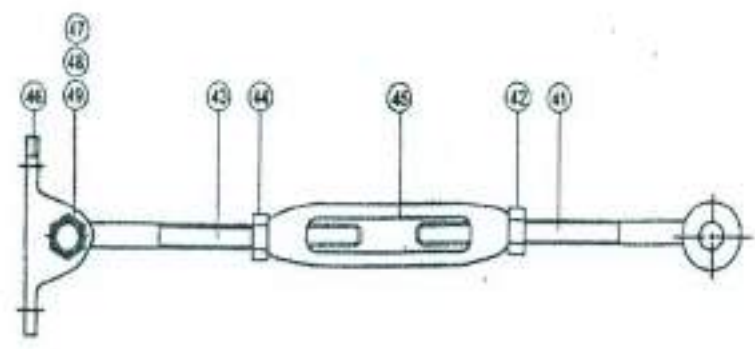


PARTS IDENTIFICATION



When ordering parts for reducer, please specify :

1. Reducer Size No.
2. Part Name
3. Quantity





INDIVIDUAL PARTS

Ref. No.	DESCRIPTION	Nos. Reqd.
2	Case RH	1
3	Case LH	1
4	Hollow Dowel	2
5	Case Bolt	6
6	Case Nut	6
7	Case Plain Washer	4
8	Case Lock Washer	6
9	Input Shaft & Pinion (13:1)	1
9	Input Shaft & Pinion (20:1)	1
9	Input Shaft & Pinion (5:1)	1
10	Input Shaft Oil Seal (13:1 - 20:1)	1
11A	Input Shaft Brg. - Shaft Side 13:1	1
11B	Input Shaft Brg. - B Stop Side 13:1	1
11A	Input Shaft Brg. - Shaft Side 20:1	1
11B	Input Shaft Brg. - Stop Side 20:1	1
11A	Input Shaft Brg. - Shaft Side 05:1	1●
11B	Input Shaft Brg. - B Stop Side 05:1	1●
12	Backstop Cover	1
13	Backstop Cover Gasket	1
14	Backstop Cover Lockwasher	3
15	Backstop Cover Lockwasher	3
16	Torque-Arm Case Bolt	1
17	Torque-Arm Case Bolt Lockwasher	1
18	Torque-Arm Case Bolt Lockwasher	1
20	1st Reduction Gear (13:1) only	1★
20	1st Reduction Gear (20:1) only	1★
21	1st Reduction Gear Key	1★
22	Intermediate Pinion (13.1& 20:1)	1★
24	Intermediate Bearing	2★
25	Intermediate Cover	2
26	2nd Reduction Gear (13:1 & 20:1)	1
	Reduction Gear 5:1)	
27	Gear Key	1
28	Input Hub (Standard Bore)	1
28	Output Hub (Alternative Metric Bore)	1
32	Collar Screw (Std.) Over Key	2
33	Collar Screw (Std.) Over Shaft	4
32	Collar Screw (Alt.) Over key	2
33	Collar Screw (Alt.) Over Shaft	4
34	Output Hub Oilseal	2
35	Output Hub Bearing	2
36	Pipe Plug not shown	3
38	Breather Plug Adapter	
41	Torque-Arm Rod End	1
42	Rod End Locknut	1
43	Torque-Arm Extension	1
44	Extension Locknut	1
45	Turn-buckle	1
46	Fulcrum	1
47	Fulcrum Bolt	1
48	Fulcrum Bolt Nut	1
49	Fulcrum Bolt Lockwasher	1

Note: (●) Not required for 5:1 ratio gear units.

(★) For 5:1 units fitted with a backstop input shaft bearing are as ref. No. 24

Shaft Mounted Speed Reducer



REPLACEMENT OF PARTS

REMOVING REDUCER FROM SHAFT

Loosen screws in both output hub collars. Remove the collar next to end of shaft, turn the collar and replace with the flush side outwards. Replace and tighten screws fully and then slacken off slightly in order to have maximum engagement in the hub but not gripping the shaft. Using any suitable three legged hub drawer engage the feet recesses of the collar and remove the gearbox by screwing down on the shaft.

IMPORTANT

Using tools normally found in the maintenance department, the Reducer can be dismantled and reassembled. Cleanliness is very important to prevent the introduction of dirt into the bearings and other parts of the Reducer. A tank of clean solvent, an arbor press and equipment for heating bearings and gears should be available for shrinking these parts on the shafts.

Rubbing type oilseals are fitted and great care should be taken during dismantling and reassembling to avoid damage to the rubbing surfaces.

The keyseat in the input shaft should be covered with cellotape or other suitable material. Any burrs on shaft or hub surfaces should be carefully removed before fitting seals.

We are prepared to repair reducers for customers who do not have proper facilities or who do for any reason desire factory service. An estimate of the cost will be sent after examination and before the repair is begun.

ORDERING PARTS

When ordering parts for a Reducer, specify reducer size, serial number, part name, code number, and quantity required.

It is strongly recommended that when a pinion or gear is replaced, the mating gear or pinion be replaced also. If the large gear on the output hub must be replaced, it is recommended that an output hub assembly of a gear assembled on a hub be ordered to secure undamaged surfaces on the outer hub where the oilseals rub.

However, if it is desired to use the old output hub, press the gear and bearing off and examine the rubbing surfaces under the oilseal carefully for possible scratching or other damage resulting from the pressing operation. To prevent oil leakage at the shaft oilseals, the smooth surface of the output hub must not be damaged.

If any part must be pressed from a shaft or from the output hub, this should be done before ordering parts to make sure that none of the bearings or other parts are damaged on removal. Do not press against the outer race of any bearing.

Because old shaft oilseals and gaskets may be damaged in dismantling, it is advisable to order replacements for these parts.

BOLT TIGHTENING TORQUES

Reducer Size	B	C&D	E	F&G	H&J
Torque Nm	16	30	50	80	50&80°
Torque lbf ft	12	22	37	59	37&59*

H&J

*Torque-arm case bolts only.

LENGTH

Inches x25.4 = millimetres

Inches x0.0254 = metres

Feet x0.30480 = metres

Yards x0.91440 = metres

FORCE

Kilogramforce (kgf) x 9.81 = Newtons (N)

Poundsforce (lbf) x 4.45 = Newtons (N)

Note: The kilopond (kp) is an alternative name for the kilogramforce (kgf)

TORQUE

Kilogramforce metre (kgfm)x9.81 =Newton metre (Nm)

Pounds feet (lbf ft) x1.36 =Newton metre (Nm)

Pounds inches (lbf in) x0.113 =Newton metre (Nm)

POWER

Horse power (hp) x0.746 = kilowatt (kW)

Cheval-vapeur (CV) x0.735 = kilowatt (kW)

Pferdestärke (PS) x0.735 = kilowatt (kW)

TORQUE AND POWER EQUIVALENTS

The kilowatt (kW) is the common unit of mechanical power, i.e. the rate of doing work.

Torque is a turning moment or twisting effort and is expressed in Newton metres (Nm)

$$kW = \frac{Nm \times rev/min}{9550} \quad Nm \equiv \frac{kW \times 9550}{rev/min}$$

PRESSURE

Poundsforce per square inch (lbf/in²) x0.0689 = bar

Kilonewtons per square metre (kN/m²) x0.01 = bar

Kilogramforce per square centimetre (kgf/cm²)x0.981 = bar

FLUID VOLUME

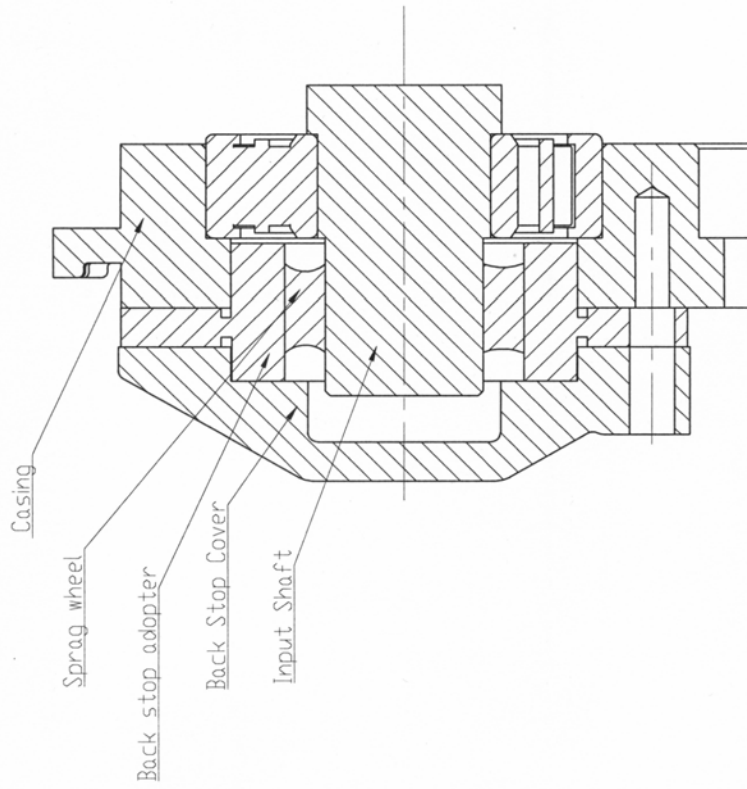
Gallons x 4.55 = litres

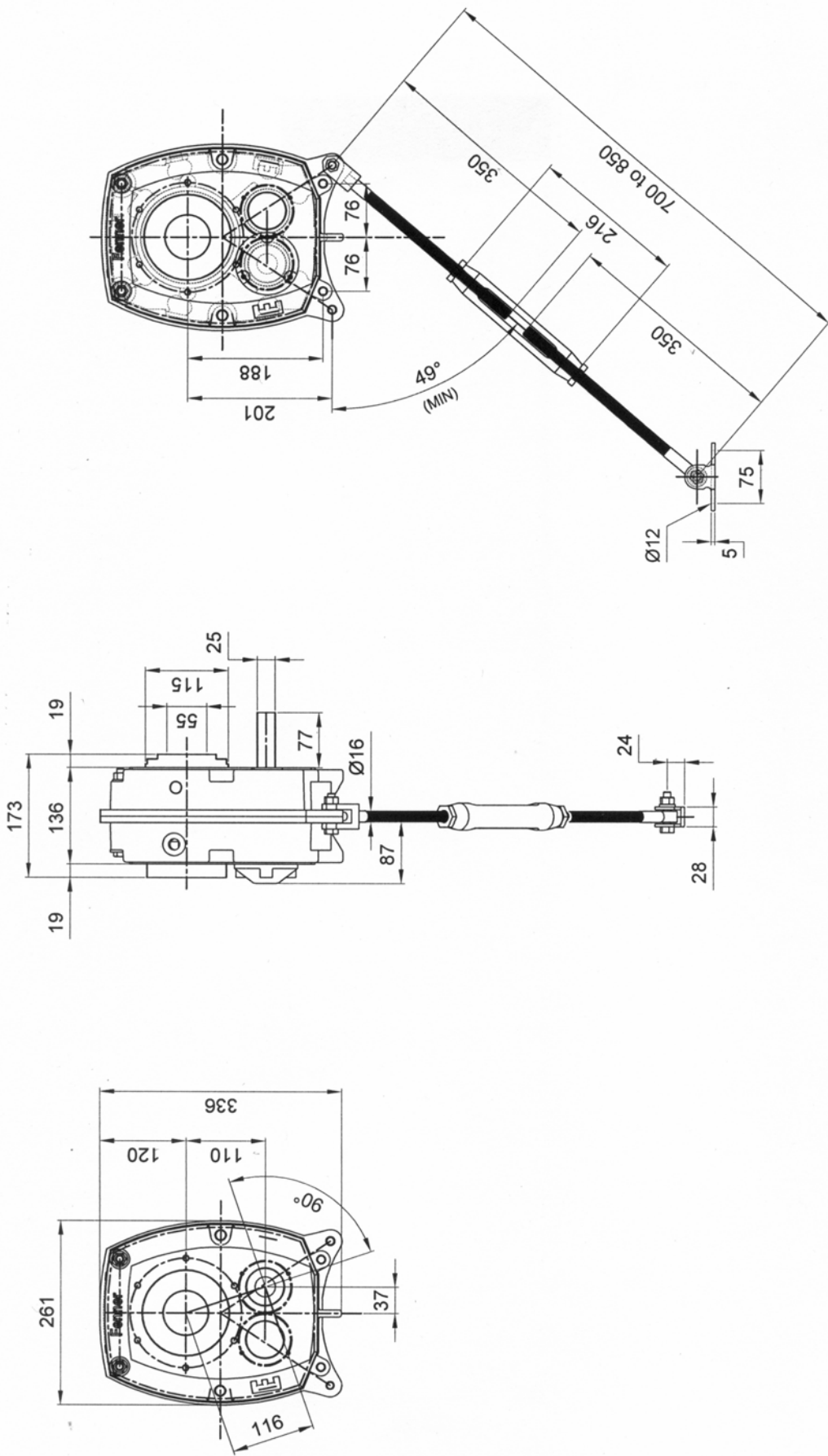
Cubic inches x 0.0164 = litres

Cubic feet x 28.3 = litres

Cubic metres x 1000 = litres

BACK STOP ASSEMBLY FOR E, F & G





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:
FRACTIONS
DECIMALS

BEAR AND
BROCK SHARP
EDGE

DO NOT SCALE DRAWING

REVISION

NAME	SIGNATURE	DATE
DAWN	Sprakash	28/05/12
CHIT		28/05/12
PRV		28/05/12
REG		
DA		

FINISH	DATE

TITLE
Fenner (India) Ltd. Engineering product division

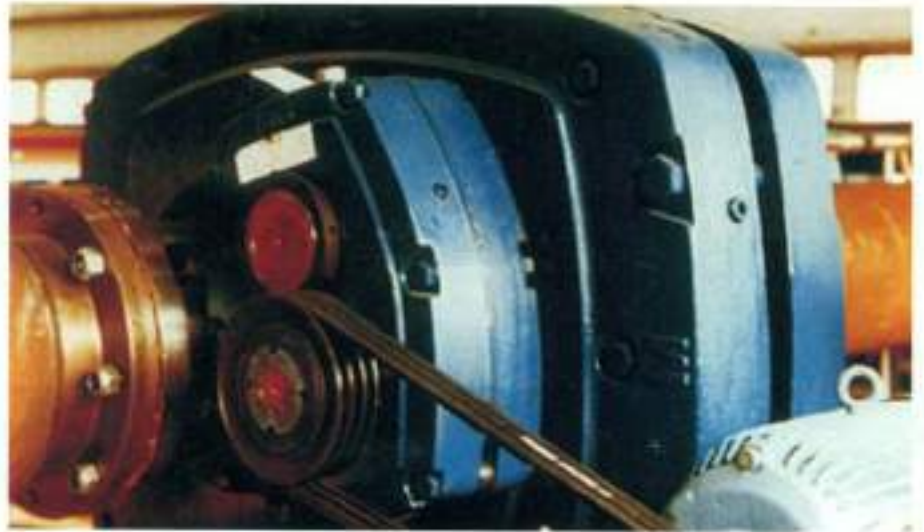
SCALE	WEIGHT
E - PLUS SERIES SMSR	A1



SMSR with motor mount for a Conveyor



Foot Mounted SMSR in a Leather Plant



SMSR in a Tandem Drive



SMSR on a Dough mixer



SMSR in Tandem for a Line Shaft