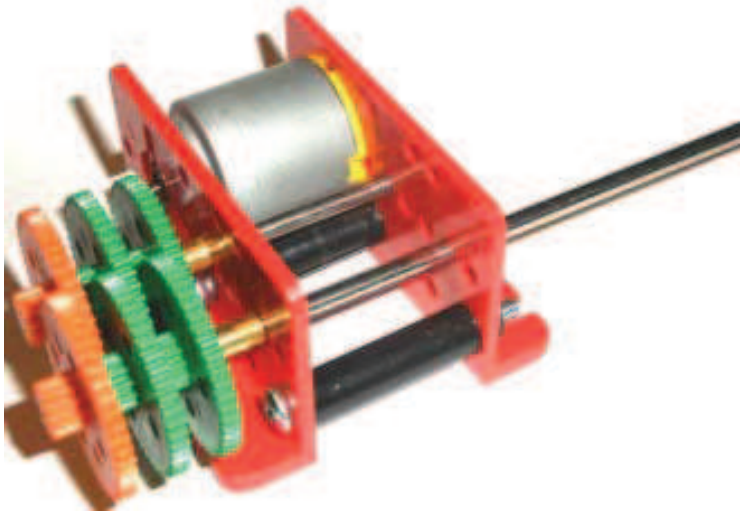
MULTI RATIO GEARBOX - DESIGNED FOR EDUCATIONAL USE

MULTI RATIO GEARBOX. IDEAL FOR CDT (CRAFT, DESIGN AND TECHNOLOGY)



917D KIT FORM (RE 140 MOTOR)
917D/A ASSEMBLED VERSION (RE 140 MOTOR)
920D KIT FORM (RE 280 MOTOR)
920D/A ASSEMBLED VERSION (RE 280 MOTOR)
927D KIT FORM (RE 280/1 MOTOR)
927D/A ASSEMBLED VERSION (RE 280/1 MOTOR)
932D KIT FORM (RE140/1 MOTOR)
932D/A ASSEMBLED VERSION (RE140/1 MOTOR)

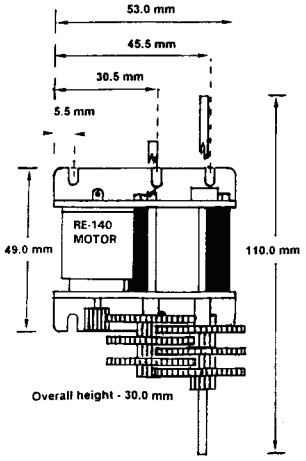
**** PROVIDES 6 DIFFERENT RATIOS AND 18 SPEEDS.* RUGGED AND COMPACT DESIGN AND CONSTRUCTION.* IDEAL FOR MODELS, CDT (CRAFT,DESIGN AND TECHNOLOGY) PROJECTS.* OPERATES FROM 1.5 - 3v (RE140 &, WITH THE HIGHER TORQUE MOTOR,RE280),6 - 9v RE140/1, AND 12 - 24v (RE280/1) D.C.SUPPLIES. * EXTENSIVE RANGE OF ACCESSORIES AVAILABLE.***

The unit operates on 1.5 - 3v (917D & 917D/A, also with higher torque motor 920D & 920D/A), with 6 - 9v (932D & 932D/A), or 12-24v (927D & 927D/A) D.C. power sources, either battery or suitable transformer. Its simple versatile design and sturdy construction make it suitable for a host of uses from powering models and robots to teaching the principles of mechanics. Current consumption depends on eventual load but is within the range 0.2 to 0.8n amps. The output shaft is 3mm diameter.

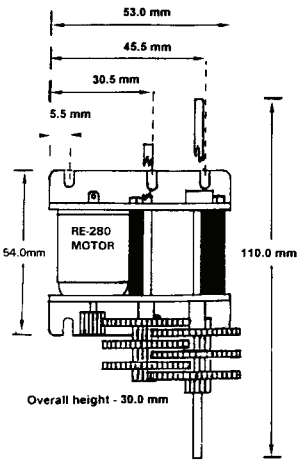
WEIGHT	
917D	54g
920D	76g
927D	76g
932D	54g

GEARBOX DIMENSIONS.

(917D & 932D)



(920D & 927D)



IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

MOTOR DATA. (RE-140 & RE-140/1, RE-280 & RE-280/1)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 140	1.5 - 3.0	3.0v CONSTANT	14800	0.300	11500	1.05	0.152	10.92	1.29	41.03	0.68	49.0
RE - 140/1	6 - 9	6V CONSTANT	9200	0.066	7071	0.219	0.11	8.1	0.589	44.79	0.48	35.1
RE - 280	1.5 - 3.0	1.5v CONSTANT	4600	0.120	3750	0.53	0.160	11.53	0.44	56.20	0.86	62.0
RE - 280	1.5 - 3.0	3.0v CONSTANT	9200	0.155	7800	0.85	0.278	20.00	1.60	62.30	1.81	130.0
RE - 280/1	12 - 24	12V CONSTANT	8400	0.100	6300	0.30	0.347	25.00	1.62	44.87	1.389	100.0

REDUCTION TABLE R.P.M. (917D)

	1.5V	3.0V
4:1	1850	3700
16:1	462	925
64:1	115	231
256:1	29	57
1024:1	7	14
4096:1	2	4

REDUCTION TABLE R.P.M. (920D)

	1.5V	3.0V
4:1	1150	2300
16:1	287	575
64:1	72	144
256:1	18	36
1024:1	4	9
4096:1	1	2

REDUCTION TABLE R.P.M. (927D)

	12V	15V	18V	24V
4:1	2100	2625	3150	4199
16:1	525	656	787	1050
64:1	131	164	196	261
256:1	33	42	50	67
1024:1	8	10	12	16
4096:1	2	2	3	4

REDUCTION TABLE R.P.M. (932D)

	6V	9.0V
4:1	2300	3067
16:1	575	767
64:1	144	192
256:1	36	48
1024:1	9	12
4096:1	2	2.67

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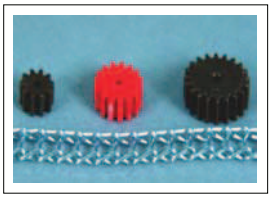
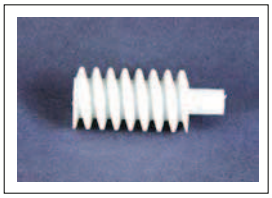
MULTI RATIO GEARBOX

MULTI RATIO GEARBOX ACCESSORIES.
(917D, 917D/A, 920D, 920D/A, 927D, 927D/A, 932D, 932D/A.)

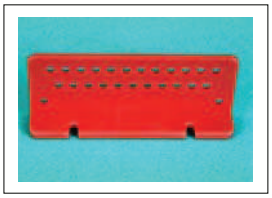


Pt.No.917D2401,2402,2403
2404,2449/1

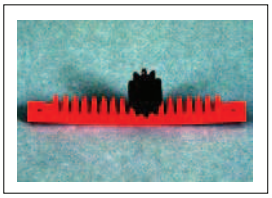
Pt.No.917D2417,2458



Pt.No.917D2420

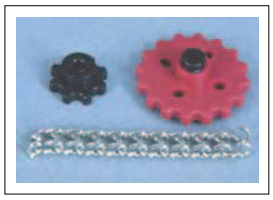


Pt.No. 917D2425

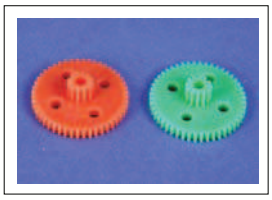


Pt.No. 917D2401
Pt.No. 917D2430
(Set: 917D/1)

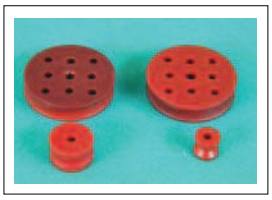
Pt.No. 917D2440



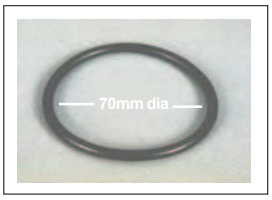
Pt.No.917D2445,2446,2449



Pt.No.917D2452,2456

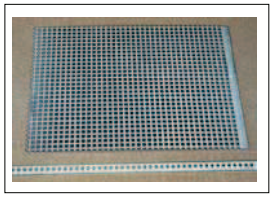


Pt.No.917D2460,2461,2462,2463



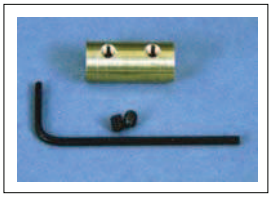
Pt.No.917D2515

Pt.No.917D2501,2502,2504,
2505,2506,2507,2509, 2513

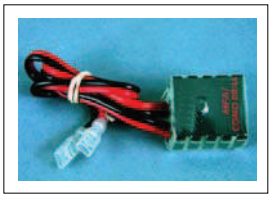


Pt.No.917D2531,2540

Pt.No.917D2551,2553



Pt.No. 917D8



Pt.No.917D9,D10,D11

Part No. 917D8.	Inline Coupling. 3mm - 3mm. (7.9mm x 20mm)
Part No. 917D9.	Voltage regulator. 6-15v DC Input.3v1.5amp output. (31mm x 26mm x 15.5mm)
Part No. 917D10.	Voltage regulator.6-15v DC Input. 1.5v,1.5amp output. (31mm x 26mm x 15.5mm)
Part No. 917D11.	Voltage regulator. 6-15v DC Input. 4.5v,1.5amp output. (31mm x 26mm x 15.5mm)
Part No. 917D2401.	Gear. 10 tooth. 2.9mm bore. (Dia. 11.2mm x 5.8mm)(pkt 10)
Part No. 917D2402	Gear. 15 tooth. 2.9mm bore. (Dia. 16.2mm x 5.8mm)(pkt 10)
Part No. 917D2403.	Gear. 20 tooth. 2.9mm bore. (Dia. 22mm x 6.3mm)(pkt 10)
Part No. 917D2404.	Gear. 40 tooth. 2.9mm bore. (Dia. 41.3mm x 6.3mm)(pkt 10)
Part No. 917D2415.	Stop Rings.(pkt 10)
Part No. 917D2417.	Micro-Switch operating pins. (Dia. 3.9mm/5.7mm x 8mm)(pkt 10)
Part No. 917D2420.	Worm Drive. (Dia. 11.94mm x 32mm)(pkt 10)
Part No. 917D2425.	Custom gearbox bracket. (69.8mm x 27.9mm x 2.0mm)(pkt 2)
Part No. 917D2426.	Gearbox Brackets. (52.8mm x 30.0mm x 2.0mm)(pkt 2)
Part No. 917D2430.	Rack. (50.mm x 4.7mm x 5.13mm)(pkt 10)
Part No. 917D2440.	Crown Gear. (OD 16.4mm x 6.9mm high)(pkt 10)
Part No. 917D2445.	Chain Sprocket. 8 tooth 2.9mm bore. (OD 13.9mm)(pkt 10)
Part No. 917D2446.	Chain Sprocket.16 tooth 2.9mm bore. (OD 26.7mm)(pkt 10)
Part No. 917D2449.	Chain in 1m length approx. (7.1mm wide) For gears 917D2445, 2446.
Part No. 917D2449/1	Chain in 1m length approx. (10.8mm Wide) For gears 917D2401,2402, 2403 & 2404.
Part No. 917D2452.	Double Gear. 48/12. 2.9mm bore. (OD24.57mm/OD6.72mm)(pkt 10
Part No. 917D2456.	Double Gear. 48/12. 3.1mm bore. (OD24.57mm/OD6.72mm)(pkt 10
Part No. 917D2458.	Pinion. 12 tooth (for motor) 1.9mm Bore. (OD6.92mm)(pkt 10)
Part No. 917D2460.	Pulley. 14/10mm dia. 2.9mm bore.(pkt 10)
Part No. 917D2461.	Pulley. 30/25mm dia. 2.9mm bore.(pkt 10)
Part No. 917D2462.	Pulley. 30/25mm dia. 3.9mm bore with brass sleeve.(pkt 10)
Part No. 917D2463.	Pulley. 8/5.5m dia. 2.9mm bore. (pkt 10)
Part No. 917D2501.	Robotic Wheels - 25mm x 10mm. 2.6mm bore.(pkt 4)
Part No. 917D2502.	Robotic Wheels - 35mm x 7mm. 2.6mm bore.(pkt 4)
Part No. 917D2504.	Robotic Wheels - 51mm x 16mm. 2.6mm bore.(pkt 4)
Part No. 917D2505.	Robotic Wheels - 68mm x 20mm. 3.5mm bore.
Part No. 917D2506.	Robotic Wheels - 37mm x 16mm. 2.6mm bore.(pkt 4)
Part No. 917D2507.	Robotic Wheels - 44mm x 16mm. 2.6mm bore.(pkt 4)
Part No. 917D2509.	Robotic Wheels - 56mm x 16mm. 2.6mm bore.(pkt 4)
Part No. 917D2513.	Robotic Wheels - 54mm x 30mm. 2.6mm bore.
Part No. 917D2515.	'O' Ring (70mm Diameter x 5mm).
Part No. 917D2531.	Perforated Metal Strip. (305mm x 8.75mm x 0.5mm)(pkt 5)
Part No. 917D2540.	Perforated Metal Sheet. (200mm x 110mm x 0.6mm)
Part No. 917D2551.	Shaft 3mm dia (long for output). (3mm x 110mm)(pkt 10)
Part No. 917D2553.	Shaft 3mm dia (short for intermediate). (3mm x 60mm)(pkt 10)
Part No. 917D2682.	Spacers (25mm).(pkt 10)
Part No. 917D2683.	Spacers (30mm).(pkt 10)

RACK & PINION SET. PT.NO. 917D/1.
Consisting of: 1 Rack (917D2430), 1 Pinion (917D2401) and Mounting Screws.

CHAIN & SPROCKET SET. PT.NO. 917D/3.
Consisting of:2 Sprockets(917D2445),2 Sprockets(917D2446) & 1m approx Chain(917D2449)

CROWN WHEEL & PINION SET. PT.NO. 917D/5.
Consisting of: 1 Crown Wheel (917D2440) & 1 Pinion (917D2401).

PULLEY SET. PT. NO. 917D/7.
Consisting of: 1 each of Pulley (917D2460, 917D2461, 917D2462, 917D2463) Micro Switch operating Pin. (917D2417), & "O" Ring (917D2515).

GEAR SET. PT.NO. 917D/2.
Consisting of:4 gears(917D2456),2 gears (917D2452) and 1 Pinion (917D2458).

WORM DRIVE SET. PT.NO. 917D/4.
Consisting of:1 Worm drive(917D2420),& 1 Spur Gear(917D2404).

SPUR GEAR SET. PT.NO. 917D/6.
Consisting of: 1 each Spur Gear (917D2403, 917D2401 & 917D2404).

918D SERIES 25mm SINGLE RATIO METAL GEARBOX (RE280 MOTOR/RE 280/1 MOTOR)

WITH 2mm OUTPUT SHAFT (15:1 ONLY)

WITH 4mm OUTPUT SHAFT (ALL RATIOS)

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

918D151	(1.5v - 3v) WITH RE 280 MOTOR (RATIO 15:1). 2mm SHAFT
918D151/1	(1.5v - 3v) WITH RE 280 MOTOR (RATIO 15:1). 4mm SHAFT
918D301/1	(1.5v - 3v) WITH RE 280 MOTOR (RATIO 30:1). 4mm SHAFT
918D1001/1	(1.5v - 3v) WITH RE 280 MOTOR (RATIO 100:1). 4mm SHAFT
918D2501/1	(1.5v - 3v) WITH RE 280 MOTOR (RATIO 250:1). 4mm SHAFT
918D3601/1	(1.5v - 3v) WITH RE280/3 MOTOR (RATIO 360:1). 4mm SHAFT
918D5001/1	(1.5v - 3v) WITH RE280 MOTOR (RATIO 500:1). 4mm SHAFT
918D15112	(12v - 24v) WITH RE 280/1 MOTOR (RATIO 15:1). 2mm SHAFT
918D15112/1	(12v - 24v) WITH RE 280/1 MOTOR (RATIO 15:1). 4mm SHAFT
918D30112/1	(12v - 24v) WITH RE 280/1 MOTOR (RATIO 30:1). 4mm SHAFT
918D100112/1	(12v - 24v) WITH RE 280/1 MOTOR (RATIO 100:1). 4mm SHAFT
918D250112/1	(12v - 24V) WITH RE280/1 MOTOR (RATIO 250:1). 4mm SHAFT
918D360112/1	(12v - 24v) WITH RE280/4 MOTOR (RATIO 360:1). 4mm SHAFT
918D500112/1	(12v - 24v) WITH RE280 MOTOR (RATIO 500:1). 4mm SHAFT
918D10241/1	(12v - 24v) WITH RE280/1 MOTOR (RATIO 1024:1). 4mm SHAFT

This miniature gearbox is of steel and brass construction with brass gears and is mounted on a 1mm thickness steel bracket. It incorporates a high quality three pole motor with sleeved bearings. The design and construction of the unit make it suitable for a host of model and light industrial applications.

MOTOR DATA. (RE-280 & RE-280/1)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 280	1.5 - 3 .0	1.5v CONSTANT	4600	0.120	3750	0.53	0.160	11.53	0.44	56.2	0.86	62.0
RE - 280	1.5 - 3.0	3.0v CONSTANT	9200	0.155	7800	0.85	0.278	20.00	1.60	62.3	1.81	130.0
RE - 280/1	12 - 24	12v CONSTANT	8400	0.10	6300	0.30	0.347	25.0	1.62	44.87	1.389	100
RE - 280/3	1.5 - 3	3v CONSTANT	8800	0.24	7200	1.06		23.2	1.71	53.8		126
RE - 280/4	12 - 24	12v CONSTANT	8224	0.046	6636	0.194		19.2		56.1		99.3

REDUCTION TABLE. R.P.M.

Stall Current RE280 at 1.5v = 2.41A

SUPPLY VOLTAGE	1.5v	3.0v	6v	12v	18v	24v
918D61	730	1409				
918D6112			476	1158	1974	2684
918D151	319	604				
918D15112			193	472	778	1086
918D301	159	296				
918D30112			96	238	405	543
918D1001	43	87				
918D100112			30	74	124	166
918D2501	18	34				
918D250112			12	29	50	67
918D3601	11	23				
918D360112			10	23	35	48
918D5001	8	15				
918D500112			7.5	16	25	33
918D10241	4.5	8.75				
918D1024112			2.8	7.25	12	16.75

WEIGHT	
918D61	75g
918D6112	75g
918D151	75g
918D15112	72g
918D301	75g
918D30112	75g
918D1001	77g
918D100112	77g
918D2501	78g
918D250112	78g
918D3601	87g
918D360112	87g
918D5001	g
918D500112	g
918D10241	89g
918D1024112	89g

GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE
6:1	300	900
15:1	400	1200
30:1	600	1800
100:1	1000	3000
250:1	1200	3600
360:1	1200	3600
500:1	1200	3600
1024:1	1500	4500

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NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

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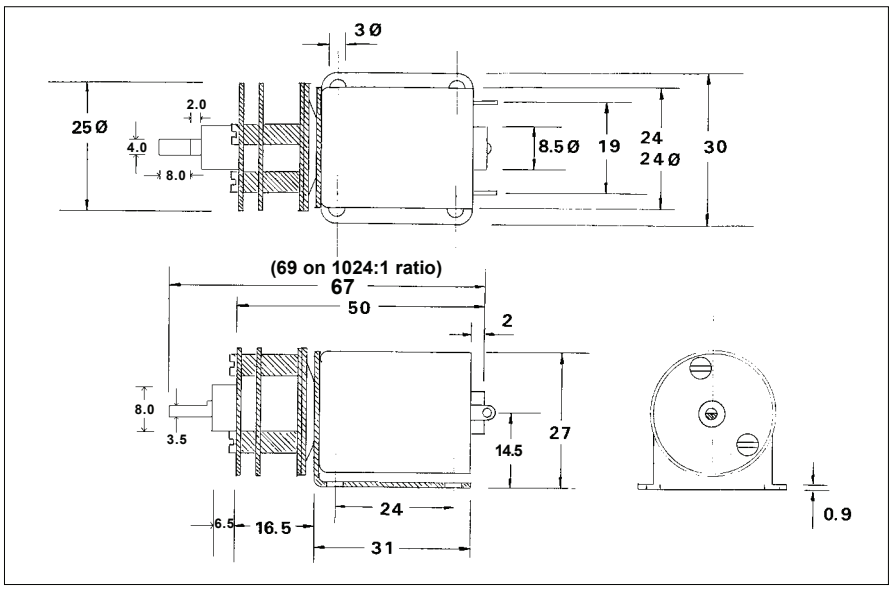
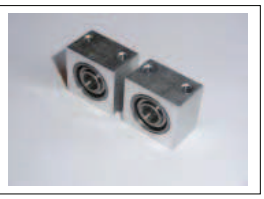
918D SERIES 25mm SINGLE RATIO METAL GEARBOX

GEARBOX DIMENSIONS.



Part No. 1071. Anti vibration mount. M3

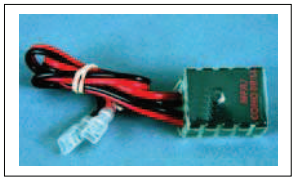
Part No. 918D8. Stainless Steel Shaft. 4mm OD x 150mm



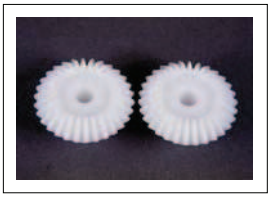
Part No. 918D10. Bearing Blocks. 4mm I.D. (20 x 20 x 12.5mm)

Part No. 1105/61 Universal Coupling. 4mm - 4mm

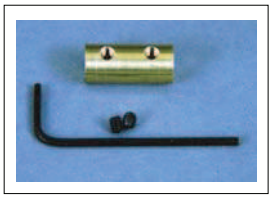
ACCESSORIES FOR 918D SERIES GEARBOX.



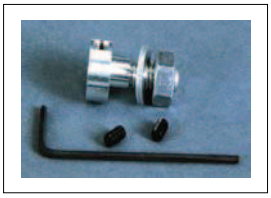
Part No. 917D9. Voltage Regulator. (6-15v DC Input, 3v, 1.5amp output)
Part No. 917D10. Voltage Regulator. (6-15v DC Input. 1.5v, 1.5amp output)
Part No. 917D11. Voltage Regulator. (6-15v DC Input. 4.5v, 1.5amp output)
(Above for 280 motor only)



Part No. 918D7. Nylon Bevel Gears (1:1). O.D. 17.2mm. 4mm I.D.

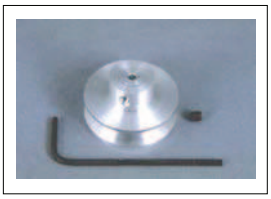


Part No. 918D1. In-Line Coupling. 2mm - 3mm. (Dia. 8mm x 18.4mm)
Part No. 918D1/1. In-Line Coupling 4mm - 4mm. (Dia. 8mm x 18.4mm)



Part No. 918D4. Gear Adapter. 2mm I.D. Shaft Dia 6mm.
Part No. 918D4/1 Gear Adapter. 4mm I.D. Shaft Dia 6mm.

Part No. 917D2458. Pinions (Plastic) 12 tooth. 1.9mm I.D.



Part No. 918D2. Pulley. 2mm I.D. (25mm dia. x 14.75mm) (Aluminium)
Part No. 918D2/1. Pulley 4mm I.D. (25mm dia. x 14.75mm) (Aluminium)

Part No. 918D3. Pulley. 2mm I.D. (16mm dia. x 13.6mm) (Aluminium)
Part No. 918D3/1. Pulley 4mm I.D. (16mm dia x 13.6mm((Aluminium)

Part No. 917D2515. "O" Ring 70mm x 5mm Dia.

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time.
The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

GEARBOX 6:1	with RE280 motor (1.5v - 3v)	GEARBOX 6:1	with RE280/1 motor (12v - 24v)
GEARBOX 10:1	with RE280 motor (1.5v - 3v)	GEARBOX 10:1	with RE280/1 motor (12v - 24v)
GEARBOX 21:1	with RE280 motor (1.5v - 3v)	GEARBOX 21:1	with RE280/1 motor (12v - 24v)
GEARBOX 44:1	with RE280 motor (1.5v - 3v)	GEARBOX 44:1	with RE280/1 motor (12v - 24v)
GEARBOX 60:1	with RE280 motor (1.5v - 3v)	GEARBOX 60:1	with RE280/1 motor (12v - 24v)
GEARBOX 77:1	with RE280 motor (1.5v - 3v)	GEARBOX 77:1	with RE280/1 motor (12v - 24v)
GEARBOX 112:1	with RE280 motor (1.5v - 3v)	GEARBOX 112:1	with RE280/1 motor (12v - 24v)
GEARBOX 150:1	with RE280 motor (1.5v - 3v)	GEARBOX 150:1	with RE280/1 motor (12v - 24v)
GEARBOX 170:1	with RE280 motor (1.5v - 3v)	GEARBOX 170:1	with RE280/1 motor (12v - 24v)
GEARBOX 200:1	with RE280 motor (1.5v - 3v)	GEARBOX 200:1	with RE280/1 motor (12v - 24v)
GEARBOX 250:1	with RE280 motor (1.5v - 3v)	GEARBOX 250:1	with RE280/1 motor (12v - 24v)
GEARBOX 320:1	with RE280 motor (1.5v - 3v)	GEARBOX 320:1	with RE280/1 motor (12v - 24v)
GEARBOX 360:1	with RE280 motor (1.5v - 3v)	GEARBOX 360:1	with RE280/1 motor (12v - 24v)
GEARBOX 400:1	with RE280 motor (1.5v - 3V)	GEARBOX 400:1	with RE280/1 motor (12v - 24v)
GEARBOX 500:1	with RE280 motor (1.5v - 3v)	GEARBOX 500:1	with RE280/1 motor (12v - 24v)
GEARBOX 700:1	with RE280 motor (1.5v - 3v)	GEARBOX 700:1	with RE280/1 motor (12v - 24v)
GEARBOX 800:1	with RE280 motor (1.5v - 3v)	GEARBOX 800:1	with RE280/1 motor (12v - 24v)
GEARBOX 900:1	with RE280 motor (1.5v - 3v)	GEARBOX 900:1	with RE280/1 motor (12v - 24v)
GEARBOX 1153:1	with RE280 motor (1.5v - 3v)	GEARBOX 1153:1	with RE280/1 motor (12v - 24v)

919D SERIES 35mm SINGLE RATIO METAL GEARBOX (RE 540/1 MOTOR)

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

919D2.51	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 2.5:1
919D61	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 6:1
919D111	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 11:1
919D501	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 50:1
919D1001	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 100:1
919D1481	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 148:1
919D5001	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 500:1
919D8101	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 810:1
919D30001	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 3000:1

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

Designed for heavy-duty industrial and model applications this robust unit boasts a powerful high quality, three pole motor with sintered bronze bearings. The metal gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox. The unit is mounted on a 1mm thick plated steel bracket.

MOTOR DATA. (RE-540/1)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 540/1	4.5 - 15.0	6.0v CONSTANT	7500	0.45	6180	2.1	1.64	118.2	7.49	59.4	9.31	670
		12.0v CONSTANT	15800	0.52	13360	2.85	2.14	154.4	21.2	61.9	13.9	1000

Stall Current RE540/1 at 6v = 8.24Stall Current RE280 at 1.5v = 2.41AA

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	4.5v	6.0v	9.0v	12.0v	15.0v
919D2.51	2250	3000	4500	6300	7900
919D61	990	1316	1975	2633	3295
919D111	540	718	1077	1436	1800
919D501	120	158	237	316	395
919D1001	59	79	119	158	198
919D1481	40	53	80	106	132
919D5001	9.75	14	21.5	30	37.5
919D8101	8	10	15	20	25
919D30001	1.5	2	3	5	6

WEIGHT	
919D2.51	240g
919D61	234g
919D111	238g
919D501	246g
919D1481	255g
919D5001	260g
919D8101	255g
919D30001	262g

GEARBOX RATINGS

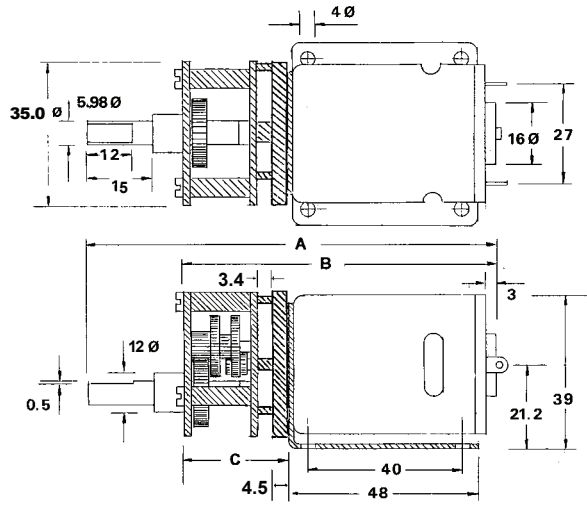
RATED TORQUE	TOLERANCE (g.cm)	MAX. MOMENTARY TOLERANCE TORQUE
2.5:1	2000	6000
6:1	3000	9000
11:1	3000	9000
50:1	3000	9000
100:1	6000	18000
148:1	6000	18000
500:1	6000	18000
810:1	6000	18000
3000:1	6000	18000

24 volt versions are available for this range of motor-gearboxes. Performance data is similar to 12 volt versions. This version also has an extended 10mm rear shaft to accommodate motor encoders. When ordering please use 12v version part number suffixed with 24V.
I.E. 919D111 will be 919D11124V

NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

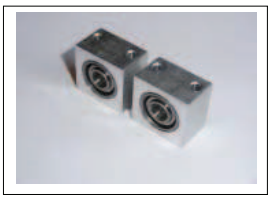
919D SERIES 35mm SINGLE RATIO METAL GEARBOX (RE 540/1 MOTOR)

GEARBOX DIMENSIONS



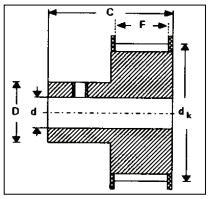
GEARBOX REF.	A	B	C
919D2.5:1	99	73	20
919D61 (6:1)	99	73	20
919D111 (11:1)	101	76	22
919D501 (50:1)	105	80	26
919D1001(100:1)	105	80	26
919D1481(148:1)	107	82	28
919D5001(500:1)	110	85	31
919D8101(810:1)	109	94	30
919D3000:1	112	97	33

Part No. 1071.
M3 Anti vibration mount.
Part No. 1072
M4 Anti vibration mount.

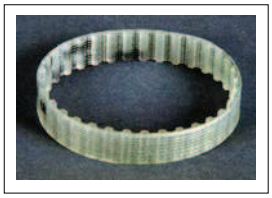


Part No. 919D30
Bearing Blocks. 5mm I.D.
(19.06 x 19.0mm x 10mm)
Part No. 919D30/1
Bearing Blocks. 6mm I.D.
(15.87 x 19.0mm x 12.5mm)
Part No. 919D30/2
Bearing Blocks. 8mm I.D.
(19.0 x 19.0mm x 13.0mm)

TIMING PULLEYS



TIMING BELTS



FOR FURTHER DETAILS SEE PAGE. 20

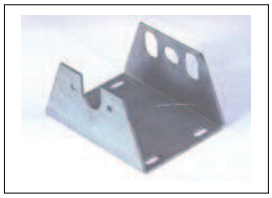
Part No. 919D7 - 14. Timing Pulleys.

Pt. No.	No. of teeth	d	dk	F	C	D
919D7/10	10	3	15.05	12	21.0	10
919D7/12	12	3	18.25	12	21.0	12
919D7	14	4	21.45	12	21.0	12
919D8	16	4	24.60	12	21.0	15
919D9	20	4	31.00	12	21.0	15
919D10	25	4	39.00	12	21.0	15
919D11	30	4	46.95	12	21.0	15
919D12	35	4	54.85	12	21.0	15
919D13	40	4	62.85	12	21.0	15
919D14	44	4	69.20	12	21.0	15

Please note. Dimension 'd' is an industry standard 4mm pilot hole. You will need to enlarge this to the size you require.

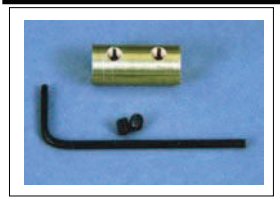
Part No. 919D15 - 23. Timing Belts.

Pt. No.	Length (Circum)	Width
919D15	165	9.8
919D16	185	9.8
919D17	200	9.8
919D18	305	9.8
919D19	390	9.8
919D20	455	9.8
919D21	545	9.8
919D22	630	9.8
919D23	840	9.8

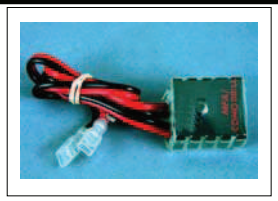


Part No. 919D29
Double ended motor mount.

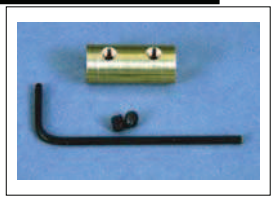
Part No. 919D26
Stainless Steel shaft 5mmOD x 150mm
Part No. 919D26/1
Stainless Steel Shaft 6mmOD x 150mm
Part No. 919D26/2
Stainless Steel Shaft 8mmOD x 150mm



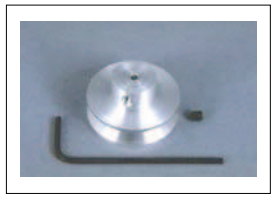
Pt No. 919D1. In-Line Coupling. 6mm - 6mm.(Dia. 12.67mm x 24.8mm)



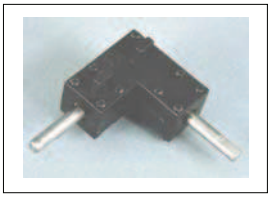
Pt No. 919D2. Voltage Regulator.(6-15v DC Input. 4v-12v output). 26mm x 31mm x 15.5mm



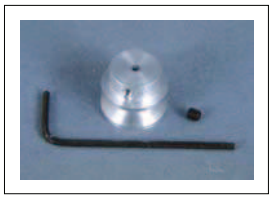
Pt No. 919D1/2. In-line Coupling.6mm-8sw (Meccano) Dia. 12.67mm x 24.8mm



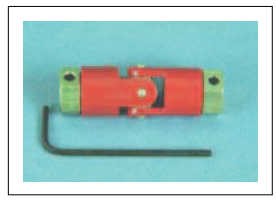
Pt No. 919D4. Pulley 25mm dia. (Aluminium)



Pt.No.919D24. Bevel Gearbox. (Right Angle)

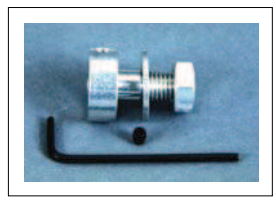


Pt No. 919D5. Pulley 16mm dia. (Aluminium)



Universal Couplings. 12.5mm dia. 44mm length.**Pt No. 1105/60.** 6mm - 6mm.**Pt.No. 1105/56** (6mm-5mm) **Pt. No. 1105/53** (6mm-4mm)

Pt No. 917D2515. "O" Ring 70mm x 5mm Dia.



Pt No. 919D27. Gear Adapter. 6mm bore. M10 thread.

Pt No. 919D25. Nylon Bevel Gears 1:1. OD30.7mm ID 6mm

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

GEARBOX 10:1 WITH 540/1 MOTOR
GEARBOX 60:1 WITH 540/1 MOTOR
GEARBOX 90:1 WITH 540/1 MOTOR.
GEARBOX 180:1 WITH 540/1 MOTOR
GEARBOX 300:1 WITH 540/1 MOTOR
GEARBOX 450:1 WITH 540/1 MOTOR
GEARBOX 700:1 WITH 540/1 MOTOR
GEARBOX 1000:1 WITH 540/1 MOTOR
GEARBOX 18:1 WITH 540/1 MOTOR.
GEARBOX 70:1 WITH 540/1 MOTOR.
GEARBOX 100:1 WITH 540/1 MOTOR
GEARBOX 200:1 WITH 540/1 MOTOR
GEARBOX 350:1 WITH 540/1 MOTOR
GEARBOX 500:1 WITH 540/1 MOTOR
GEARBOX 750:1 WITH 540/1 MOTOR
GEARBOX 1500:1 WITH 540/1 MOTOR
GEARBOX 30:1 WITH 540/1 MOTOR.
GEARBOX 75:1 WITH 540/1 MOTOR.
GEARBOX 120:1 WITH 540/1 MOTOR
GEARBOX 250:1 WITH 540/1 MOTOR
GEARBOX 400:1 WITH 540/1 MOTOR
GEARBOX 600:1 WITH 540/1 MOTOR
GEARBOX 900:1 WITH 540/1 MOTOR

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940D SERIES 32mm PLANETRY (EPICYCLIC) METAL GEARBOX

(RE 385 MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

940D51	(4.5v - 15v)	RATIO 5:1
940D271	(4.5v - 15v)	RATIO 27:1
940D511	(4.4v - 15v)	RATIO 51:1
940D1001	(4.5v - 15v)	RATIO 100:1
940D2641	(4.5v - 15v)	RATIO 264:1
940D5161	(4.5v - 15v)	RATIO 516:1
940D7211	(4.5v - 15v)	RATIO 721:1

Designed for heavy-duty industrial and model applications this robust unit boasts a powerful high quality, five pole motor with sintered bronze bearings. The metal gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA. (RE-385)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 385	6.0 - 15.0	12v CONSTANT	11646	0.18	9869	0.99		78.4	7.98	66.1		513.5

REDUCTION TABLE. R.P.M.

Stall Current RE385 at 12v = 4.62A

SUPPLY VOLTAGE	4.5v	6.0v	9.0v	12.0v	15.0v
940D51	700	1000	1600	2150	2800
940D271	141	193	298	400	498
940D511	46	72	121	174	220
940D1001	35	50	77	103	134
940D2641	12	19	30.5	41	54.5
940D5161	6	8.5	14	19	25
940D7211	4.5	6.3	10.3	14.5	19

WEIGHT	
940D51	167g
940D271	185g
940D511	213g
940D1001	214g
940D2641	235g
940D5161	239g
940D7211	241g

GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE
5:1	2000	6000
27:1	6000	18000
51:1	8000	24000
100:1	12000	36000
264:1	12000	36000
516:1	12000	36000
721:1	12000	36000

NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

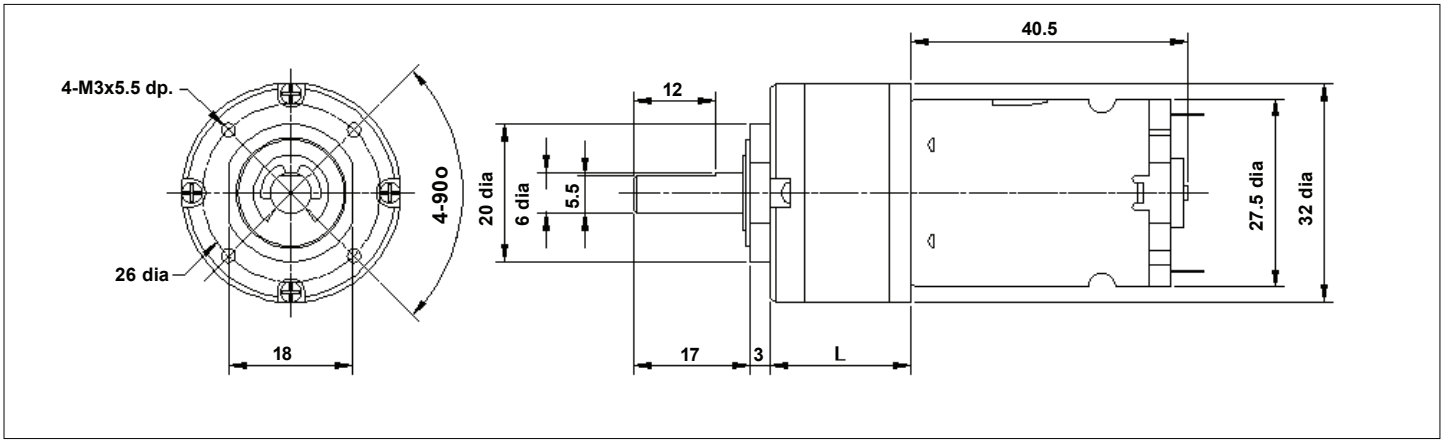
24 volt versions are available for this range of motor-gearboxes. Performance data is similar to 12 volt versions. This version also has an extended 10mm rear shaft to accommodate motor encoders. When ordering please use 12v version part number suffixed with 24V.
I.E. 940D1001 will be 940D100124V

MOTOR DATA. (RE-385/24v). Current at stall 2.26A

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 385/24v	12 - 24v	12v CONSTANT	11000	0.065	9481	0.386		65.3	6.35	68.46		447.7

940D SERIES 32mm PLANETRY (EPICYCLIC) METAL GEARBOX

GEARBOX DIMENSIONS



GEARBOX REF.	L
940D51 (5:1)	20.8
940D271 (27:1)	26.5
940D511 (51:1)	32.5
940D1001 (100:1)	33.6
940D2641 (264:1)	40.0
940D5161 (516:1)	40.0

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 919D SERIES PAGE.

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL: The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.	

Subject to minimum order quantities of 100 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

GEARBOX 14:1 WITH 385 MOTOR
GEARBOX 27:1 WITH 385 MOTOR.
GEARBOX 51:1 WITH 385 MOTOR
GEARBOX 139:1 WITH 385 MOTOR
GEARBOX 264:1 WITH 385 MOTOR
GEARBOX 939:1 WITH 385 MOTOR
GEARBOX 19:1 WITH 385 MOTOR.
GEARBOX 35:1 WITH 385 MOTOR
GEARBOX 71:1 WITH 385 MOTOR.
GEARBOX 189:1 WITH 385 MOTOR
GEARBOX 721:1 WITH 385 MOTOR

941D SERIES 16mm PLANETRY (EPICYCLIC) SUB MINIATURE METAL GEARBOX

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

941D41	(1.5v - 12v)	RATIO 4:1
941D621	(1.5v - 12v)	RATIO 62:1
941D1041	(1.5v - 12v)	RATIO 104:1
941D2311	(1.5v - 12v)	RATIO 231:1
941D10141	(1.5v - 12v)	RATIO 1014:1

Designed for heavy-duty industrial and model applications this robust unit boasts a powerful high quality motor with sintered bronze bearings. The metal gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY					STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF	
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%	g - cm
(941D)	1.5 - 12.0	12.0v CONSTANT	8000	19	5881	70		8.68	0.5	63.26	26

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE		3.0v	6.0v	9.0v	12.0v
941D41		350	800	1300	1800
941D621		18	50	82	119
941D1041		12.5	30	50	70
941D2311		5	14	23	32
941D10141		1.25	3.10	5	6.8

WEIGHT	
941D41	37g
941D621	45g
941D1041	43g
941D2311	49g
941D10141	50g

NOTE: It is not recommended to run the motor/gearbox combination at 1.5v

GEARBOX RATINGS

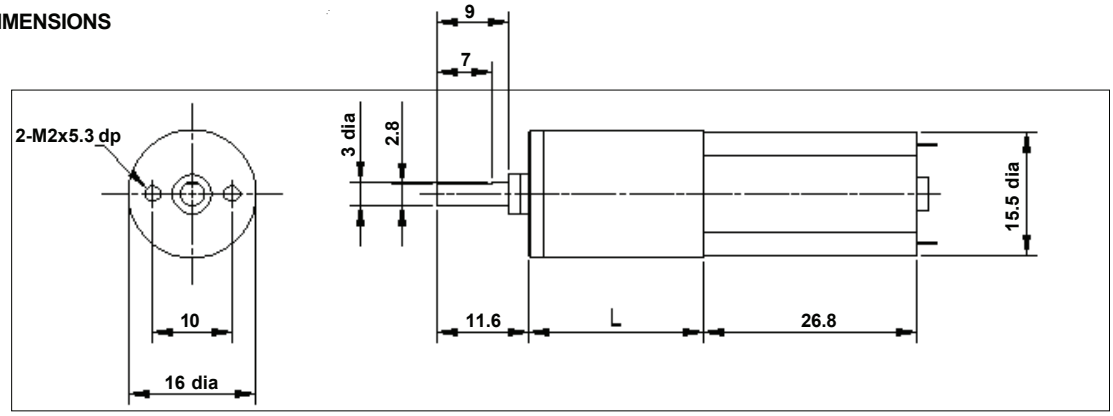
RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE
4:1	1000	3000
62:1	2000	6000
104:1	2000	6000
231:1	2500	7500
1014:1	3000	9000

NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

24 volt versions are available for this range of motor-gearboxes. Performance data is similar to 12 volt versions. This version also has an extended 10mm rear shaft to accommodate motor encoders. When ordering please use 12v version part number suffixed with 24V.
I.E. 941D621 will be 941D62124V

941D SERIES 16mm PLANETRY (EPICYCLIC) SUB MINIATURE METAL GEARBOX

GEARBOX DIMENSIONS



GEARBOX REF.	L
941D41 (4:1)	15
941D621 (62:1)	22.2
941D2311 (231:1)	25.8
941D10141 (1014:1)	29.7

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 917D SERIES PAGE.

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 100 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

GEARBOX 14:1 WITH MOTOR
GEARBOX 29:1 WITH MOTOR
GEARBOX 84:1 WITH MOTOR
GEARBOX 128:1 WITH MOTOR
GEARBOX 316:1 WITH MOTOR
GEARBOX 455:1 WITH MOTOR
GEARBOX 690:1 WITH MOTOR
GEARBOX 1996:1 WITH MOTOR
GEARBOX 19:1 WITH MOTOR
GEARBOX 72:1 WITH MOTOR
GEARBOX 104:1 WITH MOTOR
GEARBOX 157:1 WITH MOTOPR
GEARBOX 370:1 WITH MOTOR
GEARBOX 561:1 WITH MOTOR
GEARBOX 1621:1 WITH MOTOR
GEARBOX 3027:1 WITH MOTOR

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942D SERIES 32mm (36mm motor) PLANETRY (EPICYCLIC) METAL GEARBOX

(RE 540/1 MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users re-sponsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

942D51	(4.5v - 15v)	RATIO 5:1
942D271	(4.5v - 15v)	RATIO 27:1
942D511	(4.5v - 15v)	RATIO 51:1
942D1001	(4.5v - 15v)	RATIO 100:1
942D2641	(4.5v - 15v)	RATIO 264:1
942D5161	(4.5v - 15v)	RATIO 516:1
942D7211	(4.5v - 15v)	RATIO 721:1

Designed for heavy-duty industrial and model applications this robust unit boasts a powerful high quality motor with sintered bronze bearings. The metal gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M	A	oz - in	g - cm	W	%		g - cm
540/1	4.5 - 15.0	12.0v CONSTANT	15,800	0.52	13360	2.85	2.14	154.4	21.2	61.9	13.9	1000

Stall Current RE540/1 at 6v = 8.24A

REDUCTION TABLE. R.P.M. (no load)

SUPPLY VOLTAGE	4.5v	6.0v	9.0v	12.0v	15.0v
942D51	1082	1502	2287	3090	3640
942D271	184	250	380	500	614
942D511	109	150	227	288	380
942D1001	51	71	108	146	172
942D2641	18	25.5	39.5	53	68
942D5161	9.5	13	20	27	32
942D7211	7.5	10	15.5	20.5	26

WEIGHT	
942D51	254g
942D271	279g
942D511	306g
942D1001	303g
942D2641	329g
942D5161	333g
942D7211	350g

GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX MOMENTARY TOLERANCE TORQUE
5:1	2000	6000
27:1	6000	18000
51:1	8000	24000
100:1	12000	36000
264:1	12000	36000
516:1	12000	36000
721:1	12000	36000

24 volt versions are available for this range of motor-gearboxes. Performance data is similar to 12 volt versions. This version also has an extended 10mm rear shaft to accommodate motor encoders. When ordering please use 12v version part number suffixed with 24V.
I.E. 942D1001 will be 942D100124V

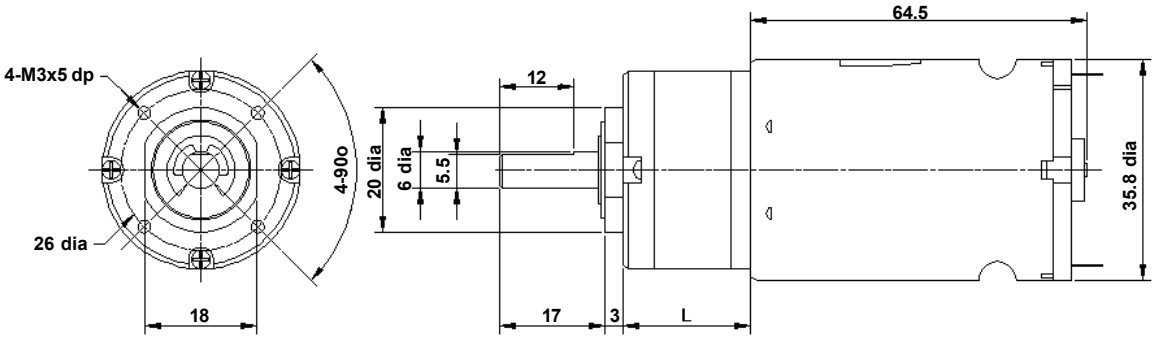
NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

MOTOR DATA. (RE-540/1 24v).

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 540/1 24v	12 - 24v	24v CONSTANT	14452	0.30	12111	1.57		177	22	65		1094

942D SERIES 32mm (36mm motor) PLANETRY (EPICYCLIC) METAL GEARBOX

GEARBOX DIMENSIONS



GEARBOX REF.	L
942D51 (5:1)	20.8
942D271 (27:1)	26.5
942D511 (51:1)	32.5
942D1001 (100:1)	33.6
942D2641 (264:1)	40.0
942D5161 (516:1)	40.0

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 919D SERIES PAGE.

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 100 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

GEARBOX 14:1 WITH 540/1 MOTOR
GEARBOX 27:1 WITH 540/1 MOTOR.
GEARBOX 51:1 WITH 540/1 MOTOR
GEARBOX 139:1 WITH 540/1 MOTOR
GEARBOX 264:1 WITH 540/1 MOTOR
GEARBOX 939:1 WITH 540/1 MOTOR
GEARBOX 19:1 WITH 540/1 MOTOR.
GEARBOX 35:1 WITH 540/1 MOTOR
GEARBOX 71:1 WITH 540/1 MOTOR.
GEARBOX 189:1 WITH 540/1 MOTOR
GEARBOX 721:1 WITH 540/1 MOTOR

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944D SERIES 22mm PLANETRY (EPICYCLIC) MINIATURE METAL GEARBOX (PRECIOUS METAL BRUSHES)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

944D41	(6v - 12v)	RATIO 4:1
944D621	(6v - 12v)	RATIO 62:1
944D1041	(6v - 12v)	RATIO 104:1
944D2311	(6v - 12v)	RATIO 231:1

Designed for smaller industrial and model applications this robust unit boasts a powerful high quality motor with precious metal brushes & sintered bronze bearings. The gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%	oz - in	g - cm
(944D)	6 - 12.0v	12.0v CONSTANT	8000	70	6650	200	0.25	18	1.25	52	1.4	100

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	4.5v	6.0v	9.0v	12.0v
944D41	800	1100	1550	2000
944D621	41	64	97	128
944D1041	24	35	55	76
944D2311	11.5	16.5	25.5	34

WEIGHT	
944D41	52g
944D621	65g
944D1041	67g
944D2311	70g

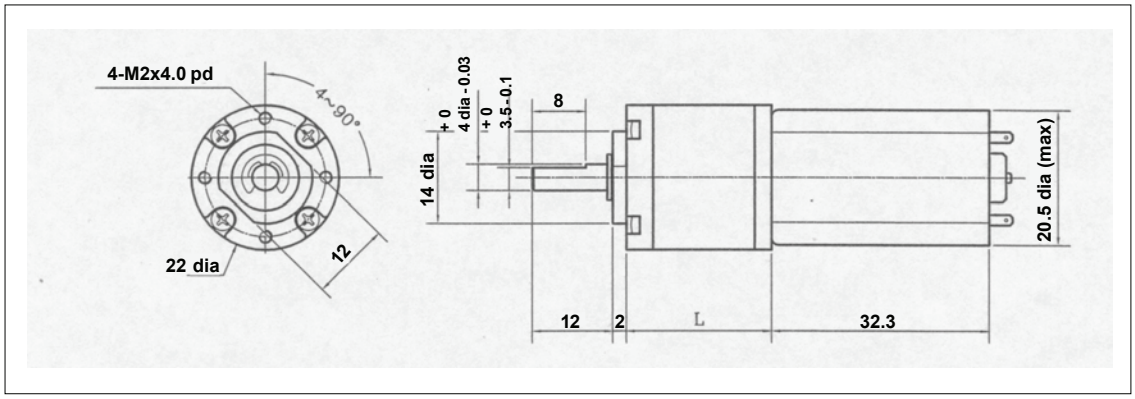
GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX MOMENTARY TOLERANCE TORQUE
4:1	1000	3000
62:1	2000	6000
104:1	2000	6000
231:1	2500	7500

NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

944D SERIES 22mm PLANETRY (EPICYCLIC) MINIATURE METAL GEARBOX (PRECIOUS METAL BRUSHES)

GEARBOX DIMENSIONS



GEARBOX REF.	L
944D41 (4:1)	14.4
944D621 (62:1)	21.7
944D1041 (104:1)	21.7
944D2311 (231:1)	25.35

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 918D SERIES PAGE.

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 100 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

14:1	16:1	19:1
53:1	72:1	84:1
198:1	270:1	316:1
370:1	455:1	742:1
1014:1	1249:1	1621:1
1996:1		

944DMS SERIES 22mm PLANETRY (EPICYCLIC) MINIATURE METAL GEARBOX

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

944D41MS	(4.5v - 6v)	RATIO 4:1
944D621MS	(4.5v - 6v)	RATIO 62:1
944D1041MS	(4.5v - 6v)	RATIO 104:1
944D2311MS	(4.5v - 6v)	RATIO 231:1

Designed for smaller industrial and model applications this robust unit boasts a powerful high quality motor with carbon brushes & sintered bronze bearings. The gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%	oz - in	g - cm
280/5 VAR	4.5 - 6.0v	6.0v CONSTANT	9280	0.108	7664	0.51		25.4	1.99	64.85		145.7

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	4.5v	6.0v
944D41MS	1740	2320
944D621MS	112	150
944D1041MS	67	89
944D2311MS	29	38.5

WEIGHT	
944D41MS	71g
944D621MS	79g
944D1041MS	79g
944D2311MS	83g

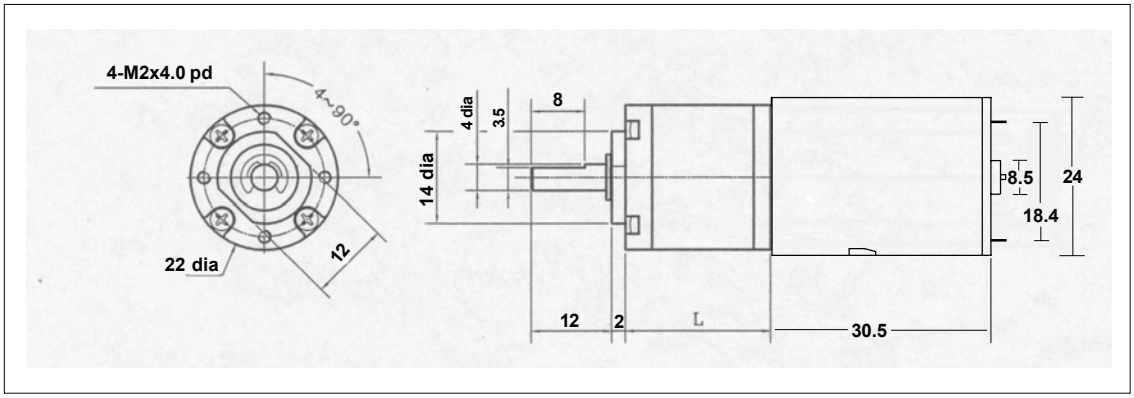
GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX MOMENTARY TOLERANCE TORQUE
4:1	1000	3000
62:1	2000	6000
104:1	2000	6000
231:1	2500	7500

NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

944DMS SERIES 22mm PLANETRY (EPICYCLIC) MINIATURE METAL GEARBOX

GEARBOX DIMENSIONS



GEARBOX REF.	L
944D41 (4:1)	14.4
944D621 (62:1)	21.7
944D1041 (104:1)	21.7
944D2311 (231:1)	25.35

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 918D SERIES PAGE.

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 100 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

14:1	16:1	19:1
53:1	72:1	84:1
198:1	270:1	316:1
370:1	455:1	742:1
1014:1	1249:1	1621:1
1996:1		

949DRA SERIES 35mm PLANETRY (EPICYCLIC) GEARED MOTOR (CARBON BRUSHES). OUTPUT VIA RIGHT ANGLE DRIVE BEVEL GEARBOX.

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

949DRA51	(6v - 15v)	RATIO 5:1
949DRA1001	(6v - 15v)	RATIO 100:1
949DRA5161	(6v - 15v)	RATIO 516:1

Designed for medium duty industrial applications. This precise and robust bevel geared unit with 1:1 final drive, boasts a quality 5 pole motor with carbon brushes. Reduction is via steel gears with acetyl first stage. The output shaft is 6mm dia with a key flat. These units are suitable in low noise applications.

MOTOR DATA.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%	oz - in	g - cm
385RA	6 - 12v	12v CONSTANT	7000		5950	900		110	7	65		733 est

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	6v	12v
949DRA51	680	1380
949DRA1001	36	73
949DRA5161	7	14.5

WEIGHT	
949RA51	321g
949RA101	365g
949RA51651	392g

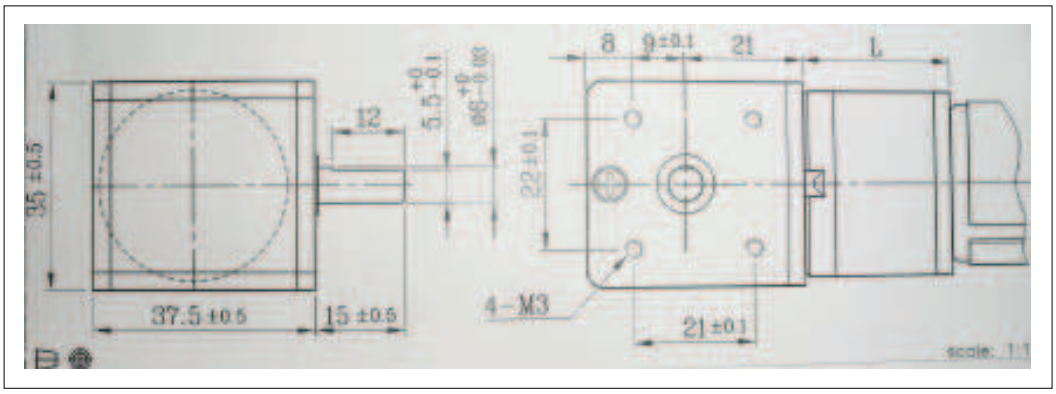
GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX MOMENTARY TOLERANCE TORQUE
5:1	4000	12000
100:1	5400	16200
516:1	12000	36000

NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

949DRA SERIES 35mm PLANETRY (EPICYCLIC) GEARED MOTOR (CARBON BRUSHES)

GEARBOX DIMENSIONS



Length of visible motor casing: 47mm excl. terminals
Total length of visible motor including rear shaft: 55mm.

GEARBOX REF.	L
949DRA51 (5:1)	20.6
949DRA1001 (100:1)	33.4
949DRA5161 (516:1)	39.8

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 918D SERIES PAGE.

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 100 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

14:1	19:1	27:1
35:1	51:1	71:1
139:1	189:1	264:1
721:1	939:1	

950D SERIES 35mm SINGLE RATIO METAL GEARBOX (RE 385 MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

950D2.51	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 2.5:1
950D61	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 6:1
950D111	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 11:1
950D501	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 50:1
950D1001	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 100:1
950D1481	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 148:1
950D5001	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 500:1
950D8101	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 810:1
950D30001	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 3000:1

Designed for heavy-duty industrial and model applications this robust unit boasts a powerful high quality, five pole motor with sintered bronze bearings. The metal gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox. The unit is mounted on a 1mm thick plated steel bracket.

MOTOR DATA. (RE-385)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 385	6.0 - 15.0	12v CONSTANT	11646	0.18	9869	0.99		78.4	7.98	66.1		513.5

Stall Current RE385 at 12v = 4.62A

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	4.5v	6.0v	9.0v	12.0v	15.0v
950D2.51	1890	2520	3375	5040	6300
950D61	787	1050	1575	2100	2625
950D111	429	572	858	1145	1430
950D501	94	126	189	252	315
950D1001	41	55	83	110	138
950D1481	32	42	64	85	106
950D5001	8	11	17	22	28
950D8101	5	7	11	15	18
950D30001	1.5	2	3	4	5

WEIGHT	
950D2.51	146g
950D61	144g
950D111	146g
950D501	156g
950D1481	162g
950D8101	164g
950D30001	168g

RATED TOLERANCE TORQUE (g.cm)		MAX MOMENTARY TOLERANCE TORQUE
2.5:1	2000	6000
6:1	3000	9000
11:1	3000	9000
50:1	3000	9000
100:1	6000	18000
148:1	6000	18000
500:1	6000	18000
810:1	6000	18000
3000:1	6000	18000

GEARBOX RATINGS

24 volt versions are available for this range of motor-gearboxes. Performance data is similar to 12 volt versions. This version also has an extended 10mm rear shaft to accommodate motor encoders. When ordering please use 12v version part number suffixed with 24V.
I.E. 950D111 will be 950D11124V

NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

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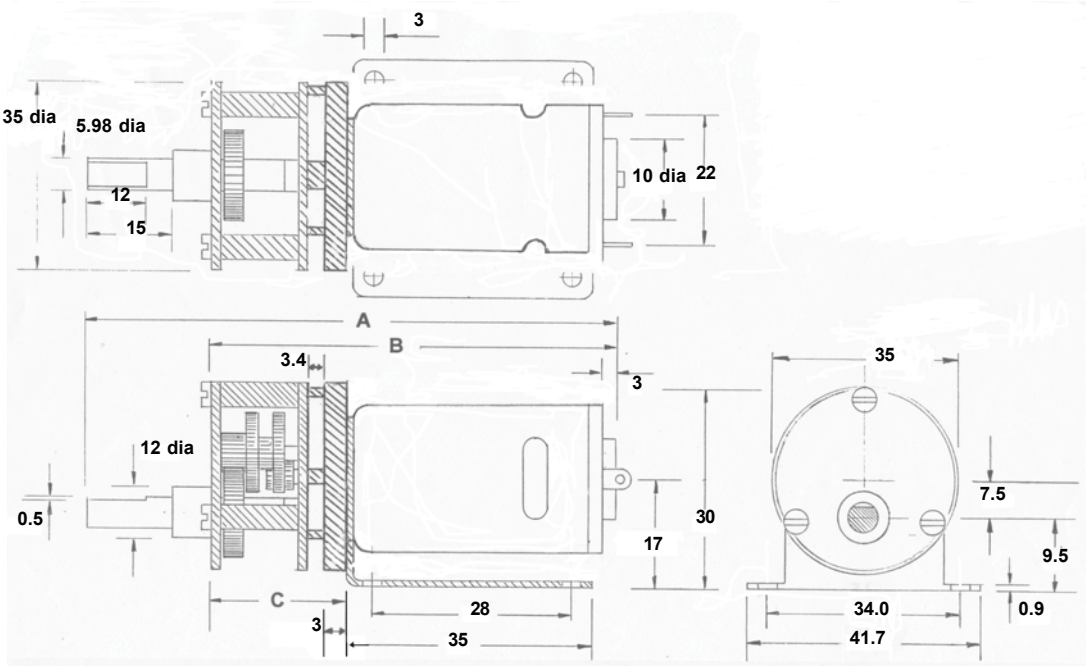
950D SERIES 35mm SINGLE RATIO METAL GEARBOX

(RE 385 MOTOR)

GEARBOX DIMENSIONS



GEARBOX REF.	A	B	C
950D2.5:1	85	60	19
950D61 (6:1)	85	60	19
950D111 (11:1)	85	60	19
950D501 (50:1)	90	65	24
950D1001 (100:1)	90	65	24
950D1481 (148:1)	92	67	26
950D5001 (500:1)	95	70	29
950D8101 (810:1)	95	70	29
950D3000:1	102	74	31

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 919D SERIES PAGE.

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

GEARBOX 18:1 WITH 385 MOTOR.
GEARBOX 70:1 WITH 385 MOTOR.
GEARBOX 100:1 WITH 385 MOTOR
GEARBOX 200:1 WITH 385 MOTOR
GEARBOX 350:1 WITH 385 MOTOR
GEARBOX 500:1 WITH 385 MOTOR
GEARBOX 900:1 WITH 385 MOTOR
GEARBOX 3000:1 WITH 385 MOTOR

GEARBOX 30:1 WITH 385 MOTOR.
GEARBOX 75:1 WITH 385 MOTOR.
GEARBOX 120:1 WITH 385 MOTOR
GEARBOX 250:1 WITH 385 MOTOR
GEARBOX 400:1 WITH 385 MOTOR
GEARBOX 600:1 WITH 385 MOTOR
GEARBOX 1000:1 WITH 385 MOTOR

GEARBOX 60:1 WITH 385 MOTOR
GEARBOX 90:1 WITH 385 MOTOR.
GEARBOX 180:1 WITH 385 MOTOR
GEARBOX 300:1 WITH 385 MOTOR
GEARBOX 450:1 WITH 385 MOTOR
GEARBOX 700:1 WITH 385 MOTOR
GEARBOX 1500:1 WITH 385 MOTOR

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951D SERIES 12mm dia. SPUR SUB MINIATURE GEARED MOTOR

(951D MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

951D101 (1.5v - 3v)	WITH 951D MOTOR.	RATIO 10:1
951D601 (1.5v - 3v)	WITH 951D MOTOR.	RATIO 60:1
951D2981 (1.5v - 3v)	WITH 951D MOTOR.	RATIO 298:1

All metal spur geared motor for sub miniature applications. The combination of a high quality three pole motor with precious metal brushes, mounted onto a rugged all metal gearbox ensure a reliable service life.

MOTOR DATA. (RE-951D)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
951D	1.5 - 3.0	3v CONSTANT	16000	0.1	13500	0.32		3.9	0.58	60		EST 20

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	1.5v	3.0v
951D101	685	1450
951D601	120	250
951D2981	25	52

WEIGHT	
951D101	10g
951D601	10g
951D2981	10g

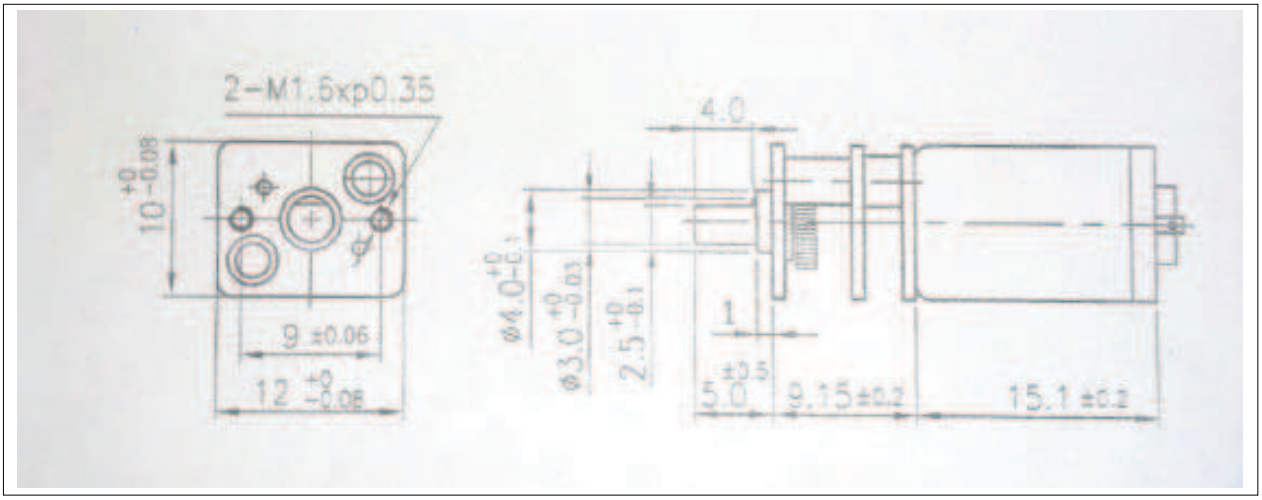
GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX MOMENTARY TOLERANCE TORQUE	EFFICIENCY %
10:1	300	900	81
60:1	600	1800	66
298:1	1000	3000	59

NOTE: To establish Torque Rating in Nm, divide g.cm by 10,197.0

951D SERIES 12mm dia. SPUR SUB MINIATURE GEARED MOTOR

GEARBOX REF.	A (mm)
951D10:1 (10:1)	9.15
951D601 (60:1)	9.15
951D2981 (298:1)	9.15



FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 918D SERIES PAGE.

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

19:1	29:1
76:1	102:1
134:1	197:1
235:1	

960D & 965D SERIES BELT DRIVE REDUCTION UNITS

Part No. 960D2.11 (RE 800 Motor)
Part No. 965D2.11 (RE 850 Motor)
Part No. 966D2.11 (Without motor)

This unit has been developed to meet a requirement for heavy duty high torque applications combined with relatively low power consumption.

The unit is powered by MFA/Como Drills 800 or MFA/Como Drills 850 series 12v d.c. 3 pole motors, with heavy duty carbon brush gear and double ended 6mm drive shaft. The motor is mounted on a rugged 1.5mm steel right angle bracket. The 2.1:1 reduction is achieved via two precision aluminium timing pulleys utilising a high quality toothed timing belt. The final drive is delivered through two block mounted precision ballraces with a 6mm keyed steel output shaft.

The RE800 motor version will deliver around 1229 g.cm torque (0.12 Nm) running at maximum efficiency.
The RE850 motor version will deliver around 1380 g.cm torque (0.14 Nm) running at maximum efficiency.

MOTOR DATA. (RE 800)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	mN-m	W	%	oz - in	mN-m
RE - 800	12.0v	12.0v CONSTANT	5167	1.058	4289	5.28		82.08	36.84	58.2		482.8

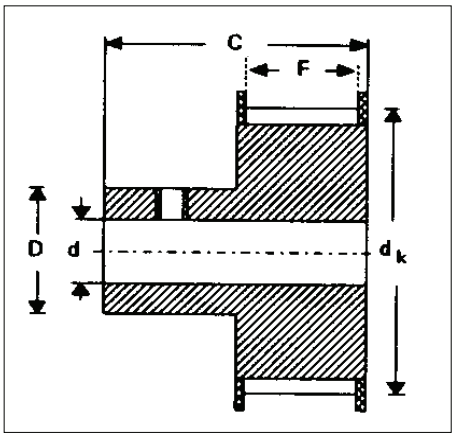
Stall Current RE800 at 12v = 25.86A

MOTOR DATA. (RE 850)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	mN-m	W	%	oz - in	mN-m
RE - 850	12.0v	12.0v CONSTANT	9778	1.90	8311	10.82		92.13	157	61.74		614

Stall Current RE850 at 12v = 61.34A

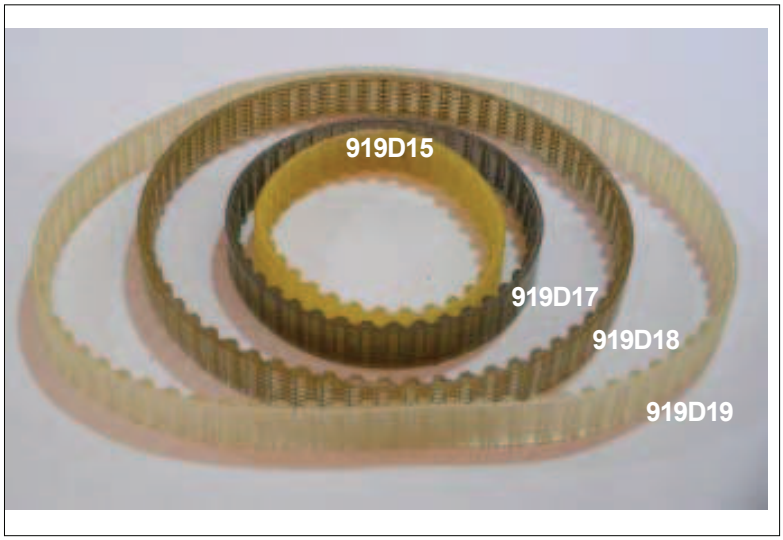
Part No's. 919D7 - 919D14. TIMING PULLEYS.



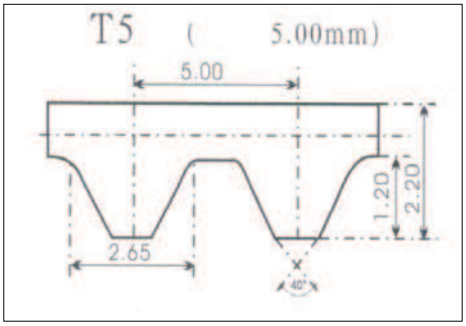
Part No.	No. of teeth	d mm	dk mm	F mm	C mm	D mm
919D7/10	10	3	15.05	12	21	10
919D7/12	12	3	18.25	12	21	12
919D7	14	4	21.45	12	21	12
919D8	16	4	24.60	12	21	15
919D9	20	4	31.00	12	21	15
919D10	25	4	39.00	12	21	15
919D11	30	4	46.95	12	21	15
919D12	35	4	54.85	12	21	15
919D13	40	4	62.85	12	21	15
919D14	44	4	69.20	12	21	15

Please note. Dimension 'd' is an industry standard 4mm pilot hole. You will need to enlarge this to the size you require.

Part No's. 919D15 - 919D23. TIMING BELTS.



Part No.	Type	Length (Circumference)	Width
919D15	T5x165	165mm	9.8
919D16	T5x185	185mm	9.8
919D17	T5x200	200mm	9.8
919D18	T5x305	305mm	9.8
919D19	T5x390	390mm	9.8
919D20	T5x455	455mm	9.8
919D21	T5x545	545mm	9.8
919D22	T5x630	630mm	9.8
919D23	T5x840	840mm	9.8



SPEED REGULATORS

* *ALLOWS INFINITELY VARIABLE R.P.M. TO BE SET ON MFA/COMO DRILLS 919D SERIES GEARBOXES AND MOTORS.*
* *OPERATES FROM INPUTS OF 6 - 15 VOLT*
* *OUTPUT 0 - INPUT VOLTAGE*
* *PULSE WIDTH MODULATION PROVIDES PROPORTIONAL OUTPUT CONTROL.*
* *SMALL - COMPACT - ROBUST CONSTRUCTION FOR VERSATILITY AND RELIABLE SERVICE.*

PART NO. 919D2

SPECIFICATION:-

Min Input	6 volts	Input & output cables 21cm
Max Input	15volts	Insulated spade connectors fitted on input cables
Min Output	0 volts	Dims. 34 x 27 x 18 mm
Max Output	15 volts	Weight 30 gms approx.
Loading	3 amps continuous 5 amps peak only.	

(Input power supply must not be digital)
Supply and output cables are trimmed to 21 cm to meet current EMC regulations.
Edge to edge frequency, min 1136 Hz, max 1250 Hz, average 1200 Hz. Mark to space varies motor speed.

Panel Mounted Variable Speed Regulator

Part No. 919D2P

Features

* *Panel Mounted with external control knob.*
* *Allows infinitely variable R.P.M. to be set on MFA/Como Drills. 919D, 927D, 918D (12v), 940D, 941D & 950D series gearboxes and motors.*
* *Operates from inputs of 6-15 volt. (Input power supply must not be digital)*
* *Output 0 - input voltage.*
* *Pulse width modulated provides torque maintenance and proportional output control.*
* *Small - compact - robust construction for versatility and reliable service.*

Specification:

Min Input	**6 volts**	**Dims 62mm x 41mm x 25mm (approx)**
Max Input	**15 volts**	**Weight 32 gms approx**
Min Output	**0 volts**	
Max Output	**3 amps**	
Loading	**3 amps continuous**	
	5 amps peak only	

Supply and output cables must be trimmed to 21cm to meet current EMC regulations.
Edge to edge frequency, min 1136 Hz, max 1250 Hz, average 1200 Hz. Mark to space varies motor speed.

PANEL MOUNTED BI-DIRECTIONAL VARIABLE SPEED REGULATOR

Part No. 919D2PR

* **Forward & Reverse PWM Speed Regulator.**
* **Easy installation - Unit panel mounted through 9.5mm hole. (Electrical connection via screw terminals).**
* **6 - 15v operation d.c. (from smooth non digital d.c. input).**
* **Output 0 - 100% of input voltage.**
* **Compact construction - board size 66 x 58mm**

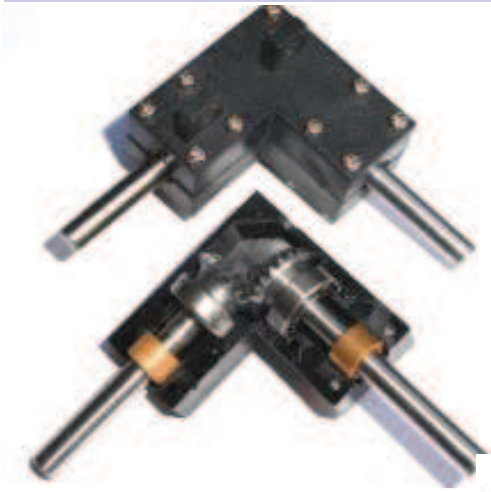
These are regulators with variable outputs designed to be used with miniature and sub miniature motors. Allows the motor to be powered from a d.c. source either battery or transformer recitifier (transformer rectifier must have a non digital output).

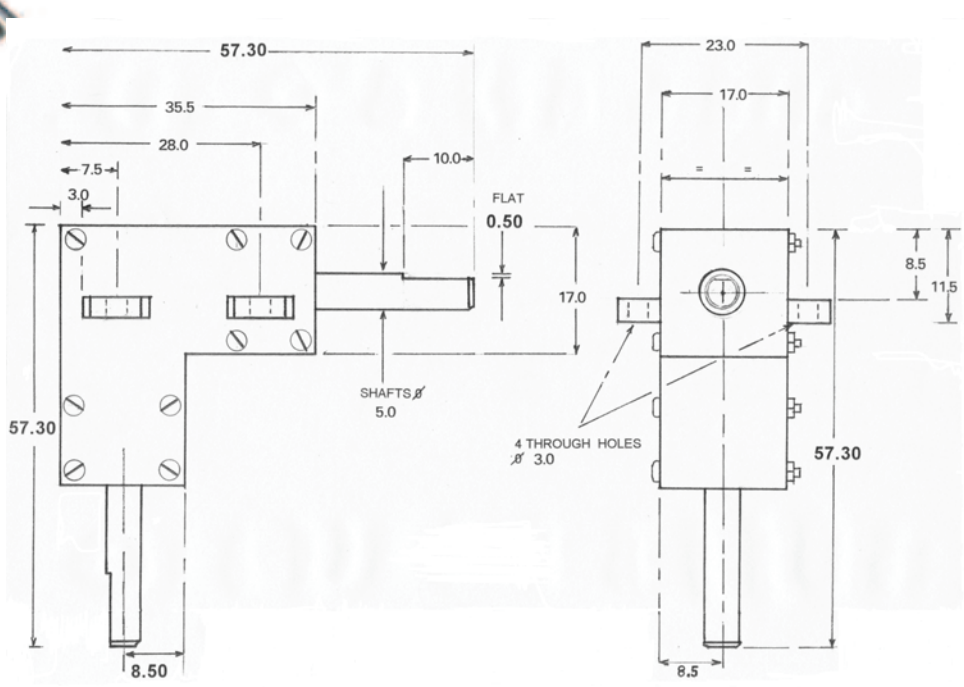
Unit employs PWM circuitry which varies the output pulse width to vary the motor speed while maintaining a constant output voltage. PWM also assists in maintaining motor torque. Output may not zero motor speed in NO load conditions.

Specifications:-

Edge to edge frequency 2KHz
Linear output response
Input 6 - 15 volts d.c. (non digital)
Full 'H' bridge output drive
Rating 3 Amps continuous, 5 Amps peak.
Circuit provides approx 1/5th second breaking pause between directional changes.

BEVEL GEARBOX. PART NO. 919D24





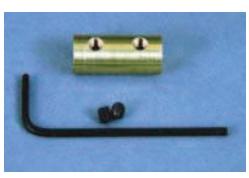
BEVEL GEARBOX

This unit has steel gears and shafts running in ballraces and scintered bronze bearings, 1 ball race and sintered bearing per shaft. The former act also as thrust races protecting the bevel gears from external pressures of varying loads. The housing mouldings are 30% glass filled nylon for strength and have four pre-drilled mounting holes. Key flats are provided on both shafts.

*** 1:1 gear ratio ***
*** Lubricated for life ***
*** Designed for rugged service life ***

Specification		Material
Weight:	42g	Case: 30% glass filled nylon
Backlash:	1 deg approx	Gear: Mild steel: BS970:part 3:1991:230MO7

Max input speed: 5000 r.p.m.
Rated tolerance torque: 7.5 Kg-cm
Max momentary tolerance torque: 22.5 Kg-cm



IN-LINE COUPLINGS: **5 - 5mm** **Pt No. 919D1/5**
5 - 6mm **Pt No. 919D1/3**

970D SERIES 35mm SINGLE RATIO METAL GEARBOX (CENTRAL OUTPUT SHAFT)

(RE 540/1 MOTOR)

Metal Gearbox cover included with this series

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

970D61	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 6:1
970D161	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 16:1
970D471	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 47:1
970D1561	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 156:1
970D7501	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 750:1
970D28121	(4.5v - 15v)	WITH RE 540/1 MOTOR.	RATIO 2812:1

Designed for heavy-duty industrial and model applications this robust unit boasts a powerful high quality, three pole motor with sintered bronze bearings. The metal gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox. The unit is mounted on a 1mm thick plated steel bracket.

MOTOR DATA. (RE-540/1)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 540/1	4.5 - 15.0	6.0v CONSTANT	7500	0.45	6180	2.1	1.64	118.2	7.49	59.4	9.31	670
		12.0v CONSTANT	15800	0.52	13360	2.85	2.14	154.4	21.2	61.9	13.9	1000

Stall Current RE540/1 at 6v = 8.24A

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	4.5v	6.0v	9.0v	12.0v	15.0v	Direction of rotation
						Clockwise/ Anticlockwise
970D61	800	1050	1700	2150	2900	ACW
970D161	228	500	700	900	1250	CW
970D471	106	144	216	350	450	ACW
970D1561	32	44	68	94	124	CW
970D7501	7	9	14	19	23	CW
970D28121	2	3	4	5	7	ACW

WEIGHT	
970D61	247g
970D161	252g
970D471	257g
970D1561	261g
970D7501	270g
970D28121	271g

GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX MOMENTARY TOLERANCE TORQUE
6:1	1000	3000
16:1	2000	6000
47:1	3000	9000
156:1	6000	18000
750:1	6000	18000
2812:1	6000	18000

NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

24 volt versions are available for this range of motor-gearboxes. Performance data is similar to 12 volt versions. This version also has an extended 10mm rear shaft to accommodate motor encoders. When ordering please use 12v version part number suffixed with 24V.
I.E. 919D111 will be 919D11124V

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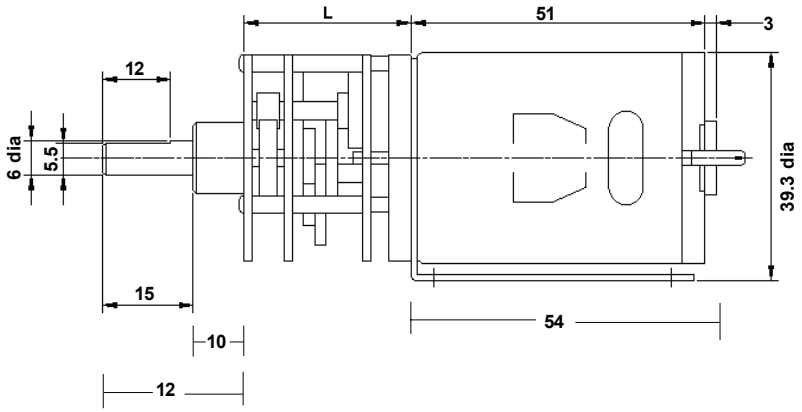
970D SERIES 35mm SINGLE RATIO METAL GEARBOX (CENTRAL OUTPUT SHAFT)

(RE 540/1 MOTOR)



GEARBOX REF.	L
970D61 (6:1)	22
970D161 (16:1)	25
970D471 (47:1)	27.5
970D1561 (1561)	30
970D7501 (750:1)	35
970D28121(2812:1)	37.5

RATED TOLERANCE TORQUE	
970D61 (6:1)	1000 gf.cm
970D161 (16:1)	2000 gf.cm
970D471 (47:1)	3000 gf.cm
970D1561 (1561)	6000 gf.cm
970D7501 (750:1)	6000 gf.cm
970D28121(2812:1)	6000 gf.cm

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 919D SERIES PAGE.

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

Gearbox 6:1 with 540/1 motor
Gearbox 31:1 with 540/1 motor
Gearbox 63:1 with 540/1 motor
Gearbox 104:1 with 540/1 motor
Gearbox 169:1 with 540/1 motor
Gearbox 250:1 with 540/1 motor
Gearbox 422:1 with 540/1 motor
Gearbox 625:1 with 540/1 motor
Gearbox 1875:1 with 540/1 motor

Gearbox 16:1 with 540/1 motor
Gearbox 38:1 with 540/1 motor
Gearbox 69:1 with 540/1 motor
Gearbox 113:1 with 540/1 motor
Gearbox 188:1 with 540/1 motor
Gearbox 281:1 with 540/1 motor
Gearbox 438:1 with 540/1 motor
Gearbox 750:1 with 540/1 motor
Gearbox 2813:1 with 540/1 motor

Gearbox 19:1 with 540/1 motor
Gearbox 47:1 with 540/1 motor
Gearbox 75:1 with 540/1 motor
Gearbox 125:1 with 540/1 motor
Gearbox 219:1 with 540/1 motor
Gearbox 312:1 with 540/1 motor
Gearbox 469:1 with 540/1 motor
Gearbox 938:1 with 540/1 motor
Gearbox 3750:1 with 540/1 motor

Gearbox 21:1 with 540/1 motor
Gearbox 56:1 with 540/1 motor
Gearbox 94:1 with 540/1 motor
Gearbox 156:1 with 540/1 motor
Gearbox 234:1 with 540/1 motor
Gearbox 375:1 with 540/1 motor
Gearbox 563:1 with 540/1 motor
Gearbox 1250:1 with 540/1 motor
Gearbox 5625:1 with 540/1 motor

975D SERIES 42mm (45mm motor) PLANETRY (EPICYCLIC) METAL GEARBOX

(RE 975 MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

975D41	(4.5v - 15v)	RATIO 4:1
975D1041	(4.5v - 15v)	RATIO 104:1
975D2121	(4.5v - 15v)	RATIO 212:1
975D5041	(4.5v - 15v)	RATIO 504:1

Designed for heavy-duty industrial and model applications this robust unit boasts a powerful high quality motor with sintered bronze bearings. The metal gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY					STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF	
			R.P.M.	A	R.P.M	A	oz - in	g - cm	W	%	g - cm
RE975	6.0 - 12.0	12v CONSTANT	7000	0.9	5700	5.5		700	41.3	63	4290

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE		6.0v	9.0v	12.0v
975D41		850	1275	1750
975D1041		35	51	67
975D2121		10	17.5	27
975D5041		6.5	10	14

WEIGHT	
975D41	541g
975D1041	632g
975D2121	669g
975D5041	683g

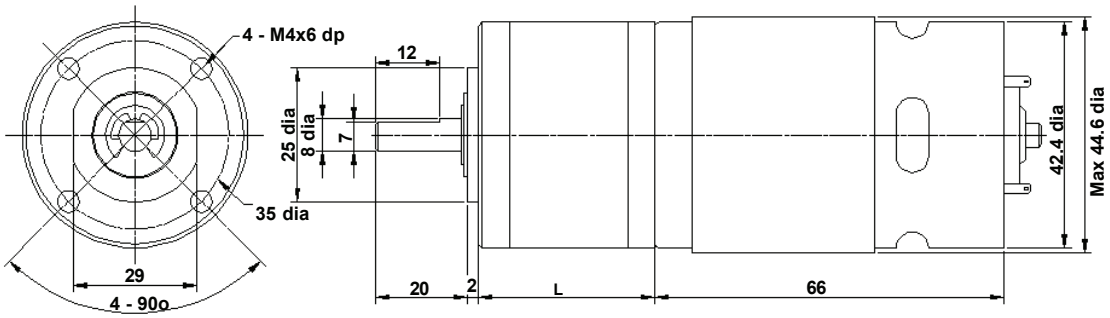
GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE
4:1	5000	15000
104:1	20000	60000
212:1	25000	75000
504:1	30000	90000

NOTE: To establish Torque Rating in Nm, divide g.cm by 10,197.0

975D SERIES 42mm (45mm motor) PLANETRY (EPICYCLIC) METAL GEARBOX

GEARBOX DIMENSIONS



	Rated Tolerance Torgue. g.cm	Max momentary Tolerance Torque g.cm	Efficiency %
975D41 (4:1)	5,000	15,000	80
975D1041 (104:1)	20,000	60,000	61
975D5041 (504:1)	30,000	90,000	52

GEARBOX REF.	L
975D41 (4:1)	32.5
975D1041 (104:1)	45.9
975D2121 (212:1)	52.6
975D5041 (504:1)	52.6

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 919D SERIES PAGE.

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 100 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

Gearbox 14:1 with 975 motor
Gearbox 49:1 with 975 motor
Gearbox 144:1 with 975 motor
Gearbox 624:1 with 975 motor
Gearbox 1062:1 with 975 motor
Gearbox 3000:1 with 975 motor
Gearbox 17:1 with 975 motor
Gearbox 61:1 with 975 motor
Gearbox 212:1 with 975 motor
Gearbox 720:1 with 975 motor
Gearbox 1470:1 with 975 motor
Gearbox 3600:1 with 975 motor
Gearbox 24:1 with 975 motor
Gearbox 84:1 with 975 motor
Gearbox 294:1 with 975 motor
Gearbox 864:1 with 975 motor
Gearbox 2500:1 with 975 motor

980D SERIES 35mm SINGLE RATIO METAL GEARBOX (CENTRAL OUTPUT SHAFT) (RE 385 MOTOR)

Metal Gearbox cover included with this series

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

980D61	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 6:1
980D161	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 16:1
980D471	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 47:1
980D1561	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 156:1
980D7501	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 750:1
980D28121	(4.5v - 15v)	WITH RE 385 MOTOR. RATIO 2812:1

Designed for heavy-duty industrial and model applications this robust unit boasts a powerful high quality, five pole motor with sintered bronze bearings. The metal gearbox incorporates sleeved bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox. The unit is mounted on a 1mm thick plated steel bracket.

MOTOR DATA. (RE-385)

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 385	6.0 - 15.0	12v CONSTANT	11000	0.155	9281	0.837		65.3	6.21	61.85		417.6

Stall Current RE385 at 12v = 4.62A

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	4.5v	6.0v	9.0v	12.0v	15.0v
980D61	650	900	1300	1830	2250
980D161	210	270	500	685	950
980D471	72	108	170	204	300
980D1561	23	32	51	69	90
980D7501	4.4	6.6	11.6	14.5	18.5
980D28121	1.3	1.8	2.8	3.8	5

WEIGHT	
980D6	145g
980D161	150g
980D471	155g
980D1561	160g
980D7501	168g
980D28121	170g

GEARBOX RATINGS

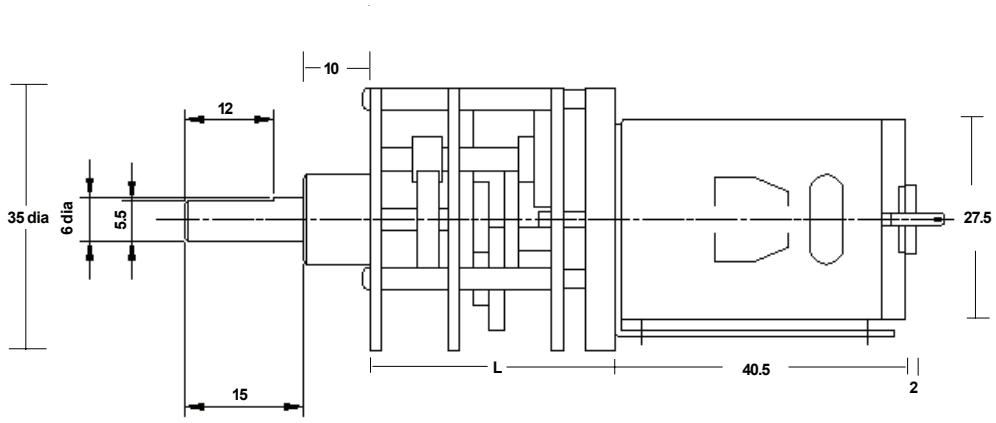
RATED TOLERANCE TORQUE (g.cm)		MAX MOMENTARY TOLERANCE TORQUE
6:1	1000	3000
16:1	2000	6000
47:1	3000	9000
156:1	6000	18000
750:1	6000	18000
2812:1	6000	18000

NOTE: To establish Torque Rating in nM, divide g.cm by 10,197.0

24 volt versions are available for this range of motor-gearboxes. Performance data is similar to 12 volt versions. This version also has an extended 10mm rear shaft to accommodate motor encoders. When ordering please use 12v version part number suffixed with 24V.
I.E. 950D111 will be 950D11124V

980D SERIES 35mm SINGLE RATIO METAL GEARBOX (CENTRAL OUTPUT SHAFT) (RE 385 MOTOR)

GEARBOX DIMENSIONS



GEARBOX REF.	L
980D61 (6:1)	14.8
980D161 (16:1)	17.5
980D471 (47:1)	20.1
980D1561 (156:1)	22.6
980D7501 (750:1)	27.5
980D28121(2812:1)	30.0

FOR ACCESSORIES TO FIT THIS SERIES GEARBOX, REFER TO 919D SERIES PAGE.

RATED TOLERANCE TORQUE	
980D61 (6:1)	1000 gf.cm
980D161 (16:1)	2000 gf.cm
980D471 (47:1)	3000 gf.cm
980D1561 (1561)	6000 gf.cm
980D7501 (750:1)	6000 gf.cm
980D28121(2812:1)	6000 gf.cm

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

Gearbox 6:1 with 385 motor
Gearbox 31:1 with 385 motor
Gearbox 63:1 with 385 motor
Gearbox 104:1 with 385 motor
Gearbox 169:1 with 385 motor
Gearbox 250:1 with 385 motor
Gearbox 422:1 with 385 motor
Gearbox 625:1 with 385 motor
Gearbox 1875:1 with 385 motor

Gearbox 16:1 with 385 motor
Gearbox 38:1 with 385 motor
Gearbox 69:1 with 385 motor
Gearbox 113:1 with 385 motor
Gearbox 188:1 with 385 motor
Gearbox 281:1 with 385 motor
Gearbox 438:1 with 385 motor
Gearbox 750:1 with 385 motor
Gearbox 2813:1 with 385 motor

Gearbox 19:1 with 385 motor
Gearbox 47:1 with 385 motor
Gearbox 75:1 with 385 motor
Gearbox 125:1 with 385 motor
Gearbox 219:1 with 385 motor
Gearbox 312:1 with 385 motor
Gearbox 469:1 with 385 motor
Gearbox 938:1 with 385 motor
Gearbox 3750:1 with 385 motor

Gearbox 21:1 with 385 motor
Gearbox 56:1 with 385 motor
Gearbox 94:1 with 385 motor
Gearbox 156:1 with 385 motor
Gearbox 234:1 with 385 motor
Gearbox 375:1 with 385 motor
Gearbox 563:1 with 385 motor
Gearbox 1250:1 with 385 motor
Gearbox 5625:1 with 385 motor

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986D SERIES 52mm DIA (EPICYCLIC) METAL GEARBOX

(RE 800 MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

986D41	(6v - 12v)	RATIO 4:1
986D1001	(6v - 12v)	RATIO 100:1
986D4881	(6v - 12v)	RATIO 488:1

Designed for heavy-duty industrial and model applications this robust unit boasts a powerful high quality motor with scintered bronze bearings. The metal gearbox incorporates ballrace bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox. The extended rear motor shaft can facilitate encoder installation.

MOTOR DATA.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M	A	oz - in	g - cm	W	%		g - cm
RE800	6.0 - 12.0	12v CONSTANT	5167	1.058	4289	5.28		837	36.88	58.2		4923

Stall Current RE800 at 12v = 25.86A

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	6.0v	12.0v
986D41	640	1292
986D1001	25	52
986D4881	5	11

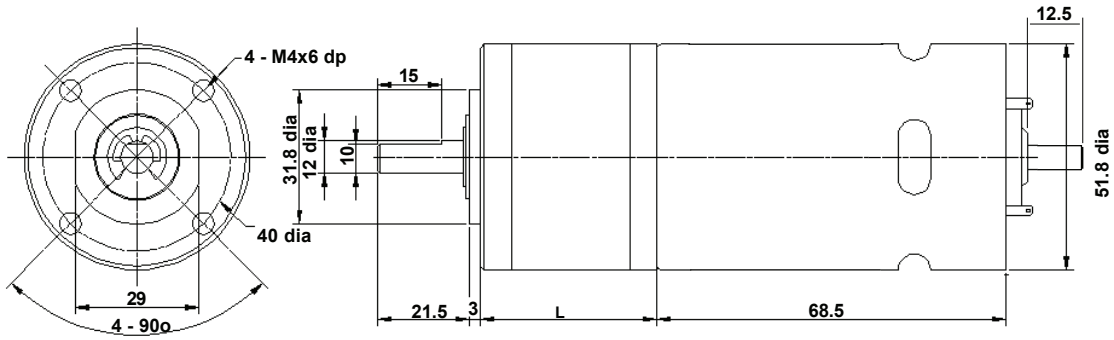
WEIGHT	
986D41	1070g
986D1001	1445g
986D4881	1615g

GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE
4:1	15000	45000
100:1	100000	300000
488:1	100000	300000

NOTE: To establish Torque Rating in Nm divide g.cm by 10,197.0

986D SERIES 52mm DIA (EPICYCLIC) METAL GEARBOX (RE 800 MOTOR)



GEARBOX REF.	L
986D41 (4:1)	53
986D1001 (100:1)	84
986D4881 (488:1)	99.5

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

Gearbox 3:1 with 800 motor
Gearbox 43:1 with 800 motor
Gearbox 113:1 with 800 motor
Gearbox 353:1 with 800 motor

Gearbox 12:1 with 800 motor
Gearbox 53:1 with 800 motor
Gearbox 150:1 with 800 motor
Gearbox 546:1 with 800 motor

Gearbox 15:1 with 800 motor
Gearbox 66:1 with 800 motor
Gearbox 230:1 with 800 motor
Gearbox 676:1 with 800 motor

Gearbox 19:1 with 800 motor
Gearbox 81:1 with 800 motor
Gearbox 285:1 with 800 motor

990D SERIES 12mm DIA SUB MINIATURE (EPICYCLIC) METAL GEARBOX

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE AS EX-STOCK ITEMS.

990D41	(3v)	RATIO 4:1
990D641	(3v)	RATIO 64:1
990D2561	(3v)	RATIO 256:1

A sub miniature epicyclic motor/gearbox combination with scintered steel output bearings and precious metal motor brushes. Ideal in situations requiring high torque in a limited space with low current consumption.

MOTOR DATA.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY					STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF	
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%	g - cm
RE990	3V	3v CONSTANT	12500	80	10300	340		5.6	0.59	58	22(est)

REDUCTION TABLE. R.P.M.

SUPPLY VOLTAGE	3.0v
990D41	3125
990D641	195
990D2561	49

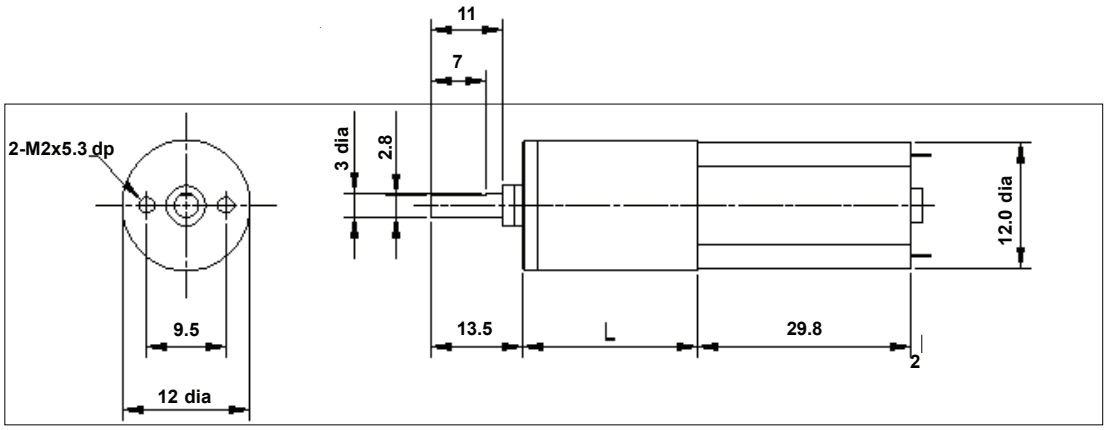
WEIGHT	
990D41	12.6g
990D641	16.8g
990D2561	18.9g

GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE	Efficiency %
4:1	800	2400	85
64:1	1600	4800	65
256:1	1800	5400	55

NOTE: To establish Torque Rating in Nm divide g.cm by 10,197.0

990D SERIES 12mm DIA SUB MINIATURE (EPICYCLIC) METAL GEARBOX



GEARBOX REF.	L
990D41 (4:1)	12.9
990D641 (64:1)	19.8
990D2561 (256:1)	23.1

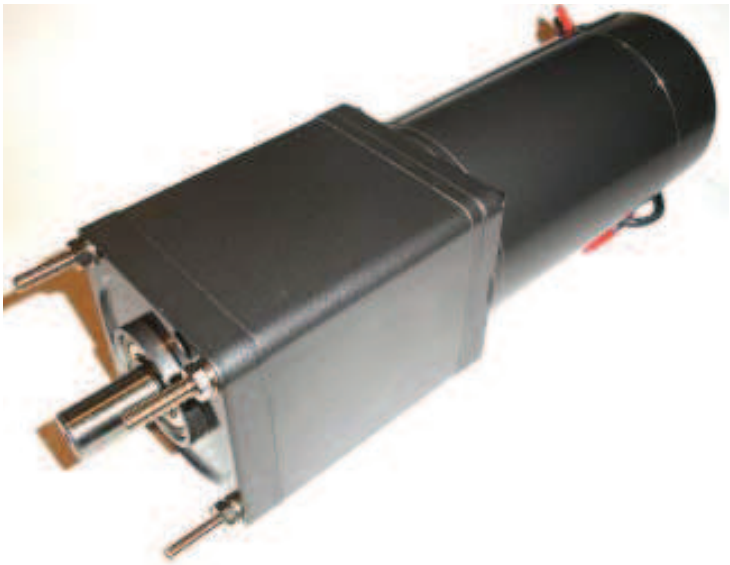
ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time.
The physical dimensions of these other gearboxes may vary from the data as illustrated above.
Details of individual gearboxes are available upon request.

Gearbox 16:1 Gearbox 1024:1 Gearbox 4096:1

995D SERIES 60mm DIA EPICYCLIC GEARED MOTOR. METAL GEARBOX



(RE 995 MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE

995D41	(12v & 24v)	RATIO 4:1
995D531	(12v & 24v)	RATIO 53:1
995D1001	(12v & 24v)	RATIO 100:1
995D4881	(12v & 24v)	RATIO 488:1

Designed for industrial applications this robust unit boasts a powerful high quality 12 pole motor with carbon brushes & ball raced bearings. The metal gearbox incorporates ballrace bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA. 12v d.c.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%		g - cm
RE995 (12V)	12.0v	12v CONSTANT	5100	1500	4760	3300		700	34.2	86		7727

MOTOR DATA. 24v d.c.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%		g - cm
RE995 (24V)	24V	24v CONSTANT	5100	800	4830	2400		1000	49.6	86		12427

REDUCTION TABLE. R.P.M. 12v TYPE.

SUPPLY VOLTAGE	12.0v
995D41	1090
995D531	89
995D1001	47
995D4881	9.8

REDUCTION TABLE. R.P.M. 24v TYPE.

SUPPLY VOLTAGE	24.0v
995D41	1100
995D531	90
995D1001	48
995D4881	10

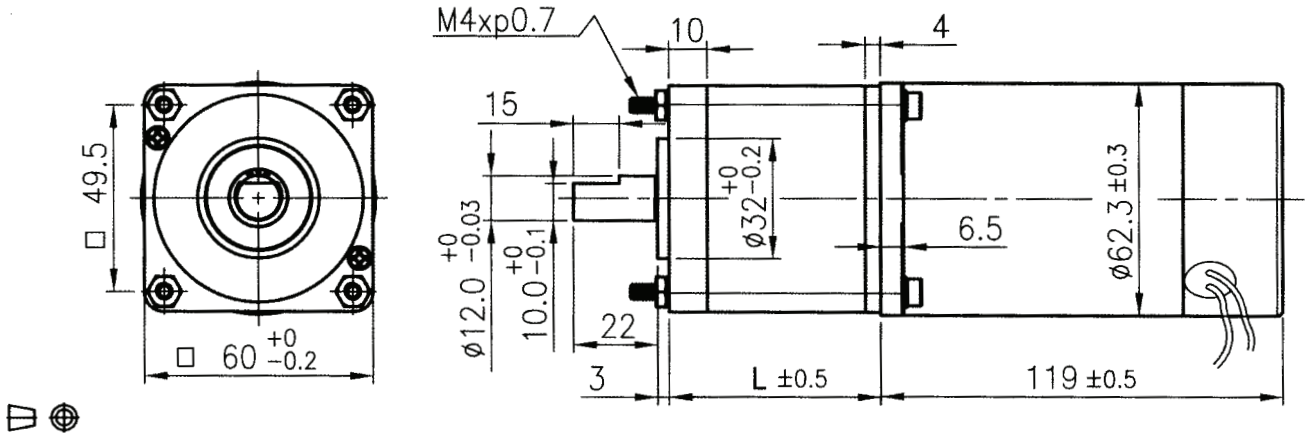
GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE
4:1	15000	45000
53:1	100000	300000
100:1	100000	300000
488:1	100000	300000

NOTE: To establish Torque Rating in Nm divide g.cm by 10,197.0

WEIGHT. Kg.	
995D41	1.60kg
995D531	2.13kg
995D1001	2.13kg
995D4881	2.36kg

995D SERIES 60mm DIA (EPICYCLIC) METAL GEARBOX (RE 995 MOTOR)



GEARBOX REF.	L
995D41 (4:1)	43.3
995D531 (53:1)	74.3
995D1001 (100:1)	74.3
995D4881 (488:1)	89.8

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

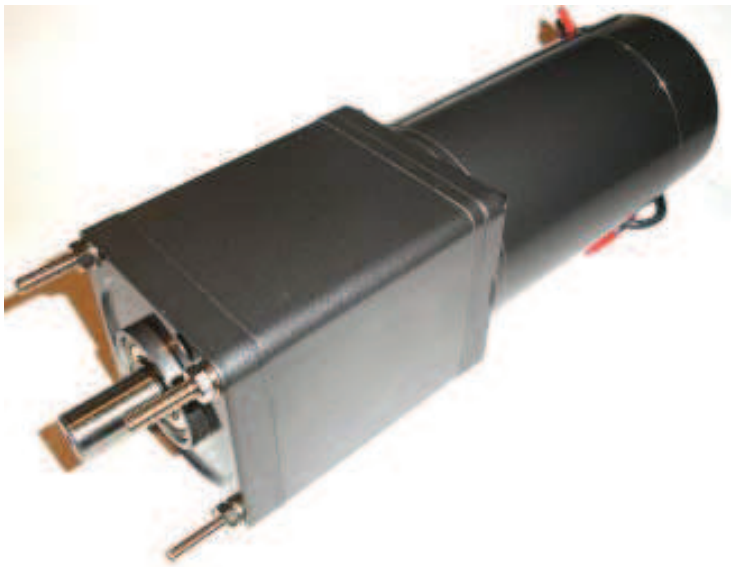
Gearbox 3:1 with 995 motor
Gearbox 43:1 with 995 motor
Gearbox 113:1 with 995 motor
Gearbox 353:1 with 995 motor

Gearbox 12:1 with 995 motor
Gearbox 53:1 with 995 motor
Gearbox 150:1 with 995 motor
Gearbox 546:1 with 995 motor

Gearbox 15:1 with 995 motor
Gearbox 66:1 with 995 motor
Gearbox 230:1 with 995 motor
Gearbox 676:1 with 995 motor

Gearbox 19:1 with 995 motor
Gearbox 81:1 with 995 motor
Gearbox 285:1 with 995 motor

996D SERIES 70mm DIA EPICYCLIC GEARED MOTOR. METAL GEARBOX



(RE 996 MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE

996D41	(12v & 24v)	RATIO 4:1
996D501	(12v & 24v)	RATIO 50:1
996D1021	(12v & 24v)	RATIO 102:1
996D4931	(12v & 24v)	RATIO 493:1

Designed for industrial applications this robust unit boasts a powerful high quality 12 pole motor with carbon brushes & ball raced bearings. The metal gearbox incorporates ballrace bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA. 12v d.c.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY					STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF	
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%	g - cm
RE996 (12V)	12.0v	12v CONSTANT	2000	800	1800	3000		1500	27.7	77	12727

MOTOR DATA. 24v d.c.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY					STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF	
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%	g - cm
RE996 (24V)	24V	24v CONSTANT	2000	400	1800	2500		2500	46.2	77	21232

REDUCTION TABLE. R.P.M. 12v TYPE.

SUPPLY VOLTAGE	12.0v
996D41	510
996D501	36
996D1021	17.6
996D4931	3.7

REDUCTION TABLE. R.P.M. 24v TYPE.

SUPPLY VOLTAGE	24.0v
996D41	510
996D501	36
996D1021	17.7
996D4931	3.8

GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE
4:1	15000	45000
50:1	125000	375000
102:1	125000	375000
493:1	150000	450000

NOTE: To establish Torque Rating in Nm divide g.cm by 10,197.0

WEIGHT. Kg.	
996D41	2.43kg
996D501	3.09kg
996D1021	3.09kg
996D4931	3.43kg

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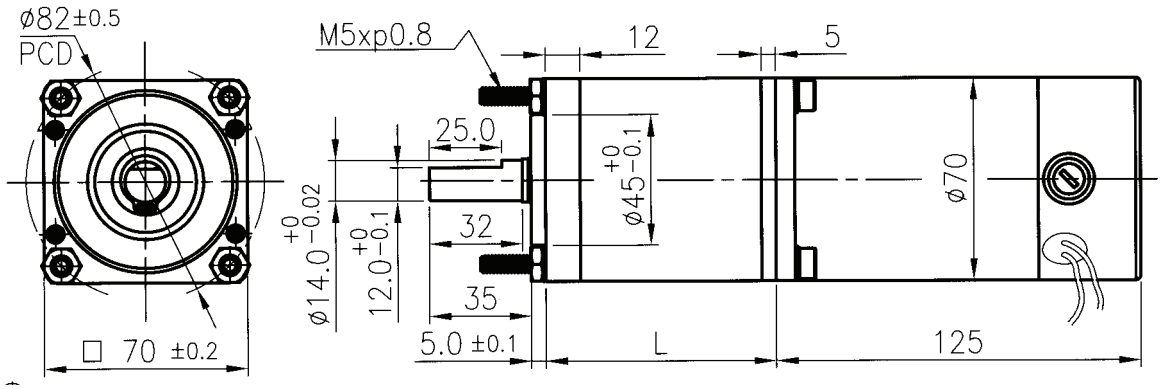
996D SERIES 70mm DIA (EPICYCLIC) METAL GEARBOX (RE 996 MOTOR)



GEARBOX REF.	L
996D41 (4:1)	47.3
996D501 (50:1)	80.3
996D1021 (102:1)	80.3
996D4931 (493:1)	96.8

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

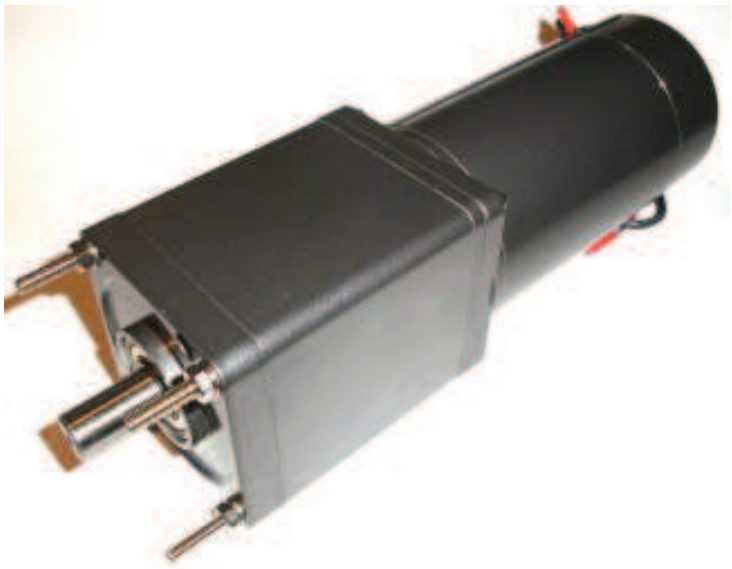
Gearbox 13:1 with 996 motor
Gearbox 75:1 with 996 motor
Gearbox 242:1 with 996 motor
Gearbox 543:1 with 996 motor

Gearbox 16:1 with 996 motor
Gearbox 91:1 with 996 motor
Gearbox 300:1 with 996 motor
Gearbox 611:1 with 996 motor

Gearbox 20:1 with 996 motor
Gearbox 126:1 with 996 motor
Gearbox 363:1 with 996 motor

Gearbox 60:1 with 996 motor
Gearbox 189:1 with 996 motor
Gearbox 414:1 with 996 motor

997D SERIES 80mm DIA EPICYCLIC GEARED MOTOR. METAL GEARBOX



(RE 997 MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE

997D41	(12v & 24v)	RATIO 4:1
997D491	(12v & 24v)	RATIO 49:1
997D1031	(12v & 24v)	RATIO 103:1
997D4451	(12v & 24v)	RATIO 445:1

Designed for industrial applications this robust unit boasts a powerful high quality 12 pole motor with carbon brushes & ball raced bearings. The metal gearbox incorporates ballrace bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA. 12v d.c.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%		g - cm
RE997	12.0v	12v CONSTANT	3200	1400	2750	6300		2000	56.5	75		22356

MOTOR DATA. 24v d.c.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%		g - cm
RE997(24v)	24V	24v CONSTANT	3200	850	2800	4400		2900	83.4	79		31608

REDUCTION TABLE. R.P.M. 12v TYPE.

SUPPLY VOLTAGE	12.0v
997D41	720
997D491	56
997D1031	26.5
997D4451	6.5

REDUCTION TABLE. R.P.M. 24v TYPE.

SUPPLY VOLTAGE	24.0v
997D41	730
997D491	57
997D1031	27.5
997D4451	6.7

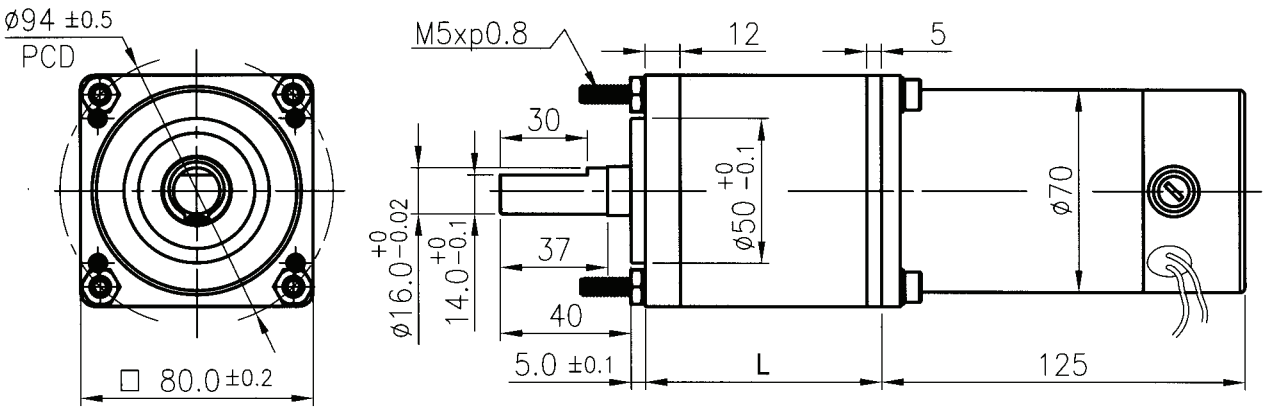
GEARBOX RATINGS

RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE
4:1	15000	45000
49:1	125000	375000
103:1	125000	375000
445:1	150000	450000

NOTE: To establish Torque Rating in Nm divide g.cm by 10,197.0

WEIGHT. Kg.	
997D41	2.75kg
997D491	3.69kg
997D1031	3.69kg
997D4451	4.16kg

997D SERIES 80mm DIA (EPICYCLIC) METAL GEARBOX (RE 997 MOTOR)



GEARBOX REF.	L
997D41 (4:1)	49.3
997D491 (49:1)	82.3
997D1031 (103:1)	82.3
997D4451 (445:1)	98.8

ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

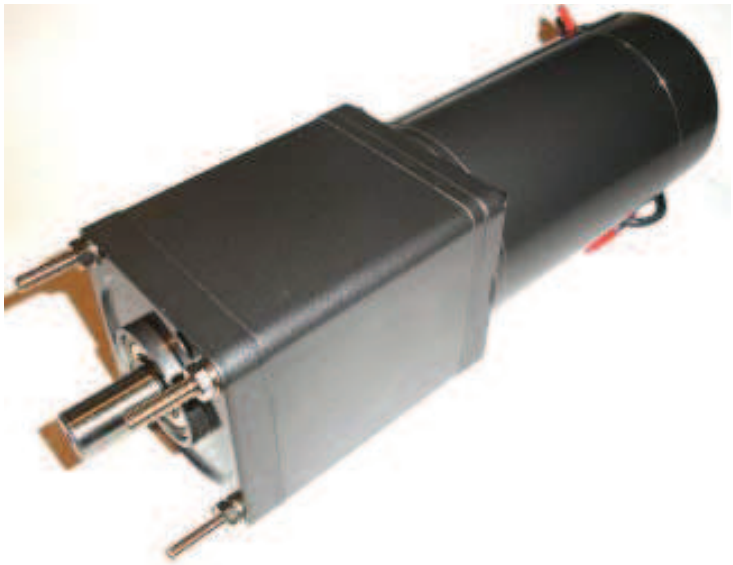
Gearbox 13:1 with 997 motor
Gearbox 55:1 with 997 motor
Gearbox 186:1 with 997 motor
Gearbox 571:1 with 997 motor

Gearbox 15:1 with 997 motor
Gearbox 71:1 with 997 motor
Gearbox 210:1 with 997 motor
Gearbox 647:1 with 997 motor

Gearbox 19:1 with 997 motor
Gearbox 80:1 with 997 motor
Gearbox 306:1 with 997 motor

Gearbox 21:1 with 997 motor
Gearbox 117:1 with 997 motor
Gearbox 393:1 with 997 motor

998D SERIES 90mm DIA EPICYCLIC GEARED MOTOR. METAL GEARBOX



(RE 998 MOTOR)

IMPORTANT NOTICE
Due to the wide range of applications for this product it is the users responsibility to establish the products suitability for their individual purpose(s).

RATIOS NOW AVAILABLE

998D41	(12v & 24v)	RATIO 4:1
998D521	(12v & 24v)	RATIO 52:1
998D981	(12v & 24v)	RATIO 98:1
998D5171	(12v & 24v)	RATIO 517:1

Designed for industrial applications this robust unit boasts a powerful high quality 16 pole motor with carbon brushes & ball raced bearings. The metal gearbox incorporates ballrace bearings, enabling the high torque transfer from the motor to be transmitted through the gearbox.

MOTOR DATA. 12v d.c.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY					STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF	
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%	g - cm
RE998	12.0v	12v CONSTANT	2000	1100	1700	5300		2500	43.6	69	33328

MOTOR DATA. 24v d.c.

MODEL	VOLTAGE		NO LOAD		MAX EFFICIENCY					STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF	
			R.P.M.	mA	R.P.M	mA	oz - in	g - cm	W	%	g - cm
RE998 (24v)	24V	24v CONSTANT	2000	600	1800	3700		3200	59.0	66	47190

REDUCTION TABLE. R.P.M. 12v TYPE.

SUPPLY VOLTAGE	12.0v
998D41	470
998D521	32
998D981	17
998D5171	3.6

REDUCTION TABLE. R.P.M. 24v TYPE.

SUPPLY VOLTAGE	24.0v
998D41	500
998D521	34
998D981	18.5
998D5171	3.7

GEARBOX RATINGS

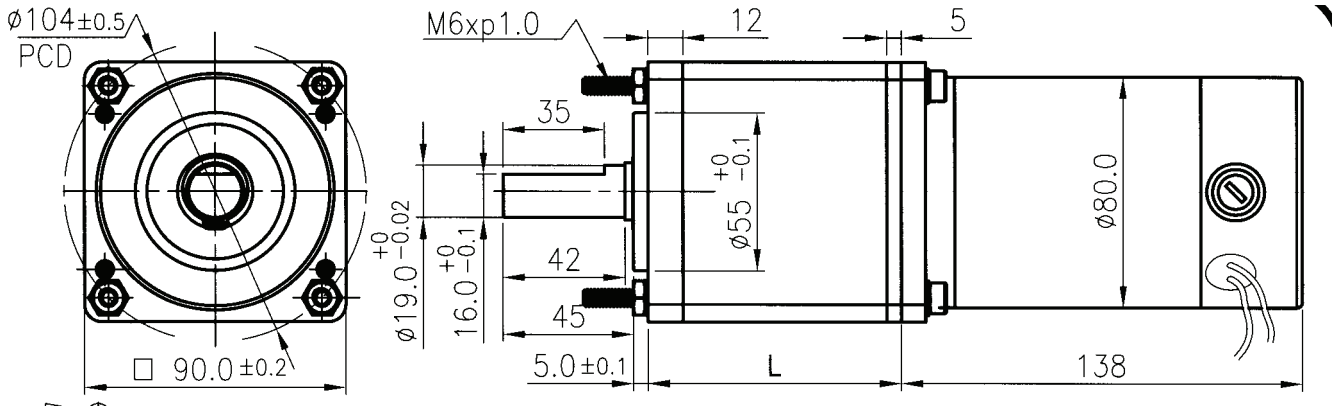
RATED TOLERANCE TORQUE (g.cm)		MAX. MOMENTARY TOLERANCE TORQUE
4:1	20000	60000
52:1	150000	450000
98:1	150000	450000
517:1	180000	540000

NOTE: To establish Torque Rating in Nm divide g.cm by 10,197.0

WEIGHT. Kg.	
998D41	3.64kg
998D521	4.90kg
998D981	4.90kg
998D5171	5.53kg

MFA/COMO DRILLS FELDERLAND LANE. WORTH. DEAL. KENT. CT14 OBT
TEL: 01304 612132. FAX: 01304 614696
E-MAIL: info@mfacomo.com www.mfacomodrills.com

998D SERIES 90mm DIA (EPICYCLIC) METAL GEARBOX (RE 998 MOTOR)



ADVANTAGES OF PLANETARY GEARBOXES.

EFFICIENCY:	Efficiencies of planetary gearboxes can be above 90% while some other types of transmission can be 50% or less. This allows the use of smaller motors.
SIZE:	Planetary gearboxes can be half the size of conventional boxes.
WEIGHT:	Weight savings can be as high as 60%, allowing smaller, lighter support structures.
MAINTENANCE:	Other than routine oil changes, no maintenance is required, eliminating the need to hold spares.
REVERSIBLE:	Planetary gears can be equally efficient in either direction. This is an advantage for use in running machinery in both clockwise and anti-clockwise directions.
COAXIAL:	The coaxial configuration of input and output shafts allows planetary gears to be installed in line with a motor and a machine.

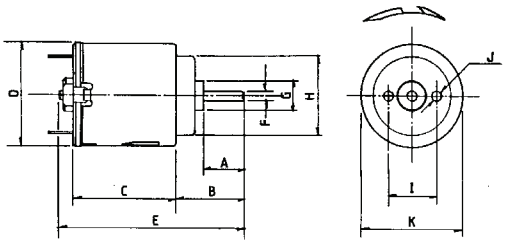
GEARBOX REF.	L
998D41 (4:1)	53.3
998D521 (52:1)	86.3
998D981 (98:1)	86.3
998D5171 (517:1)	102.8

Subject to minimum order quantities of 250 units, the following ratios are also available with a six week lead-time. The physical dimensions of these other gearboxes may vary from the data as illustrated above. Details of individual gearboxes are available upon request.

Gearbox 15:1 with 998 motor
Gearbox 19:1 with 998 motor
Gearbox 60:1 with 998 motor
Gearbox 77:1 with 998 motor
Gearbox 201:1 with 998 motor
Gearbox 294:1 with 998 motor
Gearbox 403:1 with 998 motor

RE - 140 (3 POLE) & RE - 140/1

PT.NO. 457 RE 140 (WITH BRACKET).
PT.NO. 719 RE 140 (WITHOUT BRACKET)
PT.NO. 457 RE 140/1 (WITH BRACKET)
PT.NO. 719 RE 140/1 (WITHOUT BRACKET)
PT.NO. 724 MOTOR BRACKET (90o ONLY)



Weight 20g (approx)

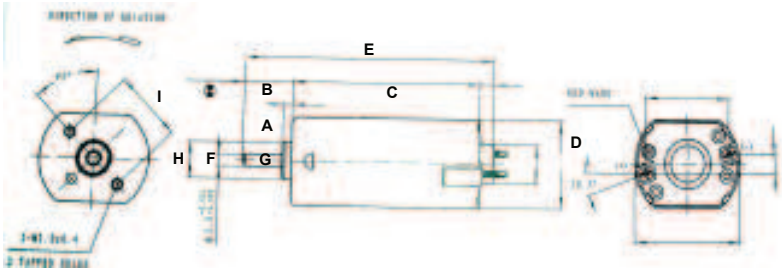
DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	8.3	14.0	21.0	21.0	38.0	2.0	6.15	16.0	10.0	2.0	20.15
DECIMAL INCHES	0.33	0.55	0.827	0.827	1.496	0.079	0.242	0.63	0.394	0.079	0.793

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 140	1.5 - 3.0	1.5v CONSTANT	8200	0.190	6250	0.62	0.089	6.4	0.400	44.2	0.375	27.0
RE - 140	1.5 - 3.0	3.0v CONSTANT	14000	0.230	11300	0.96	1.444	10.4	1.210	42.0	0.750	54.0
RE - 140/1	3.0 - 9.0	6v CONSTANT	9200	0.066	7071	0.219	0.11	8.1	0.589	44.79	0.48	35.1

Stall Current RE140 at 3v = 3.41A

RE - 170 (3 POLE)

PT.NO. 457 RE 170 (WITH BRACKET).
PT.NO. 719 RE 170 (WITHOUT BRACKET)
PT.NO. MOTOR BRACKET (90o ONLY)



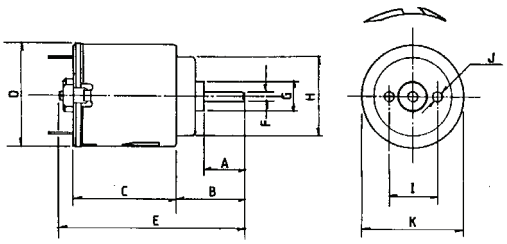
Weight 29g (approx)

DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	6.7	8.3	32.0	18.7	42.7	2.0	6.5	14.5	M2	12.0	45o
DECIMAL INCHES	0.26	0.33	1.26	0.74	1.68	0.08	0.24	0.57		0.47	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 170	1.5 - 3.0	3.0v CONSTANT	10400	0.17	8870	1.03		27	2.47	79.9		184.0

RE - 260 (3 POLE)

PT.NO. 457 RE 260 (WITH BRACKET).
PT.NO. 719 RE 260 (WITHOUT BRACKET)
PT.NO. 724 MOTOR BRACKET (90o ONLY)



Weight 29g (approx)

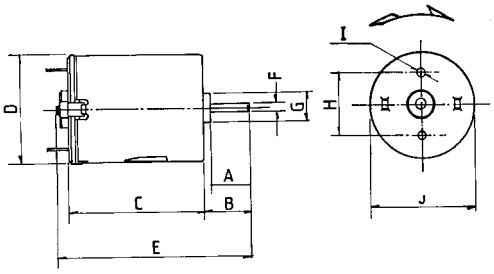
DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	8.2	11.3	23.5	23.7	42.0	2.0	6.1	19.1	11.5	2.3	23.7
DECIMAL INCHES	0.32	0.44	0.93	0.93	1.65	0.079	0.24	0.75	0.45	0.09	0.93

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 260	3.0 - 6.0	3.0v CONSTANT	4242	0.042	3296	0.151		6.8	0.345	33.91		30.61
RE - 260	3.0 - 6.0	4.5v CONSTANT	6360	0.065	4942	0.227		10.2	0.518	50.84		45.9
RE - 260	3.0- 6.0	6.0v CONSTANT	8478	0.087	6587	0.302		13.6		31.5		61.84

Stall Current RE260 at 4.5v = 0.79A

RE - 280 (3 POLE) & RE - 280/1 & RE-280/5

PT.NO. 457 RE 280 (WITH BRACKET)
PT.NO. 457 RE 280/1 (WITH BRACKET)
PT. NO. 457 RE 280/5 (WITH BRACKET)
PT.NO. 719 RE 280 (WITHOUT BRACKET)
PT.NO. 719 RE 280/1 (WITHOUT BRACKET)
PT. NO. 719 RE 280/5 (WITHOUT BRACKET)
PT.NO. 724 MOTOR BRACKET (90o ONLY)



Weight 44g (approx)

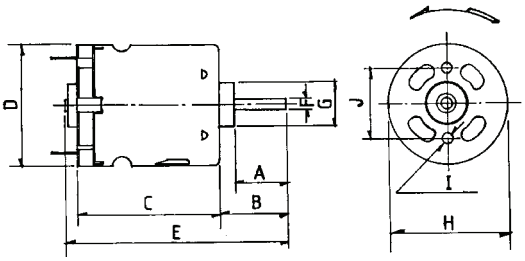
	DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
RE 280, RE 280/1 RE 280/5	MILLIMETER	7.40	12.0	30.5	23.8	42.0	2.0	6.35	14.0	2.3	24.2	
	DECIMAL INCHES	0.41	0.472	1.201	0.937	1.65	0.078	0.250	0.551	0.090	0.953	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 280	1.5 - 3.0	1.5v CONSTANT	4600	0.120	3750	0.53	0.160	11.53	0.44	56.2	0.86	62.0
RE - 280	1.5 - 3.0	3.0v CONSTANT	9200	0.155	7800	0.85	0.278	20.00	1.60	62.3	1.81	130.0
RE - 280/1	12 - 24	12v CONSTANT	8400	0.10	6300	0.30	0.347	25.00	1.62	44.87	1.389	100.0
RE - 280/5	3 - 6	6v CONSTANT	9280	0.108	7664	0.51	0.347	25.00	1.99	64.85	2.02	100.0

Stall Current RE280 at 1.5v = 2.41A

RE - 360 (3 POLE) & RE - 360/1

Pt. No. 457 RE 360 (with Bracket)
Pt. No. 719 RE 360 (without Bracket)
Pt. No. 457 RE 360/1 (with bracket)
Pt. No. 719 RE 360/1 (without bracket)
Pt. No. 725 Motor Bracket (90o only)



Weight 51g (approx)

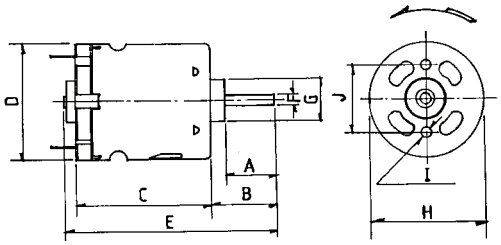
DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	8.2	11.5	32.5	27.63	47.0	2.305	10.0	27.5	M2.6	16.0	
DECIMAL INCHES	0.323	0.453	1.28	1.088	1.85	0.091	0.394	1.083		0.63	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A		g - cm	W	%	oz - in	g - cm
RE - 360	6 - 15	12v CONSTANT	11370	0.151	9511	0.77		58.8	5.75	61.94		360.0
RE - 360/1	6v	6v CONSTANT	11070	0.34	9224	1.70		62.8	5.96	58.35		377.2

Stall Current RE360 at 12v = 3.95A

RE - 380 (3 POLE)

Pt. No. 457 RE 380 (with Bracket)
Pt. No. 719 RE 380 (without Bracket)
Pt. No. 725 Motor Bracket (90o only)



Weight 69g (approx)

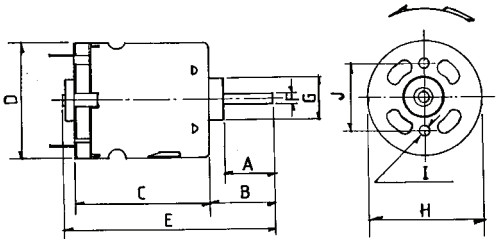
DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	12.5	16.0	38.0	27.7	57.0	2.30	10.0	27.5	M2.6	16.0	
DECIMAL INCHES	0.492	0.630	1.496	1.091	2.244	0.091	0.394	1.083		0.630	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 380	3.0 - 7.2	7.2v CONSTANT	26000	1.000	19000	4.41	5.000	375.00	19.68	62.0	30.000	594.8

Stall Current RE380 at 7.2v = 25.19A

RE - 385 (5 POLE)

Pt. No. 457 RE 385 (with Bracket)
Pt. No. 719 RE 385 (without Bracket)
Pt. No. 725 Motor Bracket (90o only)



Weight 66g (approx)

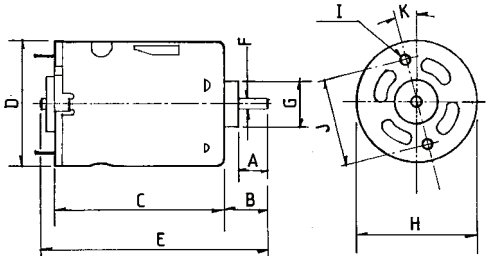
DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	11.5	15.0	38.0	27.7	56.0	2.305	10.0	27.5	M2.6	16.0	
DECIMAL INCHES	0.453	0.591	1.496	1.091	2.205	0.091	0.394	1.083		0.630	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 385	6.0 - 15.0	12v CONSTANT	11646	0.18	9869	0.99		78.4	7.98	66.1		513.5

Stall Current RE385 at 12v = 4.62A

RE - 540 (3 POLE)

Pt. No. 457 RE 540 (with Bracket)
Pt. No. 719 RE 540 (without Bracket)
Pt. No. 726 Motor Bracket (90o only)



Weight 148g (approx)

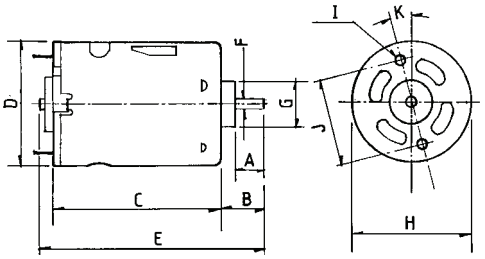
DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	8.5	13.0	50.0	35.8	67.0	3.175	13.0	35.7	M3	25.0	
DECIMAL INCHES	0.335	0.512	1.969	1.409	2.638	0.125	0.512	1.406		0.984	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 540	3.0 - 9.0	3.6v CONSTANT	8400	0.80	8350	5.71	1.87	135	11.6	56.4	10.8	780
RE - 540	3.0 - 9.0	6.0v CONSTANT	14000	1.00	10800	7.10	3.5	254	28.1	66.0	26.4	1900

Stall Current RE540 at 6v = 28.87A

RE - 540/1 (3 POLE)

Pt. No. 457 RE 540/1 (with Bracket)
Pt. No. 719 RE 540/1 (without Bracket)
Pt. No. 726 Motor Bracket (90o only)



24 volt versions are available for this range of motors. Performance data is similar to 12 volt versions. This version also has an extended 10mm rear shaft to accommodate motor encoders.

Pt. No's
457RE540124V
719RE540124V

Weight 146g (approx)

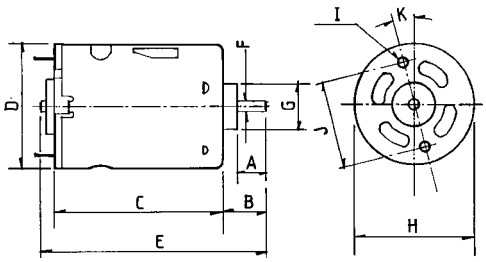
DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	9.0	13.5	50.0	35.8	68.0	3.175	13.0	35.7	M3	25.0	
DECIMAL INCHES	0.354	0.531	1.969	1.409	2.67	0.125	0.512	1.406		0.984	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 540/1	4.5 - 15.0v	6.0v CONSTANT	7500	0.45	6180	2.1	1.64	118.2	7.49	59.4	9.31	670
		12.0v CONSTANT	15800	0.52	13360	2.85	2.14	154.4	21.2	61.9	13.9	1000

Stall Current RE540/1 at 6v = 8.24A

RE - 550/1 (3 POLE)

Pt. No. 457 RE 550/1 (with Bracket)
Pt. No. 719 RE 550/1 (without Bracket)
Pt. No. 726 Motor Bracket (90o only)



Weight 146g (approx)

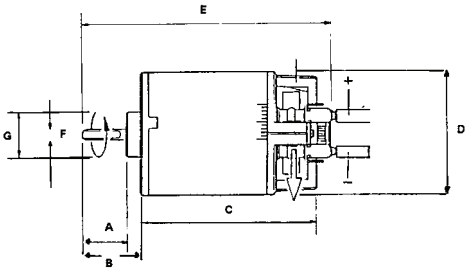
DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	7.3	11.8	56.9	35.8	74.0	3.175	13.0	37.07	M3	25.0	
DECIMAL INCHES	0.287	0.464	2.24	1.409	2.91	0.125	0.512	1.456		0.984	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE - 550/1	3.0 - 9.0v	3.6v CONSTANT	7350	0.60	6309	3.64		138.0	20.87	29.25		976
		6.0v CONSTANT	12250	1.00	10516	6.06		229.0	34.78	48.75		1627

Stall Current RE550/1 at 8.4v = 51.54A

RE - 700 (3 POLE) Ball raced motor

Pt. No. 457 RE 700 (with Bracket)
Pt. No. 719 RE 700 (without Bracket)
Pt. No. 726 Motor Bracket (90o only)



Weight 178g (approx)

DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	12.45	16.45	50.0	36.6	70.0	3.165	13.0	36.6	M2.5x5	24.0	
DECIMAL INCHES											

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	g - cm	W	%	oz - in	g - cm
RE700	6.0 - 8.4v	7.2v constant	22500	2.4	15600	10.3			65	75.0		

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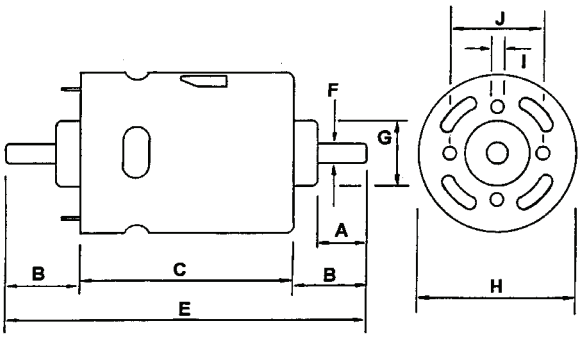
RE 800

Pt. No. 457 RE 800 (with Bracket)
Pt. No. 719 RE 800 (without Bracket)
Pt. No. 1114/2Pt. No. 457 RE 550/1 (with Bracket)



Weight 595g (approx)

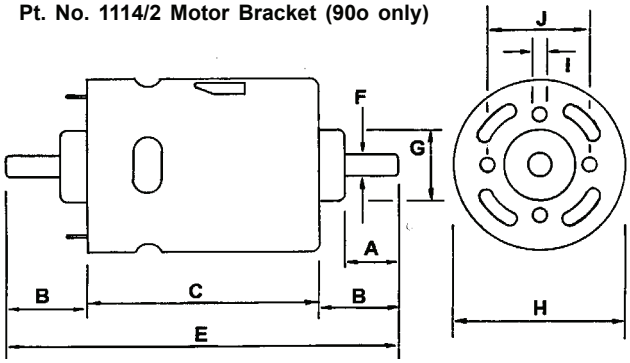
DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	13.2	20.5	69.0		110.0	6.35	21.75	51.8	M5	32.0	
DECIMAL INCHES	0.520	0.810	2.720		4.330	0.250	0.860	2.040		1.260	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	mN-m	W	%	oz - in	mN-m
RE - 800	12.0v	12.0v CONSTANT	5167	1.058	4289	5.28		82.08	36.88	58.2		482.8

Stall Current RE800 at 12v = 25.86A

RE 850

Pt. No. 457 RE 850 (with Bracket)
Pt. No. 719 RE 850 (without Bracket)
Pt. No. 1114/2 Motor Bracket (90o only)



Weight 595g (approx)

DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
MILLIMETER	13.2	20.5	69.0		110.0	6.350	21.75	51.8	M5	32.0	
DECIMAL INCHES	0.520	0.810	2.720		4.330	0.250	0.860	2.040		1.260	

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL TORQUE	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF		
			R.P.M.	A	R.P.M.	A	oz - in	mN-m	W	%	oz - in	mN-m
RE - 850	12.0v	12.0v CONSTANT	9778	1.90	8311	10.82		92.13	80.16	61.74		614

Stall Current RE850 at 12v = 61.34A

BATTERIES

As MFA 'TITAN' batteries are sealed-lead-acid rechargeable batteries, the problems of liquid leakage, gas discharge, and tedious maintenance from conventional lead acid batteries now have been solved. As a result, MFA 'TITAN' batteries can be used as a power source for hobby & toy use, portable instruments such as VTR's, vacuum cleaners, electric powered bicycles, and electromotive tools that must be lightweight, compact and powerful. They can also be used for power back-up of OA-FA, U.P.S., telecommunication and emergency facilities requiring long term reliability.
MFA 'TITAN' batteries are being used in a wide variety of applications in advanced high technical equipment.

FEATURES OF MFA 'TITAN' BATTERIES

The advantages of MFA 'TITAN' batteries over its conventional counterpart are numerous. They include:

1. Maintenance Free. MFA 'TITAN' batteries have an excellent life with absolutely no maintenance required apart from routine charging.

2. No leakage of liquid or gas. By a special sealing design, there is no leakage of liquid or gas, so it is safe for all applications, even when fully recharged, there is no possibility of leakage due to the recombination system which converts the gas into liquid. **MFA 'TITAN'** batteries can be installed safely in equipment with no leakage occuring.

3. Low in self-discharge rate. MFA 'TITAN' batteries keep a low self-discharging rate and they also have a long life, because of using only specially selected lead, calcium-lead, and refined electrolytes.

4. Able to operate in a wide temperature range. MFA 'TITAN' batteries can be used in temperatures ranging from as low as -20oC to as high as 50oC.

5. Economical and long life. MFA 'TITAN' batteries are proven to have a longer life than conventional ones, due to improved durability from our specially selected Pb-Ca alloy.

6. Designed for high-discharging purpose. MFA 'TITAN' batteries are designed especially for high-discharge current. They also have low internal resistance with stable voltage.

7. Available in any position. Our special sealing design enables our batteries to operate in any position, even upside down.

Application of MFA 'TITAN' batteries.

Floating Application

* Most Toy & hobby applications
* Automatic fire alarm devices
* All types of UPS
* Other memory backup devices etc
* Security & burglar systems
* Telecommunication systems
* Electronic cash registers

Cyclic Application

* Portable video tape recorders
* Communication and telephone equipment.
* Medical electronics
* Automatic fire alarm facilities
* Cassette tape recorders
* Cordless tools
* Measuring equipment

CYCLON BATTERY 2V 2.5 AH.
PT. NO. 444
Sealed lead acid battery. "D" cell.

CYCLON BATTERY 2V 5 AH.
PT. NO. 444/1
Sealed lead acid battery. "D" cell.

PART NO.	NOMINAL VOLTAGE	NOMINAL CAPACITY (AH)				DIMENSIONS								WEIGHT (APPROX)	
		20 HR	10 HR RATE	5 HR RATE	1 HR RATE	LENGTH		WIDTH		HEIGHT		HEIGHT OVER TERMINAL			
						(MM)	(INCH)	(MM)	(INCH)	(MM)	(INCH)	(MM)	(INCH)	(LB)	(KG)
629	6	3.0	-	2.60	1.80	134	5.28	34	1.34	60	2.36	66	2.61	1.43	0.65
177	6	4.0	3.80	3.60	2.40	70	2.76	47	1.85	102	4.02	108	4.25	1.72	0.78
1153	6	12.0	11.0	10.0	7.3	151	5.95	50	1.97	94	3.70	100	3.94	4.4	2.0
1095	12	1.2	1.13	1.1	0.72	99	3.9	48	1.9	52	2.05	58	2.3	1.26	0.57
887	12	3.0	2.73	2.55	1.80	134	5.28	67	2.64	60	2.36	68	2.68	2.87	1.30
1113	12	7	6.44	6.30	4.20	151	5.95	65	2.56	94	3.70	100	3.94	6.06	2.75
1119	12	12				151		98		94					4.00

BATTERY CHARGERS

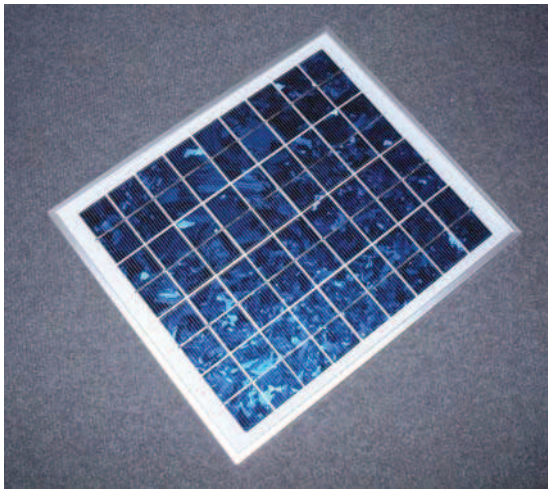
'TITAN' PLUG IN CHARGER. For charging 12v lead-acid batteries. Plugs directly into mains wall socket. Charge rate 720 ma. approx. Features 'charge-complete' indicator. In line fuse and thermal fuse for safety. Instructions included.

PART NO. 827

'TITAN' PLUG IN CHARGER. For charging 6v lead-acid batteries. Plugs directly into mains wall socket. Charge rate 1/2 amp approx. Features 'charge-complete' indicator. In line fuse and thermal fuse for safety. Instructions included.

PART NO. 1077/5MOD

New MFA 10W Solar Panel. Part No. SP10



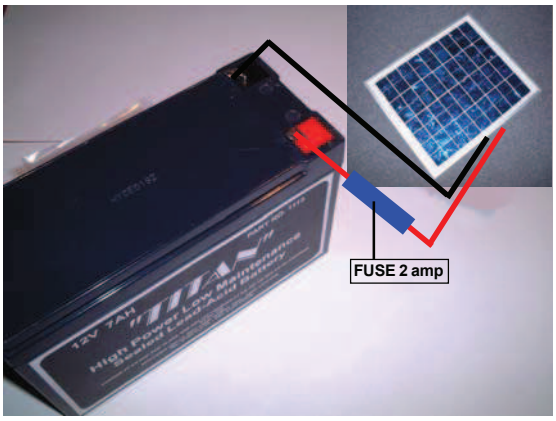
In order to preserve our environment, the use of fossil fuels will need to be replaced by renewable power sources such as wind, solar, hydrogen etc. MFA/Como has introduced two high specification solar panels of practical size and output to aid research and develpment and power models.

The cells are sealed, weather and ultraviolet resistant and will operate effectively from -25 deg C to 90 deg C. They will operate up to 100 humidity. They are TUV approved and CE marked.

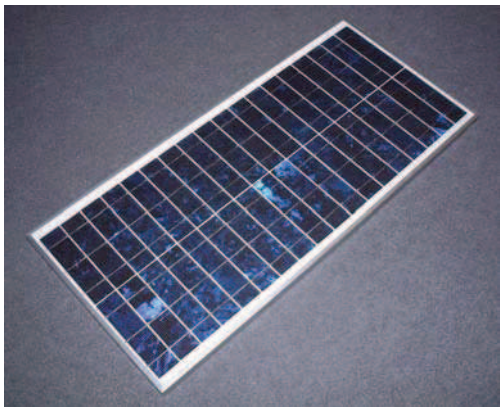
Typical applications include:-
REMOTE TELEMETRY
INSTRUMENTATION SYSTEMS
SECURITY SENSORS
LAND BASED NAVIGATION AIDS
EMERGENY LIGHTING
POWER SOURCE FOR MODELS AND EDUCATIONAL PROJECTS
OFF GRID POWER SUPPLIES
POWER SOURCE FOR ELECTRIC FENCING.

Part No. SP10

Peak Power (W)	10W
Max. Current (ImP)	0.555A
Max. Voltage (Vmp)	18V
Short Circuit Current (Isc)	0.58A
Open Circuit Voltage (Voc)	21.6V
Dimensions	340 x 290 x 25mm
Weight	1.26kg

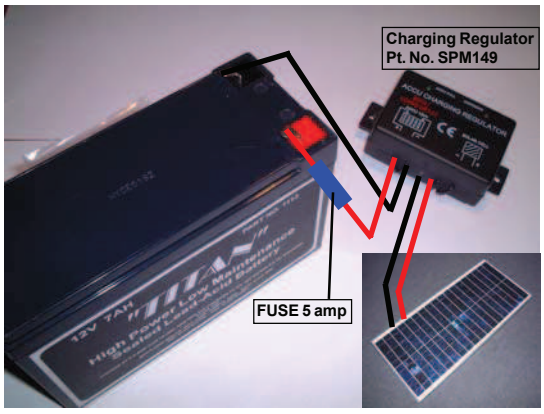


New MFA 30W Solar Panel. Part No. SP30



Part No. SP30

Peak Power (W)	30W
Max. Current (ImP)	1.66A
Max. Voltage (Vmp)	18V
Short Circuit Current (Isc)	1.82A
Open Circuit Voltage (Voc)	21.8V
Dimensions	736 x 342 x 25mm
Weight	2.9kg



Solar Charging Regulator. Part No. SPM149.

This unit is an electronic switch that switches on the connection to the solar cells if the battery is empty and switches off again when the battery is fully charged. There is a charging LED and a battery full LED on the unit.

For use with a variety of applications including solar panels, 12v batteries, motorgearboxes etc.

CLOCKWORK TIMER. Pt. No. 618/1
Compact 30 minute clockwork timer supplied with an easy push fit knob with cursor indication. Unit is faced mounted. Dims 76 x 51 x 23.3mm. excluding knob shaft.
Rated 12v 25A.
24v 10A.

12volt FLUOURESCENT LAMP. Pt. No. 1121/3
Energy saving lamp providing approx. 120w white light with power consumption of only 21w. E27 screw fitting. Ideal where no mains supply is available.

12V OPERATION ONLY
NOT TO BE USED WITH MAINS ELECTRICITY SUPPLY.

12volt LAMP HOLDER. Pt. No. 1121/5
Plastic construction with aluminium alloy E27 screw socket. Two fixing holes. Ideal for use with 12v fluourescent lamp. Mounting ring dia. 63mm.

12V OPERATION ONLY.
NOT TO BE USED WITH MAINS ELECTRICTY SUPPLY

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The MFA/Como Drills

Mini Drill Kit

Part No. 399DPLUS

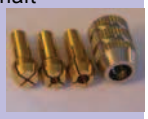
DRILLS
CUTS
POLISHES
ENGRAVES
SANDS
CARVES
ETC.

WOOD
PLASTIC
METALS
COMPOSITES
GLASS
CERAMICS
ETC.

* Includes new "MicroTurbo 1 plus" handset.
* Powerful, precise and very compact mini drill.
* 16 piece toolkit includes drills, burrs, abrasives, brushes, cutting disc, mop, etc.
* carry case with rigid plastic workstation insert.
* 220/240v input, 12 volt output, variable speed transformer with electronic (torque maintained) circuitry.

MICROTURBO 1 PLUS.
Pt.No. 398DPLUS
12V, 11,000 r.p.m, Torque 430g.cm, Smallest precision keyless 3 jaw universal chuck (0 - 3.1mm) with spring loaded chuck lock. Shaft runs in precision ballrace

Now also includes 3 collets & chuck



MAKES LIGHT WORK OF THOSE MORE DIFFICULT INTRICATE TASKS IN THE HOME AND WORKSHOP.

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Mini Drill Kit Pt. No. 397DMT7

Now includes unique mini 3 jaw chuck and three collets

DRILLS
CUTS
POLISHES
ENGRAVES
SANDS
CARVES
ETC..

* *Powerful, precise and very compact mini drill.*
* *18 piece toolkit includes drills, burrs, abrasives, brushes, cutting disc, mop, etc.*
* *carry case with rigid plastic workstation insert.*
* *220/240v input, 12 volt output, integral speed control with electronic (torque maintained) circuitry.*

WOOD, PLASTIC, METALS COMPOSITES, GLASS, CERAMICS, GEMSTONES ETC.

VARIABLE SPEED DRILL & PLUG-IN POWERSUPPLY

Pt. No397D/1MT7

The NEW Microturbo 7 drill combines controllable power with ergonomic comfort. The integral speed control allows smooth progressive speed control with ample torque.
Specification:
Input voltage 230v AC. Output voltage 12v DC nominal. Safety tested and CE certified.

MICROTURBO 7 SPARE HAND PIECE ONLY
PT. NO. 397D/3MT7.

12V POWER SUPPLY
PT. NO. 397D/2MT7.

Power supply for MicroTurbo 7 drill. Plugs directly into mains wall socket. Also a full charger for 12v batteries recommended up to 12Ah. 230v input. 12v nominal output.

CE

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Thunderbolt BEACHLAMP

MFA/Como
set new standards
with the

MK3

'THUNDERBOLT BEACHLAMP'

* Ultra bright 21W flourescent light.
* Long duration.
  up to 10hours duration
* Rechargeable.
* Rugged and stable.
* Weather resistant.
* Removeable reflector for all round lighting.
* Internal circuit protection.
* Spares and service readily available
* Now just 4 kgs.

Part No. 1121

now 1.1/2Kg (3lbs) LIGHTER with VARIABLE LIGHT OUTPUT (via dimmer).

NOW INCLUDES PLUG-IN CHARGER

NO RISK OF PETROL/PARAFFIN CONTAMINATION - NO MANTLE PROBLEMS

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thunderbolt MK3 boxlabel

MFA 2'n'1 DUAL ZOOM HALOGEN & 3 LED HEADLAMP

Part No. 1077MK3COMP

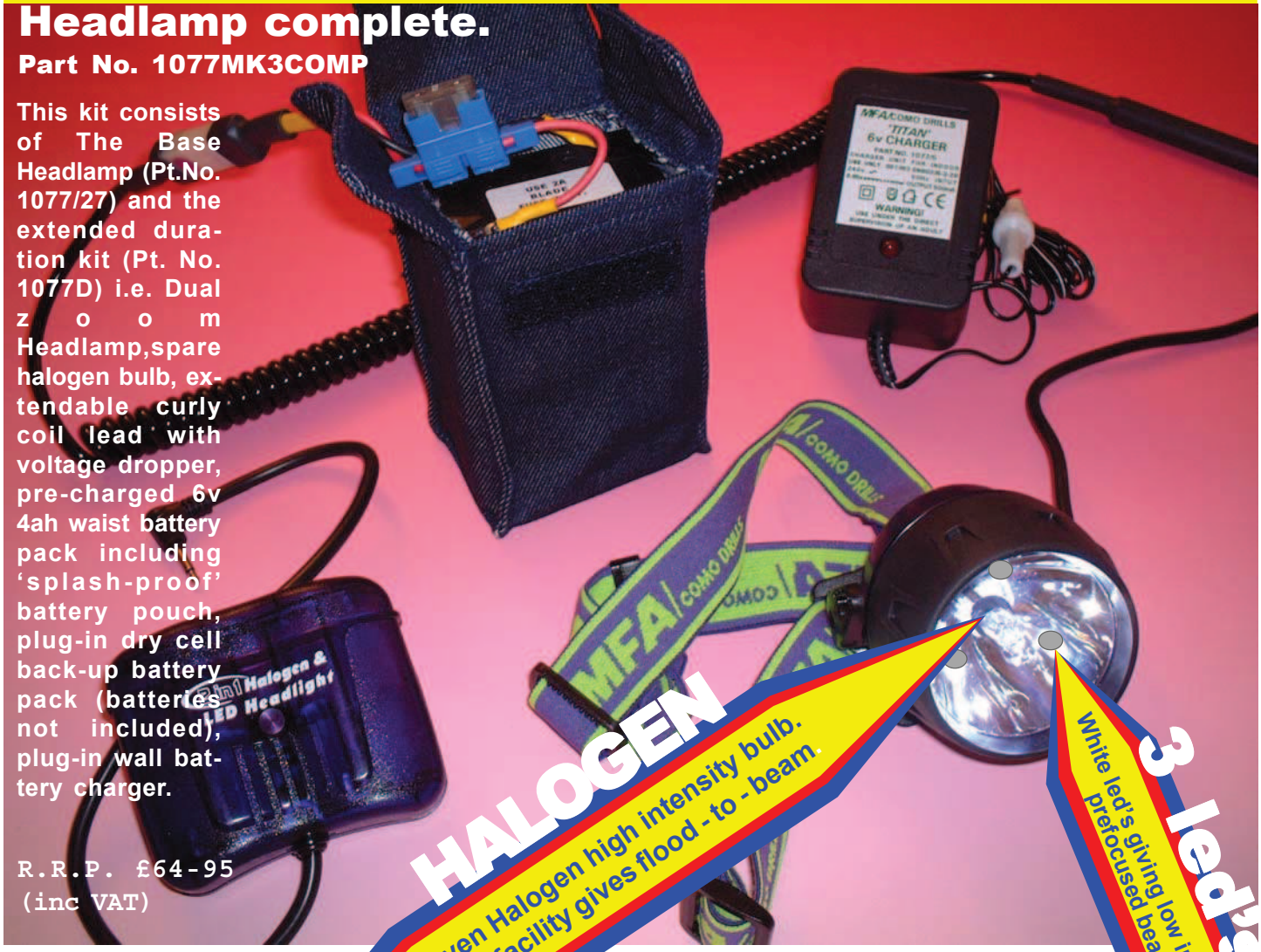
2 'n' 1 Dual Zoom

Headlamp complete.

Part No. 1077MK3COMP

This kit consists of The Base Headlamp (Pt.No. 1077/27) and the extended duration kit (Pt. No. 1077D) i.e. Dual zoom Headlamp,spare halogen bulb, extendable curly coil lead with voltage dropper, pre-charged 6v 4ah waist battery pack including 'splash-proof' battery pouch, plug-in dry cell back-up battery pack (batteries not included), plug-in wall battery charger.

R.R.P. £64-95 (inc VAT)



A combination giving exceptional endurance.

7.5 to 45 hours

per charge dependant on low/high switch selection

Also available as separate options:-

BASE HEADLAMP (Pt. No. 1077/27)

EXTENDED DURATION KIT (Pt. No. 1077D)

All spares readily available

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