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TruMotion

Low voltage sleeve bearing cooling fans
40x40x10mm
From **£1.15**

See page 316

Low voltage ball bearing cooling fans
40x40x20mm
From **£2.22**

See page 316

Low voltage sleeve bearing cooling fans
60x60x25mm
From **£1.84**

See page 317

Low voltage sleeve bearing cooling fans
80x80x25mm
From **£1.84**

See page 317

Low voltage sleeve bearing cooling fans
60x60x15mm
From **£1.77**

See page 316

230V Sleeve bearing cooling fan
80x80x38mm
From **£3.99**

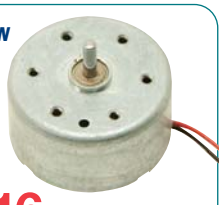
See page 317

230V Sleeve bearing cooling fan
120x120x38mm
From **£3.40**

See page 318

Low voltage sleeve bearing cooling fan
120x120x25mm
From **£2.75**

See page 318

Miniature low inertia solar motor 2V 1540rpm
From **£0.8216**

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Low inertia motor 6V 2700rpm
From **£0.9048**

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RVFM

Right angled motor and gearbox 1:220
From **£0.884**

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Single and dual output shaft inline motor and gearbox 1:200
From **£1.03**

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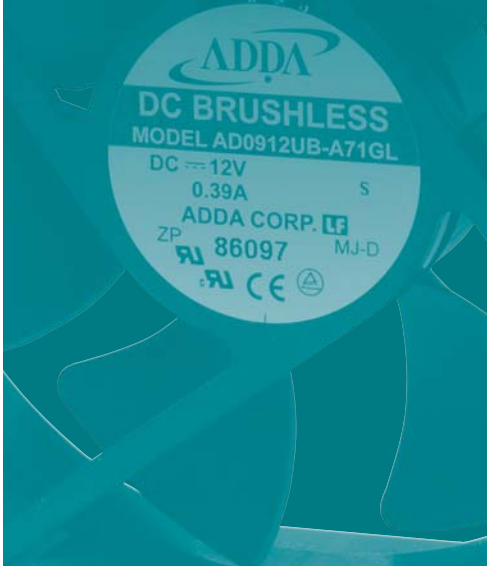

Box fans

TruMotion Low voltage sleeve bearing cooling fans - 40x40x10mm

These low voltage sleeve bearing DC fans are both reliable and quiet.

- Motor: Brushless DC, auto restart impedance and polarity protected
- Impeller and frame: Glass fibre reinforced thermoplastic PBT UL94V-0
- Insulation resistance: 10M at DC500V min.
- Dielectric strength: 500V AC/ 1 second max.
- Permissible temperature range: -10°C to +50°C
- Life expectancy at 40°C: 30,000 hours
- **CE**, **UL** and **CUL** approved
- Fitted with flying leads
- Dimensions: 40 x 40 x 10mm
- Available in **5** and **12V** options

Technical specification

Order code	37-0656	37-0657
Rated Voltage DC	5V	12V
Start up voltage DC	3V	5V
Watts	0.95W	1.2W
Current	0.19A	0.10A
Speed	6500rpm	6500rpm
Air flow	6.08 CFM	6.08CFM
Static pressure	0.16 inch	0.16 inch
Noise level	28dB	28dB
Weight	16g	16g

Type	Order code	1+	10+	100+
5V 40x40x10mm Sleeve fan	**37-0656**	2.40	1.57	1.31
12V 40x40x10mm Sleeve fan	**37-0657**	2.10	1.40	1.15

TruMotion Low voltage ball bearing cooling fans - 40x40x20mm

These low voltage DC fans are low-cost and quiet. They are fitted with ball bearings and have a life expectancy of 50,000 hours.

- Motor: Brushless DC, auto restart impedance and polarity protected
- Impeller and frame: Glass fibre reinforced thermoplastic PBT UL94V-0
- Insulation resistance: 10M at DC500V min.
- Dielectric strength: 500V AC/ 1 second max.
- Permissible temperature range: -20°C to +75°C
- Life expectancy at 40°C: 50,000 hours
- **CE**, **UL** and **CUL** approved
- Fitted with flying leads
- Dimensions: 40 x 40 x 20mm
- Available in **12** and **24V** options

Technical specification

Order code	37-0658	37-0659
Rated Voltage DC	12V	24V
Start up voltage DC	5V	10V
Watts	1.7W	1.7W
Current	0.14A	0.07A
Speed	9000rpm	9000rpm
Air flow	8.28CFM	8.28CFM
Static pressure	0.22 inch	0.22 inch
Noise level	35dB	35dB
Weight	24g	24g

Type	Order code	1+	10+	100+
12V 40x40x20mm	**37-0658**	3.20	2.45	2.22
24V 40x40x20mm	**37-0659**	3.35	2.60	2.33

Downloadable datasheets
www.rapidonline.com

Adda 40mm Low voltage axial fans

This is a low-cost, low voltage high speed axial fan.

- Frame and impellers are made from a glass filled polyester
- 12 and 24V DC versions available
- Brushless ball bearing fan
- Five blades for quiet operation
- Long life expectancy of >50,000 hours
- 40 x 40 x 20mm
- Suitable for spot cooling, small space requirements, desktop and PCs

Technical specification

	12V DC	24V DC
Operating voltage range	10.8-13.2V DC	21.6-26.4V DC
Start up voltage	9V DC nominal	17V DC nominal
Rated current	0.070 Amps ± 10% max.	0.060 Amps ± 10% max.
Rated power	0.84W	1.44W
Rated speed	6200rpm ± 10% max.	6200rpm ± 10% max.
Air flow	7.7 CFM	7.7 CFM
Noise level	25.0dB	25.0dB
Motor protection	By impedance	By impedance
Connection lead type	Wire, 24AWG	Wire, 24AWG
Life expectancy	50,000hrs at +25°C	50,000hrs at +25°C
Weight	28g	28g
Dimensions	40 x 40 x 20mm	40 x 40 x 20mm
Bearing type	Ball	Ball
Adda type	**ADQ412LB-C50**	**ADQ412LB-C50**

Type	Order code	1+	5+	10+
12V Fan	**37-0927**	3.59	3.12	2.96
24V Fan	**37-0929**	3.59	3.28	3.12

40mm Low voltage axial fans, AD4010 series

The AD4010 series is a low-cost range of low-voltage fans offering low noise and high air flow.

- Frames and impellers are manufactured in black UL94V-0 glass filled polyester
- Fitted with 300mm flying leads
- **UL** and **TUV** approved

Technical specification

	5V DC	12V DC
Input current	0.11A	0.08A
Power	0.55W	0.96W
Speed (rpm)	4200	4200
Airflow (cu ft/min)	4.7	4.7
Noise dBA 1m	17.2	17.2
Operating temperature	-10°C to +70°C	-10°C to +70°C
Dimensions	40 x 40 x 10mm (FC 32 x 32mm)	40 x 40 x 10mm (FC 32 x 32mm)
Adda type	**AD0405MS-G70**	**AD0412MS-G70**

Type	Order code	1+	10+	50+	100+
5V DC	**37-0880**	2.76	2.44	2.03	1.72
12V DC	**37-0882**	2.76	2.44	2.03	1.72

ebmpapst 40mm Low voltage axial fan

Sleeve bearing DC fan with electronically commutated external rotor motor.

- Fully integrated electronics
- Fan will only operate when polarity is correct
- Fitted with 310mm flying leads

Technical specification

	12V DC
Power input	1.0W
Speed (rpm)	6000
Air flow (cu ft/min)	5.9
Noise dBA	18
Operating temperature	-20°C to +70°C
Service life at 20°C	50,000 hours
Dimensions	40 x 40 x 20mm (FC 32 x 32mm)
Papst type	**412**

Type	Order code	1+
12V	**37-0926**	11.13

ebmpapst 40mm Low voltage compact fan

A low voltage DC medium speed axial fan.

- Quiet operation
- Fibreglass strengthened plastic fan
- Only operates when polarity is correct
- Fitted with flying 300mm 24AWG leads
- Weight 48g
- **UL** and **CE** approved
- **Papst 400J** series

Technical specification

Papst type	412JH	414JH
Input voltage	12V DC	24V DC
Power input	2.9W	2.7W
Airflow cu.ft/min	13.6	13.6
Noise	43dB	43dB
Temperature range	-20°C to +70°C	-20°C to +70°C
Dimensions	40 x 40 x 25mm	40 x 40 x 25mm

Type	Order code	1+
414JH 24V Fan	**37-0919**	11.50

ebmpapst 50mm Low voltage axial fans

A low voltage DC high speed axial fan.

- Quiet operation
- Glass fibre strengthened plastic fan
- Will only operate when polarity is correct
- Fitted with flying 310mm 28AWG leads
- Weight 25g
- **UL, VDE, CSA** and **CE** approved
- **Papst 500 F** series

Technical specification

	12V DC	24V DC
Input voltage	10.8V to 13.2V DC	21.6V to 26.4V DC
Voltage range	1W	1W
Power input	20M3/h	20M3/h
Airflow	5000rpm	5000rpm
Speed	3dB (A)	3dB (A)
Noise	>50,000 hours	>50,000 hours
Life expectancy	-20°C to +75°C	-20°C to +75°C
Temperature range	50 x 50 x 25mm	50 x 50 x 25mm
Dimensions	**512 F**	**514 F**
Papst type		

Type	Order code	1+
50 x 50 x25mm	12V **37-0903**	10.38
50 x 50 x25mm	24V **37-0904**	10.38

TruMotion Low voltage sleeve bearing cooling fans - 60x60x15mm

These low voltage sleeve bearing DC fans are both reliable and quiet.

- Motor: Brushless DC, auto restart impedance and polarity protected
- Impeller and frame: Glass fibre reinforced thermoplastic PBT UL94V-0
- Insulation resistance: 10M at DC500V min.
- Dielectric strength: 500V AC/ 1 second max.
- Permissible temperature range: -10°C to +50°C
- Life expectancy at 40°C: 30,000 hours
- **CE**, **UL** and **CUL** approved
- Fitted with flying leads
- Dimensions: 60 x 60 x 15mm
- Available in **12** and **24V** options

Technical specification

Order code	37-0660	37-0661
Rated Voltage DC	12V	24V
Start up voltage DC	5V	10V
Watts	2.16W	2.4W
Current	0.18A	0.10A
Speed	4500rpm	4500rpm
Air flow	16.60CFM	16.60CFM
Static pressure	0.15 inch	0.15 inch
Noise level	31dB	31dB
Weight	42g	42g

Type	Order code	1+	10+	100+
12V 60x60x15mm	**37-0660**	3.20	2.15	1.77
24V 60x60x15mm	**37-0661**	3.50	2.37	1.96

New products
www.rapidonline.com

TruMotion NEW

Low voltage sleeve bearing cooling fans - 60x60x25mm

These low voltage sleeve bearing DC fans are both reliable and quiet.
- Motor: Brushless DC, auto restart impedance and polarity protected
- Impeller and frame: Glass fibre reinforced thermoplastic PBT UL94V–0
- Insulation resistance: 10M at DC500V min.
- Dielectric strength: 500V AC/ 1 second max.
- Permissible temperature range: –10°C to +50°C
- Life expectancy at 40°C: 30,000 hours
- **CE**, **UL** and **CUL** approved
- Fitted with flying leads
- Dimensions: 60 x 60 x 25mm
- Available in **12** and **24V** options

Technical specification

Order code	**37–0662**	**37–0663**
Rated Voltage DC	12V	24V
Start up voltage DC	5V	10V
Watts	2.4W	3.6W
Current	0.20A	0.15A
Speed	4500rpm	4500rpm
Air flow	25.11CFM	25.11CFM
Static pressure	0.20 inch	0.20 inch
Noise level	37dB	37dB
Weight	56g	56g

Type	Order code	1+	10+	100+
12V 60x60x25mm	**37-0662**	3.30	2.22	1.84
24V 60x60x25mm	**37-0663**	3.65	2.45	2.03

ADDA

60mm Low voltage axial fans

The AD6025GL series is a low-cost, low voltage DC high speed axial fan.
- Fitted with sleeve bearings
- Life expectancy >50,000 hours
- Frames and impellers manufactured from black **UL94V-0** glass filled polyester
- **UL, CSA** and **TUV** approved
- Fitted with 320mm flying leads

Technical specification

	12V DC	**24V DC**
Input current	0.23A	0.15A
Power rating	2.8W	3.6W
Speed (rpm)	4500	4500
Airflow (cu ft/min)	23.2	23.2
Noise dBA @ 1m	2.3	2.3
Operating temperature	–10°C to +70°C	–10°C to +70°C
Dimensions	60 x 60 x 25mm (FC 50 x 50mm)	60 x 60 x 25mm (FC 50 x 50mm)
Adda type	**AD0612HS-A70GL**	**AD0624HS-A70GL**

Voltage	Order code	1+	10+	50+	100+
12V	**37-0745**	4.68	3.64	3.02	2.60
24V	**37-0750**	4.68	3.64	3.02	2.60

ebmpapst

60mm Low noise axial fans

A low voltage DC medium speed axial fan.
- Quiet operation
- Glass fibre strengthened plastic fan
- Only operates when polarity is correct
- Fitted with flying 310mm 28AWG leads
- Weight 25g
- **UL, VDE, CSA** and **CE** approved
- **Papst 600 F** series

Technical specification

Input voltage	**12V DC**	**24V DC**
Voltage range	11.5V to 13.2V DC	21.6V to 26.4V DC
Power input	1W	1.1W
Airflow	17.1m3/h	17.1m3/h
Speed	3900rpm	3900rpm
Noise	27dB (A)	27dB (A)
Life expectancy	>50,000 hours	>50,000 hours
Temperature range	–20°C to +70°C	–20°C to +70°C
Dimensions	60 x 60 x 15mm	60 x 60 x 15mm
Papst type	**612 F**	**614 F**

Voltage	Order code	1+
12V	**37-0905**	10.90
24V	**37-0906**	13.47

TruMotion NEW

Low voltage sleeve bearing cooling fans - 80x80x25mm

These low voltage DC fans are low-cost and quiet. They are fitted with sleeve bearings and have a life expectancy of 30,000 hours.
- Motor: Brushless DC, auto restart impedance and polarity protected
- Impeller and frame: Glass fibre reinforced thermoplastic PBT UL94V–0
- Insulation resistance: 10M at DC500V min.
- Dielectric strength: 500V AC/ 1 second max.
- Permissible temperature range: –10°C to +50°C
- Life expectancy at 40°C: 30,000 hours
- **CE**, **UL** and **CUL** approved
- Fitted with flying leads
- Dimensions: 80 x 80 x 25mm
- Available in **12** and **24V** options

Technical specification

Order code	**37–0664**	**37–0665**
Rated Voltage DC	12V	24V
Start up voltage DC	5V	10V
Watts	2.4W	3.36W
Current	0.20A	0.14A
Speed	3000rpm	3000rpm
Air flow	43.59CFM	43.59CFM
Static pressure	0.31 inch	0.31 inch
Noise level	33dB	33dB
Weight	58g	58g

Type	Order code	1+	10+	100+
12V 80x80x25mm	**37-0664**	3.30	2.22	1.84
24V 80x80x25mm	**37-0665**	3.65	2.45	2.03

TruMotion NEW

230V Sleeve bearing cooling fan - 80x80x38mm

Aluminium framed, mains voltage AC cooling fan fitted with sleeve bearings.
- Airflow: 21 to 28CFM
- Noise: 26 to 33dB
- Impeller: PBT Thermoplastic UL94–VO
- Frame: Aluminium alloy
- Colour: Black
- Lead wire: 22AWG
- Motor: Shaded pole induction motor
- Operating temperature: –10°C to +65°C
- Dimensions: 80 x 80 x 38mm
- Weight: 310g
- **CE**, **UL** and **CUL** approved

Technical specification

Rated Voltage:	200 to 240V
Frequency:	50 to 60Hz
Current:	0.07A
Watts:	14W
Speed:	2400 to 2900rpm
Phase:	1

Type	Order code	1+	10+	100+
230V 80x80x38mm	**37-0666**	5.70	4.50	3.99

ADDA

80mm Low voltage axial fans

The **AD8025GL** series is a low-cost, voltage DC high speed axial fan.
- Fitted with sleeve bearings
- Life expectancy >50,000 hours
- Frames and impellers are manufactured in **UL94V-0** glass filled polyester
- Fitted with 300mm flying leads
- **UL**, **CSA** and **TUV** approved

See this section for suitable guards

Technical specification

	12V DC	**24V DC**
Input Current	0.25A	0.16A
Power	3W	3.8W
Speed (rpm)	3010	3010
Airflow (cu ft/min)	38.6	38.6
Noise dBA 1M	–10°C to +70°C	–10°C to +70°C
Adda Type	**AD0812HS-A70GL**	**AD0824HS-A706L**

Type	Order code	1+	10+	50+	100+
12V	**37-0765**	5.10	4.37	3.74	3.02
24V	**37-0770**	5.10	4.37	3.74	3.02

ADDA

80mm Mains axial fans

A high-speed, aluminium-alloy framed, mains voltage AC fan fitted with copper sleeve bearings.
- The impeller is manufactured in glass-filled polyester
- Connection is via 300mm flying leads. See this section for suitable guards
- **UL** and **TUV** approved

Technical specification

Nominal voltage	230V, 50Hz
Input current	0.07A
Input power	8.8W
Speed	2,300 rpm
Air flow	24.0 cu ft/min
Noise level	25.3dBA
Dimensions	80 x 80 x 38mm
Fixing centres	71.5 x 71.5mm
Mounting holes	4 x 4.5mm dia.
Weight	370g
Adda type	**AA8382HS-AW**

Type	Order code	1+	10+	50+	100+
230V AC	**37-0970**	6.97	6.14	5.51	5.10

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Soldering irons

ebmpapst

80mm Low voltage axial fans

A low voltage DC medium speed axial fan.

- Quiet operation
- Glass fibre strengthened plastic fan
- Electronic protection against reverse polarity
- Fitted with flying 310mm 22AWG leads
- Weight 170g
- **UL, VDE, CSA** and **CE** approved
- **Papst 8300** series

Technical specification

Input voltage	**12V DC**	**24V DC**
Voltage range	6V to 15V DC	12V to 28V DC
Power input	2.2W	2.5W
Airflow	54m3/h	54m3/h
Speed	3300rpm	3300rpm
Noise	36dB (A)	36dB (A)
Life expectancy	>70,000 hours	>70,000 hours
Temperature range	–20°C to +75°C	–20°C to +75°C
Dimensions	80 x 80 x 32mm	80 x 80 x 32mm
Papst type	**8312**	**8314**

Voltage	Order code	1+
12V	**37-0958**	11.90

ADDA

12V 92mm Box fan

This fan is a low-cost, low voltage DC medium speed axial fan. Fitted with sleeve bearings Life expectancy > 50,000 hours. Frames and impellers are manufactured in UL94V-0 glass filled polyester Fitted with 300mm flying leads.

- Quiet operation
- Glass fibre strengthened plastic fan
- Electronic protection against reverse polarity
- Fitted with flying leads
- Description: DC Fans 92mm 12V DC 60CFM

Technical specification

Product category	Fans and blowers
Current type	DC
Supply voltage	12V DC
Airflow	60 CFM
Noise	39.4 dBA
Speed	3300 RPM
Frame dimensions (mm)	92mm x 25mm
Termination style	Wire
Power rating	4.68W

Type	Order code	1+	10+	50+	100+
Box fan	**37-0939**	5.72	4.68	4.06	3.85

ebmpapst

92mm Low voltage standard fan

A low voltage DC medium speed axial fan.

- Quiet operation
- Fibreglass strengthened plastic fan
- Only operates when polarity is correct
- Fitted with flying 300mm 28AWG leads
- Weight 100g
- **UL** and **CE** approved
- **Papst 3400N** series

Technical specification

Papst type	**3414N**	**3414NGH**	**3412NGH**
Input voltage	24V DC	24V DC	12V DC
Power input	2.3W	2.5W	2.5W
Airflow l/s	23.3l/s	26.1l/s	26.1l/s
Airflow cu.ft/min	49.4	55.3	55.3
Noise	32dB	36dB	36dB
Order Code	**37-0953**	**37-0955**	**37-0943**

Temp. range -20°C to +70°C
Dimensions 92 x 92 x 25mm

Type	Order code	1+
3412NGH 12V Fan	**37-0943**	9.88
3412N 12V Fan	**37-0951**	15.06
3414N 24V Fan	**37-0953**	9.53
3414NHG 24V Fan	**37-0955**	6.92

ebmpapst

92mm Low voltage axial fans

A low voltage DC medium speed axial fan.

- Electronic protection against reverse polarity
- Quiet operation
- Glass fibre strengthened plastic fan
- Fitted with flying 310mm 22AWG leads
- Weight 190g
- **UL, VDE, CSA** and **CE** approved
- **Papst 3300** series

Technical specification

Input voltage	**12V DC**	**24V DC**
Voltage range	6V to 15V DC	12V to 28V DC
Power input	2.4W	2.6W
Airflow	47.1m3/h	80m3/h
Speed	3000rpm	3000rpm
Noise	37dB (A)	37dB (A)
Life expectancy	>70,000 hours	>70,000 hours
Temperature range	-20°C to +75°C	-20°C to +75°C
Dimensions	92 x 92 x 32mm	92 x 92 x 32mm
Papst type	**3312**	**3314**

Type	Order code	1+
92 x 92 32mm	12V	**37-0923** 12.82
92 x 92 32mm	24V	**37-0924** 20.24

ADDA

12V 92mm Box fan

This fan is a low-cost, low voltage DC medium speed axial fan. Fitted with sleeve bearings Life expectancy > 50,000 hours. Frames and impellers are manufactured in UL94V-0 glass filled polyester Fitted with 300mm flying leads.

- Quiet operation
- Glass fibre strengthened plastic fan
- Electronic protection against reverse polarity
- Fitted with flying leads
- Description: DC Fans 92mm 12V DC 60CFM

Technical specification

Product category	Fans and blowers
Current type	DC
Supply voltage	12V DC
Airflow	60 CFM
Noise	39.4 dBA
Speed	3300 RPM
Frame dimensions (mm)	92mm x 25mm
Termination style	Wire
Power rating	4.68W

Type	Order code	1+	10+	50+	100+
Box fan	**37-0939**	5.72	4.68	4.06	3.85

ebmpapst

119mm Low voltage axial fans

A low voltage DC medium speed axial fan.

- Quiet operation
- Glass fibre strengthened plastic fan
- Electronic protection against reverse polarity
- Fitted with flying 310mm 22AWG leads
- Weight 220g
- **UL, VDE, CSA** and **CE** approved
- **Papst 4300** series

Technical specification

Input voltage	**48V DC**
Voltage range	36V to 53V DC
Power input	5W
Airflow	170m3/h
Speed	2800rpm
Noise	45dB (A)
Life expectancy	>62,500 hours
Temperature range	–20°C to +75°C
Dimensions	119 x 119 x 32mm
Papst type	**4318**

Size	Voltage	Order code	1+
110 x 119 x 32mm	12V	**37-0925**	15.86
110 x 119 x 32mm	48V	**37-0933**	22.70

TruMotion

NEW

Low voltage sleeve bearing cooling fan - 120x120x25mm

These low voltage sleeve bearing DC fans are both reliable and quiet.

- Motor: Brushless DC, auto restart impedance and polarity protected
- Impeller and frame: Glass fibre reinforced thermoplastic PBT UL94V–0
- Insulation resistance: 10M at DC500V min.
- Dielectric strength: 500V AC/ 1 second max.
- Permissible temperature range: –10°C to +50°C
- Life expectancy at 40°C: 30,000 hours
- Fitted with flying leads
- Dimensions: 120 x 120 x 25mm
- **CE**, **UL** and **CUL** approved
- Available in **12 and 24V options**

Technical specification

Order code	**37-0667**	**37-0668**
Rated Voltage DC	12V	24V
Start up voltage DC	5V	10V
Watts	2.64W	3.12W
Current	0.22A	0.13A
Speed	2200rpm	2200rpm
Air flow	74.06CFM	74.06CFM
Static pressure	0.17 inch	0.17 inch
Noise level	35dB	35dB
Weight	140g	140g

Type	Order code	1+	10+	100+
12V 120x120x25mm	**37-0667**	4.95	3.35	2.75
24V 120x120x25mm	**37-0668**	5.30	3.55	2.90

TruMotion

NEW

230V Sleeve bearing cooling fan - 120x120x38mm

Aluminium framed, mains voltage AC cooling fan fitted with sleeve bearings.

- Airflow: 82 to 95CFM
- Noise: 39 to 48dB
- Impeller: PBT Thermoplastic UL94–V0
- Frame: Aluminium alloy
- Colour: Black
- Lead wire: 22AWG
- Motor: Shaded pole induction motor
- Operating temperature: –10°C to +65°C
- Dimensions: 120 x 120 x 38mm
- Weight: 480g
- **CE**, **UL** and **CUL** approved

Technical specification

Rated Voltage:	200 to 240V
Frequency:	50 to 60Hz
Current:	0.14A
Watts:	21W
Speed:	2600 to 3000rpm
Phase:	1

Type	Order code	1+	10+	100+
230V 120x120x38mm	**37-0669**	4.90	3.80	3.40

No minimum order value
UK mainland only

120mm Low voltage axial fans

The **AD12025GL** series is a low voltage DC medium speed axial fan fitted with sleeve bearings (life expectancy >50,000 hours).

- Frames and impellers are manufactured in **UL94V-0** glass filled polyester
- Fitted with 280mm flying leads
- **UL**, **CSA** and **TUV** approved

See this section for suitable guards.

Technical specification

	12V DC	24V DC
Input Current	0.34A	0.2A
Power	4.08W	4.8W
Speed (rpm)	2050	2050
Air Flow (cu ft/min)	80.5	80.5
Noise dBA 1m	38	38
Operating Temperature	-10°C to +7°C	-10°C to +7°C
Adda Type	**AD1212MS-A71GL**	**AD1224MS-A71GL**

Type	Order code	1+	10+	50+
12V	**37-0920**	10.30	9.26	7.80
24V	**37-0922**	9.26	8.22	6.76

120mm Mains axial fans

A high-speed, aluminium-alloy framed, mains voltage AC fan fitted with copper sleeve bearings.

- The impeller is manufactured in glass-filled polyester
- Connection is via 280mm flying leads
- **UL** and **TUV** approved

See this section for suitable guards.

Technical specification

Nominal voltage	230V, 50Hz
Input current	0.12A
Input power	16.0W
Speed	2,600 rpm
Air flow	83.0 cu ft/min
Noise level	42.2dBA
Dimensions	120 x 120 x 38.5mm
Fixing centres	105 x 105mm
Mounting holes	4 x 4.3mm dia.
Weight	530g

Type	Order code	1+	10+	50+	100+
230V AC	**37-0972**	6.14	5.51	5.30	5.15

ebmpapst

120mm Mains axial fans

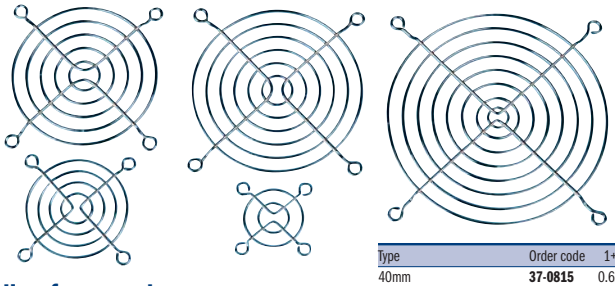
Sleeve bearing AC mains fans fitted with external rotor shaded pole motors.

- Connection via solder tags
- **UL**, **CSA** and **VDE** approved

Technical specification

Type	Standard
Power input	18.0W
Air flow (cu ft/mn)	94
Noise dBA	46
Operating temperature	-10°C to +45°C
Dimensions	119 x 119 x 38 (FC 105 x 105mm)

Type	Order code	1+
230V AC	**37-0980**	21.03



Cooling fan guards

A range of metal finger guards suitable for a wide range of fans.

- Nickel-chrome plated steel
- Screw fixing

Type	Order code	1+	10+	50+	100+
40mm	**37-0815**	0.62	0.4784	0.3848	0.3328
50cm	**37-0817**	0.78	0.6032	0.4805	0.416
60mm	**37-0820**	0.62	0.4784	0.3848	0.3328
80mm	**37-0825**	0.75	0.572	0.468	0.4056
92mm	**37-0830**	1.04	0.8112	0.6625	0.572
120mm	**37-0835**	0.99	0.7592	0.624	0.5304

ABS Fan filter assemblies

Fan filter assemblies consisting of a guard, filter media and snap-fit retainer.

- Guard and retainer are moulded in **UL 94V-0**
- Hi-impact ABS
- Guards have 4 countersunk mounting holes
- Assemblies have been specially designed for minimal air resistance
- Low noise and ease of filter changing
- Re-useable polyurethane foam filters can simply be vacuumed or cleaned with detergent or cleaning solvents as required
- Available to suit fan sizes as listed in price panel

Size	Order code	1+	10+	50+	100+
40mm	**37-0870**	0.98	0.676	0.5845	0.5065
60mm	**37-0872**	1.04	0.7592	0.65	0.572
80mm	**37-0874**	0.86	0.728	0.624	0.5408
92mm	**37-0876**	2.41	1.63	1.29	0.8445
120mm	**37-0878**	2.28	1.56	1.14	0.78

120mm Low noise mains axial fans

A brushless, medium speed 230V AC fan with rugged aluminium alloy frame.

- Ball bearings for long life
- Low noise
- Connection via terminals
- Glass-filled polyester impeller
- **Adda type AA1282MB-ATGL5**

Technical specification

Nominal voltage	230V, 50Hz
Input current	0.10A
Input power	13.7W
Speed	2,500 rpm
Air flow	80.0 cu ft/min
Noise level	40.0dBA
Dimensions	120 x 120 x 38mm
Fixing centres	105 x 105mm
Mounting holes	4 x 4.5mm dia.
Weight	550g

Type		Order code	1+	10+	50+
120 x 120 x 38mm	230V	**37-0975**	7.54	5.98	5.42

ABS Fan guards

Fan guards moulded in UL 94V-0.

- Hi-impact ABS
- Guards have 4 countersunk mounting holes
- Designed for low air noise
- Available to fit fan sizes listed below

Type	Order code	1+	10+	50+	100+
40mm	**37-0800**	0.98	0.7176	0.6365	0.546
60mm	**37-0802**	1.11	0.78	0.6885	0.598
80mm	**37-0804**	1.18	0.8528	0.7405	0.6625
92mm	**37-0806**	0.50			
120mm	**37-0808**	1.56	1.11	0.988	0.8445

Domestic fans

CLICK

100mm Extractor fan

An excellent range of extractor fans suitable for the kitchen, toilet and bathroom.

- Air movement capacity is 98.4 cubic metres per hour
- 230V AC
- Colour: white
- Full instructions included

Technical specification

Type	Order Code
Extractor fan (standard)	**37-9000**
Extractor fan (with timer)	**37-9002**

Type	Order code	1+
Timer fan	**37-9002**	17.63

Motors

TruMotion

3V, 13,100rpm DC Motor

A low-cost miniature DC motor with many applications including models, robotics and educational demonstration equipment.

- Operating voltage 1.5 to 4.5V DC
- Two flat sides make the motor ideal for mounting on a PCB
- Rotates counter-clockwise when viewed from shift end
- Solder tag termination

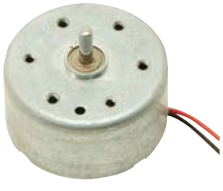
Technical specification

Rated voltage	3V DC
No load current	0.34A max.
No load speed	16,400rpm ± 15%
Rated load	8.0 g.cm
Rated load current	1.07A max.
Rated load speed	13,100rpm ± 12%
Length excluding shaft	25mm
Diameter	20mm
Width across flats	15.1mm
Shaft length	9.4mm
Shaft diameter	2mm
Weight	17g approx.

Type	Order code	1+	25+	100+
3V, 13,100 rpm	**37-0140**	0.41	0.3016	0.1976

TruMotion NEW

Miniature low inertia solar motor 2V 1540rpm



A low inertia precision solar motor with a starting current making it ideal for low power applications. (2V nominal).

- Direction: Clockwise
- Constant volts: 2.0V
- No load speed rpm: 2200
- No load current (A): 0.025
- Max efficiency speed (rpm): 1540
- Max efficiency current (A): 0.06
- Torque g-cm: 5.5
- Output watts:0.05
- Stall torque g-cm:11
- Diameter:24mm
- Weight:21g

Type	Order code	1+	25+	100+	500+
Mini solar motor	**37-0441**	1.20	1.03	0.9048	0.8216

TruMotion NEW

Low inertia motor 6V 2700rpm

A precision low-inertia motor ideal for low power applications.

- Direction: Clockwise
- Nominal volts: 6.0V
- Operating range: 12V max.
- No load speed rpm: 2700
- No load current 0.020A
- Max efficiency speed (rpm): 2180
- Max efficiency current (A): 0.06
- Torque: 60g-cm
- Stall torque: 5.88g-cm
- Weight:45g

Type	Order code	1+	25+	100+	500+
	37-0445	1.51	1.22	1.03	0.9048

TruMotion

3V, 5240rpm Miniature motor

A low-cost miniature motor offering a higher stall torque.

- Ideal for models, robotics, etc.
- Operating voltage 1.5 to 4.5V DC
- Rotates clockwise when viewed from shaft end
- Solder tag termination

Technical specification

Rated voltage	3V DC
No load current	0.13A max.
No load speed	6700rpm ±15%
Rated load	10.0 g.cm
Rated load current	0.45A max.
Rated load speed	5240rpm ±12%
Length excluding shaft	26.9mm
Diameter	23.8mm
Shaft length	8.6mm
Shaft diameter	2mm
Weight	28g approx.

Type	Order code	1+	25+	100+
3V, 5240 rpm motor	**37-0142**	0.54	0.4056	0.364

TruMotion

3V, 8000rpm Miniature motor

A high torque miniature DC motor for higher power requirements.

- Operating voltage 1.5 to 6.0V DC
- Rotates clockwise when viewed from shaft end
- Solder tag termination

Technical specification

Rated voltage	3V DC
No load current	0.23A max.
No load speed	9000rpm ±15%
Rated load	10.0 g.cm
Rated load current	0.63A max.
Rated load speed	8000rpm ±12%
Length excluding shaft	30.5mm
Diameter	24.2mm
Shaft length	12mm
Shaft diameter	2mm
Weight	42g approx.

Type	Order code	1+	25+	100+
3V, 8000 rpm motor	**37-0144**	0.59	0.468	0.4056

TruMotion

3V 12,200rpm Miniature motor

A 3V miniature motor ideal for low voltage applications.

- Operating voltage 1.5 to 4.5V DC
- Applications include motorised toys, models, etc.
- Rotates clockwise when viewed from shaft end
- Connection is by means of 2.8mm fast-on connectors, or by soldering

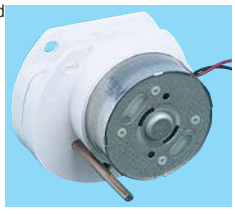
Technical specification

Rated voltage	3V DC
No load current	0.34A max.
No load speed	15,000rpm ±15%
Rated load	10.0 g.cm
Rated load current	1.17A max.
Rated load speed	12,200rpm ±12%
Length excluding shaft	25mm
Diameter	21mm
Shaft length	10mm
Shaft diameter	2mm
Weight	19g approx.

Type	Order code	1+	25+	100+
3V, 12,200 rpm	**37-0146**	0.35	0.2704	0.2288

RVFM

Solar motor drive



A miniature gearbox and solar motor which provides a gear ratio of 27:1 providing approximately 25 revs. per minute at 0.5 volts.

- Final output via 2mm shaft
- Motor operating range 1.5 to 4.5V
- Gearbox dimensions 36 x 15mm

Type	Order code	1+	10+	50+
Solar motor drive	**37-0443**	4.21	3.56	3.32

RVFM

Solar panel

Use these solar panels to build your own robots or other solar energy powered applications. Ideal for use for solar cars, solar motor kits and school projects.

- Solid, almost-unbreakable module
- Great for low power consumption projects
- Supplied with flying leads
- Output approximately 1V
- Dimensions 60(L) x 30(W) x 2(D)mm

Type	Order code	1+	25+	100+
Solar panel	**37-0438**	2.54	2.41	2.08

RVFM

Submarine motor

A submarine motor encased in a plastic housing with a rubber sucker for attachment.

- Motor pulls apart to insert battery
- Twisting the battery starts the motor
- Dimensions 120mm(L) approx.

Requires 1x AA battery (not included).

Type	Order code	1+
Submarine motor	**06-6050**	1.63

Rapid

… where price meets quality

shaw magnets

Magnet motor kit

This magnet motor kit demonstrates the workings of a DC motor. Electricity runs through the coil of wire, and a magnetic field is formed. The coil pushes away from the ceramic magnet with enough force to turn it all the way round. As the coil turns around, it becomes charged again and gets another push.

- Simply wind the coil, fit the magnet and battery to operate this easy to use kit

Requires 1x D cell battery (not included).

Type	Order code	1+
Magnet motor kit	**06-0593**	5.46

RVFM

Self adhesive motor mount

A push fit motor mount to suit our range of miniature motors.

- Base has self adhesive surface for easy mounting of the motor as required
- Colour may vary
- Supplied in **packs of 10**

Type	Order code	1+	10+
Motor mount	**37-0360**	2.43	2.06

RVFM

Motor clip

Suitable for holding a motor to a flat surface.

- Ideal for use with motors with a diameter of 21mm

Type	Order code	1+
21mm Motor clip	**06-6054**	0.09

RVFM

Motor clip

Suitable for holding a motor.

- Heat in hot water to soften for easier fitting
- Ideal for use with motors with a diameter of 21 and 23.8mm
- Paper packaging may be required with 21mm motors

Type	Order code	1+
21/23.8mm dia. Motors	**06-6052**	0.10

RVFM

Solder free motor holder

Connects wires to a motor without the use of solder.

- Suitable for use with motors with a diameter of 24.2mm

Type	Order code	1+
Motor holder	**06-6056**	0.21

Stepper motors

RVFM

1.8° Step angle stepper motor

A 12V bi-directional 4-phase unipolar permanent magnet stepper motor. Applying the correct electrical pulse sequence to the windings of the motor results in a 1.8° step angle rotation of the spindle (200 steps per revolution).

- Number of steps and speed are determined by frequency of input signal applied
- Suitable for many control applications where a medium torque motor is required
- 5mm shaft diameter

Technical specification

Step angle	1.8°
Holding torque	830gf/cm (8.14Ncm) min.
Phase (coil) resistance	75Ω/phase ±10%
Current per coil	160mA
Nominal voltage	12V
Output shaft	5mm dia.

Type	Order code	1+
Stepper motor	**37-0506**	13.78

RVFM

2-phase Bi-polar stepper motor 12V

A 2 phase bi-polar stepper motor with a 7.5° step angle rotation of the spindle.

- Number of steps and speed are determined by the frequency of the input signal applied
- 3mm shaft diameter

Technical specification

Step angle	7.5° full step
No. of phases	2
Rated voltage	12V DC
Rated current	0.48A/phase
Insulation class	E
Ambient temperature	-10°C to +50°C
Coil temperature	115°C
Operating humidity	20% to 90% RH (no condensation)
Life span	>3000 hours min.
Shaft diameter	3mm
Weight	125g

Type	Order code	1+
Stepper motor	**37-0507**	7.72

RVFM

Size 17 Hybrid stepper motors

The high performance hybrid stepper motor utilises advanced high energy magnet technology to provide increased torque while the low inductance windings provide excellent high speed performance.

Consequently the unit is ideally suited to applications that require high dynamic performance where space is at a premium.

- Step angle 1.8
- Number of steps and speed are determined by the frequency of the input signal applied
- Smooth running
- Low vibration
- Compact design
- Reliable
- Available in 40mm length with 6 leads for greater control
- Available in 48mm length with 4 leads
- Long life and high reliability

Type	Order code	1+
40in Hybrid motor	**37-0514**	26.00
48in Hybrid motor	**37-0515**	36.40

RVFM

Mini hybrid stepper motor size 11

A high torque stepper motor suitable for heavy duty applications. By applying the correct electrical pulse sequence to the windings of the motor results in a 1.8° step angle rotation of the spindle.

- Number of steps and speed are determined by the frequency of the input signal applied
- Lightweight
- Compact size
- Low inertia
- High accuracy
- 6 leads for greater control
- 5mm shaft diameter

Technical specification

Step angle	1.8°
Holding torque	7N-cm
No. of leads	6
Phase current	0.95A
Phase resistance	3.4Ω
Phase inductance	1.6mH
Rotor inertia	12g-cm²
Detent torque	50g-cm
Insulation class	B
Step accuracy	Angular deviation is ±5% of one step
Weight	140g

Type	Order code	1+
Stepper motor size 11	**37-0508**	19.02

RVFM

Mini hybrid stepper motor size 14

A high torque stepper motor suitable for heavy duty applications. By applying the correct electrical pulse sequence to the windings of the motor results in a 1.8° step angle rotation of the spindle

- Number of steps and speed are determined by the frequency of the input signal applied.
- Low noise.
- Low inertia.
- High accuracy.
- 6 leads for greater control.
- 5mm shaft diameter.

Technical specification

Step angle	1.8°
Holding torque	8N-cm
No. of leads	6
Phase current	0.76A
Phase resistance	10.5Ω
Phase inductance	4.8mH
Rotor inertia	12g-cm²
Detent torque	100g-cm
Insulation class	B
Step accuracy	Angular deviation is ±5% of one step
Weight	150g

Type	Order code	1+
Stepper motor size 14	**37-0509**	19.02

velleman

Stepper motor card

This stepper motor controller card kit can be used with bi-polar and uni-polar stepper motors.

- Makes high precision motor control possible
- One high precision stepper motor included
- Test program included
- I²C controlled via K8000RS input/output interface board for PC control
- Communication address of the card is selectable (from 0 to 15) via DIP switches on the PCB
- Maximum of 4 K8005 stepper motor control cards can be connected to 1 K8000RS
- Stepper motor controller has adjustable drive speed
- Programmable in TurboPascal for DOS, Quick Basic, Visual Basic, Windows 95, 98 and ME
- Emergency stop signal can be sent to one or all cards
- Some previous knowledge of electronics required
- Good soldering techniques for medium dense boards recommended
- Dimensions 990(L) x 890(W)mm
- **Velleman K8005**

Technical specification

Power supply	7 to 25V DC or AC/1.5A (maximum current depends on the motor type)
Dimensions	990(L) x 890(W)mm

Type	Order code	1+
Stepper motor card	**70-4072**	26.99

RVFM

Stepper motor interface modules

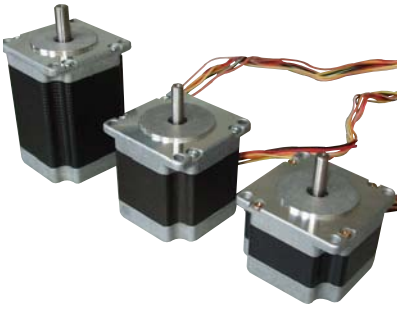
A pair of modules which use the printer port of a PC suitable for use with 4 phase stepper motors

- Requires a power supply between 4 and 18V with a consumption not exceeding 2A
- DOS based programme supplied (on 3 1/2in disk). (The software is also available as a download from the manufactures Website)
- M106 module allows programming of the control of the stepper motor either directly via the keyboard of the PC (286 or higher)
- M106 requires a split mode power supply of between 4 and 18V determined by the stepper motor used
- The module is isolated from the computer by employing optocouplers on input stages
- M108 module allows the independent control of up to four stepper motors when used with the M106 modules (one M106 needed for each motor)
- Ideally suited to educational users

Type	Order code	1+
M106 Stepper motor control	**37-0650**	16.89
M108 4-channel Interface	**37-0655**	14.29

RVFM

Size 23 Hybrid stepping motor 1.8°



The hybrid is probably the most widely used of all stepping motors. The hybrid consists of a multi-phased toothed stator and a three part rotor. These high torque stepper motors are suitable for heavy duty applications. By applying the correct electrical pulse sequence to the windings of the motor results in a 1.8° step angle rotation of the spindle.

- High torque output
- Number of steps and speed are determined by the frequency of the input signal applied
- Step angle 1.8°
- Available in single stack, two stack and three stack options
- Single stack available with 4 leads
- Double and triple stack options available with 8 leads for exceptional control
- The size 23 motor and drive are contained in a compact aluminium heatsink housing
- Long life and high reliability

Technical specification

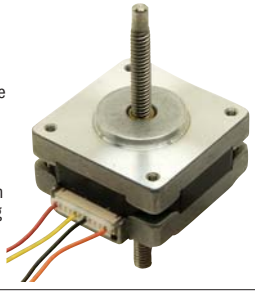
Order code	37-0510	37-0511	37-0512
Step angle	1.8&deg	1.8&deg	1.8°
Step angle accuracy	5%	5%	5%
Phase current	2.1A	1.0A	3.0A
Phase resistance	1.2Ω	6.2Ω	1.0Ω
Phase inductance	2.1mH	10mH	2.1mH
Holding torque unipolar	-	80Ncm	125Ncm
Holding torque bipolar	50Ncm	100Ncm	160Ncm
Detent torque	2.2Ncm	4.0Ncm	7.0Ncm
Rotor inertia	135g cm²	260g cm²	460g cm²
Mass	0.42Kg	0.6Kg	1.0Kg
Insulation class	B	B	B
Shaft configuration	Single	Single with flat	Single
Number of leads	4	8	8

Type	Order code	1+
Single stack hybrid	**37-0510**	28.08
Two stack hybrid	**37-0511**	33.28
Three stack hybrid	**37-0512**	45.76

RVFM

Size 16 Linear actuator

This electric actuator is a compact design for industrial applications with high demands. The high quality unit will give long term reliability.



- Step angle 1.8
- Compact design
- Smooth running
- Low vibration
- 4-Leads

Technical specification

Order code	37-0513
Step angle	1.8&deg
Step angle accuracy	5%
Phase current	4.8A
Phase resistance	2.5Ω
Phase inductance	2.6mH
Holding torque unipolar	-
Holding torque bipolar	10Ncm
Rotor inertia	13g cm²
Mass	0.12Kg
Insulation class	B
Number of leads	4

Type	Order code	1+
Size 16 Linear actuator	**37-0513**	40.56

Timed delivery service

See page 4 for table of charges

RVFM

High performance microstepping driver

A high performance microstepping driver suitable for 2-phase and 4-phase hybrid steppers. It has advanced bipolar constant-current chopper circuit with current control technology. The motor is suited to motion control applications requiring low noise, low vibration, high speed and high precision.

- Supply voltage +40V DC
- Inaudible 20kHz chopping frequency
- TTL compatible and optically isolated input signals
- Automatic idle current reduction
- Mixed decay current control for reduced motor heating
- 15 step resolutions in decimal and binary
- Microstepping to 51.200 steps/revolution
- Suitable for 4, 6 or 8 lead wire motors
- Overcurrent, overvoltage and short circuit protected

Technical specification

Electrical	
Drive current	Adjustable from 1.3A to 3.5A
Supply voltage	input voltage from +24V to +40V DC
Step control	Half step or microstepping
Control inputs	Connections for pulse, direction and enable signals
Pulse signal	Speed control to maximum frequency 300kHz
Direction signal	Clockwise or counter-clockwise rotation
Enable signal	Driver enable or disable
Logic signals	Current from 6mA to 30mA
Mechanical	
Material	Black coated Aluminium with integral heatsink
Mounting	Free standing or via mounting holes
Dimensions	45(W) x 132(H) x 76(D)mm

Type	Order code	1+
2A Stepper motor	**37-0516**	119.60
3.5A Stepper motor	**37-0517**	153.92

RVFM

Stepper damper

Stepper motors are affected by resonance. The resonance can become so severe that the stepper will stall and lose position; stalling can also damage the stepper. Resonance is caused by parts vibrating in concert with each other. It can be lessened by fitting a stepper damper.

In addition to the improved settling time system resonances are suppressed as well as vibrations and motor noise greatly reduced.

- Metallic mounting plate with rubber inserts
- Available for stepper motor sizes 16, 17 and 23
- Sisgnificantly reduce audible noise and resonance traditionally transmitted during operation

Type	Order code	1+
Damper size 16 and 17	**37-0519**	3.64
Damper size 23	**37-0520**	3.64

RVFM

4-Phase hybrid stepping driver

This hybrid stepping driver is a cost effective unit designed to drive 4-phase stepper motors. This driver is supplied by direct current with DC input voltage of 18-36V. An unregulated, smoothed, rectified AC transformer output can also be used as the supply. In this case, the rectified AC peak voltage must be less than 38V and the transformer secondary ac output should be less than 23V.

It has strong anti-interference capability with state-of-the-art performance on high frequency and high starting frequency

- DC Input 18V - 36V
- Max output current 1.0A/phase
- PWM constant current bipolar drive
- 7 operation modes with maximum 64 microstepping options
- Opto-isolated digital signal inputs
- Low vibrations, low noise, excellent design

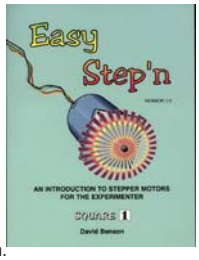
Technical specification	
Applicable motors	Applicable with up to 1.0A/phase for 2 or 4-phase stepping system
Voltage supply	18-36V DC
Output current	0.2A -1.0A/phase
Drive mode	Full bridge micro polar PWM MOSFET drive
Pulse signal and direction signal	Photo coupler input voltage H=3.5 to 5.5V, L=0 to 0.5V Input impedance: 330
Dimensions	22 x 55 x 88mm
Weight	150g
Humidity	400-085%RH
Temperature	-10°C to 45°C
Heat dissipation	Additional heatsinking should be provided for phase currents greater than 0.8A/hase

Switch position			DIV	Pulse amount
2	3	4	Full	200
ON	ON	ON	2	400
ON	ON	OFF	4	800
ON	OFF	ON	8	1600
ON	OFF	OFF	16	3200
OFF	ON	ON	32	6400
OFF	ON	OFF	64	12800
OFF	OFF	ON	64	12800

Type	Order code	1+
4-Phase stepper	**37-0518**	61.36

Square 1

Easy Step'n



David Benson, 2001, 200 pages An introduction to stepper motors, written in a hands on style featuring over 150 experiments and applications. All you ever wanted to know about stepper motors and drivers but were afraid to ask. The format of the book uses flow charts and many code examples with an easy-to-follow, step-by-step approach. This book explains how to:

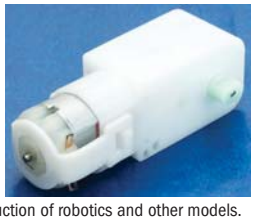
- Determine surplus motor electrical and mechanical specs by using easy-to-build electrical and mechanical test equipment
- Design and build microcontroller-based control systems
- Design and build driver circuits to switch power applied to stepper motor windings

Type	Order code	1+	2+	5+
Easy step'n	**97-0030**	28.05	27.34	26.83

Gearboxes

RVFM

Single and dual output shaft inline motor and gearbox 1:200



A choice of either dual output shaft or single output shaft inline motor and gearbox assemblies.

The gearbox delivers a ratio of 1:200 and is made from high quality plastic. Ideal for use in the construction of robotics and other models. All that is needes is to add wheels, hubs or tracks.

- Available with dual or single output shaft
- Gear Ratio: 1:200
- Power: 3 to 12V DC
- Single motor
- Without loading: 40-230mA / 25-100rpm
- Output torque: 2-12Kgf.cm
- Weight: 31.9g
- Size 68 x 20mm
- Shafts: 7mm diameter, 4.5mm flat edge, 5mm long

Type	Order code	1+	25+	100+	250+
Dual output shaft motor	**37-1221**	1.65	1.34	1.24	1.03
Single output shaft motor	**37-1214**	1.65	1.34	1.24	1.03

RVFM

120:1 Inline motor and gearbox

This economy motorised gearbox is fitted with a 3 to 12V DC motor. The output shaft is 5.5mm diameter and 9mm long with 2 flats. Ratios of 1:120 give final speeds of between 70-140rpm depending on voltage used.

- Smooth running
- 3x mounting holes
- Ideal for small educational projects including fairgrounds and robots
- No load current: 70 – 130mA
- Under load at 6.0V: Motor output turning power is 1.8kgf.cm
- Dimensions 7(L) x 2(W) excluding shaft x 2(W)cm
- Weight: 30g

Type	Order code	1+	25+	100+	250+
Motor and gearbox	**37-1217**	1.30	1.20	0.988	0.884

RVFM

NEW

Right angled motor and gearbox 1:220

A low-cost miniature right-angled DC motor with many applications including models, robotics and educational demonstration equipment.

- Two flat sides on the motor shaft
- Solder tag termination
- Suggested voltage: 6V DC
- Direction of rotation: Bidirectional
- Change of polarity changes the direction of the motor
- Gearbox position: All positions
- Gear ratio: 1:220
- Storage humidity range (with the exception of the gearbox): 30% to 70%
- Operating temperature range (with the exception of the motor): +10°C to +30°C
- Storage humidity range (with the exception of the motor): 10% to 70%
- Storage humidity range of the motor: 30% to 95%
- Gearbox position: To be placed horizontally
- Power supply: Regulated DC 6V power supply

Type	Order code	1+	25+	100+	250+
Right angled motor & gearbox	**37-1216**	1.30	1.20	0.988	0.884

RVFM

Twin motor gearbox kit

This twin motor gear box uses a two motor system to provide power and speed to turn the round shaft in two different directions.

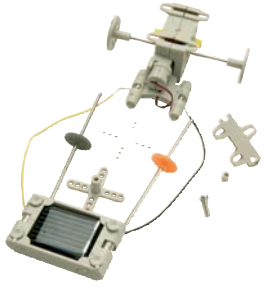
The gear box is made from high quality plastic. Use this gear box and motor set to construct mechanical toys and robotic products. Two battery powered mmotors are included. The easily adjusted gearboxes can be used with a gear ratio of 1:60, 1:120 or 1:288.

- Ideal for hobbies and education projects
- Two motor and gearbox sets to have wheels running in different directions
- 3 different gear ratios for out of your choice
- Battery operated
- Wheels, tyres and all other necessary parts included
- Easy to follow instruction manual included

Type	Order code	1+	10+
Twin motor gearbox kit	**37-1218**	7.54	5.41

RVFM

Solar gearbox kit



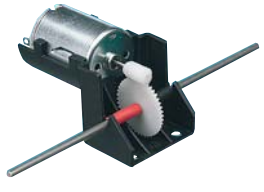
This solar building kit will help teach children the benefits of solar energy while they create a toy that is both fun to play with and requires no batteries. All that is required is a light source. This educational solar motor and solar panel is an excellent beginner building kit designed to teach how solar power is used to drive a small motor. The kit requires no soldering.

- Ideal for teaching children the fundamentals of solar power
- Uses jumber wires to connect between solar panel and motor
- Solar panel specification: 1V x 75mA
- 2x gear ratios
- Ideal for education
- Kit includes solar panel motor with drive wheels and full easy to follow instructions

Type	Order code	1+	10+
Solar gearbox kit	**37-1219**	9.26	6.76

RVFM

Worm drive gearbox with motor



A robust worm-drive gearbox powered by an MM28 motor (included).

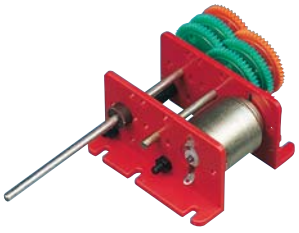
- Most suitable for applications where an easy to fit, high torque output is required
- Ideal for student based projects including robots and buggies

Technical specification		
Motor operating voltage	3V	6V
Motor speed	3V no load	9,700rpm
	6V no load	17,100rpm
Motor stall torque	122g-cm	220g-cm
Gearbox ratio		
Axle diameter	3mm	3mm
Axle length	125mm	125mm
Fixing holes	4 x 4mm	4 x 4mm
Overall dimensions of box + motor	35(W) x 40(H) x 60(L)mm	

Type	Order code	1+	10+	25+	100+
Worm drive gearbox	**37-0310**	1.75	1.64	1.56	1.46

MFA/COMO DRILLS
Multi-ratio gearbox and motor

A multi-ratio gearbox available supplied fully assembled or in kit form.



- Supplied with drive motor which operates on 1.5, 3.0 or 4.5 volt DC power sources
- Suitable for battery or transformer operation
- Sturdy, simple and versatile design
- Suitable for a host of uses from powering models and robots to teaching the principles of mechanics
- Current consumption depends on load but is within the range 0.2 to 0.8A
- Output shaft is 3mm diameter
- Gearbox is mounted on flanged frame for easy mounting

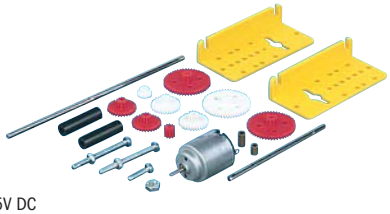
Technical specification

Ratio	1.5V	3V	4.5V
	RPM		
	966	1932	2898
	241	483	724
	60	121	181
	15	30	45
	3	7	10
	1	2	3

Type	Order code	1+	10+
Gearbox (kit form)	**37-1210**	4.11	3.59
Gearbox (assembled)	**37-1215**	5.15	4.94

RVFM
Multi-ratio gearbox and motor

A multi-ratio gearbox supplied in kit form which allows a range of different transmission ratios from 5:1 to 3125:1 to be constructed.



- Possible ratios: 5:1, 15:1, 25:1, 45:1, 125:1, 243:1, 625:1, 1125:1 and 3125:1
- Included in the kit is a medium torque motor which will operate from 1.5V to 4.5V DC
- Easy to mount to any surface with the slots that are provided in the mounting plates
- Output shaft is 3mm diameter
- Ideally suited to many projects within education
- Supplied with full instructions on assembly and gearbox ratios

Type	Order code	1+	10+	25+	50+
Multi-ratio gearbox	**37-1220**	4.94	4.37	3.73	3.56

RVFM
2-in-1 Gearbox

A gearbox kit which contains:

- Electric motor (3-6V)
- 2 sets of gears giving either a 60:1 or 288:1 reduction (approx. 200 or 42rpm)
- Gearbox chassis and shafts

Type	Order code	1+
2-in-1 Gearbox	**13-1020**	2.76

MFA/COMO DRILLS
Geared motor accessory kit

A kit containing a useful selection of mechanical parts, ideal for the construction of motorised models, robots, buggies, technology projects, etc. The selection includes:

- Motorised gearbox
- Wheels
- Hardware
- Gears
- Rack and pinion
- Perforated metal sheet and strips
- Axles/shafts
- Nuts
- Bolts and washers
- Chain and sprockets
- Worm drive
- Toggle switch
- Size D 1.5V zinc-chloride battery and battery box

Type	Order code	1+	5+	10+
Geared motor kit	**37-1100**	20.75	20.18	19.50

MFA/COMO DRILLS
Fixed ratio 12mm diameter subminiature epicyclic geared motor

A range of geared motors suitable for subminiature applications in industry, R&D and modelling. Indispensable where space considerations are paramount. They have high quality 3 pole motors with precious metal brush gear. They are of metal construction with a 3mm output shaft with a key flat.

- Designed for heavy duty industrial and model applications.
- Robust unit boasts a powerful high quality motor
- Sintered Steel bearings
- Precious metal motor brushes
- No maintenance is required
- Gears are equally efficient in either direction
- 3 versions available (please see specification or price panel)
- **MFA/Como 990D** series

Technical specification

Motor data

Type	Voltage	Motor output at max. efficiency (W)	Rated torque (g.cm)	Mftrs. part no.	Order code
4:1 ratio	3V	0.59	800	990D41	**37-1080**
64:1 ratio	3V	0.59	1600	990D641	**37-1081**
256:1 ratio	3V	0.59	1800	990D2561	**37-1082**

Reduction table (rpm)

Type	Supply Voltage (3V)
990D41	3125
990D641	195
990D2561	49

Type	Order code	1+	10+	50+
4:1 Epicyclic motor	**37-1080**	22.78	19.14	17.58
64:1 Epicyclic motor	**37-1081**	30.13	25.31	23.25
256:1 Epicyclic motor	**37-1082**	34.18	28.72	26.38

MFA/COMO DRILLS
Fixed ratio 16mm diameter subminiature epicyclic geared motor

Suitable for light industrial, educational, modelling and R&D applications. The 16mm series have a high quality 3 pole motors with precious metal brushgear. They are of metal construction with acetyl first stage gears for noise reduction. The output shaft is 3mm diameter with a key flat.

For speed regulation see panel mounted speed regulator order code **37-1245** (Not for use below 6V operation)

- Designed for heavy duty industrial and model applications.
- Robust unit boasts a powerful high quality motor
- Sintered Steel bearings
- Precious metal motor brushes
- No maintenance is required
- Gears are equally efficient in either direction
- 5 versions available (please see specification or price panel)
- **MFA/Como 941D** series

Technical specification

Motor data

Type	Voltage	Motor output at max efficency (W)	Rated Torque (g.cm)	Mftrs. part no.	Order code
4:1 ratio	3 to 12V	0.5	1000	941D41	**37-1196**
62:01 ratio	3 to 12V	0.5	2000	941D621	**37-1198**
104:01 ratio	3 to 12V	0.5	2000	941D1041	**37-1083**
231:1 ratio	3 to 12V	0.5	2500	941D2311	**37-1200**
1014:1 ratio	3 to 12V	0.5	3000	941D10141	**37-1084**

Reduction table (rpm)

Type	Supply Voltage (3V)	Supply Voltage (6V)	Supply Voltage (9V)	Supply Voltage (12V)
4:01 ratio	350	800	1300	1800
62:01 ratio	18	50	82	119
104:01 ratio	12.5	30	50	70
231:01 ratio	5	14	23	32
1014:01 ratio	1.25	3	5	6.8

Type	Order code	1+	5+	10+
4:1 Epicyclic motor	**37-1196**	11.86	10.71	9.52
62:1 Epicyclic motor	**37-1198**	16.43	14.87	13.21
104:1 Epicyclic motor	**37-1083**	16.55	13.90	12.77
231:1 Epicyclic motor	**37-1200**	19.24	17.37	15.44
1014:1 Epicyclic motor	**37-1084**	21.67	18.21	16.63

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Miniature tool set

MFA/COMO DRILLS

Fixed ratio 22mm diameter epicyclic geared motor (RE944 motor)

This range is designed for smaller industrial and modelling applications. Due to its size and power it is very popular with design engineers in many fields. It has a high quality 3 pole motor with carbon brushgear. It is of metal construction with acetyl first stage gears for noise reduction. The output shaft is 4mm diameter with a key flat.

For speed regulation see PWM panel mounted speed regulator (see order code **37-1245**)

- Designed for heavy duty industrial and model applications
- Robust unit boasts a powerful high quality motor
- Sintered Steel bearings
- Precious metal motor brushes
- No maintenance is required
- Gears are equally efficient in either direction
- 4 versions available (please see specification or price panel)
- **MFA/Como 944D** series

Technical specification

Motor data

Type	Voltage	Motor output at max efficency (W)	Rated Torque (g.cm)	Mftrs. part no.	Order code
4:1 ratio	6 to 12V	1.25	1000	944D41	**37-1201**
62:1 ratio	6 to 12V	1.25	2000	944D621	**37-1202**
104:1 ratio	6 to 12V	1.25	2000	944D1041	**37-1203**
231:1 ratio	6 to 12V	1.25	2500	944D2311	**37-1204**

Reduction table (rpm)

Type	Supply Voltage (3V)	Supply Voltage (6V)	Supply Voltage (9V)	Supply Voltage (12V)
4:1 ratio	800	1100	1550	2000
62:1 ratio	41	64	97	128
104:1 ratio	24	35	55	76
231:1 ratio	11.5	16.5	25.5	35

Type	Order code	1+	5+	10+
4:1 Epicyclic motor	**37-1201**	11.96	10.66	10.14
62:1 Epicyclic motor	**37-1202**	16.85	15.60	14.51
104:1 Epicyclic motor	**37-1203**	16.85	15.60	14.51
231:1 Epicyclic motor	**37-1204**	19.76	18.20	16.64

MFA/COMO DRILLS

Fixed ratio 25mm diameter spur geared motors

Suitable for light industrial, educational, modelling and R&D applications. They are of metal construction and fitted with quality 3 pole motors with carbon brushgear. Available in 1.5-3V or 12-24V options, they have 4mm diameter central output shafts with key flats.

For speed regulation see panel mounted PWM speed regulator (see order code **37-1245**). (Not for use below 6V operation)

- Designed for heavy duty industrial and model applications.
- Robust unit boasts a powerful high quality motor
- Sintered Steel bearings
- Precious metal motor brushes
- No maintenance is required
- Gears are equally efficient in either direction
- 3 versions available (please see specification or price panel)
- **MFA/Como 918D** series

Technical specification

Motor data

Type	Voltage	Motor output at max efficency (W)	Rated torque (g.cm)	Mftrs. part no.	Order code
15:1 ratio	1.5 to 30V	1.6	400	918D151	**37-1085**
15:1 ratio	12 to 24V	1.62	400	918D15112	**37-1086**
30:1 ratio	1.5 to 3V	1.6	600	918D301	**37-1226**
30:1 ratio	12 to 24V	1.62	600	918D30112	**37-1228**
100:1 ratio	1.5 to 3V	1.6	1000	918D1001	**37-1222**
100:1 ratio	12 to 24V	1.62	1000	918D100112	**37-1224**
250:1 ratio	1.5 to 3V	1.6	1200	918D2501	**37-1087**
250:1 ratio	12 to 24V	1.62	1200	918D250112	**37-1088**
1024:1 ratio	1.5 to 3V	1.6	1500	918D10241	**37-1089**
1024:1 ratio	12 to 24V	1.62	1500	918D1024112	**37-1090**

Reduction table (rpm)

Type	Voltage	Supply Voltage (1.5V)	(3V)	(6V)	(12V)	(18V)	(24V)
15:1 ratio	1.5 to 30V	306	613	-	-	-	-
15:1 ratio	12 to 24V	-	-	280	560	840	1120
30:1 ratio	1.5 to 3V	153	306	-	-	-	-
30:1 ratio	12 to 24V	-	-	140	280	420	560
100:1 ratio	1.5 to 3V	46	92	-	-	-	-
100:1 ratio	12 to 24V	-	-	42	84	126	168
250:1 ratio	1.5 to 3V	18	37	-	-	-	-
250:1 ratio	12 to 24V	-	-	17	34	50	67
1024:1 ratio	1.5 to 3V	4.5	9	-	-	-	-
1024:1 ratio	12 to 24V	-	-	3	7	11	15

Type	Order code	1+	5+	10+
15.1 Spur motor	**37-1085**	8.86	7.45	6.83
15.1 Spur motor	**37-1086**	9.73	8.18	7.52
30.1 Spur motor	**37-1226**	8.84	7.18	6.76
30.1 Spur motor	**37-1228**	9.78	8.22	7.70
100.1 Spur motor	**37-1222**	8.84	7.23	6.76
100.1 Spur motor	**37-1224**	9.78	8.22	7.70
250.1 Spur motor	**37-1087**	9.34	7.85	7.21
250.1 Spur motor	**37-1088**	9.73	8.18	7.52
1024.1 Spur motor	**37-1089**	9.92	8.31	7.65
1024.1 Spur motor	**37-1090**	10.81	9.08	8.31

MFA/COMO DRILLS

Fixed ratio 32mm diameter epicyclic geared motor (RE 385 motor)

Suitable for light industrial, educational, modelling and R&D applications. This combination of motor and gearbox has particular application where high torque with lower current consumption is required. It has a high quality 5 pole motor with carbon brushgear. It is of metal construction with a 6mm diameter output shaft with a key flat.

For speed regulation see panel mounted PWM speed regulator, (see order code **37-1245**)

- Designed for heavy duty industrial and model applications
- Robust unit boasts a powerful high quality motor
- Sintered Steel bearings
- Precious metal motor brushes
- No maintenance is required
- Gears are equally efficient in either direction
- 3 versions available (please see specification or price panel)
- **MFA/Como 940D** series

Technical specification

Motor data

Type	Voltage	Motor output at max efficency (W)	Rated torque (g.cm)	Mftrs. part no.	Order code
5:1 ratio	6 to 15V	6.21	2000	940D51	**37-1190**
100:1 ratio	7 to 15V	6.21	12000	940D1001	**37-1192**
264:1 ratio	8 to 15V	6.21	12000	940D2641	**37-1091**
516:1 ratio	9 to 15V	6.21	12000	940D5161	**37-1194**

Reduction table (rpm)

Type	Supply Voltage (4.5V)	Supply Voltage (6V)	Supply Voltage (9V)	Supply Voltage (12V)	Supply Voltage (15V)
5:1 ratio	700	1000	1600	2150	2800
100:1 ratio	35	50	77	103	134
264:1 ratio	12	19	30.5	41	54.5
516:1 ratio	6	8.5	14	19	25

Type	Order code	1+	5+	10+
5:1 Epicyclic motor	**37-1190**	17.52	15.81	14.04
100:1 Epicyclic motor	**37-1192**	23.82	21.53	19.08
264:1 Metal gearbox	**37-1091**	27.71	23.28	21.38
516:1 Epicyclic motor	**37-1194**	27.56	24.86	22.10

MFA/COMO DRILLS

Fixed ratio 35mm spur geared motor (RE 540/1 motor)

Suitable for light industrial, educational, modelling and R&D applications. This range offers a wide variety of ratios with a quality high torque 3 pole motor with carbon brushgear. They are of metal construction with a 6mm diameter output shaft with key flats.

For speed regulation see panel mounted speed regulator (see order code: **37-1245**) (Not for use below 6V operation)

- Designed for heavy duty industrial and model applications.
- Robust unit boasts a powerful high quality motor
- Sintered Steel bearings
- Precious metal motor brushes
- No maintenance is required
- Gears are equally efficient in either direction
- 3 versions available (please see specification or price panel)
- **MFA/Como 919D** series

Technical specification

Motor data

Type	Voltage	Motor output (W)	Rated torque (g.cm)	Mftrs. part no.	Order code
6:1 ratio	4.5 to 15V	21.2	3000	919D61	**37-1092**
11:1 ratio	4.5 to 15V	21.2	3000	919D111	**37-1093**
50:1 ratio	4.5 to 15V	21.2	3000	919D501	**37-1094**
100:1 ratio	4.5 to 15V	21.2	6000	919D1001	**37-1095**
148:1 ratio	4.5 to 15V	21.2	6000	919D1481	**37-1238**
500:1 ratio	4.5 to 15V	21.2	6000	919D5001	**37-1096**
810:1 ratio	4.5 to 15V	21.2	6000	919D8101	**37-1240**
3000:1 ratio	4.5 to 15V	21.2	6000	919D30001	**37-1097**

Reduction table (rpm)

Type	Supply Voltage (4.5V)	Supply Voltage (6V)	Supply Voltage (9V)	Supply Voltage (12V)	Supply Voltage (15V)
6:1 ratio	990	1316	1975	2633	3295
11:1 ratio	540	718	1077	1436	1800
50:1 ratio	120	158	237	316	395
100:1 ratio	59	79	119	158	198
148:1 ratio	40	53	80	106	132
500:1 ratio	9.75	14	21.5	30	37.5
810:1 ratio	8	10	15	20	25
3000:1 ratio	1.5	2	3	5	6

Type	Order code	1+	5+	10+
6:1 Spur geared motor	**37-1092**	16.84	14.15	13.00
11:1 Spur geared motor	**37-1093**	16.86	14.16	13.01
50:1 Spur geared motor	**37-1094**	16.84	14.15	13.00
100:1 Spur geared motor	**37-1095**	16.86	14.16	13.01
148:1 Spur geared motor	**37-1238**	16.59	14.14	13.42
500:1 Spur geared motor	**37-1096**	21.86	18.37	16.87
810:1 Spur geared motor	**37-1240**	18.67	16.22	15.50
3000:1 Spur geared motor	**37-1097**	19.56	16.43	15.09
264:1 Metal gearbox	**37-1091**	27.71	23.28	21.38

MFA/COMO DRILLS
Fixed ratio 35mm spur geared motor (RE 385 motor) central output shaft

Suitable for light industrial, educational, modelling and R&D applications. This unit has a high quality 5 pole motor with carbon brushgear. It differs from the standard 35mm range due to the central output shaft and range of alternative reduction ratios. This range has particular application where high torque requirements with lower current consumption are at a premium. It has a 6mm diameter output shaft with a key flat.

For speed regulation see panel mounted speed regulator (see order code: **37-1245**)

- Designed for heavy duty industrial and model applications.
- Robust unit boasts a powerful high quality motor
- Sintered Steel bearings
- Precious metal motor brushes
- No maintenance is required
- Gears are equally efficient in either direction
- 3 versions available (please see specification or price panel)
- **MFA/Como 970D** series

Technical specification

Motor data

Type	Voltage	Motor output at max efficency (W)	Rated torque (g.cm)	Mftrs. part no.	Order code
6:1 ratio	6 to 15V	6.21	1000	970D61	**37-1844**
16:1 ratio	6 to 15V	6.21	2000	970D161	**37-1845**
47:1 ratio	6 to 15V	6.21	3000	970D471	**37-1846**
156:1 ratio	6 to 15V	6.21	6000	970D1561	**37-1847**
750:1 ratio	6 to 15V	6.21	6000	970D7501	**37-1848**
2812:1 ratio	6 to 15V	6.21	6000	970D28121	**37-1849**

Reduction table (rpm)

Type	Supply Voltage (4.5V)	Supply Voltage (6V)	Supply Voltage (9V)	Supply Voltage (12V)	Supply Voltage (15V)
6:1 ratio	650	900	1300	1830	2250
16:1 ratio	210	270	500	685	950
47:1 ratio	72	108	170	204	300
156:1 ratio	23	32	51	69	90
750:1 ratio	4.4	6.6	11.6	14.5	18.5
2812:1 ratio	1.3	1.8	2.8	3.8	5

Type	Order code	1+	3+	5+
6:1 Spur geared motor	**37-1844**	17.63	16.59	15.96
16:1 Spur geared motor	**37-1845**	17.63	16.59	15.96
47:1 Spur geared motor	**37-1846**	17.63	16.59	15.96
156:1 Spur geared motor	**37-1847**	17.63	16.59	15.96
750:1 Spur geared motor	**37-1848**	19.71	18.67	17.63
2812:1 Spur geared motor	**37-1849**	21.79	20.75	19.71

MFA/COMO DRILLS
Fixed ratio 35mm spur geared motor (RE 385 motor) central output shaft

Suitable for light industrial, educational, modelling and R&D applications. This unit has a high quality 5 pole motor with carbon brushgear. It differs from the standard 35mm range due to the central output shaft and range of alternative reduction ratios. This range has particular application where high torque requirements with lower current consumption are at a premium. It has a 6mm diameter output shaft with a key flat.

For speed regulation see panel mounted speed regulator (see order code: **37-1245**)

- Designed for heavy duty industrial and model applications.
- Robust unit boasts a powerful high quality motor
- Sintered Steel bearings
- Precious metal motor brushes
- No maintenance is required
- Gears are equally efficient in either direction
- 3 versions available (please see specification or price panel)
- **MFA/Como 970D** series

Technical specification

Motor data

Type	Voltage	Motor output at max efficency (W)	Rated torque (g.cm)	Mftrs. part no.	Order code
6:1 ratio	6 to 15V	6.21	1000	970D61	**37-1844**
16:1 ratio	6 to 15V	6.21	2000	970D161	**37-1845**
47:1 ratio	6 to 15V	6.21	3000	970D471	**37-1846**
156:1 ratio	6 to 15V	6.21	6000	970D1561	**37-1847**
750:1 ratio	6 to 15V	6.21	6000	970D7501	**37-1848**
2812:1 ratio	6 to 15V	6.21	6000	970D28121	**37-1849**

Reduction table (rpm)

Type	Supply Voltage (4.5V)	Supply Voltage (6V)	Supply Voltage (9V)	Supply Voltage (12V)	Supply Voltage (15V)
6:1 ratio	650	900	1300	1830	2250
16:1 ratio	210	270	500	685	950
47:1 ratio	72	108	170	204	300
156:1 ratio	23	32	51	69	90
750:1 ratio	4.4	6.6	11.6	14.5	18.5
2812:1 ratio	1.3	1.8	2.8	3.8	5

Type	Order code	1+	3+	5+
6:1 Spur geared motor	**37-1844**	17.63	16.59	15.96
16:1 Spur geared motor	**37-1845**	17.63	16.59	15.96
47:1 Spur geared motor	**37-1846**	17.63	16.59	15.96
156:1 Spur geared motor	**37-1847**	17.63	16.59	15.96
750:1 Spur geared motor	**37-1848**	19.71	18.67	17.63
2812:1 Spur geared motor	**37-1849**	21.79	20.75	19.71

MFA/COMO DRILLS
Fixed ratio 42mm epicyclic geared motor (RE 975 motor)

Suitable for medium duty industrial applications. This range is capable of delivering higher torques. They boast high quality 5 pole motors, heavy duty carbon brushgear, with the output shaft running in a ball race. They are of metal construction. They have an 8mm output shaft with a key flat.

For speed regulation see panel mounted speed regulator (see order code: **37-1245**)

- Designed for heavy duty industrial and model applications.
- Robust unit boasts a powerful high quality motor
- Sintered Steel bearings
- Precious metal motor brushes
- No maintenance is required
- Gears are equally efficient in either direction
- 3 versions available (please see specification or price panel)
- **MFA/Como 975D** series

Technical specification

Motor data

Type	Voltage	Motor output at max efficency (W)	Rated torque (g.cm)	Mftrs. part no.	Order code
4:1 ratio	6 to 12	41.3	5000	975D41	**37-1205**
104:1 ratio	6 to 12	41.3	20000	975D1041	**37-1206**
504:1 ratio	6 to 12	41.3	30000	975D5041	**37-1207**

Reduction table (rpm)

Type	Supply Voltage (4.5V)	Supply Voltage (6V)	Supply Voltage (9V)	Supply Voltage (12V)
4:1 ratio	600	850	1275	1750
104:1 ratio	25	35	51	67
504:1 ratio	4.5	6.5	10	14

Type	Order code	1+	3+	5+
4:1 Epicyclic motor	**37-1205**	23.87	22.83	20.75
104:1 Epicyclic motor	**37-1206**	26.99	25.95	24.91
504:1 Epicyclic motor	**37-1207**	29.07	28.03	26.99

MFA/COMO DRILLS
Fixed ratio 42mm epicyclic geared motor (RE 975 motor)

Suitable for medium duty industrial applications. This range is capable of delivering higher torques. They boast high quality 5 pole motors, heavy duty carbon brushgear, with the output shaft running in a ball race. They are of metal construction. They have an 8mm output shaft with a key flat.

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- **MFA/Como 975D** series

Technical specification

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104:1 ratio	6 to 12	41.3	20000	975D1041	**37-1206**
504:1 ratio	6 to 12	41.3	30000	975D5041	**37-1207**

Reduction table (rpm)

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104:1 Epicyclic motor	**37-1206**	26.99	25.95	24.91
504:1 Epicyclic motor	**37-1207**	29.07	28.03	26.99

MFA/COMO DRILLS

Panel mounted PWM speed regulator

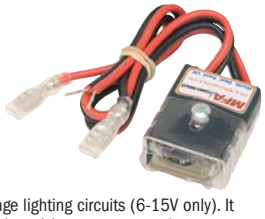
This regulator has variable outputs providing smooth progressive speed control from min to max, ideal for use in controlling motors and geared motors. It can also provide a dimmer facility for low voltage lighting circuits (6-15V only). It employs PWM circuitry, giving a constant voltage output. Speed control is achieved by varying the width of the output pulse. Maximum rated output is 3 amps constant, (5 amps peak only). It operates from 6-15V D.C. inputs. Requires non-digital power supply, i.e battery or non-digital mains transformer rectifier.

- A voltage regulator employing pulse width modulation is also available, which allows infinitely variable motor R.P.M. to be set
- **MFA/Como 918D/1** and **919D** series

Type	Order code	1+	5+	10+
Voltage/speed regulator	**37-1245**	8.84	8.22	7.90

MFA/COMO DRILLS

Panel mounted PWM speed regulator



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Voltage/speed regulator	**37-1245**	8.84	8.22	7.90

MFA/COMO DRILLS

Bevel gearbox 1:1 gear ratio

These drives are used primarily to transmit power at 90 degrees. The unit has steel gears and shafts running in ballraces and sintered bronze bearings.

- 1:1 gear ratio
- Lubricated for life
- Designed for rugged service life
- 1 ball race and S B bearing per shaft
- Housing mouldings are 30% glass filled nylon for strength
- 4 pre-drilled mounting holes
- Key flats provided on both shafts

Technical specification

Gear	Mild steel: BS970
Input speed	5000rpm max.
Case	30% glass filled nylon
Backlash	1 degree approximately

Type	Order code	1+	5+	10+
Bevel gearbox	**37-1208**	14.51	13.47	12.43

Accessories

RVFM

Soft-link tubing

Soft silicone polymer tubing which can be used as a flexible coupling in many low-torque applications, such as flexible drive shafts, universal joints, linking push/pull rods, etc. Its unusual softness and strength allows for an amount of compliance in otherwise rigid drive systems.

- Ideal for modelling and robotics applications where high torque and accuracy are not of paramount importance
- Bore dia. approx. 2.5mm
- Supplied in **lengths of 1m**

Type	Order code	1+
1m Soft-link tube	**37-1275**	1.30

RVFM

Solar panel

Use these solar panels to build your own robots or other solar energy powered applications. Ideal for use for solar cars, solar motor kits and school projects.

- Solid, almost-unbreakable module
- Great for low power consumption projects
- Supplied with flying leads
- Output approximately 1V
- Dimensions 60(L) x 30(W) x 2(D)mm

Type	Order code	1+	25+	100+
Solar panel	**37-0438**	2.54	2.41	2.08

RVFM

Off-centre mass wheels

These small plastic mouldings fit directly onto 2mm motor spindles, providing imbalance that is required for vibrating mechanisms.

- Ideal for use in building vibrating 'bugs' and robotics
- Obviate the need to apply any adhesive to ordinary wheels
- Approx. dimensions: 8mm thick x 20mm diameter

Motor not included. Suitable motors are available separately.

Type	Order code	1+
Off-centre mass wheels	**06-0698**	0.16

RVFM

Model wheels

Model wheels moulded in robust ABS material with 2.6mm diameter bores.

- Supplied in **packs of 4**

Wheel size	Order code	1+	10+	25+
37 x 16mm	**37-1310**	1.32	1.15	1.10
44 x 16mm	**37-1315**	1.62	1.33	1.15
56 x 16mm	**37-1320**	2.58	2.20	1.97

RVFM

Steel shafts

Steel shafts for use with miniature gears, wheels, motors, etc.

- 2 or 3mm diameter
- Can be easily cut with a hacksaw

Pack size	Shaft size	Order code	1+	10+	50+
Pk of 50	75 x 2mm dia.	**37-0350**	0.75	0.5616	0.4784
Pk of 50	75 x 3mm dia.	**37-0352**	1.75	1.46	1.29
Pk of 25	120 x 3mm dia.	**37-0354**	1.29	1.11	0.9745

RVFM

Steel axle

Steel and aluminium rod, ideal for axles for wheels, gears and cams.

- Steel 300 x 3mm dia.
- Aluminium 300 x 3.2mm dia.
- Supplied in **packs of 50**

Type	Order code	1+
300 x 3mm Steel	**06-6032**	8.52
300 x 3.2mm Aluminium	**06-6034**	9.31

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Toggle switches

MFA/COMO DRILLS
In-line shaft couplers

A range of brass, in-line shaft couplers, ideal for connecting motors to shafts or gearboxes, extending shafts, etc.

- The couplers are fixed to the shaft by means of Allen screws, supplied
- The 8swg coupling can be used in conjunction with Meccano™ products

For suitable Allen keys, please see **Hand tools** *section.*

Technical specification

Coupler size	Outside diameter	Length	Allen screw
2mm - 2mm	8mm	20mm	M3
3mm - 3mm	8mm	20mm	M3
3mm - 4mm	10mm	20mm	M3
4mm - 4mm	10mm	20mm	M3
5mm - 6mm	12.5mm	25mm	M4
6mm - 6mm	12.5mm	25mm	M4
6mm - 8swg	12.5mm	25mm	M4

Type	Order code	1+	5+	10+
2mm - 2mm	**43-1050**	3.33	3.07	2.86
3mm - 3mm	**43-1052**	3.07	2.81	2.65
3mm - 4mm	**43-1054**	4.00	3.69	3.43
4mm - 4mm	**43-1056**	3.33	3.07	2.86
5mm - 6mm	**43-1060**	4.37	4.06	3.80
6mm - 6mm	**43-1062**	3.07	2.81	2.65

TruMotion
Miniature worm gears

A range of miniature worm gears for use with our motors.

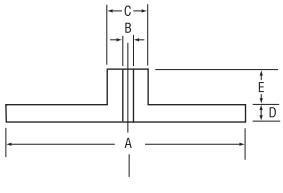
- Bore size in all cases is 1.9mm which ensures correct tight fit for 2mm diameter shaft
- Supplied in **packs of 50**

Length	Outside dia.	Order code	1+	10+
6mm	6mm	**37-0300**	0.98	0.8528
10mm	6mm	**37-0305**	0.99	0.676

TruMotion
Miniature gears

A range of miniature gears for use with our motors.

- Bore size in all cases is 1.9mm which ensures correct tight fit for 2mm diameter shaft
- MOD = 0.5
- Supplied in **packs of 50**



Technical specification

No. teeth outer dia.	No. teeth inner dia.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Order code
16	-	9	1.9	-	5	-	**37-0200**
30	-	16	1.9	6	1.5	1.5	**37-0205**
42	-	22	1.9	6	1.5	2.5	**37-0210**
60	-	31	1.9	6	1.5	1.5	**37-0215**
30	10	16	1.9	6	1.5	2.5	**37-0220**
42	10	22	1.9	6	1.5	2.5	**37-0225**

Price per pack of 50

No. outer	No. inner	Order code	1+	10+	25+
16	-	**37-0200**	0.98	0.78	0.65
30	-	**37-0205**	1.30	1.04	0.8445
42	-	**37-0210**	1.70	1.37	1.10
60	-	**37-0215**	2.34	1.96	1.62
30	10	**37-0220**	1.30	1.04	0.8445
42	10	**37-0225**	1.70	1.37	1.10

RVFM
Miniature pulleys

Miniature pulleys which will push-fit on to 2mm shafts, commonly found on miniature motors.

- Manufactured in high-impact polystyrene
- All sizes include motor spindle stand-offs
- All sizes have 2mm bore
- Supplied in **packs of 10**

Type	Order code	1+
8mm	**37-0371**	1.25
12mm	**37-0376**	1.70
25mm	**37-0381**	2.30

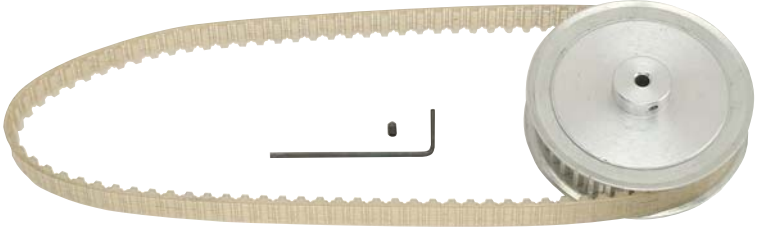
TruMotion
Plastic pulleys

A range of plastic pulleys ideal for use with our range of miniature motors.

- Rigid black plastic with deep V-grooves
- All sizes include motor spindle stand-offs
- Excellent for robots, mechanical constructions, science experiments as well as functional tasks
- 10mm pulley will interference fit on to a 2mm shaft
- Other pulleys will interference fit on to a 3.2mm shaft

Type	Order code	1+	10+	50+	100+
10mm dia.	**37-0342**	0.12	0.1092	0.0988	0.0894
20mm dia.	**37-0344**	0.19	0.1664	0.1508	0.1352
30mm dia.	**37-0346**	0.21	0.1872	0.1716	0.156
40mm dia.	**37-0348**	0.29	0.26	0.2288	0.208

MFA/COMO DRILLS
Toothed timing pulleys and belts



An excellent range of high quality timing belts and pulleys.

- Pulleys made of solid aluminium
- Includes allen screw (M3 thread) and key
- Various teeth options available
- Timing belts 9.8mm wide
- Various belt lengths available

Please note: Pulleys and belts are supplied separately.

Technical specification

Timing pulley	
Bore diameter	See below
Length through bore	21mm
Pulley material	Aluminum
Pulley on shaft	Screw tightens directly onto shaft for pulley attachment

No. of teeth	Bore diameter	Pulley diameter	Pulley width	Weight	MFA part no.	Order code
10	3mm	15.05mm	12mm	10g	**919D7/10**	**37-1400**
12	3mm	18.25mm	12mm	15g	**919D7/12**	**37-1401**
14	4mm	21.45mm	12mm	19g	**919D7**	**37-1402**
16	4mm	24.60mm	12mm	26g	**919D8**	**37-1403**
20	4mm	31.00mm	12mm	39g	**919D9**	**37-1404**
25	4mm	39.00mm	12mm	57g	**919D10**	**37-1405**
30	4mm	46.95mm	12mm	79g	**919D11**	**37-1406**
35	4mm	54.85mm	12mm	116g	**919D12**	**37-1407**
40	4mm	62.85mm	12mm	142g	**919D13**	**37-1408**
44	4mm	69.20mm	12mm	172g	**919D14**	**37-1409**

Timing belt Circumference	Belt width	MFA part no.	Order code
165mm	9.8mm	**919D15**	**37-1410**
185mm	9.8mm	**919D16**	**37-1411**
200mm	9.8mm	**919D17**	**37-1412**
305mm	9.8mm	**919D18**	**37-1413**
390mm	9.8mm	**919D19**	**37-1414**
455mm	9.8mm	**919D20**	**37-1415**
545mm	9.8mm	**919D21**	**37-1416**
630mm	9.8mm	**919D22**	**37-1417**
840mm	9.8mm	**919D23**	**37-1418**

Type	Order code	1+	5+	10+
Timing pulley 10 tooth	**37-1400**	3.48	3.12	2.86
Timing pulley 12 tooth	**37-1401**	3.48	3.12	2.86
Timing pulley 14 tooth	**37-1402**	4.42	4.16	3.90
Timing pulley 16 tooth	**37-1403**	4.42	4.16	3.90
Timing pulley 20 tooth	**37-1404**	5.15	4.89	4.68
Timing pulley 25 tooth	**37-1405**	6.14	5.88	5.46
Timing pulley 30 tooth	**37-1406**	7.02	6.71	6.40
Timing pulley 35 tooth	**37-1407**	7.85	7.44	7.02
Timing pulley 40 tooth	**37-1408**	8.74	8.32	7.80
Timing pulley 44 tooth	**37-1409**	9.62	9.10	8.58
Timing belt 165mm	**37-1410**	4.11	3.85	3.59
Timing belt 185mm	**37-1411**	4.11	3.85	3.59
Timing belt 200mm	**37-1412**	4.11	3.85	3.59
Timing belt 305mm	**37-1413**	4.58	4.16	3.85
Timing belt 390mm	**37-1414**	4.84	4.42	4.11
Timing belt 455mm	**37-1415**	5.04	4.68	4.37
Timing belt 545mm	**37-1416**	5.20	4.84	4.52
Timing belt 630mm	**37-1417**	5.72	5.20	4.84
Timing belt 840mm	**37-1418**	6.55	6.03	5.62

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ISO metric steel screw kits