

# Low Cost Precision Planetary Gearheads

## TYPICAL APPLICATIONS

- Conveyor systems
- Medical pumps
- Packaging equipment
- Machine tools
- Factory automation
- Any application requiring:
  - Speed reduction
  - Torque multiplication

## FEATURES

- Fits C13 brush-type motors
- Fits BN12 brushless motors
- Precision manufactured in accordance with DIN EN ISO 9001 Standards
- Compact design
- High efficiency
- Suitable for continuous, reversing and intermittent operation
- Can be installed in any attitude
- Life-time lubricant for maintenance-free operation
- Available in either sintered or ball bearing versions
- Non-metallic input gear

## BENEFITS

- Coaxial arrangement of input and output
- Compact design
- High efficiency
- Low moments-of-inertia
- Can be installed in any attitude
- Suitable for continuous, reversing and intermittent operation
- Low sensitivity to impact load
- Large range of ratios available

32 mm (1.26 inch) Diameter



### **Quiet Precision Gearheads**

Moog Components Group precision gearheads, when coupled to our line of brush-type and brushless motors, provide the user with a quiet and powerful precision gearmotor. Available in a wide range of ratios and output torques, these gearmotors will meet the requirements of a vast number of applications. Life-time lubrication ensures long life and maintenance-free operation.

Our engineering department is available for consultation to help you tailor a gearmotor for your specific application.

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## 32 MM SPECIFICATIONS

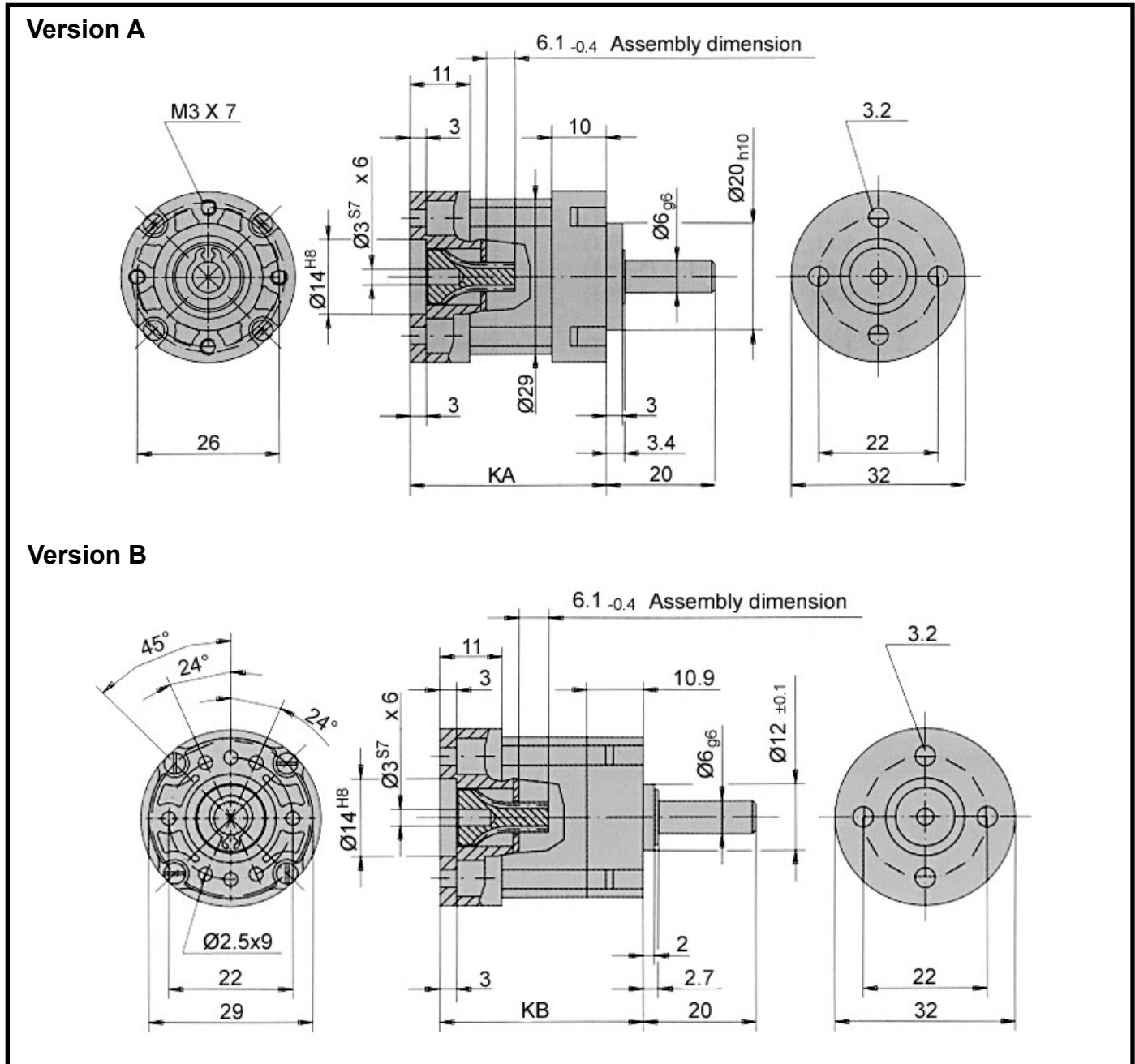
Available Ratios	# of Stages	Output Torque	Shaft Inertia (gcm <sup>2</sup> )
4:1 (3.70:1)	One	0.40 Nm (56.6 oz - in)	1.35
4:1 (4.28:1)	One	0.40 Nm (56.6 oz - in)	1.11
5:1 (5.18:1)	One	0.40 Nm (56.6 oz - in)	1.01
7:1 (6.75:1)	One	0.40 Nm (56.6 oz - in)	0.89
14:1 (13.73:1)	Two	1.0 Nm (141.6 oz - in)	1.38
16:1 (15.88:1)	Two	1.0 Nm (141.6 oz - in)	1.13
18:1 (18.36:1)	Two	1.0 Nm (141.6 oz - in)	1.12
19:1 (19.20:1)	Two	1.0 Nm (141.6 oz - in)	1.03
22:1 (22.20:1)	Two	1.0 Nm (141.6 oz - in)	1.02
25:1 (25.01:1)	Two	1.0 Nm (141.6 oz - in)	0.90
27:1 (26.85:1)	Two	1.0 Nm (141.6 oz - in)	1.01
29:1 (28.93:1)	Two	1.0 Nm (141.6 oz - in)	0.89
35:1 (34.97:1)	Two	1.0 Nm (141.6 oz - in)	0.89
46:1 (45.56:1)	Two	1.0 Nm (141.6 oz - in)	0.89
51:1 (50.89:1)	Three	2.0 Nm (283.2 oz - in)	1.38
59:1 (58.85:1)	Three	2.0 Nm (283.2 oz - in)	1.13
68:1 (68.06:1)	Three	2.0 Nm (283.2 oz - in)	1.12
71:1 (71.16:1)	Three	2.0 Nm (283.2 oz - in)	1.03
79:1 (78.71:1)	Three	2.0 Nm (283.2 oz - in)	1.12
93:1 (92.70:1)	Three	2.0 Nm (283.2 oz - in)	0.90
95:1 (95.17:1)	Three	2.0 Nm (283.2 oz - in)	1.02
100:1 (99.50:1)	Three	2.0 Nm (283.2 oz - in)	1.01
107:1 (107.20:1)	Three	2.0 Nm (283.2 oz - in)	0.89
115:1 (115.07:1)	Three	2.0 Nm (283.2 oz - in)	1.01
124:1 (123.97:1)	Three	2.0 Nm (283.2 oz - in)	0.89
130:1 (129.62:1)	Three	2.0 Nm (283.2 oz - in)	0.89
139:1 (139.13:1)	Three	2.0 Nm (283.2 oz - in)	1.01
150:1 (149.90:1)	Three	2.0 Nm (283.2 oz - in)	0.89
169:1 (168.84:1)	Three	2.0 Nm (283.2 oz - in)	0.89
181:1 (181.24:1)	Three	2.0 Nm (283.2 oz - in)	0.89
195:1 (195.26:1)	Three	2.0 Nm (283.2 oz - in)	0.89
236:1 (236.09:1)	Three	2.0 Nm (283.2 oz - in)	0.89
308:1 (307.54:1)	Three	2.0 Nm (283.2 oz - in)	0.89

### 32 mm Low Cost Technical Data

Parameter	Units	1-Stage	2-Stage	3-Stage
Max Input Speed	rpm	5000	5000	5000
Efficiency	%	75	70	65
Approx. Backlash(no-load, input locked)	DMS°	2.5	3.0	3.5
Sintered Bearing	-	-	-	-
Radial Load	N	15	30	45
Axial Load	N	5	10	15
Weight	g	100	115	130
Max Permitted Fitting Pressure	N	150	150	150
Dimension (diameter x length)	mm	32 x 56	32 x 65.5	32 x 84.5
Ball Bearing	-	-	-	-
Radial Load	N	40	70	100
Axial Load	N	10	20	30
Weight	g	120	135	150
Max Permitted Fitting Pressure	N	120	120	120
Dimension (diameter x length)	mm	32 x 52	32 x 61.5	32 x 80.5
Lubrication	Grease (life-time lubrication)			
Installation Attitude	Any			
Operating Temperature	-15 to +65° C			
Direction of Rotation	Same for input and output shaft			

# Gearheads

## Package Dimensions



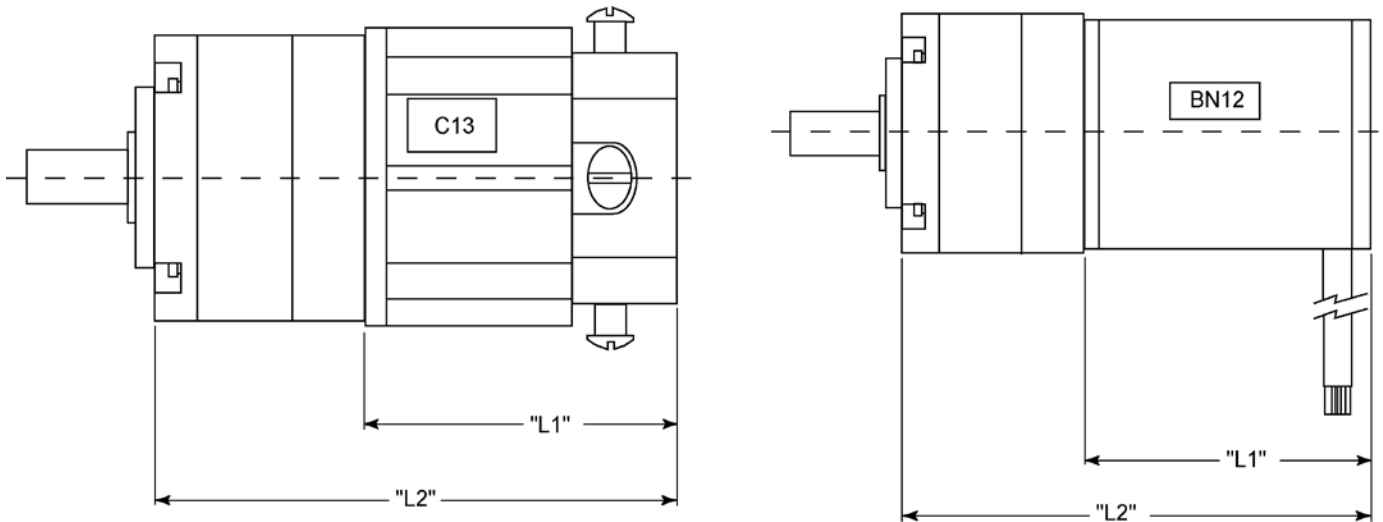
Gear Unit Length		1-Stage	2-Stage	3-Stage
KA	Bearing flange of plastic, sintered bearing on output	36	45.5	55
KA	Bearing flange of die-cast zinc, ball bearing on output	32	41.5	51

Gear Unit Length		1-Stage	2-Stage	3-Stage
KB	Bearing flange of plastic, sintered bearing on output	37	46.5	56

Preferred series Version A. We reserve the right to make technical changes.

**Note:** All dimension on this page are in millimeters.

## 32 mm Dimensional Drawings



### Motor + Gearhead Dimensions\*

Sintered Bearing Version	L1 Max	L2 Max (1-Stage)	L2 Max (2-Stage)	L2 Max (3-Stage)
C13-L19	1.90 in (48.3 mm)	3.317 in (84.3 mm)	3.691 in (93.8 mm)	4.065 in (103.3 mm)
C13-L25	2.45 in (62.2 mm)	3.867 in (98.2 mm)	4.241 in (107.7 mm)	4.615 in (117.2 mm)
C13-L28	2.78 in (70.6 mm)	4.197 in (106.6 mm)	4.571 in (116.1 mm)	4.945 in (125.6 mm)
BN12-15	1.50 in (38.1 mm)	3.350 in (85.1 mm)	3.724 in (94.6 mm)	4.098 in (104.1 mm)
BN12-20	2.00 in (50.8 mm)	3.850 in (97.8 mm)	4.224 in (107.3 mm)	4.598 in (116.8 mm)
BN12-25	2.50 in (63.5 mm)	4.350 in (110.5 mm)	4.724 in (120 mm)	5.098 in (129.5 mm)
BN12-30	3.00 in (76.2 mm)	4.850 in (123.2 mm)	5.224 in (132.7 mm)	5.598 in (142.2 mm)
Ball Bearing Version	L1 Max	L2 Max (1-Stage)	L2 Max (2-Stage)	L2 Max (3-Stage)
C13-L19	1.90 in (48.3 mm)	3.160 in (80.3 mm)	3.534 in (89.8 mm)	3.908 in (99.3 mm)
C13-L25	2.45 in (62.2 mm)	3.710 in (94.2 mm)	4.084 in (103.7 mm)	4.458 in (113.2 mm)
C13-L28	2.78 in (70.6 mm)	4.040 in (102.6 mm)	4.414 in (112.1 mm)	4.788 in (121.6 mm)
BN12-15	1.50 in (38.1 mm)	3.193 in (81.1 mm)	3.567 in (90.6 mm)	3.941 in (100.1 mm)
BN12-20	2.00 in (50.8 mm)	3.693 in (93.8 mm)	4.067 in (103.3 mm)	4.441 in (112.8 mm)
BN12-25	2.50 in (63.5 mm)	4.193 in (106.5 mm)	4.567 in (116 mm)	4.941 in (125.5 mm)
BN12-30	3.00 in (76.2 mm)	4.693 in (119.2 mm)	5.067 in (128.7 mm)	5.441 in (138.2 mm)

\*All dimensions are reference dimensions

### Ordering Information - Examples

32-SB-46:1 – 32 mm gearhead, 46:1 ratio, sintered bearing  
 32-BB-308:1 – 32 mm gearhead, 308:1 ratio, ball bearing

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## FEATURES

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- Compact design
- High efficiency
- Suitable for continuous, reversing and intermittent operation
- Can be installed in any attitude
- Life-time lubricant for maintenance-free operation

## BENEFITS

- Coaxial arrangement of input and output
- Compact design
- High efficiency
- Low moments-of-inertia
- Can be installed in any attitude
- Suitable for continuous, reversing and intermittent operation
- Low sensitivity to impact load
- Large range of ratios available

32, 52, 62, 81 and 120 mm  
(1.26 - 4.72 inch) Diameter



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## 32 MM (1.26 INCH) DIAMETER SPECIFICATIONS

Available Ratios	# of Stages	Output Torque	Shaft Inertia (gcm <sup>2</sup> )
4:1 (3.70:1)	One	0.75 Nm (106.2 oz - in)	1.54
4:1 (4.28:1)	One	0.75 Nm (106.2 oz - in)	1.29
5:1 (5.18:1)	One	0.75 Nm (106.2 oz - in)	1.14
7:1 (6.75:1)	One	0.75 Nm (106.2 oz - in)	0.89
14:1 (13.73:1)	Two	2.5 Nm (318.6 oz - in)	1.49
16:1 (15.88:1)	Two	2.5 Nm (318.6 oz - in)	1.25
18:1 (18.36:1)	Two	2.5 Nm (318.6 oz - in)	1.26
19:1 (19.20:1)	Two	2.5 Nm (318.6 oz - in)	1.12
22:1 (22.20:1)	Two	2.5 Nm (318.6 oz - in)	1.12
25:1 (25.01:1)	Two	2.5 Nm (318.6 oz - in)	0.96
27:1 (26.85:1)	Two	2.5 Nm (318.6 oz - in)	1.13
29:1 (28.93:1)	Two	2.5 Nm (318.6 oz - in)	0.96
35:1 (34.97:1)	Two	2.5 Nm (318.6 oz - in)	0.97
46:1 (45.56:1)	Two	2.5 Nm (318.6 oz - in)	0.98
51:1 (50.89:1)	Three	4.5 Nm (637.3 oz - in)	1.49
59:1 (58.85:1)	Three	4.5 Nm (637.3 oz - in)	1.25
68:1 (68.06:1)	Three	4.5 Nm (637.3 oz - in)	1.26
71:1 (71.16:1)	Three	4.5 Nm (637.3 oz - in)	1.12
79:1 (78.71:1)	Three	4.5 Nm (637.3 oz - in)	1.26
93:1 (92.70:1)	Three	4.5 Nm (637.3 oz - in)	0.96
95:1 (95.17:1)	Three	4.5 Nm (637.3 oz - in)	1.12
100:1 (99.50:1)	Three	4.5 Nm (637.3 oz - in)	1.13
107:1 (107.20:1)	Three	4.5 Nm (637.3 oz - in)	0.96
115:1 (115.07:1)	Three	4.5 Nm (637.3 oz - in)	1.13
124:1 (123.97:1)	Three	4.5 Nm (637.3 oz - in)	0.96
130:1 (129.62:1)	Three	4.5 Nm (637.3 oz - in)	0.97
139:1 (139.13:1)	Three	4.5 Nm (637.3 oz - in)	1.13
150:1 (149.90:1)	Three	4.5 Nm (637.3 oz - in)	0.97
169:1 (168.84:1)	Three	4.5 Nm (637.3 oz - in)	0.96
181:1 (181.24:1)	Three	4.5 Nm (637.3 oz - in)	0.97
195:1 (195.26:1)	Three	4.5 Nm (637.3 oz - in)	0.96
236:1 (236.09:1)	Three	4.5 Nm (637.3 oz - in)	0.96
308:1 (307.54:1)	Three	4.5 Nm (637.3 oz - in)	0.96

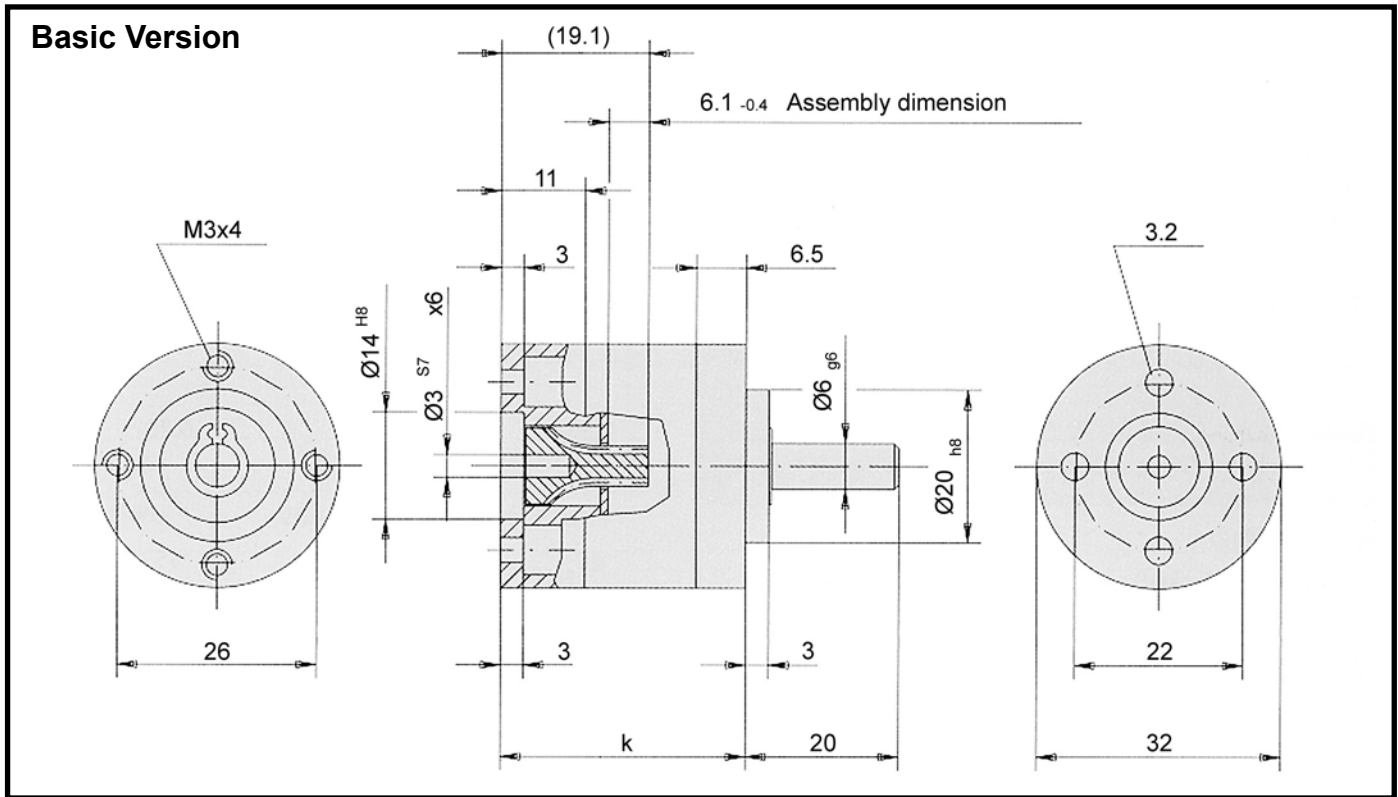


### 32 mm Technical Data

Parameter	Units	1-Stage	2-Stage	3-Stage
Max Input Speed	rpm	5000	5000	5000
Efficiency	%	80	75	70
Approx. Backlash (no-load, input locked)	DMS°	1.5	2.0	2.5
Radial Load	N	40	70	100
Axial Load	N	10	20	30
Max Permitted Fitting Pressure	N	120	120	120
Weight	g	160	210	260
Dimension (diameter x length)	mm	32 x 52	32 x 61.5	32 x 71
Lubrication	Grease (life-time lubrication)			
Installation Attitude	Any			
Operating Temperature	-15 to +80° C			
Direction of Rotation	Same for input and output shaft			

# Gearheads

## Package Dimensions

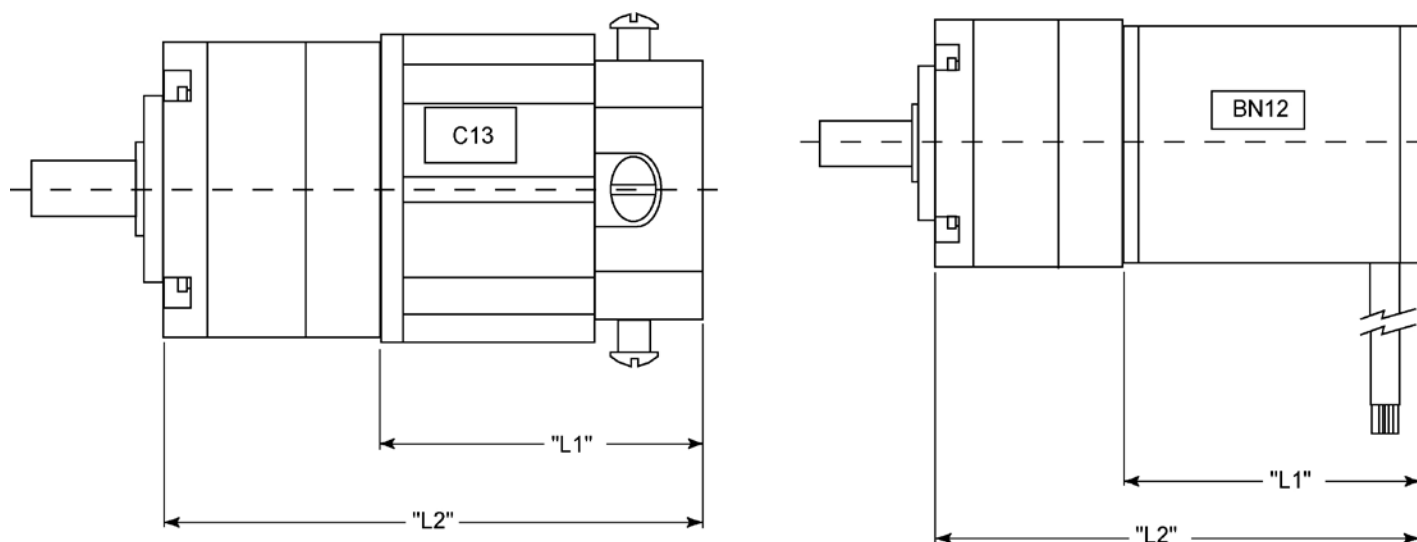


Gear Unit Length			1-Stage	2-Stage	3-Stage	4-Stage
K			32	41.5	51	60.5

We reserve the right to make technical changes.

**Note:** All dimension on this page are in millimeters.

## 32 mm Dimensional Drawings



### Motor + Gearhead Dimensions\*

	L1 Max	L2 Max (1-Stage)	L2 Max (2-Stage)	L2 Max (3-Stage)
C13-L19	1.90 in (48.3 mm)	3.160 in (80.3 mm)	3.534 in (89.8 mm)	3.908 in (99.3 mm)
C13-L25	2.45 in (62.2 mm)	3.710 in (94.2 mm)	4.084 in (103.7 mm)	4.458 in (113.2 mm)
C13-L28	2.78 in (70.6 mm)	4.040 in (102.6 mm)	4.414 in (112.1 mm)	4.788 in (121.6 mm)
BN12-13	1.30 in (33.02 mm)	3.193 in (81.1 mm)	3.567 in (90.6 mm)	3.941 in (100.1 mm)
BN12-18	1.80 in (45.72 mm)	3.693 in (93.8 mm)	4.067 in (103.3 mm)	4.441 in (112.8 mm)
BN12-23	2.30 in (58.42 mm)	4.193 in (106.5 mm)	4.567 in (116 mm)	4.941 in (125.5 mm)
BN12-28	2.80 in (71.12 mm)	4.693 in (119.2 mm)	5.067 in (128.7 mm)	5.441 in (138.2 mm)

\*All dimensions are reference dimensions

### Ordering Information - Examples

32-46:1 – 32 mm gearhead, 46:1 ratio  
 32-308:1 – 32 mm gearhead, 308:1 ratio



## 52 MM (2.05 INCH) DIAMETER SPECIFICATIONS

Available Ratios	# of Stages	Output Torque	Shaft Inertia (gcm <sup>2</sup> )
4:1 (3.70:1)	One	4.0 Nm (2.95 ft - lbs)	16.57
7:1 (6.75:1)	One	4.0 Nm (2.95 ft - lbs)	9.52
14:1 (13.73:1)	Two	12.0 Nm (8.85 ft - lbs)	16.49
25:1 (25.01:1)	Two	12.0 Nm (8.85 ft - lbs)	9.33
46:1 (45.56:1)	Two	12.0 Nm (8.85 ft - lbs)	9.21
51:1 (50.89:1)	Three	25.0 Nm (18.4 ft - lbs)	16.49
93:1 (92.70:1)	Three	25.0 Nm (18.4 ft - lbs)	9.32
169:1 (168.84:1)	Three	25.0 Nm (18.4 ft - lbs)	9.21
308:1 (307.54:1)	Three	25.0 Nm (18.4 ft - lbs)	9.21

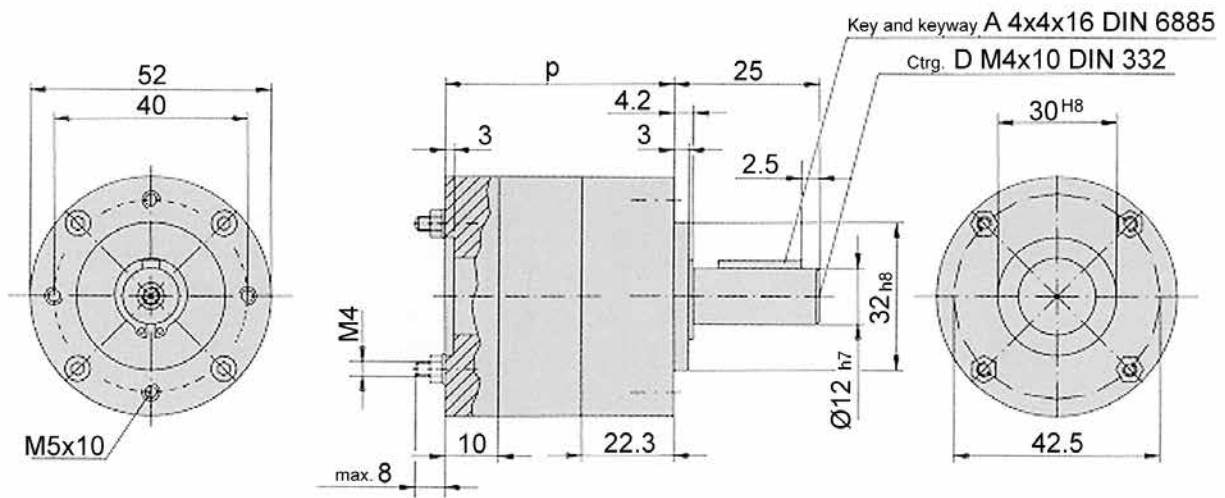


### 52 mm Technical Data

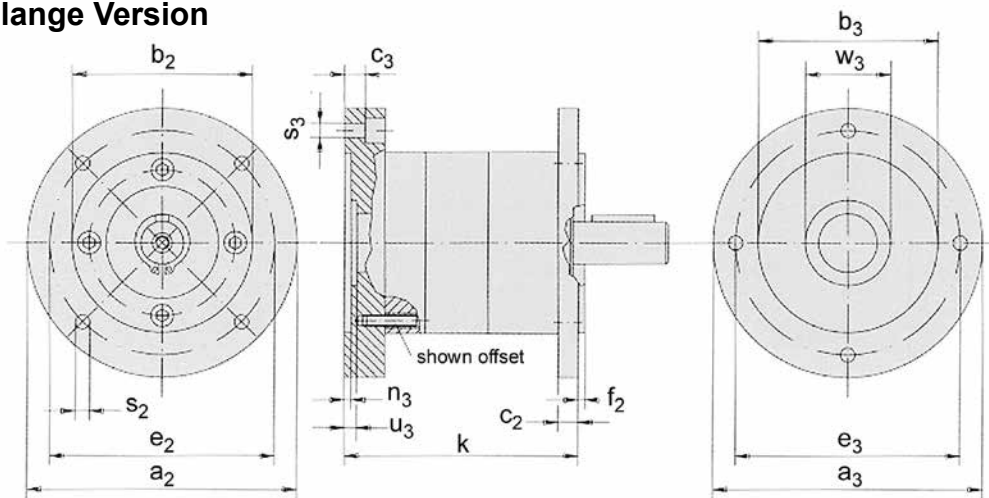
Parameter	Units	1-Stage	2-Stage	3-Stage
Max Input Speed	rpm	5000	5000	5000
Efficiency	%	80	75	70
Approx. Backlash(no-load, input locked)	Minutes	45	45	45
Radial Load	N	200	320	450
Axial Load	N	60	100	150
Max Permitted Fitting Pressure	N	500	500	500
Weight	kg	0.7	0.9	1.1
Dimension (diameter x length)	mm	52 x 81	52 x 95	52 x 109
Lubrication	Grease (life-time lubrication)			
Installation Attitude	Any			
Operating Temperature	-15 to +80° C			
Direction of Rotation	Same for input and output shaft			

## Package Dimensions

### Basic Version



### Standard Flange Version



Gear Unit Length				1-Stage	2-Stage	3-Stage
P				56	70	84
K				83	97	111

DIM of Motor Mounting Flange		a <sub>3</sub>	b <sub>3</sub>	u <sub>3</sub>	c <sub>3</sub>	e <sub>3</sub>	n <sub>3</sub>	w <sub>3</sub>	s <sub>3</sub>
Motor size 56 (B14, B3/B14)	C 80	80	50 H7	38 H7	10.2	65	3	5.5	5.5
	C 105	105	70 H7	-	10.2	85	3	-	6.5

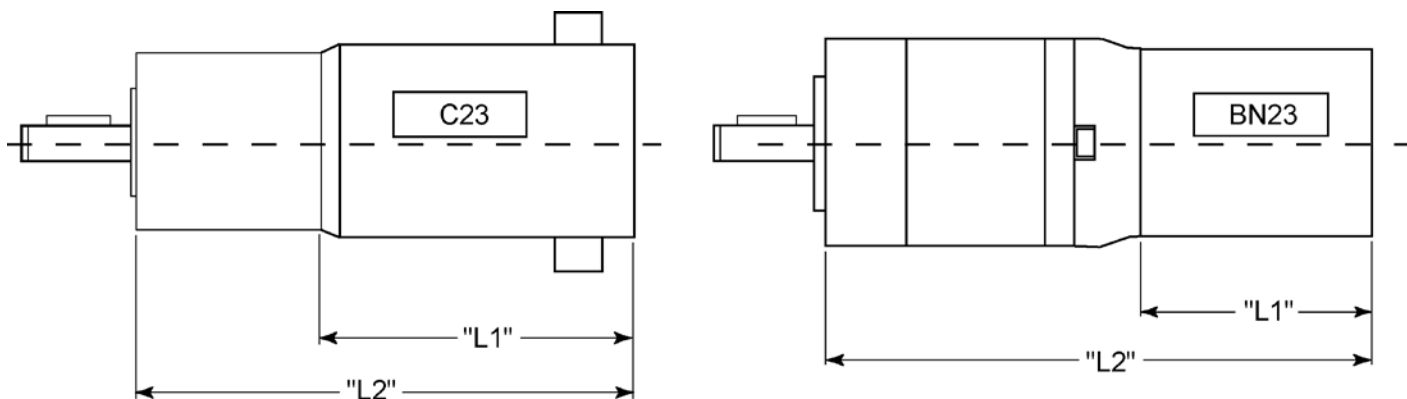
DIM of Gear Unit Output Flan		a <sub>2</sub>	b <sub>2</sub>	c <sub>2</sub>	e <sub>2</sub>	f <sub>2</sub>	s <sub>2</sub>
C 80		80	50 j7	9	65	2.5	5.5
C 90		90	60 j7	9	75	2.5	5.5
C 105		105	70 j7	9	85	2.5	6.5
C 120		120	80 j7	9	100	3.0	6.5

We reserve the right to make technical changes.

**Note:** All dimension on this page are in millimeters.

# Gearheads

## 52 mm Dimensional Drawings



## Motor + Gearhead Dimensions\*

Unit Type	L1 Max	L2 Max (1-Stage)	L2 Max (2-Stage)	L2 Max (3-Stage)
C23-L33	3.30 in (83.8 mm)	5.986 in (152 mm)	6.538 in (166 mm)	7.089 in (180 mm)
C23-L40	4.00 in (101.6 mm)	6.686 in (169.8 mm)	7.238 in (183.8 mm)	*7.789 in (197.8 mm)
C23-L45	4.50 in (114.3 mm)	7.186 in (182.5 mm)	7.738 in (196.5 mm)	8.289 in (210.5 mm)
C23-L50	5.00 in (127 mm)	7.686 in (195.2 mm)	8.238 in (209.2 mm)	8.789 in (223.2 mm)
C23-L55	5.50 in (139.7 mm)	8.186 in (207.9 mm)	8.738 in (222 mm)	9.289 in (236 mm)
BN23-13	1.41 in (35.8 mm)	4.484 in (113.9 mm)	5.044 in (128.1 mm)	5.594 in (142 mm)
BN23-18	1.91 in (48.5 mm)	4.984 in (126.6 mm)	5.544 in (140.8 mm)	6.094 in (154.8 mm)
BN23-23	2.41 in (61.2 mm)	5.484 in (139.3 mm)	6.044 in (153.5 mm)	6.594 in (167.5 mm)
BN23-28	2.91 in (73.9 mm)	5.984 in (152 mm)	6.544 in (166.2 mm)	7.454 in (189.3 mm)

\*All dimensions are reference dimensions

## Ordering Information - Examples

52-46:1 – 52 mm gearhead, 46:1 ratio  
 52-308:1 – 52 mm gearhead, 308:1 ratio

## 62 MM (2.44 INCH) DIAMETER SPECIFICATIONS

Available Ratios	# of Stages	Output Torque	Shaft Inertia (gcm <sup>2</sup> )
4:1 (3.70:1)	One	8.0 Nm (5.90 ft - lbs)	0.037
4:1 (4.28:1)	One	8.0 Nm (5.90 ft - lbs)	0.029
5:1 (5.18:1)	One	8.0 Nm (5.90 ft - lbs)	0.023
7:1 (6.75:1)	One	8.0 Nm (5.90 ft - lbs)	0.017
14:1 (13.73:1)	Two	25.0 Nm (18.44 ft - lbs)	0.035
16:1 (15.88:1)	Two	25.0 Nm (18.44 ft - lbs)	0.028
18:1 (18.36:1)	Two	25.0 Nm (18.44 ft - lbs)	0.028
19:1 (19.20:1)	Two	25.0 Nm (18.44 ft - lbs)	0.022
22:1 (22.20:1)	Two	25.0 Nm (18.44 ft - lbs)	0.022
25:1 (25.01:1)	Two	25.0 Nm (18.44 ft - lbs)	0.017
27:1 (26.85:1)	Two	25.0 Nm (18.44 ft - lbs)	0.022
29:1 (28.93:1)	Two	25.0 Nm (18.44 ft - lbs)	0.017
35:1 (34.97:1)	Two	25.0 Nm (18.44 ft - lbs)	0.017
46:1 (45.56:1)	Two	25.0 Nm (18.44 ft - lbs)	0.017
51:1 (50.89:1)	Three	50.0 Nm (36.88 ft - lbs)	0.035
59:1 (58.85:1)	Three	50.0 Nm (36.88 ft - lbs)	0.028
68:1 (68.06:1)	Three	50.0 Nm (36.88 ft - lbs)	0.028
71:1 (71.16:1)	Three	50.0 Nm (36.88 ft - lbs)	0.021
79:1 (78.71:1)	Three	50.0 Nm (36.88 ft - lbs)	0.028
93:1 (92.70:1)	Three	50.0 Nm (36.88 ft - lbs)	0.016
95:1 (95.17:1)	Three	50.0 Nm (36.88 ft - lbs)	0.022
100:1 (99.50:1)	Three	50.0 Nm (36.88 ft - lbs)	0.022
107:1 (107.20:1)	Three	50.0 Nm (36.88 ft - lbs)	0.017
115:1 (115.07:1)	Three	50.0 Nm (36.88 ft - lbs)	0.022
124:1 (123.97:1)	Three	50.0 Nm (36.88 ft - lbs)	0.017
130:1 (129.62:1)	Three	50.0 Nm (36.88 ft - lbs)	0.017
139:1 (139.13:1)	Three	50.0 Nm (36.88 ft - lbs)	0.022
150:1 (149.90:1)	Three	50.0 Nm (36.88 ft - lbs)	0.017
169:1 (168.84:1)	Three	50.0 Nm (36.88 ft - lbs)	0.017
181:1 (181.24:1)	Three	50.0 Nm (36.88 ft - lbs)	0.017
195:1 (195.26:1)	Three	50.0 Nm (36.88 ft - lbs)	0.017
236:1 (236.09:1)	Three	50.0 Nm (36.88 ft - lbs)	0.017
308:1 (307.54:1)	Three	50.0 Nm (36.88 ft - lbs)	0.017

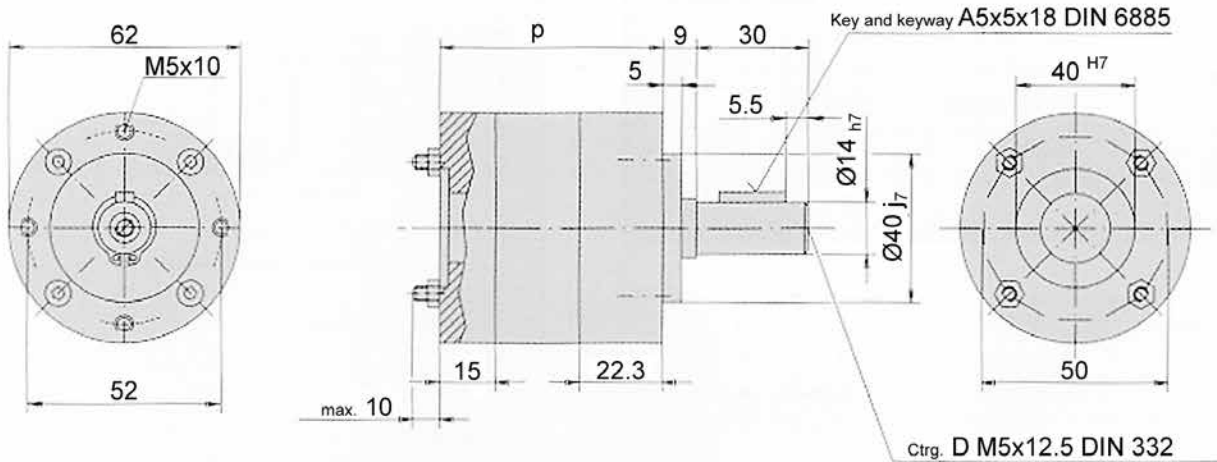


### 62 mm Technical Data

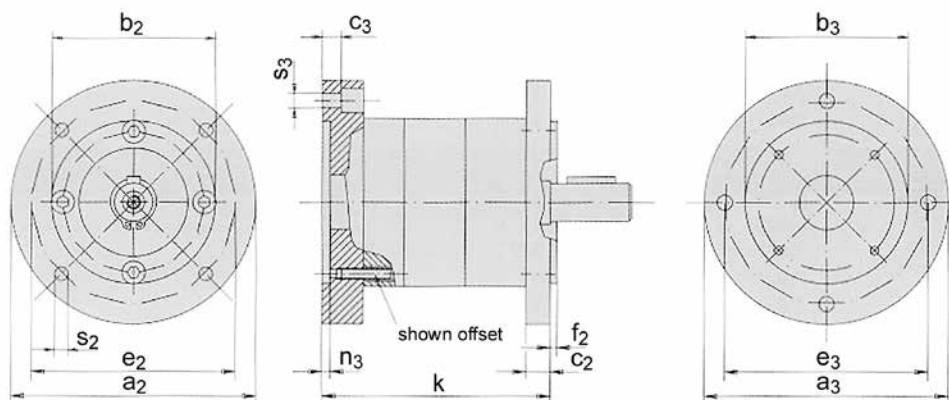
Parameter	Units	1-Stage	2-Stage	3-Stage
Max Input Speed	rpm	5000	5000	5000
Efficiency	%	80	75	70
Approx. Backlash (no-load, input locked)	DMS°	1.0	1.5	2.0
Radial Load	N	240	360	520
Axial Load	N	50	70	120
Max Permitted Fitting Pressure	N	1000	1000	1000
Weight	kg	0.8	1.2	1.6
Dimension (diameter x length)	mm	62 x 102	62 x 118	62 x 134
Lubrication	Grease (life-time lubrication)			
Installation Attitude	Any			
Operating Temperature	-15 to +80° C			
Direction of Rotation	Same for input and output shaft			

## Package Dimensions

### Basic Version



### Standard Flange Version



Gear Unit Length				1-Stage	2-Stage	3-Stage
P				63	77	93
K				84	100	116

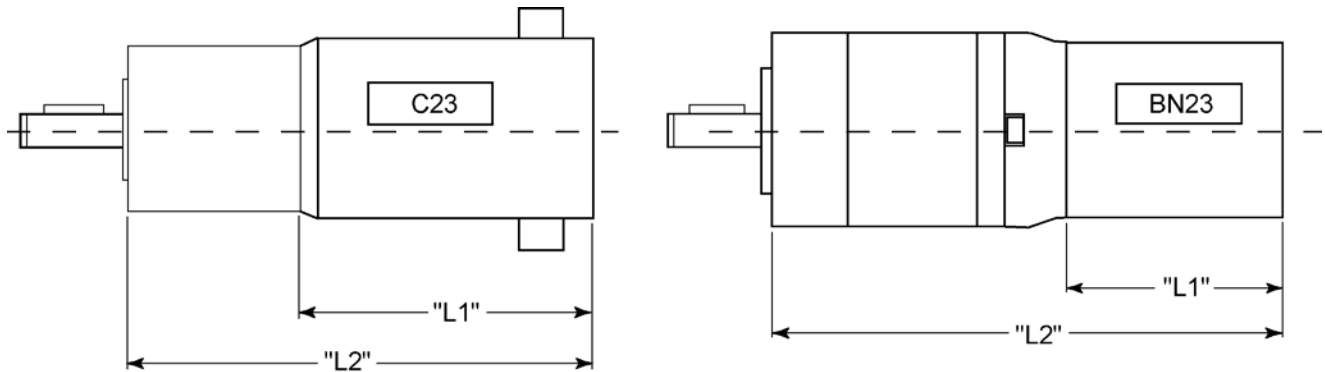
DIM of Motor Mounting Flange		a <sub>3</sub>	b <sub>3</sub>	c <sub>3</sub>	e <sub>3</sub>	n <sub>3</sub>	s <sub>3</sub>
Motor size 56 (B14, B3/B14)	C 80	80	50 H7	7	65	3	5.5
	C 105	105	70 H7	7	85	3	6.5
Motor size 63 (B14, B3/B14)	C 90	90	60 H7	7	75	3	5.5
	C 120	120	80 H7	7	100	3.5	6.5

DIM of Gear Unit Output Flange		a <sub>2</sub>	b <sub>2</sub>	c <sub>2</sub>	e <sub>2</sub>	f <sub>2</sub>	s <sub>2</sub>
C 80		80	50 J7	9	65	2.5	M5
C 90		90	60 J7	9	75	2.5	5.5
C 105		105	70 J7	9	85	2.5	6.5
C 120		120	80 J7	9	100	3.0	6.5

We reserve the right to make technical changes.

**Note:** All dimension on this page are in millimeters.

## 62 mm Dimensional Drawings



### Motor + Gearhead Dimensions\*

Unit Type	L1 Max	L2 Max (1-Stage)	L2 Max (2-Stage)	L2 Max (3-Stage)
C23-L33	3.30 in (83.8 mm)	5.986 in (152 mm)	6.538 in (166 mm)	7.089 in (180 mm)
C23-L40	4.00 in (101.6 mm)	6.686 in (169.8 mm)	7.238 in (183.8 mm)	7.789 in (197.8 mm)
C23-L45	4.50 in (114.3 mm)	7.186 in (182.5 mm)	7.738 in (196.5 mm)	8.289 in (210.5 mm)
C23-L50	5.00 in (127 mm)	7.686 in (195.2 mm)	8.238 in (209.2 mm)	8.789 in (223.2 mm)
C23-L55	5.50 in (139.7 mm)	8.186 in (207.9 mm)	8.738 in (222 mm)	9.289 in (236 mm)
BN23-13	1.41 in (35.8 mm)	4.865 in (123.6 mm)	5.415 in (137.5 mm)	6.045 in (153.5 mm)
BN23-18	1.91 in (48.5 mm)	5.365 in (136.3 mm)	5.915 in (150.2 mm)	6.545 in (166.2 mm)
BN23-23	2.41 in (61.2 mm)	5.865 in (149.9 mm)	6.415 in (162.9 mm)	7.045 in (178.9 mm)
BN23-28	2.91 in (73.9 mm)	6.365 in (161.7 mm)	6.915 in (175.6 mm)	7.545 in (191.6 mm)

\*All dimensions are reference dimensions

### Ordering Information - Examples

62-46:1 – 62 mm gearhead, 46:1 ratio  
 62-308:1 – 62 mm gearhead, 308:1 ratio

## 81 MM (3.19 INCH) DIAMETER SPECIFICATIONS

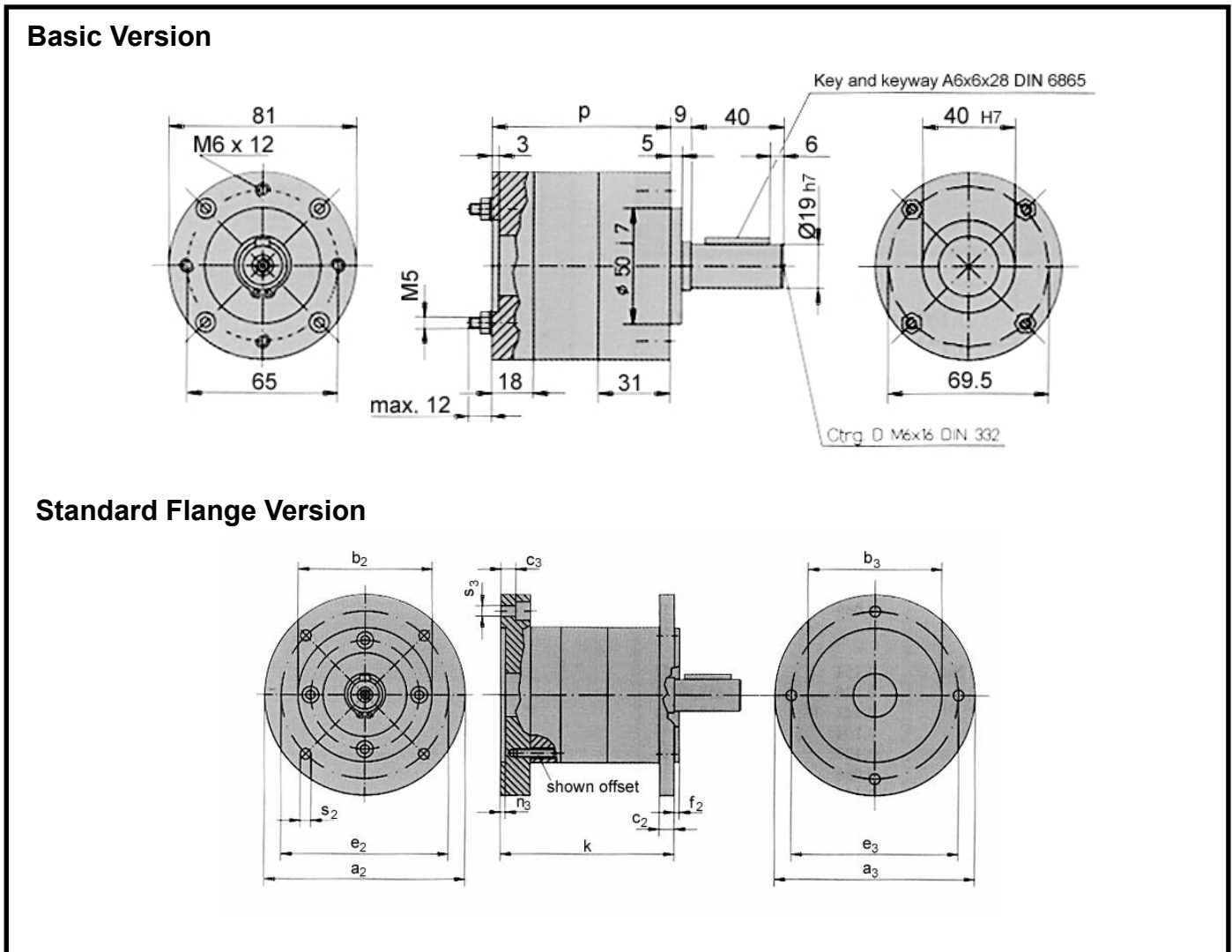
Available Ratios	# of Stages	Output Torque	Shaft Inertia (gcm <sup>2</sup> )
4:1 (3.70:1)	One	20.0 Nm (14.75 ft - lbs)	0.165
4:1 (4.28:1)	One	20.0 Nm (14.75 ft - lbs)	0.134
5:1 (5.18:1)	One	20.0 Nm (14.75 ft - lbs)	0.109
7:1 (6.75:1)	One	20.0 Nm (14.75 ft - lbs)	0.091
14:1 (13.73:1)	Two	60.0 Nm (44.25 ft - lbs)	0.155
16:1 (15.88:1)	Two	60.0 Nm (44.25 ft - lbs)	0.127
18:1 (18.36:1)	Two	60.0 Nm (44.25 ft - lbs)	0.129
19:1 (19.20:1)	Two	60.0 Nm (44.25 ft - lbs)	0.100
22:1 (22.20:1)	Two	60.0 Nm (44.25 ft - lbs)	0.105
25:1 (25.01:1)	Two	60.0 Nm (44.25 ft - lbs)	0.125
27:1 (26.85:1)	Two	60.0 Nm (44.25 ft - lbs)	0.105
29:1 (28.93:1)	Two	60.0 Nm (44.25 ft - lbs)	0.088
35:1 (34.97:1)	Two	60.0 Nm (44.25 ft - lbs)	0.089
46:1 (45.56:1)	Two	60.0 Nm (18.44 ft - lbs)	0.089
51:1 (50.89:1)	Three	120.0 Nm (88.50 ft - lbs)	0.154
59:1 (58.85:1)	Three	120.0 Nm (88.50 ft - lbs)	0.126
68:1 (68.06:1)	Three	120.0 Nm (88.50 ft - lbs)	0.127
71:1 (71.16:1)	Three	120.0 Nm (88.50 ft - lbs)	0.104
79:1 (78.71:1)	Three	120.0 Nm (88.50 ft - lbs)	0.127
93:1 (92.70:1)	Three	120.0 Nm (88.50 ft - lbs)	0.088
95:1 (95.17:1)	Three	120.0 Nm (88.50 ft - lbs)	0.104
100:1 (99.50:1)	Three	120.0 Nm (88.50 ft - lbs)	0.105
107:1 (107.20:1)	Three	120.0 Nm (88.50 ft - lbs)	0.088
115:1 (115.07:1)	Three	120.0 Nm (88.50 ft - lbs)	0.105
124:1 (123.97:1)	Three	120.0 Nm (88.50 ft - lbs)	0.088
130:1 (129.62:1)	Three	120.0 Nm (88.50 ft - lbs)	0.088
139:1 (139.13:1)	Three	120.0 Nm (88.50 ft - lbs)	0.102
150:1 (149.90:1)	Three	120.0 Nm (88.50 ft - lbs)	0.088
169:1 (168.84:1)	Three	120.0 Nm (88.50 ft - lbs)	0.089
181:1 (181.24:1)	Three	120.0 Nm (88.50 ft - lbs)	0.088
195:1 (195.26:1)	Three	120.0 Nm (88.50 ft - lbs)	0.089
236:1 (236.09:1)	Three	120.0 Nm (88.50 ft - lbs)	0.089
308:1 (307.54:1)	Three	120.0 Nm (88.50 ft - lbs)	0.089



### 81 mm Technical Data

Parameter	Units	1-Stage	2-Stage	3-Stage
Max Input Speed	rpm	5000	5000	5000
Efficiency	%	80	75	70
Approx. Backlash (no-load, input locked)	DMS°	1.0	1.5	2.0
Radial Load	N	400	600	1000
Axial Load	N	80	120	200
Max Permitted Fitting Pressure	N	1500	1500	1500
Weight	kg	1.8	2.5	3.2
Dimension (diameter x length)	mm	81 x 126	81 x 148	81 x 170
Lubrication	Grease (life-time lubrication)			
Installation Attitude	Any			
Operating Temperature	-15 to +80° C			
Direction of Rotation	Same for input and output shaft			

## Package Dimensions



Gear Unit Length P81 / SP81		1-Stage	2-Stage	3-Stage
P		77	99	121
K		104	125	147

DIM of Motor Mounting Flange		$a_3$	$b_3$	$c_3$	$e_3$	$n_3$	$s_3$
Motor size 56 (B14, B3/B14)	C 80	81	50 H7	9	65	3.0	5.3
	C 105	105	70 H7	9	85	3.0	6.3
Motor size 63 (B14, B3/B14)	C 90	90	60 H7	9	75	3.0	5.3
	C 120	120	80 H7	9	100	3.5	6.3

DIM of Gear Unit Output Flange		$a_2$	$b_2$	$c_2$	$e_2$	$f_2$	$s_2$
C 90		90	60 J7	9	75	2.5	M5
C 105		105	70 J7	9	85	2.5	M6
C 120		120	80 J7	9	100	3.0	6.5

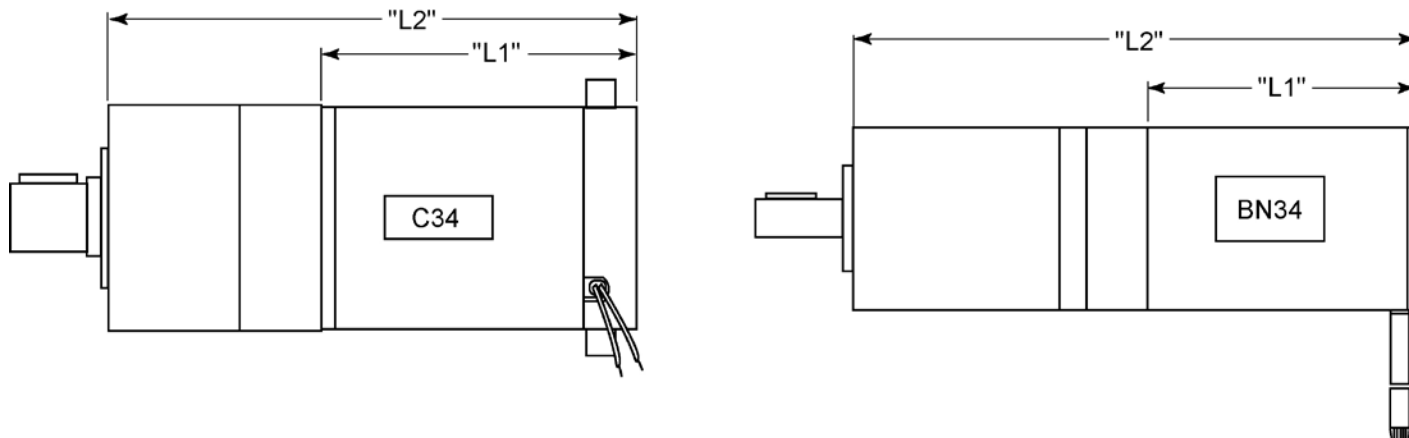
We reserve the right to make technical changes.

**Note:** All dimension on this page are in millimeters.



# Gearheads

## 81 mm Dimensional Drawings



## Motor + Gearhead Dimensions\*

Unit Type	L1 Max	L2 Max (1-Stage)	L2 Max (2-Stage)	L2 Max (3-Stage)
C34-L60	6.00 in (152.4 mm)	9.781 in (248.4 mm)	10.647 in (270.4 mm)	11.514 in (292.5 mm)
C34-L70	7.00 in (177.8 mm)	10.781 in (273.8 mm)	11.647 in (295.8 mm)	12.514 in (317.9 mm)
C34-L80	8.00 in (203.2 mm)	11.781 in (299.2 mm)	12.647 in (321.2 mm)	13.514 in (343.3 mm)
BN34-25	2.50 in (63.5 mm)	6.281 in (159.5 mm)	7.147 in (181.5 mm)	8.014 in (203.6 mm)
BN34-35	3.50 in (88.9 mm)	7.281 in (184.9 mm)	8.147 in (213.8 mm)	9.014 in (229 mm)
BN34-45	4.50 in (114.3 mm)	8.281 in (210.3 mm)	9.147 in (232.3 mm)	10.014 in (254.4 mm)
BN34-55	5.50 in (139.7 mm)	9.281 in (235.7 mm)	10.147 in (257.7mm)	11.014 in (279.8 mm)

\*All dimensions are reference dimensions

## Ordering Information - Examples

81-46:1 – 81 mm gearhead, 46:1 ratio  
 81-308:1 – 81 mm gearhead, 308:1 ratio

## 120 MM (4.72 INCH) DIAMETER SPECIFICATIONS

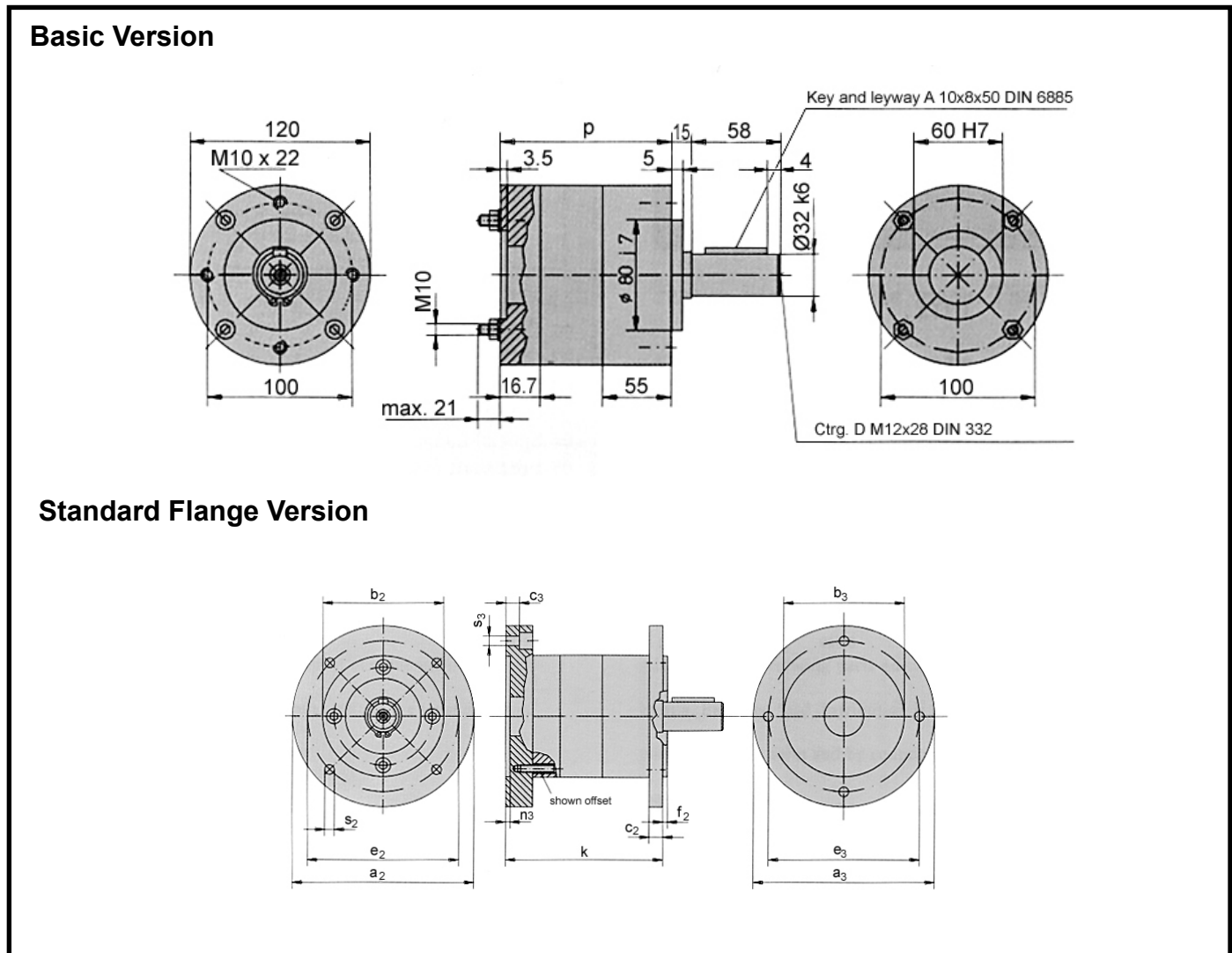
Available Ratios	# of Stages	Output Torque	Shaft Inertia (gcm <sup>2</sup> )
4:1 (3.70:1)	One	50.0 Nm (36.88 ft - lbs)	1.112
7:1 (6.75:1)	One	50.0 Nm (36.88 ft - lbs)	0.557
14:1 (13.73:1)	Two	150.0 Nm (110.6 ft - lbs)	0.997
25:1 (25.01:1)	Two	150.0 Nm (110.6 ft - lbs)	0.515
46:1 (45.56:1)	Two	150.0 Nm (110.6 ft - lbs)	0.520
51:1 (50.89:1)	Three	300.0 Nm (221.3 ft - lbs)	0.967
93:1 (92.70:1)	Three	300.0 Nm (221.3 ft - lbs)	0.513
169:1 (168.84:1)	Three	300.0 Nm (221.3 ft - lbs)	0.519
308:1 (307.54:1)	Three	300.0 Nm (221.3 ft - lbs)	0.519



### 120 mm Technical Data

Parameter	Units	1-Stage	2-Stage	3-Stage
Max Input Speed	rpm	5000	5000	5000
Efficiency	%	80	75	70
Approx. Backlash (no-load, input locked)	DMS°	1.0	1.5	2.0
Radial Load	N	600	900	1500
Axial Load	N	120	180	300
Max Permitted Fitting Pressure	N	2500	2500	2500
Weight	kg	5.6	8.0	10.4
Dimension (diameter x length)	mm	120 x 180	120 x 214	120 x 248
Lubrication	Grease (life-time lubrication)			
Installation Attitude	Any			
Operating Temperature	-15 to +80° C			
Direction of Rotation	Same for input and output shaft			

## Package Dimensions



Gear Unit Length		1-Stage	2-Stage	3-Stage
P		107	141	175
Motor size 71	K	150	184	218
Motor size 80	K	160	194	228

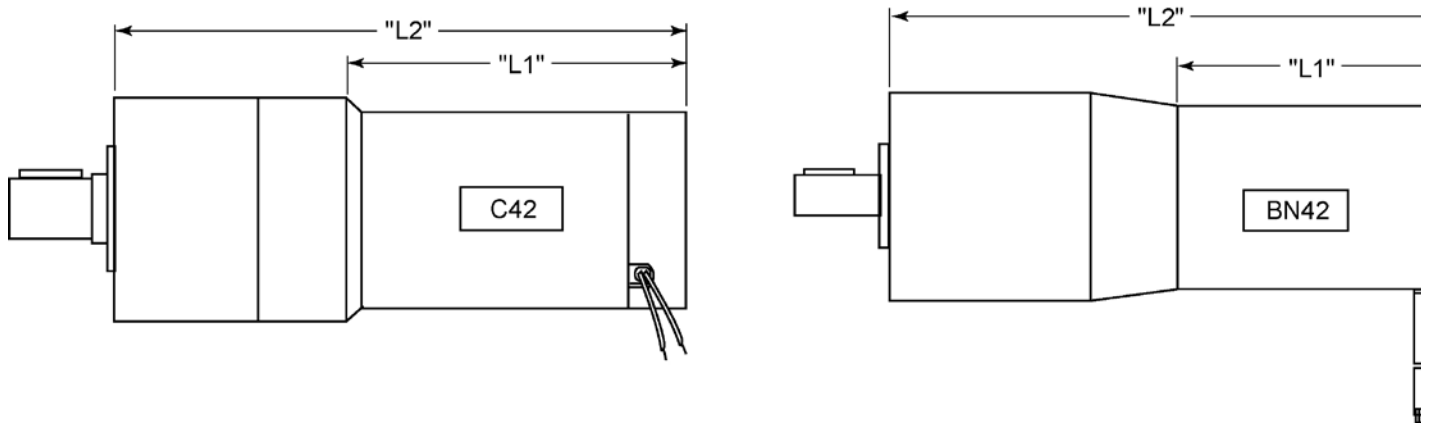
DIM of Motor Mounting Flange		a <sub>3</sub>	b <sub>3</sub>	c <sub>3</sub>	e <sub>3</sub>	n <sub>3</sub>	s <sub>3</sub>
Motor size 71 (B14, B3/B14)	C 105	120	70 H7	15	85	3.0	6.4
	C 140	140	95 H7	15	115	3.5	8.4
Motor size 80 (B14, B3/B14)	C 120	120	80 H7	15	100	3.5	6.4
	C 160	160	110 H7	15	130	4.0	8.4

DIM of Gear Unit Output Flange		a <sub>2</sub>	b <sub>2</sub>	c <sub>2</sub>	e <sub>2</sub>	f <sub>2</sub>	s <sub>2</sub>
C 140		140	95 J7	15	115	3.0	M8
C 160		160	110 J7	15	130	3.5	M8

We reserve the right to make technical changes.

**Note:** All dimension on this page are in millimeters.

## 120 mm Dimensional Drawings



### Motor + Gearhead Dimensions\*

Unit Type	L1 Max	L2 Max (1-Stage)	L2 Max (2-Stage)	L2 Max (3-Stage)
C42-L50	5.00 in (127 mm)	10.213 in (259.4 mm)	11.551 in (293.4 mm)	12.890 in (327.4 mm)
C42-L70	7.00 in (177.8 mm)	12.213 in (310.2 mm)	13.551 in (344.2 mm)	14.890 in (378.2 mm)
C42-L90	9.00 in (228.6 mm)	14.213 in (361 mm)	15.551 in (395 mm)	16.890 in (429 mm)
BN42-23	2.30 in (63.5 mm)	7.513 in (190.8 mm)	8.851 in (224.8 mm)	10.190 in (258.8 mm)
BN42-33	3.30 in (88.9 mm)	8.513 in (216.2 mm)	9.851 in (250.2 mm)	11.190 in (284.2 mm)
BN42-43	4.30 in (114.3 mm)	9.513 in (241.6 mm)	10.851 in (275.6 mm)	12.190 in (309.6 mm)
BN42-53	5.30 in (134.6 mm)	10.513 in (267 mm)	11.851 in (301 mm)	13.190 in (335 mm)

\*All dimensions are reference dimensions

### Ordering Information - Examples

120-46:1 – 120 mm gearhead, 46:1 ratio  
 120-308:1 – 120 mm gearhead, 308:1 ratio