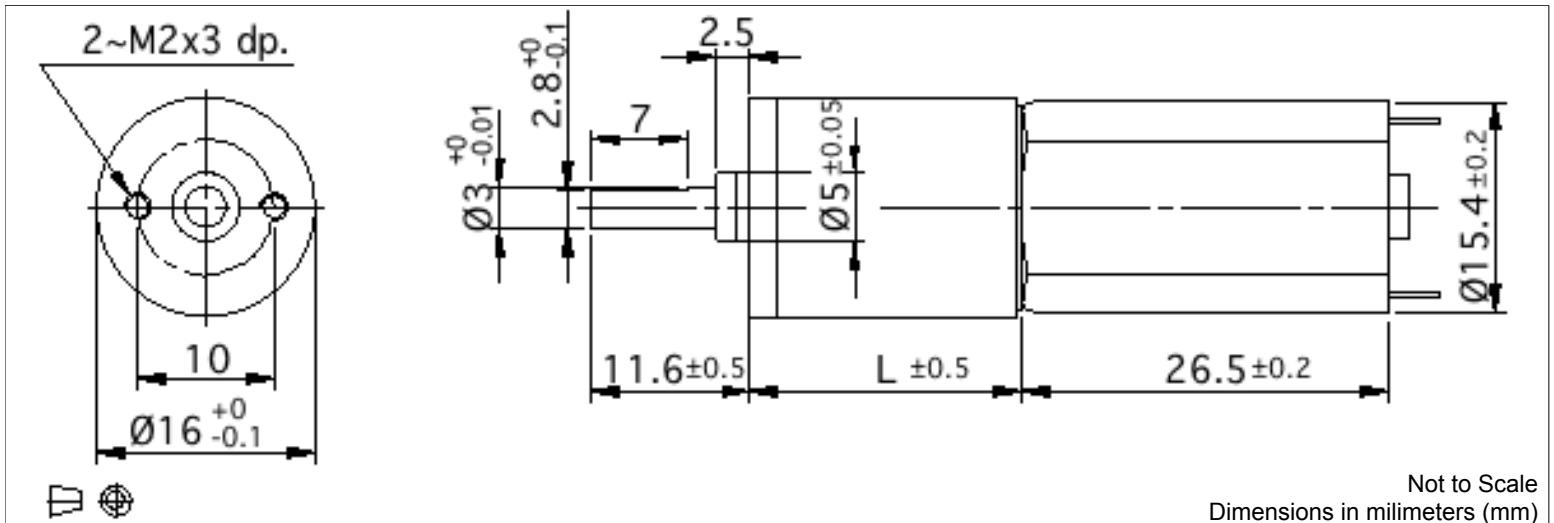


Planetary Gearmotor - 16 mm Ø



A16 •••• AS00

Global Motion Products



Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
4:1	3 Volts	80 %	2,038 rpm	0.100 Amp	0.01 Nm		15.1 mm	37.0 grams	Same	A160004GM00
14:1	3 Volts	70 %	582 rpm	0.100 Amp	0.03 Nm		18.7 mm	41.0 grams	Same	A160014GM00
19:1	3 Volts	70 %	429 rpm	0.100 Amp	0.05 Nm		18.7 mm	41.0 grams	Same	A160019GM00
29:1	3 Volts	60 %	281 rpm	0.100 Amp	0.06 Nm		22.4 mm	45.0 grams	Same	A160029GM00
62:1	3 Volts	60 %	132 rpm	0.100 Amp	0.13 Nm		22.4 mm	45.0 grams	Same	A160062GM00
72:1	3 Volts	60 %	113 rpm	0.100 Amp	0.15 Nm		22.4 mm	45.0 grams	Same	A160072GM00
84:1	3 Volts	60 %	97 rpm	0.100 Amp	0.18 Nm		22.4 mm	45.0 grams	Same	A160084GM00
104:1	3 Volts	60 %	78 rpm	0.100 Amp	0.22 Nm		22.4 mm	45.0 grams	Same	A160104GM00
128:1	3 Volts	60 %	64 rpm	0.100 Amp	0.27 Nm		22.4 mm	45.0 grams	Same	A160128GM00
157:1	3 Volts	60 %	52 rpm	0.100 Amp	0.33 Nm		22.4 mm	45.0 grams	Same	A160157GM00
231:1	3 Volts	50 %	35 rpm	0.100 Amp	0.41 Nm		26.0 mm	49.0 grams	Same	A160231GM00
316:1	3 Volts	50 %	26 rpm	0.100 Amp	0.56 Nm		26.0 mm	49.0 grams	Same	A160316GM00
370:1	3 Volts	50 %	22 rpm	0.100 Amp	0.66 Nm		26.0 mm	49.0 grams	Same	A160370GM00

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Oper.	60°C
Radial Load Distance	10 mm	Thrust Play	≤ 0.20 mm	Min Temperature Oper.	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Oper.	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Options	Bearing	Sleeve	
CAUTION. Stall Torque is a theoretical calculation- NOT a rating/maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.		Magnetic Encoders. Leads. Connectors. Pinion/Gear Mounting. Lubricants. Motor Windings. Gear material. Shaft modifications and component mounting.			

* Rotational Sense of Gearbox Output Shaft to Motor Shaft

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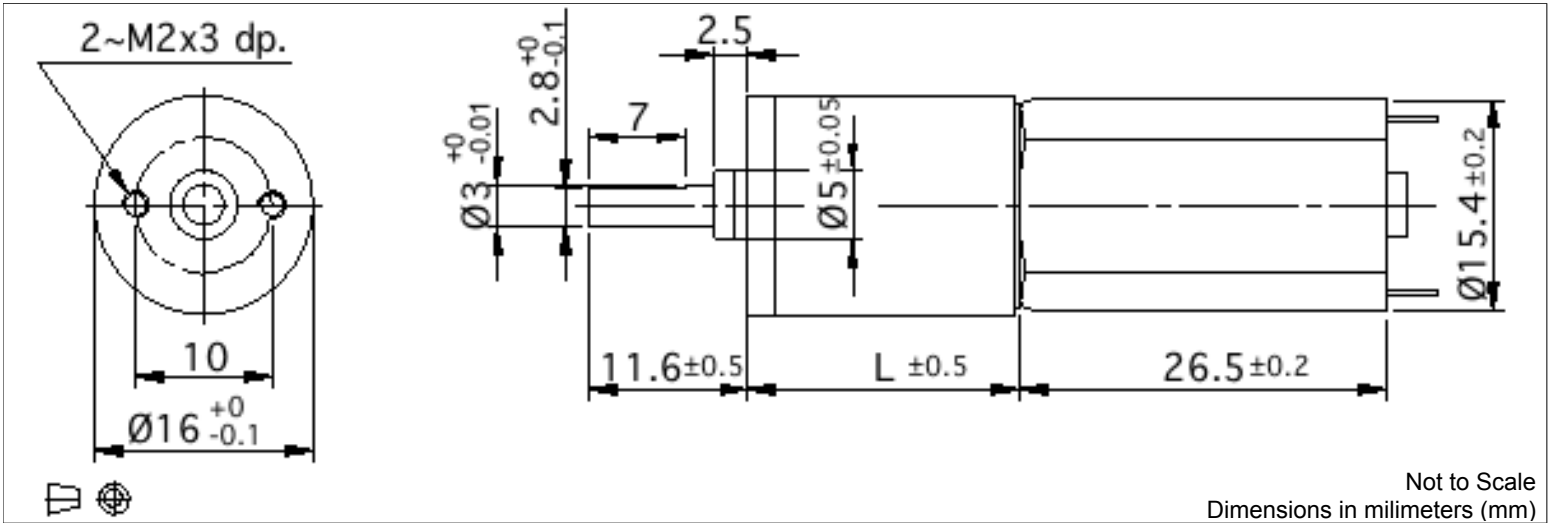
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Planetary Gearmotor - 16 mm Ø



A16 •••• AS00

Global Motion Products



Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
455:1	3 Volts	50 %	18 rpm	0.100 Amp	0.81 Nm		26.0 mm	49.0 grams	Same	A160455GM00
561:1	3 Volts	50 %	15 rpm	0.100 Amp	0.99 Nm		26.0 mm	49.0 grams	Same	A160561GM00
690:1	3 Volts	50 %	12 rpm	0.100 Amp	1.22 Nm		26.0 mm	49.0 grams	Same	A160690GM00
1,014:	3 Volts	40 %	8 rpm	0.100 Amp	1.44 Nm		29.6 mm	53.0 grams	Same	A161014GM00
1,621:	3 Volts	40 %	5 rpm	0.100 Amp	2.30 Nm		29.6 mm	53.0 grams	Same	A161621GM00
1,996:	3 Volts	40 %	4 rpm	0.100 Amp	2.83 Nm		29.6 mm	53.0 grams	Same	A161996GM00
3,027:	3 Volts	40 %	3 rpm	0.100 Amp	4.29 Nm		29.6 mm	53.0 grams	Same	A163027GM00

Radial Load Rating ≤ 4.9 N
 Radial Load Distance 10 mm
 Axial Load ≤ 4.9 N
 Press Fit Force - Max ≤ 14.7 N

Radial Play ≤ 0.05 mm
 Thrust Play ≤ 0.20 mm
 Backlash ≤ 3.0 °

Max Temperature Oper. 60°C
 Min Temperature Oper. -10°C
 Relative Humidity Oper. 20% to 85%

CAUTION. Stall Torque is a theoretical calculation- NOT a rating/maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.

Options
 Magnetic Encoders. Leads. Connectors. Pinion/Gear Mounting. Lubricants. Motor Windings. Gear material. Shaft modifications and component mounting.

* Rotational Sense of Gearbox Output Shaft to Motor Shaft

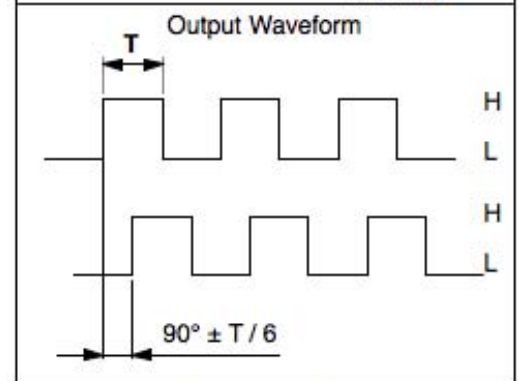
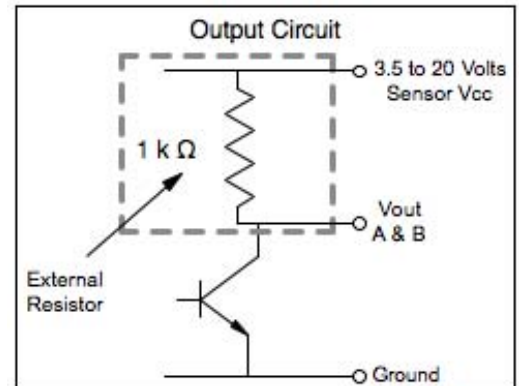
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Low Cost - Single & Quadrature Channels



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Supply Voltage - Max	20.0 Volt
Supply Voltage - Min	3.5 Volt
Supply Voltage - Symbol	Vcc
Output Saturation Voltage - Max	700 mVolts
Output Saturation Voltage - Ref	300 mVolts
Output Saturation Voltage - Symbol	Vce(sat)
Output Saturation Voltage - Test Conditions	Vcc =14 Volts; Ic = 20mA
Output Leakage Current - Max	10.0 µAmp
Output Leakage Current - Ref	< 0.1 µAmp
Output Leakage Current - Symbol	Icex
Output Leakage Current - Test Conditions	Vce =14 Volts; Vcc = 14 V
Supply Current - Max	10 mAmp
Supply Current - Ref	5 mAmp
Supply Current - Symbol	Ice
Supply Current - Test Conditions	Vcc =20 Volts, Output Open
Output Rise Time - Max	1.5 µSec
Output Rise Time - Ref	0.3 µSec
Output Rise Time - Symbol	tr
Output Rise Time - Test Condition	Vce =14 Volts; RI = 820 Ω; CI = 20pF
Output Fall Time - Max	1.5 µSec
Output Fall Time - Ref	0.3 µSec
Output Fall Time - Symbol	tf
Output Fall Time - Test Conditions	Vce =14 Volts; RI = 820 Ω; CI = 20pF
Max Temperature - Operating	60°C
Min Temperature - Operating	-10°C
Relative Humidity - Operating	20% to 85% RH

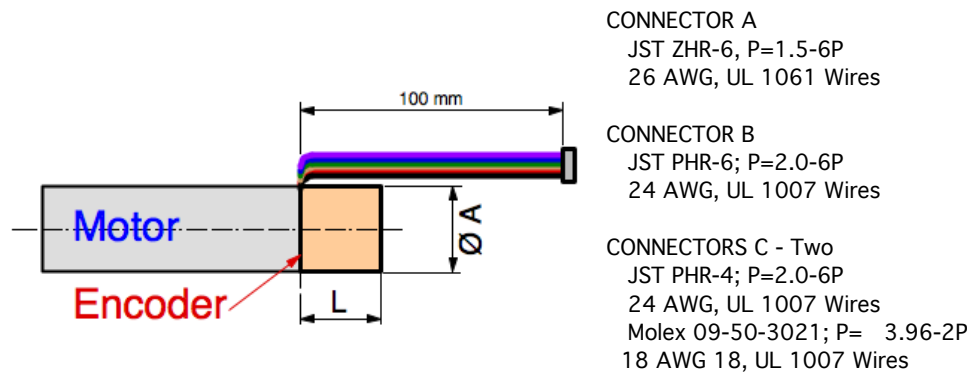


Two Channel Encoder

Connector Pin	Color	Function
1	Black	- Motor
2	Red	+ Motor
3	Brown	Hall Sensor Vcc
4	Green	Hall Sensor Ground
5	Blue	Hall Sensor A Vout
6	Purple	Hall Sensor B Vout

One Channel Encoder

Connector Pin	Color	Function
1	Black	- Motor
2	Red	+ Motor
3	Brown	Hall Sensor Vcc
4	Green	Hall Sensor Ground
5	Blue	Hall Sensor A Vout
6	Purple	No Function



Note:
For encoder resolution and channel options, how to order, diameter and encoder length details refer to the following pages. Resolution options vary by motor diameter, as do connector(s) and wire gauge(s).

Below 30 mm motor diameter the magnetic encoder does not have the option for a dust cap at this time. The encoder is exposed and the dimensions represent the largest dimension of the encoder. On 30 mm and larger diameter motors an OPTIONAL Dust Cap is available. Part Numbers here represent no Dust Cap.

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Pulses per Revolution per Track	Track Number	Dust Cap Option	Cover ØA mm	Cover or Encoder L - mm	Connector Type(s)	Compatible Gearmotor Series	Order Part Number
1	X	No	12.0	6.5	A	A12----GM--	EM120001X00
3	X	No	12.0	6.5	A	A12----GM--	EM120003X00
1	X	No	15.4	6.5	A	A16----AS--	EM160001X00
3	X	No	15.4	6.5	A	A16----AS--	EM160003X00
1	X	No	20.3	8.5	B	S20----AM--; A22----GM--; A22----HM--	EM210001X00
3	X	No	20.3	8.5	B	S20----AM--; A22----GM--; A22----HM--	EM210003X00
1	X	Yes	30.0	12.6	B	A30----GM--	EM300001X00
3	X	Yes	30.0	12.6	B	A30----GM--	EM300003X00
7	X	Yes	30.0	12.6	B	A30----GM--	EM300007X00
7	X	Yes	32.0	14.3	B	A32----GM--	EM320007X00
7	X	Yes	36.0	13.5	B	A36----GM--	EM360007X00
1	X	Yes	42.5	15.5	C	A45----A---	EM430001X00
5	X	Yes	42.5	15.5	C	A45----A---	EM430005X00
1	X	Yes	52.0	18.0	C	A52----GM--	EM520001X00
1	X	Yes	52.0	18.0	C	A52----GM--	EM520001X00
5	X	Yes	54.0	18.0	C	A54----GM--	EM540005X00
5	X	Yes	54.0	18.0	C	A54----GM--	EM540005X00
1	X & Y	No	12.0	6.5	A	A12----GM--	EM120001Y00
3	X & Y	No	12.0	6.5	A	A12----GM--	EM120003Y00
1	X & Y	No	15.4	6.5	A	A16----AS--	EM160001Y00
3	X & Y	No	15.4	6.5	A	A16----AS--	EM160003Y00
1	X & Y	No	20.3	8.5	B	S20----AM--; A22----GM--; A22----HM--	EM210001Y00
3	X & Y	No	20.3	8.5	B	S20----AM--; A22----GM--; A22----HM--	EM210003Y00
1	X & Y	Yes	30.0	12.6	B	A30----GM--	EM300001Y00
3	X & Y	Yes	30.0	12.6	B	A30----GM--	EM300003Y00
7	X & Y	Yes	30.0	12.6	B	A30----GM--	EM300007Y00
7	X & Y	Yes	32.0	14.3	B	A32----GM--	EM320007Y00
7	X & Y	Yes	36.0	13.5	B	A36----GM--	EM360007Y00
1	X & Y	Yes	42.5	15.5	C	A45----A---	EM430001Y00
5	X & Y	Yes	42.5	15.5	C	A45----A---	EM430005Y00
1	X & Y	Yes	52.0	18.0	C	A52----GM--	EM520001Y00
1	X & Y	Yes	52.0	18.0	C	A52----GM--	EM520005Y00
5	X & Y	Yes	54.0	18.0	C	A54----GM--	EM540001Y00
5	X & Y	Yes	54.0	18.0	C	A54----GM--	EM540005Y00

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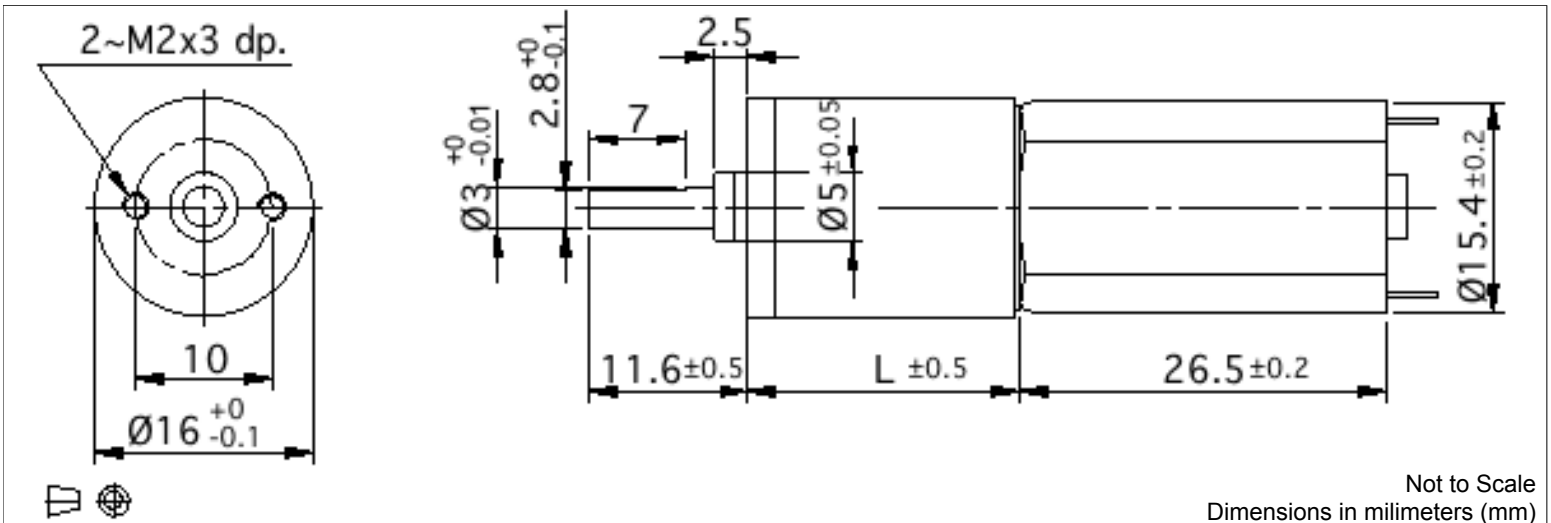
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Planetary Gearmotor - 16 mm Ø



A16 •••• AS10

Global Motion Products



Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
4:1	6 Volts	80 %	2,000 rpm	0.065 Amp	0.01 Nm	0.003 Nm	15.1 mm	37.0 grams	Same	A160004GM10
14:1	6 Volts	70 %	571 rpm	0.065 Amp	0.03 Nm	0.007 Nm	18.7 mm	41.0 grams	Same	A160014GM10
19:1	6 Volts	70 %	421 rpm	0.065 Amp	0.04 Nm	0.009 Nm	18.7 mm	41.0 grams	Same	A160019GM10
29:1	6 Volts	60 %	276 rpm	0.065 Amp	0.05 Nm	0.015 Nm	22.4 mm	45.0 grams	Same	A160029GM10
62:1	6 Volts	60 %	129 rpm	0.065 Amp	0.10 Nm	0.026 Nm	22.4 mm	45.0 grams	Same	A160062GM10
72:1	6 Volts	60 %	111 rpm	0.065 Amp	0.12 Nm	0.031 Nm	22.4 mm	45.0 grams	Same	A160072GM10
84:1	6 Volts	60 %	95 rpm	0.065 Amp	0.14 Nm	0.036 Nm	22.4 mm	45.0 grams	Same	A160084GM10
104:1	6 Volts	60 %	77 rpm	0.065 Amp	0.17 Nm	0.045 Nm	22.4 mm	45.0 grams	Same	A160104GM10
128:1	6 Volts	60 %	62 rpm	0.065 Amp	0.21 Nm	0.055 Nm	22.4 mm	45.0 grams	Same	A160128GM10
157:1	6 Volts	60 %	51 rpm	0.065 Amp	0.26 Nm	0.069 Nm	22.4 mm	45.0 grams	Same	A160157GM10
231:1	6 Volts	50 %	35 rpm	0.065 Amp	0.31 Nm	0.084 Nm	26.0 mm	49.0 grams	Same	A160231GM10
316:1	6 Volts	50 %	25 rpm	0.065 Amp	0.43 Nm	0.114 Nm	26.0 mm	49.0 grams	Same	A160316GM10
370:1	6 Volts	50 %	22 rpm	0.065 Amp	0.50 Nm	0.133 Nm	26.0 mm	49.0 grams	Same	A160370GM10

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Oper.	60°C
Radial Load Distance	10 mm	Thrust Play	≤ 0.20 mm	Min Temperature Oper.	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Oper.	20% to 85%
Press Fit Force - Max	≤ 14.7 N			Options	Bearing Sleeve

CAUTION:
Stall Torque is a theoretical calculation- NOT a rating/ maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.

Magnetic Encoders. Leads. Connectors. Pinion/Gear Mounting. Lubricants. Motor Windings. Gear material. Shaft modifications and component mounting.

* Rotational Sense of Gearbox Output Shaft to Motor Shaft

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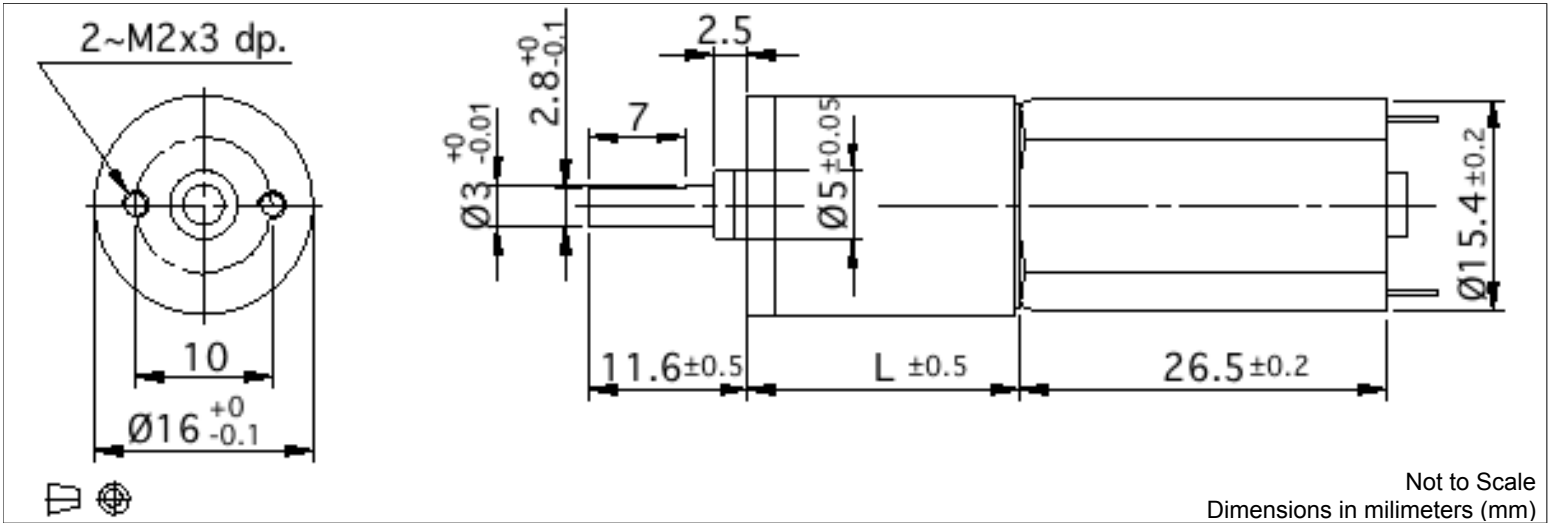
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Planetary Gearmotor - 16 mm Ø



A16 •••• AS10

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Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
455:1	6 Volts	50 %	18 rpm	0.065 Amp	0.62 Nm	0.165 Nm	26.0 mm	49.0 grams	Same	A160455GM10
561:1	6 Volts	50 %	14 rpm	0.065 Amp	0.76 Nm	0.201 Nm	26.0 mm	49.0 grams	Same	A160561GM10
690:1	6 Volts	50 %	12 rpm	0.065 Amp	0.94 Nm	0.245 Nm	26.0 mm	49.0 grams	Same	A160690GM10
1,014:	6 Volts	40 %	8 rpm	0.065 Amp	1.10 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161014GM10
1,621:	6 Volts	40 %	5 rpm	0.065 Amp	1.76 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161621GM10
1,996:	6 Volts	40 %	4 rpm	0.065 Amp	2.16 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161996GM10
3,027:	6 Volts	40 %	3 rpm	0.065 Amp	3.28 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A163027GM10

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Oper.	60°C
Radial Load Distance	10 mm	Thrust Play	≤ 0.20 mm	Min Temperature Oper.	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Oper.	20% to 85%
Press Fit Force - Max	≤ 14.7 N			Options	Bearing Sleeve

CAUTION:
Stall Torque is a theoretical calculation- NOT a rating/ maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.

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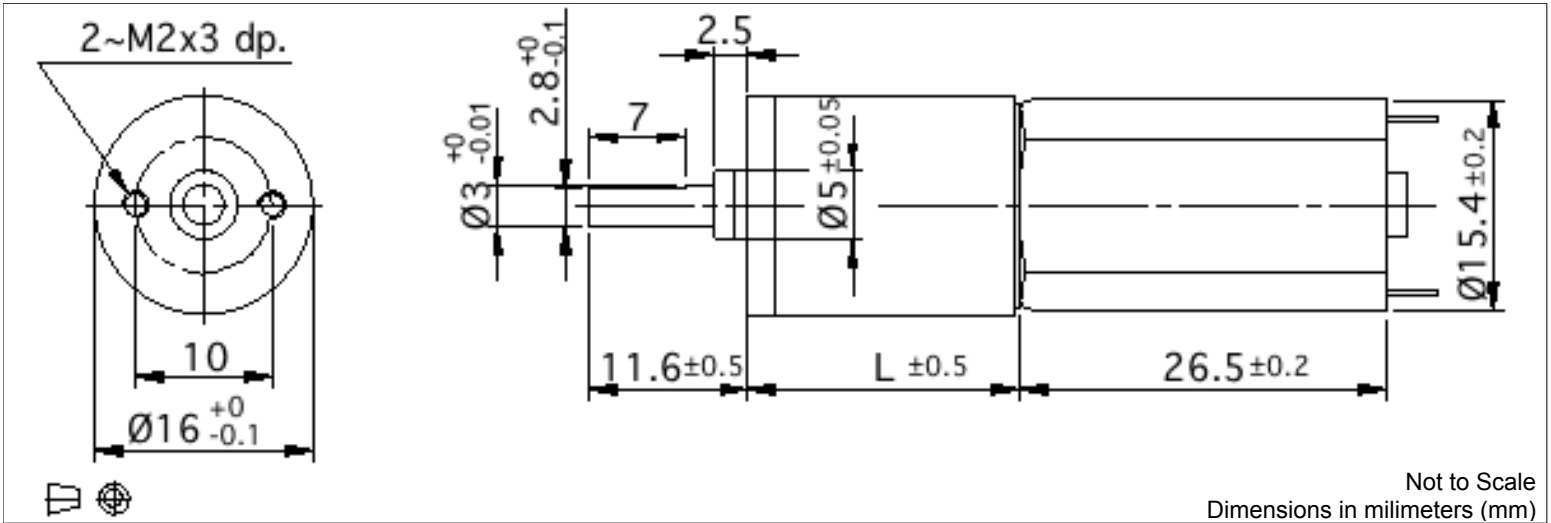
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Planetary Gearmotor - 16 mm Ø



A16 •••• AS20

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Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
4:1	9 Volts	80 %	2,000 rpm	0.050 Amp	0.01 Nm	0.002 Nm	15.1 mm	37.0 grams	Same	A160004GM20
16:1	9 Volts	70 %	500 rpm	0.050 Amp	0.03 Nm	0.007 Nm	18.7 mm	18.0 grams	Same	A160014GM20
19:1	9 Volts	70 %	421 rpm	0.050 Amp	0.04 Nm	0.009 Nm	18.7 mm	41.0 grams	Same	A160019GM20
29:1	9 Volts	60 %	276 rpm	0.050 Amp	0.05 Nm	0.014 Nm	22.4 mm	45.0 grams	Same	A160029GM20
62:1	9 Volts	60 %	129 rpm	0.050 Amp	0.11 Nm	0.025 Nm	22.4 mm	45.0 grams	Same	A160062GM20
72:1	9 Volts	60 %	111 rpm	0.050 Amp	0.13 Nm	0.029 Nm	22.4 mm	45.0 grams	Same	A160072GM20
84:1	9 Volts	60 %	95 rpm	0.050 Amp	0.15 Nm	0.034 Nm	22.4 mm	45.0 grams	Same	A160084GM20
104:1	9 Volts	60 %	77 rpm	0.050 Amp	0.19 Nm	0.042 Nm	22.4 mm	45.0 grams	Same	A160104GM20
128:1	9 Volts	60 %	62 rpm	0.050 Amp	0.23 Nm	0.052 Nm	22.4 mm	45.0 grams	Same	A160128GM20
157:1	9 Volts	60 %	51 rpm	0.050 Amp	0.29 Nm	0.065 Nm	22.4 mm	45.0 grams	Same	A160157GM20
231:1	9 Volts	50 %	35 rpm	0.050 Amp	0.35 Nm	0.078 Nm	26.0 mm	49.0 grams	Same	A160231GM20
316:1	9 Volts	50 %	25 rpm	0.050 Amp	0.48 Nm	0.108 Nm	26.0 mm	49.0 grams	Same	A160316GM20
370:1	9 Volts	50 %	22 rpm	0.050 Amp	0.56 Nm	0.123 Nm	26.0 mm	49.0 grams	Same	A160370GM20

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Oper.	60°C
Radial Load Distance	10 mm	Thrust Play	≤ 0.20 mm	Min Temperature Oper.	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Oper.	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Options	Bearing	Sleeve	

CAUTION. Stall Torque is a theoretical calculation- NOT a rating/maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.

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* Rotational Sense of Gearbox Output Shaft to Motor Shaft

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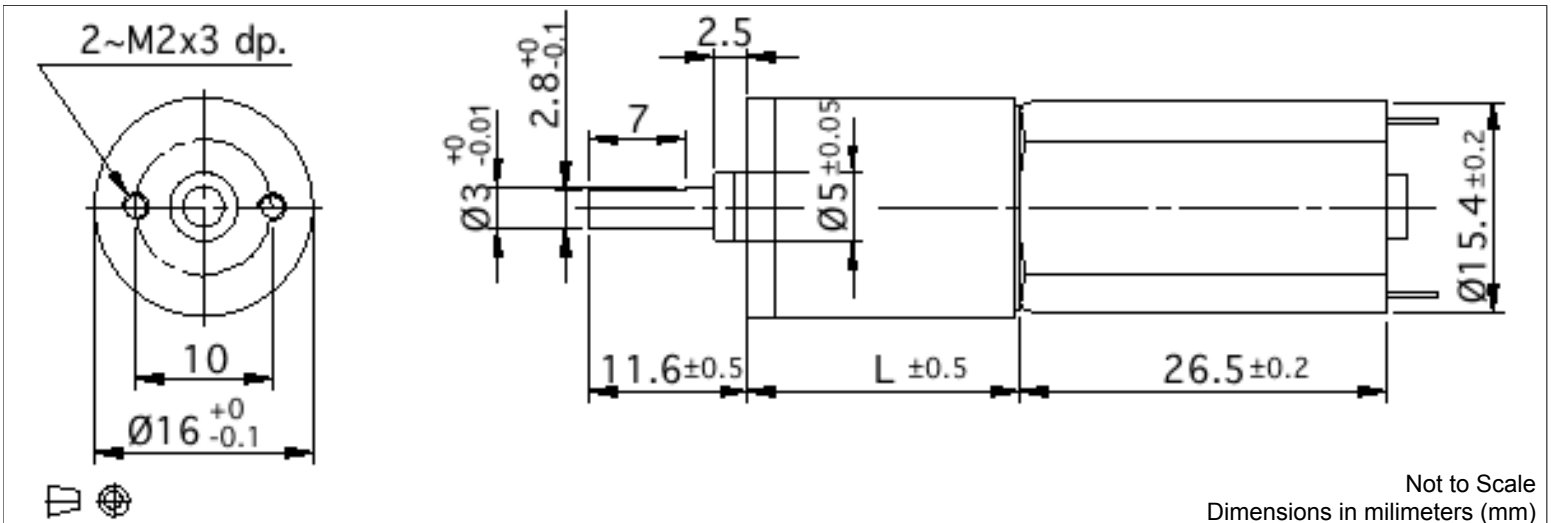
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Planetary Gearmotor - 16 mm Ø



A16 •••• AS20

Global Motion Products



Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
455:1	9 Volts	50 %	18 rpm	0.050 Amp	0.69 Nm	0.152 Nm	26.0 mm	49.0 grams	Same	A160455GM20
561:1	9 Volts	50 %	14 rpm	0.050 Amp	0.85 Nm	0.186 Nm	26.0 mm	49.0 grams	Same	A160561GM20
690:1	9 Volts	50 %	12 rpm	0.050 Amp	1.04 Nm	0.235 Nm	26.0 mm	49.0 grams	Same	A160690GM20
1,014:	9 Volts	40 %	8 rpm	0.050 Amp	1.23 Nm	0.275 Nm	29.6 mm	53.0 grams	Same	A161014GM20
1,621:	9 Volts	40 %	5 rpm	0.050 Amp	1.96 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161621GM20
1,996:	9 Volts	40 %	4 rpm	0.050 Amp	2.42 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161996GM20
3,027:	9 Volts	40 %	3 rpm	0.050 Amp	3.66 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A163027GM20

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Oper.	60°C
Radial Load Distance	10 mm	Thrust Play	≤ 0.20 mm	Min Temperature Oper.	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Oper.	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Options	Bearing	Sleeve	
CAUTION. Stall Torque is a theoretical calculation- NOT a rating/maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.		Magnetic Encoders. Leads. Connectors. Pinion/Gear Mounting. Lubricants. Motor Windings. Gear material. Shaft modifications and component mounting.			

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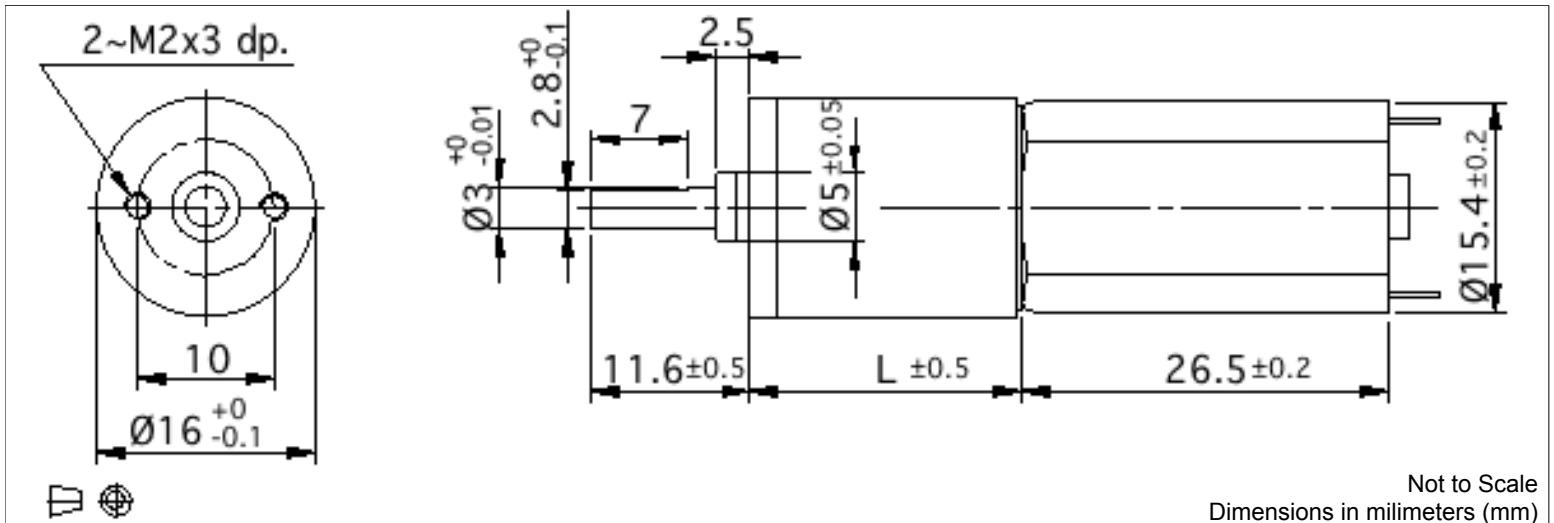
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Planetary Gearmotor - 16 mm Ø



A16 •••• AS30

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Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
4:1	12 Volts	80 %	2,000 rpm	0.050 Amp	0.01 Nm	0.002 Nm	15.1 mm	37.0 grams	Same	A160004GM30
16:1	12 Volts	70 %	500 rpm	0.050 Amp	0.02 Nm	0.006 Nm	18.7 mm	18.0 grams	Same	A160014GM30
19:1	12 Volts	70 %	421 rpm	0.050 Amp	0.02 Nm	0.008 Nm	18.7 mm	41.0 grams	Same	A160019GM30
29:1	12 Volts	60 %	276 rpm	0.050 Amp	0.03 Nm	0.012 Nm	22.4 mm	45.0 grams	Same	A160029GM30
62:1	12 Volts	60 %	129 rpm	0.050 Amp	0.06 Nm	0.022 Nm	22.4 mm	45.0 grams	Same	A160062GM30
72:1	12 Volts	60 %	111 rpm	0.050 Amp	0.07 Nm	0.025 Nm	22.4 mm	45.0 grams	Same	A160072GM30
84:1	12 Volts	60 %	95 rpm	0.050 Amp	0.09 Nm	0.029 Nm	22.4 mm	45.0 grams	Same	A160084GM30
104:1	12 Volts	60 %	77 rpm	0.050 Amp	0.11 Nm	0.037 Nm	22.4 mm	45.0 grams	Same	A160104GM30
128:1	12 Volts	60 %	63 rpm	0.050 Amp	0.13 Nm	0.045 Nm	22.4 mm	45.0 grams	Same	A160128GM30
157:1	12 Volts	60 %	51 rpm	0.050 Amp	0.16 Nm	0.054 Nm	22.4 mm	45.0 grams	Same	A160157GM30
231:1	12 Volts	50 %	35 rpm	0.050 Amp	0.20 Nm	0.069 Nm	26.0 mm	49.0 grams	Same	A160231GM30
316:1	12 Volts	50 %	25 rpm	0.050 Amp	0.27 Nm	0.093 Nm	26.0 mm	49.0 grams	Same	A160316GM30
370:1	12 Volts	50 %	22 rpm	0.050 Amp	0.31 Nm	0.108 Nm	26.0 mm	49.0 grams	Same	A160370GM30

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Oper.	60°C
Radial Load Distance	10 mm	Thrust Play	≤ 0.20 mm	Min Temperature Oper.	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Oper.	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Options	Bearing	Sleeve	
CAUTION. Stall Torque is a theoretical calculation- NOT a rating/maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.		Magnetic Encoders. Leads. Connectors. Pinion/Gear Mounting. Lubricants. Motor Windings. Gear material. Shaft modifications and component mounting.			

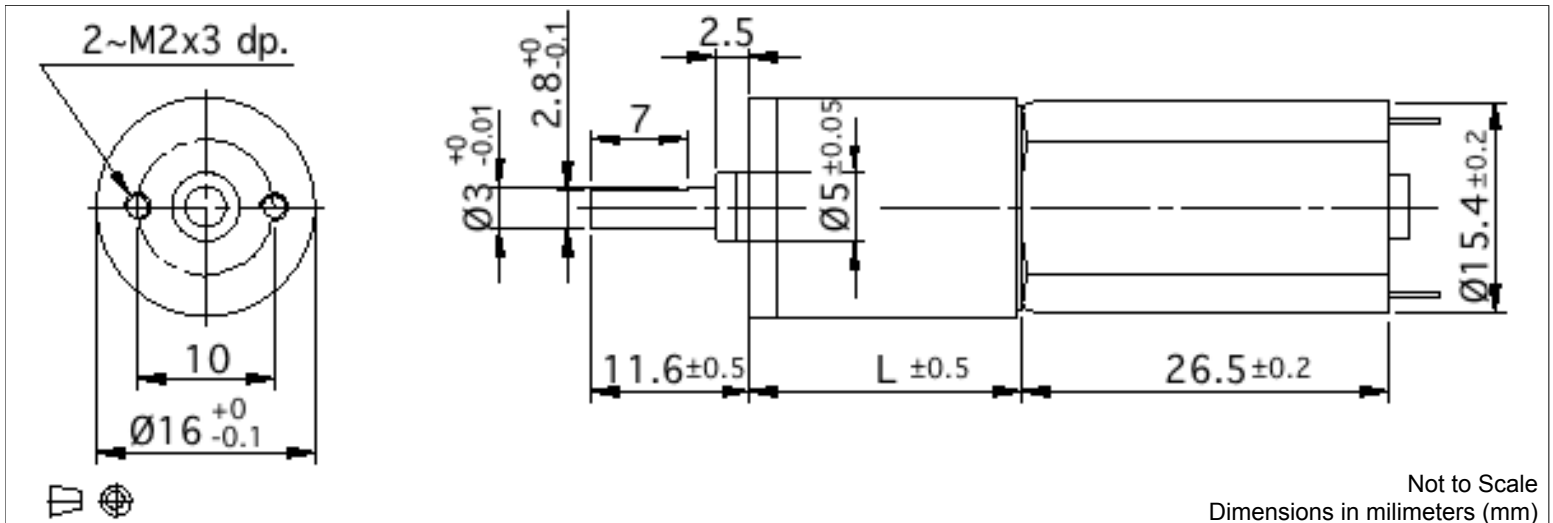
* Rotational Sense of Gearbox Output Shaft to Motor Shaft

Planetary Gearmotor - 16 mm Ø



A16 •••• AS30

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Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
455:1	12 Volts	50 %	18 rpm	0.050 Amp	0.38 Nm	0.132 Nm	26.0 mm	49.0 grams	Same	A160455GM30
561:1	12 Volts	50 %	14 rpm	0.050 Amp	0.47 Nm	0.167 Nm	26.0 mm	49.0 grams	Same	A160561GM30
690:1	12 Volts	50 %	12 rpm	0.050 Amp	0.58 Nm	0.206 Nm	26.0 mm	49.0 grams	Same	A160690GM30
1,014:	12 Volts	40 %	8 rpm	0.050 Amp	0.69 Nm	0.235 Nm	29.6 mm	53.0 grams	Same	A161014GM30
1,621:	12 Volts	40 %	5 rpm	0.050 Amp	1.10 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161621GM30
1,996:	12 Volts	40 %	4 rpm	0.050 Amp	1.35 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161996GM30
3,027:	12 Volts	40 %	3 rpm	0.050 Amp	2.05 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A163027GM30

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Oper.	60°C
Radial Load Distance	10 mm	Thrust Play	≤ 0.20 mm	Min Temperature Oper.	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Oper.	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Options	Bearing	Sleeve	
CAUTION. Stall Torque is a theoretical calculation- NOT a rating/maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.		Magnetic Encoders. Leads. Connectors. Pinion/Gear Mounting. Lubricants. Motor Windings. Gear material. Shaft modifications and component mounting.			

* Rotational Sense of Gearbox Output Shaft to Motor Shaft

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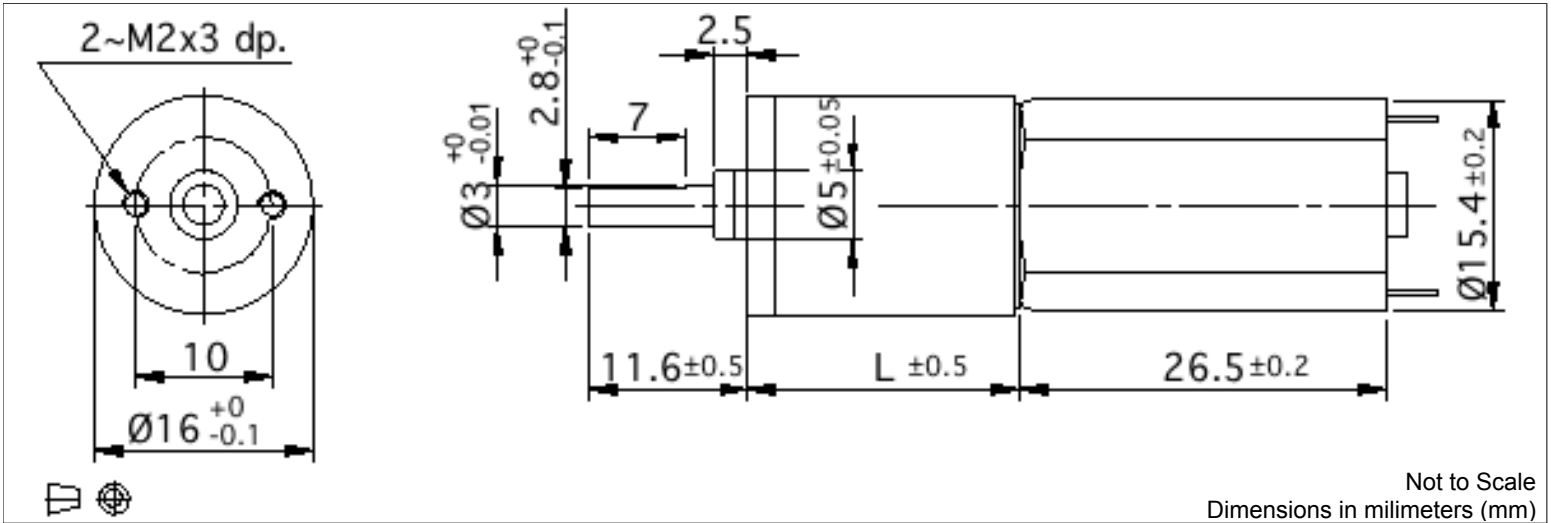
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Planetary Gearmotor - 16 mm Ø



A16 •••• AS40

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Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
4:1	24 Volts	80 %	3,375 rpm	0.050 Amp	0.01 Nm	0.003 Nm	15.1 mm	37.0 grams	Same	A160004GM40
16:1	24 Volts	70 %	844 rpm	0.050 Amp	0.04 Nm	0.008 Nm	18.7 mm	18.0 grams	Same	A160014GM40
19:1	24 Volts	70 %	711 rpm	0.050 Amp	0.04 Nm	0.012 Nm	18.7 mm	41.0 grams	Same	A160019GM40
29:1	24 Volts	60 %	466 rpm	0.050 Amp	0.06 Nm	0.018 Nm	22.4 mm	45.0 grams	Same	A160029GM40
62:1	24 Volts	60 %	218 rpm	0.050 Amp	0.12 Nm	0.032 Nm	22.4 mm	45.0 grams	Same	A160062GM40
72:1	24 Volts	60 %	188 rpm	0.050 Amp	0.14 Nm	0.037 Nm	22.4 mm	45.0 grams	Same	A160072GM40
84:1	24 Volts	60 %	161 rpm	0.050 Amp	0.16 Nm	0.044 Nm	22.4 mm	45.0 grams	Same	A160084GM40
104:1	24 Volts	60 %	130 rpm	0.050 Amp	0.20 Nm	0.055 Nm	22.4 mm	45.0 grams	Same	A160104GM40
128:1	24 Volts	60 %	105 rpm	0.050 Amp	0.25 Nm	0.068 Nm	22.4 mm	45.0 grams	Same	A160128GM40
157:1	24 Volts	60 %	86 rpm	0.050 Amp	0.30 Nm	0.083 Nm	22.4 mm	45.0 grams	Same	A160157GM40
231:1	24 Volts	50 %	58 rpm	0.050 Amp	0.37 Nm	0.098 Nm	26.0 mm	49.0 grams	Same	A160231GM40
316:1	24 Volts	50 %	43 rpm	0.050 Amp	0.50 Nm	0.137 Nm	26.0 mm	49.0 grams	Same	A160316GM40
370:1	24 Volts	50 %	36 rpm	0.050 Amp	0.59 Nm	0.157 Nm	26.0 mm	49.0 grams	Same	A160370GM40

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Oper.	60°C
Radial Load Distance	10 mm	Thrust Play	≤ 0.20 mm	Min Temperature Oper.	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Oper.	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Options	Bearing	Sleeve	

CAUTION. Stall Torque is a theoretical calculation- NOT a rating/maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.

Magnetic Encoders. Leads. Connectors. Pinion/Gear Mounting. Lubricants. Motor Windings. Gear material. Shaft modifications and component mounting.

* Rotational Sense of Gearbox Output Shaft to Motor Shaft

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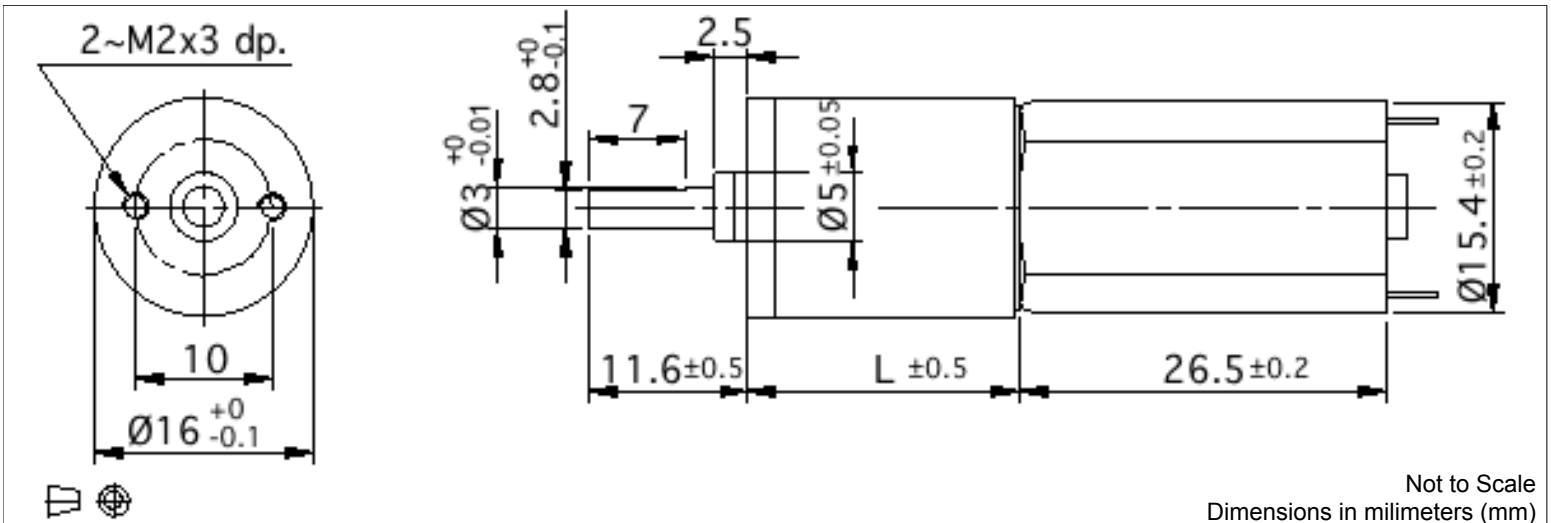
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Planetary Gearmotor - 16 mm Ø



A16 •••• AS40

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Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque Nm	Continuous Torque Nm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
455:1	24 Volts	50 %	30 rpm	0.050 Amp	0.73 Nm	0.196 Nm	26.0 mm	49.0 grams	Same	A160455GM40
561:1	24 Volts	50 %	24 rpm	0.050 Amp	0.90 Nm	0.245 Nm	26.0 mm	49.0 grams	Same	A160561GM40
690:1	24 Volts	50 %	20 rpm	0.050 Amp	1.10 Nm	0.294 Nm	26.0 mm	49.0 grams	Same	A160690GM40
1,014:	24 Volts	40 %	13 rpm	0.050 Amp	1.29 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161014GM40
1,621:	24 Volts	40 %	8 rpm	0.050 Amp	2.07 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161621GM40
1,996:	24 Volts	40 %	7 rpm	0.050 Amp	2.55 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A161996GM40
3,027:	24 Volts	40 %	4 rpm	0.050 Amp	3.86 Nm	0.294 Nm	29.6 mm	53.0 grams	Same	A163027GM40

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Oper.	60°C
Radial Load Distance	10 mm	Thrust Play	≤ 0.20 mm	Min Temperature Oper.	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Oper.	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Options	Bearing	Sleeve	
CAUTION. Stall Torque is a theoretical calculation- NOT a rating/maximum value. Continuous Torque is the lesser of the Gearbox Continuous Torque Rating or the Motor's Continuous Torque Rating at gearbox output shaft.		Magnetic Encoders. Leads. Connectors. Pinion/Gear Mounting. Lubricants. Motor Windings. Gear material. Shaft modifications and component mounting.			

* Rotational Sense of Gearbox Output Shaft to Motor Shaft

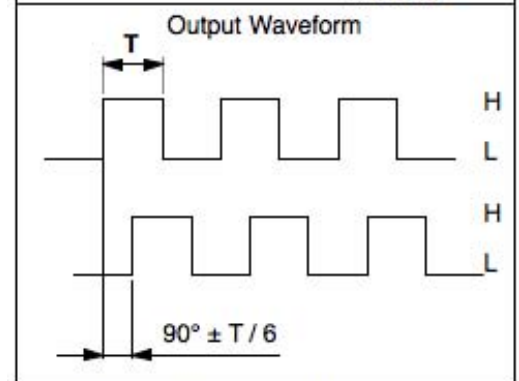
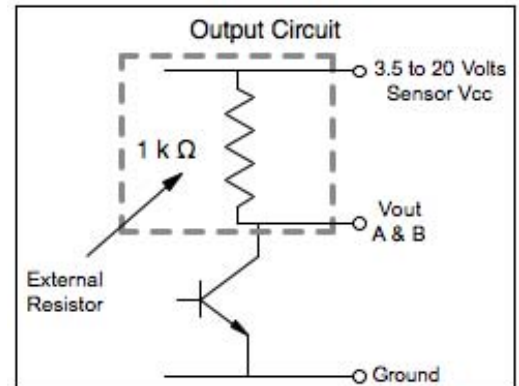
Magnetic Encoders - Integrated

Low Cost - Single & Quadrature Channels



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Supply Voltage - Max	20.0 Volt
Supply Voltage - Min	3.5 Volt
Supply Voltage - Symbol	Vcc
Output Saturation Voltage - Max	700 mVolts
Output Saturation Voltage - Ref	300 mVolts
Output Saturation Voltage - Symbol	Vce(sat)
Output Saturation Voltage - Test Conditions	Vcc = 14 Volts; Ic = 20mA
Output Leakage Current - Max	10.0 µAmp
Output Leakage Current - Ref	< 0.1 µAmp
Output Leakage Current - Symbol	Icex
Output Leakage Current - Test Conditions	Vce = 14 Volts; Vcc = 14 V
Supply Current - Max	10 mAmp
Supply Current - Ref	5 mAmp
Supply Current - Symbol	Ice
Supply Current - Test Conditions	Vcc = 20 Volts, Output Open
Output Rise Time - Max	1.5 µSec
Output Rise Time - Ref	0.3 µSec
Output Rise Time - Symbol	tr
Output Rise Time - Test Condition	Vce = 14 Volts; RI = 820 Ω; CI = 20pF
Output Fall Time - Max	1.5 µSec
Output Fall Time - Ref	0.3 µSec
Output Fall Time - Symbol	tf
Output Fall Time - Test Conditions	Vce = 14 Volts; RI = 820 Ω; CI = 20pF
Max Temperature - Operating	60°C
Min Temperature - Operating	-10°C
Relative Humidity - Operating	20% to 85% RH



Two Channel Encoder

Connector Pin	Color	Function
1	Black	- Motor
2	Red	+ Motor
3	Brown	Hall Sensor Vcc
4	Green	Hall Sensor Ground
5	Blue	Hall Sensor A Vout
6	Purple	Hall Sensor B Vout

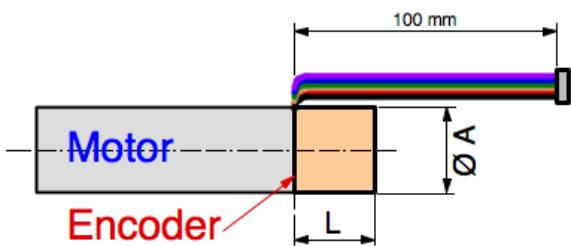
One Channel Encoder

Connector Pin	Color	Function
1	Black	- Motor
2	Red	+ Motor
3	Brown	Hall Sensor Vcc
4	Green	Hall Sensor Ground
5	Blue	Hall Sensor A Vout
6	Purple	No Function

CONNECTOR A
JST ZHR-6, P=1.5-6P
26 AWG, UL 1061 Wires

CONNECTOR B
JST PHR-6; P=2.0-6P
24 AWG, UL 1007 Wires

CONNECTORS C - Two
JST PHR-4; P=2.0-6P
24 AWG, UL 1007 Wires
Molex 09-50-3021; P= 3.96-2P
18 AWG 18, UL 1007 Wires



Note:

For encoder resolution and channel options, how to order, diameter and encoder length details refer to the following pages. Resolution options vary by motor diameter, as do connector(s) and wire gauge(s).

Below 30 mm motor diameter the magnetic encoder does not have the option for a dust cap at this time. The encoder is exposed and the dimensions represent the largest dimension of the encoder. On 30 mm and larger diameter motors an OPTIONAL Dust Cap is available. Part Numbers here represent no Dust Cap.

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Pulses per Revolution per Track	Track Number	Dust Cap Option	Cover ØA mm	Cover or Encoder L - mm	Connector Type(s)	Compatible Gearmotor Series	Order Part Number
1	X	No	12.0	6.5	A	A12----GM--	EM120001X00
3	X	No	12.0	6.5	A	A12----GM--	EM120003X00
1	X	No	15.4	6.5	A	A16----AS--	EM160001X00
3	X	No	15.4	6.5	A	A16----AS--	EM160003X00
1	X	No	20.3	8.5	B	S20----AM--; A22----GM--; A22----HM--	EM210001X00
3	X	No	20.3	8.5	B	S20----AM--; A22----GM--; A22----HM--	EM210003X00
1	X	Yes	30.0	12.6	B	A30----GM--	EM300001X00
3	X	Yes	30.0	12.6	B	A30----GM--	EM300003X00
7	X	Yes	30.0	12.6	B	A30----GM--	EM300007X00
7	X	Yes	32.0	14.3	B	A32----GM--	EM320007X00
7	X	Yes	36.0	13.5	B	A36----GM--	EM360007X00
1	X	Yes	42.5	15.5	C	A45----A---	EM430001X00
5	X	Yes	42.5	15.5	C	A45----A---	EM430005X00
1	X	Yes	52.0	18.0	C	A52----GM--	EM520001X00
1	X	Yes	52.0	18.0	C	A52----GM--	EM520001X00
5	X	Yes	54.0	18.0	C	A54----GM--	EM540005X00
5	X	Yes	54.0	18.0	C	A54----GM--	EM540005X00
1	X & Y	No	12.0	6.5	A	A12----GM--	EM120001Y00
3	X & Y	No	12.0	6.5	A	A12----GM--	EM120003Y00
1	X & Y	No	15.4	6.5	A	A16----AS--	EM160001Y00
3	X & Y	No	15.4	6.5	A	A16----AS--	EM160003Y00
1	X & Y	No	20.3	8.5	B	S20----AM--; A22----GM--; A22----HM--	EM210001Y00
3	X & Y	No	20.3	8.5	B	S20----AM--; A22----GM--; A22----HM--	EM210003Y00
1	X & Y	Yes	30.0	12.6	B	A30----GM--	EM300001Y00
3	X & Y	Yes	30.0	12.6	B	A30----GM--	EM300003Y00
7	X & Y	Yes	30.0	12.6	B	A30----GM--	EM300007Y00
7	X & Y	Yes	32.0	14.3	B	A32----GM--	EM320007Y00
7	X & Y	Yes	36.0	13.5	B	A36----GM--	EM360007Y00
1	X & Y	Yes	42.5	15.5	C	A45----A---	EM430001Y00
5	X & Y	Yes	42.5	15.5	C	A45----A---	EM430005Y00
1	X & Y	Yes	52.0	18.0	C	A52----GM--	EM520001Y00
1	X & Y	Yes	52.0	18.0	C	A52----GM--	EM520005Y00
5	X & Y	Yes	54.0	18.0	C	A54----GM--	EM540001Y00
5	X & Y	Yes	54.0	18.0	C	A54----GM--	EM540005Y00

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