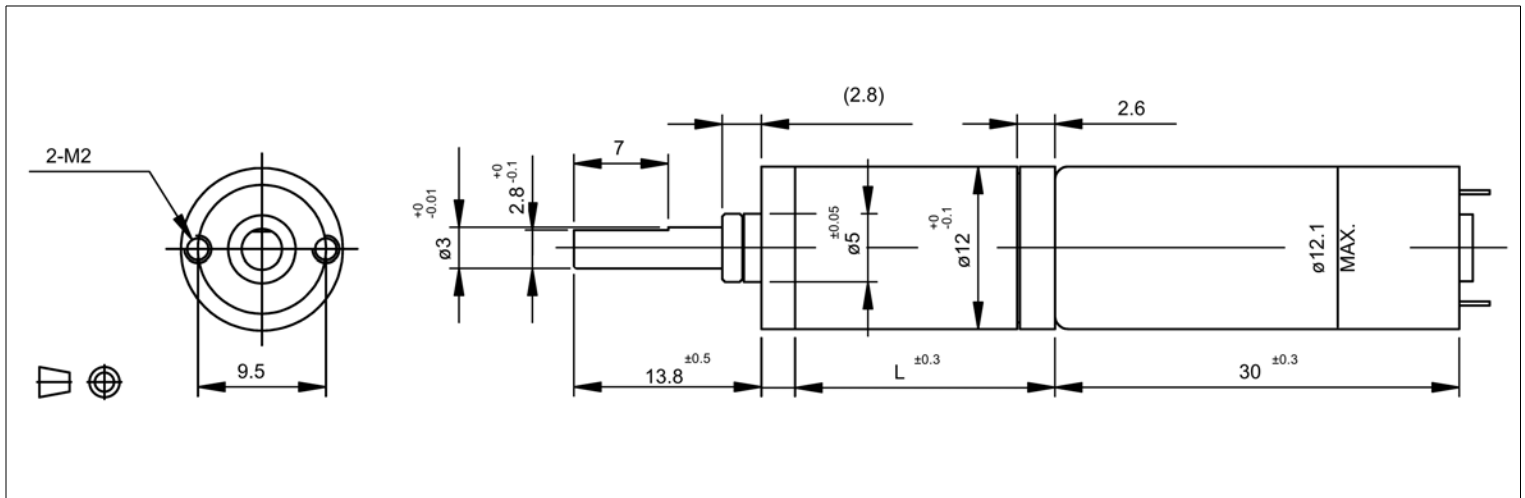


Planetary Gearmotor - 12 mm Ø



Tapped Mounting - 2.4 Volt - 2 Channel Encoder

Global Motion Products



Not to Scale. Dimensions in millimeters (mm)

Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque mNm	Continuous Torque mNm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
4.0:1	2.4	85 %	2,992 rpm	0.177 Amp	8 mNm	2 mNm	12.8 mm	25.1 grams	Same	A120004GM00
16.0:1	2.4	75 %	748 rpm	0.177 Amp	29 mNm	7 mNm	16.1 mm	27.2 grams	Same	A120016GM00
64.0:1	2.4	65 %	187 rpm	0.177 Amp	99 mNm	25 mNm	19.4 mm	29.3 grams	Same	A120064GM00
256.0:1	2.4	55 %	47 rpm	0.177 Amp	336 mNm	82 mNm	22.7 mm	31.4 grams	Same	A120256GM00
1,024.0	2.4	45 %	12 rpm	0.177 Amp	1,098 mNm	196 mNm	26.0 mm	33.6 grams	Same	A121024GM00
4,096.0	2.4	40 %	3 rpm	0.177 Amp	3,905 mNm	196 mNm	29.3 mm	35.6 grams	Same	A124096GM10

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Operating	60°C
Radial Load Distance	8 mm	Axial Play	≤ 0.20 mm	Min Temperature Operating	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Operating	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Bearing	Sleeve		

CAUTION:
Stall Torque is a theoretical calculation- NOT a rating or 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. Corless Motors.

* Rotational Sense of Gearbox Output Shaft to Motor Shaft

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Commutation Type:
Precious Metal

Manufactured under a Certified ISO
9001 Quality System and ISO
14001 Environmental Management
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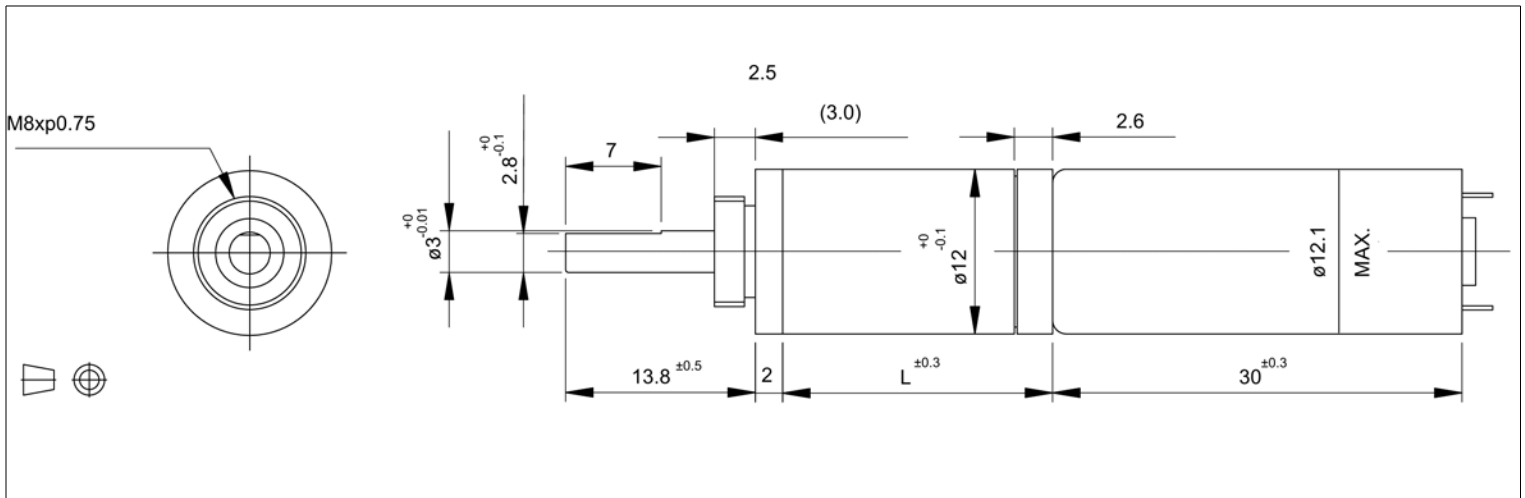
Specifications Subject to change without notice

Planetary Gearmotor - 12 mm Ø



Threaded Mounting - 3 Volt - XY Encoder

Global Motion Products



Not to Scale. Dimensions in millimeters (mm)

Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque mNm	Continuous Torque mNm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
4.0:1	3.0	85 %	2,990 rpm	0.150 Amp	10 mNm	2 mNm	12.9 mm	25.6 grams	Same	A120004GM30
16.0:1	3.0	75 %	748 rpm	0.150 Amp	34 mNm	6 mNm	16.5 mm	27.7 grams	Same	A120016GM30
64.0:1	3.0	65 %	187 rpm	0.150 Amp	117 mNm	23 mNm	19.8 mm	29.8 grams	Same	A120064GM30
256.0:1	3.0	55 %	47 rpm	0.150 Amp	396 mNm	76 mNm	23.1 mm	31.9 grams	Same	A120256GM30
1,024.0	3.0	45 %	12 rpm	0.150 Amp	1,294 mNm	196 mNm	26.4 mm	34.0 grams	Same	A121024GM30
4,096.0	3.0	40 %	3 rpm	0.150 Amp	4,602 mNm	196 mNm	29.7 mm	36.1 grams	Same	A124096GM30

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Operating	60°C
Radial Load Distance	8 mm	Axial Play	≤ 0.20 mm	Min Temperature Operating	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Operating	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Bearing	Sleeve		

CAUTION:
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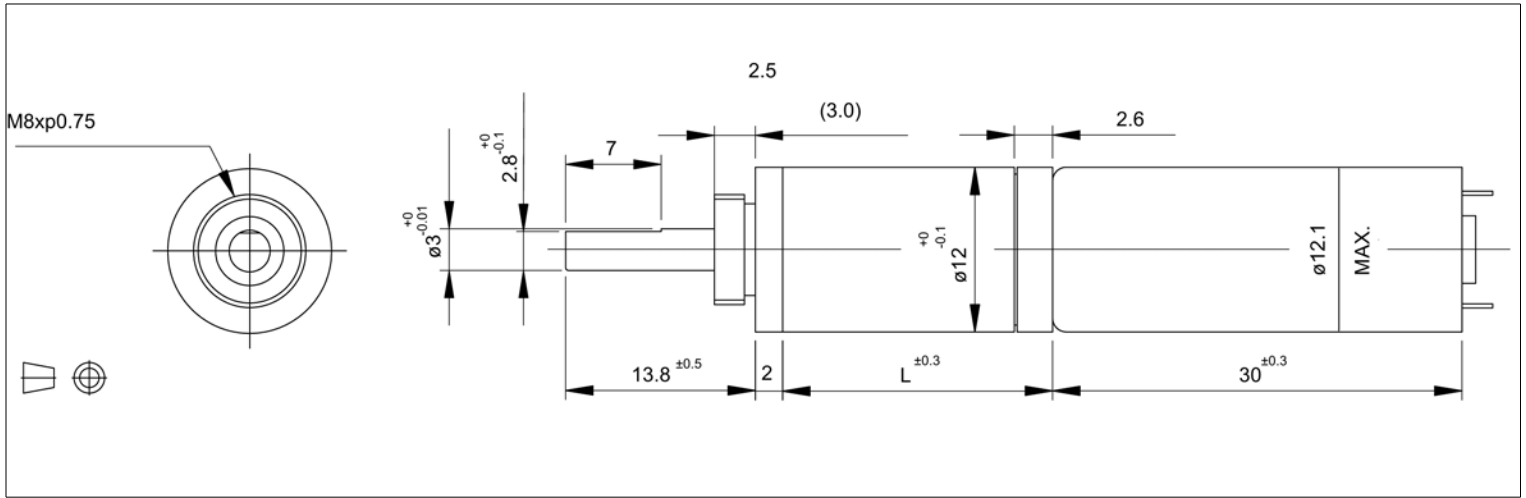
Specifications Subject to change without notice

Planetary Gearmotor - 12 mm Ø



Threaded Mounting - 2.4 Volt - XY Encoder

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Not to Scale. Dimensions in millimeters (mm)

Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque mNm	Continuous Torque mNm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
4.0:1	2.4	85 %	2,992 rpm	0.177 Amp	8 mNm	2 mNm	12.9 mm	25.6 grams	Same	A120004GM20
16.0:1	2.4	75 %	748 rpm	0.177 Amp	29 mNm	7 mNm	16.5 mm	27.7 grams	Same	A120016GM20
64.0:1	2.4	65 %	187 rpm	0.177 Amp	99 mNm	25 mNm	19.8 mm	29.8 grams	Same	A120064GM20
256.0:1	2.4	55 %	47 rpm	0.177 Amp	336 mNm	82 mNm	23.1 mm	31.9 grams	Same	A120256GM30
1,024.0	2.4	45 %	12 rpm	0.177 Amp	1,098 mNm	196 mNm	26.4 mm	34.0 grams	Same	A121024GM30
4,096.0	2.4	40 %	3 rpm	0.177 Amp	3,905 mNm	196 mNm	29.7 mm	36.1 grams	Same	A124096GM30

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Operating	60°C
Radial Load Distance	8 mm	Axial Play	≤ 0.20 mm	Min Temperature Operating	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Operating	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Bearing	Sleeve		

CAUTION:
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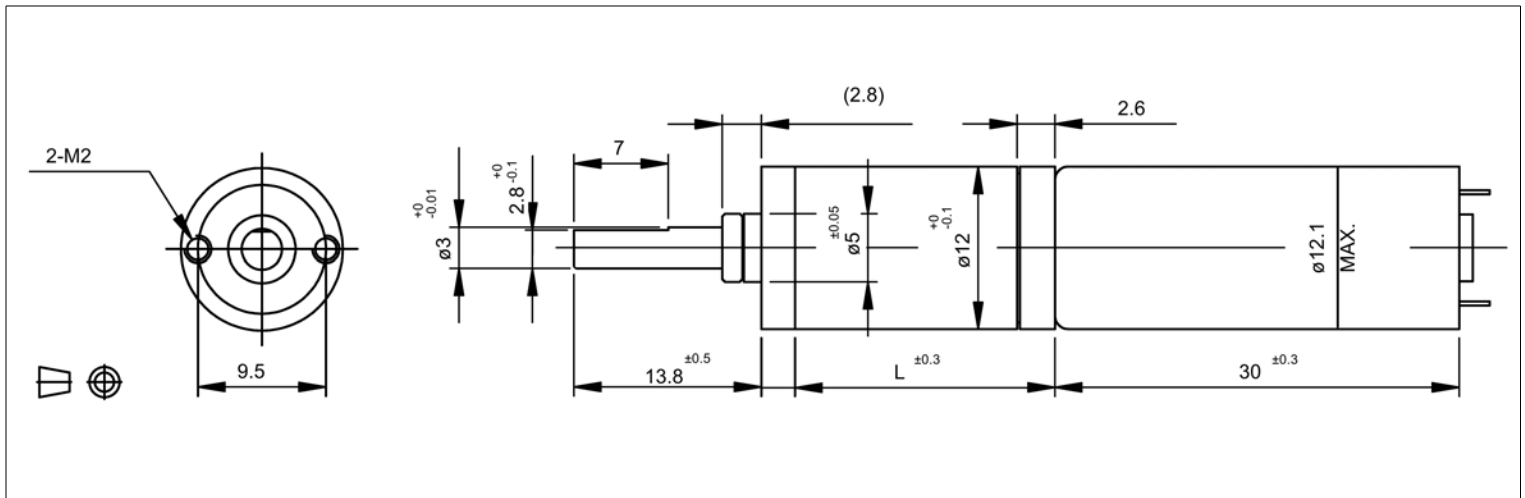
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Planetary Gearmotor - 12 mm Ø



Tapped Mounting - 3 Volt - 2 Channel Encoder

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Not to Scale. Dimensions in millimeters (mm)

Ratio	Voltage Volts	Gearbox Efficiency %	No Load Speed rpm	Gearmotor No Load Current A	Stall Torque mNm	Continuous Torque mNm	Length L mm	Gearmotor Mass grams	Direction of Rotation*	Order Part Number
4.0:1	3.0	85 %	2,990 rpm	0.150 Amp	10 mNm	2 mNm	12.8 mm	25.1 grams	Same	A120004GM10
16.0:1	3.0	75 %	748 rpm	0.150 Amp	34 mNm	6 mNm	16.1 mm	27.2 grams	Same	A120016GM10
64.0:1	3.0	65 %	187 rpm	0.150 Amp	117 mNm	23 mNm	19.8 mm	29.3 grams	Same	A120064GM10
256.0:1	3.0	55 %	47 rpm	0.150 Amp	396 mNm	76 mNm	22.7 mm	31.4 grams	Same	A120256GM10
1,024.0	3.0	45 %	12 rpm	0.150 Amp	1,294 mNm	196 mNm	26.0 mm	33.5 grams	Same	A121024GM20
4,096.0	3.0	40 %	3 rpm	0.150 Amp	4,602 mNm	196 mNm	29.3 mm	35.6 grams	Same	A124096GM20

Radial Load Rating	≤ 4.9 N	Radial Play	≤ 0.05 mm	Max Temperature Operating	60°C
Radial Load Distance	8 mm	Axial Play	≤ 0.20 mm	Min Temperature Operating	-10°C
Axial Load	≤ 4.9 N	Backlash	≤ 3.0 °	Relative Humidity Operating	20% to 85%
Press Fit Force - Max	≤ 14.7 N	Bearing	Sleeve		

CAUTION:
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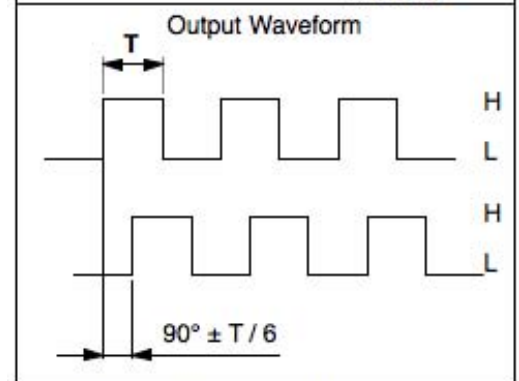
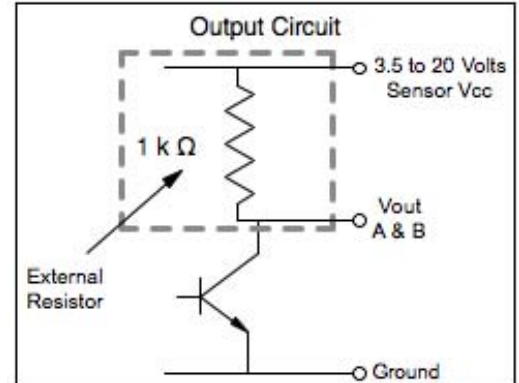
Magnetic Encoders - Integrated

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

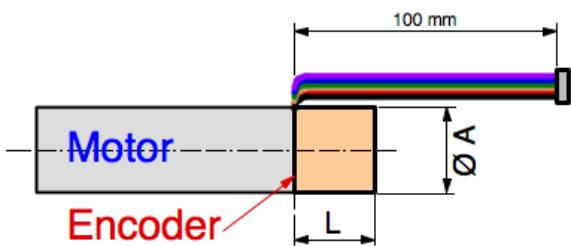
One Channel Encoder

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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Magnetic Encoders - Integrated



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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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