



SERIES: M223X000X

DESCRIPTION: M223 with AMT103 kit

## AMT SPECIFICATIONS

output phase difference	90° ±45°
frequency response	0 ~ 250 kHz
output current	0 ~ 5 mA max.
output waveform	square wave
output signals	A, B, Z phase
current consumption	6 mA typ., 10 mA max.
supply voltage	3.6 ~ 5.5 V dc
output resolution (ppr) <sup>1</sup>	48, 96, 100, 125, 192, 200, 250, 256, 384, 400, 500, 512, 800, 1000, 1024, 2048
time constant	0.2 ms (at 48, 96, 100, 125, 200, 250, 256, 512 ppr) 0.4 ms (at 192, 384, 400, 500, 800, 1000, 1024, 2048 ppr)
accuracy	±15 arcmin (at 192, 384, 400, 500, 800, 1000, 1024, 2048 ppr) ±30 arcmin (at 96, 200, 250, 512 ppr) ±60 arcmin (at 48, 100, 125, 256 ppr)
max. rotational speed	7500 rpm (at 384, 800, 1000, 2048 ppr) 15000 rpm (at 192, 400, 500, 1024 ppr) 30000 rpm (at 48, 96, 100, 125, 200, 250, 256, 512 ppr)
operating temp.	-40° ~ 100°C
mounting hole options	A) 2 each M1.6 holes on 16 mm (0.63") bolt circle B) 2 each #4 holes on 19.05 mm (0.75") bolt circle C) 2 each M1.6 or M2 holes on 20 mm (0.787") bolt circle D) 3 each M1.6 or M2 holes on 20.9 mm (0.823") bolt circle E) 3 each M1.6 or M2 holes on 22 mm (0.866") bolt circle F) 4 each M1.6 or M2 holes on 25.4 mm (1") bolt circle

note: 1. All resolutions stated are before quadrature decoding (example: 1000 ppr x 4 = 4000 counts)  
2. Some stepper motors may leak a magnetic field causing the AMT index pulse to not function properly.

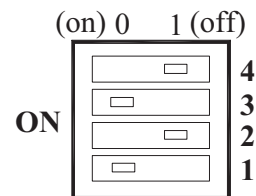
## DIP SWITCH SETTINGS

0 = On, 1 = Off

Resolution (PPR)	Maximum RPM	4	3	2	1
2048	7500	1	1	1	1
1000	7500	1	1	1	0
800	7500	1	1	0	1
384	7500	1	1	0	0
1024	15000	1	0	1	1
500	15000	1	0	1	0
400	15000	1	0	0	1
192	15000	1	0	0	0
512	30000	0	1	1	1
250	30000	0	1	1	0
200	30000	0	1	0	1
96	30000	0	1	0	0
256	30000	0	0	1	1
125	30000	0	0	1	0
100	30000	0	0	0	1
48	30000	0	0	0	0

DIP switch:

Example setting: 500



(located on back of encoder)



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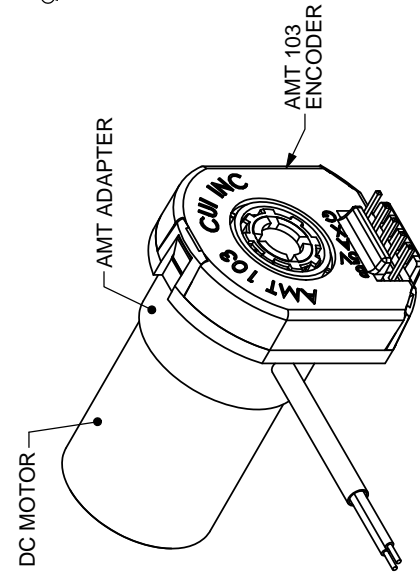
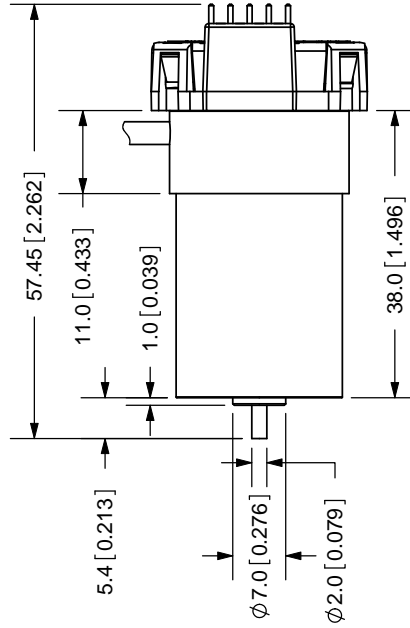
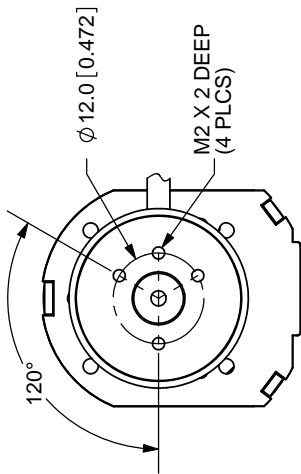
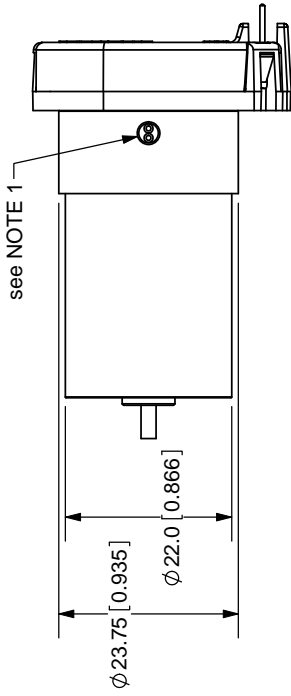
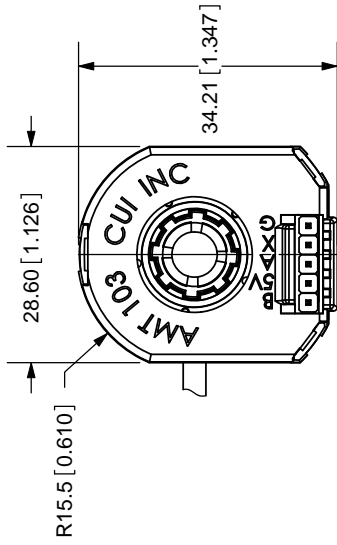
DESCRIPTION: M223 with AMT103 kit

## M223X DC MOTOR SPECIFICATIONS



parameter	conditions/description	min	nom	max	units
gear reduction	M223X0002 M223X0003 M223X0004		none 1:84 1:231		
voltage			12		V dc
winding resistance		6.34	7.2	8.06	$\Omega$
output power				4.65	W
efficiency				66	%
no load speed		7,400	8,400	9,400	rpm
no load current	shaft $\varnothing$ 2 mm	0.03	0.06	0.09	A
stall torque			21.92		mNm
friction torque			0.79		mNm
speed constant			726		rpm/V
back-EMF constant			1.38		mV/rpm
torque constant			13.15		mNm/A
current constant			0.076		A/mNm
rotor inductance			3,400		$\mu$ H
mechanical time constant			19		ms
rotor inertia			4.5		gcm <sup>2</sup>
angular acceleration				49	10 <sup>3</sup> rad/s <sup>2</sup>
thermal resistance			17/22		k/W
thermal time constant			450		s
operating temp.		-10		50	$^{\circ}$ C
shaft bearing	sintered bronze sleeves				
shaft load	shaft $\varnothing$ 2 mm: radial at 3,000 rpm (3 mm from bearing) axial at 3,000 rpm axial at standstill (shaft supported)			2 1 294	N N N
shaft play	radial $\leq$ axial $\leq$	0.5		0.025 0.45	mm mm
direction of rotation	clockwise, viewed from the front face				
speed up to				10,000	rpm
torque up to				5,307	mNm
current up to	thermal limits			0.502	A

REV.	DESCRIPTION	DATE
A	NEW DRAWING	8/3/2009



TOLERANCE:  
#0.3mm UNLESS OTHERWISE  
SPECIFIED

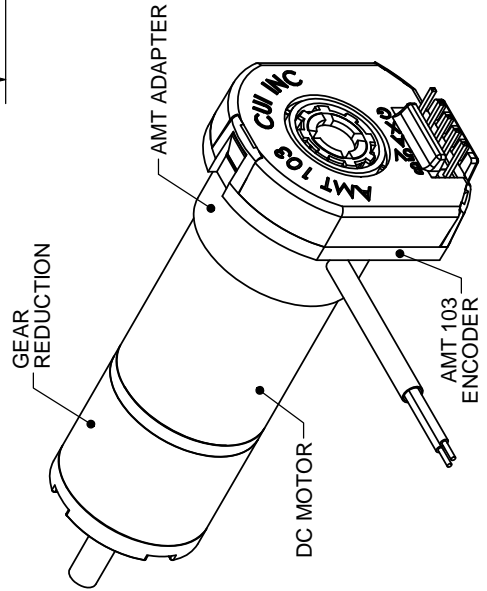
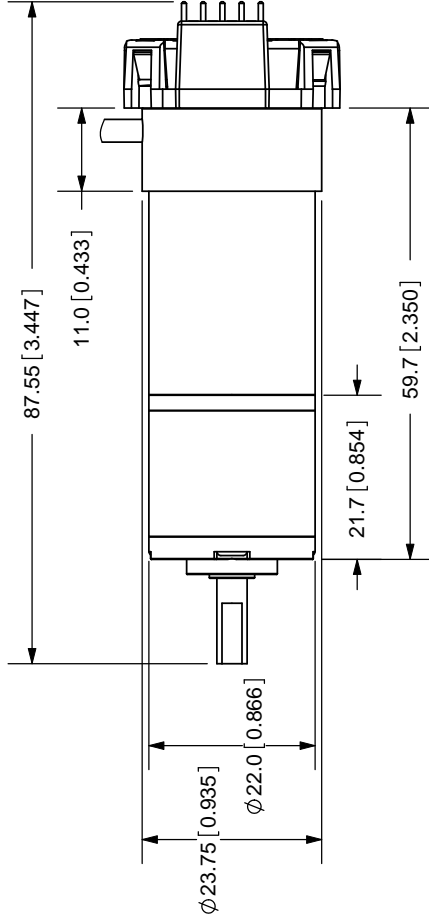
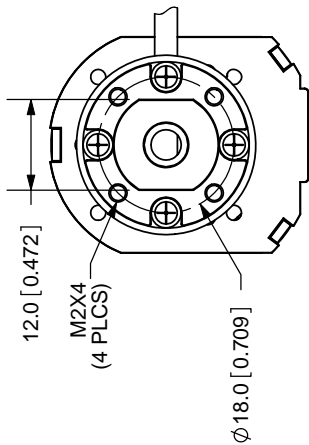
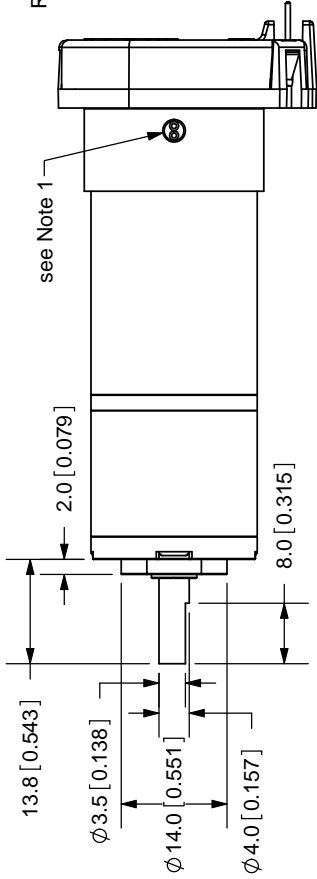
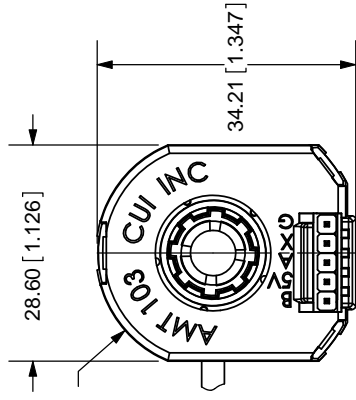


20050 SW 112th Ave.  
Tualatin, OR 97062  
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800-275-4899  
Fax: 503-612-2383  
Website: www.cui.com

TITLE:	M223 WITH AMT103 KIT	REV:	A
PART NO:	M223X0002	UNITS:	MM [INCHES]
DRAWN BY:	ZRJ	APPROVED BY:	
		SCALE:	1:1

SPECIFICATIONS:  
NOTE 1: 4mm opening for 24AWG power leads to be covered with heat shrink, power leads to be tied into 50mm diameter bundle.

REV. A	DESCRIPTION NEW DRAWING	DATE 8/3/2009
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SPECIFIED

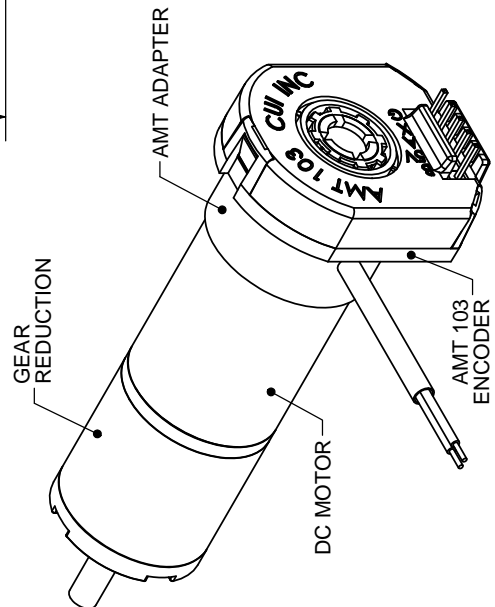
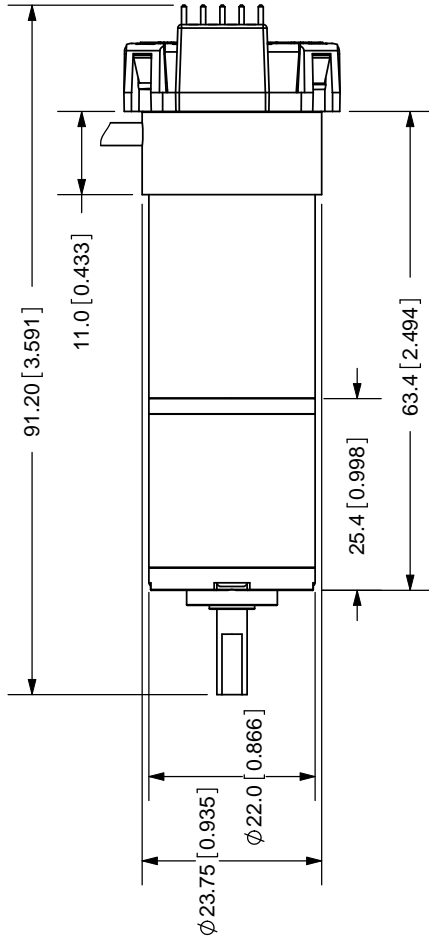
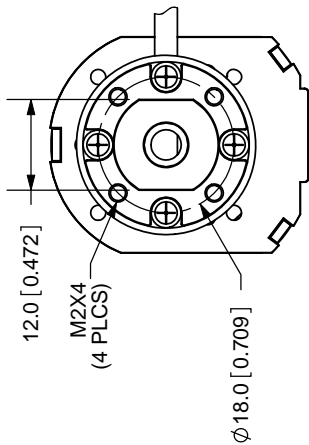
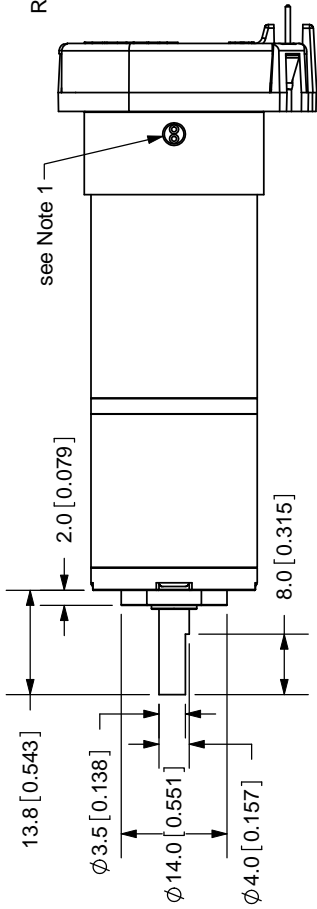
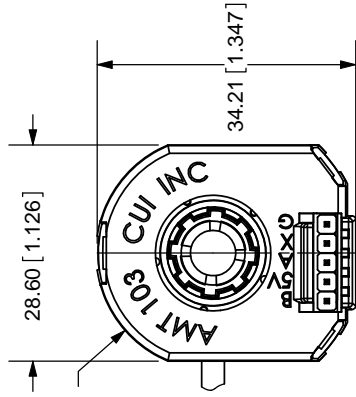


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TITLE: M223 WITH AMT103 KIT	REV: A
PART NO: M223X0003	UNITS: MM [INCHES]
DRAWN BY: ZRJ	APPROVED BY:
	SCALE: 1:1

SPECIFICATIONS:  
NOTE 1: 4mm opening for 24AWG power leads to be covered with heat shrink, power leads to be tied into 50mm diameter bundle.

REV. A	DESCRIPTION NEW DRAWING	DATE 8/3/2009
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TOLERANCE:  
#0.3mm UNLESS OTHERWISE  
SPECIFIED



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TITLE: M223 WITH AMT103 KIT	REV: A
PART NO: M223X0004	UNITS: MM [INCHES]
DRAWN BY: ZRJ	APPROVED BY:
	SCALE: 1:1

SPECIFICATIONS:  
NOTE 1: 4mm opening for 24AWG power leads to be covered with heat shrink, power leads to be tied into 50mm diameter bundle.