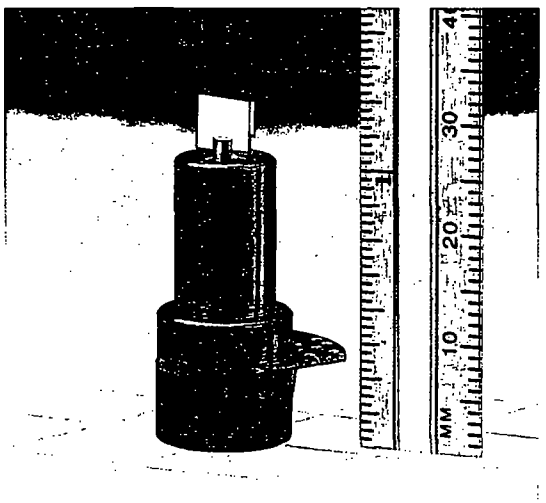
Cambridge Technology, Inc.
109 Smith Place, Cambridge, MA 02138
Tel: 617-441-0600
Fax: 617-497-8800

# Model 6200 Optical Scanner

## Preliminary Mechanical and Electrical Specifications

*All angles are in mechanical degrees*
*All specifications apply after a 30 second warm-up*
*Consult manual for complete operating instructions*

### Mechanical Specifications



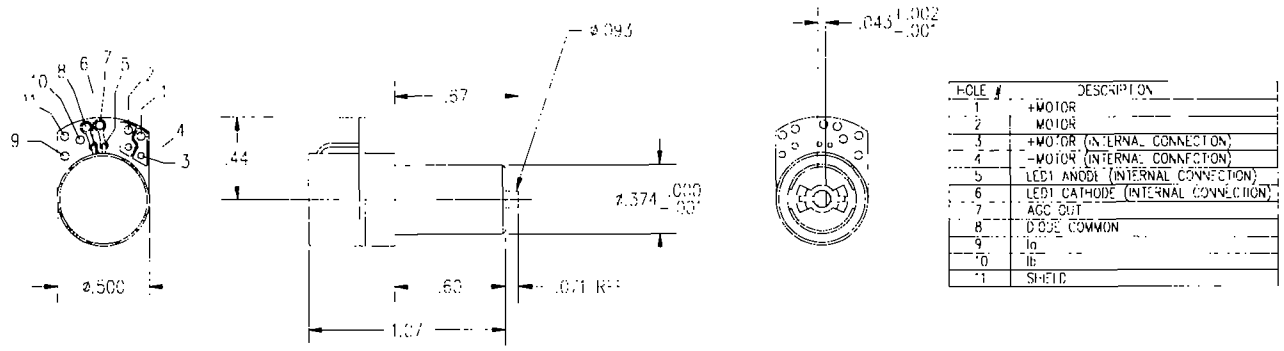
Rated Angular Excursion: 40°
Rotor Inertia: 0.012 gm*cm$^2$, +/-10%
Torque Constant: 1.08x10$^4$ dyne-cm/amp, +/-10%
Maximum Coil Temperature: 110 °C
Thermal Resistance (Coil to Case): 7.5°C/Watt, Max

### Electrical Specifications/Drive Mechanism

Coil Resistance: 2.4 Ohms, +/-10%
Coil Inductance: 96 uH, +/-10%
Back EMF Voltage: 18.9 mV/degree/sec, +/-10%
RMS Current: 1.6 Amperes at Tcase of 50°C, Max
Peak Current: 6 Amperes, Max
Small Angle Step Response Time: 0.3 ms, with balanced load

### Position Detector

Linearity: 99.5 %, Minimum, over 40 degrees
Scale Drift: 75 PPM/°C, Maximum
Zero Drift: 25 urad/°C, Maximum
Repeatability, Short Term: 15 microradians
Output Signal, Common Mode: 155 microamperes with AGC current of 30mA, +/-20%
Output Signal, Differential Mode: 12 microamperes/°, at common mode current of 155 microamperes, +/-20%




| HOLE # | DESCRIPTION |
|---|---|
| 1 | +MOTOR |
| 2 | -MOTOR |
| 3 | +MOTOR (INTERNAL CONNECTION) |
| 4 | -MOTOR (INTERNAL CONNECTION) |
| 5 | LED1 ANODE (INTERNAL CONNECTION) |
| 6 | LED1 CATHODE (INTERNAL CONNECTION) |
| 7 | AGC OUT |
| 8 | DIODE COMMON |
| 9 | Ia |
| 10 | Ib |
| 11 | SHIELD |

(ALL DIMENSIONS ARE IN INCHES)
MASS = 12.5 GRAMS

02/99

# Moving Magnet Optical Scanner Product Line


# Cambridge Technology Inc.

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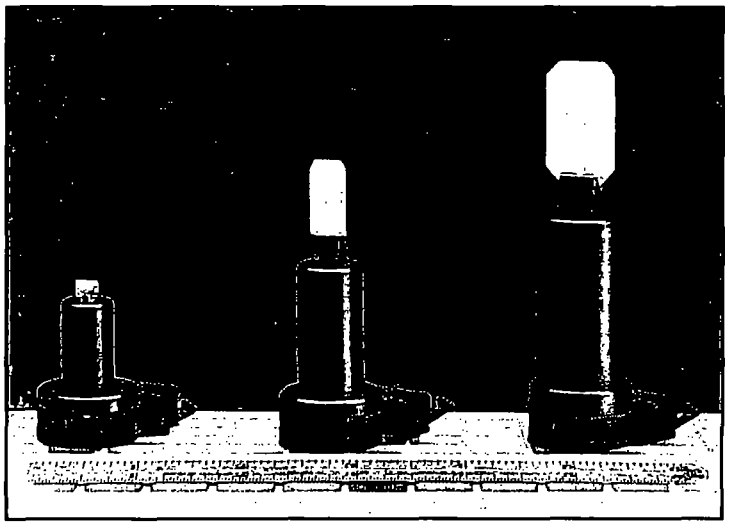
Tel. 617-441-0600
Fax 617-497-8800


Cambridge Technology's line of Moving Magnet Optical Scanners are designed for a wide variety of applications where the predominant concern is scanning speed.



The selected magnetic material for the rotor is state of the art neodymium-iron-boron, resulting in exceptional flux densities in the air gap. The intense magnetic field strength combined with low rotor inertias gives these products significantly higher torque to inertia ratios when compared with competing products, resulting in superior peak accelerations.

The moving magnet scanner line uses an efficient low inertia optical position detector design developed by Cambridge Technology. This simple design allows us to offer an inexpensive but fast and reliable closed loop product.

The product line was initiated with the Model 6800HP scanner. The Model's 6810P and 6850P incorporate technical advances that were originally developed in the 6800HP. Consistent with our moving coil scanner product line, the moving magnet scanners do not use torsion bars. The advantages of this technique are high reliability, wide angle operation and that minimal power is required to achieve or hold any given position.

Cambridge Technology offers a variety of supporting products for the moving magnet scanners including controlling electronics, X/Y Mounts and mirror sets. Custom single and dual axis optical apertures can be supported, consult the factory for details.

## Specifications

*All Specifications Apply After a 30 Second Warm-up. All Angles are in Mechanical Degrees*

| | Model | | | |
|---|---|---|---|---|
| **Mechanical and Electrical Specifications** | **6800HP** | **6810P** | **6850P** | **Units and Tolerances** |
| Optical Apertures Supported, Two Axis | 3 | 5 | 10 | MM, Typical |
| Maximum Recommended Load | 0.18 | 1.0 | 5.0 | GM*CM$^2$ |
| **Mechanical Specifications** | | | | |
| Rated Angular Excursions | +/-20 | +/-20 | +/-20 | Degrees |
| Rotor Inertia | 0.018 | 0.1 | 0.5 | GM*CM$^2$, +/-10% |
| Torque Constant | 2.5 | 5.7 | 9.5 | x10$^3$ Dyne-CM/Ampere, +/-10% |
| Coil Temperature | 110 | 110 | 110 | ° C, Maximum |
| Thermal Resistance, Coil to Case | 4 | 2 | 1.5 | ° C/Watt, Maximum |
| **Electrical Specifications, Drive Armature** | | | | |
| Coil Resistance | 4.2 | 3.4 | 1.5 | Ohms, at 25°, C, +/-10% |
| Coil Inductance | 96 | 160 | 160 | uH, +/-10% |
| Back EMF Voltage | 0.04 | 0.10 | 0.16 | mV/Degree/Second, +/-10% |
| Current, RMS | 1.6 | 2.6 | 4.3 | A, Maximum |
| Current, Peak | 6 | 12 | 25 | A, Maximum |
| Small Angle Step Response | 0.3 | 0.4 | 0.5 | mS, with balanced inertia matched load |
| **Electrical Specifications, Position Detector** | | | | |
| Linearity | 98 | 98 | 98 | %, Minimum, over 30 Degrees |
| Scale Drift | 0.05 | 0.05 | 0.05 | %/° C, Maximum |
| Zero Drift | 0.01 | 0.01 | 0.01 | Degree/° C, Maximum |
| Repeatability | 20 | 20 | 20 | Microradians, typical |
| Output Signal, Common Mode | 50 | 50 | 50 | uA, with AGC Voltage of 10V +/-10% |
| Output Signal, Differential Mode | 3.2 | 3.2 | 3.2 | uA/Degree, with Common Mode of 50uA, +/-10% |

## Features

**Extremely high mirror speed positioning • Wide scanning angle of 80° optical**
**Precision mounting eliminates most optical realignment • Low wobble and jitter • Highest peak accelerations**
**Rugged and reliable design • Minimal power required to achieve and maintain any position**

Cambridge Technology Inc. 109 Smith Place, Cambridge, MA 02138 USA
Tel (617) 441-0600 / Fax (617) 497-8800
*Web Site Address:* http://www.camtech.com

Dear Colleague:

Thank you for your inquiry concerning our line of galvanometer based optical scanners. Enclosed with this letter is a brochure describing the full range of optical scanning products offered by Cambridge Technology.

We are presently manufacturing six different moving magnet and five different moving coil optical scanners for driving mirror loads from 0.001 $gm*cm^2$ to over 100,000 $gm*cm^2$. We also routinely provide controlling electronics, mirrors, and X/Y mounts for all of our scanners.

When you compare Cambridge Technology's optical scanners to competing products, you will find that ours are faster and more repeatable at very competitive prices. Our patented moving dielectric "Butterfly" position sensing technology in the moving coil scanner line rivals the accuracy of rotary interferometers. Our moving magnet scanner line offers some of the highest peak accelerations of any closed loop galvanometer based scanner.

For further technical information, or for a quotation on a system or components to meet your specific needs, please contact *your Regional Representative* by telephone, facsimile or letter.

Best regards,

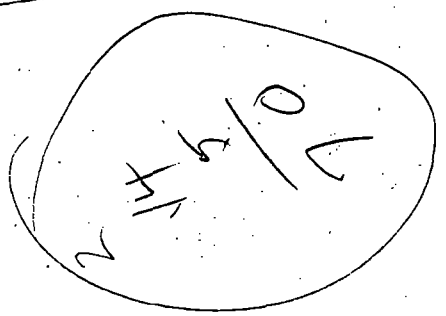
Redmond P Aylward

Redmond P. Aylward
Vice President of Sales and Marketing

with Provision 302119100 ~~21F513~~ 7.16

21F553

without 302119000 21F552 6.06



end plate 400 40 ~~11~~ 000
21F587

Screws (5) 21F593

#12 702000

Screws 21F591

Thumbwheel Switches — Newark

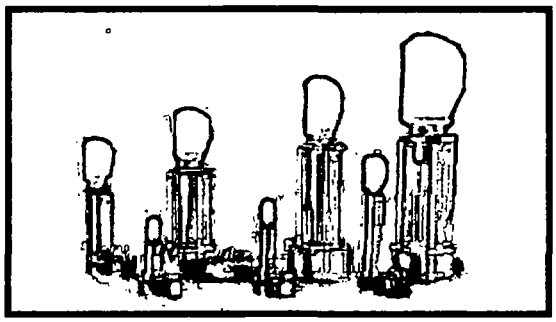
| | | | | |
|---|---|---|---|---|
| (10) | with Provision for Diode | 302119100 | 21F553 | 7.16 |
| | without " " " | 302119000 | 21F552 | 6.06 |
| (4) | end plate, | 400402000 | 21F587 | .42 |
| (4) | screws | 412702000 | 21F593 | 2.10 |
| (4) | nuts | 403500000 | 21F591 | .21 |
| (10) | without Provision for Diode, Comp BCD | ~~302H~~ 302319000 | 21F560 | 6.06 |

Cambridge Technology

109 Smith Place, Cambridge, MA 02138
617-441-0600 617-497-8800
www.cambridgetechnology.com

# The 6200H Series Scanners

## Moving Magnet Series with Advanced Optical Position Detector



**The 6200H Series of closed loop galvanometer based optical scanners** combines our new moving magnet actuator technology with our innovative patented advanced optical position detector design. This combination offers the highest torque per watt and closed loop bandwidths, resulting in the highest positioning speed, precision and reliability available in any compact closed loop galvanometer in today's market.

**The 6200H Series compact design and material selection deliver the fastest step response times and high RMS speeds.** The neodymium-iron boron rotor material allows for exceptional flux densities in the air gap. The intense magnetic field strength combined with the highest rotor and mounted mirror resonant frequencies give the 6200H Series products superior peak accelerations and the fastest step response times possible in galvo technology.

**Instrumentation level accuracy and stability.** Exceptional closed loop positioning accuracy and stability are achieved through Cambridge Technology's patented advanced optical position detector providing instrumentation level accuracy and stability at a very cost effective price.

**The fastest step response times**. Sized for the fastest step response times, high RMS speeds at wide angles and for a broad range of apertures with single and dual axis solutions from 3 to 25mm, the 6200H series provides the broadest range of choices to optimize your system price/performance for any application. It is available in several different connector and cable options to meet specific system requirements.

**Designed for a wide variety of applications.** The 6200H Series is the optimal choice in for laser marking and material processing, biomedical systems, imaging and printing, semiconductor processing, laser projection or any application where speed, size and accuracy are critical to system performance.

**Cambridge Technology, Inc. also offers a variety of integral supporting products for the 6200H Series, including servo electronics, mirrors sets with coating options and X/Y system mounts. Custom single and dual axis optical apertures can be supported, consult the factory for more details.**

# Mechanical and Electrical Specifications

| | 6200H | 6210H | 6215H | 6220H | Units and Tolerances |
|---|---|---|---|---|---|
| Optical Apertures Supported, Two Axis | 3, 5, 6 | 3, 5, 6 | 3, 5 ,6 | 5, 8, 10 | MM |
| Maximum Recommended Inertial Load | 0.13 | 0.2 | 0.28 | 1.25 | gm*cm$^2$, +/-10% |
| **Mechanical Specifications** | | | | | |
| Rated Angular Excursions | ± 20 | ± 20 | ± 20 | ±20 | Degrees |
| Rotor Inertia | 0.013 | 0.018 | 0.028 | 0.125 | gm*cm$^2$, +/-10% |
| Torque Constant | 1.2 | 2.79 | 3.78 | 6.17 | $10^4$ Dyne-cm/Amp, +/-10% |
| Coil Temperature | 110 | 110 | 110 | 110 | °C, Maximum |
| Thermal Resistance, Coil to Case | 3.8 | 2 | 1 | 1 | °C/Watt, Maximum |
| **Electrical Specifications, Drive Armature** | | | | | |
| Coil Resistance | 2.1 | 3.72 | 2.53 | 2.79 | Ohms, +/-10% |
| Coil Inductance | 52 | 109 | 94 | 180 | µH, +/-10% |
| Back EMF Voltage | 20.9 | 48.7 | 66 | 108 | µV/Degree/Second, +/-10% |
| Current, RMS | 2.3 | 2.4 | 4.1 | 3.9 | A, Maximum |
| Current, Peak | 6 | 8 | 20 | 20 | A, Maximum |
| Small Angle Step Response | 130 | 100 | 130 | 200 | µs, with appropriate CTI Y mirror |
| **Electrical Specifications, Position Detector** | | | | | |
| Linearity | 99.9 | 99.9 | 99.9 | 99.9 | %, minimum, over 40° optical |
| Scale Drift | 50 | 50 | 50 | 50 | PPM/°C, Maximum |
| Zero Drift | 15 | 15 | 15 | 15 | Microradians/°C, Maximum |
| Repeatability | 8 | 8 | 8 | 8 | Microradians, Maximum |
| Output Signal, Common Mode | 155 | 155 | 155 | 155 | µA, with AGC Voltage of 30mA, +/-20% |
| Output Signal, Differential Mode | 12 | 12 | 12 | 12 | µA/Deg., with Common Mode of 155µA,± 20% |

| | 6231HC | 6230H | 6240H | Units and Tolerances |
|---|---|---|---|---|
| Optical Apertures Supported, Two Axis | 8,10,12,15 | 8,10,12,15 | 12,15,20,25 | MM |
| Maximum Recommended Inertial Load | 8 | 10 | 24 | gm*cm$^2$, +/- 10% |
| **Mechanical Specifications** | | | | |
| Rated Angular Excursions | ±20 | ±20 | ±20 | Degrees |
| Rotor Inertia | 0.82 | 0.97 | 2.4 | gm*cm$^2$, +/-10% |
| Torque Constant | 1.11 | 1.31 | 2.00 | $10^5$ Dyne-cm/Amp, +/-10% |
| Coil Temperature | 110 | 110 | 110 | °C, Maximum |
| Thermal Resistance, Coil to Case | 1 | 0.80 | 0.62 | °C/Watt, Maximum |
| **Electrical Specifications, Drive Armature** | | | | |
| Coil Resistance | 1.2 | 1.07 | 1.03 | Ohms, +/-10% |
| Coil Inductance | 176 | 173 | 350 | µH, +/-10% |
| Back EMF Voltage | 195 | 229 | 346 | µV/Degree/Second, +/-10% |
| Current, RMS | 5.8 | 7.1 | 8.2 | A, Maximum |
| Current, Peak | 25 | 25 | 25 | A, Maximum |
| Small Angle Step Response | 250 | 250 | 350 | µs, with appropriate CTI Y mirror |
| **Electrical Specifications, Position Detector** | | | | |
| Linearity | 99.9 | 99.9 | 99.9 | %, minimum, over 40° optical |
| Scale Drift | 50 | 50 | 50 | PPM/°C, Maximum |
| Zero Drift | 15 | 15 | 15 | Microradians/°C, Maximum |
| Repeatability | 8 | 8 | 8 | Microradians, Maximum |
| Output Signal, Common Mode | 155 | 155 | 155 | µA, with AGC Voltage of 30mA, +/-20% |
| Output Signal, Differential Mode | 12 | 12 | 12 | µA/Deg., with Common Mode of 155µA, ±20% |

3/11/05

# Moving Magnet Optical Scanner Product Line


# Cambridge Technology Inc.

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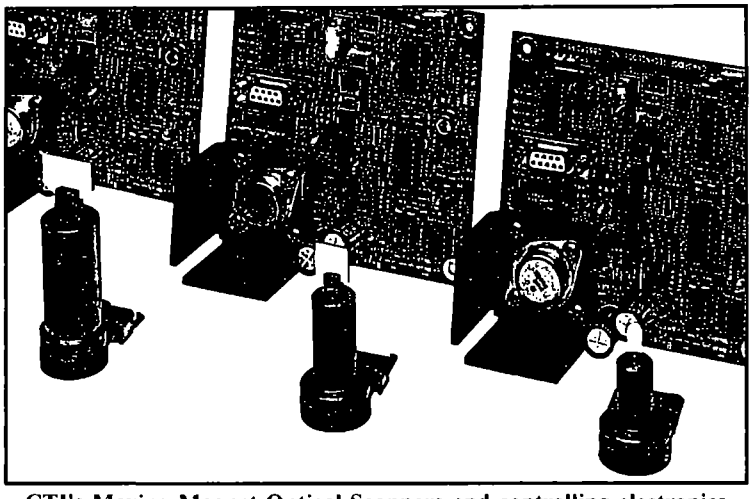


**CTI's Moving Magnet Optical Scanners and controlling electronics**

The product line was initiated with the Model 6800HP scanner. The Model's 6810P and 6850P incorporate technical advances that were originally developed in the 6800HP. Consistent with our moving coil scanner product line, the moving magnet scanners do not use torsion bars. The advantages of this technique are high reliability, wide angle operation and that minimal power is required to achieve or hold any given position.

Cambridge Technology offers a variety of supporting products for the moving magnet scanners including controlling electronics, X/Y Mounts and mirror sets. Custom single and dual axis optical apertures can be supported, consult the factory for details.

## Specifications

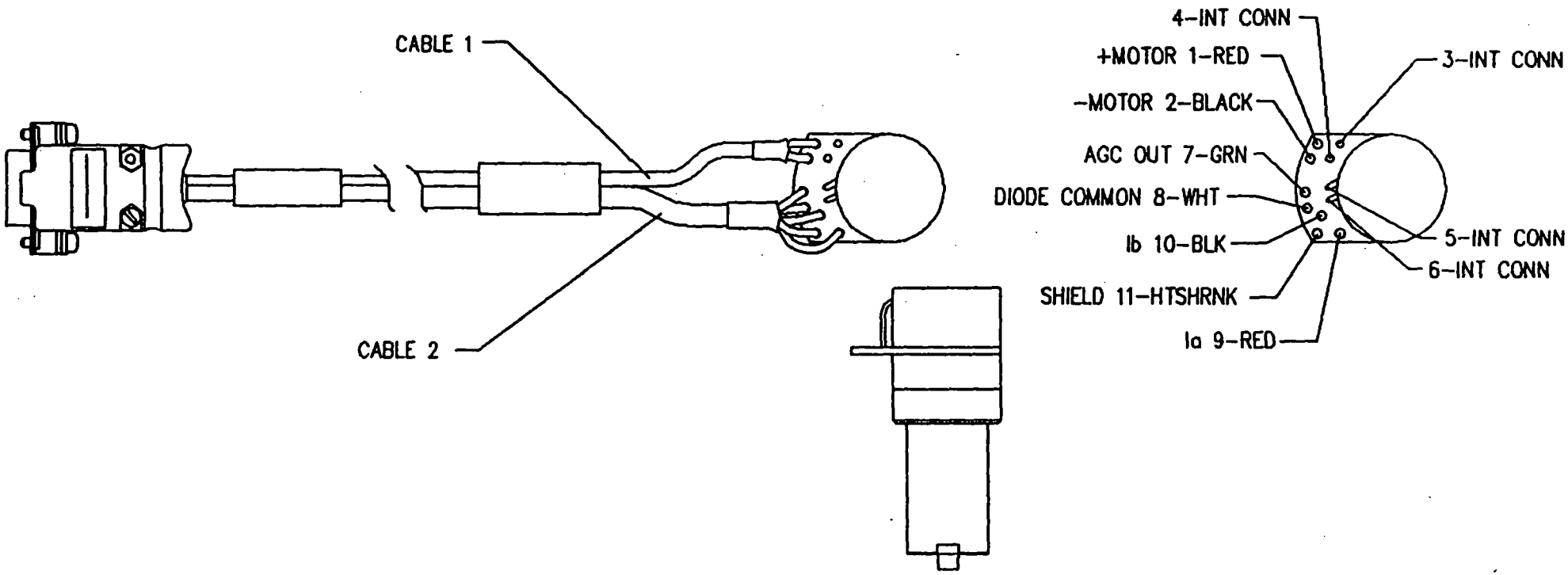
*All Specifications Apply After a **30 Second Warm-up**. All Angles are in Mechanical Degrees*

| | Model | | | |
|---|---|---|---|---|
| **Mechanical and Electrical Specifications** | **6800HP** | **6810P** | **6850P** | **Units and Tolerances** |
| Optical Apertures Supported, Two Axis | 3 | 5 | 10 | MM, Typical |
| Recommended Inertial Load | 0.016 | 0.1 | 0.5 | $GM*CM^2$ |
| Maximum Inertial Load | 0.15 | 1.0 | 5.0 | $GM*CM^2$ |
| **Mechanical Specifications** | | | | |
| Rated Angular Excursions | +/-20 | +/-20 | +/-20 | Degrees |
| Rotor Inertia | 0.016 | 0.1 | 0.5 | $GM*CM^2$, +/-10% |
| Torque Constant | 2.5 | 5.7 | 9.3 | $x10^4$ Dyne-CM/Ampere, +/-10% |
| Coil Temperature | 110 | 110 | 110 | ° C, Maximum |
| Thermal Conductivity, Coil to Case | 4 | 2 | 1.25 | ° C/Watt, Maximum |
| **Electrical Specifications, Drive Armature** | | | | |
| Coil Resistance | 4.0 | 3.4 | 1.4 | Ohms, at 25°, C, +/-10% |
| Coil Inductance | 120 | 250 | 350 | uH, +/-10% |
| Back EMF Voltage | 0.04 | 0.10 | 0.16 | mV/Degree/Second, +/-10% |
| Current, RMS | 1.6 | 2.6 | 5.0 | A, Maximum |
| Current, Peak | 6 | 12 | 25 | A, Maximum |
| Small Angle Step Response | 0.3 | 0.5 | 1.0 | mS, with balanced inertia matched load |
| **Electrical Specifications, Position Detector** | | | | |
| Linearity | 98 | 98 | 98 | %, Minimum, over 40 Degrees |
| Scale Drift | 0.05 | 0.05 | 0.05 | %/° C, Maximum |
| Zero Drift | 0.01 | 0.01 | 0.01 | Degree/° C, Maximum |
| Repeatability | 20 | 20 | 20 | Microradians, typical |
| Output Signal, Common Mode | 58 | 58 | 58 | uA, with AGC Voltage of 10V +/-10% |
| Output Signal, Differential Mode | 1.2 | 1.2 | 1.2 | uA/Degree, with Common Mode of 58uA, +/-10% |

## Features

**Extremely high mirror speed positioning • Wide scanning angle of 80° optical**
**Precision mounting eliminates most optical realignment • Low wobble and jitter • Highest peak accelerations**
**Rugged and reliable design • Minimal power required to achieve and maintain any position**

| REVISION | | | | |
|---|---|---|---|---|
| ECO | REV | DESCRIPTION | APPR | DATE |
| 1453 | B | PINS 9,10 & 11 CORRECTED | PTH | 5/99 |




| HOLE # | CBL # | WIRE COLOR | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | RED | +MOTOR |
| 2 | 1 | BLACK | -MOTOR |
| 3 | — | — | INTERNAL CONNECTION |
| 4 | — | — | INTERNAL CONNECTION |
| 5 | — | — | INTERNAL CONNECTION |
| 6 | — | — | INTERNAL CONNECTION |
| 7 | 2 | GREEN | AGC OUT |
| 8 | 2 | WHITE | DIODE COMMON |
| 9 | 2 | RED | Ia |
| 10 | 2 | BLK | Ib |
| 11 | 2 | HTSHRNK | SHIELD |

USED ON

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.XX±.010
.XXX±.005
( ) INDICATES mm
ANGLES± 0°-30'
SURFACE ROUGHNESS 63
BREAK ALL SHARP EDGES

MATERIAL

FINISH

| | | |
|---|---|---|
| DRN 12/30/98 | PTH | |
| DES | | |
| CHK | | |
| ENG | | |
| APPR | | |

PROJECTION

REVISION B

CAMBRIDGE TECHNOLOGY, INC.
109 SMITH PLACE
CAMBRIDGE, MA. 02138 - USA

# 62XX/6010-8L WIRING DIAGRAM

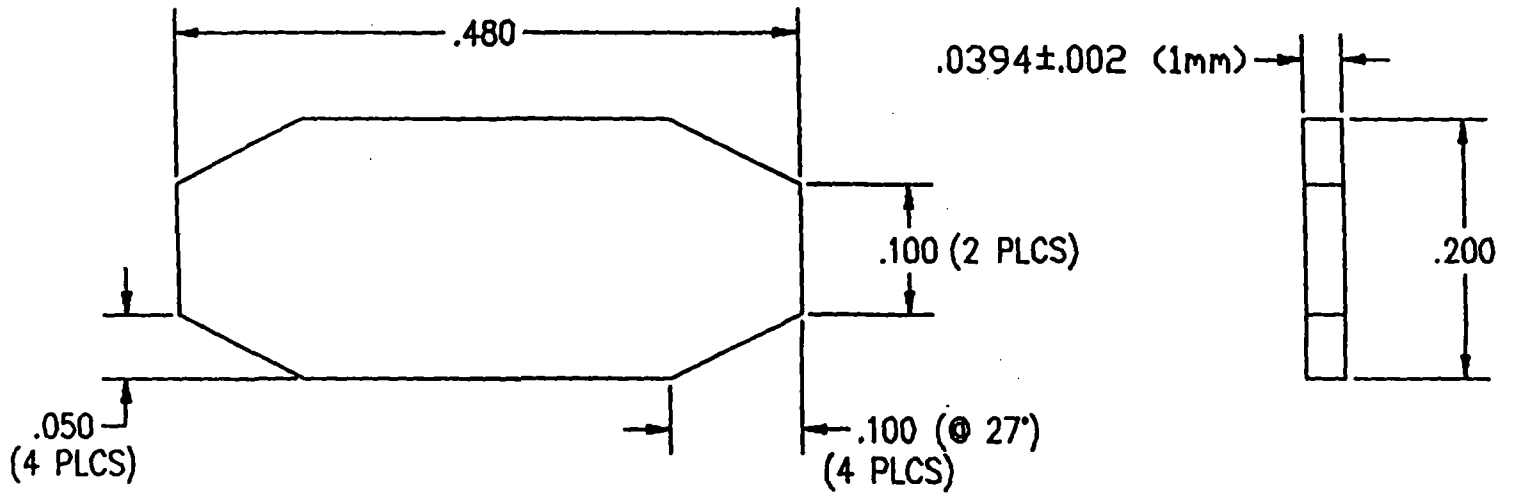
D03762

SCALE : NTS

SHEET 1 OF 1

| REVISION | | | | |
|---|---|---|---|---|
| ECO | REV | DESCRIPTION | APPR | DATE |
| | | | | |

J=2.4MGM*CM2




## MIRROR COATING SUFFIX TABLE

| SUFFIX | DESCRIPTION | WAVELENGTH | THICKNESS | REFLECTIVITY | ∠ OF INCIDENCE | PROT. COATING |
|---|---|---|---|---|---|---|
| -V | DIELECTRIC, VISIBLE | 450-675nm | MULTI-LAYER | 98% MIN | 16.5° TO 65° | |
| -S | PROTECTED SILVER | 400nm-10.6um | 1000 A | | | SiO |
| -A | PROTECTED ALUMINUM | 300-800nm | 1000 A | | | MgF |
| -G | PROTECTED GOLD | >2.0um | 1000 A | | | SiO |
| -Y | DIELECTRIC, YAG | 1.06um | | | | |
| -C | DIELECTRIC, CO2 | 10.6um | | | | |
| -E | EXCIMER | | | | | |

NOTES:

(SUBSTRATE)

1) FLATNESS: LAMBDA/2 @ 633NM
2) SCRATCH/DIG: 60/40
3) MAXIMUM CHAMFER .005
4) POLISH BOTH SIDES

(COATING)

4) REFLECTIVE COATING ON ONE SIDE ONLY PER SUFFIX TABLE.
5) CONSULT CTI ENGINEERING FOR IRRADIANCE POWER RATINGS.

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.XX± .010
.XXX± .005
( ) INDICATES mm
ANGLES± 0°-30'

MATERIAL: FUSED SILICA

FINISH: SEE NOTES

USED ON

| | | |
|---|---|---|
| DRN | 02/03/99 | AMB |
| DES | | |
| CHK | | |
| ENG | | |
| APPR | | |

PROJECTION

REVISION

CAMBRIDGE TECHNOLOGY, INC.
23 ELM ST.
WATERTOWN, MA. 02172 - USA

6200/6210 3mm STANDARD Y
.0394 THK. SUBSTRATE

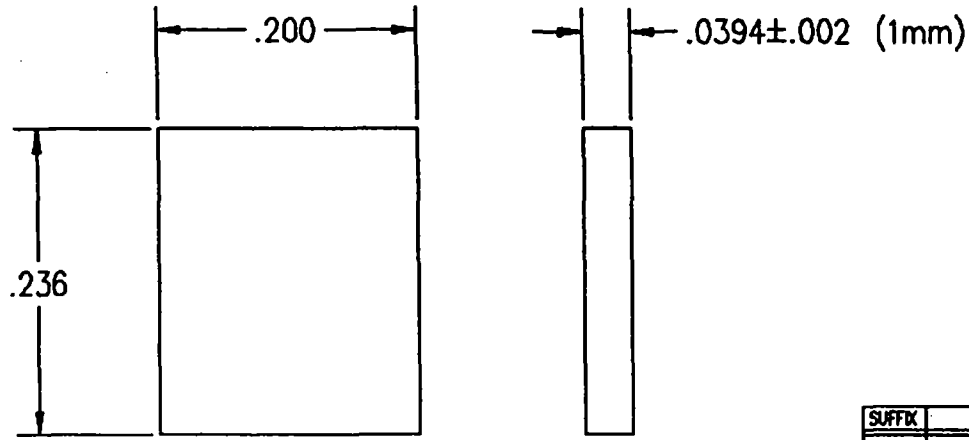
D03783

SCALE NONE

J=2.1MGM*CM2



| REVISION | | | | |
|---|---|---|---|---|
| ECO | REV | DESCRIPTION | APPR | DATE |
| | | | | |




## MIRROR COATING SUFFIX TABLE

| SUFFIX | DESCRIPTION | WAVELENGTH | THICKNESS | REFLECTIVITY | ∠ OF INCIDENCE | PROT. COATING |
|---|---|---|---|---|---|---|
| -V | DIELECTRIC, VISIBLE | 450-675nm | MULTI-LAYER | 98% MIN | 16.5° TO 65° | |
| -S | PROTECTED SILVER | 400nm-10.6um | 1000 A | | | SiO |
| -A | PROTECTED ALUMINUM | 300-800nm | 1000 A | | | MgF |
| -G | PROTECTED GOLD | 2.0um | 1000 A | | | SiO |
| -Y | DIELECTRIC, YAG | 1.06um | | | | |
| -C | DIELECTRIC, CO2 | 10.6um | | | | |
| -E | EXCIMER | | | | | |

NOTES:

(SUBSTRATE)

1) FLATNESS: LAMBDA/2 @ 633NM
2) SCRATCH/DIG: 60/40
3) MAXIMUM CHAMFER .005
4) POLISH BOTH SIDES

(COATING)

4) REFLECTIVE COATING ON ONE SIDE ONLY PER SUFFIX TABLE.
5) CONSULT CTI ENGINEERING FOR IRRADIANCE POWER RATINGS.

USED ON

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.XX± .010
.XXX± .005
( ) INDICATES mm
ANGLES± 0°-30'

MATERIAL
FUSED SILICA

FINISH
SEE NOTES

| | | |
|---|---|---|
| DRN | 02/2/99 | AMB |
| DES | | |
| CHK | | |
| ENG | 02/2/99 | AMB |
| APPR | | |

PROJECTION

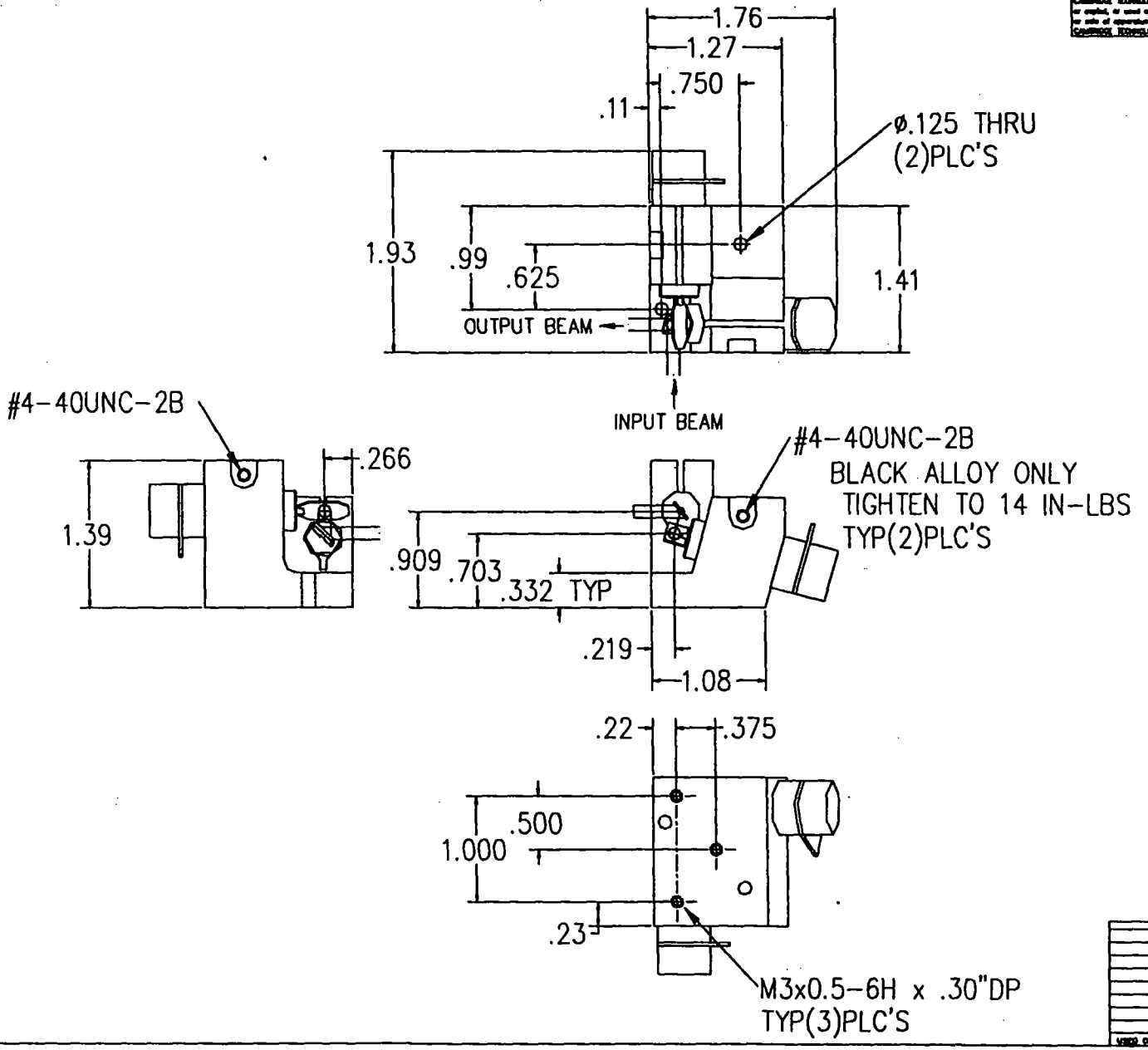
REVISION

CAMBRIDGE TECHNOLOGY, INC.
23 ELM ST.
WATERTOWN, MA. 02172 - USA

6200/6210 3mm STANDARD X .0394 THK SUBSTRATE

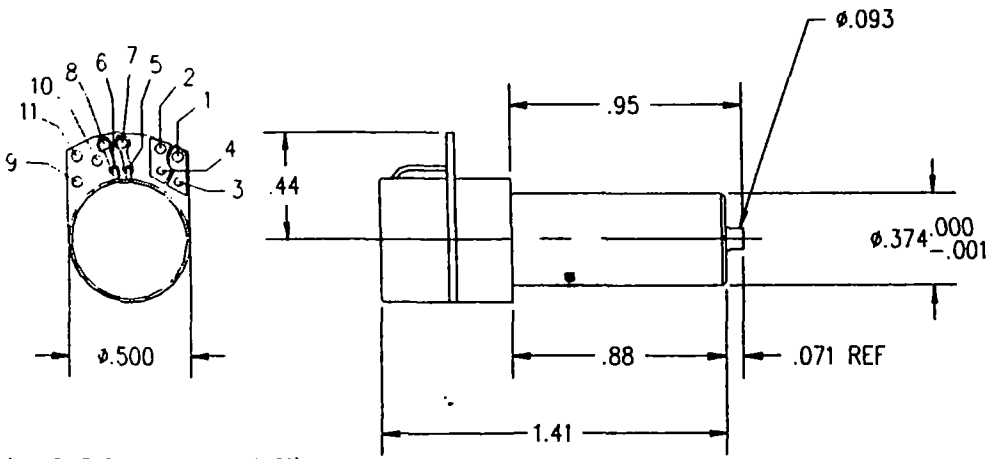
D03782

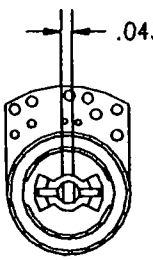
SCALE NONE | SHEET 1 OF 1




| | | | |
|---|---|---|---|
| UNLESS OTHERWISE SPECIFIED TOLERANCES .XX = ±0.010 .XXX = ±0.005 ( ) INDICATES mm ANGLES± 0°-30' SURFACE ROUGHNESS BREAK ALL SHARP EDGES | DRN 02/26/09 | PB | CAMBRIDGE TECHNOLOGY, INC. 100 SMITH PLACE CAMBRIDGE, MA. 02138 - USA |
| MATERIAL | CHK | | 6210 XY INTERFACE RH 3mm ±15' MECH |
| FINISH | ENG | | D03793 |
| USED ON | APPR | | |
| | PROJECTION | | |
| | REVISION A | | SCALE: 1x SHEET 1 OF 1 |

| REVISION | | | | |
|---|---|---|---|---|
| ECO | REV | DESCRIPTION | APPR | DATE |
| – | B | .88 WAS .89, .95 WAS .96 | PTH | 10/98 |
| – | C | $.043^{+.002}_{-.001}$ WAS $.034^{+.002}_{-.001}$, ROT 90° | PTH | 2/99 |




| HOLE # | DESCRIPTION |
|---|---|
| 1 | +MOTOR |
| 2 | -MOTOR |
| 3 | +MOTOR (INTERNAL CONNECTION) |
| 4 | -MOTOR (INTERNAL CONNECTION) |
| 5 | LED1 ANODE (INTERNAL CONNECTION) |
| 6 | LED1 CATHODE (INTERNAL CONNECTION) |
| 7 | AGC OUT |
| 8 | DIODE COMMON |
| 9 | Ia |
| 10 | Ib |
| 11 | SHIELD |

(ALL DIMENSIONS ARE IN INCHES)

MASS = 17 GRAMS

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.XX±.010
.XXX±.005
( ) INDICATES mm
ANGLES± 0'-30'
SURFACE ROUGHNESS 63
BREAK ALL SHARP EDGES

MATERIAL

FINISH

USED ON

DRN
DES
CHK
ENG
APPR
PROJECTION
REVISION C

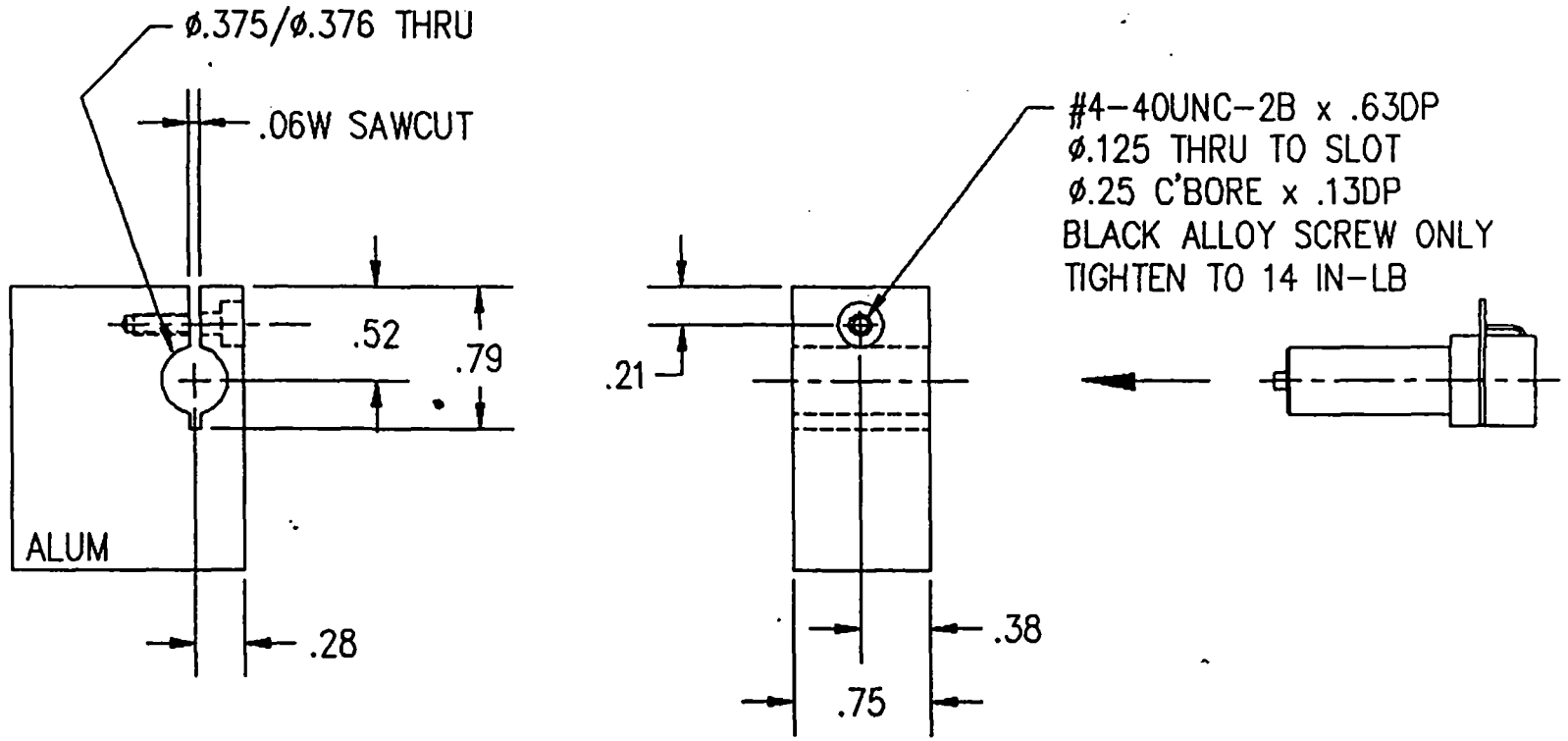
CAMBRIDGE TECHNOLOGY, INC.
109 SMITH PLACE
CAMBRIDGE, MA. 02138 – USA

6210
OUTLINE DWG.

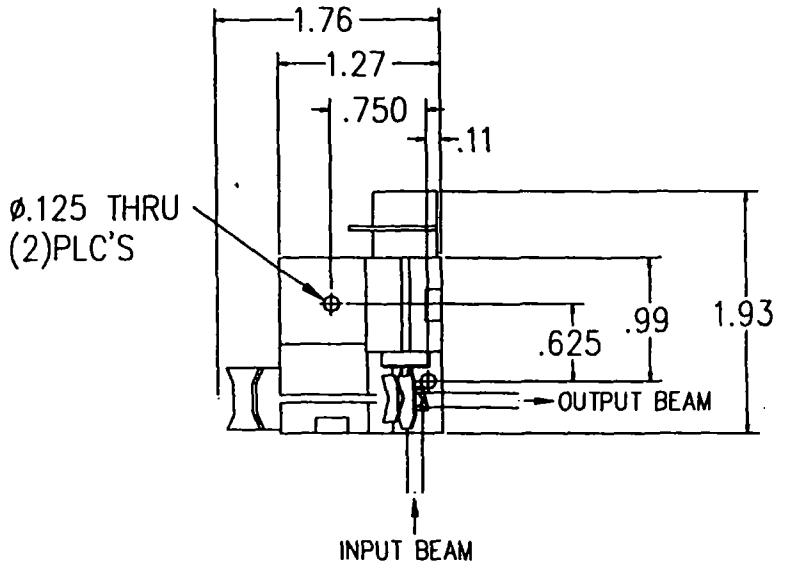
D03628

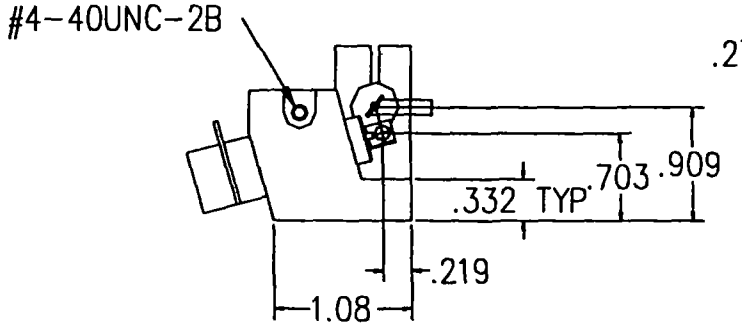
SCALE NONE | SHEET 1 OF 1

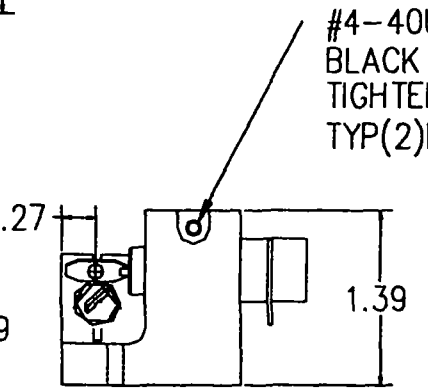
| REVISION | | | | |
|---|---|---|---|---|
| ECO | REV | DESCRIPTION | APPR | DATE |
| | | | | |

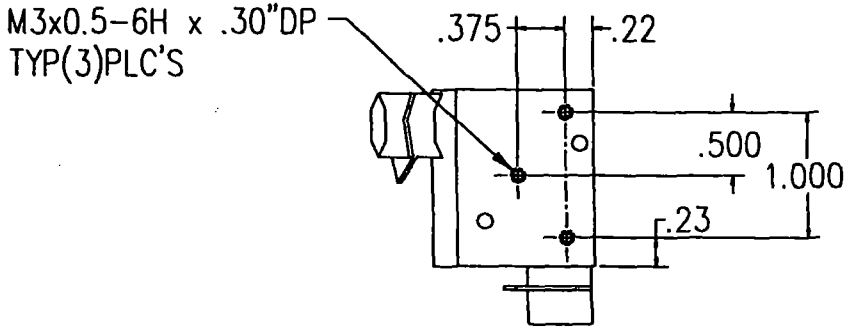



| | | | |
|---|---|---|---|
| UNLESS OTHERWISE SPECIFIED<br>TOLERANCES<br>.XX±.010<br>.XXX±.005<br>( ) INDICATES mm<br>ANGLES± 0°-30' | DRN 02/11/99 | PTH | CAMBRIDGE TECHNOLOGY, INC.<br>109 SMITH PLACE<br>CAMBRIDGE, MA. 02138 - USA |
| | DES | | |
| | CHK | | |
| | ENG | | |
| | APPR | | |
| MATERIAL<br>—— | PROJECTION | | 6210<br>PREFERRED MOUNTING SCHEME |
| FINISH<br>—— | REVISION<br>A | | D03800 |
| | | | SCALE ; NONE — SHEET 1 OF 1 |

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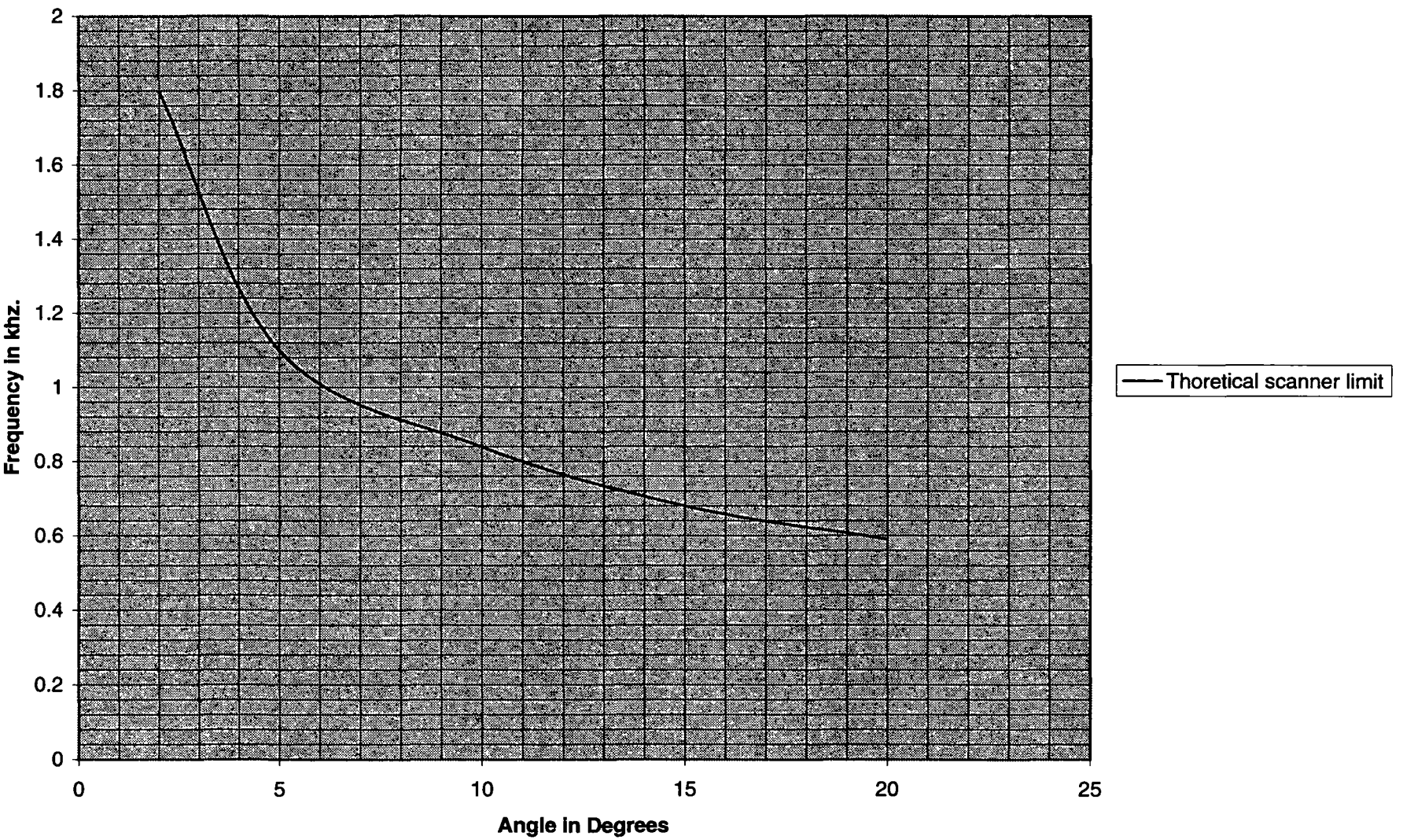
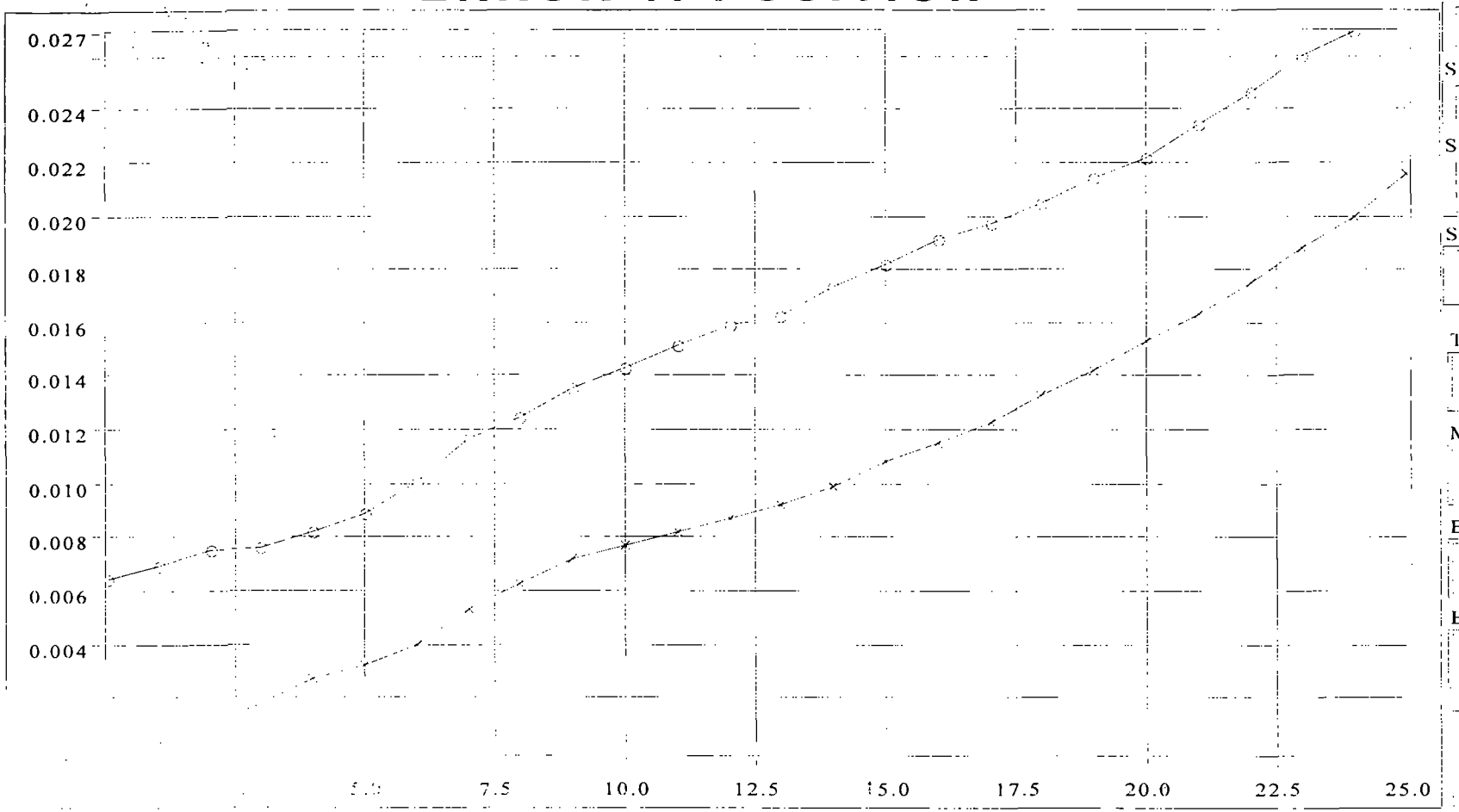
100 SMITH PLACE
CAMBRIDGE, MA. 02138 - USA

6210 XY INTERFACE LH
3mm ±15° MECH

D03807


Thoretical scanner angle limit for sin drive
Frequency in khz.
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
5
10
15
20
25
Angle in Degrees
Thoretical scanner limit

# ERROR v. POSITION




Run Time
0 Hour 6 Minutes

Sample #
51 of 51

Stage Model
CMA-25PP

Stage S/N
012550

Target / Init Position
0.0000

Measured Position
0.0064

ESP Position
0.0000

Error
0.0064

Forward

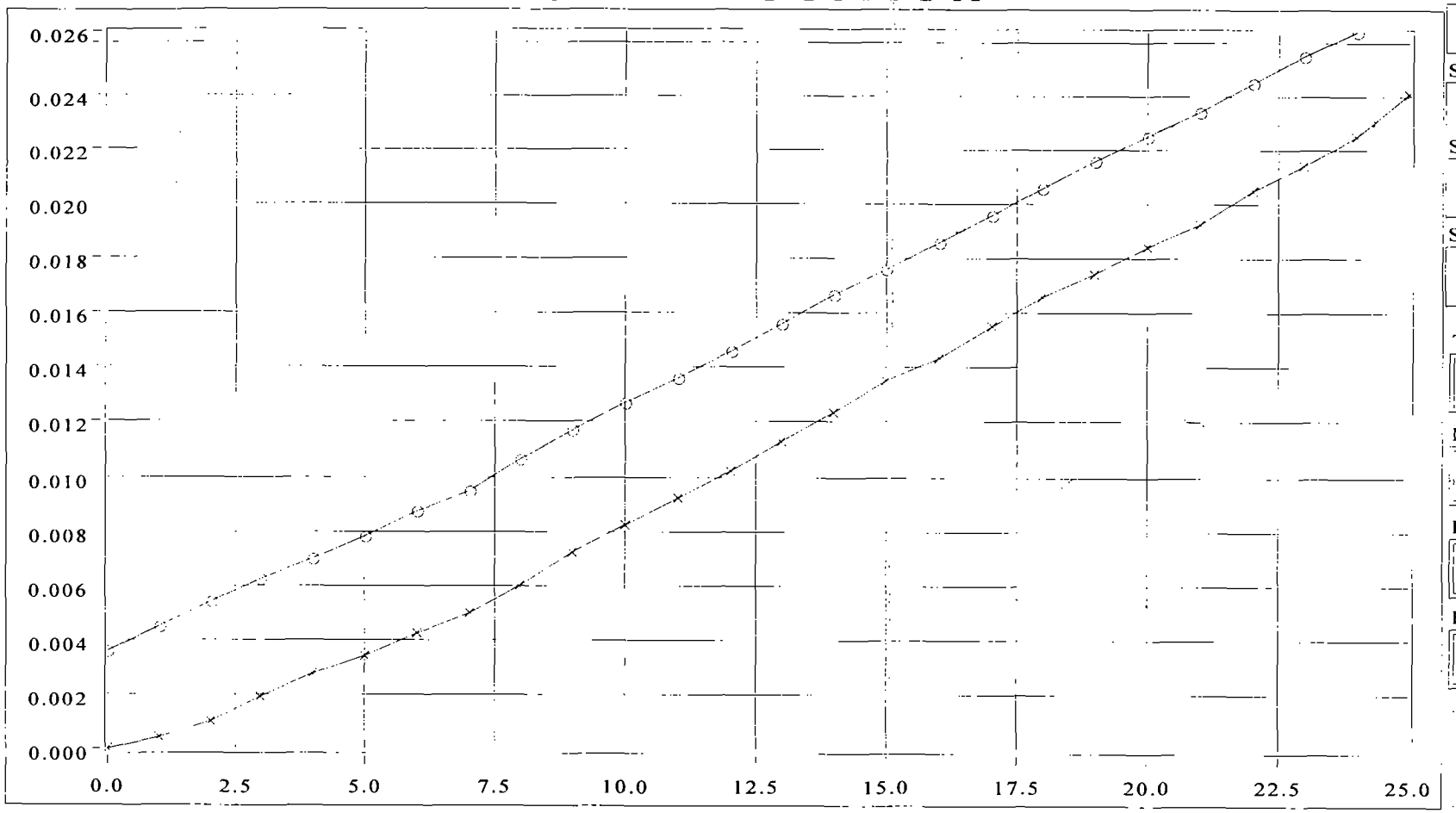
Reverse

Absolute Accuracy
0.0269

0.0067

STOP

# ERROR v. POSITION




Run Time
0 Hour 6 Minutes

Sample #
51 of 51

Stage Model
CMA-25PP

Stage S/N
012553

Target / Init Position
0.0000

Measured Position
0.0036

ESP Position
0.0000

Error
0.0036

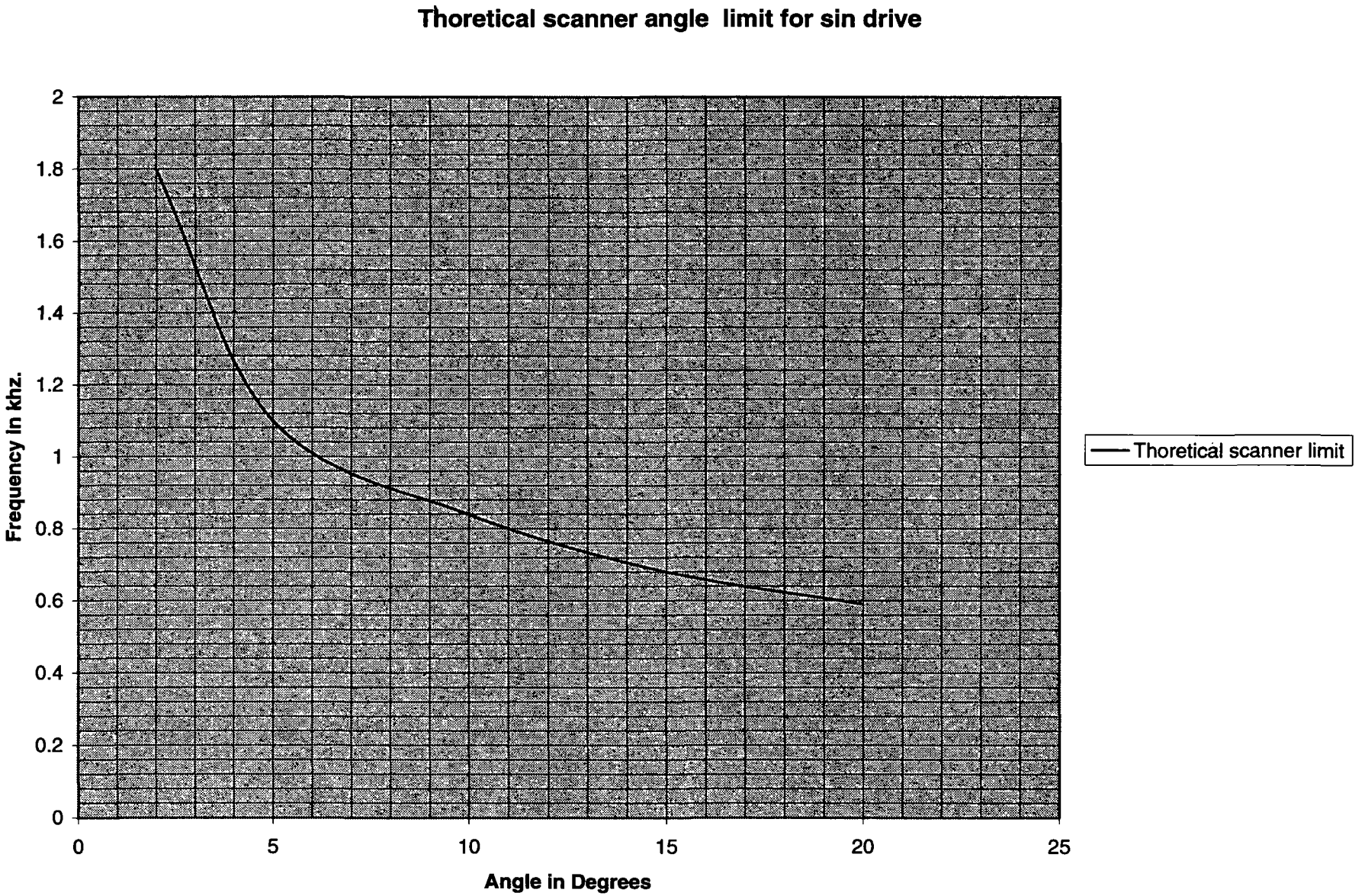
Forward
Reverse

Max Hysteresis
0.0046

Avg Hysteresis
0.0042

Absolute Accuracy
0.0264

STOP


Thoretical scanner angle limit for sin drive
Frequency in khz.
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
5
10
15
20
25
Angle in Degrees
Thoretical scanner limit