

Model K1 CentriMax™

Long-Distance Microscope System

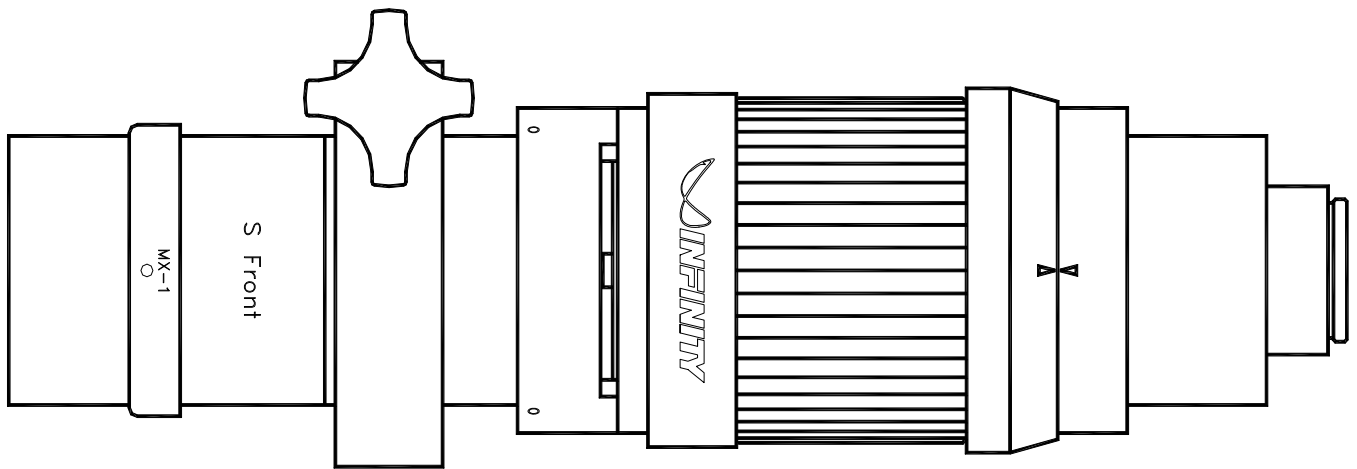


Photo-Optical Company • *Manufacturers of precision optical instruments.*

2530 Frontier Ave., Boulder, CO 80301 • Tel: (303) 440-4544 • Fax: (303) 440-4144 • E-mail: info@infinity-usa.com • Web: www.infinity-usa.com

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Model K1 CentriMax Long-Distance Microscope

General Description. The Model K1 CentriMax is Infinity's premier all-inclusive CentriTel® system long-distance microscope. Due to its incorporated CentriTel system, the Model K1 CentriMax can first be brought to a selected working distance and field of view. Then, by using its internal focus adjustment, the focal depth can be ranged without essential magnification change—from a fixed position. This allows both precise "montaging" and precise dimensional measurements to be made—even at significant distances from objects. Although the instructions now provided are primarily for the manual focusing version, the K1 CentriMax can also be supplied for motorized applications.

The K1 CentriMax provides resolution second only to Infinity's world-standard Model K2/SC Long-Distance Microscope. This makes the K1CentriMax an outstanding value within its performance envelope. Its Main Body is composed of a central focusing section with reference ring and is equipped with either an S or Z Front (see below) to which MX-Series and other infinity-corrected objectives can be attached.

Seven MX-Series objectives attach directly to the Model K1 CentriMax Main Body to obtain seven magnification/working distance range choices, ultimately from 3meters down to 60mm. Once a working distance and field of view are chosen, the focus can be ranged (CentriTel function) without essential magnification change—an exclusive feature. Because all focusing is accomplished internally, the K1 CentriMax maintains constant external dimensions.

The K1 CentriMax comes equipped with the S Front for use with all MX-Series objectives and, by adaptation, for use with any infinity-corrected objectives from Infinity Photo-Optical (Achromid™), Edmund, Mitutoyo, Olympus and Nikon. The magnification factor is then generally 2x the objective's rated power (slightly less with Olympus 180mm standard). However, since the K1 CentriMax cannot "anticipate" the characteristics of each and every microscope objective made by other manufacturers, it may or may not maintain the exact CentriTel function during focal translation when these are used.

A specific Z Front can be ordered which replaces the S Front. The Z Front provides the proper spherical and color corrections when Zeiss ICS™ objectives are used on the K1 CentriMax. It is not recommended to use Zeiss ICS objectives with the S Front, since the incompatibility (which is corrected by using the Z Front) will result in imagery much degraded from optimal.

Formats. The K1 CentriMax is able to cover up to 4/3-in. sensors directly via C- or T-mount adapters (e.g., Nikon or Canon EOS, etc.) Adding an NTX Tube accommodates formats as large as 35mm (24x36mm; 43mm diagonal).

Note: "Flip-mirror" DSLR's must be used with an interfaced NTX Tube because the rear assembly of the K1CentriMax will otherwise come into contact with their mirrors.

Mounts. The K1 CentriMax comes equipped with a Large Mounting Clamp that can slip over the Main Body at any convenient position and be locked in place. It has one central 1/4-20 and two "outboard" M4 taps. The M4 taps are particularly useful for attaching the Mounting Bar. A 24mm spacer tube is common to the Main Body and can be exchanged with various stereomicroscope stand mounts (see Price List). Additional Large Mounting Clamps can be used on the MX-Series objectives themselves, as well as on the Z Front to further secure the system.

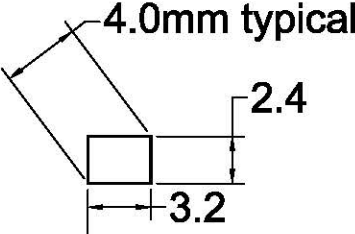
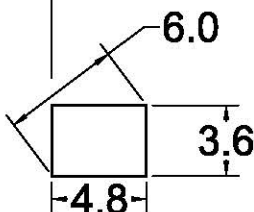
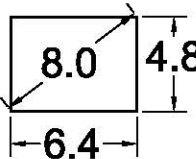
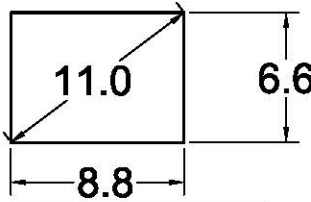
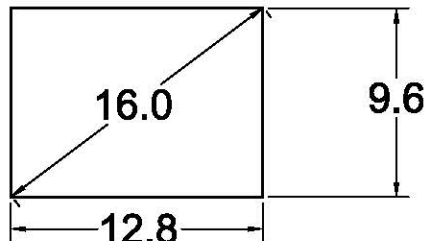
Reference Ring and Focus Lock. Atop the focusing section is a Reference Ring which can be reset by unlocking the three 2-56 setscrews on it. A single 2-56 setscrew on the top of the Reference Ring can be gently set to lock the K1 CentriMax at a particular focus.

Aperture Control. The K1 CentriMax is equipped with a variable iris diaphragm to control aperture and light intensity. Like all microscopes, the K1 CentriMax functions optimally when the iris is activated just enough to cause a noticeable "contrast jump." This point almost always establishes the best overall contrast and usable (as opposed to "statistical") resolution. Likewise, this point is almost always at or near 3/4 of the full aperture and is known in reputable microscope texts as the "Nelson Rule." As the K1 CentriMax is used progressively closer, the aperture may require the "Nelson Rule" to be progressively re-established as well. This constitutes the proper use of the iris diaphragm per "classical" microscopical technique--and the K1 CentriMax is no exception.

Coaxial Illuminator. K1 CentriMax can be used with the Coaxial Illuminator to illuminate highly-reflective, flat object with our IF-3, IF-4, Achrovid™ and infinity-corrected microscope objective made by other manufacturers. The Coaxial Illuminator adapts to the S Front when the Microscope Objective Step Down Adapter is interfaced and attaches directly when the Z Front is used with Zeiss ICS objectives. Suitable microscope objective adapters mount to its bottom side. A 0.312-in. diameter fiber guide (from other sources) fits into the side collector. For objectives up to 10x magnification, Collector I gives best results. Collector II is designed to illuminate objectives of 10x or greater; however, it can also be used reasonably with objectives of 2x and more.

Care and Cleaning. The K1 CentriMax should be treated as the fine optical instrument that it is. Care should be taken to keep dust and dirt off the external lens surfaces. The unit can be cleaned (metal parts only) by a cloth slightly moistened with alcohol. The external optical surfaces should be cleaned only when necessary by a soft cotton swab moistened by an approved optical glass cleaner. If you have further questions, please contact Infinity Photo-Optical Company or an authorized dealer.

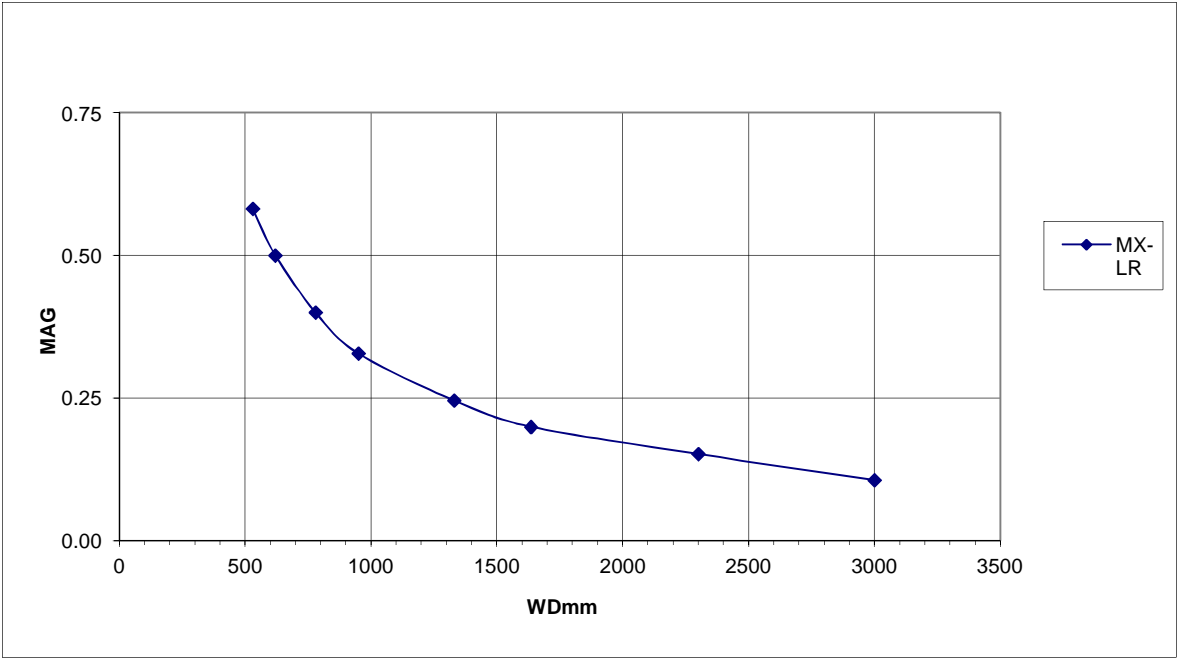
Video Formats

| Format | Factor | |
|--------|--------|--|
| 1/4" | 0.5 |  |
| 1/3" | 0.75 |  |
| 1/2" | 1.0 |  |
| 2/3" | 1.375 |  |
| 1" | 2.0 |  |

Unless otherwise noted all data is given for 1/2" camera sensors. For FOV or magnification in other sensor sizes use the factors listed. For example, a FOV of 25mm listed for a 1/3" camera would be $25 \times 0.75 = 18.75\text{mm}$.

K1 CentriMax™ with MX-LR Objective

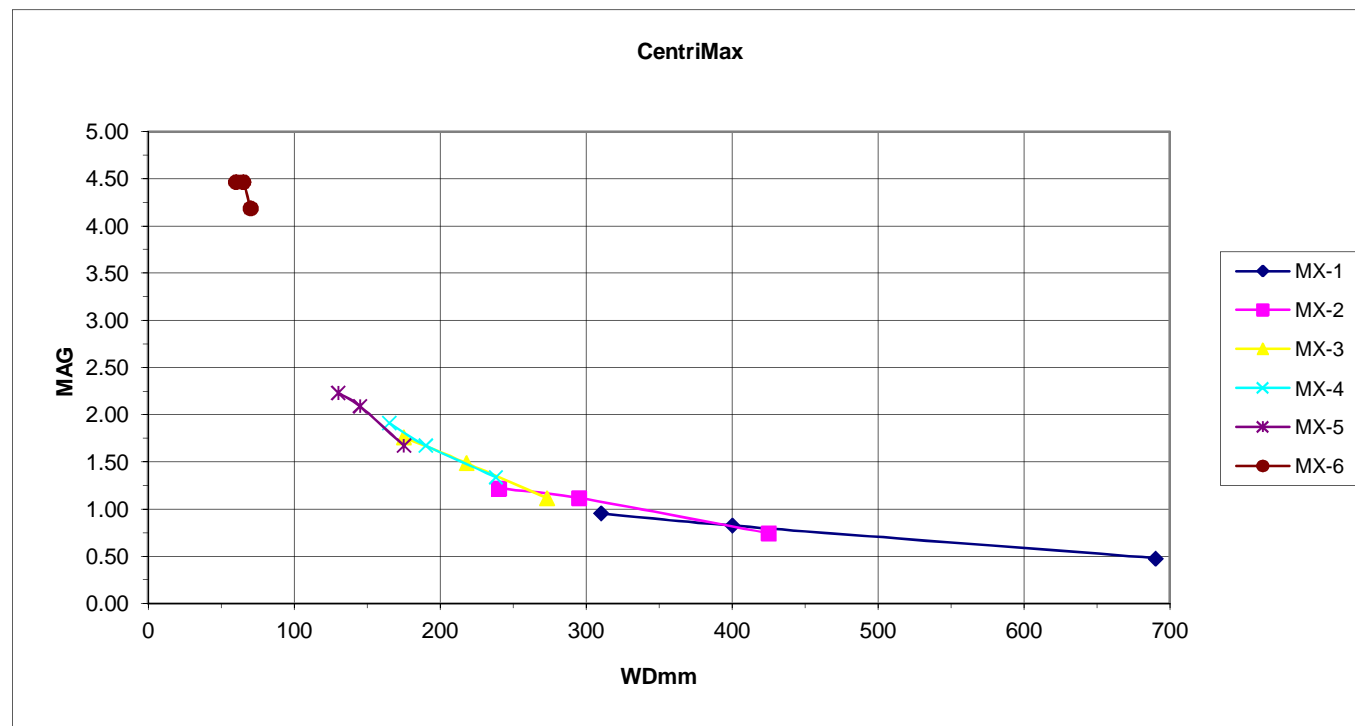
| K1 CentriMax with MX-LR Objective | | | | | | | | | |
|-----------------------------------|-------|------|------|------|------|------|------|------|------|
| | | Far | | | | | | | Near |
| | WDmm | 3000 | 2300 | 1635 | 1330 | 950 | 780 | 620 | 530 |
| | MAG | 0.11 | 0.15 | 0.20 | 0.25 | 0.33 | 0.40 | 0.50 | 0.58 |
| | FOVmm | 60 | 42 | 32 | 26 | 19.5 | 16 | 12.8 | 11 |



Field of View for 1/2-in. CCD Format camera.

Model K1 CentriMax™ OPTICAL DATA

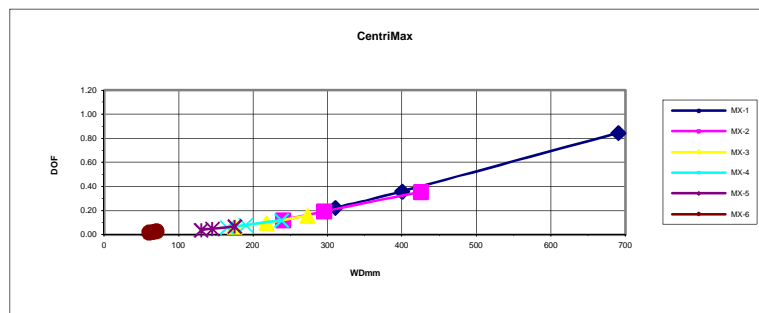
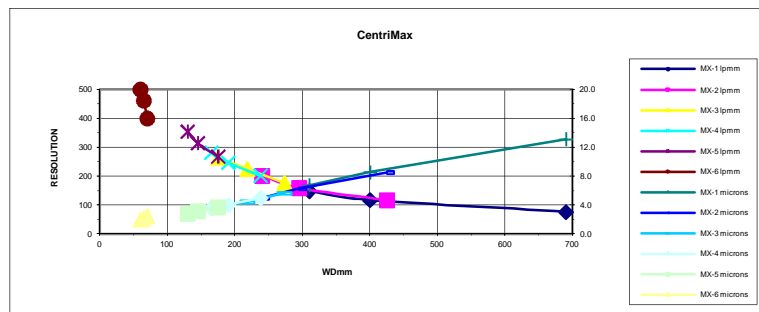
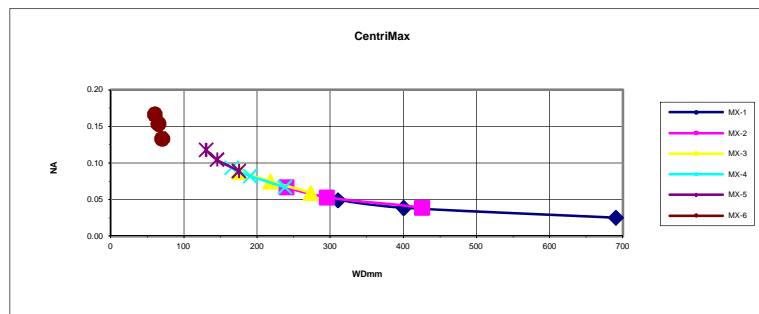
| CentriMax | Objective | MX-1 | | | MX-2 | | | MX-3 | | | MX-4 | | | MX-5 | | | MX-6 | | |
|-----------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | Near | Mid | Far | Near | Mid | Far | Near | Mid | Far | Near | Mid | Far | Near | Mid | Far | Near | Mid | Far |
| | WDmm | 310 | 400 | 690 | 240 | 295 | 425 | 175 | 218 | 273 | 165 | 190 | 238 | 130 | 145 | 175 | 60 | 65 | 70 |
| | MAG | 0.96 | 0.83 | 0.48 | 1.22 | 1.12 | 0.74 | 1.76 | 1.49 | 1.12 | 1.91 | 1.68 | 1.34 | 2.23 | 2.09 | 1.68 | 4.47 | 4.47 | 4.19 |
| | FOVmm | 7.0 | 8.1 | 14.0 | 5.5 | 6.0 | 9.0 | 3.8 | 4.5 | 6.0 | 3.5 | 4.0 | 5.0 | 3.0 | 3.2 | 4.0 | 1.5 | 1.5 | 1.6 |



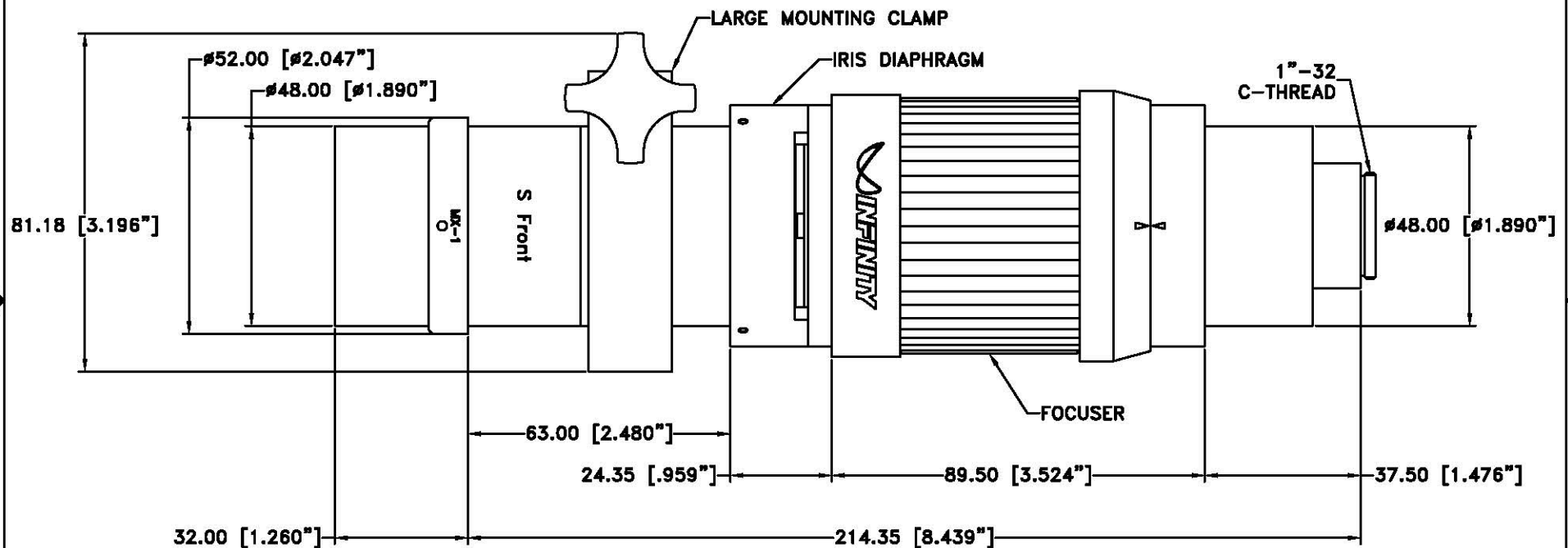
Field of View for 1/2-in. CCD Format camera.

Model K1 CentriMax™ OPTICAL RESOLUTION DATA

| CentriMax | Objective | MX-1 | | | MX-2 | | | MX-3 | | | MX-4 | | | MX-5 | | | MX-6 | | |
|-----------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| | | Near | Mid | Far | Near | Mid | Far | Near | Mid | Far | Near | Mid | Far | Near | Mid | Far | Near | Mid | Far |
| | WDmm | 310 | 400 | 690 | 240 | 295 | 425 | 175 | 218 | 273 | 165 | 190 | 238 | 130 | 145 | 175 | 60 | 65 | 70 |
| | MAG | 0.96 | 0.83 | 0.48 | 1.22 | 1.12 | 0.74 | 1.76 | 1.49 | 1.12 | 1.91 | 1.68 | 1.34 | 2.23 | 2.09 | 1.68 | 4.47 | 4.47 | 4.19 |
| | NA | 0.05 | 0.04 | 0.03 | 0.07 | 0.05 | 0.04 | 0.09 | 0.08 | 0.06 | 0.09 | 0.08 | 0.07 | 0.12 | 0.10 | 0.09 | 0.17 | 0.15 | 0.13 |
| | Resolution (lpmm) | 149 | 117 | 76 | 202 | 160 | 117 | 265 | 225 | 177 | 281 | 247 | 202 | 354 | 315 | 268 | 500 | 462 | 400 |
| | Resolution (microns) | 6.7 | 8.6 | 13.1 | 5.0 | 6.3 | 8.5 | 3.8 | 4.4 | 5.6 | 3.6 | 4.0 | 5.0 | 2.8 | 3.2 | 3.7 | 2.0 | 2.2 | 2.5 |
| | DOFmm | 0.22 | 0.36 | 0.84 | 0.12 | 0.19 | 0.36 | 0.07 | 0.10 | 0.16 | 0.06 | 0.08 | 0.12 | 0.039 | 0.049 | 0.068 | 0.019 | 0.023 | 0.030 |



| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |
| | | | | |



NOTE:

1. CENTRIMAX SHOWN WITH MX-1 OBJECTIVE.

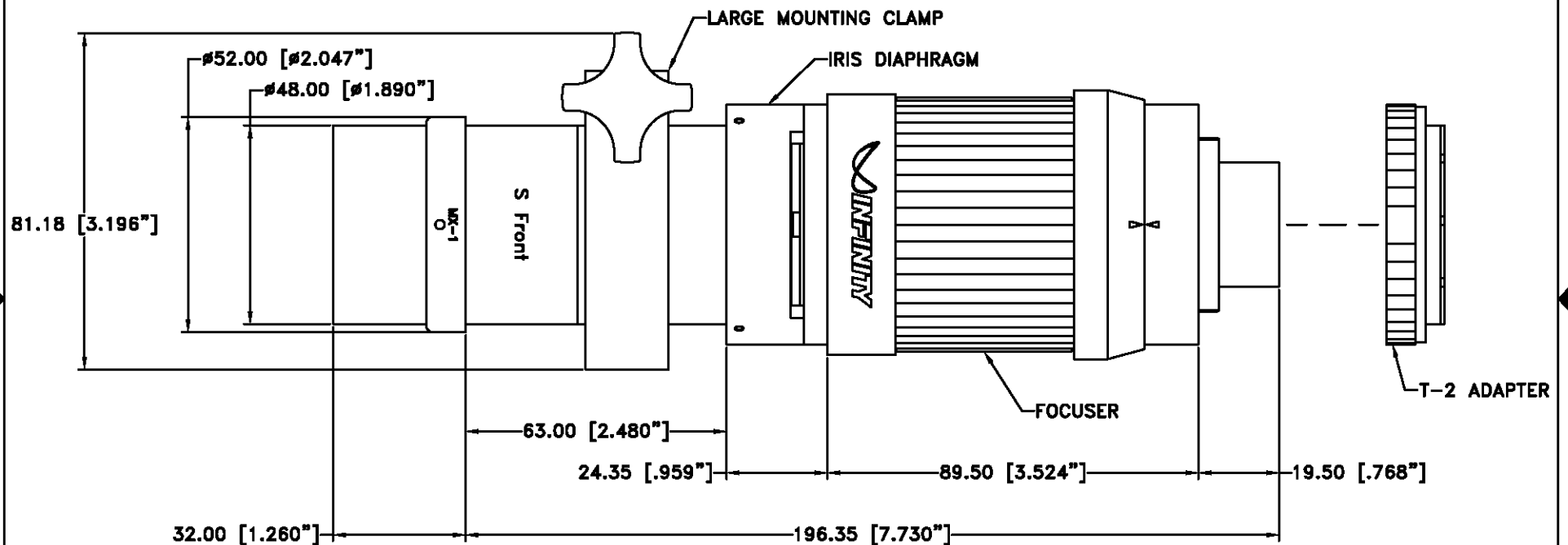
ALL DIM ARE mm
[Inches] AND ARE FOR
REFERENCE ONLY AND
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CENTRIMAX

| | | | | |
|-------------------|------------|----------|--------------|----------|
| Date: 01/02/12 MB | SIZE B | FSCM NO. | DWG NO. - | REV - |
| Modified: | SCALE NONE | - | SHEET 1 OF 1 | |

| REVISIONS | | | | |
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NOTE:

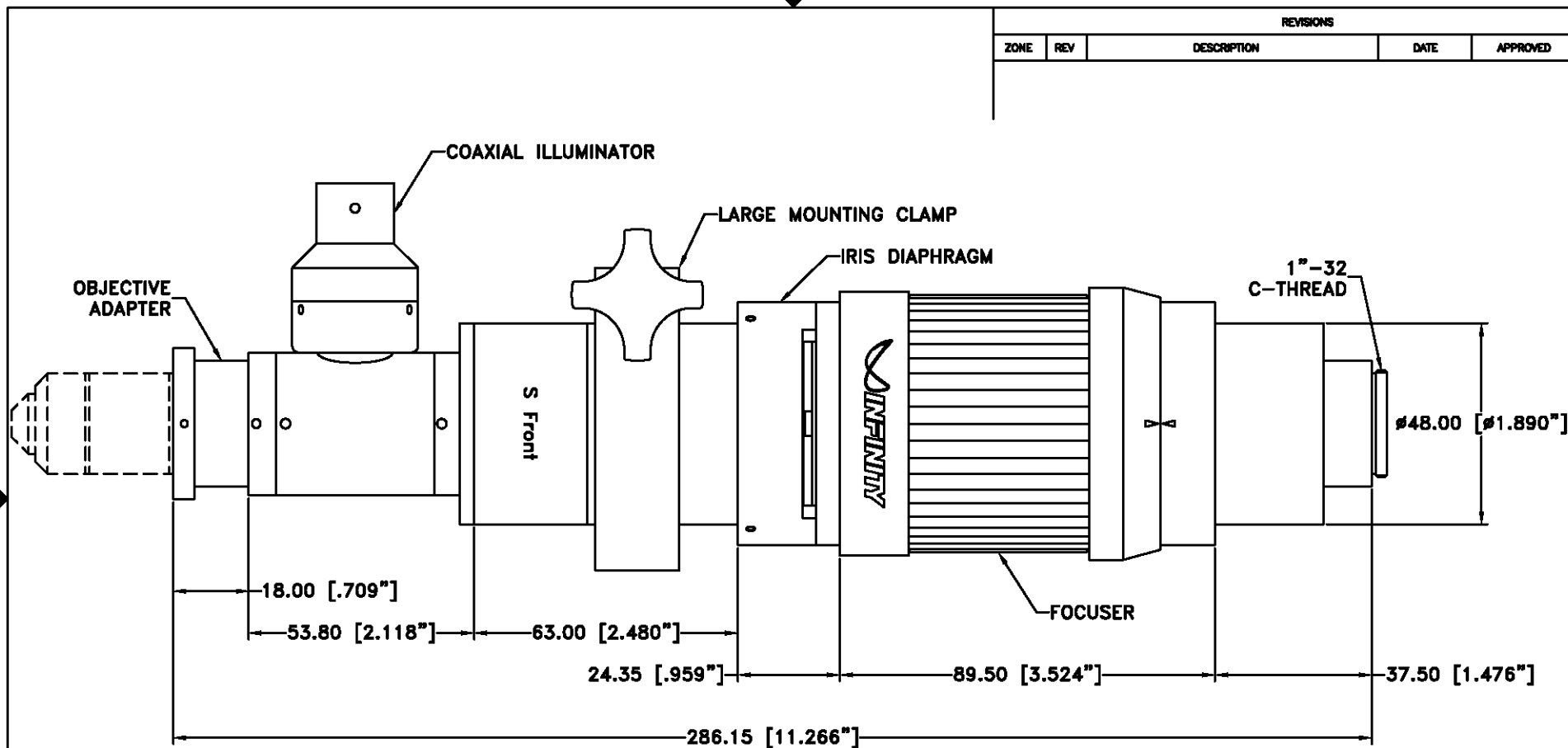
1. CENTRIMAX SHOWN WITH MX-1 OBJECTIVE.

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CENTRIMAX w/T-2 ADAPTER

| | | | | |
|-------------------|------------|----------|--------------|-----|
| Date: 01/02/12 MB | SIZE B | PSCM NO. | DWG NO. | REV |
| Modified: | SCALE NONE | - | SHEET 1 OF 1 | - |



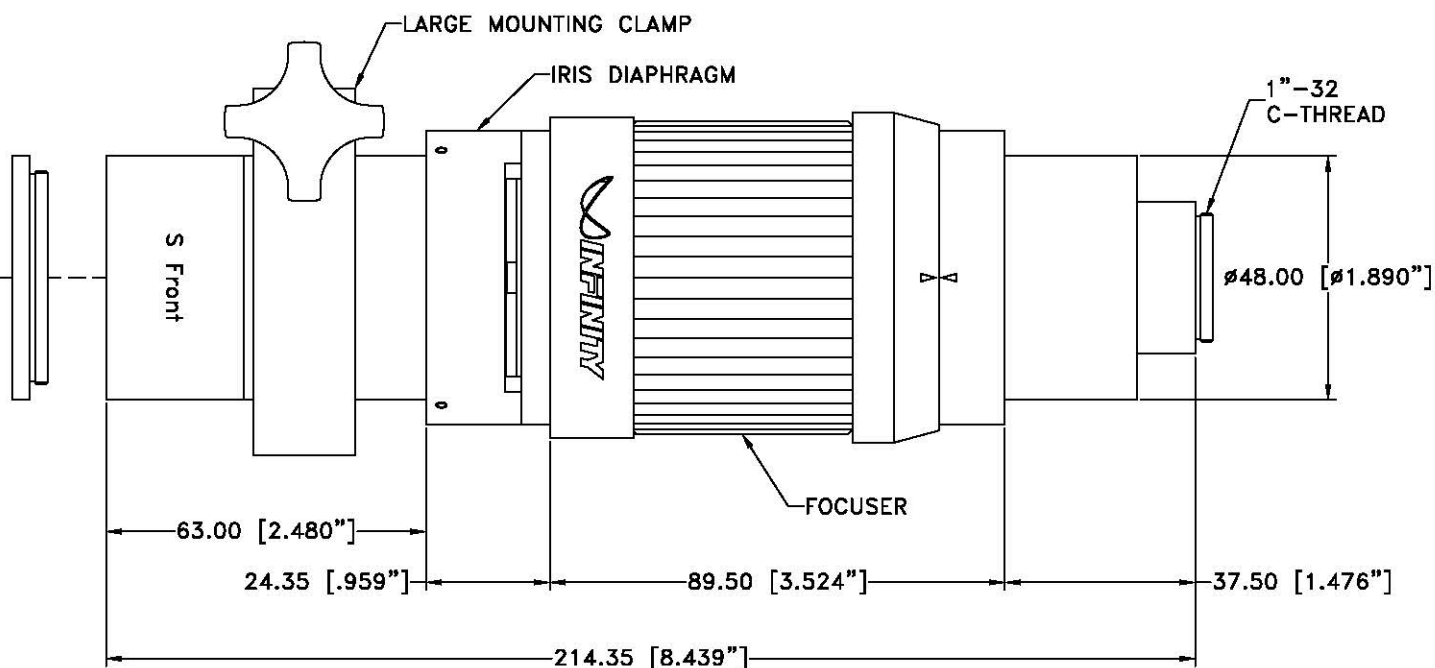
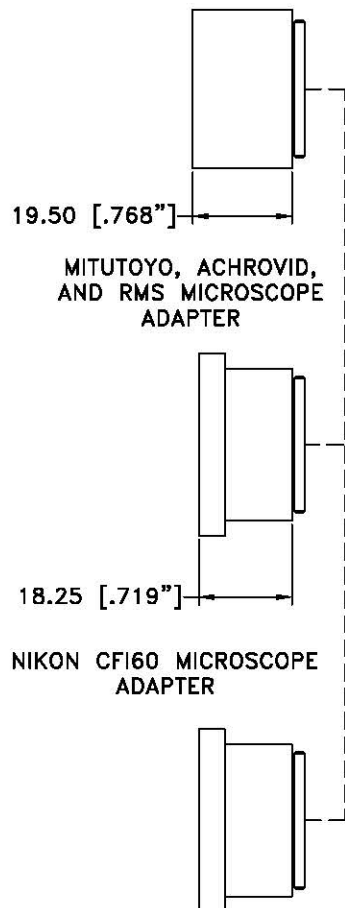
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NOTE:

1. CENTRIMAX SHOWN WITH INFINITY CORRECTED OBJECTIVE.

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| | | CENTRIMAX w/COAXIAL ILLUMINATOR | | |
| Date: 01/02/12 MB | SIZE B | PSCM NO. | DWG NO. - | REV - |
| Modified: | SCALE NONE | - | SHEET 1 OF 1 | |

IF OBJECTIVES



NOTE:

1. CENTRIMAX SHOWN WITH INFINITY CORRECTED OBJECTIVE.

| REVISIONS | | | | |
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| ZONE | REV | DESCRIPTION | DATE | APPROVED |

ALL DIM ARE mm
[Inches] AND ARE FOR
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ARE SUBJECT TO
CHANGE.

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MODEL K1 CENTRIMAX FRONT OBJECTIVE ADAPTER OPTIONS

Date: 01/02/12 MB

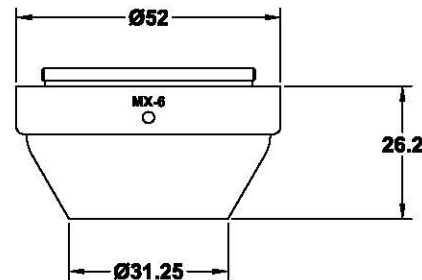
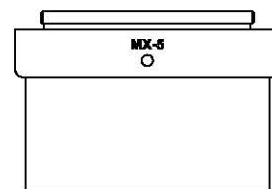
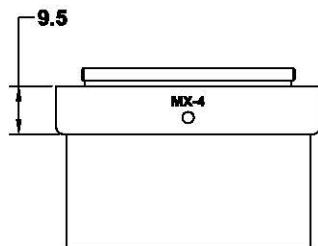
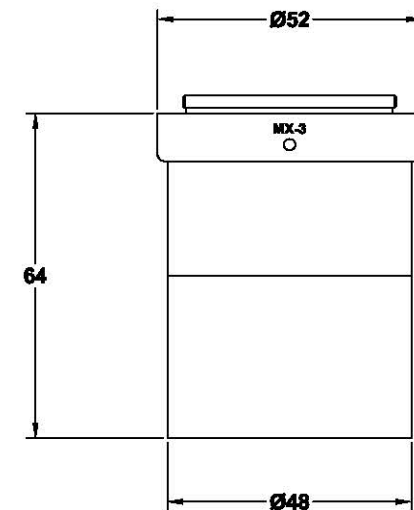
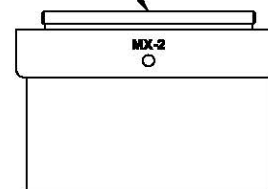
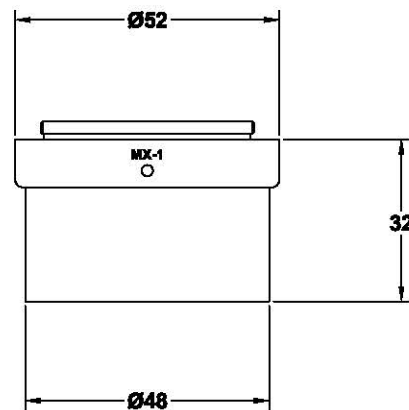
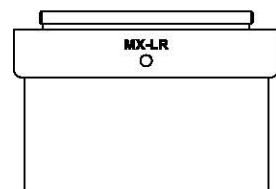
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REVISIONS

| ZONE | REV | DESCRIPTION | DATE | APPROVED |
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M42 TYPICAL



NOTES:

1. SURFACE ANODIZED BLACK.
2. DIMS. ARE IN MILLIMETERS.
3. SEE ATTACHED TABLES AND GRAPHS FOR SPECIFICATIONS.

ALL DIM ARE mm
[Inches] AND ARE FOR
REFERENCE ONLY AND
ARE SUBJECT TO
CHANGE.

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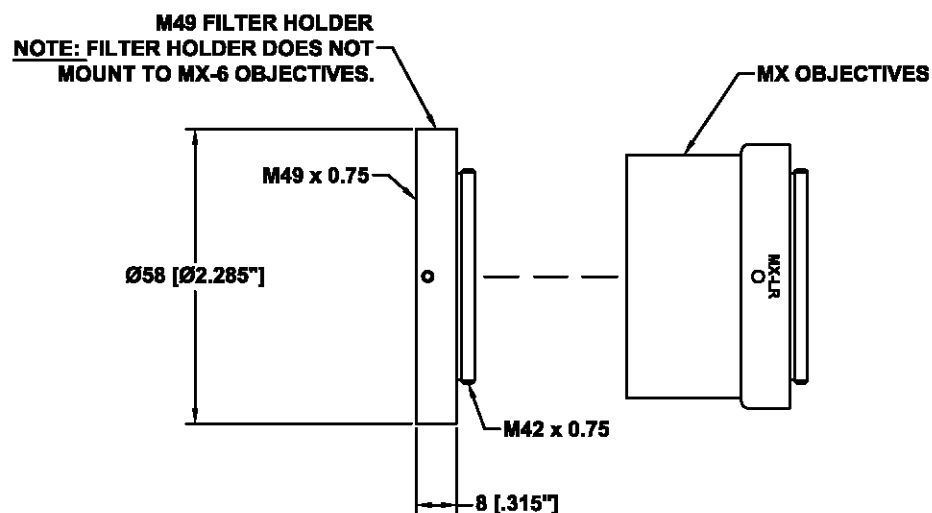
MX OBJECTIVES

Date: 03/04/02 MB

Modified: 03/07/12 MB

| SIZE | FSCM NO. | DWG NO. | REV |
|-------|----------|---------|-----|
| B | | - | B |
| SCALE | SHEET | | |
| NONE | 1 OF 1 | | |

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |
| | | | | |



NOTES:

1. MX-LR USED AS EXAMPLE.
2. FILTER CAN BE MOUNTED TO THE FOLLOWING OBJECTIVES: MX-LR, MX-1 TO MX-5.
3. DIMS. ARE IN MILLIMETERS.
4. SEE ATTACHED TABLES AND GRAPHS FOR SPECIFICATIONS.

ALL DIM ARE mm
[Inches] AND ARE FOR
REFERENCE ONLY AND
ARE SUBJECT TO
CHANGE.

Date: 06/25/12 MB

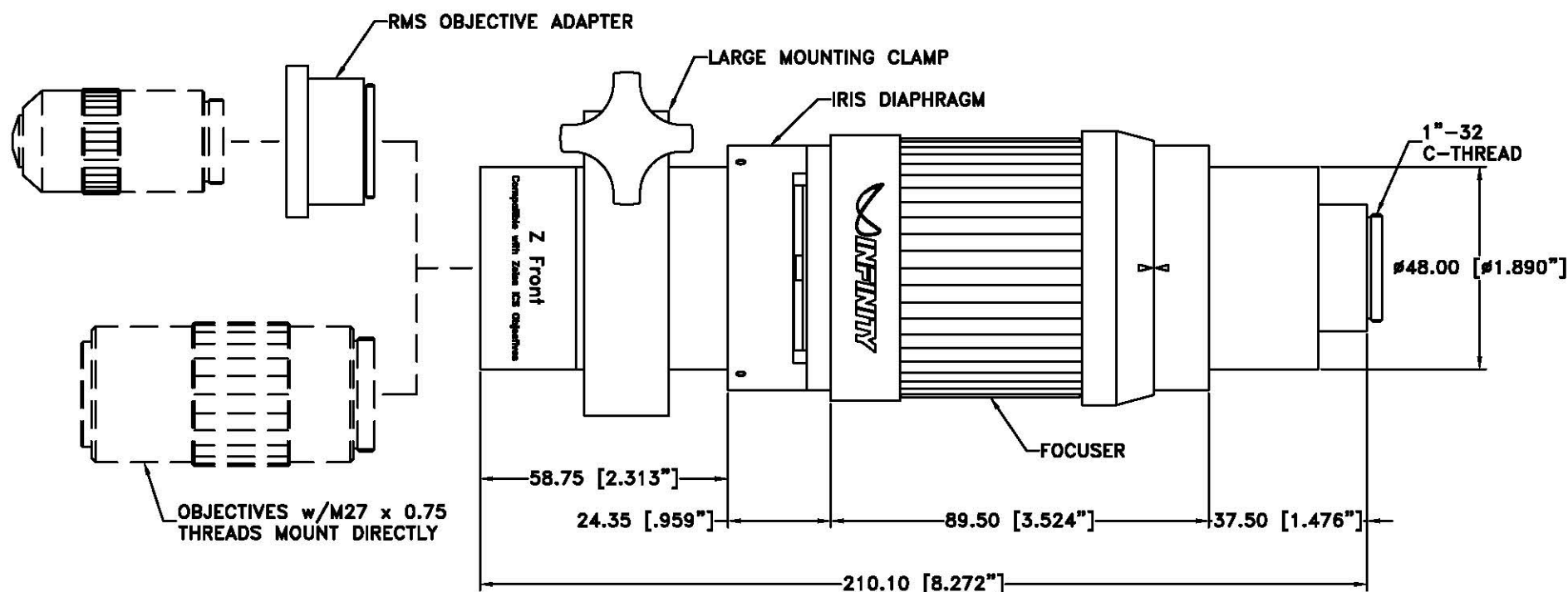
Modified:

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MX OBJECTIVE WITH M49 FILTER HOLDER

| SIZE | FSCM NO. | DWG NO. | REV |
|-------|----------|---------|--------------|
| B | | - | - |
| SCALE | NONE | - | SHEET 1 OF 1 |

| REVISIONS | | | | |
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| ZONE | REV | DESCRIPTION | DATE | APPROVED |
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ALL DIM ARE mm
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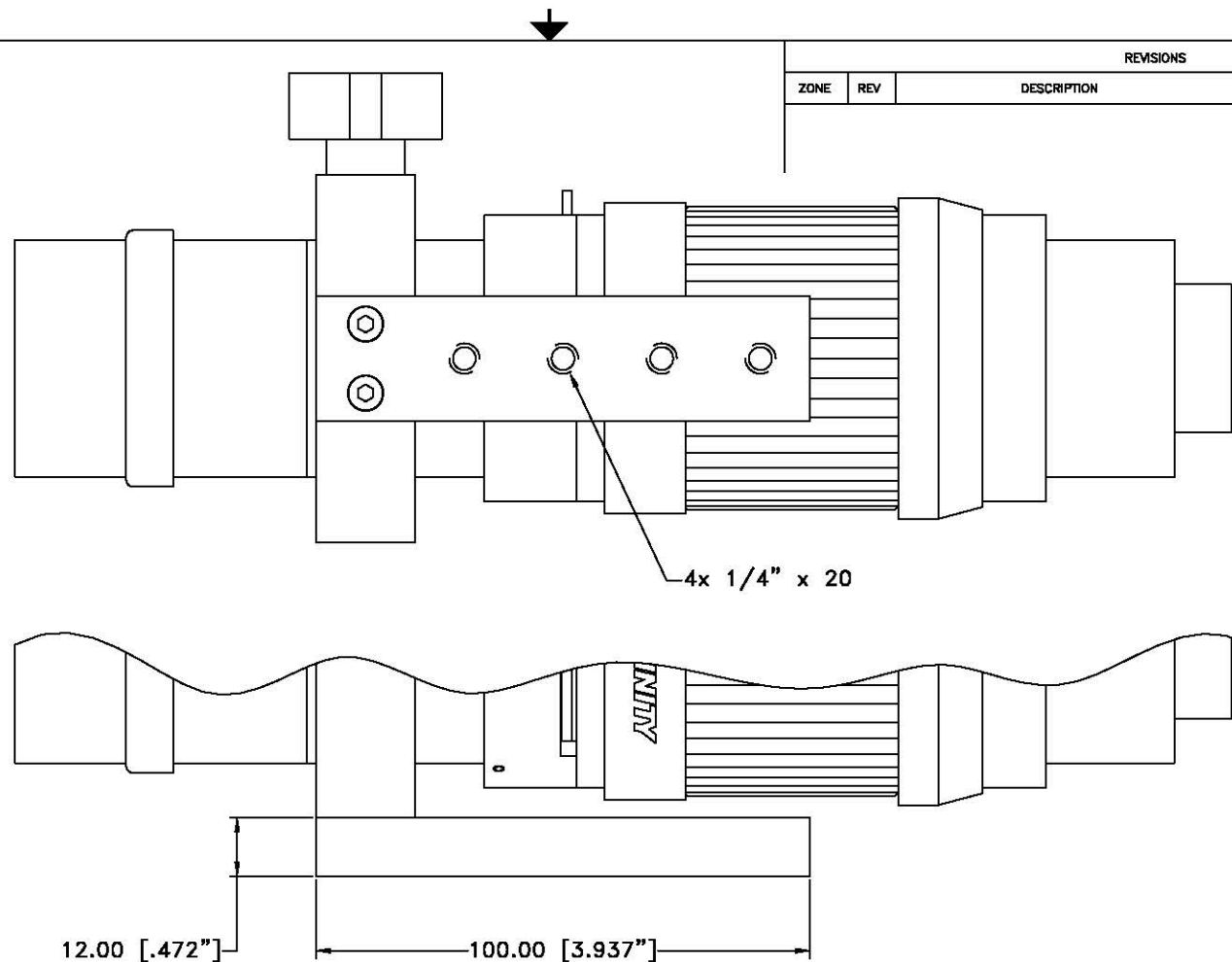
Date: 01/02/12 MB

Modified:

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**CENTRIMAX™ WITH Z FRONT FOR
ZEISS ICS OBJECTIVE**

| SIZE | PSCM NO. | DWG NO. | REV |
|-------|----------|---------|--------------|
| B | | - | - |
| SCALE | NONE | - | SHEET 1 OF 1 |



| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |

NOTE:

1. CENTRIMAX SHOWN WITH MX-1 OBJECTIVE AND MOUNTING BAR.

ALL DIM ARE mm
[Inches] AND ARE FOR
REFERENCE ONLY AND
ARE SUBJECT TO
CHANGE.

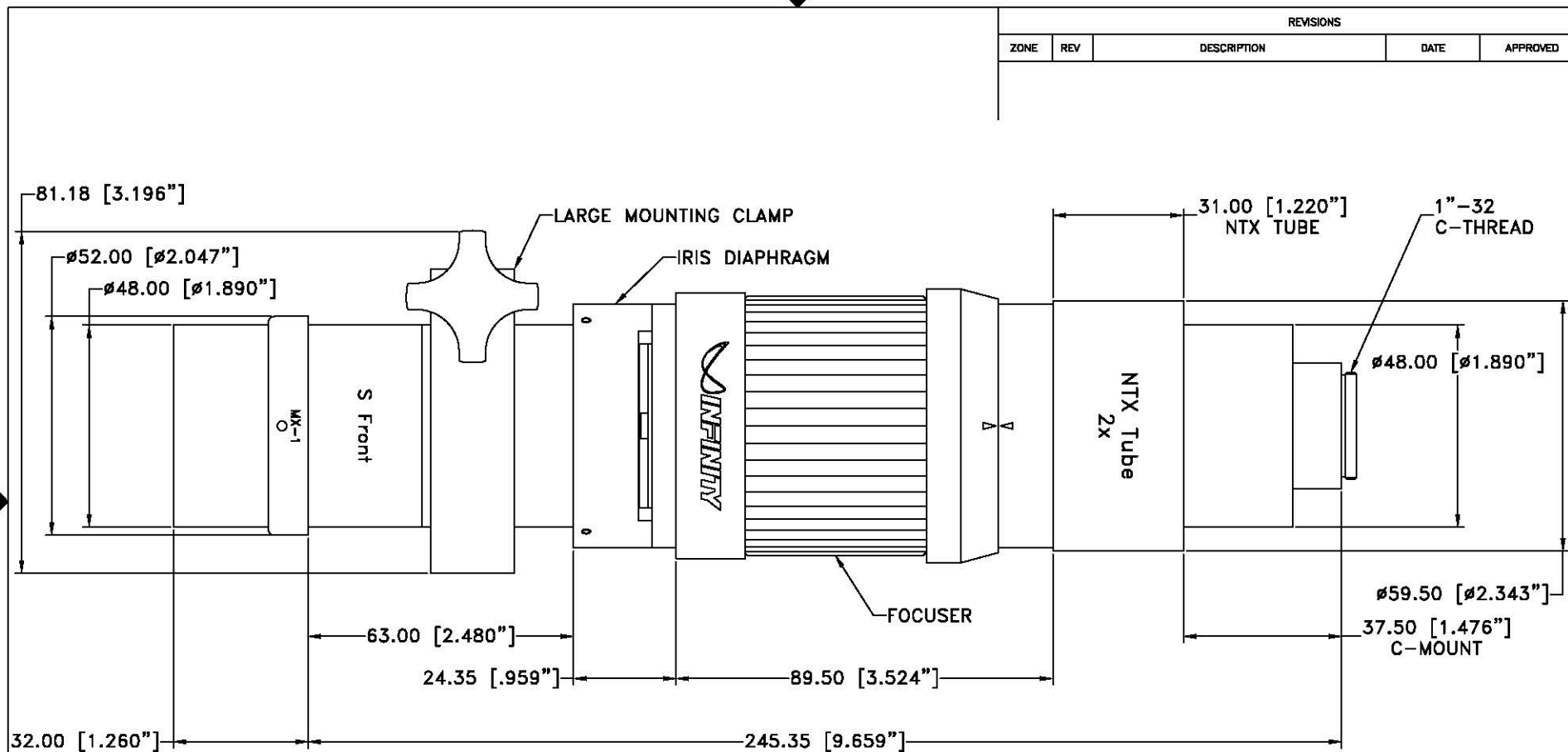
Date: 01/02/12 MB

Modified:

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CENTRIMAX w/MOUNTING BAR

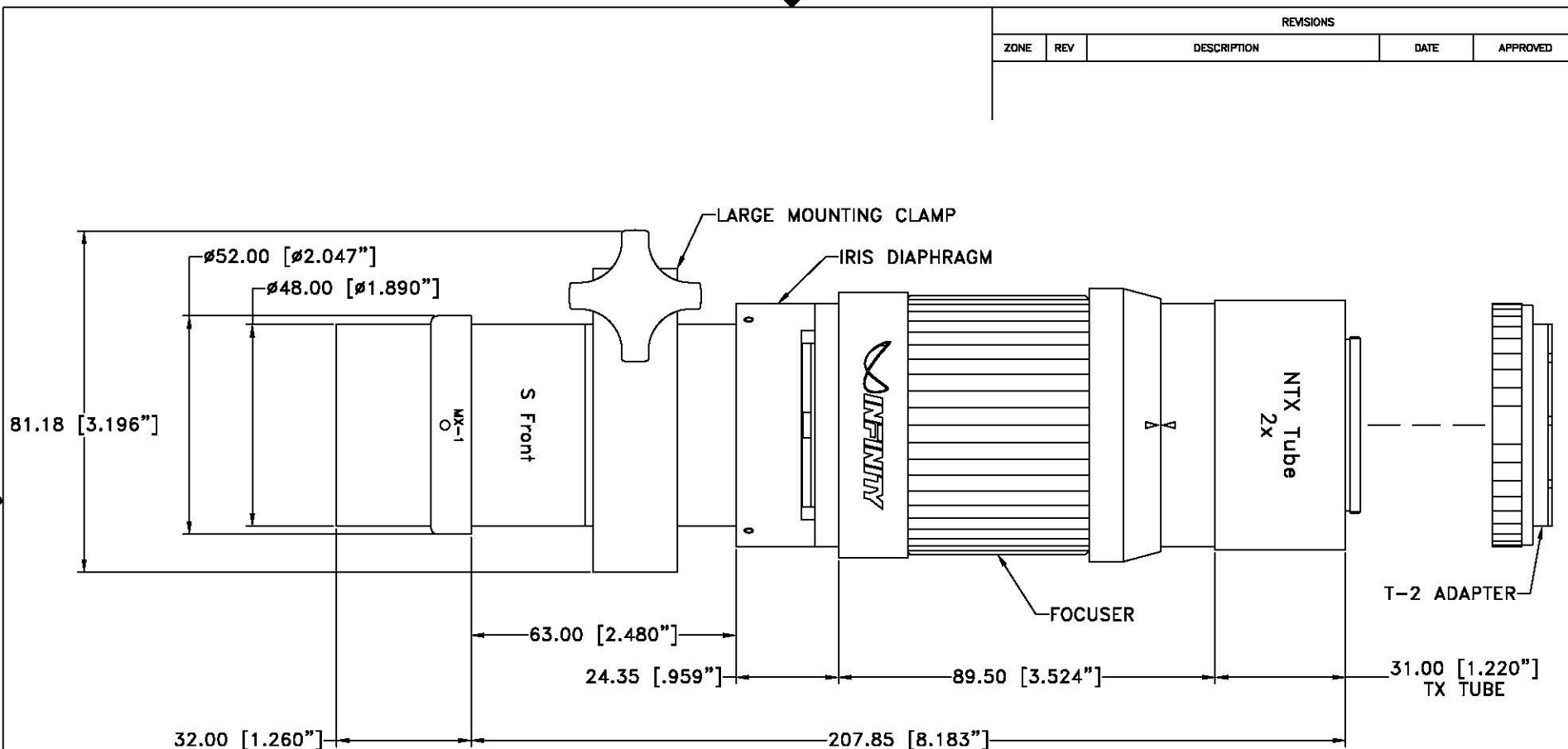
| SIZE | FSCM NO. | DWG NO. | REV |
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| B | | - | - |
| SCALE | | | SHEET |
| NONE | - | | 1 OF 1 |



| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |
| | | | | |

NOTE:
1. CENTRIMAX SHOWN WITH MX-1 OBJECTIVE.

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| | | MODEL K1 CENTRIMAX WITH NTX TUBE | | |
| Date: 06/20/12 MB | SIZE B | FSCM NO. - | DWG NO. - | REV - |
| Modified: | SCALE NONE | - | SHEET 1 OF 1 | |



| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |
| | | | | |

NOTE:

1. CENTRIMAX SHOWN WITH MX-1 OBJECTIVE.

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**MODEL K1 CENTRIMAX w/NTX TUBE
AND T-2 ADAPTER**

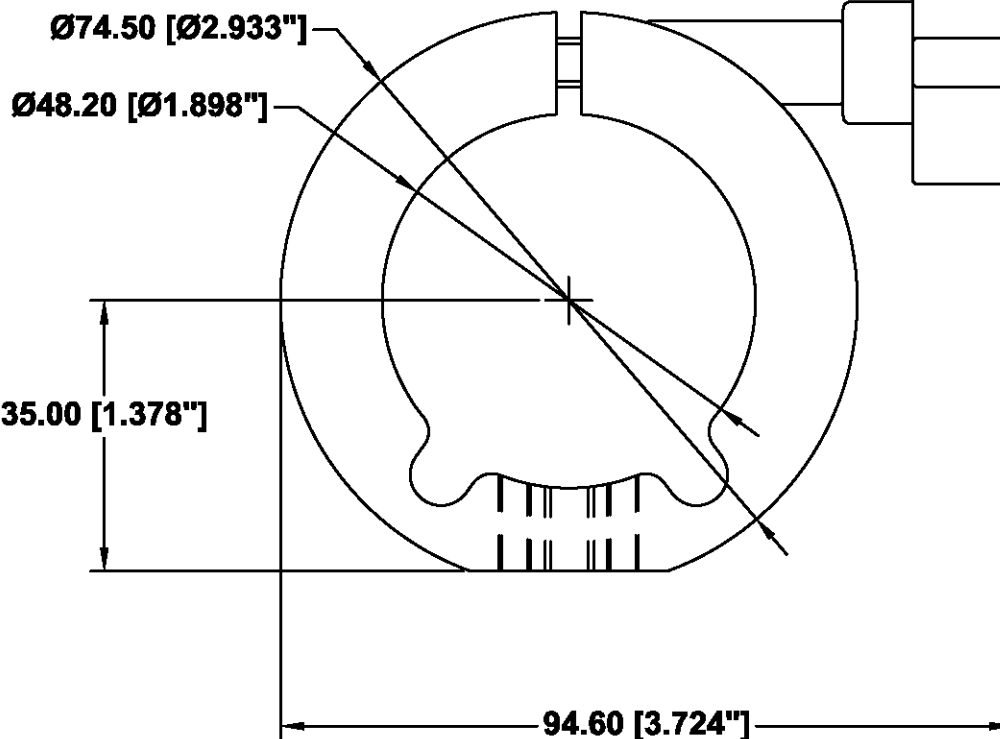
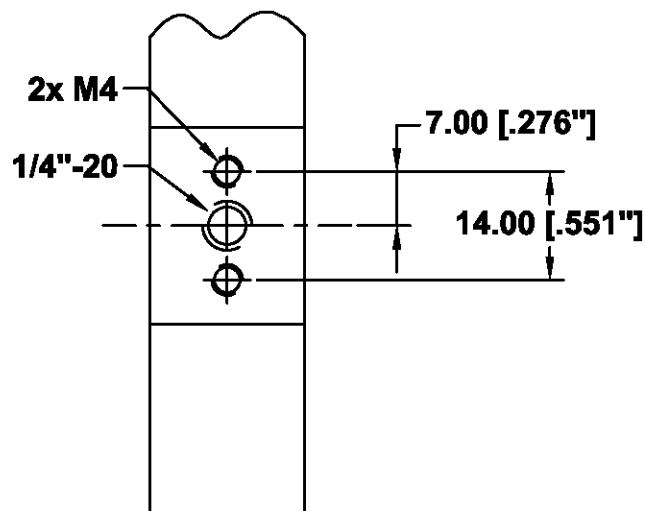
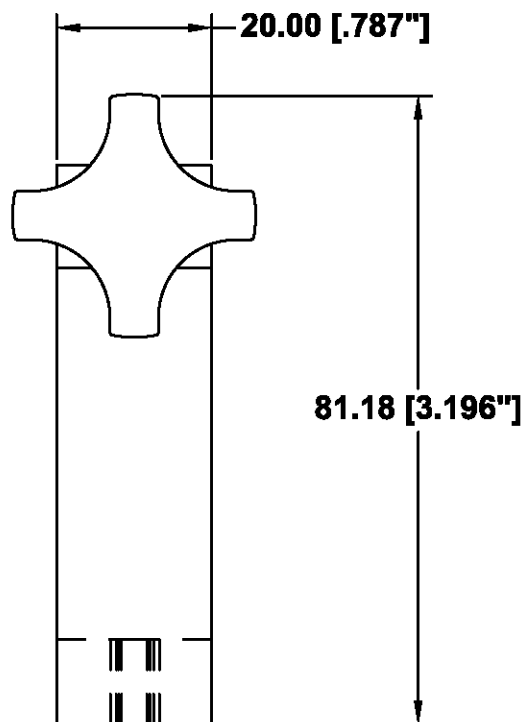
Date: 06/20/12 MB

| | | | |
|------------------|----------|--------------|----------|
| SIZE B | FSCM NO. | DWG NO. - | REV - |
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Modified:

| | | |
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| SCALE NONE | - | SHEET 1 OF 1 |
|----------------------|---|------------------------|

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**ALL DIM ARE mm
[inches] AND ARE FOR
REFERENCE ONLY AND
ARE SUBJECT TO
CHANGE.**

INFINITY Photo-Optical Company
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303/440-4544 Fax 303/440-4144

LARGE MOUNTING CLAMP

Date: 07/24/97 MS

Modified: 08/10/05 MB

SIZE
A

FSCM NO.

DWG NO.

770 170

REV
-

SCALE **NONE**

SHEET **1 OF 1**

INFINITY PHOTO-OPTICAL COMPANY LIMITED WARRANTY

INFINITY PHOTO-OPTICAL COMPANY hereby warrants its products to be free from defects in workmanship or materials for the warranty period set forth below. INFINITY PHOTO-OPTICAL COMPANY, at its option, shall repair or replace the defective product without cost to the purchaser, and such repair or replacement shall be the full extent of this express limited warranty. INFINITY PHOTO-OPTICAL COMPANY shall not be liable for any other damages either direct or consequential.

This warranty is made to the original purchaser, and is effective only on new equipment purchased from INFINITY PHOTO-OPTICAL COMPANY, or a dealer authorized by INFINITY PHOTO-OPTICAL COMPANY to sell the product.

This warranty is valid only when the product is returned to the authorized dealer from whom it was purchased, or returned directly to INFINITY PHOTO-OPTICAL COMPANY, freight prepaid, with proof of date of purchase.

This warranty does not extend to any defect, malfunction or failure caused by misuse, abuse or the use of the product with equipment for which it may not have been intended. Any unauthorized repair voids this warranty.

The warranty period for all products manufactured by INFINITY PHOTO-OPTICAL COMPANY is five (5) years from date of original purchase. Parts or components made or sourced from other manufacturers shall be solely covered by that manufacturer's warranty.

The warranty contained herein is the only warranty made by INFINITY PHOTO-OPTICAL COMPANY. Any implied warranty of merchantability and/or fitness for a particular purpose is expressly excluded from this warranty. INFINITY PHOTO-OPTICAL COMPANY shall not be liable for any expense, loss, incidental or consequential damages which may arise in connection with the use of this equipment. Recovery under this warranty is limited to repair or replacement of the equipment as provided above.

INFINITY PHOTO-OPTICAL COMPANY reserves the right to modify designs, equipment and accessories without notice.