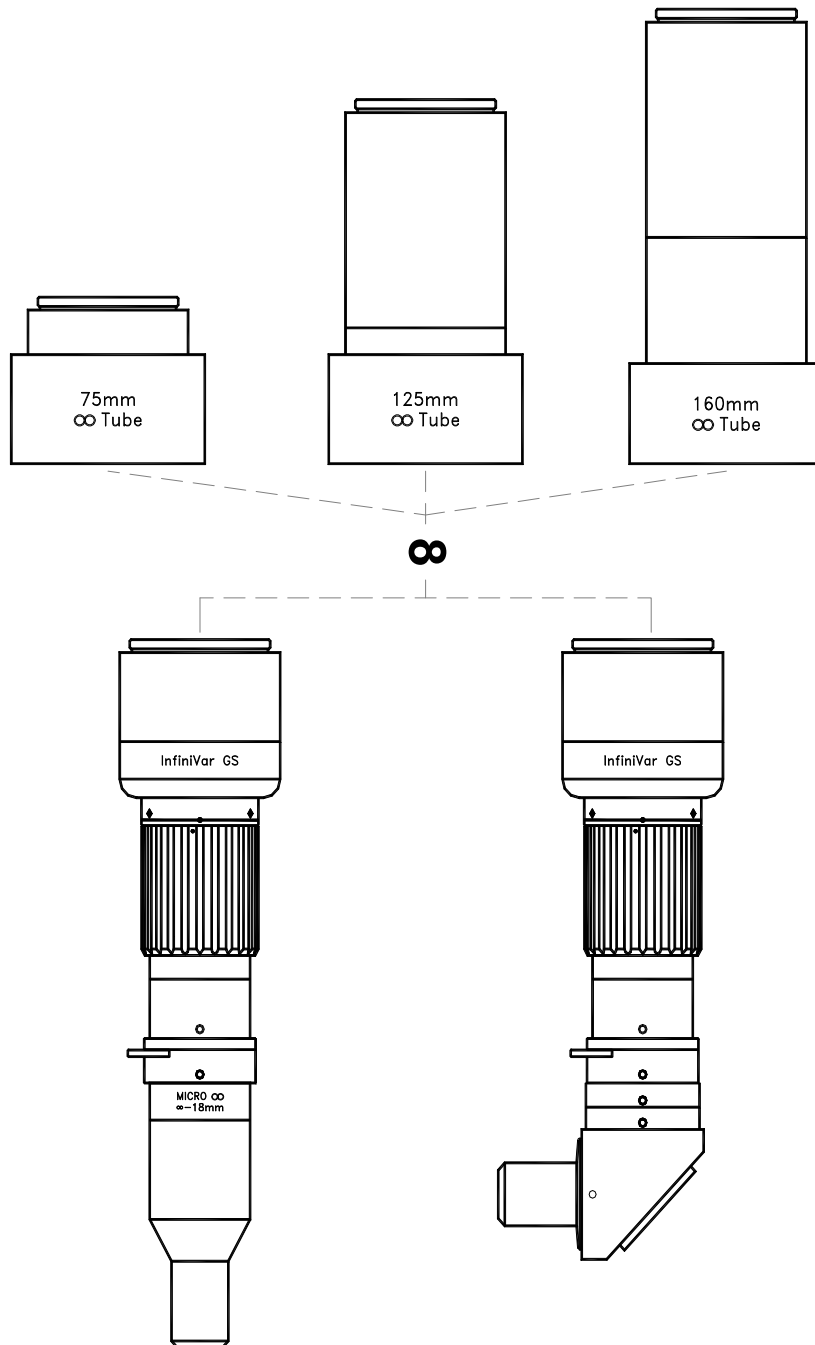


INFINIVAR™ GS

Infinity-Corrected Continuously-Focusable Microscope



 **INFINITY** 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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InfiniVar GS™ CONTINUOUSLY-FOCUSABLE MICROSCOPE INSTRUCTIONS FOR USE

IMPORTANT: As you read through the following instructions, please note the sections dealing with the use of the Variable Iris control. The InfiniVar GS requires its active use. At first, the use of the Variable Iris as detailed below may seem to be "counter-intuitive" but when properly set, the resulting images will be worth the effort.

The InfiniVar GS System. The InfiniVar GS consists of a Optical Pod which contains a patent-pending internally-focusable optical system with infinity-correction, activated by a Focusing Ring which turns 360-degrees. Inside is a provision for 25mm diameter filters (for example, polarizers or fluorescence types). At its rear is a single T24mm Tube which can be exchanged for a stereomicroscope stand mount. A Clamp is supplied as standard equipment so that the InfiniVar GS can be mounted on tripods or fixtures via 1/4-20 or two "outboard" M4 taps. A Variable Iris allows contrast control. For special applications, a 90-degree RA (Right-angle) Pod is also available.

The InfiniVar GS is not a zoom lens. It is a continuously-focusable microscope. This means you can focus on any suitable object at a distance and move in to see it become a single frame at great magnification. Instead of being limited to a single distance, you can choose whatever working distance you wish. You will never lose sight of your object as you focus closer and closer. As you focus, detail (resolution) increases and depth of field gets shallower. If you need more depth of field, just back up to get what you need. The depth of field and magnification are then balanced for best results.

Infinity Correction and Format Matching. What makes the InfiniVar GS unique is that the image is put to an infinity condition which requires Infinity Tube Lenses to establish final focus. Separation between the Main Body and the three Infinity Tubes Lenses does not change the focus. This means that InfiniVar GS—like all infinity-corrected microscopes—can position accessories or experimental components within the infinity beam. Further, by selecting one of the three (75mm, 125mm and 160mm) Infinity Tube Lenses, it is possible to match the dimensions of various sensor sizes—from as small as 1/3-in. to as large as 24 x 36mm (the 35mm format). By using successive Infinity Tube Lens, magnification can be amplified as well, so that C-mount cameras can also use the 125mm and 160mm types. A small 12mm thick DL/2x Doubler Tube may be interfaced with all Infinity Tubes when C-mount cameras are used.

Integrated Optical Pod. The InfiniVar GS is an integrated Optical Pod composed of the Main Body and the Micro Infinity Objective. In order to function, the entire Optical Pod must be supplemented by a rear Infinity Tube Lens system. The total InfiniVar GS Optical Pod can be focused from infinity down to 18mm, regardless of which rear Infinity Tube Lens is utilized. Refer to the included Magnification/Working Distance tables for specific working distance combinations.

RA Pod. The InfiniVar GS RA Pod is the same as the regular pod, except that its front objective section is mounted in a right-angle mirror housing. Just after the mirror housing is a small dovetail mount with an outer cap that has three 2-56 setscrews located around its periphery. This assembly allows the objective to be "plumbed" tangentially to the object. Under the cap is a stainless steel dovetail to facilitate smooth rotation. NOTE: Care should be taken that the three setscrews should only be loosened—not removed. Infinity Photo-Optical can not assume responsibility for incidental damage if the setscrews on the front assembly are loosened beyond necessity or if doing so causes the front objective/mirror assembly to fall. If the rotational adjustment is done with care, there should be no problems in doing so.

Operation. Moving the InfiniVar GS unit up and down establishes working distance, magnification and the potential depth of field. Turning the 360-degree Focus Ring focuses the image.

A Variable Iris is incorporated into each InfiniVar GS. Its operation is analogous to that of a regular laboratory compound microscope's iris in the condenser. Like laboratory-type microscopes, there are no f/stops to be found—they are irrelevant. The Variable Iris' real purpose is not to control exposure—but to control contrast. In the same way that lab scopes are not supposed to be used with the condenser full-open, the InfiniVar GS is not supposed to be used full-open either. The proper use of the condenser on lab scopes is to close-down until the first "jump" in contrast is observed—virtually an "automatic" characteristic that essentially equals the cross-over point where the contrast and resolution are best-matched. This means that when the InfiniVar GS is used correctly, all you have to do is: 1) Focus; 2) Set the contrast "jump;" 3) Observe or record. Perfect results are as easy as that.

Professionally Setting the Variable Iris. The ultimate determination of the best position for the Variable Iris' setting can be ascertained by stopping-down to the contrast "jump" and then going just slightly beyond that. Then, if it is possible to do so, focus up and down and through the object. Note that the defocused light (Airy discs) can be set so that the blur above focus is equal to the blur below focus. This is actually the finest setting possible and produces the sharpest imagery that the InfiniVar GS is capable of at the chosen working distance.

Working Distance/Magnification/Field of View Tables. The tables contained in these instructions are averaged between all factors. The cam action of the focus is made with great precision. Nevertheless, minute tolerances can add up between the sum total of the parts. When the table refers to "4x" it is possible that the actual magnification of one InfiniVar GS can be 4.02x and another 3.99x, etc. —just as no two automobile engines of 300hp have exactly 300hp each. The same holds true for possible minute differences for Working Distances and Fields of View. However, if exact Magnifications and Fields of view must be established between two or more InfiniVar GS units, this can be done by using a ruling to set them precisely equal.

Illumination. The InfiniVar GS provides the best results when the light is intense and highly-directed. Fiber optic or LED sources are recommended. For high quality image capture, flash units are to be preferred.

Filter Holder. Removing the T24 Tube (or Stereomicroscope stand mount) allows access to the Filter Holder Receptacle. Most 25mm diameter filters can be positioned there and locked in place by the optional Retaining Ring. In this way, the InfiniVar GS can be equipped with polarizing, color, neutral density or fluorescence filters.

Motor-drive Capability. The InfiniVar GS can be supplied (special order) not only with its regular Fluted Focusing Ring, but with either of two others that can be used for motor drive applications. We offer a Grooved Ring for use with O-Rings and a Smooth Ring for use with custom gear attachments. Please see the appropriate drawing in this manual and contact us for further details.

Care and Cleaning. Your InfiniVar GS should be treated as the fine 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) with a cloth moistened with alcohol. The external optical surfaces should be cleaned only when necessary, and then, only by a soft cotton swab moistened by an approved optical glass cleaner. If you have further questions, please contact Infinity Photo-Optical Company or your authorized dealer.

Warranty. Details of the Warranty are contained on the Warranty Page (attached).

INFINIVAR GS System

InfiniVar GS Optical Pod and 75mm Tube Based on 6.4mm 1/2-in. format

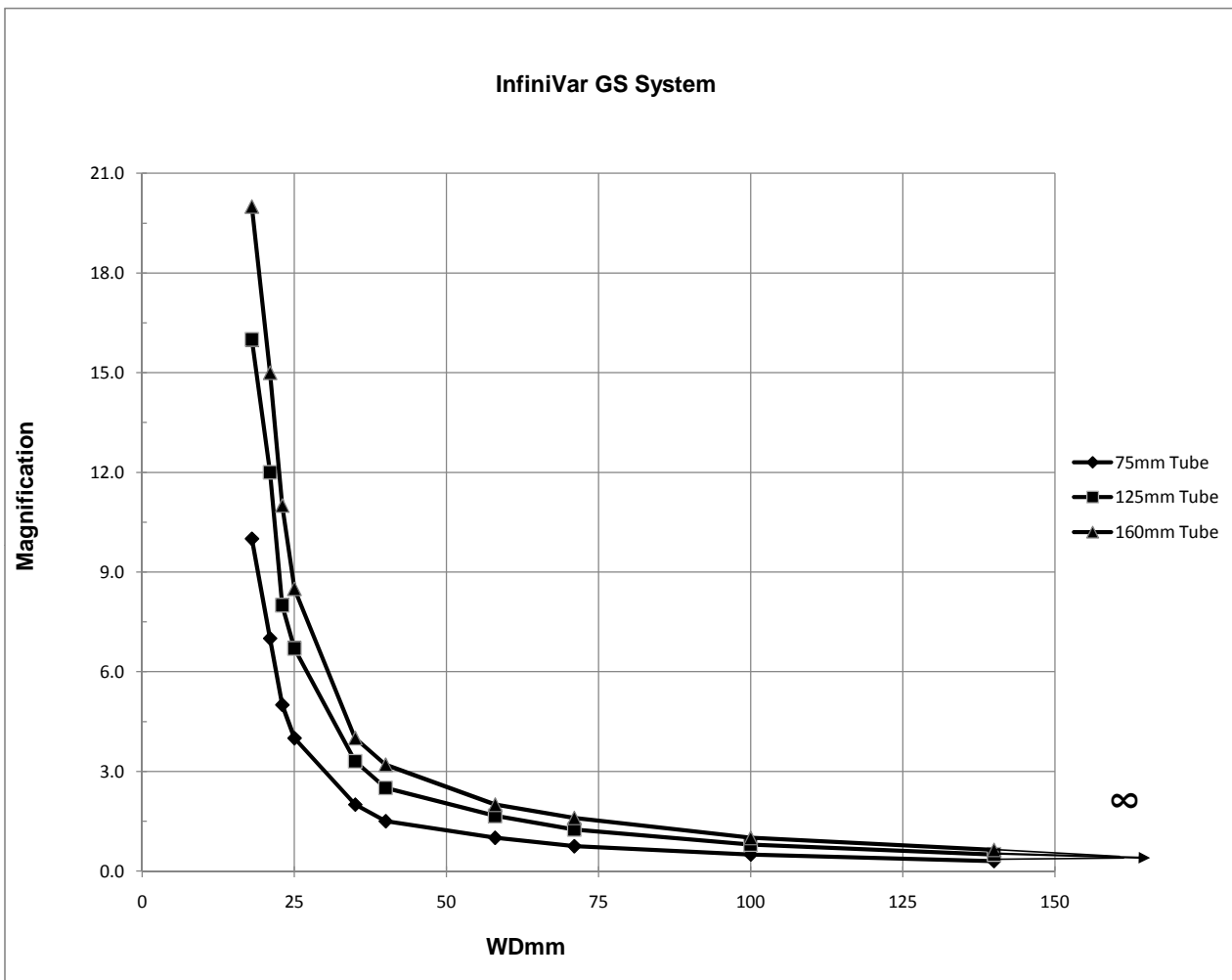
WD mm	18	21	23	25	35	40	58	71	100	140
Mag	10.0	7.0	5.0	4.0	2.0	1.5	1.0	0.75	0.50	0.30
FOV	0.64	0.91	1.28	1.60	3.20	4.27	6.40	8.53	12.80	21.33

InfiniVar GS Optical Pod and 125mm Tube Based on APS-C (15.6mm x 23.4mm) format

WD mm	18	21	23	25	35	40	58	71	100	140
Mag	16.0	12.0	8.0	6.7	3.3	2.5	1.66	1.25	0.8	0.5
FOV	1.46	1.95	2.93	3.49	7.09	9.36	14.10	18.72	29.25	46.80

InfiniVar GS Optical Pod and 160mm Tube Based on 35mm (24mm x 36mm) format

WD mm	18	21	23	25	35	40	58	71	100	140
Mag	20.0	15.0	11.0	8.5	4.0	3.2	2.0	1.6	1.0	0.64
FOV	1.80	2.40	3.27	4.24	9.00	11.25	18.00	22.50	36.00	56.25



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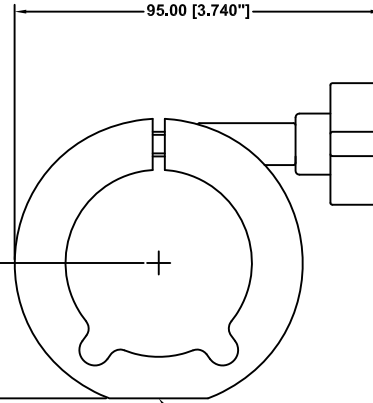
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REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

LARGE MOUNTING CLAMP (SUPPLIED)



2x M4 & 1x 1/4"-20 MOUNTING HOLES

IRIS DIAPHRAGM

FOCUSER

M42 x 0.75

Ø30.00 [Ø1.182"]

Ø17.00 [Ø.670"]

MICRO Ø1.50mm

InfiniVar GS

Ø48.00 [Ø1.891"]

48.00 [1.890"]

71.50 [2.815"]

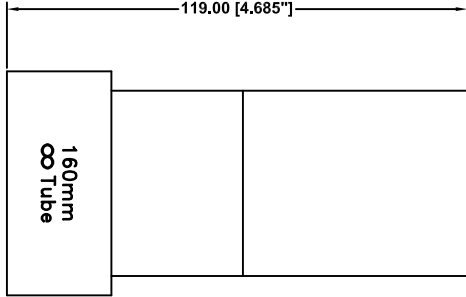
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24.00 [.945"]

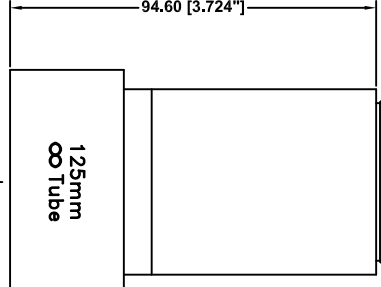
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INFINIVAR™ GS OPTICAL POD

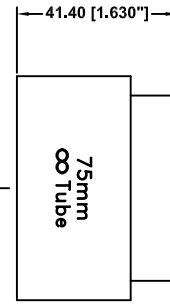


160mm
∞ Tube

T-2 ADAPTER



125mm
∞ Tube



75mm
∞ Tube

C-MOUNT

37.50 [1.476"]

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INFINIVAR™ GS SYSTEM

Date: 01/12/11 MB

SIZE C

FSCM NO.

DWG NO.

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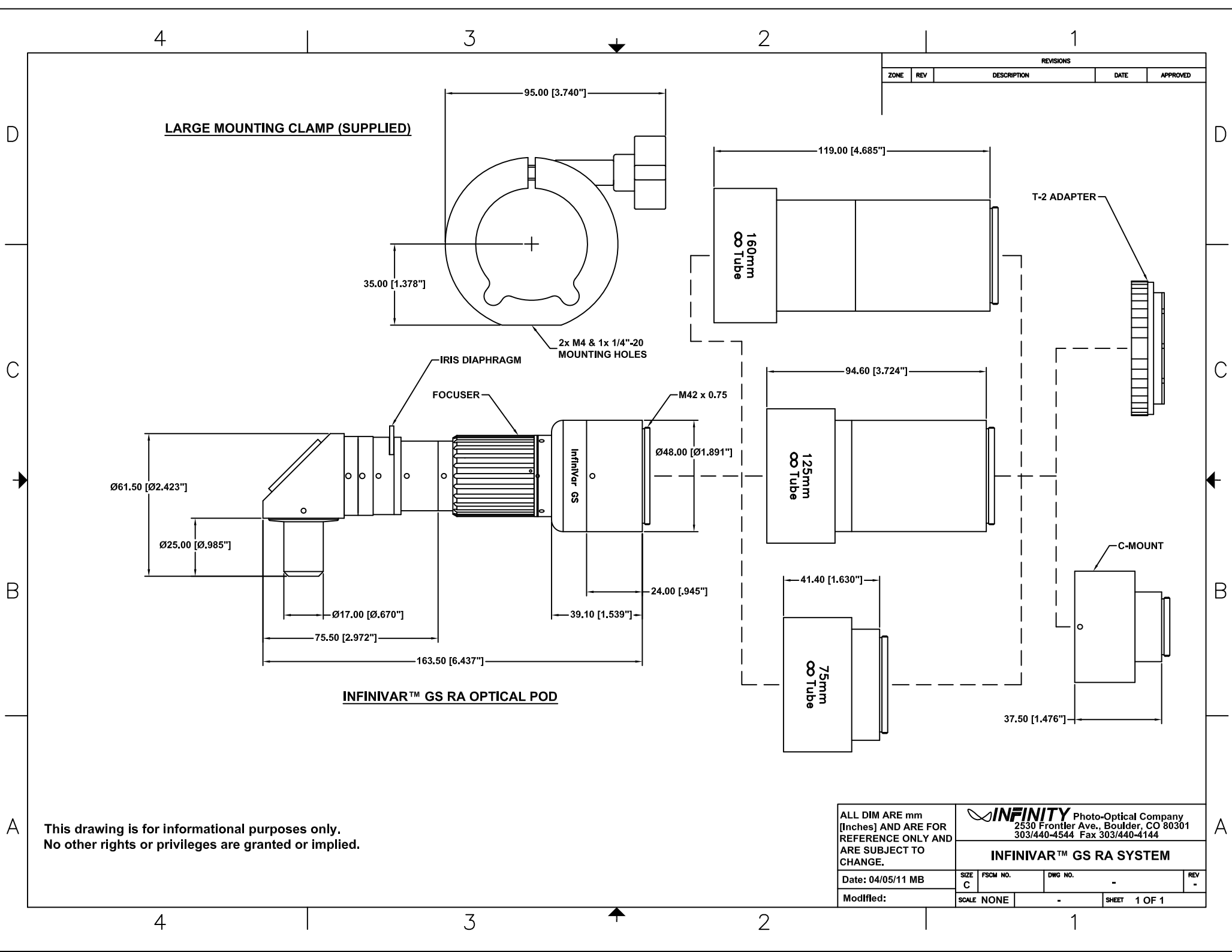
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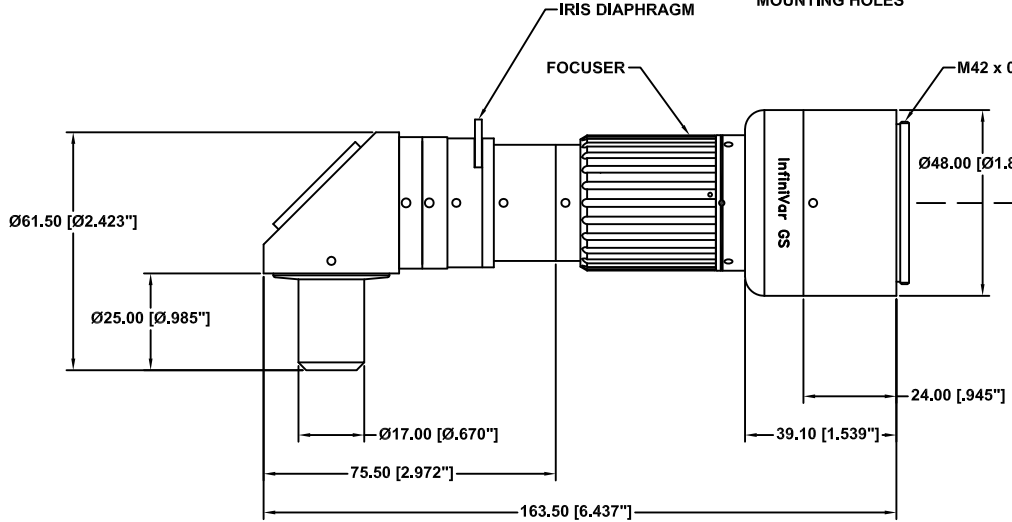
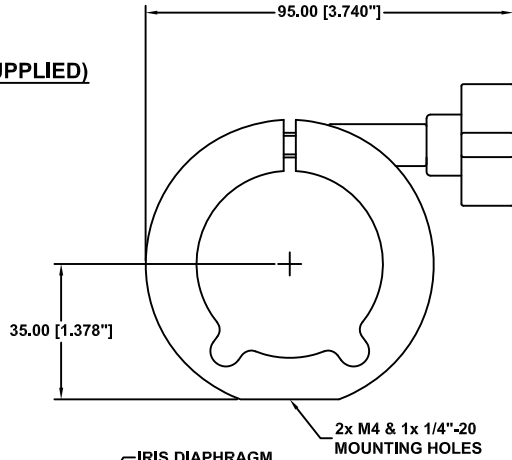
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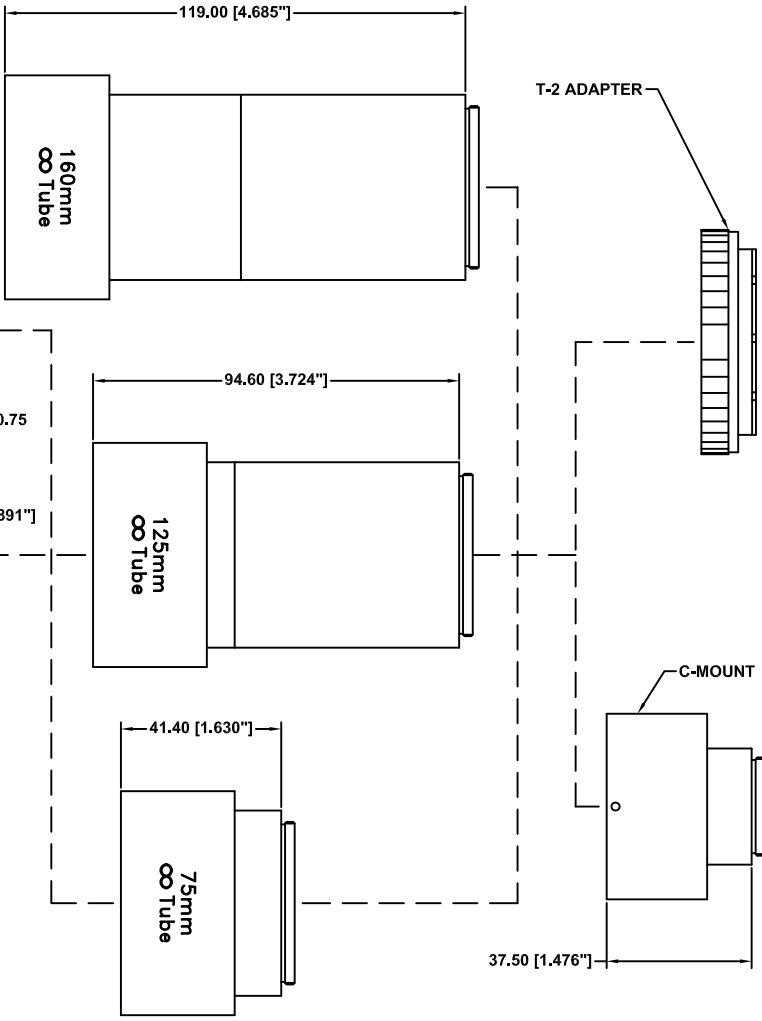


REVISIONS				
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LARGE MOUNTING CLAMP (SUPPLIED)



INFINIVAR™ GS RA OPTICAL POD



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INFINIVAR™ GS RA SYSTEM

Date: 04/05/11 MB

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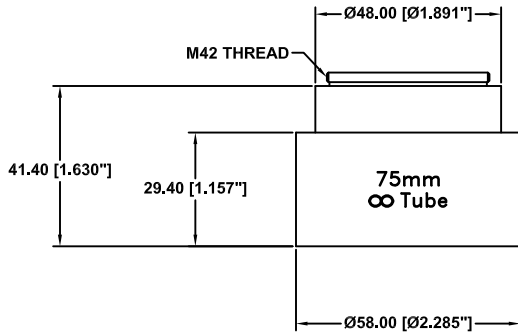
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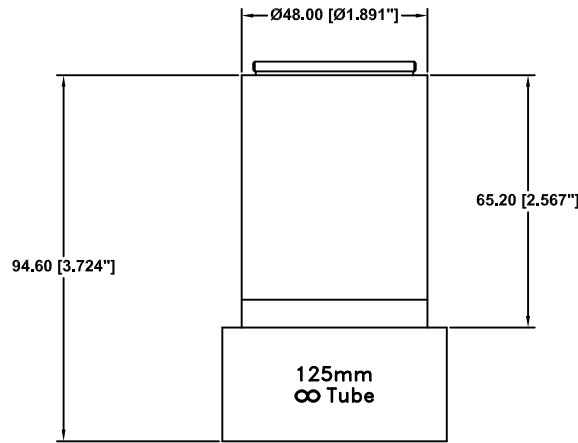
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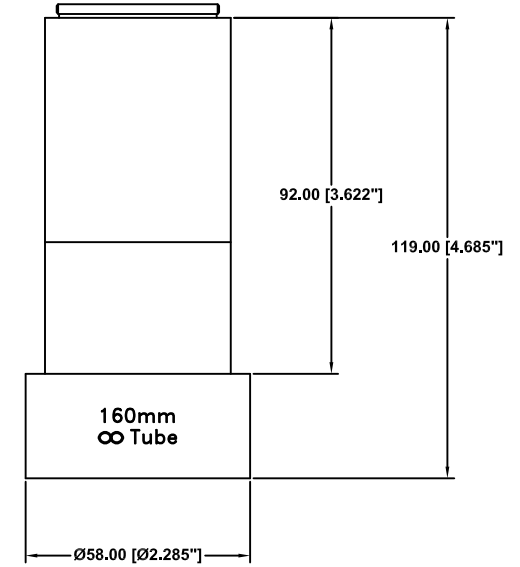
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75mm INFINITY TUBE



125mm INFINITY TUBE



160mm INFINITY TUBE

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INFINIVAR™ GS INFINITY TUBES

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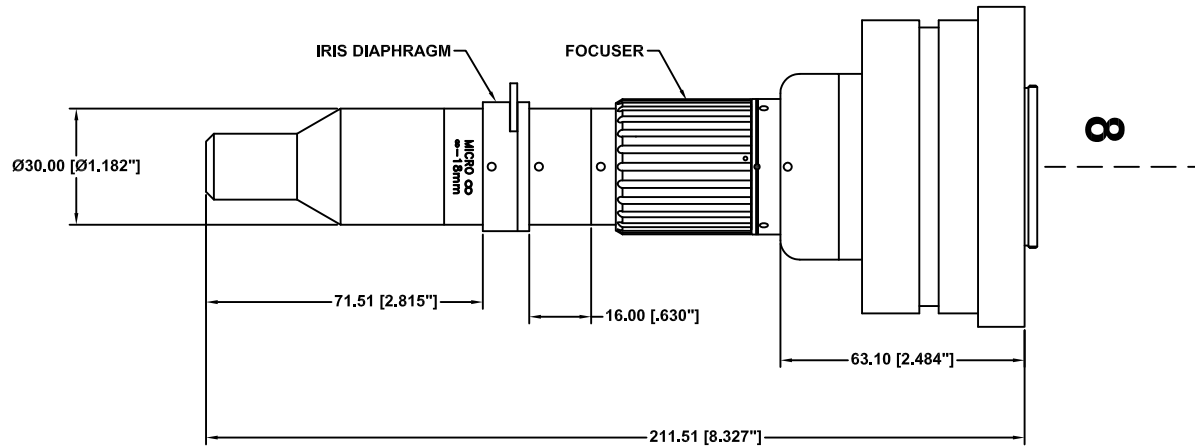
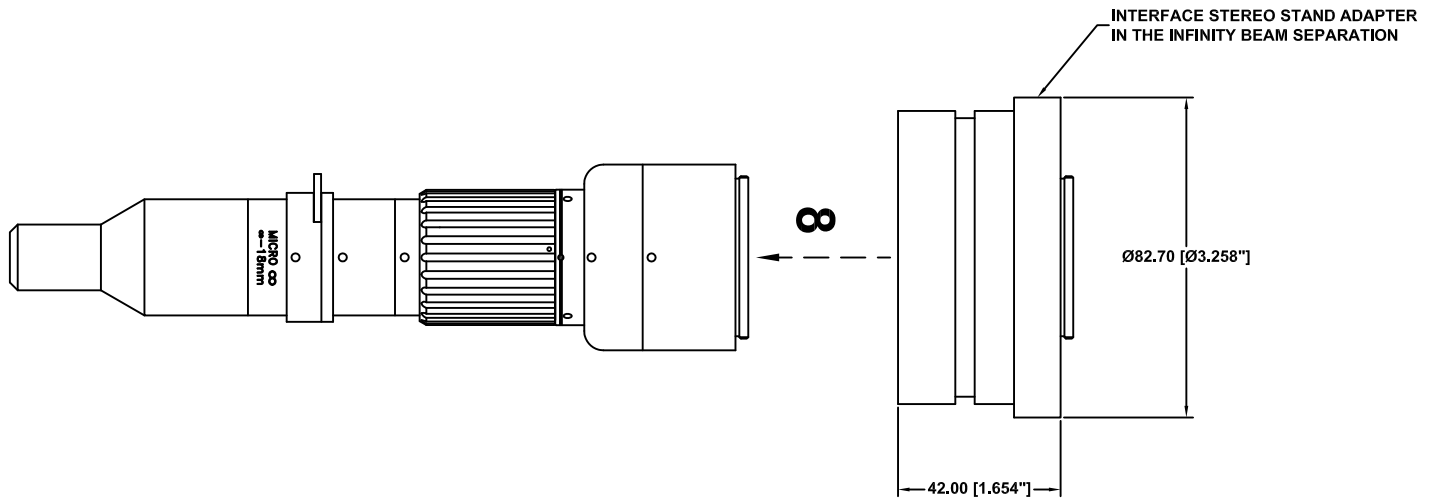
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**INFIVAR GS OPTICAL POD WITH
STEREO STAND ADAPTER**

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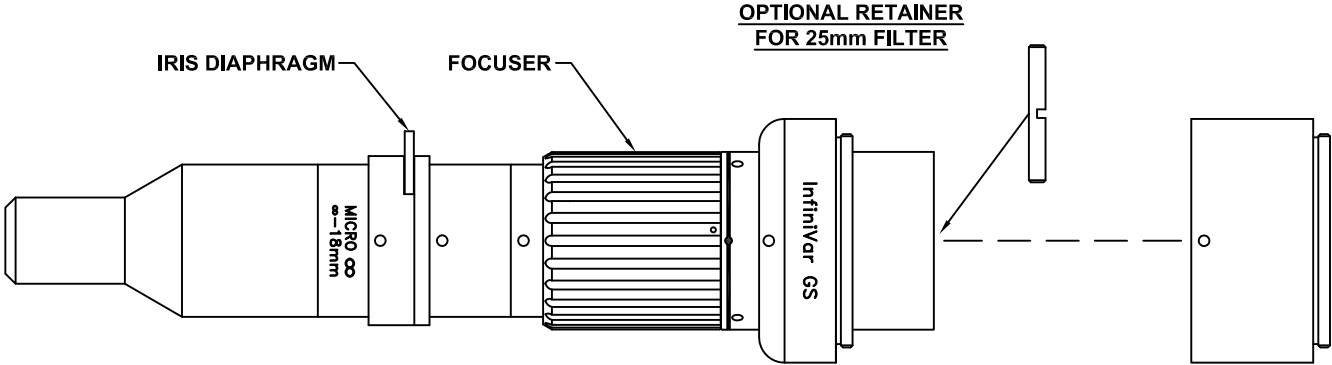
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ZONE	REV	DESCRIPTION	DATE	APPROVED



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		INFINIVAR GS OPTICAL POD (FILTER INSERTION)		
Date: 01/11/11 MB	SIZE B	FSCM NO.	DWG NO. -	REV -
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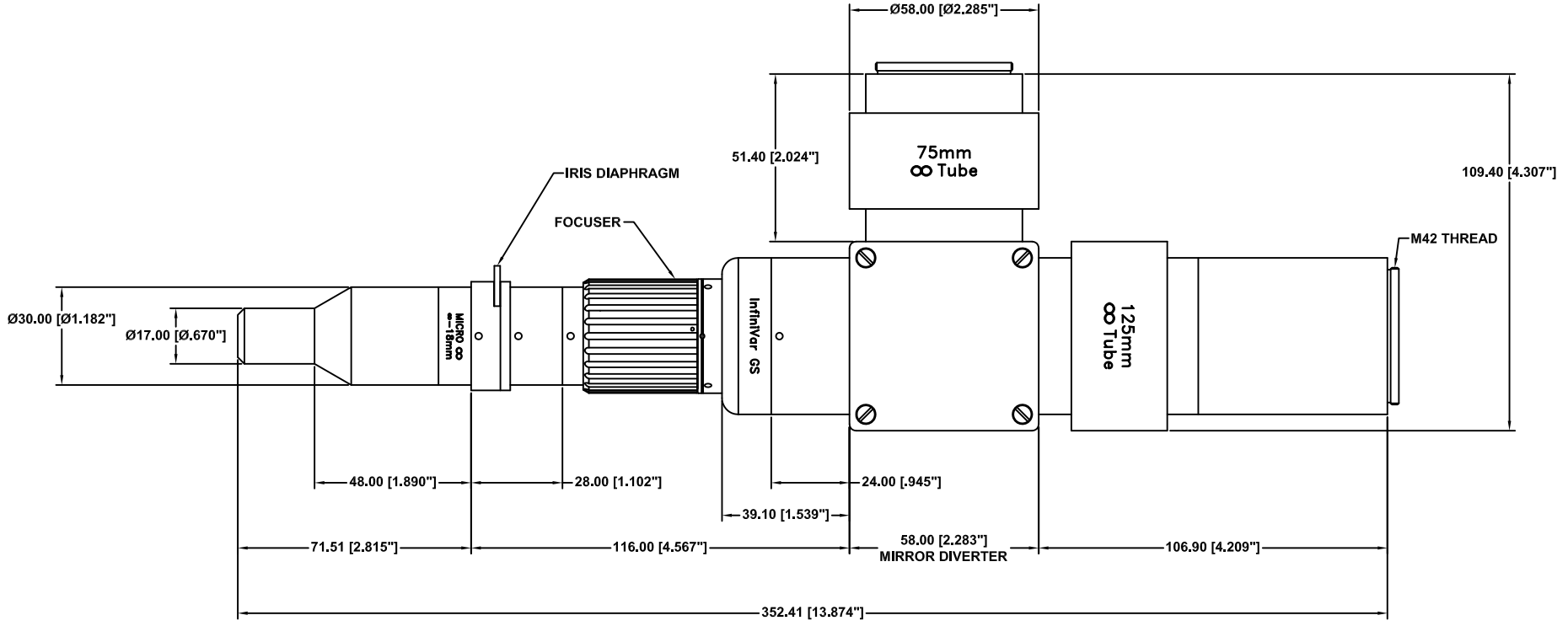
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Date: 01/12/11 MB
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**INFINIVAR™ GS SYSTEM WITH
MIRROR DIVERTER IN INFINITY BEAM**

SIZE C	FSCM NO.	DWG NO. -	REV -
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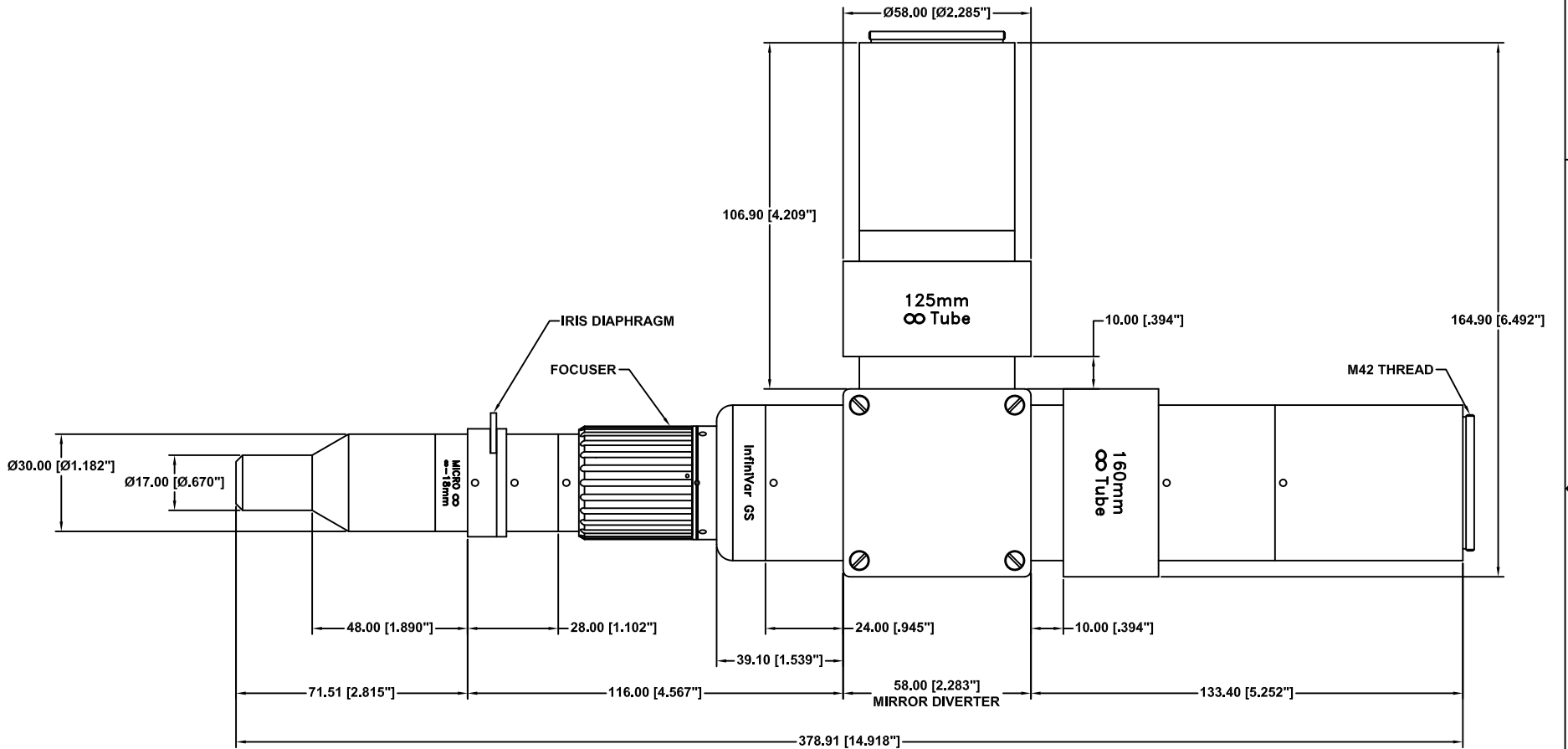
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INFINIVAR™ GS OPTICAL POD

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Modified:

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**INFINIVAR™ GS SYSTEM WITH
MIRROR DIVERTER IN INFINITY BEAM**

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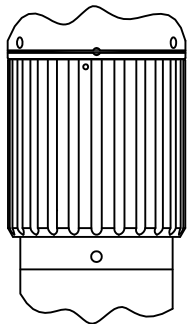
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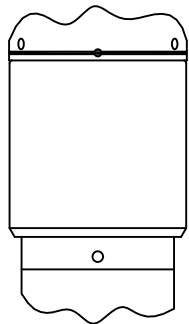
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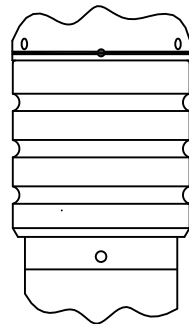
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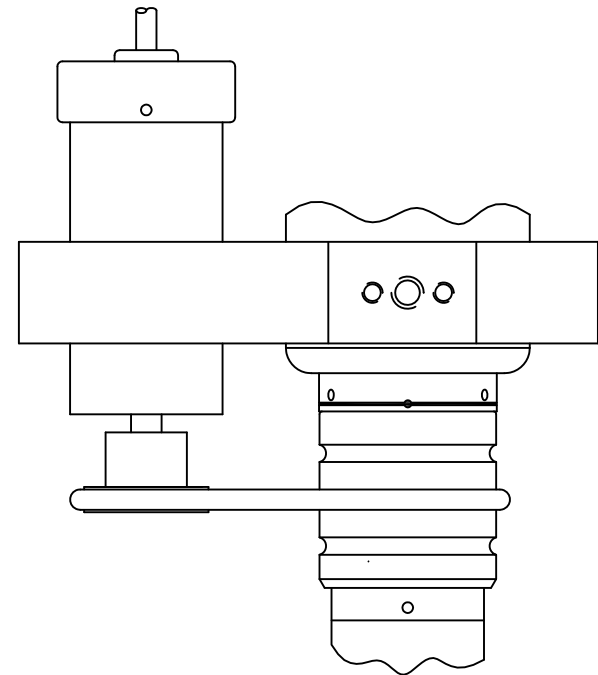
FOCUSER WITH
FLUTED GRIP



FOCUSER WITH
SMOOTH BARREL
FOR GEAR DRIVES



FOCUSER WITH
O-RING GROOVES



FOCUSER WITH
MOTOR DRIVE

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

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FOCUSER CONFIGURATIONS

Date: 06/28/11 MB	SIZE B	FSCM NO.	DWG NO. -	REV -
Modified:	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.