

μBIP series x-Ray Beam Imager



The μBIP series is STI's latest imaging system designed specifically for use with soft x-rays [1-2 nm]; it cannot be used for longer wavelengths such as 193 nm or 248 nm from excimer lasers which would cause severe internal damage. Most importantly, the system is designed for use with high vacuum chambers using our custom vacuum flange assembly for attaching the optical system to the vacuum chamber. The flanges are rated at $\geq 10^{-8}$ Torr.

Features:

Focus:	Adjustable $\pm 0.35''$
Image Rotation:	Rotational adjustment about the optical axis for alignment to the camera sensor
Iris Diaphragm:	Adjustable from fully closed to wide open.
Camera mount:	Standard c-mount
Vacuum Flanges:	Conflat [®] copper vacuum flange, 2.75", 304, SS. To $\leq 10^{-8}$ Torr.

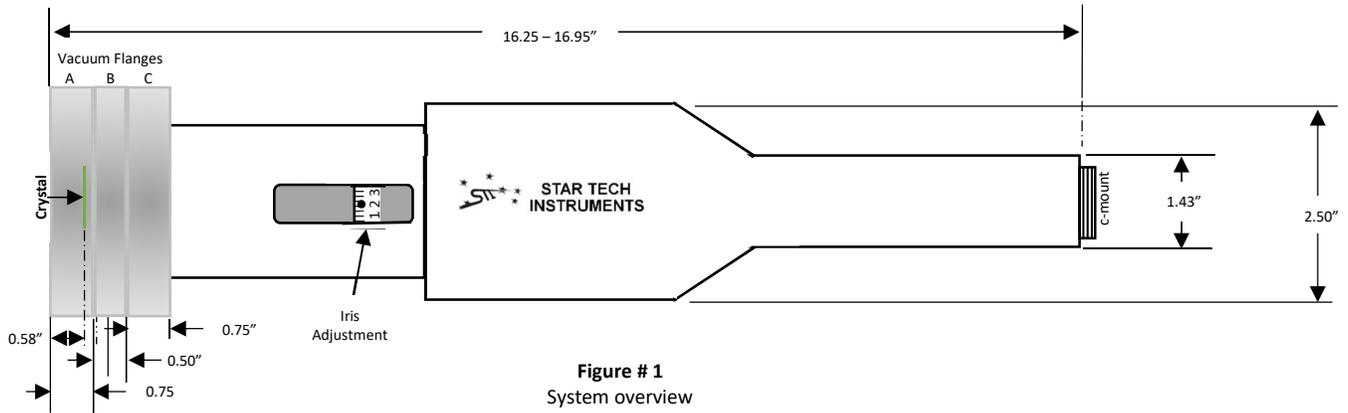
Specifications:

FoV:	1.5mm^2 with 7.5x Microscope Objective
Wavelength:	1.0 - 20 nm other wavelengths and designs available to 405 nm
Resolution:	$10.6 \mu\text{m}$
Magnification:	$17.5\times$
OAL:	16.25-16.95"
Vacuum Flange:	2.75" diam. With a 2.312" hole pattern

¹Values calculated using 1" sensor. Actual values will be determined by the pixel size and overall size of the camera sensor. Measurements taken with sensor-2048 x 2048, 11.3 x 11.3 mm, 5.5 μm pixel, 4.2 Mega pixel camera.

Resolution:

The resolution of the final system is a function of the quality of the optics and the resolution of the camera (pixel size). STI uses only diffraction limited optics in our system so the final resolution of the system will be defined by the pixel size of the camera.



The 3x Conflat® 2.75" diameter vacuum flanges (A,B,C) have 6x ¼-28 holes every 60° on a 2.312" circle (see illustrations below). A torque wrench is required to compress the vacuum flanges. The compression torque rating is 144 in-lb, 12 ft-lb, or 16.27 N-m. Additional copper gaskets are available. From STI or **MDC Model 191004**.

Vacuum flange A is a 0.75" thick mounting flange with 10G crystal and OFE copper gasket. The crystal is recessed 0.17" from the right face of the flange on the vacuum chamber to STI specifications. (see figures #1 and #2). This flange is MDC Model-9712002

- MODEL: REF# FD-275000
- PART NUMBER: 140007
- PART NAME: Double Sided Flange, 2.75"
- NOMINAL SIZE: 2-3/4
- A: 2.73
- B: 2.312
- C: 0.750
- D: 0.040
- E: 0.005
- F: 0.315 clear
- NO. HOLES: 12, 6 thrd 1/4-28
- HOLE SIZE: 0.265
- WT LB: ¼

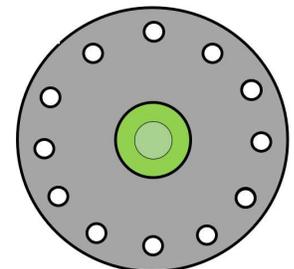
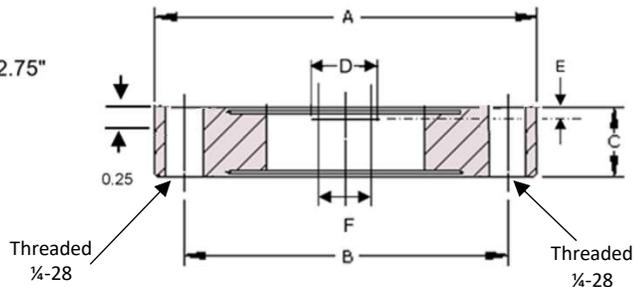


Figure # 2
Vacuum Flange A
mounting hole pattern
60° apart, with crystal
and OFE Copper gasket.

Vacuum flange B- Viewport is a 0.50" thick mounting flange with fused silica viewport and OFE copper gasket. This Flange is **MDC Model-9722005** with Fused Silica viewport reworked to STI specifications.

- MODEL: 1001401
- PART NUMBER: 9722005
- PART NAME: UV Grade Fused Silica Viewport,
1.40" View Dia, 2.75" Conflat Flange
- LENS GRADE: UV
- LENS SIZE: 1 1/2 INCH
- MOUNT SIZE: 2.73 DS
- A: 1.40
- B: 0.130
- D: 2.73
- E: 0.35
- F: 0.50

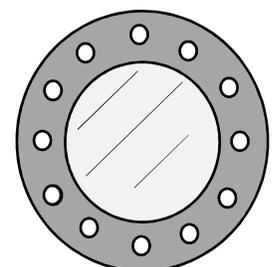
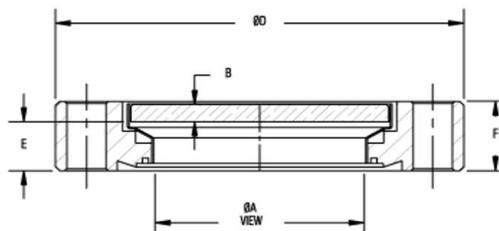


Figure # 3
Vacuum Flange B with
Fused Silica viewport
and OFE copper gasket.

Vacuum flange C is a 0.75" thick mounting flange to connect the imaging system to the vacuum flanges. This flange is an STI custom part.

- PART NAME: Double Sided Flange, 2.75"
- NOMINAL SIZE: 2-3/4
- A: 2.73
- B: 2.312
- C: 0.750
- D: 1.378
- E: 0.125
- NO. HOLES: 12, 6 with 1/4-28 thrd, 6- 0.265 thru
- HOLE SIZE: 0.265
- WT LB: 3/4 (approx.)

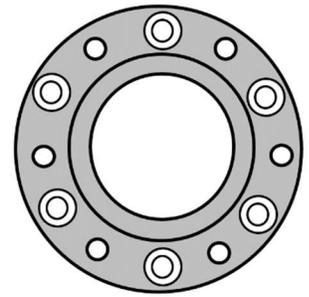
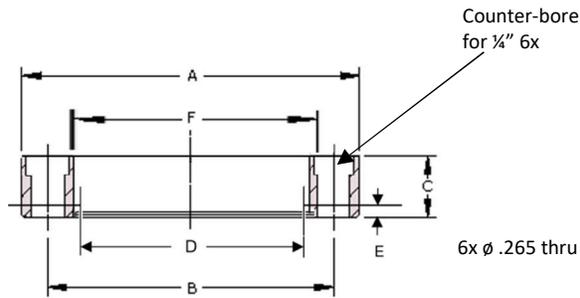


Figure #4
Vacuum Flange C
Connects vacuum flanges
to Optical system

Focusing:

The unit has been focused and locked in prior to shipping but some slippage may have occurred. If an adjustment in the focus is required- slightly loosen the 3x 10-32x 5/16 flat set screws on the Mid-Tube. This will allow for up to a 0.7" adjustment in the focus location. *Note the c-mount and Iris adjustment have moved to the right.*

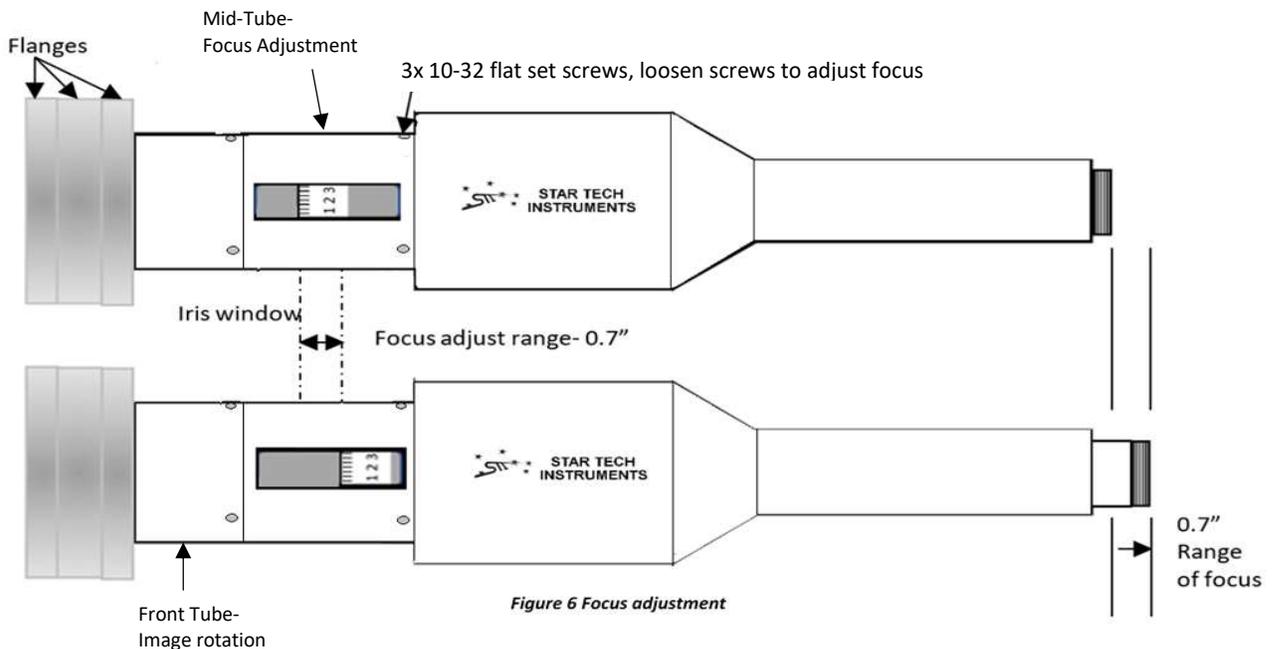


Image Rotation:

The Front Tube has 3x 10-32 set screws for image rotation. This will enable users to rotate the image on the camera sensor to align the image for best analysis. Be sure the Focus Tube screws are locked before rotating the front tube so as not to lose the focus setting.

Calibration:

The system comes calibrated and a calibration certificate is included with each system. STI uses a high resolution Ronchi ruling at the focus. The Ronchi ruling divisions are used to calculate the magnification. Please save the Certificate. If you need to have the system re-calibrated please contact STI for an RMA# for the return.

Notes:

*We do not recommend the use of this instrument with longer wavelengths.
Use with excimer lasers: 193 nm or 248 nm could cause severe internal damage.*

Magnification Options:

STI offers several magnification options. Please consult the chart below for the best configuration for your application.

	<i>(Measured)</i>	<i>(Not supplied)</i>	<i>(Not supplied)</i>
μBIP Model	Standard Magnification	+ Ext 1.5- (E1.5)	+Ext 2.0 (E2.0)
μBIP-5	7.5x <i>(as supplied)</i>	11x	15x
μBIP-10	10 x	15x	20x