

INO

QuickPOZ

Optomechanical Mounts and Breadboards 2020-2021 Catalog

INO-PLT0201-0037 version 3.0



Table of Content

| | |
|--|----|
| QuickPOZ, INO's family of robust optomechanical mounts for accurate positioning..... | 3 |
| How does it work? | 3 |
| Performance specifications..... | 5 |
| What is included in INO's QuickPOZ family?..... | 6 |
| What can be done with these mounts? | 9 |
| Need a custom configuration?..... | 9 |
| General considerations | 10 |
| Tooling & miscellaneous..... | 11 |
| Reference ball, 6.35mm | 12 |
| Threaded ring | 13 |
| Split ring | 14 |
| XY adjustment tooling, D05 & D1 | 16 |
| Breadboard locating union | 17 |
| Breadboard clamp tool | 18 |
| Mirror mount leaf spring assembly | 19 |
| Male-female QC thread adaptor | 20 |
| Threaded iris | 21 |
| Optical spacer ring | 22 |
| Mounting Plates..... | 23 |
| Breadboard | 24 |
| Breadboard disc, gimbal | 25 |
| Gimbal adaptor for mirror mount and fixed mount series | 26 |
| Mirror Mounts | 27 |
| Fixed mirror mount, horizontal | 28 |
| Fixed mirror mount, vertical-bottom | 29 |
| Adjustable mirror mount, horizontal | 31 |
| Generic Mounts | 33 |
| XY adjustable mount | 34 |
| Through-hole XY adjustable mount | 35 |
| Fixed mount with flange | 36 |
| Fixed mount | 37 |

Tubes..... 38

- Lens tube, male-female**.....39
- Lens tube, male-female, adapted for MA_TH_**.....40
- Lens tube with axial adjustment**.....41

Rotation Mounts..... 42

- Rotation mount**..... 43

Translation Mounts.....44

- Translation mount, 1.5mm, 62.5MM**..... 45

QuickPOZ, INO’s family of robust optomechanical mounts for accurate positioning

The QuickPOZ optical mounts and breadboard line-up is addressing the need for robust optomechanical prototyping. Using these self-positioning optomechanical mounts is a cost-effective way of rapidly assembling prototypes that will remain aligned even under severe operating or transportation conditions. All mounts have been designed to be operated under a typical transport vehicle vibration environment up to 500 Hz while keeping their pointing stability under $\pm 50 \mu\text{rad}$.

The nominal positioning of all optics on the breadboard is easy with INO’s QuickPOZ, since each mount can be located with high position repeatability using removeable reference balls on INO’s special breadboard. These mounts integrate the patent-pending QuickCTR-edge technology allowing the positioning of all optical components within $\pm 50 \mu\text{m}$ @ 2 sigma from any mount assembled on the same breadboard with respect to nominal optical axis.

There are three standard heights for the mount optical axis with respect to the breadboard: 25.4 mm, 31.8 mm, and 38.1 mm.

How does it work?

INO’s QuickPOZ is the combination of robust optomechanical mounts and a patent-pending technology to accurately and rapidly position them on a breadboard.

These optomechanical mounts are the fruit of more than 25 years of development of prototypes used in demanding environments. The mounts included in the QuickPOZ line-up are found in surveillance planes, severe industrial environments, and bioscience labs – to name a few. High accuracy threaded reference balls are temporarily installed on INO’s proprietary breadboard to locate each mount with respect to one another. Breadboard threaded holes are accurately manufactured allowing precise positioning of all mounts. To complement the component positioning, each mount has been designed with tight tolerance reference features.

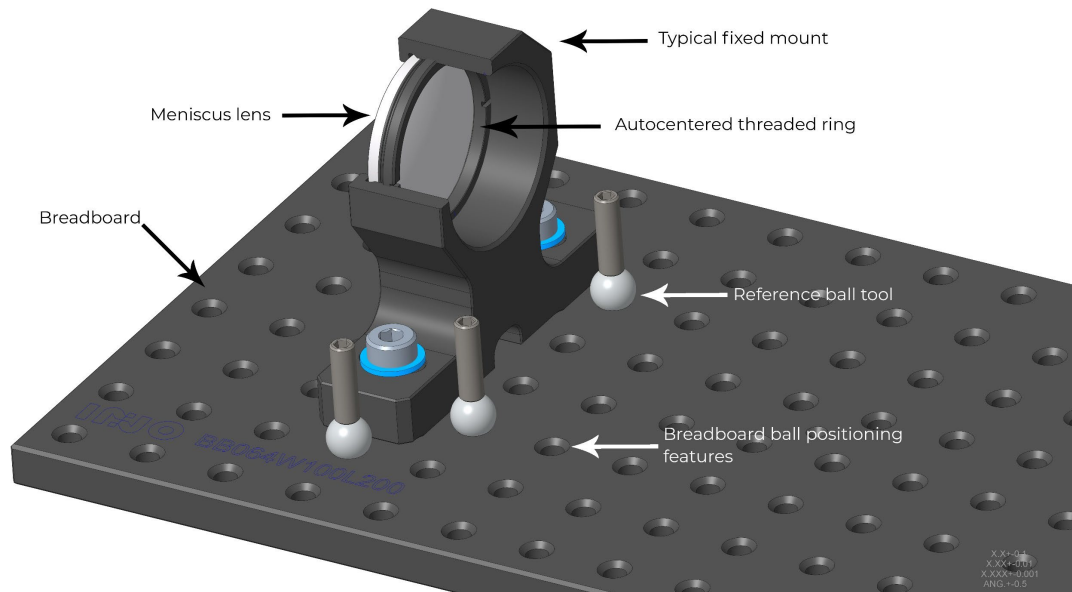


Figure 1 QuickPOZ breadboard reference ball positioning method

The lenses are autocentered into the mounts using INO’s patent-pending QuickCTR-edge technology which is based on the geometrical relationship between the lens chamfer and the threaded ring contact seat radius.

If needed, mounts from other vendors can be fitted on QuickPOZ breadboards.

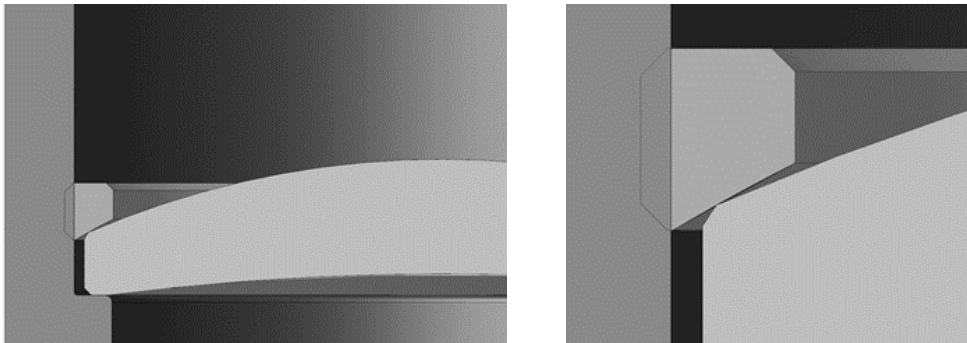


Figure 2 QuickCTR-edge technology principle

The technology is applicable to multiple mounting configurations like: convex, concave, and plano optical surfaces; optical subassemblies; and tube stacks.

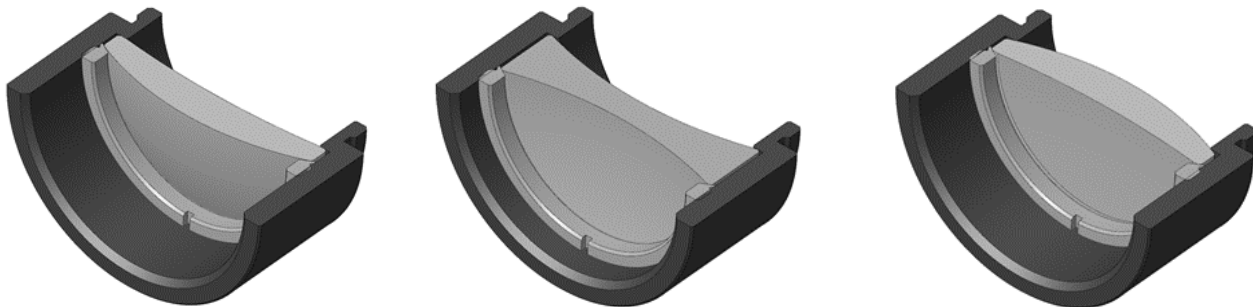


Figure 3 A few configurations using QuickCTR-edge technology

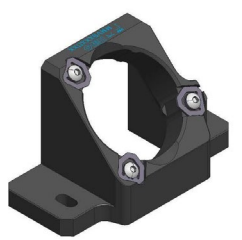
Performance specifications

| Feature | Performance |
|--|---|
| Optomechanical mount compatibility | Compatible with standard threads 0.535"-40, 1.035"-40, 2.035"-40 and RMS commercial accessories (Thorlabs, Edmund, Newport, ...). When a commercial accessory is used, centering and positioning performances are not met. In some cases, their robustness may also not be met. |
| Operating temperature | -40°C to +50°C |
| Storage temperature | -46°C to +63°C MIL-STD-810H Method 501.7 Procedure I, minimum 7 cycles (25°C to 63°C) with 2-hour plateau, 3°C/min MIL-STD-810H Method 502.7 Procedure I, 1 cycle (25°C to -46°C), 24-hour plateau, 3°C/min |
| Optical axis positioning accuracy | Statistical RSS accuracy of ±0.05 mm between optical axis of any optomechanical mount with respect to the nominal optical axis of the breadboard assembly. For breadboard dimensions up to 200 x 400 mm or 300 x 300 mm. |
| Mirror surface deformations induced by mount | MMA, MMH, and MMV mirror mount series induced deformations are ≤ lambda/10 PV @ 633 nm over their clear aperture. Measured on Ø25.4 mm x 6.13 mm and Ø50.8 x 12 mm mirror substrates mounted with a stack of 3x3 blades with a maximal deflection of 0.5 mm. ***Do not exceed 0.5 mm of blade deflection to avoid creeping*** |
| Dimensional pointing stability over operating temperature range | ≤ ±50 µrad (mechanical angle) Optics below Ø25 mm may exceed the ±50 µrad pointing stability due to their small size and small mounting seat. |
| Mounting repeatability | ≤ ±0.015 mm in positioning |
| Shipping vibrations impact on angular positioning | Without shipping packaging: ≤ ±50 µrad (mechanical angle). MIL-STD-810H Method 514.8 C.II category 4, unknown orientation, random vibration, 20 -500Hz, 1.17 Grms. Within a typical cardboard shipping packaging: ≤ ±50 µrad (mechanical angle). MIL-STD-810H Method 514.8 E-1 category 24, all axis orientation, random vibration, 20 -2000Hz, 7.7 Grms, 1 hour/axis. |
| Shock survival | 30 G minimum, without shipping packaging. 30 G corresponds to the limit of the most sensitive components, which are Ø50.8 mm mirror mounts. |
| Stress relief | If necessary, it is possible to improve dimensional stability performances by conditioning the assembly to thermal stress relief cycles. Thermal stress relief cycles are application specific and may be available upon request. |

What is included in INO's QuickPOZ family?

The whole family covers nearly 150 mounts of several sizes (QC05, QC1, QC30, QC2), available in three optical axis heights (25.4 mm, 31.8 mm, and 38.1 mm), and in four different mirror diameters. Adjustable mounts are also available for transversal (normal to optical axis), axial, tip/tilt, and clocking positioning.

QuickPOZ mount and accessory overview

| | Product name | Description |
|---|--------------------------------------|--|
|  | Threaded rings | Autocentered threaded rings for optical components, available in QC05, QC1, QC30, and QC2 thread sizes. |
|  | Adjustment tools | Several removable tool designed to be used with the QuickPOZ mounts for nominal or precise alignment.. |
|  | Threaded iris | Autocentered Ø1 mm iris, available in QC05 & QC1 thread sizes. Used for alignment purposes. |
|  | Fixed mirror mounts, horizontal | Low distortion fixed mirror mounts for horizontal beam folding, available in Ø12.7 mm, Ø25.4 mm, Ø38.1 mm, and Ø50.8 mm sizes. |
|  | Fixed mirror mounts, vertical-bottom | Low distortion fixed mirror mounts for downwards beam folding, available in Ø12.7 mm, Ø25.4 mm, Ø38.1 mm, and Ø50.8 mm sizes. |

| | | |
|---|--------------------------|--|
|  | Adjustable mirror mounts | Adjustable mirror mounts with $\pm 2^\circ$ tip-tilt for horizontal beam folding, available in $\varnothing 12.7$ mm, $\varnothing 25.4$ mm, $\varnothing 38.1$ mm, and $\varnothing 50.8$ mm sizes. Left-hand and right-hand versions are available. |
|  | XY adjustable mounts | X-Y adjustable mounts (± 1 mm) with QC05 & QC1 threads and axial support, for submicron positioning with removable XY adjustment tool. |
|  | Fixed mounts | Fixed mounts with and without flange, available in autocentered thread sizes QC05, QC1, QC30, and QC2, and microscope size 0.8"-36 (RMS). |
|  | Lens tubes | Standard autocentered tubes of several lengths, stackable, available sizes. Some can be used with through-hole XY adjustable mounts. Tube thread adaptors and autocentered axially adjustable tubes are also available. |
|  | Rotation mounts | Compact rotating mounts with autocentered thread sizes QC05 & QC1. |
|  | Translation mounts | Ultra-stable and high accuracy translation stage (± 1.5 mm) to be combined with adjustable and fixed mounts. |

Correspondence between INO’s autocentered threads and industry standards

| QuickPOZ thread | Industry standard equivalent |
|-----------------|--|
| QC05 | 0.535"-40 |
| QC1 | 1.035"-40 |
| QC30 | <i>This thread is not compatible with industry standard.</i> |
| QC2 | 2.035"-40 |
| RMS | RMS |

Many mounting breadboards, plates, and associated accessories are also available.

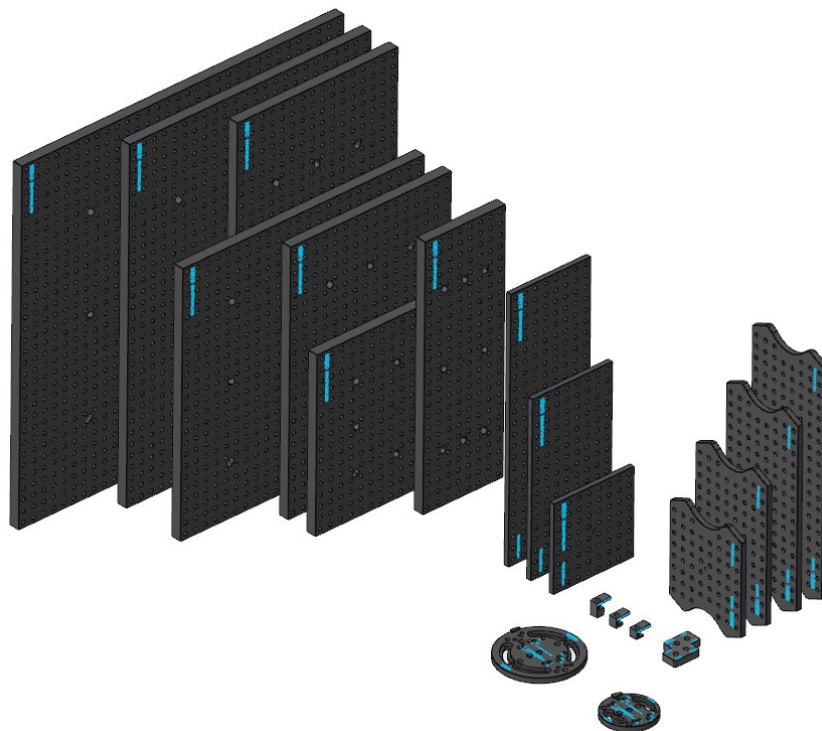


Figure 4 QuickPOZ mounting plates overview

What can be done with these mounts?

Any industrial optical applications where robustness and precise positioning are a concern may benefit from QuickPOZ. There are infinite ways of using these mounts, whether for an industrial laser source, a bulk fibre optical device, a spectrometer, a medical optical device, an illumination system, or an objective lens.



Figure 5 First example of configuration

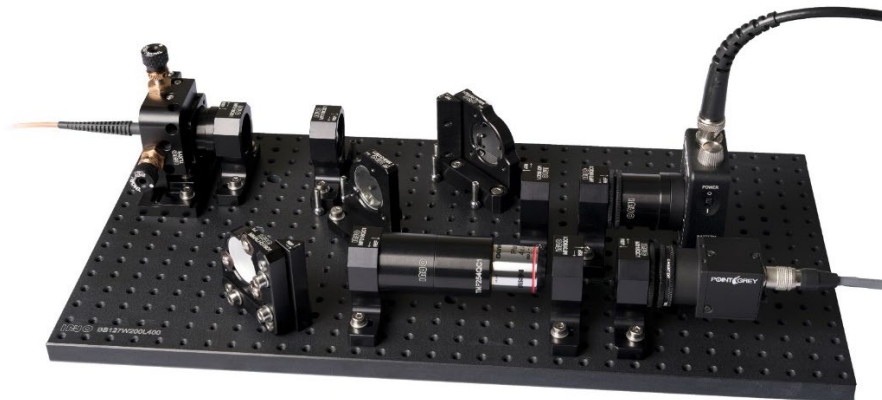


Figure 6 Second example of configuration

Need a custom configuration?

INO is offering consultation services to build up your own configuration for optimum performances. INO can also fully customize your need, from a custom breadboard up to a full turnkey solution. Our specialists in optical and optomechanical design can assist you during the whole design development process and even for your production series.

General considerations

All QuickPOZ mounts are designed to be attached using M4x0.7 screws which are 14 mm or 20 mm in length, depending of the mount type. In all cases, a washer $\varnothing 9$ mm x 0.8 mm thick (McMaster #93475A230) must be used with the deburred side downwards to avoid damaging the mount.

QuickPOZ specifications are guaranteed only if screws have the proper tightening torque:

| D | P | At (mm²) | N-m | ozf-in | lbf-in | lbf-ft |
|----------|----------|----------------------------|------------|---------------|---------------|---------------|
| 1.6 | 0.35 | 1.27 | 0.12 | 17 | | |
| 2 | 0.4 | 2.07 | 0.25 | 35 | | |
| 2.5 | 0.45 | 3.38 | 0.51 | 72 | 4 | |
| 3 | 0.5 | 5.03 | 0.91 | 128 | 8 | |
| 4 | 0.7 | 8.80 | 2.11 | | 19 | |
| 5 | 0.8 | 14.20 | 4.26 | | 38 | |
| 6 | 1 | 20.10 | 7.24 | | 64 | |
| 8 | 1 | 39.20 | 18.82 | | | 14 |
| 10 | 1.25 | 61.2 | 36.72 | | | 27 |
| 14 | 1.5 | 124.5 | 104.58 | | | 77 |

All QuickPOZ threaded rings are compatible with Thorlabs spanner wrenches for SM05, SM1, SM2, and SM30 formats.

Tooling & miscellaneous

Reference ball, 6.35mm

| | |
|----------------------|---|
| Description | Positioning ball assembly |
| Adjustments | n/a |
| Required tool | 2mm Allen wrench, or fingers |
| Product notes | Only lightly tighten by hand; only use hex key for accessibility. |

| | |
|-----------------|------------------------|
| Part no. | Unit Price (\$) |
| TLBAL1 | TBA |

Drawing TLBAL1

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| <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 30%; font-size: x-small;"> UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT 0.8 SHOWN: ±0.1, ∠ ±1/4° DRAWING IN ACCORDANCE WITH ASME Y14.5 2009 </td> <td style="width: 20%; text-align: center;"> CONTRACT NUMBER/INITIAL PROJECT 189810 </td> <td style="width: 10%; text-align: center;"> NATIONAL OPTICS INSTITUTE 2740, EINSTEIN STREET QUEBEC CITY, QUEBEC CANADA, G1P 4S4 </td> <td style="width: 40%; font-size: x-small;"> T (418) 657-7006 F (418) 657-7009 www.ino.ca </td> </tr> <tr> <td style="font-size: x-small;"> MATERIAL STAINLESS STEEL </td> <td style="font-size: x-small;"> DESIGNED S. PARADIS 2019-06-01 DRAWN S. PARADIS 2019-09-20 </td> <td colspan="2" style="text-align: center;"> TITLE REFERENCE BALL ASSY, 6.35MM </td> </tr> <tr> <td style="font-size: x-small;"> SURFACE TREATMENT N/A </td> <td style="font-size: x-small;"> EXAM./CHECK <i>SP</i> 2020-03-27 VÉRIF./VERIF. <i>MD</i> 2020-03-27 </td> <td style="font-size: x-small;"> FORMAT A DAI (CAGE CODE) 3AT79 SCALE 2:1 </td> <td style="font-size: x-small;"> DRAWING NUMBER TLBAL1 MASS (kg) 0.002 PAGE 1/1 </td> </tr> <tr> <td colspan="2"></td> <td style="font-size: x-small;"> REV. A </td> <td style="font-size: x-small;"> Released: A.S. TLBAL1 </td> </tr> </table> | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT 0.8 SHOWN: ±0.1, ∠ ±1/4° DRAWING IN ACCORDANCE WITH ASME Y14.5 2009 | CONTRACT NUMBER/INITIAL PROJECT 189810 | NATIONAL OPTICS INSTITUTE 2740, EINSTEIN STREET QUEBEC CITY, QUEBEC CANADA, G1P 4S4 | T (418) 657-7006 F (418) 657-7009 www.ino.ca | MATERIAL STAINLESS STEEL | DESIGNED S. PARADIS 2019-06-01 DRAWN S. PARADIS 2019-09-20 | TITLE REFERENCE BALL ASSY, 6.35MM | | SURFACE TREATMENT N/A | EXAM./CHECK <i>SP</i> 2020-03-27 VÉRIF./VERIF. <i>MD</i> 2020-03-27 | FORMAT A DAI (CAGE CODE) 3AT79 SCALE 2:1 | DRAWING NUMBER TLBAL1 MASS (kg) 0.002 PAGE 1/1 | | | REV. A | Released: A.S. TLBAL1 | |
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| | | REV. A | Released: A.S. TLBAL1 | | | | | | | | | | | | | | |

Threaded ring

| | |
|----------------------|--|
| Description | Threaded ring for autocentered optical components |
| Adjustments | n/a |
| Required tool | Compatible with Thorlabs spanner wrench for ring series SM05RR, SM1RR, SM2RR, SM30RR |
| Product notes | Compatible with QuickPOZ QC_ and commercial tube series. |

| Part no. | Unit Price (\$) |
|----------|-----------------|
| RQC05 | TBA |
| RQC1 | TBA |
| RQC30 | TBA |
| RQC2 | TBA |

Drawing RQC_

4
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2
1

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|-----------|-------------|-------------------|-------|
| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
| | | | |

| PRODUCT # | NAME | WIDTH | THREAD | ID | THK | MASS (KG) |
|-----------|--------------------|-------|--------------------|-------|-------|-----------|
| RQC05 | THREADED RING QC05 | 1.191 | 0.535"-40 CLASS 3A | 11.00 | 2.480 | 0.0003 |
| RQC1 | THREADED RING QC1 | 0.794 | 1.035"-40 CLASS 3A | 22.90 | 2.781 | 0.0008 |
| RQC30 | THREADED RING QC30 | 0.794 | M31 X 0.5 - 4h | 27.94 | 2.781 | 0.0009 |
| RQC2 | THREADED RING QC2 | 0.794 | 2.035"-40 CLASS 3A | 48.26 | 3.281 | 0.0020 |

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
REMOVE BURRS AND SHARP EDGES
TOLERANCES AFTER SURFACE TREATMENT 0.8
SHOWN: ±0.1, ∠±14°
DRAWING IN ACCORDANCE WITH ASME Y14.5 2009

MATERIAL: ALUMINUM

SURFACE TREATMENT: BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT: 189810

| APPROVALS | DATE (YYYY-MM-DD) |
|-------------------------|-------------------|
| DESIGNED F LAMONTAGNE | 2018-11-26 |
| DRAWN J. RÉGNIER | 2020-03-02 |
| EXAM./CHECK <i>PR</i> | 2020-03-30 |
| VÉRIF./VERIF. <i>MD</i> | 2020-03-30 |

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FORMAT: A DAI (CAGE CODE): 3AT79

SCALE: 2:1

TITLE: THREADED RING

DRAWING NUMBER: RQC_

REV. A

MASS (kg): PAGE: 1/1

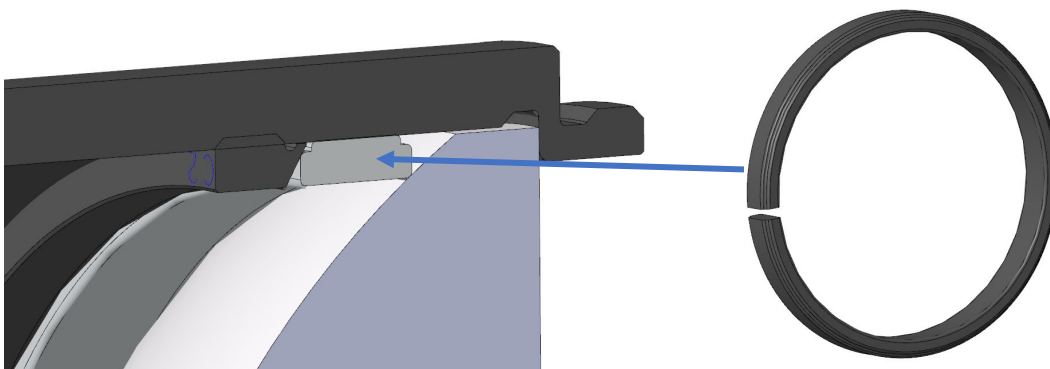
Released: A-4, RQC_

4
3
2
1

Split ring

| | |
|----------------------|--|
| Description | Complementary ring for lens with small convex radius of curvature |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | This split ring needs to be added between the lens and the QuickPOZ Threaded Ring when the radius of curvature of a convex lens is smaller than the threaded ring mounting radius. Compatible with QuickPOZ QC_ and commercial tube series. |

| Part no. | Unit Price (\$) |
|----------|-----------------|
| SRD05 | TBA |
| SRD1 | TBA |
| SRD30 | TBA |
| SRD2 | TBA |



This split ring is required for convex lens radius of curvature smaller than:

| Threaded ring P/N | Max. radius of curvature of convex lens (mm) |
|-------------------|--|
| RQC05 | 11.5 |
| RQC1 | 23.0 |
| RQC30 | 27.5 |
| RQC2 | 47.0 |

Drawing SRD_ (...see next page)

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| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:15%;">PRODUCT #</th> <th style="width:45%;">NAME</th> <th style="width:10%;">ID</th> <th style="width:10%;">OD</th> <th style="width:10%;">THK</th> <th style="width:10%;">MASS (KG)</th> </tr> <tr> <td>SRD05</td> <td>SPLIT RING, D05</td> <td>11.0</td> <td>12.98</td> <td>2.50</td> <td>0.0002</td> </tr> <tr> <td>SRD1</td> <td>SPLIT RING, D1</td> <td>22.9</td> <td>25.68</td> <td>3.00</td> <td>0.0008</td> </tr> <tr> <td>SRD30</td> <td>SPLIT RING, D30</td> <td>27.9</td> <td>30.56</td> <td>3.25</td> <td>0.0010</td> </tr> <tr> <td>SRD2</td> <td>SPLIT RING, D2</td> <td>48.3</td> <td>51.08</td> <td>4.00</td> <td>0.0022</td> </tr> </table> | PRODUCT # | NAME | ID | OD | THK | MASS (KG) | SRD05 | SPLIT RING, D05 | 11.0 | 12.98 | 2.50 | 0.0002 | SRD1 | SPLIT RING, D1 | 22.9 | 25.68 | 3.00 | 0.0008 | SRD30 | SPLIT RING, D30 | 27.9 | 30.56 | 3.25 | 0.0010 | SRD2 | SPLIT RING, D2 | 48.3 | 51.08 | 4.00 | 0.0022 | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%; font-size: 8px;"> UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT 0.8/ SHOWN: ±0.1, <±1/4" DRAWING IN ACCORDANCE WITH ASME Y14.5 2009 </td> <td style="width:30%; font-size: 8px;"> CONTRACT NUMBER/INITIAL PROJECT 189810 </td> <td style="width:40%; text-align: center;"> NATIONAL OPTICS INSTITUTE 2740, EINSTEIN STREET QUEBEC CITY, QUEBEC CANADA, G1P 4S4 T (418) 657-7006 F (418) 657-7009 www.ino.ca </td> </tr> <tr> <td style="font-size: 8px;"> MATERIAL ALUMINUM </td> <td style="font-size: 8px;"> APPROVALS DESIGNED F. LAMONTAGNE DRAWN J. RÉGNIER VERIFIED APPROVED </td> <td style="font-size: 8px;"> DATE (YYYY-MM-DD) 2019-10-10 2020-03-30 </td> </tr> <tr> <td style="font-size: 8px;"> SURFACE TREATMENT BLACK ANODIZING </td> <td colspan="2" style="font-size: 8px;"> TITLE SPLIT RING </td> </tr> <tr> <td style="font-size: 8px;"> FORMAT A </td> <td style="font-size: 8px;"> DAI (CAGE CODE) 3AT79 </td> <td style="font-size: 8px;"> DRAWING NUMBER SRD </td> </tr> <tr> <td style="font-size: 8px;"> SCALE 2:1 </td> <td style="font-size: 8px;"> MASS (kg) </td> <td style="font-size: 8px;"> PAGE 1/1 </td> </tr> </table> | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT 0.8/ SHOWN: ±0.1, <±1/4" DRAWING IN ACCORDANCE WITH ASME Y14.5 2009 | CONTRACT NUMBER/INITIAL PROJECT 189810 | NATIONAL OPTICS INSTITUTE 2740, EINSTEIN STREET QUEBEC CITY, QUEBEC CANADA, G1P 4S4 T (418) 657-7006 F (418) 657-7009 www.ino.ca | MATERIAL ALUMINUM | APPROVALS DESIGNED F. LAMONTAGNE DRAWN J. RÉGNIER VERIFIED APPROVED | DATE (YYYY-MM-DD) 2019-10-10 2020-03-30 | SURFACE TREATMENT BLACK ANODIZING | TITLE SPLIT RING | | FORMAT A | DAI (CAGE CODE) 3AT79 | DRAWING NUMBER SRD | SCALE 2:1 | MASS (kg) | PAGE 1/1 |
| PRODUCT # | NAME | ID | OD | THK | MASS (KG) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SRD05 | SPLIT RING, D05 | 11.0 | 12.98 | 2.50 | 0.0002 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SRD1 | SPLIT RING, D1 | 22.9 | 25.68 | 3.00 | 0.0008 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SRD30 | SPLIT RING, D30 | 27.9 | 30.56 | 3.25 | 0.0010 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SRD2 | SPLIT RING, D2 | 48.3 | 51.08 | 4.00 | 0.0022 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT 0.8/ SHOWN: ±0.1, <±1/4" DRAWING IN ACCORDANCE WITH ASME Y14.5 2009 | CONTRACT NUMBER/INITIAL PROJECT 189810 | NATIONAL OPTICS INSTITUTE 2740, EINSTEIN STREET QUEBEC CITY, QUEBEC CANADA, G1P 4S4 T (418) 657-7006 F (418) 657-7009 www.ino.ca | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MATERIAL ALUMINUM | APPROVALS DESIGNED F. LAMONTAGNE DRAWN J. RÉGNIER VERIFIED APPROVED | DATE (YYYY-MM-DD) 2019-10-10 2020-03-30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SURFACE TREATMENT BLACK ANODIZING | TITLE SPLIT RING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FORMAT A | DAI (CAGE CODE) 3AT79 | DRAWING NUMBER SRD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCALE 2:1 | MASS (kg) | PAGE 1/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

XY adjustment tooling, D05 & D1

| | |
|----------------------|--|
| Description | Transverse X-Y manipulator, removable with differential screws; fits with MA_QC05 and MA_QC1 mounts. |
| Adjustments | +/-1.5mm; coarse 318 µm/rev. and fine 25µm/rev. |
| Required tool | 2mm Allen wrench |
| Product notes | <p>Can be used either with the adjuster located at right or at left.</p> <p>***Warning*** Do not forget to detent the spring plunger before adjustment (small set screws located in front of the mount.)</p> <p>***Warning*** Do not forget to retract the spring plunger before removing the tool from the mount.</p> |

| | |
|-----------------|------------------------|
| Part no. | Unit Price (\$) |
| TLXY1 | TBA |

Drawing TLXY1

| <p style="font-size: 8px;">PROPRIETARY NOTICE/CONFIDENTIALITY: THIS DOCUMENT AND THE INFORMATION DISCLOSED HEREIN ARE CONFIDENTIAL AND THE PROPERTY OF INSTITUT NATIONAL D'OPTIQUE NATIONAL OPTICS INSTITUTE (HEREAFTER INO). THEY SHALL NOT BE REPRODUCED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF INO. INO RESERVES ALL PATENT, COPYRIGHT AND OTHER PROPRIETARY RIGHTS TO THIS DOCUMENT, INCLUDING ALL DESIGN, MANUFACTURING, REPRODUCTION, USE AND SALES RIGHTS THEREIN, REPRODUCTION, USE AND SALES RIGHTS THEREIN, EXCEPT TO THE EXTENT SAID RIGHTS ARE EXPRESSLY GRANTED TO OTHERS.</p> <p>NOTES: 1 - FOR REFERENCE ONLY, NOT FOR MANUFACTURING PURPOSES</p> | <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">REVISIONS</th> </tr> <tr> <th style="width:10%;">REV.</th> <th style="width:60%;">DESCRIPTION</th> <th style="width:20%;">DATE (YYYY-MM-DD)</th> <th style="width:10%;">DRAWN</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <div style="text-align: center; margin-top: 20px;"> </div> <div style="text-align: right; margin-top: 20px;"> </div> | REVISIONS | | | | REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|-----------------|-----------------------|------------------------------------|---|--------------------------------------|---------------------|------------|--|--|-----------------------|------------|--------------------------------|--|-------------------------|------------|--------------|--|--|--|-----------------|--|--|--|----------|--|------|---|------|------------|-------|------------|-------|---------------------------------|------|---|
| REVISIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| MATERIAL N/A | DESIGNED M. LEGROS | DATE (YYYY-MM-DD) 2019-06-01 | TITLE XY ADJUSTMENT TOOLING, D05 & D1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SURFACE TREATMENT BLACK ANODIZING | DRAWN S. PARADIS | 2019-09-20 | FORMAT DAI (CAGE CODE) A 3AT79 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EXAM./CHECK <i>SA</i> | 2020-03-17 | DRAWING NUMBER TLXY1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | VERIF./VERIF. <i>MD</i> | 2020-03-17 | SCALE 3:4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | MASS (kg) 0.194 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | PAGE 1/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REV. | A | DATE | 2019-06-01 | DRAWN | S. PARADIS | TITLE | XY ADJUSTMENT TOOLING, D05 & D1 | REV. | A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Breadboard locating union

| | |
|----------------------|--|
| Description | Tool to join 2 mounting plates together |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | User instructions available upon request |

| | |
|-----------------|------------------------|
| Part no. | Unit Price (\$) |
| TLBBU | TBA |

Drawing TLBBU

4
3
2
1

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| REVISIONS | | | |
|-----------|-------------|-------------------|-------|
| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
| | | | |

NOTES:
 1 - FOR REFERENCE ONLY, NOT FOR MANUFACTURING PURPOSES

REF1
 REF2
 TLBBU
 4X Ø 4.8
 12.5 TYP.
 7.6

4
3
2
1

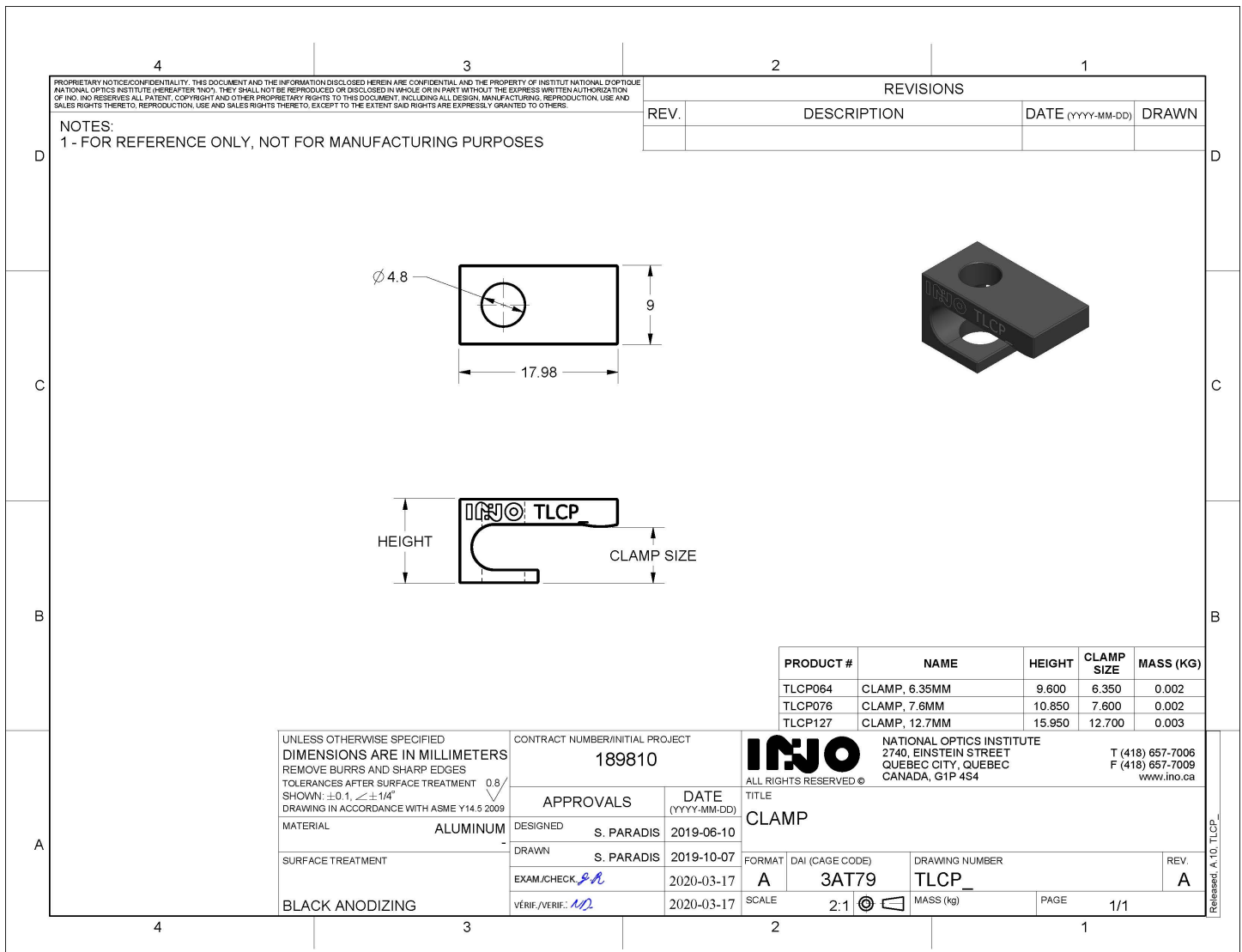
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| MATERIAL ALUMINUM | DESIGNED K. BILODEAU | DATE (YYYY-MM-DD) 2019-06-01 | TITLE BREADBOARD LOCATING UNION |
| SURFACE TREATMENT BLACK ANODIZING | DRAWN K. BILODEAU | DATE 2020-03-17 | FORMAT A |
| DA1 (CAGE CODE) 3AT79 | | DRAWING NUMBER TLBBU | |
| VERIF./VERIF.: <i>MD</i> | | SCALE 1:1 | |
| MASS (kg) 0.020 | | PAGE 1/1 | |
| REV. A | | REV. A | |

Referenc. A.8: TLBBU

Breadboard clamp tool

| | | | |
|----------------------|--|-----------------|------------------------|
| Description | Clamp tool to fix breadboard gimbals, or to fix mounts and other breadboards (6.4mm, 7.6mm or 12.7mm thick). | Part no. | Unit Price (\$) |
| Adjustments | n/a | TLCP064 | TBA |
| Required tool | n/a | TLCP076 | TBA |
| Product notes | | TLCP127 | TBA |

Drawing TLCP_

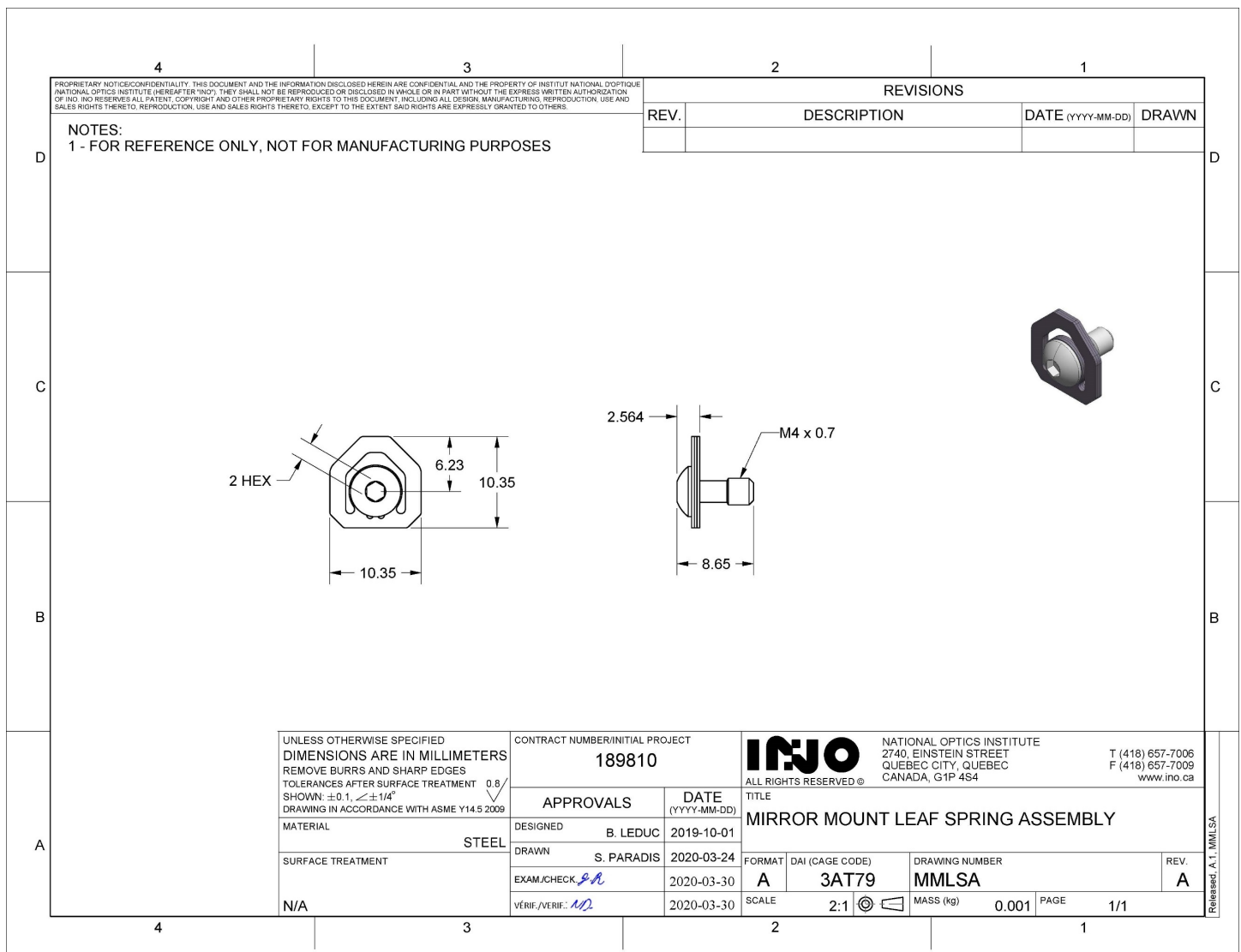


Mirror mount leaf spring assembly

| | |
|----------------------|--|
| Description | 3 leaf springs with 1 captive screw |
| Adjustments | n/a |
| Required tool | 2mm Allen wrench |
| Product notes | *** Warning*** These blades have been designed to be used in stack of 3 with a maximal deflection of 0.5mm at the tip. |

| | |
|-----------------|------------------------|
| Part no. | Unit Price (\$) |
| MMLSA | TBA |

Drawing MMLSA



Male-female QC thread adaptor

| | |
|----------------------|----------------------------|
| Description | Male-female thread adaptor |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | |

| Part no. | Unit Price (\$) |
|-------------|-----------------|
| AMFQC05QC1 | TBA |
| AMFQC05QC30 | TBA |
| AMFQC1QC05 | TBA |
| AMFQC1QC30 | TBA |
| AMFQC1QC2 | TBA |
| AMFQC30QC05 | TBA |
| AMFQC30QC1 | TBA |
| AMFQC2QC1 | TBA |

Drawing AMFQC_QC_

4
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1

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SECTION A-A

| PRODUCT # | NAME | OD | ID | MALE THREAD | FEMALE THREAD | MASS (KG) |
|-------------|--|-------|-------|--------------------|--------------------|-----------|
| AMFQC05QC1 | QC THREAD ADAPTOR, MALE-FEMALE, QC05 TO QC1 | 30.48 | 11.00 | 0.535"-40 CLASS 3A | 1.035"-40 CLASS 3B | 0.004 |
| AMFQC05QC30 | QC THREAD ADAPTOR, MALE-FEMALE, QC05 TO QC30 | 35.00 | 11.00 | 0.535"-40 CLASS 3A | M31 x 0.5 - 4G | 0.005 |
| AMFQC1QC05 | QC THREAD ADAPTOR, MALE-FEMALE, QC1 TO QC05 | 30.48 | 23.40 | 1.035"-40 CLASS 3A | 0.535"-40 CLASS 3B | 0.008 |
| AMFQC1QC30 | QC THREAD ADAPTOR, MALE-FEMALE, QC1 TO QC30 | 35.00 | 23.40 | 1.035"-40 CLASS 3A | M31 x 0.5 - 4G | 0.005 |
| AMFQC1QC2 | QC THREAD ADAPTOR, MALE-FEMALE, QC1 TO QC2 | 55.88 | 23.40 | 1.035"-40 CLASS 3A | 2.035"-40 CLASS 3B | 0.011 |
| AMFQC30QC05 | QC THREAD ADAPTOR, MALE-FEMALE, QC30 TO QC05 | 35.00 | 28.00 | M31 x 0.5 - 4h | 0.535"-40 CLASS 3B | 0.011 |
| AMFQC30QC1 | QC THREAD ADAPTOR, MALE-FEMALE, QC30 TO QC1 | 35.00 | 28.00 | M31 x 0.5 - 4h | 1.035"-40 CLASS 3B | 0.007 |
| AMFQC2QC1 | QC THREAD ADAPTOR, MALE-FEMALE, QC2 TO QC1 | 55.88 | 48.80 | 2.035"-40 CLASS 3A | 1.035"-40 CLASS 3B | 0.026 |

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
REMOVE BURRS AND SHARP EDGES
TOLERANCES AFTER SURFACE TREATMENT 0.8
SHOWN: ±0.1, ∠±1/4°
DRAWING IN ACCORDANCE WITH ASME Y14.5 2009

MATERIAL: ALUMINUM

SURFACE TREATMENT: BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT
189810

INO NATIONAL OPTICS INSTITUTE
2740, EINSTEIN STREET
QUEBEC CITY, QUEBEC
CANADA, G1P 4S4

T (418) 657-7006
F (418) 657-7009
www.ino.ca

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TITLE: QC THREAD ADAPTOR, MALE-FEMALE

DESIGNED: J. RÉGNIER DATE: 2020-02-06

DRAWN: J. RÉGNIER DATE: 2020-03-10

EXAM./CHECK: *J.R.* DATE: 2020-03-30

VÉRIF./VERIF: *M.D.* DATE: 2020-03-30

FORMAT: A DAI (CAGE CODE): 3AT79 DRAWING NUMBER: AMFQC_QC_ REV: A

SCALE: 3:2 MASS (kg): PAGE: 1/1

4
3
2
1

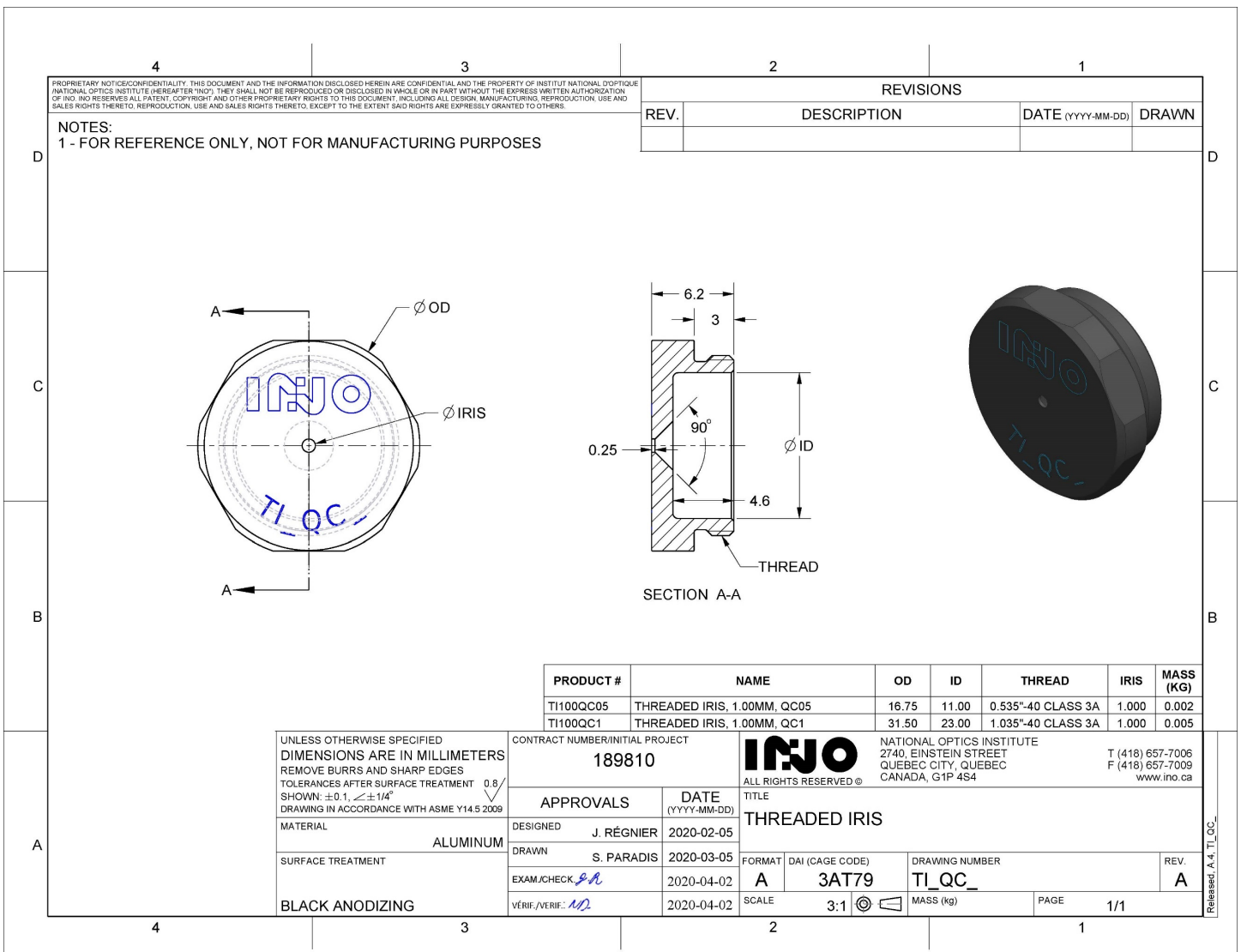
Released: A. J. AMFQC_QC_

Threaded iris

| | |
|----------------------|--|
| Description | Autocentered threaded iris, QC1 or QC05, with a 1mm hole |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | These iris are used for alignment purposes |

| Part no. | Unit Price (\$) |
|-----------|-----------------|
| TI100QC05 | TBA |
| TI100QC1 | TBA |

Drawing TI_QC_



Optical spacer ring

| | |
|----------------------|--|
| Description | Shims to fill in thickness gap of some mirrors, filters, and dichroics for mirror mount series |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | |

| Part no. | Unit Price (\$) | Part no. | Unit Price (\$) |
|----------|-----------------|----------|-----------------|
| OST05D05 | TBA | OST05D15 | TBA |
| OST1D05 | TBA | OST1D15 | TBA |
| OST2D05 | TBA | OST2D15 | TBA |
| OST3D05 | TBA | OST3D15 | TBA |
| OST5D05 | TBA | OST5D15 | TBA |
| OST05D1 | TBA | OST05D2 | TBA |
| OST1D1 | TBA | OST1D2 | TBA |
| OST2D1 | TBA | OST2D2 | TBA |
| OST3D1 | TBA | OST3D2 | TBA |
| OST5D1 | TBA | OST5D2 | TBA |

Drawing OST_D_

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D
C
B
A

4
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NOTES:
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THICK. ±0.05

SECTION A-A

| REVISIONS | | | | | |
|-----------|-------------|-------------------|-------|--|--|
| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN | | |
| | | | | | |
| | | | | | |

| PRODUCT # | NAME | ID | OD | THICK. | MASS (g) |
|-----------|---------------------------------------|--------|--------|--------|----------|
| OST05D05 | OPTICAL SPACER RING, 0.5MM THICK, D05 | 10.400 | 12.600 | 0.500 | 0.054 |
| OST1D05 | OPTICAL SPACER RING, 1MM THICK, D05 | 10.400 | 12.600 | 1.000 | 0.105 |
| OST2D05 | OPTICAL SPACER RING, 2MM THICK, D05 | 10.400 | 12.600 | 2.000 | 0.213 |
| OST3D05 | OPTICAL SPACER RING, 3MM THICK, D05 | 10.400 | 12.600 | 3.000 | 0.326 |
| OST5D05 | OPTICAL SPACER RING, 5MM THICK, D05 | 10.400 | 12.600 | 5.000 | 0.551 |
| OST05D1 | OPTICAL SPACER RING, 0.5MM THICK, D1 | 21.900 | 25.300 | 0.500 | 0.172 |
| OST1D1 | OPTICAL SPACER RING, 1MM THICK, D1 | 21.900 | 25.300 | 1.000 | 0.335 |
| OST2D1 | OPTICAL SPACER RING, 2MM THICK, D1 | 21.900 | 25.300 | 2.000 | 0.677 |
| OST3D1 | OPTICAL SPACER RING, 3MM THICK, D1 | 21.900 | 25.300 | 3.000 | 1.028 |
| OST5D1 | OPTICAL SPACER RING, 5MM THICK, D1 | 21.900 | 25.300 | 5.000 | 1.706 |
| OST05D15 | OPTICAL SPACER RING, 0.5MM THICK, D15 | 34.900 | 38.000 | 0.500 | 0.241 |
| OST1D15 | OPTICAL SPACER RING, 1MM THICK, D15 | 34.900 | 38.000 | 1.000 | 0.471 |
| OST2D15 | OPTICAL SPACER RING, 2MM THICK, D15 | 34.900 | 38.000 | 2.000 | 0.952 |
| OST3D15 | OPTICAL SPACER RING, 3MM THICK, D15 | 34.900 | 38.000 | 3.000 | 1.447 |
| OST5D15 | OPTICAL SPACER RING, 5MM THICK, D15 | 34.900 | 38.000 | 5.000 | 2.401 |
| OST05D2 | OPTICAL SPACER RING, 0.5MM THICK, D2 | 46.200 | 50.700 | 0.500 | 0.465 |
| OST1D2 | OPTICAL SPACER RING, 1MM THICK, D2 | 46.200 | 50.700 | 1.000 | 0.913 |
| OST2D2 | OPTICAL SPACER RING, 2MM THICK, D2 | 46.200 | 50.700 | 2.000 | 1.841 |
| OST3D2 | OPTICAL SPACER RING, 3MM THICK, D2 | 46.200 | 50.700 | 3.000 | 2.787 |
| OST5D2 | OPTICAL SPACER RING, 5MM THICK, D2 | 46.200 | 50.700 | 5.000 | 4.630 |

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
REMOVE BURRS AND SHARP EDGES
TOLERANCES AFTER SURFACE TREATMENT $0.8/\sqrt{R}$
SHOWN: $\pm 0.1, \angle \pm 1/4^\circ$
DRAWING IN ACCORDANCE WITH ASME Y14.5 2009

MATERIAL: ALUMINUM

SURFACE TREATMENT: BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT: 189810

| APPROVALS | DATE (YYYY-MM-DD) |
|-------------------------|-------------------|
| DESIGNED: B. LEDUC | 2020-03-30 |
| DRAWN: B. LEDUC | 2020-04-01 |
| EXAM./CHECK: <i>BR</i> | 2020-04-09 |
| VERIF./VERIF: <i>MD</i> | 2020-04-09 |

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TITLE: OPTICAL SPACER RING

| | | | |
|------------|------------------------|------------------------|--------|
| FORMAT: A | DAI (CAGE CODE): 3AT79 | DRAWING NUMBER: OST_D_ | REV. A |
| SCALE: 2:1 | MASS (kg): | PAGE: 1/1 | |

Released: A.T. OST_D_

Mounting Plates

Breadboard

| | |
|----------------------|--|
| Description | Mounting plate, 6.35 or 12.7mm thick with M4 x 0.7 threaded holes |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | Use only three of the eight mounting holes for mounting otherwise the breadboard may warp. |

| Part no. | Unit Price (\$) |
|---------------|-----------------|
| BB064W100L100 | TBA |
| BB064W100L200 | TBA |
| BB064W100L300 | TBA |
| BB127W100L300 | TBA |
| BB127W200L200 | TBA |
| BB127W200L300 | TBA |
| BB127W200L400 | TBA |
| BB127W300L300 | TBA |
| BB127W300L400 | TBA |
| BB127W400L400 | TBA |

Drawing BB_W_L_

4
3
2
1

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| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
|------|-------------|-------------------|-------|
| | | | |

| PRODUCT # | NAME | THK | WIDTH | LENGTH | X | Y | MASS (KG) |
|---------------|-------------------------------|-------|-------|--------|-------|-------|-----------|
| BB064W100L100 | BREADBOARD, 6.35MM, 100X100MM | 6.35 | 100 | 100 | 50.0 | 50.0 | 0.166 |
| BB064W100L200 | BREADBOARD, 6.35MM, 100X200MM | 6.35 | 100 | 200 | 50.0 | 50.0 | 0.332 |
| BB064W100L300 | BREADBOARD, 6.35MM, 100X300MM | 6.35 | 100 | 300 | 50.0 | 50.0 | 0.499 |
| BB127W100L300 | BREADBOARD, 12.7MM, 100X300MM | 12.70 | 100 | 300 | 25.0 | 87.5 | 0.987 |
| BB127W200L200 | BREADBOARD, 12.7MM, 200X200MM | 12.70 | 200 | 200 | 50.0 | 50.0 | 1.323 |
| BB127W200L300 | BREADBOARD, 12.7MM, 200X300MM | 12.70 | 200 | 300 | 50.0 | 87.5 | 1.991 |
| BB127W200L400 | BREADBOARD, 12.7MM, 200X400MM | 12.70 | 200 | 400 | 50.0 | 112.5 | 2.659 |
| BB127W300L300 | BREADBOARD, 12.7MM, 300X300MM | 12.70 | 300 | 300 | 87.5 | 87.5 | 2.993 |
| BB127W300L400 | BREADBOARD, 12.7MM, 300X400MM | 12.70 | 300 | 400 | 87.5 | 112.5 | 3.997 |
| BB127W400L400 | BREADBOARD, 12.7MM, 400X400MM | 12.70 | 400 | 400 | 112.5 | 112.5 | 5.335 |

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
REMOVE BURRS AND SHARP EDGES
TOLERANCES AFTER SURFACE TREATMENT 0.8
SHOWN: ±0.1, ±.14"
DRAWING IN ACCORDANCE WITH ASME Y14.5 2009

MATERIAL: ALUMINUM

SURFACE TREATMENT: BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT
189810

APPROVALS: M. GRENIER (DESIGNED), S. PARADIS (DRAWN)

DATE (YYYY-MM-DD): 2019-01-22

DATE: 2020-03-17

DATE: 2020-03-17

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TITLE: BREADBOARD

FORMAT: A, DAI (CAGE CODE): 3AT79

DRAWING NUMBER: BB_W_L_

SCALE: 3:8

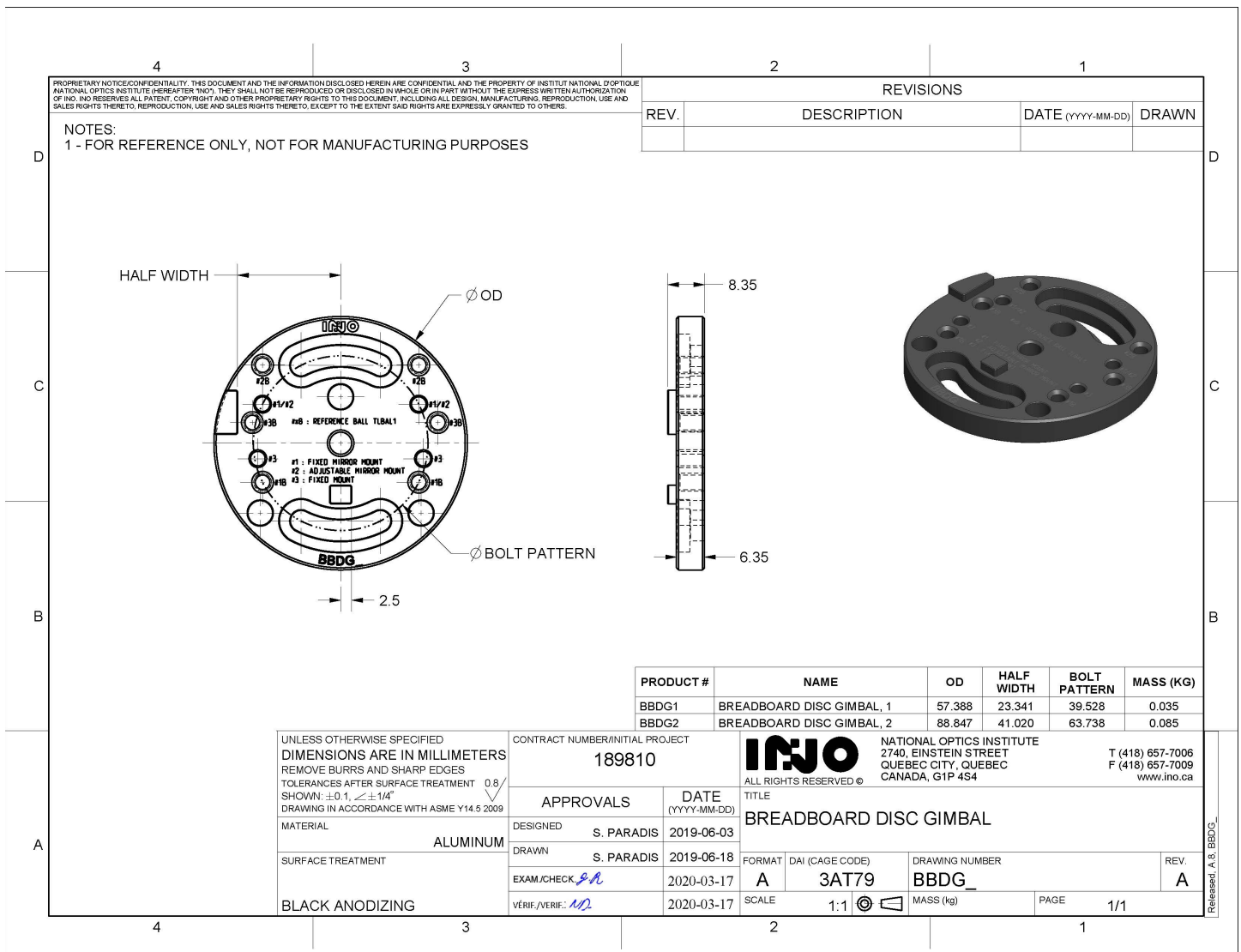
REV. A

Breadboard disc, gimbal

| | |
|----------------------|--|
| Description | Mounting disc with rotation adjustment, 6.35mm thick |
| Adjustments | 360° |
| Required tool | n/a |
| Product notes | |

| Part no. | Unit Price (\$) |
|----------|-----------------|
| BBDG1 | TBA |
| BBDG2 | TBA |

Drawing BBDG_

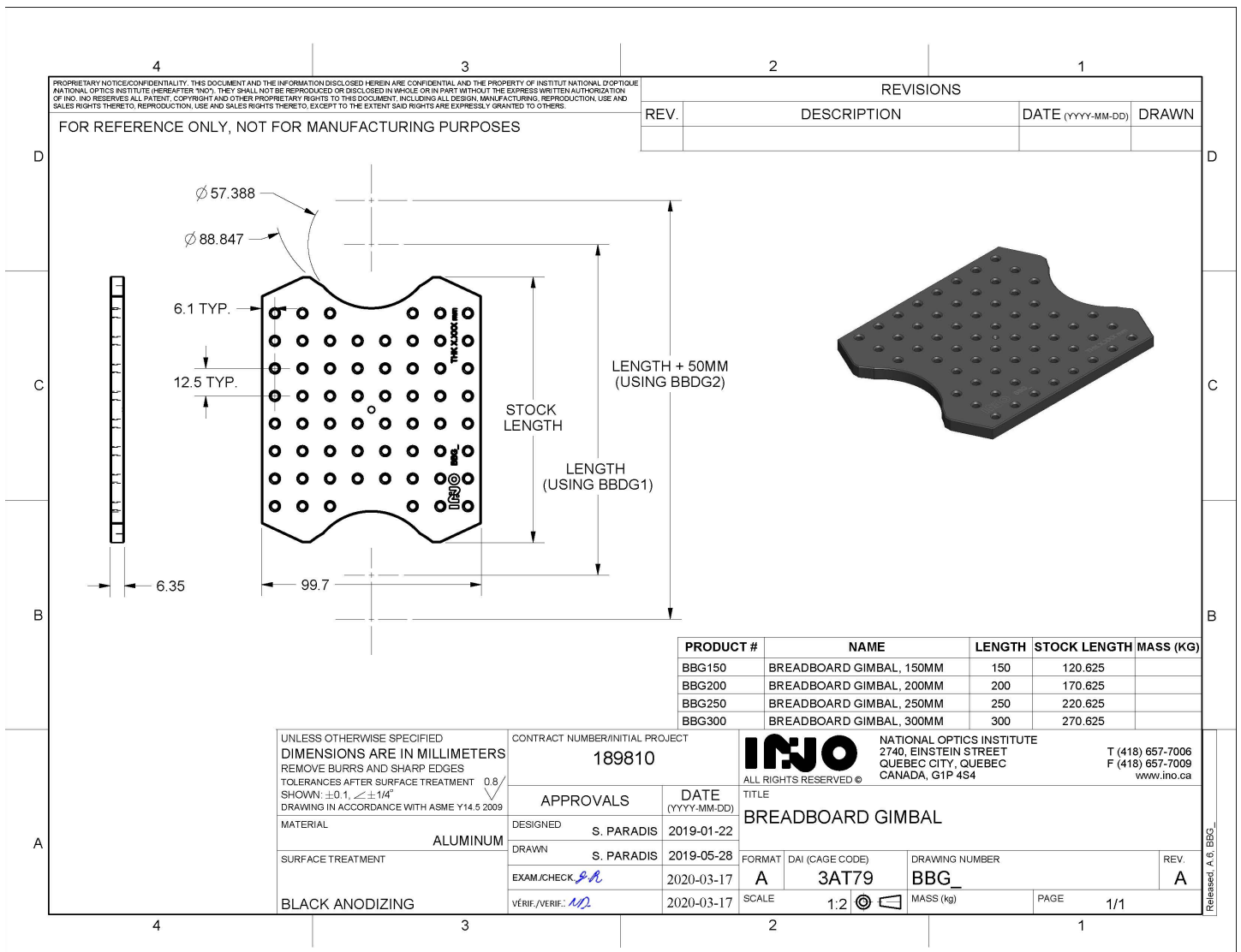


Gimbal adaptor for mirror mount and fixed mount series

| | |
|----------------------|--|
| Description | Mounting plate, 6.35mm thick with circular end |
| Adjustments | 360° horizontal travel |
| Required tool | n/a |
| Product notes | |

| Part no. | Unit Price (\$) |
|----------|-----------------|
| BBG150 | TBA |
| BBG200 | TBA |
| BBG250 | TBA |
| BBG300 | TBA |

Drawing BBG_



Mirror Mounts

Fixed mirror mount, horizontal

| | |
|----------------------|---|
| Description | Fixed mirror mount for horizontal beam folding |
| Adjustments | n/a |
| Required tool | 2 mm Allen wrench |
| Product notes | <p>Nominal mirror preload is reached at 0.4mm deflection which corresponds to a mirror thickness of 6 ± 0.1 mm for $\varnothing 12$-12.7mm and $\varnothing 25$-25.4mm mirrors / 9.525 ± 0.1 mm for $\varnothing 38.1$mm mirrors / 12 ± 0.1 mm for $\varnothing 50$-50.8mm mirrors.</p> <p>The mount can accommodate other mirror thicknesses by adding OST_D_ shims between the mirror and the blades. If the mirror is too thick, use ID $\varnothing 1/8''$ x OD $\varnothing 3/16''$ precision shims from McMaster of the desired thickness.</p> <p>*** Warning*** Blades have been designed to be used in stack of 3 with a maximal deflection of 0.5mm at the tip.</p> |

| Part no. | Unit Price (\$) |
|-----------|-----------------|
| MMH254D05 | TBA |
| MMH318D05 | TBA |
| MMH381D05 | TBA |
| MMH254D1 | TBA |
| MMH318D1 | TBA |
| MMH381D1 | TBA |
| MMH254D15 | TBA |
| MMH318D15 | TBA |
| MMH381D15 | TBA |
| MMH318D2 | TBA |
| MMH381D2 | TBA |

Drawing MMH_D_

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NOTES:
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| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
|------|-------------|-------------------|-------|
| | | | |
| | | | |

| PRODUCT # | NAME | AXIS HEIGHT | INNER DIA. | C/A | SEAT DEPTH | LENGTH | WIDTH | HEIGHT | MASS (KG) |
|-----------|---|-------------|------------|-------|------------|--------|-------|--------|-----------|
| MMH254D05 | FIXED MIRROR MOUNT, HORIZONTAL, D05, 25.4MM | 25.40 | 12.9 | 10.40 | 5.600 | 22.203 | 46.68 | 41.90 | 0.040 |
| MMH318D05 | FIXED MIRROR MOUNT, HORIZONTAL, D05, 31.8MM | 31.75 | 12.9 | 10.40 | 5.600 | 22.203 | 46.68 | 48.25 | 0.044 |
| MMH381D05 | FIXED MIRROR MOUNT, HORIZONTAL, D05, 38.1MM | 38.10 | 12.9 | 10.40 | 5.600 | 22.203 | 46.68 | 54.60 | 0.047 |
| MMH254D1 | FIXED MIRROR MOUNT, HORIZONTAL, D1, 25.4MM | 25.40 | 25.6 | 21.90 | 5.600 | 21.503 | 46.68 | 47.65 | 0.035 |
| MMH318D1 | FIXED MIRROR MOUNT, HORIZONTAL, D1, 31.8MM | 31.75 | 25.6 | 21.90 | 5.600 | 21.503 | 46.68 | 54.00 | 0.041 |
| MMH381D1 | FIXED MIRROR MOUNT, HORIZONTAL, D1, 38.1MM | 38.10 | 25.6 | 21.90 | 5.600 | 21.503 | 46.68 | 60.35 | 0.046 |
| MMH254D15 | FIXED MIRROR MOUNT, HORIZONTAL, D15, 25.4MM | 25.40 | 38.3 | 34.90 | 9.125 | 25.378 | 82.04 | 53.65 | 0.056 |
| MMH318D15 | FIXED MIRROR MOUNT, HORIZONTAL, D15, 31.8MM | 31.75 | 38.3 | 34.90 | 9.125 | 25.378 | 82.04 | 60.00 | 0.063 |
| MMH381D15 | FIXED MIRROR MOUNT, HORIZONTAL, D15, 38.1MM | 38.10 | 38.3 | 34.90 | 9.125 | 25.378 | 82.04 | 66.35 | 0.069 |
| MMH318D2 | FIXED MIRROR MOUNT, HORIZONTAL, D2, 31.8MM | 31.75 | 51.0 | 46.20 | 11.600 | 28.603 | 82.04 | 66.00 | 0.071 |
| MMH381D2 | FIXED MIRROR MOUNT, HORIZONTAL, D2, 38.1MM | 38.10 | 51.0 | 46.20 | 11.600 | 28.603 | 82.04 | 72.35 | 0.080 |

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT SHOWN: ± 0.1 , $\leq \pm 1/4''$ DRAWN IN ACCORDANCE WITH ASME Y14.5 2009

CONTRACT NUMBER/INITIAL PROJECT: 189810

APPROVALS: DESIGNED S. PARADIS, DRAWN S. PARADIS, EXAM/CHECK, VERIF./VERIF.

DATE: 2019-06-10, 2020-01-27, 2020-04-24, 2020-04-24

MATERIAL: ALUMINUM

SURFACE TREATMENT: BLACK ANODIZING

INO NATIONAL OPTICS INSTITUTE 2740, EINSTEIN STREET QUEBEC CITY, QUEBEC CANADA, G1P 4S4

TITLE: FIXED MIRROR MOUNT, HORIZONTAL

FORMAT: A, DAI (CAGE CODE) 3AT79, SCALE: 1:1

DRAWING NUMBER: MMH_D_

REV. A

MASS (kg), PAGE 1/1

Fixed mirror mount, vertical-bottom

| | |
|----------------------|---|
| Description | Fixed mirror mount for vertical beam folding, downwards |
| Adjustments | n/a |
| Required tool | 2 mm Allen wrench |
| Product notes | <p>Nominal mirror preload is reached at 0.4mm deflection which corresponds to a mirror thickness of 6 ± 0.1 mm for $\varnothing 12$-12.7mm and $\varnothing 25$-25.4mm mirrors / 9.525 ± 0.1 mm for $\varnothing 38.1$mm mirrors / 12 ± 0.1 mm for $\varnothing 50$-50.8mm mirrors.</p> <p>The mount can accommodate other mirror thicknesses by adding OST_D_ shims between the mirror and the blades. If the mirror is too thick, use ID $\varnothing 1/8''$ x OD $\varnothing 3/16''$ precision shims from McMaster of the desired thickness.</p> <p>*** Warning*** Blades have been designed to be used in stack of 3 with a maximal deflection of 0.5mm at the tip.</p> <p>Optical axis positioning accuracy after the folding may be up to ± 0.1mm RSS.</p> |

| Part no. | Unit Price (\$) |
|------------|-----------------|
| MMVB254D05 | TBA |
| MMVB254D1 | TBA |
| MMVB254D15 | TBA |
| MMVB318D05 | TBA |
| MMVB318D1 | TBA |
| MMVB318D15 | TBA |
| MMVB381D05 | TBA |
| MMVB381D1 | TBA |
| MMVB381D15 | TBA |

Drawing MMVB_D_ (...see next page)

| 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|------------|-------------|-------------|-------------------|------------|--------|-----------|-----------|------------|-------------|--|-------------|------------|---------------|-------|-------------|------------|------|-------|------------|--|-------|-------|-------|-------|-------|-------|------|-------|------------|--|-------|-------|-------|-------|-------|-------|------|-------|-----------|---|-------|-------|-------|-------|-------|-------|------|-------|-----------|---|-------|-------|-------|-------|-------|-------|------|-------|-----------|---|-------|-------|-------|-------|-------|-------|------|-------|------------|--|-------|-------|-------|-------|-------|-------|------|-------|------------|--|-------|-------|-------|-------|-------|-------|------|-------|------------|--|-------|-------|-------|-------|-------|-------|------|-------|--|--|
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| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>PRODUCT #</th> <th>NAME</th> <th>AXIS HEIGHT</th> <th>INNER DIA.</th> <th>Ø C/A</th> <th>SPACING</th> <th>LENGTH</th> <th>WIDTH</th> <th>HEIGHT</th> <th>MASS (KG)</th> </tr> </thead> <tbody> <tr> <td>MMVB254D05</td> <td>FIXED MIRROR MOUNT, VERTICAL BOTTOM, D05, 25.4MM</td> <td>25.40</td> <td>12.90</td> <td>10.41</td> <td>37.50</td> <td>31.15</td> <td>56.15</td> <td>44.4</td> <td>0.050</td> </tr> <tr> <td>MMVB318D05</td> <td>FIXED MIRROR MOUNT, VERTICAL BOTTOM, D05, 31.8MM</td> <td>31.75</td> <td>12.90</td> <td>10.41</td> <td>37.50</td> <td>31.15</td> <td>56.15</td> <td>50.7</td> <td>0.053</td> </tr> <tr> <td>MMVB381D05</td> <td>FIXED MIRROR MOUNT, VERTICAL BOTTOM, D05, 38.1MM</td> <td>38.10</td> <td>12.90</td> <td>10.41</td> <td>37.50</td> <td>31.15</td> <td>56.15</td> <td>57.1</td> <td>0.056</td> </tr> <tr> <td>MMVB254D1</td> <td>FIXED MIRROR MOUNT, VERTICAL BOTTOM, D1, 25.4MM</td> <td>25.40</td> <td>25.60</td> <td>21.84</td> <td>37.50</td> <td>36.00</td> <td>56.15</td> <td>44.4</td> <td>0.048</td> </tr> <tr> <td>MMVB318D1</td> <td>FIXED MIRROR MOUNT, VERTICAL BOTTOM, D1, 31.8MM</td> <td>31.75</td> <td>25.60</td> <td>21.84</td> <td>37.50</td> <td>36.00</td> <td>56.15</td> <td>50.7</td> <td>0.052</td> </tr> <tr> <td>MMVB381D1</td> <td>FIXED MIRROR MOUNT, VERTICAL BOTTOM, D1, 38.1MM</td> <td>38.10</td> <td>25.60</td> <td>21.84</td> <td>37.50</td> <td>36.00</td> <td>56.15</td> <td>57.1</td> <td>0.057</td> </tr> <tr> <td>MMVB254D15</td> <td>FIXED MIRROR MOUNT, VERTICAL BOTTOM, D15, 25.4MM</td> <td>25.40</td> <td>38.30</td> <td>35.05</td> <td>62.50</td> <td>40.00</td> <td>81.15</td> <td>49.4</td> <td>0.074</td> </tr> <tr> <td>MMVB318D15</td> <td>FIXED MIRROR MOUNT, VERTICAL BOTTOM, D15, 31.8MM</td> <td>31.75</td> <td>38.30</td> <td>35.05</td> <td>62.50</td> <td>40.00</td> <td>81.15</td> <td>55.7</td> <td>0.082</td> </tr> <tr> <td>MMVB381D15</td> <td>FIXED MIRROR MOUNT, VERTICAL BOTTOM, D15, 38.1MM</td> <td>38.10</td> <td>38.30</td> <td>35.05</td> <td>62.50</td> <td>40.00</td> <td>81.15</td> <td>62.1</td> <td>0.089</td> </tr> </tbody> </table> | | PRODUCT # | NAME | AXIS HEIGHT | INNER DIA. | Ø C/A | SPACING | LENGTH | WIDTH | HEIGHT | MASS (KG) | MMVB254D05 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D05, 25.4MM | 25.40 | 12.90 | 10.41 | 37.50 | 31.15 | 56.15 | 44.4 | 0.050 | MMVB318D05 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D05, 31.8MM | 31.75 | 12.90 | 10.41 | 37.50 | 31.15 | 56.15 | 50.7 | 0.053 | MMVB381D05 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D05, 38.1MM | 38.10 | 12.90 | 10.41 | 37.50 | 31.15 | 56.15 | 57.1 | 0.056 | MMVB254D1 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D1, 25.4MM | 25.40 | 25.60 | 21.84 | 37.50 | 36.00 | 56.15 | 44.4 | 0.048 | MMVB318D1 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D1, 31.8MM | 31.75 | 25.60 | 21.84 | 37.50 | 36.00 | 56.15 | 50.7 | 0.052 | MMVB381D1 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D1, 38.1MM | 38.10 | 25.60 | 21.84 | 37.50 | 36.00 | 56.15 | 57.1 | 0.057 | MMVB254D15 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D15, 25.4MM | 25.40 | 38.30 | 35.05 | 62.50 | 40.00 | 81.15 | 49.4 | 0.074 | MMVB318D15 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D15, 31.8MM | 31.75 | 38.30 | 35.05 | 62.50 | 40.00 | 81.15 | 55.7 | 0.082 | MMVB381D15 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D15, 38.1MM | 38.10 | 38.30 | 35.05 | 62.50 | 40.00 | 81.15 | 62.1 | 0.089 | | |
| PRODUCT # | NAME | AXIS HEIGHT | INNER DIA. | Ø C/A | SPACING | LENGTH | WIDTH | HEIGHT | MASS (KG) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MMVB254D05 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D05, 25.4MM | 25.40 | 12.90 | 10.41 | 37.50 | 31.15 | 56.15 | 44.4 | 0.050 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MMVB318D05 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D05, 31.8MM | 31.75 | 12.90 | 10.41 | 37.50 | 31.15 | 56.15 | 50.7 | 0.053 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MMVB381D05 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D05, 38.1MM | 38.10 | 12.90 | 10.41 | 37.50 | 31.15 | 56.15 | 57.1 | 0.056 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MMVB254D1 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D1, 25.4MM | 25.40 | 25.60 | 21.84 | 37.50 | 36.00 | 56.15 | 44.4 | 0.048 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MMVB318D1 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D1, 31.8MM | 31.75 | 25.60 | 21.84 | 37.50 | 36.00 | 56.15 | 50.7 | 0.052 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MMVB381D1 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D1, 38.1MM | 38.10 | 25.60 | 21.84 | 37.50 | 36.00 | 56.15 | 57.1 | 0.057 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MMVB254D15 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D15, 25.4MM | 25.40 | 38.30 | 35.05 | 62.50 | 40.00 | 81.15 | 49.4 | 0.074 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MMVB318D15 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D15, 31.8MM | 31.75 | 38.30 | 35.05 | 62.50 | 40.00 | 81.15 | 55.7 | 0.082 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MMVB381D15 | FIXED MIRROR MOUNT, VERTICAL BOTTOM, D15, 38.1MM | 38.10 | 38.30 | 35.05 | 62.50 | 40.00 | 81.15 | 62.1 | 0.089 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT 0.8 / SHOWN: ±0.1, <±14° DRAWING IN ACCORDANCE WITH ASME Y14.5 2009</p> | | <p>CONTRACT NUMBER/INITIAL PROJECT 189810</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>MATERIAL: ALUMINUM</p> | | <p>INNOVATION NATIONAL OPTICS INSTITUTE 2740, EINSTEIN STREET QUEBEC CITY, QUEBEC CANADA, G1P 4S4 T (418) 657-7006 F (418) 657-7009 www.ino.ca</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>SURFACE TREATMENT: BLACK ANODIZING</p> | | <p>APPROVALS</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>DESIGNED</th> <th>DATE</th> </tr> <tr> <td>M.GRENIER</td> <td>2020-02-05</td> </tr> <tr> <th>DRAWN</th> <th>DATE</th> </tr> <tr> <td>M.GRENIER</td> <td>2020-02-24</td> </tr> <tr> <th>EXAM/ICHECK</th> <th>DATE</th> </tr> <tr> <td><i>J.P.</i></td> <td>2020-04-30</td> </tr> <tr> <th>VERIF./VERIF.</th> <th>DATE</th> </tr> <tr> <td><i>M.D.</i></td> <td>2020-04-30</td> </tr> </table> | | DESIGNED | DATE | M.GRENIER | 2020-02-05 | DRAWN | DATE | M.GRENIER | 2020-02-24 | EXAM/ICHECK | DATE | <i>J.P.</i> | 2020-04-30 | VERIF./VERIF. | DATE | <i>M.D.</i> | 2020-04-30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DESIGNED | DATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M.GRENIER | 2020-02-05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DRAWN | DATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M.GRENIER | 2020-02-24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EXAM/ICHECK | DATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>J.P.</i> | 2020-04-30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VERIF./VERIF. | DATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>M.D.</i> | 2020-04-30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>TITLE: FIXED MIRROR MOUNT, VERTICAL-BOTTOM</p> | | <p>FORMAT: A DAI (CAGE CODE): 3AT79 DRAWING NUMBER: MMVB_D_ REV. A</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>SCALE: 1:2</p> | | <p>MASS (kg) - PAGE 1/1</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Adjustable mirror mount, horizontal

| | |
|----------------------|--|
| Description | Adjustable mirror mount with $\pm 2^\circ$ tip-tilt for horizontal beam folding. Left-hand and right-hand versions. |
| Adjustments | _D05 & _D1: travel tip/tilt $\pm 2^\circ$; Z ± 1 mm, 8.4 mrad/rev., resolution after locking: 10-15 _D15: travel tip/tilt $\pm 2^\circ$; Z ± 1 mm, 6.6 mrad/rev. _D2: travel tip/tilt $\pm 2^\circ$; Z ± 1 mm, 5.3 mrad/rev. |
| Required tool | 2mm Allen wrench |
| Product notes | A 2 or 2.5 mm gage pin can be used for nominal gap axial control position. Belleville spring stack nominal position is reached at one turn of M4 screw loosening with respect to fully compress position. For locking, fully compress Belleville spring stack and then loosen for $\frac{1}{4}$ turn of M4 screw. Nominal mirror preload is reached at 0.4mm deflection which corresponds to a mirror thickness of 6 ± 0.1 mm for $\varnothing 12-12.7$ mm and $\varnothing 25-25.4$ mm mirrors / 9.525 ± 0.1 mm for $\varnothing 38.1$ mm mirrors / 12 ± 0.1 mm for $\varnothing 50-50.8$ mm mirrors. The mount can accommodate other mirror thicknesses by adding OST_D_ shims between the mirror and the blades. If the mirror is too thick, use ID $\varnothing 1/8''$ x OD $\varnothing 3/16''$ precision shims from McMaster of the desired thickness. *** Warning*** Blades have been designed to be used in stack of 3 with a maximal deflection of 0.5mm at the tip. |

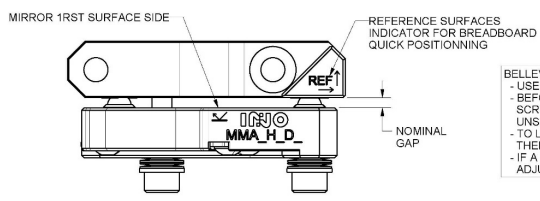
| Part no. | Unit Price (\$) |
|-------------|-----------------|
| MMALH318D05 | TBA |
| MMALH318D1 | TBA |
| MMALH381D05 | TBA |
| MMALH381D1 | TBA |
| MMALH381D15 | TBA |
| MMALH381D2 | TBA |
| MMARH318D05 | TBA |
| MMARH318D1 | TBA |
| MMARH381D05 | TBA |
| MMARH381D1 | TBA |
| MMARH381D15 | TBA |
| MMARH381D2 | TBA |

Drawing MMA_H_D_ (...see next page)

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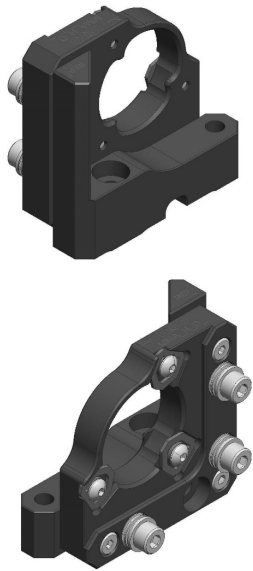
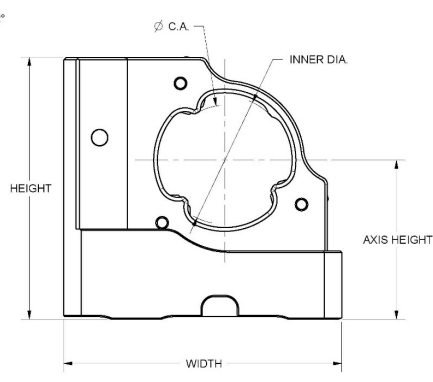
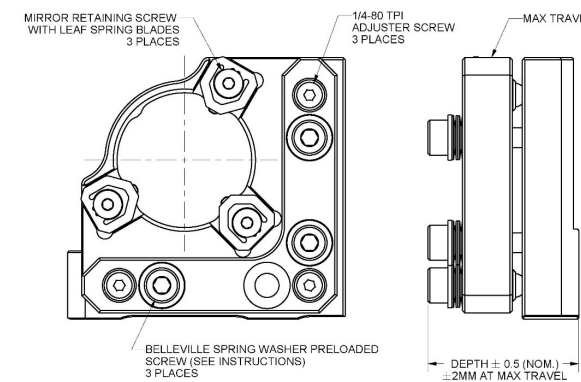
NOTES:
 1 - FOR REFERENCE ONLY, NOT FOR MANUFACTURING PURPOSES.
 2 - ONLY LEFT SIDE VERSION (MMALH_D_) IS REPRESENTED IN THE DRAWING, FOR ILLUSTRATION PURPOSES ONLY.

| REVISIONS | | | |
|-----------|-------------|-------------------|-------|
| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
| | | | |



BELLEVILLE STACK PRELOADING INSTRUCTIONS:

- USE A GAUGE PIN SIZED TO NOMINAL GAP DISTANCE TO FIND NOMINAL POSITION
- BEFORE ADJUSTING THE MIRROR MOUNT ANGLE WITH THE MICROMETER SCREWS, ALL BELLEVILLE STACKS MUST BE FULLY COMPRESSED AND THEN UNSCREW BY 1 TURN.
- TO LOCK POSITION, CRUSH ALL BELLEVILLE STACKS UNTIL FULLY COMPRESSED, THEN UNSCREW BY 1/4 TURN.
- IF A BELLEVILLE STACK BECOMES LOCKED OR LOOSE DURING ALIGNMENT, ADJUST PRELOAD ACCORDINGLY BY USING THE PREVIOUS STEPS.



| PRODUCT # | NAME | AXIS HEIGHT | INNER DIA. | ∅ C/A | NOMINAL GAP | WIDTH | HEIGHT | DEPTH | MASS (KG) |
|-------------|--|-------------|------------|-------|-------------|--------|--------|-------|-----------|
| MMALH318D05 | ADJ. MIRROR MOUNT, LEFT-HORIZONTAL, 31.8MM, D05 | 31.75 | 12.9 | 10.4 | 2.000 | 55.522 | 52.25 | 26.65 | 0.092 |
| MMALH318D1 | ADJ. MIRROR MOUNT, LEFT-HORIZONTAL, 31.8MM, D1 | 31.75 | 25.6 | 21.9 | 2.000 | 55.522 | 52.25 | 26.65 | 0.086 |
| MMALH381D05 | ADJ. MIRROR MOUNT, LEFT-HORIZONTAL, 38.1MM, D05 | 38.10 | 12.9 | 10.4 | 2.000 | 55.522 | 58.60 | 26.65 | 0.097 |
| MMALH381D1 | ADJ. MIRROR MOUNT, LEFT-HORIZONTAL, 38.1MM, D1 | 38.10 | 25.6 | 21.9 | 2.000 | 55.522 | 58.60 | 26.65 | 0.090 |
| MMALH381D15 | ADJ. MIRROR MOUNT, LEFT-HORIZONTAL, 38.1MM, D15 | 38.10 | 38.3 | 34.9 | 2.000 | 73.200 | 64.10 | 29.32 | 0.136 |
| MMALH381D2 | ADJ. MIRROR MOUNT, LEFT-HORIZONTAL, 38.1MM, D2 | 38.10 | 51.0 | 46.2 | 2.500 | 89.538 | 72.10 | 37.66 | 0.190 |
| MMARH318D05 | ADJ. MIRROR MOUNT, RIGHT-HORIZONTAL, 31.8MM, D05 | 31.75 | 12.9 | 10.4 | 2.000 | 55.522 | 52.25 | 26.65 | 0.092 |
| MMARH318D1 | ADJ. MIRROR MOUNT, RIGHT-HORIZONTAL, 31.8MM, D1 | 31.75 | 25.6 | 21.9 | 2.000 | 55.522 | 52.25 | 26.65 | 0.086 |
| MMARH381D05 | ADJ. MIRROR MOUNT, RIGHT-HORIZONTAL, 38.1MM, D05 | 38.10 | 12.9 | 10.4 | 2.000 | 55.522 | 58.60 | 26.65 | 0.098 |
| MMARH381D1 | ADJ. MIRROR MOUNT, RIGHT-HORIZONTAL, 38.1MM, D1 | 38.10 | 25.6 | 21.9 | 2.000 | 55.522 | 58.60 | 26.65 | 0.092 |
| MMARH381D15 | ADJ. MIRROR MOUNT, RIGHT-HORIZONTAL, 38.1MM, D15 | 38.10 | 38.3 | 34.9 | 2.000 | 73.200 | 64.10 | 29.32 | 0.136 |
| MMARH381D2 | ADJ. MIRROR MOUNT, RIGHT-HORIZONTAL, 38.1MM, D2 | 38.10 | 51.0 | 46.2 | 2.500 | 89.538 | 72.10 | 37.66 | 0.190 |

CONTRACT NUMBER/INTEL PROJECT: 189810

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

REMOVE BURRS AND SHARP EDGES

TOLERANCES AFTER SURFACE TREATMENT 0.8 / SHOW - 0.1, 0.2, 0.15

DRAWING IN ACCORDANCE WITH ASME Y14.5-2009

MATERIAL: ALUMINUM

SURFACE TREATMENT: BLACK ANODIZING

APPROVALS: DESIGNED B. LEDUC, DATE 2020-02-13, DRAWN B. LEDUC, DATE 2020-03-23

EXAM/CHECK: SR, DATE 2020-03-25, VERIF./VERIF: AJ, DATE 2020-03-25

FORMAT: DAI (CASE CODE), DRAWING NUMBER: MMA_H_D, SCALE: 3:2

TITLE: ADJUSTABLE MIRROR MOUNT, HORIZONTAL

REV: A

PAGE: 1/1

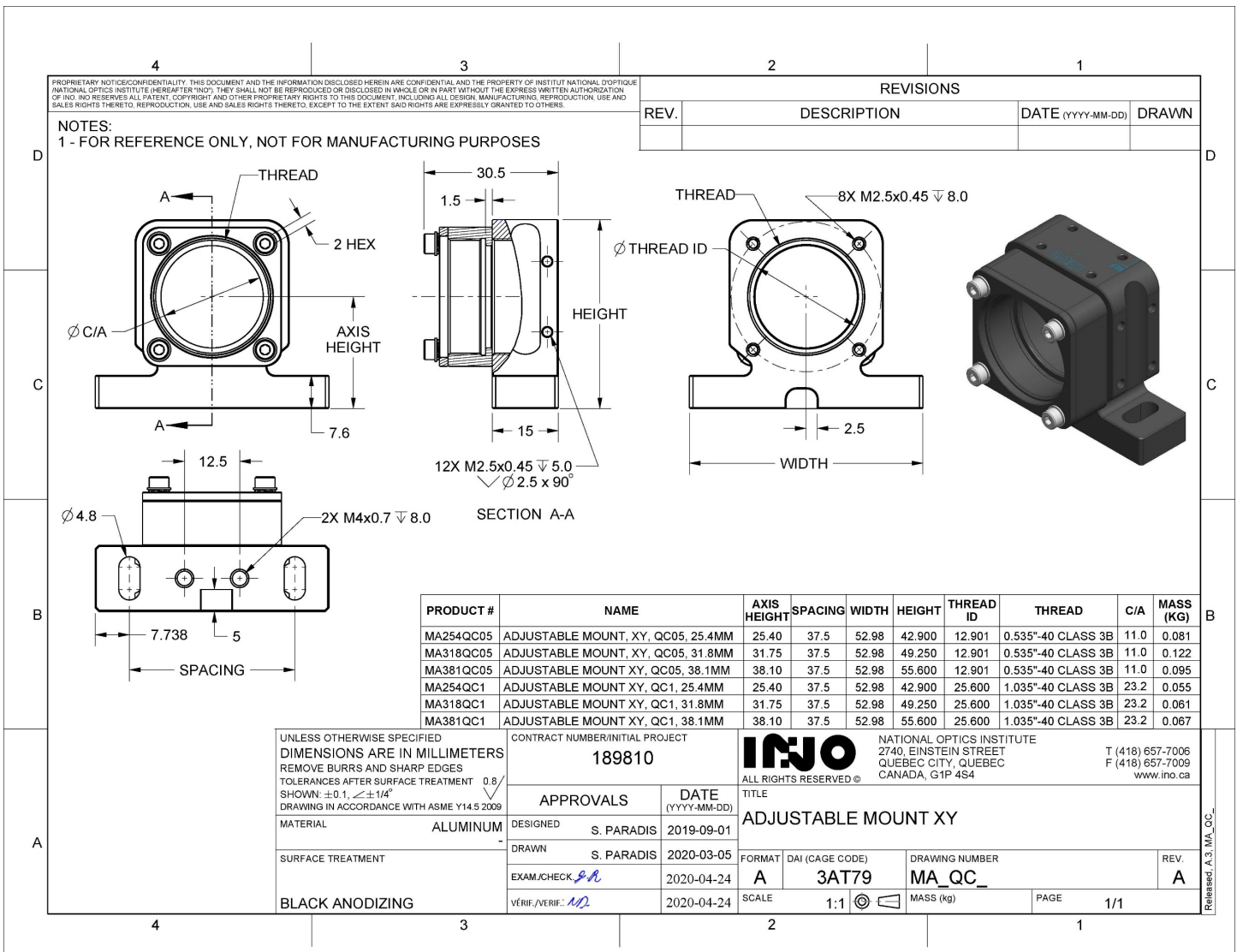
Generic Mounts

XY adjustable mount

| | |
|----------------------|--|
| Description | X-Y adjustable mount with axial support and QC threads |
| Adjustments | Refer to TLXY1 |
| Required tool | 2mm Allen wrench |
| Product notes | Compatible with QuickPOZ TLXY1 adjustment tool, QuickPOZ Tube QC series, commercial threaded and unthreaded accessories. |

| Part no. | Unit Price (\$) |
|-----------|-----------------|
| MA254QC05 | TBA |
| MA318QC05 | TBA |
| MA381QC05 | TBA |
| MA254QC1 | TBA |
| MA318QC1 | TBA |
| MA381QC1 | TBA |

Drawing MA_QC_



Through-hole XY adjustable mount

| | |
|----------------------|---|
| Description | X-Y adjustable mount with axial support and through-hole |
| Adjustments | Refer to TLXY1 |
| Required tool | 2mm Allen wrench |
| Product notes | Compatible with QuickPOZ TLXY1 adjustment tool, QuickPOZ Tube QC thread series, commercial threaded and unthreaded accessories. |

| Part no. | Unit Price (\$) |
|-----------|-----------------|
| MA254TH05 | TBA |
| MA318TH05 | TBA |
| MA381TH05 | TBA |
| MA254TH1 | TBA |
| MA318TH1 | TBA |
| MA381TH1 | TBA |

Drawing MA_TH_

4
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| REVISIONS | | | |
|-----------|-------------|-------------------|-------|
| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
| | | | |

NOTES:
1 - FOR REFERENCE ONLY, NOT FOR MANUFACTURING PURPOSES

THREAD 2 HEX
AXIS HEIGHT
7.6
Ø THREAD ID

30.5
1.5
15
12X M2.5x0.45 5.5
2.5 x 90°
SECTION A-A

Ø THRU-HOLE
Ø C/A
2.5
WIDTH

12.5
2X M4x0.7 8.0
Ø 4.8
7.738 5
SPACING

| PRODUCT # | NAME | AXIS HEIGHT | THRU-HOLE | SPACING | WIDTH | HEIGHT | THREAD ID | C/A | THREAD | MASS (KG) |
|-----------|---|-------------|-----------|---------|-------|--------|-----------|------|--------------------|-----------|
| MA254TH05 | ADJUSTABLE MOUNT XY, THRU-HOLE 22MM, 25.4MM | 25.40 | 22.00 | 37.5 | 52.98 | 42.90 | 12.901 | 11.0 | 0.535"-40 CLASS 3B | 0.071 |
| MA318TH05 | ADJUSTABLE MOUNT XY, THRU-HOLE 22MM, 31.8MM | 31.75 | 22.00 | 37.5 | 52.98 | 49.25 | 12.901 | 11.0 | 0.535"-40 CLASS 3B | 0.112 |
| MA381TH05 | ADJUSTABLE MOUNT XY, THRU-HOLE 22MM, 38.1MM | 38.10 | 22.00 | 37.5 | 52.98 | 55.60 | 12.901 | 11.0 | 0.535"-40 CLASS 3B | 0.084 |
| MA254TH1 | ADJUSTABLE MOUNT XY, THRU-HOLE 28.5MM, 25.4MM | 25.40 | 28.50 | 37.5 | 52.98 | 42.90 | 25.601 | 23.2 | 1.035"-40 CLASS 3B | 0.050 |
| MA318TH1 | ADJUSTABLE MOUNT XY, THRU-HOLE 28.5MM, 31.8MM | 31.75 | 28.50 | 37.5 | 52.98 | 49.25 | 25.601 | 23.2 | 1.035"-40 CLASS 3B | 0.056 |
| MA381TH1 | ADJUSTABLE MOUNT XY, THRU-HOLE 28.5MM, 38.1MM | 38.10 | 28.50 | 37.5 | 52.98 | 55.60 | 25.601 | 23.2 | 1.035"-40 CLASS 3B | 0.062 |

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT 0.8 SHOWN: ±0.1, ∠±1/4° DRAWING IN ACCORDANCE WITH ASME Y14.5 2009

MATERIAL ALUMINUM

SURFACE TREATMENT BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT 189810

APPROVALS
DESIGNED S. PARADIS 2019-09-01
DRAWN S. PARADIS 2020-02-19
EXAM./CHECK *SP* 2020-04-24
VÉRIF./VERIF. *MD* 2020-04-24

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REV. A

4
3
2
1

ADJUSTABLE MOUNT XY, THRU HOLE

FORMAT A DAI (CAGE CODE) 3AT79
DRAWING NUMBER MA_TH_
SCALE 3:4

REVISIONS

REV. A

1/1

4
3
2
1

MASS (kg)

PAGE 1/1

REV. A

1/1

4
3
2
1

MASS (kg)

PAGE 1/1

REV. A

1/1

4
3
2
1

MASS (kg)

PAGE 1/1

REV. A

1/1

Fixed mount with flange

| | |
|----------------------|---|
| Description | Fixed mount with axial support and QC threads |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | Compatible with QC and commercial threads |

| Part no. | Unit Price (\$) |
|-----------|-----------------|
| MF254QC05 | TBA |
| MF318QC05 | TBA |
| MF381QC05 | TBA |
| MF254QC1 | TBA |
| MF318QC1 | TBA |
| MF381QC1 | TBA |
| MF254QC30 | TBA |
| MF318QC30 | TBA |
| MF381QC30 | TBA |
| MF318QC2 | TBA |
| MF381QC2 | TBA |

Drawing MF_QC_

4
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SECTION A-A

| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
|------|-------------|-------------------|-------|
| | | | |

| PRODUCT # | NAME | AXIS HEIGHT | INNER DIA. | C/A | THREAD | SPACING | WIDTH | HEIGHT | MASS (KG) |
|-----------|-------------------------------------|-------------|------------|-------|--------------------|---------|-------|--------|-----------|
| MF254QC05 | FIXED MOUNT, QC05 W/ FLANGE, 25.4MM | 25.40 | 12.901 | 11.00 | 0.535"-40 CLASS 3B | 37.5 | 56.15 | 34.65 | 0.030 |
| MF318QC05 | FIXED MOUNT, QC05 W/ FLANGE, 31.8MM | 31.75 | 12.901 | 11.00 | 0.535"-40 CLASS 3B | 37.5 | 56.15 | 41.00 | 0.035 |
| MF381QC05 | FIXED MOUNT, QC05 W/ FLANGE, 38.1MM | 38.10 | 12.901 | 11.00 | 0.535"-40 CLASS 3B | 37.5 | 56.15 | 47.35 | 0.039 |
| MF254QC1 | FIXED MOUNT, QC1 W/ FLANGE, 25.4MM | 25.40 | 25.601 | 23.20 | 1.035"-40 CLASS 3B | 37.5 | 56.15 | 40.40 | 0.029 |
| MF318QC1 | FIXED MOUNT, QC1 W/ FLANGE, 31.8MM | 31.75 | 25.601 | 23.20 | 1.035"-40 CLASS 3B | 37.5 | 56.15 | 47.25 | 0.035 |
| MF381QC1 | FIXED MOUNT, QC1 W/ FLANGE, 38.1MM | 38.10 | 25.601 | 23.20 | 1.035"-40 CLASS 3B | 37.5 | 56.15 | 53.60 | 0.040 |
| MF254QC30 | FIXED MOUNT, QC30 W/ FLANGE, 25.4MM | 25.40 | 30.479 | 28.08 | M31 X 0.5 - 4G | 62.5 | 81.15 | 44.40 | 0.046 |
| MF318QC30 | FIXED MOUNT, QC30 W/ FLANGE, 31.8MM | 31.75 | 30.479 | 28.08 | M31 X 0.5 - 4G | 37.5 | 56.15 | 49.25 | 0.035 |
| MF381QC30 | FIXED MOUNT, QC30 W/ FLANGE, 38.1MM | 38.10 | 30.479 | 28.08 | M31 X 0.5 - 4G | 37.5 | 56.15 | 55.60 | 0.040 |
| MF318QC2 | FIXED MOUNT, QC2 W/ FLANGE, 31.8MM | 31.75 | 51.001 | 48.60 | 2.035"-40 CLASS 3B | 62.5 | 81.15 | 59.75 | 0.045 |
| MF381QC2 | FIXED MOUNT, QC2 W/ FLANGE, 38.1MM | 38.10 | 51.001 | 48.60 | 2.035"-40 CLASS 3B | 62.5 | 81.15 | 66.10 | 0.056 |

| | | |
|---|--|---|
| <small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT 0.8 SHOWN: ±0.1, ∠±14° DRAWING IN ACCORDANCE WITH ASME Y14.5 2009</small> | <small>CONTRACT NUMBER/INITIAL PROJECT 189810</small> | <small>NATIONAL OPTICS INSTITUTE 2740, EINSTEIN STREET QUEBEC CITY, QUEBEC CANADA, G1P 4S4 T (418) 657-7006 F (418) 657-7009 www.ino.ca</small> |
| <small>MATERIAL</small> ALUMINUM | <small>APPROVALS</small> <small>DESIGNED</small> S. PARADIS <small>DRAWN</small> S. PARADIS <small>EXAM/CHECK</small> <i>SP</i> <small>VÉRIF./VERIF.</small> <i>MD</i> | <small>DATE (YYYY-MM-DD)</small> 2019-04-20 2019-05-07 2020-04-08 2020-04-08 |
| <small>SURFACE TREATMENT</small> BLACK ANODIZING | <small>TITLE</small> FIXED MOUNT, QC THREAD W/ FLANGE | <small>FORMAT</small> A <small>DAI (CAGE CODE)</small> 3AT79 <small>DRAWING NUMBER</small> MF_QC_ <small>REV.</small> A |
| <small>SCALE</small> 1:1 | <small>MASS (kg)</small> | <small>PAGE</small> 1/1 |

4
3
2
1

Released: A.42, MF_QC_

Fixed mount

| | |
|----------------------|---|
| Description | Fixed mount with QC threads |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | Compatible with QC and commercial threads |

| Part no. | Unit Price (\$) |
|----------|-----------------|
| M254QC05 | TBA |
| M318QC05 | TBA |
| M381QC05 | TBA |
| M254QC1 | TBA |
| M318QC1 | TBA |
| M381QC1 | TBA |
| M254QC30 | TBA |
| M318QC30 | TBA |
| M381QC30 | TBA |
| M318QC2 | TBA |
| M381QC2 | TBA |
| M254RMS | TBA |
| M318RMS | TBA |
| M381RMS | TBA |

Drawing M_QC_

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| REVISIONS | | | |
|-----------|-------------|-------------------|-------|
| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
| | | | |

NOTES:
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| PRODUCT # | NAME | AXIS HEIGHT | INNER DIA. | THREAD | SPACING | WIDTH | HEIGHT | MASS (KG) |
|-----------|---------------------------|-------------|------------|--------------------|---------|-------|--------|-----------|
| M254QC05 | FIXED MOUNT, QC05, 25.4MM | 25.40 | 12.90 | 0.535"-40 CLASS 3B | 37.5 | 56.15 | 34.650 | 0.030 |
| M318QC05 | FIXED MOUNT, QC05, 31.8MM | 31.75 | 12.90 | 0.535"-40 CLASS 3B | 37.5 | 56.15 | 41.000 | 0.035 |
| M381QC05 | FIXED MOUNT, QC05, 38.1MM | 38.10 | 12.90 | 0.535"-40 CLASS 3B | 37.5 | 56.15 | 47.350 | 0.039 |
| M254QC1 | FIXED MOUNT, QC1, 25.4MM | 25.40 | 25.60 | 1.035"-40 CLASS 3B | 37.5 | 56.15 | 40.400 | 0.029 |
| M318QC1 | FIXED MOUNT, QC1, 31.8MM | 31.75 | 25.60 | 1.035"-40 CLASS 3B | 37.5 | 56.15 | 47.250 | 0.035 |
| M381QC1 | FIXED MOUNT, QC1, 38.1MM | 38.10 | 25.60 | 1.035"-40 CLASS 3B | 37.5 | 56.15 | 53.600 | 0.040 |
| M254QC30 | FIXED MOUNT, QC30, 25.4MM | 25.40 | 30.48 | M31 X 0.5 - 4G | 62.5 | 81.15 | 44.400 | 0.046 |
| M318QC30 | FIXED MOUNT, QC30, 31.8MM | 31.75 | 30.48 | M31 X 0.5 - 4G | 37.5 | 56.15 | 49.250 | 0.035 |
| M381QC30 | FIXED MOUNT, QC30, 38.1MM | 38.10 | 30.48 | M31 X 0.5 - 4G | 37.5 | 56.15 | 55.600 | 0.039 |
| M318QC2 | FIXED MOUNT, QC2, 31.8MM | 31.75 | 51.00 | 2.035"-40 CLASS 3B | 62.5 | 81.15 | 59.750 | 0.044 |
| M381QC2 | FIXED MOUNT, QC2, 38.1MM | 38.10 | 51.00 | 2.035"-40 CLASS 3B | 62.5 | 81.15 | 66.100 | 0.055 |
| M254RMS | FIXED MOUNT, RMS, 25.4MM | 25.40 | 19.56 | 0.8"-36 CLASS 3B | 37.5 | 56.15 | 39.400 | 0.024 |
| M318RMS | FIXED MOUNT, RMS, 31.8MM | 31.75 | 19.56 | 0.8"-36 CLASS 3B | 37.5 | 56.15 | 45.750 | 0.027 |
| M381RMS | FIXED MOUNT, RMS, 38.1MM | 38.10 | 19.56 | 0.8"-36 CLASS 3B | 37.5 | 56.15 | 52.100 | 0.030 |

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
REMOVE BURRS AND SHARP EDGES
TOLERANCES AFTER SURFACE TREATMENT
SHOWN: ±0.1, $\le \pm 1/4''$
DRAWING IN ACCORDANCE WITH ASME Y14.5 2009

MATERIAL: ALUMINUM
SURFACE TREATMENT: BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT
189810

| APPROVALS | DATE (YYYY-MM-DD) |
|-------------------------|-------------------|
| DESIGNED S. PARADIS | 2019-04-20 |
| DRAWN S. PARADIS | 2019-05-07 |
| EXAM/CHECK <i>SP</i> | 2020-04-08 |
| VÉRIF./VERIF. <i>MD</i> | 2020-04-08 |

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TITLE: **FIXED MOUNT, QC THREAD**

| | | | |
|--------|-----------------|----------------|----------|
| FORMAT | DAI (CAGE CODE) | DRAWING NUMBER | REV. |
| A | 3AT79 | M_QC_ | A |
| SCALE | 1:1 | MASS (kg) | PAGE 1/1 |

Tubes

Lens tube, male-female

| | |
|----------------------|---|
| Description | Autocentered tube with QC threads |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | Compatible with QC and commercial threads |

| Part no. | Unit Price (\$) | Part no. | Unit Price (\$) |
|------------|-----------------|------------|-----------------|
| TMF127QC05 | TBA | TMF127QC30 | TBA |
| TMF254QC05 | TBA | TMF254QC30 | TBA |
| TMF381QC05 | TBA | TMF381QC30 | TBA |
| TMF508QC05 | TBA | TMF508QC30 | TBA |
| TMF127QC1 | TBA | TMF127QC2 | TBA |
| TMF254QC1 | TBA | TMF254QC2 | TBA |
| TMF381QC1 | TBA | TMF381QC2 | TBA |
| TMF508QC1 | TBA | TMF508QC2 | TBA |

Drawing TMF_QC_

NOTES:
1 - FOR REFERENCE ONLY, NOT FOR MANUFACTURING PURPOSES

SECTION A-A

| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
|------|-------------|-------------------|-------|
| | | | |

| PRODUCT # | NAME | DEPTH | LENGTH | OD | ID | THREAD | MASS (KG) |
|------------|--------------------------------------|-------|--------|-------|-------|-----------------------|-----------|
| TMF127QC05 | LENS TUBE MALE-FEMALE, QC05, 12.7 mm | 12.70 | 16.5 | 17.78 | 11.00 | 0.535"-40 CLASS 3A/3B | 0.005 |
| TMF254QC05 | LENS TUBE MALE-FEMALE, QC05, 25.4 mm | 25.40 | 29.2 | 17.78 | 11.00 | 0.535"-40 CLASS 3A/3B | 0.009 |
| TMF381QC05 | LENS TUBE MALE-FEMALE, QC05, 38.1 mm | 38.10 | 41.9 | 17.78 | 11.00 | 0.535"-40 CLASS 3A/3B | 0.013 |
| TMF508QC05 | LENS TUBE MALE-FEMALE, QC05, 50.8 mm | 50.80 | 54.6 | 17.78 | 11.00 | 0.535"-40 CLASS 3A/3B | 0.017 |
| TMF127QC1 | LENS TUBE MALE-FEMALE, QC1, 12.7 mm | 12.70 | 16.5 | 30.48 | 23.20 | 1.035"-40 CLASS 3A/3B | 0.009 |
| TMF254QC1 | LENS TUBE MALE-FEMALE, QC1, 25.4 mm | 25.40 | 29.2 | 30.48 | 23.20 | 1.035"-40 CLASS 3A/3B | 0.016 |
| TMF381QC1 | LENS TUBE MALE-FEMALE, QC1, 38.1 mm | 38.10 | 41.9 | 30.48 | 23.20 | 1.035"-40 CLASS 3A/3B | 0.023 |
| TMF508QC1 | LENS TUBE MALE-FEMALE, QC1, 50.8 mm | 50.80 | 54.6 | 30.48 | 23.20 | 1.035"-40 CLASS 3A/3B | 0.031 |
| TMF127QC30 | LENS TUBE MALE-FEMALE, QC30, 12.7 mm | 12.70 | 16.5 | 35.00 | 28.08 | M31.0 X 0.5 - 4h / 4G | 0.009 |
| TMF254QC30 | LENS TUBE MALE-FEMALE, QC30, 25.4 mm | 25.40 | 29.2 | 35.00 | 28.08 | M31.0 X 0.5 - 4h / 4G | 0.017 |
| TMF381QC30 | LENS TUBE MALE-FEMALE, QC30, 38.1 mm | 38.10 | 41.9 | 35.00 | 28.08 | M31.0 X 0.5 - 4h / 4G | 0.025 |
| TMF508QC30 | LENS TUBE MALE-FEMALE, QC30, 50.8 mm | 50.80 | 54.6 | 35.00 | 28.08 | M31.0 X 0.5 - 4h / 4G | 0.033 |
| TMF127QC2 | LENS TUBE MALE-FEMALE, QC2, 12.7 mm | 12.70 | 16.5 | 55.88 | 48.60 | 2.035"-40 CLASS 3A/3B | 0.017 |
| TMF254QC2 | LENS TUBE MALE-FEMALE, QC2, 25.4 mm | 25.40 | 29.2 | 55.88 | 48.60 | 2.035"-40 CLASS 3A/3B | 0.031 |
| TMF381QC2 | LENS TUBE MALE-FEMALE, QC2, 38.1 mm | 38.10 | 41.9 | 55.88 | 48.60 | 2.035"-40 CLASS 3A/3B | 0.045 |
| TMF508QC2 | LENS TUBE MALE-FEMALE, QC2, 50.8 mm | 50.80 | 54.6 | 55.88 | 48.60 | 2.035"-40 CLASS 3A/3B | 0.059 |

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
REMOVE BURRS AND SHARP EDGES
TOLERANCES AFTER SURFACE TREATMENT 0.8/
SHOWN: ±0.1, <±1/4"
DRAWING IN ACCORDANCE WITH ASME Y14.5 2009

MATERIAL: ALUMINUM

SURFACE TREATMENT: BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT: 189810

APPROVALS: F LAMONTAGNE (DESIGNED), S. PARADIS (DRAWN), J.A. (EXAM/CHECK), M.D. (VERIF./VERIF.)

DATE: 2018-11-23, 2020-03-03, 2020-04-24, 2020-04-24

TITLE: LENS TUBE MALE-FEMALE

FORMAT: A, DAI (CAGE CODE): 3AT79, DRAWING NUMBER: TMF_QC_, REV. A

SCALE: 1:1, MASS (kg), PAGE: 1/1

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Released A.7: TMF_QC_

Lens tube, male-female, adapted for MA_TH_

| | |
|----------------------|---|
| Description | Autocentered tube with QC threads, adjusted for use with MA_TH_ mount |
| Adjustments | n/a |
| Required tool | n/a |
| Product notes | Compatible with QC and commercial threads |

| Part no. | Unit Price (\$) |
|-------------|-----------------|
| TMFR244QC05 | TBA |
| TMFR244QC1 | TBA |

Drawing TMFR_QC_

4
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1

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SECTION A-A

| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
|------|-------------|-------------------|-------|
| | | | |

| PRODUCT # | NAME | OD | ID | THREAD | MASS (KG) |
|-------------|-------------------------------------|-------|-------|-----------------------|-----------|
| TMFR244QC05 | LENS TUBE MALE-FEMALE REDUCED, QC05 | 17.78 | 11.00 | 0.535"-40 CLASS 3A/3B | 0.008 |
| TMFR244QC1 | LENS TUBE MALE-FEMALE REDUCED, QC1 | 30.48 | 23.20 | 1.035"-40 CLASS 3A/3B | 0.009 |

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
REMOVE BURRS AND SHARP EDGES
TOLERANCES AFTER SURFACE TREATMENT 0.8
SHOWN: ±0.1, ∠±1/4°
DRAWING IN ACCORDANCE WITH ASME Y14.5 2009

MATERIAL
ALUMINUM

SURFACE TREATMENT
BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT
189810

| APPROVALS | DATE (YYYY-MM-DD) |
|-------------------------|-------------------|
| DESIGNED F. LAMONTAGNE | 2018-11-23 |
| DRAWN S. PARADIS | 2020-03-04 |
| EXAM./CHECK <i>SA</i> | 2020-04-24 |
| VÉRIF./VERIF: <i>MD</i> | 2020-04-24 |

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TITLE
LENS TUBE MALE-FEMALE REDUCED

| FORMAT | DAI (CAGE CODE) | DRAWING NUMBER | REV. |
|--------|-----------------|----------------|------|
| A | 3AT79 | TMFR_QC_ | A |

SCALE 1:1

MASS (kg) PAGE 1/1

4
3
2
1

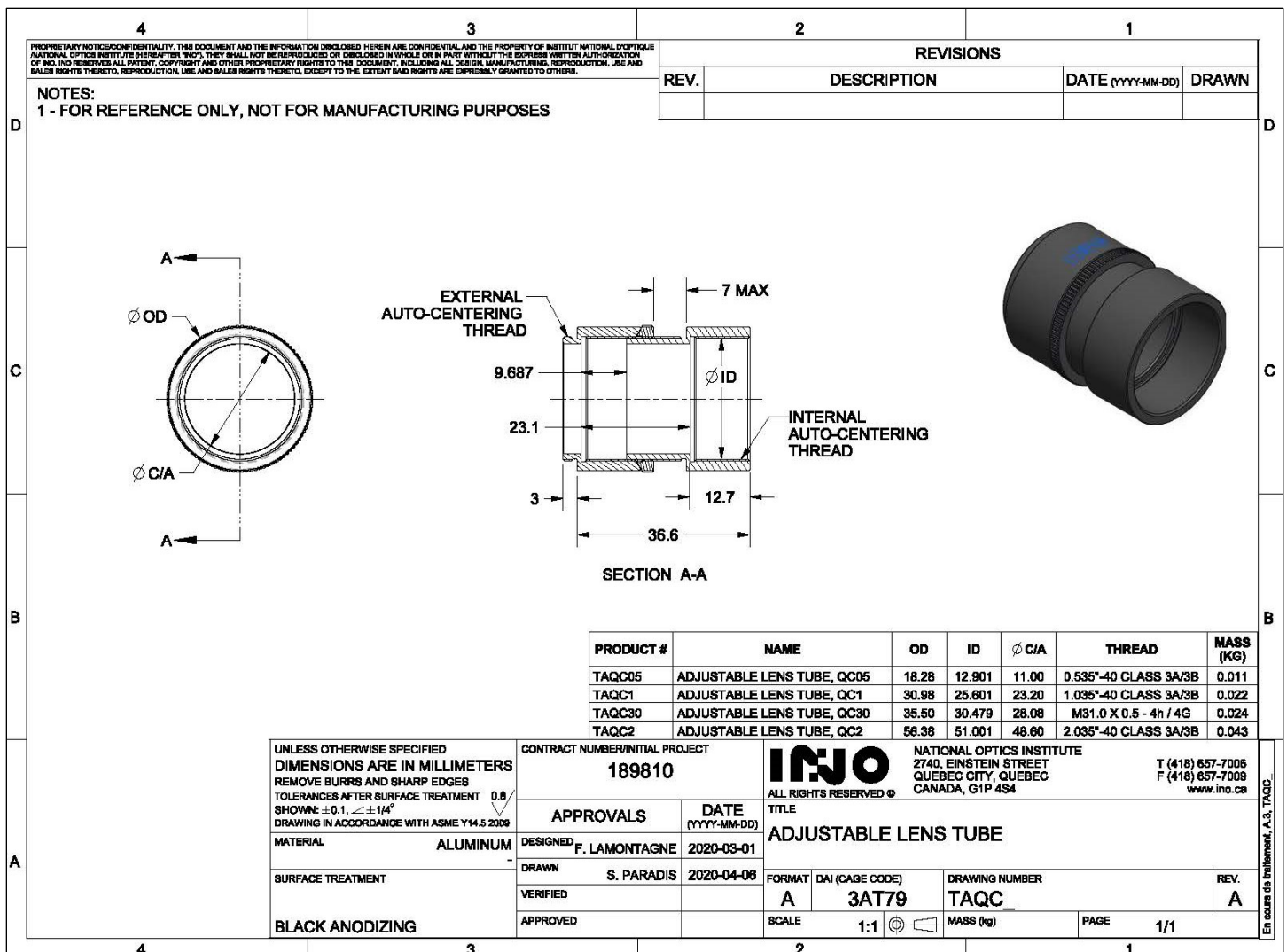
Released: A 4: TMFR_QC_

Lens tube with axial adjustment

| | |
|----------------------|---|
| Description | Tube with axial adjustment |
| Adjustments | 7 mm travel, Knurled locking ring |
| Required tool | n/a |
| Product notes | Compatible with QC and commercial threads |

| Part no. | Unit Price (\$) |
|----------|-----------------|
| TAQC05 | TBA |
| TAQC1 | TBA |
| TAQC30 | TBA |
| TAQC2 | TBA |

Drawing TAQC_



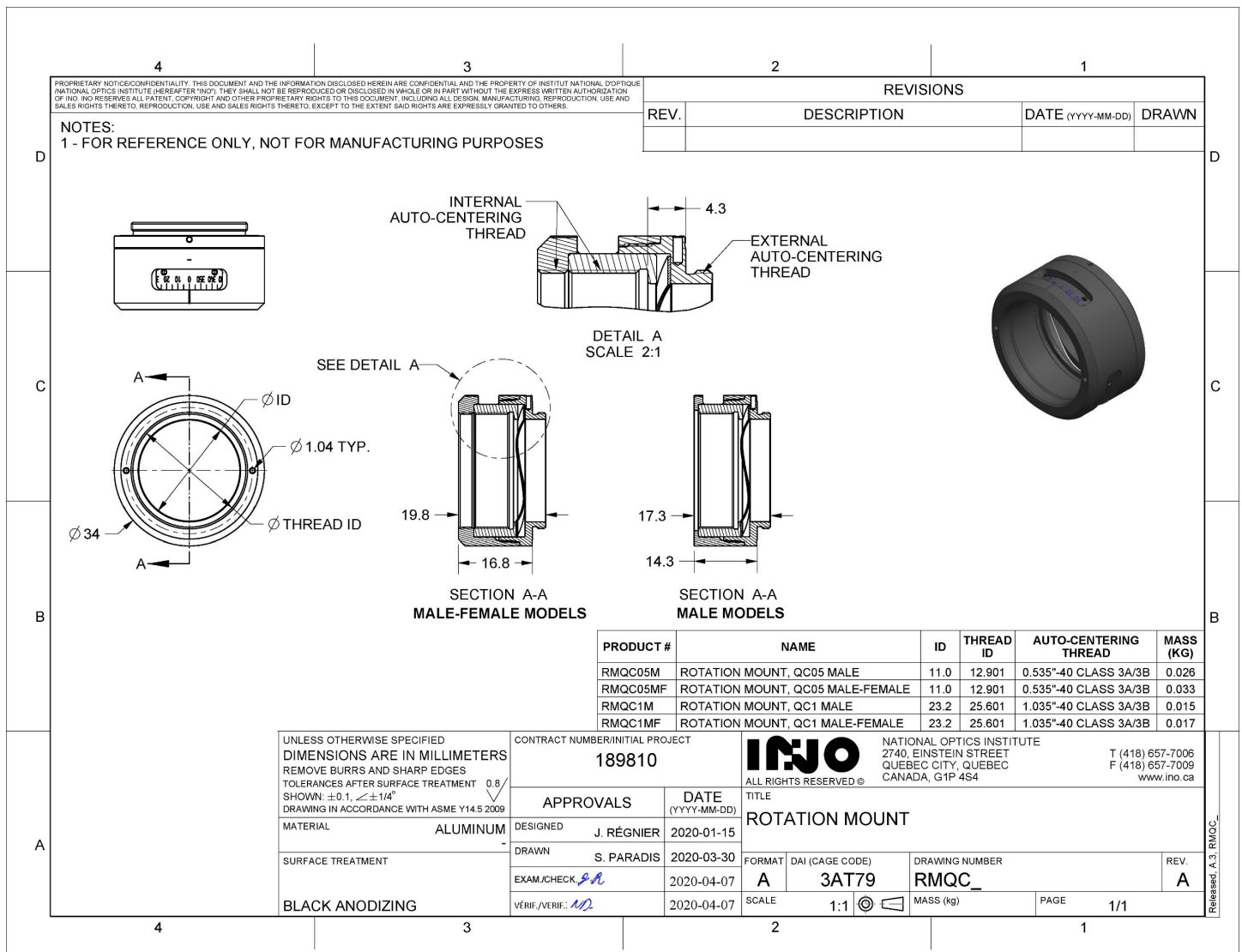
Rotation Mounts

Rotation mount

| | |
|----------------------|--|
| Description | Rotation mount |
| Adjustments | Travel: 360° endless; resolution $\pm 1^\circ$, self locking. |
| Required tool | Pin $\varnothing 1$ mm |
| Product notes | Compatible with QC and commercial threads |

| Part no. | Unit Price (\$) |
|----------|-----------------|
| RMQC05M | TBA |
| RMQC05MF | TBA |
| RMQC1M | TBA |
| RMQC1MF | TBA |

Drawing RMQC_



Translation Mounts

Translation mount, 1.5mm, 62.5MM

| | |
|----------------------|--|
| Description | Translation flexure, +/-1.5mm, 62.5MM |
| Adjustments | +/-1.5mm; 300 μm/revolution |
| Required tool | 2mm Allen wrench |
| Product notes | Compatible with QuickPOZ MA_QC05 & MA_QC1 mounts. The use of Belleville springs is recommended to spring load QuickPOZ MA_QC_mount during adjustment. |

| | |
|-----------------|------------------------|
| Part no. | Unit Price (\$) |
| MZ1 | TBA |

Drawing MZ1

4
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NOTES:
1 - FOR REFERENCE ONLY, NOT FOR MANUFACTURING PURPOSES

| REVISIONS | | | |
|-----------|-------------|-------------------|-------|
| REV. | DESCRIPTION | DATE (YYYY-MM-DD) | DRAWN |
| | | | |

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1

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
REMOVE BURRS AND SHARP EDGES
TOLERANCES AFTER SURFACE TREATMENT 0.8
SHOWN: ±0.1, ∠±14°
DRAWING IN ACCORDANCE WITH ASME Y14.5 2009

MATERIAL ALUMINUM

SURFACE TREATMENT
BLACK ANODIZE

CONTRACT NUMBER/INITIAL PROJECT
189810

| | |
|-------------------------|-------------------|
| APPROVALS | DATE (YYYY-MM-DD) |
| DESIGNED S. PARADIS | 2019-05-16 |
| DRAWN S. PARADIS | 2019-05-16 |
| EXAM./CHECK <i>SA</i> | 2020-03-17 |
| VÉRIF./VERIF. <i>MD</i> | 2020-03-17 |

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4
3
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1

TITLE
TRANSLATION MOUNT ±1.5MM, 62.5MM

| | | | |
|--------|-----------------|----------------|------|
| FORMAT | DAI (CAGE CODE) | DRAWING NUMBER | REV. |
| A | 3AT79 | MZ1 | A |
| SCALE | 1:1 | MASS (kg) | PAGE |
| | | 0.036 | 1/1 |

4
3
2
1

Retranscrit A.7. MZ1



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