QuickPOZ

Optomechanical Mounts and Breadboards 2022-2023 Catalog

EC19500 / INO-PLT0201-0037 version 5.0

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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 ±50 µrad.

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 patented QuickCTR-edge technology (US Patent 11,327,332) allowing the positioning of all optical components within ±50 µm @ 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 patented 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.

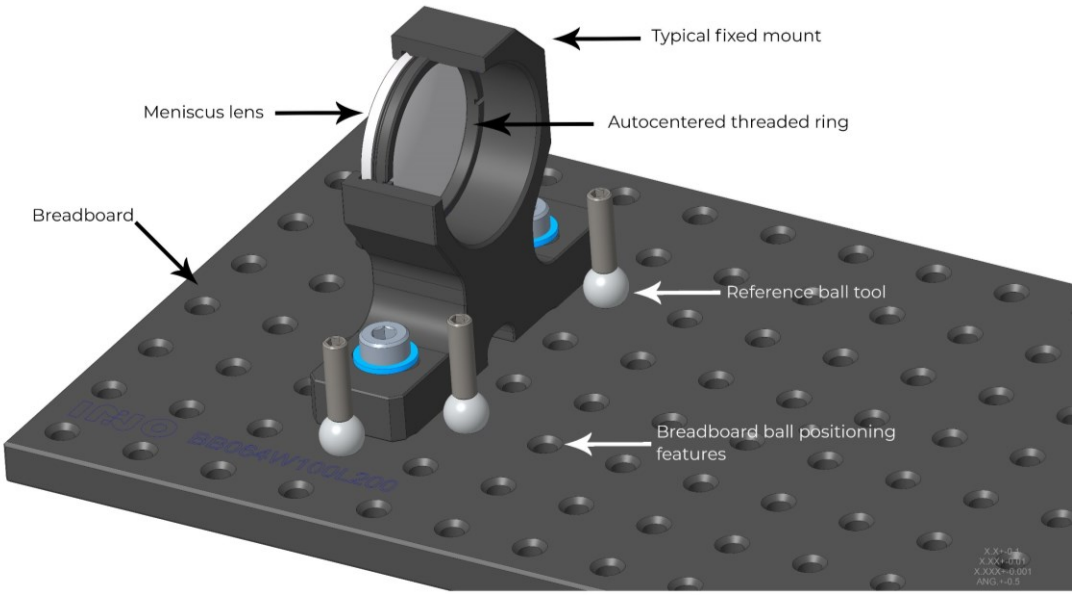


Figure 1 QuickPOZ breadboard reference ball positioning method

The lenses are autocentered into the mounts using INO's patented 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.

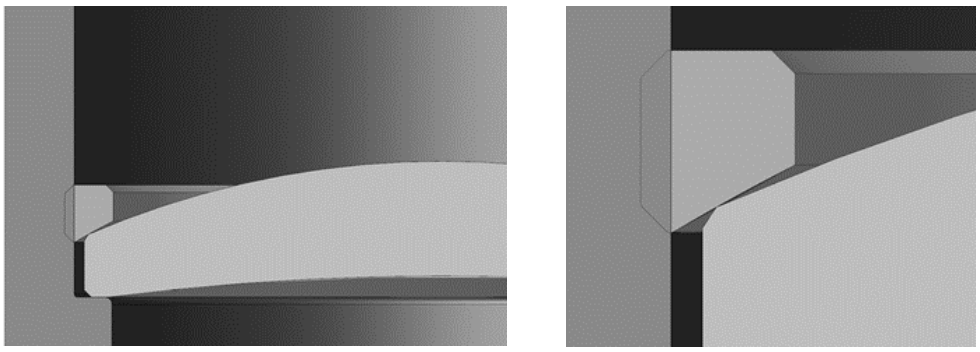


Figure 2 QuickCTR-edge technology principle

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

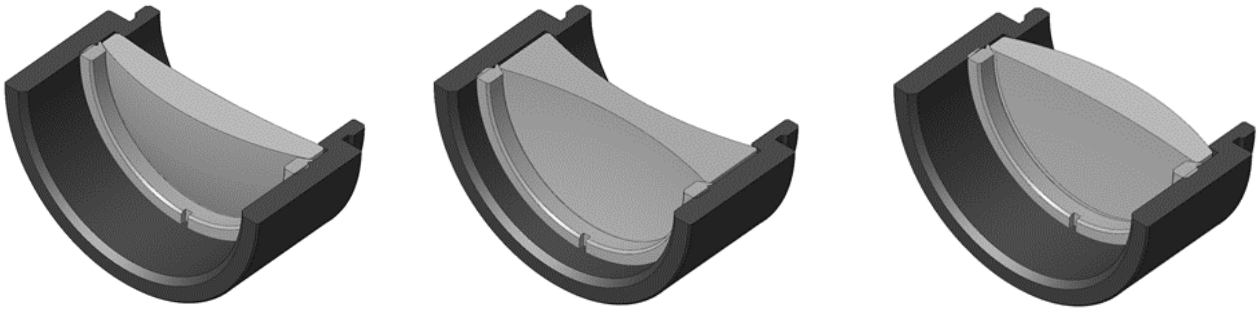


Figure 3 A few configurations using QuickCTR-edge technology

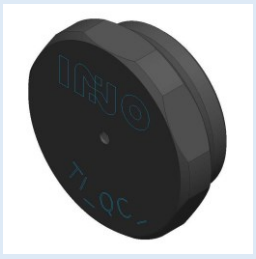
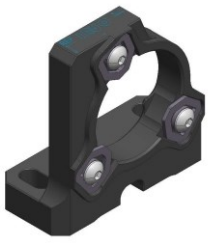
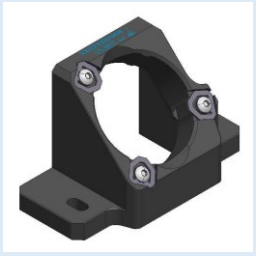
Performance specifications

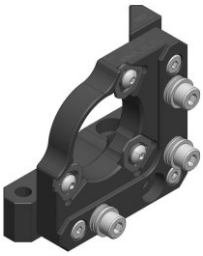
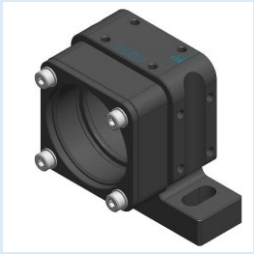
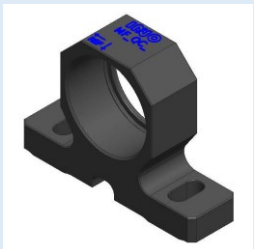
Feature	Performance
Optomechanical mount compatibility	Compatible with standard threads 0.535''-40, 1.035''-40, 2.035''-40 and RMS commercial accessories (Thorlabs, Edmund, Newport, …). When a commercial accessory is used, centering and positioning performances are not met. In some cases, their robustness 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 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	Low distortion adjustable mirror mounts with ±2° tip-tilt for horizontal beam folding, available in Ø12.7 mm, Ø25.4 mm, Ø38.1 mm, and Ø50.8 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.
	XYZ adjustable mounts	X-Y-Z adjustable mounts with QC1 threads, for submicron positioning with removable XY adjustment tool (±1 mm), and 7mm travel in Z.
	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	*This thread is not compatible with industry standard.*
QC2	2.035"-40
RMS	RMS

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

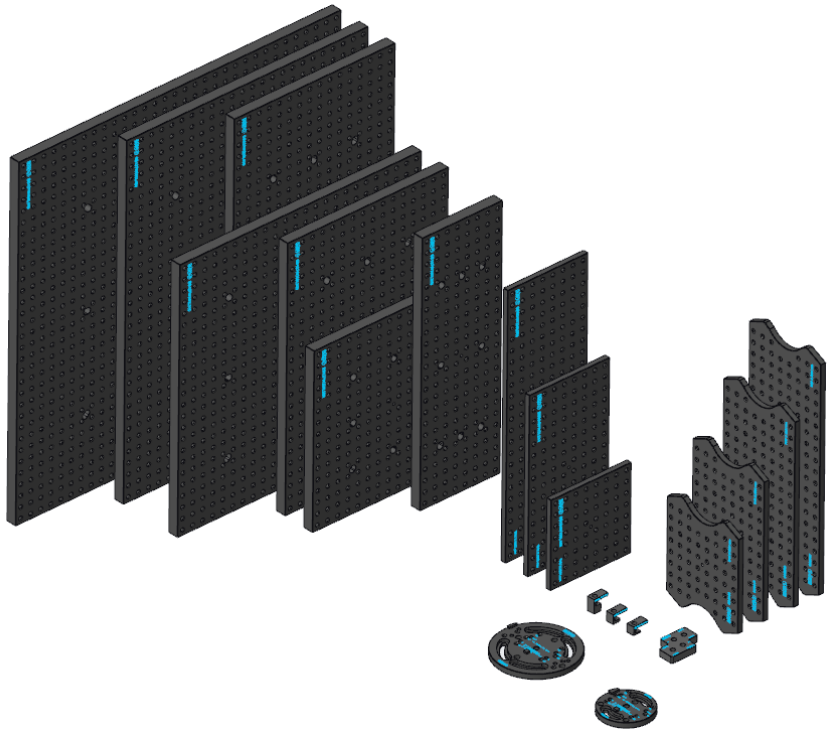


Figure 4 QuickPOZ mounting plates overview

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

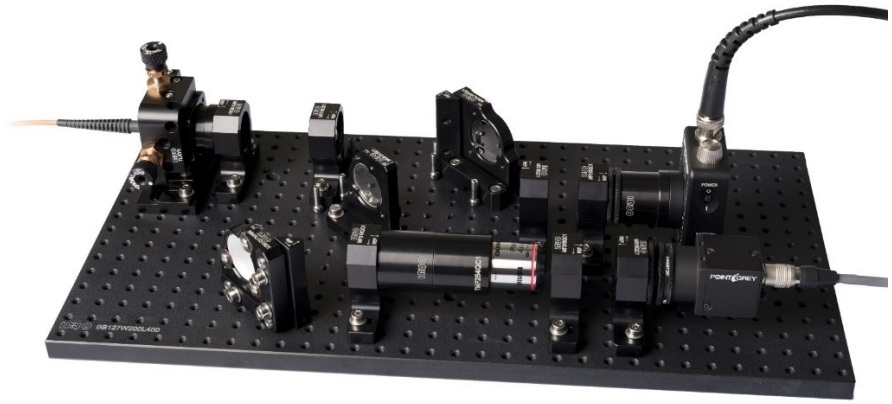


Figure 6 Second example of configuration

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 Ø9 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:

Screw Size Diameter	Thread Pitch	Torque			
(mm)	(mm)	(N-m)	(ozf-in)	(lbf-in)	(lbf-ft)
1.6	0.35	0.12	17		
2	0.4	0.25	35		
2.5	0.45	0.51	72	4	
3	0.5	0.91	128	8	
4	0.7	2.11		19	
5	0.8	4.26		38	
6	1	7.24		64	
8	1	18.82			14
10	1.25	36.72			27
14	1.5	104.58			77

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

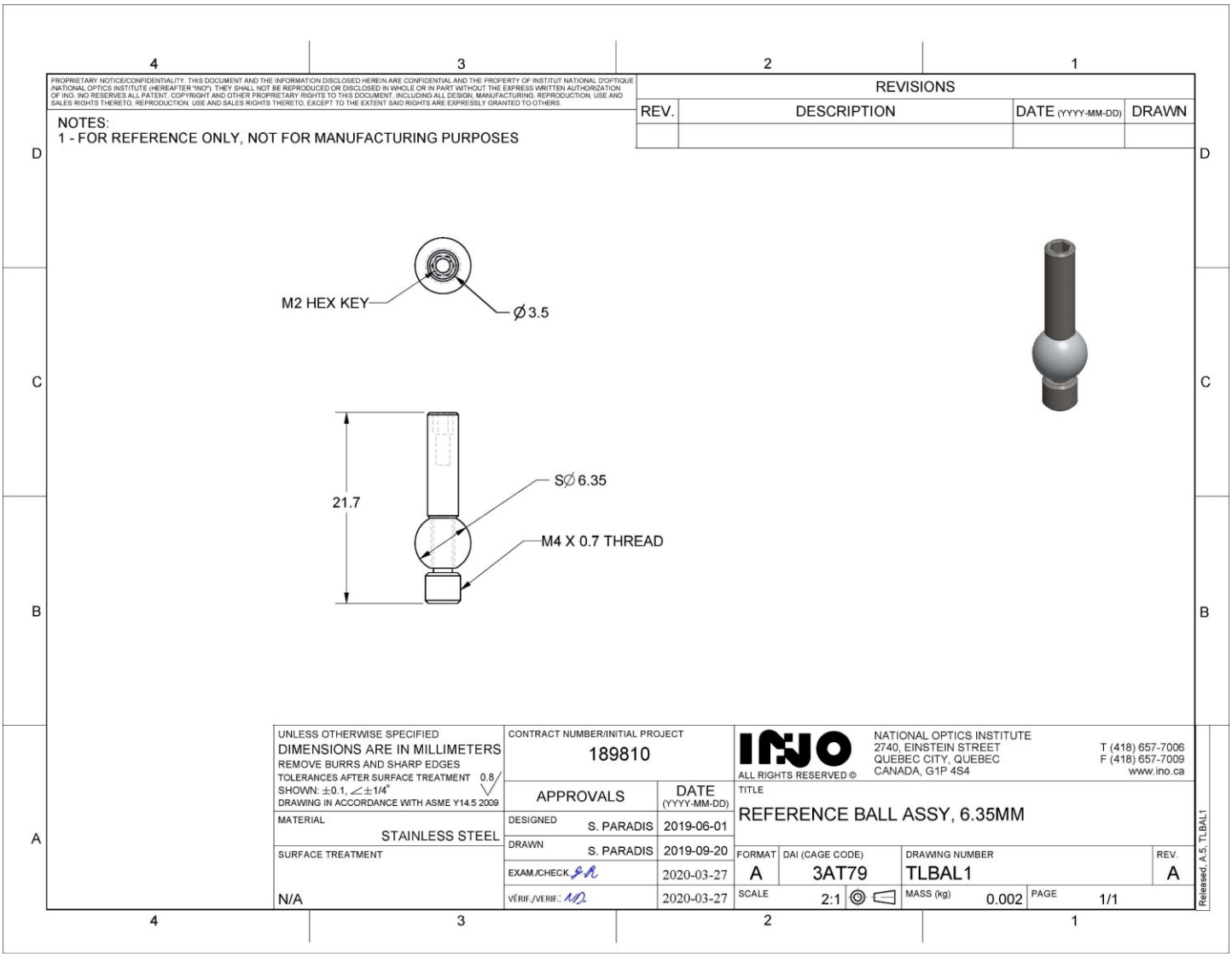
Tooling & miscellaneous

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

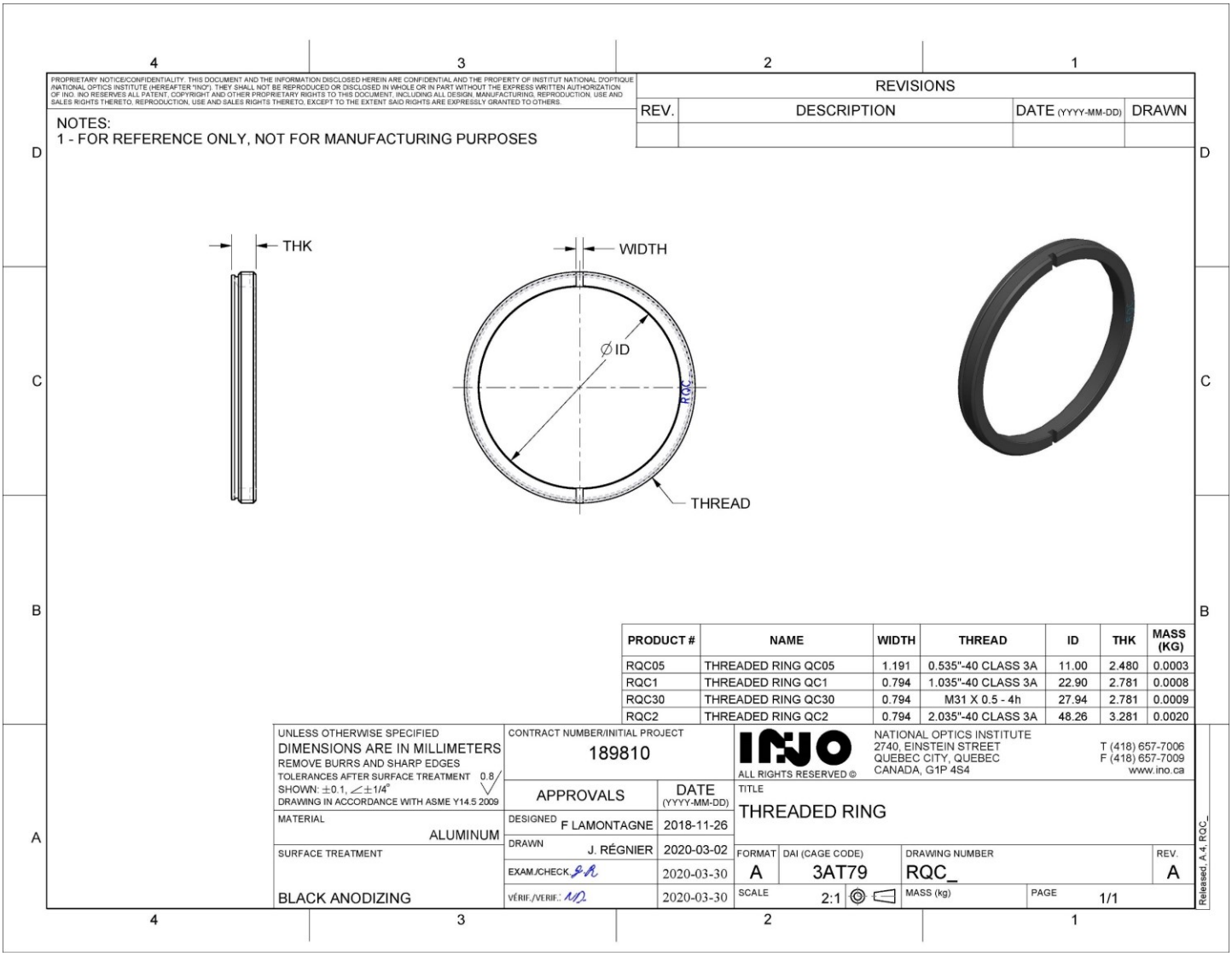


Threaded ring

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*

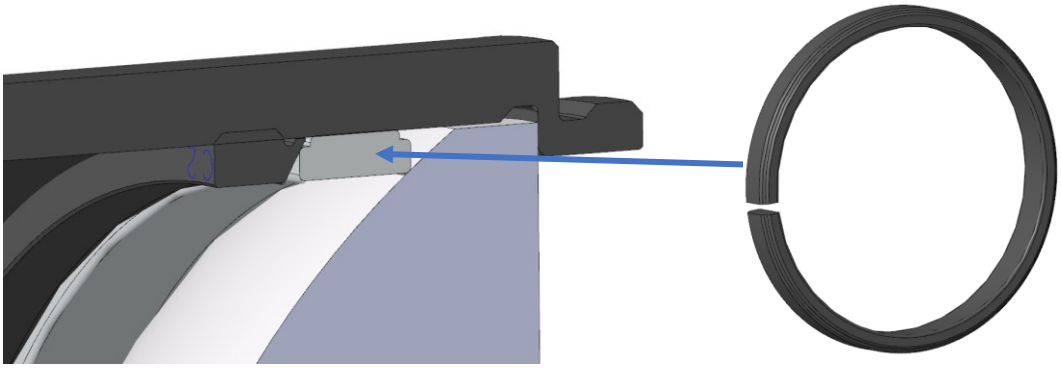
Drawing RQC_



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

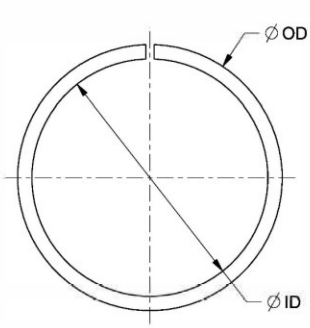
Drawing SRD_ (…see next page)

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

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

FOR SRD05 ONLY :
INSTALLATION NOT REVERSIBLE. THIS SIDE MUST BE IN CONTACT WITH RETAINING RING RQC05.

DETAIL A
SCALE 5:1



SRD05

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

MATERIAL: ALUMINUM

SURFACE TREATMENT: BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT: 189810

APPROVALS	DATE (YYYY-MM-DD)
DESIGNED F. LAMONTAGNE	2019-10-10
DRAWN J. RÉGNIER	2020-03-30
VERIFIED	
APPROVED	

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TITLE: SPLIT RING

FORMAT	DAI (CAGE CODE)	DRAWING NUMBER	REV.
A	3AT79	SRD_	A

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

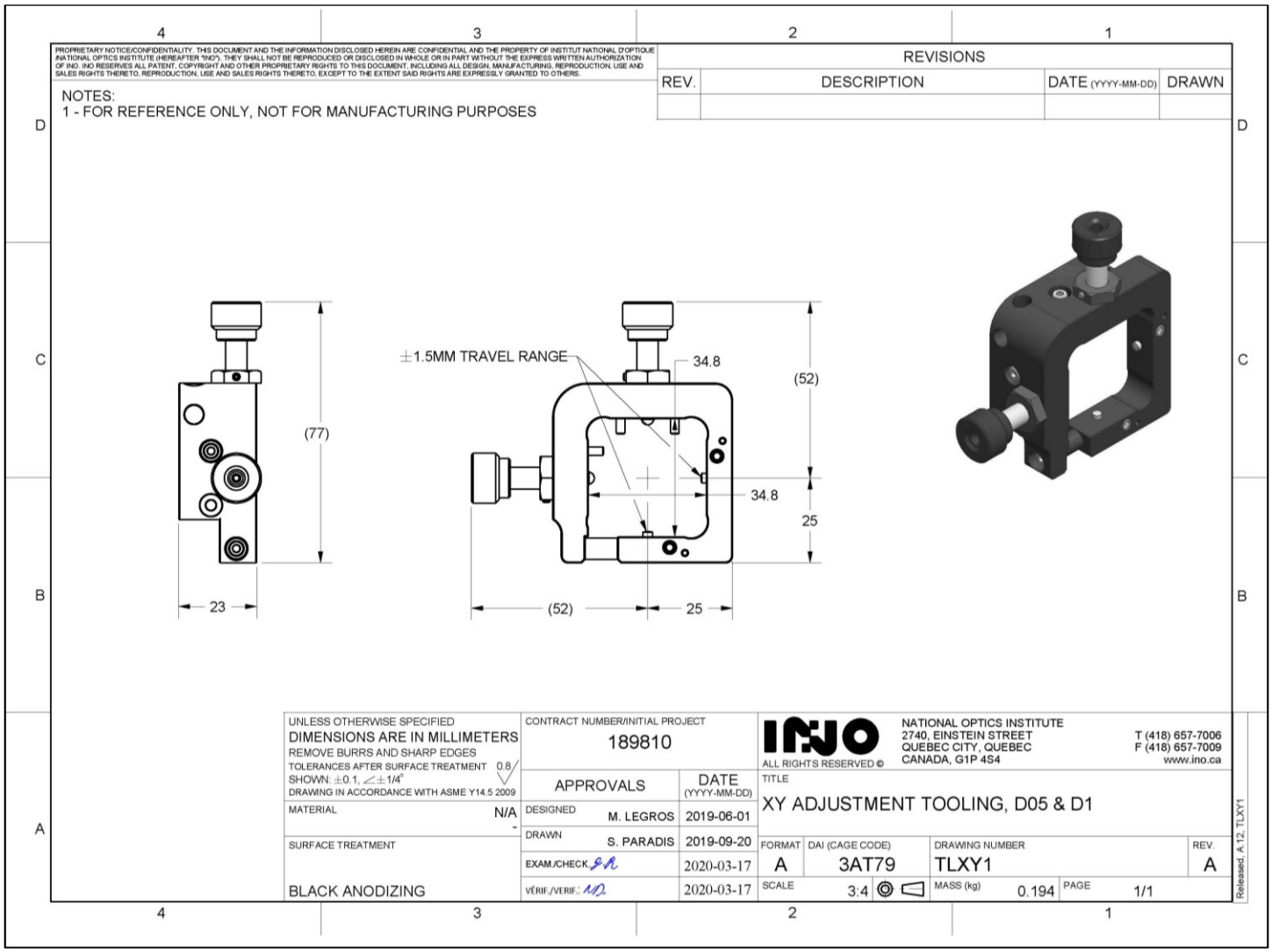
En cours de traitement, A.3, SRD_

XY adjustment tooling, D05 & D1

Description	Transverse X-Y manipulator, removable with differential screws; fits with QuickPOZ mounts MA_QC05, MA_QC1, MA_TH05, MA_TH1, and MA_TAQC1.
Adjustments	±1.5mm; coarse 318µm/rev. and fine 25µm/rev.
Required tool	2mm Allen wrench
Product notes	Can be used either with the adjuster located at right or at left. ***Warning*** Do not forget to detent the spring plunger before adjustment (small set screws located in front of the mount). ***Warning*** Do not forget to retract the spring plunger before removing the tool from the mount.

Part no.	Unit Price ($)
TLXY1	*TBA*

Drawing TLXY1

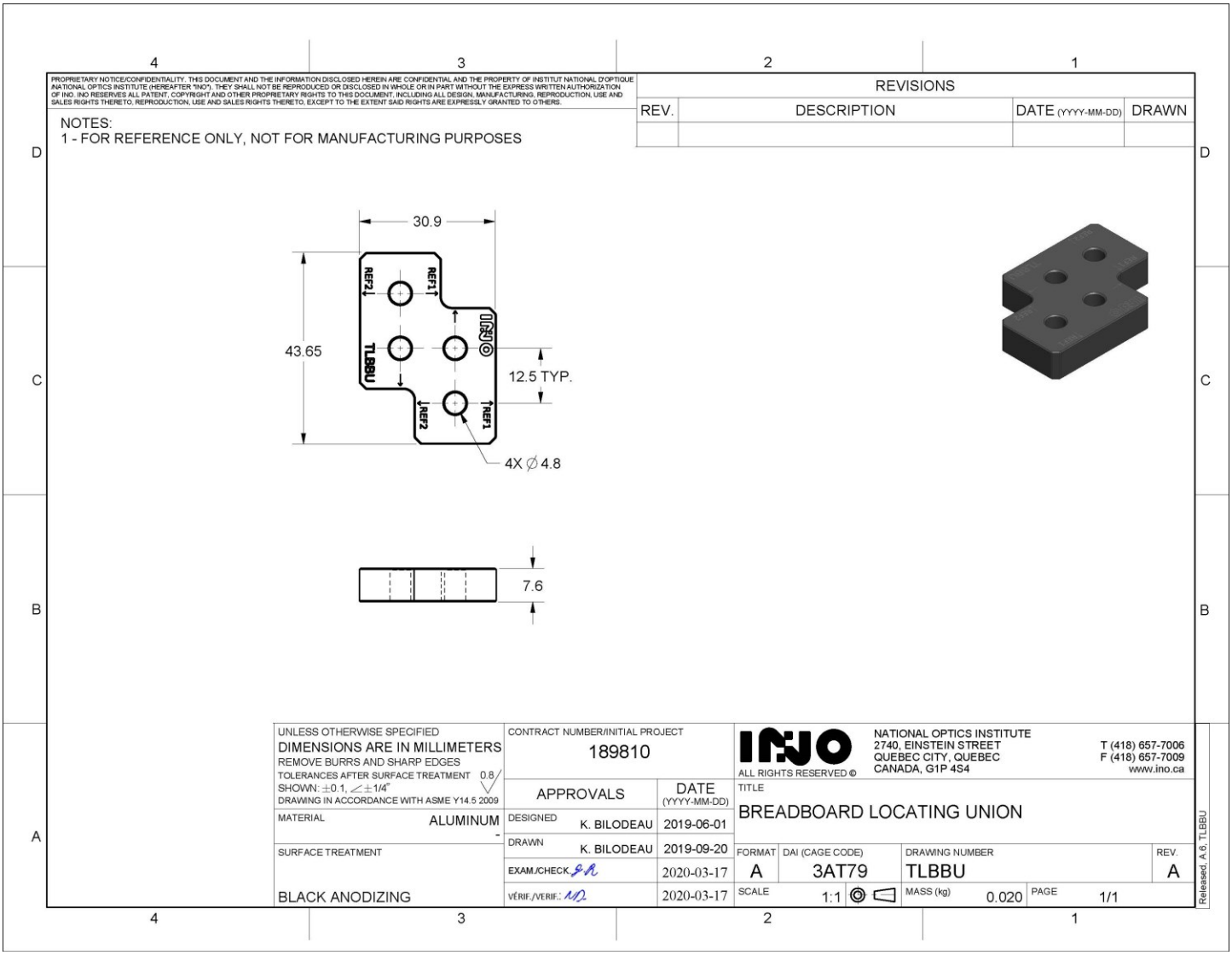


Breadboard locating union

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

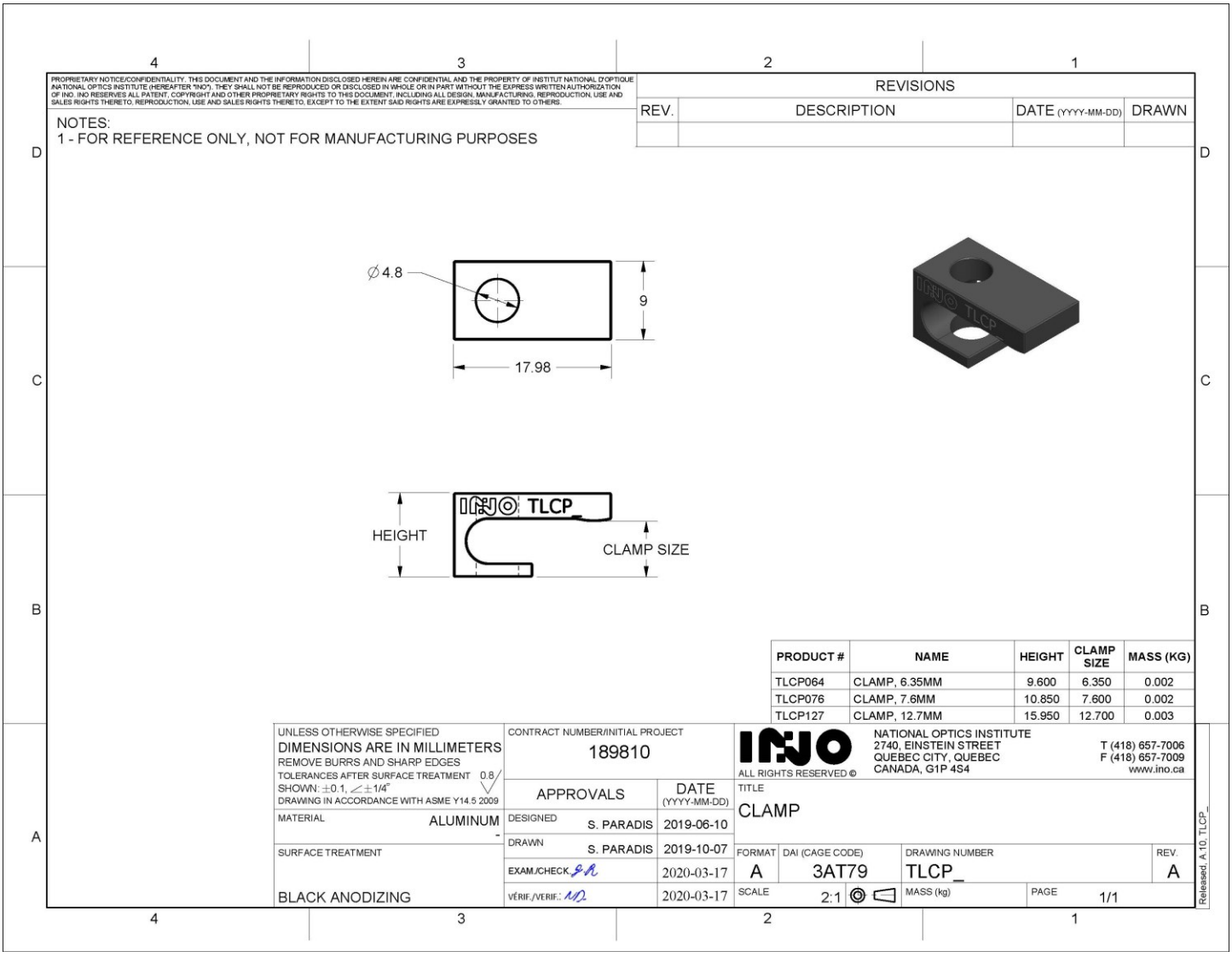


Breadboard clamp tool

Description	Clamp tool to fix breadboard gimbals, or to fix mounts and other breadboards (6.4mm, 7.6mm, or 12.7mm thick).
Adjustments	n/a
Required tool	n/a
Product notes	

Part no.	Unit Price ($)
TLCP064	*TBA*
TLCP076	*TBA*
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	This stack of 3 leaf springs gives the following force per mounting point: • 5.9 ±0.5 N @ 0.5mm deflection • 3.9 ±0.5 N @ 0.4mm deflection • 2.9 ±0.2 N @ 0.3mm deflection • 2.0 ±0.2 N @ 0.2mm deflection ***Warning*** These leaf springs 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

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

NOTES:
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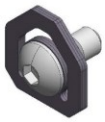
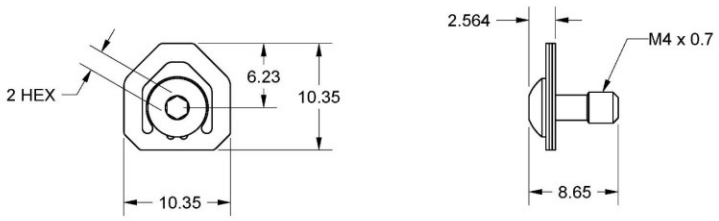




UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS REMOVE BURRS AND SHARP EDGES TOLERANCES AFTER SURFACE TREATMENT 0.8 SHOWN: ±0.1, ∠±1/4° DRAWING IN ACCORDANCE WITH ASME Y14.5 2009	CONTRACT NUMBER/INITIAL PROJECT 189810		INO ALL RIGHTS RESERVED ©	NATIONAL OPTICS INSTITUTE 2740, EINSTEIN STREET QUEBEC CITY, QUEBEC CANADA, G1P 4S4		T (418) 657-7006 F (418) 657-7009 www.ino.ca	
	APPROVALS	DATE (YYYY-MM-DD)	TITLE MIRROR MOUNT LEAF SPRING ASSEMBLY				
MATERIAL STEEL	DESIGNED B. LEDUC	2019-10-01					
	DRAWN S. PARADIS	2020-03-24					
SURFACE TREATMENT N/A	EXAM./CHECK J.R	2020-03-30	FORMAT A	DAI (CAGE CODE) 3AT79	DRAWING NUMBER MMLSA		REV. A
	VÉRIF./VERIF.: M.D.	2020-03-30	SCALE 2:1	MASS (kg) 0.001	PAGE 1/1		

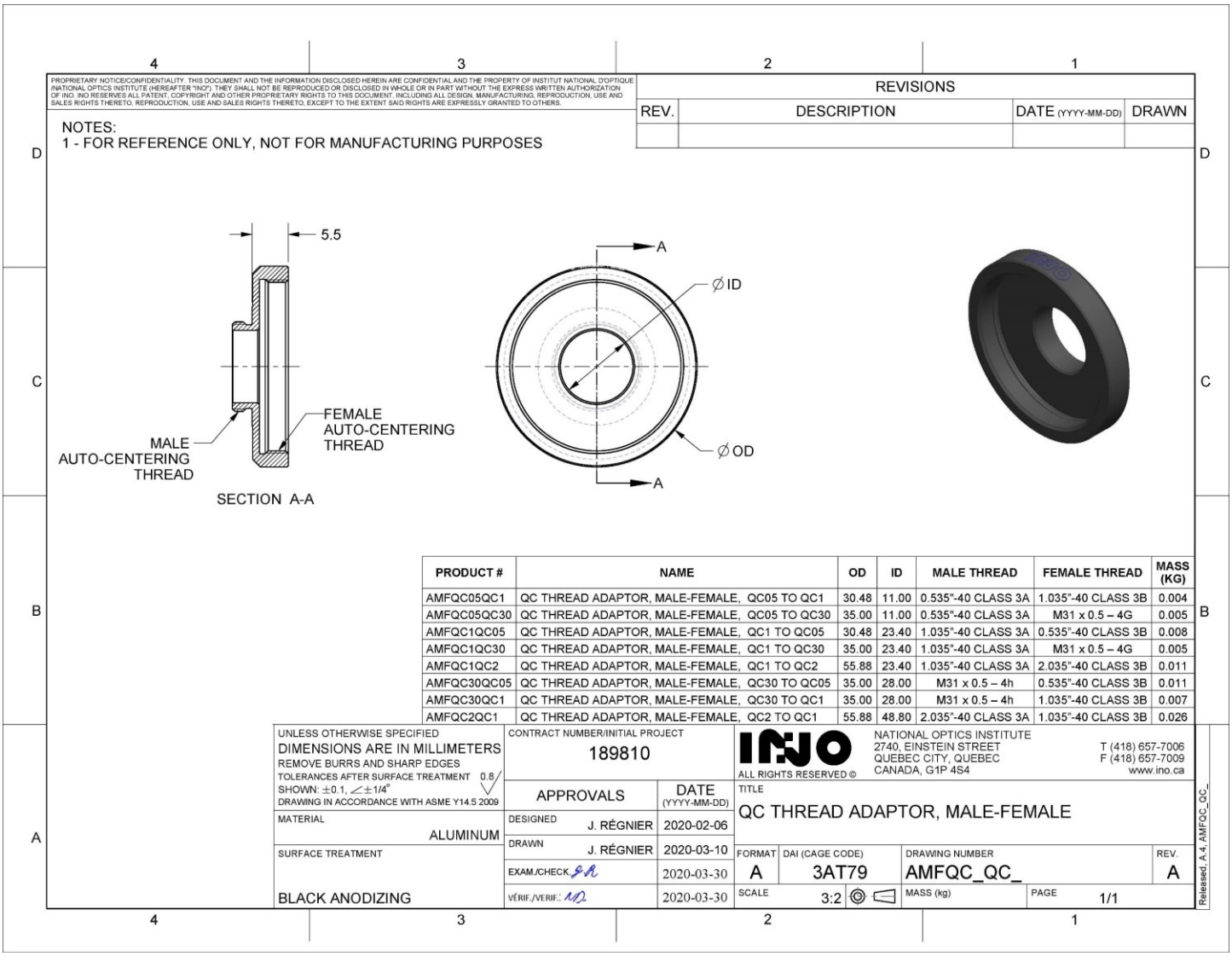
Released, A.1, MML.SA

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_

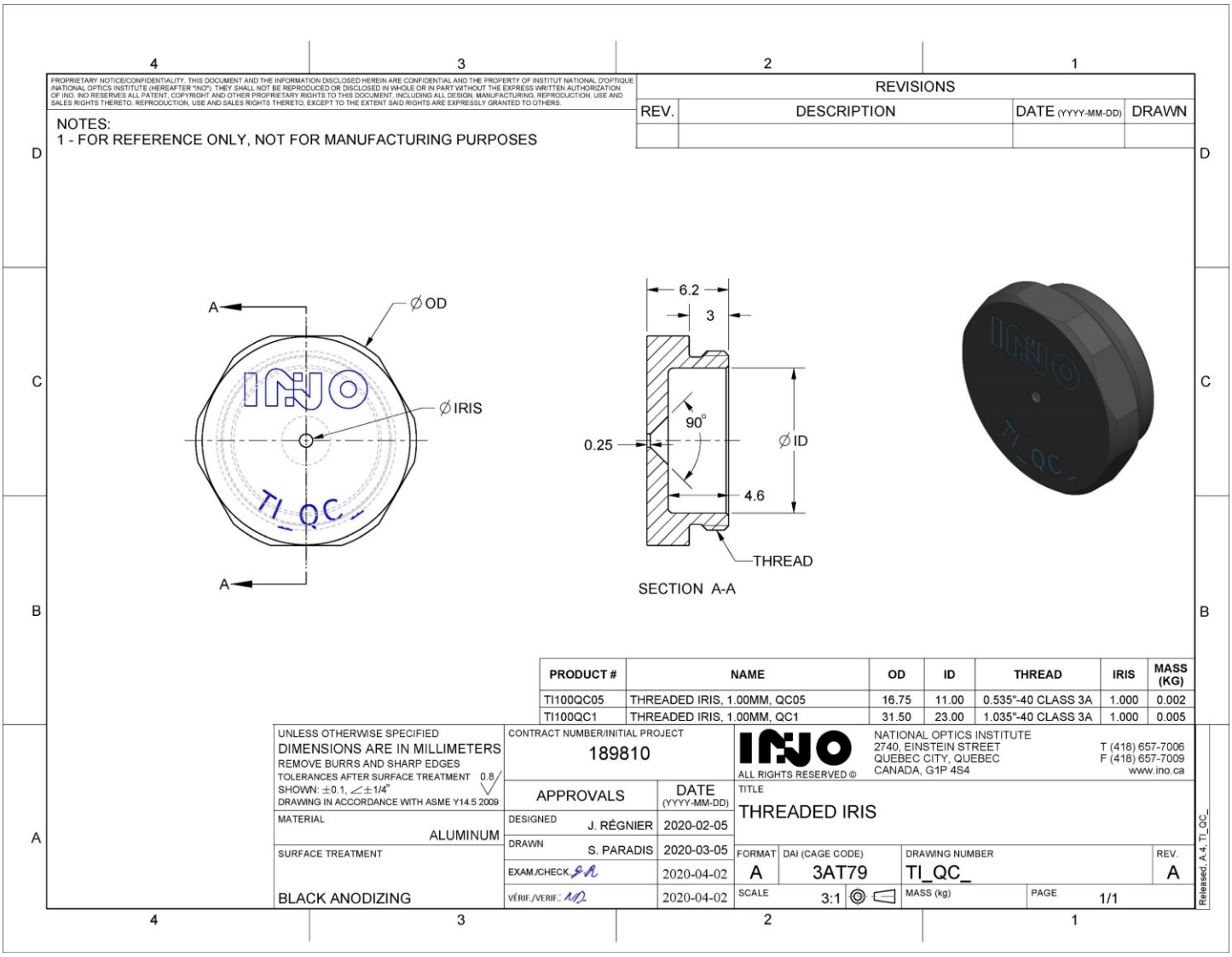


Threaded iris

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_



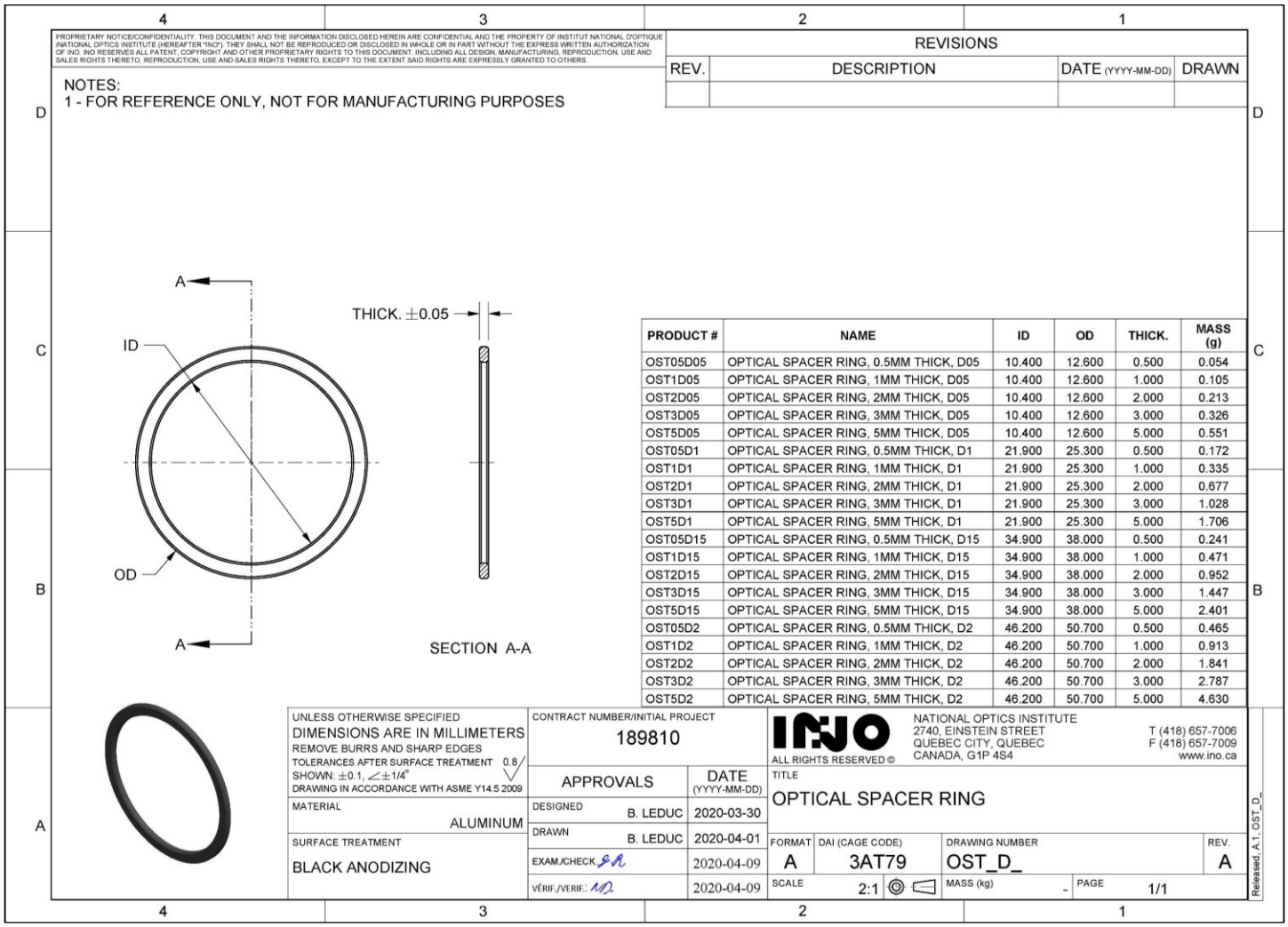
Optical spacer ring

Description	Shims to be used with QuickPOZ mirror mount series, to fill in the thickness gap obtained with some mirrors, filters, or dichroics
Adjustments	n/a
Required tool	n/a
Product notes	

Part no.	Unit Price ($)
OST05D05	*TBA*
OST1D05	*TBA*
OST2D05	*TBA*
OST3D05	*TBA*
OST5D05	*TBA*
OST05D1	*TBA*
OST1D1	*TBA*
OST2D1	*TBA*
OST3D1	*TBA*
OST5D1	*TBA*

Part no.	Unit Price ($)
OST05D15	*TBA*
OST1D15	*TBA*
OST2D15	*TBA*
OST3D15	*TBA*
OST5D15	*TBA*
OST05D2	*TBA*
OST1D2	*TBA*
OST2D2	*TBA*
OST3D2	*TBA*
OST5D2	*TBA*

Drawing OST_D_

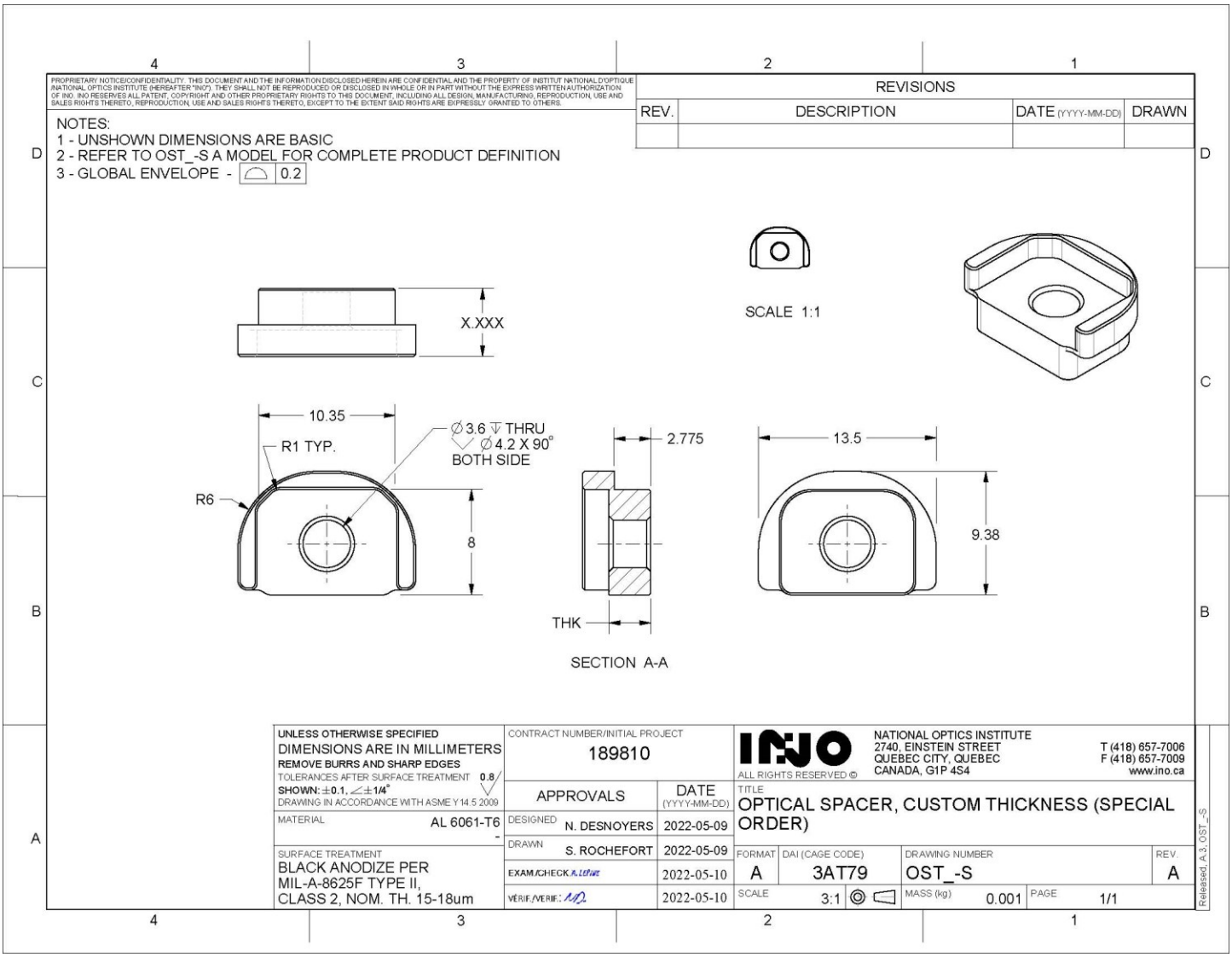


Optical spacer, special order

Description	Custom-made spacer to hold thicker mirrors, filters, or dichroics in QuickPOZ mirror mount series
Adjustments	n/a
Required tool	n/a
Product notes	Custom spacer available for mount sizes D05, D1, D15, and D2. Custom thickness “THK” shown in drawing section A-A will be determined upon request.

Part no.	Unit Price ($)
OST_-S	*TBA*

Drawing OST_-S



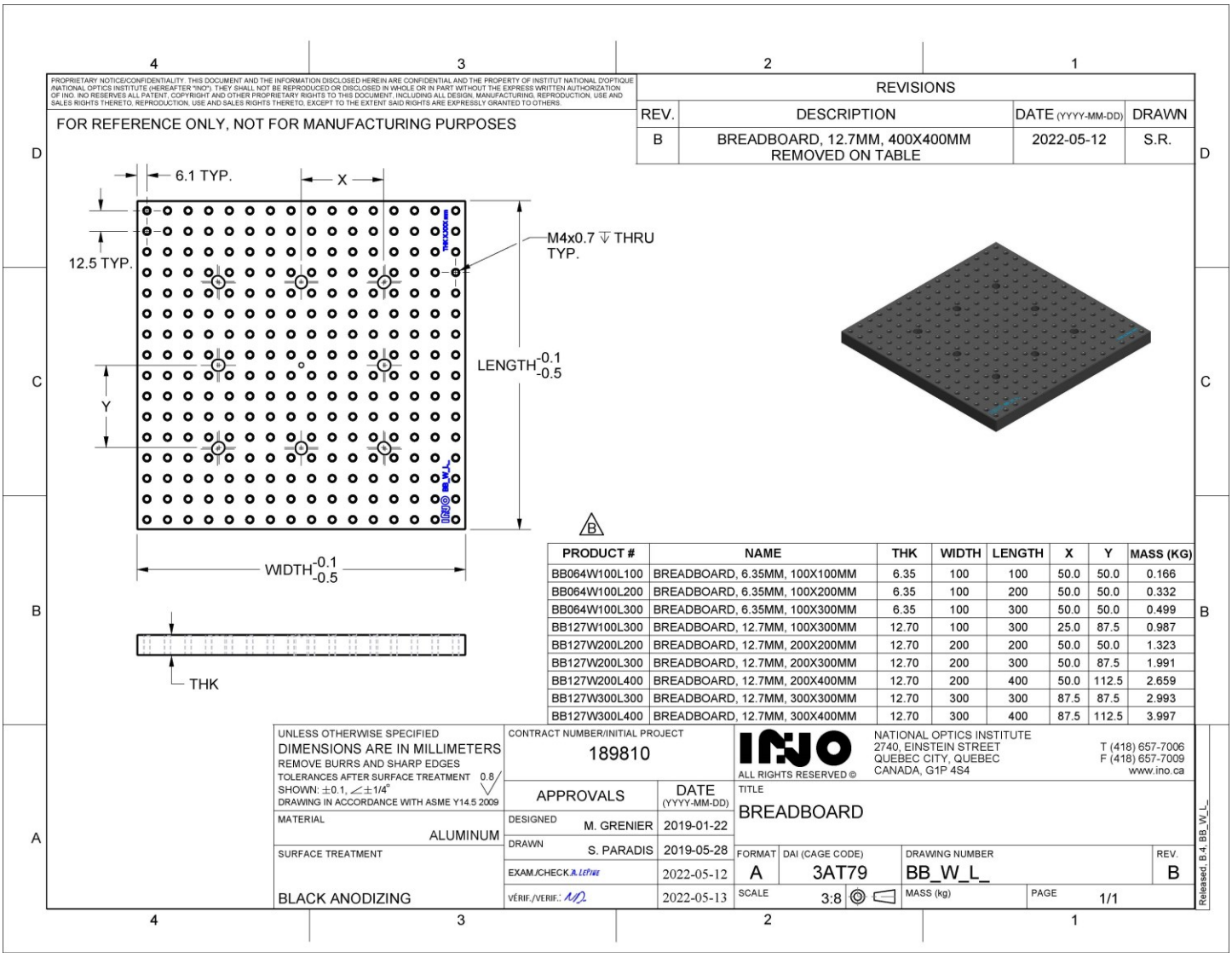
Mounting Plates

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 3 of the 8 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*

Drawing BB_W_L_

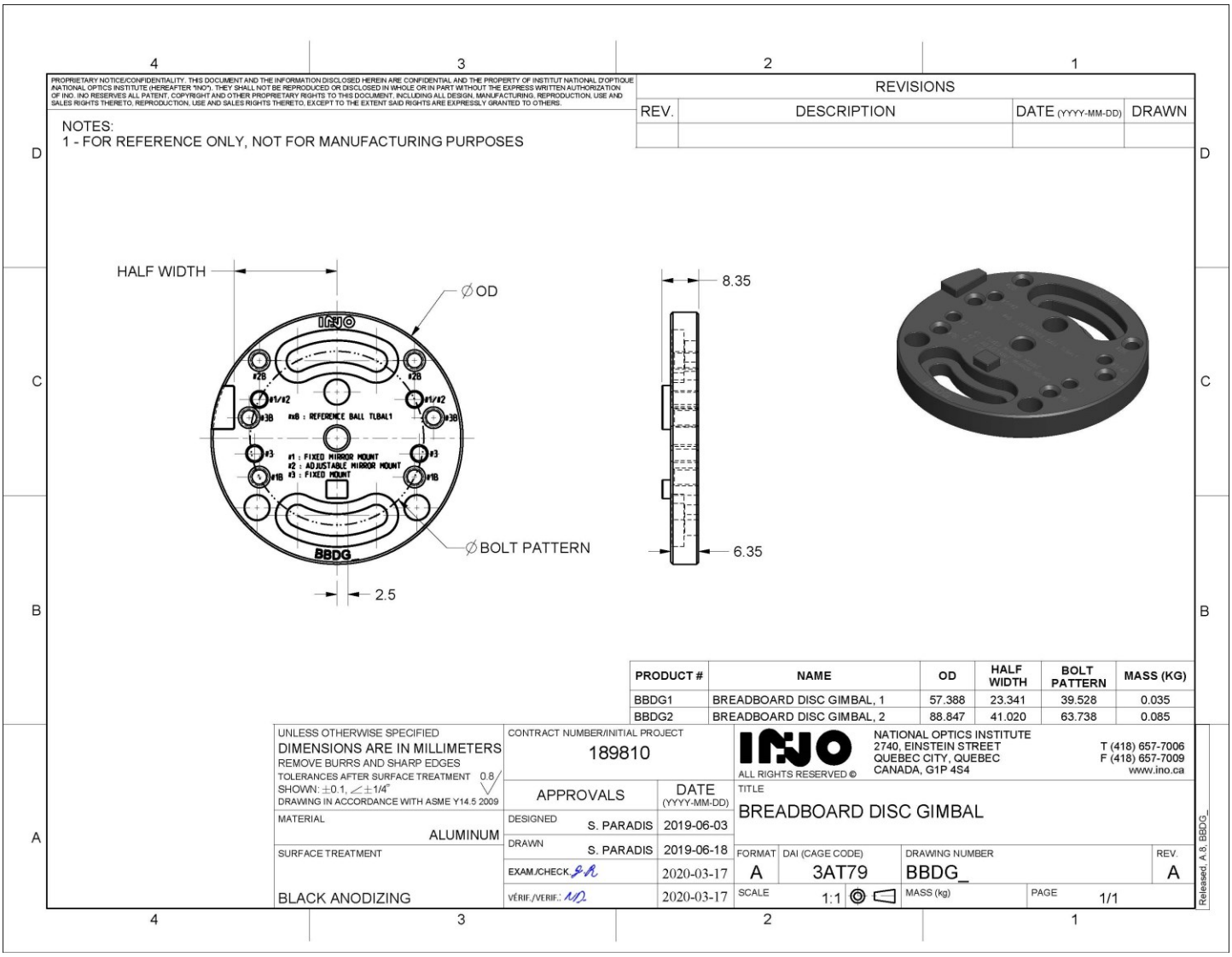


Breadboad disc, gimbal

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_

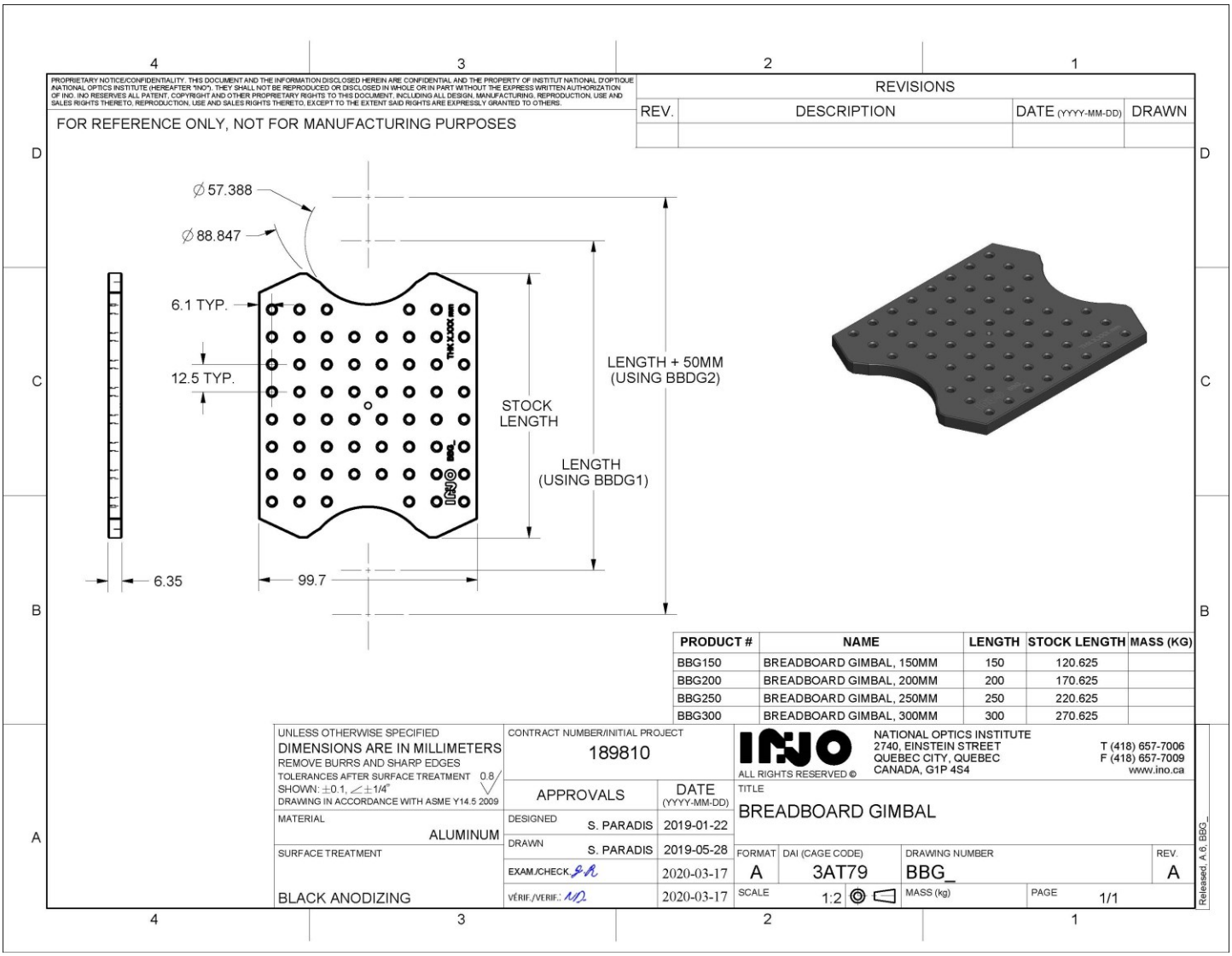


Gimbal adaptor for mirror mount and fixed mount series

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

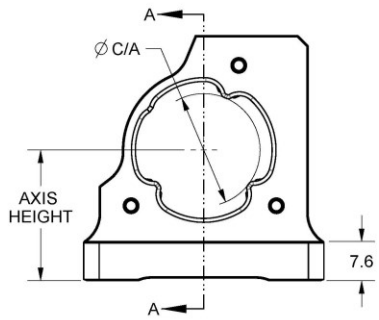
Description	Low distortion fixed mirror mount for horizontal beam folding
Adjustments	n/a
Required tool	2 mm Allen wrench
Product notes	Nominal mirror preload is reached at 0.4mm deflection which corresponds to a mirror thickness of: • 6 ±0.1 mm for Ø12-12.7mm and Ø25-25.4mm mirrors, • 9.525 ±0.1 mm for Ø38.1mm mirrors, • 12 ±0.1 mm for Ø50-50.8mm mirrors. The mount can accommodate other mirror thicknesses by adding optical spacer rings (OST_D_ shims) between the mirror and the blades. If the mirror is just slightly too thick, use ID Ø1/8'' x OD Ø3/16'' precision shims of the desired thickness from McMaster. For significantly thicker mirrors, use our special OST_-S optical spacer with custom thickness – contact INO for details. *** Warning *** Blades have been designed to be used in stack of 3 with a maximal deflection of 0.5mm at the tip.

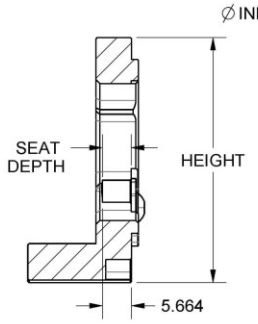
Part no.	Unit Price ($)
MMH254D05	*TBA*
MMH318D05	*TBA*
MMH381D05	*TBA*
MMH254D1	*TBA*
MMH318D1	*TBA*
MMH381D1	*TBA*
MMH254D15	*TBA*
MMH318D15	*TBA*
MMH381D15	*TBA*
MMH318D2	*TBA*
MMH381D2	*TBA*

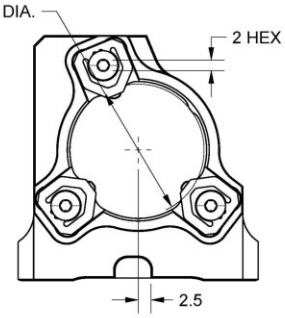
Drawing MMH_D_ (…see next page)

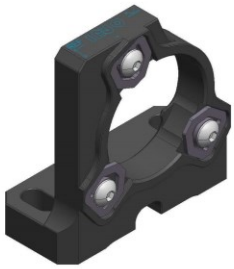
REVISIONS			
REV.	DESCRIPTION	DATE (YYYY-MM-DD)	DRAWN

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

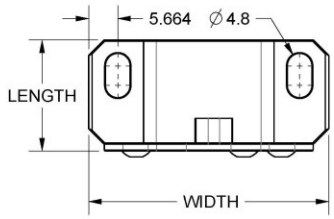








SECTION A-A



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, ∠±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	2019-06-10
DRAWN	S. PARADIS	2020-01-27
EXAM./CHECK.		2020-04-24
VÉRIF./VERIF.:		2020-04-24

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TITLE: FIXED MIRROR MOUNT, HORIZONTAL

FORMAT	DAI (CAGE CODE)	DRAWING NUMBER	REV.
A	3AT79	MMH_D_	A

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

Released, A.36, 1026864

Fixed mirror mount, vertical-bottom

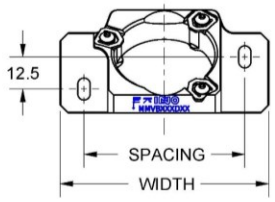
Description	Low distortion fixed mirror mount for vertical beam folding, downwards
Adjustments	n/a
Required tool	2 mm Allen wrench
Product notes	Nominal mirror preload is reached at 0.4mm deflection which corresponds to a mirror thickness of: • 6 ±0.1 mm for Ø12-12.7mm and Ø25-25.4mm mirrors, • 9.525 ±0.1 mm for Ø38.1mm mirrors, • 12 ±0.1 mm for Ø50-50.8mm mirrors. The mount can accommodate other mirror thicknesses by adding optical spacer rings (OST_D_ shims) between the mirror and the blades. If the mirror is just slightly too thick, use ID Ø1/8'' x OD Ø3/16'' precision shims of the desired thickness from McMaster. For significantly thicker mirrors, use our special optical spacer OST_-S with custom thickness – contact INO for details. ***Warning*** Blades have been designed to be used in stack of 3 with a maximal deflection of 0.5mm at the tip. Optical axis positioning accuracy after the folding may be up to ±0.1mm RSS.

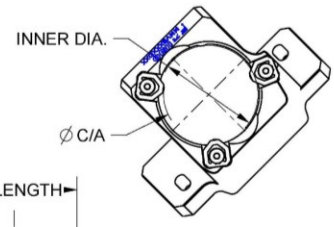
Part no.	Unit Price ($)
MMVB254D05	*TBA*
MMVB254D1	*TBA*
MMVB254D15	*TBA*
MMVB318D05	*TBA*
MMVB318D1	*TBA*
MMVB318D15	*TBA*
MMVB381D05	*TBA*
MMVB381D1	*TBA*
MMVB381D15	*TBA*

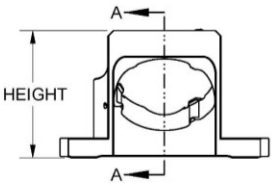
Drawing MMVB_D_ (…see next page)

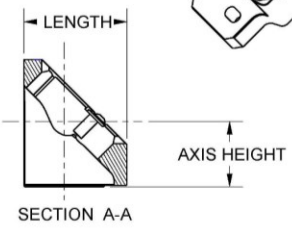
REVISIONS			
REV.	DESCRIPTION	DATE (YYYY-MM-DD)	DRAWN

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

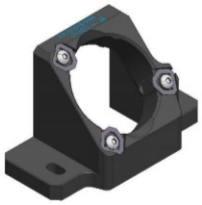








SECTION A-A



PRODUCT #	NAME	AXIS HEIGHT	INNER DIA.	∅ 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

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

MATERIAL: ALUMINUM

SURFACE TREATMENT: BLACK ANODIZING

CONTRACT NUMBER/INITIAL PROJECT: 189810

APPROVALS		DATE (YYYY-MM-DD)
DESIGNED	M.GRENIER	2020-02-05
DRAWN	M.GRENIER	2020-02-24
EXAM./CHECK.		2020-04-30
VÉRIF./VERIF.:		2020-04-30

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TITLE: FIXED MIRROR MOUNT, VERTICAL-BOTTOM

FORMAT	DAI (CAGE CODE)	DRAWING NUMBER	REV.
A	3AT79	MMVB_D_	A

SCALE 1:2 | MASS (kg) - | PAGE 1/1

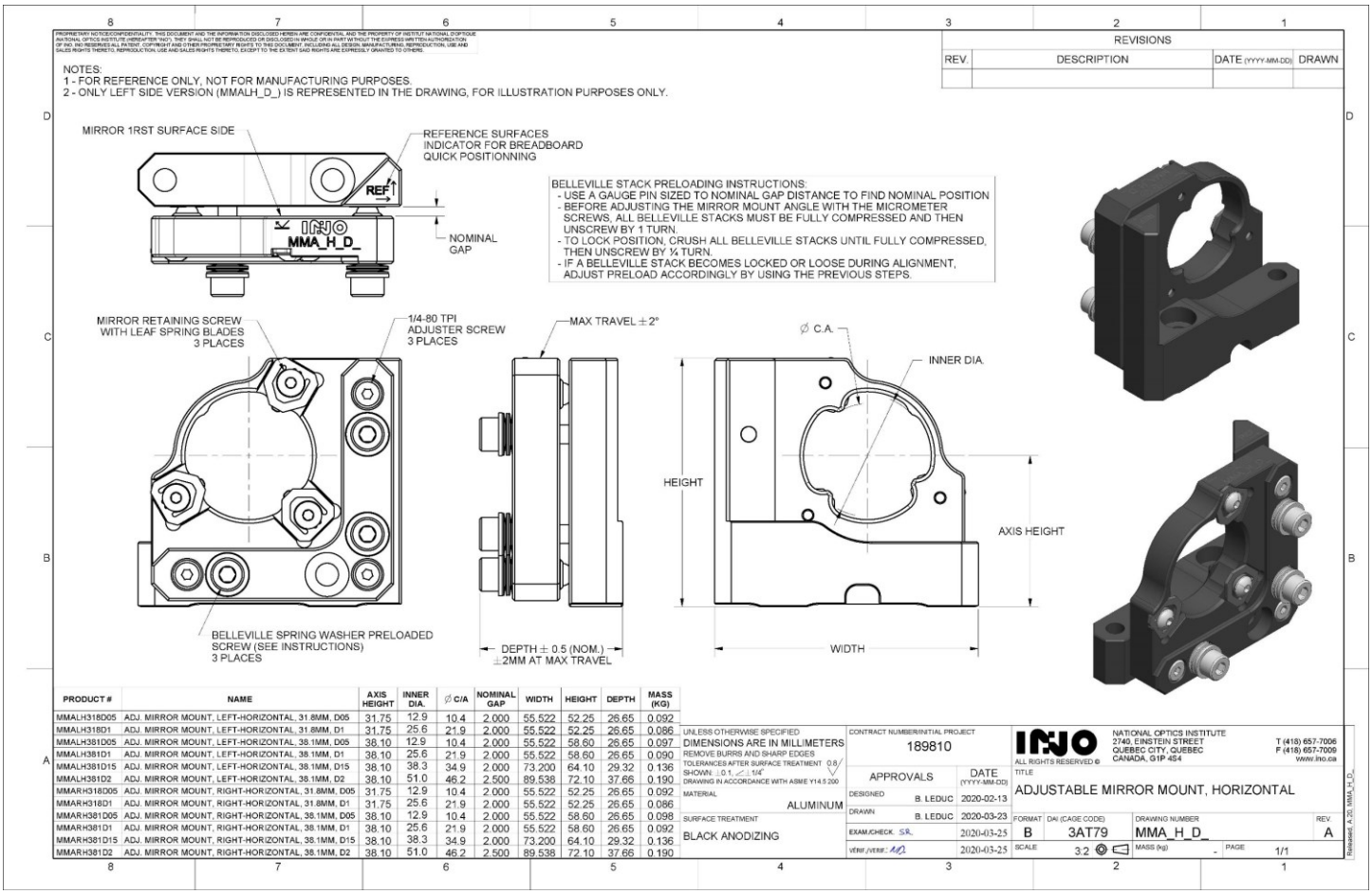
Released, A.4, MMVB_D_

Adjustable mirror mount, horizontal

Description	Low distortion adjustable mirror mount with ±2° tip-tilt for horizontal beam folding. Left-hand and right-hand versions.
Adjustments	D05 & D1: travel tip/tilt ±2°; Z ±1mm, 8.4 mrad/rev. D15: travel tip/tilt ±2°; Z ±1mm, 6.6 mrad/rev. D2: travel tip/tilt ±2°; Z ±1mm, 5.3 mrad/rev. Resolution after locking: 0.010-0.015 mrad.
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 ¼ 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 Ø12-12.7mm and Ø25-25.4mm mirrors, • 9.525 ±0.1 mm for Ø38.1mm mirrors, • 12 ±0.1 mm for Ø50-50.8mm mirrors. The mount can accommodate other mirror thicknesses by adding optical spacer rings (OST_D_ shims) between the mirror and the blades. If the mirror is just slightly too thick, use ID Ø1/8'' x OD Ø3/16'' precision shims of the desired thickness from McMaster. For significantly thicker mirrors, use our special optical spacer OST_-S with custom thickness – contact INO for details. ***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)



PRODUCT #	NAME	AXIS HEIGHT	INNER DIA.	Ø 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

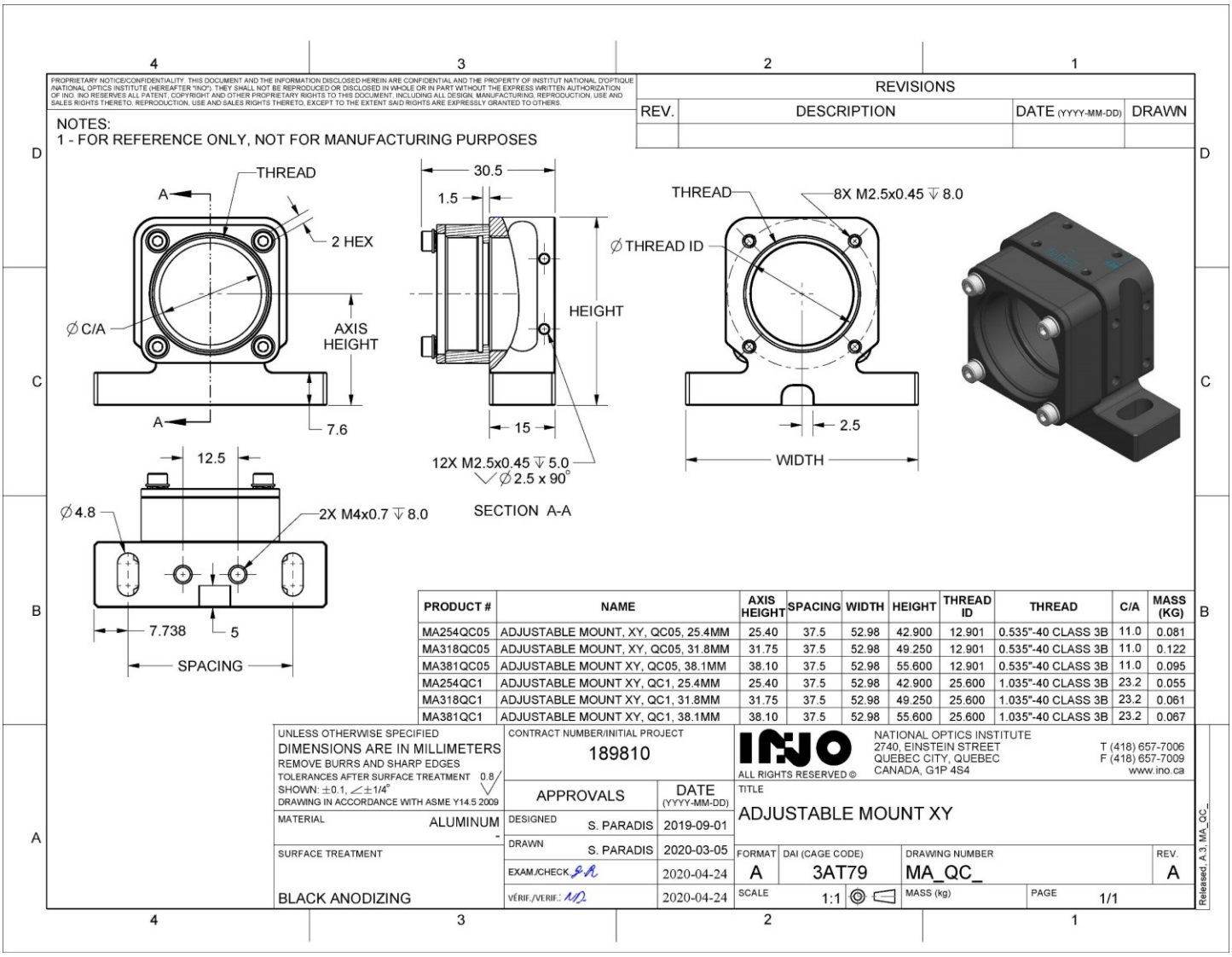
Generic Mounts

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_



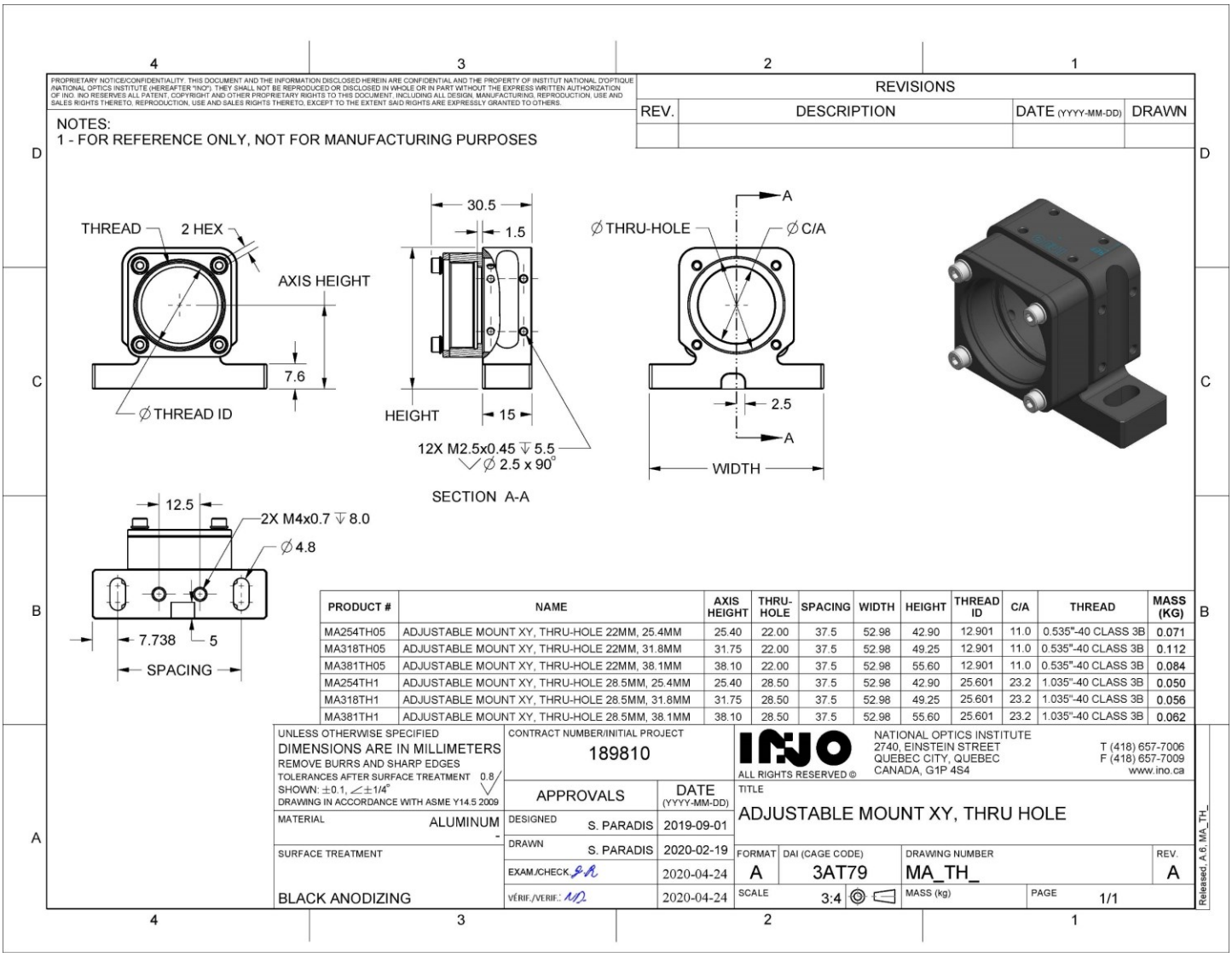
PRODUCT #	NAME	AXIS HEIGHT	SPACING	WIDTH	HEIGHT	THREAD ID	THREAD	C/A	MASS (KG)
MA254QC05	ADJUSTABLE MOUNT, XY, QC05, 25.4MM	25.40	37.5	52.98	42.900	12.901	0.535"-40 CLASS 3B	11.0	0.081
MA318QC05	ADJUSTABLE MOUNT, XY, QC05, 31.8MM	31.75	37.5	52.98	49.250	12.901	0.535"-40 CLASS 3B	11.0	0.122
MA381QC05	ADJUSTABLE MOUNT XY, QC05, 38.1MM	38.10	37.5	52.98	55.600	12.901	0.535"-40 CLASS 3B	11.0	0.095
MA254QC1	ADJUSTABLE MOUNT XY, QC1, 25.4MM	25.40	37.5	52.98	42.900	25.600	1.035"-40 CLASS 3B	23.2	0.055
MA318QC1	ADJUSTABLE MOUNT XY, QC1, 31.8MM	31.75	37.5	52.98	49.250	25.600	1.035"-40 CLASS 3B	23.2	0.061
MA381QC1	ADJUSTABLE MOUNT XY, QC1, 38.1MM	38.10	37.5	52.98	55.600	25.600	1.035"-40 CLASS 3B	23.2	0.067

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_

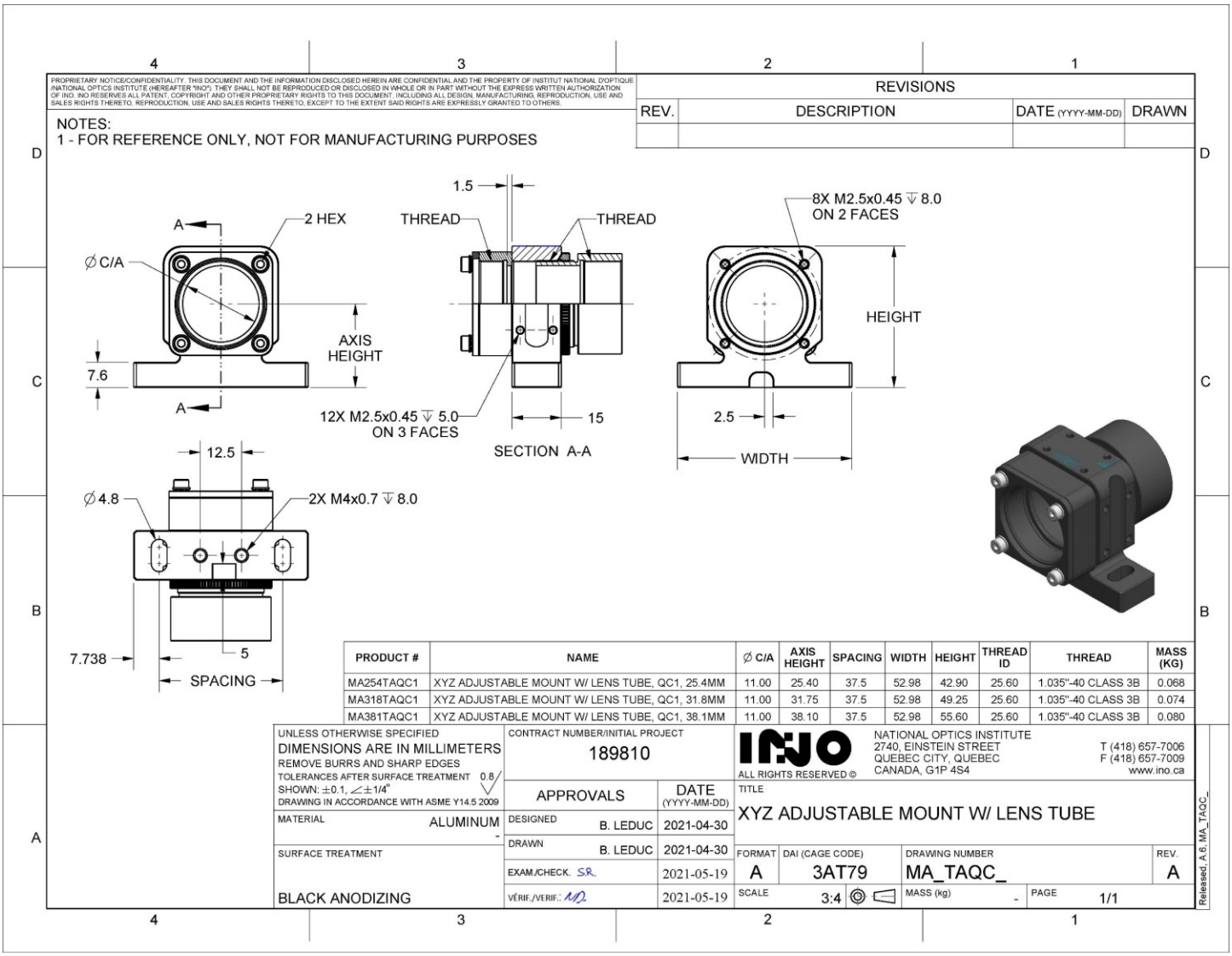


XYZ adjustable mount

Description	X-Y-Z adjustable mount with QC threads
Adjustments	Refer to TLXY1 for X & Y adjustment. For axial adjustment: 7mm travel, 2µm axial resolution (1° of adjuster rotation), Knurled locking ring.
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 ($)
MA254TAQC1	*TBA*
MA318TAQC1	*TBA*
MA381TAQC1	*TBA*

Drawing MA_TAQC_

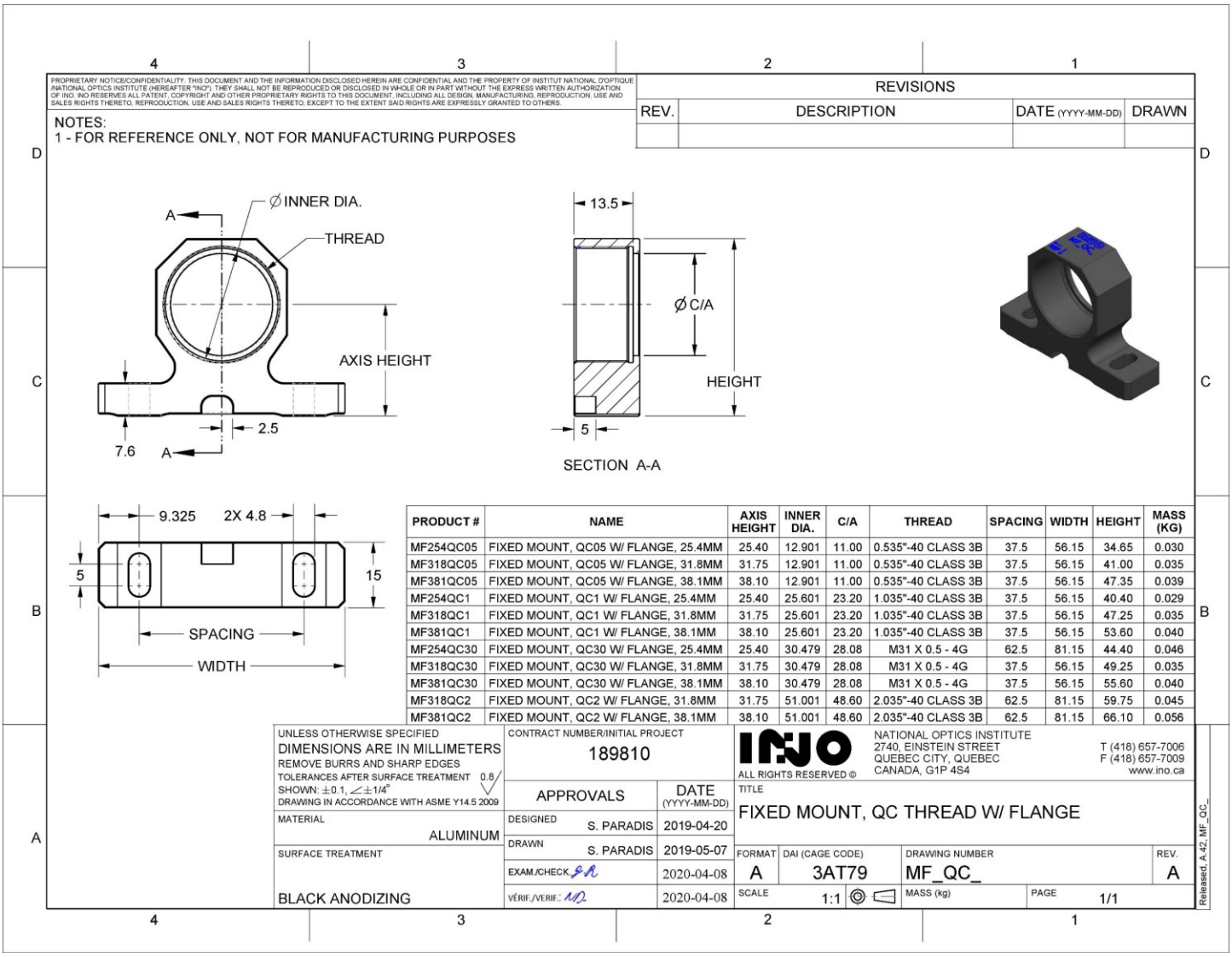


Fixed mount with flange

Description	Fixed mount with axial support and QC threads
Adjustments	n/a
Required tool	n/a
Product notes	Compatible with QuickPOZ QC threads as well as 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_

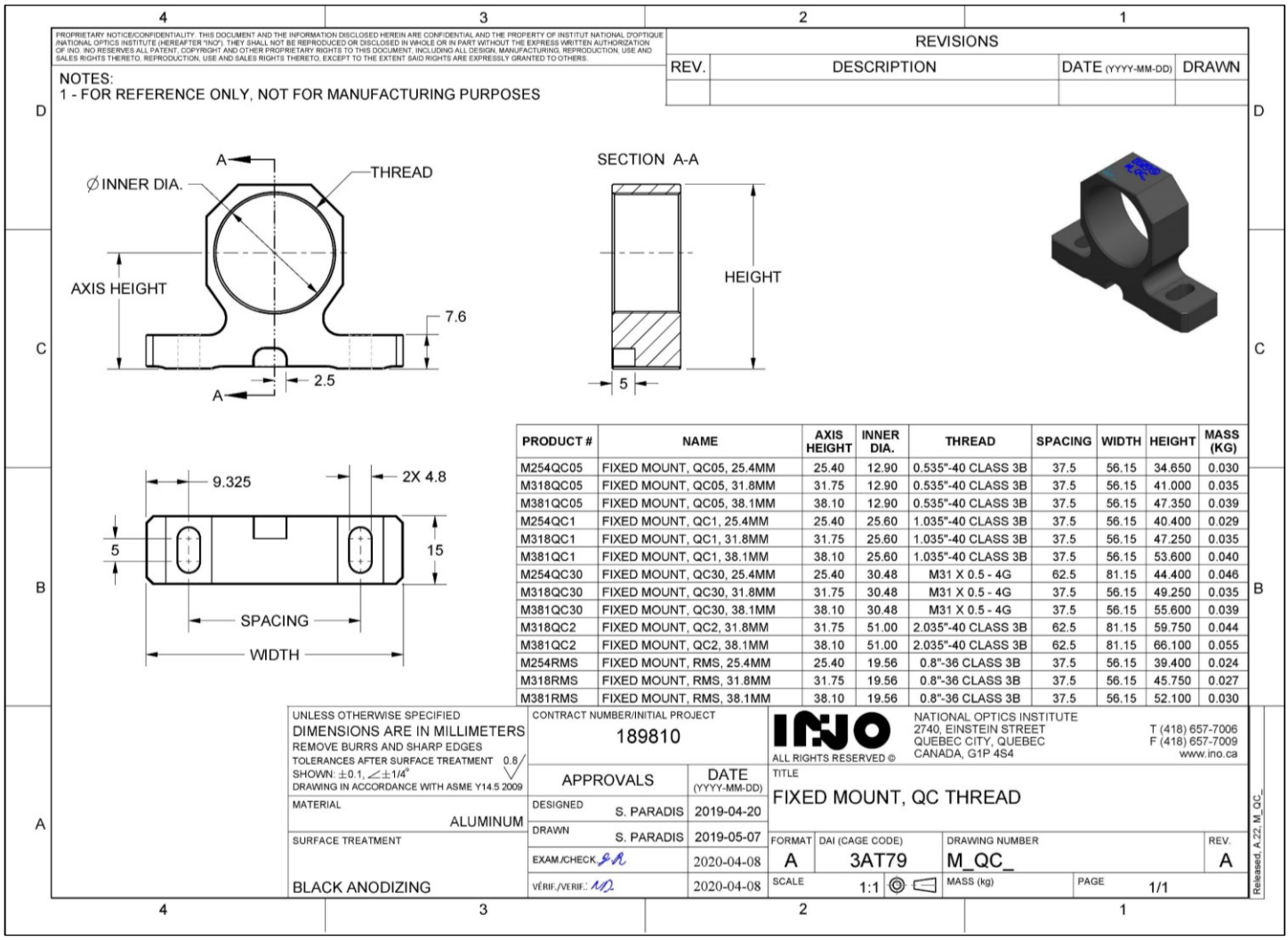


Fixed mount

Description	Fixed mount with QC threads
Adjustments	n/a
Required tool	n/a
Product notes	Compatible with QuickPOZ QC threads as well as 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_



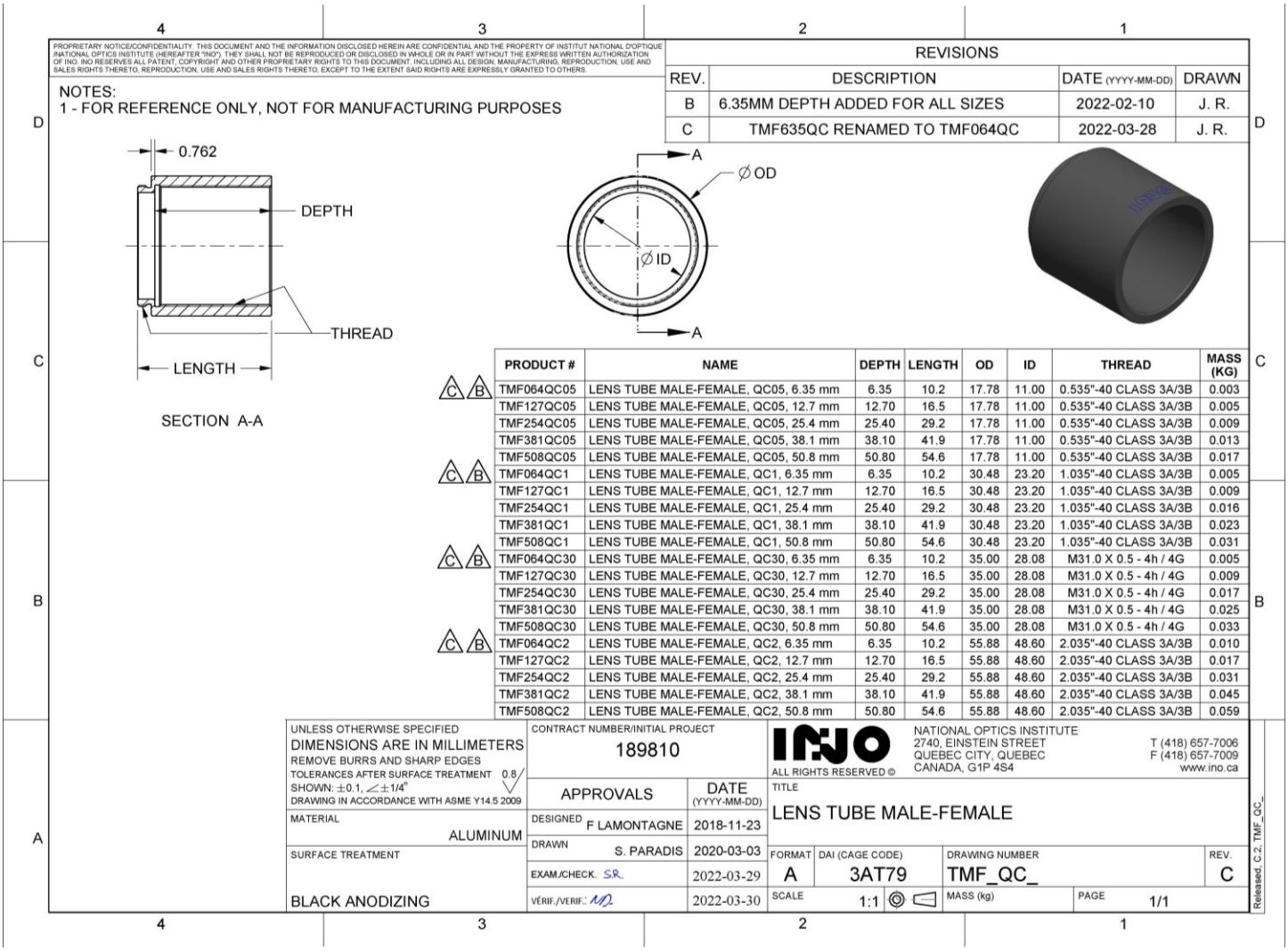
Tubes

Lens tube, male-female

Description	Autocentered tube with QC threads
Adjustments	n/a
Required tool	n/a
Product notes	Compatible with QuickPOZ QC threads as well as commercial threads

Part no.	Unit Price ($)	Part no.	Unit Price ($)
TMF064QC05	*TBA*	TMF064QC30	*TBA*
TMF127QC05	*TBA*	TMF127QC30	*TBA*
TMF254QC05	*TBA*	TMF254QC30	*TBA*
TMF381QC05	*TBA*	TMF381QC30	*TBA*
TMF508QC05	*TBA*	TMF508QC30	*TBA*
TMF064QC1	*TBA*	TMF064QC2	*TBA*
TMF127QC1	*TBA*	TMF127QC2	*TBA*
TMF254QC1	*TBA*	TMF254QC2	*TBA*
TMF381QC1	*TBA*	TMF381QC2	*TBA*
TMF508QC1	*TBA*	TMF508QC2	*TBA*

Drawing TMF_QC_

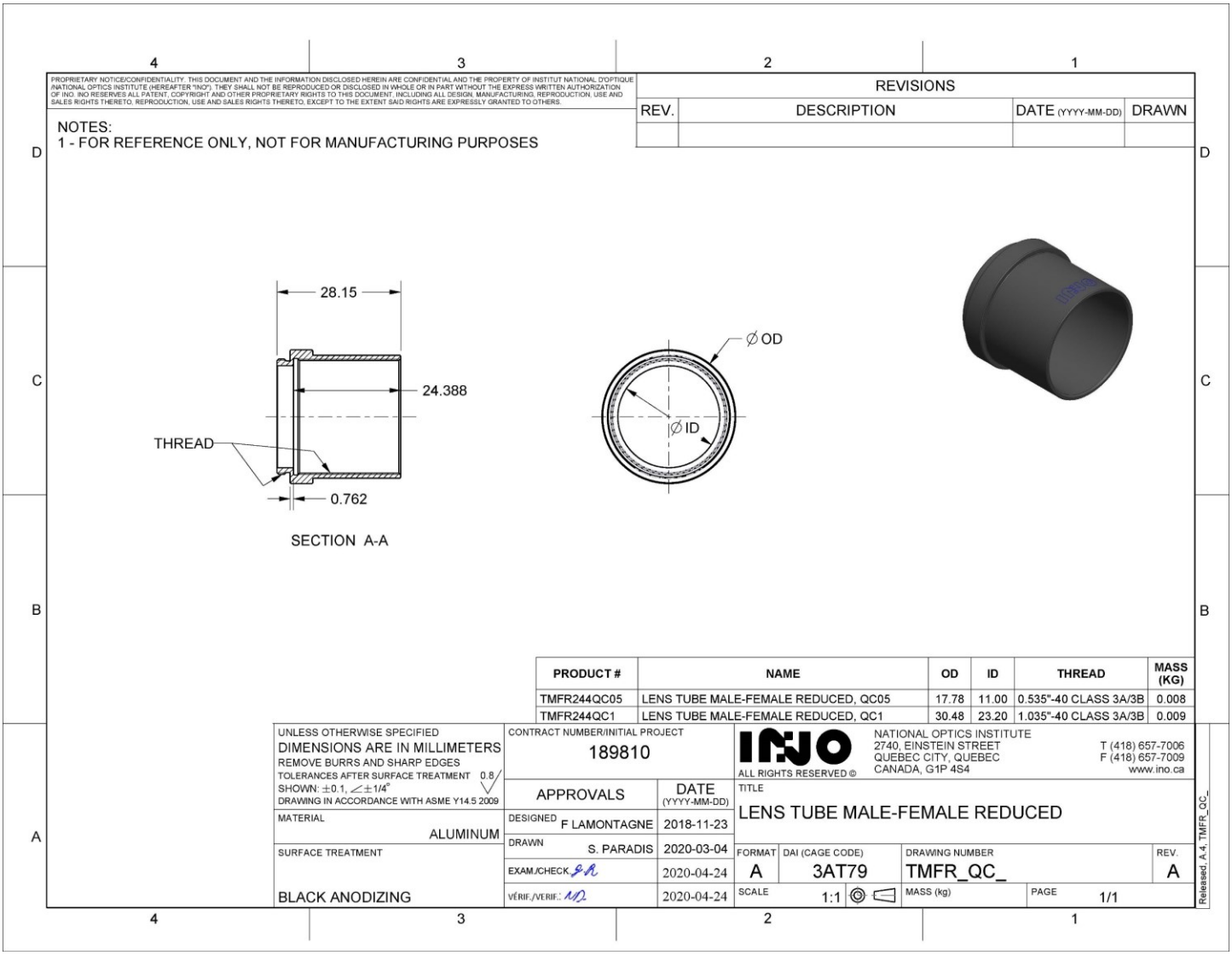


Lens tube, male-female, adapted for MA_TH_

Description	Autocentered tube with QC threads, adjusted for use with MA_TH_ mount
Adjustments	n/a
Required tool	n/a
Product notes	Compatible with QuickPOZ QC threads as well as commercial threads

Part no.	Unit Price ($)
TMFR244QC05	*TBA*
TMFR244QC1	*TBA*

Drawing TMFR_QC_

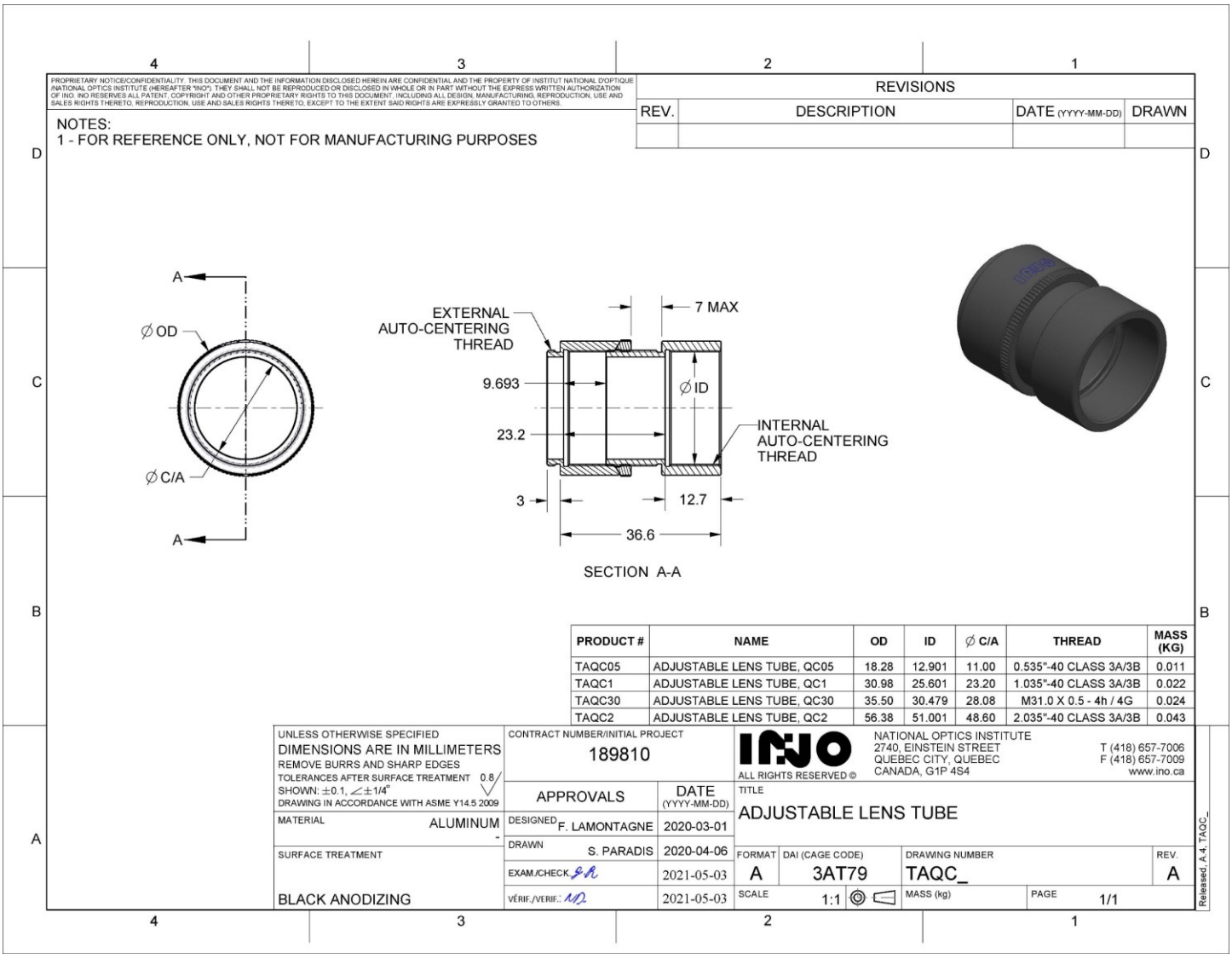


Lens tube with axial adjustment

Description	Tube with axial adjustment
Adjustments	7 mm travel, 2µm axial resolution (1° of adjuster rotation), Knurled locking ring.
Required tool	n/a
Product notes	Compatible with QuickPOZ QC threads as well as commercial threads

Part no.	Unit Price ($)
TAQC05	*TBA*
TAQC1	*TBA*
TAQC30	*TBA*
TAQC2	*TBA*

Drawing TAQC_



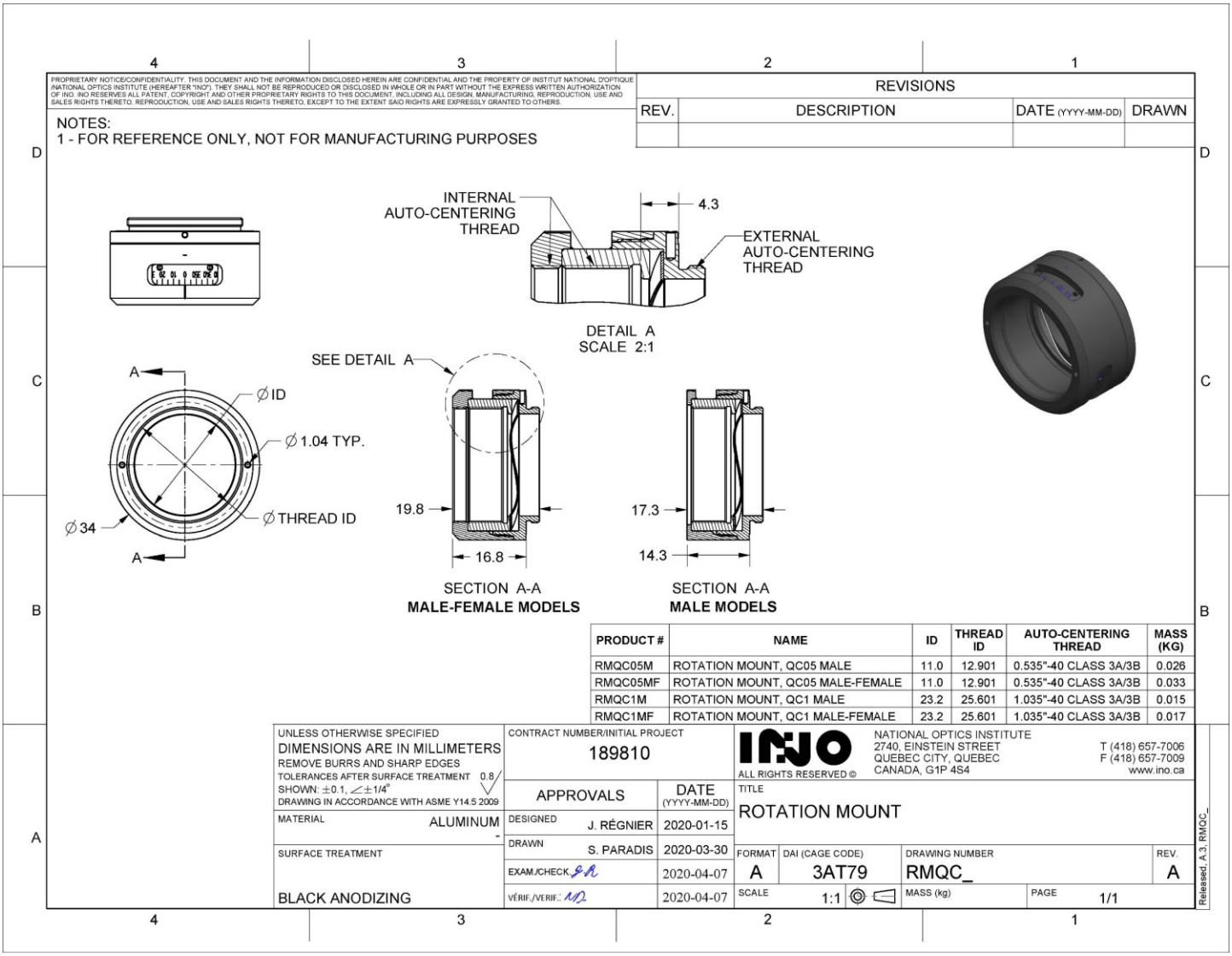
Rotation Mounts

Rotation mount

Description	Rotation mount
Adjustments	Travel: 360° endless; resolution ±1°, self locking.
Required tool	Pin Ø1 mm
Product notes	Compatible with QuickPOZ QC threads as well as commercial threads

Part no.	Unit Price ($)
RMQC05M	*TBA*
RMQC05MF	*TBA*
RMQC1M	*TBA*
RMQC1MF	*TBA*

Drawing RMQC_



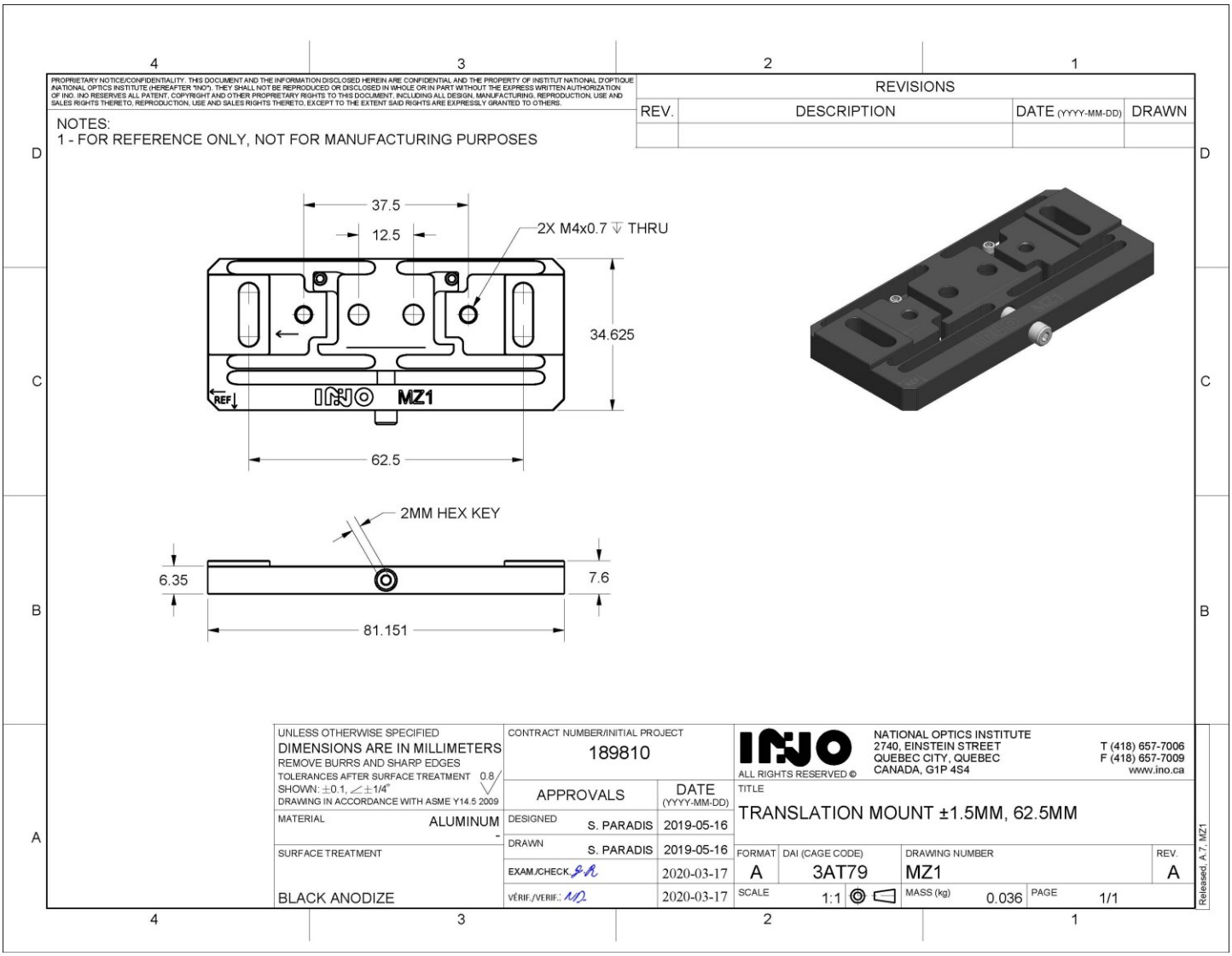
Translation Mounts

Translation mount, 1.5mm, 62.5MM

Description	Translation flexure, ±1.5mm, 62.5MM
Adjustments	±1.5mm; 300 µm/revolution, resolution of ±0.8µm
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



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