

**SolidWorks Student Edition
For Academic Use Only.**

| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|----------------------|-----------------------|-------------------|-----------------------|------------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.1 | +/- 0.1 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| LESS OR EITHER TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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DO NOT SCALE DRAWING

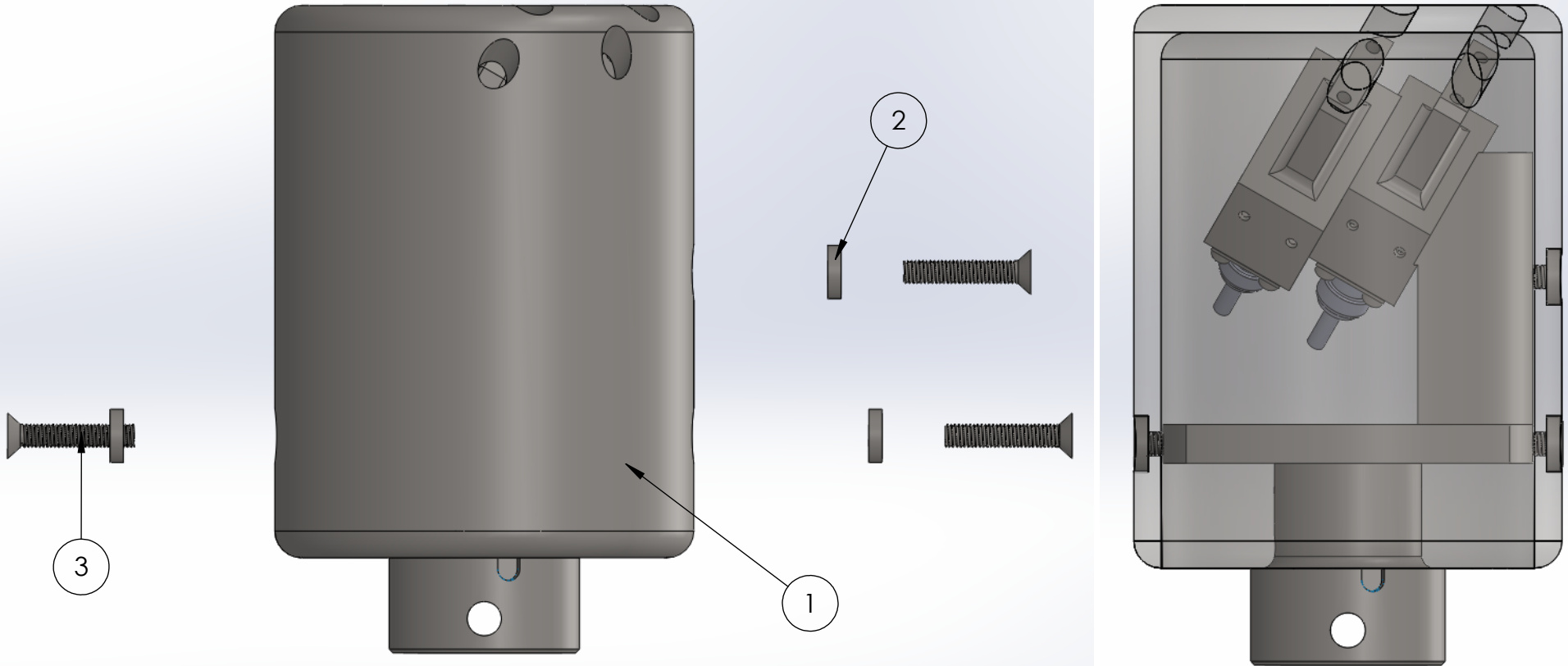


| | | |
|----------------------------------------------------|------------------------------------------|----------|
| MATERIAL | PEEK 1000, SS316, BN CERAMIC GRADE XP | |
| | NAME | DATE |
| DRAWN | RAMONA V PEREZ | 06/13/13 |
| CHECKED | RAMONA V PEREZ | 06/19/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | REMOVE ALL BURRS AND SHARP EDGES | |

TITLE:
**PROTON DETECTOR
 ASSEMBLED TOTAL**

SIZE **A** DWG. NO. PD_22_TOTAL_VIEW REV

SHEET 1 OF 1



| PARTS LIST | | | |
|------------|----------------------------|---------------|----------|
| ITEM NO. | TITLE | DWG. NO. | QUANTITY |
| 1 | PROTON DETECTOR SHIELD | PD_22_Shell | 1 |
| 2 | PROTON DETECTOR BRACKET | PD_22_Bracket | 3 |
| 3 | McMaster-Carr PN#93395A366 | | 3 |

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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|-------------|--------------|----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.15 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| LESS THAN 50 | 50 TO 120 | 120 TO 400 | OVER 400 | | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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DO NOT SCALE DRAWING

FIU FLORIDA INTERNATIONAL UNIVERSITY

MATERIAL: SS316 AND BN CERAMIC GRADE XP

| | | | |
|---------|----------------|------|----------|
| DRAWN | RAMONA V PEREZ | DATE | 06/13/13 |
| CHECKED | RAMONA V PEREZ | DATE | 06/19/13 |

UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM

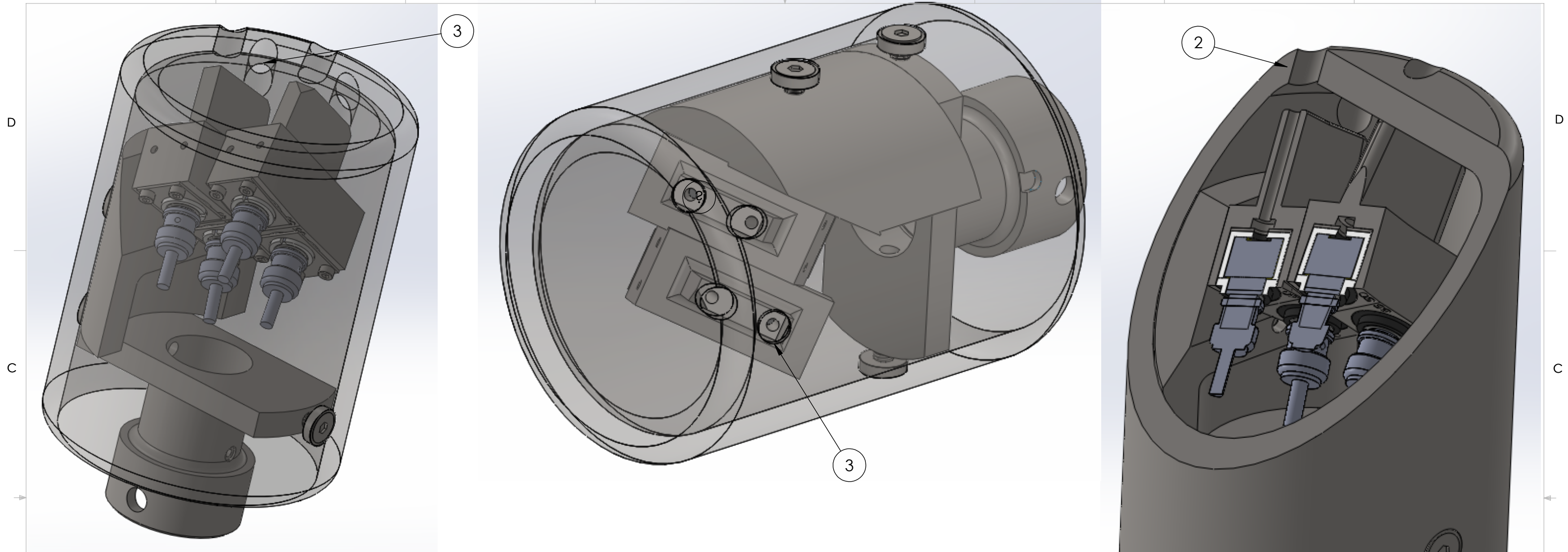
REMOVE ALL BURRS AND SHARP EDGES

TITLE: PROTON DETECTOR ASSEMBLED SHIELD

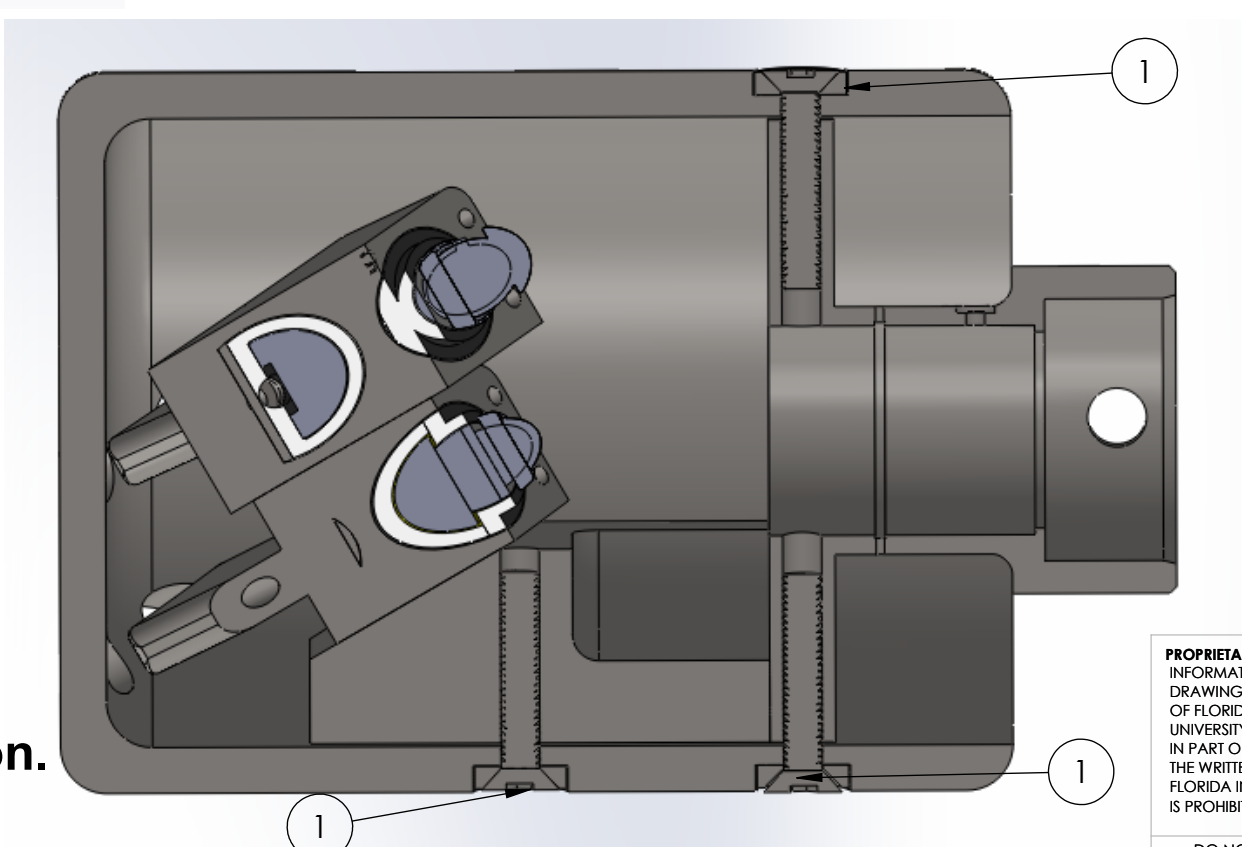
| | | |
|----------|------------------------|-----|
| SIZE | DWG. NO. | REV |
| A | PD_22_Shield_assembled | |

SHEET 1 OF 1

8 7 6 5 4 3 2 1



NOTES:
 1. SHIELD ATTACHED TO SS316 COMPONENTS WITH BRACKETS AND SCREWS.
 2. CROSS SECTIONAL VIEW OF 10mm DIAMETER COLLIMATOR HOLES IN SHIELD.
 3. VIEW OF ASSEMBLED INSTRUMENT WITH SHIELD HOLES (SHIELD IS TRANSPARENT).



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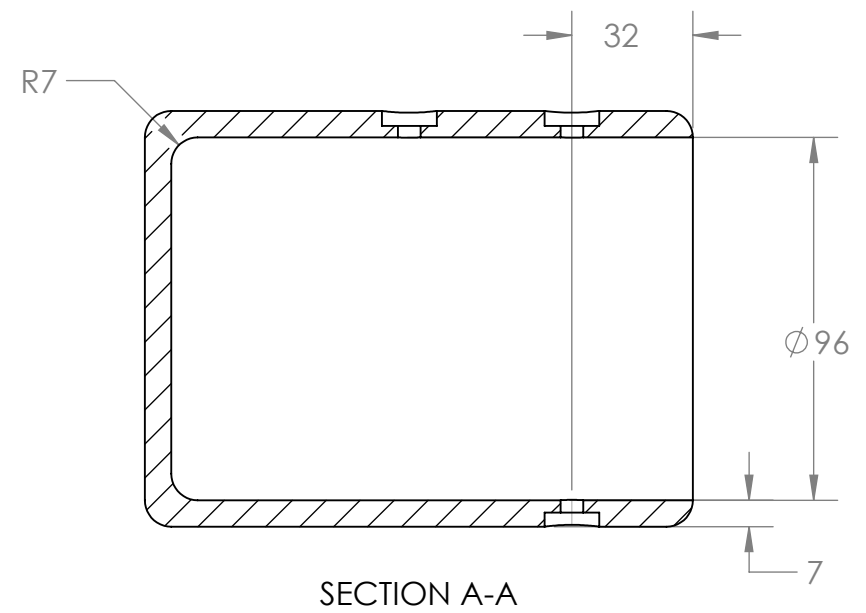
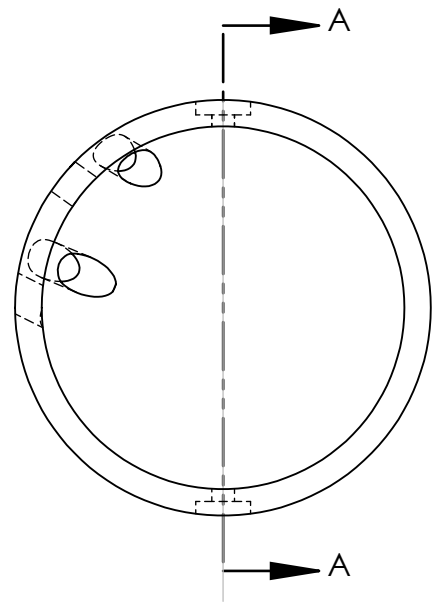
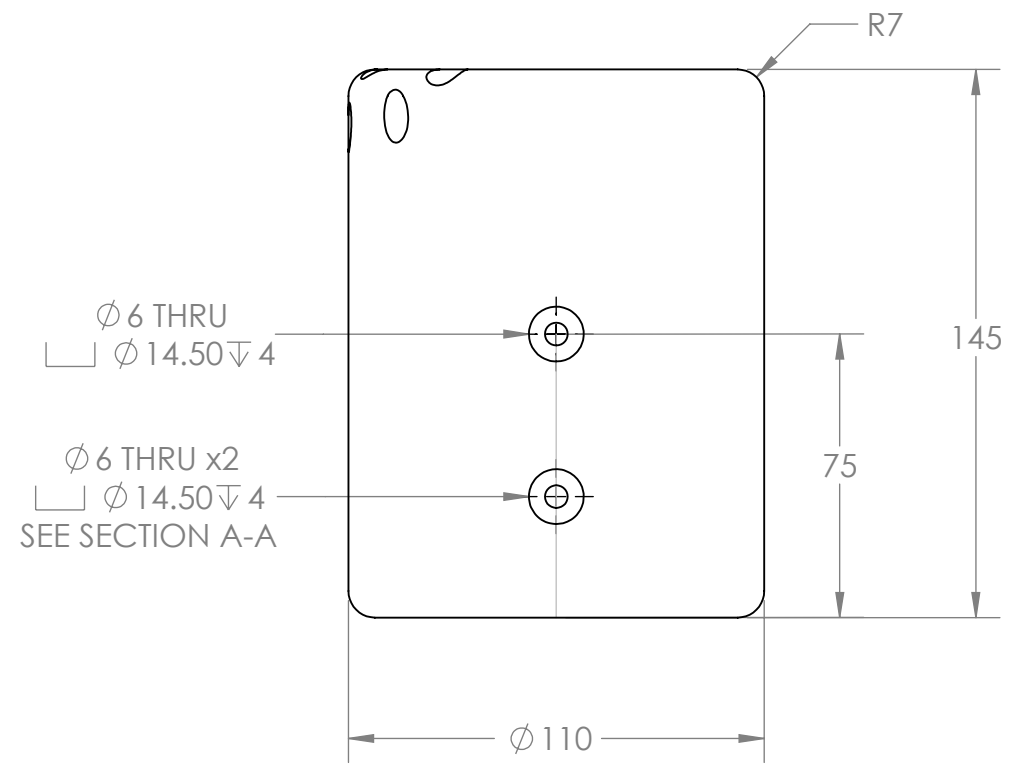
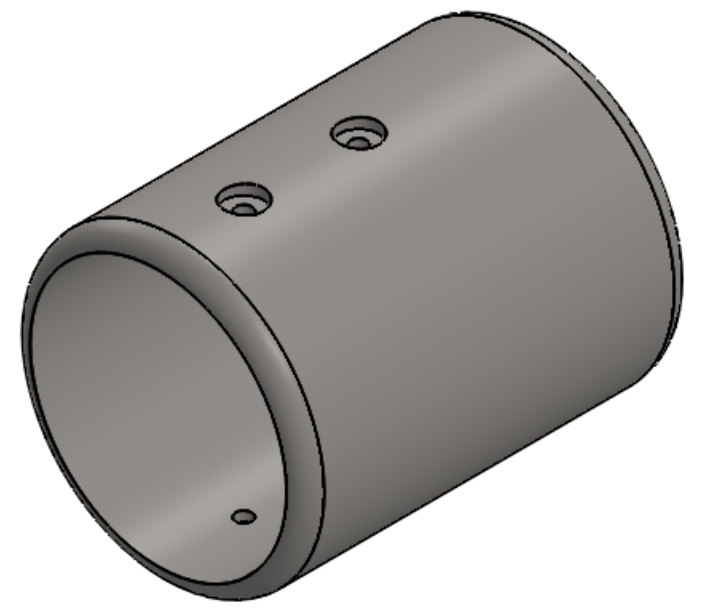
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| | |
|----------------------------------------------|----------------------------------|
| FIU FLORIDA INTERNATIONAL UNIVERSITY | |
| MATERIAL | BN CERAMIC GRADE XP |
| NAME | DATE |
| DRAWN | RAMONA V PEREZ 06/06/13 |
| CHECKED | RAMONA V PEREZ 06/07/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | REMOVE ALL BURRS AND SHARP EDGES |

| | | |
|-----------------------------------------|--------------------|--------------|
| TITLE: PROTON DETECTOR SHIELD | | |
| SIZE | DWG. NO. | REV |
| B | PD_22_Shell | |
| DATE: 06/12 | WEIGHT: 1.2kg | SHEET 1 OF 4 |

8 5 7 4 6 3 5 2 4 1 2 1

NOTES:
 1. ALL MACHINING TOLERANCES TO +/-0.2mm AND +/- 0Degree 30' EXCEPT WHERE SHOWN OTHERWISE.



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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|---------------|----------------|-----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.1 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| 10 OR LESS | OVER 10 TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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| | | | |
|----------------------------------------------|----------------|----------------------------------|--|
| MATERIAL | | BN CERAMIC GRADE XP | |
| NAME | | DATE | |
| DRAWN | RAMONA V PEREZ | 06/06/13 | |
| CHECKED | RAMONA V PEREZ | 06/07/13 | |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES | |

TITLE:
PROTON DETECTOR SHIELD

SIZE **B** DWG. NO. **PD_22_Shell** REV

SCALE: 1:2 WEIGHT: 1.2kg SHEET 2 OF 4

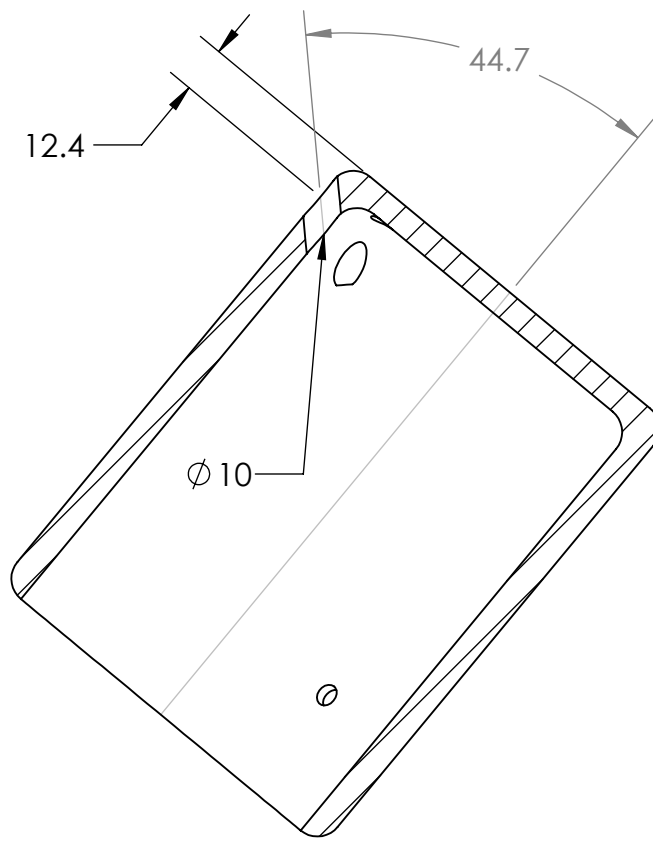
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D

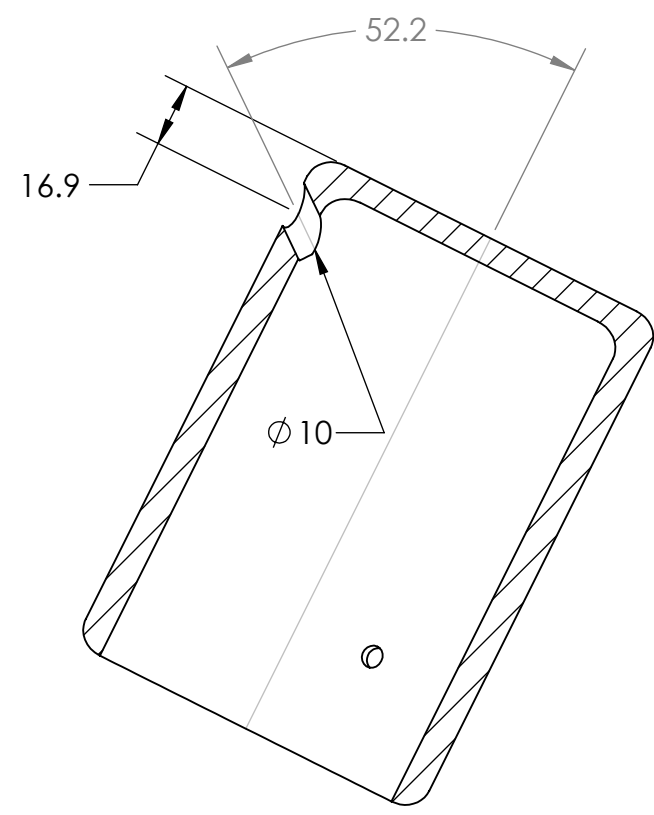
C

B

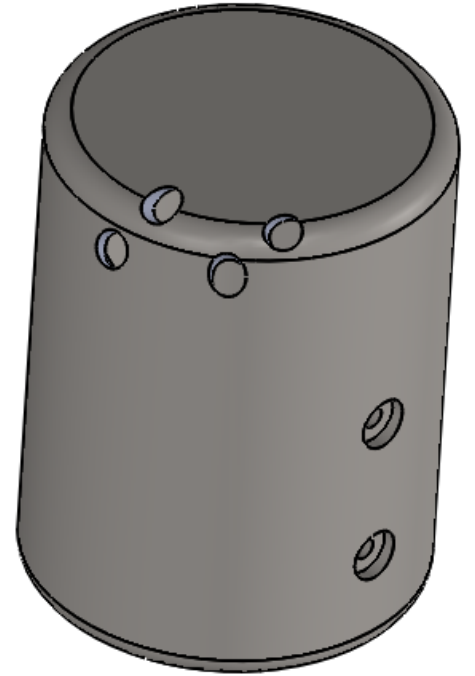
A



SECTION B-B



SECTION C-C

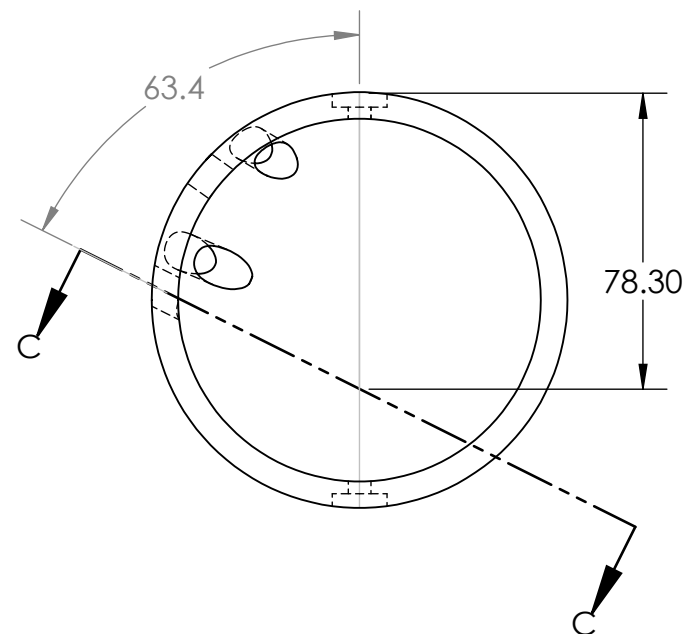
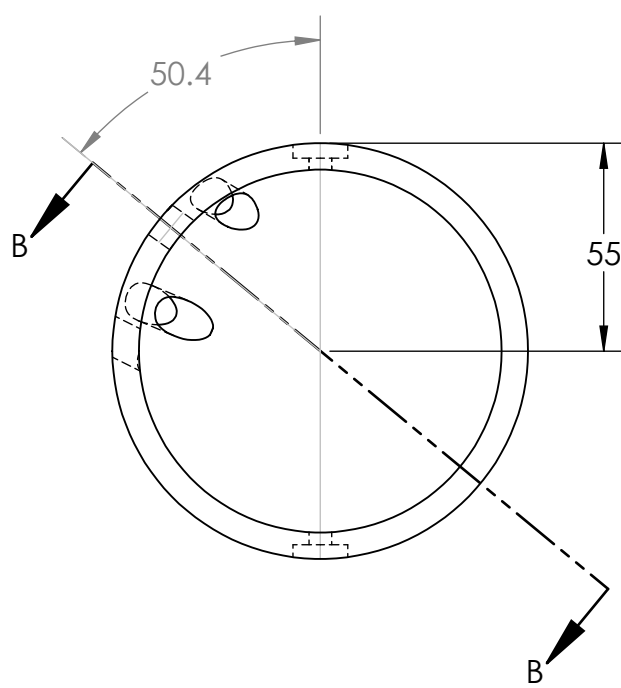


D

C

B

A



NOTES:
 1. ALL MACHINING TOLERANCES TO +/-0.2mm AND +/- 0Degree 30' EXCEPT WHERE SHOWN OTHERWISE.

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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|---------------|----------------|-----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.1 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| 10 OR LESS | OVER 10 TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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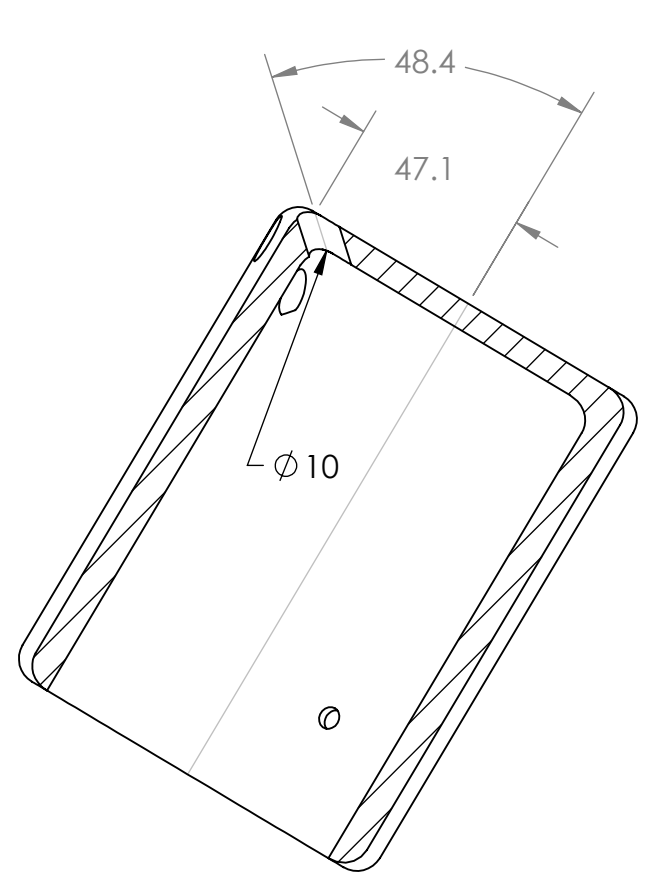
| | | | |
|----------------------------------------------|--|----------------------------------|----------|
| MATERIAL | | BN CERAMIC GRADE XP | |
| DRAWN | | RAMONA V PEREZ | 06/06/13 |
| CHECKED | | RAMONA V PEREZ | 06/07/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES | |

TITLE:
PROTON DETECTOR SHIELD

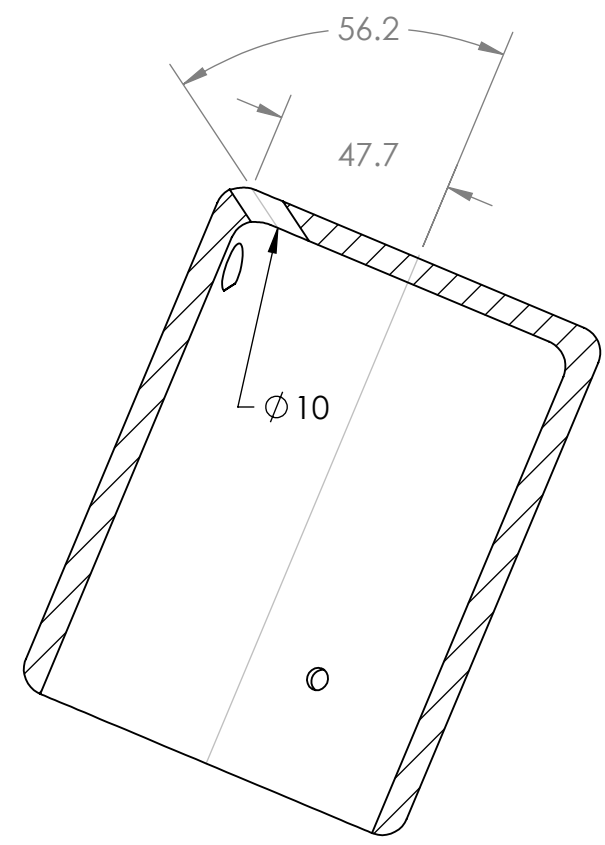
SIZE DWG. NO. REV
B PD_22_Shell

SCALE: 1:2 WEIGHT: 1.2kg SHEET 3 OF 4

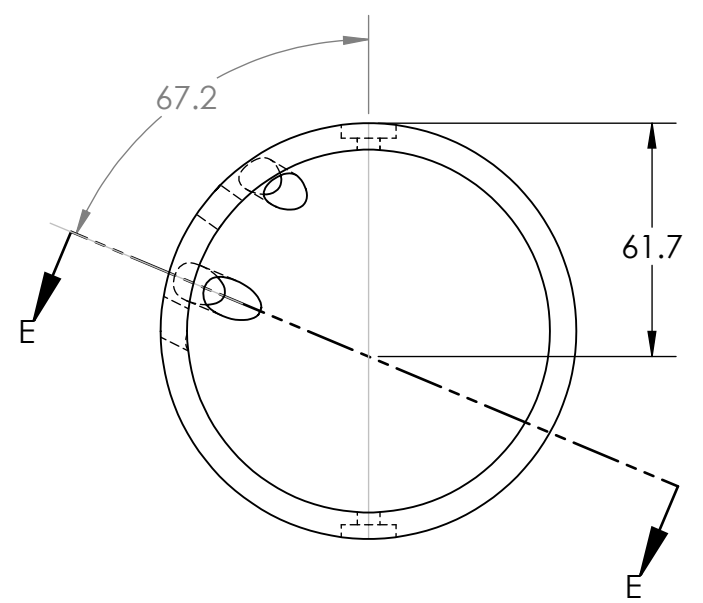
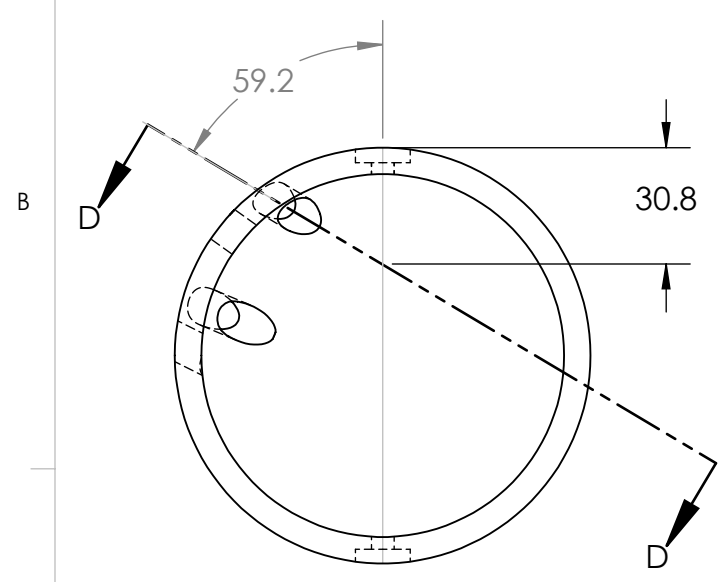
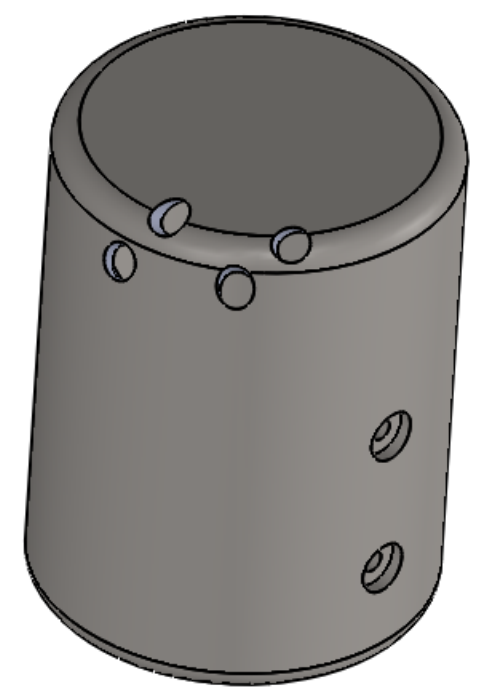
8 5 7 4 6 3 5 2 4 1 2 1



SECTION D-D



SECTION E-E



NOTES:
 1. ALL MACHINING TOLERANCES TO $\pm 0.2\text{mm}$ AND $\pm 0^\circ 30'$ EXCEPT WHERE SHOWN OTHERWISE.

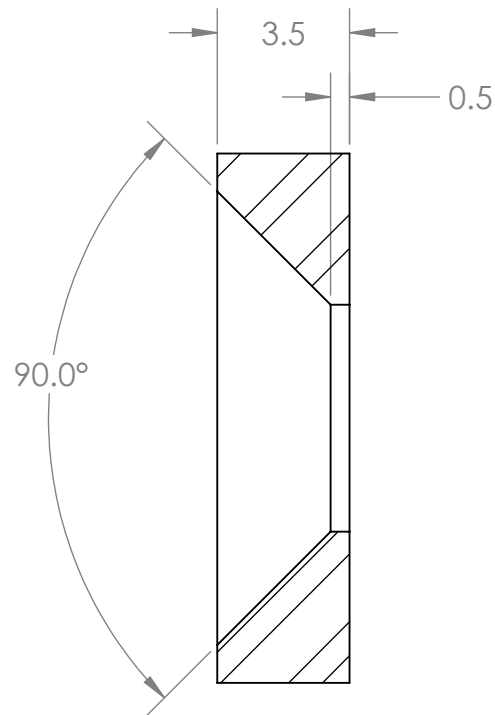
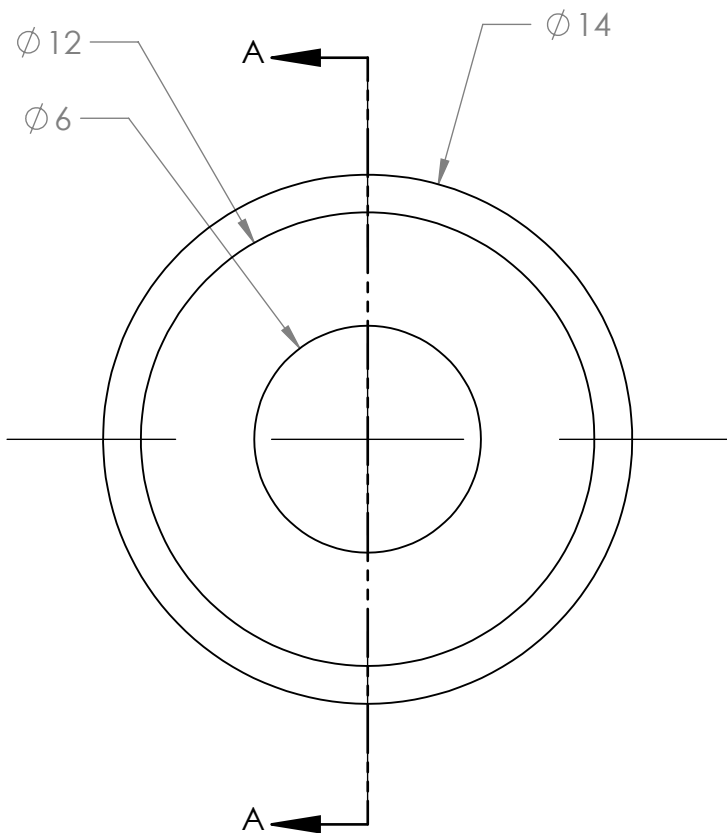
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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|-------------------|-------------------|-------------------|------------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| ± 0.1 | ± 0.1 | ± 0.2 | ± 0.3 | ± 0.5 | ± 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| 10 OR LESS | OVER 10 TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | |
| $\pm 1^\circ$ | $\pm 0^\circ 30'$ | $\pm 0^\circ 20'$ | $\pm 0^\circ 10'$ | $\pm 0^\circ 5'$ | |

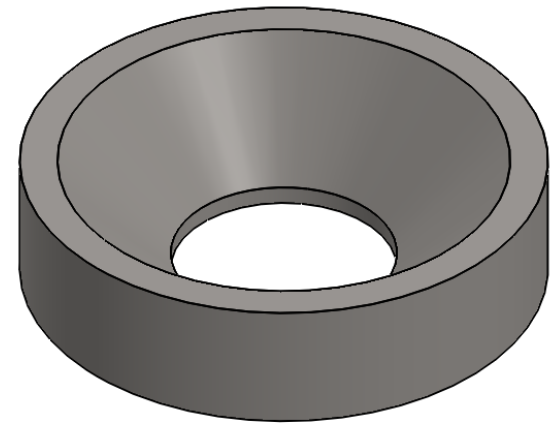
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| | |
|----------------------------------------------|----------------------------------|
| FIU FLORIDA INTERNATIONAL UNIVERSITY | |
| MATERIAL | BN CERAMIC GRADE XP |
| NAME | DATE |
| DRAWN | RAMONA V PEREZ 06/06/13 |
| CHECKED | RAMONA V PEREZ 06/07/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | REMOVE ALL BURRS AND SHARP EDGES |

| | | |
|-----------------------------------------|--------------------|--------------|
| TITLE: PROTON DETECTOR SHIELD | | |
| SIZE | DWG. NO. | REV |
| B | PD_22_Shell | |
| SCALE: 1:2 | WEIGHT: 1.2kg | SHEET 4 OF 4 |



SECTION A-A



NOTES:
 1. ALL MACHINING TOLERANCES TO +/-0.2mm EXCEPT WHERE SHOWN OTHERWISE.

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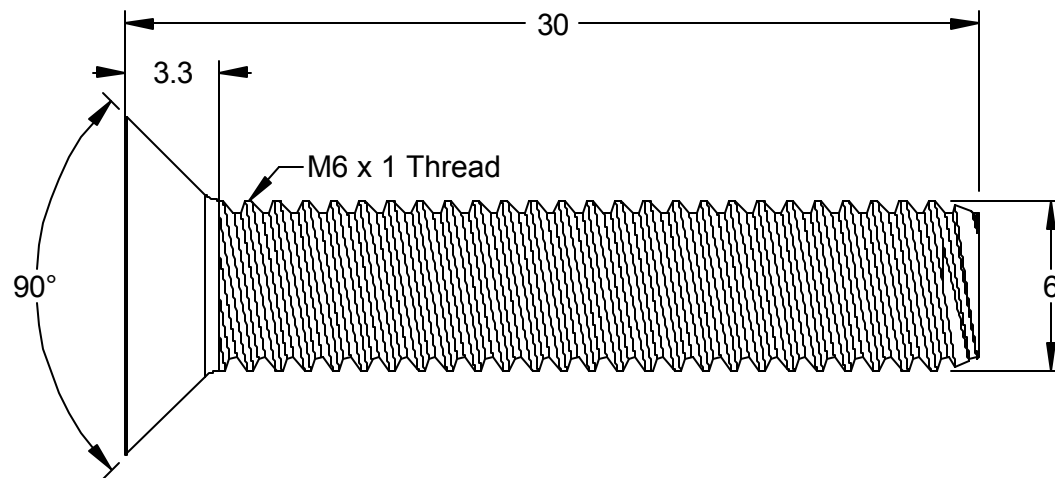
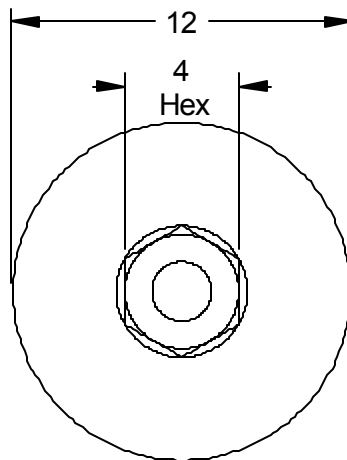
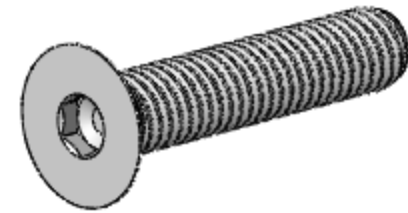
| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|-------------|--------------|----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.15 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| LESS THAN 50 | 50 TO 120 | 120 TO 400 | OVER 400 | | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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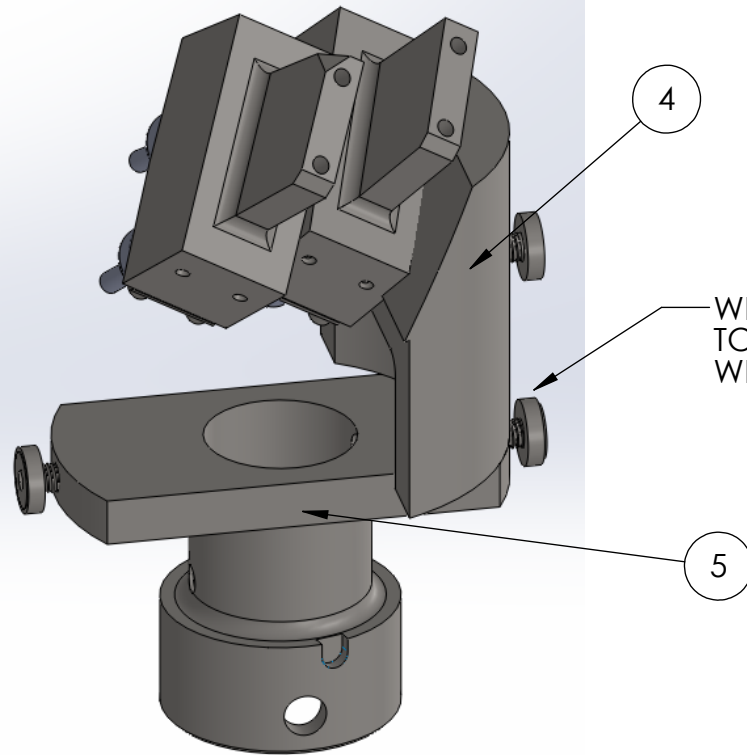


| | | |
|----------------------------------------------|----------------|----------------------------------|
| MATERIAL | | SS316 |
| NAME | | DATE |
| DRAWN | RAMONA V PEREZ | 05/01/13 |
| CHECKED | RAMONA V PEREZ | 06/19/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES |

| | | |
|-------------------------------------------------|---------------------------|--------------|
| TITLE: PROTON DETECTOR SHIELD BRACKET | | |
| SIZE A | DWG. NO. PD_22_Bracket | REV |
| SCALE: 5:1 | WEIGHT: .003KG | SHEET 1 OF 1 |



| | |
|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| McMASTER-CARR CAD | PART NUMBER 93395A366 |
| http://www.mcmaster.com (c) 2004 McMaster-Carr Supply Company | Type 316 Stainless Steel DIN 7991-A4 Flat Socket Head Cap Screw |
| Unless otherwise specified, dimensions are in millimeters. Information in this drawing is provided for reference only. | |



WELD PROTON DETECTOR CONNECTOR TO PROTON DETECTOR MAST CONNECTOR; WELD FOR ULTRA HIGH VACUUM

| PARTS LIST | | | |
|------------|--------------------------------|------------------|----------|
| ITEM NO. | TITLE | DWG. NO. | QUANTITY |
| 4 | PROTON DETECTOR CONNECTOR | PD_22_connector | 1 |
| 5 | PROTON DETECTOR MAST CONNECTOR | MAST_connector_1 | 1 |
| | | | |

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|------------------------------|-------------|--------------|----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.15 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |

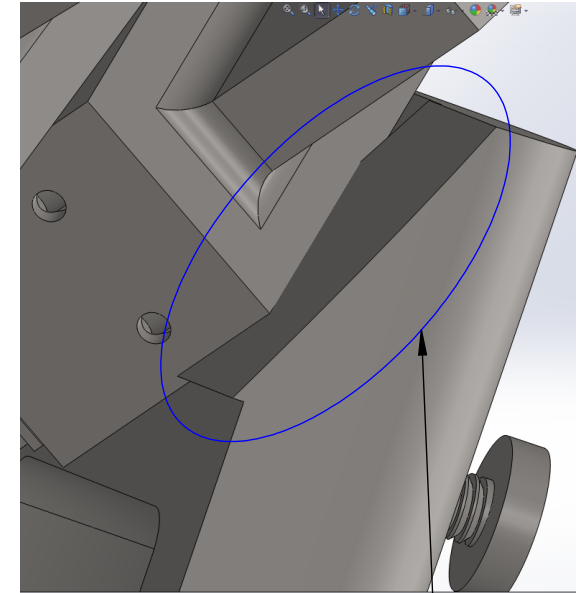
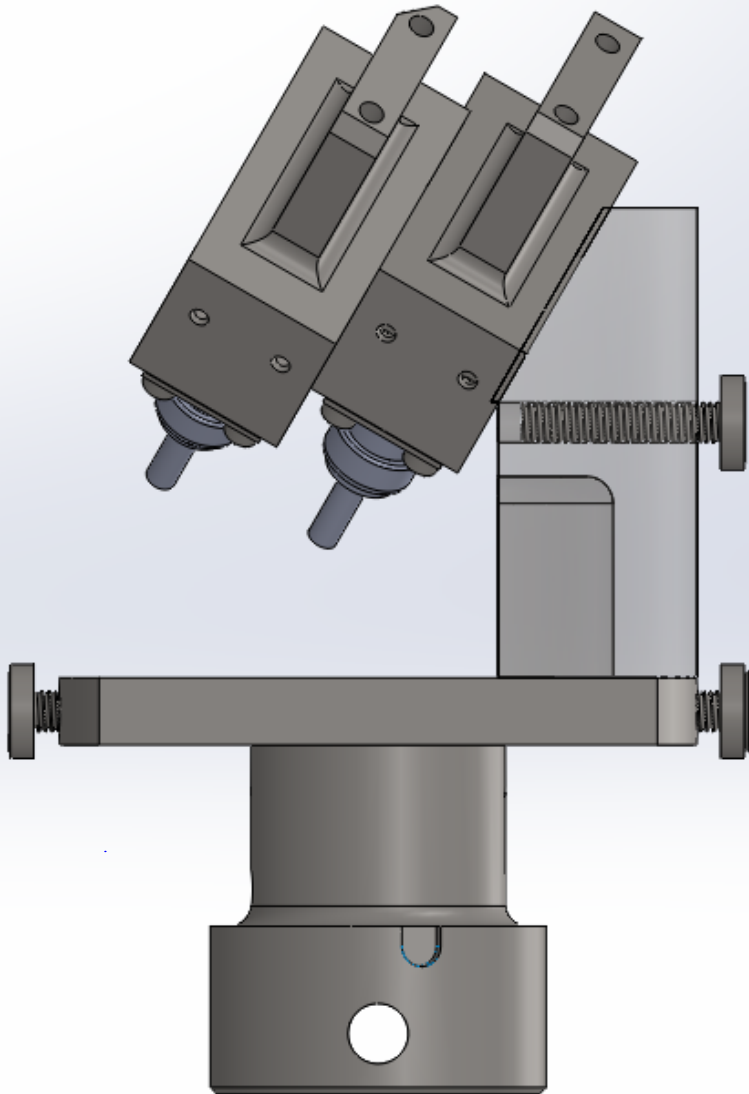
| TOLERANCES ANGULAR DIMENSIONS | | | | |
|-------------------------------|-----------|------------|-----------|----------|
| LESS THAN 50 | 50 TO 120 | 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' |

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| | | |
|----------------------------------------------|----------------|----------------------------------|
| MATERIAL | | SS316 |
| | NAME | DATE |
| DRAWN | RAMONA V PEREZ | 05/28/13 |
| CHECKED | RAMONA V PEREZ | 06/19/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES |

| | | |
|-------------------------------------|---------------------------|--------------|
| TITLE: | | |
| PROTON DETECTOR ASSEMBLED CONNECTOR | | |
| SIZE | DWG. NO. | REV |
| A | PD_22_connector_assembled | |
| | | SHEET 1 OF 2 |



NOTES:

1. WELD PROTON DETECTOR MODULE A TO PROTON DETECTOR CONNECTOR
2. WELD FOR ULTRA HIGH VACUUM
3. NOTE STEP ON CONNECTOR IS TO CORRECTLY POSITION PROTON DETECTOR MODULE A

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|--------------------------------|----------------------|-----------------------|------------------------|-----------------------|------------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.15 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| LESS OR EQUALLY TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 | | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

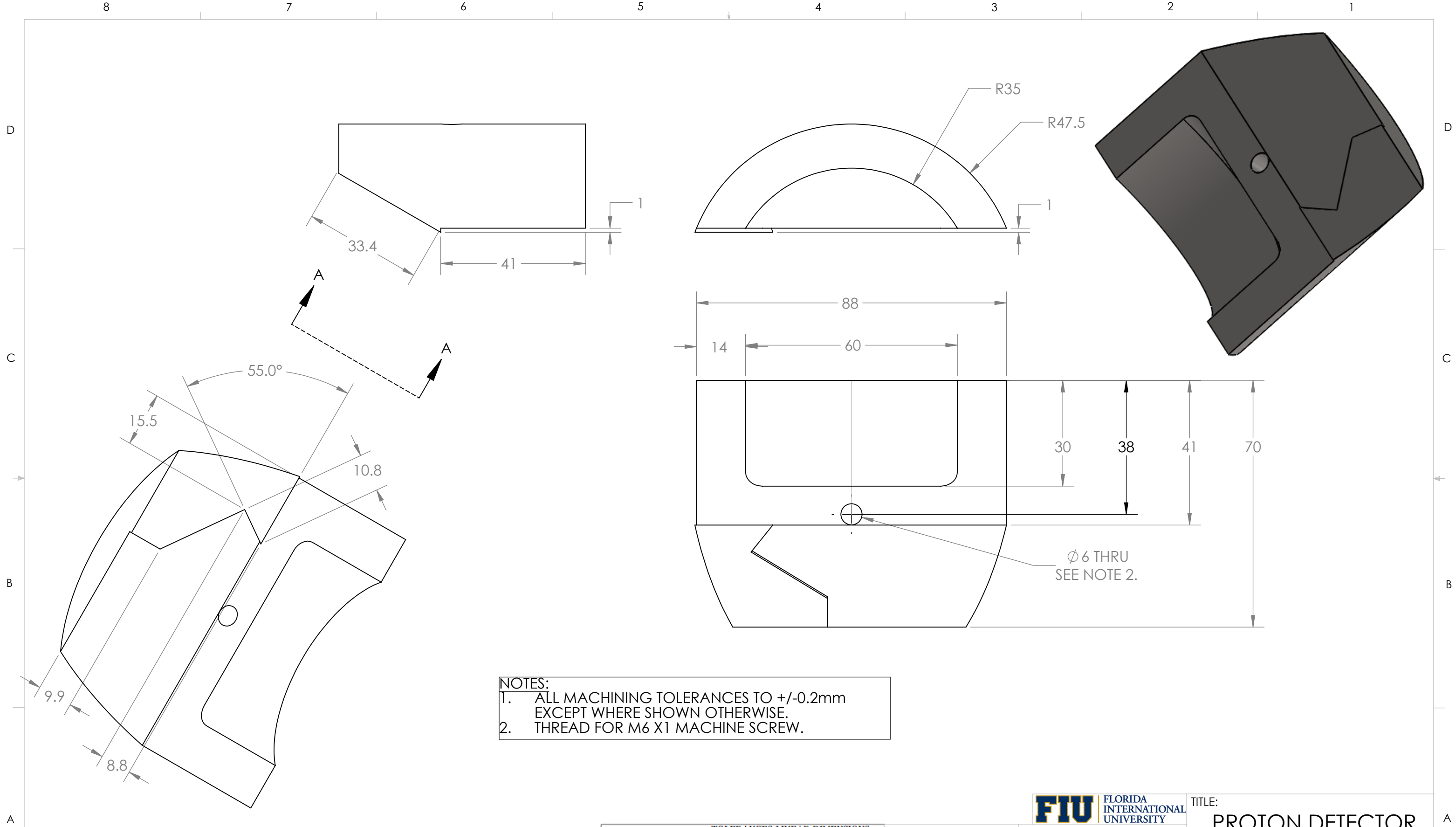
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DO NOT SCALE DRAWING



| | | |
|----------------------------------------------|----------------|----------------------------------|
| MATERIAL | | SS316 |
| | NAME | DATE |
| DRAWN | RAMONA V PEREZ | 06/13/13 |
| CHECKED | RAMONA V PEREZ | 06/19/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES |

| | | |
|-------------------------------------|---------------------------|--------------|
| TITLE: | | |
| PROTON DETECTOR ASSEMBLED CONNECTOR | | |
| SIZE | DWG. NO. | REV |
| A | PD_22_connector_assembled | |
| | | SHEET 2 OF 2 |



NOTES:
 1. ALL MACHINING TOLERANCES TO +/-0.2mm EXCEPT WHERE SHOWN OTHERWISE.
 2. THREAD FOR M6 X1 MACHINE SCREW.

VIEW A-A
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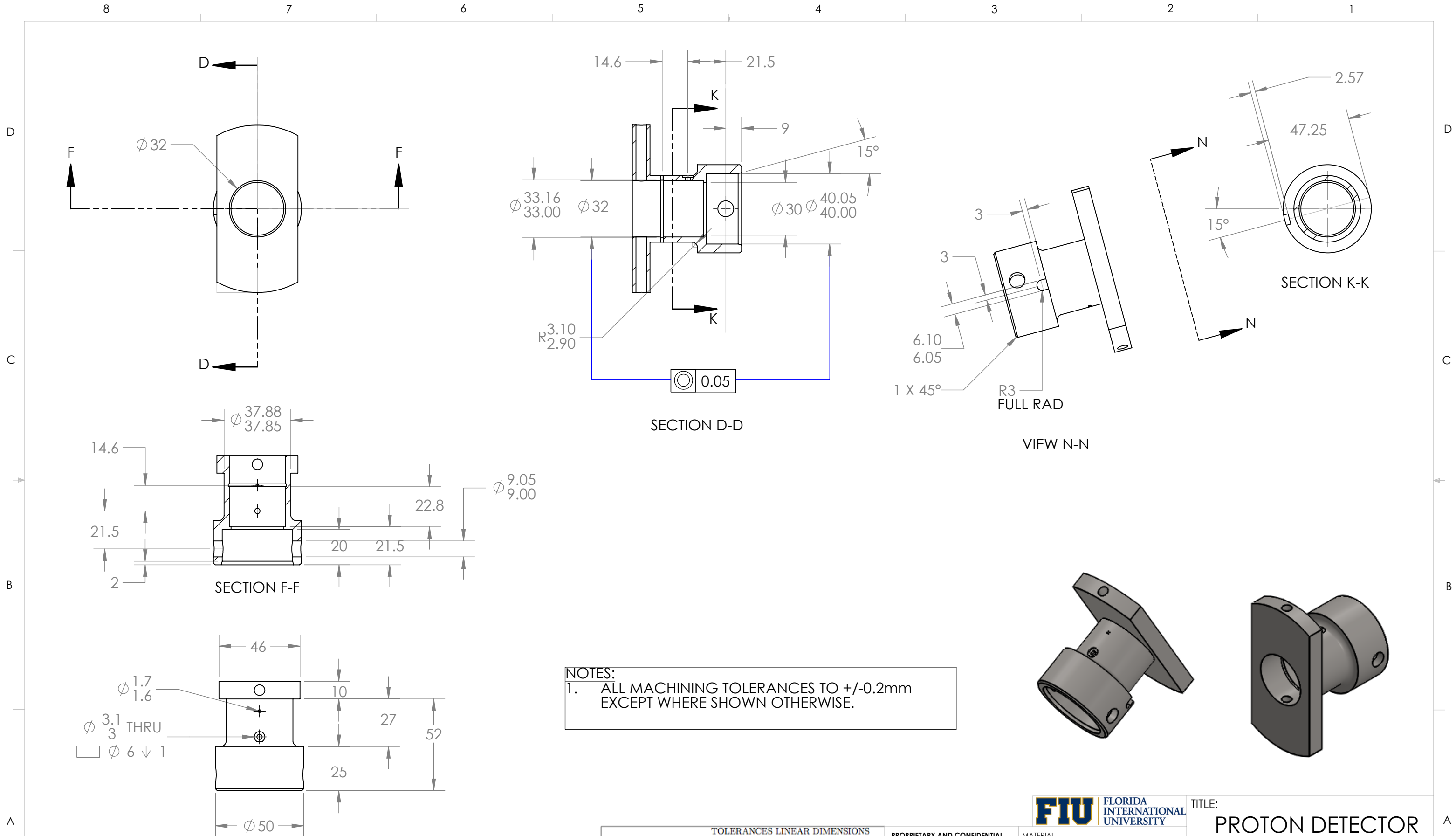
| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|---------------|----------------|-----------------|-----------------|------------------|
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| +/- 0.1 | +/- 0.1 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| 10 OR LESS | OVER 10 TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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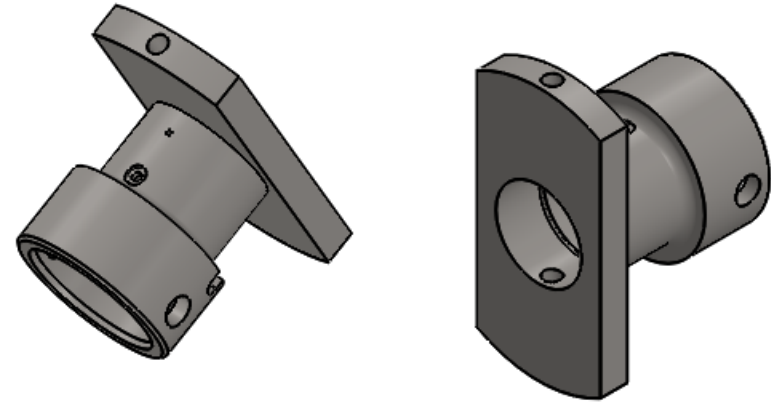
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|----------------------------------------------|----------------------------------|
| FIU FLORIDA INTERNATIONAL UNIVERSITY | |
| MATERIAL | SS316 |
| NAME | DATE |
| DRAWN | RAMONA V PEREZ 06/13/13 |
| CHECKED | RAMONA V PEREZ 06/19/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | REMOVE ALL BURRS AND SHARP EDGES |

| | | |
|--------------------------------------------|-----------------------------|--------------|
| TITLE: PROTON DETECTOR CONNECTOR | | |
| SIZE B | DWG. NO. PD_22_connector | REV |
| SCALE: 1:1 | WEIGHT: .72kg | SHEET 1 OF 1 |

DO NOT SCALE DRAWING



NOTES:
 1. ALL MACHINING TOLERANCES TO +/-0.2mm EXCEPT WHERE SHOWN OTHERWISE.



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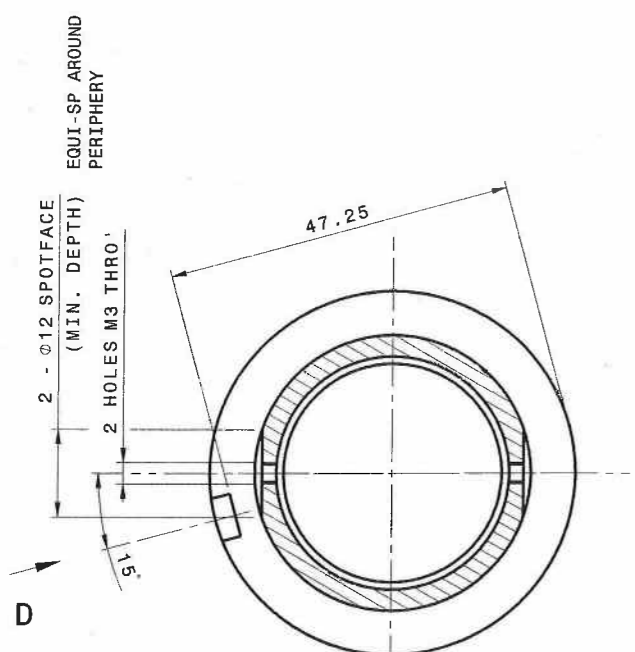
| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|---------------|----------------|-----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.1 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| 10 OR LESS | OVER 10 TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

PROPRIETARY AND CONFIDENTIAL
 REFER TO UNITED KINGDOM ATOMIC ENERGY AUTHORITY CULHAM CENTRE FOR FUSION ENERGY DWG M1150123 ISSUE C. DWG PROPERTIES USED TO COMPLY WITH MAST RECIPROCATING PROBE INSTALLATION OF PROTON DETECTOR.

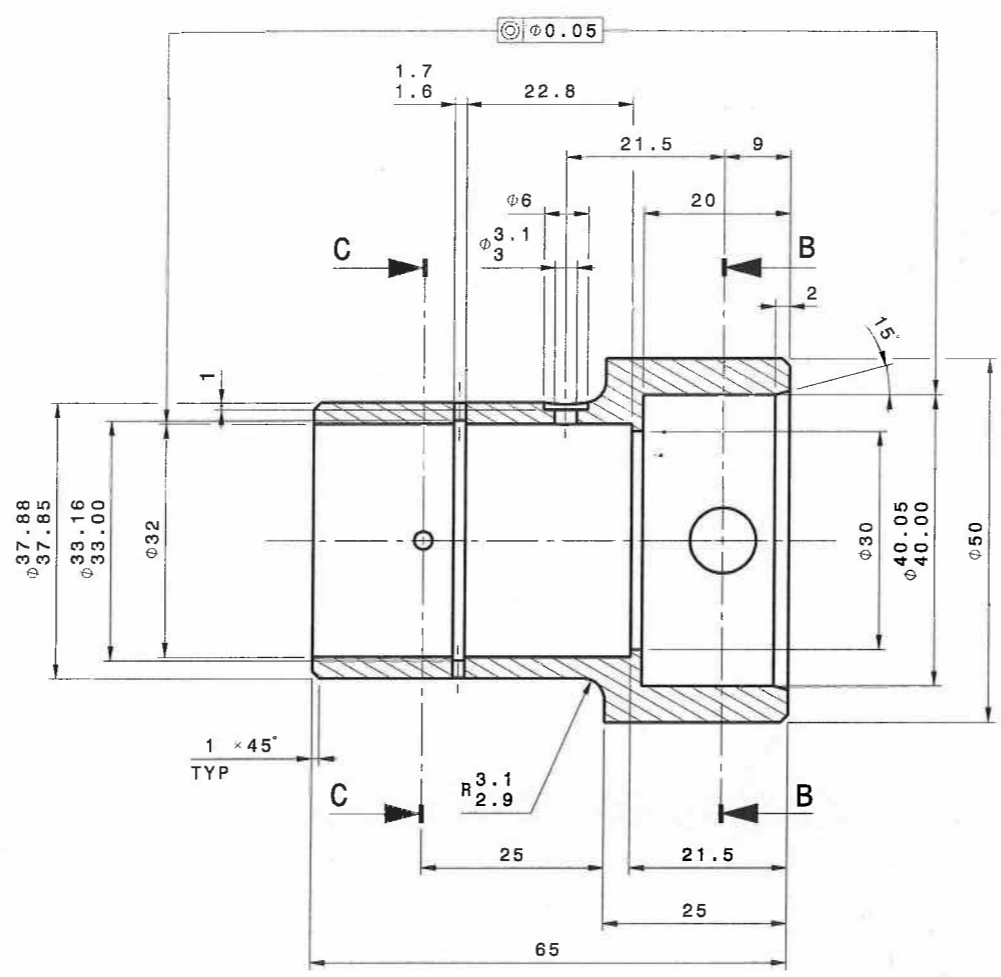
| | | |
|----------------------------------------------|----------------|----------------------------------|
| MATERIAL | | SS316 |
| NAME | | DATE |
| DRAWN | RAMONA V PEREZ | 05/27/13 |
| CHECKED | RAMONA V PEREZ | |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES |

| | | |
|-------------------------------------------------|------------------------------|--------------|
| TITLE: PROTON DETECTOR MAST CONNECTOR | | |
| SIZE B | DWG. NO. MAST_connector_1 | REV |
| SCALE: 1:2 | WEIGHT: 0.49kg | SHEET 1 OF 1 |

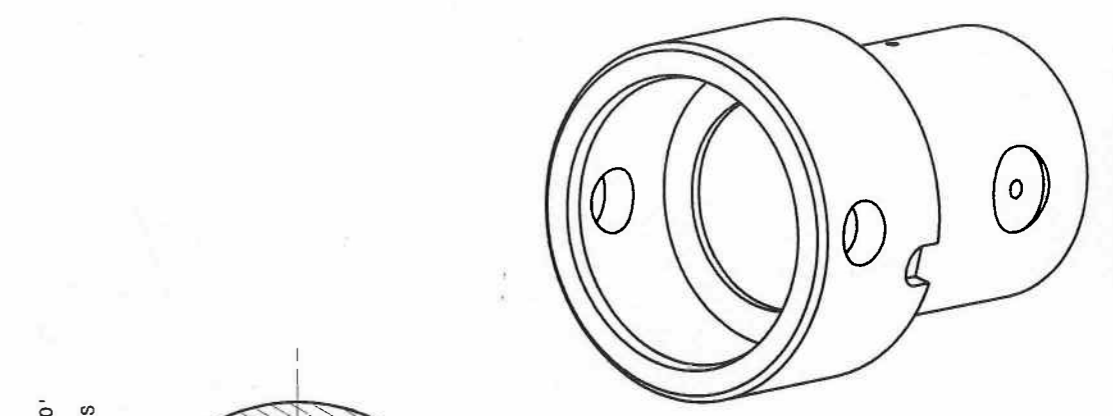
THIRD ANGLE PROJECTION - DO NOT SCALE - IF IN DOUBT ASK



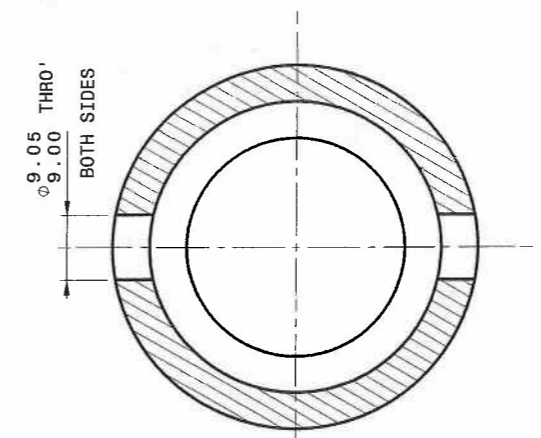
SECTION C - C



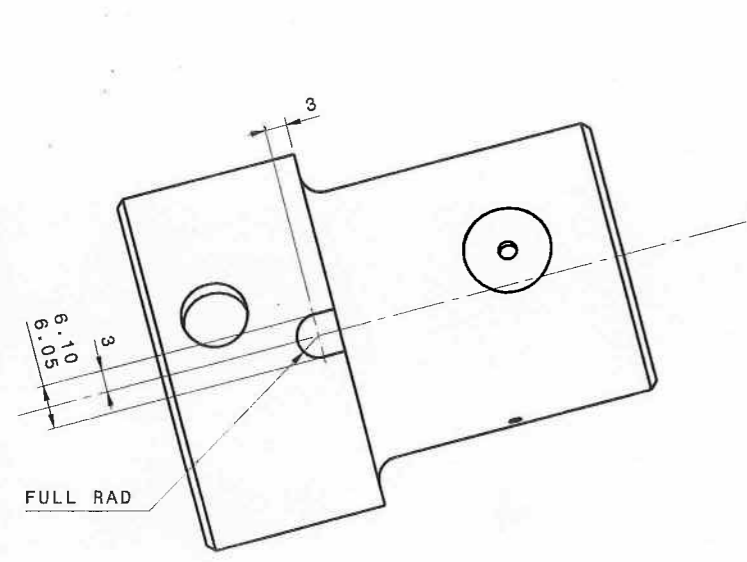
SECTION A - A



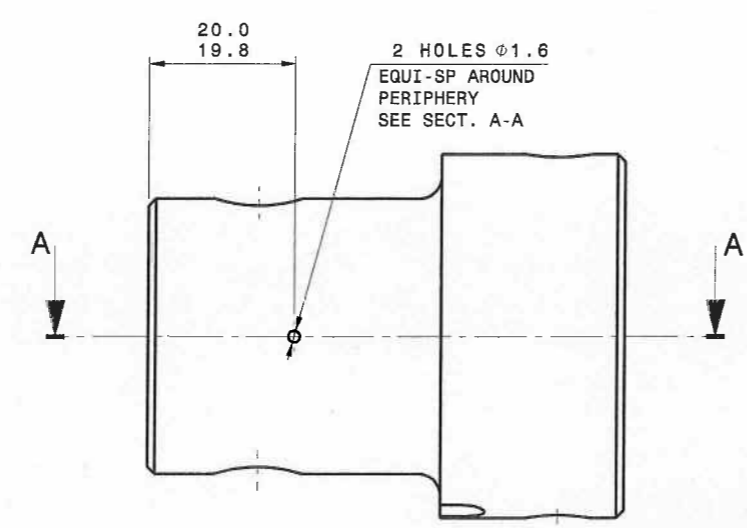
ISOMETRIC VIEW



SECTION B - B



VIEW ON ARROW D

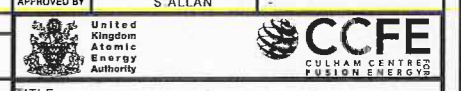


FOR MANUFACTURE

NOTES:-

- UNLESS OTHERWISE STATED THE FOLLOWING APPLIES.
- 1. ALL MACHINING TOLERANCES TO $\pm 0.2\text{mm}$ EXCEPT WHERE SHOWN OTHERWISE
- 2. ALL THREADS ARE METRIC COARSE SERIES 6H/6g (RIGHT HAND)
- 3. ALL CUT OR MACHINED SHARP EDGES TO BE DE-BURRED

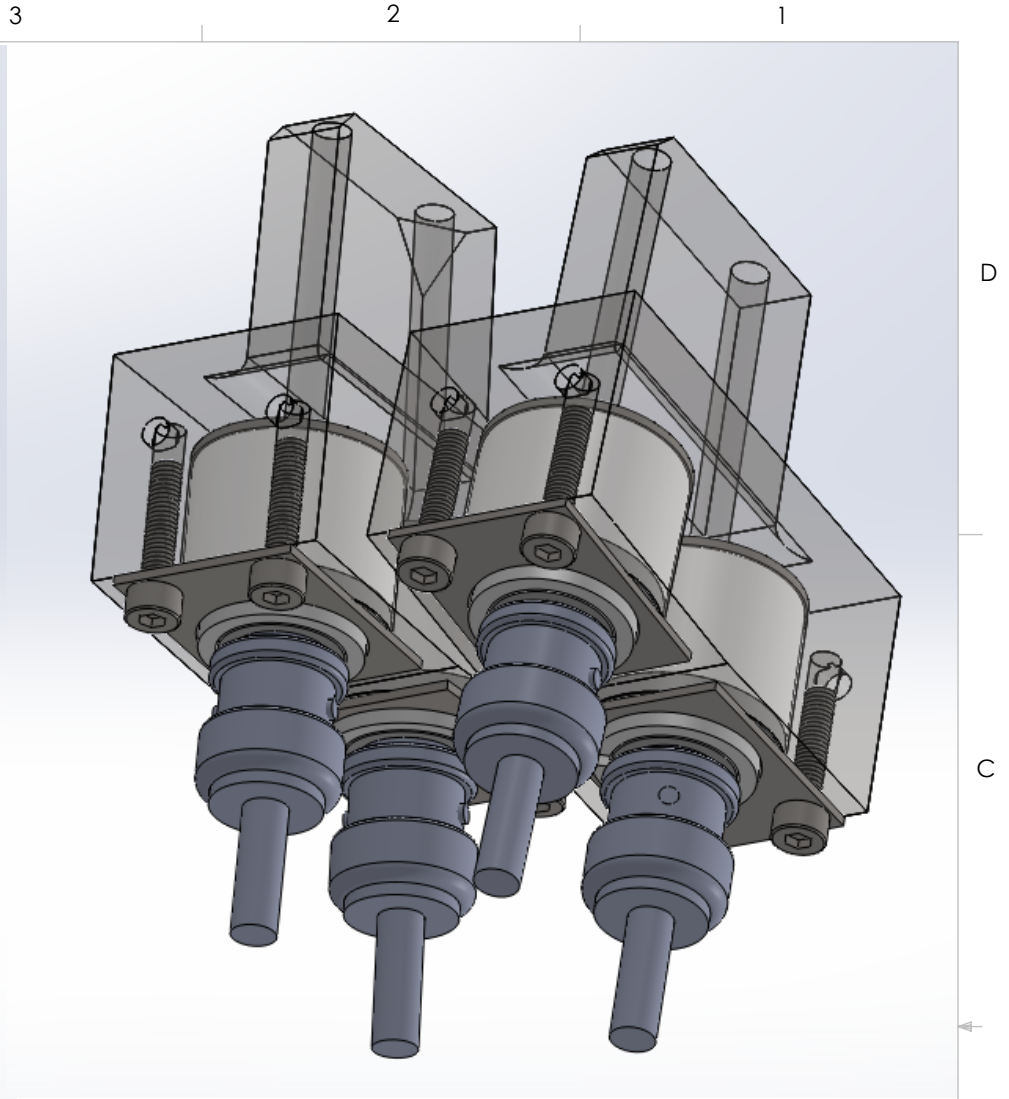
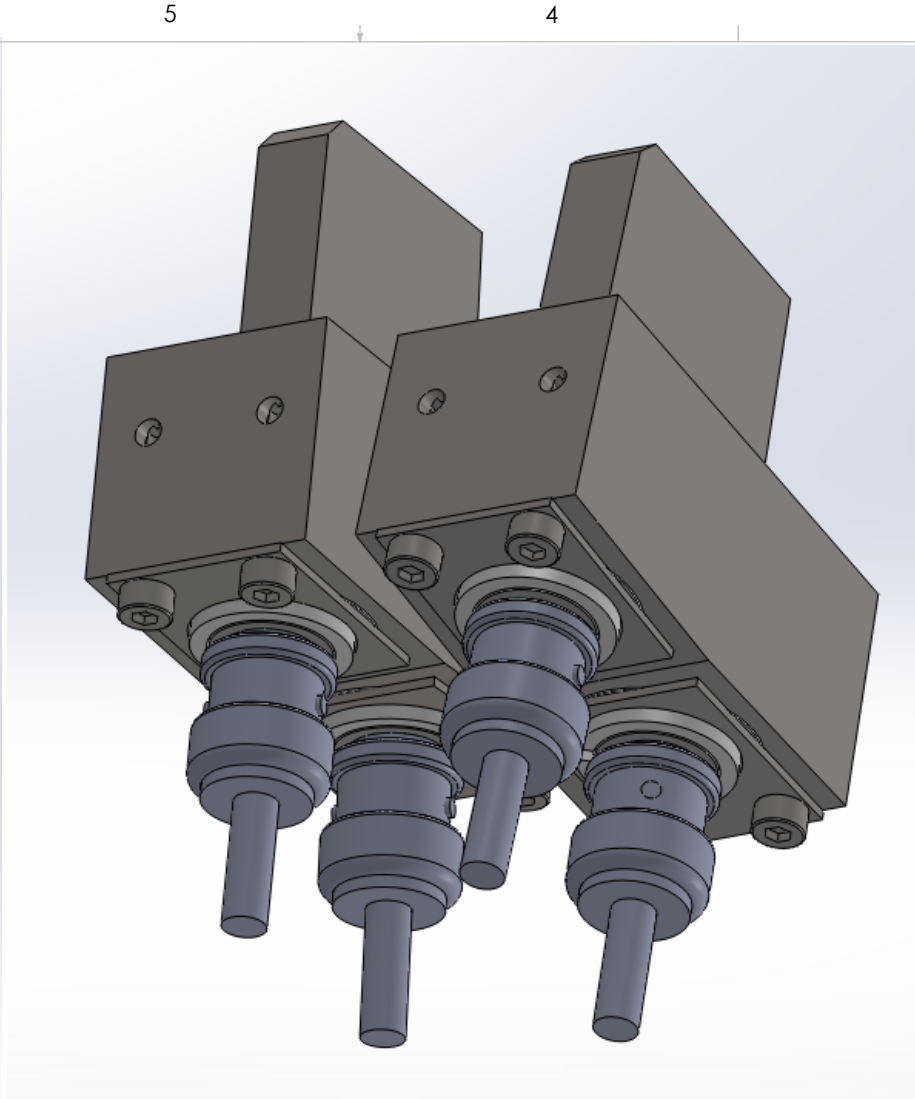
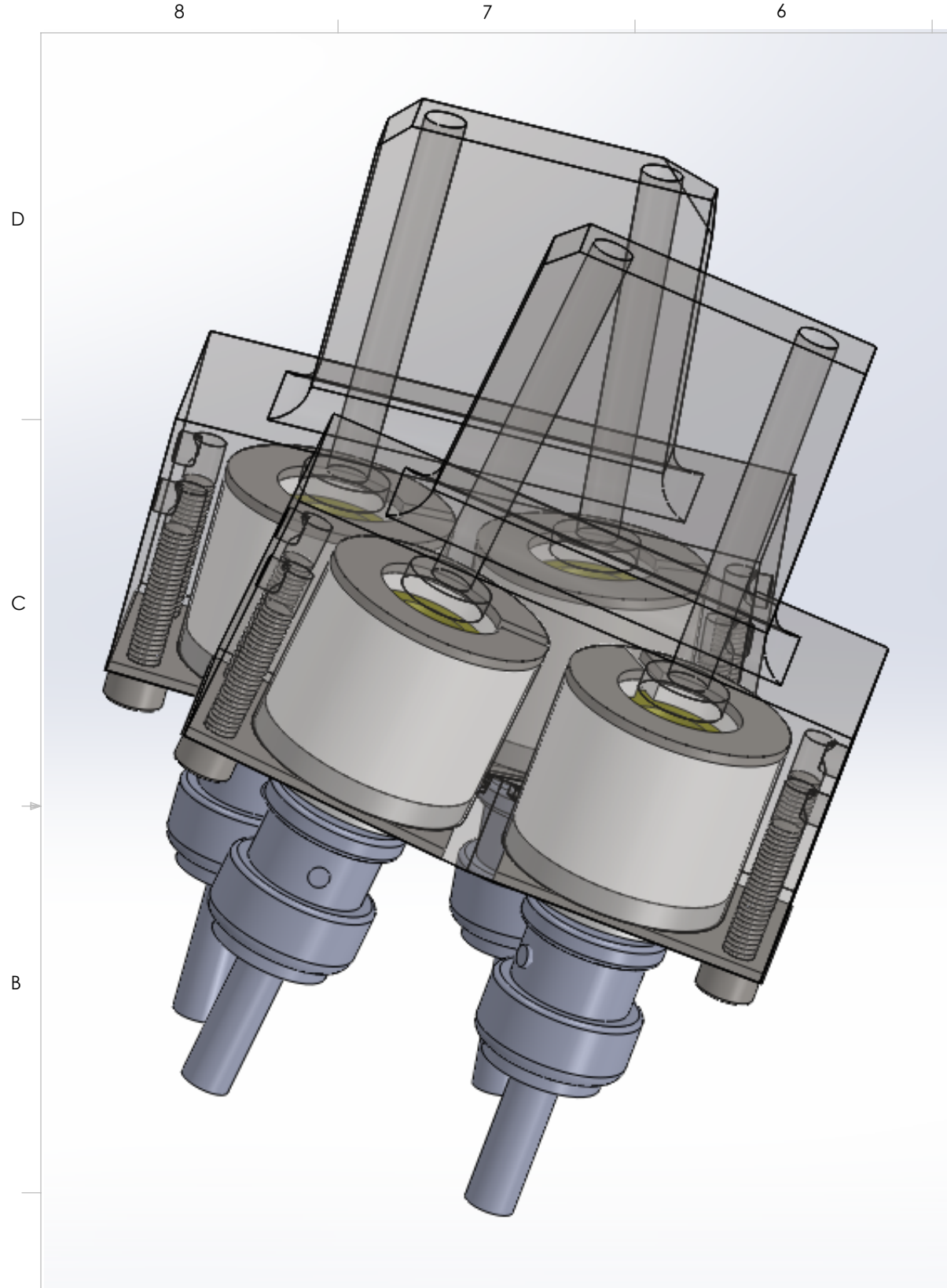
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|--------------------------------------|--|--|--|-------------------------------|--|--|--|-----------------------------------------|--|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|-------------|--|------------|--|----------------------------------|--|-----------|--|------------------|--|--------|--|--------------------------|--|----|--|
| CAD DRAWN NOT TO BE MODIFIED BY HAND | | | | MATERIAL AND SPECIFICATION | | | | DIMENSIONS IN MILLIMETERS UNLESS STATED | | | | TECHNICAL CLASSIFICATIONS (FOR INTERNAL USE ONLY) | | | | DRAWN BY | | P.R.JONES | | SUBJECT TO WORK PROCEDURE | | | | | | | | | | | |
| | | | | ST. STEEL 316 | | | | GENERAL TOLERANCING IS TO 2768-1 & -2 | | | | R/H RAD. VAC. TRIT | | | | CHECKED BY | | S.BAILEY | | WELD ENG | | | | | | | | | | | |
| | | | | SURFACE TEXTURE UNLESS STATED | | | | PERMISSIBLE DEVIATIONS FOR LINEAR DIMS | | | | QUALITY CLASS | | | | APPROVED BY | | S ALLAN | | | | | | | | | | | | | |
| | | | | N7 | | | | PERMISSIBLE DEVIATIONS FOR ANGULAR DIMS | | | | THIS DRAWING IS THE PROPERTY OF CCFE AND MAY NOT WITHOUT THE PRIOR CONSENT OF CCFE BE COPIED IN WHOLE OR IN PART OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS SUPPLIED | | | | DRG No | | M 11501213 | | CURRENT ISSUE | | | | | | | | | | | |
| C 310712 SEE MOD. SHEET M115/09 | | | | IF NW RG DDI.73 | | | | SURFACE TREATMENT | | | | USED ON/REF DRAWING | | | | D O REF | | 50 | | ORIGINAL SCALE | | 2:1 | | FIRST ISSUE DATE | | 010310 | | SHEET No 01 OF 01 SHEETS | | A1 | |
| B 211010 SEE MOD. SHEET M115/05 | | | | IF NW RG DDI.61 | | | | CLEAN | | | | M11501282 | | | | WEIGHT | | 0.26kg | | REMOVE ALL BURRS AND SHARP EDGES | | SMARTTEAM | | | | | | | | | |



TITLE
PROBE PLUG HOUSING

DRG No
M 11501213

CURRENT ISSUE
C



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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|---------------|----------------|-----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.1 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| 10 OR LESS | OVER 10 TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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DO NOT SCALE DRAWING



MATERIAL SS316, PEEK 1000

NAME DATE

DRAWN RAMONA V PEREZ 06/13/13

CHECKED RAMONA V PEREZ 06/19/13

UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM

REMOVE ALL BURRS AND SHARP EDGES

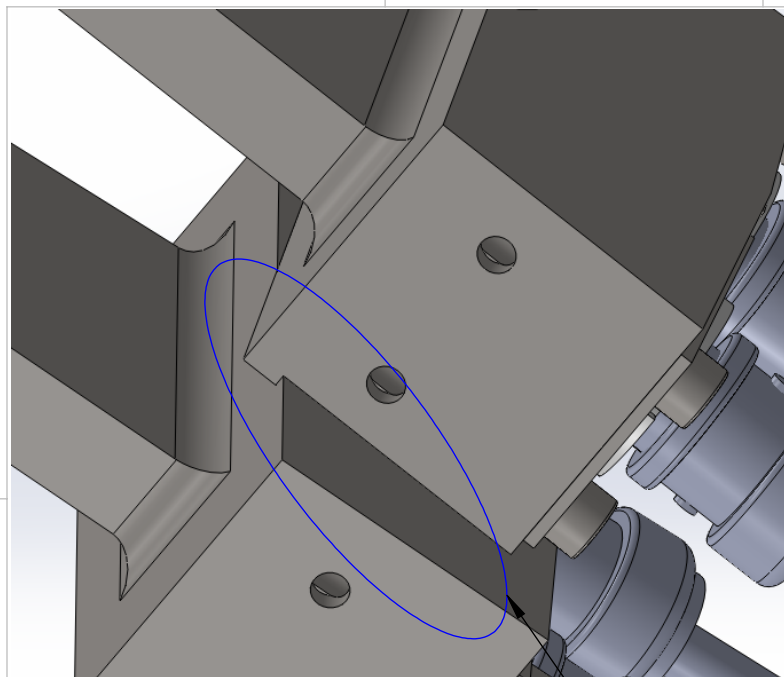
TITLE:
**PROTON DETECTOR
ASSEMBLED MODULE**

SIZE **B** DWG. NO. PD_22_Module_assembled REV

SHEET 1 OF 2

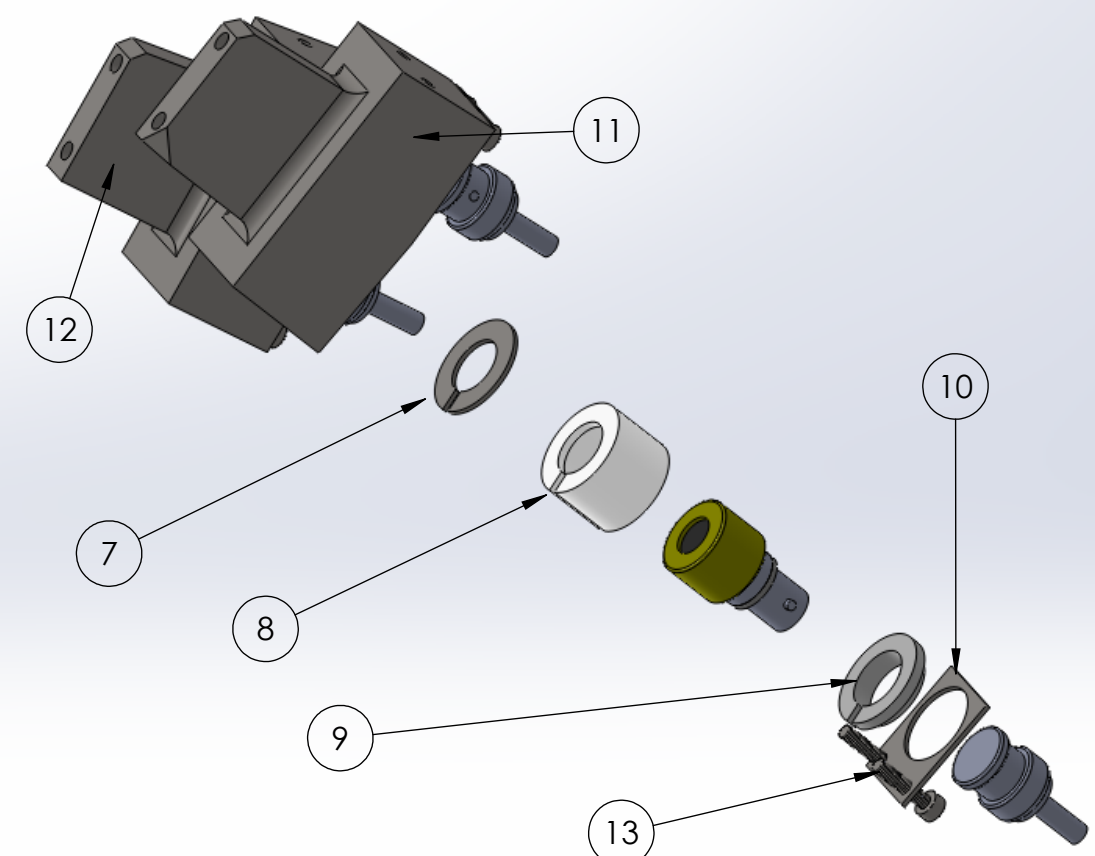
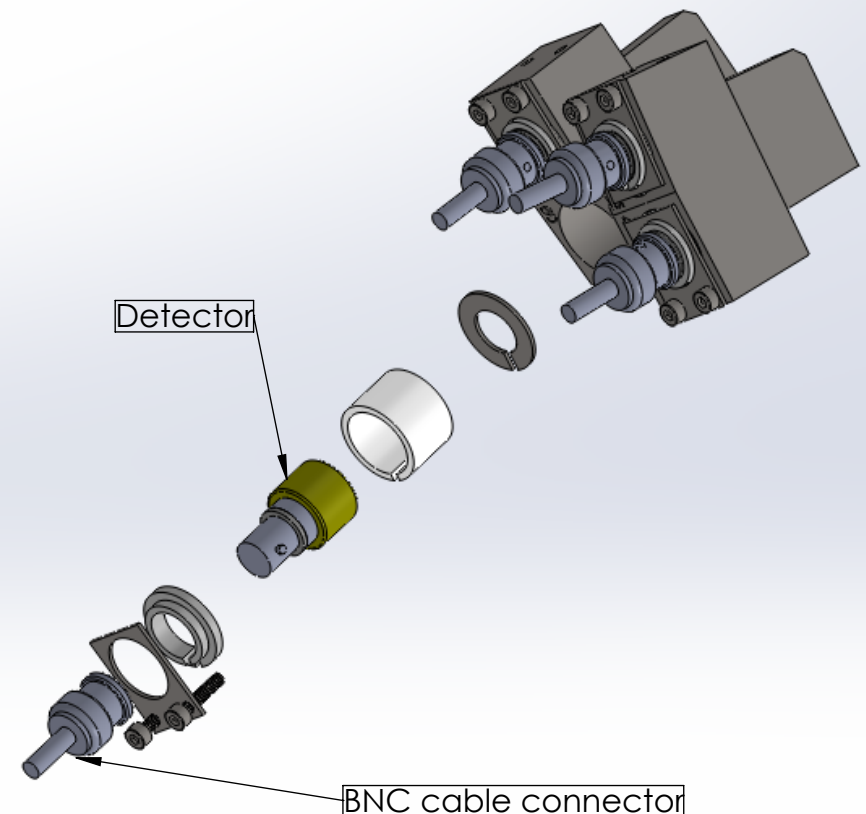
8 7 6 5 4 3 2 1

8 5 7 4 6 3 5 2 4 1 2 1



NOTES:

1. WELD PROTON DETECTOR MODULE B TO PROTON DETECTOR MODULE A
2. WELD FOR ULTRA HIGH VACUUM
3. NOTE STEP ON PROTON MODULE A TO CORRECTLY POSITION PROTON DETECTOR MODULE B



| PARTS LIST | | | |
|------------|-----------------------------|-------------------|----------|
| ITEM | TITLE | DWG. NO. | QUANTITY |
| 6 | NO ITEM 6 | N/A | N/A |
| 7 | PROTON DETECTOR WASHER | PD_22_Washer | 4 |
| 8 | PROTON DETECTOR PEEK SLEEVE | PD_22_Peek_sleeve | 4 |
| 9 | PROTON DETECTOR PEEK BOTTOM | PD_22_Peek_bottom | 4 |
| 10 | PROTON DETECTOR MODULE BASE | PD_22_base | 4 |
| 11 | PROTON DETECTOR MODULE A | PD_22_b | 1 |
| 12 | PROTON DETECTOR MODULE B | PD_22_a | 1 |
| 13 | McMaster-Carr PN#92290A118 | | 8 |

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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|---------------|----------------|-----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.1 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| 10 OR LESS | OVER 10 TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

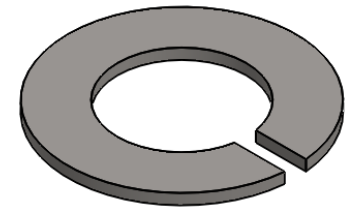
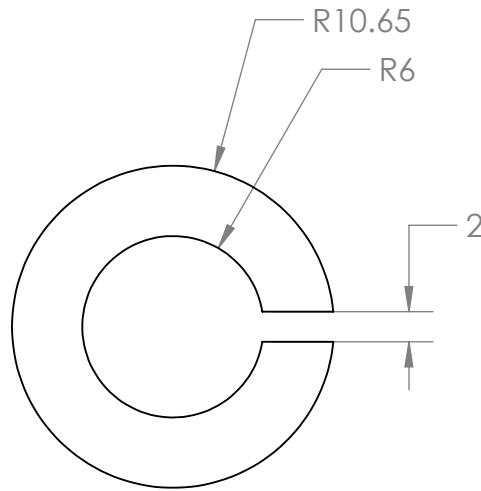
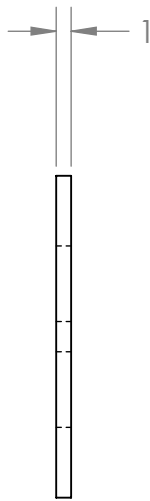
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| | | |
|----------------------------------------------|----------------|----------------------------------|
| MATERIAL | | SS316, PEEK 1000 |
| NAME | | DATE |
| DRAWN | RAMONA V PEREZ | 06/13/13 |
| CHECKED | RAMONA V PEREZ | 06/19/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES |

TITLE:
PROTON DETECTOR ASSEMBLED MODULE

| | | |
|----------|------------------------|-----|
| SIZE | DWG. NO. | REV |
| B | PD_22_Module_assembled | |



NOTES:
 1. ALL MACHINING TOLERANCES TO +/-0.2mm EXCEPT WHERE SHOWN OTHERWISE.

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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|------------------------------|-------------|--------------|----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.15 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |

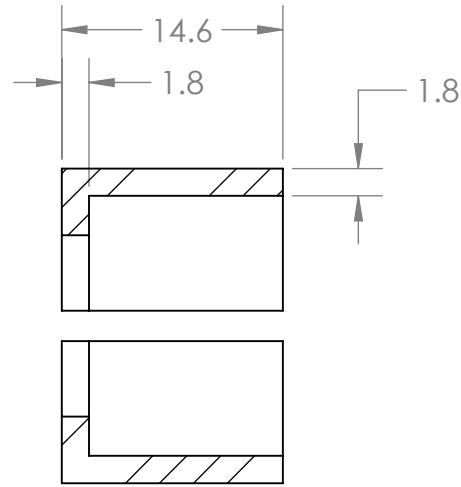
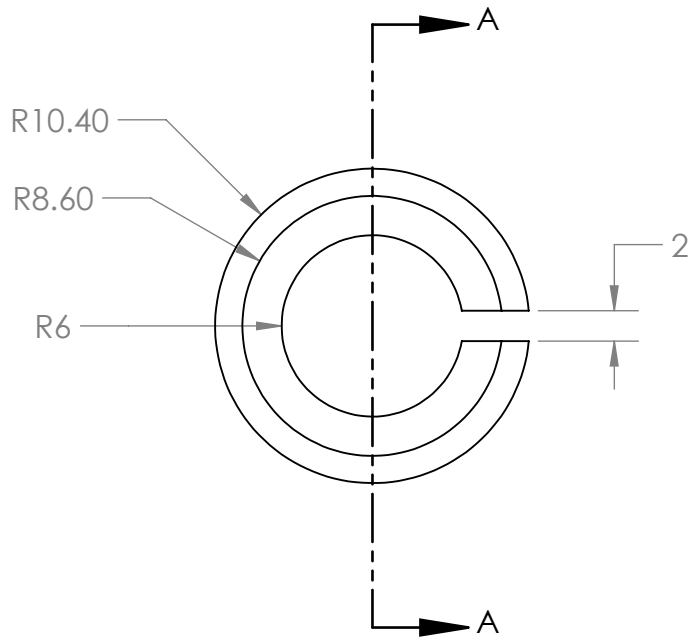
| TOLERANCES ANGULAR DIMENSIONS | | | | |
|-------------------------------|-----------|-----------|-----------|------------|
| LESS THAN 10 | 10 TO 30 | 30 TO 60 | 60 TO 120 | 120 TO 400 |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' |

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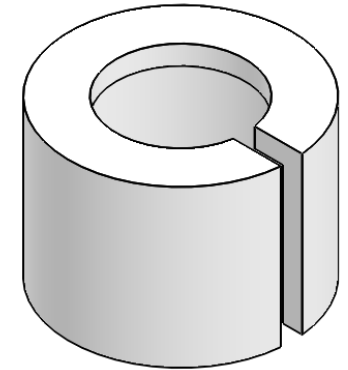
DO NOT SCALE DRAWING

| | | |
|----------------------------------------------|-----------------------------------------|---------------|
| FIU | FLORIDA INTERNATIONAL UNIVERSITY | |
| | MATERIAL | SS316 |
| DRAWN | RAMONA V PEREZ | DATE 06/13/13 |
| CHECKED | RAMONA V PEREZ | DATE 06/14/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | REMOVE ALL BURRS AND SHARP EDGES | |

| | | |
|-----------------------------------------|--------------------------|--------------|
| TITLE: PROTON DETECTOR WASHER | | |
| SIZE A | DWG. NO. PD_22_Washer | REV 1 |
| SCALE: 2:1 | WEIGHT:0.002kg | SHEET 1 OF 1 |



SECTION A-A



NOTES:
 1. ALL MACHINING TOLERANCES TO +/-0.2mm EXCEPT WHERE SHOWN OTHERWISE.

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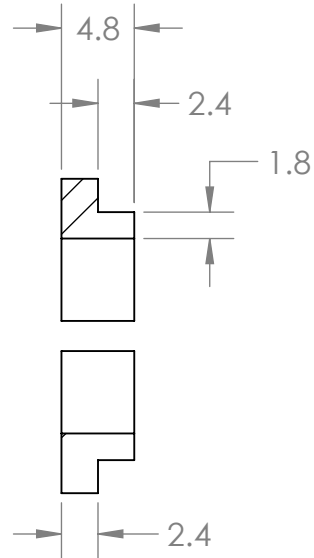
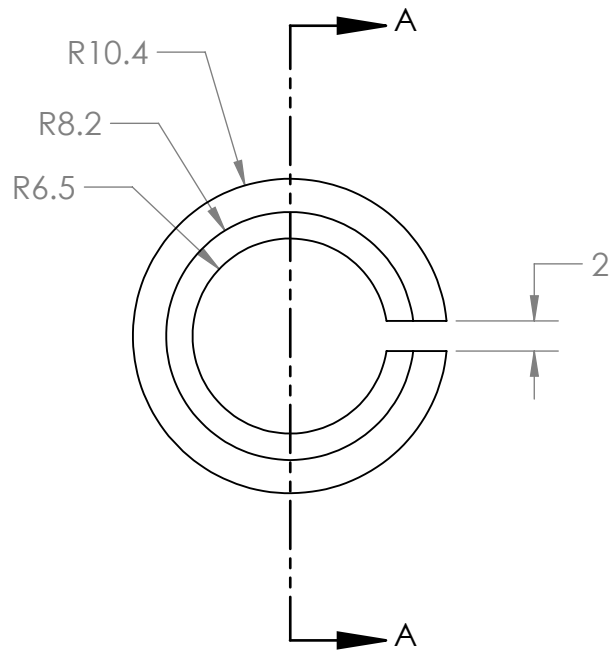
| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|-------------|--------------|-----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.15 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| LESS THAN 90° | 90° TO 120° | 120° TO 180° | OVER 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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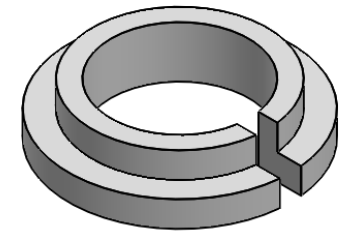


| | | | |
|----------------------------------------------|--|----------------------------------|----------|
| MATERIAL | | PEEK 1000 | |
| DRAWN | | NAME | DATE |
| CHECKED | | RAMONA V PEREZ | 06/14/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES | |

| | | |
|--------------------------------------------------|-------------------------------|--------------|
| TITLE: PROTON DETECTOR PEEK SLEEVE | | |
| SIZE A | DWG. NO. PD_22_Peek_sleeve | REV |
| SCALE: 2:1 | WEIGHT: 0.002kg | SHEET 1 OF 1 |



SECTION A-A



NOTES:

- ALL MACHINING TOLERANCES TO +/-0.2mm EXCEPT WHERE SHOWN OTHERWISE.

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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|------------------------------|-------------|--------------|----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.15 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |

| TOLERANCES ANGULAR DIMENSIONS | | | | |
|-------------------------------|-----------|------------|-----------|----------|
| LESS THAN 50 | 50 TO 120 | 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' |

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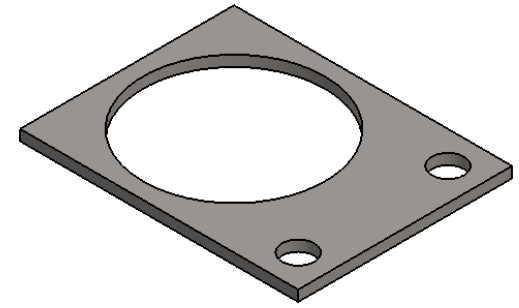
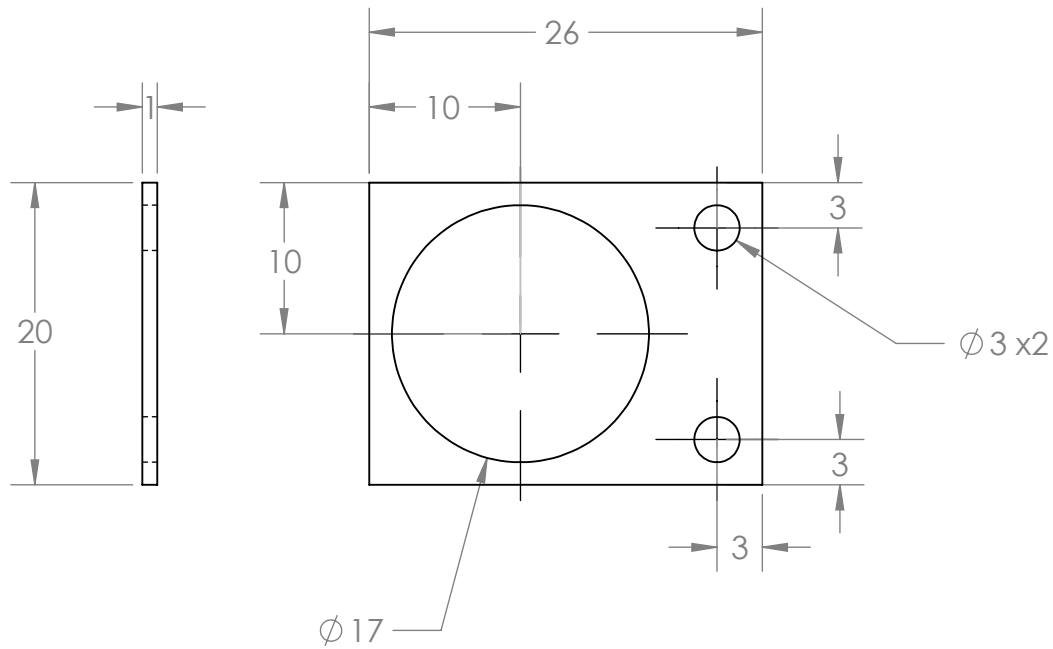


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|----------------------------------------------|----------------|----------------------------------|
| MATERIAL | | PEEK 1000 |
| NAME | | DATE |
| DRAWN | RAMONA V PEREZ | 06/13/13 |
| CHECKED | RAMONA V PEREZ | 06/14/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES |

TITLE:
**PROTON DETECTOR
PEEK BOTTOM**

SIZE **A** DWG. NO. PD_22_Peek_bottom REV

SCALE: 2:1 WEIGHT: 0.001kg SHEET 1 OF 1



NOTES:
 1. ALL MACHINING TOLERANCES TO +/-0.2mm EXCEPT WHERE SHOWN OTHERWISE.

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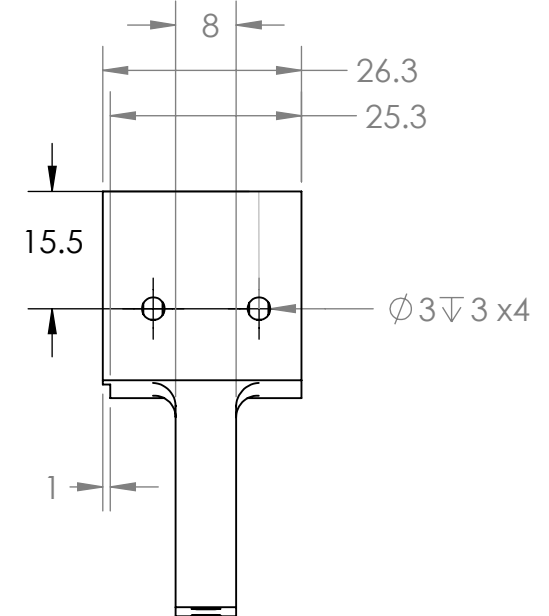
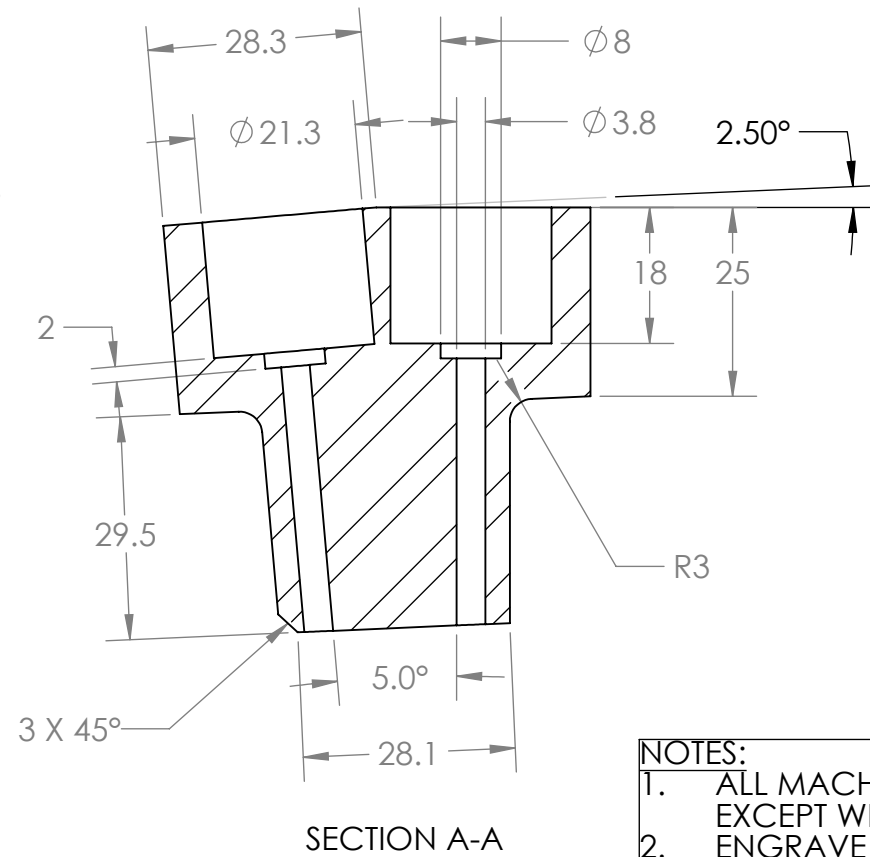
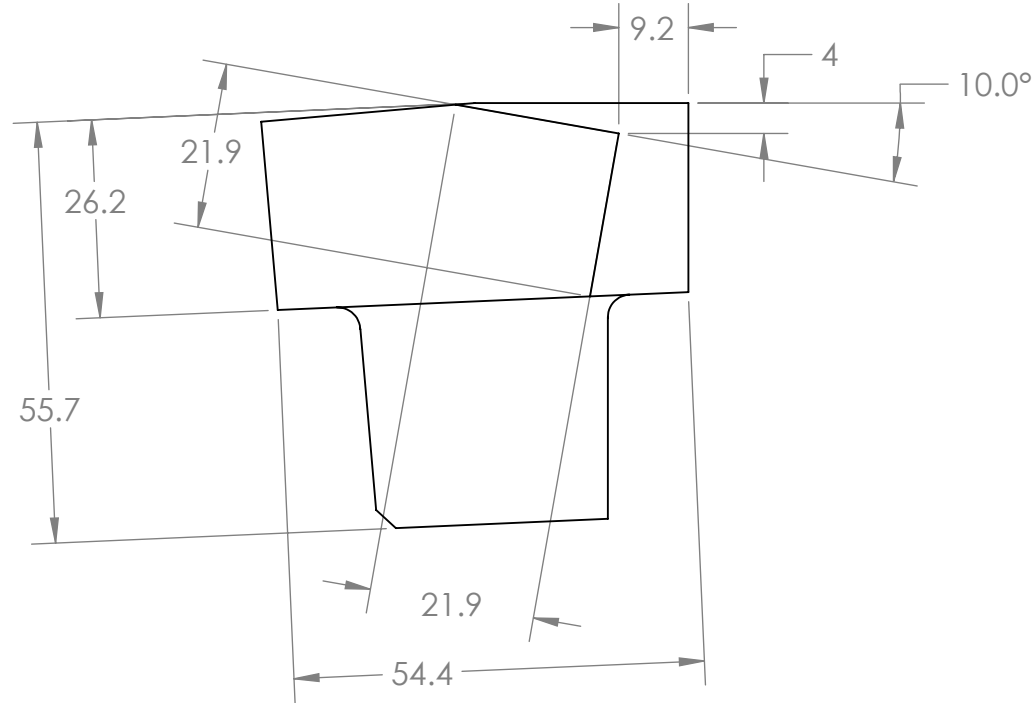
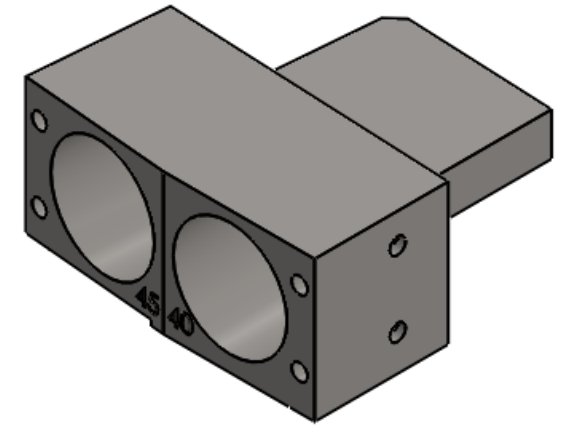
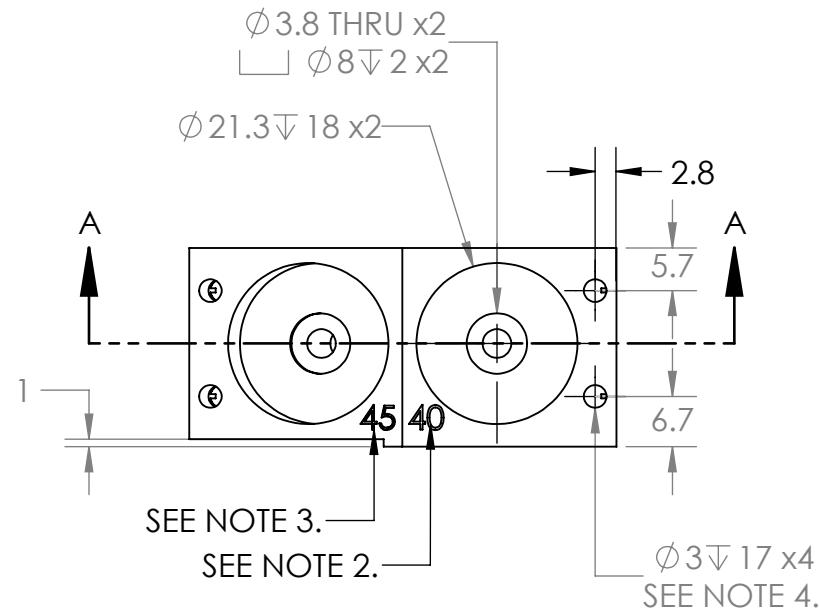
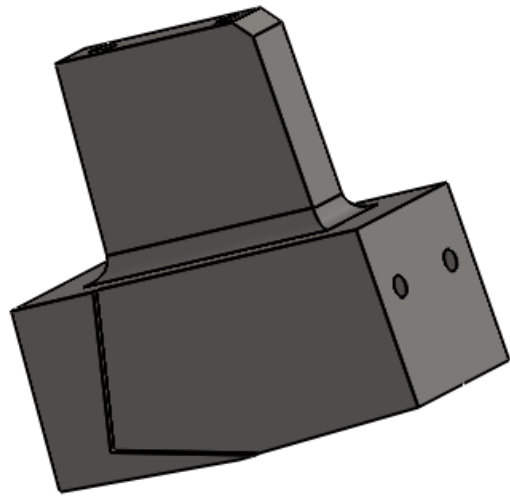
| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|-------------|--------------|-----------------|------------------|-------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.15 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| LESS THAN 10° | 10° TO 30° | 30° TO 60° | OVER 60° TO 90° | OVER 90° TO 120° | OVER 120° TO 180° |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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| | | |
|----------------------------------------------|----------------------------------|----------|
| MATERIAL | | SS316 |
| NAME | | DATE |
| DRAWN | RAMONA V PEREZ | 06/13/13 |
| CHECKED | RAMONA V PEREZ | 06/14/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | REMOVE ALL BURRS AND SHARP EDGES | |

| | | |
|------------------------------------------|-----------------|--------------|
| TITLE: PROTON DETECTOR MODULE BASE | | |
| SIZE | DWG. NO. | REV |
| A | PD_22_base | |
| SCALE: 2:1 | WEIGHT: 0.002kg | SHEET 1 OF 1 |



- NOTES:**
1. ALL MACHINING TOLERANCES TO +/-0.2mm EXCEPT WHERE SHOWN OTHERWISE.
 2. ENGRAVE "40."
 3. ENGRAVE "45."
 4. THREAD FOR M3X0.5 MACHINE SCREW.

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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|---------------|----------------|-----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.1 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| 10 OR LESS | OVER 10 TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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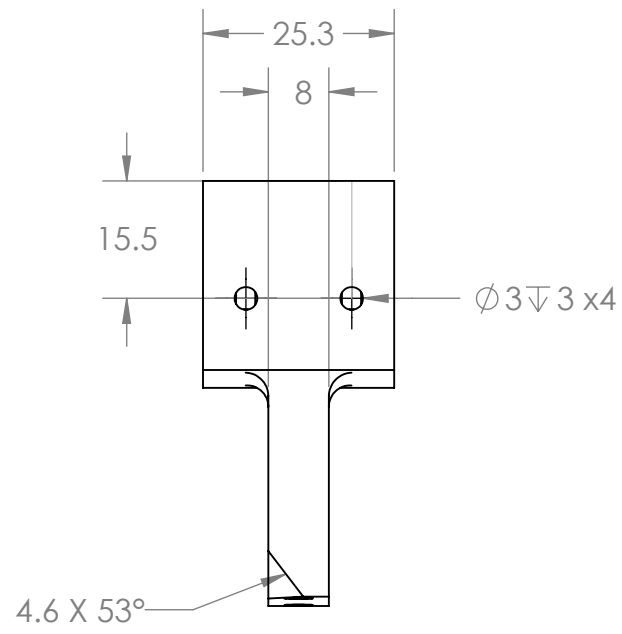
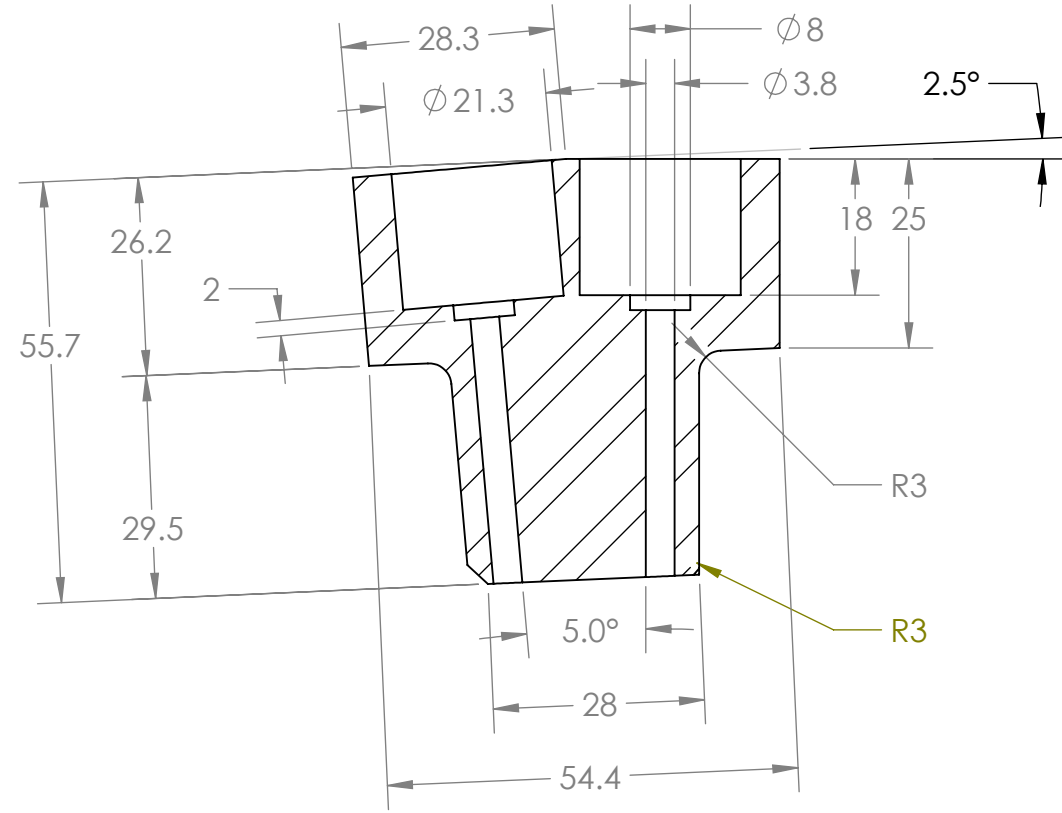
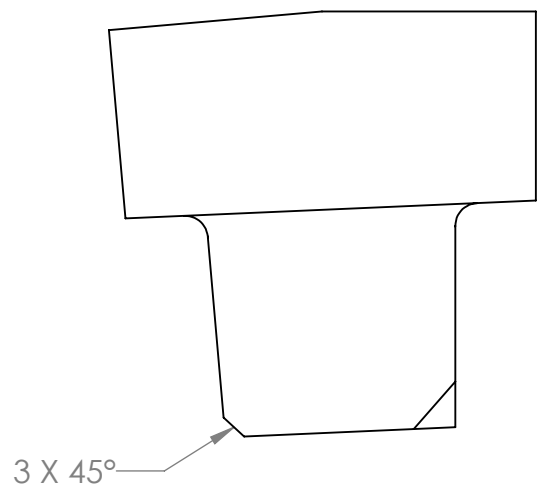
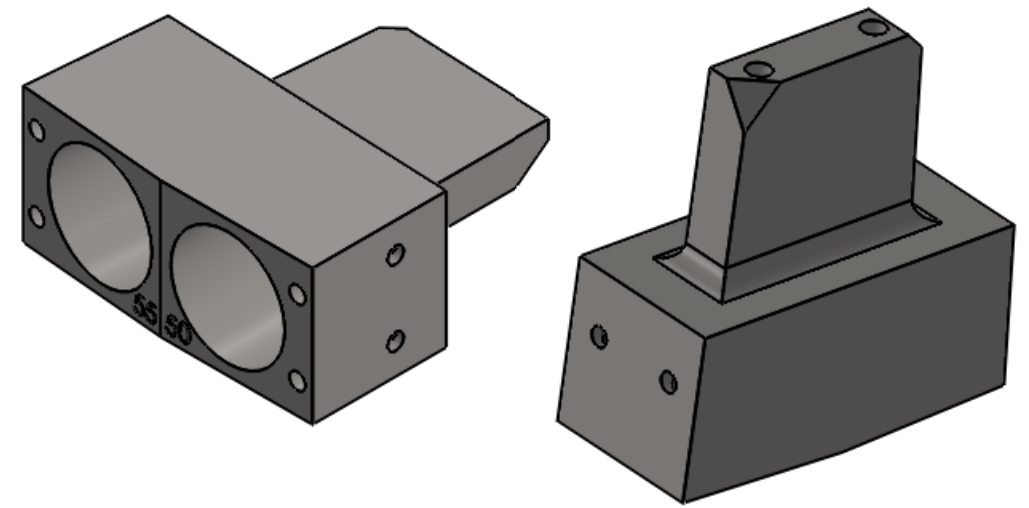
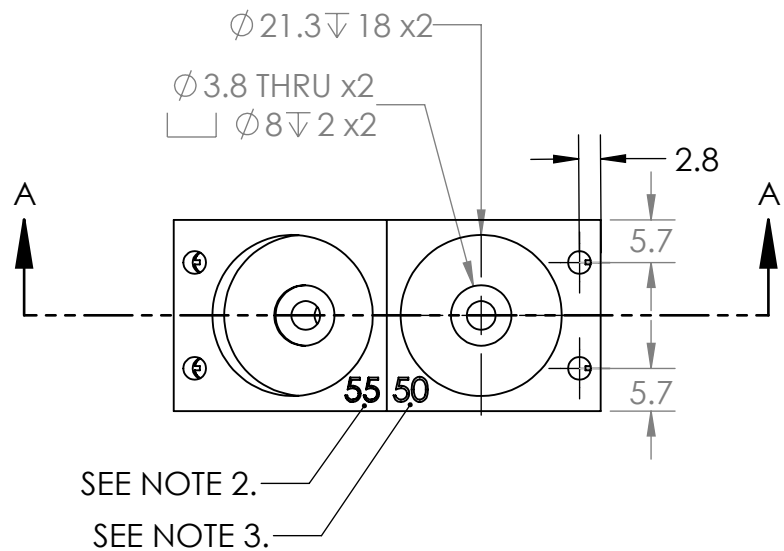


| | | |
|----------------------------------------------|----------------|----------------------------------|
| MATERIAL | | SS316 |
| NAME | | DATE |
| DRAWN | RAMONA V PEREZ | 06/13/13 |
| CHECKED | RAMONA V PEREZ | 06/19/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES |

| | | |
|--------------------------|---------------|--------------|
| TITLE: | | |
| PROTON DETECTOR MODULE A | | |
| SIZE | DWG. NO. | REV |
| B | PD_22_a | |
| SCALE: 1:1 | WEIGHT: .24kg | SHEET 1 OF 1 |

D
C
B
A

D
C
B
A



- NOTES:**
1. ALL MACHINING TOLERANCES TO +/-0.2mm EXCEPT WHERE SHOWN OTHERWISE.
 2. ENGRAVE "55."
 3. ENGRAVE "50."
 4. THREAD FOR M3X0.5 MACHINE SCREW.

SECTION A-A

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| TOLERANCES LINEAR DIMENSIONS | | | | | |
|-------------------------------|---------------|----------------|-----------------|-----------------|------------------|
| OVER 0.5 TO 3 | OVER 3 TO 6 | OVER 6 TO 30 | OVER 30 TO 120 | OVER 120 TO 400 | OVER 400 TO 1000 |
| +/- 0.1 | +/- 0.1 | +/- 0.2 | +/- 0.3 | +/- 0.5 | +/- 0.8 |
| TOLERANCES ANGULAR DIMENSIONS | | | | | |
| 10 OR LESS | OVER 10 TO 50 | OVER 50 TO 120 | OVER 120 TO 400 | OVER 400 | |
| +/- 1° | +/- 0°30' | +/- 0°20' | +/- 0°10' | +/- 0°5' | |

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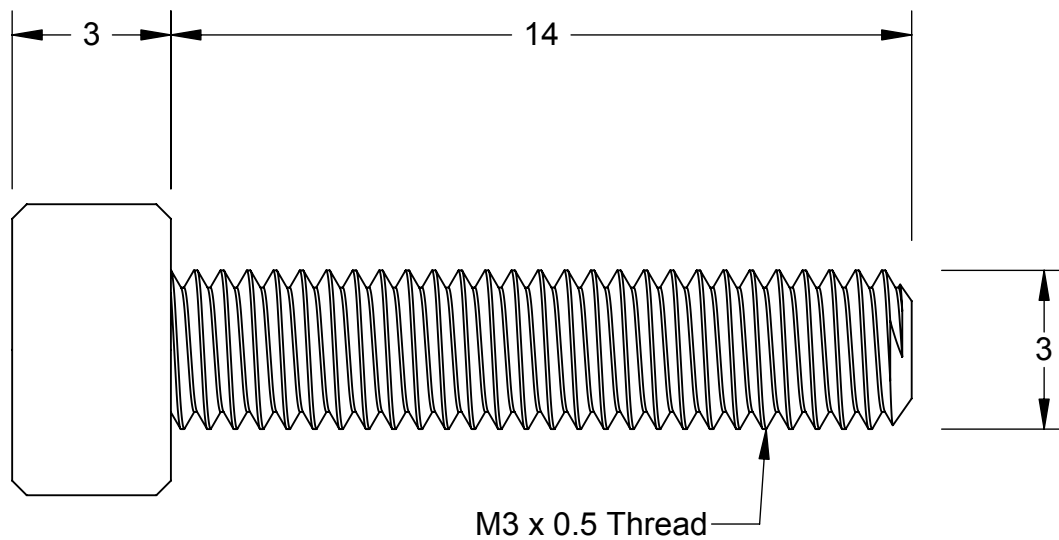
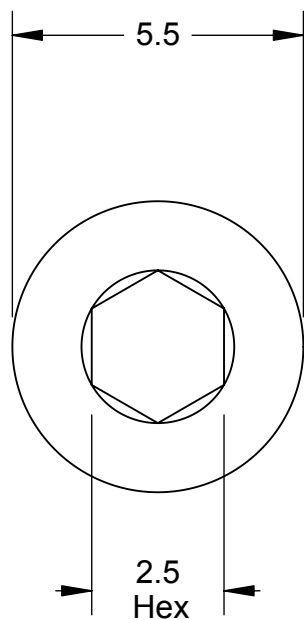
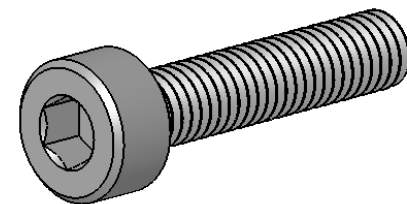


| | | |
|----------------------------------------------|----------------|----------------------------------|
| MATERIAL | | SS316 |
| NAME | DATE | |
| DRAWN | RAMONA V PEREZ | 06/13/13 |
| CHECKED | RAMONA V PEREZ | 06/19/13 |
| UNLESS OTHERWISE STATED DIMENSIONS ARE IN MM | | REMOVE ALL BURRS AND SHARP EDGES |

TITLE:
**PROTON DETECTOR
MODULE B**

| | | |
|----------|----------|-----|
| SIZE | DWG. NO. | REV |
| B | PD_22_b | |

SCALE: 1:1 WEIGHT: 0.23kg SHEET 1 OF 1



McMASTER-CARR  PART NUMBER **92290A118**

<http://www.mcmaster.com>
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Type 316 Stainless Steel
Socket Head Cap Screw

Unless otherwise specified, dimensions are in millimeters. Information in this drawing is provided for reference only.