



GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
BHABHA ATOMIC RESEARCH CENTRE
VISAKHAPATNAM



Computational Analysis Division

Ref: CAD/HEDM/WO/IND/22-23/22

Date: 20/12/2022

Subject: Notice inviting tender for;

“Fabrication and supply of cylindrical vacuum vessel and corresponding in-vacuum components”
(See Annexure-I)

1. Quotations are invited for minor fabrication job as per details described below.
2. **Scope of work:** See details in Annexure-I.
3. **General guidelines for submitting tender**
 - You shall send your offer in a **sealed envelope** indicating delivery period, price inclusive of taxes and other relevant information by speed post to:

Head,
CAD, Computational Analysis Division
Bhabha Atomic Research Centre
Village: Maduturu (Sub: P.O.)
Near Nagavaram Junction,
Gajuwaka-Yellamanchilli Highway
Atchutapuram, Visakhapatnam
Andhra Pradesh- 531011

(Kind Attention: Rahulnath P.P., SO/D,CAD, 0891-283-2149/ 8985875318)

- Quotation shall reach us on/or before **05/01/2023 by Speed Post/Courier/ Only.**
- On top left corner of the envelope please indicate Quotation for- **“Fabrication and supply of cylindrical vacuum vessel”** And due date 05/01/2023
- Overwriting, scratching etc. must be avoided in the quotation. Rewriting the whole figure shall carry out any alteration in the figure. The authorized person from the firm shall countersign such figure.
- The delivery period mentioned in the quotation shall be strictly adhered to. If the contractor fails to supply and secure extension of delivery date before effecting delivery of the supply against the contract, acceptance of such item by the purchaser will in no way prejudice the right of the purchaser to levy liquidated damage nor will it be entitled to the contractor for payment of statutory levies that comes into force after the expiry of the delivery date.
- **Minimum Guarantee/Warranty period** of the material and workmanship shall be **One Year.**
- **Supplier shall mention clearly the PAN /TAN no. on quotation.**
- **GST number shall be clearly mentioned on Quotation.**
- All the charges and taxes shall be mentioned clearly.
- You may contact us for any clarification before **05/01/2023** (Shri. Rahulnath P.P., 0891-2832149,8985875318, rahulnath@barc.gov.in)

4. **Rates:**
As per Scope of Work.

5. **Place of Delivery/Work:**

Address: Stores Officer, Bhabha Atomic Research Centre, Near Nagavaram Junction, Gajuwaka-Yellamanchilli Highway, Maduturu PO, Visakhapatnam, Andhra Pradesh- 531011.

5. **PAYMENT TERMS:**

- a. Part payment/Advance or against delivery cannot be made.
- b. Payment will be made only after satisfactory completion of work and on production of (along with Delivery Challan):
 - i. Bill/Invoice containing Location of supply, separate tax components along with PAN and GSTN numbers.
 - ii. Advance Stamped Receipt.
 - iii. Bank Account No, Bank and Branch name with IFSC code.
 - iv. Undertaking stating that GST has been promptly deposited with the authorities
- c. It may be noted that:
 - i. Income tax @2% will be deducted from your bill.
 - ii. TDS (under GST) will be deducted as applicable from your bill of taxable goods and/or services, where the total value of such supply exceeds 2.50lakh.
 - iii. Declaration confirming filing of Income Tax Return from immediate two preceding years, in accordance with Section 206 AB of the Income Tax Act 1961, has to be submitted in the prescribed proforma along with necessary acknowledgements in support of declaration. In case the aforesaid declaration is not submitted, TDS/TCS shall be deducted at higher rates as instructed under the provisions of Income Tax Act.

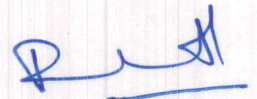
6. **CONFIDENTIALITY CLAUSE:**

No, party shall disclose any information to any third party, concerning the matters under this contract generally. In particular, any information identified as "Proprietary" in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party.
This clause shall apply to the sub-contractors, consultants, advisers or the employees engaged by a party with equal force.

"Restricted information "categories under section 18 of the Atomic Energy Act,1962 and "Official Secrets" under section 5 of the official secrets act, 1923.

Any contravention of the above-mentioned provisions by any contractor, sub-contractor, consultant, adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation.

Prohibition against use of BARC's name without permission for publicity purposes. The contractor or sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC's name for any publicity purpose through any public medial like press, radio, T.V. or Internet without the prior written approval of BARC.



(Rahulnath P.P.)
SO/D, CAD

Phone: 0891-2832149,

Email: rahulnath@barc.gov.in

Scope of work

Fabrication and supply of cylindrical vacuum vessel and corresponding in-vacuum components

The following items are to be fabricated;

Sl. No.	Ref. Drawing No.	Item Description(Material)	Quantity
1.	01	Vacuum Chamber(SS)	01 No.
2.	02 & 13	Central Flange(SS)	01No.
3.	03	Barrel Coupler flange(SS)	01No.
4.	04	Barrel Coupler(SS)	01No.
5.	05	Bridge Wire adaptor(SS304)	01No.
6.	05	Bridge Wire adaptor(Acrylic)	05Nos.
7.	06	Outer Shield(SS)	01No.
8.	07	Central Pipe(SS)	01No.
9.	08	Target Adaptor(SS)	01No.
10.	09	Closing cap(SS)	01No.
11.	10	Plug(SS)	01No.
12.	11	Rotating Disc(SS)	01No.
13.	Nil	ISO250F Blank Flange	01No.
14.	Nil	ISO250 Bellows with ISO250F end flanges	01No.

Note:

1. Vacuum port and flange dimensions are **indicative**.
2. All ports and flanges are to be manufactured as per **ISO standards**.
3. GTA/W/TAG Welding has to be used for joining ports to chamber.
4. The vendor has to **provide complete 2D/3D drawing** after discussion with the indenter upon release of work order. Fabrication has to be done only after **receiving approval** from the indenter.
5. **Leak testing** has to be done at the vendor's site. Pressure of 10^{-4} mBar has to be obtained at a leak rate of at least 10^{-7} mBar-litre/second.
6. **Electropolishing** has to be done for each component.
7. Pre-dispatch inspection would be done at vendor's site. Items should be dispatched only after **clearance is issued** by the indenter.

[Handwritten Signature]

8. **Duration of work order** includes the time taken for drawing approval, fabrication time and time for pre-dispatch inspection.
9. **Surface roughness** has to be brought below 10microns.
10. There are 13 drawings.
11. All the components are to be fabricated and assembled as per drawings.

Brief details of fabrication work need to be carried out are given below;

1. Vacuum Chamber (Drg. No.01)

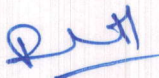
- a. Vacuum Chamber: Material: SS304.
- b. The vessel has to be made out of **single solid material**. Apart from the flanges and ports outside.
- c. Length:352mm
- d. ISO250F flange on both ends are to be welded to the vessel.
- e. 3Nos. of ports are to be provided on the surface of vessel at right angles as mentioned in the drawing. The ports are to be at a distance of 175mm from the centre. ISO150F Flange ends are to be welded on the port.
- f. 10mm wall thickness has to be provided at the ends of vessel whereas 20mm wall thickness is to be provided at the middle part.
- g. The critical feature to be ensured is that, the junction between end section and middle section where 10mm thickness portion transits to 20mm section, **perpendicularity** has to be maintained within 0.01mm. Any radius portion coming in between the junctions has to be avoided.
- h. **Tolerance** as mentioned has to be maintained. If not mentioned, a tolerance of +0.1mm has to be ensured.
- i. All other dimensions are to be strictly adhered to.
- j. **Electropolishing** has to be done.

2. Central Pipe Flange (Drg. No.2 & 13)

- a. Material: SS304.
- b. Overall Dimensions: Dia.230X40mm
- c. A step of Dia.200X20mm has to be provided as mentioned in the drawing.
- d. M10 tappings 8Nos. are to be provided at pcd of 175mm and M10 tappings 06Nos. are to be provided at pcd of 75mm.
- e. This piece has to be welded with vacuum chamber as shown in Drg.No.13.
- f. TIG welding has to be done.
- g. M30 Thread has to be made at one end as shown. The matching connecting component is given in drg.No.09. See Drg.No.12 for details.
- h. **Perpendicularity** with respect to vessel has to be maintained within 0.05mm after welding.
- i. **Electropolishing** has to be done.
- j. **Tolerance** has to be maintained as per drawing.

3. Barrel Coupler flange (Drg. No.3 & 13)

- a. Material: SS304
- b. This is a flat 25mm disc of diameter 230mm.with central hole of 40mm.



- c. M10 tapping 08Nos. have to be made on the disc as per drawing.
- d. The disc has to be welded on to the vacuum vessel as mentioned in Drg.no.13.
- e. **Perpendicularity** with respect to vessel has to be maintained within 0.05mm after welding.
- f. **Electropolishing** has to be done.
- g. **Tolerance** has to be maintained as per drawing.

4. Barrel Coupler(Drg.No.04)

- a. Material: SS304
- b. Overall length: 310mm.
- c. **No welding joints** must be made. The piece has to be made out of single piece.
- d. This has to have a long section of length 150mm of inner dia.30mm and outer dia.50mm followed by a shorter section of Inner dia.21.40mm and outer dia.50mm.
- e. This is followed by a flange of diameter 140mm and thickness 10mm.
- f. 21.40mm is to be maintained up to an offset of 12mm from the end.
- g. 04Nos. of grooves of dimension 14mmx50mm length are to be made as shown in drg.No.04.
- h. Holes of size 10.5mm are to be made on flange at pcd of 116mm
- i. **Perpendicularity** as mentioned in the drawing has to be maintained.
- j. **Parallelity** has to be maintained as mentioned in the drawing.
- k. **Electropolishing** has to be done.
- l. **Tolerance** has to be maintained as per drawing.

5. Bridge Wire adaptor (Drg.No.05)

- a. Material: SS304 and Acrylic
- b. Overall Length: 97mm
- c. This component has 3 sections.
- d. First section is a cylindrical section of length 40mm of diameter 40mm and inner diameter of 26mm up to 12mm length followed by 21.4mm bore.
- e. Second section is a flat flange of diameter 90mm and thickness 10mm.
- f. Third section is a square section of 50x50 followed by a cylindrical end of dia.26mm.
- g. The inner bore is 21.40mm throughout except a length of 12mm at on side.
- h. **Electropolishing** has to be done.
- i. **Tolerance** has to be maintained as per drawing.

6. Outer Shield(Drg.No.06)

- a. Material: SS304
- b. Overall length: 112mm.
- c. Double O-ring grooves are provided at inner surface.
- d. This vessel should be made **vacuum compatible**.
- e. The component has to be made in single part. **No welding joints**.
- f. **Electropolishing** has to be done.
- g. **Tolerance** has to be maintained as per drawing.

7. Central Pipe(Drg.No.07)

- a. Material: SS304
- b. This has to be **critically** made according to dimension and tolerances mentioned.

Put

- c. **Parallelity and perpendicularity** has to be ensured as mentioned.
- d. The whole of piece has to be made in single entity. **No welding joints.**
- e. The component has to be aligned with the Outer Shield as shown in assembly drawing no.12. So corresponding matching must be ensured.
- f. **Electropolishing** has to be done.
- g. **Tolerance** has to be maintained as per drawing.

8. Target adaptor(Drg.No.08)

- a. Material:SS304
- b. This has to be **critically** made according to dimension and tolerances mentioned.
- c. Internal thread of M12x2mm pitch along a length of 12mm has to be made as shown.
- d. Surface roughness of 5microns and less must be ensured on the facing surface.
- e. **O-ring groove** of 38mm dia. is to be made as shown.
- f. **Parallelity and perpendicularity** has to be ensured as mentioned.
- g. The whole of piece has to be made in single entity. **No welding joints.**
- h. The component has to be aligned with the Central pipe as shown in assembly drawing no.12. So corresponding matching must be ensured.
- i. **Electropolishing** has to be done.
- j. **Tolerance** has to be maintained as per drawing.

9. Closing Cap(Drg.No.09)

- a. Material: SS304
- b. Overall dimension: Dia.36mm X28mm length.
- c. Metric thread of M30 has to be kept on one side and M16 on other side.
- d. Flat Faces of width 36mm has to be made on circular surface.
- e. O-ring groove of 1.5mm width has to be made as shown.
- f. **Electropolishing** has to be done.

10. Plug(Drg.No.10)

- g. Material: SS304
- h. Overall dimension: Dia.29mm X18mm length.
- i. O-ring groove of 2.35mm width has to be made as shown.
- j. **Electropolishing** has to be done.
- k. **Dimensions** are to be adhered to.

11. Rotating Disc(Drg.No.11)

- a. Material: SS304
- b. This component has a circular disc at bottom.
- c. This has to be welded to vessel as shown in Drg.No.13.
- d. Circular slots of 40° are to be machined as mentioned along R155 and R145.
- e. The component can be made in 2 parts viz. circular bottom and C-Block
- f. **Flatness** at bottom surface has to be ensured.
- g. **Electropolishing** has to be done.
- h. **Dimensions** are to be adhered to.

Put

12. ISO250F Blank flange

- a. ISO250F Blank flange of standard dimension have to be supplied (16mm Thick).

13. ISO250F Bellow with flange ends

- b. ISO250F bellow with ISO250F flange is to be supplied.

Note to the vendor:

- a. All components are to be used in vacuum environment in the pressure range of 10-6mBar.
- b. **Electropolishing** has to be done on all SS components.
- c. All dimensions are to be strictly adhered to.
- d. Tolerance, straightness, parallelity, perpendicularity, flatness etc has to be maintained.
- e. TIG welding has to be done wherever applicable.
- f. The quality of workmanship shall conform to high engineering standards and strictly as per instructions of engineer in charge (EIC) of job.
- g. **Delivery period:** Delivery period must be within 10Weeks.

GENERAL REQUIREMENTS:

- a) The vendors are encouraged to hold prior discussions with the indentor for any clarifications.
- b) Finished products should be delivered to the address given below.

Address:

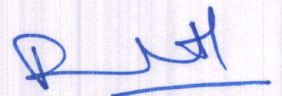
"Stores Officer, Bhabha Atomic Research Center, Near Nagavaram Junction, Nagavaram-Atchutapuram Highway, Visakhapatnam, Andhra Pradesh- 531011"

- c) The cost of transportation/delivery if any should be mentioned in the quotation.
- d) No part payment will be done for any part delivery.
- e) It is mandatory to mention prices of **each item separately**.
- f) Single order will be placed for all the above items and no partial work is permitted.
- g) Minimum Guarantee/**Warranty period** of the raw material and workmanship shall be **One Year**.
- h) **Contact Persons:**

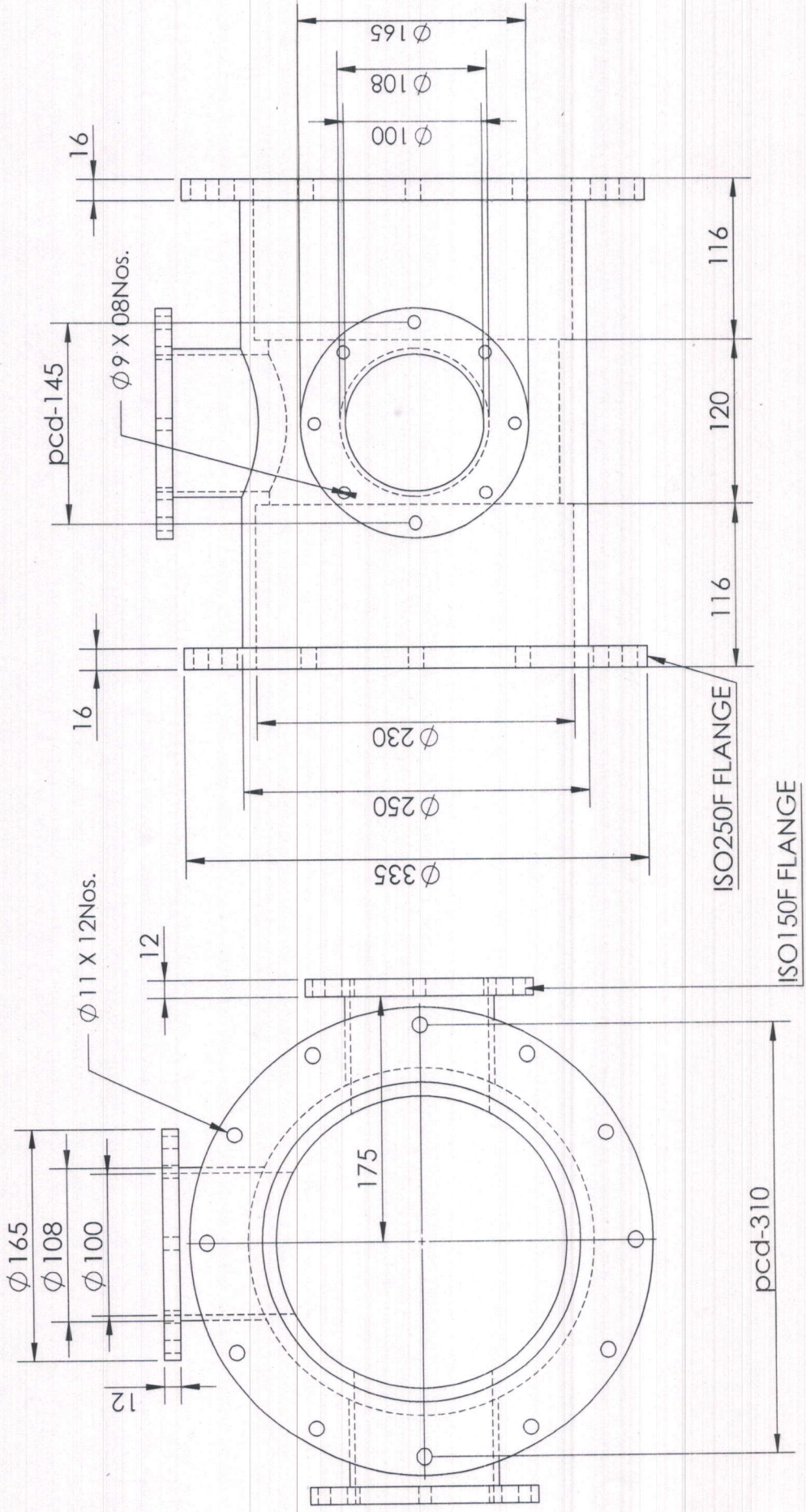
a) **Shri. Rahulnath P.P.**, Computational Analysis Division, BARC

Contact details: rahulnath@barc.gov.in

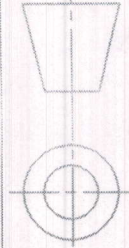
Phone: 0891-283-2149, 8985875318



(Rahulnath P.P.)
SO/D, CAD



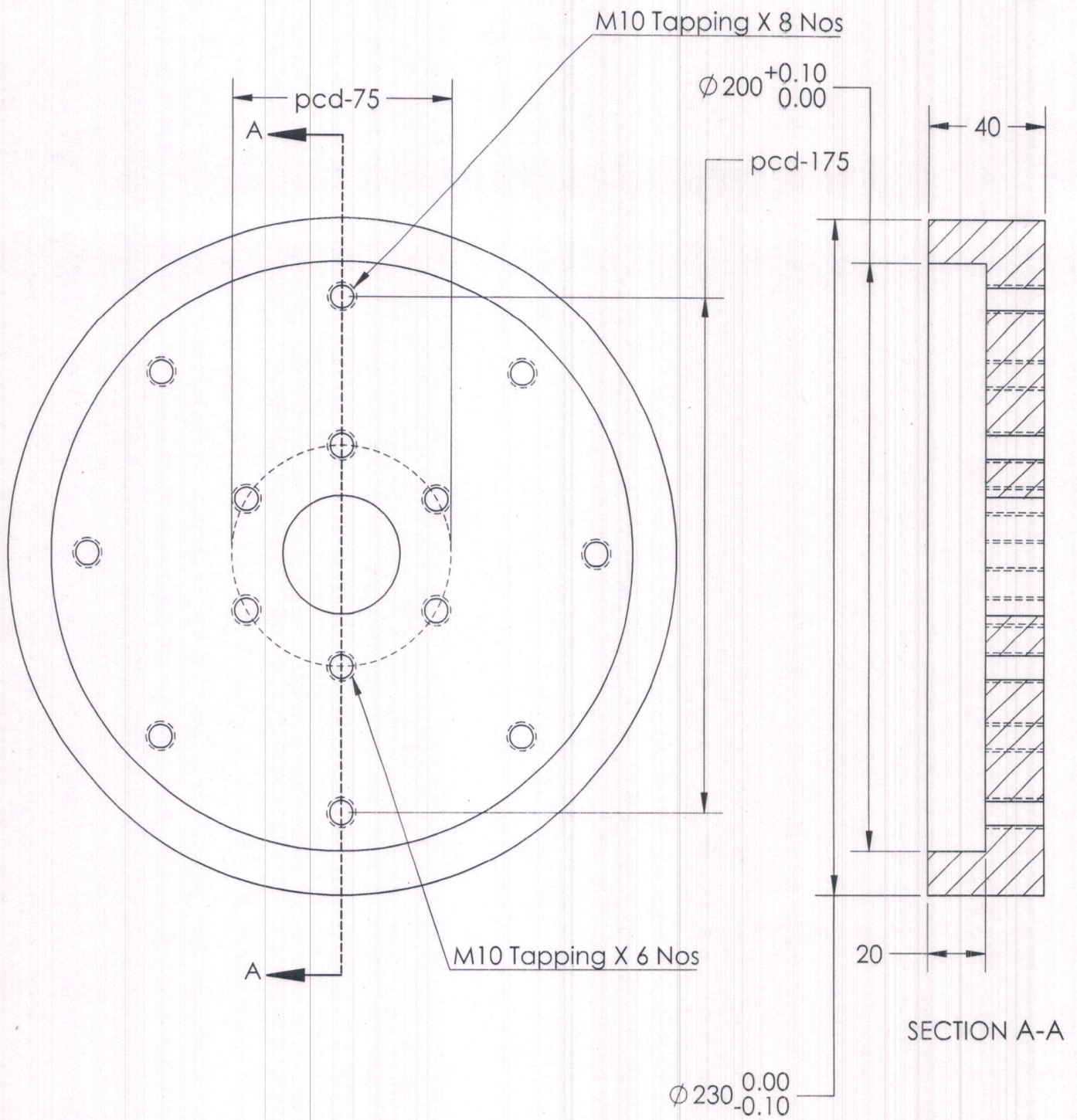
Vacuum Chamber



DRG. No.: 01 All dimensions are in mm

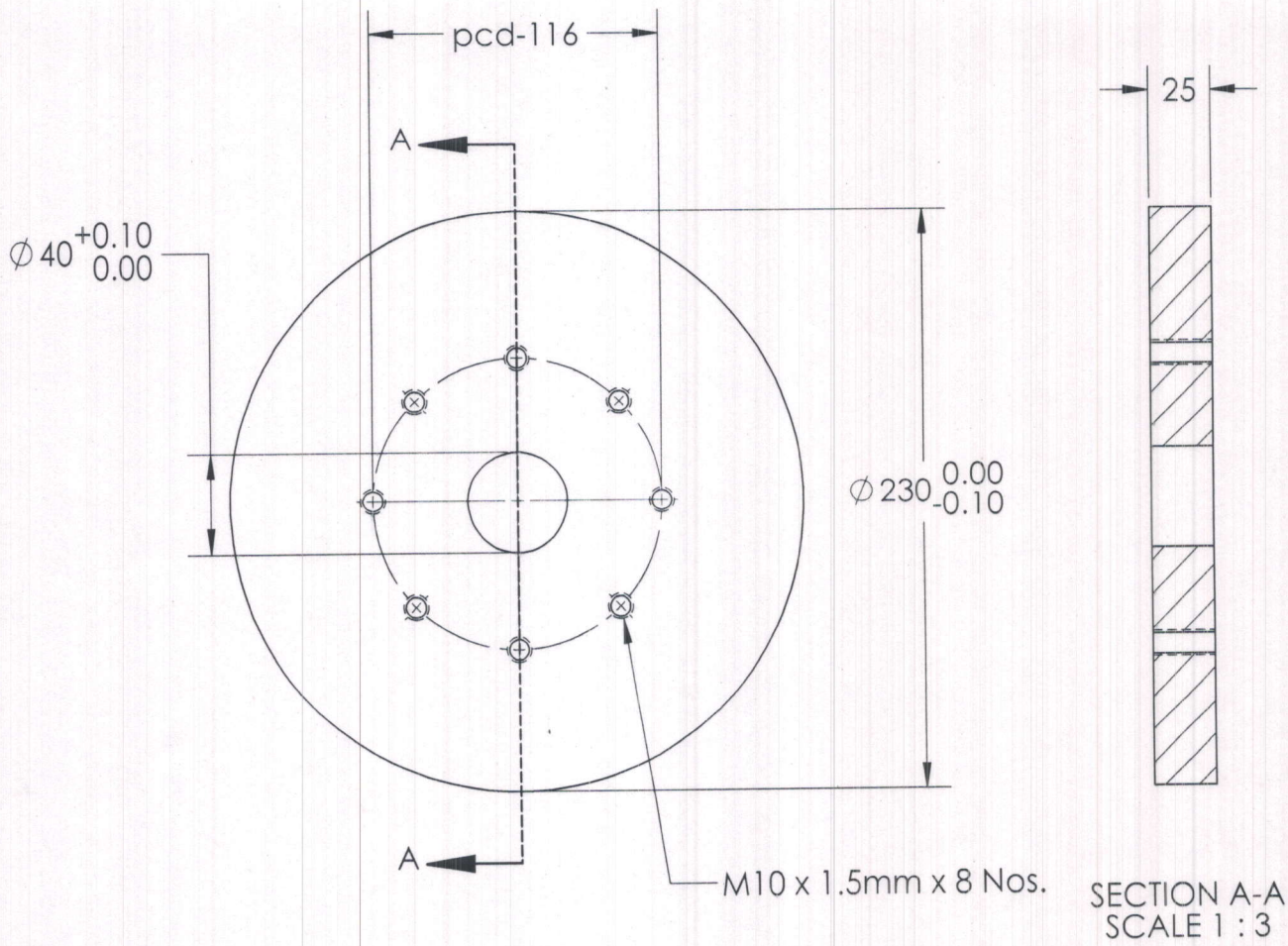
Quantity: 01 SCALE: 1:4 Material: SS304

Handwritten signature

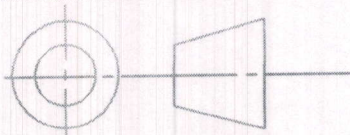
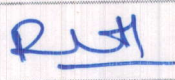


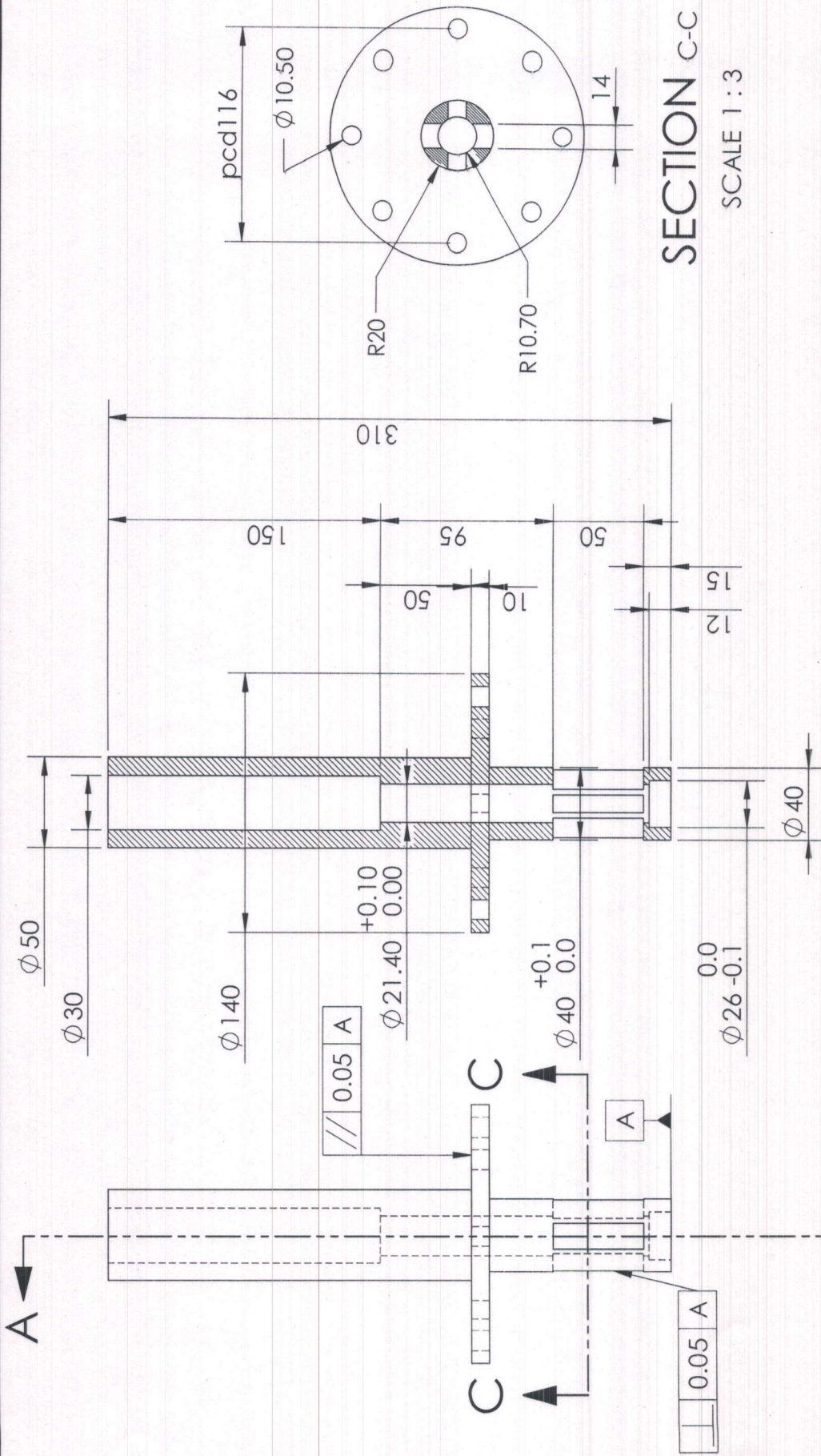
Central Pipe Flange

DRG. No.:02	All dimensions are in mm		
Quantity:01	SCALE: 1:2	Material: SS304	
			<i>P. S. H.</i>



Barrel Coupler Flange

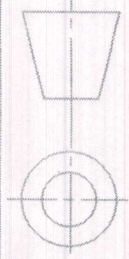
DRG. No.: 03	All dimensions are in mm		
Quantity: 01	SCALE: 1:3	Material: SS304	
			



SECTION C-C

SCALE 1 : 3

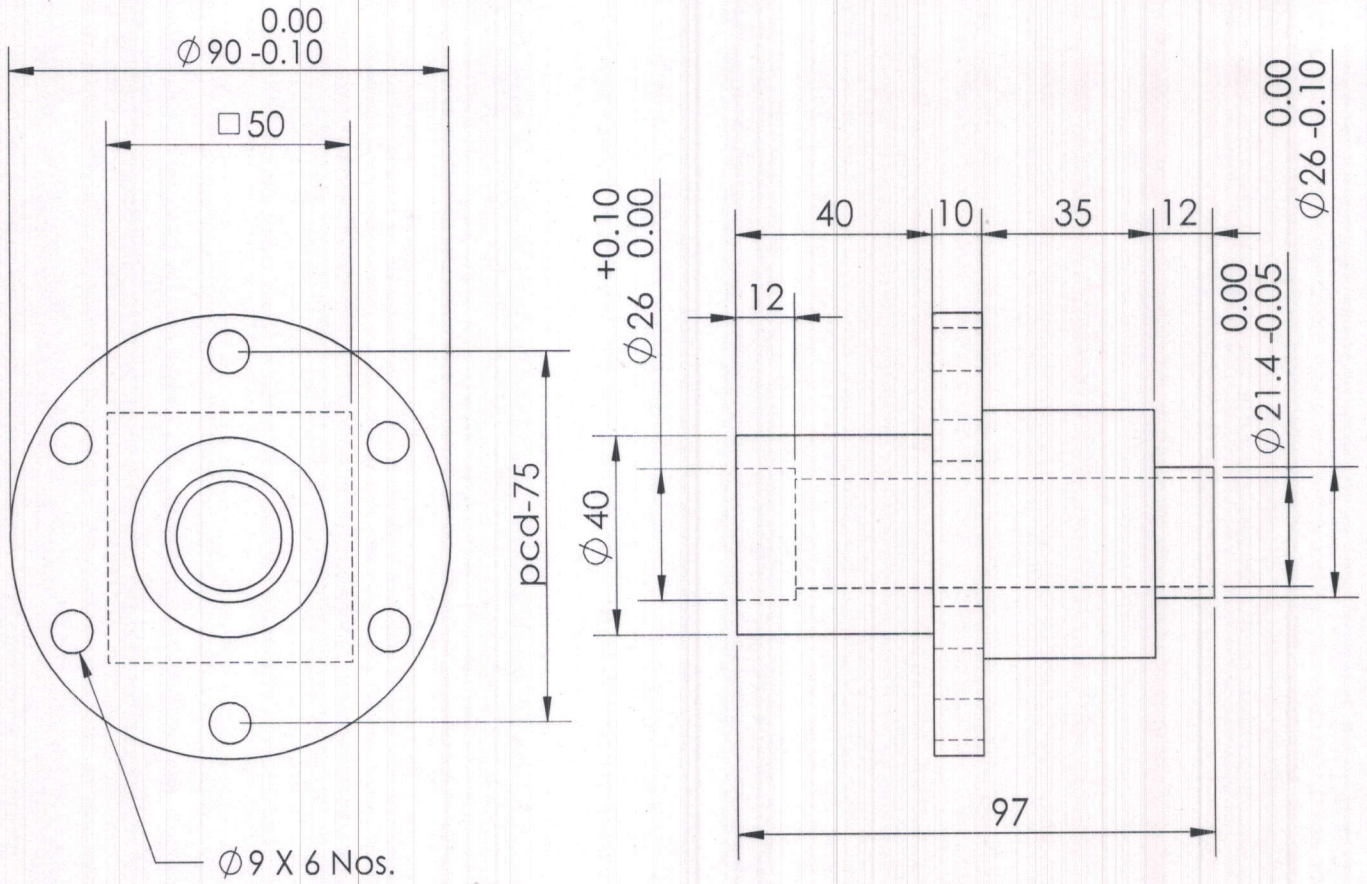
Barrel Coupler



DRG. No.: 04 All dimensions are in mm

Quantity: 01 SCALE: 1:3 Material: SS304

[Handwritten signature]



Bridge Wire Adaptor

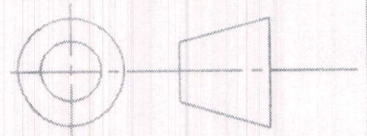
DRG. No.: 05

All dimensions are in mm

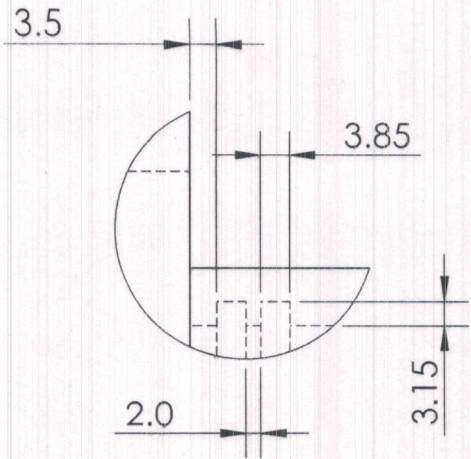
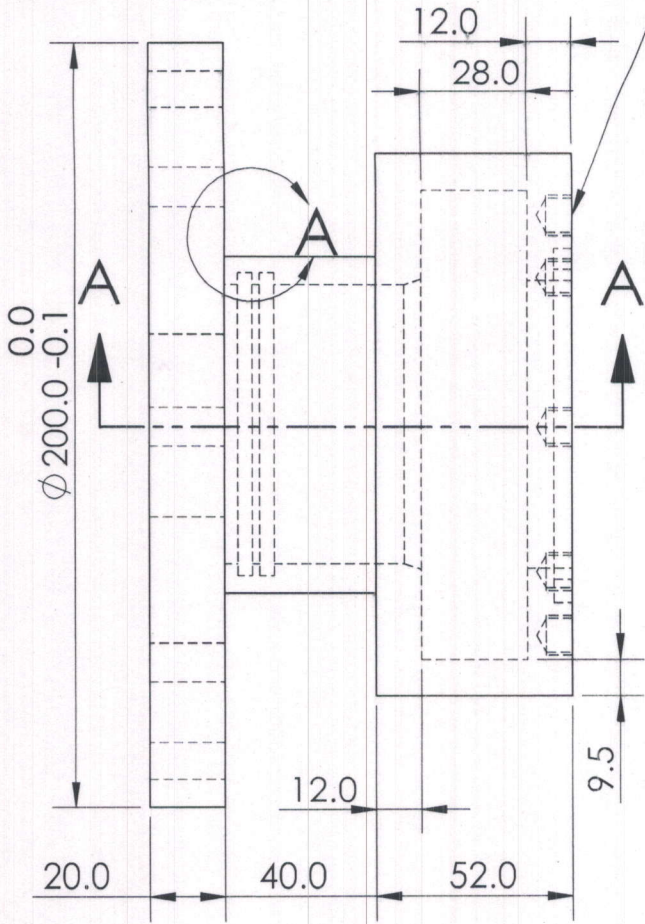
Quantity: 01+05

SCALE: 1:3

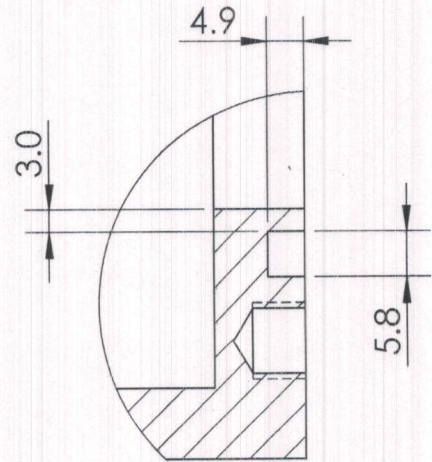
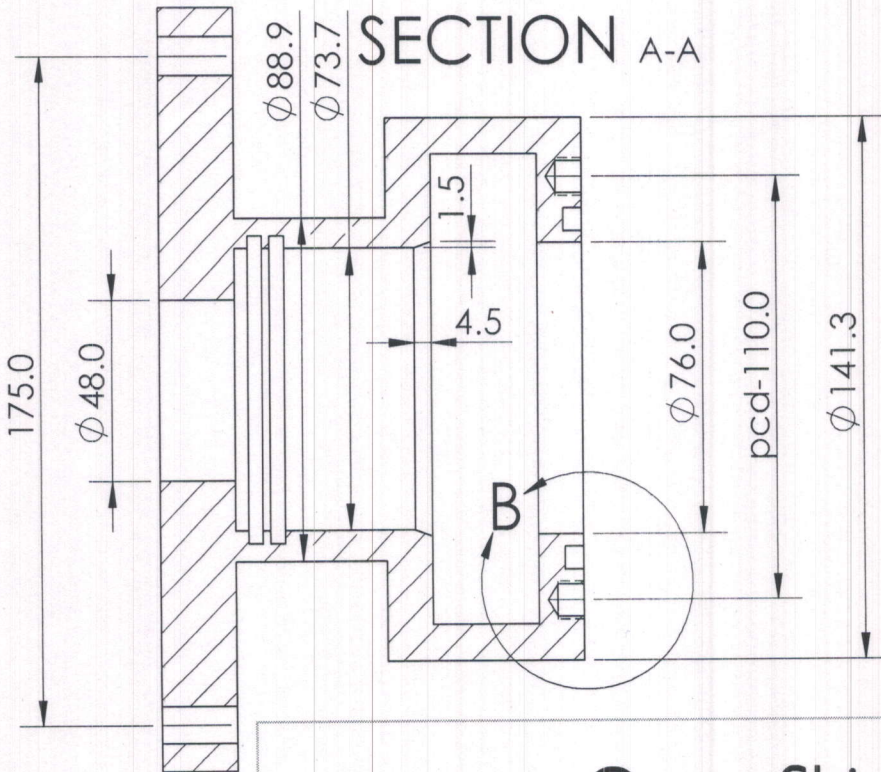
Material: SS304 &
Acrylic



Put



DETAIL A
 SCALE 1 : 1



DETAIL B
 SCALE 1 : 1

Outer Shield

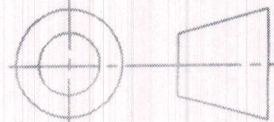
DRG. No.: 06

All dimensions are in mm

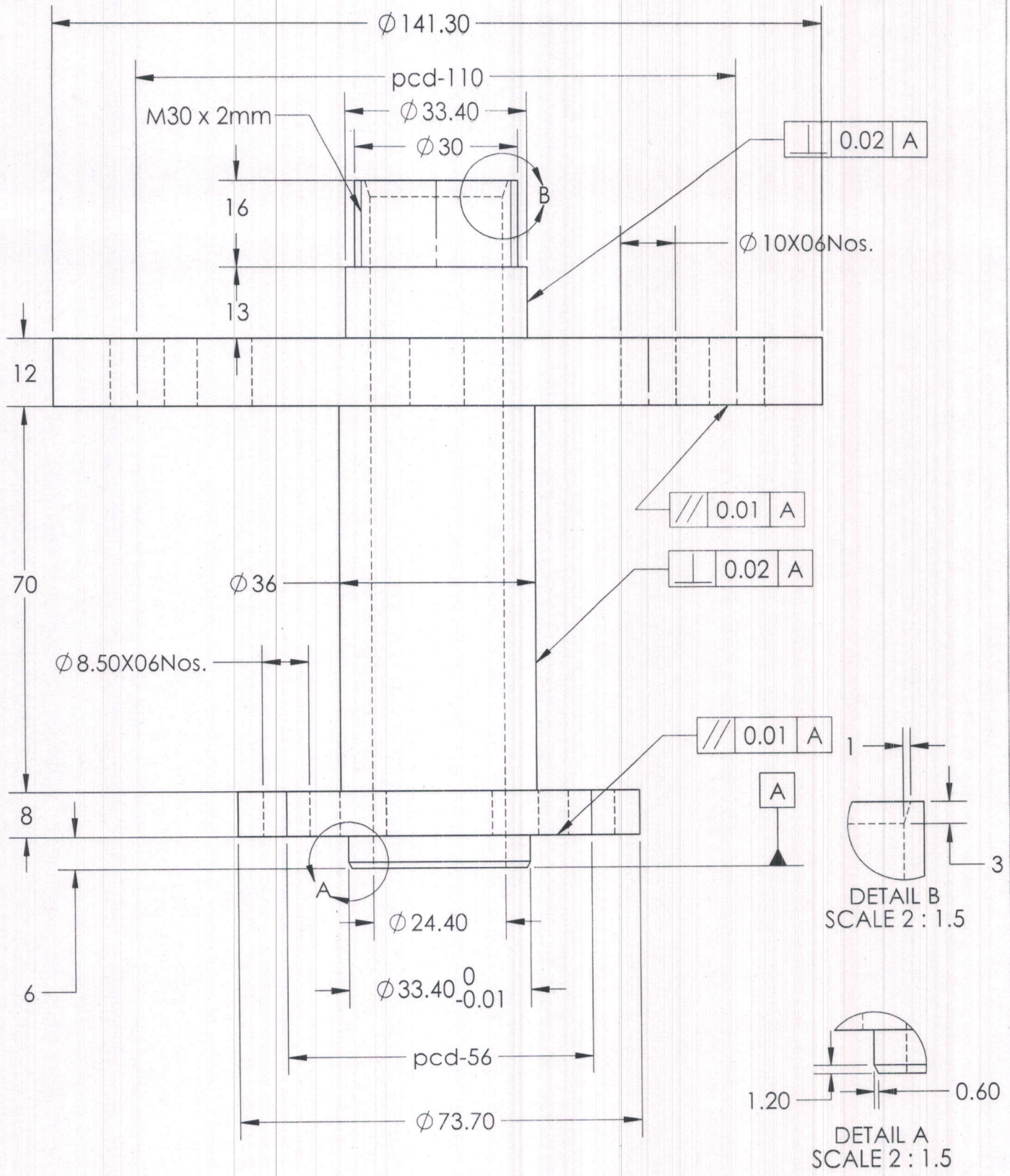
Quantity: 01

SCALE: 1:2

Material: SS304



PUT



Central Pipe

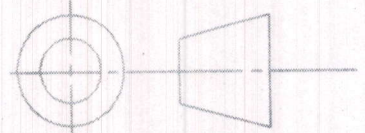
DRG. No.: 07

All dimensions are in mm

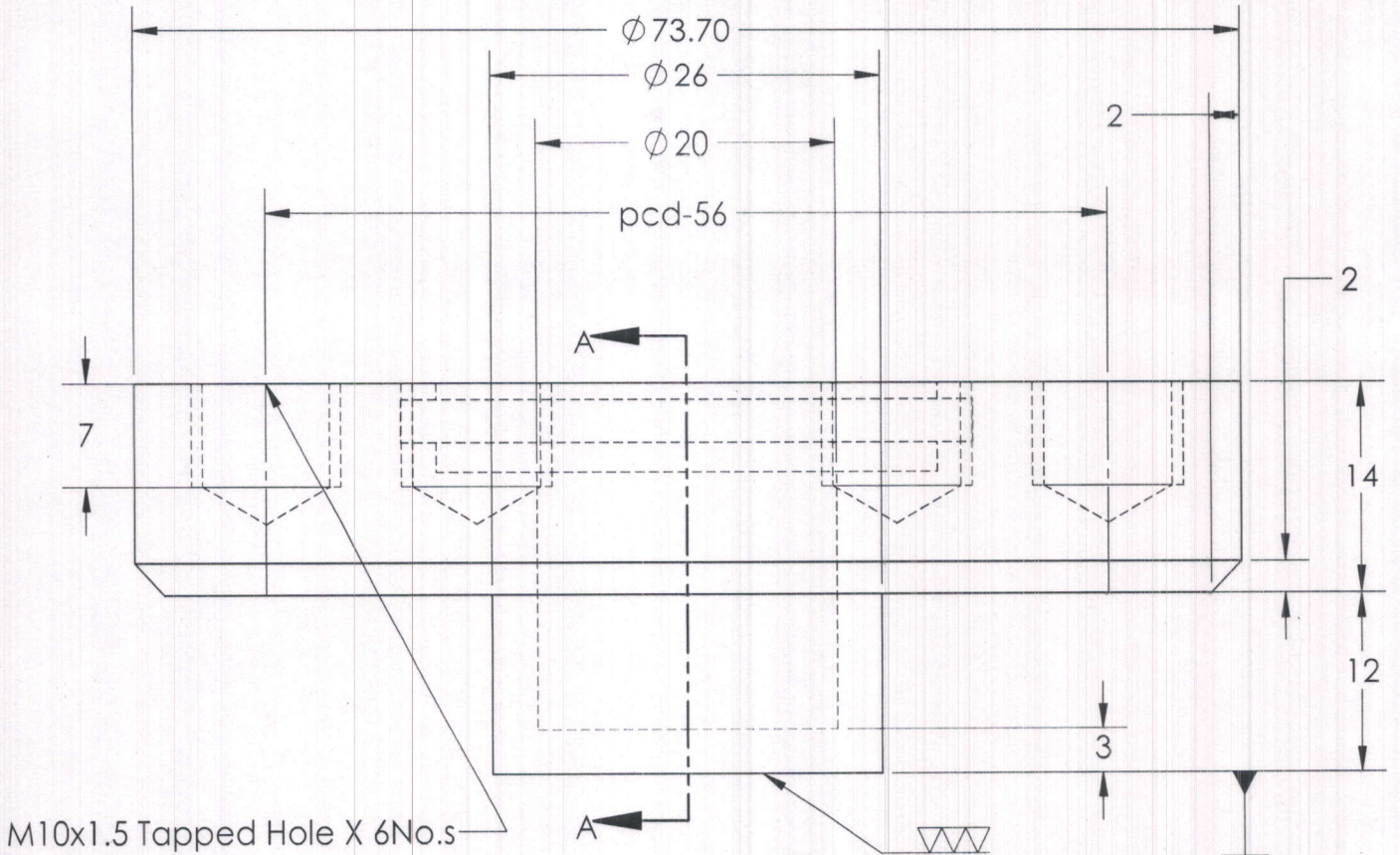
Quantity: 01

SCALE: 1:1

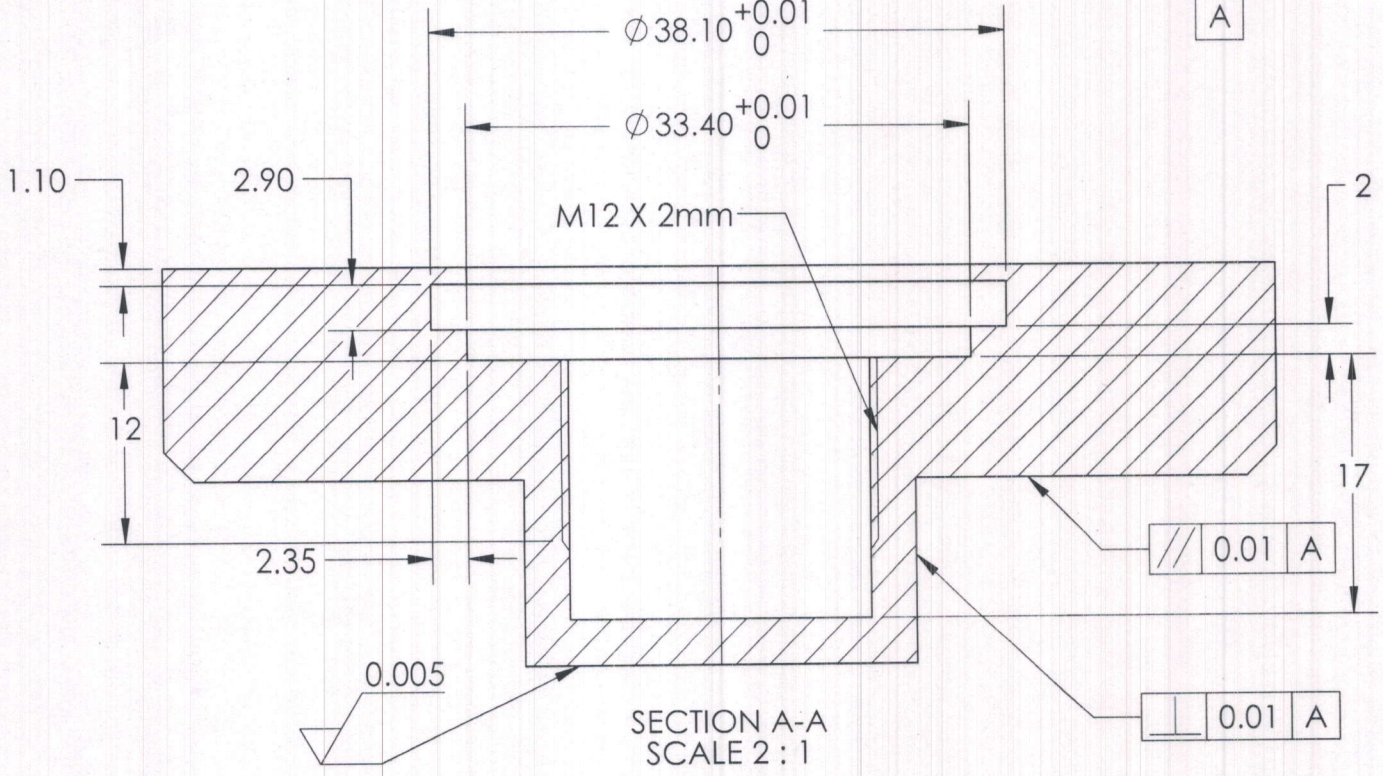
Material: SS304



Handwritten signature

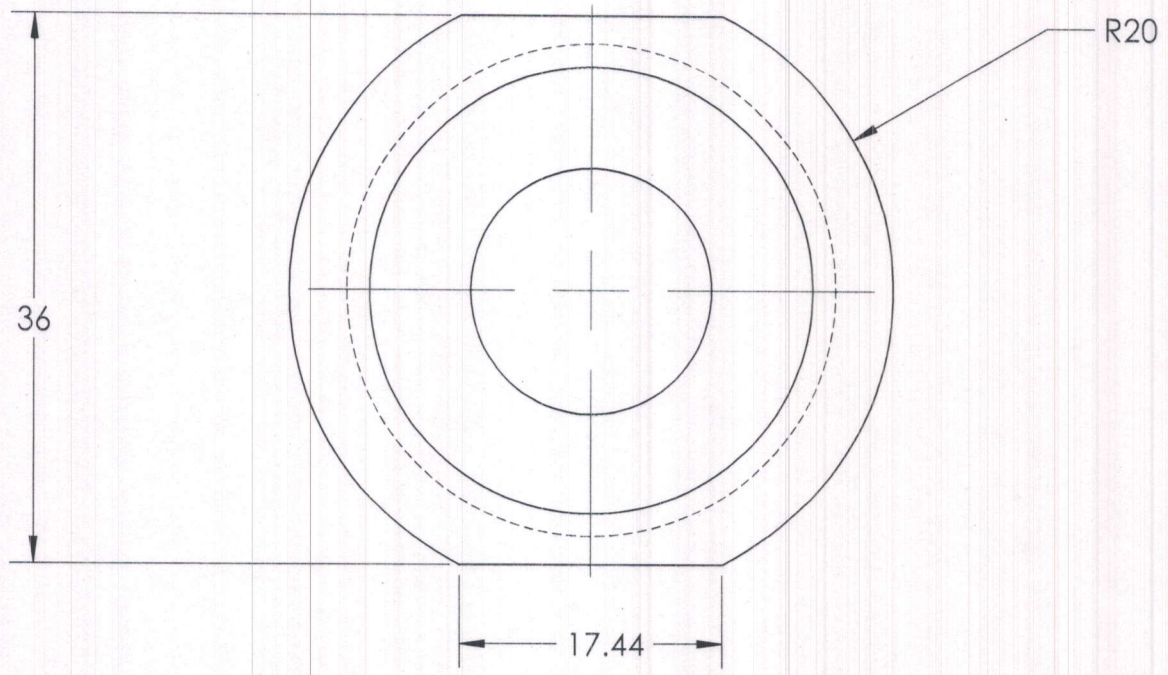
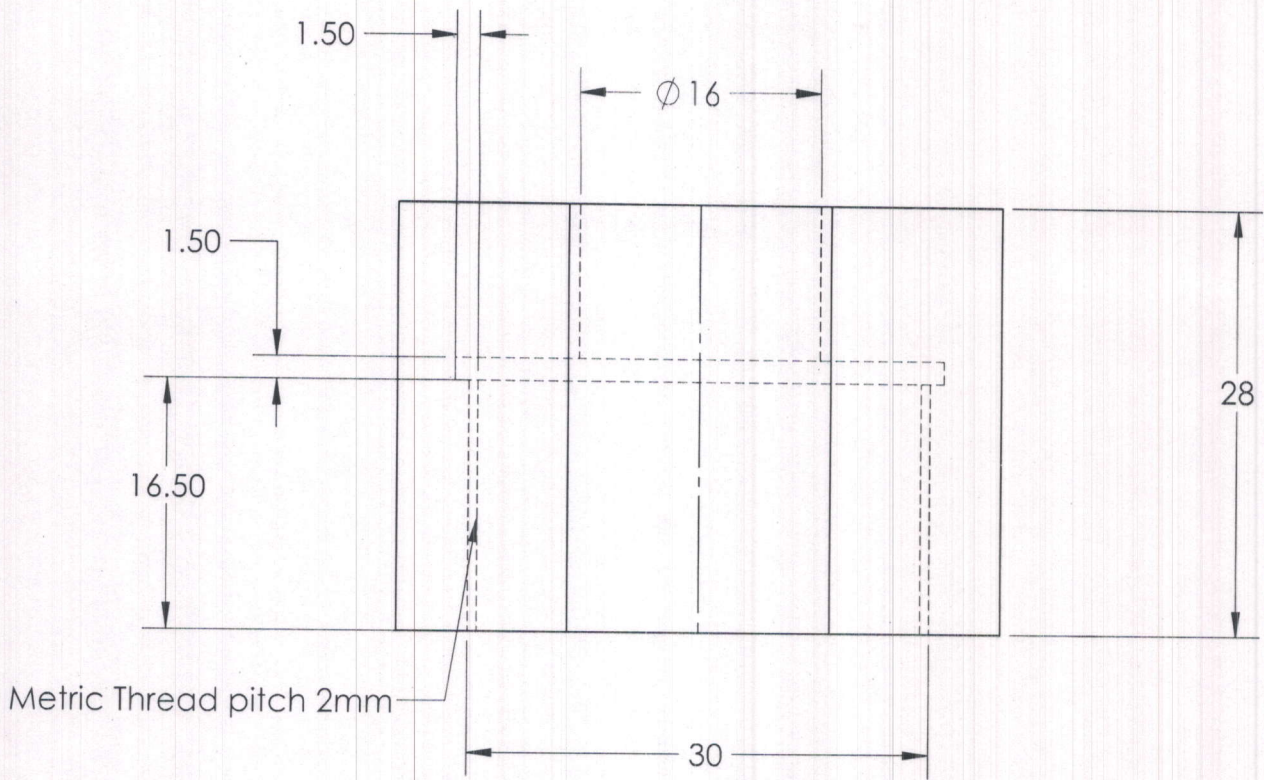


M10x1.5 Tapped Hole X 6No.s

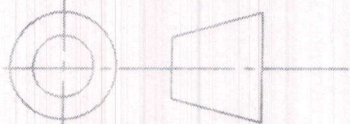


Target Adaptor

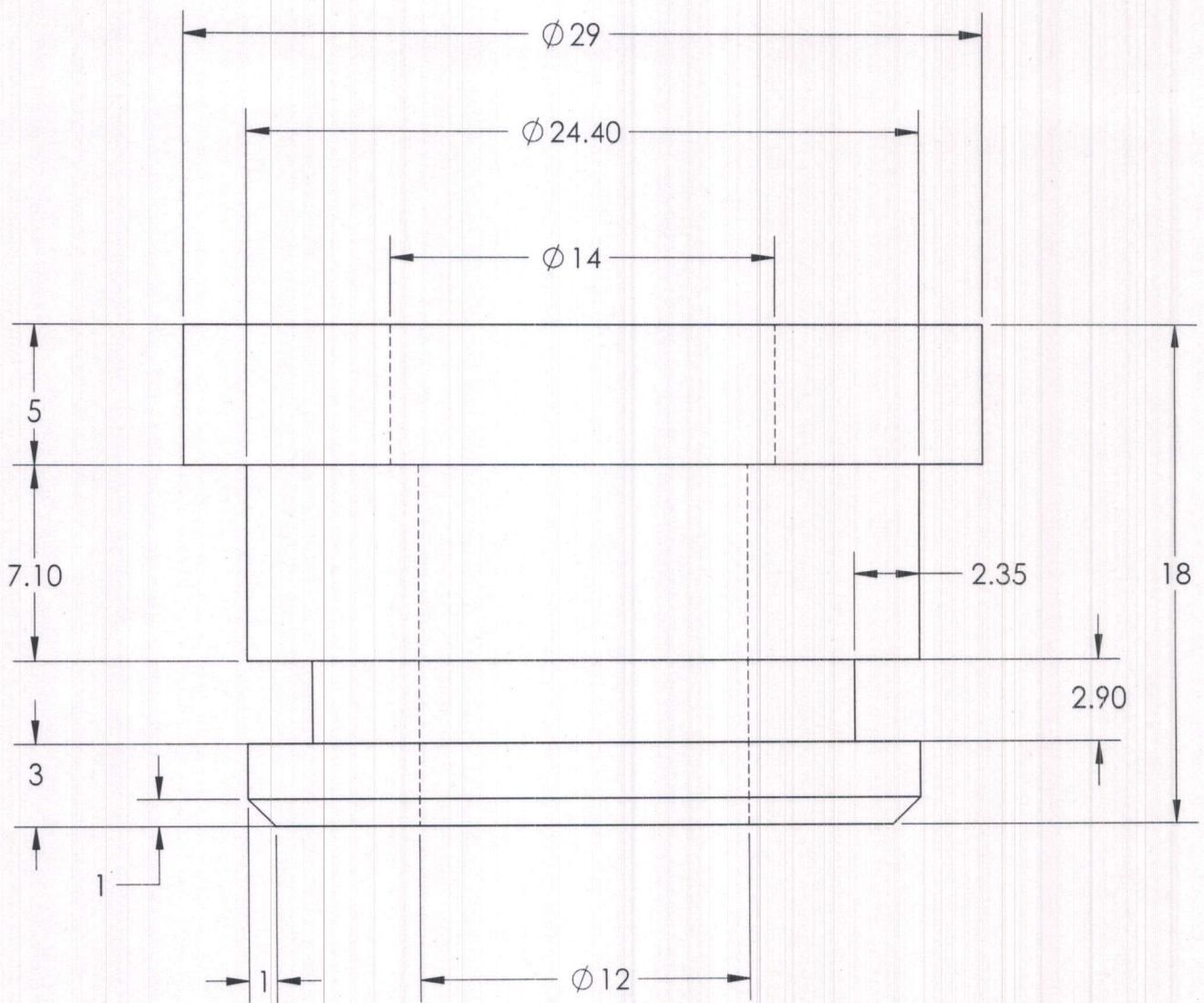
DRG. No.:08	All dimensions are in mm		
Quantity: 01	SCALE: 2:1	Material: SS304	
			<i>P. S. H.</i>



Closing Cap

DRG. No.: 09	All dimensions are in mm		
Quantity: 01	SCALE: 2:1	Material: SS304	

Handwritten signature



Plug

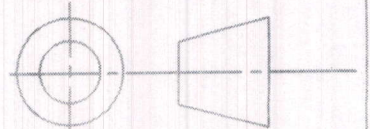
DRG. No.: 10

All dimensions are in mm

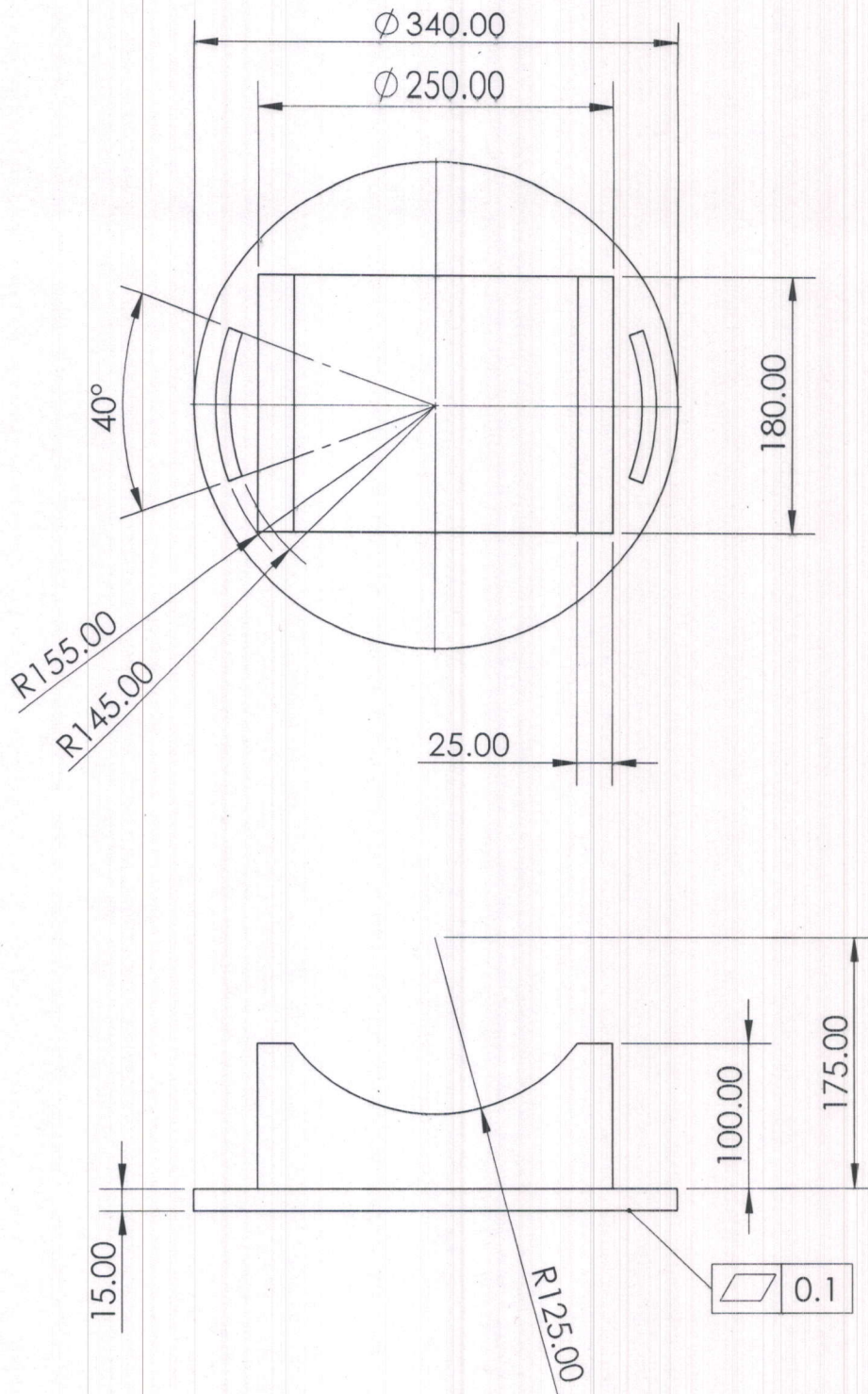
Quantity: 01

SCALE: 1:3

Material: SS304



R.H.



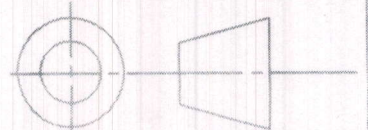
Rotating Disc

DRG. No.:11

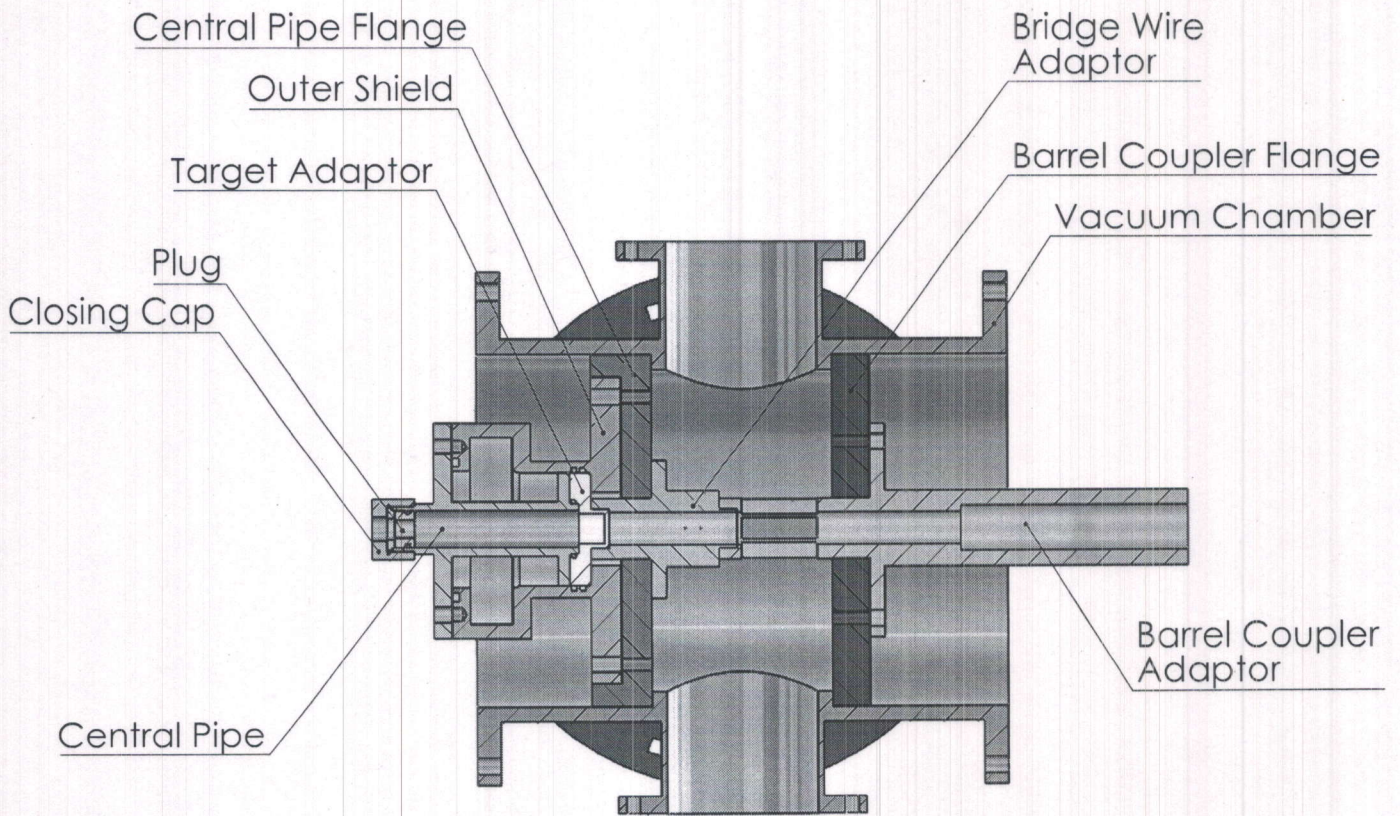
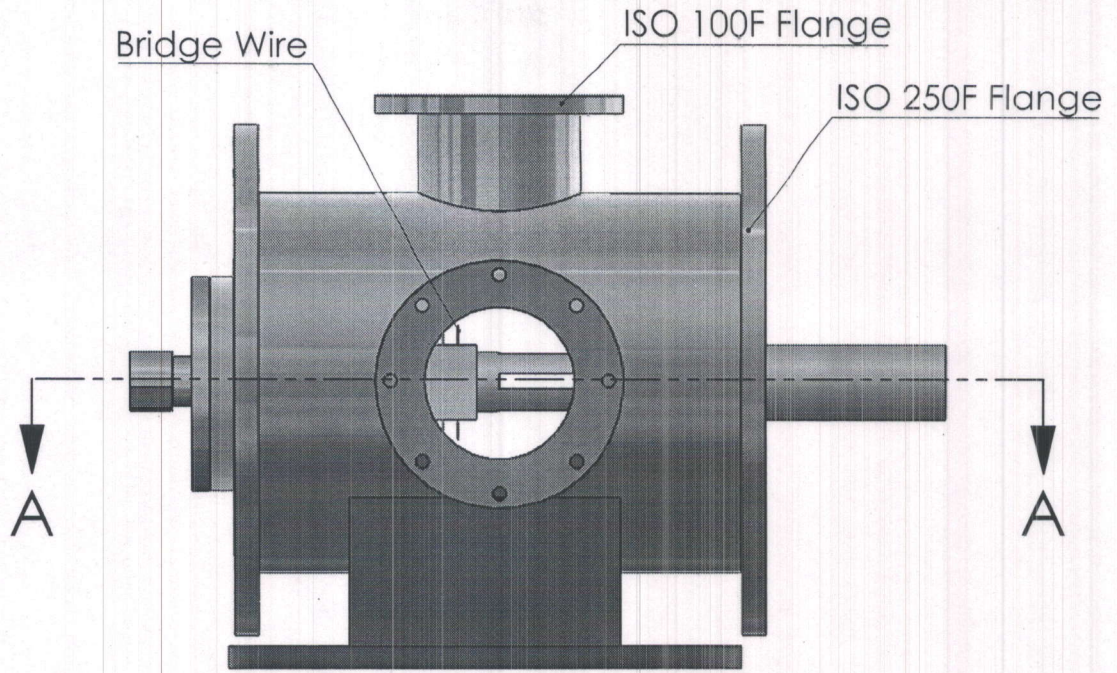
All dimensions are in mm

Quantity: 01

SCALE: 1:3 Material: SS304



Handwritten signature



SECTION A-A

Vacuum Chamber Assembly

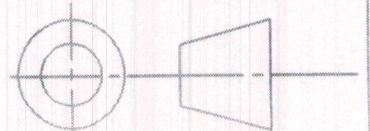
DRG. No.:12

All dimensions are in mm

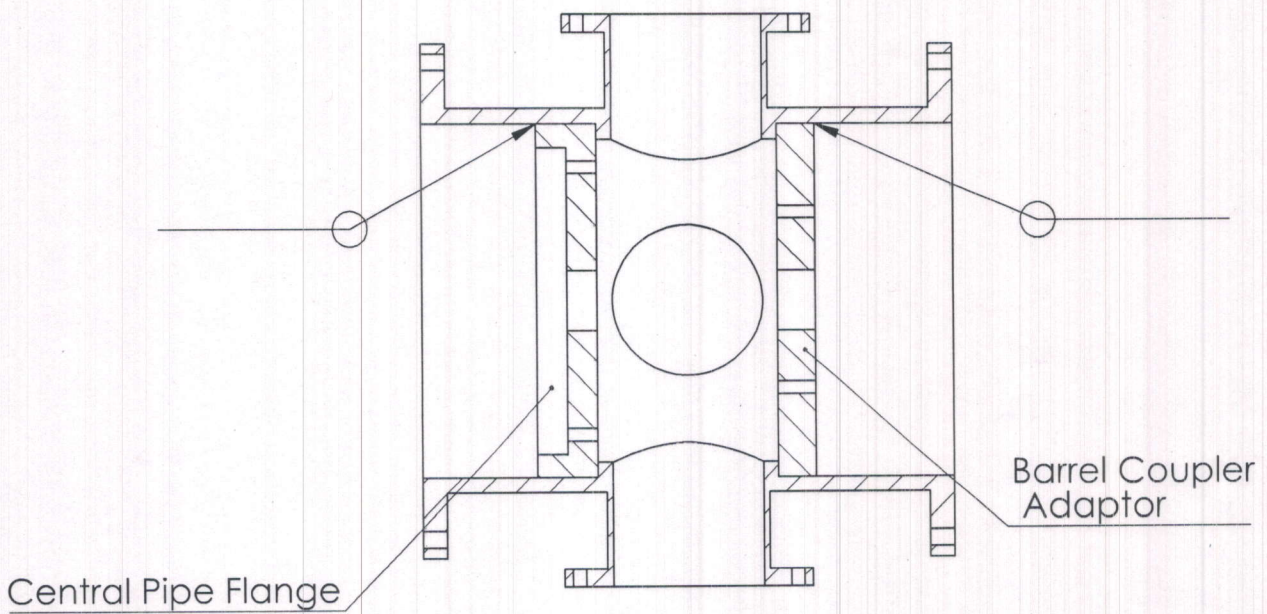
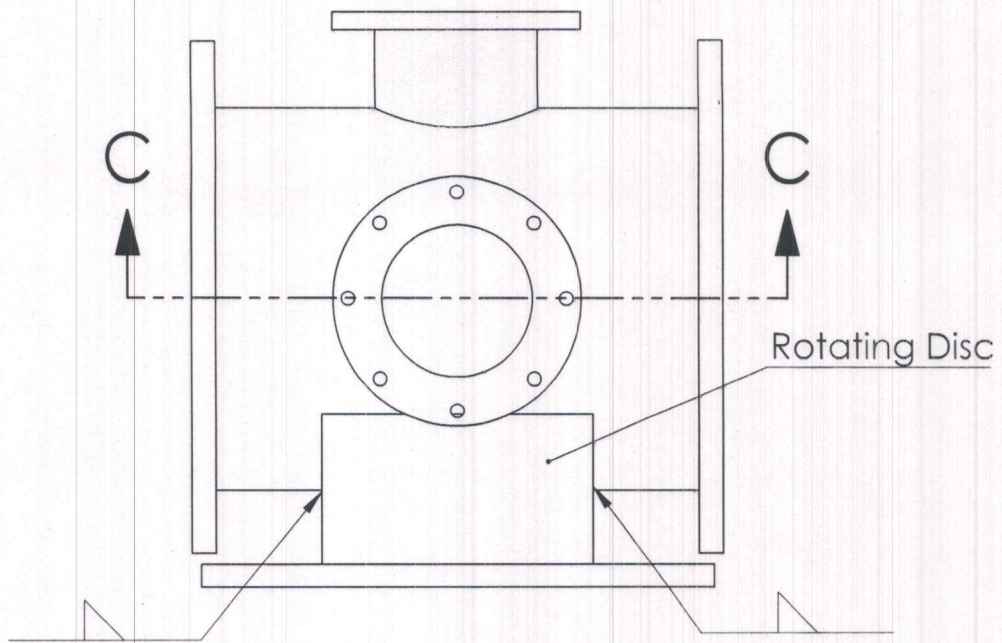
Quantity: 01

SCALE:

Material: SS304



Handwritten signature



SECTION C-C
SCALE 1 : 5

Vacuum Chamber_Weld Joints

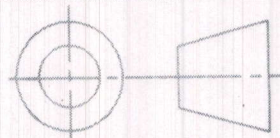
DRG. No.:13

All dimensions are in mm

Quantity:01No.

SCALE: 1:5

Material: SS304



R. S. A.