प्लाज़्मा अनुसंधान संस्थान
Institute for Plasma Research
Bhat, Gandhinagar 382 428, Gujarat, (India)
भाट, गांधीनगर ३८२ ४२८, गुजरात, (भारत)

निविदा आमंत्रण सूचना (एनआईटी)
Notice Inviting Tender (NIT)

निविदा सूचना TENDER NOTICE NO: IPR/TN/PUR/TPT/ET/21-22/052 दिनांकित DATED 23-02-2022

निदेशक, प्लाज़्मा अनुसंधान संस्थान (आईपीआर) के लिए और उनकी ओर से प्रमुख- क्रय एवं भंडार अनुभाग, प्लाज़्मा अनुसंधान संस्थान, क्रेता की निविदा विनिर्देशों के अनुसार अनुबंध के निष्पादन हेतु **दो भाग** में ऑनलाइन निविदाएं आमंत्रित करते हैं। निविदा आमंत्रण, निविदा शर्तें, अनुबंध की सामान्य शर्तें, अनुबंध की विशेष शर्तें और अनुबंध की अतिरिक्त शर्तें, यदि कोई हो, जो निविदा के अनुसार अनुबंध को नियंत्रित करेगी, संलग्न हैं।

बोली जमा करने के इच्छुक बोलीदाताओं से अनुरोध है कि वे इस दस्तावेज़ की सामग्री को देखें और सुनिश्चित करें कि निविदा आमंत्रण सूचना में निर्दिष्ट नियत तारीख और समय पर या उससे पहले और तकनीकी विनिर्देशों एवं नियमों और शर्तों के अनुसार बोली ऑनलाइन जमा करें और इसके साथ संलग्न प्रपत्र संख्या **e_IPR-PUR-103A** एवं **e_IPR-PUR-103B** डिजिटल रूप से हस्ताक्षरित या स्याही से हस्ताक्षरित वचनपत्र को अपलोड करें।

ऑफलाइन बोलियां हार्ड कॉपी सहित किसी भी रूप में स्वीकार नहीं की जाएगी।

Head-Purchase and Stores Department, Institute for Plasma Research, for and on behalf of Director, Institute for Plasma Research (IPR) invites online tenders IN **TWO PART** for execution of contract in accordance with the purchaser's tender specifications. The invitation to tender, tendering conditions, general conditions of contract, special conditions of contract and additional conditions of contract, if any, which will govern the contract pursuant to the tender are attached.

Bidders interested to submit bid are requested to go through the contents of the NIT and ensure that the bid is submitted online on or before the due date and time indicated in NIT and as per technical specifications and terms and conditions indicated herein and upload digitally signed or ink signed undertaking of Form Nos. **e_IPR-PUR-103A** and **e_IPR-PUR-103B.**

Off line bids including hard copy in any form will not be accepted.

प्रमुख-खरीद अनुभाग / Head-Purchase Section
निदेशक, आईपीआर के लिए और उनकी ओर से / For and on behalf of Director, IPR
(खरीदार / The Purchaser)

संलग्नक: ऊपर के रूप में। / Encl: as above.

निविदा सूचना TENDER NOTICE NO: IPR/TN/PUR/TPT/ET/21-22/052 दिनांकित DATED 23-02-2022

निम्नलिखित के लिए प्रतिष्ठित और योग्य पार्टियों से ई-निविदा विधि के माध्यम से **दो भाग** में ऑनलाइन निविदा आमंत्रित की जाती है।

Online tender is invited in **TWO PARTS** through e-tendering mode from reputed and eligible parties for the following.

कार्य/वस्तु विवरण / Work/Item Description	Manufacturing Drawings, Fabrication, Assembly, Pre-dispatch Inspection & Testing, Supply, Installation and Final Acceptance Tests at IPR of Ohmic Coil and Toroidal Field Coils Assembly alongwith Mandatory Spares as per the detailed specifications mentioned in the tender document.
निविदा शुल्क / Tender Fee	Not Applicable
बयाना राशि जमा (ईएमडी) / Earnest Money Deposit (EMD)	Rs. 170000.00 **Earnest Money Deposit (EMD)** must be in the form of **Demand Draft drawn** in favour of "**Institute for Plasma Research**" payable at **Gandhinagar** and **a copy** thereof **must be uploaded along with quotation.** Demand Draft shall be sent to "**Head-Purchase Section, Institute for Plasma Research, Bhat, Near Indira Bridge, Gandhinagar-382428** in a **sealed envelope super scribing** boldly **Tender Number and Due date, so as to reach before the due date and time. Offers opened without receipt of EMD before due date and time will be rejected. EMD will be forfeited if the bidder withdraws or amends, impairs or derogates from tender in any respect within the period of validity of the tender.** **Exemption from Payment of EMD : As per Tender Document**
प्रकाशन तिथि / Publishing Date	**23-02-2022 at 18:00 Hrs.**
दस्तावेज़ डाउनलोड / बिक्री प्रारंभ तिथि / Document Download / Sale Start Date	**23-02-2022 at 18:00 Hrs.**
स्पष्टीकरण प्रारंभ तिथि / Seek Clarification Start Date	**23-02-2022 at 18:00 Hrs.**
स्पष्टीकरण समाप्ति तिथि / Seek Clarification End Date	**10-03-2022 by 17:00 Hrs.**
आईपीआर द्वारा स्पष्टीकरण का जवाब / Response to Clarification by IPR	**25-03-2022** by **17.00 Hrs.**
बोली जमा करने की तिथि / Bid Submission Start Date	**26-03-2022** at **10.00 Hrs.**
बोली जमा करने की अंतिम तिथि / Bid Submission Closing Date	**19-04-2022** at **13.00 Hrs.**
भाग-I (तकनीकी बोली) के ऑनलाइन खुलने का समय और तिथि / Time and Date of online Opening of PART-I (Technical Bid)	**20-04-2022** at **14.00 Hrs.**
भाग-II के ऑनलाइन खुलने का समय और तिथि (मूल्य बोली) / Time and Date of online Opening of PART-II (Price Bid)	**Will be declared later on**

पूर्व-बोली पूछताछ की प्राप्ति के बाद 17-03-2022 @ 10:30 **बजे पर वीडियो कॉन्फ्रेंस के माध्यम से विक्रेताओं के साथ प्री-बिड मीटिंग आयोजित की जाएगी। इच्छुक विक्रेताओं को** 15-03-2022 **पर या उससे पहले निम्नलिखित लिंक के माध्यम से पूर्व-बोली बैठक में भाग लेने के लिए सवयं को पंजीकृत करना आवश्यक है:**

https://forms.gle/oTiKv6St3ojCupL1A

पासवर्ड के साथ वीडियो कॉन्फ्रेंस के माध्यम से निर्धारित पूर्व-बोली बैठक में शामिल होने के लिए वेब लिंक को उन विक्रेताओं के साथ साझा किया जाएगा, जिन्होंने 16th March, 2022 तक केवल उपरोक्त लिंक के माध्यम से (पूर्व-बोली बैठक भागीदारी के लिए) पंजीकृत किया है। यदि, उन्हें वीडियो कॉन्फ्रेंस में शामिल होने के लिए लिंक प्राप्त नहीं होता है, वे निविदा आमंत्रण अधिकारी से nodalofficer.et@ipr.res.in **पर संपर्क कर सकते हैं।**

कृपया ध्यान दें कि यदि इस निविदा में किसी भी प्रकार का स्पष्टीकरण आवश्यक हो, चाहे वह तकनीकी है या अन्यथा, तो बोलियां जमा करने से पहले स्पष्टीकरण प्राप्त करना होगा।

पात्रता मानदंड और निविदा दस्तावेज के साथ विस्तृत निविदा सूचना वेबसाइट https://eprocure.gov.in/eprocure/app **पर नि:शुल्क देखने और डाउनलोड करने के लिए उपलब्ध है। ई-निविदा प्रक्रिया में भाग लेने के लिए, उपरोक्त ई-निविदा पोर्टल पर पंजीकृत होना अनिवार्य है और डिजिटल हस्ताक्षर प्रमाणपत्र (कक्षा-**III) **होना आवश्यक है। नए पंजीकरण/निविदा के लिए, बोलीदाता नीचे दिए गए "ऑनलाइन बोली जमा करने हेतु निर्देश" पढ़ सकते हैं।**

इस एनआईटी की एक प्रति संस्थान की वेबसाइट **www.ipr.res.in** पर भी उपलब्ध है**।**

Pre-bid meeting with the vendors will be held through Video Conference on **17-03-2022** @ 10:30 Hrs onwards after receipt of pre-bid queries. The interested vendors are required to register themselves for participation in the pre-bid meeting through the following link on or before **15-03-2022**:

https://forms.gle/oTiKv6St3ojCupL1A

The web link to join the scheduled pre-bid meeting through Video Conference along with password will be shared with the vendors who have registered themselves through the above link only (for pre-bid meeting participation) by 16th March, 2022. In case, if they do not receive the link to join the video Conference, they may contact the Tender Inviting officer at nodalofficer.et@ipr.res.in

It may please be noted that any clarifications required in this tender either technical or otherwise shall be carried out before submission of bids.

Detailed tender notice along with Eligibility criteria and Tender Document is available on website https://eprocure.gov.in/eprocure/app for free view and downloading**.** For participating in the e-tendering process, it is mandatory to get registered on the above e-tender portal and required to have Digital Signature Certificate (Class -III). For new registration/ tendering, bidders may go through the "**Instructions for Online Bid Submission**" provided as under.

A copy of this NIT is also available on the Institute's website **www.ipr.res.in** .

Instructions for Online Bid Submission

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submittingtheir bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at: https://eprocure.gov.in/eprocure/app.

REGISTRATION

1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: https://eprocure.gov.in/eprocure/app) by clicking on the link"**Online bidder Enrollment**" on the CPP Portal which is free of charge.
2) As part of the enrolment process, the bidders will be required to choose a unique usernameand assign a password for their accounts.
3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile.
5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
6) Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

SEARCHING FOR TENDER DOCUMENTS

1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.
2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e- mail in case there is any corrigendum issued to the tender document.
3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" or "Other Important Documents" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

Note: *My Documents space is only a repository given to the Bidders to ease the uploading process. If Bidder has uploaded his Documents in My Documents space, this does not automatically ensure these Documents being part of Technical Bid.*

SUBMISSION OF BIDS

1) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.
4) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.
5) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

6) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

7) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

8) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

9) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

ASSISTANCE TO BIDDERS

1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.

2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk.

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प्लाज्मा अनुसंधान संस्थान
INSTITUTE FOR PLASMA RESEARCH
(भारत सरकार के परमाणु ऊर्जा विभाग का सहायता प्राप्त संस्थान)
(An Aided Institute of Dept. of Atomic Energy, Govt. of India)
इंदीरा ब्रिज के पास, भाट, गांधीनगर – 382428,
NEAR INDIRA BRIDGE, BHAT, GANDHINAGAR-382428

TWO-PART TENDER

INVITATION TO TENDER

Head-Purchase and Stores Department, Institute for Plasma Research, for and on behalf of Director, Institute for Plasma Research (IPR) invites online tenders IN **TWO PART** for execution of contract in accordance with the purchaser's tender specifications. The invitation to tender, tendering conditions, general conditions of contract, special conditions of contract and additional conditions of contract, if any, which will govern the contract pursuant to the tender are attached.

Bidders interested to submit bid are requested to go through the contents of the NIT and ensure that the bid is submitted online on or before the due date and time indicated in NIT and as per technical specifications and terms and conditions indicated herein and upload digitally signed or ink signed undertaking of Form Nos. **e_IPR-PUR-103A** and **e_IPR-PUR-103B.**

Off line bids including hard copy in any form will not be accepted.

Head-Purchase Section
For and on behalf of Director, IPR
(The Purchaser)

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DEFINITIONS AND INTERPRETATION

In the invitation to tender, tendering condition, contract, general conditions of contract and special conditions of contract, unless the context otherwise require the following interpretation shall be valid.

1.1 "BID" shall mean the quotation in response to the NIT submitted with EMD, if applicable and within the period mentioned in the NIT.

1.2 "BIDDER" means an individual, a firm, a limited liability partnership, a company whether incorporated or not, an association of person or joint venture who has submitted a bid to execute the contract and shall be deemed to include his successors, heirs, executors, administrators and permitted assignees, as the case may be.

1.3 "CONSIGNEE" shall mean the authorised representative or officer of the purchaser at the site to whom the stores are required to be delivered in the manner indicated in the contract.

1.4 "CONTRACTOR" means a successful bidder with whom a contract agreement has been entered to by the purchaser and shall be deemed to include his successors, heirs, executors, administrators and permitted assignees, as the case maybe.

1.5 "CONTRACT" or "PURCHASE ORDER" means and comprises of a letter or e- mailor ink signed or digitally signed document issued/sent by the purchaser conveying acceptance of bidder's/contractor's bid submitted in response to the NIT within the validity of the bid and any subsequent amendments/alterations thereto made on thebasis of mutual agreement.

1.6 "DELIVERY DATE" means date of completion of contract excluding warranty period and its obligations as stipulated in the contract.

1.7 "DIRECTOR, INSTITUTE FOR PLASMA RESEARCH" means the Director, Institute for Plasma Research, for the time being in the charge of the Purchase and Stores Department, IPR and includes Head- Purchase & Stores Department, Head- Purchase Section, Purchase Officer-II, Purchase Officer-I, Dy. Officer (Purchase) or Assistant Purchase Officer of the said Institute for Plasma Research or any other officer authorized in writing to execute the contract on behalf of the purchaser.

1.8 "EARNEST MONEY DEPOSIT (EMD)" means the deposit made in the form and manner specified in the NIT by the participating bidder towards bid security.

1.9 "HINDRANCE" means an event resulting in stoppage or delay of work because of the purchaser as recorded by the contractor and authenticated by the purchaser.

1.10 "INSPECTOR" or "QUALITY SURVEYOR" means any engineer/officer nominated and deputed by the purchaser or their appointed consultants or quality surveillance agency or any other person authorized by the purchaser from time to time to act as his representative for the purpose of inspection of stores under the contract.

1.11 "Notice Inviting Tender (NIT)" means invitation to tender, tendering condition, general conditions of contract, special conditions of contract, additional conditions of contract, if any and any other document mentioned thereto.

1.12 "PARTIES" mean the parties to the contract, i.e., the contractor and the purchaser named in the contract.

1.13 "PERFORMANCE SECURITY BANK GUARANTEE (PSDBG)" means the depositmade in the form and manner specified in this document by the contractor towards satisfactory performance of the contract till completion of the warranty period.

1.14 "PURCHASER" means Director, Institute for Plasma Research forthe time being the Head- Purchase and Stores Department or any other authorized officer and includes his successor or assignees.

1.15 "STORES" or "PLANT" means the materials, goods, machinery, plants, equipment or parts thereof specified in the contract which the contractor has agreed under the

contract.

1.16 “SUB-CONTRACTOR” means any contractor engaged by the contractor with the prior approval of the purchaser in relation to the contract.

TWO PART TENDER SECTION –A

Invitation to Tender and Tendering Conditions

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1. INVITATION TO TENDER

1.1 Head-Purchase and Stores Department, Institute for Plasma Research, for and on behalf of Director, Institute for Plasma Research (IPR), invites bids for execution of contract in accordance with the purchaser's technical specifications. The conditions of contract which will govern the contract pursuant to this tender are available in the NIT. Bidders who are in a position to be submitted online in Two Parts in English language as under:

1.2 PART-I (TECHNO-COMMERCIAL): This part of the bid shall include/contain all technical details, technical specifications, drawings submit their bid for the same as per the conditions stipulated in the NIT are requested to submit their bid in a manner and method specified in the NIT.

2 EMD

2.1 EMD where called for will have to be submitted by the participating bidder in the form and manner specified in the NIT so as to reach the purchaser at the address mentioned in the NIT on or before the due date and time mentioned in the NIT.

2.2 Non receipt of EMD as per Clause no. 2.1 above, will result in rejection of bid without any reference to the bidder, except in cases given under Clause no. 2.3 below.

2.3 The following categories of bidders are exempted from submission of EMD:

2.3.1 Bidders having valid registration with Directorate of Purchase and Stores, Department of Atomic Energy;

2.3.2 Micro and Small Enterprises having valid registration with MSME or NSIC or Udyog Aadhaar/ Udyam Aadhar in respect of procurement of goods and services, produced and provided by MSE and startups recognized by Department of Industrial Policy & Promotion (DIPP) are eligible for exemption according to government policies.

2.3.3 Foreign Bidder directly submitting bid (not through their Indian Agent or Indian Counterpart or Indian subsidy) in the currency other than INR.

2.4 Forfeiture of EMD

2.4.1 EMD shall be forfeited if the bidder withdraws or amends impairs or derogates from the tender in any respect within the validity of his bid.

2.4.2 If the successful bidder fails to furnish the required Security Deposit/ Performance Security Bank Guarantee (PSDBG), the EMD furnished shall be forfeited.

2.5 REFUND OF EMD

2.5.1 EMD of unsuccessful bidders will be returned within thirty days after finalization of the tender or after expiry of validity of their bid, whichever is later.

2.5.2 EMD of successful bidders will be returned within thirty days of submission of security deposit as called for in the contract.

3. MANNER AND METHOD FOR SUBMISSION OF BIDS

3.1 All bids in response to this invitation to tender shall, literature, reference to earlier supplies of similar stores along with quantity, time required for submission and approval of drawings, manufacturing and delivery period, inspection/testing procedure, itemized list of spares and quantity recommended by the bidder for purchase, term of price, mode and payment terms, mode of despatch, excluding any price details thereof. The bidder shall note that this part of the bid is purely techno-commercial.

3.2 The bidder shall not mention the price of the stores or the financial bid in the uploaded document as Part-I of the bid. If Bidder includes prices of the stores or the financial bid in Part-I (Techno-Commercial) of the bid, such bids will be rejected without any notice to the bidder.

3.3 Part-II (Price) of the bid shall be submitted strictly online in accordance with the format provided by the Purchaser.

3.4 The bidder shall quote cost of essential accessories and spares specified in the price bid format, wherever asked for, to make their bid complete in all respect as per purchaser's technical specifications in Part-II of bid.

3.5 If bidder indicates any changes of any nature of the Techno-Commercial bid or upload any technical document indicating changes of any manner/nature of Techno-Commercial bid in Part-II of the bid; such bids will be rejected without any notice to the bidder.

3.6 The bidder will co-relate the prices of stores in Part-II of the bid with the description of the stores indicated in Part-I (Techno-Commercial) of the bid in order to enable the purchaser to identify the prices with the corresponding stores in Part-I (Techno-Commercial) of the bid.

3.7 Both Part-I (Techno-Commercial) and Part-II (Price) of the bid should be submitted together online on or before the time and date specified for its submission in the NIT.

4 PRICE

4.1 The prices quoted must be FIRM during the currency of the contract.

5 PAYMENT TERMS

5.1 Standard payment terms for supplies made against this tender will be as indicated in Form no. IPR-P-100.

6 CONDITIONAL DISCOUNT

6.1 In case the bidder offers any conditional discount with regard to acceptance of the bid within a specific period or specific payment terms, delivery date, quantity, etc., the purchaser will not take into consideration such conditional discount while evaluating the bid.

7 VALIDITY OF BIDS

7.1 Bids shall be kept valid for acceptance for a period as mentioned in the NIT. Bids with shorter validity period shall be rejected without any notice to the bidder.

8 ONE BID PER BIDDER

8.1 Each bidder shall submit only one bid for a tender. All bids of the bidder who submits more than one bid for the same tender; will be rejected without any notice to the bidder.

8.2 If a bidder submits bid on behalf of two principals or if the bidder and his sister concern participates in the same tender or such instances where participation of any bidder leads to conflict of interest, the bid will be rejected without any notice to the bidder.

9 QUALIFYING REQUIREMENTS

9.1 The bidder is required to upload all supporting documents/information on the e- tender portal necessary for establishing their qualification as mentioned in the NIT.

10 PRE-BID MEETING

10.1 A pre-bid meeting for providing clarifications to the bidder will be held on-line unless otherwise specified, on the date and time mentioned in the NIT. Bidders participating in this tender and who have enrolled in our e-tender portal (https://eprocure.gov.in/eprocure/app) can login and upload their queries. Bidders are requested to upload their queries both Technical and Commercial well in advance at the eTender portal within the due date and time prescribed for the submission of queries. Queries/clarification/information sought in any other manner shall be ignored. Any modification to the tender, which may become necessary as a result of the pre-bid meeting, will be uploaded on the e-tender portal against the particular Tender ID. Bidders are requested to update themselves by visiting e-tender portal

(https://eprocure.gov.in/eprocure/app frequently. It may be noted that no queries will be entertained after the date and time for submission of queries. Therefore, bidders in their own interest should participate in the pre-bid meeting to understand the tendered requirements.

11 OPENING OF BID

11.1 Unless otherwise preponed or postponed, bids will be opened online in two stages on the date and time indicated in the NIT.

11.2 Part-I (Techno-Commercial) of the bid will be opened at the first stage on the due date and time indicated for opening in this NIT.

11.3 All the bidders who have submitted bids within the due date and time specified for its submission can view the list of bidders who have participated in the tender online after opening of the tender.

11.4 After completion of the evaluation of the Part-I (Techno-Commercial) of the bid, the due date and time for opening of Part-II (Price) of the bid shall be intimated to the bidders whose bids are found technically acceptable to the purchaser. The due date and time will also be displayed on the e-tender portal.

11.5 Part-II (Price) of the bid, whose Part-I of the bid is found to be techno-commercially acceptable to the Purchaser can be viewed.

12 DECLARATION OF HOLIDAY

12.1 If the date(s) specified for opening of the bid is/are declared as holidays due to any administrative reasons, then the due date(s) for receipt/opening of bid will get postponed to the next working day.

13 EVALUATION OF BIDS

13.1 TECHNICAL CLARIFICATION

After opening the Part – I (Techno-Commercial) of the bid, if it becomes necessary for the technical authorities/user department of the purchaser to seek clarifications from the bidder, the same will be sought for from the bidder by the Purchase Section. In such an event, the bidder shall furnish all techno-commercial information/clarification to the Purchase Section to reach them on or before the due date and time fixed by the Purchaser. If the techno-commercial clarifications/details sought for by the Purchase Section from the bidder do not reach them on or before the due date and time fixed for its receipt, such bid will be liable for rejection at the discretion of the purchaser without any further notice. The bidder shall not, however, furnish a new bid at this stage. A new bid at this stage will be rejected by the purchaser.

13.2 Evaluation of bids shall be based on technical specification attached with tender and on the basis of total landed cost considering taxes/duties as applicable without any concession/exemption.

13.3 **DETERMINATION OF TOTAL LANDED COST FOR COMPARISON (AIR/SEA SHIPMENTS)**

13.3.1 The following will be the loading for air/sea freight

13.3.1.1 FCA/FOB price + air/sea freight @10% of FCA/FOB price = CFR price

13.3.1.2 CFR price + insurance @ 1% of CFR price= CIF price

13.3.1.3 CIF price + taxes & duties as applicable =DDP

13.3.1.4 [DDP + clearing charges @ 1% of CIF price + inland freight @ 1% of CIF price] x exchange rate = total landed cost in INR

Exchange rate means Purchase price of the quoted currency as intimated by State Bank of India and as applicable on the date of opening of bid.

13.4 **CAPACITY AND FINANCIAL CAPABILITY**

13.4.1 In case it is found that the bidder does not possess the requisite infrastructure, capacity, capability and their financial capability satisfactory or not meeting the qualification criteria indicated in the NIT or not complied with warranty obligations; such bids are liable to be rejected by the purchaser during evaluation of bid.

13.5 **PAST PERFORMANCE**

13.5.1 In case the past performance of the bidder is not found to be satisfactory with regard to quality, delivery date, warranty obligation and compliance of terms and conditions of the contract, their bid is liable to be rejected by the purchaser during evaluation of bid.

13.6 **POST SUPPLY INSPECTION**

13.6.1 The bidder should clearly mention requirement of post supply inspection in the bid. The purchaser reserves the right to deny access to the contractor or its representative or any third party to the Stores supplied by the contractor after its supply. Bids which are not complying with this post supply inspection requirement are liable to be rejected by the purchaser during evaluation of bid.

14 QUANTITY

14.1 Quantities mentioned in the NIT are approximate. One or more of the items of the stores tendered or a portion of any one or more of the items of such stores may be accepted by the purchaser. A bidder shall be bound to supply to the purchaser such an item or items or such portion or portions of one or more of the items as may be accepted by the purchaser.

15 INSTALLATION/ERECTION AND COMMISSIONING

15.1 Wherever, the purchaser's NIT includes installation and commissioning or supervision of installation and commissioning or erection and commissioning of the stores by the bidder, the bidder must clearly and separately quote the prices for the supply of the Stores and the charges for installation and commissioning or its supervision or erection and commissioning, as the case may be.

15.2 The bidder should not include charges towards installation and commissioning or its supervision or erection and commissioning in the price of the stores offered. In case of failure to quote separately, purchaser will deduct taxes as applicable on full contract value.

15.3 In respect of contracts involving installation and commissioning or its supervision or erection and commissioning by the contractor where identifiable charges for the same have been quoted, the contractor shall bear the tax liability as per the rates prevailing at the time of undertaking the job in accordance with the relevant Act/Laws in force in India.

15.4 When the scope of the contract includes installation and commissioning, it shall be the sole responsibility of the contractor to undertake the installation and commissioning as and when called for, by the purchaser.

16 TEST CERTIFICATE

16.1 Wherever the tests and test certificates are required by the purchaser, test shall be conducted and test certificate shall be furnished by the contractor as per the requirement of technical specification.

17 OPERATION/INSTRUCTION MANUAL:

17.1 In respect of stores where instruction/operation manual is essential to enable the purchaser to put the stores into proper use, the contractor shall furnish such instruction/operation manual in English language along with the stores free of cost.

18 LEAFLET/CATALOGUE:

18.1 Bidder shall upload all necessary catalogues/drawings technical literature data sheet as are considered essential for full and correct evaluation of their technical bid. The bids are liable to be ignored if this condition is not complied with.

19 ACCEPTANCE OF BID

19.1 The purchaser shall be under no obligation to accept the lowest or any other bid and shall be entitled to accept or reject any bid in part or full without assigning any reasons whatsoever.

19.2 The purchaser also reserves the right to reject the bid, which is not in conformity with the conditions contained in this document or the instructions to bidders attached in NIT, if any including non-acceptance of submission of securities as called for in the NIT.

Clauses 20.0 to 24.0 are applicable only for bids quoted in INDIAN RUPEES.

20 STATUTORY LEVIES SUCH AS GOODS AND SERVICE TAX

20.1 Statutory levies at rate applicable for the purchaser within original delivery date will be admitted by the purchaser.

20.2 GOODS AND SERVICE TAX

20.2.1 The purchaser is entitled for GST at the concessional rate as per notifications issued by the Government, as amended from time to time, in respect of purchases made for certain stores.

20.3 Decision to avail concession/exemption, in each case will be at the sole discretion of the purchaser. Wherever concession/exemption is mentioned in the contract, purchaser will provide the relevant certificate to the contractor. It would be the responsibility of the contractor to obtain the same from the purchaser before effecting the delivery of stores failing which the excess tax paid by the contractor shall not be reimbursed by the purchaser.

21 CUSTOMS DUTY

21.1 In case an Indian bidder submits a bid for supply of outrightly imported stores in Indian Rupees, they should quote price for free and safe delivery of stores at destination. The name of their foreign contractor and country of origin shall also be indicated. However, purchaser will neither provide any certificate for availing concession/exemption from payment of customs duty nor will reimburse the same.

21.2 Bids on High Sea sales basis will not be considered.

22 FLUCTUATION IN THE STATUTORY LEVIES

22.1 Unless otherwise specifically agreed to in terms of the contract, the purchaser shall not be liable for any claim on account of fresh imposition and /or increase in statutory levies on raw materials and/or components used directly in the manufacture of the contracted stores, taking place during the pendency of the contract. However, any reduction in statutory levies on these raw materials and/or components must be passed on to the purchaser.

23 AUTHENTICATION

23.1 The person digitally signing and uploading the bid or any other document in respect of the tender on behalf of the bidder shall be deemed to warrant that he has the authority to do so and the action will be binding on the bidder. The bidder shall indemnify the purchaser from any consequences arising thereof.

23.2 Overseas bidder should also refer Clause No. 46.1 of this Section for details on obtaining digital signature certificate valid in India.

23.3 If, on enquiry or later on, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the bidder and signatory liable jointly and severally for all costs

and damages.

24 DELIVERY OF STORES FOR CONTRACT IN INDIAN CURRENCY

24.1 Bidder should note that the bid is liable for rejection by the purchaser unless the bidder offers to complete the contract within the delivery date specified by the purchaser. The prices quoted by the bidder should include all charges involved for direct and safe delivery of the stores to the place of delivery indicated by the purchaser. Purchaser will neither undertake responsibility for transit insurance nor pay for it separately. The bidder shall quote as per the delivery terms stated in the NIT.

24.2 The stores shall neither be despatched under 'purchaser's risk' nor consigned to 'self', but only to the consignee indicated in the contract. Non-adherence to this condition shall make the contractor liable to bear all consequential penalties/expenses such as demurrage, wharfage, etc. which the purchaser may incur.

24.3 The consignee will, as soon as possible, but not later than thirty days from the date of arrival of stores at destination notify the contractor of any loss or damage to the stores that may have occurred during transit to enable the contractor to repair/rectify the defects/damages or replace the stores as is appropriate, free of all charges. In case it is desired by the contractor for returning of the stores to them, all expenses towards transportation, etc. will be borne by the contractor and the contractor will also furnish bank guarantee as per format in Annexure for the payment already made by the purchaser to the contractor on this account, if any.

25. DOCUMENTS TO BE UPLOADED BY INDIAN BIDDER

25.1 Indian bidders are required to upload a copy of the PAN card/letter and copy of the factory registration/licence or shop establishment certificate/GSTIN etc. as applicable with the bid.

26. PURCHASE/PRICE PREFERENCE

26.1 Purchase/price preference to industries will be given as per the policy of the Government of India in force at the time of opening of bids provided their bid is in compliance with the conditions of the policy.

26.2. PURCHASE PREFERENCE FOR MICRO & SMALL ENTERPRISES (MSE's):

26.2.1. Benefits, as prescribed by the MSME Policy of the Government of India shall be provided to MSE vendors registered as manufacturers for the goods procured or for the service providers for services to this Department. The procuring Entity reserves its option to give price preference to Micro and Small Industries in comparison to the large-scale industries as per policies of the Government from time to time.

26.3. MAKE IN INDIA:

26.3.1. As defined under the Public Procurement (Preference to Make in India), order 2017, Revised order dated: 16/09/2020 or as being revised from time to time, in procurement of goods or services in respect of which the Nodal Ministry/Department has communicated, that there is sufficient local capacity and local competition, only "Class-I local supplier', as defined under the said order, shall be eligible to bid irrespective of purchase value.

26.3.2. Only "Class-I local supplier" and "Class-II local supplier', as defined under the above said order, shall be eligible to bid in procurements under taken by this Directorate, except where the mode of procurement is by issue of Global Tender Enquiry. The bidding supplier shall indicate the percentage of local content for the item being offered in their bid.

26.3.3. Where the procurement is by issue of Global Tender enquiry, Non local suppliers, shall also be eligible to bid along with "Class-I local suppliers and Class-II local suppliers". Suppliers/bidders offering imported products will fall under the category of Non-local suppliers.

26.3.4. Subject to the provisions of the above said order, and to any specific instructions issued by the Nodal Ministry or in pursuance of the said order, purchase preference shall be given to "Class-I local Suppliers" in procurements under taken by this Directorate, in the manner specified there in the order.

26.3.5. The bidders along with their bid/tender shall be required to provide a self-declaration certificate of the local content (where the procurement value is Rs.10 Crore or less) for the item offered and their status as Class-I/Class-II/Non-Local supplier and their eligibility to participate in the tender as per Annexure-XI failing which bid will be rejected. In cases of procurement for a value in excess of Rs.10 crores, the "Class-I local supplier'/'Class-II local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of Contractors other than companies) giving the percentage of local content.

26.3.6. Self-declaration certificate should quantify the percentage of local content of the offered product only. It should also indicate the location. However, claiming the services such as transportation, insurance, installation & commissioning, training and after sale service support like AMC/CMC etc., shall not be considered as local content as per OM N.P-45021/102/2019-BE-II-Part(1)(E-50310) dated:4/03/2021 issued by Ministry of Commerce and Industry, DPIIT.

26.3.7. False declarations/violation of this order terms shall be deemed to be breach of code of integrity resulting in debarment of the firm for a period up to 2 years. Under such circumstances, the supplier shall not be considered for any preferences as proposed in the order.

26.3.8. Wherever the bids are received without accompanying the above said requisite certificate such offers shall be treated as incomplete and not considered.

26.3.9. Bidders/contractors are divided into three categories based on Local Content (The total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent):

26.3.9.1. Class-I local supplier is with local content equal to or more than as prescribed by the Nodal Ministry/ NIT, if prescribed, for the item being procured or 50% whichever is higher.

26.3.9.2. Class-II Local supplier is with local content more than as prescribed by the Nodal Ministry/NIT, if prescribed, for the item being procured or 20% whichever is higher, but less than that applicable for class-I local supplier.

26.3.9.3. Non-local supplier is with local content less than that applicable to class-II local supplier, as stated above.

Note: Where the estimated value of the procurement is less than Rs.5 Lakhs (or as being amended by the competent authority from time to time) is exempted from the provisions of the above Make in India policy as stated therein the order.

26.4. GLOBAL TENDER:

The currency of the price quoted in the bid can be in foreign currencies, in addition to the Indian rupees, except for expenditure incurred in India (Including incidental services rendered in India and agency commission, if any) which should be stated in Indian Rupees.

26.5. ELIGIBILITY OF BIDDERS FROM SPECIFIED COUNTRIES:

26.5.1. Orders issued by the Government of India restricting procurement from bidders of certain countries which shares a land border with India shall apply to this procurement.

26.5.2. Any bidder from a country which shares a land border with India (https://mea.gov.in/india-and-neighnours.htm), excluding countries as listed in the website of Ministry of External Affairs (https://meadashbaord.gov.in/indicators/92), to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects – hereinafter called "Restricted

countries') shall be eligible to bid in this tender only if the bidder is registered (https://dipp.gov.in/sites/default/files/Revised-Application-Format-for- Registration-of-Bidders-15Oct2020.pdf) with the Registration committee constituted by the Department for promotion of Industry and Internal Trade(DPIIT) . The bidders shall enclose valid registration certificate along with their offer. Wherever the bids are received without accompanying the above said requisite certificate such offers shall be treated as incomplete and not considered.

Furthermore, every bidder participating against this Department tender shall invariably enclose along with the Bid, a self-declared undertaking "Annexure to Bid Form: Eligibility Declarations" (Annexure-XII), failing which Bid will be rejected.

27. FREE ISSUE MATERIAL (FIM): (This clause shall apply only to contract for supply of fabricated stores with purchaser's FIM)

27.1 Wherever the contract envisage supply of FIM by the purchaser to the Indian contractor for fabrication of the stores, such FIM shall be safeguarded by a Bank Guarantee as per format in Annexure or insurance policy to be provided by the Indian contractor at his own cost for the full value of FIM and the insurance policy or Bank Guarantee shall cover, the following risks specifically and shall be valid for six months beyond the delivery date.

27.2 RISKS TO BE COVERED: Any loss or damage to the FIM due to fire, theft, riot, burglary, strike, civil commotion, terrorist act, natural calamities, etc. and any loss or damage arising out of any other causes such as other objects falling on FIM while in his possession including transit period.

Insured by:	(Name of the contractor)
Beneficiary:	Head- Purchase and Stores Department, Institute for Plasma Research, (On behalf of Director, Institute for Plasma Research), Near Indira Bridge, Bhat Gandhinagar-382428
Amount for which insurance Policy/Bank Guarantee has to be Furnished	The amount will be indicated in the respective contract.

27.3 Notwithstanding the insurance cover taken out by the Indian contractor as above, the contractor shall indemnify the purchaser and keep the purchaser indemnified to the extent of the value of FIM to be issued till such time the entire contract is executed and proper account for the FIM is rendered and the left over/surplus and scrap items are returned to the purchaser. The contractor shall not utilize the FIM for any job other than the one contracted out in this case and also not indulge in any act, commission or omission or negligence which may cause/result in any loss/damage to the purchaser and in which case, the contractor shall be liable to pay full compensation to the purchaser to the extent of damage/loss as assessed by the purchaser. The decision of the purchaser will be final and accepted by the contractor. The contractor shall be responsible for the safety of the FIM after these are received by him and all through the period during which the materials remain in his possession/control/custody. The FIM on receipt at the contractor's works shall be inspected by him for ensuring safe and correct receipt of FIM. The contractor shall report the discrepancies, if any, to the purchaser immediately but not later than five working days from the date of receipt of FIM. The contractor shall take all necessary precautions against any loss, deterioration, damage or destruction of the FIM from whatever cause arising whilst the said FIM remain in his possession/custody or control. The FIM shall be inspected periodically at regular intervals by the contractor for ensuring safe preservation and storage and maintain inspection report. The contractor shall also not mix up the FIM in question with any other goods and shall render true and proper account of the FIM actually used and return balance/remaining/unused FIM on hand and scrap within the delivery date. If it is not possible to return balance remaining unused FIM on hand and scrap within

the delivery date, the contractor hereby authorizes the purchaser to deduct the difference between the cost of FIM supplied and the cost of FIM actually used from the amount payable to the contractor. The contractor shall also indemnify the purchaser to compensate the difference in cost between the actual replacement cost of FIM lost/damaged and the claim settled in favour of the purchaser by the insurance company. The decision of the purchaser, as to whether the contractor has caused any loss, destruction, damage or deterioration of FIM while in his possession, custody or control from whatever cause arising and also on the quantum of damage suffered by the purchaser, shall be final and binding upon the contractor.

27.4 Wherever the contract envisage supply of FIM by the purchaser to the foreign contractor for fabrication of the stores, such FIM shall be safeguarded by a Bank Guarantee to be provided by the contractor at his own cost for the full value of FIM and the Bank Guarantee shall cover, the risks mentioned in Clause 27.2 and 27.3 above and shall be valid for six months beyond the delivery date.

27.5 FIM will be issued to the contractor only after receipt of the insurance policy/Bank Guarantee from the contractor. The contractor shall arrange collection of the FIM from the purchaser's premises and safe transportation of the same to his premises at his risk and cost.

28. BIDS FROM INDIAN AGENTS ON BEHALF OF FOREIGN CONTRACTOR

28.1 Indian agents are allowed to quote on behalf of only one foreign contractor against this tender.

28.2 In case the bid is submitted by an Indian bidder or Indian agent on behalf of their foreign contractor, following documents is required to be uploaded with the bid, failing which, bid is liable to be rejected without further notice to the bidder.

28.2.1 Copy of the agency agreement between the principal and the Indian agent showing the percentage or the quantum of agency commission payable and included in the price quoted and a valid letter of authority from the principal authorizing the Indian agent to submit the bid on their behalf should be uploaded with the bid. The agency agreement shall be valid on the date of opening of bid and shall remain valid throughout the currency of contract.

28.2.2 The type and nature of after sales services to be rendered by the Indian agent.

29. RESTRICTED INFORMATION CATEGORIES UNDER SECTION 18 OF ATOMIC ENERGY ACT, 1962 AND OFFICIAL SECRETS UNDER SECTION 5 OF THE OFFICIAL SECRETS ACT, 1923

29.1 Any contravention of the above-mentioned provisions by the bidder or contractor or its sub-contractor, consultant, adviser or its employees will invite penal consequences under the aforesaid legislations as amended from time to time.

30. PROHIBITION AGAINST USE OF THE NAME OF INSTITUTE FOR PLASMA RESEARCH WITHOUT PERMISSION FOR PUBLICITY PURPOSES

30.1 The bidder or contractor or its sub-contractor, consultant, adviser or its employees or any one claiming on behalf of them shall not use the name of Institute for Plasma Research for any publicity purpose through any public media like Press, Radio, T.V. or Internet without the prior written approval of the purchaser.

31. CONFIDENTIALITY

31.1 The drawings, specifications, prototypes, samples or any other correspondence/ details/information provided by the purchaser relating to the tender or the contract shall be kept confidential by the bidder or contractor as the case may be, and should not be disclosed or passed on to any other person/firm without prior written consent of the purchaser. This clause shall also apply to anyone claiming through bidder or contractor, i.e., the sub-contractors, consultants, advisers of the contractor and its employees, etc.

32. CANVASSING

32.1 Canvassing in any form with regard to this tender will lead to rejection of the bid

33. EXPORT LICENCE/EXPORT PERMISSION

33.1 It is entirely the responsibility of the bidder or contractor to obtain export permission/license/authorisation for stores of foreign origin as required from the respective Government before arranging shipment.

33.2 Establishment of letter of credit or similar payment instruments shall be done only after receipt of export license/export permission, if applicable the contract/ purchase order.

33.3 The contractor shall indemnify the purchaser against any consequences in respect of any end-use declaration they/their overseas principals may furnish to the government/government agencies of the country of origin of the Stores, while seeking export permission/license. It is, therefore, necessary that the contractor offering stores from foreign countries shall have thorough knowledge of export contract regulations prevalent in those countries.

33.4 Post supply inspection by the contractor or his representative or any third party at purchaser's site, contrary to the terms and conditions of purchaser's contract shall not be permitted.

34. END USE CERTIFICATE

34.1 Whenever an End Use Certificate is desired by the bidder, the same shall be clearly mentioned in the bid and the purchaser shall provide an End Use Certificate as per the format given below. The purchaser will not provide any other document/declaration in this regard.

END USE STATEMENT

"We hereby certify that the item/s i.e.....being procured from M/s…… against our Purchase Order No. IPR/…….…… dated …… will be used for……

We also certify that the item/s will not be used in designing, developing, fabricating or testing of any chemical, biological, nuclear, or weapons of mass destruction or activities related to it.

It is further certified that we will not re-export the Item/s prior to obtaining permission from the concerned authorities as may be required".

35. COMPLIANCE WITH THE SECURITY REQUIREMENTS OF THE PURCHASER

35.1 The contractor shall strictly comply with the security rules and regulations of the purchaser in force and shall complete the required formalities including verification from police and any other authority and obtain necessary prior permission for entry into the purchaser's premises, wherever authorized by the purchaser.

36. COUNTRY OF ORIGIN

36.1 Wherever the tenders are for imported stores, the country of origin of the stores must be clearly specified in the bid.

37. TERMS AND CONDITIONS OF THE CONTRACT

37.1 It must be clearly understood that any contract concluded pursuant to this NIT shall be governed by the General, Special and Additional Conditions of the Contract as contained in the NIT. Bidder must, therefore, take special care to go through the NIT. It should also be realized that the General Conditions of Contract, Special Conditions of Contract and Additional Conditions of Contract, if any, contained in NIT is binding and

the bidder is willing to execute the contract as per the purchaser's terms and conditions of contract.

38. SAMPLES

38.1 Samples of the offered stores, if called for in the NIT, shall be submitted by the bidder free of all charges indicating purchaser's tender number so as to reach the authorized person on or before the last date of submission of bid and without any obligation of the purchaser as regards acceptance/approval, safe custody or safe- return thereof. Each sample submitted must be clearly labeled with the bidder's name and address and tender number. In the event of non-acceptance of the bid, the bidder shall collect the samples at his own expenses within fifteen days from the date of intimation. In case bidder fails to collect such samples within the designated time, the same will be disposed-off by the purchaser and no claim will be entertained from the bidder for the same. Bids without samples shall be rejected, where these were asked for submission in the NIT.

38.2 If the bidder submits the sample with his bid; the same shall not be considered to be part of the stores unless it has been specifically stated in the NIT.

38.3 In case supplies of tendered goods are required as per sample available with the purchaser, the purchaser will provide the sample on submission of a deposit as indicated in the NIT, as a standard for bidding and supply, on request. The contractor may send their representative at an address indicated in the NIT for collection of the sample. The purchaser will not be responsible for any delay in receipt/collection of sample by the bidder. It will be the responsibility of the bidder to return the sample without any damage/deterioration as indicated in the NIT. In the event of non-return of the sample in the desired condition within fifteen days from the date of intimation, the purchaser reserves the right to forfeit the deposit of the bidder.

39. DETAILS OF BANKERS

39.1 The bidder shall submit along with Part-I (Techno-Commercial Part) of the bid account details, IFSC code, the name and address of his bankers for refund of EMD and payment as applicable.

40. SUBMISSION OF DRAWINGS

40.1 The bidder shall upload all drawings pertaining to the stores, wherever called for in the NIT along with Part-I (Techno-Commercial) of bid for correct understanding and evaluation of the bid. Bidder's drawing will form part of the contract only after these are approved by the purchaser.

41. SUB-CONTRACTING

41.1 The contractor in the event of his bid being accepted by the purchaser shall not assign/sublet or delegate the contract or any part thereof without the prior written consent of the purchaser. The contractor may without the purchaser's consent purchase such parts, accessories, raw materials etc. from any of the leading and reputed manufacturers in case he does not normally manufacture such items provided these items comply with the technical specifications. However, the contractor shall be solely responsible for the satisfactory execution of the contract irrespective of the fact whether a part or a portion of the contract has been assigned or sublet by him to a sub-contractor even when such sub-contracting has been done with the prior written consent of the purchaser.

42. SHOP/FACTORY EVALUATION, QUALITY SURVEILLANCE/ INSPECTION AND SUBMISSION OF PROGRESS REPORT

42.1 The purchaser or his technical authorities may at his option and prior to evaluation of the bid depute his inspector or any quality surveillance agency to the factory/workshop/premises of the bidder or contractor to assess and establish the manufacturing capability etc. of the bidder. Similarly, the purchaser may also depute his inspector/quality surveillance agency for inspection of the stores during the various stages of manufacture. In such an event the contractor shall allow reasonable facility

and free access to his factory/work/records to the inspector for the purpose of inspection or for ascertaining the progress of contract.

43. PACKING

43.1 Contractor shall note that packing for shipment shall be in accordance with the instructions outlined in this NIT. Each package shall be limited to the size and weights that are permissible under the existing air, sea or road cargo limits, as the case may be. Even when no packing specification is included in the NIT, it will be contractor's responsibility to provide appropriate packing depending upon the nature of the supply and the transportation and handling hazards. The stores shall be so packed and protected as not to suffer deterioration, damage or breakage during shipment and storage in a tropical climate.

43.2 Each package shall be properly labeled to indicate the type and quantity of stores it contains, the purchase order number, its dimensions and weight and any other necessary data to identify the stores and relate it to the contract.

43.3 In case of damage of the stores due to inadequate/poor packaging, the purchaser's decision will be final and binding on the contractor. In such cases, the contractor will arrange replacement of such stores at his risk and cost within the delivery date on receipt of written intimation from the purchaser.

44. DEVIATIONS TO PURCHASER'S TECHNICAL SPECIFICATIONS

44.1 If any deviation or substitution from the technical specifications contained in Section "D" to this tender document is involved, such details should be clearly indicated by the bidder in Part-I (Techno-Commercial) and it should be uploaded as an Annexure to Part-I (Techno-commercial) of the bid as otherwise it shall be an admission on the part of the bidder that he will supply the stores as specified by the purchaser. Part-II (Price) should be submitted online in the bid format provided by the purchaser.

45. SETTLEMENT OF COMMERCIAL TERMS AND CONDITIONS OF CONTRACT

45.1 The commercial terms and conditions of sale/contract stipulated in Part-I (Techno-commercial) of the bid submitted by the bidder should be in line with the purchaser's terms and conditions stipulated in the NIT. In case, the bidder does not accept the purchaser's terms and conditions stipulated in the NIT, their bid will be outrightly rejected. The bidder should note that the authority to settle the commercial terms and conditions of contract rests only with the purchaser and any agreement/understanding reached between the bidder and any other authorities will not be valid and binding.

46. PARTICIPATION OF INDIAN/OVERSEAS BIDDER IN THE TENDER

46.1 Indian and overseas bidder can participate in the tender by using digital signature certificate/encryption certificate issued by any licenced certifying authority authorized by Controller of Certifying Authority, India.

47. TERMS OF DELIVERY

47.1 Indian bidders quoting in INR should quote only for safe delivery of stores to the purchaser's consignee.

47.2 Overseas/foreign/Indian bidder quoting in foreign currency should quote on the following INCOTERM basis:-

47.2.1 For air shipment: **FCA at the specified 'Gateway Airport'**, as per list given

47.2.1.1 List of Gateway Airports

Sl. No.	Country	Gateway Airport
1	Argentina	Buenos Aires
2	Australia	Melbourne
3	Austria	Vienna
4	Belgium	Antwerp
5	Canada	Toronto / Montreal
6	China	Beijing
7	Czech Republic	Prague
8	Denmark	Copenhagen
9	Finland	Helsinki
10	France	Paris
11	Germany	Frankfurt
12	Hong Kong	Hong Kong
13	Ireland	Dublin
14	Italy	Rome
15	Japan	Tokyo / Osaka
16	Netherlands	Amsterdam
17	Norway	Oslo
18	Poland	Warsaw
19	Russia	Moscow
20	Singapore	Singapore
21	South Africa	Johannesburg
22	South Korea	Seoul
23	Spain	Barcelona/Madrid
24	Sweden	Stockholm
25	Switzerland	Zurich
26	United Kingdom	London
27	U.S.A.	JFK

47.2.1.2 Since the purchaser has authorized consolidation agents, they will arrange for air-freight from the respective Gateway Airport.

47.2.2 For sea shipment: FOB (Port of despatch)

47.2.2.1 The price quoted shall include the cost of the stores, packing charges, inland transportation charges up to the port of despatch, i.e., major sea ports in country of despatch and loading of the stores on to the ship. The name of the sea port from where the shipment will be made shall also be indicated.

48. AGENCY COMMISSION

48.1 Agency commission payable to the contractor's agents in India, if any, shall be included in the price. Name and address of Indian agent and the percentage of commission payable to them and included in the price shall be clearly indicated. The commission will be paid in INR directly by the purchaser to the Indian agents after final acceptance. The manner and method of payment of agency commission is indicated in the General Conditions of Contract/Special Conditions of Contract.

SECTION 'B'

FORMAT FOR SUBMISSION OF TENDER

Form No: e_IPR-PUR-103A

DECLARATION

Part-I (Techno-commercial) of Tender No:_____Dated_____

Bidder's Bid No:_____ Dated_____

From,
M/S_____
_____
_____

To,
Head- Purchase and Stores Department
Institute for Plasma Research
Near Indira Bridge; Bhat
Gandhinagar-382428 (INDIA),

Dear Sir,

I / We have gone through the tendering conditions pertaining to the Two Part Tender and General Conditions of Contracts and Special Conditions of Contracts, if any

a. I/we hereby agree to execute the contract in accordance with the tender specifications incorporated in Section "D" of the tender document also agree to abide by General Conditions of Contract, Special Conditions of Contract contained in Section "C" of the Tender Document and Additional Conditions of Contract, if any.
b. Purchaser will be at liberty to accept any one or more of the items of Stores offered by us and I/We shall be bound to supply the stores as may be specified in the contract.
c. I/We hereby agree to keep our above mentioned bid valid for the period mentioned in the NIT.
d. Deviations to technical specifications contained in Section "D" of the tender documents are detailed in Annexure "A" of the tender form while deviations proposed to General Conditions of Contract and Additional Conditions of Contract, if any, are detailed in Annexure "B" to this tender.
e. Prices applicable are indicated in the price bid format of the tender.
f. I/We are also uploading herewith all the leaflet/ catalogue, etc. pertaining to the stores offered.
g. If I/We withdraw or modify the bid during the period of validity of if I/We are awarded the contract and I/We fail to submit a PSDBG before the deadline mentioned in the contract, I/We shall be suspended for a period of one year from being eligible to submit bids for contracts with Institute for Plasma Research.

Yours faithfully
Bidder
(Digitally signed or ink signed)

Form No: e_IPR-PUR-103B

DECLARATION

Part-II (Price) of Tender No:_____ Dated:_____
Bidder's Bid No:_____ Dated_____

From,
M/S_____
_____
_____

To,
Head- Purchase and Stores Department
Institute for Plasma Research
Near Indira Bridge; Bhat
Gandhinagar-382428 (INDIA),

Dear Sir,

In response to purchaser's invitation to tender and as per the tender and contract conditions, the prices applicable for the contract as contained in Part-I (Techno-commercial) of our tender are indicated in the price bid format of the tender.

I/We hereby agree to keep our above mentioned bid valid for the period mentioned in the NIT.

If I/We withdraw or modify the bid during the period of validity or if I/we are awarded the contract and I/We fail to submit a PSDBG before the deadline mentioned in the contract, I/we shall be suspended for a period of one year from being eligible to submit bids for contracts with Institute for Plasma Research.

Yours faithfully
Bidder
(Digitally signed or ink signed)

SECTION 'C'

General Conditions of Contract and
Special Conditions of Contract

Form No. IPR-P-100

INSTITUTE FOR PLASMA RESEARCH
(An Aided Institute of Dept. of Atomic Energy, Govt. of India)
NEAR INDIRA BRIDGE, BHAT
GANDHINAGAR-382428

General Conditions of Contract
and Special Conditions of
Contract

Index

Clause No. Clause Title Page No.

SPECIAL CONDITIONS OF CONTRACT (Part-B)

PREAMBLE

While the conditions contained in General Conditions of Contract will apply to all types of contracts, whereas General Conditions of Contract as well as Special Conditions of Contract will apply to contracts for design/ manufacture, supply installation and commissioning of the plant/machinery/equipment/instrument as the case may be.

PART-A

GENERAL CONDITIONS OF CONTRACT

1. AUTHORITY OF PERSON SIGNING THE CONTRACT ON BEHALF OF THE CONTRACTOR

The person/s signing or digitally signing the bid or any other document in respect of the bid or contract on behalf of the bidder or contractor shall be deemed to warrant that he has the authority to bind the contractor.

2. DRAWINGS AND SPECIFICATIONS

The drawings and specifications are intended to be complementary and to provide for and comprise everything necessary for the completion of the contract. Any material shown on the drawing even if not particularly described in specifications or vice versa is to be supplied by the contractors if it were both shown and specified.

In case any discrepancy is noted in the drawings and/or specifications and any interpretation of the same be required, the matter shall be referred to the purchaser for clarification which shall be binding upon the contractor. Otherwise, the contractor shall assume responsibility for the interpretation of the drawings and specifications including his sub-contractor(s).

In case any difference or dispute arises with regard to the true intent and meaning of drawings or specification or in case any portion of the same be obscure or capable of more than one interpretation, the same shall be decided by the purchaser whose decision shall be final.

All lettering on the drawings is to be considered as part of the specification and contract. In all cases figured dimensions are to be followed rather than those indicated by scale. Large scale drawings will take precedence over smaller scale drawings.
The contractor's drawings shall, when approved by the purchaser, be deemed to be included in the list of drawings which form part of the contract. The contractor shall not proceed with fabrication until all drawings associated therewith have been duly approved by the purchaser in writing or as specified in the NIT.

The contractor shall be responsible for and shall pay for any alterations of the stores and shall indemnify the purchaser for any consequential expenditure incurred by the purchaser due to any discrepancies, errors, omissions etc. what so ever in the drawings or other specifications supplied by him whether such drawings etc. whatsoever have been approved by the purchaser or not, provided that such discrepancies, errors or omissions etc. is not due to inaccurate information or specifications furnished to the contractor on behalf of the purchaser.

3. GENERAL WARRANTY

The stores supplied by the contractor under the contract shall be of best quality and workmanship. The contractor shall execute the contract in accordance with the technical specifications unless any deviation has been expressly specified in the contract and any amendments agreed thereto in writing.

The contractor's bid to execute the contract in accordance with the technical specifications shall be deemed to be an admission on his part that he has fully acquainted himself with the details thereof and no claim shall lie against the purchaser on the ground that the contractor did not examine or acquaint himself fully with the technical specifications of the contract.

4. ALTERATIONS

The purchaser may, in exceptional circumstances, make changes in the drawings, technical specifications and issue additional instructions without altering the contract in any manner provided that the changes will be as far as possible not materially alter the character and scope of the contract.

It shall be lawful for the parties to the contract to alter by mutual consent at any time, the drawings and technical specifications of stores. The stores to be supplied shall be in accordance with such altered drawings and technical specifications from the dates specified by the parties; provided that if any such alterations involve increase or decrease in the cost of or in the period required for production, a revision of the contract price and/or the delivery date shall be made by mutual agreement in respect of the stores to which the alteration applies. In all other respects, the contract shall remain unaltered.

5. PACKING

The contractor shall pack the stores at his own cost sufficiently and properly for transit by air/sea/road as the case may be so as to ensure their being free from loss or damage while in transit to the ultimate destination specified in the contract.

Unless otherwise provided in the contract all containers (including packing cases, boxes, tins, drums and wrappings etc.) in which the stores are supplied by the contractor shall be considered as property of the purchaser and their cost as having been included in the contract price.

6. INSPECTION

The contractor shall be responsible for and perform all testing required in accordance with the contract and technical specifications included therewith.

The purchaser may at his option depute inspector(s) for inspection of the stores at contractor's works. The contractor shall facilitate such inspection of stores manufactured by him.

The contractor shall give notice of readiness for inspection to the inspector (deputed under Clause 6.2 above) so that the inspector can be present at the requisite time. The contractor shall dispatch stores only after inspector deputed by the purchaser has issued shipping release.

The contractor shall allow reasonable facility and free access to his work/factory/premises and records to the inspector for the purpose of inspection or for ascertaining the progress of work related to ordered stores under the contract.

The contractor shall provide the drawings, tooling, gauges, instruments etc. and extend all the help required for carrying out the inspection work.

The contractor shall produce an inspection plan to the purchaser's satisfaction notifying check points on the plan. The final inspection shall be conducted as per the approved quality assurance plan.

The contractor shall not supply or deliver the stores unless and until a shipping release or an authorisation for despatch is obtained in the format provided by the purchaser if Pre Despatch Inspection is mentioned in Technical specification. Failure to comply with this instruction as applicable will not only make the contractor ineligible for payment for the supply, but also hold the contractor liable for payment of compensation to the purchaser due to delay in clearance of the stores from the carriers.

If the contractor dispatches stores without obtaining shipping release or authority to dispatch, he will not be entitled to get any payment for such supply, in addition the contractor will pay damages for delayed clearance of the stores from the carrier.

7. SECURITIES

The contractor shall provide the securities in favour of the purchaser in the form of bank guarantees as stated in sub-clauses indicated herein below for a period covering sixty days beyond the completion period mentioned in the contract or such extended period as may be agreed to between the parties, subject to the following conditions:

7.1. Applicable for contracts in INDIAN RUPEE

The bank guarantee should be executed by State Bank of India or any Indian nationalized banker Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks), on a non- judicial stamp paper of appropriate value as per the purchaser's format.

7.2. Applicable for contracts other than in INDIAN RUPEE having condition for submission of Bank Guarantee by Foreign Contractor.

The bank guarantee should be executed by State Bank of India or any Indian Nationalized banker Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks) or any Foreign Bank acceptable to the Purchaser. Bank Guarantee drawn from any bank in India shall be on a non- judicial stamp paper of appropriate value whereas Bank Guarantee drawn from Overseas Bank shall be on the Letter Head of the Bank, as per the purchaser's format.

The bank guarantees shall be submitted as per the format available in Annexure.

All bank guarantees are to be sent by the bankers of the contractor directly to the purchaser.

Where the contractor fails to complete the contract within the delivery

date, the contractor shall apply to the purchaser for extension of delivery date of the contract. Such application shall be made before the last date of completion of the contract. The purchaser may at his discretion extend delivery date of the stores under such condition as he may deem fit. All Bank Guarantees so submitted shall also be suitable extended well in time, failing which the purchaser shall have the right to invoke the bank guarantee without prejudice to the terms and conditions of the contract. The contractor shall not supply the material unless the purchaser has extended delivery date of stores in writing

7.3. PERFORMANCE SECURITIES

Contractor shall furnish Performance Security Deposit in the form of bank guarantee for three percent of the value of the contract, including statutory levies, for due performance of the said contract till expiry of warranty period, as per Annexure-I within thirty days from the date of issue of contract in case of Indian Rupee contracts or within thirty days from the date of receipt of Export License by the contractor from respective Government in case of contracts having currency other than Indian Rupee, as the case may be. The Bank Guarantee shall be valid till satisfactory completion of the contract till expiry of warranty period pursuant to General Conditions of Contract, plus a claim period of sixty days from the completion period mentioned in the contract for lodging of claims, if any.

If the contractor fails to provide PSDBG as stated herein above, within thirty days from the date of issue of contract such failure shall constitute a breach of contract and action as deemed fit may be initiated against the contractor.

In case, the contractor fails to fulfill the obligations under the contract; the purchaser shall have the right to invoke and appropriate the PSDBG. This right shall be in addition to and without prejudice to the rights of the purchaser under the terms and conditions of contract

7.4. BANK GUARANTEE FOR FREE ISSUE MATERIAL

Bank Guarantee for Free Issue Material (hereinafter referred to as FIM) (for fabrication of stores at contractor's works outside purchaser's site): The contractor shall submit a Bank Guarantee as per Annexure VIII as applicable to the extent of full value of FIM as security of free issue material issued to the contract or till such time the entire contract is executed and proper account for the FIM is rendered by the contractor to the Purchaser.

8. DELIVERY DATE – TIME IS THE ESSENCE OF CONTRACT

The delivery date stipulated in the contract shall be deemed to be the essence of the contract and the contract must be completed not later than date(s) stipulated therein.

PHASED DELIVERY/MILESTONE

Where the contract envisages phased delivery or completion of milestone, the delivery date for each phase or milestone shall be deemed to be the essence of contract.

Acceptance beyond the delivery date is at the sole discretion of the purchaser and subject to Section C Part A Clause No.10. The contract shall be deemed to be terminated after the expiry of delivery date and subjected to Section C Part A Clause 32.2 and Clause 32.3.

9. ADVANCE INTIMATION OF DELIVERY

Contractors shall send advance intimation to the consignee preferably by e-mail regarding intended delivery of material at least five days prior to the date of delivery of stores to the consignee so as to make proper arrangements for receipt of the stores. If delivery of stores is being carried out by a vehicle, the contractor shall confirm that the driver carries, as on date of delivery, all valid documents, viz., driving license, vehicle registration documents, insurance cover for the vehicle etc. in addition to delivery challan in duplicate along with other documents if any, as per the contract. Failure to carry the valid documents by the driver will result in denial of entry of vehicle inside consignee's premises and the consignee will not be responsible for any consequences thereof.

10. EXTENSION OF DELIVERY DATE

The purchaser will without prejudice to the other rights of the purchaser invoke the following damages for extension of delivery date:

Sl. No.	Delivery Period	Liquidated Damages, Rate per Week	Maximum Amount of Liquidated Damages
1.	Delivery period (as originally stipulated) not exceeding one year	@0.5% of the value of the stores, per week or part thereof	5% of the value of stores.
2.	Delivery period (as originally stipulated) exceeding one year but not exceeding two years.	@ 0.25% of the value of the stores, per week or part thereof.	5% of the value of stores.
3.	Delivery period (as originally stipulated) exceeding two years	@ 0.1% of the value of the stores, per week or part thereof.	5% of the value of stores.

Delivery Period means "The time from date of release of the contract to the date of delivery of stores".

However, the payment of liquidated damages shall not in any way absolve the contractor from any of its obligations and liabilities under the contract.

11. FORECLOSURE OF CONTRACT OR REDUCTION IN SCOPE OF WORK BEFORE DELIVERY DATE

If before the delivery date, the purchaser may at its discretion, decide to abandon or reduce the scope of the contract for any reason whatsoever and does not require the whole or part of the contract to be executed, the purchaser shall give notice of four weeks in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The

contractor shall have no claim for any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the contract in full but which he did not derive in consequence of the foreclosure of the whole or part of the contract.

The contractor shall be paid at contract rates, full amount for part of contract executed and delivered to the purchaser. In addition, a reasonable amount as certified by the purchaser will be paid to the contractor for the stores hereunder mentioned which could not be utilized in the contract to the full extent in view of the foreclosure.

Purchaser shall have the option to take over contractor's materials or any part thereof either bought for execution of the contract or of which the contractor is legally bound to accept delivery from its contractor (for use in the contract). For materials taken over or to be taken over by purchaser, cost of such materials as calculated by purchaser shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.

If any materials supplied by purchaser are rendered surplus, the same except normal wastage shall be returned by the contractor to purchaser at rates not exceeding those at which these were originally issued, less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting of such materials from contractor's site to consignee, if so required by purchaser, shall be paid.

The contractor shall, if required by the purchaser, furnish books of accounts and other relevant documents and evidence as may be necessary to enable the purchaser to certify the reasonable amount payable under Clause 11.2 above.

The reasonable amount payable for the stores shall not be in excess of the cost of the contract remaining incomplete on the date of closure, i.e. total stipulated cost excluding taxes of the contract as per accepted tender less the cost of stores actually delivered and also less the cost of contractor's materials at site taken over by the purchaser as above. Provided always that against any payments due to the contractor on this account or otherwise, the purchaser shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of this contract and any other sums which on the date of termination were recoverable by the purchaser from the contractor under the terms of this contract.

12. INSPECTOR'S AUTHORITY

The inspector, wherever deputed by the purchaser under relevant Clauses of the Contract shall have the power:

to certify that the stores are not in accordance with the specifications provided in the contract owing to the adoption of any unsatisfactory method of manufacture, before any Stores or parts thereof are inspected.

to reject any Stores submitted for inspection or part thereof as not being in accordance with the technical specification provided in the contract.

13. RECTIFICATION AND REPLACEMENT OF DEFECTIVE STORES

If the inspector finds that the contractor has executed any unsound or imperfect work, the inspector shall notify such defects to the contractor in writing with thirty days from the date of delivery and the contractor on receiving the details of such defects or deficiency, shall at his own expenses, within seven days or otherwise within such time as may be mutually agreed upon between the parties as reasonably necessary, proceed to alter, reconstruct or remanufacture the stores to the requisite standard and technical specifications according to the contract.

In case repair/replacement of defective/rejected stores is necessary and becomes essential to return the stores, to the contractor, where full or part payment has already been made by the purchaser, the contractor shall submit bank guarantee for the value of stores so found defective/rejected as per Annexure-V or VI as may be applicable and valid till receipt and acceptance of repaired/replaced/entire stores within fifteen days of intimation. However, the contractor will not be absolved from his responsibility as specified under Section C Part-A Clause No.8.

14. CONSEQUENCE OF REJECTION

If the stores are rejected by the inspector or consignee at the destination and the contractor fails to make satisfactory supplies within the delivery date, then the purchaser may:

Allow the contractor to submit for inspection of fresh stores in replacement of the rejected, within extended delivery period subject to Section C Part A Clause No. 10, the contractor bearing the cost of freight on such replacement without being entitled to any extra payment on that account. OR

Purchaser may take recourse to Section C Part A Clause 8.4.

15. RECOVERY OF SUMS DUE

Whenever any claim for payment arises out of or under this contract against the contractor, the purchaser shall be entitled to recover the sum by appropriating, in part or whole, the security deposited by the contractor or any payment which at any time may become due to the contractor under this or any other contract with the purchaser. If this sum is not sufficient to cover the full amount recoverable, the contractor shall pay to the Purchaser on demand the remaining balance due. Similarly, if the purchaser has or makes any claim, whether liquidated or not, against the contractor under any other contract with the purchaser the amount payable to the contractor under the contract including the security deposit shall be withheld till such claims of the purchaser are finally adjudicated upon and paid by the contractor

16. LIEN IN RESPECT OF CLAIMS IN OTHER CONTRACTS

It is agreed that any sum of money due and payable to the contractor under any contract may be withheld or retained by way of lien by the purchaser or any other person or persons contracting through the purchaser against any claim of the purchaser or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the purchaser or with other such person or persons.

It is further agreed term of the contract that the sum of money so withheld or retained under this Clause by the purchaser will be kept withheld or

retained as such by the purchaser until the claim arising out of in the same contract or any other contract is either mutually settled or determined by the arbitrator, and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this Clause and duly notified as such to the contractor.

17. WARRANTY

The contractor warrants that stores to be supplied under the contract shall be free from all defects and faults in materials, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for stores of the types under the contract in full conformity with the specifications, drawings or samples, if any and shall if operable, operate properly. This warranty shall expire (except in respect of complaints notified to the contractor prior to such date) twelve months after the date of receipt and acceptance of the last lot of stores under the contract at the ultimate destination stipulated in the contract.

In case any defect or deficiency in the stores supplied by the contractor under the contract appear to be discovered within twelve months from the date of receipt and acceptance of the stores in India, the contractor upon notification of such defects or deficiency by purchaser, shall forthwith take measure to rectify every such defect, deficiency or failure without any cost to the purchaser.

In case the contractor opts for return of stores for rectification/repair at their works, contractor shall furnish bank guarantee for the cost of stores as per Annexure-V or VI (as applicable) valid till acceptance of rectified/repaired Stores. Further the warranty period will get extended for the period the Stores were not available to the purchaser for his use. If the contractor, after such notification, makes default or delay in rectifying all such defects, deficiencies or failure to the satisfaction of the purchaser, the purchaser may take recourse to the remedies provided for in Section C Part-A Clause no. 11 and14.

18. PERMIT AND LICENSES

The contractor shall secure and pay for all licenses and permit at his end which he may be required to comply with all laws, ordinances and regulations etc. of the public authorities in connection with the performance of his obligations under the contract. The contractor shall be responsible for all damages and shall indemnify and save the purchaser from against all claims for damages and liability which may arise out of the failure of the contractor to secure and pay for any such licenses and permits and/or to comply fully with any and all applicable laws ordinances and regulations etc.

19. PATENT INDEMNIFICATION

The contractor shall indemnify and keep the purchaser indemnified from and against any and all claims, actions, costs, charges and expenses arising from or for infringement of patent rights, copyright or other protected rights, etc. of any design plans, diagrams, drawings in respect of the stores supplied by the contractor or any of the manufacturing methods or process adopted by contractor for the Stores supplied under the contract.

In the event of any claim being made or action being taken against the purchaser in respect of the matter referred to in Clause No. 19.1 above, the contractor shall promptly be notified thereof and he shall at his own expense, conduct all negotiations for the settlement of the same and any litigation that may arise there from.

In the event of any designs, drawing, plans or diagrams or any manufacturing methods or process furnished by the contractor etc. constituting infringement of patent or any other protected rights etc. and use thereof is restrained, the contractor shall procure for purchaser, at no cost to the latter, the rights to continue using the same or to the extent it is possible to replace the same so as to avoid such infringement and subject to approval by the purchaser or modify them so that they become non-infringing, but such modifications shall otherwise be to the entire satisfaction of the purchaser.

The provision of the Clause remains effective and binding upon the contractor even after the completion, expiration or termination of the contract.

20. MODE AND DOCUMENTATION OF PAYMENT

20.1. Payment for contracts in currency other than INDIAN RUPEES

Unless otherwise specified elsewhere, payment in full (excluding the amount of the commission included in the price payable directly by the purchaser to the Indian agent) shall be made by wire transfer within thirty days of final acceptance of stores.

The following documents are required to be sent to the purchaser immediately after shipment of consignment:

20.1.1. Bill of Lading/Negotiable Airway Bill evidencing shipment
20.1.2. Invoice for the shipment : Four copies
20.1.3. Packing list : Four copies
20.1.4. Shipping release from inspector or quality surveillance agency nominated by the purchaser for the purpose of inspection: Four copies, if applicable.
20.1.5. Shipping authorization from purchaser wherever required.

The contractor shall send invoice only for the net amount payable to him after deducting the amount of agency commission included in the invoice which would be paid to the Indian agents directly by the purchaser. However the contractor's invoice should separately reflect the amount of commission payable to his Indian agent.

20.2. PAYMENT FOR CONTRACTS IN INDIAN RUPEE

Unless otherwise mentioned elsewhere, payments for the contract will be made after final acceptance of stores and within a reasonable time on submission of following documents.

i) GST compliant invoice in favour of paying authority duly pre-receipted.

ii) Receiving voucher from Stores (RV).

Normally thirty days will be allowed for inspection and payment after receipt of the stores.

21. STATUTORY DEDUCTIONS

The purchaser has the right to make statutory deductions from the payments made to the contractor as applicable on the date of making

such payment as per the provisions of relevant Act or Rules made there under. Appropriate certificate to that effect will be provided by the purchaser's paying authority.

22. AGENCY COMMISSION

The amount of commission included in the price and payable to the Indian agents of the contractor shall be paid in INR directly to the Indian agents by the purchaser on the basis of an Invoice from the Indian agent. "Payment will be released to the Indian agents after receipt and final acceptance of the goods by the purchaser".

INSURANCE FOR CONTRACTS IN CURRENCY OTHER THAN INDIAN RUPEE

Transit insurance from warehouse to warehouse will be arranged by the purchaser through his underwriters unless this responsibility is specifically entrusted to the contractor in any particular case.

23. MARKING

The marking shall generally be as under:

Name and address of the consignee	Head - Stores Section, INSTITUTE FOR PLASMA RESEARCH (An Aided Institute of Dept. of Atomic Energy, Govt. of India) NEAR INDIRA BRIDGE, BHAT GANDHINAGAR-382428
Contract Number and Date	No._____Date_____
Brief Description of Goods	
Weight	
Dimension	
Ultimate Destination	
Port of Discharge	
Package Number	

Each package shall contain a packing note specifying the name and address of the contractor, the number and date of the contract, name and address of the consignee, description of the stores and the quantity contained in such package.

The inspector, wherever deputed by the purchaser under Section C Part-A Clause No. 6 may reject the stores if the same is not packed and/or marked as aforesaid and in case where the packing materials are specifically prescribed, if such materials are not in accordance with the terms of the contract.

24. CODE OF INTEGRITY

No official of a procuring entity or bidder or contractor shall act in contravention of the codes which include

(i) Prohibition of
   (a) making offer, solicitation or acceptance of bribe, reward or gift or any material benefit, either directly or indirectly, in exchange for an unfair advantage in the procurement process or to otherwise influence the procurement process.
   (b) any omission, or misrepresentation that may mislead or attempt

to mislead so that financial or other benefit may be obtained or an obligation avoided.

(c) any collusion, bid rigging or anticompetitive behavior that may impair the transparency, fairness and the progress of the procurement process.

(d) improper use of information provided by the procuring entity to the bidder with an intent to gain unfair advantage in the procurement process or for personal gain.

(e) any financial or business transactions between the bidder and any official of the procuring entity related to tender or execution process of contract; which can affect the decision of the procuring entity directly or indirectly any coercion or any threat to impair or harm, directly or indirectly, any party or its property to influence the procurement process.

(f) obstruction of any investigation or auditing of a procurement process.

(g) making false declaration or providing false information for participation in a tender process or to secure a contract;

(ii) Disclosure of conflict of interest.

(iii) Disclosure by the bidder of any previous transgressions made in respect of the provisions of sub-clause (i) with any entity in any country during the last three years or of being debarred by any other procuring entity.

(iv) Institute for Plasma Research, after giving a reasonable opportunity of being heard, comes to the conclusion that a bidder or prospective bidder, as the case may be, has contravened the code of integrity, may take appropriate measures as deemed fit, including rejecting his bid and forfeiting EMD and/or debarring him from participating in future bidding.

25. LAW GOVERNING THE CONTRACT

This contract shall be governed by the laws of India for the time being in force. The marking of all stores must comply with the requirements of India Acts relating to Merchandise Marks and all the rules made under such Acts.

26. JURISDICTION

The Courts within the local limits (i.e. Gandhinagar) of whose jurisdiction the place from which the purchase order is issued is situation only shall, subject to Arbitration Clause, have jurisdiction to deal with and decide any matter out of this Purchase Order/Contract.

27. SETTLEMENT OF DISPUTES

The Purchaser and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

If the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Goods under the Contract.

28. Arbitration

In the event of any dispute or difference arising out or of in connection with any of the terms and conditions of the Purchase Order/Contract, the matter shall be referred to the Director, IPR for settlement. In case the parties to the Purchase Order are not in a position to settle the dispute mutually, the matter shall be referred to a Sole Arbitrator to be appointed in accordance with the Arbitration & Reconciliation Act, 1996 & Arbitration and Conciliation (Amendment) Act, 2015 as amended time to time.

29. TRANSFER OF OWNERSHIP

29.1 Ownership of the stores supplied by the foreign contractor shall be transferred to the purchaser in accordance with the payment terms or INCOTERMS accepted.

29.2 Ownership of the stores supplied by the Indian contractor shall be transferred to the purchaser when the stores are delivered and accepted by the purchaser

29.3 Transfer of title shall not in any way absolve the contractor from his responsibilities and liabilities under the contract. Notwithstanding the

transfer of ownership of the stores, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the contractor until safe delivery of the stores to the purchaser' site.

INTELLECTUAL PROPERTY RIGHTS

All rights of design documents and drawings, if paid by the purchaser separately or compositely included in the contract cost, will remain with the purchaser and the contractor shall have no claim whatsoever on these rights.

30. EXERCISING THE RIGHTS AND POWERS OF THE PURCHASER

Director, Institute for Plasma Research is the authorized person to deal with, exercise, negotiate on behalf of the purchaser having all the rights, discretions and powers of the purchaser under this contract and any reference to the opinion of the purchaser in the terms and conditions contained in these General Conditions of Contract/Special Conditions of Contract shall mean and be construed as reference to the opinion of any of the persons authorized by him as mentioned in this Clause. All notices on behalf of the purchaser shall be issued by Director, Institute for Plasma Research.

31. TERMINATION OF CONTRACT

In case of non-compliance of any of the Terms and Conditions of the Contract, Purchaser reserves the right to terminate the contract after serving notice to the contractor.

Performance Security, if any, already available shall be forfeited.

In addition to the above, the contractor will be liable to be debarred and/or banned from participation against any tender issued by Institute for Plasma Research, including its regional units, and/or the bid of defaulting contractor is being considered for award of contract of stores.

PART-B

In addition to the General Conditions of Contract contained in Section C Part-A the following Special Conditions of Contract shall apply to contracts for design/manufacture, supply, installation and commissioning of plant/ machinery/equipment/instrument as the case may be . These Special Conditions of Contract in Part-B shall override the General Conditions of Contract, wherever there is any ambiguity/conflict.

SPECIAL CONDITIONS OF CONTRACT

1. RESPONSIBILITY FOR COMPLETENESS

All fittings or accessories which may not be specifically mentioned in the tender specifications of the contract but which are necessary are to be provided by the contractor without any extra charge and the stores comprising plant/machinery/equipment/instruments must be completed in all respect within the delivery date.

2. FINAL TEST

The final tests to ascertain the performance and guarantee shall commence within one month of completion of installation. The contractor will inform the purchaser well in advance the services/facilities required to start the final test, as mentioned in the contract.

3. REJECTION OF DEFECTIVE PLANT

If the completed plant or any portion thereof before it is finally accepted is found to be defective or fails to fulfill the requirements of the contract during the currency of the contract including warranty period, the purchaser shall give the contractor notice setting forth with the details of such defects or failure and the contractor shall forthwith rectify the defective plant or alter the same to make it comply with the requirement of the contract at the earliest and in any case not later than thirty days from the date of such intimation of the incident. In case the contractor fail to do so within the abovementioned time the purchaser may reject and replace at the cost of the contractor, the whole or any portion of the plant as the case may be, which is defective or fails to fulfill the requirement of the contract. Such replacement shall be carried out by the purchaser within a reasonable time and at reasonable price and to the same specifications as far as possible and under competitive conditions. The contractor shall be liable to pay to the purchaser the extra cost, if any, of such replacement procured and/or erected as provided for in the contract, such extra cost being the difference between the price paid by the purchaser under the contract for such replacement and the original price admitted in the contract placed with the contractor or the cost as determined by the purchaser out of the price admitted in the original contract, where separate price for such defective/rejected stores is not available in the contract. Contractor shall refund to purchaser any sum paid by the purchaser to the contractor in respect of such defective plant when rejected and no replacement is procured by the purchaser.

4. WARRANTY

The contractor shall provide warranty of stores supplied for a minimum period of twelve calendar months after the stores comprising plant/machinery/equipment/ instruments has been put into operation

(or a suitable mutually agreed longer period to be reckoned from the date of last major shipment depending upon the nature of the stores comprising plant/machinery/equipment/instrument) the contractor shall be responsible for any defects that may develop under conditions provided for in the contract and under proper use, arising from the faulty materials, design or workmanshipintheplantorfromfaultyerectionoftheplantbythecontractor,butotherwise and shall rectify such defects at his own cost when called upon to do so by the purchaser who shall state in writing such defects.

If it becomes necessary for the contractor to replace or renew any defective portions of the plant for purpose of rectification under this Clause, the provisions of this Clause shall apply to the portions of the plant so replaced or renewed until expiration of six months from the date of such replacement or renewal or until the end of the above mentioned period of twelve months whichever is later. If any defect is not rectified within a reasonable time, the purchaser may cancel the contract or part thereof whose decision will be final and binding on the contractor and the contractor will refund the money so paid to the contractor forthwith without any demur.

All inspections adjustments, replacements or renewals carried out by the contractor during the warranty period shall be subject to the same conditions as in the contract.

The contractor shall, give advance notice of not less than twelve months to the purchaser whenever spare parts of the stores are going out of production so that the purchaser may order requirement of spares in one lot or more lots if so desired.

The contractor shall further guarantee up to the plant/equipment/instrument/stores life that if spare parts go out of production, the contractor will make available blue prints, drawings of spare parts and specifications of stores at no cost to the purchaser, if and when required in connection with the stores to enable purchaser to fabricate or procure spare parts from other sources.

The provision of this Clause shall remain effective and binding upon the contractor even after the completion and fifteen years of expiration of the contract or till the stores supplied under the contract is in use by the purchaser, whichever is earlier.

5. ERECTION AND COMMISSIONING

In all cases where contract provide for supervision of erection and commissioning or for test at the purchaser's premises, the contractor shall indicate in advance the services required for installation and commissioning and the purchaser except where otherwise specified, shall provide free of charge, such labour, materials, fuels, apparatus and instruments as may be required from time to time and as may reasonably be demanded by the contractor to carryout efficiently such supervision of erection and commissioning and for the requisite test. In case of contract requiring electricity or services for the completion of erection, commissioning and testing at site, such electricity or services shall be supplied free of cost to the contractor or as specified in the NIT.

Action by the purchaser under the Clause shall not relieve the contractor of his warranty obligations under the contract.

6. TRAINING

The contractor shall, if required by the purchaser, provide facilities for the practical training of purchaser's engineering or technical personnel and for their active association on the manufacturing process through the manufacturing period of the contract/stores, number of such personnel shall be mutually agreed upon.

7. PAYMENT TERMS

7.1.FOR CONTRACTS IN INDIAN RUPEE ONLY

90% of total contract value exclusive of charges for installation and commissioning, if applicable after delivery of all consignment and preliminary inspection by purchaser's inspector on submission of the following:

7.1.1.1. GST compliant invoice in favour of paying authority duly pre-receipted.

7.1.1.2. Original shipping release containing the stamp and signature of the purchaser's inspection authority.

7.1.1.3. Preliminary Inspection Report alongwith Material receipt confirmation documents from Stores.

And balance payment will be released against following documents:

i) Installation, commissioning and training certificate if applicable

ii) Receiving voucher receipt from Stores.

7.2.FOR CONTRACTS IN CURRENCIES OTHER THAN INDIAN RUPEE

Unless otherwise specified elsewhere in the NIT, payment for the stores will be made as follows

90% of total contract value exclusive of charges for installation and commissioning, if applicable by Irrevocable Letter of Credit on submission of the following documents:

i. Bill of Lading/Negotiable Airway Bill evidencing shipment
ii. Invoice for the shipment : Four copies
iii. Packing List : Four copies
iv. Shipping authorization from purchaser wherever required. if applicable,
v. Any other document(s) as specified in the contract.

An advance copy of invoice along with details of documents forwarded through bank should be sent to the Paying Authority mentioned in the contract to enable him to verify the documents and honor the claim without delay.

The contractor shall be responsible to make available to the purchaser the documents which are essential for arranging customs clearance in India. The contractor shall arrange through his bank to have the documents air mailed to the purchase's bank without any delay. He shall also arrange to forward directly to the purchaser, three copies of Airway Bill, along with a copy of the invoice and packing list. If the purchaser incurs any extra expenditure by way of penalty payable to the Airport authorities in India or any other such expenditure due to delay in receipt of shipping documents specified by purchaser, the contractor shall be responsible for making good such extra expenditure incurred by the purchaser.

While the purchaser shall bear the bank charges payable to his bankers in India (State Bank of India) the contractor shall bear all the bank

charges payable outside India including the charges towards advising/amendments, commission.

The contractor shall send invoice only for the net amount payable to him after deducting the amount of agency commission included in the invoice which would be paid to the Indian agents directly by the purchaser in Indian Rupee. However the contractor's invoice should separately reflect the amount of commission payable to his Indian agent.

Balance payment will be made by wire transfer after final inspection, testing, installation, commissioning (where applicable), final acceptance and submission of PSDBG acceptance letter from the Purchaser against following documents.

i. Acceptance Report
ii. Receiving voucher from Stores

8. FORCE MAJEURE

DEFINITION OF FORCE MAJEURE

Force Majeure shall mean any event which is beyond the control of the contractor or the purchaser, as the case may be, which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affects the performance of the contract, such as

war, hostilities or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy and civil war.

rebellion, insurrection, mutiny, usurpation of civil or military government, civil commotion.

embargo, import restriction, confiscation, nationalization, mobilization, commandeering or requisition by or under the order of Central, State Government or Local Authority in India or any other act or failure to act, of any local, state or national government in India

riot

state/region/country wide transporters strike

earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone hurricane, storm, lightning and pressure waves or other natural disaster

nuclear event causing nuclear radiation, radioactive

contamination NOTICE OF FORCE MAJEURE

If either party is prevented, hindered or delayed from or in performing any of its obligations under the contract by an event of force majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen days after the occurrence of such event. A party shall give notice to the other party when it ceases to be affected by the force majeure. Failure to notify the purchaser about occurrence of such event within the time frame specified, the contractor shall have no right to claim any provisions under clause 8.4 below (consequences of force majeure)

DUTY TO MINIMISE THE EFFECT

The party or parties affected by the event of force majeure shall use reasonable efforts to mitigate the effect thereof upon its or their

performance of the contract and to fulfill its or their obligations under the contract

CONSEQUENCES OF FORCE MAJEURE

The party who has given notice of force majeure shall be excused from the performance or punctual performance of its obligations under the contract for so long as the relevant event of force majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The delivery time shall be re- fixed in accordance with Section C Part-A Clause 10, even though such force majeure event may occur after contractor's performance of his obligations has been delayed for other cause. No delay or non-performance by either party hereto caused by the occurrence of any event of force majeure shall

Constitute a default or breach of the contract give rise to any claim for damages or additional cost or expense occasioned thereby; if and to the extent that such delay or non-performance is caused by the occurrence of an event of force majeure. If the performance of the contract is substantially prevented, hindered or delayed for a single period of more than sixty days or an aggregate period of more than one hundred and twenty days on account of one or more events of force majeure during the currency of the contract, the parties will attempt to develop a mutually satisfactory solution.

FORCE MAJEURE AFFECTING SUB-CONTRACTOR

Conditions as enumerated in Section C Part B Clause 8 will be applicable to sub- contractor.

If any sub-contractor is entitled under the contract for Force Majeure on terms additional to or broader than those specified in this Clause, such additional or broader Force Majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.

9. LIMITATIONS

Anything in this Contract to the contrary not withstanding

The affected party shall not be relieved from obligations under this contract to the extent any gross negligence of the affected party aggravates the force majeure event; and

Force majeure shall not apply to obligations of either party to make payments to the other party under the contract.

10. HINDRANCES

The contractor is required to maintain hindrance register for reporting hindrance if any, while executing the work, as per Annexure-X

. The contractor shall get record of hindrances in the hindrance register(s) approved/ endorsed by the purchaser. Such hindrance in the work endorsed by the purchaser will only be taken into consideration for granting delivery date re-fixation.

ANNEXURE

BANK GUARANTEE / HINDRANCE
REGISTER FORMAT

ANNEXURE-I: PERFORMANCE SECURITY BOND

[Note: Bank Guarantee shall be got executed from a Nationalised / Scheduled commercial Bank (Except Co-operative Bank and Grameen Banks) only on non-judicial stamp paper of appropriate value]

Institute for Plasma Research
(Acting through) Director/ Head- Purchase and Stores Department/ Head-Purchase Section
Institute for Plasma Research

1. WHEREAS on or about the (Date of the Purchase Order) M/s._____a Company incorporated under the Companies Act 1956 and having its registered office at _____
(hereinafter referred to as 'The Contractor') entered into an agreement bearing No. _____(hereinafter referred to as 'The Contract'), with Institute for Plasma Research acting through Director/ Head- Purchase and Stores Department/ Head-Purchase Section, Institute for Plasma Research, Bhat, Near Indira Bridge, Gandhinagar-382428. (hereinafter referred to as (Purchaser) for supply of _____(hereinafter referred to as 'The Equipment').

2. AND WHEREAS under the terms & conditions of the contract, the Contractor shall furnish Performance Security Bond for an amount of Rs. _ (Rupees _____only) representing 3% of the total value of the contract in the form of a bank guarantee, in a manner herein contained duly executed by a scheduled/nationalised bank towards satisfactory performance of the contract and performance of the equipment and against any loss or damage caused to or suffered or would be caused to or suffered by the Purchaser by reason of any breach by the said Contractor(s) of any terms and conditions contained in the said agreement. The Performance Security Bond shall be valid till satisfactory completion of Defect Liability Period covering the Warranty/Guarantee period of the equipment as per the terms & conditions of the said agreement.

3. NOW WE, the____(Bank) in consideration of the promises do hereby agree and undertake to pay to the Institute for Plasma Research, (the purchaser) on behalf of the Contractor, the said sum of Rs._____(Rupees __Only), the amount due and payable under the guarantee without any demur, merely on a demand from the Institute for Plasma Research stating that the amount claimed is due by way of loss or damage caused to, or suffered by, the Purchaser by reason of any breach by the said Contractor of any of the terms and conditions contained in the said agreement or by reason of the contractors failure to perform the said agreement or by reason of unsatisfactory performance of the equipment during the Warranty period. Any such demand, made on the bank, shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____ (Rupees _____only).

4. WE undertake to pay to the Purchaser the said sum of ₹_____ (Rupees_____Only), demanded notwithstanding any dispute or disputes raised by the Contractor(s), in any suit on proceedings pending before any Court or Tribunal relating thereto, our liability under this presents being absolute irrevocable and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor shall have to no claim against us for making such payment.

5. WE HEREBY further agree that the decision of the Institute for Plasma Research as to the

amount of damages suffered by the Purchaser by reasons(s) of any breach by the said Contractor or whether the said equipment is giving satisfactory performance or not during the Warranty Period as per the terms and conditions of the said agreement, shall be final and binding on us.

6. AND WE, the_____(Bank) do hereby further agree that our liability hereinunder shall not be discharged by virtue of any agreement between the Purchaser and the Contractor whether with or without our knowledge and/or consent and shall remain in full force and effect during the period that would be taken for the performance of the said agreement or by reason of the Purchaser showing any indulgence or forbearance to the Contractor whether as to payment, time for performance, or any other matter whatsoever relating to the contract, which but for this provision, would amount to discharge of the surety under the law.

7. THIS guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

8. OUR Guarantee shall remain in force until_____and unless a claim under the guarantee is lodged with us within three months from the said date, all rights of the Purchaser under the guarantee shall be forfeited and we shall be relieved and discharged from all our liabilities hereunder.

9. Notwithstanding anything contrary contained in any law for the time being in force or banking practice, this guarantee shall not be assignable or transferable by the beneficiary. Notice or invocation by any person such as assignee, transferee or agent of beneficiary shall not be entertained by the bank. Any invocation of the guarantee can be made only by the beneficiary directly.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE-V: BANK GUARANTEE FORMAT FOR RE-EXPORT/RETURN OF REJECTED FOR EQUIPMENT REPAIRS / REPLACEMENT.

(By Indian/Foreign Contractor)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira Bridge,
Gandhinagar, Gujarat, India
Pin- 382428

Whereas on or about the_____day of_____20 , M/s._____a company having incorporated their office at_____(hereinafter referred to as 'the Contractor') entered into an Contract No._____dt._____(hereinafter referred to as 'the Contract') with the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research (Hereinafter referred to as 'the Purchaser') for manufacture and supply of_____Nos. of (hereinafter referred to as the instrument') at a cost of_____(in words).

Whereas as per the terms and conditions of the Contract, the Contractor had delivered to the consignee all the_____Nos. of instruments, out of which_____No./s. of the instrument costing_____(in figure and words) was found defective and not working satisfactorily after its receipt by the consignee and therefore the instrument received from the Contractor was rejected by the Purchaser.

Whereas as per the terms and conditions of the Contract, the Contractor has agreed to either repair or replace the instrument, as is deemed fit, free of cost, to the purchaser within a period of_____months from the date of receipt of the rejected instrument by the Contractor, under the warranty conditions of the Contract.

Whereas, as per the Purchaser policy, the Contractor was required to furnish a Bank Guarantee for full value of the defective instrument/s amounting to_____(in figure and words) as a safeguard to the Purchaser on account of any damage/loss that may be caused or suffered by the Purchaser due to the Contractor's inability/failure to return the instrument duly repaired or supply a new instrument in replacement of the defective instrument within the specified time and also when the instruments lie under the Contractor's custody, control or possession.

Whereas the Contractor, based on the Purchaser's requirement has agreed to furnish such a Bank Guarantee as a safeguard to the Purchaser interest as indicated in para 4 above, valid till the return of the repaired instruments or a replacement thereof, to the Purchaser.

Whereas, we,_____(name and address of the Bank) (herein after referred to as 'the Bank'), in consideration the Purchaser having agreed to despatch the defective instrument to the Contractor's works on freight to pay basis and Contractor having agreed to repair and return the defective instrument duly repaired or arrange free replacement of the defective instrument on freight paid/CIF_____basis, do hereby agree and undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of a sum not exceeding _____(in figure and words.) against any loss or damage that may be caused or suffered by the Purchaser by reason of the Contractor either no returning the repaired instrument or arrange free replacement within a specified time and also when the instrument lie under the custody, control or possession of the Contractor.

We, the Bank, do hereby undertake to pay to the Purchaser, the amount due and payable under this Guarantee, without any demur, merely on a demand from the Purchase Officer, Institute for Plasma Research on behalf of the Purchaser, stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Purchaser by reason of the Contractor either not returning the instrument duly repaired or arrange free replacement to the Purchaser and also when the instrument lie under the custody, control or possession of Contractor. Any such demand on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding _____(in figure and words).

We, the Bank, undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or disputes raised by the Contractor/s or by agents in any suit or proceeding pending before any' court or tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor/s and the agents shall have no claim against us for making such payment.

And we, the Bank, hereby further agree that the decision of the said Head-Purchase and Stores Department, Institute for Plasma Research as to whether the Contractor has committed breach of any such terms and conditions of the Contract or not and as to the amount of damage or loss assessed by the said Head-Purchase and Stores Department, Institute for Plasma Research on account of such breach would be final and binding on us.

We, the Bank, further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time for performance by the said Contractor from time to time or to postpone for any time or from time to time, any of the powers exercisable by the Purchaser against the said Contractor/s and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor/s or for any forbearance, act or commission on the part of the Purchaser or any indulgence by the Purchaser to the said Contractor/s or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This Guarantee will not be discharged due to the change in the constitution of the Bank, the Contractor or the agent.

Our Guarantee shall remain in force until and unless a claim under the Guarantee is lodged with us within three months from that date, all rights of the Purchaser under the Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE VI: BANK GUARANTEE FORMAT FOR RE-EXPORT OF REJECTED EQUIPMENT FOR REPAIRS / REPLACEMENT.
(By local agents of foreign Contractor)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira
Bridge, Gandhinagar,
Gujarat, India
Pin-382428

Whereas on or about the_____day of_____20 , M/s._____, a company having incorporated their office at_____(hereinafter referred to as 'the Contractor') entered into a Contract bearing No._____dt._____(hereinafter referred to as 'the Contract') with the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research, Gandhinagar, Gujarat, (Hereinafter referred to as 'the Purchaser') for manufacture and supply of Nos._____of (hereinafter referred to as the instrument') at a cost of_____(in figures and words). The Contract recognizes M/s._____(name and address) as the Indian agent of the Principals M/s._____in India.

Whereas as per the terms and conditions of the Contract, the Contractor had delivered to the consignee all the_____instrument costing_____(in figure and words) was found defective and not working satisfactorily after its receipt by the consignee and therefore the instrument received from the Contractor was rejected by the Purchaser.

Whereas as per the terms and conditions of the Contract, the Contractor has agreed to either repair or replace the instrument, as is deemed fit, free of cost, to the purchaser within a period of _____months from the date of receipt of the rejected instrument by the Contractor, under the warranty conditions of the Contract.

Whereas, as per the Purchaser policy, the Contractor was required to furnish a Bank Guarantee for full value of the defective instruments amounting to (in figure and words) as a safeguard to the Purchaser on account of any damage/loss that may be caused or suffered by the Purchaser due to the Contractor's inability/failure to return the instrument duly repaired or supply a new instrument in replacement of the defective instrument within the specified time and also when the instruments lie under the Contractor's. custody, control or possession. As the Indian agent has agreed to furnish the Bank Guarantee on behalf of the Principal in this Contract, M/s._ ____is required to execute the Bank Guarantee.

Whereas the Contractor, based on the Purchaser's requirement has agreed to furnish such a Bank Guarantee as a safeguard to the Purchaser interest as indicated in para 4 above, valid till the return of the repaired instruments or a replacement thereof, to the Purchaser.

Whereas, we, (the name and address of the Bank) (herein after referred to as 'the Bank'), in consideration of the Purchaser having agreed to despatch the defective instrument to the Contractor's works on freight to pay basis and Contractor having agreed to repair and return the defective instrument duly repaired or arrange free replacement of the defective instrument on freight paid /CIF _____basis, do hereby agree and undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of a sum not exceeding _____(in figure and words) against any loss or damage that may be caused or suffered by the Purchaser by reason of the Contractor either not returning the repaired instrument or arrange free replacement within a specified time and also when the instrument lie under the custody, control or possession of the Contractor.

We, the Bank, do hereby undertake to pay to the Purchaser, the amount due and payable under this Guarantee, without any demur , merely on a demand from the Purchase Officer, Institute for Plasma Research, stating that the amount claimed is due by way of loss or damage caused to

or would be caused to or suffered by the Purchaser by reason of the Contractor either not returning the instrument duly repaired or arrange free replacement to the Purchaser and also when the instrument lie under the custody, control or possession of Contractor. Any such demand on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding_____(in figure and words).

We, the Bank, undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or disputes raised by the Contractor/s or by agents in any suit or proceeding pending before any court or tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor/s and the Indian agents shall have no claim against us for making such payment.

And we, the Bank, hereby further agree that the decision of the said Head-Purchase and Stores Department as to whether the Contractor has committed breach of any such terms and conditions of the Contract or not and as to the amount of damage or loss assessed by the said Head-Purchase and Stores Department, Institute for Plasma Research on account of such breach would be final and binding on us.

We, the Bank, further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time for performance by the said Contractor from time to time or to postpone for any time or from time to time, any of the powers exercisable by the Purchaser against the said Contractor/s and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor/s or for any forbearance, act or commission on the part of the Purchaser or any indulgence by the Purchaser to the said Contractor/s or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This Guarantee will not be discharged due to the change in the constitution of the Bank, the Contractor/s or the agents.

Our Guarantee shall remain in force until_____and unless a claim under the Guarantee is lodged with us within three months from that date, all rights of the Purchaser under the Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE-VII: BANK GUARANTEE FORMAT FOR SUPPLY OF FREE ISSUE MATERIAL
(By Indian/Foreign Contractor)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira
Bridge, Gandhinagar,
Gujarat, India
Pin-382428

Whereas on or about the_____(date), the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research,(hereinafter referred to as the Purchaser) has entered into a Contract bearing No._____Dated_____for manufacture, inspection, testing and safe delivery of_(herein after referred to as the equipment) with M/s. _____having their office at_____(hereinafter referred to as the Contractor.)

And whereas in terms of the above said agreement, the Purchaser is required to supply free issue materials costing Rs._____as listed out in the agreement for the manufacture of the equipment at the Contractor's site, and that the Purchaser has agreed to authorise the Contractor to collect the free issue materials from the Purchaser's site subject to the Contractor furnishing a Bank Guarantee for Rs._____in a manner herein specified towards the safeguard of free issue materials.

Now, we_____(bank) in consideration of the Purchaser having agreed to authorise issue of free issue material for collection by the Contractor, hereby undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of the full value of the free issue material till such time the materials are lying under the custody/possession/control of the Contractor and till the equipment along with balance material, if any, are received by the Purchaser after manufacture of the equipment.

We,_____(bank) do hereby undertake to pay to the Head-Purchase and Stores Department, Institute for Plasma Research, the amount due and payable under this Guarantee without any demur, merely on a demand from the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Purchaser stating that the amount claimed is due by way of loss, destruction, deterioration or damage caused to or suffered by the Purchaser to the purchaser's material thereby resulting in a loss to the Purchaser while they are lying under the Contractor's custody, possession or control or on account of the Contractor's failure to fulfill any of the contractual obligations.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs. _____

We,_____(Bank) undertake to pay to the Purchaser any money so demanded

notwithstanding any dispute or any disputes raised by the Contractors in any suit or proceeding pending before any court of Tribunal relating

thereto our liability under this present being absolute and unequivocal. They payment so made by us under this Bond shall be a valid discharge of our liability for payment thereunder and the Contractors shall have no claim against us for making such payments.

We,_____(Bank), also agree that the decision of the Purchase Officer, Institute for Plasma Research, Gandhinagar, Gujarat as to whether the Contractor has caused any loss/destruction or deterioration or damage to the Purchaser's material while these are lying under his custody/possession/control from whatever cause arising as also on the quantum of damage suffered by the Purchaser shall be final and binding on us.

We,_____(bank) further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time for performance by the said Contractors from time to time or to postpone for any time or from time to time any of the powers exercisable by the Purchaser against the said Contractors and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractors or for any forbearance, act or omission on the part of the said Purchaser or any indulgence by the Purchaser to the said Contractors or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have the effect of so relieving us.

This Guarantee will not be discharged due to change in the constitution of the Bank or the Contractors.

Our Guarantee shall remain in full force until_____and unless a claim under the guarantee is lodged with us within six months from that date all rights of the Purchaser under the guarantee shall be relieved and discharged from all liabilities thereunder.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE-VIII: BANK GUARANTEE FORMAT FOR FIM
(Foreign Currency Contract)
(to be executed by the Indian Agent)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira
Bridge, Gandhinagar,
Gujarat, India
Pin-382428

Whereas on or about the _____ day of _____ 200 , M/s. _____, a company having incorporated their office at _____ (hereinafter referred to as 'the Contractor') entered into a Contract bearing No. _____ dt. _____ (hereinafter referred to as 'the Contract') with the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research (Hereinafter referred to as 'the Purchaser') for manufacture and supply of Nos. _____ of (hereinafter referred to as the instrument') at a cost of _____ (in figures and words). The Contract recognises M/s. _____ (name and address) as the Indian agent of the Principals M/s. in India.

And whereas in terms of the above said agreement, the Purchaser is required to supply free issue materials costing Rs. _____ as listed out in the agreement for the manufacture of the equipment at the Contractor's site, and that the Purchaser has agreed to authorise the Contractor to collect the free issue materials from the Purchaser's site subject to the Contractor furnishing a Bank Guarantee for Rs. in a manner herein specified towards the safeguard of free issue materials. As the Indian agent has agreed to furnish the Bank Guarantee on behalf of the Principal in this Contract, M/s. _____ is required to execute the Bank Guarantee.

Now, we _____ (bank) in consideration of the Purchaser having agreed to authorise issue of free issue material for collection by the Contractor, hereby undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of the full value of the free issue material till such time the materials are lying under the custody/possession/control of the Contractor and till the equipment along with balance material, if any, are received by the Purchaser after manufacture of the equipment.

We, _____ (bank) do hereby undertake to pay to the Head-Purchase and Stores Department, Institute for Plasma Research, the amount due and payable under this Guarantee without any demur, merely on a demand from the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Purchaser stating that the amount claimed is due by way of loss, destruction, deterioration or damage caused to or suffered by the Purchaser to the purchaser's material thereby resulting in a loss to the Purchaser while they are lying under the Contractor's custody, possession or control or on account of the Contractor's failure to fulfill any of the contractual obligations.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs. _____

We,_____(Bank) undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or any disputes raised by the Contractors in any suit or proceeding pending before any court of Tribunal relating thereto our liability under this present being absolute and unequivocal. They payment so made by us under this Bond shall be a valid discharge of our liability for payment thereunder and the Contractors shall have no claim against us for making such payments.

We,_____(Bank), also agree that the decision of the Head-Purchase and Stores Department, Institute for Plasma Research, Gandhinagar, Gujarat as to whether the Contractor has caused any loss/destruction or deterioration or damage to the Purchaser's material while these are lying under his custody/possession/control from whatever cause arising as also on the quantum of damage suffered by the Purchaser shall be final and binding on us.

We,_____(bank) further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time for performance by the said Contractors from time to time or to postpone for any time or from time to time any of the powers exercisable by the Purchaser against the said Contractors and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractors or for any forbearance, act or omission on the part of the said Purchaser or any indulgence by the Purchaser to the said Contractors or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have the effect of so relieving us.

This Guarantee will not be discharged due to change in the constitution of the Bank or the Contractors.

Our Guarantee shall remain in full force until_____and unless a claim under the guarantee is lodged with us within six months from that date all rights of the Purchaser under the guarantee shall be relieved and discharged from all liabilities thereunder.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE-X: FORMAT FOR HINDRANCE REGISTER

Sl. No.	From	To	Nature of Hindrances in execution of Contract	Remarks with signature of Contractor	Remarks with Signature of Purchaser's representative

(To be printed in letter head)

Annexure-XI

Self-Certification under preference to Make in India order Certificate

In line with Government Public Procurement Order No. P-45021/2/2017-PP (BE-II) dated 04.06.2020 and its amendments, we hereby certify that we M/s. _____ are local supplier meeting the requirement of minimum local content i.e., _____% excluding transportation, insurance, installation, commissioning, testing, training and after sales service support like AMC/CMC etc. as defined in above orders for the material against IPR Enquiry/Tender No **IPR/TN/PUR/TPT/ET/21-22/012** dated **31-08-2021.** Details of location at which local value addition will be made as follows: _____.

_____

_____

We also understand, false declarations will be in breach of the code of integrity under rule 175(1) (i) (h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

Thanking You,

_____
Signature with date:
Name:
Designation:
Official Seal

(To be printed in letter head)

ANNEXURE-XII

Annexure to Bid Form: Eligibility Declarations

(To be submitted as part of tender/Technical Bid)
(on company letter head)
(Along with supporting documents, if any)

Tender No. IPR/

Tender Tile:
Bidder's Name: _____
(Address and contact details)
Bidder's Reference No._____

Date:_____

Restrictions on procurement from Bidders from a country or countries, or a class of countries under Rule 144(xi) of the General Financial Rules 2017.

"We have read the clause regarding restrictions on procurement from a Bidder of a country which shares a land border with India; and solemnly certify that we are not from such a country or, if from such a country, we are registered with the Competent Authority (copy enclosed). We hereby certify that we fulfill all requirements in this regard and are eligible to be considered."

Penalties for false or misleading declarations:

We hereby confirm that the particulars given above are factually correct and nothing is concealed and also undertake to advise any future changes to the above details. We understood that any wrong or misleading self-declaration by us would be violation of Code of integrity and would attract penalties as mentioned in this tender document, including debarment.

_____
(Signature with date)

_____
(Name and designation)
Duly authorized to sign Bid for and on behalf of

_____
(Name & address of the Bidder and Seal of Company)

SECTION 'D' :

TECHNICAL SPECIFICATIONS OF STORES

AND

DRAWINGS

Please see attachment to the tender

SECTION 'E' :

PRICE SCHEDULE

Please see attachment to the tender

Annexure-IV

प्लाज्मा अनुसंधान संस्थान
(भारत सरकार के परमाणु ऊर्जा विभाग का सहायता प्राप्त संस्थान)
इंदीरा ब्रिज के पास, भाट, गांधीनगर – 382428, भारत
दूरभाष: 079-23962020/23962021, **फैक्स:** 079-23962277

ADDITIONAL CONDITIONS OF CONTRACT against

IPR Tender No: IPR/TN/PUR/TPT/ET/21-22/052 Dated: 23/02/2022

Following clauses are deleted in Form No. e_IPR-P-103

(Section–A)

a) 47.2

Following clause is modified in Form No. e_IPR-PUR-103

7 VALIDITY OF BIDS

7.1 Bids shall be kept valid for acceptance for a period till **120 Days** from the date of **Opening of PART-I (Technical Bid)**. Bids with shorter validity period shall be rejected without any notice to the bidder.

Following clauses are deleted in Form No. IPR-P-100

PART-A

a) 7.2
b) 20.1
c) 22
d) 29.1

PART-B

a) 7.2

Following clause is modified in Form No. IPR-P-100

PART–A

29.2 Ownership of the stores supplied by the contractor shall be transferred to the purchaser when the stores are delivered and accepted by the purchaser.

Following clause is modified in Form No. IPR-P-100

PART–B

7.1 The Clause Sr. No. 7.1 under heading Payment Terms of Section-B "General Conditions of Contract" of Form No. e_IPR-PUR-103 (Terms and Conditions) is replaced with the following:

Payment: Unless otherwise agreed to in writing between the Purchaser and the Contractor, payment for the delivery of the tendered items, will be made as follows.

a) 80% of basic price of Item Sr. No. 1.01 of Price-Schedule + 100% of all other charges will be paid after receipt of all material at IPR Site, Bhat, Gandhinagar, its physical verification by representative of IPR and on receipt of Invoice in triplicate.

b) Balance 20% of basic price of Item Sr. No. 1.01 of Price-Schedule and 100% of Item Sr. No. 1.02 of Price-Schedule + all other taxes will be paid within 30 days after satisfactory completion of site acceptance tests (SAT) and on receipt of final invoice**.**

Following Annexures are deleted in Form No. IPR-P-100

Following Annexures are added in Form No. IPR-P-100

Annexure-XIII (**COMMERCIAL TERMS & CONDITIONS)**

Vendor/ Bidder should upload the duly filled (signed and stamped) copy of commercial bid (unpriced) as per Annexure-XIII

IMPORTANT NOTE:

1) **QUOTATIONS ARE INVITED IN INDIAN CURRENCY ONLY.**
2) **QUOTATIONS RECEIVED OTHER THAN "INR" QUOTE SHALL SUMMARILY BE REJECTED.**
3) **OFFERED PRICE SHOULD BE EXCLUSIVE OF APPLICABLE GST.**
4) **PARTIAL OFFER IS NOT ACCEPTABLE. OFFER RECEIVED FOR THE PARTIAL ITEM SHALL BE SUMMARILLY BE REJECTED**
5) **RATE MENTIONED AS "0" IN PRICE SCHEDULE SHALL BE CONSIDERED AS "WITHOUT ANY CHARGE/ FREE OF COST".**

Annexure – XIII

COMMERCIAL TERMS & CONDITIONS

IPR Enquiry/Tender No	**IPR/TN/PUR/TPT/ET/21-22/052 dated 23/02/2022**
Item Description	Manufacturing Drawings, Fabrication, Assembly, Pre-dispatch Inspection & Testing, Supply, Installation and Final Acceptance Tests at IPR of Ohmic Coil and Toroidal Field Coils Assembly alongwith Mandatory Spares as per the detailed specifications mentioned in the tender document.

Sl. No.	PARTICULARS	REMARKS
I	**Name of the Bidder**	
II	**Bidder Bid No & Date**	
III	**Postal address**	
IV	**Contact with STD code**	
V	**Fax with STD code**	
VI	**Name of Contact person**	
VII	**Mobile No.**	
VIII	**e-mail ID**	
IX	**Currency of offer/quotation**	INR
	Commercial Terms for Quoted items (Please Provide Commercial terms and conditions in the below form)	
1	Price Term for Supplies offered in Indian Currency	FOR IPR Gandhinagar
3	**Goods and Services Tax**: **Goods and Service Tax <u>for Supply Items</u> only**: IPR is entitled to avail GST Concessional Rate as per Ministry of Finance Notification No. 47/2017 Integrated Tax (Rate) dated 14/11/17 (for IGST) and (CGST @ 2.5% and SGST @ 2.5%) as per Notification No. 45/2017-Central Tax (Rate) dated 14/11/17 and Notification No. 45/2017-State Tax (Rate) dated 15/11/17 **Confirm that in the event of issuance of GST Concessional Certificate you shall charge GST on Supply Portion @5% only** **Goods and Service Tax for Service items: As applicable**	
4	**Delivery period:** Refer tender terms	
5	**Installation and commissioning charges:** Have you offered Installation	

	& Commissioning Charges? **(if applicable)**	
6	**Liquidated Damages**:- Please confirm that the Liquidated Damages as per Sr. No. 10 of Form No. IPR-P-100 attached with the tender/enquiry is acceptable to you	
7	Terms of Payment:- Please confirm payment terms mentioned in the tender document is acceptable to you Refer "**Annexure-IV" for details**	
8	Guaranty / Warranty:- Refer tender terms	
9	**Validity of offer/quotation**:- Refer tender terms	
	QUESTIONNAIRE TO BE FILLED BY BIDDER IN AND SENT ALONG WITH OFFER DULY SIGNED	Accepted/ Not Accepted
10	**Performance Security:** In the event of a purchase order/contract vendor has to provide Performance Security (PSDBG) as per tender terms, wherever applicable shall be submitted.	
11	**Free Issue Material:** Successful tenderer will have to arrange insurance/ Bank Guarantee towards adequate security for the materials/property provided/issued by the Purchaser as Free Issue Material for the due execution of the contract, wherever applicable.	

Yours faithfully
Bidder
(Digitally signed or ink signed)

SECTION 'D' :

TECHNICAL SPECIFICATIONS OF STORES

AND

DRAWINGS

Institute for Plasma Research

(An Aided Institute of Dept. of Atomic Energy)
Bhat, Gandhinagar

QUALIFYING REQUIREMENTS

ITEM DESCRIPTION	**Manufacturing Drawings, Fabrication, Assembly, Pre-dispatch Inspection & Testing, Supply, Installation and Final Acceptance Tests at IPR of Ohmic Coil and Toroidal Field Coils Assembly alongwith Mandatory Spares as per the detailed specifications mentioned in the tender document.**

Sr. No.	Detailed Criteria	Documents required to submit / upload
1	The Bidder must have ISO 9001:2015 certification	Bidder should upload/submit copy of the valid ISO 9001:2015 certificate.
2	The bidder must have carried out Precision machining work (size of at least 1m length) in-house or through sub-contractor on either of copper or aluminium or stainless steel materials in the last 8 years from the date of publication of this tender.	The Bidder should upload copies of following executed by the bidder: (a) Purchase order/Contract copy with technical details. (b) documentary proof of acceptance/installation or completion certificate from the end user (c) Self-declaration by the bidder mentioning work sub-contracted by the bidder against the submitted contract/PO.
3	The bidder shall have in-house Vacuum Pressure Impregnation (VPI) facility or access to VPI facility through his sub-vendor, for components (size of at least 1.5m in length)	The Bidder should upload copies of following executed by the bidder: (a) Purchase order/Contract copy with technical details. (b) documentary proof of acceptance/installation or completion certificate from the end user (c) If Bidder does not have in-house VPI facility and plans to sub-contract VPI work to his sub-vendor, he shall submit a self-declaration from his sub-vendor regarding their VPI facility capacity.

Note:

a	The response to tender without submission of proof of above points will summarily be rejected without further communication
b	The bidder shall not be under a declaration of ineligibility for corrupt or fraudulent practices or blacklisted with any of the Government agencies
c	Original documents shall be produced for verifications, if required

Technical Specifications
Fabrication, Assembly,
Testing, Supply & Installation of
Integrated Ohmic Coil & Toroidal Field Coils
Assembly

INSTITUTE FOR PLASMA RESEARCH

(An Aided Institute of Department of Atomic Energy, Government of India)

NEAR INDIRA BRIDGE,

BHAT, GANDHINAGAR – 382 428

GUJARAT, INDIA

Abbreviations

CS	Center Stack
CSC	Center Stack Casing
Cu	Copper
ETP	Electrolytic Tough Pitch
FAT	Factory Acceptance Test
IPR	Institute for Plasma Research
IEC	International Electrotechnical Commission
LPT	Liquid Penetrant Test
MIP	Manufacturing and Inspection Plan
OH	Ohmic Heating
PCS	Prototype Center Stack
QAP	Quality Assurance Plan
RTD	Resistance Temperature Detector
SAT	Site Acceptance Test
SS	Stainless Steel
TF	Toroidal Field
VPI	Vacuum Pressure Impregnation

Table of Contents

Technical Specifications
Fabrication, Assembly, Testing, Supply & Installation of Integrated Ohmic Coil & Toroidal Field Coils Assembly

1. INTRODUCTION

The **"Integrated Ohmic Coil & Toroidal Field Coils Assembly"**, also called as **"Prototype Center Stack (PCS) assembly",** is one of the important systems of Spherical Tokamak configuration. It consists of components such as Toroidal Field (TF) coils, Ohmic Heating (OH) coil, tension cylinder, center stack casing, support structure in a stringent limited volume.

A single complete TF Coil is formed by connecting the three inner TF turns with the outer leg. An outer leg of TF coil also has three outer turns. There are 6 such TF Coils in the proposed PCS assembly. The OH coil is formed by winding an insulated continuous square cross-section ETP Copper hollow conductor (5.6mm x 5.6mm), having a throughout channel of 2.5mm diameter in the center, over an insulated tension cylinder of SS 304. The TF coil outer legs, TF inner legs bundle along with OH coil needs to undergo Vacuum Pressure Impregnation (VPI) process to ensure insulation protection and integrity of the coil.

Prototype Center Stack (PCS) needs to demonstrate dimensional accuracy with strict control on tolerances at each of the manufacturing stages, during and after assembly. Major works involved in the manufacturing of PCS Assembly are as follows

- TF Coils: Fabrication, electrical insulation (including VPI) and testing (inner and outer legs with envelope).
- OH Coil: Fabrication, electrical insulation (including VPI) and testing.
- Fabrication: Support structure, Center Stack Casing (CSC) & other PCS internal components.
- Assembly & Testing at Factory site: TF Coils, OH Coil, CSC on the Support structure.
- Disassembly, Packing and Shipping
- Final Installation & Testing at IPR site.

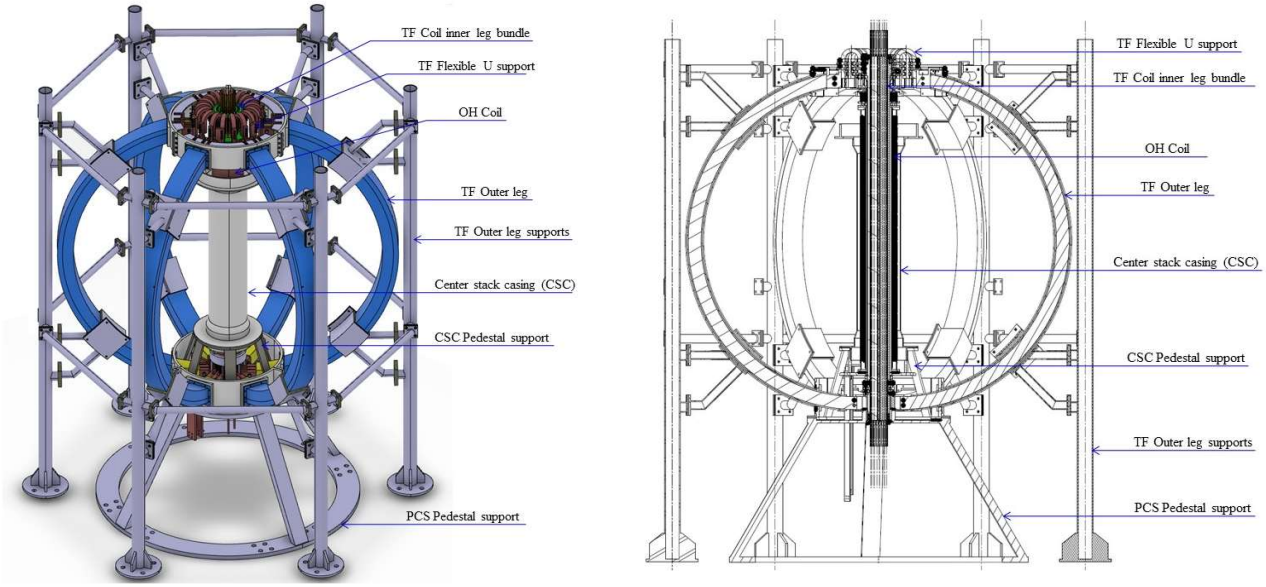


Figure – 1: Isometric View of Prototype Center Stack Assembly with Support Structure

2. SUBJECT OF THIS TECHNICAL SPECIFICATION

The aim of this technical specification is to get manufactured, tested, supplied and installed at IPR a Prototype Center Stack Assembly along with the Support Structure as per the requirements stipulated in this document.

3. SCOPE OF SUPPLY

3.1. The item of supply constitutes:

Sr. No.	*Items*	*Drawing*	*Qty*
1.	Prototype Center Stack Assembly with Support Structure	IPR/ATD/PCS/01	1 unit
2.	**Mandatory Spares:** Supply of all types of wedge-lock washers/bolts/nuts/temperature sensors/G10 sleeves used in the assembly	-	10% of used quantity to be supplied as spares

3.2. Documentation

Along with the items supplied as given in section 3.1, following documents are the part of supply:

(a) Quality Assurance Plan (QAP)

(b) Manufacturing and Inspection Plan (MIP)

(c) Manufacturing drawings

(d) Certified Materials test certificates,

(e) Test procedures for Pressure test.

(f) Inspection reports (dimensional & visual inspection, pressure tests, electrical tests etc.)

(g) As-built drawings

(h) Coil interconnections diagram

(i) Assembly & Disassembly Manual

(j) Photographs from different stages of manufacturing & processes for all the components and the assembly.

4. INPUT DOCUMENTS PROVIDED BY IPR

4.1. Applicable drawings: The list of engineering drawings is provided in ***Annexure – 1***.

4.2. QAP: A format of QAP for a typical component and for activities involved in this project is provided in ***Annexure – 2***.

4.3. **Location of temperature sensors installation:** The locations indicating the placement of temperature sensors on the component is indicated in ***Annexure – 3***.

4.4. **Thermal Insulation Properties:** This is provided in ***Annexure – 4***.

4.5. **Suggested Assembly Sequence:** This is described in detail in ***Annexure -5***.

5. SCOPE OF WORK:

5.1. The Vendor shall study all the General Assembly & Engineering drawings and technical specifications including assembly sequence for the entire job provided by IPR. *The vendor or his representative shall make a presentation to IPR describing their understanding of the entire scope of work within one month from the date of work contract*. The vendor may propose any needed changes in work or assembly sequence to IPR, during this presentation with appropriate justification, for review & necessary approval.

5.2. Preparation of Quality Assurance Plan (QAP) for the entire project with remarks on review, hold and witness points at each stage of the manufacturing and inspection. The Quality Assurance Plan shall also be accompanied with a tentative time schedule for all the activities in the entire project. *The vendor shall submit the same to IPR within six (6) weeks from the acceptance of work contract for review and approval*. A tentative format of QAP for this project and a typical component is provided in ***Annexure 2***.

5.3. Preparation of detailed Manufacturing & Inspection Plan (MIP) for each major component of PCS Assembly mentioning every stage of their manufacturing and inspection. *The vendor shall submit the same to IPR within six (6) weeks from the acceptance of work contract for review and approval*.

5.4. Preparation of detailed fabrication/manufacturing drawings based on the approved engineering drawings provided by IPR as described in ***Section 6***. *These shall be submitted to IPR within 2 months from the acceptance of work contract for review and approval*.

5.5. Preparation of manufacturing documents such as procedures for fabrication (machining, cutting, brazing, welding etc.) envisaged in this work, application of electrical and thermal insulation as required, inspection and testing, cleaning, quality control for various stages of work, etc. *The same shall be submitted to IPR within 2 months from the acceptance of work contract for review and approval*.

5.6. Procurement (including inspection and evaluation) of raw material, joining consumables, insulation (electrical and thermal), temperature sensors and other needed items or materials including bolts/fasteners etc as per ***Section 8 & Bill of Material***. Chemical composition analysis, mechanical tests, electrical conductivity/resistivity tests etc. to be carried out at an NABL approved Laboratory for the procured raw material as specified in ***Section 8***. The vendor is responsible for the safe storage of procured material. Care should be taken to avoid contact of stainless steel with carbon steel at any time.

5.7. Fabrication of each component of PCS as per the approved manufacturing drawings as per ***Section 9***. During fabrication, if any change in the procedure is sought by the vendor, the same shall be submitted to IPR for approval. No fabrication work shall be attempted without prior approval for modified procedures.

5.8. Development/procurement of any required special purpose tooling, winding or bending equipment is in the scope of the vendor.

5.9. Detailing & development of templates, gauges, special tools, test set-up etc. for Dimensional Inspection. The details of these items and their usage shall be submitted to IPR along with the manufacturing procedures for review and approval.

5.10. Dimensional inspection at every stage of fabrication to ensure dimensional accuracy as specified in drawings as described in ***Section 11***. Final dimensional report for each component shall be submitted to IPR.

5.11. Inter-coil joints, electrical connections, terminal connections are in the scope of the vendor as per ***Section 9.5***.

5.12. Application of thermal & electrical insulation, Vacuum Pressure Impregnation (VPI) of coils as required and specified in drawings and in this specification in ***Section 8.3, 8.4*** & ***9.4*** respectively.

5.13. Fabrication of "Support Structure" for PCS as per MIP and approved manufacturing drawings.

5.14. The Vendor shall ensure that all finished components including support structure shall be non-magnetic.

5.15. The Vendor shall assemble the fabricated components as per the approved assembly procedures at his site in the presence of IPR representatives as described in ***Section 10***. The vendor shall arrange for appropriate temporary supports and storage of the components during and after manufacturing stages, sub-assembly and assembly stages etc.

5.16. During Assembly, for any type of machining or modifications required, the vendor shall inform IPR and request for approval. Without IPR approval, vendor shall not perform any modification in the components.

5.17. Connection of temperature sensors (16 Nos.) at the locations provided by IPR in ***Annexure – 3***.

5.18. Quality assurance & control – testing (mechanical and electrical) and inspection at all stages of manufacturing as per the approved QAP & MIP as described in ***Section 11***. Fabrication of connections and fixtures needed for hydro-test and other required tests are in the scope of the vendor.

5.19. Disassembly, Packing, Transportation, safe delivery of the entire PCS assembly at IPR as per ***Section 12***.

5.20. Unpacking and Final Installation & Acceptance at IPR as per ***Section 13 and 14*** respectively.

5.21. The vendor is responsible for any damage caused to the components during fabrication, assembly, testing or transport till final acceptance at IPR.

5.22. The vendor shall **deliver the entire package along with completion of Site Acceptance Tests at IPR within 12 months** from the date of acceptance of work contract.

5.23. Complete documentation including photographs.

6. MANUFACTURING DRAWINGS:

6.1. The Vendor shall submit the detailed manufacturing drawings (two sets of hard copy and two sets of soft copy in electronic media) to IPR within 2 months from the date of acceptance of work contract to obtain approval from IPR.

6.2. The manufacturing drawings shall give details of manufacture such as different stages of machining with machining margin, braze/weld edge preparation, chamfer and counter sink dimensions, surface finishes, dimensions with numerical value of tolerances (shall be sufficiently bold for ease in reading), geometrical tolerances of form and positions, accuracy of built-in dimensions, attachments weld joint details, method of Inspection/Testing, bill of materials, surface treatment instructions, besides other relevant information and details.

6.3. The drawings shall be prepared in accordance with ISO standards. (Viz. ISO 128: "Technical drawings-General principles of presentation; parts 1, 20, 21 etc.", ISO 406: "Technical drawings-Tolerancing of linear and angular dimensions, ISO 5459 "Technical Drawings-Geometrical tolerancing- Datums and datum-systems for geometrical tolerances", ISO 2692 "Technical Drawings-Geometrical tolerancing- Maximum material principle", ISO 2553 "Welded, brazed and soldered joints- Geometric representation on drawings", ISO 6410 "Technical drawings- Screw threads and threaded parts; parts 1,2,3 etc.", ISO 10578 "Technical drawings- Tolerancing of orientation and location- Projected tolerance zone" etc.). AutoCAD/Solidworks/CATIA softwares shall be used for CAD.

6.4. All dimensions at component level and at assembly level to be controlled within permissible tolerances specified in the provided input engineering drawings.

6.5. The manufacturing drawings shall be inclusive of but not limited to the following:

a) General Assembly and Subassembly drawings shall identify the inter-stage checks/inspections to be performed at sub assembly levels.
b) Detailed fabrication drawings for all components.
c) All drawings for design of templates, fixtures, gauges etc. to be used for assembly, inspection & testing.

6.6. The Vendor shall also carry out revision of drawings in order to incorporate any subsequent modifications required in the drawings before and during the manufacture. Any deviation/revision in the fabrication drawings will need approval from IPR.

6.7. The checking and approval of all fabrication documents by IPR shall not relieve the vendor from full responsibility for ensuring correct interpretation of drawings & specifications and for the completeness and accuracy of the fabrication drawings and relevant documents.

6.8. **As-Built drawings:** Prior to shipment of the equipment, the Vendor shall prepare 'As-Built' drawings which will show actual dimensions achieved on the component. IPR is free to ask additional dimensional/geometrical measurements to be performed and incorporated in the as-built drawings. The deviations occurred during the manufacture shall be recorded in reports and reflected in these drawings.

7. APPLICABLE CODES & STANDARDS:

7.1. Applicable codes and standard (latest edition) covering scope of work are mentioned below. In case of ASTM standards, corresponding equivalent Indian standards can be considered.

- IS 613 - Copper Rods and Bars for Electrical Purposes
- IS 2501 - Solid Drawn Copper Tubes for General Engineering Purposes
- IS 14811 - Rolled Copper Plate, Sheet, Strip and Foils for General Engineering Purposes
- IS 191 - Copper Specification
- IS 1897 - Copper strip for electrical purposes
- IS 2927 – Specifications for Brazing Alloys
- ASTM A312 – Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
- ASTM A479 – Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels
- ASTM A240 – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- ASME/ANSI B36.19 - Stainless Steel Pipes – Dimensions
- AWS D1.6/1.6M – Structural Steel Welding Code – Stainless Steels
- AWS A5.9 – Specification for bare stainless steel welding electrodes and rods.
- ASTM A-700, Standard Guide for Packaging, Marking, and Loading Methods for Steel Products for Shipment
- IEC 60751 – Industrial platinum resistance thermometers and platinum temperature sensors
- IEC 60060-1 – Dielectric voltage with impulse voltage
- IEC 60851-5.4 – Breakdown voltage test

7.2. Any apparent conflicts between the requirements given in this document and the applicable code/Specification shall be brought to attention of IPR for clarification.

8. MATERIAL OF CONSTRUCTION:

8.1. ETP Copper for TF Coils & OH Coil

8.1.1. For TF Coils – ETP Copper bars/rods, tubes & plates in adequate number and of adequate dimensions to be procured by the vendor shall be as per the Section 8.1.3 specifications/properties.

8.1.2. For OH Coil – Single continuous ETP Copper hollow conductor having square cross-section (5.6 mm x 5.6 mm) with throughout channel of 2.5mm diameter at the center of more than the required length shall be procured by the vendor as per the properties mentioned in ***Section 8.1.3.*** No joints are permitted in the entire length of the conductor.

8.1.3. ETP Copper specifications/properties

Sr. No.	Parameter	Specifications	
1	Material	ETP Copper (half hard) as per IS – 613 for bars/rods	or equivalent ASTM standards;
		ETP Copper (half hard) as per IS – 2501 for tubes	
		ETP Copper (half hard) as per IS – 14811 for plates	
2	Surface Finish	Bright, clean and smooth surface, free from any kind of surface defects. Free from sharp edge, blisters, cracks and die marks with buffed and mechanical polished.	
3	Chemical Composition	Minimum 99.90 Cu%; As per IS 191 (part-5)-1980 shall be determined by the method specified in IS-440:1964	
4	Electrical Conductivity	Minimum 97% IACS at 20°C	
5	Electrical Resistivity	1.78×10^{-8} Ωm at 20°C	
6	Thermal Conductivity	394 W/m°C	
7	Density at 20 °C	8.89 g/cm^3	
8	Tensile Strength	240 – 300 N/ mm^2, (as per IS 1608/standard method)	
9.	Hardness	70-90 HV, (as per IS 1501/standard method)	
10.	Applicable standards	IS 1897 (2008) , IS 613, IS 191- Part V, IS 2501	

8.1.4. Testing & Acceptance of procured ETP Copper raw material

One piece/sample per each lot/batch of copper bars has to be tested in NABL certified Laboratory and the material test report should be provided to IPR by the vendor for approval. Test parameter values should strictly comply with IPR technical specifications. Test certificate should include points mentioned in ***Section 8.1.3*** (Sr. No. 1, 3, 4, 8 and 9 of the table).

Vendor has to provide test certificates for bending test of one piece/sample per each lot/batch of copper bars as per IS 1599 to be tested in NABL certified lab. Test parameters should comply with IPR technical specifications.

8.2. Stainless Steel for Support Structure and other components

8.2.1. Support Structure & related components (SS 304): All Support structure and other components (Center Stack Casing & OH Tension Cylinder, bolts/nuts/studs/washers etc.) shall be of SS 304 product forms of SS 304 and shall be procured as per following requirements

Sr. No.	Parameter	Specifications
1	Material	Pipes – ASTM A312 TP304;
		Bars – ASTM A479 Grade 304;
		Plates/Strips/Sheets – ASTM A240 TP304
		Bolts – ASTM A193 Grade B8
		Nuts – ASTM A194 Grade 8
2	Surface Finish	Free from mill scales and injurious defects like laps, seams, folds, cracks, string, tears, blisters, scratches etc. Finish on faces, which are not to be machined subsequently shall be within 3.2 microns.
3	Chemical Composition	As per the product specific standards
4	Ultimate Tensile Strength (UTS) & Yield Strength (YS)	Pipes: >485 MPa (UTS) & 170 MPa (YS) Bars: >485 MPa (UTS) & 170 MPa (YS) Plate/Strips/Sheets: > 485MPa (UTS) & 170 MPa (YS)
5	Hardness	Pipes: 192 BHN max. Bars: 200 BHN max Plate/Strips/Sheets: 200 BHN max.
6	Non Destructive Evaluation	As per the product specific standards
7.	Applicable standards	ASTM A312, A479, A240, A370, A193, A194 or equivalent Indian Standards

8.2.2. Wedge-lock Washers (SS 316): Wedge-lock washers shall be used for bolt-nut assemblies wherein specified in drawings. Standard size wedge-lock washers shall be procured as per dimensions of bolt-nut assemblies specified in the drawings. ***Material of wedge-lock washers shall be SS316;*** non-magnetic and austenitic stainless steel.

8.2.3. Testing & Acceptance of procured Stainless Steel raw material

8.2.3.1. The vendor shall submit the Material Test Certificates of the procured material that has details of Chemical Composition Analysis, mechanical testing results & Ultrasonic Inspection results to IPR for approval.

8.3. Thermal Insulation

8.3.1. Cerawool or similar thermal insulation of 7mm thickness is to be used as the thermal insulation between OH coil and Center Stack Casing. The procured thermal insulation should have the physical properties as specified in ***Annexure 4***.

8.4. Electrical Insulation Requirements

8.4.1. Central G10 rod of dimensions as specified in the approved drawings and for electrical insulation application in locations specified in the approved drawings shall meet the requirements as required in ***Section 8.4.4***.

8.4.2. For all the individual copper conductors, copper joints, inter layer and turn-turn insulation, Polyester film insulation tape (F class or above), 0.25mm thickness should be used. The specified coil insulation thickness should be obtained by uniformly wrapping the insulation tape.

8.4.3. At the ends/joints of copper conductor to keep the Polyester film insulation tape integrity with the conductor a Kapton Polyimide Film tape should be wrapped (3 turns) upon the Polyester film insulation tape to maintain the integrity of insulation with the copper conductor.

8.4.4. **Required Electrical Insulation and their properties**

Sr. No.	Insulation material	Thickness in mm	Usage	Sample Testing *	
				Test method	Breakdown voltage (±10%)
1.	G10 sheet/rod	As specified in the drawings	As specified in the drawings	IEC 60851 - 5.4	≥ 25kV/mm
2.	Polyester film insulation tape (F class or above)	0.125	All individual copper conductors, copper joints, inter layer and turn-turn insulation, ground wrap insulation	IEC 60851 - 5.4	≥ 25kV/mm
3.	Kapton Polyimide Film tape	≤ 0.07	At the ends/joints of copper conductor to keep integrity of Polyester film insulation tape	IEC 60851 - 5.4	≥ 25kV/mm
4.	G10 sleeve	1 mm wall thickness	As insulated sleeve for bolt when joined with more than one turn	IEC 60851 - 5.4	≥ 25kV/mm

* **Sample testing**: Vendor has to provide the above test certificates (from certified labs) for the sample material taken from the insulation bundles.

8.5. Temperature Sensors

8.5.1. Temperature Sensors as specified below along with their calibration certificates shall be procured:

Sr. No.	Item	Description
1.	Sensor Type	PT100
2.	Wire Configuration (Nos.)	3
3.	Class of Tolerance	Class A
4.	Mounting type	Surface mount
5.	Conformity Standard	IEC 60751
6.	Working temperature	40 - 100 °C
7.	Grade of Protection	IP55
8.	Cable length	~30 ft
9.	Width of tip	< 10mm
10.	length of tip	< 20mm
11	Cable heat resistance	≥ 100 °C

8.5.2. The procured sensors shall be calibrated and the vendor shall provide the calibration certificates for each of the temperature sensors.

9. FABRICATION REQUIREMENTS:

9.1. GENERAL

9.1.1. Fabrication of all components shall be carried out based on drawings/specifications/procedures duly approved by IPR.

9.1.2. The vendor shall provide adequate provisions to take care of tolerances as specified in the drawings in the assembly of the components, coils, support structure etc.

9.1.3. At no point during the manufacturing or assembly, the vendor shall use hammering or any other forceful methods on the components. Poor workmanship identified in the work, shall be liable for rejection.

9.1.4. Manufacturing Procedures prepared for the manufacture of all the items and assemblies involved in the supply shall contain details of all the manufacturing stages in a sequential way. They should incorporate a flow chart or sequential narrative listing of all the processes, procedures and work instructions. Internal inspection stages, IPR's witness-points and hold-points shall be identified in the flow chart/listing. Work shall not proceed beyond the inspection stage / witness-point / hold-point unless confirmatory record is generated and accepted.

9.1.5. The vendor shall ensure that all components, where insulation is required to be wrapped, have no sharp edges so that tearing of the insulation is avoided.

9.2. CUTTING AND MACHINING:

9.2.1. All material cutting operations shall be preferably carried out by mechanical cutting process, wherever possible.

9.2.2. The machining parameters shall be selected to get the best surface finish requirements of the component as specified in drawings.

9.2.3. The manufacturing scheme of the PCS assembly shall identify methodology to get the desired geometrical accuracies (parallelism and concentricity) between any two seating/joining surfaces.

9.2.4. The drawing identifies the sub-assemblies and individual component/subassembly level of tolerances to be targeted to get the final desired features.

9.2.5. Toroidal Field (TF) coil inner legs are to be manufactured by cutting and machining processes.

9.2.6. For Toroidal Field (TF) Coil outer legs, the vendor shall cut and machine the D-profile of the outer legs from the procured ETP Copper plates (Section 8.1.1) as per the dimensions and tolerances specified in the ***Drawing No. IPR/ATD/PCS/03***. If the vendor has any other alternative fabrication procedure to manufacture the required D-profile of the outer legs of TF Coils, the proposal for the same shall be submitted in detail to IPR for consideration as part of the technical bid.

9.3. OH (OHMIC) COIL FABRICATION

9.3.1. *TENSION CYLINDER*

9.3.1.1. As indicated in the specifications and the drawings, SS 304 shall be used to manufacture the Tension Cylinder in two halves as specified in the Drawings ***IPR/ATD/PCS/04-1 & IPR/ATD/PCS/04-2***. 1 mm electrical insulation shall be sandwiched between the two halves of tension cylinder which shall be then joined by bolts.

9.3.1.2. The Tension Cylinder shall be coated with Teflon coating up to 0.5mm thickness followed by ground wrapping of 2 mm thickness.

9.3.1.3. The attachment (SS 304) for conductor entry and exit shall be welded on the Tension Cylinder as specified in the drawings.

9.3.2. *WINDING OF ETP COPPER CONDUCTOR ON THE TENSION CYLINDER*

9.3.2.1. A single continuous ETP Copper conductor having square cross-section (5.6mm x 5.6 mm) with throughout hole of 2.5mm diameter in the center procured as per requirements mentioned in Section 8.1 shall be used to wound around the Tension Cylinder.

9.3.2.2. The vendor shall ensure that the edges of the square conductor are not sharp and have corner radius of 1mm on all sides.

9.3.2.3. The conductor shall be wrapped with insulation specified in ***Section 8.4*** as per the thickness specified in the Drawing ***IPR/ATD/PCS/04*** prior to winding.

9.3.2.4. The vendor shall prepare the necessary fixtures/forms for winding the conductor around the Tension Cylinder.

9.3.2.5. All measures are to be taken to avoid any damage/tearing of the insulation wrapped on the conductor during the winding process.

9.3.2.6. After the first layer of the conductor coil (with the number of turns as specified in the drawing of OH coil) is wrapped around Tension cylinder, the vendor shall wrap the 2mm thickness electrical insulation on the first layer of the conductor and then proceed for the winding of the second layer over it.

9.4. VACUUM PRESSURE IMPREGNATION (VPI) OF COILS

9.4.1. VPI is needed for Toroidal Field Coil (TF Coil) Outer legs, for inner TF coil bundle consisting of Inner legs of TF coil and OH Coil assembly.

9.4.2. The vendor shall carry out Vacuum Pressure Impregnation (VPI) of the insulated coil assemblies considering the electrical insulation used for these coils. Following requirements are to be considered for the VPI process:

9.4.2.1. The vendor shall provide details of the epoxy resin used for the VPI process. Appropriate solvent free epoxy resin shall be selected by the vendor considering the insulation used and its needed properties.

9.4.2.2. VPI process should ensure that there is no short circuiting between the conducting components of the coil that are already insulated.

9.4.2.3. Necessary cutouts/removable inserts shall be used in those locations where it is required so that the resin does not flow inside.

9.4.2.4. The temperature shall not rise beyond 125°C during the VPI process considering the maximum temperature resistance of the insulation that is used.

9.4.2.5. The final dimensions of the coil assembly after VPI shall meet those specified in the drawings.

9.4.3. The vendor shall develop the VPI procedure for PCS components by carrying out trials on smaller samples in order to establish the procedure before working on the actual coils. The results of such trials shall be shared with IPR to approve the developed procedure.

9.4.4. The detailed proposal indicating the VPI cycle, epoxy resin used, curing temperature and holding time for VPI of both TF Coils and OH Coil assembly shall be submitted by the vendor to IPR as part of manufacturing procedures.

9.5. ELECTRICAL JOINTS & CONNECTIONS FOR TF COILS

9.5.1. While joining the Copper conductors, silver foil should be kept between the joints using an appropriate commercially available electrical conducting compound/paste.

9.5.2. All bolted joints shall be properly tightened at a controlled rate by applying specified torque as per wedge-lock washer requirement.

9.5.3. To maintain the sufficient contact pressure at these bolted joints (at room temperature), SS 316 wedge-lock washers shall be used with technical details as specified for corresponding bolts-nuts in the drawings.

9.5.4. If more than one turn of copper coil is to be bolted together for a bolted joint (TF outer leg), the bolt should be insulated with G10 sleeve as specified in ***Section 8.4***.

9.6. CENTER STACK CASING (CSC) FABRICATION

9.6.1. Center Stack Casing (CSC) is an envelope of SS 304L that is used to cover the inner TF coil bundle and OH Coil assembly after this assembly has undergone VPI process.

9.6.2. CSC as specified and required in ***Drawing No. IPR/ATD/PCS/05*** shall be fabricated from SS 304 products by Gas Tungsten Arc (GTA) welding by qualified welder as per welding requirements mentioned in ***Section 16***.

9.6.3. Before the CSC is installed over OH coil assembly, Cerawool or similar thermal insulation as specified in ***Section 8.3*** shall be placed over the OH coil assembly after its VPI. Between the thermal insulation and OH coil assembly, temperature sensors procured as per ***Section 8.5*** shall be mounted on locations that are marked in ***Annexure 3 – Temperature Sensors Location***.

9.7. BRAZING

9.7.1. Brazing is required to be done (a) for joining the ETP Copper tube placed in the slot of the Inner turn of TF coil (b) for some joints and bus-bar connections and (c) for Copper cooling tubes to SS 304 nozzles joints. Torch brazing procedure may be used to braze.

9.7.2. Brazing shall be carried out using Copper Silver brazing alloy "BA CuAg6" as classified in IS 2927. This brazing alloy in foil or wire form shall be procured by the vendor in suitable required quantity and the test certificates of the same shall be submitted to IPR for approval. Only approved procedures shall be used for this application.

9.7.3. Necessary precautions and measures shall be taken to ensure prior cleaning of the surfaces to be brazed by alcohol so that they are free of grease or dirt. Care shall be taken to ensure adjacent surfaces are not damaged during brazing.

9.7.4. The brazed region may then be machined to match the surfaces.

9.7.5. The vendor shall submit the detailed brazing procedure to IPR as part of manufacturing procedures.

9.8. WELDING FOR SUPPORT STRUCTURE & SS COMPONENTS:

9.8.1. Any welding activity needed, including tack welds, shall be carried out by Gas Tungsten Arc Welding (GTAW) as per the requirements of AWS D1.6/1.6M only by qualified welder, procedure and filler wire.

9.8.2. Welding Consumable (Filler wires) used for SS 304 components shall be ER-308L manufactured by reputed firms and duly approved by IPR. The make/grade of filler wires shall be identified in the welding procedures as per AWS A5.9.

9.8.3. The Vendor shall submit the welding procedure specification (WPS), Procedure Qualification Record (PQR) & Welder Performance Qualification (WPQ) for approval by IPR.

9.8.4. Welding procedure shall be adopted considering features (like adequate fit-up, dial monitoring during welding, balanced welding, simultaneous welding by two or more welders etc.) to minimize Distortion. The vendor shall give a scheme for evaluation of the distortion/shrinkage, its measurement and control along with the manufacturing procedures.

9.8.5. Necessary precautions and measures shall be taken to ensure preheating, maintain inter-pass temperature, post-heating as per the requirements of the welding of austenitic stainless steel.

9.8.6. Any grinding adjacent to the weld seam or on the base material shall be carried out only with the concurrence of IPR.

9.8.7. Tack welds shall be of sufficient size to maintain joint alignment. They shall be thoroughly cleaned, prepared at each end and inspected for cracks. Any cracked tacks shall be removed before welding the joint. Arc strikes, gouges and other indications of careless workmanship (such as porosity, uneven weld profiles and undercut) shall be removed by grinding.

9.8.8. Inspection by liquid penetrant methods shall be made on areas where temporary welds have been removed. Any weld not meeting the acceptance criteria defined for liquid penetrant testing shall be cut out or repaired.

9.8.9. Fillet Welds:

9.8.9.1. For fillet welds between parts with surfaces meeting at an angle between 80° and 100°, fabrication drawings shall show the fillet weld leg size.

9.8.9.2. For welds between parts with surfaces meeting at an angle less than 80° or greater than 100°, the fabrication drawings shall show the detailed arrangement of welds and required leg size to account for effects of joint geometry.

10. SUGGESTED SEQUENCE FOR MANUFACURING OF PCS COMPONENTS AND ASSEMBLY

10.1. ***Annexure 5*** provides the suggested sequence for manufacturing of PCS components and assembly.

11. INSPECTION & TESTING (FACTORY ACCEPTANCE TESTS (FAT)):

11.1. GENERAL

11.1.1. The vendor shall be responsible to perform all the inspection and testing specified in their scope stage-wise and at final stage.

11.1.2. All inspection and testing shall be carried out in presence of IPR representative/s.

11.2. MECHANICAL CHECKS & TESTS

11.2.1. *Visual Examination*

11.2.1.1. Visual inspection shall be carried out throughout the scope of work for good workmanship which includes checks for cleanliness, machined surface lay, weld joints, scratches, burr or dents.

11.2.2. *Liquid Penetrant Test (LPT) for welds on Support Structure:*

11.2.2.1. For all welds on the support structure, for detecting discontinuities that are open to the surface, liquid penetrant inspection shall be used with dyes suitable for stainless steel.

11.2.2.2. The standard methods described in ASTM E 165 shall be used for liquid penetrant inspection.

11.2.2.3. The vendor shall submit Liquid Penetrant Test procedure to IPR for review and approval along with manufacturing procedures.

11.2.2.4. **Acceptance Criteria:**

11.2.2.4.1. Lack of Fusion (LOF), exposed porosity, undercuts, surface cracks, spatter & arc strikes, excessive grinding and profile defects etc defects/discontinuities as revealed by Liquid Penetrant Test (LPT) shall not be acceptable

11.2.2.4.2. Only imperfections producing indications with major dimensions greater than 1⁄16 in. (1.6 mm) shall be considered relevant imperfections. Imperfections producing the following indications are unacceptable (ASME Section VIII Div. 1 Mandatory Appendix 8):

- any cracks or linear indications with length three times greater than the width;
- rounded indications with dimensions greater than 3⁄16 in. (4.8 mm);
- four or more rounded indications in a line separated by 1⁄16 in. (1.6 mm) or less edge to edge;
- Ten or more rounded indications in any 6 sq in. (3 871 mm^2) of surface with the major dimension of this area not to exceed 6 in. (152 mm) with the Area taken in the most unfavourable location relative to the indications being evaluated.

11.2.3. *Dimensional Inspection:*

11.2.3.1. The vendor shall make suitable templates, gauges and fixtures to measure the dimensions as required in the Drawings. These gauges, tools, templates shall be made available by the vendor at each of the specific stages of manufacturing and inspection at both factory and site.

11.2.3.2. All dimensions, clearances, fits and tolerances of the components shall be measured and reported after fabrication or when a stage of fabrication is completed.

11.2.3.3. The vendor shall submit detailed proposal for dimensional inspection procedure to IPR along with the manufacturing procedures. This proposal shall indicate how dimensions required in the drawings shall be measured and complied along with the list of tools/jigs/gauges/fixtures/templates etc. for measuring these dimensions.

11.2.4. *Hydro-test for TF Copper Tubes post brazing & for Copper Conductor of OH coil*

11.2.4.1. Hydro test shall be carried out for the copper tubes after they have been brazed on the inner turn of TF coils and for the copper conductor of OH coil after it has been wound around the tension cylinder.

11.2.4.2. The vendor shall make suitable connections for hydro-testing. Suitable air vents shall be provided in the system for hydro-test.

11.2.4.3. Pressure gauges used shall be calibrated and calibration certificates shall be provided prior to test.

11.2.4.4. Clean de-mineralized (DM) water shall be used with following quality: Conductivity < 10 micro mho/cm; pH- Neutral; Total halogen content < 25 ppm.

11.2.4.5. Hydro test of the copper tubes brazed on inner turn of TF coils and Copper conductor of OH coil shall be carried out at 3 bar (test pressure) in accordance to ASTM-E-1003.

While pressurizing, pressure shall be gradually increased to 50 % of test pressure and an initial check for leakage shall be carried out. Thereafter, pressure shall be slowly increased to the final test pressure. Hold time at test pressure shall be 10 minutes. At the completion of test pressure holding time, the entire length of copper tube having the brazed portion and the copper conductor shall be examined for leakage and shall not have any pressure drop.

11.2.4.6. The TF copper tubes and OH conductor shall be drained thoroughly and dried immediately by using oil free hot air after the test is completed.

11.2.4.7. The hydro-test procedure shall be part of inspection procedures to be submitted along with manufacturing procedures.

11.3. ELECTRICAL TESTS

11.3.1. *Electrical Tests of OH coil*

11.3.1.1. **Electrical Resistance Measurement**: The resistance of the OH coil will be measured by four-probe method.

11.3.1.2. **Electrical Inductance Measurement:** The Inductance of the OH coil will be measured by LCR meter at 100 Hz.

11.3.1.3. **Insulation resistance test:** Short DC megger test will be done performed to measure the Insulation resistance (IR) value at different voltages (500V to 1kV). The IR values should be > 20 MΩ. The IR tests will also be performed during fabrication with mutual agreement with the vendor. IR test will be done between coil to ground (support structure/earth), OH coil to TF coil

11.3.1.4. **Hi-pot test:** Hi-pot test will be carried out after VPI of the coil. High voltage is applied between any one of the terminal of coil and support structure (Stainless steel) which is grounded. The applied voltage will be raised from 0 to 10 kV DC. The maximum drainage current is to be set at ≤ 2.0 mA/ kV. During testing there should not be any breakdown or tripping of the Hi-pot tester. If breakdown or tripping occurs, then the coil will not be acceptable.

11.3.2. *Electrical Tests of TF coil*

11.3.2.1. **Electrical Resistance Measurement:** The resistance of the TF coil will be measured by four-probe method.

11.3.2.2. **Electrical Inductance Measurement:** The Inductance of the TF coil will be measured by LCR meter at 100 Hz.

11.3.2.3. **Insulation resistance test:** Short DC megger test will be performed to measure the Insulation resistance (IR) value at different voltages (500V to 1kV). The IR values

should be > 20 MΩ. The IR tests will also be performed during fabrication with mutual agreement with the vendor. IR test will be done between coil and ground (support structure/earth), OH coil to TF coil.

11.3.2.4. **Hi-pot test:** Hi-pot test will be carried out after VPI of the coil. High voltage is applied between any one of the terminal of coil and support structure (Stainless steel) which is grounded. The applied voltage will be raised from 0 to 2 kV DC. The maximum drainage current is to be set at ≤ 2.0 mA/ kV. During testing there should not be any breakdown or tripping of the Hi-pot tester. If breakdown or tripping occurs, then the coil will not be acceptable.

12. DISASSEMBLY, PACKING & SUPPLY:

12.1. After receiving dispatch clearance from IPR, the fabricated, as-assembled and inspected PCS assembly along with the Support structure shall be carefully disassembled into major completed assemblies such as Center Stack assembly, outer legs of TF coil with their SS casing, support structure etc. The procedure for disassembly shall be finalized and mutually agreed at that time between IPR & the vendor.

12.2. All components shall be identified with specific part numbers so as to avoid any mixing. These components shall be marked as per methodology approved by IPR.

12.3. These shall be then suitably packed in wooden boxes to protect from any damage or misalignment during transportation and unloading at site. The packing shall include adequate cushioning, support, anti-skidding, hoisting and tie-down provisions with the approval of IPR.

12.4. The package shall be delivered to IPR.

13. UNPACKING AT IPR SITE

13.1. IPR shall inform the vendor about the receipt of the package. The boxes received at IPR shall be opened by vendor or his representatives.

13.2. On prior request of the vendor (at least 14 days before), IPR can arrange for casual unskilled labourers on paid basis for opening the boxes. The vendor shall arrange for all the tools needed for unpacking the received boxes/package.

13.3. Any damage observed shall be the responsibility of the vendor. It is the vendor's responsibility to replace the damaged component.

14. FINAL INSTALLATION & SITE ACCEPTANCE TESTS (SAT) AT IPR

14.1. Installation:

14.1.1. The vendor shall arrange for required skilled manpower along with required tools and equipment for installation of the system at IPR.

14.1.2. IPR will provide only electricity supply and water. Vendor shall arrange for all electrical connections from the available power supply connection for installation work. If required, IPR can provide overhead crane with prior intimation for moving and shifting the components at the site of installation.

14.1.3. The vendor shall assemble and install the entire system as per the as-built drawings. A template shall be used to mark the locations to install the support structure on the site floor. Anchoring of the support structure on the site floor as per the drawings is the responsibility of the vendor. SS 304 material anchor fasteners shall be used for anchoring and the details of these fasteners are specified in the drawings.

14.1.4. The assembly of the major completed assemblies and support structure shall be carried out as per a mutually agreed sequence between IPR & the vendor.

14.1.5. No damage shall be caused to nearby systems during this activity.

14.2. Site Acceptance Tests (SAT):

14.2.1. Mechanical Checks

14.2.1.1. Visual examination shall be carried out as per Section 11.2.1.

14.2.1.2. Dimensional checks of TF inner bundle, OH coil and PCS assembly as per given GA drawings, D profile checks of TF outer leg, Tolerances and clearance checks, Support assembly checks shall be carried out as per section 11.2.3

14.2.2. Electrical Tests

14.2.2.1. Electrical Tests of OH coil:

14.2.2.1.1. **Electrical Resistance Measurement**: The resistance of the OH coil will be measured by four-probe method.

14.2.2.1.2. **Electrical Inductance Measurement:** The Inductance of the OH coil will be measured by LCR meter at 100 Hz.

14.2.2.1.3. **Insulation Resistance test:** Short DC megger test will be done performed to measure the Insulation resistance (IR) value at different voltages (500V to 1kV). The IR values should be > 20 MΩ. The IR tests will also be performed during fabrication with mutual agreement with the vendor. IR test will be done between coil to ground, OH coil to TF coil

14.2.2.1.4. **Hi-pot test:** Hi-pot test will be carried out after VPI of the coil. High voltage is applied between any one of the terminal of coil and support structure (Stainless steel) which is grounded. The applied voltage will be raised from 0 to 10 kV DC. The maximum drainage current is to be set at ≤ 2.0 mA/ kV. During testing there should not be any breakdown or tripping of the Hi-pot tester. If breakdown or tripping occurs, then the coil will not be acceptable.

14.2.2.2. Electrical Tests of TF coil:

14.2.2.2.1. **Electrical Resistance Measurement:** The resistance of the TF coil will be measured by four-probe method.

14.2.2.2.2. **Electrical Inductance Measurement:** The Inductance of the TF coil will be measured by LCR meter at 100 Hz.

14.2.2.2.3. **Insulation resistance test:** Short DC megger test will be performed to measure the Insulation resistance (IR) value at different voltages (500V to 1kV). The IR values should be > 20 MΩ. The IR tests will also be performed during fabrication with mutual agreement with the vendor. IR test will be done between coil and ground, OH coil to TF coil.

14.2.2.2.4. **Hi-pot test:** Hi-pot test will be carried out after VPI of the coil. High voltage is applied between any one of the terminal of coil and support structure (Stainless steel) which is grounded. The applied voltage will be raised from 0 to 2 kV DC. The maximum drainage current is to be set at ≤ 2.0 mA/ kV. During testing there should not be any breakdown or tripping of the Hi-pot tester. If breakdown or tripping occurs, then the coil will not be acceptable.

15. DELIVERY PERIOD:

The above job shall be completed within 12 months from the date of contract.

16. WARRANTY:

12 (TWELVE) Months from date of final acceptance of the components for poor workman ship/welding/fabrication. During this period if any fault occurs/is detected in the supplied items, the vendor shall rectify the same at no extra cost.

17. TIMELINE FOR THE SCHEDULE OF WORK

Tasks/ Activities	Timeline	Duration	Remarks
Acceptance of Work Contract by Vendor	T0	-	

Presentation by Vendor regarding understanding of scope of work	T1	T0 + 1 month	
Submission of QAP & MIP	T2	T0 + 6 weeks	Comments/Approval by IPR within a week
Submission of Manufacturing Drawings	T3	T0 + 2 months	Comments/Approval by IPR within 2 weeks
Submission of Manufacturing Documents (Fabrication procedures, thermal and electrical insulation application procedures, VPI procedure, inspection and testing procedures etc.)	T3	T0 + 2 months	Comments/Approval by IPR within 2 weeks
Procurement of Raw Material and all required items by the Vendor	T4	T3 + 2 months	Comments/Approval by IPR within 1 week of submission of Test Certificates
Manufacturing/ Fabrication of components of PCS	T5	T3 + 6 months	
Assembly at Vendor's Factory	T6	T3 + 7 months	
Factory Acceptance Tests	T7	T3 + 8 months	
Disassembly, Packaging and Supply to IPR Store	T8	T3 + 9 months	
Unpacking at IPR, Final Installation & Site Acceptance Tests at IPR	T9	T8 + 1 month	
Total duration from T0		**12 months**	

Annexure-1

List of Drawings

Sr. No.	Component assembly	Sub-Assembly	Drawing Nos.
1	PCS System Assembly	Assembly: PCS System	IPR/ATD/PCS/01
2	TF Inner turns bundle	Assembly: TF Inner turns bundle	IPR/ATD/PCS/02
		TF inner leg: Overview	IPR/ATD/PCS/02-1
		TF inner leg: Details of Top and Bottom view	IPR/ATD/PCS/02-2
		TF inner leg: Details of Top and Bottom connections	IPR/ATD/PCS/02-3
		Anti-Torque disc	IPR/ATD/PCS/02-4
		Mechanical support	IPR/ATD/PCS/02-5
		Compression Spring Support	IPR/ATD/PCS/02-6
3	TF Outer leg	Assembly: TF Outer leg	IPR/ATD/PCS/03
		TF outer turns : Details of TF outer turns	IPR/ATD/PCS/03-1
		TF outer turns : Details of Bottom connections	IPR/ATD/PCS/03-2
		TF Outer turns: Intermediate Insulation	IPR/ATD/PCS/03-3
		TF Outer leg: Upper envelope	IPR/ATD/PCS/03-4
		TF Outer leg: Lower envelope	IPR/ATD/PCS/03-5
		Flexible U connector	IPR/ATD/PCS/03-6
		TF outer turns : Details of Top connections	IPR/ATD/PCS/03-7
4	OH Coil	Assembly: OH coil	IPR/ATD/PCS/04
		Tension cylinder overview	IPR/ATD/PCS/04-1
		Details of Tension cylinder	IPR/ATD/PCS/04-2
		OH coil conductor winding	IPR/ATD/PCS/04-3
5	Center Stack Casing	Assembly: Center Stack Casing (CSC)	IPR/ATD/PCS/05
		Details of CSC center pipe, reducer and flanges	IPR/ATD/PCS/05-1
		Details of CSC top and bottom pipe	IPR/ATD/PCS/05-2
6	PCS Upper support structure	Assembly: PCS Upper support structure	IPR/ATD/PCS/06
		Details of flanges and supporting ribs	IPR/ATD/PCS/06-1

7	PCS Lower support structure	Assembly: PCS Lower support structure	IPR/ATD/PCS/07
		Details of flanges and supporting ribs	IPR/ATD/PCS/07-1
8	TF Outer_Upper Support Ring	Assembly: TF Outer_Upper Support Ring	IPR/ATD/PCS/08
		Details of support section and insulation	IPR/ATD/PCS/08-1
9	TF Outer_Lower Support Ring	Assembly: TF Outer Lower Support Ring	IPR/ATD/PCS/09
		Details of support section and connection port	IPR/ATD/PCS/09-1
10	TF outer support assembly	Assembly: TF Outer leg Support	IPR/ATD/PCS/10
		Details of Center Pipe support	IPR/ATD/PCS/10-1
		Details of connector plate, bottom flange and supporting ribs	IPR/ATD/PCS/10-2
		Assembly: TF Outer leg holder	IPR/ATD/PCS/10-3
		Details of holder and cover	IPR/ATD/PCS/10-4
		Details of connector plate, Y-link, Pipe and insulation	IPR/ATD/PCS/10-5
		Details of connecting rod	IPR/ATD/PCS/10-6
		Details of connector plate	IPR/ATD/PCS/10-7
11	TF End Connectors	TF coil: End connectors	IPR/ATD/PCS/11
12	Bus Bar	OH coil: Bus bar end connectors	IPR/ATD/PCS/12
13	Inverted Pedestal	Details of Inverted Pedestal	IPR/ATD/PCS/13
14	G10 Support	Support for G10 Machine Center	IPR/ATD/PCS/14
15	Auxiliary Items	Details of PCS bolts and nuts	IPR/ATD/PCS/15
		Details of PCS support G10 insulation	IPR/ATD/PCS/15-1
		Details of G10 support cap insulation	IPR/ATD/PCS/15-2

Annexure -2

Format for Tentative QAP/MIP for activities involved in PCS Assembly Project and for a typical component

P-Perform, H-Hold, R-Review, W-Witness

Sr. No.	Work stage / Operation / Component etc	Type of Check & Record	Extent of check	Reference Documents, Acceptance Criteria/ Standard	Inspection Points		Remarks
					Vendor	IPR	
1.	Presentation by vendor on Understanding of Work to IPR	Through in person meeting; Presentation (ppt, doc or pdf file)	100%	Technical Specifications, Drawings, Work Contract etc	P	R	
2.	Submission & Approval of QAP for the entire project	Document	100%	Technical Specifications, Drawings, Work Contract etc	P	R	
3.	Submission & Approval of Manufacturing drawings, manufacturing procedures, manufacturing and inspection plans (MIP), Inspection Procedures	Drawing sheets and documents	100%	Technical Specifications, Engineering Drawings,	P	R & H	
4.	Procurement of Raw Material required for the entire project	Material test certificates, Lab reports	100%	Technical Specifications, Engineering Drawings, Approved Manufacturing Drawings, Bill of Material and relevant mentioned standards	P	R	
5.	**Manufacturing of a typical Component (Vendor to prepare as per individual components and their fabrication routes)**						
5.1	Raw Materials Identification, for manufacturing and entire component and testing, if any	Material test certificates, Lab reports	100%	Technical Specifications, Engineering Drawings, Approved Manufacturing Drawings, Bill of Material and relevant mentioned standards	P/W	R	

5.2	Fabrication	Brazing/welding reports, in-stage Dimensional Reports and test reports etc	100%	Technical Specifications, Engineering Drawings, Approved Manufacturing Drawings, Bill of Material , Approved manufacturing procedure	P	R/W/H	As applicable
5.3	Application of electrical insulation	in-stage Dimensional Reports and test reports etc	100%	Technical Specifications, Approved Manufacturing Drawings, Bill of Material,	P	R	
5.4	Sub assembly at component level	In stage Dimensional Reports and test reports	100%	Engineering Drawings, Approved Manufacturing Drawings,	P	R/W/H	As applicable
5.5	Hydro-test, if any	Report	100%	Technical Specifications, Engineering Drawings, Approved Manufacturing Drawings, Approved hydro test procedure	P	W/H	
5.6	Electrical Checks/Tests, if any	Report	100%	Technical Specifications, Approved Manufacturing Drawings,	P	R/W/H	As applicable
5.7	Vacuum Pressure Impregnation (VPI) Process for relevant components/sub-assemblies	Report	100%	Technical Specifications, Engineering Drawings, Approved Manufacturing Drawings, Approved VPI procedure	P	R/W/H	As applicable
5.8	Mechanical Checks - Visual and Dimensional	Inspection reports	100%	Engineering Drawings, Approved Manufacturing Drawings,	P	R/W/H	As applicable
6.	Assembly of components on the Support Structure and in-	Inspection reports	100%	Engineering Drawings, Approved Manufacturing	P	W/H	

	stage testing (mechanical and electrical)			Drawings, Approved Assembly Sequence			
7.	Factory Acceptance Tests	Inspection reports, As built drawings	100%	Technical Specifications, Engineering Drawings, Approved Manufacturing Drawings, Approved Assembly Sequence, Approved Inspection Procedures	P	W/H	As applicable
8.	Disassembly & Packing	Photographs, Assembly and Disassembly manual, Installation Template, List of major assemblies, components, templates and spares etc	100%	Technical Specifications, Engineering Drawings, Approved Manufacturing Drawings,	P	H	Vendor to initiate this after receiving dispatch clearance from IPR
9.	Delivery to IPR	Challan etc	100%	Work Contract	P	H	
10.	Unpacking at IPR	List of major assemblies, components, templates and spares etc	100%	Technical Specifications, Engineering Drawings, Approved Manufacturing Drawings,	P	W/H	As applicable
11.	Final Installation at IPR	Installation Template	100%	Technical Specifications, Approved Manufacturing Drawings, As-built drawings, Assembly Manual	P	W/H	As applicable
12	Site Acceptance Test at IPR	Inspection reports (Mechanical checks and Electrical tests)	100%	Technical Specifications, Approved Manufacturing Drawings, As-built drawings, Approved Inspection Procedures	P	W/H	As applicable

Annexure - 3

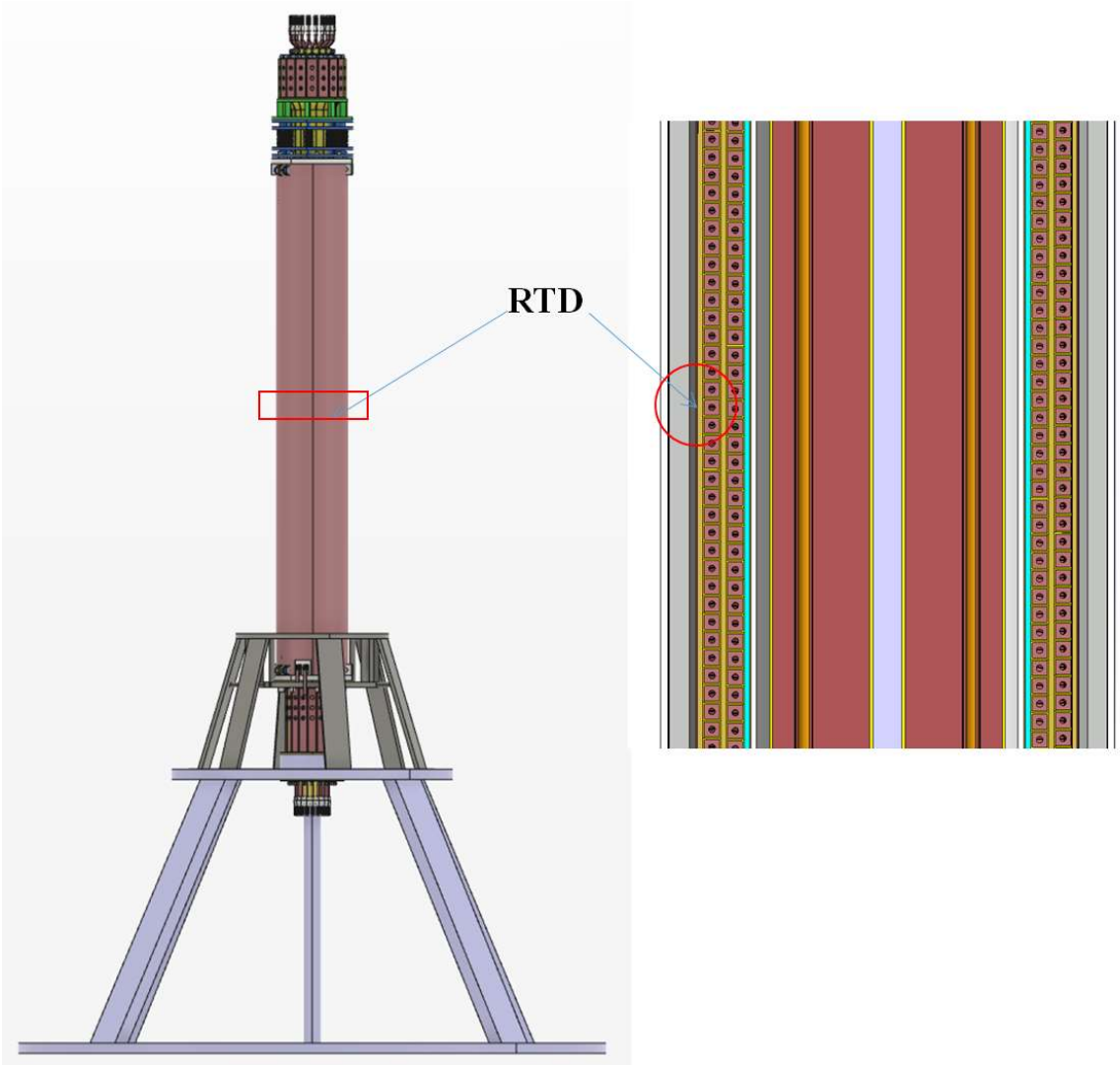
Location for Installation of RTD Temperature Sensors

Mounting Procedure for Temperature Sensors:

The temperature sensors should be properly mounted at locations mentioned below with high temperature adhesive (preferably Loctite EA 3463 metal filled compound adhesive) whose holding temperature should be more than working temperature.

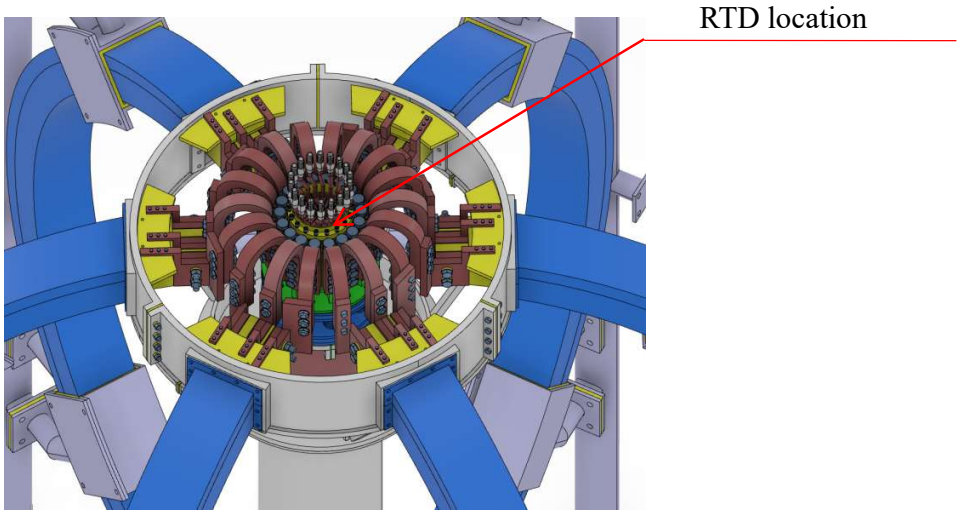
Installation of RTDs in OH coil:

Total 4 nos. of RTDsas per ***Section 8.5*** are to be installed in the center plane of OH coil. The RTDs are to be circumferentially installed in equal distance on the surface of ground wrap insulation (after VPI).



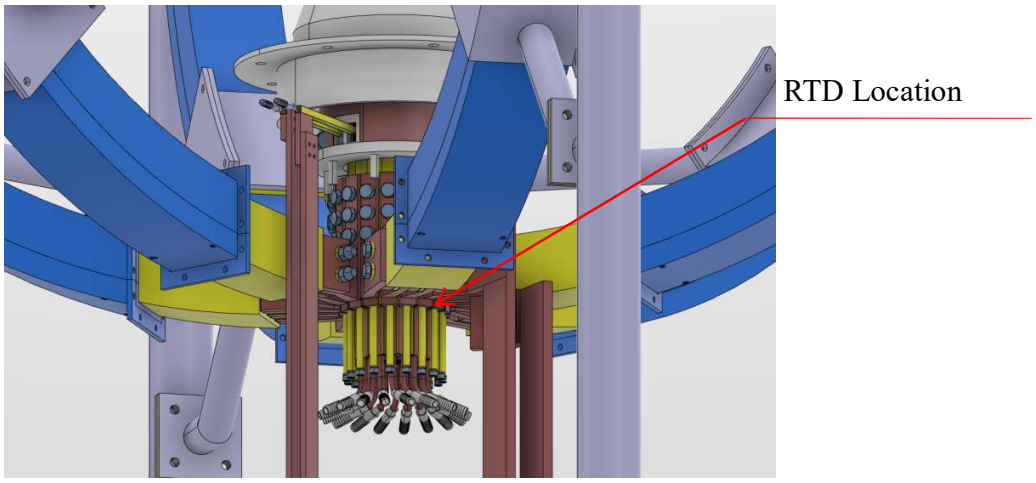
Installation of RTD in TF coils top side:

At the top side of TF coil, total 6 nos. of RTD at each TF Coil outer leg as per ***Section 8.5*** are to be installed.



Installation of RTD in TF coils bottom side:

At the bottom side of TF coil, total 6 nos. of RTDs are to be installed at each TF Coil outer leg as per ***Section 8.***



Testing of temperature sensors after installation:

Once the above temperature sensors are installed at their respective locations, the vendor shall demonstrate measurement of room temperature reading for each of the temperature sensors. The vendor has to make the required setup for the testing. These tests shall be done in the presence of IPR representative/s.

Annexure – 4

Thermal Insulation Material Properties (CERAWOOL)

Table 1: Physical properties of thermal insulation 'CERAWOOL'

Properties	**Value/Ingredients**
Density	96-128 kg/m^3
Composition	Al_2O_3: 32-36%
	SiO_2: 44-48%,
	ZrO_2: 16.5-19.5%,
	Others: traces
Classification Temperature	1260°C
Continuous Max. Operating. Temperature	1175°C
Specific heat capacity	1.13 kJ/kg.K

Annexure-5: Suggested Assembly Sequence

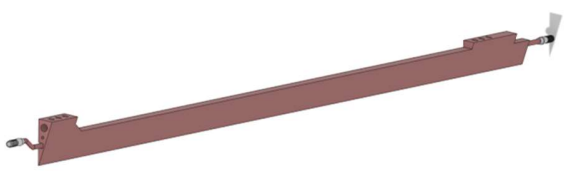
1) **TF inner turns bundle Assembly**
   a) Flow chart of TF inner turns bundle assembly
   b) Assembly Sequence of TF inner turns bundle

2) **OH coil assembly**
   a) Flow chart of OH coil assembly
   b) Assembly Sequence of OH coil

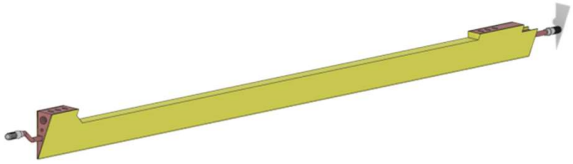
3) **TF outer leg assembly**
   a) Flow chart of TF outer leg assembly
   b) Assembly Sequence of TF outer leg

4) **PCS assembly**
   a) Flow chart of PCS assembly
   b) Assembly Sequence of entire PCS along with Support Structure

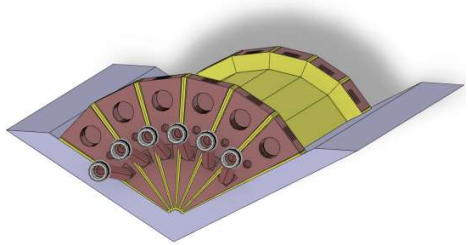
1(a): Flow Chart of TF inner turns bundle assembly



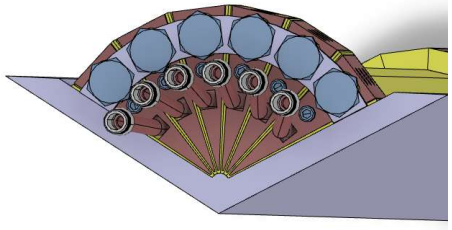
1. Trapezoidal shape TF inner turn
   -Dimensional check
   -Hydro test of Cu tubes



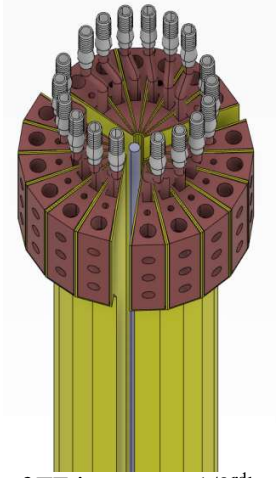
2. TF inner turn with turn insulation
   -Dimensional check



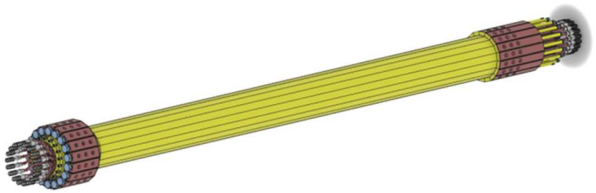
3. TF turns with Fixture
   -Dimensional check
   -Insulation resistance test



4. Temporary fixtures for holding



5. Assembly of TF inner turn 1/3rdbundle
   - VPI



6. TF inner turn bundle
   -VPI
   -Dimensional check
   -Insulation resistance test

1(b): Assembly Sequence of TF inner turns bundle

TF inner legs are made in trapezoidal shape from ETP copper bars. TF inner turn would be fabricated as per the given drawings mentioned in Annexure-1.

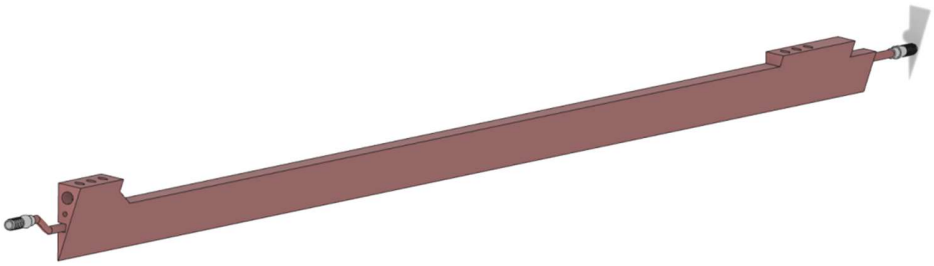


Figure-1 Trapezoidal shape TF inner turn

A hole is drilled throughout the TF inner turn in which the cooling tube is brazed. Some holes of certain depths are also drilled on top and bottom sides for tightening of other assembly components. Please refer to Figure-1.

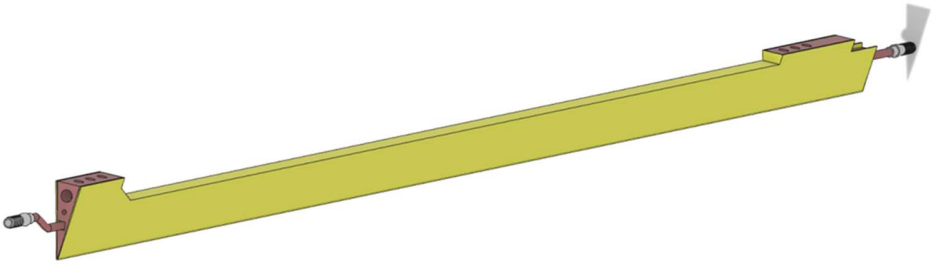


Figure-2 TF inner turn with insulation

Electrical insulation (Polyester film insulation tape, F class) of 1 mm thickness is wrapped over the fabricated TF inner turn. The top and bottom areas are uncovered; the outer leg would be connected here through bolts. Please refer to Figure-2.

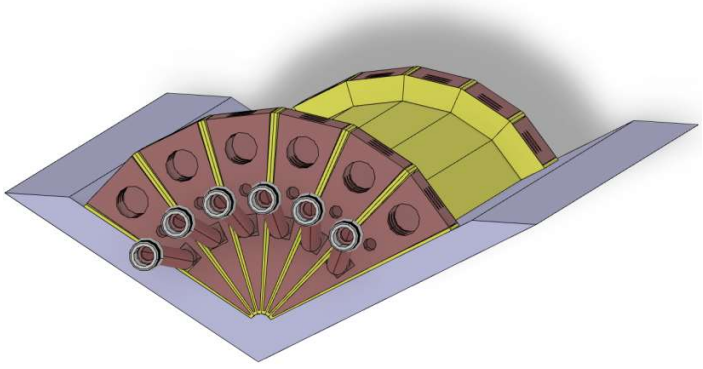


Figure-3a Preparation of TF inner leg bundle: TF turns with Fixture

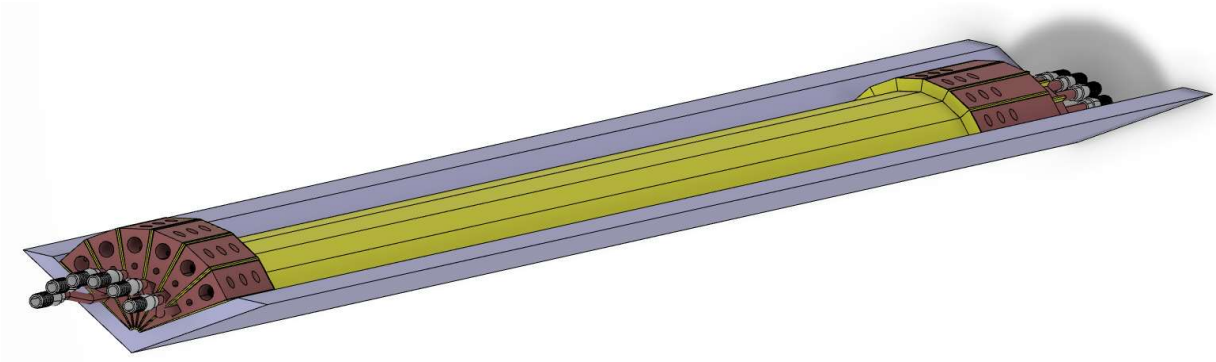
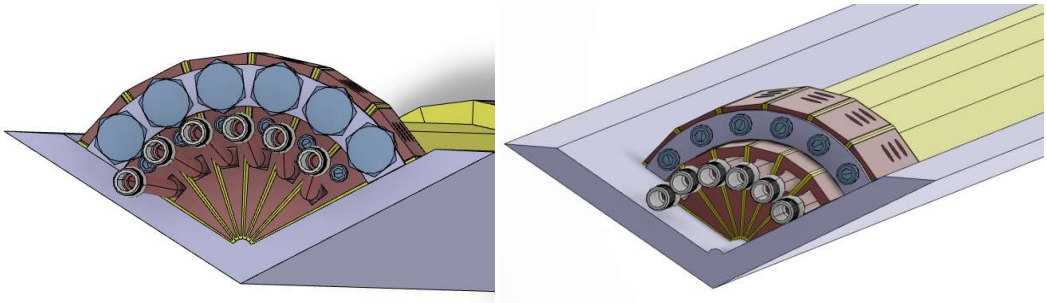


Figure-3b Preparation of TF inner leg bundle: Isometric view

The assembly of TF inner turn bundle is prepared in 3 stages; in each stage, 6 turns are compiled in a fixture. The fixture is 120 degrees wide open and has a semi-circle profile (equivalent to the radius of central G10 rod) towards the inside. The fixture would hold the inner turns and provide a uniform shape and minimize the deviations.



i) Top side fixture ii) Bottom side fixture

Figure-3c Temporary fixtures

Once all 6 turns are arranged in a fixture (1/3rd bundle), a curved metallic strip (holding strip as a temporary support to be arranged by the vendor) is bolted at the top and bottom side so that it maintains the integrity of the bundle and provides a uniform shape outside the fixture. Further, VPI would be performed for the prepared bundle. The VPI process enhances the shear strength of electrical insulation and provides a finished surface. Please refer Figure-3a, 3b & 3c.

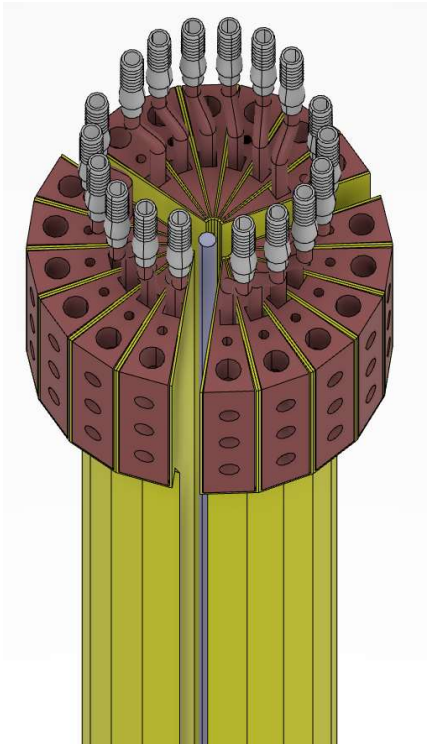


Figure-4a TF inner turns exploded view

Similarly, another 2 pieces of 1/3rd TF inner turns are fabricated and assembled with G-10 center rod. The TF inner turns exploded view is shown in Figure -4a.

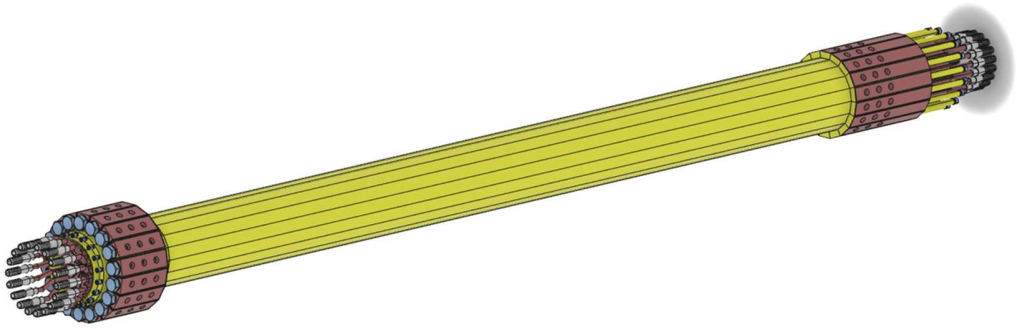
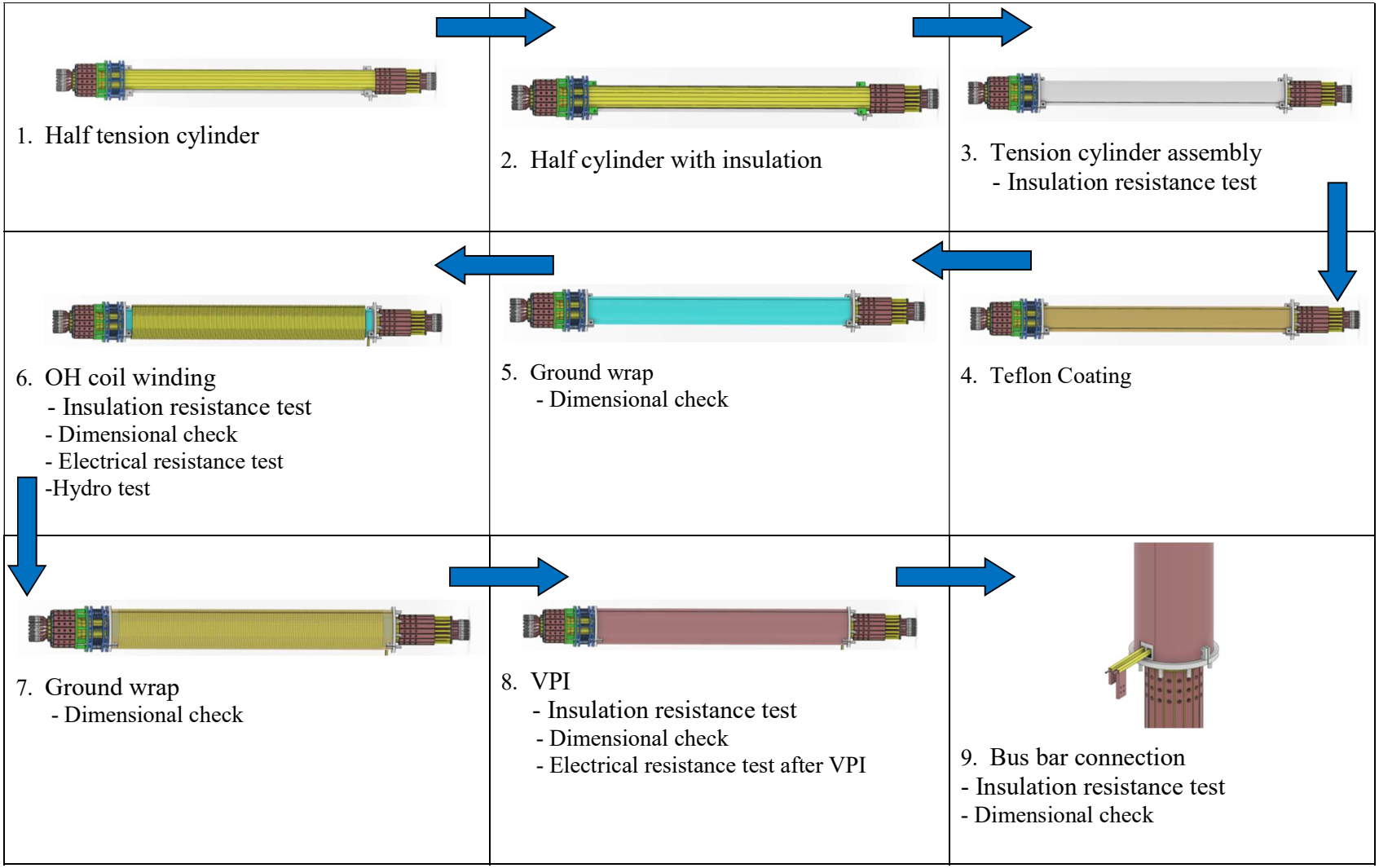


Figure-4b TF inner turn bundle

The assembled bundle would be wrapped again with the same polyester film insulation to avoid any kind of misalignments. Further, VPI would be performed for the integrated bundle. Please refer to Figure-4b.

2(a): Flow Chart of OH coil assembly



2(b): Assembly Sequence of OH coil

The TF inner leg bundle and OH coil assembly would be prepared in a separate workbench (laid horizontally).

After assembly of the TF inner leg bundle, mechanical support is inserted from the bottom side of the bundle. This support would cover the trapezoidal profile of TF inner turn and provide a uniform profile for the next component. Please refer to Figure-5.

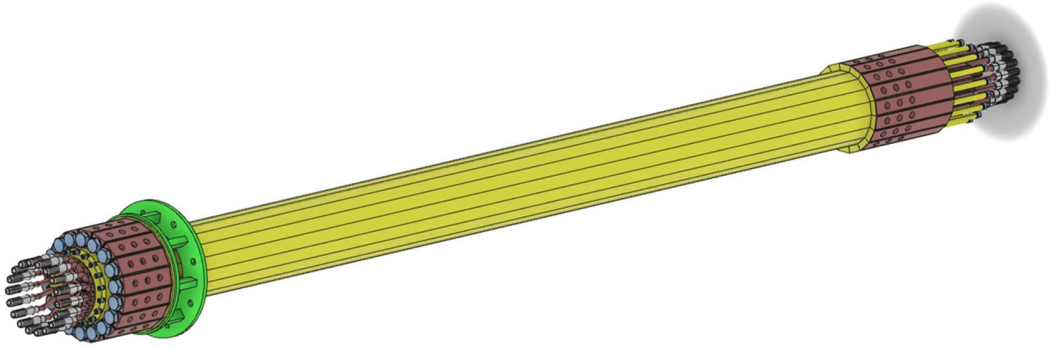


Figure-5 TF inner turn bundle with mechanical support

The next component is spring support, which is also inserted from the bottom side of TF inner leg bundle similar to the mechanical support. The spring support would provide sufficient spring action when the OH coil expands linearly during the pulse mode operation. Please refer to Figure-6.

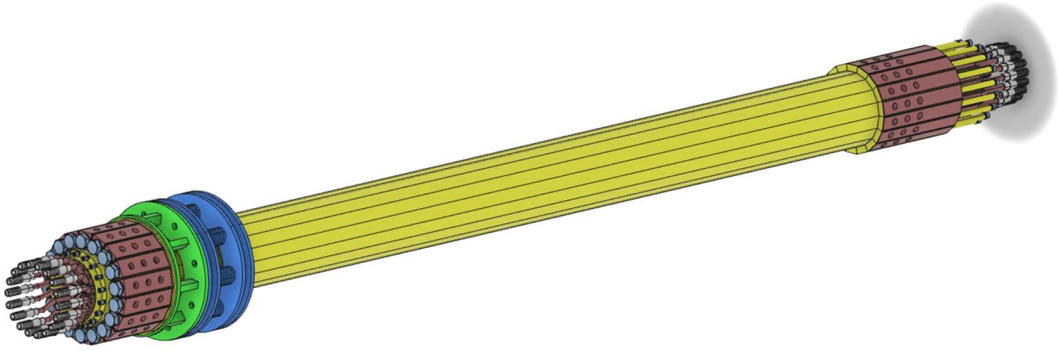


Figure-6 Spring Support

In the assembly sequence, the next component is OH coil. OH coil consists of tension cylinder, OH winding, and electrical insulations. The details of OH coil assembly are described below.

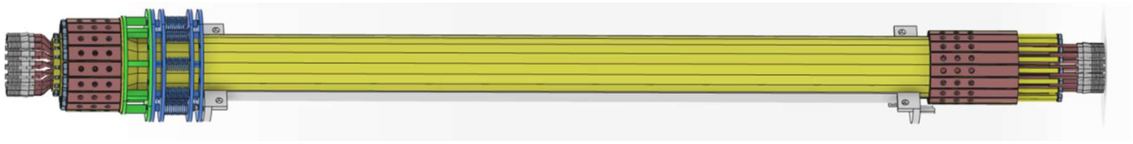


Figure-7 Half tension cylinder

The tension cylinder is made of SS304 material. The pipe size of 3.5 inch, schedule 5 is chosen for tension cylinder. The straight pipe length is 1000 mm. It is cut horizontally in 2 pieces and half- half flanges are welded on both ends. Please refer to Figure-7.

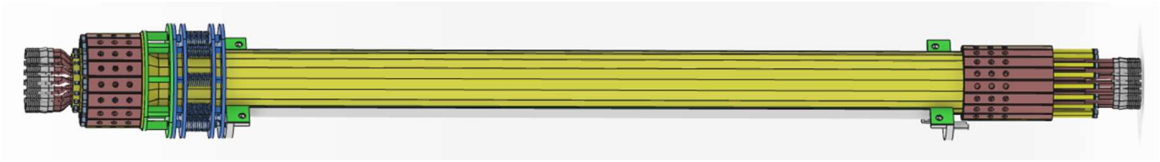


Figure -8Half tension cylinder with insulation

A G10 material uniform insulation strip is sandwiched between 2 half's of tension cylinder. Please refer to Figure-8.

Figure -9 Assembly of tension cylinder

The two half's of Tension cylinder is bolted at both ends. The assembly of tension cylinder is ready for OH coil winding. Please refer to Figure-9.

Figure -10 Teflon coating

A thin film of 0.5 mm Teflon coating is applied on the tension cylinder surface. Please refer to Figure-10.

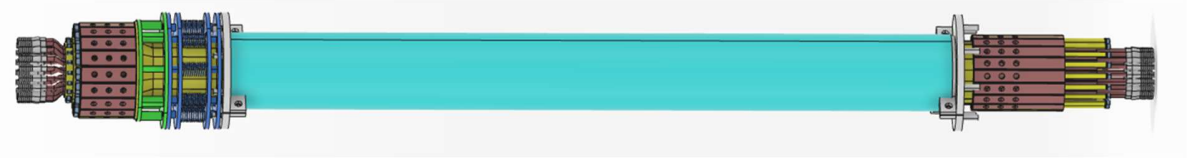


Figure -11 Ground wrap

The cylinder assembly is ground wrapped (2 mm thickness) before OH coil winding. Please refer to Figure-11.

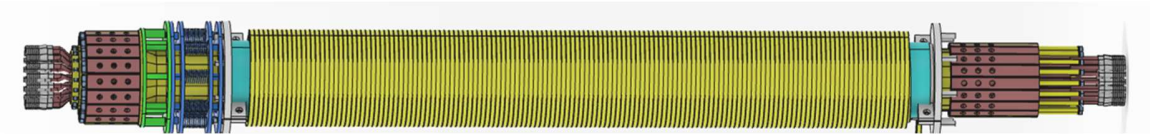


Figure -12 OH coil wrapping

The square conductor of 5.6 mm x 5.6 mm with a central cooling hole of 2.5 mm is considered for the OH coil winding. The square copper conductor is insulated with polyester film insulation tape (F class) of 0.5mm thickness before winding. A continuous copper conductor (with no intermediate joints) of required length is considered for the OH winding.

After the first layer of the insulated copper conductor is wound over the entire tension cylinder, a 2 mm thick polyester film insulation tapeis wrapped over the first layer. Only after this insulation wrapping, second layer of the insulated copper conductor is wound over the tension cylinder. Please refer to Figure-12.

Figure -13 Ground wrap

The OH coil is again ground wrapped with 2 mm thickness after copper conductor winding. Please refer to Figure-13.

Figure -14VPI

The sub-assembly of TF inner leg bundle and OH coil will undergo VPI process in order to fill any voids/ gaps between the insulations and to provide integrity. Please refer to Figure-14.

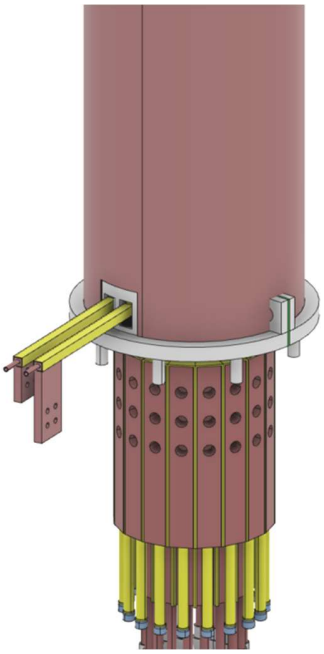
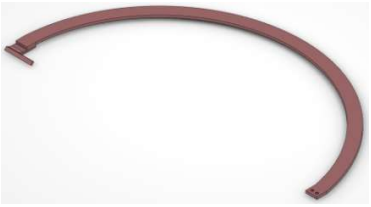


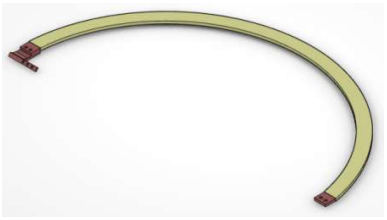
Figure -15 Bus bar connections

The bus bar connectors are brazed on OH coil terminals. The power supply bus bars would connect here through bolt. Please refer to Figure-15.Now the assembly is ready to be assembled on PCS supports.

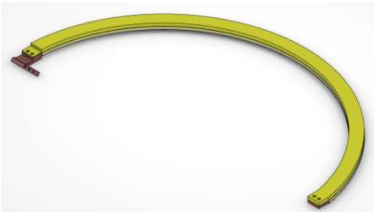
3(a): Flow Chart of TF outer leg assembly



1. TF outer turn
   -Dimensional check

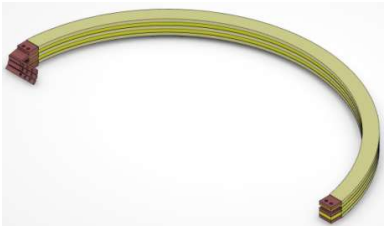


2. Turn insulated TF outer turn

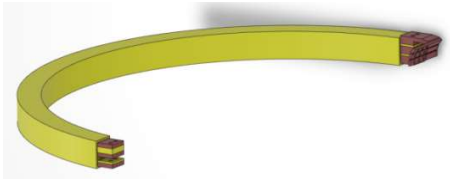


3. G-10 insulation layer

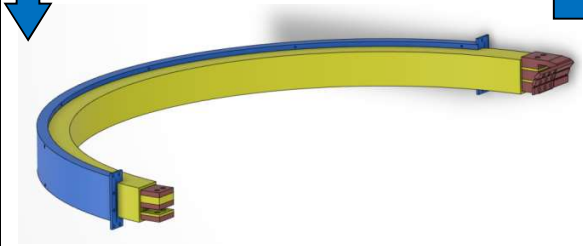
4. 2nd layer of TF outer turn



5. TF outer leg:3 turn insulated TF turns with intermediate 2 layers of G10 insulation
   -Dimensional check

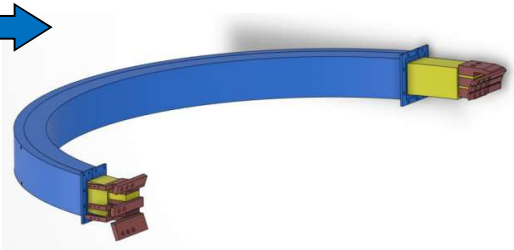


6. TF outer leg wrapped with insulation
-VPI
-Insulation resistance test
-Dimensional check



7. Insulated TF outer leg with half envelope

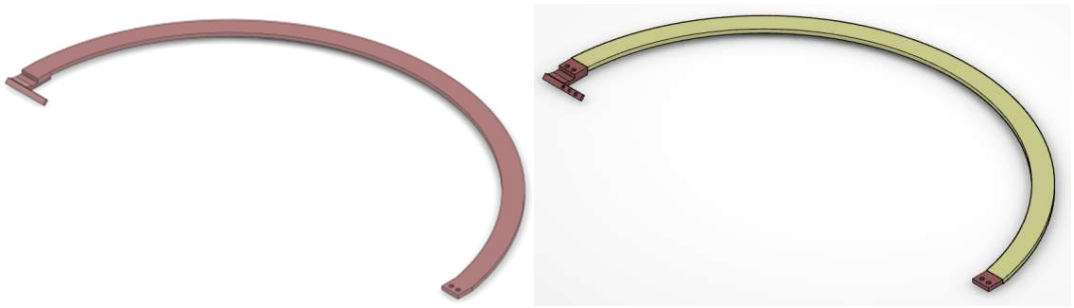
8. TF outer leg with envelope



9. Installation of radial connectors
   -Insulation resistance test
   -Dimensional check

3(b): Assembly Sequence of TF outer turn

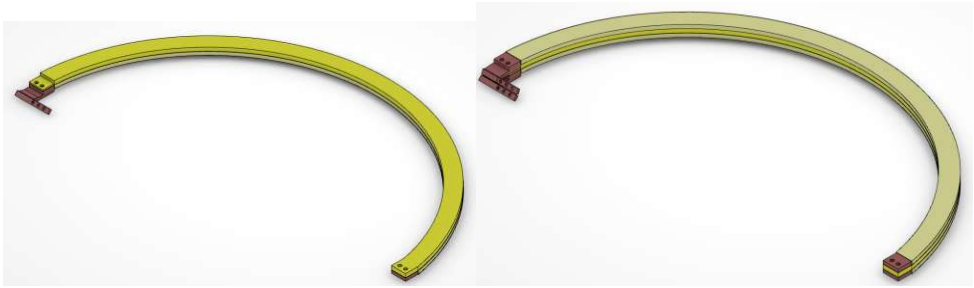
The TF outer leg assembly consists of TF outer turns, intermediate insulation (G10), turn insulation (polyester film insulation tape), envelope and radial connectors. The three D-shape TF outer turns forms a single TF outer leg. The assembly sequence of TF outer leg is described below.



(a) 1st TF outer turn (b) TF outer turn with turn insulated

Figure 16-TF outer turn with insulation

TF outer turn would be fabricated as per the drawings mentioned in the ***Annexure-1***. The material of construction for TF outer turns is ETP copper. Further, The TF outer turn is wrapped with 1 mm turn insulation. Please refer to Figure-16.



(a) G-10 insulation layer (b) 2nd layer of TF outer turn

Figure 17-TF outer turn

A 10 mm thick, D profile G-10 insulation layer is kept after1stTF outer turn. Please refer to Figure-17a. The 2nd TF outer turn is placed above D-shape G-10 insulation. Please refer to Figure-17b.

Similarly, 2nd layer of insulation and 3rd layer of TF outer turn is placed sequentially. The 2 layers of G-10 insulation is sandwiched in 3 layers of TF outer turns. Please refer to Figure 17 c.

Figure 17c- TF outer leg: 3 turn insulated TF turns with intermediate 2 layers of G10 insulation

The 3 TF outer turns forms a single TF outer leg. The formed TF outer leg is now further turn insulated with polyester film insulation tape, F class insulation.

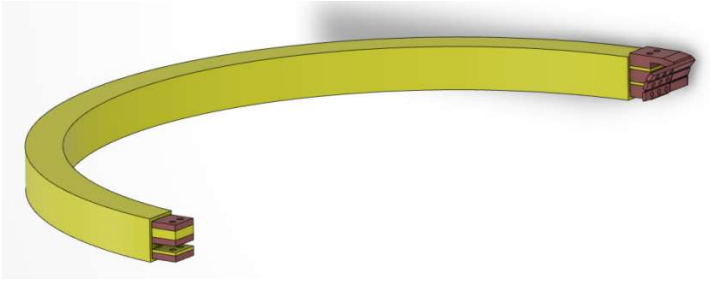


Figure 18- TF outer leg with turn insulation

The polyester film insulation tape is uniformly wrapped around TF outer leg and provide extra 4 mm thick insulation layer. Further, VPI would be performed for the prepared TF outer leg. Please refer Figure 18.

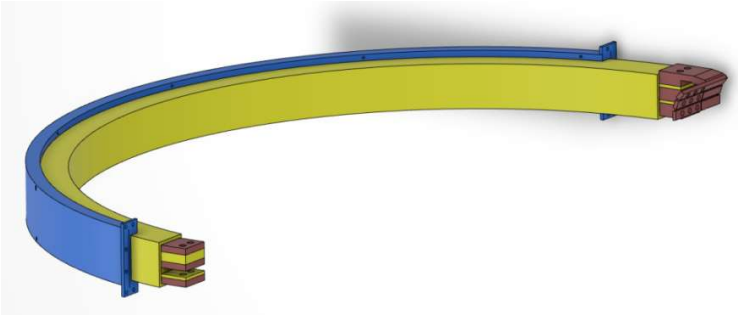


Figure-19a: Insulated TF outer leg with half envelope

Insulated TF outer turns are covered with 2 pieces of SS 304 envelope. The half layer of envelope is covering outer periphery of TF outer turn. Pease refer Figure 19a.

Figure-19b: TF outer leg with envelope

Another half envelope covers the inner periphery of TF outer turn. Pease refer to Figure-19b.The two half's are further bolted and form a TF outer leg envelope.

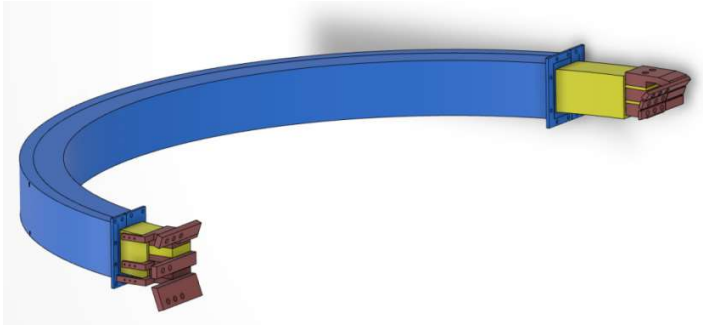


Figure 20- Installation of radial connectors

The radial connectors are installed at the ends. Please refer to Figure-20.The radial connector connects the TF outer leg to the inner legs.

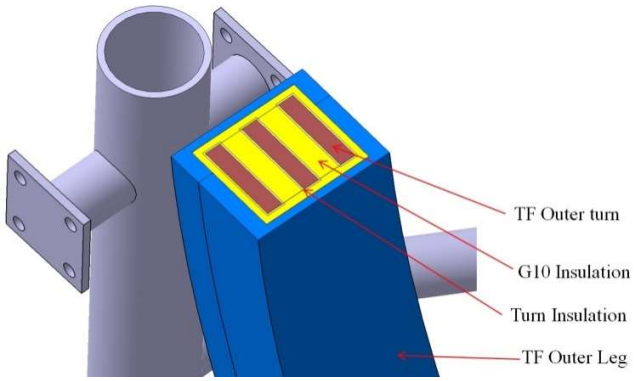
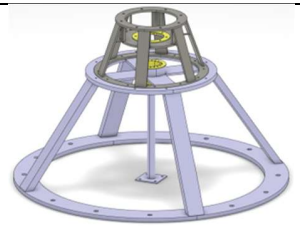


Figure-21 Cut view of TF outer turn

The cut view details are shown in Figure-21.

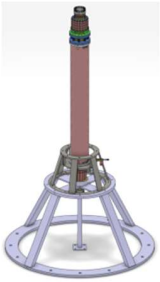
4(a): Flow Chart of PCS assembly



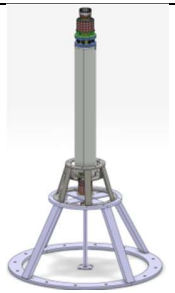
1. TF outer leg assembly
   -Dimensional check
   - Template for installation and fixing bolts

2. PCS upper support structure

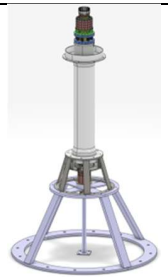
3. TF inner turn bundle with OH coil



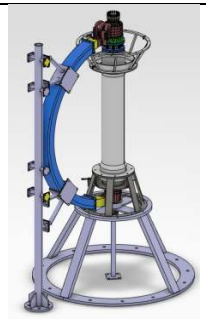
4. Installation of coils on support structure
   -Dimensional check
   - Insulation resistance test



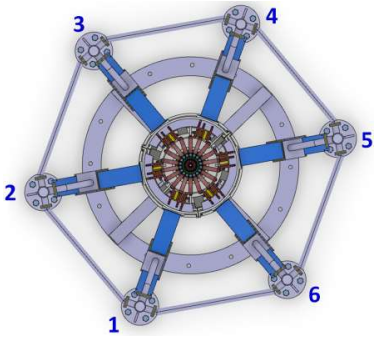
5. Installation of Temperature sensors and thermal insulation



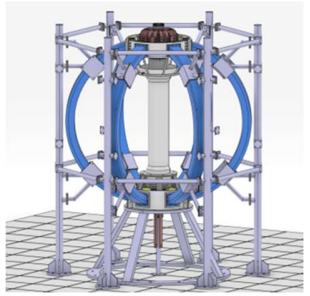
6. Installation of CSC
   -Dimensional check



7. TF outer leg assembly
   -Dimensional check
   -Insulation resistance test



8. TF outer legs installation
   -Dimensional check



9. Assembly of PCS
   -FAT

4(b): Assembly Sequence of PCS along with Support Structure

The Assembly of TF inner turns bundle and OH coil would be fitted on the support structure. The pedestal supports design is selected for PCS system. The pedestal supports provide extra floor space for maintenance and inspection activities.

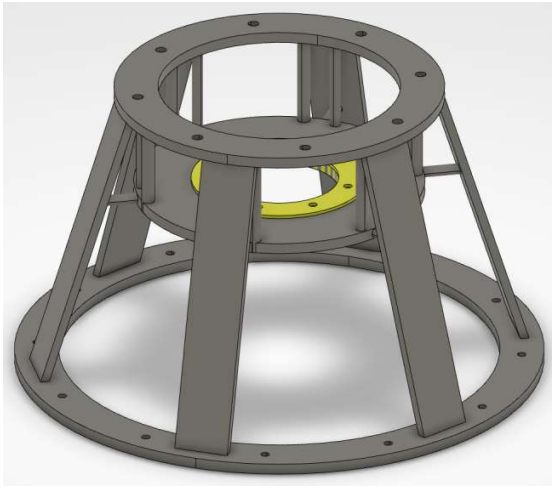


Figure-22 Upper support structure

There are mainly 2 pedestal support structures (upper and lower) designed for PCS assembly. The upper support is bolted on lower support and the lower support is directly anchored on floor.

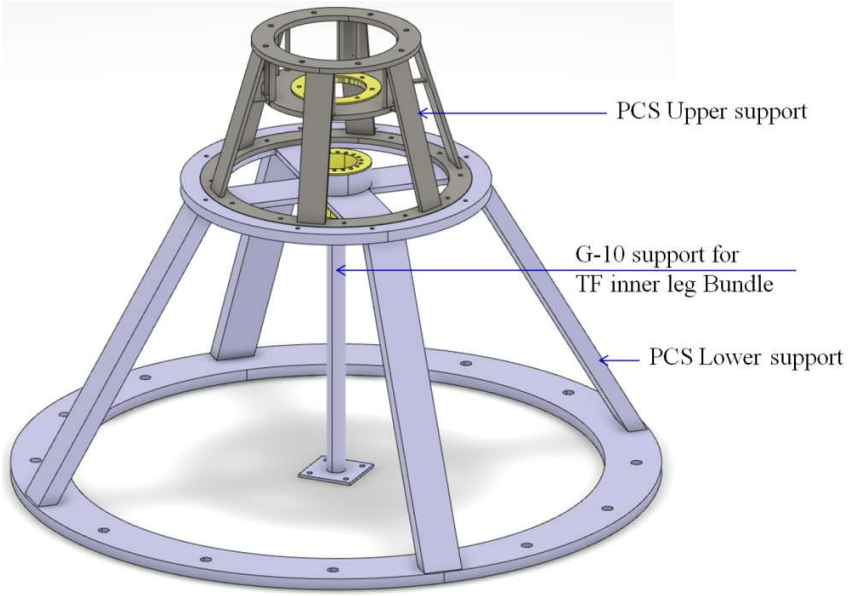


Figure-23 Upper and lower, PCS support structure

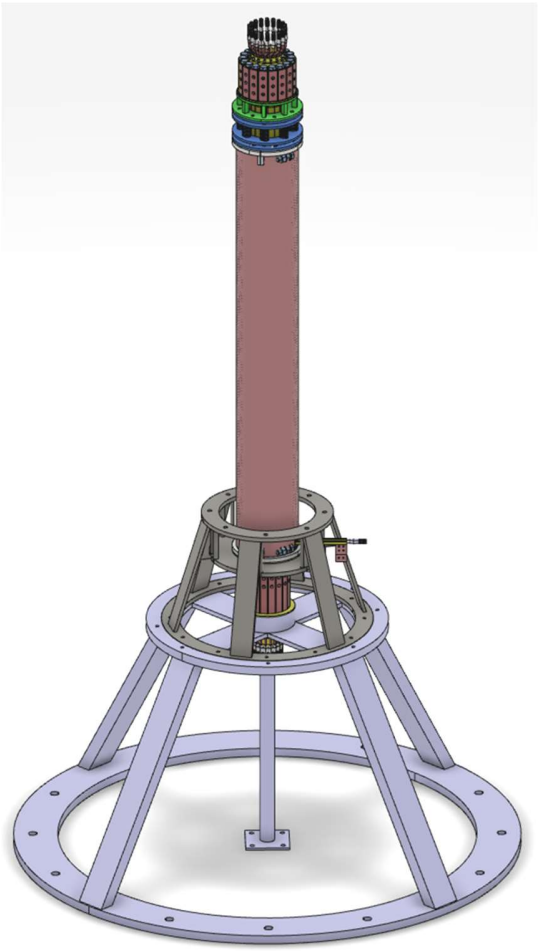


Figure-24 Installation of TF-OH coil bundle on support structure

The TF inner leg bundle is vertically mounted on lower support structure and the OH coil and CSC casing are rested on the upper support structure.The extra pipe support is also provided for G-10 rod which is also anchored on floor. Please refer to Figure-24. All the support structures are electrically insulated with G-10 (highlighted in yellow color). Please refer to Figure-22 &23.

Temporary supports maybe required for stage wise fabrication and assembly. The Vendor is responsible for arranging all kind of temporary supports.

After installation of TF-OH coil bundle, the sensors are mounted on the surface of OH coil to monitor coil temperature. The details of sensors are presented in ***Annexure – 3***.

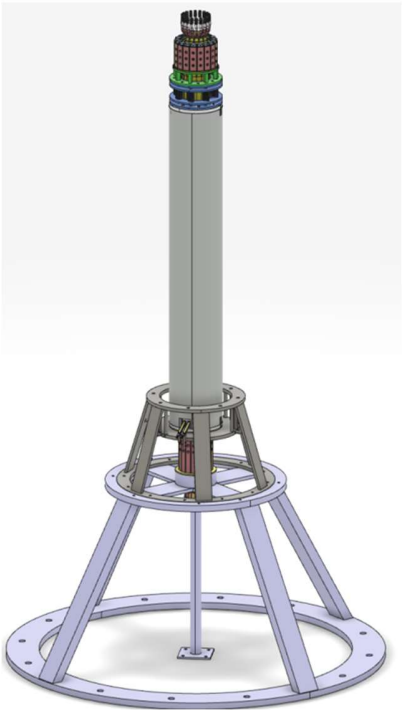


Figure-25 Installation of Temperature sensors and thermal insulation

After installation of sensors, OH coil would be wrapped with a 7 mm thick layer of CERAWOOL thermal insulation. Please refer to Figure-25. The details of CERAWOOL are presented in ***Annexure – 4***.

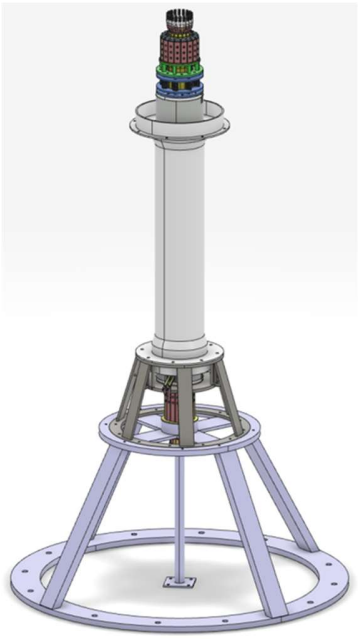


Figure-26 Installation of CSC

Further the TF-OH coil bundle is covered with Center stack casing (CSC). The CSC is inserted from the top side of the bundle which is rested on PCS upper support structure. Please refer to Figure-26. The CSC is made of SS 304 material.

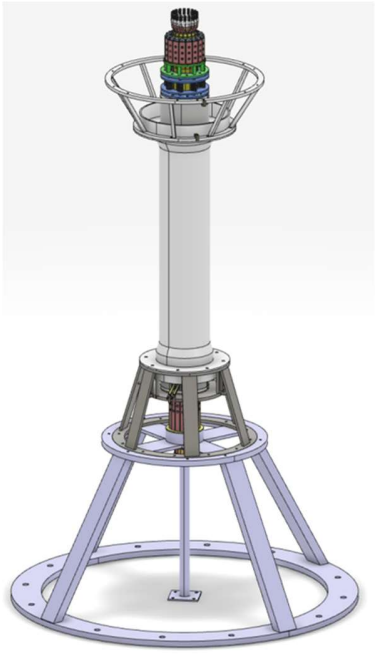


Figure-27 Inverted pedestal support

The Inverted pedestal is installed at top of CSC to support TF outer leg profile and its envelope (refer to Figure-27). At the lower side, a bracket (wedge) support is installed on the PCS lower support structure. The TF outer leg envelope would be tightened here through bolts. Temporary supports would be required for stage wise installation which will have to be removed after the final assembly.

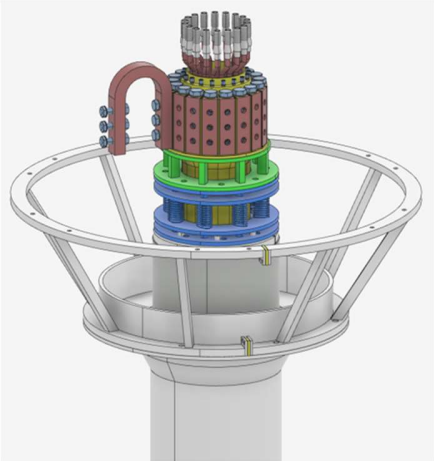
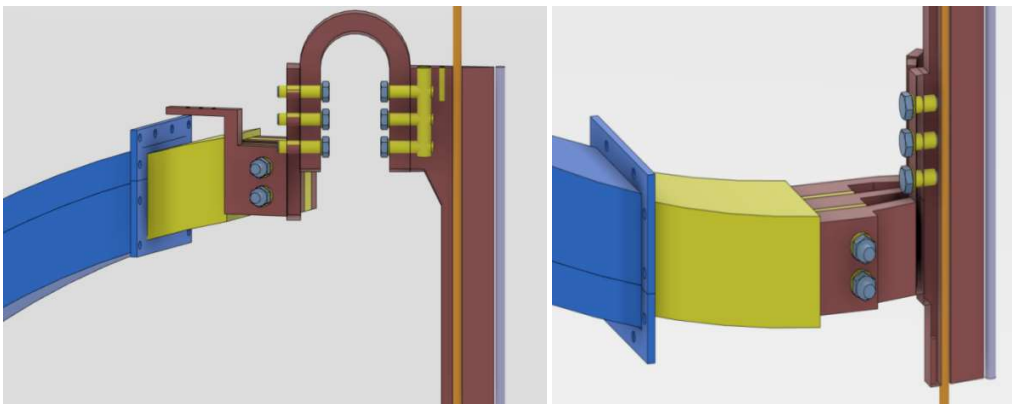


Figure-28 U bend connection

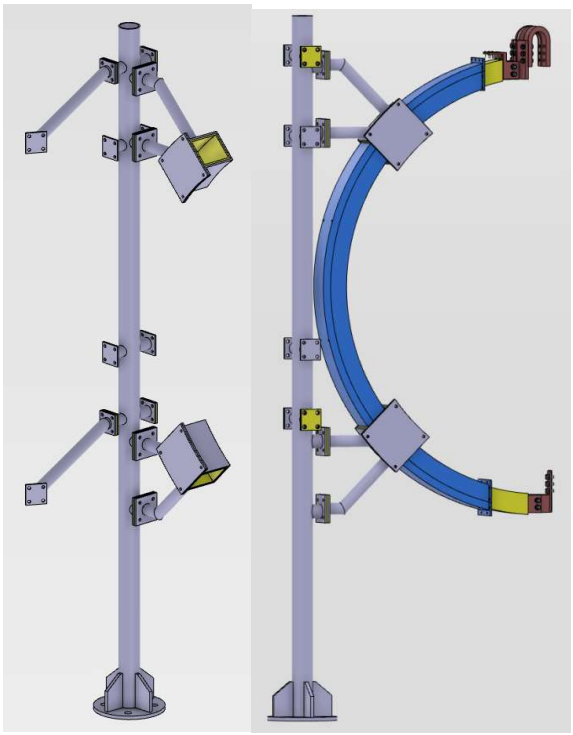
The TF coil consists of inner and outer turns which are connected through a flexible U bend support. The U bend configuration accommodates the thermal expansions within its profile limits. Please refer to Figure- 28.



(a) Top side (b) Bottom side

Figure-29 TF Inner and Outer turn connection

At the top side, TF inner and outer turns are connected with U bend support and at the bottom side, outer and inner turns are connected through radial connectors. Please refer to Figure-29.



(a) Outer leg pipe support (b) TF outer leg with support

Figure-30 TF outer leg

There are total 6 TF outer legs in the PCS system. The details of TF outer leg assembly are presented in section 3a & 3b.

TF outer leg assembly is supported with pipe support structure. The pipe support extensions are modular type and connected with nut and bolts. All pipe supports, connectors, nuts, and bolts used in this assembly are made of SS304. The details of pipe supports are mentioned in the relevant drawings. Please refer to Figure - 30.

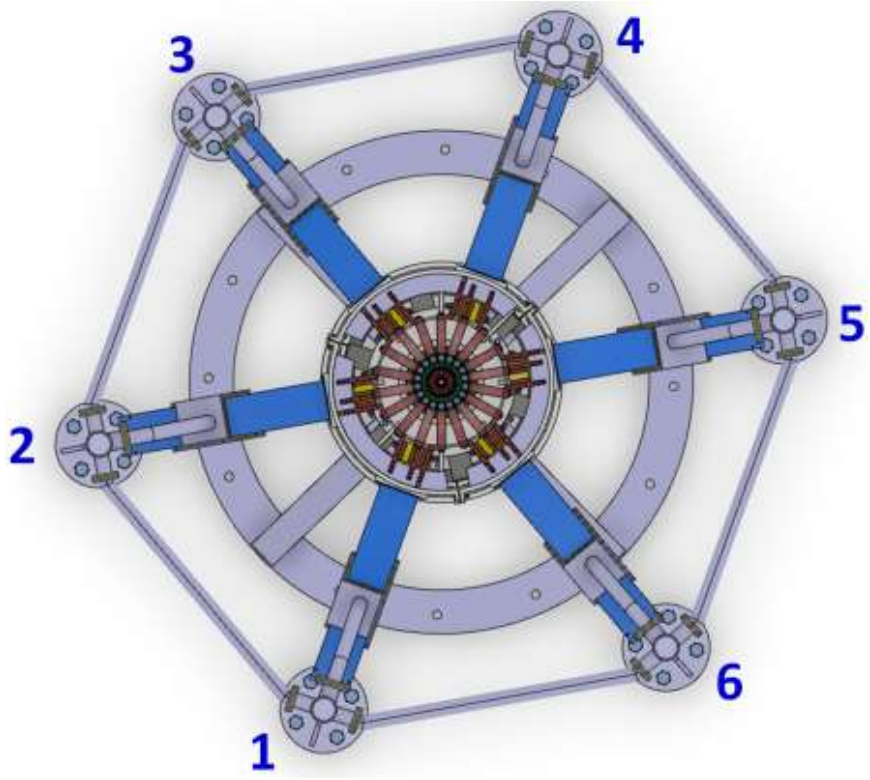
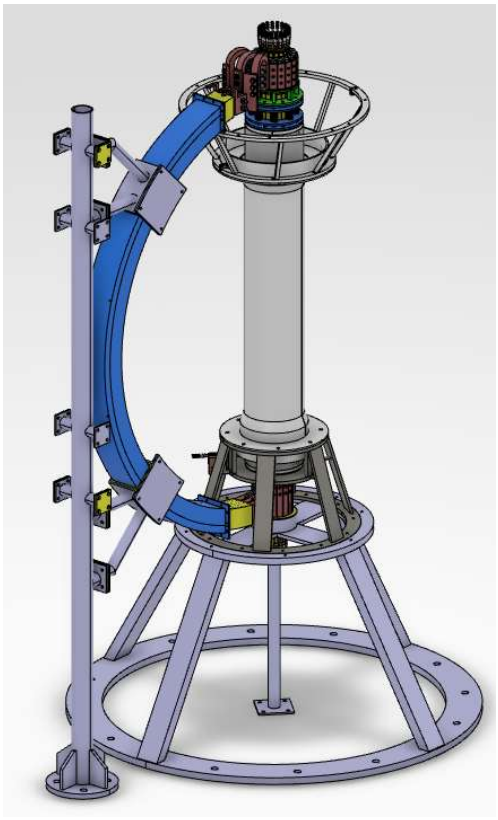
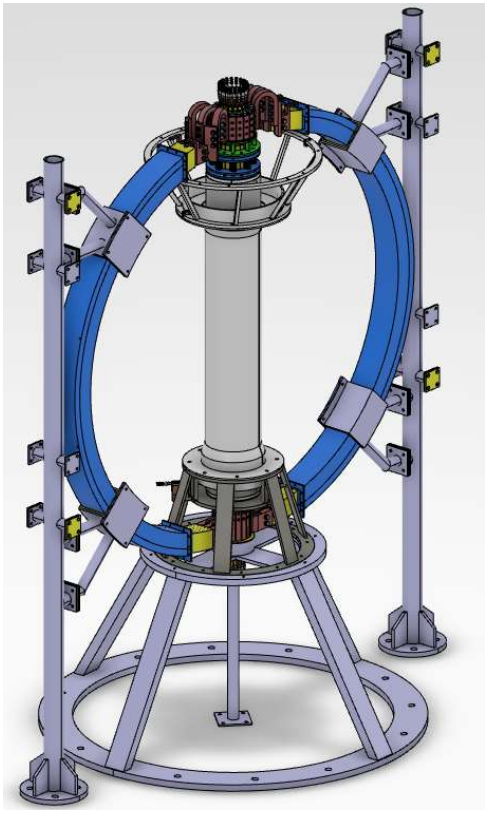


Figure-31 TF outer legs installation sequence

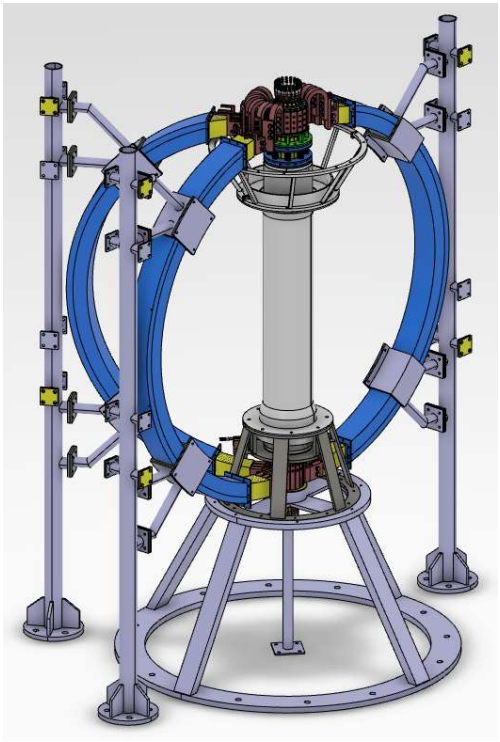
The pipe supports are directly anchored on the floor. The supports; peripheries and holes would be marked with the help of templates before installation of supports. The installation of TF outer legs follow the assembly sequence described below. The 1st TF outer leg assembly provides reference for the installation of the remaining TF outer legs.



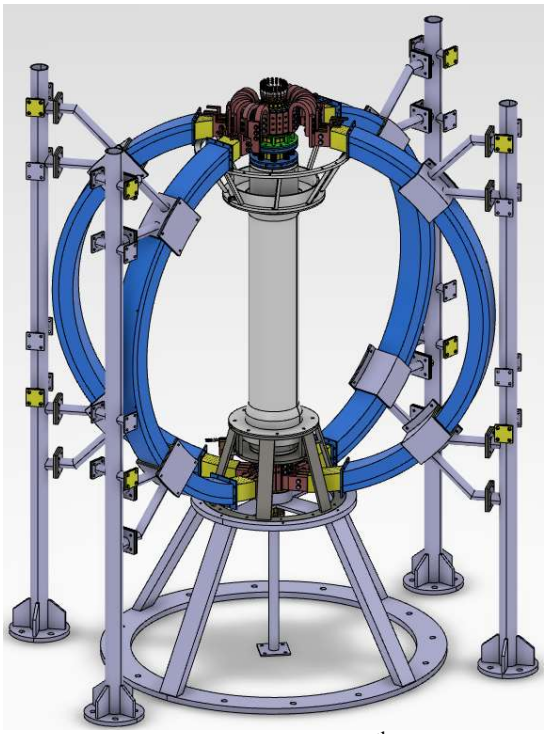
(a) Installation of 1st outer leg



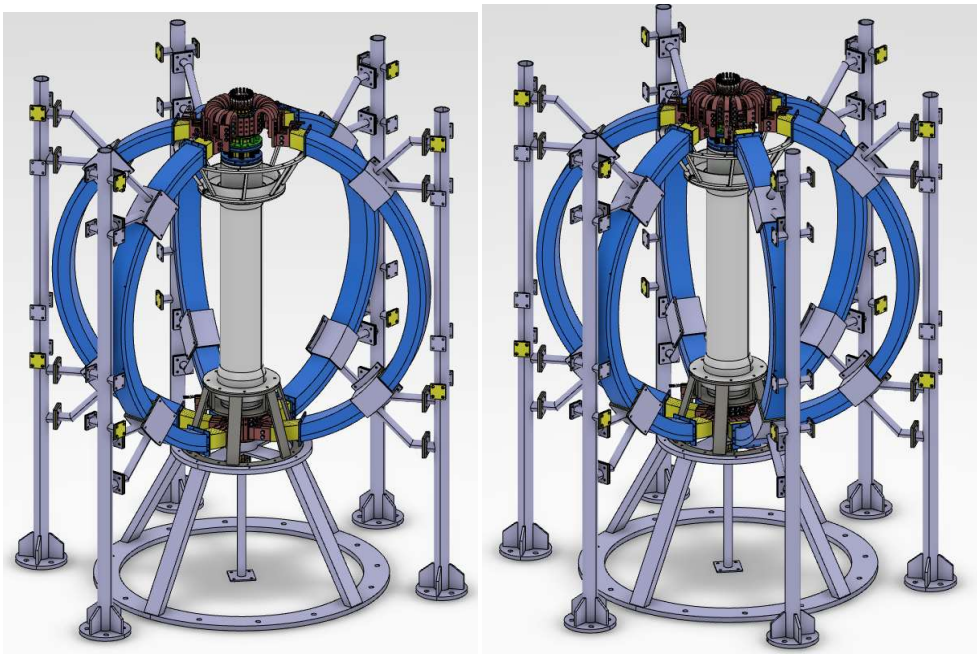
(b) Installation of 4nd outer leg



(c) Installation of 2nd outer leg



(d) Installation of 5th outer leg



(e) Installation of 3rd outer leg (f) Installation of 6th outer leg

Figure-32 TF outer legs installation sequence

After installation of 1st TF outer leg assembly, 4thTF outer leg would be installed. The installation of opposite TF outer legs minimizes the assembly loads. Similarly, 2&5 and 3&6 would be installed sequentially. Please refer to Figure- 31 & 32 (a, b, c, d, e, f).

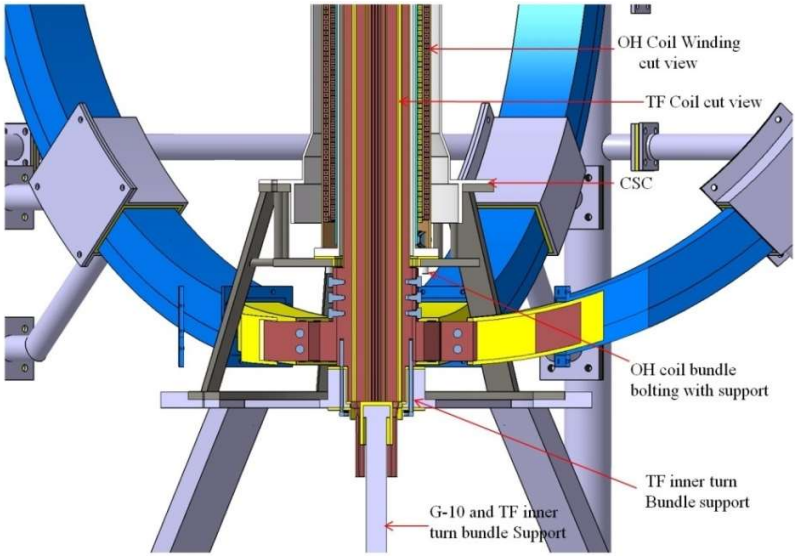


Figure-33 cut view coils on support structure

The cut view of PCS system is shown in Figure-33. The highlighted yellow color shows the presence of electrical insulation. The copper used in the PCS assembly are insulated with different types of electrical insulations (polyester film insulation, G10, kapton, Teflon coating). Depending

on the application, different thicknesses are considered for coils. The supports, nut/bolts are also insulated with suitable insulation. The details of insulation are provided in ***Section 8.4.4***.

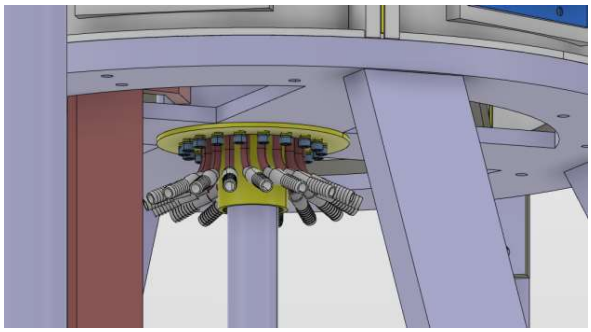


Figure-34 Bending of TF inner bundle copper tubes

After installation of TF outer legs, alignments would be checked and supports would be anchored on the floor. Later on, the lateral supports (connecting bars) would be installed. Further, the upper bracket would be installed and integrated with the TF outer envelopes. The TF inner bundle copper tubes are bent at the bottom side so that the copper tubes have sufficient gap to connect with water tubes. Please refer to the drawings for the details of copper tube bending. The final PCS assembly is shown in Figure 35.

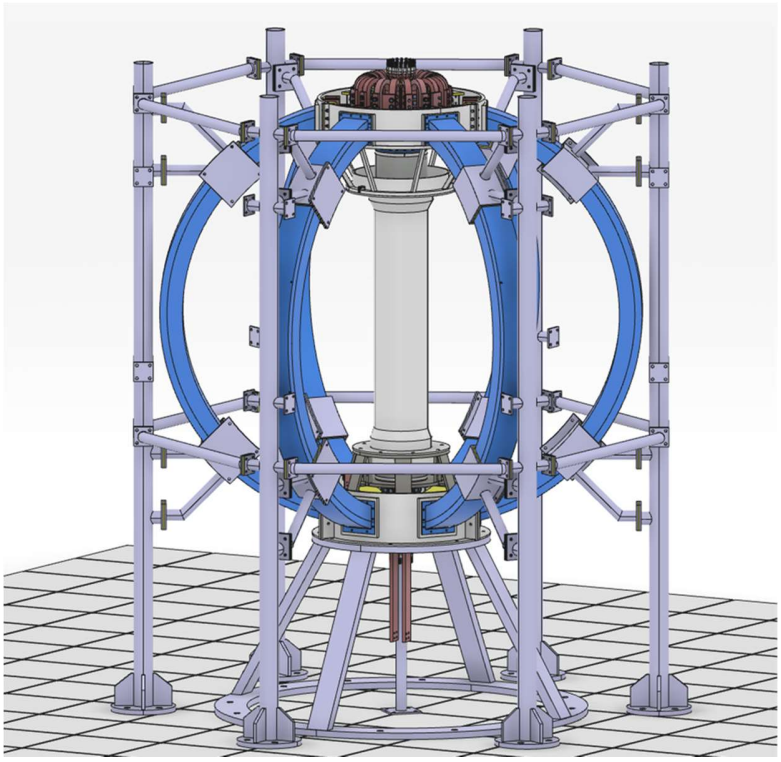


Figure-35 Assembly of PCS

Technical Compliance Statement of

Fabrication, Assembly, Testing, Supply & Installation Of Integrated Ohmic Coil & Toroidal Field Coils Assembly

Technical Compliance Sheet

Reference: Tender Document for Fabrication, Assembly, Testing, Supply & Installation of Integrated Ohmic Coil & Toroidal Field Coils Assembly

The vendor shall provide their acceptance/confirmation for each point. Kindly ***avoid "Yes/Agree/Comply"*** in your response ***for numeric value/parameters*** asked in this compliance sheet.

<table>
<tr><th>Sr. No.</th><th>IPR Specifications</th><th>Vendor Acceptance/Response/ Comments for IPR Specifications</th></tr>
<tr><td>1</td><td>Introduction:
Vendor shall confirm that they have read the introduction part carefully and has clear understanding of the assembly and the work involved.</td><td></td></tr>
<tr><td>2.</td><td>Subject of this Technical Specification:
Vendor shall confirm that they have understood the aim of this technical specification</td><td></td></tr>
<tr><td>3.</td><td>Scope of Supply</td><td></td></tr>
<tr><td>3.1</td><td>Item of Supply to be done by the Vendor
<table>
<tr><th>Sr. No</th><th>Items</th><th>Drawing</th><th>Qty</th></tr>
<tr><td>1.</td><td>Prototype Center Stack Assembly with Support Structure</td><td>IPR/ATD/PCS/01</td><td>1 unit</td></tr>
<tr><td>2.</td><td><u>Mandatory Spares:</u> Supply of all types of wedge-lock washers/bolts/nuts/temperature sensors/G10 sleeves used in the assembly</td><td>-</td><td>10% of used quantity to be supplied as spares</td></tr>
</table></td><td></td></tr>
<tr><td>3.2</td><td>Documentation to be supplied by Vendor:
(a) Quality Assurance Plan (QAP)</td><td></td></tr>
</table>

	(b) Manufacturing and Inspection Plan (MIP) (c) Manufacturing drawings (d) Certified Material test certificates, (e) Test procedures for Pressure test. (f) Inspection reports (dimensional & visual inspection, pressure tests, electrical tests etc.) (g) As-built drawings (h) Coil interconnections diagram (i) Assembly & Disassembly Manual (j) Photographs from different stages of manufacturing & processes for all the components and the assembly.	
4.	**Input Documents Provided by IPR:** The Vendor shall confirm that they have checked and understood the input documents provided by IPR in Annexures 1-5 as mentioned in Section 4.1 to 4.5	
5.	**Scope of Work:**	
5.1	The Vendor shall study all the General Assembly & Engineering drawings and technical specifications including assembly sequence for the entire job provided by IPR. *The vendor or his representative shall make a presentation to IPR describing their understanding of the entire scope of work within one month from the date of work contract issued*. The vendor may propose any needed changes in work or assembly sequence to IPR, during this presentation with appropriate justification, for review & necessary approval	
5.2	Preparation of Quality Assurance Plan (QAP) for the entire project with remarks on review, hold and witness points at each stage of the manufacturing and inspection. The Quality Assurance Plan shall also be accompanied with a tentative time schedule for all the activities in the entire project. *The vendor shall submit the same to IPR within six (6) weeks from the acceptance of work contract for review and approval*. A tentative format of QAP for this project and a typical component is provided in ***Annexure 2***	
5.3	Preparation of detailed Manufacturing & Inspection Plan (MIP) for each major component of PCS Assembly mentioning every stage of their manufacturing and inspection. *The vendor shall submit the same to IPR within six (6) weeks from the acceptance of work contract for review and approval*.	
5.4	Preparation of detailed fabrication/manufacturing drawings based on the approved engineering drawings provided by IPR as described in ***Section 6***. *These shall be submitted to IPR within 2 months from the acceptance of work contract for review and approval*. Autocad/Solidworks/CATIA to be used for CAD	

5.5	Preparation of manufacturing documents such as procedures for fabrication (machining, cutting, brazing, welding etc.) envisaged in this work, application of electrical and thermal insulation as required, inspection and testing, cleaning, quality control for various stages of work, etc. *The same shall be submitted to IPR within 2 months from the acceptance of work contract for review and approval.*	
5.6	Procurement (including inspection and evaluation) of raw material, joining consumables, insulation (electrical and thermal), temperature sensors and other needed items or materials including bolts/fasteners etc as per ***Section 8 & Bill of Material***. Chemical composition analysis, mechanical tests, electrical conductivity/resistivity tests etc. to be carried out at an NABL approved Laboratory for the procured raw material as specified in ***Section 8***. The vendor is responsible for the safe storage of procured material. Care should be taken to avoid contact of stainless steel with carbon steel at any time.	
5.7	Fabrication of each component of PCS as per the approved manufacturing drawings as per ***Section 9***. During fabrication, if any change in the procedure is sought by the vendor, the same shall be submitted to IPR for approval. No fabrication work shall be attempted without prior approval for modified procedures.	
5.8	Development/procurement of any required special purpose tooling, winding or bending equipment is in the scope of the vendor.	
5.9	Detailing & development of templates, gauges, special tools, test set-up etc. for Dimensional Inspection. The details of these items and their usage shall be submitted to IPR along with the manufacturing procedures for review and approval.	
5.10	Dimensional inspection at every stage of fabrication to ensure dimensional accuracy as specified in drawings as described in ***Section 11***. Final dimensional report for each component shall be submitted to IPR.	
5.11	Inter-coil joints, electrical connections, terminal connections are in the scope of the vendor as per ***Section 9.5***.	
5.12	Application of thermal & electrical insulation, Vacuum Pressure Impregnation (VPI) of coils as required and specified in drawings and in this specification in ***Section 8.3, 8.4*** & ***9.4*** respectively.	
5.13	The Vendor shall ensure that all finished components including support structure shall be non-magnetic.	
5.14	Fabrication of “Support Structure” for PCS as per MIP and approved manufacturing drawings.	

5.15	The Vendor shall assemble the fabricated components as per the approved assembly procedures at his site in the presence of IPR representatives as described in ***Section 10***. The vendor shall arrange for appropriate temporary supports and storage of the components during and after manufacturing stages, sub-assembly and assembly stages etc.	
5.16	During Assembly, for any type of machining or modifications required, the vendor shall inform IPR and request for approval. Without IPR approval, vendor shall not perform any modification in the components.	
5.17	Connection of temperature sensors (16 Nos.) at the locations provided by IPR in ***Annexure – 3***.	
5.18	Quality assurance & control – testing (mechanical and electrical) and inspection at all stages of manufacturing as per the approved QAP & MIP as described in ***Section 11***. Fabrication of connections and fixtures needed for hydro-test and other required tests are in the scope of the vendor.	
5.19	Disassembly, Packing, Transportation, safe delivery of the entire PCS assembly at IPR as per ***Section 12***.	
5.20	Unpacking and Final Installation & Acceptance at IPR as per ***Section 13 and 14*** respectively	
5.21	The vendor is responsible for any damage caused to the components during fabrication, assembly, testing or transport till final acceptance at IPR.	
5.22	The vendor shall **deliver the entire package along with completion of Site Acceptance Tests at IPR within 12 months** from the date of acceptance of work contract.	
5.23	Complete documentation including photographs	
6.	**Manufacturing Drawings:** The Vendor shall confirm that they have understood the requirements of manufacturing drawings as mentioned in this ***Section*** and shall deliver the same.	
7.	**Applicable Codes & Standards:** The Vendor shall confirm that they have understood the applicable codes & standards as mentioned in this Section and shall follow the same during this project.	
8.	**Material of Construction**	

8.1	The vendor shall confirm and use **ETP Copper for TF Coils & OH Coil** as per requirements mentioned in Section 8.1.1 – 8.1.4. Applicable Test Certificates shall be submitted by the Vendor to IPR as mentioned.	
8.2	The vendor shall confirm and use **Stainless Steel for Support Structure and other components** as per requirements mentioned in Section 8.2.1 – 8.2.3. Applicable Test Certificates shall be submitted by the Vendor to IPR as mentioned.	
8.3	The vendor shall confirm and use **thermal insulation** as per requirements mentioned in Section 8.3.1 & Annexure 4. Applicable Test Certificates shall be submitted by the Vendor to IPR.	
8.4	The vendor shall confirm and use **electrical insulation** as per requirements mentioned in Section 8.4.1 – 8.4.4. Applicable Test Certificates shall be submitted by the Vendor to IPR.	
8.5	The vendor shall confirm and use **temperature sensors** as per requirements mentioned in Section 8.5.1. Applicable Test Certificates shall be submitted by the Vendor to IPR.	
9.	**Fabrication Requirements**	
9.1	The vendor shall confirm compliance to the **General Requirements** of fabrication as mentioned in this Section. Manufacturing procedures as required shall be submitted to IPR.	
9.2	The vendor shall confirm compliance to the **Cutting and Machining Requirements** of fabrication as mentioned in this Section.	
9.3	The vendor shall confirm compliance to the **OH Coil Fabrication Requirements** as mentioned in this Section.	
9.4	The vendor shall confirm compliance to the **Vacuum Pressure Impregnation of Coils** as mentioned in this Section. Detailed proposal of VPI, its cycle, epoxy resin used, curing temperature, holding time shall be submitted by Vendor to IPR as part of manufacturing procedures.	
9.5	The vendor shall confirm compliance to the **Electrical Joints and Connection for TF Coils Requirements** as mentioned in this Section.	
9.6	The vendor shall confirm compliance to the **Center Stack Casing Fabrication Requirements** as mentioned in this Section.	
9.7	The vendor shall confirm compliance to the **Requirements of Brazing of Copper** as mentioned in this Section.	
9.8	The vendor shall confirm compliance to the **Requirements** of Welding for Support Structure & SS Components as mentioned in this Section.	
10.	**Suggested Sequence for Manufacturing of PCS Components and Assembly** The vendor shall confirm that they have read the suggested sequence in Annexure 5 for manufacturing of components and assembly carefully and has clear understanding of the work and testing involved during each stage of assembly and will comply with the same.	

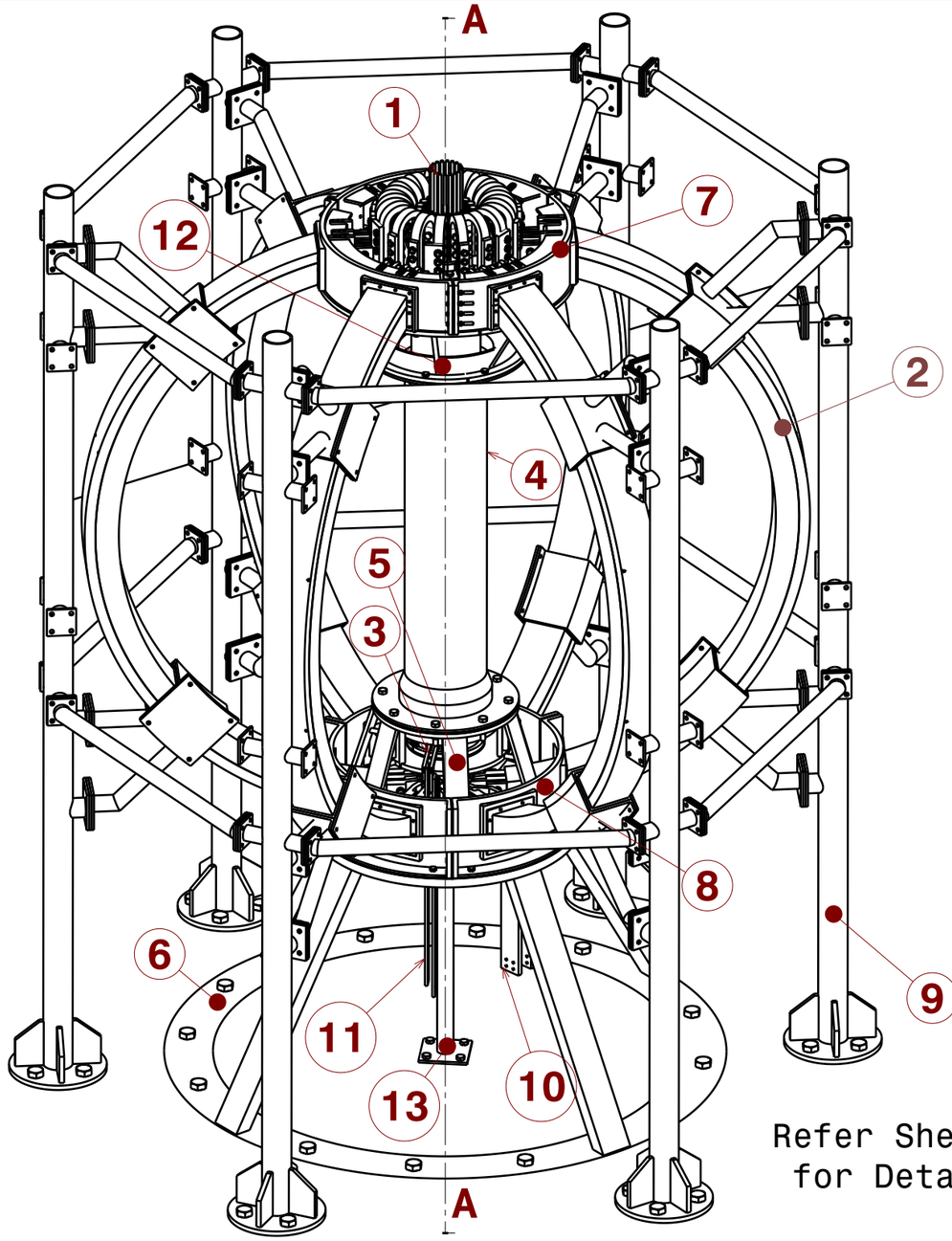
11.	**Inspection & Testing (Factory Acceptance Tests)** The vendor shall comply with the all the factory acceptance tests described in this Section.	
12.	**Disassembly, Packing & Supply** The vendor shall comply with the all the requirements for disassembly, packing and supply described in this Section	
13.	**Unpacking at IPR Site** The vendor shall comply with requirements of Unpacking at IPR site as described in this Section.	
14.	**Final Installation & Site Acceptance Tests (SAT) at IPR** The vendor shall comply with the all the requirements of final installation and site acceptance tests described in this Section	
15.	**Delivery Period** The vendor shall complete the entire activities in the scope of this specifications within 12 months from the date of contract.	
16.	**Warranty**	
	12 (TWELVE) Months from date of final acceptance of the components for poor workman ship/welding/fabrication. During this period if any fault occurs/is detected in the supplied items, the vendor shall rectify the same at no extra cost.	
17.	**Timeline for the Schedule of Work** The vendor shall confirm that they have gone through the timeline for the schedule of work and shall provide their compliance for the same.	
Annexure–1	**List of Drawings** The vendor shall study each drawing of assembly, sub-assemblies, parts and BOM provided in the respective drawings and provide their compliance/acceptance.	
Annexure-2	**Format for Tentative Quality Assurance Plan for activities involved in PCS Assembly Project and for a typical component**	

	The vendor shall study this format and prepare their QAP for the entire project as as well as for typical component accordingly clearly mentioning perform, hold, review and witness points as required.	
Annexure–3	**Location for Installation of RTD Temperature Sensors** The vendor shall comply with the requirements regarding the mounting of RTD Temperature Sensors at the required locations as mentioned in this Annexure.	
Annexure–4	**Thermal Insulation Material Properties (Cerawool)** The vendor shall comply with the requirements of thermal insulation (Cerawool). Equivalent or similar thermal insulation desired to be used by the vendor shall be clearly mentioned here in the bid itself and it should fulfilling IPR requirement as mentioned in this Annexure.	
Annexure–5	**Suggested Assembly Sequence** The vendor shall comply with the requirements of assembly sequence as suggested by IPR. Any deviation needed or suggestions by the vendor shall be clearly mentioned here in the bid itself.	

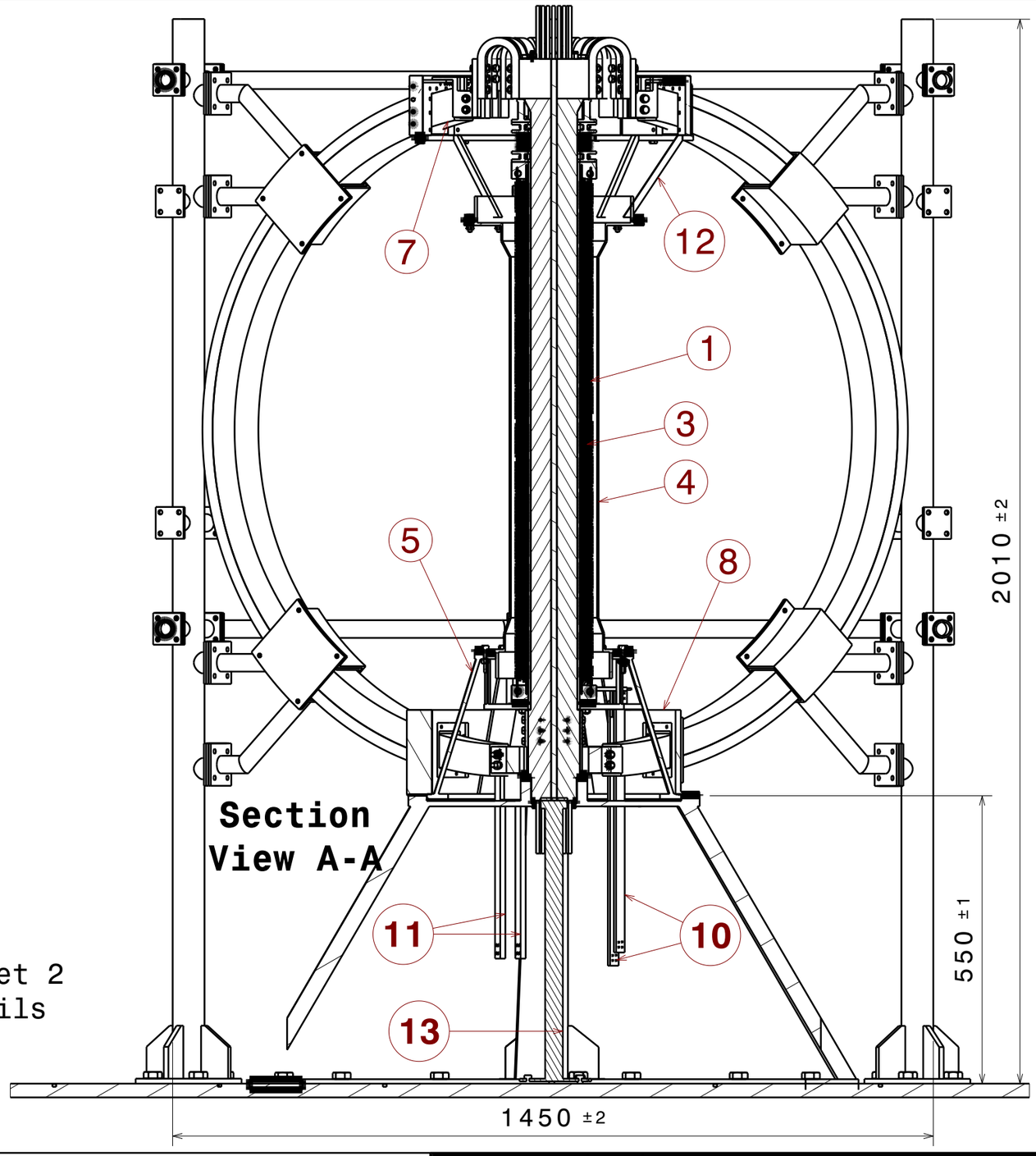
Authorized Signatory's Name & Signature

Official Seal

Date :- _____



Refer Sheet 2
for Details



PCS System

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN					
REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

THIRD ANGLE PROJECTION

Assembly:PCS System

REF DRG NO:	REV R1
DRG.NO IPR/ATD/PCS/01	SHEET 01 OF 02

Sr No	Description	Type	Qty	Remarks
1	TF Inner Turns Bundle	Assembly	1	Refer Drawing -IPR/ATD/PCS/02
2	TF Outer Leg	Assembly	6	Refer Drawing -IPR/ATD/PCS/03
3	OH Coil	Assembly	1	Refer Drawing -IPR/ATD/PCS/04
4	Center Stack Casing	Assembly	1	Refer Drawing -IPR/ATD/PCS/05
5	PCS Upper Support Structure	Assembly	1	Refer Drawing -IPR/ATD/PCS/06
6	PCS Lower Support Structure	Assembly	1	Refer Drawing -IPR/ATD/PCS/07
7	TF Outer_Upper Support Ring	Assembly	1	Refer Drawing -IPR/ATD/PCS/08
8	TF Outer_Lower Support Ring	Assembly	1	Refer Drawing -IPR/ATD/PCS/09
9	TF outer support assembly	Assembly	6	Refer Drawing -IPR/ATD/PCS/10
10	TF End Connectors	Part	2	Refer Drawing -IPR/ATD/PCS/11
11	OH coil Bus Bar connectors	Part	2	Refer Drawing -IPR/ATD/PCS/12
12	Inverted Pedestal	Assembly	1	Refer Drawing -IPR/ATD/PCS/13
13	Support for G10 Central Rod	Assembly	1	Refer Drawing -IPR/ATD/PCS/14
14	Auxillary Items	Miscellaneous	-	Refer Drawing -IPR/ATD/PCS/15

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

REVISION COLUMN

ASS'Y GROUP/ DIVISION:	SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED	

SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

THIRD ANGLE PROJECTION

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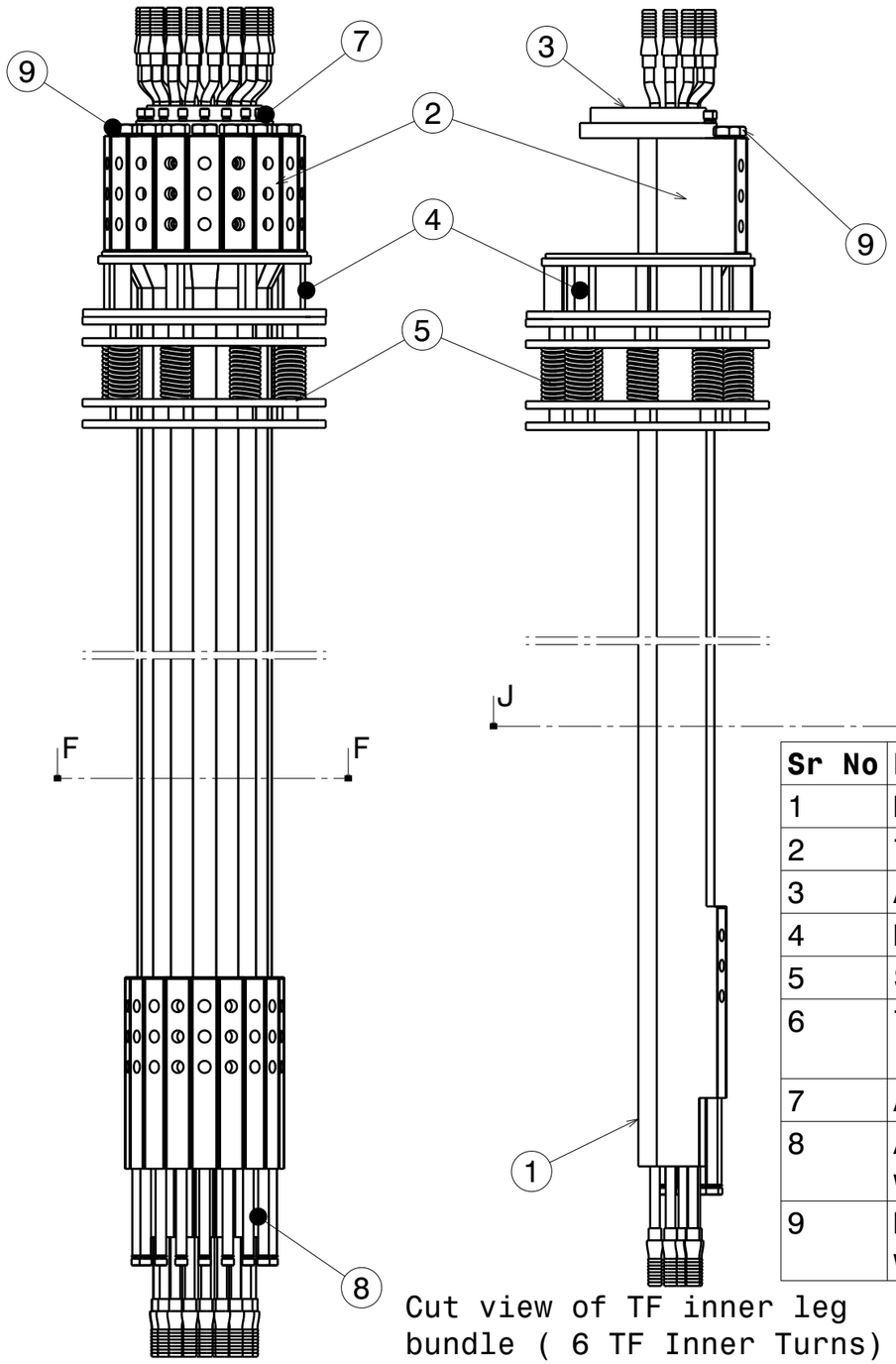
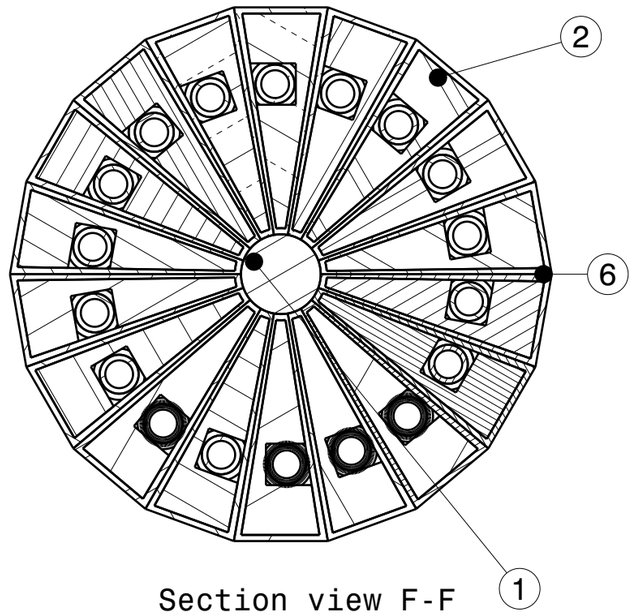
INDIA

Assembly:PCS System

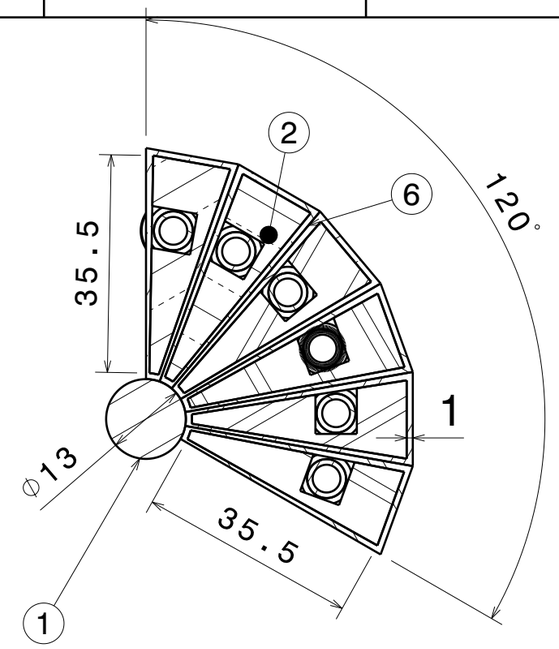
REF DRG NO: IPR/ATD/PCS/01		REV R1
DRG.NO	IPR/ATD/PCS/01-1	SHEET 02 OF 02



Cut view of TF inner leg bundle (6 TF Inner Turns)



Section view F-F



Section view J-J

Sr No	Description	Material	Qty	Remarks
1	Machine Center	G10	1	G10 Rod- Length 1400mm ⌀7mm
2	TF Inner Leg	ETP Copper	18	Detail Drawing on Sheet 2-4
3	Anti Torque Disc	G10	1	Detail Drawing on Sheet 5
4	Mechanical Support	SS304	1	Detail Drawing On Sheet 6
5	Spring Support	SS304	1	Detail drawing on Sheet 7
6	Turn Insulation	Polyester Film Insulation Tape	-	Thickness-1mm (Refer Assembly sequence)
7	Allen Bolts M4x25 & washer	SS304	18	With G10 Sleeve
8	Allen Bolts M6x90 (SS304)with wedge lock washers (SS316)	SS304	18	With G10 Sleeve
9	M10 Customized Bolts (SS304) with wedge lock washers (SS316)	SS304	18	Details on Sheet 4

DRG.NO | ▽ 8-25 | ▽▽ 1.6-8 | ▽▽▽ 0.025-1.6 | ▽▽▽▽ < 0.025

CO-ORDINATED BY

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION: | SIZE A3

ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED

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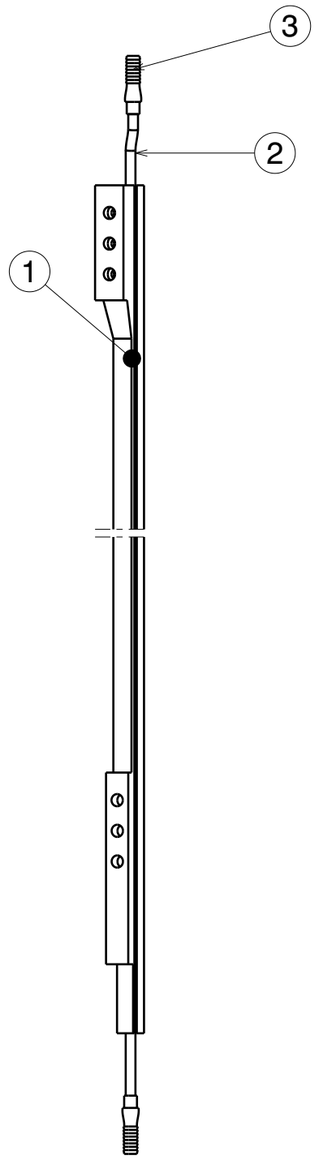
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

THIRD ANGLE PROJECTION

Assembly: TF Inner turns bundle

REF DRG NO: IPR/ATD/PCS/01 | REV R1

DRG.NO IPR/ATD/PCS/02 | SHEET 01 OF 07



TF Inner Turn

Sr No	Description	Material	Qty	Remarks
1	Trapezoidal Shape Copper Bar	ETP Copper	18	Assemble as per Assembly Sequence (Annexure 5) (Detail drawing on page 3-4)
2	1/4" Cooling Tube Length -1600 mm (OD ~6.35mm thickness ~0.91mm)	ETP Copper	18	To be brazed in slot on Trapezoidal shape Copper Bar As per the specification (Detail drawing on page 4)
3	1/4" Cooling Tube nipple (connector)	SS304	36	To be brazed with cooling tube

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN		
CO-ORDINATED BY					REV	ZONE	DESCRIPTION
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS							
LENGTH IN mm OF SHORTER SIDE OF ANGLES							
UPTO 10	10-50	50-120	OVER 120-400				
±1°	±0°-30'	±0°-20'	±0°-10'				

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

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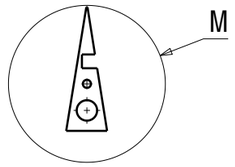
INDIA

THIRD ANGLE PROJECTION

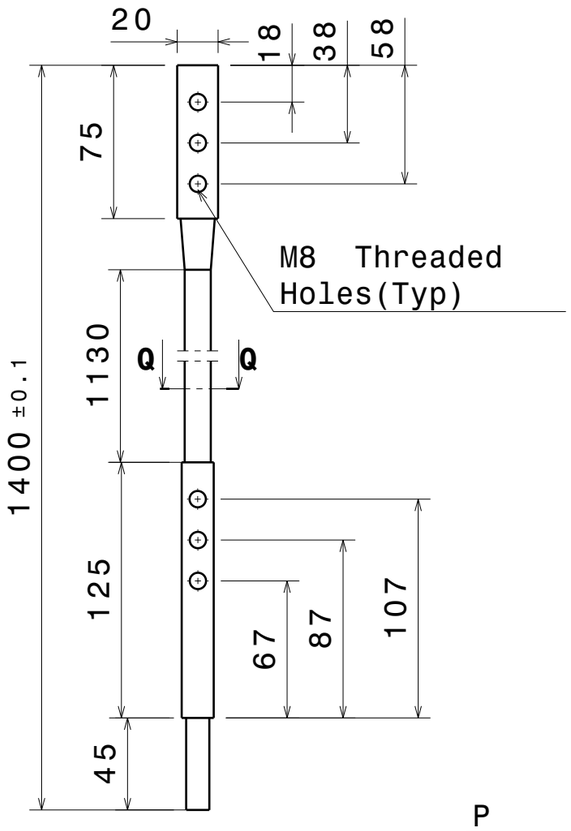
TF inner leg: Overview

REF DRG NO: IPR/ATD/PCS/02 REV R1

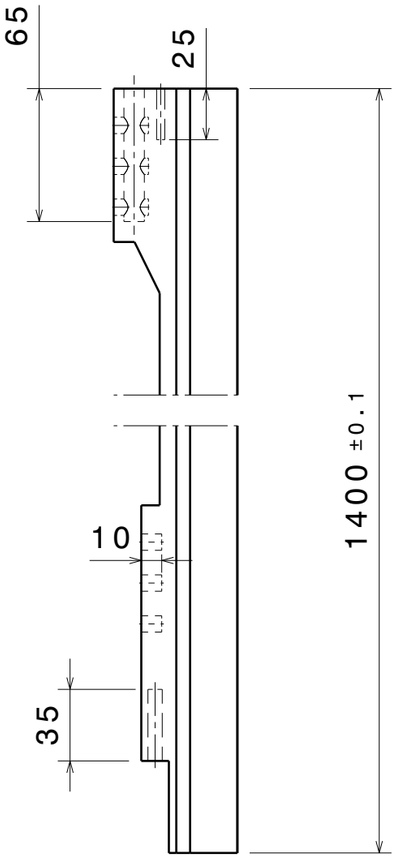
DRG.NO IPR/ATD/PCS/02-1 SHEET 02 OF 07



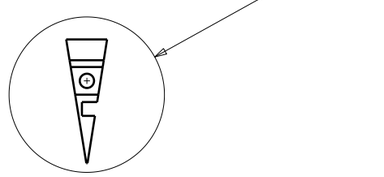
Top View



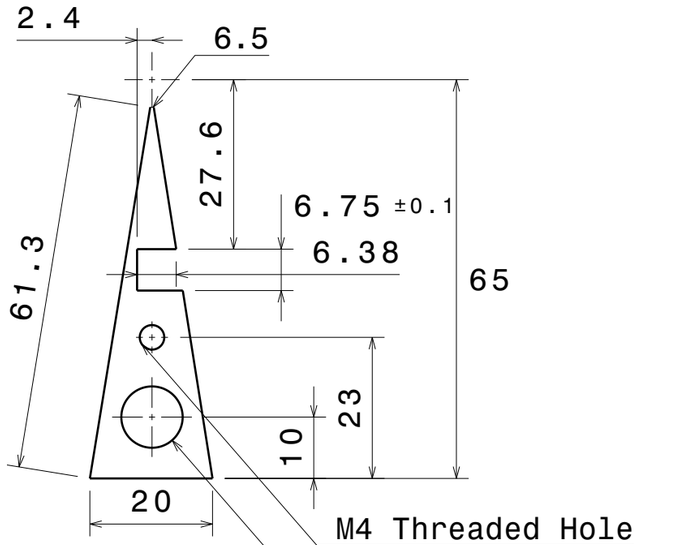
Front View



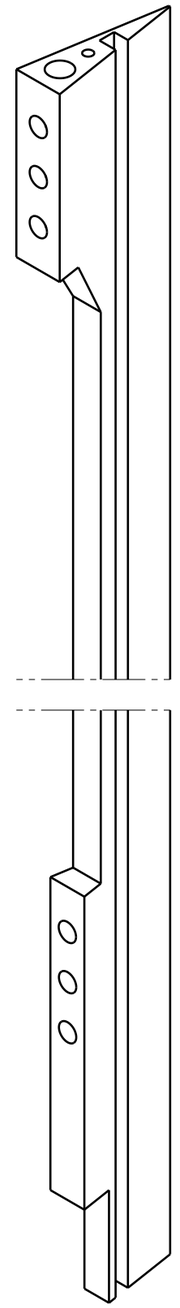
Side View



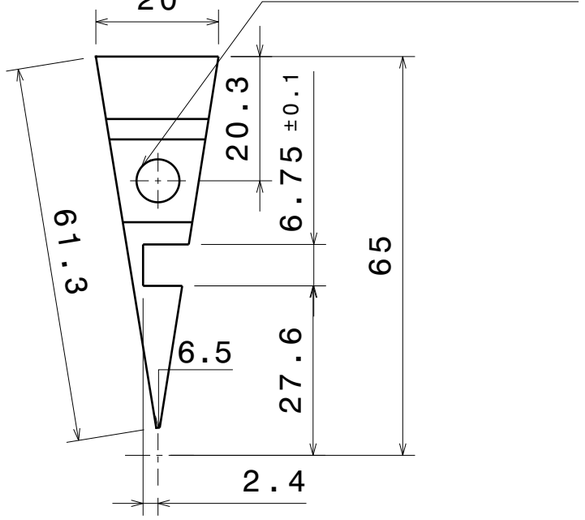
Bottom View



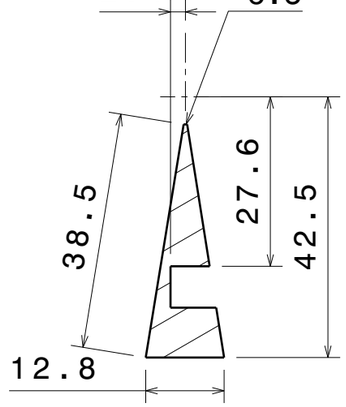
Detail M



Trapezoidal Shape Copper Bar



Detail P



Section cut Q-Q

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION: | SIZE A3

ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED

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BHAT, GANDHINAGAR-382 428.
INDIA

SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

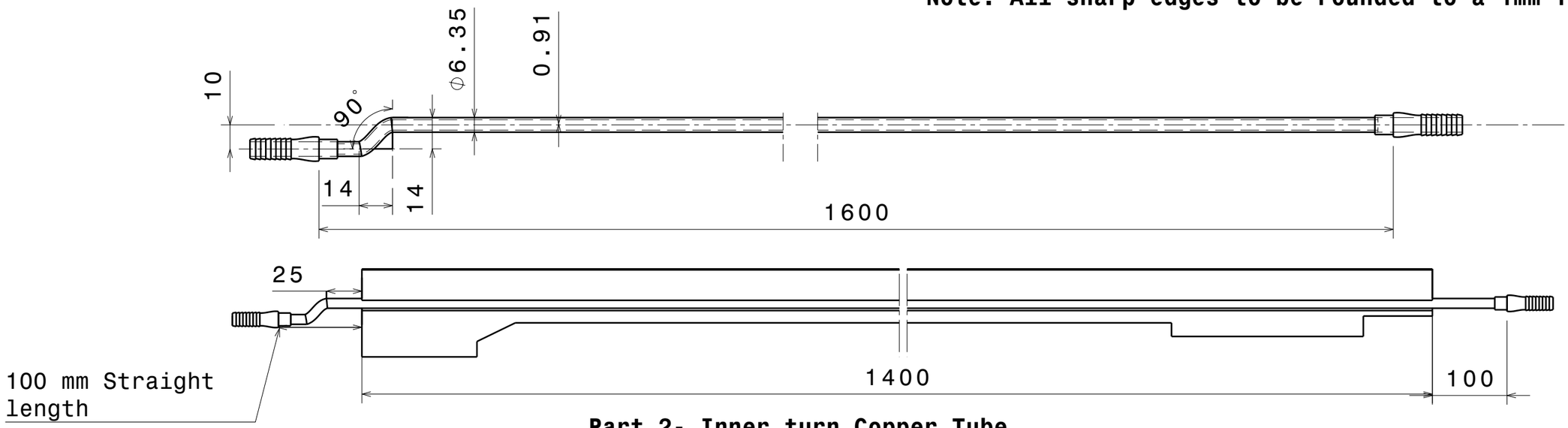
THIRD ANGLE PROJECTION

TF inner leg: Detials of Top and Bottom view

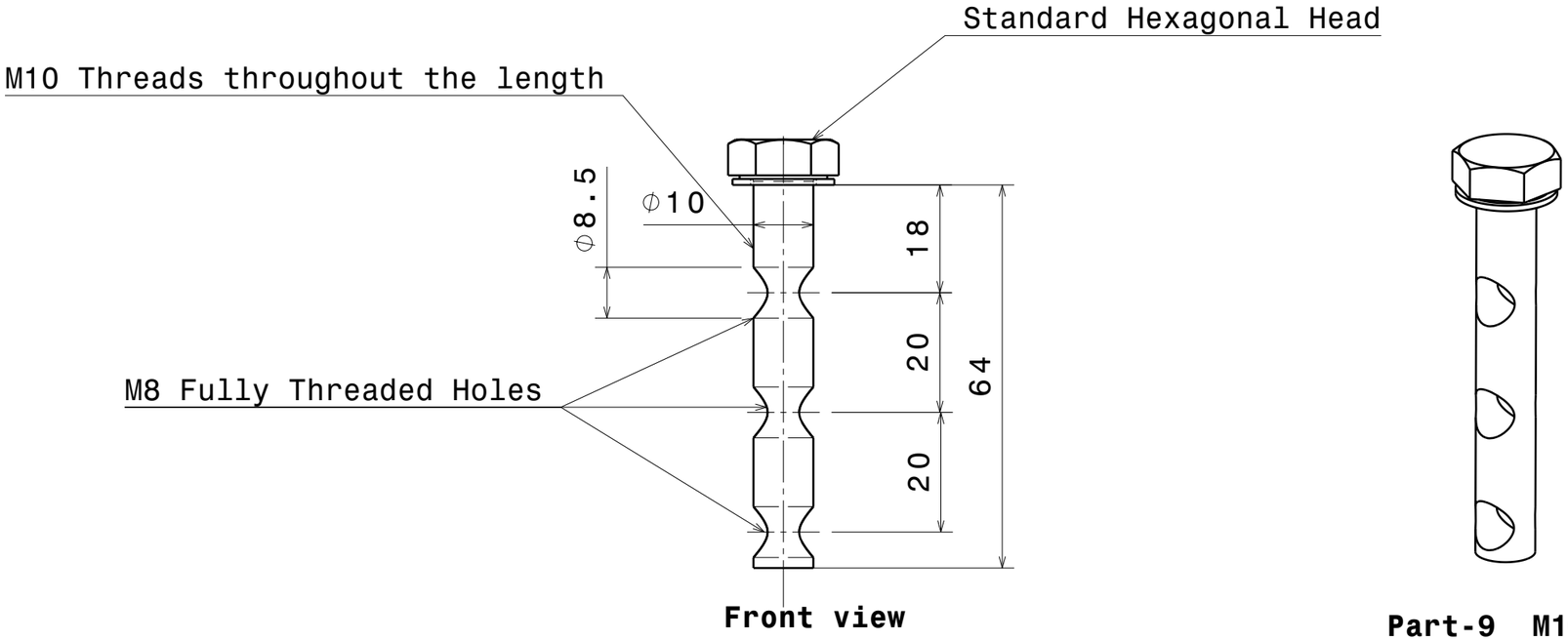
REF DRG NO: IPR/ATD/PCS/02 | REV R1

DRG.NO IPR/ATD/PCS/02-2 | SHEET 03 OF 07

Note: All sharp edges to be rounded to a 1mm fillet radius.



Part 2- Inner turn Copper Tube



Front view

Part-9 M10 Bolt

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

REVISION COLUMN

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

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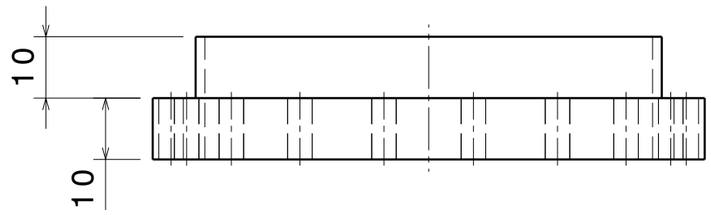
INDIA

THIRD ANGLE PROJECTION

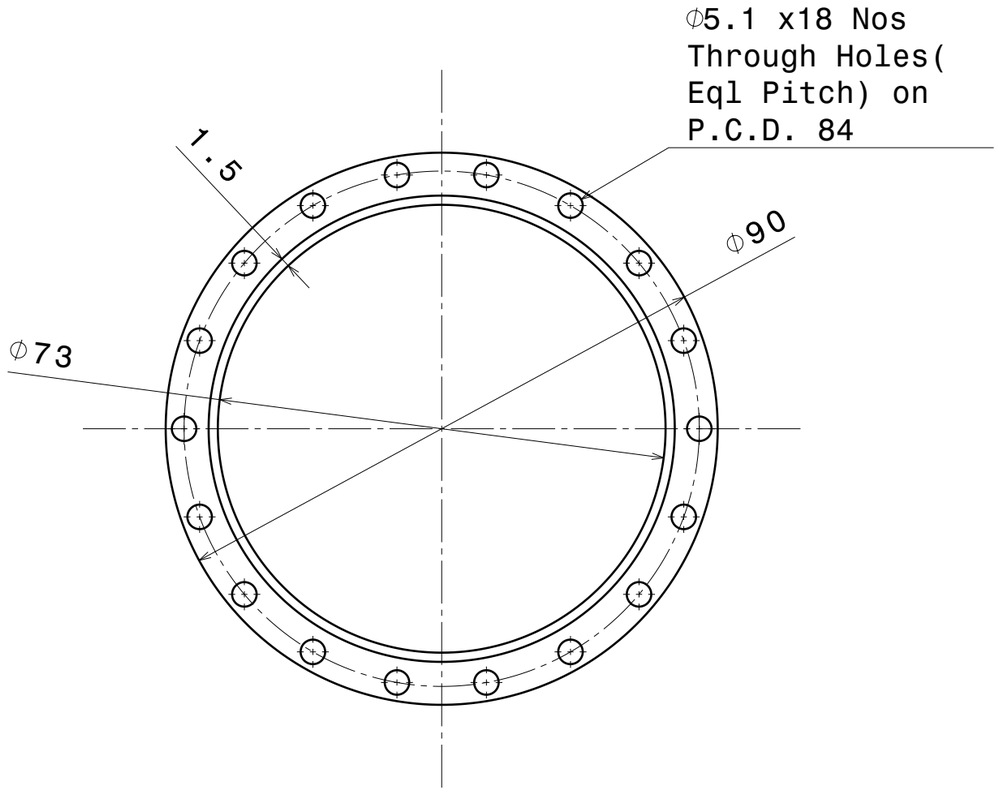
TF inner leg: Details of Top and Bottom connections

REF DRG NO: IPR/ATD/PCS/02 REV R1

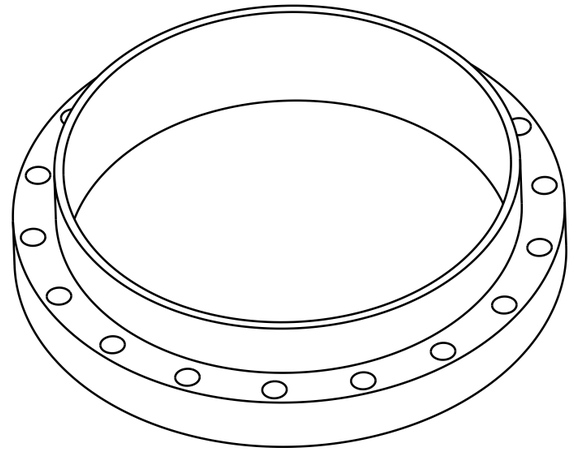
DRG.NO IPR/ATD/PCS/02-3 SHEET 04 OF 07



Top View



Front View



Anti Torque Disc
Material-G10
Qty-1No

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	±0.1	±0.2	±0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

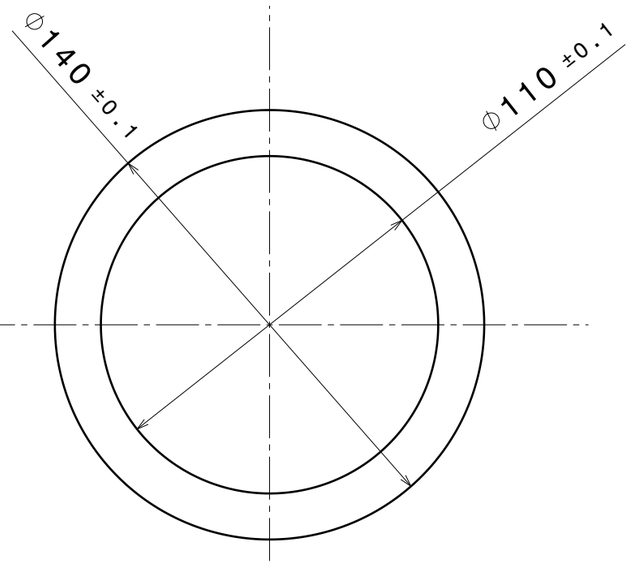
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

THIRD ANGLE PROJECTION

Anti Torque disc

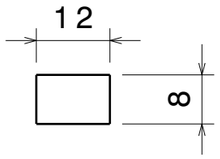
REF DRG NO: IPR/ATD/PCS/02 — REV R1

DRG.NO IPR/ATD/PCS/02-4 — SHEET 05 OF 07

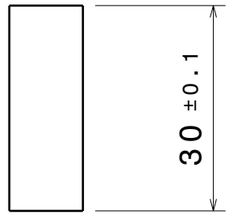


Part -1

Thickness - 5mm



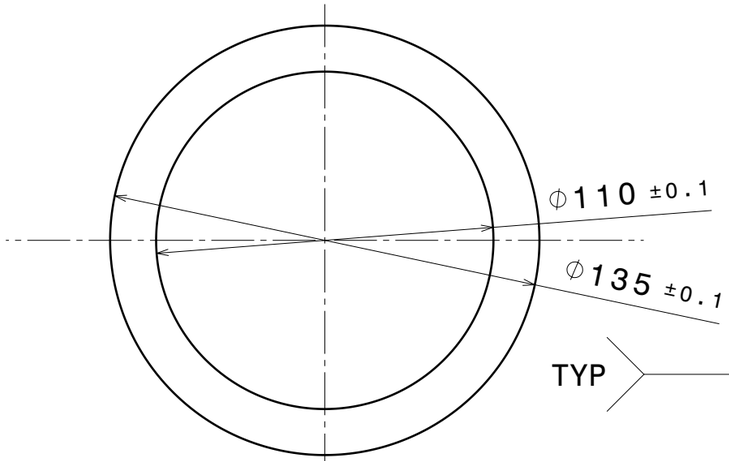
Top View



Front View

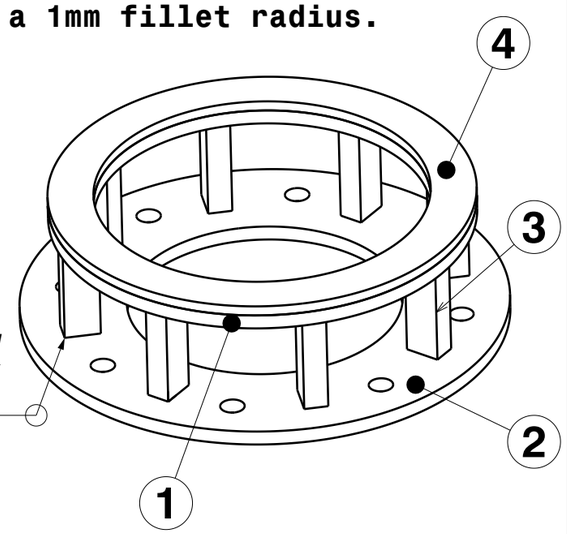
Part-3

Note: All sharp edges to be rounded to a 1mm fillet radius.

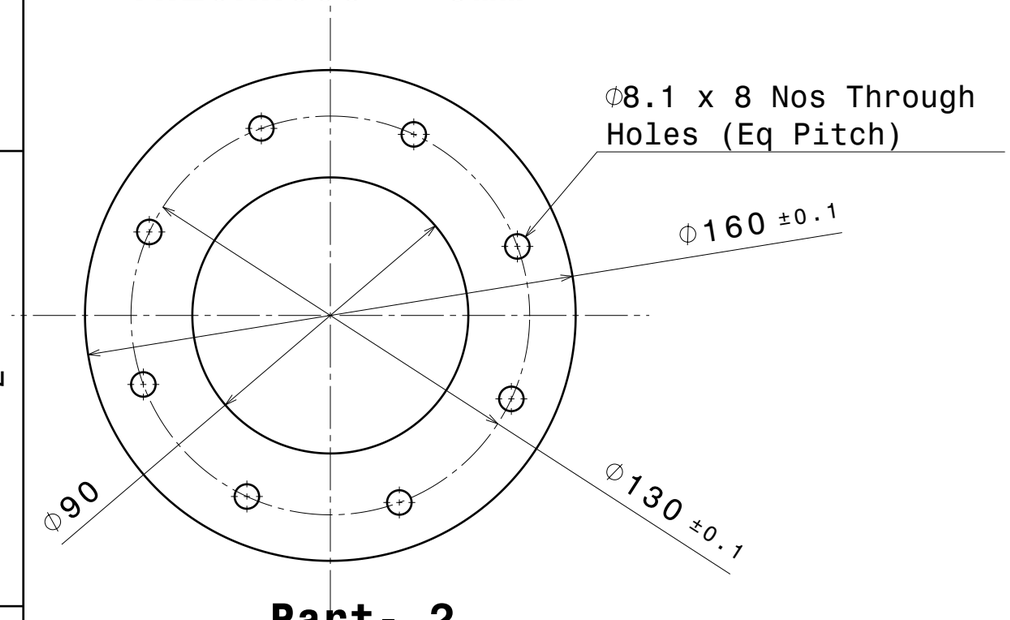


Part-4

Thickness - 3mm

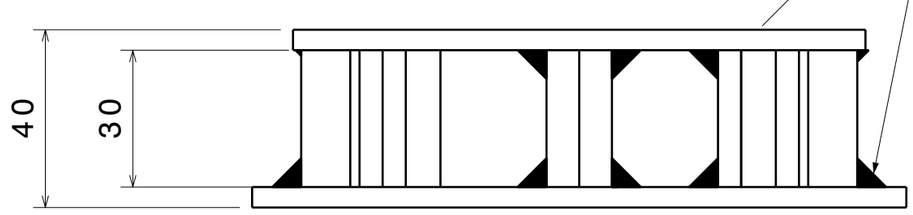


Mechanical Support



Part- 2

Thickness -5mm



Assembly Front View

Sr No	Description	Material	Qty(Nos)	Remarks
1	Upper Plate	SS304	1	-
2	Lower Plate	SS304	1	-
3	Connecting Lugs	SS304	8	-
4	Insulation	G10	1	-

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

REVISION COLUMN

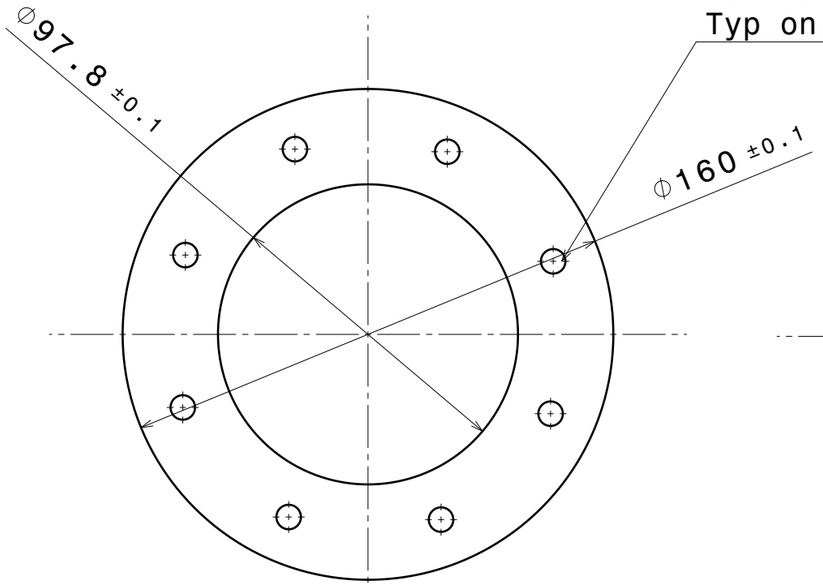
ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

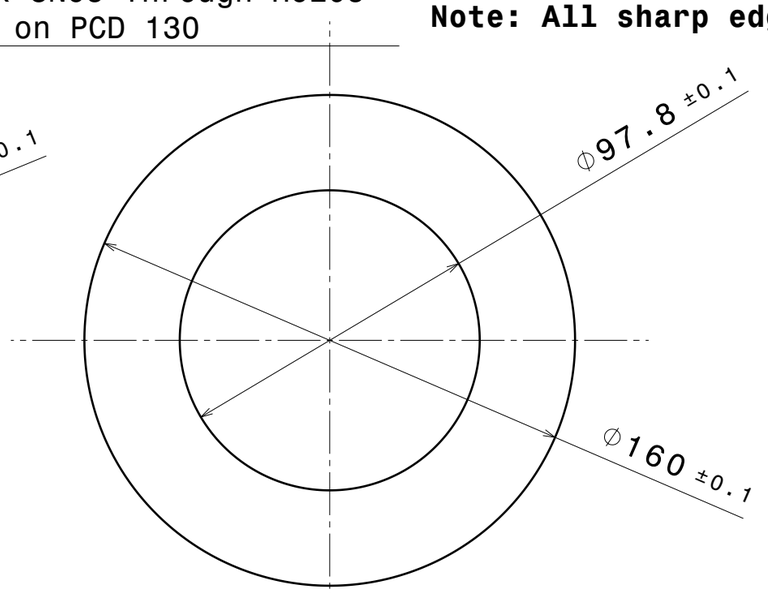
THIRD ANGLE PROJECTION

Mechanical support

REF DRG NO:	IPR/ATD/PCS/02	REV R1
DRG.NO	IPR/ATD/PCS/02-5	SHEET 06 OF 07

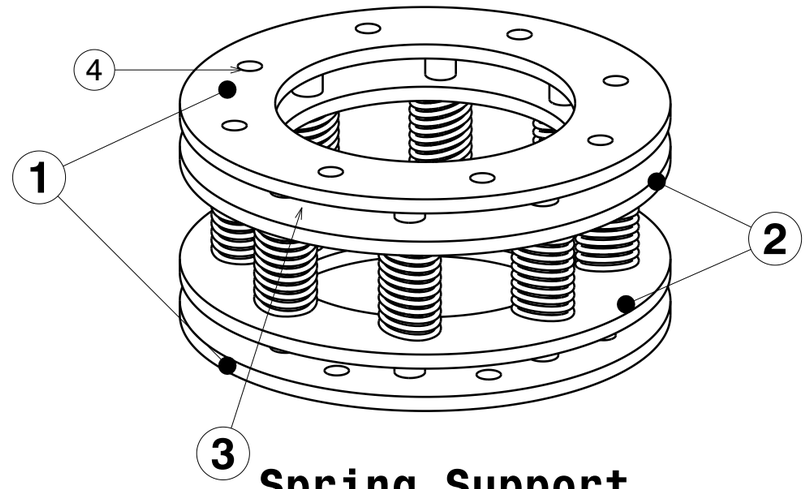


Part -1 Outer Plate
Thickness- 5mm

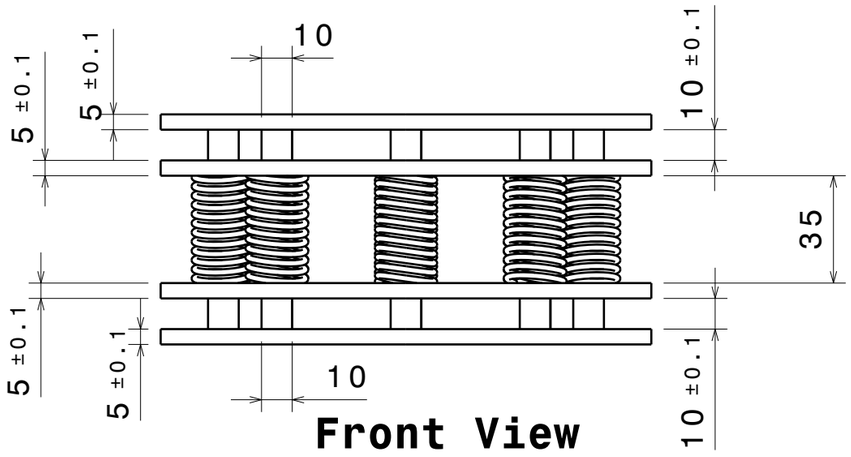


Part -2 Inner Plate
Thickness- 5mm

Note: All sharp edges to be rounded to a 1mm fillet radius.



Spring Support



Front View

Springs to be welded on Inner plates at equilateral pitch

Sr.no	Parameters	Values	Remarks
1	Spring Type		Compression type
2	Material	SS 304	ASTM A313
3	No. of total coils	12	
4	Spring rate, N/mm	2.15	
5	Spring O.D., mm	20	
6	Spring wire dia., mm	2	
7	Spring free length,mm	38	
8	Pitch at free length, mm	3	

Sr No	Description	Material	Qty(Nos)	Remarks
1	Outer Plate	SS304	2	-
2	Inner Plate	SS304	2	-
3	Springs	SS304	8	As per specification
4	M8 bolts (SS304) with wedge lock washers (SS316)	SS304	8	

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN	
CO-ORDINATED BY					REV	ZONE
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS						
LENGTH IN mm OF SHORTER SIDE OF ANGLES						
UPTO 10	10-50	50-120	OVER 120-400			
±1°	±0°-30'	±0°-20'	±0°-10'			

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

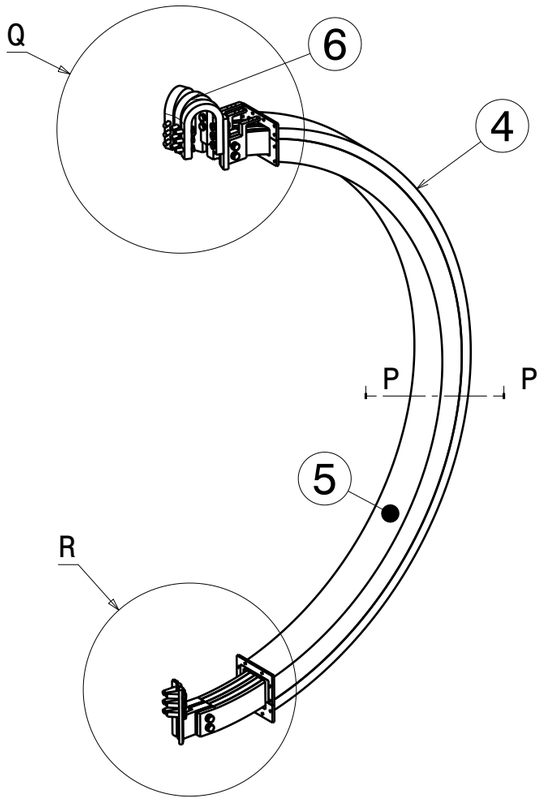
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

THIRD ANGLE PROJECTION

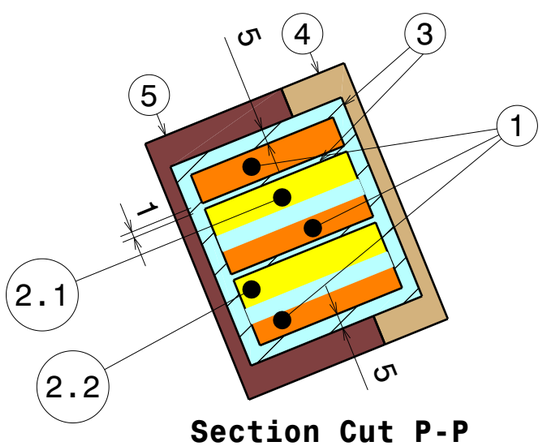
Compression Spring Support

REF DRG NO: IPR/ATD/PCS/02 REV R1

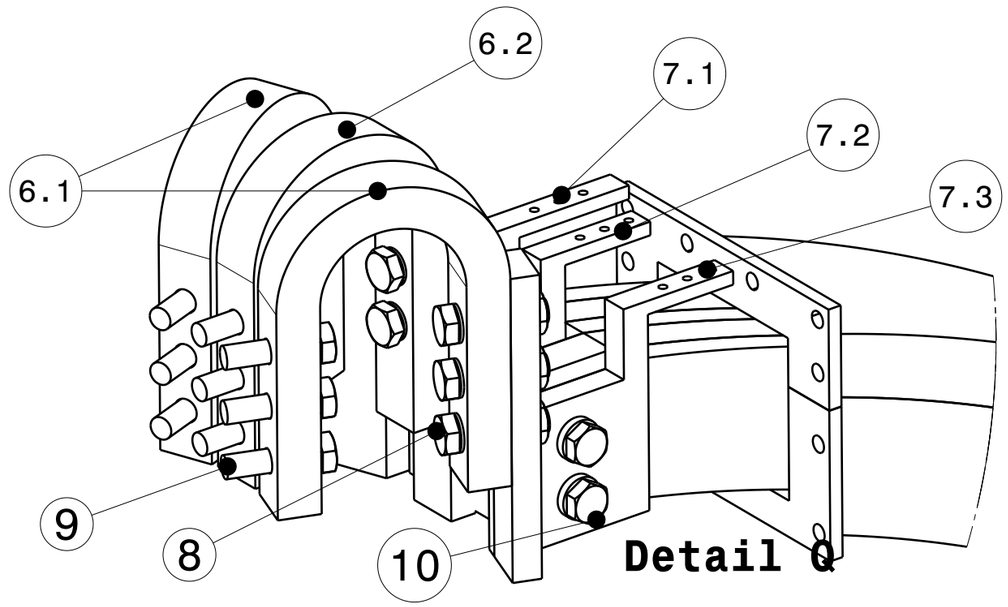
DRG.NO IPR/ATD/PCS/02-6 SHEET 07 OF 07



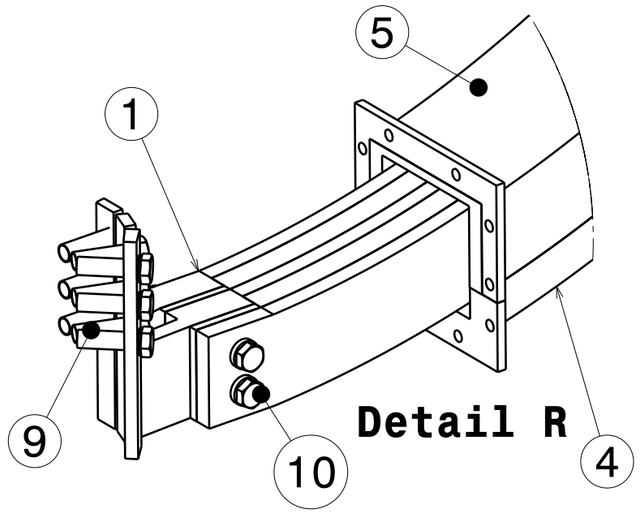
TF Outer Leg Assembly



Section Cut P-P



Detail Q



Detail R

Sr No	Description	Material	Qty(Nos)	Remarks
1	TF Outer turn	ETP Copper	6	Details on Sheet 2-3
2.1	TF Intermediate Insulation (Type 1)	G10	6	Details on Sheet 4
2.2	TF Intermediate Insulation (Type 2)	G10	6	Details on Sheet 4
3	Turn Insulation	Polyester Film	-	Thickness- 5mm each side
4	Upper Envelope	SS304	6	Details on Sheet 5
5	Lower Envelope	SS304	6	Details on Sheet 6
6.1	U Connector Type 1	ETP Copper	12	Details on Sheet 7
6.2	U Connector Type 2	ETP Copper	6	Details on Sheet 7
7.1	Upper Side End Connector (Type 1)	ETP Copper	6	Details on Sheet 8
7.2	Upper Side End Connector (Type 2)	ETP Copper	6	Details on Sheet 8
7.3	Upper Side End Connector (Type 3)	ETP Copper	6	Details on Sheet 8
8	M8 Hex Bolts (SS304) set Length- 32mm with wedge lock washers (SS316)	SS304	48	Set Includes Bolt, nut & wedge Lock washers
9	Allen M8 Hex Bolts (SS304) set Length- 32mm with wedge lock washers (SS316)	SS304	108	
10	M10 Hex Bolts (SS304) set Length- 90mm with wedge lock washers (SS316)	SS304	24	Set Includes Bolt , Nut ,wedge lock washer & G10 Sleeve
11	M4 Hex Bolts (SS304) set Length- 32mm with wedge lock washers (SS316)	SS304	60	For Joining Part 4 & 5 together

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION: | SIZE A3

ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

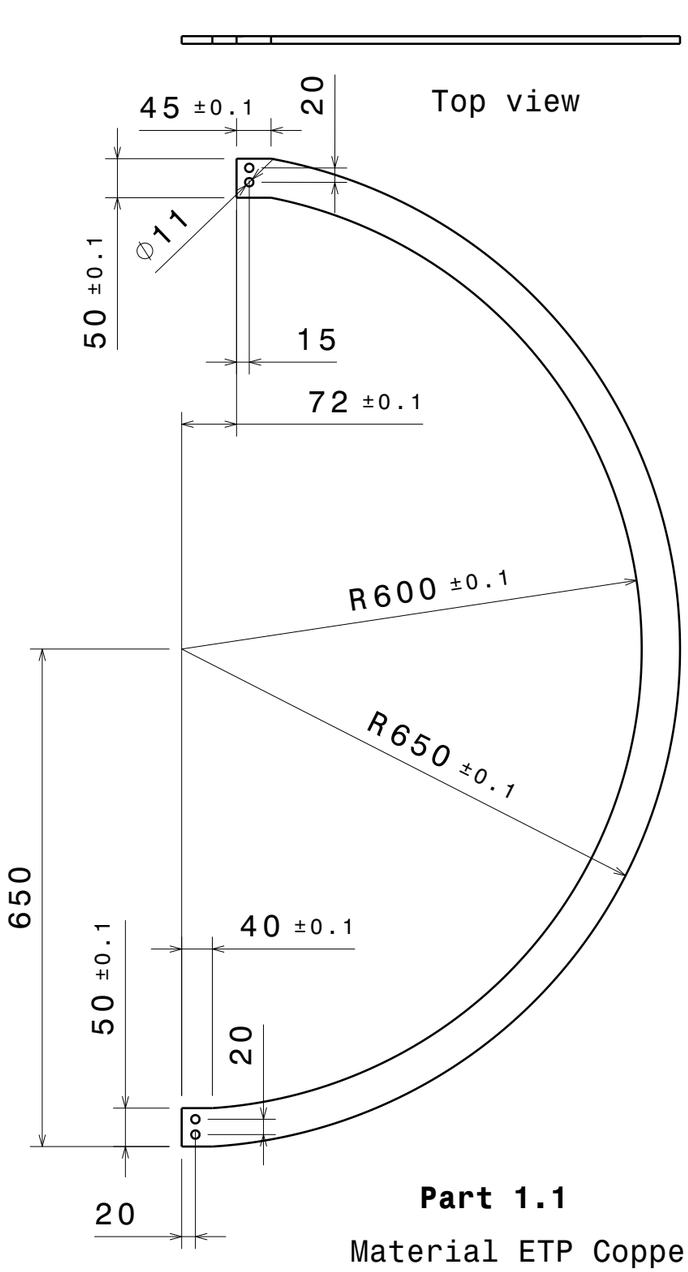
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

THIRD ANGLE PROJECTION

Assembly: TF Outer leg

REF DRG NO: IPR/ATD/PCS/01 | REV R1

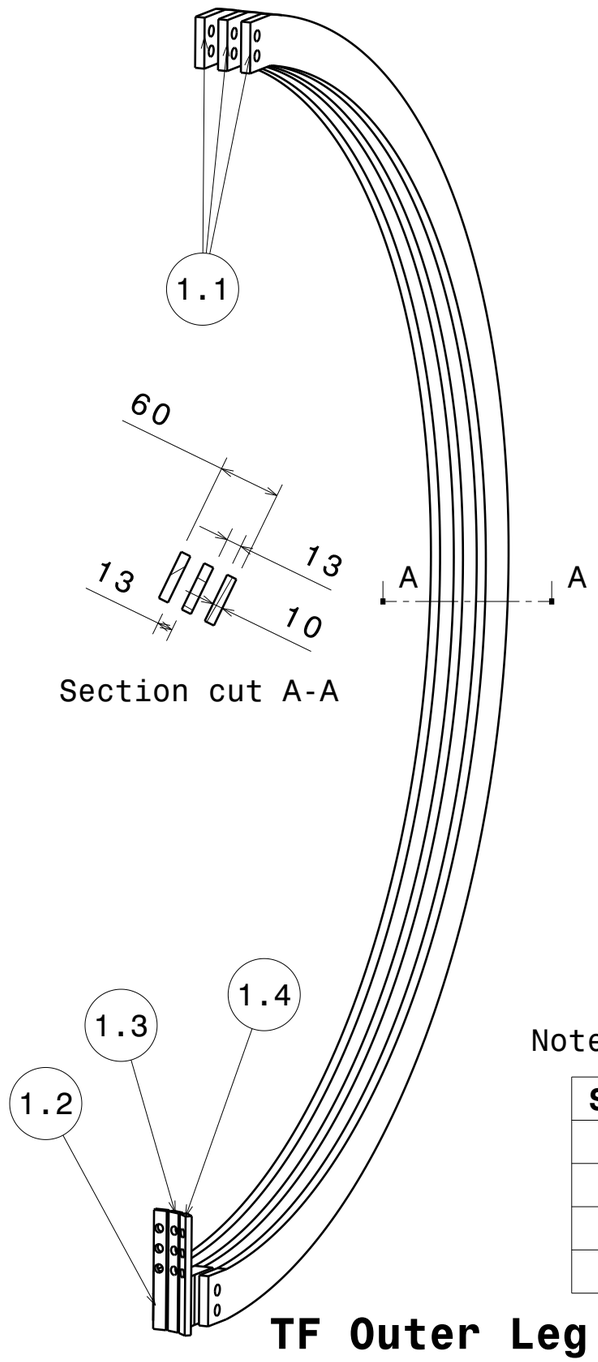
DRG.NO IPR/ATD/PCS/03 | SHEET 01 OF 08



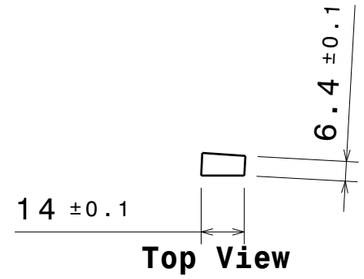
Part 1.1

Material ETP Copper

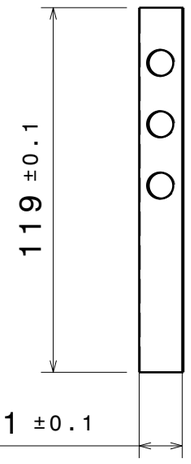
Qty- 18 Nos



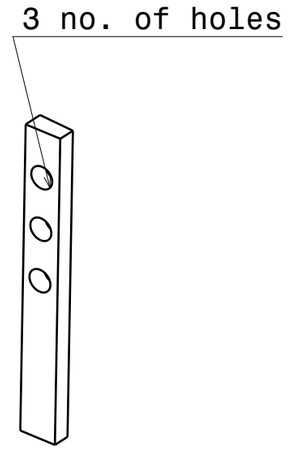
Section cut A-A



Top View



Front View



Part 1.4

Qty -6 Nos

Note: All sharp edges to be rounded to a 1mm fillet radius.

Sr No	Description	Material	Qty	Remarks
1.1	TF Outer Turn	ETP Copper	18	-
1.2	Connector 1	ETP Copper	6	Refer Sheet 3
1.3	Connector 2	ETP Copper	6	Refer Sheet 3
1.4	Connector 3	ETP Copper	6	-

TF Outer Leg

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

REVISION COLUMN

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

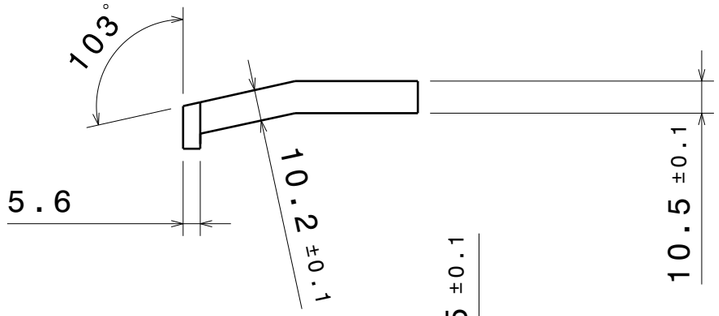
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

THIRD ANGLE PROJECTION

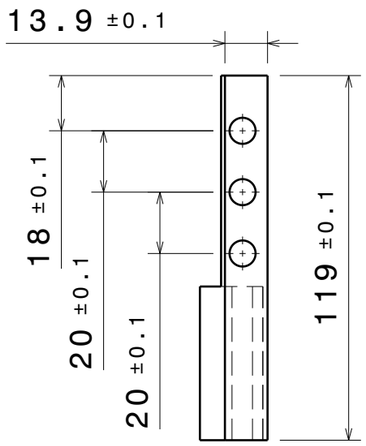
TF outer turns
Details of TF outer turns

REF DRG NO: IPR/ATD/PCS/03 — REV R1

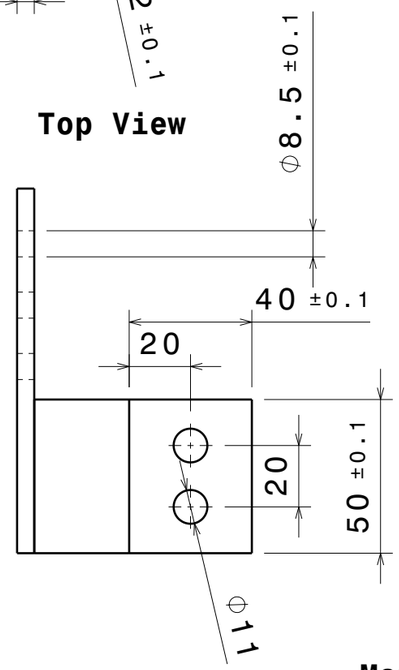
DRG.NO IPR/ATD/PCS/03-1 — SHEET 02 OF 08



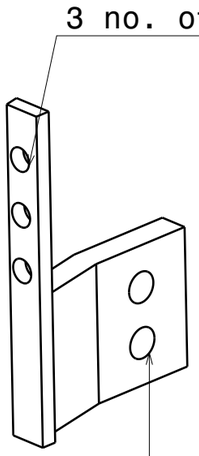
Top View



Side View



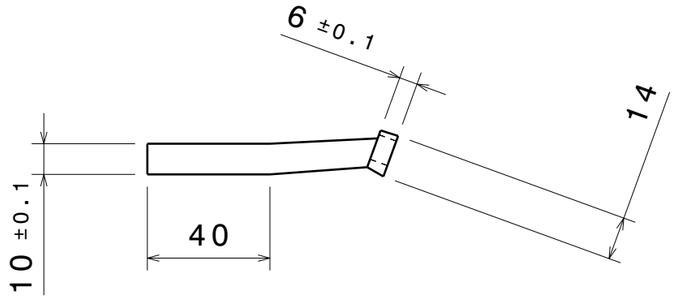
Front View



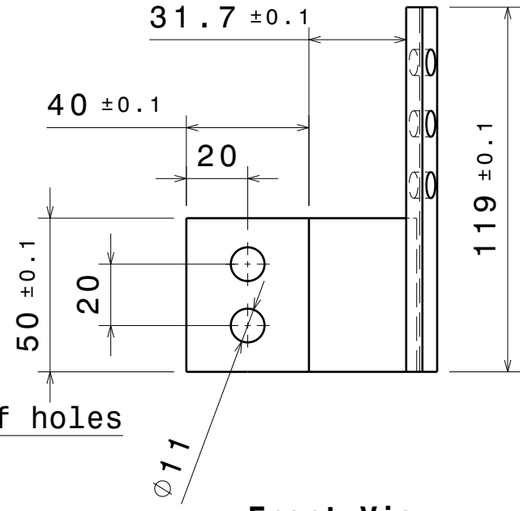
Part 1.2 2 no. of holes

Material-ETP Copper

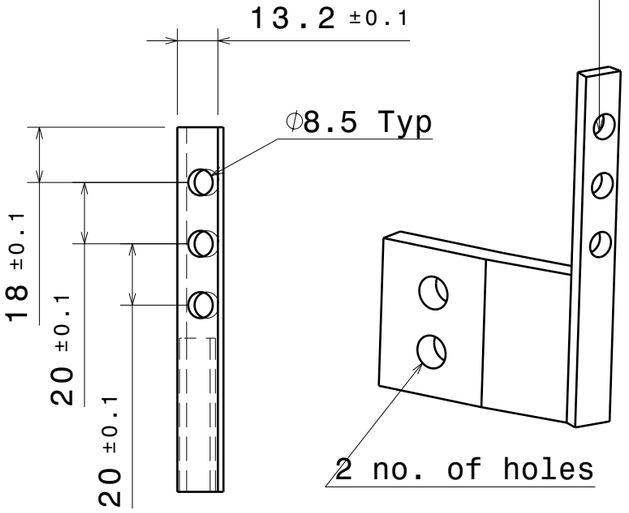
Qty-6Nos



Top View



Front View



Side View

Part 1.3

Material -ETP Copper

Qty - 6 Nos

Part 1.2 & Part 1.3 to be Joined with Part 1.1 to make a single Component for assembly as per assembly sequence

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

REVISION COLUMN					
REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

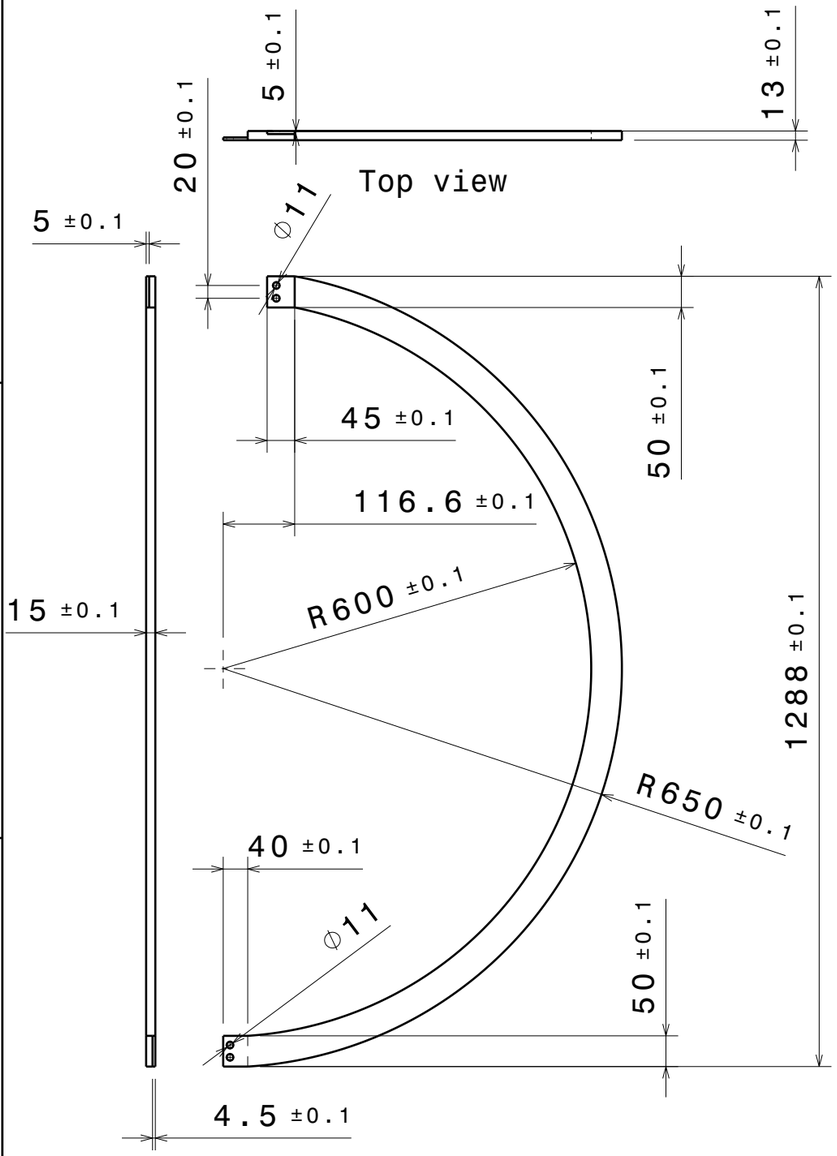
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

THIRD ANGLE PROJECTION

TF outer turns
Details of Bottom connections

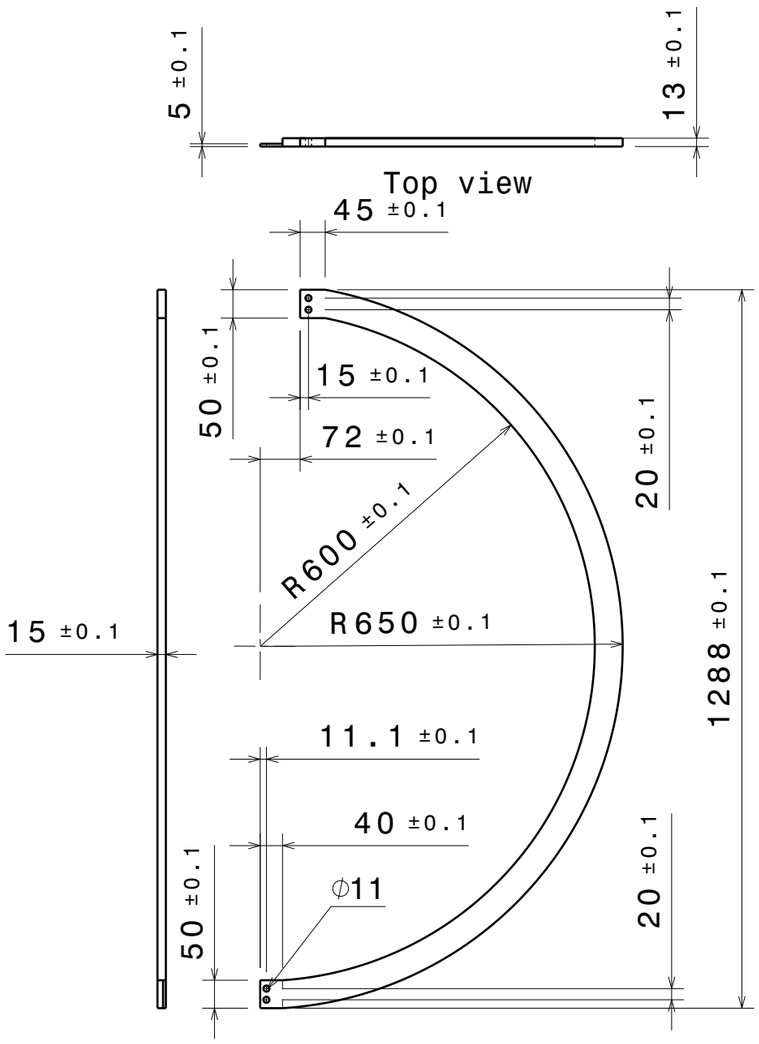
REF DRG NO: IPR/ATD/PCS/03 — REV R1

DRG.NO IPR/ATD/PCS/03-2 — SHEET 03 OF 08



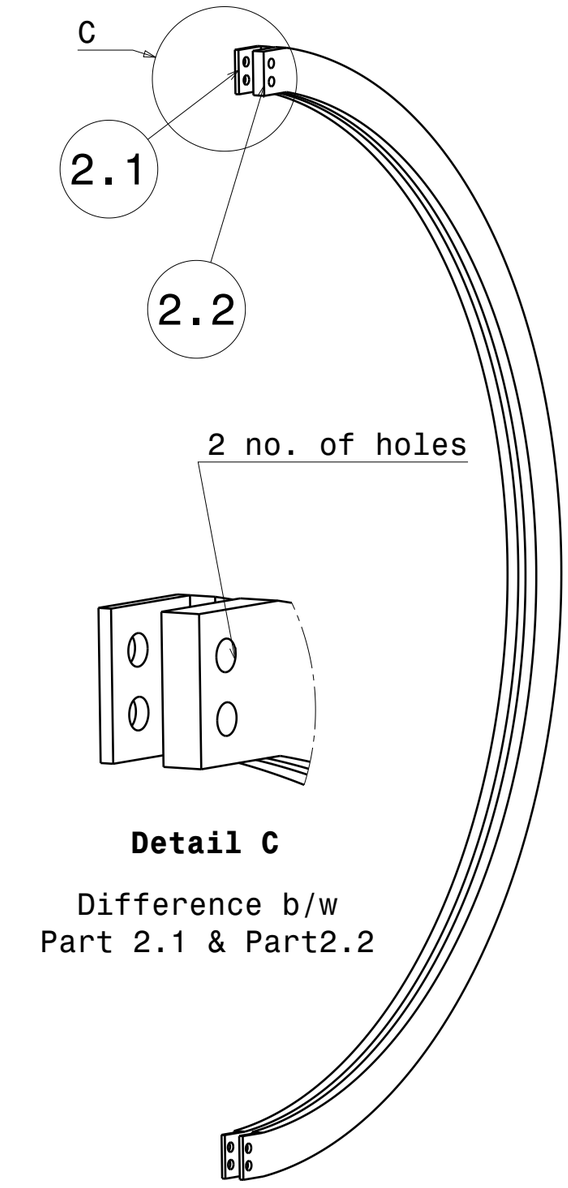
Side View Front view

Part-2.1
Material - G10
Qty -6 Nos



Side View Front view

Part-2.2
Material -G10
Qty-6 Nos



Detail C

Difference b/w
Part 2.1 & Part2.2

Part 2.1 & 2.2
TF Intermediate Insulation

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN					
REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

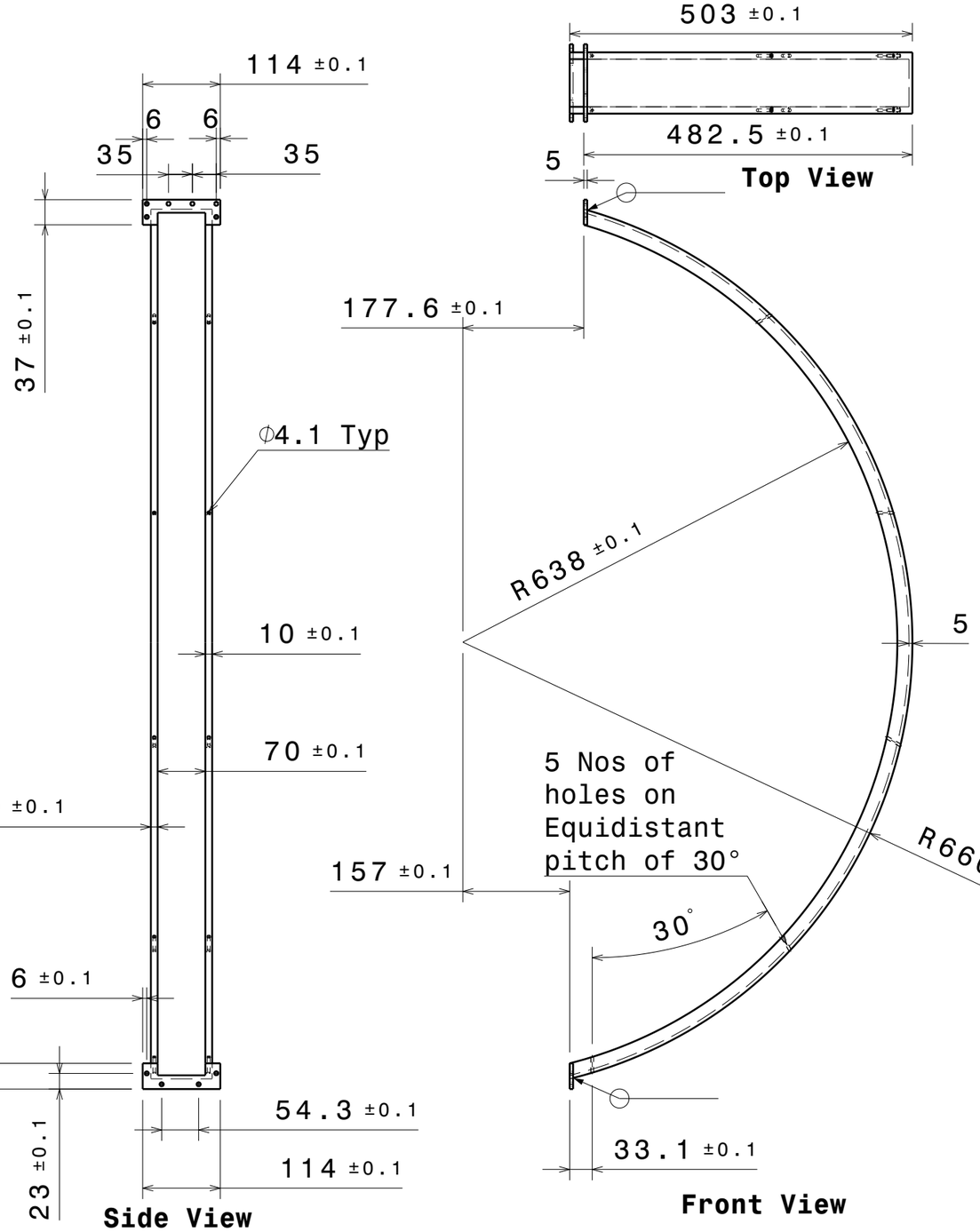
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

THIRD ANGLE PROJECTION

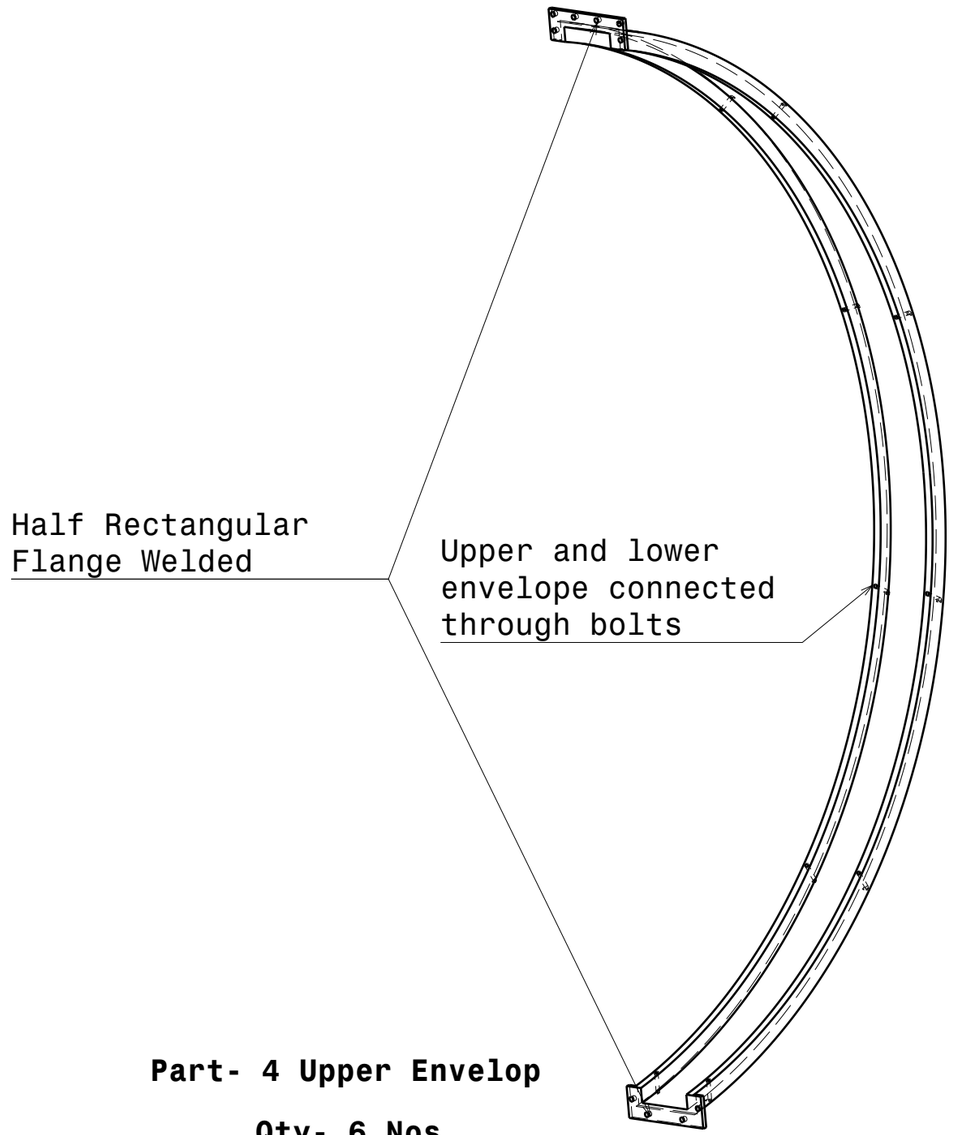
TF Outer turns Intermediate Insulation

REF DRG NO: IPR/ATD/PCS/03 REV R1

DRG.NO IPR/ATD/PCS/03-3 SHEET 04 OF 08



Note: All sharp edges to be rounded to a 1mm fillet radius.



Part- 4 Upper Envelop

Qty- 6 Nos

Material- SS304

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN						ASS'Y GROUP/ DIVISION: SIZE A3
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											SCALE NTS DATE
LENGTH IN mm OF SHORTER SIDE OF ANGLES											DRAWN Ankur 8/12/21
UPTO 10	10-50	50-120	OVER 120-400								CHECKED Aditya 13/12/21
±1°	±0°-30'	±0°-20'	±0°-10'								APPROVED

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

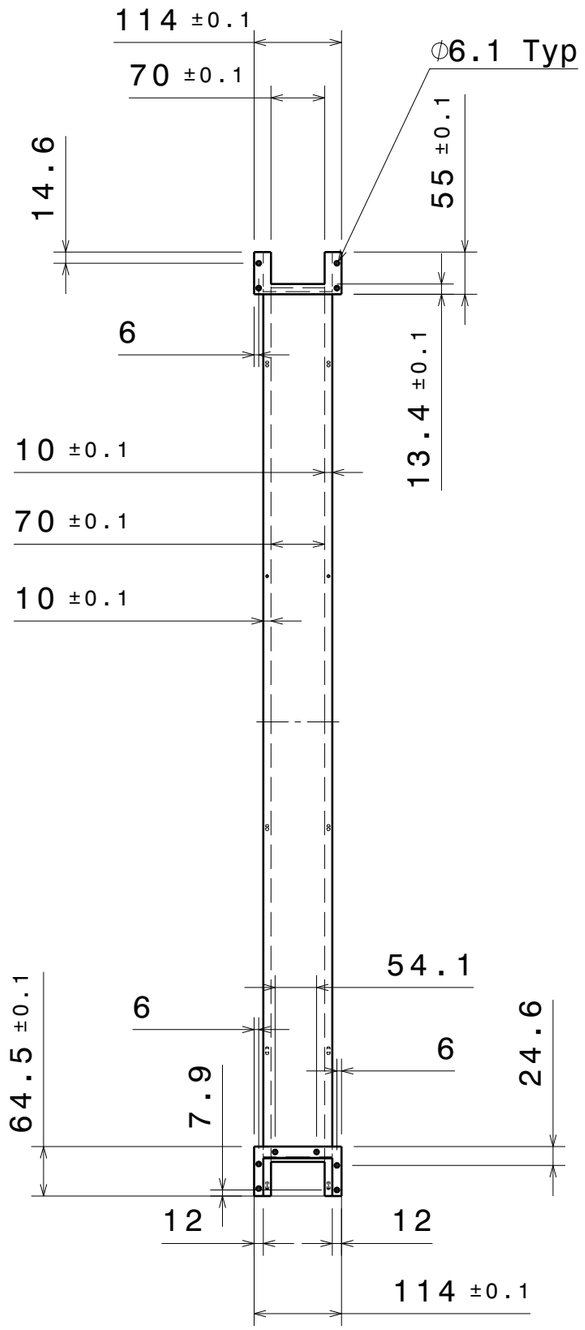
THIRD ANGLE PROJECTION

TF Outer leg Upper envelope

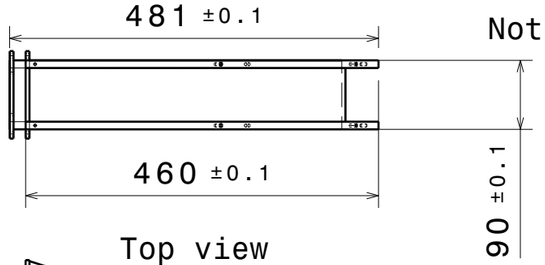
REF DRG NO: IPR/ATD/PCS/03 REV R1

DRG.NO IPR/ATD/PCS/03-4 SHEET 05 OF 08

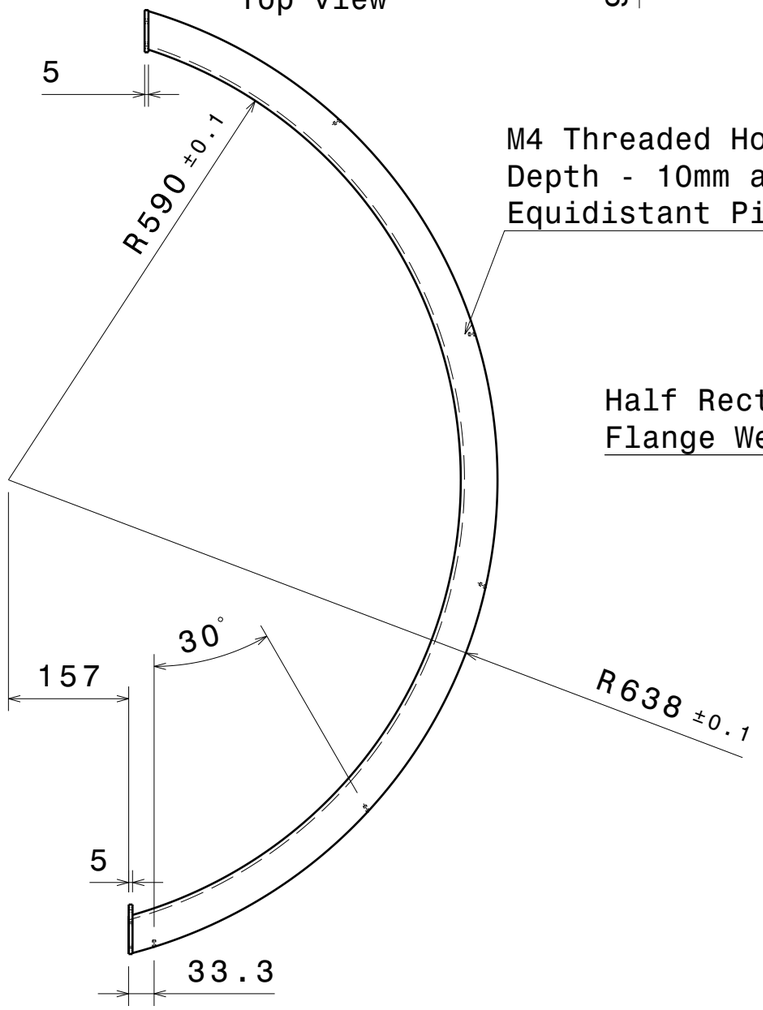
Note: All sharp edges to be rounded to a 1mm fillet radius.



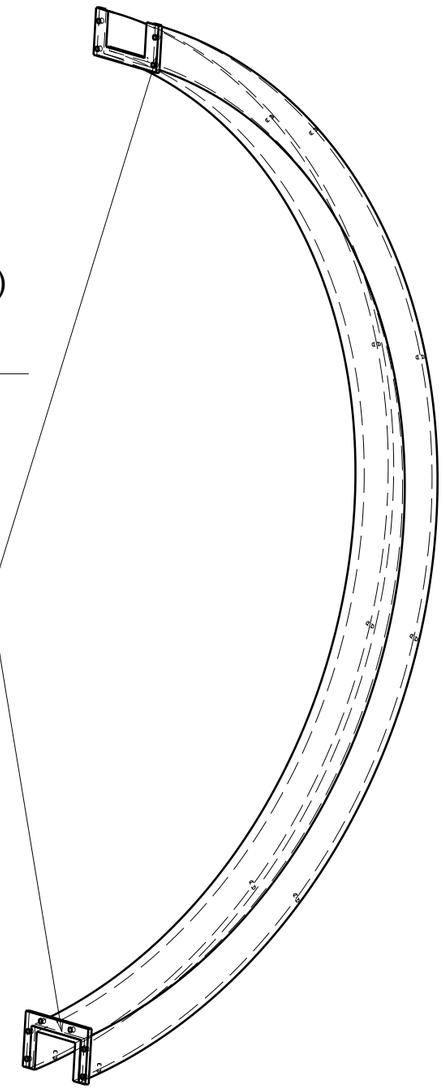
Side View



Top view



Front View



Part-5 Lower Envelop
Material- SS304
Qty- 6Nos

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN						ASS'Y GROUP/ DIVISION: SIZE A3
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											SCALE NTS DATE
LENGTH IN mm OF SHORTER SIDE OF ANGLES											DRAWN Ankur 8/12/21
UPTO 10	10-50	50-120	OVER 120-400								CHECKED Aditya 13/12/21
±1°	±0°-30'	±0°-20'	±0°-10'								APPROVED

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

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INDIA

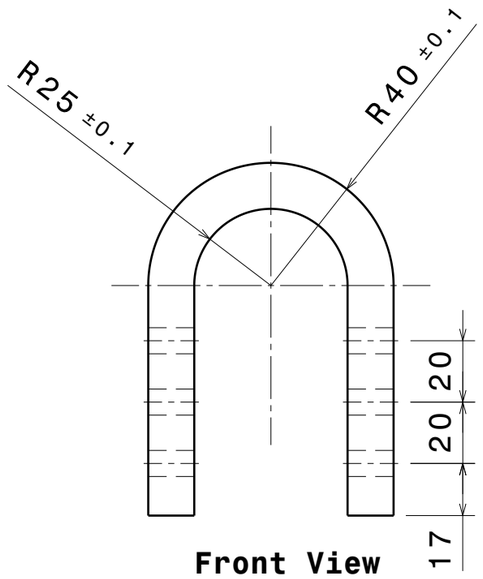
THIRD ANGLE PROJECTION

TF Outer leg Lower envelope

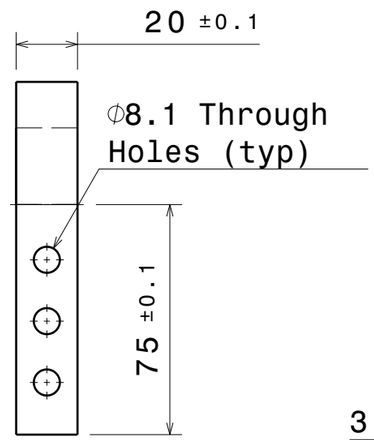
REF DRG NO: IPR/ATD/PCS/03 REV R1

DRG.NO IPR/ATD/PCS/03-5 SHEET 06 OF 08

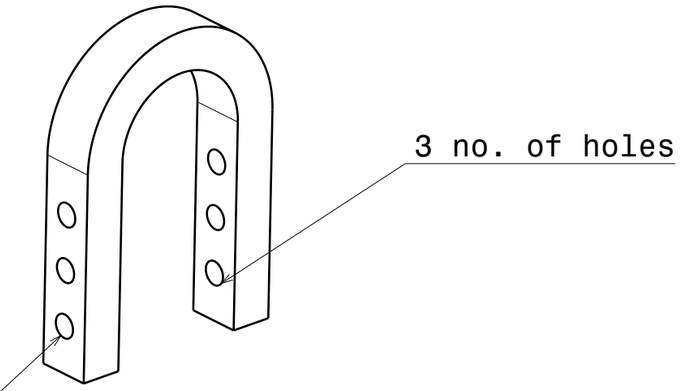
Note: All sharp edges to be rounded to a 1mm fillet radius.



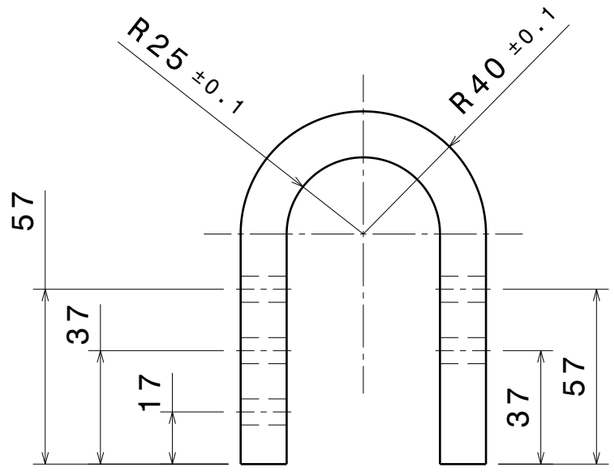
Front View



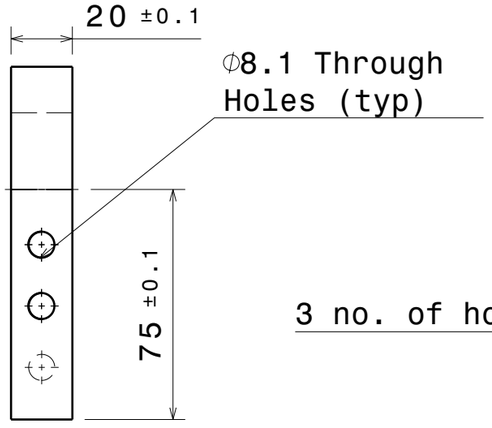
Side View



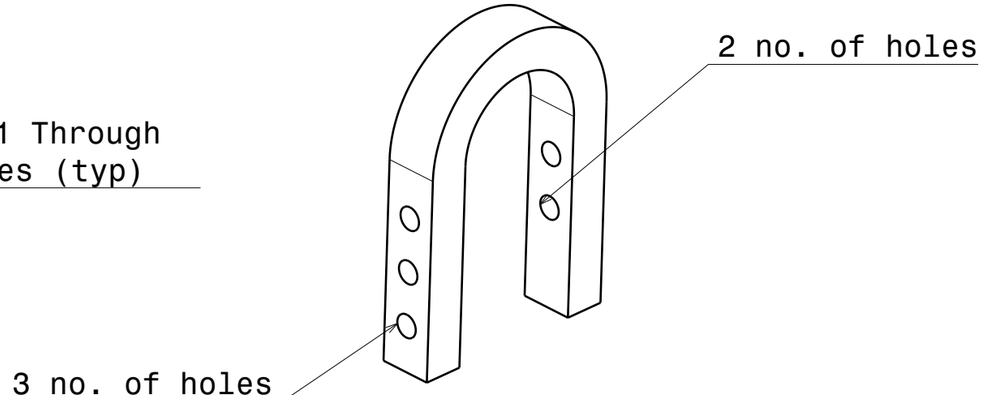
Part -6.1
U Connector (Type -1)
Qty- 12 Nos



Front View



Side View



Part -6.2
U Connector (Type -2)
Qty- 6Nos

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

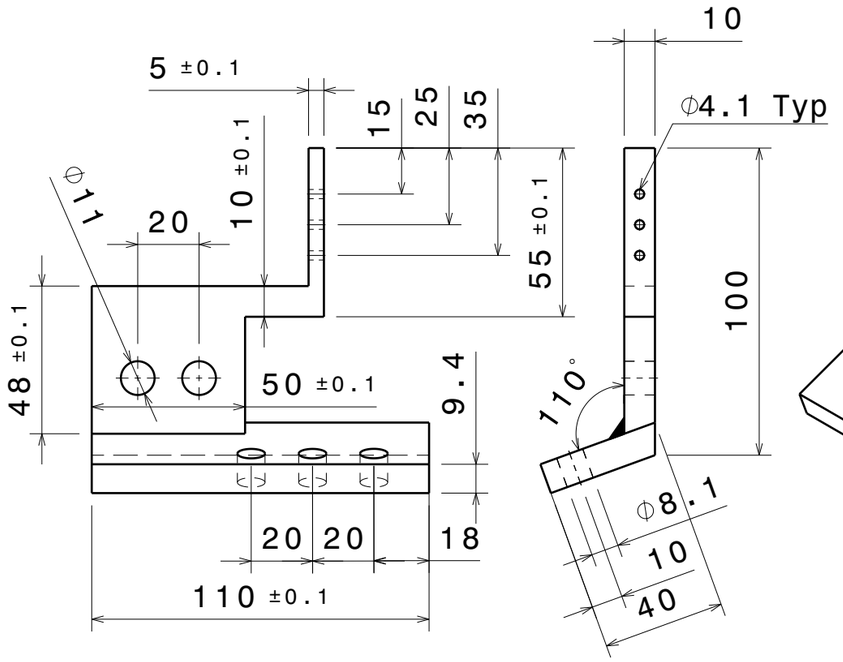
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

THIRD ANGLE PROJECTION

Flexible U connector

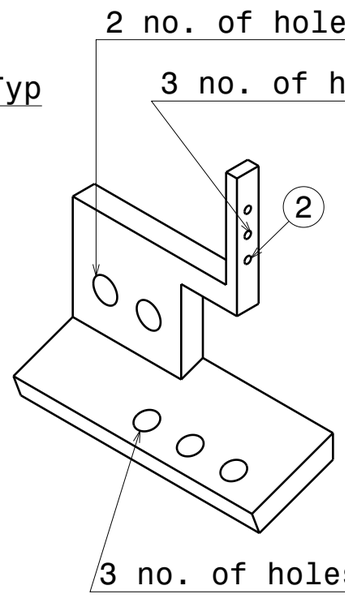
REF DRG NO: IPR/ATD/PCS/03 — REV R1

DRG.NO IPR/ATD/PCS/03-6 — SHEET 07 OF 08

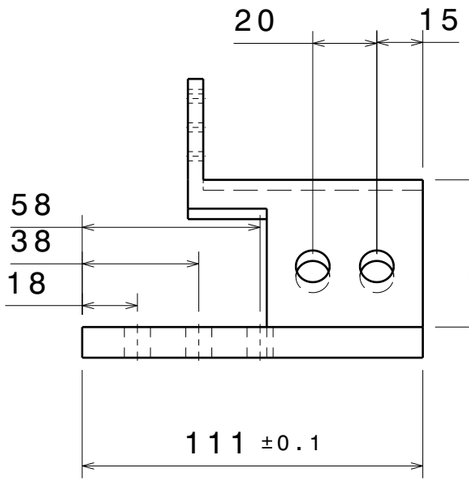


Front view

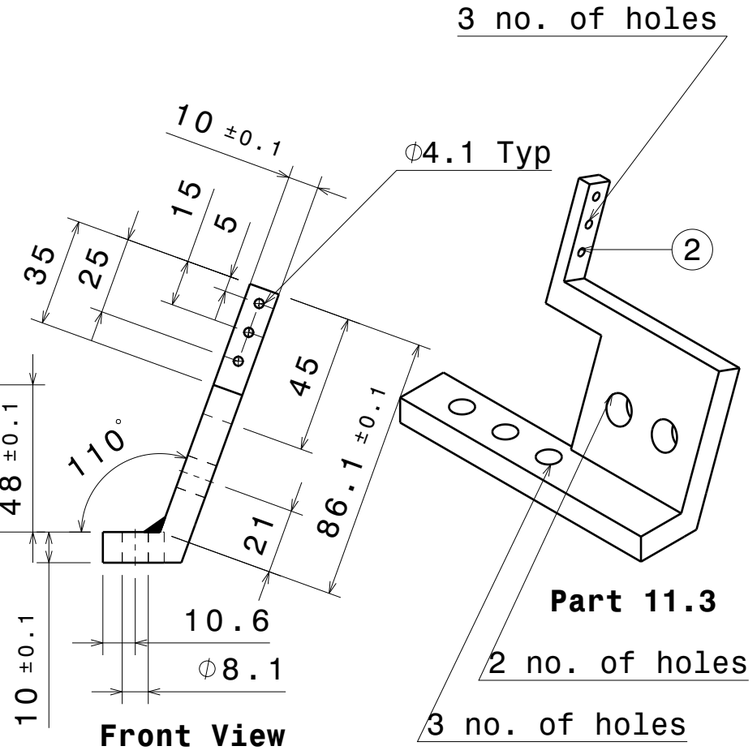
Side VIew



Part 11.1

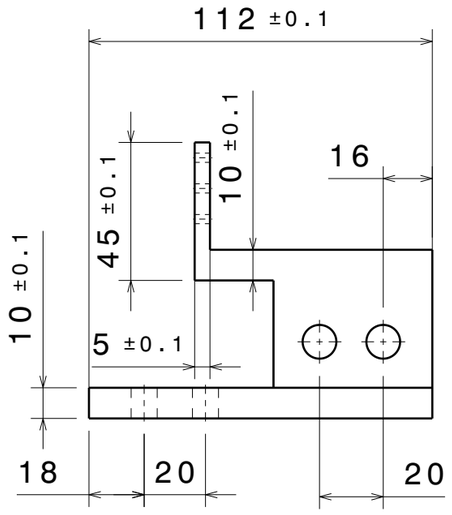


Side View

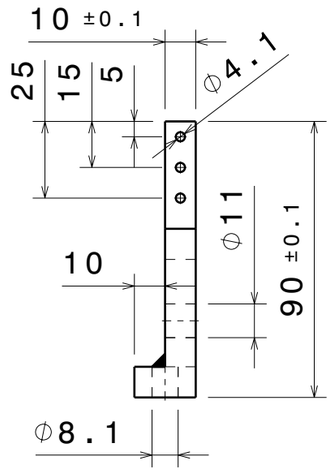


Front View

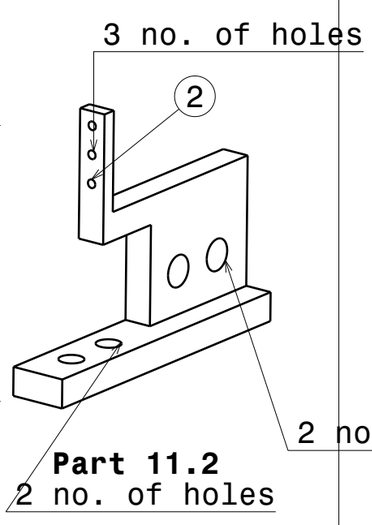
Part 11.3



Front View



Side View



Part 11.2
2 no. of holes

Sr No	Description	Material	Qty	Remarks
11.1	End Connector Upper Side Type 1	ETP Copper	6	-
11.2	End Connector Upper Side Type 2	ETP Copper	6	-
11.3	End Connector Upper Side Type 3	ETP Copper	6	
2	M4 Hex Bolts (SS304) set Length- 32mm with washers	SS304	54	-

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

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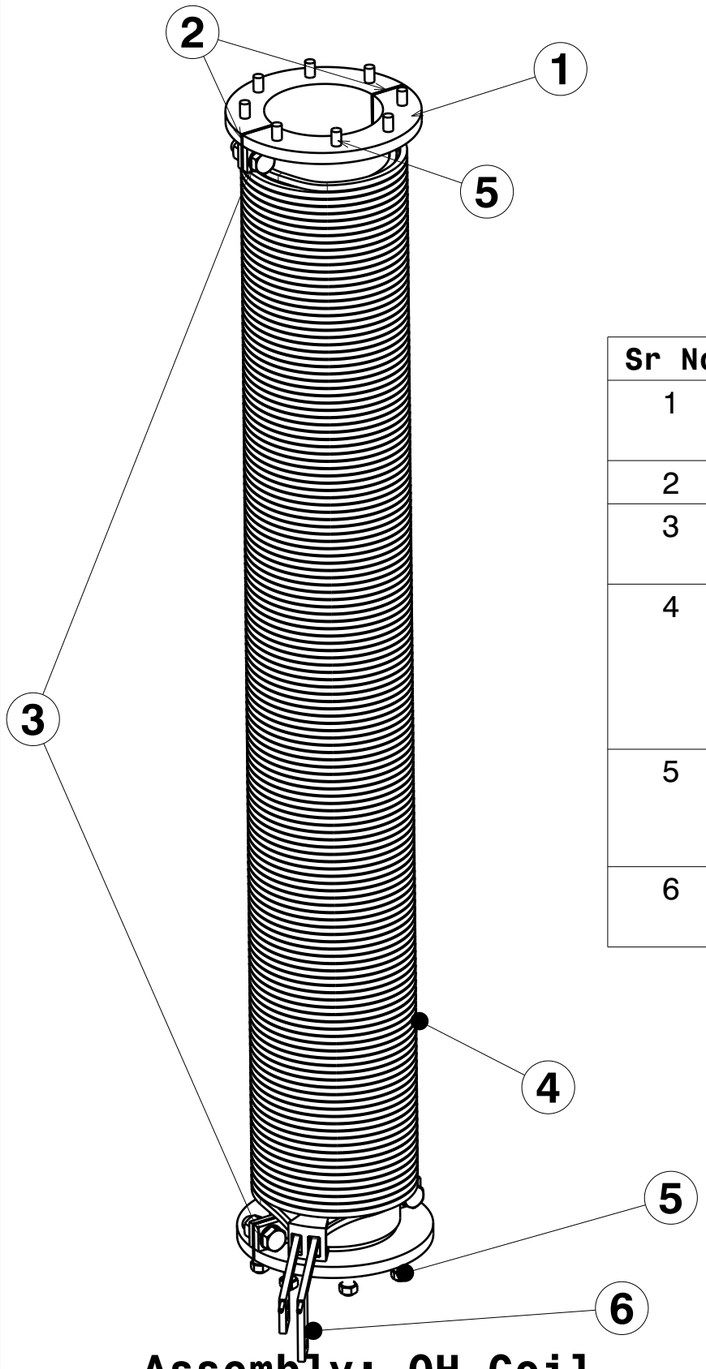
INDIA

THIRD ANGLE PROJECTION

TF outer turns Details of Top connections

REF DRG NO: IPR/ATD/PCS/03 REV R1

DRG.NO IPR/ATD/PCS/03-7 SHEET 08 OF 08



Assembly: OH Coil

Sr No	Description	Material	Qty	Remarks
1	Tension Cylinder (Made from 2 Half cylinders)	SS304	1	Details on Sheet 2-3
2	Insulation Strip	G10	2	Details on Sheet 2-3
3	M12 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	4	Set Includes Nut Bolt & wedge lock washer
4	OH Conductor with turn Insulation	ETP Copper with Polester Film Insulation tape	1	Details on Sheet 4
5	M8 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	16	Set Includes Nut Bolt & wedge lock washer
6	M4 Hex Bolts with washers	SS304	16	Details on Sheet 4, Set Includes Nut Bolt & wedge lock washer

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

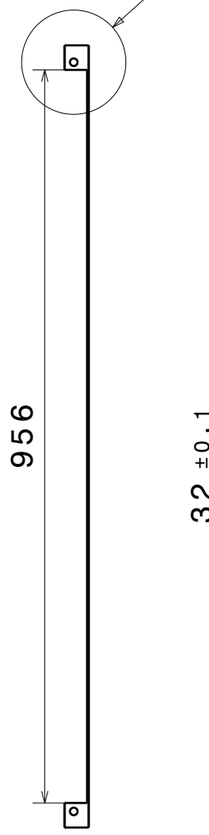
ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

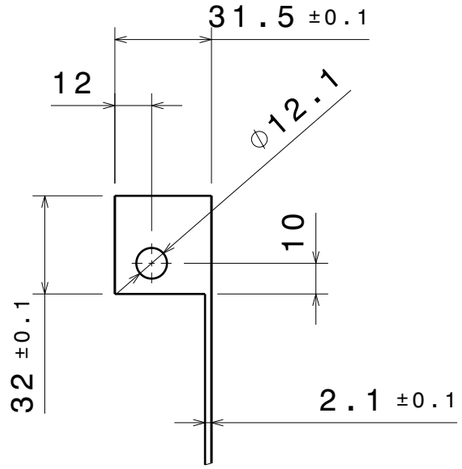
THIRD ANGLE PROJECTION

TITLE **Assembly: OH coil**

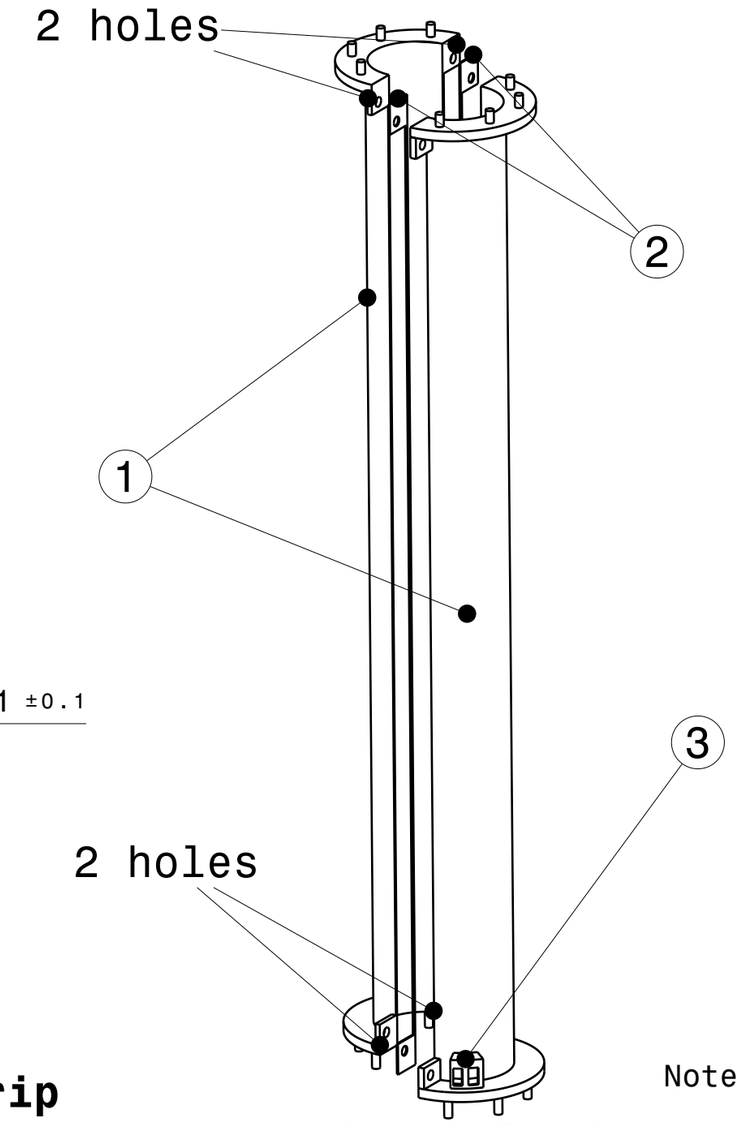
REF DRG NO:	IPR/ATD/PCS/01	REV	R1
DRG.NO	IPR/ATD/PCS/04	SHEET	01 OF 04



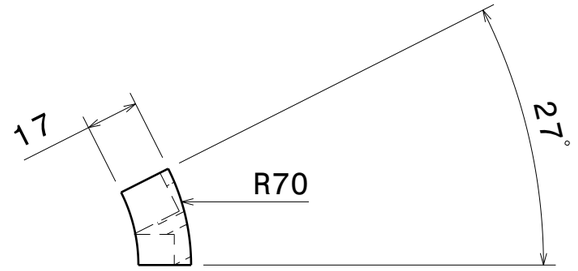
Detail S



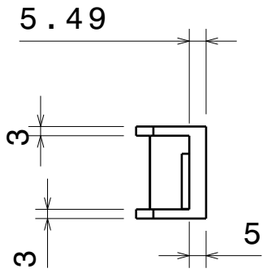
Detail S



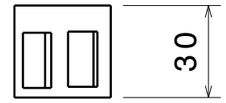
Tension Cylinder Assy



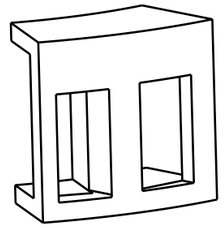
Top view



Front view



Side View



Conductor Entry /Exit box

Material-SS304

Qty-1No

Part 2- Insulation Strip

Qty -2 Nos

Material -G10

Thickness -1.5mm

Note: All sharp edges to be rounded to a 1mm fillet radius.

Sr No	Description	Material	Qty	Remarks
1	Tension Cylinder (Half)	SS304	2	Refer Sheet 3
2	Insulation Strip	G10	2	-
3	Conductor Entry/Exit Box	SS304	1	-

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

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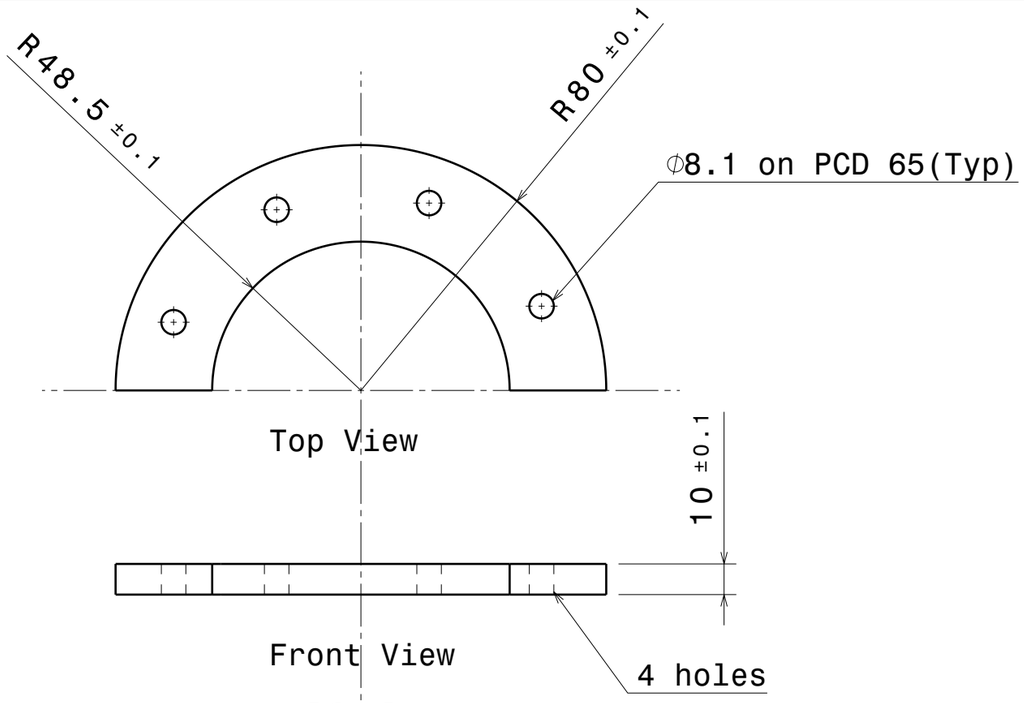
INDIA

THIRD ANGLE PROJECTION

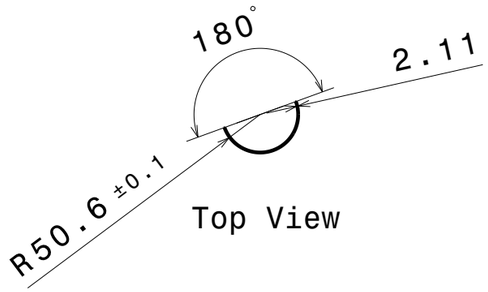
TITLE: **Tension cylinder overview**

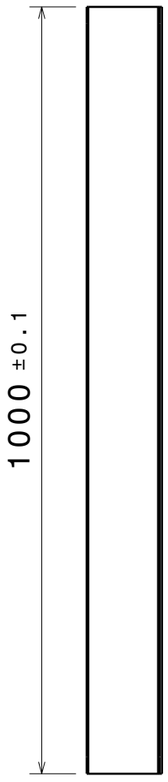
REF DRG NO:IPR/ATD/04 — REV R1

DRG.NO IPR/ATD/PCS/04-1 — SHEET 02 OF 04



Half Flange
Material- SS304
Qty-4nos

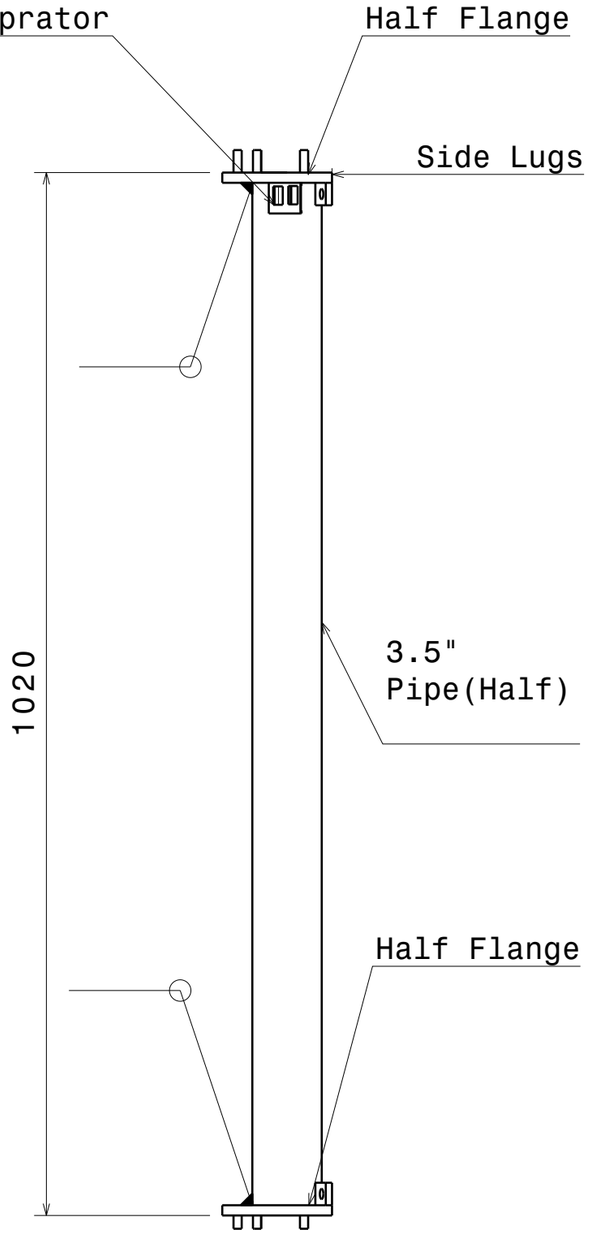




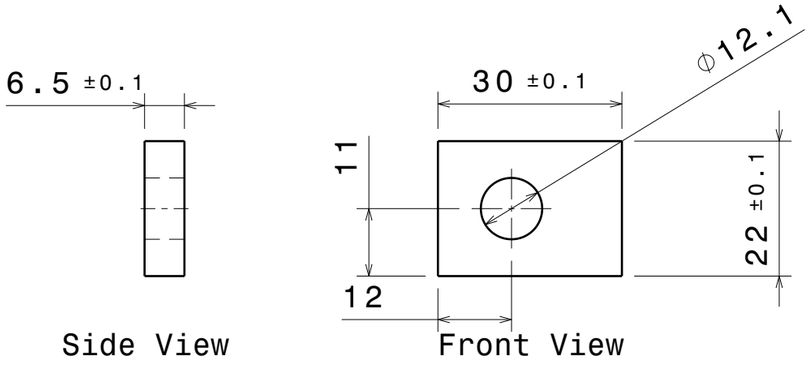
3.5 Inch Sch 5 seamless Pipe
(Split into two parts)

Material -SS304

Qty- 2 Nos



Tension Cylinder



Side Lugs

Material -SS304

Qty- 8 Nos

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN					
REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

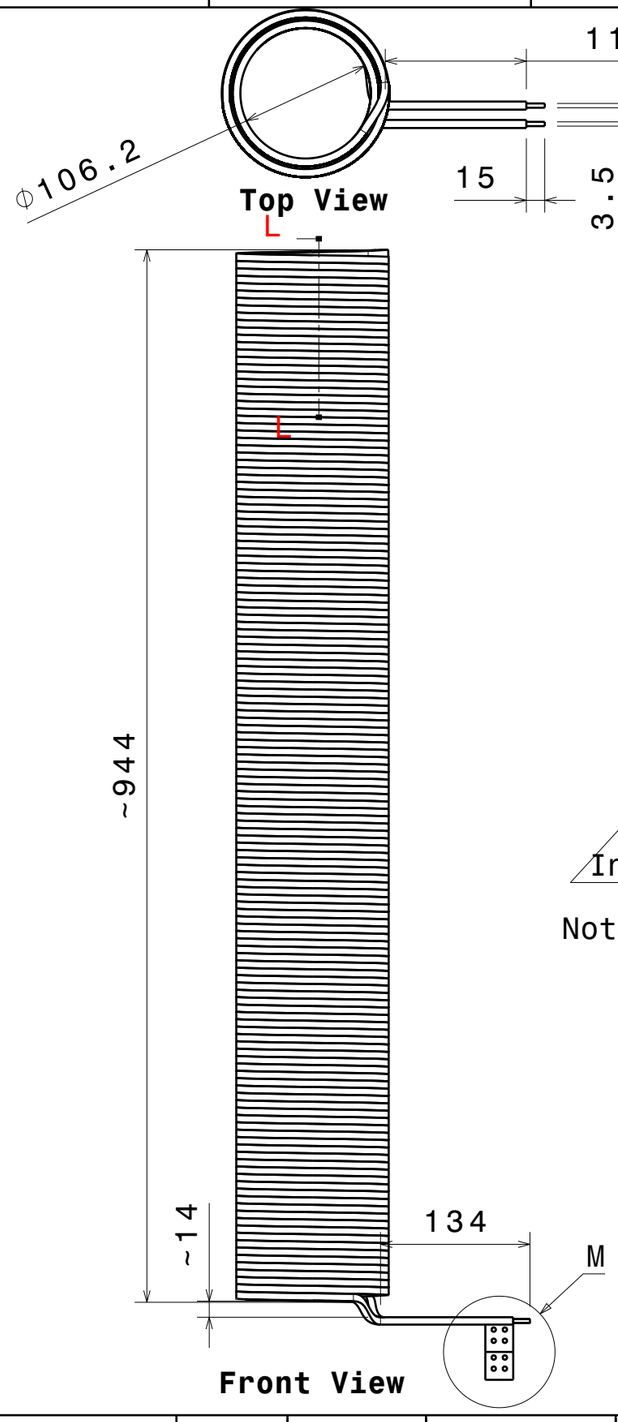
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

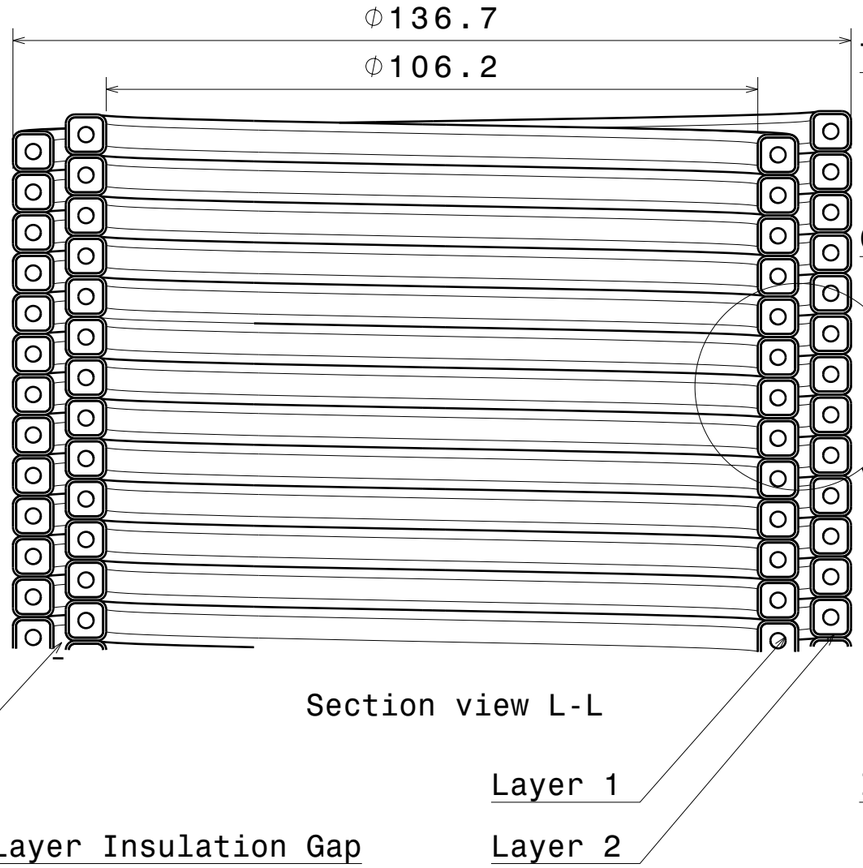
THIRD ANGLE PROJECTION

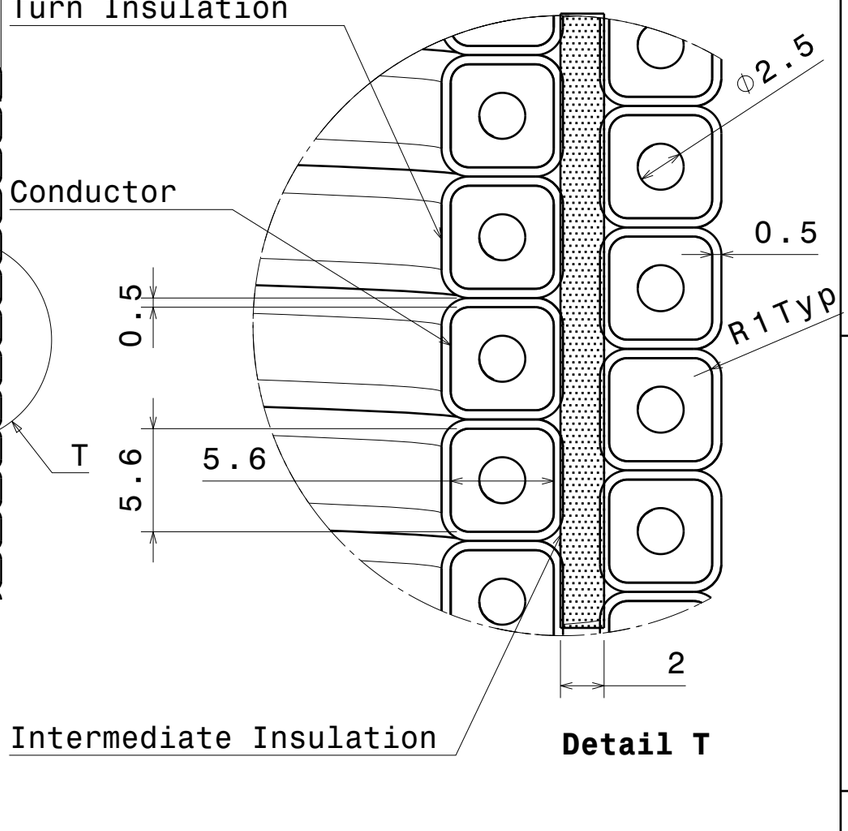
TITLE: **Details of Tension cylinder**

REF DRG NO:IPR/ATD/04 — REV R1

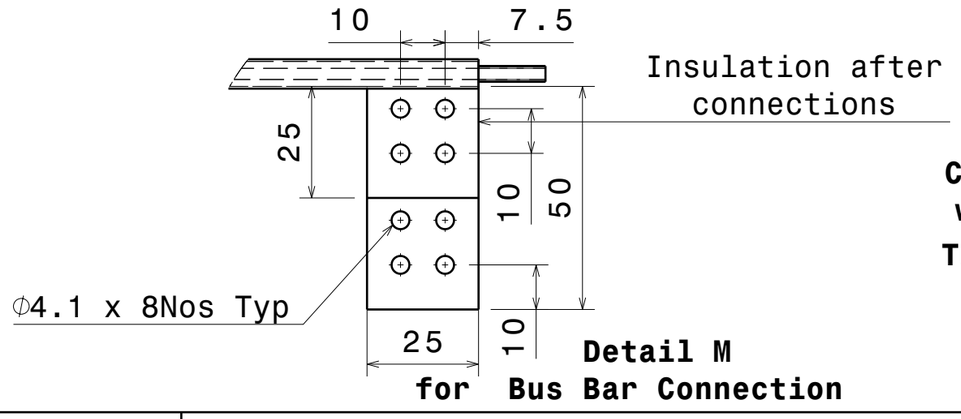
DRG.NO IPR/ATD/PCS/04-2 — SHEET 03 OF 04







Note: All sharp edges to be rounded to a 1mm fillet radius.



OH COIL Nomenclature

Total Turns - 284 (±2) Turns
Turns in Layer 1-142 (±1) turns
Turns in Layer 2-142 (±1) turns
Height of Coil - ~944mm
Conductor Dimensions- 5.6mmx5.6mm (Sq) with central hole ϕ2.5mm for Coolant
Turn Insulation Thickness- 0.5mm each side
Inter Layer Insulation Thickness- 2mm
Conductor Length- ~130(±10) meters

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	±0.1	±0.2	±0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:	SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED	

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

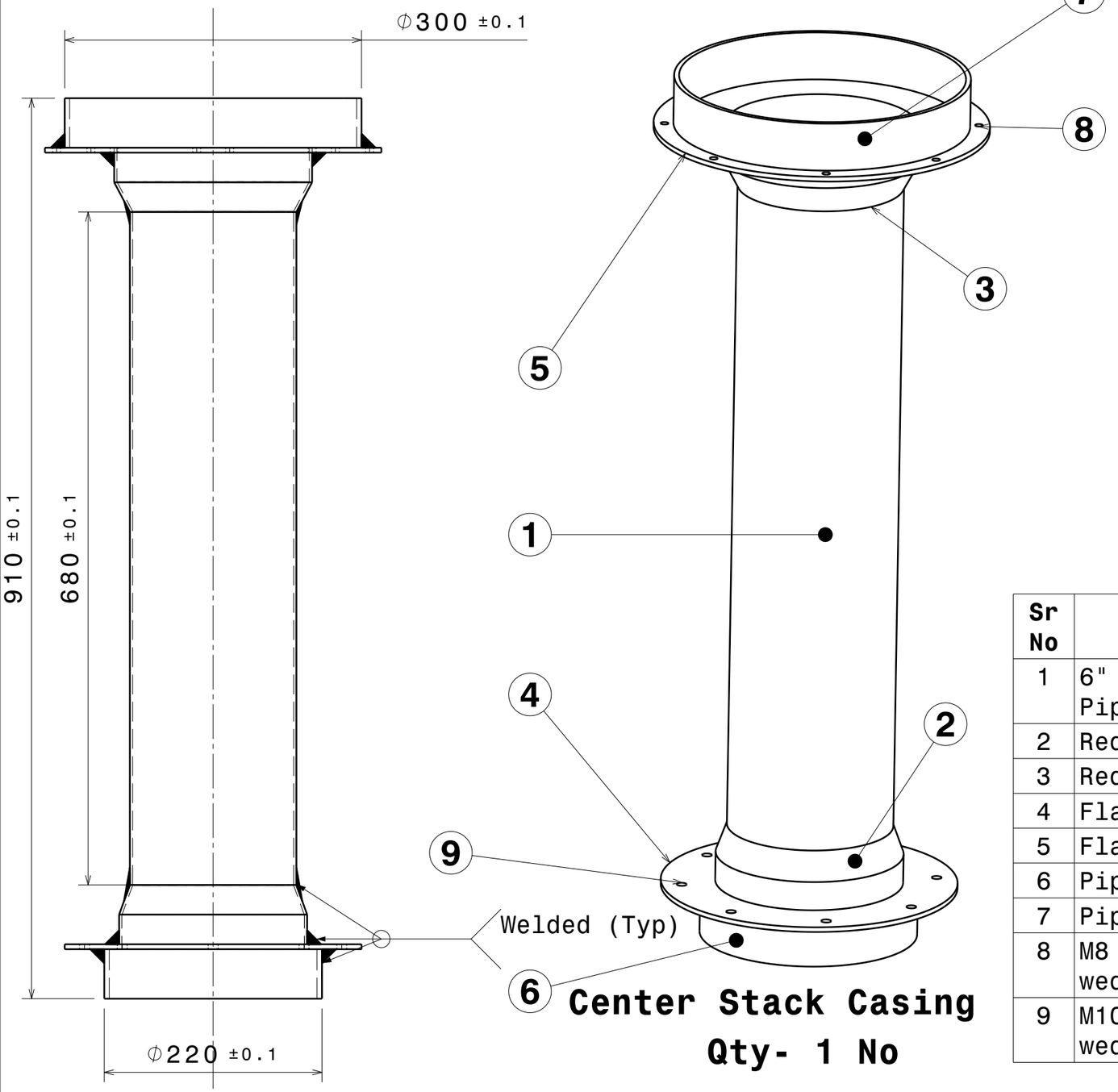
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

THIRD ANGLE PROJECTION

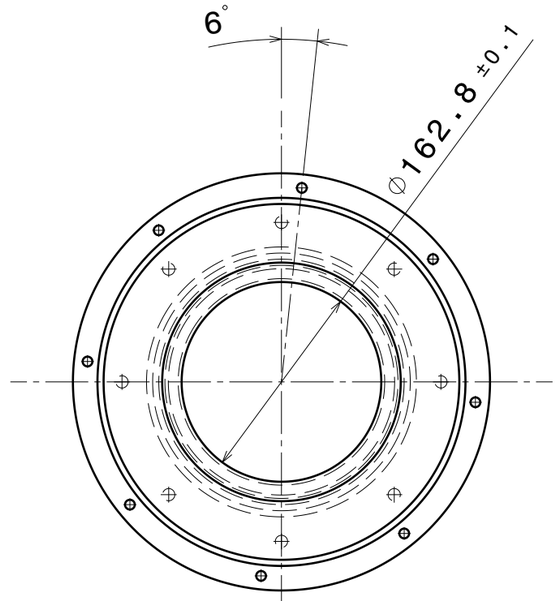
TITLE
OH coil conductor winding

REF DRG NO:IPR/ATD/04 — REV R1

DRG.NO IPR/ATD/PCS/04-3 — SHEET 04 OF 04



Center Stack Casing
Qty- 1 No



Top View

Sr No	Description	Material	Qty	Remarks
1	6" inch SCH 5 seamless Pipe 1	SS304	1	Details on Sheet 2
2	Reducer 1	SS304	1	Details on Sheet 2
3	Reducer 2	SS304	1	Details on Sheet 2
4	Flange 1	SS304	1	Details on Sheet 2
5	Flange 2	SS304	1	Details on Sheet 2
6	Pipe 2	SS304	1	Details on Sheet 3
7	Pipe 3	SS304	1	Details on Sheet 3
8	M8 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	8	Details on Sheet 2
9	M10 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	8	Details on Sheet 2

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	±0.1	±0.2	±0.3	±0.5	±1	±2

REVISION COLUMN					
REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

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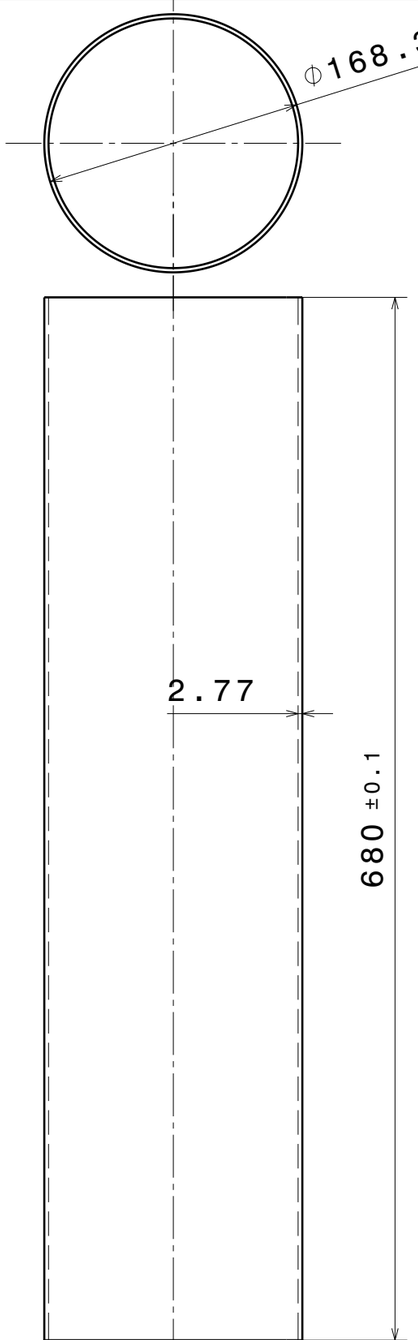
INDIA

THIRD ANGLE PROJECTION

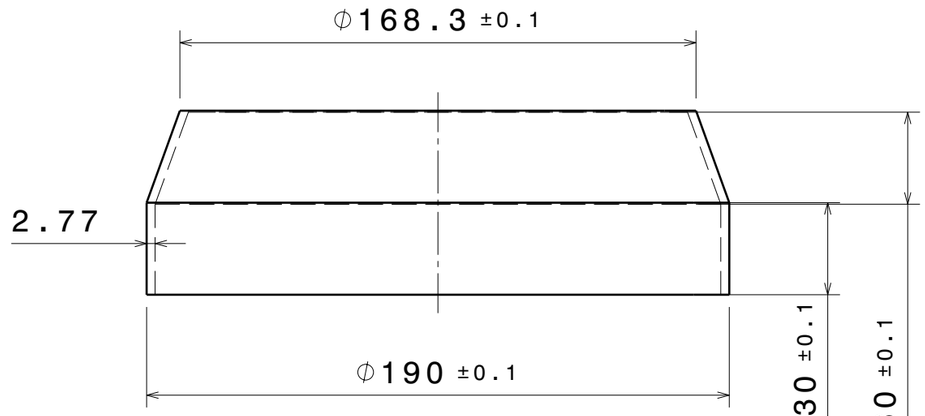
Assembly: Center Stack Casing (CSC)

REF DRG NO: IPR/ATD/PCS/01 REV R1

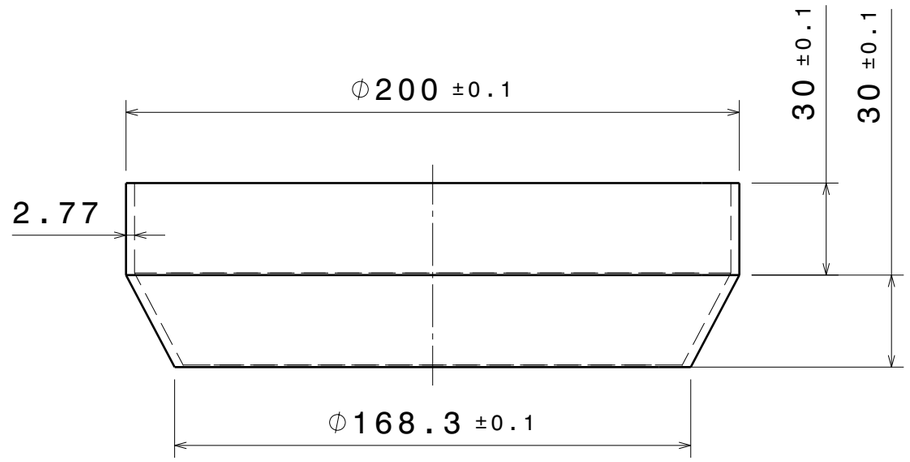
DRG.NO IPR/ATD/PCS/05 SHEET 01 OF 03



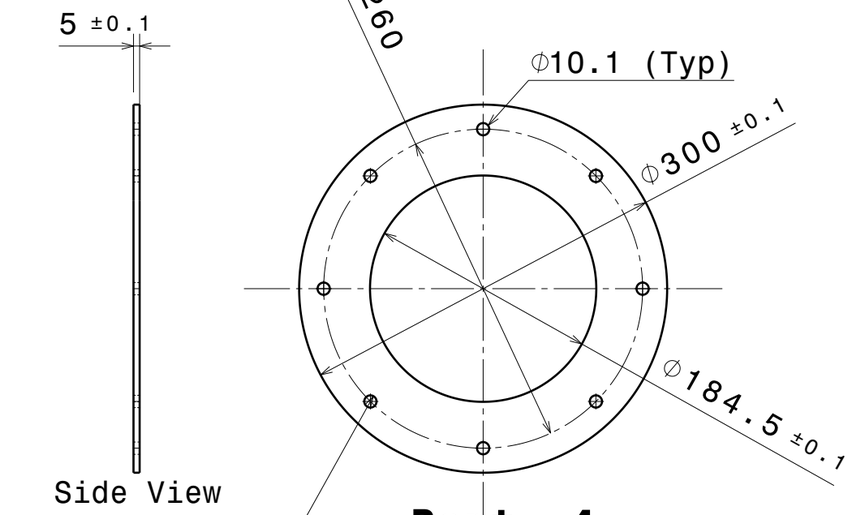
Part 1 (Pipe -1)



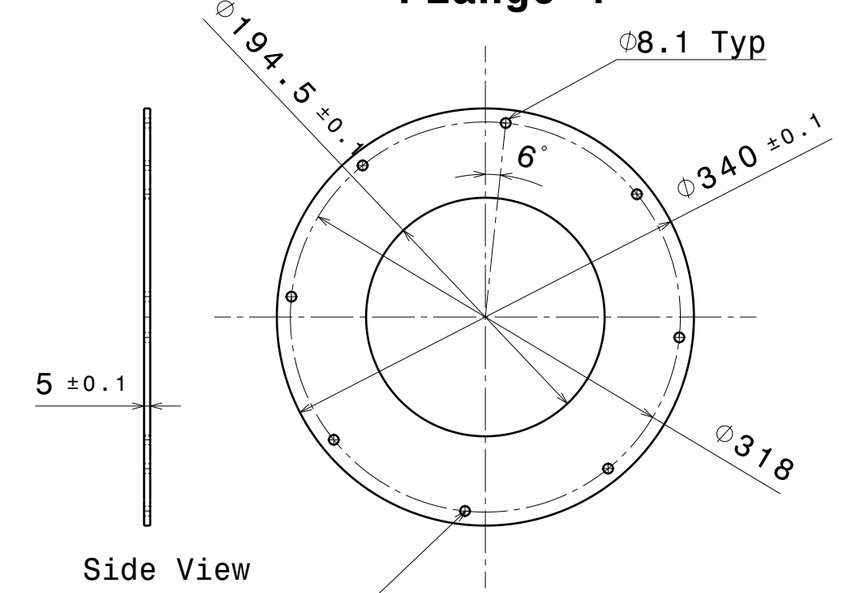
Part -2
Reducer - 1



Part - 3
Reducer -2



Part- 4
Flange-1



Part -5
Flange-2

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

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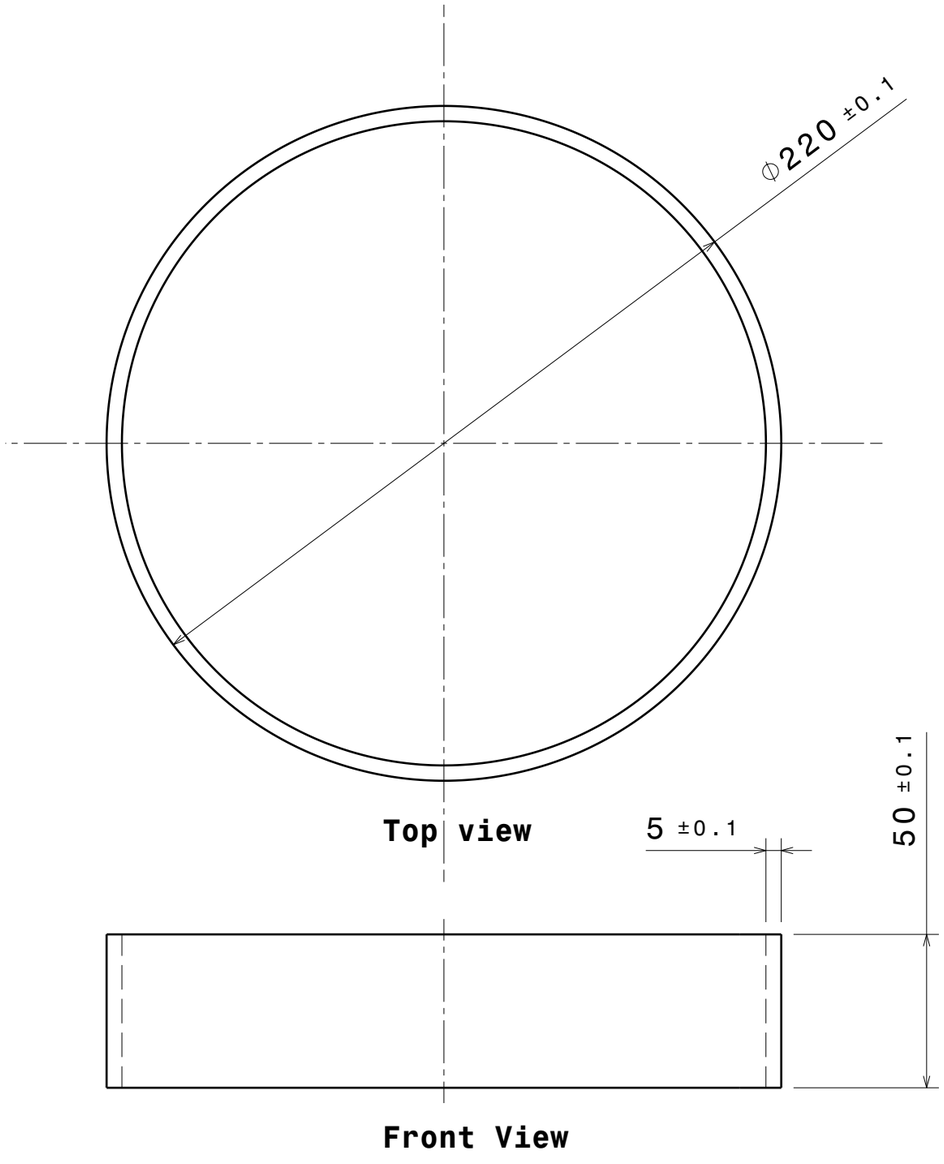
INDIA

THIRD ANGLE PROJECTION

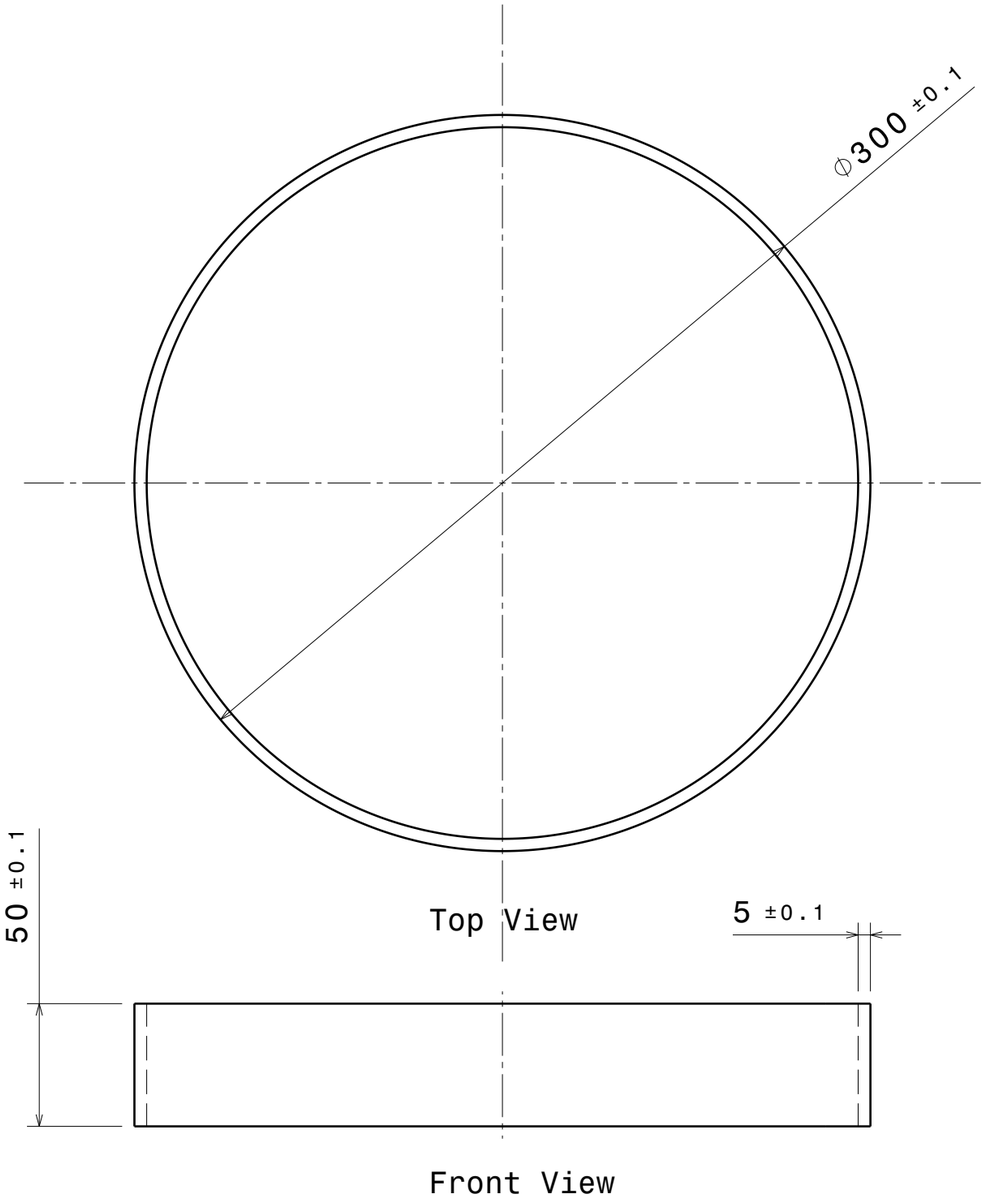
Details of CSC center pipe, reducer and flanges

REF DRG NO: IPR/ATD/PCS05 REV R1

DRG.NO IPR/ATD/PCS/05-1 SHEET 02 OF 03



Part- 6 (Seamless Pipe -2)



Part 7 (Seamless Pipe -3)

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN						ASS'Y GROUP/ DIVISION:	SIZE A3
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED	
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											SCALE	NTS / DATE
LENGTH IN mm OF SHORTER SIDE OF ANGLES											DRAWN	Ankur / 8/12/21
UPTO 10	10-50	50-120	OVER 120-400								CHECKED	Aditya / 13/12/21
±1°	±0°-30'	±0°-20'	±0°-10'								APPROVED	

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

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INDIA

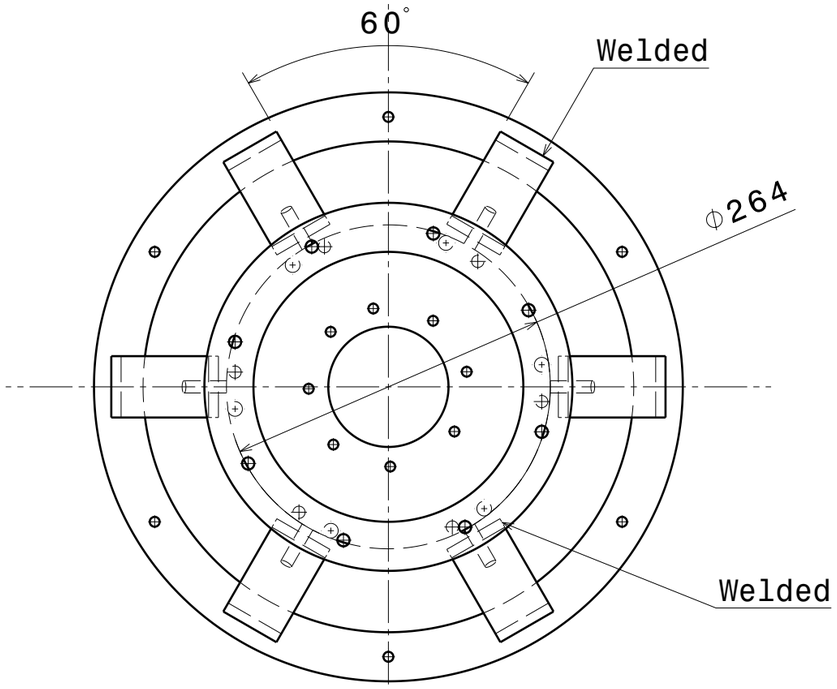
THIRD ANGLE PROJECTION

TITLE: **Details of CSC top and bottom pipe**

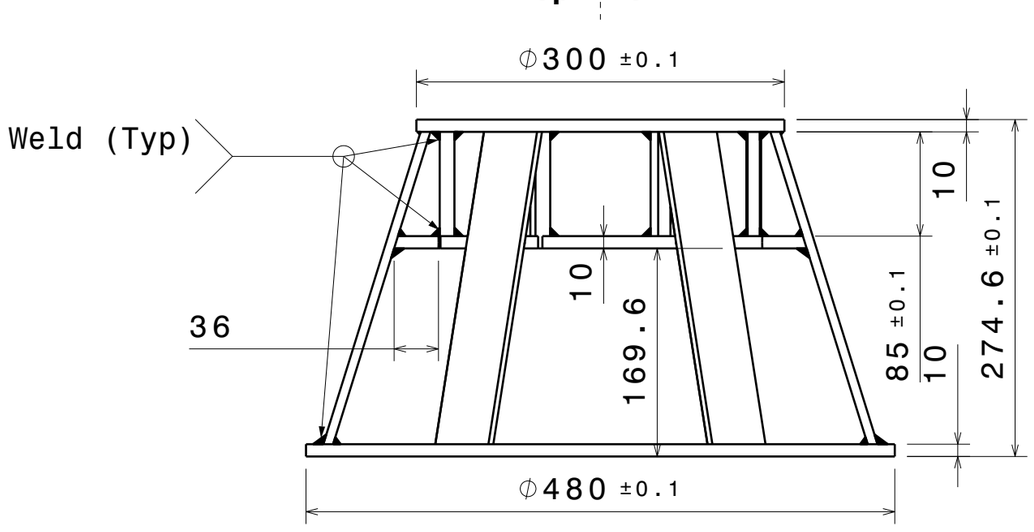
REF DRG NO: IPR/ATD/PCS05 — REV R1

DRG.NO: IPR/ATD/PCS/05-2 — SHEET 03 OF 03

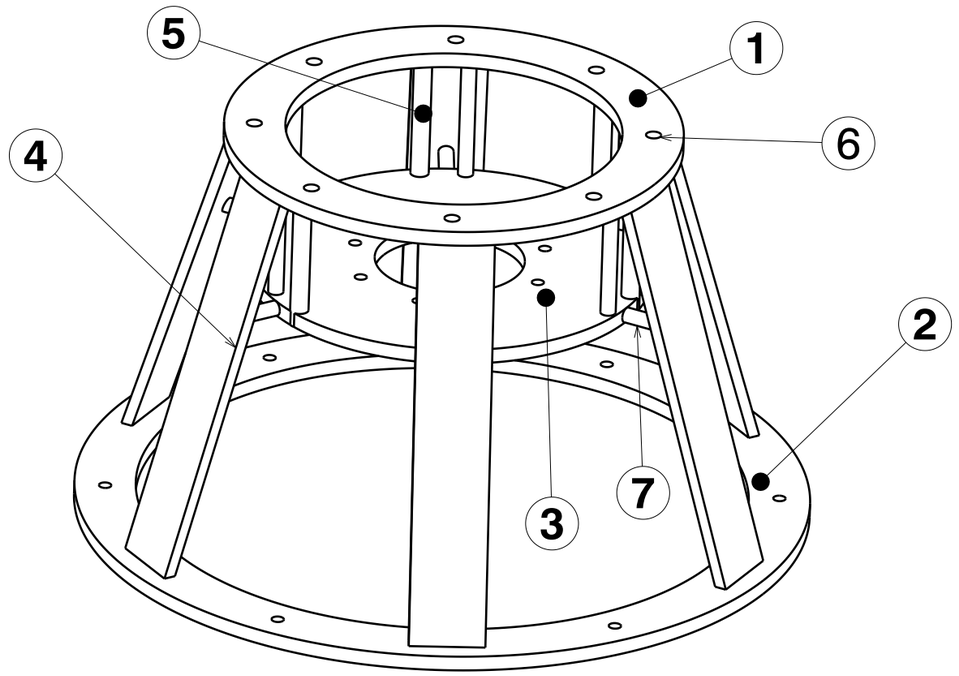
Note: All sharp edges to be rounded to a 1mm fillet radius.



Top View



Front View



Assembly: PCS Upper Support Structure

Sr No	Description	Material	Qty(Nos)	Remarks
1	Flange 1	SS304	1	Details on Sheet 2
2	Flange 2	SS304	1	Details on Sheet 2
3	Flange 3	SS304	1	Details on Sheet 2
4	Supporting Rib	SS304	6	Details on Sheet 2
5	ϕ13 Rod	SS304	12	Length- 85 mm
6	M10 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	8	Set of nuts and bolts
7	ϕ13 Rod	SS304	6	Length- ~36mm

DRG.NO | ▽ 8-25 | ▽▽ 1.6-8 | ▽▽▽ 0.025-1.6 | ▽▽▽▽ < 0.025

CO-ORDINATED BY

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:

SIZE A3

ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED

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INDIA

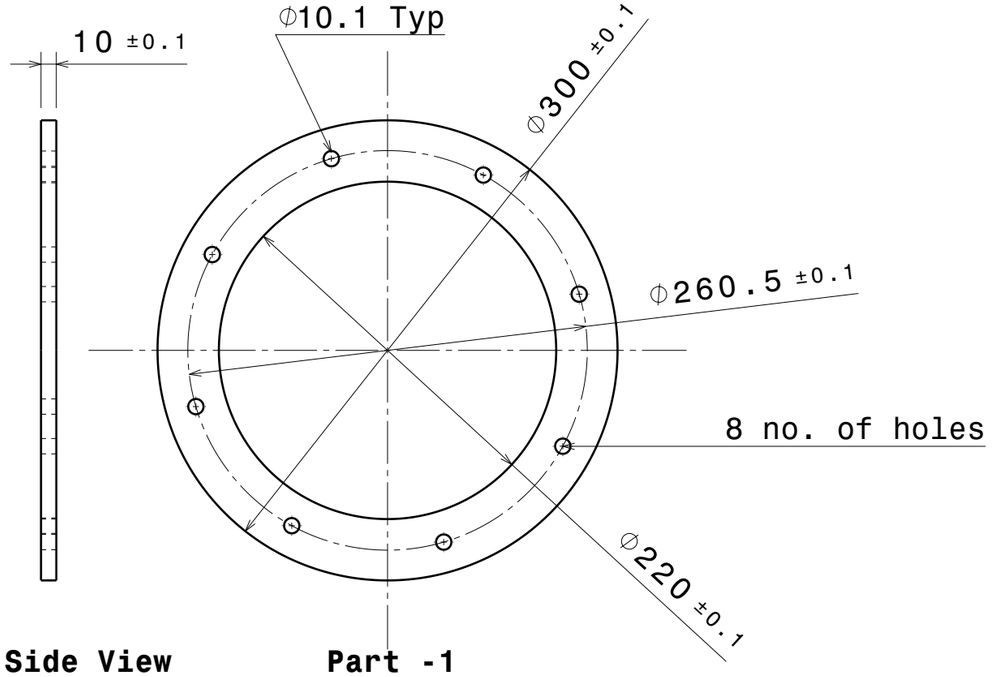
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

THIRD ANGLE PROJECTION

Assembly: PCS Upper support structure

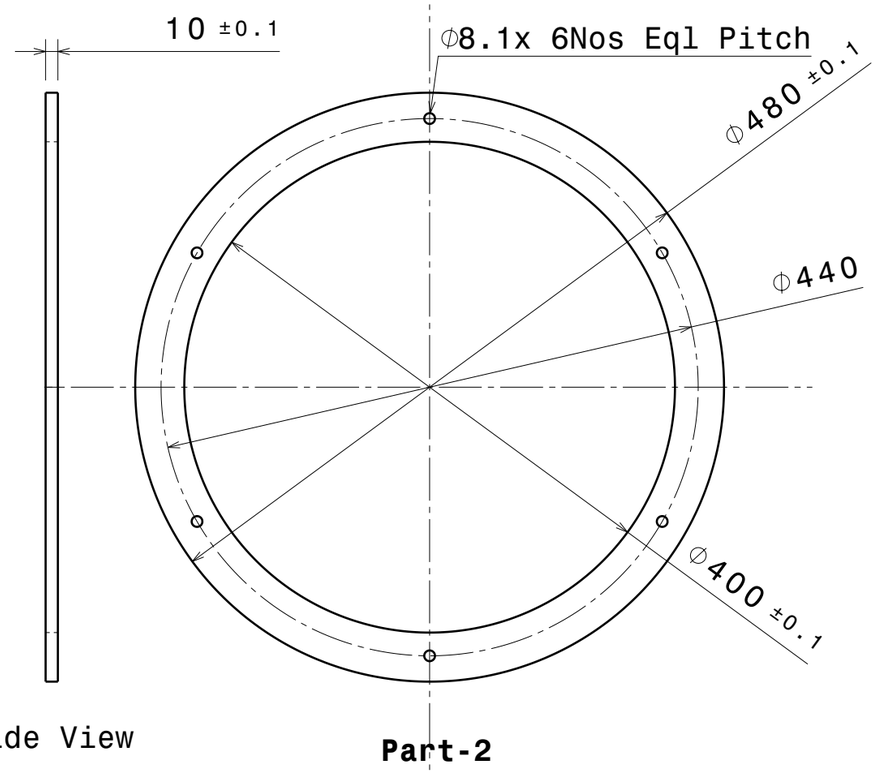
REF DRG NO: IPR/ATD/PCS/01 | REV R1

DRG.NO IPR/ATD/PCS/06 | SHEET 01 OF 02



Side View **Part -1**

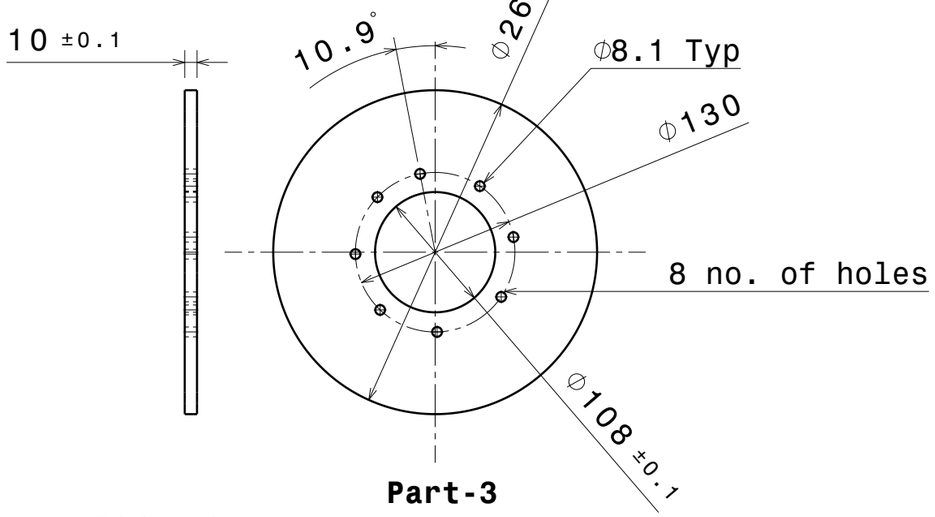
Flange -1



Side View **Part-2**

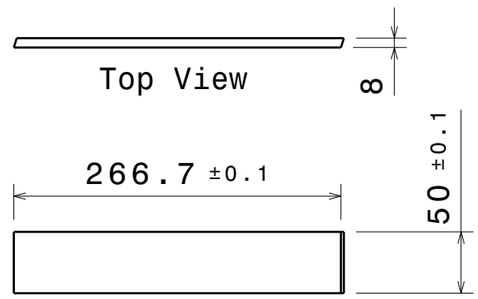
Flange-2

Note: All sharp edges to be rounded to a 1mm fillet radius.



Side View **Part-3**

Flange -3



Top View

Front View

Part-4 Supporting Rib

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS				
LENGTH IN mm OF SHORTER SIDE OF ANGLES				
UPTO 10	10-50	50-120	OVER 120-400	
±1°	±0°-30'	±0°-20'	±0°-10'	

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	±0.1	±0.2	±0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

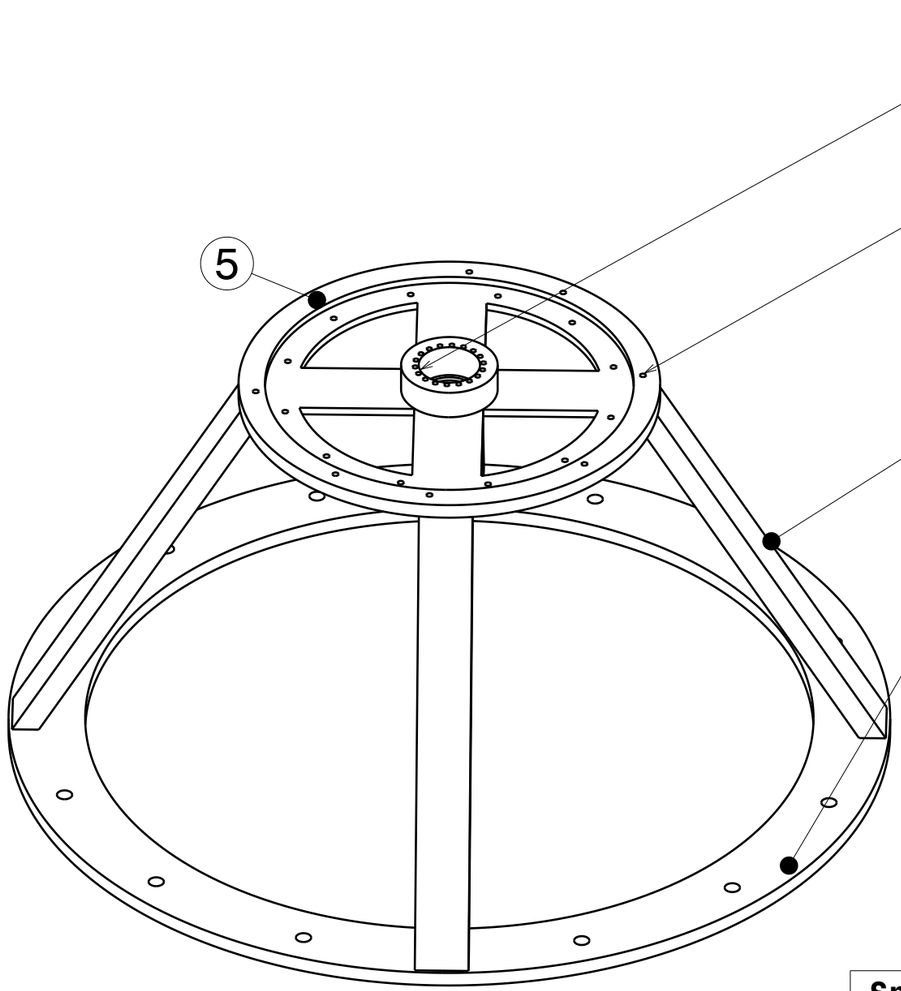
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

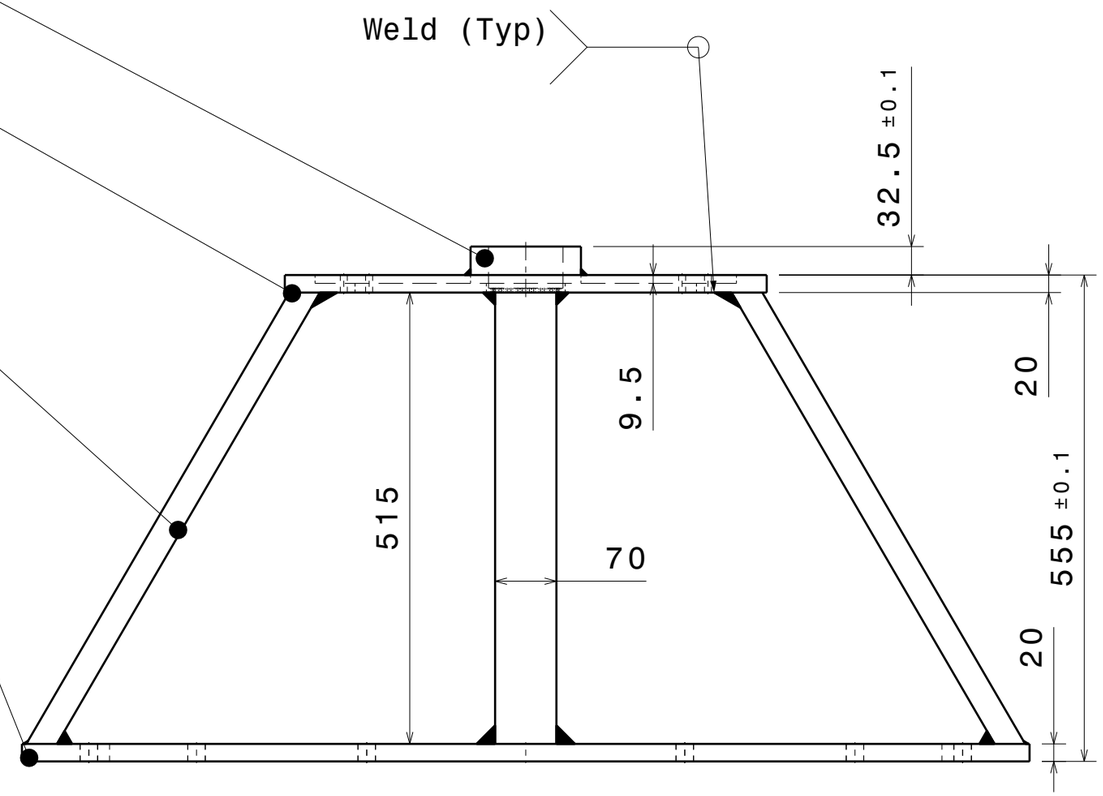
THIRD ANGLE PROJECTION

TITLE: **Details of flanges and supporting ribs**

REF DRG NO: IPR/ATD/PCS/06 REV R1

DRG.NO IPR/ATD/PCS/06-1 SHEET 02 OF 02





Assembled View

Assembly: PCS Lower Support Structure

Sr No	Description	Material	Qty(Nos)	Remarks
1	Flange 1	SS304	1	Details on Sheet 2
2	Flange 2	SS304	1	Details on Sheet 2
3	Central Seamless Pipe	SS304	1	Details on Sheet 2
4	Supporting Rib	SS304	4	Details on Sheet 2
5	M8 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	14	Details on Sheet 2

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS			
LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN					
REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

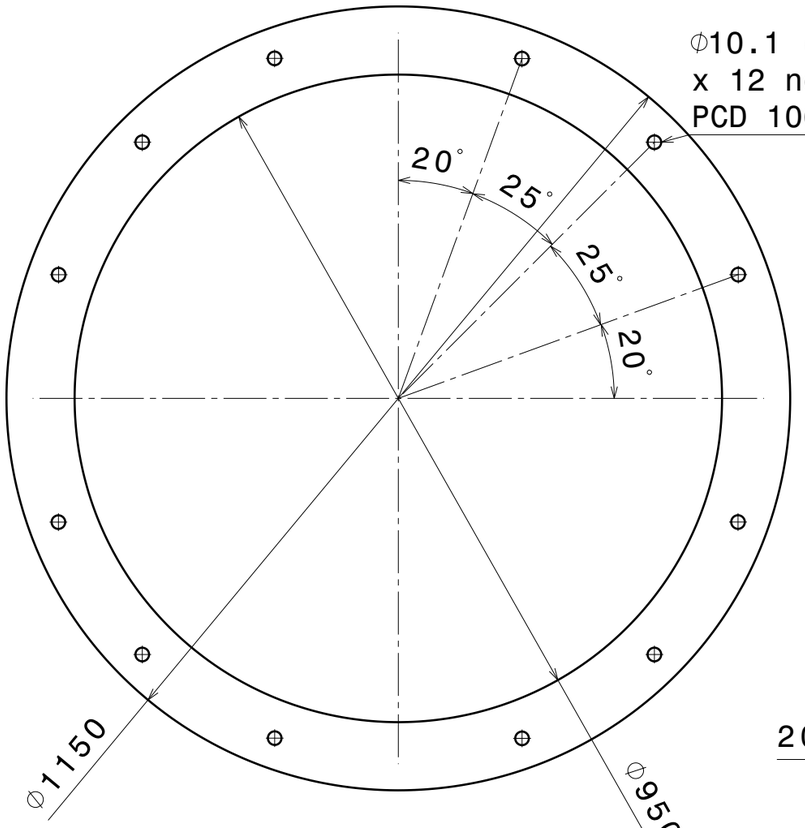
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

THIRD ANGLE PROJECTION

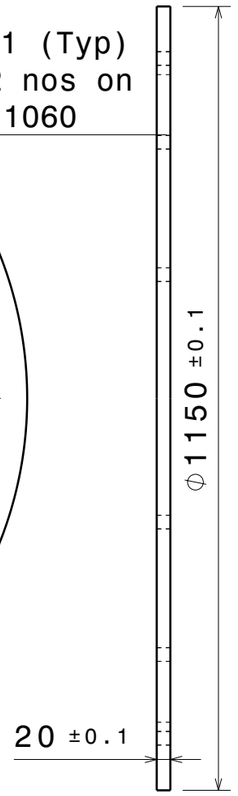
Assembly: PCS Lower support structure

REF DRG NO: IPR/ATD/PCS/01 REV R1

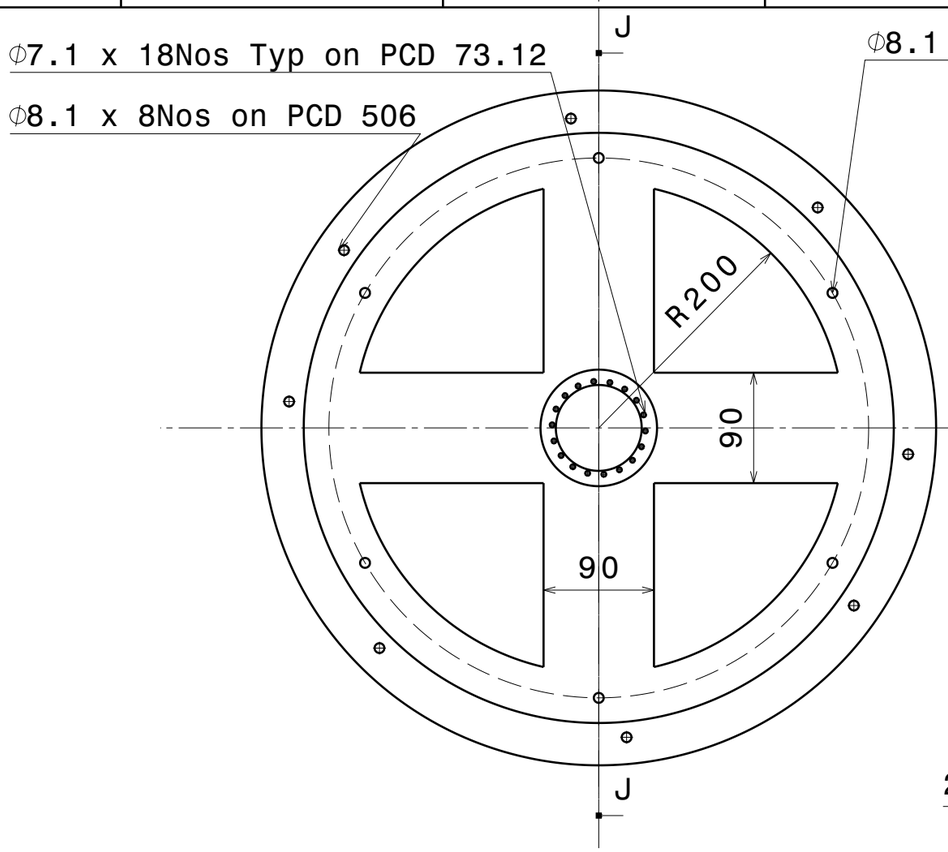
DRG.NO IPR/ATD/PCS/07 SHEET 01 OF 02



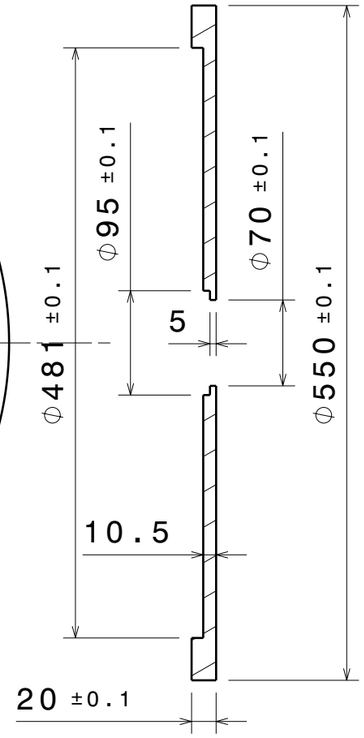
1. Flange - 1



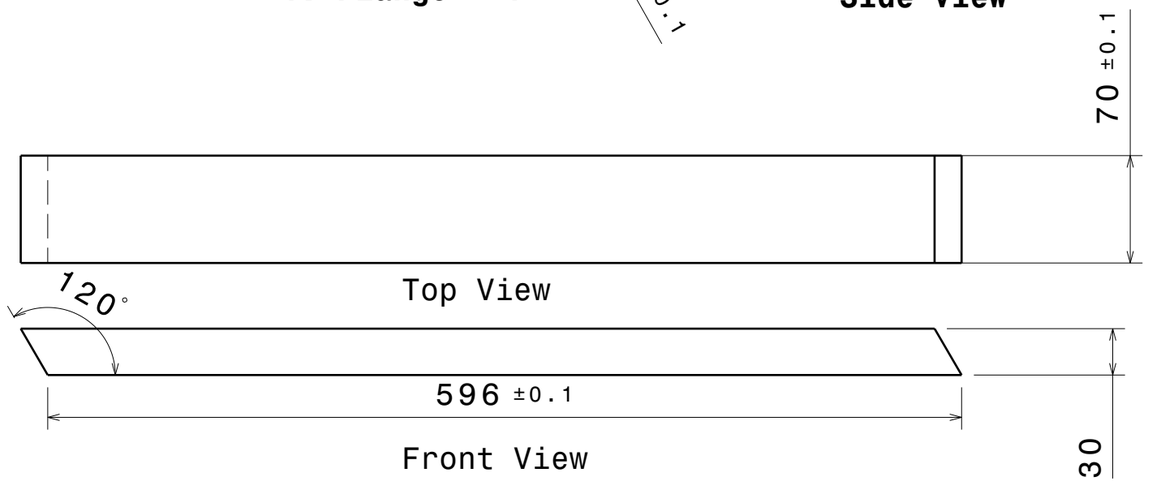
Side View



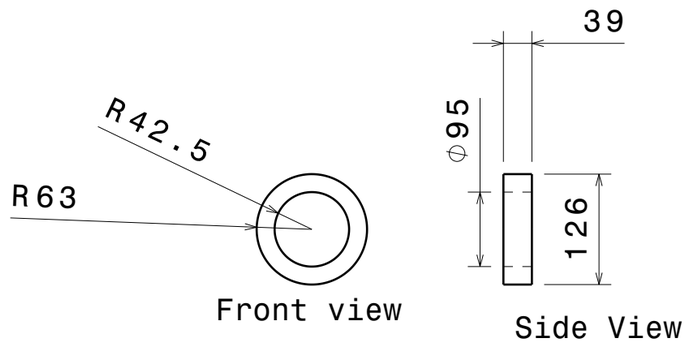
2. Flange - 2



Section cut J-J



4. Supporting Rib



3. Central Seamless Pipe

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN						ASS'Y GROUP/ DIVISION: SIZE A3
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											SCALE NTS DATE
LENGTH IN mm OF SHORTER SIDE OF ANGLES											DRAWN Ankur 8/12/21
UPTO 10	10-50	50-120	OVER 120-400								CHECKED Aditya 13/12/21
±1°	±0°-30'	±0°-20'	±0°-10'								APPROVED

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

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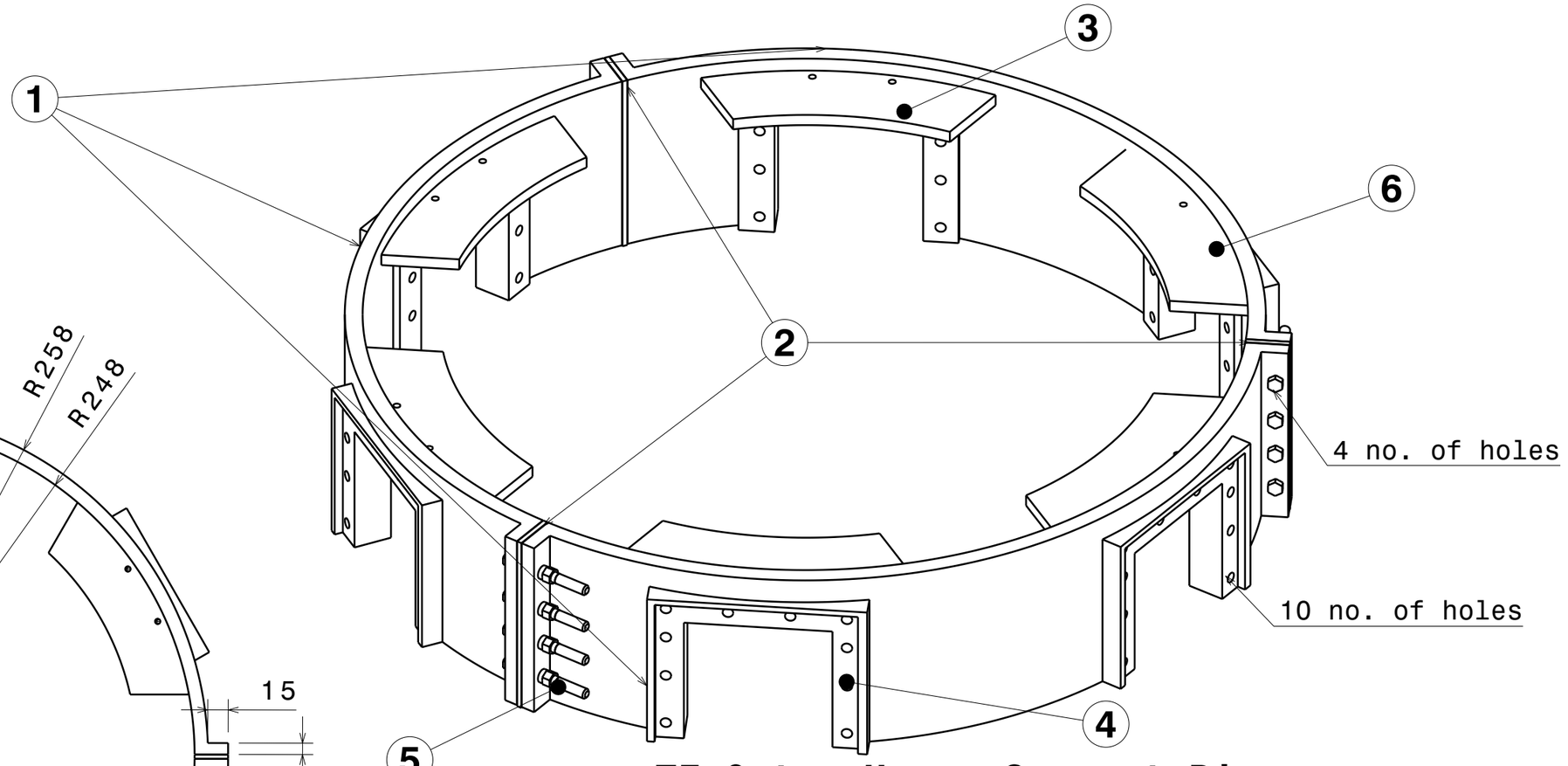
INDIA

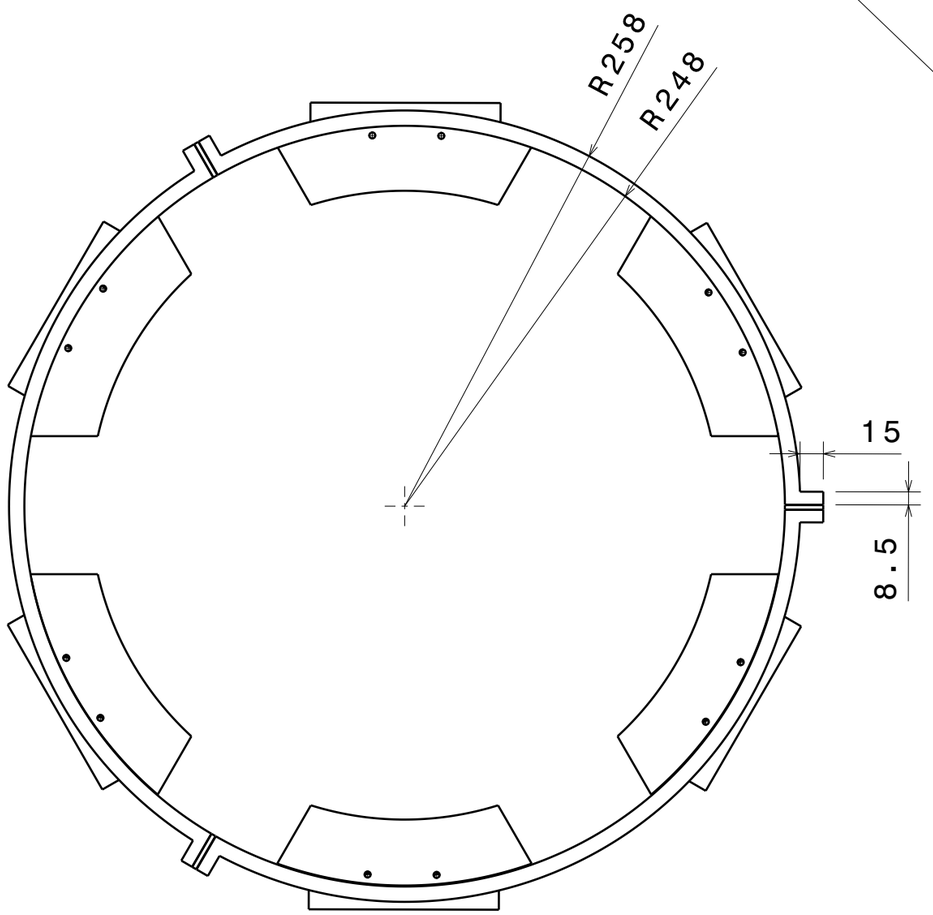
THIRD ANGLE PROJECTION

Details of flanges and supporting ribs

REF DRG NO: IPR/ATD/PCS/07 REV R1

DRG.NO IPR/ATD/PCS/07-1 SHEET 02 OF 02





TF Outer Upper Support Ring

Sr No	Description	Material	Qty(Nos)	Remarks
1	Upper Support Ring	SS304	3	Details on Sheet 2
2	Insulation	G10	3	Details on Sheet 2
3	Insulation for Support	G10	6	Details on Sheet 2
4	Allen M6 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	60	Details on Sheet 2
5	Allen M6 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	12	
6	M4 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	12	-

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

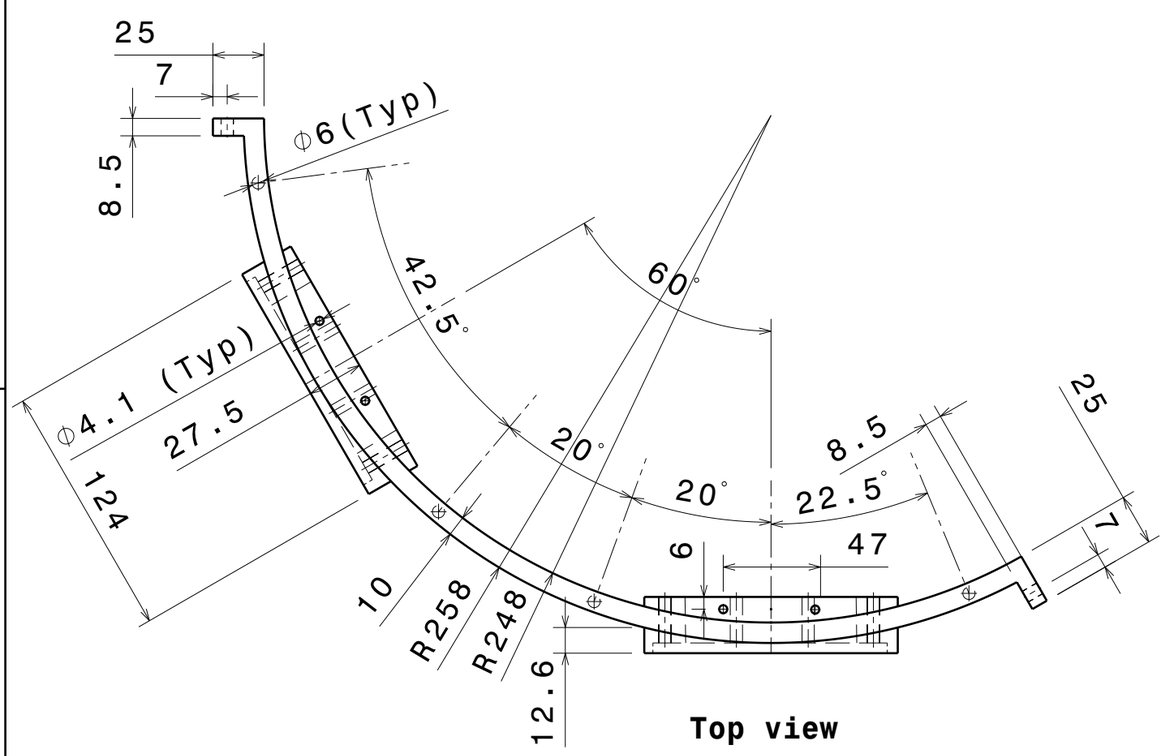
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

THIRD ANGLE PROJECTION

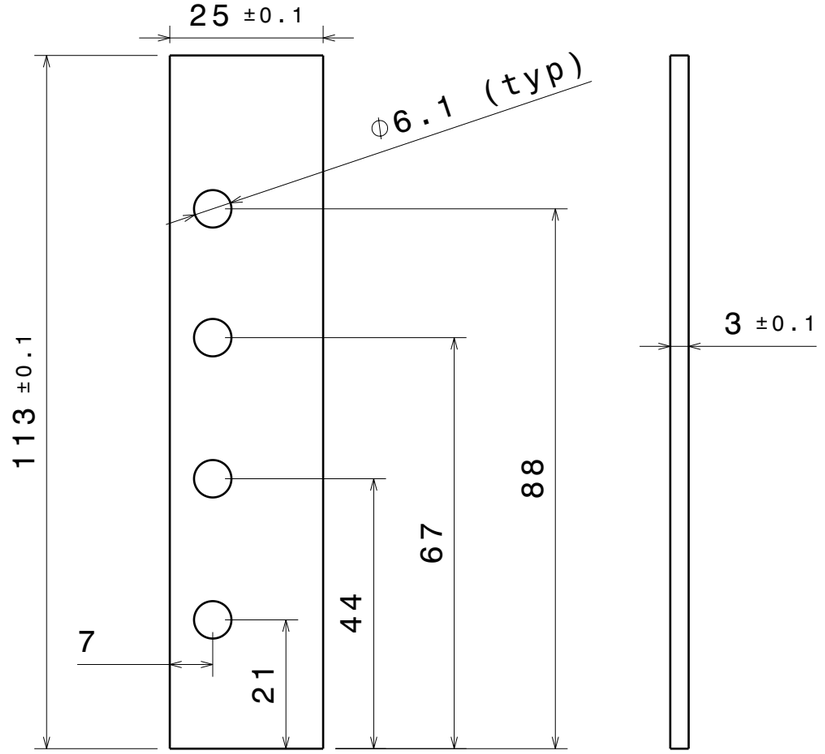
Assembly: TF Outer_Upper Support Ring

REF DRG NO: IPR/ATD/PCS/01 REV R1

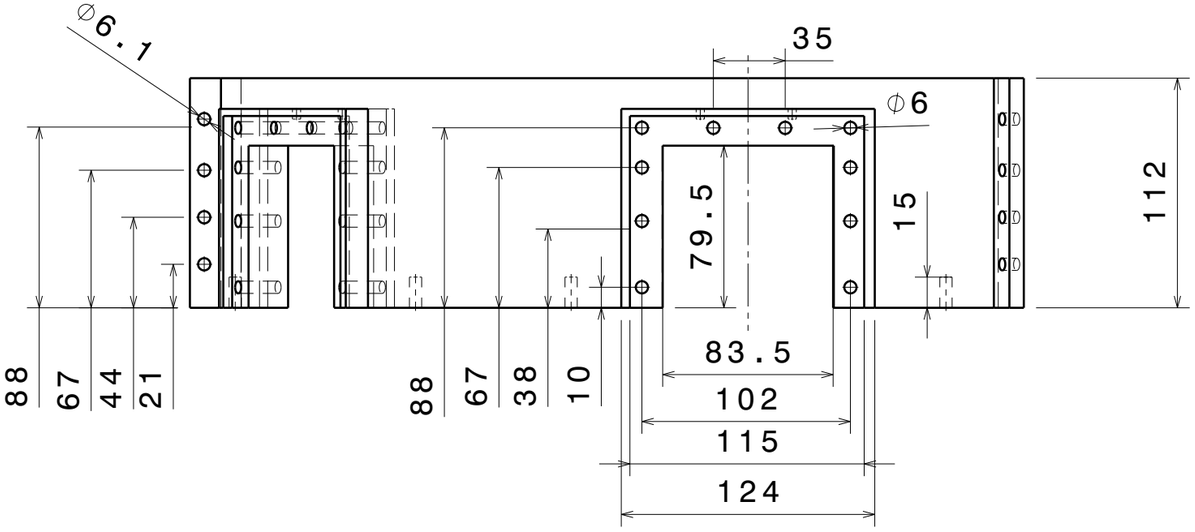
DRG.NO IPR/ATD/PCS/08 SHEET 01 OF 02



Top view



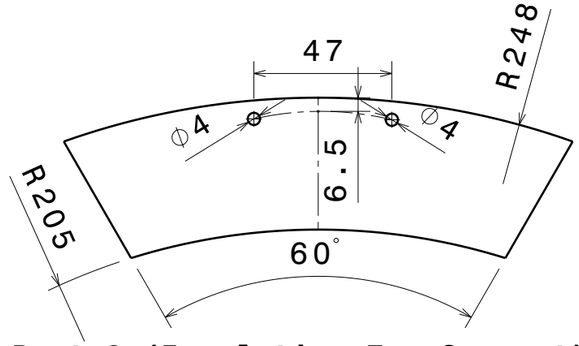
Front view Side View

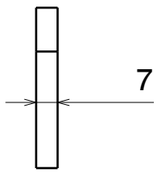


Part-1 Front view

Part-2 Insulation

Note: All sharp edges to be rounded to a 1mm fillet radius.





Part-3 (Insulation For Support) **Side View**

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN						ASS'Y GROUP/ DIVISION: SIZE A3
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											
LENGTH IN mm OF SHORTER SIDE OF ANGLES											
UPTO 10	10-50	50-120	OVER 120-400								
±1°	±0°-30'	±0°-20'	±0°-10'								

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

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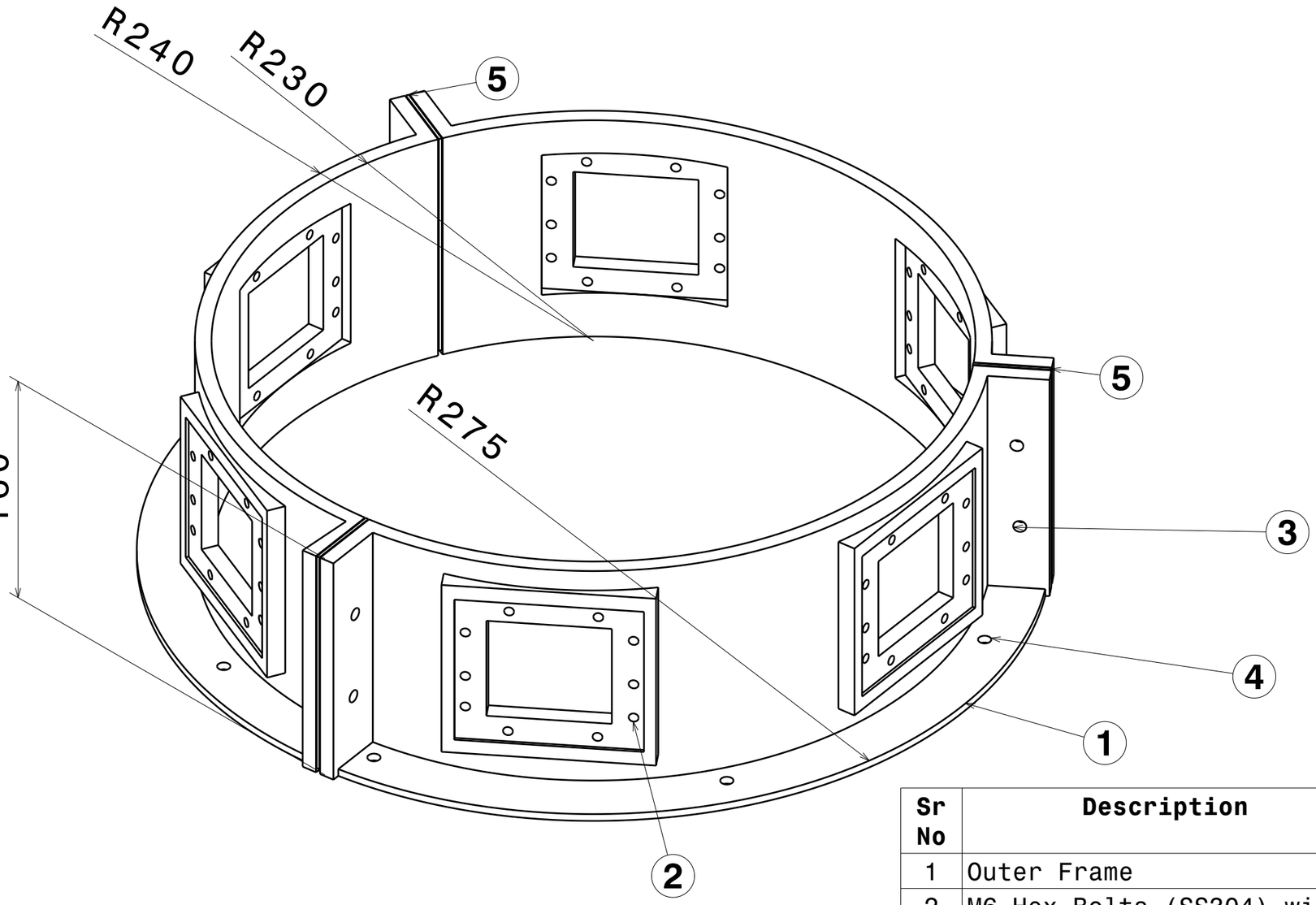
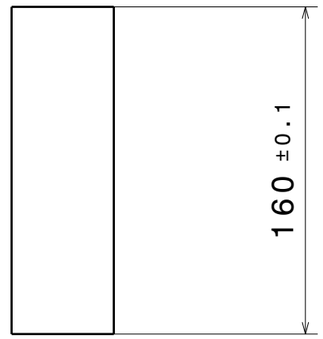
INDIA

SCALE	NTS	DATE	Details of support section and insulation
DRAWN	Ankur	8/12/21	THIRD ANGLE PROJECTION
CHECKED	Aditya	13/12/21	REF DRG NO: IPR/ATD/PCS/08 REV R1
APPROVED			DRG.NO IPR/ATD/PCS/08-1 SHEET 02 OF 02



TF Outer_Lower Support Ring



Part-5

G10 Insulation

Thickness - 2mm

Sr No	Description	Material	Qty(Nos)	Remarks
1	Outer Frame	SS304	3	Details on Sheet 2
2	M6 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	60	
3	M8 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	6	
4	M8 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	9	
5	Insulation	G10	60	Details on Sheet 2

DRG.NO | ▽ 8-25 | ▽▽ 1.6-8 | ▽▽▽ 0.025-1.6 | ▽▽▽▽ < 0.025

CO-ORDINATED BY

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION: | SIZE A3

ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED

SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

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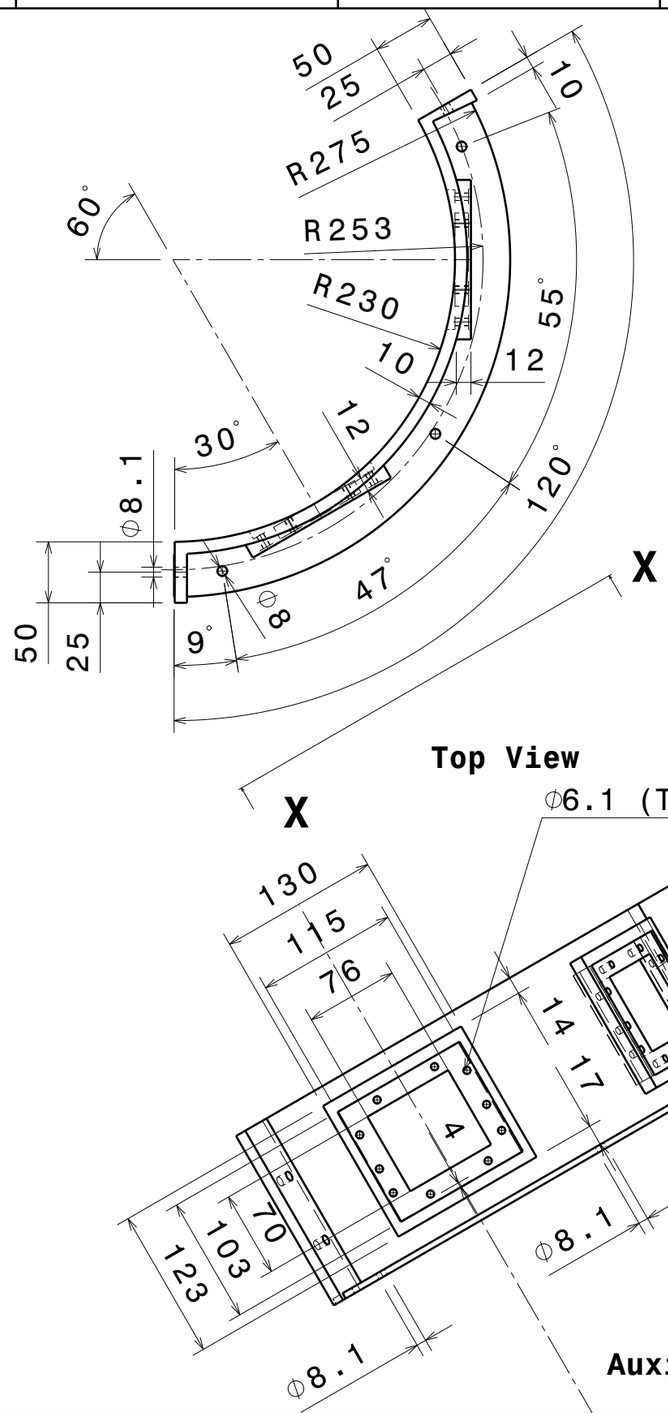
BHAT, GANDHINAGAR-382 428.
INDIA

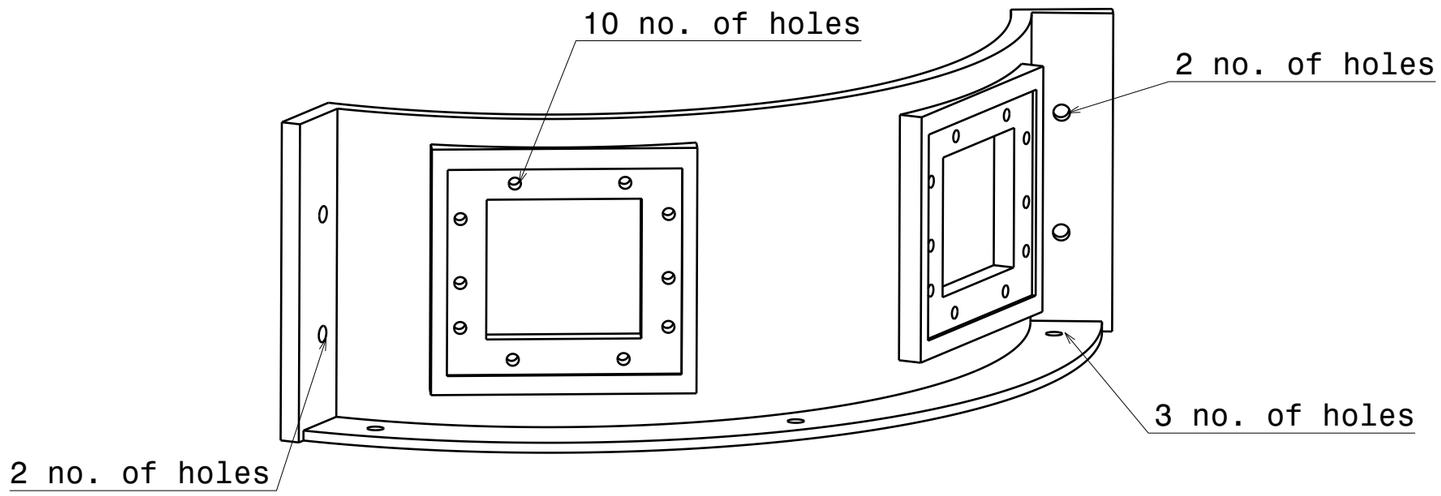
THIRD ANGLE PROJECTION

Assembly: TF Outer_Lower Support Ring

REF DRG NO: IPR/ATD/PCS/01 | REV R1

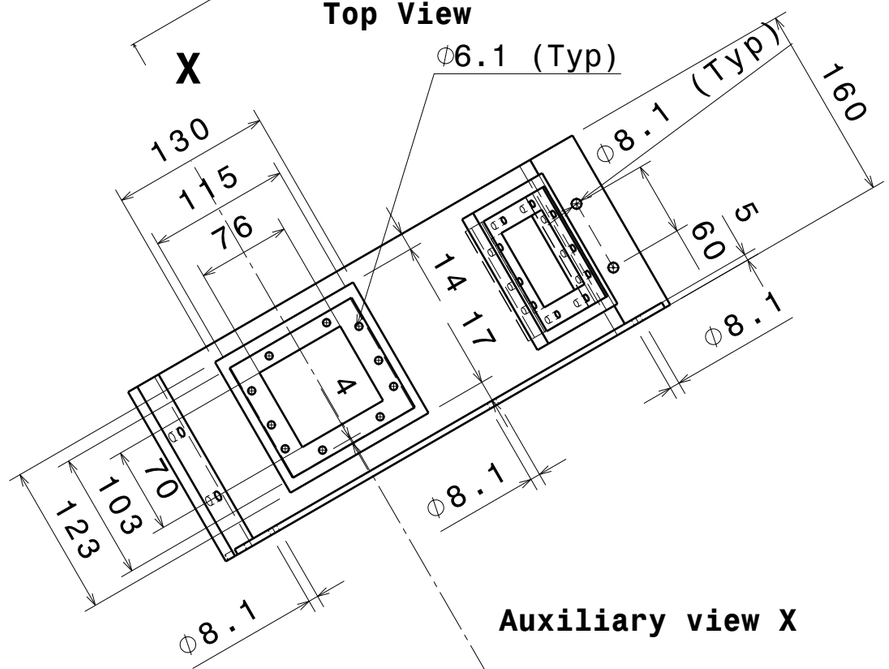
DRG.NO IPR/ATD/PCS/09 | SHEET 01 OF 02





TF Outer_Lower Support Ring

Top View



Auxiliary view X

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN						ASS'Y GROUP/ DIVISION:
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											SCALE NTS DATE
LENGTH IN mm OF SHORTER SIDE OF ANGLES											DRAWN Ankur 8/12/21
UPTO 10	10-50	50-120	OVER 120-400								CHECKED Aditya 13/12/21
±1°	±0°-30'	±0°-20'	±0°-10'								APPROVED

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

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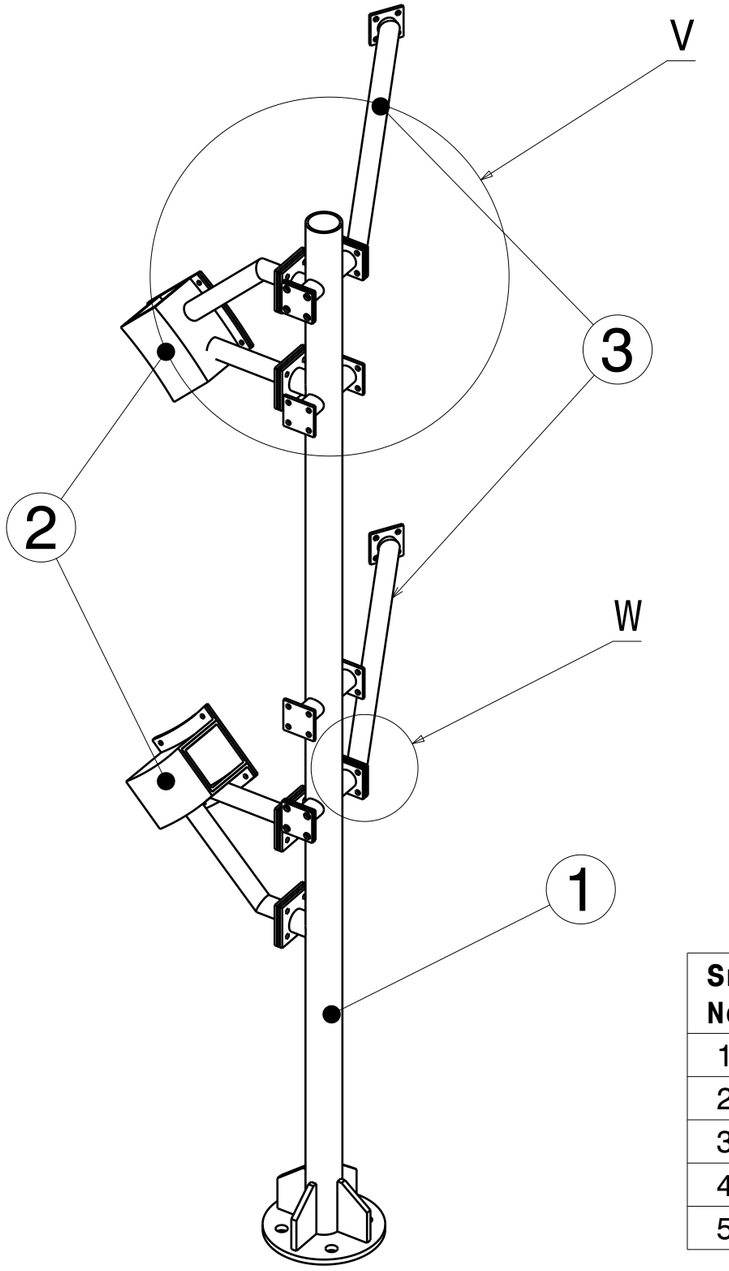
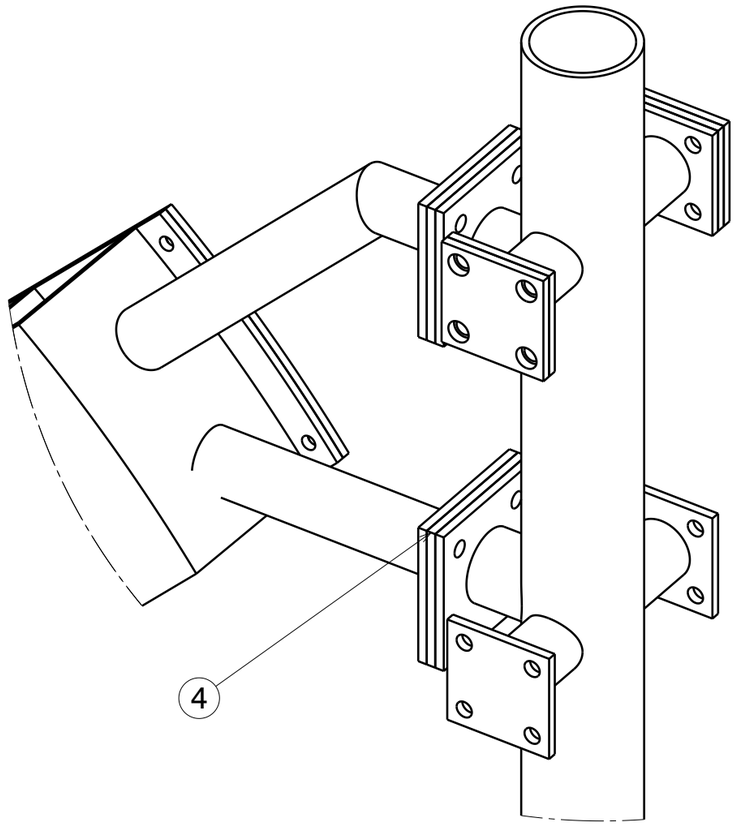
THIRD ANGLE PROJECTION

Details of support section and connection port

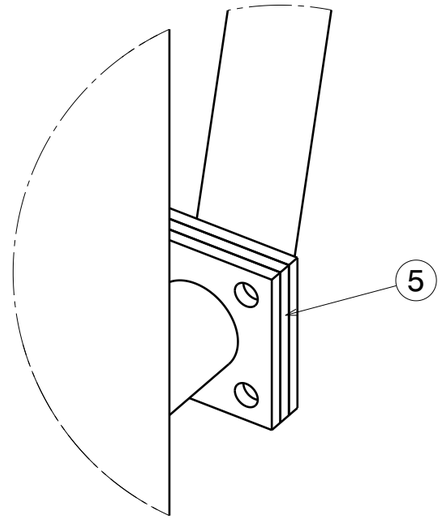
REF DRG NO: IPR/ATD/PCS/09 REV R1

DRG.NO IPR/ATD/PCS/09-1 SHEET 02 OF 02





Detail V



Detail W

Sr No	Description	Material	Qty(Nos)	Remarks
1	Central Seamless Pipe Support	SS304	1	Details on Sheet 2
2	Slope Support	SS304	2	Details on Sheet 4
3	Connecting Rods	SS304	2	Details on Sheet 7
4	Insulation 80x80	G10	4	Details on Sheet 8
5	Insulation 60x60	G10	8	Details on Sheet 8

TF Outer Support - Assembly (Total Qty- 6 Nos)

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:	SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED	

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BHAT, GANDHINAGAR-382 428.
INDIA

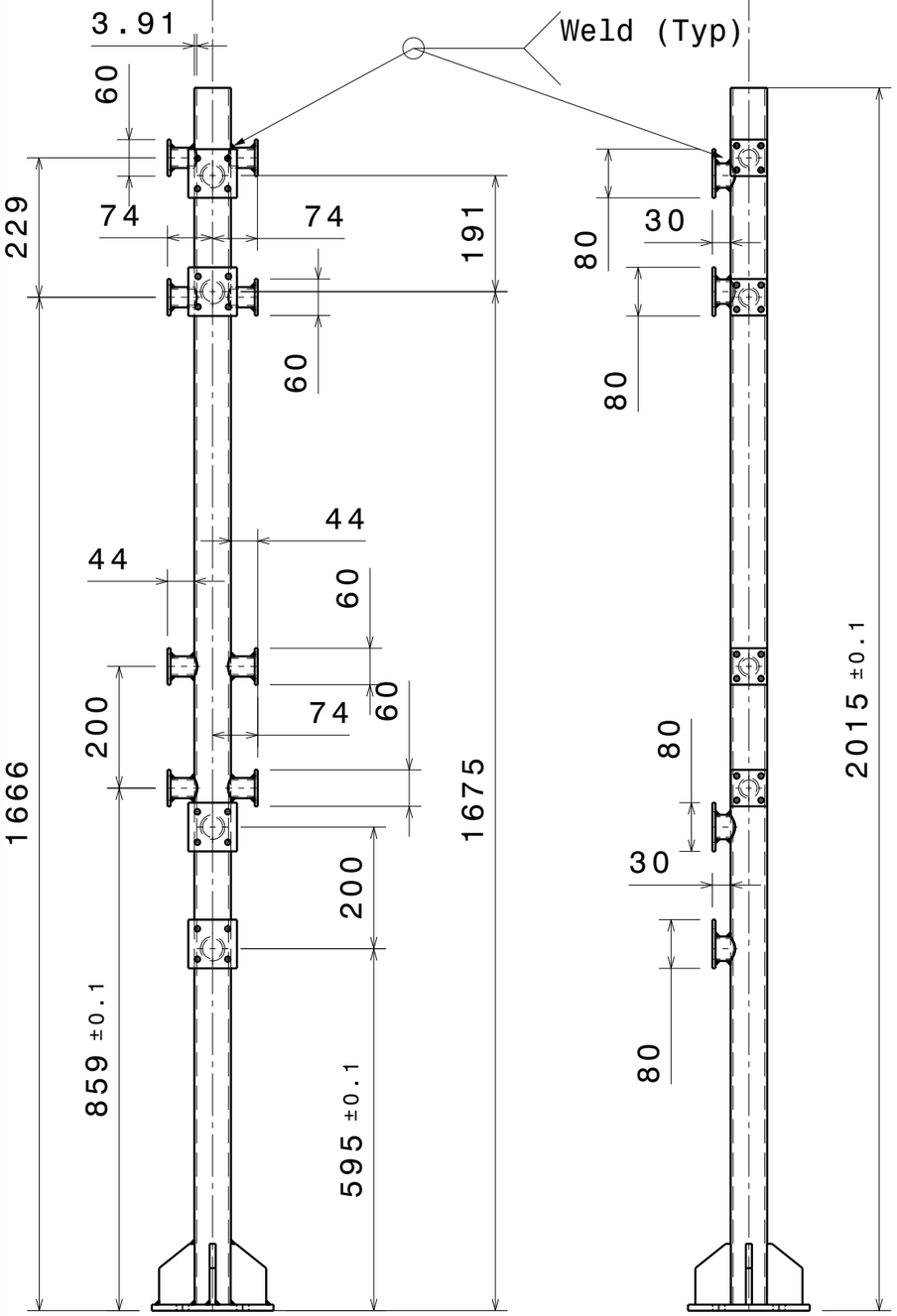
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

THIRD ANGLE PROJECTION

Assembly: TF Outer leg Support

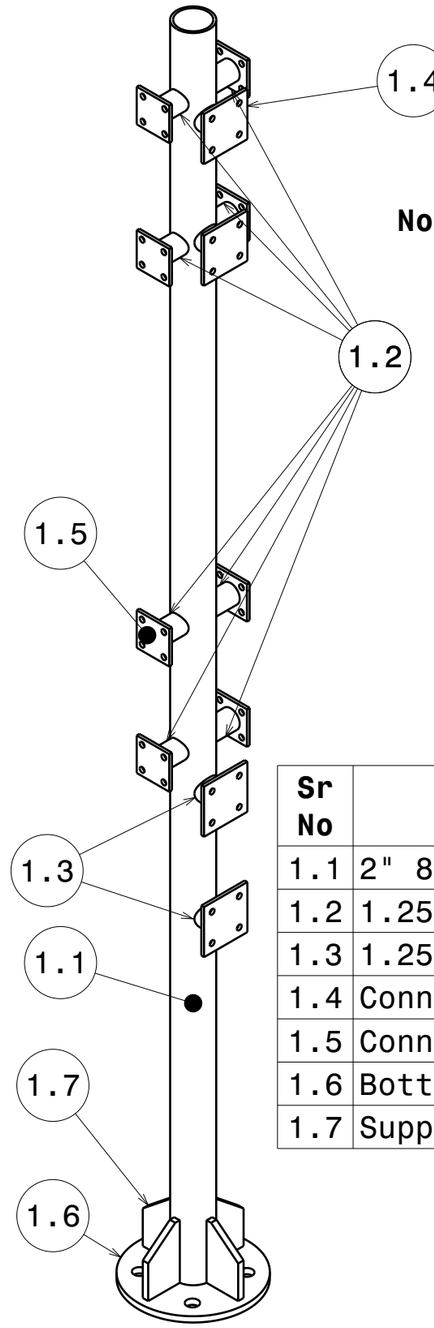
REF DRG NO: IPR/ATD/PCS/01 — REV R1

DRG.NO IPR/ATD/PCS/10 — SHEET 01 OF 08



Front view

Side View



Central Pipe Support

Note: All sharp edges to be rounded to a 1mm fillet radius.

Sr No	Description	Mateial	Qty(Nos)	Remarks
1.1	2" 80S Seamless Pipe	SS304	1	Length- 2 meters
1.2	1.25" 40S Seamless Pipe	SS304	8	Length- 44mm /piece
1.3	1.25" 40S Seamless Pipe	SS304	4	Length -32mm /piece
1.4	Connector Plate 80x80	SS304	4	Details on Sheet 3
1.5	Connector Plate 60x60	SS304	8	Details on Sheet 3
1.6	Bottom Flange	SS304	1	Details on Sheet 3
1.7	Supporting Ribs	SS304	4	Details on Sheet 3

DRG.NO | ▽ 8-25 | ▽▽ 1.6-8 | ▽▽▽ 0.025-1.6 | ▽▽▽▽ < 0.025

CO-ORDINATED BY

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION: | SIZE A3

ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

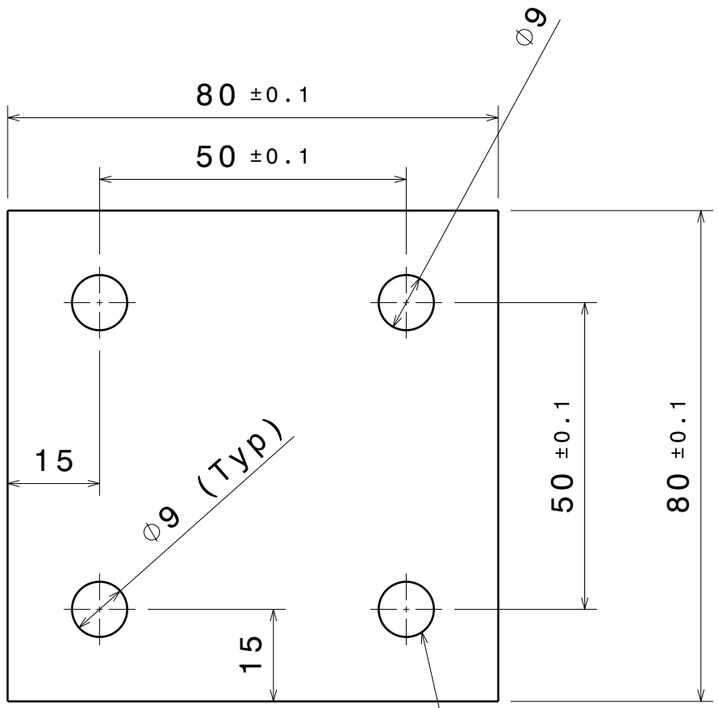
THIRD ANGLE PROJECTION

Details of Center Pipe support

REF DRG NO:IPR/ATD/PCS/10 | REV R1

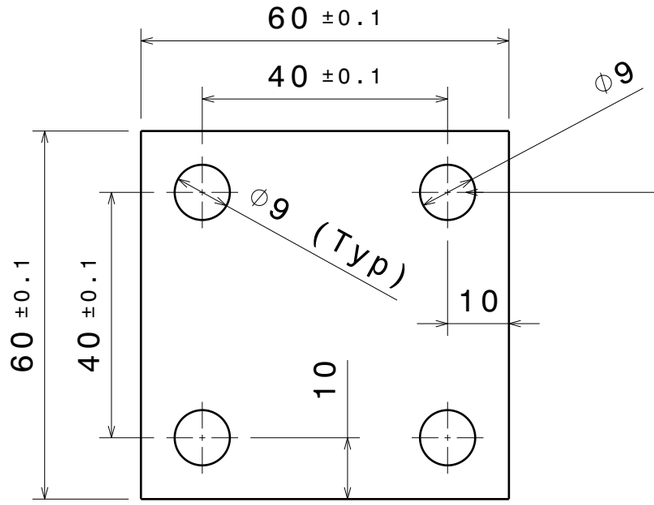
DRG.NO IPR/ATD/PCS/10-1 | SHEET 02 OF 08

Note: All sharp edges to be rounded to a 1mm fillet radius.



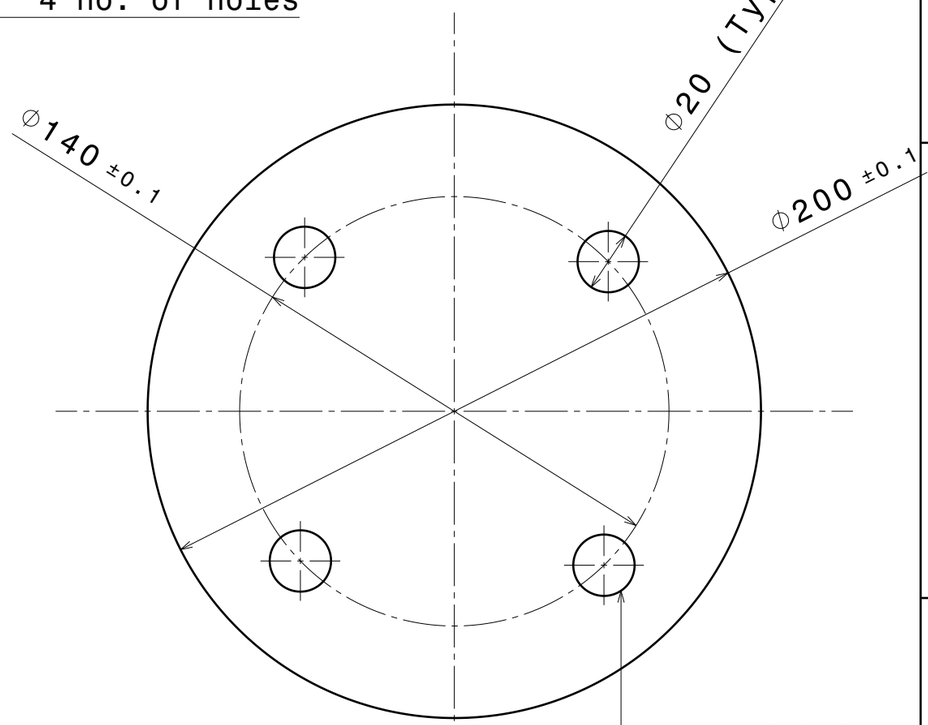
Part - 1.4

Thickness - 5 mm



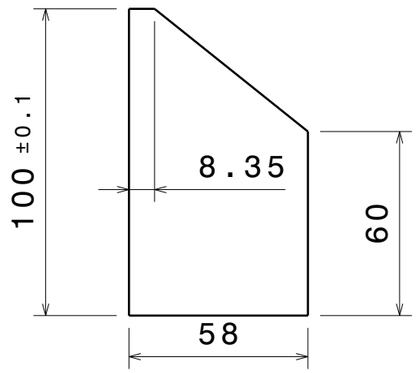
Part - 1.5

Thickness - 5 mm



Part- 1.6

Thickness - 15 mm



Part-1.7

Thickness-10mm

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN						
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											
LENGTH IN mm OF SHORTER SIDE OF ANGLES											
UPTO 10	10-50	50-120	OVER 120-400								
±1°	±0°-30'	±0°-20'	±0°-10'								

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	±0.1	±0.2	±0.3	±0.5	±1	±2

ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

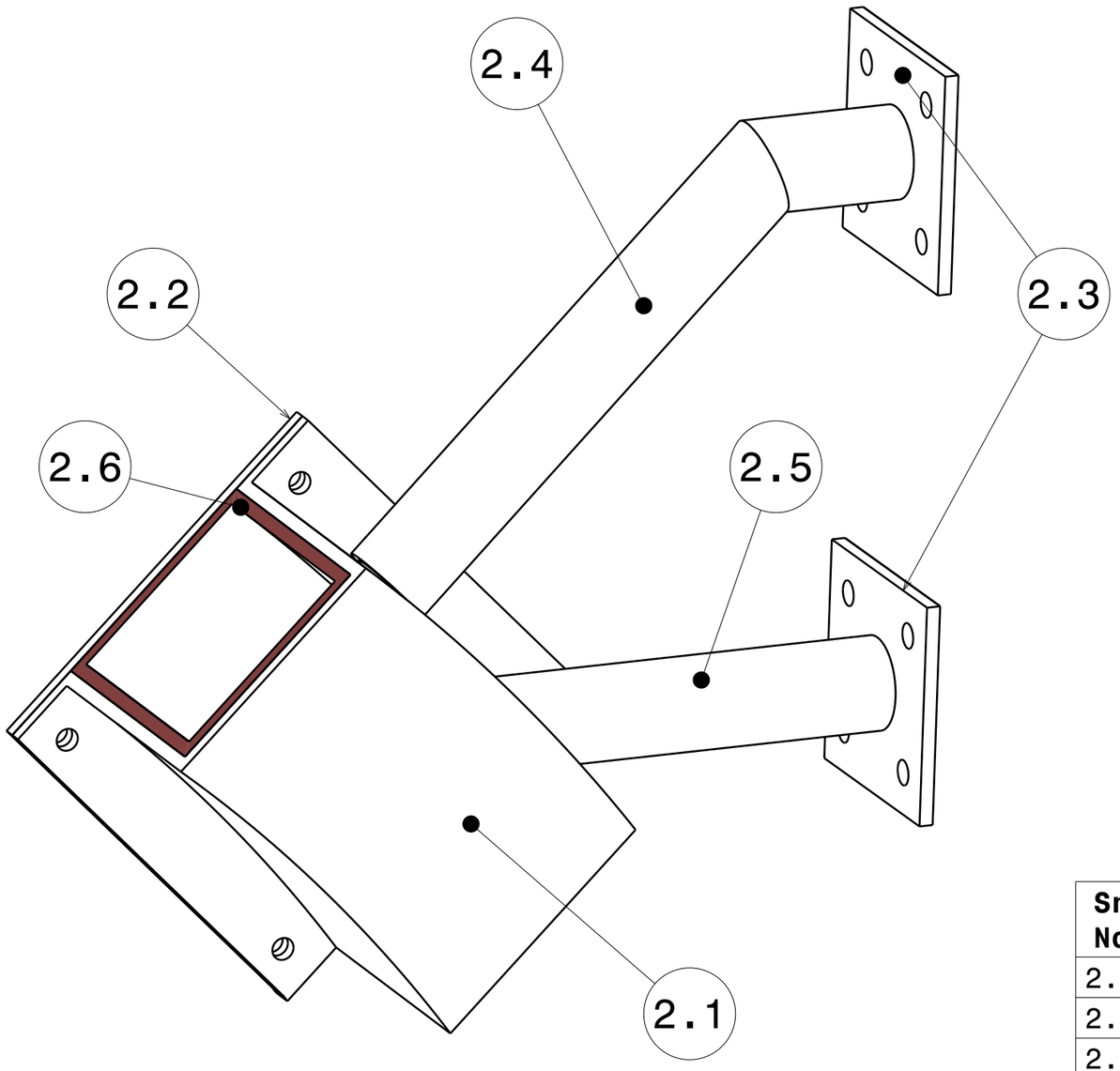
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

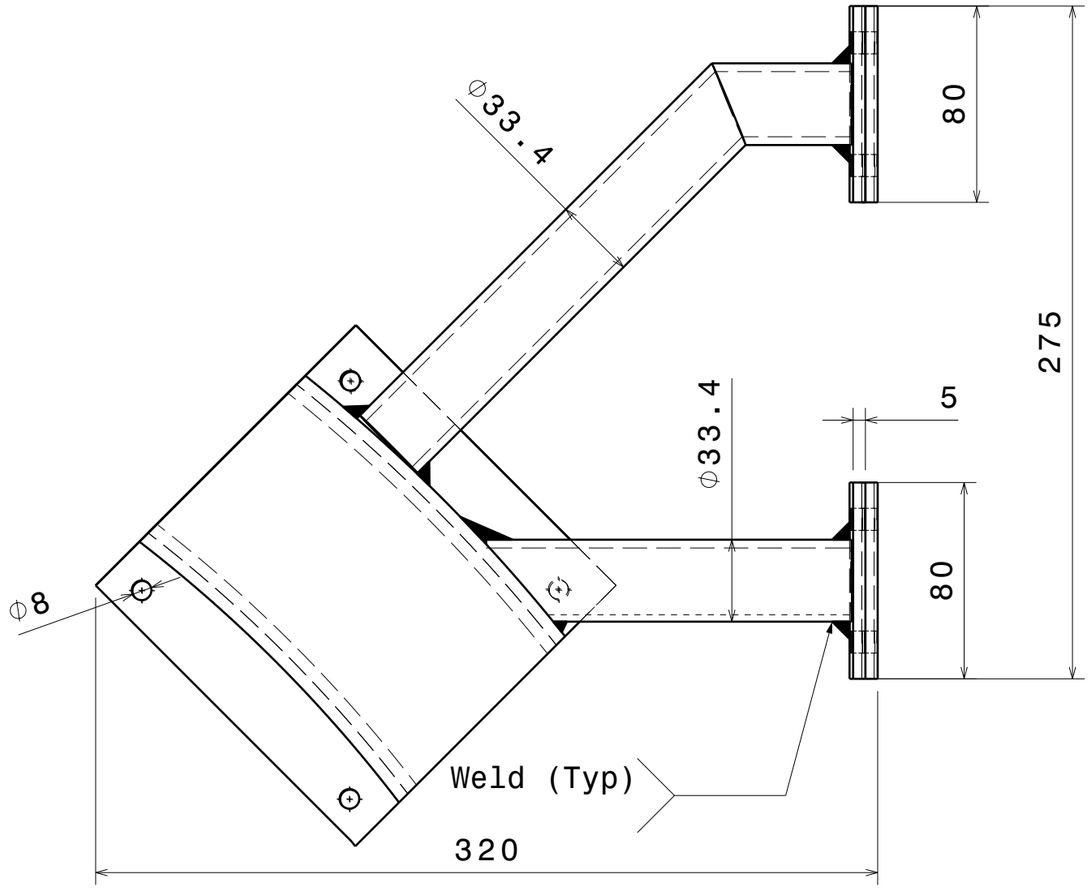
THIRD ANGLE PROJECTION

Details of connector plate, bottom flange and supporting ribs

REF DRG NO:IPR/ATD/PCS/10 — REV R1

DRG.NO IPR/ATD/PCS/10-2 — SHEET 03 OF 08





Sr No	Description	Mateial	Qty(Nos)	Remarks
2.1	Leg Holder	SS304	2	Details on Sheet 5
2.2	Cover	SS304	2	Details On Sheet 5
2.3	Connector Plate -80x80	SS304	4	Details on Sheet 6
2.4	Pipe - Y Link	SS304	4	Details on Sheet 6
2.5	Pipe -Straight Link	SS304	8	Details on Sheet 6
2.6	Insulation	G10	2	Details on Sheet 6

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

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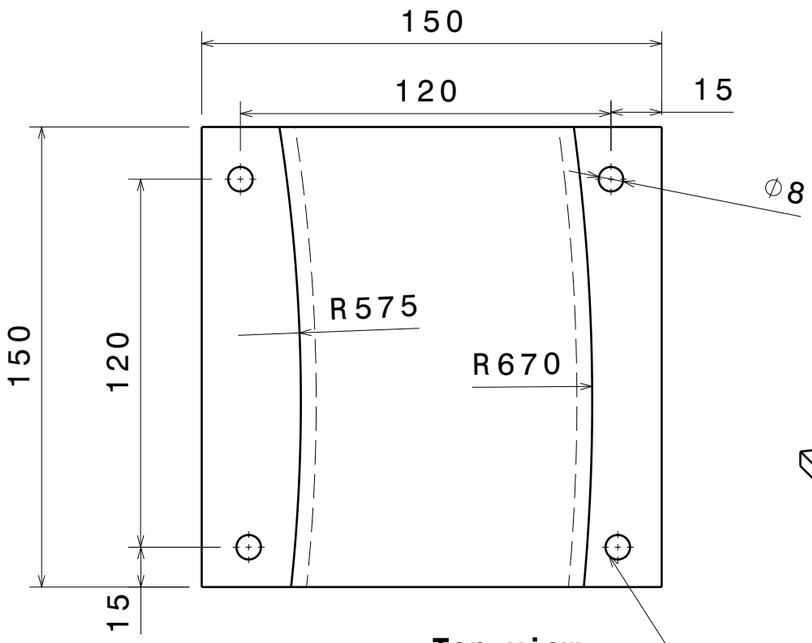
INDIA

THIRD ANGLE PROJECTION

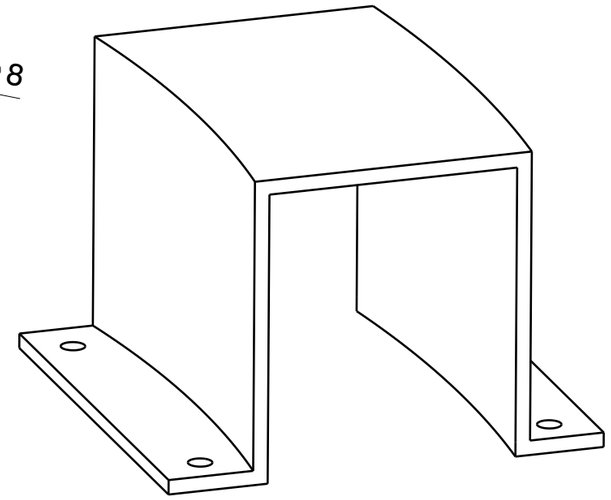
Assembly: TF Outer leg holder

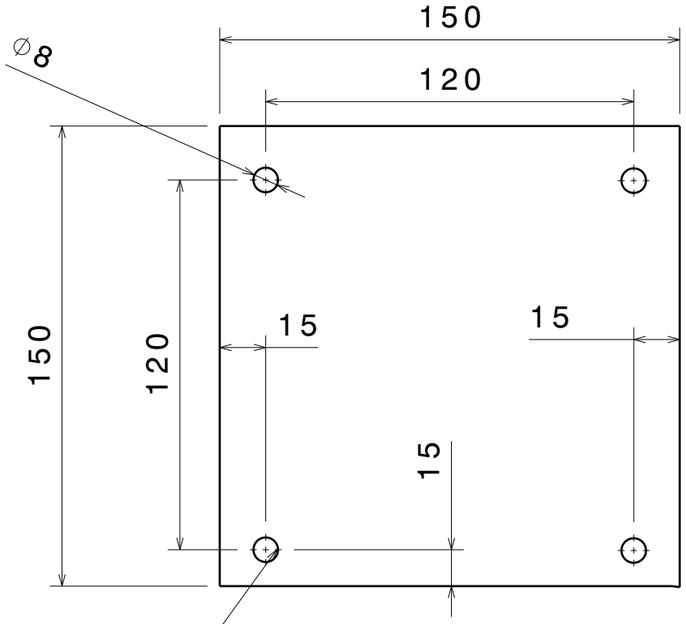
REF DRG NO:IPR/ATD/PCS/10 | REV R1

DRG.NO IPR/ATD/PCS/10-3 | SHEET 04 OF 08



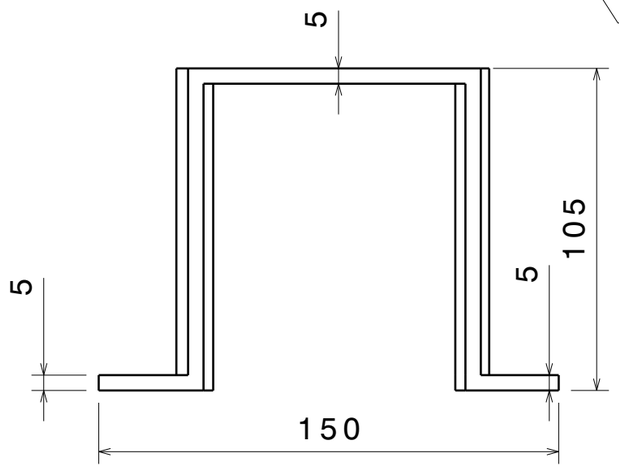
Top view





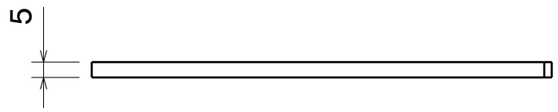
Top view

Leg Holder



Front view

Part2.1- Leg Holder



Front view

Part 2.2 Cover

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

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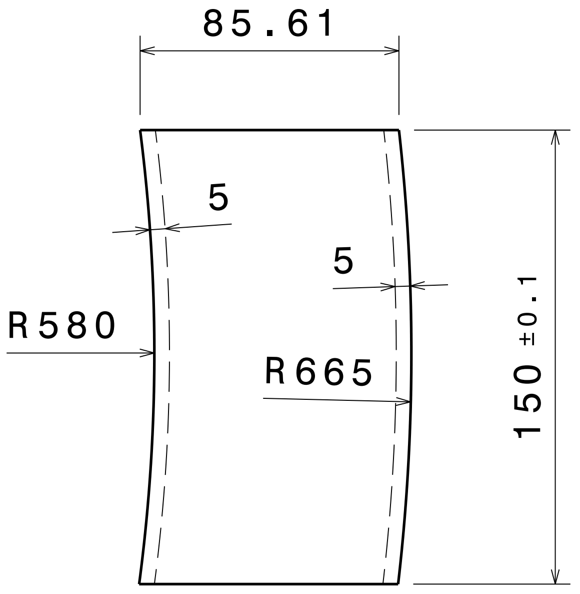
INDIA

THIRD ANGLE PROJECTION

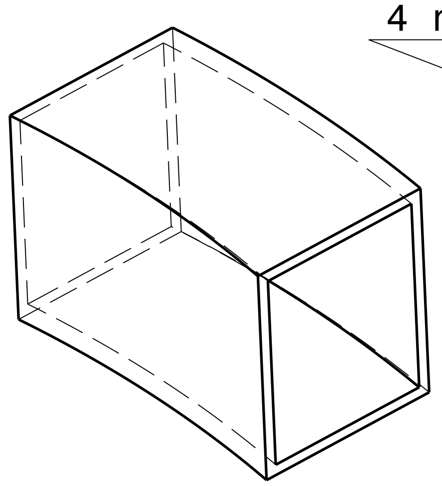
Details of holder and cover

REF DRG NO:IPR/ATD/PCS/10 — REV R1

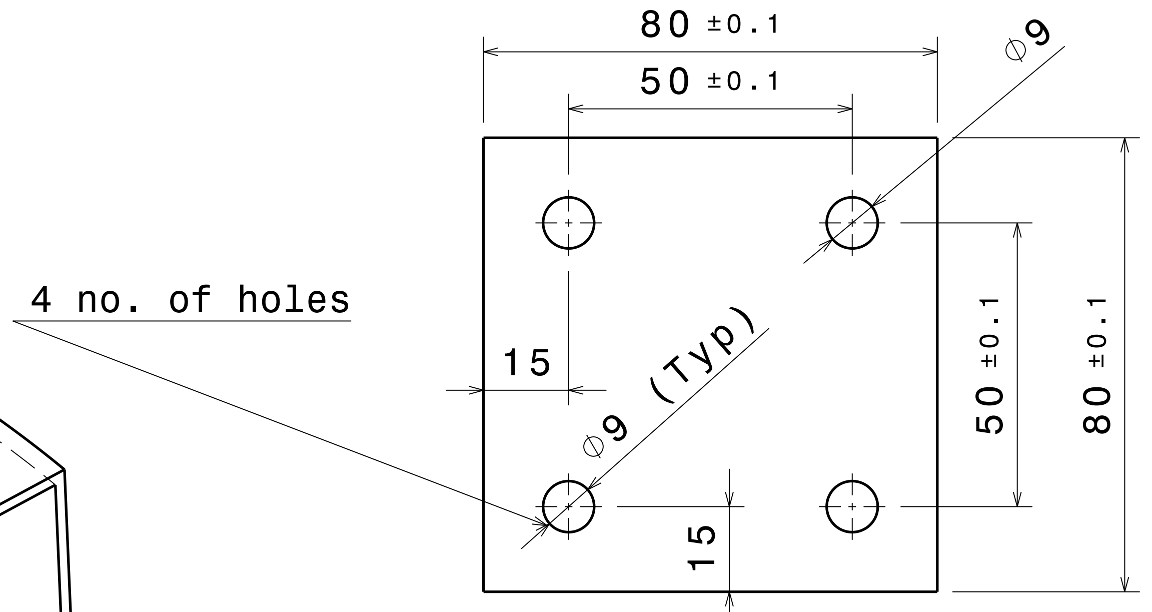
DRG.NO IPR/ATD/PCS/10-4 — SHEET 05 OF 08



Top view

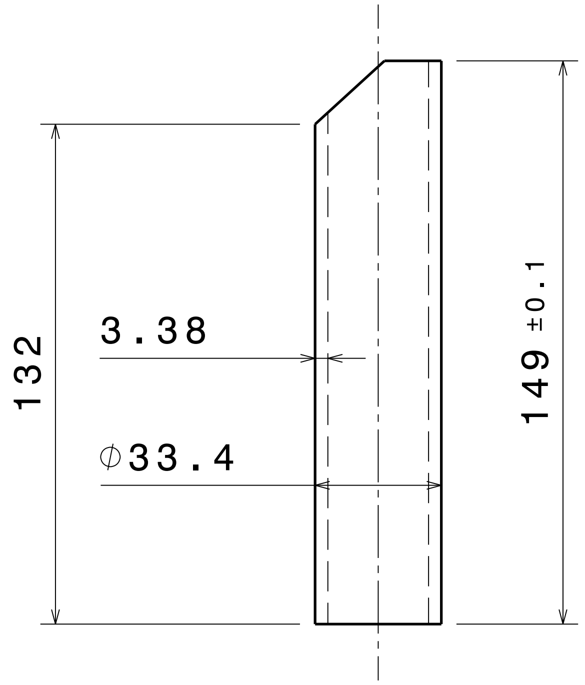


Part- 2.6

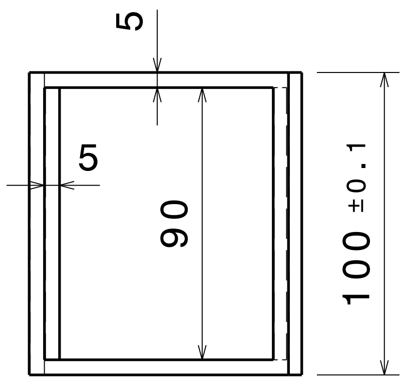


Part - 2.3

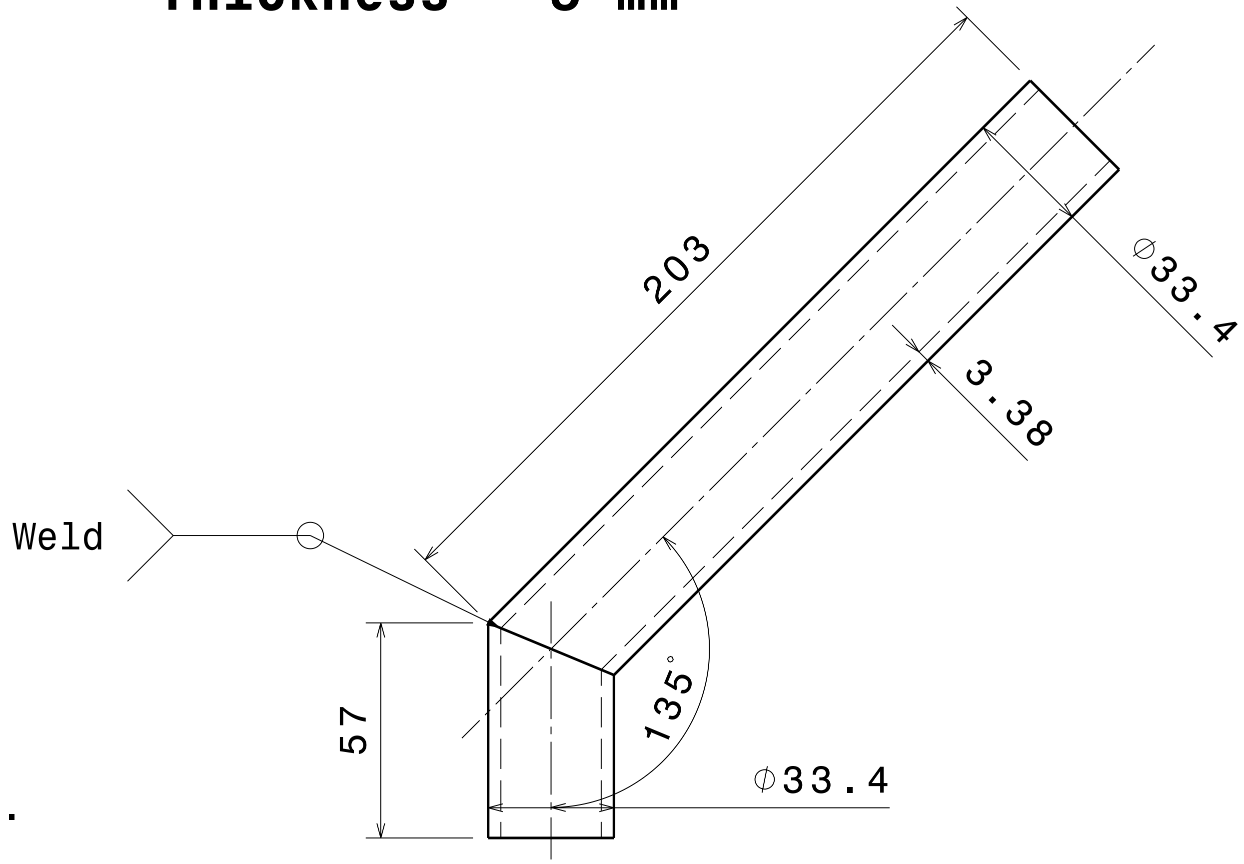
Thickness - 5 mm



Part-2.5



Front view



Note: All sharp edges to be rounded to a 1mm fillet radius.

Part-2.4

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES

UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

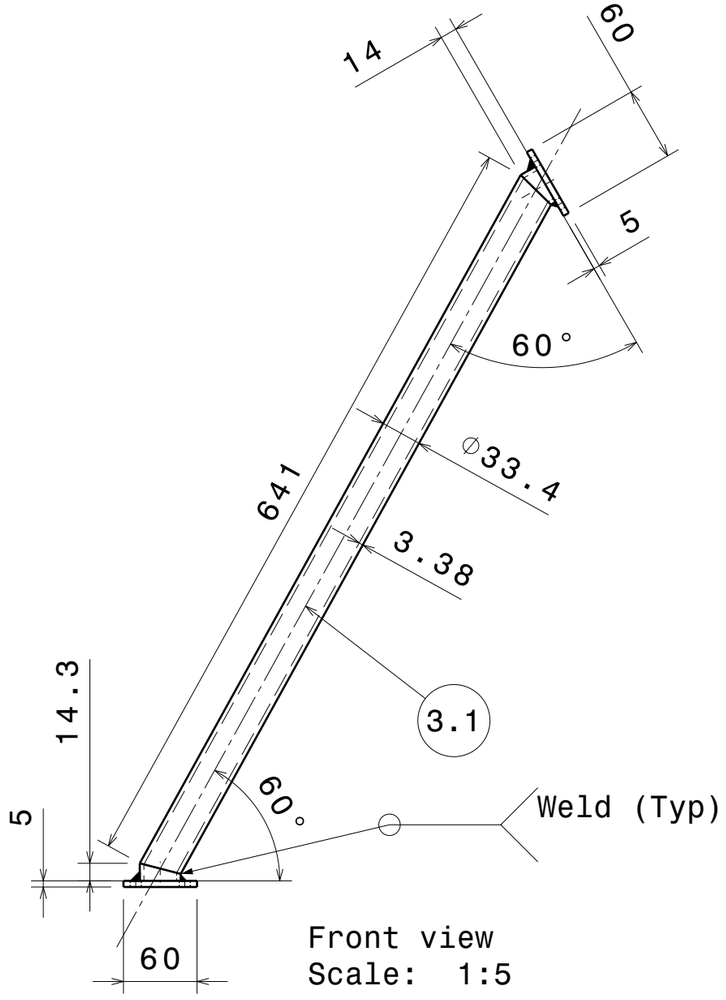
ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

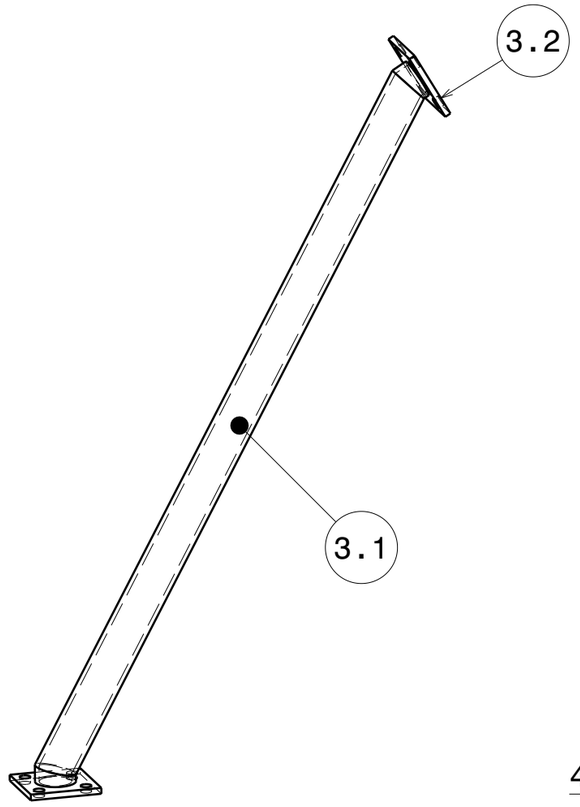
THIRD ANGLE PROJECTION

Details of connector plate, Pipe and insulation

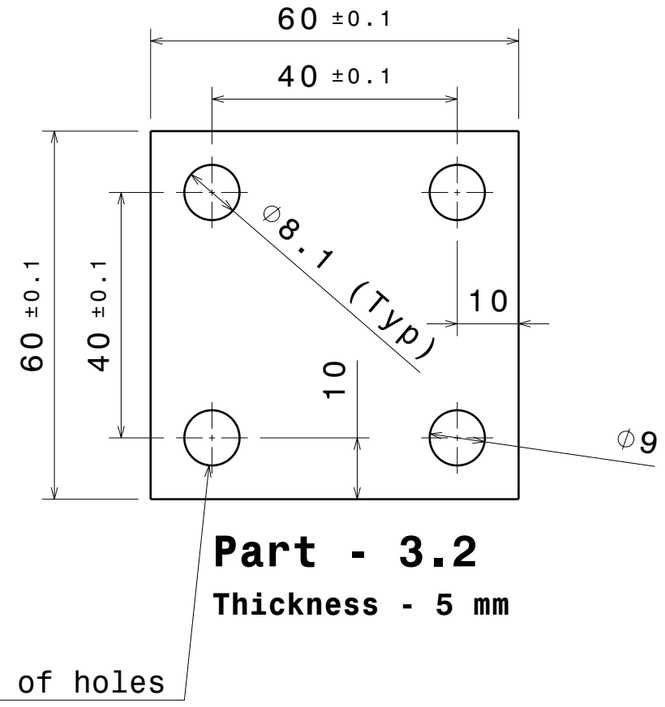
REF DRG NO:IPR/ATD/PCS/10	REV R1
DRG.NO IPR/ATD/PCS/10-5	SHEET 06 OF 08



Front view
Scale: 1:5



Part-3
Connecting Rod



Part - 3.2
Thickness - 5 mm

4 no. of holes

Note: All sharp edges to be rounded to a 1mm fillet radius.

Sr No	Description	Mateial	Qty(Nos)	Remarks
3.1	1" Seamless Pipe	SS304	2	-
3.2	Connecting Plate 60x60	SS304	4	-

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

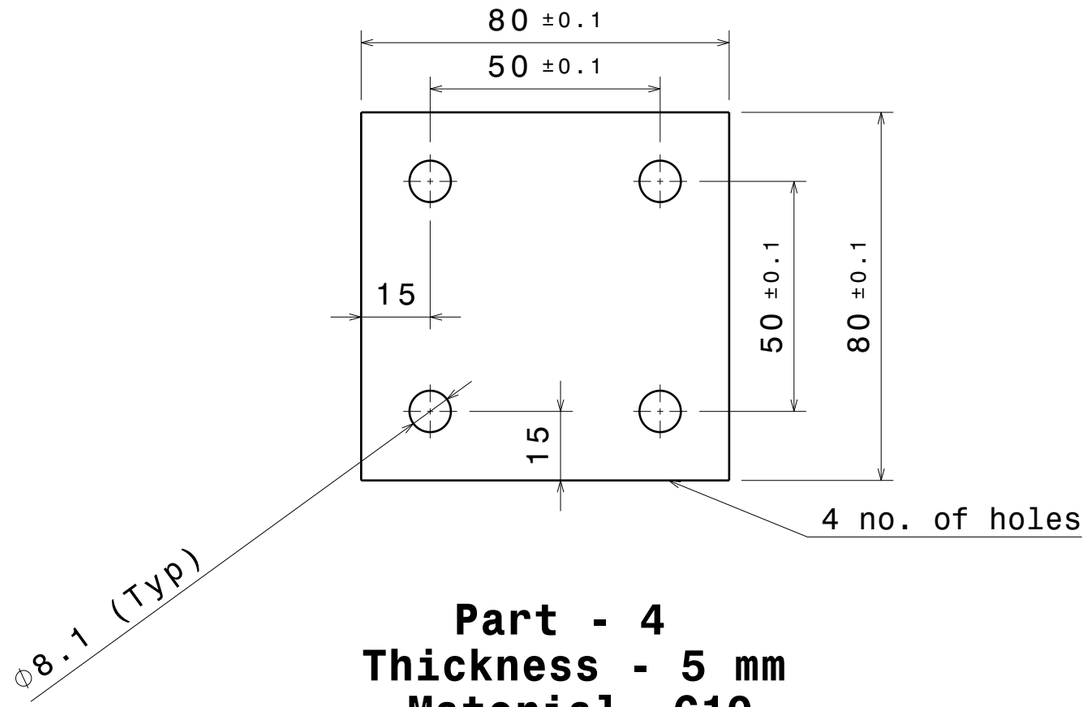
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

THIRD ANGLE PROJECTION

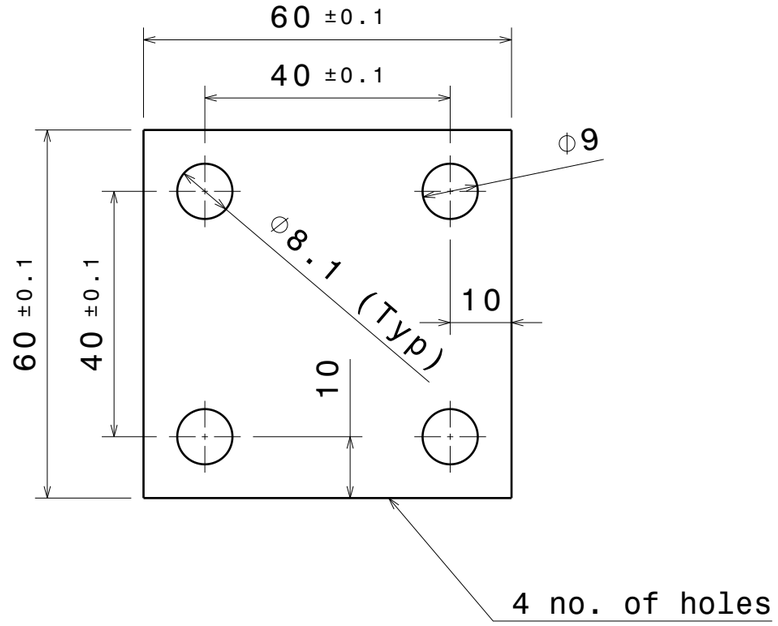
Details of connecting rod

REF DRG NO:IPR/ATD/PCS/10 REV R1

DRG.NO IPR/ATD/PCS/10-6 SHEET 07 OF 08



Part - 4
Thickness - 5 mm
Material- G10



Part - 5
Thickness - 5 mm
Material-G10

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN						ASS'Y GROUP/ DIVISION: / SIZE A3
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											SCALE: NTS / DATE
LENGTH IN mm OF SHORTER SIDE OF ANGLES											DRAWN: Ankur / 8/12/21
UPTO 10	10-50	50-120	OVER 120-400								CHECKED: Aditya / 13/12/21
±1°	±0°-30'	±0°-20'	±0°-10'								APPROVED:

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

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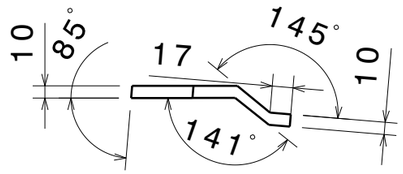
THIRD ANGLE PROJECTION

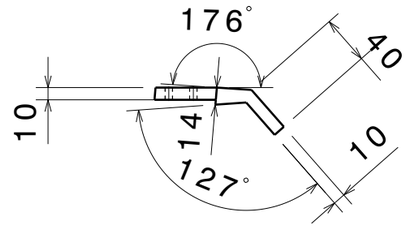
Details of connector plate

REF DRG NO:IPR/ATD/PCS/10 — REV R1

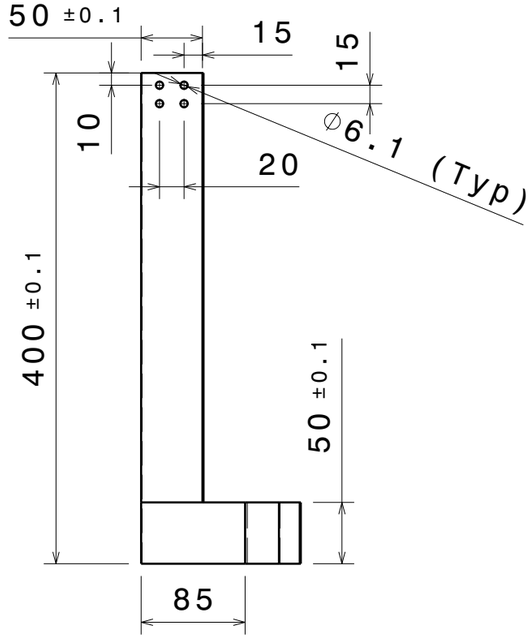
DRG.NO IPR/ATD/PCS/10-7 — SHEET 08 OF 08



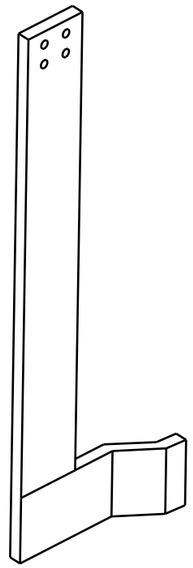
Top View



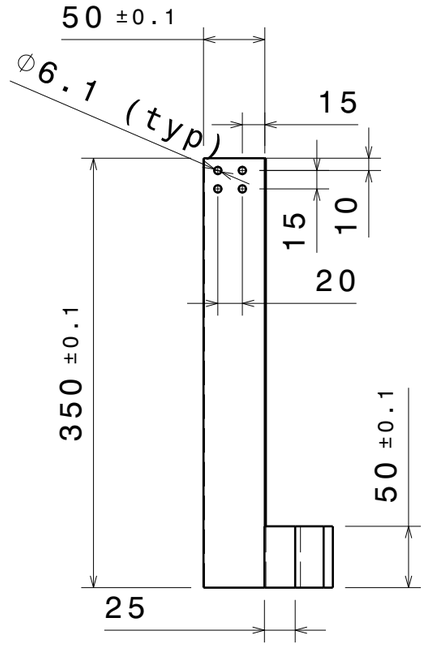
Top View



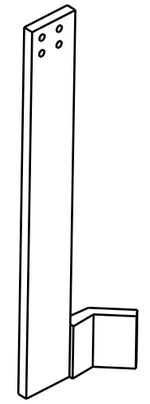
Front view



End Connector - 1
Qty-1 No
Material-ETP Copper



Front view



End Connector -2
Qty- 1No
Material- ETP Copper

Note: All sharp edges to be rounded to a 1mm fillet radius.

Bus Bar Shape can be routed as per the availibilty of the space

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:			SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

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INDIA

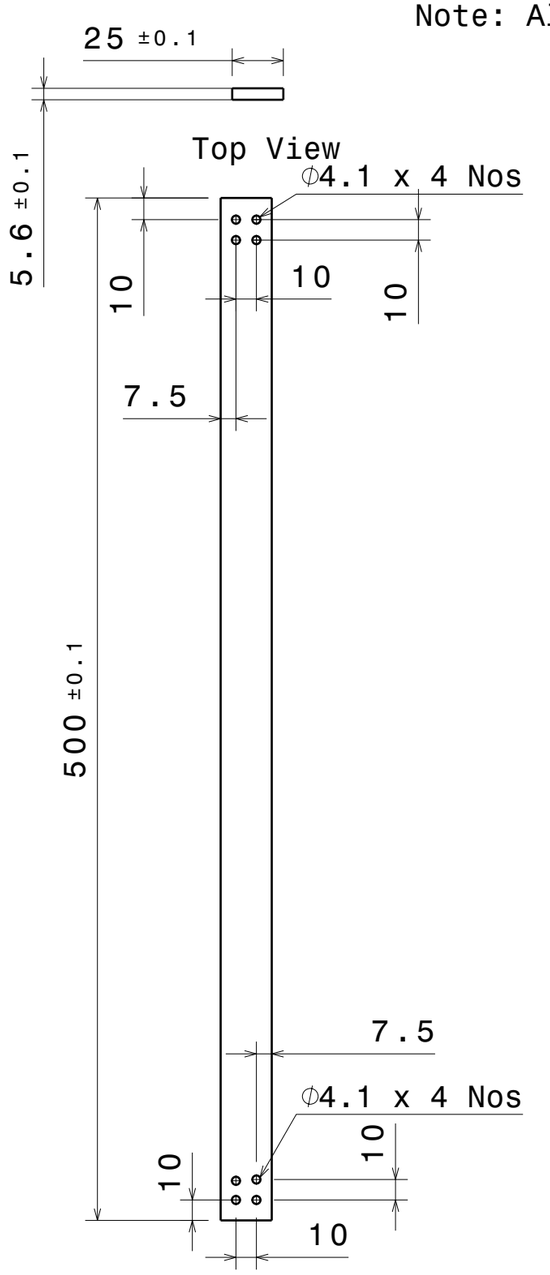
THIRD ANGLE PROJECTION

TITLE **TF coil: End connectors**

REF DRG NO: IPR/ATD/PCS/02 & 03 — REV R1

DRG.NO IPR/ATD/PCS/11 — SHEET 01 OF 01

Note: All sharp edges to be rounded to a 1mm fillet radius.



Bus Bar for OH Coil

Material- EPT Copper

Qty- 2 Nos

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

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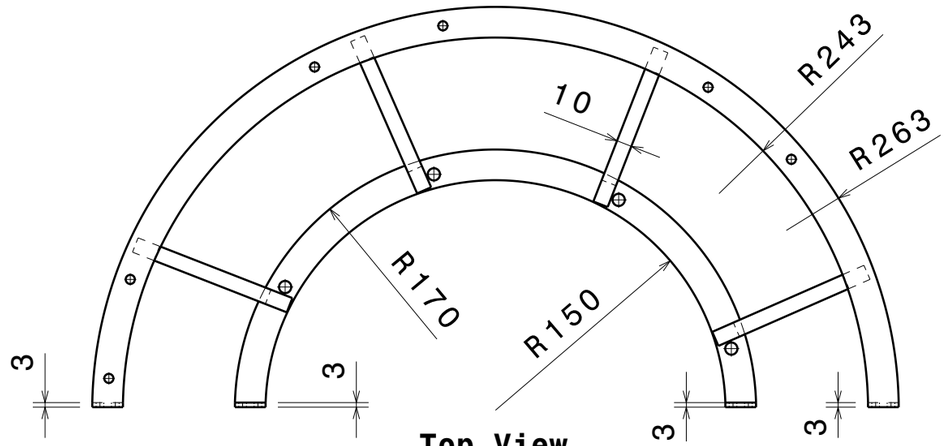
INDIA

THIRD ANGLE PROJECTION

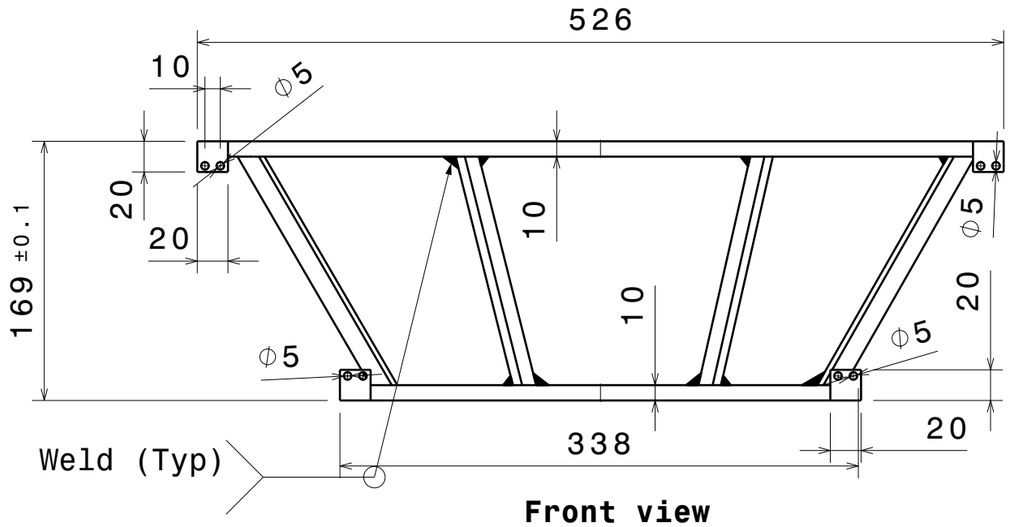
OH coil: Bus bar end connectors

REF DRG NO: IPR/ATD/PCS/04 REV R1

DRG.NO IPR/ATD/PCS/12 SHEET 01 OF 01

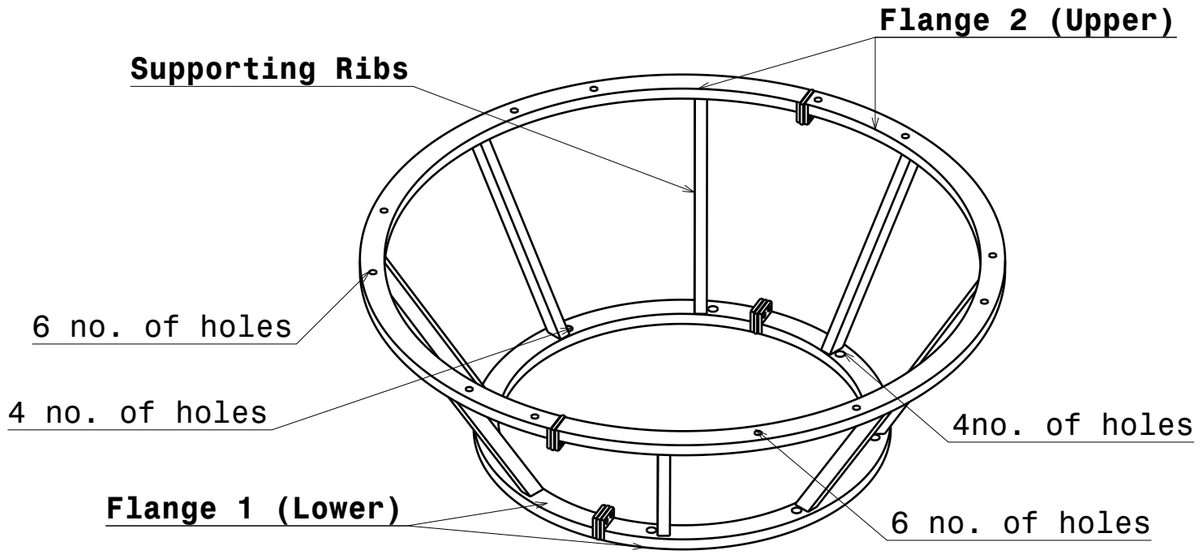


Top View

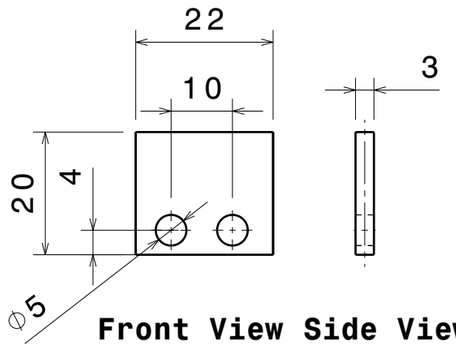


Front view

Inverted Pedestal (Half)
Material-SS304
Qty- 2Nos



Inverted Pedestal (Assembled)

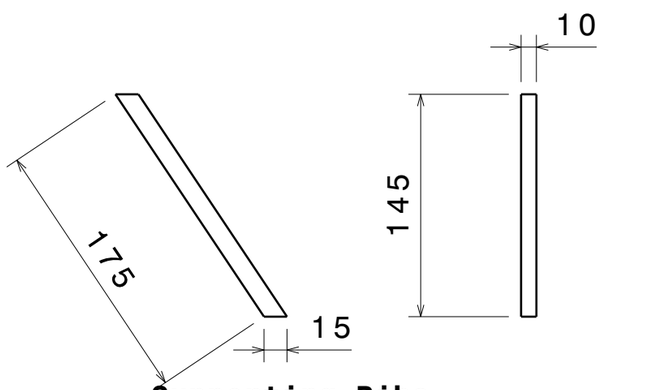


Front View Side View

Insulation

Material- G10

Qty-8Nos



Supporting Ribs
Material-SS304
Qty- 8 Nos

Side View

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN						
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											
LENGTH IN mm OF SHORTER SIDE OF ANGLES											
UPTO 10	10-50	50-120	OVER 120-400								
±1°	±0°-30'	±0°-20'	±0°-10'								

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	±0.1	±0.2	±0.3	±0.5	±1	±2

ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

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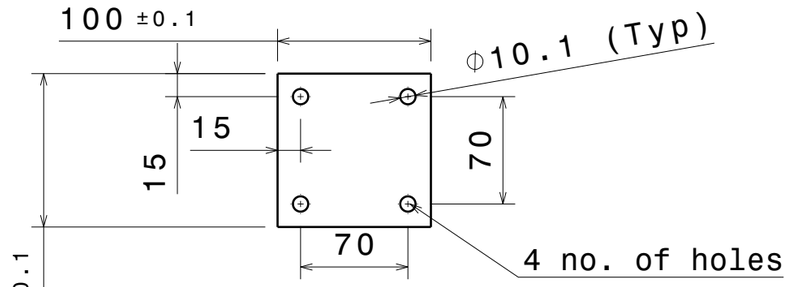
INDIA

THIRD ANGLE PROJECTION

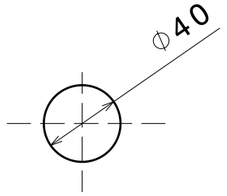
Details of Inverted Pedestal

REF DRG NO: IPR/ATD/PCS/01 — REV R1

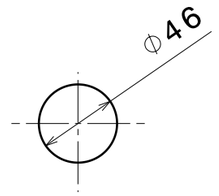
DRG.NO: IPR/ATD/PCS/13 — SHEET 01 OF 01



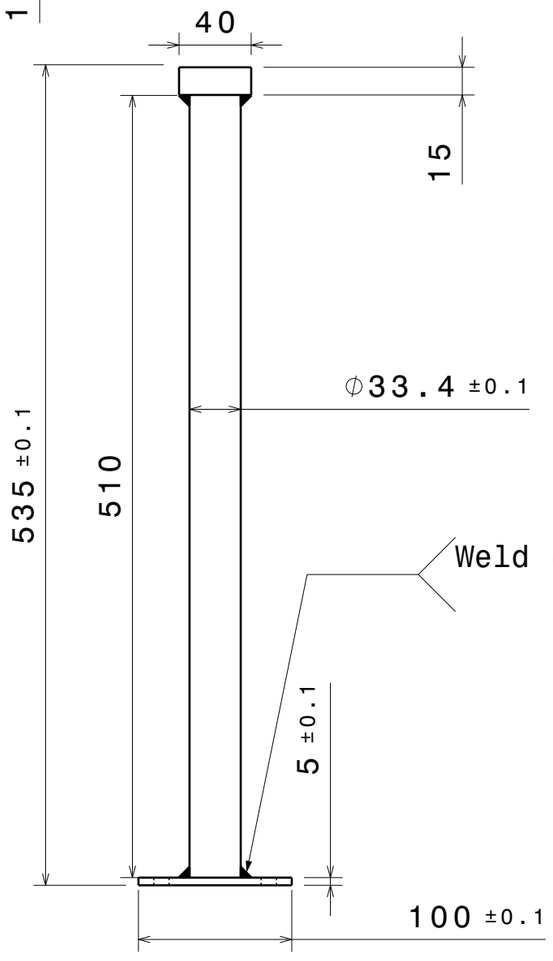
Part 1 - Base Pate
Thickness- 5mm



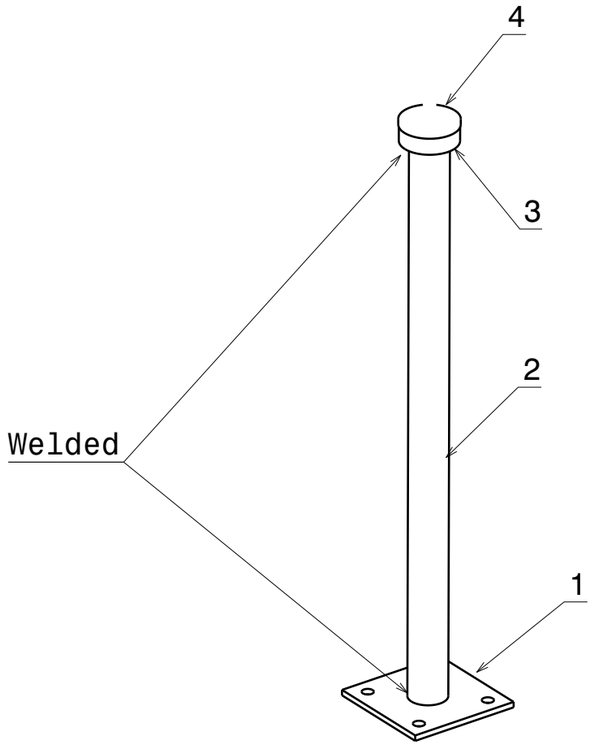
Part - 3 SS Disc
Thickness- 15mm



Part 4- Insulation Disc
Thickness- 5mm



Support - Assembly View



Sr No	Description	Material	Qty	Remarks
1	Base Plate	SS304	1	-
2	1" Seamless Pipe Length -510mm	SS304	1	SCH 40
3	SS Disc	SS304	1	-
4	Insulation Disc	G10	1	

Support for Central G-10 Rod

Qty-1 No

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

REVISION COLUMN

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

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INDIA

THIRD ANGLE PROJECTION

Machine Centre with Support

REF DRG NO: IPR/ATD/PCS/01 — REV R1

DRG.NO IPR/ATD/PCS/14 — SHEET 01 OF 01

Sr No	Description	Material	Qty (Nos)	Remarks
1	M20x200 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	12	Anchor bolts for PCS Lower Support Structure Bottom Flange
2	M20x200 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	24	Anchor bolts for TF outer leg support assembly
3	M8 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	336	Set Includes Nut Bolt & wedge lock washer for TF outer leg assembly support
4	M6 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	8	Set Includes Nut Bolt & wedge lock washer for TF coil end connectors
5	M4 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	8	Set Includes Nut Bolt & wedge lock washer for OH coil end connectors
6	M4 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	8	Set Includes Nut Bolt & wedge lock washer for Inverted Pedestal
7	M10 Hex Bolts (SS304) with wedge lock washers (SS316)	SS304	4	Set Includes Nut Bolt & wedge lock washer for Central G-10 Rod
8	Insulation-TF Inner Bottom	G10	1	Refer Sheet 2
9	Insulation- TF Inner Leg Bottom	G10	1	Refer Sheet 2
10	Insulation- TF Inner Leg Bottom_1	G10	1	Refer Sheet 2
11	Insulation- TF Inner Leg Bottom_2	G10	1	Refer Sheet 2
12	Insulation-Cap for G10 Support	G10	1	Refer Sheet 3

Note- 1.) Wedge Lock washers used shall be of SS316 material.

2.) All bolts to be insulated with G10 Sleeves

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

ASS'Y GROUP/ DIVISION:	SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED	

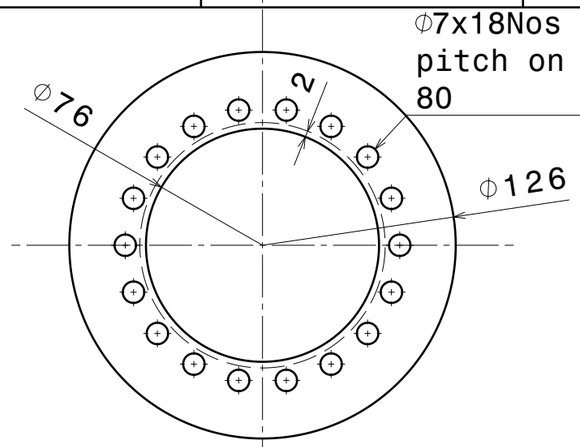
INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

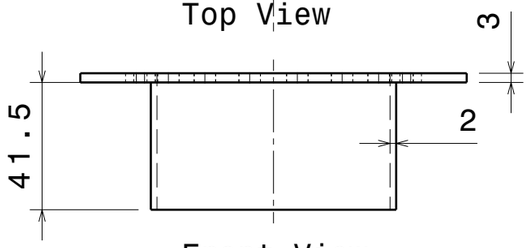
THIRD ANGLE PROJECTION

Details of PCS bolts and nuts

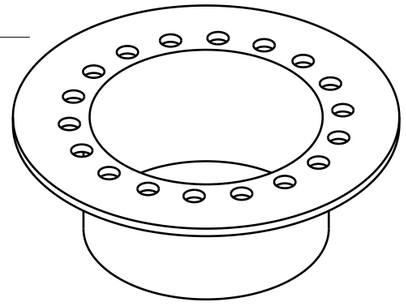
REF DRG NO:	IPR/ATD/PCS/01	REV R1
DRG.NO	IPR/ATD/PCS/15	SHEET 01 OF 03



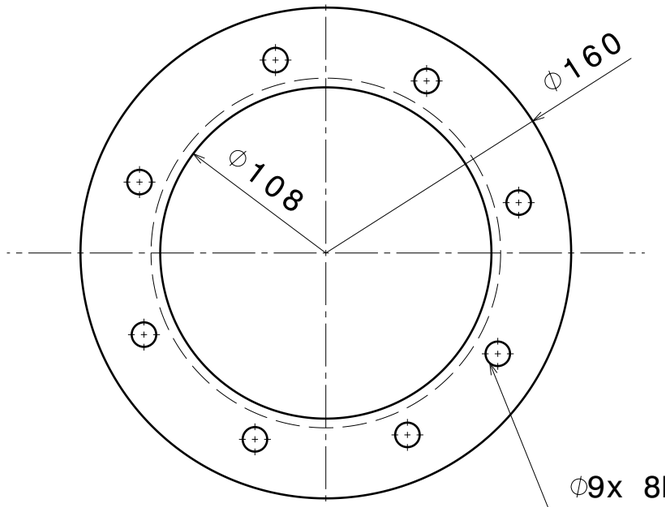
Top View



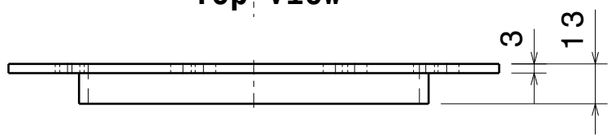
Front View



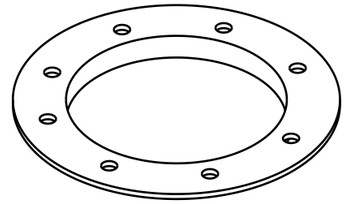
Insulation -TF Inner Bottom



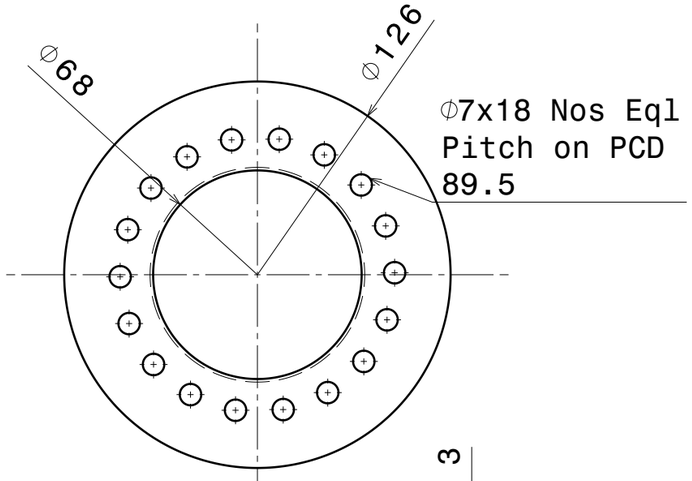
Top View



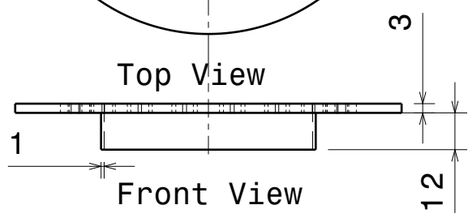
Front View



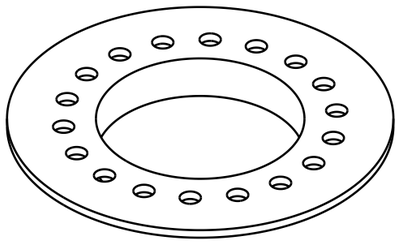
Insulation- TF Inner Leg Bottom



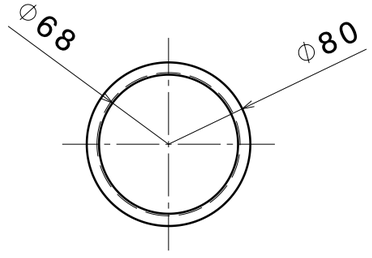
Top View



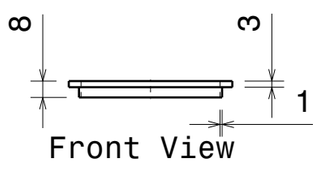
Front View



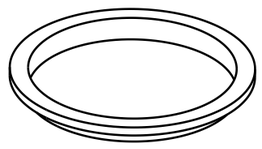
Insulation -TF Inner Leg Bottom_1



Top View



Front View



Insulation-TF Inner leg Bottom_2

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

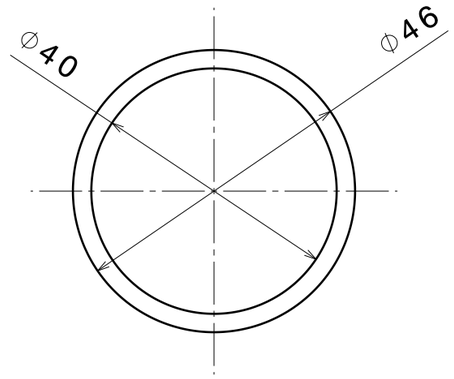
ASS'Y GROUP/ DIVISION:		SIZE	A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED			
SCALE	NTS	DATE	
DRAWN	Ankur	8/12/21	
CHECKED	Aditya	13/12/21	
APPROVED			

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

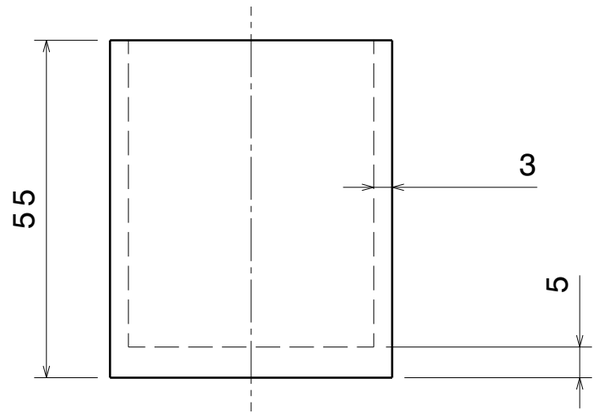
THIRD ANGLE PROJECTION

Details of PCS support G10 insulation

REF DRG NO: IPR/ATD/PCS/06 & 07	REV R1
DRG.NO IPR/ATD/PCS/15-1	SHEET 02 OF 03



Top View



Front View

G10 Support Cap

Note: All sharp edges to be rounded to a 1mm fillet radius.

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025
CO-ORDINATED BY				

MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS

LENGTH IN mm OF SHORTER SIDE OF ANGLES			
UPTO 10	10-50	50-120	OVER 120-400
±1°	±0°-30'	±0°-20'	±0°-10'

LENGTH OR DIA	0-6	6-30	30-120	120-315	315-1000	1000-2050
	± 0.1	± 0.2	± 0.3	±0.5	±1	±2

REVISION COLUMN

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY

ASS'Y GROUP/ DIVISION:		SIZE A3
ALL DIMENSIONS ARE IN `mm' UNLESS OTHERWISE STATED		
SCALE	NTS	DATE
DRAWN	Ankur	8/12/21
CHECKED	Aditya	13/12/21
APPROVED		

INSTITUTE FOR PLASMA RESEARCH
BHAT, GANDHINAGAR-382 428.
INDIA

THIRD ANGLE PROJECTION

Details of G10 support cap insulation

REF DRG NO: IPR/ATD/PCS/14 — REV R1

DRG.NO IPR/ATD/PCS/15-2 — SHEET 03 OF 03

SECTION 'E':

PRICE SCHEDULE

Validate Print Help

Item Rate BoQ

Tender Inviting Authority: Head - Purchase Section

Name of Work : Manufacturing Drawings, Fabrication, Assembly, Pre-dispatch Inspection & Testing, Supply, Installation and Final Acceptance Tests at IPR of Ohmic Coil and Toroidal Field Coils Assembly alongwith Mandatory Spares as per the detailed specifications mentioned in the tender document.

Tender No: IPR/TN/PUR/TPT/ET/21-22/052 Dated 23/02/2022

Name of the Bidder/ Bidding Firm / Company :	

PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

NUMBER #	TEXT #	NUMBER #	TEXT #	NUMBER #	NUMBER #	TEXT #
Sl. No.	Item Description	Quantity	Units	BASIC RATE In Figures To be entered by the Bidder in Rs. P	TOTAL AMOUNT Without Taxes in Rs. P	TOTAL AMOUNT In Words
1	2	4	5	13	53	55
1	**Manufacturing Drawings, Fabrication, Assembly, Pre-dispatch Inspection & Testing, Supply, Installation and Final Acceptance Tests at IPR of Ohmic Coil and Toroidal Field Coils Assembly alongwith Mandatory Spares as per the detailed specifications mentioned in the tender document.**					
1.01	Manufacturing Drawings, Fabrication, Assembly, Pre-dispatch Inspection & Testing, Supply including Unloading at IPR of Ohmic Coil and Toroidal Field Coil Assembly alongwith Mandatory Spares as per the detailed specifications mentioned in the tender documents	1.000	Assembly		**0.00**	INR Zero Only
1.02	Installation, Testing and Final Acceptance Tests at IPR Site, Bhat, Gandhinagar, of above system as per the details mentioned in the tender documents	1.000	Job		**0.00**	INR Zero Only
Total in Figures					**0.00**	INR Zero Only
Quoted Rate in Words					**INR Zero Only**	