


Government eProcurement System		eProcurement System Government of India	
		Tender Details	
		Date : 04-Jun-2024 05:16 PM	
		 Print	
<b>Basic Details</b>			
<b>Organisation Chain</b>	Bose Institute - Kolkata		
<b>Tender Reference Number</b>	BI-K/E-TEND/01/2024-25		
<b>Tender ID</b>	2024_BIK_809893_1	<b>Withdrawal Allowed</b>	Yes
<b>Tender Type</b>	Single	<b>Form of contract</b>	Supply
<b>Tender Category</b>	Goods	<b>No. of Covers</b>	2
<b>General Technical Evaluation Allowed</b>	No	<b>ItemWise Technical Evaluation Allowed</b>	No
<b>Payment Mode</b>	Offline	<b>Is Multi Currency Allowed For BOQ</b>	No
<b>Is Multi Currency Allowed For Fee</b>	No	<b>Allow Two Stage Bidding</b>	No
<b>Payment Instruments</b>		<b>Cover Details, No. Of Covers - 2</b>	
Offline	<b>S.No</b>	<b>Instrument Type</b>	
	1	Bankers Cheque	
	2	Bank Guarantee	
	3	Demand Draft	
	4	FDR	
	5	NEFT	
<b>Cover No</b>	<b>Cover</b>	<b>Document Type</b>	<b>Description</b>
1	Fee/PreQual/Technical	.pdf	NIT
		.pdf	EMD
		.pdf	PRECONTRACT INTEGRITY PACT
		.pdf	STATUTORY DOCUMENTS
		.pdf	NONSTATUTORY DOCUMENTS
		.pdf	TECHNICAL BID
2	Finance	.xls	BOQ
		.pdf	ADDITIONAL DOCUMENT, IF ANY
<b>Tender Fee Details, [Total Fee in ₹ * - 0.00]</b>		<b>EMD Fee Details</b>	
<b>Tender Fee in ₹</b>	0.00	<b>EMD Amount in ₹</b>	30,00,000
<b>Fee Payable To</b>	Nil	<b>EMD Exemption Allowed</b>	Yes
<b>Fee Payable At</b>	Nil	<b>EMD Fee Type</b>	fixed
<b>Tender Fee Exemption Allowed</b>	No	<b>EMD Payable To</b>	Bose Institute
		<b>EMD Percentage</b>	NA
		<b>EMD Payable At</b>	Kolkata
<a href="#">Click to view modification history</a>			
<b>Work /Item(s)</b>			
<b>Title</b>	Power Converters For Corrector Magnets in SFRS Type FR C3		
<b>Work Description</b>	Power Converters For Corrector Steerer Sextupole and Octupole Magnets in SFRS Type FR C3		
<b>Pre Qualification Details</b>	As per tender document		
	Shri Umakant Lal and Shri Vishnu Agarwal		

<b>Independent External Monitor/Remarks</b>					
<b>Show Tender Value in Public Domain</b>	No				
<b>Tender Value in ₹</b>	15,50,00,000	<b>Product Category</b>	Electronics Equipment	<b>Sub category</b>	NA
<b>Contract Type</b>	Tender	<b>Bid Validity(Days)</b>	120	<b>Period Of Work (Days)</b>	450
<b>Location</b>	FAIR, GERMANY 64291	<b>Pincode</b>	700091	<b>Pre Bid Meeting Place</b>	Unified Academic Campus Kolkata 700091
<b>Pre Bid Meeting Address</b>	Bose Institute, Unified Academic Campus, Block EN 80 Sector V Kolkata 700091	<b>Pre Bid Meeting Date</b>	11-Jun-2024 12:00 PM	<b>Bid Opening Place</b>	Bose Institute Unified Academic Campus Kolkata 91
<b>Should Allow NDA Tender</b>	No	<b>Allow Preferential Bidder</b>	No		

**Critical Dates**

<b>Publish Date</b>	04-Jun-2024 05:25 PM	<b>Bid Opening Date</b>	05-Jul-2024 12:00 PM
<b>Document Download / Sale Start Date</b>	04-Jun-2024 05:30 PM	<b>Document Download / Sale End Date</b>	03-Jul-2024 05:00 PM
<b>Clarification Start Date</b>	04-Jun-2024 06:00 PM	<b>Clarification End Date</b>	10-Jun-2024 05:00 PM
<b>Bid Submission Start Date</b>	25-Jun-2024 11:00 AM	<b>Bid Submission End Date</b>	03-Jul-2024 05:00 PM

**Tender Documents**

<b>NIT Document</b>	<b>S.No</b>	<b>Document Name</b>	<b>Description</b>	<b>Document Size (in KB)</b>
	1	Tendernotice_1.pdf	NIT	2888.42

<b>Work Item Documents</b>	<b>S.No</b>	<b>Document Type</b>	<b>Document Name</b>	<b>Description</b>	<b>Document Size (in KB)</b>
	1	BOQ	BOQ_851185.xls	BOQ	284.00
	2	Additional Documents	OP.pdf	Additional documents	656.02

**Single Bidders List**

<b>S.No.</b>	<b>Bidder Name</b>	<b>Bidder Login Id</b>
1.	ELECTRONICS CORPORATION OF INDIA LIMITED	csgmkg@ecil.co.in

**Bid Openers List**

<b>S.No</b>	<b>Bid Opener Login Id</b>	<b>Bid Opener Name</b>	<b>Certificate Name</b>
1.	archie_132000@yahoo.com	ACHINTYA MUKHERJEE	ACHINTYA MUKHERJEE
2.	rajarshi.ray@gmail.com	Rajarshi Ray	RAJARSHI RAY
3.	debdas_nandy@rediffmail.com	DEBDAS NANDY	DEBDAS NANDY

**GeMARPTS Details**

<b>GeMARPTS ID</b>	4YOKQWV9WQ01
<b>Description</b>	POWER CONVERTERS FOR CORRECTOR MAGNETS IN SFRS
<b>Report Initiated On</b>	04-Jun-2024

<b>Valid Until</b>	04-Jul-2024		
<b><u>Tender Properties</u></b>			
<b>Auto Tendering Process allowed</b>	No	<b>Show Technical bid status</b>	Yes
<b>Show Finance bid status</b>	Yes	<b>Stage to disclose Bid Details in Public Domain</b>	Technical Bid Opening
<b>BoQ Comparative Chart model</b>	Normal	<b>BoQ Comparative chart decimal places</b>	2
<b>BoQ Comparative Chart Rank Type</b>	L	<b>Form Based BoQ</b>	No
<b><u>TIA Undertaking</u></b>			
S.No	Undertaking to Order	Tender complying with Order	Reason for non compliance of Order
1	<a href="#">PPP-MII Order 2017</a>	Agree	
2	<a href="#">MSEs Order 2012</a>	Agree	
<b><u>Tender Inviting Authority</u></b>			
<b>Name</b>	Registrar (Officiating)		
<b>Address</b>	Bose Institute, Unified Academic Campus, Block EN 80 Sector V Kolkata 700091		
<b><u>Tender Creator Details</u></b>			
<b>Created By</b>	Rajarshi Ray		
<b>Designation</b>	Registrar		
<b>Created Date</b>	04-Jun-2024 04:30 PM		



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KOLKATA

## **SINGLE TENDER ENQUIRY (STE)**

**STE DOCUMENT FOR  
“POWER CONVERTERS FOR CORRECTOR  
(Steerer, Sextupole and Octupole)  
MAGNETS IN SFRS”**

**Tender Notice No. BI-K/E-TEND/01/2024-25**

**To be addressed to:**

**Registrar (Officiating)**

**Bose Institute, Unified Academic Campus,**

**Block EN, Sector – V**

**Salt Lake**

**Kolkata – 700091 (INDIA)**

**e-mail ID: [registrar\\_office@icbose.ac.in](mailto:registrar_office@icbose.ac.in) / [bipurchase@icbose.ac.in](mailto:bipurchase@icbose.ac.in)**



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CHAPTER - I

**NOTICE INVITING QUOTATION (NIQ)**

To  
M/s. Electronics Corporation of India Limited (ECIL),  
ECIL Post, Hyderabad – 500 062,  
Telangana, India.

Bose Institute, Kolkata, West Bengal, India invites online offer with two bid system (Technical & Financial) from **M/s. Electronics Corporation of India Limited (ECIL), Hyderabad** for **manufacture, testing and supply** of Power Converters as detailed below:

Sl. No.	Name of the item	Qty (Nos.)	Bid security(EMD) (INR)
1.	<b>Power Converters For Corrector (Steerer, Sextupole and Octupole) Magnets in SFRS</b>  Type: FR.C3	70	30.00 Lakh

The prices for **Installation & Commissioning** may be quoted separately (in the additional folder under **price bid**), which if required will be considered.

**\* Unsolicited bids will not be considered**

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Tender No. BI-K/E-TEND/01/2024-25

**Schedule of dates :**

Please incorporate the following in the appropriate place ::

Sl. No.	Particulars	Date & Time
1.	Date of uploading of NIQ & other documents (Online) (Publishing date)	04-06-2024 at 17:00 hrs.
2.	Documents download start date (Online)	04-06-2024 at 17:30 hrs.
3.	Clarification Start date Queries to be sent to the mail id <a href="mailto:registrar_office@jcbose.ac.in">registrar_office@jcbose.ac.in</a> / <a href="mailto:bipurchase@jcbose.ac.in">bipurchase@jcbose.ac.in</a> )	04-06-2024 at 18:00 hrs.
4.	Clarification End date	10-06-2024 upto 17:00 hrs.
5.	<b>Prebid meeting</b>	11-06-2024 at 12:00 noon
6.	Amendment (if any) (On line)	24-06-2024 at 17:00 hrs.
7.	Bid submission start date (On line)	25 -06-2024 at 11:00 hrs.
8.	Documents download end date (Online)	03-07-2024 at 17:00 hrs.
9.	Bid Submission closing (On line)	03-07-2024 at 17:00 hrs.
10.	Last date of submission of Earnest money deposit including the technical brochure, if any (off line) in the Purchase Cell	03-07-2024 within 17:00 hrs.
11.	Bid opening date for Technical Proposals (Online)	05-07-2024 at 12:00 noon
12.	Date for opening of Financial Proposal (Online)	To be notified later



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### **GENERAL INFORMATION TO BIDDER**

*The procurement will be made by Bose Institute in compliance with the Govt. of India rules framed for public procurement from time to time. Notice Inviting Quotation (NIQ) are invited from M/s. ECIL in accordance with Govt. Of India's Public Procurement (Preference to Make In India) order 2017, revision order issued No.P-45021/2/2017-PP (BE-II) dated 16 September 2020.*

<b>INSTRUCTIONS :</b>
<ul style="list-style-type: none"><li>The bids would be opened in the presence of the bidders who wish to attend the Bid-opening. However, the representative should bring with them a letter of authority from the corresponding bidders, without which, they are not permitted to attend the bid opening.</li></ul>
<ul style="list-style-type: none"><li>The acceptance of the quotation will rest with the competent authority of Bose Institute, Kolkata who does not bind himself to accept the lowest quotation and reserves the right to himself to reject, or partially accept any or all the quotations.</li></ul>
<ul style="list-style-type: none"><li>The offer shall be valid for <b>120 days</b> from the date of opening of the technical bid. No revision in price will be allowed after opening the quotation.</li></ul>
<ul style="list-style-type: none"><li>Unsolicited / conditional / incomplete / unsigned digitally tenders shall not be considered.</li></ul>
<ul style="list-style-type: none"><li><u>Offers that have been blindly copied from the tender specifications are not acceptable and shall be rejected.</u></li></ul>
<ul style="list-style-type: none"><li>The Bidder / Company should not be in the list of black listed firms by any Govt. Dept. / agencies.</li></ul>
<ul style="list-style-type: none"><li>To assess in the examination / evaluation, comparison and post qualification of the bids, purchaser may at its discretion, ask the bidder for a clarification of its bid. The request for clarification and the response shall be in writing and no change in the prices or substance of the bids shall be sought, offered or permitted. Any clarification submitted by the bidder in respect of its bid which is not in response to a request by the purchaser shall not be considered.</li></ul>
<ul style="list-style-type: none"><li>Two or more vendors cannot submit bid quoting the rates on behalf of same OEM.</li></ul>
<ul style="list-style-type: none"><li>The mode of dispatch of the items must be mentioned clearly in the quotation.</li></ul>
<ul style="list-style-type: none"><li>Samples, if called for, shall be submitted free of charge and on no obligation basis.</li></ul>
<ul style="list-style-type: none"><li>The offered delivery period shall have to be strictly adhered to in case an order is placed.</li></ul>
<ul style="list-style-type: none"><li>Bidders must submit exact specification in detail against the required tender specification. Writing only yes / no / complied etc. will not be accepted.</li></ul>

**1. Submission of Quotation :** Quotation is to be submitted in CPP Portal only for FR.C3 Power Converters (70 Nos.).

#### **Pre-Bid meeting:**

Venue: Unified Academic Campus of Bose Institute (online option will also be available, link for the online meeting will be displayed in the institute website. The bidder is advised to keep a watch on the institute website for the same).



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1. A. **Technical Proposal:** The Technical proposal should contain scanned copies of the following in two covers as **PQ criteria** as well as their offered technical details

(a) **Statutory Cover** containing the following documents :

- NIQ (The published NIQ duly signed & stamped as acceptance of tender Terms and Conditions)

Annexure 1 : Pre-contract Integrity Pact  
Annexure 2 : Bid Form  
Annexure 3 : Bidder's Information Form  
Annexure 4 : Techno-Commercial Bid Form  
Annexure 5 : Manufacturer's Authorization Form  
Annexure 6 : Bidder's Performance Statement Form  
Annexure 7 : Service Support Details Form  
Annexure 8 : Technical Compliance Statement Form  
Annexure 9 : Fall Clause Certificate  
Annexure 10 : Declaration of local content

(b) **Non-statutory Cover** containing the following documents :

**The bidder has to upload the following requisite certificates:**

1) PAN 2) Factory License 3) GST Registration Certificate 4) Last 3 years Audited Balance Sheet ending on March 31, 2023 with UDIN 5) Machinery list, 6) ISO 9001, ISO 14001, OHSAS 18001 (As applicable), 7) Non-blacklisting declaration on non-judicial stamp paper 8) Valid Export License., 9) Average Annual Turnover of Rs.15.00 Cr. during each of the last 03 Financial Years ending 31 March 2023.

- The Bidder should be an Indian manufacturer.
- That the Bidder will assume total responsibility for the fault-free operation of supplied items, during the warranty period. Necessary undertaking to be given on the company letterhead by the bidder.
- Bidder should have in-house facilities and sufficient infrastructure for manufacturing testing and supplying the offered Power Converter to FAIR Darmstadt (Germany) strictly in conformity with the technical specification. The purchaser reserves the right to verify the set-up of the Bidder to assess their capacity and capability and can reject the offer in case of non compliance. A declaration in this regard to be submitted on bidders letter head.





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- A notarized declaration on non-judicial stamp paper of appropriate value shall be submitted by the bidder that the bidder or manufacturer is not black listed by any Government organization/GST Authority/Department/PSU at the time of bidding. Any such black listed manufacturer is NOT eligible to participate in this tender. In addition to this, the Bidder also should not have been disqualified for non- performance in any of the Government Utilities/Department/Undertaking in the past five years as on the date of submission of bid, otherwise the offer shall be rejected.
- Engineers/ representatives from the purchaser shall have free access during normal working hours to the manufacturing site or testing facilities during the contract period. Written confirmation to that effect on a company letterhead is necessary.
- The bidder shall have Audited Average annual turnover of Rs. 15.00 crore during the last 3 Financial Years ending 31 March, 2023 from similar kind of operation, i.e., manufacturing, testing and supplying of Power Converters or identical items. The bidder shall provide the Audited Annual Accounts (Financial year 2020-21, 2021-22 and 2022-23) and ITR copies for the last 3 Assessment Years (2021-22, 2022-23 and 2023-24).
- **Bidder is required to sign and submit Pre-Integrity pact in prescribed format as per requirement at the time of bid submission, on a non-judicial stamp of value Rs 100, duly signed by both the bidder as well as the buyer. Non- compliance of this would result in rejection of the bid.**

**B. Financial Proposal :**

- a. The financial bid should contain the Bill of Quantities (BOQ) corresponding to this tender, which is available on the tender webpage as an MS-Excel file.
- b. This file must be downloaded and opened with MS-Excel. The rate being quoted by the bidder must be entered in the space marked for this purpose in the file. Quoted rate will be encrypted under BOQ. **In case quoting any rate in Tender Form, the tender is liable to be summarily rejected.**
- c. All fields in the BOQ file other than those allocated for the name of the bidder and the rate(s) being quoted are non-editable.
- d. The BOQ file must be saved after this and should be uploaded using digital signature.
- e. OPTIONAL ITEMS/Additional Warranty Charge beyond Standard warranty period and training charges (if any) must be separately quoted and uploaded as PDF file in the additional folder under price bid.



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f. In the BOQ quoted in INR fill up the applicable column (i.e. 'Basic Rate', 'GST', 'freight charges' (if applicable), Insurance (if applicable), Any other taxes (if applicable)).

g. Bidders are requested not to put any percentage (%) in any column of the BOQ.

2. **Bid Security:** EMD of value Rs. 30.00 lakh to be submitted in the form of Insurance surety bonds, Account Payee Demand draft, Fixed Deposit Receipt, Banker's cheque, Bank Guarantee (including e-bank Guarantee) from any of the scheduled commercial banks or nationalized banks in favour of "Bose Institute" payable at "Kolkata". In case of non-submission of EMD, bid will not be considered and rejected.

- Bidder must upload valid Registration Certificate (i.e. MSME, NSIC) for EMD Exemption.
- Bid Security is valid for a period of 45 days beyond the final bid validity period.
- Bid security will be forfeited if the bidder withdraws or amends its/his tender or impairs or derogates from the tender in any respect within the period of validity of the tender or if the successful bidder fails to furnish the required performance security within the specified period.
- No interest shall be payable by the BUYER to the BIDDER on Earnest Money / Security Deposit for the period of its currency.
- Bid Security will be refunded to the successful bidder on receipt of performance security. Bid Security of unsuccessful bidders will be returned after award of the contract. No interest will be paid on EMD/Bid Security by Bose Institute.

**Note:** Failure to submit any of the above mentioned documents 1 (A) (a) & (b) & 2 under Pre-qualification criteria for Statutory & Non-statutory documents & Earnest Money Deposit even after asking for shortfall documents may render the bid liable to be summarily rejected. However for IP & EMD, non-submission of the same would result in rejection of the bid. For IP & EMD, no shortfall would be asked.



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**PQC Compliance Sheet**

To be submitted by the bidder along with the bid, duly stamped and signed

Sl. No.	PQ Criteria	Bidder's Response (Folder Name with Page No. to be mentioned)	For office use only	
			Verified	Complied (Yes / No)
1	Earnest Money Deposit (EMD)			
2	Signed & stamped NIQ			
3	Annexure 1 : Pre-contract Integrity Pact (to be submitted along with the bid with authorized signature of both the buyer and the bidder, without submission of which the bid will not be considered)			
4	Annexure 2 : Bid Form			
5	Annexure 3 : Bidder's Information Form			
6	Annexure 4 : Techno-Commercial Bid Form			
7	Annexure 5 : Manufacturer's Authorization Form			
8	Annexure 6 : Bidder's Performance Statement Form			
9	Annexure 7 : Service Support Details Form			
10	Annexure 8 : Technical Compliance Statement Form			
11	Annexure 9 : Fall Clause Certificate			
12	Annexure 10 : Declaration of local content			
13	PAN			
14	Factory License			
15	GST Registration Certificate			
16	Last 3 years Audited Balance Sheet ending on March 31, 2023 with UDIN			
17	Machinery list			
18	ISO 9001, ISO 14001, OHSAS 18001 (As applicable)			
19	Non-blacklisting declaration on non-judicial stamp paper			
20	Valid Export License			



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Sl. No.	PQ Criteria	Bidder's Response (Folder Name with Page No. to be mentioned)	For office use only	
			Verified	Complied (Yes / No)
21	Audited Average annual turnover of Rs.15.00 Crore during the last 03 Financial Years ending 31 March, 2023 for similar kind of operation			
22	Audited annual accounts (financial year 2020-21, 2021-22 and 2022-23)			
23	ITR copies for the last 03 Assessment Years (2021-22, 2022-23 and 2023-24).			
24	The Bidder should be an Indian manufacturer			
25	That the Bidder will assume total responsibility for the fault-free operation of supplied items, during the warranty period. Necessary undertaking to be given on the company letterhead by the bidder			
26	Bidder should have in-house facilities and sufficient infrastructure for manufacturing testing and supplying the offered Power Converter to FAIR Darmstadt (Germany) strictly in conformity with the technical specification. The purchaser reserves the right to verify the set-up of the Bidder to assess their capacity and capability and can reject the offer in case of non-compliance. A declaration in this regard to be submitted on bidders letter head.			
27	Engineers/ representatives from the purchaser shall have free access during normal working hours to the manufacturing site or testing facilities during the contract period. Written confirmation to that effect on a company letterhead is necessary.			



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Tender No. BI-K/E-TEND/01/2024-25

**BOSE INSTITUTE**  
**Unified Academic Campus**  
**Block-EN, Sector-V, Salt Lake City**  
**Kolkata - 700091 (INDIA)**

Bose Institute, Kolkata, an autonomous R&D Institute, registered under Societies Registration Act, under administrative control of Department of Science & Technology, Ministry of Science & Technology, Government of India, has been designated as the Indian shareholder in the Facility for Antiproton & Ion Research (FAIR) Company, GmbH, Germany and the nodal Indian Institution for the management of FAIR programme in India.

**Bose Institute Indo-FAIR Co-ordination Centre (BI-IFCC) established at Bose Institute, Kolkata jointly by the DST and the DAE, Govt. of India, is the implementing body of the Indo-FAIR Programme.**

Bose Institute (for Indo-FAIR Project), invites quotation (NIQ) from renowned, experienced and established Indian manufacturers (based in India) with highly skilled engineering & technological background in manufacture, testing, supply, Installation & commissioning of Power Converter, having manufacturing facility located in India and must have experience of Power Converter manufacturing. The products as required are needed to be delivered to FAIR, GmbH, Darmstadt, Germany.

Total quantity of FR.C3 Power Converters is 70 Nos.

**Bidder shall have to quote for 100% of all the above quantities to be eligible for participation in the bid.**

The evaluation of bid and the process of selection of bidder/vendor will be done based on pre-qualification criteria and fulfilling the eligibility criteria and all terms and conditions of the NIQ. Bidder is requested to submit the offer. Technically suitable offer only will be considered in financial evaluation. After final acceptance of the bid, a provisional purchase order will be issued for production as given below:

Sl. No.	Description of Power Converter	Type of Power Converter	PSP of Power Converter	No. of Power Converter
1.	Power Converters For Corrector (Steerer, Sextupole and Octupole) Magnets in SFRS	FR.C3	2.4.3.3.2.1	02 (Prototype)
2.			2.4.3.3.5.1, 2.4.3.4.1.1 and 2.4.3.3.3.1	68 (Bulk Production)

After placing the Provisional Purchase Order, the manufacturer will manufacture pre-series (prototype) of 02 Nos of Power Converters as per the technical specifications. After that, Factory Acceptance Tests (FAT) at manufacturer's site shall be performed. After the successful FAT, the Power Converters should be transported to FAIR/GSI at Darmstadt, Germany.



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Final acceptance of the delivered Power Converters will take place after successful completion of the Site Acceptance Test (SAT) at FAIR site. Only after Successful SAT, final approval shall be given to the manufacturer with final Purchase Order (PO) to start bulk production for remaining 68 Nos. of Power Converter. **Detailed Specifications of the Power Converters is attached with NIQ.**

In the event of rejection of the pre-series (prototype) Power Converter by FAIR/GSI Germany, the purchase order of the products shall be deemed to have been automatically cancelled without any liability to the purchaser and the selected bidder cannot claim for any kind of payment in case of such event.

## 1. DELIVERY SCHEDULE

**Time is the essence of the contract.** Pre-series (prototype) of the Power Converter of 02 Nos. shall be manufactured for Factory Acceptance Test (FAT) **within 270 days time** from the date of placing Provisional Purchase Order (PO). FAT testing shall be conducted at their factory/manufacturing site by a duly constituted team comprising of engineers from Germany and India. After successful SAT only, approval will be given for bulk production of remaining Power Converters as mentioned above.

Completion time for the remaining part of Power Converter (bulk) for FAT testing shall **not be more than 450 days** from the date of final purchase order for bulk production. **Periodic status reports are mandatory during the phases of production.** During the bulk production, stage inspection may be carried out by our engineers and experts at manufacturing site.

## 2. BRIEF TECHNICAL SPECIFICATIONS OF POWER CONVERTER (FR.C3)

Technical details with applicable standards and testing procedures are mentioned in Annexure-13 (as Detailed Specification, Document from FAIR, Germany)

## 3. SUMMARY OF DELIVERABLES

Manufacture, testing and supply of FR.C3 Power Converters with specified dimensions, technical requirements and quality standard mentioned in the **Annexure-13**.

## 4. ACCEPTANCE TESTS

### a) Factory Acceptance Test (FAT)

The Factory Acceptance Tests (FAT) shall be carried out at manufacturer's site after fabrication of pre series (prototype) sample as well as complete production of the Power Converters as per the details mentioned in "Detailed specifications" of FR.C3 Power Converters in **Annexure-I** attached. FAT tests shall be witnessed by a team of engineers from FAIR/GSI, Germany and India authorized by BI and final acceptance will be given by the team. The manufacturer must have to inform the due date of FAT well in advance.



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**b) Site Acceptance Test (SAT)**

After the FAT, the Power Converters should be transported to FAIR/GSI at Darmstadt, Germany. Final acceptance of the delivered Power Converters will take place after successful completion of the Site Acceptance Test (SAT) at FAIR site as per **Annexure-13**.

**5. QUALITY ASSURANCE PLAN (QAP)**

The manufacturer has to establish a quality management system as per ISO 9001, ISO 14001 and OHSAS 18001 and quality assurance plan.

**6. SPECIFIC POINTS ON PACKING AND MARKING**

Bidder should note that the packing of the Power Converters shall be in accordance to the specifications from FAIR, Germany.

**7. TRANSPORTATION AND SHIPMENT**

After the successfully pass of FAT tests, shall have to be shipped to the FAIR site in Darmstadt, Germany and delivery to the designated space at site. Following points are important for bidder:-

- a. Materials shall be dispatched/shipped only after obtaining a prior approval or a shipping release from the purchaser. The purchaser will carry out necessary inspection in this regard before giving approval for release of shipment.
- b. The supplier shall be fully responsible for protective measures to ensure the safe delivery of the materials. The supplier shall arrange for necessary insurance of the items at his own cost against damage/loss during transportation.
- c. The suppliers should, at his responsibility check and ascertain the mode of transport of the material to the site.
- d. Packaging of the materials shall be properly done. Each package shall be limited to size and weight that are permissible under the existing ship/rail/road limitations. All lifting points shall be clearly marked.

**Bose Institute reserves the right to accept or reject the quotation without assigning any reason what so ever.**

**Registrar (Officiating)  
Bose Institute**



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**CHAPTER –II: INSTRUCTION TO BIDDERS**

**A. INTRODUCTION**

**1. General guidance for e-Tendering :**

Instructions / Guidelines for electronic submission of the tenders have been annexed for assisting the vendors to participate in e-Tendering.

- i. **Registration of Vendors** : Any vendor willing to take part in the process of e-Tendering will have to enrol and get registered in the Central Public Procurement (CPP) Portal, NIC, GOI through logging on to '<http://eprocure.gov.in/eprocure/app>' and the vendor is to click on the link for e-Tendering site as given on the above.
- ii. **Digital Signature certificate (DSC)** : Each vendor is required to obtain a Class-II or Class-III Digital Signature Certificate (DSC) for submission of tenders as applicable from the approved service provider of the National Informatics Centre (NIC) on payment of requisite amount. Details are available at the Web Site. DSC is given as a USB e-Token.
- iii. The vendor can search & download N.I.T. & Tender Document(s) electronically from computer once they log on to the website mentioned in Clause 1. (i) using the Digital Signature Certificate. This is the only mode of collection of Tender Documents.
- iv. **Submission of Tenders**: Tenders are to be submitted through online in two folders at a time for each bid, one in Technical Proposal & the other is Financial Proposal before the prescribed date & time using the Digital Signature Certificate (DSC). The uploaded documents are to be virus scanned and duly Digitally Signed. The documents will get encrypted (transformed into non readable formats).

**Cost of Bidding**

The Bidder shall bear all costs associated with the preparation and submission of its bid, and "the Purchaser", will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.





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**B. THE BIDDING DOCUMENTS**

**2. Bid Document**

The present bid document consists of instructions and criteria mentioned in various chapters including annexure. All conditions mentioned in the document including the annexure are to be satisfied as a part of the bidding. Confusions, if any on any criterion will have the technical specifications mentioned in Annexure-XIII as the final one.

**3. Contents of Bid Document**

The goods required, bidding procedures and contract terms are prescribed in this Bid Document which includes the following:

<b>S. No.</b>	<b>Title</b>	<b>Chapter No.</b>
01.	Notice Inviting Quotation (NIQ)	I
02.	Instructions to Bidder (ITB)	II
03.	General Conditions of Contract (GCC)	III
04.	Special Conditions of Contract (SCC)	IV
05.	Pre Contract Integrity Pact	Annexure-1
06.	Bid Form	Annexure-2
07.	Bidder's Information Form	Annexure-3
08.	Techno-Commercial Bid Form	Annexure-4
09.	Manufacturer's Authorization Form	Annexure-5
10.	Bidders Performance Statement Form	Annexure-6
11.	Service Support Details Form	Annexure-7
12.	Technical Compliance Statement Form	Annexure-8
13.	Fall Clause Certificate	Annexure-9
14.	Declaration of Local Content	Annexure-10
15.	Bid Security Form	Annexure-11
16.	Performance Security Form	Annexure-12
17.	Technical Documents	Annexure-13

The Bidder is expected to examine all instructions, forms, terms (ITB/GCC/SCC etc.), and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or submission of a bid not substantially responsive shall result in rejection of the bid.



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**4. Amendment To Bid Document**

At any time prior to the deadline for submission of bids, the Purchaser may, for any reason modify the Bid Document by amendment. Such amendments shall form an integral part of bid documents and it shall amount to an amendment of relevant clauses of the Bid Document.

The Purchaser reserves the right to reject the bids if the bids are submitted without taking into account these amendments/clarifications. In order to allow the bidders reasonable time in which to take the amendment into account in preparing their bids, and also with the objective of obtaining more number of competitive bids, the Purchaser, at its discretion, may extend the deadline for the submission of bids.

**C.PREPARATION OF BIDS**

**5. Language of Bid**

The Bid prepared by the Bidder and all correspondence and documents relating to the bid exchanged by the bidder and the purchaser shall be written in English language, provided that any printed literature furnished by the bidder may be written in another language but it is to be accompanied by an English translation of its pertinent passage(s) duly signed and verified as true English translation. The responsibility for the correctness of the translation will be solely and completely on the bidder and the Purchaser will not be responsible for any loss/likely loss due to error in translation whatsoever. In such cases, for the purpose of interpretation of the bid, the English translation shall only prevail.

**6. Documents Comprising the Bid**

- (i) The Tender Documents should be completed in all respects. Wherever the information is not relevant, the space should be appropriately filled with '**NA or NIL**'. No space shall be left blank. All pages of the tender form should be duly stamped & signed by the bidder and uploaded.
- (ii) The bid is liable to be set aside if complete information as specified in the techno-commercial bid is not given.
- (iii) If the given space is insufficient to give required information, additional sheets may be added.



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- (iv) Attention should be paid to the delivery dates, technical specifications and the terms and conditions of the NIQ.
- (v) The break up prices, as applicable should be separately indicated in the additional folder under BOQ.
- (vi) A brief description of the proposed plan for the execution of this work.
- (vii) The bidder shall furnish documentary evidence about technical and production capability to perform the contract without delay.

**Note:- All the documents submitted by the bidders/manufacturers should be signed with company's stamp.**

## **7. Bid Prices**

Bidder is requested to give his final and best offer. Techno-Commercial Discussions will be held with the Bidder, if necessary.

Bidder, who do not accept our standard commercial terms are liable to be ignored. **A categorical confirmation of acceptance of all our terms and conditions in toto will have to be observed which enable speedy processing of the offers.**

Pre-conditioned, incomplete offers, not in line with the terms and conditions of the bid documents, are liable to be rejected.

The Bidder shall indicate the unit prices with detail break-up and total bid prices of the goods it proposes to supply under the order in the Financial cover.

- (i) **Taxes:** The amount payable on account of applicable taxes should be mentioned clearly. If there is no explicit mention of taxes in your offer then quoted price will be deemed inclusive of such taxes. No other charges except those mentioned clearly in the quotation will be paid. Delay/Demurrage charges, if any, need to be paid by M/s. ECIL.



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Rates should be quoted onsite FAIR/GSI, Germany, inclusive of packing, forwarding, handling charges, loading and unloading charges, Freight & Insurance charges etc. In case of Freight & insurance charges, the payment will be made on the basis of original papers of payments and back-up sheets. Installation & Commissioning Charges shall be quoted separately. If required, it will be paid accordingly.

Where there is no mention of packing, forwarding, freight, insurance charges, taxes etc. such offers shall be assumed to be inclusive with all the applicable charges.

**8. Bid Currencies**

Prices shall be quoted in Indian Rupees only.

**9. Documents Establishing Bidder's Eligibility and Qualifications**

Pursuant to instruction to Bidder, the bidder shall furnish, as part of its bid, documents establishing the bidders' eligibility to bid and its qualification to perform the contract if its bid is accepted.

**10. Documents Establishing Goods' Eligibility and Conformity to Bid Document**

The documentary evidence of the goods and services eligibility shall consist of a statement on the country of origin of the goods and services offered which shall be confirmed by a certificate of origin at the time of shipment.

**Specifications are basic essence of the product.** It must be ensured that the offers are strictly as per our specifications. At the same time it must also be kept in mind that merely copying our specifications in their quotation shall not make firms eligible for consideration. The documentary evidence of conformity of the goods and services to the Bid Document may be in the form of literature, drawings and data, and shall consist of:

- (i) A detailed description of the essential technical and performance characteristics of the goods;
- (ii) An item-by-item commentary on the Purchaser's Technical Specifications demonstrating substantial responsiveness of the goods and services to those specifications or a statement of deviations and exceptions to the provisions of the Technical Specifications.



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For purposes of the commentary to be furnished pursuant to above, the Bidder shall note that standards for workmanship, material and equipment, and references to brand names or catalogue numbers designated by the Purchaser in its Technical Specifications are intended to be descriptive only and not restrictive. Technically unsuitable offers, and/or, offers not conforming to tender schedule, shall be rejected.

- (iii) In case the bidder furnishes wrong or false information willfully in the technical compliance chart, such action shall be viewed strictly and the bidders may be blacklisted.

**11. Period of Validity of Bids**

**Bids shall remain valid at least for 120 days after the date of opening of bid by the Purchaser.** A bid valid for a shorter period may be rejected by the Purchaser as non-responsive.

In exceptional circumstances, the Purchaser may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing, fax or e mail). A Bidder granting the request will neither be required nor permitted to modify its bid.

Bid evaluation will be based on the bid prices without taking into consideration the above correction.

**12. Deadline for Submission of Bids**

The Purchaser may, at its discretion, extend this deadline for submission of bids by amending the bid documents in accordance with Clause 4 of ITB, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

**D. SUBMISSION AND EVALUATION OF BID**

**13. Submission of Bid**

Bid/Quotation complete in all respect uploaded through CPP Portal. The Technical bid will be opened first and evaluated at Bose Institute and will be intimated to M/s. ECIL in due course of time.

In the event of the specified date of Bid opening being declared a holiday for the Purchaser, the Bids shall be opened at the appointed time and location on the next working day.



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Bose Institute reserves the right to call for techno-commercial / price negotiations, if required. The company should depute competent representative for such discussion/ negotiations whenever called for and the representative should be competent to take on the spot decisions.

No correspondence/discussions/visits whatsoever will be entertained on the subject unless specifically called by this office after opening the quotation for technical discussions / price negotiations. Any violation of this will render the bid invalid and the firm is liable to be blacklisted.

**14. Clarification of Bid**

To assist in the examination, evaluation and comparison of bids, the Purchaser may, at its discretion ask the bidder for any clarification(s) of its bid. The request for clarification and the response shall be in writing and no change in the price substance of the bid shall be sought, offered or permitted. However no post-Bid clarifications at the initiative of the Bidder shall be entertained.

**15. Preliminary Examination**

The Purchaser will examine the bids to determine whether they are complete, and whether the bids are generally in order.

The Purchaser may waive any minor informality, non-conformity, or irregularity in a bid, which does not constitute a material deviation, provided such a waiver, does not prejudice or affect the relative ranking of any Bidder.

Prior to the detailed evaluation, the Purchaser will determine the substantial responsiveness of each bid to the Bid Document. For purposes of these Clauses, a substantially responsive bid is one, which conforms to all the terms and conditions of the Bid Document without material deviations. Deviations from or objections or reservations to critical provisions such as those concerning Bid Security, Warranty, Force Majeure, Applicable law and Taxes & Duties will be deemed to be a material deviation. The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

If a bid is not substantially responsive, it will be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the non-conformity.



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The language of standard clauses etc. mentioned in this 'Bid Document' should not be tampered with/ changed/modified in any manner whatsoever. If any such modification etc. comes to our knowledge at any stage, the bid shall be rejected immediately.

**16. Conditional NIQ etc. shall not be accepted.**

**17. Contacting the Purchaser**

No Bidder shall contact or attempt to contact the Purchaser or anyone related to the Purchaser on any matter relating to its bid, from the time of the bid opening to the time the Contract is awarded. If the bidder wishes to bring additional information to the notice of the Purchaser, it should do so in writing.

Any effort by a Bidder to influence the Purchaser in its decisions on bid evaluation, bid comparison or contract award may result in rejection of the Bidder's bid.

**18. Post Qualification**

The Purchaser will determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated responsive bid is qualified to perform the contract satisfactorily.

The determination will take into account the Bidder's financial, technical and production capabilities. It will be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, as well as such other information as the Purchaser deems necessary and appropriate.

An affirmative determination will be a prerequisite for award of the contract to the Bidder. A negative determination will result in rejection of the Bidder's bid.



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**19. Award Criteria**

The evaluation of bid and the process of selection of bidder/vendor will be done based on pre-qualification criteria and fulfilling the eligibility criteria and all terms and conditions of the quotation. Bidder is requested to submit their offer as mentioned in the document. Technically suitable quotation will be considered in financial evaluation. The bid if Technically qualified, will be finally selected and a provisional purchase order will be issued.

After placing the Provisional Purchase Order, the manufacturer shall first manufacture **pre-series (prototype) of 02 Nos. of Power Converter** as per the technical specifications. After that, Factory Acceptance Tests (FAT) at manufacturer's site shall be performed. After the successful FAT, the Power Converters should be transported to FAIR/GSI at Darmstadt, Germany. Final acceptance of the delivered Power Converters will take place after successful completion of the Site Acceptance Test (SAT) at FAIR site. Only after Successful SAT, final approval shall be given to the manufacturer with final Purchase Order (PO) to start bulk production for remaining 68 Nos. of Power Converter. The acceptance criteria of the pre-series (prototype) Power Converter will be same as the Power Converters of all FR.C3 type mentioned in the bid document (Detailed Specifications). Detailed Specifications of the Power Converters is mentioned in **Annexure-XIII**.

In the event of rejection of the pre series (prototype) Power Converter in FAT, the purchase order of the products shall be deemed to have been automatically cancelled without any liability to the purchaser and the selected bidder cannot claim for any kind of payment in case of such event. Any payment will be made only after successful FAT test of the pre-series (prototype) Power Converter of all types.

**20. Purchaser's Right to vary Quantities at the Time of Award**

The Purchaser reserves the right during the tenure of the Contract **to increase or decrease the quantity of goods up to 25%** of the same originally specified in the Schedule of Requirements without any change in unit price or other terms and conditions.

**21. Purchaser's Right to Accept Any Bid and to Reject any or All Bids**

The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Purchaser's action.





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**22. Notification of Award**

Prior to the expiration of the period of bid validity, the Purchaser will notify the successful bidder in writing that the bid has been accepted by way of a Purchase Order for prototyping.

**23. Acceptance of award**

The successful bidder should submit acceptance of the Purchase Order immediately but not later than 15 days in any case from the date of issue of the Purchase Order failing which it shall be presumed that the vendor is not interested.

**24. Agreement**

a) The successful bidder will be required to enter into a bi-party agreement with the Purchaser on non-judicial stamp paper of appropriate value within 21 days of order acceptance. The arrangement of the stamp paper and the cost thereof has to be borne by the bidder. The format of the agreement will be provided to the successful bidder only.

b) The Successful bidder will also have to enter into a tri-party agreement between Purchaser (Bose Institute), Successful Bidder (Provider) and FAIR, Germany.

**25. Performance Security**

Within **15 days from the date of issuance of the bulk supply order**, the Bidder shall furnish the performance security equivalent to 5% of the total purchase order value, in the form of **Account Payee demand draft, Fixed Deposit Receipt, Bankers Cheque or Bank Guarantee** of any commercial bank as mentioned in Performance Security Form. **No interest shall be payable by the buyer to the bidder on Performance Security for the period of its currency.**

Failure of the successful bidder to accept the order shall constitute sufficient grounds for the annulment of the award and procure the items at the risk and cost of the bidder.



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- 26.** The procurement will be made by Bose Institute in compliance with the Govt. of India rules framed for public procurement from time to time. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the competent authority.

In this regard the clause and conditions issued as per Ministry of Finance, Department of Expenditure, Public Procurement Division order no F.No.6/18/2019-PPD dated 23 July 2020, must be strictly adhered to and necessary certification as mentioned in the subject order must be submitted along with the tender.

Debarment of firms from bidding will be guided by the OM No. F.1/20/2018-PPD, Department of Expenditure, Ministry of Finance dated 02-11-2021.

Bose Institute will abide by the provisions of PPP-MII Order with Ref. No. 45021/2/2017-PP (BE-II) dated 16-09-2020 issued by the DPIIT, Ministry of Commerce & Industry, Govt. of India.



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**CHAPTER - III: GENERAL CONDITIONS OF CONTRACT (GCC)**

**1. Definitions**

In this Contract, the following terms shall be interpreted as indicated:

- (i) "The Order" means the Purchase Order placed by the Purchaser including all the attachments and appendices thereto and all documents incorporated by reference therein;
- (i) "The Contract Price" means the price payable to the Supplier under the Order for the full and proper performance of its contractual obligations;
- (ii) "The Goods" means all the materials, which the Supplier is required to supply to the Purchaser at indented site under the Contract. Here final destination of the supplies is FAIR site in Germany;
- (iii) "Services" means services ancillary to the supply of the Goods, such as transportation and insurance, and any other incidental services, such as, arrangement for requisite tests and other obligations of the Supplier covered under the Contract;
- (iv) "GCC" mean the General Conditions of Contract contained in this section.
- (v) "SCC" means the Special Conditions of Contract.
- (vii) "The Purchaser" as specified in Special Conditions of Contract.
- (viii) "The Purchaser's country" is "India".
- (ix) "The Supplier" means the individual or firm supplying the Goods and Services under this Contract.
- (x) "Day" means calendar day

**2. Application**

These General Conditions shall apply to the extent that they are not superseded by provisions in other parts of the Contract.

**3. Standards**

The Goods supplied under this Contract shall conform to the standards mentioned in the Annexure-I Detailed Technical Specifications and Annexure-II attached. and, when no applicable standard is mentioned, to the authoritative standard appropriate to the Goods' country of origin and such standards shall be the latest issued by the concerned institution.



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**4. Use of Contract Documents and Information**

The Supplier shall not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far, as may be necessary for purposes of such performance. The Supplier shall not, without the Purchaser's prior written consent, make use of any document or information except for purposes of performing the Contract.

Any document, other than the Contract itself, shall remain the property of the Purchaser and shall be returned (in all copies) to the Purchaser on completion of the Supplier's performance under the Contract if so required by the Purchaser.

The purchaser may be under obligation to make any document/information submitted by the bidder in response to this bid public if required under the provision of Right to Information Act 2005 or other statutory provisions. Therefore the bidder may explicitly indicate if any document/information in his tender includes information of commercial confidence, trade secrets or intellectual property, the disclosure of which would jeopardize the competitive position of the bidder.

**5. Patent Rights**

The Supplier shall indemnify the Purchaser against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the Goods or any part thereof in India as well as Germany

**6. Submission of the bids**

All bids complete in every respect must be uploaded in CPP portal **within the last date and time**. No extension shall be allowed for any reason what so ever.



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**7. Performance Security**

Within 15 days from the date of acceptance of award the Supplier shall furnish performance security for the amount specified in SCC.

The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

The Performance Security shall be submitted in following forms:

- (i) In the form of **Account Payee demand draft, Fixed Deposit Receipt, Bankers Cheque or Bank Guarantee** issued by a Commercial bank located in India in the format provided in the bidding documents.

The performance security shall remain valid for a period of 60 days following the date of completion of the Supplier's performance obligations, including any warranty obligations, unless specified otherwise in SCC. The performance Security shall be discharged by the Purchaser and returned to the Supplier on expiry. In the event of any contract amendment, the supplier shall, within 30 days of receipt of such amendment, furnish the amendment to the performance security, rendering the same valid for the duration of the contract, as amended for further period of 60 days thereafter.

**8. Inspections and Tests**

The Purchaser or its representative shall have the right to inspect and/or to FAT test at manufacturer's site the Goods to confirm their conformity to the Contract specifications at no extra cost to the Purchaser. SCC, the Technical Specifications and the relevant clause(s) the agreement, shall specify what inspections and tests the Purchaser requires and where they are to be conducted. The Purchaser shall notify the Supplier in writing in a timely manner of the identity of any representative(s) retained for these purposes. All costs related to the such tests, including transport, accommodation, local transport for Purchaser's representatives (maximum of 3 members) will be borne by the supplier.

The inspections and FAT tests shall be conducted on the premises of the Supplier **and only after successful testing and on obtaining purchaser's approval, the bidder shall have to ship the supply to FAIR, Germany.** All reasonable facilities and assistance, including access to drawings and production data shall be furnished to the inspectors at no charge to the Purchaser.



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Should any inspected or tested Goods fail to conform to the specifications, the Purchaser may reject the goods and the Supplier shall either replace the rejected Goods or make alterations necessary to meet specification requirements free of cost to the Purchaser.

The Purchaser's right to inspect, test and, where necessary, reject the Goods after the Goods arrival at Project Site shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the Purchaser or its representative prior to the Goods shipment.

Nothing in GCC Clause 8 shall in any way release the Supplier from any warranty or other obligations under this Contract.

**9. Packing**

The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be provided for in the Contract including additional requirements, if any, specified in SCC and in any subsequent instructions ordered by the Purchaser.

**10. Delivery and Documents**

Delivery of the Goods shall be made by the Supplier in accordance with the terms specified by the Purchaser in the order within the period as indicated in the SCC. The details of shipping and/or other documents to be furnished by the supplier are specified in SCC. The place of delivery of the equipment is FAIR, GSI, Darmstadt, Germany.

**11. Insurance**

The Goods supplied under the Contract shall be fully insured in Indian Rupees against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in SCC. The goods should be insured at 110% of the ordered value.



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Necessary documents including premium receipt should be submitted to the Institute, before consideration of payment. The Insurance cost to be paid as per actual subject to maximum of the rate quoted in financial bid, subject to submission of proof, i.e. Proof of Insurance premium payment etc.

**12. Transportation**

Where the Supplier is required under the Contract to transport the Goods to a specified place of destination / Project site, transport to such place of destination including insurance etc., as shall be specified in the Contract, shall be arranged by the Supplier, and the related cost shall be included in the Contract Price. The transportation cost to the delivery site to be paid as per actual, subject to maximum of the rate quoted in the financial bid.

**13. Warranty**

The Supplier shall warrants that the Goods supplied under this Contract are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier shall further warrants that all Goods supplied under this Contract shall have no defect arising from design, materials or workmanship or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions prevailing in the country of final destination. The warranty should be comprehensive and on site.

**This warranty shall remain valid for 24 months.** The warranty period of the supply shall start on the day after signing of the final technical acceptance certificate at Facility site by the competent authority of FAIR after supply of all the required materials, but not later than 60 calendar days after delivery of the last component. The supplier continue to warrant for substituted goods, parts provided and for reparation work just as he warrants for the ordered goods quality. For parts of delivery that broke down because of defects in quality and that cannot be used for operation purposes, therefore, a prolongation of the warranty period for the length of operation interruption is to be agreed.

The cost of correction of faults payable by the supplier include the expenses for packing, freight and carriage etc., the cost for work of removing and installing goods and parts provided, travel expenses as well as the cost to remedy, delivery, deficiencies at the Company.



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The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall immediately, within a reasonable period, arrange to repair or replace the defective goods or parts thereof free of cost at the ultimate destination. The Supplier shall take over the replaced parts/goods at the time of their replacement. No claim whatsoever shall lie on the Purchaser for the replaced parts/goods thereafter. If the supplier having been notified fails to remedy the defects within a reasonable period, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expenses and without prejudice to any other rights, which the purchaser may have against the supplier under the contract.

**14. Payment**

The general conditions of payment

- (i) For the prototypes supply are 100% payment within 45 days from the date of successful acceptance. Payment will be considered only after satisfactory SAT tests of the same, at FAIR, Darmstadt, Germany.
- (ii) For the bulk supply are 100% payment within 45 days from the date of successful acceptance. Payment will be considered only after satisfactory SAT tests of the same, at FAIR, Darmstadt, Germany.

The Supplier's request(s) for payment shall be made to the Purchaser in writing, accompanied by an invoice describing, the Goods delivered and the Services performed, and by documents, submitted pursuant to GCC Clause 10 and upon fulfillment of other obligations stipulated in the contract.

Payments shall be made promptly by the Purchaser normally within forty five (45) days after submission of the invoice or claim by the Supplier along with all relevant documents. No interest will be paid by the Institute for late payment.

Payment shall be made in Indian currency.  
TDS, if any, will be deducted as per rule.

**15. Prices**

Prices charged by the Supplier for Goods delivered and Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid. Conditional offers indicating changes to price quoted due to price increase by the principal firm and market fluctuations shall make the bid liable to be cancelled.





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**16. Change Orders**

The Purchaser may at any time, by written notice given to the Supplier pursuant to GCC Clause 28, make changes within the general scope of the Contract in any one or more of the followings:

- (i) Drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;
- (ii) The method of shipping or packing;
- (iii) The place of delivery; and/or
- (i) The Services to be provided by the Supplier;
- (ii) The delivery schedule.

If any such change causes an increase or decrease of time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract delivery schedule and the Contract shall accordingly be amended. Any claim by the Supplier for adjustment under this clause must be asserted within fifteen (15) days from the date of the Supplier's receipt of the Purchaser's change order.

**17. Contract Amendments**

Subject to GCC Clause 16, no variation in or modification of the terms of the contract shall be made except by written amendment signed by the parties.

**18. Assignment**

The Supplier shall not assign, in whole or in part, its obligations to perform under the Contract, except with the Purchaser's prior written consent.

**19. Subcontracts**

Normally no subcontract will be allowed for this supply. However, in very special cases, sub contracting may be allowed only upon written approval with competent authority of the Purchaser.



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**20. Delays in the Supplier's Performance**

**Since time is the essence of the contract**, delivery of the prototypes and bulk Goods and performance of the Services shall be made by the Supplier in accordance with the Delivery Schedule mentioned elsewhere in this document.

If at any time during performance of the Contract, the Supplier or its sub-contractor(s) should encounter conditions impeding timely delivery of the Goods and performance of Services, the Supplier shall promptly notify the Purchaser in writing of the fact of the delay, its likely duration and its cause(s).

As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may, at its discretion, extend the Supplier's time for performance with or without penalty, in which case the extension shall be ratified by the parties by amendment of the Contract.

Except as provided under GCC Clause 23, a delay by the Supplier in the performance of its delivery obligations shall render the Supplier liable to the imposition of penalty pursuant to GCC Clause 21, unless an extension of time is agreed upon pursuant to GCC Clause 20 without the application of penalty clause.

**21. Penalty**

Subject to GCC Clause 23, if the Supplier fails to deliver any or all of the Goods or to perform the Services within the period(s) specified in the Contract, the Purchaser shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as penalty, a sum equivalent to the percentage specified in SCC of the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the Percentage specified in SCC. Once the maximum is reached, the Purchaser may consider termination of the Contract pursuant to GCC Clause 22.

**22. Termination for Default**

The Purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, terminate the Contract in whole or part:

- (i) If the Supplier fails to deliver any or all of the Goods within the period(s) specified in the order, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 20; or
- (ii) If the Supplier fails to perform any other obligation(s) under the Contract;  
or



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- (iii) If the Supplier, in the judgment of the Purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this Clause:

- (i) "Corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.
- (ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefit of free and open competition;"

In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 22.1, the Purchaser may procure, upon such terms and in such manner, as it deems appropriate, Goods or Services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for such similar Goods or Services. However, the Supplier shall continue the performance of the Contract to the extent not terminated.

### **23. Force Majeure**

Notwithstanding the provisions of GCC Clauses 20, 21 and 22, the Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, earthquake, epidemics, quarantine restrictions and freight embargoes.

If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.



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**24. Termination for Insolvency**

The Purchaser may at any time terminate the Contract by giving written notice to the Supplier, if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the Purchaser.

**25. Resolution of Disputes**

The Purchaser and the supplier 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, after thirty (30) days from the commencement of such informal negotiations, the Purchaser and the Supplier have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanisms specified in the SCC. These mechanisms may include, but are not limited to, conciliation mediated by a third party, adjudication in an agreed national or international forum, and national or international arbitration.

**26. Governing Language**

The contract shall be written in English language. Subject to GCC Clause 28, English language version of the Contract shall govern its interpretation. All correspondence and other documents pertaining to the Contract, which are exchanged by the parties, shall be written in the same language.

**27. Applicable Law**

The Contract shall be interpreted in accordance with the laws of the Union of India and all disputes shall be subject to place of jurisdiction as specified in SCC.

**28. Notices**

Any notice given by one party to the other pursuant to this contract/order shall be sent to the other party in writing or by, FAX or e mail and confirmed in writing to the other party's address specified in the SCC.

A notice shall be effective when delivered or on the notice's effective date, whichever is later.



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**CHAPTER - IV: SPECIAL CONDITIONS OF CONTRACT (SCC)**

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract. The corresponding clause number of the General Conditions is indicated in parentheses.

**1. Definitions (GCC Clause 1)**

The Purchaser is 'Bose Institute (for Indo-FAIR Project), Kolkata (WB), INDIA'.

**2. Performance Security (GCC Clause 7)** Substitute clause 7.1 of the GCC by the following:

Within 15 days from the date of award for the bulk supply, the Supplier shall furnish Performance Security to the Purchaser for an amount of 5% of the contract value, valid up to 60 days after the date of completion of performance obligations including warranty obligations. The period therefore includes the warranty period of 24 months plus sixty days.

If the performance security is not furnished within the stipulated time as per 2 above, the contract shall be deemed terminated in pursuance of GCC Clause 22.

**3. Inspection and Tests:** Inspection and tests prior to shipment of Goods and at final acceptance are as follows:

After the goods are manufactured and assembled, inspection and testing of the goods (FAT) shall be carried out at the supplier's plant by a duly constituted committee of the Purchaser in presence of the supplier, prior to shipment to check whether the goods are in conformity with the technical specifications attached to the purchase order. Manufacturer's test certificate with data sheet shall be issued to this effect and submitted along with the delivery documents. The Representative(s) of Purchaser/FAIR, GSI shall be present at the supplier's premises during such inspection and testing. The location where the inspection is required to be conducted should be clearly indicated. All arrangement for FAT to be done by the supplier.

The site acceptance test (SAT) will be conducted by the Purchaser / FAIR, GSI, their consultant or other such person(s) nominated by the Purchaser / FAIR, GSI before the equipment is installed at FAIR, GSI site in the presence of supplier's representative(s). The SAT will involve trouble free operation and ascertaining conformity with the ordered specifications and quality. There shall not be any additional charges for carrying out site acceptance test. No



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malfunction, partial or complete failure of any part of the equipment is expected to occur. The Supplier shall maintain necessary log in respect of the result of the test to establish to the entire satisfaction of the Purchaser / FAIR, GSI, the successful completion of the test specified.

In the event of the ordered item failing to pass the site acceptance test, the supplier needs to rectify the defect at the earliest in consultation with the end user and clear the acceptance test, failing which the Purchaser reserve the right to get the item replaced by the Supplier at no extra cost to the Purchaser.

The final acceptance shall take place when the equipment is transported to the FAIR Facility site at Germany. The final acceptance (in the case of SAT) test will be formally documented by a final acceptance protocol. The final acceptance shall be deemed to be completed, when all conditions are met due to the given technical specification and the Company (FAIR/GSI) has detected no defect or when all defects have been successfully remedied. With successfully final acceptance the equipment shall become the property of the Company.

Successful conduct and conclusion of the site acceptance test for the supplied goods and items shall also be the responsibility and at the cost of the Supplier.

**4. Manuals and Drawings**

Before the items are taken over by the Purchaser / FAIR, GSI, the Supplier shall supply operation and maintenance manuals. These shall be in such details as will enable the Purchaser / FAIR, GSI to operate, maintain, adjust and repair all parts of the works as stated in the specifications.

The Manuals shall be in the ruling language (English) in such form and numbers as stated in the contract.

Unless and otherwise agreed, the goods / item shall not be considered to be completed for the purposes of taking over until such manuals and drawing have been supplied to the Purchaser / FAIR, GSI.

**5. Packing (GCC Clause 9) Add as Clause 9.2 of the GCC of the following:**

Packing Instructions: Each package will be marked on two sides with proper paint/indelible ink, the following:

- (i) Item Nomenclature
- (ii) Order/Contract No.



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- (iii) Country of Origin of Goods
- (iv) Supplier's Name and content
- (v) Packing list reference number

**6. Delivery and Documents (GCC Clause 10)**

Delivery of the goods should be made as per the delivery time such that the entire bulk of set of cables shall be ready for dispatch to FAIR, Darmstadt, Germany by **24 months from the date of PO**, duly packed after satisfactory Factory Acceptance Test along with their documents. Within 24 hours of shipment, the supplier shall notify the Purchaser / FAIR, GSI and the insurance company by cable/telex/fax/e mail the full details of the shipment including contract number, railway receipt number/ AWB etc and date, description of goods, quantity, name of the consignee, invoice etc. The supplier shall mail the following documents to the Purchaser / FAIR, GSI with a copy to the insurance company:

- (i) 4 Copies of the Supplier invoice showing contract number, goods' description, quantity, unit price, total amount;
- (ii) Acknowledgment of receipt of goods from the consignee(s) by the transporter
- (iii) Insurance Certificate.
- (iv) Manufacturer's/Supplier's warranty certificate;
- (v) Inspection Certificate issued by the nominated inspection agency, if any, and the Supplier's factory inspection report;
- (vi) Certificate of Origin; and
- (vii) Two copies of the packing list identifying the contents of each package.

The above documents should be received by the Purchaser / FAIR, GSI before arrival of the Goods (except where the Goods have been delivered directly to the Consignee with all documents) and, if not received, the Supplier will be responsible for any consequent expenses.

**7. Insurance (GCC Clause 11)**

For delivery of goods at the FAIR, GSI premises, the insurance shall be obtained by the Supplier for an amount equal to 110% of the value of the goods from "warehouse to warehouse" (final destinations) on "All Risks" basis including War Risks and Strikes. The insurance shall be valid for a period of not less than 3 months after SAT (Site Acceptance TEST) at FAIR. .



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**8. Incidental services (GCC clause 13)**

The incidental services also include: Furnishing of 01 set of detailed operations and maintenance manual.

**9. Warranty (GCC Clause 13)**

Warranty period shall be 24 months from date of acceptance of Goods. The Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the contract. If for reasons attributable to the Supplier, these guarantees are not attained in whole or

in part, the Supplier shall at its discretion make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expenses and to carry out further performance tests. The warranty should be comprehensive on site.

**10. Payment (GCC Clause 14)**

Payment will be made after satisfactory SAT test at the designated location at FAIR, GSI, Darmstadt, Germany as mentioned earlier.

**11. Penalty Clause (GCC Clause 21)**

**For delays: GCC Clause 21.1 -- The applicable rate is 0.5% per week or part thereof and the maximum deduction is 10% of the contract price.**

**12. Resolution of Disputes (Clause 25):** Add as GCC Clause 27 the following:

The dispute resolution mechanism to be applied pursuant to GCC Clause 27 shall be as follows:

- (i) Save and except the Clause in the agreement, in case of Dispute or difference arising between the Purchaser and Supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996, the rules there under and any statutory modifications or re-enactments thereof shall apply to the arbitration proceedings.
- (ii) The venue of the arbitration shall be the place from where the Purchase Order is issued.





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- 13. Applicable Law (GCC Clause 27)** Add as Clause 27.1 of the GCC the following :

**The place of jurisdiction would be Kolkata (West Bengal) INDIA.**

**14. Notices**

For the purpose of all notices, the following shall be the address of the Purchaser and Supplier.

- (i) **Purchaser:** Registrar (Officiating),  
Bose Institute  
Unified Academic Campus  
Block EN , Sector V, Salt lake  
Kolkata - 700091 (West Bengal) INDIA.
- (ii) **Supplier:** (To be filled in by the supplier)

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**15. Progress of Supply**

Supplier shall regularly intimate progress of supply, in writing, to the Purchaser as under:

- (i) Quantity offered for inspection and date;
- (ii) Quantity accepted/rejected by inspecting agency and date;
- (iii) Quantity dispatched/delivered to consignees and date;
- (iv) Quantity where incidental services have been satisfactorily completed withdate;
- (v) Quantity where rectification/repair/replacement effected/completed onreceipt of any communication from consignee/Purchaser with date;
- (vi) Date of completion of entire Contract including incidental services, if any;and
- (vii) Date of receipt of entire payments under the Contract (In case of stage-wise inspection, details required may also be specified).



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**16. Right to Use Defective Goods**

If after delivery, acceptance and installation and within the guarantee and warranty period, the operation or use of the goods proves to be unsatisfactory, the FAIR, GSI shall have the right to continue to operate or use such goods until rectifications of defects, errors or omissions by repair or by partial or complete replacement is made without interfering with the Purchaser's operation.

**17. Supplier Integrity**

The Supplier is responsible for and obliged to conduct all contracted activities in accordance with the Contract using state of the art methods and economic principles and exercising all means available to achieve the performance specified in the contract.



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**ANNEXURE-1**

**PRE CONTRACT INTEGRITY PACT**

**General**

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on \_\_\_\_\_ day of the month of \_\_\_\_\_ 2024, between, on one hand, the Director, Bose Institute acting through Shri....., Designation of the officer, Bose Institute (hereinafter called the “BUYER”, which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/s\_\_\_\_\_ represented by Shri\_\_\_\_\_, Chief Executive Officer (hereinafter called the “BIDDER/Seller” which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry/Department of the Government of India/PSU performing its functions on behalf of the President of India

NOW, THEREFORE, to avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.



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The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:	
<b>1.</b>	<b>Commitments of the BUYER</b>
1.1	The BUYER undertakes that no official of the BUYER, connected directly or indirectly with contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or their party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.
1.2	The BUYER will, during pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.
1.3	All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.
2.	In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.
<b>3</b>	<b>Commitments of BIDDERS</b>
3.1	The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-
3.2	The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.



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3.3	The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the Government.
3.4	BIDDERS shall disclose the name and address of agents and representatives and Indian BIDDERS shall disclose their foreign principals or associates.
3.5	BIDDERS shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
3.6	The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.
3.7	The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
3.8	The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.
3.9	The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
3.10	The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.



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3.11	The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
3.12	The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.
3.13	If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender. The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.
3.14	The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.
4.	<b><u>Previous Transgression</u></b>
4.1	The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Section Enterprise in India or any Government Department in India that could justify BIDDER's exclusion from the tender process.
4.2	The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.
5.	<b><u>Earnest Money / Bid Security</u></b>
5.1	While submitting commercial bid, the BIDDER shall deposit an amount of Rs. 30 Lakh as Earnest Money / Security Deposit, with the BUYER through any of the following instruments:
i.	Account payee Bank Draft / fixed deposit receipt / Banker's cheque / Bank Guarantee in favour of Bose Institute, Kolkata.
ii.	A confirmed guarantee by a Scheduled commercial Bank or Indian Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.
iii.	Any other mode or through any other instrument such as NEFT/RTGS.



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5.2	The Earnest Money/Bid Security shall be valid upto a period covering the bid validity plus 45 days beyond the final bid validity period.
5.3	In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.
5.4	No interest shall be payable by the BUYER to the BIDDER on Earnest Money /Security Deposit for the period of its currency.
6	<b>Sanctions for Violations</b>
6.1	Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-
i.	To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.
ii.	The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.
iii.	To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.
iv.	To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.
v.	To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.
vi.	To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such Cancellation / rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.
vii.	To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further



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	extended at the discretion of the BUYER.
viii.	To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.
ix.	In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.
x.	Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.
6.2	The BUYER will be entitled to take all or any of the actions mentioned at Para 6.1(i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal Code, 1860 or Prevention of Corruption Act, 1988, or any other statute enacted for prevention of corruption.
6.3	The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the independent Monitor(s) appointed for the purposes of this Pact.
7.	<b><u>Fall Clause</u></b>
7.1	The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.
8.	<b><u>Independent Monitors</u></b>
8.1	The BUYER has appointed independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Independent External Monitors appointed by CVC for the tender – Shri Umakant Lal,, IPS (Retd.) [ <a href="mailto:umakantlal@yahoo.co.in">umakantlal@yahoo.co.in</a> ] & Shri Vishnu Agarwal, Director (F), MRPL (Retd.) [ <a href="mailto:agrawal.vishnu@gmail.com">agrawal.vishnu@gmail.com</a> ].
8.2	The task of the Monitors shall be to review independently and objectively whether and to what extent the parties comply with the obligations under this Pact.





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8.3	The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.
8.4	Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.
8.5	As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.
8.6	The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.
8.7	The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.
8.8	The Monitor will submit a written report to the designated Authority or BUYER/Secretary in the Department/within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and should the occasion arise, submit proposals for correcting problematic situations.
9.	<b><u>Facilitation of Investigation</u></b> In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.
10.	<b><u>Law and Place of Jurisdiction</u></b> This Pact is subject to Indian Law. All disputes arising out of this Contract will be subjected to Kolkata jurisdiction.



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11.	<b>Other Legal Actions</b> The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.
12.	<b>Validity</b>
12.1	The validity of this Integrity Pact shall be from date of its signing and extend up to 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.
13.	Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.
14.	The parties hereby sign this Integrity Pact at _____ on _____

**BUYER**

**BIDDER**

**Name of the Officer**

**CHIEF EXECUTIVE OFFICER**

**Designation**

**BOSE INSTITUTE**

Witness

Witness

1. \_\_\_\_\_

1. \_\_\_\_\_

2. \_\_\_\_\_

2. \_\_\_\_\_

\*Provisions of these clauses would need to be amended / deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers.



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The bidders may note that they must upload the Integrity Pact signed by both the bidder as well as the buyer (Institute) in non-judicial stamp paper of denomination of Rs. 100/- and upload the same alongwith the bidding document in the portal and hard copy must be submitted in the Purchase Cell of Bose Institute before the date of opening of the tender.

Failure of submission of the same as stated above would render the bidder liable to be rejected.

In the event of any dispute between BI and the selected vendor as per the IP applicable, the disputes may be settled through mediation before the panel of IEM's in on time bound manner. The mediation rule to be adopted is to be decided in appropriate manner.



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**ANNEXURE-2**

**BID FORM**

(to be submitted on the official letterhead of the bidder)

The Registrar (Officiating)  
Bose Institute,  
Unified Academic Campus  
Block-EN 80, Sector V  
Kolkata – 700 091 (W.B.) India

Sir,

Having examined the bidding documents the receipt of which is hereby duly acknowledged, I / We agree to furnish required supplies/services in conformity with the Techno-Commercial Bid or such portions thereof at the prices given in the Price Bid on receipt of order for the same.

I/We agree to hold this offer open until ..... and to supply, install and commission the equipment and complete the whole of the work and hand over to the purchaser within the period of .....weeks, from the date of receipt of intimation from you regarding acceptance of this tender/receipt of supply order.

I/We agree to submit the bank guarantee as specified in the form prescribed by your goodself for the due performance of the contract, if our bid is accepted.

I/We understand that you are not bound to accept the lowest or any bid you may receive.

.....  
Signature of Bidder  
With Office Stamp

Name & Address :

Telephone No.:

FAX No.:

E-mail address:

Name & Designation of the Contact Person:



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**ANNEXURE-3**

**BIDDER'S INFORMATION FORM**

[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted. This should be done of the letter head of the firm]

Date: [insert date of Bid Submission]

Tender No.: [insert number for Invitation for bids]

1. Bidder's Legal Name [insert Bidder's legal name]
2. In case of JV, legal name of each party: [insert legal name of each party in JV]
3. Bidder's actual or intended Country of Registration: [insert actual or intended Country of Registration]
4. Bidder's Year of Registration: [insert Bidder's year of registration]
5. Bidder's Legal Address in Country of Registration: [insert Bidder's legal address in country of registration]
6. Bidder's Authorized Representative Information  
Name: [insert Authorized Representative's name]  
Address: [insert Authorized Representative's Address]  
Telephone/Fax numbers: [insert Authorized Representative's telephone/fax numbers]  
Email Address: [insert Authorized Representative's email address]
7. Attached are copies of original documents of: [check the box(es) of the attached original documents]

Signature of the Bidder

Name

Business Address



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**ANNEXURE-4**

**TECHNO-COMMERCIAL BID FORM**

1	Tender reference No.	:	
2	Due date of bid submission	:	
3	Main Item Model No.	:	
4	Life Expectancy of the Equipment (in years)	:	
5	Warranty Period (in years)	:	
6	Delivery Period of the Equipment	:	
7	Details of Bank Guarantee enclosed as Bid Security :		
	i. Name of the Bank	:	
	ii. Branch	:	
	iii. Address with Phone, FAX & E-mail Nos.	:	
	iv. Amount Rs.	:	
	v. Valid Upto	:	
8	Schedule of Requirements :		
	i. Whether agreeing to all the terms and conditions including payment terms as mentioned in the bidding documents	:	
	ii. Approximate Shipment Weight (chargeable weight) in Kg. of the packed consignment	:	
	iii. Approximate Dimensions/ Volume of the packed consignment	:	
Note ::			
1.	Adhering to the format given above is a pre-requisite for considering your bid.		
2.	All columns must be filled up.		
3.	Separate list should be attached where required in the same format giving details of each item.		
4.	Please indicate applicability.		
I/we certify that I/We have completely read and understood and agree to all the terms & conditions given in NIT.			

.....  
Signature of Bidder  
With Office Stamp



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**ANNEXURE-5**

**MANUFACTURERS' AUTHORIZATION FORM**

No.....

Dated .....

The Registrar (Officiating)  
Bose Institute,  
Unified Academic Campus  
Block-EN 80, Sector V  
Kolkata – 700 091 (W.B.) India

Sir,

I/We .....who are established and reputable manufacturers of ..... having factories at .....  
(*address of factory*) do hereby authorize M/s. .... (*Name and address of Agent*) to submit a bid, negotiate and receive the order from you against your tender enquiry.

No company or firm or individual other than M/s. ....is authorized to bid, and conclude the contract in regard to this business.

I/We hereby extend our full guarantee and warranty as per Clause 15 of the General Conditions of Contract and Clause of the Special Conditions of Contract for the goods and services offered by the above firm.

Yours faithfully,

(Name)  
(Name of manufacturers)

**Note:** This letter of authority should be on the **letterhead of the manufacturer** and should be signed by a person competent and having the power of attorney to bind the manufacturer. It should be included by the Bidder in its techno-commercial unpriced bid.



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**ANNEXURE-6**

**BIDDER'S PERFORMANCE STATEMENT FORM**  
(For a Period of Last 3 Years)

Name of the Firm.....

Order placed by (full address with Tel. No., Fax No. & e-mail address of purchaser)	Date	Description and quantity of ordered equipment	Date of completion of delivery as per Contract/ Actual	Remarks indicating reasons for late delivery, if any	Has the equipment been installed satisfactory? (Attach a certificate from the purchaser/ Consignee)

Place :

Signature :

Date :

Office stamp





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**ANNEXURE-7**

**SERVICE SUPPORT DETAILS FORM**

Sl. No.	Nature of training imparted	List of similar type equipment serviced in the past 3 years	Address, TelephoneNos., Fax and e mail address of the firm located in Kolkata, if any	Value of minimum stock of consumable spares held at all times.	Value of minimum stock of consumable spares held at all times.

Signature and Seal of the  
manufacturer/Bidder.....

Place :

Date :



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**ANNEXURE-8**

**TECHNCAL COMPLIANCE STATEMENT FORM**

An item-by-item commentary on the Purchaser's Technical Specifications demonstrating substantial responsiveness of the goods and services to those specifications or a statement of deviations and exceptions to the provisions of the Technical Specifications.

ITEM NAME :			
Sl. No.	Tender Specifications	Bidder's specifications	Deviation/ Remarks, if any Including justification

*(Technical literature/brochures/manuals should be attached along with this format)*

Please note:

- **Bidders must submit exact specification in detail against the required tender specification. Writing only yes / no / complied etc. will not be accepted.**
- Compliance/Deviation statement comparing the specifications of the quoted model to the required specifications. This statement should also give the page number(s) of the technical literature where the relevant specification is mentioned.
- Bids must have supporting documents (technical literature or copies of relevant pages from the service manual or factory test data) for all the points noted above, failure regarding which may result in rejection of bid.
- In case the bidder furnishes wrong or false information willfully in the technical compliance chart, such action shall be viewed strictly and the bidders may be blacklisted.
- Where there is no deviation, the statement should be returned duly signed with an endorsement indicating "No Deviations".

Signature and Seal of the  
manufacturer/Bidder.....

Place:

Date:



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ANNEXURE-9

Quotation No. : .....

Date : .....

**PROFORMA OF FALL CLAUSE CERTIFICATE**

If on any subsequent date after submission of quotation or placing of supply order, the manufacturer (the term manufacturer will also include his authorized distributor / agent) reduces the sale price of such stores or sells such stores to any party at a price lower than the price charged / chargeable against supply order placed by Bose Institute, Kolkata, the manufacturer (including his authorized distributor / agent) as aforesaid in case the quotation is submitted by them and supply / service is also effected by them) will forth-with notify such reduction in sale price to Bose Institute, Kolkata and price payable for the stores to be supplied against the Supply Order after the date of such reduction in sale price coming into force shall reduced **correspondingly and will be reimbursed to the Institute.**

(Signature & Name of Bidders  
with Rubber Stamp)

\*\* This certificate should be uploaded on the letter head of the company / firm / agency



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**ANNEXURE-10**

**DECLARATION OF LOCAL CONTENT**

Self-Certification for Local Content (on Letter Head of the Bidder)

Ref: DPIIT Order No. P-45021/2/2017-PP (BE-II) pref. to Make in India dated 16<sup>th</sup> Sept 2020 and subsequent orders / directives made thereto.

Local content value added for the offered Item (in percentage)	
Details list of local content addition in India for the offered item	

.....  
Signature & Name  
with Designation of Applicant with Rubber Stamp



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**ANNEXURE-11**

**BID SECURITY FORM**

(To be executed by a scheduled commercial Bank or  
Nationalized Bank in India on non-judicial stamp paper)

The Registrar (Officiating)  
Bose Institute,  
Unified Academic Campus  
Block-EN 80, Sector V  
Kolkata – 700 091 (W.B.) India

Dear Sir,

Whereas ..... (Name and address of Bidder)  
(hereinafter called “the Bidder”) in response to your Tender Notification  
No..... dated ..... is submitting its bid for the supply of  
..... (Name and/or description of the goods) (Hereinafter called “the Bid”).

KNOW ALL PEOPLE by these presents that We ..... (Name of bank) of .....  
(Name of country), having our registered office at ..... (Address of bank) (Hereinafter called  
“the Bank”), are bound unto Director, Bose Institute, Kolkata, INDIA (Hereinafter called “the  
Purchaser”) for the sum of ..... (Amount of the Guarantee in Words and  
Figures)

for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its  
successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this  
..... Day of ..... 20.....

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or
2. If the Bidder, having been notified of the acceptance of its bid by the Purchaser during the period of bid validity:



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3. Fails or refuses to execute the Contract Form if required; or
4. Fails or refuses to furnish the performance security, in accordance with the Instruction to Bidders.
5. This guarantee is valid up to .....(six months from date).

We undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including forty-five (45) days after the period of the bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

Date:

Signature.....

Place: Seal of Bankers  
(Complete Address/Contact Details with Tel./Fax/email etc)

Witness: 1. ....

2. ....



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**ANNEXURE-12**

**PERFORMANCE SECURITY FORM**

(To be executed by a scheduled Bank in India on non-judicial stamp paper)

The Registrar (Officiating)  
Bose Institute,  
Unified Academic Campus  
Block-EN 80, Sector V  
Kolkata – 700 091 (W.B.) India

Dear Sir,

Sub: Your Contract No. -----dated -----

for -----

You have entered into a contract with reference no as given above with (herein after referred to as the contractor) for the supply, installation, and commissioning of (herein after referred to as stores) for the price and on the terms and conditions contained in the said contract.

In accordance with the terms of said contract, the contractor has undertaken to produce a bank guarantee for Rs.....(Rupees only) being 3% of the total value of the said stores supplied to you, for the due fulfillment of its obligations to you for due performance as per the contract during warranty period.

In consideration thereof, we hereby expressly, irrevocably and unconditionally undertake and guarantee as principal obligator on behalf of the contractor that in the event you submit a written demand to us that the contractor has not performed according to the contractual obligations included in the said contract, we will pay you on written demand, without demur and without reference to the Contractor any sum upto a maximum amount of Rs..... (Rupees .....only). Your demand shall be conclusive evidence to us that such payment is due under the terms of the said contract. Payment by us to you will be made within thirty (30) days from receipt of your request making reference to this guarantee and on demand.

This guarantee shall not be revoked without your express consent and shall not be affected by your granting any indulgence to the contractor, which shall include but not be limited to postponement from time to time of the exercise of any powers vested in you or any right which you may have against the contractor and to exercise the same in any manner at any time and either to forbear or to enforce any covenant contained or implied in the said contract or any other course or remedy or



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security available to you, and our Bank shall not be released from its obligations under this guarantee by your exercising any of your rights with reference to matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on your part or any other indulgence shown by you or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving our Bank from its obligation under this guarantee.

Notwithstanding anything herein contained, our liability under this guarantee is restricted to Rs..... (Rupees ..... only) and the guarantee shall remain in force up to and including the day of being reported to us by you and returned to us duly discharged.

Unless a demand or claim under this guarantee is made on us in writing on or before the aforesaid expiry date as provided above or unless this guarantee is extended by us all your rights under this guarantee shall be proscribed and we shall be discharged from the liabilities hereunder.

This guarantee shall not be affected by any change in the constitution of our Bank or of the contractor or for any other reason whatsoever.

Date:

Signature.....

Place: Seal of Bankers

(Complete Address/Contact Details with Tel./Fax/email etc)

Witness:

1. ....

2. ....





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**ANNEXURE-13**


**Technical specifications of Power Converters For Corrector  
(Steerer, Sextupole and Octupole) Magnets in SFRS (Type:  
FR.C3)**

Configuration Management and Documentation	Document Type	Document Number:	Date
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Document Title:	<b>Power Converters for Corrector (Steerer, Sextupole and Octupole) Magnets in SFRS</b>
Description:	This document describes detailed specifications of power converters for the Corrector Magnets in SFRS
Division/ Organization:	GSI-EPS "Electrical Power System"
Field of Application:	FAIR GmbH and GSI GmbH

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### Abstract


This document describes detailed specifications of power converters for the Corrector (Steerer, Sextupole and Octupole) Magnets in SFRS

PSP: 2.4.3.3.2.1, 2.4.3.3.5.1, 2.4.3.4.1.1 and 2.4.3.3.3.1; AID: 0000402

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## 1. Purpose and classification of the document

This document describes technical requirements of the power converter dedicated to all the corrector magnets of sextupole, octupole and horizontal and vertical steerers for the dipole magnets in SFRS (Super FRagment Separator) inside FAIR project.


General technical requirements for all the parts and components of the power converters are given in the Common Specifications for power converters [2]. General, legal and technical issues are given in the General Specifications [1] and technical guidelines “Electrical Design Rules and Regulations” [3], respectively.

*However, statements made in this document override the ones in all other documents: the general specifications, the common specifications for power converters and the technical guidelines.* Contracting body for the equipment described in this document is FAIR GmbH. Therefore, all further references to the term ‘the Company’ will refer to FAIR GmbH.

## 2. Abbreviations, terms and Definitions

ACU	Adaptive Control Unit
CID	Component-ID (identification number)
CDR	Conceptual Design Review
DC	Direct Current
DCCT	DC Current Transformer
$\delta I$	Permissible deviation of the power converter output current
FAIR	Facility for Antiproton and Ion Research
FAIR GmbH	International GmbH under German law aiming to realize the FAIR project – acting as contracting body
FAT	Factory Acceptance Test
FDR	Final Design Review
Frame	19" rack IEC 297-3
FT	Freewheeling Thyristors. Antiparallel thyristors to freewheel the output of the PC.
gG	Operating class / utilization category for melting fuses (see IEC 60269)
GSI	GSI Helmholtz-Zentrum für Schwerionenforschung
LEB	Low-Energy Branch
MFU	Multi-Function Unit
MPS	Machine Protection System
PC	Power Converter
PSP	Project Structure Plan
RIB	Rare Isotope Beam
SAT	Site Acceptance Test
SFRS	Super FRagment Separator
SM_x	Switch Mode_x

**Table 2-1: List of Abbreviations**

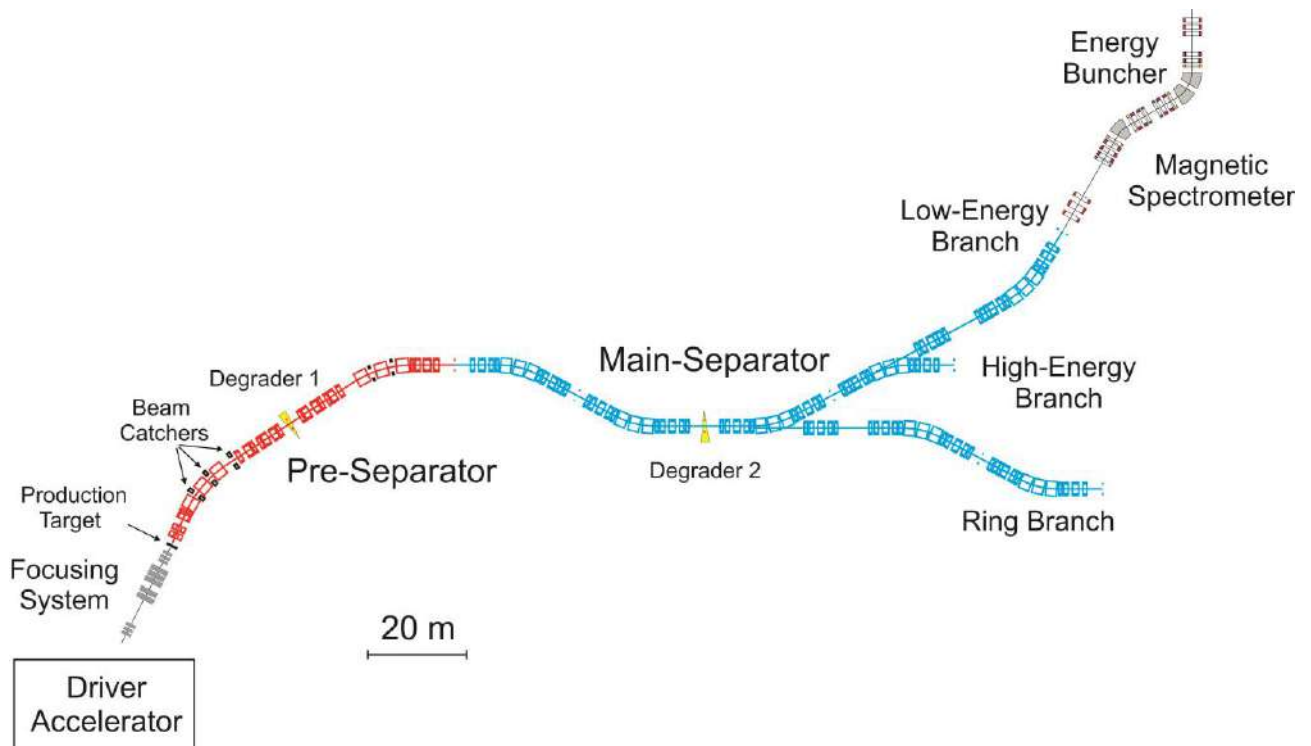
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### 3. Scope of the technical System

#### 3.1. System Overview

As a part of the FAIR project, Super-FRS is the central device of the NUSTAR (Nuclear Structure, Astrophysics and Reactions) collaboration. It is more than 100 m long. With the help of magnets (some of them weighing several tons), the system will sort the exotic nuclei according to their charge and mass. This will enable the scientists to filter out exactly the exotic nuclei they want to study — a feat not achievable anywhere else in the world.


The Super-FRS is a two-stage fragment separator consisting of a Pre-Separator and a Main-Separator (see Figure 1). The Main-Separator will serve three experimental branches i.e. the Ring Branch (RB), the High-Energy Branch (HEB), and the Low-Energy Branch (LEB) including a dedicated Magnetic Spectrometer/ Energy Buncher stage. The Super-FRS is characterized by a large phase-space acceptance employing large-aperture superconducting magnets.



**Figure 1: Layout of Super-FRS**

The high-radiation load in the target area requires a dedicated design. The heavy shielded area includes the high-power production target as well as the beam-catcher stations which will remove the non-reacting primary beam. Remote handling must be applied and maintenance will take place in a Hot Cell complex which is integrated in the Super-FRS Target Building.

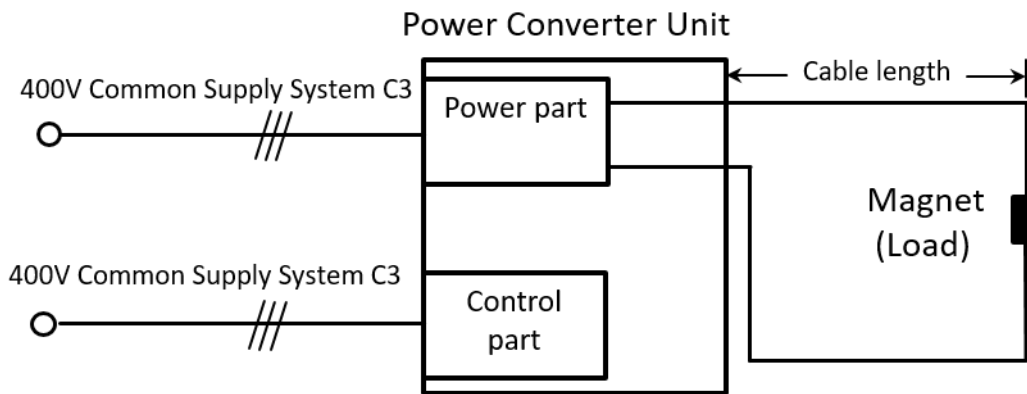
All the corrector magnet in SFRS are of superconducting type and fed by a dedicated PC. This PC has to be, a ramped power supply, capable of reaching a nominal current ( $I_N$ ) of 300 A within a time of 60s with an absolute accuracy of  $1 \times 10^{-4} I_N$ . The maximum output voltage of this PC shall be of about 40V.

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### 3.2. Structure of Power Converters

The power converter can be divided in two independent parts:

1. Power part,  
It is supplied by a 400V, 3-phase Common supply system C3 (Sec. 2.3 of [3]).
2. Control part,  
It is supplied by a 400V, 3-phase Common supply system C3 (Sec. 2.3 of [3]).



**Figure 2: Power Converter Set-up**


The power part is under the responsibility of the manufacturer and the control part is mainly designed and provided by the Company.

Table 4-1 gives the technical parameters for the power part. The design principles for the main components and functionalities of the power part can be found in Sec. 4 of [2] and 8.5 of [2].

From the standardization point of view, it is mandatory for the power converter to be compatible with the control part, specifically, ACU systems and DCCT. Both, ACU system and DCCT, will be provided by the company and to be integrated by the contractor. ACU system has to be integrated in the control part and the DCCT (per power converter) has to be installed at the output of the power converter. Further details can be found in Sec. 8.3 and 8.4 of [2], [4] and [7].

Each PC shall supply its corresponding magnet/ load through a coaxial power cable (see Sec. 4.2) with a cross-section of 150 mm<sup>2</sup>. The cable length is determined by the physical distance between the power converter and the magnet (Figure 2) and the routing of the cable trays. The minimum cable length in this case is around 40 meters and maximum length is 210m. The connection of the PCs shall be done according to Sec. 8.5.13 of [2]. The power cables will be provided and connected by the Company.



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### 3.3. Scope of Delivery

The contractor has to deliver the following power converters:

PC Description	PC Type	PSP Code	Nº of PCs	Nº of Cabinets
Corrector PCs	FR.C3	2.4.3.3.2.1 (FoS) 2.4.3.3.5.1 2.4.3.4.1.1 2.4.3.3.3.1	70	36 (34 double and two single cabinets)

**Table 3-1: Type and PSP codes of the power converters to be delivered by the contractor. The first power converter of PSP 2.4.3.3.2.1 (FR.C3) shall be built as FoS, First of Series (prototype).**


#### Provisions of the contractor:

- Design of the power converter in Table 3-1, including CDR and FDR (see Sec. 5.1);;
- Manufacturing of the pre series and series power converters in Table 3-1;
- Integration of the ACU systems, DCCTs and further provided electronics;
- Factory Acceptance Tests, FAT, for all assembled power converters (see Sec. 5.3.1);
- Packaging, transportation to and unloading at the Company's location;
- Internal transportation of the power converters to the final location for testing;
- Cable connectors and, the clamp and rack assembly (see Sec. 4.9 and [6]) for all load cables;
- Final assembly (if needed) of the power converters at final location for testing;
- Site Acceptance Tests (SAT), for all assembled power converters (see Sec. 5.3.2);
- Documentation (see Sec. 6);
- Spare parts as described in Sec. 3.4.

#### Provisions of the Company:

- The load cables connecting the power converter output to the load will be provided as well as mounted by the Company;
- Input power cables connecting the power converter input to the low voltage distributions (including ground) will be provided as well as mounted by the Company;
- Interlock cables will be provided as well as mounted by the Company;
- Connection to the water supply system;
- One ACU system<sup>1</sup> (Sec. 8.3 of [2]);
- One DCCT<sup>1</sup> (Sec. 8.4 of [2]);

<sup>1</sup> Components will be delivered to the contractor, by the Company, as per the schedule.

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- One Interface Card (FG660\_504\_MPS; width 7cm) to connect the PC and the MPS. It's placed beside ICM card.
- One Quench Detection, QD card (see Sec. 4.6).
- One QD Interface Card (FG660\_873; width 9.5cm) to connect the QD and ICM. This card, preferably, to be placed near to QD card.

### 3.4. Spare Parts

The following spare parts are necessary:

Device Name	Quantity in relation to the total device number of the same type <sup>2</sup>
Power semiconductors (rectifier diodes)	20%
Power semiconductors (IGBT, Thyristors)	25%
Power capacitors (DC-link, output filter)	1%
Contactors (main contactor, auxiliary contactors)	1%
Water flow control meter	2%
Line voltage monitoring card	1%
IGBT driver cards	15%
Thyristor firing cards	1%
Voltage sensing cards	1%
Current sensing cards	1%
Power fuses	15%


**Table 3-2: List of spare parts**

### 3.5. Interfaces

The power converter will have the following interfaces:

1. Electrical inputs for the electrical supply systems (see Sec. 3.2 and 4.9)
2. Integration of the ACU system (see Sec. 8.3 and 8.4 of [2]);
3. Inputs for interlocks (see Sec. 4.5);
4. Connection to the water system (see Sec. 4.10);
5. Electrical outputs (see Sec. 4.2);

<sup>2</sup> At least one piece of each device has to be delivered, if not stated otherwise.

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6. Mechanical dimensions (interface to building, see Sec. 4.11);
7. Interface to MPS system (see Sec. 4.7).
8. Ground connection (see Sec. 4.4).

## 4. Technical Specification

### 4.1. Technical Parameters

PC type	FR.C3
PC description	Corrector. PC
Maximum current <sup>3</sup> , $I_{max}$ , A	320
Nominal current, $I_N$ , A	300
Minimum current, $I_{min}$ , A	0
Range of load current, A	-320 ... 320
Current ramping rate $di/dt$ , A/s	$\pm 5.33$
Maximum ramping time, s	60
Maximum flat top time, s	any
Cycle frequency, $f$ , mHz	8.33
Permissible total deviation absolute: $\delta_2 I (= \Delta I / I_N)$	$\pm 1 \times 10^{-4}$
Minimum current for accuracy, A	+/-10
№ of magnets in series	1
Resistance of the Magnet, $R_m$ , m $\Omega$	0 (superconducting magnet)
Low field inductance of the magnet, $L_m$ , H	0.054 to 1.07
High field inductance of the magnet, $L_m$ , H	0.053 to 0.7
№ of load cables in parallel	1
Cross section of load cable conductor (positive /negative)), mm <sup>2</sup>	150

<sup>3</sup> There is no specific requirement for the rise time and accuracy from  $I_N$  to  $I_{max}$

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Resistance of load cables, $R_L$ , m $\Omega$	9.2 ... 62
Maximum length of load cables, m	215
Minimum length of load cables, m	40
Number of PC/cabinet	2 or 1 (for total 36 cabinets: 34 cabinets with double PCs i.e. two PCs/ cabinet; 2 cabinets with single PCs i.e. one PC/ cabinet)
Max. cabinet dim. W x B, m; H = 2.2 m	0.8 x 0.8

**Table 4-1: Technical Parameters**


Beside the technical parameters of Table 4-1, following aspects have to be considered:

1. The power converters must operate in DC and in Pulsed mode (type B and C in Subsec. 8.1.3 of [2]). Pulsed mode will be used when the power converter has to change its load current to different values. This procedure can be described as follows,
  - 1) Set the value to minimum current
  - 2) Wait for 10 seconds until the discharge is finished
  - 3) Set the value to maximum (nominal) current
  - 4) Wait for 10 seconds
  - 5) Set the value to minimal current again
  - 6) Wait for 10 seconds
  - 7) Set the value to the new nominal current
2. It is to be noted that the cycle frequency mentioned in Table 4-1 is calculated by assuming an extreme case with no flat top.
3. In DC mode, constant load currents up to  $I_N$  will be applied.
4. The permissible voltage ripple of the output voltage must be as per the given in Section 8.2 of [2]. Additionally, the normalized voltage ripple during flat top ( $U_{NFTripple}$ ) at any current level from 0 to 300 A ( $I_{FT}$ ) must fulfil the following requirement (limits in Section 8.2 of [2] still valid):

$$U_{NFTripple}(f) \leq \pm I_{FT} \times 1 \times 10^{-4} \times 2\pi \times f_{min} \times L(I)$$

$f_{min}$  – the smallest existing ripple frequency (depending on the power converter design);

$U_{NFTripple}(f)$  – measured ripple amplitude of frequency  $f$ , normalized to  $f_{min}$ ;  $L(I)$  given in Table 4-1.

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However, the aim is that the total ripple (amplitude of the sum of the different frequency components is not exceeding the tolerance given by the previous expression).

Inductance for these magnets is lowering with the increase of the current, so called-saturation effect. Specifically, this effect is significant in case of sextupole magnets, its inductance reduces from 1.07 to 0.75 H for nominal current and to 0.7 for the maximum current.

## 4.2. Electrical Outputs

Coaxial cable will be used to connect the power converter output to the respective load. The cable dimensions are given in Table 4-1. The principle of the connection of this type of cable is explained in [6].

## 4.3. Electrical Inputs (Power Part, Control Part)

As mentioned in Sec. 3.2, the power converter has to be equipped with two electrical inputs. The dimensions of the input terminals for the power part and the rating of the fuse placed in the low voltage distribution (gG characteristic, see IEC 60269) shall be proposed by the contractor and approved by the Company.

The Input terminals for the control part must be equipped with terminals of 2.5mm<sup>2</sup> and the fuse rating in the low voltage distribution will be 16 A (B characteristic, see EN 60898).

## 4.4. Grounding of the Power Converters

The power converters are usually grounded by the input cable for the power part. In addition, they have to be connected to the equipotential bonding rail (copper bus bar) inside the false floor. Therefore, a possibility to connect a copper strap to the mounting plate of the power part (the plate where the switch mode circuit is located) has to be foreseen and done by the contractor. The copper strap to be fixed with M10 size screw.


## 4.5. Interlocks

Most of the applicable interlocks are listed in Subsec. 8.5.10 of [2]. Also, a Beam interlock system (version 'A' in Subsec. 8.5.11 of [2]) has to be foreseen. The pin assignment is presented in Subsec. 4.3.2 of [4].

In case of superconducting magnet coil a spread of hotspot coil which may force the magnet to lose its superconductivity is known as quench. A quench, though not wished to occur, is a part of normal operation for the superconducting magnet. Each PC to be equipped with a quench detection card (see Sec 4.6), provided by the company and the quench has to be treated as any other fault/interlock leading the PC to a fault state.

In addition, to protect the magnet in case of a fault (including quench) power converters must include a Free-wheeling Thyristor (FT). Depending on the type of the interlock (see Sec. 4.7), the FT must be activated simultaneously with the PC turn off. FT shall be provided and installed at the output of the PC by the contractor.

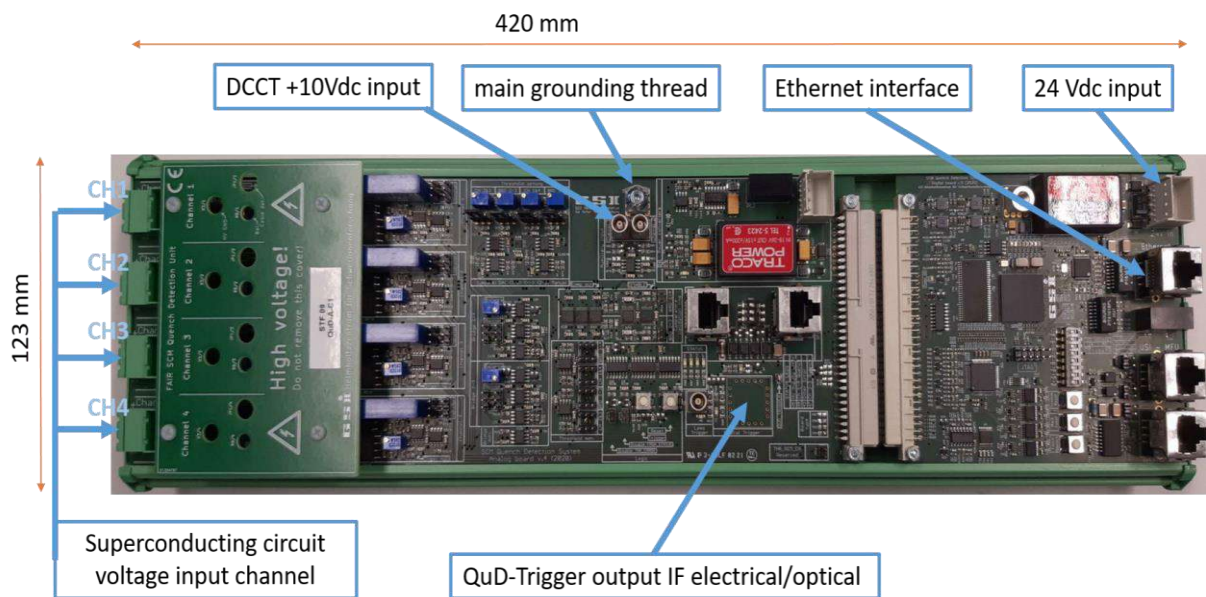
For additional information on the actions to be taken in case of an interlock, refer Sec. 4.7.

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#### 4.6. Quench Detection Card

For these SFRS power converters, each power converter unit is associated to a dedicated Quench Detection Unit (QuD-U). Its function is to continuously monitor the voltages across the corresponding SFRS superconducting magnet and current leads.


For these power converters the corresponding QuD-U is called type B2 i.e. quench detection for superconducting SFRS low inductance ( $L \leq 1.1$  H) corrector magnets. A prototype of a QuD-U installed to its board carrier profile is shown in Figure 3. It is referring to all on-board input/output connectors required for cabling within the SFRS power converter cabinets:

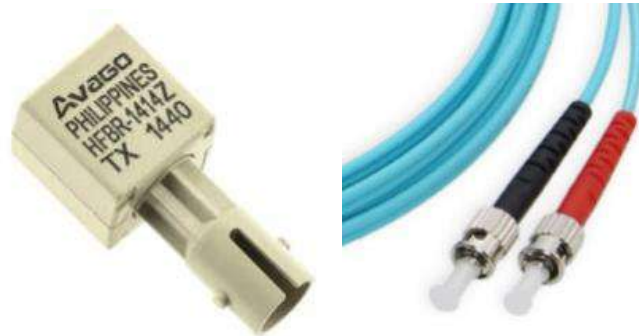


**Figure 3: Quench Detection unit prototype.**

##### 4.6.1. Main requirements for this card in the PC cabinet

1. There are four differential voltage input channels CH1 to CH4 (Phoenix Contact 1728853, 2-pin). A screened signal cable (HELU Dataflamm-C-Paar, 5x2x0.5mm<sup>2</sup>, provided by GSI) used for QuD will arrive from the false floor beneath the power converter cabinet and will be connected to these input channels. Two wires of the cable are spares and shall be grounded (PE). Preparation within the cabinet for laying, strain and bend relief as well as grounding of the cable screen and the spare wires close to the QuD-U is the responsibility of the Contractor.
2. In Figure 4 is, quench trigger interface adapter on this board provides an optical output with ST connector (Broadcom/ Avago HFBR-1414Z) for connecting an optical fiber (type OM3) to ICM, the power converter's trigger card (ST input connector). A suitable optical fiber cable using ST connector on both ends needs to be installed within the cabinet. Its length to be defined by the Contractor.

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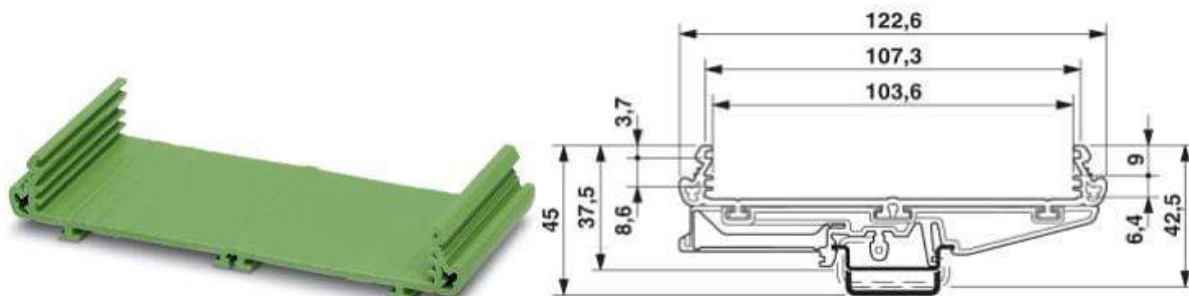



**Figure 4: A quench trigger interface adapter (L) and connecting optical fiber (R).**

3. DCCT monitoring input (LEMO EPA.00.250.NTN, 1-pin coax + GND/PE). This input shall be connected using a pre-confectioned cable LEMO MSB.00.250.LTExxx at suitable length (xxx) to the DCCT analogue output socket of the corresponding SCU/MFU unit at the power converter's cabinet front door.
4. Ethernet interface (RJ-45 8P8C, shielded). The corresponding cable is arriving from the false floor beneath the cabinet and is provided by GSI. The cabinet shall be prepared to lay and fix this cable inside.
5. DC +24 V powering input (WAGO 2091-1404, 4-pin, pins 1&4 = +24V, pins 2 & 3 = 0V). A twisted pair wire (max. 2x0.75mm<sup>2</sup> incl. ferrules with insulating collar) using the counterpart, WAGO 2091-1104/002-000 needs to be installed within the cabinet. Moreover, a 1A fast acting fuse has to be inserted in this connection close to the QuD-U.
6. Grounding thread M5 x 6 mm. This shall be connected to the cabinet ground (PE) respectively the mounting plate or DIN-rail using a short piece of yellow/green PE-wire (stranded, 2.5 mm<sup>2</sup>) as well as M5 ring terminals (crimp type) and suitable screws including a standard and spring washer.

#### 4.6.2. Other Installation/ Connection requirements

QuD-U's are assembled on a common board carrier profile type Phoenix Contact UM108 including two side elements UM108-SE and two feet UM108-FE (all provided by GSI) for DIN-rail mounting on DIN-rail type TS35x7.5mm (Figure 5).



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**Figure 5: Board carrier profile Phoenix Contact UM108 and accessory used for QuD-U**

The maximum height of the board carrier containing the QuD electronics including the feet measures approx. 55 mm between the mounting surface and the on-board HV-insulation plate. On top, there are the required connector's dimensions and cable bending radii. This has to be considered at installation locations regarding space constraints or movable parts within the cabinet.

The DIN-rail is responsibility of the Contractor and shall be at sufficient length (e.g. 565 mm) in order to provide space left and right to the QuD-U for additional components like terminals, end clamps, fuses, shielding, grounding or fixation. In case the suggested DIN-rail length and component arrangement will not be compatible with the power converter cabinet inner dimensions, the Contractor is asked to provide an alternative solution.

**Electrical connection of the DIN-rail to the cabinet grounding system (PE) is mandatory.** The QuD-U can be mounted horizontally on a mounting plate or the cabinet doors with CH1-to-CH4 connector's orientation to the left. Alternatively, mounting vertically on the cabinets left and right side is possible with the CH# connector's orientation downward. At least vertical QuD-U positions have to be secured with end clamps on the DIN-rail. Installation of QuD-U's in general shall only be done within the climate-controlled area of the power converter cabinet.

Typically, the cable entry into all SFRS cabinets is from the bottom, applying a false floor. The (double) power converter cabinet needs to provide direct entry and sufficient laying space for two QuD cables (HELU as specified above, carrying high voltage signals from the superconducting circuits) and two Ethernet cables (e.g. Cat 6 F/UTP, for QuD-U communication). These cables and their installation to two QuD-U's within the cabinet will be responsibility of GSI. Provisions for strain relief, shielding, grounding, laying, HV-separation, etc. of these cables within the cabinet is the responsibility of the Contractor.


The style and orientation of the cable strain relief/shielding assembly may need to be modified as per the possible entry/ orientation of the QuD cable as well as the QuD-U within the cabinet. This is left to the Contractor's engineering decision.

The Ethernet cable, possibly, can be laid/ fixed in an existing cable tray aside the QuD electronics. If not, the Contractor needs to suggest an alternative fixation and strain relief method.

All other QuD-U interconnections (quench trigger, grounding/PE, +24V supply, DCCT) are the responsibility of the Contractor and shall be prepared using the recommended materials, connectors and cables/ wires. In particular, the QuD-U's are supplied by the power converter's internal DC 24 V infrastructure. The corresponding cabling using a WAGO 4-pin plug requires an extra fuse to be inserted in this connection close to the QuD-U.

**Any modification to the given assembly proposal has to be approved by GSI.**



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#### 4.6.3. Dummy QuD-Units

The final QuD-U's are responsibility of GSI and will not be delivered to the Contractor. In order to validate the mechanical integration and the cabling of QuD-U's within the power converter cabinet, GSI will provide two "Dummy QuD-U" devices. Such devices will have the same dimensions as a standard QuD-U, but equipped with just the intended board connectors plus some status LEDs. An example is shown in Figure 6:



**Figure 6: Dummy Quench detection unit**

After each cabinet QuD-U preparation, the "Dummy QuD-U's" shall be disassembled for use in the next cabinet. Therefore, all loose parts (like grounding screws, washers, cable ties, etc.) need to be collected in a bag (per unit) and fixed to the individual QuD-U installation location. Alternatively, collecting, packaging and fixation of all loose parts per power converter or as an entity for all power converters can be provided.


#### 4.6.4. System Specification

The power converter cabinets and therefore QuD-U's will permanently be operated in the accelerator facility for 20 years or more. Therefore, high quality requirements are imposed on the type and assembly of the cabinet and its components. Moreover, it is mandatory using expert tools and mounting accessories throughout all stages of the installation/cabling process.

The Company recommends using the material references as stated in the initial components overview. However, the Contractor is free to suggest alternative components to ensure component availability, feasibility or the required quality and safety.

**Any modification to the GSI assembly proposal needs written agreement by GSI and shall be recorded in the final production documentation of the Contractor.**

All applied electrical components shall be CE-certified and assembled in accordance with good electrical engineering practice.

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#### 4.6.5. QuD-U integration setup

A possible setup for integration of one QuD-U and the related components on a DIN-rail are shown in Figure 7. It suggests standard electrical cabinet components from Phoenix Contact and ICOTEK:

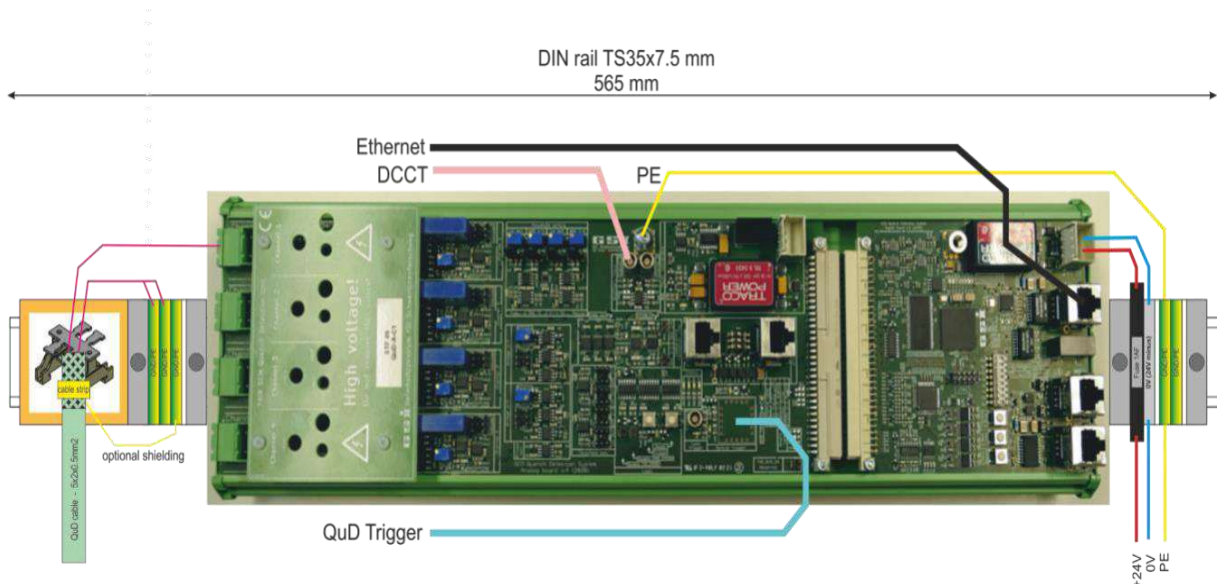


Figure 7: : Exemplary component layout for integration of one QuD-U

#### 4.6.6. Cables, Wiring and Routing


##### Cables

All the cables/wires must be labelled on both ends.

The exact length of cables/wires needs to be determined at the object. (+24V, DCCT, grounding, trigger cables).

##### Wiring and Routing

1. All the cable installation, especially the crimp connections shall be done using appropriate tooling.
2. Wiring in general shall be based on the application of appropriate ferrules with insulating collar on all wire ends and expert stripping/crimping tools for assembly. Using a square or hex crimp shape is mandatory. Moreover, direct touching of the bare copper strands or the ferrules with fingers should be avoided.
3. Electrically associated wires within a circuit shall be routed as much as possible in twisted pairs. If applicable, consider wire colors of twisted pairs according to DIN 47100.
4. Superconducting circuit voltage cables (QuD) should be routed separately (e.g. independent cable duct) from the other cables.
5. Cable routing shall be done such that there is no strain on any connector, in particular the QuD-U board connectors.

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6. All cable routing shall be performed considering at least the minimum allowed cable bending radius throughout the installation.
7. Any open or unused wire/pair shall be insulated using a spare connector, terminal block or similar insulation arrangement.
8. All cables entering/exiting the cabinet shall have a strain relief.

#### 4.6.7. Device Designation

For unique identification of individual components in the power converters, all devices shall have a device designation. Each QuD-U shall too get a designation sticker onto the device and below to the mounting plate. These stickers have to be visible as well with the actual QuD-Us installed.

#### 4.7. Interaction of the PC with the MPS

The protection of the SFRS is coordinated by the Machine Protection System (MPS).


The PC shall interact with the MPS as described in Table 4-2. These actions must be taken together with what is mentioned in Sec. 4.5 of this document.

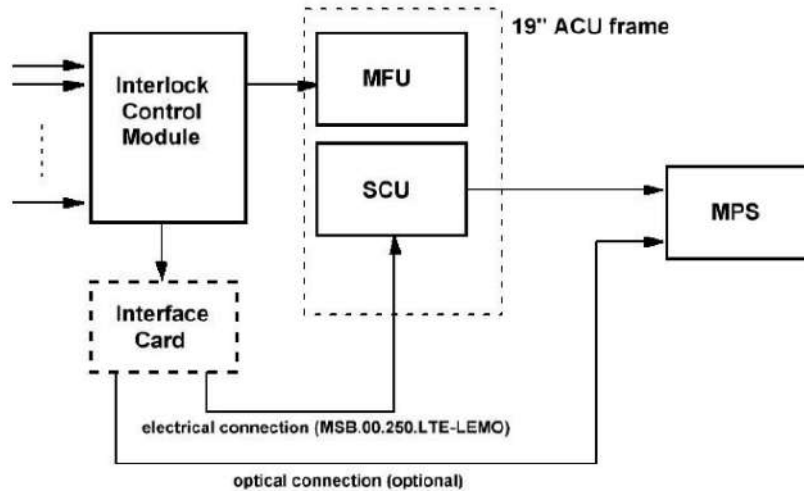
Type of Interlock	Free-wheeling through FT	Power Converter (PC)	MPS
Internal	Activate	Turn off	Send information
External	Activate	Turn off	Send information
$\delta I$ violation	-	-	Send information

**Table 4-2: Actions to be taken in case of interlock**

The actions described in Table 4-2 will be managed by the ACU system.

An interface card to connect the PC and the MPS will be provided by the Company. In case of an interlock, this card will send the information from the Interlock Control Module of the PC to the MPS (see Figure 8).

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**Figure 8: Action diagram during an interlock**

The signal sent from the interface card to the MPS can be either optical or electrical. An electrical signal cable (MSB.00.250.LTE – Lemo), which shall be provided and installed by the contractor, will be connected to the front panel of the ACU Frame (SCU card). This connection will be done by the company whereas the integration of the interface card shall be done by the contractor.

Additionally, the current through the FT (mentioned in Sec. 4.5) must be monitored. If the corresponding signal exceeds an adjustable threshold, an interlock has to be produced. This monitoring can be done using AC current transformers, which should be proposed by the manufacturer.

#### 4.8. Labelling of Power Converters


The labelling of the power converter has to be done according to Subsec. 8.5.8 of [2]. The reference to the document [8] in Subsec. 8.5.8 of [2] is replaced by [5] of this document. The CID numbers for the specified power converters are given in [8].

#### 4.9. Electrical Supply System

All the power parts of the power converters described in this document along with all the electrical interfaces for electronic parts are going to be fed by a 20kV/400V transformer in the common supply system feeder C3 (Sec. 2.3 in [3]).

#### 4.10. System Environment and Constraints

All the environmental conditions and constraints that shall be considered, like water cooling system and mechanical properties of the installation location as well as the interactions of the power converters with the installation location environment, are described in Sec. 6.1 of [2], Sec. 6.2 of [2] and Sec. 7 of [2].

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#### 4.11. Transportation of Power Converter

The transportation and installation of the produced power converters shall be performed taking into account Sec. 10 of [2]. Details about the transportation within the Company will be provided in the contract. The packaging of the power converters has to be labelled with the cabinet name it's to ensure their appropriate distribution to the respective places for testing.

### 5. Quality Assurance, Procedures for Construction and Production

General design aspects, quality assurance and, tests and acceptance are specified in the General Specification [1] and in the Contract. Main and specific points for the systems specified in this document are listed below and they substitutes the requirements mentioned in Sec. 9 of [2] and Sec. 9.1 of [2].

The realization process of the specified systems consists of the following phases:

- Design development and preparation of the production:
  - Design development;
  - Conceptual Design Review (CDR);
  - Creation of manufacturing documents;
  - Final Design Review (FDR).
- Production of the systems, FAT and shipping;
- Installation, commissioning and testing at the Company site (SAT).

Monthly status reports are mandatory during all the phases (design, manufacturing, testing, and transportation). The deliverables of each phase and the corresponding rights will become property of the company.


Additionally, it must be taken into account that the shipment of the power converter must be regulated and released by the Company.

#### 5.1. Design Reviews

Conceptual Design Review (CDR) and Final Design Review (FDR) between the company and the manufacturer shall be done to complete the "Design development and preparation of the production" phase, mentioned in Sec. 5.

During CDR, design documents will be discussed. Furthermore, following information have to be provided:

1. Functional description of all the components;
2. Explanation of design criteria according to Sec. 8.5 of [2];
3. Technical data;
4. Block diagrams;
5. Manufacturer/type of all main components;

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6. Description of interface (control interfaces and interfaces to the environment);
7. Simulation of the operation modes given in the corresponding detailed specification;
8. Draft version of the production plan;
9. Test concept to ensure testability during FAT and SAT;
10. Definition of the critical components which are operated on the verge of or beyond to their specification limits;
11. Draft version of the Risk / Hazard Assessment.

During FDR, in addition to the design documents, manufacturing documents will be discussed. Furthermore, following information have to be provided:

1. A description of the complete power converter;
2. Detailed specification (technical and mechanical data) of all main components i.e. Cabinet, transformer, inductor, capacitor bank, arrangement of semiconductors, placement of DCCT-head etc.;
3. Drawings or preferably 3D-models of the physical configuration of the complete power converter (components placement inside the cabinet);
4. Block diagrams and schematics of the control loops;
5. Complete schematics of all the electrical circuits;
6. Complete specification of all the interfaces (electrical, mechanical, building, media, software, etc.);
7. List of recommended spare parts;
8. Provision of design and production documents (production plan, quality plans, work instructions and test instructions);
9. Test plans and templates of test protocols for FAT and SAT;
10. Adjustment plan if necessary;
11. Draft version of the transportation specification (dimensions and weights with and without packaging).
12. Declaration of Conformity;
13. Risk / Hazard assessment;
14. Draft version of the operating manual.


Draft versions of documents must be available at least 14 days before each design review.

A formal acceptance given in written form by the Company after each review is mandatory. It means that the production of the documents for FDR shall start only after the CDR is complete and the respective design documents are accepted by the Company.

In general, design and manufacturing documents together contain all needed information to start the production without any further R&D activities.

## 5.2. Production of the systems

The production phase starts after a successful completion of the FDR. This phase can be split in two

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parts:

1. Pre-series production: During this phase, the contractor shall fabricate the pre-series implementing the production plan approved during FDR. Once the FAT (described Sec. 5.3) for the pre-series PCs is completed, the series production can start.
2. Series production: During this phase, the contractor shall fabricate the series PCs by implementing the production plan approved during the FDR and eventual adjustments to this plan after the successful pre-series production.

### 5.3. Tests and Acceptance

Concerning the details about the tests and acceptance refer to Sec. 9.2 and 9.3 of [2]. Additionally, consider the following points:

#### 5.3.1. Factory Acceptance Test (FAT)

The FAT has to be performed according to the procedure described in Subsec. 9.2.1 of [2]. The tests can be performed using a test load.

#### 5.3.2. Site Acceptance Test (SAT)


SAT comprises of 3 parts (SAT Aa, SAT Ab and SAT Ba, see Sec. 9.3 of [2]). They will be performed by the contractor at the final location of the power converters. In addition, oppositely to what is mentioned in Section 9.3.1 of [2], during the SAT Ab, the passivating of the cooling system doesn't need to be done. SAT Ab only involves the scouring of the cooling system with de-ionised water.

## 6. Documentation

Concerning the details about the documentation refer Sec. 11 of [2]. According to 2006/42/EG, the assembly, operation or service manual has to be supplied by the contractor at least in German or preferably in English and German (in contrast to Sec. 11.2 of [2]).

## 7. Related Documents

- [1] General Specifications, F-GS-PMO-en-General\_Specification-V003
- [2] Common Specifications on Power Converters, F-CS-PC-01e
- [3] Electrical Design Rules and Regulations, F-TG-ET-01e
- [4] Integration of ACU for switched mode Power Converters, F-TN-PC-01e
- [5] Component ID and Barcode System, F-TG-B-05e

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[6] Connection of the Coaxial power cables inside power converters, F-TN-PC-02e

[7] DCCT class 3 Installation in Power Converters, F-TN-PC-0005e

### 8. Attached Documents

[8] List\_with\_CID\_numbers\_for\_F-DS-EPS-en-PC\_0047\_Power\_Converters\_for\_SFRS\_Corrector\_Magnet