

Mandatory Pre-Qualification Requirements-Technical for RC-Block (W96414300136), used in Revolving 3-phase rectifier bridge of high rating Brushless Exciters

Introduction:

RC Blocks are used in 3000rpm (max 3600 RPM) rotating 3-phase full wave rectifier bridge of Brushless Exciter in large ratings sets. Not only Electrical proven-ness of the components is important, but the Mechanical design of these components and their proven-ness is of utmost importance.

Pre-Qualification Requirements:

1. Vendor must confirm that they are regular manufacturer, and have supplied RC Block with minimum rating 5.6Ω, 0.6μF, 750Vrms AC, or higher, of 3-phase full wave Rectifier Bridge for rotating application (speed 3000rpm or more) during last 5 years. In support of this, vendor should furnish list of Purchase Orders, Customer name, rating, quantity and year of supply.
2. Vendor to also furnish copy of at least one PO (not older than Five year) from above list and detailed test certificates.
3. Routine and Type tests as listed below are required as per specification. The vendor should provide details of in-house testing facilities for these tests. In case of non-availability of facilities for type tests, vendor shall have tie-up with any National / International accredited test house. The details of the same shall be furnished to BHEL for reference purpose.

3.1 Type test:

- Over speed withstand ability test for centrifugal acceleration of 8200g minimum (1 cycle).
- Fatigue cyclic test for centrifugal acceleration of 5750g minimum (1000 cycles).
- Electrical loading during cyclic fatigue test.
- Radiographic examination.

NOTE: In case vendor has performed type tests on similar RC blocks manufactured by them (of rating and application as defined in clause-1), type test reports has to be submitted for our review. Else, they have to confirm that all type tests shall be performed.

3.2 Routine test:

- Capacitor unit (0.6μF±5%, 750Vrms AC) tested at 4KV DC for 5 minutes
 - Complete RC Block tested at 2.5KV DC for 5 minutes.
 - HV testing against earth at 6KV AC for one minute.
 - Resistance & capacitance measurement.
4. Vendor shall confirm to meet all the technical requirements of Drg. 01431001003 and clauses of spec.TG60562.
 5. Vendor shall confirm that RC Block shall be capable to work at 150Hz sinusoidal 3-phase AC supply for rotating application.
 6. Vendor shall confirm that the raw material/components Capacitor, Resistance wire, Casing, Epoxy resin/hardener, solder etc.) shall be sourced from reputed suppliers and details of the same shall be furnished to BHEL.
 7. Vendor shall also confirm that in case of award of PO, detailed test certificates for tests mentioned in clause 3.1 and 3.2 including test certificates of sub-items shall be furnished along with supply.

Notes:

1. Details against clause 1 to 7 are mandatory to be submitted by vendor. Offers of vendors not meeting the mandatory PQR are liable to be rejected.
2. BHEL reserves the right to verify information submitted by vendor. In case any information is found to be false/ incorrect, the offer shall liable to be rejected.
3. All the documents and correspondence shall be in English/Hindi language.

Mandatory Pre-Qualification Requirements-Technical for RC-Block (W96414300896), used in Revolving 3-phase rectifier bridge of high rating Brushless Exciters

Introduction:

RC Blocks are used in 3000rpm rotating 3-phase full wave rectifier bridge of Brushless Exciter in large ratings sets. Not only Electrical proven-ness of the components is important, but the Mechanical design of these components and their proven-ness is of utmost importance.

Pre-Qualification Requirements:

1. Vendor must confirm that they are regular manufacturer, and have supplied RC Block with minimum rating 5.6 Ω , 0.6 μ F, 750Vrms AC, or higher, of 3-phase full wave Rectifier Bridge for rotating application (speed 3000rpm or more) during last 7 years. In support of this, vendor should furnish list of Purchase Orders, Customer name, rating, quantity and year of supply.
2. Vendor to also furnish copy of at least one PO (not older than seven year) from above list and detailed test certificates.
3. Routine and Type tests as listed below are required as per specification. The vendor should provide details of in-house testing facilities for these tests. In case of non-availability of facilities for type tests, vendor shall have tie-up with any National / International accredited test house. The details of the same shall be furnished to BHEL for reference purpose.

3.1 Type test:

- Over speed withstand ability test for centrifugal acceleration of 8200g (1 cycle)
- Fatigue cyclic test for centrifugal acceleration of 5750g (1000 cycles)
- Electrical loading during cyclic fatigue test.
- Radiographic examination

NOTE: In case vendor has performed type tests on similar RC blocks manufactured by them (of rating and application as defined in clause-1), type test reports has to be submitted for our review. Else, they have to confirm that all type tests shall be performed.

3.2 Routine test:

- Capacitor unit (0.6 μ F \pm 5%, 750Vrms AC) tested at 4KV DC for 5 minutes
 - Complete RC Block tested at 2.5KV DC for 5 minutes.
 - HV testing against earth at 6KV AC for one minute.
 - Resistance & capacitance measurement.
4. Vendor shall confirm to meet all the technical requirements of Drg. 31431001169, Drg. 11431001039, Drg. 21431001083 and clauses of spec.TG60562.
 5. Vendor shall confirm that RC Block shall be capable to work at 150Hz sinusoidal 3-phase AC supply for rotating application.
 6. Vendor shall confirm that the raw material/components Capacitor, Resistance wire, Casing, Epoxy resin/hardener, solder etc.) shall be sourced from reputed suppliers and details of the same shall be furnished to BHEL.
 7. Vendor shall also confirm that in case of award of PO, detailed test certificates for tests mentioned in clause 3.1 and 3.2 including test certificates of sub-items shall be furnished along with supply.

Notes:

1. Details against clause 1 to 7 are mandatory to be submitted by vendor. Offers of vendors not meeting the mandatory PQR are liable to be rejected.
2. All the documents and correspondence shall be in English language.

Mandatory Pre-Qualification Requirements-Technical for Fuse (W96414300500), used in Revolving 3-phase rectifier bridge of high rating Brushless Exciters

Introduction:

Fuses are used in 3000rpm rotating 3-phase full wave rectifier bridge of Brushless Exciter in large ratings sets. Not only Electrical proven-ness of the components is important, but the Mechanical design of these components and their proven-ness is of utmost importance.

Pre-Qualification Requirements:

1. Vendor must confirm that they are regular manufacturer, and have supplied Fuse (minimum rating 400A, 700V or higher) for 3-phase full wave Rectifier Bridge for rotating application (speed 3000rpm or more) during last 7 years. In support of this, vendor should furnish list of Purchase Orders, Customer name, Fuse rating, quantity and year of supply.
2. Vendor to also furnish copy of at least one PO (not older than seven year) from above list and detailed test certificates.
3. Routine and Type tests as listed below are required as per specification. The vendor should provide details of in-house testing facilities for these tests. In case of non-availability of facilities for type tests, vendor shall have tie-up with any National / International accredited test house. The details of the same shall be furnished to BHEL for reference purpose.

3.1 Type test:

- Over speed withstand ability test for centrifugal acceleration of 6396g min. (1 cycle)
- Fatigue cyclic test for centrifugal acceleration of 4442g min. (100 cycles)
- Current loading during cyclic test
- I^2t characteristics
- Time-current characteristics
- Current Interruption tests
- Radiographic examination

NOTE: In case vendor has performed type tests on similar Fuses manufactured by them (of rating and application as defined in clause-1), type test reports has to be submitted for our review. Else, they have to confirm that all type tests shall be performed.

3.2 Routine test:

- Measurement of fuse resistance ($300\mu\Omega \pm 6\%$)
 - Measurement of dimensions and weight
4. Vendor shall confirm to meet all the technical requirements of Drg. 21431001031 and all clauses of spec. TG60563.
 5. Vendor shall confirm that offered Fuse shall be capable to work at 150Hz sinusoidal 3-phase AC supply for rotating application.
 6. Vendor shall confirm that the raw material / components (Silver foil, Insulation tube, Connection terminals, Quartz sand etc.) shall be sourced from reputed suppliers.
 7. Vendor shall also confirm that in case of award of PO, detailed test certificates for tests mentioned in clause 3.1 and 3.2 including test certificates of sub-items shall be furnished with supply.

Notes:

1. All the documents and correspondence shall be in English/Hindi language.

Mandatory Pre-Qualification Requirements-Technical for Fuses (W96414300128), used in Revolving 3-phase rectifier bridge of high rating Brushless Exciters

Introduction:

Fuses are used in 3000 rpm (max 3600 RPM) rotating 3-phase full wave rectifier bridge of Brushless Exciter in large ratings sets. Electrical as well as mechanical design proven-ness of the components is of utmost importance.

Pre-Qualification Requirements:

1. Vendor must confirm that they are regular manufacturer, and have supplied Fuse (minimum rating 800A, 800V or higher) for 3-phase full wave Rectifier Bridge for rotating application (speed 3000 rpm or more) during last 5 years. In support of this, vendor should furnish list of Purchase Orders, Customer name, Fuse rating, quantity and year of supply.
2. Vendor to also furnish copy of at least one PO (not older than Five years) from above list and detailed test certificates.
3. Routine and Type tests as listed below are required as per specification. The vendor should provide details of in-house testing facilities for these tests. In case of non-availability of facilities for type tests, vendor shall have tie-up with any National / International accredited test house. The details of the same shall be furnished to BHEL for reference purpose.

3.1 Type test:

- Over speed withstand ability test for centrifugal acceleration of 6396g minimum. (1 cycle)
- Fatigue cyclic test for centrifugal acceleration of 4442g minimum. (100 cycles)
- Current loading during cyclic test
- P_t characteristics
- Time-current characteristics
- Current Interruption tests
- Radiographic examination

NOTE: In case vendor has performed type tests on similar Fuses manufactured by them (of rating and application as defined in clause-1), type test reports has to be submitted for our review. Else, they have to confirm that all type tests shall be performed.

3.2 Routine test:

- Measurement of fuse resistance ($150\mu\Omega \pm 6\%$)
 - Measurement of dimensions and weight
4. Vendor shall confirm to meet all the technical requirements of Drg. 21431001010 and all clauses of spec.TG60563.
 5. Vendor shall confirm that offered Fuse shall be capable to work at 150 Hz sinusoidal 3-phase AC supply for rotating application.
 6. Vendor shall confirm that the raw material / components (Silver foil, Insulation tube, Connection terminals, Quartz sand etc.) shall be sourced from reputed suppliers. Name of such suppliers shall be informed to BHEL.
 7. Vendor shall also confirm that in case of award of PO, detailed test certificates for tests mentioned in clause 3.1 and 3.2 including test certificates of sub-items shall be furnished with supply.

Notes:

1. Details against clause 1 to 7 are mandatory to be submitted by vendor. Offers of vendors not meeting the mandatory PQR, are liable to be rejected.
2. BHEL reserves the right to verify information submitted by vendor. In case any information is found to be false/ incorrect, the offer shall liable to be rejected.
3. All the documents and correspondence shall be in English/Hindi language.



CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन

SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली

i.	Item/Scope of Sub-contracting उप-संविदा(अनुबंध) का मद/ दायरा	
ii.	Address of the registered office पंजीकृत कार्यालय का पता 	Details of Contact Person संपर्क व्यक्ति का विवरण (Name, Designation, Mobile, Email) (नाम, पदनाम, मोबाइल, ईमेल)
iii.	Name and Address of the proposed Sub-vendor's works where item is being manufactured प्रस्तावित उप-विक्रेता के कार्य का नाम और पता, जहां मद का निर्माण किया जा रहा है 	Details of Contact Person: संपर्क व्यक्ति का विवरण (Name, Designation, Mobile, Email) (नाम, पदनाम, मोबाइल, ईमेल)
iv.	Annual Production Capacity for proposed item/scope of sub-contracting उप-संविदा(अनुबंध) के प्रस्तावित मद / दायरे के लिए वार्षिक उत्पादन क्षमता	
v.	Annual production for last 3 years for proposed item/scope of sub-contracting उप-संविदा(अनुबंध) के प्रस्तावित मद / दायरे के लिए पिछले 3 वर्षों का वार्षिक उत्पादन	
vi.	Details of proposed works प्रस्तावित कार्यों का विवरण	
1.	Year of establishment of present works वर्तमान फैक्टरी की स्थापना का वर्ष	
2.	Year of commencement of manufacturing at above works उपरोक्त फैक्टरी में निर्माण कार्य शुरू होने का वर्ष	
3.	Details of change in Works address in past (if any पूर्व में फैक्टरी स्थल में परिवर्तन का विवरण (यदि कोई हो))	
4.	Total Area कुल क्षेत्र	
	Covered Area शामिल क्षेत्र	
5.	Factory Registration Certificate फैक्टरी पंजीकरण प्रमाण पत्र	Details attached at Annexure – F2.1 विवरण अनुलग्नक- एफ 2.1 पर संलग्न है
6.	Design/ Research & development set-up डिजाइन / अनुसंधान और विकास सेटअप (No. of manpower, their qualification, machines & tools employed etc.) (श्रमिकों की संख्या, उनकी योग्यता, मशीन और उपलब्ध उपकरण का दि)	Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design) Details attached at Annexure – F2.2 (if applicable) लागू / लागू नहीं, अगर विनिर्माण मुख्य संविदाकार / खरीददार के डिजाइन के अनुसार है) विवरण अनुलग्नक –एफ 2.2 पर संलग्न है।

		(यदि लागू हो)
7.	Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc) मैनेपावर विवरण के साथ समय संयोजन का चार्ट (डिजाइन / विनिर्माण / गुणवत्ता आदि)	<i>Details attached at Annexure – F2.3</i> विवरण अनुलग्नक – F2.3 में संलग्न है।
8.	After sales service set up in India, in case of foreign sub-vendor (Location, Contact Person, Contact details etc.) भारत में बिक्री सेवा की स्थापना के बाद, विदेशी उप-विक्रेता के मामले में (स्थल, संपर्क व्यक्ति, संपर्क विवरण आदि)	<i>Applicable / Not applicable</i> लागू / लागू नहीं <i>Details attached at Annexure – F2.4</i> विवरण अनुलग्नक - F2.4 पर संलग्न है।
9.	Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any फ्लोचार्ट सहित विनिर्माण प्रक्रिया निष्पादन योजना, जिसमें आउटसोर्स प्रक्रिया, यदि कोई हो, सहित कच्चे माल से तैयार उत्पाद तक विनिर्माण के विभिन्न चरणों को दर्शाया गया हो,	<i>Details attached at Annexure – F2.5</i> विवरण अनुलग्नक - F2.5 में संलग्न है।
10.	Sources of Raw Material/Major Bought Out Item कच्चे माल के स्रोत / खरीदे हुए मुख्य मद	<i>Details attached at Annexure – F2.6</i> विवरण अनुलग्नक - F2.6 में संलग्न है।
11.	Quality Control exercised during receipt of raw material/BOI, in-process, Final Testing, packing कच्चे माल / खरीदे हुए मद, प्रक्रियाबद्ध, अंतिम परीक्षण, पैकिंग करते समय गुणवत्ता नियंत्रण	<i>Details attached at Annexure – F2.7</i> विवरण अनुलग्नक - F2.7 पर संलग्न है
12.	Manufacturing facilities (List of machines, special process facilities, material handling etc.) विनिर्माण सुविधा (मशीनों की सूची, विशेष प्रक्रिया सुविधाएं, सामग्री रख-रखाव आदि)	<i>Details attached at Annexure – F2.8</i> विवरण अनुलग्नक - F2.8 में संलग्न है।
13.	Testing facilities (List of testing equipment) परीक्षण सुविधाएं (परीक्षण उपकरण की सूची)	<i>Details attached at Annexure – F2.9</i> विवरण अनुलग्नक – F2.9 में संलग्न है।
14.	If manufacturing process involves fabrication then- यदि निर्माण प्रक्रिया में फेब्रिकेशन की गई है तो- List of qualified Welders पात्र वेल्डर की सूची List of qualified NDT personnel with area of specialization विशेषज्ञता के क्षेत्र सहित पात्र एनडीटी कर्मियों की सूची	<i>Applicable / Not applicable</i> लागू / लागू नहीं <i>Details attached at Annexure – F2.10</i> विवरण अनुलग्नक - F2.10 में संलग्न है। <i>(if applicable)</i> लागू / लागू नहीं
15.	List of out-sourced manufacturing processes with Sub-Vendors' names & addresses सब-वेंडर द्वारा बाह्य स्रोतों (उनके नाम और पते सहित) से करवाए गए निर्माण प्रक्रियाओं की सूची	<i>Applicable / Not applicable</i> लागू / लागू नहीं <i>Details attached at Annexure. –F2.11</i> विवरण अनुलग्नक - F2.10 में संलग्न है।



CORPORATE QUALITY ASSURANCE/ कॉर्पोरेट गुणवत्ता आश्वासन

SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली

		(if applicable) (यदि लागू हो)			
16.	Supply reference list including recent supplies नवीनतम आपूर्ति सहित आपूर्ति संदर्भ सूची		Details attached at Annexure – F2.12 विवरण अनुलग्नक - F2.12 में संलग्न है। (as per format given below) (नीचे दिए गए प्रारूप का अनुसार)		
Project/ package परियोजना / पैकज	Customer Name ग्राहक का नाम	Supplied Item (Type/Rating/Model /Capacity/Size etc) आपूर्ति की गई वस्तु (प्रकार / रेटिंग / मॉडल / क्षमता / आकार आदि)	PO ref no/date पीओ संदर्भ सं. / तिथि	Supplied Quantity आपूर्ति की मात्रा	Date of Supply आपूर्ति की तारीख
17.	Product satisfactory performance feedback letter/certificates/End User Feedback उत्पाद का संतोषजनक प्रदर्शन संबंधी फीडबैक पत्र / प्रमाण पत्र / अंतिम उपयोगकर्ता फीडबैक		Attached at annexure - F2.13 अनुलग्नक F2. 3 पर संलग्न है		
18.	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating) प्रस्तावित उत्पाद (एक समान या उच्च रेटिंग वाले) के लिए टाइप टेस्ट रिपोर्ट (टाइप टेस्ट विवरण, रिपोर्ट संख्या, एजेंसी, जांच की तारीख) का सारांश नोट:- रिपोर्ट प्रस्तुत करने की आवश्यकता नहीं है Note:- Reports need not to be submitted		Applicable / Not applicable लागू / लागू नहीं Details attached at Annexure – F2.14 विवरण अनुलग्नक - F2.1 4 में संलग्न है (if applicable) (यदि लागू हो)		
19.	Statutory / mandatory certification for the proposed product प्रस्तावित उत्पाद के लिए वैधानिक / अनिवार्य प्रमाणीकरण		Applicable / Not applicable लागू / लागू नहीं Details attached at Annexure – F2.15 (if applicable) (यदि लागू हो)		
20.	Copy of ISO 9001 certificate आईएसओ 9001 प्रमाण पत्र की प्रति (if available (यदि उपलब्ध हो)		Attached at Annexure – F2.16 अनुलग्नक में संलग्न - F2.1 6 है		
21.	Product technical catalogues for proposed item (if available) प्रस्तावित मद के लिए उत्पाद तकनीकी कैटलॉग (यदि उपलब्ध हो)		Details attached at Annexure – F2.17 विवरण अनुलग्नक - F2.1 7 में संलग्न है		
Name: नाम:		Desig: पद:		Sign: हस्ता क्षर:	Date: तिथि:

Company's Seal/Stamp:- कंपनी की मुहर/ मोहर:-

MANUFACTURER'S NAME AND ADDRESS			QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL			
BHEL	VENDOR'S NAME	ITEM			QP NO.							
					REV							
		DRG. NO.	AS PER PO									
		SPEC.	AS PER PO									
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
1	2	3	4	5	6	7	8	9	D	10		11

Note: All page of inspection documents shall be numbered in chronology with the QAP clause , dully mentioning the corresponding QAP clause nos. at the top of each page. One index page containing the documents descriptions, their page no & QAP clause shall be attached upfront the inspection documents.

MANUFACTURER/SUBCONTRACTOR		LEGEND:	FOR CUSTOMER USE	
		! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.		APPROVED BY
		M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		