



CONTROLS & INSTRUMENTATION (FB)
PRE-QUALIFICATION REQUIREMENT (PQR)

CI:PE:PQR:LS

Rev. No: 01

Dt. : 14-08-2021

HEAVY DUTY LIMIT SWITCH

S.No.	Bid Requirements (Allowed Values)	Vendor Compliance
1.	Type of Vendor: - Bidder should be an Original Equipment manufacturer/Dealer/Distributor for Heavy Duty Limit Switches.	
2.	Credentials in Power plant/ Heavy Industries: - Bidder should have supplied IP67 rated heavy-duty limit switches of similar specification as called in enquiry to coal fired thermal power plants in India. Reference list for the same to be furnished.	



Bharat Heavy Electricals Limited

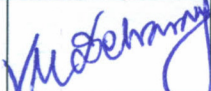
HIGH PRESSURE BOILER PLANT, TIRUCHIRAPPALLI 620 014.

CONTROLS AND INSTRUMENTATION/FB

Technical Specification for Burner Tilt Shear Pin Failure Indication System

Specification Number - TCI:335, Rev. 03

Revision History

Rev. No.	Date	Description	Prepared	Reviewed	Approved
			K Sudharsan	Aswini Kumar Panda	V M Selvaraaj
00	04-05-2017	Initial Release	-Sd-	-Sd-	-Sd-
01	05-07-2017	Contact rating of limit switch revised	-Sd-	-Sd-	-Sd-
02	23-07-2018	Limit switch models revised to suit application requirement	-Sd-	-Sd-	-Sd-
03	06-12-2019	Updated Name Plate Description			

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Description :

The Burner Tilt Shear Pin Failure Indication System shall comprise of 2 components namely, Item # 1 - Indication box and Item #2 - Heavy duty Limit switches.

All the limit switches are connected to the Indication box for interlock and local indication, at field.

This technical specification covers the technical requirements of the Indication box and the Heavy duty Limit switch.

Item-1 : Indication box

1.	Site Conditions	Tropical, Dusty, Salty, and Corrosive & Highly polluted.	
2.	Reference Standard	IS-513, IS-60529/2001	
3.	Material of the box	14 SWG (2 mm), CRCA Sheet Steel as per IS-513, Grade-D	
4.	Pre-treatment	By 7 tank process.	
5.	Dimensions, other fabrication details and mounting accessories.	As per Drawing No. 1-95-091-10793, Rev. 07. However, the depth of the box shall be 200 mm.	
6.	Internal Wiring Scheme # # - As per Enquiry Requirement	Indication box Variant	Wiring Scheme
		72-way	Sheet-7.
		48-way	Sheet-8.
		24-way	Sheet-9.
7.	Internal Wiring	Internal wiring shall be carried out by using 1100 V Grade, PVC Insulated, 1 sq.mm. Annealed, Tinned, Stranded Copper conductor cable or better. Wiring shall be done by using proper Insulated copper tubular end sealing ferrules.	
8.	Indication box Colour #	As per Purchase Enquiry.	
9.	Indicating lamp	Red colour, clustered LED type, 24 V DC rating. This lamp shall be mounted on the door.	

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10.	Enclosure Protection	Water and dust proof – IP 54 protection as per IS-60529. Enclosure protection Type test certificate from any of the National Test House shall be submitted during the time of Inspection (Typical Certificates produced shall not be earlier than 5 years from the date of Purchase Enquiry).
11.	Name Plates # # - As per Enquiry Requirement	1 number Name Plate of SS-304, with dimensions, 75mm x 25mm and 0.5 mm thick shall be affixed on to the tag mounting plate of the box . Name plate inscription : “BURNER TILT SHEAR PIN FAILURE INDICATION BOX” # (or) “BOFA TILT SHEAR PIN FAILURE INDICATION BOX” # as per the enquiry Specification requirement. 1 number nameplate of above specification shall be affixed below the indication lamp, with inscription “SHEAR PIN FAILED”. Nameplates shall be affixed by using suitable adhesive. Colour of Engraving shall be Black.
12.	Inspection & Testing	As per Quality Plan QA:CI:STD:QP:03, Rev. 05.
13.	Packing	Packing shall be as per Packing Procedure QA:CI:STD:PR:02, Rev. 02
14.	Guarantee	A Guarantee certificate for 18 months from the date of shipment (or) 12 months from the date of commissioning whichever is earlier shall be furnished.
15.	Documents to be submitted along with offer.	The “Sub-Delivery Enquiry Deviation format” has to be filled with “No Deviation” and shall be duly signed and submitted along with offer. The offer without the above document will be liable to be rejected.

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Item-2 : Heavy duty Limit Switches			
1.	Reference Standard	IS-60529/2001 for enclosure protection	
2.	Body Material	Cast Aluminium or better	
3.	Type	Heavy Duty, Side Roller-Lever operated	
4.	No. of Contacts and Contact Rating	2 NO + 2 NC (2 SPDT or 1 DPDT) (Single or Double break, Simultaneous) 3 A @ 240 V AC, 0.1 A @ 220 V DC	
5.	Electrical Cable Entry	Bottom Entry – with ¾” BSC (F). In case the limit switch does not have the above mentioned entry thread, vendor can supply suitable Aluminium/Brass/SS adapter with the above thread. Terminals inside the limit switch Shall be suitable for 1 sq. mm. copper conductor cable.	
6.	Mounting Accessories	2 Sets of Stainless Steel mounting Screws/Bolts, Nuts, Plain & Spring Washers.	
7.	Paint/Finish of Limit switch body	Corrosion Resistant Enamel paint Finish or as per manufacturer’s standard.	
8.	Material and dimensions of Lever	Steel/Stainless Steel. Length of Lever : 38 mm ± 2 mm.	
9.	Material and dimensions of Roller	Stainless Steel. Diameter of Roller: 17 mm ± 2 mm Width of Roller : 6 ± 2 mm	
10.	Action of operating lever	Clock-wise (CC) or Counter clock-wise (CCW) Convertible by the user.	
11.	Maximum angle of Rotation of Lever	90°	
12.	Make should be as per this clause. Suggested models are indicated. Vendor can also offer other models conforming to the specification requirements in full.	Suggested Make	Switch & Roller Lever Part Ref.
		Omron	D4A-2501-N + D4A-A00
		Honeywell	LSA-2B + LSZ-51
		BCH	NLL1-22

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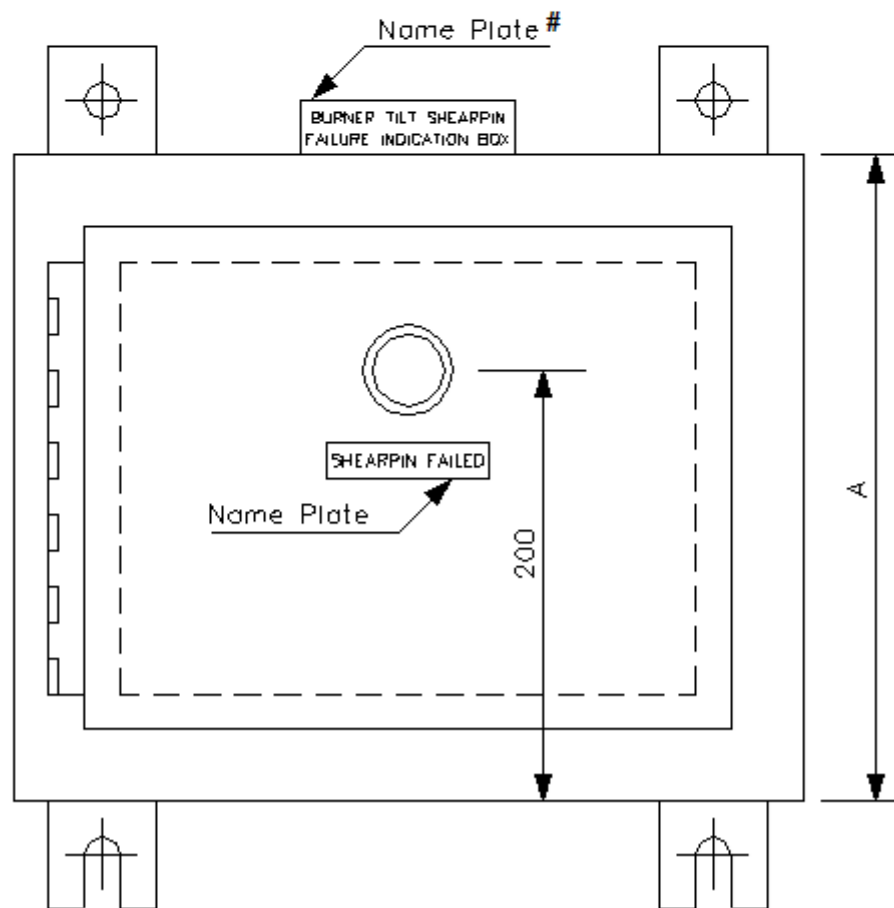
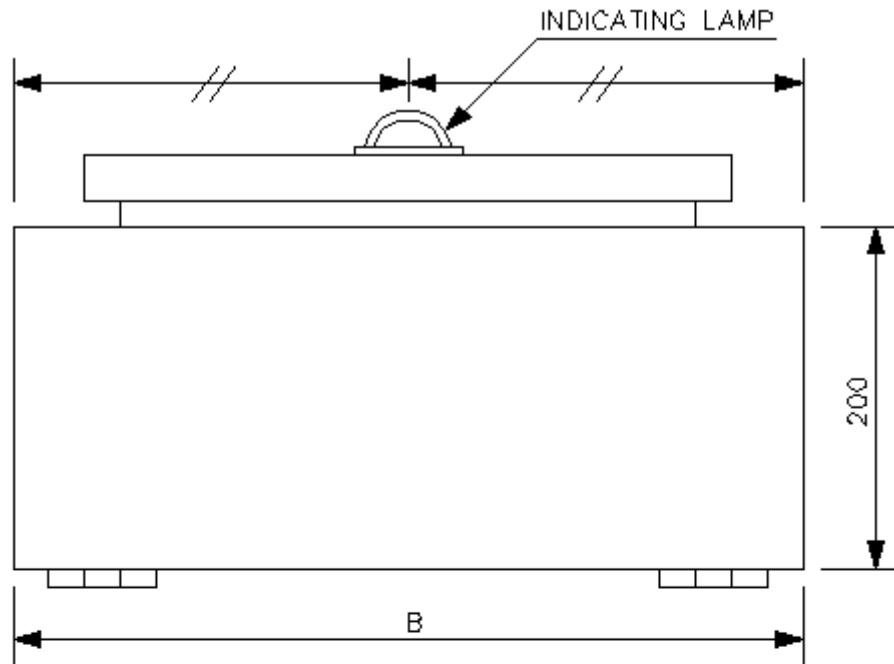
13.	Inspection & testing	As per quality plan QA:CI:STD:QP:05, Rev 04.
14.	Packing	Shall be adequately packed for safe delivery at BHEL stores. Roller Lever & Limit Switch shall be packed together during despatch.
15.	Documents to be submitted along with the offer	a. Copy of Type test certificate. b. Catalogue of relevant model number. c. The offered model number should conform to the technical specification, in full. d. The “Sub-Delivery Enquiry Deviation format” has to be filled with “No Deviation” and shall be duly signed and submitted along with offer. The offer without the above documents will be liable to be rejected.

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General Arrangement of the box and Indicating lamp



As per Specification Clause: Item -1 S.no 11

For dimensions "A" and "B", the standard junction box drawing 1-95-091-10793, Rev. 07. shall be referred.

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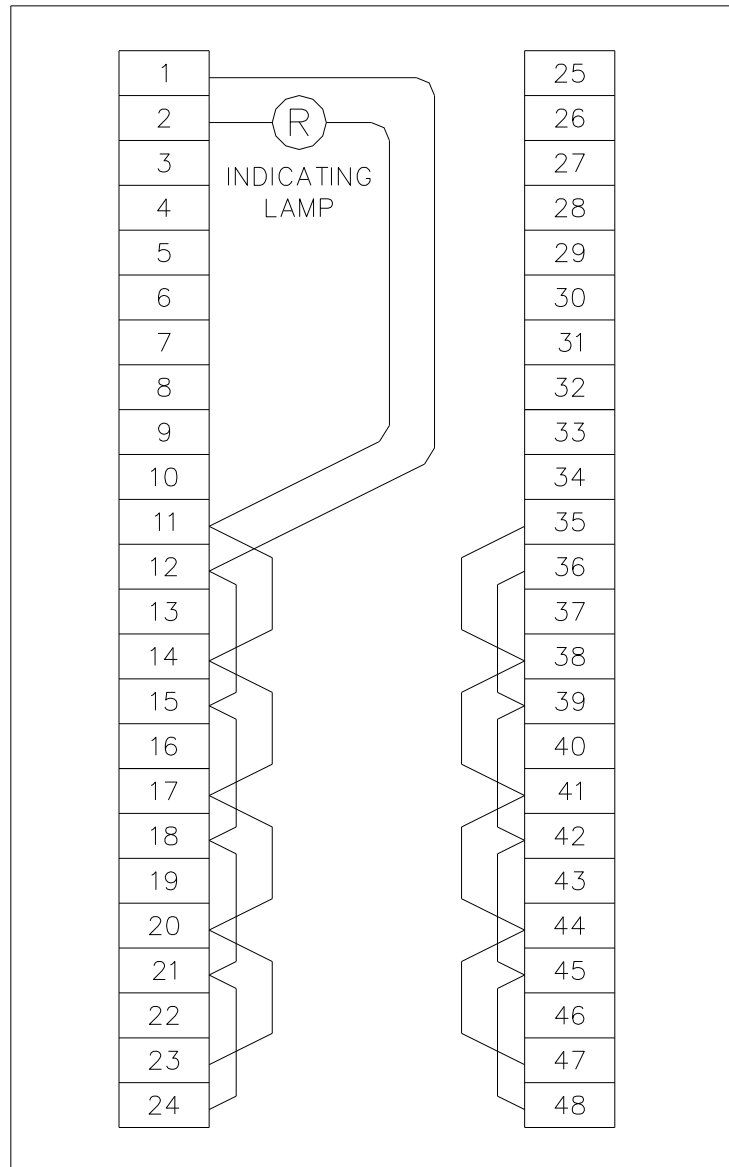
The diagram illustrates a 72-line bus system organized into three vertical columns of 24 lines each. The lines are numbered 1 through 72. An 'INDICATING LAMP' (represented by a circle with an 'R') is connected to lines 1, 2, and 25. The connections are as follows:

- Line 1 is connected to the lamp.
- Line 2 is connected to the lamp.
- Line 25 is connected to the lamp.

The bus system is represented by a series of zigzag lines connecting the three columns of lines. The connections are as follows:

- Line 1 is connected to line 25.
- Line 2 is connected to line 26.
- Line 3 is connected to line 27.
- Line 4 is connected to line 28.
- Line 5 is connected to line 29.
- Line 6 is connected to line 30.
- Line 7 is connected to line 31.
- Line 8 is connected to line 32.
- Line 9 is connected to line 33.
- Line 10 is connected to line 34.
- Line 11 is connected to line 35.
- Line 12 is connected to line 36.
- Line 13 is connected to line 37.
- Line 14 is connected to line 38.
- Line 15 is connected to line 39.
- Line 16 is connected to line 40.
- Line 17 is connected to line 41.
- Line 18 is connected to line 42.
- Line 19 is connected to line 43.
- Line 20 is connected to line 44.
- Line 21 is connected to line 45.
- Line 22 is connected to line 46.
- Line 23 is connected to line 47.
- Line 24 is connected to line 48.

Wiring Scheme for 48 Way Indication box

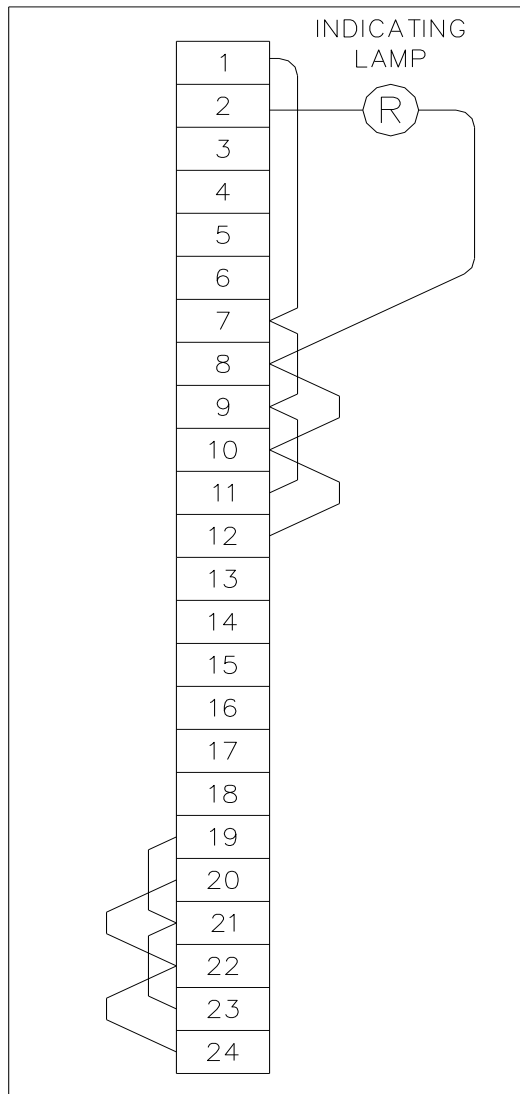


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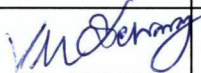
Wiring Scheme for 24 Way Indication box



	BHARAT HEAVY ELECTRICALS LIMITED TIRUCHIRAPPALLI-620014	STANDARD QUALITY PLAN FOR LIMIT SWITCHES	QA:CI:STD:QP:05 Rev: 04 Page: 1 of 3
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CONTROLS & INSTRUMENTATION/QA/FB

STANDARD QUALITY PLAN FOR LIMIT SWITCHES

REV	DATE	PREPARED	REVIEWED		APPROVED	REVISION HISTORY
00	17.01.1990	Sd/-	Sd/-	Sd/-	Sd/-	Initial release
01	16.06.1997	Sd/-	Sd/-	Sd/-	Sd/-	Format revised
02	21.03.2002	Sd/-	Sd/-	Sd/-	Sd/-	Department name changed, CTQ requirement added & general revision
03	14.03.2007	Sd/-	Sd/-	Sd/-	Sd/-	General revision, format changed
04	20.02.2018	 V AVINASH	 A SRIHARI RAO	 V M SELVARAJ	 R M VAIRAVAN	Standards updation and format changed

	BHARAT HEAVY ELECTRICALS LIMITED TIRUCHIRAPPALLI-620014	STANDARD QUALITY PLAN FOR LIMIT SWITCHES	QA:CI:STD:QP:05 Rev: 04 Page: 2 of 3
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S.No	Component & Operation	Characteristics	Class	Type of Check	Quantum of check		Ref Doc. & Acceptance STD	Format of Record	Agency			Remarks
					M	B/C			M	B	C	
A	FINISHED PRODUCT INSPECTION											
1	Routine Tests	a) Verification of Make, Type & Model Number	Major	VISU	100%	10%	Purchase specification	IR	P	W	-	
		b) Dimension verification	Major	MEAS	100%	10%	Purchase specification	IR	P	W	-	
		c) Accessories verification	Major	VISU	100%	10%	Purchase specification	IR	P	W	-	
		d) Functional Test: Verification of contact change over	Major	ELEC	100%	10%	Manufacturer Standard	IR	P	W	-	
2	Type Tests	a) Degree of enclosure protection	Critical	ENVI	One of Design	One of Design	NEMA / IEC 60529	TC	V	V	-	
		b) Test for rated making & breaking capacity	Critical	MECH			IEC 60947	TC	V	V	-	
		c) Endurance Test	Critical	MECH			No. of Cycles:6000 6 – 10 cycles per minute of making and breaking at rated current.	TC	V	V	-	There shall be no damage at the end of test.

M- MANUFACTURER/ SUB-VENDOR; B - BHEL / TPI ; C - CUSTOMER / TPI
P - PERFORM ; W - WITNESS V - VERIFICATION OF DOCUMENTS ;

	BHARAT HEAVY ELECTRICALS LIMITED TIRUCHIRAPPALLI-620014	STANDARD QUALITY PLAN FOR LIMIT SWITCHES	QA:CI:STD:QP:05 Rev: 04 Page: 3 of 3
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B.NOTES: 1.LEGENDS: ENVI : Environmental MEAS : Measurement MECH : Mechanical TC : Test certificate VISU : Visual IR : Inspection Report THER : Thermal 2) Vendor shall arrange all the required facilities for routine tests at their works . Tests for which facilities are not available are to be carried out at recognized National Test Houses like ETDC/CIL/NPL/ERTL etc., at vendor cost. 3) Through Log Book / any other documents available at the vendor's works, it shall be possible to correlate the finished product with inspection carried out. 4) All Measuring and Testing Instruments shall be periodically calibrated from recognized test houses & certificates made available during inspection for verification. 5) Type test certificate shall not be earlier than 5 years from the date of Purchase enquiry.	6) Vendor to give tentative inspection program in advance and confirm exact date two weeks in advance for arranging BHEL's inspection. 7) Packing shall be as per "PACKING PROCEDURE "indicated in the specification. 8) If non-conformity is observed even in one number of the sample lot in any characteristic, inspection shall be carried out on 100% of the offered lot. C. REFERENCE STANDARDS: (For Indicated Standards Refer the Latest Version) IEC 60529 : Specification for Degree of protection provided by enclosure IEC 60947-1 : Low voltage switchgear & Controlgear- General Rules IEC 60947-5 : Low voltage switchgear & Controlgear- Switching elements
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QA:CI:STD:QP:05/ Rev.04

GEM/2021/B/1464239 dt 24.08.2021

Sl no	Terms	Conditions	Vendor confirmation
1	Delivery term	Vendor shall quote unit price on FOR /Panki Project site bais inclusive of Packing & Forwarding, Freight & GST . Insurance will be on BHEL scope.	Quoted /Not quoted
2	Delivery days	For this GeM tender, delivery days is 60 days from document approval . Delivery days shall inclusive of all the activities like manufacturing, inspection, Packing & Forwarding and dispatch. Vendor to submit applicable documents within 15 days from receipt of GeM PO.	Accepted
3	Payment term	As per present GEM T&C	Accepted
4	LD clause	As per present GEM T&C	Accepted
5	Guarantee period	As per specification / tender T&C ie 18 months from the date of shipment (or) 12 months from the date of commissioning whichever is earlier.	Accepted
7	HSN CODE	Indicate HSN code for quoted items	
8	GST	Pl Mention in GST % for quoted items	%
		Document submission along with bid	
9	Attachments 1	Whether vendor belongs to MSE & Have you submitted Udyam registration certificate (To validate MSE status)	Yes / No
10	Attachments 2	Have you submitted filled ,sign & sealed point wise compliance for PQR with supporting documents . Please mention the corresponding page no also for each PQR point.	Yes / No
11	Attachments 3	Have you submitted Filled, signed & sealed “NIL Deviation Format” .	Yes / No
12	Attachments 4	Have you submitted signed , sealed in the all pages of tender documents like “Technical Specification, Drawing /datasheet , testing procedure, Quality Plan & packing procedure” with respect to this tender along with offer.	Yes / No
13	Attachments 5	Have you Filled local content %, signed , sealed & submitted “Self declaration format for MII clause” as per BHEL format in your company letter head.	Yes / No
Note: vendor consents that the terms & conditions accepted, in GEM alone, shall be binding between BHEL and the Vendor; and no other terms mentioned, elsewhere in the un priced offer / Quotation will be considered / accepted by BHEL.			
VENDOR DETAILS			
1	Vendor Name		
2	Office Address		
3	Contact Person Name		
4	Mobile No		
5	E mail Id		
6	GSTN		

Vendor to fill & submit this Annexure with sign & seal along with offer .

/ On Bidder's office letter pad /

Self-Declaration

Enquiry No.	GEM/2021/B/1464239
Enquiry Date	24.08.2021

In line with Government public procurement order Number P-45021/2/2017-B.E-II dated 15.06.2017, and further modified order dt.04.06.2020 issued by DPIIT,

I / We hereby declare that I / We are a “Local Supplier” meeting the requirement of minimum local content (.....%) defined in the above government notification for the goods against above mentioned enquiry Number.

Details of location at which local value addition will be made is as follows:

Door No.	
Street / Address 1	
Street / Address 2	
District	
State	
Country	
PIN Code	

We also understand that the false declarations will be considered as breach of Integrity and liable for action.

For Company Name:

Seal:

Signature:

Date:

Place:

(Please fill all the yellow color field)



429-024

MATERIALS MANAGEMENT / BOI
SUB-DELIVERY ENQUIRY DEVIATION FORMAT

Page : of

Schedule of deviation to Sub-delivery Enquiry No. : **GEM/2021/B/1464239**

Description : **Heavy Duty Limit Switch**

Documents : **Specification: TCI:335 / Rev 03**

Drawing Nos. : -

Quality Plan : **QA:CI:STD:QP:05 Rev 04**

Packing Procedure : **As per specification.**

Document reference	BHEL called for	Firm's alternative offer

Certified that other than the above deviations, we are accepting all the other specifications and requirements in full to your Enquiry.

Station :

Date : Signature of firm's representative Firm seal

Note : 1. Deviations should be taken only in the extreme case
2. If necessary, use additional sheets with page control number