

## **SPECIAL CONDITIONS OF THE CONTRACT**

**(NOTE: APPLICABLE TO SPECIFIC WORK AND PROVISIONS MENTIONED HERE IN SUPERSEDES GCC AND ALL OTHER STIPULATIONS MENTIONED ANYWHERE ELSE)**

- 1.0** The special conditions of contract (SCC) quoted herein in the tender shall supplement the general conditions. In the event of any conflict or inconsistency between them the special conditions of the contract, contained herein shall prevail. The standard general conditions of the contract for use in connection with Civil Engineering works of South-Central Railway and Signal Engineering Manual, Telecom Engineering Manual, Way and Works Manual as amended up to date will form part of the contract agreement and for all purposes shall be treated as if the same have been incorporated herein. The contractor can obtain a copy of the General Conditions of the contract for Civil Engineering works from office of SR.DSTE/CO-ORD/SC, Secunderabad on any working day.

Scope of the work is **SIGNALLING & TELECOMMUNICATION ARRANGEMENTS IN CONNECTION WITH PROVIDING LONGER LOOP AT NASHKAL (NSKL) STATION IN UP LOOP LINE TOWARDS SC END and GHANPUR (GNP) STATION IN DN LOOP LINE TOWARDS KZJ END.**

a) Supply , design , testing and commissioning of Distributed Electronic Interlocking system , Trenching, laying and termination of signalling cables and telecommunication cables, foundation, erection and wiring of location boxes, earthing arrangements, supply and laying of GI/DWC/RCC pipes, horizontal boring, supply and laying of HDPE duct, Laying of quad cable, laying and blowing of OFC cable and its termination and fixing of various telecom equipments, painting of all signalling and telecom gears with particulars, Provision of cameras etc.

C)The Railway reserves the right to supply its own materials if the contractor fails to supply within a reasonable period and the contractor will execute the labour portion as directed by the Engineer. Liquidity damages will be imposed for non-supply of material. Thus, if the material is used from railway stocks due to non-supply from contractor, a deduction of 21.5% of the contracted amount for the corresponding item for quantity used for the work but defaulted by the contractor as applicable at the time of execution will be made from contractor's bills. The engineer's interpretation regarding quantities used is final.

d)The contractor shall be liable to render full accountal for all the materials issued by the Railway. If any quantity of Railway materials is consumed in excess or wasted or damaged or lost or otherwise not satisfactorily accounted for, recovery shall be made from the contractor at twice the issued rate prevailing at the time of last issue of the materials consumed in excess or wasted or damaged or lost or not satisfactorily accounted for.

## **2.0 TIME OF COMPLETION:**

- i. All works including documentation shall be completed within the period as mentioned in NIT inclusive of the intervening monsoon period from the date of issue of acceptance letter, excluding Training of staff. The contractor would be expected to adhere to the progress of work as per the accepted bar chart. Liquidated damages as per rules in force will be levied on the belated supply of materials and execution of work in the event of failure on part of the contractor to complete the supplied and execution of work within the period of completion of work as stated.
- ii. In the event of failure of the part of the contractor for maintaining the progress thoroughly/ commensurate progress with reference to time limit given in contract, the Railway reserves the right to terminate or to withdraw the whole balance work or part thereof at the discretion of the engineer-in-charge the security deposit and performance guarantees shall be forfeited by them as per relevant clauses.

**3.0 PAYMENTS TERMS:**

<b>S. No.</b>	<b>Schedule Description</b>	<b>Payment conditions</b>
1	Schedule – A (SOR Items: Supply Portion)	a) 90% on Supply & acceptance of material at Railway stores/site. b) 10% after installation and commissioning of equipment.
2	Schedule- B (Non SOR Items: Supply Portion)	a) 90% on Supply & acceptance of material at Railway stores/site. b) 10% after installation and commissioning of equipment.
3	Schedule – C (SOR Items: Labour Portion)	On account payment will be made for the completed certified portion of the work.
4	Schedule – D (Non SOR Items: Labour Portion)	On account payment will be made for the completed certified portion of the work.
5	Schedule – E (Electronic Interlocking)	<p><b>For item:1</b></p> <p>a) 70 % on initial Supply and acceptance of material at nominated Railway Stores/Site. b) 10% on supply of all type of relays required for EI duly inspected by the inspecting authority c) 10 % on loading of software and completion of simulation test. d) 10% will be on successful commissioning.</p> <p><b>For Item :2</b> Call letter for 70 % of Quantities only will be issued. For remaining 30% Quantities call letter will be issued after approval of Signal Interlocking plan or after approval of interface logic (as per site requirements).</p> <p>1. 70 % on Supply and acceptance of material at nominated Railway Stores/Site. 2. 10% on supply of all type of relays required for EI duly inspected by the inspecting authority 3. 10 % on loading of software and completion of simulation test. 4. 10% will be on successful commissioning.</p> <p><b>For balance items,</b> 90% on supply and acceptance of the material at Railway Stores/Site, 10% on commissioning.</p> <p><b>(Note: Table for Calculation of Function is attached in Special Conditions as Annexure A)</b></p>
6	Composite items (Supply and installation items)	a) 70% on Supply & acceptance of material at Railway stores/site. b) 30% after installation testing and commissioning.

**B. RDSO/RITES inspection charges shall be borne by the contractor.** For the signalling materials to be inspected by RDSO/RITES, the contractor shall pay directly to RDSO/RITES their inspection charges.

**4.0 Undertaking by tenderer:** The successful bidder shall submit an undertaking from RDSO approved OEM, before the supply of material, to confirm compliance with extant RDSO guidelines and to meet contract specific requirements.

**5.0 WARRANTY:** (a) Contractor is responsible for Warranty of all the materials supplied and installed by him for a period of **ONE YEAR** from date of Completion of Work Certificate .

(b) **MAINTENANCE PERIOD** : Maintenance period of 24 months from Date of Commissioning of Work shall be applicable. Completion certificate will be issued by JAG officer after obtaining “No Due” certificate from SSE-In-charge stating that all works are completed in all respects. During the period of warranty contractor shall be responsible for:

- i. The contractor shall guarantee that all material & equipment to be supplied and installed as per this contract shall be free from defect and fault in design, material, workmanship, and manufacture and shall be of the highest grade and consistent with established and generally accepted standard for materials of the type ordered and in full conformity with the contract specification.
- ii. The contractor shall be responsible to the extent expressed in this clause for any defects that may develop under the conditions provided for by the contractor and under proper use, arising from faulty materials, design, or workmanship on the plant or from faulty erection of the equipment under the supervision of the contractor, but not to do so by the purchaser who shall state in writing in what the portion is faulty.
- iii. The Contractor shall remain responsible to arrange replacement and for setting right at his own cost any equipment supplied by him which is of defective manufacture or defective design, or defective material/ component become unworkable due to any cause whatsoever. The decision to attend to any damage or defect in work shall be final and binding on the contractor.
- iv. If it becomes necessary for the contractor to replace or renew any defective portions of the system under this clause, the provision of the above clauses shall apply to the replaced/renewed equipment for the period of six months from the date of such replacement or renewal or until date of warranty period whichever may be later. If any defect is not remedied within reasonable time, the Railway may proceed to do the work at contractor's risk and expenses, but without prejudice to any other rights, which the Railway may have against the contractor in respect of such defects.
- v. If the replacement or renewals are of such a character as may affect the efficiency of the system, the Railway shall have the right to give the contractor within one month from such replacement or renewal notice in writing that test on completion will be carried out at his cost. Should such tests show that the plant sustains the guarantee in the contract; the cost of the tests shall be borne by the purchaser. Should the guarantees not be sustained, the cost of the tests shall be borne by the contractor.
- vi. Until the completion of work, the contractor shall have the right to entry with permission of Railways, at his own risk and representatives, whose names shall have previously been communicated, in writing, to the
- vii. Railways at all reasonable working hours upon all necessary parts of the works for the purpose of inspecting the working and the records of the plant and taking notes there from and if he desires at his own risk and expense, making any tests, subject to the approval of the purchaser which shall not be unreasonably withheld.
- viii. All replacement and repairs and design change that the Railway shall call upon the contractor to deliver or perform under this warranty period shall be delivered and performed by the contractor within three months, promptly and satisfactorily.

- ix. The decision of the Railway in regard to contractor's liability and the amount, if any, payable under this warranty shall be final and conclusive.
- x. During failure analysis/de-bugging, if any design deficiency is pointed out by the Railway, the contractor shall rectify it at his own cost.

#### **6.0 Goods and Services Tax (GST): GST rates are applicable and as modified from time to time.**

As Per the guidelines of Railway Board Lr. No. 2022/R(G)/779/14, dated.10.11.2022 and communicated by Dy.CE/Works/SC vide Lr. No. W.496/Policy/Vol.IX, dt. 16.11.2022, that the prospective tenderers are advised to indicate the details of their Jurisdictional Assessing officers (Designation, Address and e-Mail Id with regards to payment of GST.

**In case of a contract award, a copy of the LOA/Purchase order shall immediately forwarded by the purchaser to the jurisdictional Assessing officer mentioned in the tenderer's Bid.**

#### **7.0 "Letter of Credit" as Mode of Payment in Works Tenders or Service Tenders:**

(Ref: Railway Board Letter No.2018/CE-I/CT/9; Dt.04-06-2018communicated by PCE/SC vide letter. No.W.148/P/GCC/Vol-III dt.15-06-2018.)

##### **1. This is applicable only for Tenders whose advertised tender value is Rs.10 lakhs and above.**

2. This is an option for the contractors to take payment from Railways through a Letter of Credit (LC) arrangement and the following are the special conditions.
  - i. For all tenders having advertised cost of Rs. 10 lakh or above, the contractor shall have the option to take payment from Railways through a letter of credit (LC) arrangement.
  - ii. This option of taking payment through LC arrangement has to be exercised in IREPS (Indian Railway Electronic Procurement System- the e-application on which tenders are called by Railways) by the tenderer at the time of bidding itself, and the tenderer shall affirm having read over and agreed to the terms and conditions of the LC option.
  - iii. The option so exercised, shall be an integral part of the bidders offer.
  - iv. The above option of taking payment through LC arrangement, once exercised by tenderer at the time of bidding, shall be final and no change shall be permitted, thereafter, during execution of contract.
  - v. In case tenderer opts for payment through LC, following shall be the procedure to deal release of payment through LC.
    - a. The LC shall be a sight LC.
    - b. The contractor shall select his Advising/Negotiating bank for LC. The incidental cost towards issue of LC and its operation thereof shall be borne by the contractor.
    - c. SBI, New Delhi, Main Branch will be the nodal branch for issue of LCs based on line requests received from Railway Accounts Units for tenders opened in financial year 2018-19. SBI branches, where the respective Railway Accounts Office has its Account (local SBI branch) will be the issuance/reimbursing branch for LC issued under this arrangement. The Bank shall remain same for this tender till completion of contract. The incidental cost @ 0.15% per annum of LC value, towards issue of LC and operation thereof shall be borne by the contractor and shall be recovered from his bills.
    - d. The LC shall be opened initially for duration of 180 to 365 days in consultation with contractor. The LC shall be extended time to time as per the progress of the contract, on the request of the contractor. The value of LC to be opened initially as well as extended thereafter shall be finalized by the engineer in consultation with the contractor on the basis of expected progress of work.
    - e. The LC terms and conditions shall inter-alia indemnify and save harmless the Railway from and against all losses, claims and demands of every nature and description brought or recovered against the Railways by reason of any act or omission of the contractor, his agents or employees, in relation to the **Letter of Credit (LC)**. All sums payable/borne by Railways on this account shall be considered as reasonable compensation and paid by contractor.

- f. The LC terms and conditions shall inter-alia provide that Railways will issue a Document of Authorization (format enclosed as Annexure-2) after passing the bill for completed work, to enable contractor to claim the authorized amount from their bank.
- g. The acceptable, agreed upon document for payments to be released under the LC shall be the Document of Authorization.
- h. The Document of Authorization shall be issued by Railway Accounts Office against each bill passed by Railways.
- i. On issuance of Document of Authorization, a copy of Document of Authorization shall be posted on IREPS for download by the contractor. A digitally signed copy of Document of Authorization shall also be sent by Railway accounts office to Railways bank (Local SBI branch)
- j. The contractor shall take print out of the Document of Authorization available on IREPS and present his claim to his bank (advising Bank) for necessary payment as per LC terms and conditions. The claim shall comprise of copy of Document of Authorization, Bill of Exchange and Bill.
- k. The payment against LC shall be subject to verification from Railways Bank (Local SBI branch).
- l. The contractors bank (advising bank) shall, submit the documents to the Railways Bank (SBI local branch)
- m. The Railways bank (issuing bank) shall, after verifying the claim so received w.r.t the digitally signed Document of Authorization received from Railway Accounts office, release the payment to contractors bank (advising bank) for crediting the same to contractors account.
- n. Any number of bills can be dealt within one LC, provided the sum total of payments to contractor is within the amount for which LC has been opened.
- o. The LC shall be closed after the release of final payment including PVC amount, if any to the contractor
- p. The release of performance guarantee or security deposit shall be dealt directly by railway with the contractor i.e. not through LC
3. For opening of LC, executive department shall make a request letter to concerned Accounts Department on a format, placed as Annexure-I.
4. Necessary changes in IREPS and IPAS e- applications have already been carried out, for having option for payment to contractors through LC.
  - a. In case of any dispute in interpretation of Payment clauses, the decision of Railways is final and binding on the Tenderer.
  - b. The contractor shall submit bills/gate passes/ invoices for the materials purchased by them to Railways at the time of supplying the materials to nominated Railway Stores Depot or nominated Railway site.
  - c. No stores will be considered ready for delivery until RDSO/RITES have certified in writing they have been inspected and approved by them. Facilities must be given by the contractor to the Railway or their nominee for inspection of stores, manufacturer and fabrication. The materials mentioned with RDSO Specification implies that the item to be referred with the existing latest Specification.
  - d. Sr.DFM/SC, South Central Railway, will be the accounts officer-in- charge of payment etc., under this contract.

## **8.0 MATERIALS AND WORKMANSHIP:**

- i. Wherever RDSO specification is prescribed for any material in the tender, the same shall have to be procured from the RDSO approved/recommended firms only.
- ii. Any material to be used for this work shall not be procured from any sources banned for business dealing with Indian Railways under any circumstances.
- iii. If the total value of an item to be supplied as per RDSO/IRS specification is less than Rs. 5 Lakhs (Rs. Five Lakhs only), the same shall be inspected by Consignee subject to supplies being from sources approved by RDSO. However, certain specified items irrespective of value shall invariably

be inspected by RDSO as per the extant policy of Indian Railways. [Railway Board Letter No: 2000/RS(G)/379/2 Dated 06.09.2017].

- iv. If the inspection agency requires any modification from RDSO to RITES/Consignee, approval is to be taken from competent authority.
- v. The material should be in properly packed condition, and the consignee reserves the right to reject the material even though it was passed by RDSO/nominated inspecting authority of Railways if it is received in damaged or defective condition.
- vi. In case materials are to be inspected by consignee, then materials shall be supplied from the firms approved by not below the rank of JAG.
- vii. All the materials and workmanship used in this work shall be of extremely good quality and high class in every respect and is expected to give trouble free service.
- viii. The contractor shall neither divert the materials nor use them for any other purposes than exclusively for execution of the project for which the materials are intended for.

## **9.0 STORES - RECEIPT & ACCOUNTAL:**

- A. Proper requisition and receipt exchange shall be done on a suitable Proforma as mentioned between the Contractor and the Railway's authorized representative.
- B. The Contractor shall issue a receipt along with the demand slip for the materials required for the work and obtain a receipt when any material is returned to stores. These transactions shall be done with the consignee.
- C. All stores drawn by the contractor shall be accounted for either as installed as per recorded site measurements or as surplus stores returned to the respective Consignee (stores). On submitting every "on account bill," the contractor has to submit a material statement duly signed by Concerned SSE-In-charge and contractor to the bill passing authority.

## **I. LOADING/UNLOADING & TRANSPORTATION OF MATERIAL:**

1. The Contractor shall deliver the material at the Depot of SSE/Stores/Signal /RRI/SC or SSE//Telecom/Stores /SC as applicable . Material to be supplied by Railways for the execution of the work and the material delivered by the Contractor will be transported from the Consignee depot or any other nominated depot notified by Railway to site by the Contractor at his own cost. This includes loading and unloading of materials at the consignee depot and site by the contractor.
2. Alternatively, suppose the worksite is ready, and work is in progress physically. In that case, the materials can be brought to the site directly and supplied with prior approval of the Engineer in-charge after appropriate accounting by the consignee. Empty cable drums and balance materials after completion of work, if any, should be returned at the nominated Depot by the contractor at his own cost. The contractor will have to furnish an Indemnity Bond Form No.5 (in Forms & Annexures part of Chapter-3) for the Security of the Railway material issued to him.
3. Indemnity Bond will be released after commissioning of work and when the contractor returns all balance material. The security of the material brought to the site of work will remain with the Contractor till commissioning.
  - a) The contractor shall bear the cost of transit insurance required as per rules.
  - b) The freight and insurance cost for the material to site of work shall be borne by the contractor.

- II. **SECURITY OF MATERIAL:** Once the material is handed over to the contractor, the contractor shall be responsible for the security of the material irrespective of the fact that the material is kept in Railway premises. The contractor shall make adequate arrangements at the site as deemed necessary for guarding the same from thefts or damage of any sort. In the event of any loss, the contractor shall be responsible to that effect and shall execute an indemnity bond for the materials, which has been supplied by the Railway and will remain in his custody. The cost of stores lost/damaged shall be realized by the Railway out of any payments due to the contractor in this contract or from any other contract executed by Govt. of India.

- III. RETURN OF SURPLUS STORES:** A register shall be maintained at the site, which the Contractor shall sign as a token of receipt of material. All the issued material shall either be used in the installation or returned to Consignee.
- IV. RETURN OF RELEASED STORES:** Released material/equipment shall be returned and systematically deposited to Consignee. Proper care of material shall be taken while releasing & transporting the stores.
- V. PACKING AND FORWARDING:**
- Packing shall conform to Para 14 of RDSO Specification No RDSO/SPN/192/2019 Ver 2.
  - The contractor shall pack at his own cost the stores sufficiently and properly for transit by Rail/Road, Air, and/or Sea as provided in the contract to ensure their being free from loss or damage on arrival at their destination.
  - All containers (including packing cases, boxes, tins, drums, and wrappings) in which the contractor supplies the stores shall be considered as non-returnable and their cost as deemed to have been included in the contractor price.
  - Each packing delivered under the contract shall be marked by the contractor at his own expenses. Such marking shall be distinct (all previous irrelevant marking being carefully obliterated and shall clearly indicate the description and quantity of stores, the name and address of the Contractor with a distinctive number of mark sufficient for the purpose of identification). All marking shall be carried out with such material as may be found satisfactory by the inspecting officer as regard quickness of drying, fastness and indelibility.
  - Materials and Equipment meant for each section shall be separately packed in separate boxes and marked with name of section, consignee and Railway.
  - The inspecting officer may reject the store if the stores are not packed and/or marked as aforesaid and in case where the packing materials are separately prescribed, if such materials are not in accordance with the term of contract such rejection of the stores by the inspecting officer shall be binding on the contractor and he shall arrange for removal of such rejected store within 7 days. Such rejected stores shall lie at the consignee's risk from the date of rejection. If the Contractor does not remove the stores within this period, the Railway or his nominee shall have the right to dispose of such stores, as though fit, at the contractor's risk and account. The Railway shall also be entitled to recover from the contractor, handling and ground rent/demurrage and any other charges for the period during the rejected stores are not removed after the period aforementioned.

- 10.0 DEPLOYING QUALIFIED / TRAINED MANPOWER:** The contractor shall deploy adequate number of competent and trained personnel for work as per instructions of Engineer in charge of Railways. It is responsibility of the contractor to deploy skilled staff.

All contractors' staff & Supervisors must display Identity Badges while working in Railway Premises and put on Helmets & Florescent coloured Safety Jackets while working on Tracks with name of Firm/Contractor labelled on Rear side. No extra payments will be made for above Items.

OEM's authorized Installation Engineers must be mobilized well in advance for commissioning of E.I, Dataloggers, MSDAC, UFSBI, IPS etc as the case may be, without fail. Safety at work Site to be ensured as per (Chief admin. Officer/Con/Sc's letter No. W.Con/496/PL/C/T&C/XIX(Safety), dated 29.02.2016).

- 11.0 EXECUTIVE AUTHORITY IN CHARGE OF THE WORK:** The SR.DSTE/CO-ORD/SC South Central Railway, Secunderabad or any other officer nominated by SR.DSTE/CO-ORD /SC South Central Railway, will be the Engineer -in- charge of this work. He shall nominate a field officer who shall be the Executive Engineer for the work and shall coordinate for day-to-day execution of the work, any clarifications or instructions given by the said engineer/executive engineer shall be final and binding on the contractor. Regarding alterations & Interpretations to the contents of the contract or any other matter connected with the contract, **The Sr.DSTE/Co-Ord/SC** South Central Railway, Secunderabad will be the final authority and his decision shall be final and binding on the contractor.

**12.0 ROYALTIES AND PATENTS RIGHTS:**

- a. The Contractor is forbidden to use any patents or registered drawings, processes or patterns in fulfilling his contract without the previous consent in writing of the owner of such patent's drawings, patterns or trademarks, except where these are specified by the purchaser himself. Royalties where payable for the use of such patented processes, registered drawings or patterns shall be borne exclusively by the Contractor. The Contractor shall advise the purchaser of any proprietary rights that may exist on such processes, drawings or patterns which he may use of his own accord.
- b. The contractor shall defray the cost of all Royalties fees and other payment in respect of patents, patent rights and licenses which may be payable to patentee, licensor or other person or corporation and shall obtain all necessary licenses. In case of any breach (whether will fully or inadvertently) by the contractor on this provision, the contractor shall indemnify the Railway and their officers, servant and representative against all claims, proceeding, damages, cost charges, expenses , loss and liability which they or any of them may sustain, incur or be put to, by reason or in consequence, directly or indirectly of any such breach and against payment of any royalties, damages or other moneys, which the Railway may have to make, to any person or holder entitled to patent rights in respect of the users of any machine, instruments, process, article, matter or thing, constructed, manufacturing supplied or delivered by the contractor or to his order under this contract. The tenderer is deemed to have accepted this clause, in regard to indemnifying the railway as stated above, when his tender has been submitted to the Railway.
- c. In the case of patents taken out by the Contractor of the drawings or patterns registered by him, or of those patents, drawings or patterns for which he holds a license, the signing of the contract automatically gives the Purchaser the right to repair by himself the purchased articles covered by the patent or any person or body chosen by him and to obtain from any sources he desires the component parts required by him for carrying out the repair work. In the event of infringement of any patent rights due to above action of the purchaser, he shall be entitled to claim damages from the contractor on the grounds of any loss of any nature which he may suffer.

**14.0 CONTRACTOR 'S OFFICE: Contractor will intimate office address along with Telephone/Fax, E-mail and name of Key personnel responsible for execution of work.** Any communication sent to the contractor by post at his said address shall be deemed to have reached the contractor duly and in time. Important document shall be sent by Registered post.

**15.0 CHANGES IN ADDRESS:** Any change in the address of the contractor with respect to Para 3.13 above shall be forthwith intimated in writing to the Railway. The Railway will not be responsible for any loss/inconvenience suffered by the Contractor on account of his failure to comply with this.

**16.0 SUPERVISION & LABOUR:**

- i. Contractor shall keep sufficient and competent staff as per relevant GCC clause at the work site. The work shall be carried out as per Railway's extant practice.
- ii. During the execution of the works, the contractor or his representative shall not leave the site where the works are being carried out. At the site of work, the contractor shall always make available one representative who shall be approved by the Railway Administration and who shall be invested with adequate powers by the Contractor so that orders or instruction given to the said representative by the Railway Administration in writing could be considered as duly given or conveyed to the Contractor himself. Representative of the Railway will check up the work from time to time. Supervision and Erection of work will be done by the contractors with their own labour, till completion and testing of the work.
- iii. The field Supervisor shall receive instructions from the Engineer-in-charge of the work or his representative at site and comply with the instructions. The Contractor shall be responsible for the compliance of such instructions.



- iv. If the supervisor acting on behalf of the Contractor disregards the instructions of the Railway's supervisor/representative and does not execute the work to the satisfaction of this Railway supervisor, the Railway's Engineer, in consultation with superior will have the authority to order stoppage of work and/or ask for the replacement of the supervisor, which it shall be binding on the contractor.
- v. The contractor shall make his own arrangement for accommodation, for his staff during installation, testing & commissioning.

#### **17.0 SAFETY OF WORK, TRAINS & PERSONNEL:**

- i. The contractor should abide by all the Railway regulations and also ensure that the same are followed by his representatives, agents, servants or workmen. He is therefore bound under these clauses to give notice to them about the provision of this clause and the consequent liability of the contractor under the agreement. The contractor shall conform to all the Railway Rules relating to safety of personnel and operation of signals and points. In the A.C. electrified areas the special precautions as laid down in AC Traction Manual shall be followed.
- ii. No petroleum spirit within the meaning of the Indian Petroleum Act shall be stored at site or adjacent land until the approval of the Railway and necessary license under the Act has been obtained by the contractor. The tenderer shall also ensure that approval of the Engineer has been obtained for storing any other inflammable material well in advance.
- iii. The contractor's employees and workers shall not for any reason operate any appliances or installations of the Railway concerning the safety of train movements, but they should whenever necessary notify the qualified Railway staff who will then take necessary steps. The contractor shall also be responsible for any damage that may cause due to the carelessness of his workmen and will bear the consequences in this regard.
- iv. The work must be carried out most carefully in such a way that they do not hinder the Railway operation except as agreed to by the Railway. The Contractor shall do no work that may interfere with traffic until protection has been provided by the Railway and under supervision of Railway's representative. When the work is required to be carried out on the track itself or as close to the track as may pose a hazard to rail traffic, the work shall be carried out under the supervision of an authorized Railway representative Junior Engineer/Senior Section Engineer (JE/SSE). Whenever trackside work are undertaken by the contractors, areas for unloading of bulk materials should be clearly demarcated and barricades provided if necessary with the consent of the (SSE/JE) Signal/Telecom, in-charge of the work. Suitable steps shall also be taken to prevent transport vehicles and such other machinery gaining access so near the track as to threaten the safety of running trains. That, whenever it becomes inescapable to allow transport vehicles or mobile machinery to operate in close proximity to the running lines the maximum moving dimensions for the said lines shall be adequately protected by fencing or such other suitable measures. No vehicle will normally be permitted to ply adjacent to the running lines.
- v. Contractor will be responsible for the safety of hired trucks and men etc. working at the site. He will also be responsible for any damage caused to the Railway property, staff and passengers travelling on the line on account of his truck/vehicles having been allowed to ply on the bank.
- vi. The contractor shall take all precautionary measures in order to ensure protection of his own personnel moving about or working on the Railway premises and shall have to conform to the Rules and Regulations of the Railway.
- vii. Suitable ladders for climbing the post and slings for supporting men on the post shall be used. Ropes as required shall be used for erection of the poles. The size of the rope shall be adequate. The contractor shall take necessary precaution for working near the power lines. If at any time the Railway finds the safety arrangements are inadequate or insufficient, the contractor shall take immediate corrective action as directed by the Railway's representative at site. However, it is not obligatory on the part of the Railway's to give such directions. The issue or non-issue of any direction in the matter by the

Railway shall in no way absolve the contractor of his sole responsibility to adopt safe working methods. The stone-breakers, if employed shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

- viii. Necessary personal safety equipment as considered adequate by the Engineer-in –Charge should be kept available by the contractor for the use of the persons employed on the site and maintained in condition suitable for immediate use and the contractor should take adequate steps, to ensure proper use of equipment by these concerned. When not in use, electrical apparatus shall be switched off. No paint containing lead or lead products shall be used except in the form of paste or ready mixed paints. Suitable face masks should be supplied by the contractor for use by the workers when paint is applied in the form of spray.
- ix. Within the station premises and especially on passenger platforms, the contractor shall ensure sufficient free space for movement of passenger traffic. He must cover and protect the excavations carried out in such areas with a view to avoid any accidents.
- x. In case of an accident of any nature, the contractor will indemnify the Railway for any losses caused by him as a result of the accident.
- xi. The contractor will not be entitled to any compensation for any damage or loss sustained by him during execution of the work, for any idle labour transport or any loss or deterioration of the material or tools.
- xii. The contractor shall also be responsible for any damage that he may cause due to the carelessness of his workmen and will bear the consequences in this regard.

**18.0 EMERGENCY WORKS:** In the event of any accident or failure occurring in or about the work or arising out of or in connection with the construction, completion or maintenance of the works which in the opinion of the Engineer requires immediate attention, the Railway may bring its own workmen or other agency to execute or partly execute the necessary work or carry out repairs if the Engineer considers that the contractor(s) is/are not in a position to do so in time and charge the cost thereof to the contractor, as to be determined by the Railway.

**19.0 OBLIGATION TO CARRY OUT ENGINEER 'S INSTRUCTIONS:** The contractor shall also satisfy the Engineer that adequate provision has been made: - To carry out his instructions fully and with promptitude. To ensure that parts required to be inspected before use are not used before inspections; and to prevent rejected parts being used in error. Where, parts rejected by the inspector have been rectified or altered, such parts shall be segregated for separate inspection and approval before being used in the work.

**20.0 INSPECTION OF WORKS:**

- i. The Engineer or his representative may inspect and test the various portions of the work at all stages and shall have full power to reject all or any portion of the work that he may consider to be defective or inferior in quality of materials, workmanship of design in comparison to what is called for in the specification. In the event of rejection of any work already executed and not in accordance with specification as in this tender and/or as determined by the Engineer or which the Contractor has been apprised, the Contractor shall carry out alterations/replacements to such works to the satisfaction of the Engineer for which no additional expenses will be borne by the Railway.
- ii. The responsibility of providing facilities for inspection lies with the contractor. He shall be responsible for providing required facilities i.e. tools, equipment for inspection at the place of work, for which no additional payments shall be made. For the purpose of inspection, the contractor shall make a written request for inspection of sites to be done next day.
- iii. The completed installation at all stages shall be subjected to checks and test as decided by Railways and the contractor shall be liable to remedy such defects as discovered during these checks and test and make good all deficiencies brought out. However, complete installation will be taken over finally on completion of the full system. It will be the responsibility of the contractor to rectify any discrepancy noticed within

a reasonable period from the date the complete system is taken over. For the purpose of taking over, joint inspection will be carried out by nominated representative of Railways.

- iv. The contractor will be called upon to pay all the expenses incurred by the Railway in respect of any work found to be defective or of inferior quality, adulterated or otherwise unacceptable.
- v. During the execution of the contract, samples may be taken for the purpose of test and/or analysis under the conditions laid down in specification, such samples to be prepared for testing and forwarded free of all cost to the Railway.

#### **21.0 SITE ORDER BOOK:**

An Inspection Register/Site Order book shall be maintained at the site of work by the contractor, wherein the Engineer in-charge of the work or his executive subordinate shall record instructions regarding the working etc. It is expected that the Contractor or his representative at the site shall note such instructions whenever asked upon to do so and take action accordingly. His non-noting the logbook entries shall not be considered sufficient grounds for non-compliance of the instructions. This register shall have entry on day-to-day basis regarding the progress of work. Record should also be kept with joint signature of Railways & firms representative for all release material too.

This should be produced during the inspection & check of Railway engineer in charge or his authorized representative along with drawing showing new installation locations.

#### **22.0 QUALITY AUDIT OF INSTALLATION:**

The Contractor shall arrange for a quality audit of installation by OEM(s) authorized representative who will certify that the installation has been done as per OEM's specification and standard practices.

#### **23.0 PROGRESS REPORTING:**

- i. The contractor shall submit to Railways at his own cost periodic progress reports at regular intervals regarding the state and progress of work. The details and pro-forma of the report will mutually be agreed after award of the Contract. Such reports shall be for weekly work progress (man power, equipment and work development) and monthly progress review reports. All actions as directed by Railway's representative to such reports shall be promptly attended to by Contractor.
- ii. The purchaser's engineer shall also conduct monthly meetings with the contractor to assess and review the programme of works. The action proposed to progress the work as planned, difficulties, assistance required etc. shall be clearly brought out and remedial action taken. The minutes of these meetings shall be jointly signed by Railway and contractor.

**24.0 MODIFICATIONS:** The contractor shall be responsible for supply of any additional equipment without extra cost for any alterations of the works due to any discrepancies, errors or omissions in the drawings or other particulars supplied by him, whether such drawings or particulars have been approved by the Railway or not due to inaccurate information or particulars furnished to the Contractor on behalf of the Railway. If any dimensions/figures upon the drawings or plans differ from those obtained by scaling, the dimensions/figures of the original before scaling shall be taken as correct.

**25.0 Procedure for undertaking digging work in the vicinity of Signalling, Electrical and Telecommunication cables governed by Railway Board Lr. No. 2021/Tele/5(2)/3-Part(I)(3425647) Dt.12.06.2023.**

#### **Guidelines for protection of cables while doing work its vicinity**

1. Cable route marking for all types of cable must be made available block section wise on Railnet.
2. Before allowing the contractor to work near the tracks, the work executing agency (like Sr.DSTE/Sr.DEN/Sr.DEE or Dy.CSTE/Dy.CEE/Dy.CE etc) shall ensure that the permission has been granted by the division to the contractor in accordance with the local instructions/JPO to work in the vicinity of the cables. Zonal Railways shall devise suitable mechanism and timelines for the obtaining /granting such permission.

3. In case of works being taken up by the State Government, National Highway Authority etc., Zonal Railways shall devise mechanism for shifting the cables or for proper protection of cables before granting permission to work.
4. The engineering control shall keep all the information regarding any works being done near the track. S&T and electrical control shall obtain this information from engineering control. These controls shall coordinate among themselves to ensure that no work is done in the vicinity of the track without proper permission.
5. The concerned SE/P.Way/SE/Works/SE/Sig/SE/Tele SE/Electrical (TRD or G) or RailTel supervisors supervising the work of the contractor shall ensure that the existing emergency socket are not damaged due to their importance in providing communication during accident/emergency.
6. For all new works, cable shifting should be a mandatory part of DPR and estimate. For ongoing works, Zonal Railways may sanction works for cable shifting, if necessary, through contingency/supplementary/revised estimate where provision does not exist. However, in case of zonal railways decide not to shift cables (due to any reason) then protection of cable shall be ensured by the Zonal Railways during execution of the work.
7. Penalty to be imposed for damages to cables shall be as under:

<b>Cable damaged</b>	<b>Penalty Per Location</b>
Only Quad Cable or Signalling Cable	₹ 1.0 Lakh
Only OFC	₹ 1.25 Lakhs
Both OFC & Quad	₹ 1.50 Lakhs
Electrical Cable	₹ 1.0 Lakh

8. Penalty should be levied on the contractor when they work without permission or resort to careless working without making arrangements for protecting cable and other utilities. Based upon the local conditions and practices, zonal railway shall devise its own conditions for examining and levying penalty. For each cable cut, a joint report at the level of supervisors should be prepared on the same day and it should become the basis for levying penalty and fixing responsibility. Joint note should be forwarded by Sr.DSTE/Sr.DEE to the executive in-charge of the work. The executive in-charge of the work should act and decide on the cable cut case within 15 days under information to Sr.DSTE/Sr.DEE as the case may be. There should be provision of appeal by contractors within one month of notice for levying penalty at ADRM level. Decision of ADRM shall be final and binding upon both parties.
9. Railways shall not lodge FIR with RPF in cases of works being executed by authorized contractor of Railways who have been duly permitted to execute the works.
10. Zonal Railways shall issue local instructions/JPO for protection of cables while undertaking works in the vicinity of railway tracks in line with this guideline. Zonal Railways shall also ensure that such instructions become part of their tender documents within one month of the issue of the local instructions. Suitable action against erring officials shall also be incorporated in these instructions if the same is not adhered to.
11. For Supply and Installation Items (like RCC duct , route markers , etc )of the entire tender schedule, transport charges are to be borne by the contractor himself . (No extra payment will be made for transporting the those items from stores depot to site)

## 26.0 EXPLANATORY NOTES FOR SCHEDULE E (EISCH)

(i) Item No.1:

- a. Supply of Centralized/Distributed Electronic Interlocking (EI) Hot Standby System with seamless changeover -complete as per technical specification of Contract suitable for use in 25KV RE area and generally confirming to RDSO Specifications No. RDSO/SPN/192/2019 VER 2.0 OR Latest.
- b. Microprocessor Equipment (Having Hot standby with seamless changeover system provided with facility of automatic changeover) Configuration of the system to be supplied by the tenderer shall be got approved from Railways before placing the order.
- c. Optical interface equipment and connectors for communication between CIU and OCs.
- d. All interface relays in relay room including QSPA1, required lamp proving relays and point operation relays in relay room required for commissioning of the electronic interlocking are to be supplied under this item. All Point Operation Relays in Relay Room like QBCA1 & QL1 relays also to be supplied under EI scope for outdoor point operation as per RDSO Standard diagram. All these relays are to be got tested by RDSO.
- e. Fuses, fuse links, fuse blocks, all terminals used for connecting wires/cables in indoor including those used for cable termination racks), Tag blocks with covers. All the RDSO part listed items to be got inspected by RDSO.
- f. Wiring Materials, wire coils, all connecting material required for EI system, 6 way terminals/ wago terminals/phoenix terminals, indoor signalling cables. All the RDSO part listed items to be got inspected by RDSO.
- g. Maintenance Terminal with a) Supply of fan less embedded industrial grade computers ( Similar to Moxa V2406 or better ) with all accessories such as key board, mouse, antivirus etc. of industrial grade as per approved Specification as recommended by RDSO (TAN No. STS/TAN/3007 Version 1.0 or latest) (prior approval for storage capacity to be taken from officer in charge) to work in Hot standby mode.(Inspection by Consignee) b) Supply of commercial grade operator VDU of size 55" Full HD,4K resolution Model same as supplied for operator VDU under separate supply item of this schedule.(approval of engineer in charge to be taken before supply)No separate payment will be made for this VDU & PC.

Note: One maintenance terminal shall be provided for each EI system.

- h. Interface for data transfer to central monitoring unit through data logger including (Protocol converter).
- i. All power supply equipment required for EI system Note: 110V DC will be provided by railways. All power supply equipment such as DC-DC converts or any other equipment further required for EI, VDUs shall be supplies under this item. All the RDSO part listed items to be got inspected by RDSO. Three number inverter – Supply , installation & Commissioning is in scope of the work as per latest TAN of EI (As on date of tender floating)
- j. Relay racks, fixtures, mounting arrangements, Ladder, runway and accessories. Note: Relay racks which are being supplied shall have 25% spare capacity for future use. All the RDSO part listed items to be got inspected by RDSO.

- k. Protective devices like fuses, lightening protectors etc. as per requirement and recommended by manufacturer and RDSO All the RDSO part listed items to be got inspected by RDSO.
- l. Interconnecting optical cable along with interface to make connections between EI and VDU as per RDSO Cl. 5.1.4, all the patch chords required for making connections of the system .
- m. Any other petty items required for making the EI system functional.
- n. Supply of system OEM manuals (Installation, Maintenance, and Troubleshooting etc ) Two sets per equipment.
- o. Supply of essential spares to the extent of 15% subject to minimum of one, for the cards/modules/PCB, connectors/couplers, fuses, all relays, crimp contact, lightening arrestors, isolators, convertors etc used in the complete EI system. In addition, spare to the extent of 15% subject to minimum of one for all type of interface relays with bases used in EI. The item-wise details of spares to be supplied with unit rates should be listed out in separate annexure by the tenderer. Calculation of spares will be per station wise.

NOTE: For calculating spares of station total items installed under item No. 1 and 2 must be taken into account. No separate payment will be made for these spares.

- p. Supply of Tools and Instruments - Tool Kits and Measuring Instruments for technicians/Junior Engineers for testing & maintenance and repair at site and troubleshooting of hardware & software for EI systems as per manufacturer's recommendations. List of instruments & tool kits to be provided by the supplier along with number and unit prices.
1. Item No.2: Payment under this item will be made for Electronic Interlocking supplied against item no.1 by calculating the functions controlled by EI. Functions up to 125 are covered under item no 1. For each additional function beyond 125, payment will be made against this item. Typical value of each function is indicated in the enclosed table and based on the actual number of functions controlled by the EI, the total value of functions can be calculated.
  2. Item No.3 :- Prior approval is to be taken before supply. The model and specifications should be compatible with EI system and any other interface equipment required to make it functional shall also be supplied along with this item by tenderer at his own cost.
  3. Item No.4:-Supply of industrial grade embedded PC for operator VDUs as per RDSO TAN No. STS/TAN/3007 Version 1.0 or latest in to work Hot standby mode. The embedded PC should be compatible for operation of VDU supplied as per the above Configuration. The embedded PC shall have sufficient storage capacity to store one month data or 1000000 events whichever is more. Prior approval is to be taken for model and capacity before supply. Warrantee 5 years from date of supply.
  4. Item No. 6:-
    - (a) Submission of As Made Documents: - Preparation and supply of 6 sets of as made documents in hard and soft copies for each station as per the practice of south central railway. After execution of the work, the tenderer has to supply six sets of documents as mentioned in the table below along with system details, site installation details/drawing, maintenance manual, and operation procedure in a bound book as per practice of S.C. Railway consisting of :
      1. Wiring diagrams.
      2. Application programme listing.
      3. Relay / Cable termination particulars.
      4. Input / Output Assignment details.
      5. Relay lay out and contact analysis chart .
      6. Equipment deposition layout.
      7. Details of Power Supply arrangement .
      8. Any other Drawing as required by the railway as per its practice The tenderer shall also submit six copies of the approved documents finally along with a soft copy of the same for Railways" use. These drawings shall be prints taken from original drawings

arranged in plastic folders. Each sheet shall be put in a separate plastic folder. All the other documents are to be supplied as per clause 10.1 of RDSO Specifications or latest. A full record of tests conducted shall be maintained by the tenderer and handed over to the railway along with the installation. Only signalling plan and table of control will be issued by railways. All indoor work details shall be prepared by tenderer and submitted to railways for approval.

- (b) The connection to ring earth, Surge and lightening protection arrangements as specified by RDSO specifications and TAN shall be provided by the tenderer as per the instructions of engineer in charge. Earthing of EI Equipment, Relay Racks and Power Equipment etc with bonding ring conductor to be done along with supply of all requisite materials as per EI requirement, RDSO directives and Signal Engineering Practice for lightening protection by tenderer.

Maintenance free ring earthing arrangements to be connected to indoor equipment will be provided by other agencies.

- (c) Supply of Flexible Wire Copper multistrand, 16 Sqmm, PVC insulated as per para 10.1 of RDSO Specification No:RDSO/SPN/192/2019 VER 2.0 OR LATEST as per specification no: IRS:S 76/89 Amendt-3 or latest for wiring from IPS room to EI room and power wiring as per site requirement RDSO.
- (d) Design, Drawing, Installation, Wiring, testing, Soldering of all EI equipment with contractor's material including wiring & soldering of relays, in Goomties (where ever provided) as well as central EI location and bring the functions up to cable termination Rack provided.
- (e) Supply of all related consumable materials like rosin core, lacing thread, PVC bunching tape and buttons eyelets of sizes, etc. required for the work.
- (f) Power wiring of all EI equipment's, laying of power cable from IPS room to EI room and to all other associated functions like panel processors, interface relay racks, data logger, maintenance terminals etc.
- (g) Testing of the system: The testing includes -Functional testing, selection table testing with contractor's simulation panel (Both SAT and FAT inclusive).

5. Item No. 8: Commissioning of Electronic Interlocking system after interfacing of indoor equipment with outdoor gears in association with Railway Personnel during Non-Interlock working. Competent Engineer of manufacturer must be available during Pre NI, NI and Post NI.

## ANNEXURE-A

EI INPUT / OUTPUT FUNCTIONS GEAR WISE REFERENCE					
Sl. No	Description of signaling Gears	Equivalent No of Functions	Relays Inputs	Relays Outputs	Other Functions
1	Signal Two aspect	3	RECR, HECR	HR	...
2	Signal Three aspect	5	RECR, HECR, DECR	HR, DR	...
3	Signal Four aspect	7	RECR, HECR, HHECR, DECR	HR, HHR, DR	...
4	Route indicator one way	2	UECR	UGR	...
5	Route indicator Two way	3	UECR	UGR1,UGR2	...
6	Route indicator Threeway	4	UECR	UGR1,UGR2,UGR3	...
7	Route indicator Four way	5	UECR	UGR1,UGR2,UGR3,UGR4	...
8	Calling on signal	2	COHECR	COHR	...
9	Shunt signal post type	2	SH OFF ECR	SH HR	...
10	Shunt signal ground type	3	SH OFF ECR, SH ON ECR	SH HR	...
11	Track circuit	1	TPR	...	...
12	Point (Double end/Single end)	7	NWKR, RWKR	NWR, RWR, N-RWLR, NDKR, RDKR	...
13	PCR'S	2	...	PCR1,PCR2	...
14	Crank handle	2	CHCR	CHYR	...
15	L.C.Gate	2	LXCR	LXYR	...
16	Em extraction of CH/LX	2	ECH-PZR, ECHRB PZR		...
17	G.F.operated point	3	KLCR	KLYR,NWKR	...
18	S.P.I	4	CR, HECR	YR, HR,	...
19	Slot out going	2	AR	YR,	...
20	Slot in coming	2	YR	AR,	...
21	A marker	2	AMGECR	AMGR,	...
22	B lock instrument SGE	8	BH.LC, BH.TOL, BH.TOL-LB, BR.LC, BR.TOL,	COM LOCK, GNSR, ZR3.	...
23	Block instrument UFSBI Single line	10	ASCR	AS RR,HS RR,AS GNCR,HS GNCR,AS DECPR,AS RECPR,HSATPR,HSBTTPR,VP R	...



24	Block instrument UFSBI Double line	10	ASCR	AS RR,HS RR,AS GNCR,HS GNCR,AS DECPR,AS RECPR,HSATPR,HSBTPR,UP VPR,DN VPR	...
25	Block instrument DIADO	4	TAR, ASR	IR, TA BEL,	...
26	IBS	6	RECR,DECR, CRR,TPR	DR,CPBR	...
27	SSDAC –each section	3	VPR,PPR	RSTR	...
28	DUAL SSDAC- each section	5	PPR1,PPR2 VPR1,VPR2	RSTR	...
29	HASSDAC- each section	5	VPR1,PPR1,VPR2,PPR 2	RSTR	...
30	MSDAC- each section	1	ACPR	...	...
31	DUAL MSDAC- each section	1	FINAL ACPR	...	...
32	SM'S KEY	2	SMCR1,SMCR2	...	...
33	LVR	1	LVR	...	...
34	AXLE Counter	4	EVR,SUPR,ACPR	ACZR	
35	Track feed charger Failure	1	TJFR	...	...
<p>NOTE:</p> <p>1) No payment shall be made for auxiliary bits , or counter bits irrespective of MAKE of EI.</p> <p>2) In case of OC based architecture (as in case of Medha EI) , Crank handle Bits are to be repeated in 2 Ocs for redundancy. No extra payment shall be made for this.</p> <p>3) In case of any modification of circuits by RDSO guidelines , if any bit is increased/reduced in logic circuit , functions will be increased/reduced based on actual designed circuits.</p> <p>4) In case of Kyosan make EI, EI spares will also include FRMC card min 15% subject to minimum one.</p>					

**TOOLKIT TO BE SUPPLIED AS PART OF EI ITEM No.1 & 2 of SCHEDULE-E**  
(One Toolkit Set Per Station)

SI. No.	Description of Items	Quantity
1	Insulated spanners-16*17,9*8,10*11	1 no each
2	Screw driver flat	01
3	Nut Driver 8mm x125	01
4	Nose plier ring	01
5	Nose plier	01
6	Small wire cutter	01
7	Wire stripper	01
8	Cutting plier	01
9	Screw Driver Set	01
10	Self-Adjusting Cutter-Stripper	01
11	Nose Plier Without Teeth Cutter	01
12	Soldering Iron (25 w)	01
13	Wago Tool Set	01
14	Wago Crimping Tool	01
15	Bending Wago Tool	01
16	Allen Key 4mm with 'T' Handle	01
17	Taparia Plastic Box	01
18	Insulated Ring Spanner 24x 26	01
19	Insulated Ring Spanner 17x19	01
20	Insulated Flat Spanner 24x26	01
21	Insulated Flat Spanner 17x19	01
22	Adjustable Torque Wrench With Spanner	01
23	Digital Earth Resistance Meter Specification : With measuring range 0-20 ohms & higher. Resolution: 0.01ohms at 0 20ohms & 0.1 at 0 200 ohms. Accuracy:+/- 2% Supplied complete with test leads, spikes & simplified measurement probe. Also measures earth voltage up to 200V with accuracy of +/- 1%. Complies with EN/IEC61010-1 CATIII 600V. Model Stanley521 or similar	01
24	Digital AC / DC Clamp Meter Specification: With display count 6000,AC current 600mA/6000mA/ 60A, DCCurrent 6000mA/ 60A, AC/DC voltage600V, AC current resolution 0.1mA (@60A), Resistance 60MegaOhms,Capacitance upto 62mF, Frequency10Hz to 60kHz with resolution0.001Hz, Variable frequency control(VFC) mode, Zero button for DCA,Clamp opening 17mm, Non contact voltage measurement function. Brand:STAN ONE Model SCM222 or similar	01
25	Digital Multimeter Specification: multimeter Specifications: digital TRMS 5 Digit60000 counts with following features Frequency range: 6Hz to 1MHzFrequency mv AC band width: 100KHzAC voltage rage: 1mV-1000V, +/-0.5% DC voltage rage: 1uV-1000V,+/- 0.05% AC current rage: 1uA-10A,+/- 0.5% DC current rage: 1nA-10A,+/- 0.2% Capacitance range: 1pF-10000uF Datalogging: 32000 Readings Dual display: Available Other features: Temperature messurement, Diode,continuty, Duly cycle measurement,self battery voltage measurement, Lowpass filter, Min, Max and Average valuerecording, Back light, Bargraph, Protective rubber holster. Model no:Rishabh 6016 or Similar	01