

# दक्षिण मध्य रेलवे/SOUTH CENTRAL RAILWAY

## विद्युत लोको शेड/ELECTRIC LOCO SHED, विजयवाड़ा/VIJAYAWADA

**कार्य का नाम/NAME OF THE WORK:** Supply, installation, testing and commissioning of Induction Heater (40 kW) with intelligent micro controller based electronic control, portable to carry suitable for dismounting/mounting bearing racers/Seal PE Rings of 3-Phase and Conventional TM and for inner racer along with necessary accessories including coils.

| Clause | Item  | Description   |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
|--------|---|---|----|------------------|--|----|--------------|----------|----|----------|---------|----|--------|-------------------|----|------------------------|--|----|---------------|--|----|-----------------------|---|----|--------------|---|
| 1.0    | Scope of Work                                       | The specification covers the technical and functional requirements for Induction heater (40 kW) with intelligent micro controller based electronic control, portable to carry suitable for dismounting/mounting bearing racers/Seal PE Rings of 3-Phase and Conventional TM and for inner racer along with necessary accessories including coils.   |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 2.0    | General Specification                               | i) The Equipment shall conform to the latest and relevant BIS and international specifications if any.<br>ii) The equipment shall be robust and compact.<br>iii) The equipment shall be tropicalized to suit Indian climate conditions.   |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 3.0    | <b>Technical Specification for Induction Heater</b> |   |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 3.1    | Specific requirements                               | i) Latest, intelligent microcontroller based electronic control, solid high frequency induction heater, specifically designed for mounting/dismounting of racers, throwers etc.<br>ii) The induction heater should be suitable for heating the work piece to a temperature of 250°C safely. Maximum time required to attain the temperature should be indicated in the offer.<br>iii) Heating effect by induction should take place only on the work piece. The heater casing and the magnetic conductor should remain cold throughout the heating cycle.<br>iv) A suitable control system should be provided to ensure that the temperature should not deviate more than $\pm 5^\circ\text{C}$ .<br>v) The equipment shall have built in digital temperature controller and timer control for the temperature of the component.<br>vi) It should consist of both temperature mode and timer mode of operation.   |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 3.2    | Technical Specification                             | <table> <tr> <td>1.</td><td>Incoming voltage</td><td>: 3 phase, 440 V <math>\pm 10\%</math>, 50 Hz <math>\pm 10\%</math>.</td></tr> <tr> <td>2.</td><td>Power factor</td><td>: &gt; 0.90</td></tr> <tr> <td>3.</td><td>Capacity</td><td>: 40 kW</td></tr> <tr> <td>4.</td><td>Rating</td><td>: 100% continuous</td></tr> <tr> <td>5.</td><td>Operational parameters</td><td>: Time (0-9.99 mins), Temperature (0-250°C), Power (0-100%).</td></tr> <tr> <td>6.</td><td>Memory backup</td><td>: To set &amp; save all the operational parameters for different jobs (250 jobs) in rewritable memory (EEPROM) of the micro-controller).</td></tr> <tr> <td>7.</td><td>Man machine interface</td><td>a. LED display to show all set, operational and trip parameters.<br/>b. Keys to set and save the operational parameter shall be available.<br/>c. All faults should be displayed on LED screen.</td></tr> <tr> <td>8.</td><td>Heating mode</td><td>: Temperature and time (as per selection)</td></tr> </table> | 1. | Incoming voltage | : 3 phase, 440 V $\pm 10\%$ , 50 Hz $\pm 10\%$ . | 2. | Power factor | : > 0.90 | 3. | Capacity | : 40 kW | 4. | Rating | : 100% continuous | 5. | Operational parameters | : Time (0-9.99 mins), Temperature (0-250°C), Power (0-100%). | 6. | Memory backup | : To set & save all the operational parameters for different jobs (250 jobs) in rewritable memory (EEPROM) of the micro-controller). | 7. | Man machine interface | a. LED display to show all set, operational and trip parameters.<br>b. Keys to set and save the operational parameter shall be available.<br>c. All faults should be displayed on LED screen. | 8. | Heating mode | : Temperature and time (as per selection) |
| 1.     | Incoming voltage                                    | : 3 phase, 440 V $\pm 10\%$ , 50 Hz $\pm 10\%$ .  |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 2.     | Power factor  | : > 0.90  |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 3.     | Capacity  | : 40 kW   |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 4.     | Rating  | : 100% continuous   |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 5.     | Operational parameters                              | : Time (0-9.99 mins), Temperature (0-250°C), Power (0-100%).  |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 6.     | Memory backup                                       | : To set & save all the operational parameters for different jobs (250 jobs) in rewritable memory (EEPROM) of the micro-controller).  |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 7.     | Man machine interface                               | a. LED display to show all set, operational and trip parameters.<br>b. Keys to set and save the operational parameter shall be available.<br>c. All faults should be displayed on LED screen.   |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |
| 8.     | Heating mode  | : Temperature and time (as per selection)   |    |                  |  |    |              |          |    |          |         |    |        |                   |    |                        |  |    |               |  |    |                       |   |    |              |   |

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| संदर्भ/Ref: As per site requirement   |                       |                      | अनुमोदित/Approved | विद्युत लोको शेड/ Electric Loco Shed,<br>दक्षिण मध्य रेलवे/South Central Railway,<br>विजयवाड़ा/Vijayawada |
| <b>Technical Specification for:</b><br>Supply, installation, testing and commissioning of Induction Heater (40 kW) with intelligent micro controller based electronic control, portable to carry suitable for dismounting/mounting bearing racers/Seal PE Rings of 3-Phase and Conventional TM and for inner racer along with necessary accessories including coils |                       |                      | व.सं.वि.अ./Sr.DEE | No. B/TRS/SPEC/4/262  |
| व.अ.अ./एम6/<br>SSE/M6   | व.अ.अ./एम4/<br>SSE/M4 | व.अ.अ./आ/<br>SSE/DRG | म.वि.अ./ DEE      | व.सं/Alt. No.   |
|   |                       |                      |                   | दिनांक/Date: 17.03.2026   |
|   |                       |                      |                   | पत्रक/Sheet 1 of 4  |

Signature Not Verified

Digitally signed by  
LAKSHMI PHANI  
KUMAR BANAREDDY  
Date: 2026.03.23  
11:54:04 IST  
Reason: IREPS-CRIS  
Location: New Delhi



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|-----|---------------------|---|-------------------------|---|---|
|     |                     | 9.  | Type of heating element | : | Coil type.  |
|     |                     | 10.   | Type of cooling         | : | Provision to be provided for sufficient cooling wherever required.  |
|     |                     | 11.   | Temperature controls    | : | 0° C to 250° C (max) using microprocessor based controls adjustable in steps of 1° C. Sensing accuracy $\pm 5^\circ$ C.   |
|     |                     | 12.   | Time controls           | : | 0 to 9.99 minutes adjustable in steps of 0.01 minute with accuracy $\pm 2\%$ .  |
|     |                     | 13.   | Application             | : | Mounting/Dismounting of racers and throwers.  |
|     |                     | 14.   | Connecting cables       | : | 02 Nos. of 05 metre length and having dry type quick release coupling on both ends suitable to connect and disconnect induction coil without loss of coolant.   |
|     |                     | 15.   | Control                 | : | Remote and manual control shall be available.   |
|     |                     | 16.   | Control panel           | : | Control panel should be provided at a suitable location and should have the following equipment of adequate capacity:<br>a) Ammeter (for both input and output sides)<br>b) Voltmeter (for both input and output sides)<br>c) ID selection rotary switch for 100%, 75%, 50% and 25% power<br>d) Digital indicating type temperature controller and timer (0 to 999) seconds with buzzer<br>e) Push button switches with mains indicating lamps<br>f) MCB<br>g) Electronics overload relay<br>The control panel should be located in a convenient place and easily accessible to the operator. |
|     |                     | 17.   | Cycle                   | : | Heating cycle should include De magnetic cycle  |
| 3.3 | Protection features | 18.   | Special features        | : | a) Soft start/ auto ramping<br>b) No surge in current<br>c) Low coolant level indicator<br>d) Residual magnetism less than 2A/cm  |
|     |                     | The machine should have following protection features:<br>i) Overheating protection<br>ii) Phase failure protection<br>iii) Overload protection (overcurrent and overvoltage protection)<br>iv) Low water level protection<br>v) Low water pressure protection<br>vi) No core protection<br>vii) Auto shut off in case of failure of coolant system (i.e. low level, low pressure and high temperature of coolant)<br>viii) Earth fault protection  |                         |   |   |
| 3.4 | Credentials         | i) The bidders must be Original Equipment Manufacturers or Authorized dealer of OEM. The OEM shall submit self-declaration with warranty backup regarding the same. Authorized dealers shall submit valid authorization certificate with warranty backup from OEM.<br>ii) The OEM or their distributor must have supplied minimum 10 nos. of similar Induction Heater or above capacity in Indian railways, other govt., or private sector company in India. Proof like order copy, commissioning certificate or performance certificate should be attached with the offer. |                         |   |   |

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| संदर्भ/Ref: As per site requirement  |  |  | अनुमोदित/Approved  | विद्युत लोको शेड/ Electric Loco Shed,<br>दक्षिण मध्य रेलवे/South Central Railway,<br>विजयवाड़ा/Vijayawada |
| Technical Specification for:<br>Supply, installation, testing and commissioning of Induction<br>Heater (40 kW) with intelligent micro controller based<br>electronic control, portable to carry suitable for<br>dismounting/mounting bearing racers/Seal PE Rings of 3-<br>Phase and Conventional TM and for inner racer along with<br>necessary accessories including coils |  |  |  |   |
| <br>व.अ.अ./एम6/<br>SSE/M6   | <br>व.अ.अ./एम4/<br>SSE/M4 | <br>व.अ.अ./आ./<br>SSE/DRG | <br>व.म.वि.अ./S. DEE | No. B/TRS/SPEC/4/262  |
|  |  |  |  | व.सं./Alt. No.  |
|  |  |  |  | दिनांक/Date: 17.03.2026   |
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|                                       |                       | iii) At least one number of satisfactory performance certificate from Indian Railways/ Central Government/ State Government/ PSU must be provided along with the offer. The offer will be summarily rejected unless it can be clearly proven by the performance certificate that the machine has been operating satisfactorily for at least a year since installation and commissioning.   |  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
|---------------------------------------|-----------------------|--|--|-----------------------|----------------------------|--|---------|--|---------|---|---------|---|---------|--|---------|---|---------|
| 3.5                                   | No. of coils required | i. Induction heater along with all necessary accessories.  |  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
|                                       |                       | ii.  | <table><tr><th>Type of Bearing/Racer</th><th>Quantity of coils required</th></tr><tr><td>a) PE side bearing racer of 3-phase Locos.(OD-347.30 mm)</td><td>02 Nos.</td></tr><tr><td>b) Enclosure of MSU in conventional Locos. (OD-460 mm)</td><td>02 Nos.</td></tr><tr><td>c) Racers of WAG9 / WAP7 Locos (5080D / 5088D) (OD-174.90 mm)</td><td>02 Nos.</td></tr><tr><td>d) Racers of WAP4 / WAG7 Locos (i) NBC 5020 / 5062, OD – 179.80 mm (ii) FAG-LWUZ148X270, H307, OD-177.90 mm</td><td>02 Nos.</td></tr><tr><td>e) Throwers of 3 Phase locos (i) OD- 229.0mm</td><td>02 Nos.</td></tr><tr><td>f) Throwers of WAP4 &amp; WAG7 Locos (FAG 901-17-104, OD – 234.45 mm)</td><td>02 Nos.</td></tr></table> | Type of Bearing/Racer | Quantity of coils required | a) PE side bearing racer of 3-phase Locos.(OD-347.30 mm) | 02 Nos. | b) Enclosure of MSU in conventional Locos. (OD-460 mm) | 02 Nos. | c) Racers of WAG9 / WAP7 Locos (5080D / 5088D) (OD-174.90 mm) | 02 Nos. | d) Racers of WAP4 / WAG7 Locos (i) NBC 5020 / 5062, OD – 179.80 mm (ii) FAG-LWUZ148X270, H307, OD-177.90 mm | 02 Nos. | e) Throwers of 3 Phase locos (i) OD- 229.0mm | 02 Nos. | f) Throwers of WAP4 & WAG7 Locos (FAG 901-17-104, OD – 234.45 mm) | 02 Nos. |
|                                       |                       | Type of Bearing/Racer  | Quantity of coils required   |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
|                                       |                       | a) PE side bearing racer of 3-phase Locos.(OD-347.30 mm)   | 02 Nos.  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
|                                       |                       | b) Enclosure of MSU in conventional Locos. (OD-460 mm)   | 02 Nos.  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
|                                       |                       | c) Racers of WAG9 / WAP7 Locos (5080D / 5088D) (OD-174.90 mm)  | 02 Nos.  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
|                                       |                       | d) Racers of WAP4 / WAG7 Locos (i) NBC 5020 / 5062, OD – 179.80 mm (ii) FAG-LWUZ148X270, H307, OD-177.90 mm  | 02 Nos.  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
|                                       |                       | e) Throwers of 3 Phase locos (i) OD- 229.0mm   | 02 Nos.  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
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| <b>4.0 Other Technical Conditions</b> |                       |  |  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
| 4.1                                   | Erection              | 1. Electrical Work: All types of cables, connections, circuit breakers, grounding etc. required for connecting the electrical supply to the machine shall be the responsibility of the vendor.<br>2. Assembling work: All the components shall be fabricated & assembled to facilitate smooth functioning of the machine. After Assembly of the machine, it shall be checked for any difficulties in handling and operation and the same shall be rectified before final commissioning of the machine.   |  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
| 4.2                                   | Commissioning         | 1. Vendor to take full responsibility for commissioning of the equipment with and all accessories at consignee's premises within 30 days from the date of receiving of the machine by the consignee.<br>2. During commissioning vendor will have to demonstrate proper operation/functioning of the equipment. In addition, the consignee's staff shall be trained by the supplier for satisfactory operation, maintenance and trouble shooting.<br>3. If the contractor failure to have commissioning the machine within the prescribed period as mentioned above, Railway shall withhold, deduct or recover from the contractor as agreed as Liquidated Damages, as per latest IRS conditions. |  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
| 4.3                                   | Inspection & Testing  | i) The equipment along with complete accessories shall be inspected as per IRS conditions.<br>ii) The equipment will be subjected to testing of all protection features at the time of commissioning.<br>iii) Test certificates shall be furnished in triplicate by the supplier along with supply.  |  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |
| 4.4                                   | Warranty              | i) The equipment shall be warranted <b>as per IRS Conditions</b> for trouble free performance and against any defects in material, workmanship, design and also any abnormality along with mandatory scheduled visits (quarterly) apart from the breakdown visit by the firm.<br>ii) Any deficiency/ defect during the warranty period shall be addressed through repair/replacement without any additional cost.  |  |                       |                            |  |         |  |         |   |         |   |         |  |         |   |         |

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| संदर्भ/Ref: As per site requirement   |  | अनुमोदित/Approved  |  |
| <b>Technical Specification for:</b><br>Supply, installation, testing and commissioning of Induction Heater (40 kW) with intelligent micro controller based electronic control, portable to carry suitable for dismounting/mounting bearing racers/Seal PE Rings of 3-Phase and Conventional TM and for inner racer along with necessary accessories including coils |  | विद्युत लोको शेड/ Electric Loco Shed,<br>दक्षिण मध्य रेलवे/South Central Railway,<br>विजयवाड़ा/Vijayawada      |  |
| <br>व.अ.अ./एसएम6/<br>SSE/M6  |  | <br>व.अ.अ./एसएम4/<br>SSE/M4 |  |
| <br>व.अ.अ./आ/<br>SSE/DRG   |  | <br>व.अ.अ./डीई<br>DEE      |  |
|   |  | No. B/TRS/SPEC/4/262   |  |
|   |  | व.सं/AIL No.   |  |
|   |  | दिनांक/Date: 17.03.2026  |  |
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| 4.5  | Product support  | The bidders must be Original Equipment Manufacturers or Authorized dealer of OEM. The OEM shall submit self-declaration with warranty backup regarding the same. Authorized dealers shall submit valid authorization certificate with warranty backup from OEM.   |
| 4.6  | Service support  | The firm shall provide service support and spare support for at least ten years from the date of expiry of the warranty period. The supplier shall clearly spell out the facilities available with him or his local agent for providing adequate after sales service  |
| 4.7  | Technical literature, drawings and maintenance manuals | Successful tenders shall supply all details of technical literature, drawings and maintenance manuals in three sets i.e.<br>i. Operation of maintenance manual<br>ii. Trouble shooting guide<br>iii. Part drawings along with consumable details<br>iv. Detailed drawing<br>v. Spare parts list   |
| 4.8  | Bought out items                                       | Bidders shall provide warranty certificates, conformity certificates supplied by various firms for bought out items.  |
| 4.9  | Marking  | All the equipment shall be properly numbered and name plates made on aluminum shall be provided at all allocations including the following data:<br>1. Manufacturer's name<br>2. Sl. No.<br>3. Date of manufacturing.<br>4. Rated capacity.   |
| 4.10 | Safety   | Safety regulations shall be fulfilled to relevant Indian standards/ international standards. Complete protection for operator & machine from all sorts of hazards of equipment shall be provided.   |
| 5.0  | <b>General Conditions</b>                              |   |
| 5.1  | Performance Guarantee                                  | The successful bidder shall submit the Performance Guarantee (PG), amounting to 10% of the contract value.<br>i) The Performance Guarantee (PG) shall be released after completion of the warranty period based on 'Completion Certificate' issued by the competent authority stating that the Contractor has completed the work in all respects satisfactorily.<br>ii) Whenever the contract is rescinded, the Performance Guarantee already submitted for the contract shall be encashed. |
| 5.2  | Payment Terms  | i) 80% of the payment on proof of inspection certificate and receipt challan to be made within 30 days of receipt of material as specified.<br>ii) Balance 20% payment within 90 days after satisfactory installation/commissioning and proving test of M&P subject to submission of PG for an amount of 10% of contract value or as per latest Rly. Bd. norms during the supply period as Guarantee security.  |
| 6.0  | All other Statutory conditions as applicable.          |   |

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| संदर्भ/Ref: As per site requirement  |  |  | अनुमोदित/Approved  | विद्युत लोको शेड/ Electric Loco Shed,<br>दक्षिण मध्य रेलवे/South Central Railway,<br>विजयवाड़ा/Vijayawada |
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| <br>व.अ.अ./एम6/<br>SSE/M6   | <br>व.अ.अ./एम4/<br>SSE/M4 | <br>व.अ.अ./आ./<br>SSE/DRG | व.अ.वि.अ/S/DEE   | No. B/TRS/SPEC/4/262  |
|  |  |  | <br>मं.वि.अ/ DEE | व.सं/Alt No.  |
|  |  |  |  | दिनांक/Date: 17.03.2026   |
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