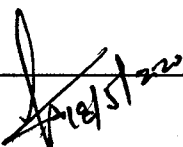


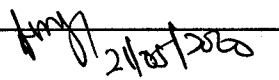
**Rail Coach Factory  
Kapurthala**

**Technical Specifications of  
Thermal Camera-Based Contactless  
Elevated Skin Temperature Screening System**




**MDTS- 39346 REV.00**

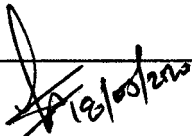
**DATE: 18.05.2020**

  
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<b>Designation</b>	<b>Name</b>	<b>Signature</b>	<b>Date</b>	<b>Level</b>
JE	Parkash Chand		18/05/2020	Prepared
Dy.CME/D-2	Abhey Priya Dogra		21.05.2020	Agreed &Reviewed
CQM	Nitin Chowdhary		21/5/2020	Approved

  
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**1. Objective:**

In order to prevent suspected Covid-19 patients from entering into workshop and intermingling with non Corona virus-infected personnel in RCF, it is planned to deploy a system of Elevated Skin Temperature screening of incoming working personnel at the Factory gate itself by using accurate appropriate technology based thermal scanning systems.

The deliverable expected from such a system is to able to scan large number of moving people in each frame of thermal camera at a very fast rate so that an accurate thermal and visual indication of scanned personnel's above-normal body temperature can be detected quickly. This first-stage quick detection shall enable RCF to rapidly isolate any suspected symptomatic Covid19 infected personnel before they enter workshop premises and come in contact with rest of the workers.

**2. Scope of supply:**

Supplier will have to choose appropriate system as per given technical and operational requirements for deploying at RCF entrance gates. Indicative sketch of the entrance to RCF where the system shall be installed, is enclosed as *annexure-A*.

The system shall consist of:

- 2.1 Four (4) Nos. of thermal cameras including reference temperature correction system ("*Black body*" wherever inescapable for accuracy purpose due to system's inherent design) for scanning of skin temperature.
- 2.2 One set of modular cabling to connect each of these cameras to the Computer.
- 2.3 One complete computer system along with software to process, store and display on LCD panels the processed images from thermal and optical cameras.
- 2.4 Four numbers of 32" (32 inch diagonal) or larger TFT LCD display monitors along with complete cabling.
- 2.5 Network switch(es).
- 2.6 Uninterruptible power supply(ies) for computers
- 2.7 Uninterruptible power supply(ies) for Cameras and its illumination lights.
- 2.8 Uninterruptible power supply(ies) for all four display LCD monitors.

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- 2.9 The camera based in-built AI system must identify faces in the zone of significance in the image. Necessary AI based facial recognition software must be integrated with the elevated skin temperature monitoring software while supplying the complete system.
- 2.10 Complete system should be modular, rugged and robust enough to stand the elements of nature as are prevalent in RCF Kapurthala, Punjab.
- 2.11 In those cases where the thermal cameras of the bidder essentially requires a "Black body" for referencing to achieve the demanded accuracy as per this document, the cost of Black body must be clubbed with the camera hardware cost. In such a case, Black body may not be offered as an optional cost element but an integral part of the system.
- 2.12 For all those bidders whose thermal scanning systems can deliver the demanded accuracy as per this Technical Specification without using the Black body, they need not quote by unnecessarily including the "Black body" in the system.
- 2.13 Irrespective of whether the system needs a "Black body" or not, the level of accuracy demanded in this document elsewhere is non-negotiable.
- 2.14 Power supply for the complete system should give a backup operating time of at least 30 minutes for the entire system unconditionally.
- 2.15 All accessories, hardware, wiring, working instruction & maintenance manual etc. required to perform the full intended function shall be supplied to the complete satisfaction of the RCF's operating personnel.

**3. Eligibility Condition:**

- 3.1 Supplier of the thermal elevated skin temperature monitoring system must be authorized agency of manufacturer of thermal camera systems. Letter of Authority

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must be submitted at the time of bidding. Any offer which is received without such an authorization letter shall be summarily rejected.

- 3.2 The thermal camera system proposed to be supplied by the bidder must be a reputed make of camera and optics in thermal imaging field. Such thermal cameras makers should have a minimum experience of five years in the field of manufacturing and sale of thermal monitoring equipment.
- 3.3 Bids from those bidders who have not executed even one such thermal imaging system installation and commissioning in the past five years shall not be entertained and shall be summarily rejected. For such assessment, installation of Surveillance cameras, which also have basic, limited infrared imaging functionality, shall not be counted as high resolution Thermal Scanning systems and such experience shall be summarily rejected.
- 3.3 Bidder must give an undertaking that the necessary servicing and repair facilities for the proposed systems are existing and are functional in India on date. This clause is important for ensuring the uptime of the system installed at site as described in this document elsewhere.

#### 4. Service/Operating Environment condition:

- 4.1 System shall be rugged enough to be installed in open area without any shade in the ambient conditions prevailing at RCF Kapurthala factory and RCF gates.
- 4.2 Ambient temperature is expected to be 0°C to +50° C.
- 4.3 Humidity is expected to be upto 90%.
- 4.3 Visual display system and the computer systems are planned to be installed close to cameras in cabin meant for gate security guards which is non air-conditioned.
- 4.4 Systems which are to be installed in the open must have a minimum of IP54 rating.
- 4.5 Camera system should be able to work in spite of the normal dusty conditions including in mild dust-storm without having to deploy a person for cleaning the camera lens
- 4.6 The system must be tamper proof and vandal proof.

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**5. Technical requirements:**

5.1 Thermal Camera system must meet the following minimum technical requirements:

<b>1.0 Thermal Detector</b>		
1.1	Pixels (native resolution – not interpolated)	Microbolometer based system with minimum 384 × 288 pixels
1.2	Thermal Sensitivity (NETD)	50mK @F1.0, 300K <0.05°C @ 30°C (86°F) / 50 mK or better
1.3	System Accuracy	≤ 0.3°C
1.4	Spectral Range	7.5–13 μm or better But natively limited to Infrared spectrum only.
1.5	Image frequency	30 Hz or better
1.6	Spatial Resolution	1.1 mrad or smaller
1.7	Optical Resolution (D:S)	150:1 or better
1.8	Imaging	As per Para 6 of this specification
<b>2.0 Thermal Lens</b>		
2.1	Lens	Interchangeable
2.2	F No.	F1.3 or better
2.3	Temperature measurement range	-20 °C ~ 60 °C (-4°F ~ 140°F)
2.4	FoV	H:24°, V:18° or wider
<b>3.0 Intelligence</b>		
3.1	Temperature alarm	User settable
3.2	Detection capability	AI based Multiple person face detection in single frame.
3.3	Temperature detection distance of target	Minimum 5.0m from the camera within its FoV or better.
3.4	System response time	≤30ms (image capture to alarm Generation)

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3.5	Ingress Protection and Environmental test compliance	Adequate protection as required for site usage condition. Camera unit must be IEC 60068 compliant.
3.6	Usage condition	System must be able to do accurate elevated skin temperature scanning and monitoring while the human targets are in motion towards the camera at normal walking speed.

**6. Image quality & Resolution:**

- 6.1 The system should be able to clearly outline the facial profiles of men/women in the field of view and measure facial temperature to above mentioned accuracies.
- 6.2 The system shall be able to capture the temperature the skin temperature any time of the day irrespective of the availability of sunlight i.e. the system shall be able to work in night also. The provision of required illumination for working of the complete system shall be in the scope of the firm.
- 6.3 Person(s) with skin temperature above the user defined set value as captured on the thermal image should be immediately flagged distinctly in the image monitor. The display monitor on which the images are displayed must concurrently show the thermogram as well as the optical image side-by-side in real time.
- 6.4 High resolution TFT LCD Display monitor capable of displaying 1920x1080p resolution shall be placed in a small security cabin having large-sized transparent glass windows. Monitor shall be of minimum 32 inches size and should be suitable for viewing in high ambient light prevailing in such an outdoor security cabin.

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- 6.5 Video and photographic image record of 15 days should be stored in a time stamped manner on non-volatile memory/disk drive of the system.
- 6.6 All hardware, cameras, UPS, cabling and communication hardware, software and systems shall be supplied and installed by the successful bidder as a single-ownership turnkey work.
- 6.7 System should be able to work accurately even with Reflected Background Temperature of 0 °C to +60 °C.
- 6.8 The layout drawing of the factory gate will be supplied with the tender and the acquaintance to actual location before submission of bid shall be the responsibility of the supplier.
- 6.9 All systems should be supplied with licensed copies of software along with Media/License Key. License should be valid in perpetuity.
- 6.10 Computer system and Monitors should be of reputed make. Following brands of computer/monitor are acceptable:  
6.10.1 Computer - HP, Dell, Lenovo or Acer.  
6.10.2 Monitor – HP, Dell, Lenovo, Acer, Samsung, Sony, LG, Viewsonic, or ASUS.  
Computer system assembled using motherboard, CPU, memory modules, SMPS, Cabinet, etc which are not integrated in dust and humidity controlled “clean-room” **may kindly Not be offered.**
- 6.11 The optical camera system for concurrent display must be able to capture the video and still images with adequate clarity and sharpness to discern facial features of the persons in the camera frame. The video must be captured to 1920/1080 resolution or better. Field of View of the optical camera must cover the thermal camera’s FoV without optical distortion. Images and videos of the two systems must be processed suitable so that they are displayed on the monitor in a split-screen mode without any perceptible time lag between the two systems.

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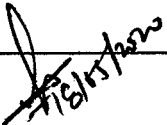


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**7. Warranty & Service Support:**

- 7.1 The complete system shall be under warranty for period of 36 from the date of placement of Purchase order or 24 months from the date of commissioning whichever is the later.
- 7.2 The supplier shall provide free support at site for duration of six months post successful installation and commissioning. This includes swapping of defective/malfunctioning parts of the system at the installed location itself without having to move any item to laboratory/supplier's premises.
- 7.3 The supplier shall make to attend the breakdown within 48 hrs after intimation on registered communication address. The warranty period will be extended by the period equivalent to breakdown period.
- 7.4 The supplier shall give undertaking that the supply of spares for 5 years after the warranty period shall be ensured by them.
- 7.5 Upon getting the supply order by the successful bidder, proving of the imaging and detection system shall be at site and approved by nominated inspecting agency. A test report from NABL certified LAB should be submitted in respect of accuracies and other detection measurement parameters given in specification. Such a certificate will be provided before installation of the system at Site. Inspecting agency will verify all above parameters indicated in the specification before granting commissioning certificate.

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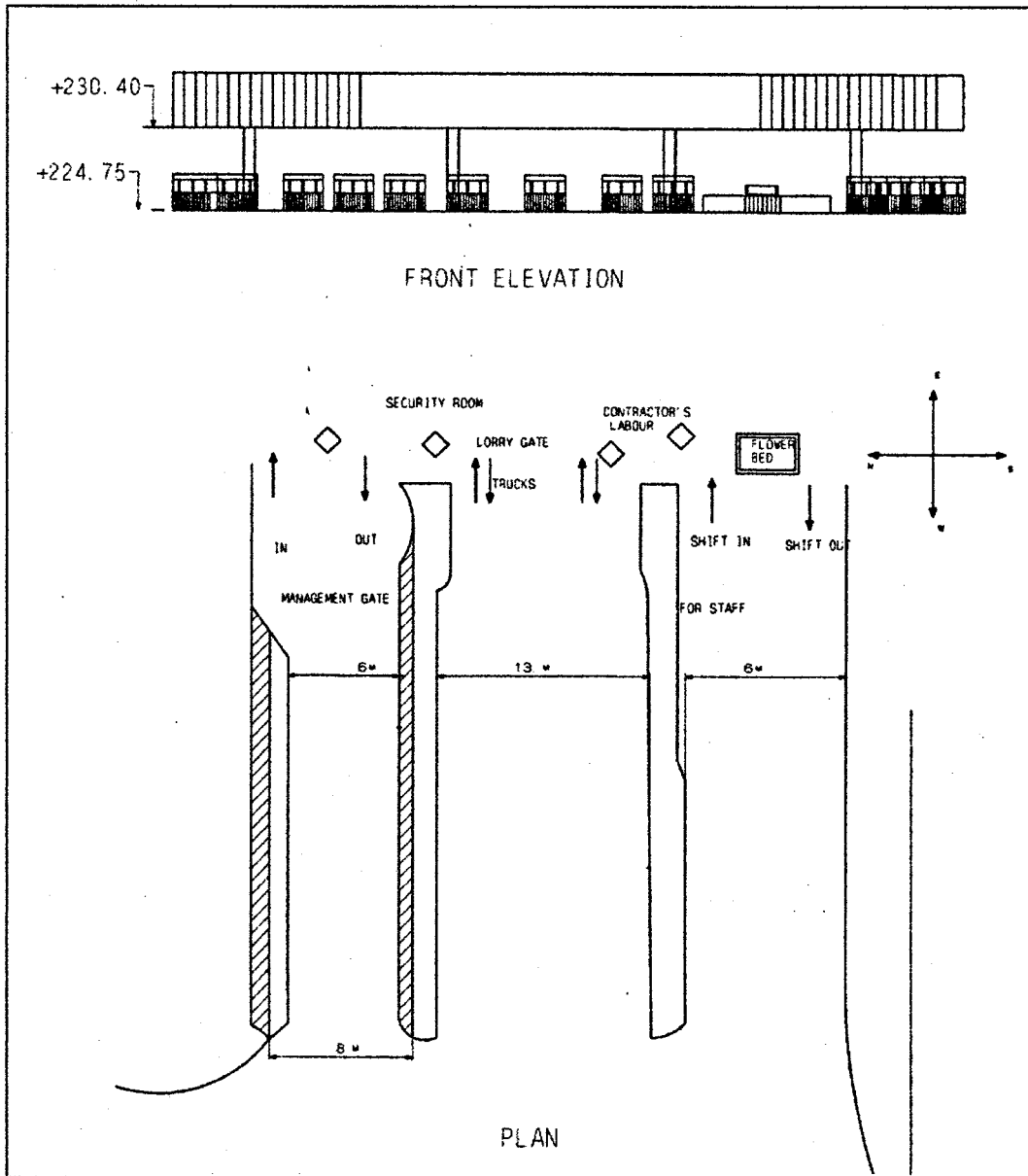
  
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*Annexure-I*

**RCF FACTORY GATE NO. 8 LAYOUT**



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