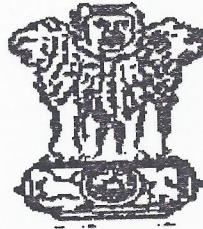


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GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS



सत्यमेव जयते

SPECIFICATION
For
INFRARED IMAGING SYSTEM
FOR
STATIONARY INSTALLATION


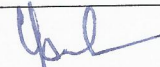
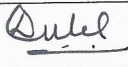
SPECIFICATION No-TI/SPC/OHE/TIPS/1031
December, 2013

Issued by

**TRACTION INSTALLATION DIRECTORATE,
RESEARCH DESIGNS & STANDARDS ORGANISATION
MANAK NAGAR, LUCKNOW- 226 011
(INDIA)**

SPECIFICATION FOR INFRARED IMAGING SYSTEM FOR STATIONARY INSTALLATION

Amendment	Date of Amendment	Total pages	Amendment/Revision
0	NA	04	First issue
1	June-2005	04	Revision -1
2	December-2013	05	Revision-2

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
DATE	03-12-2013	4/14/2013	23.12.2013
DESIGNATION	SSE/TI	DTI-(OHE-E)	Sr. ED/TI

COPY NUMBER

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NOTE:

1. This Specification is property of RDSO; No reproduction shall be done without permission from DG (TI), RDSO. This specification is not general use.
2. This revised specification supersedes the earlier specification no- TI/SPC/OHE/TIPS/0010 & TI/SPC/OHE/TIPS/1030 (06/2005), Rev-1.

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DRAFT TECHNICAL SPECIFICATION FOR INFRARED IMAGING SYSTEM FOR STATIONARY INSTALLATION


The infrared imaging system shall be single unit suitable for hand held operation. This system shall be a battery operated and rugged enough for use in the field. The imaging system shall have inbuilt display facility to show the infrared images on the spot. The system shall be capable of working in open environment and shall not use any cooling system either internally or externally. The on board image analysis and storage facility must be provided. The optics of the camera should include suitable (Horizontal Field of view) HFOV & (Vertical field of view) VFOV lens for measurements of the different objects/installation in the network.

The infrared imaging system shall be suitable for monitoring, measurement and storing hot spot temperatures on the following applications:-

1. Detect heat build-up on bus ducts/bus bar/isolators.
2. Connections of overhead distribution lines/cable termination in HT circuits, switch board & HT/LT panels.
3. Overhead transmission/power lines.
4. Scanning of Sub-station yard for identification of any critical problem areas.
5. Transformer bushings.
6. Detect problems with oil filled SF-6 breakers.
7. Scanning of joints in 25KV overhead equipment, jumpers etc.

The system should be menu operated and should assist the user for different measurements including focus, histogram etc. The setup menu should provide the facility for adjustment/selection of emissivity, background temperature, auto range, time, date, colour pallets etc. It should also include internal memory for the storage of the scanned images in the field and for its further processing.

The system shall have on board battery for hand held operation. The accessories shall include 2 sets of spares rechargeable batteries having back up of minimum 4 hours, AC power adaptor/battery charger, carrying case, user manual and software installation CD and any other appliances that may be required. Operational training shall be imparted for two days for two railway engineers at site by supplier.


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S.No	Features	Present Specification
1.	Detector	Un-cooled focal plane array (FPA) of 320 x 240 pixels or more
2.	Temperature measurement Range	0 to 500 degree centigrade or Higher
3.	Field of View	Standard Lens: 23 degree Horizontal X 17 degree vertical or more.
4.	Spatial Resolution (IFOV)	Less than 1.4 mRad.
5.	Minimum focus distance	Minimum focus distance less than or equal to 40 cm to infinity.
6.	Spectral Range	Within (7.5 to 14 μm) $\pm 0.5 \mu\text{m}$
7.	Image frame rate/Image refresh rate	Not less than 20 Hz
8.	Emissivity setting	User selectable from 0.1 to 1.0
9.	Accuracy	With $\pm 2\%$ of display or $\pm 2^{\circ}\text{C}$ whichever is greater.
10.	Focus	Auto or Manual
11.	Display	Not less than 75 mm diagonally active matrix colour LCD with high luminance or better.
12.	Video output/Format	NTSC/PAL, User should be able to connect camera to external display.
13.	Image storage	1000 images or more with 2GB memory card extra.
14.	Power input	Rechargeable battery pack. Battery charging input 230 V, 50Hz
15.	Battery Operating time	Minimum 4 Hrs
16.	Communication	Scanned image should be download able to PC through USB port.
17.	Image analysis & report generation software	With compatible software and hardware for downloading on PC with window 7 or latest. Full featured software along with analysis features and Report generation software shall be provided with the Thermal Imager. It shall be possible to generate a report with the software in Word or PDF Format. The software shall be license free so that it can be installed in multiple PCs.
18.	Operating function	Touch screen or toggle button Operated.

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19.	Weight with battery	Not more than 2 kg.
20.	Operating temperature	-10 to 50 °C or better
21.	Operating humidity	0 to 90 % non-condensing. Operating range can also be selected depending upon the regions in which the instrument shall be used and humidity encountered there.
22.	Thermal sensitivity	Less than 0.05 °C @ 30°C or 50 mk
23.	Image Streaming	Fully dynamic IR Image streaming with radiometric data.
24.	Image Capturing	Simultaneous storage of thermal & visual image by click of a button
25.	Laser pointer	Laser pointer should be displayed on thermal image.
26.	Measurement mode	<ul style="list-style-type: none"> i- Moveable spot minimum 1 nos ii- Area moveable & scale able. Maximum temperature, Auto hot spot identification. iii- Measurement Corrections.
27.	Ingress Protection	IP-54
28.	Voice annotation	Camera shall have a voice annotation feature to record a Min. 20 second voice tag along with every thermal image.
29.	Text annotation	User define text identification should be possible with every individual image.
30.	Visual Camera	The Thermal Imager shall have Inbuilt Visual Image camera with minimum 2MP to capture the visual image simultaneously along with the Thermal Image.
31.	Image fusion as well as Picture in picture display	It shall be possible to display the Thermal Image within visual image. The size of thermal image should be moveable & scale able.
32.	Vibration Protection	2G (IEC 60068-2-6)
33.	Bump Test	25G (IEC-60068-2-29)
34.	Zoom	Minimum 1-2x digital zoom


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