West Bengal State Electricity Distribution Company Limited

(A Govt. Of West Bengal Enterprise)

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Technical Specification for Thermovision Camera

TECHNICAL SPECIFICATION OF THERMOVISION CAMERA

Sl No.	Specification	Details
1	Functional requirement	This infrared thermal imaging and temperature measurement camera should be fully automated and should be useful for thermo-vision scanning, having capability to identify hotspot and loose connections in substation and in Distribution line up to 66 KV. The camera should have laser pointing facility and should have built-in high-resolution color **touch screen** (LCD/LED min 3.5") having I.R resolution- 640 X 480 pixels. The instrument should be lightweight, portable and battery operated.
		The infrared thermal imaging and measurement system should be based on uncooled infrared focal plane array (UFPA) technology. It should also have a built-in digital color visual camera of minimum **5 mega pixels**, thus creating a color visual image of corresponding thermal image. It should be possible to store the thermal and visual image together merging of visual and thermal image in analysis software.
2	Thermal imaging performance	The thermal detector of the thermo-vision camera should be based on focal plane array, Un cooled micro bolometer technology with minimum 300000 IR pixels without any enhancement technology/software.
		It should have thermal sensitivity of the order of 5**0 mk / 0.05°C** at 30° C or better
		Image frequency should be such that the buffering effect should not come on display, **Image Frequency- 24 Hz or higher.**
		The spectral image should be of the range **7.5 to 14 µm** or better
		The thermo- vision camera should be supplied with the standard lens.
		The minimum focus distance (15cm or less) of the camera for the standard lens should be such that it does not affect measurements in switchyard & Distribution lines.
		The thermo- vision camera should have automatic or manual focus. It should also have digital zoom for IR function of **4X or better**.
		The instrument should have an automatic measurement recognition facility and storage management which helps user to save the image into the user defined path storage(internal storage, SD card etc). The user saves a lot of time and it is also beneficial for the trend analysis.
	a) Spatial resolution (Horizontal IFOV)	**Standard lens: 1.2 mrad or less**
		Image Modes- Infrared, Visual, Picture in picture
	b) Lens Field Of View/ Focal Length	**Standard lens: 25°X 19° or better**
	c) Visual Image output	**5 MP or better**
3	Temperature measurement range & accuracy	**-20 °C to 600 °C. °or more with accuracy of ± 2% of reading or** ± 2C

	Emissivity correction	The camera should have automatic temperature correction facility for emissivity. (Emissivity range 0.05 to 1)
5	Display and indication	**Display should be properly visible in sunlight.** The camera should also have status indications to view the status of battery /power mode indication etc.
6	Measurement Preset	Centre spot, Hot Spot, Cold Spot, User preset 1 & 2
7	Physical Characteristics	**The system should be lightweight, suitable for one-hand operation**, with on-board rechargeable, field replaceable batteries. The thermo- vision camera should also operate on 230 V AC supply ± 10 % and camera battery should also get charged with this while the camera is in operation. A separate battery charger and spare battery should also be provided. The equipment should be well balanced for one-hand operation. Hand/ Neck straps should be provided for safety of Camera while using in field. The total weight of the thermos- vision camera including battery, memory card, LCD/LED display, **laser marker** and **Standard photo - lens should not exceed 1.75 kg (included battery).**
8	Battery	Camera battery (preferably Li-Ion) should have sufficient power for at least 3 **hours @ 25'C** of continuous operation with LCD/LED displays ON. One battery and one spare battery to be included with camera.
9	Output / interface	The camera should have a USB output for downloading the images to PC/Laptop. Blue Tooth or Wi-Fi connectivity with mobile applications to use thermal imager as remote device.
10	Voice Recording	The system should have the voice annotation (voice recording) facility for not less than 60 seconds per image and voice recording should be tagged to image. Real time radiometric recording, video recording, non-radiometric H.264 recording to memory card.
11	Image storage capacity	The system should be supplied with minimum of 2 GB flash memory card (internal /external).
12	Image storage facilities	The camera should store (in selectable built in flash memory or flash memory card in selectable directory) the image in full radiometric JPEG format, with date and time stampings along with all technical parameters and atmospheric conditions corresponding to image, in addition to visual image, voice/ text annotation. If required, the operator should have the facility to recall, analyze, save, and delete the images in the field including the replay and edit of its voice/text annotation. It should be possible for operator to view the live images/ recalled image details.
		Camera should have the facility to freeze/ hold the image and store a single image or multiple of images either continuously or periodically. While saving the image, the camera should automatically prompt for saving of voice or text annotation and visual image. It should also be possible to store only IR images with or without voice/text annotation or IR image.

	Measurement function	The thermo- vision camera should measure absolute temperature of hotspots and have auto spot function (auto placement of cursor at min or max temperature). It should be possible to create movable crosshairs/ spots in the live/freeze image. The temperature of each crosshair/ spot should be displayed in the screen itself. It should be possible to create different areas **(minimum 3)** with continuously adjustable dimensions and position in an image with their selectable max., min., and average temperature display. All the area should be movable and should give maximum and minimum temperature value and its position within the area. It should be possible to manually adjust emissivity (preferably with an online help table), reflected temperature, distance for individual spot as well as for individual area.
		The laser locator should be active in IR mode with push button. The camera should have all the required standard palettes/ color schemes (**minimum 7 pallets**).
14	Software	The analyzing software (to be provided along with the Camera) should be windows based, simple to operate, compatible to IR and visual camera images and capable of providing comprehensive report generation facility in addition to image analysis and post processing. It should also be possible to insert a visual image(photo)as well as text object in the report. The software should include professional and advanced tools for extensive image analysis & reporting.IR analysis software should be license free, multiuser and with free downloadable upgrades. Analysis software should include isotherm feature, delta-T feature, line profile, area selection.
15	Accessories	All the required accessories like **PC/ interface cables**, Power supply cables, battery charger (in addition to the AC adopter), Standby battery set **along with one spare battery**, Operating Manual, Original CD and software, Application CD, hard carrying case etc. should be provided.
16	Operating conditions (with all accessories)	Should operate at Temperature -10'C to 50°C, Relative Humidity: 10 to 90% non- condensing.
17	Safety Standards	Thermo- vision camera should have minimum protection grade of IP-54. The unit should meet all EMC emission, immunity standards as per IEC/ EN 61000-4-4, IEC/ EN 61000-4-2 and IEC/ EN 61000-4-8 respectively **with EUCE marking** to work in EHV areas without any interference. Copy of relevant certificates should be furnished along with the bid/before contract awarding.
18	Demonstration	Before opening of price bid, the techno-commercially qualified bidder(s) should be asked for presentation of the offered equipment for "IN SITE" demo free of cost at any of our Sub-Station in & around Kolkata or other WBSEDCL Zonal Testing site a specified date, as per prerogative of the authority which will be intimated to the bidder(s). After Successful demonstration of all the declared features, and after satisfactory acceptance of WBSEDCL Authority, this instrument will be accepted technically, which will be an integral part of the tendering process.
19	Guarantee	The instrument should be guaranteed for a minimum of Five(05) years. If the kit needs to be shifted to supplier works for repairs during warranty period, supplier will have to bear the cost of period, supplier insurance (to & from) etc. of kit for repair at test lab/works. Kit after repairs need to be returned within thirty days from the date of dispatch or returnable replacement of defective instrument should be arranged for work.

	Calibration Certificate	Calibration certificate from/traceable to NABL accredited lab or internationally reputed lab should be submitted. Date of calibration should not be older than one month from the date of supply of kit.
21	Service after sale	Bidder will have to submit the documentary evidence of having established mechanism for prompt services as & when required by customer. Bidder must submit their or their OEM's service center details along with documents.
22	Commissioning, Training & Handing over of the Instrument	Successful Bidder will have to commission the instrument to the satisfaction of customer. The instrument failed during the demo should be rejected and no repairs are allowed.
23	Instrument performance	The bidder will have to submit a document that the model being offered has been running well in India for min 2 years within the last 05 financial years. As a proof, they must submit atleast one (1) performance certificate of offered model from any government power utility company of India.
24	Bidder technical criteria	Bidder must be a manufacturer/ authorized dealer of offered item. Dealer must have to submit tender specific authorization letter. Bidder should have atleast 5 nos. successful supply record of offered model in India in last 5 years. Bidders must submit point wise compliance along with their bid.