

<b>EEHC DISTRIBUTION MATERIALS SPECIFICATION</b>	<b>EDMS 32-301-1</b>
<b>Infra-Red Thermography Camera</b>	<b>10-12-2024</b>

**EDMS 32-301-1**

**SPECIFICATION**

**FOR**

**INFRA-RED THERMOGRAPHY CAMERA**

Issue: December-2024/ Rev- 1

- This revision contains option items that must be selected by EDC before bidding.

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## 1. SCOPE

This specification covers the minimum technical requirements for supply, inspection and delivery of portable infra-red thermography camera. The required camera shall be used for remote temperature scanning of electrical equipment in either medium voltage or low voltage distribution networks of Egyptian Electricity Distribution Companies (EDCs). The thermography camera is required to detect the hot spots due to bad contacts, loose connections, overloading and other predictive maintenance works in distribution boards, transformers, circuit breakers, connections, ... etc.

## 2. APPLICABLE STANDARDS

The equipment/material covered in this specification shall comply with the latest edition/amendment of the standards given in Table (1). Where any provision of this specification differs from those of the standards listed below, the provisions of this specification shall apply. Any deviations from the listed standards or the provisions of this specification shall be clearly set out in the offer.

**Table (1)**

<b>Standard No.</b>	<b>Description</b>
IEC TS 62446-3	Photovoltaic (PV) systems - Requirements for testing, documentation and maintenance - Part 3: Photovoltaic modules and plants - Outdoor infrared thermography
ISO 10880	Non-destructive testing — Infrared thermographic testing — General principles
ISO 18251-1	Non-destructive testing — Infrared thermography — System and equipment — Part 1: Description of characteristics
ISO 18434-1	Condition monitoring and diagnostics of machines — Thermography — Part 1: General procedures

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ISO 18434-2	Condition monitoring and diagnostics of machine systems — Thermography — Part 2: Image interpretation and diagnostics
ISO 18436-7	Condition monitoring and diagnostics of machines — Requirements for qualification and assessment of personnel — Part 7: Thermography
ASTM E1933	Standard Practice for Measuring and Compensating for Emissivity Using Infrared Imaging Radiometers
ASTM E1934	Standard Guide for Examining Electrical and Mechanical Equipment with Infrared Thermography
EN 16714-3	Non-destructive testing - Thermographic testing - Part 3: Terms and definitions
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
IEC 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
IEC 61326-2-2	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-2: Particular requirements - Test configurations, operational conditions and performance criteria for portable testing, measuring and monitoring equipment used in low-voltage distribution systems
IEC 61010	Safety requirements for electrical equipment for measurement, control, and laboratory use
IEC 60068-2-6	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)
IEC 60068-2-27	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock
IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)

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### 3. ENVIRONMENTAL CONDITIONS

The behavior of the required camera shall be guaranteed under the environmental conditions given in Table (2).

**Table (2)**

Operating temperature	-10°C to +50°C
Storage temperature	-10°C to +50°C
Maximum relative humidity	90 %
Altitude	Up to 1000 m above mean sea-level

### 4. MAIN FEATURES

The infra-red thermography camera should have the following main features:

- Robust, compact and portable instrument designed for measuring temperature scanning of electrical equipment with user-friendly operation in a complete safety.
- Simple design, small size and easy to use.
- Digital Visual Display.
- Precise aiming on small objects such as bolts, cables, connectors and clamps.
- Adjustable parameters: emissivity and reflected temperature.
- Adjustable functions: Focus, temperature level and span.
- Measurement functions: Measuring spot, measuring area with average and maximum temperature.
- Flashlight for night-mode operation.
- Laser sighting for targeting objects.
- Windows-based and simple to use software for picture evaluation and reporting.
- Automatically powers off screen for power saving in case of not in use for a reasonable time.

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## 5. TECHNICAL PARAMETERS

The infra-red thermography camera should have the following requirements:

- Spectral response: 8  $\mu\text{m}$  to 14  $\mu\text{m}$  (long wavelength)
- Temperature range: -20° C to 400° C.
- Detector resolution: not less than 320 x 240 pixels.
- Distance to Spot ratio (D:S) not less than: 400:1 (equivalent to 1.3 mRad)
- Thermal sensitivity: NETD (Noise equivalent temp. difference)  $\leq 0.1$  K at 30° C.
- Accuracy (Absolute error of measurement):  $\leq \pm 2$  K.
- High- resolution color touch LCD, 3.5 inch.
- USB port for PC connection.
- Memory to store up to 1000 images.
- Image modes: Thermal, Visual, Picture-in-picture.
- File format: jpeg, bmp or img. (selectable)
- Lens identification: Automatic.
- Voice annotation: not less than 30 sec. of digital voice can be stored together with each image.
- Text annotation: Predefined text can be stored together with each image.
- Rechargeable battery for at least 2.5 hours of continuous operation.
- Battery charging time: less than 2.5 hours to full charge.
- Delivered in rugged, hard carrying case for camera and accessories
- Encapsulation: IP54 according to IEC60529.
- The Instrument should automatically check and display the battery status Indication.
- Standard software for data recovery and processing of the results.
- The camera shall be light in weight not more than 1 kg without accessories.
- Extra lens of specified field of view for D:S not less than 800:1 (Optional according to \_\_ EDC requirements).

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## 6. ACCESSORIES

Each camera should be attached with the following accessories:

- Battery charger from 220 V, 50 Hz mains. Automotive charging adapter is optional according to \_ \_ EDC requirements.
- Communication cable between camera and PC for each camera.
- Latest version of software program for image transferring and analysis with free license and future updates.
- Extra lens of specified field of view (Optional according to \_ \_ EDC requirements).
- One extra battery equivalent to the main battery.
- Hard carrying case for each camera and its accessories.

## 7. MARKING

- The camera shall be marked legibly and indelibly with the following information:
  - Name or trade mark of the manufacturer
  - Country of origin
  - Type/model serial number
- All marking shall to be written in English with suitable font.

## 8. SUBMITTALS AND OTHER REQUIREMENTS

- Tenderer must submit with the offer original catalogue containing full technical data and the instruction manual of operation and maintenance.
- The supplier should provide a device sample and furnish a seminar about the device capabilities (upon request)
- The supplier should provide test certificates, calibration results and Origin country certificate.

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## 9. GUARANTEE

- The supplier guarantee the supplied instruments against any defects arising out of faulty design or workmanship, or of defective material for a period of two (2) years from the date of delivery.

## 10. TRAINING and CUSTOMER SUPPORT

- The supplier shall provide adequate on-site training for a sufficient number of \_\_\_\_ EDC representatives, to be agreed by (.....EDC) and supplier.
- The Supplier must have a dedicated service center and support line in Egypt to cover any maintenance or repair requirements.
- \_\_ EDC reserves the right to claim a free after-sales service for the entire warranty period. After-sales service should include and not limited to the following:
  - Technical support.
  - Maintenance.
  - Original Spare parts.

## 11. TECHNICAL DATA SCHEDULE

- The tenderer must fill in thoroughly the attached technical data schedule.
- Any offer does not accompanied with clear and complete technical data schedule shall be rejected.



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## TECHNICAL DATA SCHEDULE

### INFRA-RED THERMOGRAPHY CAMERA

\_\_ EDC Inquiry No: \_\_\_\_\_ Item No: \_\_\_\_\_

No.	DESCRIPTION	UNIT	__ EDC Specified Values	Vendor Proposed Values
1	Manufacturer's name			
2	Country of Origin			
3	Camera Model			
4	Spectral response (Wavelength)	μm	8 to 14	
5	Temperature range	° C	-20 to 400	
6	Detector resolution	pixels	≥ 320 x 240	
7	Distance to Spot ratio	-	≥ 400:1	
8	Thermal sensitivity	K	≤ 0.1	
9	Accuracy	K	≤ ±2	
10	Camera weight	kg	≤ 1	
11	Memory storage	images	≥ 1000	
12	File format:			
13	Voice annotation	Sec.	≥ 30	
14	Text annotation	-	Yes	
15	Battery life of continuous operation	h	≥ 2.5	
16	Battery charging time	h	≥ 2.5	
17	Hard carrying case for camera and accessories	-	Yes	
18	Encapsulation: IP		IP54	
19	Guarantee	Month	24	
20	Accessories meet all the requirements?		Yes	
21	Training and customer support meets all the requirements?		Yes	
22	Submittals meet all the requirements?		Yes	

I / We guarantee the technical data given above for the offered material/equipment.

Description	Manufacturer of Material/Equipment	Vendor/Supplier
Vendor/Supplier		
Location and Office Address		
Name and Signature of Authorized Representative with Date		
Official Seal / Stamp		