

- 2.4 Click Wrenches with removable ratchet, 9x12 End Fitting, size 1/4" inches Drive, Capacity 5-25 cNm
  - 2.5 Click Wrenches with removable ratchet, 9x12 End Fitting, size 3/8" inches Drive, Capacity 5-25 cNm
  - 2.6 Click Wrenches with removable ratchet, 9x12 End Fitting, size 3/8" inches Drive, Capacity 10-50 cNm
  - 2.7 Torque wrench accessory - Open End Bits, End Fitting 9x12, assorted size ( at least 13 pieces) in the size range of the 7-19 millimeters
  - 2.8 Torque wrench accessory - Open End Bits, End Fitting 9x12, assorted size ( at least 8 pieces) in the size range of the 1/4" – 3/4" inches
  - 2.9 Torque Wrench Head, Square Drive, End Fitting 9x12, size 3/8" inches
  - 2.10 Crowfoot Square Set 3/8" Drive (at least 8 pieces) assorted size in the range of 5/8" - 1 1/16" inches
3. Screwdrivers set (3 sets) , each set consists of the set of screwdrivers, as follows:
- 3.1 Assorted Slotted Screwdrivers (at least 13 pieces) at least 2 pieces each having 3mm- 6.5mm and at least 1 piece each having 2.5mm- 12mm
  - 3.2 Assorted Stubby Slotted Screwdrivers ( at least 3 pieces) with blade length of 4, 5.5 and 6.5 mm.
  - 3.3 Assorted Phillips Screwdrivers set (at least 10 pieces) Each size at least 2 pieces each of size PH0, PH1, PH2 and at least 2 piece each of size PH3 and PH4.
  - 3.4 Stubby, short blade length Phillips screwdriver set (at least 2 pieces) of size PH1 and PH2.
  - 3.5 Pozidriv Screwdriver set (at least 5 pieces) size PZ0, PZ1, PZ2, PZ3, PZ4
  - 3.6 Stubby Pozidriv Screwdriver set (at least 2 pieces) size PZ1, PZ2
  - 3.7 Offset Slotted / Phillips Screwdrivers set (at least 3 pieces) with offset slotted of size 4mm, 5mm, PH1xPH2
  - 3.8 Jeweler's Screwdriver Set / Precision Screwdriver Set

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- 3.9 Assorted Nut Drivers Screwdriver set (at least 10 pieces) with size in the range of 4 - 13 mm.
- 3.10 Assorted Nut Drivers Screwdriver set (at least 10 pieces) with size in the range of 3/16" – 9/16" inches.
- 3.11 Minimum 11 pieces of accessories including handle of Slotted, PHILIPS, POZIDRIV, TORX, HEX type
- 4. Socket Sets of size 1/4" inches Drive (3 sets of each size range) with Socket sizes in the range of 4 – 13 mm. and 3/16 "- 1/12" inches.
- 5. Wrench Set (3 sets), each set consists of the set of wrenches, as follows:
  - 5.1 Assorted Combination Wrench Set (at least 17 pieces) in the size range of the 6-22 mm.
  - 5.2 Assorted Combination Wrench Set (at least 16 pieces) in the size range of the 1/4" – 1 1/4" inches
  - 5.3 Ratchet combination wrenches (Straight) (at least 18 pieces) in the size range of the 8-32 mm
  - 5.4 Hinged Joint combination wrenches (at least 12 pieces) in the size range of the 8-19 mm
  - 5.5 Double Open-End Wrenches (at least 23 pieces) in the size range of the 6x7 – 30x32 mm
  - 5.6 Double Open-End Wrenches (at least 10 pieces) in the size range of the 1/4 "x 5/16" - 1 1/16"x 1 1/4" inches
  - 5.7 Double Ring-End Wrenches (at least 12 pieces) in the size range of the 6x7 – 30x32 mm
  - 5.8 Ratcheting Adjustable Wrenches (at least 3 pieces) with the size of 6 ", 8", 10" inches
- 6. Tool cart with toolbox (1 set) which include 1 tool cart with the following tools in the cart:
  - 6.1 Tool cart with toolset (1 set) with at least 7 drawers with 1 toolbox which must have at least 4 drawers ( example in Figure 28)

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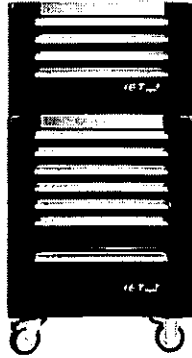


Figure 28: Tool cart with toolbox\*

Unique features

- (1) must have locking mechanism
- (2) must have heavy duty wheels and provide high resistance to heavy loads with wheel locking mechanism
- (3) The drawer must be laid with foam that has been cut to fit precisely with the provided tools

6.2 Toolbox within the tool cart must have at least 314 tool pieces and must include the following tools:

- 6.2.1 Combination Wrench Set
- 6.2.2 Double Open End Wrench Set
- 6.2.3 T-Handle and Ballpoint L Hex Key Set
- 6.2.4 T-Handle and L TORX Key Set
- 6.2.5 1/4" Drive Socket and Hex Key Set
- 6.2.6 1/2" Drive Socket and Hex Key Set
- 6.2.7 1/2" Drive TORX/Hex/XZN Socket Bits Set
- 6.2.8 E-TORX Ring Wrench and Socket Set
- 6.2.9 C-PLUS Slotted/PH Screwdriver and Bit Set
- 6.2.10 C-PLUS TORX Screwdriver Set

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\* (Figure is used for installation and physical characteristics reference only. There is no affiliation to the product.)

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- 6.2.11 DuoTech Pliers Set (Polished Finish)
- 6.2.12 Pliers and Adjustable Wrench Set
- 6.2.13 Circlip Pliers Set
- 6.2.14 Measuring and Cutting Tool Set
- 6.2.15 Hammer and Chisel Set
- 6.2.16 Drill Bit and Impact Screwdriver Set
- 6.2.17 Oil Service Tool Set
- 6.2.18 Wheel Service Tool Set
- 6.2.19 Auto Electrician Set
- 6.2.20 Special Automotive Socket Set

**7. Pliers and cutters set (3 sets) each consisting of the following types of pliers:**

- 7.1 Oval Head Cutters (at least 1 piece)
- 7.2 Tapered Head Cutters (at least 1 piece)
- 7.3 Relieved Head Cutters (at least 1 piece)
- 7.4 Flush Cutting Edges (at least 1 piece)
- 7.5 Round Nose Pliers (at least 1 piece)
- 7.6 Short Nose Pliers (at least 1 piece)
- 7.7 Long Nose Pliers (at least 2 pieces), 1 piece each of Smooth Jaws and Serrated Jaws type
- 7.8 Tweezers (at least 1 set), each with minimum of 5 pieces per set, such as the 2A, 3C, 5, 7, 00 set or AA, 00, 2A, 3C, 5, 7 set or 2A, 3, 00, 6, 7 set
- 7.9 Circlip Pliers Set (at least 4 pieces) which includes the External Circlip Pliers (Straight-with Spring), External Circlip Pliers (Bent-with Spring), Internal Circlips Pliers (Straight-with Spring), Internal Circlips Pliers (Bent-without Spring)
- 7.10 Screw Removal Pliers (at least 2 pieces), with each having different jaw
- 7.11 Locking Pliers, Mole Grip, Vice-Grip Pliers (at least 2 pieces), with size 6LN and 10WR
- 7.12 Wire Twisting Pliers (at least 1 piece)

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7.13 Stripper, Cutter and Crimper (Bolt Cutter) (at least 2 piece each) with 1 type each with unit in millimeters and the other in inches

**8. Inspection / Marking up tools (3 sets)**

8.1 LED Magnifiers Lens (at least 1 set)

8.2 Digital Microscope with Polarizer (at least 1 set) with magnification more than or equal to 20x-220x, 1.3 M Pixels with the following accessories.

8.2.1 Wi-Fi connectivity

8.2.2 Backlight illuminator for both Brightfield and Darkfield illumination

8.2.3 Stand and table top stand with quick-release

8.2.4 X-Y sliding platform with 360-degree swivel base

8.2.5 8Backlight Pad (Polarizer)

8.3 Circular Inspection Mirror (at least 2 pieces), assorted small and large size

8.4 Rectangular Inspection Mirror (at least 2 pieces), assorted small and large size

8.5 LED Pen Light Aluminum Tube

8.6 Stainless Steel Rule Rounded End, size 6" inches

8.7 Stainless Steel Rule Rounded End, size 12" inches

8.8 Powerlock Measuring Tape Rules, 5m long

8.9 Feeler gauge , 19 blades, 0.04-1 millimeter

8.10 Digital Micrometer Moore and Wright with measuring range of 0-25 millimeters

8.11 Digital/Electronic Caliper Stainless Steel frame with measuring range of 0-150 millimeters

8.12 Analog Vernier Calipers with measuring Needle and measuring range of 0-300 millimeters

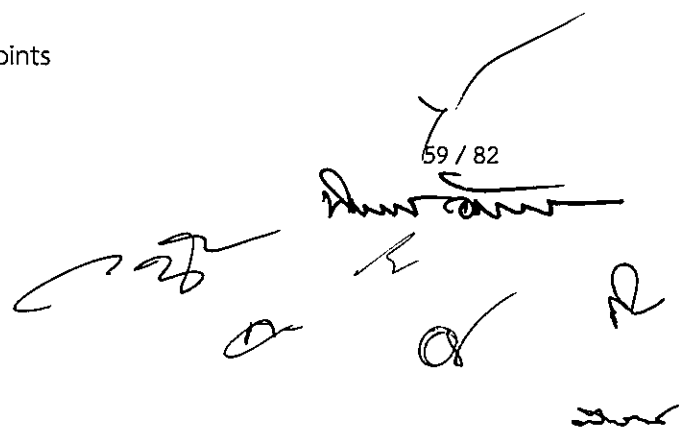
8.13 Assorted Scribes (at least 4 pieces)

8.14 G-Clamp, size 100 millimeters

8.15 Dial Gauge, needle type, size 0-100 millimeters

8.16 Spirit Level, size more than 200 millimeters

8.17 Self-leveling Cross-Line Laser with Plumb Points

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9. General tools (3 sets), with each set including the following tools or better:

9.1 Cordless Impact Hand-held drill - 12 V

9.1.1 The Torque must be greater than or equal to (hard / soft): 28/11

9.1.2 The Idle speed must be greater than or equal to (1<sup>st</sup> gear/2<sup>nd</sup> gear): 0-380 or 430/0-1300 rpm

9.1.3 The type of battery must be lithium-ion.

9.2 Heat Gun

9.2.1 The Power must be greater than or equal to 2000W

9.2.2 Adjustable levels with more than or equal to 3 levels.

9.2.3 Adjustable heating level in the range of 50-630°C.

9.2.4 Must produce air volume in the range of 120-550 liters/minute

9.2.5 Must have Electronic temperature control system with digital dial

9.3 Jigsaw

9.3.1 The Rated power input must be more than or equal to 710W

9.3.2 . The stroke range must be more than or equal to 500-3100 time/minute.

9.3.3 The Stroke range must be greater than or equal to 20mm

10. Hammers (3 sets) with each set including the following items or better:

10.1 Ball Pein Hammer at least 16 oz.

10.2 Dead Blow Hammer Nylon Tip with diameter of 40 millimeters

10.3 Dead Blow Hammer with steel micro balls with diameter of 60 millimeters

11. Infrared Thermometer (1 set)

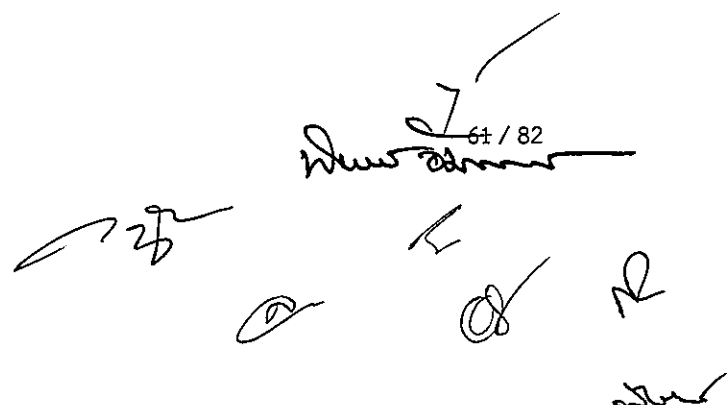
11.1 General Features

The Infrared Thermometer must be able to display the heat image and indicate the source of heat clearly as well as simultaneously capture an optical image with the thermal image as well as record audio and save onto memory card and can also produce report on the computer and mobile devices that support the application.

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- 11.2 Technical Features including Imaging Performance:
- 11.2.1 The Field of View must be greater than or equal to 34 degree (Horizontal) x greater than or equal to 24 degree (Vertical).
  - 11.2.2 The Minimum Focus Distance must be less than or equal to 15 centimeters
  - 11.2.3 The IFOV with standard lens must be less than or equal to 0.93 mRad
  - 11.2.4 Must have at least the following focus capability - Laser sharp Auto Focus, Multi Sharp Focus and Manual Focus
  - 11.2.5 Must have Detector Type - Focal Plane Array (FPA) Uncooled, microbolometer, 640 x 480 pixels (1280 x 960 with Super Resolution)
  - 11.2.6 Must have Visible Light Camera Built-in with resolution more than or equal to 5.0 megapixels
  - 11.2.7 The Measurement Temperature Range must be less than or equal to -20°C to greater than or equal to 800°C
  - 11.2.8 The LCD Panel must be more than or equal to 3.5 "Color LCD (640 x 480) with Touch Screen capability
  - 11.2.9 Must be able to support Laser distance meter and calculates distance
  - 11.2.10 Must have the following Storage Medium capability - micro SD card, Flash memory, USB Flash with minimum support for size larger than or equal to 4GB
  - 11.2.11 Must be able to streaming video via USB and HDMI
  - 11.2.12 Must have Rechargeable Li-Ion battery system
  - 11.2.13 Must have 2-bay intelligent charger powered via AC outlet for battery charging
  - 11.2.14 The Operating temperature range must be less than or equal to -10°C to greater than or equal to 50°C
  - 11.2.15 Must meet the Environmental Protection IP 54 standard
  - 11.2.16 Must meet the Shock 25G standard IEC 68-2-29
  - 11.2.17 Must meet the Drop2 meter standard with standard lens
  - 11.2.18 Must meet the Safety Standards IEC 61010-1

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11.2.19 The software must be able to manage and manipulate the Thermal Image data and the software must be able to be installed in unlimited number of computers.

11.3 Accessories:

11.3.1 Carrying case (soft and hard) (1 set)

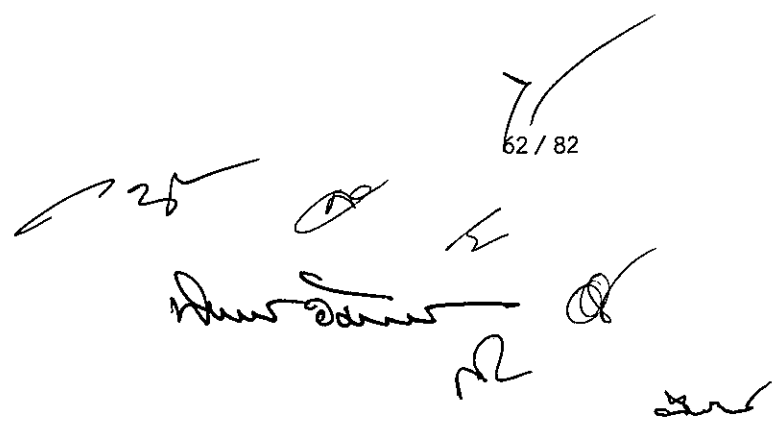
11.3.2 Rechargeable battery packs with 2 LED indicated energy (2 sets)

11.3.3 Micro SD Card (1 set)

11.3.4 Infrared Telephoto (2X magnification) (1 set)

11.3.5 Infrared Wide-Angle Lens (1 set)

11.3.6 Tripod Mounting Accessory with Tripod (1 set)

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Appendix D.

Technical Specifications – Security and Electrical Systems

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## Appendix D.- Technical Specifications – Security and Electrical Systems.

### 1. Installation of CCTV system

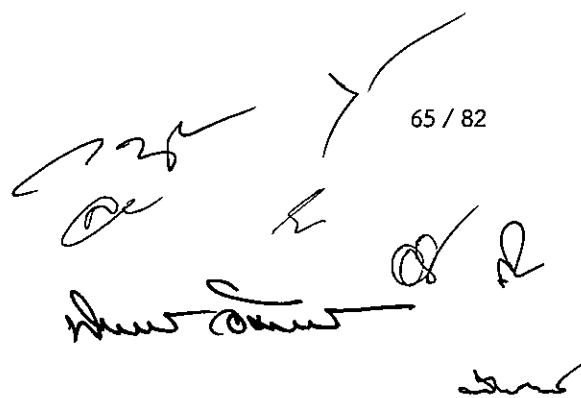
- 1.1 Network type closed circuit camera with fixed view for indoor installation (at least 24 sets) with the following characteristics:
  - 1.1.1 The image resolution must not be less than 1,920x1,080 pixels or 2,073,600 pixels.
  - 1.1.2 The frame rate must not less than 50 frames per second at the image resolution of not less than 1,920 by 1,080 pixels or 2,073,600 pixels.
  - 1.1.3 Must have IR-Cut filter or Infrared Cut-off Removable (ICR) technology for day and night recording.
  - 1.1.4 Must have light sensitivity no greater than 0.22 LUX for color and 0.04 LUX for black and white monitoring.
  - 1.1.5 The Image Sensor must not be smaller than 1/3 inch
  - 1.1.6 The focal length range must not less be than 4.5 millimeters
  - 1.1.7 Must have Motion Detection
  - 1.1.8 Must be able to display the details of the image with Wide Dynamic Range or Super Dynamic Range
  - 1.1.9 The video stream must be able to stream to at least two locations
  - 1.1.10 Must meet Onvif standard (Open Network Video Interface Forum)
  - 1.1.11 Must be able to support and transmit at least H.264 codec video or newer.
  - 1.1.12 Must be compatible with IPv4 and IPv6 network standards.
  - 1.1.13 Must have at least one 10/100 Base-T Network Interface or better and support POE (Power over Ethernet: IEEE 802.3af or IEEE 802.3at standard) over the same port.
  - 1.1.14 Must be compatible with HTTP, HTTPS, "NTP or SNTP", SNMP, RTSP protocols and IEEE802.1X standards.
  - 1.1.15 Must include a slot for recording data to SD Card or MicroSD Card or Mini SD Card.
  - 1.1.16 Must include a Software Development Kit (SDK) or Application Programming Interface (API) in the form of a properly licensed CD or DVD or downloadable file.
  - 1.1.17 Must have the appropriate security standards for end-users.

- 1.1.18 The manufacturer must be certified for environmental management systems.
- 1.1.19 The manufacturer must be certified for quality management or organization management standards.
- 1.2 Network Video Recorder which supports no less than 24 channels:
  - 1.2.1 Must be an equipment that has been designed to record from CCTV specifically.
  - 1.2.2 Must be able record and compress images in MPEG4 or H.264 format or better.
  - 1.2.3 Must meet Onvif standard (Open Network Video Interface Forum)
  - 1.2.4 Must have at least one 10/100/1000 Base-T Network Interface or better
  - 1.2.5 Must be able to record and send image resolution of no less than 1,920 x1,080 pixels or less than 2,073,600 pixels.
  - 1.2.6 Must be compatible with HTTP, SMTP, "NTP or SNTP", SNMP, RTSP protocols
  - 1.2.7 Must have a dedicated SATA Surveillance Hard Disk with total capacity of not less than 8TB for storing CCTV footage.
  - 1.2.8 Must have no less than 2 USB interfaces.
  - 1.2.9 Must be compatible with IPv4 and IPv6 standards.
  - 1.2.10 Must include a Software Development Kit (SDK) or Application Programming Interface (API) in the form of a properly licensed CD or DVD or downloadable file.
  - 1.2.11 Must be able to replay recorded footage via network.
  - 1.2.12 The manufacturer must be certified for quality management or organization management standards.

**2. Uninterruptable Power Supply (UPS):**

- 2.1 The Uninterruptable Power Supply shall support at least the following areas and equipment ( example in Figure 29):
  - 2.1.1 Vibration Test Equipment
  - 2.1.2 Thermal Vacuum Chamber Equipment
  - 2.1.3 Thermal Cycling Equipment
  - 2.1.4 Mass Properties Measurement Equipment
  - 2.1.5 Lighting in office and Clean Room areas

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## 2.2 600 kVA Uninterruptable Power Supply (3 phase)

### 2.2.1 Input Features

- (1) Input voltage: 250 to 600, 3 Phases
- (2) Input frequency: 40 to 70 Hz (or better)
- (3) THDi (Total current harmonic distortion): less than 3% at full load or better
- (4) Input Power Factor: 0.98 or better

### 2.2.2 Output characteristics

- (1) Output voltage: 380/400/415V, 3 Phases
- (2) Output frequency: 50 Hz  $\pm$  0.1% (or better)
- (3) Total voltage harmonic distortion (THDV): Less than 3% for non-linear load or better
- (4) Overload capacity: 10 minutes for 125% overload or better
- (5) Output Power Factor: 0.9 or better

### 2.2.3 Display Unit: The proposed UPS system

- (1) Must have a LCD Display for displaying the status and anomalous conditions of the UPS.
- (2) Must have a LCD displays for displaying information such as voltage, current, power, backup time, etc.
- (3) Must have a communication port (Potential-free contact) that supports connection to a computer.

### 2.2.4 Performance and Standards:

- (1) Must meet these following international standard:

EMC/EMI/RFI: : IEC 62040-2 or EN 62040-2

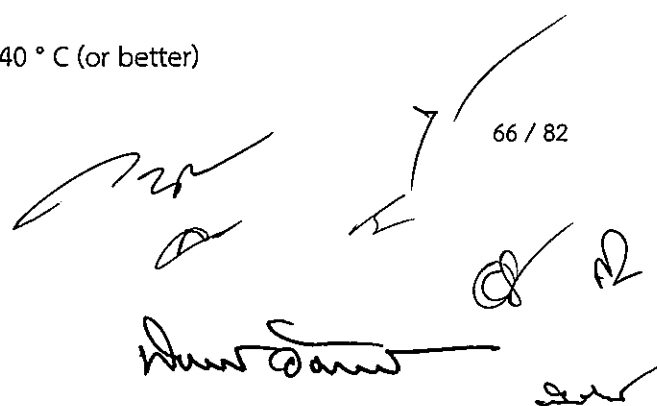
Safety: : IEC 62040-1 or EN 62040-1

Other (Option): : CE or TUV

### 2.2.5 Environmental conditions

- (1) Operating Temperature Range: 0 - 40 ° C (or better)

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- (2) Relative humidity: less than 90 (non-condensing) (or better)

### 2.2.6 Spare Power System (Battery)

- (1) Must use a Maintenance Free such as Sealed Lead Acid or better battery
- (2) The battery must be flame resistant.
- (3) The battery must be able to provide backup for not less than 10 minutes while operating on full load throughout the lifetime of the battery.
- (4) The battery pack must be installed within a battery cabinet which must be strong, rust-free or installed as a built-in within the UPS
- (5) Must have battery protection system such as individually fused or Circuit Breaker or better.
- (6) Other accessories, such as terminals connections between rows and between layers of batteries.

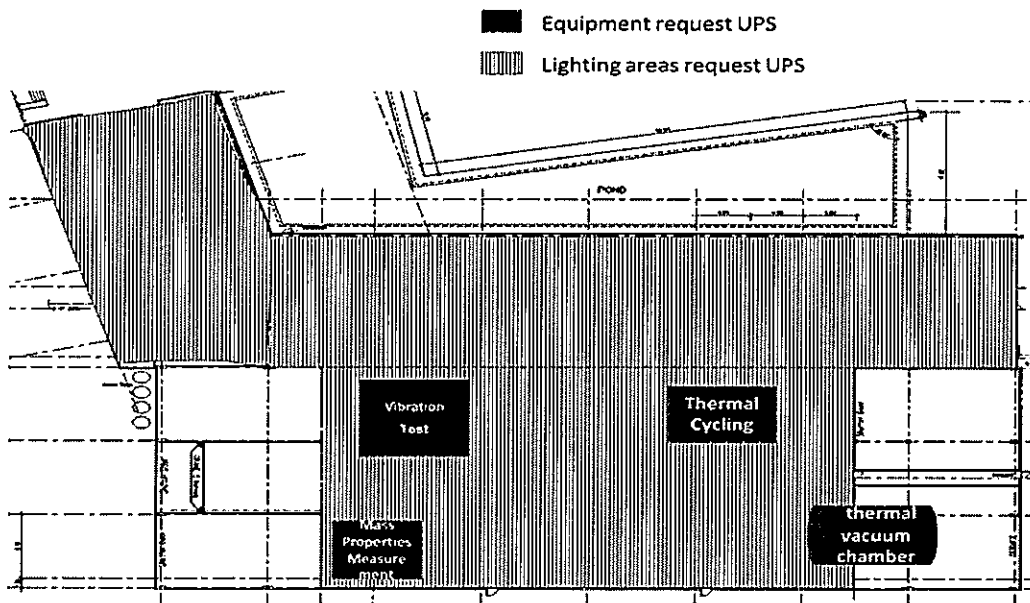


Figure 29: Layout and location of equipment that must be connected to the Uninterrupted Power Supply

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### 3. Transformers with complete installation

- 3.1 The Transformers must not be less than 2,000 kVA or the full power requirement of the satellite AIT Facility including all the equipment as per the scope of this work. As well as the air conditioning and office lighting including all internal power supply.
- 3.2 The transformers must be type Oil Transformer
- 3.3 Must have copper coils
- 3.4 The input voltage must be 33,000 volts or according to the Provincial Electricity Authority
- 3.5 The output voltage must be 400/230 Volt
- 3.6 The frequency must be 50 Hz
- 3.7 The no-load power loss must be no more than 3300 watts
- 3.8 The power loss when loaded and at 75 ° C must not exceed 24,000 watts
- 3.9 Must meet IEC 60076 standard
- 3.10 The warranty must be no less than 2 years
- 3.11 Must include two inspections year already included in the price
- 3.12 The transformers proposed must have been tested and approved by the Provincial Electricity Authority.

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Appendix E.

Scoring Rubric for proposal consideration.

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Appendix E - Scoring Rubric for proposal consideration.

Table 2: Scoring Rubric for technical evaluation

Item no.	Details	Weight	Full Score	Received Score	Scoring Details	Note
1	Vibration Test		50			
	Sine $\geq 160\text{kN}$		4		4 points $\geq 170\text{kN}$ , 3 points $\geq 165\text{kN}$ , 2 points $\geq 160\text{kN}$	
	Random $\geq 160\text{kN}$		4		4 points $\geq 170\text{kN}$ , 3 points $\geq 165\text{kN}$ , 2 points $\geq 160\text{kN}$	
	Shock $\geq 300\text{ kN}$		4		4 points $\geq 500\text{kN}$ , 3 points $\geq 400\text{kN}$ , 2 points $\geq 300\text{kN}$	
	Maximum Displacement $\geq 30\text{ mm (P-P)}$		4		4 points $\geq 70\text{mm}$ , 3 points $\geq 50\text{mm}$ , 2 points $\geq 30\text{mm}$	
	Maximum load capacity $\geq 500\text{ kg}$		4		4 points $\geq 1500\text{kg}$ , 3 points $\geq 1000\text{kg}$ , 2 points $\geq 500\text{kg}$	
	Minimum frequency $\leq 5\text{ Hz}$		4		4 points $\leq 3\text{Hz}$ , 3 points $\leq 4\text{Hz}$ , 2 points $\leq 5\text{Hz}$	
	Acquisition data $\geq 80\text{ channel}$		4		4 points $\geq 100\text{Ch}$ , 3 points $\geq 90\text{Ch}$ , 2 points $\geq 80\text{Ch}$	
	sampling rate $\geq 51\text{kHz}$		4		4 points $\geq 100\text{kHz}$ , 3 points $\geq 70\text{kHz}$ , 2 points $\geq 51\text{kHz}$	
	The average weight of the 1-axis accelerometer		2		2 points $\leq 30\text{g}$ , 1 points $\geq 30\text{g}$	
	The average weight of the 3-axis accelerometer		2		2 points $\leq 30\text{g}$ , 1 points $\geq 30\text{g}$	
	Lowest ambient temperature of sensor		3		3 points $\leq -20\text{C}$ , 2 points $\geq -20\text{C}$	
	Highest ambient temperature of sensor		3		3 points $\geq 150\text{C}$ , 2 points $\leq 150\text{C}$	
	Amplitude sine error smaller than $\pm 10\%$		4		4 points $\leq 0\%$ , 3 points $\leq \pm 2\%$ , 2 points $\leq \pm 5\%$ , else 1 points	
	Frequency sine error smaller than $\pm 2\%$		4		4 points $\leq 0\%$ , 3 points $\leq \pm 1\%$ , 2 points $\leq \pm 2\%$ , else 1 points	
	Warranty		10			

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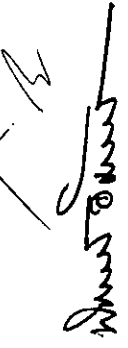
Item no.	Details	Weight	Full Score	Received Score	Scoring Details	Note
	Warranty ≥ 1 year		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	After sales service		15			
	Maintenance services ≥ 1 year		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	Calibration services ≥ 1 year		5		5 points ≥ 5 years, 4 points ≥ 3 years, 3 points ≥ 1 years	
	Experience		20			
	Installation Experience (years)		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	Installation Experience (in Space sector)		5		5 points = Have relevant experience, 2.5 points = No relevant experience	
	Contract value (Baht)		5		5 points ≥ 20 million Baht, 4 points ≥ 15 million Baht, 3 points ≥ 5 million Baht	
	Distributor		5			
	Authorized distributor		5		5 points = possess authorized distributor letter, 2.5 points = does not possess authorized distributor letter	
	<b>Total points (100)</b>	<b>20%</b>	<b>100</b>	<b>A1</b>		
2	<b>Thermal Vacuum Chamber Equipment</b>		<b>50</b>			
	internal diameter ≥ 2.2 m		7		7 points ≥ 2.5m, 6 points ≥ 2.3mm, 5 points ≥ 2.2m	
	length ≥ 1.5 m		7		7 points ≥ 1.8m, 6 points ≥ 1.6mm, 5 points ≥ 1.5m	
	Minimum Temperature ≤ -150 C		6		6 points ≤ -170C, 5 points ≤ -160C, 4 points ≤ -150C	
	Maximum Temperature ≥ +150 C		6		6 points ≥ +170C, 5 points ≥ +160C, 4 points ≥ +150C	

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Item no.	Details	Weight	Full Score	Received Score	Scoring Details	Note
	Heating rate $\geq 2.0$ C/min		6		6 points $\geq 4.0$ C/min, 5 points $\geq 3.0$ C/min, 4 points $\geq 2.0$ C/min	
	Cooling rate $\geq 2.0$ C/min		6		6 points $\geq 4.0$ C/min, 5 points $\geq 3.0$ C/min, 4 points $\geq 2.0$ C/min	
	(Vacuum pressure $\leq 10^{-6}$ mbar		6		6 points $\leq 10^{-8}$ mbar, 5 points $\leq 10^{-7}$ mbar, 4 points $\leq 10^{-6}$ mbar	
	Acquisition data $\geq 128$ channels		6		6 points $\geq 200$ Ch, 5 points $\geq 150$ Ch, 4 points $\geq 128$ Ch	
	Warranty		10			
	Warranty $\geq 1$ year		10		10 points $\geq 5$ years, 9 points $\geq 3$ years, 8 points $\geq 1$ years	
	After sales services		15			
	Maintenance services $\geq 1$ year		10		10 points $\geq 5$ years, 9 points $\geq 3$ years, 8 points $\geq 1$ years	
	Calibration services $\geq 1$ year		5		5 points $\geq 5$ years, 4 points $\geq 3$ years, 3 points $\geq 1$ years	
	Experience		20			
	Installation Experience (years)		10		10 points $\geq 5$ years, 9 points $\geq 3$ years, 8 points $\geq 1$ years	
	Installation Experience (in Space sector)		5		5 points=Have relevant experience, 2.5 points=No relevant experience	
	Contract value (Baht)		5		5 points $\geq 20$ million Baht, 4 points $\geq 15$ million Baht, 3 points $\geq 5$ million Baht	
	Distributor		5			
	Authorized distributor		5		5 points=possess authorized distributor letter, 2.5 points=does not possess authorized distributor letter	


Item no.	Details	Weight	Full Score	Received Score	Scoring Details	Note
	Total points (100)	20%	100	A2		
3	Mass Properties Measurement Equipment		40			
	Highest spin rate		10		10 points ≥ 300 RPM, 9 points ≥ 270 RPM, 8 points ≥ 250 RPM	
	Total dynamic unbalance measuring error < ± 5%		10		10 points ≤ ± 3%, 9 points ≤ ± 4%, 8 points ≤ ± 5%	
	CG accuracy < +0.1%		10		10 points ≤ +0.01%, 9 points ≤ +0.05%, 8 points ≤ +0.1%	
	MOI accuracy < ± 0.1%		10		10 points ≤ ± 0.01%, 9 points ≤ ± 0.05%, 8 points ≤ ± 0.1%	
	Warranty		10			
	Warranty ≥ 1 year		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	After sales services		15			
	Maintenance services ≥ 1 year		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	Calibration services ≥ 1 year		5		5 points ≥ 5 years, 4 points ≥ 3 years, 3 points ≥ 1 years	
	Experience		25			
	Installation Experience (years)		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	Installation Experience (in Space sector)		10		5 points = Have relevant experience, 2.5 points = No relevant experience	
	Contract value (Baht)		5		5 points ≥ 20 million Baht, 4 points ≥ 15 million Baht, 3 points ≥ 5 million Baht	
	Distributor		10			
	Authorized Distributor		10		5 points = possess authorized distributor letter, 2.5 points = does not possess authorized distributor letter	





Item no.	Details	Weight	Full Score	Received Score	Scoring Details	Note
	<b>Total points (100)</b>	<b>20%</b>	<b>100</b>	<b>A3</b>		
4	Clean Room					
	Warranty		20			
	Warranty ≥ 1 year		20		20 points ≥ 5 years, 18 points ≥ 3 years, 16 points ≥ 1 years	
	After sales services		20			
	Maintenance services ≥ 1 year		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	Calibration services ≥ 1 year		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	Experience		60			
	Installation Experience (years)		20		20 points ≥ 5 years, 18 points ≥ 3 years, 16 points ≥ 1 years	
	Installation Experience (in Space sector)		10		10 points = Have relevant experience, 5 points = No relevant experience	
	Contract value (Baht)		30		30 points ≥ 20 million Baht, 20 points ≥ 15 million Baht, 10 points ≥ 10 million Baht, 5 points ≥ 5 million Baht	
	<b>Total points (100)</b>	<b>4%</b>	<b>100</b>	<b>A4</b>		
5	UPS 600 KVA		40			
	Overload capacity		20		20 points ≥ 20 minutes, 18 points ≥ 15 minutes, 16 points ≥ 10 minutes	
	output power factor		20		20 points ≥ 1.0, 18 points ≥ 0.9, 16 points ≥ 0.8	
	Warranty		10			
	Warranty ≥ 1 year		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	

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Item no.	Details	Weight	Full Score	Received Score	Scoring Details	Note
	After sales services		15			
	Maintenance services ≥ 1 year		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	Calibration services ≥ 1 year		5		5 points ≥ 5 years, 4 points ≥ 3 years, 3 points ≥ 1 years	
	Experience		25			
	Installation Experience (years)		10		10 points ≥ 5 years, 9 points ≥ 3 years, 8 points ≥ 1 years	
	Installation Experience (in Space sector)		10		5 points = Have relevant experience, 2.5 points = No relevant experience	
	Contract value (Baht)		5		5 points ≥ 20 million Baht, 4 points ≥ 15 million Baht, 3 points ≥ 5 million Baht	
	Distributor		10			
	Authorized Distributor		10		5 points = possess authorized distributor letter, 2.5 points = does not possess authorized distributor letter	
	<b>Total Points (100)</b>	4%	100	A5		
6	Appendix C		100			
	List items No.2,5		50		50 Points = Have, 25 Points = Do not have Standard DIN ISO or equivalent	
	List item No.11		50		50 Points = Have, 25 Points = Do not have Certification from calibration center ISO17025	
	<b>Total Points (100)</b>	2%	100	A6		

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Technical Evaluation Scoring (70) =  $(0.2*A1) + (0.2*A2) + (0.2*A3) + (0.04*A4) + (0.04*A5) + (0.02*A6)$

Financial proposal score (30) is scored whereby the lowest bidder shall receive a full score and the score shall be adjusted accordingly based on the ratio of price differences according to the following formula:

Financial proposal score (30) =  $30 * (\text{price of the lowest proposal} / \text{price of the proposal under consideration})$

The overall score = Technical Evaluation Scoring + Financial proposal score

Therefore, the successful bidder shall be whom evaluated the highest overall score.

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List of Deliverables

No.	Lists	Specifications	Amount	Unit	Milestone	Note
<b>Appendix A. the characteristics of the equipment and measurement for satellite test and integration</b>						
1.	Vibration Test	≥ 160 kN	1	Set	4	
	data acquisition	(80 CH) or more than				
2	Thermal Vacuum Chamber Equipment	-work space diameter ≥ 2.2 m and L ≥ 1.5 m temp ≤-150c to ≥150c	1	Set	6	
3	Thermal Cycling Equipment	-work space 1.5x1.5x1.5 m '-temp ≤-70c to ≥150c	1	set	3	
4	Mass Properties Measurement Equipment	-maximum load Equipment under test 500 kg (exclude L fixture)	1	set	5	
5	Theodolite	Total station	3	set	2	
<b>Appendix B the characteristics of supporting equipment and facility</b>						
1	Installation Clean Room Class 100k	30x50x12 m	1	room	7	
	Installation Clean Room Class 100k	10x15x12 m	2	room	7	
	Accessories					

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No.	Lists	Specifications	Amount	Unit	Milestone	Note
	shutter door electrical type for loading room	- w 8 x h 6 m	2	set	7	
	shutter door electrical type for EMC room	- w 5 x h 6 m	1	set	7	
	Passed box		1	set	7	
	Air shower box		1	set	7	
	Locker for Ground coat		1	set	7	
	Ground coats, Clean Room shoes, Clean Room gloves and hair caps		500	set	7	
	Safety goggles and earplugs		50	set	7	
2	Installation - Clean tent Class 100	10 x 20 m	1	set	7	
3	Foundation Isolator		1	set	2	
4	Furniture					
	4.1 Stainless steel working table	≥ 0.81 x 1.5 x 0.7 m.	10	set	2	

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No.	Lists	Specifications	Amount	Unit	Milestone	Note
	4.2 Table for holding satellite	≥ 1.2 x 2 x 0.7 m. (supports 500 kg)	2	set	2	
	4.3 Chair with ESD-Safe standard		20	set	2	
	4.4 ESD-Safe Parts Storage Cabinets with Drawers		2	set	2	
	4.5 Standard Tool Storage Cupboard		2	set	2	
	4.6 Corrosive Safety Cabinet		1	set	2	
5	Materials Handling Equipment					
	5.1 ESD-Safe Stackable Super Tek-Tray	size 18" x 11-3/8" x 1-3/4" - 10 sets and size 22-3/4" x 17-1/2" x 2-1/2" - 10 sets	20 (10/size)	set	2	

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*[Handwritten initials]*

No.	Lists	Specifications	Amount	Unit	Milestone	Note
	5.2 ESD-Safe Steel mobile shelving system		4	set	2	
	5.3 Two-tier stainless-steel trolley	(Wire-Shelving System 2 levels)	3	set	2	
	5.4 Mobile Instruments Cart	(Mobile Instruments Carts Optional Steel Cabinet)	5	set	2	
	5.5 Utility Carts with Pneumatic Wheel	(Utility Carts) PNEUMATIC WHEELS	3	set	2	
	5.6 Single-tier Stainless steel cart		2	set	2	
	5.7 Plastic Pallet	Plastic Pallet	5	set	2	
	5.8 Stainless steel trash bin		5	set	2	
	5.9 A-shape Aluminum ladder	Height is not less than 1100 millimeter (Ladder aluminum type A ≥ 1100mm)	1	set	2	

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No.	Lists	Specifications	Amount	Unit	Milestone	Note
	5.10 A-shape Aluminum ladder	Height is not less than 2075 millimeter (Ladder aluminum type A ≥ 2075mm)	1	set	2	
	5.11 Mobile Stainless-Steel ladder	(Ladder stainless with wheels)	1	set	2	
	5.12 Anti-electrostatic Adjustable Wrist Strap	(Adjustable Wrist Strap with 6ft. Coil Cord)	20	set	2	
6	Forklift for Clean Room		1	set	2	
<b>Appendix C Hand tools equipment</b>						
1	Screwdriver / hex wrench	(Screwdriver / hex wrench)	3	set	2	
2	Torque Wrench / Screwdriver	(Torque Wrench)	3	set	2	
3	Screwdrivers / nuts / screws	(Screwdrivers / nuts / screws)	3	set	2	
4	Socket Sets	(Socket Sets)	3	set	2	

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No.	Lists	Specifications	Amount	Unit	Milestone	Note
5	Spanner sets	(Spanner sets)	3	set	2	
6	Tool cart with toolbox		1	set	2	
7	Pliers and Cutters	(Pliers and Cutters)	3	set	2	
8	Inspection/Marking up	(Inspection/Marking up)	3	set	2	
9	General tools		3	set	2	
10	Hammers	(Hammers)	3	set	2	
11	IR Thermometers	(IR Thermometers)	1	set	2	
<b>Appendix D Security System and Electrical Supply</b>						
1	CCTV camera	≥ 24 CH	1	set	7	
2	UPS	(600KVA)	2	set	2	
3	Transformer	2000 KVA	1	set	2	


  
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