

ANNEX 1

Specifications:

1. For **Pressure Chamber** with data logger, reference sensor and ambient sensors (for pressure, temperature and humidity) for LICs (Tuguegarao, Davao): **2 units**

Pressure Chamber :

Pressure chamber, small version including vacuum pump

Heavy duty table for pressure chamber adapted for use with pressure chamber

Vibrating table

Measuring cable set for pressure chamber

Consisting of 4 each single pole cables with 4mm plugs and open ends, different colors and 6 pcs single pole cables with 4mm plugs on both ends

Table top housing for pressure chamber

Including data logger, precision barosensor with an accuracy of 0.1 pHa and power supply unit, connections at the data logger via 4mm plugs at the front panel for use as a reference devices for pressure chamber. Also including in data logger, a combined temperature/humidity sensor connected at the back plate to measure the room temperature and humidity.

Interface cable Ethernet/Network

To connect data logger, length 3 meters

RS232 to USB 3.0 connection cable

To readout data logger, length 3 meters

Power distribution unit, 8 ports with overvoltage

For mains connection, cable length 3 meters

Software for data transfer from data logger

Operating range

: 700 – 1100 hPa

Dimensions

: 760 x 560 x 685 mm (LxWxH)

Power supply

: 230 V AC, 50/60 Hz, single phase

2. For **Reference Precision Digital Barometer** with humidity and temperature measurements used as Working Standard for LICs (Tuguegarao, Davao): **2 units**

Portable, battery operated transfer standard with data logging capability

Composed of **three (3) pressure sensors** module

Barometric pressure range (Class A) : 500 – 1100 hPa

Linearity : ± 0.05 hPa

Hysteresis : ± 0.03 hPa

Repeatability : ± 0.03 hPa

Calibration uncertainty : ± 0.07 hPa

Accuracy at +20 °C : ± 0.10 hPa

Resolution : 0.01 hPa

Temperature Dependence

500 hPa to 1100 hPa : ± 0.1 hPa

Total accuracy -40°C to +60°C
 500 hPa to 1100 hPa : ±0.15 hPa
 Long-term stability
 500 hPa to 1100 hPa : ±0.1 hPa/year
 Measurement Indicator
 Multi-probe operation (two probes or transmitters)
 Link software and USB connection cable
 Rechargeable NiMH battery pack with AC adapter

Temperature and Relative Humidity Probe
 RH measurement range : 0 – 100% RH
 Factory calibration : ±0.6 %RH (0 ... 40 %RH)
 Uncertainty (+20 °C /+68 °F) : ±1.0 %RH (40 ... 97 %RH)
 Temperature measurement range : -10 ... +40 °C (+14 ... +104 °F)
 Accuracy
 -10 ... +20 °C : ±(0.176 - 0.0028 x temperature) °C
 +20 ... +40 °C : ±(0.07 + 0.0025 x temperature) °C

Accessories
 Serial interface cable (2 meters)
 USB-RJ45 serial connection cable
 Software interface kit
 Power supply module
 Barbed fitting 1/8 in
 Quick connector 1/8 in
 1 meter silicon tube
 Transport case with interior foams
 Tabletop casing

3. **Barometer with Temperature and Humidity Sensors as travelling standard for LICs (Tuguegarao, Davao): 2 units**

General
 Operating temperature range -10 ... +40 °C (+14 ... +104)°F
 Operating humidity range non-condensing
 Maximum pressure limit 5000 hPa abs.
 Power supply **Rechargeable NiMH battery pack with AC-adapter**
 Operation time
 (using rechargeable battery pack)
 Continuous use 11 h typical at +20 °C (+68 °F)
 Datalogging use **up to 30 days**
 Menu languages English,
 Display LCD with backlight, graphic trend display of any parameter, character height up to 16 mm
 Data logging capacity 2700 points
 Alarm audible alarm function
Barometric Pressure
 Measurement range 500 ... 1100 hPa
 Linearity* ±0.05 hPa

Hysteresis*	±0.03 hPa
Repeatability*	±0.03 hPa
Calibration uncertainty**	±0.07 hPa
Accuracy at +20 °C (+68 °F) ***	±0.10 hPa
Temperature dependence****	±0.1 hPa
Total accuracy -40... +60 °C (-40...+140 °F)	±0.15 hPa
Long-term stability	±0.1 hPa/year
Settling time at power-up (one sensor)	4 s
Response time (one sensor)	2 s
Acceleration sensitivity	negligible
Relative humidity	
Measurement range	0 ... 100 %RH
Accuracy (incl. non-linearity, hysteresis and repeatability) at +15 ... +25 °C (+59 ... +77 °F)	±1 %RH (0 ... 90 %RH) ±1.7 %RH (90 ... 100 %RH) ±(1.0 + 0.008 x reading) %RH
-10 ... +40 °C (-4 ... 104 °F)	
Factory calibration uncertainty (+20 °C /+68 °F)	±0.6 %RH (0 ... 40 %RH)* ±1.0 %RH (40 ... 97 %RH)*
Response time at +20 °C in still air with a sintered PTFE filter	
63 %	20 s
90 %	60 s
Temperature	
Measurement range	-10 ... +40 °C (+14 ... +104 °F)
Accuracy	
-10 ... +20 °C	±(0.176 - 0.0028 x temperature) °C
+20 ... +40 °C	±(0.07 + 0.0025 x temperature) °C
Response time with additional temperature probe in 3 m/s air flow	
63 %	<20 s
90 %	<35 s
Inputs and outputs	
probe ports	2
data interface	RS-232 (accessible only with Link software)
Pressure sensor supply voltage	10 ... 35 VDC (if not powered by MI70)
Pressure sensor data interface	RS-232C
Pressure sensor serial I/O connectors	RJ45 (service port) Male 8-pin M12 (user port)
Temp & RH data interface	RS-485
Temp & RH serial I/O connector	Male 8-pin M12
Accessories	
<i>Pressure sensor</i>	
USB-RJ45 serial connection cable	
Barbed fitting 1/8"	
Quick Connector 1/8"	
Link software	

connection cable
battery pack

Temp & RH Sensor

connection cable
protective plug
USB cable

**4. For Climatic Chamber for Temperature in LICs (Tuguegarao, Davao):
2 units**

Operating temperature range (°C)	: -40 to +180°C
Chamber Volume	: 110 liter
Rate of temperature change	
Cooling	: 3.5°C/min
Heating	: 3.5°C/min
Heat compensation at 20°C	: max 1000 W
Test space dimensions	: 630 x 560 x 350 mm (HxWxD)
Housing dimensions	: 1640 x 850 x 1030 mm (HxWxD)
Power supply	: 230V 50/60Hz, single phase
Access port (mm)	: Ø 40 standard
Glass window	: 400 x 400 mm (Customized)

Accessories

- Colour touch panel
- Pt100 temperature reference sensor, including holding clamp and accredited laboratory certificate.
- Table top housing with integrated data logger type 1022. Connection at the data logger via 4mm plugs at the front panel. Also including in data logger, a combined temperature/humidity sensor connected at the back plate to measure the room temperature and relative humidity.
- Measuring cable set. Consisting of 4 each 4-pol Teflon cable, inside connected to 4mm plugs mounted at a cross bar, outer ends with 4mm banana plugs
- Interface cable Ethernet/Network
 To connect data logger length 3 meter
- RS232 to USB 3.0 connection cable
 To readout data logger length 3 meters
- Power distribution unit, 8 ports with overvoltage
 For mains connection, cable length 3 meter
- Software for data transfer from data logger

5. Chamber for Relative Humidity in RIC-Manila, & LICs (Tuguegarao, Davao): 3 units

Temperature range (°C)	: +10 to +50
Temperature display resolution (°C)	: 0.001
Temperature set resolution (°C)	: 0.1
Temperature stability (°C)	: ±0.08 @ 15°C, 75% Rh ±0.05 @ 20°C, 60% Rh

	±0.05 @ 30°C, 65% Rh
	±0.10 @ 50°C, 75% Rh
	±0.10 @ 50°C, 15% Rh
Temperature uniformity (°C)	: ±0.30 @ 15°C, 75% Rh
	±0.25 @ 20°C, 60% Rh
	±0.50 @ 30°C, 75% Rh
	±0.60 @ 50°C, 75% Rh
	±1.30 @ 50°C, 15% Rh
Relative humidity range (%)	: 10 to 98
Relative humidity display resolution (%)	: 0.1
Relative humidity set resolution (%)	: 0.1
Relative humidity stability (%)	: ±0.3 @ 15°C, 75% Rh
	±0.3 @ 20°C, 60% Rh
	±0.3 @ 30°C, 65% Rh
	±0.3 @ 50°C, 75% Rh
	±0.3 @ 50°C, 15% Rh
Temperature control	: proportional integral derivative (PID)
Relative humidity control	: Dew point humidity control / dry air purge for extended
Power supply	: 230 V AC 50/60 Hz, single phase
Internal dimensions	: 500 x 500 x 500 (WxHxD)
External dimensions	: 670 x 1135 x 755 (WxHxD)
Access port (mm)	: Ø 40 standard
Door with 2 flanged ports & 1 multilayer isolative glass	
USB & Ethernet interface	
Software monitoring and history	
Trolley	

6. For **Mobile Humidity Chamber for RIC-Manila, & LICs (Tuguegarao, Davao): 3 units**

- Temperature and RH control
- Maintaining superior temperature & RH stability
- Data loggers and sensors calibration
- World-class metrology performance

Temperature Range: +10 C 55 C
 Temperature Stability: ±0.05 C @ +21 C, 50%RH (better than ±0,08 C in full range)
 Temperature uniformity: ±0.2 C @ +21 C, 50% RH
 Door with flanged ports & 1 multilayer isolative glass (left) & 1 isolative block with ports
 Exterior dimensions (WxHxD): 570 x 800 x 615 mm
 Interior dimensions (WxHxD): 400 x 400 x 360 mm
 Power supply: 230V 50/60 Hz, single phase

7. Specification for Dew Point Mirror Hygrometer as Standard for Relative Humidity for LICs (Tuguegarao, Davao): 2 units

Measuring range

Frost/Dew Point	: -20 to +70 °C
% RH	: 5 to 100% Rh
Temperature	: -50 to +100 °C

Accuracy

Frost/Dew point	: ±0.1 °C
Temperature	: ±0.07 °C

Reproducibility

Frost/Dew point	: ±0.05 °C
Temperature	: ±0.05 °C

Standard Features

Digital I/O	: RS-232
Display	: LCD with color touch screen
Mirror temperature sensor	: Platinum Resistance Thermometer (Pt-100)
Transport case	
Power cable	
Calibration Certificate (ISO 17025)	
Internal Barometric Pressure sensor	
Calibration Upgrade	
Power Supply	: 230V AC, 50/60Hz, single phase

8. Specification for Thermometer Test Bath for LICs (Tuguegarao, Davao): 2 units

- Temperature test bath, 24L content with electronic temperature control unit
- Continuous flow cooler
- Special lighting device
- Precision measuring resistance **PT100-70** with manufacturer's calibration certificate
- Bath liquid 40 L water glycol solution (down to -20°C)
- Table top housing with integrated data logger. Connection at the data logger via 4mm plugs at the front panel. Also including in data logger, a combined temperature/humidity sensor connected at the back plate to measure the room temperature and relative humidity.
- Interface cable Ethernet/network to readout data logger (3 meters)
- RS232 to USB 3.0 connection cable to readout data logger (3 meters)
- Power distribution unit (Power Supply: 230V AC, 50/60Hz, single phase)
- Interface software of data logger

**9. PORTABLE TEMPERATURE CALIBRATOR (DRY BLOCK) for LICs
(Tuguegarao, Davao): 2 units**

Portable Temperature Calibrator (Dry Block)
Calibration and checking of all kinds of thermometers
Temperature range: (-50.0 . . to . . 150)°C

With two inputs for External Reference and test specimen.
Accuracy of temperature reading: +/-0.15°C
Integrated reference probe: Resistance thermometer (3-wire), class A
Display resolution: 0.01 / 0.1°C (display switchable to °F and K)
Stability of regulated temperature: ±0.03°C (at 0°C)
Uniformity (at 0°C): radial ±0.02°C, axial ±0.1°C
RS232 interface: included (built-in)
Dry block: 140 mm dept or greater, 35 mm diameter
Usable depth: 130 mm or greater
Power Supply: 230 VAC, 50/60Hz, single phase
Power consumption: 300 VA

Case: metal casing

With Software

Power supply cable, fuses kit, thermostats connection cables, operating manual, certificate of calibration (traceable), tweezers for inserts removing, USB to serial (RS-232) cable.

1 insert with 6 holes (3.5 - 4.5 - 5.5 - 6.5 - 8.5 - 10.5 mm).

With soft carrying bag and aluminum case.

**10. Specification of standard for Automated Tipping Bucket Rain Gauge
Calibrator for RIC-Manila & LICs (Tuguegarao, Davao): 3 units**

Features

- Automated Laboratory Calibration Device (Model TB340A)
- Up to two Tipping Bucket Rain Gauges (TBRGs) calibrated simultaneously.
- Support of up to 5 nozzles for up to 31 rainfall rates without changing nozzles.
- Height adjustable platform for different TBRGs
- PC software can run a series of tests without user interaction
- PC software supports many stations through MODBUS on RS-485
- Automated report generation at test completion.
- Support for third-party TBRGs through custom setups.
- Construction
 - Frame : aluminum
 - Valves : brass
 - Vessels : polycarbonate

- Power
 - Operating voltage : 110/240 VAC, 50/60 Hz
- Performance
 - Dispensed Mass : 653g
 - Dispensed Accuracy : ± 0.3 %F.S. (± 2 g)
 - Load Cell SWL : 3 kg
 - Max. Dispense Rate : 4 x 300 mm/hr,
1 x 1000 mm/hr
- Overall Dimensions : 2000mm x 700mm x 500mm (HxWxD)

Local training should be conducted for a minimum of seven (7) technical personnel from RIC Manila Tuguegarao and Davao station within two days (7 hours/day) after the installation/commissioning of the instruments/equipment. Training manuals including meals and all expenses related to the training shall be provided by the winning bidder.

11. **Field Calibration Device (FCD) for LICs (Tuguegarao, Davao): 4 units**
(for calibration of rain gauge) - 653 ml., (nozzles- 50, 100, 200, 300) mm. with 3 legs adaptor & metal casing.

12. **WIND MONITOR / ANEMOMETER for LICs (Tuguegarao, Davao): 2 Units**

- High Resolution Display
- Fully Programmable
- Large Data Storage Capacity
- Wide Variety of Inputs and Outputs
- Compact Design
- USB port

Specifications:

Dimensions: 200 mm (7.8 in) x 144 mm (5.7 in) x 54 mm (2.1 in)

Weight: 0.8 kg (1.8 lb)

Operating Temperature: 0° C to 50° C

Storage Temperature: -30° C to 50° C

Display: Adjustable high-brightness, high-contrast with 8 user programmable screens.

Power: 10 to 30 VDC at 4 W max

Memory: 2,162,688 data records. 512 User Program Instructions.

Voltage Input

Channels: 16 max.

Measurement Range: -5 to 5 VDC

Accuracy: 0.1% from 0 to 40° C

Pulse / Frequency Input

Channels: 4 Inputs. 0 to 2500 Hz

Excitation

Channels 2 Outputs Regulated 5VDC at 10mA

Voltage / Current Output

Channels: 4 Outputs.

Range: Voltage 0 to 5VDC. Current 0 to 20mA.

Resolution 12-bits (1.25 mV or 0.005 mA)

Serial I/O

Channels: 2 ports. One for RS-232, one for RS-485. Both channels are full duplex with no

handshaking, 1 start, 8 data, 1 stop, no parity.

Baud Rate: 1200 to 230,400 Baud

Switch Output

Channels: 4 Solid State Switch outputs.

Voltage/Current: Each switch can handle 60VDC at 5A.

Range: Wind speed: 0-100 m/s (224 mph); Wind direction: 0-360 degrees; Resolution: Wind speed: 0.1 unit (m/s, kts, mph, km/h); Wind direction: 1 degree; Accuracy: Wind speed: ± 0.3 m/s (0.6 mph) or 1% of reading; Wind direction: ± 2 degrees; Dynamic Response: Damping ratio: 0.3; Damped natural wavelength: 7.4 m (24.3 ft); Undamped natural wavelength: 7.2 m (23.6 ft); Threshold:* Propeller: 1.0 m/s (2.2 mph); Vane: 1.1 m/s (2.5 mp); Available Outputs: Voltage Output: WS: 0-5 VDC for 0-100 m/s; WD: 0-5 VDC for 0-540°; Serial RS-485: RMY, NCAR, or NMEA protocols; Polled or continuous output; Power Requirement: 11-24 VDC, 20 mA; Dimensions: Overall height: 37 cm (14.6 in); Overall length: 55 cm (21.6 in); Propeller: 18 cm (7.0 in) diameter; Mounting: 34 mm (1.34 in) diameter (standard 1 inch pipe); Weight: Sensor weight: 1.0 kg (2.2 lbs); Shipping weight: 2.3 kg (5 lbs); Operating Temperature: -50 to 50° C; **12 meters cable (from transmitter to receiver)**

13. HANDHELD GPS for LICs (Tuguegarao, Davao): 2 units

Specifications:

Display resolution, WxH - 240 x 400 pixels

Display type transfective color TFT touchscreen

Battery rechargeable NiMH pack (included) or 2 AA batteries (not included); NiMH or Lithium recommended

Battery life up to 16 hours

Water rating IPX7

High-sensitivity receiver

Interface high-speed USB and NMEA 0183 compatible

Camera (8 megapixel with autofocus; digital zoom)

Barometric altimeter

Electronic compass (tilt-compensated 3-axis)

Unit-to-unit transfer (shares data wirelessly with similar units)(plus images and custom maps)

Basemap

Ability to add maps

Built-in memory - 4 GB

Accepts data cards microSD™ card up to 32 GB

Custom POIs (ability to add additional points of interest)

Automatic routing (turn by turn routing on roads) (with optional mapping for detailed roads)

Sun and moon information

Tide tables (with optional Bluechart)

Area calculation

Wireless compatible: yes (Wi-Fi, Bluetooth and ANT+)

Map segments: 1500

Connect IQ compatible: yes (data fields)

Flashlight: yes

14. **AWS Station calibrators for RIC-Manila & LICs (Tuguegarao, Cebu, Davao): 4 sets**

A. **TECHNICAL SPECIFICATION – Standardized AWS**

1.0 **Sensors**

- Barometric Pressure Sensor with hose- **PTB330 Class A**
- Measurement Range: **500-1100** HPa.
 - Accuracy; +20°C **±0.10** HPa
 - Temperature dependence: **±0.15** HPa or better
 - Long term Stability Class: **±0.10** HPa/year
 - Operating Environment: -40° to +60°C
 - Supply Voltage: **10 35** Vdc
 - Serial I/O RS232C, RS485/422
 - Resolution:0.01 HPa
 - Cable Length: 3 meters

- Temperature/Humidity Sensor- **Vaisala HMP155**
 - Radiation shield **41003P**
 - RH Measurement range: 0 – 100%RH
 - Temp. Measurement range: -80 to 60°C
 - Operating Voltage: 7 to 28 Vdc
 - Probe Cable Length: 3 meters
 - Sensor protection; Sintered PTFE
 - Calibration: ISO9001 compliant

- Pyranometer- **Kipp and Zonen CMP3 or higher**
 - Spectral Range: 300 – 2800 nm
 - Sensitivity: 5 to 20 $\mu\text{V/W/m}^2$
 - Response Time: 18 s
 - Zero Offset A: < 15 W/m^2
 - Zero Offset B: < 5 W/m^2
 - Directional error (up to 80° with 1000 W/m^2 beam): < 20 W/m^2
 - Temp. dependence of sensitivity (-10° to 40°C): < 5%
 - Operating Temp: -40° to 80°C
 - Max. solar Irradiance: 2000 W/m^2
 - Field of View: 180°
 - Standard weather-proof cable: 5 meters length

- **Mounting Stand/ bracket**
- **Sensor crossarm with CM210 4ft**
- **Right angle mounting bracket**

- Wind Vane Anemometer- **R.M.Young 5103V** and cable (**12m**)
 - Wind Speed Range: 0-100 m/s (224 mph)
 - Wind Direction Range: 0-360 degrees
 - Resolution Speed: 0.1 unit (m/s, mph, kmh)
 - Accuracy(speed): ± 0.3 m/s (0.6 mph)
 - Accuracy(direction): $\pm 3^\circ$
 - Operating Environment: -50° to 50°C
 - Signal Output:

- Wind speed
 - a. magnetically induced AC voltage
 - b. 3 pulses per revolution
 - c. 1800 rpm
- Wind direction:
 - a. DC Voltage
 - b. 10 kΩ resistance
- Propeller Threshold: 1.0 m/s (2.2 mph)
- Voltage Output:
 - Wind Speed: 0 -5 Vdc for 0 -100 m/s
 - Wind direction: 0-5 V dc for 0 -540°
- Appropriate weatherproof cable; 12 meter length
- Surge Protection Unit (SPU) 09120
 - short shielded cable at least 1 meter 24awg / cable gland
 - long shielded cable at least 12 meters / waterproof housing

2.0 Data Logger Specifications

- **Data Logger Controller- Campbell Scientific CR310**
 - Operating Temperature Range
 - 40° to +70°C (standard)
 - 55° to +85°C (extended)
 - Analog Inputs 16 single-ended or 8 differential (individually configured)
 - Pulse Counters 10 (P1 to P2 and C1 to C8)
 - Voltage Excitation Terminals 4 (VX1 to VX4)
 - Communications Ports Ethernet ; USB; CS I/O; RS-232; CPI; RS-485
 - Data Storage Ports microSD
 - Switched 12 Volt 2 terminals
 - Digital I/O 8 terminals (C1 to C8) configurable for digital input and output. Includes status high/low, pulse width modulation, external interrupt, edge timing, switch closure pulse counting, high-frequency pulse counting, UART, RS-232, RS-485, SDM, SDI-12, I2C, and SPI function. Terminals are configurable in pairs for 5 V or 3.3 V logic for some functions.
 - Input Limits ±5 V
 - Analog Voltage Accuracy
 - Accuracy specifications do not include sensor or measurement noise.
 - ±(0.04% of measurement + offset) at 0° to 40°C
 - ±(0.06% of measurement + offset) at -40° to +70°C
 - ±(0.08% of measurement + offset) at -55° to +85°C (extended temperature range)
 - ADC 24-bit
 - Power Requirements 10 to 18 Vdc
 - Real-Time Clock Accuracy ±3 min. per year (Optional GPS correction to 10 μs)
 - Internet Protocols Ethernet, PPP, CS I/O IP, RNDIS, ICMP/Ping, Auto-IP(APIPA), IPv4, IPv6,
 - UDP, TCP, TLS, DNS, DHCP, SLAAC, SNMPv3,

- NTP, Telnet, HTTP(S), FTP(S), SMTP/TLS, POP3/TLS
 - Communication Protocols PakBus, Modbus, DNP3, SDI-12, TCP, UDP, and others
 - Warranty 3 years (against defects in materials and workmanship)
 - Battery-backed SRAM for CPU Usage & Final Storage 4 MB
 - Data Storage 4 MB SRAM + 72 MB flash (Storage expansion of up to 16 GB with removable microSD flash memory card.)
 - Idle Current Drain, Average < 1 mA (@ 12 Vdc)
 - Active Current Drain, Average 1 mA (1 Hz scan @ 12 Vdc)
55 mA (20 Hz scan @ 12 Vdc)
 - [Software latest version](#)
- **Configuration for:**
 - RM Young Anemometer 5103V
 - Vaisala HMP 155 Temperature and Humidity
 - Vaisala Analog Barometric Pressure PTB 330
 - Pyranometer Kipp and Zonen – CMP3
- Configured to send data at a user selected time frequency of every:
 - [one \(1\) minute](#)
 - ten (10) minutes
 - fifteen (15) minutes
 - thirty (30) minutes
 - sixty (60) minutes or 1 hour

3.0 Power Supply Specifications - Power for the AWS station is to be supplied by 12 VDC rechargeable battery charged by solar panels

- **Solar Panel**
 - Construction - Solar cell modules shall use poly-crystalline photovoltaic cell technology.
 - Protection - The cells should be encapsulated beneath high-transmission tempered glass. The rear surface should be completely sealed from moisture and mechanical damage by a continuous high-strength polymer sheet.
 - Rated Power: 50 watts, minimum
 - Solar Panel to Charge Controller Cable: Heavy duty outdoor type.
- **Solar Panel Controller/Charger**
 - Solar charge controller w/ display
 - Construction – It shall be of 100% solid-state construction and tropicalized to withstand local conditions.
 - Rated solar current :30 amperes
 - Rated load current: 30 amperes
 - System voltage: 12/24 volts DC

- Operating temperatures: -40 °C - +60 °C
- Diagnostics: Self tests with results on a digital display showing detected faults and operating parameters
- **Rechargeable Battery**
 - Construction – The batteries should be sealed lead-acid type with one-way pressure-relief vent typically used for Solar power supply system. The casing should be made of polypropylene with thermally-welded case-to-cover bond.
 - It should have a rated capacity of at least 50 Ah on 12 VDC.
- **Surge Protection**
 - Surge protection unit with DIN rail 12"
 - Brand : Load Track
 - Model : TK-LT240-15A-DIN2
- **Miniature Circuit Breaker**
 - Miniature Circuit Breaker w/ DIN rail 12"
 - DC400V, 10Amp, 2poles
 - Model: DZ47-63,C10 CHNT
 - Brand: Amico US

4.0 Control Box (NEMA box)

- Enclosure Box w/ pole mounting kit
- Plain door w/ polyurethane seal
- Texture paint finish RAL7032
- Double thickness, gutter shape front profile
- External earthing by crimped blind nut
- Complete with gland plate and lock and key
- External mechanical impact resistance
- Fully welded body, single part
- Cable gland plate (6 pcs)
- Six (6) hole in base panel mounting
- Size 16" x 24" x 8"
- Brass plate w/ clamp for terminal circuit protection / grounding
- Includes metal sheet and mounting bracket
- Stainless bolts and nut/ washers
- With rainproof ventilation on both side
- **To be provided with Silica Gel Desiccant – 1kg pouch/pack**

B. Tripod



Local training specifically in programming the data logger should be conducted for a minimum of twelve (12) technical personnel from RIC Manila and LICs within two days (7 hours/day) after the installation/commissioning of the instruments/equipment. Training manuals including meals and all expenses related to the training shall be provided by the winning bidder.

15. Temperature (PT-100) standard sensors for RIC-Manila & LICs (Tuguegarao, Cebu & Davao): 4 sensors w/ 4 wires each

Specification: 6.35 mm x 305 mm (0.250 x 12.0 in), -200 °C to 420 °C, lead wire (cable) 6 ft, (12 in) long (17025 accredited calibration included.

Traceable to NIST standards.)

Accuracy: ± 0.024 °C at -200 °C
 ± 0.012 °C at 0 °C
 ± 0.035 °C at 420 °C

Short-term repeatability: ± 0.009 °C at 0.010 °C

Drift: ± 0.007 °C at 0.010 °C

Sensor length: 28 mm (1.1 in)

Sensor location: 6.9 mm ± 3.3 mm from tip (0.27 in ± 0.13 in)

Sheath dimensions: 5615-12: 305 mm x 6.35 mm (12.0 in x 0.250 in)

Sheath diameter tolerance: ± 0.127 mm (± 0.005 in)

Sheath material: Inconel™ 600

Response time: 9 seconds typical

16. Mobile Service Vans for RIC-Manila & LICs (Tuguegarao, Davao): 3 units

Internal Dimension: (3.05 x 1.7 x 2.0) meters

Four wheelers

Weight capacity: 2.6 Tons

With Aircon: Driver side and inside the Van

Table made of steel; chairs with cushion and foldable

See Internal Design of the Van

17. Specification of Laser Doppler Velocimeter for National standard for wind speed measurement in Wind Tunnel for RIC-Manila: 1 set

- Self-contained
- No alignment needed
- Calibration done at the factory
- No water cooling required
- Makes accurate measurement of fluids of varying temperature, pressure, and density
- Computer controlled 1, 2, and 3-axis traversing system
- 2D and 3D automated profile measurement
- Battery operated option
- Waterproof and temperature resistant housing option
- NO FREQUENCY SHIFTING for miniLDV. The two beams of the miniLDV are always co-located. Diode lasers are used without the need for external cooling.
- **With Seeding Generator**
- miniLDV Processing Engine and sensor drive
Containing ONE (1) photodetector - DC to 10MHz
High speed, high resolution digitizers
Speed range - 1 to 52 m/s
BP-LDV Data acquisition and processing software

MEASUREMENT SPECIFICATIONS

Velocity range	-50 to 600 m/sec*
Repeatability	99.9 %
Accuracy	99.7%

PROBE VOLUME

PV dimensions (x by y by z)	Minimum: 30 x 60 x 200 m**
Available Standoff distances	35, 50, 100, 150, 240, 400, 50 and 700 mm
Signal cable -	10 ft furcation tubing

PROBE SPECIFICATIONS

Probe weight	250g
Dimensions	32 (dia) x 165 mm 1.3 (dia) x 6.5 inches

LASER SPECIFICATIONS

Laser power	130 mW
Wavelength	658 nm
Laser type	Class IIIb

OPERATING PARAMETERS

Temperature	5 to 35°C
Pressure	Atmospheric
PC requirements	Laptop or PC

OPTIONAL FEATURES

Water proof, high pressure, and high temperature housing
Traversing stage for profile measurements
1-D, 2-D, and 3-D traversing systems

POWER SUPPLY

12 VDC Universal

Local training should be conducted for a minimum of seven (7) technical personnel from RIC Manila within two days (7 hours/day) for the duration of the training after the installation/commissioning of the instruments/equipment. Training manuals including meals shall be provided by the winning bidder.

INTERNAL DESIGN OF MOBILE SERVICE VAN



