



TERMS OF REFERENCE
FOR THE
SUPPLY AND DELIVERY OF SEVEN HUNDRED (700) PCS.
RADIOSONDE TRANSMITTER –GRAW MET. DFM-17
with Free Met. Balloons

A. BACKGROUND

Upper-air soundings complete the required weather parameters in 3 dimensions which are necessary for weather analysis and prediction. Its importance is so great that the equipment used should be of great quality such as the transmitters and weather balloons which measure the different weather parameters up to 12,000 meters above mean sea level and send these data to the receiving stations in the country. The upper-air soundings can be used to deliver real-time data required for local-area weather forecasts such as thunderstorms and rainy days-to name a few. These can be of additional help in the formulation of the localized weather forecasts in the newly formed five (5) PAGASA Regional Services Divisions in NCR, Northern and Southern Luzon, Visayas, and Mindanao.

B. APPROVED BUDGET FOR THE CONTRACT (ABC)

The Approved Budget for the Contract is Eleven Million Nine Hundred Thousand Pesos (**Php11,900,000.00**) inclusive of VAT and all applicable government taxes.

C. TECHNICAL SPECIFICATIONS:

Radiosonde Transmitter **GRAW MET. DFM-17 with free Met. Balloons** shall have the following minimum technical specifications:

1. Temperature:

Type: Resistive

Measurement Range: -90 to +60°C

Resolution: 0.01°C (internal)

Temperature Accuracy: <0.2°C

Repeatability in Calibration: <0.05°C

Reproducibility in Sounding: <0.2°C

Response Time (63.2%, 5 m/s, 1000hPa: <0.6s

Stability (0.5years): <0.03°C

2. Humidity:

Type: Thin-Film Capacitor

Measurement Range: 0 to 100%rH

Resolution: 0.1%rH

Uncertainty: <3%rH

Reproducibility in Sounding: <2%rh

Repeatability in Calibration: <1%rH
Response Time (6m/s,1000hPa, +20°C): 0.2 s
Response Time (6m/s, 1000hPa,-60°C): 10 s (time lag Corrected)
Optional Heating (de-icing): Expected availability end of 2020

3. Pressure:

Type: Calculated by GPS (optional barometric)
Measurement Range: 1100 to 1 hPa
Resolution: 0.01 hPa (internal)
Uncertainty> 100hPa: < 1hPa
Uncertainty 100-10hPa: <0.2hPa
Uncertainty < 10hPa: <0.04hPa

4. Geopotential Height:

Measurement Range: -500 m to 40,000 m
Resolution: 0.1 m
Uncertainty: < 8 m
Reproducibility in Sounding: <5 m

5. Wind Speed:

Method: Calculated by GPS
Measurement Range: 0 to 200 m/s
Resolution: 0.01 m/s (internal)
Uncertainty: <0.1 m/s

6. Wind Direction:

Method: Calculated by GPS
Measurement Range: 0 to 360°
Resolution: 0.01° (internal)
Uncertainty:<1°

7. Telemetry:

Transmitter Type: Synthesized
Tuning Range: 400-405.99MHz
Bandwidth: < 12 KHz
Max.Range:>250km
Frequency Stability: <1 KHz (frequency Drift < 1 KHz)
Emission Bandwidth: Acc. To EN 302 054
Output Power: <100 mW
Sideband Radiation: Acc. To EN 302 054
Modulation: GFSK
Data downlink: 1250 bit/s
Data Loss: <1%
Sampling rate: 1 Hz
Frequency Channels: 300 (tuneable in 20 KHz steps)
National Standards: ETSI (Europe), NTIA (USA)

8. GNSS Receiver:

Type: GPS/GLONASS/BEIDOU
Number of Channels: 72

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Cold Start Acquisition Time: 26s
Reacquisition Time: 1 s
Technology: DGPS (SBAG)
Horizontal Position Accuracy: <2.5m
Horizontal Position Error: <5 m (CEP90)
Vertical Position Error: < 10 m (CEP90)
Velocity Accuracy: <0.05 m/s
Heading Accuracy: <0.3°
Maximum Altitude: Unlimited

9. Interface to Internal Sensors:

Protocol: Xdata
Transfer Rate: 24 bytes/s

10. Miscellaneous:

Battery Type: 2 x Lithium CR123A, Replaceable
Battery Capacity: 2 x 1500 mAh
Battery Operating Time: >240 min
Battery Voltage: 3-6 V
Battery Saving Feature: Radiosonde Powered by Ground Station During preparation
Dimensions (Body): 90 x 67 x 44 mm
Weight: 63 g
Antenna: Soft Wire Cover to protect from Injuries
Documentation: Complete use documentation set is available

11. Unwinder:

Material of String: Polypropylene (Optional Cotton)
Tenacity: <120N
Length of String: 30m
Unwinding Speed: 0.3 m/s
Weight: 25 g
Technical Data: GRAW Radiosondes GmbH & Co.KG

12. Packing/Labelling:

Packing Type: Robust carton with individual protective placeholders
Moisture Protection: Optional Sealed packing with an Appropriate Desiccant package
Quantity per Carton: Standard (1,5,25) or customer-specific
Labeling: Standard or customer-specific with durable legible Marking
Serial Numbers: Standard or customer-specific
Shipping Documentation Standard or Customer-specific packing lists, commercial Invoices, custom documents, etc.

METEOROLOGICAL BALLOONS SPECIFICATIONS:

Weight	: 350 grams Uncolored
Neck Size & Diameter:	: 120±20mm 32±3mm
Brand	: TOTEX (Japan)

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PACKAGING

Must be individually packed in a hermetically sealed aluminum bag with anti-insect powder inside.

Note: *A certification from the manufacturer must be attached and submitted by the winning bidder/supplier.*

D. DELIVERY PERIOD AND PLACE OF DELIVERY

The winning bidder shall supply and deliver the **Seven Hundred (700) pcs. of Radiosonde Transmitter Graw Met. DFM-17 with Free Met Balloons** on-site at **PAGASA Laoag Upper Air Station at Airport, Gabu, Laoag City, Ilocos Norte**. Before delivery transmitters and Met. balloons shall be inspected by the PAGASA and COA inspectors at PAGASA Central Office Science Garden Complex, Senator Miriam P. Defensor-Santiago Ave., Brgy. Central, Quezon City.

Delivery of the total **700 pcs. Radiosonde Transmitters – Graw Met DFM-17 with Free Met Balloons** shall be made by the following schedule:

Tranche	Quantity	Schedule of Delivery
1 st	350 pcs.	1 st week of February 2025
2 nd	350 pcs.	1 st week of July 2025
Total	700 pcs.	

Failure to deliver within the prescribed period without valid and justifiable reason shall constitute a delay on the part of the winning bidder/supplier which is a ground for the imposition of liquidated damages by Section 68 and Section 3 (Annex "D") of the Revised IRR of RA 9184.

E. PAYMENT TERMS

The winning bidder/supplier may be allowed to collect partial payment commensurate to the number of goods/items delivered, provided that said deliveries are made according to the schedule of requirements specified above and subject to the complete submission of the documentary requirements prescribed under the accounting and auditing rules and regulations.

F. WARRANTIES

1. To assure that manufacturing defects shall be corrected by the winning bidder/supplier, warranty security shall be required from the contract awardee for a minimum period of **one (1) year** after acceptance by PAGASA of the delivered goods/supplies.

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2. Either retention money shall cover the obligation for the warranty in an amount equivalent to at least one percent (1%) of every progress payment, or a special bank guarantee equivalent to at least one percent (1%) of the total contract price. The said amounts shall only be released after the lapse of the warranty period: Provided, however: That the supplies delivered are free from patent and latent defects and that all the conditions imposed under the contract have been fully met.
3. The winning bidder likewise warrants that it shall strictly conform to all the Terms and Conditions of this Terms of Reference.

