



**NATIONAL ATMOSPHERIC DEPOSITION PROGRAM**

A research program sponsored by the  
Association of State Agricultural Experiment Stations  
of the North Central Region • NC-141

**TO: NADP Participants**  
**FROM: J. H. Gibson, Program Development Coordinator**  
**RE: Purchase of Collectors**

Enclosed please find a memo regarding "Specifications for Purchase of Precipitation Sampler" indicating the basis for identification of the Aerochem Metrics Model 301 as the collector to be used in NADP projects. We trust that this memo will permit each Experiment Station or other participating agency to purchase collectors for use at the collection sites in each state.

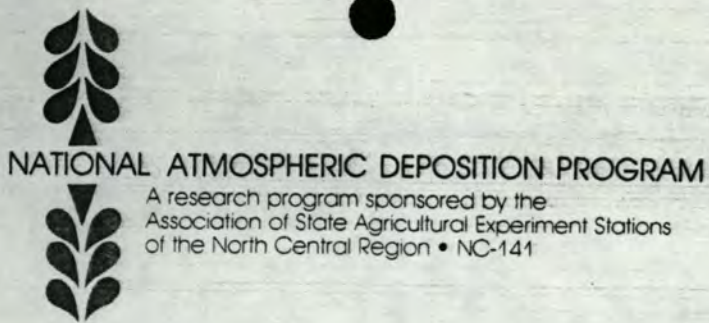
Also enclosed is a copy of the technical data on the Model 301. We anticipate that the collectors used at most sites will not require the peaked snow roof or the teflon coating of arms. These attachments may be necessary at sites exposed to extremely severe icing conditions which we believe will be rare at almost all proposed sites in the NADP network.

We have negotiated an arrangement for bulk purchase of the extra plastic buckets that will be required at each site. Buckets will be provided by the Central Analytical Laboratory and no additional buckets need to be ordered by the site.

Since there is no price advantage for orders of multiple instruments to be delivered to separate locations we are recommending that each Experiment Station or other participating agency place its own purchase orders directly with Aerochem Metrics. Please note that the present price quotation includes the event recorder kit and postage (air freight).

JHG/lb

Enclosures



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**TO:** Participants in the National Atmospheric Deposition Program (NADP)  
**FROM:** E. B. Cowling, Chairman Technical Committee  
**RE:** Specifications for Purchase of Precipitation Sampler

As you know a wet/dry deposition collector is required at each collection site in the NADP atmospheric monitoring network. The Technical Committee has specified that uniformity in sampling instrumentation and procedures are necessary in order to achieve the highest possible quality in the project data. This memo is to serve as a guide and reference for procurement of the wet/dry deposition collector and its essential attachments.

An exhaustive search and investigation of published information and user experiences with potential collectors has been made and clearly shows that there is only one firm in this country that can supply suitable instrumentation. This is Aerochem Metrics of Miami, Florida. This device (Model 301) has been tested for more than one year at three different locations (Cornell University, the Environmental Monitoring Laboratory of the Department of Energy, and University of Virginia) and has been found to be reliable. The Collector design was based upon the original Health and Safety Laboratory (AEC) collector, which has been tested in many locations and was the most highly recommended of 13 units tested in the Cornell University intercomparison study (Galloway and Likens, 1976. Calibration of collection procedures for the determination of precipitation chemistry. Water, Air, and Soil Pollution 6:241-258). The Executive Committee of the NADP has reviewed all available data and has designated the Aerochem Metrics Model 301 as the only acceptable unit to be used at NADP monitoring sites. If further information is required, please contact J. H. Gibson, Program Development Coordinator (303-491-5571).

Enclosed are copies of a descriptive sheet on the instrument describing available attachments and ordering information.

EBC/jm

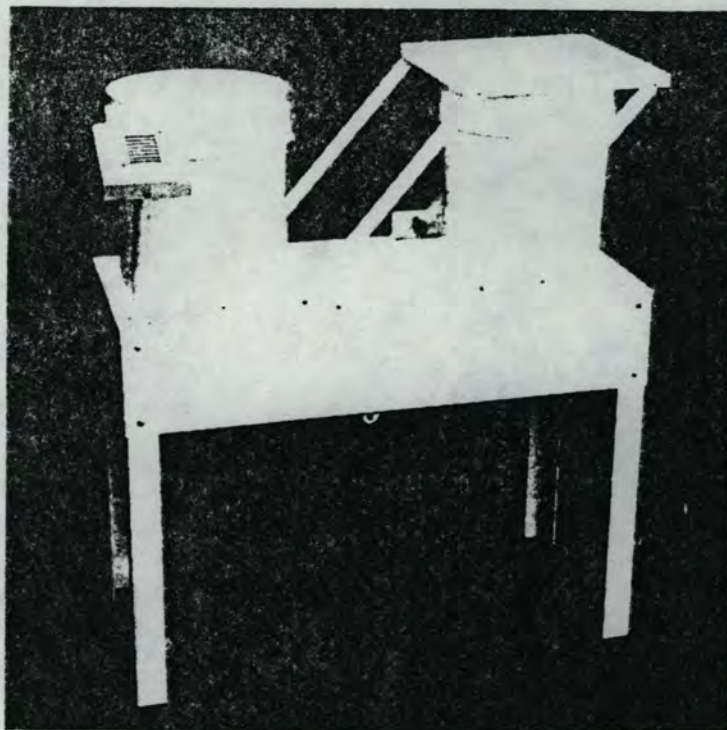
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## AUTOMATIC SENSING WET/DRY PRECIPITATION COLLECTOR

The Model 301 is designed to collect rain and snow in a container which is open only during precipitation events; a second container is uncovered between precipitation events and thus collects only dry-deposited material. A sensor detects the occurrence of precipitation and activates a motor which removes a cover (i.e., roof) from the wet collector and transfers it to the dry collector. When the precipitation ceases, the cycle is reversed.

The sensor consists of a large ( $34 \text{ cm}^2$ ) stainless steel grid positioned above, but isolated from, a stainless steel base plate. The sensing circuit is activated when water droplets bridge the gap between the elements and reduce the resistance to 80K ohms; this sensitivity is sufficient to obtain a trip condition with relatively pure (i.e., very low conductivity) precipitation. The sensor base plate is heated during the wet cycle to increase the rate of evaporation and, hence, reduce the "open" time after the cessation of precipitation. The plate temperature is controlled by an adjustable thermistor circuit which is factory-set at  $50^\circ\text{C}$ . A second set point, factory-set at  $8^\circ\text{C}$ , activates the heater when the temperature approaches freezing so that snow or ice that deposits on the sensor will melt and thereby trip the circuit to a "wet" condition.

The standard collection vessels are formed from 0.20 cm thick, high density polyethylene and have a capacity of 13 liters (I.D. 28.6 cm, D. 23.2 cm). Each vessel is provided with a lid which has an "O" ring; the lid, once it is snapped in place, produces an air-tight seal which permits the handling and shipping of containers without the need for taking any further precautions against leakage.



A polyurethane foam pad, enclosed in polyethylene film, is affixed to the underside of the roof and ensures a tight seal with the collection vessel; the seal reduces evaporative losses from the sample and prevents leakage of particulate material into the "wet" collector during dry periods. Constant seal pressure is provided by a spring tension device incorporated in the roof-drive arm assembly.

The power train is rated at 300 in. oz. The train is protected by a tooth-type (detent), automatic reset, torque overload clutch. A fused, switched output is provided for operation of an event recorder.

# AERO-CHEM METRICS

6832 SOUTHWEST 81<sup>st</sup> STREET / MIAMI, FLORIDA / 33143 / 305-661-5213

AUTOMATIC SENSING WET/DRY PRECIPITATION COLLECTOR

PRICE LIST

|   |                  |
|---|------------------|
| Standard Model 301 Automatic Wet/Dry Precipitation Collector with two polyethylene buckets and covers, tie-down kit, power cord for 110 VAC and 12 VDC, fused power and switching for event recorder.<br>(Federal Stock Number: 6660-01-047-7304) | \$1,695          |
| Solid state relay for operation of ancillary equipment, installed   | 60               |
| Teflon coated aluminum roof and aluminum arms   | 160              |
| Anti-splash screen (polypropylene or stainless steel)   | 75               |
| Extra length power cord, per foot   | .35              |
| Wind screen, Alter type   | 350              |
| Solar panel   | 1,200            |
| Non-metallic (polycarbonate) roof   | 175              |
| Peaked aluminum snow roof   | 85               |
| Recording rain gauge (Belfort) with event recorder, installed   | 960              |
| Event marker kit for installation on customer's Belfort rain gauge  | 185              |
| Spare polyethylene-enclosed foam roof seal--ready to install  | 15               |
| Spare standard buckets with O-ring sealed, snap-on cover, each  | 10               |
| Complete motor box with electronics, event recorder switching, gear motor, motor crank and torque clutch--ready to install (Spares Module)  | 695              |
| Complete rain sensor with support tube flange and Cannon plug--ready to install (Spares Module)   | 325              |
| Sequential precipitation sampling module with adjustable interval timer   | Price on Request |
| Rain sensor and motor control for operation of motors and other devices   | 495              |
| Timer for operation of several precipitation collectors in sequential mode  | 500              |
| Built-in Trickle Charger  | 50               |

Prices valid 1 October, 1979; subject to change without notice. Prices include shipping in the contiguous United States.

AEROCHEM METRICS  
6832 SW 81 Street  
Miami, Florida 33143  
Telephone: 305/661-5213

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