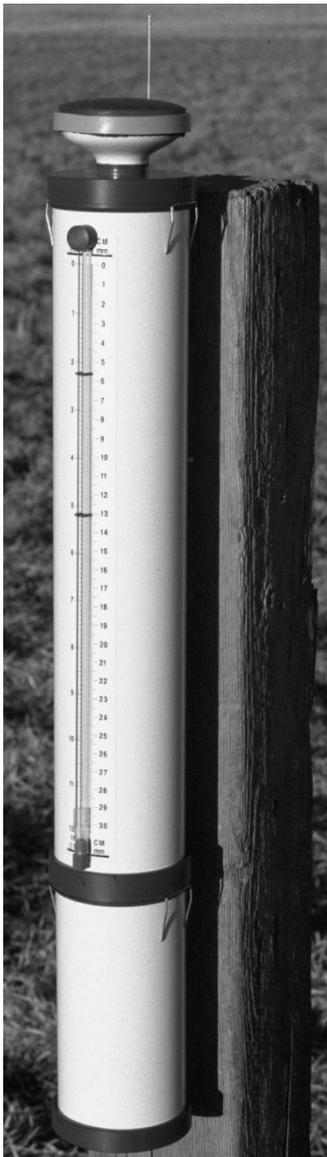


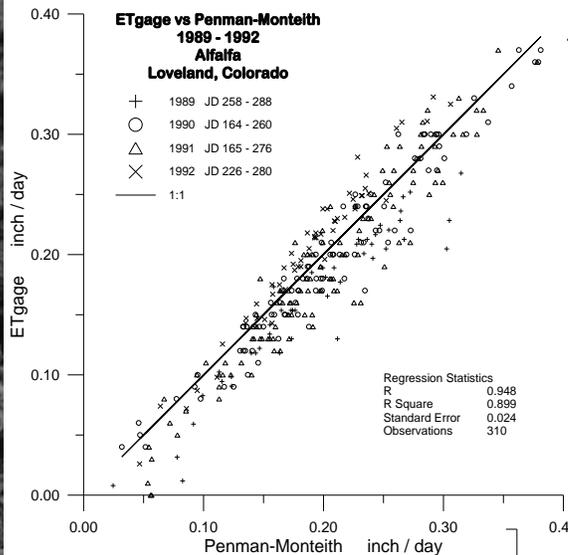
# ETgage™ Model E

Electronic Evapotranspiration Field Monitor for use with Data Loggers, Counters, Controllers



ETgage Model E is an automated atmometer for estimating evapotranspiration (ET) from turf, field crops, orchards and vineyards. The covered ceramic evaporator at the top mimics solar energy absorption and vapor diffusion resistance of irrigated crops.

A reservoir below the evaporator holds distilled water. The evaporator draws water from the reservoir at the same rate that plants remove water from soil by evapotranspiration. Water falls in the reservoir one inch for each inch of evapotranspiration. Water drawn from the reservoir must first pass through an accurately calibrated glass measuring vial. One vial-full corresponds to 0.01 inch of evapotranspiration. Electronics accurately sense when the vial is empty, and immediately refill it through a 3-way solenoid valve. At each refill the 0.01 inch event is marked by a switch-closure type pulse at the signal output terminals.



**SPECIFICATIONS**  
ETgage Model E

**PERFORMANCE**  
Accuracy:  $\pm 1\%$  of evaporated water.  
Resolution: 0.01 inch  
Output: Single pulse per 0.01 inch ET. Output signal pulse is similar to a standard tipping bucket rain gauge signal.  
Visual Readings: Sight tube with scale in inches and millimeters mounted on instrument's water reservoir.  
Capacity: 12 inches ET per filling.

**MAINTENANCE**  
Two months reservoir refill interval typical. Fill with distilled water available at grocery stores. Clean top surface of ceramic evaporator annually or as needed. Keep from freezing. Bird-wire provided, see photograph.

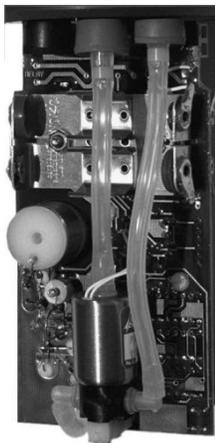
**ENVIRONMENT**  
Temperature: Above freezing to 70° C (158° F); 54° C (130° F) maximum if using batteries.  
Humidity: 0 to 100% RH.  
Housing: Weatherproof.

**MECHANICAL**  
Dimensions: 22.3 inches (56.6 cm) high, 3.1 inches (7.9 cm) diameter.  
Weight: 5.5 pounds (2.5 kg) with water, 3.1 pounds (1.4 kg) empty.  
Mounting: Stainless steel vertical bracket.  
Materials: Ceramic evaporator, green canvas diffusion covers (#30 for grass, #54 for crops), glass sight tube, PVC plastic housing, CMOS electronics. Silicone conformal coating protects circuit board.

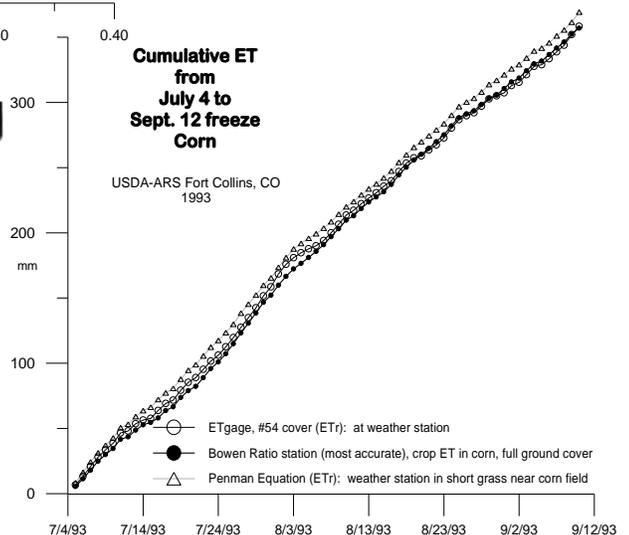
**ELECTRICAL**  
**Output Characteristics**  
Output Connection: Two wire, internal screw-terminal block.  
Signal: Line pulled low for  $2.3 \pm 0.7$  second pulse after each 0.01 inch ET. Transistor output (no contact bounce). Additional reed relay output option available.  
Output impedance: Normally open-circuit ( $<6\mu\text{A}$  leakage at 30 V), 50 ohms during pulse.  
Output Voltage: Voltage supplied by receiving equipment. This voltage should not exceed 30 VDC. Above 34 VDC a zener over-voltage diode will begin to conduct.  
Transient Protection: Fully lightning protected except for direct strike to the unit.

**Power Source**  
Internal Supply: Four alkaline "AA" cells. Replace after six months continuous use. (Batteries not included.)  
External Supply (use in lieu of batteries): 5VDC to 16VDC; 167 mA peak, 0.4 mA average current draw at 6 VDC. Internal screw-terminal block. Lightning protected.

U.S. Patents 4,709,585 5,311,769 5,423,206 5,389,311



Lower compartment contains the electronics circuit board. Back side (left) holds battery clips, r.f. oscillator and three-way solenoid valve. Front side (right) holds terminal blocks (top), battery clips and calibrated glass vial. Radio frequency sensors precisely detect vial's full-level and empty-level without contacting the water. Bulb in the vial clears bubbles.



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