Environdata FAO56 Evaporation Calculation (EV30)

Features:

- Evaporation calculation using Penman FAO56
- Calculated in the data logger
- Virtually maintenance free
- Based on hourly data
- Accurately determines Evaporation from Dams and Reservoirs
- Monitors Evapotranspiration (ET)

Applications:

- Water Balance Monitoring
- Water Storage Management
- Intensive Horticulture
- Irrigation Scheduling
- Agricultural Research
- General Meteorology

Description:

Environdata's Weather Maestro and WeatherMate 3000 Weather Stations can provide a Penman FAO56 Evaporation calculation as a standard output (from a "virtual" sensor) if the appropriate actual sensors are connected: namely, relative humidity, air temperature, wind speed and solar radiation.

The EV30 firmware is based in the data logger, providing accurate estimates based on true average meterological variables. This data is then able to be collected via Environdata's Software, or via your own PLC, MODBUS or other method, independant of Environdata's Software.

The calculation used is the hourly equation from the most recent Irrigation and drainage paper (FAO 56) entitled Crop Evapotranspiration.

The FAO56 calculation has been recognised by researchers and managers as the most accurate way to determine evapotranspiration in crops, as well as the best way to calculate evaporation from open bodies of water such as dams or reservoirs.

In both cases, however, the calculations rely on accurate data from an onsite weather station.

A Net Radiation sensor can be used in place of the Solar Radiation sensor, however the Net Radiation sensor needs to be installed directly over the surface concerned, with no nearby objects. For this reason we recommend that customers use our Solar Radiation sensor.

Specifications:

Hourly Inputs

- Average relative humidity
- Average air temperature
- Average wind speed
- Average solar radiation
- OR Average net radiation

Output:

- In millimetres per hour of evaporation
- Also, total of hourly values for the 24 hours to 9am

Traditional Methods

The calculation of evaporation has been traditionally done by meteorologists using an "A" class pan – a nine-foot diameter pan of water. This is difficult to maintain and difficult to automate.

Since about 1990, the research and agricultural communities have used a Penman calculation to calculate evaporation from more easily maintained parameters.

Although the results are not identical to the "A" class pan, they are similar and the difference is predictable. In fact, many researchers and scientists now prefer the FAO56 calculation, saying it is more appropriate to both ET and Open Water Evaporation estimates.

The calculation method avoids many of the major problems encountered in maintaining a standard "A" class pan:

- Algae growth and impurities in the water.
- The need to refill the manual pan daily to maintain accuracy.
- The galvanised pan overestimates the impact of solar radiation and underestimates the effect of wind speed.

Water Balance Weather Maestro Weather Station at Darwin River Dam

Photos courtesy Novolta Pty Ltd, NT Agent for Environdata Weather Stations