

ECN AWS Protocol - Ground Level Rain Gauge

On windy sites precipitation can be under-recorded because of the rainfall impacting on the side of a conventional rain gauge. Also snow usually melts earlier in a conventional gauge compared with snow lying on the ground. For these reasons the ECN Automatic Weather Station protocol states that the tipping bucket rain gauge should be in a ground level pit at exposed upland sites (Sykes and Lane 1996).



The pit should be dug to a depth so that the rim of the gauge is level with the surrounding ground. The gauge should be attached to a paving slab for stability with gravel around it to promote drainage and suppress vegetation growth. The walls of the pit can be constructed of rot-proofed wood and marine ply or concrete blocks. Just below ground level there should be a ledge to support the metal grid so that the lip of the gauge, the top of the grid and the surrounding ground are all level.

The purpose of the grid is to reduce wind turbulence around the gauge and rain splash into the gauge. The grid is not available commercially but because of its simplicity local metal workers can usually make them. The grid covers an area of 120 cm by 120 cm with cells of 10 cm by 10 cm, and the gauge in the middle. For easier handling the grid is manufactured in two parts each 120 cm by 60 cm. The metal used is strip of 5 cm wide and 1-2 mm thick that is galvanised after fabrication. In the picture the centre 16 cells are omitted to allow for the gauge although a differently sized gauge will require a different sized opening, so this is worth checking before manufacture.

In high rainfall and poor drainage areas some arrangement has to be made to prevent the pit from flooding during heavy rain or snow melt as this could cause damage to the electronics of the gauge. The simplest solution may be to bury a pipe running horizontally from the bottom of the pit to a point downslope where it would appear above the ground surface.

An amphibian and mammal escape ramp should be installed, simply from a plank of wood. It is also a good idea to put canes at the corners of the grid in winter to stop people inadvertently walking on it when it is covered in snow.

A gauge pit is only required for the AWS gauge. Any manual gauge should be installed according to the Met Office standard which specifies a turf wall around the gauge (Met Office 1982).

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Sykes, J.M. & Lane, A.M.J. (1996) *The United Kingdom Environmental Change Network: Protocols for Standard Measurements at Terrestrial Sites*. The Stationery Office, London (also available on the ECN website <http://www.ecn.ac.uk/protocols/index.asp>)

Met Office (1982) *Observer's Handbook*. HMSO, London.