

A removable filter for periodic cleaning and maintenance is inserted in the water collector cone so as to prevent leaves or other elements blocking the end of the hole.

For better water flow, the collector cone is treated with a teflon® paint.

The HD2013R, the version with a heater, operates using either 12Vdc or 24Vdc voltage and uses about 35W. Heating is activated around +4°C.

**When submitting your order**, upon request a bird dissuader, made of 8 3mm-diameter spikes, 60 mm in height, can be installed on the rain gauge.



## HD2013 TIPPING BUCKET RAIN GAUGE

The HD2013 is a reliable and sturdy bucket rain gauge, built entirely from corrosion resistant materials in order to guarantee its durability. So as to ensure accurate measurement even with low temperature climatic conditions or during and after precipitations of snow, a version with a heater which is automatically activated around +4°C has been developed so that snow deposits and ice formations are prevented.

The rain gauge is formed by a metal base on which a tipping bucket is set. The rain collector cone, fixed to the aluminium cylinder, channels the water inside the tipping bucket: once the predefined level is reached, the calibrated bucket rotates under the action of its own weight, discharging the water. During the rotation phase, the usually closed reed contact opens for a fraction of a second, sending an impulse to the counter.

The quantity of rainfall measured is based on the count of the number of times the bucket is emptied: the reed contacts, usually closed, open at the moment of the rotation between one bucket's section and the other. The number of impulses can be detected and recorded by a **datalogger such as the HD2013-D** DeltaOHM or by a pulse counter.



View of tipping bucket



Electrical connection

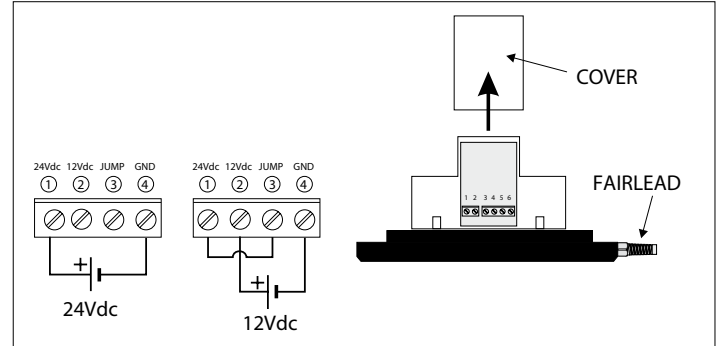


Fig. 1 Electric connection.

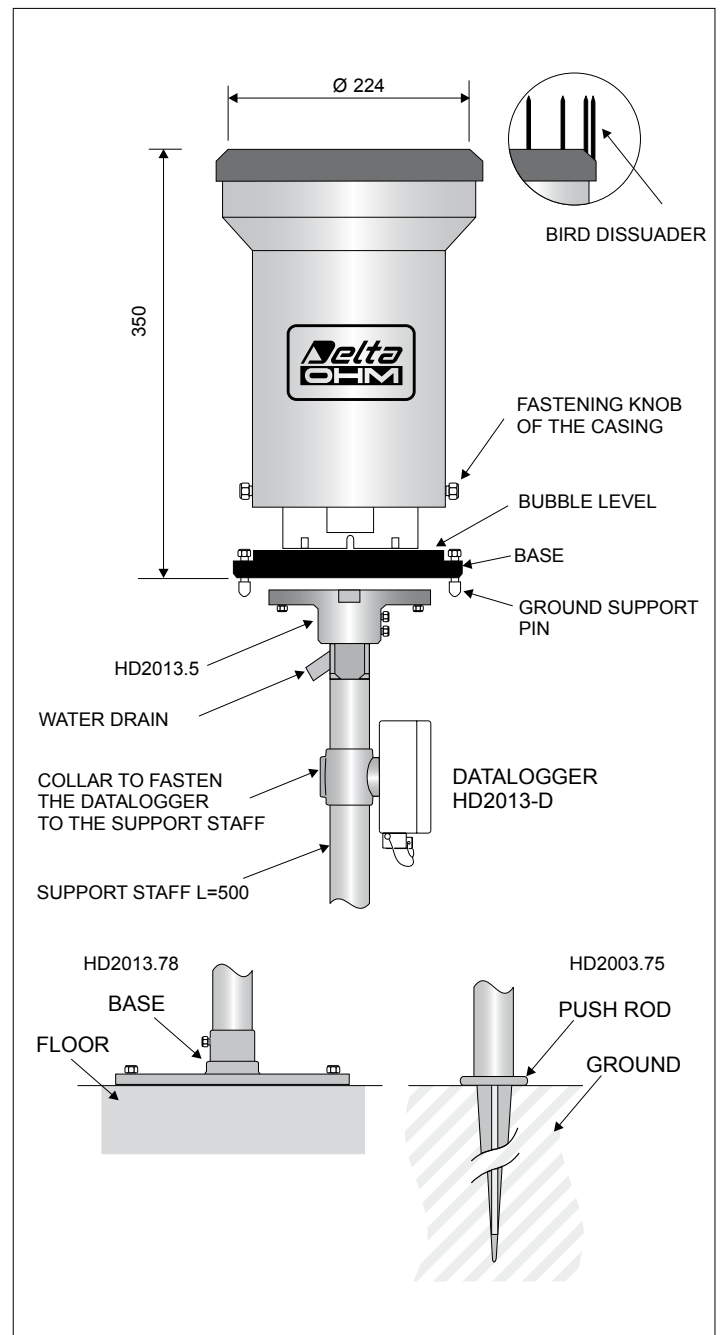


Fig. 2 Mechanical dimensions, and floor or ground fastening system.

## INSTALLATION AND MAINTENANCE

Upon request the rain gauge can be supplied ready calibrated at 0.1 - 0.2 or 0.5 mm of rain per commutation of the bucket: the calibration value is shown on the instrument's label.

The instrument must be installed in an open area, away from buildings, trees, etc..., ensuring the space over it is free from all objects which could obstruct rain measurements, and in an easily accessible position for the filter to be cleaned periodically.

Avoid installation in areas exposed to gusts of wind, turbulence (for example the top of a hill) as these may distort the measurements.

The rain gauge can be installed on the ground or raised 500 mm above the ground. Other sizes above the ground are available on request.

Three adjustable support feet have been provided for ground installation so that the instrument can be levelled correctly, and the holes aligned so that it can be fixed to the floor.

For raised installations a collar has been provided which fastens around the base of the instrument on which the support staff must be inserted. The staff may end with either a flange so that it can be fixed to the floor, or a tip to be driven into the ground. The various fastening systems can be seen in fig. 2.

For the tipping device to function correctly and so for the measurement to be correct, it is important that the instrument is placed perfectly level. The base of the rain gauge is fitted with a bubble level.

For installation, unscrew the three screws at the sides of the cylinder that supports the water collector cone.

**Note:** a heating resistor is fitted around the cone vertex in the **HD2013R** version. To disconnect the power leads, the terminal block's protection cover must be removed and the connector plugged into the heater's leads coming from the cone needs disconnecting.

### Electric connection

For the version without heater use a two-wired lead, for the version with heater use a four-wired lead. Slide the cable through the fairlead and fasten it with the cable-holder located near the entry hole at the base of the rain gauge.

The correct configuration of the connections is illustrated in figure 1. **The rain gauge output, available on terminals 5 and 6, must be connected to the rain gauge datalogger HD2013-D input** (please see the details in the instrument's description) **or to a pulse counter or to a datalogger.**

The heated version requires power for the resistors: the mode of connection depends on the level of power used (12Vdc or 24Vdc) and must be made in the manner reported in fig. 1.

The 24Vdc power must be connected between terminals 1 (+) and 4 (-), while for 12Vdc power use terminals 2 (+) and 4 (-) with a jumper between the terminals 1 and 3. If the connection are set correctly, a led placed near the terminals will be lit up.

### Maintenance

Verify filter cleanliness periodically; check that there is no debris, leaves or anything else that might obstruct the passage of water.

Check that the tipping bucket contains no dirt, sand, ... deposits, or any other obstruction.

If necessary, the surface can be cleaned with mild non aggressive detergent.

## Technical characteristics

	HD2013R	HD2013
Power	12Vdc or 24Vdc $\pm 10\%$ / 35W	---
Type of output contact	NC contact (opens during commutation)	
Resolution	0.1 - 0.2 or 0.5 mm/commutation (on request at the time of placing the order)	
Precision	$\pm 2\%$ between 20÷300 mm/h	
Operating temperature range	-20°C ... +60°C	+4°C ... +60°C
Heater intervention temperature	+4°C	---
Protection degree	IP67	
Collector area	400 cm <sup>2</sup>	

### ORDER CODES

**HD2013:** Rain gauge with tipping bucket, area 400 cm<sup>2</sup>, for temperatures from +4°C to +60°C; resolution on request, at the time of placing the order 0.1 - 0.2 or 0.5 mm. Output contact normally closed.

**HD2013R:** Rain gauge with tipping bucket, area 400 cm<sup>2</sup>, for temperatures from -25 to +60°C; resolution on request, at the time of placing the order 0.1 - 0.2 or 0.5 mm. Output contact normally closed. Power voltage 12Vdc or 24Vdc  $\pm 10\%$  / absorption 35W.

**HD2013.18:** Bird dissuader.

**HD2013.5K:** Accessory kit for installation of the 500 mm raised from ground rain gauge, formed by a support plate for the staff, support staff L=500 mm, fastening screws.

**HD2013.75:** Base with tip for the ground to support the raised from ground rain gauge (to add to the Accessory kit HD2013.5K).

**HD2013.78:** Level base for fastening the raised from ground rain gauge (to add to the Accessory kit HD2013.5K).

**HD2013.77/40:** Flange to fasten the datalogger to the support staff.



Tip for ground for rain gauge raised from ground



Support plate for rain gauge raised from ground



Rain gauge installed on the ground.



Rain gauge with bird dissuader.



Bubble level

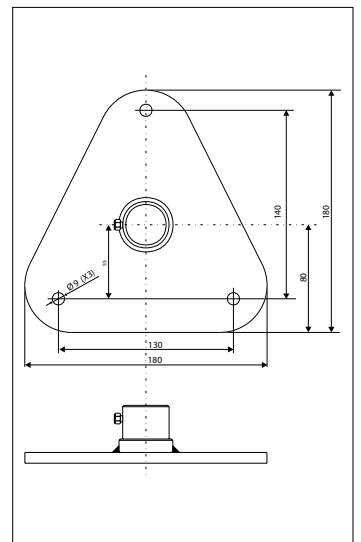


Fig. 3 Base for ground fastening HD2013.78

Distribuidor autorizado:



**RoMiotto Instrumentos  
de Medição Ltda**

Rua São Leonardo, 187 - Freguesia do Ó - São Paulo - SP  
02803-000 | Tels.: (11) 3976-4003 | 3999-7737 | Fax: (11) 3998-8044  
E-mail: [info@romiotto.com.br](mailto:info@romiotto.com.br) | Site: [www.romiotto.com.br](http://www.romiotto.com.br)