



Cylinder  
(1500-31)

Rain Gauge (1500)

## Description

The rain gauges (1500) consist mainly of the cylindrical collecting funnel with a collecting surface of 200 cm<sup>2</sup>, the bottom part, the collecting can and the measuring cylinder.

## Functionality

The quantity of precipitation falling on a ground surface is characterized by that height of liquid precipitation (measured in mm) which would cover the ground surface if no water had penetrated into the ground, run off or evaporated.

In order to ascertain the height of precipitation, the precipitation fallen on a small fractional part of the area concerned will be collected and measured at given intervals. In any case the measuring value will be evaluated as average value for the total observation region.

The quantity of precipitation may differ locally; therefore, the measuring accuracy depends on the one hand upon the proportion of the measuring area to the total observation surface, but on the other hand also upon the choice of the suitable measuring place. For economic reasons the proportion of the measuring area to the observation area can only be extraordinarily small. Special attention should, therefore, be paid to the choice of the measuring place for precipitation gauges or recorders.

The measuring cylinder is provided with a division „mm of precipitation“. Thus the precipitation can be measured directly without any conversion. For this purpose the precipitation in the collecting can has to be filled into the measuring cylinder at the respective time of observation.

The result can now be read free of parallax (eyes in the same height as water level). In the case of precipitations above 10 mm the measuring cylinder has to be filled several times. The sum of the partial measurements makes the whole precipitation. After the measurement, the collected rainwater may be poured away.

Solid precipitations have to be melted first of all and should be evaluated in the same manner as liquid precipitations. For this purpose, the collecting surface of the rain gauge filled with snow, hailstones or sleet has to be closed with a cover and the whole instrument has to be put into a room free from frost, but it should only be tempered. The cover protects the precipitation from evaporation during the melting process.

In order to continue collecting the precipitations, the instruments for measuring rain and snow (1500 b) have each two collecting funnels, bottom parts, collecting cans and snow crosses, one set of which serves for the change.



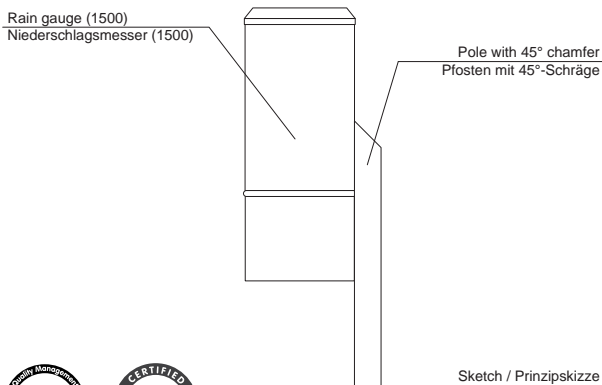
If snow is to be expected, the snow cross has to be put into the collecting funnel of the rain gauge. By this it is extensively avoided that a strong wind will blow a part of the precipitation out of the collecting funnel. The snow cross must be taken off as soon as there are only liquid precipitations, as otherwise measuring errors will occur owing to the greater surface which will cause a larger evaporation.

When taking the measurement with the measuring cylinder, the height of precipitation and thus the reading accuracy is enlarged in proportion of the diameter of the collecting surface to the inside diameter of the measuring cylinder. For further increase of the reading accuracy in the case of light precipitations, the base of the measuring cylinder has been made conically, so that below approx. 1 mm height of precipitation the distance between the graduation lines is enlarged. As the division of the measuring cylinder depends on the mentioned proportion of the diameter, it is no longer valid, if this proportion is changed e. g. by deformation of the ring limiting the collecting surface. Such rain gauges are useless.

**Installation**

Rain gauges have to be set up on a free place: houses, trees and other objects should be as far from the point of observation as they are tall. As the measuring point should not constantly be changed because of the comparison of the measurements, the growth of trees and bushes has to be taken into consideration. The setting up on roofs or in the entirely open country, especially on unprotected soil elevations, is unsuitable, since the measurements might unfavourably be influenced by the wind and representative measuring results will rarely be obtained for a large observation area.

The collecting surface should be 1 m above the ground. For the fastening the support (1500 U5) can be used, which has to be fixed to the square-bar post with dimensions of approx. 10 x 10 cm. The rain gauge should be mounted above the upper end of the post and the post should be provided with an 45° chamfer (see the sketch below) to avoid incorrect measuring values.



**Maintenance**

Rain gauges are widely unsusceptible to disturbances owing to their simple and robust construction. The leaves and other pollutions, which could obstruct the wast-pipe of the collecting can, have regularly to be removed from the collecting funnel. The lacquered surface, especially the interior of the collecting funnel, has to be attended with a commercial cleaning material, as cracks in the finishing prevent collected rain water from flowing off.

**Technical data**

|                                  |   |
|----------------------------------|---|
| <b>Id-No.</b>                    | <b>00.15000.000 000</b>   |
| Measuring element:               | collecting funnel with collecting can   |
| Measuring ranges:                | 1.2 l collecting can for 60 mm •<br>200 cm³ measuring cylinder for 10 mm precipitation quantity |
| Collecting surface:              | 200 cm²/ WMO standard   |
| Range of application:            | operating temperatures 0...+60 °C   |
| Scale:                           | 0.1 mm/ 0...10 mm   |
| Maximum Permissible Error (MPE): | 0.1 mm precipitation  |
| Housing/ Design:                 | zinc plate · RAL 7038 (agate-grey) · acc. to DWD/ DIN 58666                                     |
| Materials:                       | collecting can/ cylinder:<br>plastics/ polystyrene acc. to DIN 58667                            |
| Dimensions:                      | H 450 mm · Ø 190 mm   |
| Weight:                          | approx. 2.3 kg  |

**Version:**

**(1500 b) Rain and Snow Gauge according to Hellmann**

|               |   |
|---------------|---|
| <b>Id-No.</b> | <b>00.15002.000 000</b>   |
|               | with 2 collecting cans · 2 collecting funnels · 2 bottom parts and 2 snow crosses |
| Weight:       | approx. 5.2 kg  |

**Accessories:**

|                         |   |
|-------------------------|---|
| <b>32.15000.005 000</b> | <b>(1500 U5) Support</b><br>necessary for assembly of (1500) · galvanized flat steel · H 375 mm · weight approx. 0.7 kg |
| <b>32.15000.030 000</b> | <b>(1500 U30) Snow cross</b><br>weight 0.5 kg   |
| <b>33.15000.031 000</b> | <b>(1500-31) Spare measuring cylinder</b><br>Polystyrene acc. to DIN 58667 · weight approx. 0.05 kg                     |



Quality System certified by DQS according to DIN EN ISO 9001:2008 Reg. No. 003748 QM08

Subject to change without notice.

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