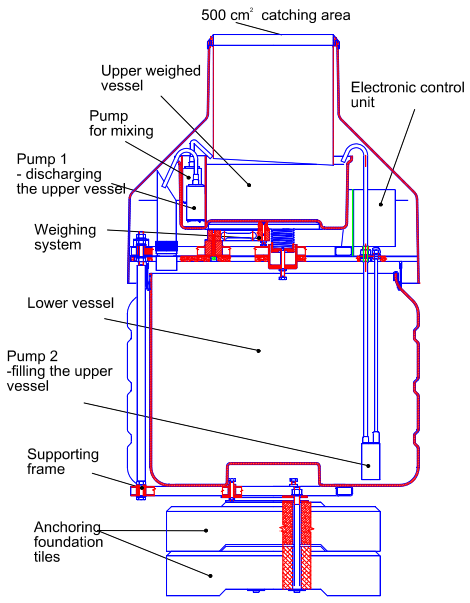
MRW500 Weighing Rain Gauge

Basic Characteristics

- **The MRW500 is a rain gauge based on weight measuring principle and with 500 cm^2 of the catchment area. This device is designed for the measuring of the liquid as well as the solid precipitation.**

- **Rain gauge consists of two vessels and the move of liquids between them is realized by the pumps. The upper, weighted vessel catches the falling precipitation and contains antifreeze liquid in which solid precipitation thaws. Apart from the antifreeze, the upper vessel also contains a thin layer of silicon oil to prevent evaporation. By that the measuring error caused by evaporation during ongoing precipitation is suppressed. At this time the standard software correction for evaporation is not possible to use.**

- **Effective capacity of the lower, collection vessel is 70 liters with an initial charge of 20 liters of antifreeze; therefore, with the catchment area of 500 cm^2, the effective capacity equals 1,400 mm of precipitation. To promote the capacity even higher, the construction of the lower vessel supports the natural evaporation of rainwater from the mixture of water and antifreeze. This in turn increases the concentration of used antifreeze in the mixture; the antifreeze may be used again in the upper, collection vessel. By that the interval for necessary discharge of the lower vessel is prolonged.**



- **Rain gauge is fitted with a data output as standard. Optionally the MRW500 rain gauge can be delivered with the pulse output simulating the output of a tipping bucket rain gauge.**

- **Mixture of rain water and antifreeze in the upper vessel is stirred by the pump in dependence on the amount of precipitation and outdoor temperature. It prevents the formation of the gel consistence of this mixture. By that the blowing of the captured snow from the upper vessel is reduced.**

- **Inner surface of the catching orifice and the outer surface of the upper weighted vessel is tempered to prevent dew formation.**

- **Depending on actual precipitation and outdoor temperature the collar of the catching aperture is heated by intensive and short-period , so called "shock" heating. This prevents undesirable**

reduction of catching area by snow glued on the collar.

- **Rain gauge have integrated the "hardware" and also "software" rain detector. Both detectors helps to observe a process of precipitation and to solve nonstandard situations.**
- **Available options of the rain gauge include external heating of the upper part for extreme winter conditions.**

Technical Specification

Catching area	500 cm ^{2}
Output: Data Output **or optionally:** **Pulse Output (simulation of the tipping bucket)**	RS232 duplex …… 19200 Bd, 8 data bit, 1 start bit , without parity Data output is cyclic or on request. Cyclic output can be in two forms – binary output or text string. The output provides two information - actual amount of precipitation and precipitation intensity over last 1 minute. Standard period of cyclic data output is 10 second but it is adjustable. Time duration of pulse …… 150 ms Max. blocking voltage …….. 100 V AC/ V DC Max. current …….. 0,1 A
Accuracy	Data Output ……. ± 0.1 mm of the precip. In the whole temp. operational range Pulse Output . up to + 0.1 mm of the precip. In the whole temp. operational range
Resolution	Operational resolution (indication of precipitation) ……. 0,01 mm Output realistic resolution (. In the whole temp. operational range.. …. ….0,1 mm
Supply voltage	Electronics, pumps and hardware rain detector …… 12 V DC Heating …… 46 V AC
Power consumption	Electronics …….. 1 W One pump (only one pump can be in operation in one moment) ……... 20 W "Shock" heating …… 105 W Tempering …… 116 W Rain detector …… 20 W
Usable volume of the upper vessel	2 l (at dilution 1:1)
Usable volume of the lower vessel*	90 l without antifreeze liquid. This capacity is increased by help of the support of the natural evaporation. (1000 mm of the precipitation with the given catching area represents the volume of 50l).
Utilised antifreeze liquid	Fridex EKO: Based on non - toxic propylene glycol, does not contain nitrites, phosphates, and amines. Biodegradable. Dilution: 1:2 ..... -15°C 1:1,5 ..... -20°C 1:1 ..... -32°C Initial fill - c. 16 - 25 l according to the climate conditions at the installation site (*)
Oil for prevention of evaporation in upper vessel	LUKOSIOL M100 methyl-silicone oil . Based on polydimethyl siloxane liquid. Physiologically inert. Initial fill …….. …… 0.4 l
Operational temperature	- 32 °C ... + 60 °C (while using Fridex EKO non-freezing liquid) - 39 °C ... + 60 °C (while using Fridex EKO Carline non-freezing liquid)
Dimensions (height x diameter)	1000 x 620 mm
Weight	c. 30 kg

***** The user must choose whether he prefers the rain gauge capacity (the larger volume of the lower vessel usable for precipitation total lowers the used amount of non-freezing liquid) or the opposite – whether at the site of installation there are very great freezes over long periods of time and it is necessary to use the maximum amount of non-freezing liquid.