

MPS system developed a new design of radiation shield (RS) for various external temperature, humidity probes and also as an our compact sensor (DMP P-TRh) with temperature, relative humidity and pressure sensors with serial channels (SDI12, MODBUS) and Bluetooth communication.

We have compared more that one year of 6 different radiation shields, small Stevenson screen, and continuous ventilated isolated shield as a reference. Accurate temperature sensors have been installed in each screen (two sensors to measure gradient inside of screen). Instant data from global radiation are also available. Sunshine radiation is the most important contribution to influence behaviour of RS.

Accuracy of temperature sensors are the same and better than $\pm 0,02^{\circ}\text{C}$ each. Resolution $0,001^{\circ}\text{C}$. Data are transmitted each second via BlueTooth to data cloud.

Conclusions:

- Cheap plastic RS overestimate $+ 7^{\circ}\text{C}$
- Standard and word wide used RS underestimate up to -1°C in the morning and overestimate $+0,3$ afternoon. During night all sensors show the same value.
- complicated inside construction of RS causes temperature gradient inside RS. This value is up to $0,4^{\circ}\text{C}$
- during sunny day reflected irradiance from the ground has influence to the aspirated radiation shield which has no mechanical protection .



90x180mm
10 lamelas



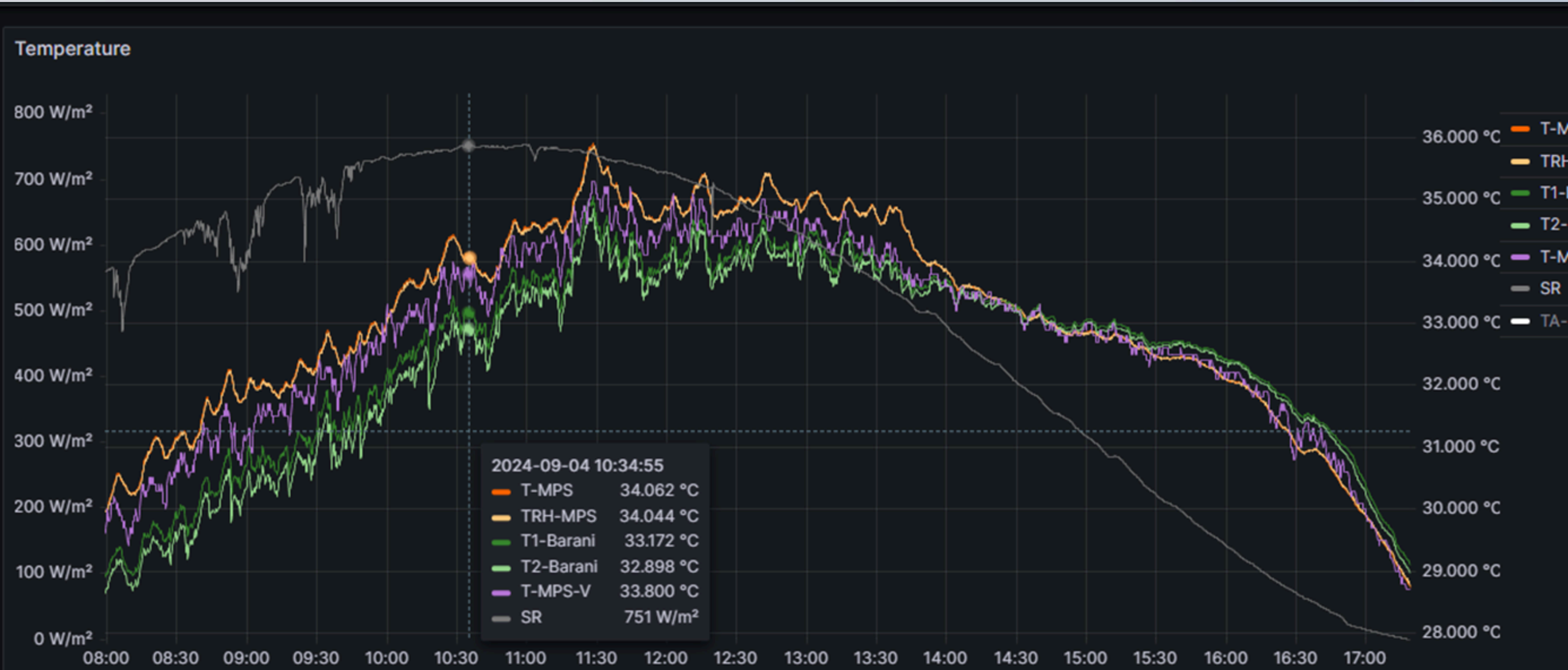
140x227mm
8 lamelas



238x294mm
10 lamelas



170x226mm
10 lamelas



underestimation - 0,7 degC

overestimation +0,2degC

New design of radiation shield should consists of vertical lamellas, which create practically infinite number of horizontal lamellas. This construction allows to exchange air very fast without very low delay and sensor can measure real temperature and humidity. Construction of lamellas can protect inside space of RS against radiation influence which is most important to others.

Our naturally aspirated RS with different principle and construction shows under all conditions excellent coincidence with reference aspirated RS.

New products

MPS RS - Radiation shield for one or two external sensors.

DMP P-TRh - compact sensor with integrated radiation shield. Measurement of ambient temperature, relative humidity and pressure.

DMP P-TRh with serial communication chanel or battery powered for 10 years

