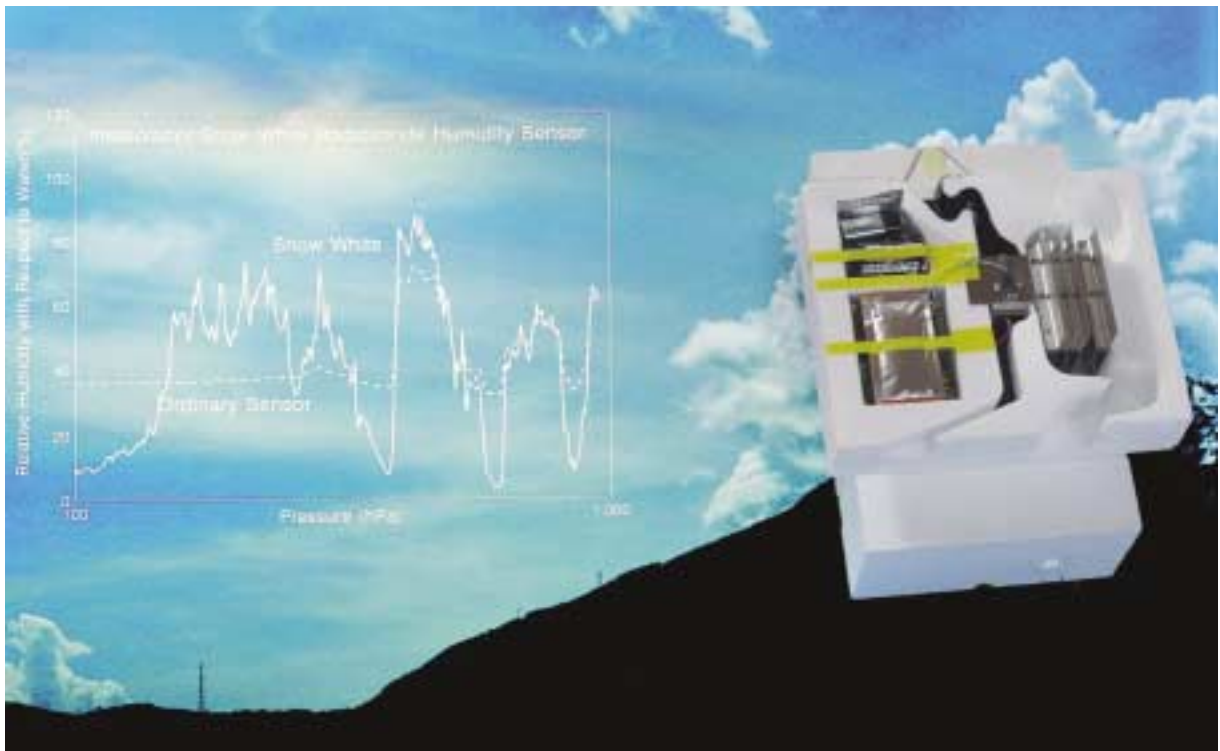


# Water vapour measurement in troposphere and lower stratosphere

**meteolabor Snow White®** Electrically chilled mirror dew-point hygrometer for radiosondes

- low cost chilled mirror dewpoint sensor, designed for radiosonde application
- light weight
- fast response
- accurate measurement of dew-point or frost-point temperature
- easy to operate ("plug in" instrument)
- needs no individual calibration.
- detects clouds and measures their liquid and solid water
- if recovered after flight, *Snow White®* can be used again without recalibration



The *Snow White®* sensor responds a lot faster to humidity changes than regular humidity sensors.

The original *Snow White®* sensor was designed for the Swiss radiosonde SRS400. *Snow White®* is now also available as sensor for other radiosondes. Because *Snow White®* is equipped with a copper constantan thermocouple in the mirror, the radiosonde must be able to process the very small thermocouple signals. The original model SW35

demands therefore a radiosonde telemetry that can process very low voltage signals, as the Swiss radiosonde SRS400.

The model *Snow White®* ASW35 transforms temperature signals to higher voltage levels, which allows easy interfacing with many types of radiosonde telemetry.

*SW35 with SRS400 sonde*



*SW35 with SRS-C34 sonde*



*ASW35-V with VIZ Mark-II*



## Interface *Snow White*<sup>®</sup> radiosonde

Snow White outputs <sup>2)</sup>	SW35		ASW35-1		ASW35-2	
	Range	Accuracy <sup>1)</sup>	Range	Accuracy <sup>1)</sup>	Range	Accuracy <sup>1)</sup>
Voltage	+1mV...-3mV -	+/- 1μV -	0...1V 4kΩ...60kΩ	+/- 1mV +/- 0.25%	0...2V 4kΩ...60kΩ	+/- 2mV +/- 0.25%

1) Accuracy of radiosonde telemetry corresponding to temperature error of 0.1 K

2) both outputs of ASW35 must be logged by the radiosonde

Note: ASW35-1 and ASW35-2 are both available with positive and negative polarity of output voltage:

ASW35-1P output 0... +1 Volt

ASW35-1N output 0... -1 Volt

ASW35-2P output 0... +2 Volt

ASW35-2N output 0... -2 Volt

## Specifications for SW35 and ASW35:

Operating time with standard battery package	4 hours
Operating time with option L battery package	8 hours
Weight	380 g (option L: 450 g)
Dimensions	W=21 cm; H=21.5 cm; D=10 cm
Measuring range RH	2% RH...100% RH
Mirror temperature range	-80°C...+40°C

Some *Snow White*<sup>®</sup> radiosonde data show "oversaturation", which may give the appearance of failed sensor function. This is not the case, but *Snow White*<sup>®</sup> offers an interesting feature: if it flies through clouds containing liquid water (fog) or ice crystals, *Snow White*<sup>®</sup> indicates higher RH values than 100% (higher mirror temperatures than air temperatures). The effect occurs because *Snow White*<sup>®</sup> sensor parts are heated in this situation. The sensor evaporates water droplets (fog) and small ice crystals in the air sample that flow through it, which raises water vapour pressure. The measured dewpoint temperature is then higher than

the value in saturated conditions. This feature of *Snow White*<sup>®</sup> makes it possible to detect clouds or even to measure the amount of liquid/solid water content in clouds. Sounding data show sometime turbulence of mirror temperature when *Snow White*<sup>®</sup> goes trough clouds containing small ice crystals. This occurs because the amount of evaporated ice crystals may change, causing variations in vapor pressure and therefore in mirror temperature.

However in all cases where mirror temperature is higher than air temperature, *Snow White*<sup>®</sup> is in a cloud.

Design and cooling performance of the sensor allow measurement of RH down to values of 2%, depending on air temperature.

Batteries are included with *Snow White*<sup>®</sup> sensors.

Battery type	IEC	USA	Remarks
1.5 Volts / 8Ah	LR14	C	normal package
1.5 Volts / 18Ah	LR20	L	option L
9 Volts / 0.6 Ah	6LR61	Transistor	<i>Snow White</i> <sup>®</sup> starts operating when 9 Volt battery is plugged in.

Please note: When the 9 Volt battery is plugged in, the 1.5 Volt battery is also discharging. If *Snow White*<sup>®</sup> is operating for more than 30 minutes before start, then both batteries must be changed.

Algorithms for evaluating of *Snow White*<sup>®</sup> data are available from meteolabor ag

If VIZ MARK II Microsonde will be used, a complete radiosonde attached with *Snow White*<sup>®</sup> can be supplied by meteolabor ag or by Sippican Inc, VIZ Meteorological System Group.

## Ordering informations

- SW35
- ASW35-1
- ASW35-2

meteolabor reserves the right to make changes without further notice