



# ms 1 Set M



**A hand-held precision instrument for the measurement of relative humidity of materials / the aw value (water activity of food-stuffs) and temperature.**

For measurements of somewhat larger material samples, such as granulates, textiles, wood chips, sawdust, tobacco, tealeaves, herbs, potato crisps, biscuits, confectioneries, cereals, coffee beans etc. Relative humidity measurements can also be performed if the sensor is open. The sintered filter provides excellent dust protection.

<b>Measurement range</b>	: 0.06 ... 0.98aw (non condensing)
<b>Temperature</b>	: -20...+80°C
<b>Box sensor</b>	: HSM-3 with resistive electrolyte measurement cell CK-3
<b>Precision</b>	: +/- 0.01aw, +/- 0.3°C
<b>Communication</b>	: RS-232 interface (optional)



## ms 1 Set M

*Precise, fast, flexible*

A practical, 1'000 times proven precision, hand-held instrument for humidity and temperature measurements. Thanks to its Novasina electrolyte sensor, the ms1 is particularly well suited to high precision humidity measurements in a broad range of materials and also in air. The instrument and sensor are extremely robust, have excellent long-term stability and are essentially hysteresis-free.

The integrated computer supplements relative humidity measurements with a number of parameters of the Mollier hx-Diagram. The large and clear LCD display is easy to read. The instrument is battery powered, but an additional mains power supply is available to support long-term measurements. An optional RS-232 interface and supporting PC software (Novalog 32) is available for connecting a printer resp. a PC.

The instrument is delivered in a sturdy plastic carrying case with space for various additional accessories.

### Examples of typical samples which can be measured :

- **Relative humidity of plastic granulates**
- **Relative humidity of tea or tobacco leaves**
- **Relative humidity of Textile samples**
- **Relative humidity (or aw values) of foodstuffs, cereals coffee beans (see also Set AM und Set AMS)**
- **Room- or air duct humidity, dew point temperature etc.**
- **Cosmetics and drugs**

### **Instrument ms 1:**

Dimensions	: 54x43x265mm
Weight	: 280 g
Power	: 9V Battery

### **Humidity sensor:**

Electrolyte-Measurement cell	
Range	: 0.06...0.98aw
Repeatability	: +/- 0.003aw
Precision	: +/- 0.01aw (0.10...0.95aw, 25°C, with 5 point calibration)

### **Temperature sensor:**

Precise NTC-Resistance	
Range	: -20...80°C
Repeatability	: +/- 0.1° C
Precision	: +/- 0.3° C

### **Humidity standards**

#### **Salt tablets SAL-T:**

Saturated pure salt solutions, based on national standards are recommended:

**!! see catalogue accessories !!**



## ms 1 Set M



[111 0511](#) ms1 Set M

### ms 1 Set M

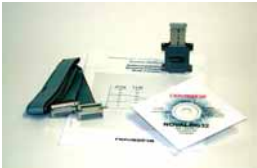
The Set M is a simple and precise entry-level set for important aw value measurements in the food sector, particularly when larger volumes of samples are involved (%RH). It consists of an ms1 hand-held instrument with a large, special-purpose measurement sensor, and a range of accessories all housed in a robust plastic case. Space is available for further options, such as a power supply or interface/cable. The Set can be tested and recalibrated as required using individual Sensor Check humidity-standards.

#### *Carrying case with:*

- Measuring instrument **ms 1 E**
  - Sensor HSM-3, 1m cable with 9-pin plug
  - 9V Battery
  - Plastic rack for the ms1
  - Sensor Check SC 75% rh
  - Adapter CH to HSM and SAL-SC
  - Styrofoam box for calibration
  - User manual
  - Factory certificate of the 5-point calibration at 11-33-53-75-90%
- Weight: 2.300 kgs



## Accessories for ms 1 sets



**111 0826** Interface PC

### Interface RS-232

RS232 interface, 1m / 1,8m long cable, CD with software **Novalog 32** for Win 9x/2000/NT/XP.

#### Interface Set comprising:

- 1m cable with D-Sub 25/25-pin
  - 1,8m cable with D-Sub 9F/25M pin
  - RS-232 Interface
  - CD with NOVALOG32 software for Windows systems
  - User manual
- Weight: 450g



**111 0562** Interface Seiko

### RS-232 interface for Seiko printer

RS-232 interface, 1m long cable to connect a Seiko **DPU 411** thermal printer. This makes it possible to control the printer using the printer parameters defined in the **ms 1** menu.

-> **The printer must be obtained locally**

#### Printer-Interface-Set Seiko:

- Printer cable : Flat cable
- 1m long printer cable with D-Sub 25/25-pin
  - RS-232 interface
  - Seiko adapter box
- Weight : 300g



**111 6256** Adapter 25F/9M

### D-Sub adapter 25F/9M

Additional adapter for the RS-232 Interface for Seiko printer (111 0562), permitting connection to the more recent Seiko **DPU 414** printer.

#### Adapter Interface:

- Dimensions : 60 x 40 x 20 mm
- Adapter D-Sub 25F/9M
- 25-pin female con.
- 9 - pin male con.
- Weight: 50g



**111 0661** Interface Epson

### RS-232 interface for Epson printer

RS-232 interface, 1m long cable to connect an Epson or other compatible 9-pin needle printer. This makes it possible to control the printer using the printer parameters defined in the **ms 1** menu.

-> **The printer must be obtained locally.**

#### Printer-Interface-Set Epson:

- Printer cable: Flat cable
- 1m long printer cable with D-Sub 25/25-pin
  - RS-232 interface
  - Epson adapter
- Weight: 300g



- - - Example - Seiko Printer

### Printer

A printer must be purchased locally.

> **Novasina does not supply printers.** <

#### Printers:

Portable printer for an easy direct connection to an ms1 hand-held instrument via a serial interface. A range of different printers can be supported by the ms1.



**111 8426** Seiko Thermal paper

### Thermal paper replacement rolls

for **Seiko DPU 411, 414** printers.

**Attention:** This paper must be stored in a dark and dry place. This is thermal transfer paper only intended for Seiko printers.

Printer type: **Seiko DPU 411, 414**

**Note:** Set of 5 rolls, each 25m long

#### Thermal paper replacement:

Set of 5 rolls, each 25 m long.  
Thermal paper for Seiko printer Models DPU 411 and 414

Paper width 11cm  
Weight: 850g each Set  
Set of 5 rolls, each 25m long



**111 0601** ePW sample dishes

**ePW sample dishes**

For an enBSK measurement chamber

Packet of 100 sample dishes for the sample sensor enBSK-3.

These are disposal, intended for a single use with any Novasina aw instrument

**A package consists of:**

- 100 sample dishes ePW
- Material : Polypropylene
- Dimensions : 40mm diameter x 12mm deep
- Weight : 440 g

**To all water activity meter**



**111 0790** SI Set BS

**SI, sorption isotherm set**

for the BSK Sensor

This accessory, together with the Novasina humidity standards SAL-T, makes it possible to easily determine points of a sorption isotherm. (A precision balance and an oven are also required.)

**Prerequisite:** the laboratory room temperature must be kept absolutely constant.

**SI – Set BS complete with:**

- 1 SI-ring BS
- 1 substance basket
- 1 weighing glass
- 1 pair of tongs

For precise determination of a sorption isotherm, the AW SPRINT or AW CENTER with temperature control should be used.

Weight: 280 g **for set aw**



**111 1218** Tweezers for CK cells

**Special tweezers**

To simplify the exchange of a CK measuring cell in an enBSK measuring head.

**Special-tweezer:**

Material : stainless steel  
For changing the humidity cell in an enBSK head

Weight: 20 g  
**for set aw**



- 111 0930** -> SAL-T 11% rh
- 111 0932** -> SAL-T 33% rh
- 111 0934** -> SAL-T 53% rh
- 111 0936** -> SAL-T 75% rh
- 111 0938** -> SAL-T 90% rh

**SAL-T salt tablets**

Humidity standards based on saturated salt solutions in plastic tablets with humidity-permeable membranes. Each salt is delivered in an airtight can. SAL-T are available with the following humidity values (at 25°C):

11,3 %	colour	white	
32.8 %	colour	blue	
52.9 %	colour	green	(DG see general terms of sales)
75.3 %	colour	purple	
90.1 %	colour	white	(DG see general terms of sales)

**Humidity values in the temperature range 15° .... 30°C:**

- 11.3 ..... 11.3% rh
- 33.3 ..... 32.4% rh
- 55.9 ..... 51.4% rh
- 75.6 ..... 75.1% rh
- 90.9 ..... 89.9% rh

The precision corresponds to the Greenspan Report 1977 typically +/- 0.3 % rh

Weight: 50 g a piece

**To all water activity meter**



- 111 1056** -> SAL-T/C 11% rh
- 111 1057** -> SAL-T/C 33% rh
- 111 1060** -> SAL-T/C 53% rh
- 111 1063** -> SAL-T/C 75% rh
- 111 1065** -> SAL-T/C 90% rh

**SAL-T/C salt tablets EU**

with European certificate

Humidity standards based on saturated salt solutions in plastic tablets with humidity-permeable membranes. Each salt is delivered in an airtight can. SAL-T are available with the following humidity values (at 25°C):

11,3 %	colour	white	
32.8 %	colour	blue	
52.9 %	colour	green	(DG see general terms of sales)
75.3 %	colour	purple	
90.1 %	colour	white	(DG see general terms of sales)

**Internationally accredited laboratory**



All Novasina humidity standards are also available with an internationally recognised certificate from an accredited European laboratory (UKAS England).

Weight: 50 g a piece

**To all water activity meter**



**111 0695** Case with 5 SAL-T

### Set of 5 SAL-T salt tablets

Humidity standards based on saturated salt solutions in plastic tablets with humidity-permeable membranes. Each salt is delivered in an airtight can. The set consists of a case containing one each of the following values (at 25°C):

11,3 %	colour	white	
32.8 %	colour	blue	
52.9 %	colour	green	(DG see general terms of sales)
75.3 %	colour	violet	
90.1 %	colour	white	(DG see general terms of sales)

### Case with 5 salt tablets:

SAL-T for 11 ... 90%rh  
Humidity values in the temperature range 15° ... 30°C:

11.3	.....	11.3%	rh
33.3	.....	32.4%	rh
55.9	.....	51.4%	rh
75.6	.....	75.1%	rh
90.9	.....	89.9%	rh

The precision corresponds to the Greenspan Report 1977 typically +/- 0.3 % rh Weight: 670 g  
**To all water activity meter**



Prices see on the pricelist

### Certification of an aw instrument

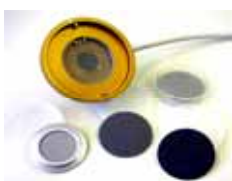
*in an accredited European laboratory*

A UKAS-laboratory will certify the instrument at two or more humidity values and at several different temperatures if required.

### Internationally accredited laboratory



Certified instruments can be also supplied



- 111 1001** -> eVC-21
- 111 1003** -> eVC-26
- 111 7212** -> Redox
- 111 0995** -> eVALC
- 111 0997** -> eVMT-2
- 111 0999** -> eVMS-2

### Cell protection filters

A number of filters are available to protect the measurement cell from abrasion or corrosive vapors.

-> Please consult the appropriate datasheets

### Filters for enBSK head:

- 111 1001** -> eVC-21 (10 pieces)
- 111 1003** -> eVC-26 (10 pieces)
- 111 7212** -> Redox (1 piece)
- 111 0995** -> eVALC (2 pieces)
- 111 0997** -> eVMT-2 (5 pieces)
- 111 0999** -> eVMS-2 (5 pieces)

Weight : 30 g

**To all water activity meter**

## Spare parts for ms 1 sets



**111 1083** 9V battery

### 9V-battery

*Alkali-manganese battery (not rechargeable)*

This battery permits up to 25 hours of continuous operation. If a rechargeable battery is used, an external charger is required. -> The ms1 cannot perform this function.

### 9V Battery for the ms1:

Alkali cell battery :  
Battery 9V DC, 180mAh  
A standard battery, available in most electronic shops  
Max. storage time : 2 years  
Weight : 50 g  
**for all ms 1 sets**



**111 1564** 230V power supply  
**111 1406** 115V power supply

### 230V or 115V power supply

The power supply is recommended when the **ms1** is used for a long period in one place, or to preserve battery power when the RS 232 interface is extensively used.

The ms1 does not recharge batteries. If rechargeable batteries are used, an external charger is needed.

### Power supply:

230V AC +/- 10% / 50-60Hz  
115V AC +/- 5% / 50-60Hz

Output : +9 V DC / 16 mA  
Power requirement: 0.4 VA  
Plug : 4 mm diameter coax  
Weight : 250 g

**for all ms 1 sets**



[111 1013](#) CK-3 cell

### CK-3 measurement cell

For the HSM-3, enSARK-3, enCSK-3, enBSK-3 Humidity measurement cell with neither temperature measurement nor integrated saturation protection. The aluminium (SARK) or sinter (CSK) filter should be removed and the measurement cell replaced by hand. In no circumstances should, the filter surface on the top of the cell be touched by hand or a hard object.

-> Humidity measurement cell. The ms1 requires recalibration after cell replacement.

#### Humidity-Measurement cell CK-3:

Humidity measurement  
Range : 6.....95 % rh  
*Attention : No saturation protection!*  
Repeatability: 0.3 % rh  
Precision : +/- 1.0 % rh  
(when calibrated on instrument on all 5-Points from 11 to 90%rh)  
Weight: 1 g

**for set aw & M**



[110 6821](#) enBSK-3

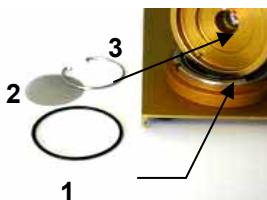
### enBSK-3 sample sensor

Ideal for small sample volumes. For use with the measuring plate PP and the disposable sample dishes ePW. The sensor consists of the head BSK, a humidity measurement cell CK-3, the NTC-temperature sensor and a metal mesh protection filter.

#### Sample sensor enBSK-3:

Material : Aluminum anodised  
Weight : 240g  
Connector : 9 pins

**for set aw**



[111 1373](#) O-Ring : 1  
[112 0175](#) Braided filter : 2  
[111 0111](#) Tension ring : 3

### Replacement parts for "head BSK"

- O-ring seal for the measurement chamber.  
*Recommendation: The O-ring should be periodically exchanged and lubricated with silicon grease.*
- Metal mesh filter for protection from particles.
- Tension ring for clamping the filter(s).

#### Spare parts to enBSK:

- O-ring seal
- Mesh filter
- Tension ring

Weight: 1 1 g  
2 30 g  
3 10 g

**for set aw**



[111 0770](#) Measurement plate

### Sample measuring plate PP

for enBSK-3

The product sample is placed in a sample dish ePW (111 0601), which is inserted in the sample measurement plate.

#### Measurement plate PP: for enBSK sensor head

Dimensionens : 15 x 9 mm  
Material : Anodised aluminium  
Weight : 200 g  
**for set aw**



[110 6515](#) Tweezers for ePW

### Tweezers

for ePW

To ease the removal of the sample dish ePW from the sample measurement plate PP.

#### Tweezers:

Material : stainless steel

Weight: 20 g

**for set aw**

## Options for ms 1 set AW / M



[110 7345](#) Adapter CH

### SAL-SC Sensor check adapter CH

for sensors with diameter 13 mm

This adapter is needed for calibration of a system with sensor diameter 13 mm. It ensures an airtight fixation of a SAL-SC check to the sensor top (measurement cell area). It reduces the diameter of 20 mm to 13 mm and ensures an airtight seal.

-> The adapter should be first mounted on the sensor top and then putted the SAL-SC check on it. Both seals should be carefully checked, leaks will bias the calibration.

#### CH adapter to SAL-SC salts for sensors with diameter 13 mm:

Dimensions : 30 x 13 mm  
Material : Polycarbonate, rubber

Weight : 5 g

**for set M**



with CK-3 measurement cell  
**252 4708** HSM-3 – 1m cable

### HSM-3 sensor incl. sample box

*Complete with the sample box large*

Modern and light polycarbonate plastic sensor with a shaft diameter of 13mm. Inclusive exchangeable resistive electrolyte measuring cell CK-3. Aluminium protective cap with a shaft diameter of 13mm and braided filter of rust-resistant steel. With a 350 ml one way plastic box for bigger sample volumes.

**Accessories:** 1 sample box

-> For SAL-SC calibration kit please use the Sensor Check adapter Nr. 1107345 (tightness)

#### HSM-3 Sensor incl. Box:

Dimensions Sensor: 160 x 13 mm  
Dimensions Box 112 x 76 mm  
Weight : approx. 200g  
Measurement : AW and Temp  
Connector : 9 –pin plug for the ms1  
Power : passive  
Outputs : Novasina specific  
Protection :braided filter without membrane  
**only for set M**



**252 5413** HSM-113–9-pin,1m cable

### HSM-113 sensor

A small, and light water activity sensor in a polycarbonate plastic housing with 100mm tube length for large sample box. Shaft diameter of 13 mm. Without measurement cell and filter.

Only for ms1 set M available.

-> Please use the Sensor Check Adapter Nr. 1107345 for SAL-SC calibration to ensure the correct sealing.

#### HSM Sensor including plug:

Dimensions : 160 x 13 mm  
Shaft length : 100 mm  
Weight : 100 g  
Measurement : AW and Temp  
Connector : 9 –pin plug for the aw-Lab Set F  
Power : passive  
Outputs : Novasina specific  
**only for set M**



**111 5343** Box Mounting Kit

### Box mounting kit

Box mounting flange for HSM sensors. For easy, sealed mounting through probe boxes. The flange can be fixed by 3 screws The sensor can be removed at any time for recalibration.

-> Clamping range: 10 .... 14 mm

#### Duct mounting kit for HS:

Flange dimensions : 60 x 20 mm  
Weight : 30 g  
Clamping range : 10...14 mm  
Available for larger sample box installation.  
**only for set M**



**111 6330** Active charcoal filter

### Filter protective cap with active charcoal for the HSM sensor

Aluminium filter protective cap for the HSM sensor. Incorporates a stainless steel metal web and an active charcoal insert. Provides optimal protection of the measurement cell from corrosive gases and industrial pollutants.

-> The filter has a 12 um mesh size

#### Active charcoal filter for HSM:

Filter dimensions : 28 x 13 mm  
Weight : 15 g  
Effect : mechanical protection  
chemical protection  
Nitrous oxide, oil-smoke, fine dust  
amine, ethylene Particle  
size over : 12 um  
**only for set M**



**111 6329** Metal webfilter

### Metal-web filter for the HSM sensor

The standard filter protective cap for the HSM sensor. Made of aluminium woven material for highly demand-ing industrial applications, Provides good protection against dirt such as dust or larger particles in an industrial environment, but no protection against water spray.

-> The HSM is delivered with this filter

#### Metal web filter for the HSM:

Filter dimensions: 25 x 13 mm  
Weight : 10g  
Effectiveness : Mech. protection  
no chemical protection  
Particle size above: 25 um  
Supplied with the HSM sensor  
**only for set M**



**252 4710** sample box large

### Sample box large HSM-3/7

New large sample box for **HSM-3 box sensor**. (without screw connection)

These are disposals, intended for a single use with Novasina aw-Lab or ms-1 instrument with HSM sensor.

#### A large sample box contains:

1 new sample box  
Material : Polypropylene  
Dimensions: 112 x diam. 76 mm  
Weight : 50 g  
**only for set M**



- [111 0885](#) -> SAL-SC 11
- [111 0855](#) -> SAL-SC 33
- [111 0857](#) -> SAL-SC 53
- [111 0859](#) -> SAL-SC 75
- [111 0896](#) -> SAL-SC 90

**Sensor-Checks SAL-SC (rh standards)**

Humidity standards based on saturated salt solutions in plastic cylinders with moisture permeable membranes. Each salt is delivered in a well-sealed box. Sensor Checks SAL-SC are obtainable for the following values (at 25°C) :

for HSM and enCK-x sSensors on ms 1 !

- 11.3 % rh colour white
- 32.8 % rh colour blue
- 52.9 % rh colour green (DG see general terms of sales)
- 75.3 % rh colour purple (DG see general terms of sales)
- 90.1 % rh colour white (DG see general terms of sales)

**Humidity values in the temperature range 15° .... 30°C:**

- 11.3 ..... 11.3% rh
- 33.3 ..... 32.4% rh
- 55.9 ..... 51.4% rh
- 75.6 ..... 75.1% rh
- 90.9 ..... 89.9% rh

The precision corresponds to the Greenspan Report 1977 typically +/- 0.3 % rh

Weight : 90 g  
for set AMS/M



- [111 1044](#) -> SAL-SC 11 C
- [111 1037](#) -> SAL-SC 33 C
- [111 1040](#) -> SAL-SC 53 C
- [111 1035](#) -> SAL-SC 75 C
- [111 1032](#) -> SAL-SC 90 C

**Sensor-Checks SAL-SC EU with European certificate**

Humidity standards based on saturated salt solutions in plastic cylinders with moisture permeable membranes. Each salt is delivered in a well-sealed box. SAL-SC are obtainable for the following values (at 25°C) :

for HSM and enCK-x sSensors on ms 1 !

- 11.3 % rh colour white
- 32.8 % rh colour blue
- 52.9 % rh colour green (DG see general terms of sales)
- 75.3 % rh colour purple (DG see general terms of sales)
- 90.1 % rh colour white (DG see general terms of sales)

**Internationally accredited laboratory**



All Novasina humidity standards can also be supplied with an internationally recognised certificate from an accredited European laboratory (UKAS -UK).

Weight : 90 g



[111 7847](#) Sensor-check set

**Set with 5 Sensor-Checks SAL-SC**

Humidity standards based on saturated salt solutions in plastic cylinders with moisture permeable membranes. Each salt is delivered in a well-sealed box. SAL-SC are obtainable for the following values (at 25°C) :

- 11.3 % rh colour white
- 32.8 % rh colour blue
- 52.9 % rh colour green (DG see general terms of sales)
- 75.3 % rh colour purple (DG see general terms of sales)
- 90.1 % rh colour white (DG see general terms of sales)

**Case with all 5 Sensor Checks from 11 to 90%rh:**

Humidity values in the temperature range 15° ... 30°C :

- 11.3 ..... 11.3% rh
- 33.3 ..... 32.4% rh
- 55.9 ..... 51.4% rh
- 75.6 ..... 75.1% rh
- 90.9 ..... 89.9% rh

The precision corresponds to the Greenspan Report 1977 typically +/- 0.3 % rh Weight : 900 g



[111 3542](#) Extension cable

**Extension cable for ms-1**

1.5m long cable with 9-pin connectors for remote measurements with the **ms 1 E**.

-> Use of the extension cable does not require recalibration of the instrument

**Extension cable to ms1:**

Extension cable: 1.5m  
Weight: 120g  
Connector: 9-pin special connectors for ms1 and sensor.



[111 0978](#) enCK-3

**enCK-3 sensor**

Sensor with resistive electrolyte humidity measurement cell CK-3 and integrated temperature sensor. Standard humidity sensor for the ms 1 E.

A precise humidity and temperature sensor for 6..95 % rh (98% non-condensing) without internal saturation protection. The integrated, precise NTC temperature probe has a range of -20 to +80 °C. The humidity sensor is protected by an integrated chemical filter.

**Information:** recalibration of the ms 1 E at a minimum of two points is required when a sensor is replaced. High precision requires a 5-point calibration.

**Sensor enCK-3:**

Dimensions : 58 x 22mm  
Weight : 10 g

Humidity measurement:

Range: 6.....95 % rh  
Attention: No saturation protection!  
Repeatability: 0.3 % rh  
Precision: +/- 1.0 % rh  
when calibrated on instrument on all 5-Points from 11 to 90%rh.

Temperature Measurement:

Range temp : -20...80°C  
Repeatability : +/- 0.1° C  
Precision : +/- 0.3° C