EIGENBRODT®

PRECIPITATION COLLECTORS
Special Edition
„Mercury“

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New products—for “Mercury”

EIGENBRODT® successfully engineers and produces Precipitation Sampler and – Analyser for more than 27 years.

The instruments are in use worldwide and all year round under several climatic conditions at the measurement sites of our customers. (Universities, Environmental Departments, Weather Services, Research Institutes, Industrial Companies)

Actual research projects as well as long term monitoring driven by legally bound norms and guide lines like EMEP guideline for Mercury, EN 15853 (being used as part of directive 2004/107/EC) or the Italian legislative decree 152 on the environment, which has incorporated the EC Regulation no. 107 give special demand to the design of precipitation collectors.

Therefore 2 new designs accomplish our precipitation collector product line:

- bulk collector BUS 100
- wet only NSA 171.

All types of Eigenbrodt collectors are manufactured at the same high quality standards and follow European laws like the machinery guide line EN 2006/42/CE (EN 2006/42/EG), which is necessary for every importer of goods or manufacturer selling machines within the European Union. The CE certification on all Eigenbrodt Instruments is taken for granted.

We are able to cover most of the requested applications with the range of our offered standard configurations. Specific applications may require customized design or also adaptation to special environment conditions are possible.

Please contact us in case of further questions.

- Suitable for all year use
- Sensitive Precipitation Sensors for all environmental conditions
- Very low service and maintenance requirements

Specifications are subject to change without prior notice, E & OE

Table of contents

NSA 171

- Compact instrument build up in modular structure, insulated PVC housing
- Precipitation Sensor RS 85
- Electronic control with SIEMENS® technology
- Sample cooled with an approx. temperature shift of –10° C with switching off cooling at approx. 5°C.
- Funnel- and sample bottle heating enables all year round operation
- borosilicate-glass funnel with 100mm (alternatively 125mm) diameter of collection area
- Thermoelectric cooling / heating
- Sample bottle volume 2000ml (not delivered content)
- Contact material to the sample: borosilicate-glass or PTFE
- Tubing with small diameters for lo evaporation and loss of sample goods.
- Precipitation capacity with 2000ml bottle:
  162mm precipitation (@ 125mm funnel) or
  254mm precipitation (@ 100mm funnel)

(picture shows optional items)

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TECHNICAL DESCRIPTION

The precipitation sampler is used for the purpose of collecting the precipitation into a large single sample bottle. The individual sample bottle can be easily removed from the apparatus at the end of the period of measurement for laboratory analysis. Every single component which is used for measurement is made out of chemically neutral material and placed in a thermally insulated housing. At high temperatures the housing is cooled automatically (optional) to avoid overheating from intense radiation of the sun. For winter operation an electronically controlled funnel heating and a heating for the sample room are provided.
Direct material, funnel shape and the collection surface correspond to the standards of the VDI-recommendations 3870. (VDI: Association of German Engineers)

PRINCIPLE OF MEASUREMENT

An impulse from the Precipitation Sensor RS 85 at the start of precipitation causes the cover device to open up the collection funnel in the following way: The lid moves up, swings to the side and sinks down to prevent introducing aerodynamic interference to the sampling process. The precipitation coming from the funnel flows over a pipe directly into the sample bottle. When precipitation has ceased, a signal from the Precipitation Sensor RS 85, which operates with an adjustable heating element, causes a motor to close the collection funnel.

CONTENTS OF DELIVERED PROGRAM

- Double walled insulated PVC housing
- Collection funnel out of borosilicate-glass diameter 100mm alt. 125mm
- Control electronics for drive for lid
- Heating for funnel
- Thermoelectric heating/cooling system for sample bottles
- Precipitation Sensor RS 85
- Sample bottle out of borosilicate-glass (others on request)

OPTIONS

- Sample bottle out of glass or PETG
- Collection funnel diameter 100mm or 125mm
- Opto-electronical Precipitation Sensor IRSS 88
- Precipitation Sensor NRS 80 or RS 85 OP for areas without snow
- Dry sample container out of PE or DURAN-glass
- LCD-hour meter
- Data logging systems
- Stand base, made of galvanized steel
- Collection bottle with various materials
- Overflow capabilities

Robsust chain drive

Easy to service

Small diameter tubing
(picture shows optional items)

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BUS 100

- Preset temperature 5°C +/-2°C up to 20°C. -At higher temperatures a difference of approx. 15°C can be maintained.
- Funnel- and sample bottle heating enables all year round operation
- borosilicate-glass funnel with 80mm (alternatively 100mm) diameter of collection area
- Thermoelectric cooling / heating
- Sample bottle volume 1000ml
- Overflow bottle volume 1000ml (not cooled or heated, material HD-PE
- Contact material to the sample: borosilicate-glass or PTFE
- Tubing with small diameters for lo evaporation and loss of sample goods.
- Bottle capacity of 198mm precipitation (@ 80mm funnel) or 127mm precipitation (@ 100mm funnel)

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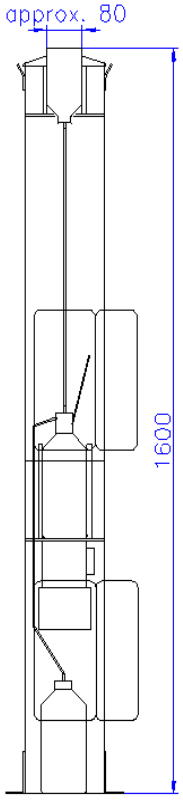
TECHNICAL DESCRIPTION

A new kind of precipitation collector designed as a routine able bulk-collector to obtain samples for analysis of mercury traces. Funnel - and sample bottle heating enables year round operation. Cooling down to a temperature of 5 °C prevents the loss of volatile sample components. The borosilicate glass funnel helps prevent droplets adhering to the funnel and is pH neutral.
Direct material, funnel shape and the collection surface correspond to the standards of the VDI-recommendations 3870 (VDI: Association of German Engineers) and LAWA-regulations.



CONSTRUCTIONAL DETAILS

The precipitation collector is of modular construction and consists of the following components:

- Tube housing with strengthening ring and anchor points
- borosilicate-glass funnel is removable for maintenance
- Heating insert with electronically controlled heating for melting the snow in the funnel while limiting evaporation
- Removable sample insert with borosilicate-glass sample bottle, maintenance free thermoelectric cooling / heating and integrated control electronics.
- Overflow system with overflow capillary inner diameter 2mm, >500mm long and HD-PE sample bottle. (others on request)

SPECIFICATIONS

Collection diameter [mm]	80, alt. 100
Power Supply, total	230 VAC,50 Hz. max.100VA
Funnel heating	12 V DC, 24 Watt
Sample cooling / heating	12 V DC, 48 Watt
Collecting height	1500mm (alt. 1600mm)
Dimensions	H 1500 mm
	∅ 320 m
Weight	35 kg

Easy to service

OPTIONS

- Anchoring robes with earth rod and tension
- Bird protection ring
- Mini data logger for temperature, including data handling
- Hoses and capillaries
- Temperature logger for climate chamber and also for main housing of the housing. (version without climate chamber: only temperature logger for main housing)
- Downgrade: No heating for funnel
- Spare collection bottle, 1000ml

Bird ring otional

Contact material PTFE

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NSA 181/K DURAN

NSA 181/KE - DURAN glass

- Compact instrument build up in modular structure, insulated PVC housing
- Precipitation Sensor RS 85
- Electronic control with SIEMENS® technology
- Collection funnel, 500 cm² collection surface
- Sample bottle (5 litre), 2-fold weekly sample bottle or single sample bottle insert (depending on model)
- Automatic climate control system for sample room to 4-6°C. (adjustable temperature 3…10°C optional)
- Cooling FCKW free
- Chemically neutral material of single components

NSA 181/KS - DURAN glass

Specifications are subject to change without prior notice, E & OE

TECHNICAL DESCRIPTION

The precipitation sampler is used for the purpose of collecting the precipitation, depending of its configuration, in a large sample bottle, in 8 separate day or single samples or weekly samples. The individual sample bottle can be easily removed from the apparatus at the end of the period of measurement for laboratory analysis. Every single component which is used for measurement is made out of chemically neutral material and placed in a thermically insulated housing. At high temperatures the housing is cooled automatically to avoid overheating from intense radiation of the sun. For winter operation an electronically controlled funnel heating and a heating for the sample bottles, respectively sample room heating are provided.
Direct material, funnel shape and the collection surface correspond to the standards of the VDI-recommendations 3870. (VDI: Association of German Engineers)

PRINCIPLE OF MEASUREMENT

An impulse from the Precipitation Sensor RS 85 at the start of precipitation causes the cover device to open up the collection funnel in the following way: The lid moves up, swings to the side and sinks down to prevent introducing aerodynamic interference to the sampling process. The precipitation coming from the funnel flows over a pipe directly into the sample bottle (E type) or into a ring funnel an then through a hole into the rotating head. The rotating head is connected to the individual hard polyethylene sample bottle by drain pipes and silicone hoses (D or S type). When precipitation has ceased, a signal from the Precipitation Sensor RS 85, which operates with an adjustable heating element, causes a motor to close the collection funnel.

DISTRIBUTION OF PRECIPITATION SAMPLES - CONFIGURATION „D“ AND „S“:

The precipitation coming from the funnel flows into a ring funnel an then through a hole into the rotating head. The rotating head is connected to the individual hard polyethylene sample bottle by drain pipes and silicone hoses. A SIEMENS® LOGO® control, which is programmable, causes a motor to advance the ring funnel and gathered precipitation fall into the following bottle by the way of the next opening of the rotating head. In case of breakdown in the external power supply all switching points will be catched up automatically.

PRINCIPLE OF COOLING

At the bottom of the collector an automatic working refrigerating machine with defrost automatic is installed. With the help of a plate evaporating unit with ventilation the temperature of the cooling space is constant held on 4-6 °C

CONTENTS OF DELIVERED PROGRAM IN GENERAL

- double walled insulated PVC housing
- Collection funnel out of DURAN-glass
- Control electronics for drive for lid
- Heating for funnel and sample bottles
- Precipitation Sensor RS 85
- Refrigerating machine with defrost automatic (refrigerating agent R 134 a, FCKW-free)

CONTENTS OF DELIVERED PROGRAM SPECIFIC TO CONFIGURATION

Configuration „E“ – with one sample bottle

- Sample bottle out of borosilicate-glass (5000 ml or 10000 ml)
- Collection room heating

Configuration „D“ – for 2 weekly samples

- 2-fold collecting insert module (bottle tray) with sample bottles out of borosilicate-glass (5000 ml)
- Control electronics for rotating head

Configuration „S“ – for 8 days single sample

- 8-fold collecting insert module (bottle tray) with sample bottles out of DURAN-glass
- Second set sample bottles out of DURAN-glass
- Control electronics for rotating head
- Optional: event depending collection of precipitation

OPTIONS

- Sample bottle out of borosilicate-glass or teflon
- Collection funnel out of Duran-glass or Quarz-glass
- Opto-electronical Precipitation Sensor IRSS 88
- Precipitation Sensor NRS 80 or RS 85 OP for areas without snow
- Snowtop
- Dry sample container out of DURAN-glass
- LCD-hour meter
- Data logging systems
- Stand base, made of galvanized steel

Options for Precipitation Collectors

High top OPTION "H"

Housings with snow top have a better aerodynamic profile and influences therewith the rain collection rate
The snow top configuration can be (optional) constantly heated and therefore avoids that snow can be built up on the housing. This option is useful especially in areas with lots of snow fall.

Available for:

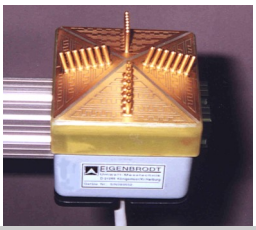
BUS 100	-
NSA 171	-
NSA 181/K	✓

Precipitation sensors

Different types of Precipitation Sensors, specially adopted to various applications and local conditions.

Available for:

BUS 100	-
NSA 171	✓
NSA 181/K	✓



RS 85
Standard Precipitation Sensor for almost all climatic conditions. The snow catching pins allow a very good detection also of snow events.

RS 85 OP
Like the RS 85, but with out the snow catching pins. This sensor is suitable for areas with few or no snow. The pyramid shape allows a good detection to all 4 directions.

NRS 80
Suitable for the use in areas without a lot of snowfall, for instance in maritime climatic conditions.

IRSS 88
For high polluted areas or close to the sea we recommend the use of the Precipitation Sensor IRSS 88. The measurement principle is opto-electronical.

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Stands

Available for:

BUS 100	-
NSA 171	✓
NSA 181/K	✓

The robust stand base for Precipitation Sampler and – Analyser has a good stand. It is made out of steel, hot dip galvanised for outdoor use. The total height, stand base and instrument, will be between 1.5 m up to 1.8 m following the WMO recommendations.
The precipitation sensor can be also mounted on a stand base separated from the collector. (hot dip galvanised) This allows the sensor to be independent from direct influence of the sampler. The height of the sensor with extra stand is approx. 1,5 m

Dry Sample Container Unit

Available for:

BUS 100	-
NSA 171	✓
NSA 181/K	✓

For certain research situation it is not only interesting to sample the wet only deposition, but also the dry only deposition at the same place during periods of no precipitation. The DSC-unit allows this type of samples. It maintains open during periods of no rain, and will be closed with the coverlid during rainy periods automatically.

LCD Hour Meter

Available for:

BUS 100	-
NSA 171	✓
NSA 181/K	✓

The LCD hour meter counts the lid open hours of the instrument. The value can be set to zero via a reset switch manually.

Event Data Logger

Available for:

BUS 100	-
NSA 171	✓
NSA 181/K	✓

The event data logger stores date and time of the opening- and closure times of the lid. The data can be read out with PC or laptop via USB interface.

Signal board (PCB)

Available for:

BUS 100	-
NSA 171	✓
NSA 181/K	✓

The signal board provides galvanically isolated digital signals for status indication and function control of the collectors/ monitors. These signals can be logged e.g. with a data logger or any other capable data acquisition system. Upon request an optional data logging system can be provided.

- Precipitation yes/no
- Lid Open
- Lid Closed
- Impulse for distributor
- Temperature sample room (optional)

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Special customized designs

NSA 181/KD "Mercury"

FOR 2 WEEKLY SAMPLES, WITH CONSTANT COOLING AND SPECIALIZED FOR MERCURY SAMPLES

BASED ON PRECIPITATION COLLECTOR NSA 181/K – SERIES

Advanced options:

- special distribution system with magnetic valves – shut to the environment during times of no precipitation
- special snow top (optional)
- chemically neutral material of single components (DURAN glass and PTFE)

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Important legal notes

TECHNICAL ALTERATIONS

- The technical description corresponds to the current products. Alterations because of technical improvements are possible. Requested functions or features are only binding, if confirmed in a contract in written form.
- Specifications are subject to change without prior notice— Errors and omissions excepted.
- Goods are subject to prior sale

ILLUSTRATIONS

- Please take into account, that illustrations are intended to clarify certain points. There may therefore be discrepancies between the illustrations and the written text.

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