

PRECIPITATION



PRECIPITATION:

The condensation of the water vapour in the air to fog, dew, rain, snow or hail. For you only the best! This has been LAMBRECHT's motto for decades in the production of precipitation sensors.

Solely high-quality, weather-, and UV-proof materials are used. Every component is especially tested. The production of exceedingly robust constructions, e.g. full-metal housings, precise tipping bucket bearings, and heating systems is a central issue.

High mountains or tropics - LAMBRECHT doesn't leave you in the cold with your meteorological problems.

Different precipitation measuring methods are used. Especially useful in cases of extremely high amounts of precipitation is the tipping bucket method. Individually tuned tipping buckets are mounted on precision-grinded cut bearings. Filled up, the 2- or 4-cm³ buckets are emptied automatically. The emptyings are counted, thus a permanent recording of precipitation is ensured. Overflowing is impossible!

Another LAMBRECHT specialty is the only precipitation sensor with heatable collecting ring - for prompt and exact snow fall measurement.

Photo credits

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PRECIPITATION SENSOR "rain[e]"

Weighing precipitation sensor

rain[e]



The first of a new kind.

Latest weighing technology combined with a self-emptying precision tipping bucket allows the rain[e] a high resolution and high precision at a very small construction volume. Already the first drop will be measured! The rain[e] is ideal to setup new measurement network as well as addition to an existing rainfall measurement network.

- amazing resolution and accuracy
- checking of sensors with tipping bucket and other weighing systems
- compact and robust construction with a very low weight
- all-metal housing, weatherproof and durable
- best connectivity by several interfaces
- installation and maintenance are very simple

classical meteorology and hydrology
 • measuring networks of water suppliers • lysimeter systems • sewage plants • Weather services • airports • traffic meteorology

Professional Line	rain[e]	Weighing precipitation sensor
rain[e], unheated Measuring principle: Operating temperature: Collecting area: Amount measuring range: Amount resolution: Amount accuracy: Intensity range: Intensity resolution: Intensity accuracy: Standards: Protection class weighing cell: Current consumption: Supply voltage: Signal outputs:	Id-No. 00.15184.000 000 weighing with automatic self emptying 0...+70 °C (unheated) 200 cm ² without limitation (0.005...∞ mm) 0.001 mm (pulse output: 0.01 mm) ± 0.1 mm or ± 1 % at < 6 mm/min and ± 2 % at > 6 mm/min 0...20 mm/min resp. 0...1200 mm/h 0.001 mm/min resp. 0.001 mm/h ± 0.1 mm/min resp. ± 6 mm/h WMO-No. 8 • VDI 3786 Bl. 7 • EN 61000-2, -4 • EN 61000-4-2, -3, -4, -5, -6, -11 NAMUR NE-21 IP67 max. 45 mA at 24 V power supply and analogue output • typ. 6.5 mA at 24 V power supply and pulse output · typ. 10.5 mA at 12 V 9.8...32 V DC · SDI-12 • RS-485 (SDI-12 protocol, ASCII protocol, TALKER protocol) · 2 Pulse-Outputs for linearised, bounce-free output signal · Status-Output (configurable, e.g. rain yes/no or heating on/off) · Analogue output 0/4...20 mA (0...2.5/5V)	
rain[e], heated <i>Data like rain[e] 00.15184.000 000, but in addition with controlled 2-circuit-heating</i> Target temperature (heating): Heating power: Supply voltage: Operating temperature:	Id-No. 00.15184.400 000 +2 °C funnel surface temperature 80 W (funnel) • 60 W (outlet/ tipping bucket) 24 V DC / 2 heating circuits 80 W and 60 W -40...+70 °C (no icing, no snowdrift)	



PRECIPITATION SENSOR „rain[e]H3“

Weighing precipitation sensor

rain[e]H3

Protected against freezing.

Due to the innovative weighing technology combined with a self-emptying collection vessel the rain[e] sets new standards in professional precipitation measurement. Its outstanding resolution and accuracy are approved all over the world. The rain[e]H3 with electronically regulated ring heating is designed especially for extreme cold climates. Integrated outside temperature sensor, real time clock, electronic monitoring when opening the housing and remote servicing are features of continuous development.

With optional port server and web interface the rain[e]H3 is well equipped for all communicative demands in future.

- electronically controlled ring-, funnel- and drain-line heaters
- easy installation and maintenance



Technical Data

Weighing Precipitation Sensor rain[e]H3

Id-No. 00.15184.540 020

Measurable precipitation types:	liquid, solid, mixed
Measuring principle:	weighing with automatic self emptying
Operating temperature:	-40...+70 °C (no icing or snow drift)
Storage temperature:	-40...+70 °C
Collecting area:	200 cm ²
Measuring range (amount):	without limitation (0.005...∞ mm)
Resolution (amount):	0.001 mm
Accuracy (amount):	± 0.1 mm or ± 1 % at < 6 mm/min and ± 2 % at > 6 mm/min
Measuring range (intensity):	0...20 mm/min resp. 0...1200 mm/h
Resolution (intensity):	0.001 mm/min resp. 0.001 mm/h
Accuracy (intensity):	± 0.1 mm/min resp. ± 6 mm/h
Integrated outside temperature sensor:	measuring range: -35...+45 °C • basic accuracy*: < 0.5 °C
Dimensions:	377 mm × 190 mm (H × Ø)
Mountable on:	Ø 60 mm
Weight:	approx. 4 kg
Standards:	WMO-No. 8 • VDI 3786 Bl. 7 • EN 61000-2, -4 EN 61000-4-2, -3, -4, -5, -6, -11 • NAMUR NE-21
Protection class weighing cell:	IP67
Protection class housing:	IP64
Current consumption:	max. 150 mA at 12 V supply with Ethernet
Supply voltage:	9.8...32 V DC
Heating data:	electronically controlled ring-, funnel- and drain-line heaters
Target temperature:	+2 °C funnel-surface temperature
Accuracy:	± 1 °C
Heating power:	40 W (funnel) · 60 W (discharge/ collecting vessel) · 70 W (ring heating)
Output signals:	· SDI-12 • RS-485 (SDI-12 protocol, ASCII protocol, TALKER protocol) · 2 Pulse-Outputs for linearised, bounce-free output signal · Status-Output (configurable, e.g. rain yes/no or heating on/off) · Analogue output 0/4...20 mA (0...2.5/5V)
Real Time Clock (RTC):	integrated

*) without the influence of sunlight

rain[e]400



ecological

Full functionality around the year without antifreeze fluid makes the rain[e]400 very environmentally friendly.

extraordinary

The rain[e]400 is a new kind of weighing precipitation sensor. Highest resolution combined with the most compact unique design.

exact

Our unique self-emptying collecting system allows single drop measurement at the high resolution of 0.001 mm/m².

efficient

Highest functionality delivered in compact space, yet providing 6 different interfaces. rain[e]400 supports solar-powered applications at low power consumption. Optionally, rain[e]400 is available with a high-efficiency heating system.

easy

rain[e]400 is easy to lift, to transport, to install, to check and to maintain.

economic

Small package volume and light weight allow for low transport costs. The rain[e]400 is up to 50% less expensive than other weighing sensors, yet providing similar or improved functionality.

Professional Line

rain[e]400, unheated

Measuring principle:
 Operating temperature:
 Collecting area:
 Amount measuring range:
 Amount resolution:
 Amount accuracy:
 Intensity range:
 Intensity resolution:
 Intensity accuracy:
 Standards:

Protection class weighing cell:
 Current consumption:

Supply voltage:
 Signal outputs:

Weighing precipitation sensor rain[e]400

Id-No. 00.15184.004 000

weighing with automatic self emptying
 0...+70 °C (unheated)
 400 cm²
 without limitation (0.0025...∞ mm)
 0.001 mm (pulse output: 0.01 mm)
 ± 0.1 mm or ± 1 % at < 3 mm/min and ± 2 % at > 3 mm/min
 0...10 mm/min resp. 0...600 mm/h
 0.001 mm/min resp. 0.001 mm/h
 ± 0.1 mm/min resp. ± 6 mm/h
 WMO-No. 8 • VDI 3786 Bl. 7 • EN 61000-2, -4 • EN 61000-4-2, -3, -4, -5, -6, -11
 NAMUR NE-21
 IP67
 max. 45 mA at 24 V power supply and analogue output •
 typ. 6.5 mA at 24 V power supply and pulse output · typ. 10.5 mA at 12 V
 9.8...32 V DC
 · SDI-12 • RS-485 (SDI-12 protocol, ASCII protocol, TALKER protocol)
 · 2 Pulse-Outputs for linearised, bounce-free output signal
 · Status-Output (configurable, e.g. rain yes/no or heating on/off)
 · Analogue output 0/4...20 mA (0...2.5/5V)

rain[e]400, heated

Data like rain[e]400 00.15184.004 000, but in addition with controlled 2-circuit-heating
 Target temperature (heating):
 Heating power:
 Supply voltage:
 Operating temperature:

Id-No. 00.15184.404 000

+2 °C funnel surface temperature
 150 W (funnel) • 60 W (outlet/ tipping bucket)
 24 V DC / 2 heating circuits 150 W and 60 W
 -40...+70 °C (no icing, no snowdrift)



PRECIPITATION SENSOR

acc. to Joss-Tognini



Grown out of experience!

- controlled three-circuit heating
- 2- and 4 cm³-volume of bucket
- no plastics at measuring parts



A uniquely brilliant idea...

lies behind the sensor (1518 H3). Not only are collecting and drain funnel heated, but also the collecting ring. Here, the snow is thawed so that the snow fall is measured promptly. The new electronically regulated three-circle heating device minimizes evaporation effects. Several thousand of these sensors are in use world-wide.

- suitable in high mountain areas
- constant operating temperature 4°C +/- 1°C for accurate measurement
- 2 or 4 cm³ high-quality stainless steel buckets
- absolutely weather-proof
- easy installation
- simple handling

meteorological reference device • automatic and high mountain area weather station • classical meteorology and hydrology • with lysimeters • sewage plants • building systems • water management/agriculture • forestry

Professional Line

(1518 H3) Precipitation Sensors

Measuring element:
Meas. range/ Resolution:

weighing tipping bucket • precision stainless steel bucket acc. to Joss-Tognini

2 cm³-volume of bucket - 0.1 mm • 0...10 mm/min

4 cm³-volume of bucket - 0.2 mm • 0...20 mm/min

Accuracy:

± 2% with intensity compensation • controlled temperature 4 °C ± 1 °C within a range of -35...+4 °C

Collecting surface:

200 cm²/ WMO standard

Range of application:

operating temperatures -35...+70 °C

Data of heating:

electr. controlled three-circuit heating • 235 VA total heating energy • 100 VA for ring • 100 VA for collecting funnel • 35 VA for downpipe/ bucket • supply voltage 42 V_{AC}

Pulse output:

reed contact • polarity protected • bounce-free signal • current consumption max. 100 µA • typical 50 µA • load max. 30 V_{DC}/ 0.5 A • supply voltage 4...30 V_{DC}

Housing/ Funnel + ring:

stainless steel • aluminium, anodized

Dimensions/ Weight:

H 494 mm • Ø 224 mm • for mounting pipe with Ø 60 mm • approx. 7 kg

Standards:

WMO-No. 8 • VDI 3786 page 7 • EN 50081/82 • VDE 0100

Varieties:

00.15183.002 000

(1518 H3) Precipitation Sensor with 2 cm³-volume of bucket

00.15183.004 000

(1518 H3W4) Precipitation Sensor with 4 cm³-volume of bucket

Accessories: (optional)

(95666.1) TROPOS-100 Data logger (see chapter „Data logger“)



PRECIPITATION SENSOR

acc. to Joss-Tognini

With success...

the sensor (15188) stands up to any comparison with others in its class.

Modern tipping- and heating technologies guarantee high reliability, precision and minimal evaporation influences.

The system empties itself and registers - overflowing is impossible.

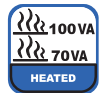
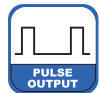
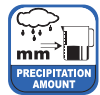
The 4cm³ bucket with large volume has been constructed especially for extreme precipitation incidents,

e. g. tropical rainstorms or longer recording intervals.

- ▶ smooth running tipping bucket bearings
- ▶ high resolution
- ▶ easy installation
- ▶ maintenance-free electronics
- ▶ fine materials

automatic weather stations • classical meteorology and hydrology

- with lysimeters • sewage plants
- building systems • water management/agriculture • forestry



Precision Inside!

- no plastics at measuring parts
- 2- and 4 cm³-volume of bucket
- controlled dual-circuit heating

Professional Line

(15188) Precipitation Sensors

Measuring element:

Meas. range/ Resolution:

Accuracy:

Collecting surface:

Range of application:

Data of heating*:

Pulse output:

Housing/ Funnel + ring:

Dimensions/ Weight:

Standards:

Varieties:

00.15188.002 000

00.15188.202 000

00.15188.004 000

00.15188.204 000

Accessories: (optional)

weighing tipping bucket · precision stainless steel bucket acc. to Joss-Tognini

2 cm³ (~2 g) volume of bucket · 0.1 mm · 0...10 mm/min

4 cm³ (~4 g) volume of bucket · 0.2 mm · 0...20 mm/min

± 2 % with intensity compensation · controlled temperature 4 °C ± 2 °C within a range of -20...+4 °C*

200 cm²/ WMO standard

operating temperatures 0...+70 °C metering (down to -20 °C frost resistant) · -30...+70 °C* controlled

electr. controlled dual-circuit heating · 170 VA total heating energy · 100 VA

collecting funnel · 70 VA downpipe/ bucket · supply voltage 42 V_{AC}

reed contact · polarity protected · bounce-free signal · current consumption max.

100 µA · typical 50 µA · load max. 30 V_{DC}/ 0.5 A · supply voltage 4...30 V_{DC}

stainless steel · aluminium, anodized

H 395 mm · Ø 190 mm · for mounting pipe with Ø 60 mm · approx. 4 kg

WMO-No. 8 · VDI 3786 page 7 · EN 50081/82 · VDE 0100

(15188)

Precipitation Sensor with 2 cm³-volume of bucket · unheated

(15188 H)*

Precipitation Sensor with 2 cm³-volume of bucket · heating

(15188 W4)

Precipitation Sensor with 4 cm³-volume of bucket · unheated

(15188 HW4)*

Precipitation Sensor with 4 cm³-Volume of bucket · heating

(95666.1)

TROPOS-100 Data logger (see chapter "Data logger")



PRECIPITATION SENSOR

acc. to Joss-Tognini

High reliability...

and precision as well as minimal evaporation influences guaranteed by modern tipping- and heating technologies. The system empties itself and registers - overflowing is impossible. The 4 cm³ bucket with large volume has been constructed especially for extreme precipitation incidents, e. g. tropical rainstorms.

- ▶ with linearised impulse output and/ or analog output signal
- ▶ smooth running tipping bucket bearings
- ▶ high resolution
- ▶ easy installation
- ▶ maintenance-free electronics
- ▶ fine materials

automatic weather stations • classical meteorology and hydrology
 • with lysimeters • sewage plants
 • building systems • water management/agriculture • forestry



Precision Inside!

- no plastics at measuring parts
- 2- and 4 cm³-volume of bucket
- controlled dual-circuit heating

Professional Line	(15188++)	Precipitation Sensors
Measuring element: Meas. range/ Resolution:		weighing tipping bucket · precision stainless steel bucket acc. to Joss-Tognini 2 cm ³ - (~2 g) volume of bucket - 0.1 mm · 0...10 mm/min 4 cm ³ - (~4 g) volume of bucket - 0.2 mm · 0...20 mm/min
Accuracy:		± 2 % · controlled temperature 4 °C ± 2 °C within a range of -20...+4 °C*
Collecting surface:		200 cm ² / WMO standard
Ranges of application:		unheated versions: 0...+70 °C metering (frost resistant down to -20 °C) heated versions: -30...+70 °C · no icing · no snowdrift
Analog outputs:		0...20 mA = basic setting · 4...20 mA · 0...5/10 V - selectable current consump. ≤ 40 mA · supply voltage 18...30 VDC · max. load 600 Ω
Pulse output:		for linearised, bounce-free output signal · At deactivated analog output: current consump. max. 100 µA · typical 50 µA · supply voltage 5...30 VDC · switch load max. 30 VDC/ max. 0.5 A - at pure ohm load
Housing/ Funnel + ring: Dimensions/ Weight: Standards:		stainless steel · aluminium, anodized H 395 mm · Ø 190 mm · for mounting pipe with Ø 60 mm · approx. 4 kg WMO-No. 8 · VDI 3786 page 7 · EN 50081/82 · VDE 0100
<u>Versions:</u>		
00.15188.002 050	(15188++)	Precipitation Sensor with 2 cm ³ -volume of bucket · unheated
00.15188.004 050	(15188 W4++)	Precipitation Sensor with 4 cm ³ -volume of bucket · unheated
00.15188.202 050	(15188 H++)*	Precipitation Sensor with 2 cm ³ -volume of bucket · heated
00.15188.204 050	(15188 HW4++)*	Precipitation Sensor with 4 cm ³ -Volume of bucket · heated
Data of heating*:		electr. controlled dual-circuit heating · 170 VA total heating energy · 100 VA collecting funnel · 70 VA downpipe/ bucket · supply voltage 42 VAC
<u>Accessories: (optional)</u>	(95666.1)	TROPOS-100 Data logger (see chapter "Data logger")



PRECIPITATION SENSOR

with weighing tipping bucket according to Joss-Tognini



Grown by experiences...

and equipped with the features and advantages of the proven forerunners is the weighing sensor (15189) the "class winner"!

Its functionality meets exactly the demands of the classical meteorology and hydrology as well as the semi-professional industrial meteorology.

The sensor (15189) and its varieties are very efficient and economical investment for a lifetime !

- ▶ Best price-performance ratio in its class!
- ▶ single device or part of an automatic weather station
- ▶ connectable to data logger TROPOS
- ▶ very reliable, weighing measuring system
- ▶ high-quality materials
- ▶ easy installation

classical meteorology and hydrology

- agriculture meteorology
- measuring networks of water suppliers
- lysimeter systems
- sewage plants
- Weather services
- airports

Standard Line

Meas. principle/ element:
Meas. range/ Resolution:

Accuracy:
Collecting funnel:
Ranges of application:

Pulse output:

Housing/ Funnel + ring:
Dimensions/ Weight:
Standards:

Varieties:

- 00.15189.002 000
- 00.15189.004 000
- 00.15189.402 000
- 00.15189.404 000

*Heating data:

Accessories:

- 00.14966.200 000

(15189) Precipitation sensors

weighing tipping bucket system • precision stainless steel bucket acc. to Joss-Tognini

2 cm³- (~2 g) volume of tipping bucket - 0.1 mm • 0...8 mm/min

4 cm³- (~4 g) volume of tipping bucket - 0.2 mm • 0...16 mm/min

± 2 % with intensity correction

200 cm²/ WMO standard

unheated varieties: 0...+70 °C metering (frost resistant down to -20 °C)

heated varieties: -20...+70 °C · no icing · no snowdrift

reed contact · polarity protected · bounce-free signal • supply voltage 4...30 V_{DC} • cur-

rent consumption max. 100 µA · typical 50 µA • load max. 30 V_{DC}/ 0.5 A

aluminium · anodized

H 292 mm · Ø 190 mm · for mounting pipe Ø 60 mm · approx. 3 kg

WMO-No. 8 · VDI 3786 lf. 7 · EN 50081/82 · VDE 0100

(15189) **Precipitation sensor** with 2 cm³-volume of bucket · unheated

(15189 W4) **Precipitation sensor** with 4 cm³-volume of bucket · unheated

(15189 H) **Precipitation sensor** with 2 cm³-volume of bucket · heated*

(15189 HW4) **Precipitation sensor** with 4 cm³-volume of bucket · heated*

electr. controlled dual-circuit heating • supply voltage 24 V_{DC} • controlled temperature of 4 ± 2 °C within a range of -20...+4°C • heating power 150 W

Masts, dirt pan, protection ring, connecting cables, data logger, evaluation software

(1496 S62) **Power supply unit** for heated sensors



PRECIPITATION SENSOR

with weighing tipping bucket acc. to Joss-Tognini



Robustness meets design...

The resistant and beautifully designed sensor has a linearised pulse output for high accuracy and easy connection to external data loggers!

Its selectable analog output signal substantially simplifies the connection to PLC.

Winter-fit models and in general a long durability are guaranteed by weather-proof materials.

- ▶ selectable measuring ranges as well as absolute or gliding sum for the analogue output signals
- ▶ single device or part of an automatic weather station
- ▶ connectable to data logger TROPOS
- ▶ very reliable, weighing measuring system
- ▶ high-quality material
- ▶ easy installation

classical meteorology and hydrology • agriculture meteorology • measuring networks of water suppliers • lysimeter systems • sewage plants • Weather services • airports

Standard Line

Meas. principle/ element:
Meas. range/ Resolution:

Accuracy:
Collecting funnel:
Ranges of application:

Analog outputs:

Pulse output:

Housing/ Funnel + ring:
Dimensions/ Weight:
Standards:

Versions:

00.15189.002 050

00.15189.004 050

00.15189.402 050

00.15189.404 050

*Heating data:

Accessories:

00.14966.200 000

(15189 analog) Precipitation Sensors

weighing tipping bucket system · precision stainless steel bucket acc. to Joss-Tognini

2 cm³- (2 g) volume of tipping bucket · 0.1 mm · 0...8 mm/min

4 cm³- (4 g) volume of tipping bucket · 0.2 mm · 0...16 mm/min

± 2 %

200 cm²/ WMO standard

unheated versions: 0...+70 °C metering (frost resistant down to -20 °C)

heated versions: -20...+70 °C · no icing · no snowdrift

0...20 mA = basic setting · 4...20 mA · 0...5/10 V - selectable

current consump. ≤ 40 mA · supply voltage 18...30 VDC · max. load 600 Ω

for linearised, bounce-free output signal · At deactivated analog output:

current consump. max. 100 µA · typical 50 µA · supply voltage 5...30 VDC ·

switch load max. 30 VDC/ max. 0.5 A - at pure ohm load

aluminium · anodized

H 292 mm · Ø 190 mm · for mounting pipe Ø 60 mm · approx. 3 kg

WMO-No. 8 · VDI 3786 page 7 · EN 50081/82 · VDE 0100

(15189 analog)

Precipitation sensor with 2 cm³-volume of bucket · unheated

(15189 W4 analog)

Precipitation sensor with 4 cm³-volume of bucket · unheated

(15189 H analog)

Precipitation sensor with 2 cm³-volume of bucket · heated*

(15189 H W4 analog)

Precipitation sensor with 4 cm³-volume of bucket · heated*

electr. controlled dual-circuit heating · controlled temperature of 4 ± 2 °C

within a range of -20...+4 °C · heating power 150 W · supply voltage 24 VDC

(1496 S62)

Power supply unit for heated sensors



PRECIPITATION SENSOR

with weighing tipping bucket acc. to Joss-Tognini



The successful precipitation sensor...

now available with serial interface. The resistant and beautifully designed sensor has additionally a linearised pulse output for high accuracy and easy connection to external data loggers.

This new sensor provides intensity adjusted measurement of precipitation with serial measurand output via RS485.

- SDI-12 protocol (at RS485) for universal use
- interface RS485
- LBP protocol (Lambrecht Bus Protocol)
- integrated intensity adjustment
- calculation of:
 - the precipitation sum since last data call
 - precipitation intensity for a slipping minute
 - precipitation intensity for a slipping hour (minute interval)

system integrators • classical meteorology and hydrology • measuring networks of water suppliers • sewage plants • traffic meteorology

Standard Line

Meas. principle/ Element:
Meas. range/ Resolution:

Accuracy:
Collecting funnel:
Ranges of application:

Interface:
Supply voltage:
Housing/ Funnel + ring:
Dimensions/ Weight:
Standards:

Versions:

00.15189.002 060
00.15189.004 060
00.15189.402 060
00.15189.404 060

*Heating data:

Accessories:

00.14966.200 000

(15189 serial) Precipitation Sensors

weighing tipping bucket system • precision stainless steel bucket acc. to Joss-Tognini
2 cm³- (2 g) volume of tipping bucket - 0.1 mm • 0...8 mm/min
4 cm³- (4 g) volume of tipping bucket - 0.2 mm • 0...16 mm/min
± 2 %
200 cm²/ WMO standard
unheated versions: 0...+70 °C metering (frost resistant down to -20 °C)
heated versions: -35...+70 °C • no icing • no snowdrift
RS485 • SDI-12 protocol (at RS485) • LBP protocol (Lambrecht Bus Protocol)
10...30 V DC (12 V DC/ 24 V DC)
aluminium • anodized
H 292 mm • Ø 190 mm • for mounting pipe Ø 60 mm • approx. 2.5 kg
WMO-No. 8 • VDI 3786 page 7 • EN 50081/82 • VDE 0100

(15189 serial)	Precipitation sensor with 2 cm ³ -volume of bucket • unheated
(15189 W4 serial)	Precipitation sensor with 4 cm ³ -volume of bucket • unheated
(15189 H serial)	Precipitation sensor with 2 cm ³ -volume of bucket • heated*
(15189 H W4 serial)	Precipitation sensor with 4 cm ³ -volume of bucket • heated*

electr. controlled dual-circuit heating • controlled temperature of 4 ± 2 °C within a range of -20...+4 °C • heating power 150 W • supply voltage 24 V DC

(1496 S62) Power supply unit for heated sensors



ACCESSORIES

for precipitation sensors

Id-No.	15189	15189 analog	15189H	15189H analog	15188	15188++	15188H	15188H++	1518H3	1518H3++	Description of the item
00.15123.242000							x	x	x	x	Filament transformer · supply voltage 230 V _{AC} · output voltage 42 VAC/ 250 VA · protection class IP 65
00.14966.200000			x	x							Power supply unit · supply voltage 88...264 VAC · output voltage 24 VDC/ 150 W · protection class IP 65
00.15180.400000	x	x	x	x	x	x					Stainless steel mast for concrete foundation · Ø 60 mm · length 1.2 m · for measuring height 1 m
00.15180.400010							x	x	x	x	Stainless steel mast for concrete foundation with support for filament transformer · Ø 60 mm · length 1.2 m · for measuring height 1 m
00.15180.800000	x	x	x	x	x	x					Stainless steel mast for concrete foundation with base plate · Ø 60 mm · length 650 mm · for measuring height 1 m (for 15188)
00.15180.800010									x	x	Stainless steel mast for concrete foundation with base plate and support for filament transformer · Ø 60 mm · length 570 mm · for measuring height 1 m
00.15180.800030							x	x			Stainless steel mast for concrete foundation with base plate and support for filament transformer · Ø 60 mm · length 650 mm · for measuring height 1 m
32.14622.220000			x	x							Support for power supply
33.15180.049000	x	x	x	x	x	x	x	x	x	x	Dirt spiral (spare part)
32.15180.021010	x	x	x	x	x	x	x	x			Protection ring against birds Ø 190 mm
32.15183.021010									x	x	Protection ring against birds Ø 224 mm
32.15183.060000									x	x	Connecting cable · 1 m · sensor/ filament transformer, 2 x 2-core, with plug
32.15183.060090									x		Connecting cable · 7 m · sensor/ data logging system, 2-core · shield on third stranded wire
32.15188.060060							x	x			Connecting cable · 1 m · sensor/ filament transformer, 2-core
32.15188.060090	x		x		x		x				Connecting cable · 7 m · sensor/ data logging system, 2-core
32.15188.061020			x	x							Connecting cable · 1 m · sensor/ filament transformer, 4-core
32.15188.061090		x		x		x		x		x	Connecting cable · 7 m · sensor/ data logging system, 4-core



PRECIPITATION RECORDER

according to Hellmann



All in good time...

reliably registered with strip chart and drum recorder.

Precipitation is registered free of manipulation. Especially in remote locations, which can only be controlled sporadically, a recording time of 31 days is of great advantage. Depending on the conditions of employment, the varieties can be used year-round out of doors and up to -20 °C (with heater).

- very robust measuring system with precision bearing
- wide temperature range of application
- easy to mount/easy to use
- data logging requires no auxiliary power

classical meteorology and hydrology • in combination with lysimeters • sewage plants • sanitary land fills • building services • water management • agriculture • forestry



Professional Line

Series (1507) and (1509) Precipitation Recorder according to Hellmann

Measuring elements:

(1507) drum recorder • (1509) strip chart recorder

Measuring ranges:

80 mm recording height / 10 mm precipitation quantity
10 l collecting can • 500 mm precipitation quantity
200 cm³ measuring cylinder • 10 mm precipitation quantity

Clockwork accuracy:

± 50 s/ day

Resolution/ Scale:

0.1 mm/ 0...10 mm • recorder and measuring cylinder: 0.05 mm

Collecting surface:

200 cm²/ WMO standard

Range of application:

operating temperatures 0...+60 °C • -20...+60 °C with electr. controlled heating

Housing/ Measuring cylinder:

zinc plate • RAL 7038 (agate-grey) • polystyrene acc. to DIN 58667

Dimensions/ Weight:

H 1200 mm • proof-Ø 420 mm • housing-Ø 302 mm • approx. 21 kg

Standards:

VDI 3786 page 7



PRECIPITATION RECORDER

Versions and accessories

Precipitation recorders series (1507)

Id-No.	00.15072.010.000	00.15072.020.000	00.15072.210.000	00.15072.220.000
Code	(1507)	(1507 a)	(1507 H42)	(1507 a H42)
Recording period:	7 days	1 day	7 days	1 day
Recording reserve:	10 hours	2 hours	10 hours	2 hours
Operating temperatures:	0...+60 °C	0...+60 °C	-20...+60 °C	-20...+60 °C
Heating:	--	--	42 V _{AC} · 215 VA	42 V _{AC} · 215 VA
Chart speed:	2.29 mm/h	16 mm/h	2.29 mm/h	16 mm/h
Accuracy of registration:	0.1 mm with max. 0.5 mm/min	0.1 mm with max. 3.5 mm/min	0.1 mm with max. 0.5 mm/min	0.1 mm with max. 3.5 mm/min

Precipitation recorders series (1509)

Id-No.	00.15090.010.000	00.15090.020.000	00.15090.210.000	00.15090.220.000
Code	(1509-10)	(1509-20)	(1509-10 H42)	(1509-20 H42)
Recording period:	31 days	31 days	31 days	31 days
Recording reserve:	1 day	1 day	1 day	1 day
Operating temperatures:	0...+60 °C	0...+60 °C	-20...+60 °C	-20...+60 °C
Heating:	--	--	42 V _{AC} · 215 VA	42 V _{AC} · 215 VA
Chart speed:	10 mm/h	20 mm/h	10 mm/h	20 mm/h
Accuracy of registration:	0.1 mm with max. 2.5 mm/min	0.1 mm with max. 4.5 mm/min	0.1 mm with max. 2.5 mm/min	0.1 mm with max. 4.5 mm/min

Accessories

32.15070.030.000	(1507 U30)	Snow cross • weight approx. 0.2 kg · for (1507) and (1509)
32.15070.121.000	(1507 U121)	Protection ring against birds · for (1507) and (1509)
32.15070.010.000	(1507 U10)	Pipette (glass tube) · for (1507) and (1509)
32.15070.002.000	(1507 U2)	Float with guide tube · for (1507) and (1509)
33.15070.149.000	(1507-149)	Dirt pan * · for (1507) and (1509)
34.15070.001.000	(1507 D1)	Graph paper * · 100 sheets · 1 day · approx. 0.5 kg · for (1507)
34.15070.002.000	(1507 D2)	Graph paper * · 100 sheets · 7 days · approx. 0.5 kg · for (1507)
34.15090.003.000	(1509 D3)	Recording chart rolls * · 12 rolls · 31 days · 20 mm/h · approx. 1.2 kg · for (1509)
34.15090.004.000	(1509 D4)	Recording chart rolls * · 12 rolls · 31 days · 10 mm/h · approx. 1.2 kg · for (1509)
33.02520.144.000	(252-144)	Felt-tipped pens ** · 6 pieces · violet · for (1507) and (1509)

Accessories for heated models (H-models):

00.15123.242.000	(15123)	Filament transformer Supply voltage 230 V _{AC} · output voltage 42 V _{AC} / 250 VA · protection class IP 65 dimensions 220 x 168 x 116 mm · weight approx. 6 kg
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Connecting cable between sensor/ filament transformer on request.

* 1 set included in delivery of the unit. ** 1 piece included in delivery of the unit.



RAIN GAUGE

according to Hellmann

The rain classic...

and evergreen. Plain and rigorously useful technologies guarantee high quality. Construction according to the requirements of the German meteorological service (DIN 58666). The polystyrene measuring cylinder is equipped with a scale with very good reading accuracy.

- ▶ measurement according to DIN-norm
- ▶ easy to mount
- ▶ simple usage and handling
- ▶ weather-proof materials
- ▶ very robust and compact
- ▶ good value
- ▶ b-variety with twice as much equipment for snow measurement

classical meteorology • sewage plants • water management and agriculture • structural and civil engineering • forestry



Standard Line	(1500)	Rain Gauge according to Hellmann	Id-No. 00.15000.000 000
Measuring element: Measuring ranges: Collecting surface: Range of application: Scale: Maximum Permissible Error: Housing/ Design: Collecting can/ Cylinder: Dimensions/ Weight: <u>Version:</u> 00.15002.000 000		collecting funnel with collecting can 1.2 l collecting can: precipitation quantity 60 mm 200 cm ³ measuring cylinder: 10 mm 200 cm ² / WMO standard operating temperatures 0...+60 °C 0.1 mm/ 0...10 mm 0.1 mm precipitation Zinc plate · RAL 7038 (agate-grey) · acc. to DWD/DIN 58666 plastics/ polystyrene acc. to DIN 58667 H 450 mm · Ø 190 mm · approx 2.3 kg	
<u>Accessories:</u> 32.15000.005 000 32.15000.030 000 33.15000.031 000	(1500 b)	Rain and Snow Gauge according to Hellmann With 2 collecting cans · 2 collecting funnels · 2 bottom parts · 2 snow crosses · 200 cm ³ measuring cylinder: 10 mm · weight approx. 5.2 kg	
	(1500 U5)	Support · necessary for assembly of (1500) · galvanized flat steel · H 375 mm · weight approx. 0.7 kg	
	(1500 U30)	Snow cross · weight approx. 0.5 kg	
	(1500-31)	Spare measuring cylinder · polystyrene acc. to DIN 58667 · weight 0.05 kg	



RAIN GAUGE

according to Diem



Really simple...

is the classical collecting funnel with measuring scale made of poly-styrene clear as crystal.

The popular model belongs in every garden, just as the measuring cup belongs in the kitchen and the inch rule in the toolbox.

Every floriculturist or farmer uses this rain gauge to optimally and economically water of the flora.

- ▶ simple measuring principle
- ▶ easy-to-read scale
- ▶ good value, with stainless steel mounting
- ▶ small, compact, practical

farmers • gardeners • hobby y
meteorology • hobby gardening



Standard Line

(1503) Rain Gauge according to Diem

Id-No. 00.15030.000 000

Measuring element:	Collecting funnel with measuring scale
Measuring ranges:	Collecting funnel 400 cm ³ • precipitation quantity 40 mm
Collecting surface:	100 cm ²
Range of application:	Operating temperatures 0...+60°C
Resolution/ Scale:	0.5 mm/ 0...5 mm • 1.0 mm/ 5...40 mm
Collecting funnel:	Highly transparent polystyrene
Holder:	Stainless steel
Dimensions:	H 365 mm · collecting funnel Ø 113 mm
Weight:	Approx. 0.15 kg · holder approx. 0.3 kg
<u>Accessories:</u>	
33.15030.001 000	(1503-1) Spare collecting funnel • weight approx. 0.15 kg



(15153)



(15152.1)

When raindrops ...

hit the sensor surface, incidents are registered without delay.

The detector (15153) counts the adjustable incidents, is heated and can therefore transform snow and hail into evaluable measurands.

The rain registrar (15152.1) reacts to wetting with contact conclusion.

The result at any one time is a reliable signal for the beginning and ending of precipitation.

The detectors can control safety systems, locking systems, and protection units.

- ▶ easy to mount
- ▶ protection against snowing in and freezing
- ▶ large temperature range of application
- ▶ includes pole mounting, suitable for wall mounting

building automatization • weather stations

Standard Line

(15152.1) Electronic Indicator for Rain

Id-No. 00.15152.100 002

Measuring element:

sensor surface • contact conclusion by wetting

Measuring value:

precipitation yes/no

Sensor surface:

18 cm²

Range of application:

temperatures -30...+60 °C

Switch-on delay:

< 0.5 s signal output · 15 s heating

Supply voltage:

11...28 V_{AC} or 11...32 V_{DC} max. 0.75 A

Signal output:

semiconductor relay · max. 36 V_{DC} · max. 0.5 A · potential-free/electrically isolated/galvanically isolated · precipitation „no“ = output activated · precipitation „yes“ = output opened · sensor „off“ (no supply voltage) = output opened

Protection class:

IP 66 acc. to DIN 40050

Abmessungen/ Gewicht:

77 x 49 x 25 mm · approx. 150 g

Professional Line

(15153) Electronic Indicator for Precipitation

Id-No. 00.15153.000 002

Measuring element:

light barrier system • single-pole change-over gate

Measuring range:

yes/ no of precipitation • size of the drop ≥ 0.2 mm

Sensor surface:

25 cm²

Range of application:

temperatures -25...+55 °C

Signal-/ Switch-off delay:

none/ 25...375 s adjustable

Switch-on conditions:

1...15 events in 50 seconds

Supply voltage:

24 V_{AC/DC} ± 15%

Breaking capacity:

230 V_{AC} / 4 A

Protection class:

IP 65 acc. to DIN 40050

Dimensions/ Weight:

130 x 140 x 40 mm • approx. 400 g

Accessory:

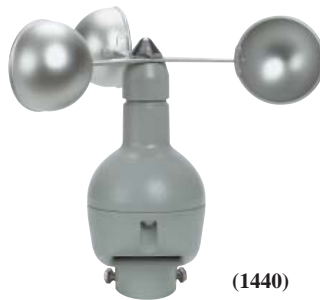
00.15152.124 000 Power supply unit for (15152.1) and (15153)

Simply evaporate ...

is impossible for the elements here. According to Piche, the water-level indicator is read on the glass tube. This method is easily applied inside buildings as well as in the open field. Realistic measuring conditions are created in the evaporation pan. Therefore, level measurement by hook gauge in the still well is the most commonly, best tested and most accurate measuring principle.

- no auxiliary power required
- easy handling

hydrology • soil science • classical meteorology • dams, reservoirs • waste management • science and research



(1440)

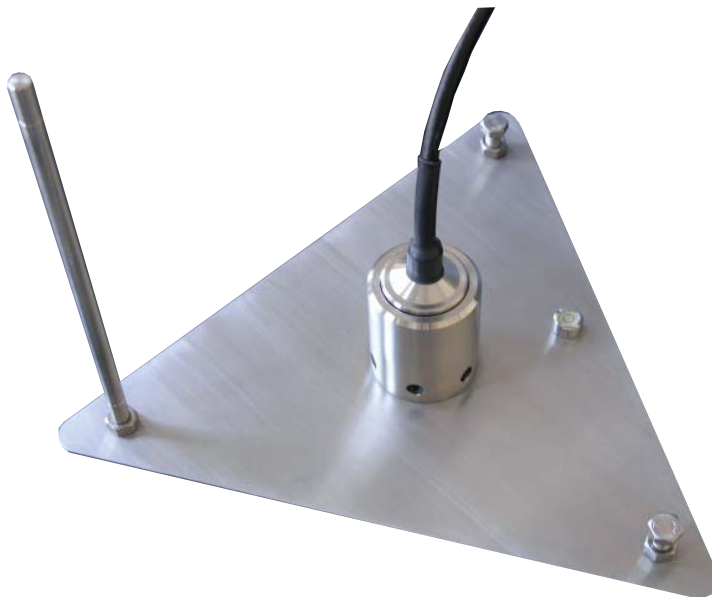


Standard Line	(1522) Evaporation Gauge according to Piche	Id-No. 00.15220.000 000
Measuring principle:	water level indication in the glass tube	
Measuring range:	0...30 ml	
Accuracy:	± 0.3 ml	
Division of scale:	0.1 ml	
Dimensions:	H 335 mm · measuring tube Ø 14 mm · blotting paper discs Ø 30 mm	
Weight:	approx. 0.07 kg	
<u>Accessories:</u>		
33.15220.001 000	(1522-1) Spare measuring tube	
33.15220.002 000	(1522-2) Blotting paper discs · 100 discs	
Professional Line	(1523) Evaporation Measuring System with Pan „Class A“ consisting of:	
00.15230.000 000	(1523) Hook gauge for level measurement Measuring range 0...100 mm · resolution 0.2 mm · weight approx. 340 g	
00.15230.110 000	(15230.11) Still well for evaporation pan Made of brass · 215 x 254 x 254 mm · weight approx. 1.8 kg	
00.15230.200 000	(15230.2) Evaporation pan „Class A“ made of aluminium Ø 1.200 mm x 250 mm · weight approx. 16 kg	
00.15230.310 000	(15230.31) Min-Max-floating thermometer (optional) Measuring range -5...+55 °C · accuracy ± 1 °C · resolution 0.5 °C	
00.14400.000 000	(1440) Wind-Run-Indicator (optional)	



DETERMINATION OF EVAPORATION

with water-level-sensor and pan „Class A“



A noble performance from LAMBRECHT again...

for precision measurement of water levels to determine the evaporation rate.

The sensitive pressure difference sensor element is built in the extreme robust stainless steel housing (IP 68).

The high-quality sensor is simply mounted on a delta base plate. This plate is designed for use in evaporation pans "Class A". The levelling of the plate can be carried out simply by levelling screws.

- ▶ flexible cable with pressure-compensation capillary
- ▶ simply handling
- ▶ water levels effective up to 180 mm
- ▶ 0...5 V output for data transfer to data logger
- ▶ meets the WMO specifications for classical, hydrological applications



classical hydrology • classical meteorology • soil science • dams, reservoirs • waste management • science and research



Standard Line	(15235) Water-Level-Sensor	Id-No. 00.15235.100 001
Measuring principle:	pressure difference transducer	
Measurand:	water level difference	
Measuring range:	200 mm total · 180 mm between the MIN- and MAX- marks at the level stick	
Accuracy/ Resolution:	0.4 mm (10...50 °C) · 0.05 mm	
Range of application:	Temperatures 0...+80°C	
Current consumption:	4 mA	
Supply voltage:	8...28 V _{DC}	
Output:	0...5 V = 0...200 mm	
Weight/ Dimension:	approx. 3.1 kg · with delta base plate · leg lenght approx. 310 mm	
Standards:	Stability EN 500 82-1 · Emitted interferences EN 500 81-2	
<u>Options:</u>		
00.15230.200 000	(15230.2) Evaporation pan "Class A" made of aluminium · Ø 1.200 mm x 250 mm · weight approx. 16 kg	
00.95666.x00 000	(95666) Data logger TROPOS	