Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
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Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
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Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
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Череповец (8202)49-02-64
Ярославль (4852)69-52-93

Киргизия (996)312-96-26-47
Россия (495)268-04-70
Казахстан (772)734-952-31

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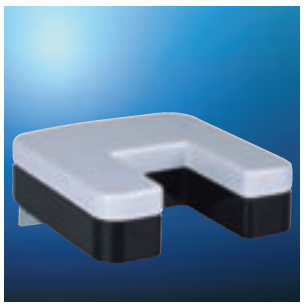
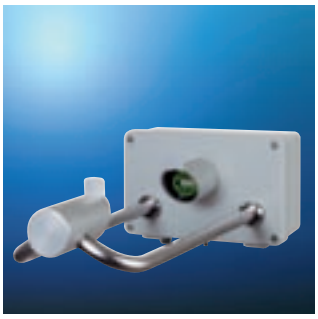
Каталог продукции

Осадки

THE WORLD OF WEATHER DATA

Measurement and Documentation: Thies' range of service for meteorology, environmental protection and industry





Today more than ever, the measurement, processing and analysis of meteorological data requires a high degree of measurement instrument precision and an optimal adaption of the data acquired to the task at hand.
For more than 60 years, we have been developing, producing and supplying practical instruments and systems for the analysis of weather data. Today we are one of the world's largest suppliers of such equipment.
Our close cooperation with scientific institutions and governmental agencies in many countries guarantees a constant and up-to-date flow of information about all aspects of individual national problems and projects and the rapid implementation of state-of-the-art developments and measurement techniques.
Our instruments and systems fulfill in all respects both to the requirements of national weather services as well as those of the World Meteorological Organization in Geneva.
Meteorological observations without computer-aided measurement and documentation systems are unthinkable today.
THIES develops complete ready-for-use-systems which include precision data transmitters, data loggers, power supply units and personal computers with adapted software.

Precipitation Evaporation Glossar

Precipitation	Any and all forms of water particles, liquid or solid, that fall from the atmosphere and reach the surface.
Dew Point	Indicates the temperature, where the saturation limit is reached – under cooling down of the air – and where dewing starts.
Evaporation	The loss of a certain water quantity, caused by a change of its aggregate state into gaseousness, under temperature influence.
Precipitation Quantity	The totality of the fallen liquid or solid precipitation. Indicated in mm, i.e. 1mm of precipitation = 1 litre per square meter.
Precipitation Meter	Generally for a precipitation collecting instrument, the collected quantity of which is measured by means of a measuring receptacle.
Precipitation Transmitter	Generally for a precipitation measuring instrument with electrical output. Here, an impulse is delivered for a defined precipitation quantity as output value.
Precipitation Recorder	Generally for a precipitation measuring instrument with mechanical recording of the collected precipitation quantity.
Snow Cross	Inset for precipitation meters. Avoids losses of snow in the precipitation funnel due to wind vorticities.
Rain	Water drops with a diameter of › 0.5 mm, falling down from the atmosphere
Drizzle	Water drops with a diameter of ‹ 0.5 mm, falling down from the atmosphere.
Hail	Balls of ice with a diameter of approx. › 5 mm, falling down from the atmosphere.
Snow	Down-falling snow crystals, single or sticking together.
Precipitation Intensity	The fallen precipitation quantity within a certain time period (e.g. mm/min)
Droplet	A nozzle where the liquid precipitation is passed through, and dripped off in a defined drop size. This procedure achieves a high resolution for the precipitation measurement (e.g. 0.005 mm)
Tipping Bucket	The collected liquid precipitation is led into a tipping bucket which tips over at a certain weight. The tipping over corresponds to a defined precipitation quantity (e.g. ≥ 0.1 mm)
Evaporation Calculation	**Mathematical calculation of the evaporation with different parameters:**
acc. to Haude	Day's value of evaporation from temperature and rel. humidity
acc. to Wendling	Hourly value of evaporation from temperature, rel. humidity, wind speed and radiation
acc. to Penman-Monteith	Day's value of the reference evaporation from temperature, rel. humidity, wind speed and radiation
acc. to Richter	Day's value of evaporation above water from wind speed, water surface temperature, rel. air humidity and air temperature
Guidelines	
VDI 3786, Part 7	Meteorological measurements, precipitation
DIN 4049, Part 101	hydrology, terms for precipitation and snow

Precipitation

Precipitation Transmitter
with electrical output for automatic data acquisition

Laser-Precipitation Monitor
for the measurement and detection of different types of precipitation such as drizzle, rain, hail, snow

Rain Monitor
with electrical output for acquisition of precipitation periods or control of protecting devices

Precipitation meter
for the mechanical acquisition of the precipitation for determining the water entry, e. g. in soil, artificial lakes, ponds etc.

Evaporation pan (Class A) with an **evaporation transmitter** for measurement of evaporation, e. g. in the agricultural field

Model Brief Description	Order No.	Technical Data	

Mechanical Precipitation Meter

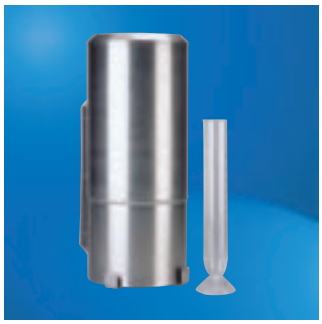
Precipitation Meter

5.4000.00.000

acc. to Hellmann
This meter meets the requirements of the German Weather Bureau.
The precipitation is collected in a vessel and then measured in litres in the measuring cylinder.
Consist of:

1 upper part	
1 lower part	
1 collecting can	**500447**
1 support	
1 measuring cylinder	**210248**

Meas. cylinder	200 cm^3 ≙ 10 mm precipitation
Graduation	0.1 mm precipitation
Collecting area	200 cm^2
Collecting can	1.4 l
Model	acc. to DIN 58666 C
Material	stainless steel
Dimension	Ø 190 x 450 mm
Weight	3.2 kg



Rain and Snow Meter

5.4001.00.000

acc. to Hellmann
Described as above, with additional parts:

2 snow crosses	**502506**
1 cover	
1 upper part	
1 lower part	
1 collecting can	**500447**

Model	acc. to DIN 58666 D as preceding
Material case	stainless steel
Snow cross	stainless steel
Cover	Aluminium, anodized
Collecting can	PE
Weight	6.5 kg

Rain and Snow Meter

5.4005.00.000

acc. to Hellmann
small-size model
Same measuring principle as with 5.4000.00.00, but smaller housing with smaller collecting area.
The precipitation is collected directly in the measuring receptacle.

Meas. cylinder	250 cm^3 ≙ 25 mm precipitation
Graduation	1 mm precipitation
Collecting area	100 cm^2
Dimensions	Ø 120 x 255 mm
Weight	1.25 kg

Accessories

Snow Cross

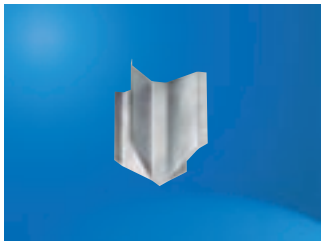
Is put into the collecting funnel of the Precipitation Meter or Rain and Snow Meter in order to avoid losses caused by snow vorticities.

502506

for	5.4000... / 5.4001...
Material	stainless steel
Dimensions	150 x 150 x 240mm
Weight	0.25 kg

502507

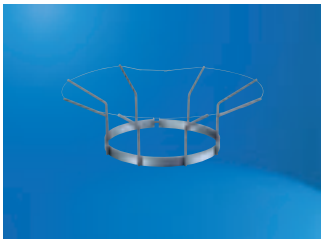
for	5.4005.00.000
Material	stainless steel
Dimensions	100 x 100 x 200 mm
Weight	0.15 kg



Precipitation

Model Brief Description	Order No.	Technical Data	
Accessories			
 **Measuring Cylinder 10** for 5.4000... / 5.4001... acc. to DIN 58667 B	**210248**	Measuring range Graduation	0 ... 10 mm precipitation 0.1 mm precipitation
Measuring Cylinder 25 for 5.4005.00.000	**210249**	Measuring range Graduation	0 ... 25 mm precipitation 1 mm precipitation
Mechanical Precipitation Recorder			
 **Precipitation Recorder** acc. to Hellmann A standard mechanical precipitation measurement instrument employed in meteorology acc. to VDI 3786, p. 7. Except for the heating system, this instrument requires no additional auxiliary power. The instrument case is made of stainless steel.	**5.4010.xx.000** **5.4011.xx.0oo** **.10.** **.16.**	**Recording time** 7 days 24 hours Heating Heating Collecting area Collecting height Recording width Graduation Transport mech. Collecting can Ambient temp. Dimensions Weight	**Thrust** 55 mm / day 16 mm / hour none 42 V AC / 250 VA 200 cm^2 1.0 m 80 mm ≙ 10 mm precipitation 0.1 mm precipitation drum clockwork acc. to DIN 58658 2.75 l 0 ... +60 °C (w/o. heat.) -20 ... +60 °C (w. heat.) Ø 370 x 1000 mm 13 kg
 **Precipitation Recorder** acc. to Hellmann A standard mechanical precipitation measurement instrument employed in meteorology acc. to VDI 3786, page 7. Except for the heating system, this instrument requires no additional auxiliary power. The instrument case is of stainless steel.	**5.4015.xx.000** **5.4016.xx.000** **...10.** **...16.**	Thrust Thrust Heating Heating Collecting area Collecting height Recording width Graduation Transport mech. Recording time Collecting can Dimensions. Weight	10 mm / hour 20 mm / hour none 42 V AC / 250 VA 200 cm^2 1.0 m 80 mm ≙ 10 mm precipitation 0.1 mm precipitation strip chart 31 days ca. 2.75 l Ø 485 x 1000 mm 21 kg

Model Brief Description	Order No.	Technical Data	
Accessories			
Recording chart (not depicted) For 5.4010... / 5.4011... (1 set = 100 pcs)	**205243** **205245**	Recording time	7 days 24 hours
Recording Roll For 5.4015... / 5.4016...	**205247** **205248**	Thrust Recording time	10 mm / hour 20 mm / hour 31 days
Felt pen (not depicted) For all Thies precipitation recorders	**500847**	Colour	violet
Device to Refuse Birds Protection against bird droppings for the collecting funnels of the precipitation recorders (5.4010/11.., 5.4015/15..). Refuses birds on the edge of the collecting funnel	**5.4010.00.010**	Material Clamping diameter Dimensions Weight	stainless steel Ø 160 Ø 360 x 100 mm 0.32 kg
Power Supply Unit Power supply unit to provide power to the heating of the preceding precipitation recorder.	**5.3288.20.000**	Primary voltage Secondary voltage Fuse Type of protection Dimensions Weight	230 V / 50 Hz / 2 A 42 V / 300 VA / 8 A primary and secondary IP 65 125 x 175 x 125 mm 5.5 kg
Precipitation Transmitter			
Ombrometer The measuring receiver transmits the values measured for amount and intensity of precipitation. Depending on the maximum possible intensity, either drops are counted or the turnovers of a tipping bucket are counted or a combination of both these measuring principles is employed. The collecting funnel is of zinc-plate and the cover is made of stainless steel grey varnished. The heating system is regulated by a thermostat.	**5.4031.xx.000** **.11.** **.31.** **.51.**	Meas. principle Dropper Tipping bucket Combination Collecting area Resolution Electr. output Heating Ambient temp. Operating voltage Housing Mounting Dimensions Weight	Intensity max. 2 mm / min. max. 10 mm / min. 2 mm / min., 10 mm / min. 200 cm^2 0.005 mm (dropper) 0.1 mm (tipping bucket) Imp. 5 V, 15 mA (TTL) 70 W; 24 V AC/DC -25 ... +60 °C 8 ... 29 V AC / 60 mA or 10 ... 38 V DC / 50 mA stainless steel, varnished onto a mast Ø 50 mm Ø 225 x 480 mm 6.5 kg



Precipitation

Precipitation Transmitter

Precipitation Transmitter

- pulse output
- with intensity-dependent linearization

Instrument serves as sensor for quantity and intensity of precipitation, for the digital transmission of measuring values.

The measuring principle is in accordance to the “Guide to Meteorological Instruments No 8” of the WMO.

The precipitation is conducted into the tipping bucket via the collecting area and funnel. On achieving the maximum volume capacity the bucket tips over. Each tipping event is acquired contract-free, is linearized, and output for further processing.

Order No. 5.4032.35.007 .008

Technical Data	
Heating	none
Heating	48.5 W; 24 V AC/DC
Collecting area	200 cm²
Resolution	0.1 mm NS
Intensity	max. 11 mm / min.
Meas. principle	tipping bucket
Electr. output	pulses
Ambient temp.	-25 ... +60 °C with heating 0 ... +60 °C w/o heating
Supply	
Electronics	5 ... 24 V DC (2-leads-circuit)
Heating	24 V AC/DC
Housing	stainless steel
Mounting	onto mast Ø 50 mm
Dimensions	Ø 186 x 445 mm
Weight	3.3 kg

Precipitation Transmitter

- pulse output
- with intensity-dependent linearization

This precipitation transmitter has an additional heating for the casing, and is therefore wellsuited particularly for the use in mountains.

Order No. 5.4032.45.008

Technical Data	
Heating	113.5 W; 24 V AC/DC
Collecting area	200 cm²
Resolution	0.1 mm NS
Intensity	max. 11 mm / min.
Meas. principle	tipping bucket
Electr. output	Pulses
Ambient temp.	-25 ... +60 °C w. heat.
Supply	
Electronics	5 ... 24 V DC (2-leads-circuit)
Heating	24 V AC/DC
Housing	stainless steel
Mounting	onto mast Ø 50 mm
Dimensions	Ø 197 x 445 mm
Weight	3.3 kg

Precipitation Transmitter

Precipitation Transmitter

Model Brief Description	Order No.
- analogue output	5.4033.35.xxx
- pulse output	.36.
- with intensity-dependent linearization	.040
	.041
	.073
	.061

Instrument serves as sensor for quantity and intensity of precipitation, for the analogue transmission of measuring values.

The precipitation is conducted into the tipping bucket via the collecting area and funnel. On achieving the maximum volume capacity the bucket tips over. Each tipping event is acquired contract-free, is linearized, and output for further processing.

Analogue output:
The following output functions are selectable:

1.) The analogue output is available as accumulated value in proportion to the precipitation pulses. Here, the analogue value is reset automatically to zero mm precipitation in case of measuring value exceeding, or through an external pulse.

2.) The analogue output can deliver the data as gliding accumulated value over a selectable time (10 / 60 min., 6 / 24 h).

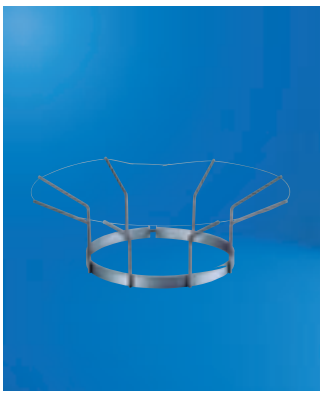
Pulse output:
The precipitation pulse is available in parallel to the analogue output via an optocoupler

Technical Data	
Heating	48.5 W; 24 V AC/DC
Heating	none
Electr. output 1	0 ... 20 mA (‹ 500 Ω)
	4 ... 20 mA (‹ 500 Ω)
	0 ... 5 V
	0 ... 10 V
Electr. output 2	pulses
Meas. range	selectable
	10 / 20 / 25 / 50 mm
Collecting area	NS
Resolution	200 cm^2
Intensity	0.1 mm NS
Meas. principle	max. 11 mm / min. tipping bucket
Operating voltage	24 V AC / DC or (w/o heating supply)
	10 ... 28 V DC
	14 ... 28 V DC (10 V-outp.)
Ambient temp.	-25 ... +60 °C with heating
	0 ... +60 °C w/o heating
Housing	Stainless steel
Mounting	onto mast Ø 50 mm
Dimensions	Ø 186 x 445 mm
Weight	3.3 kg

Precipitation

Model Brief Description	Order No.	Technical Data	
Precipitation Measuring Systems			
Precipitation Transmitter same as 5.4032.35.008, however connectable to the precipitation datalogger 509040	**5.4032.35.508**	Heating	48.5 W; 24 V AC/DC
		Collecting area	200 cm^2
		Resolution	0.1 mm NS
		Intensity	max. 11 mm / min.
		Meas. principle	tipping bucket
		Electr. output	pulses
		Ambient temp.	-25 ... +60 °C
		Supply	
		Electronics	6 V DC
		Heating	24 V AC/DC
		Housing	stainless steel
		Mounting	onto mast Ø 50 mm
		Dimensions	Ø 186 x 445 mm
		Weight	3.3 kg
M-LOG5W-Counter, Precipitation Datalogger Serves for the storing of precipitation impulses of the precipitation transmitter 5.4032.35.508	**509040**	Measuring value input	Impulse
		Memory capacity	approx. 100 000 impulses
		Operating voltage	by inserted 3.6V/2400 mAh Lithium battery
Wireless- USB-Adapter 433 MHz Serves for the read-out the precipitation datalogger 509040 by means of a PC	**212783**		
GP- Shell-Software Serves for the setting, and communication of the precipitation datalogger 509040 as well as for reading the measuring data out by means of an external PC	**212784**	Data format	CSV-File
		System requirement	WIN98SE, XP, VISTA, WIN7

Model Brief Description	Order No.	Technical Data	
Precipitation Measuring Systems			
Precipitation Transmitter Same as 5.4032.35.007 however with inserted precipitation datalogger 509040	**5.4032.35.507**	Collecting surface Resolution Intensity Measuring principle Electr. output Ambient temp. Operating voltage Supply Housing Mounting Dimension Weight Datalogger: Memory capacity Supply	200 cm^2 0,1 mm NS max. 11 mm / min. Tipping bucket Impulses 0 ... +60 °C 6V DC By inserted Lithium-battery Stainless steel on mast Ø 50 mm Ø 186 x 445 mm 3.3 kg approx. 100 000 impulses by inserted 3.6V/2400 mAh Lithium battery
The wireless read-out of the data is carried out via optional accessories:			
- Wireless- USB-Adapter	**212783**		
- GP- Shell-Software	**212784**		
Accessories for Precipitation Transmitter			
Device to Refuse Birds Protection against bird droppings for the collecting funnels of the Ombrometer (5.4031.11/31/51...). Refuses birds on the edge of the collecting funnel.	**5.4031.11.010**	Material Clamping diameter Dimensions Weight	stainless steel Ø 225 mm Ø 380 x 100 mm 0.41 kg
Device to Refuse Birds For Precipitation Transmitter and Precipitation Recorder. (5.4032.35.007/8; 5.4033.35/36...)	**5.4010.00.010**	Material Clamping diameter Dimensions Weight	stainless steel Ø 186 mm Ø 360 x 100 mm 0.32 kg
Device to Refuse Birds For Precipitation Transmitter 5.4032.45.008	**5.4010.00.011**	Material Clamping diameter Dimensions Weight	stainless steel Ø 197 mm Ø 370 x 100 mm 0.35 kg
Stand Used to mount the preceding Ombrometer, resp. Precipitation Transmitter. The collecting area can be elevated to a height of 1; 1.2 or 1.5 m.	**9.4031.35.xxx** **.36.xxx** **.065** **.085** **.115**	Material Collecting height Total length Tube diameter Mounting distance Weight	steel, zinc plated stainless steel 1.0 m 1.2 m 1.5 m 0.6 m, 0.8 m resp. 1.15 m 48.3 mm 450 mm approx. 6.5 kg, 7.5 kg, 8.5 kg



Precipitation

Model Brief Description	Order No.	Technical Data

Accessories for Precipitation Transmitter

Wind Protection Element

Serves as optional accessory for uninterrupted acquisition even in case of wind. It provides that the precipitation gets into the measuring instrument almost without swirling.

Suitable for Ombrometer and precipitation transmitter.

The wind shield is mounted onto a stand together with the measuring instrument (see order.-no. 9.4031.35/36...).

5.4032.00.000

Material	
Ring, Receptacle, Connecting bar	Steel, zinc plated
Lamella	Stainless steel
Diameter	1000 mm
Length of lamella	520 mm
Total height	800 mm
Receptacle	for Ø 48 mm
Weight	18 kg

Power Supply Unit

Provides power, for Ombrometer and Precipitation Transmitter.
The primary and secondary voltages have separate fuses.
Synthetic case.

9.3388.00.000

Primary	230 V / 50 ... 60 Hz
Secondary	26 V AC / 3.46 A 24 V AC / 0.5 A 12 V DC / 0.3 A
Housing	Synthetic
Protection	IP 65
Dimensions	125 x 125 x 125 mm
Weight	2.7 kg

Power Supply Unit

For power supply of the reinforced heating with precipitation transmitter 5.4032.45.008

9.3388.00.001

Primary	230 V / 50 ... 60 Hz
Secondary	24 V AC / 140 VA
Housing	Synthetic
Protection	IP 65
Dimensions	200 x 200 x 135 mm
Weight	3.7 kg

Power Supply Unit Compact

Used for the power supply of the Ombrometers and Precipitation Transmitters.
The primary and secondary voltages are protected by fuses.
A terminal strip is integrated additionally for the connection and distribution of the measuring cables.

9.3389.10.000

.010

Primary	230 V / 50 Hz / 0.63 A 115 V / 60 Hz / 1.3 A
Secondary	2 x 24 V AC / 27.5 VA 1 x 24 V AC / 75 VA 1 x 24 V AC / 5 VA 1 x 24 V DC / 2 W
Clamp distributor	20 pole
Housing	Synthetic
Protection	IP 65 for housing
Dimensions	300 x 200 x 140 mm
Weight	4.4 kg

Precipitation Monitoring

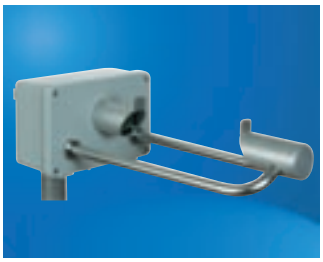
Laser Precipitation Monitor

The Laser Precipitation Monitor serves as measuring value transmitter, and is well-suited for the measurement and detection of different types of precipitation such as

- drizzle
- rain
- hail
- snow
- and mixed precipitation.

The acquisition comprises the types of precipitation, intensity and the spectrum.
All measuring values are available for the user via an RS485/422 interface.
In addition, the instrument is equipped with two further digital outputs (opto-couplers), which output, for ex., pulses and state of precipitation.

The optical components are equipped with an integrated heating.

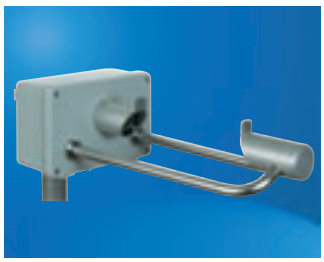


Model Brief Description	Order No.	Technical Data	
	5.4110.00.xxx		
	000	Operating voltage	24 V AC / DC or 22...30 V DC (‹ 750mA)
	100	Operating voltage	115 V AC, 15 Ω
	200	Operating voltage	230V AC, 15 Ω
	300	Operating voltage	12 ... 24 VDC, 600 mA
		Measuring value	Precipitation
		Particle size	0.16 ... › 8mm Ø
		Particle speed	0.2 ... 20 m/s
		Intensity	‹ 0,005 mm/h (drizzle) › 250 mm/h
		Output intensity -via RS485	: resolution 0.001 mm/h
		Output quantity -via RS485	: resolution 0.01 mm
		-via data output.	: pulses (res. 0.1 mm; 0.01 mm; 0.005 mm)
		Accuracy with Quantity meas.	‹ 15% (rain, 0.5-20 mm/h) ‹ 30% (snow)
		Precipit. types	drizzle (also freezing) rain (also freezing) hail snow snow grains/ ice needles soft hail/ice grains
		Precipitation output -via RS485	Synop, Metar
		-via digital output	frequency
		Accuracy for precipitation output (comparing with synoptic observation)	drizzle › 97% rain › 99% hail › 95% snow › 99% snow grains › 60% soft hail t.b.d.
		Sensors	
		Laser diode	785nm, max0.5mW
		Laser class	1M (EN60825-1:1994 A2:2001)
		Measuring surface	45.6 cm^2
		Data output	
		RS 485	1200 ... 115200Bd potential isolation
		Digital output	duplex 2 x opto couplers, potential isolation
		General	
		Ambient conditions	-40 °C ... +70 °C, 0 ... 100% r.h.
		Dimensions	270 x 170 x 540 mm
		Weight	4.8 kg
		Protection	IP 65
		EMC immunity	EN61326 with
		EMC radiation	EN61000-4-3 EN61326 class B

Precipitation

Model Brief Description	Order No.	Technical Data

Precipitation Monitoring



Laser Precipitation Monitor

The following additional sensors can be connected to this model:

- temperature
- rel. humidity
- wind speed
- wind direction

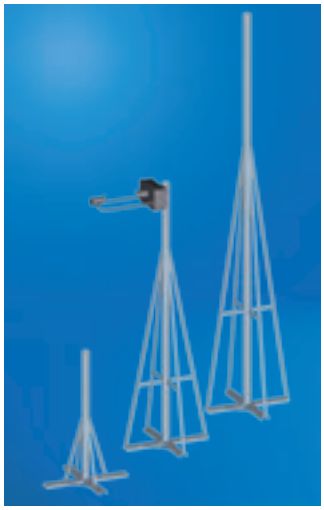
Suitable Transmitters:
Hygro-Thermotransmitter
1.1005.54.000
Wind Transmitter
4.3519.00.000
Wind Direction Transmitter
4.3129.00.000

For more details and techn. data see 5.4110.00.000

5.4110.10.x00

Additional Meas. Value Input	
Temperature	Pt 100
Meas. range	-40 ... +70 °C
Resolution	0.1 °C
Accuracy	±0.1 °C
Rel. humidity	0 ... 1V
Meas. range	0 ... 100% r.h.
Resolution	0.1%
Accuracy	±0.1%
Wind speed	0 ... 630Hz
Meas. range	0 ... 50 m/s
Resolution	0.1 m/s
Accuracy	±0.1 m/s
Wind direction	serial synchronous
Meas. range	0 ... 360 degree
Resolution	11.25 degree

Accessories for Laser Precipitation Monitor

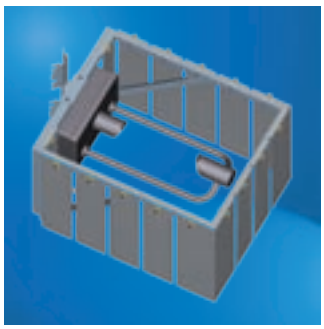


Instrument Support

For the vibration-reduced operation of the LPM on an available concrete foundation, provided by the customer. The support consists of a vertical tube with firmly welded-on tripod stand and struts.

4.3187.61.100
.200
.300

Tube length	1 m
	2 m
	3 m
Tube diameter	60 mm
Tripod stand	645 x 645 mm
Weight	30 kg
Material	steel, hot-dip galvanized



Wind Protection Element

Serves as optional accessory for uninterrupted acquisition even in case of wind. It provides that the precipitation gets into the Laser-Precipitation-Monitor (LNM) almost without swirling.

Together with the LNM, the wind shield is mounted to a carrier or mast.

5.4200.00.000

Material	
Frame	Steel, zinc plated
Lamella	Stainless steel
Dimension	600 x 480 x 400 mm (L x W x H)
Mounting set	for mast Ø 48-102 mm, optional Ø 132-200 mm
Weight	18 kg

PC-Program LNM View

Ref. chapter “Software”

9.1700.99.000

Model Brief Description	Order No.	Technical Data	

Precipitation Monitoring

Precipitation Monitor

The instrument is designed to detect the beginning and the end of precipitation. It can be used for status report, or as signal transmitter for the control of rain protection devices, such as windows, awnings, or Venetian blinds.

The precipitation is detected opto-electronically via a measuring area of approx. 25 cm^2.

A relay-contact signalises the state of precipitation. (Precipitation yes/no).

Integrated heating avoids snow covering or freezing of the instrument during winter operation.

Delivery including mast holder, which can be used for wall mounting as well.

5.4103.10.000
.700

Connection	Cable gland Plug connection
Measuring value	Precipitation yes/no
Switch-on delay	none
Switch-on condition	1 ... 15 incid. within 50s adjustable
Switch-off delay	25 ... 375s in 25s steps adjustable
Sensor area	25 cm^2
Drop size	≥ 0.2 mm
Output	single-pole double throw switch
Contact load at 5.4103.10.000 at 5.4103.10.700	 max. 230 V AC/DC; 4 A max. 60 V AC/DC; 4 A
Operating voltage	24 V AC/DC ±15%
Operating current	ca. 70 mA
Heating current	max. 1 A
Ambient temp.	-30 ... +60 °C
Protection	IP 65
Dimensions	130 x 140 x 40 mm
Weight	0.4 kg
EMC	EN 61000-6-2 EN 61000-6-3

Precipitation Sensor

Instrument serves for determination of the instantaneous precipitation intensity. Herefrom, control- and warning signals can be derived.

The precipitation is detected opto-electronically via a measuring area of approx. 25 cm^2.

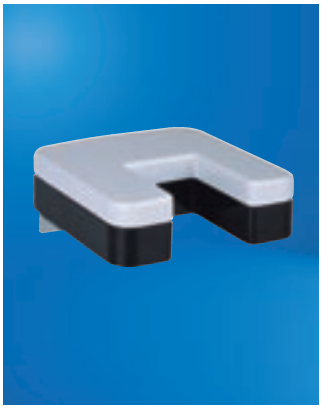
Output of the measuring signal as intensity-dependent analogue value.

Integrated heating avoids snow covering or freezing of the instrument during winter operation.

Delivery including mast holder, which can be used for wall mounting, as well.

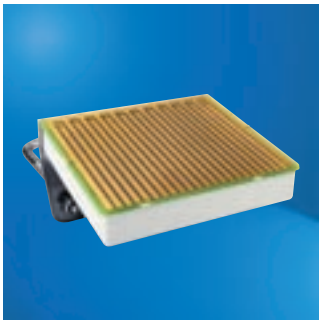
5.4103.20.041
.741

Connection	Cable gland Plug connection
Measuring value	Precipitation intensity
Measuring range	0 ... 10 mm / min.
Electr. output	4.0 ... 8.0 mA (= 0 ... 0.01 mm/min.) 8.0 ... 12.0 mA (= 0.01 ... 0.1 mm/min.) 12.0 ... 16.0 mA (= 0.1 ... 1.0 mm/min.) 16.0 ... 20.0 mA (= 1.0 ... 10 mm/min.)
Sensor area	25 cm^2
Drop size	≥ 0.2 mm
Operating voltage	24 V AC/DC ±15%
Operating current	ca. 90 mA
Heating current	max. 1 A
Ambient temp..	-30 ... +60 °C
Protection	IP 65
Dimensions	130 x 140 x 40 mm
Weight	0.4 kg
EMC	EN 61000-6-2 EN 61000-6-3



Precipitation

Precipitation Monitoring



Rain Monitor

The instrument is designed for electrical acquisition of start and end of precipitation. The precipitation drops are detected by a sensor area, and with wetting a contact is closed.

An integral heating system ensures ice and snow free operation in winter. Complete with a mast fixing that can also be utilised for wall mounting.

Order No. 5.4105.00.000

Technical Data	
Measuring value	Precipitation yes/no
Switch-on delay	none
Switch-off delay	5.5 min.
Sensor area	40 cm^2
Contact	1 change over
Contact load	max. 42 V DC, max 1 A; max. 4,5 W
Operating voltage	24 V AC/DC; max. 4 W
Ambient temp.	-30 ... +50 °C
Protection	IP 65
Cable	3 m; LiYY 5 x 0.25 mm^2
Dimensions	76.5 x 54 x 18 mm
Weight	0.5 kg

Power Supply Unit

Provides power to the preceding Precipitation Monitor. The primary and secondary voltages have separate fuses. Synthetic case.

Order No. 9.3388.00.002

Technical Data	
Primary voltage	230 V / 50 Hz
Secondary voltage	24 V AC / 20 AV
Protection	IP 65
Dimensions	107 x 125 x 100 mm
Weight	1.2 kg

Datalogger System

Datalogger DLN

The datalogger acquires the output pulse measurement values (0,1 mm prec/imp.) of max. 2 precipitation transmitters as well as one temperature value from a Pt100. It stores the data together with time and date in accordance with the set memory cycle.

In addition, measuring data of an LNM (5.4110.xx.xxx) can be acquired and stored.

The read-out of the stored data is carried out directly via the serial interface, USB, or by means of an SD-card.

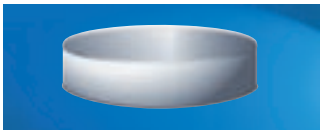
Date, time, station name, and memory cycle can be set via 3 keys.

The instrument can be operated in battery-supplied mode (mains-independent).

The pulses of the precipitation transmitter can be processed potential-free via opto-coupler.

Order No. 5.1756.00.000

Technical Data	
Measuring value inputs	2 x Reed contact/ impulses 1 x temperature Pt100 1 x serial (COM2)
Measuring range Pt100	-40 ... 70 °C
Measuring value output	2x opto-coupler (max. 24V, 1 mA)
Query cycle (Pt100)	1s ... 60 min.
Memory cycle	1 ... 60 min.
Memory capacity	4 MB (non-volatile)
Number data records	360448 (3 channels) 163840 (10 channels)
Data output	COM1: RS 232 USB Device SD-Card
Additional interface COM2	RS485 half-duplex (connection of an LNM or output of telegram)
Display	2 lines a 16 characters
Clock	Real time clock
Supply via:	
Battery connection	12V DC (10.5 ... 15V) and / or
Charching connection	16.5 ... 28 V DC 16 ... 24 V AC 50/60Hz
Power consumption	Max. 500 mA
Ambient temp.	-30 ... +60 °C
Protection	IP20
Mounting	DIN rail
Connection	clamp
Dimension	155 x 85 x 60 mm
Weight	0.7 kg

Model Brief Description	Order No.	Technical Data		
Datalogger System				
SD-Card Serves as portable data carrier for reading the measuring data out from the DATALOGGER-DLN	**9.2200.00.000**	Memory capacity Format	2 GB FAT 16	
Evaporation				
Evaporation Meter acc. to Pichè This is a measuring tube with a scale, which is closed on both ends. The lower end is closed with the blotting paper.	**6.1425.00.000** **.001**	with blotting paper with blotting paper Measuring range Graduation Volume Total length Weight	Ø 55 mm Ø 33 mm 0 ... 30 ml 0.1 ml 36 ml 325 mm 0.1 kg	
Blotting Paper (1 set = 100 papers)	**205270** **205271**	Diameter	55 mm 33 mm	
Evaporation Pan "Class A" A stainless steel pan to hold the water for evaporation.	**6.1428.10.000**	Diameter Height Material Weight	1206.5 mm = 47,5" 254 mm = 10" stainless steel 26 kg	
Smoothing Pipe with suspension measuring rod A measuring instrument to determine the water level in an Evaporation pan. A pointed rod in a smoothing pipe scans the water level by a micro meter.	**6.1428.11.000**	Measuring range Graduation Height of level Material Dimensions Weight	0 ... 100 mm 0.05 mm 177.8 mm = 7" stainless steel Ø 200 x 300 mm 2.4 kg	
Min.-Max.-Immersion Thermometer This thermometer is used to measure the temperature on the bottom of the evaporation pan. This allows comparison of the ambient temperature with existing measurements.	**6.1428.14.000**	Range of indication Accuracy Graduation Measurement fluid Material Dimensions Weight	-30 ... +50 °C ±0.5 K 1 °C mercury Aluminium, anodised 60 x 220 x 45 mm 0.26 kg	

Evaporation

Evaporation

Ultrasonic Evaporation Transmitter

- With analogue output

For the automatic measurement of the evaporation height with the aid of an ultrasonic sensor.
Referring to a reference height the down-going water-level is measured continuously, and is output as current or voltage.
The evaporation transmitter is temperature-compensated.

Order No.: 6.1432.10.xxx
.040
.041
.073

Technical Data	
Electr. output	0 ... 20 mA 4 ... 20 mA 0 ... 5 V
Measuring range	0 ... 100 mm
Accuracy	±1.5% of mr. (0 ... 50 °C)
Resolution	0.1 mm
Operating voltage	10 ... 32 V DC
Current load	approx. 40 mA + Iout
Ambient temp.	-15 ... +50 °C
Connection	Cable 5 m, LiYCY 4 x 0.25 mm²
Dimensions	Ø 100 x 430 mm
Weight	3.5 kg

Ultrasonic Evaporation Transmitter

- With serial synchronous output

For the automatic measurement of the evaporation height with the aid of an ultrasonic sensor.
Referring to a reference height the down-going water-level is measured continuously, and is output as serial synchronous telegram.
It is possible to connect it directly to a THIES-Datalogger TDL14 / DLxMET / DL16 for example.
The evaporation transmitter is temperature compensated.

Order No.: 6.1432.20.400

Technical Data	
Measuring range	0 ... 100 mm
Accuracy	±1.5% v. Mr. (-10 ... +50 °C)
Resolution	0.1 mm
Electr. output	interface serial synchronous
Data protocol	12 Data bits and 12 Control bits
Operating voltage	10 ... 32 V DC
Current load	approx. 40 mA active approx. 2 mA stand by
Ambient temp.	-15 ... +50 °C
Connection	Cable 5 m, LiYCY 4 x 0.25 mm²
Dimensions	Ø 100 x 430 mm
Weight	3.5 kg

Ultrasonic Evaporation Transmitter

- With RS485-Interface

The measured value is output as a serial data telegram via an RS485 interface.
The data telegram operate may, for example, data logger or process control systems.

Order No.: 6.1432.20.500

Technical Data	
Measuring range	0 ... 100 mm
Accuracy	±1,5% v. Mb. (0 ... +50 °C)
Resolution	0.1 mm
Electr. output	
Interface	RS485 (half-duplex)
Baudrate	1200-57600 Baud
Data format	8 Bit; no parity; 1 Stopbit
Operating voltage	10 ... 32 V DC
Current load	approx. 40mA active approx. 2 mA standby
Ambient temp.	-15 ... +50 °C
Connection	Cable 5 m, LiYCY 4 x 0,25 mm²
Dimensions	Ø 100 x 430 mm
Weight	3.5 kg

Precipitation

Model Brief Description	Order No.	Technical Data

Software

PC-Program LNM View

- communication
- visualization
- filing

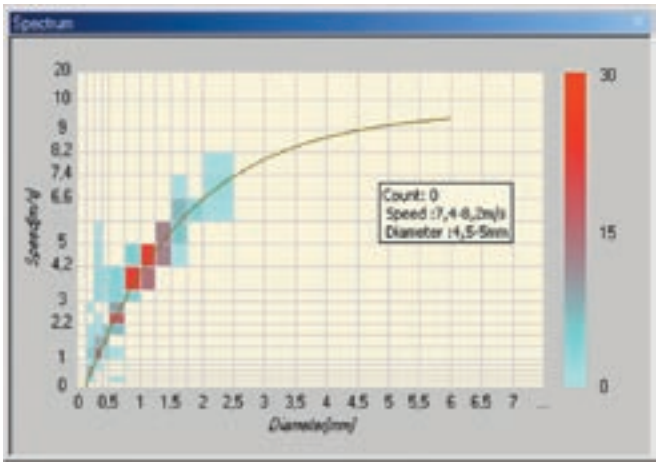
The program LNM serves for the display of data, which are induced by the LNM. The program can file the data sent by the LNM as well as represent them in graphic form. Thanks to a user-friendly surface design it is possible to analyse each record, sent by the LNM, in a very simple way.

9.1700.99.000

System Requirements

The program is made for Microsoft Windows® XP / 2000.

Minimum PC requirement	
PC	1 GHz, 512 MBRAM
Graphic resolution	800 x 600
Graphic colours	16bit TrueColor



Model Brief Description	Order No.	Technical Data

Software

Mevis T light, Version 2.2

9.1796.40.001

MEVIS T light is a software for information, data acquisition and data processing for meteorological and environmental data, acquired by the THIES dataloggers TDL 14, DLxMET or DL16. The data acquired by max. 5 dataloggers are read-out with MEVIS-light and documented. The reading-out of the data to the PC is effected in 4 different ways: via MODEM to a COM-interface, via MEMORY-CARD, SD-CARD and read-out unit to a LPT-interface or via network with DL16. The documented data can be used in 3 different ways: various graphical presentations, presentations in tabular form, exporting of data for the processing with application programs of the customer.

Graphical presentation:
Graphic 12-in-1
- for max. 12 meas. channels in 4 x/t-diagrams

Graphic 4-in-4
- for max. 4 meas. channels in 4 x/t-diagrams

Graphic 4-in-1
- for max. 4 meas. channels in 1 x/t-diagrams

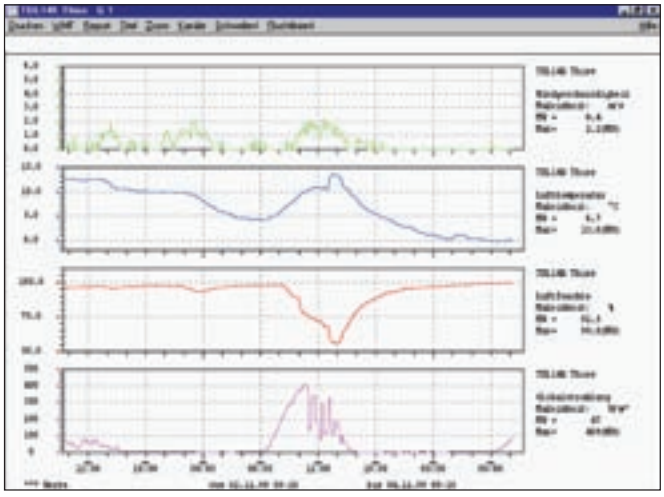
Day's values 4-in-4
- for max. 4 meas. channels in 4 diagrams as day's stage mean value

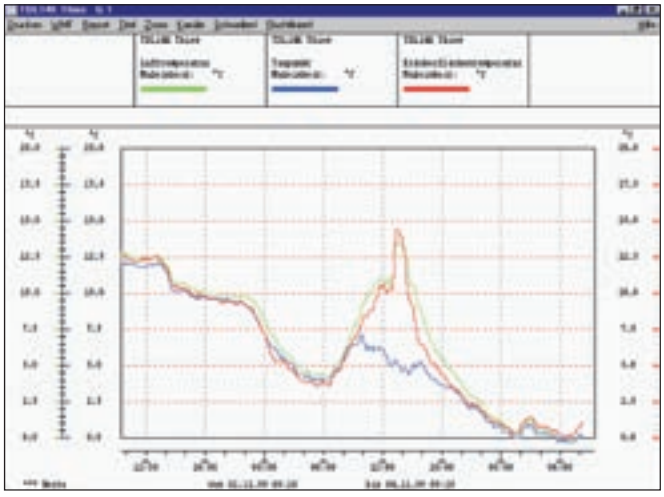
Day's values 4-in-1
- for max. 4 meas. channels in 1 diagram as day's stage mean value

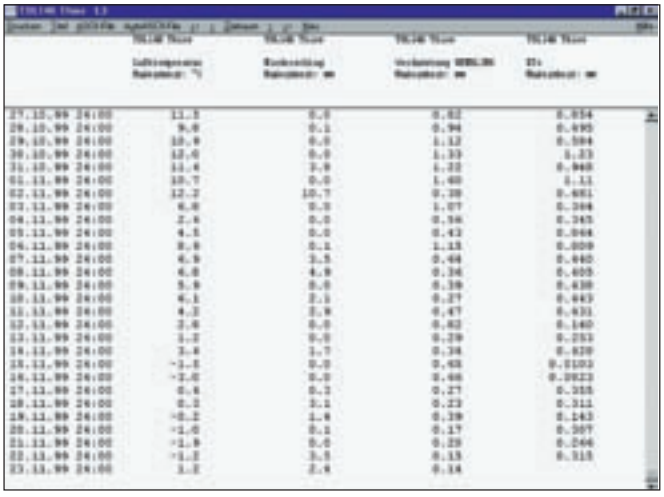
Presentation in tabular form:
4 Channel-List
- 4 channels (also from different stations) are listed

Station list
- all channels of one station are listed

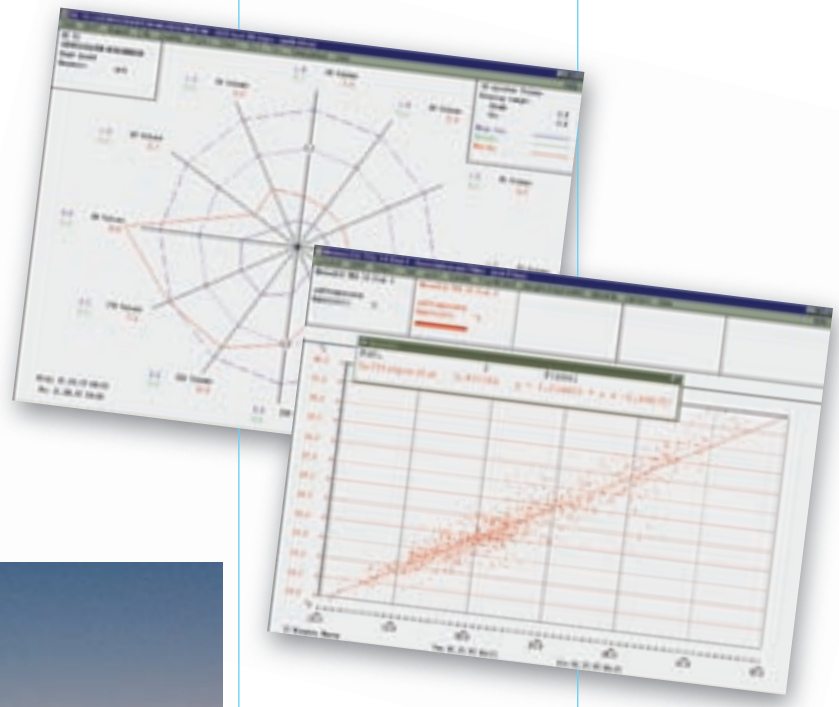
MEVIS T-light minimum system requirements:
- PC
- Windows 2000 / XP / Vista / Win 7
- Hard disc 100 MB free capacity







THIES –
as versatile as require
the international tasks



THIES-CLIMA – Worldwide

Weather and environmental monitoring technology needs a competent partner

Climatic measurement and intelligent analysis are international tasks. They do not only demand a worldwide cooperation of the responsible authorities, but also a comprehensive network of sensors and analytical systems.
We have developed a smoothly functioning system of partners and subsidiaries throughout the world to provide expert advice there where you need it.

THIES assumes complete supervision of the tasks at hand, from project planning to the installation of the system, from staff training to the processing of the measurement results.
Should you want to contact one of our foreign partners, please write or call us first in Göttingen. We will provide you with the exact address.

Thies CLIMA

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