

# PRECIPITATION MEASURING TECHNOLOGY

## 3D Stereo Disdrometer

**Part number: 5.4120.xx.xxx**

The instrument consists of a light source and a stereo camera. Particles pass through the measurement volume defined by the viewing angles of the cameras as well as minimum and maximum distance from the cameras.

All particles cause extinction of the light seen by the cameras. Particle sizes are deduced from the area seen by the cameras and their position within the measurement volume. Particle speeds are deduced from the movement of the particle during a predefined time. Furthermore, the characteristics of the particle image allow the system to distinguish between rain, snow, hail, graupel, seeds, and insects.

The calculated data are memorized over one minute, and then transmitted via serial interface, Ethernet (TCP/IP connection, up to 5 clients at a time) or store on the SD card as a file.

The type of precipitation is determined from the statistic proportion of all articles referring to diameter and velocity. These proportions have been tested scientifically (e.g. Gunn, R., and Kinzer, G.D., 1949, "The terminal velocity of fall for water droplets in stagnant air." J. of Meteorology, Vol. 6, pp. 243-248). In addition, the temperature is included in order to improve the identification.

The instrument is almost maintenance-free. Only the glasses of camera module head and LED pane should be cleaned, if necessary. For application in areas of extreme weather conditions (for example high mountains), we recommend a model with "extended heating". By using a flash-memory the internal software can be updated any time via Ethernet connection.

Various ways for data output:

- Ethernet
- RS485
- Stored on an internal SD card

## Specification

**Part number: 5.4120.xx.xxx**

### Precipitation

|                 |                     |
|-----------------|---------------------|
| Meas. principle | Camera              |
| Particle size   | 0.08 ... 40 mm      |
| Particle speed  | 0.2 ... 20 m/s      |
| Intensity       | 0.001 ... 1000 mm/h |



|                            |   |
|----------------------------|---|
| Precipitation types        | Drizzle (DZ), freezing drizzle (FZDZ)<br>Rain (RA), freezing rain (FZRA)<br>Hail (GR)<br>Snow (SN)<br>Snow grains (SG), ice needles (IC)<br>Soft hail (GS), ice grains (PL)   |
| Accuracy                   | Identification of precipitation types:<br><br>Drizzle (DZ), freezing drizzle (FZDZ) > 99%<br>Rain (RA), freezing rain (FZRA) > 99%<br>Hail (GR) > 99%<br>Snow (SN) > 99%<br>Snow grains (SG), ice needles (IC) > 99%<br>Soft hail (GS), ice grains (PL) > 99% |
| <b>Temperature</b>         |   |
| Measuring range            | Pt 100, -40 ... +80 °C  |
| Accuracy                   | ± 0,2 K   |
| <b>Data output digital</b> |   |
| Interface                  | <ul style="list-style-type: none"> <li>• Ethernet</li> <li>• RS485</li> <li>• Stored on an internal SD card</li> </ul>  |
| <b>General</b>             |   |
| Heating                    | With camera heating   |
| Ambient conditions         | -40 ... +50 °C, 0 ... 100% r.h.   |
| Mounting                   | Mast mounting Ø 48 ... 70 mm  |
| Protection                 | IP 65   |
| Dimension                  | 0.24 x 0.39 x 0.72 m<br>(9.5 x 15.4 x 28.4 inch)  |
| Weight                     | 6.2 kg  |

## Versions

As per 5.4120.xx.xxx, but:

**Product number 5.4120.00.000**

|                |                                |
|----------------|--------------------------------|
| <b>General</b> |                                |
| Heating        | With:<br>Camera heating        |
| Power supply   | 24 VAC ±15% / 20...30 VDC 50 W |
| Current load   | AC / DC current (max): 2 A     |

**Product number 5.4120.01.000**

**General**

|              |  |
|--------------|--|
| Heating      | With:<br>Camera heating<br>Camera arm heating<br>LED heating |
| Power supply | 24 VAC ±15% / 20...30 VDC 200 W                              |
| Current load | AC / DC current (max):7 A                                    |

**Product number 5.4120.10.000**

**General**

|              |   |
|--------------|---|
| Heating      | With:<br>Camera heating                                 |
| Power supply | 85 ... 264 VAC, 120 ... 370 VDC<br>47 ... 63 Hz         |
| Current load | AC current (max): 0.4 A / 115 VAC, 0.2 A / 230 VAC 55 W |

**Product number 5.4120.11.000**

**General**

|              |  |
|--------------|--|
| Heating      | With:<br>Camera heating<br>Camera arm heating<br>LED heating |
| Power supply | 85 ... 264 VAC, 120 ... 370 VDC<br>47 ... 63 Hz              |
| Current load | AC current (max): 1.6 A / 115 VAC, 0.8 A / 230 VAC 205 W     |

## Accessories

| Product | Product name | Brief description |
|---------|--------------|-------------------|
|---------|--------------|-------------------|



Instrument Support  
4.3187.61.x00

For the vibration-reduced operation of the LPM on an available concrete foundation, provided by the customer.

**General**

|                   |                    |
|-------------------|--------------------|
| Material          | steel, zinc plated |
| Tube diameter     | Ø 60 mm            |
| Mounting distance | 424 mm             |
| Dimension         | 645 x 645 mm       |
| Weight            | 30 kg              |



LNM-View  
9.1700.99.000

The Thies LNM View program is used to display data generated by the Thies Laser Precipitation Monitor and/or Thies 3D Stereo Disdrometer.

**Compatibility**

|                         |  |
|-------------------------|--|
| Connectable instruments | <ul style="list-style-type: none"> <li>• Laser precipitation monitor 5.4110.xx.xxx</li> <li>• 3D Stereo Disdrometers 5.4120.xx.xxx</li> </ul>  |
| System requirements     | PC with: <ul style="list-style-type: none"> <li>• 1GHz, 256 MBRAM, recommended 2 GHZ, 512MBRAM</li> <li>• Graphics resolution: 800 x 600</li> <li>• Graphics colours: 16bit TrueColor</li> </ul> |
| Operating system        | Recommended operation system: <ul style="list-style-type: none"> <li>• Windows 8</li> <li>• Windows 10</li> </ul>  |