



## GM32 In-situ gas analyzers

Efficient measurement of  $\text{SO}_2$ ,  $\text{NO}$ ,  $\text{NO}_2$ ,  $\text{NH}_3$   
as well as TRS components in the Kraft pulp  
process

**SICK**  
Sensor Intelligence.

## In-situ gas analyzer GM32: For emissions and process gases

**The tried-and-tested in-situ GM32 analyzer from SICK – optimized for non-contact measurement in emissions plants as well as for process gases – is available in several versions: a standard version, an Atex version and with optimized analysis technology for TRS measurement in the Kraft pulp industry.**

### Direct in-situ measurement

With the GM32 in-situ gas analyzer, your control technology systems are able to work with actual values in "real time". This is because it measures reactive gases including pressure and temperature in-situ, in other words, directly in the gas duct. Moreover, this is achieved quickly and without the need for complicated gas sampling or transportation, therefore avoiding the risk of changing or falsifying the gas composition.

Thanks to automatic self-monitoring, you can rely on the measured values and you receive prior warning in the event of deviations.

### Combinable for simultaneous or individual measurement

Depending on requirements, the GM32 can be configured simultaneously for measured components  $\text{SO}_2$ ,  $\text{NO}$ ,  $\text{NO}_2$  and  $\text{NH}_3$ , individually or in respective combinations thereof. For applications in the Kraft pulp industry, as GM32 TRS-PE (PE = Pulp Emission) version with measuring probe, also for TRS measuring components  $\text{H}_2\text{S}$ ,  $\text{CH}_3\text{SH}$ ,  $(\text{CH}_3)_2\text{S}$  and  $(\text{CH}_3)_2\text{S}_2$ . Temperature and pressure reference values are measured and calculated automatically.

### Simple and cost-effective

SICK's in-situ measuring devices have been characterized by their minimal operating costs for many years. Thanks to

this technology, complex maintenance and problems related to gas transportation and gas conditioning have become a thing of the past. The measured values are taken directly in the measuring path in the gas duct. Adjustment with test gases is not necessary.

In addition, the automatic QAL3 monitoring without test gases results in lower operating costs.

### Convenient through remote diagnostics

Easier and faster access for remote data acquisition, remote diagnostics and maintenance thanks to comprehensive networking capability e.g. via Ethernet or OPC server connection.

### Optimized evaluation processes

SICK has perfected the DOAS evaluation process (DOAS = Differential Optical Absorption Spectroscopy) as well as chemometrics in the GM32. It offers an equal level of measurement accuracy in both the high and low measuring ranges.

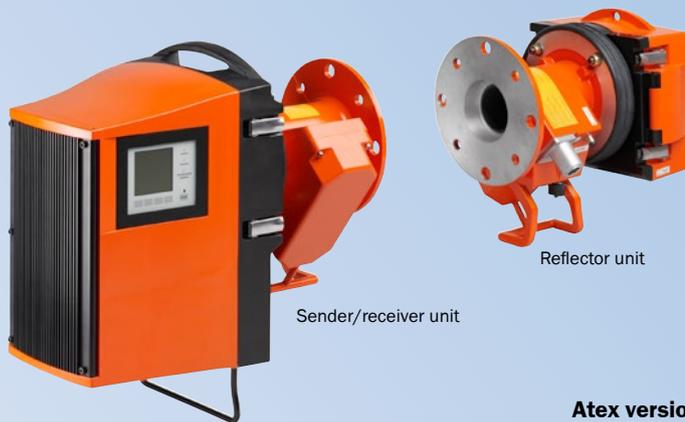
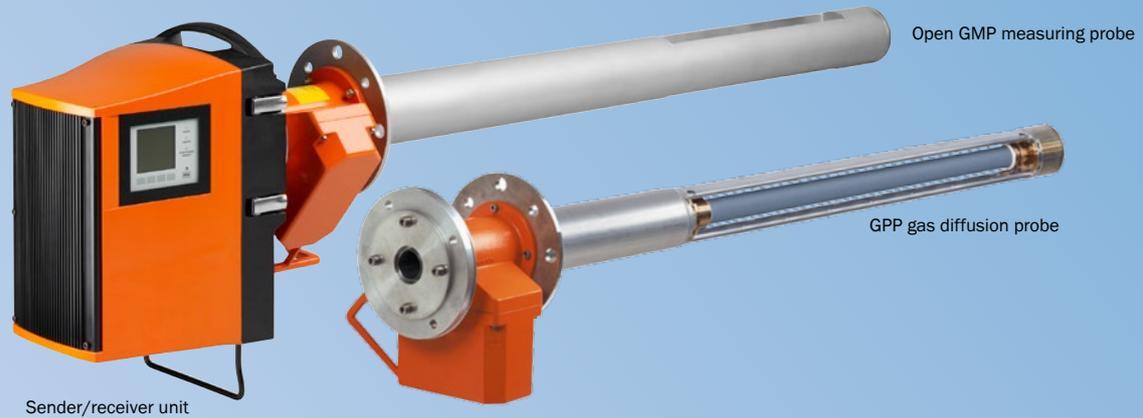
The signal evaluation is undertaken in the UV spectrum over an extremely broad range. GM32 evaluates the optimal spectral range for measuring range and measuring components in each case. This enables an extremely high level of accuracy to be achieved. Cross sensitivity

to foreign gases, dust and humidity is also ruled out. This means that flue gas purification systems can be efficiently controlled even under high dust loads. Thanks to automatic beam tracking, the GM32 measures just as efficiently even in the event of severe vibrations.

### Measuring probe version

GM32 is available with two measuring probe types:

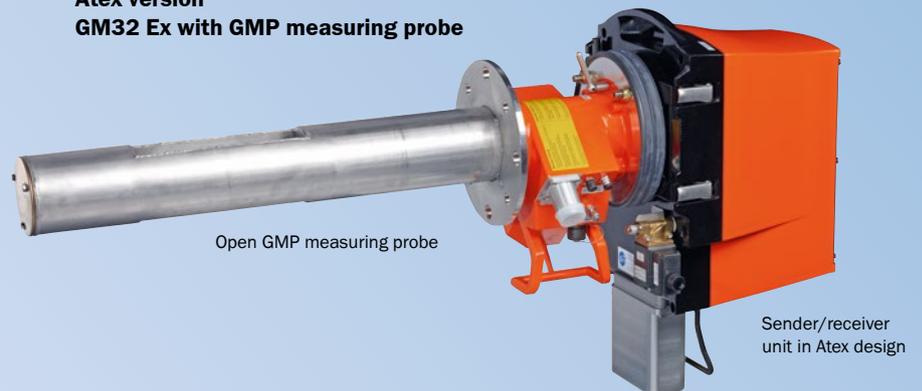
- GMP measuring probe with open measuring path
- GPP gas diffusion probe



### Cross-duct version

The sender/receiver and reflector units in the GM32 are installed adjacently to each other at the measuring site.

### Atex version GM32 Ex with GMP measuring probe



### Measuring probe version

This version proves its strengths:

- Due to installation on a single side
- Under extremely high gas or dust concentrations
- With overpressure
- In wet gases
- As GMP measuring probe with open measuring gap
- With various measuring paths
- With integrated zero point path
- As GPP gas diffusion probe:
  - For turbulent gas flows
  - Gas testing according to U.S EPA possible

### Cross-duct version

The cross-duct version is suitable for the following applications:

- Ideal for aggressive or extremely hot gases – without duct installation
- With minimal measuring ranges over large-scale duct diameters
- Representative measurement result even with extremely large duct diameters up to 12 m
- Insensitive to orientation thanks to automatic self-alignment

### Designed for ATEX zones

With comprehensive safety functions and sophisticated system technology such as:

- ATEX category conform:  
3G (ATEX Zone 2), 2G (ATEX Zone 1)
- Overpressure encapsulated device components

## In-situ measurement in ATEX zones: a new solution for familiar tasks

GM32 gas analyzers with in-situ measuring technology have a long track record both in emissions monitoring as well as in process control applications. Now the rugged GM32 is also available in an ATEX version as the GM32 Ex, with cross-duct and measuring probe versions for gas temperatures up to 650 °C, for example, for use in the chemicals industry or refineries, but also for measuring tasks in the natural gas or crude oil industry as well as emissions monitoring supporting sulfur recovery plants or FCC plants.

### A wide scope of safety functions for Ex-ranges

The in-situ GM32 Ex gas analyzer corresponds to both ATEX category 3G (ATEX Zone 2) and ATEX category 2G (ATEX Zone 1) in the measuring probe as well as the cross duct version. The sender/receiver unit (SR unit) and the connection unit are overpressure encapsulated to ensure that no explosive gases can penetrate into the units. The required permanent overpressure in the housing is ensured by protective gases with a corresponding control system.

### Sophisticated system technology

The overpressure encapsulated GM32 component's sender/receiver and connection unit are connected to each other via a pressurized hose which contains the electrical connection cable. The Ex-p controller is attached to the connection unit. All of the other device components are non-electronic and therefore intrinsically safe. The protective gas is fed to the sender/receiver unit via an Ex-p valve. In order to protect against contamination or aggressive gases, the sender/receiver unit and, depending on version, the reflector unit is flushed by an ATEX approved air purge unit.

### The advantages remain

The tried-and-tested advantages of SICK's in-situ measuring technology remain in the GM32 Ex, such as direct, rapid measurement without the need for gas transport, without gas conditioning, and especially, its automatic self-testing system without test gases. Installation directly at site of measurement



### GM32, ATEX versions

- Version with measuring probe (shown)
- Cross-duct version

Sender/receiver unit in overpressure encapsulated version



Simple, precise, cost-effective:  
TRS emissions safely under control

The first and only direct TRS measurement in the Kraft pulp process:  
GM32 TRS-PE (PE = Pulp Emission)  
from SICK.



TRS measurement success in the Kraft pulp industry  
Lime kilns and black liquor recovery boiler for the source for TRS components in Kraft pulp plants. The limit values for these emissions are strictly regulated by the authorities and are typically set between 5 ... 30 mg/m<sup>3</sup> (3 ... 20 ppm). Depending on restriction, hydrogen sulfide (H<sub>2</sub>S) must be monitored alone or as part of the sum TRS parameter.

UV spectroscopy – the optimal measuring technology  
The GM32 TRS-PE with GPP measuring probe is the optimal solution for continuous measurement of primary TRS components such as hydrogen sulfide (H<sub>2</sub>S) and methyl mercaptan (CH<sub>3</sub>SH). In addition, primary TRS components dimethyl sulfide ((CH<sub>3</sub>)<sub>2</sub>S) and dimethyl disulfide (CH<sub>3</sub>)<sub>2</sub>S<sub>2</sub>) can also be measured. This means extremely efficient process control can be achieved at minimum cost and without expensive auxiliary materials. Of course, TRS measurement with the GM32 TRS-PE also enables simultaneous measurement of SO<sub>2</sub>, NO and NH<sub>3</sub> – all with a single analyzer.

**GM32 TRS-PE (PE = Pulp Emission):  
version with GPP gas diffusion probe**



GPP gas diffusion probe

Sender/receiver unit with integrated,  
TRS optimized, spectroscopic evaluation  
procedure

## Monitoring and control of flue gas in purification plants

The in-situ GM32 analyzer with its optimized measuring technology is suitable for nitrogen oxide measurement for controlling catalytic processes in flue gas denitrification and desulfurization plants. The GM32 is the best choice, especially in situations where rapid measurement is required directly in the gas duct, even under high dust loads or where saturated sample gas is expected.

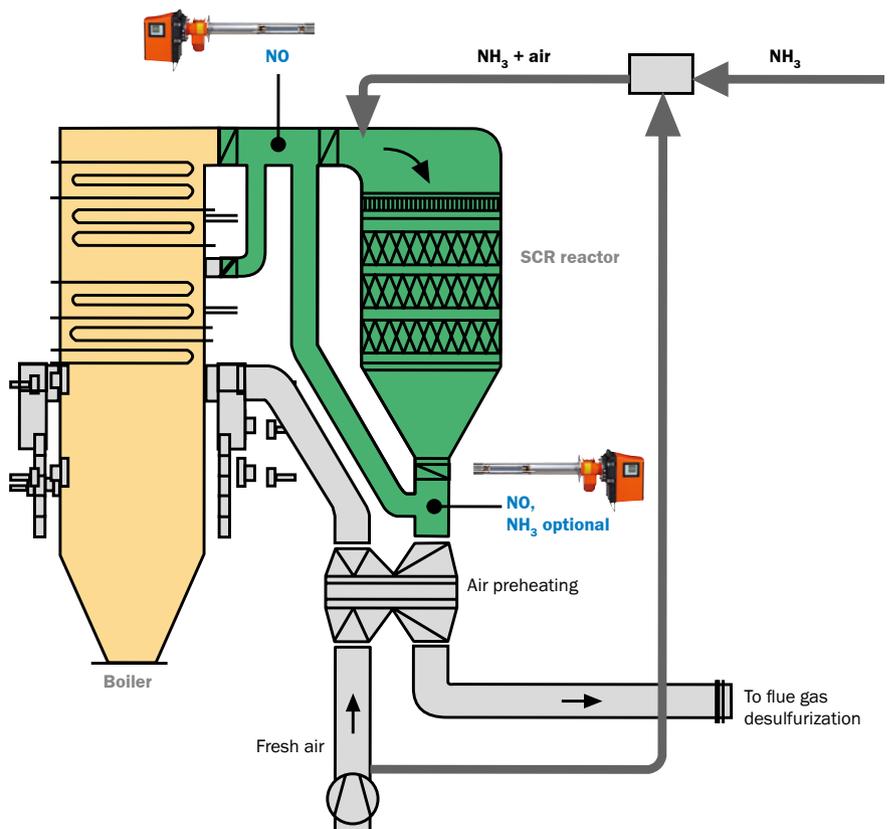
### Flue gas denitrification plants – fast, unaltered measurement

Environment protection laws demand reduction of nitrogen oxide ( $\text{NO}_x$ ) content in flue gases. The reduction of the  $\text{NO}_x$  content is typically achieved with flue gas denitrification plants (De $\text{NO}_x$ ) using selective catalytic reduction (SCR) or selective non-catalytic reduction (SCNR). The addition of ammonia ( $\text{NH}_3$ ) to the flue gas – at temperatures of approx. 400 °C – causes the nitrogen oxide to be converted to water and nitrogen. In order to determine and monitor the required  $\text{NH}_3$  volume, it is necessary to measure  $\text{NO}$  concentrations at the inlet to the denitrification plant. In order to determine the effectiveness of the catalytic denitrification process, at the output of the De $\text{NO}_x$  plant  $\text{NO}$  and additionally the  $\text{NH}_3$  concentration (slip) is again measured. This measurement serves to provide additional monitoring and maintenance of environmental standards.

### GM32 delivers the best solution

The key factor for efficient monitoring and control in flue gas denitrification plants is the extremely short response time for measurement. They can significantly increase the effectiveness and service life of the plant and simultaneously prevent fouling of the catalytic converter as well as avoid ammonia

pollutants in the flue ash. The GM32 from SICK delivers reliable measurement results without delay for monitoring  $\text{NO}$  concentrations, both in raw gas as well as clean gas ducts, also for  $\text{NH}_3$  slip measurement downstream of the catalytic converter.



## Desulphurization plants and emissions measurement

Desulphurization plants (DeSO<sub>x</sub>) use, among other things, wet scrubber systems in order to spray the flue gas with a calcareous solution after the dust has been removed. This process causes the sulfur oxides in the flue gas to react and be converted to calcium sulfite or sulfate. These products are then removed from the process by dehydration. Alternatively, compressed air can be added to the sulfite sludge causing the calcium sulfite to oxidize into gypsum.

The GM32 from SICK has also proven itself in such process control applications as well as in continuous emissions monitoring, regardless of whether the measured gases are saturated (wet) or dry.



### Product Benefits

The fast GM32 with direct, delay-free in-situ measurement of SO<sub>2</sub>, NO, NO<sub>2</sub> and NH<sub>3</sub> is the ideal analyzer for efficient monitoring and control of flue gas denitrification plants.

#### For denitrification:

- Optimization of ammonia spraying in order to minimize NH<sub>3</sub> slip.
- Continuous monitoring of catalytic converter effectiveness.
- Reduction of bound ammonia in flue ash.
- Contamination of catalytic converter and other system components due to ammonium salts avoided.

- Increase of catalytic converter service life and minimization of system downtime

#### For flue gas desulfurization:

- SO<sub>2</sub> measurement for regulating lime spraying
- Monitoring of desulfurization effectiveness
- Continuous emissions monitoring

Measure aggressive gases directly and quickly – even in ATEX zones



## Product description

The GM32 in-situ gas analyzer measures SO<sub>2</sub>, NO, NO<sub>2</sub> and NH<sub>3</sub>, as well as TRS components in Kraft pulp processes including pressure and temperature in the gas duct. Direct, fast and without gas sampling and transport. This means control systems are able to work with actual values in real time. Due to self-monitoring, the measured values are reliable. In case of deviations an early warning will be shown.

For emission measurement of SO<sub>2</sub> and NO, GM32 is tested for suitability according to European standard EN 15267-3.

An ATEX version with comprehensive safety functions and sophisticated system technology is also available, as well as the GM32 TRS-PE (PE = Pulp Emission) for TRS measurement in Kraft pulp processes.

## At a glance

- Direct, fast in-situ measurement
- No gas sampling, no gas transport, no gas conditioning
- Up to eight measuring components at the same time, plus process temperature and pressure
- DOAS and CDE evaluation process
- Numerous independent measuring ranges with consistent accuracy
- Automatic self-test function (QAL3) without test gases
- Overpressure encapsulated version for ATEX Zones 1 and 2

## Benefits

- Unaltered measured values in real time without altering the gas composition
- Short-term process deviations are detected
- Representative measurement by selection of cross-duct or measuring probe versions
- Fast on-site service due to modular design
- Long maintenance-free intervals
- Cost-effective in-situ gas analyzer – also in ATEX version
- Low cost of installation and operation, no test gases required
- Complete emissions measurement in Kraft pulp process by way of simultaneous measurement of TRS components plus SO<sub>2</sub>, NO, NH<sub>3</sub>



## Additional information

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→ [www.mysick.com/en/GM32](http://www.mysick.com/en/GM32)

For more information, just enter the link and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.

## Fields of application

- For monitoring and control in flue gas purification, such as denitrification plants, desulfurization plants and converters.
- Emissions monitoring according to EU directives or local regulations
- Monitoring of landfill gases
- Monitoring tasks, for example, in nitric acid and ammonia production processes
- TRS emissions monitoring in the Kraft pulp industry

## Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

### GM32 system; standard and Ex-version

|                                       |   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
|---------------------------------------|---|-------------------|--|-----------------|--|-------------------|--------------------------------|-------------------|--------------------------------|--------------------|--------------------------------|
| <b>Description</b>                    | Type approved in-situ gas analyzer for emission monitoring and process control  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Measured values</b>                | NO, NO <sub>2</sub> , NH <sub>3</sub> , SO <sub>2</sub>   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Performance-tested measurands</b>  | NO, SO <sub>2</sub>   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Maximum number of measurands</b>   | 4 (plus process temperature and pressure)   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Measurement principles</b>         | Differential optical absorption spectroscopy (DOAS)   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Measuring ranges</b>               | <table border="0"> <tr> <td>NH<sub>3</sub></td> <td>0 ... 30 ppm / 0 ... 2,600 ppm</td> </tr> <tr> <td>NO</td> <td>0 ... 40 ppm / 0 ... 1,900 ppm</td> </tr> <tr> <td>NO<sub>2</sub></td> <td>0 ... 50 ppm / 0 ... 1,000 ppm</td> </tr> <tr> <td>SO<sub>2</sub></td> <td>0 ... 15 ppm / 0 ... 7,000 ppm</td> </tr> <tr> <td>LowNO<sub>2</sub></td> <td>0 ... 15 ppm / 0 ... 1,000 ppm</td> </tr> </table> <p>Measuring ranges refer to 1 m measuring path<br/>Measuring ranges depend on application and device version</p> | NH <sub>3</sub>   | 0 ... 30 ppm / 0 ... 2,600 ppm                           | NO              | 0 ... 40 ppm / 0 ... 1,900 ppm                             | NO <sub>2</sub>   | 0 ... 50 ppm / 0 ... 1,000 ppm | SO <sub>2</sub>   | 0 ... 15 ppm / 0 ... 7,000 ppm | LowNO <sub>2</sub> | 0 ... 15 ppm / 0 ... 1,000 ppm |
| NH <sub>3</sub>                       | 0 ... 30 ppm / 0 ... 2,600 ppm  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| NO                                    | 0 ... 40 ppm / 0 ... 1,900 ppm  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| NO <sub>2</sub>                       | 0 ... 50 ppm / 0 ... 1,000 ppm  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| SO <sub>2</sub>                       | 0 ... 15 ppm / 0 ... 7,000 ppm  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| LowNO <sub>2</sub>                    | 0 ... 15 ppm / 0 ... 1,000 ppm  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Certified measuring ranges</b>     | <table border="0"> <tr> <td>NO</td> <td>0 ... 70 mg/m<sup>3</sup> / 0 ... 700 mg/m<sup>3</sup></td> </tr> <tr> <td>SO<sub>2</sub></td> <td>0 ... 75 mg/m<sup>3</sup> / 0 ... 1,000 mg/m<sup>3</sup></td> </tr> </table> <p>With an active measuring path length of 1.86 m (cross-duct) or 1.25 m (open path measuring probe)<br/>The gas-testable measuring probe (GPP) is not TUV approved</p>   | NO                | 0 ... 70 mg/m <sup>3</sup> / 0 ... 700 mg/m <sup>3</sup> | SO <sub>2</sub> | 0 ... 75 mg/m <sup>3</sup> / 0 ... 1,000 mg/m <sup>3</sup> |                   |                                |                   |                                |                    |                                |
| NO                                    | 0 ... 70 mg/m <sup>3</sup> / 0 ... 700 mg/m <sup>3</sup>  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| SO <sub>2</sub>                       | 0 ... 75 mg/m <sup>3</sup> / 0 ... 1,000 mg/m <sup>3</sup>  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Response time (t<sub>90</sub>)</b> | <p>Open measuring probe (GMP): ≥ 5 s<br/>Gas-testable measuring probe (GPP): ≥ 120 s<br/>Cross-duct version: ≥ 5 s<br/>Response time adjustable</p>   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Accuracy</b>                       | <table border="0"> <tr> <td>NH<sub>3</sub>:</td> <td>± 2 %</td> </tr> <tr> <td>NO:</td> <td>± 2 %</td> </tr> <tr> <td>NO<sub>2</sub>:</td> <td>± 2 %</td> </tr> <tr> <td>SO<sub>2</sub>:</td> <td>± 2 %</td> </tr> </table> <p>Relative to the smallest measuring range</p>   | NH <sub>3</sub> : | ± 2 %  | NO:             | ± 2 %  | NO <sub>2</sub> : | ± 2 %                          | SO <sub>2</sub> : | ± 2 %                          |                    |                                |
| NH <sub>3</sub> :                     | ± 2 %   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| NO:                                   | ± 2 %   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| NO <sub>2</sub> :                     | ± 2 %   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| SO <sub>2</sub> :                     | ± 2 %   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Ambient temperature</b>            | -20 °C ... +55 °C<br>Temperature change maximum ±10 °C/h  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Storage temperature</b>            | -20 °C ... +55 °C<br>Temperature change maximum ±10 °C/h  |                   |  |                 |  |                   |                                |                   |                                |                    |                                |
| <b>Ambient humidity</b>               | ≤ 96 %<br>Relative humidity; bedewing of optical surfaces not permitted   |                   |  |                 |  |                   |                                |                   |                                |                    |                                |

|                          |      |   |
|--------------------------|------|---|
| <b>Conformities</b>      |      | Approved for plants requiring approval<br>2001/80/EC (13. BImSchV)<br>2000/76/EC (17. BImSchV)<br>27.BImSchV<br>TA-Luft (Prevention of Air Pollution)<br>EN 15267<br>EN 14181<br>MCERTS<br>GOST |
| <b>Ex-approvals</b>      | ATEX | II 2G Ex px [op is] IIC T3 Gb<br>II 3G Ex pz [op is] IIC T3 Gc  |
| <b>Electrical safety</b> |      | CE  |
| <b>Enclosure rating</b>  |      | Standard: IP 65, IP 69K<br>Ex-version: IP 65  |
| <b>Operation</b>         |      | Via integrated operating unit or SOPAS ET software  |
| <b>Test functions</b>    |      | Internal zero point check<br>Check cycle for zero and span point according to QAL3  |
| <b>Options</b>           |      | SCU control unit<br>Multi range calibration (additional measuring ranges for one component)<br>Extended gas temperature range up to 550 °C or 650 °C<br>LowNO <sub>2</sub>                      |

## GM32 TRS-PE system

|                                       |  |   |
|---------------------------------------|--|---|
| <b>Description</b>                    |  | In-situ gas analyzer for TRS monitoring in the Kraft pulping process  |
| <b>Measured values</b>                |  | NO, NH <sub>3</sub> , SO <sub>2</sub> , CH <sub>3</sub> SH, (CH <sub>3</sub> ) <sub>2</sub> S, (CH <sub>3</sub> ) <sub>2</sub> S <sub>2</sub> , H <sub>2</sub> S, TRS   |
| <b>Maximum number of measurands</b>   |  | 8 (plus process temperature and pressure)   |
| <b>Measurement principles</b>         |  | Chemometrical data evaluation (CDE)   |
| <b>Measuring ranges</b>               |  |   |
|                                       | NH <sub>3</sub>                                  | 0 ... 35 ppm / 0 ... 50 ppm   |
|                                       | NO   | 0 ... 40 ppm / 0 ... 150 ppm  |
|                                       | SO <sub>2</sub>                                  | 0 ... 15 ppm / 0 ... 35 ppm   |
|                                       | H <sub>2</sub> S                                 | 0 ... 35 ppm  |
|                                       | CH <sub>3</sub> SH                               | 0 ... 25 ppm  |
|                                       | (CH <sub>3</sub> ) <sub>2</sub> S                | 0 ... 20 ppm  |
|                                       | (CH <sub>3</sub> ) <sub>2</sub> S <sub>2</sub>   | 0 ... 15 ppm  |
|                                       | TRS  | 0 ... 70 ppm  |
|                                       |  | Measuring ranges refer to 1 m measuring path<br>Measuring ranges depend on application and device version<br>TRS = H <sub>2</sub> S + CH <sub>3</sub> SH (as H <sub>2</sub> S equivalent)<br>For device variant 7: TRS = H <sub>2</sub> S + CH <sub>3</sub> SH + (CH <sub>3</sub> ) <sub>2</sub> S + 2x (CH <sub>3</sub> ) <sub>2</sub> S <sub>2</sub><br>Other measuring ranges on request |
| <b>Response time (t<sub>90</sub>)</b> |  | Gas-testable measuring probe (GPP): ≥ 120 s<br>Response time adjustable   |
| <b>Accuracy</b>                       |  |   |
|                                       | NH <sub>3</sub> :                                | ± 2 %   |
|                                       | NO:  | ± 2 %   |
|                                       | SO <sub>2</sub> :                                | ± 2 %   |
|                                       | H <sub>2</sub> S:                                | ± 2 %   |
|                                       | CH <sub>3</sub> SH:                              | ± 2 %   |
|                                       | (CH <sub>3</sub> ) <sub>2</sub> S:               | ± 2 %   |
|                                       | (CH <sub>3</sub> ) <sub>2</sub> S <sub>2</sub> : | ± 2 %   |

|                     |  |
|---------------------|--|
|                     | TRS: $\pm 2\%$<br>Relative to the smallest measuring range   |
| Ambient temperature | -20 °C ... +55 °C<br>Temperature change maximum $\pm 10$ °C/h<br>For device variant 7: +20 °C ... +30 °C |
| Storage temperature | -20 °C ... +55 °C<br>Temperature change maximum $\pm 10$ °C/h  |
| Ambient humidity    | $\leq 96\%$<br>Relative humidity; bedewing of optical surfaces not permitted                             |
| Electrical safety   | CE   |
| Enclosure rating    | IP 65, IP 69K  |
| Operation           | Via integrated operating unit or SOPAS ET software   |
| Test functions      | Internal zero and reference point check  |
| Options             | SCU control unit   |

### Sender/receiver unit; standard version

|                        |                                       |
|------------------------|---------------------------------------|
| Description            | Analyzer unit of the measuring system |
| Operation              | Via integrated operating unit         |
| Dimensions (W x H x D) | 315 mm x 580 mm x 359 mm              |
| Weight                 | 20 kg                                 |

### Sender/receiver unit; Ex-version

|                        |                                       |
|------------------------|---------------------------------------|
| Description            | Analyzer unit of the measuring system |
| Operation              | Via integrated operating unit         |
| Dimensions (W x H x D) | 315 mm x 910 mm x 410 mm              |
| Weight                 | 20 kg                                 |

### Open measuring probe (GMP)

|                                |   |
|--------------------------------|---|
| Description                    | Measuring probe in open design with integrated purge air control system   |
| Process temperature            | $\leq +550$ °C  |
| Process pressure               | -60 hPa ... 60 hPa<br>Relative  |
| Dimensions (W x H x D)         | See dimensional drawings  |
| Weight                         | 25 kg   |
| Material in contact with media | Stainless steel 1.4571, stainless steel 1.4539  |
| Auxiliary gas connections      | Purge air   |
| Integrated components          | Pressure sensor (Not for Ex-version)<br>PT1000 temperature sensor (not for Ex-version)<br>Flow monitor (monitoring of purge air feed; not for Ex version) |

### Gas-testable measuring probe (GPP)

|                                |  |
|--------------------------------|--|
| Description                    | Measuring probe with gas permeable filter element for adjustment with test gas |
| Process temperature            | With ceramic filter: $\leq +430$ °C<br>With Teflon filter: $\leq +200$ °C      |
| Process pressure               | -60 hPa ... 200 hPa<br>Relative  |
| Dimensions (W x H x D)         | See dimensional drawings   |
| Weight                         | 45 kg  |
| Material in contact with media | Stainless steel 1.4571, stainless steel 1.4539, ceramics, PTFE                 |

|                                  |  |               |
|----------------------------------|--|---------------|
| <b>Power supply</b>              | Voltage                                      | 115 V / 230 V |
|                                  | Frequency                                    | 50 Hz / 60 Hz |
|                                  | Power consumption                            | ≤ 150 W       |
| <b>Auxiliary gas connections</b> | Test gas<br>Purge air                        |               |
| <b>Integrated components</b>     | Pressure sensor<br>PT1000 temperature sensor |               |

## Reflector unit

|                               |  |
|-------------------------------|--|
| <b>Description</b>            | Reflector unit with glass triple reflector |
| <b>Process temperature</b>    | ≤ +650 °C                                  |
| <b>Process pressure</b>       | -60 hPa ... 200 hPa                        |
| <b>Dimensions (W x H x D)</b> | 291 mm x 280 mm x 161 mm                   |
| <b>Weight</b>                 | 9 kg                                       |

## Purge air fixture; sender/receiver unit

|                                  |   |
|----------------------------------|---|
| <b>Description</b>               | Fixture to flanges with connections for purge air and external cabling (only cross duct design)                   |
| <b>Dimensions (W x H x D)</b>    | 320.9 mm x 360 mm x 220 mm (for details see dimensional drawings)   |
| <b>Weight</b>                    | 7 kg  |
| <b>Auxiliary gas connections</b> | Purge air   |
| <b>Integrated components</b>     | PT1000 temperature sensor (not for Ex-version)<br>Flow monitor (monitoring of purge air feed; not for Ex version) |

## Purge air fixture; reflector unit

|                                  |   |
|----------------------------------|---|
| <b>Description</b>               | Fixture to flanges with connections for purge air and external cabling (only cross duct design) |
| <b>Dimensions (W x H x D)</b>    | 320.9 mm x 360 mm x 220 mm (for details see dimensional drawings)                               |
| <b>Weight</b>                    | 7 kg  |
| <b>Auxiliary gas connections</b> | Purge air   |
| <b>Integrated components</b>     | Flow monitor (monitoring of purge air feed; not for Ex version)                                 |

## Connection unit; standard version

|                                     |   |  |
|-------------------------------------|---|--|
| <b>Description</b>                  | Serves for connection of power supply, data and signal cabling provided by the customer |  |
| <b>Analog outputs</b>               | 2 outputs:<br>0/4 ... 22 mA, 500 Ω<br>Per module, extendable up to eight outputs        |  |
| <b>Analog inputs</b>                | 2 inputs:<br>0/4 ... 22 mA, 100 Ω   |  |
| <b>Digital outputs</b>              | 4 outputs:<br>+ 48 V AC/DC, 0.5 A, 25 W   |  |
| <b>Digital inputs</b>               | 4 inputs:<br>+ 3.9 V, 4.5 mA, 0.55 W<br>Per module, extendable up to eight inputs       |  |
| <b>Interfaces and bus protocols</b> | Ethernet  | Modbus TCP                                 |
|                                     | Ethernet  | OPC  |
|                                     | Ethernet  | SOPAS ET                                   |
|                                     | RS-485  | Modbus RTU (via optional interface module) |
| <b>Dimensions (W x H x D)</b>       | 450 mm x 424 mm x 158 mm  |  |
| <b>Weight</b>                       | 16 kg   |  |

|                     |                   |               |
|---------------------|-------------------|---------------|
| <b>Power supply</b> | Voltage           | 100 ... 250 V |
|                     | Frequency         | 50 Hz / 60 Hz |
|                     | Power consumption | ≤ 260 W       |

Connection unit; Ex-version

|                                     |   |  |
|-------------------------------------|---|--|
| <b>Description</b>                  | Serves for connection of power supply, data and signal cabling provided by the customer |  |
| <b>Analog outputs</b>               | 2 outputs:<br>0/4 ... 22 mA, 500 Ω<br>Per module, extendable up to eight outputs        |  |
| <b>Analog inputs</b>                | 2 inputs:<br>0/4 ... 22 mA, 100 Ω   |  |
| <b>Digital outputs</b>              | 4 outputs:<br>+ 48 V AC/DC, 0.5 A, 25 W   |  |
| <b>Digital inputs</b>               | 4 inputs:<br>+ 3.9 V, 4.5 mA, 0.55 W<br>Per module, extendable up to eight inputs       |  |
| <b>Interfaces and bus protocols</b> | Ethernet  | Modbus TCP                                 |
|                                     | Ethernet  | OPC  |
|                                     | Ethernet  | SOPAS ET                                   |
|                                     | RS-485  | Modbus RTU (via optional interface module) |
| <b>Dimensions (W x H x D)</b>       | 679 mm x 630 mm x 158 mm  |  |
| <b>Weight</b>                       | 16 kg   |  |
| <b>Power supply</b>                 | Voltage   | 100 V / 230 V                              |
|                                     | Frequency   | 50 Hz / 60 Hz                              |
|                                     | Power consumption   | ≤ 260 W                                    |

SLV4-2 purge air unit, 2BH1300, 3-ph

|  |  |  |
|--|--|--|
| <b>Description</b>                     | Unit to provide dust-free air for flushing of optical surfaces                                 |  |
| <b>Gas flow rate</b>                   | 38 m³/h ... 63 m³/h<br>At 30 hPa counter pressure, depending on low pressure inside the filter |  |
| <b>Ambient temperature</b>             | -40 °C ... +55 °C  |  |
| <b>Enclosure rating</b>                | IP 54  |  |
| <b>Dimensions (W x H x D)</b>          | 550 mm x 550 mm x 258 mm (for details see dimensional drawings)                                |  |
| <b>Weight</b>                          | 18 kg  |  |
| <b>Power supply</b>                    | Three-phase current  | Δ: 200 ... 240 V, 50 Hz, 2,6 A, 400 W  |
|  |  | Y: 345 ... 415 V, 50 Hz, 1,5 A, 400 W  |
|  |  | Δ: 200 ... 275 V, 60 Hz, 2,6 A, 500 W  |
|  |  | Y: 380 ... 480 V, 60 Hz, 1,5 A, 500 W  |
|  |  | Δ: 270 ... 330 V, 50 Hz, 2,0 A, 400 W  |
|  |  | Y: 465 ... 570 V, 50 Hz, 1,16 A, 400 W |
|  |  | Δ: 290 ... 360 V, 60 Hz, 2,1 A, 500 W  |
|  |  | Y: 500 ... 600 V, 60 Hz, 1,26 A, 500 W |
|  |  | Δ: 230 V, 50 Hz, 2,7 A, 370 W          |
|  |  | Δ: 115 V, 60 Hz, 3,0 A, 450 W          |
|  |  | Δ: 220 ... 270 V, 50 Hz, 2,5 A, 400 W  |
|  |  | Y: 380 ... 465 V, 50 Hz, 1,45 A, 400 W |
|  |  | Δ: 240 ... 290 V, 60 Hz, 2,6 A, 500 W  |
| Y: 415 ... 500 V, 60 Hz, 1,55 A, 500 W |  |  |
| <b>Auxiliary gas connections</b>       | Purge air: 40 mm   |  |

|                              |  |
|------------------------------|--|
| <b>Test functions</b>        | Pressure switch (switching point -35 hPa)                |
| <b>Integrated components</b> | 2-step air filter, type Europiclone, dust capacity 200 g |

## SLV6-1 purge air unit, 2SH1300, ATEX 3G

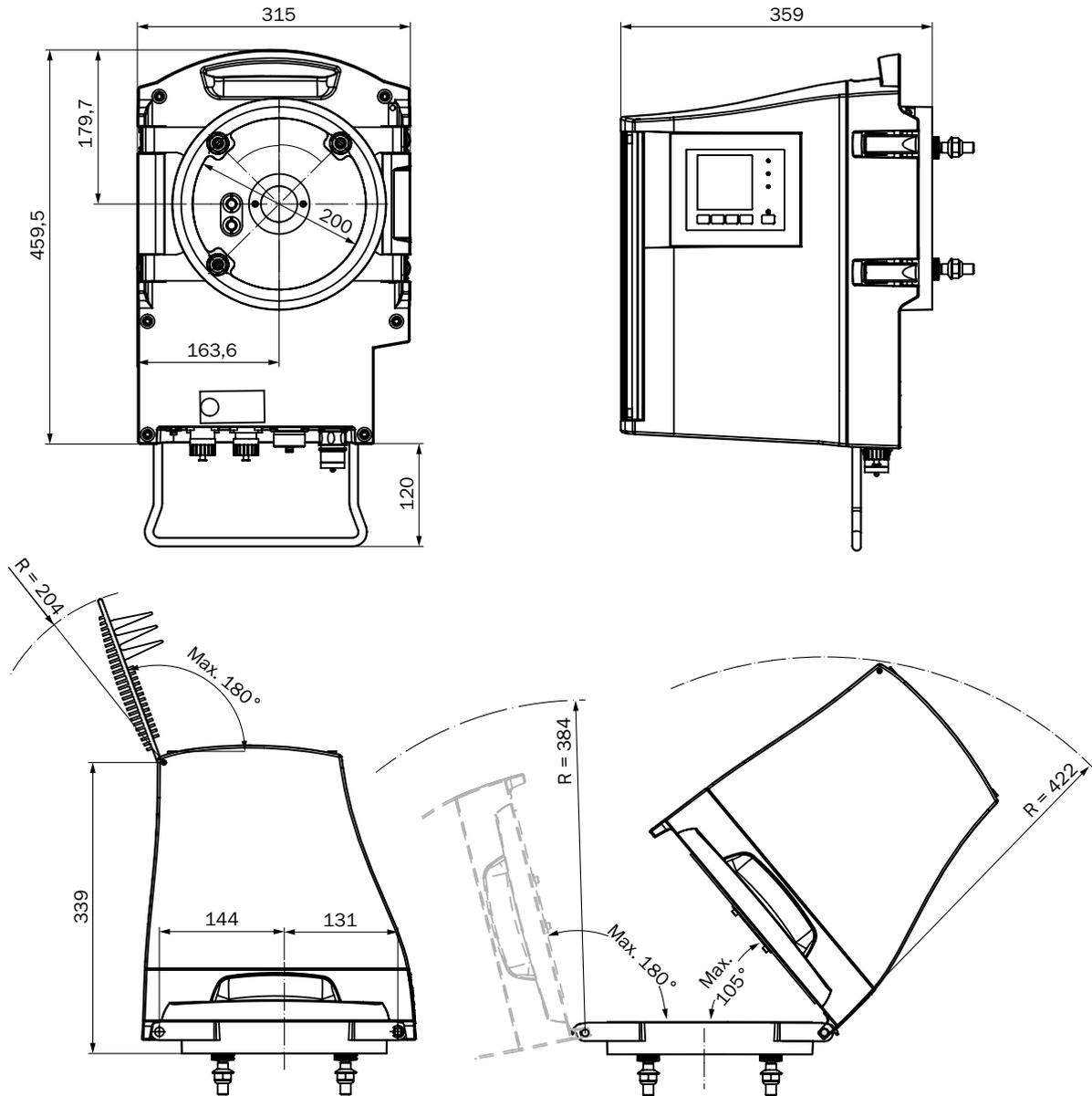
|                                  |  |
|----------------------------------|--|
| <b>Description</b>               | Unit to provide dust-free air for flushing of optical surfaces; for potentially explosive atmospheres                    |
| <b>Gas flow rate</b>             | 38 m <sup>3</sup> /h ... 63 m <sup>3</sup> /h<br>At 30 hPa counter pressure, depending on low pressure inside the filter |
| <b>Ambient temperature</b>       | -20 °C ... +40 °C  |
| <b>Ex-approvals</b>              |  |
|                                  | ATEX Ex II 3G c T3   |
| <b>Enclosure rating</b>          | IP 54  |
| <b>Dimensions (W x H x D)</b>    | 550 mm x 681 mm x 287 mm (for details see dimensional drawings)  |
| <b>Weight</b>                    | 28 kg  |
| <b>Power supply</b>              |  |
|                                  | Three-phase current  |
|                                  | 3-phase: 230 V/400 V, 50 Hz<br>3-phase: 460 V, 60 Hz   |
| <b>Auxiliary gas connections</b> | Purge air: 40 mm   |
| <b>Test functions</b>            | Pressure switch (switching point -35 hPa)  |
| <b>Integrated components</b>     | 2-step air filter, type Europiclone, dust capacity 200 g   |

Ordering information

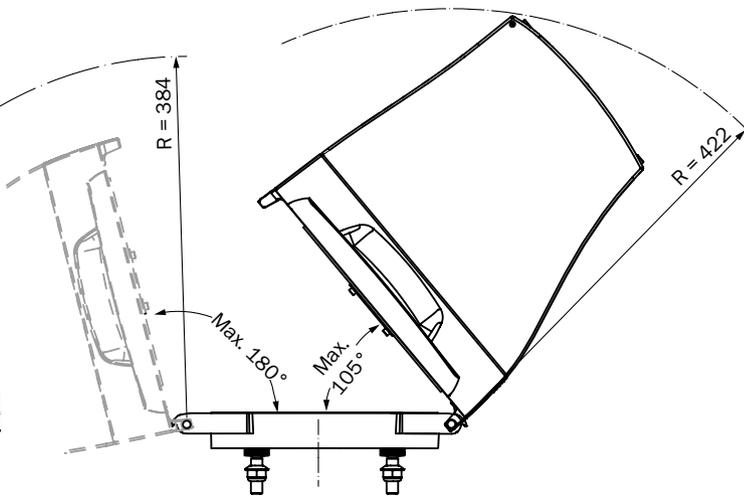
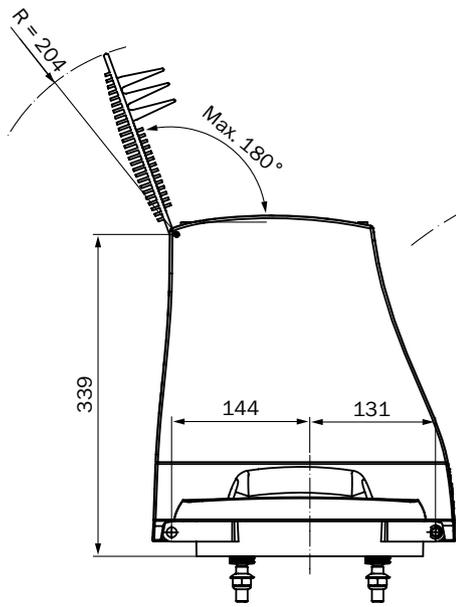
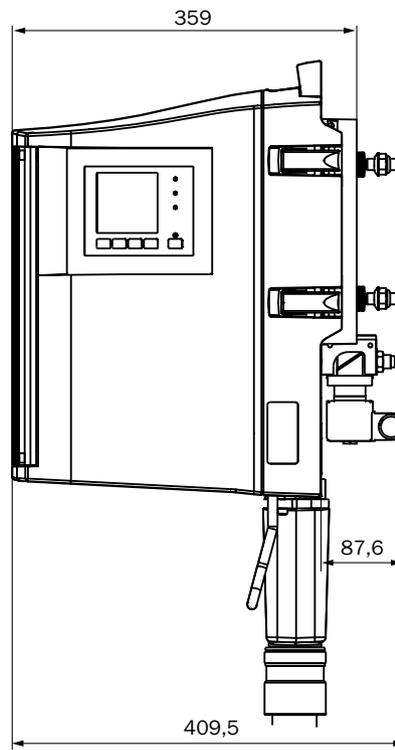
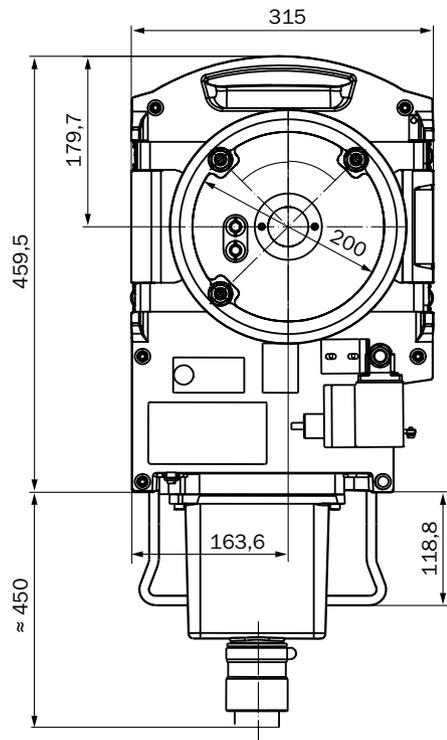
Our regional sales organization will help you to select the optimum device configuration.

Dimensional drawings (Dimensions in mm (inch))

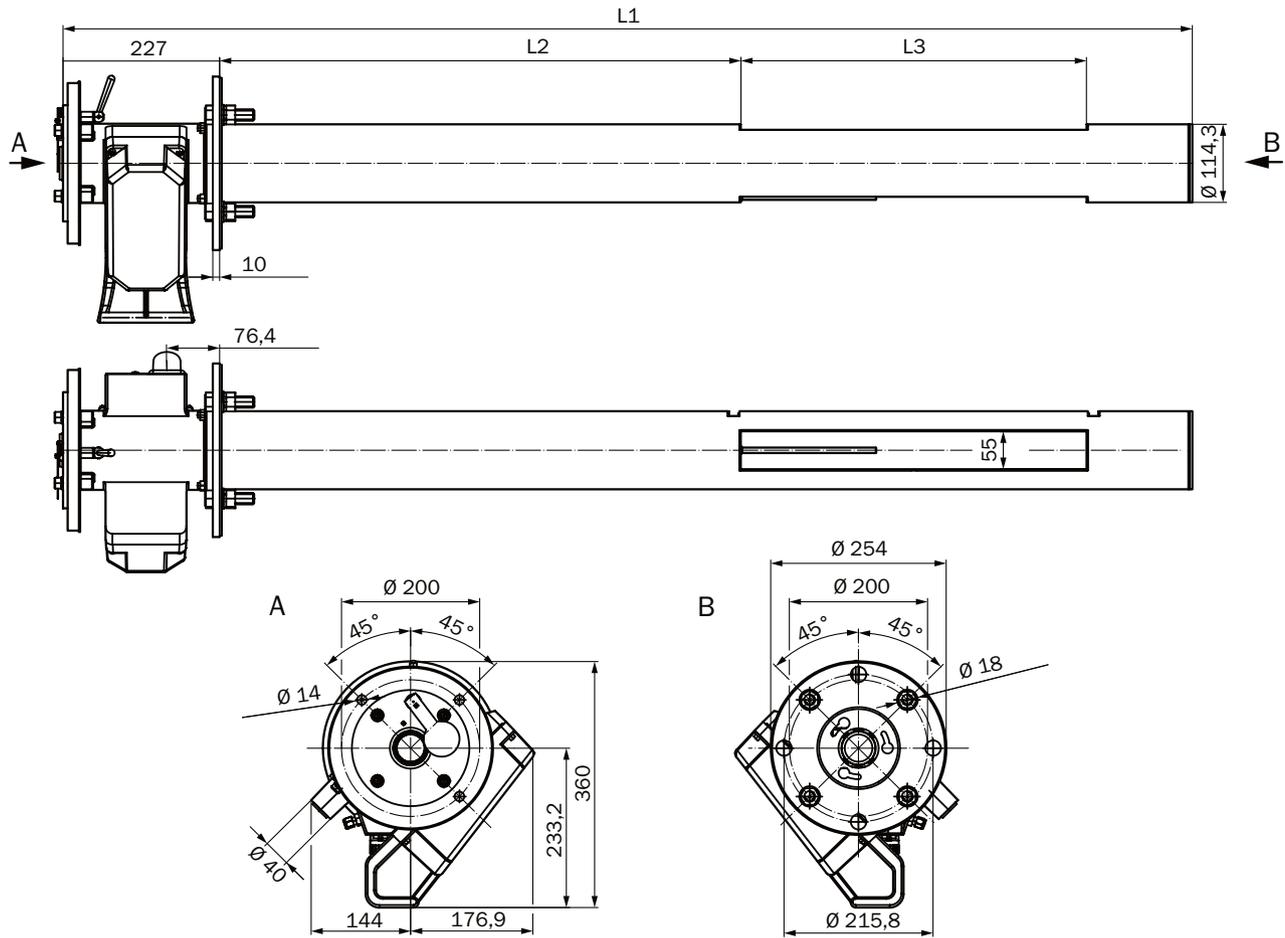
Sender/receiver unit; standard version



Sender/receiver unit; Ex-version

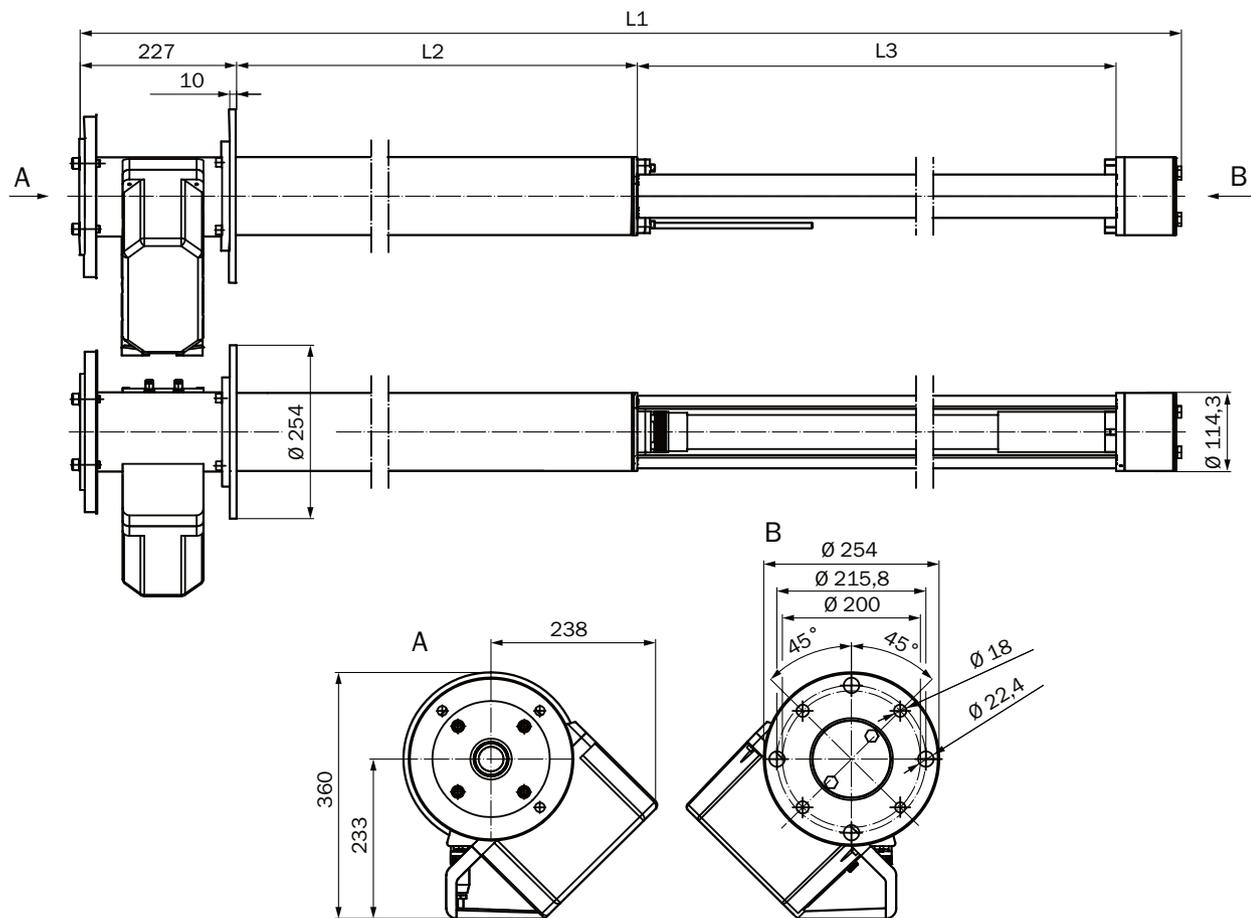


Open measuring probe (GMP)



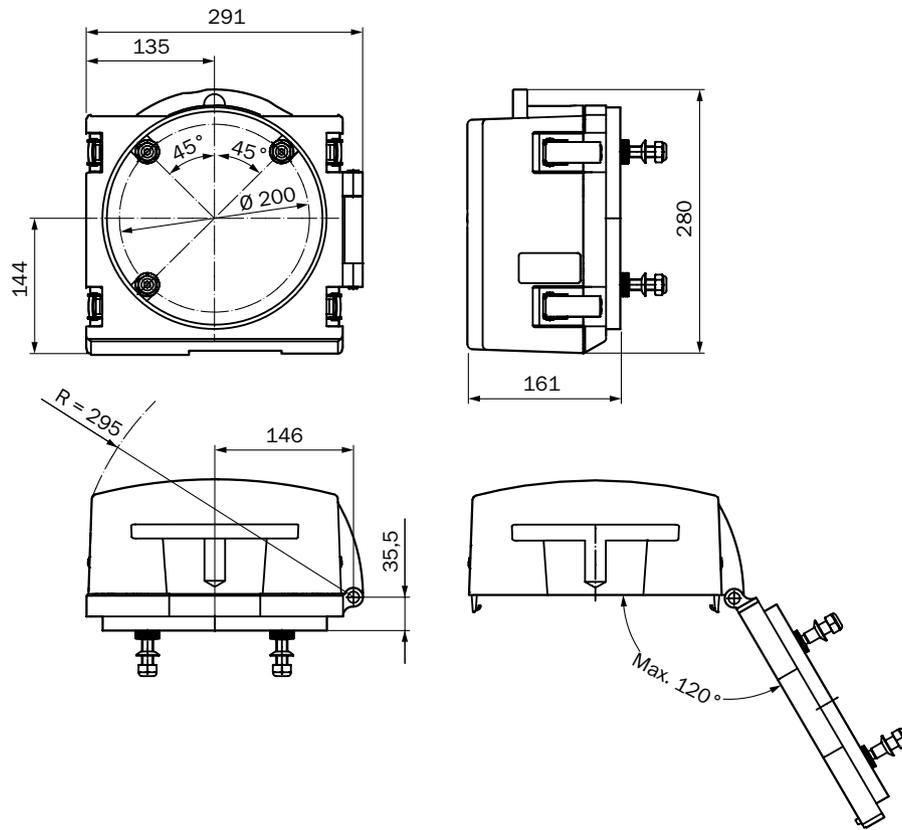
| GMP measuring probes   |       | Measuring gap L3 (active measuring path) |       |       |       |       |       |       |
|--|-------|--|-------|-------|-------|-------|-------|-------|
|  |       | 250                                      | 500   | 750   | 1,000 | 1,250 | 1,500 | 1,750 |
| Probe length, nominal  | L1    | L2                                       |       |       |       |       |       |       |
|  | 900   | 935                                      | 296   | 46    | ---   | ---   | ---   | ---   |
| 1,500  | 1,644 | 1,004.5                                  | 754.5 | 504.5 | 254.5 | ---   | ---   | ---   |
| 2,000  | 2,128 | 1,489                                    | 1,239 | 989   | 739   | 489   | 239   | ---   |
| 2,500  | 2,628 | 1,988                                    | 1,738 | 1,488 | 1,238 | 988   | 738   | 488   |
| <b>All dimensions in mm</b><br>Application-specific lengths available on request |       |  |       |       |       |       |       |       |

## Gas-testable measuring probe (GPP)

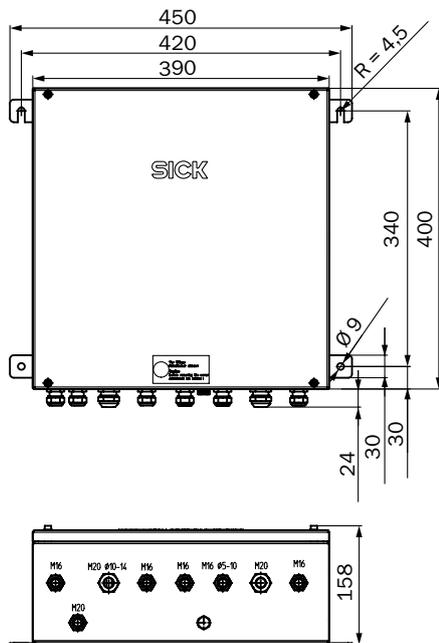


| GPP measuring probes                              |       | Measuring gap L3 (active measuring path) |       |       |       |
|---|-------|--|-------|-------|-------|
|   |       | 227                                      | 477   | 727   | 977   |
| Probe length, nominal                             | L1    | L2                                       |       |       |       |
| 1,000   | 904   | 353                                      | 103   | ---   | ---   |
| 1,500   | 1,614 | 1,063                                    | 813   | 563   | 313   |
| 2,000   | 2,098 | 1,547                                    | 1,297 | 1,047 | 797   |
| 2,500   | 2,598 | 2,047                                    | 1,797 | 1,547 | 1,297 |
| <b>All dimensions in mm</b>                       |       |  |       |       |       |
| Application-specific lengths available on request |       |  |       |       |       |

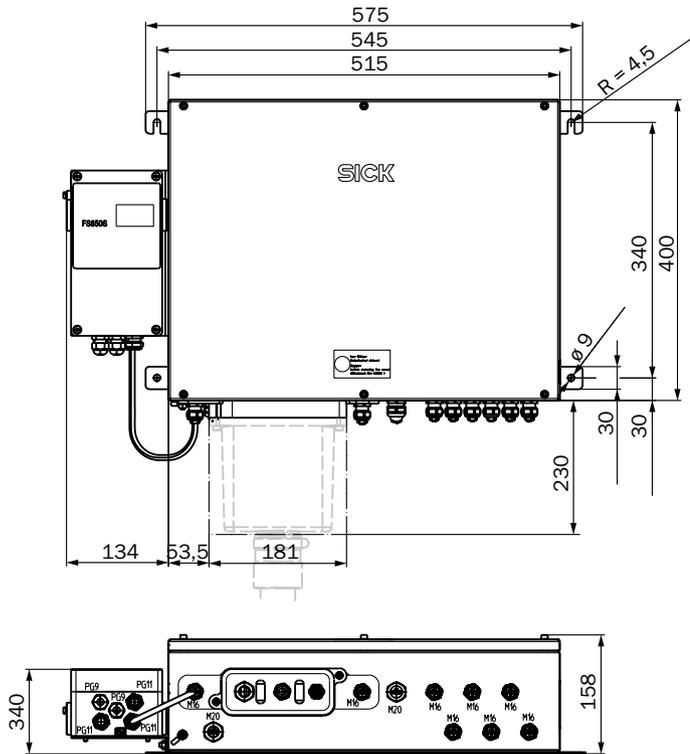
GM32 reflector unit



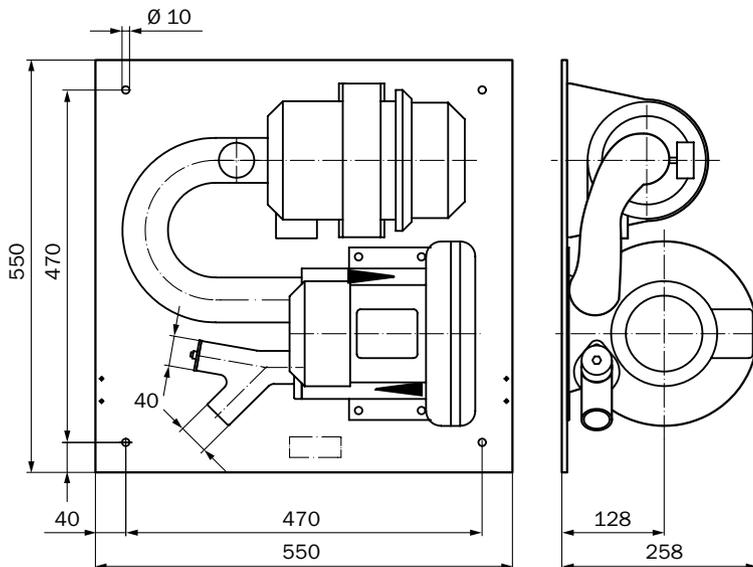
Connection unit; standard version



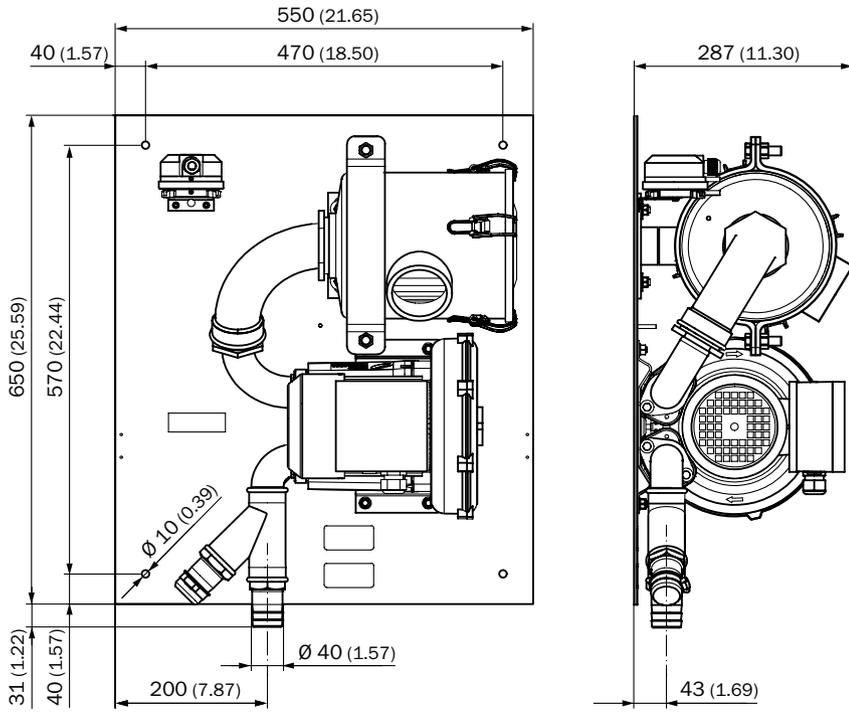
## Connection unit; Ex-version



## SLV4-2 purge air unit, 2BH1300



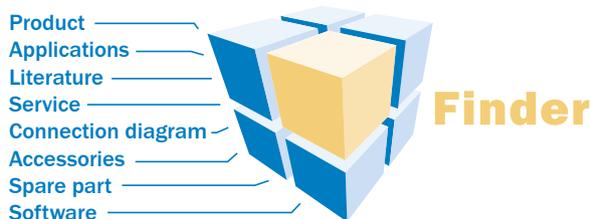
SLV6-1 purge air unit, 2SH1300, ATEX 3G





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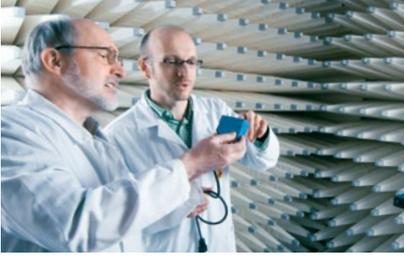
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