



## GM35 IN-SITU IR GAS ANALYZER

SIMULTANEOUS OR INDIVIDUAL MEASUREMENT OF  
 $\text{CO}_2$ ,  $\text{H}_2\text{O}$  AND  $\text{CO}$  OR  $\text{N}_2\text{O}$

In-situ gas analyzer

**SICK**  
Sensor Intelligence.

## Efficient control of combustion and drying processes

Efficient control of process-relevant parameters is important for controlling and regulating combustion or drying processes. Apart from oxygen, mainly CO must be reliably and exactly measured. In drying processes, the humidity curve during the process must be acquired and the plants monitored for CO concentrations. The in-situ gas analyzer GM35 from SICK is predestined for this purpose because it measures CO, CO<sub>2</sub> and H<sub>2</sub>O simultaneously and directly in the process.

Moreover, monitoring and reducing greenhouse gas emissions in industrial plants is becoming more and more important. The GM35 measures the concentrations of greenhouse gases CO<sub>2</sub> and N<sub>2</sub>O as well as CO also in this sector and measures fast or short-time process fluctuations with excellent precision.

### Simple and cost-saving

With the innovative in-situ measurement technology, SICK provides equipment solutions mainly characterized by simple installation and start-up, minimum maintenance and extremely short response times. This is because the GM35 measures the sample gases, including pressure and temperature in-situ, i.e. directly in the gas carrying duct. Moreover, this is achieved quickly and without complicated gas sampling or transportation, therefore avoiding the risk of changing or falsifying the gas composition.

The GM35 has a compact sender/receiver unit with zero point reflector, gas cell and grid filter which enable a real zero point and span test (QAL3). Complicated adjustment with test gases is not required.

### Proven measurement technology

In-situ gas analyzer GM35 contains optical and electronic subassemblies for simultaneous or individual measurement of gas components CO<sub>2</sub>, H<sub>2</sub>O and CO or N<sub>2</sub>O. The in-situ measurement technology allows direct installation of the analyzer at the respective measuring location.

Two versions are available:

- **A cross-duct version** for representative measured results across the entire duct cross diameter.
- **A measuring probe version** – optimized for single-sided installation allowing simple integration into an extremely varied range of system conditions.

## Measuring probe version

Sender/receiver unit with measuring probe. Two measuring probe types with integrated temperature and pressure sensors are available:

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

### GMP measuring probe

- Single-side duct access and simple installation
- Integrated zero point path
- Application adaptation, independent from duct dimensions
- Versatile use, suitable for dust concentrations up to  $3 \text{ g/m}^3$
- Cost-efficient to purchase

### GPP gas diffusion probe

- Single-side duct access
- Suitable for applications with high dust concentrations
- Integrated zero point path
- Application adaptation, independent from duct dimensions
- Gas check possible (EPA compliant)
- Suitable for turbulent gas flows

Sender/receiver unit

Open GMP measuring probe

GPP gas diffusion probe

## Cross Duct version

Sender/receiver unit and reflector unit are installed opposite each other at the measuring location.

- Representative measuring results over the whole duct cross-sections; also over large duct diameters
- Requires very little maintenance
- Very fast reaction time

Reflector unit

Sender/receiver unit

### Additional components

- Evaluation unit for measured value editing, output and control function
- Purge air unit for GMP measuring probe and for Cross-Duct version

### Optional components:

- Flange with tube, weather protection
- Probe with temperature and pressure sensor for Cross-Duct layout
- System Control Unit SCU

# EFFICIENT CONTROL OF COMBUSTION AND DEHYDRATION PROCESSES



## Product description

Simultaneous or individual measurements: the GM35 gas analyzer measures CO<sub>2</sub>, H<sub>2</sub>O and CO or N<sub>2</sub> concentrations as well as temperature and pressure quickly, easily and economically. The in-situ measurement technology of the GM35 records the measured

values directly in the gas-carrying duct without gas sampling. Reliability, accuracy and short response time of the analyzer offer a key advantage for efficient control loops in all CO and CO<sub>2</sub> generating processes.

## At a glance

- Dynamic humidity correction
- Fast in-situ measurement directly in the process
- Simultaneous determination of up to three gas components, temperature and pressure
- No gas sampling and conditioning
- Gas testable version of measuring probe available
- Integrated self test and control functions

## Your benefits

- Dynamic humidity measurement directly in the process
- Provision of real humidity reference values
- Unbiased measured values due to in-situ measurement
- Fast or short-term fluctuations in the process are recorded
- Representative measurement by selection of an appropriate probe or cross-duct type



## Additional information

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→ [www.mysick.com/en/GM35](http://www.mysick.com/en/GM35)  
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

- Emission monitoring according to EN 14181, e.g. in power or cement plants
- Control of the water-injection upstream of the electrostatic precipitator
- Monitoring of combustion efficiency in hazardous waste incineration
- Process monitoring in urea production
- Tube rupture detection in heat exchangers

## 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.

### GM35 system

<b>Measured values</b>	CO, CO <sub>2</sub> , H <sub>2</sub> O, N <sub>2</sub> O
<b>Performance tested measurands</b>	CO, CO <sub>2</sub> , H <sub>2</sub> O
<b>Measurement principles</b>	Gas filter correlation, Interference filter correlation
<b>Measuring ranges</b>	<div>CO 0 ... 180 ppm / 0 ... 20,000 ppm</div> <div>CO<sub>2</sub> 0 ... 22.5 Vol.-% / 0 ... 100 Vol.-%</div> <div>H<sub>2</sub>O 0 ... 25 Vol.-% / 0 ... 100 Vol.-%</div> <div>N<sub>2</sub>O 0 ... 60 ppm / 0 ... 2,500 ppm</div> <div>Measuring ranges refer to 1 m measuring path</div> <div>Measuring ranges depend on application and device version</div>
<b>Certified measuring ranges</b>	<div>CO 0 ... 75 mg/m<sup>3</sup> / 0 ... 2,000 mg/m<sup>3</sup></div> <div>CO<sub>2</sub> 0 ... 15 Vol.-%</div> <div>H<sub>2</sub>O 0 ... 25 Vol.-%</div> <div>Cross-duct and GMP version are type approved</div>
<b>Zero point drift</b>	± 2 % relative to measuring range end value
<b>Reference point drift</b>	± 2 % within the maintenance interval, relative to measuring range full scale
<b>Ambient temperature</b>	-40 °C ... +55 °C Temperature change ±10 °C/h maximum
<b>Storage temperature</b>	-40 °C ... +55 °C
<b>Ambient humidity</b>	≤ 96 % Relative humidity; bedewing of optical surfaces not permitted
<b>Conformities</b>	EN 14181 EN 15267 2001/80/EC 2000/76/EC 27. BImSchV
<b>Electrical safety</b>	CE
<b>Enclosure rating</b>	IP 65 / NEMA 4x
<b>Operation</b>	Menu-driven operation via separate control unit
<b>Model</b>	Cross-duct version Measuring probe version
<b>Test functions</b>	Automatic control cycle for zero and span point

## Sender/receiver unit

<b>Description</b>	Analyzer unit of the measuring system
<b>Enclosure rating</b>	IP 65 / NEMA 4x
<b>Bus protocol</b>	CAN (internal system bus)
<b>Dimensions (W x H x D)</b>	291 mm x 527 mm x 529 mm
<b>Weight</b>	≤ ± 29 kg
<b>Electrical connection</b>	
Voltage	115 V AC / 230 V AC
Frequency	48 ... 62 Hz
Power consumption	≤ 350 W

## Open measuring probe (GMP)

<b>Description</b>	Measuring probe in open design with integrated purge air control system
<b>Process temperature</b>	≤ +430 °C For N <sub>2</sub> O measurement max 180 °C
<b>Process pressure</b>	≤ 120 hPa Depending on purge air supply
<b>Process gas velocity</b>	≤ 40 m/s
<b>Dust load</b>	≤ 3 g/m <sup>3</sup>
<b>Bus protocol</b>	CAN (internal system bus)
<b>Dimensions (W x H x D)</b>	See dimensional drawings
<b>Weight</b>	Measuring probe: ≤ ± 25 kg Purge air fixture: ≤ ± 7 kg
<b>Material in contact with media</b>	Stainless steel 1.4571, stainless steel 1.4539
<b>Auxiliary connections</b>	Purge air
<b>Integrated components</b>	Pressure sensor PT1000 temperature sensor

## Gas-testable measuring probe (GPP)

<b>Description</b>	Measuring probe with gas permeable filter element for adjustment with test gas
<b>Process temperature</b>	≤ +430 °C For N <sub>2</sub> O measurement max 180 °C
<b>Process pressure</b>	≤ 250 hPa Depending on purge air supply
<b>Process gas velocity</b>	≤ 40 m/s
<b>Dust load</b>	≤ 30 g/m <sup>3</sup>
<b>Bus protocol</b>	CAN (internal system bus)
<b>Dimensions (W x H x D)</b>	See dimensional drawings
<b>Weight</b>	Measuring probe: ≤ ± 45 kg Purge air fixture: ≤ ± 7 kg
<b>Material in contact with media</b>	Stainless steel 1.4571, stainless steel 1.4539, ceramics, PTFE
<b>Electrical connection</b>	
Voltage	115 V AC / 230 V AC
Frequency	50 Hz / 60 Hz
Power consumption	≤ 150 W
<b>Auxiliary connections</b>	Test gas Purge air
<b>Integrated components</b>	Pressure sensor PT1000 temperature sensor

## Reflector unit

<b>Description</b>	Reflector unit with hollow triple reflector
<b>Process temperature</b>	≤ +500 °C For N <sub>2</sub> O measurement max 180 °C
<b>Process pressure</b>	Depending on purge air supply
<b>Dimensions (W x H x D)</b>	291 mm x 280 mm x 161 mm
<b>Weight</b>	≤ ± 1.5 kg

## GM35 evaluation unit: steel sheet enclosure

<b>Description</b>	The evaluation unit serves as user interface and is responsible for data processing and output as well as control and monitoring functions
<b>Enclosure rating</b>	IP 65 / NEMA 4x
<b>Analog outputs</b>	3 outputs: 0/4 ... 20 mA, 500 Ω Electrically isolated
<b>Analog inputs</b>	1 input: 0 ... 20 mA, 100 Ω
<b>Digital outputs</b>	3 relay contacts: 48 V AC, 1 A, 60 W / 48 V DC, 1 A, 30 W
<b>Digital inputs</b>	3 inputs: 24 V Preset for failure, maintenance and functional control
<b>Interfaces</b>	RS-232 (service interface)
<b>Bus protocol</b>	CAN (internal system bus)
<b>Indication</b>	LC display Status LEDs: "Power", "Maintenance" and "Fault"
<b>Input</b>	Arrow keys Functional keys
<b>Operation</b>	Menu-driven operation via LC-display and membrane keyboard
<b>Model</b>	Steel sheet enclosure
<b>Dimensions (W x H x D)</b>	200 mm x 346 mm x 97.5 mm
<b>Weight</b>	≤ ± 3 kg
<b>Electrical connection</b>	
Voltage	115 V / 230 V
Frequency	50 Hz / 60 Hz
Power consumption	≤ 50 W

## GM35 evaluation unit: cast metal enclosure

<b>Description</b>	The evaluation unit serves as user interface and is responsible for data processing and output as well as control and monitoring functions
<b>Enclosure rating</b>	IP 67
<b>Analog outputs</b>	3 outputs: 0/4 ... 20 mA, 500 Ω Electrically isolated
<b>Analog inputs</b>	1 input: 0 ... 20 mA, 100 Ω
<b>Digital outputs</b>	3 relay contacts: 48 V AC, 1 A, 60 W / 48 V DC, 1 A, 30 W Preset for failure, maintenance and functional control
<b>Digital inputs</b>	3 inputs: 24 V
<b>Interfaces</b>	RS-232 (service interface)

<b>Bus protocol</b>	CAN (internal system bus)
<b>Indication</b>	LC display Status LEDs: "Power", "Maintenance" and "Fault"
<b>Input</b>	Arrow keys Functional keys
<b>Operation</b>	Menu-driven operation via LC-display and membrane keyboard
<b>Model</b>	Cast metal enclosure
<b>Dimensions (W x H x D)</b>	289 mm x 370 mm x 138 mm
<b>Weight</b>	≤ ± 3 kg
<b>Electrical connection</b>	
Voltage	115 V / 230 V
Frequency	50 Hz / 60 Hz
Power consumption	≤ 50 W

#### Connection unit

<b>Description</b>	To lengthen the internal CAN-Bus connection with cable provided by the customer
<b>Bus protocol</b>	CAN (internal system bus)
<b>Dimensions (W x H x D)</b>	125 mm x 103 mm x 57 mm
<b>Weight</b>	≤ ± 3 kg

#### Purge air fixture: sender/receiver unit

<b>Description</b>	Fixture to flanges with connections for purge air and external cabelling
<b>Bus protocol</b>	CAN (internal system bus)
<b>Dimensions (W x H x D)</b>	320.9 mm x 360 mm x 220 mm
<b>Weight</b>	≤ ± 7 kg
<b>Auxiliary connections</b>	Purge air
<b>Integrated components</b>	PT1000 temperature sensor Pressure sensor

#### Purge air fixture: reflector unit

<b>Description</b>	Fixture to flanges with connections for purge air and external cabelling
<b>Bus protocol</b>	CAN (internal system bus)
<b>Dimensions (W x H x D)</b>	320.9 mm x 360 mm x 220 mm
<b>Weight</b>	≤ ± 7 kg
<b>Auxiliary connections</b>	Purge air

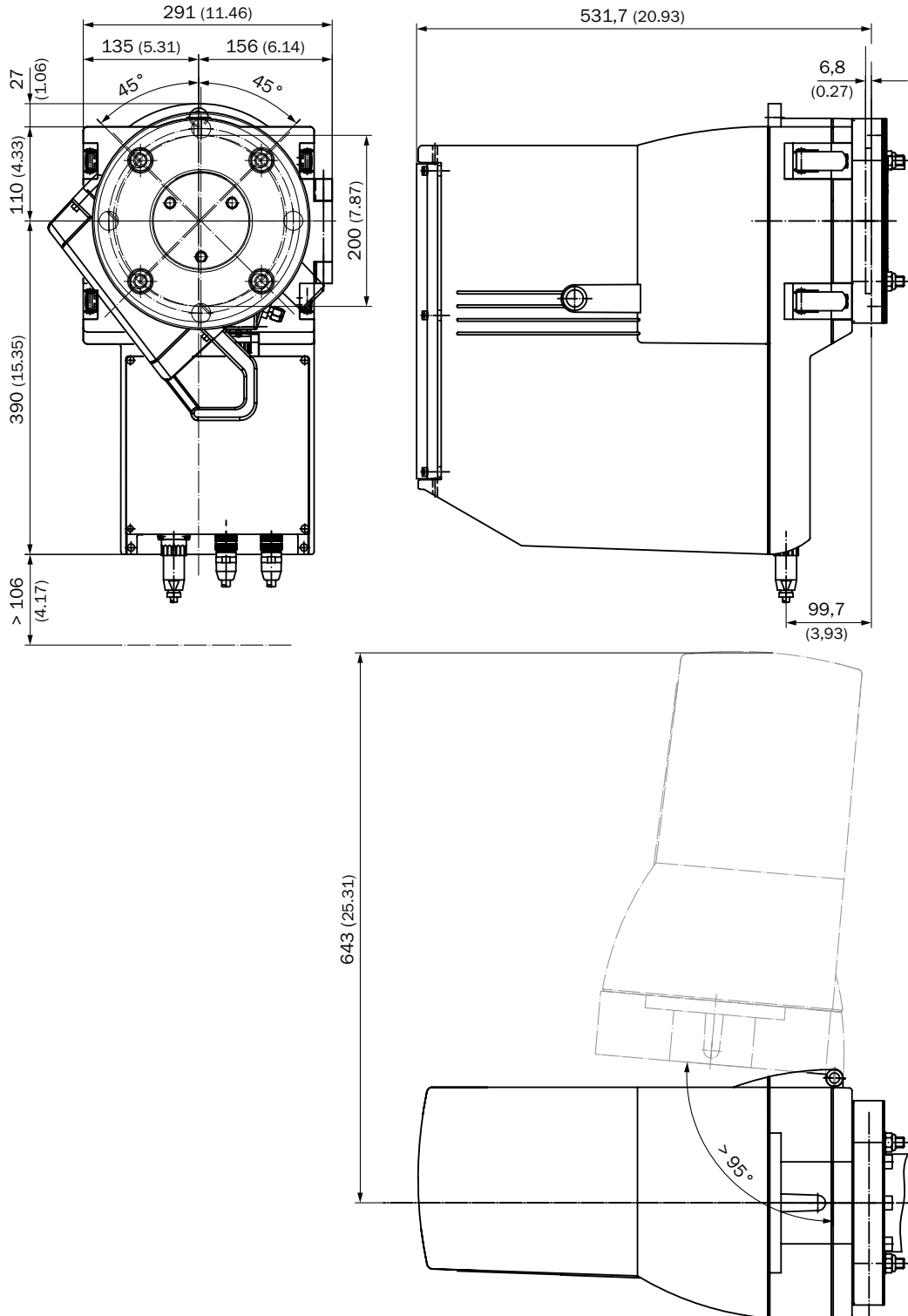


## Ordering information

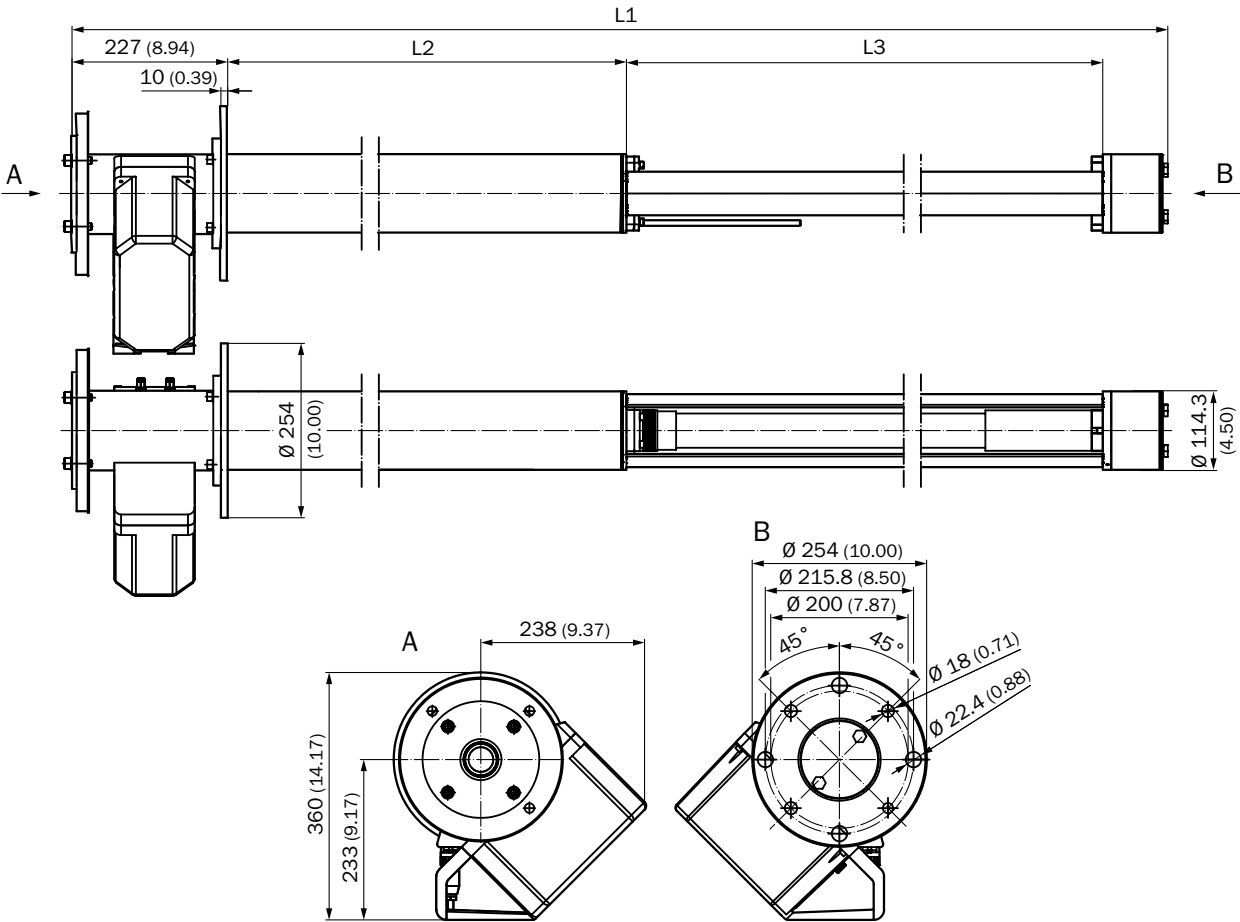
Our regional sales organization will help you to select the optimum device configuration.

## Dimensional drawings (Dimensions in mm (inch))

GM35 sender/receiver unit

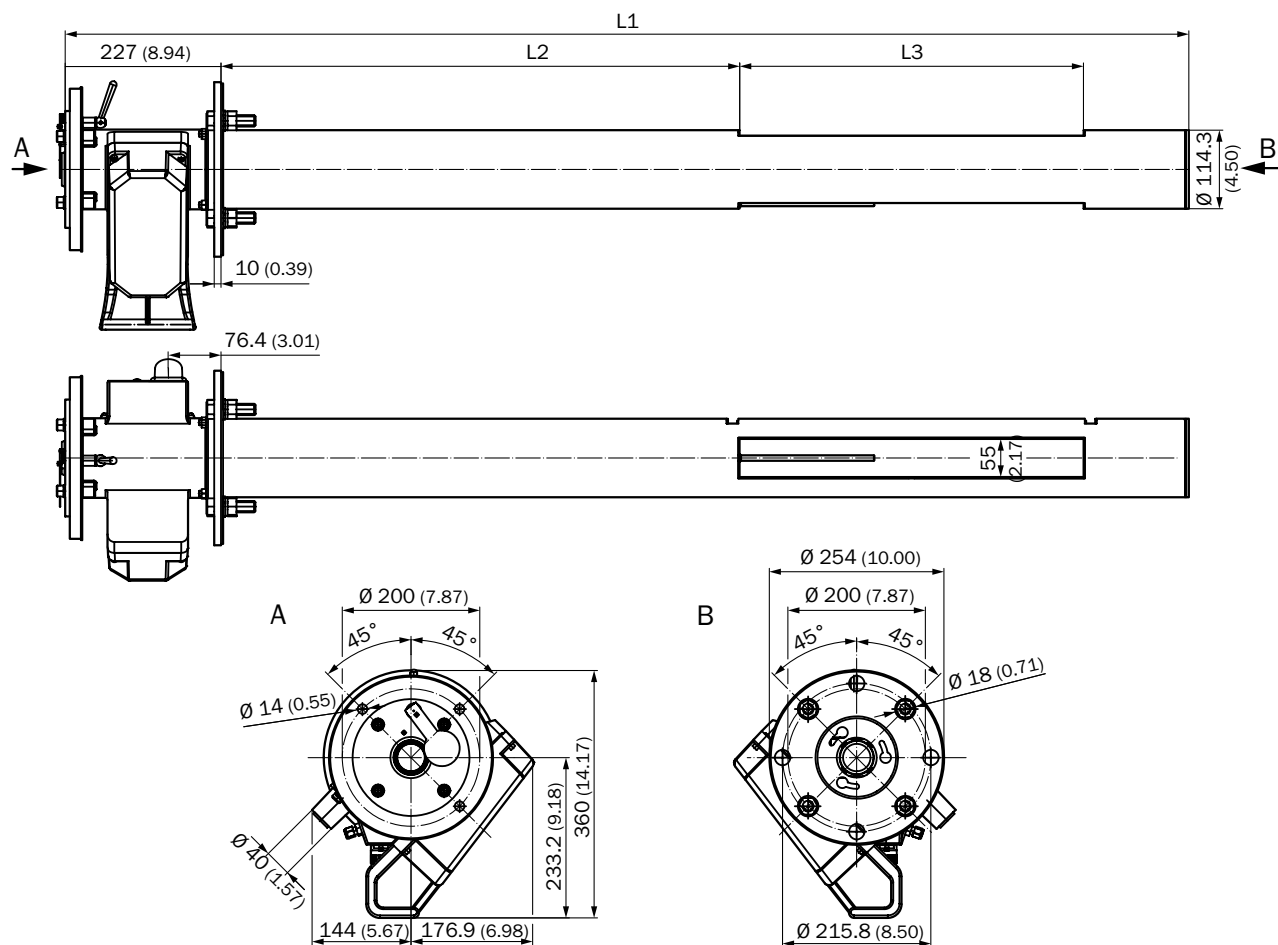


Gas-testable measuring probe (GPP)



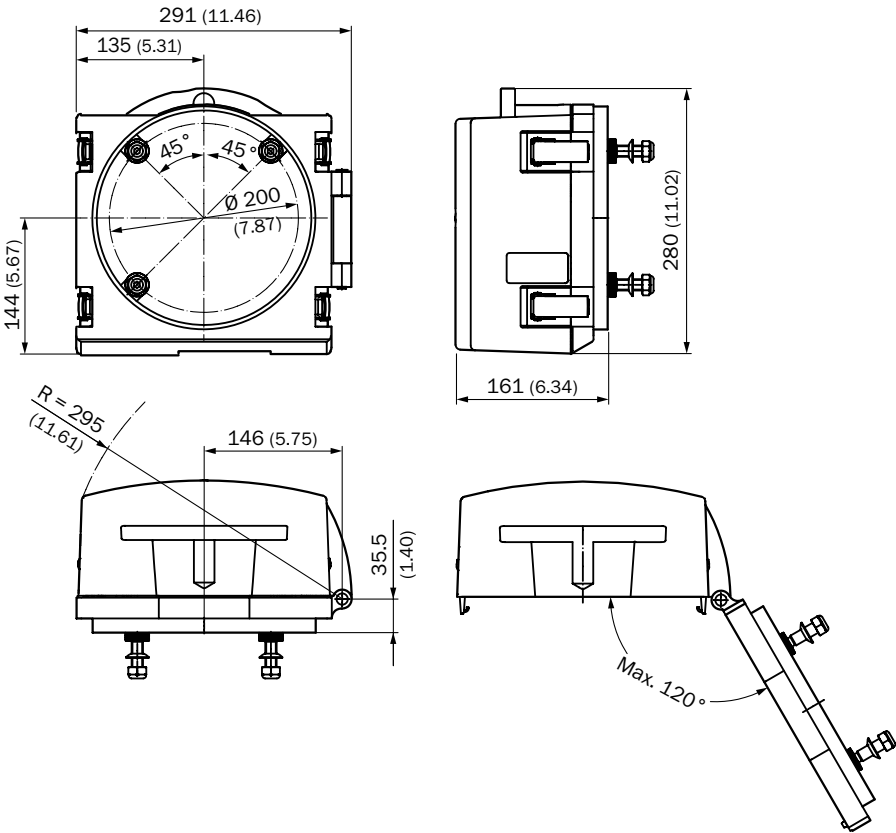
GPP measuring probes		Measuring gap L3 (active measuring path)			
		227 (8.94)	477 (18.78)	727 (28.62)	977 (38.46)
Probe length, nominal	L1	L2			
1,000 (39.37)	904 (35.59)	353 (13.90)	103 (4.06)	---	---
1,500 (59.06)	1,614 (63.54)	1,063 (41.85)	813 (32.01)	563 (22.17)	313 (12.32)
2,000 (78.74)	2,098 (82.60)	1,547 (60.91)	1,297 (51.06)	1,047 (41.22)	797 (31.38)
2,500 (98.43)	2,598 (102.28)	2,047 (80.59)	1,797 (70.75)	1,547 (60.91)	1,297 (51.06)
All dimensions in mm (inch)					
Application specific lengths on request					

## Open measuring probe (GMP)

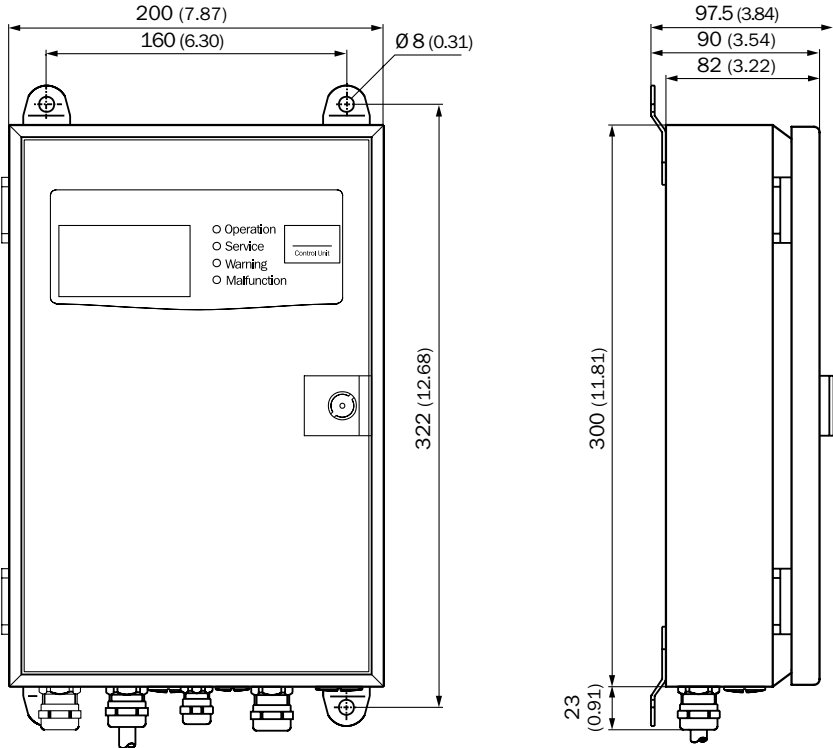


GMP measuring probes		Measuring gap L3 (active measuring path)						
		250 (9.84)	500 (19.69)	750 (29.53)	1,000 (39.37)	1,250 (49.21)	1,500 (59.06)	1,750 (68.90)
Probe length, nominal	L1	L2						
900 (35.43)	935 (36.81)	296 (11.65)	---	---	---	---	---	---
1,500 (59.06)	1,644 (64.72)	1,004.5 (39.55)	754.5 (29.70)	504.5 (19.86)	254.5 (10.02)	---	---	---
2,000 (78.74)	2,128 (83.78)	1,489 (58.62)	1,239 (48.78)	989 (38.94)	739 (29.09)	489 (19.25)	239 (9.41)	---
2,500 (98.43)	2,628 (103.46)	1,988 (78.27)	1,738 (68.43)	1,488 (58.58)	1,238 (48.74)	988 (38.90)	738 (29.06)	488 (19.21)
All dimensions in mm (inch)								
Application specific lengths on request								

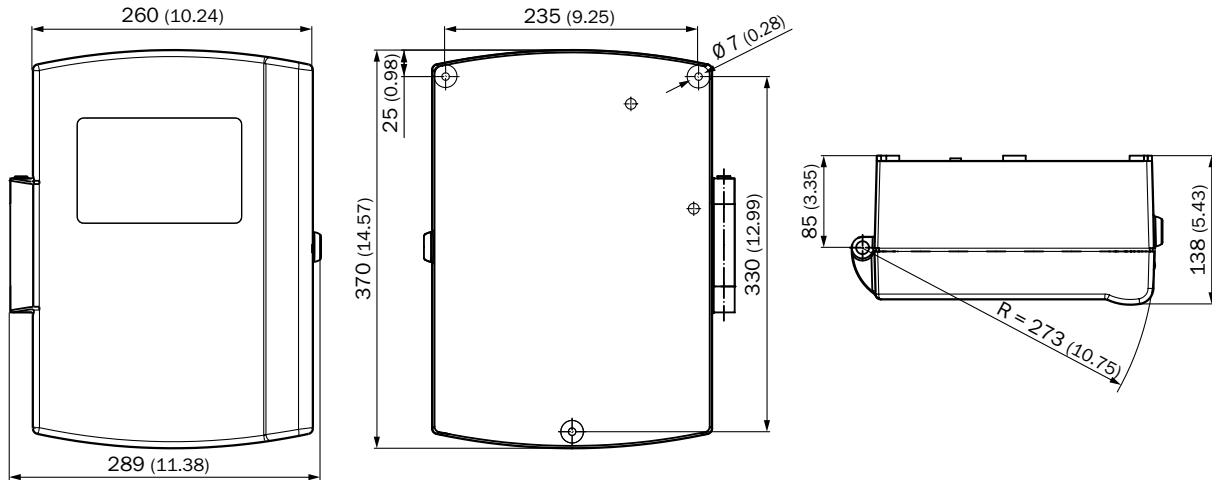
GM35 reflector unit



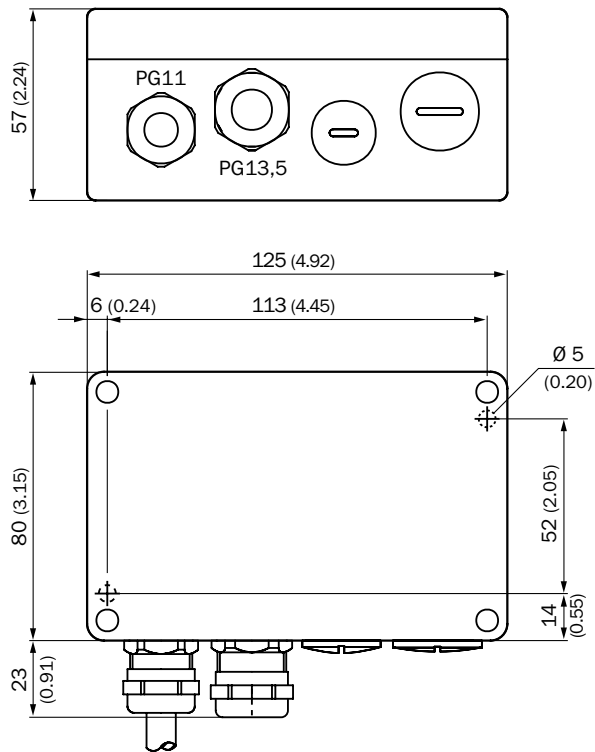
GM35 AWE evaluation unit: steel sheet enclosure



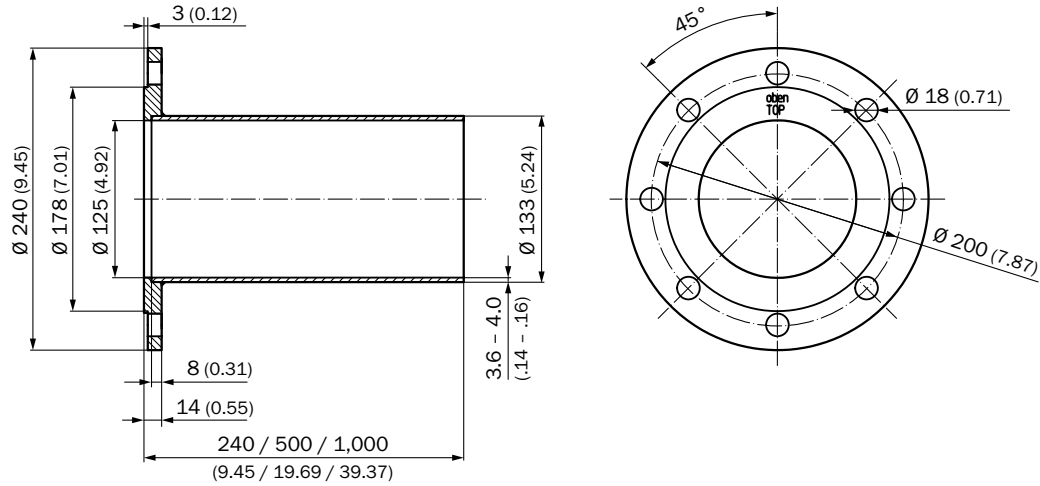
GM35 AWE evaluation unit: cast metal enclosure



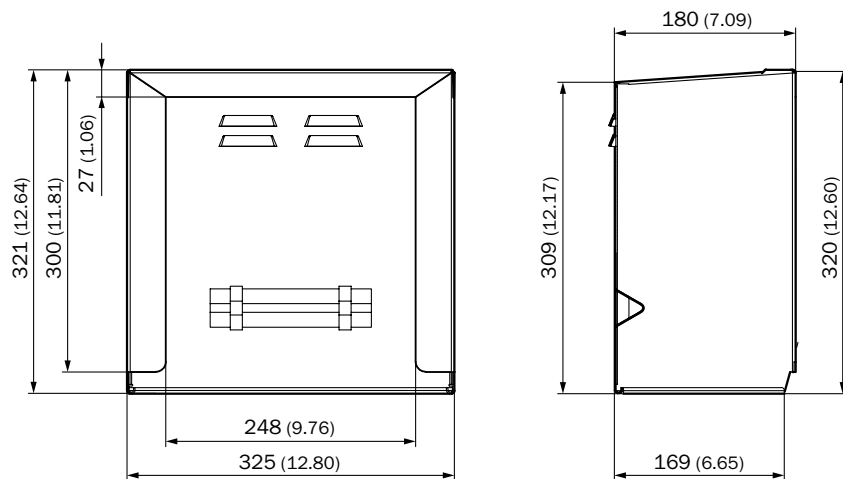
GM35 connection unit



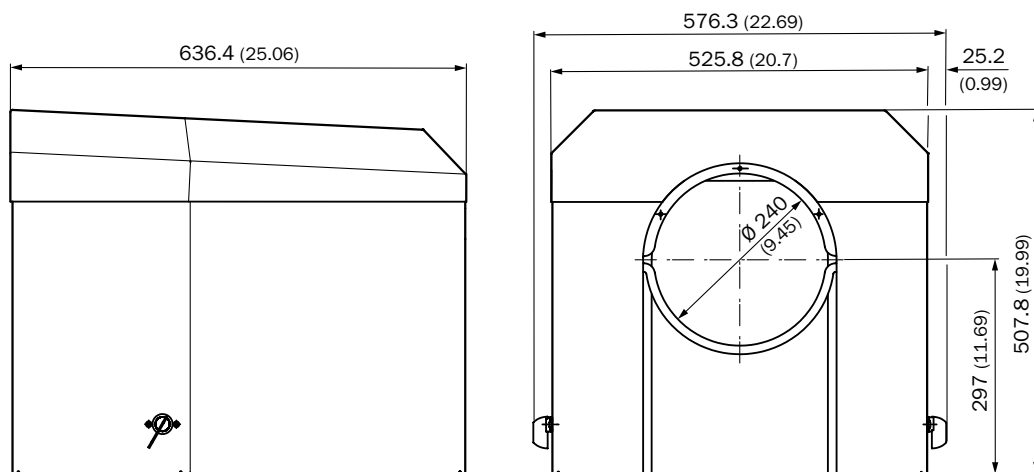
Mounting flange,  $D_i=125$  mm



Weather hood for reflector unit



Weather hood for sender/receiver unit



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SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With almost 7,000 employees and over 50 subsidiaries and equity investments as well as numerous representative offices worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

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For us, that is “Sensor Intelligence.”

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Detailed addresses and additional representatives → [www.sick.com](http://www.sick.com)