GM35

In-situ gas analyzer for simultaneous or individual measurement of CO_2, H_2O and CO

Efficient control of combustion and drying processes

- Reliable measuring results – even for water-soluble gas components
- Dynamic humidity measurement directly within the process
- Provision of measured humidity reference values
- Nearly uncompromised measured values thanks to in-situ measurement
- Fast or transient process deviations are measurable
- Representative measurement by selecting a suitable measuring probe or cross-duct type

Endress+Hauser
People for Process Automation

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 is predestined for this purpose because it measures CO, CO_2 and H_2O 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_2 and 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, we provide 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. 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_2, H_2O and CO. The in-situ measurement technology allows direct installation of the analyzer at the respective measuring location.

Two versions are available:

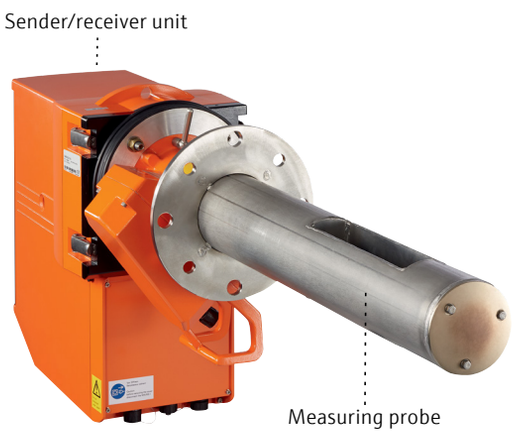
- A cross-duct version for representative measured results across the entire duct cross diameter.
- A measuring probe version – optimized for single-sided installation allowing simple integration into an extremely varied range of system conditions.

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 g/m³
- 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

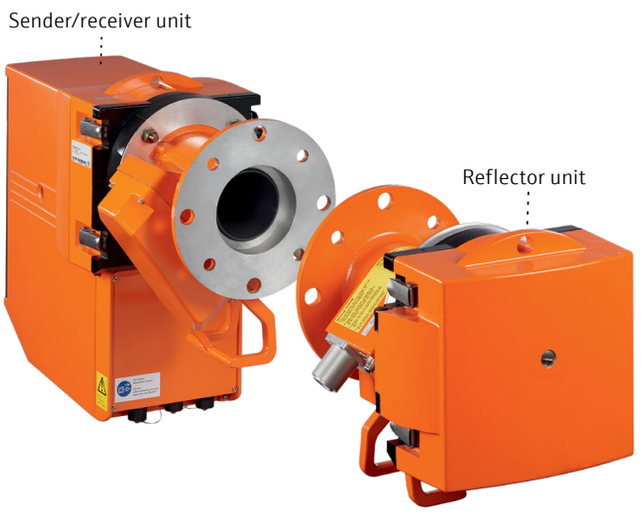


Cross Duct version

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

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



GM35 – Efficient control of combustion and dehydration processes

GM35 measuring probe version

GM35 cross duct version

Product Description

Simultaneous or individual measurements: the GM35 gas analyzer measures CO_2, H_2O and CO or N_2 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_2 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

Fields of application

- Emission monitoring according to EN 14181 (MCERTS), 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

CE EN 15267 certified EN 14181 certified

More Information online

For more information, enter the link or scan the QR code to get direct access to technical data, operating instructions, software, application examples, and much more.
www.endress.com/gm35

Technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

GM35: general

Description	Cross-duct version, probe version
Measured values	CO, CO_2, H_2O
Performance-tested measurand	CO, CO_2, H_2O
Measurement principles	Gas filter correlation, interference filter correlation
Measuring ranges	
CO	0 180 ppm / 0 to 20,000 ppm
CO_2	0 to 22.5 Vol.-% / 0 to 100 Vol.-%
H_2O	0 to 25 Vol.-% / 0 to 100 Vol.-%
	Measuring ranges refer to 1 m measuring path Measuring ranges depend on application and device version
Certified measuring ranges	
CO	0 to 180 ppm / 0 to 20,000 ppm
CO_2	0 to 22.5 Vol.-% / 0 to 100 Vol.-%
H_2O	0 to 25 Vol.-% / 0 to 100 Vol.-%
Zero point drift	± 2 % relative to measuring range end value
Reference point drift	± 2 % within maintenance interval, relative to measuring range full scale
Ambient temperature	–40 °C ... +55 °C (-40 ... + 130 °F); temperature change ±10 °C/h (50 °F/h) maximum
Storage temperature	–40 °C ... +55 °C (-40 ... + 130 °F)
Ambient humidity	≤ 96 %; relative humidity; bedewing of optical surfaces not permitted
Conformities	EN 15267 (MCERTS)
Electrical safety	CE
Enclosure rating	IP 65 / NEMA 4x
Operation	Menu-driven operation via separate control unit
Menu language	German, English
Model	Cross-duct version Measuring probe version
Test functions	Automatic control cycle for zero and span point

Sender/receiver unit

Description	Analyzer unit of the measuring device
Enclosure rating	IP 65 / NEMA 4x
Bus protocol	CAN (internal system bus)
Dimensions (W x H x D)	291 mm x 527 mm x 529 mm (11.46" x 20.75" x 20.83")
Weight	Appr. 29 kg (63.9 lbs)
Electrical connection	
Voltage	115 V AC / 230 V AC
Frequency	48 ... 62 Hz
Power consumption	≤ 350 W

Open measuring probe [GMP]

Description	Measuring probe in open design with integrated purge air control system
Process temperature	+430 °C (806 °F)
Process pressure	≤ 120 hPa, depending on purge air supply
Process gas velocity	≤ 40 m/s
Dust load	≤ 3 g/m³
Bus protocol	CAN (internal system bus)
Dimensions (W x H x D)	See dimensional drawings
Weight	Measuring probe: 25 kg (55.1 lbs) Purge air fixture: 7 kg (15.4 lbs)
Material in contact with media	Stainless steel 1.4571, stainless steel 1.4539
Auxiliary connections	Purge air
Integrated components	Pressure sensor PT1000 temperature sensor

Gas-testable measuring probe [GPP]

Description	Measuring probe with gas permeable filter element for adjustment with test gas
Process temperature	+430 °C (806 °F)
Process pressure	≤ 250 hPa, depending on purge air supply
Process gas velocity	≤ 40 m/s
Dust load	≤ 30 mg/m³
Bus protocol	CAN (internal system bus)
Dimensions (W x H x D)	See dimensional drawings
Weight	Measuring probe: 45 kg (99.2 lbs) Purge air fixture: 7 kg (15.4 lbs)
Material in contact with media	Stainless steel 1.4571, stainless steel 1.4539, ceramics, PTFE

Electrical connection	
Voltage	115 V AC, ± 10% 230 V AC, ± 10%
Frequency	50 Hz / 60 Hz
Power consumption	≤ 150 VA
Auxiliaries	Test gas Purge air
Integrated components	Pressure sensor PT1000 temperature sensor

Reflector unit

Description	Reflector unit with hollow triple reflector
Process temperature	+500 °C (932 °F)
Process pressure	Depending on purge air supply
Dimensions (W x H x D)	291 mm x 280 mm x 161 mm (11.46" x 11.02" x 6.34")
Weight	1.5 kg (3.3 lbs)

Evaluation unit: steel sheet enclosure

Description	The evaluation unit serves as user interface and is responsible for data processing and output as well as control and monitoring functions
Enclosure rating	IP 65 / NEMA 4x
Analog outputs	3 outputs: 0/4 ... 20 mA, 500 Ω; electrically isolated
Analog inputs	1 input: 0 ... 20 mA, 100 Ω
Digital outputs	3 relay contacts: 48 V AC, 1 A, 60 W / 48 V DC, 1 A, 30 W
Digital inputs	3 inputs: 24 V; preset for failure, maintenance and functional control
Interfaces	RS-232 (service interface)
Bus protocol	CAN (internal system bus)
Indication	LC display, status LEDs: "Power", "Maintenance" and "Fault"
Input	Arrow keys, functional keys
Operation	Menu-driven operation via LC-display and membrane keyboard
Model	Steel sheet enclosure
Dimensions (W x H x D)	200 mm x 346 mm x 97.5 mm (7.87" x 13.62" x 3.84")
Weight	3 kg (6.6 lbs)
Electrical connection	
Voltage	115 V AC, ± 10% 230 V AC, ± 10%
Frequency	50 Hz / 60 Hz
Power consumption	≤ 150 VA

Evaluation unit: cast metal enclosure

Description	The evaluation unit serves as user interface and is responsible for data processing and output as well as control and monitoring functions
Enclosure rating	IP 67
Analog outputs	3 outputs: 0/4 ... 20 mA, 500 Ω; electrically isolated
Analog inputs	1 input: 0 ... 20 mA, 100 Ω
Digital outputs	3 relay contacts: 48 V AC, 1 A, 60 W / 48 V DC, 1 A, 30 W; preset for failure, maintenance and functional control
Digital inputs	3 inputs: 24 V
Interfaces	RS-232 (service interface)
Bus protocol	CAN (internal system bus)
Indication	LC display, status LEDs: “Power”, “Maintenance” and “Fault”
Input	Arrow keys, functional keys
Operation	Menu-driven operation via LC-display and membrane keyboard
Model	Cast metal enclosure
Dimensions (W x H x D)	289 mm x 370 mm x 138 mm (11.38” x 14.57” x 5.43”)
Weight	3 kg (6.6 lbs)
Electrical connection	
Voltage	115 V AC, ± 10% 230 V AC, ± 10%
Frequency	50 Hz / 60 Hz
Power consumption	≤ 50 VA

Connection unit

Description	To lengthen the internal CAN-Bus connection with cable provided by the customer
Bus protocol	CAN (internal system bus)
Dimensions (W x H x D)	125 mm x 103 mm x 57 mm (4.92” x 4.06” x 2.24”)
Weight	3 kg (6.6 lbs)

Purge air fixture: sender/receiver unit

Description	Fixture to flanges with connections for purge air and external cabling
Bus protocol	CAN (internal system bus)
Dimensions (W x H x D)	320.9 mm x 360 mm x 220 mm (12.63” x 14.17” x 8.66”)
Weight	7 kg (15.4 lbs)
Auxiliary connections	Purge air
Integrated components	PT1000 temperature sensor Pressure sensor

Purge air fixture: reflector unit

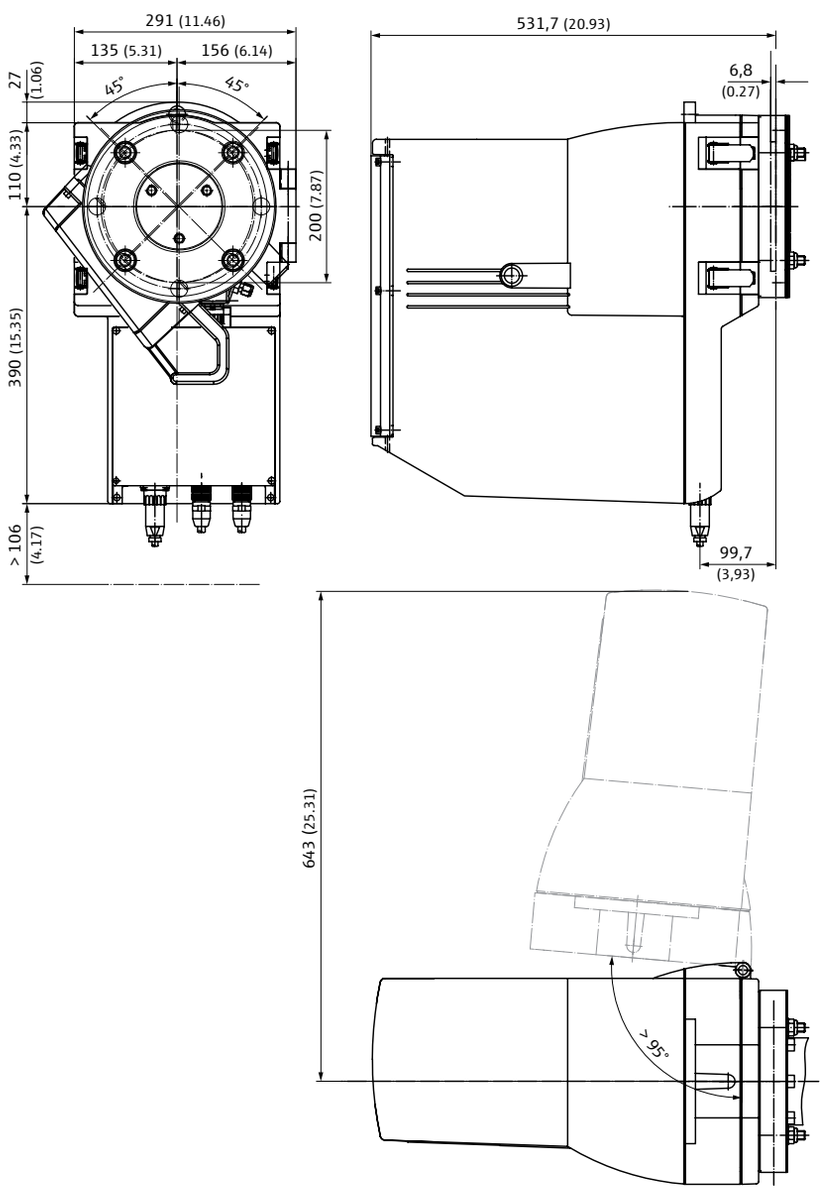
Description	Fixture to flanges with connections for purge air and external cabling
Bus protocol	CAN (internal system bus)
Dimensions (W x H x D)	320.9 mm x 360 mm x 220 mm (12.63” x 14.17” x 8.66”)
Weight	7 kg (15.4 lbs)
Auxiliary connections	Purge air

Order information

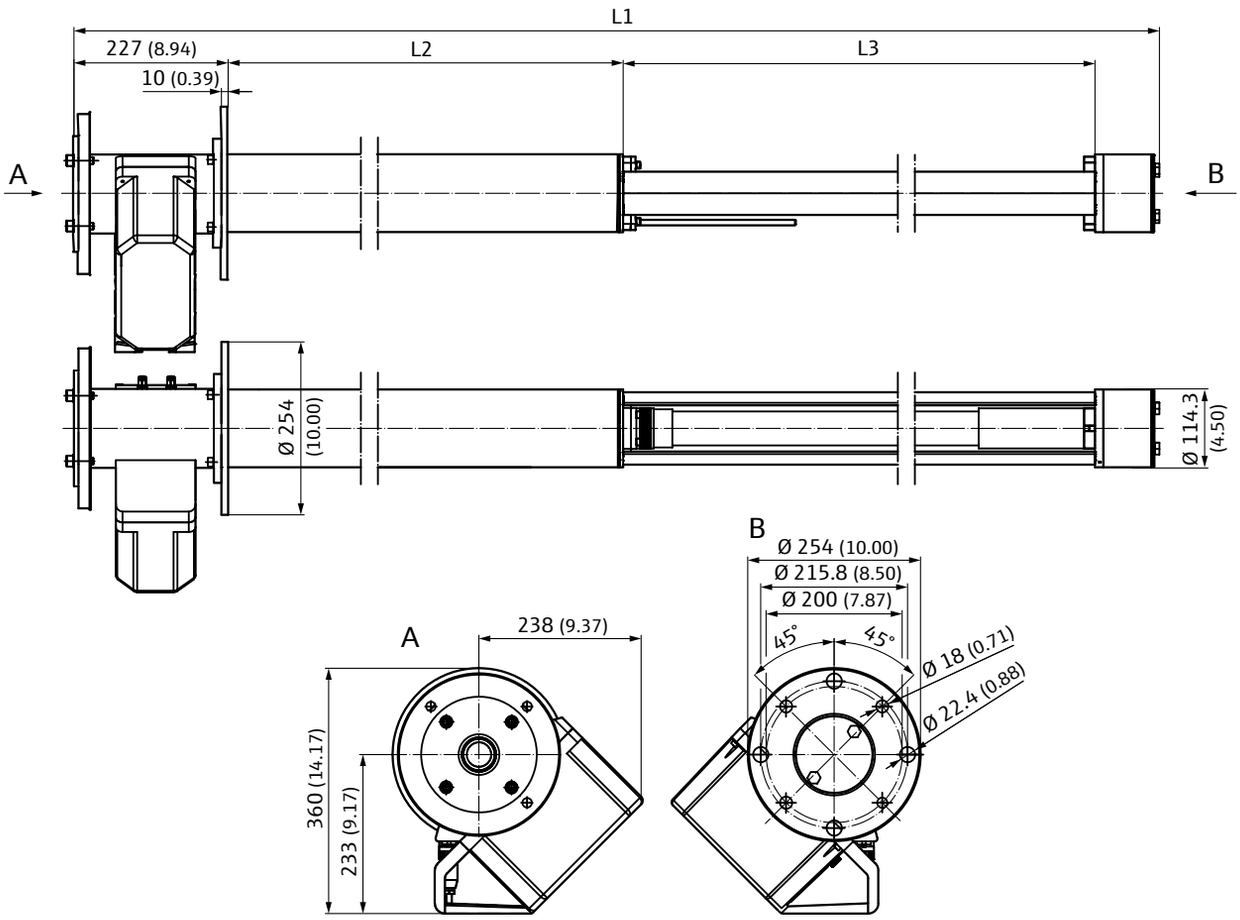
Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings

GM35 sender/receiver unit (dimensions in mm (inch))



Gas-testable measuring probe (GPP) (dimensions in mm (inch))

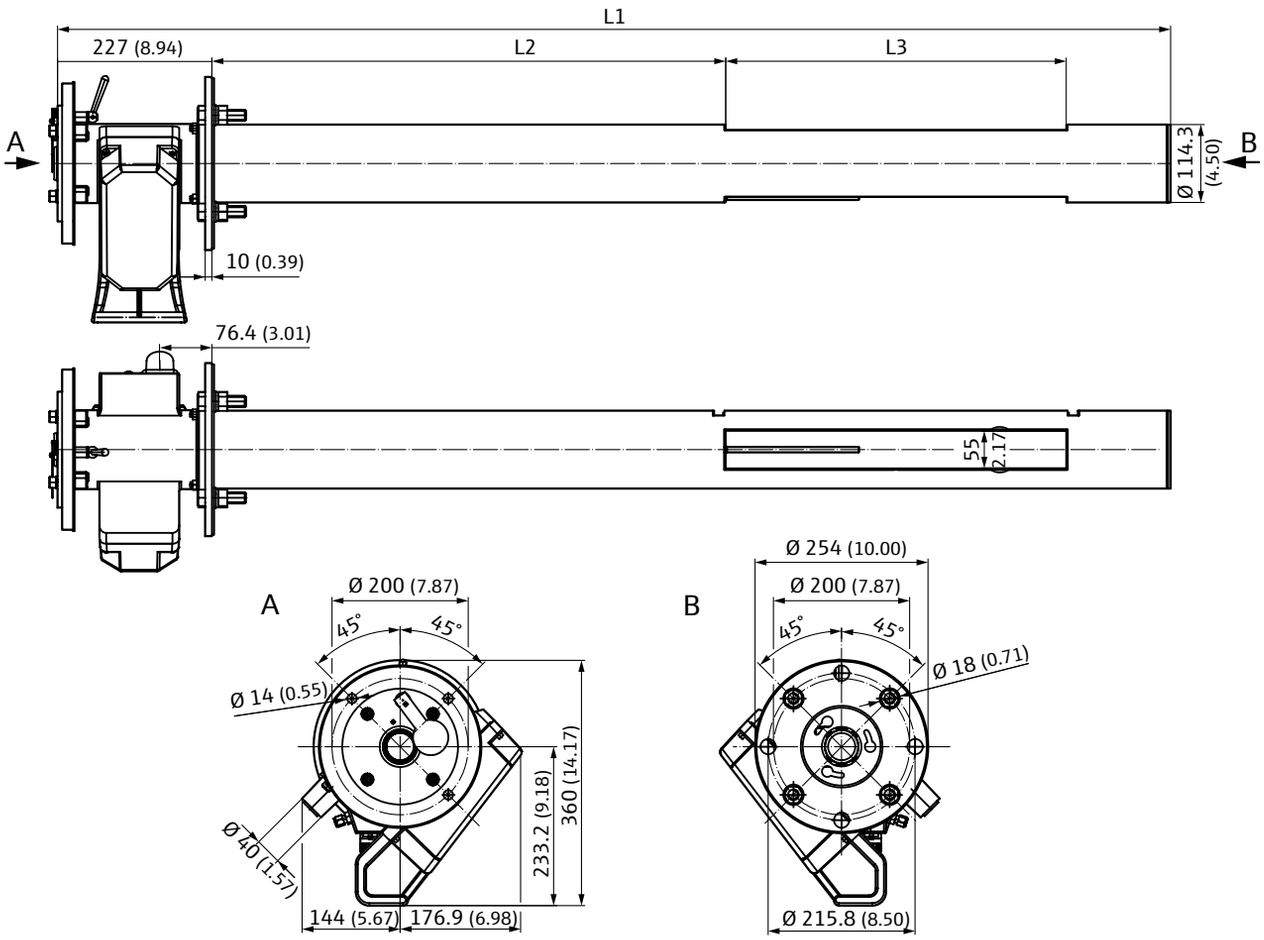


GPP measuring probes

		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) (dimensions in mm (inch))

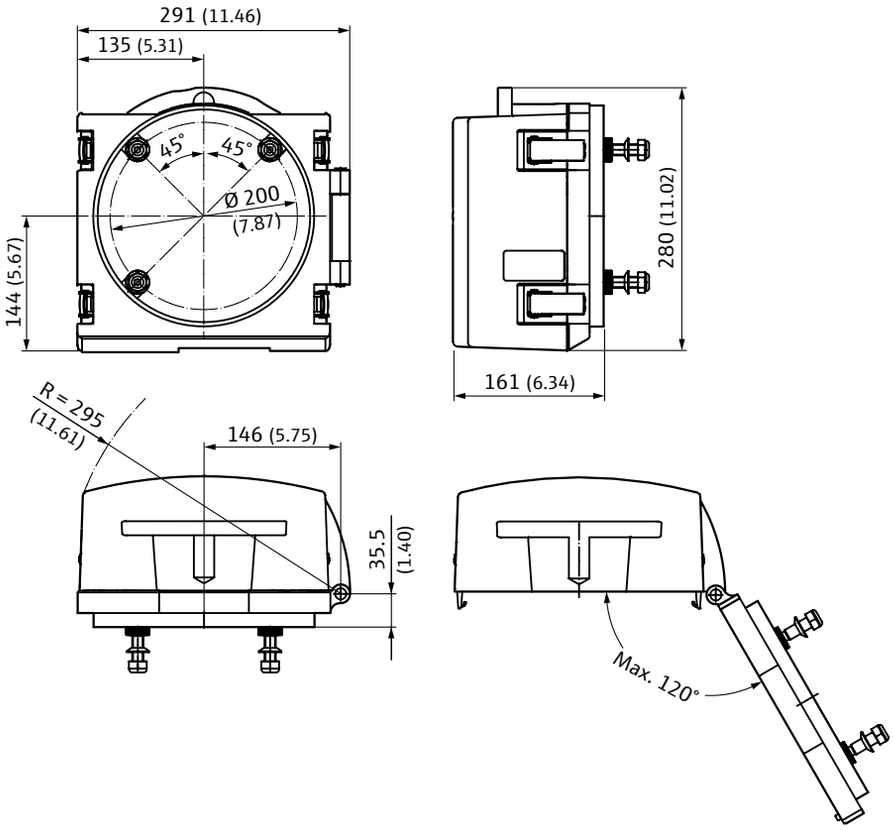


GMP measuring probes

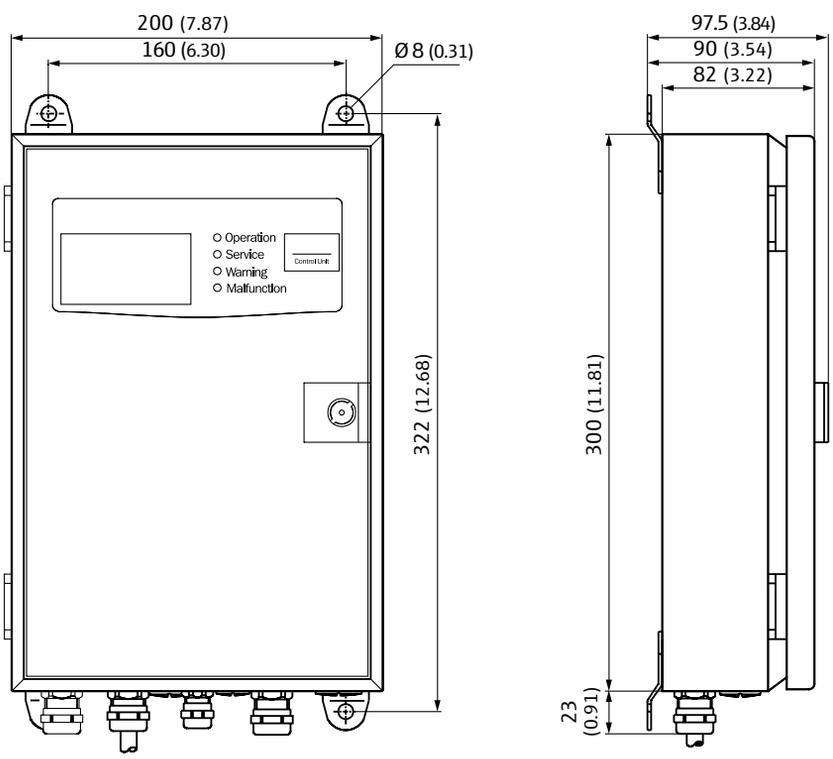
		Measuring gap L3 (active measuring path)						
		250 (9.84)	500 (19.69)	750 (29.53)	1,000 (39.37)	1,250 (49.21)	1,500 (59.06)	1,750 (68.90)
Probe length, nominal	**L1**	**L2**						
1,000 (39.37)	935 (36.81)	296 (11.65)	---	---	---	---	---	---
1,500 (59.06)	1,644 (64.72)	1,004.5 (39.55)	754.5 (29.70)	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

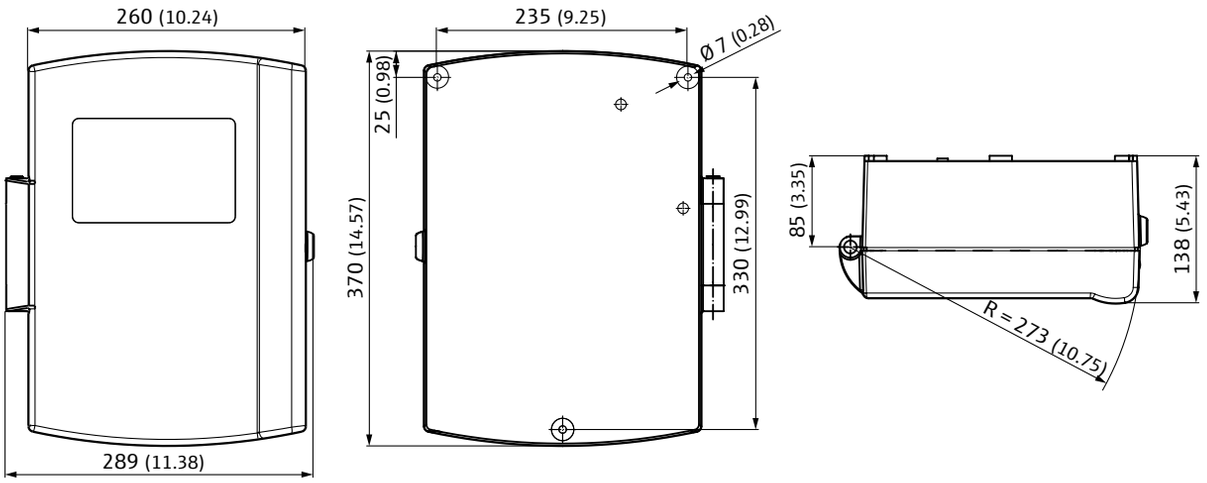
GM35 reflector unit (dimensions in mm (inch))



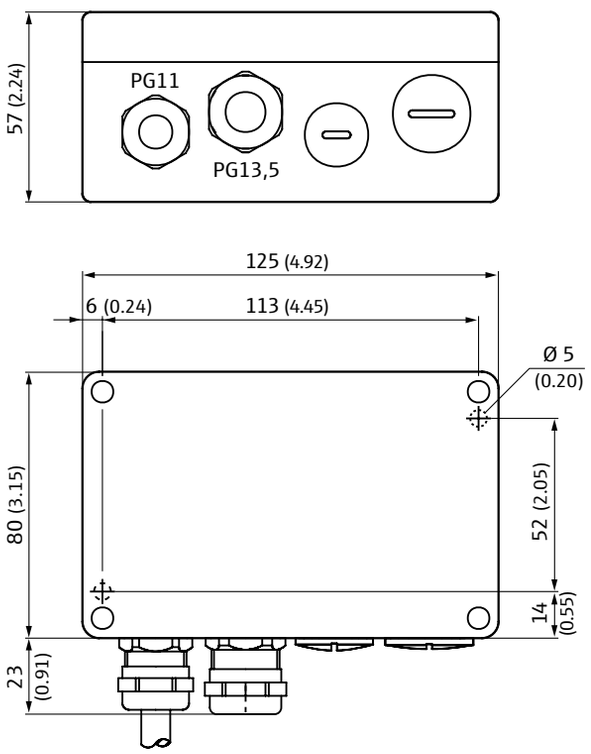
GM35 AWE evaluation unit: steel sheet enclosure (dimensions in mm (inch))



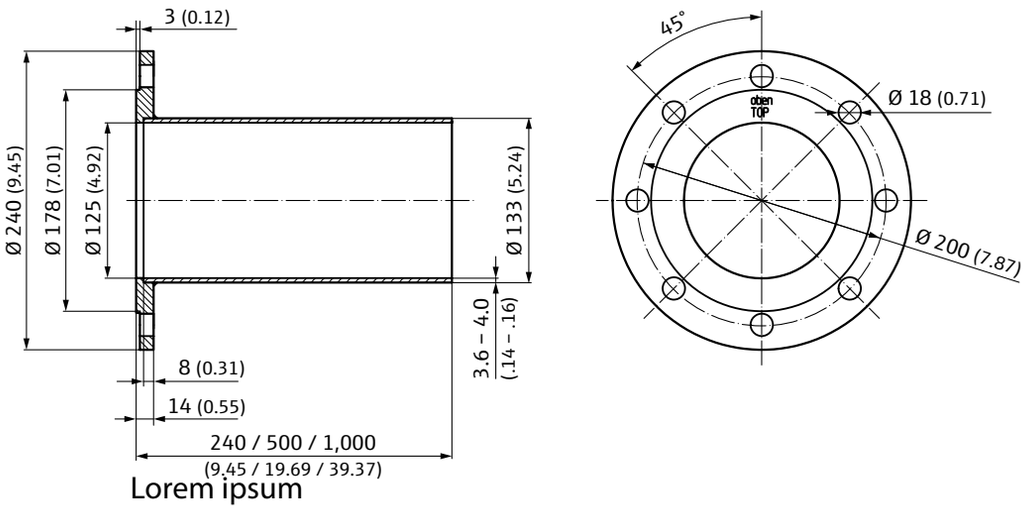
GM35 AWE evaluation unit: cast metal enclosure (dimensions in mm (inch))



GM35 connection unit (dimensions in mm (inch))

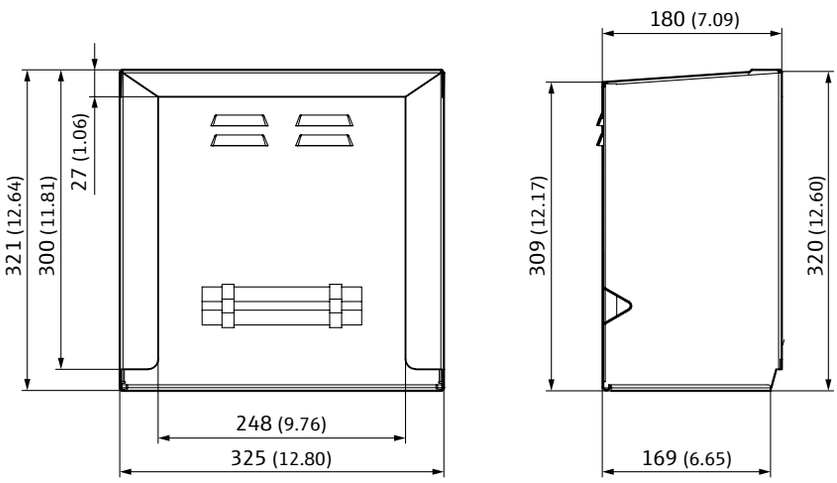


Mounting flange, D_i=125 mm (dimensions in mm (inch))

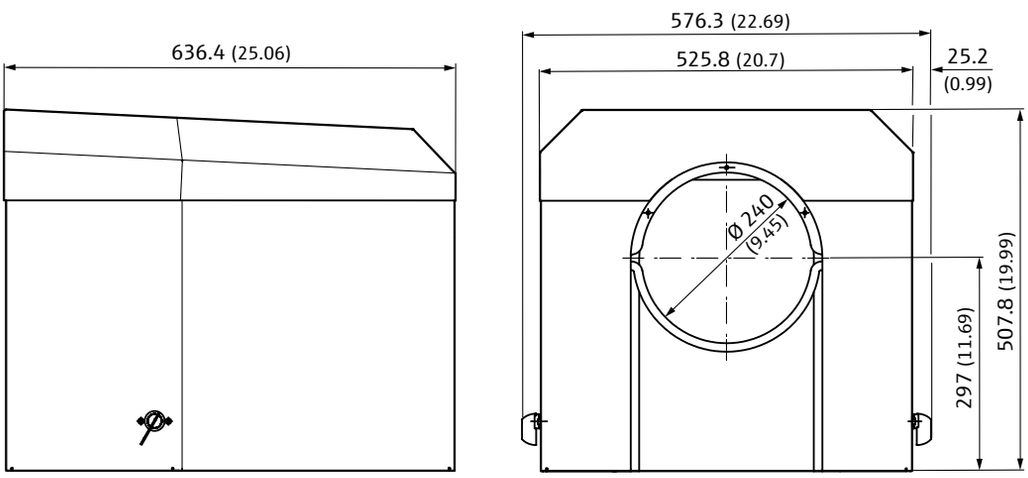


Lorem ipsum

Weather hood for reflector unit (dimensions in mm (inch))



Weather hood for sender/receiver unit (dimensions in mm (inch))



www.addresses.endress.com

Eco-friendly produced and printed on paper
from sustainable forestry.

IN 8029966 / EHS / EN / 03.01

Endress+Hauser

People for Process Automation