

GM32

In-situ gas analyzer for efficient measurement of SO₂, NO, NO₂, NH₃ – even in ATEX zones

Measure aggressive gases directly and quickly – even in ATEX zones

- Nearly uncompromised measured values measured directly in the gas duct
- Short-term process deviations can be measured
- Representative measurement by selection of cross-duct or measuring probe type
- Fast on-site service possible due to modular design
- Long maintenance-free intervals
- Cost-effective in-situ gas analyzer – Ex-type also available
- Low cost of installation and operation, no test gases required



Cleaner environment thanks to our proven measurement technology

Since the beginning of industrialization, air pollution caused by exhaust gases and environmental impact has been a challenge that needs to be addressed. In order to comply with limit values and protect the environment from further pollution, it is necessary to measure accurately and monitor reliably at the crucial points. For decades, we have been working with our customers on innovative solutions that have proven themselves thousands of times to make an effective contribution to environmental protection.

In-situ measurement technology offers many advantages for continuous gas analysis. It delivers accurate results directly, quickly and without expensive gas extraction and transportation. In addition to compliance with limit values, the GM32 gas analyzer also significantly increases plant efficiency and ensures optimum process control while minimizing maintenance costs. The gas analyzers in the GM32 product family measure SO_2 , NO, NO_2 and NH_3 simultaneously and continuously 24/7, 365 day a year.



Versatile success – the all-rounder for many industries and applications

Every industry also produces exhaust gases. The GM32 therefore offers efficient solutions for a wide range of requirements. Different device variants enable process access for every application.

With its robust in-situ measurement technology, the GM32 proves its worth in both emission monitoring and process control - day in, day out in all its fields of application.

GM32 overview

Version	GM32 standard versions	GM32 Ex versions
		
Measurement components		
SO ₂	✓	✓
NO	✓	✓
NO ₂	✓	✓
NH ₃	✓	✓
Temperature	✓	✓
Pressure	✓	✓
Process access (plant)		
Cross duct version	✓	✓
Open measuring probe version	✓	✓
Measuring probe with gas permeable filter element	✓	
Maximum temperature		
Up to + 550 °C (+ 1,020 °F)	✓	✓
Ex zones		
Zone 2	–	ATEX / IEC Ex
Non-ex area	✓	✓

Advantages through intelligent design

Environmental protection and process optimization are not that complicated and costly. The GM32 proves this with its robustness, uncomplicated installation and automatic self-testing. They ensure long maintenance-free intervals and minimal maintenance costs. The compact connection unit with many outputs and connection options allows remote

data retrieval and remote maintenance anywhere in the world. The fast response time due to the in-situ technology and the high accuracy of the measurement results optimize process control and the balance between economic efficiency and environmental compatibility.



Signal evaluation in UV spectrum

Advantage:

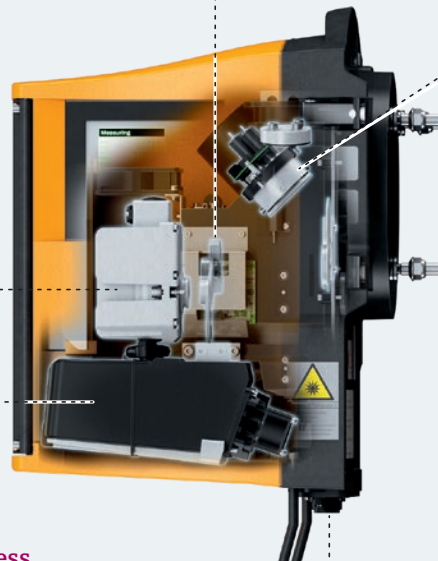
Very high accuracy, no cross-sensitivity to foreign gases, dust and humidity.



Automatic self-monitoring

Advantage:

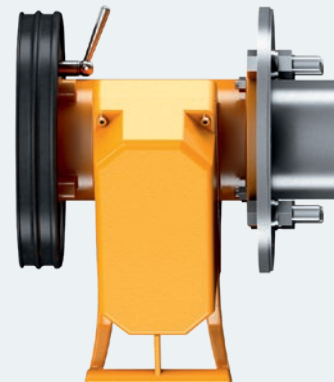
Minimal maintenance costs and long maintenance-free intervals



4 gases simultaneously + process, temperature and pressure

Advantage:

Direct and fast measurement of 4 gases simultaneously with unadulterated measured values in real time.



Convenient thanks to remote diagnosis

Advantage:

Simple and fast access for remote data retrieval, remote diagnostics and -maintenance thanks to extensive network capability, e.g. via Ethernet or OPC server connection.



AAC (Automatic Alignment Correction)

Advantage:

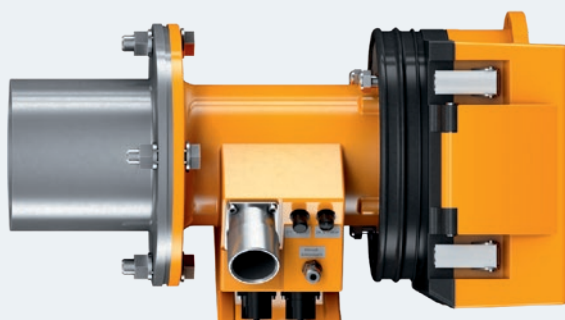
Thanks to automatic beam tracking of the optical path, the GM32 measures reliably even in the event of strong vibrations.



Cross duct or measuring probe version

Advantage:

High flexibility in adapting to the respective application, representative measurement results through selection of cross-duct or measuring probe version.



Flexible process access

Version with open measuring probe (GMP)

Device components

- Sender/receiver unit
- GMP measuring probe with open design

Advantages

- Very fast response time
- Mounting from only one side
- High gas or dust concentrations possible
- With various measuring paths
- With integrated zero-point path

Cross-duct version

Device components

- Sender/receiver unit
- Reflector unit

Advantages

- Very fast response time
- Non-contact measurement with aggressive or hot gases
- Representative results even with duct diameters of up to 12 m (40 ft)
- Insensitive to swiveling due to automatic self-alignment of the measuring path

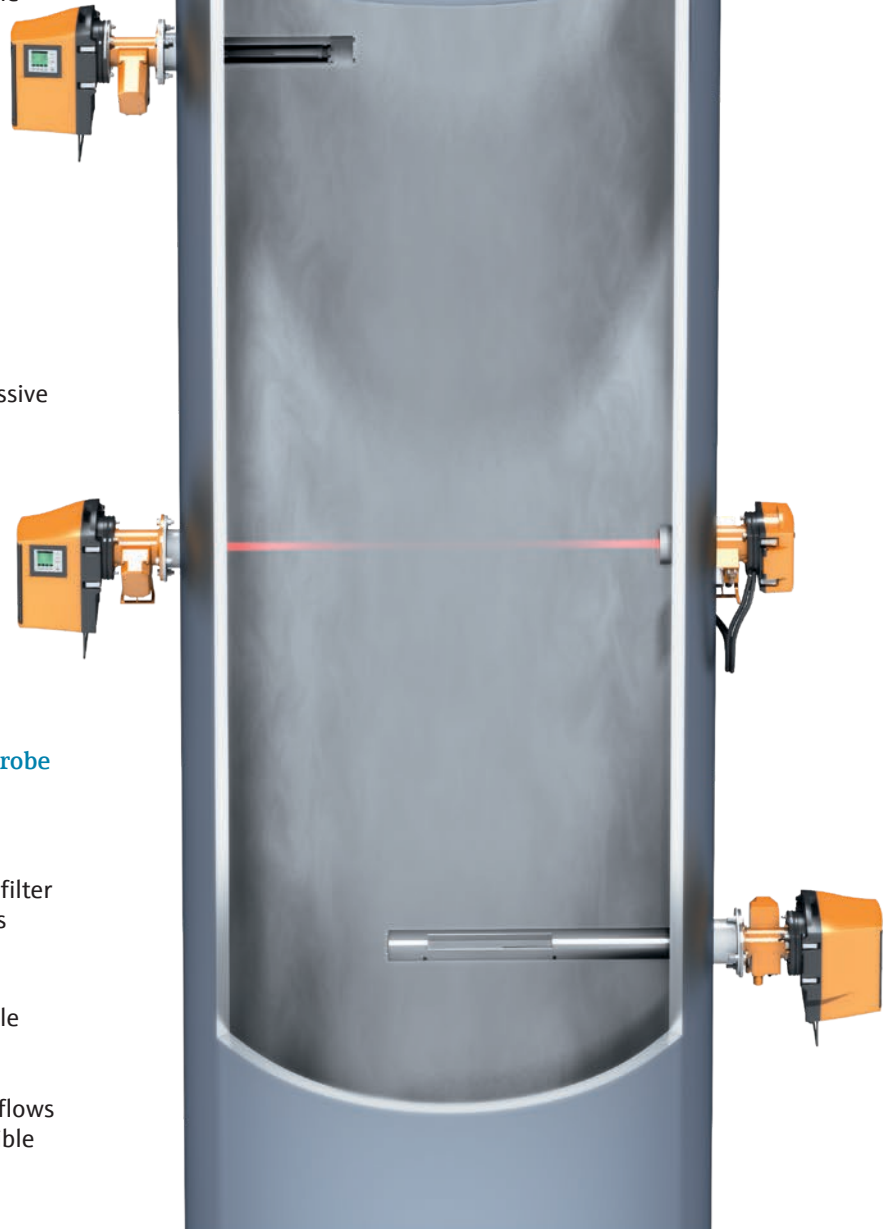
Version with gas-testable measuring probe (GPP)

Device components

- Sender/receiver unit
- GPP measuring probe with permeable filter element for adjustment with test gases

Advantages

- Mounting only from one side
- High gas or dust concentrations possible
- With various measuring paths
- With integrated zero-point paths
- Stable results even with turbulent gas flows
- Gas testing according to U.S. EPA possible



For industrywide measurement tasks

Denitrification (DeNO_x)

The key factor for efficient monitoring and control of the flue gas denitrification plant is a very short response time of the measurement. This can significantly increase the efficiency and service life of the plant and at the same time avoid follow-up costs due to pollutant loads caused by ammonia in the fly ash. The GM32 provides reliable measurement results in real time for monitoring NO concentrations in both the raw gas and clean gas ducts as well as for NH₃ slip measurement downstream of the catalytic converter. Only one analyzer for NO, NO₂ and NH₃ means less installation and maintenance effort.

Process control in CPR plants

The GM32 Ex is also available for non-contact measurement thanks to the cross-duct version and is of interest to the chemical, natural gas and petroleum industries. The pressurized version can be used in Ex zones 1 and 2 with ATEX class 3G or 2G up to 650 °C (1,200 °F). GM32 Ex can be applied as an emission measuring instrument downstream of sulphur recovery units or FCC crackers.

Desulfurization (DeSO_x)

Here too, the GM32 proves its worth in process control and continuous emission measurement. Regardless of whether the sample gases are saturated (wet) or dry. The fast GM32 analyzer with its direct, delay-free in-situ measurement of SO₂ is the ideal analyzer for the efficient monitoring and control of flue gas cleaning systems.

Emission measurements and monitoring

Always on the safe side: GM32 is since decades certified and conform to by most of the worldwide emission norms like EN15267 and US EPA. And it is characterized by minimal operating costs. Thanks to its technology, maintenance costs and problems caused by gas transportation and gas treatment do not arise in the first place. The measured value is virtually recorded in the active measuring section directly in the gas duct. Adjustment with test gases is not necessary. In addition, the QAL3 control without test gases is the last logical step in achieving very low operating costs. Thanks to the automatic self-test function, you can rely on the measured values and are warned in good time in the event of deviations.



GM32: Measure aggressive gases directly and quickly – even in ATEX zones



Product Description

The GM32 in-situ gas analyzer measures SO₂, NO, NO₂ and NH₃, pressure and temperature in the gas duct. Direct, fast and without gas sampling and transport. This means that control systems work directly with almost uncompromised values. Due to self-monitoring, the measured values

are reliable. In case of a malfunction, an early warning will be shown. For emission measurement of SO₂ and NO, the GM32 is tested for suitability according to European standard EN 15267. An Ex-type with extensive safety functions and sophisticated system technology is also available.

At a glance

- Direct, fast in-situ measurement
- No gas sampling, no gas transport, no gas conditioning
- Up to four measured values at the same time, plus process temperature and pressure
- DOAS evaluation methods
- Numerous independent measuring ranges with consistent accuracy
- Automated self-test function (QAL3) without test gases
- Overpressure encapsulated type for Ex-zone 2

Your benefits

- Nearly uncompromised measured values measured directly in the gas duct
- Short-term process deviations can be measured
- Representative measurement by selection of cross-duct or measuring probe type
- Fast on-site service possible due to modular design
- Long maintenance-free intervals
- Cost-effective in-situ gas analyzer – Ex-type also available
- Low cost of installation and operation, no test gases required

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



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/gm32



Technical Data

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

GM32 general

Measured values	NO, NO ₂ , NH ₃ , SO ₂
Performance-tested measurands	NO, SO ₂
Maximum number of measurands	4 (plus process temperature and pressure)
Measurement principles	Differential optical absorption spectroscopy (DOAS)
Measuring ranges	
NH ₃	0 ... 30 ppm / 0 ... 2,600 ppm
NO	0 ... 40 ppm / 0 ... 1,900 ppm
NO ₂	0 ... 50 ppm / 0 ... 1,000 ppm
SO ₂	0 ... 32 ppm / 0 ... 7,000 ppm
LowNO ₂	0 ... 20 ppm / 0 ... 1,000 ppm
	Measuring ranges refer to 1 m measuring path Measuring ranges depend on application and device version
Certified measuring ranges	
NO	0 ... 70 mg/m ³ ; 0 ... 700 mg/m ³ ; 0 ... 1,300 mg/m ³
SO ₂	0 ... 75 mg/m ³ ; 0 ... 1,000 mg/m ³ ; 0 ... 2,500 mg/m ³
Remark	With an active measuring path length of 1.86 m (cross duct) or 1.25 m (open path measuring probe) The gas-testable measuring probe (GPP) is not TUV approved
Response time (t ₉₀)	
Open measuring probe (GMP):	≥ 5 s
Gas-testable measur. probe (GPP):	≥ 120 s
Cross-duct version:	≥ 5 s
Remark	Response time adjustable
Accuracy	
NH ₃ :	± 2 %
NO:	± 2 %
NO ₂ :	± 2 %
SO ₂ :	± 2 %
Remark	Relative to the smallest measuring range
Ambient temperature	-20 °C ... +55 °C (-4 °F ... + 131 °F); temperature change max. ±10 °C/h
Storage temperature	-20 °C ... +55 °C (-4 °F ... + 131 °F); temperature change max. ±10 °C/h
Ambient humidity	≤ 95 %, relative humidity; non-condensing

Conformities	Approved for plants requiring approval 2001/80/EC (13. BImSchV) 2000/76/EC (17. BImSchV) 27 th BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 MCERTS GOST US EPA 40 CFR part 60 & 75 (compliant, depending on configuration)
Ex-approvals	
IECEX	Ex pzc op is [ia] IIC T3 Gc
ATEX	II 3G Ex pzc op is [ia] IIC T3 Gc
Electrical safety	CE
Mounting	Mounting flange, DN125, PN6 Mounting flange, ANSI, 5"
Test functions	Internal zero point check Check cycle for zero and span point according to QAL3

Options	SCU control unit (for non-hazardous areas only) Multi range calibration (additional measuring ranges for one component) Extended gas temp. range up to 550 °C or 650 °C (1,020 °F or 1,200 °F) LowNO ₂
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Open measuring probe (GMP)

Description	Measuring probe in open design with integrated purge air control system
Measuring distance	See dimensional drawings
Accuracy	
Pressure sensor:	1 %
Temperature sensor:	1 %
Process temperature	≤ + 550 °C (≤ + 1,020 °F)
Process pressure	−60 hPa ... 30 hPa (−0.9 psi ... 0.4 psi), depending on purge air supply
Dust load	≤ 3 g/m ³ , based on a 1 m measuring distance, depending on application
Electrical safety	CE
Dimensions (W x H x D)	Dimensions may vary. For details, see the dimensional drawings.
Weight	See dimensional drawings
Material in contact with media	Stainless steel 1.4571, stainless steel 1.4539
Power supply	
Voltage	Supply via sender/receiver unit

Auxiliary gas connections	
Purge air	Hose nozzle 40 mm (1.6")
Integrated components	Flow monitor for purge air monitoring PT1000 temperature sensor Pressure sensor

Gas-testable measuring probe (GPP)

Description	Measuring probe with gas permeable filter element for adjustment with test gas
Measuring distance	See dimensional drawings
Accuracy	
Pressure sensor:	1 %
Temperature sensor:	1 %
Process temperature	
With ceramic filter	$\leq +430\text{ °C}$ ($\leq +805\text{ °F}$); brief (max. 30 min.) up to 550 °C ($1,020\text{ °F}$). At temperatures higher than 430 °C (805 °F), reliable output of measured values can no longer be guaranteed.
NH ₃ measurement w. ceramic filter	NH ₃ measurement with ceramic filter $+300\text{ ... }+430\text{ °C}$ ($+572\text{ ... }805\text{ °F}$); brief (max. 30 min.) up to 550 °C ($1,020\text{ °F}$). At temperatures higher than 430 °C (805 °F), reliable output of measured values can no longer be guaranteed.
With Teflon filter	$\leq +200\text{ °C}$ ($\leq +392\text{ °F}$)
Process pressure	$-120\text{ hPa ... }200\text{ hPa}$ ($-1.7\text{ psi ... }2.9\text{ psi}$)
Dust load	$\leq 30\text{ g/m}^3$
Electrical safety	CE
Enclosure rating	IP 65
Dimensions (W x H x D)	Dimensions may vary. For details, see the dimensional drawings.
Weight	See dimensional drawings
Material in contact with media	Stainless steel 1.4571, stainless steel 1.4539, ceramics, PTFE
Power supply	

Voltage:	115 V AC, $\pm 10\%$ 230 V AC, $\pm 10\%$
Frequency	50 Hz / 60 H
Power consumption	≤ 150 VA
Auxiliary gas connections	
Test gas	Clamp connection 1/4"
Integrated components	Pressure sensor PT1000 temperature sensor Heating of optical surfaces

Sender/receiver unit: standard version

Description	Analyzer unit of the measuring device
Electrical safety	CE
Enclosure rating	IP 65 / IP 69K
Operation	Via integrated control unit
Dimensions (W x H x D)	239 mm x 316 mm x 338 mm (for details see dimensional drawings) (9.4" x 12.4" x 13.3") (for details see dimensional drawings)
Weight	20 kg (44 lbs)
Power supply	
Voltage:	24 V DC, supply via sender/receiver unit
Power consumption	≤ 36 W

Sender/receiver unit: Ex-version

Description	Analyzer unit of the measuring device
Electrical safety	CE
Enclosure rating	IP 65 / IP 69K
Operation	Via integrated control unit
Dimensions (W x H x D)	315 mm x 910 mm x 410 mm (for details see dimensional drawings) (12.4" x 35.8" x 16.1") (for details see dimensional drawings)
Weight	20 kg (44 lbs)
Power supply	
Voltage:	24 V DC, supply via sender/receiver unit
Power consumption	≤ 36 W

Connection unit: standard version

Description	Serves for connection of power supply, data and signal cabling provided by the customer
Electrical safety	CE
Enclosure rating	IP 65 / IP 69K
Analog outputs	2 outputs: 0/4 ... 22 mA, 500 Ω Per module, extendable up to eight outputs
Analog inputs	2 inputs: 0/4 ... 22 mA, 100 Ω
Digital outputs	4 outputs: 48 V AC/DC, 0.5 A, 25 W
Digital inputs	4 inputs: 3.9 V, 4.5 mA, 0.55 W Per module, extendable up to eight inputs
Modbus	✓

Type of fieldbus integration	TCP RTU RS-485 (via optional interface module)
CAN bus	✓
Function	Internal system bus
Ethernet	✓
Function	Connection to SOPAS ET software or OPC server
Dimensions (W x H x D)	450 mm x 424 mm x 158 mm (for details see dimensional drawings) (17.7" x 16.7" x 6.2") (for details see dimensional drawings)
Weight	16 kg (7.3 lbs)
Power supply	
Voltage	100 V AC ... 250 V AC, $\pm 10\%$
Frequency	50 Hz / 60 Hz
Power consumption	≤ 260 VA

Connection unit: Ex-version

Description	Serves for connection of power supply, data and signal cabling provided by the customer
Electrical safety	CE
Enclosure rating	IP 65 / IP 69K
Analog outputs	2 outputs: 0/4 ... 22 mA, 500 Ω Per module, extendable up to eight outputs
Analog inputs	2 inputs: 0/4 ... 22 mA, 100 Ω
Digital outputs	4 outputs: 48 V AC/DC, 0.5 A, 25 W

Digital inputs	4 inputs: 3.9 V, 4.5 mA, 0.55 W Per module, extendable up to eight inputs
Modbus	✓
Type of fieldbus integration	TCP RTU RS-485 (via optional interface module)
CAN bus	✓
Function	Internal system bus
Ethernet	✓
Function	Connection to SOPAS ET software or OPC server
Dimensions (W x H x D)	679 mm x 630 mm x 158 mm (for details see dimensional drawings) (26.7" x 24.8" x 6.2") (for details see dimensional drawings)
Weight	16 kg (7.3 lbs)
Power supply	

Voltage	100 V AC ... 250 V AC, $\pm 10\%$
Frequency	50 Hz / 60 Hz
Power consumption	≤ 260 VA

Purge air fixture: sender/receiver unit

Description	Flange fixture for connections for purge air hose, temperature and pressure sensor
Electrical safety	CE
Dimensions (W x H x D)	309 mm x 364 mm x 242 mm (for details see dimensional drawings) (12.2" x 14.3" x 9.5") (for details see dimensional drawings)

Weight	9.6 kg (21.2 lbs)
Auxiliary gas connections	
Purge air	Hose nozzle 40 mm (1.6")
Electrical connections	Purge air unit low-pressure monitor PT1000 temperature sensor Pressure sensor
Integrated components	Flow monitor for purge air monitoring Pressure sensor

Purge air fixture: reflector unit

Description	Flange fixture for connections for purge air hose and purge air monitoring
Electrical safety	CE
Dimensions (W x H x D)	309 mm x 364 mm x 242 mm (for details see dimensional drawings) (12.2" x 14.3" x 9.5") (for details see dimensional drawings)
Weight	9.6 kg (21.2 lbs)

Auxiliary gas connections	
Purge air	Hose nozzle 40 mm (1.6")
Electrical connections	Purge air unit low-pressure monitor
Integrated components	Flow monitor for purge air monitoring

Pressure and temperature sensor (cross-duct version)

Description	Pressure and temperature sensor with DN40 / PN40 mounting flange
Accuracy	
Pressure sensor	1 %
Temperature sensor	1 %
Process temperature	$\leq +500\text{ }^{\circ}\text{C}$ ($\leq +1,020\text{ }^{\circ}\text{F}$)
Electrical safety	CE
Dimensions (W x H x D)	Dimensions may vary. For details, see the dimensional drawings.
Immersion depth	
PT1000 temperature sensor	500 mm (19.7") 1,000 mm (39.4") 1,400 mm (55.1")
Material	Stainless steel 1.4571, steel ST37
Scope of delivery	Connecting cable for temperature sensor, 5 m (16.4 ft) Connecting hose for pressure sensor, 5 m (16.4 ft) Flange cover, including seal and screws

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

Description	Unit to provide dust-free air for flushing of optical surfaces
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Gas flow rate	38 m ³ /h ... 63 m ³ /h (1.3 ft ³ /hr ... 2.2 ft ³ /hr) At 30 hPa (0.4 psi) counter pressure, dep. on low pressure inside the filter
Ambient temperature	-40 °C ... +55 °C (-40 °F ... +131 °F)
Electrical safety	CE

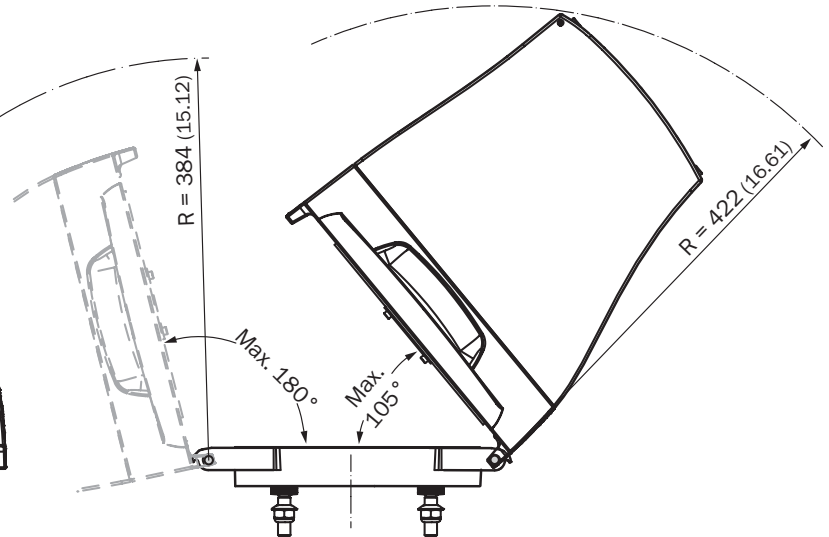
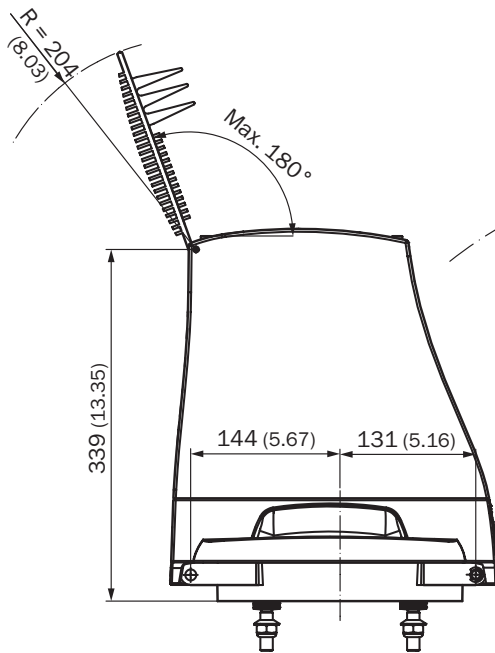
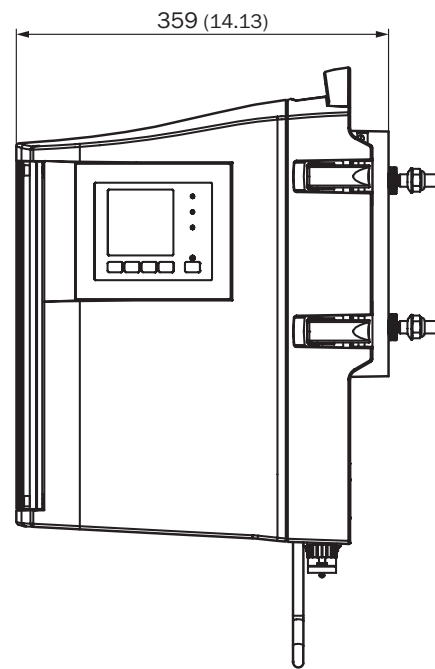
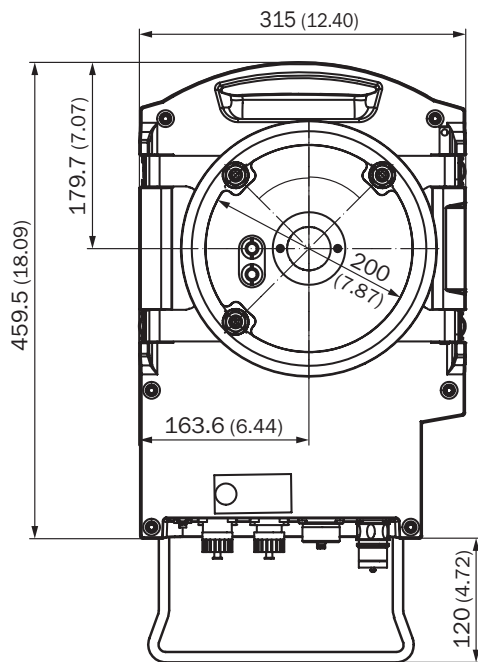
Enclosure rating	IP 54
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details see dimensional drawings) (21.7" x 21.7" x 10.2") (for details see dimensional drawings)
Weight	18 kg (40 lbs)
Power supply	
Three-phase current	Δ: 200 ... 240 V AC, 50 Hz, 2,6 A, 400 VA Y: 345 ... 415 V AC, 50 Hz, 1,5 A, 400 VA Δ: 200 ... 275 V AC, 60 Hz, 2,6 A, 500 VA Y: 380 ... 480 V AC, 60 Hz, 1,5 A, 500 VA Δ: 270 ... 330 V AC, 50 Hz, 2,0 A, 400 VA Y: 465 ... 570 V AC, 50 Hz, 1,16 A, 400 VA Δ: 290 ... 360 V AC, 60 Hz, 2,1 A, 500 VA Y: 500 ... 600 V AC, 60 Hz, 1,26 A, 500 VA Δ: 230 V AC, 50 Hz, 2,7 A, 370 VA Δ: 115 V AC, 60 Hz, 3,0 A, 450 VA Δ: 220 ... 270 V AC, 50 Hz, 2,5 A, 400 VA Y: 380 ... 465 V AC, 50 Hz, 1,45 A, 400 VA Δ: 240 ... 290 V AC, 60 Hz, 2,6 A, 500 VA Y: 415 ... 500 V AC, 60 Hz, 1,55 A, 500 VA
Auxiliary gas connections	
Purge air	40 mm (1.6")
Test functions	Pressure switch (switching point –35 hPa (–0.5 psi))
Integrated components	2-step air filter, type Europiclön, dust capacity 200 g

Order Information

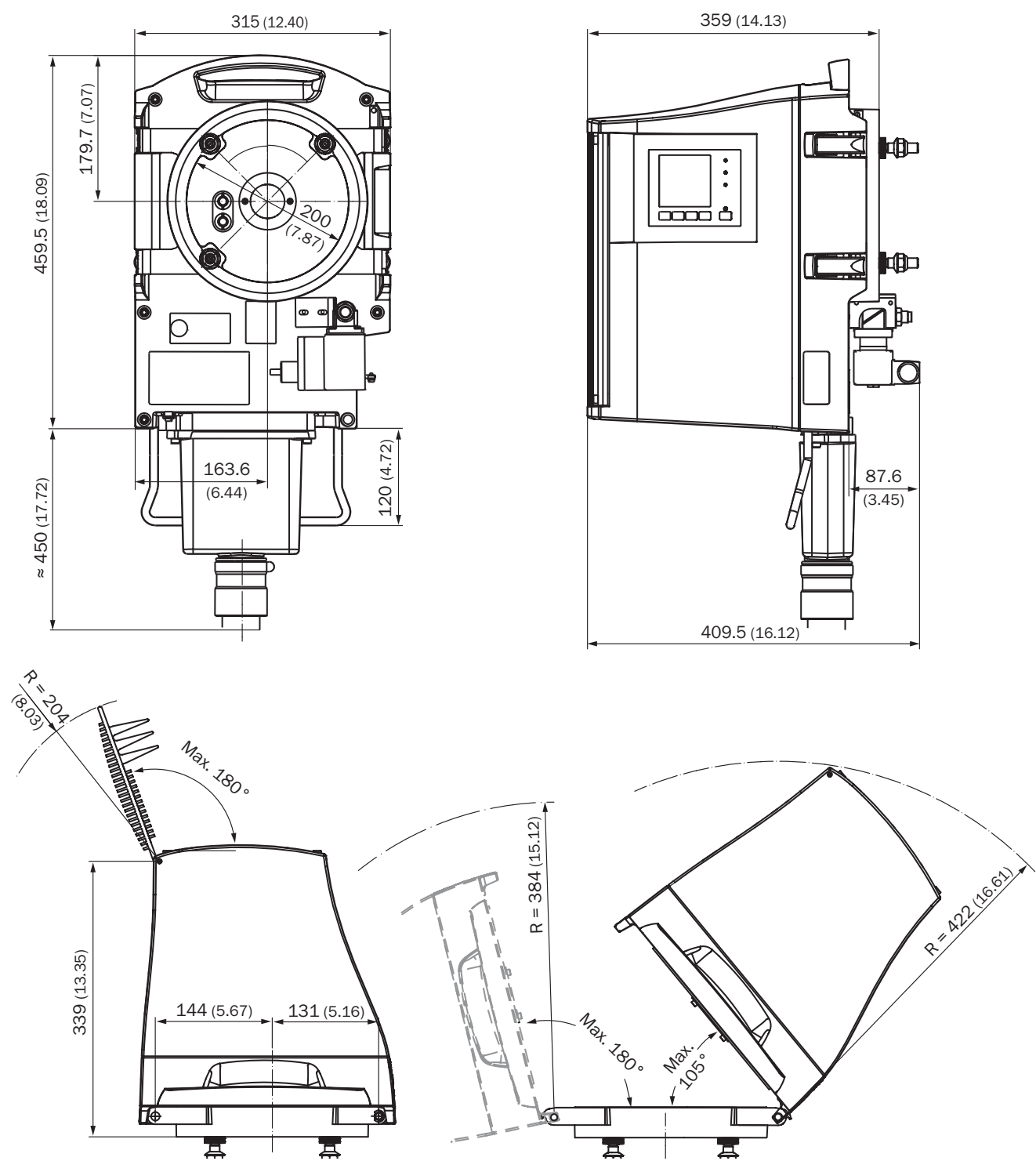
Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings

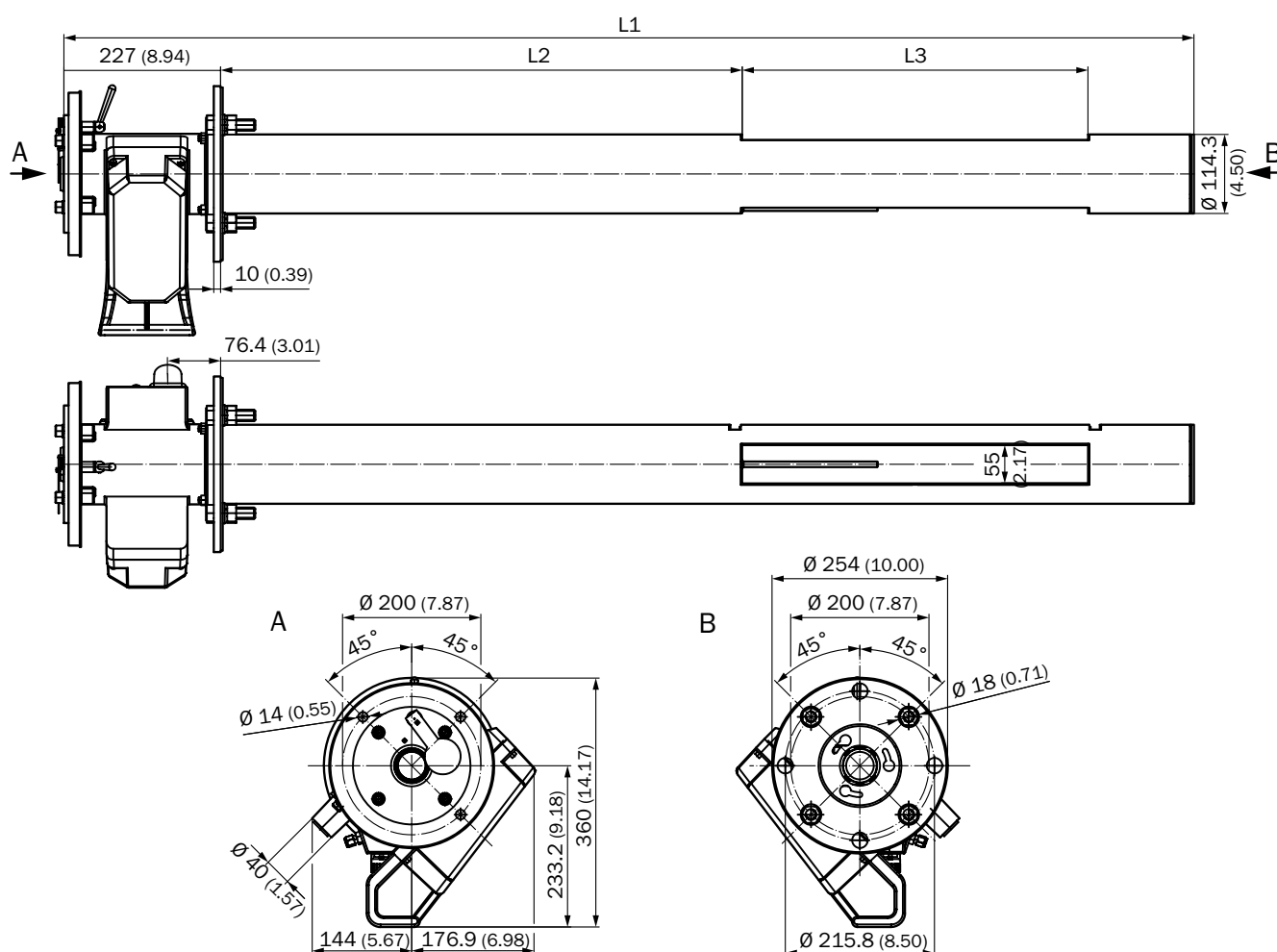
Sender/receiver unit; standard version (dimensions in mm (inch))



Sender/receiver unit; Ex-version (dimensions in mm (inch))



Open measuring probe (GMP) (dimensions in mm (inch))



GMP measuring probes

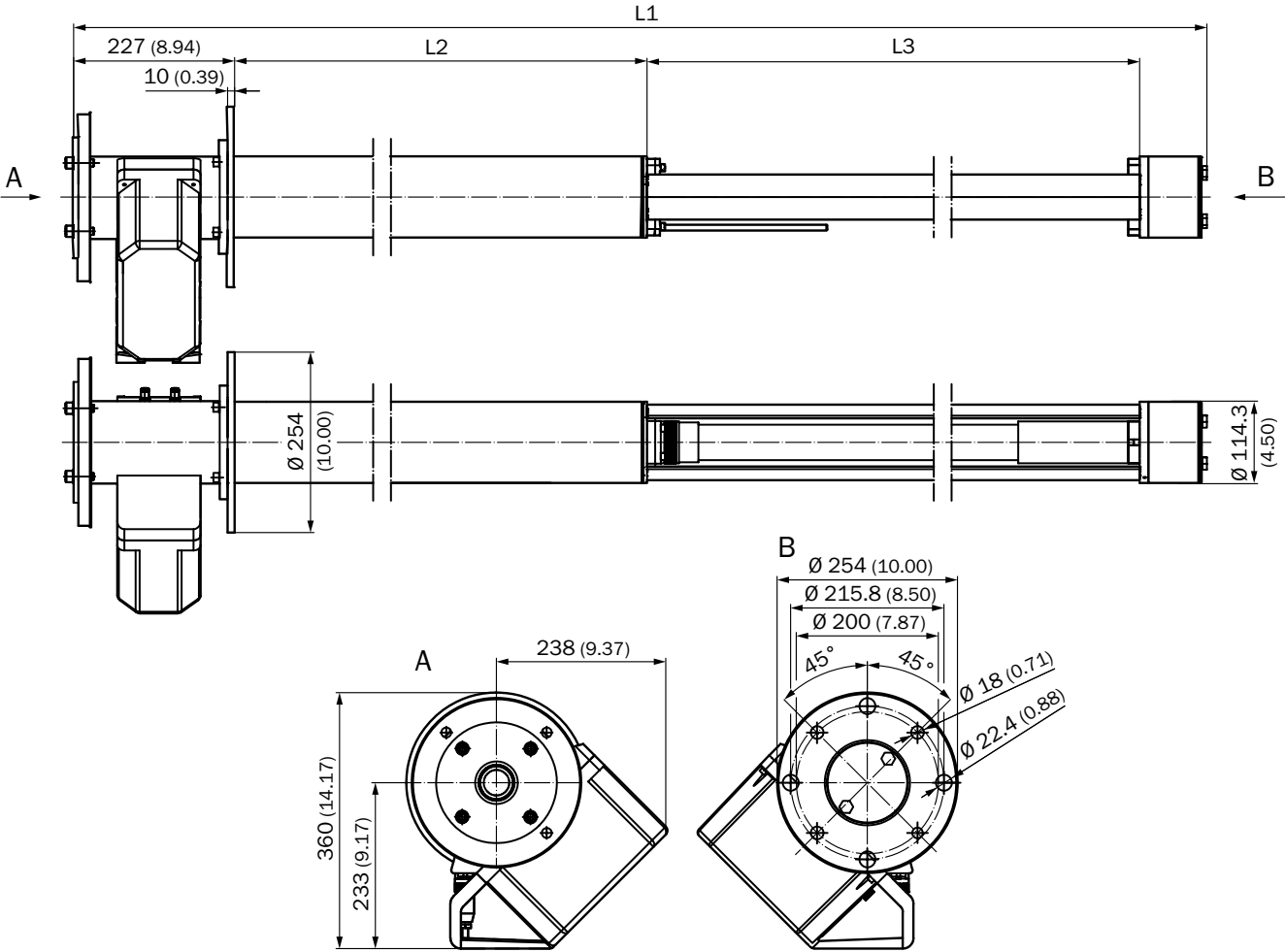
		Measuring gap L3 (active measuring path)								Weight
		250 (9.8)	500 (19.7)	750 (29.5)	1,000 (39.4)	1,250 (49.2)	1,500 (59.1)	1,750 (68.9)		
Probe length*	L1	L2								
900 (35.4)	935 (36.8)	296 (11.7)	---	---	---	---	---	---	21 (46.3)	
1,500 (59.1)	1,644 (64.7)	1,005 (39.6)	755 (29.7)	505 (19.9)	255 (10.0)	---	---	---	24 (52.9)	
2,000 (78.7)	2,128 (83.8)	1,489 (58.6)	1,239 (48.8)	989 (38.9)	739 (29.1)	489 (19.3)	239 (9.4)	---	30 (66.1)	
2,500 (98.4)	2,628 (103.5)	1988 (78.3)	1,738 (68.4)	1,488 (58.6)	1,238 (48.7)	988 (38.9)	738 (29.1)	488 (19.2)	35 (77.2)	

* Probe length, nominal

All dimensions in mm (inch), weight in kg (lbs)

Application specific lengths on request

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

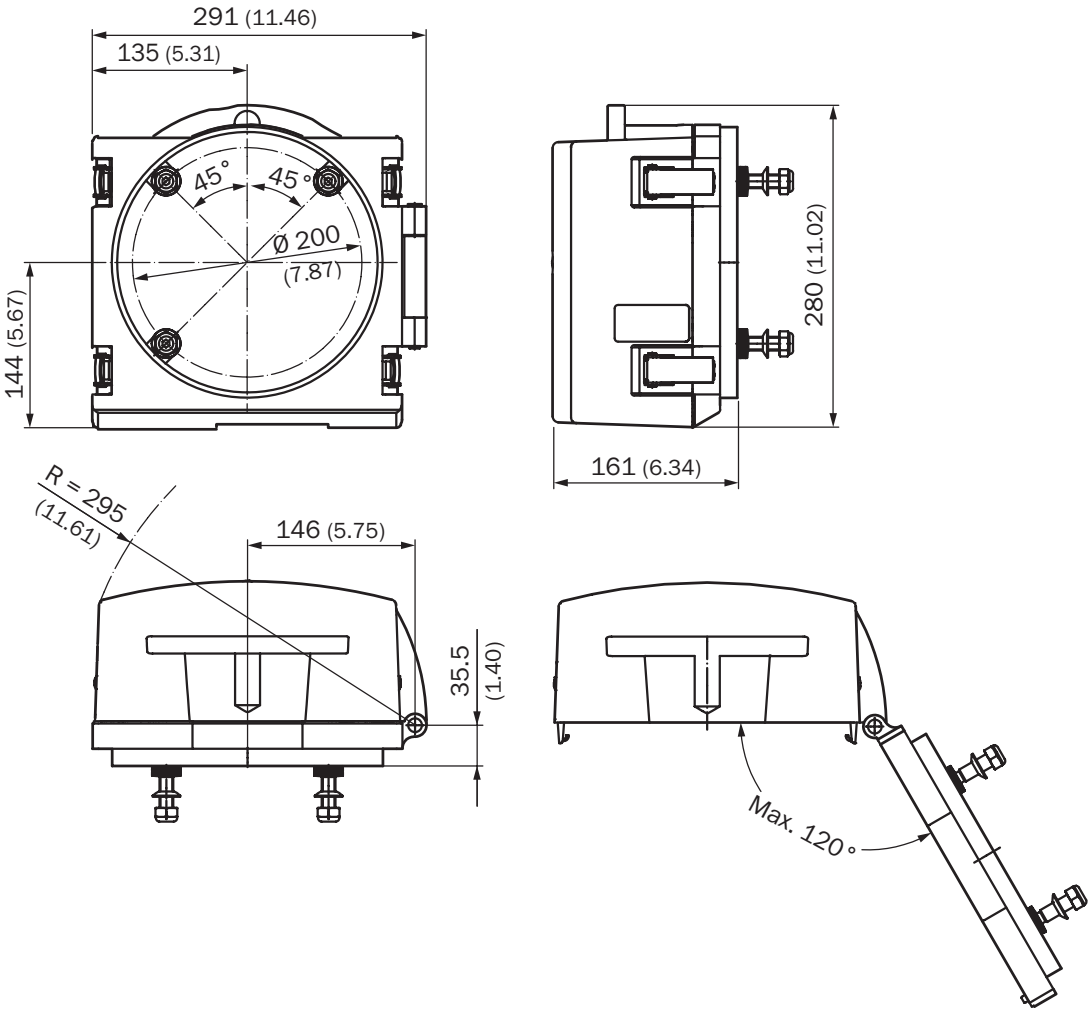


Gas-testable measuring probe (GPP)

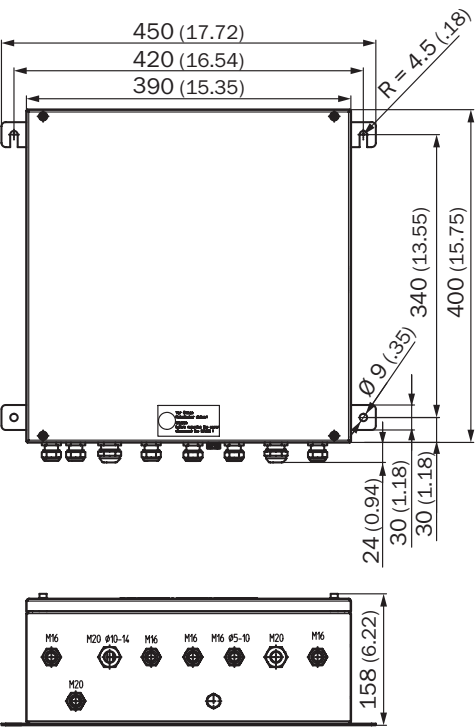
Probe length*	L1	Measuring gap L3 (active measuring path)				Weight
		227 (8.9)	477 (18.8)	727 (28.6)	977 (38.5)	
		L2				
900 (35.4)	914 (35.9)	353 (13.9)	103 (4.1)	---	---	27 (59.5)
1,500 (59.1)	1,624 (63.9)	1,063 (41.9)	813 (32.0)	563 (22.2)	313 (12.3)	35 (77.2)
2,000 (78.7)	2,108 (83.0)	1,547 (60.9)	1,297 (51.1)	1,047 (41.2)	797 (31.4)	42 (92.6)
2,500 (98.4)	2,608 (102.7)	2,047 (80.6)	1,797 (70.7)	1,547 (60.9)	1,297 (51.1)	50 (110)

* Probe length, nominal
All dimensions in mm (inch), weight in kg (lbs)
Application specific lengths on request

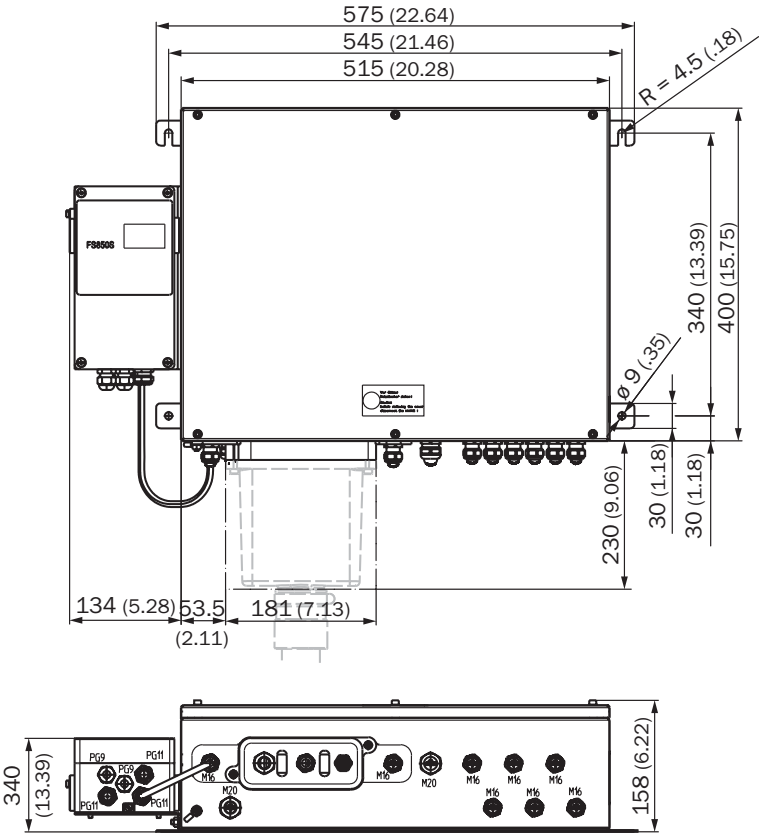
GM32 reflector unit (dimensions in mm (inch))



Connection unit; standard version (dimensions in mm (inch))



Connection unit; Ex-version (dimensions in mm (inch))



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