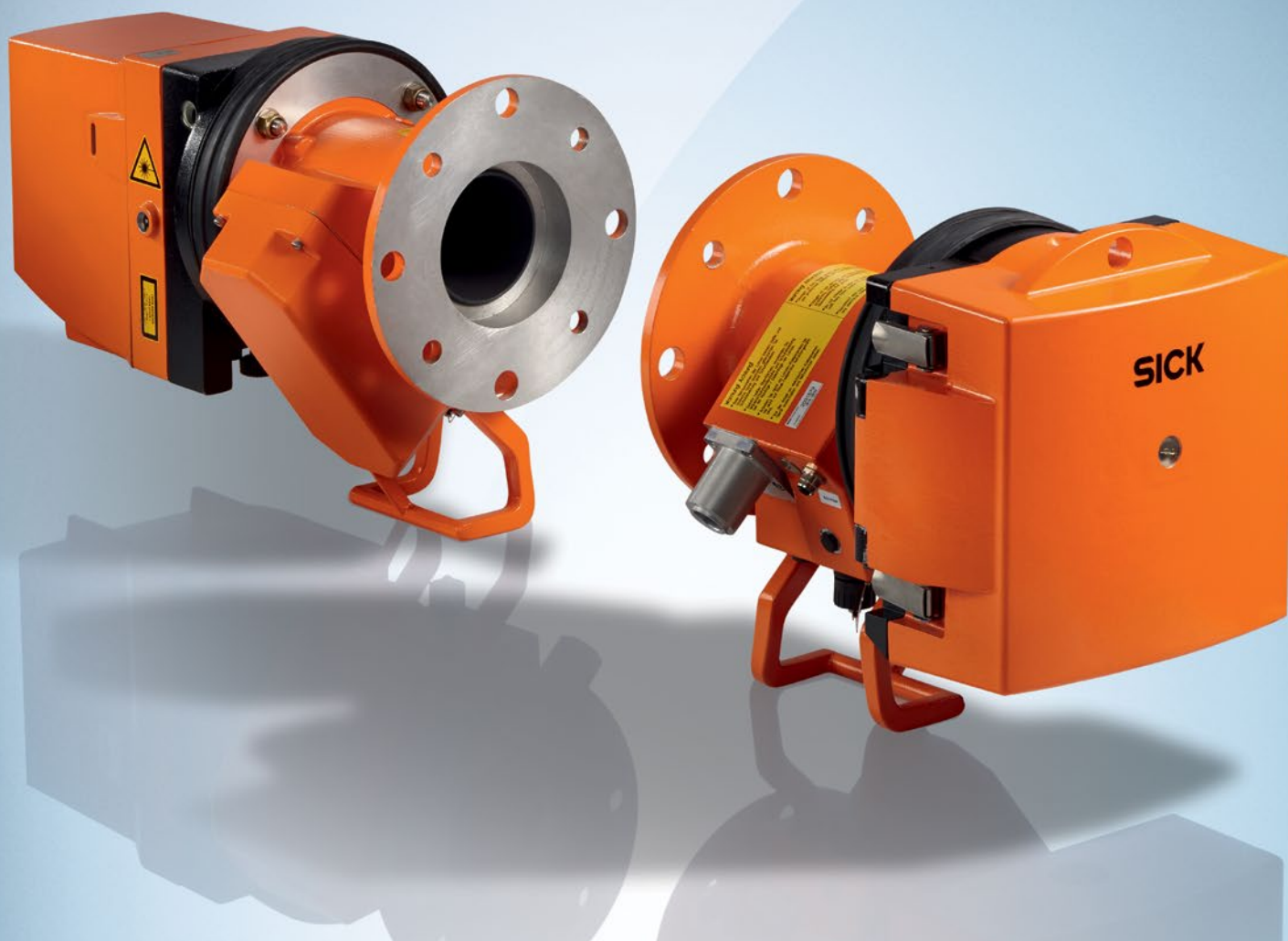




GM700 Laser Gas Analyzer

EFFICIENT PROCESS ANALYSIS –
EVEN UNDER DIFFICULT CONDITIONS

In-situ gas analyzers

SICK
Sensor Intelligence.



Measuring difficult, selective gas components such as ammonia (NH_3), hydrogen fluoride (HF), and hydrogen chloride (HCl) is a major challenge for process analysis and emission monitoring. The GM700 in-situ gas analyzer opens up new options here. With unparalleled flexibility – without the need for test gases.

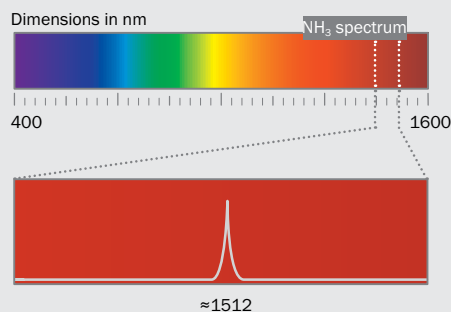
Technology and principle of operation

The GM700 gas analyzer operates reliably and efficiently. Thanks to its innovative in-situ measuring technology, the analyzer can be mounted at the measurement location directly in the duct through which the gas flows. The benefits: time and cost savings thanks to simple installation and commissioning, low maintenance requirements, and very short response times. The GM700 delivers a high-resolution measurement using

direct laser spectroscopy (see below) with a precisely adjusted spectral line. The result: fast and undistorted recording of measuring gas concentrations without time-consuming gas extraction, conditioning, and cost-intensive transportation. Gas components that can be measured by the GM700 include: NH_3 , HF , and HCl .

Laser spectroscopy (tunable diode laser spectroscopy, TDLS)

In laser spectroscopy, the laser beam from the sender is sent through the gas to be measured to the reflector. From there, it is reflected back to a sensitive detector (photo diode) in the sender/receiver unit. The wavelength of the laser diode is adjusted to a spectral line of the measuring gas component. This is scanned by modulating the wavelength and recorded by the photo diode of the detector. A signal evaluation then provides the gas concentration based on the wavelength-specific absorption of the measurement signal. The TDLS principle therefore allows gas components in a gas mixture to be measured selectively.



Product versions

The GM700 system offers the following versions for optimum adaptation to the measurement task:

GM700 – version with measuring probe



System components

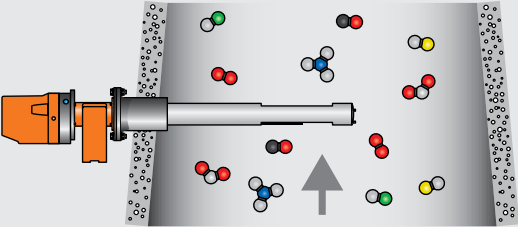
- Sender/receiver unit with optical and electronic modules
- Measuring probe with purge air attachment as version with an open measuring path (GMP) or as a gas diffusion probe (GPP)
- Evaluation unit for outputting measured values and performing the control and monitoring function

Optional components

- Purge air unit
- Weather protection covers
- Flange with tube for mounting

Benefits

- Access to the duct from one side and easy installation
- Integrated zero-point path
- Application adjustment irrespective of duct dimensions and plant conditions
- Drift and calibration-free



GM700 – cross duct version



System components

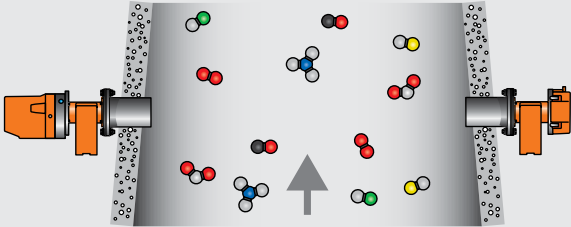
- Sender/receiver unit with optical and electronic modules
- Reflector unit with triple reflector and purge air attachment
- Evaluation unit for outputting measured values and performing the control and monitoring function

Optional components

- Purge air unit
- Weather protection covers
- Flange with tube for mounting
- Zero-point comparison path

Benefits

- Representative measurement results due to measurement across the entire duct cross section
- Drift and calibration-free
- Particularly low maintenance



EFFICIENT PROCESS ANALYSIS – EVEN UNDER DIFFICULT CONDITIONS



Product description

High reliability and precision as well as minimal response times are the distinguishing features of the GM700 laser gas analyzer. Based on the principle of TDLS (Tunable Diode Laser Spectroscopy) and by using specific light absorp-

tion, the GM700 is able to measure several gas components, such as NH₃, HF, HCl or H₂O. The in-situ measurement is ideal for the fast determination of gas concentrations in process control and emission monitoring.

At a glance

- High selectivity due to high spectral resolution
- Short response times
- No calibration required
- No moving parts: minimal wear and tear
- No gas sampling and conditioning required

Your benefits

- Unbiased measuring values due to in-situ measurement directly in the process
- Best application solution using probe or cross-duct type
- High reliability during operation
- Also applicable for harsh environment conditions
- Detection of fast and short-term process fluctuations



Additional information

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→ www.mysick.com/en/GM700
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

- Ammonia slip measurement in DeNOx plants
- Emission monitoring of hydrogen fluoride in aluminum smelters
- Ammonia measurement in exhaust gas of combustion engines
- Ammonia measurement in urea production or composting plants
- HCl measurement in combustion plants
- HF measurement in ceramic 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.

System

Measured values	NH ₃ , HF, HCl, H ₂ O	
Performance-tested measurands	HF	
Measurement principles	Diode laser spectroscopy (TDLS)	
Length of measuring path	Cross-duct version: 0.5 m ... 6 m Depending on application Open measuring probe (GMP): 0.25 mm ... 1.5 m Depending on application Gas-testable measuring probe (GPP): 0.227 m ... 0.977 m Depending on application	
Measuring ranges	NH ₃ HF HCl	0 ... 25 ppm / 0 ... 4,000 ppm 0 ... 5 ppm / 0 ... 2,000 ppm 0 ... 10 ppm / 0 ... 3,000 ppm Measuring ranges refer to 1 m measuring path Measuring ranges depend on application and device version
Dual measuring ranges	HCl / H ₂ O NH ₃ / H ₂ O	0 ... 10 ppm / 0 ... 3,000 ppm (HCl) 0 ... 50 Vol.-% / 0 ... 100 Vol.-% (H ₂ O) 0 ... 25 ppm / 0 ... 4,000 ppm (NH ₃) 0 ... 5 Vol.-% / 0 ... 40 Vol.-% (H ₂ O) Measuring ranges refer to 1 m measuring path Measuring ranges depend on application and device version
Certified measuring ranges	HF	0 ... 5 mg/m ³ / 0 ... 25 mg/m ³ Only the cross-duct version is type approved
Response time	1 s ... 360 s Adjustable	
Accuracy	Zero point: Sensitivity:	≤ ± 2 % Relative to measuring range end value ≤ ± 2 % Within the maintenance interval (6 months), relative to measuring range full scale
Process temperature	-40 °C ... +200 °C Depending on device version	
Ambient temperature	-40 °C ... +50 °C Depends on parameterization; temperature change max. ±10 °C/h	
Storage temperature	-40 °C ... +55 °C	
Ambient humidity	≤ 85 % Relative humidity; non-condensing	

Conformities	Approved for plants requiring approval 2001/80/EC (13. BImSchV) 2000/76/EC (17. BImSchV) 27. BImSchV German Clean Air Regulations EN 15267 EN 14181 Only for HF
Electrical safety	CE
Test functions	Automatic check cycle for zero and span point (only for NH ₃ and HCl)

Sender/receiver unit

Description	Analyzer unit of the measuring system
Enclosure rating	IP 65
Dimensions (W x H x D)	239 mm x 272 mm x 330 mm
Weight	13 kg
Power supply	
Voltage	Supply via evaluation unit: 24 V DC
Auxiliary gas connections	Test gas: Swagelok 1/4" Purge gas: Swagelok 1/4"

Open measuring probe (GMP)

Description	Measuring probe in open design with integrated purge air control system
Process temperature	-40 °C ... +250 °C
Process pressure	Depending on purge air supply
Process gas humidity	Non-condensing
Enclosure rating	IP 65
Dimensions (W x H x D)	See dimensional drawings
Weight	25 kg
Power supply	
Voltage	Supply via evaluation unit: 24 V DC
Integrated components	Flow monitor (monitoring of purge air feed) PT1000 temperature sensor (measurement of gas temperature) Pressure sensor

Gas-testable measuring probe (GPP)

Description	Measuring probe with gas permeable filter element for adjustment with test gas
Process temperature	HCl: +130 °C ... +430 °C NH ₃ : +300 °C ... +430 °C
Process pressure	120 hPa
Enclosure rating	IP 65
Dimensions (W x H x D)	See dimensional drawings
Weight	45 kg
Power supply	
Voltage	150 V / 230 V
Frequency	50 Hz / 60 Hz
Power consumption	≤ 150 W
Integrated components	PT1000 temperature sensor (measurement of gas temperature) Pressure sensor Heating of optical interfaces

Reflector unit (cross-duct version)

Description	Reflector unit with hollow triple reflector
Process temperature	≤ +200 °C
Process gas humidity	Non-condensing
Enclosure rating	IP 65
Dimensions (W x H x D)	291 mm x 280 mm x 161 mm
Weight	7 kg

GM700 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	2 inputs: 0 ... 20 mA, 100 Ω For gas temperature and gas pressure	
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	
Interfaces and bus protocols	RS-232	Proprietary service interface
Indication	LC display Status LEDs: "Operation", "Service", "Warning" and "Malfunction"	
Input	Arrow keys Functional keys	
Model	Steel sheet enclosure	
Dimensions (W x H x D)	200 mm x 346 mm x 97.5 mm	
Weight	≤ 4.7 kg	
Power supply	Voltage	115 V / 230 V
	Frequency	50 Hz / 60 Hz
	Power consumption	≤ 50 W

GM700 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/NEMA 6	
Analog outputs	3 outputs: 0/4 ... 20 mA, 500 Ω Electrically isolated	
Analog inputs	2 inputs: 0 ... 20 mA, 100 Ω For gas temperature and gas pressure	
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	
Interfaces and bus protocols	RS-232	Proprietary service interface
Indication	LC display Status LEDs: "Operation", "Service", "Warning" and "Malfunction"	

Input	Arrow keys Functional keys
Model	Cast metal enclosure
Dimensions (W x H x D)	289 mm x 370 mm x 138 mm
Weight	≤ 8.6 kg
Power supply	
Voltage	115 V / 230 V
Frequency	50 Hz / 60 Hz
Power consumption	≤ 50 W

Connection unit

Description	To lengthen the internal CAN-Bus connection with cable provided by the customer
Dimensions (W x H x D)	175 mm x 110.5 mm x 175 mm
Weight	3 kg
Power supply	
Voltage	115 V / 230 V
Frequency	50 Hz / 60 Hz
Integrated components	Integrated 24 V power supply for sender/receiver unit

Purge air fixture

Description	Fixture to flanges with connections for purge air hose and temperature sensor
Dimensions (W x H x D)	420 mm x 429 mm x 220 mm
Weight	7 kg
Auxiliary gas connections	Purge air: Hose nozzle 40 mm
Electrical connections	Flow monitor PT1000 temperature sensor

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

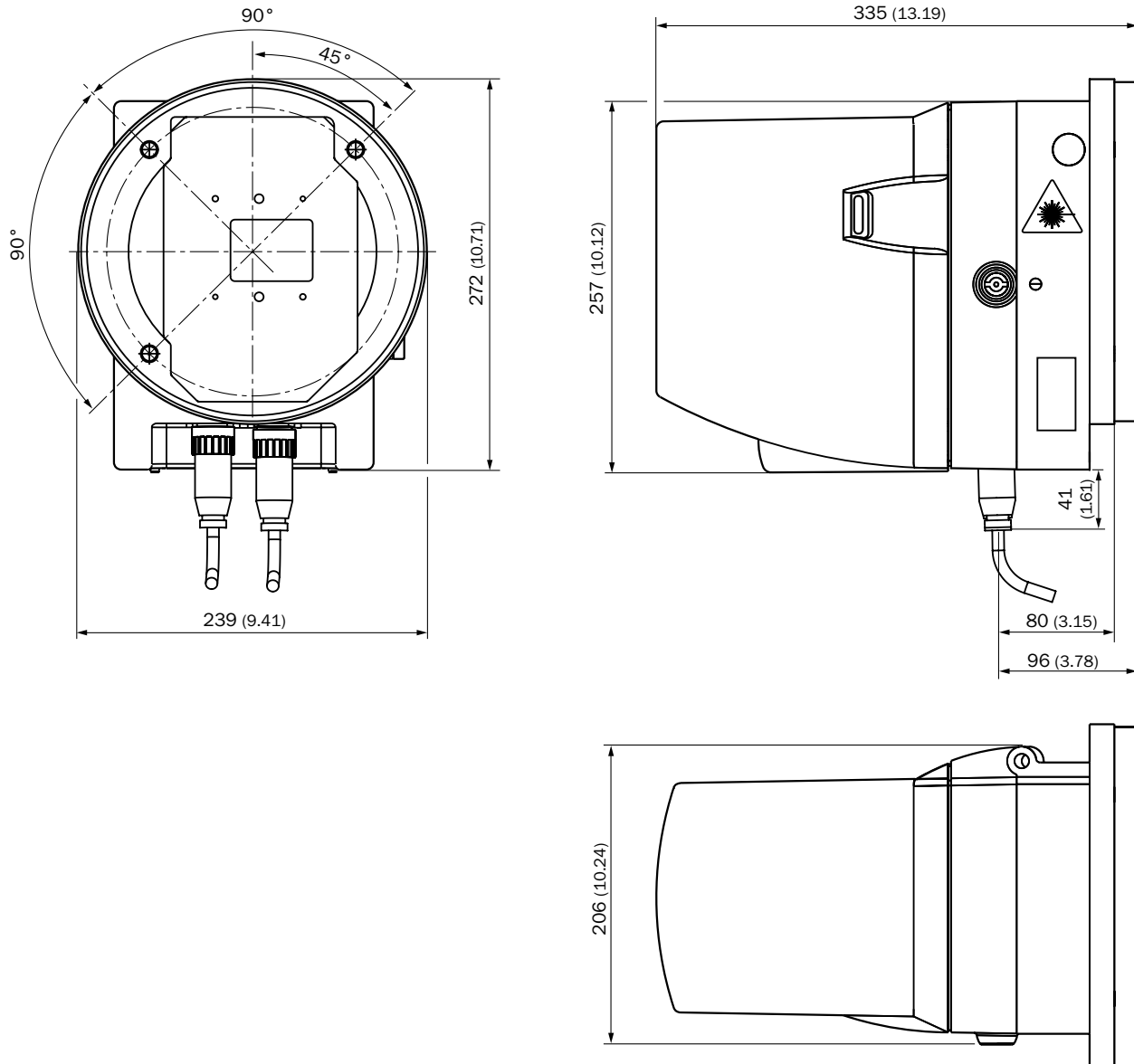
Description	Unit to provide dust-free air for flushing of optical surfaces
Gas flow rate	38 m³/h ... 63 m³/h At 30 hPa counter pressure, depending on low pressure inside the filter
Ambient temperature	-20 °C ... +40 °C
Enclosure rating	IP 54
Dimensions (W x H x D)	550 mm x 550 mm x 258 mm (for details see dimensional drawings)
Weight	18 kg
Power supply	
Three-phase current	3-phase, Δ: 200 ... 240 V, 50 Hz, 2.6 A, 350 W 3-phase, Δ: 220 ... 275 V, 60 Hz, 2.3 A, 450 W 3-phase, Y: 345 ... 415 V, 50 Hz, 1.5 A, 350 W 3-phase, Y: 380 ... 480 V, 60 Hz, 1.3 A, 450 W
Auxiliary gas connections	Purge air: 40 mm
Test functions	Low pressure controller (switch point -35 hPa)
Integrated components	2-step air filter, type Europiclon, dust capacity 200 g

Ordering information

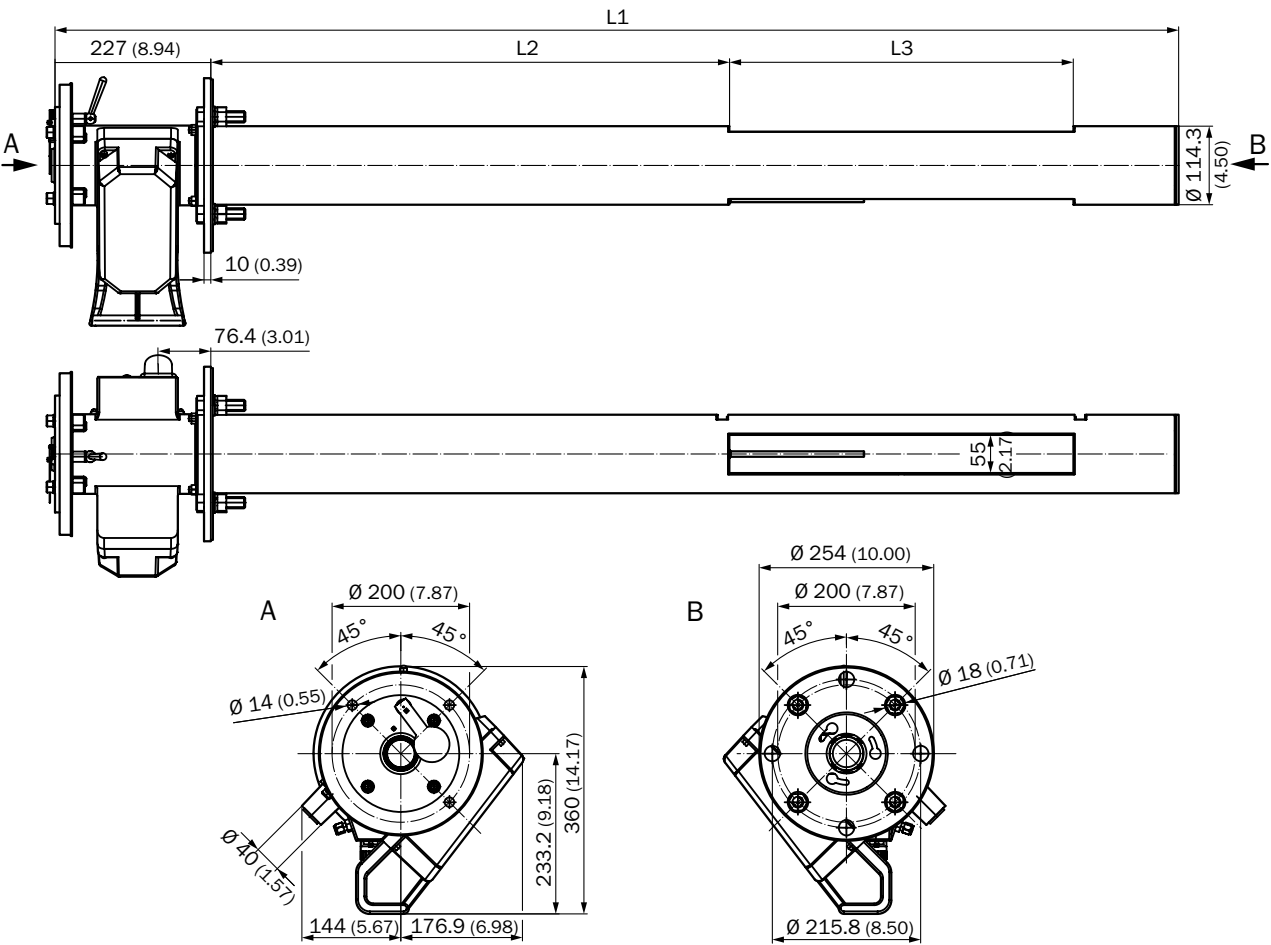
Our regional sales organization will help you to select the optimum device configuration.

Dimensional drawings (Dimensions in mm (inch))

GM700 sender/receiver unit

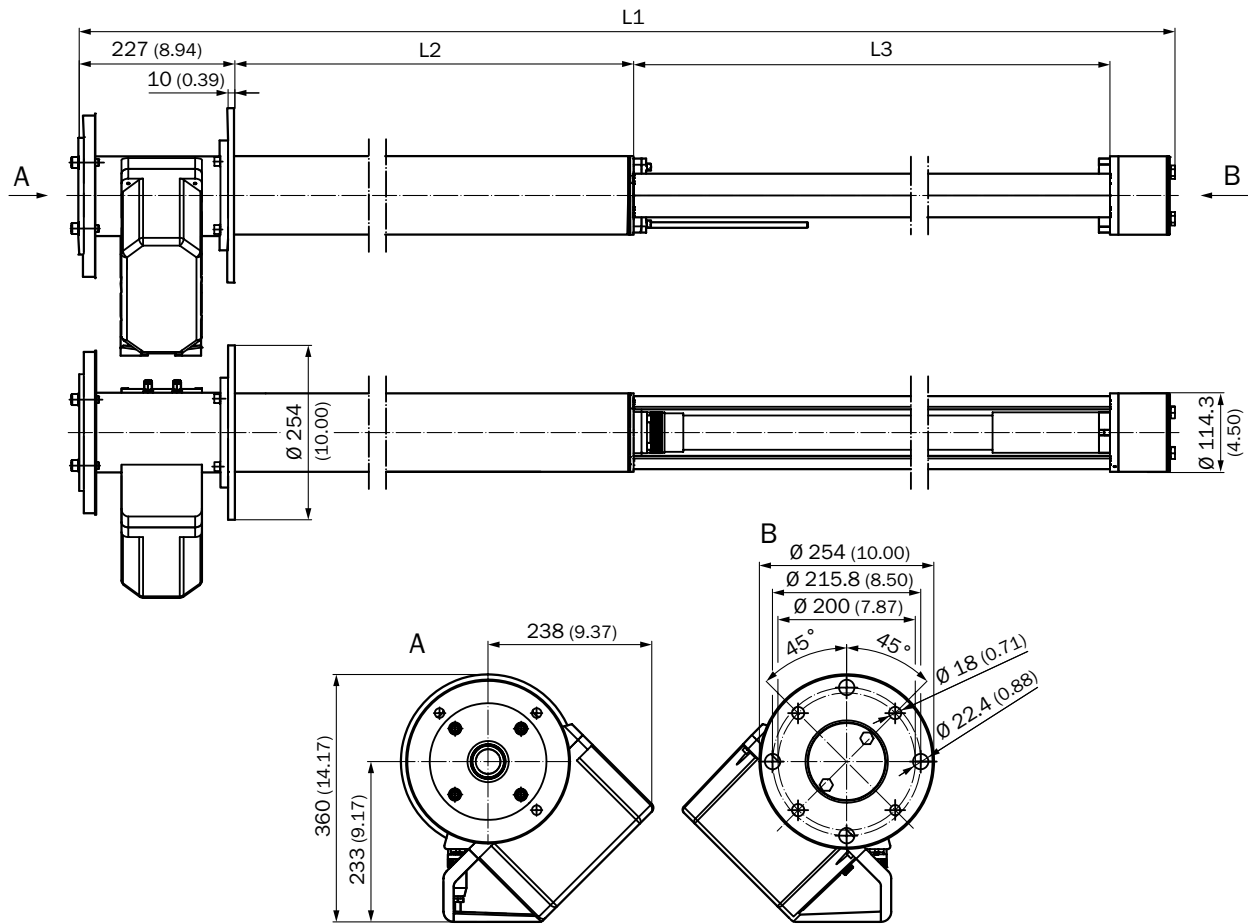


Open measuring probe (GMP)



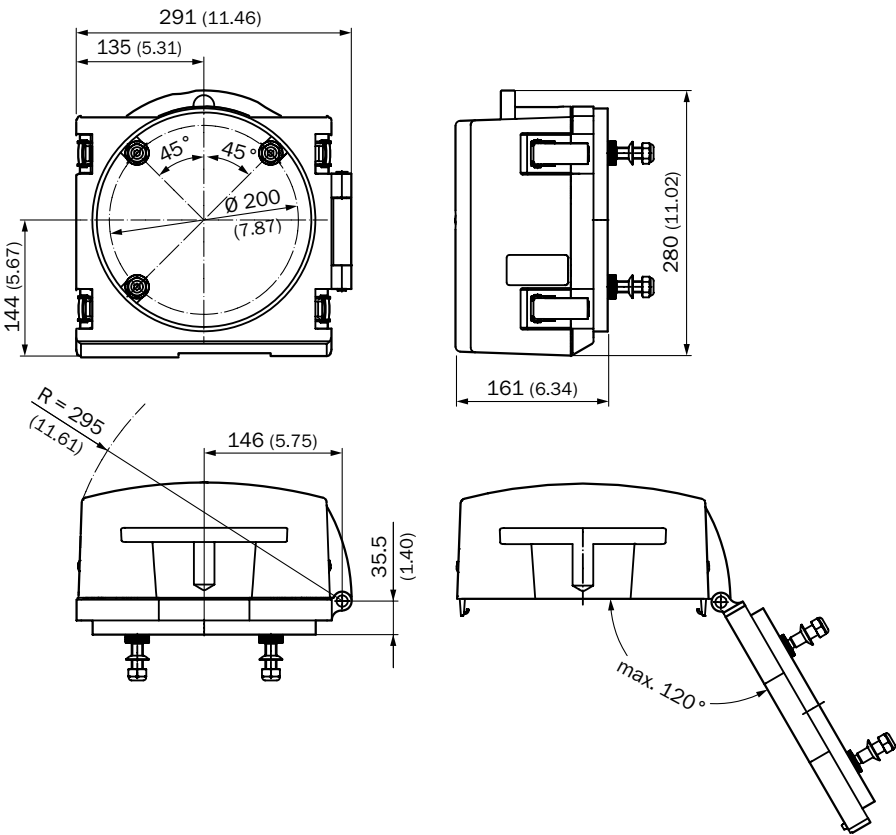
GMP measuring probes		Measuring gap L3 (active measuring path)					
Probe length, nominal	L1	250 (9.84)	500 (19.69)	750 (29.53)	1,000 (39.37)	1,250 (49.21)	1,500 (59.06)
900 (35.43)	935 (36.81)	296 (11.65)	46 (1.81)	---	---	---	---
1,500 (59.06)	1,644 (64.72)	1,004.5 (39.55)	754.5 (29.70)	504.5 (19.86)	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)
All dimensions in mm (inch)							
Application specific lengths on request							

Gas-testable measuring probe (GPP)

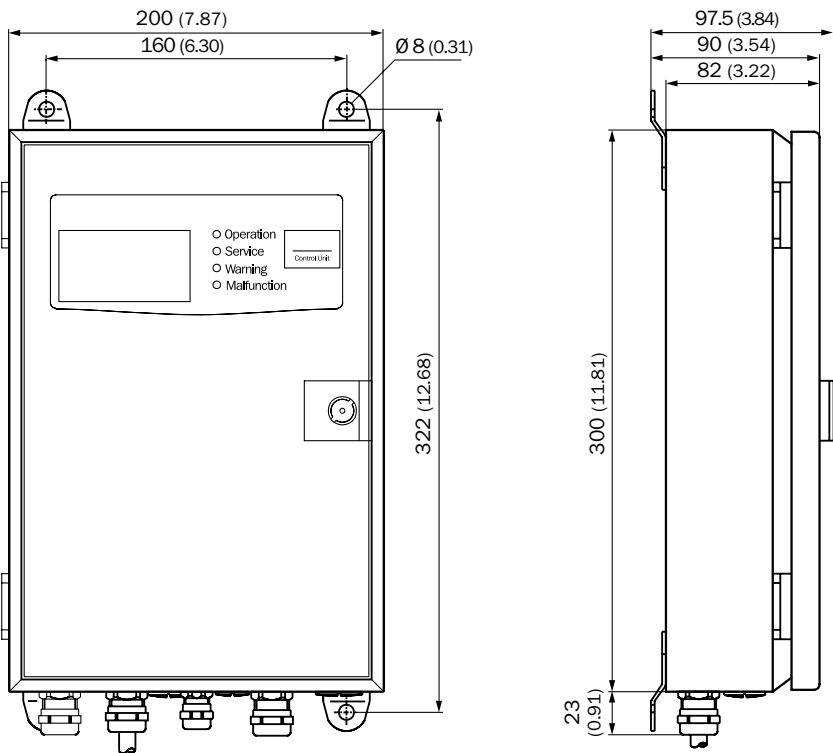


GPP measuring probes		Measuring gap L3 (active measuring path)			
		227 (8.94)	477 (18.78)	727 (28.62)	977 (38.46)
Probe length, nominal	L1	L2			
1,000 (39.37)	904 (35.59)	353 (13.90)	103 (4.06)	---	---
1,500 (59.06)	1,614 (63.54)	1,063 (41.85)	813 (32.01)	563 (22.17)	313 (12.32)
2,000 (78.74)	2,098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

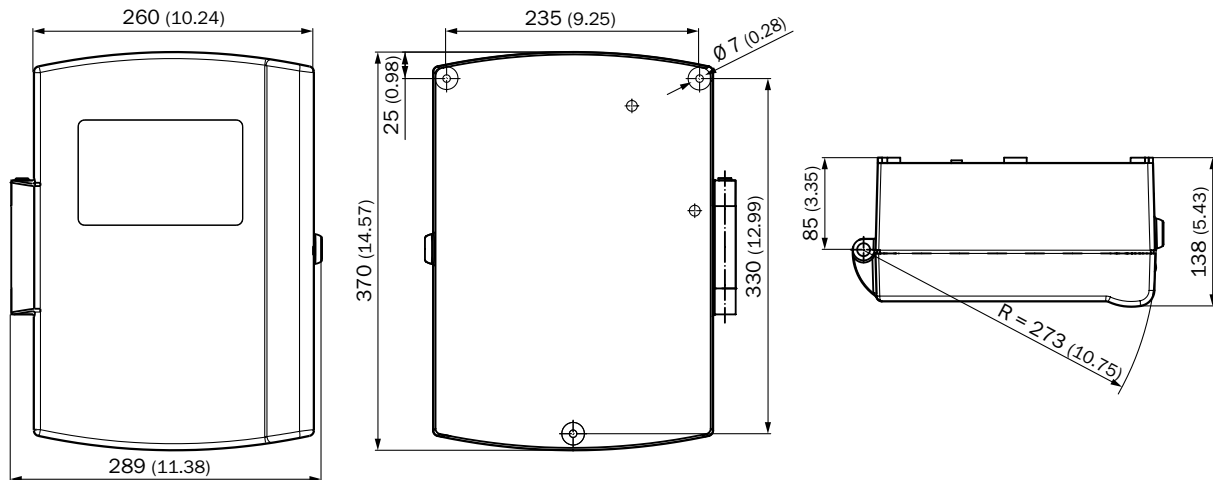
GM700 reflector unit



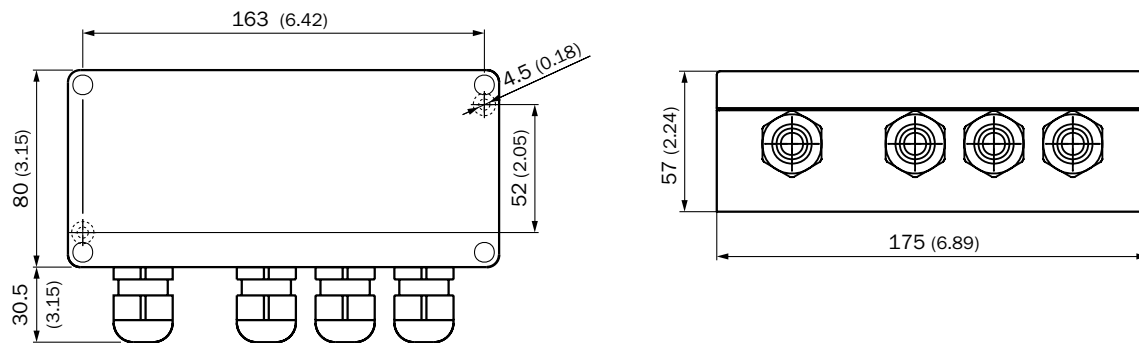
Evaluation unit; steel sheet enclosure



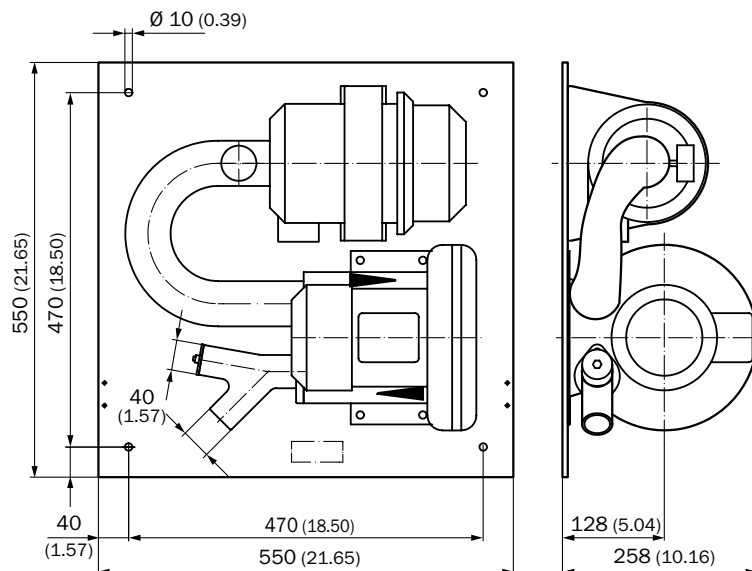
GM700 evaluation unit cast metal enclosure



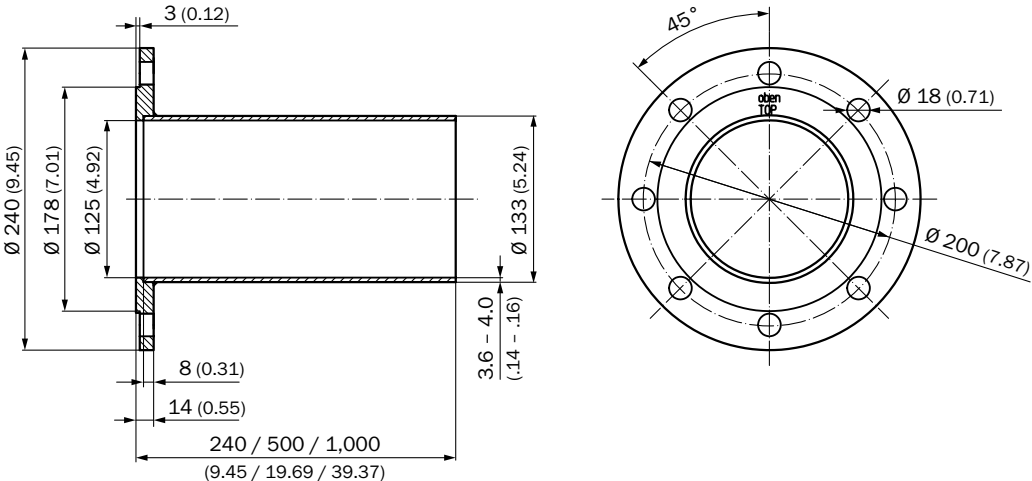
GM700 connection unit



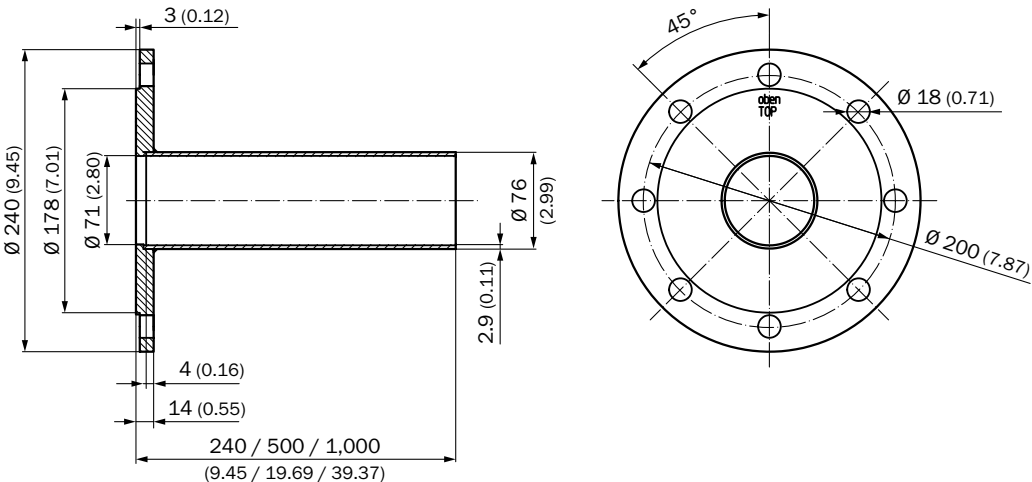
SLV4-2 purge air unit, 2BH1300



Mounting flange, $D_i=125$ mm



Mounting flange, $D_i=125$ mm only for cross-duct version



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