TRANSIC100LP

Laser oxygen transmitter

The good nose for oxygen

- Measures in real-time directly in the process
- Easy installation and operation
- Self-diagnostics with maintenance display
- Low requirements for gas conditioning
- Low operating costs: no consumables and no purging gas consumption
- Rugged: reliable measurement even in contaminated gases

Endress+Hauser

People for Process Automation

TRANSIC100LP: Laser oxygen transmitter Simple, fast and low maintenance

Process par ameters are best measured where they are relevant and present in an unaltered state – directly in the process. "In-situ measuring technology" or "Inline measuring" are the phrases used. The process parameters are determined under process conditions.

Simple

The TRANSIC100LP is an oxygen transmitter that measures in-situ or "inline". The sensor is designed as a measuring probe. This ensures that the lens system in the transmitter is always optimally aligned and installation is very simple. The measuring task can be implemented with little need for additional technical aids. Costly sampling and gas conditioning can be omitted in many cases.

Consistent

The TRANSIC100LP is the consistent implementation of a gas analyzer in the form of a field device: it combines the advantages of oxygen laser spectroscopy with the easy handling of a transmitter. Its transmitter design offers the following:

- Very easy to install
- Uncomplicated transmitter configuration
- Security with password protection for configuration level
- Clear connection concept

Fast

For the operation of the system it is decisive to always have the relevant process parameters in view. Direct measurement in the process is characterized by an extremely low response time. When the flow reaches the sensor of the TRANSIC100LP, the measured value is displayed without any significant delay.

Low maintenance

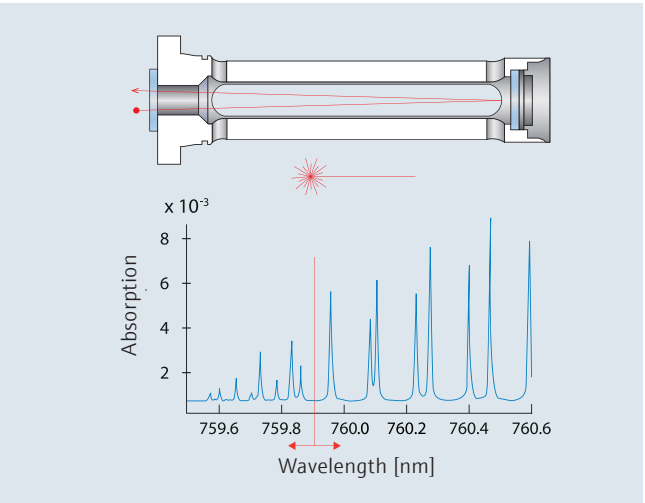
The TRANSIC100LP is based on the measurement principle of Tunable Diode Laser Spectroscopy (TDLS) and is a purely optical sensor. The TRANSIC100LP measures a natural characteristic of the oxygen directly independent of location and time. The measurement is virtually free of temporary drift. The gas transmitter has no mechanical components and is wear-free. Omitting sampling and gas conditioning means no operating or maintenance costs occur. We recommend calibration intervals of 12 months. Measurement runs at all times without using any consumables.

With exact laser technology

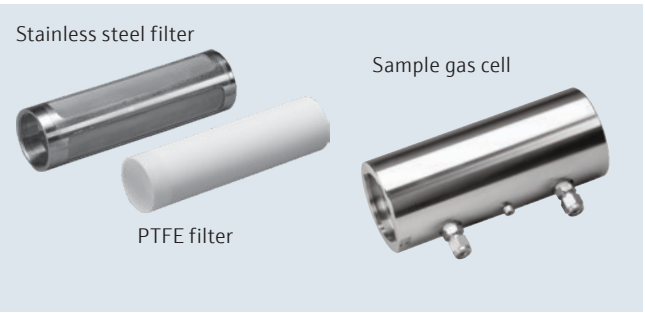
The TDLS Tunable Diode Laser Spectroscopy is primarily used in high-end gas analyzers and is characterized by its highly selective measurement capability. The oxygen properties are used for O_2 measurement: That means O_2 atoms in the near infrared range are stimulated at specific wavelengths. A laser diode modulates the radiation precisely over an absorption peak. The high-energy radiation transfers energy to the O_2 atoms and the signals becomes weaker. In the measuring probe, the laser beam hits the O_2 atoms and is weakened according to the concentrations of oxygen present there. A receiver measures the intensity of the arriving radiation and accurately determines the absorption. One distinct advantage of laser spectroscopy is it´s insensitivity to possible interference. For O_2 in particular, there is no absorption of other gases in the range of sampled absorption peaks.

Extended application area

The sensor optics can become contaminated in certain processes. Two filters are available to prevent this happening: a stainless steel filter to protect against soiling, and a PTFE filter for use in processes in which smaller particles or droplets can occur. If the process does not permit direct in-situ/inline measurement due to an increased pressure or temperature range, a sample gas cell provides a simple way to implement an extractive installation.



Specific wavelengths at which the TRANSIC100LP measures oxygen selectively



Accessories

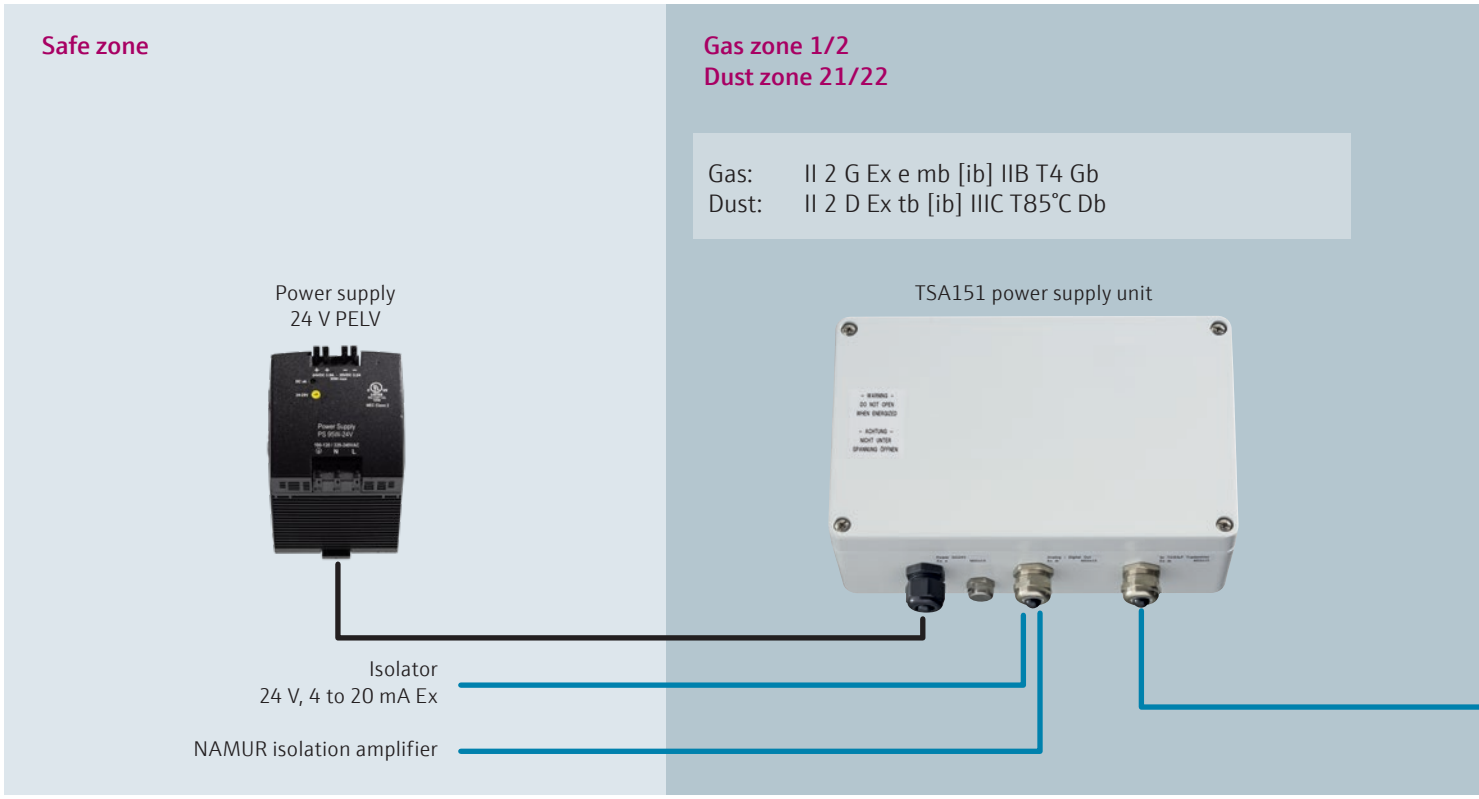
TRANSIC121LP and TRANSIC151LP: Measuring oxygen in potentially explosive atmospheres

An explosion can only occur when all three elements (fuel, an ignition source and oxidant), referred to as the explosion triangle, are present. The primary explosion protection prevents the simultaneous occurrence of a fuel and an oxidant. If flammable substances cannot be avoided, no oxidants may be present.

The secondary explosion protection describes how to avoid ignition sources. Various applicable laws, standards and regulations have become established throughout the world.

For example the European Directive 94/9/EC (European Commission, 1994) for devices and 1999/92/EC (European Commission, 1999) for operation (ATEX Directive) and the harmonized standards, or NEC 500 and NEC 505 in the USA.

For use in potentially explosive atmospheres, one version of the TRANSIC100LP approved by the Factory Mutual (FM) and one approved according to IECEx/ATEX are available.



Class I, Division 2

Groups A–D
Temperature Class T4

TRANSIC121LP

Class I, Division 1 and 2

Groups A–D
Temperature Class T4

Gas zone 0
Dust zone 21

Gas: II 2 G Ex ib IIB T4 Gb
Dust: II 2 D Ex ib tb IIIC T85°C Db

TRANSIC151LP

Gas: II 1 G Ex op is IIB T4 Ga
Dust: II 2 D Ex ib tb IIIC T85°C Db

Process

TRANSIC100LP
The good nose for oxygen

Product description

Measuring the oxygen in the process can be quite simple. TRANSIC100LP is the rugged transmitter that uses Tunable Diode Laser Spectroscopy (TDLS) to measure O_2 reliably. A technology more common in the world of high-tech analysis, is now being used in a field instrument: at an attractive price, easy installation, a long life, low maintenance and suitable for use in potentially explosive atmospheres.

At a glance

- O_2 transmitter based on high-performance laser spectroscopy (TDLS)
- For use in potentially explosive atmospheres (FM, ATEX and IECEx approvals)
- Measurement directly in-situ or extractive using a sample gas cell (option)
- Designed for heavy-duty industrial applications
- Compact design and easy to operate
- Long-term stability
- No moving parts

Your benefits

- Measures in real-time directly in the process
- Easy installation and operation
- Self-diagnostics with maintenance display
- Low requirements for gas conditioning
- Low operating costs: no consumables and no purging gas consumption
- Rugged: reliable measurement even in contaminated gases

Fields of application

- Monitoring of inert gas blanketing in tanks and vessels
- O_2 measurement in process gases
- Measurements in potentially explosive atmospheres
- Process monitoring in fermenters and bioreactors
- Room air monitoring
- Quality monitoring for the production of technical gases
- Replacement of extractive paramagnetic oxygen analyzers and electrochemical cells

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/transic100lp

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.

TRANSIC100LP

Measured values	O_2
Measurement principles	Diode laser spectroscopy (TDLS)
Measuring ranges	
O_2	0 ... 5 Vol.-% / 0 ... 100 Vol.-%
Response time	≤ 10 s
Accuracy	≤ 0.2 Vol.-%
Zero point drift	± 0.1 Vol.-% per year
Process temperature	−20 °C ... +80 °C (−4 °F ... 176 °F)
Process pressure	800 hPa ... 1,400 hPa (1,160 psi ... 2,030 psi)
Ambient temperature	−20 °C ... +60 °C (−4 °F ... 140 °F)
Storage temperature	−30 °C ... +80 °C (−22 °F ... 176 °F)
Ex-approvals	
IECEx	Sender/receiver unit: II 1/2G Ex ib IIB T4 Gb; II 2D Ex ib tb IIIC T85°C Db Measuring probe: II 1/2G Ex op is IIB T4 Ga; II 2D Ex ib tb IIIC T85°C Db Power supply: II 2G Ex e mb [ib] IIB T4 Gb; II 2D Ex tb [ib] IIIC T85°C Db
ATEX	Sender/receiver unit: II 1/2G Ex ib IIB T4 Gb; II 2D Ex ib tb IIIC T85°C Db Measuring probe: II 1/2G Ex op is IIB T4 Ga; II 2D Ex ib tb IIIC T85°C Db Power supply: II 2G Ex e mb [ib] IIB T4 Gb; II 2D Ex tb [ib] IIIC T85°C Db
NEC/CEC (US/CA)	Sender/receiver unit: Class I, Division 2, Group A, B, C, D, T4 Measuring probe: Class I, Division 1 + 2, Group A, B, C, D, T4
Electrical safety	CE, FM
Enclosure rating	IP 66
Analog outputs	1 output: 0/4 ... 20 mA, 500 Ω 1 output: 0/4 ... 20 mA, 200 Ω; Only for ATEX/IECEx version TRANSIC151LP
Digital outputs	1 relay contact: 30 V AC, 1 A / 60 V DC, 0.5 A 1 NAMUR output: Only for ATEX/IECEx version TRANSIC151LP
Interfaces	RS-485 (not for the ATEX/IECEx version) RS-232c (service interface; not for the ATEX/IECEx version) USB (not approved for Ex-applications)
Dimensions (W x H x D)	See dimensional drawings
Weight	2.2 kg (4.85 lb)
Material in contact with media	Stainless steel 1.4404 (AISI 316L), Kalrez®, EPDM, PTFE, SiN, MgF_2, polymer coating
Mounting	Flange for direct installation in the process Wall-mounting bracket for ambient air measurement Wall-mounting bracket for measurement with measuring gas cell

Electrical connection	
Voltage	24 V DC TRANSIC151LP: 21.6 ... 26.4 V
	For ATEX/IECEx version via TSA151 power supply, a PELV power supply is mandatory
Current consumption	500 mA TRANSIC151LP: 240 mA
Power consumption	≤ 6 W TRANSIC151LP: ≤ 5.2 W
Corrective functions	Adjustment with ambient air or test gases
Test functions	Contamination check

Ordering information

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

Type code

TRANSIC111LP

Version

A	With flange for in-situ installation, <0.5 bar, O_2 measuring range of 0 ... 25 vol.-%
B	With wall bracket for ambient air measurement, O_2 measuring range 2 ... 25 vol.-%
C	With sample cell and wall bracket, PN10, O_2 measuring range 0 ... 25 vol.-%
D	With flange for in-situ installation, <0.5 bar, O_2 measuring range 0 ... 100 vol.-% [1]
E	With sample cell and wall bracket, PN10, O_2 measuring range 0 ... 100 vol.-% [1]
F	With flange for in-situ installation, PN10, O_2 measuring range of 0 ... 25 vol.-%
G	With weld-on nozzle for in-situ installation, PN10, O_2 measuring range of 0 ... 25 vol.-%
H	With 3" clamp connection for in-situ installation, PN10, O_2 measuring range of 0 ... 25 vol.-%
I	With flange for in-situ installation, PN10, O_2 measuring range of 0 ... 100 vol.-% [1]
J	With weld-on nozzle for in-situ installation, PN10, O_2 measuring range of 0 ... 100 vol.-% [1]
K	With 3" clamp connection for in-situ installation, PN10, O_2 measuring range of 0 ... 100 vol.-% [1]

Filter type

1	No filter [2]
2	Stainless steel mesh filter
3	PTFE filter with stainless steel mesh [3]

Analog output range [4] [5]

A	Output range 0 ... 5 vol.-%
B	Output range 0 ... 10 vol.-%
C	Output range 0 ... 15 vol.-%
D	Output range 0 ... 20 vol.-%
E	Output range 0 ... 25 vol.-%
K	Output range 0 ... 100 vol.-%
X	Output range from _____ vol.-% to _____ vol.-%

Analog output [6]

1	4 ... 20 mA
2	0 ... 20 mA

Fault state for analog output [6]

A	≤ 3 mA [7]
B	≥ 21 mA

Digital output [4]

1	Digital output opens ONLY in case of fault state
4	Digital output opens to indicate maintenance request
X	Digital output opens, if O_2 value undercuts the preset value of _____ vol.-% [8]
Y	Digital output opens, if O_2 value exceeds the preset value of _____ vol.-% [8]

Material O-ring set

A	EPDM
B	FFKM (Kalrez®)
C	FKM (BAM approved)

Cable bushing

1	Cable gland M20 x 1.5 for cable Ø 8 ... 11 mm
2	Conduit fitting NPT 1/2" for inner threads
3	Connector, 8-pin M12, male, with cable, 2 m
4	Connector, 8-pin M12, male, with cable, 6 m
5	Connector, 8-pin M12, male, with cable, 10 m

TS111LP-

[1] With certificate for oxygen service
[2] For use in clean gas only or with a sample cell
[3] Not selectable for the O_2 measuring range 0 ... 100 vol.-%. Not recommended for wet gas near dew point.
[4] Can be reconfigurated in the field
[5] Factory setting: 0 ... 25 vol-% O_2
[6] Can be reconfigurated in the field (requires a serial interface and a terminal program on PC)
[7] Selectable only for the output range of 4 ... 20 mA
[8] Factory setting: 10 vol-% O_2
[9] PTFE filter for reference gas inlet recommended

TRANSIC121LP

Version

A	With flange for in-situ installation, < 0.5 bar, O_2 measuring range of 0 ... 25 vol.-%
B	With wall bracket for ambient air measurement, O_2 measuring range 2 ... 25 vol.-%
C	With sample cell and wall bracket, PN10, O_2 measuring range 0 ... 25 vol.-%
F	With flange for in-situ installation, PN10, O_2 measuring range of 0 ... 25 vol.-%
G	With weld-on nozzle for in-situ installation, PN10, O_2 measuring range 0 ... 25 vol.-%
H	With 3" clamp connection for in-situ installation, PN10, O_2 measuring range 0 ... 25 vol.-%

Filter type

1	No filter [1]
2	Stainless steel mesh filter
3	PTFE filter with stainless steel mesh [2]

Analog output range [3]

A	Output range 0 ... 5 vol.-%
B	Output range 0 ... 10 vol.-%
C	Output range 0 ... 15 vol.-%
D	Output range 0 ... 20 vol.-%
E	Output range 0 ... 25 vol.-%
X	Output range from _____ vol.-% to _____ vol.-% [4]

Analog output [6]

1	4 ... 20 mA
2	0 ... 20 mA

Fault state for analog output [6]

A	≤ 3 mA [5]
B	≥ 21 mA

Digital output [3]

1	Digital output opens ONLY in case of fault state
2	Digital output opens, if O_2 value undercuts the preset value of _____ vol.-% [7]
3	Digital output opens, if O_2 value exceeds the preset value of _____ vol.-% [7]
4	Digital output opens to indicate maintenance request

Cable bushing

A	Cable gland Ex M20 x 1.5 for cable Ø 8 ... 11 mm [8]
B	Conduit fitting NPT 1/2" for inner threads

Reference gas inlet

A	No reference gas inlet
B	Reference gas inlet with check valve [9]

Language operation instructions

B	English

Approval

1	FM (USA, Canada)

Material O-ring-set

B	FFKM (Kalrez®)
C	FFKM (BAM approved)

TS121LP-										1	

[1] For use in clean gas only or with a sample cell
[2] Not recommended for wet gas near dew point
[3] Can be reconfigurated in the field
[4] Maximum O_2 concentration: 25 vol.-% (higher concentrations are not covered by the FM standards)
[5] Selectable only for the output range of 4 ... 20 mA
[6] Can be reconfigurated in the field (requires a serial interface and a terminal program on PC). Reconfiguration should be done only in a non-hazardous area!
[7] Factory setting: 10 vol-% O_2
[8] Cable gland usable only in the USA according to FM approval
[9] PTFE filter for reference gas inlet recommended

TRANSIC151LP

Version

A	With flange for in-situ installation, < 0.5 bar, O_2 measuring range of 0 ... 25 vol.-%
B	With wall bracket for ambient air measurement, O_2 measuring range 2 ... 25 vol.-%
C	With sample cell and wall bracket, PN10, O_2 measuring range 0 ... 25 vol.-%
F	With flange for in-situ installation, PN10, O_2 measuring range of 0 ... 25 vol.-%
G	With weld-on nozzle for in-situ installation, PN10, O_2 measuring range 0 ... 25 vol.-%
H	With 3" clamp connection for in-situ installation, PN10, O_2 measuring range 0 ... 25 vol.-%

Filter type

1	No filter [1]
2	Stainless steel mesh
3	PTFE filter with stainless steel mesh [2]

Analog output range [3]

A	Output range 0 ... 5 vol.-%
B	Output range 0 ... 10 vol.-%
C	Output range 0 ... 15 vol.-%
D	Output range 0 ... 20 vol.-%
E	Output range 0 ... 25 vol.-%
X	Output range from _____ vol.-% to _____ vol.-% [4]

Analog output [5]

1	4 ... 20 mA
2	0 ... 20 mA

Fault state for analog output [5]

A	≤ 3 mA [6]
B	≥ 21 mA

NAMUR digital output [5]

1	Digital output opens ONLY in case of fault state
4	Digital output opens to indicate maintenance request
X	Digital output opens, if O_2 value undercuts the preset value of _____ vol.-% [7]
Y	Digital output opens, if O_2 value exceeds the preset value of _____ vol.-% [7]

Material O-ring set

B	FFKM (Kalrez®)
C	FKM (BAM approved)

Cable bushing

D	Ex M20 x 1.5 with 0.5 m cable to TSA151 [8]
E	Ex M20 x 1.5 with 2 m cable to TSA151 [8]
F	Ex M20 x 1.5 with 5 m cable to TSA151 [8]
G	Conduit NPTf 1/2" for inner threads with 0.5 m cable to TSA151 [8]
H	Conduit NPTf 1/2" for inner threads with 2 m cable to TSA151 [8]
I	Conduit NPTf 1/2" for inner threads with 5 m cable to TSA151 [8]

Reference gas inlet

A	No reference gas inlet
B	Reference gas inlet with check valve [9]

Accessories

1	No accessories
4	USB interface cable for PC [10]

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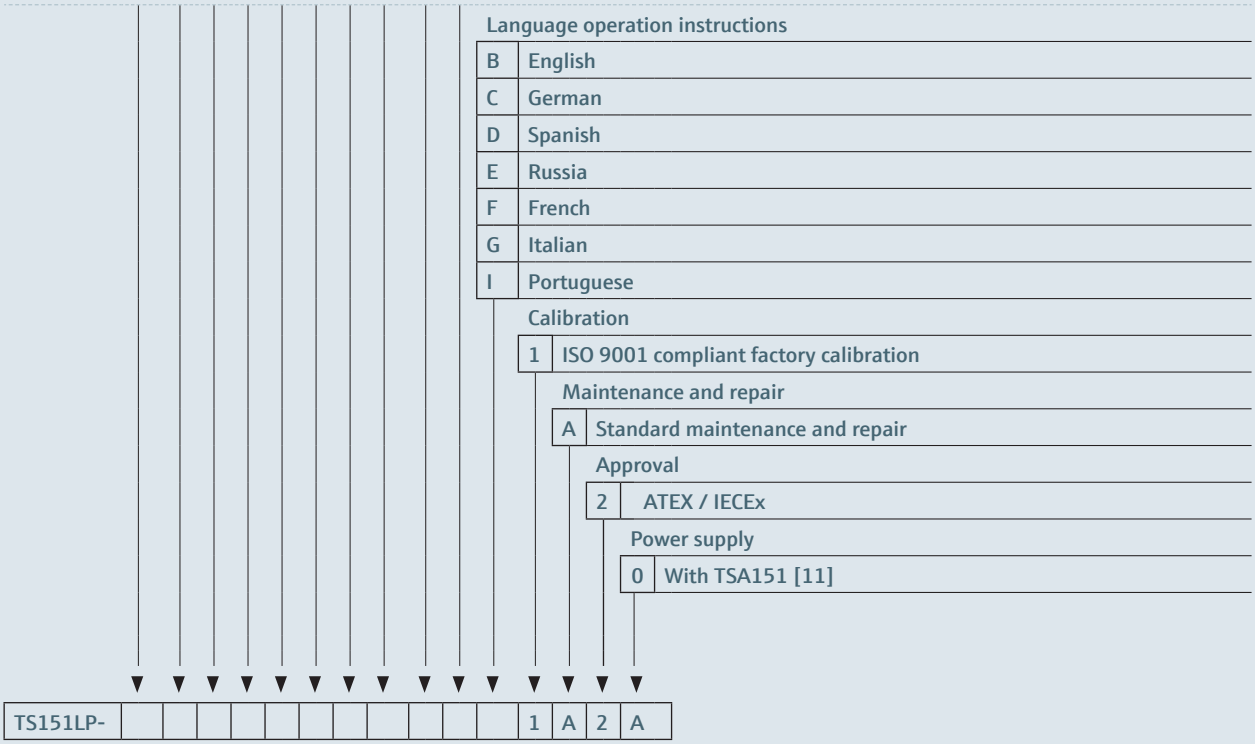
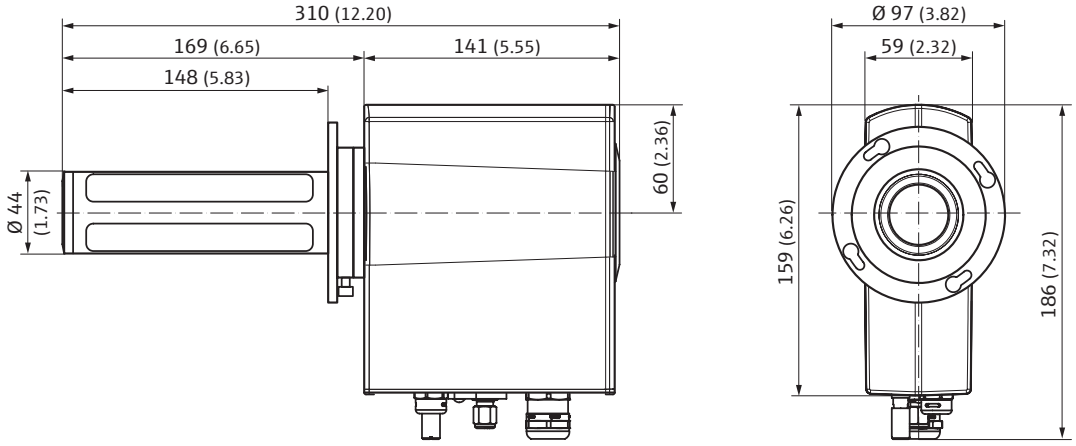


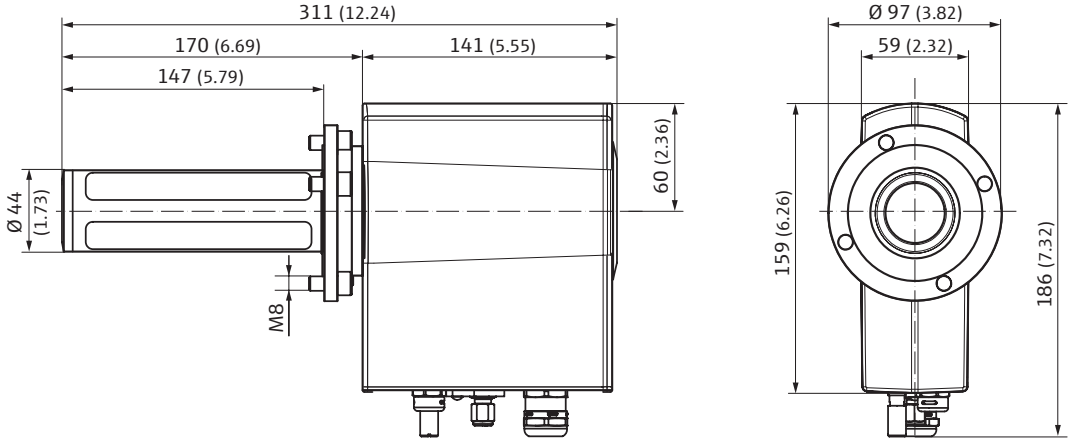
[1] For use in clean gas only or with a sample cell
[2] Not recommended for wet gas near dew point
[3] Can be reconfigurated in the field
[4] Maximum O_2 concentration: between 5 vol.-% and 25 vol.-%. Factory setting: 0 ... 25 vol.-% O_2
[5] Can be reconfigurated in the field (requires a serial interface and a terminal program on PC). Reconfiguration should be done only in a non-hazardous area!
[6] Selectable only for the output range of 4 ... 20 mA
[7] Factory setting: 10 vol-% O_2
[8] For connection between transmitter and power supply TSA151 only Ex i cable must be used
[9] PTFE filter for reference gas inlet recommended
[10] Connection to PC should be done only in a non-hazardous area! Use our service interface cables only.
[11] Do not operate TRANSIC151LP transmitter without TSA151 power supply!

Dimensional drawings

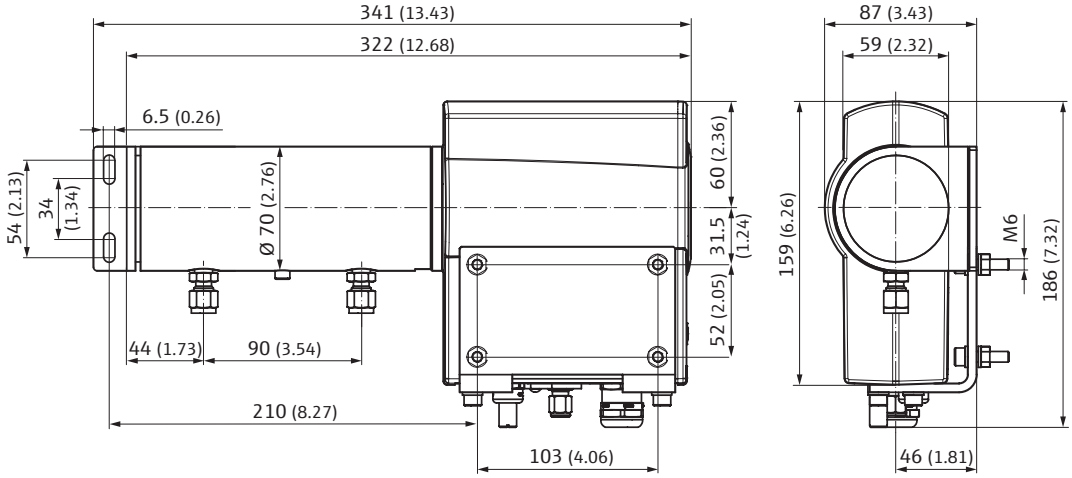
TRANSIC100LP with flange adapter for process measurements below 0.5 bar (dimensions in mm (inch))



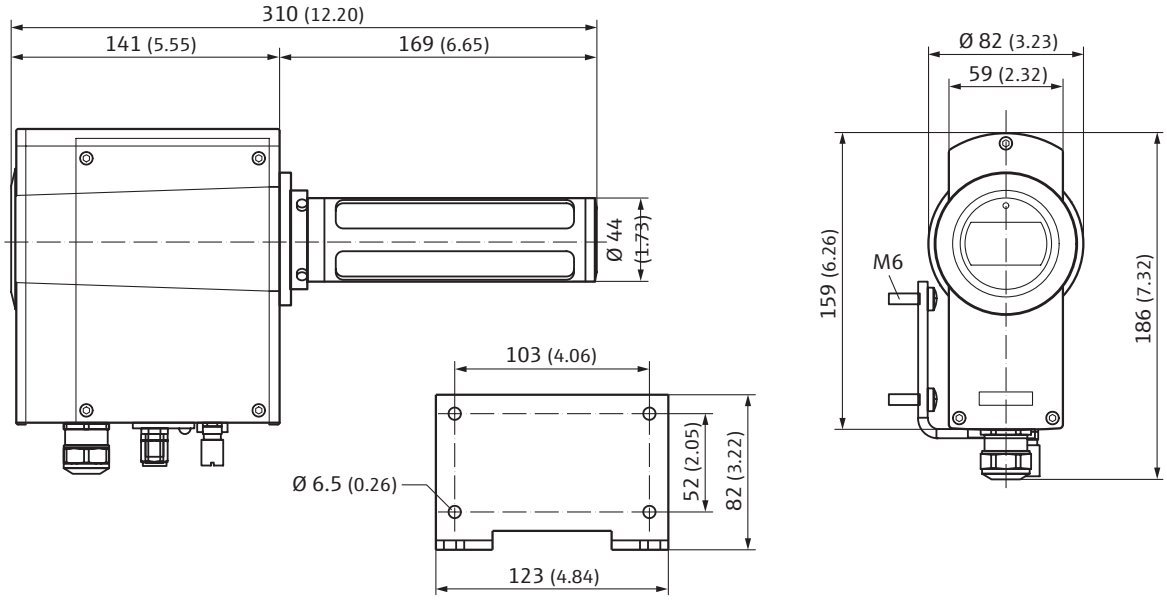
TRANSIC100LP with flange adapter PN10 (dimensions in mm (inch))



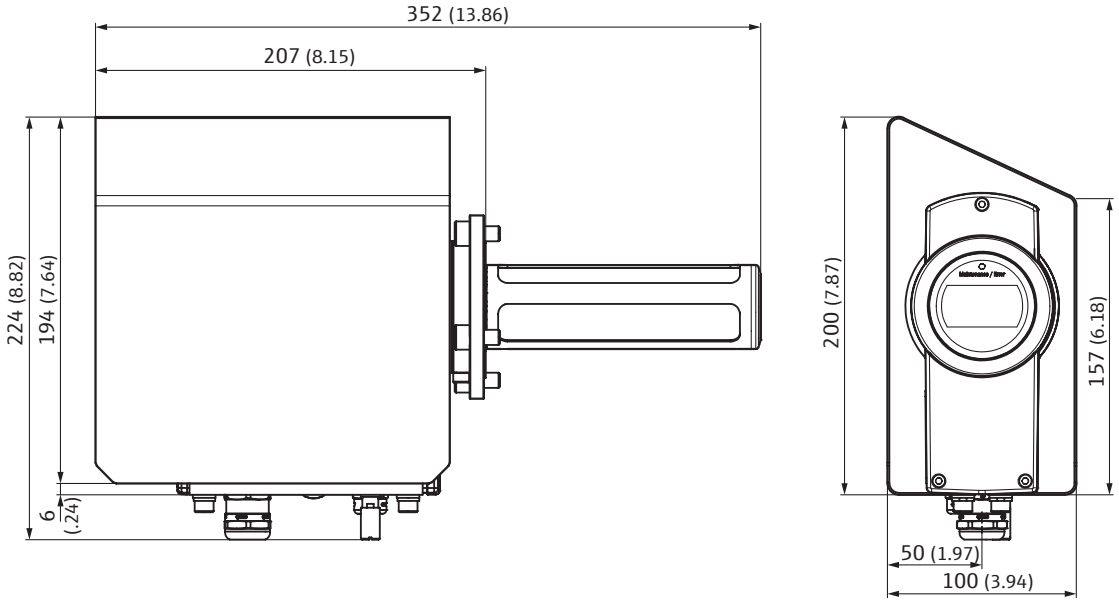
TRANSIC100LP with wall bracket and sample gas cell (dimensions in mm (inch))



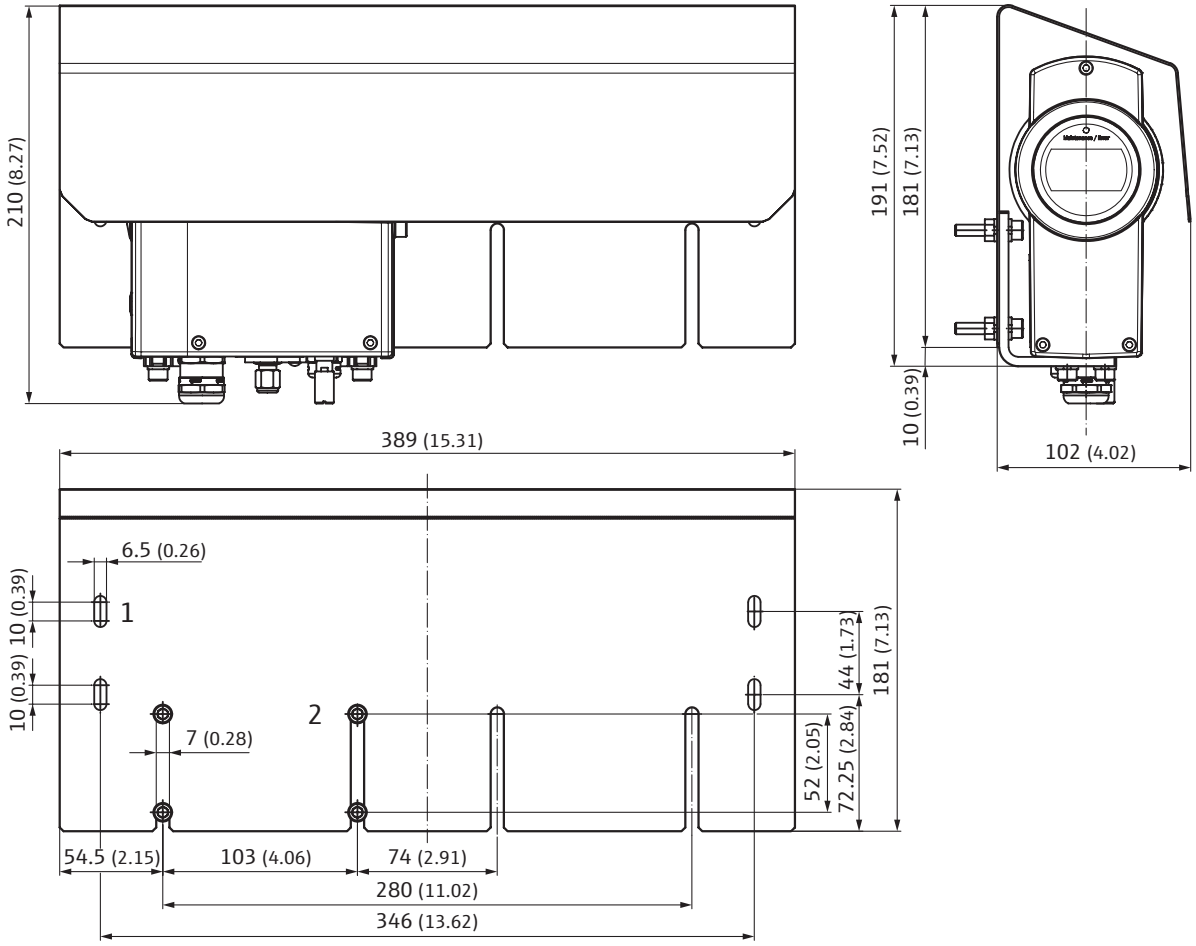
TRANSIC100LP with wall bracket for ambient measurements (dimensions in mm (inch))



TRANSIC100LP, weather hood for flange mounting (dimensions in mm (inch))

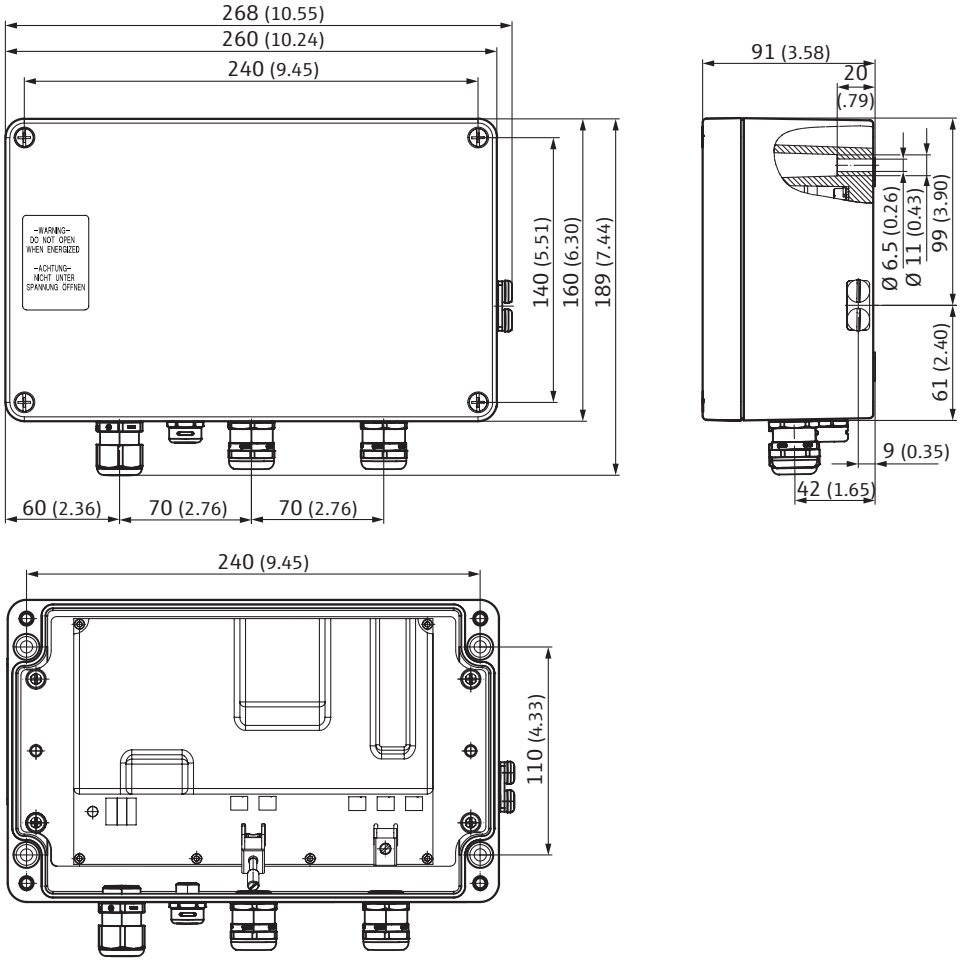


TRANSIC100LP, weather hood for wall mounting (dimensions in mm (inch))



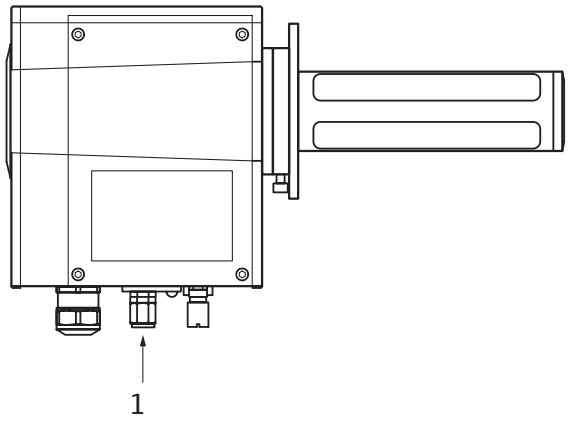
1 Mounting holes for transmitter bracket
2 Mounting slots for wall mounting bracket

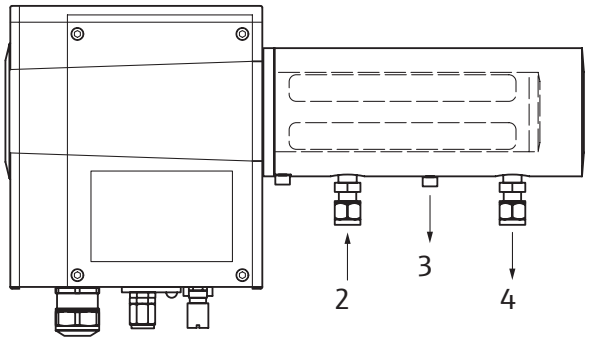
TRANSIC151LP, TSA151 intrinsically safe power supply (dimensions in mm (inch))



Connection types

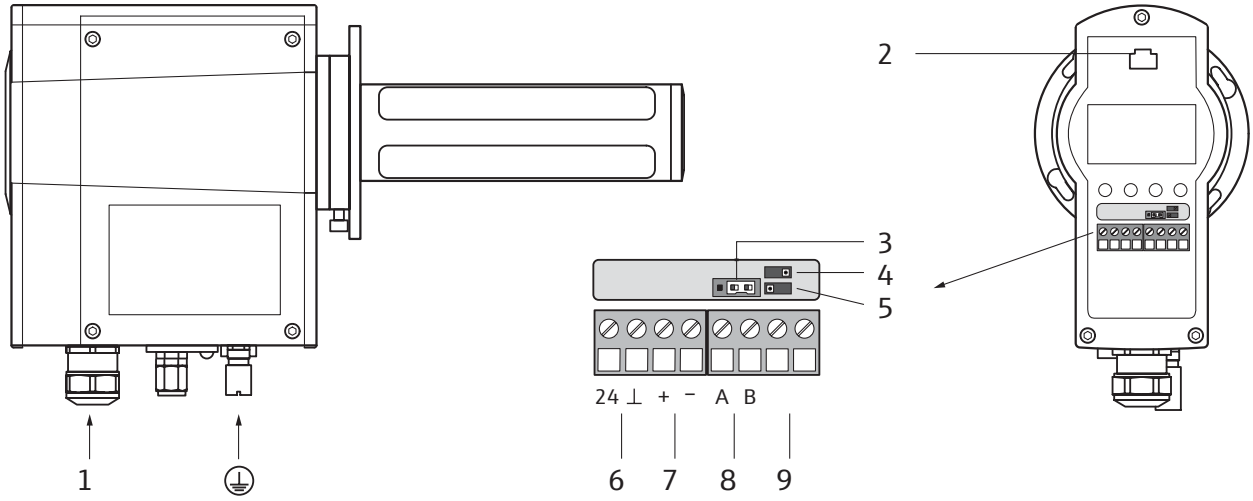
Gas connections





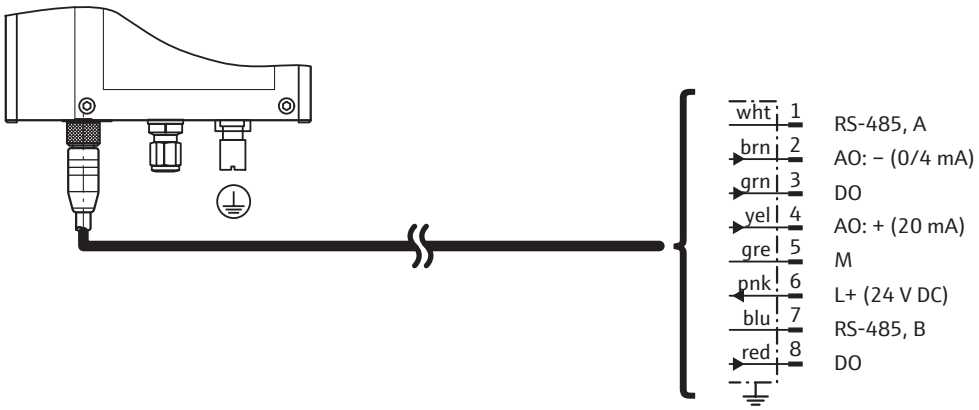
1 Optional inlet for reference gas (Swagelok, 6 mm)
2 Gas inlet (Swagelok, 6 mm)
3 Condensate outlet
4 Gas outlet (Swagelok, 6 mm)

Electrical connections and pin assignment



1 Cable gland
2 RS-232, service interface (RJ45)
3 Jumper for RS-485 termination
4 RS-485 termination: activated
5 RS-485 termination: de-activated
6 Power supply UIn: +24 V DC, 0 V (GND)
7 Analog output IOut: +, –
8 RS-485 connections: A, B
9 Digital output: alarm

Pin assignment connector, 8-pin, M12 with cable (option)



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