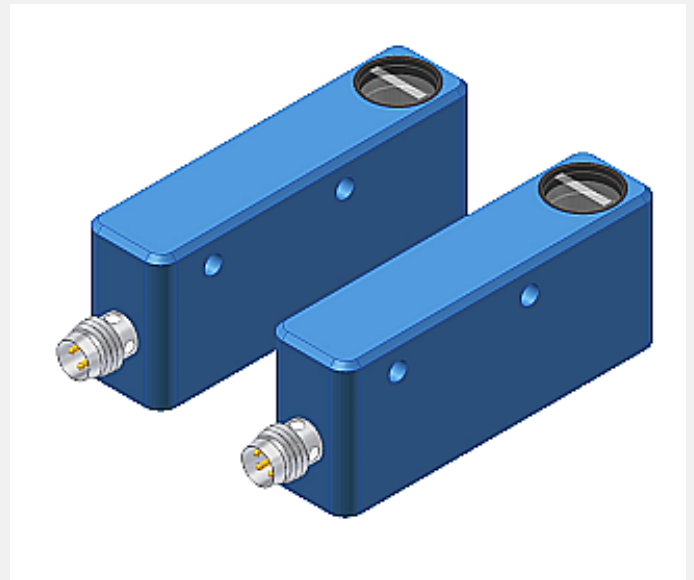


A-LAS Series

▶ A-LAS-15/90-...

- Analog signal (0...+10V) in connection with an electronic control unit type AGL4, AGL4-HS, AGL-DIF, SI-CON11 (without PC connection) or SI-CON8, SI-CON34, A-LAS-CON1 (with PC connection and software) *(stand-alone operation of the light barrier is not possible)*
- Parallel aligned, visible red laser beam (<0.39 mW, 670 nm), **laser class 1**
- Measuring range up to 9.5 mm (aperture 1.5 mm x 9.5 mm suppressed on filter)
- Working range max. 10 m
- Insensitive to outside light due to interference filter
- Optics cover made of scratch-resistant glass
- Compact design, sturdy metal housing, IP67

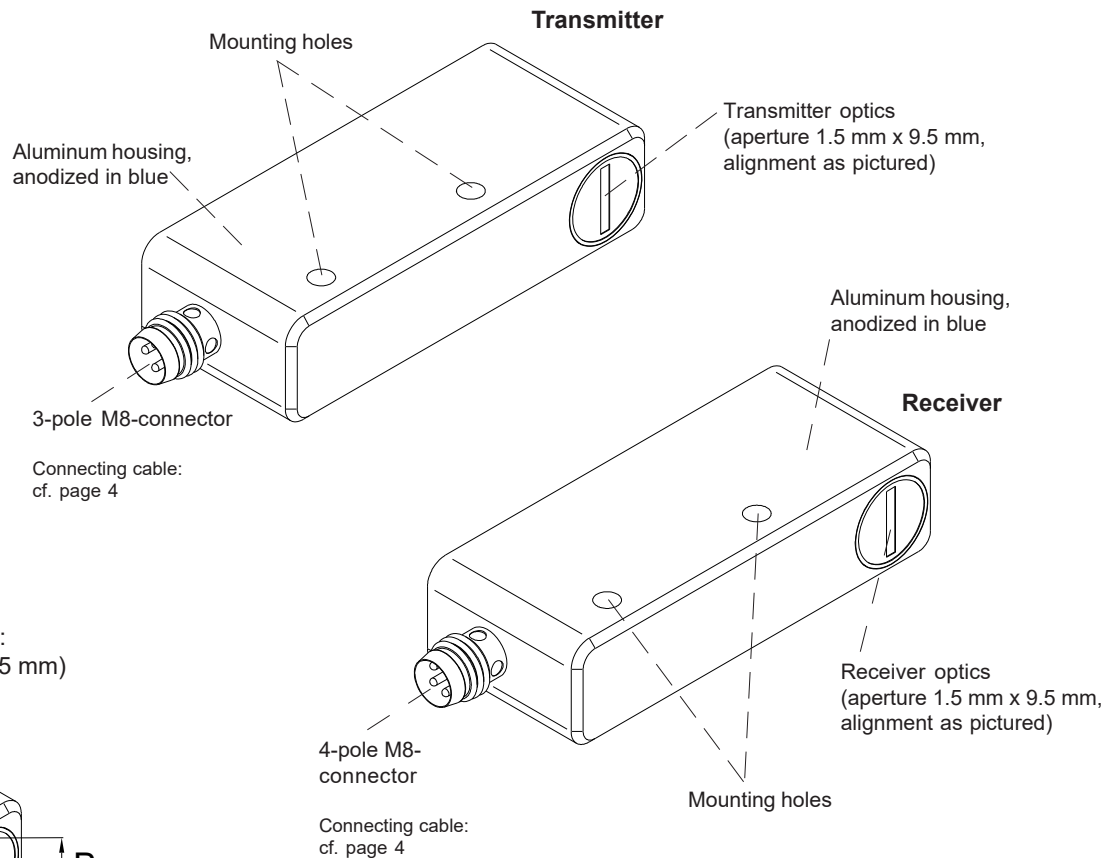


Design

Product name:

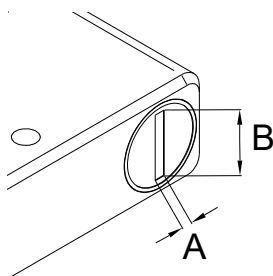
A-LAS-15/90-T (Transmitter)

A-LAS-15/90-R (Receiver)



Aperture size:

Rectangular aperture (AxB):
1.5x9.5 (A = 1.5 mm, B = 9.5 mm)





Technical Data

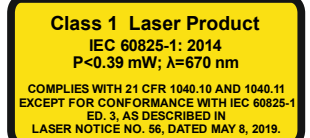
Type	A-LAS-15/90
Shape	Split laser light barrier in rectangular housing.
Laser	Solid-state laser, 670 nm, DC-operation, <0.39 mW opt. power, laser class 1 acc. to DIN EN 60825-1. The use of these laser transmitter therefore requires no additional protective measures.
Available aperture sizes	1.5 mm x 9.5 mm
Measuring range	Up to 9.5 mm
Working range	Max. 10 m
Min. detectable object	Typ. 0.8% of aperture size
Reproducibility	Typ. 0.8% of aperture size, with threshold correction (via electronic control unit): typ. 0.1% of aperture size
Threshold correction	Can be activated via a software-controlled electronics of type A-LAS-CON1, SI-CON8, or SI-CON34
Optical filters	Red light filter RG 630 and interference filter
Voltage supply	Transmitter: +5VDC, receiver: +5VDC
Ambient light (outside light)	With 5000 Lux ambient light around optical receiver unit typ. < 300mV influence on analog signal (0...+10V)
Analog output	0 ... +10V (in connection with any electronic control unit of A-LAS Series)
Band width analog signal	100 kHz (-3 dB)
Current control input (I-CONTROL)	0V ... 5V, laser power decreases linear to increase of voltage: 0V: full power, 5V: laser off
Sensitivity setting (switching threshold)	Via software (with control electronics A-LAS-CON1, SI-CON34, or SI-CON8) or via potentiometer (with control electronics AGL4 or AGL4-HS)
Gain (analog signal)	Via software (with control electronics A-LAS-CON1, SI-CON34, or SI-CON8) or via potentiometer (with control electronics AGL4, AGL4-HS, AGL-DIF, or SI-CON11)
Current consumption	Transmitter: typ. 50 mA, receiver typ. 20 mA
Operating temperature range	0°C ... +50°C
Storage temperature range	-20°C ... +85°C
Type of connector	Transmitter: 3-pole M8-connector, receiver: 4-pole M8-connector
Housing material	Aluminum, anodized in blue
Housing dimensions	Transmitter and receiver: each LxWxH approx. 68 mm x 15 mm x 25 mm (without connector M8)
Enclosure rating	IP67
EMC test acc. to	DIN EN 60947-5-2



Laser Information

The laser transmitters of A-LAS series comply with laser class 1 according to EN 60825-1. Under reasonably foreseeable conditions a class 1 laser is safe. The reasonably foreseeable conditions are kept during specified normal operation. The use of these laser transmitters therefore requires no additional protective measures.

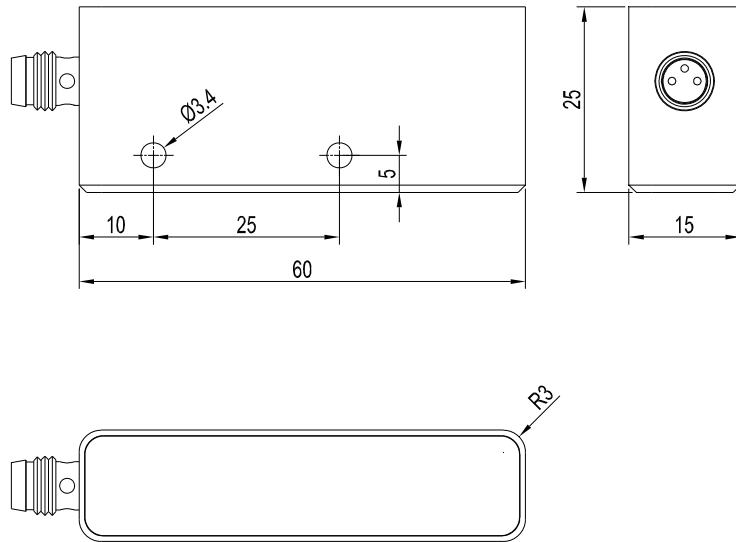
The laser transmitters of A-LAS series series are supplied with an information label „CLASS 1 Laser Product“.



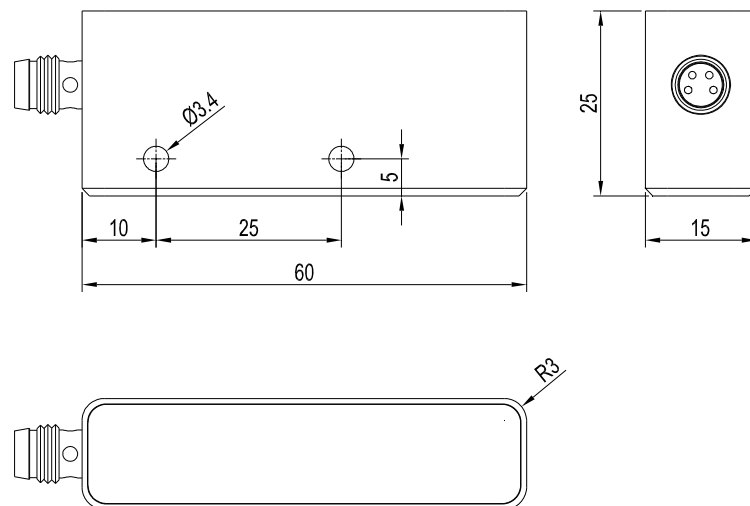


Dimensions

A-LAS-15/90-T (Transmitter):



A-LAS-15/90-R (Receiver):

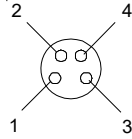


All dimensions in mm

Connector Assignment

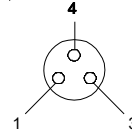
Receiver: 4-pole M8-connector

Pin No.:	Assignment:
1	+5 VDC
2	GND (0V)
3	SHIELD
4	ANALOG

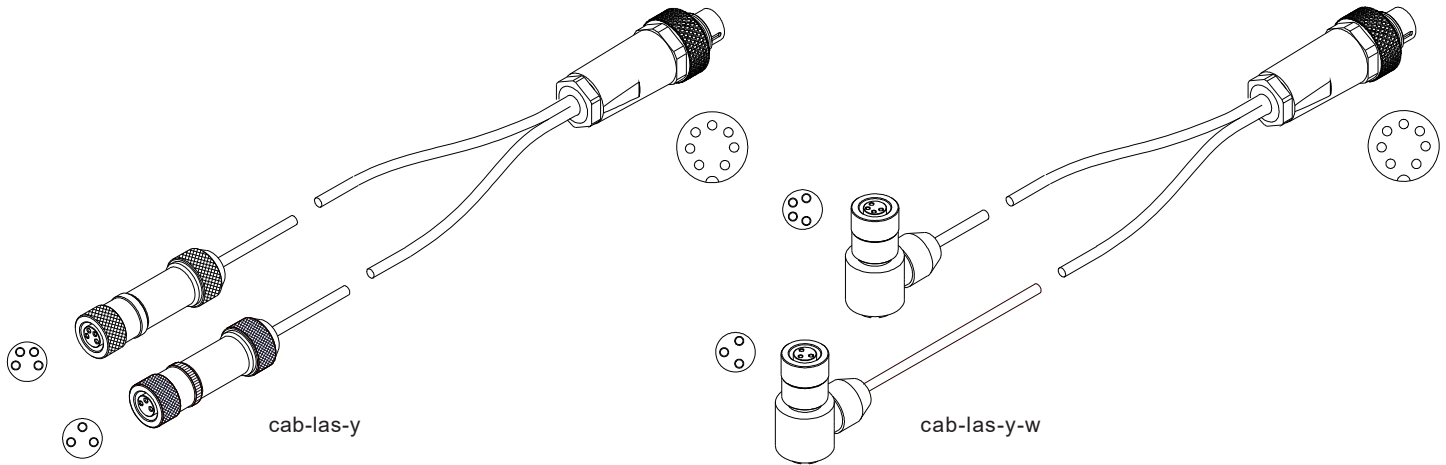


Transmitter: 3-pole M8-connector

Pin No.:	Assignment:
1	+5 VDC
3	GND (0V)
4	I-CONTROL (0V...+5V)



For use with AGL4, AGL4-HS, AGL-DIF, SI-CON11, SI-CON8, SI-CON34, A-LAS-CON1:
 cab-las-y-(length) or
 cab-las-y-w-(length)
 (standard length each 1m, also available lengths: 2m, 3m, or 5m)

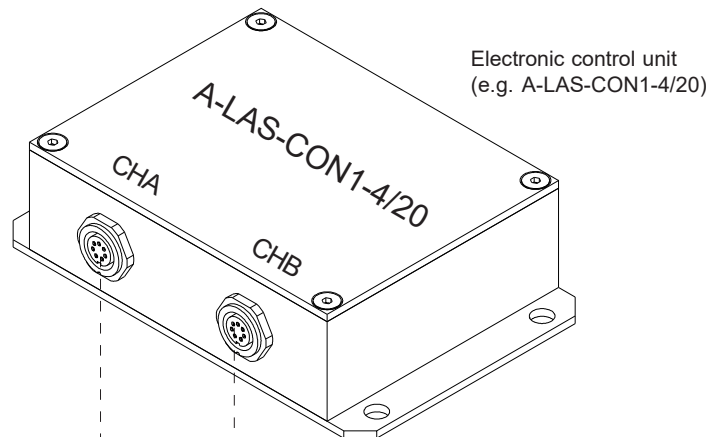


Electronic Control Unit

**Connection to electronic control unit
 (e.g. A-LAS-CON1-4/20, cf. sketch):**

7-pole female connector type Binder Series 712

Pin No.:	Assignment:
1	GND (0V)
2	+5V
3	I-CONTROL (0V...+5V)
4	+5V
5	ANALOG
6	not connected
7	GND (0V)



Connecting cable:
 cab-las-y-... (1m, 2m, 3m, 5m)

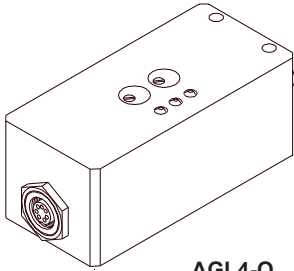
**Connection of A-LAS-15/90 sensor
 to e.g. A-LAS-CON1-4/20 (CHA)**

(not used)

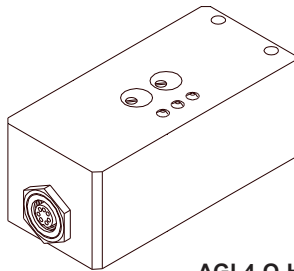


Electronic Control Units

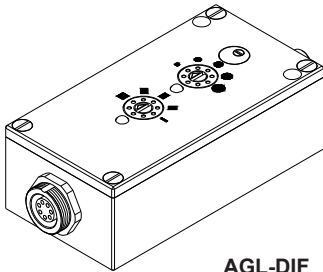
Suitable electronic control units for A-LAS-15/90:



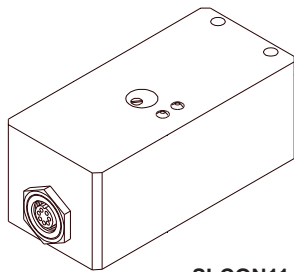
AGL4-Q
AGL4-Qinv
AGL4-Qinv-200ms



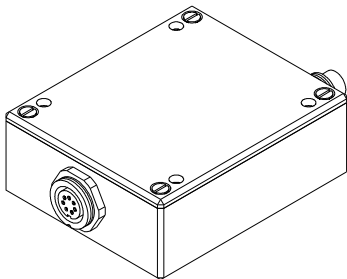
AGL4-Q-HS-500kHz-24V_LED
AGL4-Qinv-HS-500kHz-24V_LED



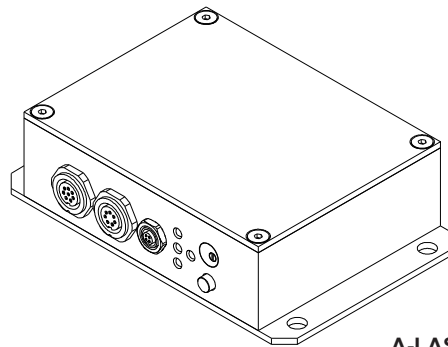
AGL-DIF



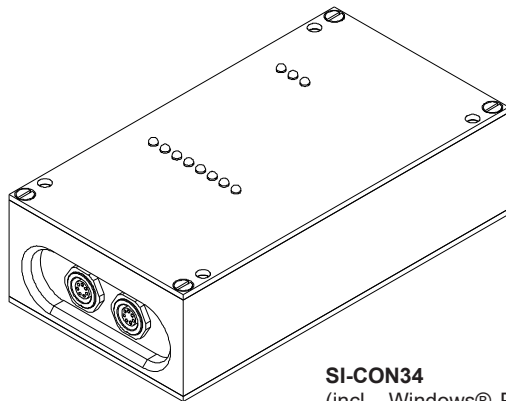
SI-CON11-0/20
SI-CON11-0/20-5V
SI-CON11-0/20-IC
SI-CON11-4/20
SI-CON11-4/20-IC
SI-CON11-5/25
SI-CON11-5/25-IC



SI-CON8
(incl. Windows® PC software
SI-CON8-Scope)



A-LAS-CON1
(incl. Windows® PC software
A-LAS-CON1-Scope)



SI-CON34
(incl. Windows® PC software
SCOPE34)



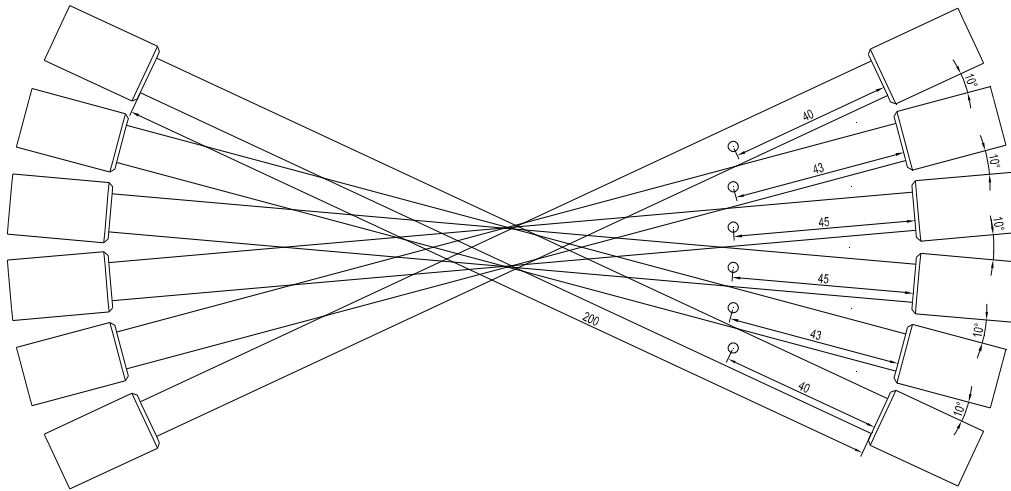


Application Example

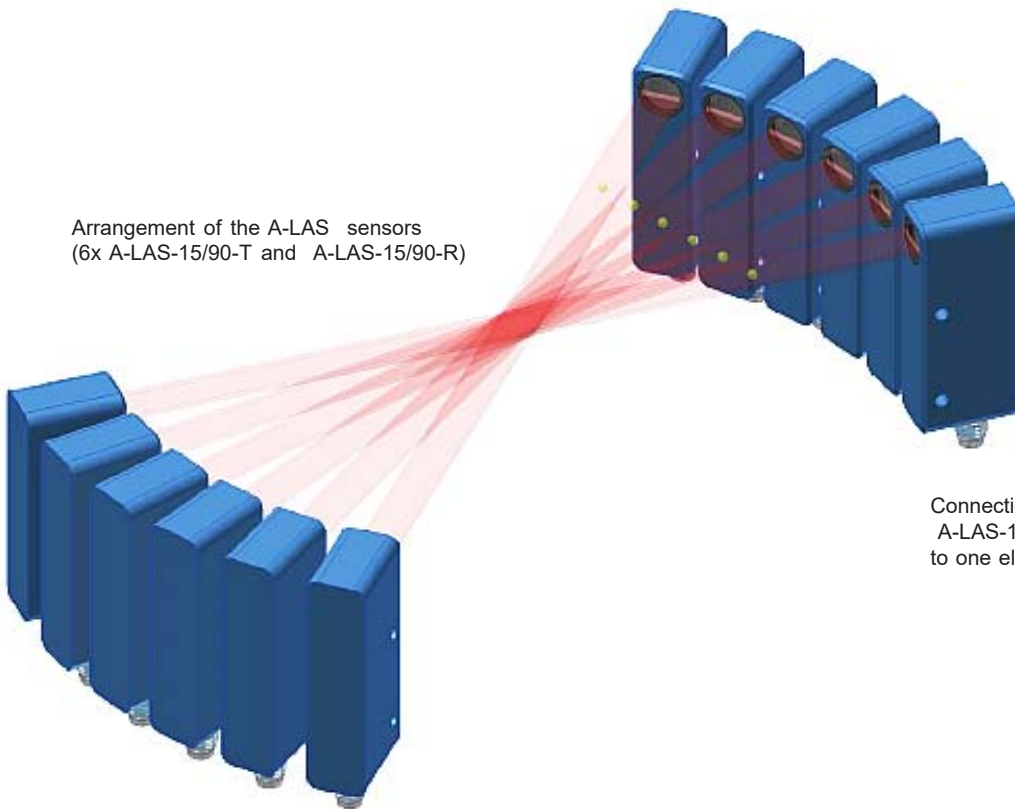
Droplet measurement detection

Aim of the application is to measure the geometric size of liquid drops. The drops fall at right angle for a distance of 50 mm before they pass through the homogeneous, planar laser beam that runs from a A-LAS-15/90-T laser transmitter to a A-LAS-15/90-R analog receiver. The A-LAS-15/90 analog sensor pair generates a analog voltage signal proportional to the amount of received laser light. When passing through the laser beam, part of the receiver aperture is covered through the drop. The analog signal of the receiver decreases for the same amount as the drop covers from the aperture. By monitoring the analog signal of the A-LAS-15/90 receiver one can determine it's minimum. This minimum corresponds to maximum diameter of the liquid drop.

Used to control the A-LAS sensor pair is a A-LAS-CON1-4/20 control unit running a custom made firmware. The drops pass the light curtain with a speed of up to one meter per second. Equipped with fast analog to digital converter the inbuilt micro controller samples new analog values with a rate of 66 kHz guaranteeing a sufficient temporal resolution and reaction time. After each sample the digitalized value is evaluated. Three digital outputs are set to indicate the width, the successful detection and whether the drop meets the preset requirements. The analog output generates a current signal from 4 to 20 mA linear to the last measured drop size.



Arrangement of the A-LAS sensors
(6x A-LAS-15/90-T and A-LAS-15/90-R)



Connection of each one A-LAS sensor pair
A-LAS-15/90-T and A-LAS-15/90-R
to one electronic control unit A-LAS-CON1-4/20