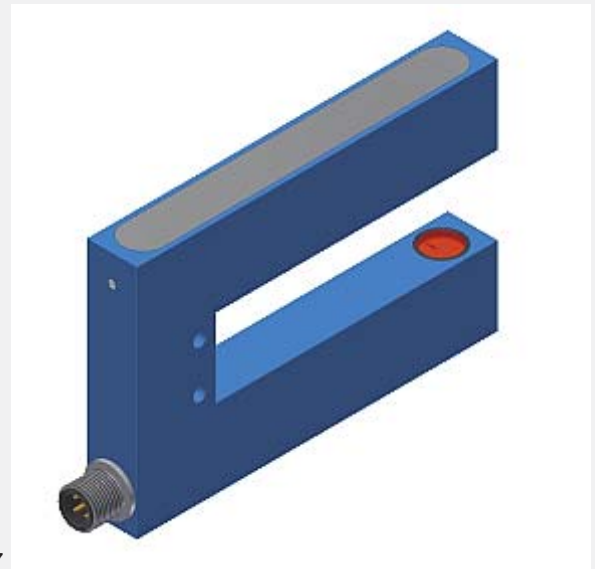


F-LAS Series

► F-LAS-16-DC-...-HS (High Speed)

- Collimated, visible red laser beam, according to selected aperture size:
 - Laser class 1** (<0.39 mW, 670 nm) or
 - Laser class 2** (<1 mW, 670 nm)
- DC operation
- **High switching frequency (typ. 200 kHz)**
- Various fork sizes and aperture sizes available
- Potentiometer either for gain setting or for adjustment of comparator threshold
- Threshold correction optionally (TC)
- Analog output (0 ... +10V)
- 4-pole M12-conn., scratch-resistant optics, sturdy aluminum housing, IP67



Design

Product name:

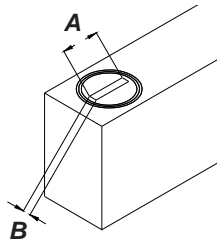
F-LAS-16-DC-(fork size)-(aperture)-(potentiometer)-(output)-HS (High Speed)

F-LAS-16-DC-(fork size)-(aperture)-(potentiometer)-(output)-TC-HS (High Speed)

Available apertures:

Rectangular apertures (AxB):

- 0.2x5** (0.2 mm x 5 mm)
- 1.5x5** (1.5 mm x 5 mm)
- 0.2x9.5** (0.2 mm x 9.5 mm)
- 0.3x9.5** (0.3 mm x 9.5 mm)
- 0.5x3** (0.5 mm x 3 mm)
- 0.8x9.5** (0.8 mm x 9.5 mm)
- 1.5x9.5** (1.5 mm x 9.5 mm)
- 2.5x9.5** (2.5 mm x 9.5 mm)
- 3x0.5** (3 mm x 0.5 mm)
- 5x0.2** (5 mm x 0.2 mm)
- 5x1.5** (5 mm x 1.5 mm)
- 9.5x0.2** (9.5 mm x 0.2 mm)
- 9.5x0.3** (9.5 mm x 0.3 mm)
- 9.5x0.8** (9.5 mm x 0.8 mm)
- 9.5x1.5** (9.5 mm x 1.5 mm)
- 9.5x2.5** (9.5 mm x 2.5 mm)



Available fork sizes:

- 25/80** (fork width A=25 mm, fork depth B=80 mm)
- 80/40** (fork width A=80 mm, fork depth B=40 mm)
- 80/65** (fork width A=80 mm, fork depth B=65 mm)
- 80/80** (fork width A=80 mm, fork depth B=80mm)
- 150/80** (fork width A=150 mm, fork depth B=80 mm)

Potentiometer:

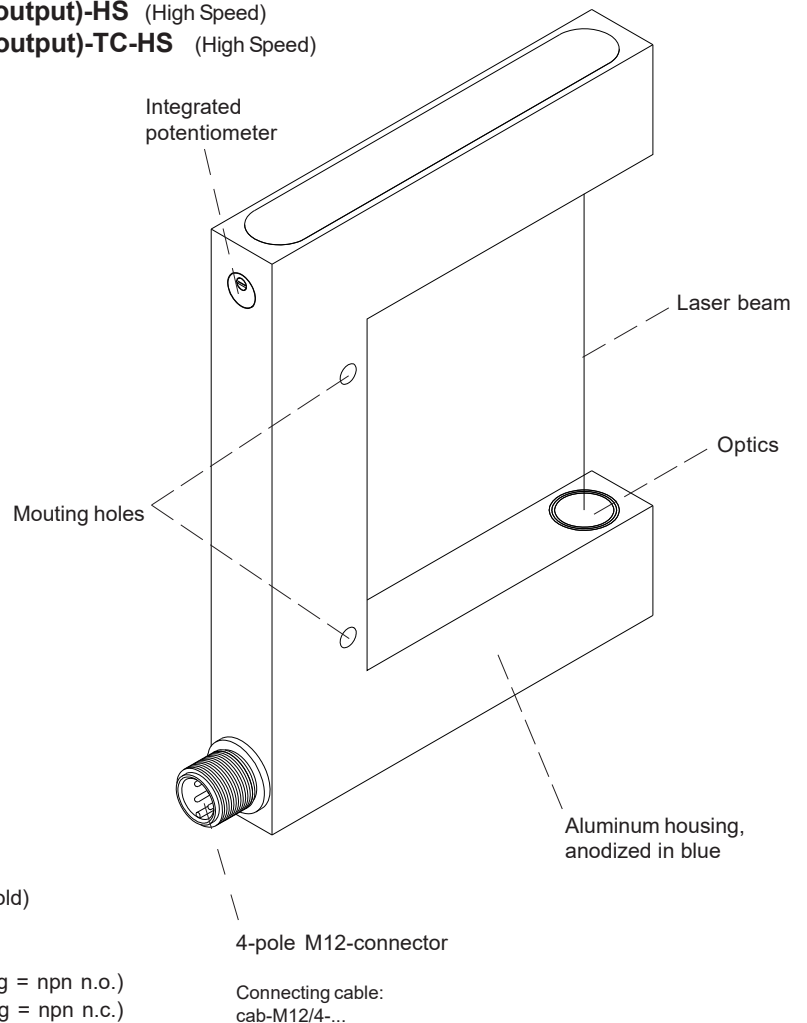
- A** (Potentiometer for adjustment of gain)
- T** (Potentiometer for adjustment of comparator threshold)

Switching output:

- Q** (pnp bright-switching = pnp n.c. / npn dark-switching = npn n.o.)
- Qinv** (pnp dark-switching = pnp n.o. / npn bright-switching = npn n.c.)

Optionally:

- TC** (threshold correction)





Technical Data

Type	F-LAS-16-DC-...-HS	F-LAS-16-DC-...-TC-HS
Laser	<p style="color: green;">With aperture size 0.2x5, 0.2x9.5, 0.3x9.5, 0.5x3, 0.8x9.5, 3x0.5, 5x0.2, 9.5x0.2, 9.5x0.3, 9.5x0.8:</p> Semiconductor laser, 670 nm, 0.39 mW max. optical power, laser class 1 acc. to DIN EN 60825-1. The use of these laser light barriers therefore requires no additional protective measures.	
	<p style="color: red;">With aperture size 1.5x5, 1.5x9.5, 2.5x9.5, 5x1.5, 9.5x1.5, 9.5x2.5:</p> Semiconductor laser, 670 nm, 1 mW max. optical power, laser class 2 acc. to DIN EN 60825-1. The use of these laser light barriers therefore requires no additional protective measures.	
Available aperture sizes	Rectangular apertures: 0.2 mm x 5 mm to 9.5 mm x 2.5 mm (cf. page 1)	
Optical filters	Interference filter and red light filter RG 630	
Min. detectable object	Analog typ. 2% of aperture size, digital typ. 1% of aperture size	
Reproducibility	Analog typ. 2% of aperture size, digital typ. 1% of aperture size, with threshold correction "TC": typ. 0.1% of aperture size	
Voltage supply	+12VDC ... +32VDC, reverse-polarity protected, overcurrent protected	
Ambient light	up to 1000 Lux	
Operation mode	DC operation	
Current consumption	typ. 60 mA	
Max. switching current	100 mA, short-circuit protected	
Digital output (1x)	Q = pnp bright-switching (pnp n.c.) / npn dark-switching (nnp n.o.) or Qinv = pnp dark-switching (pnp n.o.) / npn bright-switching (nnp n.c.) 100mA, short-circuit protection	
Analog output (1x)	0 ... +10V	
Potentiometer	either for adjustment of gain factor (A) or for adjustment of comparator threshold (T)	
Threshold correction	---	with type -TC
Switching frequency	typ. 200 kHz	
Operating temperature range	-20°C ... +50 °C	
Storage temperature range	-20°C ... +85°C	
Housing material	Aluminum, anodized in blue	
Housing dimensions	cf. pages 4 and 5	
Type of connector	4-pole M12-connector	
Current output	Max. output current with pnp-output: 2mA Max. output current with npn-output: 10mA Min. resistance to 0V (GND): 10kOhm (with pnp-output) Min. resistance to + : 2kOhm (with npn-output)	
Enclosure rating	IP67	
EMC test acc. to	DIN EN 60947-5-2	CE



Laser Warning

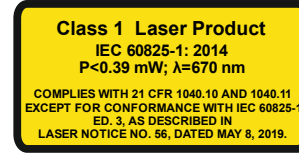
Laser class 1

is true for the following aperture sizes:

0.2x5, 0.2x9.5, 0.3x9.5, 0.5x3, 0.8x9.5, 3x0.5, 5x0.2, 9.5x0.2, 9.5x0.3, 9.5x0.8

In case that an aperture as listed above is used, the laser transmitters of F-LAS-16-DC 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.

These laser transmitters of F-LAS-16-DC series series are supplied with an information label „CLASS 1 Laser Product“.



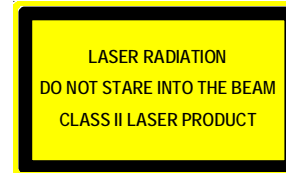
Laser class 2

is true for the following aperture sizes:

1.5x5, 1.5x9.5, 2.5x9.5, 5x1.5, 9.5x1.5, 9.5x2.5

In case that an aperture as listed above is used, the laser transmitters of F-LAS-16-DC series comply with laser class 2 according to EN 60825-1. The use of these laser transmitters therefore requires no additional protective measures.

These laser transmitters of the F-LAS-16-DC Series are supplied with a laser warning label.

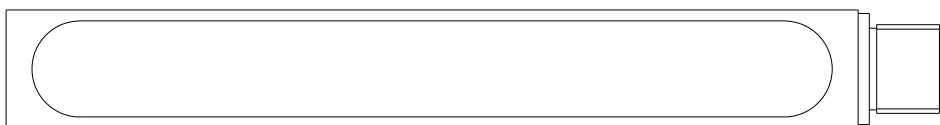
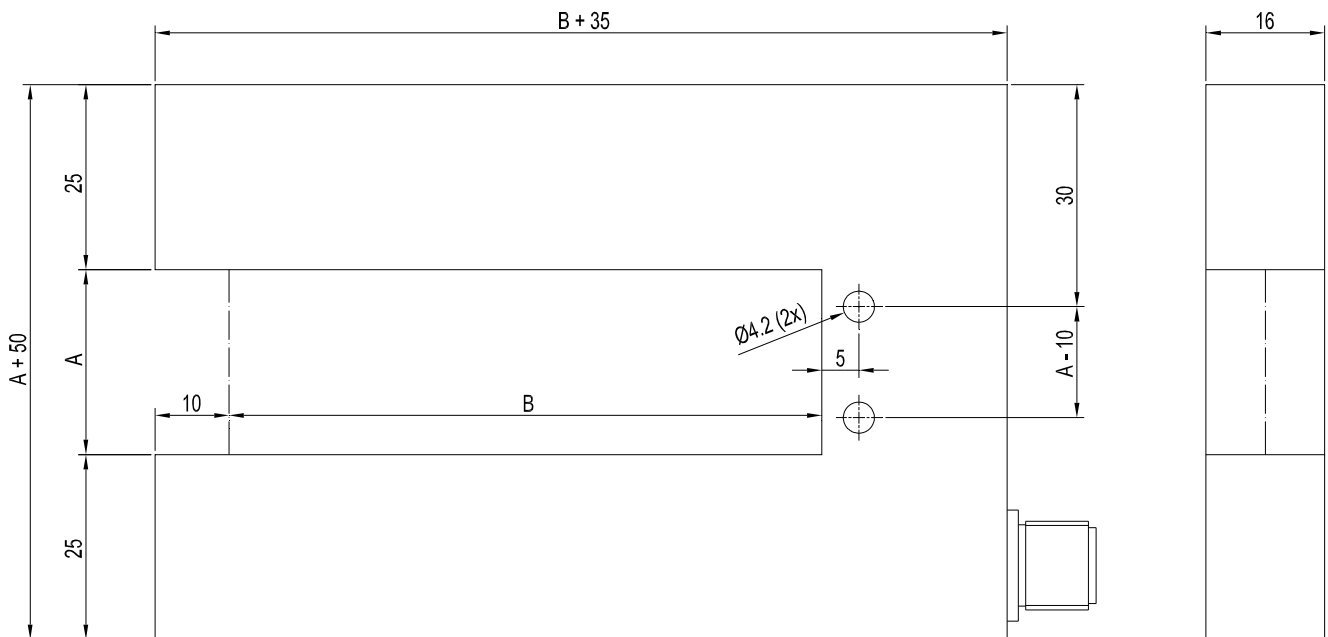
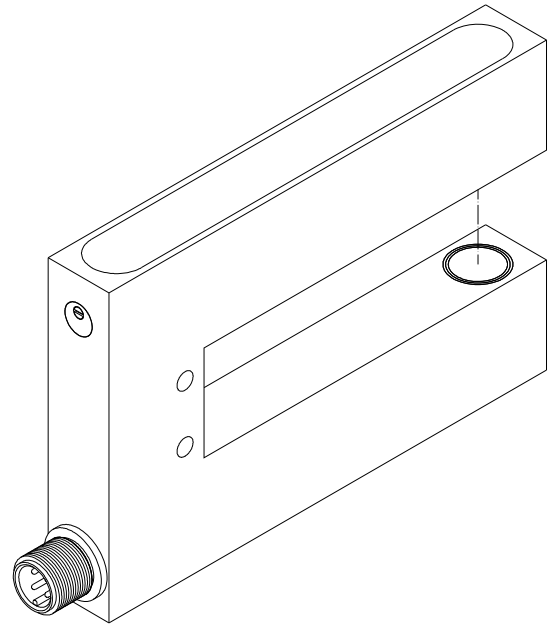




Dimensions

Type	Fork width (Dim. A)	Fork depth (Dim. B)
F-LAS-16-DC-25/80-...-HS	25 mm	80 mm

(other dimensions see next page)

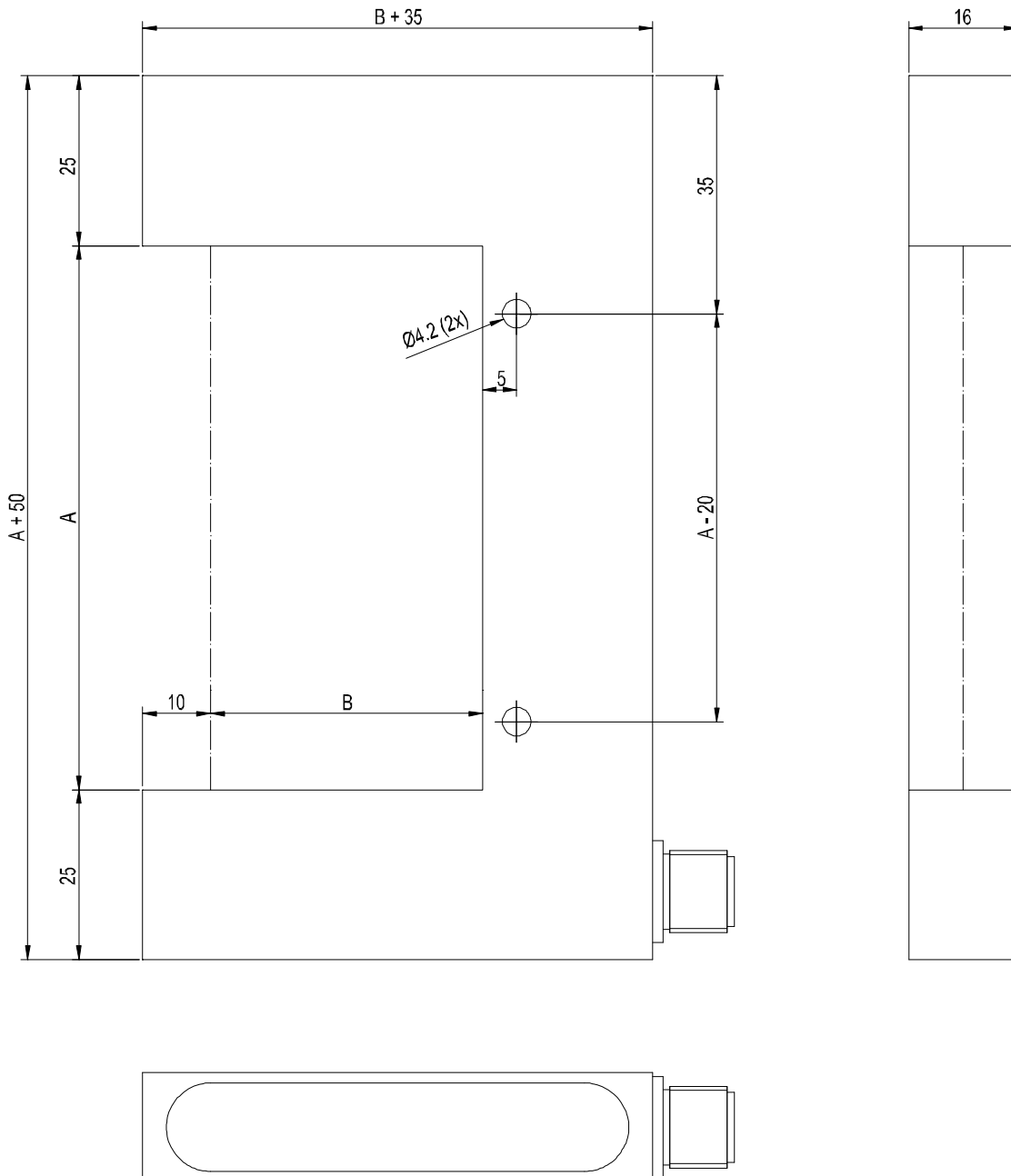


(All dimensions in mm)



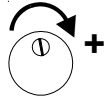
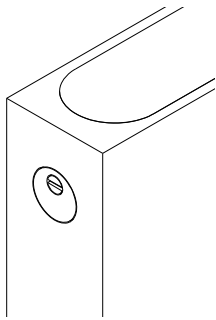
Dimensions

Type	Fork width (Dim. A)	Fork depth (Dim. B)
F-LAS-16-DC-80/40-...	80 mm	40 mm
F-LAS-16-DC-80/65-...	80 mm	65 mm
F-LAS-16-DC-80/80-...	80 mm	80 mm
F-LAS-16-DC-150/80-...	150 mm	80 mm



(All dimensions in mm)

Setting



Setting of potentiometers A respectively T:

Potentiometer for adjustment of gain (A)

Rotation clockwise: Increase of analog voltage

Potentiometer for adjustment of comparator threshold (T)

Rotation clockwise: Increase of threshold

Connector Assignment

F-LAS-16-DC-...-Q-HS
F-LAS-16-DC-...-Q-TC-HS

(4-pole M12-connector):

Pin:	Color:	Assignment:
1	brown	+Ub (+12VDC ... +32VDC)
2	white	ANALOG (0 ... +10V)
3	blue	0V (GND)
4	black	Output Q (pnp bright-switching = pnp n.c. / nnp dark-switching = npn n.o.)

F-LAS-16-DC-...-Qinv-HS
F-LAS-16-DC-...-Qinv-TC-HS

(4-pole M12-connector):

Pin:	Color:	Assignment:
1	brown	+Ub (+12VDC ... +32VDC)
2	white	ANALOG (0 ... +10V)
3	blue	0V (GND)
4	black	Output Qinv (pnp dark-switching = pnp n.o. / nnp bright-switching = npn n.c.)

Connecting Cables

Available connecting cables:

cab-M12/4-g-2	(l=2m, outer jacket PUR)
cab-M12/4-g-5	(l=5m, outer jacket PUR)
cab-M12/4-w-2	(angle type 90°, l=2m, outer jacket PUR)
cab-M12/4-w-5	(angle type 90°, l=5m, outer jacket PUR)
cab-M12/4-g-2-shd	(l=2m, shielded, outer jacket PUR)
cab-M12/4-g-5-shd	(l=5m, shielded, outer jacket PUR)
cab-M12/4-w-2-shd	(angle type 90°, l=2m, shielded, outer jacket PUR)
cab-M12/4-w-5-shd	(angle type 90°, l=5m, shielded, outer jacket PUR)

