FLB Series



FLB-MSHC-450

Metal Sheet Height Control

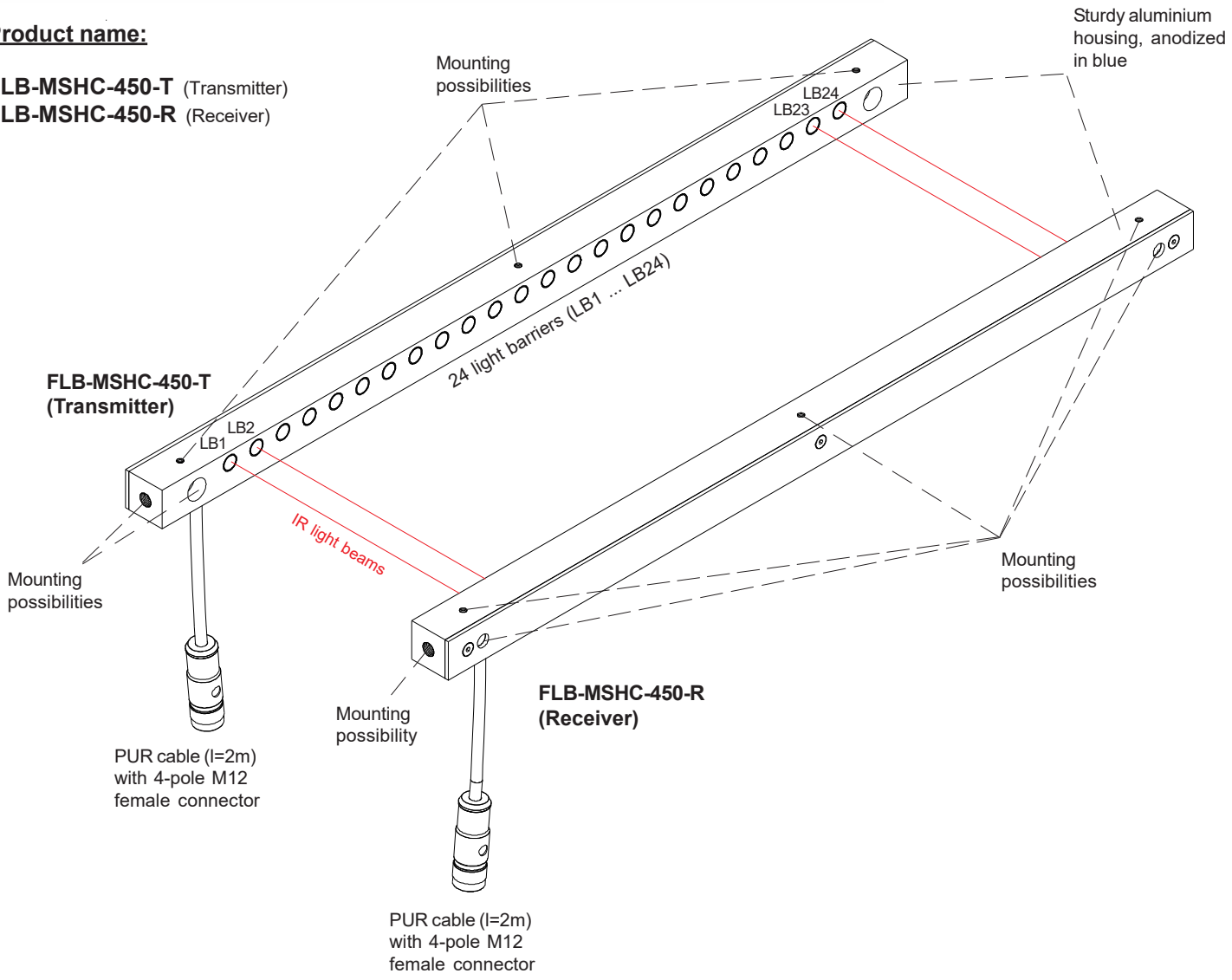
Infrared multiple light barrier for detection of punching strip position: At punching strip feed systems (unwinders) the height of the punching strip is monitored.

- Max. distance transmitter/receiver typ. 180 mm
- Monitoring range typ. 400 mm
- 24 light barriers (screen 16 mm)
- Reaction period < 1 ms
- 2 analog outputs (0 ... +10V)
- Controller integrated in the receiver

Design

Product name:

FLB-MSHC-450-T (Transmitter)
FLB-MSHC-450-R (Receiver)

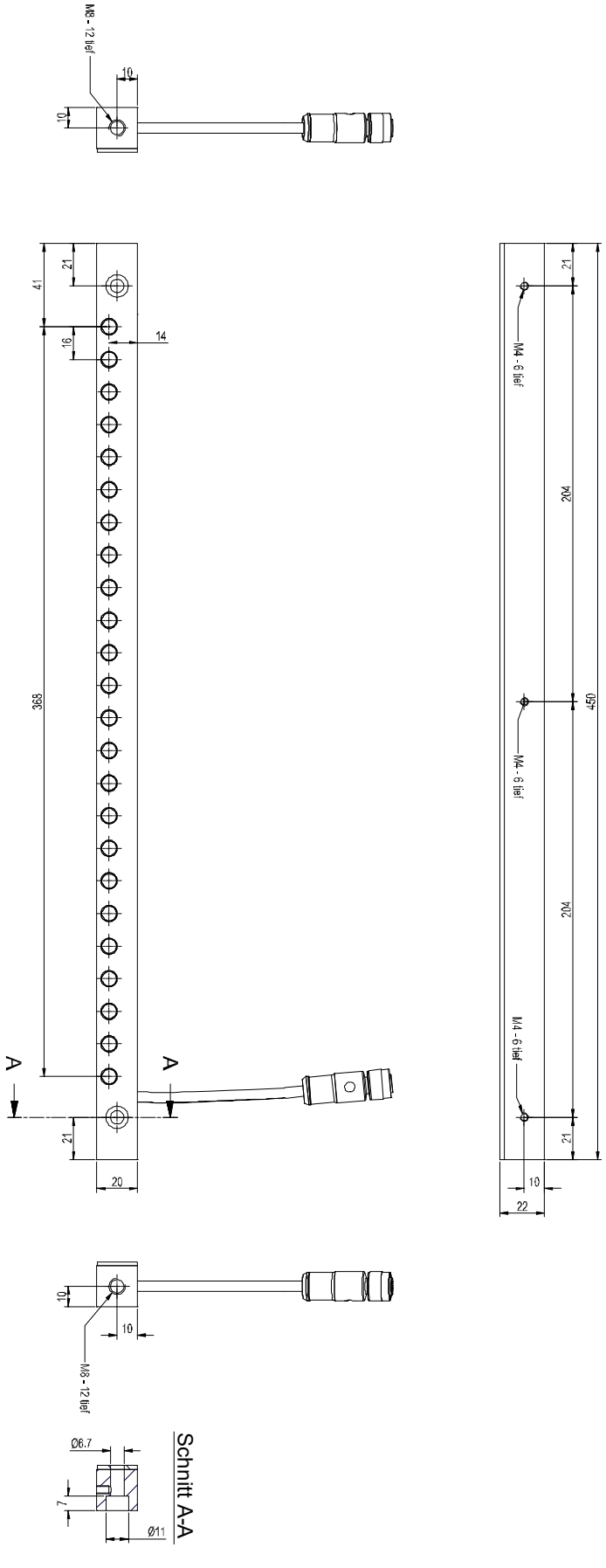


Technical Data

Model	**FLB-MSHC-450-T (transmitter) FLB-MSHC-450-R (receiver)**
Max. distance transmitter/receiver	typ. 180 mm
Monitoring range	typ. 400 mm
Transmitter	24 IR-LEDs (905 nm)
Receiver	24 photo transistors
Voltage supply	+24V ± 10%, short-circuit proof
Resolution	approx. 0,4 V (approx. 16 mm)
Optical filter	IR filter RG715
Analog outputs (2x)	ANA1 and ANA2: 0 ... +10V
Band width analog signals	1 kHz
Current consumption	< 350 mA
Aperture size of receiver	24x circular aperture: Ø 1 mm
Enclosure rating	IP67
Operating temperature range	-20°C ... +50°C
Storage temperature range	-20°C ... +85°C
Housing material	Aluminium, anodized in blue
Dimensions	FLB-MSHC-450-T (transmitter) and FLB-MSHC-450-R (receiver): each LxWxH approx. 450 mm x 20 mm x 22 mm
Connecting cables	FLB-MSHC-450-T and FLB-MSHC-450-R: each PUR-cable of 2 m length with 4-pole M12 female connector
EMC test acc. to	DIN EN 60947-5-2 CE
Scan frequency	typ. 50 kHz

Dimensions

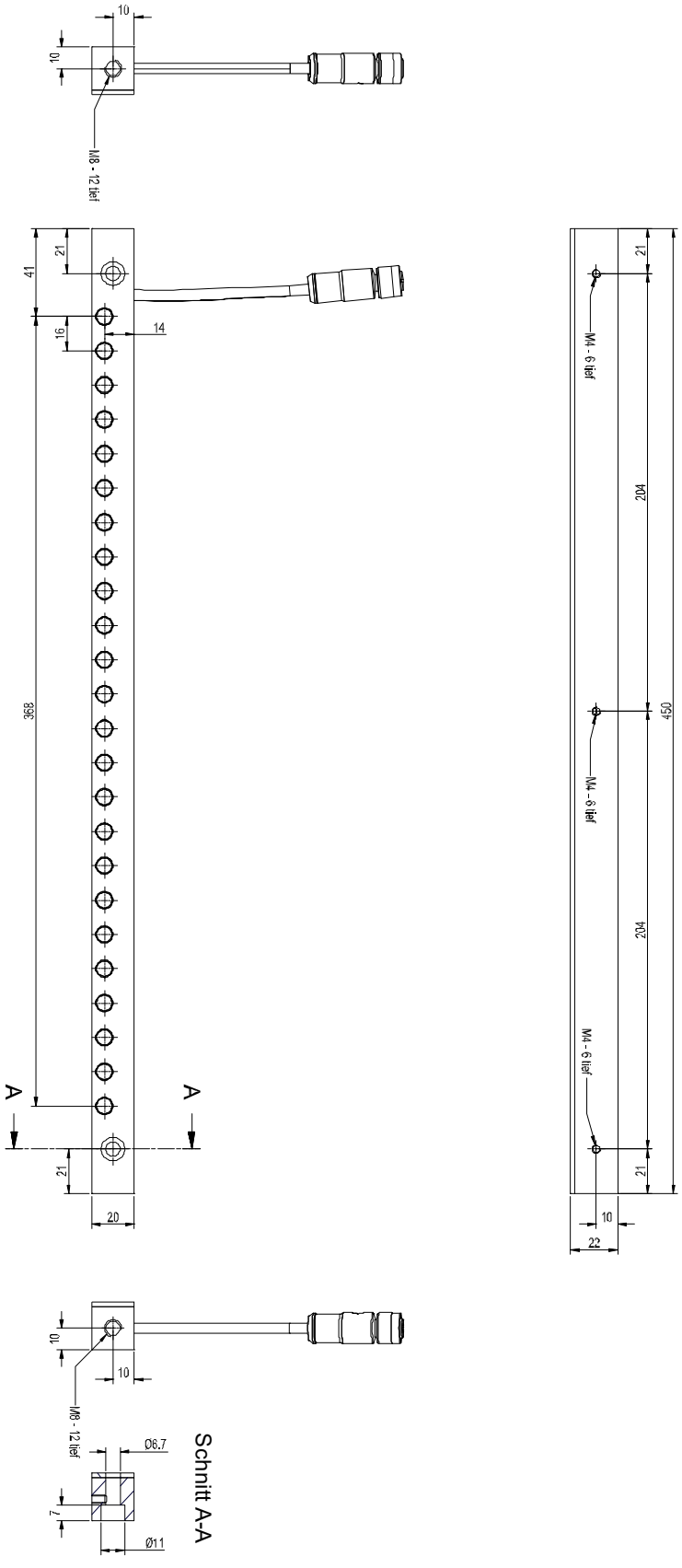
FLB-MSHC-450-T (Transmitter)



All dimensions in mm

Dimensions

FLB-MSHC-450-R (Receiver)



All dimensions in mm

Measuring Principle

24 light barriers that are uniformly distributed over 400 mm are used, which results in a grid of 16 mm. IR-LEDs with low divergence are used as transmitter diodes, which guarantees that there is no mutual influencing of the light barriers.

24 phototransistors are used as receivers, the receiving area is limited to approx. 1 mm. The phototransistors are set back in order to additionally increase the aperture effect. The individual light barriers are not modulated in order to achieve as high a measuring frequency as possible. Outside light suppression rather is effected by IR filtering (glass cover with IR filter and additional IR filter at the phototransistors).

The individual phototransistors are read by the controller that is integrated in the receiver with a frequency of approx. 50 kHz.
When the individual light barriers are covered, two analog signals ANA1 and ANA2 are generated in the controller. The values of the analog signals are coupled to the respective interrupted light barrier.

The analog values are divided into 24 steps: With each step the analog value of ANA1 increases by approx. 0.4 V, and the analog value of ANA2 decreases by approx. 0.4V.

When the lowest light barrier LS1 (see drawing on page 1) is interrupted (also in case of short-time interruption), the analog value of ANA1 increases to 0.4 V, and the analog value of ANA2 decreases to 9.6 V. When the second light barrier LS2 is interrupted, ANA1 increases to 0.8V, and ANA2 decreases to 9.2. V, etc..
The value is maintained at the analog outputs until one of the 24 light barriers is interrupted again.

After initialisation, the analog value of ANA1 = 0V, and the analog value of ANA2 = 10V.
The bandwidth of the analog outputs is 1 kHz.

The sensor system consists of a transmitter unit FLB-MSHC-450-T (approx. 450 mm x 20 mm x 22 mm, aluminium) and a receiver unit FLB-MSHC-450-R (approx. 450 mm x 20 mm x 22 mm, aluminium).

The complete electronic evaluation module is integrated in the receiver unit. Two analog signals ANA1 and ANA2 (0 ... +10V) are provided at the 4-pole M12 socket, transmitter and receiver unit are supplied with +24 V ± 10%.

Connector Assignment

FLB-MSHC-450-T (Transmitter):

Asssignment 4-pole M12 female connector

Pin:	(Color):	Assignment:
1	(brn)	+Ub
2	(wht)	not connected
3	(blu)	GND (0V)
4	(blk)	not connected

FLB-MSHC-450-R (Receiver):

Assignment 4-pole M12 female connector

Pin:	(Color):	Assignment:
1	(brn)	+Ub
2	(wht)	ANA1
3	(blu)	GND (0V)
4	(blk)	ANA2