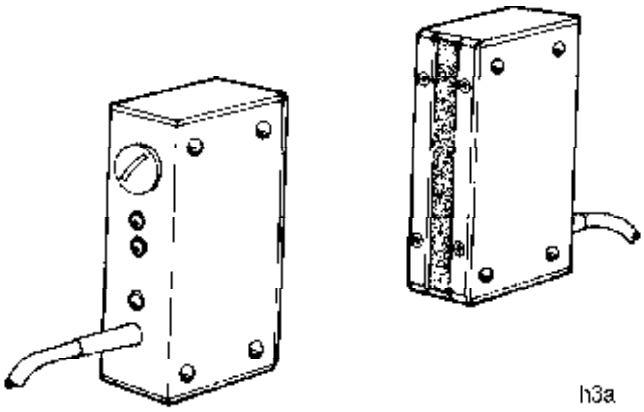
Proxitron
Sensoren für Automation

Piros Light Grid System
LAH / LSH

The exactitude of measuring the lengths of pipes is influenced by the reproducibility of determining the first and the second pipe end. By means of the Piros light grid pipes are safely detected independent from varying pipe diameters, whereas in case of one-beam light barriers adjustment would always be required. Simple starting-up, high exactitude in repetition and safe integrated fault control were requested as precondition for reversing operation of a pipe adjustment.



The light grid LH operates as one-way light barrier with 10 individual paths at the spacing of 8 mm. The invisible infrared radiation between sender and receiver scans a height of 75 mm for entering material.

In connection with a barrier width of e. g. 1400 mm a supervised area of 75 mm x 1400 mm results.

In case of mode of operation 1 the smallest object which can safely be detected must have a diameter of 15 mm. Then outlet 1 (LED yellow) is activated by interrupting at least two neighbor paths. In case of this mode of operation outlet 2 (LED red) can be used as dirt indication: Outlet 2 opens with a delay of 1 second after interruption of one path and closes 10 ms after elimination of the trouble. For mode of operation 0 the object size must be at least 30 mm in diameter.

The output 1 can be switched over from light switching to dark switching (normally-closed / normally-open). Both outlets are short-circuit-proof and over-load-proof. If so the red and the yellow LED give intermittent light.

Notes: The receiver is synchronized by the wire colors yellow and beige for reproducibility's sake. These lines should be led on the shortest possible way.

For perfect functioning of the light grid exact alignment towards all directions is required. The green LED serves as adjustment help and lightens brightly as soon as the 10 paths are installed without any interruption.

Depending of the measuring frequency which is adjustable by the incorporated potentiometer the switching evaluates the number of the interrupted light pulses. Therefore for increasing the trouble safety a minimum measuring frequency is recommended as the case of application makes this possible.

Potentiometer and the switch for the modes of operation are installed behind a protective cap.

Works picture: Mannesmannröhren Werke

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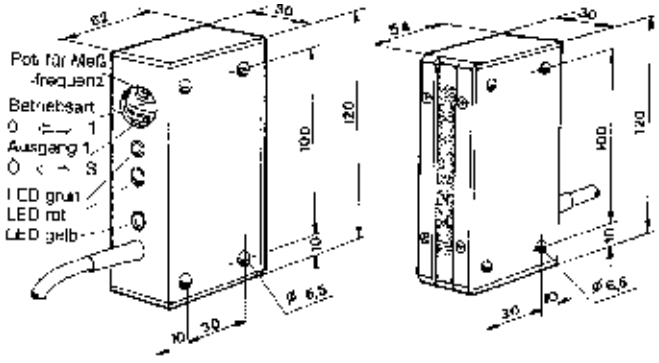
Technical Data

	Sender	Receiver
Type	**LAH 050.1**	**LSH 050.18**
Art.-No.	5007A	5008A
Voltage	20 - 28 V DC	20 - 28 V DC
Barrier width	500 mm	500 mm
Connection	3 m cable	1,5 m cable

Type	**LAH 050.2**	**LSH 050.28**
Art.-No.	5007B	5008B
Voltage	10 - 15 V DC	10 - 15 V DC
Barrier width	500 mm	500 mm
Connection with cable-plug Binder	3 m cable 5-Terminals	1,5 m cable 7-Terminals

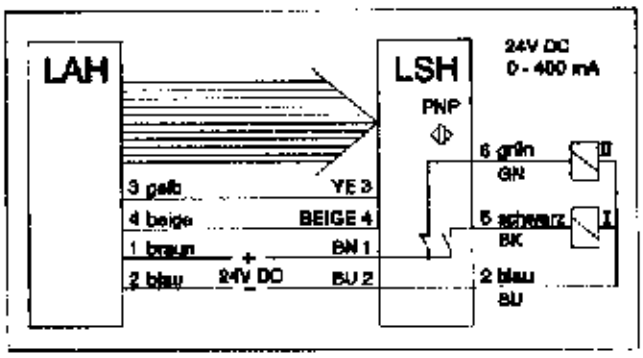
Type	**LAH 140.1**	**LSH 140.18**
Art.-No.	5007C	5008C
Voltage	20 - 28 V DC	20 - 28 V DC
Barrier width	1400 mm	1400 mm
Connection	3 m cable	3 m cable

Barrier height	75 mm
Number of paths	10
Spacing	8 mm
Housing material	Aluminum
Enclosure rating	IP 67
Ambient temperature	-25 ... +70 °C
Current consumption	sender 100 mA receiver 30 mA
Ripple	max. 15%
Output 1 (operation) programmable	PNP n.o. / n.c. dark/bright switching
Output 2 (trouble indication)	PNP norm. closed bright switching
Constant current	0 - 400 mA
Short-time load current	2A / 10 ms 0,8 A / 100 ms
Short circuit protected	yes
Voltage drop	2 V
Pulse frequency	1000 Hz
Measuring frequency, adjustable (switching time, adjustable)	10 upto 400 Hz (50 upto 1,25 ms)
Object size min., mode 1 Object size min., mode 0	15 mm ∅ 30 mm ∅
Weight	



Receiver LSH Sender LAH

Diagram of Connections



Switching times

The switching output of the light grids is effected with time delay after an object entered the scanning area. This time delay consists of several components:

a: The grid consisting of 10 light barriers is cyclically pulsed with a frequency of approx. 1 kHz. (Each individual barrier sends a time-staggered light pulse of approx. 50 µs at a break of 950 µs.) Thus a systematic scanning error is produced between the time-random inlet/outlet from the grid and the electronic detection. This error can amount to upto 1 ms and can differ for each switching process.

b: Dependent on the fixed adjustment of the potentiometer for the safety factor (integrated filter) an additional delay results between electronic detection and switching output. This delay is nearly identical for the switching-on and the switching-off process and remains constant. When the potentiometer is turned to the clockwise end, the delay is approx. 1,5 - 2 ms (lowest trouble safety). When the potentiometer is turned to the other end, the delay is approx. 22ms (highest trouble safety).

Compared with the a.m. times the switching slopes of the quick final stages of semi-conductors are not relevant.