

High Range self-checking Transmitter-Receiver Light Barrier PP2126/4

Operating Instructions

1. Function

The purpose of the high range self-checking transmitter-receiver light barrier PP2126/4 is to turn off an operating machine when its light beam is interrupted.

By means of one or two tilted mirrors an angular or straight protection zone is created with two beams, one above the other (to prevent creeping underneath for example).

2. Description of the appliance

The high range light barrier consists of a transmitter PP2126/4S and a receiver PP2126/4E, each in its own housing.

Each appliance part has its own power supply.

The transmitter has a control optoelectronic coupler. To operate, this coupler must be connected by means of terminals to the appliance's supply voltage, whereby the transmitter is activated.

The receiver contains in addition to the evaluation electronics a pair of mutually-monitoring relays which supply the output contacts.

3. Functional description

The transmitter delivers pulse packages of approx. 10 ms duration which are followed by a pause of approx. 2 ms. Out of this, the receiver generates a square wave of about 6:6 ms. By means of dynamic evaluation, this activates the two mutually monitoring relays referred to in the above.

The relays can only be energized if *one* PP2126S transmitter is in proper alignment with the receiver and the light beam is not interrupted.

Just any other light transmitter would not be suitable for energizing the relay. No second light transmitter may shine into the receiver's light collector either; the relays would either be de-energized completely or at least switch over periodically if this is not prevented anyway by the restart disabling described in the appendix.

The transmitter has a red light diode to check functioning while the receiver has green light diodes which indicate which of the two output relays is energized. If functioning properly, both LED's will be on or both will be off. If only one green LED is on, it will not be possible to obtain an output contact.

If the optical performance is very weak (too great a distance, faulty adjustment, contamination of the lenses etc.), the relays may switch over periodically or in very rare cases only one relay is energized. If the defects still persist after whatever adjustments are necessary to the interruption of the light beam and after restarting, the cause must be established and the defect eliminated.

The receiver also has a "DIANA" level indicator, four additional LED's which serve as adjustment aids and controls on the state of reception performance. With DIANA the input level can be estimated to approx. 25 times the response threshold.

4. Assembly

Transmitter, receiver and perhaps up to two tilted mirrors are mounted at the locations intended. We urgently recommend the use of adjusting flanges or angles, especially where tilted mirrors are used. Transmitters and receivers should not be exposed to any steep-edged vibrations; they may need to be provided with a rubber-metal connection.

The following are the most important assembly criteria:

- The monitoring light beam and the protection zone must be so far apart that the monitored machine comes to a standstill before the person who has penetrated the protection zone can reach the point of danger.
- It should not be possible to evade the protection zone, either from above or below or from the side without interrupting the light beam.
- It must be possible to see into the protection zone from the machine's control desk.

5 Optical Adjustment (light-beam method)

Both appliances must be adjusted according to the light-beam method (see appendix I). A strong lamp (storage-battery projector) and the JH2 adjusting aid are necessary for this. Lasers are of no use in this adjustment method! As after unscrewing the housing lid, the view onto the transducer benches is free, it might be possible to dispense with the JH2 adjustment aid. Adjustment can be optimized with the DIANA level indicator also. If all four DIANA LED's light up, one lens should be covered so that only one LED is still lit; optimization is done again now. After adjustment, any lens cover there must be removed!

In all cases both transmitter *and* receiver must be adjusted.

If tilted mirrors are used, these must also be adjusted in accordance with the light-beam method.

6. Connection

The operating voltage in transmitter and receiver is applied to the **terminals 1 and 2**. (In the DC version: Terminal 1 =+, Terminal 2 = 0V.)

Terminals 3 and 4 of the transmitter serve to control an optoelectronic coupler which receives the same voltage with which the transmitter itself is operated. The electronics following the activated optoelectronic coupler enable the dynamic blanking-out of the transmission diode.

The (monitored) make contacts **on terminals 5/6 and 7/8** of the receiver control suitable self-monitoring sequential switching which controls the machine.

This sequential switching should contain restart disabling; an easy-to-implement solution with guided relay is shown in figure 1 in the appendix "Restart disabling". This self-monitoring switching is also immune to a situation where the start button S gets stuck; the starting test must be carried out manually, however, by interrupting the light beam.

A more comfortable but much more costly method is the switching shown in figure 2, which is created with six guided relays, restart disabling and starting test with simultaneous monitoring of all relays and start button.

Caution:

- **The make contacts which lie on terminals 5/6 and 7/8 must always be used together in series switching!**
- **The receiver's break contacts (terminals 3 / 4) in independent switching circuits may only be used for signaling purposes as they are not proof against line break.**
- **The light barrier's output contacts must be protected with a maximum of 6A fuses.**

The relevant regulations must be observed!

7. Starting operation

After assembly, adjustment and application of operating voltage, the light barrier can be put into operation, whereby the optoelectronic coupler in the transmitter is activated by applying the operating voltage to the corresponding terminals 3 and 4 in the transmitter.

If the appliance is operated with the additional control as in figure 2, the output contacts are operated as change-over contacts. The light barrier is turned on with the start button S, it tests itself for an interruption in the light path and switches on again. When the start button is activated, the working relay A can be energized.

8. Accessories (optional, not standard):

Heavy adjustment flange R27SH	#8645 (2 nos. are requested (Transmitter and Receiver))
Elbow tube adjustment AD27SS1	#8643 (2 nos. are requested (Transmitter and Receiver))
Elbow tube adjustment AD27SS2	#8644 (2 nos. are requested (Transmitter and Receiver))
Anti dust tube TUB46	#8531 (2 nos. are requested (Transmitter and Receiver))
Cooling water flange KW27	#8852 (2 nos. are requested (Transmitter and Receiver))
Deflection mirror Sp100x100	#7201
Diaphragms	
Optical filters	

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