

Light Barriers

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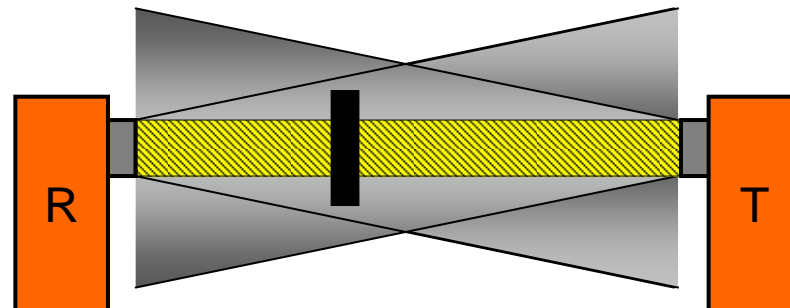
<http://www.pauly-lichtschranken.de>



Transmitter-Receiver Light Barrier

Benefit:

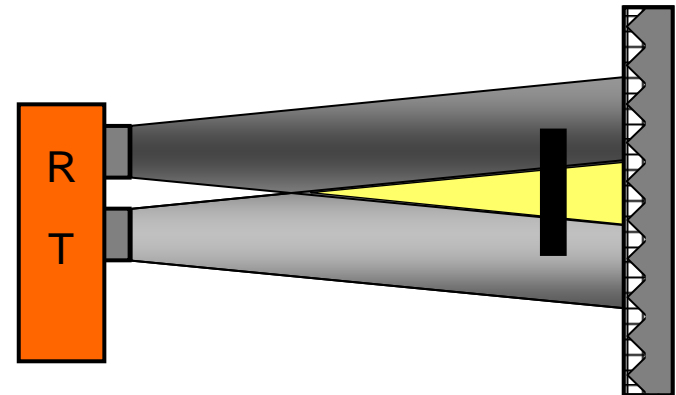
- ✓ Highest possible optical power
- ✓ High optically operating distances
- ✓ Constant resolution as long as the distance is



Reflex light barrier

Benefit:

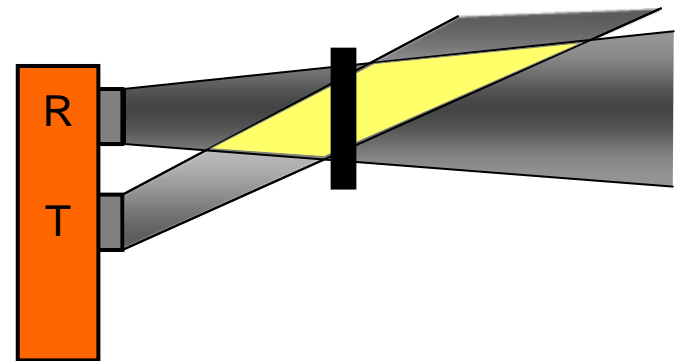
- ✓ Only one housing with active components
- ✓ Reflector as the passive component
- ✓ High operating distances up to 35 m and more



Reflection light scanner

Benefit:

- ✓ Direct surface scanning
- ✓ Only one housing for the active component
- ✓ Variable and adjustable scan distance



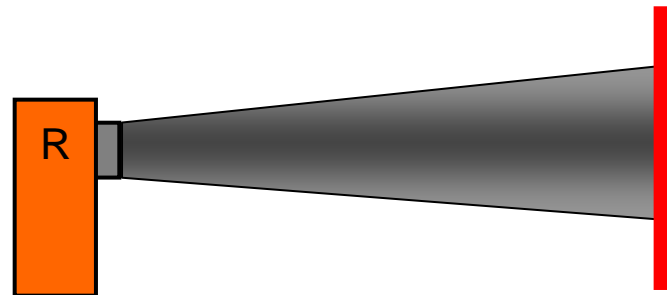
Heat Radiation Detector

Benefit:

- ✓ Detection of heated objects
- ✓ Detection temperature greater than or equal to 450 °C

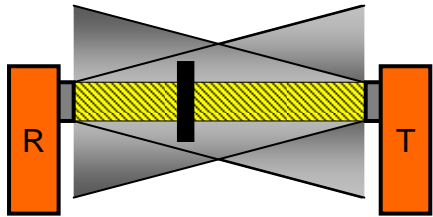


(e. g. PP5520/2)

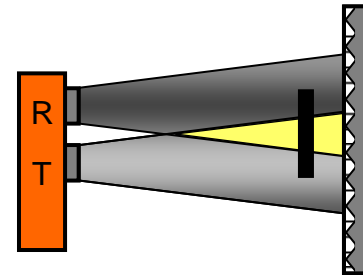


Summary – 4 kinds of light barriers

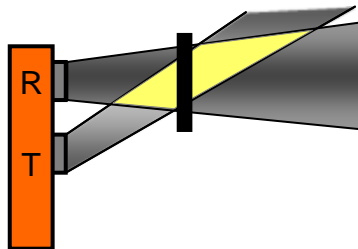
Transmitter/ Receiver light barrier



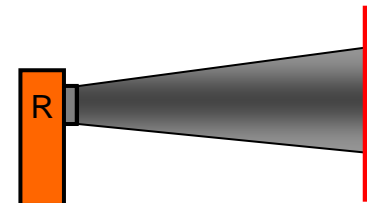
Reflex light barrier



Reflection light scanner



Heat radiation detector



Overview – Transmitter/Receiver Light Barrier



PP 2004



PP 2009/3
PP 2109/2



PP 2092/2
PP 2192/2

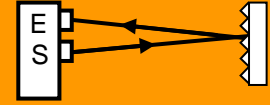


PP 2172

Type	B-No	Working distance	Transmitter
PP 2004	1620	200 m (400 m Tele)	free running
PP 2009/3	1612	120 m (200 m Tele)	forced synchronization
PP 2109/2	1697	120 m (200 m Tele)	free running
PP 2092/2	1661	80 m	forced synchronization
PP 2192/2	1665	60 m	free running
PP 2005 K	1624	100 m	free running
PP 2005 M30	1636	40 m	forced synchronization
PP 2172	1675	20 m	free running
PP 5	1685	5 m	forced synchronization
Many optical heads with external control units			



Overview – Reflex Light Barrier



JP 191 B
JP 193
JP 193-1



JP 177
JP 171/2



JP 705

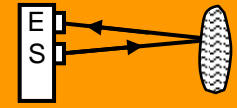


Yv R26/2 mit
PP 20110-2

Type	B No	Operating distance with reflector G85	Operating distance with reflector GR50S	Characteristics
JP 102/3	1103	50 m	140 m	Infra-red
JP 103/3	1102	35 m	70 m	Infra-red or red light
JP 191 B	1161B	25 m		Red light
JP 193	1167	12 m		Red light, Polarization filter
JP 193-1	1166	5 m		Red light, Polarization filter, close-up range
JP 177	1087	4 m		Red light, Polarization filter
JP 171/2	1181	12 m		Red light
JP 5	1116	1,5 m		Infra-red
JP 53	1117	1,5 m		Red light, Polarization filter
JP 705	1170	6 m		Infra-red
Yv R26/2	3331	25 m	50 m	Infra-red or red light, control unit PP 20110-2



Overview – Reflection Light Scanner



ET 103/2000



ET 192/800
JP 192/800



JP 705 XL



JP 105 RFZ .4



JP 103 RFZ



JP 103 RFZ Tele



JP171 NT 62



Yv RFZ.8 R26/2

Type	B No	Operating distance	HGA	Character.
ET 103/2000	1202	300...2000...(3000) mm, adjustable	active	Infra-red
ET 192/800	1268	25...1000 mm, adjustable		
JP 192/800	1267	800 mm, not adjustable	passive	
JP 705 XL	1270	100 / 200 / 300 mm, (or)		
JP 105 RFZ.4	1420	50...400 mm, not adjustable		
JP 104 RFZ.7	1440	50...700 mm, not adjustable		
JP 103 RFZ ... PRFZ 13	1450	100...1300 mm, not adjustable		
JP 103 RFZ Tele	1452	1200...3000 mm, not adjustable		
JP 171 NT 62	1381	62 mm, not adjustable, close-up r.		
Yv RFZ.8 R26/2	3334	100...800 mm, not adjustable, control u.	Infra-red	

HGA: background suppression



Hole detector - Overview



PP 2441(q)/220 R28

Hole detector series PP 2441 ...,

- Working with infra-red light
- Various watching heights available
- High optical power, operating distances up to 4 m are possible with high performance against pollution
- High speed switching, Option “q” is available (approx. 2 ms)
- To be used for detection of hole marked welded seams in the strip producing industry

Type	B No	Operating distance	Smallest hole diameter at strip speed 350m/min	Watching height
PP 2441(q) /88 R26	4311	4 m	2 mm	88 mm
PP 2441(q) /154 R27	4312	4 m	2 mm	154 mm
PP 2441(q) /220 R28	4313	4 m	2 mm	220 mm
PP 2441(q) /308 R153	4314	4 m	2 mm	308 mm
PP 2441(q) /H AI	4315	4 m	2 mm	customized



Heat Radiation Detector



PP 5510/2



PP5520/2



PP5520/2 Tele



PP5522/2 with GGFK

Type	B No	Detectable Temperature	Comment
PP 5510/2	4210	> 450 °C	
PP 5520/2	4220	> 500 °C	
PP 5522/2	4222	> 500 °C	Glass fiber operation
PP 5525/2 *01	4225M1	> 600 °C	

➤ Object scanning under heavy conditions are possible, e. g. strong steam.



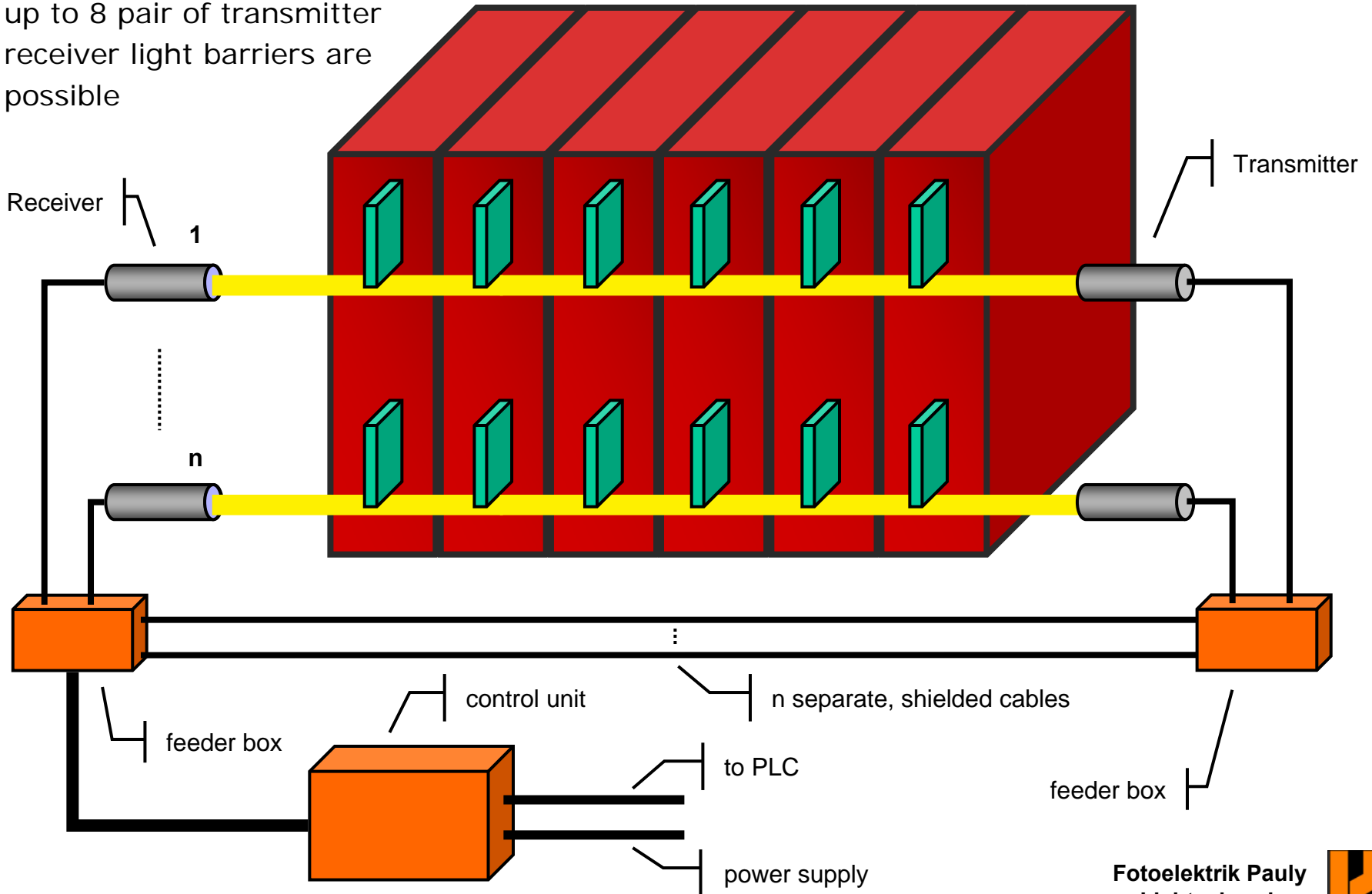
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Light barriers for hazardous locations in the Coking Plant

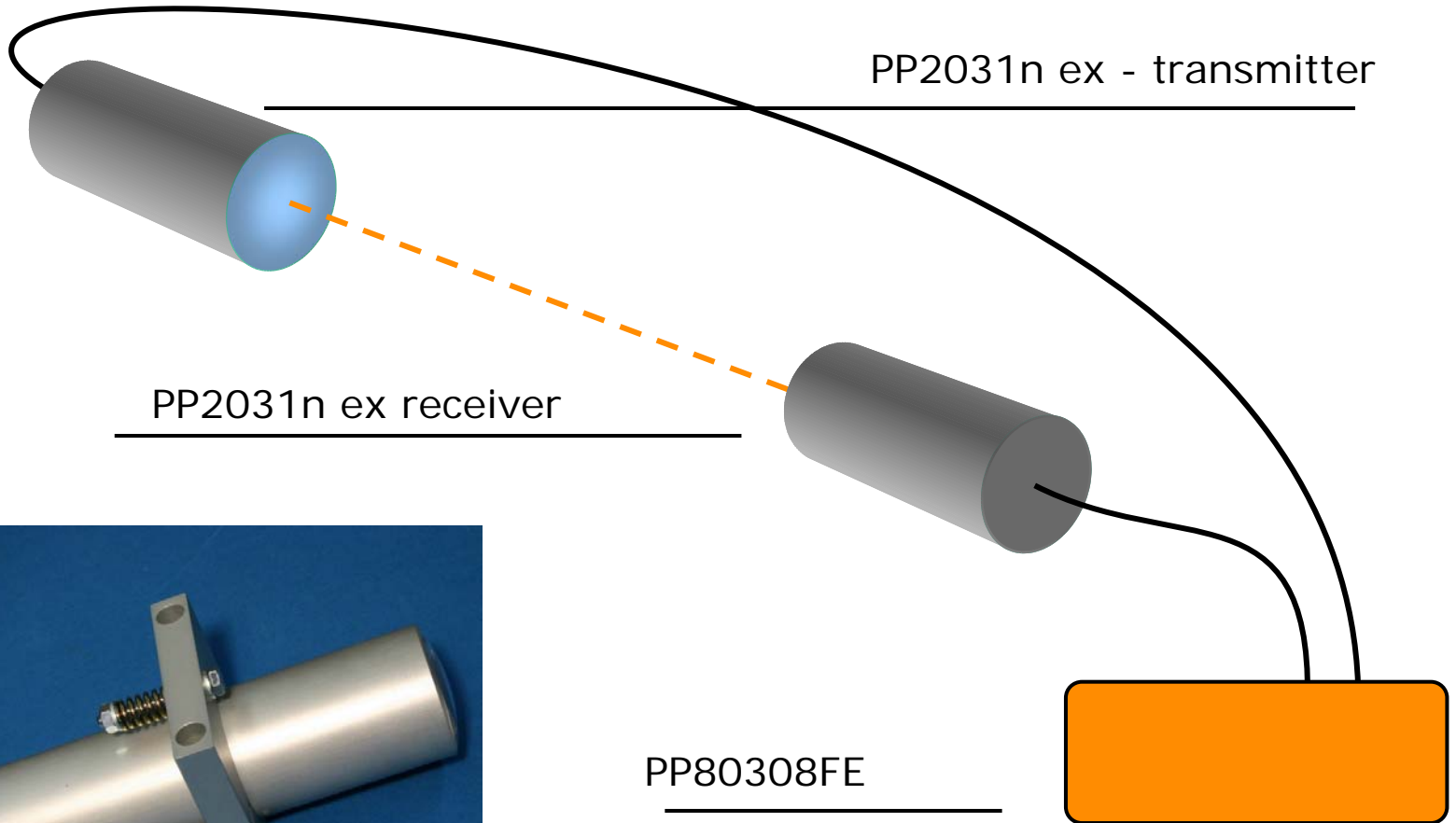


coking plant – flap control

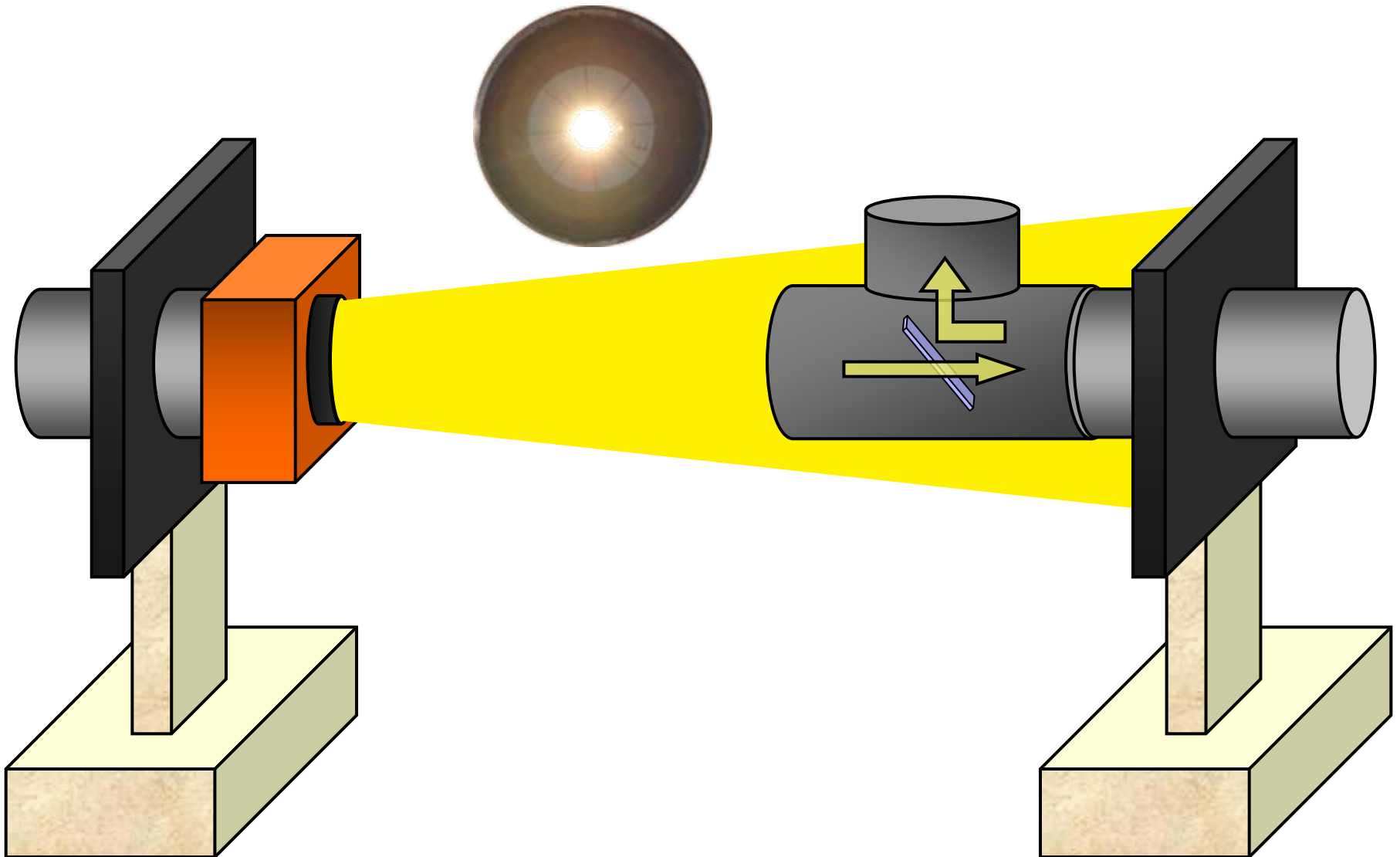
up to 8 pair of transmitter
receiver light barriers are
possible



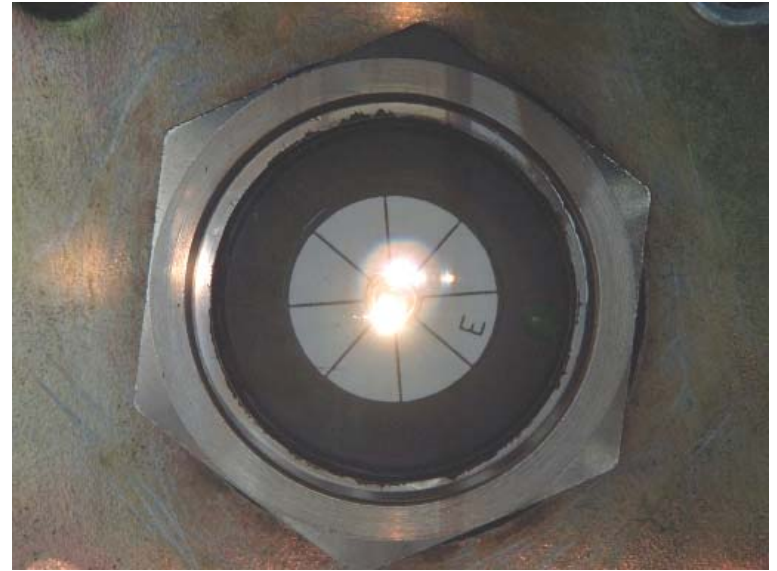
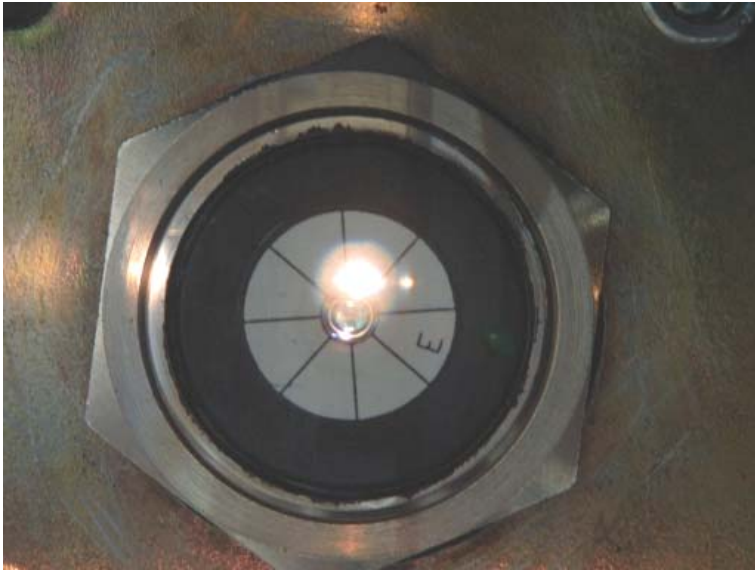
Coking plant



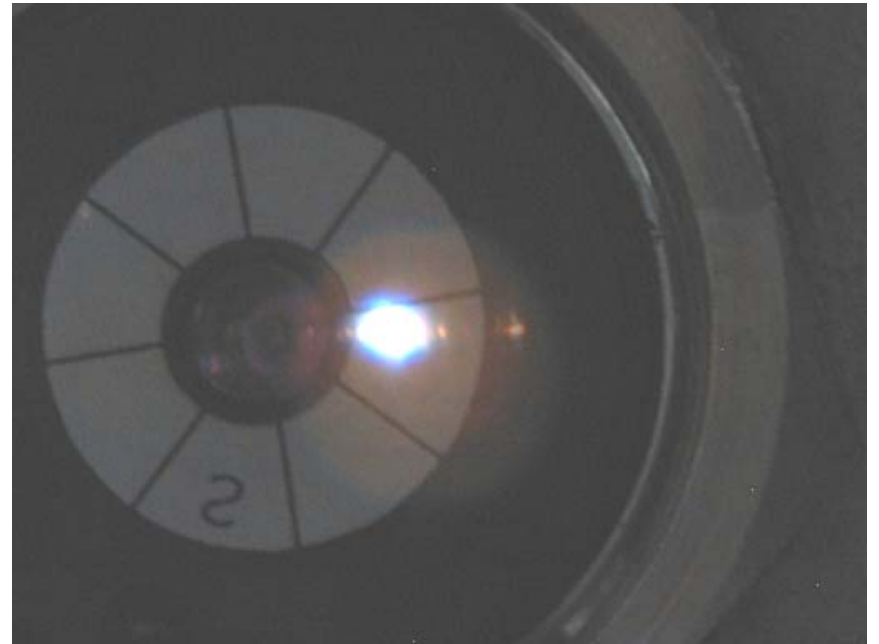
Adjustment – Transmitter/Receiver Light Barrier



Fotos 1



Fotos 2



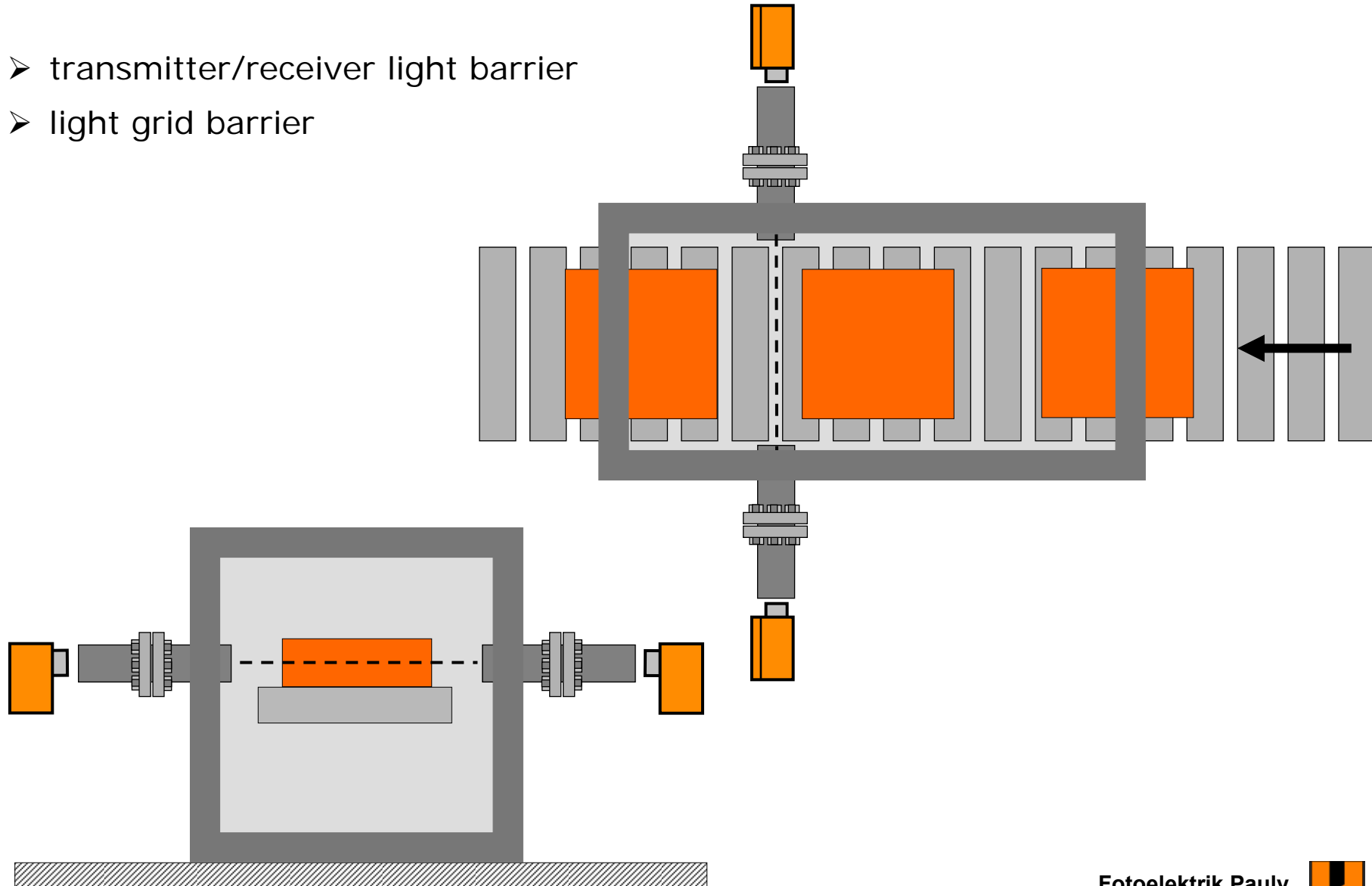
Several examples for the material
detection in the steel making industry
with light barriers



Material tracking in a furnace – horizontal



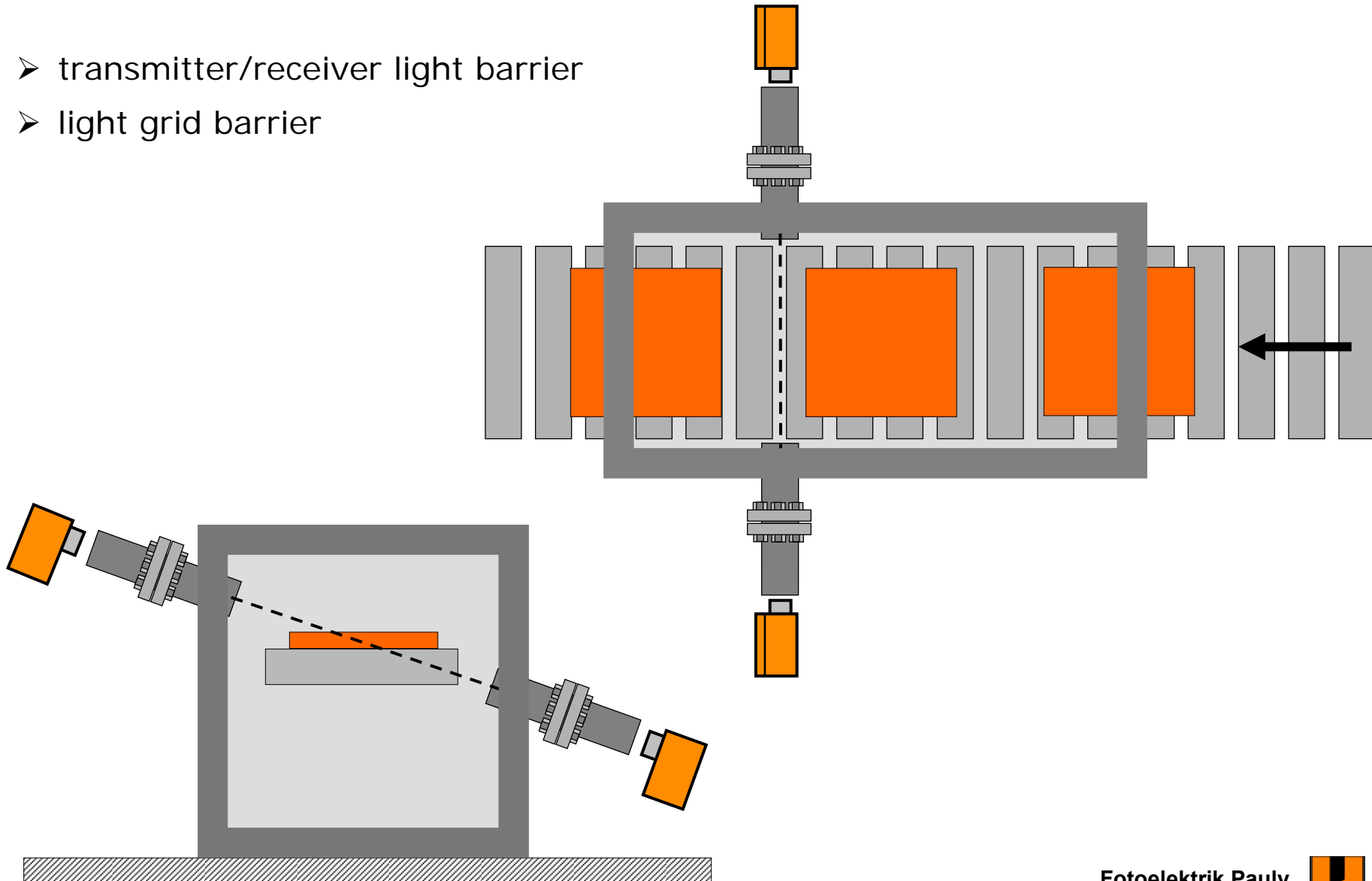
- transmitter/receiver light barrier
- light grid barrier



Material tracking in a furnace – diagonal

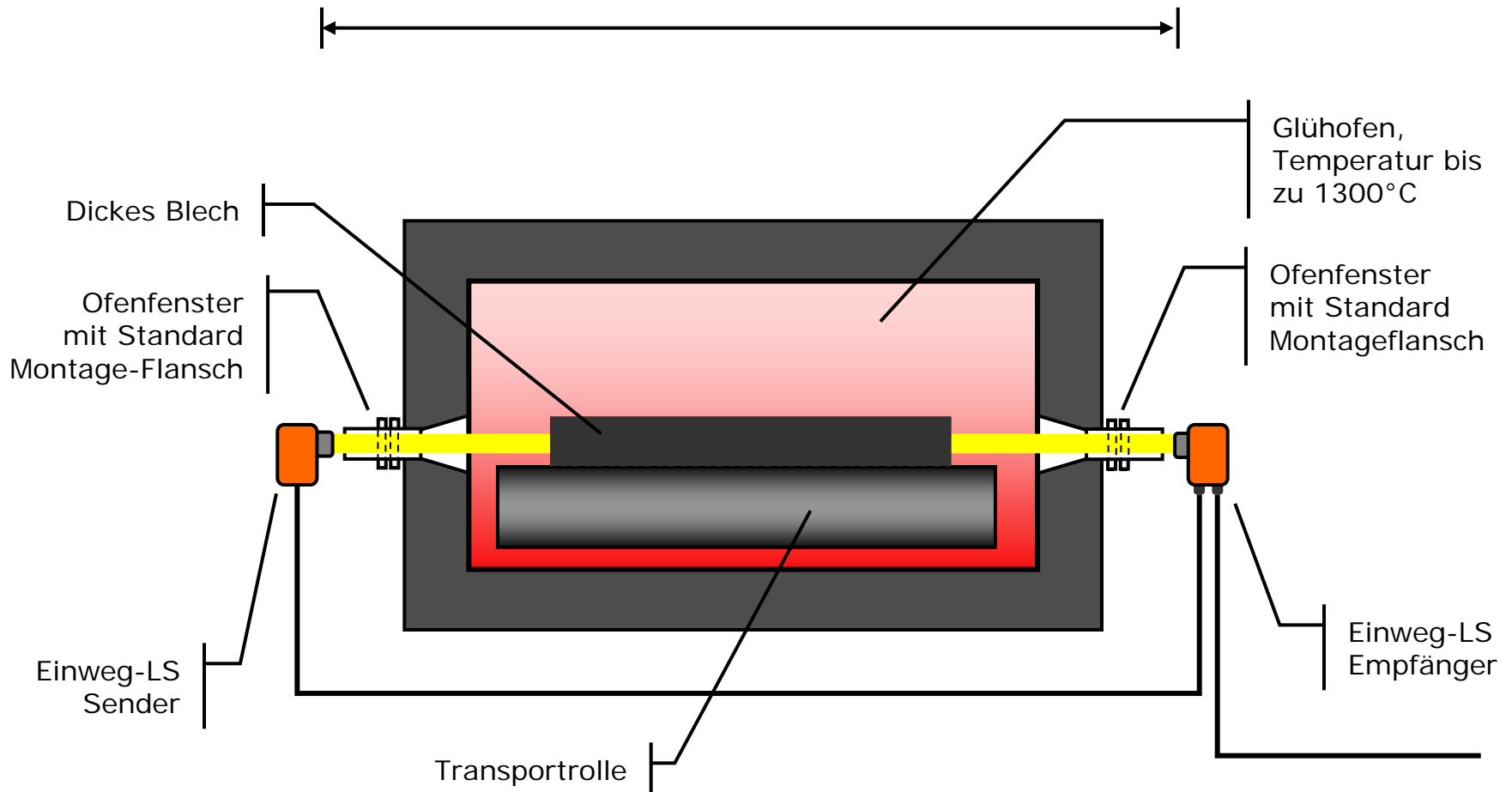


- transmitter/receiver light barrier
- light grid barrier



Einweg-Lichtschranke – Ofenanwendung

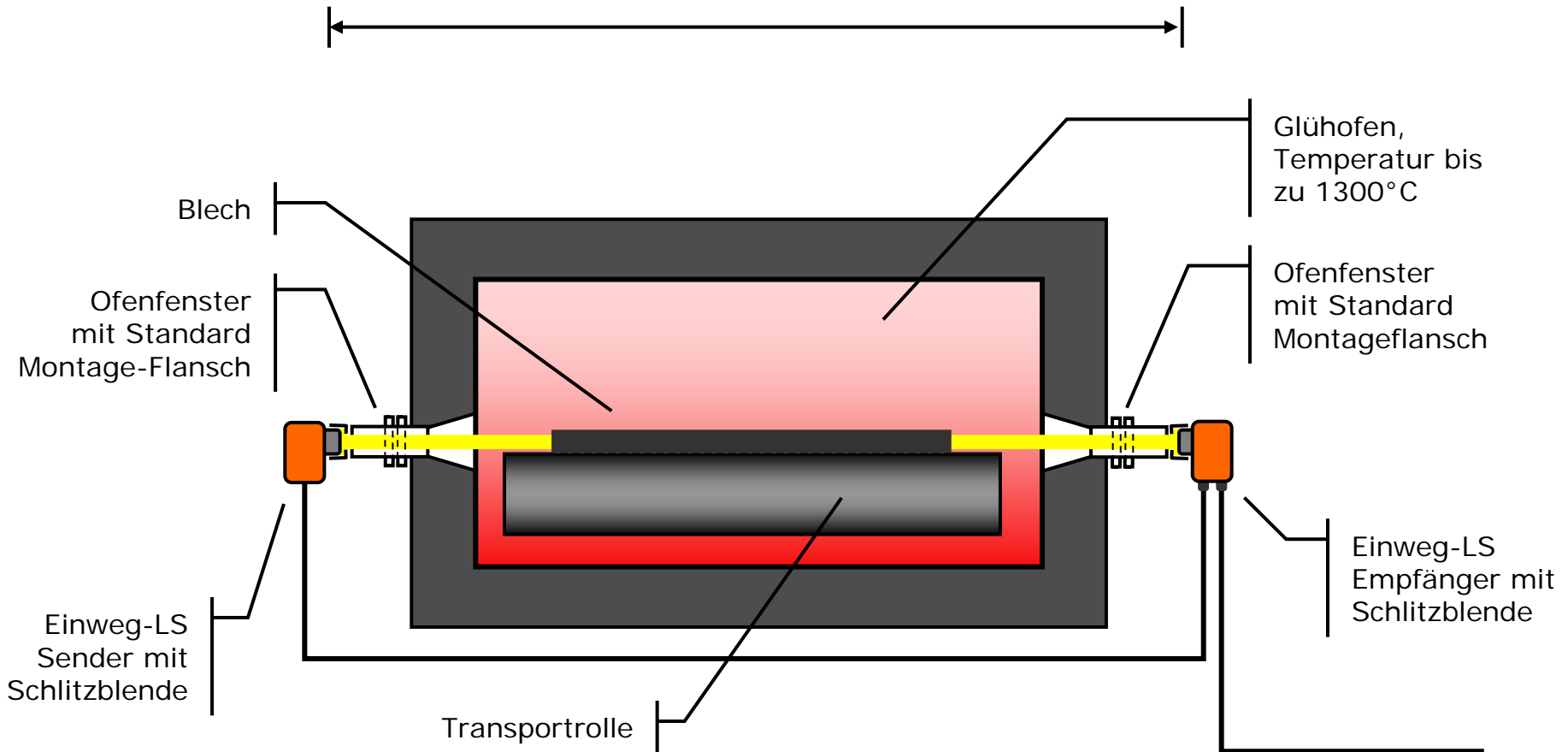
Typische Entfernungen ca. 15 bis 20 m (in abgestimmten Fällen auch sehr viel größer).



Blechdicke >> Linsendurchmesser
Der Lichtstrahl wird von dem Objekt sicher unterbrochen!

Einweg-Lichtschranke – Ofenanwendung

Typische Entfernungen ca. 15 bis 20 m (in abgestimmten Fällen auch sehr viel größer).



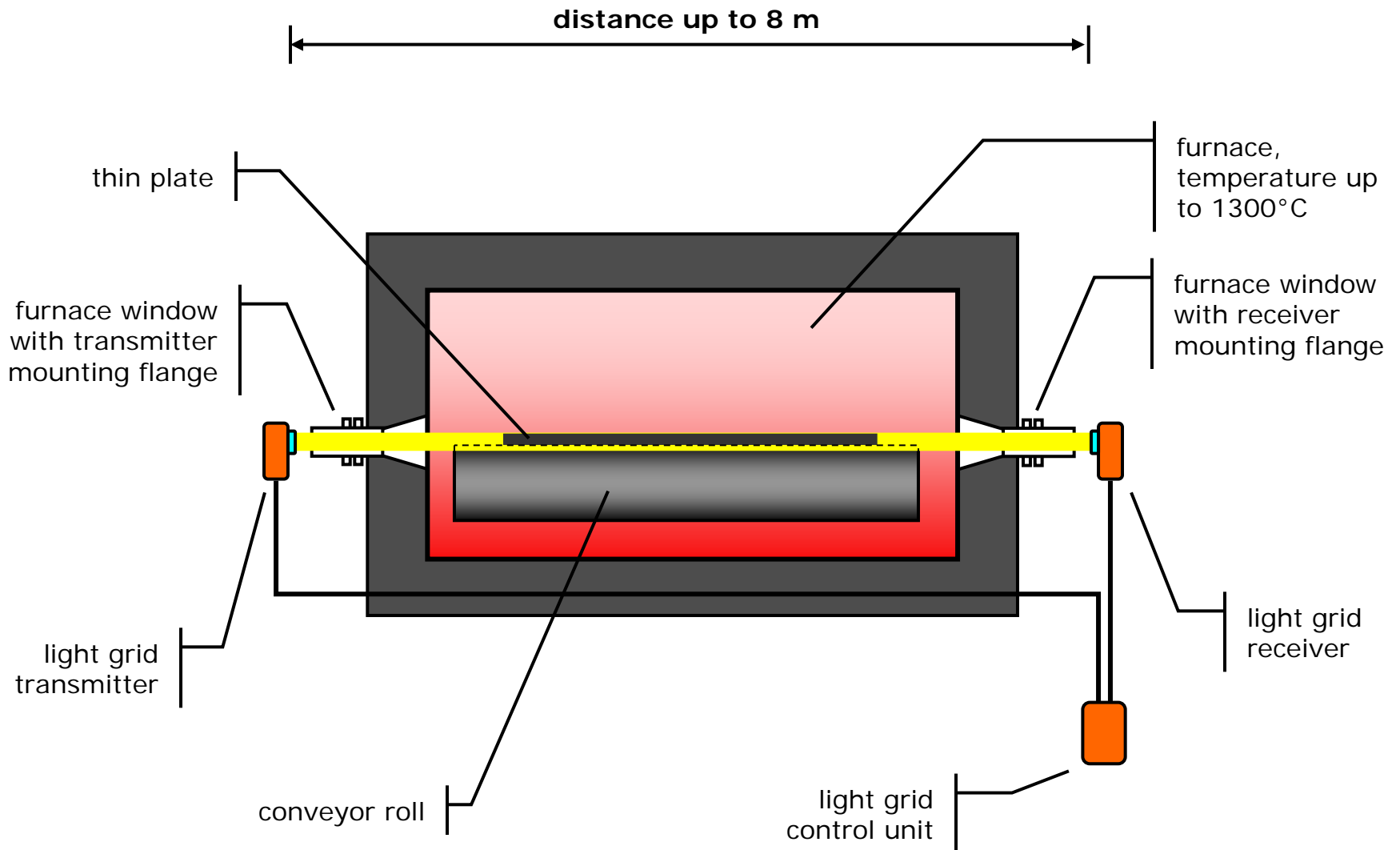
Blechdicke \approx Linsendurchmesser

Mit Blenden die Lichteintrittsflächen der Linsen eindimensional verkleinern!

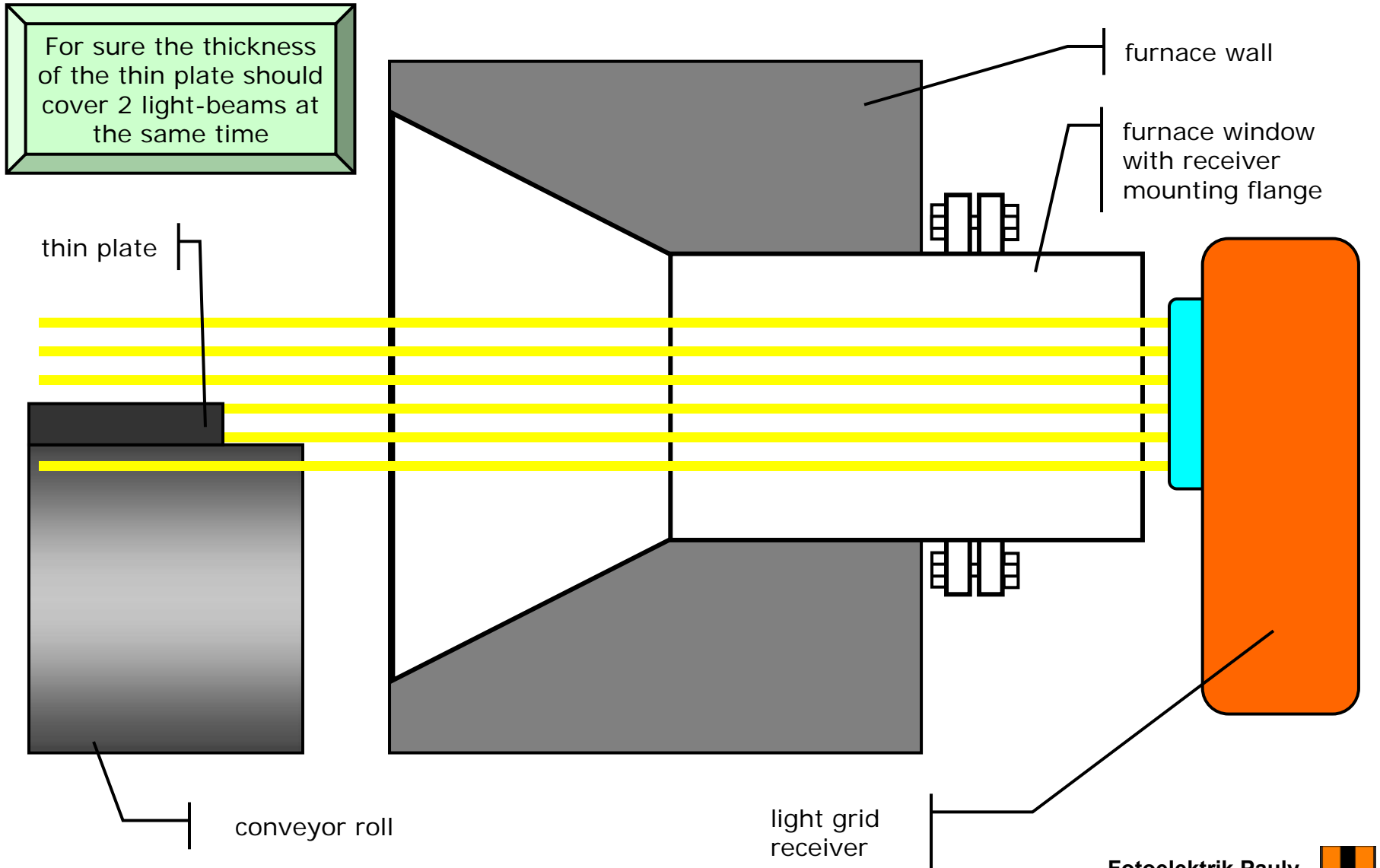
Ziel: Blechdicke > Blendenhöhe



Furnace application – light grid barrier



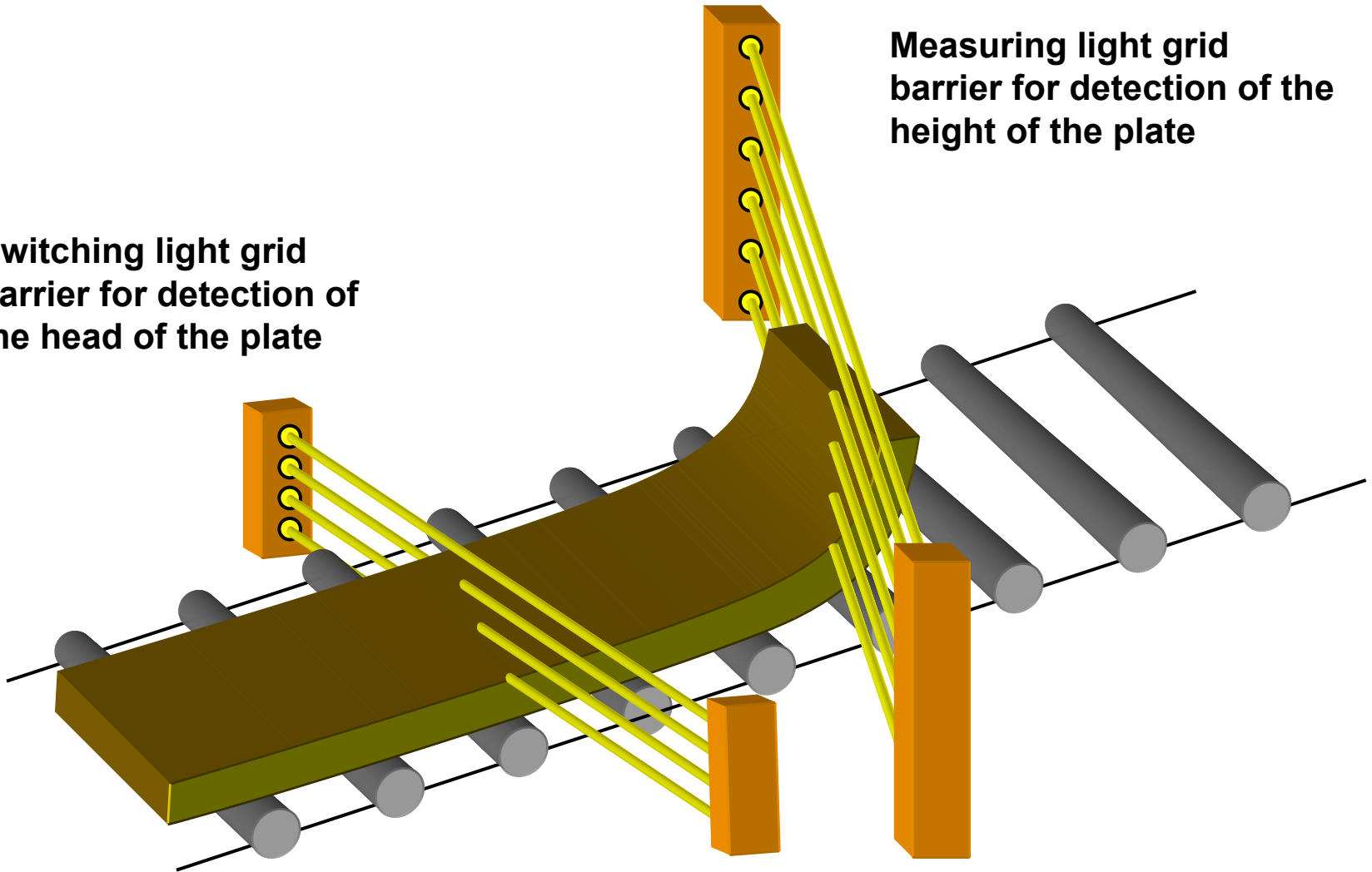
Furnace application - Details



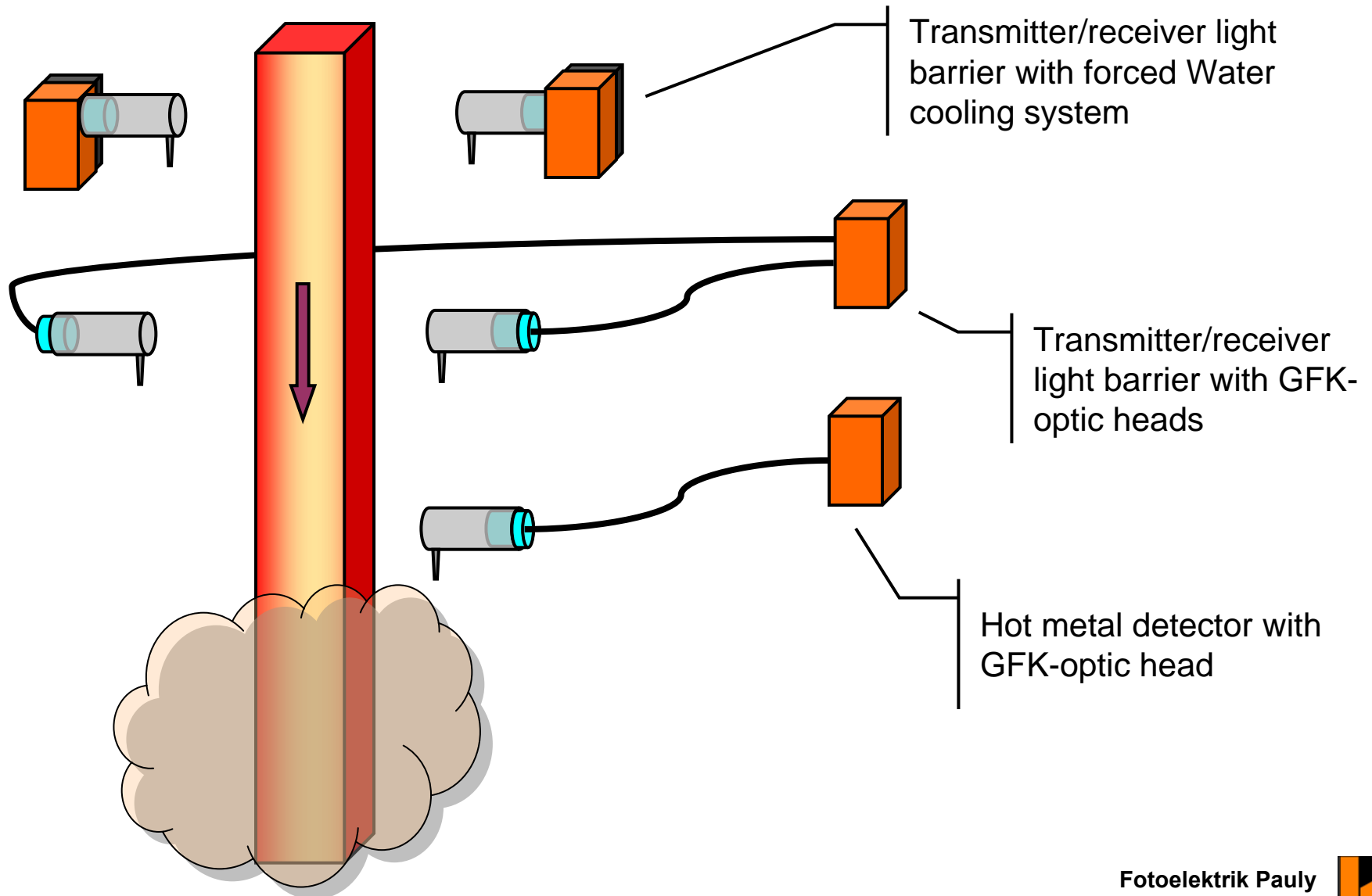
Light grid barrier – typical application

Switching light grid barrier for detection of the head of the plate

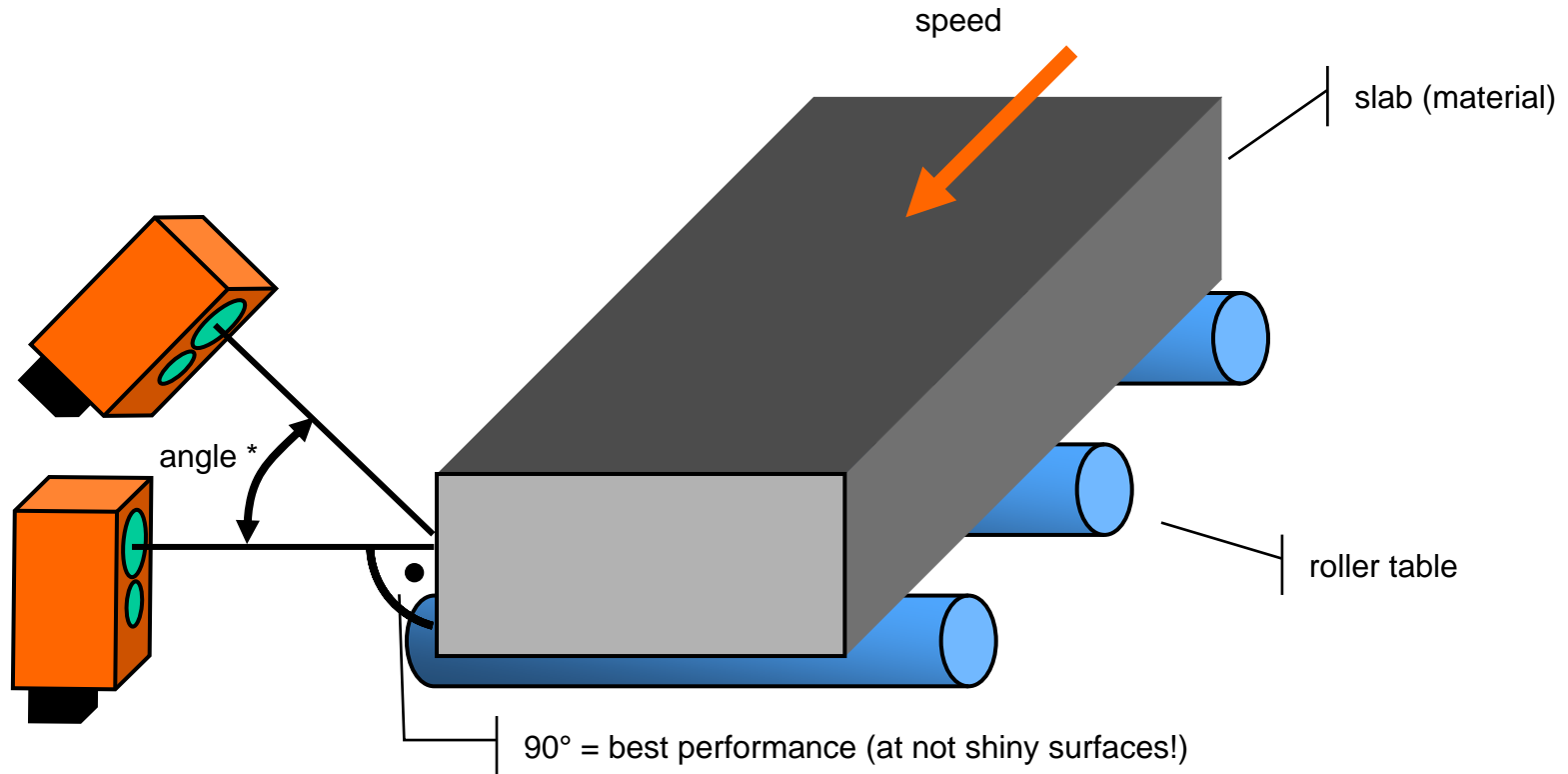
Measuring light grid barrier for detection of the height of the plate



Vertical continuous casting machine



Alignment / Angle – slab



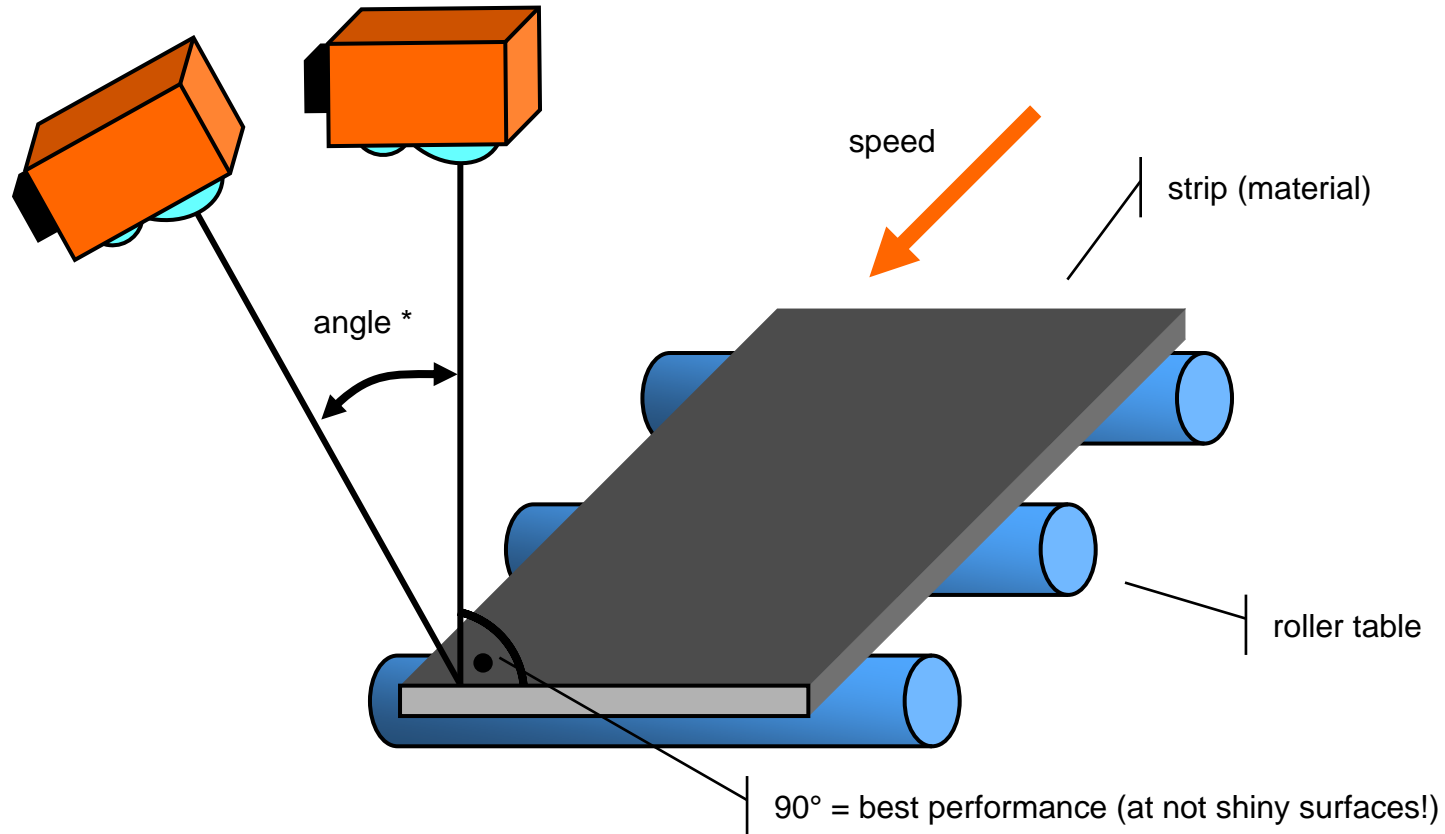
angle *

1. $\leq 30^\circ$ up to 1500 mm scanning distance max.
2. $\leq 12^\circ$ up to 3000 mm scanning distance max.

(valid for usual surfaces, means good degree of diffuse lighting reflection)



Alignment / Angle – strip



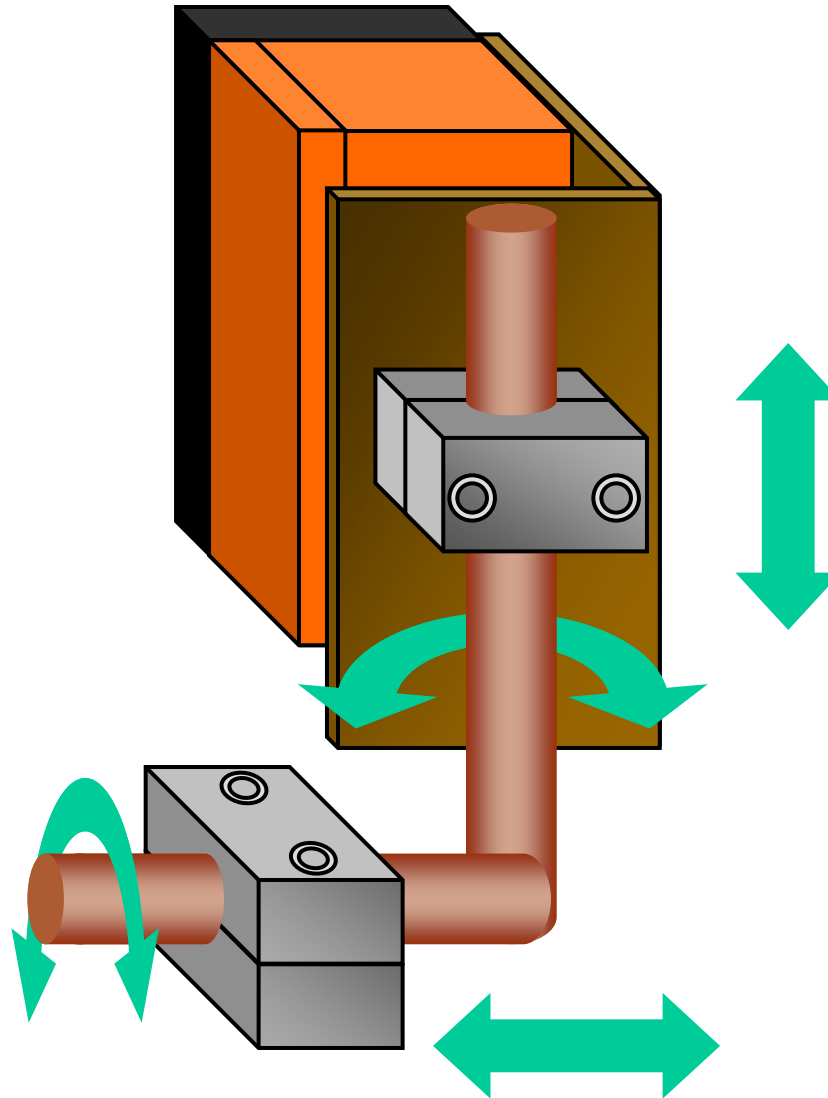
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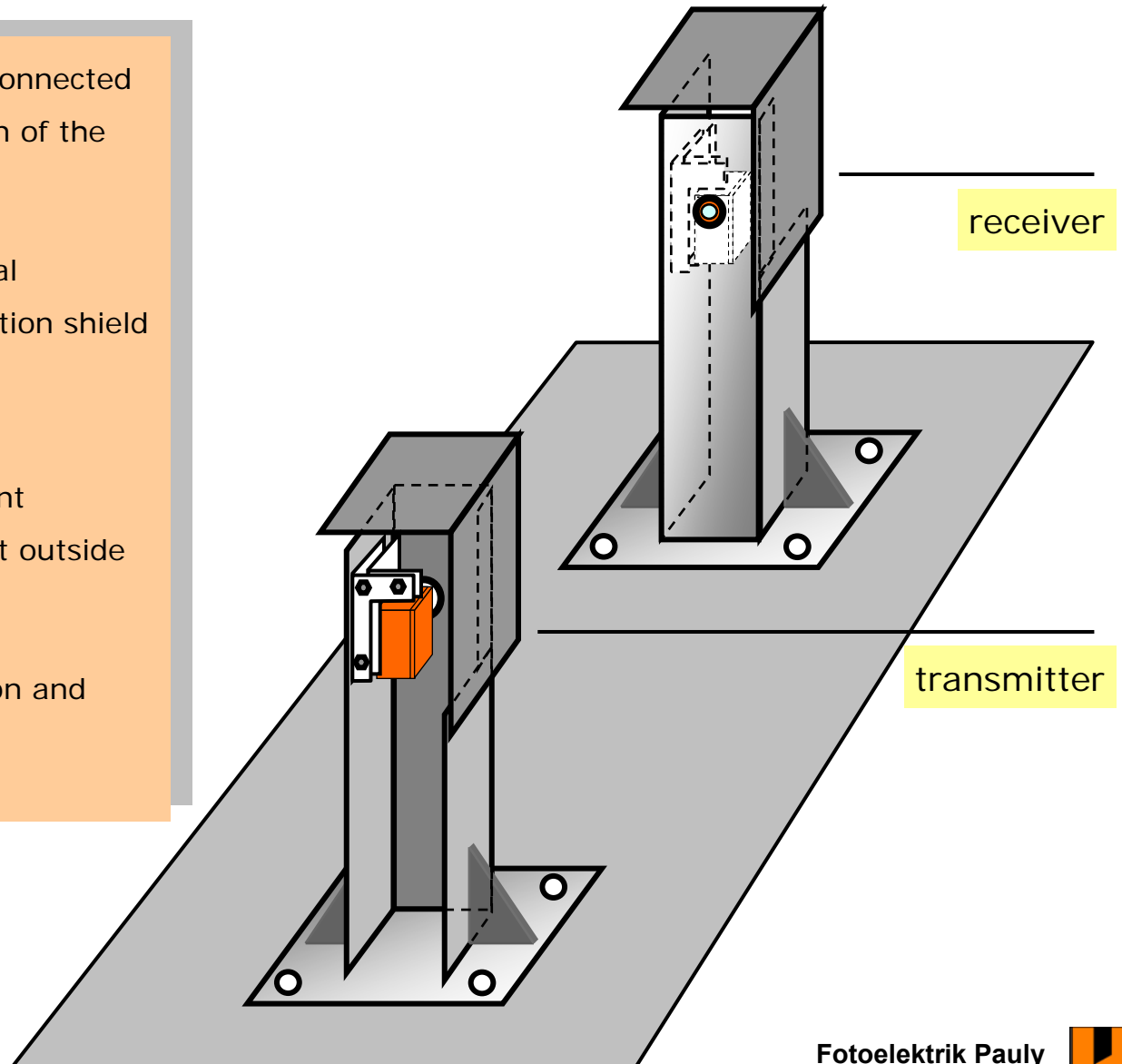


Mounting-System AD26SS2



mounting example – roller table

- **rugged design** – not direct connected to the mechanical construction of the roller table
- **U-shaped beam** – mechanical protection and thermal protection shield
- **covering cap** – removable
 - protection against different surroundings especially at outside use
 - easy mounting, connection and alignment



transmitter / receiver light barrier – typical arrangement

transmitter



receiver



Summarize

- ✓ Rugged design
- ✓ Glas lenses
- ✓ Each optical system are special adjusted
- ✓ Customized solutions

