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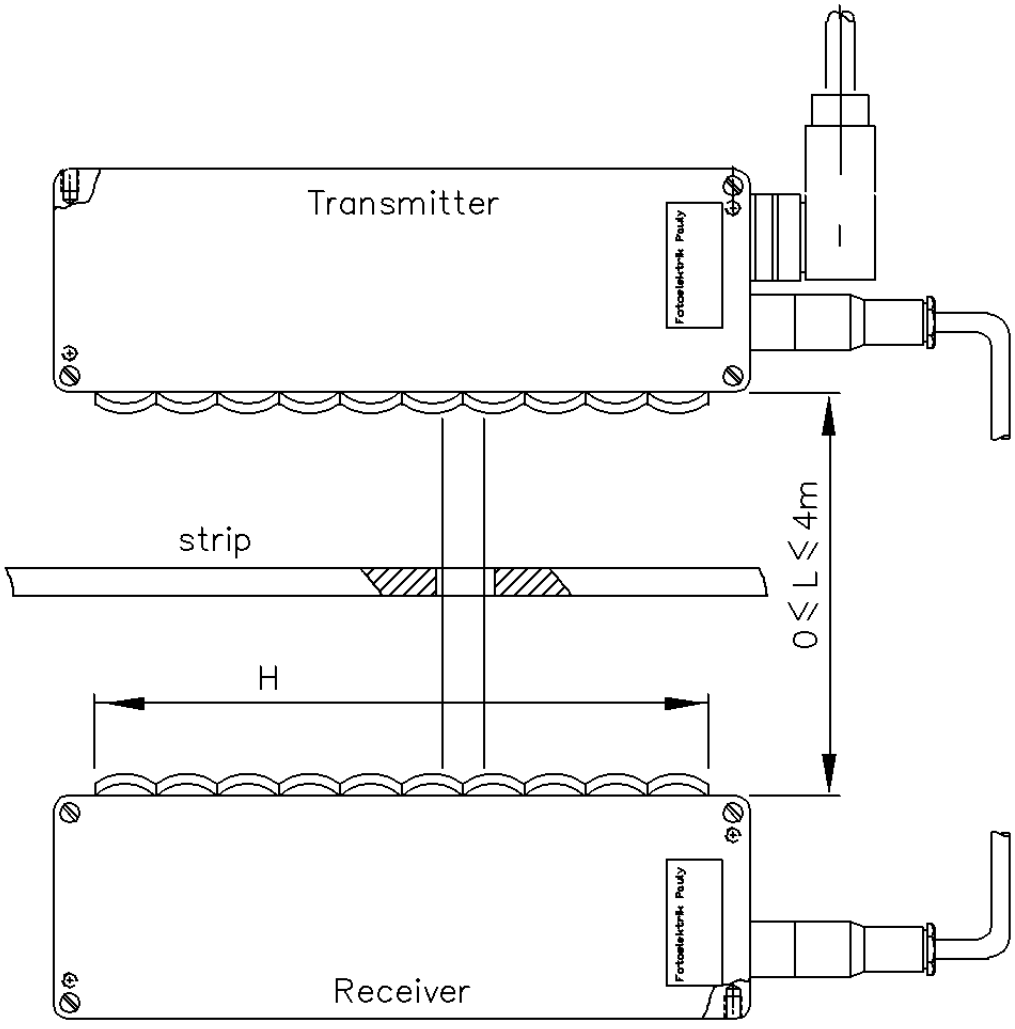
Manual
for
Hole Detectors PP2441...



* E_431x2rev2011-10-21.doc * bis 03 TA/PS * (26.01.04 tb) * (09.01.07 tb) * (19.10.11 gte) * 21.10.11 tb *

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General description

Manufacturer:	Fotoelektrik Pauly GmbH & Co. KG, Germany
Type:	PP2441(q)/…/…

One hole detector comprising (for each WPD):

1 - Transmitter PP2441(q)**S**/…/…
1 - Receiver PP2441(q)**E**/…/…
1 - Control Unit PP83201/2 – with 2m cable, with plug (in case of PP2441(q)/308/R153, the Control Unit is inside the Transmitter)
1 - Cable (4m) – with 2 plugs

Technical Characteristics

Housing		Al-Cast
Weight		see Datasheet
Protection Mode		IP65
Supply Control Device		230/115VAC, 10VA
	optional:	42…48VAC, 24VDC
Output Control Device		Relay 250VAC/8A, 150W/1,500VA, 1xc-o-c
	optional:	pnp, e2; npn, e3; Optocoupler, e1
Transmitter Light		GaAs 880nm, invisible
Steady Light Resistance		>80kLx
Interference Suppressor		Forced Synchronisation
Access Time	“normal”:	Recommended working range: ≥18ms/Switch Transition Limit: ~12ms/Switch Transition
	“q” (optional):	Recommended working range: ≥3ms/Switch Transition Limit: ~1,5ms/Switch Transition
	“qq” (optional):	Recommended working range: ≥1ms/Switch Transition Limit: ~0,5ms/Switch Transition
Switching Frequency		Relay: 10/s; electronic.: 40/s (normal), 300/s (q)
Switch Indicator		LED
Time Prolongation		0-3s switch-on-off-prolongation, z3
Ambient Temperature		-25…60°C

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Application:

Detection of hole-marked welded seams.

Principle:

The light of the hole detector-emitter source (gallium arsenide diodes in the transmitter) falls through the material strip's hole onto the hole detector receiver-source, as shown on the drawing (front page of this manual). The control unit actuates the output signal (relay or electronically Output).

Selection of types:

1. **Detection of hole-marked welded seams:**
We assume that the hole punching machine does not change its position. The strip with the hole can move to both sides during the run. The operating width is determined by the widest possible strip run.

2. **See drawing no. E_431x75 for strip speed and hole diameter**
to determine the working range.

3. Based on the following conditions: operating width, strip speed and hole diameter **the suitable device can be selected.**

3.1 **Operating width (H):**
The **operating width** is decided by the greatest possible width of the running strip.
(H) is calculated from the operating width increased to multiples of 22 mm: H_{min} = 44 cm; H_{max} = 4928 mm.

3.2 **Working range:**
The required access time and the recommended working range "normal" (without addition) and quick (-q) are calculated from the **hole diameter** and **strip speed**.

3.2 **Housing**
can be selected at will according to the table below but the appropriate operating width H_{max} should not be exceeded.

H_{max} mm	**l** mm	**b** mm	**c** mm	**Aluminium**	**Housing**	**Order no.**
88	125	57	80	die-cast	R26	4311
154	175	57	80	die-cast	R27	4312
220	250	52	80	die-cast	R28	4313
308	360	80	120	die-cast	R153	4314
4928	H+72	70	110	section	AL	4315

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Order example

H_{max} = 220mm, **normal** working range (access time <18ms):
Order No.: 4313
Type: PP2441/220/R28

H_{max} = 308mm, **quick** working range (access time <3ms):
Order No.: 4314**q**
Type: PP2441**q**/308/R153

Assembly:

Mount the transmitter and receiver as shown on the drawing (see front page).

Do not exceed distance (4m) to make sure that the smallest hole diameter (2mm) can be used.

Affix the devices (transmitter and receiver) on the back side with M6 screws.

The operating width “H” can be reduced at will by covering the lenses, if this is required by narrow thick strips (outside light which enters the lenses outside the strip-edge is permissible).

The electric connection is set up as shown on the **wiring diagram of the control unit**.

Connection cable:

Included in the scope of supply are:

One piece 4m connection cable for **transmitter-receiver-link** with 2 plugs (4-pole, metal) – separately packed – and

One piece 2m connection cable for the connection of the **control unit** with the **transmitter** with 1 plug (5-pole, cranked) – assembled on the control unit (in case of PP2441(q)/308/R153, the control unit is inside the Transmitter).

Upon request other lengths up to 20m can be ordered.

Caution: do not lay parallel to thyristor control leads.

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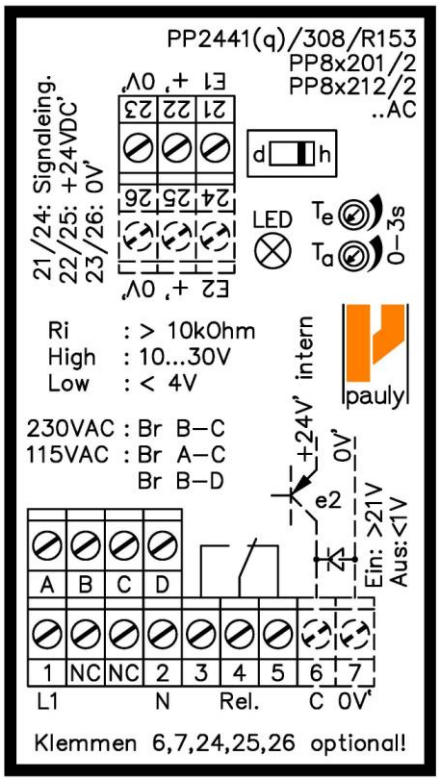
Explanations ´Control Unit PP83210/2´:



"**h** ... **d**" = Slide Switch for bright (h) / dark (d) - change. Standard programme = "h" (= bright switching) !
"**Te**" "**Ta**" = Potentiometer to prolongate the switching pulse of the switching device depending on switch position "**h** ... **d**". **Te**: pulse prolongation for switch position "h...d" = "**d**" **Ta**: pulse prolongation for switch position "h...d" = "**h**"
Note: The drawing of the layout of the components such as switches (h/d), terminals, LED and potentiometer roughly corresponds to the positions on the original printed circuit board.
Power Supply Connection: (AC) Terminal **1** (=L1) , Terminal **2** (=N). For **230VAC** : **Jumper** on **B** & **C**. For **115VAC** : **Jumper** on **A** & **C**, **B** & **D**. If not otherwise agreed: Delivery 230VAC; Otherwise delivery ex works with Jumper corresponding with order. Signaleing. = Signal input LED = LED rot = red Ein: = on Aus: = off Rel. = Relay Klemmen … optional = terminals ... optional

Depending on the construction, the output of the hole detector's switching device is at the relay contact (= terminal 3, 4, 5; floating contact) or in the case of an electronics output with p-n-p transistor switching to 24V DC / "0" V (= terminal 6; terminal 7 = ground).

The slide switch "h ... d" has the following function:
Switch position "h ... d" = "**h**": If the hole detector sees "light" (=hole) the output switching device is connected. That means, the relay is activated and the contacts are changed over (terminal connetion 3 + 4 = closed); the electronics output is connected (terminal connection 6 = approx. 24V DC).

If the slide switch position "h ... d" = "**d**" is selected, the function ot the switching device is merely logical inverted, that means, if the hole detector sees "light" (=hole) the relay contacts 4 + 5 are connected; the electronics output is then "0"V.

Note: If no light (= no hole) is seen, the a.m. switching states are reversed.

Explanation to Te / Ta: (potentiometer to prolongate the switching pulse of the switching device)

Start situation when slide switch "h ...d" = "**h**":

Te: Potentiometer **must be** turned to "0", that means turn clockwise until stop.
Ta: Potentiometer clockwise until stop (= no prolongation). Then turn potentiometer counterclockwise until the right position for the requested prolongation of the switching pulse is reached (e.g. 0-3sec.).

Start situation when slide switch "h ...d" = "**d**":

Ta: Potentiometer **must be** turned to "0", that means turn clockwise until stop.
Te: Potentiometer clockwise until stop (= no prolongation). Then turn potentiometer counterclockwise until the right position for the requested prolongation of the switching pulse is reached (e.g. 0-3sec.).

Corresponding to p/o the "h ... d" – slide switch is adjusted to "**h**" or "**d**" and the potentiometers "**Te**", "**Ta**" are adjusted to minimum or maximum.