PVA
Parts Verification Array

- **Light curtain available in 4 lengths (from 100...375 mm)**
- **Compact package size 30 mm wide x 15 mm deep**
- **Range up to 2 m**
- **Minimum resolution 35 mm**
- **Clearly visible green job indicator lights on either side of emitter and receiver**
- **2 LEDs on both emitter and receiver for easy alignment and indication of weak signal strength and system errors**
- **Crosstalk protection circuitry without need for hardwired connection**

The Banner PVA Parts Verification Array is a simple, easy-to-use light screen that aids manufacturers in quality control of assemblies. The basic function of a PVA is two-fold:

- indication of the next correct picking bin to the operator
- to verify that a part has been taken from the correct storage bin.

A typical installation using PVA systems could be an assembly station where an operator must pick components from a matrix of storage bins, and then assemble the components in a certain order. Each bin has its own PVA system mounted across the opening from which parts are to be taken. The PVA pairs are connected to a PLC (one input and one output per PVA pair).

The PLC software communicates the correct order for the parts to be picked, by activating the enable input on the selected PVA pair. This illuminates the clearly visible job light indicator on the PVA emitter and receiver, so that the operator knows from which bin the part should be picked. As the operator reaches into the bin, the system senses that the correct part has been taken and signals this to the PLC by the receiver output. If the operator takes a part from the wrong bin, the PLC will issue a warning signal to the operator and/or supervisor.

The major benefits of a PVA-driven system include increased quality control (no skipped or forgotten parts), resulting in less rework and fewer quality inspections, eventually yielding increased efficiency.

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Total beams	Total Height L1 [mm]	Height Y [mm]	Distance between drill holes - L2 [mm]	Output	Connection mode	Type		Ident number
5	137,8	100	130	pnp	cable	**PVA100P6**	**emitter/receiver pair**	30 529 01
5	137,8	100	130	-	cable	**PVA100P6E**	**emitter**	30 507 84
5	137,8	100	130	pnp	cable	**PVA100P6R**	**receiver**	30 507 88
5	137,8	100	130	pnp	connector	**PVA100P6Q**	**emitter/receiver pair**	30 529 03
5	137,8	100	130	-	connector	**PVA100P6EQ**	**emitter**	30 519 13
5	137,8	100	130	pnp	connector	**PVA100P6RQ**	**receiver**	30 519 17
5	137,8	100	130	npn	cable	**PVA100N6**	**emitter/receiver pair**	30 529 02
5	137,8	100	130	-	cable	**PVA100N6E**	**emitter**	30 519 25
5	137,8	100	130	npn	cable	**PVA100N6R**	**receiver**	30 519 09
5	137,8	100	130	npn	connector	**PVA100N6Q**	**emitter/receiver pair**	30 529 04
5	137,8	100	130	-	connector	**PVA100N6EQ**	**emitter**	30 519 29
5	137,8	100	130	npn	connector	**PVA100N6RQ**	**receiver**	30 519 21
10	266,4	225	258,5	pnp	cable	**PVA225P6**	**emitter/receiver pair**	30 529 05
10	266,4	225	258,5	-	cable	**PVA225P6E**	**emitter**	30 507 85
10	266,4	225	258,5	pnp	cable	**PVA225P6R**	**receiver**	30 507 89
10	266,4	225	258,5	pnp	connector	**PVA225P6Q**	**emitter/receiver pair**	30 529 07
10	266,4	225	258,5	-	connector	**PVA225P6EQ**	**emitter**	30 519 14
10	266,4	225	258,5	pnp	connector	**PVA225P6RQ**	**receiver**	30 519 18
10	266,4	225	258,5	npn	cable	**PVA225N6**	**emitter/receiver pair**	30 529 06
10	266,4	225	258,5	-	cable	**PVA225N6E**	**emitter**	30 519 26
10	266,4	225	258,5	npn	cable	**PVA225N6R**	**receiver**	30 519 10
10	266,4	225	258,5	npn	connector	**PVA225N6Q**	**emitter/receiver pair**	30 529 08
10	266,4	225	258,5	-	connector	**PVA225N6EQ**	**emitter**	30 519 30
10	266,4	225	258,5	npn	connector	**PVA225N6RQ**	**receiver**	30 519 22
13	341,4	300	333,5	pnp	cable	**PVA300P6**	**emitter/receiver pair**	30 529 09
13	341,4	300	333,5	-	cable	**PVA300P6E**	**emitter**	30 507 86
13	341,4	300	333,5	pnp	cable	**PVA300P6R**	**receiver**	30 507 90
13	341,4	300	333,5	pnp	connector	**PVA300P6Q**	**emitter/receiver pair**	30 529 11
13	341,4	300	333,5	-	connector	**PVA300P6EQ**	**emitter**	30 519 15
13	341,4	300	333,5	pnp	connector	**PVA300P6RQ**	**receiver**	30 519 19
13	341,4	300	333,5	npn	cable	**PVA300N6**	**emitter/receiver pair**	30 529 10
13	341,4	300	333,5	-	cable	**PVA300N6E**	**emitter**	30 519 27
13	341,4	300	333,5	npn	cable	**PVA300N6R**	**receiver**	30 519 11
13	341,4	300	333,5	npn	connector	**PVA300N6Q**	**emitter/receiver pair**	30 529 12
13	341,4	300	333,5	-	connector	**PVA300N6EQ**	**emitter**	30 519 31
13	341,4	300	333,5	npn	connector	**PVA300N6RQ**	**receiver**	30 519 23
16	416,6	375	408,5	pnp	cable	**PVA375P6**	**emitter/receiver pair**	30 529 13
16	416,6	375	408,5	-	cable	**PVA375P6E**	**emitter**	30 507 87
16	416,6	375	408,5	pnp	cable	**PVA375P6R**	**receiver**	30 507 91
16	416,6	375	408,5	pnp	connector	**PVA375P6Q**	**emitter/receiver pair**	30 529 15
16	416,6	375	408,5	-	connector	**PVA375P6EQ**	**emitter**	30 519 16
16	416,6	375	408,5	pnp	connector	**PVA375P6RQ**	**receiver**	30 519 20
16	416,6	375	408,5	npn	cable	**PVA375N6**	**emitter/receiver pair**	30 529 14
16	416,6	375	408,5	-	cable	**PVA375N6E**	**emitter**	30 519 28
16	416,6	375	408,5	npn	cable	**PVA375N6R**	**receiver**	30 519 12
16	416,6	375	408,5	npn	connector	**PVA375N6Q**	**emitter/receiver pair**	30 529 16
16	416,6	375	408,5	-	connector	**PVA375N6EQ**	**emitter**	30 519 32
16	416,6	375	408,5	npn	connector	**PVA375N6RQ**	**receiver**	30 519 24

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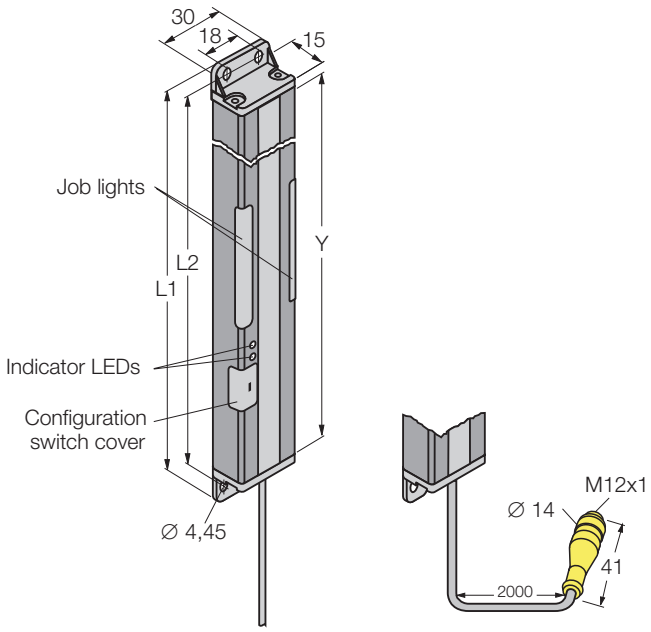
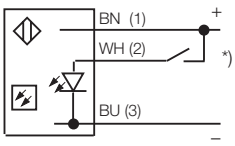
Dimensions [mm]

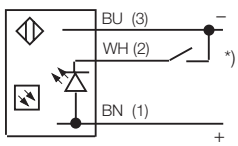


Wiring

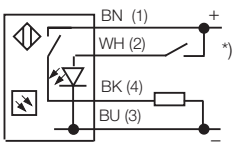
PVA...P6E



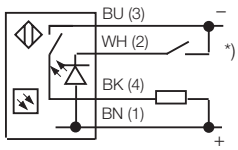
PVA...N6E



PVA...P6R



PVA...N6R



*) DIP switch 4 ON

Wave length
IR (infrared) 880 nm

Adjustment (via DIP switches)
- 2 frequencies (to avoid crosstalk from multiple pairs of sensors)
- light/dark operate
- continuous/flashing job light
- job light control input

Resolution
Minimum object size 35 mm

Max. range 2 m

Supply 12...30 V dc
Ripple V_{pp} ≤ 10 %
No load current ≤ 120 mA per pair

Protection reverse polarity
short-circuit (pulsed)

Output
Continuous load current ≤ 150 mA

Response time (without crosstalk)

Emitter/receiver sizes	100 mm	12,5 ms
	225 mm	25 ms
	300 mm	32,5 ms
	375 mm	40 ms

Material

Housing	black painted aluminum
Lens	acrylic
End caps	PBT
Programming switch cover	thermoplastic elastomer
Protection class (IEC 60529/DIN 60529)	IP62
Temperature range	0…+50 °C
Cable	2 m, PVC, 4 x 0,34 mm²
Connector	*eurocon*

Indicator LEDs

Emitter	1 x green	power on
	1 x red	frequency selection
Receiver	1 x green	power on
		correct alignment
		sensing area clear
	1 x yellow	output state
Emitter/receiver	Job light	see DIP switch settings

Accessories

Brackets included with emitter and receiver

Connectors

WAK4-2/P00	80 070 46	straight type
WWAK4/P00	80 071 48	right-angled type

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PVA DIP switch settings

Programming of the PVA may be performed simply by setting the DIP switches on the emitter and receiver as shown below.
The switches determine 4 status operating modes:

- A/B frequency (to avoid crosstalk from multiple pairs of sensors)
- light/dark operate
- solid/flashing job light (depending on assembler and/or supervisor preference)
- job light control input

Switch	Emitter	Receiver
1 *	ON = frequency A OFF = frequency B	ON = frequency A OFF = frequency B
2	no function	ON = light operate OFF = dark operate
3	ON = job light steady OFF = job light flashes	ON = job light steady OFF = job light flashes
4	Job light control input: connect the white wire of the emitter and receiver as follows: **Types PVA...P6** ON = job light ON for 5...30 VDC OFF = job light ON for 0...2 VDC/open circuit **Types PVA...N6** ON = job light ON for 5...30 VDC/open circuit OFF = job light ON for 0...2 VDC	

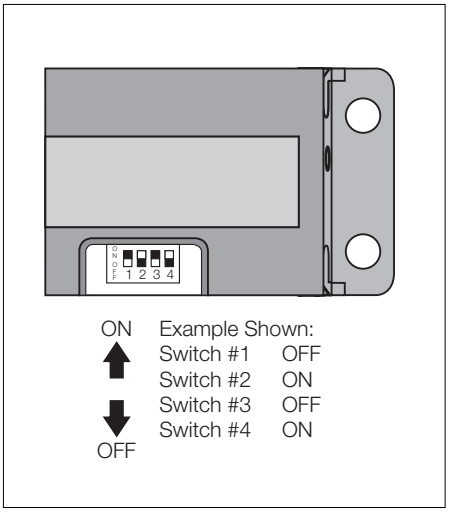

Fig. 1 DIP switch settings

* Both emitter and receiver must be set to the same frequency in order to operate.

LEDs/Troubleshooting

Emitter	**LED 1** – Steady red	**Notes** Frequency A selected (emitter/receiver switch 1 both ON) Frequency B selected (emitter/receiver switch 1 both OFF)
Emitter	**LED 2** Steady green – Flashing green 2x/s	**Notes** Power is ON and system is OK Power is OFF Emitter failure (try removing and reapplying power)
Receiver	**LED 1** Steady yellow –	**Notes** Output is active (changing switch 2 to light operate will turn the yellow indicator ON when the system is clear) Output is inactive (changing switch 2 to dark operate will turn the yellow indicator ON when the system is blocked)
Receiver	**LED 2** Steady green – Flashing green 1x/s	**Notes** Power is ON and system is OK Power is OFF Receiver failure (try removing and reapplying power)

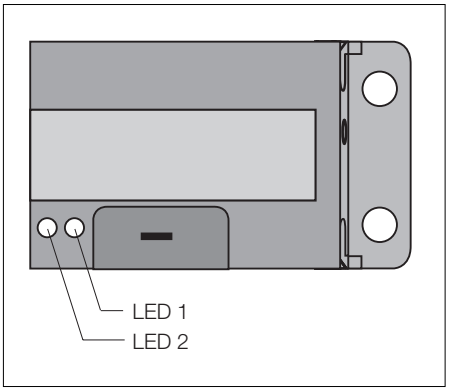

Fig. 2 PVA sensor status indicators

Subject to changes without notice • Edition 09.00 • P/N ED050I0B

IMPORTANT SAFETY WARNING ! These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can result in either an energised or de-energised output condition. These products should not be used as sensing devices for personnel safety.