# Long Distance Reflective Switch OPB720A and OPB720B Series 



## Description:

The OPB720A and OPB720B Series reflective switches detects objects as far away as 12" ( 305 mm ) using standard 90\% reflective material, and can detect objects as small as $0.08^{\prime \prime}(2 \mathrm{~mm})$. The OPB720 series consist of three standard reflective switching distances $\mathbf{- 0 6 Z}$ for typically $6^{\prime \prime}\left(152 \mathrm{~mm}\right.$ ), $-12 Z$ for typically $12^{\prime \prime}\left(305 \mathrm{~mm}\right.$ ) and -30VZ for typically $30^{\prime \prime}(762 \mathrm{~mm})$. The power supply voltage range of the OPB720A series is 10 to 30 volts while the power supply voltage range for the OPB720B is 4 to 7 volts.

The OPA720A and OPB720B sensors are NOT affected by ambient light in most conditions. Ambient light conditions are compensated by using a synchronous driver detection scheme.

This sensor has a logical output that switches from a high level with reflective target to a low level with no reflective target. With the addition of hysteresis, the OPB720 series minimizes output switching oscillations. The type of material used for the target is very dependent on the distance that can be achieved for the sensor. Taking this into consideration, the OPB720 series can be used in either a reflective or interruptive mode. As an example, the OPB720A-12Z can easily be used in a reflective mode for distances around 12" ( 305 mm ) while when reflecting off a retro-reflective target similar to 3 M 3870 or Nippon Crystallite at distances around $85^{\prime \prime}(216 \mathrm{~mm})$ the device works well in the interruptive mode. See the included charts for typical distances with different reflective material for other versions of the OPB720 series devices.

The OPB720 series has an open collector output transistor and power requirements are compatible with most PLCs and TTL gates.

## Applications:

- Conveyer belt package recognition
- Personnel movement recognition
- Near-focus security systems
- Hand wash and soap dispensing stations
- Toilet and urinal sensors
- Product dispensing systems


RoHS

| Ordering Information |  |
| :---: | :---: |
| Part Number | Description |
| $\begin{aligned} & \text { OPB720A-06Z } \\ & \text { OPB720B-06Z } \end{aligned}$ | Maximum detection of $0.04^{\prime \prime}$ to $6^{\prime \prime}(1.0 \mathrm{~mm}$ to 152 mm ) 39" (991 mm) lead length with 28 AWG wire, using white $90 \%$ reflective paper |
| OPB720A-12Z OPB720B-12Z | Maximum detection of $0.04^{\prime \prime}$ to $12^{\prime \prime}$ ( 1.0 mm to 305 mm ) $39 \prime$ ( 991 mm ) lead length with 28 AWG wire, using white $90 \%$ reflective paper |
| OPB720A-30VZ OPB720B-30VZ | Maximum detection of 0.04 " to $30^{\prime \prime}$ ( 1.0 mm to 762 mm ) 39" (991 mm) lead length with 28 AWG wire, using white 90\% reflective paper |


| OPB720A-30VZ \& OPB720B-30VZ ONLY |  |
| :---: | :---: |
|  | Additional laser safety information can be found on the Optek website. See application \#221. Classification is not marked on the device due to space limitations. See package outline for centerline of optical radiance. Operating devices beyond maximum rating may cause devices |

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| Absolute Maximum Ratings $\left(T_{\mathrm{A}}=25^{\circ} \mathrm{C}\right.$ unless otherwise noted) |  |
| :--- | ---: |
| Operating Temperature Range <br> OPB720A Series <br> OPB720B Series | $0^{\circ} \mathrm{C}$ to $+50^{\circ} \mathrm{C}$ <br> $0^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$ |
| Storage Temperature Range | $-40^{\circ} \mathrm{C}$ to $+80^{\circ} \mathrm{C}$ |
| Lead Soldering Temperature (1/16" $(1.6 \mathrm{~mm})$ from case for 5 seconds with soldering iron) | $260^{\circ} \mathrm{C}^{(1)}$ |
| Supply Voltage (VCC) <br> OPB720A Series <br> OPB720B Series | 10 to 30 Volts <br> 4 to 7 Volts |
| Maximum Collector Voltage | 30 V |
| Collector DC Current (Sink) | 50 mA |
| Power Dissipation | 300 mW |

Electrical Characteristics ( $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{OL}}$ | Low Level Output Voltage |  |  |  |  |  |
|  | OPB720A Series |  |  |  |  |  |
| OPB720B Series |  |  |  |  |  |  |

Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(2) Distance for OPB720A-06Z=6 " (152 mm), Distance for OPB720A-12Z=12" (305mm), Distance for OPB720A-30VZ=30" (762 mm)
(3) OPB720A-30VZ \& OPB720B-30VZ are class 1M laser safety device. Do Not look at the device closer than 4" ( 100 mm ) with a magnifying device.
(4) $\mathrm{R}_{\mathrm{L}}=10 \mathrm{~K}, \mathrm{~V}_{\mathrm{CE}}=\mathrm{V}_{\mathrm{CC}}$ Distance $=$ See Note 2 \& 3, (No Target)
(5) $\mathrm{R}_{\mathrm{L}}=10 \mathrm{~K}, \mathrm{~V}_{\mathrm{CE}}=\mathrm{V}_{\mathrm{CC}}$, (90\% Reflective Surface, Kodak—EK E152-7798)

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## Long Distance Reflective Switch <br> OPB720A and OPB720B Series



Voltage Response vs Displacemnent OPB720A-30VZ or OPB720B-30VZ


