

Photoelectrics Amplifier Types S1420, S1421

CARLO GAVAZZI



- Amplifier relay for photoelectric switches
- Sensivity range DIP-switch selectable
- Sensivity adjustment by potmeter
- Dirt accumulation alarm and alignment control
- Timer functions
- Modulated and synchronized light
- Make and break switching funct. DIP-switch selectable
- Rated operational voltage:
24 VDC or VAC, 115 VAC, 230 VAC
- Output 10 A/250 V SPDT relay and 100 mA NPN
- LED indications: Power supply, output, level
- Plug-in module

Product Description

Amplifier relay for long-range photoelectric switch types MIF, MKF, MHF, MCF, MDF, MMF, MNF and MFFD. Carlo Gavazzi "S-System" plug-in housing. Adjustable sensitivity, high and low range selection with LED indication. Mis-

alignment and dirt accumulation alarm output. Make and break switching function DIP-switch selectable. Short-circuit protected supply to photoelectric switches. ON-delay and OFF-delay adjustable from 0 to 10 s on S1421 types.

Ordering Key

S142 1 156 724

Type _____
 Special function _____
 Output type _____
 Power supply _____

Type Selection

| Plug type | Function | Ordering no. Supply: 24 VDC | Ordering no. Supply: 24 VAC | Ordering no. Supply: 115 VAC | Ordering no. Supply: 230 VAC |
|---------------------|--|--------------------------------|--------------------------------|---------------------------------|---------------------------------|
| Circular 11 pins | Adjustable sensitivity, dirt alarm, alignment indication | S 1420 156 724 | S 1420 156 024 | S 1420 156 115 | S 1420 156 230 |
| Circular 11 pins | Adjustable sensitivity, dirt alarm, alignment indication, ON delay & OFF delay | S 1421 156 724 | S 1421 156 024 | S 1421 156 115 | S 1421 156 230 |

Specifications

| | | | | |
|--|-------------------|--|---|---|
| Rated operational volt. AC types (U_B) pins 2 & 10 | 230 115 024 | 195 to 265 VAC, 45 to 65 Hz 98 to 132 VAC, 45 to 65 Hz 20.4 to 27.6 VAC, 45 to 65 Hz | Supply to photoelectric switch Emitter Supply voltage (open loop) Current Light modulation frequency Output resistance Receiver Supply voltage (open loop) Short circuit current Input resistance | Pins 5 & 7 8 V square wave ≤ 100mA short-circuit protected 35 kHz 47 Ω Pins 6 & 8 8 VDC 18 mA 470 Ω |
| Voltage Interruption | ≤ 40 ms | | | |
| Dielectric voltage | ≥ 2.0 kVAC (rms) | | Approvals CE-marking | UL, CSA Yes |
| Rated impulse withstand volt. | 4 kV (1.2/50 μs) | | | |
| Rated operational volt. DC types (U_B) pins 2 positive & 10 negative | 724 | 20.4 to 27.6 VDC | | |
| Dielectric voltage | None | | | |
| Rated impulse withstand volt. | 800 V (1.2/50 μs) | | | |
| Rated operational power AC supply DC supply | 2.5 VA 3 W | | | |



Specifications (cont.)

| Output Specifications Switching function Contact output current (1 & 3) Continuous AC (I_a) Continuous DC (I_a) Contact life mechanical Contact life electrical NPN Output (Pin 9) Continuous (I_a) Short-time (I) Alarm function (Pin 11) NPN Output Continuous (I_a) Short-time (I) | 10 A/250 VAC ohmic load (2500 VA) 1 A/250 VDC ohmic load (250 W) 30 x 10 ⁵ operations 2.5 x 10 ⁵ operations 100 mA/40 VDC not protected 100 mA/40 VDC 100 mA/40 VDC, not protected 100 mA/40 VDC | Sensitivity (cont.) Operating frequency (f) Light/dark ratio 1:1 Contact output NPN output Response time OFF-ON (t_{ON}) ON-OFF (t_{OFF}) Power ON delay (t_v) Output function Indication Supply ON Output ON Alignment/dirt accumulation (sensitivity level) Environment Overvoltage category Degree of protection Pollution degree Temperature Operating Storage Weight AC supply DC supply | Note: <ul style="list-style-type: none"> Maximum range indicated on photoelectric switch data sheet in high sensitivity range only Operation within low sensitivity range, increases ambient light and crosstalk immunity. <table border="1"> <thead> <tr> <th></th> <th>S 1420</th> <th>S 1421</th> </tr> </thead> <tbody> <tr> <td>Contact output</td> <td>15 Hz</td> <td>5 Hz delayset</td> </tr> <tr> <td>NPN output</td> <td>15 Hz</td> <td>5 Hz delayset</td> </tr> <tr> <td>OFF-ON (t_{ON})</td> <td>33 ms</td> <td>0.1 to 14 s +/- 4 s</td> </tr> <tr> <td>ON-OFF (t_{OFF})</td> <td>33 ms</td> <td>0.1 to 14 s +/- 4 s</td> </tr> <tr> <td></td> <td></td> <td>ON and OFF delay</td> </tr> <tr> <td>Power ON delay (t_v)</td> <td colspan="2">< 300 ms</td> </tr> <tr> <td>Output function</td> <td colspan="2">Make and break switching DIP-switch selectable</td> </tr> <tr> <td>Indication</td> <td colspan="2">LED, green LED, red LED, yellow (Steadily on if sensitivity adjusted properly)</td> </tr> <tr> <td>Environment</td> <td colspan="2">III (IEC 66064) IP 20 (IEC 60529, 60947-1) 3 (IEC 60664/60664A, 60947-1)</td> </tr> <tr> <td>Temperature</td> <td colspan="2">-20° to +50°C (-4° to +122°F) -50° to +85°C (-58° to +185°F)</td> </tr> <tr> <td>Weight</td> <td colspan="2">200 g 125 g</td> </tr> </tbody> </table> | | S 1420 | S 1421 | Contact output | 15 Hz | 5 Hz delayset | NPN output | 15 Hz | 5 Hz delayset | OFF-ON (t_{ON}) | 33 ms | 0.1 to 14 s +/- 4 s | ON-OFF (t_{OFF}) | 33 ms | 0.1 to 14 s +/- 4 s | | | ON and OFF delay | Power ON delay (t_v) | < 300 ms | | Output function | Make and break switching DIP-switch selectable | | Indication | LED, green LED, red LED, yellow (Steadily on if sensitivity adjusted properly) | | Environment | III (IEC 66064) IP 20 (IEC 60529, 60947-1) 3 (IEC 60664/60664A, 60947-1) | | Temperature | -20° to +50°C (-4° to +122°F) -50° to +85°C (-58° to +185°F) | | Weight | 200 g 125 g | |
|--|---|--|--|--|--------|--------|----------------|-------|---------------|------------|-------|---------------|---------------------|-------|---------------------|----------------------|-------|---------------------|--|--|------------------|---------------------------------|----------|--|------------------------|---|--|-------------------|---|--|--------------------|---|--|--------------------|---|--|---------------|----------------|--|
| | S 1420 | S 1421 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contact output | 15 Hz | 5 Hz delayset | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NPN output | 15 Hz | 5 Hz delayset | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OFF-ON (t_{ON}) | 33 ms | 0.1 to 14 s +/- 4 s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ON-OFF (t_{OFF}) | 33 ms | 0.1 to 14 s +/- 4 s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | ON and OFF delay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power ON delay (t_v) | < 300 ms | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Output function | Make and break switching DIP-switch selectable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Indication | LED, green LED, red LED, yellow (Steadily on if sensitivity adjusted properly) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Environment | III (IEC 66064) IP 20 (IEC 60529, 60947-1) 3 (IEC 60664/60664A, 60947-1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature | -20° to +50°C (-4° to +122°F) -50° to +85°C (-58° to +185°F) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Weight | 200 g 125 g | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated insulation volt. (U_i) Dielectric voltage Rated impulse withstand volt. | 250 VAC (rms) ≥ 2.0 kVAC (rms) (contact/electronics) 4 kV (1.2/50μs) (contact/ electronics) (IEC 664) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sensitivity (% of S_n) | <ul style="list-style-type: none"> 2 ranges, DIP-switch selectable - low sensitivity (25%) - high sensitivity (100%) Fine adjustment with 270° turn knob | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

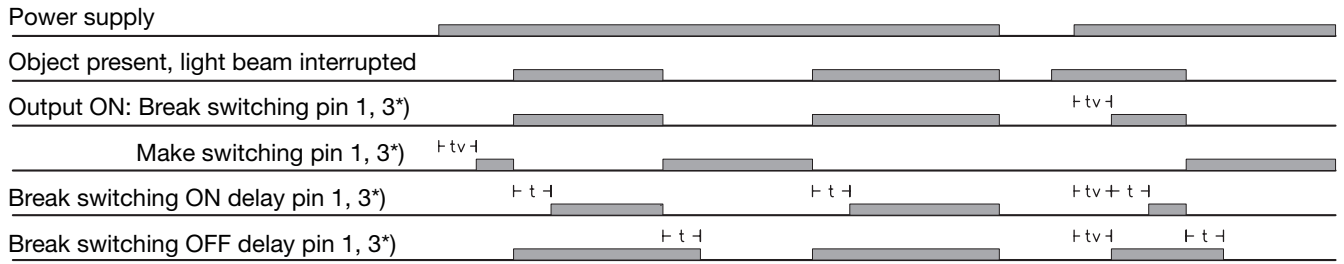
Truth Table

| | Make switching | | | Break switching | | |
|---|----------------|----------------|----------------------|-----------------|----------------|----------------------|
| | Yes | No | No | Yes | No | No |
| Object present | Yes | No | No | Yes | No | No |
| Dirt on lenses, misaligned or sensitivity too low | -- | No | Yes ¹⁾ | -- | No | Yes ¹⁾ |
| Output LED red | OFF | ON | ON | ON | OFF | OFF |
| Level LED yellow | OFF | ON steadily | OFF or weakly OFF | OFF | ON steadily | OFF or weakly OFF |
| Load Pins 1&3 | N-act. | Active | Active | Active. | N-act. | N-act. |
| Output NPN Pi. 9&7 | High | Low | Low | Low | High | High |
| Alarm Output ²⁾ NPN Pins 11&7 | High | High | Low | High | High | Low |

¹⁾ Under normal operating conditions, the yellow level indication LED has to be on steadily (bright) and alarm output has to be high.

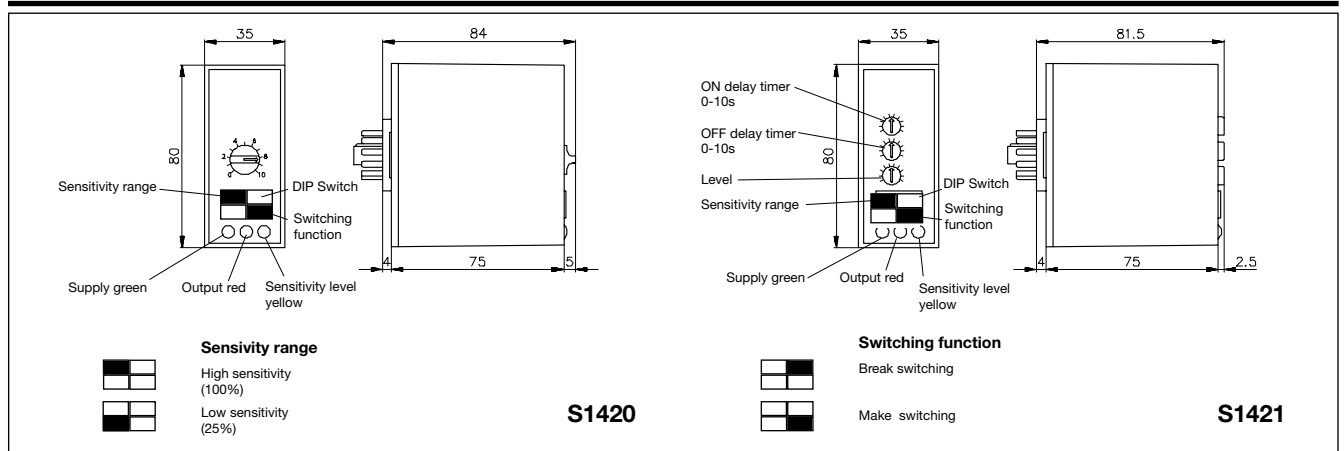
²⁾ The alarm output will turn on shortly each time an object enters or exits the sensing zone, even if the photoelectric switch is correctly installed and adjusted. To avoid false signals, the alarm functions should be delayed with an external ON delay timer (i.e. Carlo Gavazzi timer S111 series).

Operation Diagram

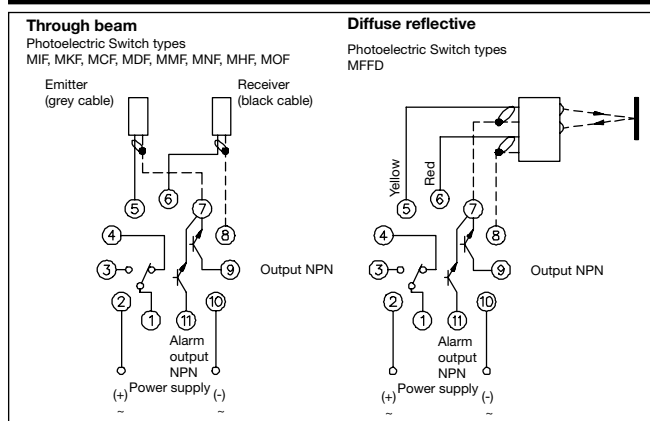


*) Switching function selected by DIP-switch, inverted function on pin 1, 4

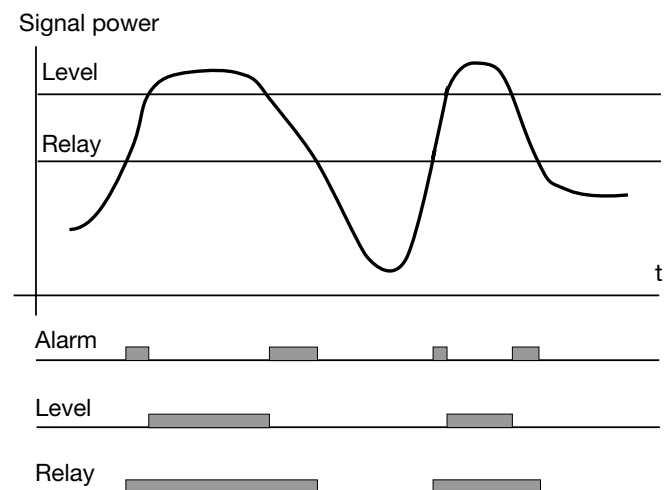
Dimensions



Wiring Diagrams



Alarm Diagram



Accessories

- 11 pole circular socket S111, S111A, S411, ZPD11
- Socket cover for S111 BB1
- Socket cover for S411 BB4
- Holding down spring HF
- Mounting rack SM13
- Front panel mounting bezel FRS2
- Potentiometer knob lock PL1

Delivery Contents

- Amplifier
- **Packaging:** styropor box