

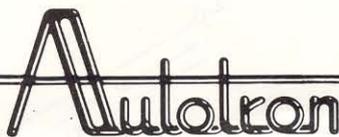
# **CB4 Series**

## **INCANDESCENT CONTROLS**

and

## **REMOTE HEADS**

**For those unique applications  
where LED light will not work**



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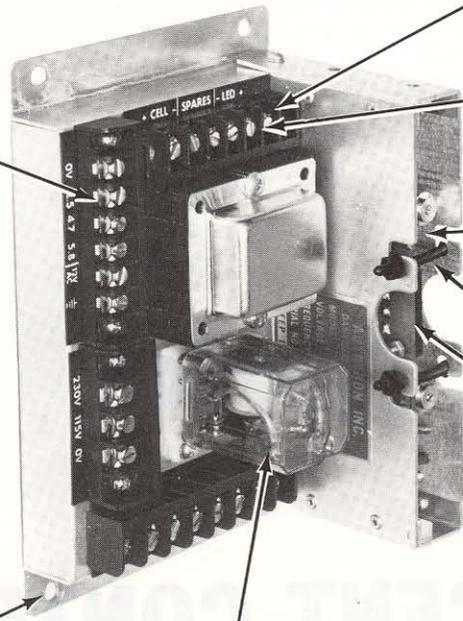
# CB1 Series Remotely Operated All-Purpose Controls

## • Plug-in Circuitry

- 5.8, 4.7, 3.3, 2.5, 2.2 and 1.1 volts produced for remote incandescent light source.

- CB1 Series includes NEMA 1, dust tight, steel case. NEMA 12 available upon request.

- CA1 Series comes without enclosure — ideal for panel mounting.



- Two output options available — plug in DPDT relay or plug-in logic.

- Rugged terminal blocks provided with break resistant barriers and back barrier for added safety and wiring ease.

- Heavy-duty screw terminals supplied in "raised" position ready to fasten on to wire. Large 8-32 screws for high voltage connections.

- All plug-in circuit boards contain red LED alignment indicator which glows when beam is properly aligned.

- Non-conducting hold-downs provided to secure plug-in circuit board into position.

- Offers a modular design for maximum flexibility and maintenance ease. Plug-in circuit board contains all electronic components.
  - a. Gold plating on board contacts and edge connector.
  - b. Rugged G-10 glass epoxy board.

- Plug-in circuit cards are protected by steel housing on 5 sides, yet all adjustments are easily accessible along card edge.

## OTHER FEATURES

- Can be used with a wide selection of remote sensors and light sources.
- Is compatible with phototransistor, cad cell or contact inputs.
- All transistors and IC's hermetically sealed for maximum performance and reliability.
- Many different functions supplied on plug-in circuit boards.
- Rugged solid state design.
- Voltage regulation of time delay circuits provides accuracy of timing within 1% over input voltage of 100 to 130 volts.

## ORDERING INFORMATION

The CB1 Series model numbers are made up of three parts:  
Base — Function — Output

Choose among the following options:

- Base**  
 CB1 — standard base in NEMA 1 enclosure  
 CA1 — CB1 less enclosure — chassis only

**Function**  
 Choose desired plug-in circuit function from page 3.

- Output**  
 R — standard plug-in DPDT relay  
 L — plug-in logic; both opto-isolated transistor switch and low-level voltage output  
 LB — plug-in logic; open-collector transistor switch

### Example of Complete Model:

CB1 - F101 - R  
 Order remote heads separately.

## SPECIFICATIONS

**Input**  
 115 or 230 V 50-60 Hz

**Power Consumption**  
 25 VA maximum

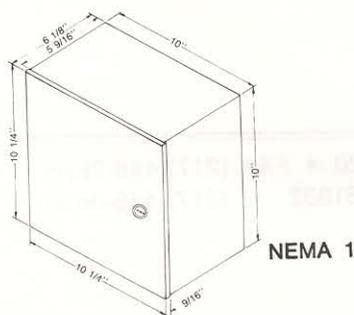
**Output**  
 Relay: Plug-in DPDT contacts rated 5 A, 115 VAC, resistive load.

**Relay Response:**  
 .03 sec. min. LIGHT time  
 .03 sec. min. DARK time

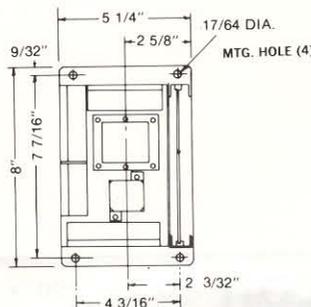
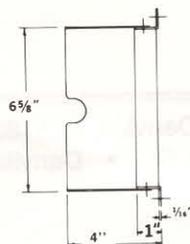
**Maximum Ambient Operating Temperature**  
 -40° F to +130° F (-40° C to +55° C)

**Enclosure**  
 Steel case, epoxy painted.  
 NEMA 1 (dust tight) is standard on CB1 Series —  
 NEMA 12 available upon request.  
 Holes available for mounting to wall.

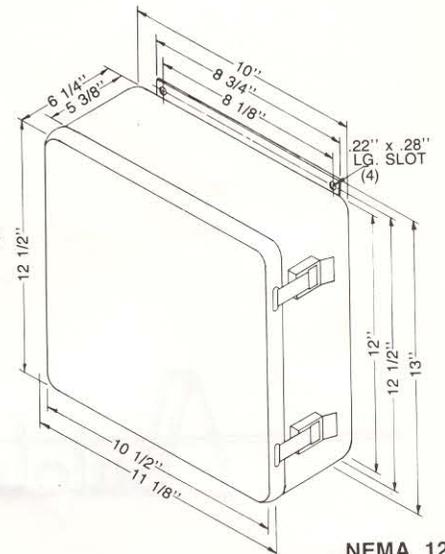
**Shipping Weight**  
 10 lbs.



NEMA 1



CHASSIS



NEMA 12

# Plug-in Circuit Information

Function No.	Operation	Sensitivity Adjustment	Output Sequence
F101	ON/OFF—Light energized	Yes	1L
F1101	ON/OFF—Light energized— High sensitivity	Yes	1L
T110	Light energized, times out Light OR Dark energized, times out Dark	Yes	2L, 3D
T120	Capacity-coupled—"One Shot"	Yes	5D, 6L
T130	Dual Timer—times out Light AND times out Dark—Light energized	Yes	4L
T160	Light energized times out Dark OR Dark energized, times out Light	Yes	2D, 3L
T1110	Same as T110—High sensitivity	Yes	2L, 3D
T1120	Same as T120—High sensitivity	Yes	5D, 6L
T1130	Same as T130—High sensitivity	Yes	4L
T1160	Same as T160—High sensitivity	Yes	2D, 3L
T2160	Same as T160—Fast response, .0005 second maximum	Yes	2D, 3L
T142	Two digit predetermined counter—light OR Dark energized	Yes	7L, 7D
T144	Same as T142—Four digit (see inset)	Yes	7L, 7D

## TIME RANGES

• Timing Ranges are specified in the last digit of the function number. The standard range is shown in the above numbers.

- Range No. 0: .1-10 seconds (standard)  
 2: .005-.5  
 3: .01-1  
 5: .02-2.5  
 6: .04-5  
 7: .2-23  
 8: .9-90 (additional charge)

Others available upon request

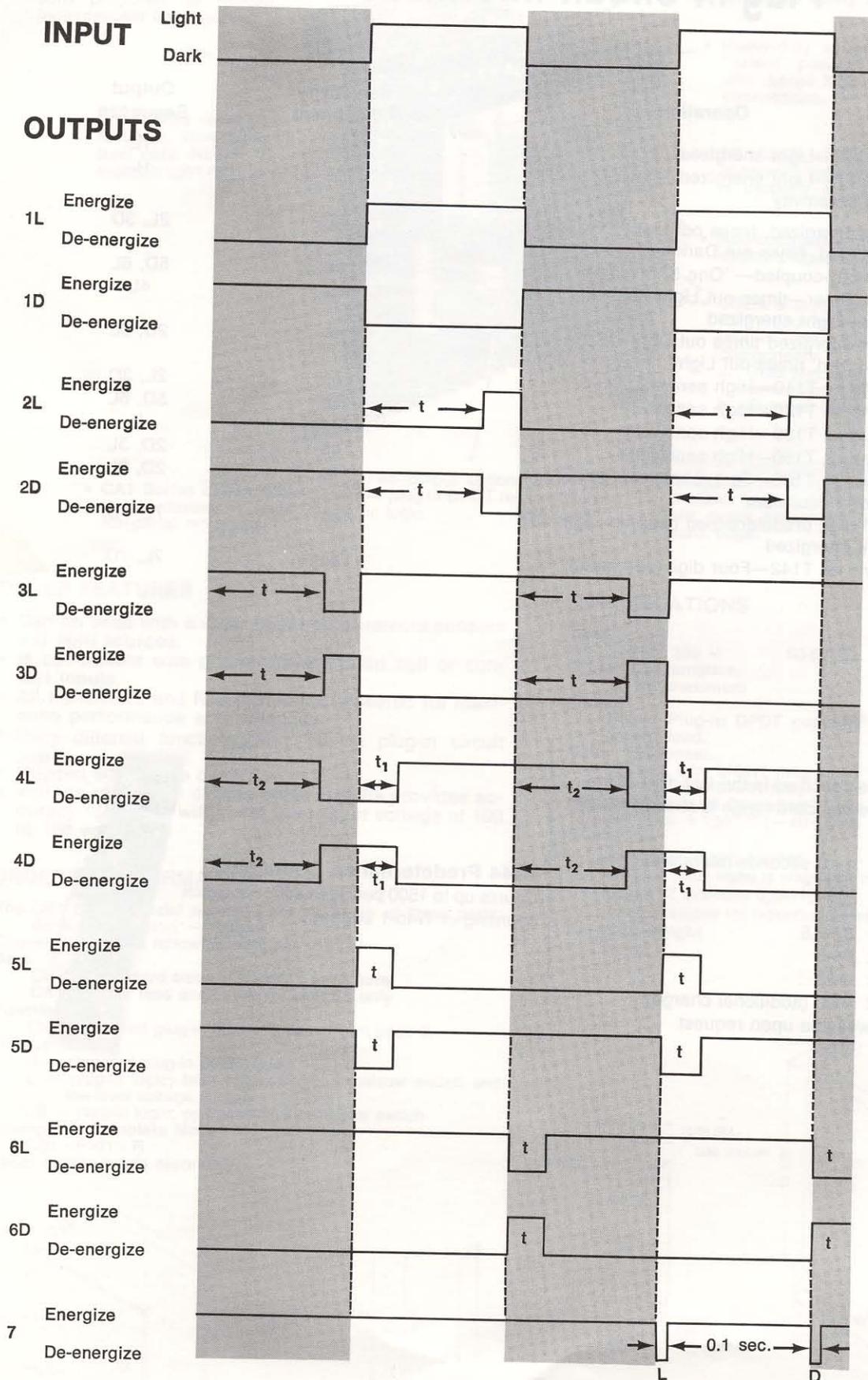
T144

### T144 Predetermined Counter

Counts up to 1500 per SECOND. For Batch counting or N-to-1 counter.



# Output Sequences



## Applications

General purpose, limit switch, counting, intrusion, edge control, die protection, positioning, level detector

"no product" alarm, pulse stretcher

"jam up" alarm, pulse stretcher, sheet stacker control

Jam up or no product alarm where delay is required before restarting

Cut-to-length switch, pulse stretching or shortening, stop motion control

Batch counting  
N-to-1 counter

# Compact Remote Sensing and Light Source Heads

## GENERAL FEATURES

- 6' factory connected cable on all heads (except 2' leads on E8Z Series).
- Solderless lugs provided for connection to control.
- Maximum ambient operating temperatures:  
115° F (46° C) for cad cells  
175° F (79° C) for phototransistors



### E8B SERIES

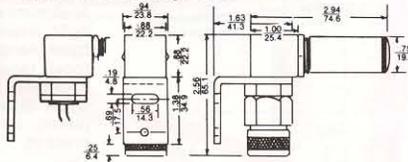
- Adjustable mounting bracket.
- Plug-in, replaceable lamp and sensor.
- Optional potted cable connection with 3/8" NPT fitting.
- Maximum range:  
20' high sensitivity cad cell and phototransistor  
8' moderate sensitivity cad cell

### SENSING HEADS

E8BP10LC has high sensitivity cad cell.  
E8BP10C has moderate sensitivity cad cell.  
▲ E8BP5BC has phototransistor.  
E8BP010LC is E8BP10LC with extra ambient light protection.  
E8BP010C is E8BP10C with extra ambient light protection.  
▲ E8BP05BC is E8BP5BC with extra ambient light protection.

### LIGHT SOURCE HEAD

E8BC has #10 lamp; .5 A at 2.5 V, 2500 hrs. average life.



Any sensing head can be actuated by any light source that provides enough light.

For practical reasons ranges, illustrations and combinations are for sensing and light source heads in physically matched pairs. In practice just about any combination that meets requirements of the application can be used if the light source supplies enough properly directed light. For example, an E8BC light source head can be used with E8AAP10LC sensing head if light source provides enough light.

▲ Designated sensing heads contain silicon phototransistor which responds to light change within 3 microseconds and withstands temperatures up to 175° F (79° C)

### E8B SERIES FIXED FOCUS BEAMS



E8BC-4  
E8BC-6  
Other Models

focal length  
1/8" 1/16" x 5/16"  
4 1/4" 1/16" x 5/16"

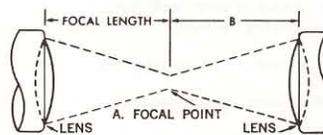
E8AC-1  
ECC-1

- Used when maximum light required through small opening.
- Allows more accurate positioning of edge of object.

focal length  
1/2" 1/32" x 1/8"  
1/2" 1/32" x 1/8"

For most effective use of focused light beams:

- Object should interrupt beam at focal point.
- Distance between object and sensor lens should not be greater than the focal length.



### E8BA SERIES

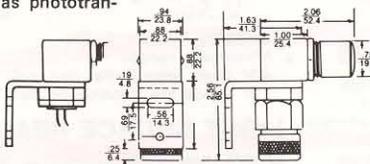
- Same features as E8B Series but with shorter lens barrel for mounting in smaller spaces.
- Maximum range:  
10' high sensitivity cad cell  
7' moderate sensitivity cad cell and phototransistor

### SENSING HEADS

E8BAP10LC has high sensitivity cad cell  
E8BAP10C has moderate sensitivity cad cell  
▲ E8BAP5BC has phototransistor

### LIGHT SOURCE HEAD

E8BAC has #10 lamp; .5 A at 2.5 V, 2500 hrs. average life.



### E8A SERIES

- Same features as E8B Series but with smaller lens barrel than E8BA Series.
- Maximum range:  
2' high sensitivity cad cell  
1' moderate sensitivity cad cell and phototransistor

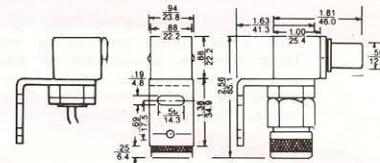


### SENSING HEADS

E8AP10LC has high sensitivity cad cell  
E8AP10C has moderate sensitivity cad cell  
▲ E8AP5BC has phototransistor

### LIGHT SOURCE HEADS

E8AC has #12 lamp; .15A at 5.8 V, 5000 hrs. average life.  
E8A10C has #10 lamp; .5 A at 2.5 V, 2500 hrs. average life.



### E8AA SERIES

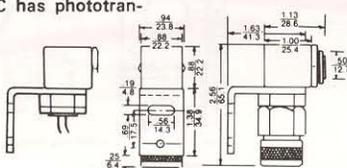
- Same features as E8B Series but with miniature lens assembly.
- Potted cable connection is standard.
- Maximum range:  
1' high sensitivity cad cell  
3" moderate sensitivity cad cell and phototransistor

### SENSING HEADS

E8AAP10LC has high sensitivity cad cell  
E8AAP10C has moderate sensitivity cad cell  
▲ E8AAP5BC has phototransistor

### LIGHT SOURCE HEAD

E8AAC has #253 lamp; .35 A at 2.5 V, 7500 hrs. average life.



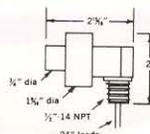
### E8Z SERIES

- UL Listed, for use in hazardous locations.
- Underwriters Laboratory Listing: Class 1, Groups C and D; Class II, Groups E, F and G. E8Z10 rated 1.25 W, 2.5 V; E8ZP10L rated 0.125 VA maximum, 40 V maximum; E8ZP5B rated 0.250 VA maximum, 10 V DC maximum.
- Plug-in replaceable lamp and sensor.
- Potted lead connection.
- Maximum range:  
20' high sensitivity cad cell and phototransistor  
8' moderate sensitivity cad cell



### SENSING HEADS

E8ZP10L has high sensitivity cad cell  
E8ZP10 has moderate sensitivity cad cell  
▲ E8ZP5B has phototransistor



### LIGHT SOURCE HEADS

E8Z10 has #10 lamp; .5 A at 2.5 V, 2500 hrs. average life.  
E8Z12 has #12 lamp; .15 A at 5.8 V, 5000 hrs. average life.

# Miniature Remote Sensing and Light Source Heads



## EC SERIES

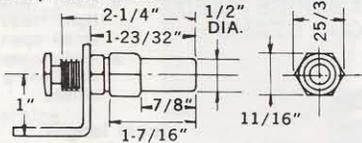
- Adjustable mounting bracket.
- Plug-in replaceable lamp and sensor.
- Potted cable connection with 1/4" NPT fitting.
- Maximum range:  
2' high sensitivity cad cell  
1' moderate sensitivity cad cell and photo-transistor

## SENSING HEADS

- ECP10LC has high sensitivity cad cell
- ECP10C has moderate sensitivity cad cell
- ▲ ECP5BC has phototransistor

## LIGHT SOURCE HEAD

ECC has #10 lamp; .5 A at 2.5 V, 2500 hrs. average life.



# Long Range Remote Sensing and Light Source Heads

## E1A SERIES



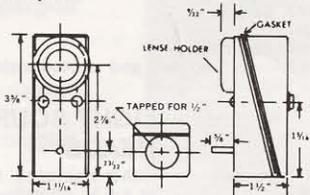
- E1A Series cases tapped for 1/2" pipe and may be rigidly positioned on pipe or conduit with lock nut.
- Lamp and cell easily replaceable without disturbing mounting.
- Cases are gasket-sealed, die cast zinc, splashproof.
- Shipping weight 1 lb.
- High intensity lamp provides long range capability.
- Maximum range:  
35' high sensitivity cad cell and phototransistor  
10' moderate sensitivity cad cell

## SENSING HEADS

- E1AP10LC has high sensitivity cad cell
- E1AP10C has moderate sensitivity cad cell
- ▲ E1AP5BC has phototransistor

## LIGHT SOURCE HEAD

E1AE has #88L lamp; 1.8 A at 5.8 V, 10,000 hrs. average life at 4.8 V.



## EAPS

## EAP/EL SERIES



- Sub-miniature assembly for very tight spaces.
- Lamp, sensor and cable potted for protection against environmental conditions and mechanical injury.
- EAP12G and EAP5BG have plug-in, replaceable sensor. In case of lamp failure, entire head is replaced.
- EAP/EL Series is end-view. EAPS Series is side-view
- Maximum range: EAP/EL 3'

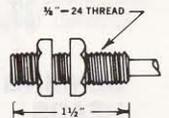
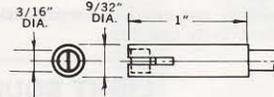
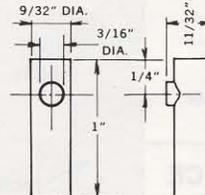


## SENSING HEADS

- EAP12G has cad cell
- ▲ EAP5BG has phototransistor
- EAPS12G has cad cell
- ▲ EAPS5BG has phototransistor
- ▲ EAP32 has phototransistor.

## LIGHT SOURCE HEADS

ELG has #253 lamp; .35 A at 2.5 V, 7500 hrs. average life. Series resistor available for longer lamp life when feasible.



## Specular-Reflective Scanner Heads

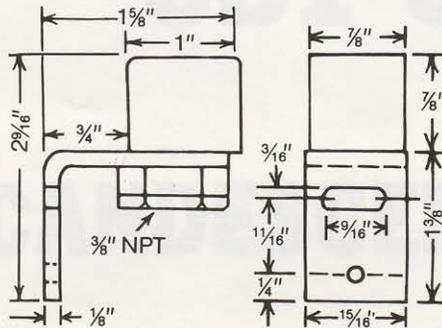


### E8LP SERIES

- Detects mirror-like surfaces. Light beam must be directed perpendicular to the reflective surface for light to bounce back and strike the light sensing cell.
- Developed for high-speed scanning in limited space.
- Compact heads contain both lamp and sensor.
- Lamp #1748, rated .4 A at 2.5 V, 5000 hrs. average life.
- Operating lamps at lower-than-rated voltage greatly prolongs lamp life.
- Lamp has built-in lens.
- Filter in front of cell protects against interference from ambient light.
- Lamp and sensor replaceable.
- Both cad cells and high-speed phototransistors available.
- Potted cable connection with  $\frac{3}{8}$ " NPT fitting and adjustable mounting bracket.
- Maximum range off mirror using higher sensitivity controls 6".

### MODELS

- ▲ E8LP12G has cad cell
- ▲ E8LP5BG has phototransistor



For those unique applications  
where LED light will not work

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