Bulletin 378
January 1997

Autotron

C Series Remotely Operated Modulated LED Controls

C Series Controls provide modular flexibility with the ultimate performance and indefinitely long life of LED design.

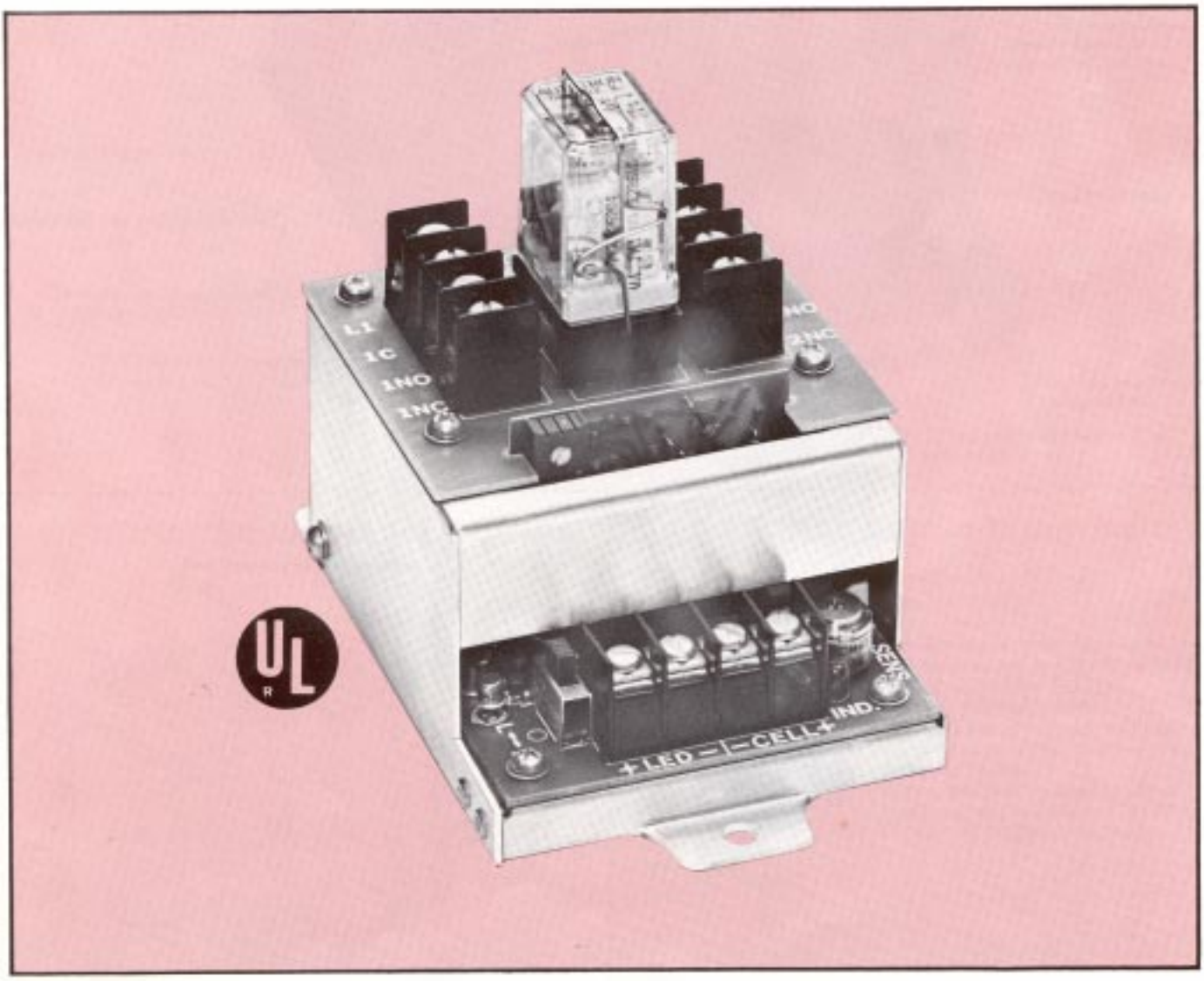
Extremely compact design requires only 16 square inches of panel space. Tongue and groove design enables close "nesting" for high density mounting.

Plug-in circuitry and interchangeable function cards combine to reduce inventory costs in an unlimited number of industrial detection uses.

This modulated LED control adapts to a wide selection of remote sensors and light sources. It performs a series of different functions supplied on plug-in function cards. A red LED indicator glows when the light beam is properly aligned.

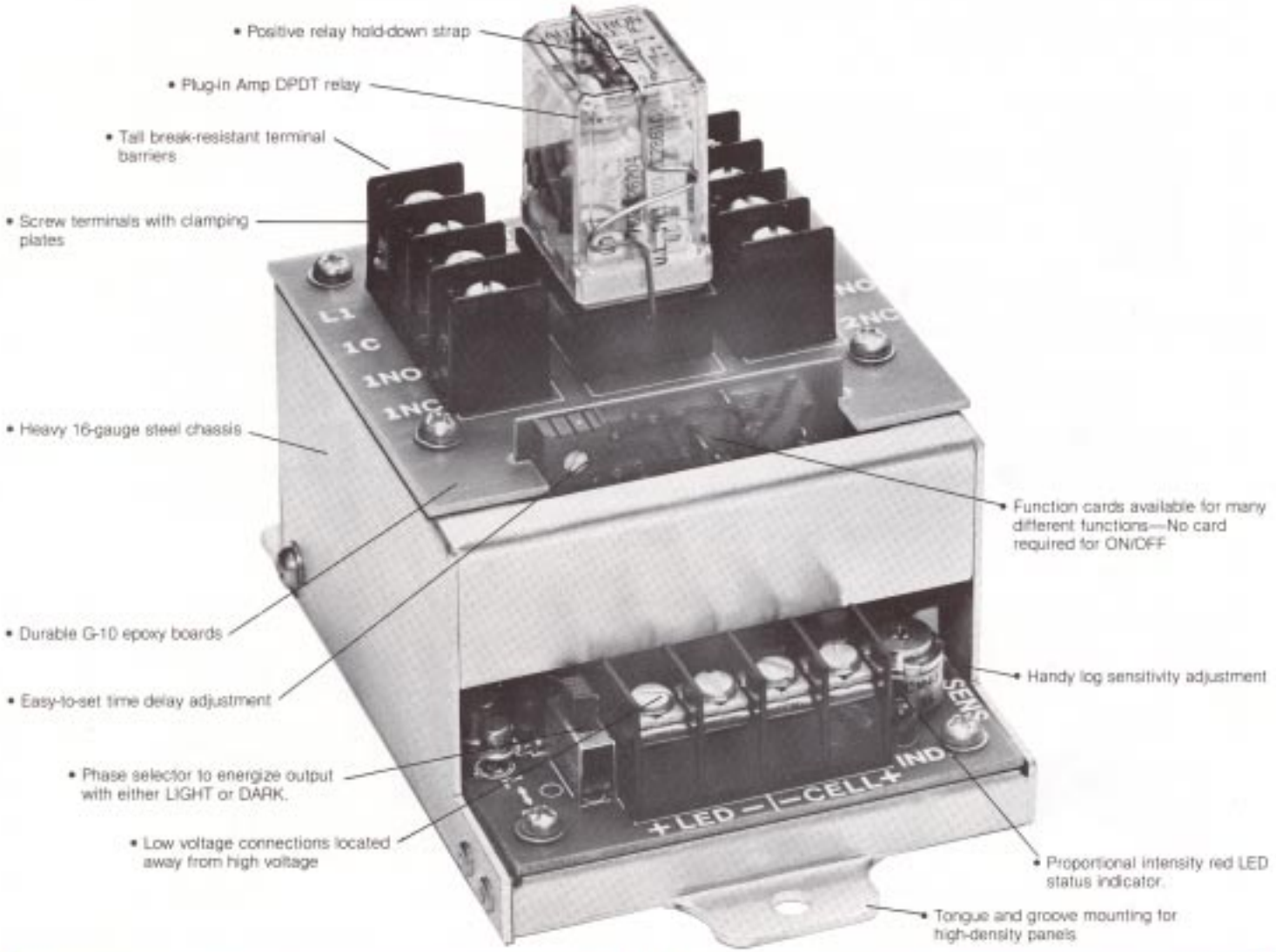
Its time delay system offers dependable accuracy—timing is within 1% over input voltage of 100 to 130 volts. Plus the C Series rugged solid state design assures you long service life.

Features, specifications and options combined, the Autotron C Series is a total design solution for a highly functional, light sensing system.



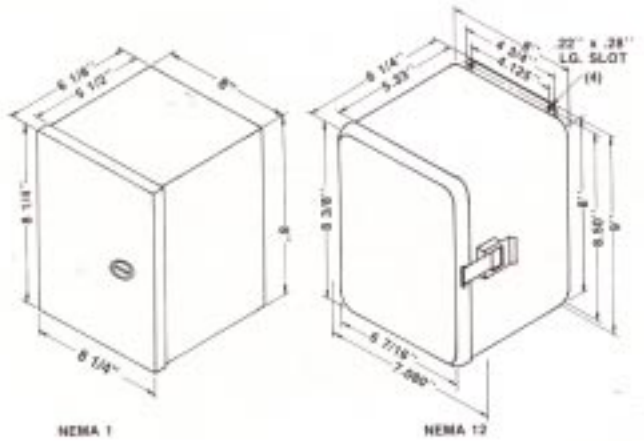
Modulated LED Beam • Compact Design

C Series Controls Give You Dependable Detection



OPTIONAL Enclosures for C Series.

Must be specified when ordering.



OPTIONAL Remote Status Indicator

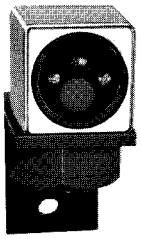
ELDZ31

- Indicator glows when beam is on target.
- Can be installed on E8LP30, E8B30, ELD31, ELDY30 or ELDX30.
- Use with CZPF303 Control.
- Red LED status indicator mounted on top of head as shown to left and listed under OPTIONS.
- Option specified by adding "Z" to model number (E8LPZ30, E8BZ30, ELDZ31, ELDYZ30 or ELDXZ30).

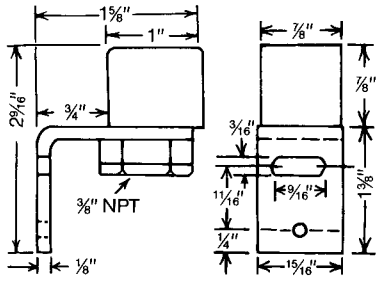
Compact LED Remote Heads

All heads, except the E8Z Series, are supplied with 6 feet of shielded cable. Any cable length up to 100 feet may be ordered at an additional charge. If the cable is spliced in the field, care must be taken to use the proper shielded cable and good splicing techniques to prevent erratic operation.

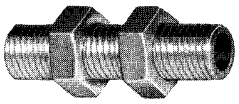
E8LP30 PROXIMITY SCANNER



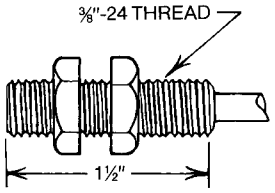
- Can detect various objects by reflecting light directly off surface.
- Potted cable connection with 3/8" NPT fitting and adjustable mounting bracket. Uses #8734 shielded cable.
- Optional red LED status indicator available as described under OPTIONS.
- MAXIMUM RANGE OFF 90% WHITE SURFACE: 8 inches.



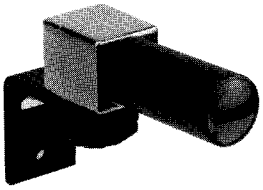
EAP30 SENSOR AND EL30 SOURCE



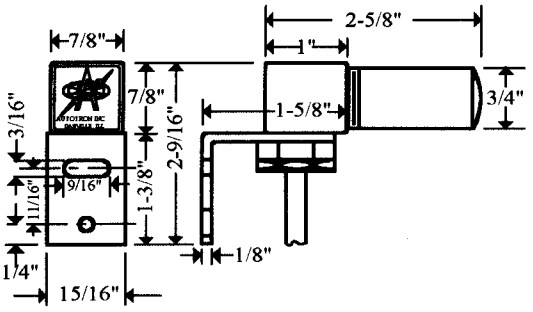
- Extremely compact for very tight spaces.
- Easy to align.
- 3/8" x 24 threaded body and two jam nuts provided for easy mounting.
- Entire assembly potted for maximum ruggedness and minimum environmental effects. Uses #8761 shielded cable.
- MAXIMUM RANGE: 4 feet



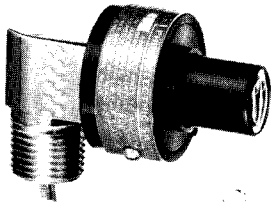
E8BP30 SENSOR AND E8B30 SOURCE



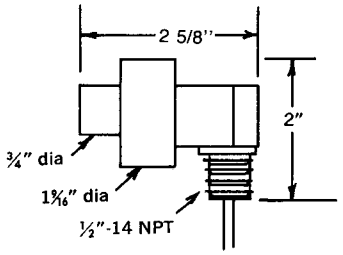
- E8B30 Source uses powerful infrared LED
- Potted cable connection with 3/8" NPT fitting and adjustable mounting bracket. Uses #8761 shielded cable.
- Optional red LED status indicator available as described under OPTIONS.
- MAXIMUM RANGE; 50 feet.



E8ZP30 SENSOR AND E8Z30 SOURCE



- UL Listed, for use in hazardous locations
- Underwriters Laboratory Listing: Class I, Groups C and D; Class II, Groups E, F, and G.
- Potted 2' cable connection. Uses #8761 shielded cable.
- MAXIMUM RANGE: 50 feet



ELD31 RETRO SCANNER
ELDY30 PROX SCANNER
ELDX30 PROX SCANNER

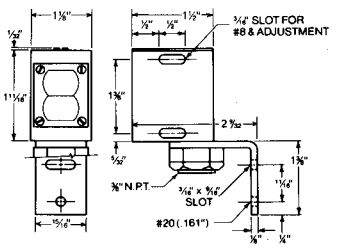
- Adjustable bracket, 3/8" NPT threads or slotted holes provided for mounting.
- Entire assembly potted for maximum ruggedness and minimum environmental effects. Uses #8734 shielded cable.
- Optional red LED status indicator available as described under OPTIONS.
- Uses invisible infrared LED source.

ELD 31 Retro-Reflective Scanner

- Operates by reflecting light off retro-reflector. (order separately)
- Range is 0-20 feet from 3" diameter reflector: 3 in. - 3 ft. from 1 inch square of 3M7800 retro tape.

ELDY30 AND ELDX30 Proximity Scanner

- Operates by reflecting light directly off the surface of the object.
- Range from a 90% diffuse white surface: ELDY30 0-15 inches, ELDX30 0-30 inches.

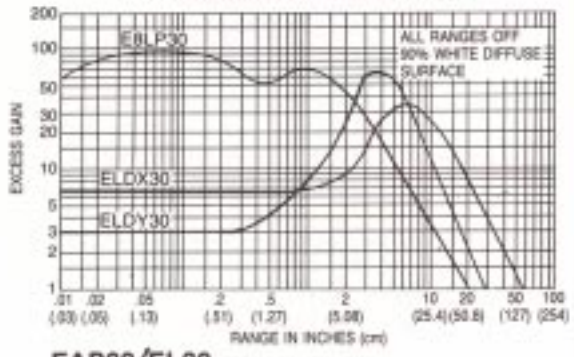


EXCESS GAIN

How well a photoelectric control can perform under less-than-ideal conditions is measured in terms of Excess Gain. Excess Gain is the ratio of the light signal available to the light signal necessary for the control to barely work. The graphs below plot this factor versus range from specific targets. If degrading factors such as dirt, a poorly reflective surface, or misalignment exist, an Excess Gain greater than one (1) is required. How much Excess Gain is required for the application is determined by the customer. An Excess Gain of 3-5 should be allowed for light industrial environments, and 5-8 for moderately dirty environments.

TYPICAL EXCESS GAIN vs. RANGE

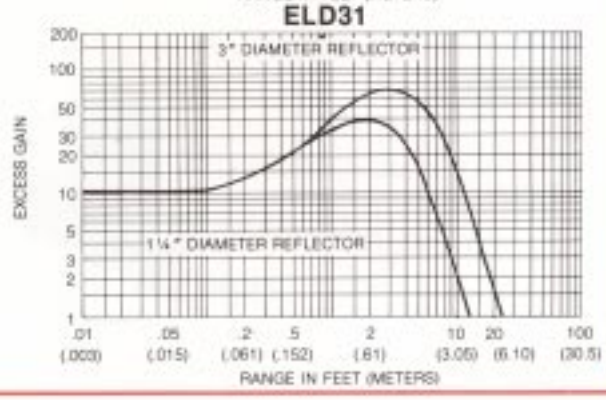
E8LP30/ELDY30/ELDX30



EAP30/EL30

E8B AND E8Z SERIES

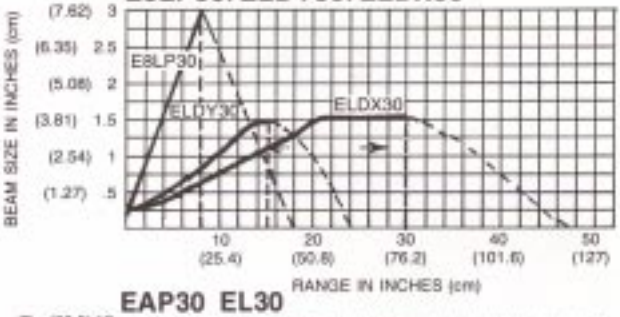
ELD31



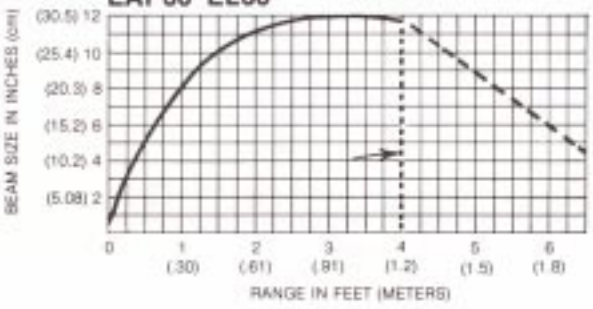
EFFECTIVE BEAM DIAMETER vs. RANGE

EFFECTIVE BEAM DIAMETER is defined as that portion of the radiation pattern that is sufficiently intense for detection. The vertical dotted lines define the maximum clean air range.

E8LP30/ELDY30/ELDX30

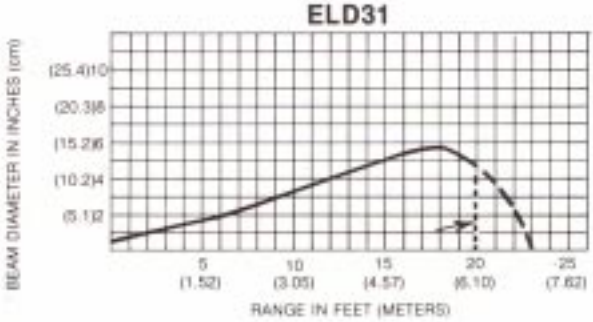


EAP30 EL30



E8B AND E8Z SERIES

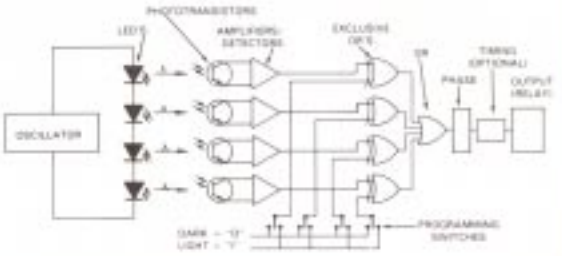
ELD31



A936 Four-Channel Control

- Can operate up to four light beams from one control.
- Can program an output only when all sensors are LIGHT (series logic), or all are DARK (parallel logic) or any combination such as: Beams 1 and 2 LIGHT; 3 and 4 DARK.
- 1, 2, 3 or 4 channels may be used—unused channels can be disabled by programming switch.
- Logic sequence easily selected by proper positioning of rocker switches on 4-pole programming switch.
- More cost effective than 4 separate controls.
- Different head styles with different light beam distances may be intermixed because inputs are independent.
- Individual sensitivity adjustments and LED indicators allow faster and surer alignment and a visual indication of any obstructed light beam.
- Works with a wide selection of remote heads for through beam, retro or proximity detection.
- Accepts plug-in timing cards to control output.
- Output relay may be set to energize or de-energize with light beams in the pre-programmed "true" condition.
- Control mounts entirely on one PC board and is supplied less enclosure. Enclosure available upon request.
- Terminal strip positions are provided for all head connections.
- Less wiring than with four separate controls.
- Better reliability with only one relay.
- Same sensitivity as CPF303.

FUNCTIONAL DIAGRAM



A952 COUNTING CONTROL

- All solid-state. No moving parts to wear out.
- Consists of CPF303 (logic output) Control driving solid-state counter directly.
- Typical service life of counter battery is 8 years.
- Counter life is independent of the total number of counts.
- Maximum count speed: 3000 CPM.
- 8-digit display with push-button reset.
- Remote contact reset available upon request.
- Control and counter mounted in compact NEMA 1 enclosure.

SPECIAL CZPF303 CONTROL

Has all the features of the CPF303 PLUS

- Utilizes synchronous detection of modulated light signal.
- Can drive up to four LED sources in series. Sensors must be connected in parallel.
- Required when the optional remote status indicator is installed on the remote head. Will also work with standard heads that do not have the indicator.

ELDY32-2 FOCUSED SPOT PROX SCANNER

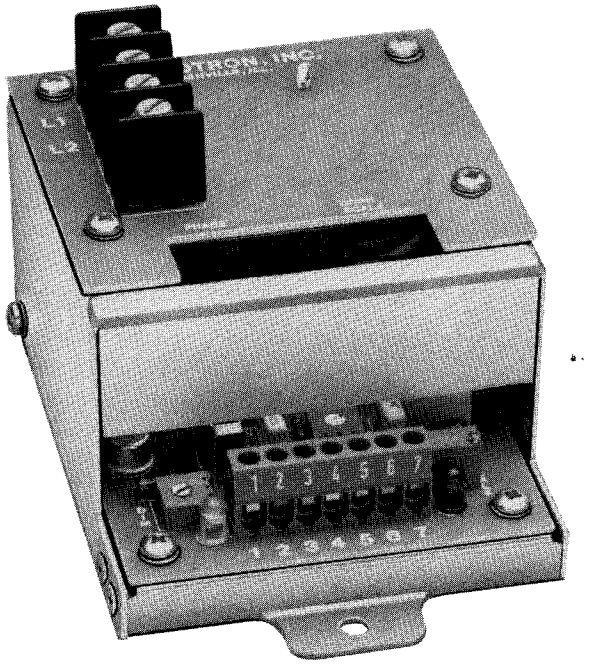
- Projects small spot of visible red LED light as shown.
- Used for accurate edge detection and detection of small parts, marks or defects.
- Operates from standard CPF303 Control.
- Not recommended for detection of red on white.

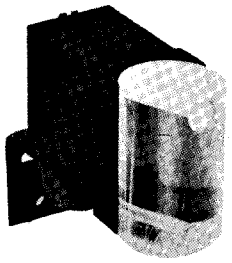
1/16" diameter spot size

ELDY32-2

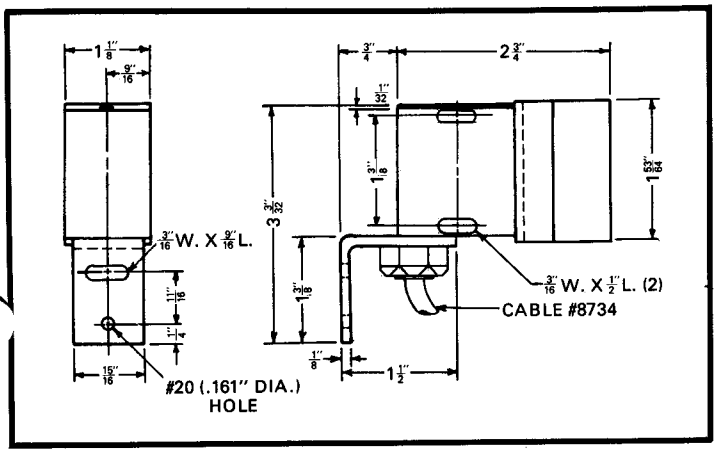
A947 Analog Control

- Output voltage is proportional to the amount of LED light received.
- Output range is either 1-10VDC or −4 to +5VDC, 10 ma maximum.
- Phase switch allows the output voltage to vary proportionally or inversely-proportionally to the light level.
- Separate LED intensity and scale adjustments allow precise set-up of application.
- Can be used with any LED remote head.
- Pulsed LED light provides long life and high immunity to ambient light.
- All other features and specifications same as CPF 303 (no time delay available).
- Not UL Listed.
- For more details, ask for Bulletin 682.

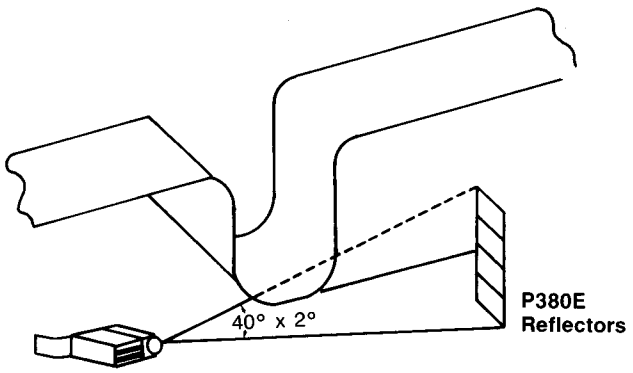




ELD31-W Fan Beam Scanner
(Ambient Operating Temperature: −40°F to +131°F)



APPLICATION



ELD31-W

Mount scanner horizontally for vertical reflector array as shown.

Six (6) inches of reflector array length are needed for each foot of distance between the scanner and the array.

Range	Beam Size	Reflector Array
3 feet	2 x 30 inches	1¼ x 18 inches
6 feet	4 x 60 inches	1¼ x 36 inches
9 feet	7 x 100 inches	1¼ x 54 inches

MAXIMUM RANGE
10 feet from array of 1¼ in x 3 in (P380E) reflectors
5 feet from array of #3870 retro tape
8 feet from array of #2000X retro tape

FEATURES

1. Can be used with a wide selection of remote sensors and LED light sources.
2. Rugged chassis requires only 16 square inches of panel space.
3. Three-point tongue and groove mounting for quick assembly on uneven surfaces and maximum space efficiency in panel.
4. Plug-in function card changes control logic easily. Card contains gold-over-nickel fingers and inserts into rugged edge connector. Control functions in On/Off mode with *no card.*
5. Plug-in 10 Amp DPDT relay.
6. Unique proportional intensity red LED alignment indicator. The better the alignment—the brighter it glows.
7. Rugged solid state design.
8. Sensitivity adjustment is log taper, easy to set.
9. Timing adjustments easy to set. Voltage regulation provides accuracy of timing within 1% over input voltage of 100 to 130 volts.
10. Low voltage LED and cell connections made away from high voltage connections.
11. Wiring terminals provided with clamping plate for wiring ease and tall break-resistant barriers.
12. Output phase selection is standard.
13. Rugged G-10 glass epoxy circuit boards.
14. Function cards and relay interchangeable with R Series.
15. Sensitivity adjustment is standard.

OPTIONS

(not UL listed)

- Plug-in logic or solid state AC switch output.
- Remote LED status indicator on head. See Page 2.
- Optional input voltages:
  - 12 VAC 50-60 Hz
  - 12 VDC
  - 24 VAC 50-60 Hz
  - 24 VDC
  - 230 VAC 50-60 Hz
  - 120 VAC 50-60 Hz

SPECIFICATIONS

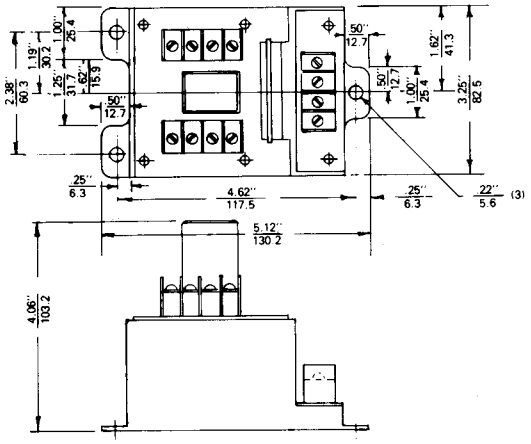
Input:
120V ± 10% 60 Hz

Power Consumption:
5VA maximum

Output:
Relay: Plug-in DPDT contacts rated 10A, 120VAC, resistive load.
Relay Response: .01 sec. for circuit, Light or Dark;
.03 sec. including relay

Ambient Operating Temperature:
Control: −40°F to +131°F (−40°C to +55°C)
Heads: −40°F to +176°F (−40°C to +80°C)

Shipping Weight: 2 lbs.



ORDERING INFORMATION

(Order remote heads Separately)

CONTROLS

Model	Description
CPF303	ON/OFF.Standard Control.
A936	ON/OFF.Special 4-channel control.
CZPF303	ON/OFF.Special feature control.
A952	ON/OFF.Counting control.
CFPF303	ON/OFF.FiberOptic Control.
A947	AnalogControl
A960	Isolation Module

C series supplied less enclosure. Enclosure available upon request.

For ordering and pricing above Model Nos. with plug-in function cards installed, substitute the Function Card No. for "F303" and add the card price.

For example, the CPF303 On/Oft Control with the T360 Single Timer Card installed is ordered as:

CPT360 Timing Control

PLUG-IN FUNCTION CARDS

Model No.	Function
T360	Single Timer, OFF Delay
T310	Single Timer, ON Delay
T330	Dual Timer
T320	One-Shot Timer
T300	Five Function Timer
T342	Two-Digit Batch Counter
T370	Delayed One-Shot Timer
T380	Shift Register
T390	Over or Under Speed Detector
T399	Output Latch
T1330	Repeat Cycle Timer
T349	Single-Digit Toggle Batch Counter

For time delays from 30 secs. to 40 hrs. Consult factory for time ranges.

T3200	Long Delay One-Shot Timer
T3600	Long Delay Single Timer,Off Delay

For more Function Card details, See Bulletin 979.

TIMING RANGES (Do not use for T3200 or T3600) Timing Ranges are specified in the last digit of the model number. The standard ranges are shown.

Range No. 0:	.1-10 sec.		
No. 2:	.005-.5 sec.	No 6:	.04-5 sec.
No. 3:	.01-1 sec.	No 7:	.2-23 sec.
No. 5:	.02-2.5 sec.	No 8:	.9-90 sec.

Others available upon request (additional charge)

ACCESSORIES (ORDER SEPARATELY)

Reflectors

Model No.	Diameter
P380	3"
P380A	1 5/8"
P380AB	1 1/4"
P380B	7/8"
P380C	5/8"
P380MH	3" (metal housing)
P380E	1 1/4" x 3"
3870 Tape	2" wide
P1099	NEMA 1 Enclosure
P1027	NEM 12 Enclosure

OPTIONAL FEATURES (Consult factory for model designation)

Description
12VAC Input (A)
12VDC Input (D)
230VAC Input (for 50-60 Hz) (E)
120VAC Input (for 50-60 Hz) (T)
Plug-in AC Switch Output (K)
Plug-in Logic Output (G or GA)
24VAC Input (for 50-60 Hz) (B)
24VDC Input (W)
Remote Status Indicator

For current pricing, please call the factory at 800-637-2648 or your local AUTOTRON sales representative or authorized distributor.

Autotron