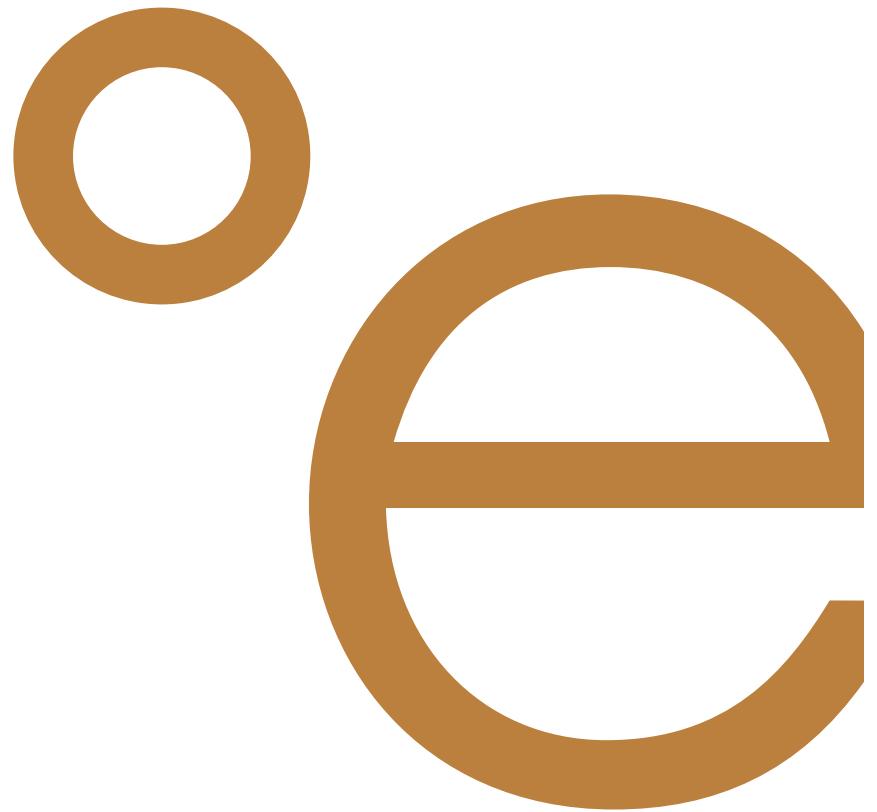


Technical Manual

°eluma

Aluminum Frame LED Panels

patents pending



°elementTM
D E S I G N S

Technical Specifications Subject to Change



TABLE OF CONTENTS

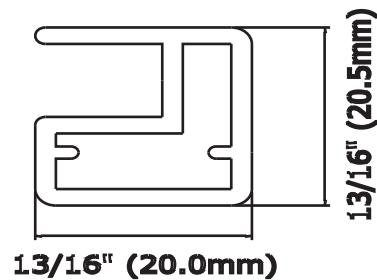
General Specifications.....	Page 3
Profile Specifications – EL001.....	Page 4
Profile Specifications – EL002.....	Page 5
Insert Specifications – Glass.....	Page 6
Insert Specifications – Acrylic.....	Page 7
LED Specifications.....	Page 8
Transformer Specifications.....	Page 9
Component Specifications – Adjustable Panels.....	Page 10
Component Specifications – Fixed Panels.....	Page 11
Component Specifications – On/ Off Switches.....	Page 12
Installation Instructions – ° eluma Panel with Power Bar	Page 13
Installation Instructions – Round Rocker Switch.....	Page 14
Installation Instructions – On/ Off Touch Switch.....	Page 15
Product Comparison – Light and Heat Output.....	Page 16
Product Comparison – Cost and Maintenance.....	Page 17
Product Comparison – Energy Efficiency.....	Page 18
Warranty and Repair/ Replacement Program.....	Page 19

GENERAL SPECIFICATIONS

- Custom sizes - panels manufactured in 1/16" increments
- Short lead time
- Adjustability – plug and play magnet to power bar allows adjustment after installation without wiring
- LED technology – long life span (50K hours or 11.7 years @ 12 hours per day), extremely low power (12VDC), minimal heat (versus fluorescent or halogen light shelves)
- Easy system to incorporate into cabinet or display program, as a standard product or as an upgrade
- Versatility – can be used as panels, doors, shelving, etc. – unlimited design possibilities
- Durability of ¼" tempered safety glass or abrasion resistant acrylic
- Fully Assembled – arrives built and ready to wire (this product cannot be disassembled)
- ETL approved system for the US & Canada.*
- Panel sizes up to 60" - Consult Element Designs for lengths exceeding 60"
- LEDs installed on one side – typically width rail
- Frames are available in 2 profiles and 2 finishes
- Inserts are ¼" tempered glass with proprietary etching technology or light transmitting acrylic
- Two LED color temperatures (K-Kelvin): warm (3500K) & daylight (6500K)
- Thermally regulated by aluminum frame system
- 0.3W per LED & LED amperage regulated by in-circuit resistors

* Both ETL and UL are privately owned, Nationally Recognized Testing Laboratories (NRTL) as recognized by OSHA and local inspectors. UL is the largest in the US, while ETL is largest worldwide. No mark is better than the other, each serving as proof of product compliance to US and Canadian standards.

PROFILE - EL001/ EL001S



Finish Options:

- natural anodized aluminum finish
- brushed nickel finish (stainless steel look)

Horizontal Load Bearing Application (Shelf)

Size Limitations:

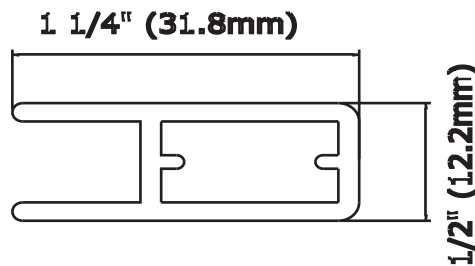
- Maximum width = 60" (1524mm)
- Maximum depth = 18" (457mm)
- Minimum width = 10" (254mm)
- Minimum depth = 4" (102mm)

Vertical Non Load Bearing Application (Backsplash/ Panel)

Size Limitations:

- Maximum width = Consult Element Designs
- Maximum depth = Consult Element Designs
- Minimum width = 10" (254mm)
- Minimum depth = 4" (102mm)

PROFILE - EL002/ EL002S



Finish Options:

- natural anodized aluminum finish
- brushed nickel finish (stainless steel look)

Horizontal Load Bearing Application (Shelf)

Size Limitations:

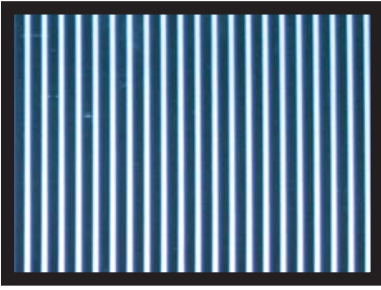
- Maximum width = 60" (1524mm)
- Maximum depth = 18" (457mm)
- Minimum width = 10" (254mm)
- Minimum depth = 4" (102mm)

Vertical Non Load Bearing Application (Backsplash/ Panel)

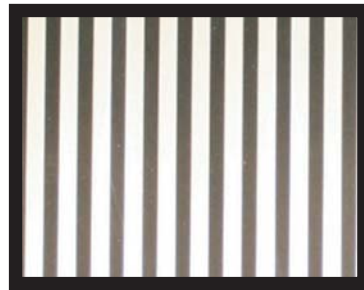
Size Limitations:

- Maximum width = Consult Element Designs
- Maximum depth = Consult Element Designs
- Minimum width = 10" (254mm)
- Minimum depth = 4" (102mm)

INSERT SPECIFICATIONS - 1/4" TEMPERED GLASS



1/16" etched lines
at 1/4" spacing



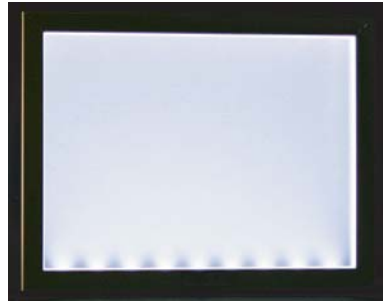
1/4" etched lines
at 1/4" spacing



custom etched logo

- 1/4" tempered safety glass is used in the eluma panel.
- The load bearing capability is 75lbs per SF.
- The glass used in eluma is a proprietary process and product that gives eluma its' illumination characteristics.
- The etched lines are recommended to be in the same direction that the light (parallel to the depth) is traveling.
- The etched lines are required – they are what carry the light throughout the panel. The lines are available in two thicknesses, 1/16" & 1/4". The spacing of the lines is 1/4" for both line thickness options.
- 15" depth/height glass is recommended. There is a 50% drop-off of light at 15".
- The amount of etching affects the light output. Thin lines provide higher light output than thick lines for longer depth panels. The light drop-off is still 50% at 15", however, the thin etched lines are brighter.
- Shelving (horizontal) applications at or around eye level will help to hide the light drop off condition.
- When panel depth/height must be greater than the recommended maximum, opposing LED strips may be used.
- Custom etched logos in the glass are possible based on the customer supplying the image in the following format:
 - Black & White (only) OR line drawings
 - Bitmap file type preferred but JPEG is also possible
- High resolution image (> 500KB)
- A custom logo etching fee will apply. The chemically etched logo fee is economical versus other glass etching techniques.
- Small scratches, bubbles, etc. may be visible in the insert when eluma is turned on. These are inherent within the glass and are part of the product.

INSERT SPECIFICATIONS - 1/4" ACRYLIC

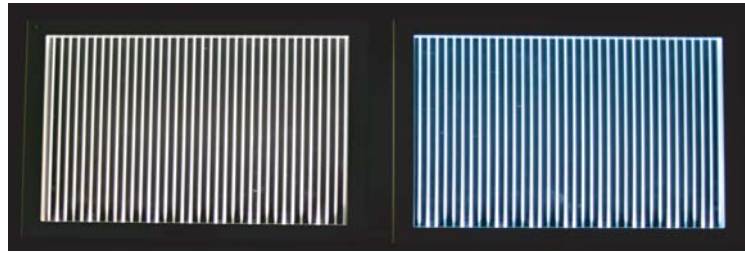


Illuminated Acrylic

- The acrylic has an abrasion resistant coating on both sides specifically designed for °eluma panels. The abrasion resistant coating makes the panels scratch resistant but not scratch proof.
- The acrylic is clear when not powered on yet becomes fully frosted when illuminated. °eluma is the only LED panel on the market with consistent and solid illumination (versus grid pattern etched acrylic, etc.).
- 18" depth/height is recommended for acrylic. A 50% drop-off of light occurs at 18". Depending on how the panel is being used, the acrylic depth/height can be up 21". Panels exceeding the 18"/ 21" recommendation can use 2 LEDs to achieve even illumination.
- Acrylic becomes amber starting beyond 18" depth, regardless of LED color.
- Consult Element Designs for load bearing limitations.

LED SPECIFICATIONS

Glass with 1/16" Etched Lines



Warm

Daylight

Acrylic



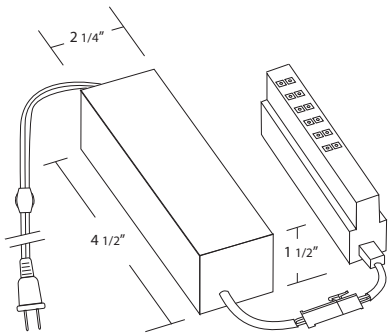
Warm

Daylight

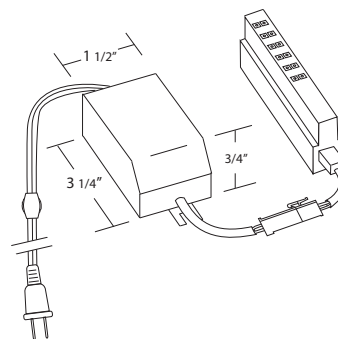
- High quality LEDs from one of the world's leading manufacturers
- 50,000 hr useful life (under ideal conditions as is with all LED ratings) = 11.7 years @ 12 hours per day
- The LEDs for eluma are offered in two colors: warm & daylight.
- Warm has a soft yellowish glow and is commonly used in residential environments. The color temperature for warm is 3500K.
- Daylight has a cool bluish tint and is commonly used in commercial & retail applications. The color temperature of daylight is 6500K.
- .3W per LED
- LEDs spaced @ 30mm
- 1LF of light output is 3W
- 3 chip diode units
- 120° of light dispersion from LEDs
- 12VDC input power
- CRI (color rendering index) of 90 (out of 100).
- Colored LED panels are also available in a variety of colors.

TRANSFORMER SPECIFICATIONS

- 3 watts from the transformer will support approximately 1LF of LED light output
- Both the 60W & 18W have a connector block with six possible inputs (6 panels)
- Maximum distance from transformer to panel or power bar track is 12ft. based on two, 2M extensions.
- Transformers are short circuit protected by automatic reset (no fuses)
- Transformers are overheat/overload protected with automatic reset (no fuses)
- FCC rated - the transformers will not interfere with other electronics



EL-DC-ELT-60-CON

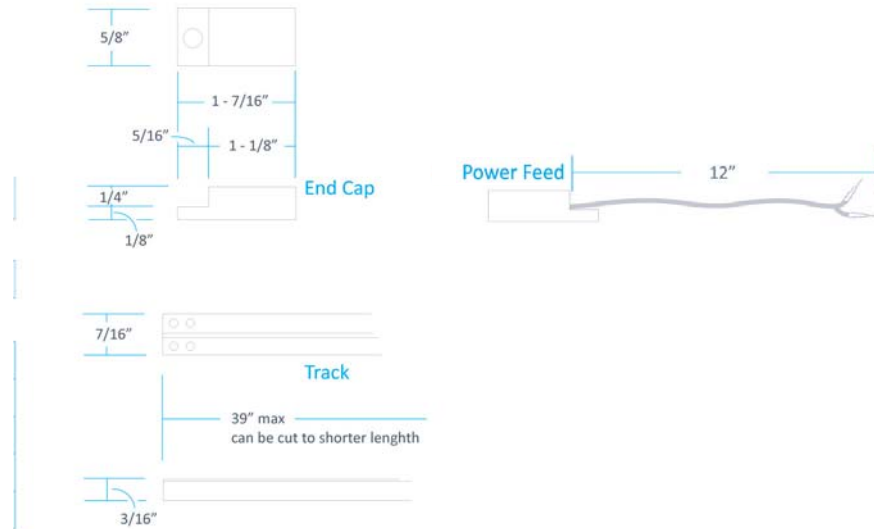


EL-DC-ELT-18-CON

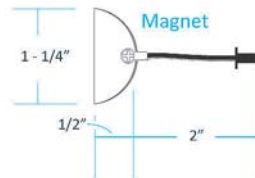
- **60W (EL-DC-ELT-60-CON):** 60W maximum transformer (20LF of LEDs)
 - The 60W transformer is ideal when powering multiple panels.
 - Input voltage is 100-240V @ 1.5A with an output of 12V = 5A
- **18W (EL-DC-ELT-18-CON):** 18W maximum transformer (6LF of LEDs)
 - The 18W transformer can support two average size panels or 3 smaller panels.
 - Input voltage is 100-240V @ 1.5A with an output of 12V = 5A

COMPONENT SPECIFICATIONS - ADJUSTABLE PANEL COMPONENTS

- **Power bar (EL-MAG-TR-1M):** The power bar track is designed to be installed vertically (primarily) or horizontally in a box or on a wall. The bar is 1M (39") in length and comes with two end caps that are NOT pre-installed.
 - Both power bar end caps, white male connector, and screws are bagged separately.
 - One end cap includes a power feed with a 12" wire that will be fitted with the male white connector. The other end cap is for mounting purposes only.
 - The white male connector will not be installed so that the installer can route the wire through a thru hole and keep the hole diameter minimized. The wires should be checked for correct orientation to the connector block on the transformer (note the side with the clip is the positive side of the block). Once correct orientation is achieved, the wires should be firmly pushed into the white male connector.
 - The track is cut using any type of saw.
 - The track can also be linked to other tracks using additional track link components. (Not supplied as a standard component. Contact Element Designs for more information.)



- **Magnet (EL-MAG-ADP):** Magnet adapter that clips to power bar. The magnet has a black male connector that will plug directly into the 2" (approx.) pig tail that exits the °eluma panel.

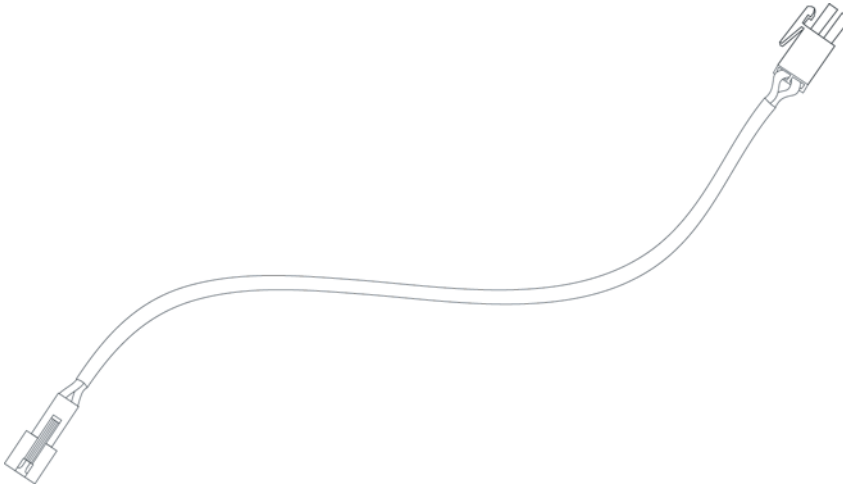


- **Extension wire for power bar (EL-EXT-2M):** 2M (78 3/4") extension wire to plug wire coming from power bar to transformer. Note if transformer & power bar are in close proximity, this extension wire is not necessary.



COMPONENT SPECIFICATIONS - FIXED PANEL COMPONENTS

- **Extension wire from panel (EL-EXT-PKT-2M):** 2m (78 ¾") extension wire that has male connector to plug directly into panel. To be used when adjustability feature is not necessary.

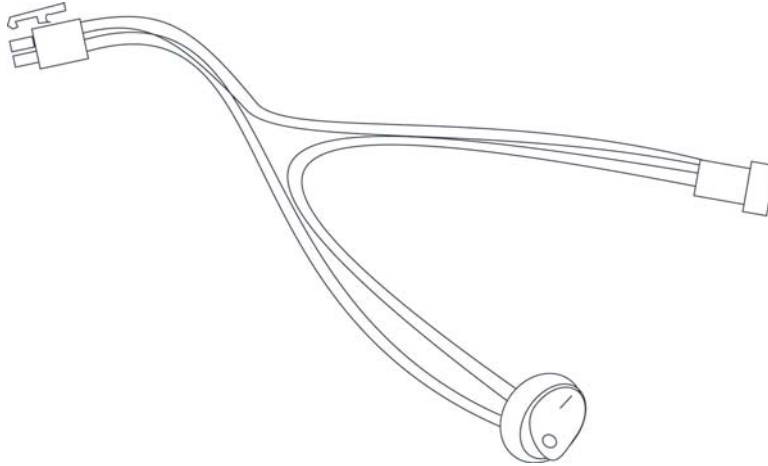


- **Extension wire for power bar (EL-EXT-2M):** 2M (78 ¾") extension wire is same as above but used in this application for additional extension between PKT 2M extension wire & transformer.

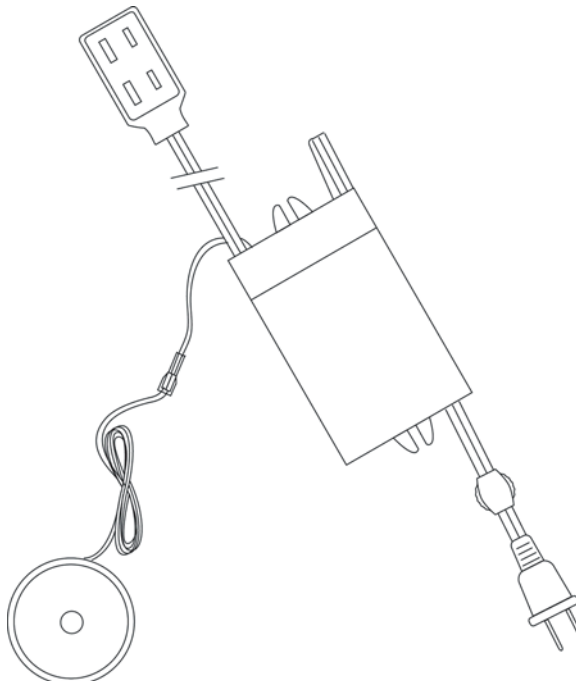


COMPONENT SPECIFICATIONS - ON/ OFF SWITCH COMPONENTS

- **Switches (EL-RDSW-2M-WH <white> & EL-RDSW-2M-BL <black>):** Rocker switches to be installed between the power source (wall outlet) & the transformer. (see instructions)



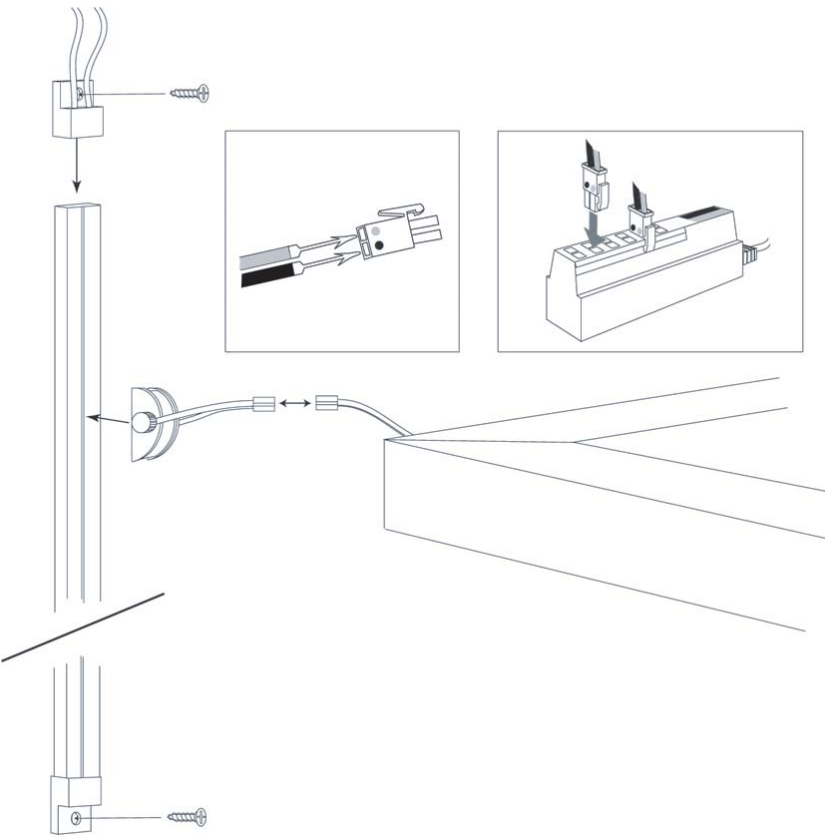
- **Touch Sensor (EL-TS2-72):** Higher end switch that will turn panels on or off with contact. Touch sensor to be installed between transformer & connector block. (see instructions)



INSTALLATION INSTRUCTIONS - ELUMA LED PANELS WITH POWER BAR

**** Read and follow all safety and installation instructions carefully****

Before beginning any wiring, be sure power is turned OFF to transformer.



To Install Magnetic Power Bar:

1. Determine where to install Class II DC transformer (EL-DC-ELT60-CON or EL-DC-ELT18-CON) and power bar. Be sure power bar wires will properly reach the transformer and 120V power source.
2. Position and mount 12V DC transformer (EL-DC-ELT60-CON or EL-DC-ELT18-CON).
3. Magnetic Power Bar is available in standard 1M (39") track lengths. Cut track lengths as required.
Precaution: When cutting track, hold it firm to prevent the metal track rails and nonconductive barrier (black plastic) from pulling apart. For best results, clamp track to a vise and cut slowly and evenly with a fine tooth blade hacksaw.

To Wire Power Bar:

4. Slide power feed over bar (pressure fit).
5. Position power bar. Use mounting end clips with screws to mount power bar to surface. (Recommended track locations: on inside face frame of cabinet, or right side of back wall of cabinet in frameless cabinets.)
6. Run wire to transformer. Snap wire into transformer block. Caution: Transformer must be turned off when making connections. 60W max per transformer. Be sure to keep polarity correct: (+)Red with (+)Red, (-)Black with (-)Black.
7. Place panel in cabinet onto shelf pins that meet KCMA requirements. Wire should be facing power bar.

IMPORTANT SAFETY INSTRUCTIONS

CAUTION: To reduce the risk of fire, electric shock, exposure to excessive UV radiation, or injury to persons:

- Use only in dry indoor locations. Not for use where exposed to the weather.
- Power bar cannot touch any other conductive surface (metal, etc.) or an electrical short may occur.
- Wiring and materials should conform to national (NEC) and local electrical codes.
- A licensed electrician should be consulted for wiring through ceilings, soffits or walls.
- Shelves over 36" should use an additional center shelf support.
- Do not exceed 75 lbs per shelf (including shelf weight = 3 lbs/ sq.ft.)

Save these instructions for future reference.

For technical assistance: (704) 332-3114

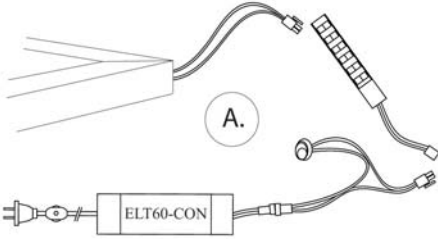
ATTENTION: Altering system from manufacturer's instructions/ recommendations voids all warranty!

To Install Panels (Shelves):

8. Connect panel wire to magnet and place magnet on power bar. Be sure to keep polarity correct: (+)Red with (+)Red, (-)Black with (-)Black. If shelf does not light, reverse the magnet connection to re-establish polarity.
9. Double check all connections and then turn power on to transformer.

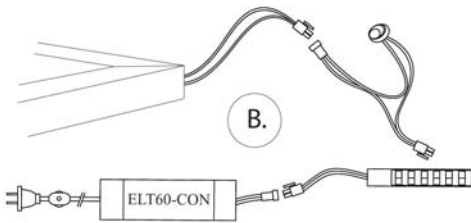
INSTALLATION INSTRUCTIONS - ROUND ROCKER SWITCH (RDSW-2M-WH/BL)

****Read and follow all safety and installation instructions carefully****



A. CONTROL ALL LIGHTS w/one TRANSFORMER

1. Determine location of switch
2. To recess mount switch: Drill 13/16" hole for switch. Place wires through hole and push switch completely into hole until snug.
3. Plug female end of switch into wiring block. Plug male end of switch into female end of transformer (12V side).

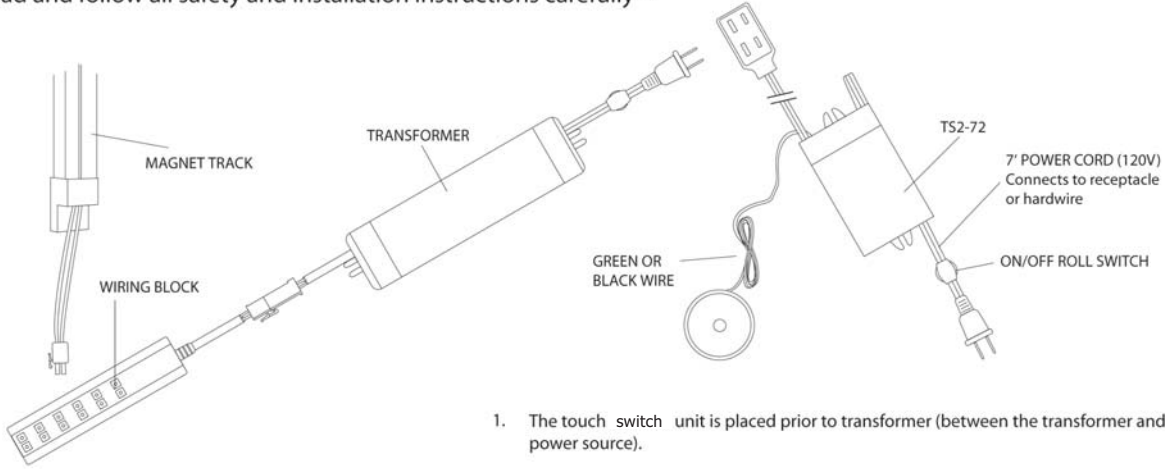


B. CONTROL LIGHTS INDEPENDENTLY

1. Determine location of switch
2. To recess mount switch: Drill 13/16" hole for switch. Place wires through hole and push switch completely into hole until snug.
3. Plug male end of switch into wiring block. Plug light into female end of switch.

INSTALLATION INSTRUCTIONS - ON/OFF TOUCH SWITCH (TS-72)

****Read and follow all safety and installation instructions carefully****



1. The touch switch unit is placed prior to transformer (between the transformer and 120V power source).
2. Determine location to place touch pad, TS2-72 unit, and transformer. Make sure green wire to touch pad is long enough for this location. (NOTE: Do not lengthen or splice green wire. This will cause the touch switch to function improperly and will void the warranty.) Peel off adhesive protector and place touch pad. (NOTE: Touch pad can be removed and green wire attached to any metal object to act as a touch pad. See box.)
3. Plug transformer into female receptacle of TS2-72.
4. Plug TS2-72 into wall receptacle or hardwire according to local code.
5. Connect lights into transformer's wiring block. TS2-72 dimmer can accommodate (3) 60W or (3)10W transformers and their lights.

Removing Touch Pad

Touch pad can be removed and green wire attached to any metal object to act as a touch pad.

- Cut green wire at touch pad ONLY
- Discard touch pad.
- Strip wire 1/4"
- Attach wire end to any metal object
- Metal part then becomes the touch pad

NOTE: Once touch pad is removed it cannot be reconnected to green wire. Following the steps above will not void your warranty.

***NOTE: Must use DC-ELT60-CON or DC-ELT10-CON transformer to ensure proper function.**

**Save these instructions for future reference.
For technical assistance: (704) 332-3114**

ATTENTION: Altering system from manufacturer's instructions/recommendations voids all warranty!!



LIGHT & HEAT OUTPUT COMPARISONS

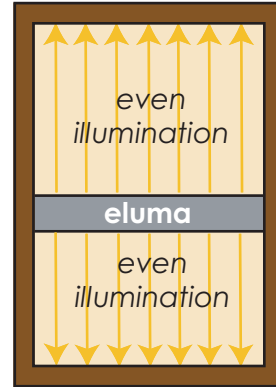
Light Output Measurement

Conventional Puck Light



Front Cabinet View

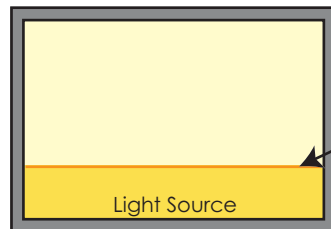
°eluma Aluminum Frame LED Panel



Front Cabinet View

Panel Depth Light Drop Off Comparison

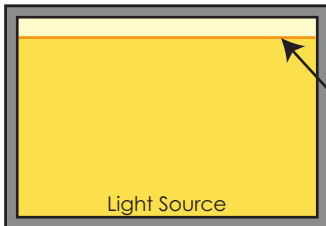
Fluorescent Panel



Top Panel View

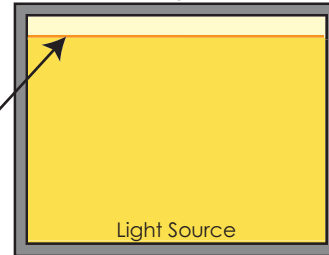
Light Drop Off is 50%

°eluma Panel with Glass Etched Lines



Top Panel View

°eluma Panel with Acrylic

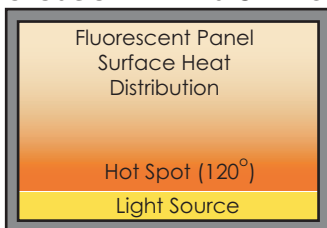


Top Panel View

Light Drop Off is 50%

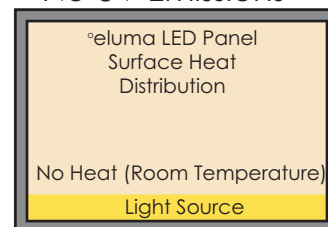
Surface Heat Distribution Comparison

Fluorescent Emits UV Rays



Top Panel View

No UV Emissions

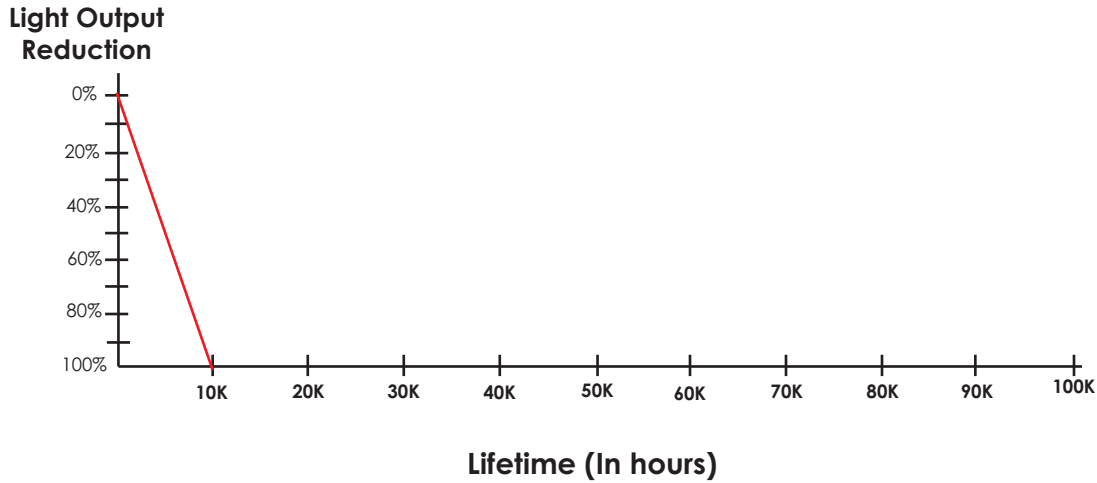


Top Panel View

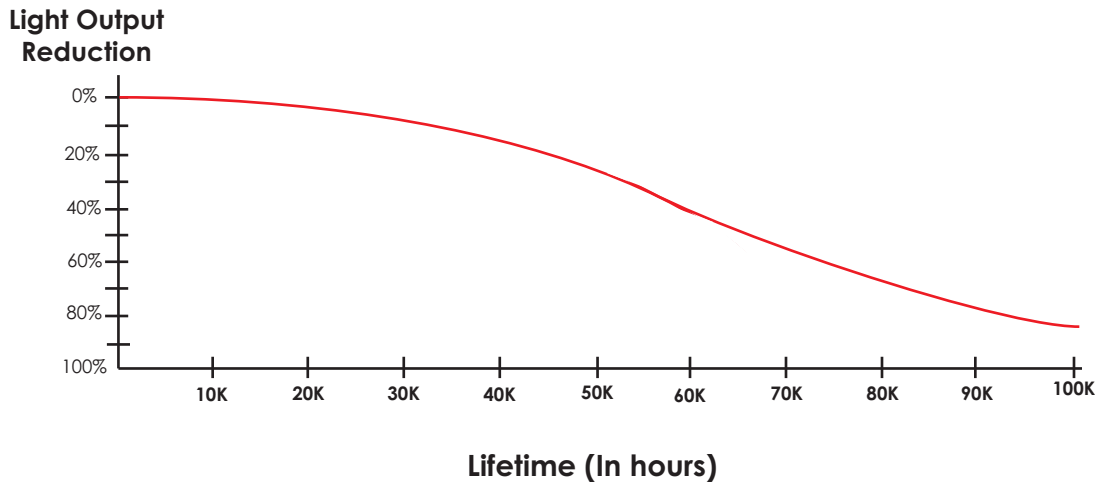
COST & MAINTENANCE COMPARISONS

Maintenance Comparison

Fluorescent Lights = 10K hour lifetime = Replacement Needed



LED = 50K hour useful lifetime = 30% reduction in light output



Cost/ Maintenance Calculations over 50,000 hours:

Fluorescent Bulb & Ballast = \$ initial cost x 5 replacements = \$\$\$\$\$
 Labor Costs (Electrician) = \$\$ x 5 replacements = \$\$\$\$\$\$\$\$\$
 Total = 15\$

eluma panel = \$\$\$\$\$ initial cost
 Labor Costs = 0
 Total = 5\$

ENERGY EFFICIENCY COMPARISON

Fluorescent Fixtures

13W per 2ft T5 Fluorescent Bulb
+ 6W Ballast = 19W Total System Consumption
x 5 Fixtures =
95W Total Energy Consumption

°eluma Aluminum Frame LED Panels

5 LED Panels @ 6W per Panel
+1 Power Source @ 80% Efficiency =
36W Total Energy Consumption

WARRANTY/ REPAIR PROGRAM

Warranty

- The eluma system carries a one year warranty from date of manufacture that will cover parts and labor.
- Any altering of the system will void warranty.

Repair/Replacement Program

- Element Designs will offer a repair and replacement program for panels which are not covered by warranty.
- The customer is not permitted to disassemble or alter the product in anyway.
- All repairs must be performed by Element Designs.
- A fee \$25.00 will apply to all repairs – not including any components.