

## Product Information

The Troffer.C is a square recessed LED fixture that provides uniform illumination in commercial settings.

This fixture features die-formed and embossed code 22 gauge steel with white reflectors.

The Troffer.C is the perfect LED fixture for Classrooms, Offices, Retail Spaces and a variety of other indoor lighting applications.

## Performance Ratings and Certifications

UL 1598  
UL 8750  
CSA C22.2#250.0  
CSA C22.2#250.13  
IP Rating: IP20

## Performance Summary

|                                                             |                                                 |
|-------------------------------------------------------------|-------------------------------------------------|
| Lumens:                                                     | 2,154 – 6,462 lm                                |
| Lumens Per Watt (typ):                                      | 110 LPW                                         |
| Power Consumption:                                          | 20 - 59 W                                       |
| Light Engine:                                               | L70 Rated Lifetime of 100,000+ hours.           |
| CRI:                                                        | Minimum 80 CRI. Optional custom CRI.            |
| CCT (Typical):                                              | 3000K, 4000K, 5000K, tight bins also available. |
| Manufactured in the U.S. with parts from U.S. and imported. |                                                 |

## Fixture Information

|           |                                                                                                                      |
|-----------|----------------------------------------------------------------------------------------------------------------------|
| Housing:  | Die-formed and embossed code 22 gauge steel                                                                          |
| Color:    | High reflectance baked white enamel, with matte white reflectors.                                                    |
| Lens:     | Linear ribbed acrylic lens                                                                                           |
| Mounting: | Recessed inverted T-Bar ceilings. Grid mount or surface mount. Wiring knockouts are provided on the back of housing. |
| Length:   | 24"                                                                                                                  |
| Width:    | 24"                                                                                                                  |
| Depth:    | 3.41"                                                                                                                |

## Electrical System Characteristics / Data

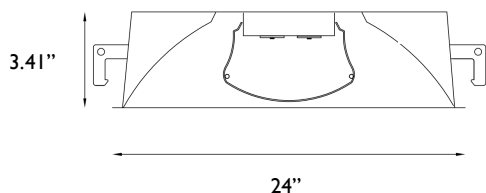
|                            |                                                                                                              |
|----------------------------|--------------------------------------------------------------------------------------------------------------|
| AC Input:                  | 120/277 VAC (standard), 480 VAC (upgrade)                                                                    |
| FCC:                       | Title 47, Part 2, Part 15, Class A                                                                           |
| EM:                        | Compliance to EN55015, EN55022 (CISPR22) Class B, EN61000-3-2 Class C (60% load); EN61000-3-3                |
| EM Immunity:               | Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN61547, EN55024, light industry level (surge 4KV), criteria A |
| Withstand Voltage:         | I/P-O/P: 3.75KVAC I/P-FG: 2KVAC O/P-FG: 1.5KVAC                                                              |
| Isolation Resistance:      | I/P-O/P, I/P-FG, O/P-FG: 100M Ohms / 500VDC / 25 / 70% RH                                                    |
| Power Factor:              | PF > 0.98/115VAC, PF > 0.92/277VAC                                                                           |
| Total Harmonic Distortion: | THD < 20%                                                                                                    |
| Standard Surge Protection: | All-Around Protection: OVP, SCP, OLP.                                                                        |
| Enhanced Surge Protection: | Protects against surges according to IEEE C62.41.2 C and ANSI C136.2                                         |
| Emergency Battery Backup:  | Optional upgrades available.                                                                                 |

## Optional Controls:

|                             |                                                   |
|-----------------------------|---------------------------------------------------|
| Wireless Controls:          | Optional via Pulse Wireless Mesh Network          |
| Dimming:                    | 0-10V, step, line voltage and bi-level available. |
| Daylight Harvesting Sensor: | Optional.                                         |
| Occupancy Sensor:           | Optional.                                         |

## Warranty

Five-Year Limited Warranty. Optional 10-Year Manufacturer's Warranty Available. Full Warranty Terms Available At [www.noribachi.com/products/warranty](http://www.noribachi.com/products/warranty)



Fixture side view

## Electrical System Specifications

| Electrical Load |                                |                                |                                |                          |
|-----------------|--------------------------------|--------------------------------|--------------------------------|--------------------------|
| Light Engine    | Drive Current<br>(Amps@120VAC) | Drive Current<br>(Amps@277VAC) | Drive Current<br>(Amps@480VAC) | System Power<br>(Watts)* |
| LINL-056-B      | 0.16                           | 0.07                           | 0.04                           | 19.58                    |
| LINL-112-B      | 0.33                           | 0.14                           | 0.08                           | 39.16                    |
| LINL-168-B      | 0.49                           | 0.21                           | 0.12                           | 58.74                    |
|                 |                                |                                |                                | *ideal wattage           |

| Operating Characteristics (Typical @5700K CCT) |                         |                     |                 |           |
|------------------------------------------------|-------------------------|---------------------|-----------------|-----------|
| Light Engine                                   | Lumens<br>(Medium Dist) | Input Power (Watts) | Lumens per Watt | Replaces  |
| LINL-056-B                                     | 2,154                   | 19.58               | 110.00          | 180-360W  |
| LINL-112-B                                     | 4,308                   | 39.16               | 110.00          | 400-750W  |
| LINL-168-B                                     | 6,462                   | 58.74               | 110.00          | 725-1200W |

## Fixture Specifications

### Construction

Die-formed and embossed 22 gauge steel with high reflectance baked white enamel and matte white reflectors.

### Optional Finishes

Custom colors available (specify RAL code). Epoxy finish and marine-grade coating available. Marine grade coating is green.

### Mounting Options

Recessed inverted T-Bar ceilings. Grid mount or surface mount. Wiring knockouts are provided on the back of housing.

### Lens Options

Linear ribbed acrylic lens standard.

### Light Distribution Patterns

T5 standard.

## Electrical System Specifications

### Electrical System

Standard AC input of 120 – 277VAC. Optional upgrade to 480VAC. Driver meets maximum harmonic distortion (THD) of 20% and is ROHS compliant. Power Factor = > 0.9. Standard Surge protection according to IEC/EN 61000-4-5 EMC test standard and can protect against up to 4KV transient surge. Optional, enhanced Surge Protection protects Line-Ground, Line-Neutral, and Neutral-Ground. Protects against surges according to IEEE C62.41.2 C(10kA and 10kV) and ANSI C136.2.

### Controls

Optional controls include: 0-10V (010V), Step, line voltage and Bi-Level Dimming functionality (not guaranteed to work with all dimming systems). Occupancy and Daylight Harvest Sensors available. Optional Emergency Battery Backup: Nickel-Cadmium Batteries, 5W, 600 Lumens for 90 minutes. Optional Cold Emergency Battery Backup: 23W, 2000 Lumens for 90 minutes. The battery has a 7-10 year lifespan.

### Driver

All LED drivers provide constant current to give flicker free lighting. Two different drive currents are provided; A (350 mA) and B (525 mA). Highly reliable. Suitable for dry, damp and wet locations. Compliant to worldwide safety regulations for lighting.

### Ambient Temperature

We provide fixtures that can sustain ambient temperature ranging from -40F to 140F (-40C to 60C).

### Wireless Control Options

Optional wireless networking using the Noribachi Pulse Wireless controller. Pulse is an Arduino-based hardware platform that provides communication between fixtures and a base station using Digi's XBEE based mesh network. Pulse controls up to 16 independent LED lighting fixtures using an FCC approved 900 MHz frequency with up to 200 Kbps data transmission speed. Transmit power output 50 mW. Data transmission rate is 156.25 kbps. 128 bit AES Encryption.

### Occupancy Sensor and Daylight Harvesting

Sensor provides 60' diameter coverage from a 40' height. Time can be set from 30 seconds to 30 minutes.

### RGBW Controls

Optional RGBW controls with communication to fixture via DMX512 or DMX256 and four channel controls. Four channel control uses red, green, blue and white (to control intensity). DMX controller optional, either software DMX master (via CD and USB adapter) or a physical DMX master. 2.4 GHz wireless DMX networking optional. Other frequencies available upon request.

### Testing Compliance

Noribachi complies with and exceeds standards set forth by UL and CSA. All luminaires comply with UL 1598 (CSA C22.2#250.13), and UL 8750 (CSA C22.2#250.0) standards for safety. Performance testing is done in accordance with LM-79 color measurements and LM-79 distribution measurements, and LM-80 lumen maintenance testing.

### Manufacturing

Manufactured in beautiful Harbor City, CA. ARRA Compliant. NAFTA Compliant. Test and burn-in of 100% of all luminaires before shipment. No less than 8-years experience in manufacturing LED-based products.

### Warranty

Standard limited 5-year warranty, first year includes labor. Optional 10-year warranty available. See details at [www.Noribachi.com](http://www.Noribachi.com).

### Note

All safety tests and performance data is done in ambient (STP) conditions. Specifications subject to change without notice. Actual performance may differ as a result of end-user environment application. Actual wattage may differ by +/- 8%. Lumen values may vary within compliance with ANSI C78-377 (unless specifying tight color bins).

## Optics Specifications

### White LED Optics

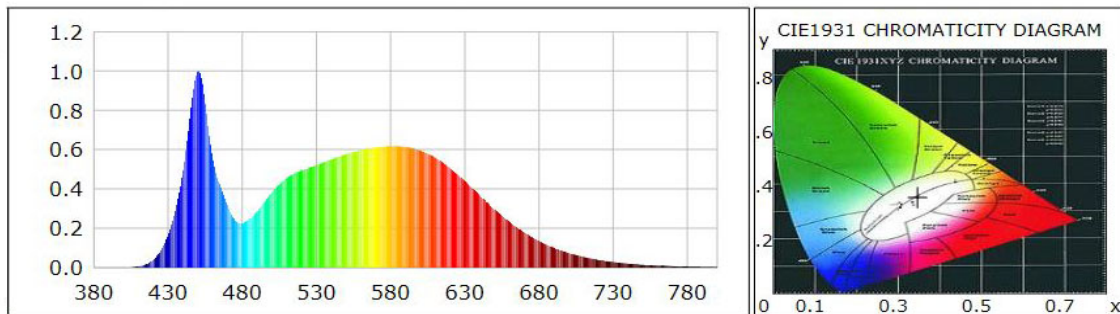
High brightness, high efficiency LEDs. Standard color temperature is Cool White (5000K typical). Neutral White (4000K typical) and Warm White (3000K typical) also available. All with minimum 70 CRI. Tight bins ( $\pm 50\text{degK}$  variability) also available – recommended for VVV installations as the eye is sensitive to variations in this color range. 40deg and 80deg beam angle optional (n/a for RGBV).

### RGBW Light Engine Optics

RGBW light engine also available, compatible with DMX controller. RGBW colors, to allow changing from pure white light to any hue available. Multiple channels of LEDs produce a full spectrum of light anywhere from deepest red to farthest violet. CRI greater than 75 in the 2700K – 4000K range.

Single color light engines also available. Red=630 nanometers, Green=525 nanometers. Blue=475 nanometers.

### Photometric Data for White LED Light Engine



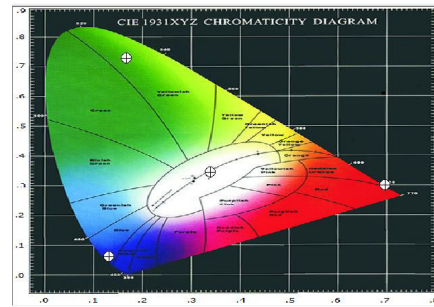
Chromaticity coordinates:  $x=0.3467$   $y=0.3550$   $u(u')=0.2112$   $v=0.3244$   $v'=0.4866$   
 CCT:  $T_c=5000\text{K}$  ( $duv=0.00107$ ) Color Ratio:  $R=0.159$   $G=0.797$   $B=0.044$   
 Peak Wavelength: 450.5nm Half Bandwidth: 21.5nm  
 Dominant Wavelength: 572.3nm Color Purity: 0.106  
 Color Render Index:  $R_a=83.2$ ,  $\text{avgR}(1\sim14)=76.2$ ,  $\text{avgR}(1\sim15)=76.2$   

|        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|
| R1 =81 | R2 =88 | R3 =92 | R4 =83 | R5 =82 | R6 =83 | R7 =88 | R8 =69 |
| R9 =12 | R10=71 | R11=81 | R12=59 | R13=83 | R14=96 | R15=77 |        |

### Photometric Data for RGBW LED Light Engine

#### Chromaticity coordinates:

White  $x = 0.3405$ ,  $y = 0.3459$   
 Green  $x = 0.1687$ ,  $y = 0.7296$   
 Red  $x = 0.6968$ ,  $y = 0.3024$   
 Blue  $x = 0.1316$ ,  $y = 0.0636$



## How to Order

Sample Order Code: Only include the optional upgrades you need.

|                                |   |                                             |   |                                |   |                             |   |                                        |   |                       |   |                                       |   |                       |   |                                           |   |
|--------------------------------|---|---------------------------------------------|---|--------------------------------|---|-----------------------------|---|----------------------------------------|---|-----------------------|---|---------------------------------------|---|-----------------------|---|-------------------------------------------|---|
| <b>TRC</b>                     | - | <b>LINL</b>                                 | - | <b>168</b>                     | - | <b>B</b>                    | - | <b>WW</b>                              | - | <b>MT</b>             | - | <b>COL-5004</b>                       | - | <b>BLD[50]</b>        | - | <b>EMC</b>                                | - |
| Fixture<br>(required)          |   | Light Board<br>(required)                   |   | Number of Diodes<br>(required) |   | Drive Current<br>(required) |   | LED Color<br>Temperature<br>(required) |   | Voltage<br>(required) |   | Custom Fixture<br>Color<br>(optional) |   | Dimming<br>(optional) |   | Emergency Battery<br>Backup<br>(optional) |   |
| <b>OS</b>                      | - | <b>DHS</b>                                  | - | <b>SRGI</b>                    | - | <b>PUL</b>                  |   |                                        |   |                       |   |                                       |   |                       |   |                                           |   |
| Occupancy Sensor<br>(optional) |   | Daylight Harvesting<br>Sensor<br>(optional) |   | Surge Protection<br>(optional) |   | Controller<br>(optional)    |   |                                        |   |                       |   |                                       |   |                       |   |                                           |   |

| Numbering Order | Specification             | Required or Optional | Allowed Values               | Description                                       |
|-----------------|---------------------------|----------------------|------------------------------|---------------------------------------------------|
| 1               | Fixture                   | Required             | TRC                          | For Troffer.C                                     |
| 2               | Light Board               | Required             | LINL                         | For LINL                                          |
| 3               | Number of Diodes          | Required             | 056                          | For LINL-056                                      |
|                 |                           |                      | 112                          | For LINL-112                                      |
|                 |                           |                      | 336                          | For LINL-336                                      |
| 4               | Drive Current             | Required             | B                            | B (525mA) drive current                           |
| 5               | LED Color Temperature     | Required             | CW                           | Standard Cool White LEDs (5000K)                  |
|                 |                           |                      | NW                           | Neutral White LEDs (4000K)                        |
|                 |                           |                      | WW                           | Warm White LEDs (3000K)                           |
|                 |                           |                      | [Specific degree Kelvin]     | Specific color temp LEDs [Specific degree Kelvin] |
|                 |                           |                      | TB1 [Specific degree Kelvin] | Tight Bin LED Color [Specific degree Kelvin]      |
|                 |                           |                      | TB2 [Specific degree Kelvin] | Tight Bin LED Color [Specific degree Kelvin]      |
|                 |                           |                      | RGBW                         | Red/Green/Blue/White light engine                 |
|                 |                           |                      | SCOL [R/G/B]                 | Single color light engine                         |
| 6               | Voltage                   | Required             | MT                           | Standard AC input: 120VAC - 277VAC                |
|                 |                           |                      | HV1                          | High Voltage (480VAC)                             |
|                 |                           |                      | HV2                          | High Voltage (480VAC)                             |
| 7               | Custom Fixture Color      | Optional             | COL-[RAL]                    | Custom Fixture Color (RAL code)                   |
| 8               | Dimming                   | Optional             | 010V                         | 0-10V dimming                                     |
|                 |                           |                      | STEP                         | Step dimming                                      |
|                 |                           |                      | BLD [%]                      | Bi-level dimming                                  |
|                 |                           |                      | LVDIM                        | Line voltage dimming                              |
| 9               | Emergency Battery Backup  | Optional             | EM                           | Emergency Battery Backup                          |
|                 |                           |                      | EMC                          | Emergency Battery Backup, Cold                    |
| 10              | Occupancy Sensor          | Optional             | OS                           | Occupancy Sensor                                  |
| 11              | Daylight Harvest Sensor   | Optional             | DHS                          | For Daylight Harvest Sensor                       |
| 12              | Surge Protector           | Optional             | SG1                          | Enhanced surge protector for 120-227VAC           |
|                 |                           |                      | SG2                          | Enhanced surge protector for 480VAC               |
| 13              | Pulse Wireless Controller | Optional             | PUL                          | Pulse Wireless Controller                         |