



## **WARNING**

- Installation, service, and maintenance of luminaries should be performed by a qualified licensed electrician.
- When working with electronic ballasts, please check the compatibility list first. If the ballast can't be found in the list, please bypass the ballast or contact the manufacturer. Do not install the tube if the ballast is not on the list.
- If the lamp or luminaire exhibits undesirable operation (buzzing, flickering, etc.), immediately turn off the power, remove the lamp from the luminaire, and contact the manufacturer.
- This LED retrofit installation requires knowledge of luminaires and electrical systems. If not qualified, do not attempt the installation and contact a qualified electrician.
- Install this lamp only in luminaires that have the construction features and dimensions that allow the lamp to properly fit in the luminaire and where the input rating of the lamp does not exceed the input rating of the luminaire.
- For single-ended power input: To avoid potential fire or shock hazard, do not use this lamp in luminaires employing shunted bi-pin lamp holders. Shunted lamp holders are found only in fluorescent luminaires with Instant-Start ballasts. Instant-start ballasts can be identified by the words "Instant Start" or "I.S." marked on the ballast. This designation may be in the form of a statement pertaining to the ballast itself, or may be combined with the marking for the lamps with which the ballast is intended to be used, for example F40T12/IS. Contact the manufacturer for additional information.
- For Type B (ballast bypass) installation, the luminaire will no longer operate fluorescent lamps after the removal of the electronic ballast.

## **CAUTION**

- Do not install this lamp in a pre-heat luminaire.
- Use in dry or damp locations only.
- Do not use where directly exposed to water or weather. Non-submergible (not watertight).
- Do not open — No user serviceable parts inside.
- This lamp only operates on electronic ballasts. If the lamp does not illuminate when the luminaire is energized, remove the lamp from the luminaire and contact the manufacturer or a qualified electrician.
- This device is not intended for use with emergency exits.
- Do not make or alter any open holes in an enclosure of wiring or electrical components during lamp installation.
- To prevent wire damage or abrasion, do not expose the wires to the edges of sheet metal or other sharp objects.
- Installation does not require disconnecting existing wires from the lamp holder terminals to make new connections at the lamp holder terminals. Instead, proper installation involves cutting the existing lamp holder leads away from the lamp holder and making new electrical connections to the lamp holder lead wires by employing applicable connectors.
- Before installation, examine all parts that are not intended to be replaced by the lamp for damage. Replace any damaged parts prior to installation of the lamp.

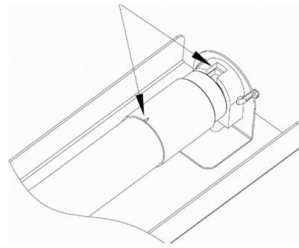
## **NOTICE**

- This lamp is accepted as a component of a luminaire where the suitability of the combination shall be determined by Authorities Having Jurisdiction (AHJ). This installation guide does not supersede local or national regulations for electrical installations.

## Installation Instructions

### Type A (Electronic Ballast Compatible)

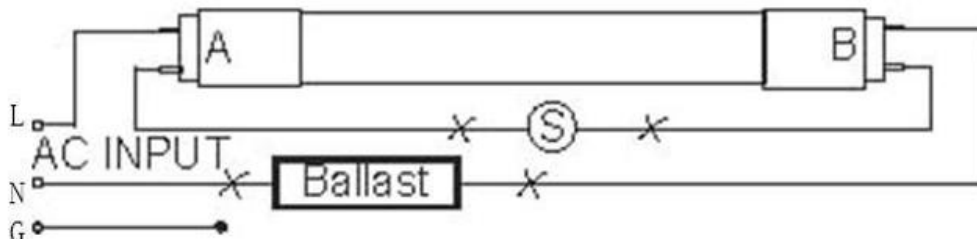
- Before installation, check the ballast compatibility list. If your ballast is not listed, please insert the lamp according to the Type B installation instructions.
- Turn off the power to the luminaire at the breaker.
- Remove the lens or diffuser (if provided).
- Remove the existing fluorescent lamp from the luminaire by rotating the lamp one quarter turn and sliding the lamp out of the lamp holders.
- Before installing the LED lamp, verify the lamp holders are suitable for the wiring diagram selected for the installation. See the Warning section for more information.
- Install the LED lamp by marking the end caps showing proper alignment with the lamp holders. Insert the lamp into the lamp holders and rotate one quarter turn. Make sure the marks are matched with the lamp holders as below.



- Install the lens or diffuser (if removal is required).
- Turn on the power to the luminaire and inspect the lamp for proper operation.

### Type B (Ballast Bypass)

- Turn off the power to the luminaire at the breaker.
- Remove the lens or diffuser (if provided).
- Remove the existing fluorescent lamp from the luminaire by rotating the lamp one quarter turn and sliding the lamp out of the lamp holders.
- Remove the ballast cover (Ballast cover may be secured with screws or tabs).
- Disconnect the wires between the starter and the ballast according to the below figure. If no starter is present, simply disconnect the wires before and after the ballast.



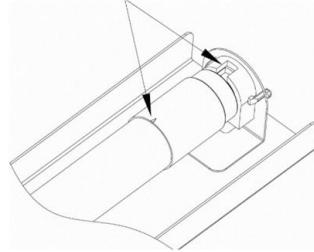
- Connect the two wires to the branch circuit L and N according to the appropriate wiring diagram listed in the Wiring Diagram section below.
- Before installing the LED lamp, verify the lamp holders are suitable for the wiring diagram selected for the installation. See the Warning section for more information.
- Before installing the LED lamp, read the label on the lamp to ensure the power end of the lamp is aligned



## T5 4FT TYPE A+B HYBRID LED TUBE SAFETY AND INSTALLATION INSTRUCTIONS

with powered lamp holders in accordance with the wiring diagram selected for the installation.

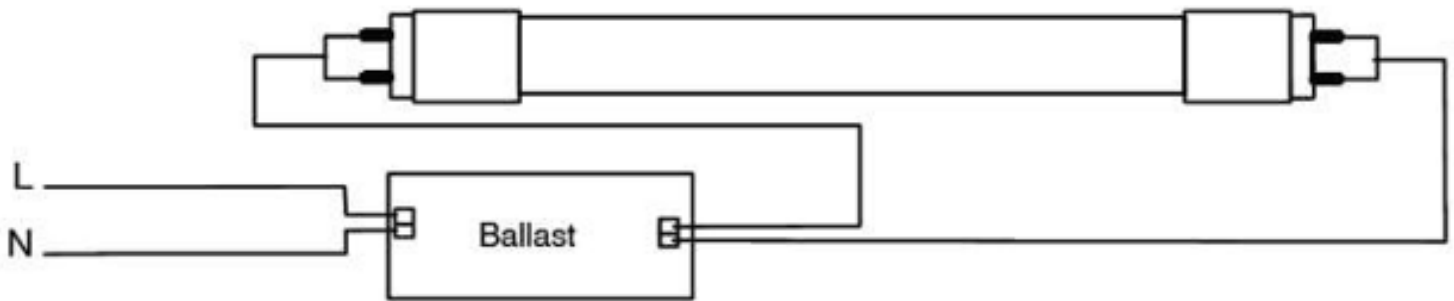
- Install the LED lamp by marking the end caps showing proper alignment with the lamp holders. Insert the lamp into the lamp holders and rotate one quarter turn. Make sure the marks are matched with the lamp holders as below.



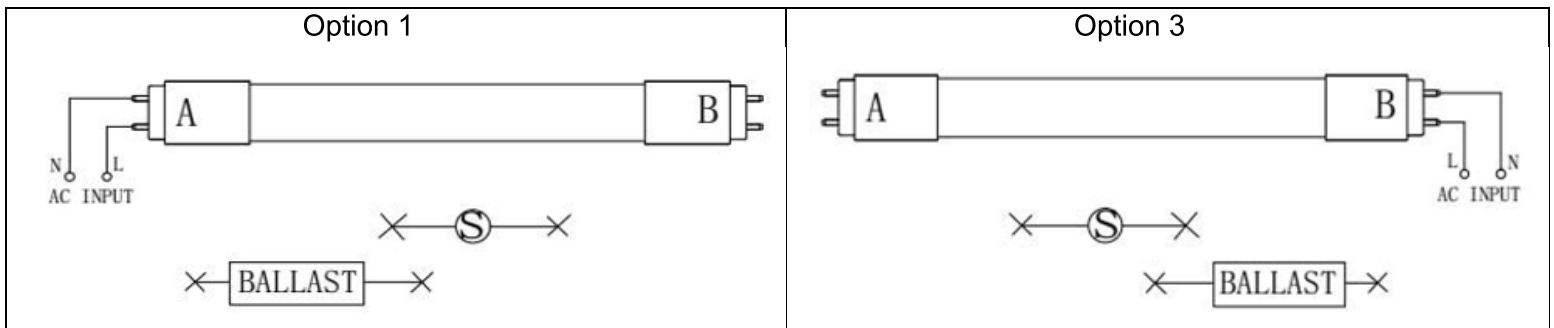
- Install the lens or diffuser (if removal was required).
- Turn on the power to the luminaire and inspect the lamp for proper operation.
- After installation is complete, attach the Cautionary Label provided with the lamp to the luminaire in a conspicuous location. This label signifies that the ballast has been removed from the luminaire, eliminating the ability of the luminaire to use of fluorescent lamps.

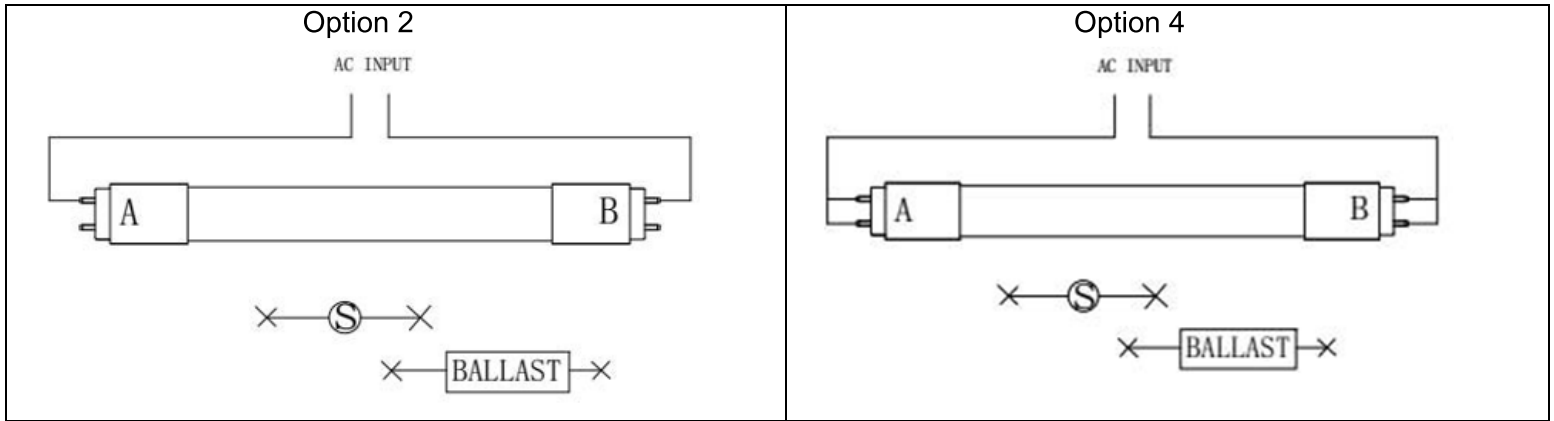
### Wiring Diagrams

#### Type A (Electronic Ballast Compatible)



#### Type B (Ballast Bypass)





### BALLAST COMPATIBILITY LIST

- When working with electronic ballasts, please check the compatibility list first. If the ballast can't be found in the list, please bypass the ballast or contact the manufacturer.
- Do not install the tube if the ballast is not on the list. Use of an incompatible ballast can result in reduced lamp lifetime, arcing or localized overheating.

No.	Ballast Brand	Model No.	Start Type	Max Loading Qty	Compatibility (Y/N)			
					1 lamp	2 lamps	3 lamps	4 lamps
1	AMAX	HD8/13-120A	Rapid Start	1	Y	N	N	N
2	ESPEN	VE454MVHRP 11088	Programmed Start	4	Y	Y	Y	Y
3	GE	GE254MVPS90-A-L	Programmed Start	2	Y	Y	N	N
4	GE	GE254MVPS-D-1	Programmed Start	2	Y	Y	N	N
5	GE	GE454PS347/480-E	Programmed Start	4	Y	Y	Y	Y
6	KEYSTONE	KTEB-113-1-TP-SN-MB/A	Rapid start	1	Y	N	N	N
7	KEYSTONE	KTEB-108-1-TP-TP-FC /L	Programmed Start	2	Y	Y	N	N
8	KEYSTONE	KTEB-114-1-TP-TP-FC /P	Programmed Start	2	Y	Y	N	N
9	KEYSTONE	KTEB-213-1-TP-SL-MB	Programmed Start	2	Y	Y	N	N
10	PHILIPS ADVANCE	ICN-2S54-T	Programmed Start	2	Y	Y	N	N
11	PHILIPS ADVANCE	ICN-2S54-N	Programmed Start	2	Y	Y	N	N
12	PHILIPS ADVANCE	ICN-2S54-90C-T	Programmed Start	2	Y	Y	N	N
13	PHILIPS ADVANCE	ICN-2S54-90C-N	Programmed Start	2	Y	Y	N	N
14	PHILIPS ADVANCE	ICN-4S54-90C-2LS-G	Programmed Start	4	Y	Y	Y	Y
15	PHILIPS ADVANCE	HCN-2S54-90C-WL	Programmed Start	2	Y	Y	N	N
16	UNIVERSAL	B228PUNV-C	Programmed Start	2	Y	Y	N	N
17	UNIVERSAL	B254PUNV-D	Programmed Start	2	Y	Y	N	N
18	UNIVERSAL	B454PUNVHB-E	Programmed Start	4	Y	Y	Y	Y

**Y: Compatible N: Incompatible**

### ⚠ WARNING

- Before installing, servicing, or performing routine maintenance upon this equipment, follow these general precautions.



## T5 4FT TYPE A+B HYBRID LED TUBE SAFETY AND INSTALLATION INSTRUCTIONS

- To reduce the risk of death, personal injury, or property damage from fire, electric shock, falling parts, cuts/abrasions, and other hazards, read all warnings and instructions included with and on the fixture box and all fixture labels.
- Proper grounding is required to ensure safety.
- Power must be turned off at the breaker before installation or maintenance.
- This product must be installed in accordance with the applicable installation code by a person familiar with the construction and operation of the product and the hazards involved.
- Wear gloves and eye protection at all times while installing, servicing, or performing maintenance on the luminaire, and avoid direct eye exposure to the light source while it is on.
- To prevent wiring damage or abrasion, do not expose wiring to edges of sheet metal or other sharp objects.
- Do not install damaged product. Inspect luminaire for damage that may have occurred during transit. If damaged, contact the manufacturer immediately.
- These instructions do not purport to cover all details or variations in equipment nor to provide every possible contingency to meet in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's or owner's purposes, contact the manufacturer.

### **⚠ ADVERTENCIA**

- Antes de instalar, reparar o realizar el mantenimiento de rutina de este equipo, siga estas precauciones generales.
- Para reducir el riesgo de muerte, lesiones personales o daños a la propiedad por fuego, descarga eléctrica, caída de piezas, cortes / abrasiones y otros peligros, lea todas las advertencias y instrucciones incluidas con y en la caja del dispositivo y todas las etiquetas del dispositivo.
- Se requiere una conexión a tierra adecuada para garantizar la seguridad.
- Se debe apagar la energía en el disyuntor antes de la instalación o el mantenimiento.
- Este producto debe ser instalado de acuerdo con el código de instalación aplicable por una persona familiarizada con la construcción y operación del producto y los peligros involucrados.
- Utilice guantes y protección para los ojos en todo momento durante la instalación, el servicio o el mantenimiento de la luminaria, y evite la exposición directa de los ojos a la fuente de luz mientras está encendida.
- Para evitar daños o abrasiones en el cableado, no exponga el cableado a bordes de láminas de metal u otros objetos afilados.
- No instale un producto dañado. Inspeccione la luminaria en busca de daños que puedan haber ocurrido durante el tránsito. Si está dañado, comuníquese con el fabricante de inmediato.
- Estas instrucciones no pretenden cubrir todos los detalles o variaciones en el equipo ni proporcionar todas las posibles contingencias a cumplir en relación con la instalación, operación o mantenimiento. Si desea obtener más información o si surgen problemas particulares que no están suficientemente cubiertos para los propósitos del comprador o propietario, comuníquese con el fabricante.