Radium
Die Lichtmarke

Installation Instruction.

LED Tubes.

ECG CCG

www.radium.de

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Please refer to the Neo conversion guide!

The type of luminaire is essential.

The right LED tube for every application.

When replacing fluorescent lamps with the latest Radium LED technology, the choice of the right LED tube depends on the type of luminaire. Basically, there are three circuit options:

– With direct wiring, the LED tube is operated directly on mains voltage. If the existing luminaire is not designed for this type of operation, the luminaire must be converted. We recommend using the supplied LED starter for conventional ballast luminaires or otherwise ensuring proper electrical protection – for electronic ballast luminaires as well – and clearly labelling the luminaire (only for LED tubes).

– For luminaires with conventional control gear (CCG), the fluorescent tube is replaced 1:1 by an LED tube. In addition, the starter is replaced by the supplied LED starter.
We recommend removing the compensation ccapacitor.
– Our HF or UN versions are suitable for luminaires with electronic control gear (ECG). The tubes are replaced 1:1, but compatibility must be checked against the compatibility list.

1. Installation options

1.1 Retrofitting a CCG luminaire accord. to EN 62776

Replacing fluorescent T8-tube and installed starter by LED Tube EM T8 and LED Tube starter. The CCG remains in luminaire and electric circuit. LED Essence S9, S11 and DUO EM can also be operated via CCG.

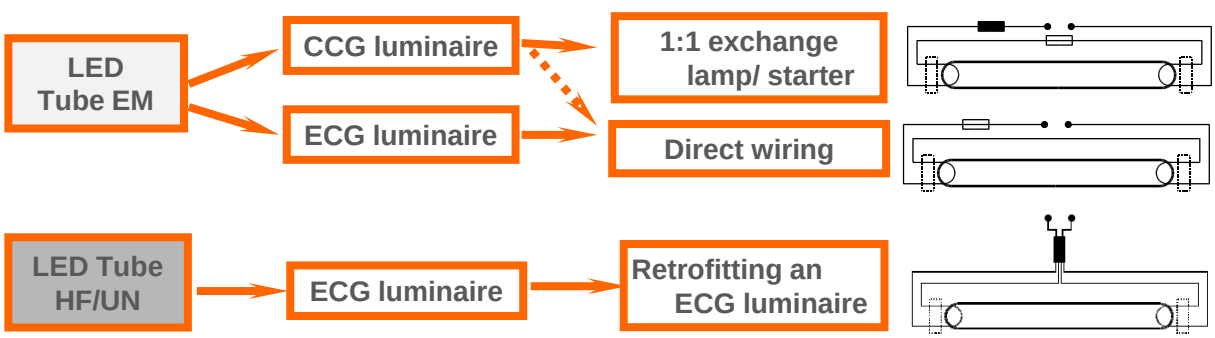
1.2 Conversion of an ECG- or CCG luminaire

Basically, rewiring of the luminaire becomes necessary if fluorescent tubes in ECG-luminaires shall be replaced by LED Tube EM. This also applies to CCG-luminaires if the CCG should be taken out of the electric circuit. LED Essence S9, S11, DUO EM or Long HF can also be operated via direct wiring.
Installation must be done by qualified electricians and all security precautions described herein must be followed. Please, refer to chapter 2.2.2 ‘Example installation direct wiring’ for more details.

1.3 Retrofitting an ECG luminaire accord. to EN 62776

Replacing conventional fluorescent T8 tube by LED Tube T8 HF. The ECG remains in luminaire and electric circuit. LED Essence Long HF can also be operated via ECG.
Note: Please, check the driver compatibility list at www.radium.de/compatibility, before the change, as the LED Star Tube HF must be compatible with the installed ECG. In general, only use the ECGs specified there as compatible! If the electronic ballast used is not listed there, but works in the test, the operator can protect himself by obtaining a specialist contractor declaration from the converter.

Overview of possible installation.



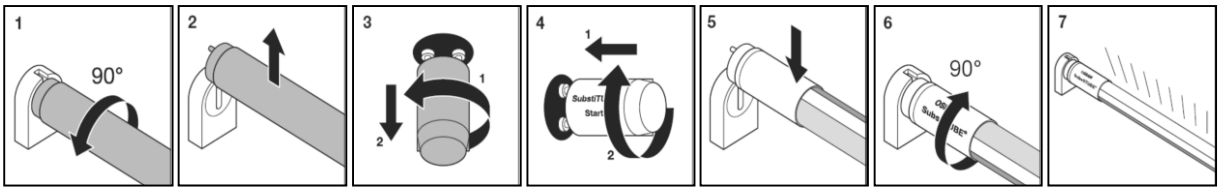
2. Retrofitting of a CCG luminaire

Description.

The T8 fluorescent tube is replaced with an LED Tube T8 EM or UN, and compact fluorescent lamps are replaced with a suitable LED replacement such as the LED Essence S9, S11, or DUO EM. The starter for fluorescent lamps is replaced with an LED Tube Starter. The built-in CCG can be used as it is and existing certifications remain valid. Its losses are reduced to ohmic losses of usually about 1W.

Note: If the starter has **not** been changed to LED Tube starter, the lamp will start blinking. Please, switch off immediately and change the starter, because in this case LED Tube EM can be damaged.
LED Tube EM can be used in luminaires with changeable starters only.

Retrofitting for common lamp holders



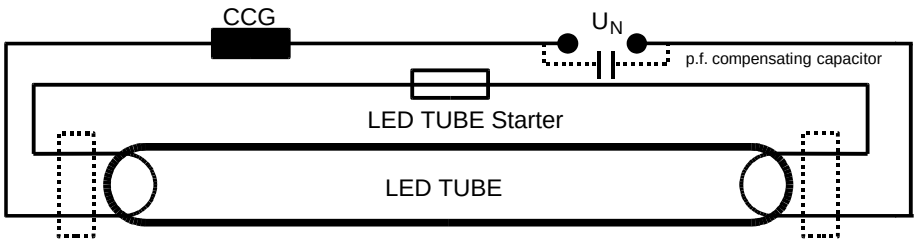
Note:

The LED Tube Starter (with fuse 250V, T 2A) is required in the CCG luminaire as a bridge for operation and acts as an additional fuse.

2.1 Luminaires with compensating capacitors

LED Tube EM can be applied in luminaires with integrated compensating capacitors. The maximum number of LED Tube EM in compensated luminaires possibly operated at one automatic fuse can be found in the LED Tube product data sheet → download area at related product www.radium.de.

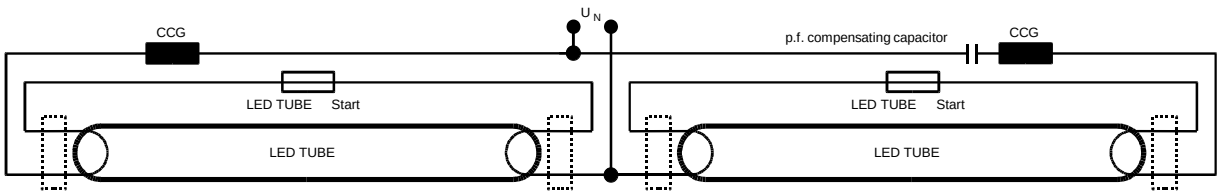
Circuit diagram of a retrofitted CCG luminaire



2.2 Duo circuit lamp luminaires

Double lamp luminaires can be refitted in analogy to below scheme to single lamp luminaires if they show duo circuit wiring. Usage in tandem circuitry luminaires with serially wired lamps requires rewiring (typically in 2ft installations).

Circuit diagram of a retrofitted double lamp CCG luminaire



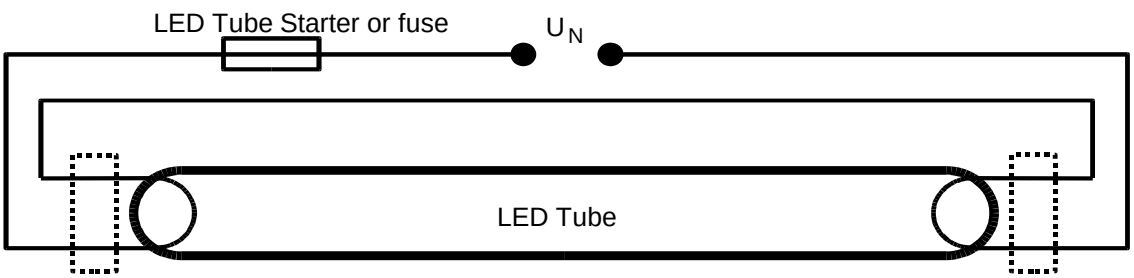
3. Direct Wiring

3.1 Direct line voltage connection

LED Tube EM and UN, as well as LED Essence S9, S11 DUO EM, and Long UN, **can** be operated directly from mains voltage 220V-240V. LED Tubes AC **must** be operated directly from mains voltage. For EM, operation in an ECG luminaire is not possible, so its conversion offers a good way out. When the lamp in a CCG luminaire is just changed, the CCG remains in the luminaire – with all its losses. Direct mains operation of LED avoids all these losses.
Conversion must be done according to 3.2 “Example installation direct wiring.”.

Rewire a luminaire on both sides as shown below. Thus, LED Tube can be inserted in any direction with standardised IEC compliant G13 lamp holders. All wires need to be approved for the existing voltages and the appliance class, respectively. Usually, solid wires with single isolation can be used for class I, double insulation wires could be used for class II. The maximum wire cross-section for lamp holders and starters is typically 0.5 mm2. Built-in control gears (ballasts) must not remain connected after rewiring.

Direct wiring cicuit of a retrofitted luminaire



Installation Guide.

Note: Rework by qualified electricians only.

- Make sure that the supply voltage is disconnected
- Remove the conventional lamp
- Remove power factor correction capacitor (if installed to improve power factor)
- Rewire the luminaire as shown in the circuit diagram on the page before

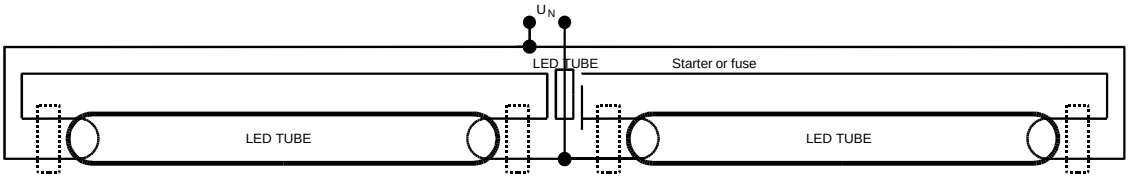
Note: The LED Tube Starter (with fuse 250V, T 2A) is required in the CCG luminaire as a bridge for operation and acts as an additional fuse.

- Insert LED Tube into lamp holders and check light distribution angle
- Make sure with appropriate tests, that the rewired luminaire complies to all relevant safety requirements and other applicable regulations, e.g. acc. to DIN VDE 0701-0702 or 2004/108/EC
- Mark rewired luminaire with new type plate

Note: An LED tube starter or fuse (250V, T2A) can provide additional protection (possible components on the next page); the protection of the circuit with the converted luminaire(s) is the responsibility of the electrician carrying out the work.

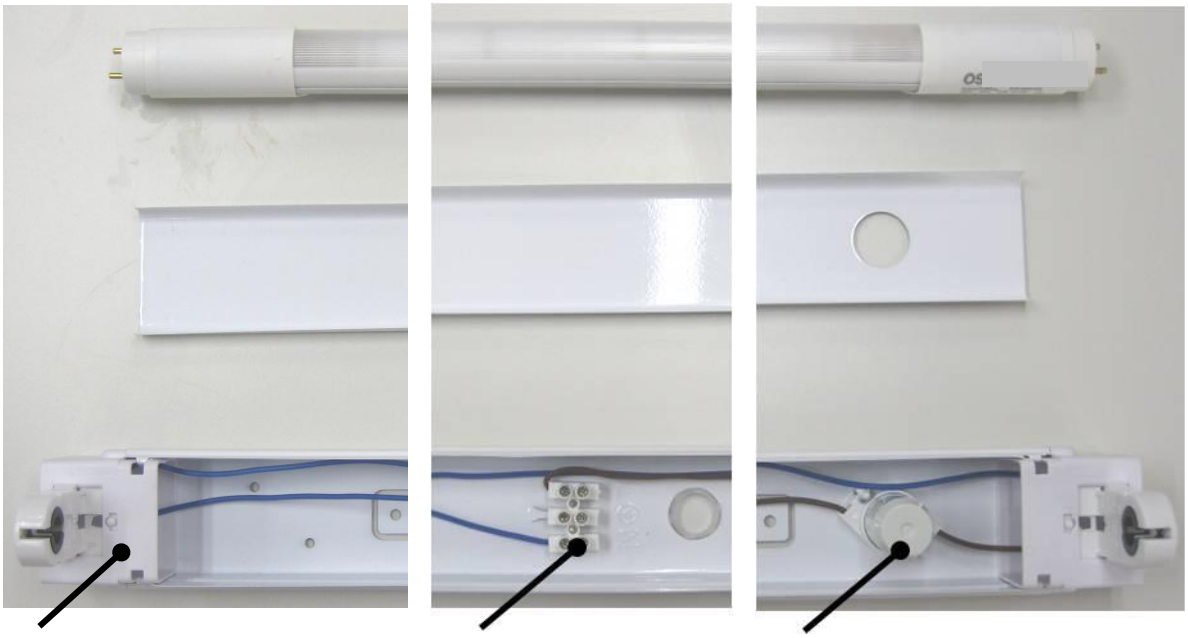
- Do not insert fluorescent lamps again, as they would be destroyed
- Responsibility of technical and safety consequences of the converted luminaire is shifted to the party carrying out the conversion.
- The installer becomes the legally responsible person for the converted luminaire.

Direct wiring circuit diagram of a retrofitted double lamp luminaire



3.2 Example installation direct wiring.

Direct wiring of a luminaire for RaLED Tube EM (control gear).



G13 lamp holder L, N connection unit LED Tube starter

Make sure to modify the wiring completely, otherwise e.g. short circuits could lead to damage.

Example for an integrated holder for LED Tube and Starter

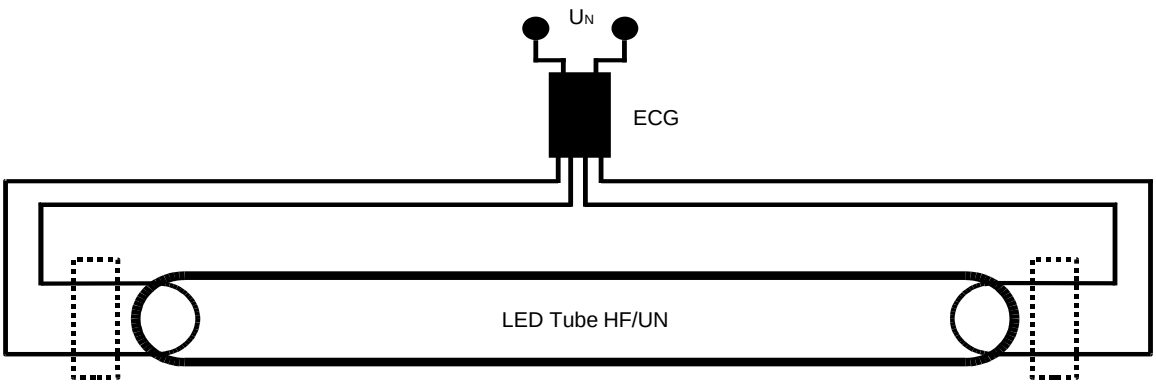
Example for terminal block with integrated fuse holder

4. Retrofitting of an ECG luminaire

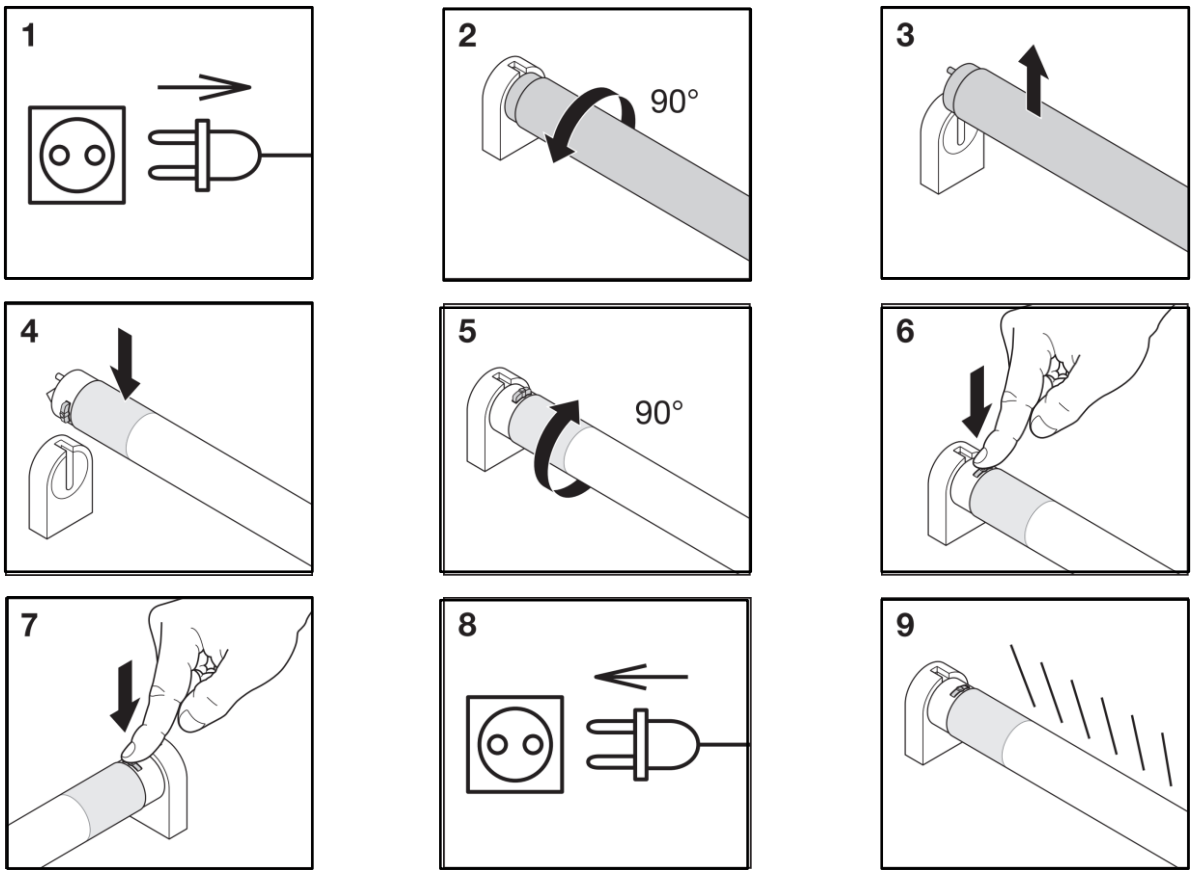
Description.

Replacing the lamp is all what needs to be done to upgrade an existing luminaire with electrical control gear to Radium HF or UN-LED-technology. Since only the lamp is replaced, there is no constructive modification necessary in the luminaire. The fluorescent lamp has to be exchanged with LED TUBE HF or UN.
The LED TUBE HF for UN tube is compatible with ECGs of various brand manufacturers. For further information regarding the tested ECGs a compatibility list is available on www.radium.de/compatibility. In any case, only use the ECGs specified there as compatible!
The energy consumption of the ballast will not be reduced by retrofitting, as compared to a retrofitted CCG luminaire.
For activating LED TUBE HF or UN-Type press the safety buttons on either side of the lamp. This is part of the new international safety standard IEC 62776 to prevent electrical shocks during installation. By reconnecting the luminaire to supply voltage you switch the lamp on.

Circuit diagram of a retrofitted ECG luminaire



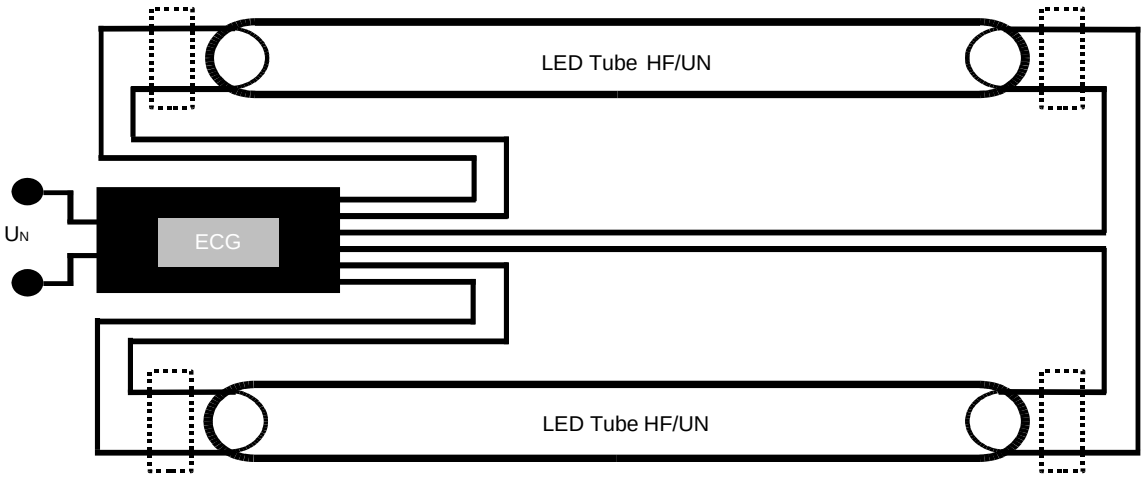
Retrofitting for common lamp holders.



4.2 Multi circuit lamp luminaires

Double lamp luminaires can be retrofitted in analogy to single lamp luminaires. However, the compatibility of the newly applied LED Tubes HF or UN with the integrated ECG has to be checked with the compatibility list at wwwradium.de/compatibility beforehand.
In any case, only use the ECGs specified there as compatible!
Rewiring of the luminiare is not required. An example wiring for luminaires with ECGs is shown below.

Circuit diagram of a retrofitted double lamp ECG luminaire



Even ECG luminaires with more than two lamps do not need to be changed.
However, LED Tube HF or UN must be compatible with the ECG installed.

5. Conversion to LED Tx Neo

The built-in ballast is replaced by an LED control gear and the lamps are replaced according to the **LED T5 or LED T8 Neo conversion guide**.

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