

## **Aura Long Life fluorescent lamps Operation at - 30 °C**

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Fluorescent lamps are able to work at very low temperatures.

Because of their characteristics of low pressure discharge lamps the emitted level of light will be very low at the beginning and not reach the 100 % nominal luminous flux measured at + 25 °C.

Fluorescent lamps with 26 mm Ø will never have a sufficient level of light when operated free burning at an ambient temperature of - 30 °C. In cold environments like this the Aura Thermo-LL with an insulation effect caused by an additional 38 mm Ø outer tube around the 26 mm lamp will be under this specific circumstances a better solution!

Aura Thermo-LL Long Life fluorescent lamps installed in a standardized equipment - free burning - will work according to follow conditions:

- Lamps will ignite at - 30 °C ambient temperature around the lamp.
- The lumen output at the beginning will be  $\leq 10$  % of the nominal value.
- After ca. 30 min. the possible highest level could be reached.

In principle fluorescent lamps will not be used free burning at - 30 °C.

Special luminaires, e.g. watertight, prepared for cool areas are preventing from the low temperatures. Based on the construction and material of the luminaire the difference from outside to inside around the lamp could be on a level of up 10 °C to 20 °C.

So, - 30 °C outside could give - 20 °C to - 10 °C inside as condition for the ignition and operation of the fluorescent lamp.

The measurements Aura is presenting in their standard product information is based on the ambient temperature around the lamp. There are too many different kind of luminaires available that it is not possible to measure all of them. To show that the Thermo-LL will ignite and start to emit light - also when free burning at - 30 °C - two technical information are attached:

1. Curve of relative light output from - 30 °C to + 60 °C.
2. Starting up behavior of light output of Aura Thermo-LL over the first 30 min.