

LIGHT SOURCES IN AUER SIGNALLING EQUIPMENT

Light can be produced in different ways. The following overview of light sources which are used in AUER signalling devices, informs about particular advantages and disadvantages of these light sources.

BULBS

FUNCTION

a tungsten wire is run on high temperature and emits energy over a wide wave range – also in the visual spectrum.



ADVANTAGE

- ▶ simplest and cheapest light source
- ▶ well known technique
- ▶ availability in various designs, voltages and performances

DISADVANTAGE

- ▶ low light output 8 – 18 lm/W
- ▶ limited lifetime – approx. 1.000 h for standard bulbs
- ▶ significantly reduced lifetime in case of vibrations, shock, flashing mode etc.
- ▶ blackening of glass body with increasing lifetime
- ▶ „yellow“ light
- ▶ relatively high loss of light energy when penetrating coloured lenses

HALOGEN BULBS

FUNCTION

by filling a glass body (smaller volume in comparison with bulbs) with halogenes (iodine, bromine) a lower degeneration of the filament is achieved maintaining almost a constant or higher light output



ADVANTAGE

- ▶ higher light output than bulb – up to 25 lm/W
- ▶ longer lifetime (approx twice as bulbs, depending on bulb type)
- ▶ less blackening of glass body – constant light current during the whole lifetime

DISADVANTAGE

- ▶ limited lifetime – approx. 1500 – 3000 h (depending on bulb type and voltage)
- ▶ reduced lifetime with vibrations, shock, etc.
- ▶ reduced lifetime with flashing mode (peak current during switching)
- ▶ relatively high loss of light energy when penetrating coloured lenses

XENON-TUBES RESP. FLUORESCENT LAMPS

FUNCTION

switching a sufficiently high voltage in a xenon gas filled glass body results a very intense light impulse or light flash



ADVANTAGE

- ▶ high signalling effect due to intense light impulse

DISADVANTAGE

- ▶ xenon tube blackens during its lifetime – decreasing light output
- ▶ limited lifetime due to large current density and stressed electrodes or due to degeneration of energy saving device (capacitor)

LED

FUNCTION

LEDs (Light Emitting Diodes) are visual semiconductors, which transfer electrical voltage in visible light. Light with very narrow spectrum results (that means the human eye only recognizes one colour)



ADVANTAGE

- ▶ high light output – standard LEDs 8 – 20 lm/W, high performance LEDs up to 70 lm/W
- ▶ LED loses due to narrow spectrum little light power in coloured lenses
- ▶ significantly reduced nominal current in comparison with bulbs
- ▶ very high lifetime – up to 100.000 h
- ▶ absolutely resistant against vibrations, shock etc..
- ▶ absolutely maintenance free
- ▶ small dimensions
- ▶ instant light when switching on

DISADVANTAGE

- ▶ higher initial cost
in many applications, particularly in case of vibrations etc., LED technology amortizes very quickly as no maintenance and long lifetime
- ▶ narrow angle/light output (in certain applications also desired)