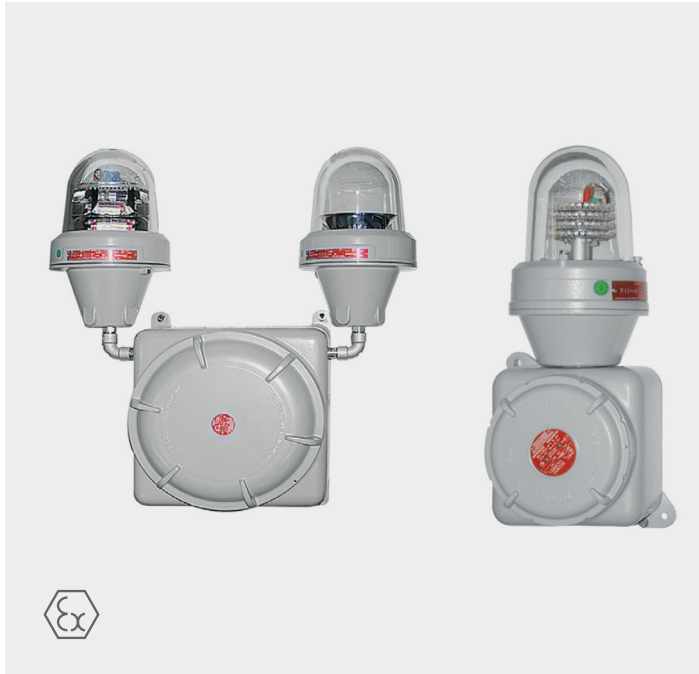


# MIOL-LIOL

## Medium intensity and low intensity multiled system aircraft warning lights



### Installation

hazardous areas - Zone 1 / 2 (Gases)  
Zone 21 / 22 (Dusts) - Safe area

### Classification

Group II - Category 2G 2D

### Mechanical characteristics

Body	Marine grade copper free aluminium
Globe	High-temperature resistant borosilicate glass (zone 1/2 - 21/22 version) Transparent polycarbonate u/v resistant (safe area version)
Painting	External epoxy powders grey RAL-9006 colour
Screws	External stainless steel
Gaskets	Silicon rubber
Cable entry	3/4" NPT size threaded

### Electrical characteristics

Leds	separate groups with individual led protection system - led technology stabilized by constant current generator
Consumption	LIOL-B = 8W (single and dual) / miol-B = 35W (single) - 70W (dual)
Medium intensity (MIOL)	flashing light with intensity 2000 cd (+/-25%) flashing 40 flash/minute
Low intensity (LIOL)	steady burning with intensity 10/32 cd
Realization	single group leds system with own reflector dual groups leds system, each group with own reflector (1 main + 1 reserve)

### Optical characteristics

Horizontal beam radiation	360° (MIOL / LIOL)
Vertical beam radiation	LIOL = between 5° and 10° / MIOL = 3°
Efficiency	91% - pfc factor 0,99
Expetancy life	long life time - more than 10 years

### On Request Accessories

- Stainless steel wire protection guard
- Aircraft Warning Lights and control panel support manufactured in according to customer specification
- External painting colour on request
- Threaded cable entry different than standard
- Control panel with simultaneous or catenary multilight flashing system

### Reference standard

Directive 2014/34/EU	
Execution	⊕ II 2G Ex db IIC T6/T4 Gb ⊕ II 2 D Ex tb IIIC T85 °C / T100 °C Db
Rules of compliance	EN/IEC 60079-0; EN/IEC 60079-1; EN/IEC 60079-31
EU Type-Examination Certificate	INERIS 01 ATEX 0054X
Protection degree	IP66
Ambient temperature	-60 °C ÷ +60 °C
Other available certificates	IECEX: IECEX INE 13.0075X INMETRO: CEPEL 14.2311X
International regulations compliancy for visual aids	ICAO International Standards and Recommended Practices: Aerodromes - Annex 14 - Volume 1 - 4th Edition (November 2004)  Charapter 6: Medium Intensity Type A-B-C Flashing - Steady burning obstacle light MIOL-A / MIOL-B / MIOL-C  Charapter 6: Low Intensity Type A-B Steady burning obstacle light LIOL-A / LIOL-B  FAA Advisor Circular AC150/5345-43F E.B.#67 - Lamp type MIOL-A / MIOL-B / MIOL-C / LIOL-A / LIOL-B



**Technical data**

Code	Led lamp group	Visual aids types	Execution	Temperature class (gas)	Temperature class (dust)	Cable entries	Detail
Low intensity obstruction warning lights (LIOL)*							
LIOL-A-S	> 10 cd x 1	Red steady	Ex-d	T6	T85 °C	1 x 3/4"	A
			Ex-de / weatherproof	T6 / -	T85 °C / -	1 x 3/4"	A.1
LIOL-A-D	> 10 cd x 2	Red steady	Ex-d	T6	T85 °C	1 x 3/4"	B
LIOL-B-S	> 32 cd x 1	Red steady	Ex-d	T6	T85 °C	1 x 3/4"	A
			Ex-de / weatherproof	T6 / -	T85 °C / -	1 x 3/4"	A.1
LIOL-B-D	> 32 cd x 2	Red steady	Ex-d	T6	T85 °C	1 x 3/4"	B

Note: S= single AWL - D= twin AWL

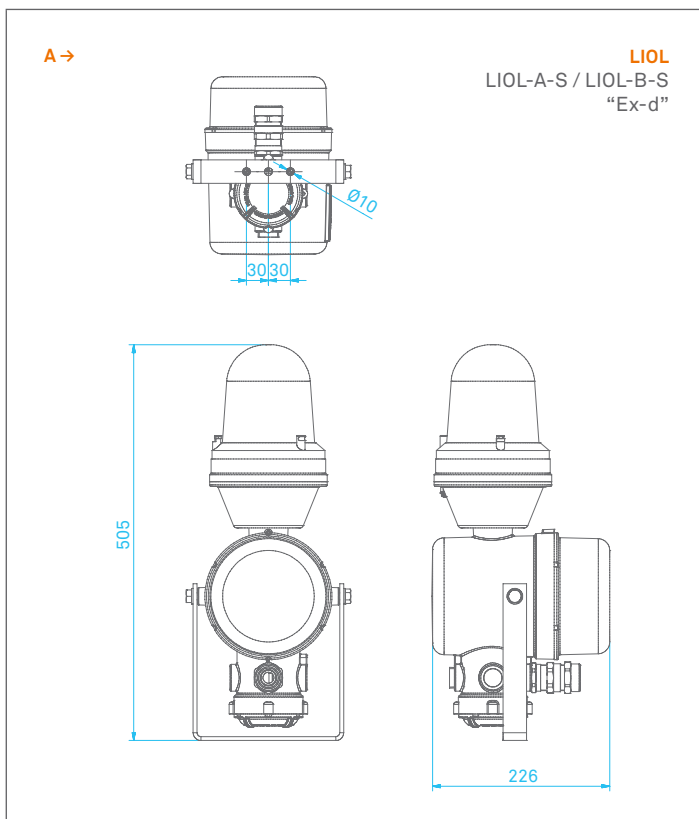
\* Incandescent/halogen lamp not included.

Medium intensity obstruction warning lights (MIOL)*							
MIOL-A-S	= 20.000 cd x 1	White flashing	Ex-d	T5	T100 °C	1 x 3/4"	C
			Ex-de	T5	T100 °C		C.1
			weatherproof	-	-		E
MIOL-A-D	= 20.000 cd x 2	White flashing	Ex-d	T5	T100 °C	1 x 3/4"	D
			weatherproof	-	-		E
			Ex-d	T5	T100 °C		C
MIOL-B-S	= 2.000 cd x 1	Red flashing	Ex-de	T5	T100 °C	1 x 3/4"	C.1
			weatherproof	-	-		E
			Ex-d	T5	T100 °C		D
MIOL-B-D	= 2.000 cd x 2	Red flashing	weatherproof	-	-	1 x 3/4"	E
			Ex-d	T5	T100 °C		C
			Ex-de	T5	T100 °C		C.1
MIOL-C-S	= 2.000 cd x 1	Red steady	weatherproof	-	-	1 x 3/4"	E
			Ex-d	T5	T100 °C		C
			Ex-de	T5	T100 °C		C.1
MIOL-C-D	= 2.000 cd x 2	Red steady	weatherproof	-	-	1 x 3/4"	E
			Ex-d	T5	T100 °C		D
			Ex-de	T5	T100 °C		C.1

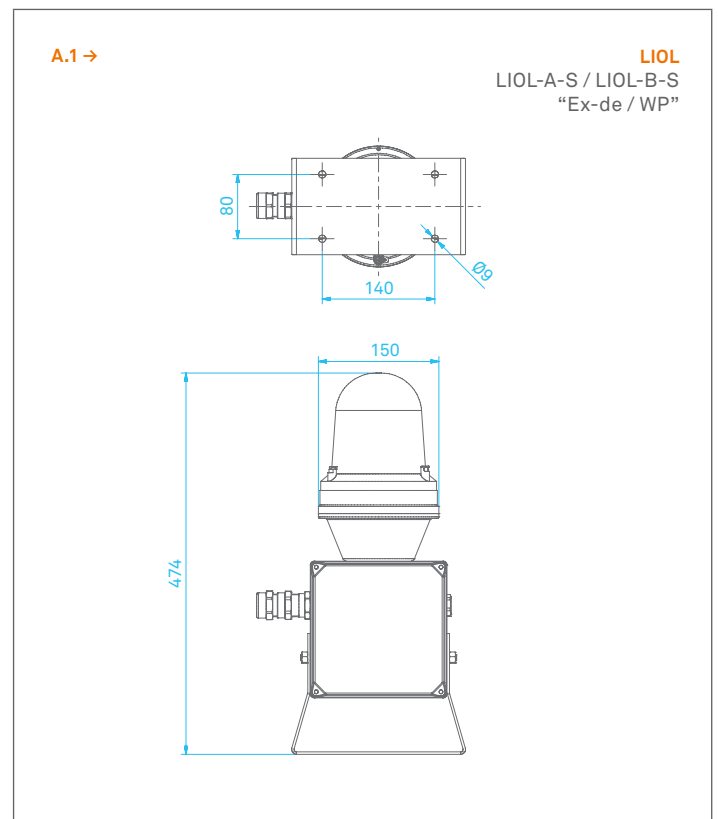
Note: S= single AWL - D= twin AWL

\* Incandescent/halogen lamp not included.

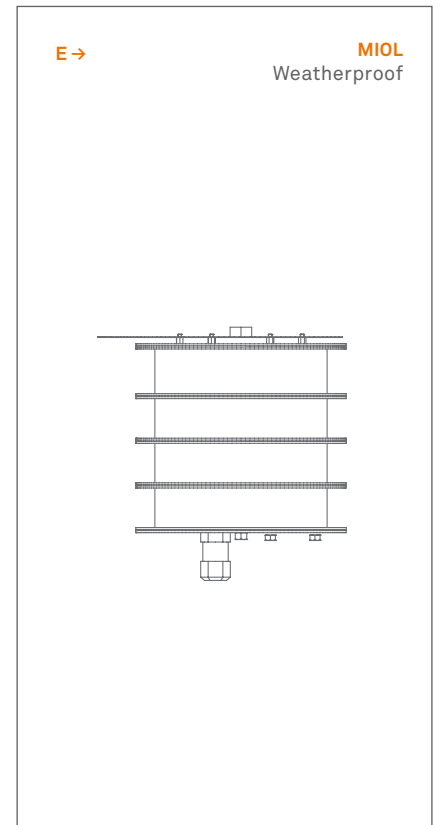
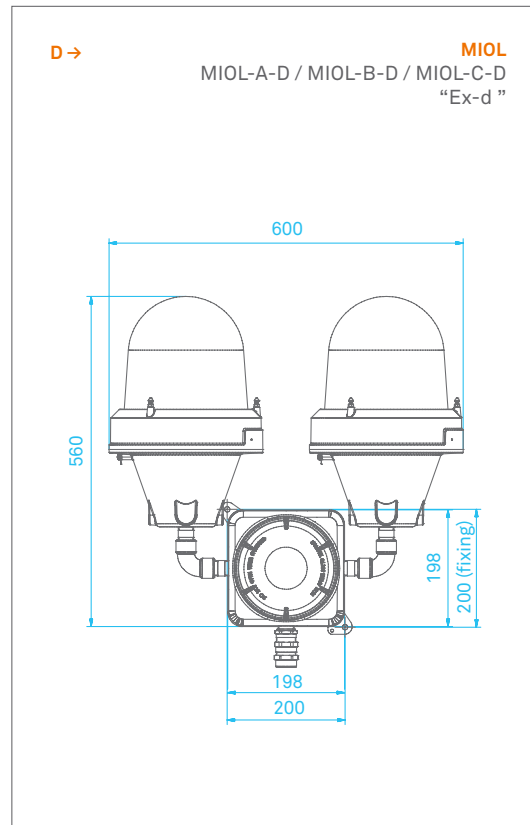
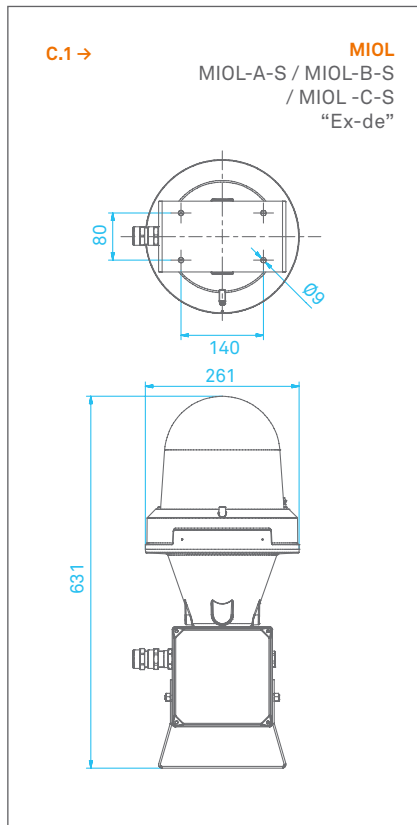
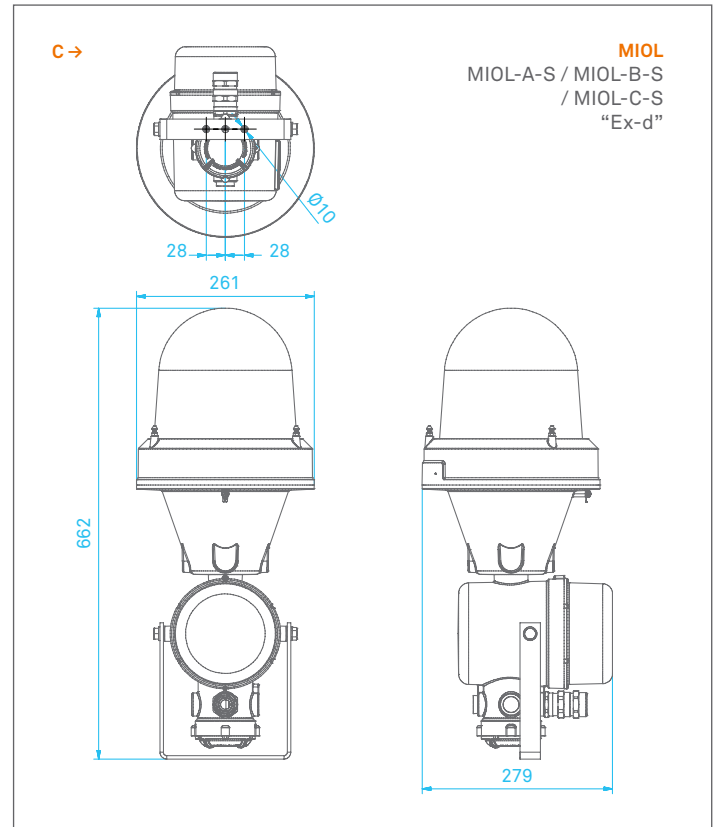
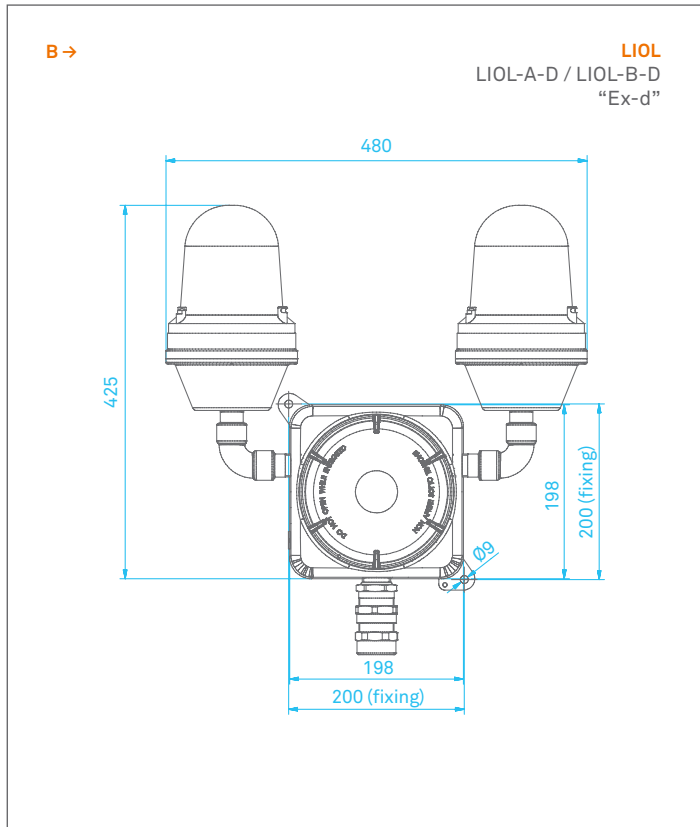
**Reference details**



**Reference details**



Reference details



**Main rules for visual aids**

ICAO Annex 14 - Aerodromes Vol. 1 - Chapter 6 / 10 (July 2004)

- The marking and/or lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of the obstacles  
(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.1)

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- Marking (red-orange/white painting) is used for day time
- Marking may be omitted when the obstacle is lighted

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- A fixed obstacle above a horizontal surface should be marked and, if the aerodrome is used at night, lighted.  
(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.1.4)

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- A system of preventive maintenance of visual aids shall be employed to ensure lighting and marking system reliability.  
(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 10.4.2)

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- The reliability of installed lighting equipments should not less than one year.  
(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 10.4.6)

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- The number and arrangement of Low, Medium or High Intensity Obstacle Lights, at each level to be marked, shall be such that the object is indicated from every angle in azimuth

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- Where a light is shielded in any direction by another, additional light shall be provided  
(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.3.22)

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- The number of lights needed for each level depends on the outside diameter of the obstacle
- The top lights should be placed sufficiently below the top, so as to minimize contamination by smoke, powders, and so on.  
(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.3.12)

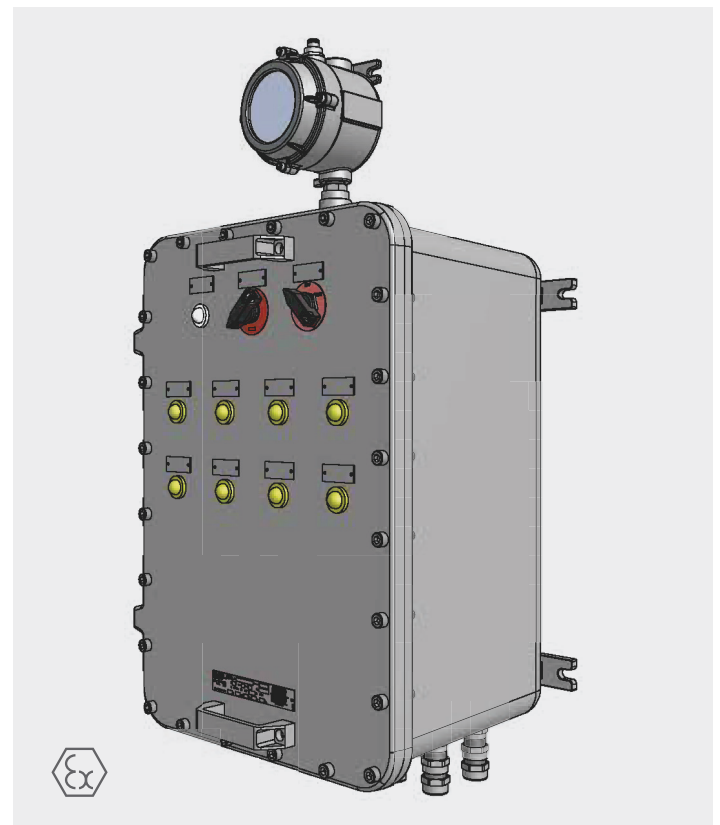
**Reference details**

Typical AWL control panels “Ex-d-IIB”



**Reference details**

Typical AWL control panels “Ex-d-IIC”



### AWL types

#### Aircraft Warning Lights

LIOL-A / B Low Intensity Obstacle Lights on fixed objects, Type-A / Type-B, shall be steady burning RED lights  
(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.3.23)

MIOL-A Medium Intensity Obstacle Lights on fixed objects, Type-A, shall be flashing WHITE lights

MIOL-B Medium Intensity Obstacle Lights on fixed objects, Type-B, shall be flashing RED lights

MIOL-C Medium Intensity Obstacle Lights on fixed objects, Type-C, shall be steady burning RED lights

(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.3.30)

MIOL-A / MIOL-B Medium Intensity Obstacle Lights Type-A / Type-B, located on an obstacle, shall be flash simultaneously

(ICA: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.3.32)

HIOL-A / B High Intensity Obstacle Lights on fixed objects, Type-A / Type-B, shall be flashing WHITE lights

(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.3.33)

HIOL-A High Intensity Obstacle Lights Type-A, located on an obstacle, shall be flash simultaneously

(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.3.35)

HIOL-B High Intensity Obstacle Lights Type-B, indicating the presence of tower supporting overhead wires, an others.. shall be flash sequentially

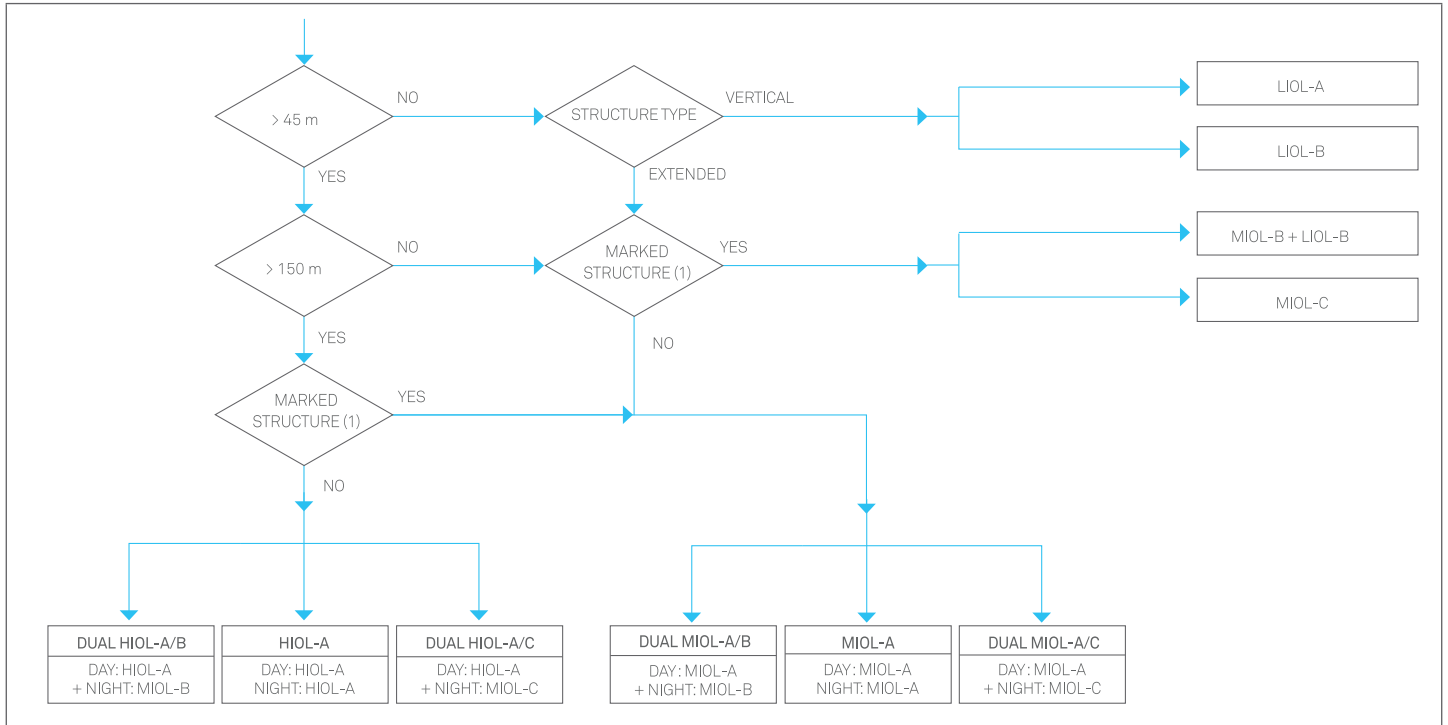
(ICAO: Aerodromes - Annex 14 - Vol. 1 - Ch. 6.3.36)

### Reference details

Typical AWL control panels “Ex-de”



**Indicative diagram to obstruction light selection**



**Legend**

(1)	Painted obstacle in acc. to ICAO directive
LIOL-A	Low intensity obstruction light - TYPE A
LIOL-B	Low intensity obstruction light - TYPE B
MIOL-A	Medium intensity obstruction light - TYPE A
MIOL-B	Medium intensity obstruction light - TYPE B
MIOL-C	Medium intensity obstruction light - TYPE C
HIOL-A	High intensity obstruction light - TYPE A
HIOL-B	High intensity obstruction light - TYPE B

**MIOL - LOL Polar diagrams – photometric data**

**LIOL 32cd - POLARE**

**LIOL 32cd - CARTESIANO**

**MIOL 2000cd - POLARE**

**MIOL 2000cd - CARTESIANO**

