

Product Selection Chart

GENERIC OXLEY LAMP TYPE NUMBERS	Mounting Hole Dia. (mm)	Sealing Characteristics (1)	Lens types													Termination options			Body finish				DESC 85122 Approved	DESC 87019 Approved XIR	Page Number		
			LED	Neon	Voltage (Integral Resistor)	Non-voltage	Sunlight viewable	Night Vision Goggle compatible	Fresnel Prominent	Fresnel Flat	Flat	Convex	Anti-Reflection Coating	EMI Shielding	Caption	LED lead terminations	Spills	Tags	Flying Leads	Black Anodised Finish	Chromate Finish	Nickel Plated				Aluminium	Plastic body
SSI/5/-	5.0	67	●		●	●	●			●				●	●	●	●	●		●							13
MI/5/-	5.0	67	●		●	●	●			●				●			●					●					14
OXL/MIL50/-	5.0	67	●		●	●	●	●		●		●	●	●			●	●	●	●	●						15
OXL/CLH/63/-	6.35	66	●		●	●			●					●	●	●	●	●	●			●					20
OXL/CLH/63/P/-	6.35	66	●		●	●		●						●	●	●	●	●	●			●					22
PS/LH/8/-	8.0	68	●		●	●	●			●	●	●	●	●			●				●			●			24
STR/LH/8/-	8.0	68	●		●	●	●	●		●	●	●	●	●			●	●	●	●	●			●	●		30
STR/5/LH/8/-	8.0	68	●		●	●	●			●		●			●		●		●	●	●						43
STR/501/LH/8/-	8.0	68	●		●	●	●	●		●		●			●		●		●	●	●						46
STR/NLH/-	8.0	68		●	●	●					●		●			●	●	●				●					41
OXL/CLH/80/-	8.0	67	●		●	●								●			●	●				●					48
STR/LH23/10/-	10.0	68	●		●	●				●	●				●	●	●	●	●			●					51
2STR/LH23/10/-	10.0	68	●		●	●	●			●	●				●		●	●	●	●		●					54
3STR/LH23/10/-	10.0	68	●		●	●	●			●	●				●		●	●	●	●		●					57
OXL/CLH/100/-	10.0	66	●		●	●	●		●					●	●	●	●	●	●	●		●					59
OXL/CLH/100/P/-	10.0	66	●		●	●	●	●						●	●	●	●	●	●	●		●					61

● option is available

(1) Panel Lamp Sealing

Various sealing options, denoted by IP ratings, are available for the different styles of lamps.

IP Ratings

The IP rating system provides a means of classifying the degrees of protection from dust, water and impact afforded by electrical equipment and enclosure. The system is recognised in most European countries and set out in BS EN 60529: 1992 Degrees of protection provided by enclosures (IP code).

First Number = Protection against solid objects		Second Number = Protection against liquids	
IP	TESTS	IP	TESTS
0	No protection.	0	No protection.
1	Protected against solid objects up to 50 mm, e.g. accidental touch by hand.	1	Protected against vertically falling drops of water (e.g. condensation).
2	Protected against solid objects up to 12 mm, e.g. fingers.	2	Protected against direct sprays of water up to 15° from the vertical.
3	Protected against solid objects over 2.5 mm, (tools and wires).	3	Protected against direct sprays of water up to 60° from the vertical.
4	Protected against solid objects over 1 mm, (tools, wires and small wires).	4	Protected against water sprayed from all directions - limited ingress permitted.
5	Protected against dust - limited ingress (no harmful deposit).	5	Protected against low pressure jets of water from all directions - limited ingress permitted.
6	Total protected against dust.	6	Protected against strong jets of water, e.g. for use on ships decks - limited ingress permitted
		7	Protected against the effects of temporary immersion between 15 cm and 1 m. Duration of test 30 minutes.
		8	Protected against long periods of immersion under pressure.

Note: All LED Indicator Lamps range from IP66 to IP68

Oxley Indicator Lamp Selection Chart (Descriptive Breakdown)

The selection chart on page 5 shows the major characteristics of Oxley indicator lamps.

For each generic lamp type the major characteristics of the basic lamp are indicated by an '●' in the appropriate column.

It is important to note that the list of lamps and options available is by no means exhaustive and many options not listed are available. Please consult factory for guidance on indicator lamps requiring a combination of options.

Sealing Characteristics

Please see Lamp Sealing chart on page 5.

Integral Resistor

The option of integral resistor eliminates the need for a current limiting resistor and therefore simplifies the external drive circuitry. Indicator lamps incorporating a current limiting resistor are identified by a colour coded sleeve on the cathode terminal. The table below displays the standard supply voltage indicator lamps available with colour codes used to identify the supply voltage.

Supply voltage (V dc)	Colour Code of bush
5	Blue
12	Yellow
15	Green
24	Brown
28	Violet
110	Black/Black
240	Blue/Black

The integral resistor limits the supply current to approximately 12 mA -15 mA at the specified supply voltage as standard. Integral resistors for different supply voltages and currents are available, but may be limited by the space inside the indicator lamp body to dissipate the power generated. (Please consult factory for details).

The majority of our Indicator Lamps are generally fitted with integral blocking diodes electrically connected in series with the LED. The blocking diode prevents the LED from being damaged through inadvertent connection to a reverse polarity supply. In addition to providing protection from reverse polarity connection the diode also provides half-wave rectification, which allows the lamp to be operated from AC supplies, providing the supply frequency is above 50 Hz to eliminate flicker.

Lens Characteristics

PLANO-CONVEX - Rear surface of lens flat - 'plano' - diffused and front of lens convex. Focal length of lens designed to increase the 'virtual image' of the light source, this in combination with the diffusion on the rear of lens increases the area of the light source and provides even illumination across the viewing aperture.

FRESNEL - Flat or convex lens with a series of concentric rings (grooves) cut into the rear surface of the lens. This provides the best of both worlds by attaining maximum on-axis brightness from the light source, viewed through clear portions of the lens, in between the concentric grooves and increasing the viewing angle of the indicator lamp by diffusing and refracting the light from the light source in the concentric rings. Due to the relatively small size and complexity of fresnel lenses used in Oxley indicator lamps these lenses are plastic injection moulded, in a variety of colours including clear to match the colour of the light source and the application. Coloured lenses viewed under conditions of high ambient light can cause spurious ON/OFF indications.

CAPTION - Character of suitable viewable engraved on rear surface of lens to provide indication of function, e.g. 'ON'.

DOMED - Domed lens. This lens provides 130° omni-directional viewing characteristics. Ideal for applications requiring wide angle visibility in low/high ambient light conditions where a high level of performance is required.

FLAT - CLEAR - used in applications where the indicator lamp is to be viewed under low ambient light conditions.

DIFFUSED - Light projected on to the rear diffused surface of the lens is 'spread out', improving the viewing angle and increasing the area of the viewed light source. Increases readability of indicator lamp under higher ambient light conditions; however, readability under sunlight conditions is compromised and improves the aesthetic appearance of the lamp, since the diffused surface on the rear of the lens provides a screen preventing direct viewing of the light source.

EMI Shielding

Special Electrostatic screen connected both electrically and mechanically between the light source and the lens. Shielding Efficiency – 20 dB reduction in electromagnetic radiation over the frequency range 5 MHz to 1 GHz when compared against a non-shielded device.

Sunlight Readable - Flat lens with light attenuating properties that are used to increase the 'ON/OFF', contrast ratio of the indicator lamp, therefore achieving greater sunlight readability. There is a common misconception that the brighter the light source the greater the sunlight readability of the indicator. Eliminating reflections and increasing the contrast ratio play the major part in achieving better sunlight readability.

The specially designed filters used in Oxley indicator lamps attenuate the ambient light passing through the lens, without affecting the colour of the light source. Any reflected light from the inner surfaces of the indicator lamp that may cause spurious ON / OFF indications is also attenuated, which produces the 'black hole' effect where reflected light is effectively quenched, thereby increasing the sunlight readability by increasing the contrast ratio. The above explains how a lamp with a lower luminous intensity can have better sunlight readability than a lamp with a higher luminous intensity.

ANTI-REFLECTION COATING - Coating vacuum deposited on to the front face of the lens designed to reduce reflections, therefore further enhancing the sunlight readability of the indicator lamp.

LENS MATERIAL - Material from which the lens is manufactured.

- **GLASS** - Used on the majority of Oxley indicator lamps due to precise control of optical properties and mechanical robustness. It also offers excellent resistance to temperature, thermal shock and solvents.
- **POLYCARBONATE** - Used for mechanically complex lenses, e.g. fresnel, that require injection moulding due to the complexity of the opto-mechanical design.

Terminals

PINS or SPILLS - Indicates lamp terminals.

TAGS - Generally more robust terminations featuring pins for insertion into PCBs, wire wraps or eyelets for ease of connecting hook-up wires.

FLYING LEADS - Available with colour coded wire for indication of polarity and different grades of wire, e.g. flame retardant, MIL-Spec etc. Incorporation of flying lead option generally indicated by addition of 'FLxx' into the part No., where 'xx' indicates the length of the flying lead in centimetres.

FLYING LEADS WITH CONNECTORS - For ease of assembly and reduced solder joints.

Secure XIR Lighting - Night Vision Goggle compatible

Used to describe an indicator lamp designed to meet the parameters specified by DESC control drawing No. 87019. The main purpose of DESC 87019 is to define secure lighting of equipment that is going into 'front-line' combat operations where standard indicator lamps could give away the position of the equipment and personnel to enemy forces.

Secure lighting is achieved by meeting two main parameters:

1. Restricting the viewing angle of visible light emitted from the indicator lamp. e.g. the operator must be standing directly in front of the equipment to see the light source.
2. Restricting the amount of energy emitted from the indicator lamp in the near infrared (NIR) region in the bandwidth of approximately 600 to 930nm. This is to eliminate detection by enemy forces using image intensifying system (NVGs).

NVG - Is the nomenclature used to describe an indicator lamp that is Night Vision Goggle compatible. For an indicator to be NVG compatible the amount of energy emitted in the near infrared (NIR) region must be restricted as described above for the XIR indicator lamps; however, unlike the XIR lamps there is no restriction other than the application on the viewing angle of the indicator lamp.

Night Vision Goggles produce an image by amplifying light in the NIR from 600 nm to 930 nm region of the spectrum. The NVGs have an Automatic Gain Control (AGC) which controls the amplification of the NIR. As NIR levels illuminating a scene increase to maintain the contrast of the image being presented to the user, the AGC reduces the level of amplification. As NIR levels reduce the AGC increases the amplification to maintain the image. The effect of stray NIR, for example, light from an indicator lamp on a control panel close to the user of NVGs, is for the amplification of the NVGs to be reduced thereby blinding the goggles; this is particularly critical for aerospace cockpit applications.

The restriction of the NIR spectrum is achieved by vacuum deposition of special materials with differing refractive indices on to the rear surface of the lens. To form the NIR blocking filter up to 60 alternate layers of two different materials are vacuum deposited onto the lens.

DESC 85122 APPROVED - Indicates styles of indicator lamps which can be approved against DESC control drawing 85122.

Indicator lamps approved against DESC 85122 are 100% screened against the following test schedule:

High Temperature Storage - at 100°C, duration 72 hours minimum.

Thermal Shock:

- high = 100°C
- low = -55°C

10 cycles duration at each temperature, 15 minutes minimum.

Constant Acceleration: 20,000 g.

Seal test: immersion per MIL- STD-750, test method 1011 condition A.

Pre Burn-in Measurements:

- Luminous Intensity (Iv)
- Forward Voltage (Vf)
- Reverse Current (Ir)
- Burn-In - (Forward bias) at ambient temperature. 168 hours minimum duration.

Post Burn-in Measurements:

- Iv (A Iv, 20% max. from initial value).
- Vf (A Vf \pm 50 mV from initial value).
- Ir

Insulation Resistance >1,000 M at 500 V between both terminations and body.

Mechanical Inspection - Additional maintenance testing is carried out against sampling plan to ensure compliance with the specification.

DESC 87019 APPROVED - Indicates styles of indicator lamps which can be approved against DESC control drawing 87019.

Testing generally as specified for DESC 85122 with the addition of total power emission measurements between 350 nm and 930 nm.

DESC - GENERAL - Only indicator lamps that are specified on the DESC control drawing can be formally released against the drawing. However other styles of indicator lamps can be certified as meeting the screening and general requirements of the DESC drawing. (Please consult factory for details).