

Direct Drive: Queen's Award-winning LED Technology Innovation

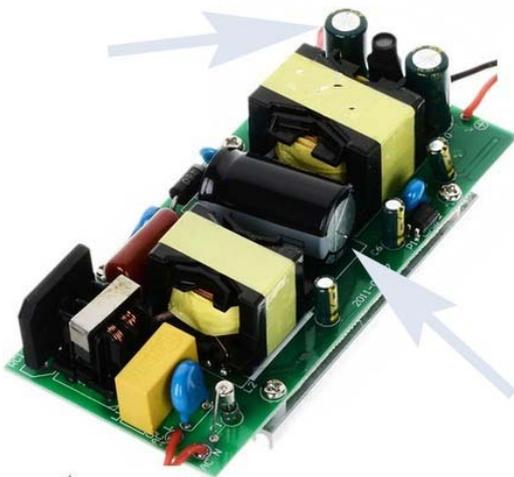
What is Direct Drive?

Unique to INDO, Direct Drive® is a pioneering LED lighting technology designed to significantly improve luminaire reliability and lifetime by removing all wear-out components... ensuring the promise of a 25-year product lifetime actually delivers.

Typical LED assemblies use a separate "LED driver" which is proven to fail and/or degrade **long** before the expiry of the LEDs' serviceable life. Costly bulk driver-changes are therefore traditionally required after every 5-7 years of operation.

But... why do traditional drivers fail?

Why is it that LED drivers are notorious for failing in an industry where products are marketed as having a lifetime of 20 years or more? One key reason is the use of wet electrolytic capacitors.



These are inherent wear-out components which store charge and are housed within all traditional LED drivers, often deployed in two parts of the driver circuit.

Capacitors comprise a liquid electrolyte which will naturally evaporate over time, (incidentally at a quicker rate at higher temperatures) altering the component properties. Depending on their position in the circuit, this failure results in a 'catastrophic' failure of the LED driver.

Once the rated life of these components is reached, a high level of failures will be observed, hence the need for bulk replacement.

How Direct Drive® works

INDO has eliminated the need for a driver; a) by employing a very specific LED system configuration; and b) using innovative design of the control circuitry. It is this advanced electronics engineering which carefully regulates LED current directly from mains voltage.



Built from the ground up

A proudly British innovation, which first came to market in 2010, the technology was developed by INDO's Product Engineering Team, who took a much more strategic approach to luminaire design.

While manufacturers pull components and building blocks together from different companies to create their product design, INDO designs all its own circuitry in-house. The team built the LED system from the ground up, rather than simply replicating the traditional HID luminaire manufacturing process.

Their aim was to better meet customer needs by matching the lifetime of ALL parts of the luminaire electronics to that of the LEDs themselves.

Critically, this has been achieved whilst ensuring equal or improved luminaire reliability, performance and functionality.

Thermal & Electrical Advantages



The lifetime of electronic components follows the "Arrhenius Law" which says that, for every 10° hotter the device is operated, its lifetime is halved.

Since an LED driver is both bulky and hot (around 30-40° hotter than the ambient temperature in fact), removing it facilitates more rigorous application of thermal design principles, which play such an important role in product reliability and lifetime

1. Strategic location of the remaining heat-producing components, means the circuitry can monitor and react to the operating temperature of all system parts in a more integrated way, ensuring everything works within its limits.
2. Thermal management can be singly focused on transferring heat away from the LEDs. The end result is a system under much less stress, thus exponentially improving both lifetime and reliability
3. Having no 'end of life' failure modes and fewer components on board means the circuit is naturally more stable
4. Absence of the driver allows for a more robust, streamlined and lightweight product form with space for additional integrations
5. Dimming as low as 10% output is possible whilst maintaining a power factor close to unity
6. Direct Drive® units are highly suited to continuous operation in high temperature environments

Customer Benefits



Being able to “**identify, eliminate and control foreseeable risks that could arise at any time during the lifetime of a highway scheme**” is one of the foremost reasons why our Direct Drive innovation is so beneficial to the public lighting sector.

Additional advantages offered by the technology are far reaching:

- Maintenance requirements reduced to a simple clean and electrical test schedule
- Better whole-life management of health and safety risk
- Significant energy and capital cost savings
- Quicker payback periods
- Small size and weight of the fittings means more can be stored in the workers vehicle, increasing productivity
- Quick and simple for a single operative to lift into position and wire in
- Reduced column loading
- Fewer public complaints and civil claims
- Improved reliability and public safety
- Confidence the system will achieve and sustain the maintenance factor used in initial designs
- More sustainable and environmentally friendly solution: elimination of unnecessary manufacturing and its associated resources PLUS significantly less WEEE waste (drivers and photocells) ending up in landfill throughout a scheme’s lifetime.
- Equal or improved product specifications
- High quality electrical performance enabling better CMS response and control
- Low inrush current reduces stress on the power network
- Excellent lumen maintenance, enhanced by CLO
- Eliminate issues around driver replacements, rewiring, onward driver and surge protection compatibility
- Delivers everything traditional LED fittings can, and more
- One warranty covers the entire luminaire – no third-party parts
- Designed and made in the UK with high quality-controlled manufacturing
- Public procurement that provides taxpayers with demonstrably better value for money

A Growing Trend

Direct Drive® first came to market in 2010 with the company's retrofit lamp products; designed specifically for highway bollards and sign lights (T5UE and PLUE). Since then, the technology has been scaled and rolled out across the company's street lighting luminaire range, decorative lanterns and retrofit gear trays.

As councils are increasingly challenged to find more ways to save money whilst simultaneously improving performance using environmentally sustainable solutions, INDO Direct Drive is unique in offering a solution that helps clients meet all those requirements.

The benefits of the technology for the lighting industry was recognised in 2017 when INDO was granted the highly prestigious Queens Award for Innovation.



And the success story was subsequently picked up by the Telegraph Business Club who produced this film for us: www.indolighting.com/telegraph

To date, INDO now has over 200,000 Direct Drive® units installed across the UK and Europe. And the business is expanding rapidly year on year. We've been increasingly successful in getting the Direct Drive® product range onto public sector procurement frameworks and continue to win many LED lighting upgrade contracts supplying thousands of products to clients across the country; from the Scottish Highlands and Cumbria through to Wales, Milton Keynes and Essex.

INDO has become a leading brand in the UK public lighting sector, setting new standards for genuine long life, driver-less LED lighting products where access to fittings and product reliability are mission-critical factors.