



LED
street lights
versatile, programmable

BELFRY



BELFRY small body.



BELFRY medium body.



APPLICATIONS

- All road types from small urban streets to major highways

CONSTRUCTION

- Die-cast aluminium body, pre-treated for corrosion resistance
- Two body sizes:
 - **Small**, 16-68W
Weight 6.5kg
Windage 0.17m²
 - **Medium**, 70-137W
Weight 8.5kg
Windage 0.29m²
- IK09 and IP66 rated

TECHNICAL DETAILS

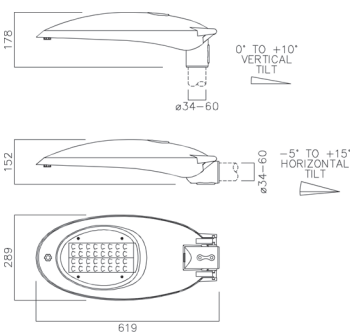
- Available in 8 standard wattages:
 - 16W nom., 1,765 lm, 16.3W act., 108 l.lm/c.W
 - 25W nom., 2,720 lm, 25.8W act., 105 l.lm/c.W
 - 34W nom., 3,590 lm, 34.3W act., 105 l.lm/c.W
 - 50W nom., 5,710 lm, 54.3W act., 105 l.lm/c.W
 - 68W nom., 7,440 lm, 68.0W act., 109 l.lm/c.W
 - 70W nom., 9,365 lm, 70.7W act., 132 l.lm/c.W
 - 95W nom., 12,245 lm, 98.3W act., 125 l.lm/c.W
 - 137W nom., 14,330 lm, 138.5W act., 104 l.lm/c.W
- Compatible with all leading CMSs
- Philips Fortimo FastFlex LED modules
- Philips Xitanium Xtreme Full programmable driver
- CRI >70, CCT 4000K
- LEDs & driver 100,000 hours rated

Extended warranty available based on advanced provision of spare modules & drivers. Please enquire for details.

OPTIONS

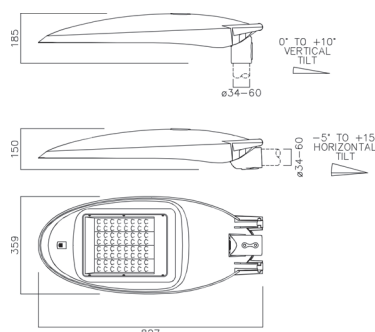
- **Lenses.** 4 lenses available. Suffix/OP2 as listed, or replace OP2 with OP3, 4 or 5
- **Mounting.** Supplied as standard for 60-34mm spigot. For 76-60mm add suffix /76. Alternatively, mounting collars can be supplied as separate items for after-sale conversion.
- **NEMA.** For a NEMA socket add suffix /NS, or a Mayflower S6000 add suffix /MS6
- **PE Cell.** Available with a range of PE cells. See page 4 for details.

Small Body



60-34MM FIXING (NO SUFFIX)

Medium Body



60-34MM FIXING (NO SUFFIX)

ORDER CODE DESCRIPTION

SMALL BODY

NBF16/OP2/740 BELFRY 16W LED ROAD LANTERN +OPTIC 2 LENS 60-34MM COLLAR

NBF25/OP2/740 BELFRY 25W LED ROAD LANTERN +OPTIC 2 LENS 60-34MM COLLAR

NBF34/OP2/740 BELFRY 34W LED ROAD LANTERN +OPTIC 2 LENS 60-34MM COLLAR

NBF50/OP2/740 BELFRY 50W LED ROAD LANTERN +OPTIC 2 LENS 60-34MM COLLAR

NBF68/OP2/740 BELFRY 68W LED ROAD LANTERN +OPTIC 2 LENS 60-34MM COLLAR

MEDIUM BODY

NBF70/OP2/740 BELFRY 70W LED ROAD LANTERN +OPTIC 2 LENS 60-34MM COLLAR

NBF95/OP2/740 BELFRY 95W LED ROAD LANTERN +OPTIC 2 LENS 60-34MM COLLAR

NBF137/OP2/740 BELFRY 137W LED ROAD LANTERN +OPTIC 2 LENS 60-34MM COLLAR

ACCESSORIES

NBF/COLLAR/76-60MM BELFRY MOUNTING COLLAR TO SUIT 76-60MM DIAMETER

NBF/COLLAR/60-34MM BELFRY MOUNTING COLLAR C/W INSERT TO SUIT 60-34MM DIAMETER

Safety cut-out - opening the cover automatically isolates the electrical supply

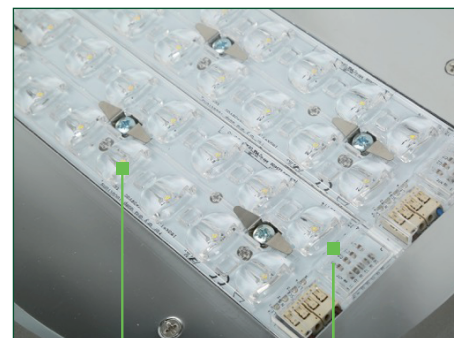
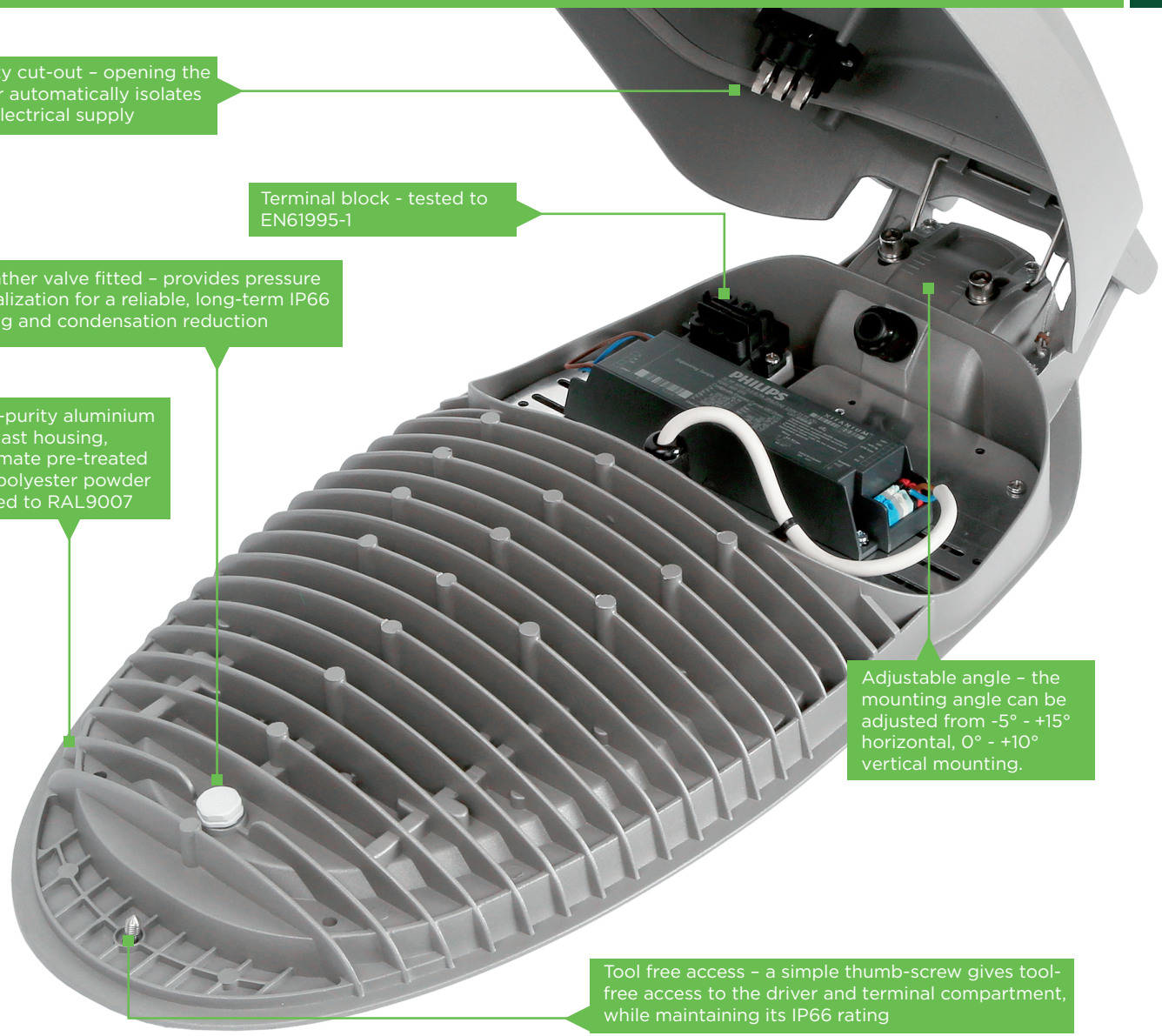
Terminal block - tested to EN61995-1

Breather valve fitted - provides pressure equalization for a reliable, long-term IP66 rating and condensation reduction

High-purity aluminium die-cast housing, chromate pre-treated and polyester powder coated to RAL9007

Adjustable angle - the mounting angle can be adjusted from -5° - +15° horizontal, 0° - +10° vertical mounting.

Tool free access - a simple thumb-screw gives tool-free access to the driver and terminal compartment, while maintaining its IP66 rating

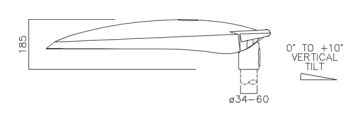
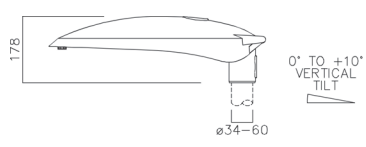


Spigot entry on the small body:
- 60-34mm as standard - see picture & line drawing opposite
- For 76-60mm as shown here, add suffix /76 when ordering

Spigot entry on the large body:
- 60-34mm as standard, see picture opposite
- 76-60mm as shown here, add suffix /76 when ordering

Individual lenses on each LED ensure precision light distribution

Philips Fortimo FastFlex LED modules for 100,000 hour rated reliability



BELFRY is versatile.

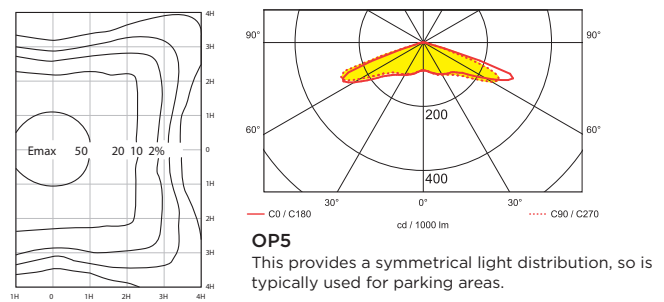
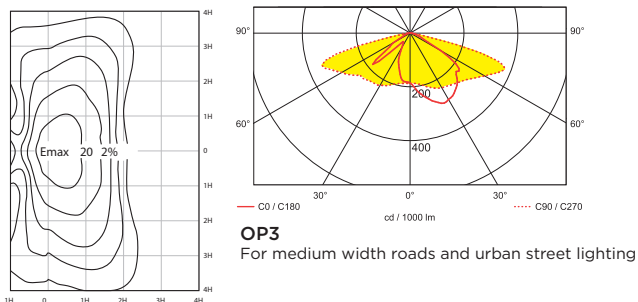
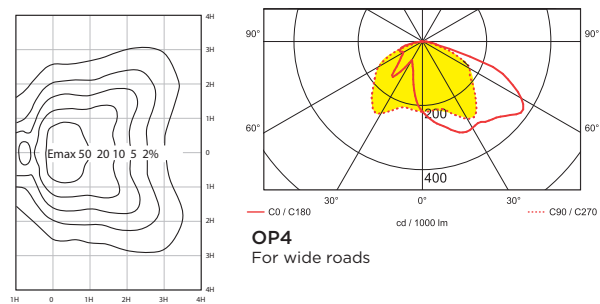
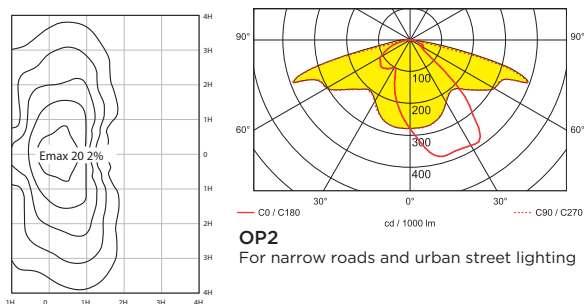
With two matching bodies, 4 lenses, 8 wattages and an almost infinite range of forward currents (programmable in the driver), BELFRY can be used in almost any street-lighting project, delivering results that are compliant with almost any S, ME or CE requirement.

PRECISION OPTICS

On traditional street lights with conventional lamps, reflectors were used to distribute the light where it was required. Despite the best efforts of the manufacturers, there was always the risk of “light-spill” – unwanted light shining into nearby properties. Typically, this was overcome by the addition of shields on individual light fittings.

With BELFRY, each LED has its own lens to direct the light precisely where it is required. The result of this is that the old problem of light-spill is eradicated and shields are no longer required.

BELFRY is available with any one of 4 optics fitted. Each one is designed to give a light distribution suited to a particular type of application. For detailed guidance, please consult your local NVC sales engineer and our lighting design department. They are equipped to model your project and advise which wattage and optic will give you the results that most closely meet your requirements.



PE cells

BELFRY is available with a choice of two types of PE cell fitted, either a miniature on/off PE cell, or a miniature part night PE cell. Both types are supplied by Royce Thompson or Zodion. Alternatively, we can supply BELFRY with a NEMA base for the installer to add his choice of PE cell.

MINIATURE PE CELL, SUPPLIED FITTED TO LUMINAIRE:

ORDER CODE	DESCRIPTION
.../PE1	MINIATURE PE CELL 35 LUX ON / 18 LUX OFF
.../PE2	MINIATURE PE CELL 70 LUX ON / 35 LUX OFF
.../PE3	MINIATURE PE CELL 55 LUX ON / 28 LUX OFF
.../PE4	MINIATURE PE CELL 20 LUX ON / 20 LUX OFF

For other lux on and lux off settings, please enquire.

Used on its own, one of these PE cells will switch the street light on and off according to the ambient light level detected.

They can also be used in conjunction with the DYNADIMMER function, described on page 6. In this mode the PE cell is detecting dusk and dawn and from that information the driver is switching and dimming the LEDs in timed steps, as it has been commissioned.

MINIATURE PART NIGHT PE CELL, SUPPLIED FITTED TO LUMINAIRE:

ORDER CODE	DESCRIPTION
.../PNI	MINIATURE PART NIGHT PE CELL 35 LUX ON / MIDNIGHT OFF / 0530 ON / 18 LUX OFF

For other settings and timings, please enquire

A part night PE cell replicates, but in a simple and less flexible fashion, the function of a miniature PE cell (as above) with the DYNADIMMER function described on page 6.

NEMA BASE SOCKET, SUPPLIED FITTED TO LUMINAIRE

ORDER CODE	DESCRIPTION
.../NS	NEMA BASE SOCKET FITTED

For other settings and timings, please enquire

If required we can supply a range of PE cells (lux-on/lux-off or part night) suitable for use with a NEMA socket. Our PE cells for use on a NEMA socket are sourced from Royce Thompson or Zodion and are to be ordered as separate items, as follows:

NEMA PE CELLS, SUPPLIED AS SEPARATE ITEMS

ORDER CODE	DESCRIPTION
N/NEMA/PE1	NEMA PE CELL 35 LUX ON / 18 LUX OFF
N/NEMA/PE2	NEMA PE CELL 70 LUX ON / 35 LUX OFF
N/NEMA/PE3	NEMA PE CELL 55 LUX ON / 28 LUX OFF
N/NEMA/PE4	NEMA PE CELL 20 LUX ON / 20 LUX OFF

For other lux on and lux off settings, please enquire.

NEMA PART NIGHT PE CELL, SUPPLIED AS A SEPARATE ITEM

ORDER CODE	DESCRIPTION
N/NEMA/PNI	NEMA PART NIGHT PE CELL 35 LUX ON / MIDNIGHT OFF / 0530 ON / 18 LUX OFF

For other settings and timings, please enquire

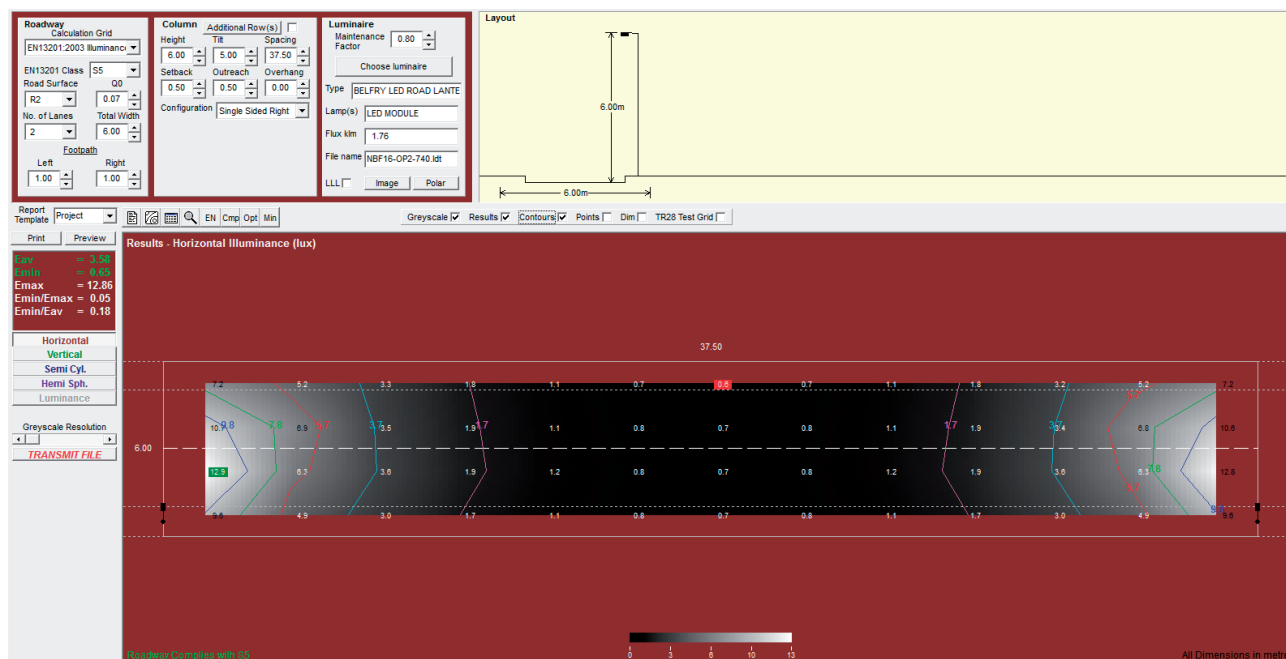
BELFRY is ready.

Charge (UMSUG) codes are in place for all 8 standard wattages, with all 4 optics at each of 9 different dim levels (from 100% to off) – a total of 288 charge codes.

The examples below show 2 different wattages of BELFRY being used in a variety of situations, delivering compliance with different S and ME classes. In all cases the roadway is 6m wide, the optic is being used is OP2 and the maintenance factor used was 0.8

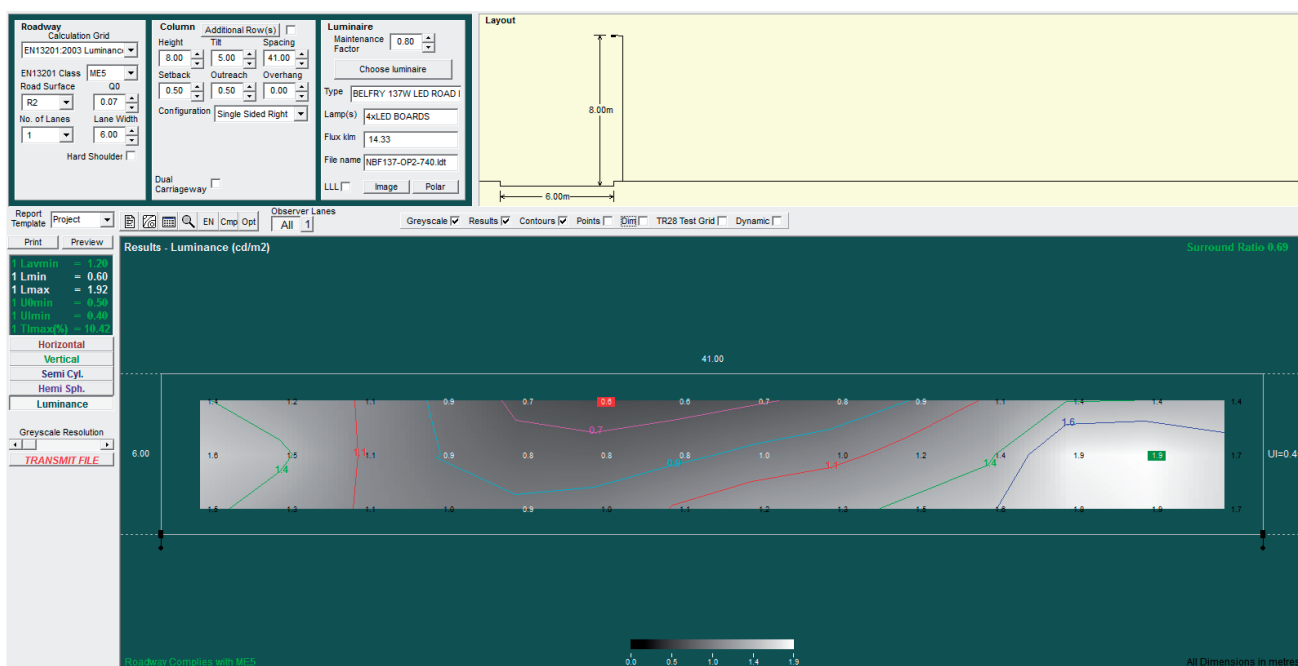
EXAMPLE 1

BELFRY 16W delivering S5 on 6m columns at 37.5m spacings



EXAMPLE 2

BELFRY 137W delivering ME5 on 8m columns at 41m spacings



With the programmable features available, almost any S or ME class can be achieved in a wide range of situations. For advice, or for simulations that reflect your specific project, please contact your local NVC distributor, sales engineer or NVC Lighting Design department on +44 (0)121 457 6343, lighting.design@nvcuk.com

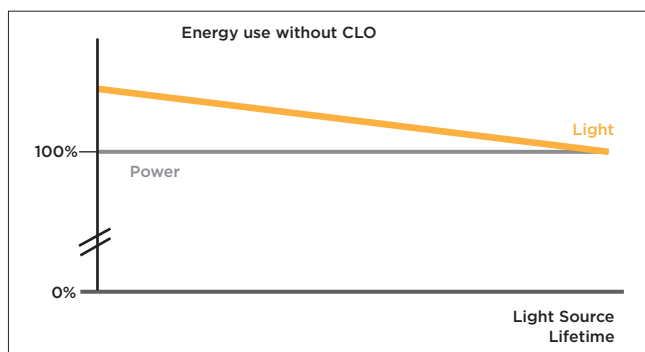
ENERGY SAVING

In addition to its class-leading efficiency and the precision of its optics, BELFRY has programmable features designed to maximise the potential energy savings without compromising the quality of the lighting installation.

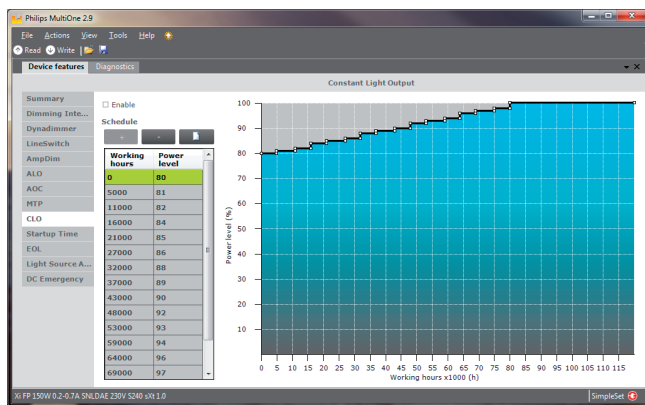
CONSTANT LIGHT OUTPUT (CLO)

When new, most street lighting schemes are over-lit. They are designed like this to compensate for the fact that over time the light output of LEDs declines. If the scheme is over-lit when new, so the reasoning goes, it will still be adequate as it reaches the end of its designed life.

This is wasteful, consuming more power than necessary over the life of the installation.



CLO saves energy by running the LEDs at just the level necessary to produce the right amount of light at the outset, gradually driving the LEDs harder over the life of the fitting to compensate for their otherwise reducing light output.



HOW DOES CLO WORK?

All LEDs have a lumen depreciation curve – the rate at which their efficiency drops over their life. The driver on the BELFRY can be pre-programmed with 16 steps that closely follow the inverse of the lumen depreciation curve of the LEDs. As the fitting is used the driver is recording the running hours and moves to the next step on the dimming curve when sufficient time has passed.

The result is a street lighting scheme exactly as the designer intended it. The light output is constant and energy is not wasted over-lighting the road in the early years of the installation.

HOW IS CLO IMPLEMENTED?

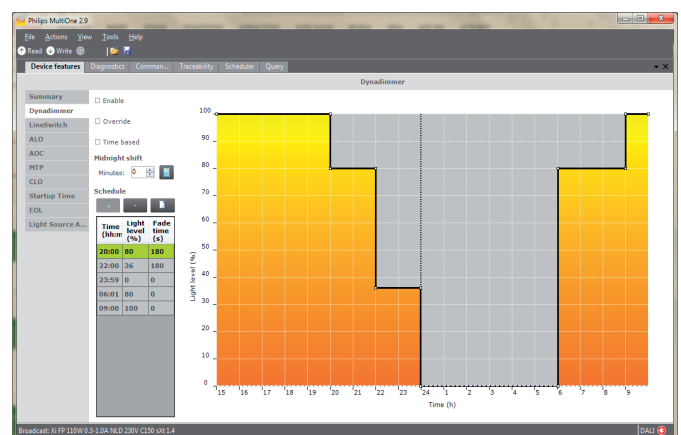
Implementation starts with lighting design. Using Lighting Reality we calculate the lumen output required to achieve the desired lighting class. From that we select the most appropriate version of the BELFRY to use, and then programme the starting forward current and the 15 remaining steps to deliver the required lumen output for the design-life of the installation.

DYNADIMMER

Where a central management system (CMS) is not in use there are two alternative ways to introduce timed dimming and switching through the night. One approach is through the use of “part-night” sensors. For details, see page 4.

A second, and more flexible approach, is to use Dynadimmer. This is a feature of the BELFRY driver which can be programmed with up to 5 different steps so that the light output steps down late at night to save energy and steps up again towards dawn. The dim levels, including completely “off”, can be set as desired, along with the fade rate so that light-level changes can be gradual over several minutes rather than in abrupt steps.

Dynadimmer is typically implemented along with a PE cell mounted on the body of the fitting to detect dusk and dawn. At commissioning the global position of the fitting is loaded into the driver to link dusk and dawn to the local time of the fitting. The 5 steps are then automatically distributed appropriately on either side of midnight.



DIMMING OPTIONS

In addition to the built-in dimming of CLO and of Dynadimmer, external controls using DALI, 1-10V, Line Switching and mains dimming can also be used to dim the BELFRY.

ADAPTABLE

For the street lighting engineer BELFRY has a wealth of programmable features that makes the range highly adaptable. In this way, a small stock of fittings and drivers can quickly be programmed so that almost any configuration required can be created.

Making good after a traffic accident, completing a small project or adjusting lighting to meet the concerns of residents has never been easier.

SIMPLESET PROGRAMMING

All the programmable features of the driver can be configured and stored on a PC and then downloaded to a driver either in the workshop or via a mobile device while the driver is in-situ on a lighting column.

The technology used is called Near Field Communication – the same as is used with contactless credit cards – avoiding the need for a wired connection.

The benefit is that the maintenance contractor can keep a small stock of un-programmed drivers and fittings, and configure them as required in response to local incidents or requirements.

SimpleSet can also be used to download detailed performance and running data (running data, temperature profiles, number of starts etc) for diagnostic and fault-finding purposes.

RELIABLE

BELFRY is designed to be reliable. First, reliability is built-in because we use the best available drivers and LEDs, and the thermal management of the fitting has been modelled in detail.

Reliability is also enhanced with some practical features built into the driver and LED module. In particular, the LED modules feature thermal protection as well as patented embedded surge protection.

MODULE TEMPERATURE PROTECTION (MTP)

The life of the LEDs will be shortened, and their performance impaired, if they are allowed to run at full output while also overheating. While this condition is rare in the UK and Northern Europe, it is more frequently encountered in the Mediterranean area.

MTP monitors the temperature in the driver (which is directly proportional to the temperature of the LEDs) and dims the LEDs if the temperature exceeds a threshold. The threshold temperature is programmable, as is the dim-to level if the threshold is exceeded. Of course, we can advise on suitable thresholds to set, and the effect they can have on lifetime.

For public safety a minimum dim level can be set so that a basic level of lighting is maintained even in the hottest weather.

MTP protects against early failures in hot climates and safeguards your warranty.

HIGH SURGE CAPABILITY

The BELFRY driver will withstand mains surges up to 8kV – industry-leading performance for maximum reliability.

DALI DIAGNOSTICS

In addition to using DALI for dimming control, BELFRY uses the latest DALI specification for diagnostics and integration with all leading Central Management Systems (CMS). In this respect, DALI is an alternative to SimpleSet. Via DALI a driver can be programmed and detailed performance and running data can be downloaded.

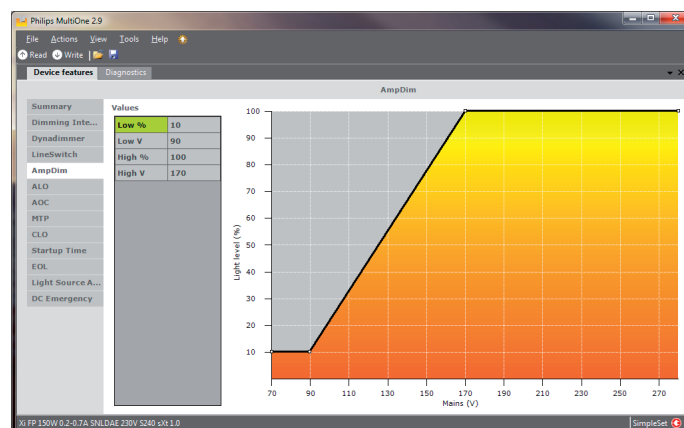
ADJUSTABLE OUTPUT CURRENT (AOC)

The forward current of the driver can be programmed to limit light output, to save energy or extend the life-time of the fitting.

MAINS GUARD

This feature is enabled, as standard, and does not need to be programmed.

The driver and the LEDs can be damaged in the event of persistent under-voltage conditions and this feature protects them against it. If the mains voltage falls to 170V the driver starts to dim the LEDs. It switches them off completely if the mains voltage falls to 85V.



LONG LIFE

The rated life of the BELFRY is 100,000 hours to just 10% failure and L70. Customers are invited to discuss with us their long-term maintenance and warranty requirements so that arrangements tailored to their needs can be put in place.

QUALITY COMPONENTS

At the heart of the BELFRY range of street lights is a set of components designed to work together to give the widest possible range of light outputs and distributions, with the highest possible performance and long-term reliability.

Philips Fortimo FastFlex LED modules

The performance of all Fortimo LEDs is assessed in accordance with LM80 for 9,000 hours. Detailed LM-80 data is available on request. From that data the lifetime performance of the LEDs is projected forwards, using TM-21.

PHILIPS LENSES

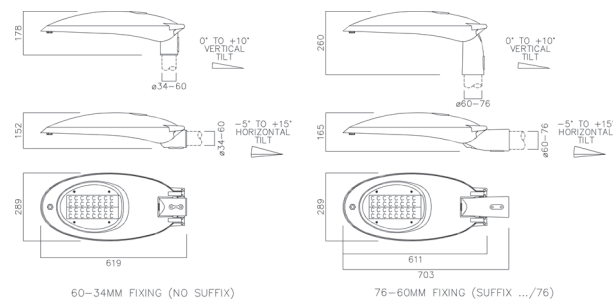
The lenses we use are made by Philips from Plexiglas. This is a specific brand of PMMA, chosen for its optical qualities. In particular it exhibits very high levels of light transmittance and low levels of yellowing, even over prolonged periods.

Of course, a slight degradation in light transmission is expected, and that is why we use Philips Xitanium drivers. With their constant light output regulation feature as standard, they adjust the drive current to compensate for falling output over time.

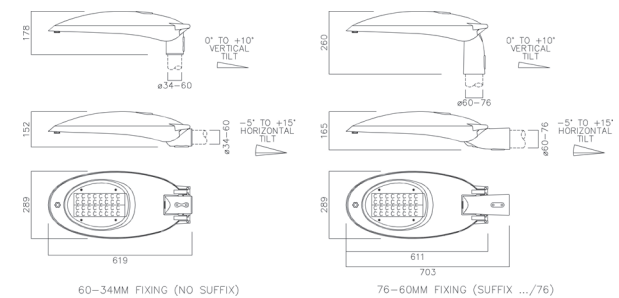
TECHNICAL DATA

Charge (UMSUG) codes are available for all standard versions of the BELFRY. If CLO is implemented a separate charge code is recommended for each setting. This will be calculated by Elexon based on the initial and final wattages.

Small Body



Medium Body



LED PERFORMANCE DATA

LED performance has been measured in accordance with IES LM80. LM80 data is available on request. LED lifetime projections have been calculated in accordance with IES TM21.

PHOTOMETRIC DATA

Photometric data is available for all the standard products in the range in .pdf, .ies and .ldt formats. All photometric data is generated in accordance with LM79 and in a laboratory accredited under ISO17025.

IMPACT RESISTANCE

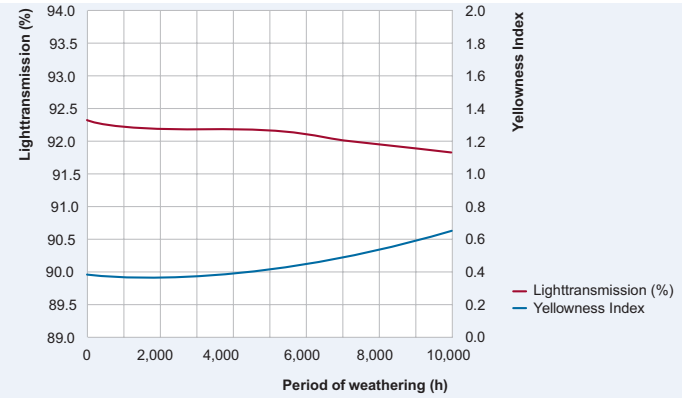
The impact resistance of the BELFRY has been independently tested to IEC/EN 62262 and is classified as IK09.

IP RATING

IP66 to IEC/EN60529

STANDARD DEVIATION OF COLOUR MATCHING (SDCM)

Measured according to IEC62707 the BELFRY LEDs are within 4 McAdam ellipses.



PHILIPS XITANIUM DRIVERS

Xitanium LED Xtreme drivers ensure luminaires will deliver exceptional light quality in harsh outdoor and industrial environments. These drivers are specifically designed to withstand case temperatures up to 90°C, powerful vibrations, high moisture levels, and surges of up to 8 kV over an industry-leading 100,000 hour lifetime. Together with their low failure rate (10%) and 5 year warranty, Xtreme reliability means confidence for those that need it most.

As standard we fit the FULL programmable variant of the Xitanium Xtreme drivers to BELFRY. With its rich feature set (see inside for more details) we know that we are delivering not just the highest quality of driver available today, but the most adaptable and flexible driver too.



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NVC Lighting is proud to be the title sponsor of the FINA Diving World Series 2014-2017. This is an invitation-only global diving competition, with entrants participating solely on the basis of their world rankings.

At the time of going to press (October 2016) the dates and venues of the Diving World Series 2017 are not yet known. If you are interested in attending, please contact NVC.

