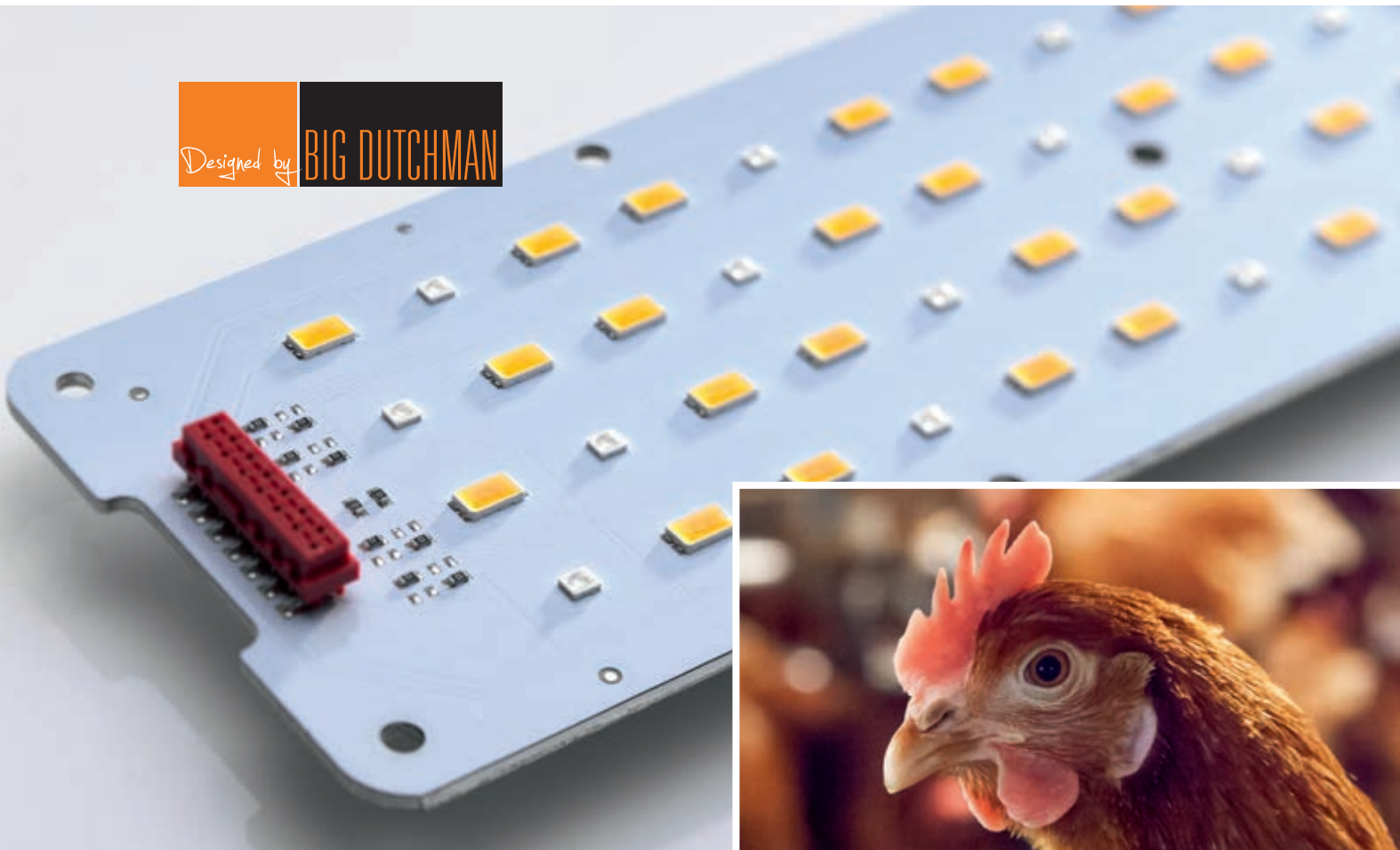




Big Dutchman®

Designed by **BIG DUTCHMAN**



LED Lighting

Efficient and durable LED solutions for your poultry house

LED lamps for the ideal lighting concept

LED lamps designed by Big Dutchman are of a high quality and have been developed specifically to meet your needs and the conditions in poultry houses. We differentiate between lighting inside the

system and the illumination of the barn. Our product range includes the following options:

- ✓ FlexLED
- ✓ FlexLED HO (High Output)

- ✓ FlexLED eco
- ✓ ZeusLED
- ✓ LED bulb

Let our experts advise you to find the best solution for your individual requirements.

BD LED

very energy-saving, high quality, 11 million lamps currently in use

Due to the many advantages of LED lamps compared to traditional light bulbs, LEDs (light-emitting diodes) are state-of-the-art technology for many applications today. In global poultry production, LED lamps are becoming more popular as well.

Big Dutchman recognised this trend early on and has developed LEDs for the specific requirements of animal husbandry. Lighting in poultry houses not only must withstand the conditions in the barn, but also be able to meet the birds' needs, or more specifically, their eyes'.

We started replacing the standard light bulbs with LED bulbs in 2011. This replacement was mainly triggered by their

energy-saving potential. Together with the control unit that Big Dutchman specifically developed for this purpose, the LED ERS dimmer, we have been able and will continue to provide farmers with a great alternative to conventional light bulbs.

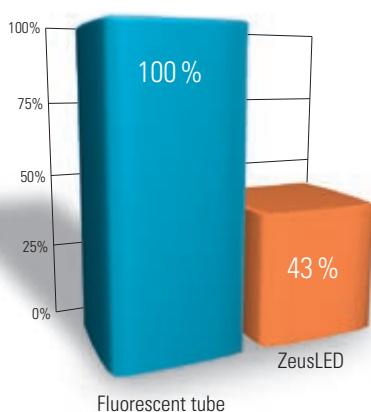
Our control unit has a 92 % efficiency and does not cause any EMC interferences, such as power surges, flickering or harmonic waves.



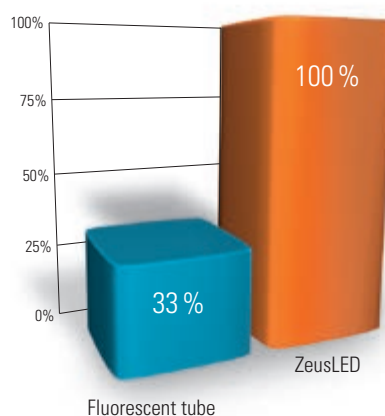
In 2014, we introduced the very successful tube lamp FlexLED to the market. Only a year later, we added the ZeusLED ceiling lamp to our product range, which was just as successful. Both Big Dutchman innovations perfectly meet the requirements in poultry houses. Because we vouch for this declaration, we only offer the best quality:

- ✓ use of brand LEDs (Osram) and other brand components;
- ✓ a series number (QR code) on each lamp or component to ensure full traceability;
- ✓ certified ammonia resistance and protection rating;
- ✓ functional testing of each lamp including tolerance measuring.

Comparison of energy costs



Comparison of the service life



Big Dutchman test centre

for our customers' benefit

Our internal test centre is equipped with a special environmental test chamber. In this chamber, we can expose our LED lamps to extreme temperatures ranging from -40 °C to +180 °C. The humidity can

also be adjusted: from 0 to 100 %. The tests give us and you the security of knowing that our LED lamps work just as well in Siberia as they do in the desert. By exposing the LED lamps to very high

temperatures over a longer time, we can simulate the ageing process. This allows us to make reliable statements regarding the lamps' actual service life.



Environmental test chamber



ZeusLED ceiling lamp, tested under temperatures of -25 °C



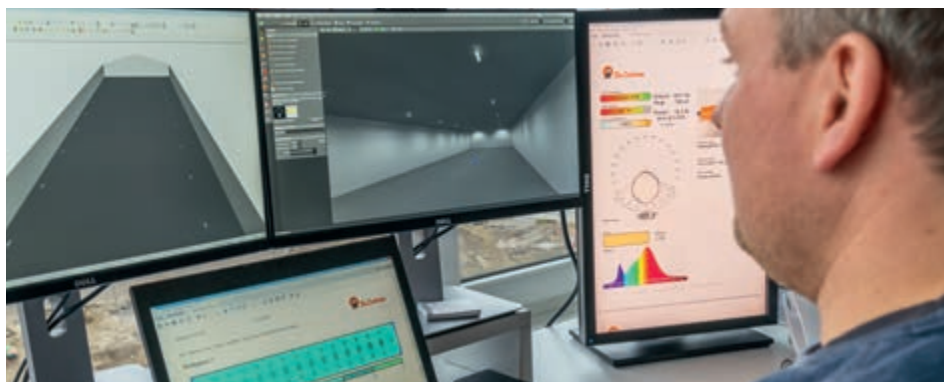
Use of an infrared camera

Big Dutchman has invested in a special measuring instrument, a goniometer, to be able to carry out specific calculations regarding lighting parameters. Using this goniometer, we can determine beam angles, the optical spectrum, the colour temperature and many other characteristics of our different LED lamps. The corresponding values are recorded in a data sheet. We also prepare a DIALux report to determine the ideal type, number and position of LED lamps individually for each house. The tool also makes 3D drawings available.

If the customer is planning to apply for subsidies, such a test report is a sure way of proving the possible energy savings.



Goniometer – testing our FlexLED lamp



Together with you and directly on site, we will define the ideal lighting concept for your barn. The only information we need are your house dimensions and the required lux value. The software promptly calculates how many lamps must be installed at which location. We can also compare the different LED lamps. This comparison is free of charge and guarantees that only the number of LED lamps that is actually required will be installed.

FlexLED

flexible tube lamp

Designed by **BIG DUTCHMAN**



**BIG DUTCHMAN
FLEXLED**
✓ Ammonia resistance
✓ Cleaning distance
DLG test report 6816



Use of FlexLED to light the litter area below a layer aviary

FlexLED is an innovative LED tube lamp which can be used very flexibly. Be it aviaries or enriched colony systems, there are nearly no boundaries for FlexLED. The lamp is wired without plugs, i.e. only one continuous main cable is required. The LED tube can thus be installed easily even

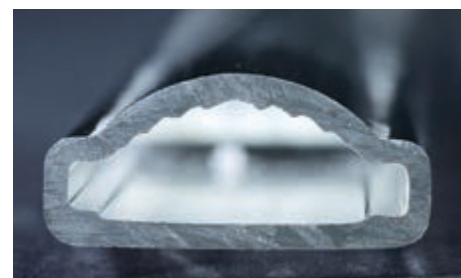
where there is little space. Retrofitting additional LED tubes at a later point is also very simple. FlexLED is characterised by the following features:

- ✓ low power consumption;
- ✓ resistant against high-pressure cleaning;
- ✓ 0 to 100 % dimmable;
- ✓ even distribution of light thanks to the special profile of the housing;
- ✓ zero flickering even at low light intensities;
- ✓ available in many different lengths.



The main cable runs through the entire house (outside of the bird area) without any plug connections and thus ensures

that the entire power remains in the main line. Thanks to the plug & play principle, each LED tube can be installed individually



Special housing profile for even light distribution

in any place. In addition, all connections are completely waterproof.

Important advantages

- ✓ 48 V DC safety extra-low voltage;
- ✓ certified by the German Agricultural Society (DLG, test report 6816);
- ✓ plug & play installation for quick, easy and flexible mounting;
- ✓ use of brand LEDs (Osram);
- ✓ continuous main cable prevents contact resistance caused by plug-in connections;
- ✓ good price / performance ratio.



Use of FlexLED in pullet rearing

FlexLED HO

efficient and economic illumination of ceilings and aisles

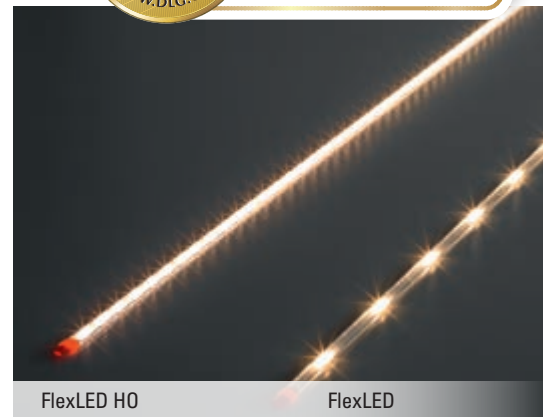
FlexLED HO (high output) is another innovative and very flexible LED tube lamp. FlexLED HO is equipped with four times as many LEDs as FlexLED, with the corresponding increased light output. FlexLED HO is also wired without plugs. At the continuous main cable, FlexLED HO lamps can be connected wherever necessary. Furthermore, it is easily possible to retrofit the lamp at a later point. FlexLED HO has the following features:

- ✓ half as many lamps required compared to FlexLED;

- ✓ low power consumption;
- ✓ long service life;
- ✓ 0 to 100 % dimmable;
- ✓ even distribution of light thanks to the special profile of the housing;
- ✓ zero flickering even at low light intensities;
- ✓ available in different lengths;
- ✓ very low installation costs.



BIG DUTCHMAN FLEXLED
 ✓ Ammonia resistance
 ✓ Cleaning distance
 DLG test report 6816



FlexLED HO

FlexLED

Important advantages

- ✓ 48 V DC safety extra-low voltage;
- ✓ optimised light distribution, especially with low ceilings;
- ✓ plug & play installation for quick, easy and flexible mounting;
- ✓ use of brand LEDs (Osram);
- ✓ continuous main cable;
- ✓ costs savings of up to 40 % compared to FlexLED, depending on the area of use.



Use of FlexLED HO in a broiler house

FlexLED eco

compact LED lamp with attractive price/performance ratio

FlexLED eco is a small LED lamp whose output is similar to that of a 25-watt bulb. In addition to the standard version, we can also offer a transparent option.



Use of FlexLED eco in pullet rearing

FlexLED eco standard produces a directed light beam, perfect to illuminate a feed pan, for example. The light from FlexLED eco transparent is dispersed in all directions, making this lamp the ideal lighting solution for the area below the aviary.

Mounting FlexLED eco is very easy: the process is the same as with FlexLED and FlexLED HO.



FlexLED eco transparent

FlexLED eco standard

Important advantages

- ✓ 48 V DC safety extra-low voltage;
- ✓ can easily be retrofitted into any existing system;
- ✓ very little space required;
- ✓ plug & play installation;
- ✓ continuous main cable;
- ✓ attractive price/performance ratio.

ZeusLED

professional LED ceiling lamp

A customised lighting concept significantly contributes to the success of your farm. The innovative ceiling lamp ZeusLED evenly illuminates all areas of a poultry house. Big Dutchman offers ZeusLED as

1- or 2-channel lamp: an exclusive brand product of the highest quality. ZeusLED can be used for multiple purposes thanks to the LED technology and a wide optical spectrum.



BIG DUTCHMAN ZEUSLED
 ✓ Ammonia resistance
 ✓ Cleaning distance
 DLG test report 6815

Energy savings of up to 50 percent compared to conventional moisture-proof lamps are an unbeatable advantage.



Cool white light



Warm white light



Red light

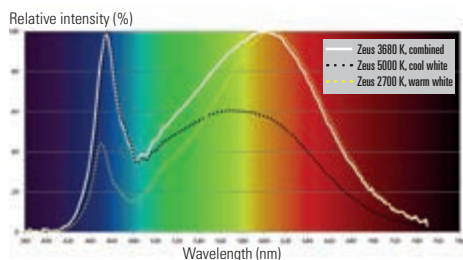
The moisture-proof lamp ZeusLED is available with different LED boards as an option. These boards can be exchanged on site without a service technician, even after installation is complete. The following combinations of luminous colours can be delivered: warm white and cool white/red/blue/UV.



Use of ZeusLED in an aviary house



Use of ZeusLED in a broiler house



Optical spectrum



Installation directly at the sandwich panel



Many different installation options

Important advantages

- ✓ great energy savings;
- ✓ DLG certification (test report 6815);
- ✓ zero flickering even at low light intensities;
- ✓ wide optical spectrum from warm white to cool white, infinitely variable;
- ✓ 2-channel moisture-proof lamp, e.g. to simulate sunrise and sunset;
- ✓ modular design consisting of a power supply unit, an LED driver and LED lamps;
- ✓ rugged aluminium housing with an exterior heat sink for optimum cooling up to an ambient temperature of +50 °C;
- ✓ use of different optics (depending on the application) for ideal and efficient lighting;
- ✓ long service life, low maintenance requirements;
- ✓ can be installed at walls, ceilings and sandwich panels or mounted to tubes.

LED bulb and LED ERS dimmer

energy-saving alternative to traditional light bulbs

Replacing traditional light bulbs with our LED bulb, combined with the LED ERS dimmer, means that you can illuminate

your barn in a most energy-efficient manner. The special ERS dimmer is the principal asset to achieve the highest

efficiency and a long service life of the LED bulb. EMC interferences will be a thing of the past.

Features of the LED bulb

- ✓ saves up to 90 % in energy;
- ✓ no heat problems in the closed housing;
- ✓ even light distribution;
- ✓ costs are amortised quickly: replacing the old lamps with LED bulbs usually pays off in less than two years (depending on the electricity price);
- ✓ high-quality and robust aluminium housing.



Incredibly easy to replace

Features of the ERS dimmer

- ✓ ~ 92 % efficiency;
- ✓ bypass switch;
- ✓ manual access;
- ✓ no minimum load;
- ✓ protection rating IP 54;
- ✓ soft dimming;
- ✓ 0–10V control input;
- ✓ external input for a control light.



TECHNICAL DATA

Voltage	208 – 277 V AC
Frequency	50 – 60 Hz
Electric current	4 A or 10 A
= number of lamps	90 or 230
Control	0 – 10 V

Light control 103

professional, modular system ideal for customisation

Designed by **BIG DUTCHMAN**



The Big Dutchman light control 103 is used for automatic light regulation of any type of lamp. It is equipped with a 3.5-inch touch screen and can control up to twelve light scenes. These scenes (e.g. sunrise and sunset) can be configured individually for nine light groups (nine houses). Additionally, four outside and sixteen inside sensors can be connected. The housing has an IP 54 protection rating and is thus protected against water. The light control can be retrofitted easily as a stand-alone version, even for non-BD lighting systems. Customised lighting

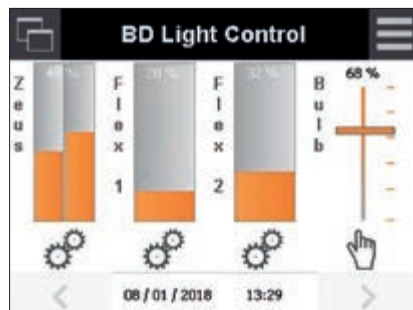
programs can be saved via an integrated USB interface and also transferred easily to other light controls (copy & paste). In addition to the stand-alone version, we also have a unit for installation in the control cabinet on offer.



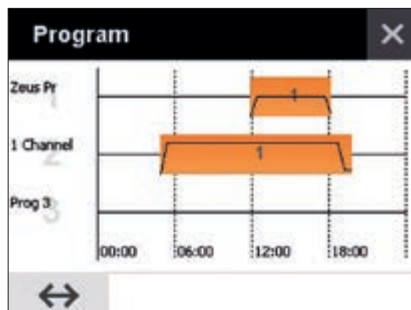
Simulation of sunset and sunrise

Important functions

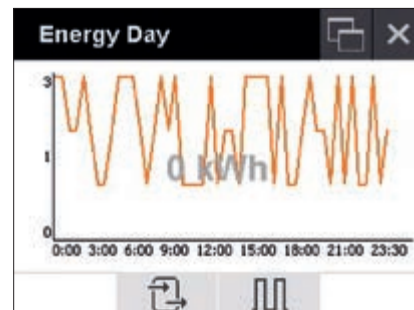
- ✓ **light programs can be customised** based on light curves that are set up individually beforehand;
- ✓ **simulation of sunrise and sunset** using brightness and colour temperature;
- ✓ **light level during the inspection rounds:** a special light that can be turned on at the touch of a button. After a defined time, the light control automatically returns to the normal lighting program;
- ✓ **recording of the power consumption:** a conventional current counter can be connected to the light control via a digital input;
- ✓ additionally, connection of up to **nine time switches** is possible.



Main menu of the light control



Example of a lighting program



Recording of the daily energy consumption

Overview of the technical data of our LED lamps

		FlexLED	FlexLED H0	FlexLED eco	ZeusLED	LED bulb
Area of use		<i>in the bird area</i>	<i>in the bird area and for ceiling and wall lighting</i>	<i>in the bird area</i>	<i>for ceiling and wall lighting</i>	<i>for aisle and ceiling lighting</i>
Supply voltage	V, Hz	48 VDC	48 VDC	48 VDC	100–240 VAC 50/60 Hz	230 VAC 50 Hz
Power	W	5.5–6	4.1–16.4	2	32.5	6.5
Light output	lm	300–450	450–1800	130–190	4100	500
Efficiency	lm/W	75	110	95	127	78
Frequency	Hz	2000	2000	2000	16000	∞
Colour temperature	K	3000	3000	3000	2700–5000	2700
Beam angle	°	110	110	110–150	105–140	200
Dimming	%	✓ 0–100	✓ 0–100	✓ 0–100	✓ 0–100	✓ 0–100
Zero flickering		✓	✓	✓	✓	✓
Number of LEDs	quantity	8–14	12–48	14	112	20
Protection rating	IP	69 K	69 K	69 K	67	65
Service life	hours	50 000	50 000	50 000	> 50 000	25 000
Temperature range	°C	-10 to +50	-10 to +50	-10 to +40	-20 to +50	-10 to +30
Certification		CE, UL	CE, UL	CE	CE, UL	CE
Height / width / length	mm	11 x 22 x 1130-2230	11 x 22 x 450-1800	16 x 16 x 60	438.5 x 121.5 x 82.5	108 x 60 x 60
Weight	kg	0.25–0.35	0.25–0.35	0.015	3.5	0.13
Material		PMMA*	PMMA*	PMMA*	Aluminium, PMMA*	PC**

* PMMA = polymethyl methacrylate

** PC = polycarbonate



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