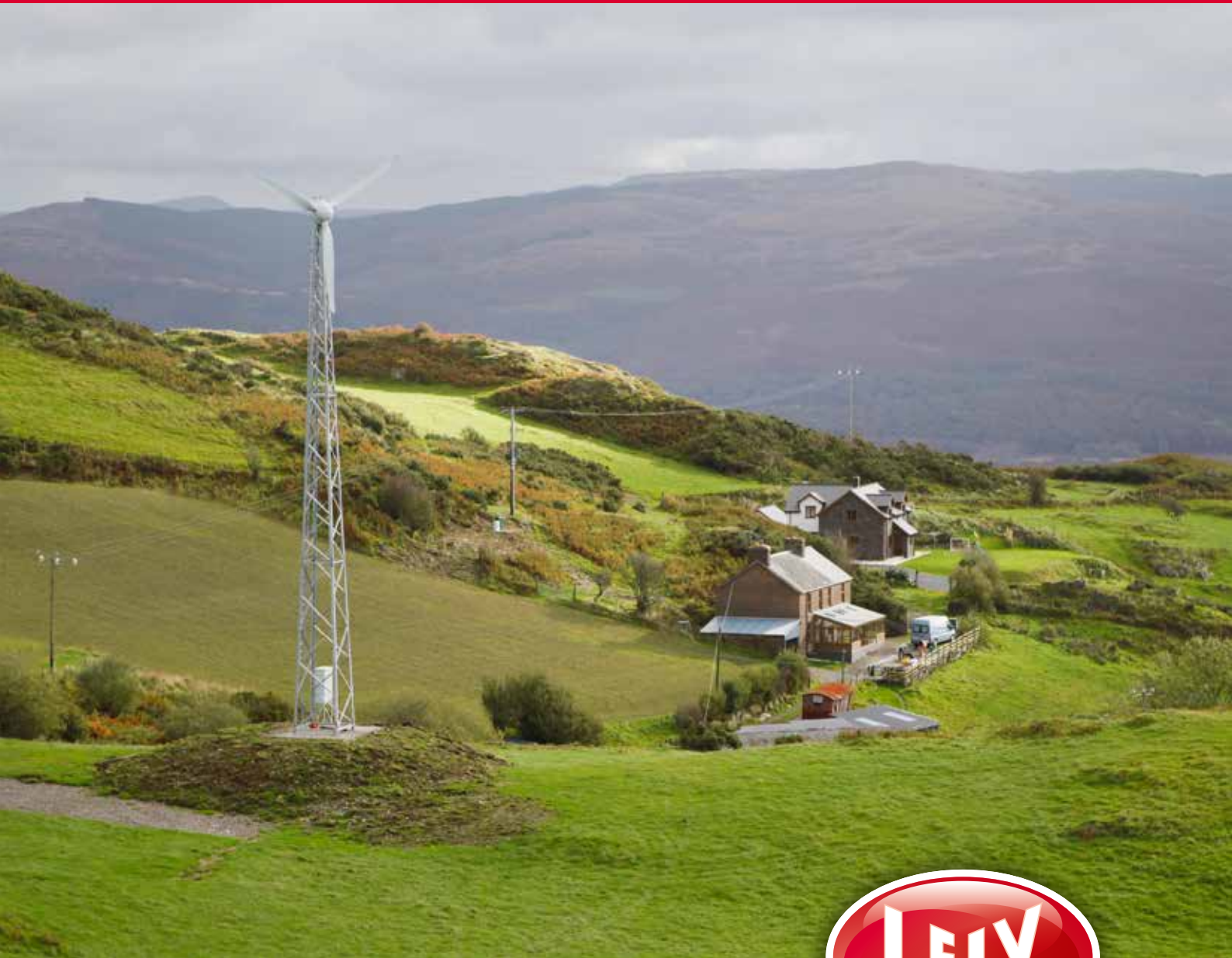


# LELY AIRCON 10

Wind turbines



[www.lely.com](http://www.lely.com)

*innovators in agriculture*

# Blending in, energy out



## Professional wind tracking systems

Thanks to an active wind-measurement system that processes velocity and direction data, the azimuth drive always rotates the nacelle into the most efficient position.



## Designed for maximum safety

The turbine is designed and built with multiple safety systems such as a remote control via a VPN connection and hydraulic brakes, as well as a safety ladder and a stand ring for use by technicians.





**Ultra-durable gearless permanent synchronous generator**

The unique, compact design with minimum moving parts has proven to be ultra-durable in all kinds of environments worldwide.

**STRONG AND SILENT**

Entirely manufactured in Germany, the Lely Aircon 10 is an engineering masterpiece that is the result of many years of market experience. Right from the beginning, the objective was to develop a small wind turbine with strong performance, new technology and safety systems comparable with larger wind turbines.

A special priority was to design the quietest turbine on the market.

Today, with over 200 installations worldwide, the concept is both accepted and proven.



**Aerodynamic blades and nacelle housing design**

The blades and the nacelle were designed to be aesthetic as well as functional, and obtain maximum yield from the wind.



**Exceptionally quiet and stable wind tracking thanks to active azimuth drive**

Due to an active wind-measurement system that processes velocity and direction data, the azimuth drive always rotates the nacelle into the most efficient position.

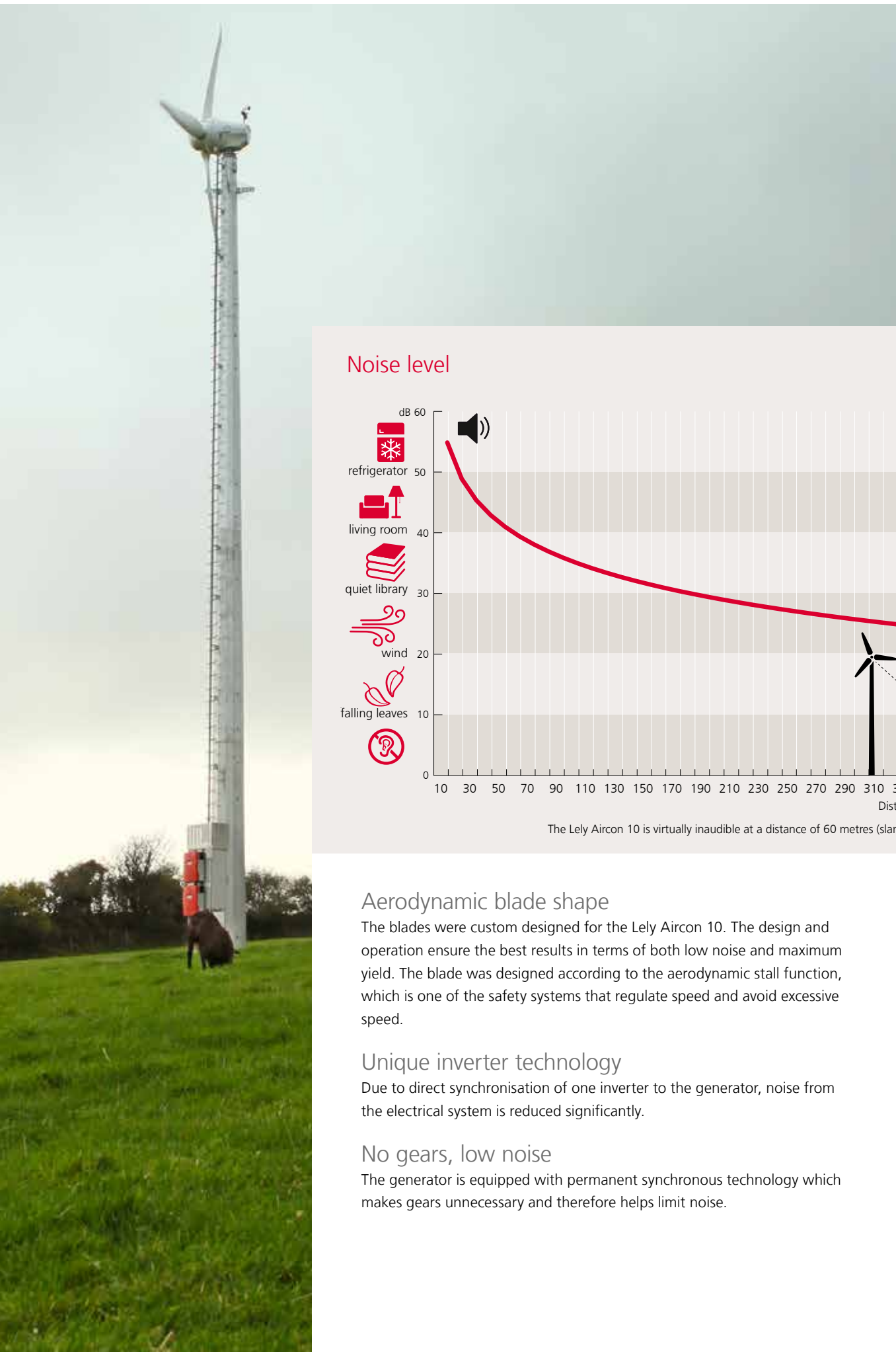
# Zzzzzzz

## Sleep well!

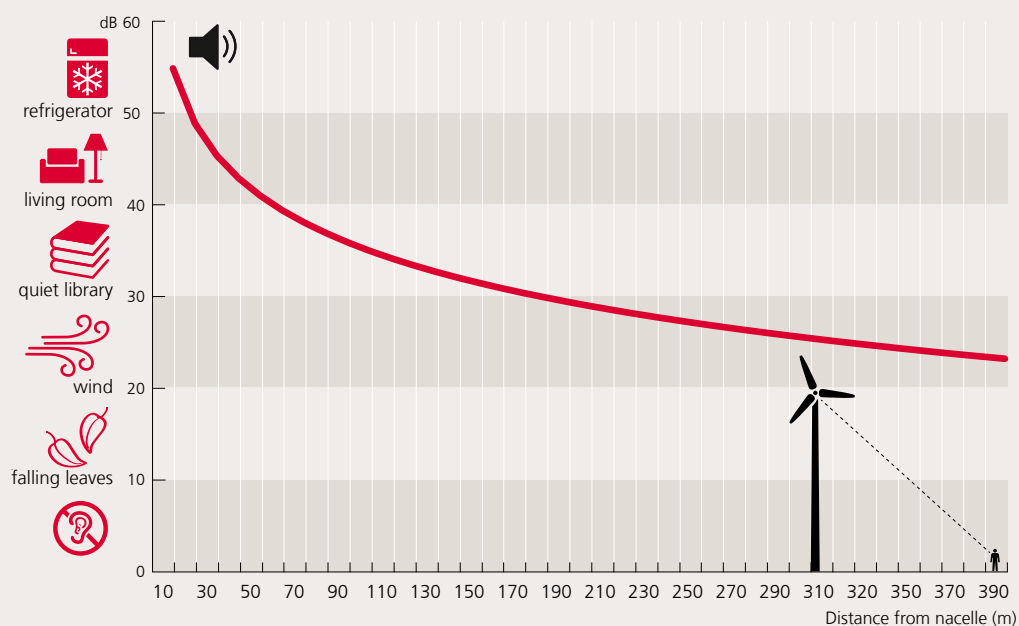
The aerodynamic blade shape, the absence of gears and the unique inverter technology for low noise frequency make the Lely Aircon 10 the quietest turbine in the market place. Even at wind speeds above 10 m/s, the turbine remains exceptionally silent. This means that the turbine can be located relatively close to urban areas.







## Noise level



The Lely Aircon 10 is virtually inaudible at a distance of 60 metres (slant angle from nacelle).

### Aerodynamic blade shape

The blades were custom designed for the Lely Aircon 10. The design and operation ensure the best results in terms of both low noise and maximum yield. The blade was designed according to the aerodynamic stall function, which is one of the safety systems that regulate speed and avoid excessive speed.

### Unique inverter technology

Due to direct synchronisation of one inverter to the generator, noise from the electrical system is reduced significantly.

### No gears, low noise

The generator is equipped with permanent synchronous technology which makes gears unnecessary and therefore helps limit noise.

# The Long-term investment

The return on investment is dependent on the incentives available in your country. The turbine is certified by the Microgeneration Certificate Scheme (MCS). In the United Kingdom, MCS accreditation ensures entitlement to generous tariffs for small wind turbines. Your own turbine will reward you with all the energy generated and exported to the grid (fixed tariffs for twenty years). In addition to the income from generation tariffs and export tariffs, you will also benefit from savings to your energy bill. In Germany, the Renewable Energy Act also offers incentives for the feed-in of energy in to the grid.

## Return on your investment

Depending on the wind conditions at your site, the development of electricity prices and the level of self-consumption, it is possible that you can realise a return on your investment in eight to ten years. The Lely Aircon 10 has a design life of more than twenty years. This means you will see a comfortable return on your investment in the long term.

If you need additional information about market incentives available in your country, we would be pleased to help you. We can also provide you with a full payback period analysis in accordance with your location.





## Quality matters

Since the original development of the Lely Aircon 10, the major objective has been to ensure the quality and the reliability of the turbine. The turbine was developed nearly 17 years ago, and has been in serial production since 2003. Design, development and manufacturing is carried out 100% in Leer, Germany. The Lely Aircon 10 turbine has sophisticated, leading-edge technology which is comparable to large utility-scale turbines. In terms of control, mechanical and safety features, the engineering is superb. The power electronics synchronise and deliver a perfectly controlled wave form to the grid.

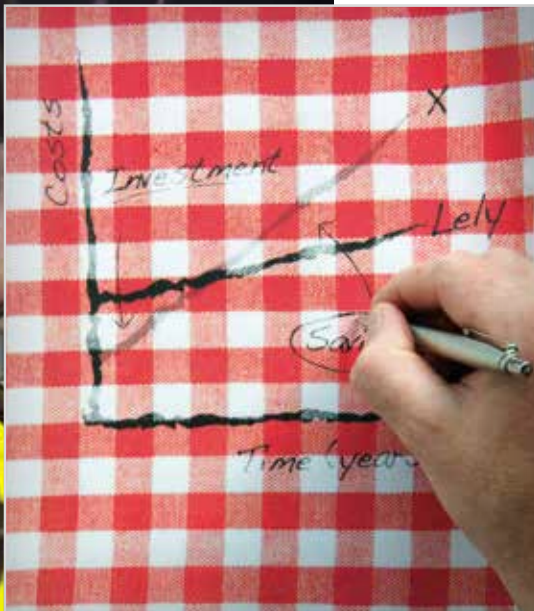
With its unique design incorporating the minimum of moving parts, the Lely Aircon 10 only requires a brief and basic annual inspection and lubrication service. To facilitate cost-effective servicing, the service technician can access the nacelle by climbing the safety ladder that is a standard feature.

## No gears, low costs

Minimal moving parts in the turbine means huge benefits in terms of reliability and durability, as well as keeping service costs to a minimum. This in turn results in low ownership costs during the expected lifetime of over 20 years.

## Lowest cost of ownership

The Lely Aircon 10 is an extremely durable wind turbine. Thanks to its long lifetime and low maintenance costs, the investment over the total lifetime is much lower than other turbines.



### PAYBACK PERIOD EXAMPLE, UK

Total turbine production per year: 25,000 kWh  
(Average annual wind speed of 6 m/s on 30 m tower)

|  |                        |                 |
|--|------------------------|-----------------|
| Annual energy production by turbine          | 25,000 kWh x 0.281 = £ | 7,025           |
| Savings from not buying energy from the grid | 15,000 kWh x 0.12 = £  | 1,800           |
| Export of energy to the grid                 | 10,000 kWh x 0.03 = £  | 300             |
| Annual income                                | <b>£</b>               | <b>9,125</b>    |
| Sum of income over 20 years                  | £                      | 182,500         |
| Turbine cost                                 | £                      | 67,000          |
| Payback period                               |                        | approx. 7 years |

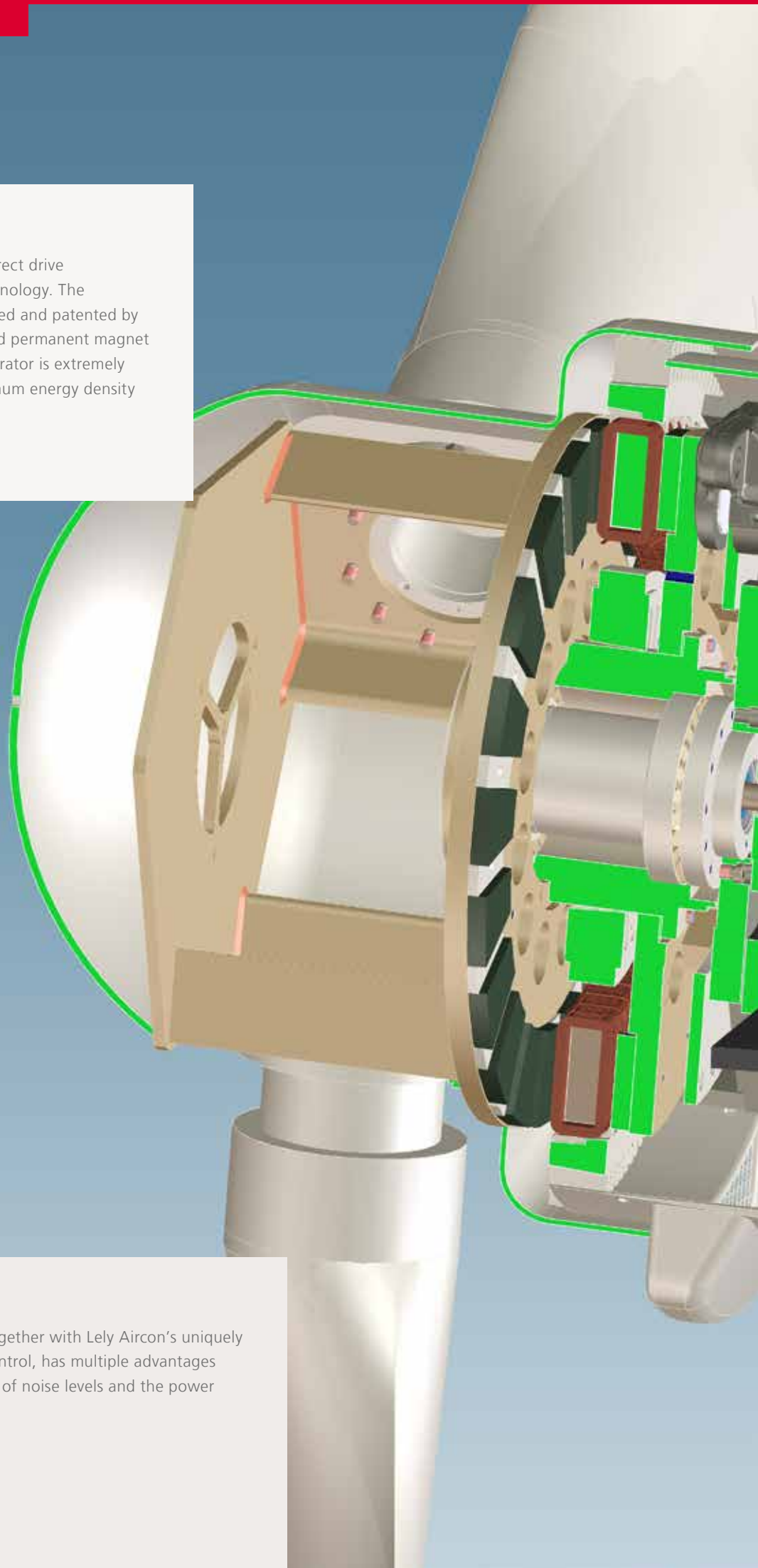
Note: This example is based on a specific site in the UK.  
Please do not hesitate to contact us if you would like a calculation at your location.

### GENERATOR

The generator is based on direct drive permanent synchronous technology. The generator technology is owned and patented by Lely Aircon. A unique coil and permanent magnet design ensures that the generator is extremely compact and provides maximum energy density and thus performance.

### INVERTER

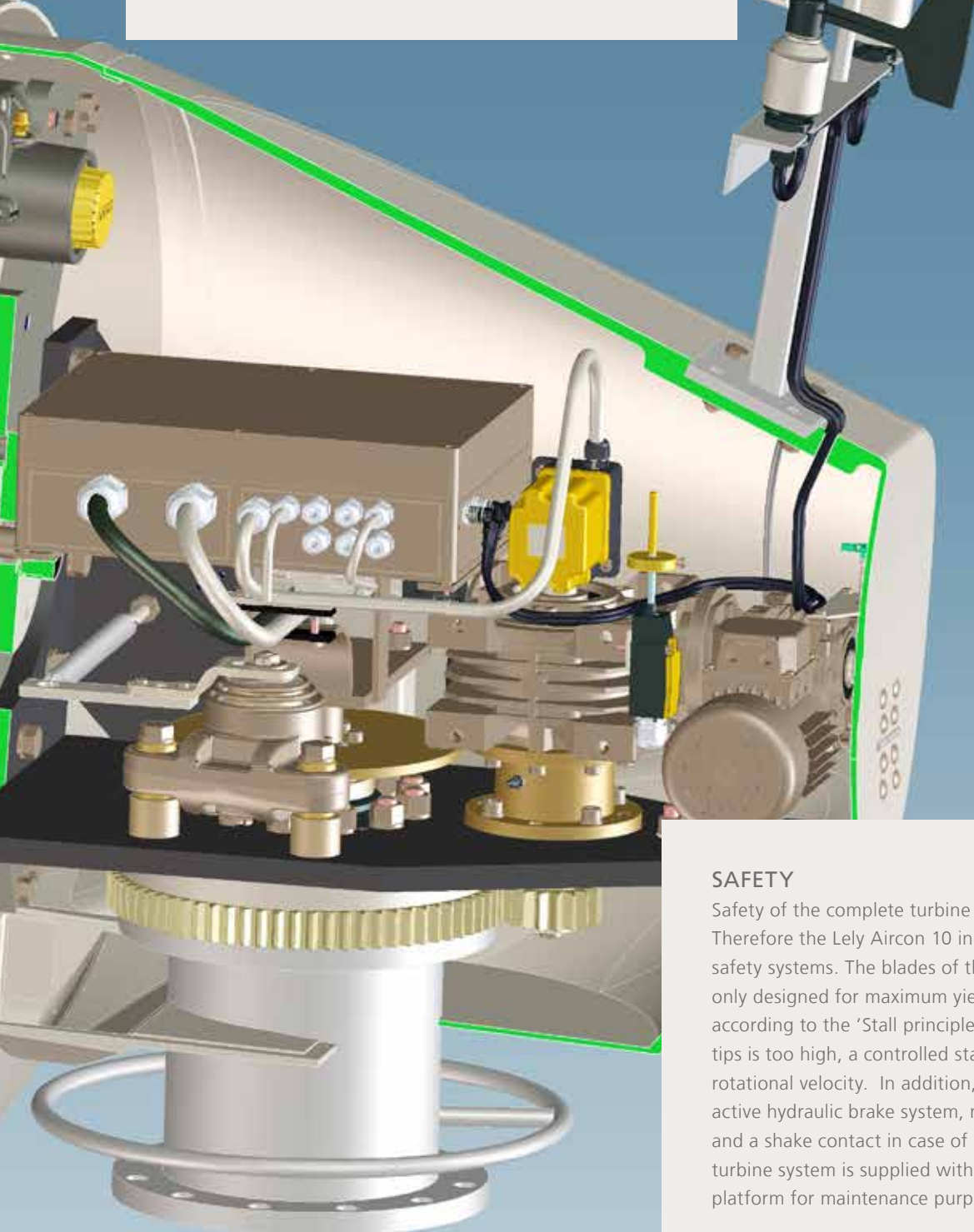
Inverter technology, together with Lely Aircon's uniquely developed software control, has multiple advantages regarding optimisation of noise levels and the power curve at your location.





## WIND

Wind is actively measured at the top of the nacelle with an anemometer for the measurement of wind velocity and a wind vane for tracking wind direction. This measurement data is processed and assessed by the turbine control system. The obvious advantage of this real-time measurement of data is that the nacelle is always rotated by the azimuth drive into the ideal position to achieve maximum efficiency.



## SAFETY

Safety of the complete turbine system is paramount. Therefore the Lely Aircon 10 includes, as standard, multiple safety systems. The blades of the Lely Aircon 10 are not only designed for maximum yield, they are also designed according to the 'Stall principle'. If the wind speed at the tips is too high, a controlled stall is forced to reduce the rotational velocity. In addition, the turbine includes an active hydraulic brake system, multiple temperature sensors and a shake contact in case of imbalance at the rotor. Every turbine system is supplied with a certified ladder and stand platform for maintenance purposes.

# A strong **concept** for sales and service

It is essential that both clients and suppliers are in close communication with one another so that all relevant expertise and experience can be shared. The local Lely Dealer is your point of contact. It provides efficient, dedicated support that includes the required local knowledge as well as extensive expertise on Lely products. Please contact us at the following web page, where you will find Lely 'dealer locator' information, as well as some additional information: [www.lely.com/energy](http://www.lely.com/energy).

## Telemetrics

The entire Lely Aircon 10 system is controlled and monitored by a remote control system with a secure VPN connection which the client can access via the internet. In the event of any problem, the turbine will send a respective error messages to the manufacturer automatically. The Lely Aircon service department can react immediately. Besides the monitoring, multiple data (wind speeds, yield, etc.) are recorded and can be viewed by the client on the control panel.



# Cost effective planning

We can provide a cost-effective planning permit service if required. Alternatively, we are happy to facilitate the planning permit process and provide the necessary documentation. We usually offer the following service to our clients:

## KEEP YOUR HANDS FREE

Financing provides flexibility and space to grow your business. Your own capital and credit arrangements at your bank remain unaffected and available for other plans!

## TRUST IN US, LOW INTEREST FOR YOU

Our knowledge and confidence in our products mean that we can make all the difference when it comes to financing. Unlike a loan or mortgage from a bank, Lely Finance bears the risk. Improved estimates of risks, costs and trade-in values mean lower interest rates for you. We can provide a range of attractive finance solutions to fund your Lely Aircon wind turbine project. If you have additional questions, please do not hesitate to contact us.



1.  
Feasibility check of client location



2.  
Estimation of average annual wind speeds



3.  
Building permit support



4.  
Grid connection with local grid supplier



5.  
Installation and service of the turbine



6.  
Financing





# Technical specifications

|  |        |
|--|--------|
| <b>LELY AIRCON</b>   | 10     |
| Rated output (kW)  | 9.8    |
| Nominal wind speed (m/s)   | 11     |
| Rotor diameter (m)   | 7.50   |
| Rotor rotations per minute (rpm)   | 50-130 |
| Acoustic emission Lp, 60 m (dB)*   | 39.70  |
| Tower height (m)**   | 10-30  |
| Switching on wind speed (m/s)  | 2-3.5  |
| Cut off wind speed (m/s)   | 25     |
| Survival wind speed (m/s)  | 59.50  |
| Client touch display   | S      |
| Remote monitoring via the internet (dealer)                                      | S      |
| Hydraulic disk brake, fail safe  | S      |
| Generator Dynamic Brake  | S      |
| Active yaw control   | S      |
| Fully galvanised tower with ladder   | S      |
| Temperature and vibration sensors for extra turbine protection                   | S      |
| Maintenance: yearly visual check and lubrication (separate maintenance contract) | S      |
| MCS (Microgeneration Certification Scheme) approved                              | S      |
| EN 50438 approved  | S      |
| Control to divert excess energy to water heating                                 | O      |
| Control to auto stop and re-start when bad flying conditions prevail             | O      |
| Control to auto stop and re-start when shadow flicker conditions prevail         | O      |

S = Standard    O = Optional

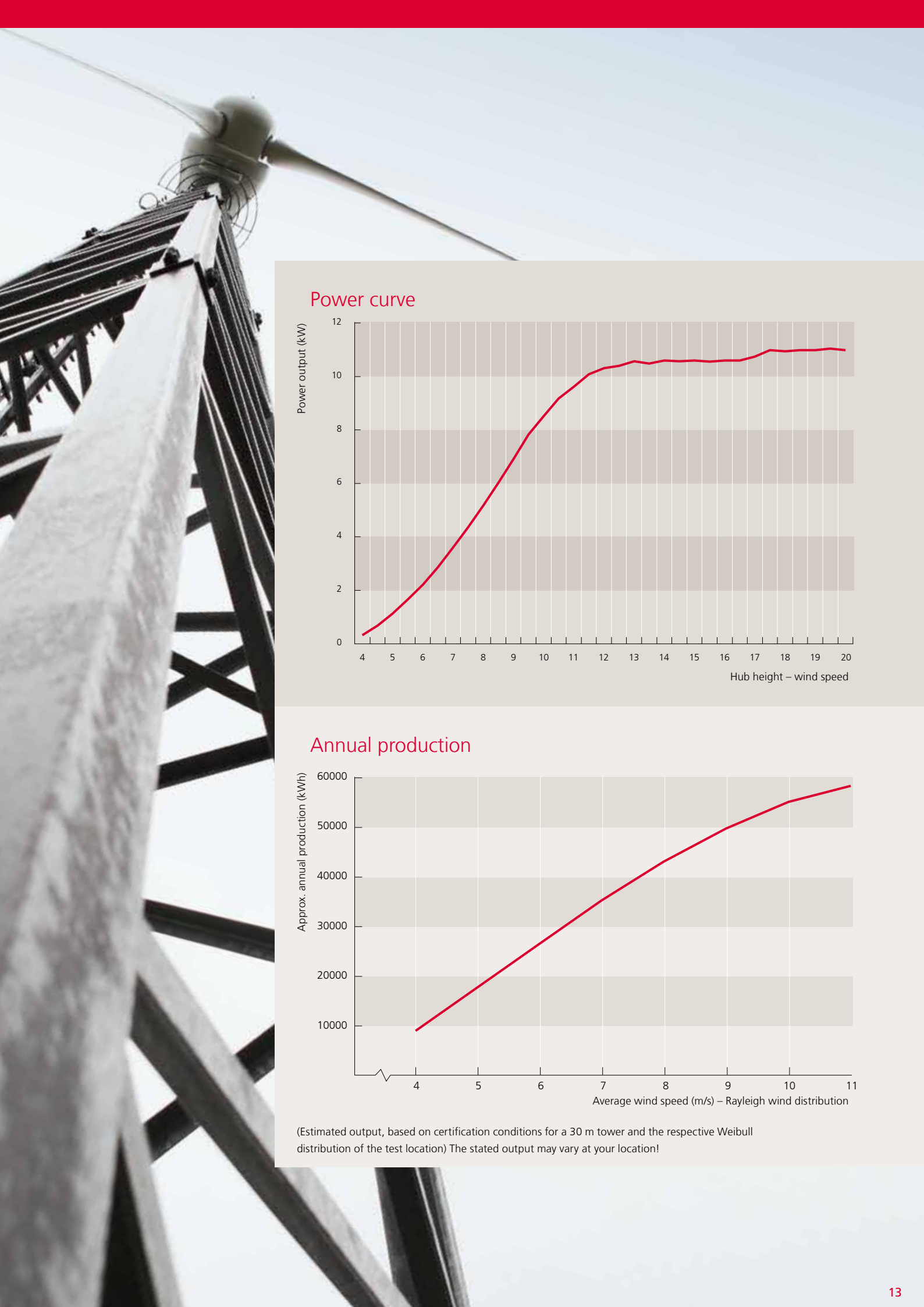
\* Full acoustic report available.

\*\* The mast height will be chosen depending on local landscape, wind conditions and planning permission.

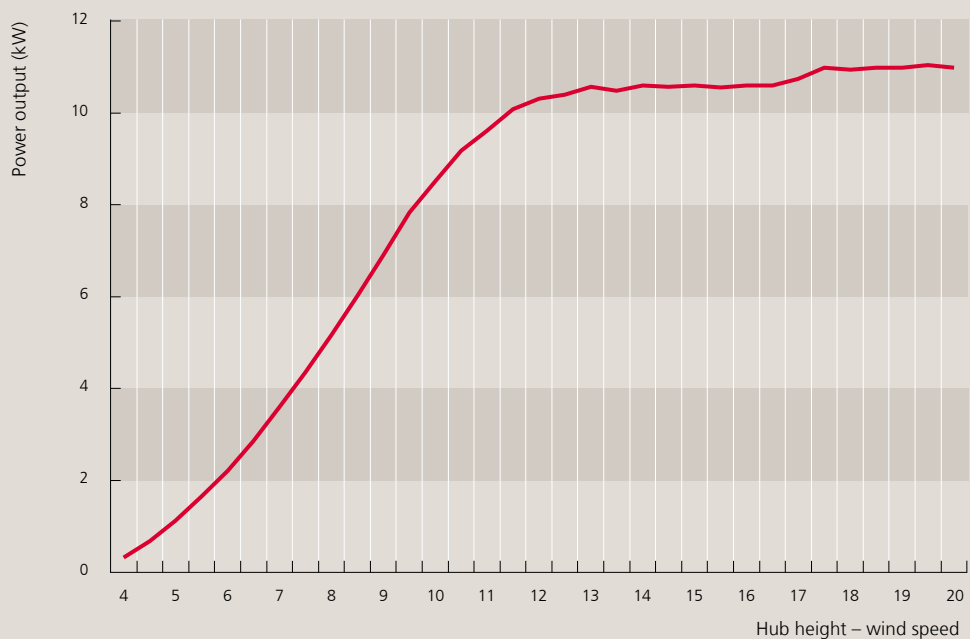


| OPTIONS                     |   |                                  |
|-----------------------------|---|----------------------------------|
| TOWERS                      | Lattice tower   | 18, 24 or 30 metres              |
|                             | Standard tubular tower  | 10, 12, 15, 18, 24 or 30 metres  |
|                             | Tubular tilt-up tower for areas where crane installation is not feasible*** | 10, 12, 15 or 18 metres          |
| ELECTRICAL CONTROL          | Single phase panel***   | For single phase grid connection |
|                             | Two phase panel***  | For split phase grid connection  |
|                             | Three phase panel   | For standard grid connection     |
| BLADES                      | set of 8.5 m blades   | For low wind speed sites         |
| *** Not allowed in Germany. |   |                                  |

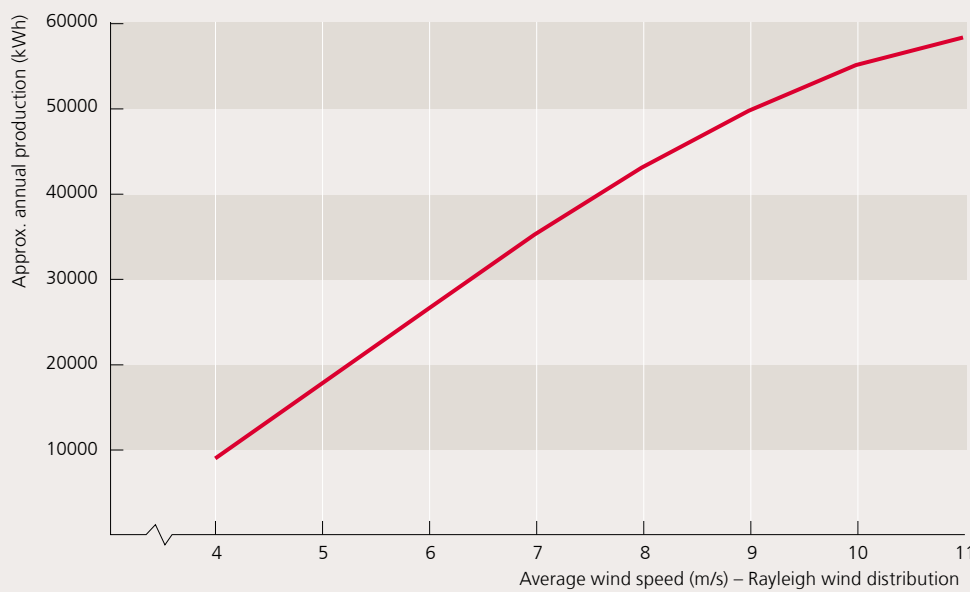




### Power curve



### Annual production



(Estimated output, based on certification conditions for a 30 m tower and the respective Weibull distribution of the test location) The stated output may vary at your location!



# What our clients say



**Craig Johnstone**  
Aberdeenshire, Scotland

"We wanted to utilise the wind resources in the North East of Scotland, but were restricted by the proximity of our neighbours and concerns over noise. The only turbine in the market that complied with the strict planning conditions was the Lely Aircon 10. Since installation in 2012, we have received no complaints from our neighbours, which is testament to the quality of the blade design.

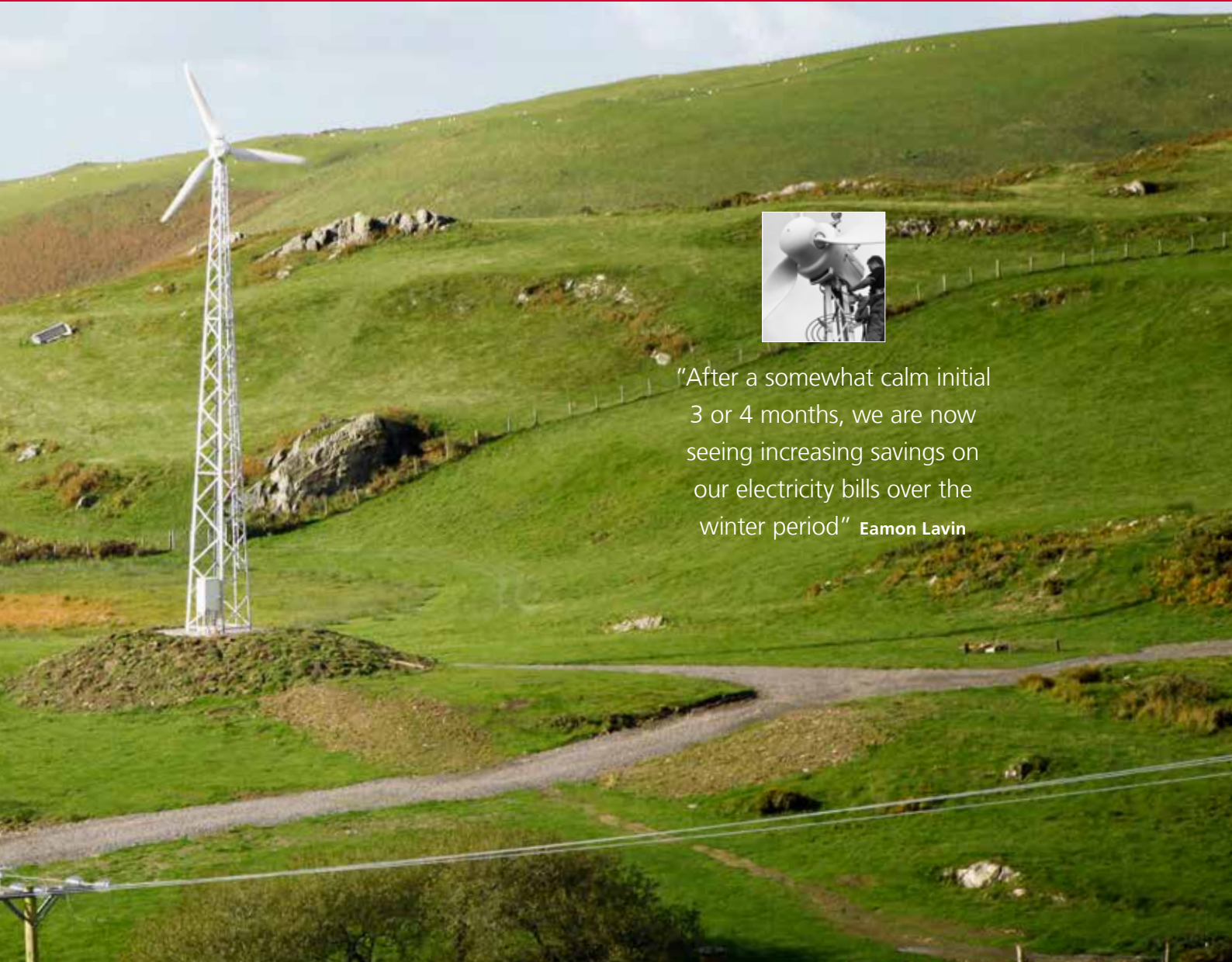
We have found that Lely Aircon can provide very efficient on-site support. The ability to access the turbine via the internet is invaluable, as it enables us to check that it is performing as designed. There has been a lot of scare-mongering in the press regarding the negative impact of wind turbines on wildlife. We have found that our horses are unaffected by the proximity of the turbine and happily graze nearby, while our fields and garden still have an abundance of birds!"

**Thomas J. Wineman Principal,**  
Clean Energy Design, USA

"As an Lely Aircon 10 dealer in the United States for the past three years, I continue to believe that this turbine offers by far the best available technology in its size range. I have six of these machines installed and operating. I chose this machine after extensive research because its sophistication is comparable to utility-scale machines. The engineering is superior to other machines in its class, as are its control, production and safety features. The machine is both attractive and quiet, making it particularly neighbour-friendly. Over the past three years, I have found the Aircon organisation responsive to work with. They have been willing to go the extra mile to meet a client's particular needs, and they have shown a complete commitment to their product.

I believe this product has a great future in both the United States and the world market."





“After a somewhat calm initial 3 or 4 months, we are now seeing increasing savings on our electricity bills over the winter period” **Eamon Lavin**

**Ian Greaves**

FRSA, St Eval Candle Company Wadebridge, United Kingdom

“The Lely Aircon 10 was installed at our candle manufacturing factory in the village of St Eval in Cornwall in November 2011. It has been very reliable and we have made significant savings on our energy bills over the past year. In fact the turbine is so quiet in operation and visually non-intrusive, we sometimes forget it’s even there. After more than a year of ownership, I am confident that the Lely Aircon 10 proved to be the correct choice of turbine and will continue to serve our needs well into the future.”

**Eamon Lavin**

Lavin Fruit & Veg Ltd. Castlebar, Ireland

“We installed a Lely Aircon 10 on an exposed site close to our Fruit and Veg processing plant near Castlebar, County Mayo in March 2012. After a somewhat calm initial 3 or 4 months, we are now seeing increasing savings on our electricity bills over the winter period. The turbine is operating reliably and proving resilient to the occasional Atlantic storm, which is reassuring. We can therefore confidently recommend the Lely Aircon10.”

**Edmond Murphy,**

Dunhill, Ireland

“I installed a Lely Aircon wind turbine on my poultry and dairy farm in Dunhill, County Waterford in December 2009. Since installation, the turbine has made me big savings on my electricity bills. It is very quiet in operation and appears to be an extremely strong turbine, operating safely and smoothly and without any incidents in all kinds of wind conditions over the past 4 years. Despite being located in view of the ocean and just 2 km away, there is no sign of corrosion on the turbine or tower. Overall I am very pleased with my Lely Aircon10.”



## Passionate about farming

Lely has a long and deep history of recognizing the needs of modern farmers. Our products are developed with the cow as starting point. We strive to let her excel and as such, we supply products to farmers and contractors ranging from forage harvesting, to feeding, housing, caring, milking and energy sourcing. In addition we boast specific knowledge and experience in facilitating farmers to get the best out of their equipment. As such our in-depth knowledge of the complete farm cycle – from grass to glass – is unrivalled in the agricultural business.

*We are committed to a sustainable, profitable and enjoyable future in farming.*

Lely really cares for the environment.

Your Lely distributor

Lely, Astronaut, Astri, Atlantis, Attis, AWS, C4C, Calm, Caltive, Commodus, Compedes, Cosmix, Discovery, F4C, Fertiliner, Gravitor, Grazeway, Hibiscus, Hubble, Juno, L4C, Lely Center, Lelywash, Lotus, Luna, Nautilus, Orbiter, Quaress, Qwes, SAE, Shuttle, Splendimo, Storm, T4C, Tigo, Vector, Viseo, Voyager, Walkway and Welger are registered trademarks of the Lely Group. The right of exclusive use belongs to the companies of the Lely Group. All rights reserved. The information given in this publication is provided for information purposes only and does not constitute an offer for sale. Certain products may not be available in individual countries and products supplied may differ from those illustrated. No part of this publication may be copied or published by means of printing, photocopying, microfilm or any other process whatsoever without prior permission in writing by Lely Holding S.à r.l. Although the contents of this publication have been compiled with the greatest possible care, Lely cannot accept liability for any damage that might arise from errors or omissions in this publication.

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