Liftra

BLADE HANDLING SOLUTIONS

BLADE YOKES FOR LIFTING SINGLE BLADES

WWW.LIFTRA.COM

Your prominent expert in state-of-the-art and secure blade yokes

With over two decades of industry experience, Liftra stands out as a leading provider of yokes for both single blade and full rotor installations in onshore and offshore environments.

Our solutions are developed in close collaboration with original blade and turbine manufacturers, offering a range of customized and standardized options for various blade handling needs. Leveraging our extensive field experience, we design solutions that streamline processes, contributing to the overall cost reduction of wind energy.

> Liftra's blade yokes feature a versatile construction that ensures optimal stability throughout the blade installation and disassembly process.

The growing appeal of single blade installation is evident as wind turbine installations are frequently conducted in challenging environments, including remote locations such as forests, mountains, and offshore sites. Liftra's blade yokes address these challenges with their flexible construction, ensuring optimal stability throughout the blade installation and disassembly process.

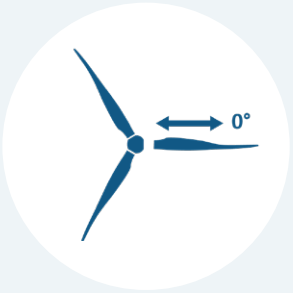
By employing blade lifting yokes, the need for working at heights and manually handling slings is eliminated, enhancing both safety and efficiency.

LIFTA BLADE INSTALLATION POSITIONS

HORIZONTAL

BLADE HAWK

Installation in horizontal position (0°). Ideal for turbines with gearbox or turning tools.



WIDE-RANGE

BLADE DRAGON

Installation and service at all angles. Enabling blade operations on direct drive turbines with both hydraulic and electric pitch.

VERTICAL

BLADE SKYLARK

Installation and service in vertical position (-90°). Enabling blade or pitch bearing exchange using Liftra Self-Hoisting Cranes.

VERTICAL CRANE-LESS

BLADE WAY

Installation in vertical position (-90°). The Blade Way is a stand-alone system for blade and pitch bearing exchange without using cranes.

KEY BENEFITS OF LIFTRA BLADE YOKES

VERSATILITY

Liftra blade yoke portfolio has a yoke for every need. Our blade yokes can be used on both standard and direct drive turbines, or with a Liftra Self hoisting crane.

CAREFULL HANDLING

Our blade yokes are designed to even the load distribution along the blade's strongest points, providing careful handling.

ADAPTS TO BLADE

All Liftra blade yokes are remote-controlled and can easily adapt to blade curvature, as well as be adjusted to account for inconsis-tencies in CoG placement and weights.

BATTERY POWERED

By utilizing battery power, our yokes offer a zero emission solution, minimizing environmental impact.

HORIZONTAL
LIFTRA BLADE HAWK

The Liftra Blade Hawk is a lightweight lifting yoke for onshore and offshore horizontal blade installation.

The Blade Hawk technology uses patented load distribution that ensures maximum friction, without damaging the blade. With its integrated tilt and pitch functionality, the Blade Hawk supports fast and secure installations and exchanging of blades.

For onshore, the yoke features an easily collapsible design, allowing it to be reduced to a size suitable for road transport on standard trailer chassis from turbine to turbine. This yoke features foldable tagline arms that also serve as support for fan positioning systems, eliminating the need for traditional taglines.

LAUNCHED
2007

PEAK WIND SPEED
12 M/S

- **EASY MOBILIZATION**
  Easy to collapse and reassemble for transportation on site.
- **INTEGRATED TILT AND PITCH**
  Built-in tilt and pitch ensure more efficient maneuvering process.
- **WLL UP TO 35 TONS**
  Designed for both onshore and offshore blades.
- **ONSHORE AND OFFSHORE USE**
  Complete third-party CG3 certification.

WIDE-RANGE
LIFTRA BLADE DRAGON

The Liftra Blade Dragon sets a new standard for single blade installation. The yoke is designed to install blades in any angle and is especially useful when turning tools or turbine power are unavailable or difficult to use. In such cases, it can be used to rotate the rotor during blade installation.

These Liftra blade yokes are electro hydraulically driven and can tilt blades 360° around the center of gravity.

Since 2011, the Liftra Blade Dragon has demonstrated its reliability throughout installation campaigns. In the Chinese offshore market, it has installed nearly 400 blades.

PATENTED
2011

PEAK WIND SPEED
18 M/S

- **INSTALLATION AT ALL ANGLES(360)°**
  Operates in 12 m/s and 18 m/s peak winds.
- **NO NEED TO POWER THE TURBINE**
  Blade Dragon requires no yawing, pitching, or rotor turning.
- **ONE-POINT LIFTING**
  No tailing crane required.
- **OFFSHORE APPROVAL**
  Complete third-party CG3 certification.

VERTICAL

LIFTRA BLADE SKYLARK

Blade exchange without conventional cranes?

Our unique Liftra Blade Skylark in combination with Liftra's

up-tower crane eliminates the need for conventional cranes during blade exchange. The Blade Skylark exists in two different sizes, one for blades up to 12 t and another for blades up to

26 t. Soon we will also have a 3rd version for the next generation of blades weighing above 26 t.

The Blade Skylark ships in a single 40 ft container and combined with the Liftra Self-Hoisting Crane, it eases blade exchange and enables more sustainable operations.

LAUNCH
2019

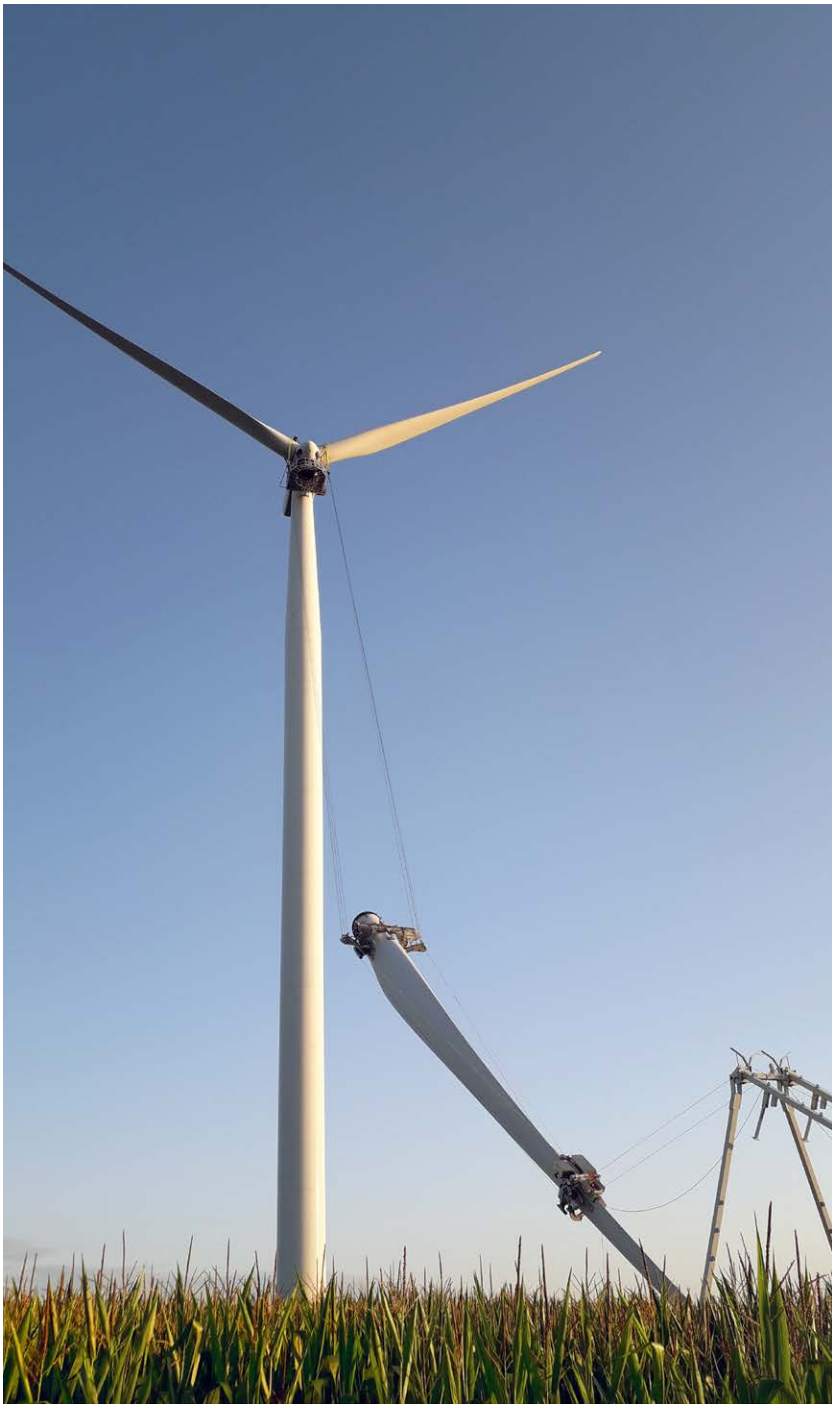
WLL (TON)
26

PEAK WIND SPEED
12 M/S

- **BLADE EXCHANGE WITH UP-TOWER CRANE ONLY**
  Works with LT1000 and LT1200 Liftra Self-Hoisting Cranes.
- **ELIMINATES THE NEED FOR A TAILING CRANE**
- **CONVENTIONAL BLADE EXCHANGE**
  Grabbing the blade vertically instead of horizontally lowers required hook height to just below nacelle for conventional cranes.
- **EASY CONFIGURATION**
  Simple adapter can be changed to fit multiple blade types.

CRANELESS BLADE & PITCH BEARING EXCHANGE

LIFTRA BLADE WAY



Blade Way represents Liftra's craneless blade and pitch bearing exchange. This innovative system efficiently handles single blades without the need for large cranes, significantly reducing mobilization costs while enhancing flexibility in blade and pitch bearing replacement. It ensures safe and stable operations, eliminating the necessity of taglines typically used for positioning and stability.

The current versions of Blade Way are designed to lift components with WLLs of 22 and 29 tons, making them suitable even for the tallest towers. Moreover, the system reduces CO_2 emissions by being transported in only two 40 ft containers.

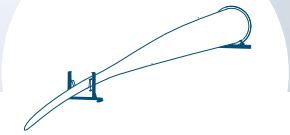
Liftra will soon launch the next generation of Blade Way with improved design and efficiency. The system is already attracting attention for its applications in both onshore and offshore environments.

LAUNCHED
2017

PEAK WIND SPEED
18 M/S

- **ELIMINATES THE NEED FOR A LARGE CRANE**
  No logistical challenges or constraints from traditional crane methods.
- **SUITABLE FOR VARIOUS TURBINE MODELS**
  Can be easily adapted to different turbine models and sizes.
- **THE SYSTEM IS TAGLINE-FREE**
  Stable control of blades and pitch bearings without using taglines.
- **MINIMIZES ON-SITE FOOTPRINT**

BLADE STORAGE FRAMES



Blade Storage Frames are designed for durability on rough terrains, making them ideal for on-site blade storage and repairs. They accommodate four different resting positions (trailing egde up ±45°, pressure side up and pressure side down) ensuring compliance with Environmental, Health, and Safety (EHS) standards.

For efficient transport, the frames can be disassembled to fit within a container. Additionally, the blade storage root frame is designed to avoid engagement with stud bolts, enhancing safety and ease of use.

LAUNCH
2025

PEAK WIND SPEED
25 M/S

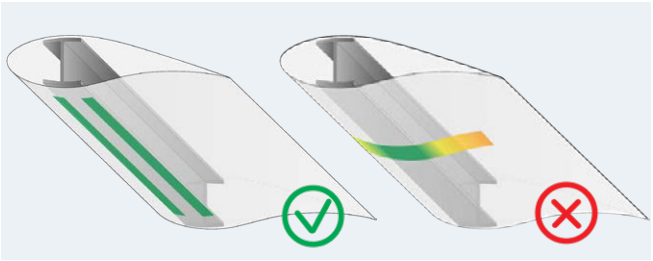
DURABLE AND VERSATILE DESIGN
Built for rough terrains, ideal for on-site use.

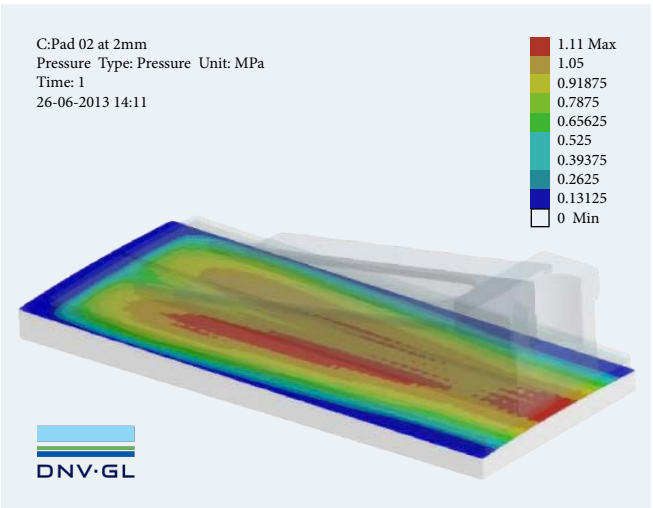
FLEXIBLE POSITIONING
Supports four resting positions for EHS compliance

EASY TRANSPORT & ASSEMBLY
Can be disassembled for easy transport and containerized shipping

ENHANCED SAFETY
The blade storage root frame avoids engagement with stud bolts

BLADE INTERFACE





THE TECHNOLOGY BEHIND THE BLADE INTERFACE

The blade interface is constructed as a single or double line of friction pads, which clamp around the blade in its strongest area (aligned with the web construction). Our blade clamping solution has been thoroughly tested and approved by DNV GL according to the highest standards in the market, on several of our yokes. The pad system is approved for a variety of blade curvatures by several leading blade manufacturers.

LATEST DESIGN

The blade is gripped by lengthwise pads around the blade's strong structural core.

- Pressure is automatically distributed between pads to achieve high friction and minimize the risk of blade damage.
- Universal pads adjust to blade curvature (used on over 50 curvatures).
- Verified through testing.
- Certification: DNV CG3 + OSS 308

CUSTOMIZED BLADE INTERFACE

When initiating the design of a new blade interface, Liftra's experienced engineers collaborate closely with the blade manufacturer (a person appointed by the client) to establish consensus on the clamping position and resulting forces in the blade structure.

RELATED PRODUCTS

LIFTRA BLADE STACKING FRAMES

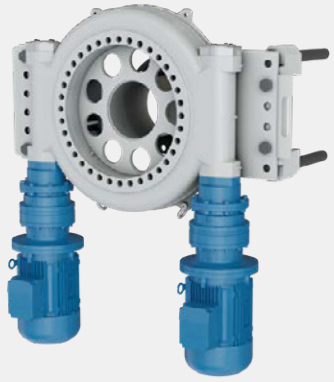
Blade stacking frames enable secure stacking and transport of wind turbine blades in single, double, and triple modes, ideal for sea transportation. Their sturdy design ensures safe delivery, facilitating efficient renewable energy logistics. They are multibrand and can enter Liftra refurbisment loop, enabling safe and on time logisitics.

LIFTRA TAGLINE SYSTEMS

The LT1108 Liftra Manual Tagline Winch System is engineered to ensure convenient and secure handling of heavy loads in the air, supporting operations such as blade, rotor, and nacelle handling.
Key features of the system include:

- Two gears for speed control and powerful pulling
- 280 meters of rope length
- WLL of 500 kg

Operated by a single operator, the Manual Tagline Winch System enhances efficiency and safety during lifting operations.



LIFRA UNIVERSAL ROTOR TURNING GEAR

The Unbalanced Rotor Turning Gear is designed to accommodate various geared wind turbines, starting from 2 MW. Compatible with multiple WTG platforms, it features a turbine-specific interface kit. Additionally, customized WTG interfaces can be developed upon request and later purchased as add-ons to the base unit.

LIFRA ROTOR YOKES

Liftra offers a variety of rotor yokes designed for hoisting the rotor or hub of wind turbines, facilitating seamless lifts from the ground to the nacelle and vice versa. Their robust construction and precise engineering ensure safe and efficient handling of these components during installation, maintenance, and servicing operations.

WE STAND BY YOUR SIDE EVERY STEP OF THE JOURNEY

Liftra serves as your premier strategic partner for pioneering equipment solutions tailored to production, transportation, and installation needs, whether onshore or offshore.

We aim to provide solutions that enhance processes and eliminate safety risks, with the resources for development, testing, and comprehensive support.

Our team of engineers and technicians brings extensive experience in the wind industry, offering a range of standardized products that meet market demands, as well as trailor-made solutions crafted in close collaboration with our clients.

Explore our website to discover a variety of solutions developed for leading wind turbine manufacturers: www.liftra.com.

Contact us

At Liftra, we believe that partnerships are the key to success. Get in touch with us if you want to learn more about what we can offer for your business. Please contact us for further information.

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Service & Field operations

- Service inspection
- 24/7 support
- Field operations
- Training

Major component exchange

- Gearboxes
- Generators
- Main shafts
- Transformer
- Full rotor
- Blades and Blade bearings

Lifting equipment

- Blade yokes
- Nacelle yokes
- Full tower yokes
- Fixtures and brackets
- Tagline systems

Transport systems

- Towerstacking frames
- Bladestacking frames
- Storage frames
- Fixtures

Liftra cranes & tools

- L1500 Installation crane
- LT1200 Self-hoisting crane
- Rotor stands
- Rotor turning tools
- Custom lifting yokes

Test facility

- 2000 ton Test rig
- Test lifting yokes
- Test crane blocks
- Test transport equipments
- Etc.

DOWNLOAD
SALES MATERIAL

Liftra

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