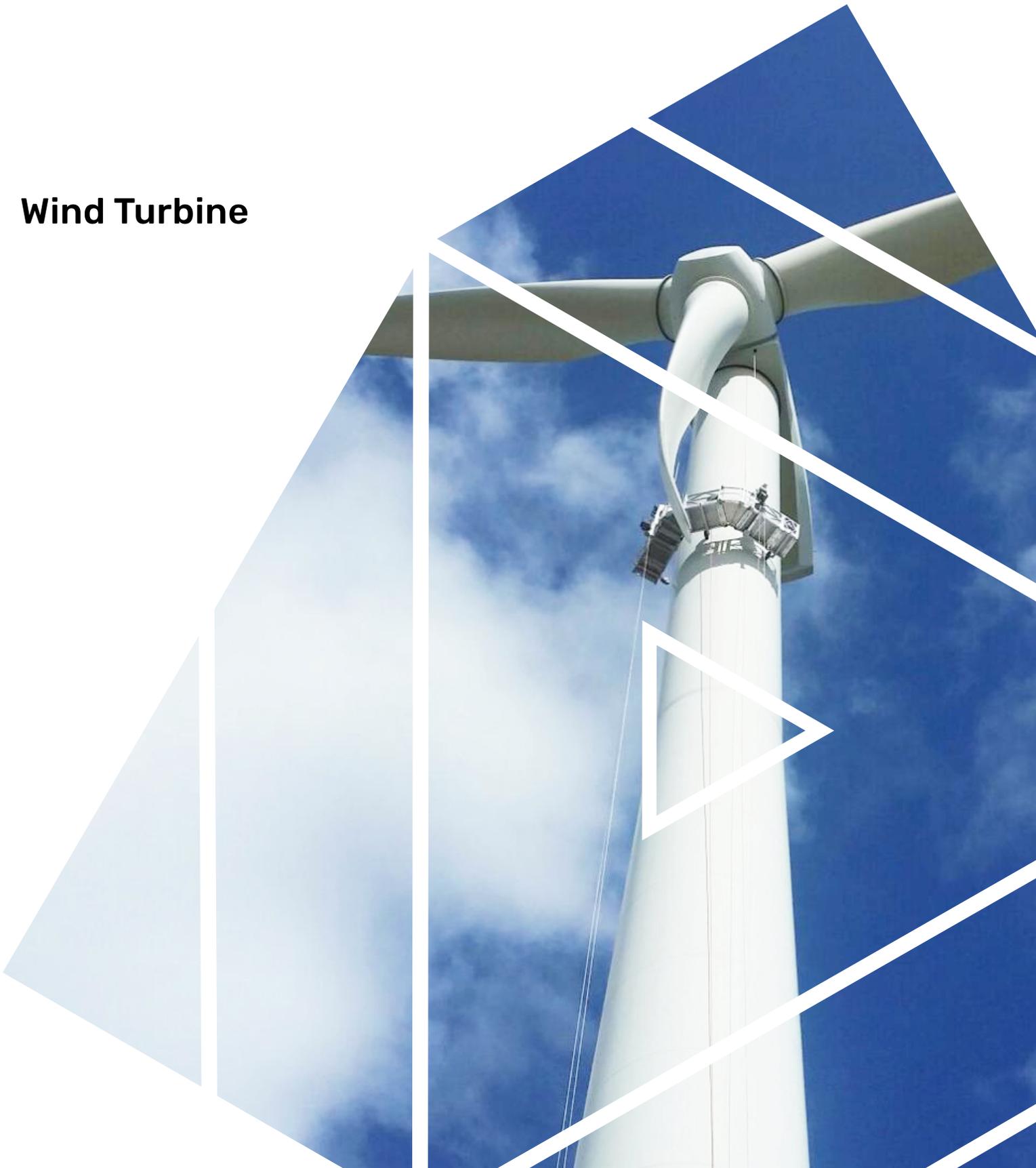


Wind Turbine



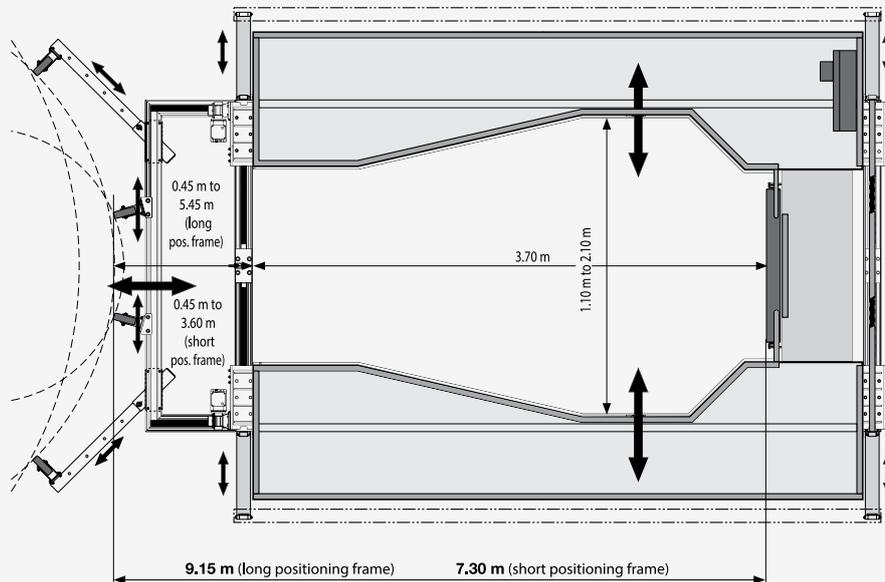
Blade Maintenance Platform

Wind farms are becoming ever taller. Hardly surprisingly, since the higher the turbine rotors are positioned, the more likely they are to be within a constant air flow affording greater efficiency.

Of course, the height of the masts imposes very special requirements upon manufacturers and operating companies.

For external access to the wind turbine and in particular for inspection and maintenance of the rotor blades, suspended platforms are proving their superiority over other forms of access.

- Consistently low costs for assembly and dismantling due to minimum installation time irrespective of operating height.
- Independence from cranes or hoists for material transport.
- Time saving, as the suspended platform always offers an optimum working position.
- And last, but not least, there is no need for anchoring to the tower.



TECHNICAL DATA

Standard Platform

Capacity (2 persons and material)
Total : 300 kg

Per platform section : 150 kg
Dead weight approx. : 1300 kg
Other dimensions on request

Service Lift, rope or ladder-guided

For access within the masts, our service lift uses the wire rope driving principle of the Tirak™ Manriding hoists:

- It simply runs up and down the wire rope which is anchored at the top of the tower.
- The quite operating Tirak™ hoist is light weight and only requires a minimum of space.
- No unnecessary wire rope weight to reduce lift capacity.
- Standard use by two persons.
- Two options available: wire ropeguided or ladder-guided.



Safety features:

- Electrically monitored door for entrance as well as exit to and from the platform.
- Standard limit switches as well as additional safety limit stops above and below the service lift.
- Blocstop™ fall arrest device ensures that the service lift does not gain too much speed during travel , in the event of wire rope rupture breaking or simply to improve operational safety!
- In the event of a power failure, the service lift can be lowered using the emergency descent device.

The ladder-guided version offers several advantages:

- No additional parts are required for wire rope guidance.
- Direct access to the ladder by means of a second door and a lower trap door. All precautions have been taken for technical failures: lift entry and evacuation on failure, and correction is possible without any special prior preparations.
- Particularly low vibration and smooth running thanks to rollers.

Tirak™ Endless Hoist & Blocstop™ BSO Fall Arrest Device

Approved and CE-marked in accordance with EN 1808 for “Suspended Access Equipment”, the Tirak™ hoists for manriding applications offer capacities from 300 to 2000 kg and speeds of up to 18 m / min, ensuring fast access to the top, and, due to the continuously circulating wire rope, height is almost irrelevant.

Safety first!

The Blocstop™ fall arrest devices are used to protect loads against falling in case of wire rope rupture, or simply to improve operational safety.

Climbing Aid for Vertical Ladders

The Climbing Aid relieves persons climbing a ladder with a constant pulling force of approx. 40 daN (≈ 40 kg) and offers the following advantages:

- Less stress on arms and legs,
- Less physical exertion for the climber,
- Lower risk of accidents as exhaustion is effectively reduced, significantly improving operational safety.

Drive and Control

A gear motor at the lower end of the ladder drives the looped belt by means of a drive pulley.

The pulley is connected to the gearbox by a continuously adjustable, oil-bath lubricated sliding clutch.

The continuous welded, reinforced round belt, made of special synthetic material, runs over the drive pulley and the diverter pulley at the upper end of the ladder.

Approved system:

The motor is automatically turned on or off by a switch signal which monitors the revolution of the drive pulley:

- At the first switch signal, e. g. when pulling the round belt upwards, the motor starts and keeps running, as long as the signal is repeated within three seconds.
- If the round belt's movement is stopped, e.g. by interrupting the ascent, the signal is not repeated within a three-second interval and the motor stops.

Advantage: no need for additional control such as a pull cord or similar, which excludes potential sources of error.

Connection to the round belt

The harness (EN 361) is connected to the round belt by a rope grab (EN 567) with a spring snap connector (EN 362). The immediate connection is to the D-ring at chest level.

The removable driver unit

One motor for any number of Climbing Aids – that is the economic solution, where neighbouring installations are not all used at the same time, as is the case in wind farms.

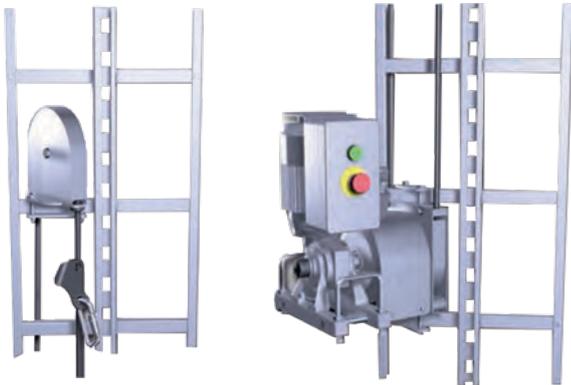


FIG. 1



FIG. 2



FIG. 3



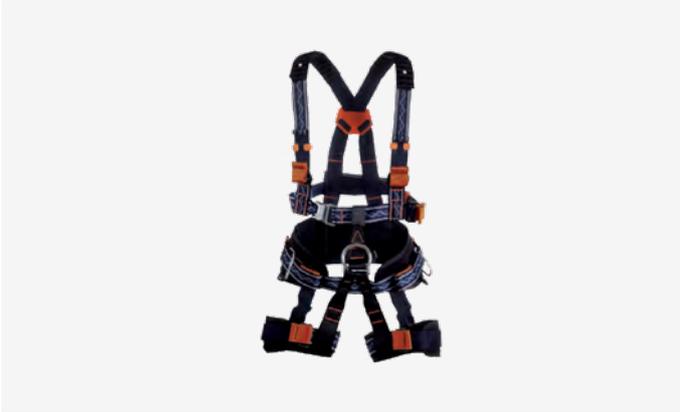
FIG. 4



FIG. 5

Universal application

Driver unit and diverter pulley are also available for standard ladders (Fig. 1 + 3), for ladders with a middle pole (Fig. 4 + 5) as well as for those with round rungs (Fig. 3).



Height Safety Equipment

When working at height, safety is the primary concern at all times. Our range offers all the appropriate equipment for the access, working and potential rescue situations that personnel are likely to encounter in wind power plants.

- Comfortable, fully equipped fall arrest, work positioning and sit harnesses.
- Web or rope lanyards with shock absorber.
- Derope™ Descender and Rescue Lifting Devices. Constant speed of approx. 42 m / min., descent height of up to 400 m for one and 125 m for two persons.
- Blocfor™ Retractable Lifelines and Rescue Lifting Devices. Available with synthetic rope to avoid damage to varnished surfaces and glass-fibre parts of the construction.
- Stopfor™ Rope Grabs on polyamide or kernmantel rope for restraint or fall arrest use.
- Temporary and permanent anchor points to attach the fall arrest system.
- Connectors, scaffolding hooks and accessories.
- Work positioning and restraint lanyards.
- Height safety kits for the most frequently encountered working situations, including bag or box for transport and storage.

Material Hoist with Textile Rope

The material hoist with textile rope has been specially designed to lift loads on wind turbines. Using through rope technology, it is an electric, portable hoist that is lightweight, compact and has a wide range of applications on the work site.

The flexibility and light weight of the textile rope offer many advantages:

- Easy handling even over lifting heights of up to 150 m.
- No damage to surfaces which come into contact with the rope.
- Smaller bending radii possible.

The uses vary according to the type of wind turbines, electric pylons and construction sites.

Training

The Tractel Group's worldwide network of companies offer height safety training and can provide on-site product and rescue training.

Engineering Solutions

Our engineering team is closely involved in all aspects of project management, bringing a high degree of efficiency and responsiveness to our services. Our knowledgeable professionals will work with you to develop engineering solutions to meet all your wind energy application needs.

Tirfor

The Tirfor Principle

- Two jaws alternately pull the wire rope and the load in the required direction, just like pulling on a rope with both hands.
- The jaws are self-clamping, providing immediate and gradual safety - the heavier the load, the tighter they clamp.
- A release mechanism allows the wire rope to be inserted between the jaws.

Safe and reliable

- Constant control of the load during lifting and lowering with accuracy to within one millimetre. When stationary, the load is automatically distributed between the two jaw units.
- Overload safety device
- TU range approved for lifting personnel. Increased capacity
- Using the sheave block technique, the capacity of the TIRFOR can be increased by a factor of 2, 3, 4 or more.
- When calculating the working load limit, a loss of around 4% per sheave is included, due to the friction of the sheaves.

Multifunction

- Work can be performed in any position: horizontal, vertical or at an angle.
- There is no limit to the length of wire rope.
- The capacity can be increased.

Increased capacity

- Using the sheave block technique, the capacity of the TIRFOR can be increased by a factor of 2, 3, 4 or more.
- When calculating the working load limit, a loss of around 4% per sheave is included, due to the friction of the sheaves.





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