Wind power
System solutions for the electrical installation in the tower
Wind turbine tower versions

A wind turbine's tower is subject to enormous stresses. On the one hand the environmental conditions with regard to changes in temperature and humidity, on the other hand the horizontal forces induced by the wind resistance of the gondola with the rotor blades. These horizontal forces induce enormously high bending moments in the mast base, which have to be safely dissipated into the ground through the foundations. Current mast generations reach a height of 140 m and more.
**Wieland system solutions** for lighting and energy distribution

Because of the height and required maintenance of the turbine, access to the nacelle / machinery house is from within the tower. That means that an escape route leads from the turbine through the inside of the tower and must be lit. Regular maintenance of the flanges and segment transitions is also required. To ensure electrical power is available to operate the tools, sockets are required in the relevant typical country configuration. It is precisely this variety that generates numerous versions when developing the towers, unnecessarily inflating planning costs. Wieland offers perfect installation systems for these applications, which help to implement the electrical installation inside the tower quickly, safely and free from defects.

**Tubular steel/concrete tower with the podis® installation system**

The podis® energy bus is the innovative tower electrification solution. The system features permanent and pluggable power take-offs and LED luminaires.

**Lattice mast installation with RST® and podis®LED as orientation lights**

For use in outside areas and lattice masts the combination of podis®LED and RST® connectors affords considerable advantages: quick, safe installation and robust, long-lasting lighting.
Installation of the lighting and maintenance sockets using the podis® energy bus system.

podis® – open and shut matter: simple, fast and safe installation worldwide

The innovative podis® flat cable system makes for straightforward installation of the lighting and maintenance sockets in no time at all. podis® offers many different system components that can be adapted to the specific requirements of the tower design, while also providing space-saving, extremely clearly arranged cable management.
Installation of the lighting and maintenance sockets using the *RST*® energy bus system.

*RST*® – if the cable needs to be round

The *RST*® round cable system creates entirely new installation possibilities. Complete system components can be pre-assembled and tested independently of the destination location. The individual modules are then simply connected with one another on site. That saves assembly time, reduces the potential for error and enhances safety. The *RST*® connector system is best for applications requiring a round cable. *RST*® makes devices easily pluggable. Device connections functioning as interfaces enable electrical users to be integrated quickly and safely with the *RST*® installation system. Modifications required at short notice can also be implemented without difficulty with consistently high and standardised installation quality.

The 6 mm² connection keeps the voltage gradient low, thus enabling installations with a tower height exceeding 140 m to be achieved.
Lighting installation with *podis*®

*podis*® features:

- Fast and flexible installation
- Clearly laid out cable routing
- Easily expanded or modified
- Safe to install and operate
- Robust components
- Protection class IP65
- International approvals (UL, CCC, VDE)
podis® in wind turbines

Basic installation for wind turbine towers
The basic installation comprises the following components:

- **podis®con** flat cable e.g. EVA 7x4 mm²
  Art.-Nr. 00.709.0504.1

- Connecting module
  Art.-Nr. 75.018.0051.2

- Connecting cable
  Art.-Nr. 83.301.1020.1

- Pluggable output
  Art.-Nr. 75.015.5153.1

- Cable end cap
  Art.-Nr. Z5.562.7553.1

Standard version with podis® LED-Luminaire
The basic installation comprises the following components:

- **podis®led** FCS 24V DC 20W
  Art.-Nr. 83.240.0110.0

- **podis®led** FCS 24V DC 5W
  Art.-Nr. 83.240.0010.0

- **podis®con** socket 230V/16A
  Art.-Nr. 83.315.0001.1

- **podis®con** socket 400V/16A
  Art.-Nr. 83.315.00002.1
Benefits for planners and consulting engineers

- Shorter planning time
- Reduced planning complexity
- Fewer versions thanks to a uniform basic installation worldwide
- 3D data for all components can be easily integrated into each planning tool
- Few system components

Benefits for wind turbine manufacturers

- Shorter tower delivery times
- Greater flexibility
- Fewer versions internationally
- Easy to modify tower fittings e.g. change luminaire spacing / maintenance sockets on the construction site

Benefits for tower manufacturers

- One standard tower for all clients/regions
- Only one order number rather than hundreds
- Variation possible in the final work step
- Reduction in installation time of 70%

Benefits for plant operators and service

- Low maintenance luminaires
- Central UPS with only one battery
- Standard, uniform, non-dazzle and flicker-free lighting
- Rapid replacement without the use of tools in the event of a failure
- Full power output immediately, even at low temperatures

podis® – unique benefits for all
The installation platform podis® CON

Quick fitting systems
Pre-fitted quick-mounting plates are in place for quick fitting in the mesh cable tray or for fitting on the rear face of the mesh cable tray; this enables the podis® connector modules to be fitted quickly and easily without any additional mounting plates or fastening bolts.

podis® CON quick fitting in the cable tray

Position within mesh cable tray
Attach to mesh cable tray
Insert flat cable

Quick and simple to connect
Affix connector ...
or luminaire, lock in place – job done!

Installation in cable tray
podis® Energy bus solutions are ideally suited for direct laying and fitting in cable trays or cable runs. The compact and narrow design (60 mm) longitudinally orientated cable routing means that only little space is required as a result of being installed in the cable tray.

Quick-mounting plate for fitting in the mesh cable tray: e.g. OBO Bettermann GRM 55/150 further installation aids upon request.
Lighting installation with \textit{RST}®

\textbf{RST}® features:
- Touch-safe
- Clearly laid out cable routing
- Easily expanded or modified
- Reusable
- Mechanical coding
- Built-in locking devices and strain relief
- Protection class IP65 for the entire system including the functional modules.
- IP66/68 (3m; 2hr/69K for the connectors)
RST® in wind turbines

Basic installation for wind turbine towers

The basic installation comprises the following components:

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Art.-Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply line e.g. cable assembly</td>
<td>96.222.5098.4</td>
</tr>
<tr>
<td>Connecting cable e.g. cable assembly</td>
<td>96.222.3092.4</td>
</tr>
<tr>
<td>podis® LED RST®</td>
<td>83.240.0030.0, 83.240.0031.1, 83.241.0040.0, 83.240.0131.0</td>
</tr>
<tr>
<td>Cover for female connector SW</td>
<td>99.414.6205.2</td>
</tr>
<tr>
<td>Quick-mounting plate</td>
<td>G0.500.2041.5</td>
</tr>
</tbody>
</table>

External lighting

For external wind turbine lighting, we offer you high quality weather, UV and ozone resistant connecting and junction cables. We will be happy to make you a cable loom specific to the tower.

Service

Additional RST® and podis® system components and accessories can be found in the Wieland eCatalog.
https://eshop.wieland-electric.com
RST® the benefits of the round cable energy bus

Benefits for planners and consulting engineers
- Shorter planning time
- Reduced planning complexity
- 3D data for all components can be easily integrated into each planning tool
- The existing 6 mm² connection supports installations of a height exceeding 140 m

Benefits for wind turbine manufacturers
- Reduction in project duration
- Shorter delivery times by the tower manufacturer
- Use of weather resistant cables and components for outdoor use

Benefits for tower manufacturers
- Reduction in installation time
- Shorter tower delivery times
- Mechanical codings for different voltages prevent mistakes when installing cabling for lighting and power socket circuits.

Benefits for plant operators and service
- Maintenance-free luminaires
- Central UPS concept enables simple battery replacement
- Component replacement without the use of tools
- Full power output immediately, even at low temperatures
Light installation including maintenance power sockets with the \textit{RST®} system

\textbf{Quick fitting system with the connector \textit{RST}®®}

Pre-fitted quick-mounting plates are in place for quick fitting in the mesh cable tray or for fitting on the rear face of the mesh cable tray; this enables the \textit{podis®} LED \textit{RST} and \textit{RST®} junction boxes to be permanently and solidly fitted on the mesh cable tray with no parts to get lost.

\textit{RST®} – connect, job done, off you go

- Affix quick-mounting plate
- Attach mounting plate to the luminaire
- Fitting on the mesh cable tray
- Affix mounting plate to the mesh cable tray
- Connect cable – job done
podis® SERVICE
Support from planning to operation

Project planning phase

Project discussion with our wind power expert at the customer’s premises.

Discussion of the logistics with the customer.

Manufacturing and logistics phase

Assembly of the parts at Wieland

Direct delivery for installation at the tower manufacturer’s premises

- Delivery of equipment packages ready for installation

After-sales phase | Training & Service

Installer training by Wieland

The most important approvals enable use in wind power projects worldwide.
Podis® energy bus system and RST® connector system from Wieland – reliable and safe

The Podis® and RST® installation platforms are certified in accordance with the most important norms and standards. This enables use in wind power projects worldwide, using the same components as far as possible. Wieland documentation and planning tools enable the required documentation to be generated quickly.
Uninterrupted Power Supply (UPS) for emergency lighting

The lower overall load through the use of podis®led and the simplified cable routing make for the cost-effective use of compact, central uninterrupted power supplies.

Customer requirements as regards country-specific buffer times for the emergency lighting and ambient temperatures can be taken into account when designing the power supply.

Wieland offers off-the-shelf pluggable control cabinet solutions specially adapted to its installation systems. These can be installed as a standalone detached control cabinet at the foot of the tower or integrated with the control system.

The podis®led lighting components are especially suited to use in emergency lighting systems. Their robust and durable design affords a high degree of safety and reliability when operating wind turbines, even in emergencies.

The podis® UPS supplements the emergency lighting system with a central power supply unit that satisfies the stringent requirements for wind turbine operation. In the process the podis® UPS offers the convenience of only maintaining and monitoring a single battery unit without requiring an additional cable run for the luminaires. Operating lighting and emergency lighting are co-located with podis®led in one cable harness.

The podis® UPS requires no complex maintenance of individual batteries. The battery can be tested and the inspection log book filled in from one convenient location. Battery failures can be reported to the service location via potential-free message outputs.

Features of the podis® UPS:

- Deep discharge protection
- Protection against overcharging
- Test switch (normal/UPS operation)
- Remote communication capable via potential-free output
- Adjustable output voltage
- Wide operating temperature range
- Customized battery capacity
Advantages

- Project-specific development and fabrication
- Procurement of modules that are ready to connect instead of individual components
- Packaging and delivery with the required installation material, e.g. cables, luminaires...

Design of the podis® UPS:

- Installation length
- Number of luminaires
- Load, power
- Emergency lighting duration
- Operating temperature range
- Heating, cooling

A system that meets all the requirements.

Technical data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Battery capacity</td>
<td>2.2 Ah, 7.2 Ah, 12 Ah, 15 Ah, 24 Ah, 30 Ah</td>
</tr>
<tr>
<td>Display</td>
<td>Battery charge, acoustic signal</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-40 °C, -20 °C, ... 230 V AC ... +45 °C, +55°C</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Indicator LED</td>
</tr>
<tr>
<td>Connections</td>
<td>RST®, revos MINI</td>
</tr>
</tbody>
</table>
Technical consultation and general information

Hotline – one call is all it takes

Industrial Automation – Electromechanical
Hotline +49 951 9324-991
E-Mail AT.TS@wieland-electric.com

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E-Mail AT.TS@wieland-electric.com

Safety Technology
Hotline +49 951 9324-999
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Building and Installation Technology
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E-Mail BIT.TS@wieland-electric.com

General information and news:
www.wieland-electric.com
Visit our e-catalog at
http://eshop.wieland-electric.com
Product portfolio

- Electronic and electrical engineering for the control cabinet
- Safety technology
- Network and field bus systems
- Energy bus systems for industry and buildings
- Connectors up to protection type IP6X
- Building automation
- PCB terminals and plug connectors
- Sensor/actuator cabling

Industries

- Machine building
- Construction machines & cranes
- Buildings and lighting
- Logistics
- Power engineering
- Renewable energy sources
- Heating, ventilation and air conditioning systems

Software/configuration tools

- **wieplan** CLICK & BUY, configuration of terminal strips including online order
- **wieprint**, marking system for DIN rail terminal blocks
- **revoas**, configurator for connectors
- **gesis** PLAN for building installation
- **podis** PLAN for configuring the **podis** energy bus system
- **samos** PLAN 6, programming tool for **samos** PRO COMPACT

Business services

- Pre-assembly and wiring
- Product labeling service
- Integrated solutions inside distributors
- Customized solutions
- On-site project support
- Optimization of decentralized, pluggable installation solutions
- Certified machine safety tests

Safety training

- Software validation
- CSE certified safety engineers
- Basics and standards of functional safety
- Modification of old machines and major changes
- Design of safety functions and calculation with Sistema
- Machinery Directive, liability issues and CE conformity explanations

Why Wieland?

- Standardized industrial solutions
- Customized solutions
- Support for your project
- Broad product portfolio
- Application worldwide due to international licenses
- Group-wide observance of human rights, including at suppliers
- Eco-friendly production
Sales Partner:
You can reach us worldwide in more than 70 countries.
Find the contact adress at: www.wieland-electric.com

Subject to technical modifications!

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