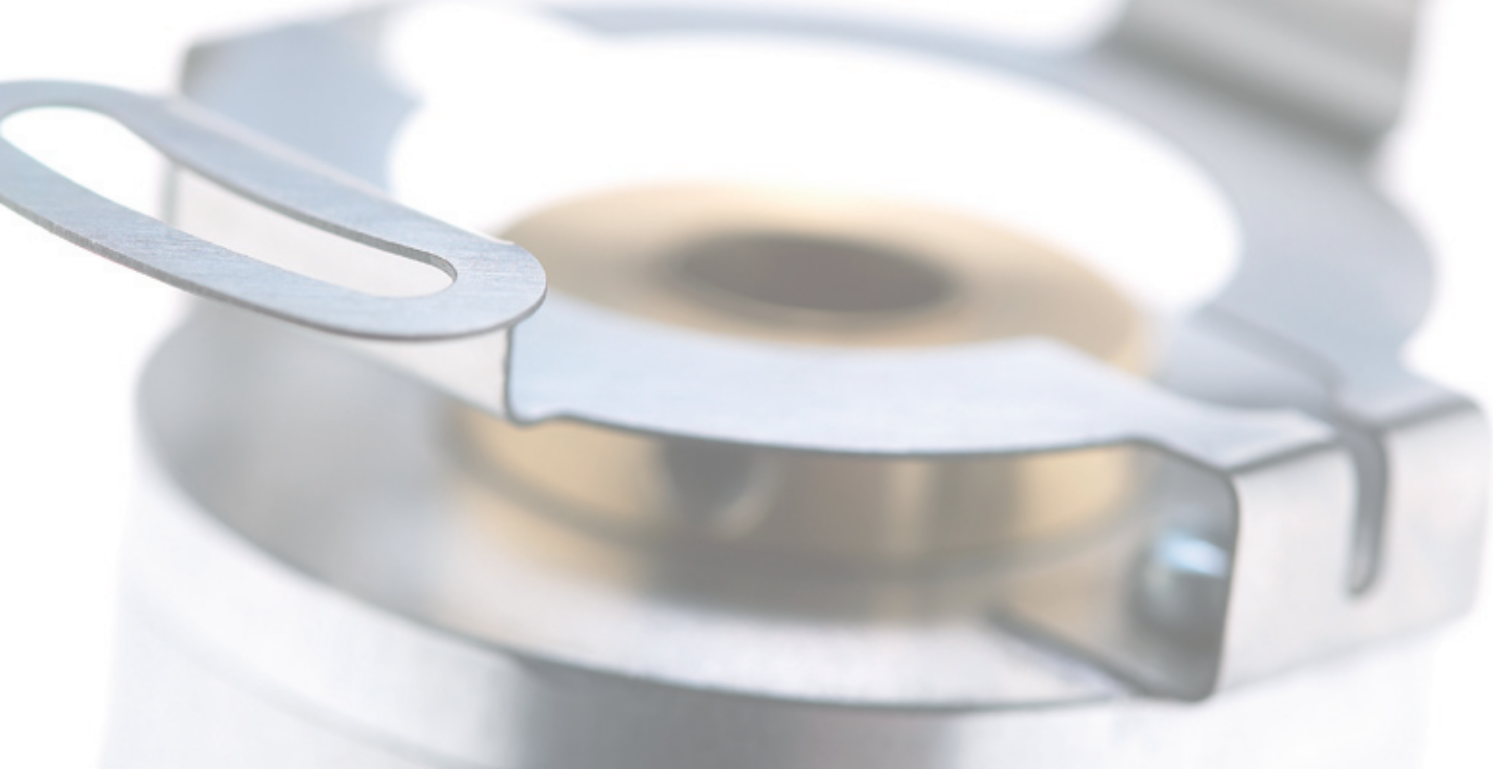




Solutions for Wind Turbines

- Absolute Encoders
- Incremental Encoders
- Functional Safety
- Transmission and Counting Technology



Kübler pulses for the wind industry. Safe and reliable.

Wind turbines are constantly in use everywhere. Encoders that are used for pitch and azimuth positioning or for speed measurement in wind turbines are consequently exposed to a harsh working environment. The deciding factor is the permanent availability and quality of the signals – since downtimes or replacements are not only expensive but also time-consuming.

Kübler encoders, counters and transmission technology measure up to these expectations. At the same time many helpful details provide the required security and offer a high level of convenience.

When it comes to the evermore important subject of Functional Safety, Kübler offers solutions for the safe monitoring of generator and rotor speed.





Kübler Headquarters, Villingen-Schwenningen, Germany



Encoders for Wind Turbines

Pitch and azimuth control	P. 4
Speed measurement of rotor and generator shafts	P. 6



Sendix Heavy Duty H120

Highly accurate and indestructible on the generator shaft	P. 8
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Solutions for Functional Safety

Safety sensors and controllers	P. 10
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Technologies for the Wind Industry

P.12

Transmission and Counting Technology

Optical fibre transmitters and receivers, connectors and cables	P. 14
Preset counters, timer and pulse counters	P. 15

The Kübler Group belongs today to the leading specialists worldwide in the fields of position and motion sensors, counting and process technology as well as transmission technology. Founded in the year 1960 by Fritz Kübler, the family business is now led by the next generation of the family, his sons Gebhard and Lothar Kübler. Proof of the strong international focus lies in the fact that exports currently account for over 60 percent of turnover, with 8 international group members and distributors in more than 50 countries. Over 380 dedicated people worldwide, of whom 290 are in Germany, make this success possible. They ensure that customers can place their trust in our company. The Kübler Group has a clear, long-term strategy to continue as an independent, owner-managed family business.



Pitch and azimuth control

Safety first! Measuring systems form an integral part of the safe control of pitch and azimuth and need to offer reliable, precise availability at all times. No matter when nor where, Kübler Sendix series encoders set standards here when it comes to safety, accuracy and ruggedness – whether in the drive or as a stand-alone measuring system in wind turbines.

The flexible and wide-ranging options offered by the Kübler Sendix encoders create the ideal solution for every eventuality when it comes to the construction of wind turbines and ensure a long service life and optimal costs.



1 Absolute encoders with integrated resolver

Safety and redundancy: Sendix encoder and resolver combined within one housing.

- Two in one advantage: encoder and resolver in one element – saves on costs and installation time
- For a safe emergency shutdown of the wind turbine
- The encoder supplies accurate position data of the pitch angle of the blade to the pitch controller
- The resolver supplies real-time signals to the frequency inverter
- Options: with reset button and as seawater resistant version



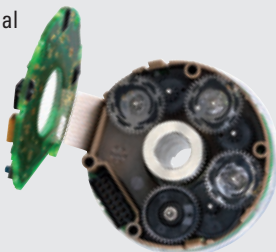
2 Encoder with rugged bearing unit

The complete mounting assembly facilitates installation and guarantees safe, reliable operation. Flexible interfaces and technologies ensure optimal adaptation to every application.

- Complete system for direct installation onto the pitch or azimuth gear rim
- Set comprises: rugged bearing unit, mounting bracket and pinion

i Optical multiturn gear for magnetic insensitivity

The extremely compact optical gear counts revolutions safely and reliably – without a battery. 100 % resistant to magnetic fields, even with strong fields as are found surrounding the magnetic brakes of the pitch drive.

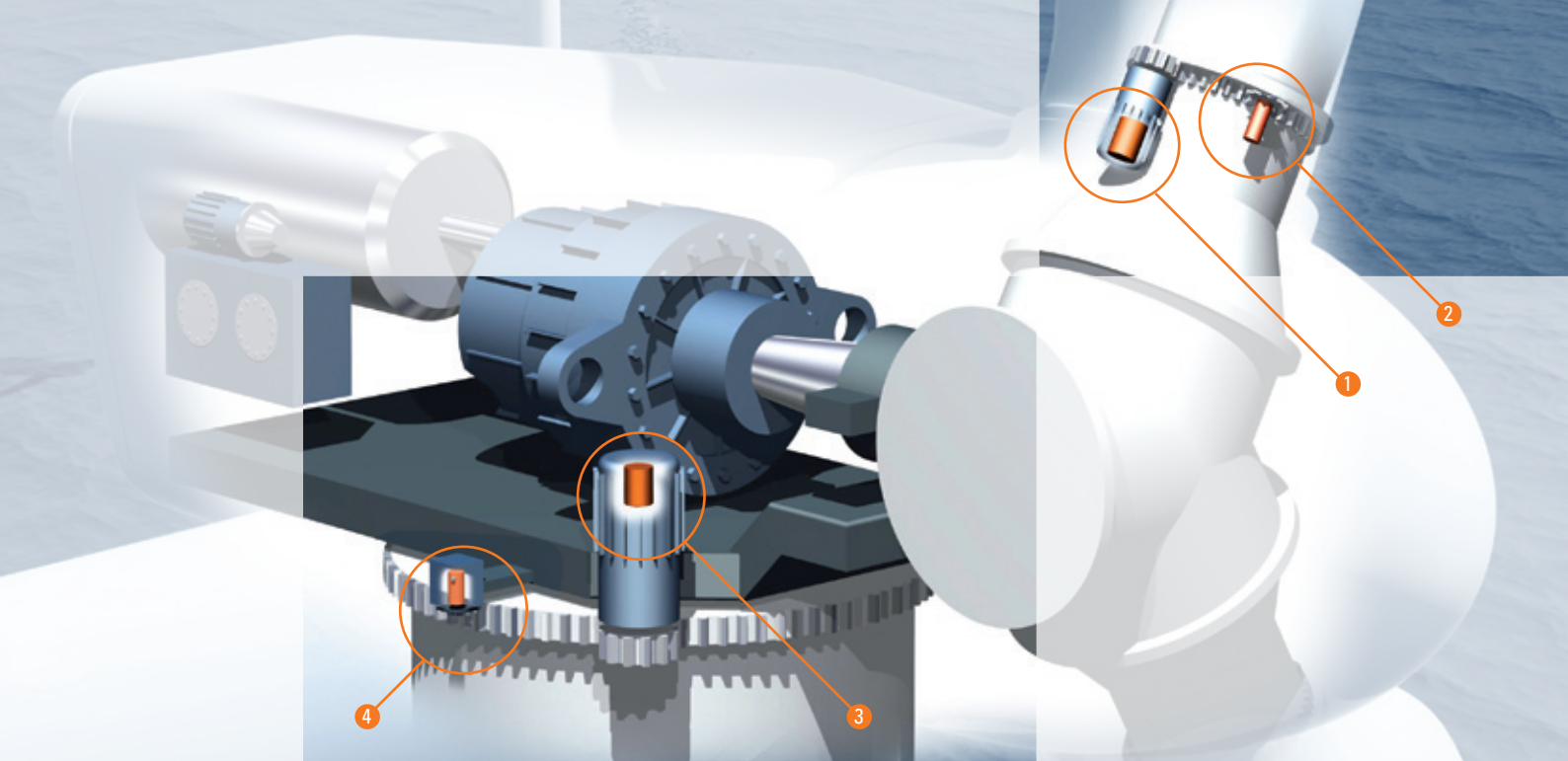


i SET button for easy servicing

Small details make installation and servicing simpler: as an option, reset buttons can be integrated into the covers of the Sendix absolute encoders.

- Reset button and status LED for easy setting of the rotor blade reference position, also during installation or servicing
- Resetting either via button or interface





3 Sendix 58 – absolute multiturn encoders

Whether integrated into the drive, or as stand-alone systems, Sendix absolute multiturn encoders with mechanical gears, in the standard 58 mm size, are tried and tested, rugged as well as high-precision measuring systems for pitch and azimuth angles.

- Highly accurate optical scanning, 100 % insensitive to magnetic fields
- No battery required to save the number of turns
- Up to 17 bits singleturn and 12 bits multiturn resolution
- Interfaces: SSI, CANopen, BiSS-C, EtherCAT and Profinet
- With additional incremental outputs RS422 and SinCos
- -40°C up to +90°C with IP67 protection level
- Sturdy bearing construction in Safety-Lock™ Design
- Simple diagnostics

4 Sendix F36 / F58 – compact absolute encoders

The Sendix families F36 / F58 are highly accurate, optical encoders without gears that are also totally insensitive to magnetic fields. Moreover they are also extremely economical.

Even where installation space is very limited, the compact version F36 in the 36 mm housing is ideal for integration into components such as in geared limit switches or drives.

The standard version F58 in the 58 mm housing offers a through hollow shaft of up to 14 mm diameter.

- Highly integrated singleturn / multiturn scanning in a single ASIC
- 17 bits singleturn + 24 bits multiturn = 41 bits total resolution
- Interfaces: SSI, CANopen, BiSS-C, additional incremental outputs RS422 and SinCos
- -40°C up to +90°C with IP67 protection level
- Sturdy bearing construction in Safety-Lock™ Design

i SIL3 / PLe approved encoders



Safety is – not least since the EU Machinery Directive 2006/42/EC – an “integral part of the construction of drives”.

When choosing the right encoder for functional safety the principle applies that safety is achieved through the intelligent combination of encoder, controller and actuator.

Sendix SSI absolute encoders, with an additional SinCos incremental output, and SinCos versions of incremental encoders are available with certification.

But safety goes further than this: safe components are characterised by a robust reliable interface and by the ability to cope with high mechanical and electronic loads.

Speed measurement of rotor and generator shafts

A tough nut. Accurate speed information is an important measurement for the control loop of a wind turbine. Measuring systems that supply this information are often subjected to harsh environmental conditions but must not suffer any loss of reliability. Kübler incremental encoders can handle strong vibration or extreme variations in temperature without any problem. Here, their diverse fitting options guarantee easy, safe installation.

Kübler offers the complete range of solutions from the extremely rugged Sendix Heavy Duty encoder through to the compact and economical Sendix 5000/5020.



1 Sendix Heavy Duty H120

Thanks to its robustness, the H120 encoder with its large hollow shaft offers effective protection against bearing damage. With its marked bearing isolation it is exceptionally well-suited for all wind industry applications. The dual protection of the shaft against soiling, with the help of a shielding cover disk and a radial shaft seal, allows for use in applications even under harshest conditions.

A further plus point is its high degree of flexibility during installation and connection.

- Bearing isolation up to 2.5 kV
- Extremely high resilience as a result of dual protection of the shaft (shielding cover disk and radial shaft seal) as well as protection levels IP66 und IP67
- High shock (200 g) and vibration (15 g) resistance
- Fastening arm on the flange or the cover – allows the device to be rotated as required during mounting
- Connection via cable, M12 or M23 connector, terminal box or optical fibre
- High pulse rates up to 5000 ppr



1 A02H – large hollow shaft

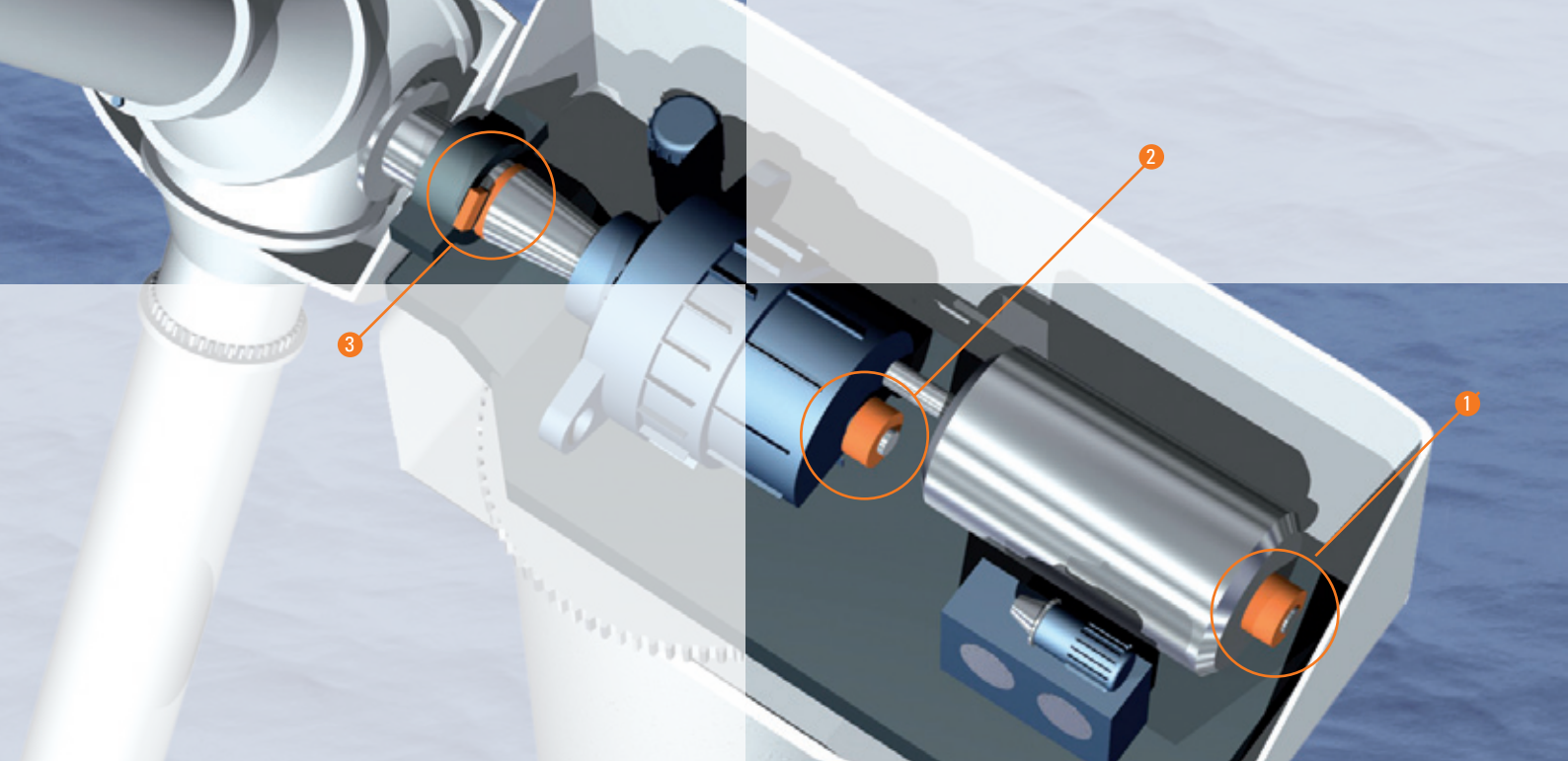
The Heavy Duty encoder A02H guarantees the exact rotational speed on the generator B-side.

- Economical alternative to classic Heavy Duty encoders
- Plastic isolating inserts protect against shaft currents and prevent damage to the bearings
- RS422, push-pull or SinCos outputs
- Balanced stainless-steel clamping ring
- -40°C up to +80°C, IP65
- Simple, accurate mounting, axial screw-fitting for taper and cylindrical shafts
- Through hollow shaft up to Ø 42 mm



i Shaft isolation – protection against bearing damage

Even well-earthed machine housings and rotors of generators and large motors carry a shaft current on the rotor. The equipotential bonding from the rotor to the stator via the encoder bearings leads to spark erosion and damages the ball-bearings. This can be remedied by isolating the encoder bearings. Isolating inserts can be used with all Sendix compact encoders. The Sendix H120 has a fully-isolated bearing construction and is tested to a breakdown voltage of 2.5 kV.



2 Sendix 5000/5020

Multitalented device for all types of application, with suitable connector options for every eventuality.

- Compact housing
- Comprehensive range of matching accessories and fixing options
- Increased resistance, due to rugged die-cast housing
- Sturdy bearing construction in Safety-Lock™ Design
- -40°C up to +85°C, IP67
- Flexible, with versions suitable for every application: cable connection, M23 or M12 connector
- Optional: seawater resistant

3 Magnetic measuring systems

The Limes LI20/LI50 bearing-free compact systems open up possibilities, where encoders have reached their limits.

- For extreme shock and vibration loadings
 - shock up to 500 g / 1 ms
 - vibration up to 30 g / 10 ... 2000 Hz
- With magnetic rings RI20: shaft diameter up to 30 mm
- With magnetic bands B1/B2: for measuring large diameters, ideal for rotary speed measurement on the rotor shaft of wind turbines

i Small, large, slim or practically indestructible ?

Kübler offers the right solution for every application from its product range.

	Sendix Heavy Duty H120	A02H – large hollow shaft	Sendix 5000/5020	Limes
Application	For applications with high bearing loads and very high shaft currents (installation space 100 x 82 mm)	For narrow installation areas and for applications with increased bearing loads (installation space 100 x 50 mm)	For applications where space is tight, with standard shaft loads (installation space 50 x 45 mm)	Non-contact system for difficult installation situations, where there is no room for an encoder (only up to 10 mm installation depth) or for applications with very high shock or vibration levels
Shaft	Up to Ø 28 mm, axial screw connection via tapered or cylinder shaft possible. 2.5 kV isolation due to fully isolated bearing construction	Up to Ø 42 mm, with isolation inserts up to Ø 38 mm (with 2.5 kV isolation max. Ø 16 mm), axial screw connection via tapered or cylinder shaft possible	Up to Ø 15 mm, with isolation inserts up to Ø 12 mm	For very large hollow shaft > Ø 42 mm
Connection	Cable / connector / terminal box / opt. fibre	Cable / connector	Cable / connector	Cable
Sensor techn.	Optical	Optical	Optical	Magnetic, non-contact
Costs	STANDARD	MEDIUM	LOW	LOW

Sendix Heavy Duty H120 – highly accurate and indestructible on the generator shaft

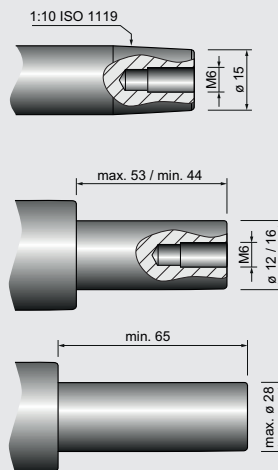
Sendix Heavy Duty H120 encoders with the special HD-Safety-Lock™ construction were specially designed for use with large motors and for the precise determination of the speed on the generator in wind turbines.

Resistant materials, wide temperature ranges and a high protection level ensure they remain unaffected by the harshest environmental conditions. The innovative connection technology enables simple quick installation.

i The encoders of the Sendix H120 family – a wide variety of versions for every installation situation

Three shaft attachment solutions

- Tapered hollow shaft 1:10 with central fixing – for highly accurate direct connection to the application shaft
- Cylindrical blind hollow shaft Ø 12 mm or 16 mm with central fixing – the standard mounting solution for generators
- Through hollow shaft from Ø 16 mm to 28 mm – the flexible mounting solution for all cases



Three connection options

- Connector or cable connection for fast error-free connection of the encoder
- Terminal box connection with plug-in spring terminal connectors and connection cover rotatable through 180° for the highest level of flexibility when installing the encoder
- Optical fibre connection for the highest degree of security during signal transmission, even over very long distances



Thanks to the HD-Safety-Lock™ bearing construction, an extremely high bearing load capacity



Integrated bearing isolation up to 2.5 kV for a reliable shaft connection



High level of protection against dust and humidity as a result of dual protection of the shaft

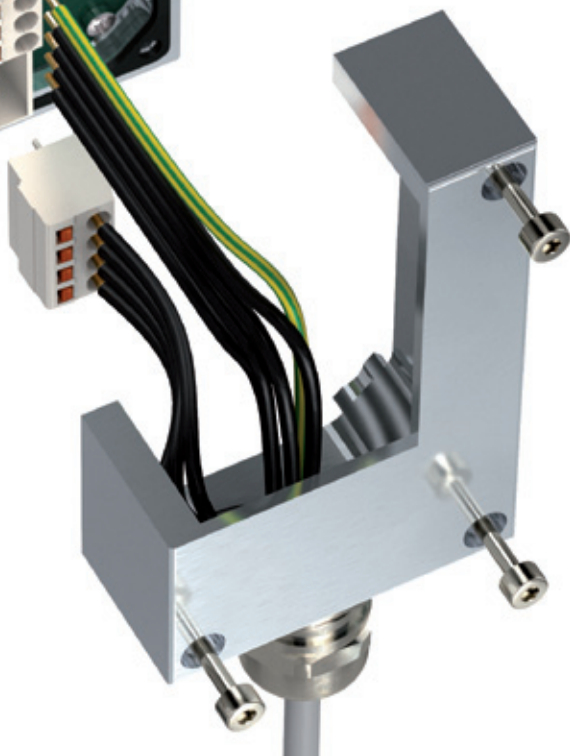
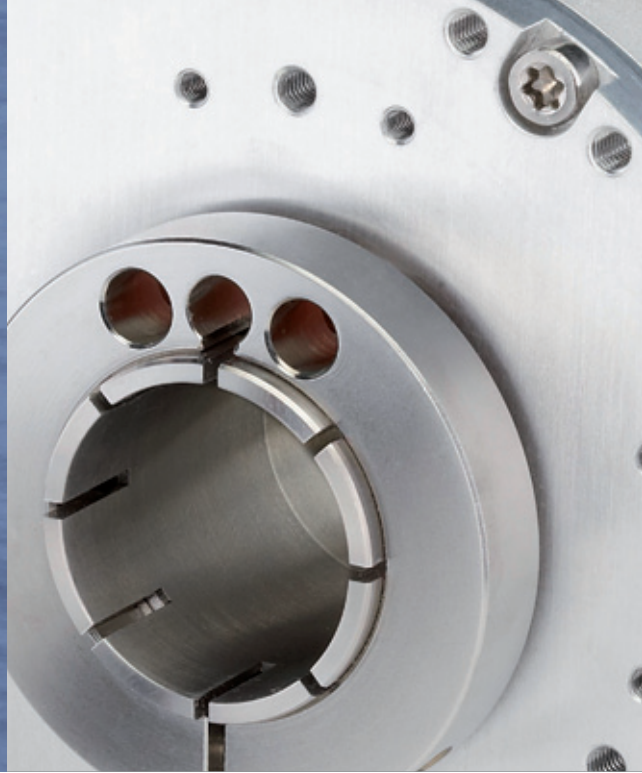
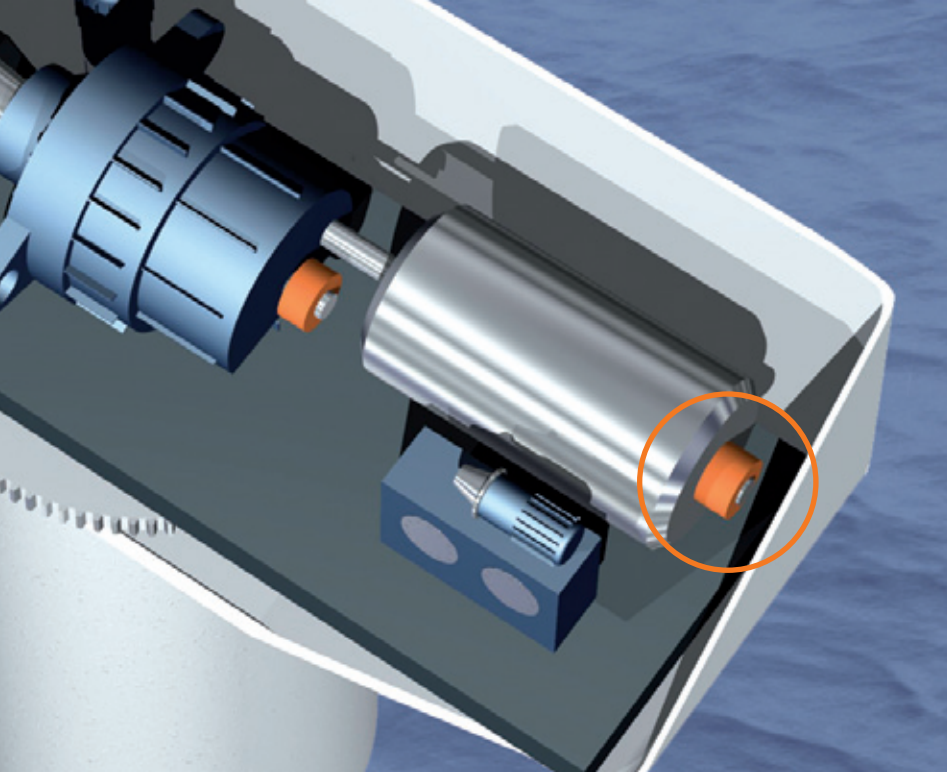


High shock (2000 m/s², 6 ms) and vibration resistance (150 m/s², 10 ...2000 Hz)



Seawater resistant housing





Accurate and reliable optical sensor technology



High pulse rates up to 5000 ppr



Through hollow shaft up to Ø 28 mm



Wide temperature range



High protection level



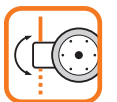
Plug-in spring terminal connectors



No need for tools



Various connection possibilities thanks to terminal box being rotatable through 180°



i HD-Safety-Lock™ – hollow shaft

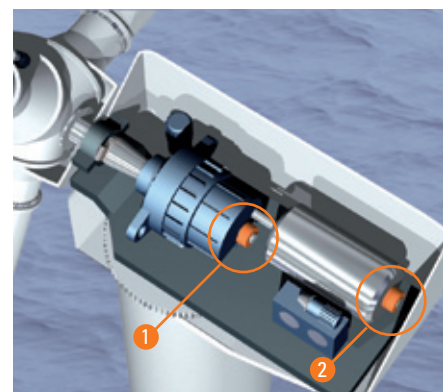
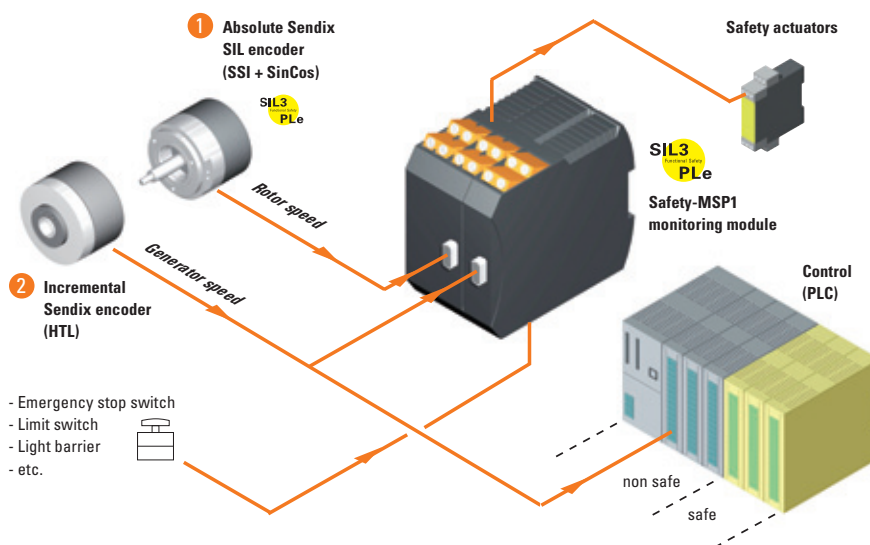
Heavy Duty hollow shaft design of the latest generation – extremely robust with integrated shaft isolation

- Extremely robust flange mounting due to screw-on housing
- Extremely robust bearing construction due to
 - mechanically interlocked bearings
 - use of very large highly robust bearings
 - large bearing span
- Maximum level of protection against dust and humidity due to:
 - shielding cover disk on the shaft
 - high quality radial shaft seal
- Bearing design incorporates integrated isolation (isolating inserts not required), tested up to 2.5 kV for high running accuracy; metal to metal connection for slip free mounting

Solutions for Functional Safety

Safe single components alone do not fully ensure a safe global application. Only the optimal interaction between safety sensors and safety monitoring modules offers reliable solutions, which will meet the necessary safety requirements. The optimal combination of Kübler's Safety-M modules and Sendix SIL encoders allows the easy implementation of a safe drive monitoring system.

Safe monitoring of generator and rotor speed



Safety functions

- Safe rotor overspeed detection for shut down mode
- Monitoring of safe low speed for enabling the mechanical brake
- Monitoring of safe rotor stop
- Monitoring of rotor position for single blade pitch control and maintenance purposes
- Azimuth positioning for cable twist protection
- Pitch positioning for safe shut down mode

Functional description

- Encoder is suitable for attachment or integration into the slip ring on the rotor - in the hub or on the drive
- The safety module is assembled in the main controller or pitch controller cabinet
- A safe and reliable communication between the encoder and the safety module is created via the SSI and SinCos interface
- The safety module communicates with the main PLC via safe digital outputs or via a BUS interface
- Many different BUS options are available
- Safety relays activate the safety actuators

Main advantages

- Certified:
 The combination of encoder and safety module is certified for applications up to SIL3 and PLe
- Reduced costs:
 Using safe components for speed and position monitoring can reduce overall costs by eliminating redundant or multiple sensors
- Simpler installation:
 Due to a lower number of components with a higher level of safety
- Easy assessment:
 Using certified components and systems for the main safety-related tasks will dramatically simplify the safety assessment of the overall machine



Encoder family for Functional Safety

Incremental SinCos encoder

- Sendix 5814SIL / 5834SIL (shaft / hollow shaft)

Absolute Singleturn SSI / SinCos encoder

- Sendix 5853SIL / 5873SIL (shaft / hollow shaft)

Absolute Multiturn SSI / SinCos encoder

- Sendix 5863SIL / 5883SIL (shaft / hollow shaft)

Safety drive controllers: Safety-M modules

Safety-MS1: Speed monitoring for 1 axis

Safety-MSP1: Speed and position monitoring for 1 axis

Safety-MS2: Speed monitoring for 2 axes

Safety-MSP2: Speed and position monitoring for 2 axes

BM: Field bus extension module for PROFINET, Profibus, EtherCAT and CANopen

Safety functions acc. to GL2010 and options with Safety-M

	Required PL	Sensors	Signal
Safety functions acc. to GL 2010			
Rotor overspeed detection	d	Encoder / proximity switch	HTL / TTL / SinCos
Excessive power generation / short circuit / shut down after power failure	d	Inverter switches off	Relay contacts
Vibration / tower oscillation / unbalance	d	Oscillation- / acceleration sensors	Analogue / relay or switch contacts
Cable twisting	d	Limit switch / encoder / potentiom.	Switch contacts / SSI / SSI + SinCos / anal.
Emergency stop – Shutdown to standstill	d	2 x emergency stop switches / encoder / proximity switch	Switch contacts / HTL / TTL / SinCos
Wind too strong / incorrect wind direction detection	d	Anemometer	Analogue / TTL / HTL / potentiometer
Safety door / rotor interlocking	d	Switch	Switch contacts
Brake wear / generator temperature / oil pressure / oil temperature / etc.	c	Analogue sensors / wear sensors / temperature sensors / status condition monitoring system	Switch contacts / analogue / digital outputs
Safe error messages			
Transfer from pitch system to Kübler Safety-M if: - Incorrect pitch angle of the blade - Maximum blade angle >90° - Blade angle deviation			Digital Low active / analogue / relay contacts
Error message main controller to Kübler Safety-M	d		Digital Low active / relay contacts
Transfer from Kübler Safety-M to pitch system for activation of braking system 1 and braking system 2			Safe relay contact / safe digital outputs
Transfer Kübler Safe PLC to main controller: - Position and speed information - Status information from sensors - Error messages			Safe relay contact / safe digital outputs / BUS communication
Blade angle monitoring with Safety-M (pitch system)			
Incorrect pitch angle of the blade	d	Encoder / resolver	SSI/SSI + SinCos/HTL/TTL/resolver/analogue
Maximum blade angle >90°	d	Encoder / resolver / limit switch	SSI/SSI + SinCos/HTL/TTL/resolver/analogue / switch contacts
Deviation of 3 blade angles relative to each other	d	Encoder / resolver	SSI/SSI + SinCos/HTL/TTL/resolver/analogue

Kübler Safety-M functions Kübler BUS communication modules

Basic modules Safety-M

- up to 4 encoder interfaces
- 2 further encoder speed terminals
- 14 safe digital inputs (including 8 OSSD)
- 2 safe analogue inputs
- 2 safe digital outputs
- 1 safe relay output
- further message outputs



Extension modules Safety-M

- 12 safe digital inputs
- 10 safe digital inputs/outputs
- 8 safe relay outputs



BUS communication modules BM

PROFINET / Profibus / EtherCat / CANopen



Complete safety control system (on req.)
for monitoring up to 6 axes with up to 12 encoders

Can be complied with via:

Technologies for the wind industry

Innovations from tradition. Kübler products benefit from 50 years experience in automation engineering.

Over the years they have undergone ongoing development and been optimised for use in drives, in outdoor and offshore applications and not least in wind turbines.

Small details make a big difference. Our products feature many intelligent, high-quality extras, which offer our customers important advantages, whilst at the same time making a significant contribution to the high availability of the wind turbine.



HD Safety-Lock™



Safety-Lock™



Bearing isolation



Shock / vibration resistant



Seawater resistant optional



High protection level



Temperature



Magnetic field proof



Optical sensor

Safety-Lock™ and HD-Safety-Lock™

The reliable Sendix encoders, with their long service life, offer a very sturdy, rugged bearing construction as a result of the Kübler Safety-Lock™ technology.

Encoders with Safety-Lock™ tolerate installation errors and high loads on the shaft, such as occur with wide temperature fluctuation or vibration. Interlocked, positive-fitting bearings, large bearing spans and a special assembly technique all make a contribution here.

The HD-Safety-Lock™ technology is employed in the Sendix Heavy Duty encoders and offers an even more robust construction with even larger bearings. Additional protection is afforded by a shielding cover disk on the shaft as well as by the integrated bearing isolation.



Optical multiturn technology

100 % resistant to magnetic fields – extremely compact design.

Even strong magnetic fields, as occur in the vicinity of brakes or drive motors, pose no problems for the sensor technology of optical single or multiturn devices.

The technology dispenses with any components that may be susceptible to magnetic influences.

As a result of the proven drive, the encoder has no need of a battery to store the number of revolutions.



Insensitive to interference: OptoASICs

The resistant Kübler OptoASIC technology offers a very high integration density of components.

This means that, on the one hand, the reliability in the application can be increased significantly and, on the other hand, the technology demonstrates quality EMC characteristics and shock resistance.



Well-protected against dust and moisture

The sturdy, thick-walled die-cast housing of the Sendix encoders is press-fit stemmed several times on the encoder flange. The high protection level and the wide temperature range from -40°C to +90°C allow a safe outdoor operation. The die-cast housing is fitted with an extremely resistant base, on which the connector flange is screwed with four screws.

High temperatures

High heat resistance – combined with high rotational speeds – make the Sendix encoders the optimal solution for all applications in a high temperature environment. Also the seals, cables and connectors used withstand extreme temperatures.

Shock and vibration resistant

The Safety-Lock™ Technology of the Kübler encoders avoids serious, expensive failures right from the start – even with increased levels of axial loading, shock and vibration. This can eliminate enormous service costs and expensive downtimes in applications worldwide.

Seawater resistant versions

Although it has already proved itself in harsh environments, the Sendix family of devices has now been tested and certified to IEC 68-2-11 for resistance to the effects of salt-spray over a period of up to 672 hours – the highest test level. The high certification level for the Sendix encoders attests a high level of corrosion resistance.



Tested
acc. to the salt-
spray test
IEC 68-2-11
=> 672 h

Transmission and counting technology

Well advised. A perfect match for Kübler encoders and counters, the comprehensive range of transmission technology, cables, connectors and cordsets ensure compatible, error-free connections and highly accurate transmissions.

Doubly safe. Counting technology components from Kübler reliably monitor control functions.

As a redundant component they can activate up to 6 alarm outputs in case of overspeed or underspeed.

Slip or gear breakage can be effectively avoided by comparing two speeds with each other.



1 Optical fibre transmitters, receivers and cable

The solution where signal transmission is difficult.

Optical fibre modules safely transmit encoder signals. Even over long distances.

The system is made up of an optical fibre transmitter and an optical fibre receiver. The optical fibre transmitter converts the electrical signals of a normal incremental encoder into a light signal for transmission by means of an optical fibre.

The receiving module converts the optical signal back into electrical signals.

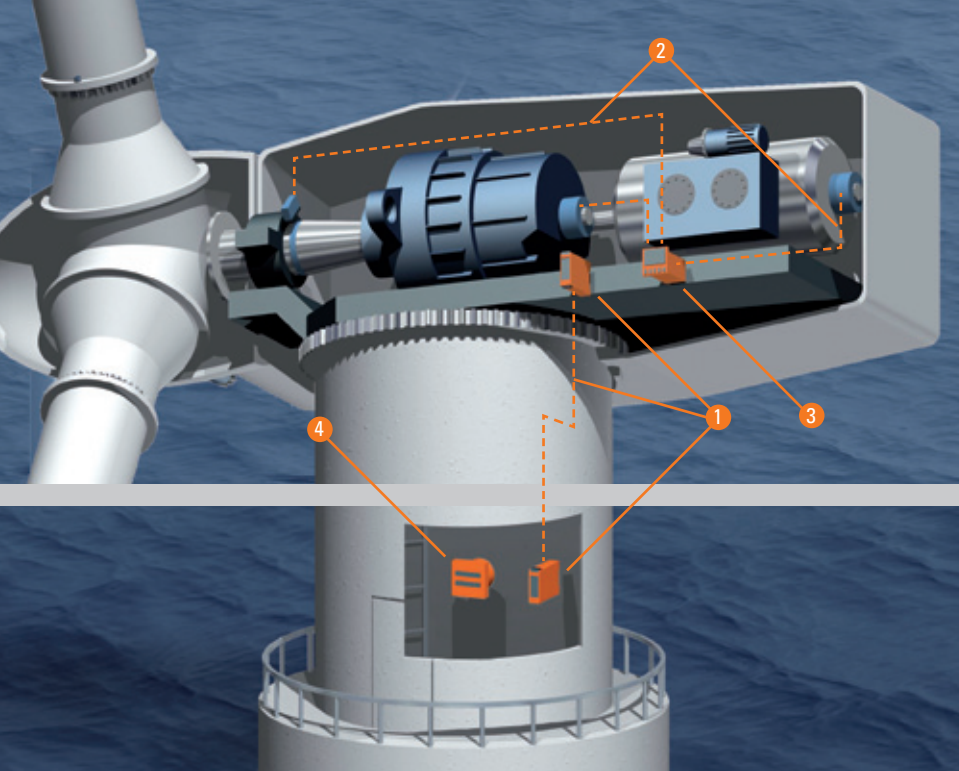
- The optical fibre does not suffer from mains-induced interference, caused for example by generators or frequency inverters
- Available for incremental and SSI signals
- Signal transmission via just a single glass fibre
- Safe signal transmission up to 1500 m
- Resists extremely strong electro-magnetical fields
- Potential separation
- Accessories: simplex patch cable, ST multimode coupling

2 Connectors and cables

A comprehensive range of cables, connectors and cordsets ensure error-free connections and reliable transmission.

A perfect match for the encoders and counters, it includes:

- M12 connection technology: cordsets – straight, angled and with LED indicator in the connector
- SSI, Profibus, CANopen and DeviceNet
- M23, MIL and valve connectors
- Connectors for self-assembly
- Cordsets



3 Position and difference preset counter 572

- 2 separate freely scalable count inputs HTL or TTL; both also with inverted inputs; max. input frequency 1 MHz/channel
- Very bright LED display, 15 mm high (6 digit) and 10 mm high (8 digit)
- 4 freely programmable fast solid-state outputs, each with 350 mA output current
- With 8 different permanent count functions, such as simple count, difference count and total count of both inputs, batch counters etc.

3 Universal preset counters Codix 923 and 924

- Multifunction: counter, timer and tachometer in one device
- Up to 6 presets with relay or optocoupler outputs
- User-friendly: simultaneous display of the actual value and the presets, batch count or total count
- Direct entry into the programming
- With accessories for DIN-rail mounting in the control cabinet

4 Timer and pulse counter HC 77

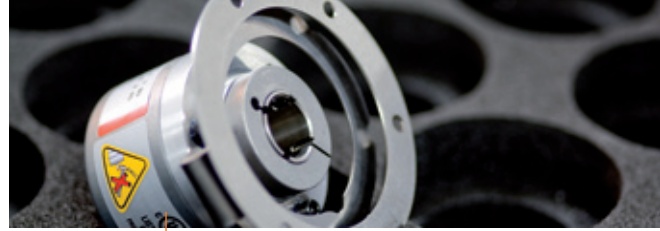
The HC 77 monitors the hours run and turn-on cycles of the wind turbine. Very simple.

- Electromechanical counter retains the values if power is lost
- Combination of hour meter and totalising counter
- High shock resistance
- Magnified figures
- UL-approval

i Kübler Codix

The Kübler Codix brand name stands for universal usability and standardised manufactured sizes, as well as the philosophy of easy, menu-driven programming of the latest generation of counters. Centre stage is taken by the large, easy-to-read LED or LCD displays and the intuitive – frequently menu-driven – programming.

The high-quality plug-in screw terminals make a significant contribution to fast, simple start-up.



Presales

Kübler – the service specialists for every industrial sector and application – supplying complete integrated solutions – globally on your doorstep

Sample Service – Fast delivery of customised versions

Selection tool
Kübler website: Product Finder

Delivery Service: 10 by 10,
48 h Express and Repair Service



Kübler Service for planning dependability

Fast, reliable service and professional advice have top priority at Kübler. We are globally on your doorstep in 6 service and application centres and offer our customers planning dependability.

We deliver from stock within one day. We can manufacture your special orders within 48 hours. Moreover, 10 by 10 is our delivery offensive, which ensures that – for quantities of up to 10 pieces – you will receive all catalogue products so marked within 10 days. Our processes and services are certified and are constantly being improved.

10 by 10

With our 10 by 10 Service we will manufacture and deliver 10 encoders within 10 working days (365 days a year - with the exception of 24th Dec. until 2nd Jan.)

The benefits to you: easier to order, the delivery can be calculated, flexibility for small production batches.



Technical Hotline

Our Hotline will answer your technical questions Mon-Fri within normal working hours:



Kübler GmbH, Germany	+49 7720 3903-35
Kübler France	+33 3 89 53 45 45
Kübler Italy	+39 0 26 42 33 45
Kübler China	+86 10 5134 8680
Kübler India	+91 9819 457 872
Kübler Poland	+48 6 18 49 99 02

Sample and Repair Service

The Kübler Service Centre can quickly manufacture special, customised versions within a short space of time. We are happy to help you with the practicalities of using our products – at your location if desired. We can carry out repairs within a maximum of 5 working days.



48 h Express Service

Short delivery times, a high level of on-time delivery, guaranteed quality and enthusiastic, service-oriented employees – these are what our customers can depend on.

We can process your order within 48 hours; we can ship stock items the same day.



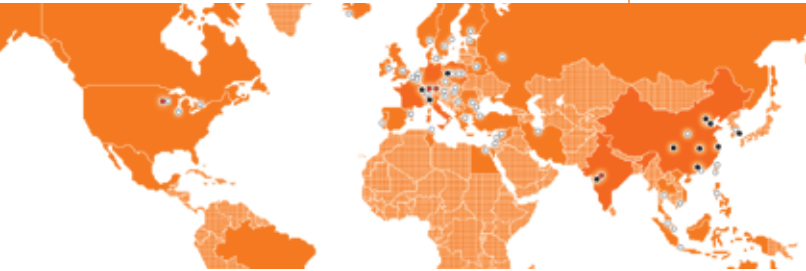


Service Excellence provided by Kübler application specialists for target sectors

Product security – replacement models at the end of the product life-cycle

Aftersales

Service Centres, globally on your doorstep:
Advice, analysis, support during installation in over 50 countries



« We were able to considerably reduce our average delivery time and I can confirm that delivery schedules were always adhered to. Technical support is very professional, efficient and not at all bureaucratic. »

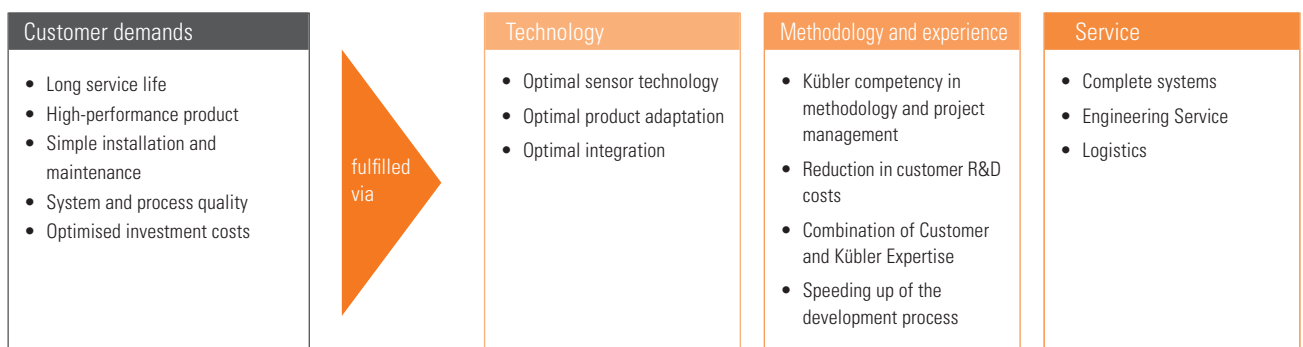
Purchasing Manager, German Producer of Geared Motors

Tailor-made solutions – Kübler Design System

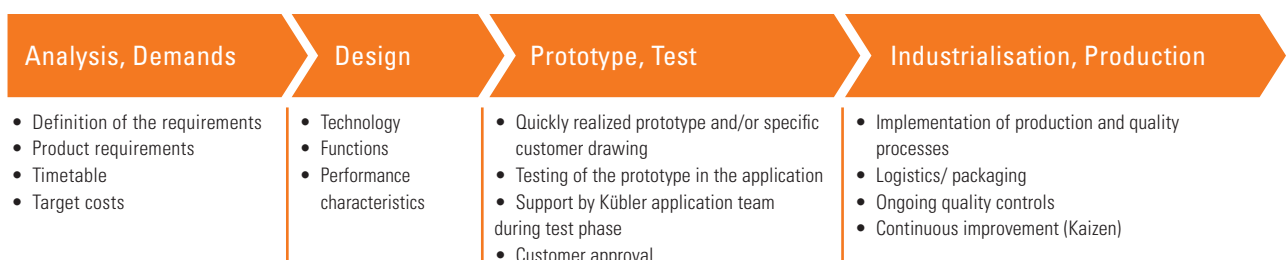
« With the KDS method our customers receive a lasting solution to lowering costs, reducing the number of models available or eliminating quality deficiencies. With KDS we develop product and engineering solutions together. The method stands out because of its structured process; this delivers innovation through experience and cooperation with the customer. »

Gebhard and Lothar Kübler, Managing Directors Kübler GmbH

The Kübler Design System – satisfying customer demands



The 4 phases of the Kübler Design System



Product information

We offer additional information on our products and system solutions in the following main catalogues:

Position and Motion Sensors

- Incremental Encoders
- Absolute Encoders
- Linear Measuring Technology
- Inclinometers
- Connection Technology
- Accessories

Order-No. German **R.100.568**

Order-No. English **R.100.569**



Counting and Process Devices

- Pulse Counters and Preset Counters
- Timers and Preset Hour Meters
- Frequency Meters and Tachometers
- Combination Time and Energy Meters
- Position Displays
- Process Displays and Controllers
- Temperature Displays and Controllers
- Strain Gauge and Setpoint Adjuster

Order-No. German **R.100.156**

Order-No. English **R.100.157**



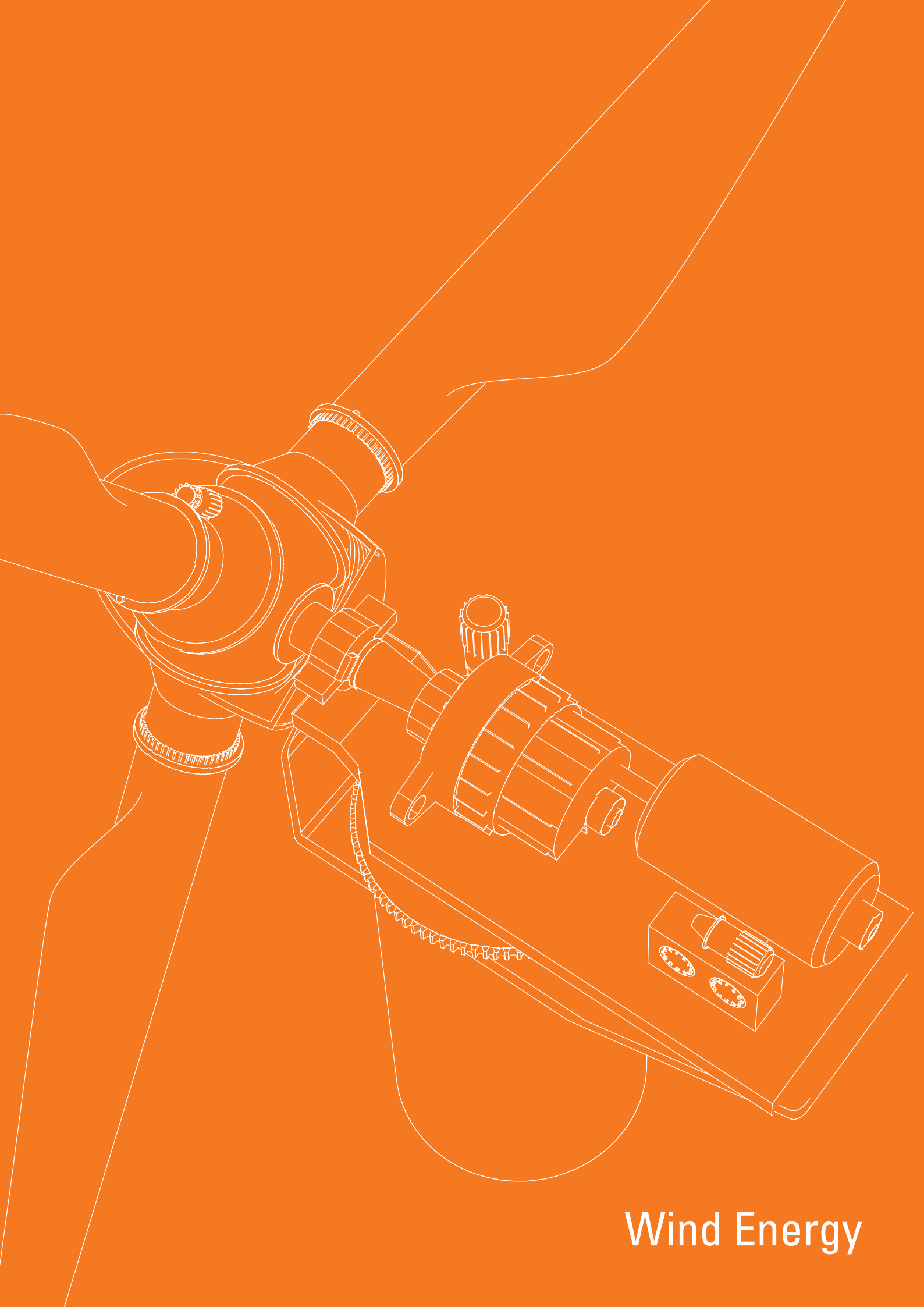
Connector and Signal Transmission Technology

- Slip Rings
- Optical Fibre Signal Transmission Modules
- Cables, Connectors and Cordsets

Order-No. German **R.600.948**

Order-No. English **R.600.948.001**





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