



*Solutions for*  
**WIND**

Product Range

 **Bonfiglioli**





# Solutions for

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# WIND

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# Engineering Sustainability

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**APQP 4 Wind**  
Company Member



[WWW.BONFIGLIOLI.COM](http://WWW.BONFIGLIOLI.COM)

# WIND

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## INNOVATIVE SOLUTIONS FOR RENEWABLE ENERGIES

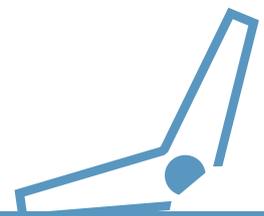
For more than 35 years, Bonfiglioli has been supplying dedicated integrated solutions to the wind industry. The combined expertise in the designing and manufacturing of gearboxes in association with years of experience in applications on wind turbines has enabled Bonfiglioli to become a global top player.

One in three wind turbines globally uses a Bonfiglioli gearbox.

The result is a complete package dedicated to the wind energy sector which seamlessly enables the control of energy generation, from rotor blade positioning with a pitch drive to nacelle orientation with a yaw drive.

Bonfiglioli has produced a completely integrated inverter solution for yaw drives and re-generator inverters to feed the electricity created by the wind turbine into the power grid.

Working closely with Customers to develop tailor-made applications, Bonfiglioli uses its flexibility to deliver reliable, superior performance products, which comply with all worldwide standards.



# MILESTONES

OVER 35 YEARS OF EXPERTISE IN THE WIND INDUSTRY

## 1980

- › **START OF WIND PRODUCTS**
- › Collaboration with “pioneers” of wind energy, Nordtank and Micon

## MID 90'S

- › Tailor made reinforced planetary gearboxes for yaw and pitch drive
- › **Turbines up to 1.0+ MW**

## 2014

Yaw and pitch drive local production in Brazil

## 2013

Turbines up to 7.0 MW

## 2012

Bonfiglioli develops lean concept in product design

## 2016

  
**+35%**

- › Thanks to its unique global footprint, Bonfiglioli now offers a local presence service for yaw & pitch drives
- › **Introduces real time load measurement by torque sensor (Patented Solution)**

## 2018

Further expansion of yaw and pitch drives up to 10 MW turbines

## 2019

- › Yaw and pitch permanent magnet motor
- › **Bonfiglioli introduces IoT solution for condition monitoring system**

## 2000

Bonfiglioli integrates self-braking motors in planetary gearboxes

## 2003

- › First supply of Bonfiglioli inverters for Yaw control
- › **Yaw inverter local production in Germany**

## 2005

**Turbines up to 5.0 MW**

## 2011

**Yaw and pitch drive local production in China**

## 2008

- › **Yaw and pitch motor local production in Vietnam**
- › Bonfiglioli market share in wind exceeds 30%

  
**+30%**

## 2006

**Yaw and pitch drive local production in India**

## 2020

- › **Turbines up to 15.0 MW**
- › Bonfiglioli develops Series 700TW Yaw Drive with integrated motoinverter

## 2022

- › Yaw drive offshore with integrated moto-inverter: 3 in 1 solution
- › Pitch drive motor offshore in permanent magnet configuration

# OUR SUSTAINABILITY COMMITMENT

## INFRASTRUCTURE & BUILDINGS

### ITALY EVO

- > A4 energy class
- > NZEB (Nearly Zero Energy Building)
- > Water recovery system
- > 1.2 MWp photovoltaic system

### ROVERETO

- > Class A building
- > 135kW photovoltaic system
- > Water recovery system
- > 350-kWh natural gas boiler and heating pumps

### GERMANY, CHINA AND VIETNAM

Energy produced by photovoltaic systems.

## TRAINING

- > Customised Bonfiglioli courses
- > A platform for all our people
- > Possibility to access a library with external contents

 LEARNING



## SUSTAINABILITY REPORT

Our responsibility towards society and the environment is certainly not recent. With the aim of mapping our impact on the planet and our initiatives to be more sustainable we developed a dedicated document where we describe what being a responsible business means for us.



## INDUSTRY 4.0

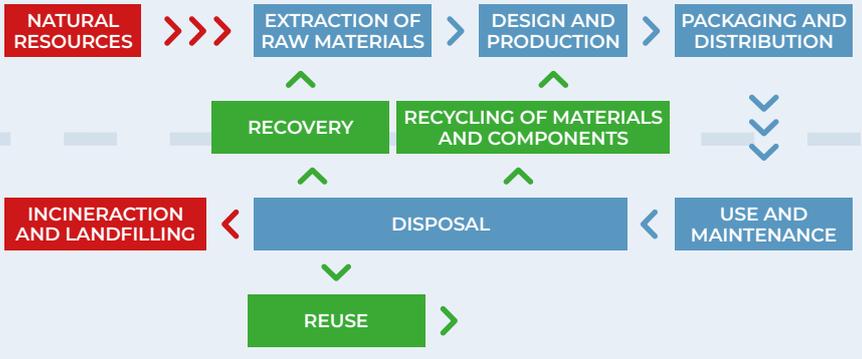
In our vision, **Industry 4.0** ensures improved and more efficient integration of our customers' needs through digital processes.



## R&D

Bonfiglioli's global research and development centers create breakthrough solutions that integrate the most advanced mechanical, electrical and hydraulic technologies.

# LCA (LIFE CYCLE ASSESMENT)



# MANAGEMENT SYSTEMS



# OUR PEOPLE

The Group reserves the right to check that the Suppliers with whom it works operate in **compliance with the law and this Code of Ethics**; for this purpose, it includes a specific clause in its supply contracts to confirm that they have read this Code of Ethics and undertake to comply with the principles contained therein.

The Group forbids the Addressees from establishing business relations with suppliers who **employ children below the legal age in Italian law** and the laws of the place in which the work is performed.

Code of Ethics, Bonfiglioli Group



# COMMUNITIES AND LOCAL TERRITORIES



Together for a quality education in Uganda, we will guarantee continuity and quality of education to 100 children!



We planted 4,500 trees between Colombia, Kenya, Nepal, Tanzania.



Bonfiglioli supports the **Emilia Romagna Epilepsy Association (AEER)**.



Malpighi La.B is the robotics, IT and 3D design laboratory dedicated to Clementino Bonfiglioli.



**INDIA**  
The boys' and girls' homes welcome disadvantaged children, giving them the opportunity to live together in a protected environment.

## INTERNET OF THINGS - IoT

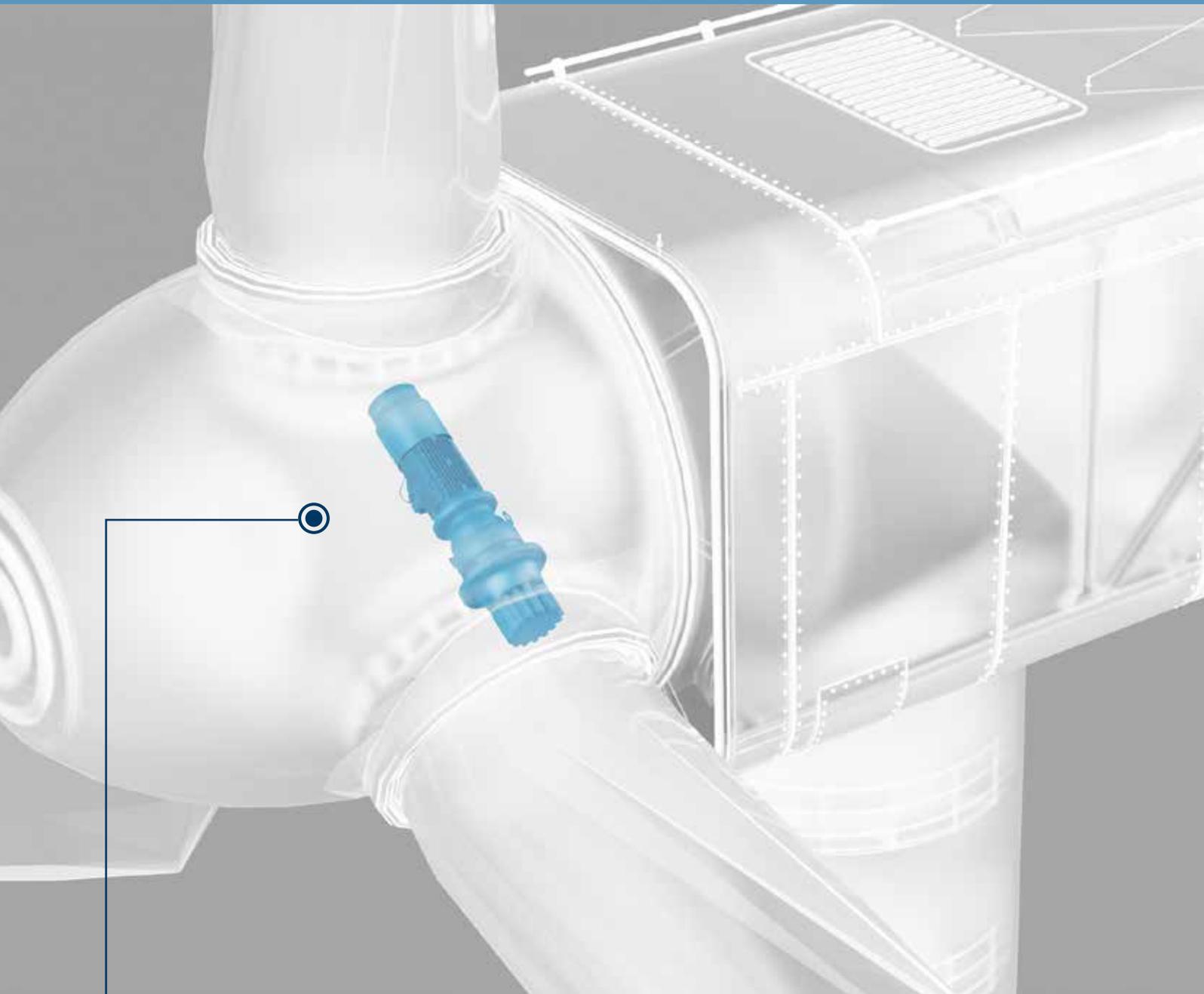
Today, with more than 60 years of know-how in the automation sector, this constant innovation allows Bonfiglioli to deliver new and advanced digitalization solutions, with a portfolio of products ranging from sensors to cloud-based services.



## PRODUCT DEVELOPMENT

We are member of the APQP4Wind organization. Thanks to our standardized quality assurance methodology we are by our customer side to reduce risks and lower the costs.



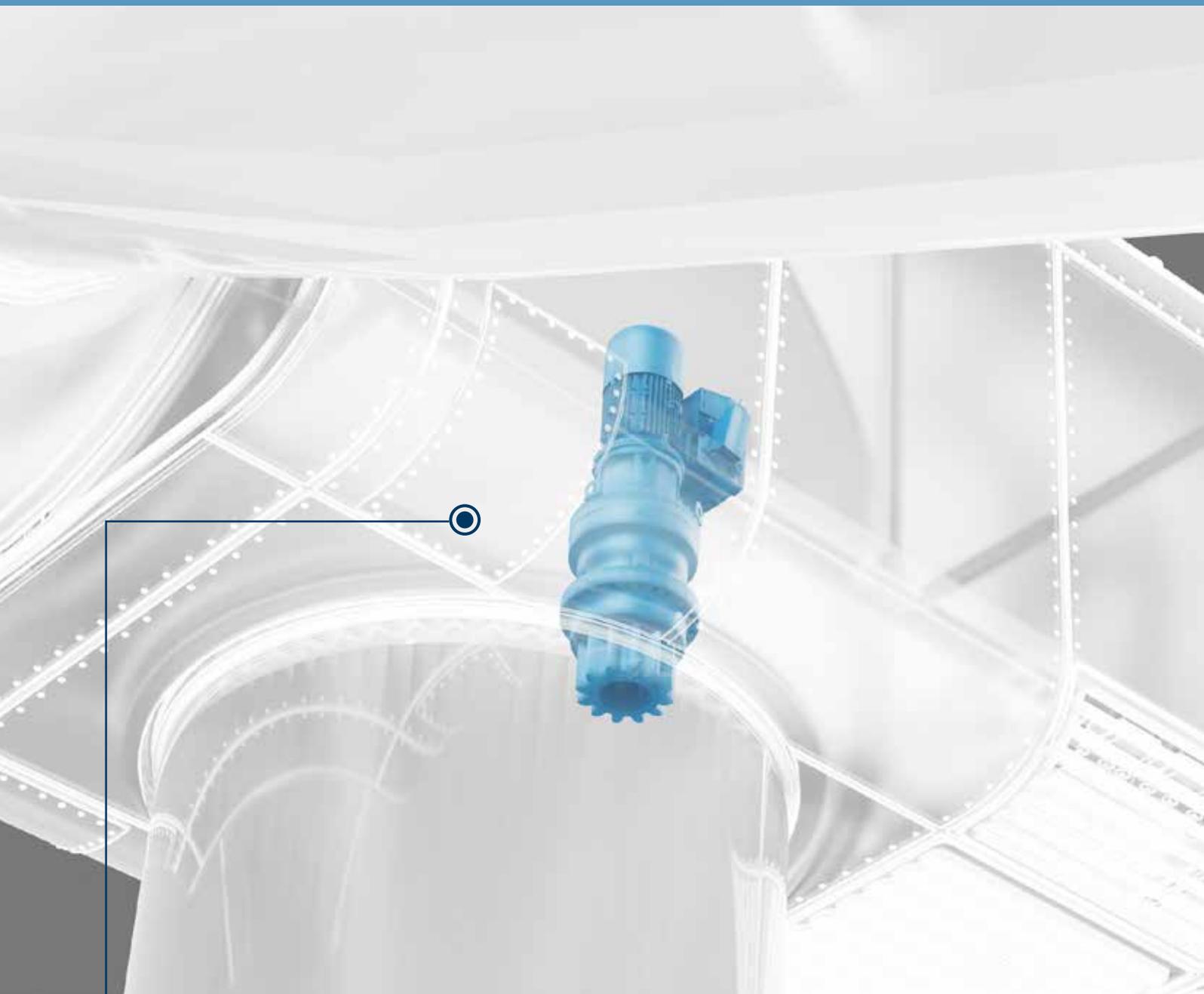


1

## **PITCH DRIVES WITH PERMANENT MAGNET OR INDUCTION MOTORS**

Bonfiglioli pitch drives' wide range of output torques and gearbox sizes expertly meet the OEM requirements of wind turbines. Completely custom made, this product offers a flexible solution to wind turbine manufacturers. Recent new features like the integrated load cell and the torque limiter show that Bonfiglioli always thinks outside the box and continuously searches for the most cost-effective solution.

- **BN, BE & BX Series**  
Asynchronous induction motors
- **BMD Series**  
Permanent magnet motors



2

## YAW DRIVES

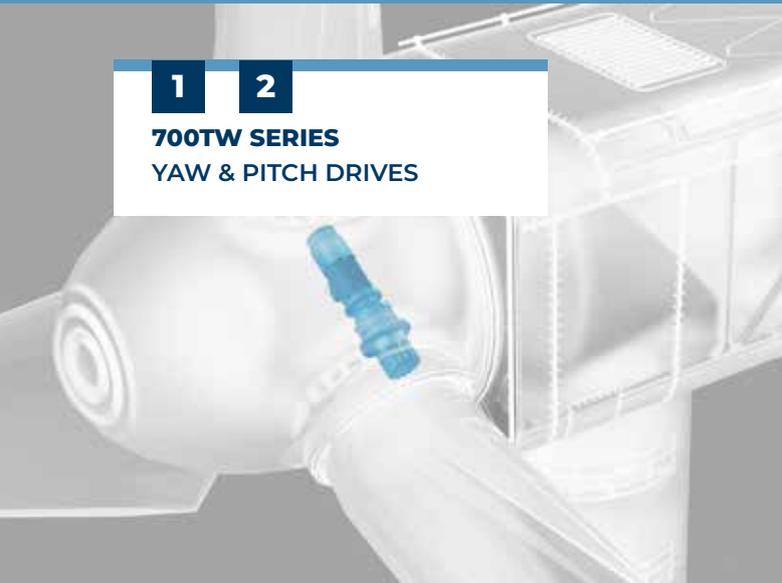
WITH PERMANENT MAGNET OR ASYNCHRONOUS INDUCTION MOTORS

With a wide range of output torques and gearbox sizes, Bonfiglioli yaw drives excellently meet the OEM requirements of wind turbines. Completely custom made, this product offers a flexible solution to wind turbine manufacturers. Recent new features, like the integrated load cell and the torque limiter, show that Bonfiglioli always thinks outside the box, continuously searching for the most cost-effective solution.

- **BN, BE & BX Series**  
Asynchronous permanent magnet motor
- **BMD Series**  
Permanent magnet motors
- **Active Cube Series**  
Premium inverters
- **AxiaVert Series**  
Premium Inverters
- **DGM Series**  
Integrated Inverter

**1 2**

**700TW SERIES**  
**YAW & PITCH DRIVES**



## 700TW Series

### Yaw & Pitch drives

Bonfiglioli products are used in the latest state-of-the-art wind turbines to control the necessary functions of pitch and yaw drive systems. 700TW series planetary yaw and pitch drives are used by a number of leading wind turbine manufacturers due to their advanced technical features, ensuring the highest level of performance and maximum torque density. All models are certified and validated through extensive test programs.



#### BENEFITS

- High torque density
- Rugged construction
- High radial/thrust load capacity
- High efficiency
- Cost effective solution
- Product development according APQP4Wind

#### FEATURES

- Product co-engineering
- Tailor made product design

#### STANDARDS

- Gears are designed according to ISO 6336
- Modular design
- In line or right angle design
- Input for electric motor (IEC, NEMA)
- Flange mounted

### PEAK TORQUE (Nm)

#### Pitch drive

706 TW	16,000
707 TW	28,000
709 TW	60,000
711 TW	80,000
712 TW	110,000
713 TW	140,000

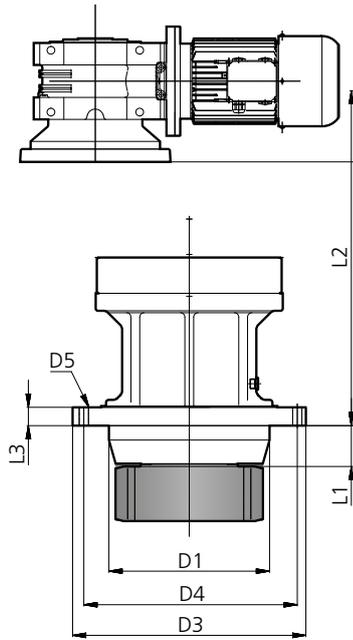
#### Yaw drive

709 TW	60,000
710 TW	70,000
711 TW	90,000
712 TW	120,000
713 TW	150,000
714 TW	180,000
716 TW	225,000
717 TW	260,000

The indicated data are for reference only; please contact Bonfiglioli for more detailed information.

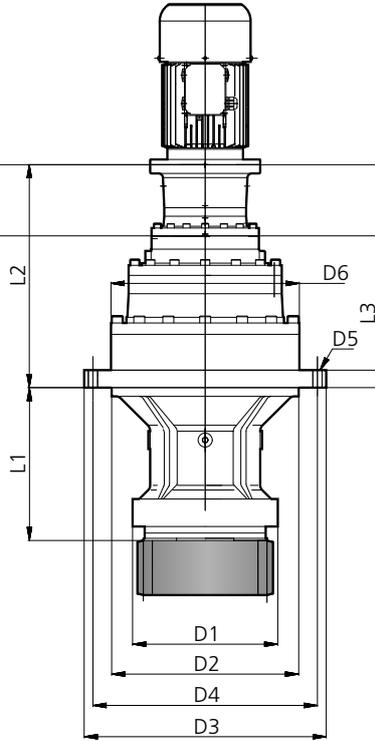
## OVERALL DIMENSIONS

Combined version  
Worm gearbox - Planetary gearbox



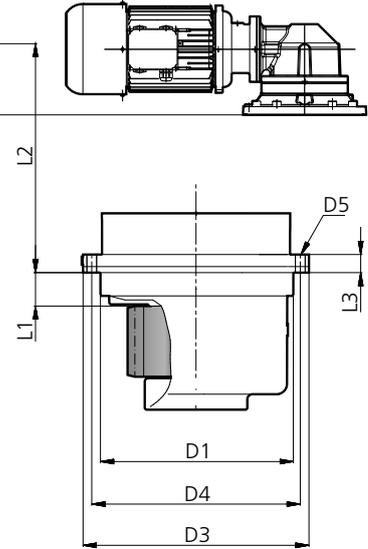
Output version **F** (short)

Inline version  
Planetary gearbox



Output version **N** (long)

Right angle version  
Planetary gearbox



Output version **U** (pinion supported)

Type	Version	D1	D2	D3	D4	D5	D6	L1	L2	L3
706T	F	250	-	360	320	∅ 18 n°24	292	130	460	35
706T	N	200	250	360	325	∅ 17 n°10	292	225	350	25
707T	F	310	-	410	360	∅ 22 n°12	348	70	540	30
707T	N	230	280	348	314	∅ 17 n°12	348	300	360	98
709T	F	310	-	410	360	∅ 22 n°12	348	70	540	30
709T	N	230	280	348	314	∅ 17 n°24	348	300	400	125
709T	U	340	-	405	375	∅ 17 n°24	348	90	450	40
710T	F	320	-	410	370	∅ 21 n°21	400	75	600	35
710T	N	300	425	500	450	∅ 22 n°12	400	360	500	40
710T	U	340	-	400	370	∅ 17 n°24	400	36	550	176
711T	F	390	-	520	480	∅ 17 n°30	428	60	700	35
711T	N	300	425	500	460	∅ 22 n°12	428	350	520	40
712T	F	410	-	490	450	∅ 21 n°24	428	125	660	40
712T	N	400	425	520	470	∅ 21 n°24	428	318	580	40
712T	U	415	-	530	480	∅ 26 n°16	428	140	500	45
714T	F	420	-	530	490	∅ 22 n°24	490	160	870	40
714T	U	555	-	645	600	∅ 30 n°32	490	97	760	100
716T	F	555	-	650	600	∅ 30 n°32	542	70	900	50
716T	U	555	-	650	600	∅ 30 n°32	542	70	900	50
717T	F	630	-	740	680	∅ 27 n°32	695	112	1250	50

The indicated data are for reference only; please contact Bonfiglioli for more detailed information.

## PITCH DRIVE

### TECHNICAL DATA

#### STANDARD SOLUTIONS



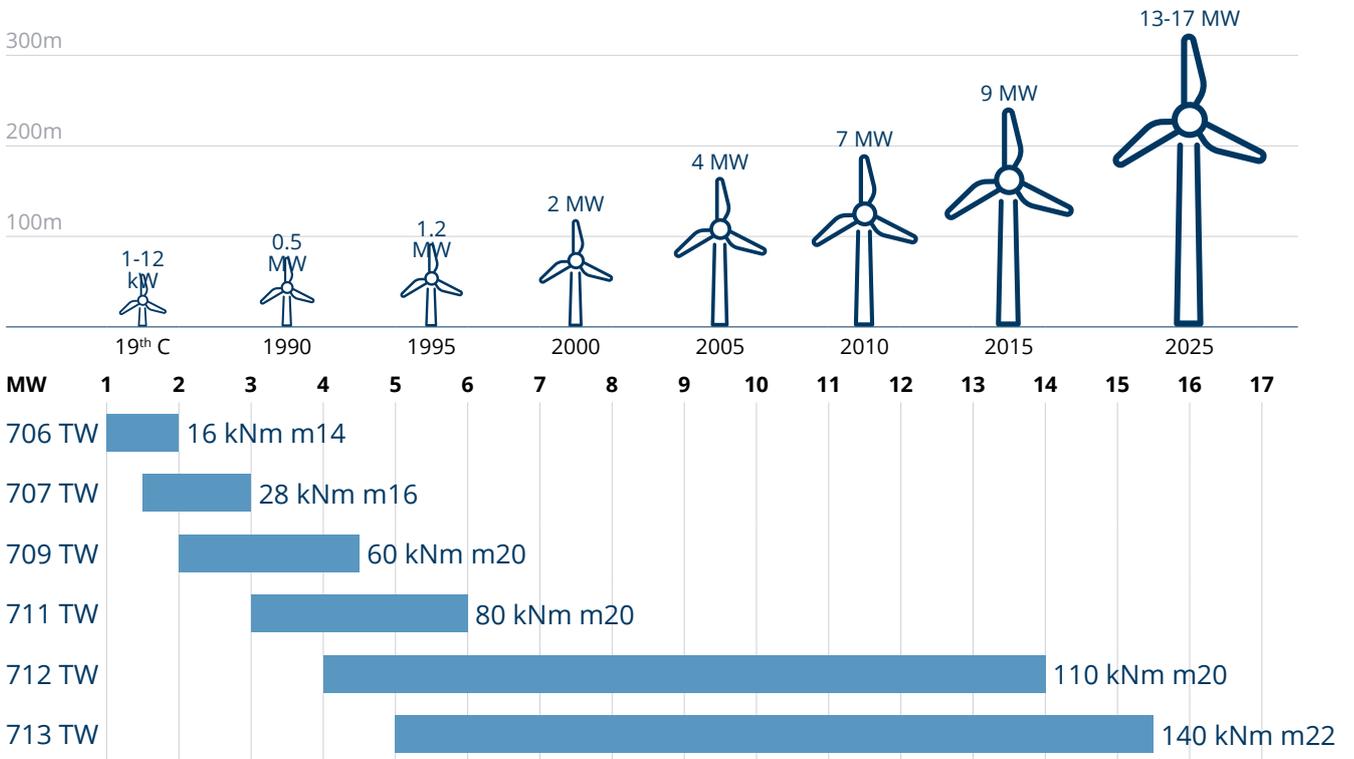
**707T3N + BN132 Series**  
Wind turbines up to 3 MW

**709T3N Series**  
Wind turbines up to 6 MW

#### INNOVATIVE SOLUTIONS



**711T3F + BMD200 Series**  
Wind turbines up to 16 MW



Typical application range, based on most common WTG architecture, special considerations may apply  
Contact Bonfiglioli for design / selection / dimensioning of pitch system

# YAW DRIVE

## TECHNICAL DATA

### STANDARD SOLUTIONS



**709T4F Series**  
Wind turbines up to 8 MW

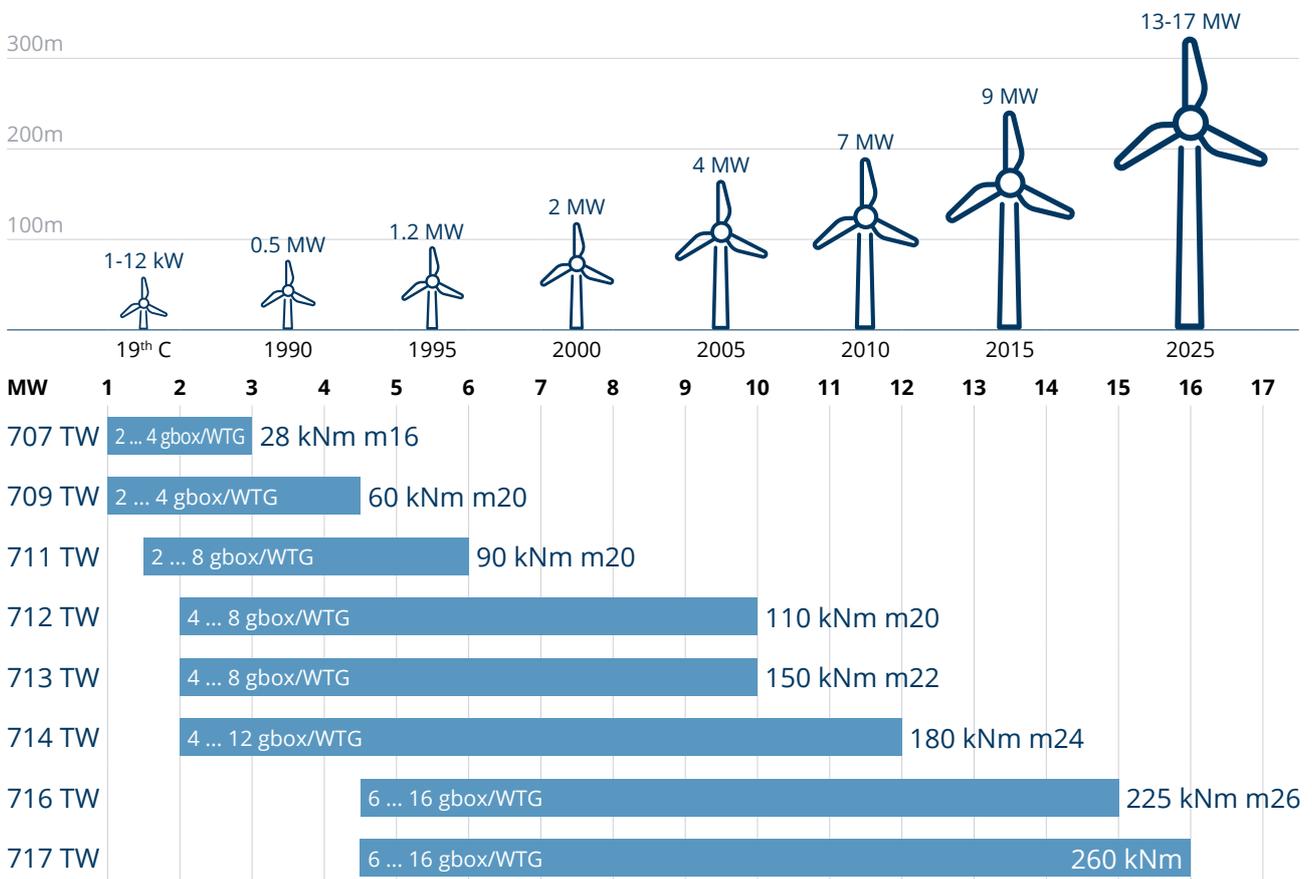


**714 T4F + BN132 Series**  
Wind turbines up to 12 MW

### INNOVATIVE SOLUTIONS



**716 T4F + BE 160 + DGM inverter**  
Wind turbines up to 16 MW



Typical application range, based on most common WTG architecture, special considerations may apply  
Contact Bonfiglioli for design / selection / dimensioning of pitch system



## ASYNCHRONOUS IE1/IE2/IE3 THREE PHASE MOTORS

The IEC normalized induction motors have been widely used in wind applications for many years. They share the same external design for all the efficiency classes formalized by global standards, this allows customers to switch easily to higher classes when needed for local regulations.

Additionally, they comply with the most common known international certification (UL, BIS, CSA) so they can be sold worldwide.

Many options are available like EM brakes or speed sensors which increase motor performance when driven by inverter.

## BN/M, BE/ME, BX/MX Series

### POLES

- 2, 4, 6

### TEMPERATURE SENSORS PTC

- PTC
- KTY84-130
- PT1000
- Bi-metallic

### FEEDBACK

- Incremental encoder
- Absolute encoder single/multi turn
- Sin/cos absolute encoder
- Resolver

### DEGREE OF PROTECTION

- Standard IP55
- Standard for brake motors IP54

### POWER SUPPLY

- @50 Hz: 230/400, 280/480, 400/690
- @60 Hz: 265/460, 280/480, 330/575, 380/660

### COOLING METHODS

- IC411 TEFNC

### MOTOR OPTIONS

- Independent forced cooling
- Tropicalization
- Anti-condensate heaters
- Up to IP65 protection
- Insulation class H
- Customized connector
- Feedback predisposition

### KEY BENEFITS

- Reduced operating cost
- Energy saving
- Complete solution (gearbox and motor)
- Control flexibility
- Flexibility
- Global motor

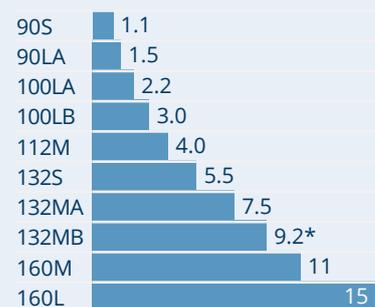
### KEY FEATURES

- Compact version
- Inverter duty ready
- Multiple-speed motors
- Certified motor (UL, CSA, BIS)

### EFFICIENCY CLASS

- BN > IE1
- BE > IE2
- BX > IE3

### POWER (kW)



Other sizes available.

\*160MA for BX

## SYNCHRONOUS SERVOMOTOR

BMD servomotors are permanent magnet synchronous motors with high torque density and compact dimensions. They meet the most stringent demands for dynamics and speed & position profiles thanks to low inertia and high overload torque even at zero speed. These features, along with the multi-turn encoder or resolver the motor is equipped with, allows for very high positioning precision. The motors are optimized for operation with frequency inverters and planetary gearboxes, offering an excellent synergy.



## BMD Series

### POLES

- 6, 8

### TEMPERATURE SENSORS PTC

- KTY84-130
- PT1000

### FEEDBACK

- Resolver
- Absolute encoders

### DEGREE OF PROTECTION

- Conformity Mounting options Brake types
- Standard IP55
- Standard for brake motors IP54

### POWER SUPPLY

230 ... 500Vac

### COOLING METHODS

- IC410 TENV
- IC416 TEFV

### MOTOR OPTIONS

- Independent forced cooling
- Tropicalization
- Anti-condensate heaters
- Up to IP65 protection
- Insulation class H
- Customized connector

### KEY BENEFITS

- Reduced operating cost
- Energy saving
- Complete solution (gearbox and motor)
- Control flexibility
- Flexibility
- Global motor
- High torque density
- Low rotor inertia
- High efficiency
- Torque control from zero speed

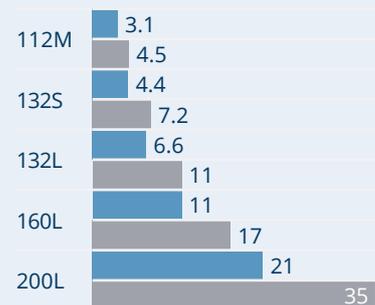
### KEY FEATURES

- Compact version
- Inverter duty

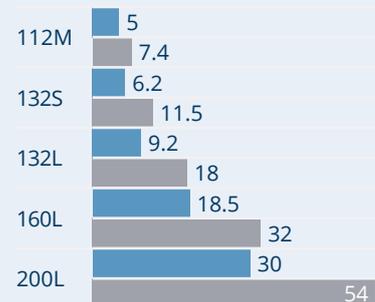
### EFFICIENCY CLASS

- IE4
- IE5

### POWER AT 1000RPM (kW)



### POWER AT 2000RPM (kW)



■ TENV  
■ TEFV



## PREMIUM DRIVE

The Bonfiglioli Active Cube (ACU) is a frequency inverter series offering both compactness and flexibility. This specific solution is adaptable on a wide range of applications, from high starting from high dynamic to heavy duty. The broad support for various field bus systems and the standardized interface for motion control applications make Active Cube an excellent jack of all trades for your application needs.

## Active Cube Series

### POWER RANGE

- 3 phase 400V mains: 0.25 - 400 kW
- 1 phase 230V mains: 0.25 - 3 kW
- 3 phase 230V mains: 0.25 – 9.2 kW

### OVERLOAD CAPACITY

- up to 150 % overload for 60 s
- up to 200 % overload for 1 s

### SWITCHING FREQUENCY

2, 4, 8, 12, 16 kHz

### ENCLOSURE

- IP20 (EN 60529)

### MOUNTING OPTIONS

- Cabinet mounting for all sizes
- Optional feed-through mounting
- Optional DIN rail mounting (size 1)
- Optional Cold-Plate (up to size 5)
- Optional liquid cooling (sizes 5 to 8)
- Vibration resilient mounting kit

### MOTOR CONTROL

(open loop or optional closed loop):

- Asynchronous AC motors
- Synchronous Reluctance motors
- Permanent magnet synchronous (brushless) motors

### HARDWARE FEATURES

- Integrated Safe Torque Off function (STO Sil 3 / PL e)
- DC-link connection
- Integrated brake chopper transistor
- Plug-in power terminals (up to size 2)
- Plug-in and programmable control terminals
- Standard HTL encoder Interface
- 6 digital inputs, 1 multifunction input,
- 1 digital output, 1 multifunction output,
- 1 relay output (changeover contact)
- External DC 24 V supply input
- DC 24 V / DC 10 V supply output
- Jumper to switch easily between TN mains and IT mains (up to size 6)

### SOFTWARE FEATURES

- Position, Speed or Torque Control
- Table Positioning Function
- CiA402 Motion Control
- Electronic gear function
- Power failure management
- Motor supervision functions (Temperature, I<sub>2t</sub>, Software Motor switch, Encoder supervision, )
- Programmable S curve
- 4 programmable data sets
- PID controller
- Jerk-free torque/speed changeover

### COMMUNICATION MODULES

- Different interface options, such as RS232, RS485, MODBUS, DeviceNet, CANopen, EtherCAT, PROFIBUS, PROFINET, Ethernet IP

### EXPANSION MODULES

- Expansion of analog, digital inputs and outputs or encoder Interfaces: TTL, Resolver, SinCos, Hiperface, EnDat 2.1, EnDat 2.2, SSI

### OPTIONS

- Commissioning and Diagnosis via optional keypad with copy function
- Remote Access Module with the connection interface to a PC
- Software tool VPlus for the commissioning, operation and monitoring available as Windows-PC-GUI

*Accessories such as brake resistor, line chokes and EMC filters available.*

## HIGH PERFORMANCE FREQUENCY INVERTER

Bonfiglioli AxiaVert (AXV) series is designed to allow great flexibility and top-level performance, making it suitable for a wide range of applications. Thanks to its modular system, the AxiaVert series offers optional encoder evaluation and open communication protocols complying with industry 4.0 standards with an intuitive GU for commissioning and monitoring. For integration in functional safety environments, the AxiaVert series offers integrated Functional Safety Features, organized into different variants, which can be selected to best suit the application's requirements, optimizing price and performance to match the machine functions



## AxiaVert Series

### POWER RANGE

- 3 phase 400V mains: 0.25 - 15 kW
- 1 phase 230V mains: 0.25 - 3 kW
- 3 phase 230V mains: 0.25 – 9.2 kW

### OVERLOAD CAPACITY

- up to 150 % overload for 60 s
- up to 200 % overload for 3 s

### SWITCHING FREQUENCY

- 2, 4, 8, 12, 16 kHz

### ENCLOSURE

- IP20 (EN 60529)

### MOUNTING OPTIONS

- Cabinet mounting for all sizes
- Optional feed-through mounting
- Optional DIN rail mounting
- Optional Cold-Plate
- Vibration resilient mounting kit

### MOTOR CONTROL

(open loop or optional closed loop):

- Asynchronous AC motors
- Synchronous Reluctance motors
- Permanent magnet synchronous (brushless) motors

### HARDWARE FEATURES

- Functional Safety Modules
- Basic FS, Standard FS, Motion FS
- DC-link connection
- Integrated brake chopper transistor
- Brake control output (DC 24 V / 3 A)
- Plug-in power terminals
- Plug-in and programmable control terminals
- Standard HTL encoder Interface
- 5 digital inputs, 1 digital input/output,
- 1 multifunction input, 1 analogue output, 1 analogue input, 1 relay output (changeover contact)
- DC 24 V input (double pin connector for easy wiring)
- DC 24 V output
- Jumper to switch easily between TN mains and IT mains

### SOFTWARE FEATURES

- Support for FSoE and Functional Safety encoders
- Industry 4.0 / IIoT ready
- CiA402 Motion Control
- Electronic gear function
- Power failure management
- Motor supervision functions (Temperature, I<sub>2t</sub>, Software Motor switch, Encoder supervision, )
- Position, Speed or Torque Control
- Programmable S curve
- 4 programmable data sets
- PID controller
- Jerk-free torque/speed changeover

### COMMUNICATION MODULES

- Different fieldbus options, such as CANopen, EtherCAT, PROFIBUS, PROFINET, Ethernet TCP/IP

### EXPANSION MODULES

- Modular capability by two optional expansion modules
- Encoder Interfaces: TTL, Resolver, SinCos, Hiperface, Hiperface DSL, EnDat 2.1, EnDat 2.2, SSI

### OPTIONS

- Commissioning and Diagnosis via optional graphical keypad with MMC slot and USB-C port
- Remote Access Module with the connection to a PC or a mobile phone via Bluetooth
- AxiaManager engineering software for the planning, commissioning, operation and monitoring available as Windows-PC-GUI and Mobile APP

*Accessories such as brake resistor, line chokes and EMC filters available.*



## DECENTRALIZED INVERTER

Bonfiglioli's experience brings you DGM - the new range of decentralized inverters for asynchronous motor control. DGM is supplied with the gearmotor, for onboard assembly. The mechanical assembly, wiring and basic programming are performed by Bonfiglioli, thus reducing installation times and operations required and limiting the risk of errors to a minimum. Design and installation are faster compared to inverters installed in centralized switchboards.

## DGM Series

### ENCLOSURE

- IP65

### OVERLOAD CAPACITY

- 150% for 60s
- 200% for 3s

### CONTROL

- Sensorless Vector Control.
- PID operation with automatic speed control.
- Automatic starting torque optimization
- Configurable operation with typical quadratic curve
- Motor-potentiometer function
- Configurable quick restart

### SAFETY AND PROTECTION

- STO operating safety option embedded PLC
- Motor protection I2t function
- Locked shaft control
- Start error assessment
- Motor current limitation based on the settings
- Embedded EMC filter in all versions

### OPTIONS

- Brake chopper & resistors
- Closed loop control
- Fieldbus (6 different options)

### PROGRAMMING

- Cover embedded MMI option
- Cover embedded Foil Keypad option
- Wide range of configuration options, also thanks to the embedded PLC

### KEY BENEFITS

- Application switchboard volume and cooling system reduction
- Streamlined and simpler plant design.
- Plant extensibility not affected by switchboard capacity.
- No expensive shielded power cables required (otherwise necessary to meet the EMC standards).

### KEY FEATURES

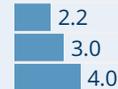
- Sensorless Vector control operation
- Configurable operation with typical quadratic curve
- Motor-potentiometer function
- PID operation with automatic speed control

## POWER (kW)

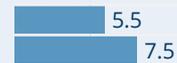
### DGM size A



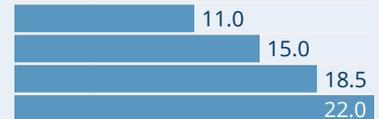
### DGM size B



### DGM size C



### DGM size D



## SYNCHRONOUS RELUCTANCE MOTOR

The reluctance motor guarantees a sustainable ecological solution which decreases the total environmental impact thanks to the absence of magnets and increased efficiency. Reduced operating costs allow a fast return. This product benefits from the proven simplicity and reliability of induction motors and the higher efficiency of synchronous motors.



## BSR Series

### SIZES

- High efficiency package  
71C ... 132 MB
- High output package  
71C ... 132 MB

### RATED MOTOR POWER

- High efficiency package  
0.37 ... 9.2 kW
- High output package  
0.55 ... 18.5 kW

### POWER SUPPLY

- 400 Vac

### DEGREE OF PROTECTION

- Standard IP55
- IP56 (optional)

### MOTOR CUSTOMIZATIONS

- Independent forced cooling
- Tropicalization
- Anti-condensate heaters
- Up to IP65 protection
- Insulation class H
- Customized connector
- Feedback predisposition

### EFFICIENCY CLASS

- BSR ... E --> IE4
- BSR ... O --> IE3 / IE4

### MAIN OPTIONS

- Thermal protection
- Silicon sensor KTY 84-130
- Thermistor PTC 150
- Platinum sensor PT1000
- Forced ventilation

### KEY FEATURES

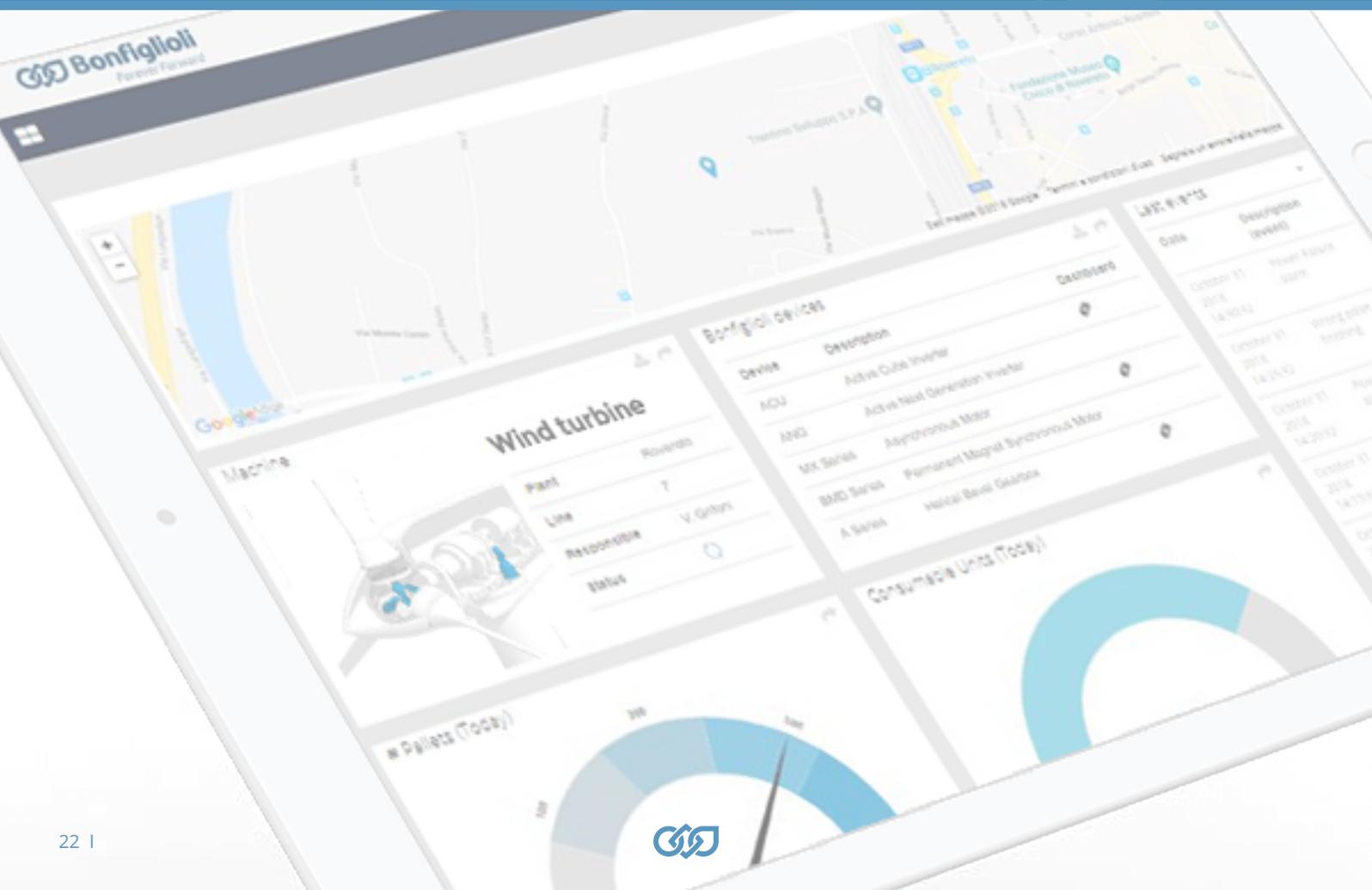
- Highly accurate sensorless control technology
- Compact, economical & eco-friendly
- High dynamic response
- Energy savings
- High reliability
- High performance solution

*Both Bonfiglioli packages are IES2 according to the International Efficiency of Systems (IES) classification for the drive and motor combination (IEC 61800-9-2).*

# INNOVATIVE SOLUTIONS

## BONFIGLIOLI CONDITION MONITORING SYSTEM

Bonfiglioli provides an IOT range that includes sensors on the gearbox and motor and an edge computer capable of conveying data and information to the customer's and/or Bonfiglioli's cloud, when a wireless connection is available. All the information relating to the RUL (Residual Useful Life), the operating conditions of the main product components and any malfunctioning is obtained through algorithms that take into account fundamental aspects such as speed, temperature, relative humidity, operating torque and operating vibrations along the entire spectrum of frequencies. This allows the operating conditions of critical components to be constantly monitored in real time and to prevent unexpected downtimes by optimizing maintenance interventions, particularly relevant for offshore wind applications where early fault detection is critical.



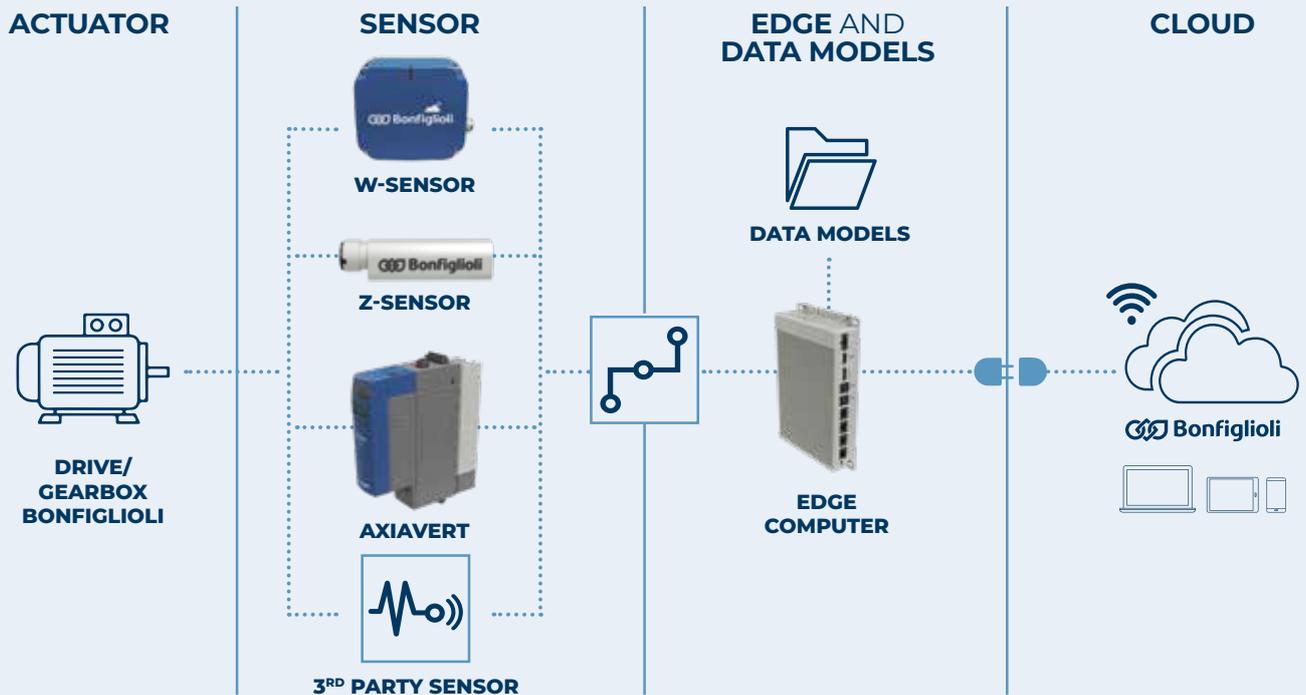
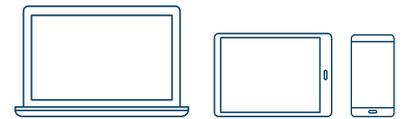
## BONFIGLIOLI AI ALGORITHMS



**PREDICTIVE MAINTENANCE**

**DYNAMIC LIFECYCLE MONITORING**

**DEVICE HEALTH ASSESSEMENT**



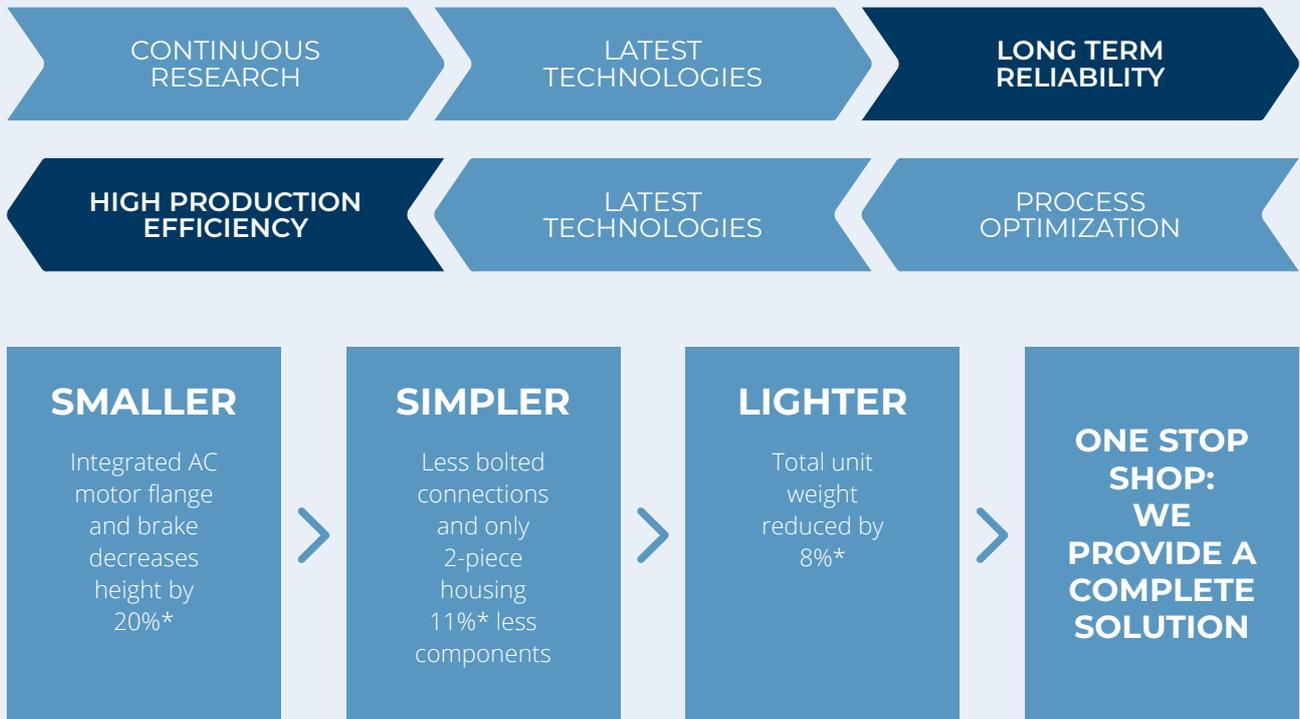
# OUR GOAL: LCOE REDUCTION

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Bonfiglioli brings an active contributes actively to reducing LCOE. Our team of experts creates, designs and produces advanced solutions to deliver tailor-made solutions, predominantly led by a constant focus on LCOE reduction from both a direct and indirect standpoint.

## HOW DO WE LOWER DIRECT COSTS?

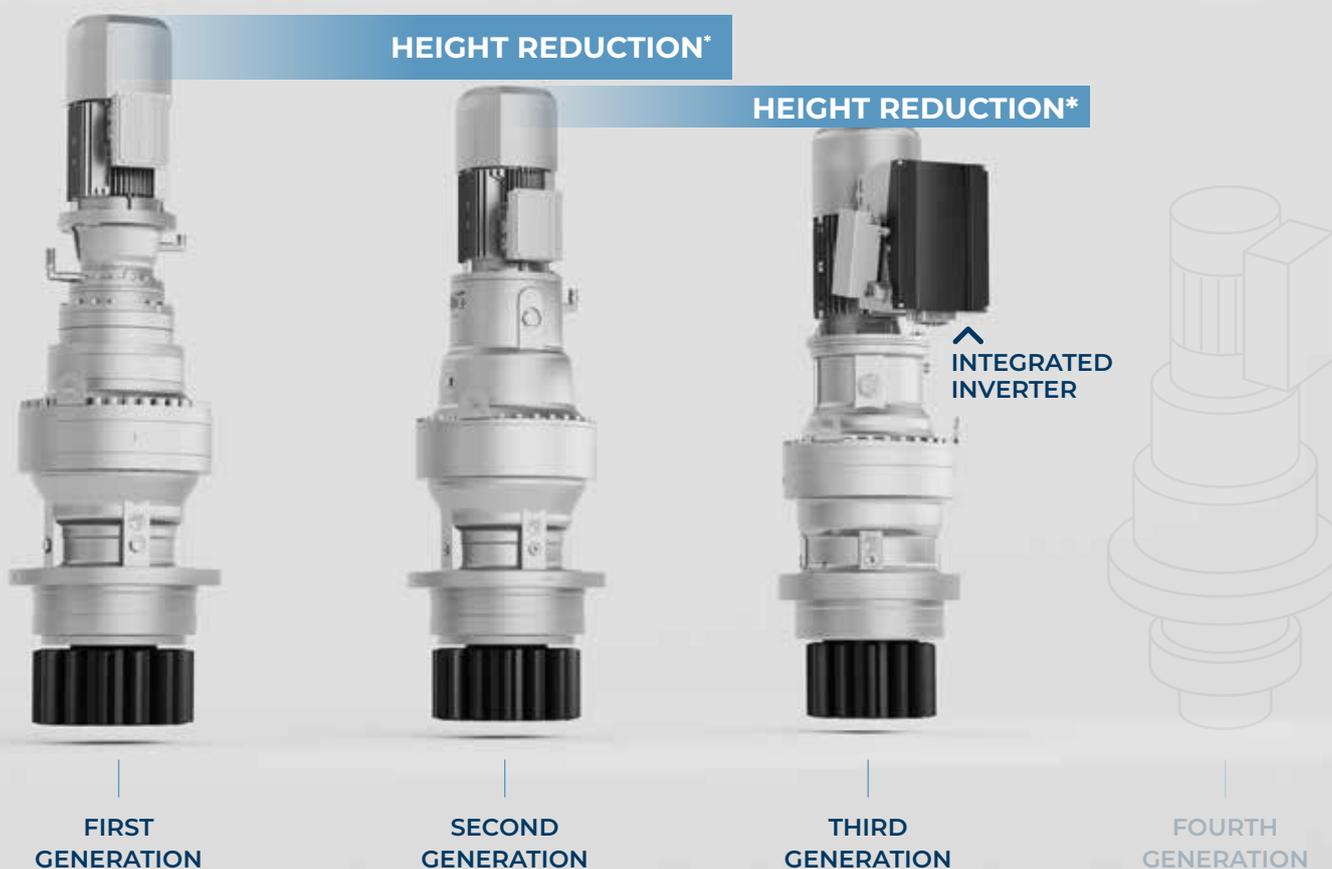
Bonfiglioli products are cost efficient by design



\* Measures vary depending on gearbox size

## HOW DO WE LOWER INDIRECT COSTS?

Indirect LCOE reduction is achieved through an evolving condition monitoring system that enables customers to maximize productivity and return on investment. Product reliability is undoubtedly an important parameter, but so is the ability to constantly check the health of the system and to plan maintenance operations. Bonfiglioli provides an IOT range that includes sensors on the gearbox and motor and an edge computer capable of conveying data and information to the customer's and/or Bonfiglioli's cloud, when a wireless connection is available.





## YAW & PITCH DRIVES WITH TORQUE LIMITER

For both Yaw and Pitch drive applications, Bonfiglioli has created a torque limiter which significantly reduces downtime in the case of stopping the transmission of wind turbines when peak torque has been reached and also reduces maintenance costs.

### 700TW Series

#### RATED TORQUE RANGE

- 2,500 ... 150,000 Nm

#### PEAK TORQUE RANGE

- 4,500 ... 400,000 Nm

#### REDUCTION RATIOS

- 1:60 ... 3,000

#### GEARBOX CONFIGURATION

- Flange mounted
- Output shaft: with integral pinion (type: F, N, U)
- Rugged design
- High torque capacity
- Output shafts supported by high load capacity bearings

#### APPLICABLE AC MOTORS

- Compact motors and brake motors M/ME series
- IEC motors and brake motors BN/BE series

#### MAIN BRAKE MOTOR FEATURES

- DC and AC brake

#### MAIN BRAKE FEATURES

- AC/DC rectifier
- Double disc brake
- Microswitch
- Thermal sensors

#### KEY FEATURES OF TORQUE LIMITER

- External to gearbox\* for fast and easy replacement - no longer necessary to replace the entire gearbox
- Limits torque peak to avoid failure
- Shuts down gearbox if torque limit is reached
- Fully interchangeable with older gearboxes - can be included in replacement drives for greater long-term reliability and reduced costs

(\*) The torque limiter is located inside an easily removable and replaceable cartridge, which is integrated into a worm gear. It is only possible in a right angle solution.

The indicated data are for reference only; please contact Bonfiglioli for more detailed information.

# OUR PROJECTION INTO THE FUTURE

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MORE THAN 250 EMPLOYEES AROUND THE WORLD ARE INVOLVED IN THE GROUP'S R&D ACTIVITIES.

## DESIGN SIMULATION

Bonfiglioli has the most advanced **virtual simulation techniques** that allow to speed up the validation process, thus reducing time to market and providing customers with optimized and efficient solutions.



## TEST LABORATORIES

In our R&D department we **research, develop, validate and certify** all the products and solutions which are engineered and manufactured in our plants across the world.



## CO-ENGINEERING

At Bonfiglioli we **work close to our customers to satisfy all their needs** and requirements with a true tailormade solution.



# OUR CONSTANT AMBITION

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QUALITY, HEALTH, SAFETY, ENVIRONMENT & ENERGY

## QUALITY: WE CARE ABOUT OUR CUSTOMERS

Our team is wholly dedicated to continuous improvement in the quality, safety, environmental and energy spheres throughout the entire value chain, from the smallest supplier to the end client. Bonfiglioli is committed to achieving the highest quality standards, and our products are intended to generate value for our customers while respecting both people and the environment. We design, manufacture and supply effective products and services that set a benchmark for quality in the industry.

Bonfiglioli management systems are certified ISO 9001: 2015, ISO 14001: 2015, ISO 45001: 2018 and ISO 50001:2018, while our products are covered by 7 international certifications. Responsibility, excellence and continuous improvement are the basic elements that make us the favored partner of our clients and suppliers.

## HEALTH & SAFETY: SUSTAINABILITY STARTS WITH SAFETY

Prevention of accidents and incidents is a key element of our company's sustainability strategy and an integral part of each one of our business processes. The successful management of risks is essential for protecting our employees and assets, thereby strengthening their contributions.

## ENVIRONMENT & ENERGY: RESPECT THE PRESENT TO BUILD THE FUTURE

At Bonfiglioli, we believe that respect for the present and the adoption of environmental protection and energy efficiency policies are essential if we are to enjoy a better future.

# OUR GLOBAL PRESENCE

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Thanks to an international network of closely interconnected commercial and production sites, we can guarantee the same high standards of Bonfiglioli quality anywhere at any given time. We know that our direct presence in local markets is the key to long-lasting success, so our family includes 20 production sites, 26 commercial sites and more than 550 distributors around the world.

Our organization is always close by, offering complete and efficient solutions and supporting our customers with dedicated services, co-engineering and after-sales assistance.



**20**  
PRODUCTION SITES

**26**  
COMMERCIAL SITES

**80**  
COUNTRIES

**550**  
DISTRIBUTORS

**~4,800**  
PEOPLE

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We have a relentless commitment to excellence, innovation & sustainability. Our team creates, distributes and services world-class power transmission & drive solutions to keep the world in motion.

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