



AxiaVert Series

Premium frequency
inverters



PRODUCTS &
SOLUTIONS

AxiaVert series

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 integrated Functional Safety, optional encoder evaluation (including digital encoders like Hiperface DSL and EnDat 2.2) and open communication protocols complying with Industry 4.0 standards and an intuitive GUI for commissioning and monitoring.

The series include:

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



Applications

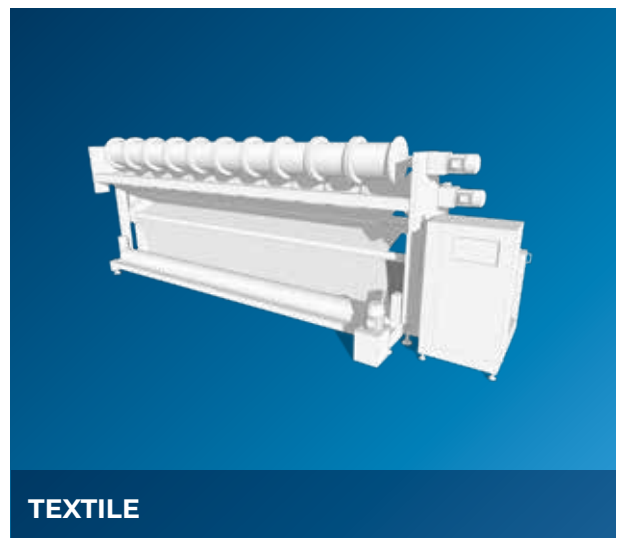
The highly flexible and modular automation system for a wide spectrum of applications

Whether in material working, logistics, automated storage, packaging or textile the frequency inverters of the AxiaVert series are **optimized for numerous applications**.

Thanks to its **modular structure**, the system can be **flexibly adapted** to meet highly diversified requirements. Machine designs are allowed great freedom in the selection of hardware modules and accessories, together with fully customizable software functionalities.

In addition, the AxiaVert series is characterized by **great process versatility** thanks to high compatibility with a wide range of motors (asynchronous, permanent magnet synchronous, synchronous reluctance) and the possibility to select reliable embedded motion and control features, making the drive optimal for many different applications.

Our offer expands far beyond standard, providing the **right solutions tailored to the most demanding customers' requirements**.



AxiaVert key features and benefits

The top-level Functional Safety, high control performance, IIoT-ready solution for a wide spectrum of applications

In order to be able to respond to the specific requirements of applications across sectors and to different degrees of complexity, the AxiaVert series offers a complete set of modular and flexible features and functionalities:



Flexible communication protocols complying with automation and Industry 4.0 standards

Smooth integration into automation networks thanks to the **compatibility with a wide range of fieldbus protocols and machine controllers**.

Dedicated communication and monitoring functions fostering the **optimization of production** and **increasing the efficiency** of the entire applications in accordance with Industry 4.0 standards.



Wide range of advanced integrated Functional Safety capabilities

The **different Functional Safety variants** allow selecting the most suitable variant in terms of costs and performance to match the functions actually needed. This approach **optimizes the configuration**, reduces the need for external safety components and installation space while ensuring a **safe and controlled operation** of all kind of applications, minimizing hazardous states, and hence damage to persons, property and environment.



High accuracy in Speed, Position and Torque control with or without encoder feedback

The smooth and accurate motion control for **open and closed loop applications** maximizes the machine efficiency and productivity. Therefore, manufacturing capabilities are expanded **for a wide range of motion requirements**, including high speed motors, multi-feedback and multi-motor applications.



Wide range of option modules, IEC 61131-3 PLC programming

Thanks to its **modular structure**, the system can be flexibly adapted to meet many different application requirements by selecting the suitable hardware modules and accessories, combining the embedded standard software functionalities and **customizing furthermore the operational behavior as needed, through user-level PLC software programmability**.



Integrated device and application monitoring

Diagnostics, alarm management, predictive maintenance on the motion chain components and at machine level, allowing:

- reduction in maintenance costs
- reduction in machine failures and downtime
- lower stock of spare parts
- longer service life of parts
- increased efficiency and productivity
- improved operator safety



Supported control of wide range of motor types with high value motion and control features

Great process versatility thanks to **high compatibility with a wide range of motors** (asynchronous, permanent magnet synchronous, synchronous reluctance) and the possibility to select **reliable embedded motion and control features**, making the drive optimal for many different applications.



Graphical user interface for PC and mobile devices, wired and wireless connectivity (USB, Bluetooth), graphical keypad

High-end user experience thanks to user friendly graphic interfaces, allowing the **guided start up, commissioning and tuning** of the inverter, the motion chain components and the application, **in both online and offline mode**, also in wireless and mobile connection. Performance monitoring, optimization and servicing also from remote. High level of security and simplicity in device management thanks to the availability of different access levels and user profiles.

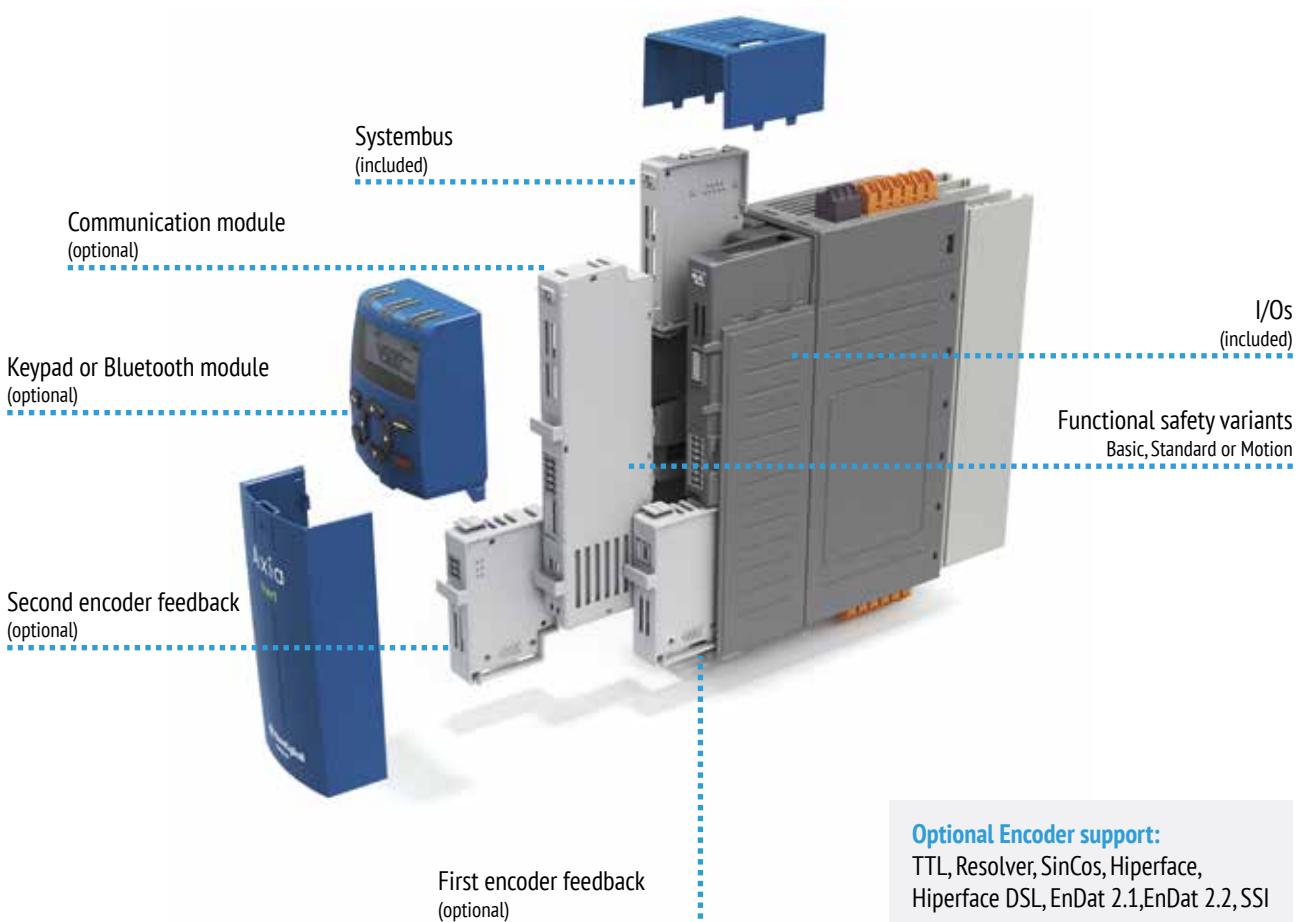
Modular system (options overview)

Great modularity to allow high flexibility for a wide range of applications.

Thanks to its modular structure, the system can be flexibly adapted to meet many different application requirements by selecting among the suitable hardware modules, variants and accessories:

- **Different frame sizes** and **electrical power sizes** for different mains voltages
- **Different mounting variants** and options allow optimum mechanical designs for the electrical cabinet and cooling concepts (Wall mounting with Air Cooling, Feed-Through mounting, ColdPlate and Vibration resilient mounting kit for Air Cooling devices)
- **Different Functional Safety variants** (Basic, Standard or Motion) allow price and performance fitting selections
- **Variant with integrated PLC** for freely programmable application adjustments
- **Optional Keypad* Module** with USB-C compatible connector for PC connection
- **Optional Bluetooth* Module** for connection to PC or mobile phone
- **Optional Fieldbus Communication module**
- **Optional First Encoder module**
- **Optional Second Encoder module**
- **Accessories** to select from like mains chokes, filters, brake resistors
- **Optional Cable sets** for connection to BMD motors

(*) Keypad and Bluetooth Module cannot be used at the same time



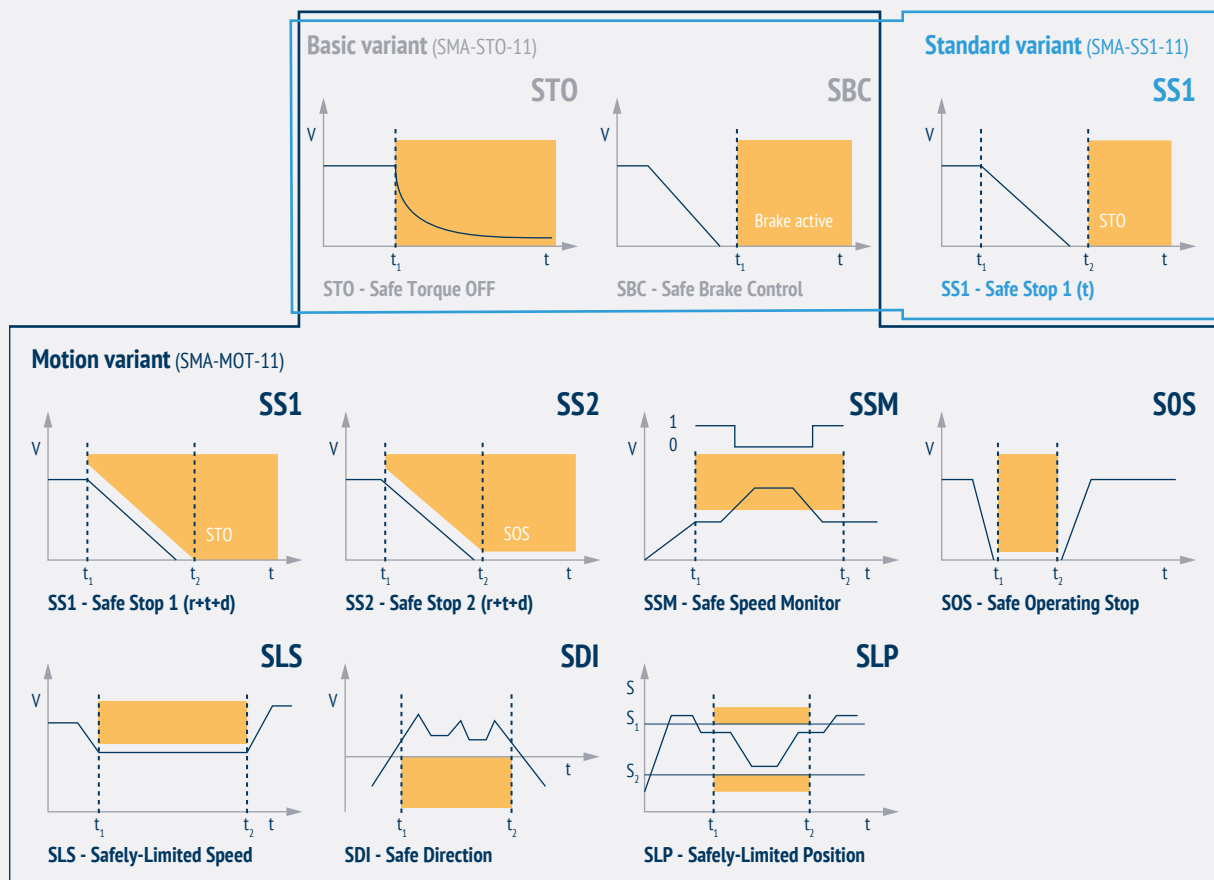
AxiaVert Functional Safety

Different integrated Functional Safety variants to suit every applications' requirements

The AxiaVert series offers integrated Functional Safety according to SIL 3 (EN 61508) and PL e (EN 13849-1), 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 Functional Safety variants

SAFETY OVER
EtherCAT



The **Basic variant** (SMA-STO-11) includes Safe Torque Off (STO) and Safe Brake Control (SBC), while the **Standard variant** (SMA-SS1-11) introduces also SS1-t (Safe Stop 1 with time monitoring) reducing the necessity for an external Functional Safety switch.

The **Motion variant** (SMA-MOT-11) adds optional advanced Functional Safety features typically required in motion application according to ISO13849-1 PLe/Cat.4 and IEC61508 SIL3, product standard 61800-5-2. Among these, the functions connected with speed SLS, SLS-SL and SSM are available both sensorless and in closed loop, with the possibility to dynamically set several different safe speed thresholds directly via safety fieldbus. These additional sensorless speed supervision features comply with SIL 2 (EN 61508) and PL d (EN 13849-1). The closed loop safety functionalities are made available with Hiperface DSL safety encoder. The FSoE (Fail Safe over EtherCAT) included in the Motion variant allows, in combination with the EtherCAT communication module, the easy integration into Functional Safety communication environments.

The AxiaVert series also offers cost effective product configurations without any Functional Safety features.

AxiaVert Connectivity

Communication and Industry 4.0 readiness

The advanced digital and open communication protocols complying with automation and Industry 4.0 standards allow a **smooth integration into automation networks** thanks to the compatibility with a **wide range of fieldbus protocols** and the possibility to extend the AxiaVert series with the OPC-UA protocol.

Communication encryption is embedded by design in the AxiaVert to ensure **secure communication**.

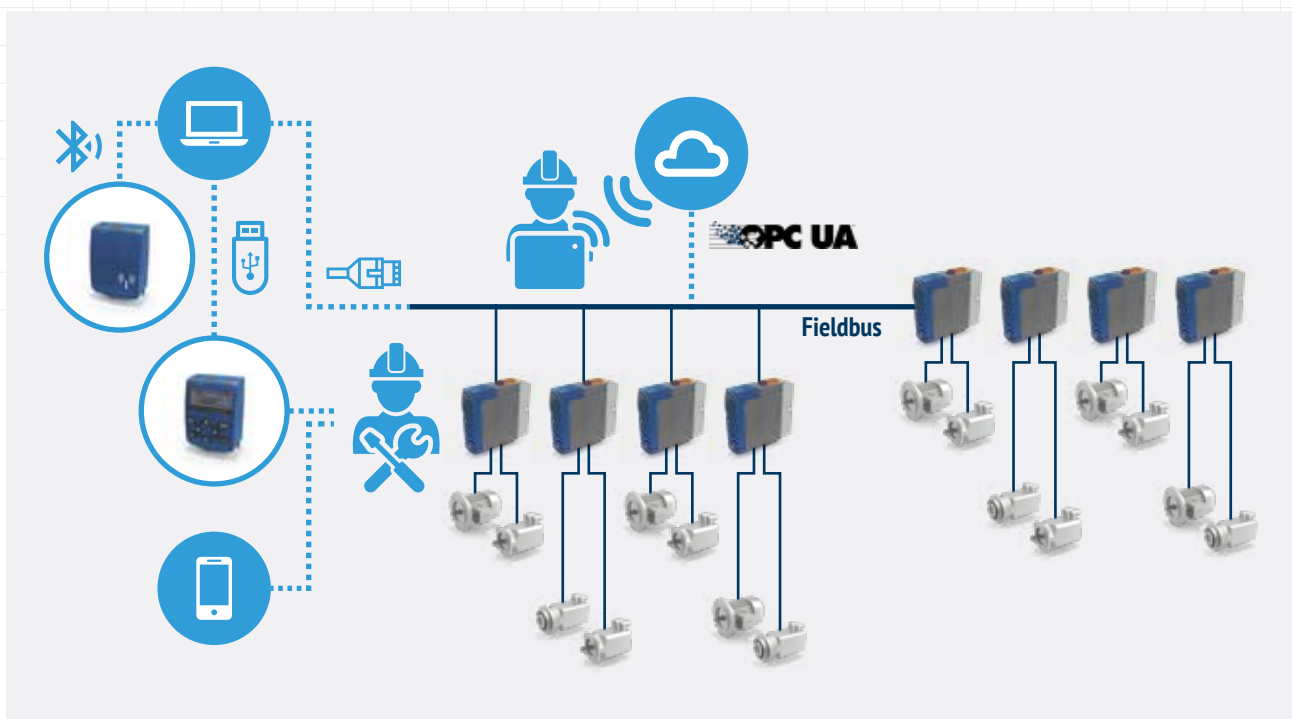
Thanks to the embedded resources and communication capabilities, it is possible to gather and elaborate data regarding **the device status and energy monitoring** which are subsequently processed through **statistical analysis** for real time **diagnostics**, alarm management, **predictive maintenance** on the motion chain components and at machine level, allowing:

- reduction in maintenance costs
- reduction in machine failures and downtime
- lower stock of spare parts
- longer service life of parts
- increased efficiency and productivity
- improved operator safety

Commissioning and monitoring made easy

The AxiaVert series offers **different options for tuning and diagnostic**:

- a **mobile App**, available for iOS with Bluetooth connection
- a **keypad** with USB-C compatible connection and MMC to store inverter files that can be exchanged with another AxiaVert inverter or a PC
- a **PC GUI** with cable bound (USB or Ethernet) or Bluetooth connection
- The **OPC-UA protocol** allows the exchange of parameter sets between users and inverters and an easy access to cloud-based information about inverters and applications from anywhere via an online connection, useful also for condition monitoring.

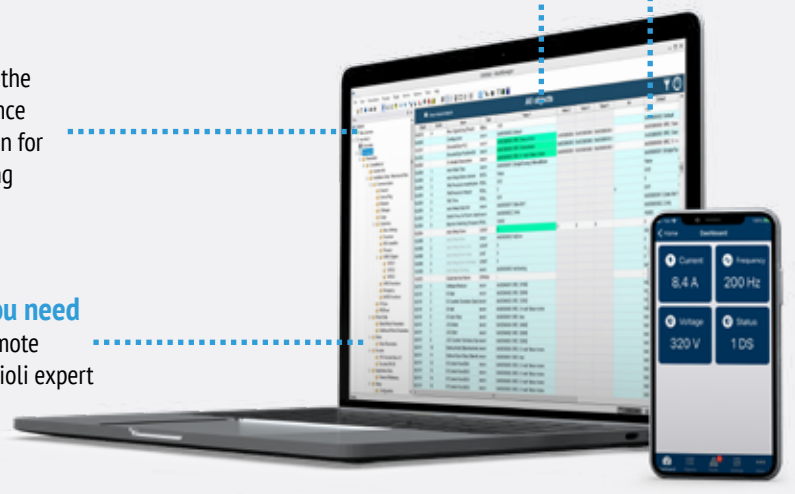


AxiaManager

AxiaManager is the **engineering software** for **the planning, commissioning, operation and monitoring** of the AxiaVert inverters series, providing a range of practical tools to manage the resources of your AxiaVert inverter completely and efficiently.

AxiaManager is available as a **Windows PC GUI** and as a **mobile App** for an instant access to the drive status and configuration with a **simplified user interface**.

Characterized by a **top-level user experience** and available in Simple and Advanced mode, it offers **optimized workflows** for both occasional and professional users, ensuring marked savings in terms of time and costs thanks to **accelerating engineering**. In addition, users can count on the support from a Bonfiglioli expert from the phase of commissioning to troubleshooting thanks to the **online remote support** function.



Save time thanks to the top-level user experience and intuitive navigation for accelerated engineering

Get the support you need thanks to real-time remote support from a Bonfiglioli expert

Increase efficiency by developing optimized, integrated solutions

Reduce complexity thanks to a unique tool for planning, commissioning, tuning and monitoring your automation projects

AxiaVert Specifications (features always onboard)

The following specifications are always included for each size and power range

Mechanical & Electrical

- **Compact** book shape **design** for easy integration in electrical cabinets
- **Plug in control terminals** for easy and fast connection
- **Plug in power terminals** in frame sizes 1 to 4
- **DC link bus** for “energy sharing” in multidrive system architectures
- Integrated **brake transistor** for **brake resistor connection** on all sizes by default
- Integral **EMI filters** (EN 61800-3) up to 9.2 kW

Automation

- **Freely programmable** and pre-setup **I/O's**
- **HTL encoder evaluation** via I/O's
- Freely programmable **Relay output**
- Dedicated **Brake Control** connector
- **External DC 24V supply input** for control board supply from backup systems with easy daisy chaining connector
- **Deactivation** and **Reactivation of internal EMC** filters (in example for operations in IT mains) with a jumper bridge
- Proprietary **Systembus** for easy integration of electronic gear applications

Motor Control

- Vector Control of **asynchronous** motors, **synchronous** motors and **synchronous reluctance** motors (all with or without encoder feedback)
- V/f Control of **asynchronous** motors
- **Preset values** for Bonfiglioli motors to reduce commissioning times
- **Auto-tuning** for advanced motor parameters
- **Auto-tuning** for angle determination (Resolver or absolute encoder) for Synchronous motors
- **Motor thermal evaluation**

Modularity

- Up to **2 optional encoder modules** for speed & positioning control
- Optional **Fieldbus communication** (EtherCAT, PROFINET and other)
- Optional **Keypad** or **Bluetooth module**

Application Control

- **Motor chopper** function to increase braking power without brake resistors
- **4 independent data sets**
- **Flying restart**
- **Spindle control** with tool change positioning
- **Electronic gear** with optional phasing
- **PID control** in example for process controlling
- **Intelligent current limits**
- **Configurable power failure management** for controlled ramping down

Motion Control Interface

- **Configurable high speed control loops** for position control and speed control
- **Motion control interface** with **CiA402** support for easy integration with external PLC including CSP mode
- **S-ramps** selection with separate adjustable acceleration/deceleration and jerk limitation

Monitoring & Diagnosis

- Up to **6 LEDs** for signaling **device status**, fieldbus status and Functional Safety status
- Adjustable **motor protection** functions
- **Overload protection** and **automatic best switching frequency** adjustment
- **Phase monitoring** (motor and mains)
- **Encoder monitoring**
- **Mean and peak values storage**
- **Fault register** (application and device)

User Interface

- Optional Extension with optional **keypad, PC connection** (wireless, USB-C compatible or Ethernet) or **mobile App** (wireless)
- **User management** (different access levels for parameterization)

Secure Communication

- **Secure Communication** by design with TLS encryption and Authentication management for user interactions via local, remote and IIoT connectivity

Global Presence



Bonfiglioli is a market force with a presence spanning 22 countries on 5 continents. Our organization makes the most of geographic proximity to offer complete solutions combining efficiency and competence.



4000
EMPLOYEES



20
BRANCHES



15
PLANTS



550
DISTRIBUTORS



80
COUNTRIES

We Are a Global Company

Thanks to an international network of sales branches and closely interconnecting production plants, we can guarantee the same high standards of Bonfiglioli quality anywhere at any given time. Aware that our direct presence in local markets is the key to long-lasting success, our family includes 20 sales branches, 15 production plants and more than 500 distributors around the world.

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



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 PRODUCTION

 ASSEMBLY

 SALES

 SERVICE



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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