



One step ahead on the future

Robotics: J-Actuators

AW-J14 | AW-J17 | AW-J20 | AW-J25 | AW-J32



AW J-Actuators

AutomationWare

Introducing the Robotics Joints: AW J-Actuators

In these years we have seen the constant expansion of new generation of Robotics.

Evolutions in mechatronic components must take into account new trends in terms of improving precision, safety, therefore operational performance in terms of load and speed, but above all easy programmability and management.

J-Actuators are a series of **Robotic Joints**, that will allow any **Robot** or **Cobot System Integrator** in producing modular robotic solutions based on applications.



Count on AutomationWare Robotics for innovation that helps improve your productivity

We know that no two motion control challenges are alike.

We develop each mechatronic solution with the latest advanced technologies for your project's specific application requirements.

Using miniature precision sensors and direct drive motors, we push the boundaries to deliver unparalleled results—again and again.

Uniquely optimized form factors, precise and dynamic performance, quality, reliability, and ease of installation are the hallmarks of everything we design and build.



Technology to evolve applications

The possibility of large pairs of movement, absolute precision, sensors for detecting the torque of the system's load of vibrations with redundancy to obtain operating safety in all conditions, make this device unique for a series of applications:

- **Robotics composition** – Robotics arms – Collaborative Robots arms – Legged Robots
- **Machine tools** – multiple axis management for CNC machining – 3+ Axis loading Arms
- **Punching or laser cutting machines** applications
- **Hygienic Analytical**, Pharma, Genetical, Clinical accurate scan analysis
- **Air Space and defence** – High torque devices rotation (*Antennas, Radar, Lasers Scanning, Mirrows*)
- **Semiconductors handling** and matrix process



MAIN SPECIFICATIONS

J-Actuators	AW-J17	AW-J20	AW-J25	AW-J32	AW-J40
Total Power	154 W	270 W	470 W	470 W	570 W
Gearbox ratio	from 80-100-120	from 80-100-120	from 80-100-120	from 80-100-120	from 100-120-160
Rated Torque	51 Nm	64 Nm	140 Nm	281 Nm	586 Nm
Peak torque	70 Nm	107 Nm	204 Nm	459 Nm	802 Nm
Motor max Speed	4000	3500	2500	2500	2000
Diameter	94 mm	104 mm	128 mm	154 mm	154 mm
Length	170 mm	170 mm	186 mm	210 mm	210 mm
Hollow shaft diameter	14 mm	16 mm	20 mm	24 mm	24 mm
Voltage	48 V 24 V	48 V 24 V	48 V 24 V	48 V 24 V	48 V 24 V
Work conditions	0 °C to +35 °	0 °C to +35 °	0 °C to +35 °	0 °C to +35 °	0 °C to +35 °
Interface	EtherCat Safe	EtherCat Safe	EtherCat Safe	EtherCat Safe	EtherCat Safe
API	ROS Platform	ROS Platform	ROS Platform	ROS Platform	ROS Platform
Encoder	2x20 bit, magnetic ABS	2x20 bit, magnetic ABS	2x20 bit, magnetic ABS	2x20 bit, magnetic ABS	2x20 bit, magnetic ABS
Torque Sensor	20 bit	20 bit	20 bit	20 bit	20 bit
Current sensor	12 Bit ADC (one each Phase)	12 Bit ADC (one each Phase)	12 Bit ADC (one each Phase)	12 Bit ADC (one each Phase)	12 Bit ADC (one each Phase)
Impact Sensors	To be defined	To be defined	To be defined	To be defined	To be defined
Weight	1700 gr	2400 gr	3000 gr	5000 g	8000 gr

AW J-Actuators

AutomationWare

AutomationWare introduces a new robotic joint platform designed to be state-of-the-art technology and make it possible to design even collaborative robotic systems of various sizes.



The basic element for the design of robots is the robotic joint that allows the system axes to precise rotations, with high torque and already configured to obtain diagnostics and safety systems integrated into the joint.

Motor control, the management of sensors and encoders for perfect positioning and for torque and contact detection and much more, are already inserted into the robotic joint that has double processor to get the safety redundancies for a total guarantee of operation even in case of accidental impacts with 3 independent control levels for the system lock.

However, joints can also be used in large number of applications as single units to deal with accurate rotational engagements with high torque and minimum size thanks to a harmonic drive reducer, which can be defined with various reduction ratios.



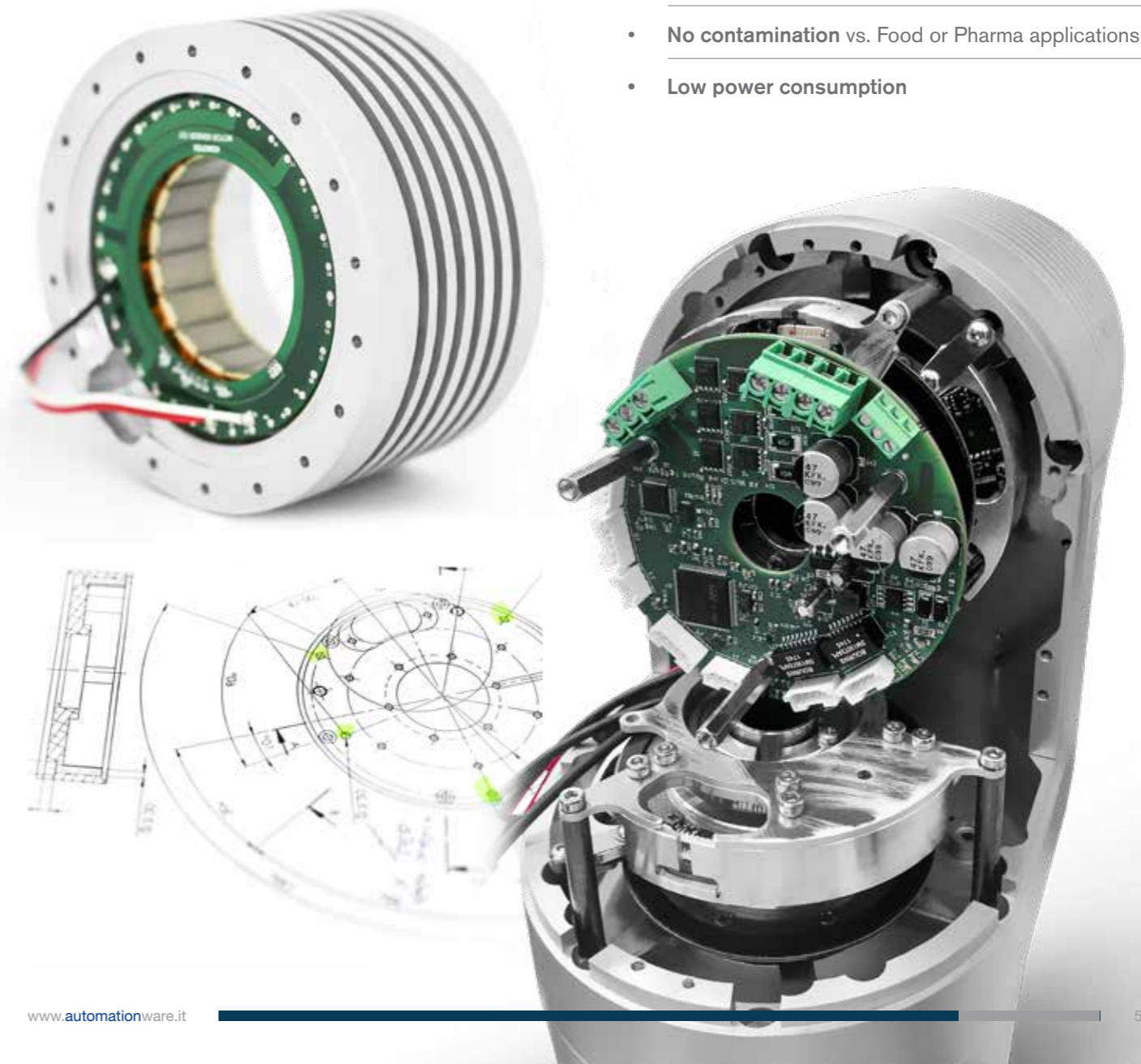
The joint control is done through an **EtherCat Bus**, so it could be easily integrated into existing mechatronic systems, offering, diagnostic performance during operation never used before, such as the control of system vibrations, gravity or the verification of torsional rigidity of the gearbox, by controlling the elasticity of the system.

In addition, for those who already use **Robot Operating System**, widely used in robotic research, the joint can be controlled directly by **ROS**, thanks to the **RoboVu application™** which allows real-time connection of applications such as **Moveit** to the bus **EtherCat**.

ROS EtherCAT

Essential Elements

- **5 sizes** to reach up to 353Nm max torque
- **Harmonic Drive technology**
0 Backlash ratio up to 1/160
- **Real time Torque control**
- **20 bit magnetic absolute encoder**
(single or double)
- **High Torque motor System**
- **Vibration control**
and **3D accelerometers detection**
- **Optional Embedded drive control EtherCat based**
- **Electronics fully supported**
Vs. **Robotic Operating System**



Benefits

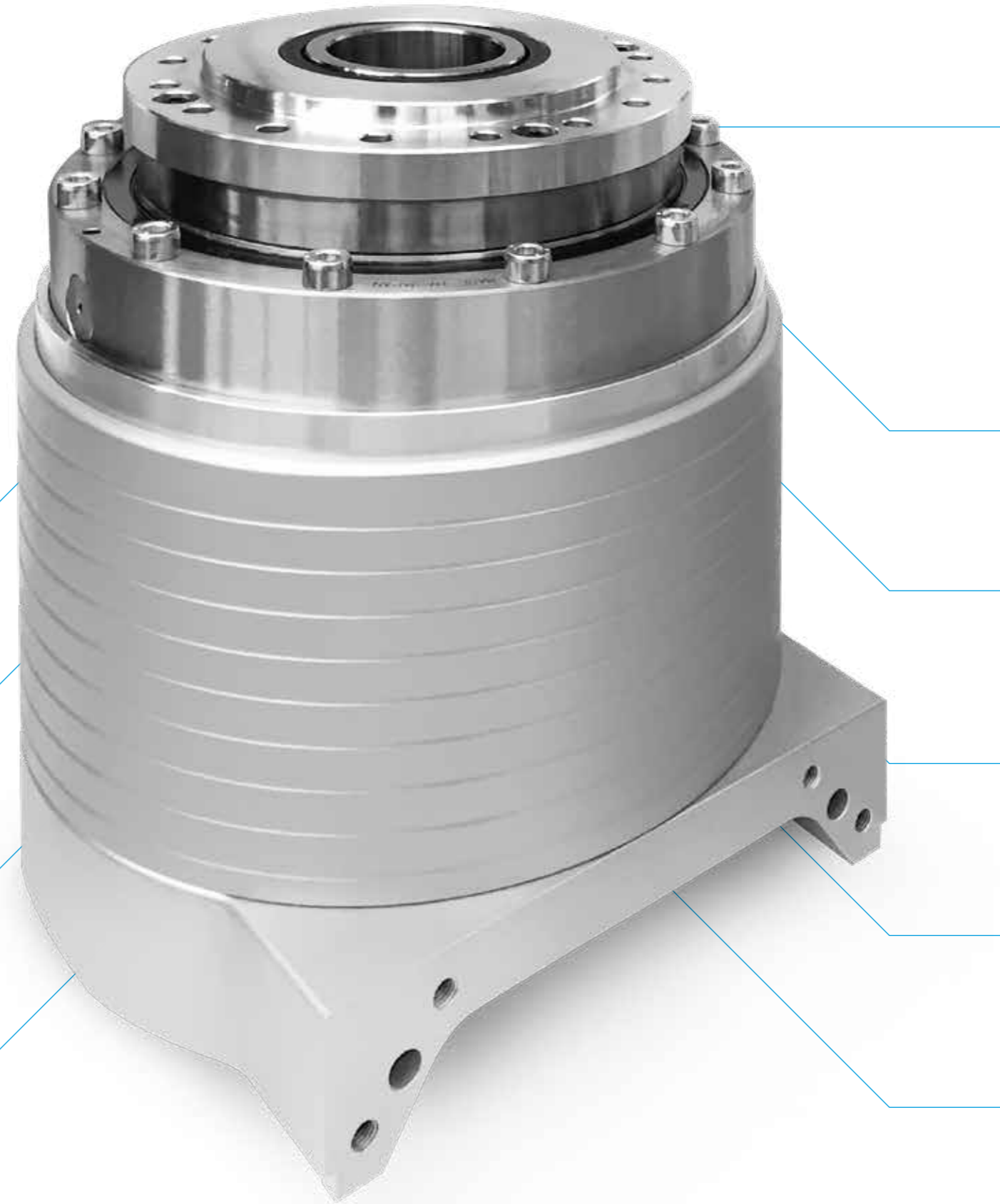
- **Extremely high capability** in torque for extreme use in small spaces
- **High precision positioning**
- Joints may be composed for robotics applications
- **ROS fully supported** in EtherCat protocol (**RoboVu applications**)
- **Compact** extremely high precision
- Several sensor to detect Low, **high speed axis, vibration, current**
- **Atex or dangerous gas detection**
- **No contamination** vs. Food or Pharma applications
- **Low power consumption**

AW J-Actuators

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Solutions
for the factory of
the future



High Quality

Harmonic Drive gearbox
reduction ratio may change on
applications (from 30 – 160)

Torsional Stiffness

measurement embedded
(2 x 20 bit Encoders)

AwareVu

Patent embedded to detect
3D accelerations and
vibrations

High Speed Torque

(3000 - 2000 rpm) motor with
current sensing technology

Best Mechanical Technology

Ergal based chassis

Embedded Power drive

With double processor and several
digital and analog inputs

EtherCat connection

From the Joint

Power off

System Block

14 bit ADC

Optional sensors plugs (Atex - Others)

Fully ROS compatible

With AW ROS interface (RoboVU)



Applications

AutomationWare entering on **Robotics** with disruptive innovation.

Enhancing lives with a visionary approach to motion control.

Across medical and advanced manufacturing markets, you design the world's most complex machines and instruments—technology that enhances the lives of others.

Here at **AutomationWare**, we share your commitment.

Our mechatronics engineering group seamlessly fuses innovative technology and expertise to create solutions that meet your most challenging precision motion requirements.

Medical Robotics

- Surgical
- Device Packaging
- Pharmacy Automation



Medical Devices

- Dental CAD/CAM
- Ophthalmic Diagnostic & Surgery
- Diagnostic Imaging
- Precision Pumps
- Radiation Therapy



Laboratory & Diagnostics

- Surface Sciences
- Life Sciences
- Laboratory Automation
- Analytical Instruments
- In Vitro Diagnostics



Satellite Communications & Surveillance

- Communications Control
- Antenna Control
- Camera & Video Control



Robotics

- Mobile & Warehouse
- Autonomous Vehicles
- Collaborative
- Precision Automation



Semiconductor Equipment

- Lithography
- Ion Implantation
- Etch, Chemical & Physical Vapor Deposition



Assembly & Wire Bonding

- Test & Inspection
- PCB Assembly



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Evolve on robotics



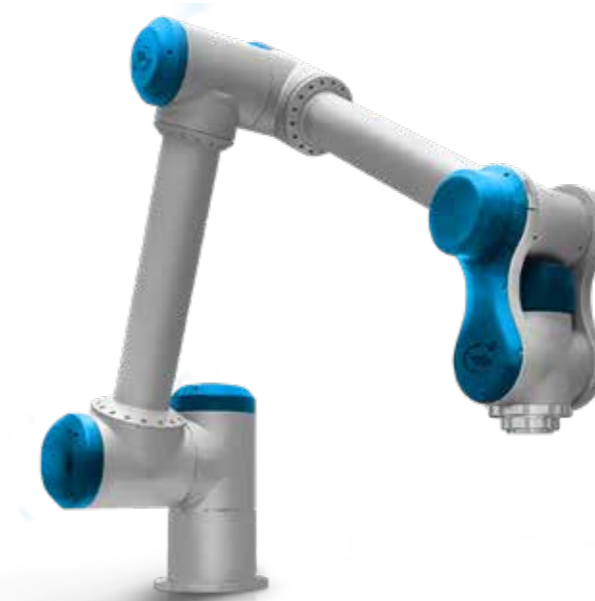
Next Products T- Actuators

A new generation of Torque actuators gearless for several applications as a rotative tables. Possibility to compose Robotics applications such SCARA e DELTA robots.

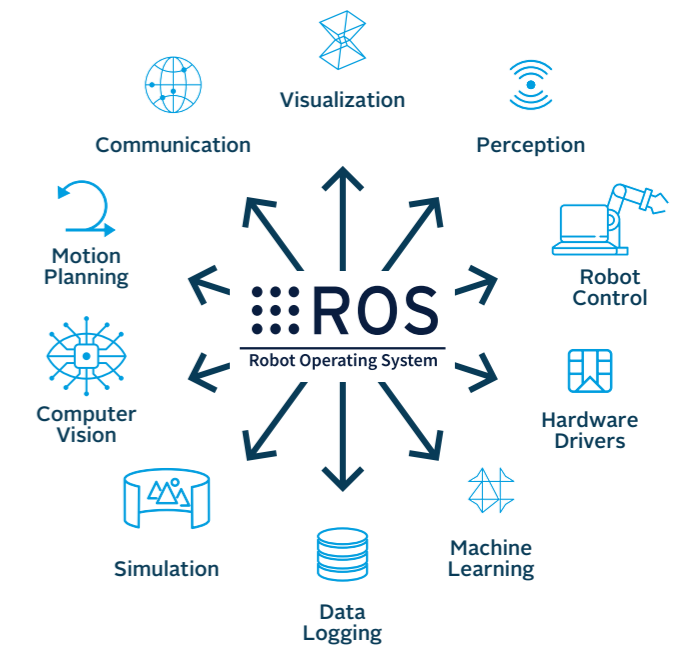


Next product AW-Tube Actuators Cobot

and the code name of AutomationWare's new Collaborative Robot. The robot is designed on the ROS platform and configures modular co-robotics solutions not only limited to the single component but to the total application.



Why Robot Operating System?



Robot Operating System: ROS is an open source framework that provides tools and libraries to help designers develop robotic software.

Starting from the mechanical model, movements are planned, from kinematics to the definition of trajectories.

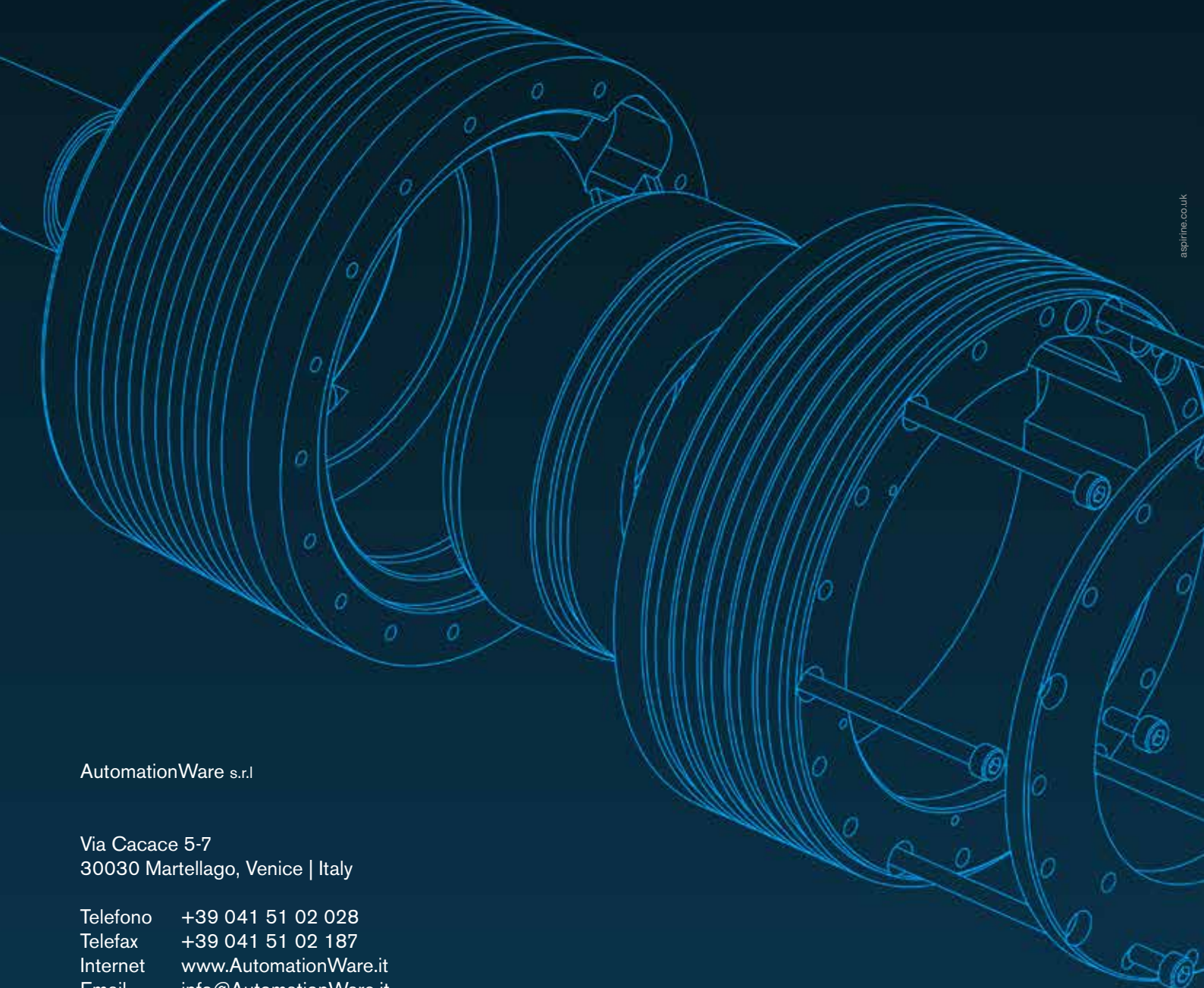
Future of Open Source robotic development platforms, such as **Robot Operating System (ROS)**, evolve a new generation of Cobots with a quick and easy implementation and permit modularity on applications.

AutomationWare release **RoboVu™** to connect **ROS** to real time **EtherCat** industrial bus.

Our robotic project, is based on the management of our actuators **J-Actuators** and **T-Actuators** on EtherCat field buses.

Since today, ROS does not have a real-time interface between the virtual and real world.

AutomationWare designed a new application called **RoboVu™** to connect ROS applications to industrial field buses such as EtherCat.



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