



DRIVE WHEELS SYSTEMS

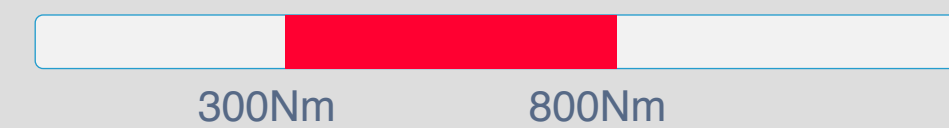
TR1 Serie is a fully modular powered wheel drive system. These units include a complete package comprised of electric motor, gearbox, wheel hubs, braking system, all in a compact ready to mount product.

The modular system includes several types of motors, gear ratios, track-widths, wheel hubs, mounting options, encoder, parking and service brakes.

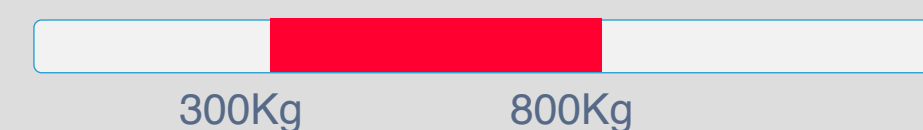
TR1 Serie is the next generation transmissions developed for eMobility market.

OPERATION RANGE

Output Torque



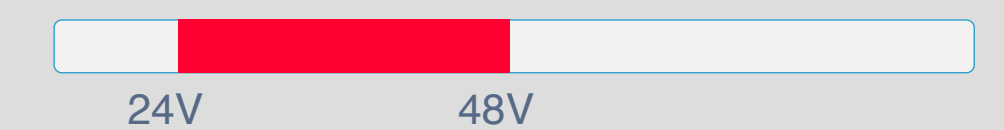
Payload



Power



Tension



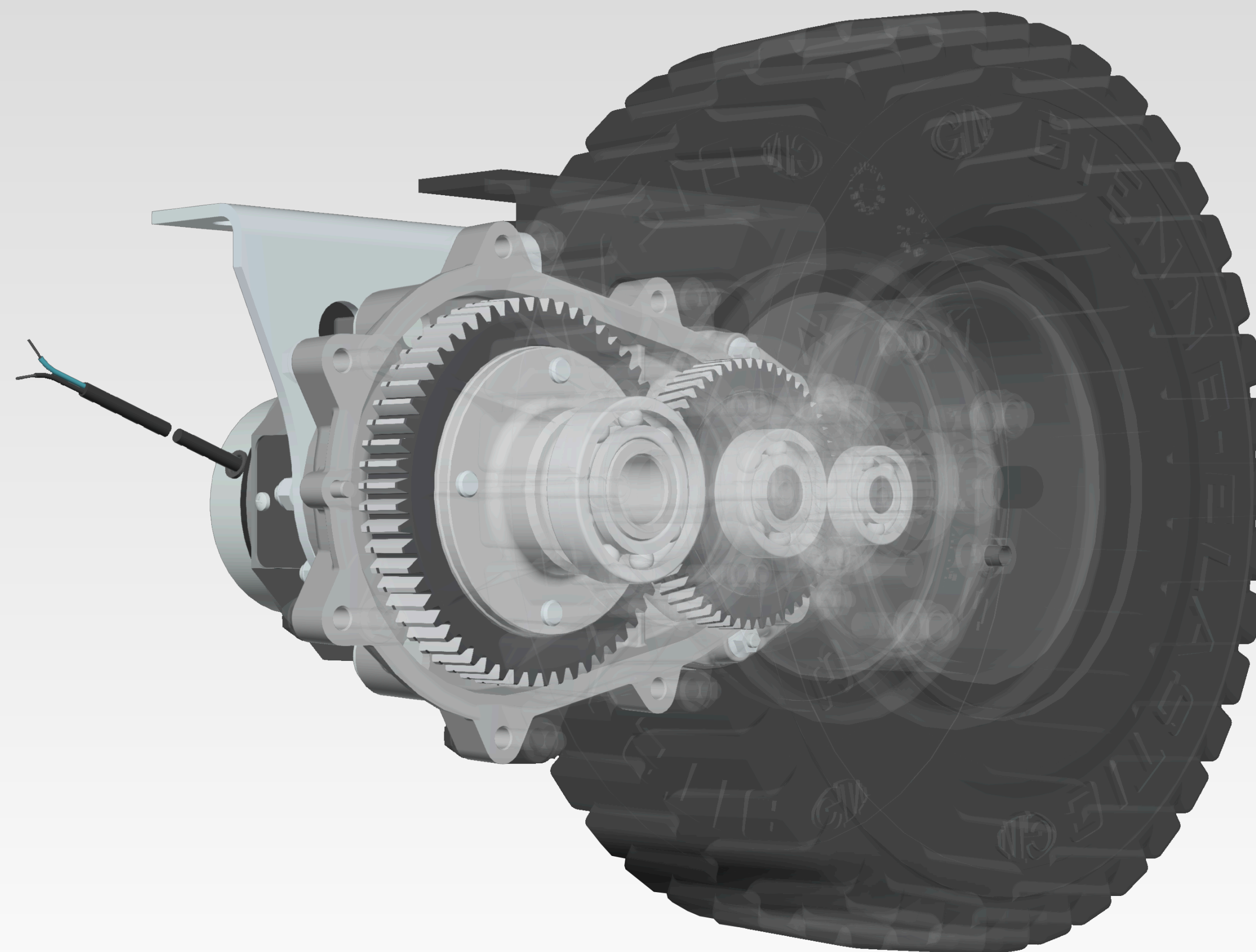
A LOOK INSIDE

Some products can look similar externally but they hide substantial differences within them.

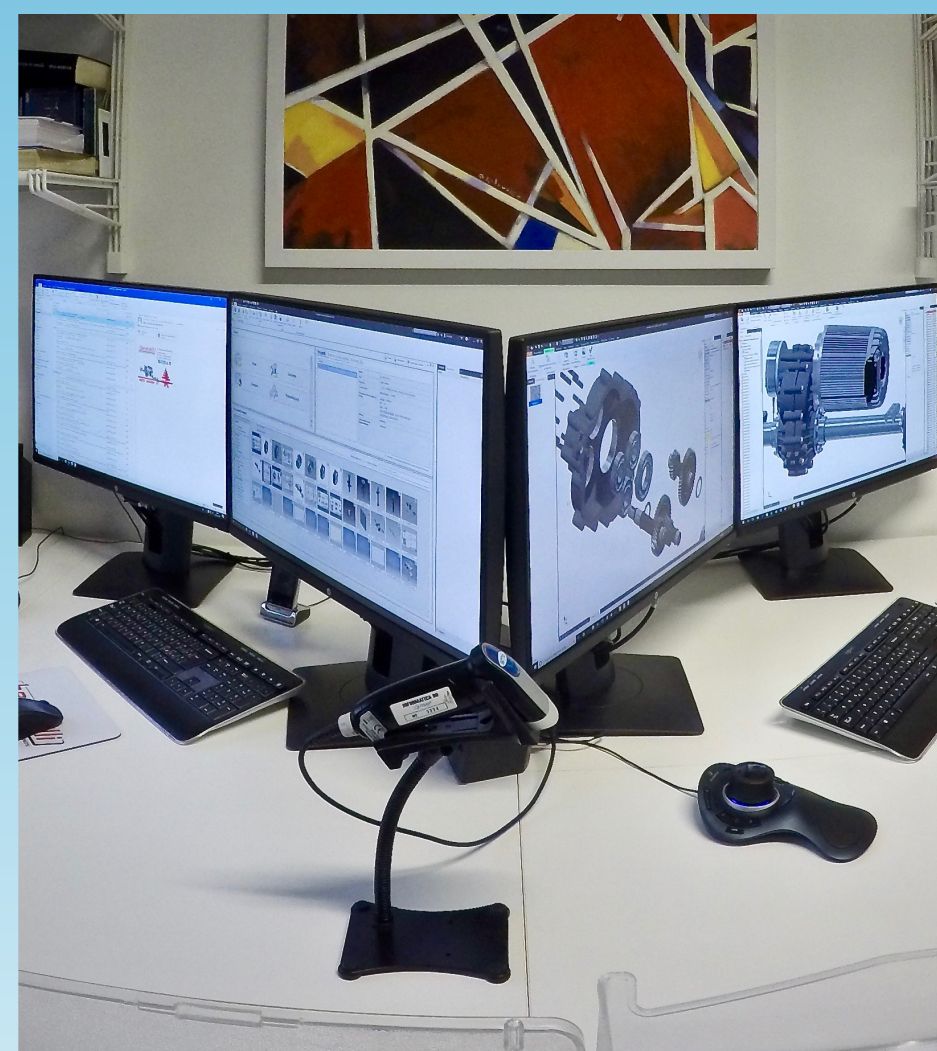
As we consider TR1 the best product on the market we are not scared to strip it.

The boxes in durable but light alloy retain a high construction technology inside them. Gears with ground profiles (Class 5) supported by **SKF** bearings guarantee high mechanical efficiencies close to 95%.

Lubricant oil, defined together with **Mobil 1**™ allows TR1 to be used even at extreme temperatures while maintaining its effectiveness.



OUR TECHNOLOGIES FOR YOUR MOBILITY



CONSTANT DEVELOPMENT

A CONSTANT RESEARCH ON MATERIALS AND CONSTRUCTION TECHNIQUES IS BEHIND THE SUCCESS OF TR1 SERIE



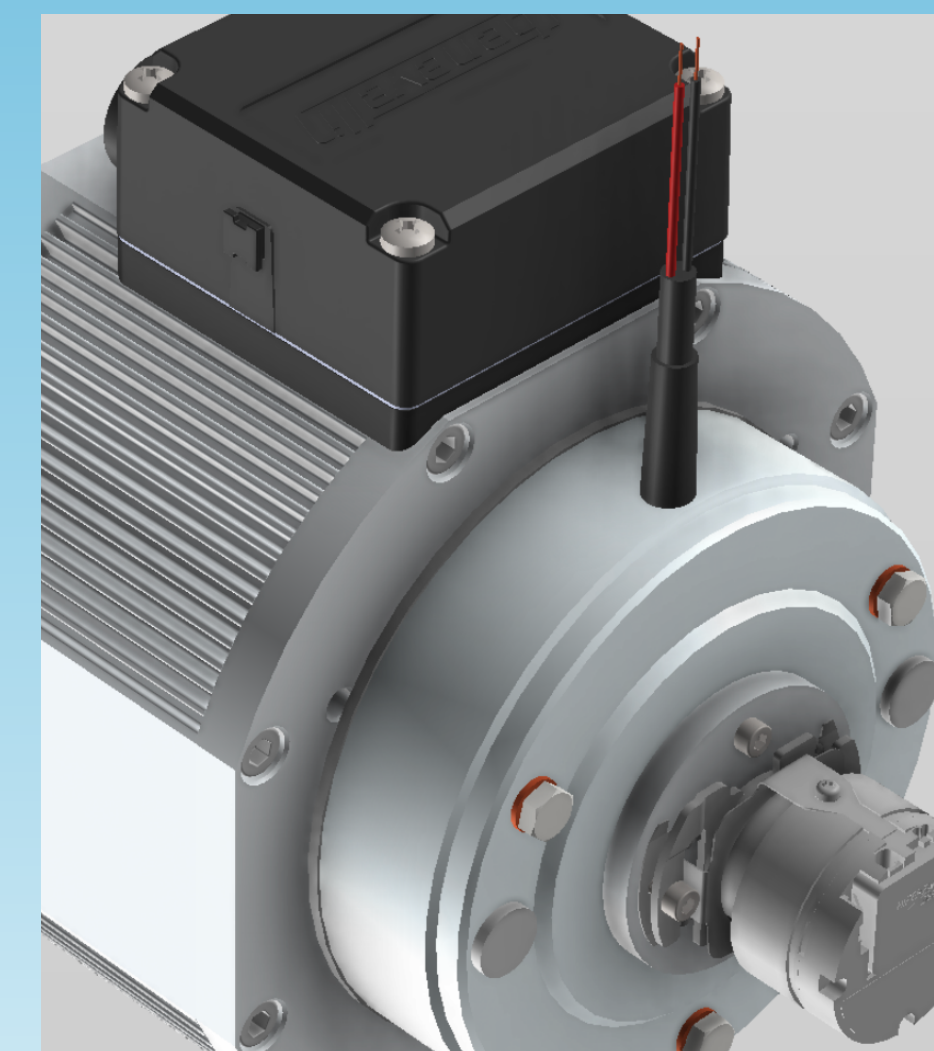
HIGH EFFICIENCY

IN OUR ELECTRIC TRANSMISSIONS YOU WILL FIND KNOW-HOW ACQUIRED IN BUILDING GEARS FOR OVER FIFTY YEARS



EASY INSTALLATION

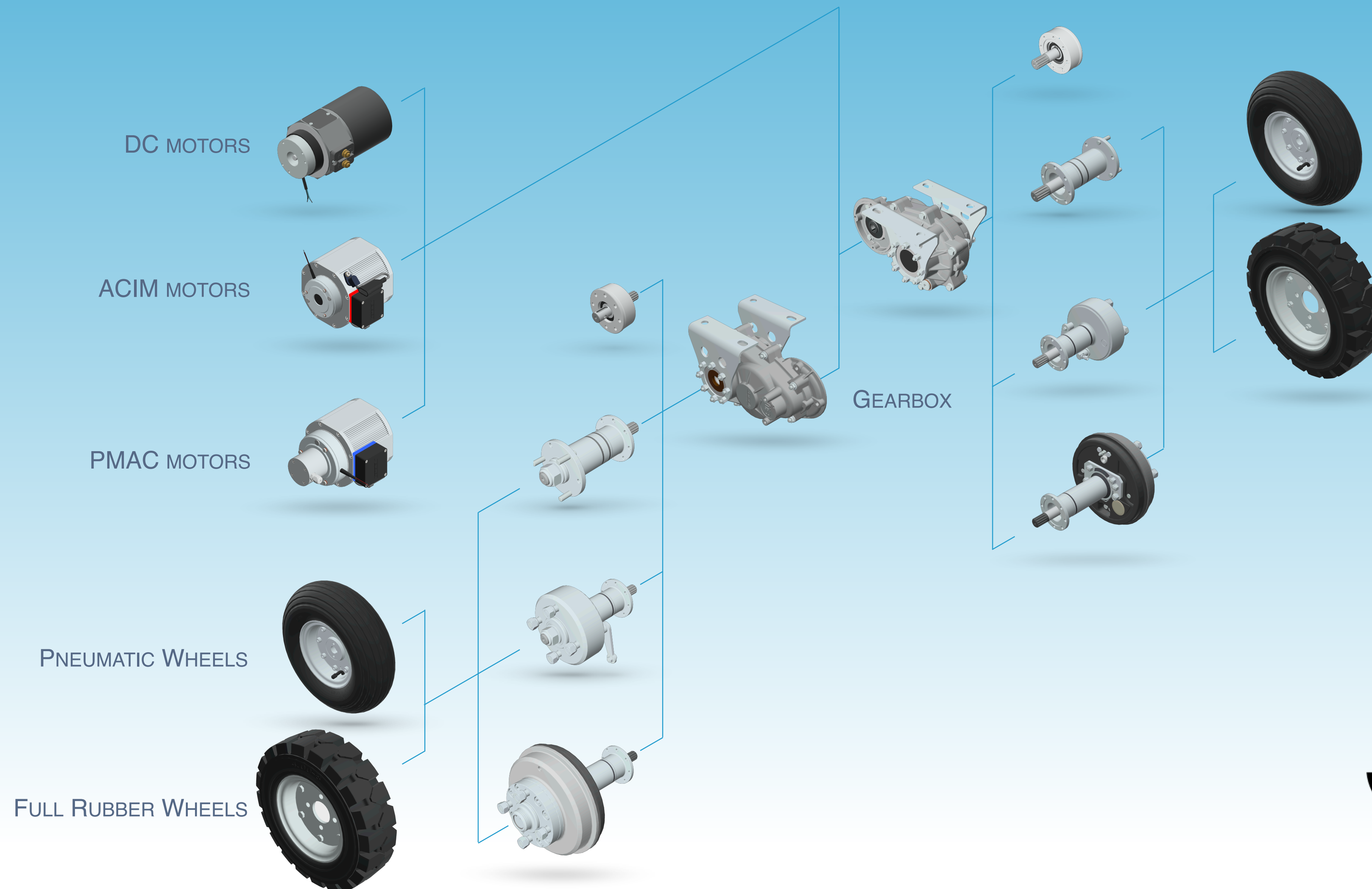
SIMPLE AND SPACE-SAVING INTEGRATION THROUGH FLEXIBLE MOUNTING POSSIBILITIES FOR SIMPLIFIED VEHICLE DESIGN



ENERGY SAVING

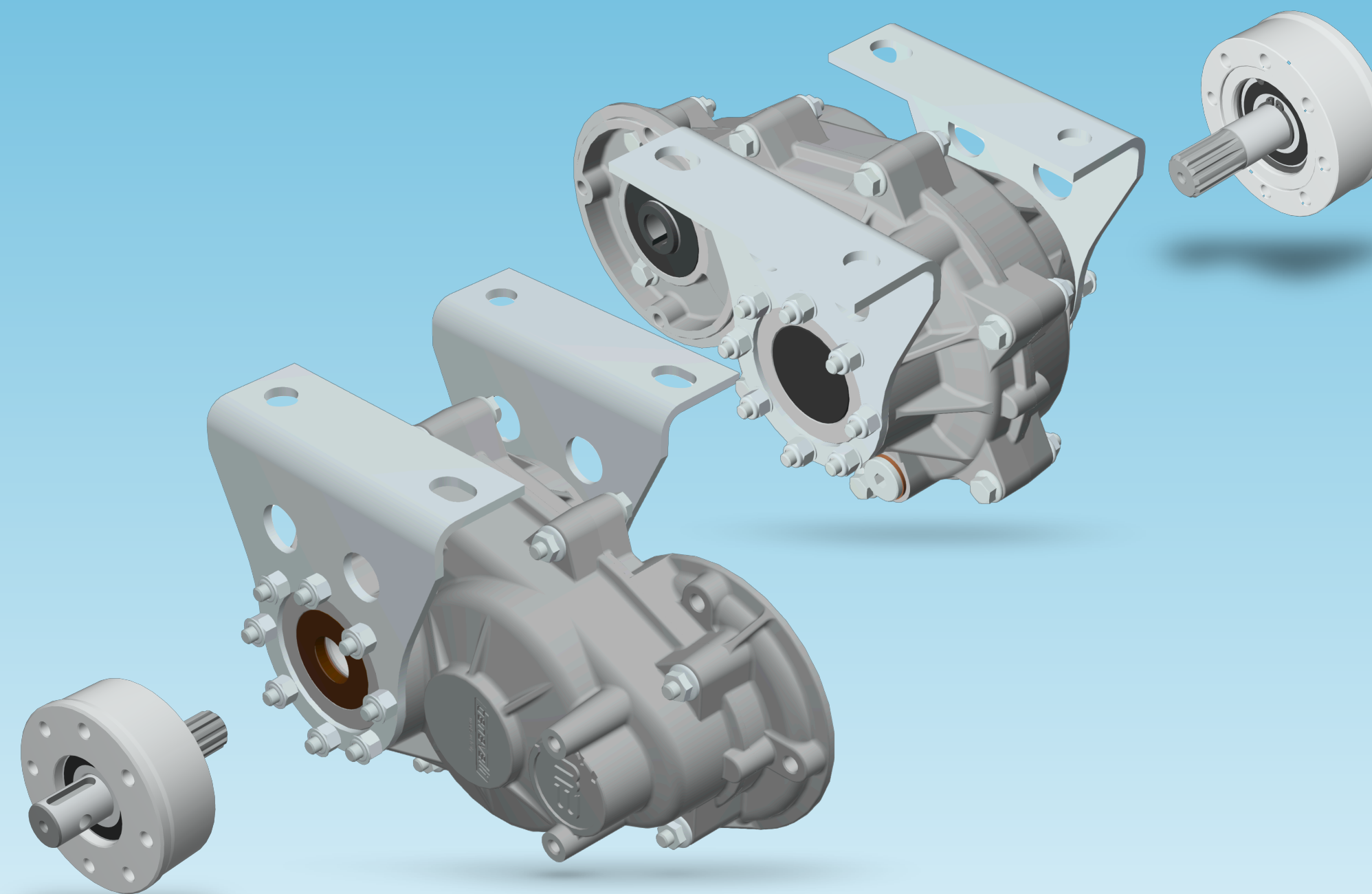
OUR MOTORS MAKES A SIGNIFICANT CONTRIBUTION TO SAVING CURRENT AND EXTENDS RUNNING TIME AUTONOMY

TR1 SERIE - MODULAR DRIVE SYSTEM



3D
ONLINE DRAWING

TR1 SERIE - CONSTANT VELOCITY JOINT VERSION

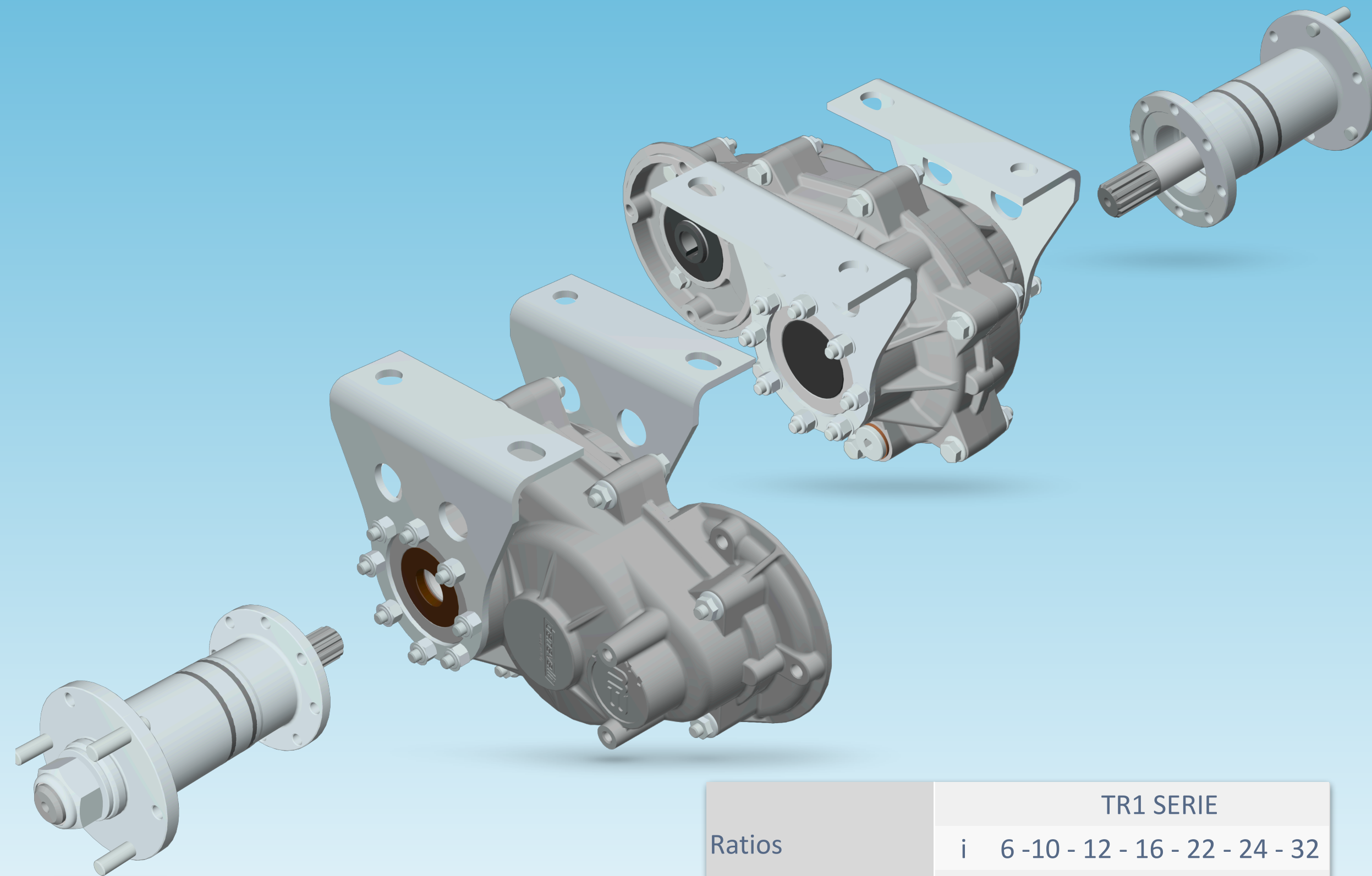
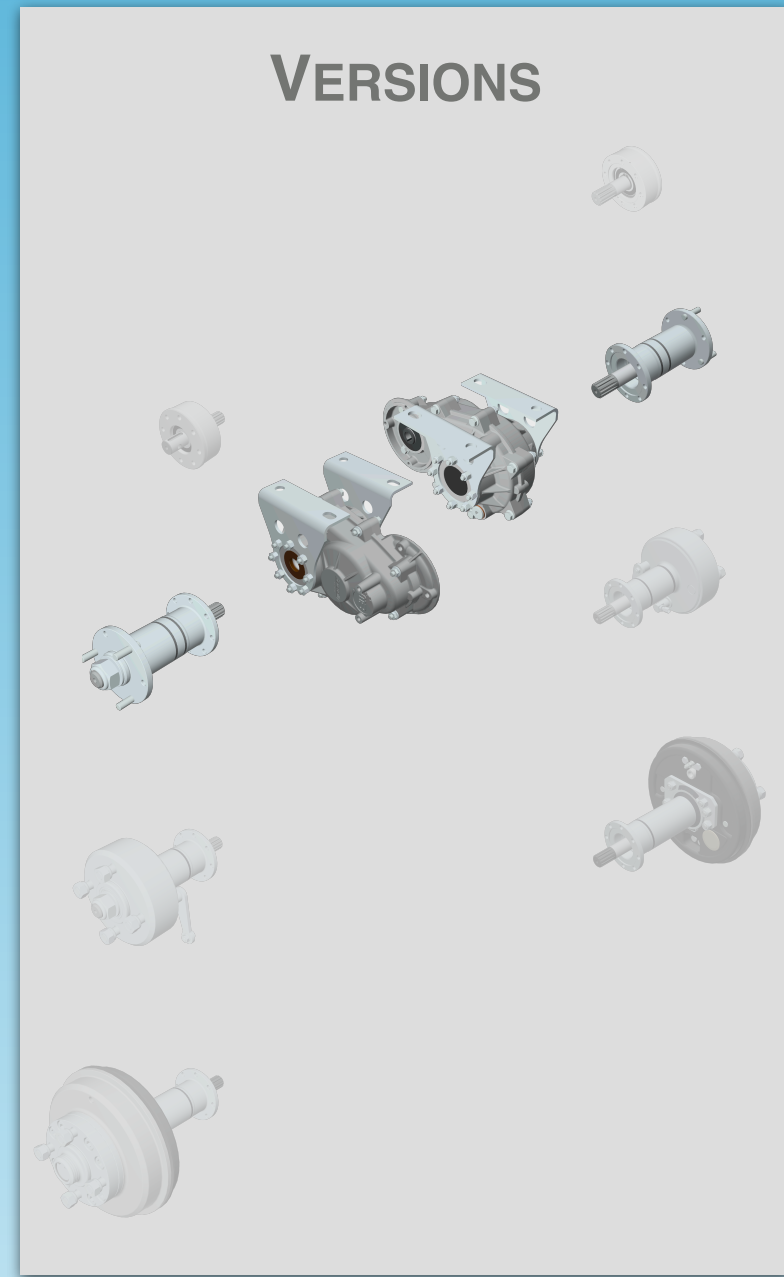


| | TR1 SERIE | |
|-------------------|-----------|---------------------------------|
| Ratios | i | 6 - 10 - 12 - 16 - 22 - 24 - 32 |
| Output Torque | Nm | 400 x 2 |
| Input Speed (Max) | rpm | 7.200 |
| Static Load | kg | 400 x 2 |
| Gearbox Finishing | | Ground Gears |
| Efficiency | % | 95 |
| Lubrication | | Synthetic Oil 75W90 |
| Differential Lock | | Electronic |

TECHNICAL FEATURES

| | TR1 SERIE | |
|------------------|-----------|----------------------------|
| Motor Type | | DC - ACIM - PMAC |
| Rated Power | kW | 0,8 ÷ 6,0 |
| Rated Voltage | V | 24 ÷ 48 |
| Insulation Class | | F (155°) |
| IEC 60529 | IP | 20 ÷ 66 |
| Service Braking | | - |
| Parking Braking | | Electromagnetic Nm 12 ÷ 40 |
| Manual Release | | Optional |
| Increm. Encoder | | Optional |

TR1 SERIE - FLOATING AXLES VERSION

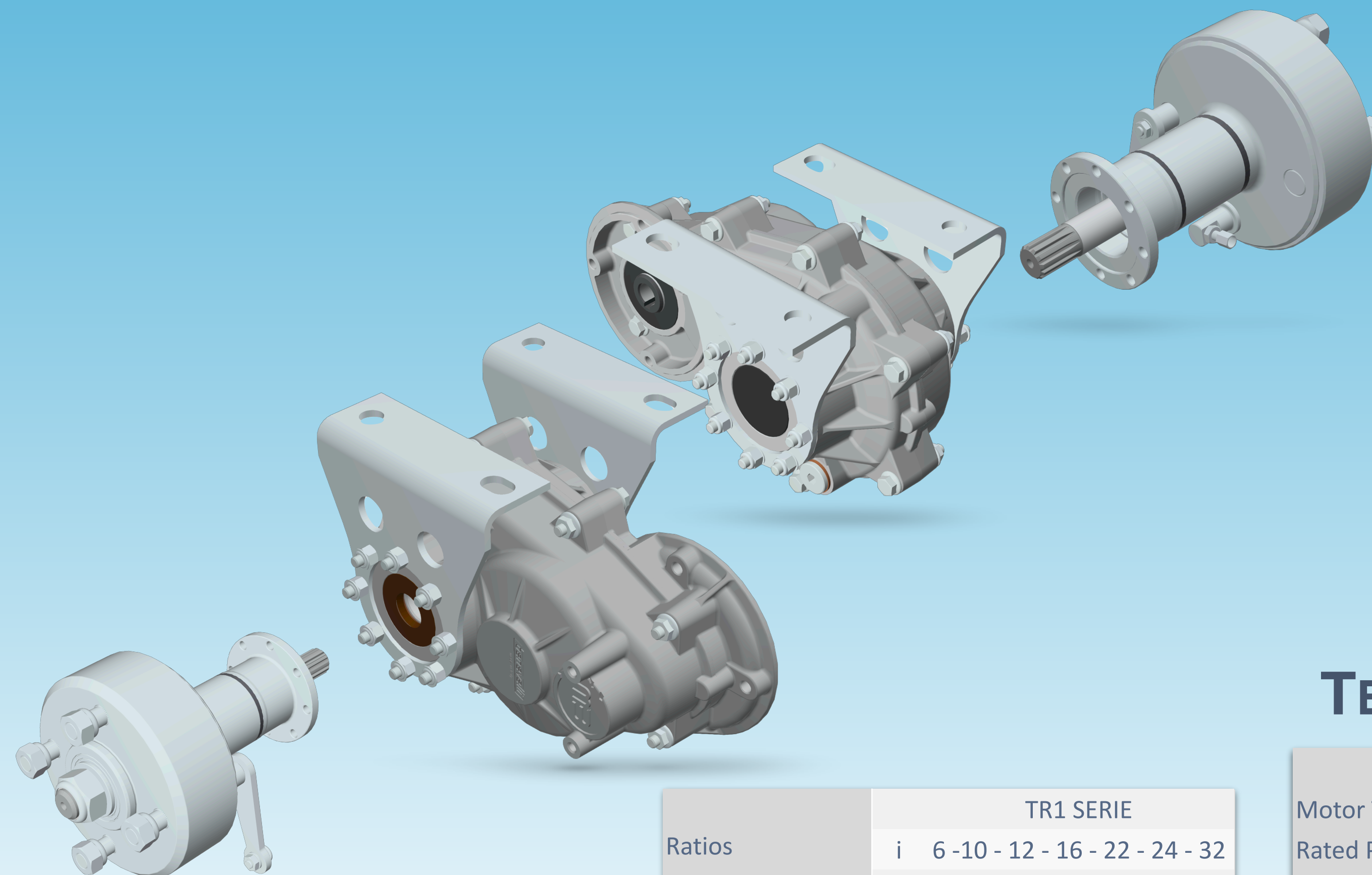
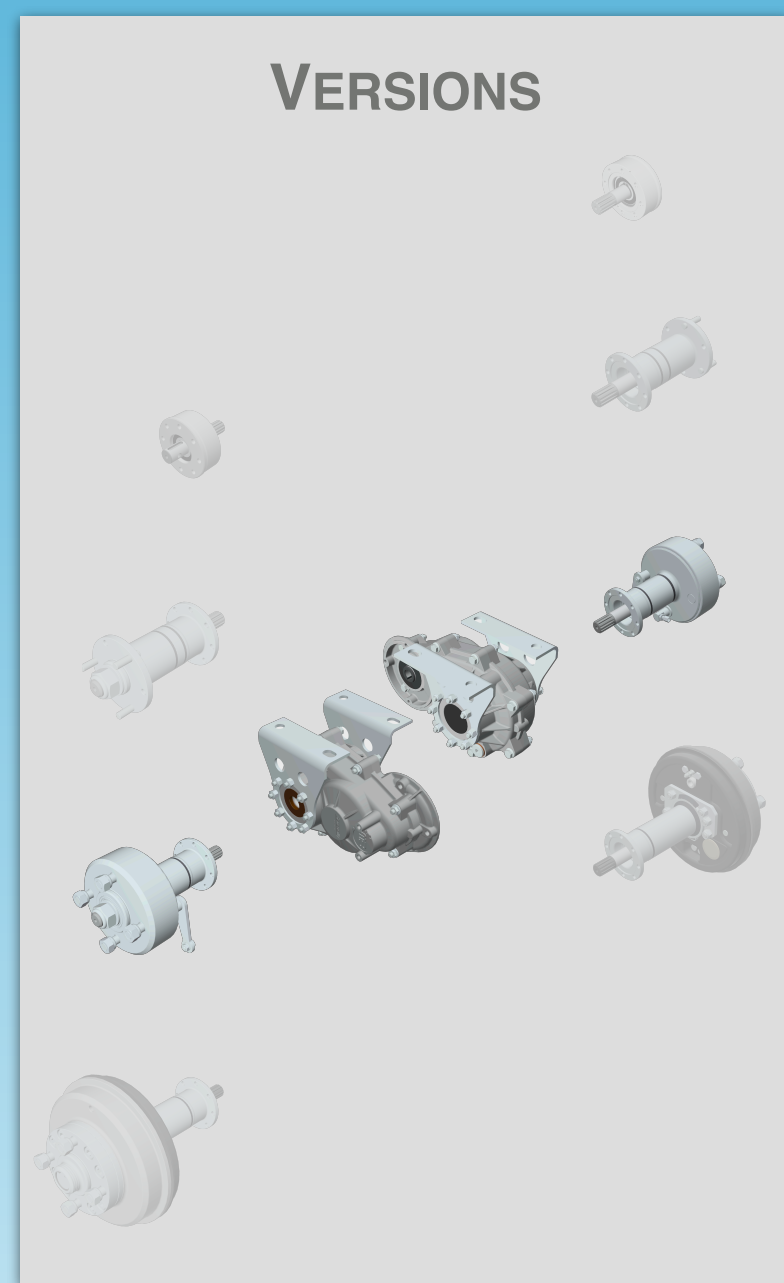


| | TR1 SERIE | |
|-------------------|-----------|---------------------------------|
| Ratios | i | 6 - 10 - 12 - 16 - 22 - 24 - 32 |
| Output Torque | Nm | 400 x 2 |
| Input Speed (Max) | rpm | 7.200 |
| Static Load | kg | 400 x 2 |
| Gearbox Finishing | | Ground Gears |
| Efficiency | % | 95 |
| Lubrication | | Synthetic Oil 75W90 |
| Differential Lock | | Electronic |

TECHNICAL FEATURES

| | TR1 SERIE | |
|------------------|-----------|----------------------------|
| Motor Type | | DC - ACIM - PMAC |
| Rated Power | kW | 0,8 ÷ 6,0 |
| Rated Voltage | V | 24 ÷ 48 |
| Insulation Class | | F (155°) |
| IEC 60529 | IP | 20 ÷ 66 |
| Service Braking | | - |
| Parking Braking | | Electromagnetic Nm 12 ÷ 40 |
| Manual Release | | Optional |
| Increm. Encoder | | Optional |

TR1 SERIE - RIGID DRIVE AXLES VERSION

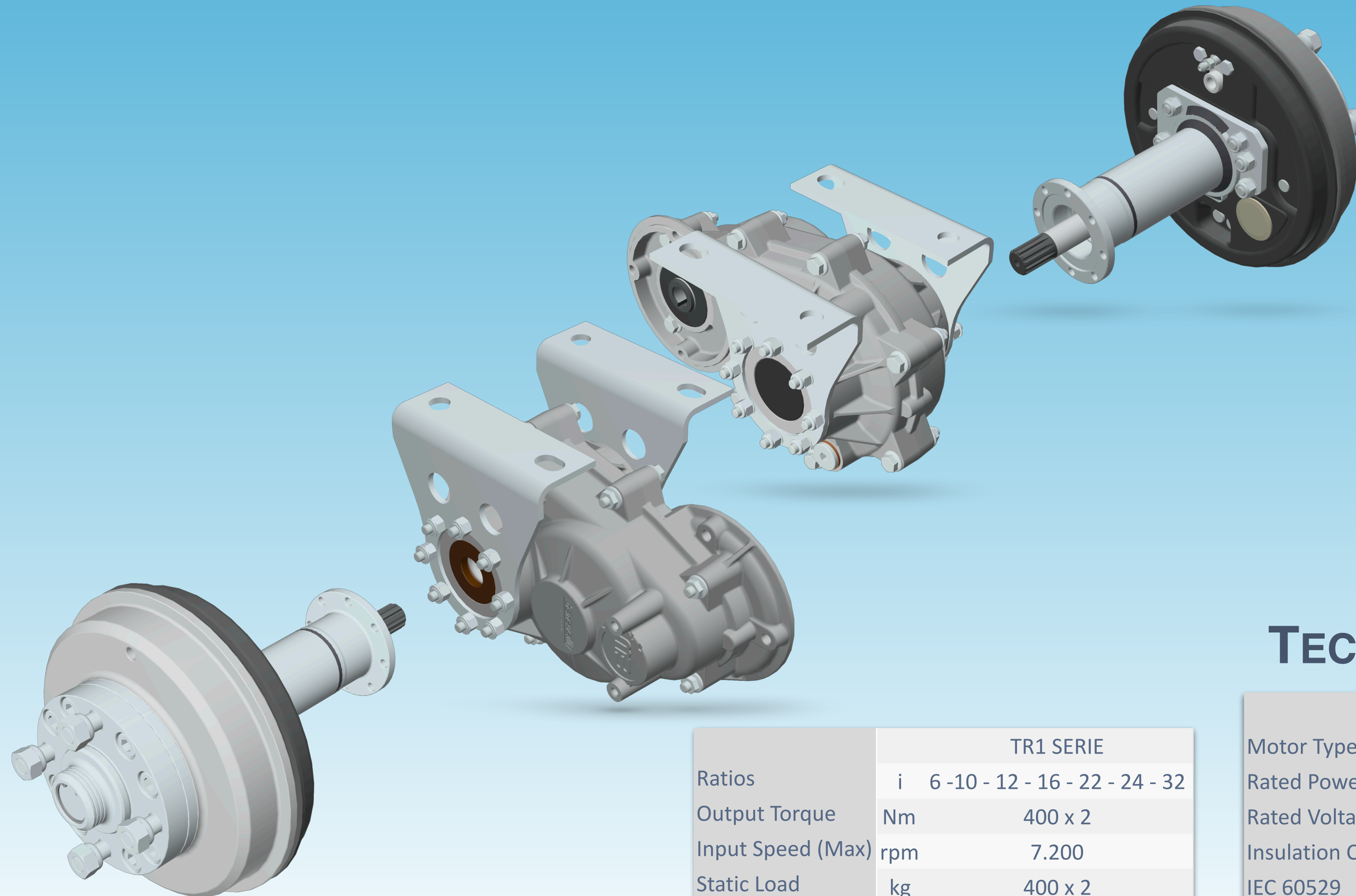
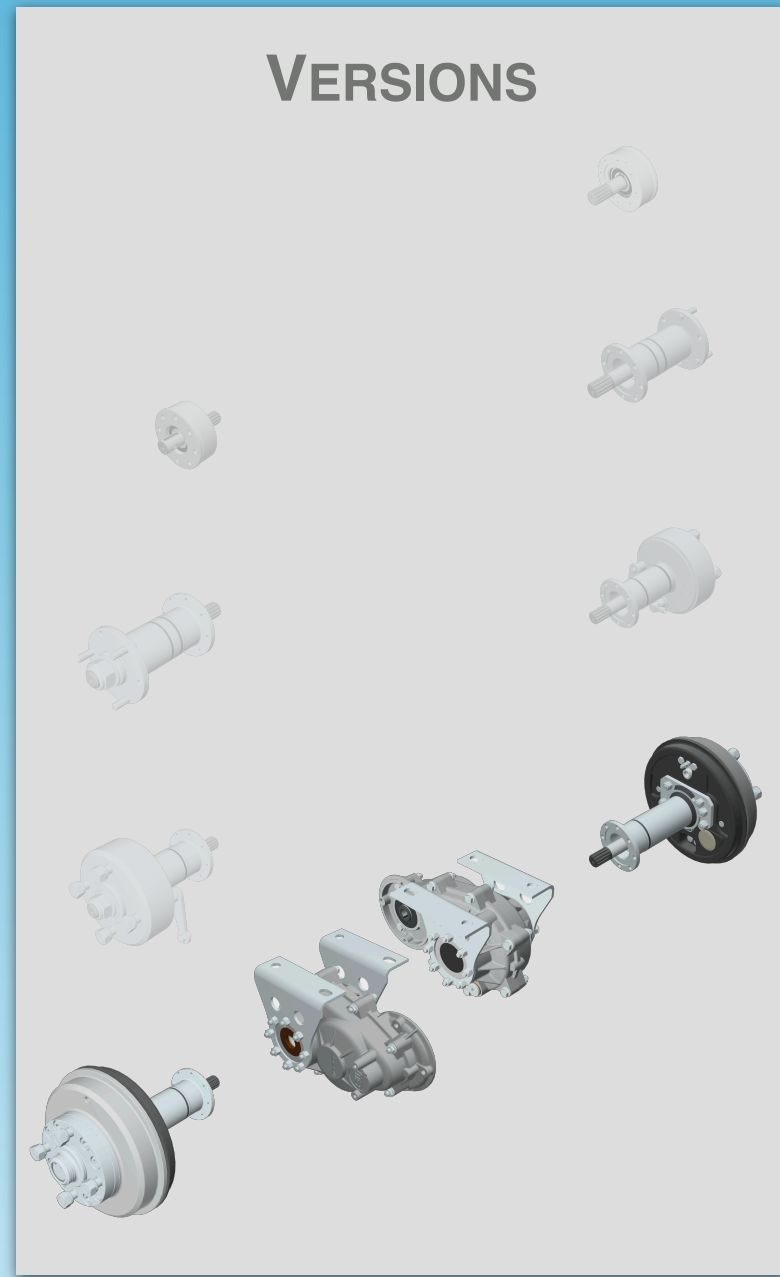


TECHNICAL FEATURES

| | TR1 SERIE | |
|-------------------|-----------|---------------------------------|
| Ratios | i | 6 - 10 - 12 - 16 - 22 - 24 - 32 |
| Output Torque | Nm | 400 x 2 |
| Input Speed (Max) | rpm | 7.200 |
| Static Load | kg | 400 x 2 |
| Gearbox Finishing | | Ground Gears |
| Efficiency | % | 95 |
| Lubrication | | Synthetic Oil 75W90 |
| Differential Lock | | Electronic |

| | TR1 SERIE | |
|------------------|-----------|----------------------------|
| Motor Type | | DC - ACIM - PMAC |
| Rated Power | kW | 0,8 ÷ 6,0 |
| Rated Voltage | V | 24 ÷ 48 |
| Insulation Class | | F (155°) |
| IEC 60529 | IP | 20 ÷ 66 |
| Service Braking | | Mechanical Nm 1.200 |
| Parking Braking | | Electromagnetic Nm 12 ÷ 40 |
| Manual Release | | Optional |
| Increm. Encoder | | Optional |

TR1 SERIE - WHEEL HUBS BRAKES VERSION

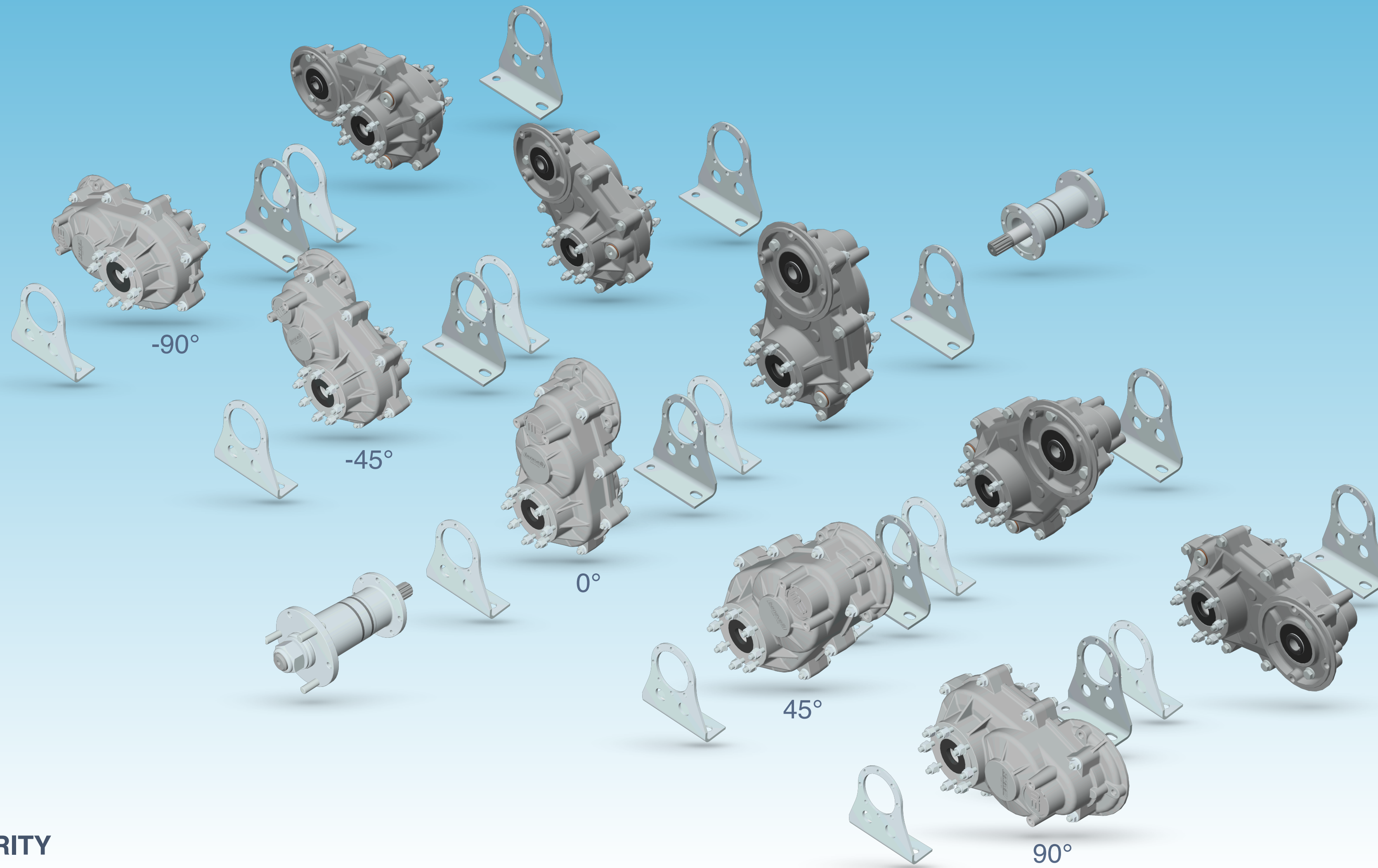


TECHNICAL FEATURES

| | TR1 SERIE | |
|-------------------|-----------|---------------------------------|
| Ratios | i | 6 - 10 - 12 - 16 - 22 - 24 - 32 |
| Output Torque | Nm | 400 x 2 |
| Input Speed (Max) | rpm | 7.200 |
| Static Load | kg | 400 x 2 |
| Gearbox Finishing | | Ground Gears |
| Efficiency | % | 95 |
| Lubrication | | Synthetic Oil 75W90 |
| Differential Lock | | Electronic |

| | TR1 SERIE | |
|------------------|-----------|----------------------------|
| Motor Type | | DC - ACIM - PMAC |
| Rated Power | kW | 0,8 ÷ 6,0 |
| Rated Voltage | V | 24 ÷ 48 |
| Insulation Class | | F (155°) |
| IEC 60529 | IP | 20 ÷ 66 |
| Service Braking | | Hydraulic Nm 1.200 |
| Parking Braking | | Electromagnetic Nm 12 ÷ 40 |
| Manual Release | | Optional |
| Increm. Encoder | | Optional |

TR1 SERIE - INSTALLATION OPTIONS



FULL MODULARITY



MECHATRONIC SOLUTIONS

With the same philosophy that has distinguished us for 56 years, we are now able to design and build electric motors providing to customers complete mechatronic solutions

Our motors are available in three different technologies: DC, ACIM and the newest PMAC with power from 0.3 to 3kW and voltages from 24 to 48V.

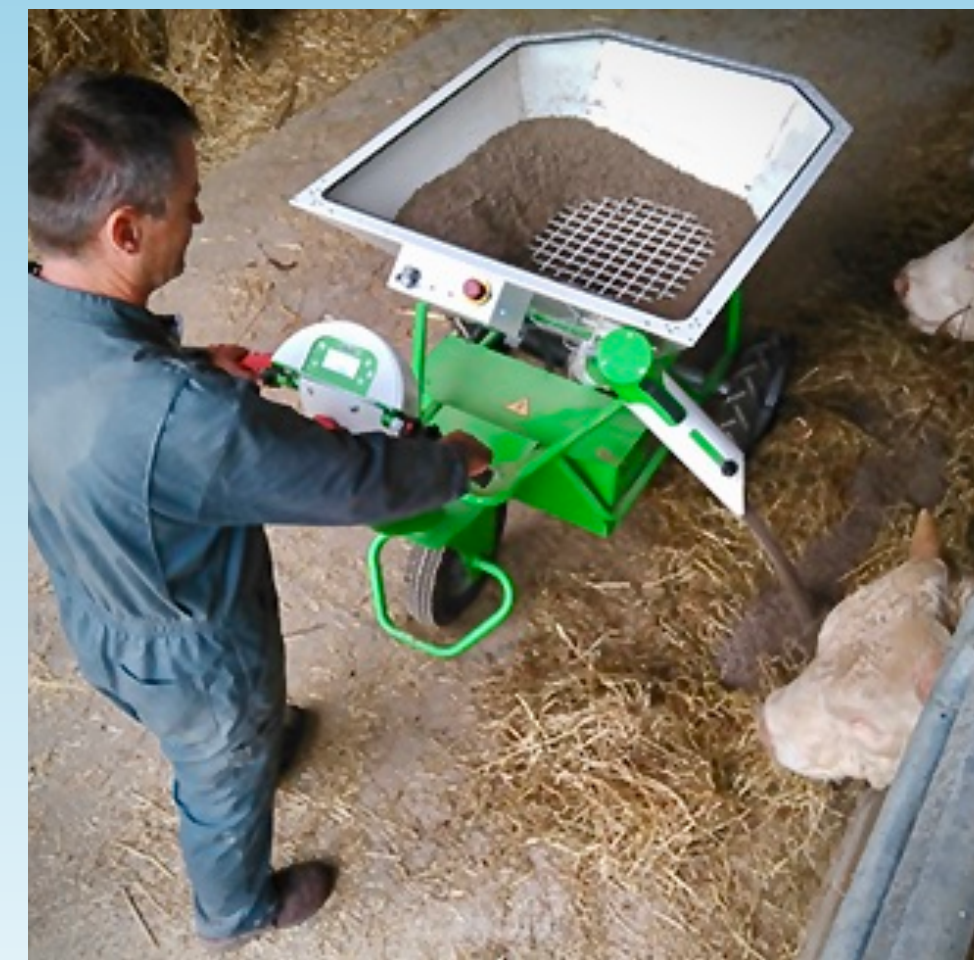
Entrust to our technicians to define what is the best choice for your vehicle, we will be able to better guide you by offering comparisons between the different available systems

COMPARATIVE TABLE

| | DC MOTORS | ACIM MOTORS | PMAC MOTORS |
|------------------|-----------|-------------|-------------|
| EM parking brake | ✓ | ✓ | ✓ |
| Speed encoder | | ✓ | ✓ |
| Maintenance free | | ✓ | ✓ |
| Noise level | | ✓ | ✓ |
| Temp °C sensor | | ✓ | ✓ |
| UL ready | | ✓ | ✓ |
| High efficiency | | | ✓ |
| Constant torque | | | ✓ |
| Working Temp °C | | | ✓ |



TR1 SERIE - eMOBILITY APPLICATION



OUR CUSTOMERS

DRIVING THE FUTURE OF ELECTRIC VEHICLES

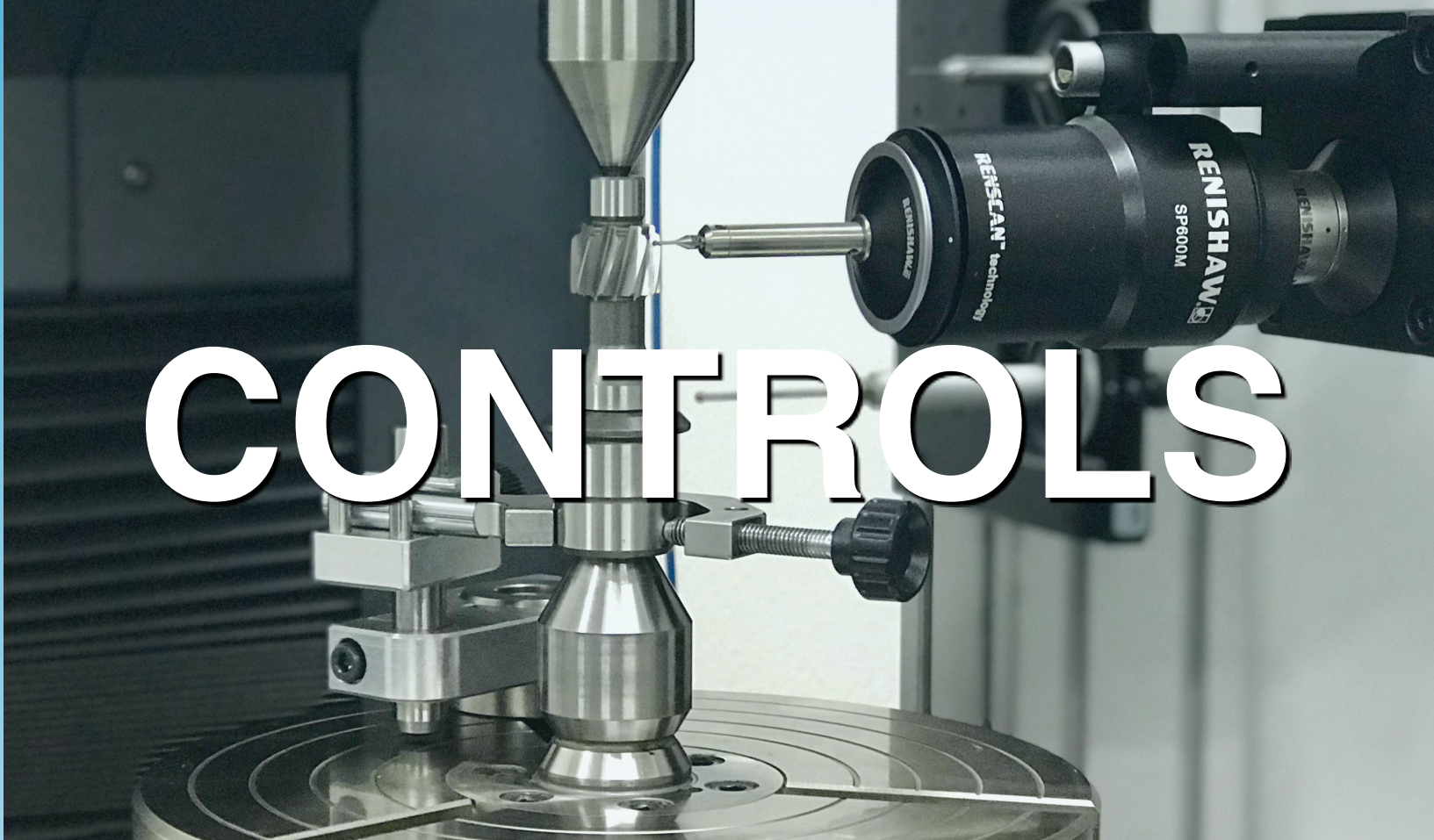
Benevelli expertise is transferable to many industries and our projects reflect this diversity. Benevelli has experience in eMobility market and we are able to follow the electrification of your vehicles from prototype to serial production.



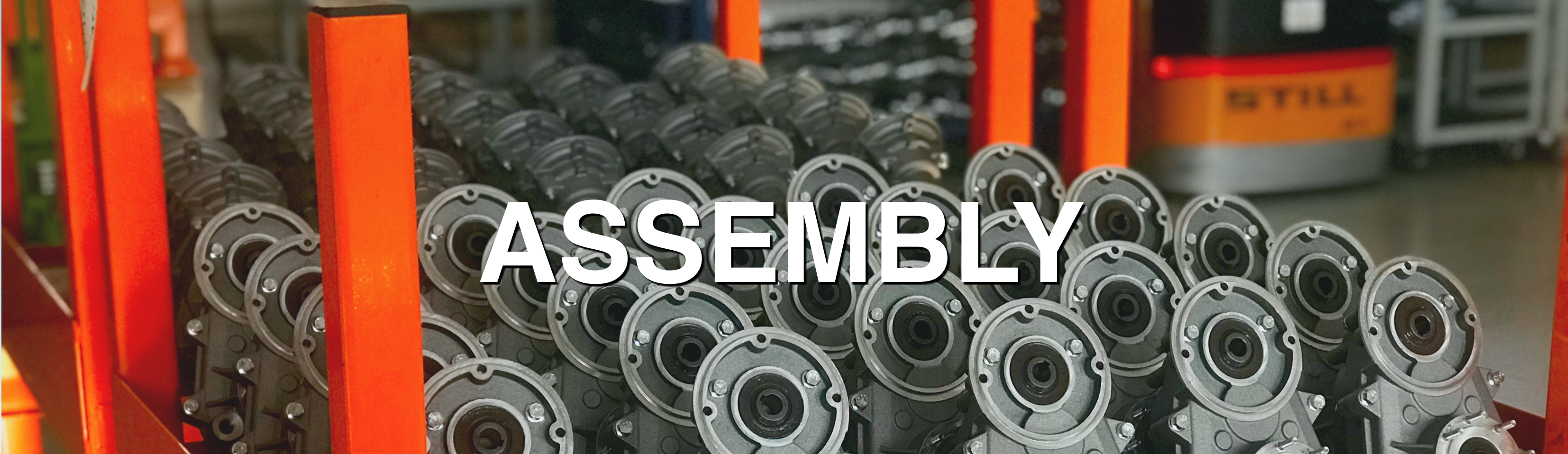
DESIGN



MACHINING



CONTROLS



ASSEMBLY

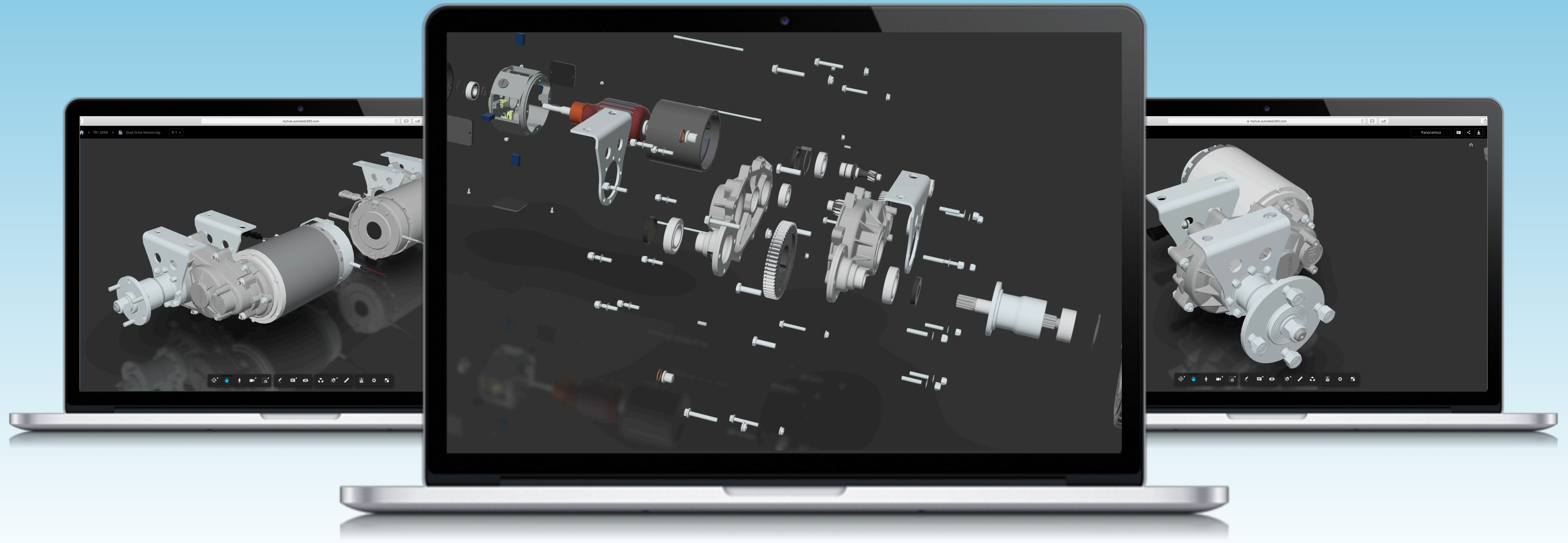
ABOUT BENEVELLI

E-MOBILITY TECHNOLOGIES PIONEERS

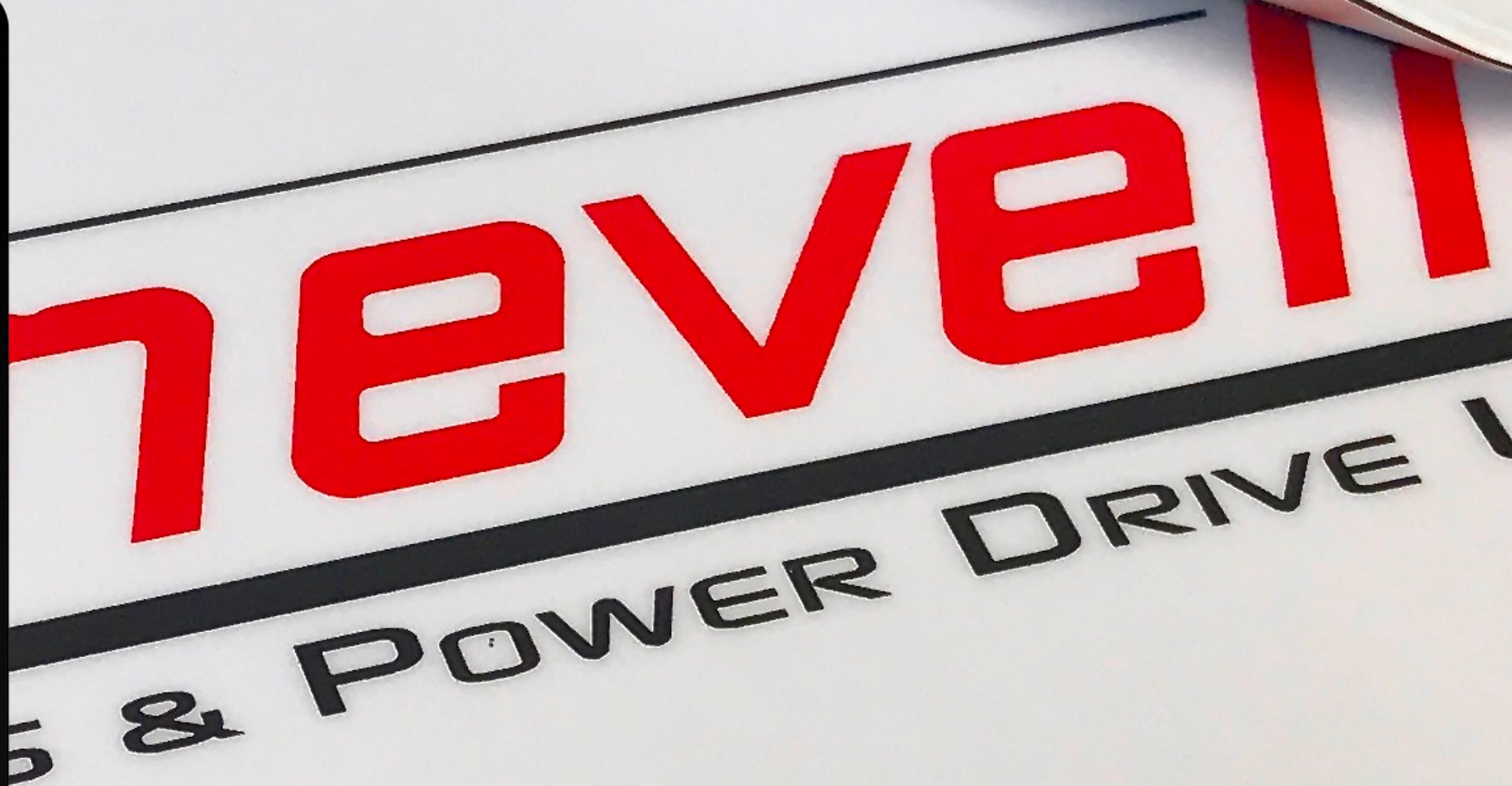
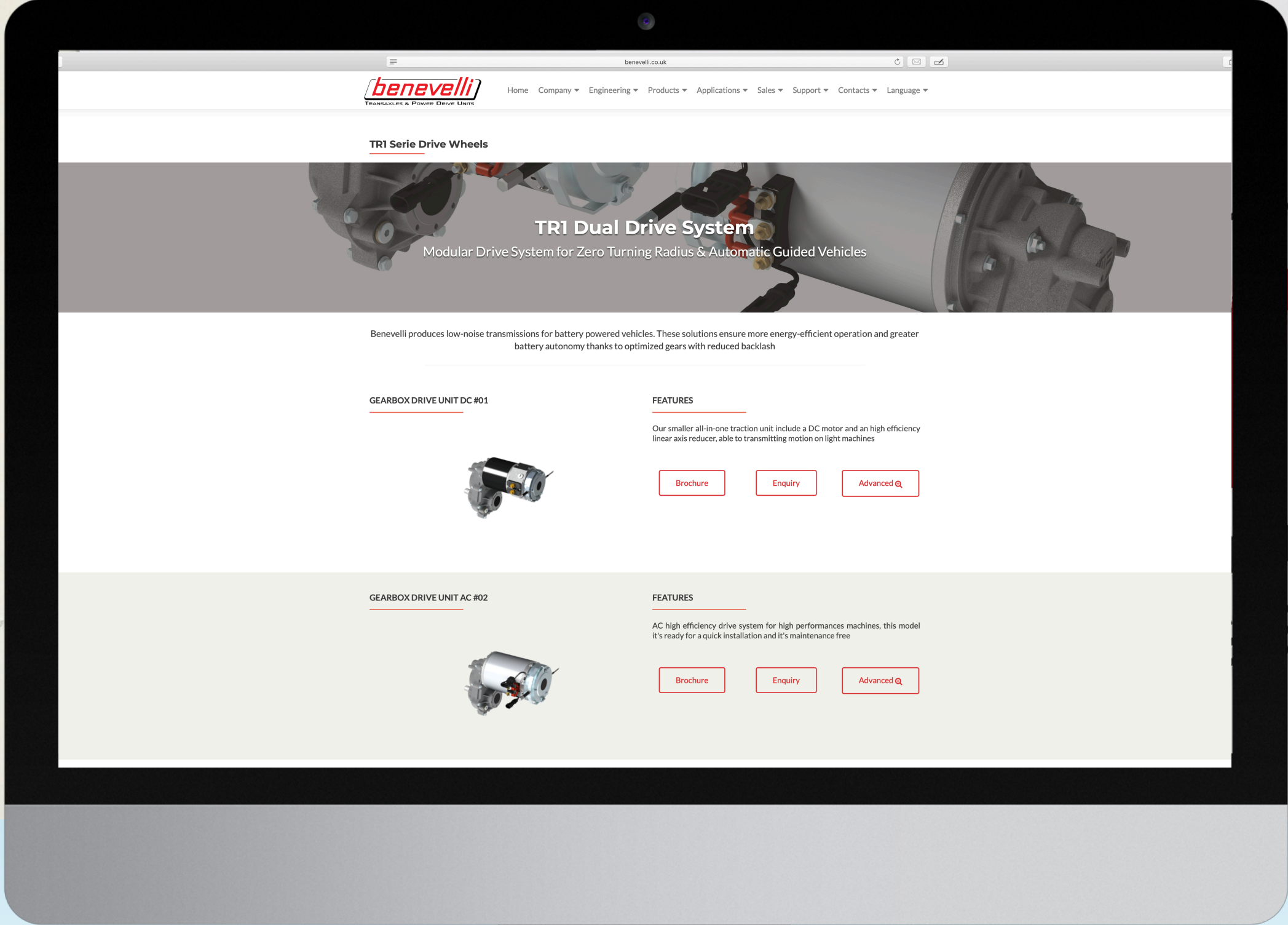
Benevelli has been working for more than half a century manufacturing products reliable and of superior quality, creating a competitive advantage for customers. Benevelli follow 100% of production processes maintaining total control of manufactured parts and work progress

Our Expertise Drives Innovations

Our team of expert engineers is ready to work with you to understand the exact functionality your equipment needs to operate at optimum capacity, and then design a solution to help make it possible.



WE ARE A COMPLETE SOLUTIONS PARTNER



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