

COMPANY OVERVIEW

OCTOBER 2019



MICROSISTEMI

Presentation: Milestones

NEARLY 40 YEARS IN THE RAILWAY SECTOR

1980

MICROSISTEMI srl was started as an engineering company mainly to support carbuilders and brake manufacturers.

1998

MICROSISTEMI srl began its own production activities in addition to engineering support.

2017

MICROSISTEMI Srl has a new Ownership.
The new Ownership is represented by **PAOLO POLI** who gained nearly three decades of experience in the railway industry sector
(POLI Costr. Mat. Traz. – WABTEC – FAIVELEY)

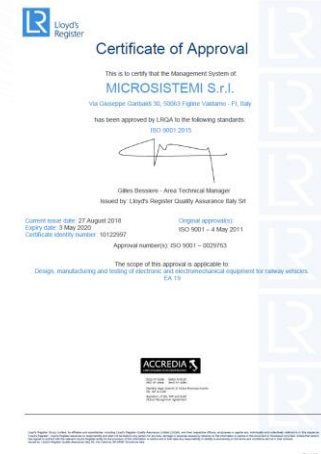
Presentation: General Features

- Headquarters: Figline Valdarno (FI) - Italy
- Average Turnover: 1,00 M€
- Quality Certification: **ISO 9001-2015**
- Industry Sector:

Railway and Urban Transportation

- Technological Expertise:

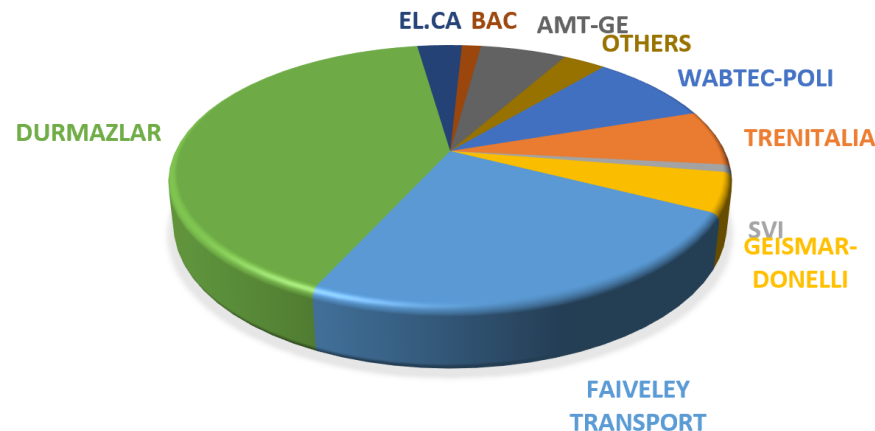
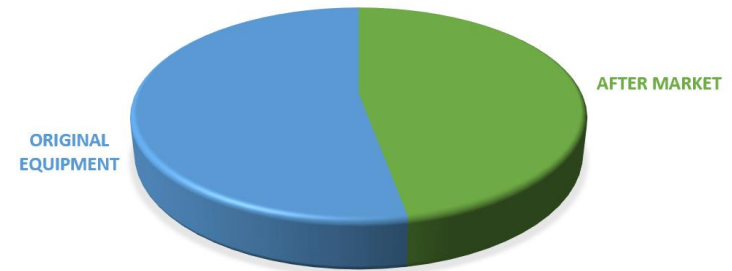
- ✓ **Electronics**
- ✓ **Hydraulics**
- ✓ **Pneumatics**
- ✓ **Mechanics**



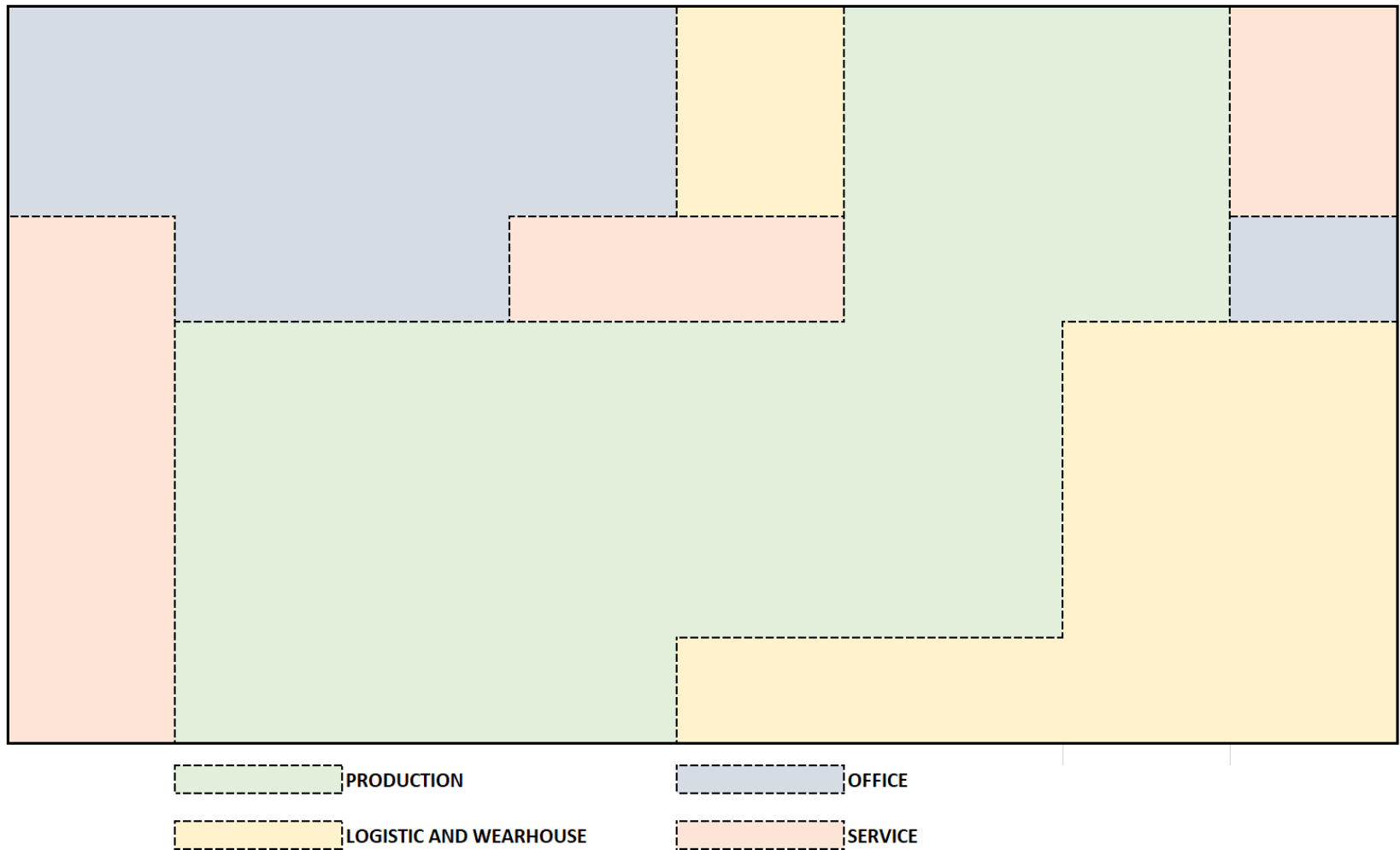
Presentation: General Features

DESIGN AND MANUFACTURING OF SINGLE
COMPONENTS OR AUXILIARIES SUBSYSTEMS FOR:

***AFTER MARKET
ORIGINAL EQUIPMENT***



Presentation: New Plant



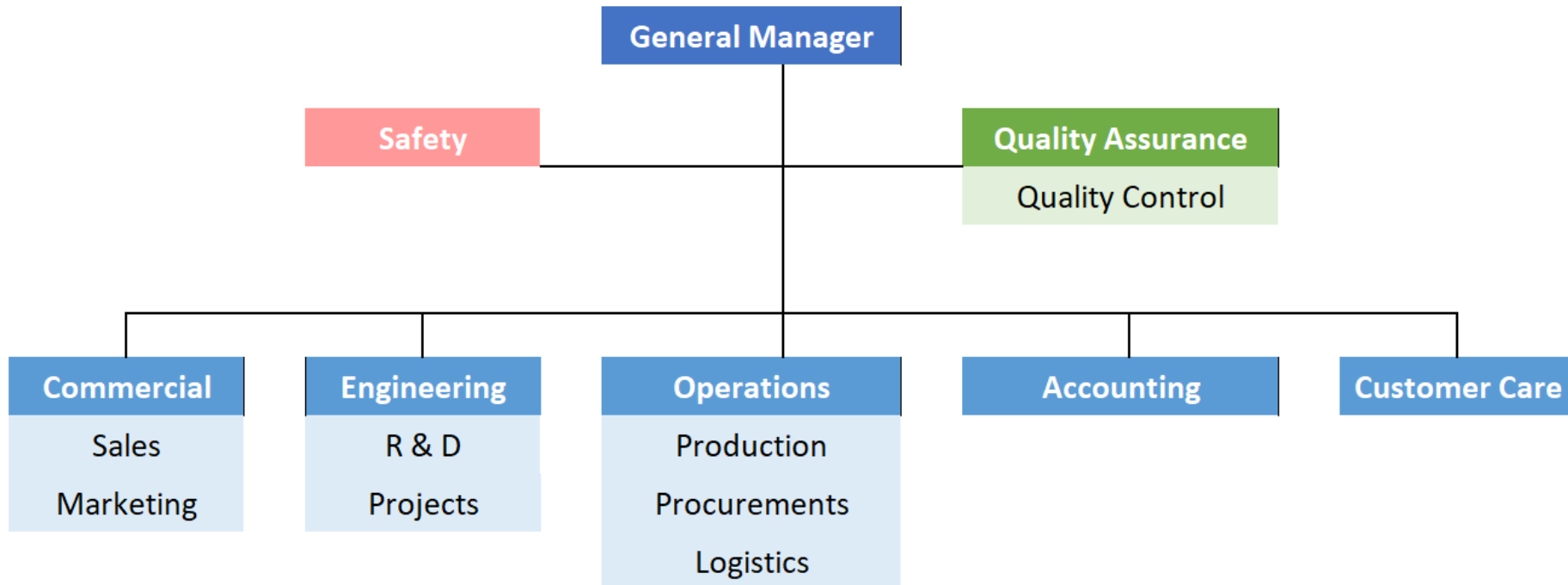
Presentation: New Plant

NEW PLANT OF MICROSISTEMI



Presentation: Organization

FUNCTIONAL ORGANIZATION OF MICROSYSTEMI

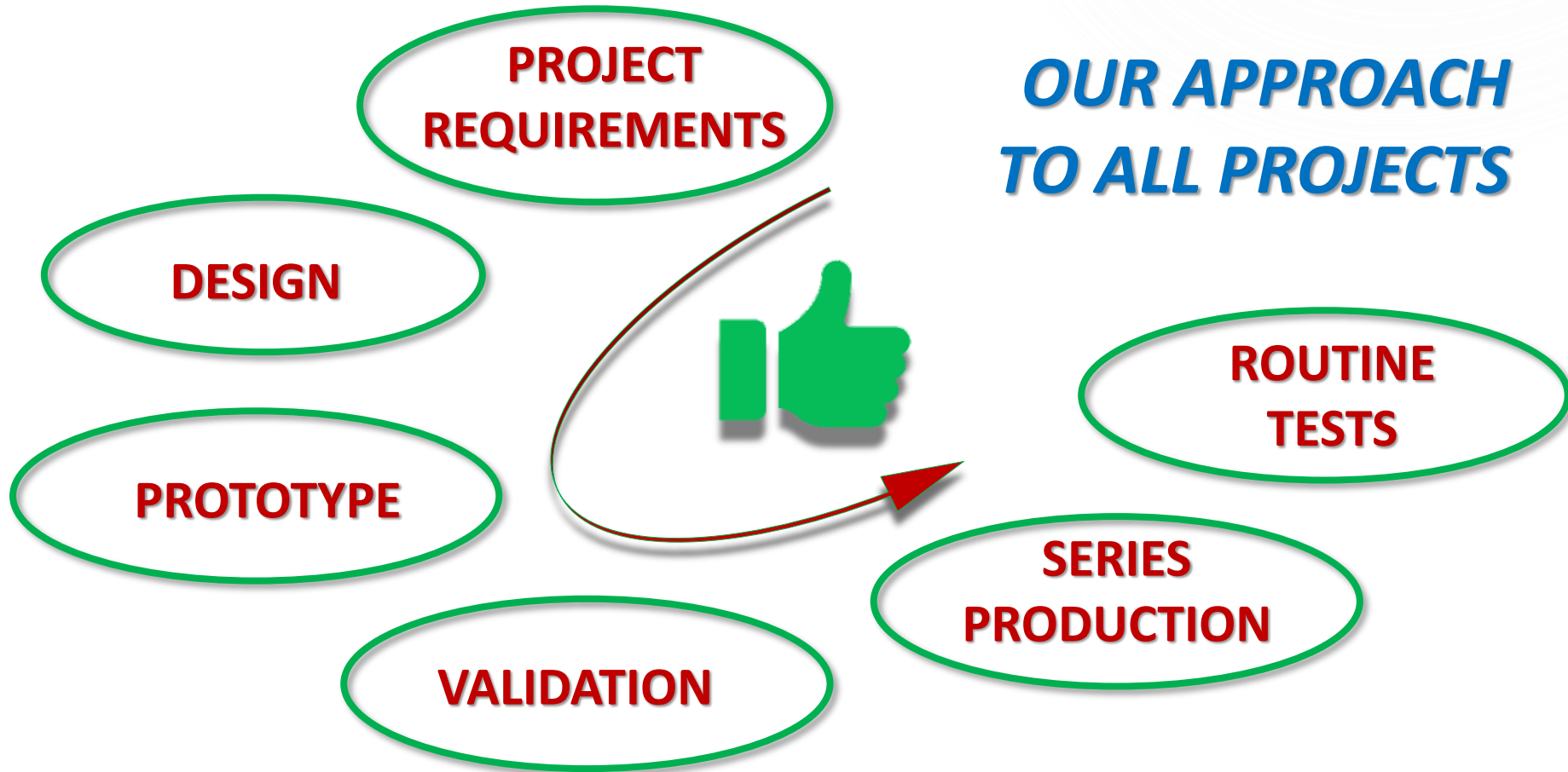


Our Mission

*We can create together
SOLUTIONS and tailor-made **PRODUCTS***

**Being a good 'Supplier' is not enough for us:
our true Ambition is to become a
PARTNER for our CUSTOMERS!**

Our Mission

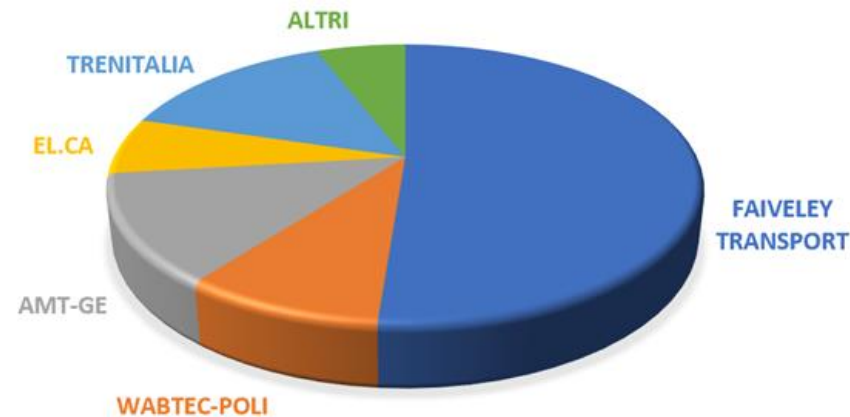


- Project Requirements - functionality
- EN-50155 – environmental
- EN-61373 – shocks and vibration
- EN-50121 - EMC

Presentation: Areas of Competence

AFTER MARKET: design and manufacturing

- SPARE PARTS for OVERHAUL and REPAIRS of SUBSYSTEMS
- COMPLETE OVERHAUL SERVICE (spares and repairs)
- REVERSE ENGINEERING
- REVAMPING and MODERNIZATION of SINGLE COMPONENTS or AUXILIARY SUBSYSTEMS

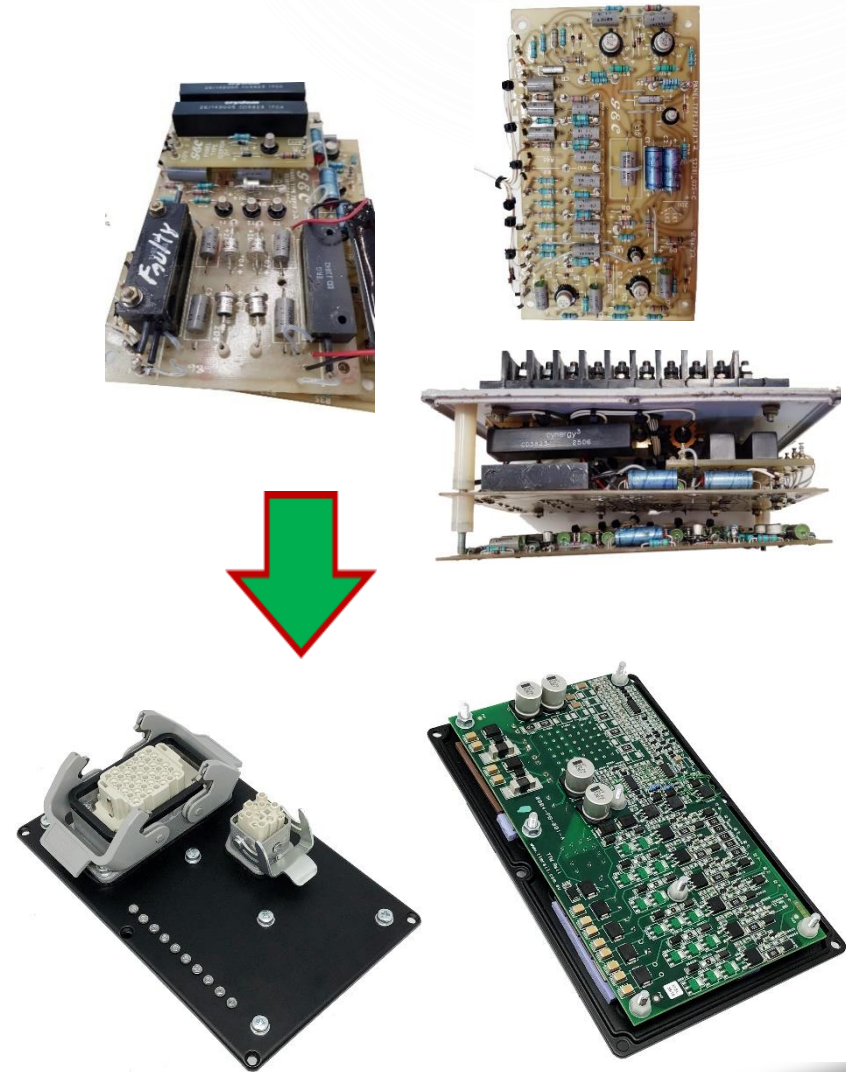


Areas of Experience: Reverse Engineering

- Reverse Engineering of functional sub-systems or single boards, both in obsolescence status.
- Complete redesign and full validation in order to guarantee interchangeability and equivalent performance.

We can guarantee:

**MODERNIZATION vs
OBSOLESCENCE**



Areas of Experience: Specific Products

OVERHAUL, REPAIR and FULL PRODUCTION of ELECTRONIC and ELECTRO-MECHANICAL COMPONENTS for ROLLING STOCKS:

- **Single ELECTRONIC BOARDS and
COMPLETE ECU for DOORS CONTROL
and AIR CONDITIONING**

(Coaches Z1, MD, Vicinali, Tram Sirio, XMU)

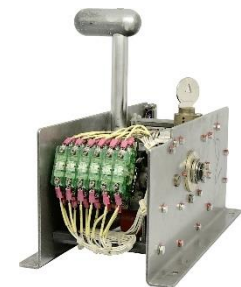
**The activity is performed by trained and
certified persons**



Areas of Experience: Specific Products

- Single **ELECTRONIC BOARDS** and **COMPLETE ECU** based on different vehicle platforms
(Passenger Cars, Metro and LRV)
- Driver's cabin **MONITOR**
(Tram Sirio and CTR-Minuetto)
- Driver's **MANIPULATOR** for traction and braking function
(Tram Sirio)

The activity is performed by trained and certified persons



Areas of Experience: Specific Products

INVERTER FOR AUXILIARIES

(Passenger Cars and vehicles with traction)

Design and full **production** (also according to customer spec) or **repair** of:

- **INVERTER CC/CA e CA/CA**
 - Single-phase and Three-phase
 - Power 1 ÷ 4 kW
- **ACCESSORIES** (for any Inverter size)
 - Autostarter
 - GPA electronic boards (Pulse Amplification Group)
 - Electronic boards for Control and Power Supply



Microsistemi New Developments

CONVERSION of conventional chopper - DC motors actuator into **BRUSHLESS SYSTEM**

- Better control and finest tuning
- More efficiency on energy consumption
- No maintenance on brushless motor



**Improved Performance and
Maintenance Cost Reduction**



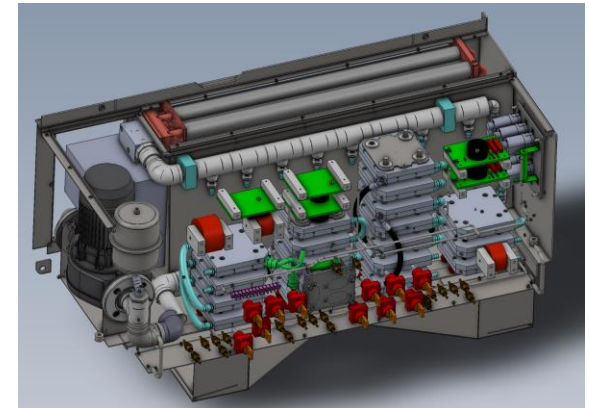
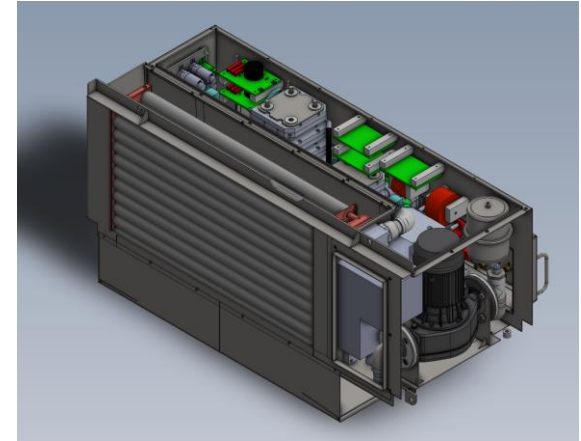
Microsistemi New Developments

ReDesign of a COOLING SYSTEM for power elements of traction management chopper

- Replacement of the present cooling system based on special fluid with one based on water
- Modernization of electrical components
- Improvement of Maintenance Concept



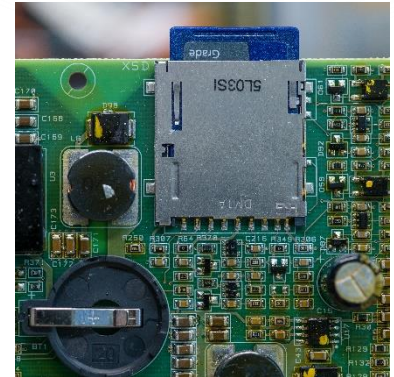
Maintenance Cost Reduction



Microsistemi New Developments

EMERGENCY SAFETY FUEL STOPPER SYSTEM for Diesel Traction Units

- ECU to manage input signals, activate output command signals and data recorder
- Accelerometer and temperature sensors
- Safety valves for diesel fuel stop
- Safety emergency buttons



Microsistemi New Focus

OVERHAUL and REPAIR

- Hydraulic Power Units
- Hydraulic Brake Actuators and Calipers



SUPPLY, OVERHAUL and REPAIR

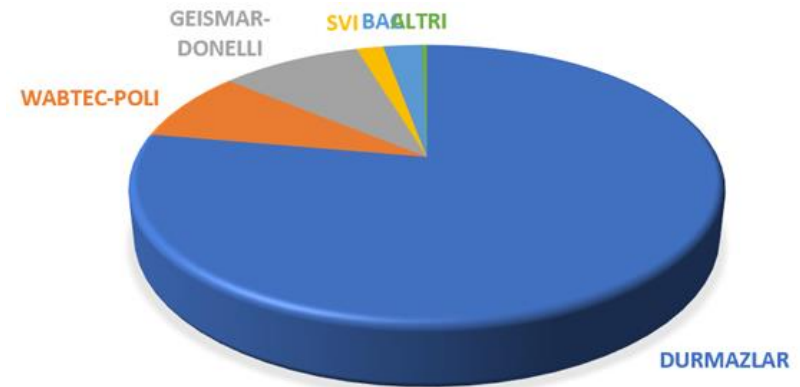
- Magnetic Track Brakes



Presentation: Areas of Competence

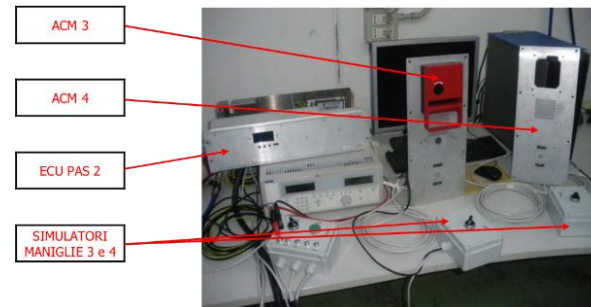
ORIGINAL EQUIPMENT: design and manufacturing

- SANDING SYSTEM INCLUDING AGTU
- DOORS CONTROL SYSTEM
- ELECTROPNEUMATIC DRIVER'S BRAKE VALVE
- AIR SUSPENSION LEVELLING CONTROL
- INTEGRATED ELECTRONIC CONTROL UNITS
- AUXILIARIES SUBSYSTEMS



Products Developed for Customers

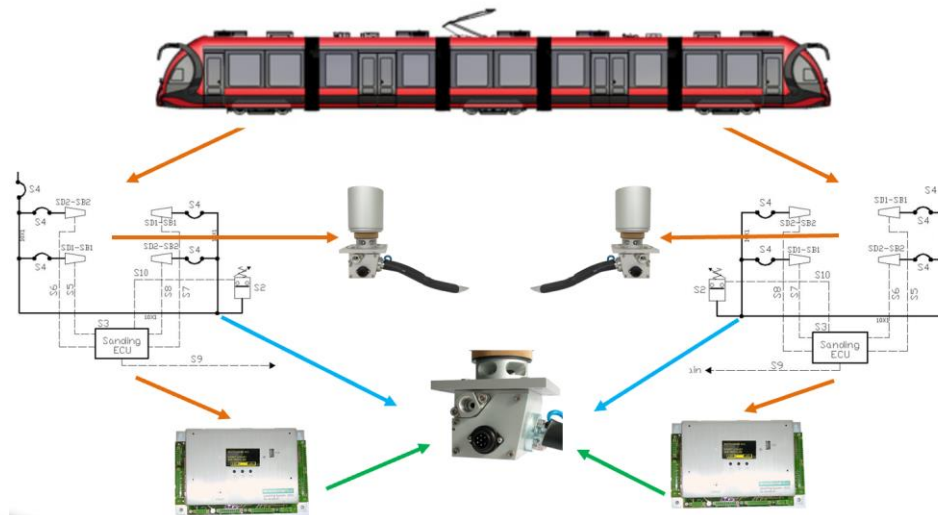
- **ELECTRONIC VALVES** for Oerlikon-KB braking System
- **REDUNDANT ANTISKID** for ETR 500 with Oerlikon-KB
- **SUSPENSION and LEVELLING ELECTRONIC CONTROL** for Lille's Tram with AnsaldoBreda
- **ECU for WSP ATHENA** for Wabtec – FT – Poli
- **PASSANGER ALARM SYSTEM** compliant to EN 16334) for Wabtec – FT – Poli



Microsistemi Products

SANDING EQUIPMENT

- Full control logic, diagnostics and **ADJUSTABLE SAND FLOW** depending on speed profile:
0.45 to 3.4 kg/min
- **ELECTRONIC** and **ELECTRO-PNEUMATIC** configuration



Microsistemi Products

ELECTRONIC VERSION:

- All commands and functions are applied through the embedded electronic board
- Embedded electronic board is managing interface to the main Electronic Control Unit for all functions and the finest tuning of sand flow



ELECTRO-PNEUMATIC VERSION:

- No embedded electronics
- Only electrical commands to the valves
- Commands are managed directly by main Electronic Control Unit (It can be integrated in vehicle TCMS or brake control)



Microsistemi Products

FUNCTION	BENEFIT	STATUS
SAND FLOW	CONSTANT: it is constant during the complete sanding application once command is applied	basic
	STEP REGULATION: it can be adjusted at fixed steps of vehicle speed. It can be only one or more	functional option (*)
	ADJUSTABLE ACCORDING TO SPEED PROFILE: it can be adjusted in continuous according to speed profile during vehicle service	functional option (*)
INTERNAL VENTILATION	To avoid sand conglomerating in sand tank: it is part of dryer function	basic
SAND EJECTION PIPE CLEANING BLOW	To prevent residual sand from conglomerating in the ejection pipe and clogging it	functional option (*)
INTERNAL HEATING	To avoid sand freezing in sand tank and clogging it: it is part of dryer function	upgrade option
SAND EJECTION PIPE HEATING	To prevent residual sand from freezing in the ejection pipe and clogging it	upgrade option
SAND LEVEL SENSOR	To monitor on driver's desk or externally by a LED light level of sand inside the tank	upgrade option
WINTER CONDITION	Components are selected in order to face low temperature down to strong winter condition with damp and - 40 °C	upgrade option

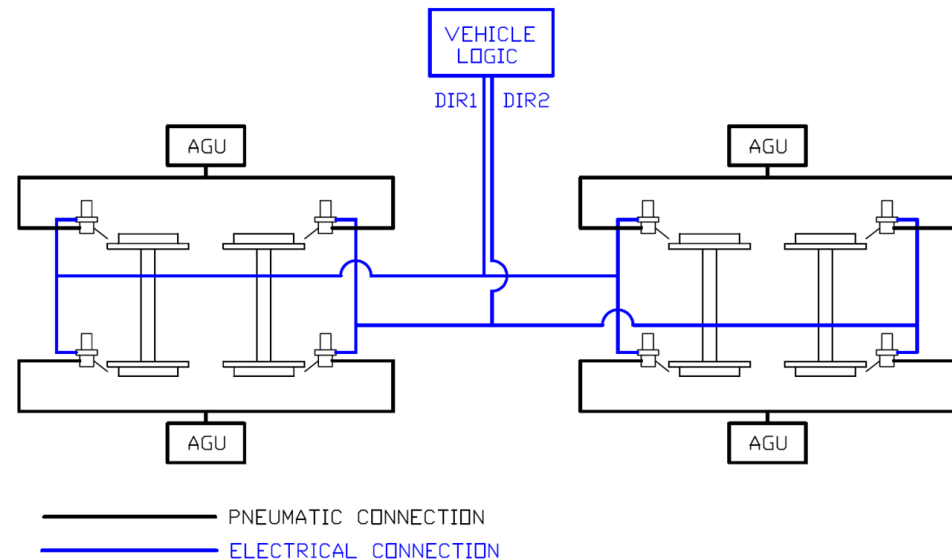
(*) No additional or different components are required.

Microsistemi Package Options: Step 1

COMPLETE SANDING SYSTEM for LRV and TRAM



- SANDING DEVICE
- AIR GENERATION UNIT (Oil-Free Piston Compressor)

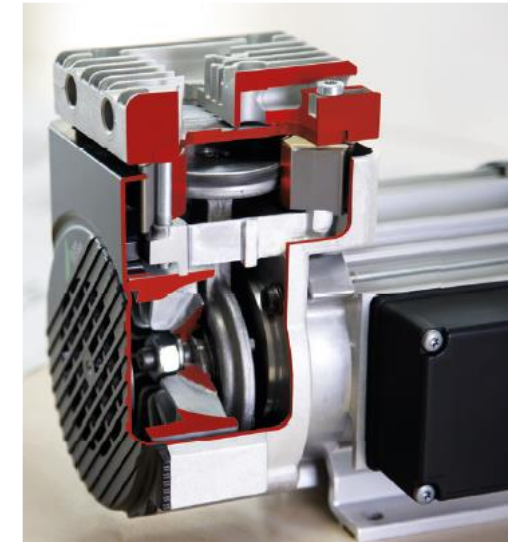


Microsistemi Package Options: Step 1

Our PREFERRED SOLUTION for **AIR GENERATION** **OIL-FREE PISTON COMPRESSORS**



- The most advanced technology in the field
- Specific choice of materials and coatings for pistons, cylinder chambers and seals
- Smooth running
- No need for lubrication
- Continuous running allowed, when needed, without specific duty-cycle restriction
- Long service life, basically **Maintenance Free**



ADVANTAGES:

- **Reduced Operating Costs** along with higher reliability and reduced down-time
- **Environmental Improvements**



Microsistemi Package Options: Step 1

COMPRESSOR RANGE

- Articulated range of **SERVICE PROVEN** compressors
- All system configurations to best meet and support Customer's specs



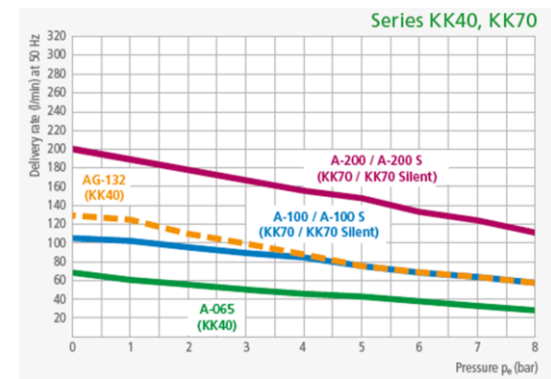
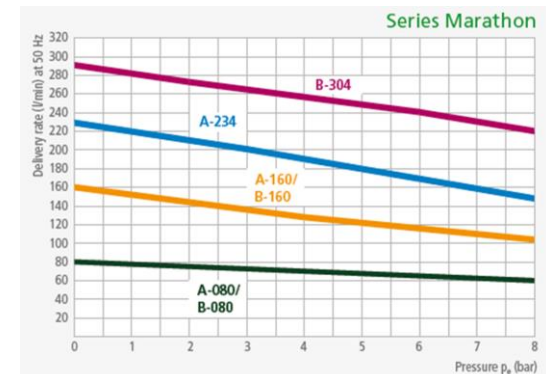
Series KK40



Series KK70

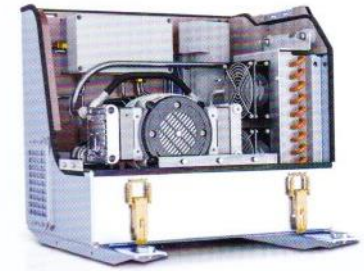
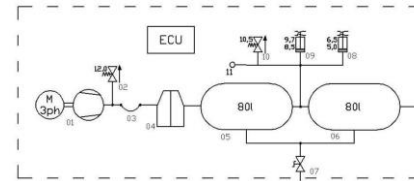
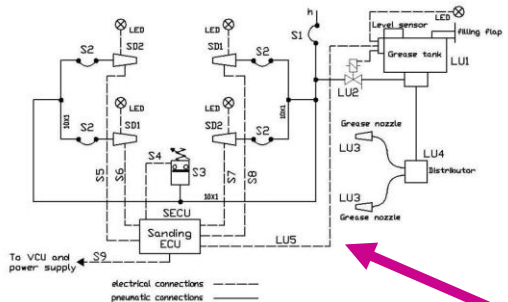


Series Marathon

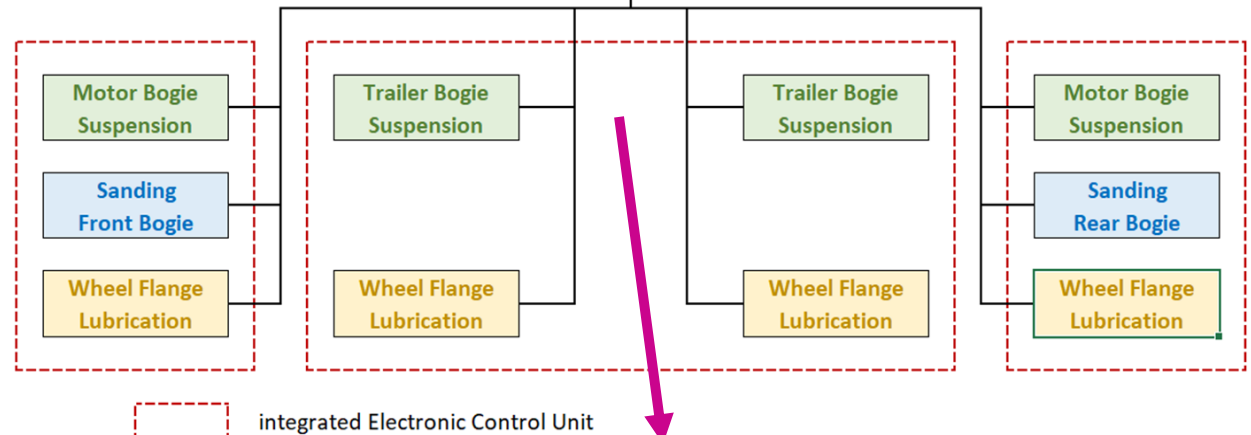


Microsistemi Package Options: Step 2

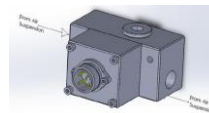
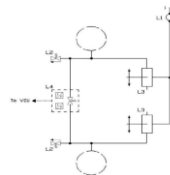
Air Generation and Treatment with Oil-Free Compressor



Air Generation and Treatment Unit



Sanding Device and ECU
to manage functions and
diagnostics, with the
option to have **Wheel
Flange Lubrication**
integrated

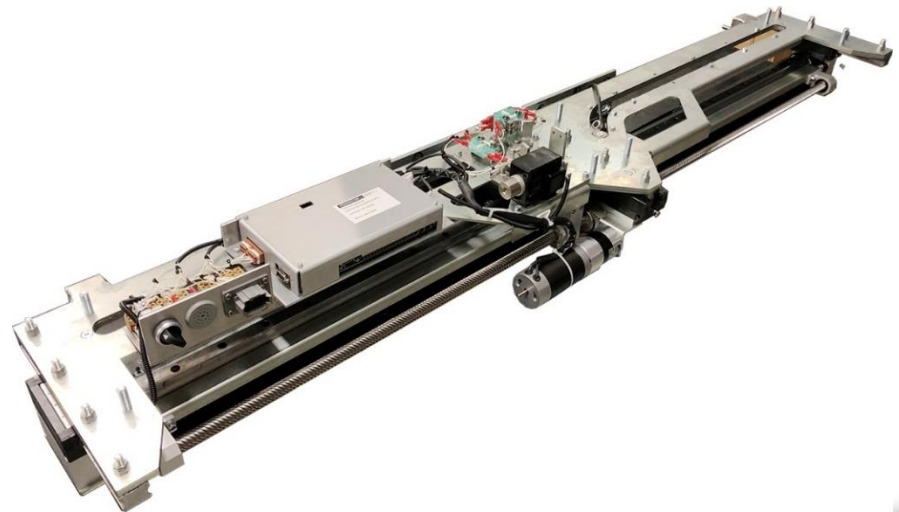


Air Suspension Levelling System
by levelling valves and one smart
valve to manage their feeding

Microsistemi Products

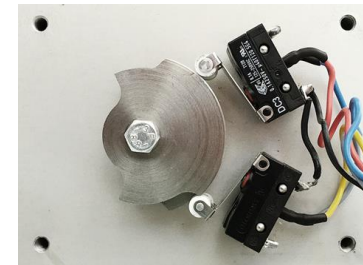
DOORS CONTROL SYSTEM

- Single and double electro-mechanical ejection and sliding door system.
- Complete with ECU, mechanical and electrical door actuation by **brushless motor drive**, doors with sensitive edge, communication with TCMS.
- Possibility to customize sliding profile.



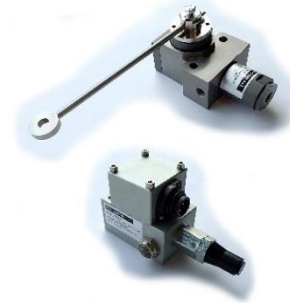
ELECTRO-PNEUMATIC DRIVER'S BRAKE VALVE (compliant to EN 14033-1:2017)

- Valve is equipped with an electrical section having four switched contacts depending on position of command lever
- Air flow sections of the valve are determined by internal chocks depending on position fixed by the command lever



AIR SUSPENSIONS LEVELLING SYSTEM

- Pneumatic, electro-pneumatic or smart valves to manage feeding and venting of air suspensions
- Electronic Control Unit to manage I/O signals between TCMS or Brake Control and components
- Electronic Control Unit can be integrated into one managing other auxiliaries functions



HOW CAN WE GENERATE TOGETHER OPPORTUNITIES FOR A COOPERATION ?

- REPAIR AND OVERHAUL
- PRODUCTION OF SPARE COMPONENTS
- PRODUCTION OF SPARE SUB-SYSTEMS
- REVERSE ENGINEERING AND MODERNIZATION OF SINGLE COMPONENTS OR FUNCTIONAL SUB-SYSTEMS
- DEVELOPMENT OF NEW PRODUCTS
- APPLICATION OF EXISTING PRODUCTS
-

MICROSISTEMI MAIN CUSTOMERS



DURMARAY



Thank You for Your Attention!

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