



*[www.kelvin.it](http://www.kelvin.it)*

1951

*KELVIN starts as a small laboratory who took care of the reparation and maintenance of small dc generators for automotive industries*



1960

*Creation of electrical spare parts distribution network for automotive industries*

1971

*Specialization in medium and low voltage DC motor repairing*

1974

*Specialization in traction, pump and hydro-guide motor reparation, mainly for forklifts.*

*Static and dynamic balancing, on behalf of a third party, up to 20 tons*



1997

*Schabmüller GmbH partnership*

2001

*Workshop and offices expansion*

2003

*ISO 9001 certification*

2010

*Mechanical machining department expansion*

2015

*Design and construction of the first KELVIN Motor-In-Wheel-Drive unit wheel Ø110mm – payload 250Kg*



2016

*Internal design office  
MAZAK 5 axis workstation for series production  
Warehouse expansion  
Increased test room capacity  
New BRUSHLESS motor line by KELVIN*

2017

*Doubling of production capacity thanks to a new 5 axis workstation of the latest generation*

...

I NOSTRI MERCATI PRINCIPALI



**FORKLIFTS**



**AGVs / LGVs**



**ELECTRIC CARS**



**CLEANING**



**GOLF KARTS**



**TRACTORS**



**PLATFORMS**



**AGRICULTURE**



**ROBOTICS**



**INDUSTRIAL AUTOMATION**



**TUGS**



**BOATING**



## MOTOR-IN-WHEEL-DRIVE UNITS AND TRACTION SYSTEMS

In addition to SCHABMULLER partnership, we developed our own horizontal and vertical Motor-In-Wheel-Drive units and differential drives, with or without steering, for all applications, sectors and wheel loads. Developed together with the customer, based on detailed specifications, they equip industry vehicles, AGVs or LGVs, wire-guided shuttles, vehicles for automotive and motorbike industries, robots, etc....

## ELECTRICAL MOTORS AND GEARED MOTORS

AC, DC, Brushless motors and geared motors for many applications. Tailored solutions designed by a skilled technical team to satisfy customer specifications and application requirements. Electrical motors for traction, lifting, hydroguide for electric vehicles, forklift trucks, AGV/LGV and robots, transpallets, floor washers, tugs, electric cars, kart, bikes and battery vehicles in general.



## ACCESSORIES

Electronic motor controllers, tillerheads, pushbuttons, DC-DC converters, and all related accessories, to let the customer operate with reliable components, validated by our staff, to guarantee the correct operation and meet the expected result.



## REPAIRING AND SPARE PARTS

From 65 years we are specialized in every kind of spare parts supplying and motor repairing: brushes, springs, holders, bearings, sensors, contactors, electric fans, fields, armatures, wheels, gear boxes, control units, pumps. Repairing of 3-phase and mono-phase motors, DC and permanent magnet, Brushless BLDC and BLAC, servomotors from few W to 100 kW. Brands: SCHABMULLER, SIEMENS, AMER, ISKRA, CIMA, AMETEK, PRESTOLITE, BOSCH, MAHLE, ADVANCED, IMPERIAL, GIEM, EBMPAPST, LENZE, IMS GEAR.

## MECHANICAL BALANCING AND MACHINING

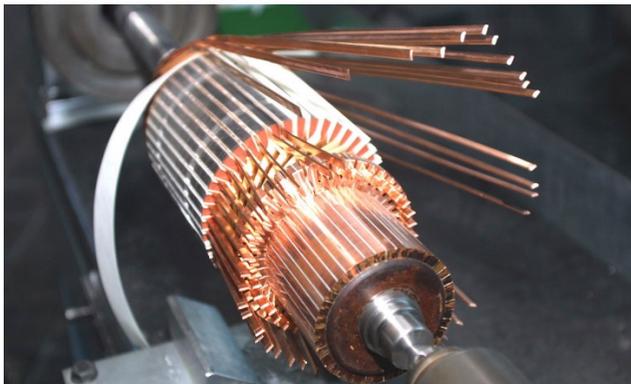
Static and dynamic balancing on behalf of a third party, to guarantee maximum precision and reliability, with our recognized quality.

Special mechanical machining, and particular drawing based ones, on behalf of a third party, thanks to a qualified technical staff and dedicated equipments (CNC lathes, 3 axis milling machine and a MAZAK 5 axis workstation of the latest generation) to guarantee the maximum quality and a huge optimization of the production cycle.



## TESTS

Execution of many tests on electrical motors, motor in wheel drives and geared motors. On load testing at nominal load performed with the direct brake method, rotor locked testing, characterization in a wide range of voltages and frequencies, torque and speed curves, predictive analysis and residual life, dielectric strength and insulation, vibration analysis, temperature rise test, data processing and reporting on client format.



**MOTORS**

Following the increased request for compact motors, and more performing solution, we designed a new BRUSHLESS motors line, made by KELVIN.

From over 65 years experience in all electrical motor types and applications, comes our new brushless motor line, strongly optimized in order to guarantee quality, reliability and high performances.

Solutions aligned to market requests, modular and flexible, able to drive the most various applications.

**BRUSHLESS MOTOR PROS**

- No maintenance required
- Constant torque on the whole operating range
- High efficiency or maximum compactness at the same performances
- Higher power density
- Wide speed range

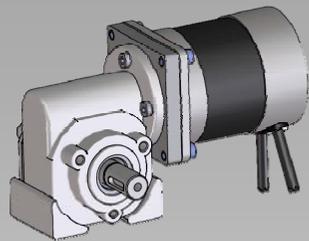
**BRUSHLESS MOTOR RANGE**

	TYPE	STATOR DIAMETER [mm]	POWER [W]	SPEED [RPM]	VOLTAGE [V]	TORQUE [Nm]	MAXIMUM TORQUE [Nm]
	KBL57	57	up to 270 up to 520	3500 7000	24 48	up to 0,8	up to 2,6
	KBL80	80	up to 200 up to 400 up to 730	up to 2300 up to 4600 up to 5800	24 48 up to 96	up to 0,8 up to 1,2 up to 1,5	up to 2,6 up to 3,5 up to 4,5
	KBL100	100	up to 3000	up to 4500	24-72	up to 7,0	up to 21
	KBL127-35 KBL127-70	127 127	up to 2000 up to 4500	up to 7000 up to 7000	24/48/80	up to 7,1 up to 6,0	up to 21 up to 16
	KBL200	200	20k	up to 5000	96	up to 40	up to 110

- VARIOUS MOUNTABLE MOTOR FEEDBACK:  
HALL SENSOR, RESOLVER, SIN-COS, etc..
- PROBES OR THERMICS ON REQUEST
- STANDARD OR CUSTOM CONNECTION FLANGES
- KEYED OR SPLINED SHAFT BASED ON SPECIFICATION
- IP PROTECTION GRADES ON REQUEST (up to IP68)
- SPRING OR MAGNETIC SAFETY BRAKES, SINGLE OR REDUNDANT
- PRE-CABLED OR INTEGRATED COMMAND ELECTRONICS



## GEARED MOTORS



Thanks to the partnership with top quality selected gearbox makers, we are able to provide tailor made solutions, based on specific customer requests, by considering our range of Brushless motors, equipped with brakes or other accessories.

Compact solution, high power and torque in a very reduced space, reliability, high efficiency and no maintenance required, make this as the proven cost-effective solution nowadays

Our experience extends from drive solutions for industry vehicles, AGVs or LGVs, to agriculture devices, like wheelbarrows, facilitators, movers or sprayers, from tugs for marine and aircraft markets, to stair climbers for carrying, lifting and moving heavy goods.

By considering helical and bevel helical, coaxial and worm, or planetary type gearboxes, we are able to meet every kind of specification, by choosing the most suitable type of Brushless motor to be joined.

From few W power, to more than 10 kW, our geared motors are able to cover the entire range of drive system on board of a battery vehicle.

Brushless technology, and a customized design based on a careful application analysis, reduce batteries cost impact, or extend the duration in already existing, in the revamping cases.

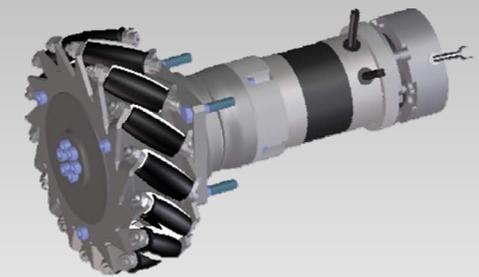


## MOTOR-IN-WHEEL-DRIVE UNITS



With a full range of Motor-In-Wheel-Drive units, we are able to cover all market requests: from the newly born MIWD 11K-16A, the most compact of the category with only 134 mm height, 110 mm wheel diameter and 250 Kg payload, to the biggest, SCHABMULLER VD41, with 1100 mm height, able to carry 4200 Kg load.

In the middle, a wide range of solutions, in terms of maximum load, overall dimensions, speeds, motors, etc...



Our units equip most of the battery vehicles (AGVs, LGVs, etc...) for automotive industry, food, hospital, cleaning, automatic storage, indoor and outdoor shuttles, and many other applications studied and designed on specific customer's request.

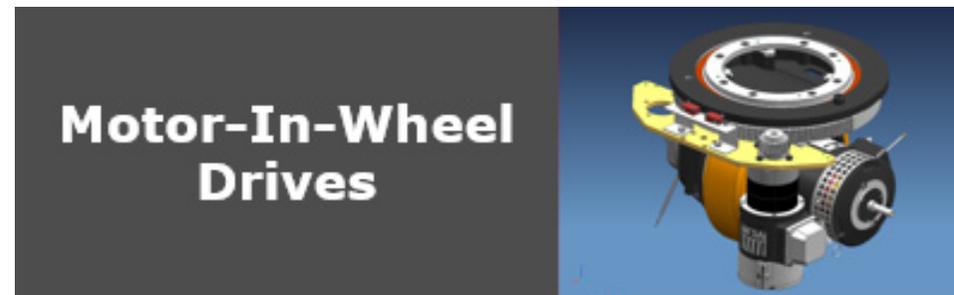
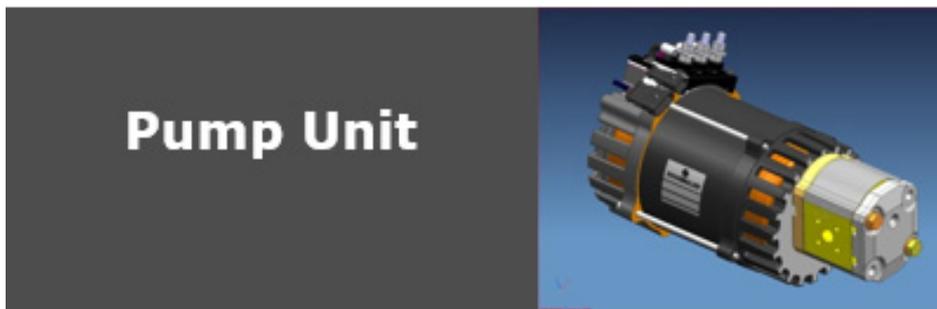
All of the series can be equipped with AC, DC, or our new Brushless motor line.

Trusted electronic partners complete the drive system unit, giving to our customers a complete turnkey solution ready to be integrated in the vehicle.





Size DC	Size AC	Voltage	kW DC max.	kW AC max.	Volume max. Liter / min
150	150	24 / 48 / 80	4,0	6,0	16,0
178	170	24 / 48 / 80	8,0	16,0	22,5
210	200	48 / 80	16,0	22,0	32,0

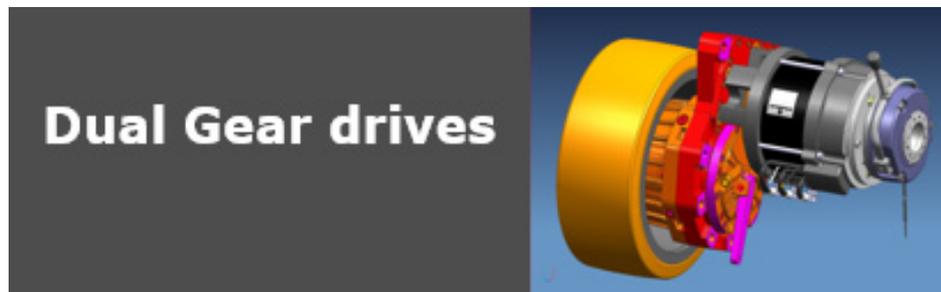


MIWD Typ	Voltage	Wheel load	Gear ratio 1 x	Height (mm)	1/min max.	Speed max. km/h	kW DC max.	kW AC max.
15	24	200	9,9	175	2000	3,6	0,13	X
21	24 / 48	400	18,0 / 23,0	293	3500	6,0	0,80	0,85
21	24 / 48	600	24,0	293	2700	4,5	0,80	0,85
27 L	24 / 48	1300	15,9 / 22,9 / 33,8	315	3500	6,0	2,00	2,50
27	24 / 48	1300	15,9 / 22,9 / 33,8	360	3500	6,0	2,00	2,50
32	48	1700	22,0 / 30,0	406	3500	10,0	2,50	4,50
35	48	2200	22,6 / 34,2	451	3500	10,0	4,00	5,50
41	48	3200	18,79 / 24,66 / 31,27	490	3500	10,0	5,40	8,00

- SAE OR EN SPLINE SHAFT AVAILABLE
- SLOT SHAFT END
- AC OR DC TECHNOLOGY
- WITH OR WITHOUT PUMP

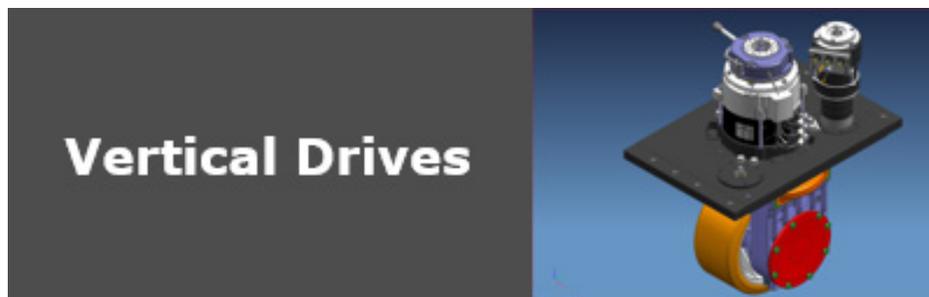
- STEERING PACKAGE
- LIMIT SWITCHES
- POTENTIOMETER
- MECHANICAL STOP
- ELECTROMAGNETIC BRAKE
- TRACTOTHAN, VULCOLLAN or PEVODYN WHEEL
- OPTIONAL ENCODER ON GEAR OR MOTOR SIDE





DG Typ	Voltage	Wheel load	Gear ratio 1 x	Height (mm)	1/min max.	Speed max. km/h	kW DC max.	kW AC max.
GP25	24 / 48	2500	26,6	600	3500		2,00	3,00
601	24 / 48	2800	26,8	600	5000		4,00	5,00
701	48	4400	24,2	600	5000		5,40	7,50
855	48 / 80	6200	36,1	700	4000		5,40	11,00

VD Typ	Voltage	Wheel load	Gear ratio 1 x	Height (mm)	1/min max.	kW DC max.	kW AC max.
23	24 / 48	1100	16,6 / 28,9	600	3500	2,00	2,50
25	24 / 48 / 80	1650	19,7	700	5500	2,00	4,00
35	48	2600	18,1	800	5500	4,00	5,50
41	48 / 80	4200	19,8	1100	5500	5,40	8,00



- OPTIONAL ELECTROMAGNETIC BRAKE
- TRACTOTHAN, PEVODYN OR VULCOLLAN WHEEL
- OPTIONAL ENCODER AND TACHO

- STEERING PACKAGE
- ELECTROMAGNETIC BRAKE
- OPTIONAL ENCODER ON GEAR OR MOTOR SIDE
- TRACTOTHAN OR VULCOLLAN WHEEL

Size DC	Size AC	Voltage	kW DC max.	kW AC max.	Gear ratio i = Max
100	106	24 / 48	Max. 0,6	1,45	308
125	120	24 / 48 / 80	Max. 1,0	2,0	308
---	135	48 / 80	---	4,0	308

## Steering Unit

## Tailored Traction Motor

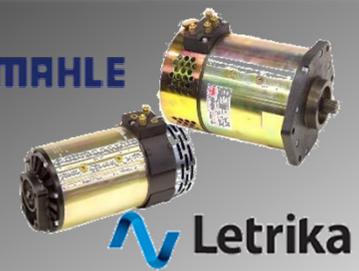
Type	Size	kW	Voltage
AC	106 - 300 mm	0,5 – 20 kW	12 – 200 V
DC	80 - 325 mm	0,2 – 40 kW	12 – 200 V

- OPTIONAL ELECTROMAGNETIC BRAKE
- OPTIONAL ENCODER OR TACHO
- AC AND DC TECHNOLOGY

- OPTIONAL ELECTRO MAGNETIC BRAKE
- OPTIONAL ENCODER OR TACHO
- AC AND DC TECHNOLOGY



MAHLE



Letrika



Haldex

SCHABMÜLLER

SAUER DANFOSS



AMETEK Prestolite Motors



CIMA 1915



amer

Iskra Iskra Avtoelektrika d.d.



INTORQ



SICK

Albright



Baumer



RoboteQ



SCHWARZMÜLLER INVERTER



ZAPI



SCHABMÜLLER OFFICIAL PARTNER



A massive warehouse, one of the biggest in this field, fully automatized with more than 40,000 spare parts ready for delivery.

Hardware and software PC-based, it guarantees a fast service and a constant availability for immediate shipment of most of the components we stock, and a very quick motor repair in case of need.

A few examples of some of the spare parts and components we stock and manage:

- **ENCODERS, SPEED CONTROLLERS**
- **ELECTROMAGNETIC BRAKES**
- **FANS / ELECTRIC FANS**
- **TERMINAL BOXES**
- **STATOR WINDINGS**
- **EXCITATION FIELD WINDINGS**
- **STATORS**
- **VULKOLLAN, TRACTOTHAN, etc... WHEELS**
- **BEARINGS / SENSORIZED BEARINGS**
- **DIFFERENTIAL DRIVES**
- **PUMPS**
- **ANCHOR WINCH MOTORS**
- **CABLES AND CONNECTORS**
- **NO, NC THERMICS**
- **REDUCTION GEARS, PINIONS**
- **BATTERIES, BATTERY RECHARGERS, STARTERS**
- **POWER CONNECTORS**
- **FORKLIFT MOTORS / INDUSTRIAL BRUSHES**
- **BRUSH HOLDERS**
- **BRUSH SPRINGS**
- **COLLECTORS**
- **ROTORS / DIE CASTED ROTORS**
- **CONTACTORS / INVERTERS / MAGNETIC RELAIS**
- **JOYSTICK AND PUSHBUTTONS**
- **TILLERHEADS**



Leader in new motor selling, for forklifts, AGVs/LGVs, and all battery vehicles. DC, AC and BRUSHLESS motors for industrial and battery application, with power up to 150kW.

The following new or fully refurbished motors are ready for shipment:

AMER	FAC	MITSUBISHI
AMETEK	FANTOZZI	MONTINI
ANSALDO	FENWICK	MORA
ATLET	FIAT - PIMESPO	NACCO
BALKANCAR	GIEM	OMG
BT	HALDEX	ORMIC
BOSCH	HYSTER	PRESTOLITE
CARER	INDOS	PELLIZZARI
CATERPILLAR	ISKRA	PGS
CESAB	JSB	PIERALISI
CIMA	JUNGHEINRICH	SCHABMÜLLER
CINESE	KALMAR	SAUER DANFOSS
CLARK	KOMATSU	SAMAG
CML	LANSING	STILL-WAGNER
CTC	LETRIKA	TCM
DECA	LINDE	TOYOTA
DETA	LIFTER	YALE
EUROCAR	LUGLI	STILL-WAGNER

With more than 60 years experience, we are specialized in electrical motor service, mainly focused on traction, steering and electrical pump motors for forklifts, AGVs, tugs, walkies, electric cars, golf carts, cleaning machines and all electrical vehicles, battery operated or not.

We repair all kinds of AC or DC motors and generators, up to 750mm diameter.

Normally, a repaired motor has a longer life compared to a new one, approx. by 30%. If this is not enough, on request, we can even optimize its design to provide a repaired motor with higher efficiency and even longer life.



## EXCHANGE PROGRAM

Our service is fast but, if you don't have time to wait for repairs, we have an identical repaired/refurbished motor available for immediate shipping. Then you can easily send us your broken one at your convenience.



*[www.kelvin.it](http://www.kelvin.it)*

## **KELVIN** srl

28, Massimo d'Azeglio street  
21010 BESNATE (Varese) – Italy

phone +39 0331 274136  
fax +39 0331 275550

eMail: *[info@kelvin.it](mailto:info@kelvin.it)*