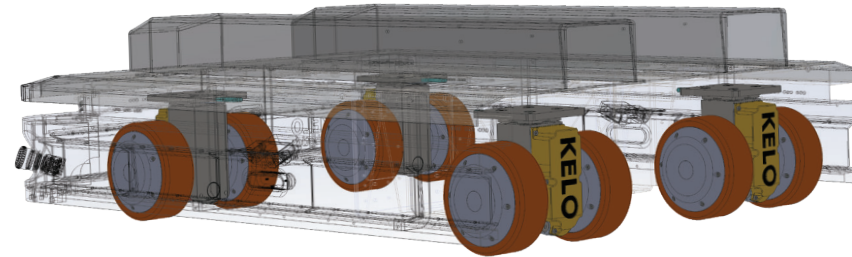


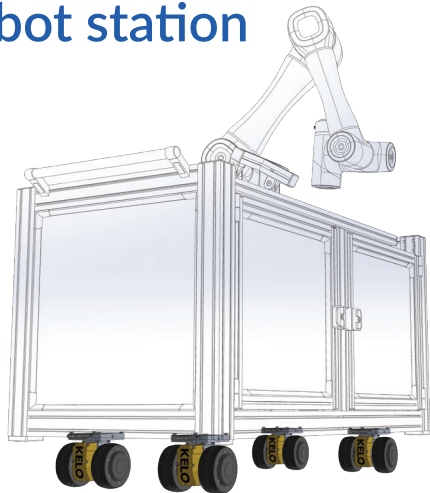
Your mobile robot with KELO drives

Autonomous robot for heavy loads

Our drives KD 165x enable you to transport arbitrary bulky and heavy loads. Each drive has a payload of 500 kg and can be placed arbitrarily under the frame carrying the load. For a cost-efficient design our drives can be combined with passive wheels.



Autonomous mobile cobot station



Concepts for future manufacturing will involve self-organizing work cells. KELO drives can be attached to existing work cells and turn them into a collaborative mobile robot. This enables the designer to design the system according to the needs of the application and not according to the needs of the robot.

Omnidirectional robotic forklift



Space in warehouses and shop floors is limited and a valuable good. This puts pressure on designer of mobile logistics robots such as robotic forklifts to make their robots move omni-directional. KELO drives can move on uneven ground and avoid the limitations of other omni-directional drive concepts like Mecanum wheels.

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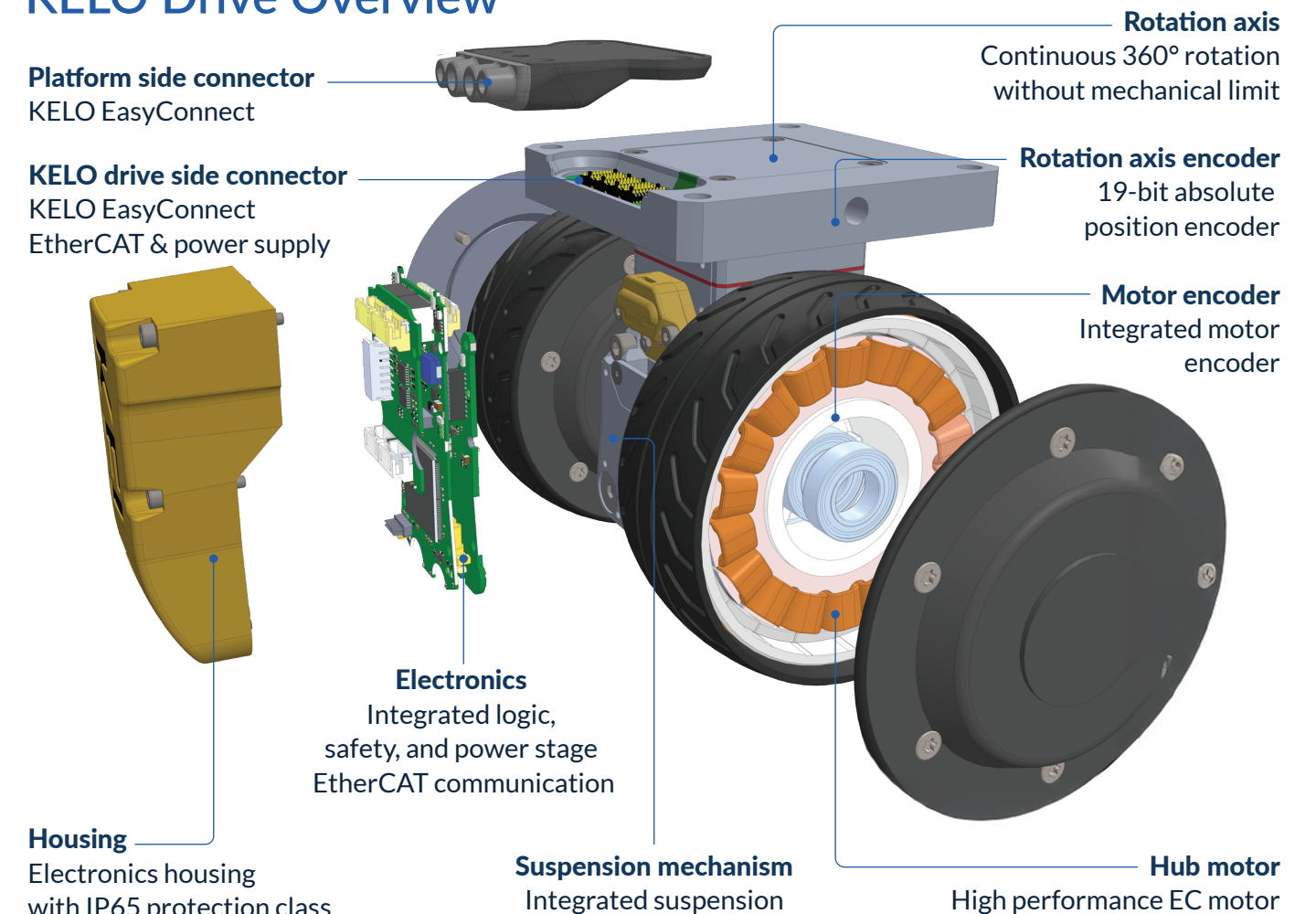
KELO Drive Family

Your path to omnidirectional robot mobility

KELO
Robotics

Our KELO drives are highly compact, self-contained units that can be mounted to a vehicle frame at arbitrary positions using just four screws and two cables. The KELO Drive family forms the core of our highly modular, configurable, customizable, maintainable, and cost-effective platform concept for professional mobile service robots.

KELO Drive Overview



KELO EasyConnect

With EasyConnect, integrating KELO drives and maintaining the robot is as easy as changing a light bulb. Once the platform-side connector is in place on the robot, the KELO drive can be attached or detached with four screws, handling mechanical, power, and data connections simultaneously.

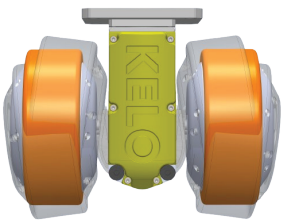


KELO Tulip

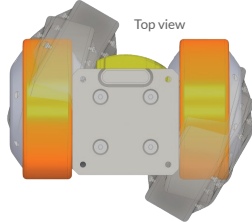
With KELO Tulip the software integration of the KELO drives becomes as easy as the mechanical integration. You need to enter the position of the wheels into a configuration file. The configuration file is then used to translate the intended velocity of the robot platform into the velocities of the drives.

KELO drive KD 165x

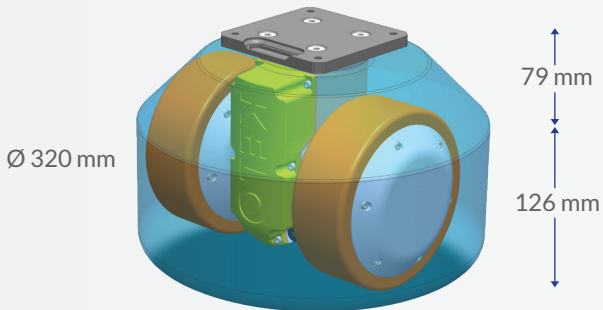
KELO
Robotics



Integrated suspension



Continuous 360° rotation

General specifications	
Power	1000 W
Rated torque	30 Nm
Peak torque	60 Nm
Velocity range	0-2 m/s
Motor type	Gearless EC motor - backdrivable
Kinematics	differentially driven twin-wheels
Software compatibility	KELO TULIP, various EtherCAT master software stacks
Firmware update	Via EtherCAT
Mechanical specifications	
Payload	500 Kg
Weight	15.5 Kg
Protection class	IP65
Tire material	Polyurethane (PU)
Hub motor	Ø 165 mm
Suspension system	±7.5° (24 mm vertical) movement with integrated rubber damper in the drive
Rotation axis	Continuous 360° rotation without mechanical limit - 15 mm off-axis wheel for enhanced stability and backdrivability
Space requirement	Cylindrical part: Ø 320 mm x 205 mm, top 79 mm chamfered
	
Safety	
Input signal	2xOSSD, FSoE ¹
Standard safety functions ¹	STO, SS1 according to SIL2 PLd

Electrical specifications	
Power supply	48 VDC (Max.: 65 V)
Controller features	
Modes	Velocity control, current (torque) control
Controller	FOC, PID
Loop frequency	Command Frequency: 1 kHz Inner Loop Frequency: 20 kHz (current and velocity control)
Communication interface	
EtherCAT	EtherCAT Slave, FSoE ¹
CAN	CAN over EtherCAT (CoE) - DS402
OSSD	2x OSSD signals
Inputs	
Velocity command (in velocity mode)	Each hub motor: 0-2 m/s command with 3 mm/s resolution
Current command (in current mode)	Each hub motor: max. 22 A with 0.01 A resolution.
Velocity limit (in current mode)	Each hub motor: 0-2 m/s command with 3 mm/s resolution
Current limit (in velocity mode)	Each hub motor: max. 22 A with 0.01 A resolution.
E-Stop	2x OSSD signals, FSoE ¹
Outputs	
Velocity data	Each hub motor: 1 mm/s resolution Rotation axis: 0.001 °/s resolution
Position data	Each hub motor: 0.1 ° resolution Rotation axis: Absolute position with 0.001 ° resolution
Current data	Each hub motor: 0.01 A resolution Drive current consumption: 0.01 A resolution
Voltage data	Drive input Voltage: 0.02 V resolution
Additional data	E-Stop, temperature, warnings, errors, timestamps, etc. (please refer to the datasheet).
Connector	
KELO EasyConnect	

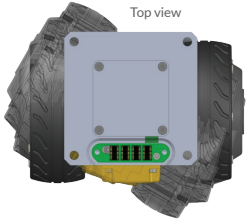
¹Available on safety certified versions

KELO drive KD 100x

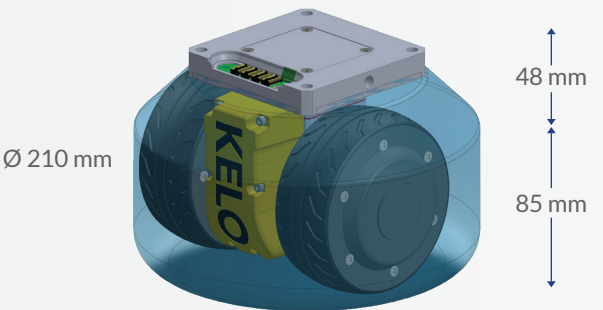
KELO
Robotics



Integrated suspension



Continuous 360° rotation

General specifications (Variants: 24 V 48 V)	
Power	200 W 400 W
Rated torque	5 Nm 8 Nm
Peak torque	10 Nm 20 Nm
Velocity range	0-2 m/s
Motor type	Gearless EC motor - backdrivable
Kinematics	differentially driven twin-wheels
Software compatibility	KELO TULIP, various EtherCAT master software stacks
Firmware update	Via EtherCAT
Mechanical specifications	
Payload	125 Kg
Weight	4.8 Kg
Protection class	IP54 overall - IP65 electronics
Tire material	Rubber Polyurethane (PU)
Hub motor	Ø 107 mm 111 mm
Suspension system	±4.75° (7.5mm vertical) movement with integrated rubber damper in the drive
Rotation axis	Continuous 360° rotation without mechanical limit - 10 mm off-axis wheel for enhanced stability and backdrivability
Space requirement	Cylindrical part: Ø 210 mm x 133 mm, top 48 mm chamfered
	
Safety	
Input signal	2xOSSD, FSoE ¹
Standard safety functions ¹	STO, SS1 according to SIL2 PLd

¹Available on safety certified versions

Electrical specifications	
Power supply	24 VDC 48 VDC (Max.: 32 V 65 V)
Controller features	
Modes	Velocity control, current (torque) control
Controller	FOC, PID
Loop frequency	Command Frequency: 1 kHz Inner Loop Frequency: 20 kHz (current and velocity control)
Communication interface	
EtherCAT	EtherCAT Slave, FSoE ¹
CAN	CAN over EtherCAT (CoE) - DS402
OSSD	2x OSSD signals
Inputs	
Velocity command (In velocity mode)	Each hub motor: 0-2 m/s command with 5 mm/s resolution
Current command (In current mode)	Each hub motor: max. 16 A with 0.01 A resolution.
Velocity limit (In current mode)	Each hub motor: 0-2 m/s command with 5 mm/s resolution
Current limit (In velocity mode)	Each hub motor: max. 16 A with 0.01 A resolution.
E-Stop	2x OSSD signals, FSoE ¹
Outputs	
Velocity data	Each hub motor: 1 mm/s resolution Rotation axis: 0.001 °/s resolution
Position data	Each hub motor: 0.1 ° resolution Rotation axis: Absolute position with 0.001 ° resolution
Current data	Each hub motor: 0.01 A resolution Drive current consumption: 0.01 A resolution
Voltage data	Drive input Voltage: 0.02 V resolution
Additional data	E-Stop, temperature, warnings, errors, timestamps, etc. (please refer to the datasheet).
Connector	
KELO EasyConnctect	