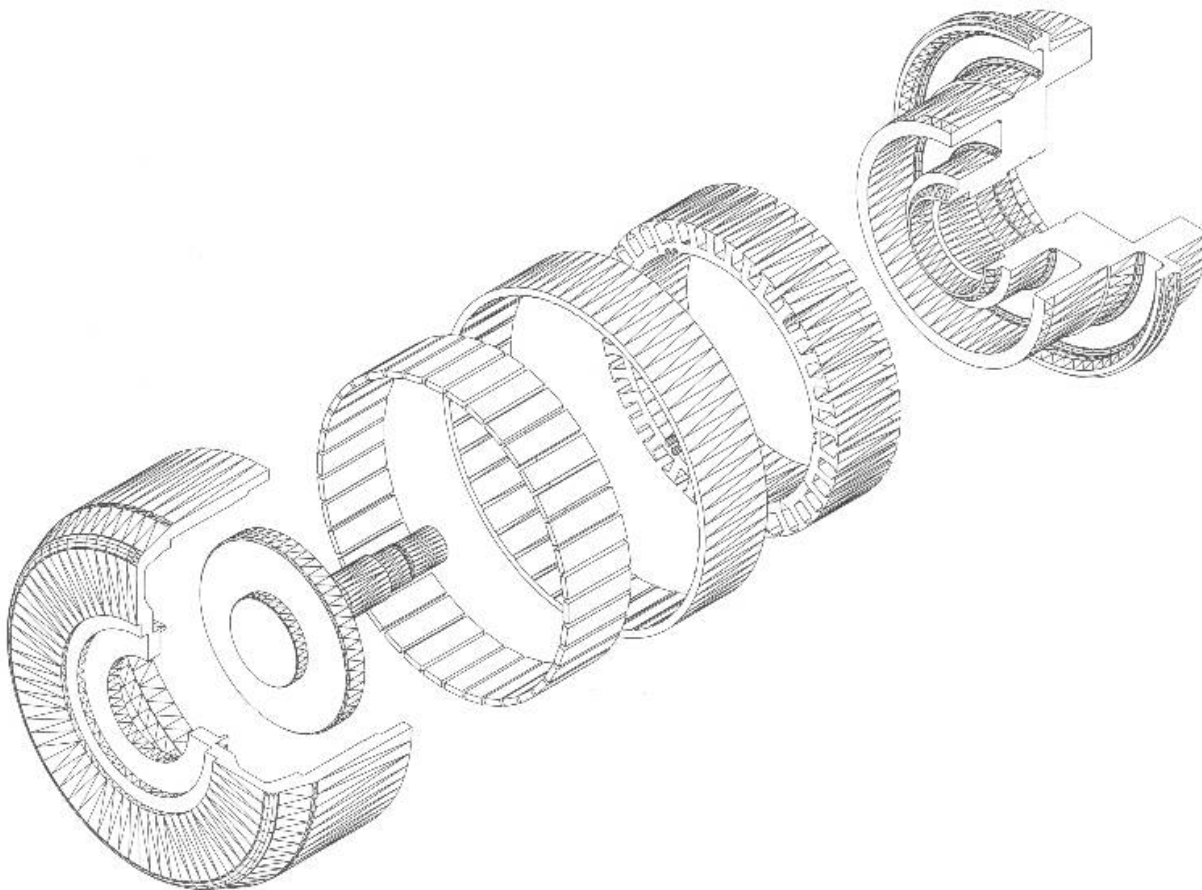


INNOVATIVE DIRECT DRIVE TECHNOLOGY



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All catalogue information corresponds to the state of the date of printing. Technical changes are possible.

PRODUCTS, BENEFITS, CHARACTERISTICS

Motors

- slow-running synchronous motors (0...300...[800] rpm)
- external rotor – without maintenance-intensive commutator and brushes
- integrated sensor for regulation of speed and position
- high torque on small space by use off high energetic magnets
- nominal torque from standstill (from 0 rpm)
 - outer diameter 168 ... 210 mm
 - length of the motor 90 ... 173 mm
 - peak torque 18 ... 120 Nm
- Options:
 - electric stop brakes
 - integrated frequency inverter and integrated control
 - single-step planetary gear up to 270 Nm peak

Inverters and Controls

- high-current output stage with PowerMOSFET for low voltages (12 / 24 / 48 V)
- vector-controlled frequency inverters
- flexible control
(examination of laser scanner, ultrasonic, transponder, radio data transmission, speed and torque control, electronic differential ...)

Sensor Elements

- force sensor with Hallelement or FSR, light barriers, capacitive sensor elements

Scope of Individual Services

- projekt engineering and realization of system solutions
- simulation of the total system
- design and optimization of electrical drives
- customized software solutions

ELECTRIC DIRECT DRIVES

slow-running synchronous motor
with external rotor

high-energetic rare earth magnets

high torque on small space

extremely compact dimensions

vector-controlled frequency inverters



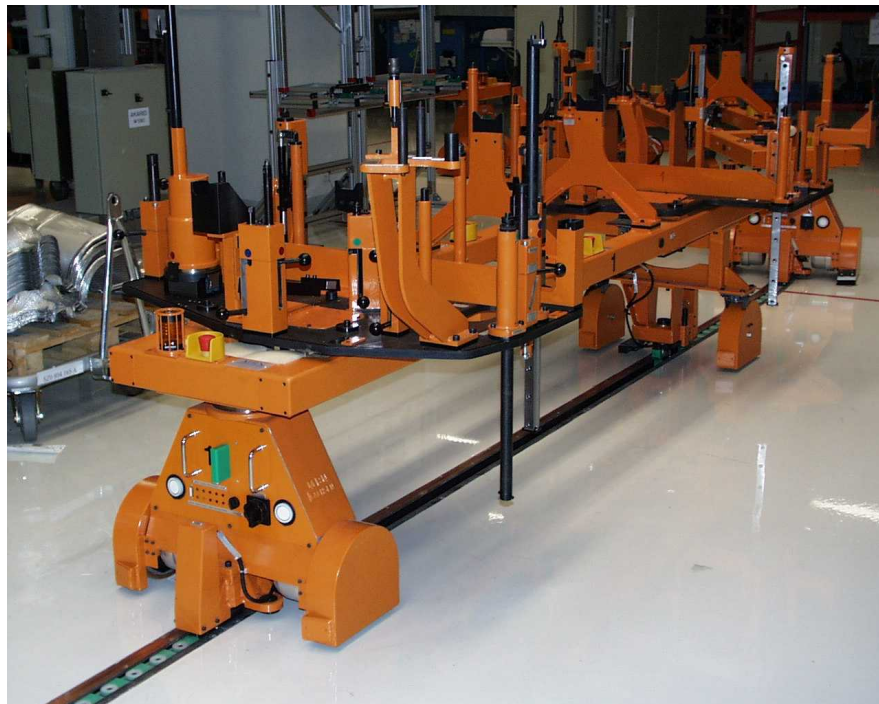
POSSIBILITIES OF APPLICATION

Electrical Drives for Transports and Logistics

- industrial trucks
- suspension tracks
- autonomously guided vehicle systems (AGV's)
- vehicles steered by an human operator
- electric vehicles
- lifting tools
- elevators

Electrical Drives for Decentralised Automation

- positioning systems
- handling systems
- robots
- cranes
- dosing equipment



Assembly carriages, system solution for automotive industry

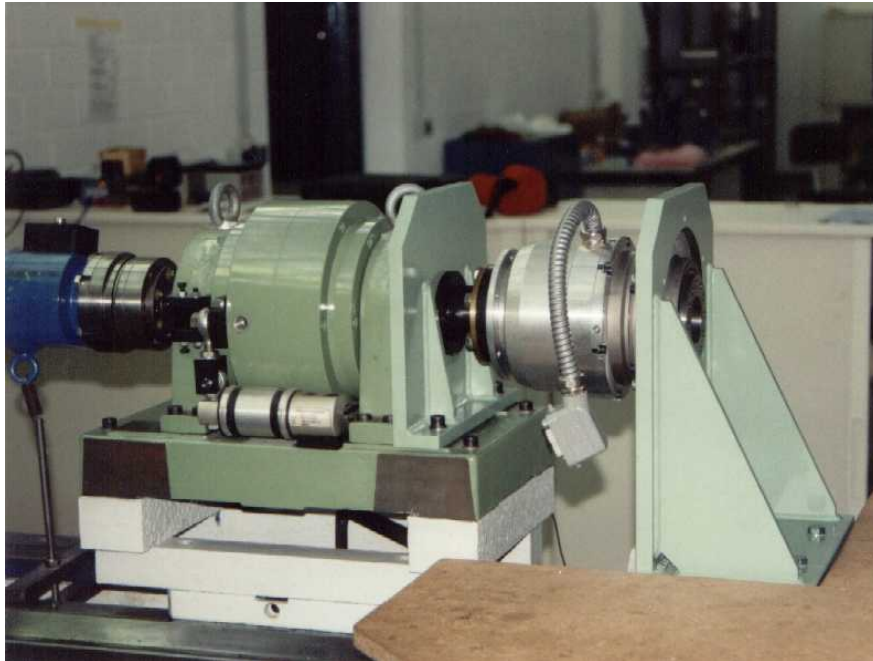
APPLICATION EXAMPLES



Autonomously guided vehicle system (AGV) for transportation



Vehicle steered by a human operator (special-purpose vehicle)



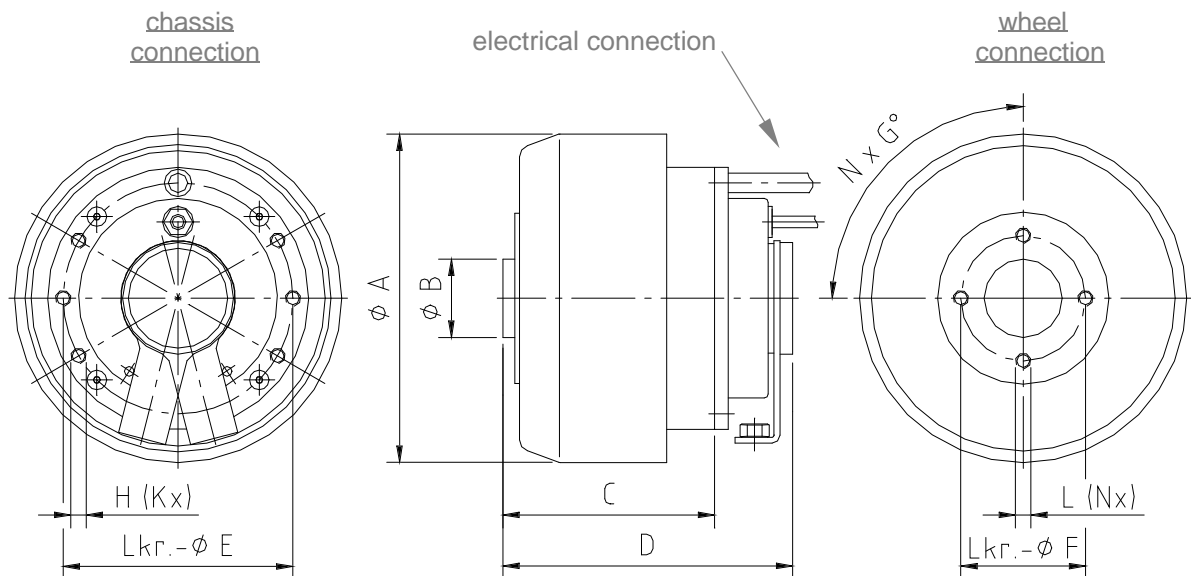
Test bench in production of electric machines



Application in the production of special machines

EXTERNAL ROTOR MOTORS

Dimensions

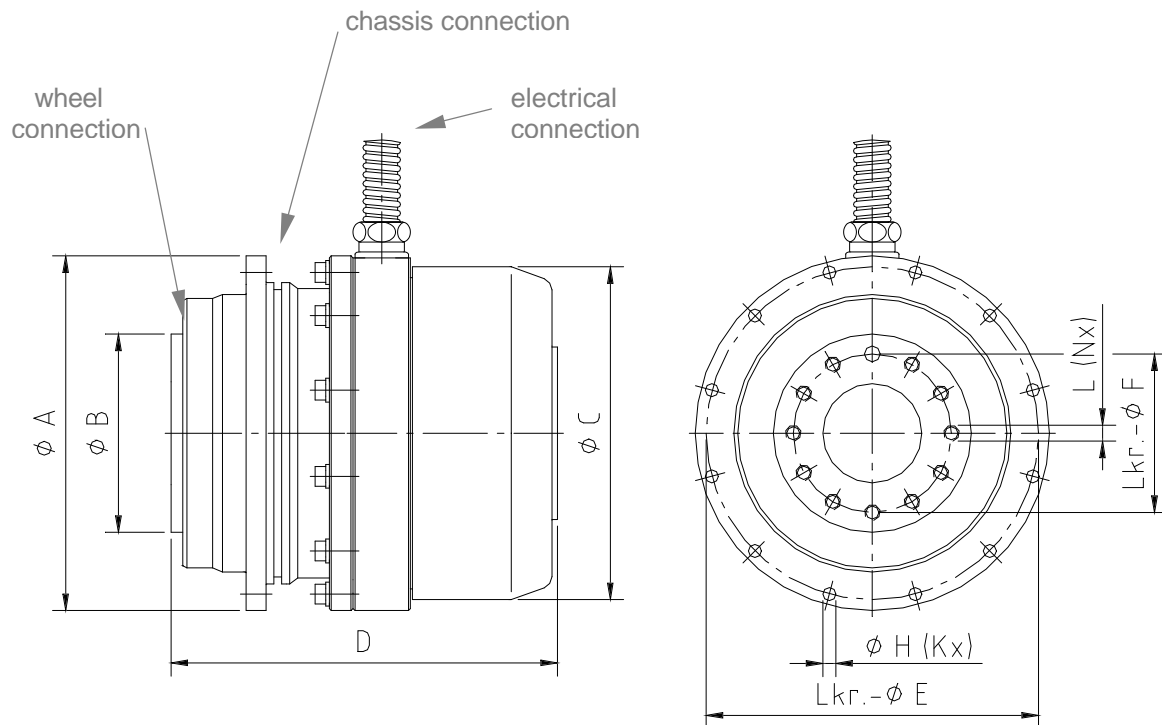


Dimensions [mm]											
Type	ϕA	ϕB	C	D	ϕE	ϕF	G	H	K	L	N
AEC 140/18	168	40	90	133,5	118	64	90°	M 8	6	M 8	4
AEC 140/36	168	40	109	152	118	64	90°	M 8	6	M 8	4
AEC 140/54	168	40	153	194	148	64	90°	M 12	4	M 8	4
AEC 150/54	180	40	148	193,5	148	64	72°	M 12	4	M 10	5

EXTERNAL ROTOR MOTORS

with planetary gear

Dimensions



Dimensions [mm]										
Type	ϕA	ϕB	ϕC	D	ϕE	ϕF	ϕH	K	L	N
AEC 140/36 TP050	179	100 h7	168	195	168	80	6,6	12	M 8	11
AEC 140/54 TP050	179	100 h7	168	213	168	80	6,6	12	M 8	11

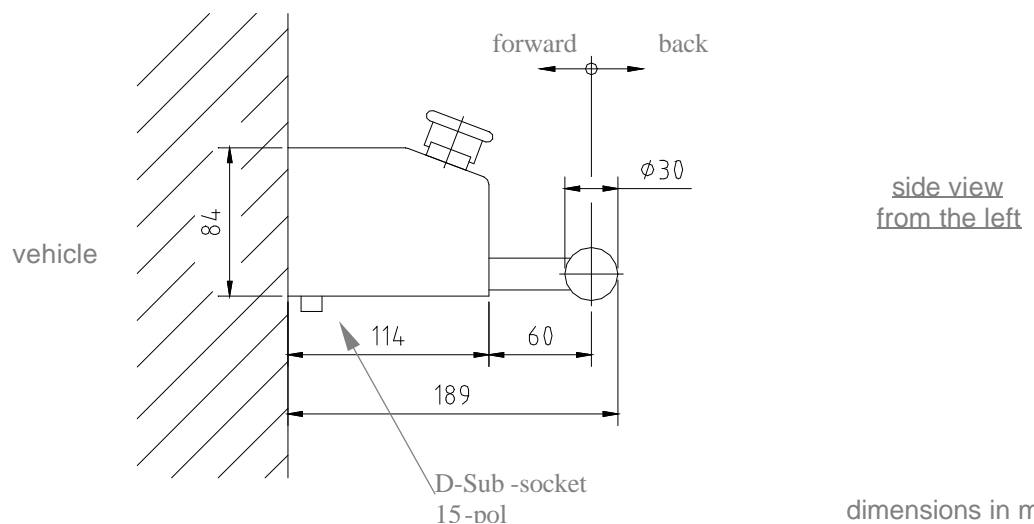
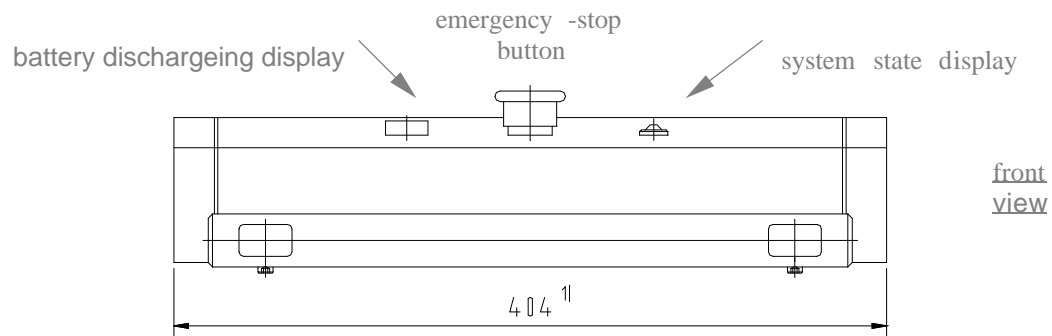
Overview technical data – motors

Type	Operating voltage [V]	max. speed [rpm]	max. torque [Nm]	S1 – specific values		
				current [A _{eff}]	torque [Nm]	power [W]
AEC 140/18	12	190	12	10	4	60
AEC 140/18 SA 24V (with MPC 140 LHG)	24	480	22	13.9	6.5	250
AEC 140/36	24	315	36	14	10	250
AEC 140/54	24	220	54	14.5	16	275
AEC 150/54	24	225	100	25	25	460
AEC 150/54	48	820	60	37	17	1500
AEC 140/36 SA with TP050	24	60	180	17	58	290
AEC 140/54 SA with TP050	24	43	270	17	90	285



External Rotor Motor AEC 140/36 (without brake)

Operating Unit for transport equipment



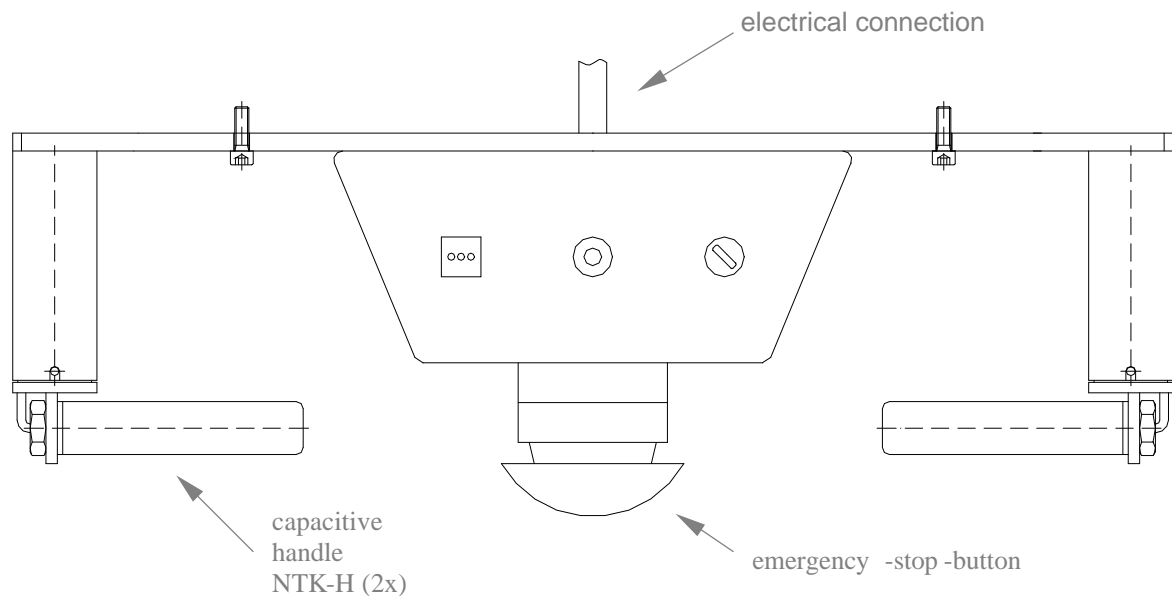
- Operating unit for transport equipment
- 2 force sensors with hallelement and evaluation electronics
- Integrated twin photoelectric barrier for checking the presence of the operator
- Plastic case RAL 7035 light grey on a fixing angle made of sheet steel
- Grip tube $\varnothing 30 \times 1,5$ aluminium plastic coated RAL 9005 black dull structure
- Emergency-stop-button, optional with key
- Battery discharging display
- System state display
- holes $\varnothing 9$ for fixing at the vehicle
- Electrical connection with D-Sub-socket 15-pol
- Weight ca. 2,5 kg

1) can be optional adapted to the wide of the vehicle

Operating Unit

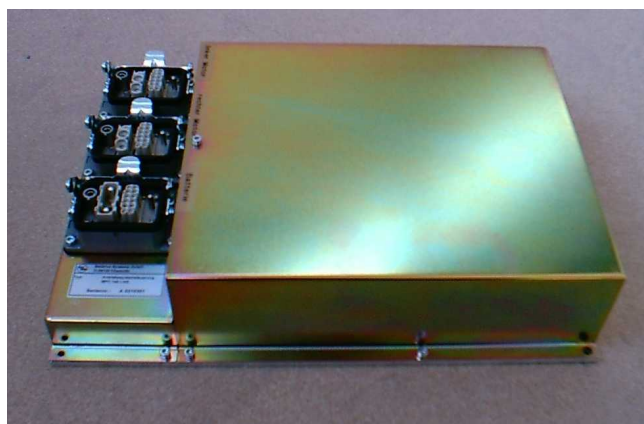
for transport equipment

heavy model



- Operating unit for transport equipment – heavy model
- 2 force sensors with hallelement and evaluation electronics
- Sensors integrated in protective tubes made of aluminium
- Capacitive handle for checking the presence of the operator
- Grip tube \varnothing 30
- Grip distance 450 mm, construction width 660 mm (can be optional adapted to the width of the vehicle)
- Key button
- Emergency-stop-button
- Battery discharging display
- System state display
- Fixing at the vehicle with 2 cylinder screws M 8
- Weight ca. 5 kg

Motor Power Control Unit MPC 140 LHG



Compact power and control electronic:

- for battery fed small vehicles and transport equipment
- to integrate costum specific drive systems in a vehicle or an equipment
- for controlling and optimal feed of 2 traction machines and
- for electrical release of 2 spring operated safety brakes

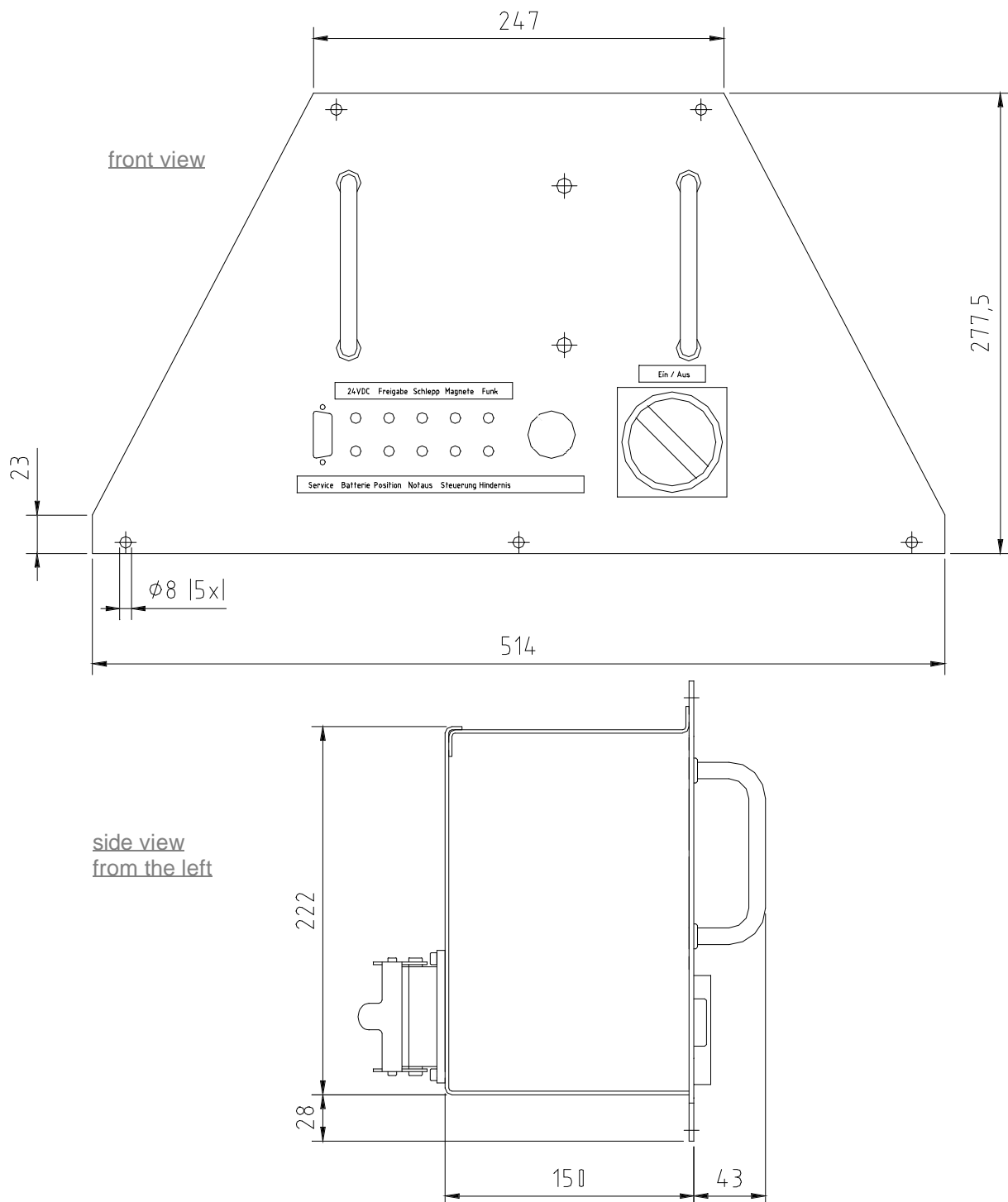
consisting of:

- one 8bit CMOS micro prozessor for the communication with the system with a serial interface, digital I/O connections and analogous inputs (CAN-Bus optional)
- two 16bit CMOS micro prozessors with high calculation capacity to control 2 traction machines with rotor position control
- D.C. power input
- 2 on board power inverters for polyphase traction machines and
- 2 current sources for 2 brake magnets and
- system software and control firmware

Technical Data

Connections	:	- Motor-phases and motor-sensor right and left - Supply Voltage 24 V - Service
Weight with case	:	2,7 kg
Type of protection	:	IP 54
Operating Temperature	:	- 25 .. + 50 °C
Storage Temperature	:	- 40 .. + 60 °C
Supply Voltage (Battery)	:	18,5 .. 29 V
Current	:	13 A
Max. Current	:	54 A
Efficiency	:	> 96 %
Max. Fundamental Frequency	:	> 200 Hz
Current Switching Frequency	:	4 .. 19 kHz

Control Unit for Assembly Carts - MPC 140



dimensions in mm

Note: Depending on requirements of the purchasers there may be different versions of the front panel.

Control Unit for Assembly Carts - MPC 140

Design

- high performance vector-controlled frequency inverters (two-channel system) for synchronous motors with permanent magnet excitation
- host system contains four microprocessors
- batterie backed power supply for host system
- brake chopper
- device interface for effective accident and personnel protection systems (Ultrasonic Sensors or Laser Scanner)
- two-channel emergency stop function
- contact monitoring of the main contacts

Functions

- program controlled driving
- simple setting of process parameters
- speed control, Field-Oriented Regulation
- electronically realized differential gear with throw recognition
- detection of position with transponders and reading antenna
- start signal by assembler, external PLC or after a time period automatically
- operating modes: automatic mode or manual inching operation
- Communication with a coordinating control by CAN-Bus, Profibus or radio data transmission (optional)
- sensor-steered steering (optional)