

FRIWO

Empowered by FRIWO

Company Profile

Company Profile

01 FRIWO in time lapse

02 The company today: our range of services

03 Figures & facts

04 Our production sites: the best of two worlds

05 Extract: current portfolio highlights

01

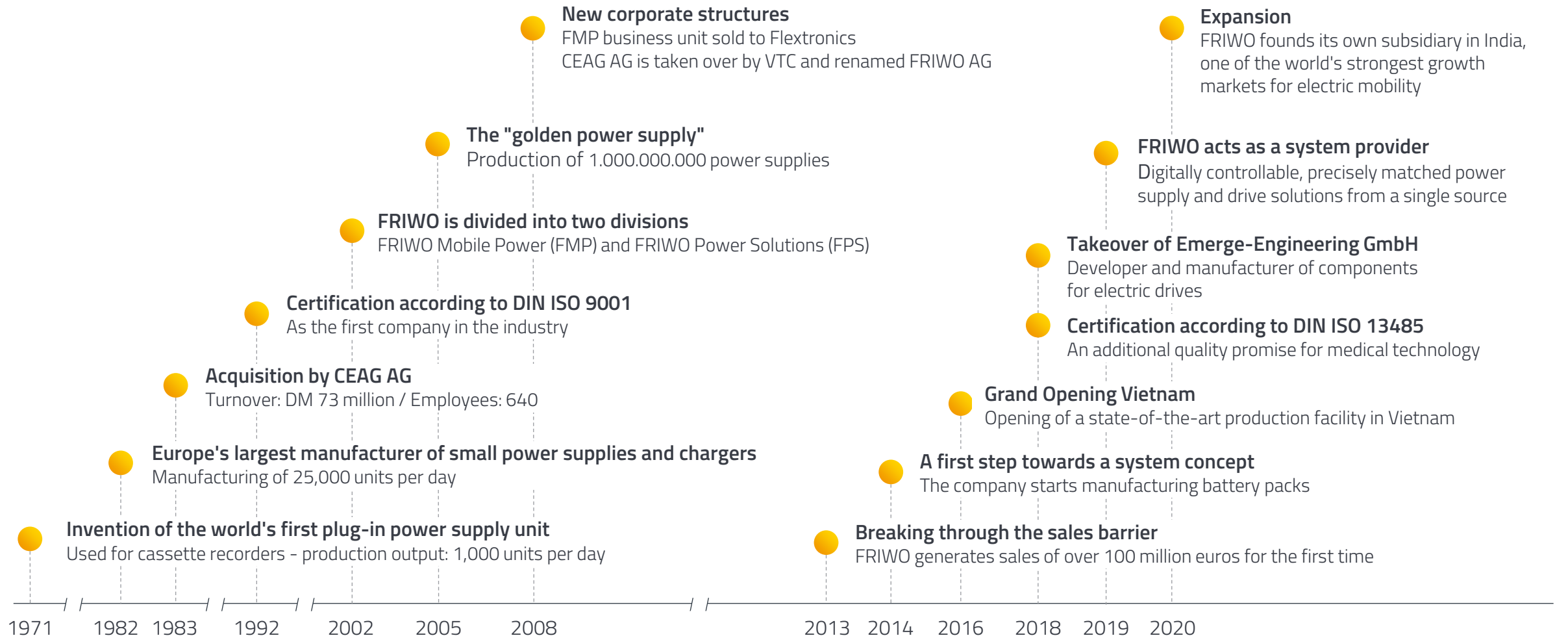
FRIWO in time lapse




1971: The beginning of a success story

Friemann & Wolf develops the world's first plug-in power supply.

FRIWO in time lapse: The milestones



A blue-tinted photograph of an industrial machine, likely a CNC router or mill, with a robotic arm and various mechanical components. The image is used as a background for the text.

2020: High-tech supplier with a global footprint
FRIWO offers digitally controllable, precisely matched
power supply and drive system solutions from a single source.

02

The company today: our range of services



FRIWO

Our product portfolio

■ Power supply systems

- Power supplies
- Chargers
- Battery packs
- LED drivers

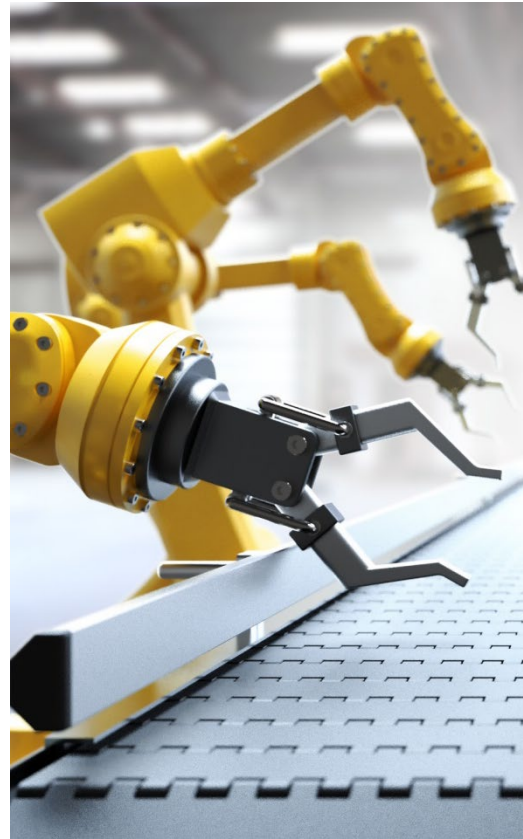
■ Drive system solutions

- Motor controllers
- Service software
- Drive units
- Vehicle control units
- Displays
- Chargers
- Battery packs

Solutions for demanding future markets



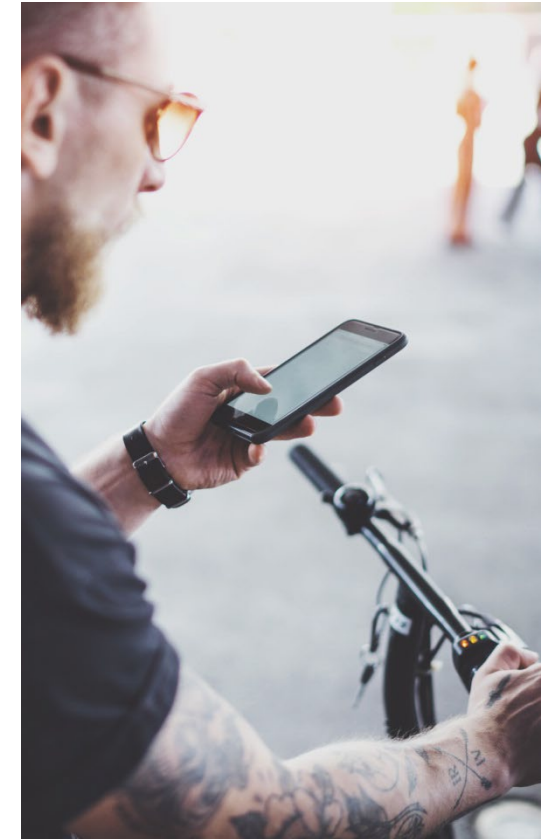
Tools



Industrial

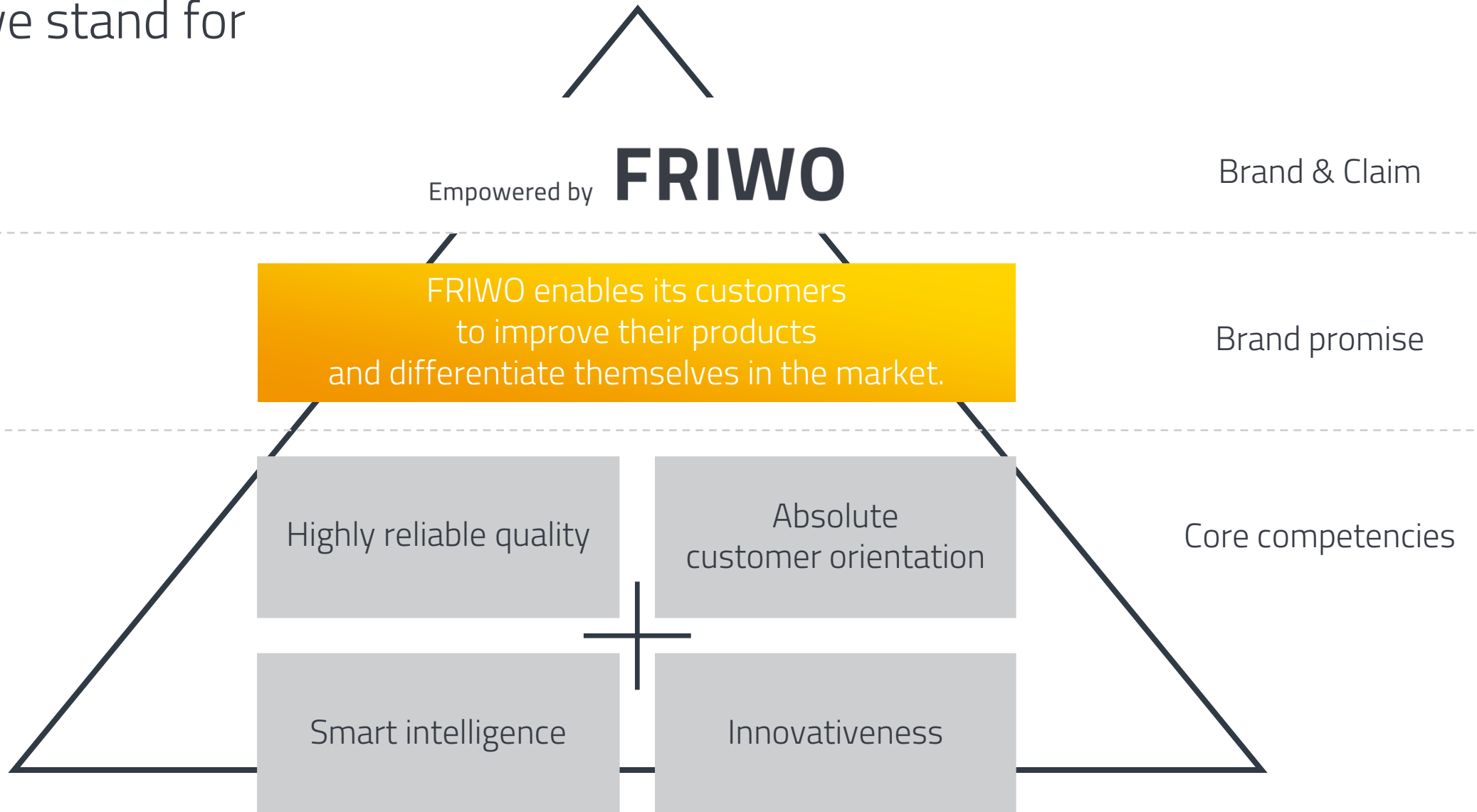



Medical



E-Mobility

What we stand for





Our development know-how: Power supply systems

- Highly efficient power supply solutions with up to 1,000 W power output
- Microcontroller operated charging systems with up to 500 W output power
- Medical technology solutions with ~0 μA leakage current
- Over 20 years of experience in ASIC design
- Patented primary PWM controller
- Use of ICs to protect against product piracy



Our development know-how: Drive systems

- Solutions for 48 V drive systems with up to 12 kW power output
- Modular system for the individual electrification of drive units
- Highly efficient control algorithms for hybrid synchronous machines
- State-of-the-art communication interfaces
- Robust solutions for continuous outdoor use under all climatic conditions



“Quality first”

- Own FRIWO laboratory
- In-house approbation department
- State-of-the-art development instruments
 - EMC cabin
 - 3D prototyping
 - X-ray control
 - Waterproof test
 - Climatic test
 - Drop test
 - Pull test
 - Vibration test
 - DFMEA

Our global network: Production flexibility with local contacts



03

Figures & facts

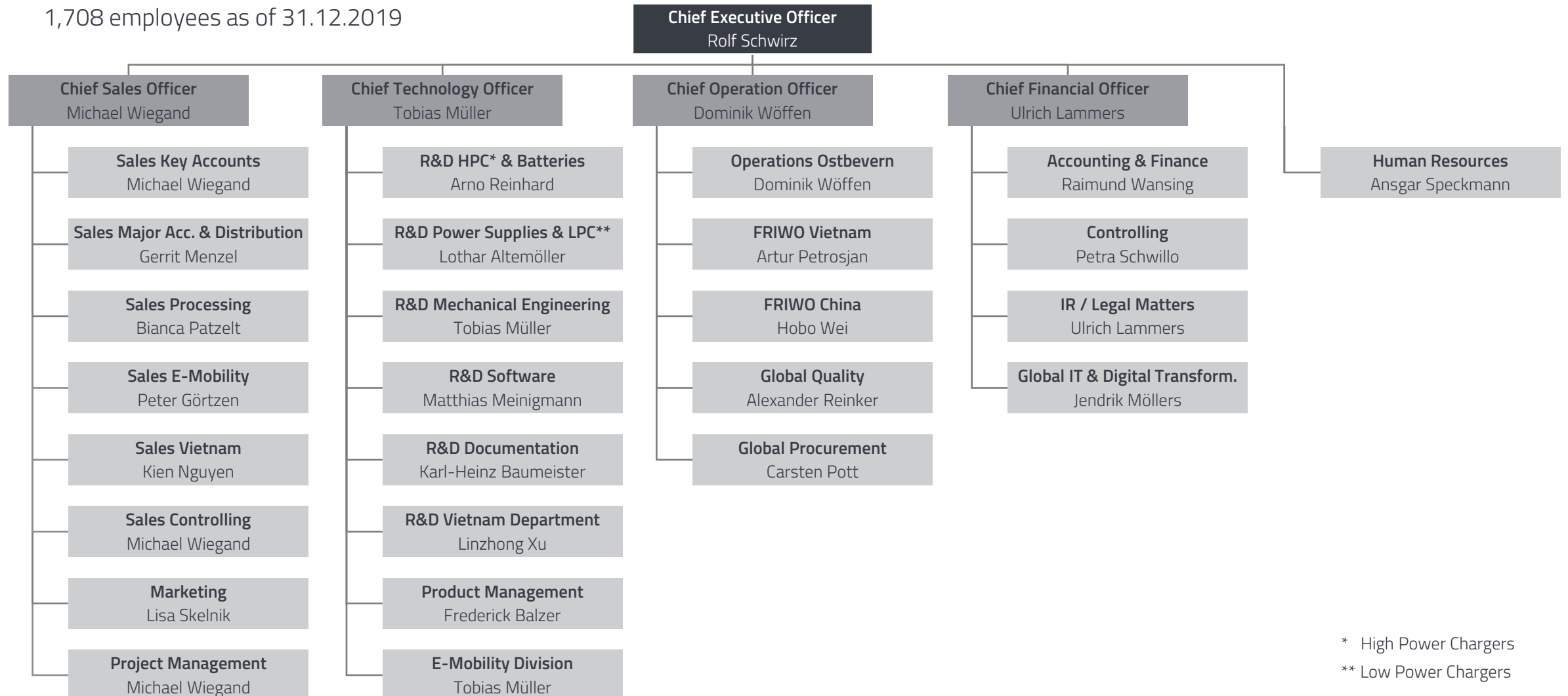
Key figures – financial year 2019

95.8
million EUR turnover

1,708
employees

Organization

1,708 employees as of 31.12.2019



* High Power Chargers

** Low Power Chargers

04

Our production sites: the best of two worlds

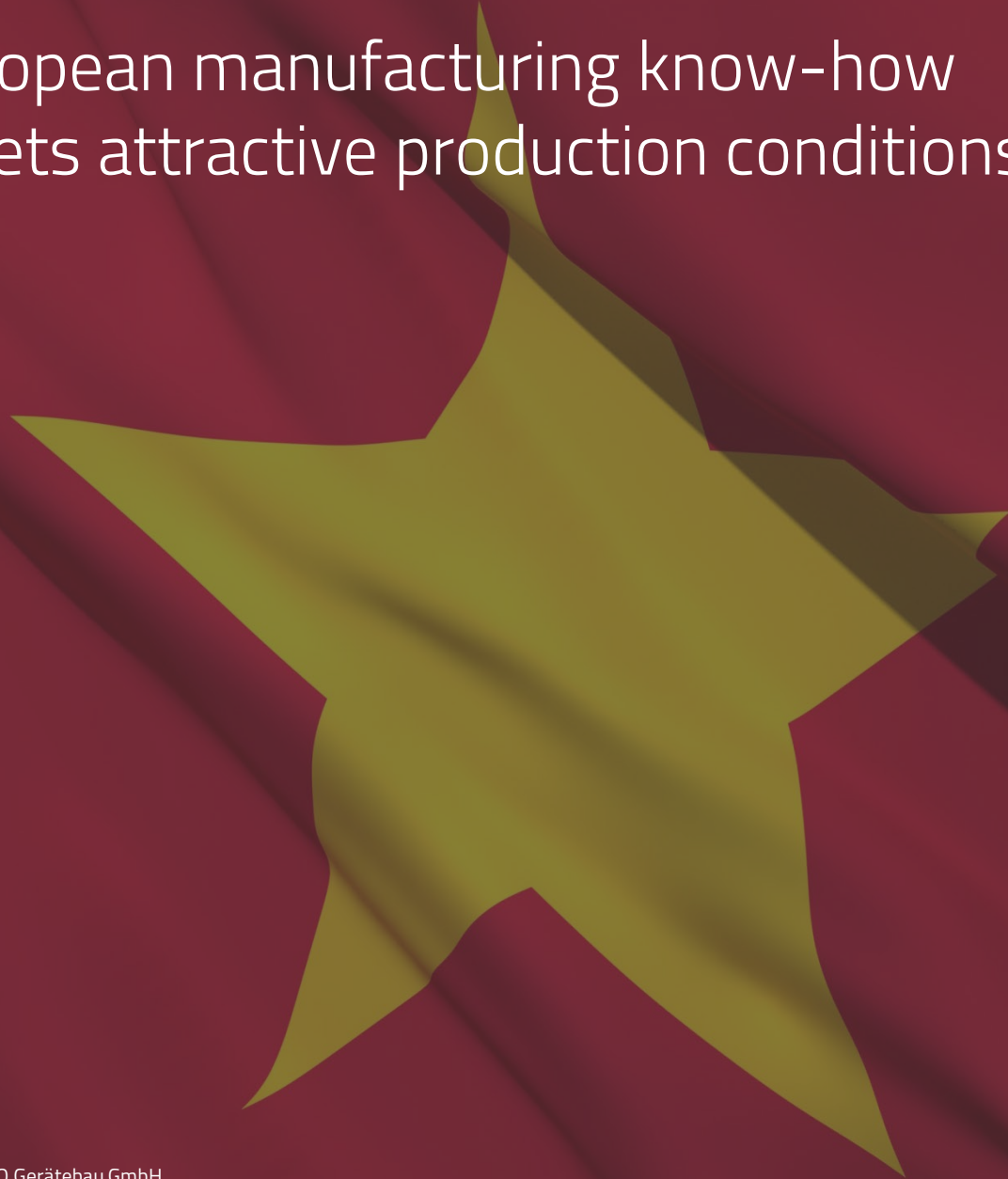
Ostbevern: highly flexible production offers shortest delivery times



FRIWO Germany

- Focus on the flexible production of power supplies and chargers in smaller quantities
- Production centre for battery packs
- Modern production facilities with the highest degree of automation
- Last minute customization of standard products: shortest delivery times for European customers
- ISO 9001, ISO 13485 and ISO 14001 certifications

Dong Nai: European manufacturing know-how meets attractive production conditions in Asia





FRIWO Vietnam

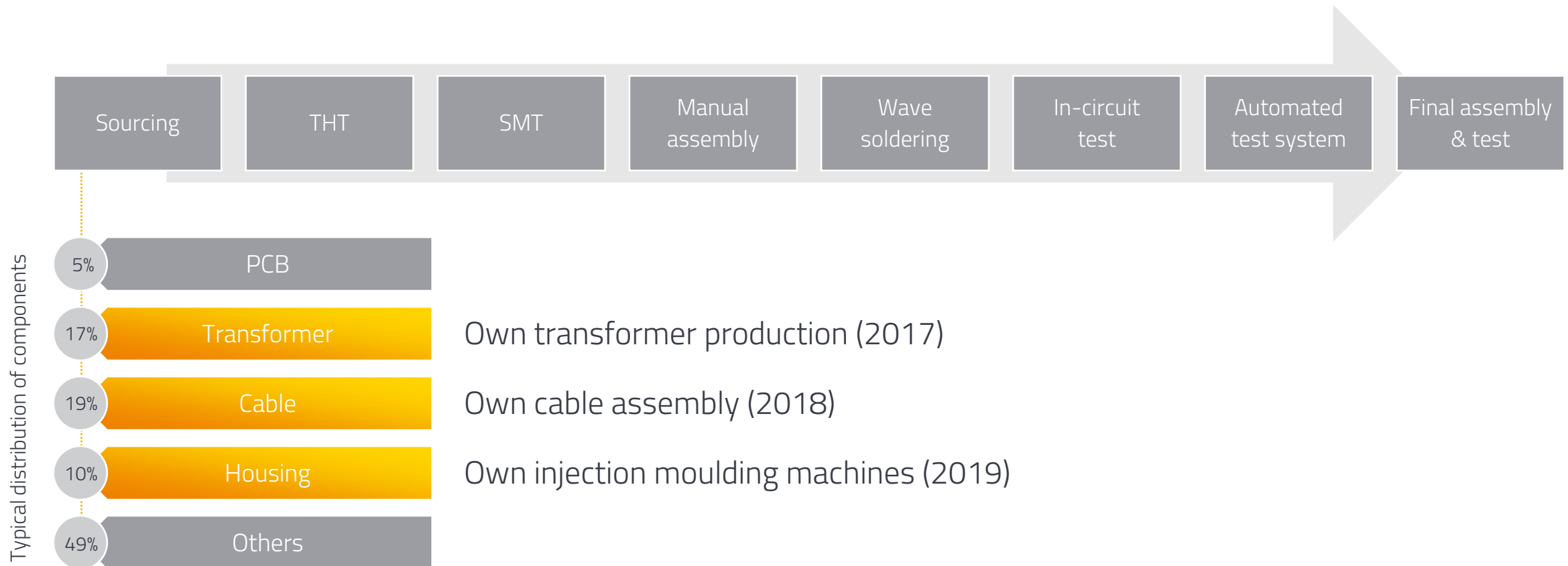
- Competence centre for the production of complex chargers and power supplies
- Production according to European standards under German management
- Focus on production of higher quantities
- Modern quality department on site
- Own training center for employees
- Certification according to SA 8000, ISO 9001 and ISO 14001



Highest quality thanks to European equipment

- Modern nitrogen wave soldering machines from German manufacturer
- Own nitrogen generator and air compressor from German manufacturer
- Fully automated varnish line
- Full temperature and humidity control inside warehouse and production
- ESD floor in the entire production

Vertical integration in Vietnam: Maximum supply security and highest quality control



Our factories in Vietnam

Plant I

- Production of power supplies and chargers
- THT & SMT
- Competence center for wave soldering

- Total area 10.827 m²
 - Production 3.000 m²
 - Warehouse 1.000 m²
 - Office 1.025 m²
- Available production hours per month:*
 - Single shift system: 140.000 h
 - Two shift system: 270.000 h

Plant II

- Production of transformers, chokes and coils

- Total area 7.500 m²
 - Production 5.000 m²
 - Warehouse 1.000 m²
 - Office 400 m²
- Available production hours per month:*
 - Single shift system: 180.000 h
 - Two shift system: 320.000 h

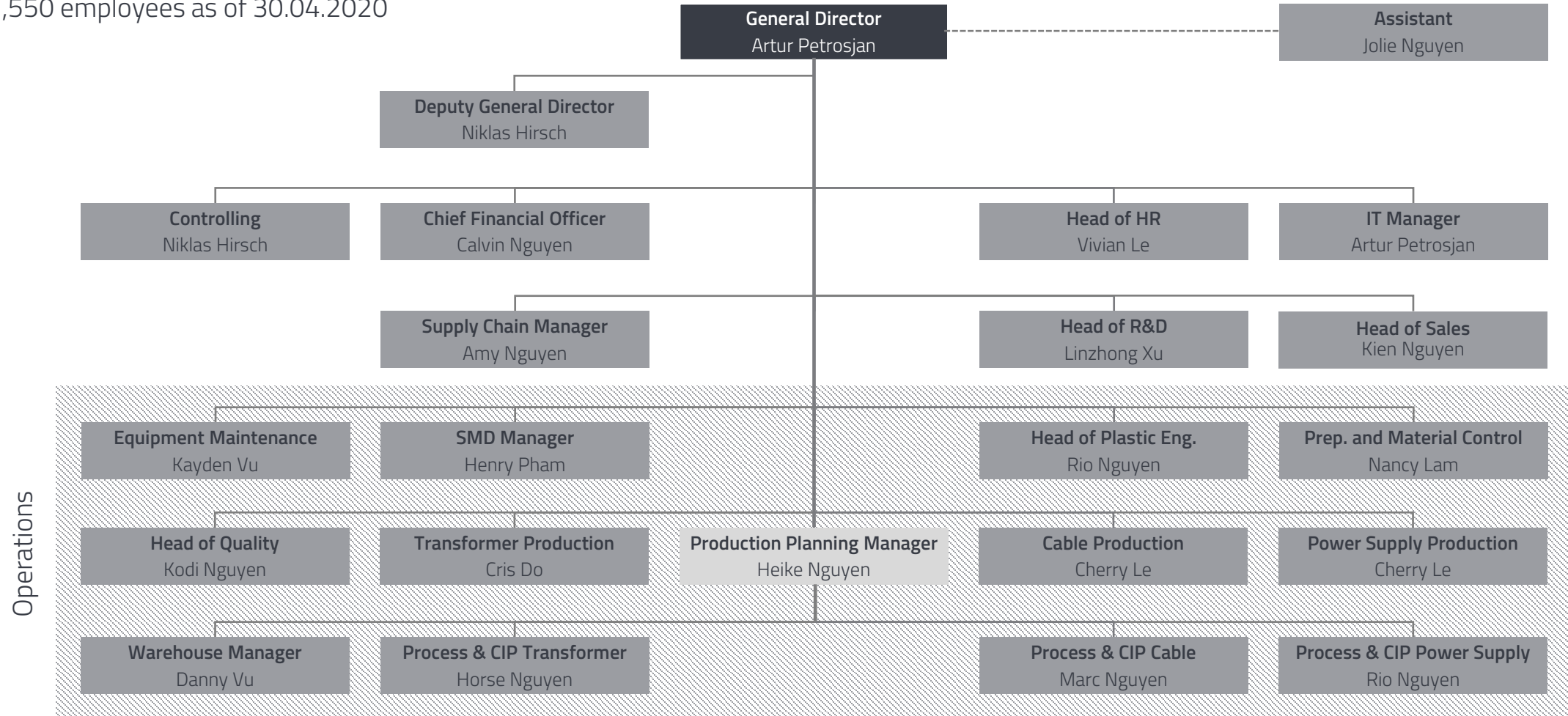
Plant III

- Production of DC cables and wires
- Production of housings and plastic bobbins
- Warehouse for raw materials and finished products

- Total area 11.000 m²
 - Production 3.200 m²
 - Warehouse 4.000 m²
 - Office 400 m²
- Available production hours per month:*
 - Single shift system: 100.000 h
 - Two shift system: 170.000 h

Organization Vietnam

1,550 employees as of 30.04.2020



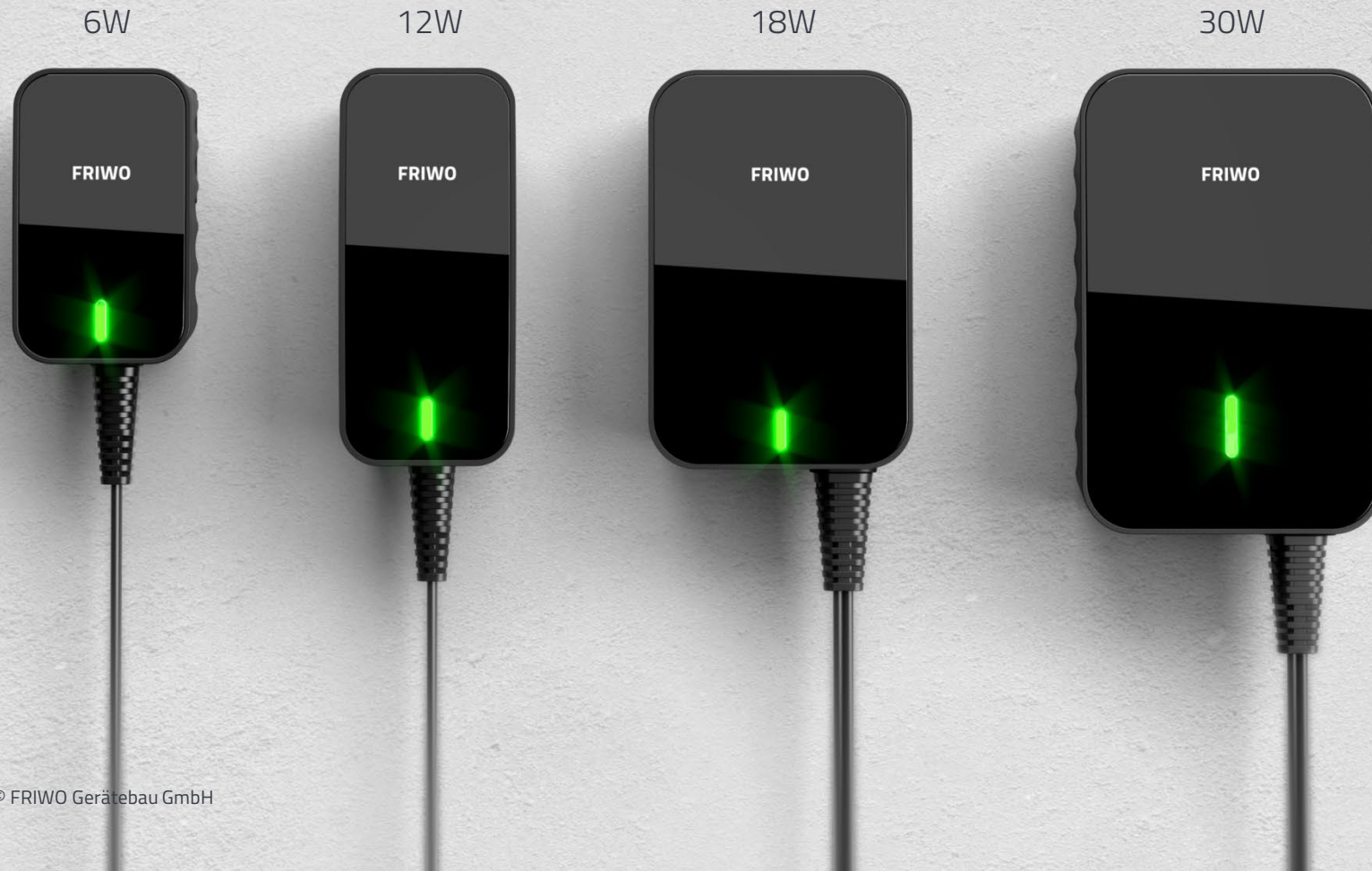
Operations Coordinator

05

Extract: current portfolio highlights

Design meets technology: FOXNEO

A standard product that sets new standards



FOXNEO



Flexibility thanks to
high configurability

Wide range of
interchangeable
adapters

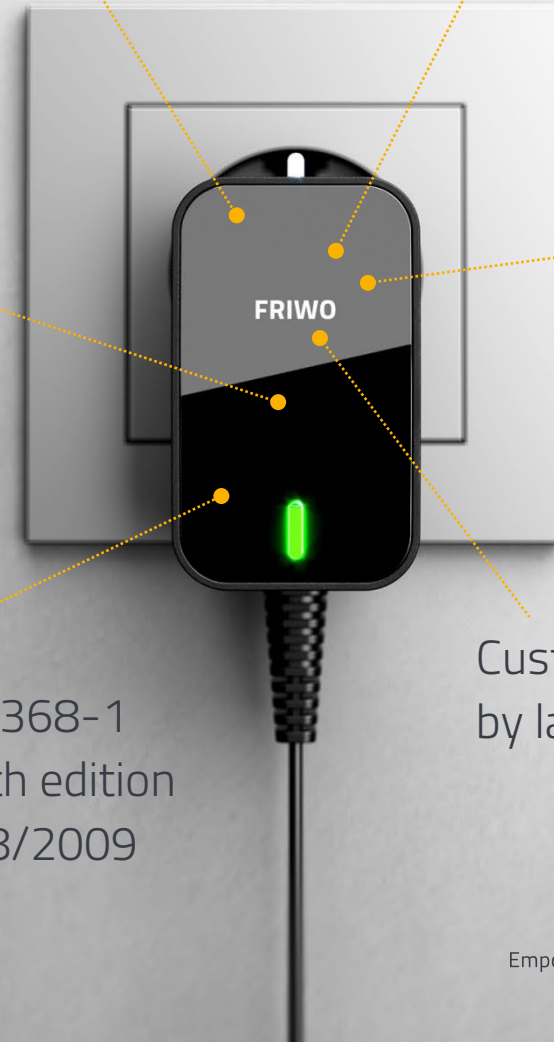
Unique
design

3 years
warranty

Conformity:

- EN/IEC 62368-1
- Medical 4th edition
- VO EG 278/2009

Customization
by laser printing





FOXNEO

Maximum availability:
48 hours delivery time
EXW Ostbevern (GER)
after order confirmation

This delivery time only
applies to orders placed via
www.NEOconfigurator.com and
depends on quantities:
≤ 250 pcs: 48 hours
≤ 1.000 pcs: 14 days



Compact e-bike charger as optimal travel companion

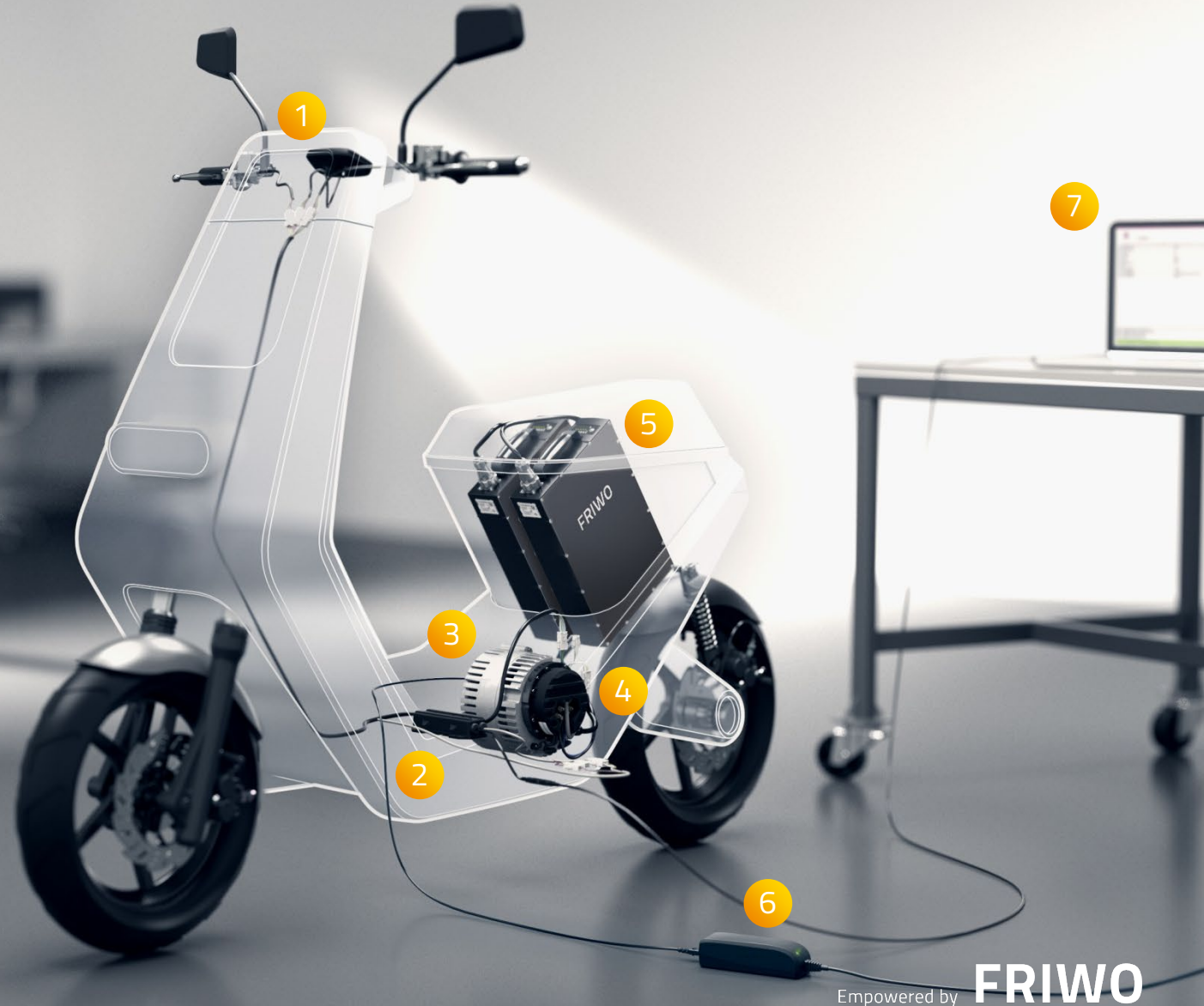
- Shortest charging times thanks to high currents:
Two power classes available with 4 A or 6 A
- 5 V / 50 mA output for battery electronics
- Variety of communication options, e.g. CAN-Bus
- With PFC and resonant circuit
- Fanless design for noiseless charging
- Closed housing without any ventilation slots
- Surface temperature of max. 65°C
- Safety: integrated temperature protection, timer, current limiting

FRIWO Systems

Digitally controllable
power supply and
drive system solutions
from one source

Example: E-Scooter

- 1 – Display
- 2 – Vehicle control unit
- 3 – Drive unit
- 4 – Motor controller
- 5 – Battery pack
- 6 – Charger
- 7 – Service software



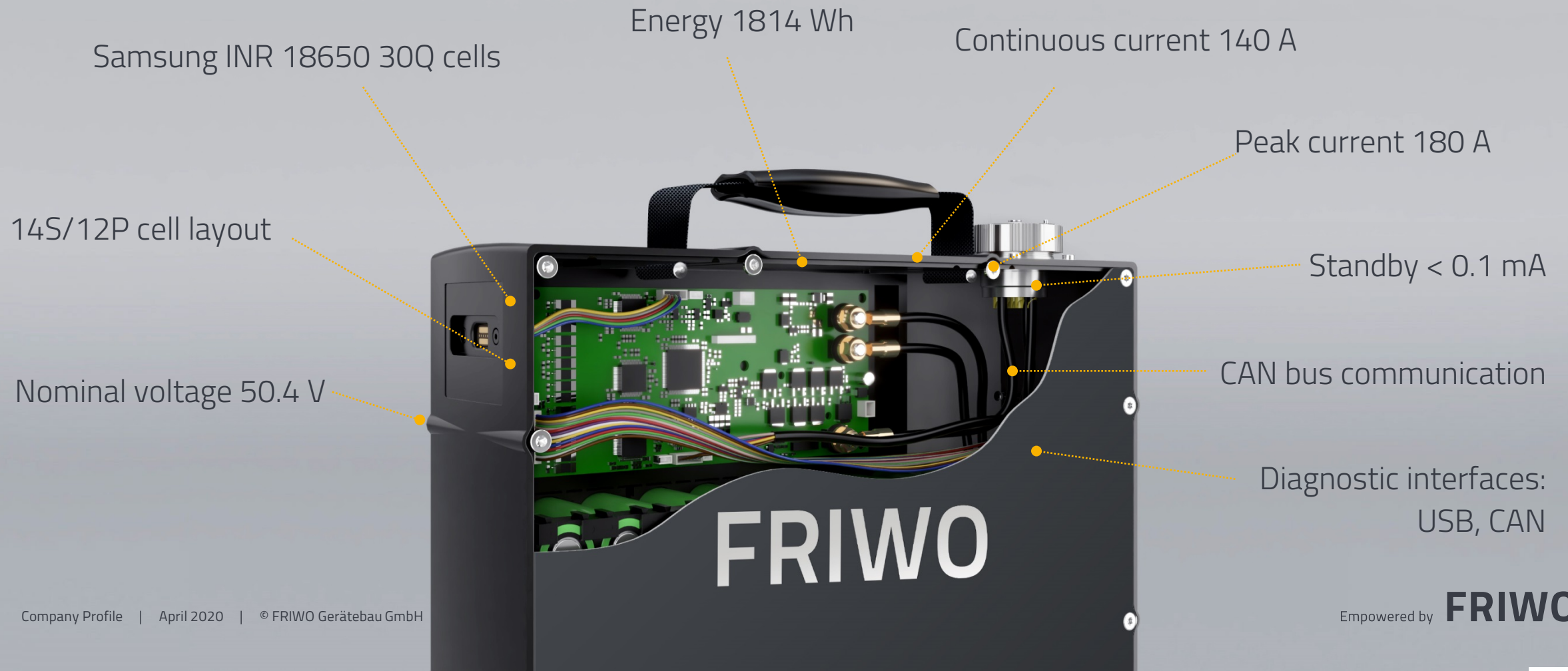
Emerge 6000: best-in-class motor controller



Our standard battery pack: a detailed view



The alternative: our high power pack



FRIWO

FRIWO Gerätebau GmbH
Von-Liebig-Straße 11
48346 Ostbevern
Germany
Tel +49 (0) 2532/81-0
hello@friwo.com
www.friwo.com