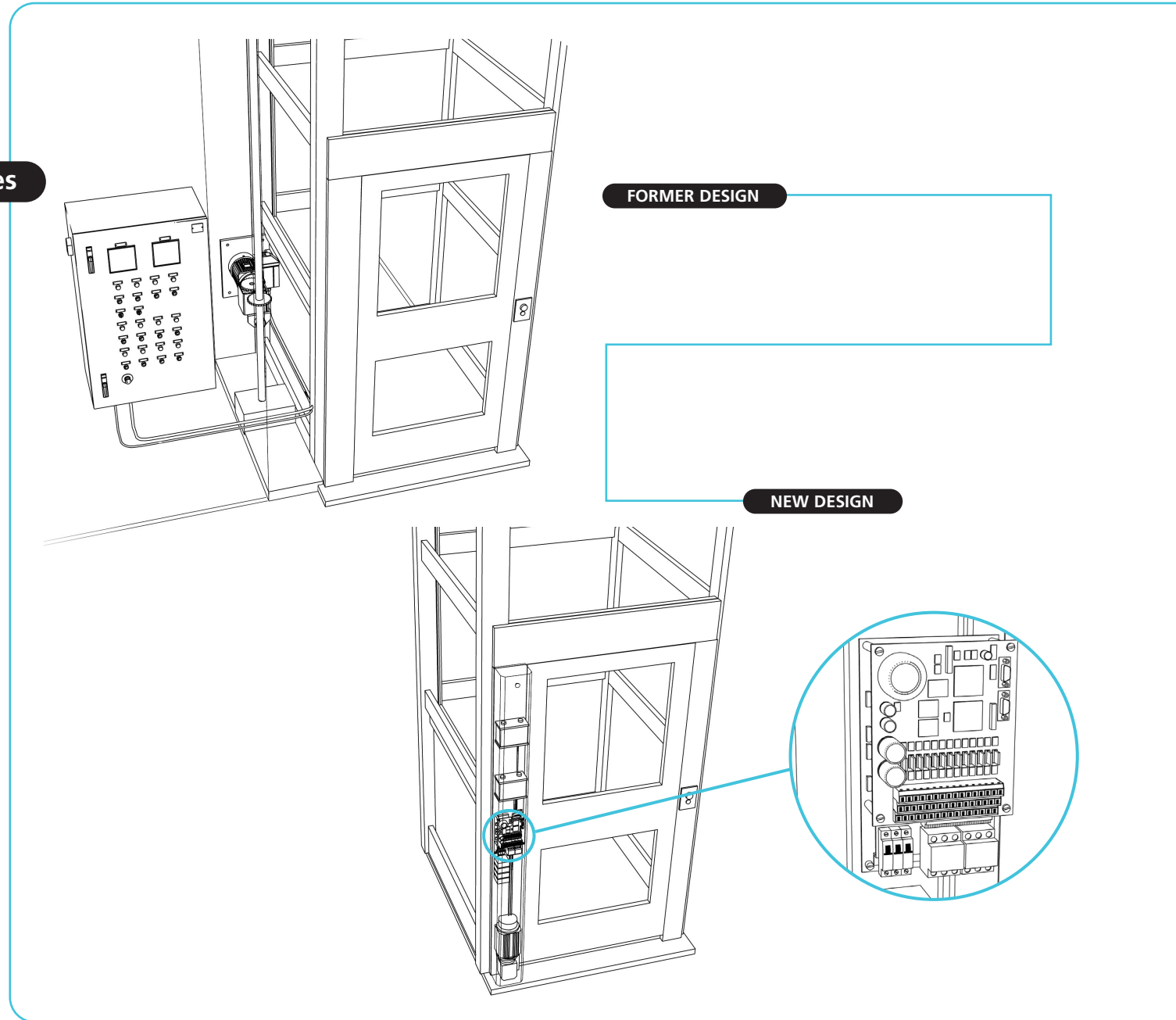


Unjo control makes huge differences

We took
an ordinary
elevator.

And gave it
extraordinary
capabilities.

Our mission was to improve the control system of a standard 3~400 VAC powered elevator. We delivered an elevator that runs on batteries and can be used as an emergency exit. The solution comprises highly compact control, motor and battery units. The elevator uses less mains power while operating and the batteries are charged with 1~230 VAC.



Development assignment: Platform elevator

PRODUCT FUNCTION

A platform elevator is a more basic kind of lift than a passenger lift. Instead of a lift cage, the transporting part of the elevator is a platform. The walls remain still in relation to the building, which means they move in relation to the passenger. Because of this, the speed is limited to 15 mm/s.

This is a common type of elevator in shopping malls and other public spaces and is used for example by people with disabilities.

TECHNICAL COMPARISON

• Existing solution

Platform elevators of this type are usually powered by an AC motor with a frequency converter which provides a soft start and soft stop, and ensures that the elevator stops in the right position on each floor. The frequency converter in turn is controlled by any number of other systems which are generally stored in a relatively large cubicle. This is also where all the operating panels are connected.

The motor is fed power from the mains supply via a three-phase group (in Europe 3 x 400 VAC). If the power is cut off, the elevator stops.

• New technical solution

The new platform elevator solution is driven by a brushless DC motor which itself is more compact than the corresponding AC motor. The electrical

power system is a low voltage 24 VDC, enabling the elevator to run on batteries – in this case standard lead accumulators.

The control unit comprises a battery charger which keeps the batteries charged while also monitoring their condition. All the operating panels are also connected to the control unit. The motor including gearing, control unit and batteries is so small that the entire system can be mounted into the frame of the bottom elevator door. Thanks to the batteries, the elevator will also work if the mains power supply fails, which means it can also be used as an emergency exit.

BENEFITS ON COMPLETION

These are the main customer benefits on completing the assignment, in order of importance:

- The elevator can run even in the absence of mains power. The client has pushed through a change to the EU Lift Directive to allow this functionality.
- The dedicated control unit for both motor control and elevator control means a highly space-efficient solution overall. This in turn gives the elevator manufacturer extensive opportunities to optimise the mechanical design.
- The batteries are used as an energy storage unit when the elevator is running. This keeps mains

power consumption down, spreading it out over time. An ordinary single-phase group (in Europe 1 x 230 VAC) is sufficient for the electrical power connection.

PROJECT BACKGROUND AND DEVELOPMENT

Unjo and the client were brought together by the company that makes the elevator's motor and gear package. An idea had been proposed to build an elevator powered by a low voltage brushless motor with battery support.

Unjo could then work in co-operation with the elevator manufacturer to develop an optimal solution in which the performance and properties exceeded the manufacturer's expectations in many respects.