



## Reference report: Hybrid Tractor “Multi Tool Trac”

A revolution in agricultural technology: The innovative agricultural machine is equipped with powerful power electronics from ARADEx and offers many improvements for arable farmers.

### The essentials in brief

Due to the electrification the following „features“ were implemented:

- + Adjustable wheelbase tractor to reduce soil compaction
- + GPS-based fixed track system
- + 20% less fuel consumption due to the hybrid drive
- + Energy recuperation
- + Higher yields and better quality and less nitrates
- + Three PTO shafts for attaching equipment between the wheels, as well as front and rear

### The project

The Multi Tool Trac should enable a more sustainable and profitable land use. The problem with agricultural machinery used in agriculture is soil compaction, which is caused by the high weight of agricultural machinery and adversely affects the quantity and quality of the harvest. Another important requirement was the provision of numerous attachment options for agricultural implements. These are essential in the various operations that can be carried out in arable farming.

### The solution

In the interests of lower CO<sub>2</sub> emissions and lower fuel costs, the tractor constructed by Dutch organic farmers should not be driven solely by an internal combustion engine, but also by electric motors. In addition to a six-cylinder diesel engine as a range extender, the Multi Tool Trac was equipped with four

44 kW asynchronous electric motors and a 30 kW battery for four wheel drive. In addition, the tractor has three PTO motors, each with 80 kW continuous output for mounting agricultural implements in addition to the rear and front as a special feature between the wheels.

In order to realize an effective energy management, two double inverters of the type VP600-28W233 from ARADEX were integrated, whereby an optimized current regulation of the electric components of the drive train is guaranteed. In addition, the drive is designed to be able to recuperate, so that the vehicle while braking can feed the resulting braking energy into the battery and for reuse. As a special refinement, the tractor has an adjustable wheelbase. Depending on whether the vehicle is on the road or on the field, the wheelbase can be varied between 2.25 and 3.25 meters - so that a narrow wheelbase meets the safety requirements in public roads, as well as the requirements of reduced soil compaction on the field using the wide wheelbase.

## The result

Rightly, the innovative agricultural machine has already attracted much attention. After all, with its careful and efficient use of land and its CO<sub>2</sub>-reduced hybrid drive, it represents significant improvements in terms of sustainability in handling soil, food and energy. The first two vehicles have already been delivered and are being tested by Dutch farmers, The highly anticipated market launch in the industry is expected to be completed in 2019/2020.

Thanks to the  
hybrid powertrain  
20% less diesel  
as comparable  
applications.



All images: © Multi Tool Trac

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