

# STREICHER launches fully-electric driven HDD rig - An intelligent and eco-sensitive solution to decarbonize the job-site footprint



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## Abstract

In recent years, the issues of the environmental protection and nature conservation - and thus the question of regenerative energy sources - have become particularly important. STREICHER also holds the objective to reduce CO2 emissions in the future in order to reduce the ecological footprint. Therefore, the group has made it a primary objective to concentrate on the development and manufacturing of products that are powered electrically, with hydrogen or with a fuel cell, among others.

These efforts are combined under a separate, appropriate label called ecotec. In line with the goal of decarbonisation, the ecotec label brings together innovative technologies with future-focused trends and essentially summarises the issues of resource conservation, environment protection, energy efficiency and optimisation of the entire energy cycle.

The experience and expertise in large scale pipeline projects with different construction methods have led to a custom-tailored solution for a series of fully-electric driven HDD rigs – which have been employed for internal operations and external customer use alike. Whereas the regular HDD-drive technology is based on a Diesel-driven hydraulic system, the new power supply system for the electrified drilling rig has been entirely re-designed. The system is, in accordance with STREICHER's electrical design concept, constructed as electrical in its entirety: The drives – spindle, carriage (thrust / pullback), mud pump and crawler tracks are run by electric motors.

The following article shows the numerous advantages of the HDD-E-rig – e.g. reduction of CO2 emissions and noise, intuitive operating concept, safety advantages.

## 1. INTRODUCTION

The necessity to protect Mother Nature as far as possible from negative environmental influences is fortunately not only on everyone's lips at the time being, but also undisputed in terms of content.

A corresponding ecological awareness is gradually coming to the fore among private individuals, politicians and companies. The need for action and the possibilities for action exist on a large and small scale at more or less all levels of human existence. Responsible use of resources will be essential if we want to preserve our planet.

The industrial landscape is changing rapidly because the requirements for safety and efficiency are constantly increasing. In recent years, the issues of the environmental protection and nature conservation - and thus the question of regenerative energy sources - have become particularly important. STREICHER also holds the objective to reduce CO2 emissions in the future to counteract climate change. Repeatedly, it has been discerned that the solutions customary on the market can no longer meet these stated goals and, accordingly, neither the requirements of the new era. STREICHER has made it a primary objective to close the gap by manufacturing equipment driven electrically, with hydrogen or with a fuel cell, among others. The many years of practical experience and the multilayered competences within the group of companies are providing support in integrating the new technologies into related modifications and new developments.

## 2. ECOTEC PRODUCTS – REDUCING THE ECOLOGICAL FOOTPRINT

These efforts are combined under a separate, appropriate label called ecotec. In line with the goal of decarbonization, the ecotec label brings together innovative technologies with future-focused trends and essentially summarizes the issues of resource conservation, environment protection, energy efficiency and optimization of the entire energy cycle – which helps to significantly reduce the ecological footprint. The specially designed label will be found on the STREICHER machines in the future. It ensures that the brand is recognizable, serves as an umbrella symbol for existing products and shall continue to unite all new members of the ecotec product family in future. STREICHER recognizes an enormous market potential in the transition to innovative and electrified machines.

Against the background of the current circumstances, looking ahead and thinking beyond the boundaries of fossil industrial structures is required. STREICHER wants to take advantage of this opportunity and establish themselves with their own products at an early stage.

## 3. HDD RIG – ELECTRICAL IN ITS ENTIRETY

MAX STREICHER GmbH & Co. KG aA ranks among the experts, as an international provider of systems for the public energy infrastructure, in the field of planning, building construction and systemic maintenance of the most diverse public supply facilities such as gas, water, electricity, long-distance heating, sewage, as well as communications and broadband systems. The many years of the STREICHER employees' international experience and the high standards of quality, safety, environmental technology and energy management contribute to the successful implementation of a wide variety of large-scale projects on an EPC basis, even under the most adverse technical and climatic conditions. Numerous laying methods come to use in the construction of pipelines – depending on the requirements of the respective project. Among other items, this applies to the trenchless horizontal directional drilling (HDD) method. The experience and expertise that such projects have yielded to the STREICHER Group in the field of pipeline construction has subsequently led to a custom-tailored solution for a series of full-electrically driven HDD rigs – which have been employed for internal operations and external customer use alike.



Figure 1: HDD80-E –STREICHER's fully-electric driven HDD rig

The HDD rig, as a new design, is the result of a highly ambitious project, which has combined STREICHER's broad-range expertise in a unique manner: The development was carried out by an interdisciplinary team of specialists from the relevant technical departments, by drillers and designers. Whereas the regular HDD-drive technology is based on a Diesel-driven hydraulic system – it has been used by STREICHER over the past 15 years – the new power supply system for the electrified drilling rig has been entirely re-designed. This meets the new technology requirements and takes full

advantage of the resultant technological enhancements. The system is, in accordance with STREICHER's electrical design concept, constructed as electrical in its entirety: the drives – spindle, carriage (thrust / pullback), mud pump and crawler tracks are driven by electric motors. The complete concept of electrification attains its fullest efficiency by the device of an integrated battery and an intelligent circuit of power distribution throughout the system. Hybrid solutions of other manufacturers, in contrast, may use an electric motor instead of a Diesel engine but will also apply a classic hydraulic drive for all their other functions of the drilling rig.

#### 4. THE HDD-E-RIG WILL OPEN UP NUMEROUS ADVANTAGES

A great advantage is that the system is compatible with the public power energy supply when working on inner city projects. It provides a flexible compatibility for project-specific requirements. A feed-in module generates with an Active-Front-End technology a mutual direct current intermediate circuit. Due to the system structure with an integrated battery, it is possible to feed back braking energy and later return it into the system where required. Conversely, this also means that less energy has to be replenished from the supply grid or the energy store. With the energy storage located in a high-voltage intermediate circuit battery, it is possible to temporarily store excess energy and use it flexibly only when required. The system is accordingly designed for efficient use of space. By using the integrated battery, the drilling rig can be moved up to 4 km without the need of any external power supply. The subsequent erection of the rig and the during operation necessary alignments are also fully electrically powered by the available capacity of the built-in battery. In terms of maintenance, the new system has generally noticeable advantages as the electrical drive technology is subject to comparatively little wear.

Moreover, due to the electric drive technology, the system is significantly quieter than any previous models. The thus resulting operation with "whispering volume" ensures a tremendously better acceptance of the related construction work in populated areas and shows its advantages for the protection of the environment in nature reserves. This will be a benefit to the drilling construction personnel and the operators of the drilling rig, as the noise level is clearly reduced. Obviously, this remarkable low noise level holds numerous advantages to the occupational health and safety of the personnel. Furthermore, not only the noise but also the CO<sub>2</sub> emissions are distinctly reduced by this new technology. The holistic improvement of environmental protection in construction projects through the reduction of direct and indirect emissions is an important industry trend that is gaining more and more significance and importance when it comes to RFQs and calls for projects.

#### 5. A COMPLETELY NEW AND INTUITIVE OPERATING CONCEPT

STREICHER has used its many years of experience and extensive know-how to select the right components and suppliers in order to ensure the mentioned advantages of their electrically driven HDD rigs. Along with many further innovations and design concepts, these rigs have been rendered highly efficient for their designated purpose during practical project operations. The entire power electronics, as one of the feature items, has been built with elements from the mobile electric drive technology. These are particularly shock and vibration resistant and offer good protection against dirt and water. With the water-cooled and specifically developed synchronous motors, the rig drive technology is very robust, powerful and highly efficient compared to the conventional devices.

The completely newly developed, intuitive operating concept of the HDD80-E rig adds another highlight feature. From the technical field of drilling to construction and software development, the design process has comprised a close cooperation of the STREICHER internal departments to integrate valuable suggestions, experiences and objectives. On this basis, a simple and highly functional

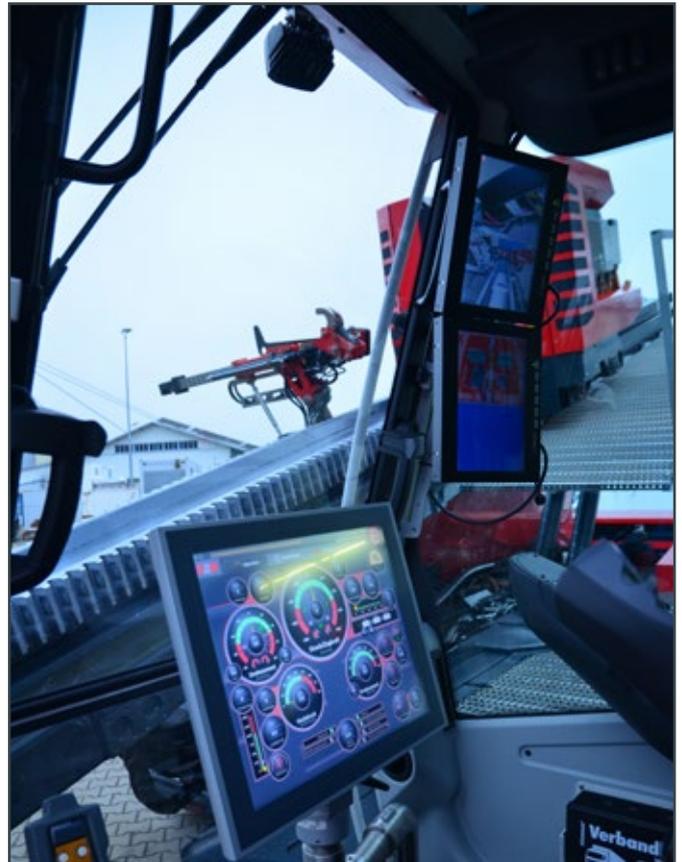


Figure 2: 19" touch panel displays all relevant drilling parameters and maintenance data

## 7. GREAT POTENTIAL FOR PIPE-LINE CONSTRUCTION

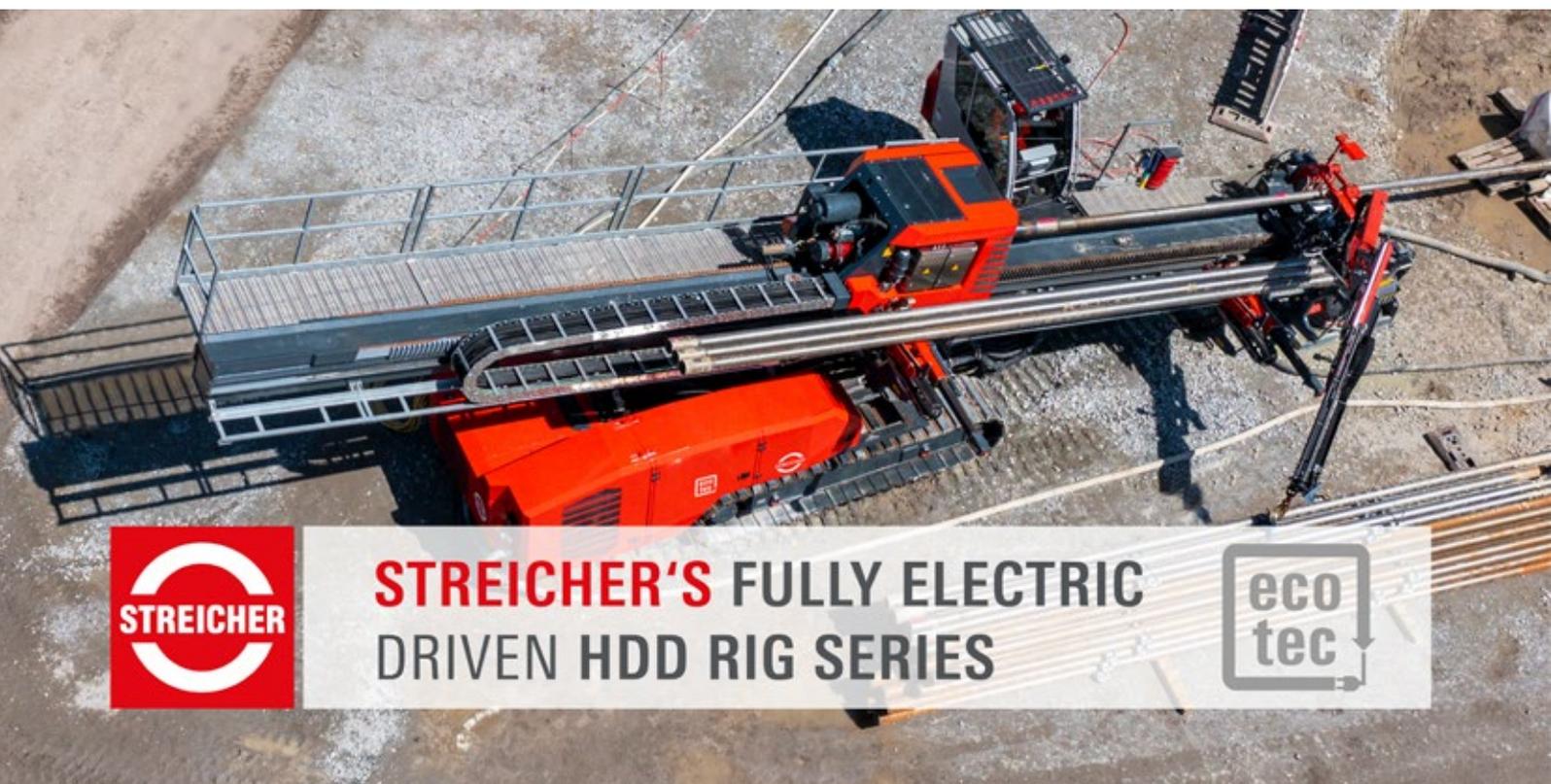
The potential of this unique overall package is great. With its state-of-the-art technology, the HDD80-E is suitable for a wide array of projects. An interdisciplinary development team of STREICHER particularly emphasised the group's strengths in this new development. The fact that these strengths have brought noticeable improvements, not only in theory but also in practice, was shown on the one hand by their intensive test operations and internal acceptance tests, and, on the other hand, by the system support and optimisation within the framework of a pilot project. By now, the HDD80-E drilling rig has been used at several projects for the trenchless laying of pipelines conduit systems and electric mid- and high voltage power lines and was immediately 100 per cent convincing. For example, in addition to various drilling projects in the Emsland region, crossings under the rivers Isar and Danube have also been carried out successfully with this innovative HDD rig, sometimes in very challenging ground conditions. STREICHER has created with these projects a product that is second to none.

The STREICHER Group heralds a new era - with the HDD80-E project – and the all-electric welding tractor, previously designed and developed prior to this project – bringing with it many exciting new developments. Experience gained from these projects shall come to use for future design and construction of machines. According to

the motto "from practitioners to practitioners", STREICHER continues to break new grounds in the pipeline construction business. Future-focused, sustainable solutions and conventional technology find their improvement in all core areas of technological development, from occupational safety and environmental protection to operative efficiency. These projects will stand for better results and a healthier environment.

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**STREICHER'S FULLY ELECTRIC  
 DRIVEN HDD RIG SERIES**

