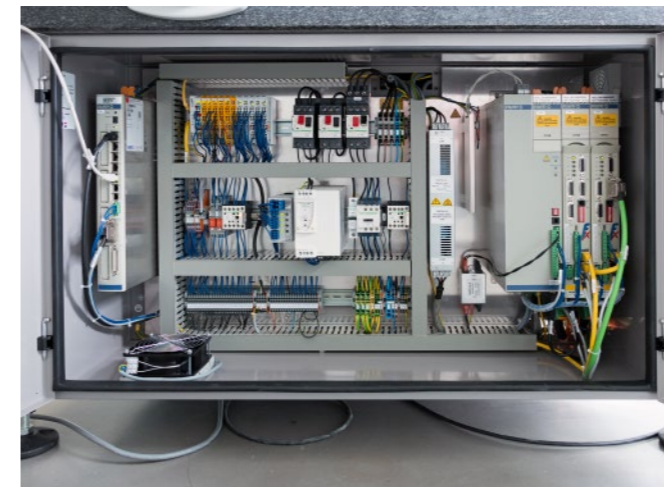


In-house creativity and close external co-operation for a new laser welding machine



Cabinet of the LSW 330.



View of the machining area of the LSW 330.

Felastec GmbH in Unterseen, picturesquely nestled between Lake Thun and Lake Brienz in the Bernese Highlands (Switzerland), was founded in 1998. Rudy Reichen has been managing the fortunes of the small, creative laser business since early 2017 and has over 25 years of experience in solid-state and fiber lasers. Felastec predominantly fulfills customer orders for laser cutting, laser welding, and laser drilling. It also offers titanium welding – a complex method of machining that requires specific expertise and specialist equipment to achieve optimum results. Spare parts for solid-state lasers are also on offer – with customers all over the world. The LSW 330 is now the first laser welding machine developed in-house to be launched on the market.

Felastec receives around 90% of its orders from the healthcare sector, but it can now accept more inquiries from the automotive and watchmaking industries, e.g. for custom developments and prototypes. Batch sizes typically run from a few hundred to a few thousand units. In the field of healthcare, items such as stents for blood vessels, titanium tweezers for surgical treatment of cataracts, or titanium bone plates with threaded bolts are manufactured. Using fiber lasers, ceramic materials such as industrial sapphire can also be machined.

The company's partnership with NUM goes back many years. Felastec, for example, today still uses the very first digital 1050 controller ever supplied (the NUM 1050 was manufactured from 1997 to 2002). Rudy Reichen: "What I truly love about working with NUM is its straightforward and consistently helpful after-sales service. We even still use NUM 760 controllers [editor's note: manufactured from 1983 to 1995], which are still supported by NUM." Reichen sees the quality of NUM products as another key advantage: "All these years, there have never been any problems."

The laser welding machine presented here is Felastec's first CNC machine developed in-house and is called the LSW 330. The customer from across the border wanted the laser welding process to be carried out in-house in the future, thereby inspiring Felastec's creativity. A risk analysis was carried out and a concept for the new machine was developed in cooperation with NUM and an expert on safety issues. The customer also requested good accessibility and compact dimensions, which Felastec succeeded in accomplishing. The overall machine has dimensions of 170 x 90 x 190 cm (L x W x H), with a machining volume of 300 mm³. A machine base made of natural black stone ensures the necessary stability. Also in response to customer requirements, the machine is CE certified and features a class 1 Nd Yag laser. Open operation in safety class 4 is also possible in combination with the necessary safety measures; this is frequently



NUM FS192i HMI, complemented by the operating panel developed in-house by Felastec.

requested especially for laser welding of small batches and high part diversity.

A Flexium+ 6 is used to control the 4-axis machine together with NUMDrive X drive amplifiers and a NUMSafe safety architecture. Also used are SPX motors from NUM with their well-known "single-cable solution" that dispenses with the need for a separate encoder cable. A modern FS192i HMI, complemented by an operating panel developed by Felastec and a separate dead-man's switch, complete the machine features.

The machine has an extremely flexible setup – on request, it is possible to switch between laser welding, laser cutting, and laser drilling at any time without having to make any changes to the control concept. The combination of Felastec's knowledge of machinery and processes relating to all aspects of laser machining and NUM's expertise in controls and implementation resulted in a new machine being launched after only a short period of development.



The extremely compact LSW 330 from Felastec.



Left: Carl Södertun, Production Manager and Rudy Reichen, Managing Director Felastec GmbH. Right: Jean-François Hermann, sales engineer at NUM Biel.