

# IPG Burbach cooling system for laser installation

## The company

IPG Photonics is with manufacturing facilities in the U.S., Germany, Russia and Italy, the world's leading manufacturer of high-power fibre lasers and fibre amplifiers for materials processing, telecommunications, medicine and other applications. Since its founding in 1990, IPG has delivered more than 35,000 units to OEM customers, system integrators and end-users. IPG offers the key products of laser technology: this includes the laser source itself, and auxiliary components such as the beam, coupler and the fibres.

## The Situation

The aim is Integrated cooling technology.

Laser cooling is the key in the secondary task - even with the efficiencies of modern laser systems (between 20 to 30%, depending on the laser version), the cooling requirement is very high.

The task of the mechanical engineer Manfred Barz and his five employees is to integrate the now separately installed cooling system into the cabin. "We have so far been purchasing the refrigeration unit from a supplier - but the strategy of our company's founder, Dr. Valentin Gapontsev, is to produce all relevant components ourselves ("Saying No to Outsourcing"). That is why we are producing as far as possible even the cooling." Generally, IPG provides in-house production depth, one of its trademarks, which ensures high product quality. Furthermore, the company is more flexible and more independence of other suppliers - quite like Grundfos.

---

### TOPIC:

IPG Burbach cooling system for laser installation

---

### LOCATION:

Germany

---

### COMPANY:

IPG Photonics

---

The challenge for Manfred Barz and his team: The integrated cooling modules need to provide a very high cooling capacity and be as small as possible.

#### The Grundfos Solution

##### Submersible pumps for different cooling circuits

In general, there are submersible pumps from Grundfos series SPK and MTH who are integrated in the two different cooling circuits of IPG's laser systems: The MTH-pumps are working mostly in the laser cooling system for cooling the laser source (here the cooling medium is untreated water and a cast iron pump is suitable). The SPK-pumps are integrated in the cooling circuit for cooling the optical fibre coupler, beam and fibre plug, where de-ionized water is used as a coolant and a stainless steel pump is required.

The modular design of the submersible pumps is important. That makes it easier to offer customized units. This means that IPG can choose from the multitude of components, materials and variants to design a pump for their particular tasks.

##### Grundfos Direct Sensors™ for the integrated cooling modules

For two years, IPG Laser is also using Direct Sensors™ of Grundfos to measure pressure and temperature in their system. Background: The integrated laser cooling module is placed inside the cabin. The laser protection class of the cabin doesn't allow connecting external sensors. "The built-in sensor solution from Grundfos is the perfect solution for us to continue monitoring the pressure and the temperature of the coolant" said Manfred Barz.

What is new about the Grundfos Direct Sensors™ technology? It is a silicon-based 3-in-1 sensor, which measures flow, the pressure or differential pressure and temperature. The special feature: The new sensor technology is not only a very small but extremely robust and is suited for use in harsh industrial environments.

In addition to the applications in the pump technology, Grundfos Direct Sensors™ are specially designed for industrial and OEM sector. Due to the measuring combination of flow and temperature this sensor is ideally suited for the detection of heat or cooling quantity.

#### The Outcome

IPG is very happy with the services offered by Grundfos pumps and sensors. The goal is, as Manfred Barz mentioned, to supply all IPG Laser worldwide with cooling technology "Made in Burbach". It is also a benefit that Grundfos as a global manufacturer offers its own sales and service organization with affiliates in more than 50 countries. Service and spare parts supply is ensured by covering all major markets.