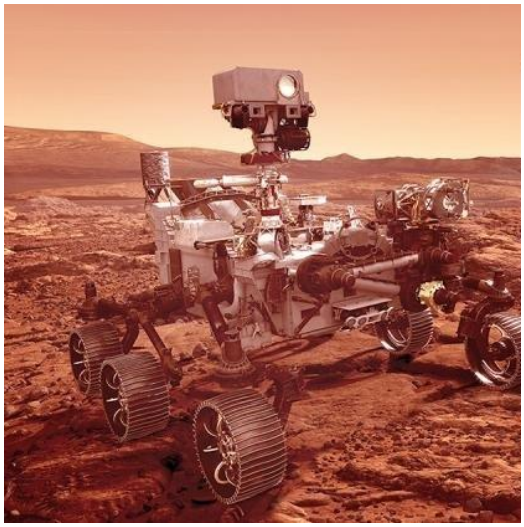
Electro Optical Components, Inc.
5464 Skylane Boulevard, Suite D, Santa Rosa, CA 95403
Toll Free: 855-EOC-6300
www.eoc-inc.com | info@eoc-inc.com

SmartGAS Acccuate & Reliable Gas Sensor Modules go to Mars

6/2021

Sensors monitor project for obtaining oxygen as fuel and for respiration

During the Mars mission in 2021, researchers are testing, among other things, whether oxygen (O2) can be extracted from the planet's extremely CO2-containing atmosphere for breathing and as fuel for space shuttles and rockets. A special module on board the Mars Rover "Perseverance" is designed to separate oxygen from the CO2 compounds in the Martian atmosphere, which can then be used as fuel. **CO and CO2 Sensors of the Flow EVO Series** from smartGAS enable the scientists to monitor the gas concentrations in a special experimental module.



Contact with the Mars mission was established through the Jet Propulsion Laboratory (JPL), which develops the propulsion technology for the space shuttle and rover and works closely with the Massachusetts Institute of Technology MIT. "For the project, we were asked to provide around 70 CO and CO2 sensors," reports Volker Huelsekopf from smartGAS. "Most of them were used for tests on the module in the run-up to the mission, others are monitoring the function of the module directly on Mars".

The sensors from smartGAS are measuring the CO or CO2 content inside the module there and thus control the process for O2 production. The ground personnel can see from the gas concentrations determined whether the process is proceeding as planned.

For the tight installation space of the rover, the engineers at MIT developed a compact so-called MOXIE module (**M**ars **Ox**ygen In-Situ Resource Utilization **E**xperiment) the size of a car battery. In this module, oxygen atoms are separated from the CO2 compounds in the Martian atmosphere. If the tests are successful, oxygen will be produced on Mars using a module about one hundred times larger than the original one. It will then be used to supply future missions and as fuel for space shuttles.

The project is of fundamental importance for the realization of manned Mars missions, as these cannot be realized at present due to the enormous distance between Earth and Mars. The amount of fuel needed to cover the distance on the return flight would be so great that the rocket would not be able to transport it. If oxygen can be produced on Mars, the rocket would only have to be refueled with part of the fuel for the return flight on Earth, which has clear technical advantages.

The mission started with launch on 30 July 2020 (https://mars.nasa.gov/mars2020/). The landing was Feb. 18, 2021. The rover is carrying out other experiments too on the surface of Mars and also collecting rock samples. The researchers hope to gain new insights into the geology of the Red Planet from them.

About smartGAS

smartGAS Mikrosensorik GmbH develops and produces reliable, precise and economical non-dispersive infrared absorption (NDIR) sensors for gas detection in a wide range of applications. The product range includes sensors for gas analysis, process measurement technology and ambient air monitoring, devices as well as installation and customer solutions. Based on the available standard sensors, smartGAS also offers customer-specific adaptation to the respective customer requirements - from a modification of the measuring range to the development of a completely new solution, everything is possible.