



SMR Sondermaschinen GmbH |  
Case Study Mechanical Engineering, Special Machine Construction

## Leak Testing Every 5 Seconds: Automating O-Ring Assembly

For the customer HANS FLEIG GmbH, the well-coordinated teams of SMR Sondermaschinen GmbH and our subsidiary REX Automation Technology realized several O-Ring assembly machines. The automation project mastered parts feeding, assembly, leak testing, optical inspection, and quality control.

**“We chose to work with SMR and REX AT as medium-sized companies because we particularly appreciate their high level of expertise and cooperative collaboration!”**

Wolfgang Weber | Senior Project Manager SIKA



### Objective

As a manufacturer of high-quality metrological solutions, SIKA offers a variety of flow sensors in the Vortex series specifically for heat pumps and large heat pumps in various designs.

With a nominal size of 20 and various connections and materials, a wide range of products is available for every heat pump application — including the practical QuickFasten connection, plastic G1 or NPT threads.

Due to extensive adaptation options that go well beyond the industry standard, the flow sensors can be precisely adapted to the piping requirements if necessary: tested in the SIKA test laboratory and matched to the sensors. Different software and hardware versions are delivered as needed.

To meet the increasing demand and necessary expansion of production capacities, SIKA set up automated production.

SIKA commissioned a solution for the automatic production of Vortex sensors from SMR Sondermaschinen GmbH, a specialist in special machine construction and

a long-term customer and partner of REX Automation Technology.

SMR implemented the order in close cooperation with REX AT. The production plant is designed for 3-shift operation and a service life of at least 15 years..

### The Customer

The success story of the family-owned traditional company SIKA from Kaufungen, Hesse, began as early as 1901 with the production of precision thermometers and technical glass apparatus.

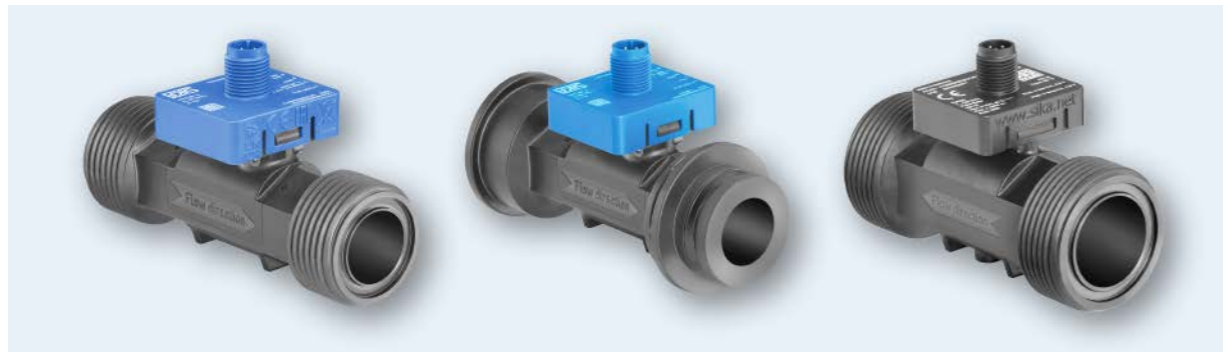
Thanks to numerous innovations and patents for measurement and calibration technology, SIKA is still considered a world leader in intelligent temperature and flow sensor technology in the HVAC, industrial, and maritime markets. With over 370 employees, the company specializes in sensors for pressure, flow, and temperature. SIKA develops and manufactures in Germany, focusing on growth in flow sensors for heat pumps.

#### Performance by Eckelmann

- ▶ The partner SMR implemented the order for SIKA together with REX AT.
- ▶ Electrical design
- ▶ Delivery of control cabinets including electrical equipment
- ▶ Design of control and drive technology
- ▶ Design of safety technology
- ▶ Machine wiring
- ▶ Software development with Siemens control technology
- ▶ Integration of external peripherals and measurement technology
- ▶ Commissioning of safety technology, axes, and control
- ▶ Commissioning of stations, machine processes, and operating modes
- ▶ Data collection and visualization with FactoryWare Data Analytics

#### Performance by SMR

- ▶ Creating the plant concept
- ▶ Design
- ▶ Design and process FMEA
- ▶ Manufacturing of mechanical parts, components, and assemblies
- ▶ Assembly of plant parts
- ▶ Selection and parameterization of camera technology
- ▶ Commissioning of mechatronic units
- ▶ Installation and commissioning
- ▶ Service



› Together with its partner SMR, the company subsidiary REX Automatisierungstechnik implemented a test bench for automated leak testing in O-ring assembly for the customer SIKA, which goes far beyond the industry standard and includes 100% traceability of the device, component and production data.

## Application

The assembly machine for the flow sensors consists of several plant parts. The main part is a rotary indexing table with 20 stations, which assembles the sensor assembly and performs various processing steps:

- › Assembly of various housing parts plus cover
- › Assembly of O-rings and dowel pins
- › Assembly of the electronic assembly into the sensor housing
- › Dispensing of a potting compound

Furthermore, each Vortex device is laser-marked in the machine, and a quality check is subsequently performed. To ensure the traceability of all produced sensors, all product and process data from the plant and upstream processes are collected and stored in a database.

In two other plant parts directly connected to the first plant part, the work steps of feeding, quality control, and pre-assembly of individual components are carried out.

10 Product Variants	Plant Autonomy over
<b>1</b> Machine	<b>1</b> Hour

## Special Features

- › 100% traceability of device, component, and production data
- › Visualization of production and process data on a dashboard directly at the machine
- › Particularly demanding assembly task due to high accuracy and quality requirements
- › Thanks to standardization at SIKA: production of various product types on one plant



## Do you have any questions?

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