

## **MIDDEX // PROCESS MONITORING**

## Customer: Ruetschi Technology GmbH

## Tool breakage monitoring in a Swiss-type lathe

During the production process, it is impossible to eliminate the possibility of tool damage. If damage goes unnoticed, it leads to additional costs due to faulty parts, loss of time, and fluctuating quality. Unexpected interruptions during series production can cause additional stress for employees.

## Data

Middex Product Monitoring system:

BKS1S Function: Monitoring of two tools

#### Swiss-type lathe

Manufacturer: Tsugami Model no. HS327 Control system: Fanuc



## To prevent such issues from arising, Ruetschi Technology GmbH in Renquishausen relies on tool monitoring solutions from Middex Electronic.

This system reliably stops production in case of tool breakage, limiting the number of rejects to a single part. This application saves Ruetschi Technology GmbH both money and workpieces. With its tactile measuring principle, the system developed and manufactured by Middex Electronic indicates tool breakage and stops the machine immediately. Moreover, the BKS1 can scan two different tools in one process step, expanding the monitoring function beyond a single tool.

# Ruetschi Technology GmbH equipped a Tsugami HS327 Swiss-type lathe with the BKS1S monitoring system to take advantage of its benefits.

With this tool configuration, only one tool needs to be monitored. By appropriately configuring the control unit and probe, the BKS1S system can be customised for any test condition, tooling, or process. In this case, after each machined workpiece, the scanning head of the BKS1S scans the drill on the T21.

This application is triggered by a touch command from the PLC after the drilling process. The probe moves until it touches the drill.





Resistance indicates to the scanning head that the tool is still present and sends an "OK" signal to the machine. As a result, the next machining process starts. If the drill broke off previously and the scanning head cannot locate a tool at the taught position, both the process and the machine are stopped through a "Not OK" signal.

Teach-in is a special function provided by our solutions. Before the tool breakage monitoring system can be used, the scanning head must be adjusted to the tool being monitored. With just a slight adjustment of the maximum teaching angle, the scanning head can recognise the position where the tool should be positioned. This adjustment can be made easily with the push of a button or via a teaching signal through the machine. This function also ensures that the system does not misinterpret for example, a chip as a drill.

The unique feature of the BKS1S is showcased in the following example. Ruetschi Technology GmbH also utilises a special feature of the BKS1S on another machine, which is also a Tsugami HS327 Swisstype lathe. The system is also capable of monitoring several tools in one machine.

After completing the relevant process steps, the probe scans the tools mounted both below and above it in the machine. If the BKS1S detects that either one of the two drills is missing, the system immediately stops to prevent further production of faulty parts.

Monitoring two highly sensitive and vital tools with one scanning head is now possible with this capability. This system provides benefits such as improving production efficiency, which includes saving space in the machine and reducing acquisition costs.

The overall design of the Tsugami HS327 Swiss-type lathe and the production processes are ideally suited for the use of Middex Electronic scanning probes. Thanks to its durability and excellent quality, even direct contact with cooling lubricants during the production process has no effect on the precision of tool monitoring. This is true even with up to 10 million test cycles.







### In summary:

- BKS1S for monitoring of two tools
- Separate signal inputs for two tools
- Scanning via change of direction