MEASUREMENT OF THE TEMPERATURE DRIFT WITH TEMP:IN

Do you grind, hone and debur with the aid of industrial robots? Do your processes need a high long-term stability, e.g. because measuring of quality characteristics is carried out with robot support? Then, LaserLAB with temp:in will help you!

If metal is heated, it expands and shrinks, if it is cooled. It is already sufficient, when a hall gate is opened during the manufacture or the robot arms warm up after a certain time. This can be fatal for high-accuracy applications as even smallest deviations lead here to faults. The consequences are that the specified tolerances cannot be reached and there will be high scrap quotas. Therefore, the goal of the measurement with LaserLAB and temp:in is the continuous compensation of modifications of the robot kinematics due to temperature changes. The modifications are compensated by continuous measurements without having to stop production.

**HOW IT IS DONE**

LaserLAB and measuring ball will be rigidly fixed in the robot plant. temp:in is a permanent part of the application and will be called up cyclic. Your production will not be influenced by the measuring procedure, as it is carried out during the feed time of the components. The calculation of the robot parameters is carried out continuously after every measuring sequence. All kinematic modifications of the robot kinematics will be recorded by measuring, fed into the robot and compensated immediately.

**YOUR ADVANTAGE**

- Permanent drift compensation
- On-line compensation, directly in the robot control
- Quick measurement, due to this, no extension of cycle time
- Integrated temperature sensor
- Recording of the temperature changes
- No scrap due to temperature drift

**KOMPATIBILITÄT**

- ABB
- Fanuc
- Kuka
- Yaskawa
SUCCESS BY PROCESS STABILITY

The measuring system LaserLAB offers high process stability, as it has no measurable temperature drift in the temperature range from 0° to 55°C. Expansions in length of the measuring device holder will be calculated and compensated with the aid of the temperature sensor. Due to this, LaserLAB is the fixed point, which stays unchanged even if everything else starts “floating”.

THE PROCEDURE IN DETAIL

When installing LaserLAB and temp:in, initially the measurement positions will be set, within which a prefabricated robot programme will be checked for freedom from collision and will be adjusted in case it is required. After this, a basic calibration will be carried out. The measuring system, as well as the measuring ball will be measured into the plant during calibration.

As the last step of the initial operation, the so called “mastering” is carried out. Here, reference measurements will be carried out and permanently stored. Mastering serves to, implicitly, store the actual status of the robot kinematics in the form of measured values.

temp:in will be simply called-up by a function call-up with split parameter from the application. The split parameter determines the number of measurements per cycle. It will be set in such a way that the measuring cycle can take place during the feed time of the components. This guarantees that the cycle time will not be prolonged.

The system is now fully integrated into the production sequence. Changes in length that occur due to temperature changes will be measured automatically and the calculated kinematics parameter will be transferred automatically into the robot control. The inverse kinematics of the robot then makes sure that the room points will be maintained unchanged.