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Section B – Electrical engineering

Part 5: Measuring equipment capability

The following delivery specifications of Wieland-Werke AG form part of the contract.
Any deviating specifications are to be agreed upon between the supplier/contractor and Wieland, and documented.

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1 Procurement

Properties are determined by testing and compared to specified target values and tolerances. Delivery specifications for measuring and testing systems ensure that the necessary conditions for testing are met. Measuring or testing systems are the totality of devices, aids and methods that solve a measuring or testing task.
For the procurement of measuring or testing systems, all relevant parts of the Wieland delivery specifications apply, in particular the requirements for CE conformity.
In addition to the present delivery specifications, the requirements to be fulfilled by the measuring/testing system may be documented in a functional specification, which shall be agreed with the supplier. The supplier guarantees to comply with the requirements of the functional specification.
The requirements for the measuring equipment capability (see section 2) must be fulfilled in any case.
The MFL-K department is to be involved in the procurement process; for complex testing systems the MFP department is to be involved.

2 Analysis of measuring equipment capability

2.1 Scope

Test equipment is subject to test equipment monitoring by Wieland (MFL-K). Proof of the measuring equipment capability must be provided.
For testing systems that are used for acceptance tests on the product, a measuring equipment capability analysis (MECA) must be carried out.
For other systems (intermediate testing, not relevant for acceptance, process measurement variables on the unit, test facilities), a MECA must be carried out where necessary to assess the suitability of the systems for process control.
If the following procedures are not applicable in special cases (attributive test equipment (e.g. plug gauge); no true repeatability of the determination of the characteristic (e.g. hardness test); no suitable measurement standard available; the tolerance requirements represent a technical/physical limit), then these measuring systems are to be assessed according to the standards, guidelines and procedures applicable to them. The criteria for the acceptance of measuring systems as test equipment are then set out in the functional specification.

2.2 Carrying out the measuring system analysis using procedure 1 [1]
This procedure investigates the accuracy and repeatability of a measuring system. A standard with a known characteristic value is used for the investigation. The standard is measured 50 times (at least 25 times). However, the standard is removed from the measuring device after each measurement then put back again, and only then is it measured again.
Based on the standard deviation of the measured values and the systematic error, the Cg and Cgk indices are then calculated.
The maximum permissible tolerance is specified in the order.
The performance of the capability test must be documented and is considered an acceptance criterion.

[1] Edgar Dietrich, Alfred Schulze: Eignungsnachweis von Prüfprozessen. Hanser Fachbuchverlag, Munich 2007, ISBN 978-3-446-22320-2.