

Adaptive Control

Limit value regulation for optimisation of tool life and machining time by means of feed adaptation



- ✓ **Increase of economic efficiency**
- ✓ **Increase of tool life periods**
- ✓ **Overload protection for tools**
- ✓ **Integrated breakage monitoring**
- ✓ **Reduction of machining times**
- ✓ **Reduction of air machining**
- ✓ **Individually configurable for each tool**

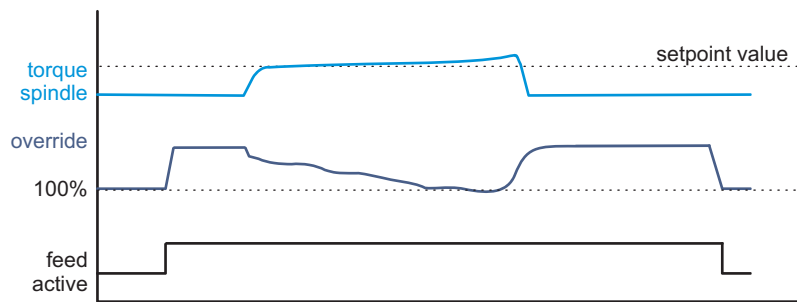
An AC regulating system can be used to influence the feed motion of a machine tool in order to make the process more economically efficient. Any sensor signal can be analysed for this purpose. The torque of the spindle, for example, is a suitable sensor signal. When the DTA (digital torque adapter) function is used, the use of external sensor systems is not required.

Two modules are available for the AC regulating system:

1. ACC limit regulating system as a strategy in CTM-1, version 3 including option package FP3 in connection with DTA or MU4 only

Functional description:

The torque of the spindle is scanned and then an override value is transmitted via the CTM card back to the control system as a regulated quantity. The machine moves at an increased rate of feed until the point of contact between the tool and workpiece is reached. Following contact between the tool and workpiece, the torque is then regulated to the limit value. The upper and lower feed limits can be individually adjusted in order to prevent machine-specific limit ranges from being exceeded.

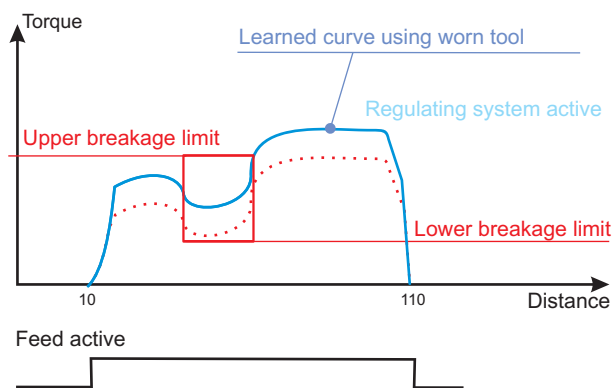


schematic diagram ACC

2. ACO optimisation regulating system as a special version of the CTM card in connection with DTA or MU4 only

The AC standard strategy is suitable for a large number of processes. However, in the case of very high component requirements and specific tools, such as step tools, for example, the standard strategy is no longer sufficient. Due to the high component requirements, only certain parts of the machining operations might be influenced. For example, when penetrating a crosswise-drilled hole, no influencing of feed is allowed to be carried out.

This is why the ACO regulating system is based on window technology. Beyond a set window, the feed is influenced according to the controller parameters, and within the window, the feed value is set to 100%. Since the time-based assignments are no longer constant because of the effects of the feed motion, the distance signal of the control system is used. As in the case of the AC standard strategy, the torque signal of the machining spindle is used as an input quantity for the controller.



schematic diagram ACO