



# Summary Overview

- 0 = can work
- ✓ = good fit
- ✓✓ = best fit

|                      |                           | Sensors type     |                   |           |       |        |
|----------------------|---------------------------|------------------|-------------------|-----------|-------|--------|
|                      |                           | Electrical Power | Acoustic Emission | Vibration | Force | Strain |
| Machining Processes  | Turning                   | ✓✓               | ✓✓                | 0         | ✓✓    | ✓      |
|                      | Grinding                  | 0                | ✓✓                | ✓         | ✓     | ✓      |
|                      | Drilling                  | ✓✓               | ✓✓                | 0         | 0     | 0      |
|                      | Stamping                  |                  | ✓                 |           | ✓✓    | ✓✓     |
|                      | Die-casting               |                  | ✓✓                | ✓✓        | ✓     | ✓      |
|                      | Rotary-cycle machine      | ✓                | ✓✓                | ✓         | 0     | 0      |
|                      | Multi-spindle lathe       |                  | ✓✓                | ✓         | ✓✓    | ✓✓     |
|                      | Machining center          | ✓                | ✓                 | 0         | ✓     | 0      |
| Detection capability | Missing tool              | ✓✓               | ✓✓                | ✓✓        | ✓✓    | ✓✓     |
|                      | Tool fracture             | ✓                | ✓✓                | ✓         | ✓✓    | ✓✓     |
|                      | Tool wear                 | ✓✓               | ✓                 | ✓         | ✓✓    | ✓      |
|                      | Chatter                   | 0                | ✓✓                | 0         | 0     | 0      |
|                      | Collision                 | ✓                | ✓✓                | ✓✓        | ✓     | ✓      |
|                      | Contact                   | 0                | ✓✓                | ✓✓        | ✓     | ✓      |
| Optimisation         | Tool life                 | ✓✓               | ✓                 | 0         | ✓     | ✓      |
|                      | Quality                   | ✓                | ✓                 | 0         | ✓     | 0      |
|                      | Process                   | ✓                | 0                 | ✓         | ✓     | ✓      |
|                      | Reduction of air grinding | 0                | ✓✓                | ✓✓        | 0     | 0      |

## Notes:

**Electrical Power:** Electrical power sensors use the clear relationship that exists between the power load requirement and amount of metal machining that is taking place to monitor the process. Reduction gears can influence the clarity of the signal level.

**Acoustic Emission:** The measurement is more sensitive the closer the sensor is installed to the processing point. Joining areas (such as screw connections) between the processing point and the sensor reduce the acoustic signals.

**Vibration:** Comparable to acoustic emissions (low frequency range)

**Force / Strain:** Forces and strain within machine components are dependent on the structure of the machine and should be interpreted separately in each case.