RS35 HS Rotating System
Defect detection at high production speeds for improved product quality
**First rate products through reliable eddy current testing**

» **Inspection before and after production**  
  • Rod, wire, tube  
  • Diameters up to 35 mm (1.375”)

» **High speed testing**  
  12 000, 9 000 or 6 000 rpm

» **High sensitivity**  
  Min. detectable notch depth: 0.05 mm (0.0012”) depending on surface conditions

» **Compact and ergonomic**  
  • Userfriendly operation  
  • Easily accessible for service  
  • Optional remote control

» **Short changeovers**  
  • External diameter adjustment  
  • Tool-free changeover of guide sleeves

» **Increased operating safety**  
  All settings are performed externally and without tools

**When is a rotating system required?**

The rotating system is essential in production lines where longitudinal defects (cracks, seams, laps, etc.) in the material surface are of major concern. Eddy current probes rotating around the material detect even the smallest defects depending on the surface quality. Due to its high resolution and transverse movement across the crack (rather than along it), the rotating system finds defects sometimes missed by conventional encircling coils.
**Quick size change without tools**

No matter whether you are adjusting the diameter or testing, the system stays closed. All procedures can be performed from the outside and without tools, increasing operating safety and reducing changeover times.

**How the rotating system works**

The rotating system scans the test piece in a helical pattern. Every time a probe crosses a crack, it generates a defect signal. In doing so, the rotating system produces a great number of consecutive signals that identify the flaw as a crack. The defect signals appear on the screen as they occur. An angular display shows the position of the defect on the circumference of the test piece.

**Minimum defect length and production speed**

In complete testing, the feed per revolution corresponds exactly to the probe width. In order to be able to definitely detect a defect, it must at least cover one probe track completely (see red defect markings). The minimum defect length MDL in complete surface testing can therefore not be smaller than twice the probe width.

In order to be able to definitely detect a defect during a non-complete surface testing, it also must at least cover one probe track completely (see red defect markings). Accordingly, MDL is enlarged to 2x track width plus 1x gap width.

The maximum possible production speed \(v_{max}\) for a specific MDL is calculated as follows:

\[
v_{max} [\text{m/s}] = \frac{\text{rpm} \times \text{number of probes} \times \text{(track width + gap)}}{60000}\\
\text{(gap} = \text{MDL minus 2x track width)}\\
\text{v}_{max} [\text{m/s}] = \frac{\text{rpm} \times \text{number of probes} \times \text{(MDL minus track width)}}{60000}
\]

**Lift-off compensation**

For high precision testing

If the test pieces are off-center, defects of the same size produce different signal amplitudes, resulting in inaccuracies in the defect evaluation. The smaller the gap, the larger the defect signal. The lift-off compensation system corrects this effect and ensures reliable test results.
### Technical data RS35 HS

**Testing material**
- Tubing, pipe, bar, wire, valve spring wire, heading wire
- Ferrous, nonferrous and austenitic metals
- Size range: Ø 2–35 mm (0.078”–1.375”)
- Temperature of inspected material: 0–70 °C (32–160 °F)

**Weights**
- RS35 HS 77 kg (169.4 lb); control box 17.4 kg (38.3 lb)

**Eddy current instrument**
- EDDYCHEK® 5; EDDYCHEK® 610

**Production line**
- Continuous production with cut-off
- Continuous production without cut-off (e.g. drawing line)
- Testing of cut lengths (inline and offline)

**Defect resolution**
- Min. defect length: depends on production speed and probe
- Min. def. depth: 0.05 mm (0.0012") dep. on surface conditions

**Probes**
- 2 differential probes with lift-off compensation
- Probe type selected according to throughput and surface condition

**Guidance system**
- Internal, with bushings; external guidance system recommended

**Spindle bearings**
- Hybrid bearings with a long service life

**Revolutions per minute**
- 6 000, 9 000 or 12 000 rpm

**Motor and power supply**
- Three-phase asynchronous drive
- 3-phase, 400V, 50 Hz; max. power rating: 500 VA
- Altern.: 3-phase, 440 V, 60 Hz; max. power rating: 500 VA

**System configuration**

Example: In the complete surface testing, the surface is scanned without a gap. If the rotating system rotates with 12,000 rpm, an 8 mm long longitudinal defect is definitely detected, if production speed does not exceed 1.6 m/s. With a higher production speed, for example, 8.4 m/s, a longitudinal defect will be definitely detected with 25 mm expansion.

Production speed (m/s) = RPM x Number of probes x (Minimum defect length (mm) – Track width (mm)) / 60 000