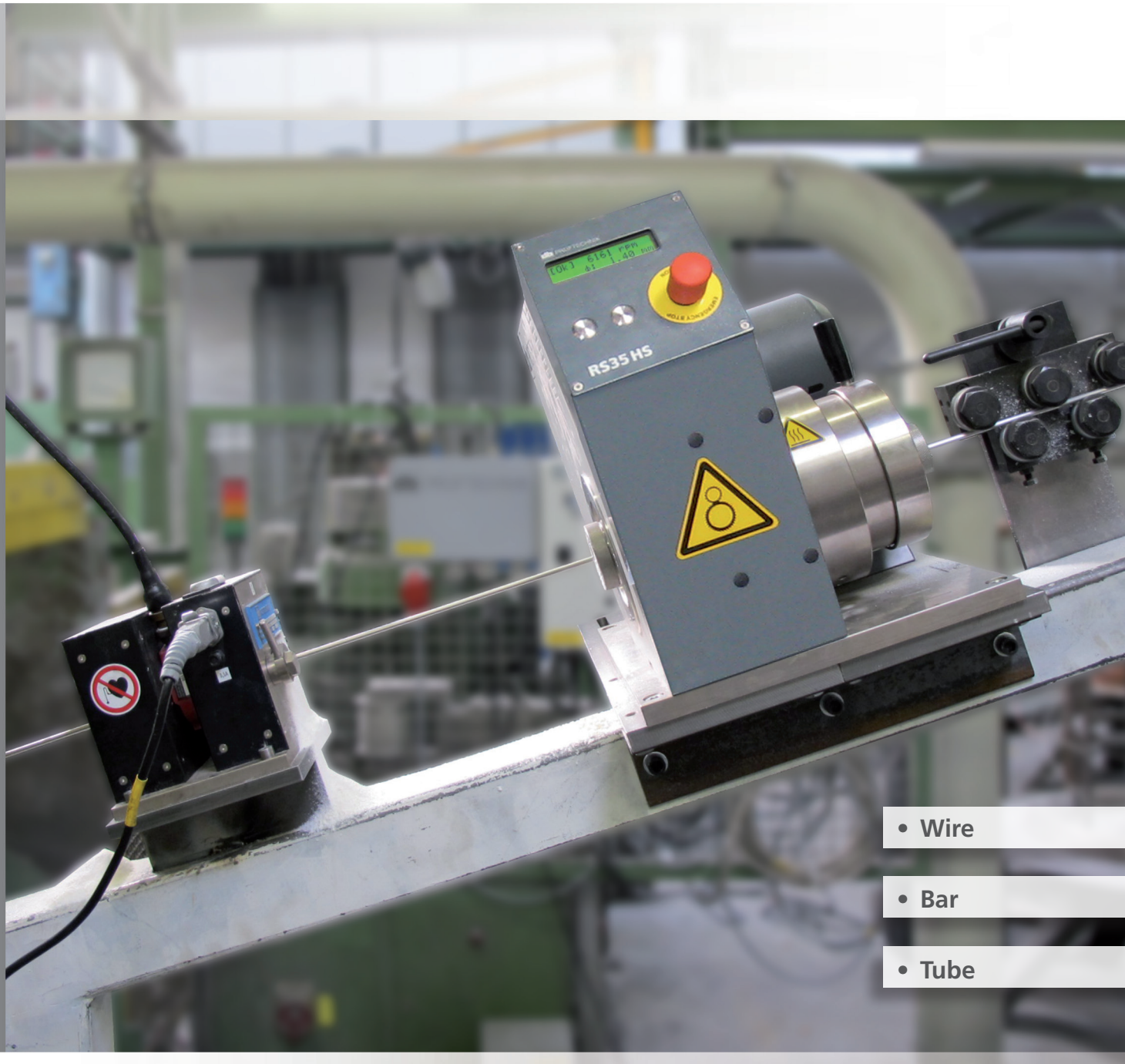
PRÜFTECHNIK

RS35 HS Rotating System

Defect detection at high production speeds for improved product quality



- Wire
- Bar
- Tube

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

Variable drive speed
The rotating system can be run at speeds of 6 000, 9 000 or 12 000 rpm, as appropriate for the production speed. The higher the rotational speed, the shorter the minimum detectable defect.

When is a rotating system required?

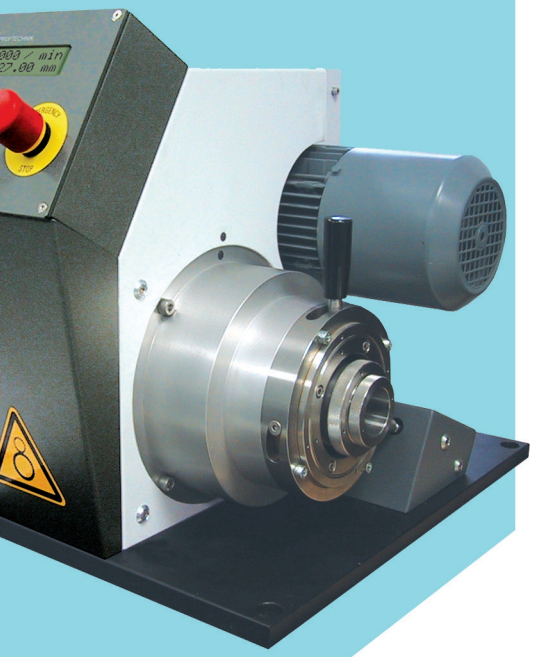
The rotating system is essential in production lines where longitudinal defects (cracks, seams, laps, etc.) in the material surface are of major concern. Eddy current probes rotating around the material detect even the smallest defects depending on the surface quality. Due to its high resolution and transverse movement across the crack (rather than along it), the rotating system finds defects sometimes missed by conventional encircling coils.

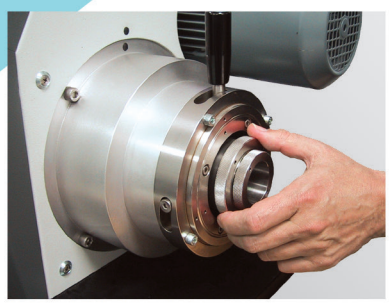
Convenient guide sleeve changeover
In advance of a change in the test material size, the guide sleeve holders can be equipped with new guide sleeves of the correct diameter. Tools are not required to screw the guide sleeve holder in place.

Ergonomic operation
The useful display shows the probe gap and operating status of the equipment. The user can adjust the probe gap without opening the equipment by using the two push buttons below the display.

Quick size change without tools

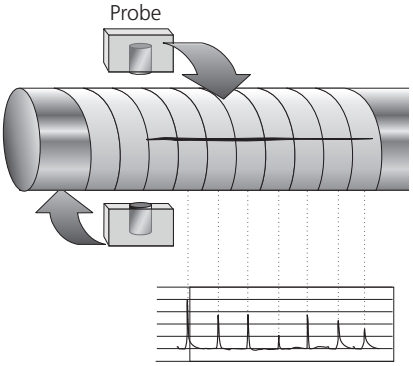
No matter whether you are adjusting the diameter or testing, the system stays closed. All procedures can be performed from the outside and without tools, increasing operating safety and reducing changeover times.





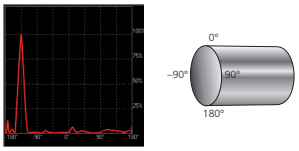
Rapid probe adjustment
In just a few steps, the probe gap can be quickly set to the required diameter without having to open the system or requiring tools.

How the rotating system works



Defect signals

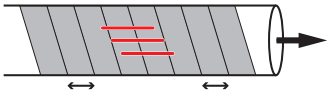
The rotating system scans the test piece in a helical pattern. Every time a probe crosses a crack, it generates a defect signal. In doing so, the rotating system produces a great number of consecutive signals that identify the flaw as a crack. The defect signals appear on the screen as they occur. An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



Minimum defect length

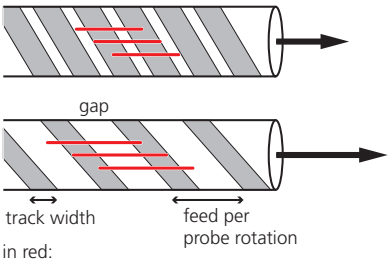
and production speed

1) complete surface testing



in red:
minimum defect length (MDL) = 2x track width

2) non-complete surface testing



in red:
MDL = 2x track width + gap

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 vmax for a specific MDL is calculated as follows:

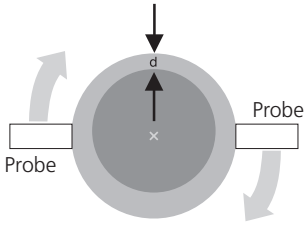
vmax [m/s] = rpm x number of probes x (track width + gap) / 60000

(gap = MDL minus 2x track width)

vmax [m/s] = rpm x number of probes x (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.

	Gap control range
	Test piece
x	Center of probe path
d	Gap (distance between probe and test piece)

Reliable semi-finished product testing

Production speed and minimum defect length

Order no.	RPM	# of probes / track width (mm)	Complete surface testing	Partial surface testing				
			Min. defect length in mm					
			8	9	10	12	15	20	25
			Max. production speed in m/s					
LAB 6400B	6000	2/4	**0.8**	1.0	1.2	1.6	2.2	3.2	4.2
LAB 6403B	9000	2/4	**1.2**	1.5	1.8	2.4	3.3	4.8	6.3
LAB 6405B	12000	2/4	**1.6**	2.0	2.4	3.2	4.4	6.4	8.4

Production speed (m/s) = RPM x Number of probes x (Minimum defect length (mm) – Track width (mm)) / 60000

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.

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

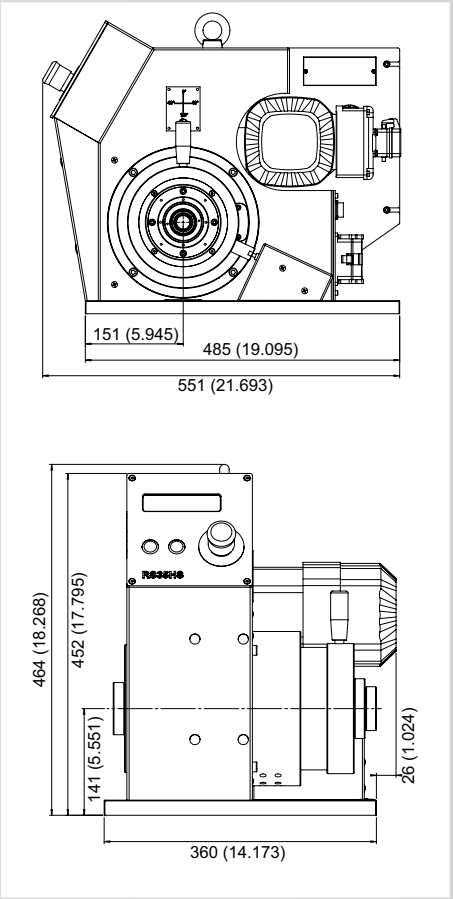
Revolutions per minute
- 6000, 9000 or 12000 rpm

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

System configuration

Control box | RS35HS5 Rotating system | Eddy current tester

Dimensions in mm (in)



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