

KAPA

NON-CONTACT THICKNESS MEASURING DEVICE

This non-contact thickness measuring device is for sheet/films up to 3 mm (new: KAPA II: max. 6 mm) thickness, a maximum width of 4 m and with a repeatability of $\leq 0,5 \mu\text{m}$. It is equipped with dual sensor, capacitive and eddy current.

Composed of:

- Measuring frame with integrated control cabinet
- Traversing unit with electrical drive
- Measuring sensor mounted on a pneumatic lift-off-device on the traversing unit
- Control cabinet with industrial PC, 17" Monitor, keyboard drawer
- Connection cable control cabinet - measuring frame, 10m length

Visualisation

- Thickness profile diagram as bolt and line chart
- Trend and SPC analysis
- Roll protocol
- Recipe storage
- Alarm and history



| Technical Data: | KAPA | KAPA II |
|----------------------------------|-----------------------------|----------------------|
| Measuring system | capacitive/eddy current | |
| Max. measuring thickness | 3000 μm | 6000 μm |
| Measuring gap | 4,5 mm | 9,5 mm |
| Diameter of the sensor | 30 mm | 45 mm |
| Measuring spot diameter | 12 mm | 18 mm |
| Sensor resolution | 0,1 μm | 0,5 μm |
| Repeatability | $\leq 0,5 \mu\text{m}$ | $\leq 1 \mu\text{m}$ |
| Measurement speed | 10 – 300 mm/s adjustable | |
| Calibration | necessary for each material | |
| Diameter of the reference roller | 200 mm | |
| Dimension of control cabinet | 600x600x1960 mm | |
| Colour: | RAL 7035/7022 | |

Thickness gauges



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| Electrical Supply: | KAPA |
|----------------------------------|------------------------|
| Supply voltage: | 115/230 VAC \pm 10 % |
| Supply frequency: | 50/60 Hz \pm 1 % |
| Max. power consumption: | 700 W |
| Max. current consumption: | 5 A |
| Electrical equipment to EN 60204 | |

| Supply compressed air: | |
|------------------------|-------|
| Operating pressure: | 6 bar |

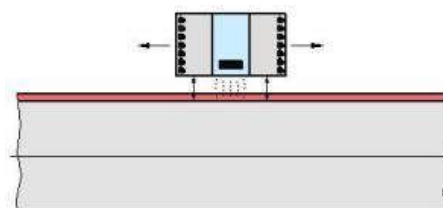
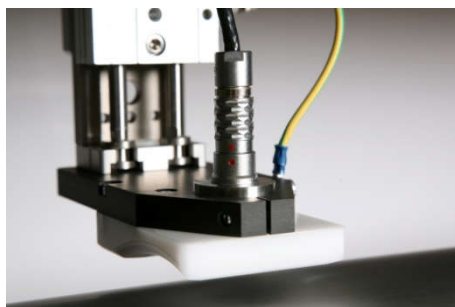
| Ambience: | |
|---------------------------|---------------------------|
| Max. ambient temperature: | 40°C |
| Max. air humidity: | 95%, without condensation |
| Max. sheet temperature: | 90°C |
| Documentation: | Every EU Language |



Measuring principle:

It is based on a non-contact, indirect thickness measurement principle.

The capacitance between sensor and roller depends on the dielectric of measured sheet and distance between sensor to roller. To eliminate the influence of distance-fluctuations between sensor to roller this distance is measured permanently with an eddy current sensor (located together with the capacitive sensor in the same casing). According to this measured distance, the result of the capacitive sensor is corrected.



Calibration:

In the calibration mode the sensor is placed in a fixed position (traversing stopped) during production. Measurement happens along a line of the sheet in extrusion direction. A piece of sheet needs to be cut out along this line and measured manually. This manually measured value needs to be keyed in the software as calibration value. Calibration is only required once per material or formulation and can be stored in the recipe storage.

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Features/Screen frames:

Description of most important screenshots

Line chart:

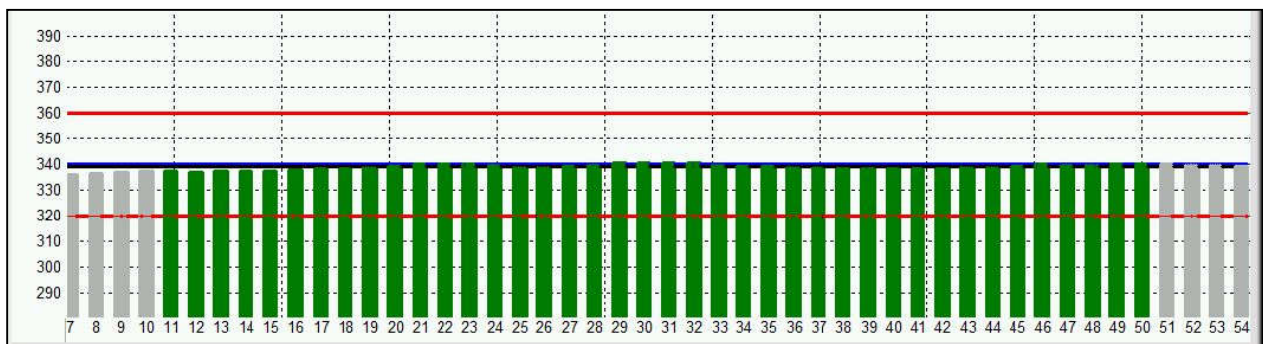
- Current thickness profile displayed over measuring width
- Average profile of last 3 scans
- Reference curve: freeze actual profile for comparing with future profiles – reference curve can be stored and reloaded.
- Net width

Bolt diagram:

- Current thickness profile displayed over bolt numbers
- Average profile of last 3 scans
- Reference curve: freeze actual profile for comparing with future profiles – reference curve can be stored and reloaded.
- Net width

Numeric displays:

- Current thickness (μm) according displayed sensor position
- Average thickness according cross profile, 2 Sigma value, min. and max. thickness
- Tolerance set values
- Thickness set value
- Net width set value



Bolt diagram

Inspect mode:

Zoom in graphics (thickness profile and bolt diagram) for close inspection

Trend diagram:

- Trend diagram shows process over 24 hours
- Most important values like set value, actual/average thickness according cross profile, min. and max. 2 Sigma, tolerances and line speed will be displayed in a line diagram.

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Buttons / Links:

- Production parameter (opens frame: production parameter)
- Calibration (opens frame: calibration)
- Analysis (opens frame: analysis)
- Password (enables setting of passwords for different protected frames)
- Alarms (displays alarm in readable text)
- Print
- Roll changing (reset parameters of frame production parameters, running meter e.g.)
- Roll protocol (report of every roll can be displayed, stored and printed)

Production parameter

Frame for setting production parameter

- Data of order: order nr., customers name, article nr.,
- Production parameter: thickness set value, + and – tolerances, resolution of displays, net width, etc.

Analysis:

This frame displays production data and trends

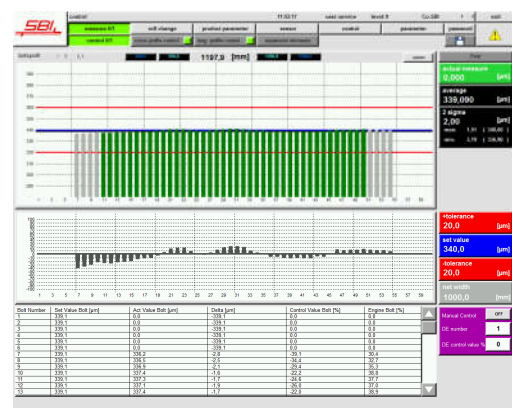
- Production data: time of start, time since start or roll changing, running meter since roll changing, weight, speed, etc.
- Trend: Displays trend graphics of last 24 hours, older trends are stored and can be loaded for viewing and printing. Trend graphics shows thickness average, set value and tolerances.

Thickness Control

Optional frames for control of thickness with automatic extrusion dies.



Main screen: thickness- and bolts diagram



Thickness control (option)