

# KNC-600 Linear Scanner

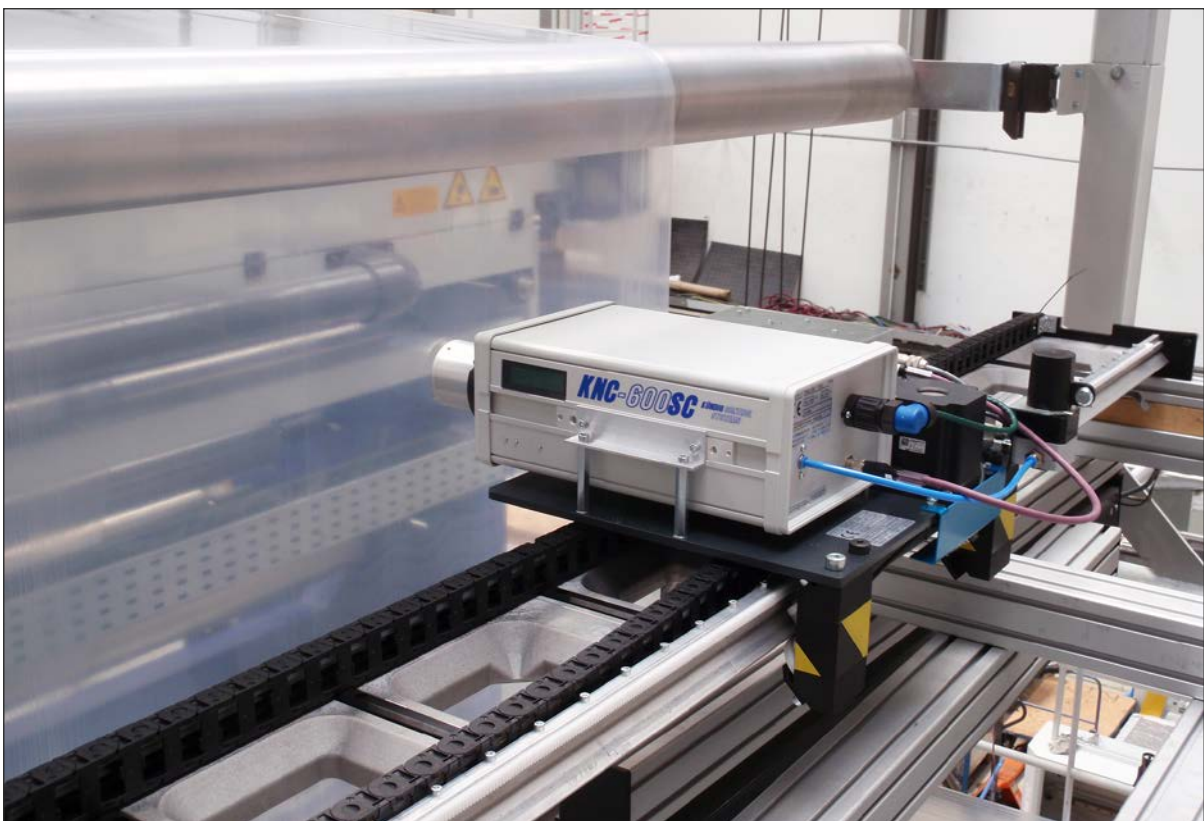
**KÜNDIG CONTROL SYSTEMS**  
The Gauge Manufacturer for Film Extrusion  **SWISS  
MADE**

***Online  
thickness  
gauge for  
cast film  
lines***

## ■ **KNC-600 Linear Scanner**

The KNC-600 Linear Scanner is a thickness gauge for cast film lines, film orientation lines or other extrusion lines where the thickness of flat film needs to be measured.

Rapid and accurate measurement of film thickness allows the film production process to be tightly controlled. This results in an enhanced film quality that is maintained during the entire production process. Optimizing film thickness profiles contributes to material savings. In addition, material waste during product changes is reduced.

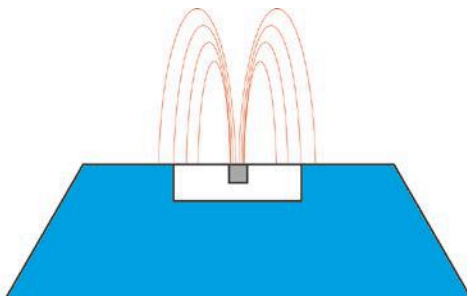


*KNC\_600 Linear Scanner*

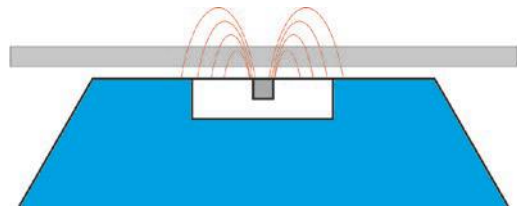
The installation of the KNC-600 can be easily done by factory technicians and immediately put into service. The measuring device is nearly maintenance free and provides a high reliability and performance.

## ■ The capacitive measuring principle

The capacitive sensor operates with an electric field, the so-called stray field of a capacitor. The field intensity varies depending on the thickness of the film. This variation is calculated and shown as thickness.



*Sensor and stray field without film*



*Sensor and stray field with film*

Capacitive thickness sensors are especially qualified for thickness measurement because of the following reasons:

- High resolution and accuracy
- Instant reproducibility of the measured profile
- No influence due to coloration or film transparency
- Not subject to licensing / No costly disposal

## ■ The non-contact thickness measurement

**Advantages of a non-contact thickness measuring system:**

- Online measurement of sticky film
- Sensitive films can be measured scratch-free
- No tear and wear of the sensor
- No contamination of the sensor

**Requirements for a reliable film measurement:**

- The film must be vertical at the installation place of the sensor
- Changes in bubble position should be no more than 0.4 inches (10mm) at max. 5 Hz



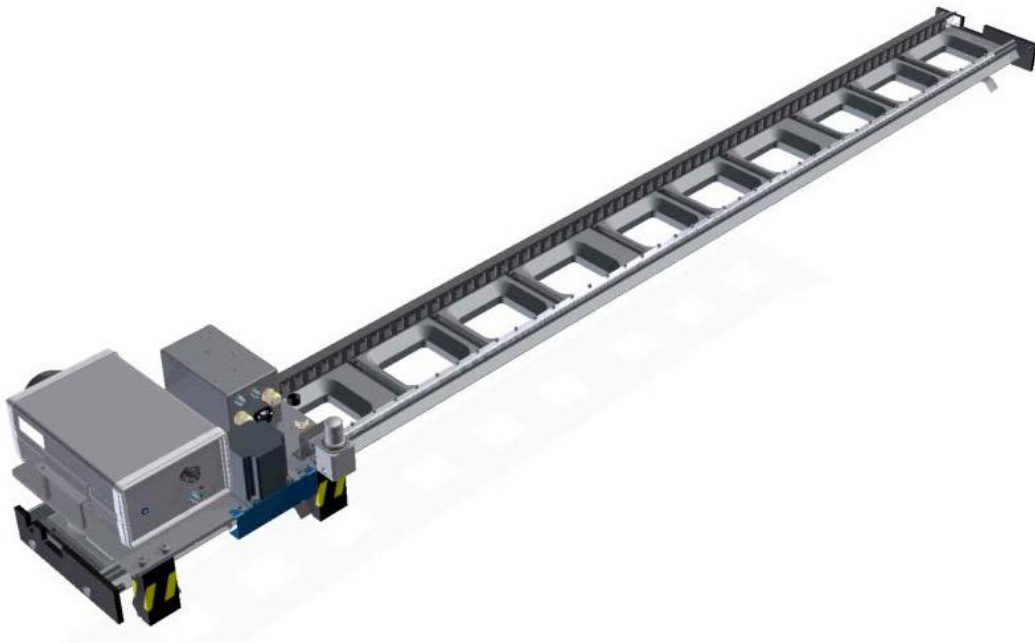
## ■ The procedure

Once the measurement is started, the traveller moves to the center of the film, before the thickness sensor extends. It continuously measures the thickness across the web. Two infrared sensors in the head ensures that the thickness gauge does not run over the edge.



## ■ The linear scanner

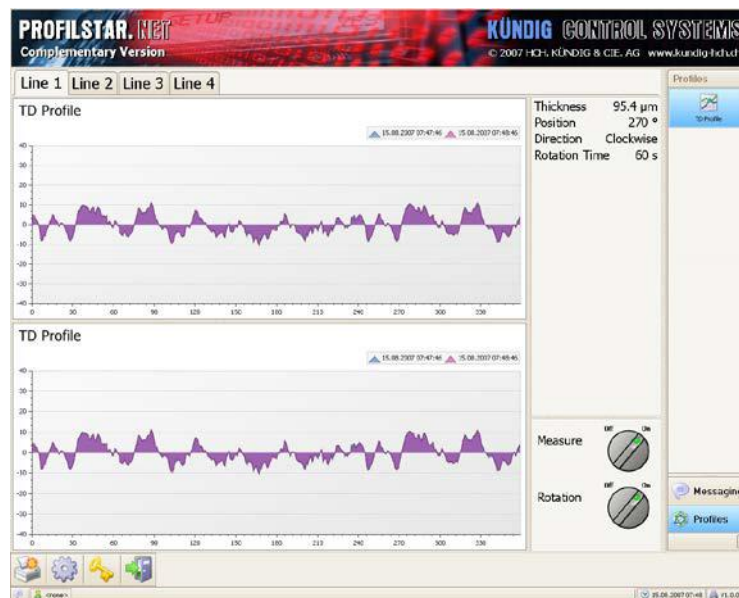
The scanner consists of modular segments, and is therefore available in almost any size.



## ■ Connections and interfaces

### PROFILSTAR.NET

The PROFILSTAR.NET is a complete visualization system for process optimization and quality control. Up to 16 lines, equipped with Kündig thickness gauges and / or layflat control systems, can be connected to one PROFILSTAR.NET unit.



### PCD-LINK via RS-422 or UDP/IP Ethernet

The proven PCD-LINK protocol, used for the communication between control system and any Kündig measuring device, is now available via RS-422 and also via UDP/IP Ethernet with the new data processor. So it is still compatible with existing host computers but at the same time offers a new and very cost efficient version.

Both ports can be used at the same time, for example one port for the control system and the other port to record the data.

### KCS-API and KCS-Process

For a fast and easy integration of Kündig measuring devices into Windows based control systems, we now offer a KCS-API (Application Programming Interface) in the widely used programming language C. The KCS-API is delivered as a DLL (Dynamic Link Library) and a KCS Process (Windows application) that acts as a driver.

### Analog output

Still available is a connection with an analog signal. In this case, the measured thickness value is transmitted as an analog signal, while the rotation signals are presented in a digital form.



## ■ Technical data KNC-400

### Interface values

Power supply	110 - 240 VAC, 50/60 Hz
Power consumption	max. 300 VA
Nominal current	1.5 A
Switch-on peak current	4.0 A
Air pressure	5 - 10 bar
Air consumption	35 dm <sup>3</sup> / min.

### Ambient temperature

Data processor	max. 55 °C
Measuring electronics	max. 60 °C
Measuring head	max. 60 °C
Transport and storage	-40 °C to 70 °C

### Thickness measurement

Measuring principle	Capacitive thickness measurement Suitable for all electrically non-conducting material
Measuring frequency	1 MHz
Measuring range	10 to 300 µm > 300 µm on request
Measuring interval	40 ms
Resolution	0.1 µm
Accuracy after calibration	10 to 30 µm ⇔ 0.5µm, > 30 µm ⇔ 2%
Linearity within range of calibration thickness (± 10%)	better than 2%

### Ambient conditions

Ambient temperature	23 °C ± 2 °C
Measured film	LDPE-film, at 50 °C approx.

## ■ Calculation of amortization

$$\begin{array}{l}
 \boxed{\text{Material output}} \text{ kg/h} \times \boxed{\text{Operation time}} \text{ h/day} \times \boxed{\text{Operation time}} \text{ days/year} \times \boxed{\text{Material price}} \text{ €/kg} = \boxed{\text{Material throughput}} \text{ €/year} \\
 \\
 \boxed{\text{Material throughput}} \text{ €/year} \times \boxed{\text{Optimization}} \text{ \% / 100} = \boxed{\text{Material savings}} \text{ €/year} \\
 \\
 \boxed{\text{Investment}} \text{ €} \div \boxed{\text{Material savings}} \text{ €/year} = \boxed{\text{Amortization time}} \text{ years}
 \end{array}$$

## Questionnaire application technology

Company \_\_\_\_\_

Address \_\_\_\_\_

Zip Code \_\_\_\_\_

City \_\_\_\_\_

Country \_\_\_\_\_

Contact person \_\_\_\_\_

E-mail \_\_\_\_\_

Phone \_\_\_\_\_

Fax \_\_\_\_\_

### We are interested in

- |   |  |
|---|--|
| <input type="checkbox"/> Online thickness gauge                               | <input type="checkbox"/> Width measurement             |
| <input type="checkbox"/> Online thickness gauge and automatic profile control | <input type="checkbox"/> Width measurement and control |
| <input type="checkbox"/> Offline system for film thickness                    | <input type="checkbox"/> Meter weight control          |

### Specifications of existing line

Film width:	Min. _____ mm	Max. _____ mm
Film thickness:	Min. _____ $\mu$ m	Max. _____ $\mu$ m
Throughput:	Min. _____ kg/h	Max. _____ kg/h
Line speed:	Min. _____ m/min	Max. _____ m/min

Extrusion:	<input type="checkbox"/> Monoextrusion ____ Components	<input type="checkbox"/> Coextrusion ____ Layers ____ Components per layer
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Processed materials: \_\_\_\_\_

Width of roll at haul-off: \_\_\_\_\_ mm

Power supply: \_\_\_\_\_ VAC \_\_\_\_\_ Hz (single phase)

Existing measuring and control units:	<input type="checkbox"/> Thickness gauge	<input type="checkbox"/> Profile control system
	<input type="checkbox"/> Width measurement	<input type="checkbox"/> Width control
	<input type="checkbox"/> Meter weight control	<input type="checkbox"/> Line speed control

Brand of existing line: \_\_\_\_\_

**E-mail:** [kcs@kundig-hch.ch](mailto:kcs@kundig-hch.ch)

**Fax:** +41-55-250 36 01

## **Product overview**

### **K-300 Rotomat KT**

Online thickness gauge with rotating scanner

### **KNC-400 Rotomat KT**

Online thickness gauge for sticky  
and sensitive films

### **KNC-600 Linear Scanner**

Online thickness gauge for cast film

### **K-NDC Rotomat KT**

Nuclear online thickness gauge  
for barrier films

### **K-300 CF Gauge**

Online thickness gauge  
for quality supervision

### **S-50**

Online thickness gauge  
for quality supervision

### **S-100**

Capacitive online thickness gauge  
for barrier films

### **FE-8**

Width measurement and control  
for lines with or without IBC

### **FILMTEST**

Offline measurement for quality control

### **PROFILSTAR.NET**

Visualization for quality supervision and control

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