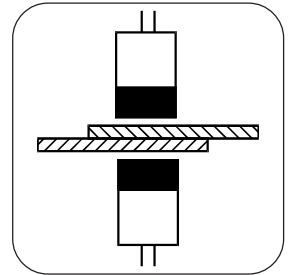


## NONCONTACT DOUBLE SHEET DETECTION AND THICKNESS GAUGING SYSTEM for metallic materials



- Dual sided capacitance distance measurement with integrated temperature probe
- Noncontact measurement of metals
- No Teach-in required
- Two unit types with 10 and 20 mm sensor gap

### Double Sheet Detection:

- **C100-10S:** 0.2 to 3.5 mm
- **C100-20S:** 0.4 to 7.0 mm

### Sheet Thickness Gauging:

- **C100-10S:** 0.2 to 8.0 mm
- **C100-20S:** 0.4 to 16.0 mm

- Nominal thicknesses are easily entered by key operation or via control input
- LCD display of nominal and actual values as well as operational and fault messages
- Sensors and control electronics in one integrated enclosure, quick disconnect, protection class IP54

### Application

When feeding sheets automatically, more than one sheet can be inadvertently fed into the processing machine. This can result in damage of the machine and tools, expensive repairs and production loss. The dual probe Double Sheet Detector C100-S has been designed to prevent such events.

### The manual contains detailed security instructions



These devices are **NOT** suitable for personnel safety applications. Never use these products as sensing devices for personnel protection. Their use as a safety device may create an unsafe condition which could lead to injury or death.

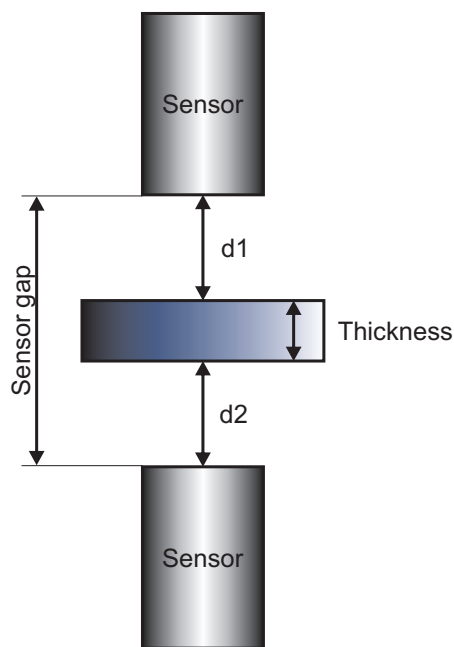
**Measurement principle**

The system functions according to capacitance principle by measuring distances from both sides of the measurement object. The sketch below depicts the measurement principle.

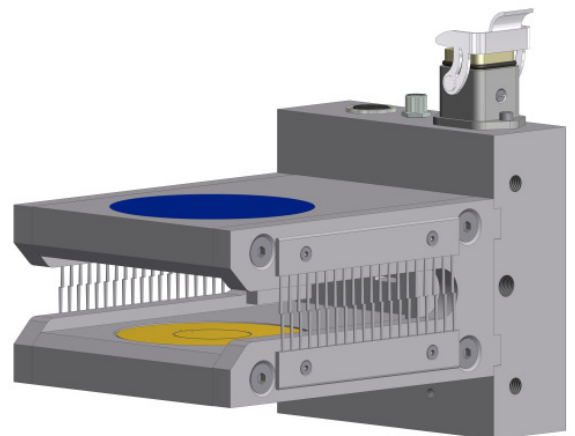
The sheet together with the electrodes are two separate parallel plate capacitors. In a plate capacitor the capacitance C depends on the plate area A, the plate gap d, the electric constant  $\epsilon_0$  and the relative permittivity  $\epsilon_r$ .

$$C = \epsilon_0 \epsilon_r \frac{A}{d}$$

As long as the plate areas and the dielectric remain constant, the capacitance is a value for the corresponding distance between the sheet and the electrode.



Thickness = Sensor gap - (d1 + d2)



**Description**

The system consists of a C-measurement frame and a control unit. In each C-frame there is an electrode with a temperature probe. The C-frame is attached to the enclosure of the control unit C100-S. The current measurement value is supplied to the machine controls as analog voltage and shown on the LCD of the control unit. The integrated double sheet detector issues also the output signals 0-1-2 sheet. In addition this system has integrated air channels for periodic cleaning of the electrodes with dry and oil free air.

Metallic brushes at the sensor gap provide the necessary electrical ground contact of the sheet.

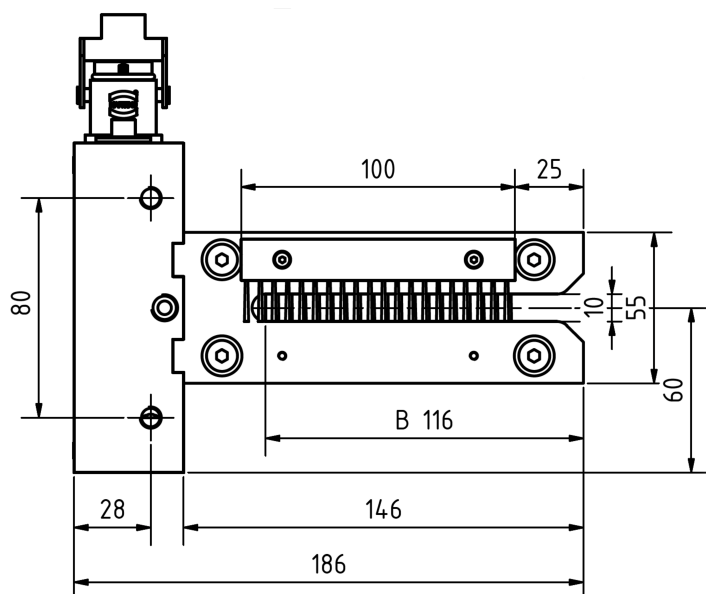
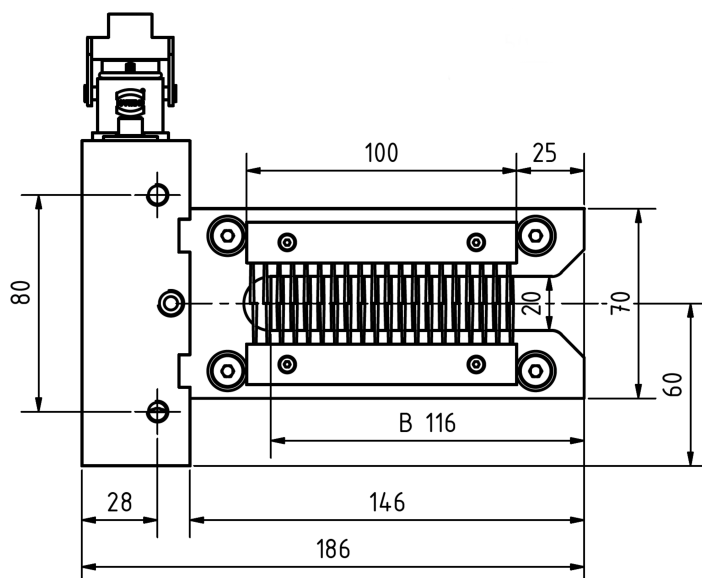
**Minimal Operator Intervention**

If the evaluation of the measurement signals is done completely in the machine controls then there is no need for any operator activity. If this system is intended as Double Sheet Detection system then the adjustment to the current nominal thickness is all that is necessary.

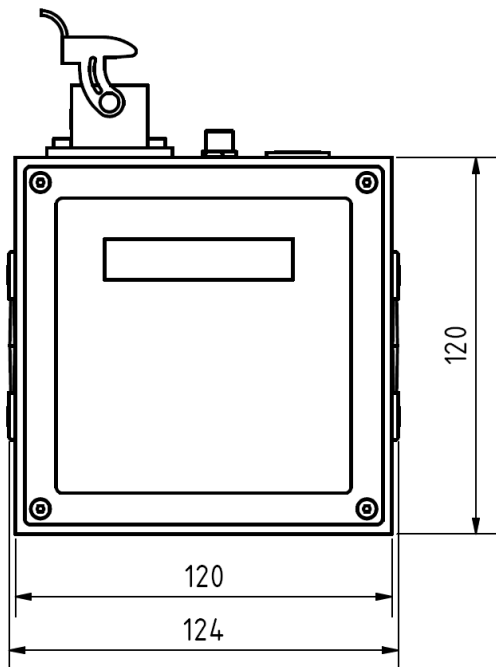
The adjustment procedure sets the switching thresholds in relation to the measure thickness. The switching thresholds remain stored in case of power outage. An adjustment by key operation or via the control input is possible.

**Technical data**

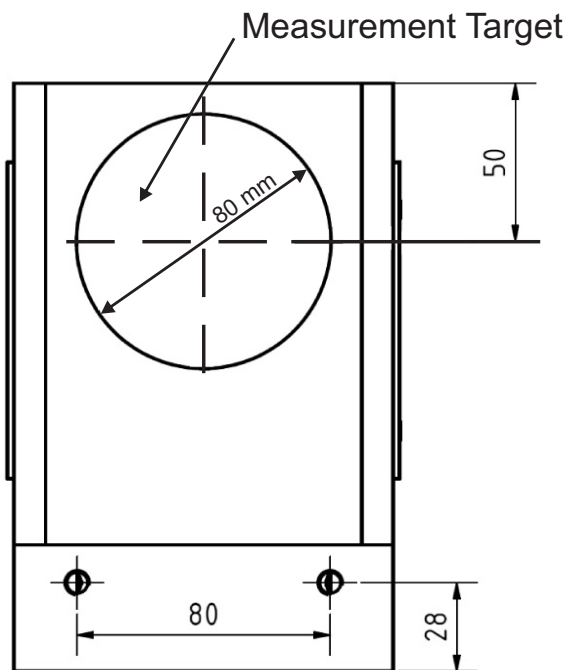
Supply voltage	24 VDC / 110 mA
Power consumption	< 3 W
Power / Switching indication	5 LEDs
Display	LCD display, 2 lines, 16 chars. each
Ambient temperature	15° to 40°C (60° - 105° F) during operation
Switching outputs 0-1-2 - Sheet	Open Emitter (NPN) of opto coupler outputs
Temperature drift of switching point	± 0.02% / °C
Switching capacity	max. 50 V, max. 50 mA
Humidity in operation	10 to 70 % relative
Measurement period	The minimum retention time of the sheet in the sensor gap is 500 ms.
Material requirements	electrically conductive, flat, dry
Measurement target size	Ø 80 mm
Measuring conditions: Situation	Plan parallel situation within the measuring gap allowable variation <math>< \pm 1^\circ</math> in x, y-Axes
Measuring conditions: Electr. potential	Material grounded over integrated brushes (replaceable)
Analog output / resolution	4 .. 20 mA / 10 Bit (1 mA = 1 mm)
Enclosure	Aluminium enclosure for machine frame mounting
Class of protection	IP54
Weight	3.0 kg (6.5 lbs)
Connections	Plug connection
Dimensions	120 x 124 x 186 mm (4.7 x 5.0 x 7.3 in) (H x W x D) (without plugs)

**Dimensions**
**C100-10S**
**Right side view**

**C100-20S**


Front View

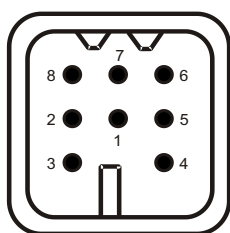


In View



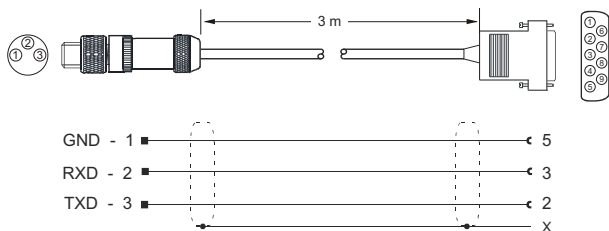
**Accessories**

**S0003515**



Enclosure HAN 3A, EMI-type, metrical 7-pin insert and PE	
Pin 1	+24 VDC
Pin 2	GND
Pin 3	Teach-in
Pin 4	2-sheet
Pin 5	1-sheet
Pin 6	0-sheet
Pin 7	+24 VDC fo. I/O
Pin 8	PE

**SM8KRS232D9S**



October 2010 / Rev. 1.0

**ORDER INFORMATION**

**Control unit**

Part name	Comment
C100-10S	Complete Dual Probe unit, operating voltage 24 VDC, 10 mm sensor gap.
C100-20S	Complete Dual Probe unit, operating voltage 24 VDC, 20 mm sensor gap.

**Accessories**

Part name	Comment
S0003515	Harting connector, complete
2277706	Cable plug M16, 2-pin for analog output 4 .. 20 mA
SM8KRS232D9S	RS232 Interface cable, Standard length 3m
RPC2.2	Software for PC