

## Double Sheet Detector R1000 Series E20

Electro magnetic principle -  
microcontroller based

One - sided contact double sheet control of ferrous materials

No force after measurement

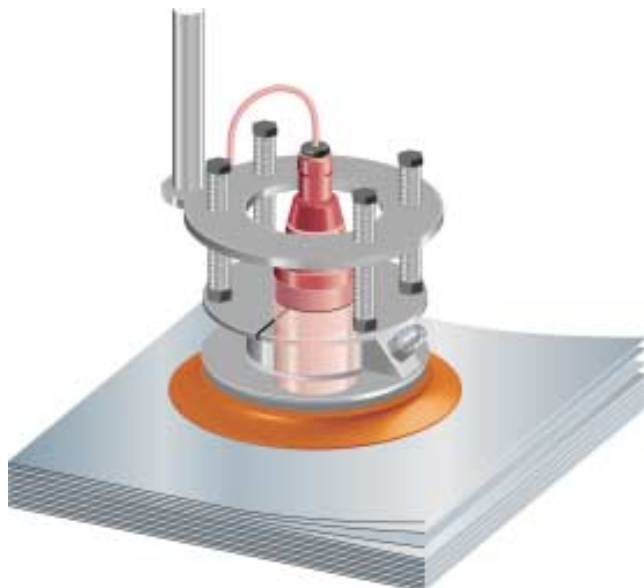
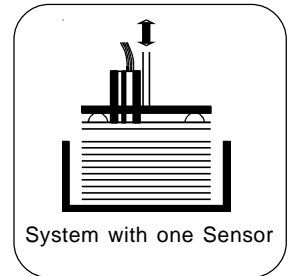
6 exchangeable linearized sensors for double sheet control  
of 0.1 to 6.5 mm (.004 to 0.250 in.) sheet thickness

Optional version 4P allows the connection of up to four sensors

- Digital display of sheet thickness and operations parameter
- Programmable for 255 different sheet thicknesses
- Monitoring of over gauge and under gauge limits
- Monitoring of operating voltage and measuring time
- Opto coupled 9 respectively 11-Bit PLC input interface
- Selectable interfaces:
  - opto coupled RS232 interface
  - Relay or opto coupled output for under gauge, nominal gauge, over gauge and enable
  - all common fieldbus technologies

**NOW AVAILABLE:**

- > Panel mount
- > Fieldbus technology



# DOUBLE SHEET DETECTOR E20

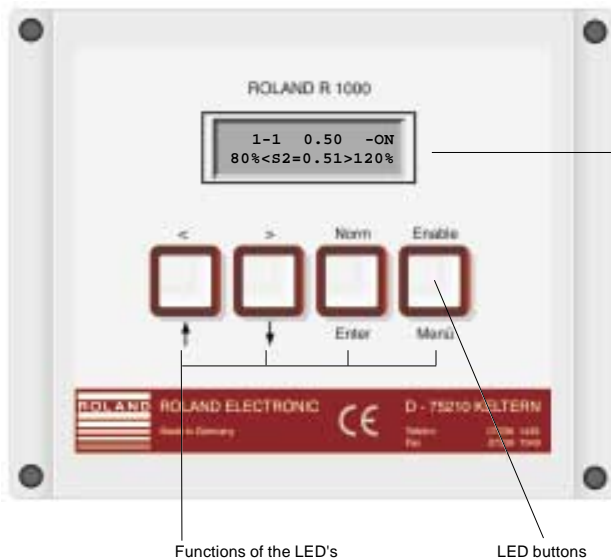
**Description:**

When sheets are fed automatically, two or more sheets may be fed inadvertently into a processing machine. This can damage tools, cause halt in production or result in expensive repairs. The double sheet detector E20 can reliably prevent this from occurring. In addition to the connection of one sensor an option is available to connect four sensors of the same type (E20-4P). In the latter configuration the system is also used for Hidden Parts Detection. The sensor switching is controlled either sequentially by the PLC or automatically in the new **sequencer mode**. This function eliminates the time-consuming switching of the measuring channel or the program by the PLC. A measurement of 4 separate sheets of 1.0 mm thickness with the P42AGS sensor and a 120% double sheet threshold takes less than 305 ms by using the **sequencer**. In contrast the same measurement with program switching by the PLC takes more than 700 ms.

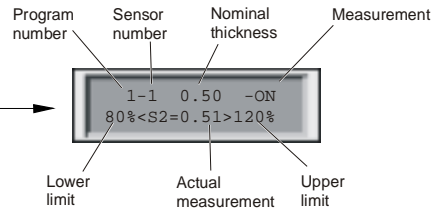
**Function:**

The double sheet detector is based on the electromagnetic principle. It monitors ferromagnetic sheets with single sided sensors and exerts forces during the monitoring process only. A change of the sheet thickness results in a change of induction. The system calculates the sheet thickness from this change. Corresponding to the pre-set limits 0-sheet, 1-sheet or 2-sheets signals are generated.

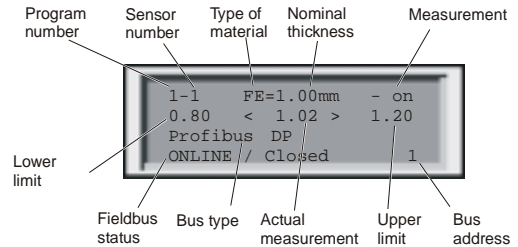
One sensor can be connected to the control unit (type E20) or up to 4 sensors (type E20-4P). The control unit is available in 3 versions B, C and fieldbus, for feature see below.



**Display Version B and C:**



**Display Fieldbus Version:**



**Technical Data:**

Operating voltage: 24 VDC ± 4V  
 Power consumption: < 120 W  
 Enclosure meets: IP65  
 Ambient temperature: 0 - 50 °C (32 to 122 °F)  
 Weight: approx. 1.5 kg (3.3 lb)

**Dimensions:**

Unit E20:	Unit E20-4P	Unit E20-(4P)-PR-S
Width: 140 mm	180 mm	225 mm
Height: 140 mm	140 mm	240 mm
Depth: 71 mm	71 mm	71 mm

**Memory and signal inputs:**

- Version B: Memory for 255 parameter sets (thicknesses); programming by push buttons; addressing with 9 respectively 11 opto coupled data inputs 24 VDC with joint common
- Version C: Memory for 255 parameter sets (thicknesses); programming by push buttons or RS232 interface; data backup via RS232 interface
- Version Fieldbus: Memory for 255 parameter sets (thicknesses); programming by push buttons or fieldbus; addressing via fieldbus interface; data backup via fieldbus or RS232 interface

**Signal outputs**

Signal outputs: dry two way contacts  
 Maximum switching voltage: 250 VAC  
 Maximum switching current: 1 A  
 Maximum switching power: 240 W / 200 VA

**Relay version (Version B):**

**Optocoupled (Version C / fieldbus):**

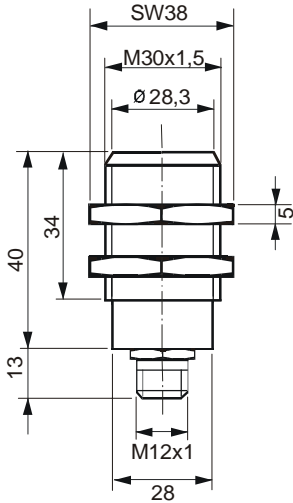
Emitter and collector  
 50 VDC  
 150 mA  
 100 mW

# DOUBLE SHEET DETECTOR E20

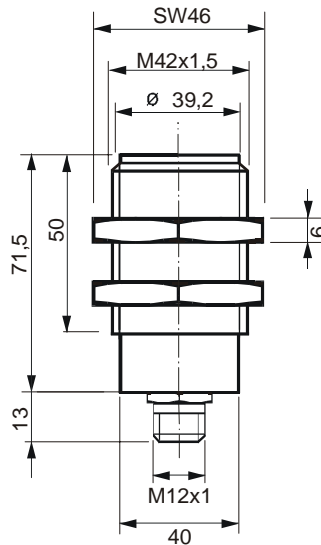
**Sensors:**

It is recommended to use the sensors P30GS, P42AGS and P75VGS with the control unit E20. The connection of the older P36GS, P42GS and P75GS sensors is also possible.

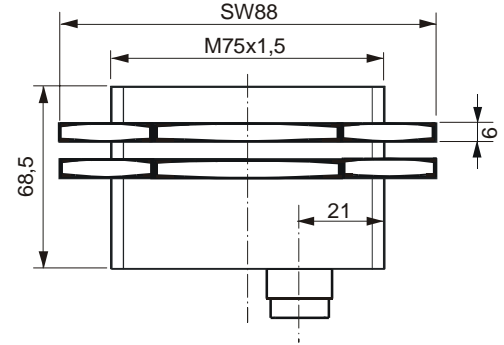
**P30GS**



**P42AGS / P42GS\***



**P75VGS / P75GS**



\* The dimensions of the sensors (P42AGS / P42GS) are identical with the exception of the connector.

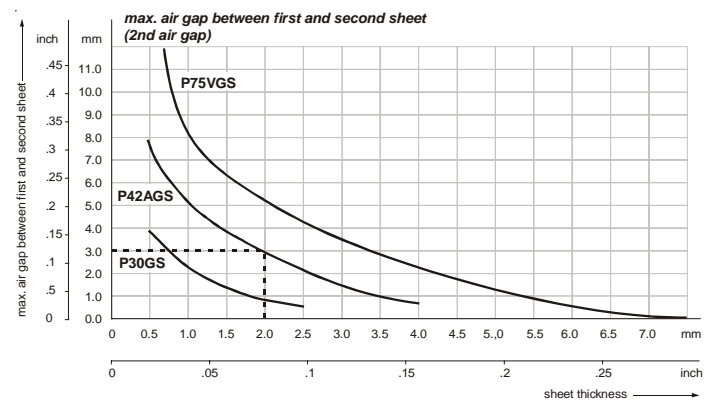
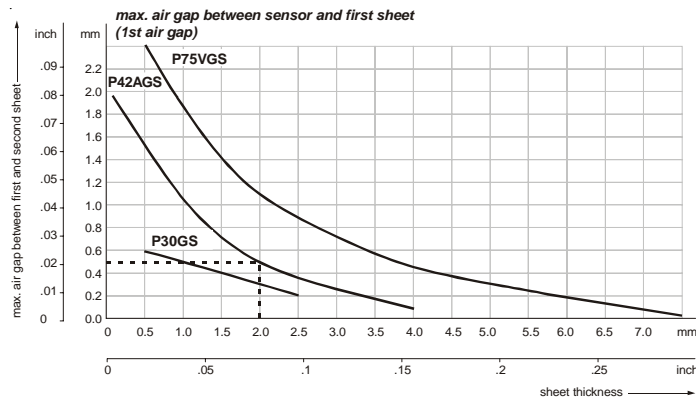
**Air gap behavior:**

The new Double Sheet Detector E20 has a much improved air gap tolerance especially in conjunction with the new sensor P42AGS. There are two types of air gaps in case of double sheet control. First there is the air gap between sensor and sheet surface (1st air gap) and the air gap between the first sheet and the second sheet (2nd air gap). The diagrams show the relationship.

Example for 1st air gap with sensor P42AGS: According to the diagram, if processing a sheet of 2.0 mm (.08 in.) an air gap of 0.5 mm (.02 in.) can be tolerated with a double sheet threshold of 120 %.

Example for 2nd air gap and sensor P42AGS with 2.0 mm (.08 in.) sheet thickness and a double sheet threshold of 120 %; an air gap of up to 3.0 mm (.12 in.) can be tolerated.

Attention ! The performance data of both diagrams **cannot** be combined !



**Measurement time:**

The table to the right shows the reaction time of the system when detecting double sheet with the maximum sheet thickness applicable to each sensor and a selected upper switching limit of 120%.

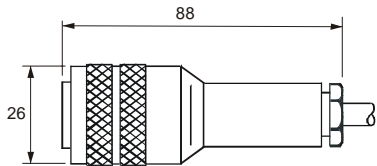
The times for 2, 3 and 4 sensors apply to the **sequenzer mode**.

Sensor	max. sheet thickness [mm] / [inch]	Measurement time [ms] with max. sheet thickness and 120 % double sheet threshold			
		1 Sensor	2 Sensors	3 Sensors	4 Sensors
P30GS	2.5 / .1	100	150	195	245
P42GS	4 / .16	140	230	310	410
P42AGS	4 / .16	145	215	305	385
P75VGS	6.5 / .25 (8 / .315)*	450	860	1280	1680

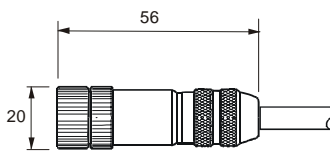
\*with restriction

**Sensor cable:**

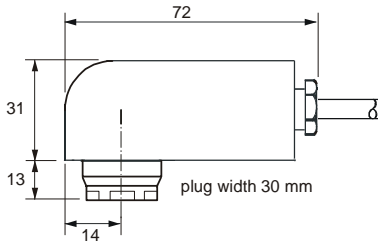
Cable: **CPS-5-G Oil** for P42GS and P75VGS  
straight receptacle



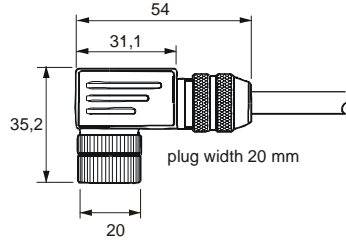
Cable: **CPM12S-G** for P30GS and P42AGS  
straight receptacle



Cable: **CPS-5-W Oil**  
right angle receptacle



Cable: **CPM12S-W**  
right angle receptacle



Sensor cable for fieldbus-technology see operating manual

**Order data:**

**Control unit for the connection of one sensor:**  
 E20-B-R Control via PLC  
 E20-B-O Control via PLC  
 E20-C-O Download, control via PLC  
 E20-PR-S\* Control via Profibus

Relay Version  
 Optocoupler Version  
 Optocoupler Version

**Control unit for the connection of up to 4 sensors:**

E20-4P-B-R Control via PLC  
 E20-4P-B-O Control via PLC  
 E20-4P-C-O Download, Control via PLC  
 E20-4P-PR-S\* Control via Profibus

Relay Version  
 Optocoupler Version  
 Optocoupler Version

\*all common fieldbus technologies are available

**Sensors:**

P30GS Electromagnet up to 2.5 mm single sheet thickness (The sensor P30GS should only be used in case of confined space situations. The standard sensor should be P42AGS)  
 P42GS Electromagnet up to 4.0 mm single sheet thickness  
 P42AGS Electromagnet up to 4.0 mm single sheet thickness  
 P75VGS Electromagnet up to 6.5 mm single sheet thickness

**Sensor cable:**

**for P30GS and P42AGS:**

CPM12S-G Straight receptacle, standard length 5 m  
 CPM12S-W Right angle receptacle, standard length 5 m  
 SM12CPM12S-GG Fieldbus technology, straight receptacle  
 SM12CPM12S-GW Fieldbus technology, right angle receptacle

**for all other sensors:**

CPS-5-G Oil Straight receptacle, standard 5 m  
 CPS-5-W Oil Right angle receptacle, standard 5 m  
 SCPM12S-GG Fieldbus technology, straight receptacle  
 SCPM12S-GW Fieldbus technology, right angle recept.

Cable up to 25 m made to order, for longer cables enquire

**Special accessoires:**

SH42GS Spring loaded sensor bracket for P42GS and P42AGS  
 SHS42GS Spring loaded sensor bracket with vacuum cup for P42GS and P42AGS  
 SHK Clamping bracket  
 2395110 Rubber lips for vacuum suction cup  
 PWS E10 Program selection box, also for E20 suitable  
 RPP Software for parameter back up on a PC (Version C only)

**Sensor bracket:**

Spring loaded sensor bracket with vacuum cup SHS for sensor P42(A)GS (also available without vacuum cup as type SH...GS)

