ROLAND
sensor technology

DOUBLE SHEET DETECTION

A100 DOUBLE SHEET

DOUBLE SHEET DETECTION SYSTEM FOR FE

- Single probe permanent-magnetic sensors
- Ferrous material 0.04 - 4 mm (0.0015 - 0.16 in) thickness (single sheet)
- Easy set-up by key operation or via control input
- LCD display for visualization of nominal / current values, operational / error message, key allocation
- Compact enclosures
  - Control unit for DIN-rail mounting, protection class IP00
  - Control unit for machine frame mounting, in protective enclosure, protection class IP54

Made in Germany

A100 DOUBLE SHEET

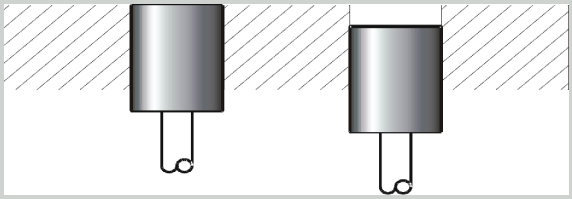
Application

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 single probe Double Sheet Detector A100 has been designed to prevent such events.

Function

The permanent magnetic sensors detect electronically magnetic flux changes caused by sheet interference. The magnetic flux changes are transformed into electrical signals by the sensors. These electrical signals are processed by the control unit and sent to the machine controls for use as a switch signal. The double sheet detector reacts to changes in the air gap between sensor and sheet surface in a similar way as to sheet thickness variations. Therefore the detector can be used to monitor the presence or absence of layers, the correct position of sandwich materials, bimetals or hidden parts. The sensor recognizes other sheets or metal parts beyond the first one. This permits applications in welding operations where e.g. the welding current is only released when the electrode holder contains the correct number of parts.

Sensor mounting



Flush and recessed mounting of sensors

Attention!
To control curved sheets it may be advantageous to use a sensor of the next bigger size in order to overcome an undesired air gap.
Opposite of the sensor, there must not be any ferromagnetic material closer than 1.5 times of the diameter of the sensor because it could distort the measurement.

The minimum measuring area should be equal to the sensor diameter.
The sensor cable should not be placed next to power cables because of potential noise interference.

The sensor can be installed in any position: horizontally or vertically.

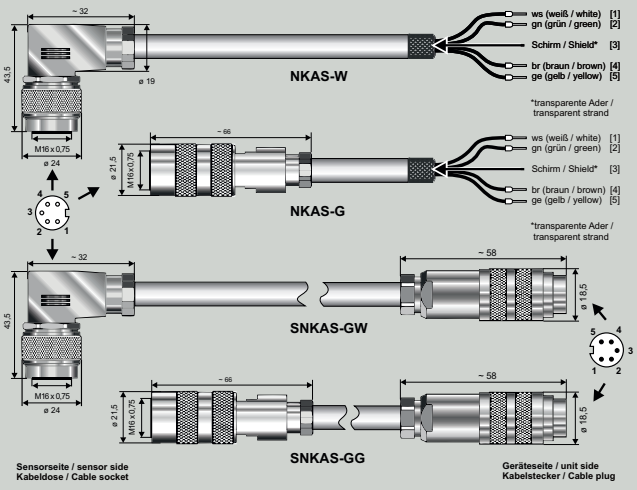
Reccomendations:

- Flush mounting is recommended because this will eliminate wear on the face as well as deposits of chips and shavings.
- Recessed mounting is possible. It is important, however, that none of the above mentioned deposits accumulate in the recessed area (fill recessed area with non-ferrous materials).
- A spring loaded movable mounting arrangement is advantageous for thick plates because the sensor can be properly positioned to buckled sheets and reduce the possibility of an uncontrollable air gap developing.

Magnetic attraction and air gap between sensor and 1st sheet

- The magnetic attraction is proportional to the thickness of the sheet.
- When lifting the sensor from the sheet, this force must be overcome by mechanical, hydraulic or pneumatic devices.
- The magnetic force can be reduced through an air gap between sensor and sheet surface (recessed mounting, use of a roller bracket).
- If sensors excerting no force are required, these are available in the product series R1000 E20.

Cable



Abbreviated Set-up

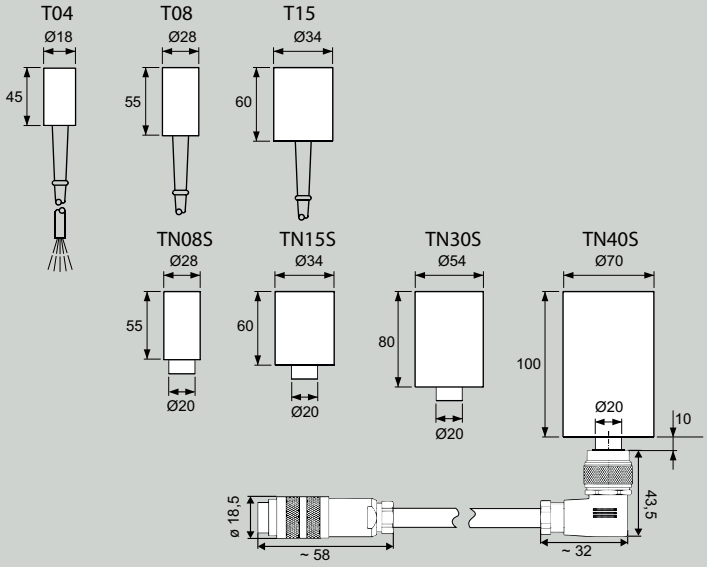
For detailed instructions refer to the Operating Manual

Teach-In instructions

1. Put a sheet with nominal thickness fully onto the sensor (see connection sketch).
2. Press the SETUP key and then the NEW key, a new Teach-In procedure will then be performed.
3. The green LED (1-sheet) lights up now, the measurin value is stored.
4. Functional check:
   If a second sheet is placed in front of the sensor (double sheet condition), the red LED (2-sheet) lights up. If both sheets are removed, the red LED (0-sheet) lights up.

SINGLE PROBE DOUBLE SHEET DETECTION SYSTEM FOR FE

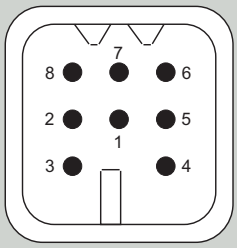
Sensors



T04	T08	T15		
Sensor with fixed cable (T...)				
	TN08S	TN15S	TN30S	TN40S
	Sensor with connecting socket (TN ...)			
Single Sheet Thickness, Min.:				
0.04 mm	0.08 mm	0.10 mm	0.20 mm	0.30 mm
Single Sheet Thickness, Max.:				
0.40 mm	0.80 mm	1.50 mm	3.00 mm	3.60 mm
Min. adhesive force at axial removal :				
1.5 kg	8 kg	15 kg	35 kg	55 kg
Diameter:				
Ø 18 mm	Ø 28 mm	Ø 34 mm	Ø 54 mm	Ø 70 mm
Length:				
45 mm	55 mm	60 mm	80 mm	100 mm
Sensor weight, approx ca.:				
0.15 kg	0.32 kg	0.38 kg	1.1 kg	2.3 kg
Ambient temperature: 0° - 50°C during operation				
Class of protection: IP65				

Supply plug

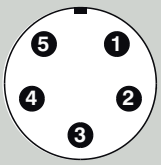
S0003515



1

Enclosure HAN 3A, EMI-Type, metrical 7-pin insert and PE	
Pin 1	+24VDC
Pin 2	GND
Pin 3	Teach-In
Pin 4	2-sheet
Pin 5	1-sheet
Pin 6	0-sheet
Pin 7	+24VDC from PLC
Pin 8	Earth ground

Sensor socket

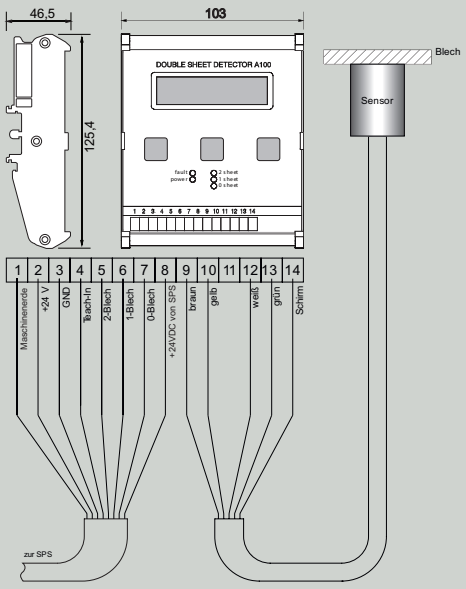


2

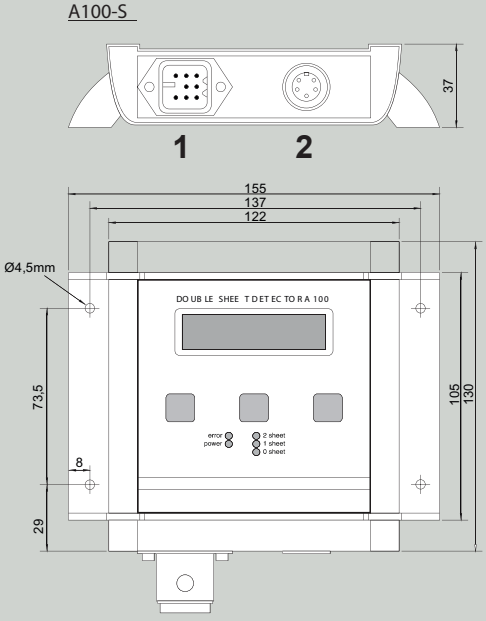
M12, 5-pin A-coded Female contacts at unit (flange socket)	
Pin 1	$+I_{hall}$
Pin 2	$-I_{hall}$
Pin 3	Shield
Pin 4	$+U_{hall}$
Pin 5	$-U_{hall}$

Dimensions

A100



A100-S



Technical Data

	A100	A100-S
Supply voltage	24 VDC (+6V / - 4V) / 110 mA	
Power consumption	approx. 2.7 W @ 24V	
Fuse	375 mA / slow-blow / size 5 x 20 mm	
Power / Switching indication	5 LEDs	
Display	LCD display, 16 characters each	
Ambient temperature	0° - 50°C (32° - 122°F) during operation	
Switching outputs 0-1-2 - Sheet	Opto coupler outputs, output sourcing (PNP)	
Temperature drift of switching point	± 0,02% / °C	
Switching capacity / Measurement period	max. 30 V, max 10 mA / The minimum dwell time of the sheet on the sensor is 15 ms	
Enclosure	For DIN-rail mounting (EN50022, BS5584)	Aluminum enclosure for machine frame mounting
Class of protection	IP00	IP54
Weight	approx. 0.2 kg	approx. 0.6 kg
Connections	Terminal Block	Plug connection
Dimensions (H x W x D)	125.4 x 103 x 46.5	130 x 155 x 37mm

Order Information

Control unit	
Part no.	Description
A100	Control unit, for single probe sensors, operating voltage 24VDC, for DIN-rail mounting (EN50022, BS5584), protection class IP00
A100-S	Control unit, for single probe sensors, operating voltage 24VDC 24 V DC, or machine frame mounting

Sensors			
Part no.	Description	Part no.	Description
T04	Sensors with fixed cable for terminal wiring, standard cable length is 2 m, lengths up to 20 meters upon order.	**TN08S**	Sensors with terminal socket for connecting the sensor cable. Order cable **NKAS-xx** or **SNKAS-xx** separately.
T08		**TN15S**	
T15		**TN30S**	
		TN40S	
		TN50S	

Cable* (for pluggable sensors)			
Part no.	Description	Part no.	Description
NKAS-W	Sensor cables, for connecting the **TNxxS** sensors, one end with cable socket, the other end with open wire ends for terminal connection at the control unit A100.	**SNKAS-GW**	Sensor cables, for connecting the **TNxxS** sensors to the A100-S.
NKAS-G		**SNKAS-GG**	
*** Standard length of cables is 2m, length up to 20m upon order.**			

Accessories (for A100-S)	
Part no.	Description
S0003515	Supply plug set, complete
S0003516	Plug for T-Sensors

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