



## UDK20 DOUBLE SHEET

SINGLE SIDE SYSTEM, CONTACTING

- Direct connection of up to 2 sensors to a unit possible (version 2 PW), via Sensor Switch Box up to 4 sensors
- Programmable for 255 different sheet thicknesses and materials
- Monitoring of over-gauge and under-gauge limits
- Monitoring of operating voltage and sensor
- Opto-coupled 3-bit PLC input interface, 5-bit PLC output interface
- Integrated fieldbus interface with process and parameter interface
  - PROFIBUS DP
  - ControlNet
  - DeviceNet
  - CANopen
  - INTERBUS
  - PROFINET IO
  - CC-Link
  - EtherNet/IP
  - EtherCAT



# UDK20 DOUBLE SHEET

## Description



In the stamping plants of the automotive industry, steel is in an increasing number of cases substituted by aluminum and other nonferrous materials. When loading blanks automatically into presses care must be taken to avoid feeding double blanks into the dies. Otherwise machines or dies may be damaged resulting in expensive repairs and loss of production. The Double Sheet Detector UDK 20 can reliably prevent such double sheet conditions by monitoring steel and aluminum blanks with only one sensor.

Either one or two sensors of the PW42AGS type can be directly connected to the UDK20, or up to four sensors can be connected via the Sensor Switch Box SSBUDK10. The sensors can be addressed either sequentially by the PLC or the new sequencer switching method (applies only to the two directly connected sensors). The sequencer function eliminates the time-consuming switching of the measuring channel or the program by the PLC. Double sheet detection of steel sheets with 1 mm thickness, 120 % double sheet threshold and two PW42AGS sensors requires in the sequencer mode only 115 milliseconds. In contrast, the same measurement with program switching by the PLC requires more than 370 ms.

## Function

The Double Sheet Detector UDK20 combines the electromagnetic and eddy current measurement principles. It monitors the sheet thickness from one side only and in the case of steel does exert forces only during measurement. A change of the sheet thickness causes a change of the inductance. The control unit calculates the sheet thickness resulting from this change. Based on the predetermined thresholds 0-sheet, 1-sheet, or 2-sheets of output signals are generated.

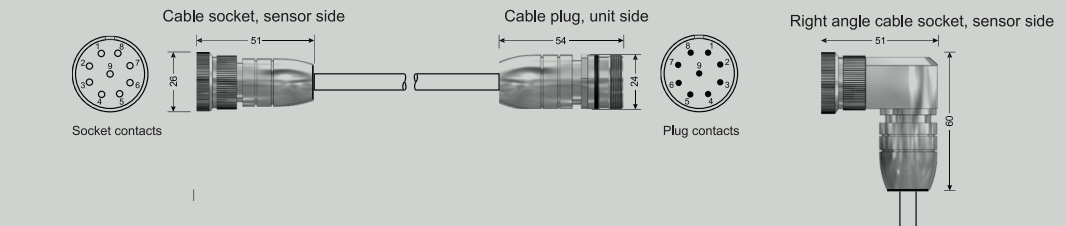
The control unit UDK20 is available in the versions to B, C and fieldbus with with varying capabilities (see technical data). All control units are available with 255 parameter sets (thicknesses). The versions and their performance features are described in the equipment designation. Standard control units have a 24 V - parallel interface for the selection of the 255 parameter sets. In case of fieldbus control units the selection is done via the fieldbus.

Standard version:	Fieldbus version:
 <p>Program-number: 1-1 Sensor-number: 0.50 Nominal thickness: -EIN Status measurement: 80% &lt; S2 = 0.51 &gt; 120%</p> <p>Lower threshold, Actual measurement, Upper threshold</p>	 <p>Program-number: 1-1 Sensor-number: 0.80 Type of material: FE=1.00mm Nominal thickness: &lt; 1.0 2 &gt; Status measurement: -ON Fieldbus status: Profibus ONLINE / Closed Bus type: DP Actual measurement: 1 Upper threshold: 1.20 Bus-address: 1</p> <p>Lower threshold, Fieldbus status, Bus type, Actual measurement, Upper threshold, Bus-address</p>
<h3>UDK20-xx-x-x-S-xx</h3> <p>Number of sensors: -- : 1 sensor / SSB up to 4 sensors 2PW : up to 2 sensors Version: B : Standard C : Data backup via RS232 Outputs: O : Optocoupler R : Relais Enclosure: -- : Wall mount FP : Panel mount</p> <p>Example UDK20-C-O: for one sensor, data backup / remote control via RS232 with optocoupler signal output</p>	<h3>UDK20-xx-xx-S-xx</h3> <p>Number of sensors: -- : 1 sensor / SSB up to 4 sensors 2PW : up to 2 sensors Fieldbus: PR : Profibus xx : all commo : fieldbusses Enclosure: -- : Wall mount FP : Panel mount</p> <p>Example UDK20-2PW-PR-S : for up to 2 sensors, data backup / remote control via fieldbus. These systems always have signal outputs with optocoupler and are completely equipped with connectors</p>

## Dimensions:

UDK20 [WxHxD]	UDK20-2PW [WxHxD]	UDK20-2PW-PR-S [WxHxD]
205x140x80 mm (8.07x5.51x3.15 in)	205x140x80 (8.07x5.51x3.15 in)	225x240x80 (8.85x9.44x3.15 in)

## Sensor cable SCPWS-GG:



Cable socket, sensor side: 51mm length, 25mm diameter, Socket contacts

Cable plug, unit side: 54mm length, 24mm diameter, Plug contacts

Right angle cable socket, sensor side: 51mm length, 80mm height

1	grey
2	pink
3	red
4	black / violet
5	blue
6	brown 1 mm <sup>2</sup>
7	brown
8	white 1 mm <sup>2</sup>
9	green
Enclosure	blank (Shield)

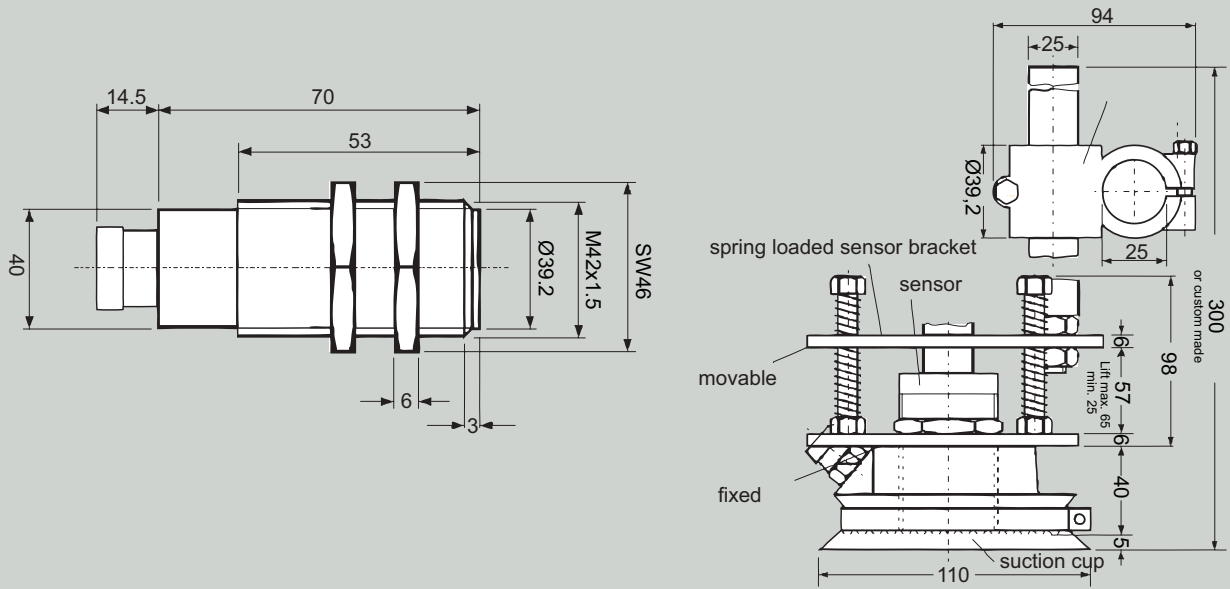
# SINGLE SIDE SYSTEM, CONTACTING

## Sensors:

Only the sensor PW42AGS is suitable for connection to the control unit UDK20. The connection of the older PW42GS sensors is only possible to the older unit UDK10.

## Spring loaded sensor bracket:

Spring loaded sensor bracket with vacuum cup SHS for sensor PW42AGS (also available without vacuum cup as type SH...GS).



## Measurement performance:

**Ferrous materials (steel):** 0.1 mm (.004 in.) to 4.0 mm (.160 in.) single sheet thickness

**Non-ferrous materials:** Bronze, zinc, aluminum (conductivity 1.3 - 38 millisiemens) up to 4 mm (.160 in.) single sheet thickness; copper alloy up to 3.5 mm (.137 in.); copper up to 3 mm (.12 in.), non-magnetic stainless steel (austenite) up to 2 mm (.08 in.)

## Measurement time:

**Ferrous materials (steel):** In case of a maximum sheet thickness of 4 mm (.160 in.), 120 % double sheet threshold and one PW42AGS sensor, the detection time required is 80 milliseconds; a maximum of 160 milliseconds in the sequencer mode with two sensors (UDK20-2PW).

**Non-ferrous materials:** With one sensor or two sensors in the sequencer mode (system 2PW) constant 85 ms.

## Air gap behaviour:

**Ferrous materials (steel):** The new Double Sheet Detector UDK20 has a much improved air gap tolerance especially in conjunction with the new sensor PW42AGS. 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).

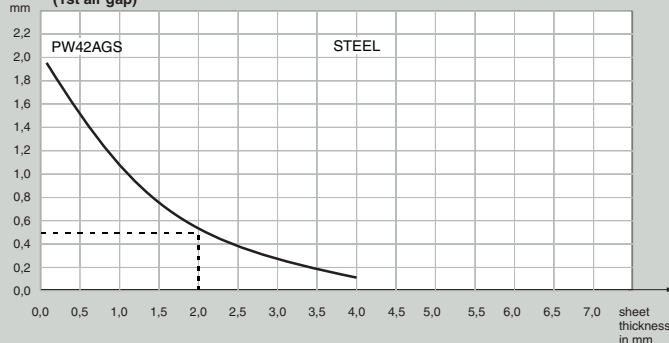
The diagrams show the relationship.

*Example for 1st air gap with sensor PW42AGS: 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 %.*

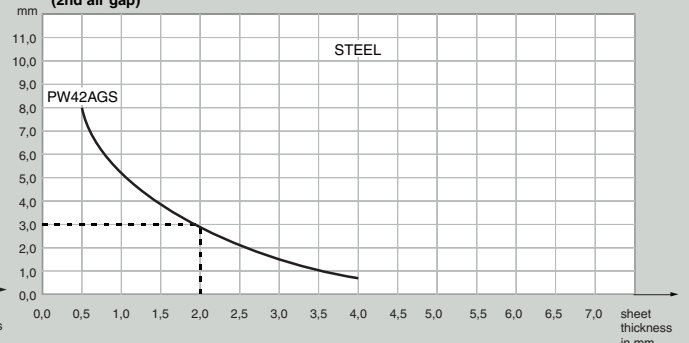
*Example for 2nd air gap and sensor PW42AGS with 2.0 mm (.08 in.) sheet thickness and a double sheet threshold of 120 %; an air gap of up to 3.0 mm (.12 in.) can be tolerated.*

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

▲ max. air gap between sensor and first sheet (1st air gap)



▲ max. air gap between first and second sheet (2nd air gap)



**Non-ferrous materials:** The air gap behavior is similar to ferrous material (steel).



# Technical Data

UDK20		
Operating voltage:	24 V DC +6 V / -2V	
Power consumption:	60 W (Operation: <60 W, in idle: <10 W)	
Protection category:	IP 65	
Ambient temperature:	0°C - 50° C	
Weight:	approx. 1,5 kg	
Signal inputs:	galvanically isolated 24 V DC with joint common	
	<b>Version B-R:</b>	<b>Version B-O, C-O and Fieldbus:</b>
Switching outputs:	Dry relay opening contacts	galvanically isolated with optocoupler
Max. switching voltage:	250 V AC	50 V AC
Max. switching current:	1 A	0.15 A
Max. switching power:	240 W / 200 V A	100 mW

# Order Information

UDK20 Fieldbus version		Wall mount enclosure		Front panel mount enclosure (FP)	
Part no.	Description	Part no.	Description	Part no.	Description
<b>UDK20-XX-S</b>	1 Sensor, (S) = Connectors pluggable	<b>UDK20-XX-S-FP</b>	1 Sensor (S) = Connectors pluggable		
<b>UDK20-2PW-XX-S</b>	2 Sensors (S) = Connectors pluggable	<b>UDK20-2PW-XX-S-FP</b>	2 Sensors (S) = Connectors pluggable		
XX: DN=DeviceNet (B-Coding), DNT=DeviceNet (A-Coding), COP=CANopen (A-Coding), CP=CANopen (B-Coding), CC=CC-Link, IN= INTERBUS, PR=PROFIBUS DP, PN=PROFINET IO, EN=EtherNet/IP, ET=EtherCAT					
UDK20 IO version		Wall mount enclosure		Front panel mount enclosure (FP)	
Part no.	Description	Part no.	Description	Part no.	Description
<b>UDK20-B-O-S</b>	1 Sensor, (O) = Outputs opto coupler; (R) =Outputs Relais; (B*); (C**)	<b>UDK20-B-O-S-FP</b>	1 Sensor, (O) = Outputs opto coupler; (R) =Outputs Relais; (B*); (C**)		
<b>UDK20-B-R-S</b>		<b>UDK20-B-R-S-FP</b>			
<b>UDK20-C-R-S</b>		<b>UDK20-C-R-S-FP</b>			
<b>UDK20-C-O-S</b>		<b>UDK20-C-O-S-FP</b>			
<b>UDK20-2PW-B-O-S</b>	2 Sensors, (O) = Outputs opto coupler; (R) =Outputs Relais; (B*); (C**)	<b>UDK20-2PW-B-O-S-FP</b>	2 Sensors, (O) = Outputs opto coupler; (R) =Outputs Relais; (B*); (C**)		
<b>UDK20-2PW-B-R-S</b>		<b>UDK20-2PW-B-R-S-FP</b>			
<b>UDK20-2PW-C-R-S</b>		<b>UDK20-2PW-C-R-S-FP</b>			
<b>UDK20-2PW-C-O-S</b>		<b>UDK20-2PW-C-O-S-FP</b>			
*Version B: Memory for 255 parameter sets (Nominal thickness and upper and lower limits). Set up and addressing by push buttons or via 9 resp. 11 opto coupled data inputs 24 VDC with joint common. ** Version C: Same as Version B but in addition: 1 opto coupled RS232 interface for bi-directional data communication with a PLC or PC.					
Sensor					
Part no.	Description				
<b>PW42AGS</b>	Electromagnet with integrated eddy current probe up to 4.0 mm (.160 in.) single sheet thickness with ferrous and non-ferrous materials and reduced thickness for copper, copper alloys and stainless steel (austenite)				
Cable					
Part no.	Description				
<b>SCPWS-GG*</b>	Straight receptacle, standard length 5 m				
<b>SCPWS-GW*</b>	Right angle receptacle, standard length 5 m				
<b>SVCPWS-SSBUDK10**</b>	Sensor cable for connection via Sensor Switch Box SSBUDK10				
* Cables up to 50 m, for longer cables enquire; ** Cables up to 25 m made to order, for longer cables enquire					
Accessoires					
Part no.	Description	Part no.	Description	Part no.	Description
<b>SSBUDK10</b>	Sensor Switch Box for the connection of up to 2 sensors	<b>SHK</b>	Clamping bracket		
<b>SH42GS</b>	Spring loaded sensor bracket for PW42AGS	<b>2395110</b>	Rubber lips for vacuum suction cup		
<b>SHS42GS</b>	Spring loaded sensor bracket with vacuum cup for PW42AGS	<b>PWSE10</b>	Program selection box, also suitable for UDK20		
<b>SHS42G-FB</b>	Spring loaded sensor bracket with bellow vacuum cup for PW42AGS	<b>RPP1000</b>	Software for parameter backup on a PC (Version C only)		

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