



Characteristics

Self-contained Double Sheet Metal Sensor for single surface contact measurement of ferromagnetic sheets transmitting switching signals to its outputs depending on the number of detected sheets (0, 1, 2).

The Teach-In mode allows the storage of a measured sheet metal thickness as reference value by applying an external *Teach-In* signal.

When measuring, the *1-sheet* output indicates the detection of one single sheet metal and the *2-sheets* output the detection of two sheets.

Application

The self-contained BDK Uno Double Sheet Metal Sensor is used to easily check feeds of ferrous sheet metals and prevent double sheets from entering tools.

Configuration

The Double Sheet Metal Sensor BDK Uno consists of a sensor for sheet detection and an evaluation unit for the conversion of the detected sheet number into output logic signals.

It is fitted with an 8-pole M12 connector for the power supply, the controlling signals, and the digital outputs.

Installation instructions

The sensor can be installed in the suction cup of the gripper or in a monitoring station. For measurement, the sheet metal has to cover completely the sensing face.

Mode of operation

The Double Sheet Metal Sensor BDK Uno for single surface contact measurement is used for double sheet monitoring with thicknesses of 0.15 to 0.5 mm.

During measurement, a field coil generates a magnetic field. The resulting force draws the sheet briefly towards the coil. The flux density in the magnetic circuit is measured and evaluated by a micro-controller.

Measurement can be *started* by an external *signal*.

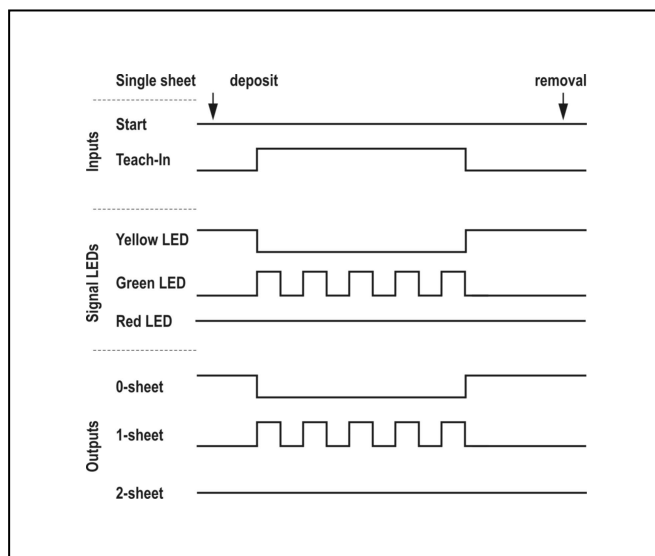
The measurement value for one sheet as reference value is determined via an external *Teach-In* signal. The Double Sheet Metal Sensor uses this value to determine the threshold for the double sheet message.

Teach-In

Calibration is initiated by the high active control input *Teach-In*. The system is calibrated for sheet thickness. For calibration, the respective sheet has to be placed on the sensing face of the sensor and must cover the sensing face completely.

The measured sheet thickness is stored in a non-volatile memory (EEPROM) so that it is available even after a power failure.

To start calibration, the control input *Teach-In* must be set for approx. 2 seconds to *High* (high level signal) while *Start* is *Low* (low level signal). The green LED blinks and output "1 sheet" switches. The yellow LED blinks after calibration and output "0 sheet" is set to *High*.



Timing diagram: Teach-In

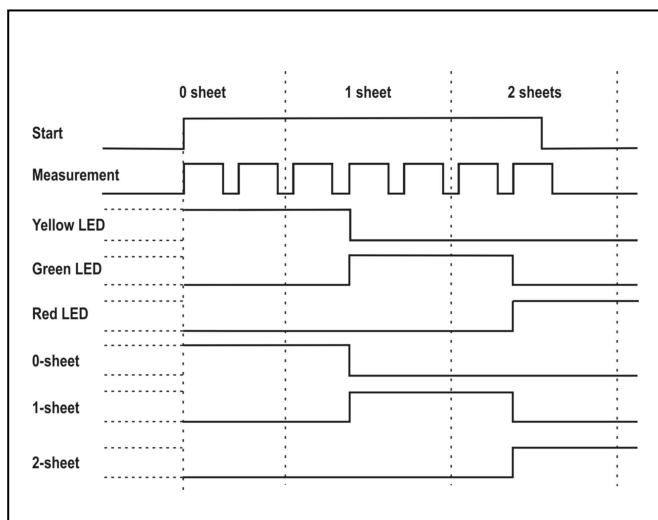
Outputs

After every measurement the current result (0-, 1-, or 2-sheet(s)) is available at three semi-conductor outputs for further processing in a Programmable Logic Controller (PLC). There are three LEDs for visual monitoring. The diagram below shows the time sequences of a measurement.

Message outputs			
Sheets	0-sheet message	1-sheet message	2-sheet message
0	1	0	0
1	0	1	0
2	0	0	1

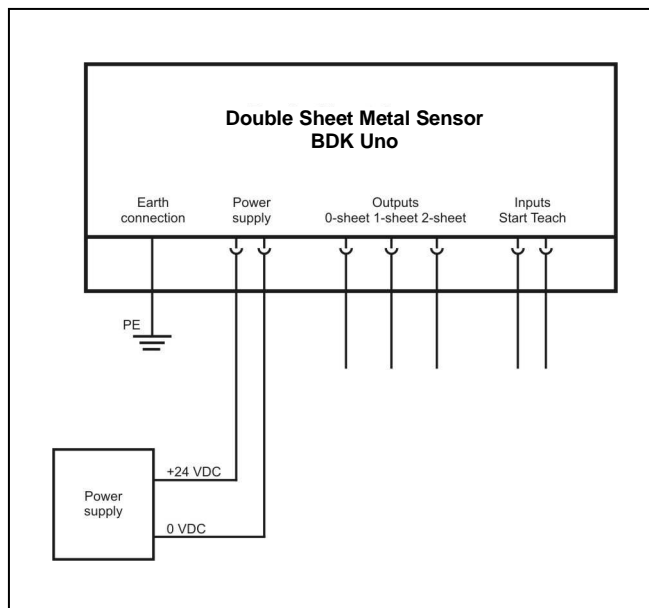
LED			
Sheets	yellow LED	green LED	red LED
0	on	off	off
1	off	on	off
2	off	off	on

Measurement is initiated by the control input *Start*. As long as this is set to *Low*, the sensor is on standby. Measurement is possible as long as the sheet is within the measuring range. For a continuous measurement the control input has to be set to *High*.

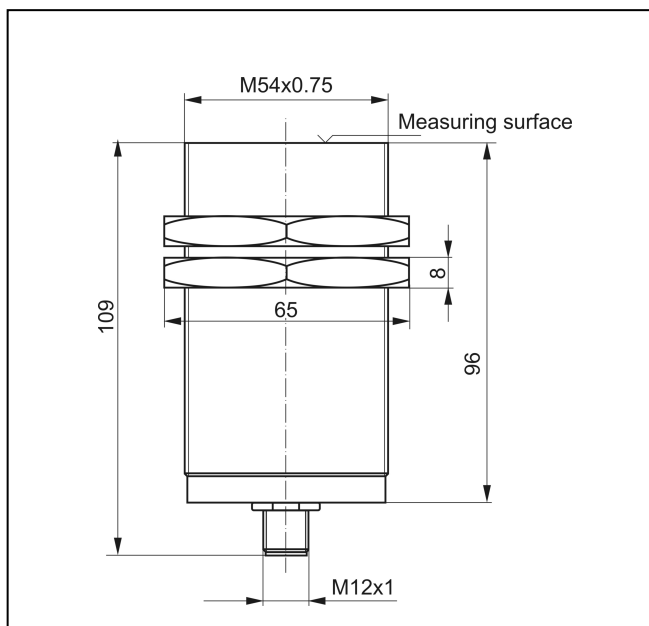


Timing diagram: Measuring procedure

Wiring diagram



Dimensions



Technical data

Self-contained Double Sheet Metal Sensor BDK Uno for ferromagnetic metals

Single surface measurement

BFD/L-54sg-1s Ref. no. **13.35-01**

Measuring range (permitted sheet thickness)	0.15...0.5 mm
Measurement method	Measurement of the magnetic flux density
Operating voltage U_B	18 ... 24 ... 30 V DC
Power consumption	max. 0.25 A
Operating temperature	0 ... + 55 °C
Inputs	
Start signal	Hi = 18 ... 24 ... 30 V DC Lo = 0 ... 5 V DC
Input current	approx. 5 mA (for 24 V DC)
Teach-In	Hi = 18 ... 24 ... 30 V DC Lo = 0 ... 5 V DC
Input current	approx. 5 mA (for 24 V DC)
Output	
Switching outputs	Semiconductor output, plus-switching, short-circuit proof
Output voltage	$U_B - 1.75$ V
Output current	max. 100 mA
Measuring time	< 10 ms
Repeat time	50 ms
Diameter	54 mm
Total length	109 mm
Weight	approx. 1200 g

Connection leads

All connection leads are resistant to oil and suitable for drag chains. When ordering, please indicate the lead length X (standard value X = 5 m).

VLG8E/8S/5-1 **5 m** Ref. no. 20.18-92-050
Connection lead of 5 m for BDK Uno, BDK Duo straight, shielded

VLG8E/8S/10-1 **10 m** Ref. no. 20.18-92-100
Connection lead of 10 m for BDK Uno, BDK Duo straight, shielded

VLG8E/8S/20-1 **20 m** Ref. no. 20.18-92-200
Connection lead of 20 m for BDK Uno, BDK Duo straight, shielded

By using unshielded leads, interference signals may be generated.

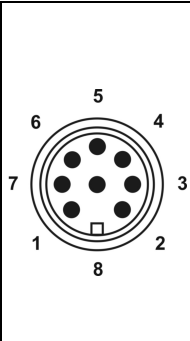
Maximum lead length is 20 m (for lead diameter 0.25 mm²).

We are certified according to DIN EN ISO 9001.

Subject to changes!

Pin assignment

Pin no.	Colour	Function
1	white	+24 V DC
2	brown	M
3	green	0-sheet message
4	yellow	1-sheet message
5	grey	2-sheet message
6	pink	Start signal
7	blue	Teach-In signal
8	-	-



The housing must be earthed with the available earth connection.

*) The colours refer to the connection leads we recommend.