Installation Manual

US01B.M8 / US04B.M8

Ultrasonic sensor for web guiding systems

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Diese Bedienungsanleitung ist auch in Deutsch erhältlich.
Bitte kontaktieren Sie Ihre nächstgelegene FMS Vertretung.

1 Table of contents

2 Safety instructions

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to the equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not stress the equipment over the specification limits neither during assembly nor operation. To do so can be potentially harmful to persons or equipment in the event of a fault to the equipment.

2.1 Presentation of safety information

The following safety symbols appear in this manual.

2.1.1 Danger that could result in minor or moderate injuries

Danger, warning, caution

Failure to follow wiring instructions in this manual may result in equipment damage or personal injury.

2.1.2 Note regarding proper function

Note

Note regarding roper operation
Simplification of operation
Ensuring function

2.2 General safety information

The Material Sensors may not be stressed over the specification limits neither during assembly nor operation.

The attachment points for the Sensors on the machine frame must be properly designed. The used mounting screws must be of the right size.

3 Product information

3.1 System description

The ultrasonic sensors can detect a very wide range of web materials including transparent films. The sensors are not suitable for sound permeable materials (e.g. net-like or open weave textiles). They are factory set and don't need any adjustments or calibration. The main advantage of these sensors is the save detection of transparent films of all sizes. The sensor is almost insensitive to changes of material planarity or dust thanks to an optimized sensor and micro-processor controlled ultra-sound transmission.

3.2 Dimensions

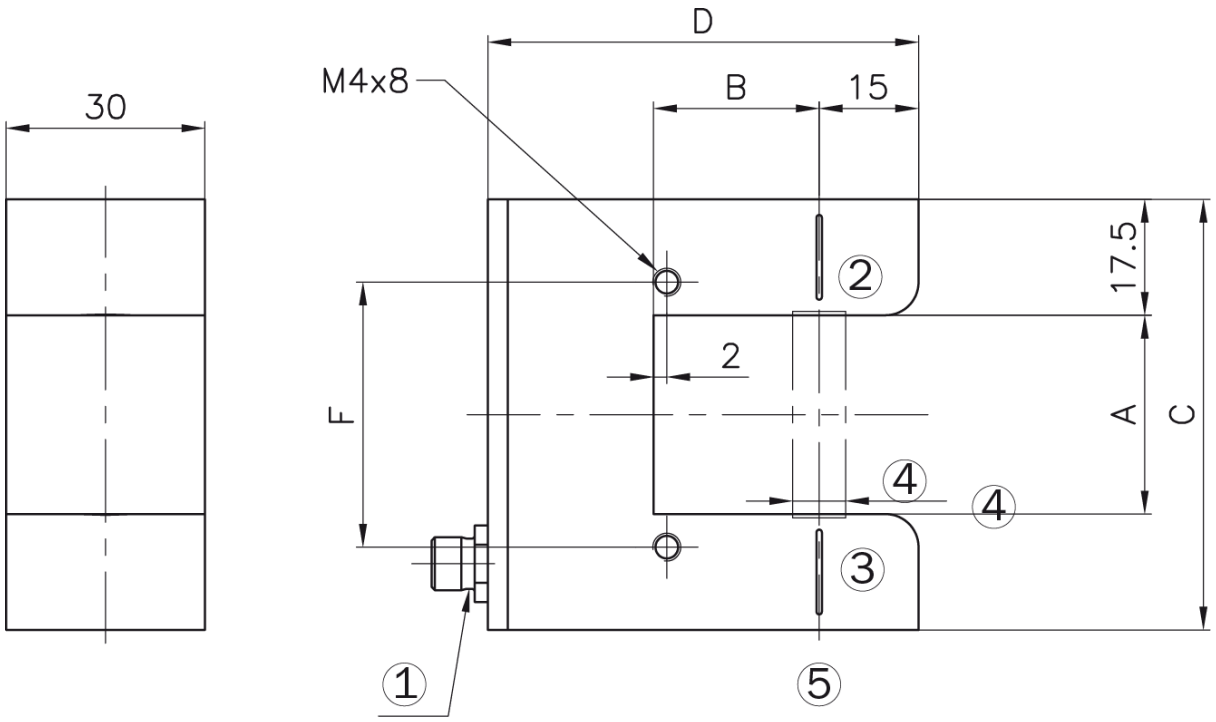


Figure 1: Dimensions US01_04B.ai

Dimensions mm (in.)		
	US01B.M8	US04B.M8
(A) Fork width	30 (1.18)	90 (3.54)
(B) Fork depth	25 (0.89)	80 (3.15)
(C) Sensor hight	65 (2.56)	125 (4.92)
(D) Sensor length	65 (2.56)	120 (4.92)
(F) Bore distance	40 (1.57)	100 (4.92)
(4) Detection range	8 (0.31)	8 (0.31)

Table 1: Dimensions

Terms	
Position	Description
1	LED in plug
2	Marking of center of sensor detection area
3	Marking of center of sensor detection area
5	Side of the ultrasonic transmitter

Table 2: Terms

3.3 Scope of delivery

3.3.1 Included

material sensor, installation manual

3.3.2 Not included

screws, washers, mounting bracket, cable

4 Installation

4.1 Preparation

The sensors are defined as “partly completed machinery” according to the Directives 2006/42/EC, article 2. In order to assure a proper functionality of the parts and guarantee the essential health and safety requirements of operators working with it, the following conditions for the assembly must be met:

4.2 General safety information

The Material Sensors may not be stressed over the specification limits neither during assembly nor operation.

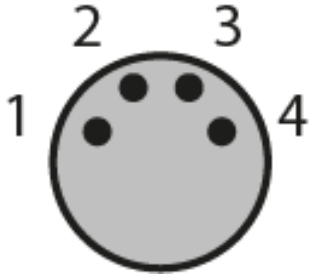
The attachment points for the Sensors on the machine frame must be properly designed. The used mounting screws must be of the right size.

For correct installation and operation, follow the electrical wiring diagram and instructions in this manual.

4.3 Electrical connections

The sensor will be mounted with two M4 screws to a bracket. The bracket itself is fixed to the location rail or to the flange of the steering frame or linear actuator. The bracket varies depending on system configuration (steering frame size, manual or motorized sensor adjustment, etc.). It is not part of supply and must be ordered separately.

If the sensor is used with an integrated web guide controller within an FMS steering frame FMS-webMASTER, the sensor is connected with a cable 4x0.14mm² of the respective length.



Pin	DE	EN	IEC 60757
1	24 VDC	24 VDC	BN
2	Signal	Signal	WH
3	nicht verbunden	not connected	BK o. YE
4	GND	GND	BU o. GN

Figure 2: Pin assignment *Pin_Assignment_Sensorkabel_Farben_Stecker.ai*

5 Operation

5.1 Denomination of the sensor position

Left and right are always seen in direction of the running web.

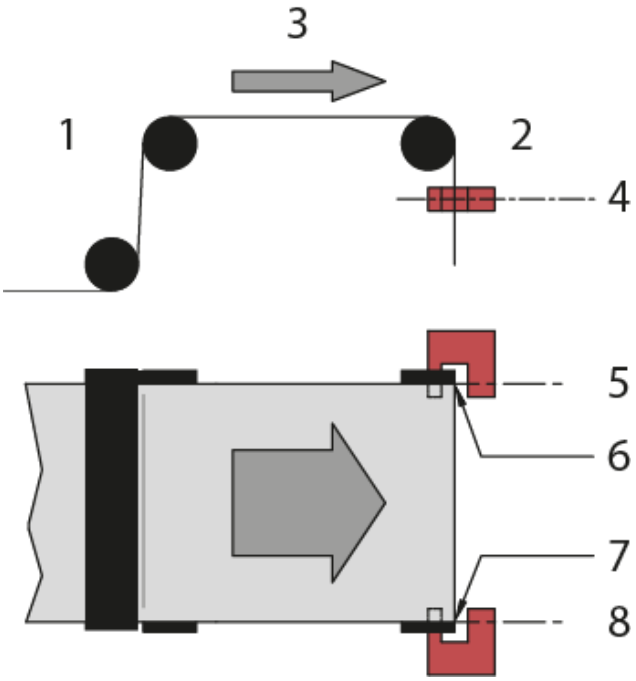


Figure 3: Terms on steering frames *BKS_309.ai*

Terms	
Position	Description
1	Entry side
2	Exit side
3	Rolling direction
4	Sensor axis
5	Sensor axis left
6	Web edge left
7	Sensor axis right
8	Web edge right

Table 3: terms sensor position

5.2 Alignment of the sensor

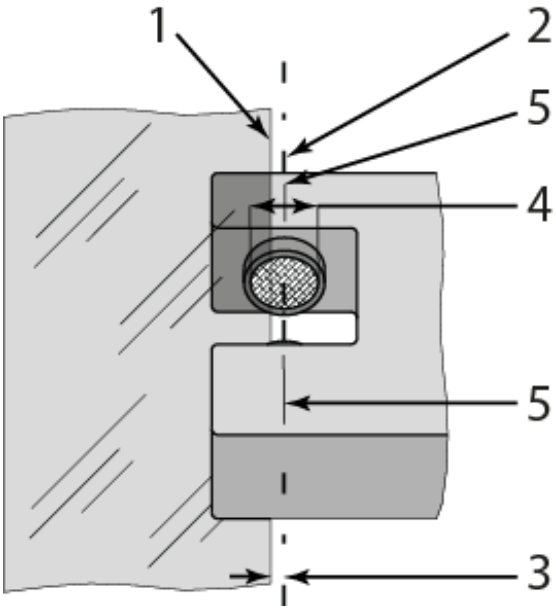


Figure 4: alignment of the sensor

Terms sensor alignment	
Position	Description
1	Web edge
2	Sensor axis
3	Deviation of web edge to sensor axis
4	Detection range of the sensor
5	Marking for mid of detection area

Table 4: Sensor alignment

- Loosen the fixing nut on the bracket and adjust the sensor.
- The positioning marks provide a quick and precise alignment of the sensor to the reference edge.
- Fix the sensor in the new position.
- The sensor will be properly positioned, if the web edge goes through the sensor axis covering half of the ultrasonic transmitter or receiver (ref. to Fig. 4).

6 Trouble shooting

Causes and possible solutions for errors		
Description of error	Cause	Corrective action
Limited control range	Edge has moved outside the sensor detection range	Adjust sensor more accurately to the center of the measuring range.
Occasional control dropouts	Ultrasonic transmitter or receiver side is dirty	Clean sensor with wet cloth
BKS guides web edge immediately out of the sensor detection area	Sensor is installed on the wrong side	Install sensor on the correct side (right sensor for „Edge right“, etc.
	Sensor is connected to the wrong socket	Connect sensor plug to the correct socket (left plug to left socket, etc.)
Steering frame does not move at all	No signal; sensor not connected correctly	Connect sensor correctly according to screw terminal arrangement, follow the installation manual of web guide controller
	No signal; cable interruption	Replace cable or send sensor to FMS
	No signal; sensor defect	Send sensor to FMS; use other sensor
	No power supply	Check 24VDC supply
	Sensor signal is 0V. The sensor is fully covered	Adjust sensor more accurately to the web edge; center measuring range
	Sensor signal is 10V. The sensor is uncovered	Adjust sensor more accurately to the web edge; center measuring range

Table 5: errors and solutions

7 Technical data

Technical data	
Parameter	US01B.M8 / US04B.M8
Detection range	8 mm [0.31”]
Resolution	0.2 mm [0.007”]
Measuring rate	2 ms
Output signal	0 to 10 VDC 0V if detection area is fully covered 10V if detectionaria is not covered at all 5V if material edge is centered in the detection area, LED is active
Power supply	24 VDC (18 to 30 VDC)
Connecting cable	M8 connector 4-pole
Temperature range	0 to 60°C [32 to 140°F]
Protection class	IP 67

Table 6: technical data

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