

# MBA100 Diaphragm Switch

## User Manual





## 1. Safety instructions

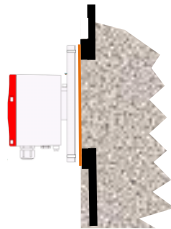
### Use in potentially explosive atmospheres

The type MBA100 level indicator can only be used in potentially explosive atmospheres if the individual equipment specification permits this.

- Check device by means of type plate and accompanying papers with regard to approvals (ATEX / IECEx).
- Avoid sparking through striking of metal parts.
- Install with equipotential bonding.
- Carry out the installation per standard EN 60079-14
- Observe the stipulations of the approvals.
- Observe the stipulations of the EC type test certificate.
- In the event of any doubts regarding the suitability of the device for a particular application: Contact the manufacturer!
- The temperature at the wire branching point can be up to 80°C. Only harmonised cable may be used
- The marking of a ATEX certified MBA100:  
In zone 20/21: II 1/2D Ex t IIIC T\* Da IP65  
(T\* see technical data - temperatures )
- Only perform the electrical installation in a suitable terminal housing

II 1/2D Ex t IIIC T\* Da/Db IP65

ATEX zone 21  
or zone 22



ATEX zone 20



### Electrical connection

#### WARNING: Open contacts inside the device

The electrical contacts inside the device are not protected against accidental contact. Switch off any signal voltage that may be connected externally before opening the head of the device.

- Have the device installed and commissioned only by specialists
- The connection diagram is located inside the cover.
- Only use connecting cable that is suitable for the cable inlets.
- The device head and the cable inlets must be closed during operation.



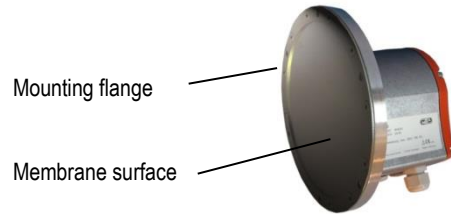
### Responsibility of the operator

- Only use the device in such a way as described in these operating instructions. The manufacturer accepts no responsibility and provides no warranty for any other use.
- All local laws, technical regulations and company-internal operating instructions that apply in the locale where the device is used, are to be observed in addition to these operating instructions.
- Do not remove, insert or alter any components in or on the device insofar as this is not described and specified in official information from the manufacturer.
- In potentially explosive areas: Observe European standard EN 60079-14 before installation or operation.
- Observe the specifications regarding voltage and temperature on the type plate.

## 2. Functional principle

Membrane switches are employed as limit switches for all types of bulk solids. The device is only to be used for fixed installation in industrial systems (large-scale tools). Primarily these would be employed as simple detectors on conveyor belts, transfer stations, downpipes and anywhere that a measurement device cannot project into the container.

The product rising in the container presses against the membrane and with the help of a transfer mechanism a microswitch is actuated. The MBA100 works in a purely mechanical manner and requires no auxiliary power.



Mounting flange

Membrane surface

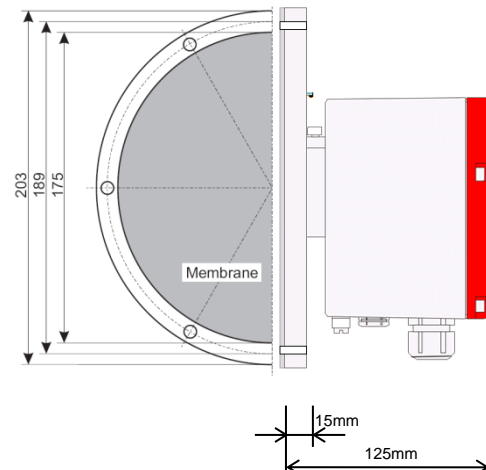
## 3. Dimensions

Hole circle: 189 mm

Bolt holes: 6

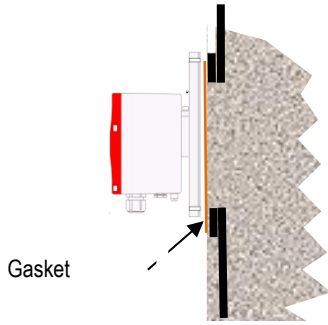
Hole diameter: 7 mm

Membrane diameter: 175 mm

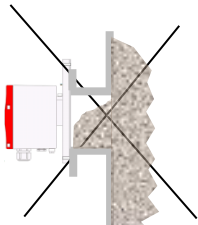


## 4. Installation

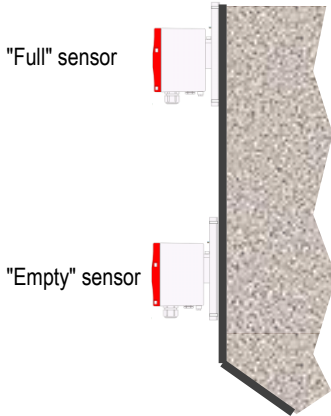
The MBA100 is installed on a silo mounting flange. In doing so the membrane should be connected as flush as possible with the inner wall of the silo. The flange surfaces of the MBA100 and the container flange are sealed with the accompanying flat gasket. The fastening of the flange is implemented with 6 bolts with a diameter of 6mm. When mounting onto a coupling adaptor care must be taken to ensure that the pressing force of the bulk solids on the membrane is sufficient to guarantee the MBA100 switching reliably. The maximum length of an adaptor depends on the properties of the bulk solids. It is essential that no cavities occur in the adaptor when filling. The membrane requires a pressing force of approx. 6 g/cm<sup>2</sup> to switch.



Gasket



Avoid cavities forming in the adaptor!

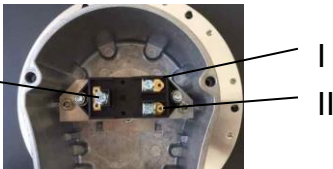


## 5. Electrical connection

The MBA 100 is a purely mechanical switch. Operation occurs without any kind of electrical power supply. A changeover relay is actuated via the membrane and this can switch an electrical signal.

The max. switching power of the relay is

- outside explosive zones: 250 V 16 A
- inside explosive zone: 250V V 10 A



Electrical contacts with unloaded membrane:



A cable with a round cross section and a diameter of 6 to 12 mm must be used for the electrical connection.

After the connection of the electrics:

1. Tighten up cable fitting: 2.7 Nm
2. Place cover on and tighten cover screws: 3.5 Nm

## 6. Adjusting the switching point (e.g. after a repair)

The switching point of the MBA100 is already ideally set when delivered and does not have to be readjusted. The adjustment of the switching point should be first carried out when the MBA100 no longer switches in a satisfactory manner e.g. if a new switch is installed during a repair.

The switching point can be readjusted with an adjusting screw in the head of the device. The switching process must be observed at all times when turning the adjusting screw. An appropriate measurement instrument (continuity tester) can be connected to the "P" and "I" terminals to assist with this. Calibration is carried out thus:

1. Load the membrane with approx. 1.5 kg
2. Turn the adjusting screw counter-clockwise until the (P-II) contacts open.
3. Turn the adjusting screw clockwise until the (P-II) contacts close.
4. Turn the adjusting screw approx. half a turn further in the clockwise direction.



Adjusting screw for calibrating switching point

## 7. Technical data

### Bulk solids

Free-flowing bulk solids

### Sensitivity

On: 950 g (6 g/cm<sup>2</sup>)

Off: (switching hysteresis): 350 g (2 g/cm<sup>2</sup>)

Option for heavy bulk solids:

On: 4600 g (30g/cm<sup>3</sup>)

Off: (switching hysteresis): 2800 g (16 g/cm<sup>2</sup>)

### Temperatures (Observe Typekey)

Typekey	min / max temperature			
	Ambiant	Membrane	Housing	Process
MBA110...	-20 .. +80°C	100°C	80°C	-20..100°C
MBA120...	-40 .. + 80°C	200°C	80°C	-40..200°C
MBA130...	-40 .. + 80°C	300°C	80°C	-40..200°C

<b>Housing</b>	Die cast aluminium, 230D alloy (EN AC-44300) with higher chemical resistance, IP 65 protection.
<b>Dimensions (diameter / height)</b>	203 mm / 120 mm
<b>Membrane and flange</b>	Stainless steel
<b>Membrane diameter</b>	174 mm
<b>Flange size, hole circle</b>	189 mm, 6 drilled holes 7 mm
<b>Cable fitting</b>	M20x1.5 second fastening optional
<b>Weight</b>	2 kg

## 8. Switch

<b>Contact:</b>	1 double-throw contact The contacts have the same polarity
<b>Switching capacity:</b>	16A 250V (AC-12 EN 60947-5-1, DIN VDE 0660) 6A 250V (AC-15) 2A DC24V (DC12)
<b>Dielectric strength:</b>	2kV (DIN VDE 0110-1)
<b>Contact gap:</b>	0,5 mm
<b>Wire:</b>	max. 1,5 mm <sup>2</sup>
<b>Contact material:</b>	AgNi

# MBA100

## Document Information

Title: Operating instructions MBA100  
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## Product described

Product name: MBA100  
Hardware: All versions

## Manufacturer

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## Information for warranty

Product properties and technical data listed do not constitute any form of warranty definition.  
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Subject to change