



PRODUCT INFORMATION



## MBA200

A Level Indicator with Rotating Paddle  
for Bulk Material

**TYPE** | MAIHAK

**MADE IN GERMANY**



## MBA200: Measuring the level of bulk better in many ways



For more than 70 years, MBA's rotating paddle level indicators have proven to be robust, safe and reliable. Now, MBA has developed a new rotating paddle indicator: the MBA200 **TYPE MAIHAK**. Highly valued for its rugged construction, it has now been improved with many attractive and functional advantages.

By choosing the MBA200, you have opted for greater optimization of time and cost efficiency. The individual components of this modular system can be selected to build differentiated solutions for your individual applications. One of the great features of the MBA200 is high reliability under most difficult operating conditions.

### Established measuring principle: the rotating paddle

A synchronous motor slowly rotates the paddle wheel. When the level of bulk material reaches the paddle, the rotating motion is blocked. The counter torque is used to turn the motor mechanics against a switch which shuts off the motor. This condition is electronically transmitted with a relay switch contact. Using a spring mechanism, the motor mechanics is returned to its operational position as soon as the rotating paddle is freed from the bulk material. The switch is released and the paddle begins to rotate again.

### Typical Application

- As full, demand or empty indicator in silos or storage containers
- As a blockage indicator in drop tubes
- As a full indicator during filling operations

# Options



## Operation monitoring

Electronic monitoring of the level indicator. Signals a fault when a mechanical break occurs between the motor and the paddle shaft. The fault signal is safety switched.

## Electrical internal heating

Permits operation even at outdoor temperatures as low as  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ).

## Display lamp

The lamp is integrated in the enclosure for the display of „full” or „empty”.

## Variable height adjustment

Permits the change of limit level at which a full signal is given. This can be adjusted (suitable for mounting to devices with protective tubes, made of stainless steel).

## Membrane

Prevents condensation building up inside the enclosure due to climatic exchange between the environment and the enclosure. It serves also as a safety balance for pressurized instruments.

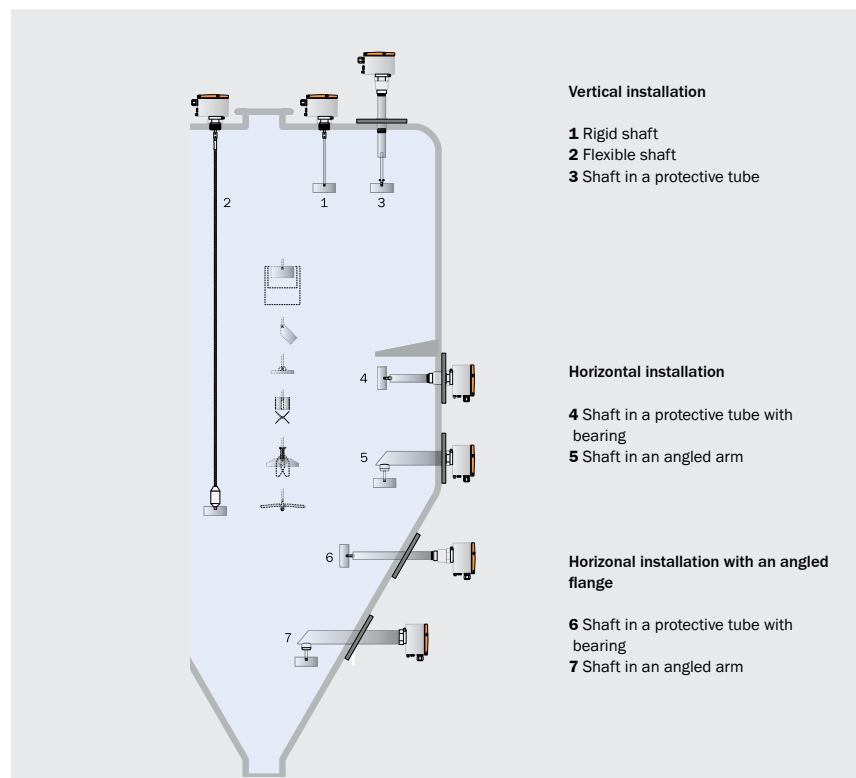
## Fast rotating motor

Higher motor speed (5 RPM) shortens the reaction time of the bin level indicator e.g. during rapid filling processes.

## Unit head anodized

Better protection of the electronic head in corrosive atmosphere.

## Installing the MBA200 for your application



# Nine good reasons to choose the MBA200

## 1 It's all in the motor

A hard-wearing AC motor is built into every MBA200, offering high performance and excellent reliability. For versions designed to operate with DC power, a built-in inverter is included to control correct supply to the motor.

## 2 Gold contacts – high quality for low signals

Highest voltage and highest current are important parameters for switch contacts. However, low signals need to be switched just as safely. That is why each MBA200 signal relay is built with gold-plated switch contacts.

## 3 Safety-orientated switching – stops malfunctions immediately

Each MBA200 can be easily set to work as an empty or full indicator. Depending on the set-up, the unit will indicate "full" or "empty" in the event of a power failure.

## 4 More room for the connection cable – quicker and safer cable installation

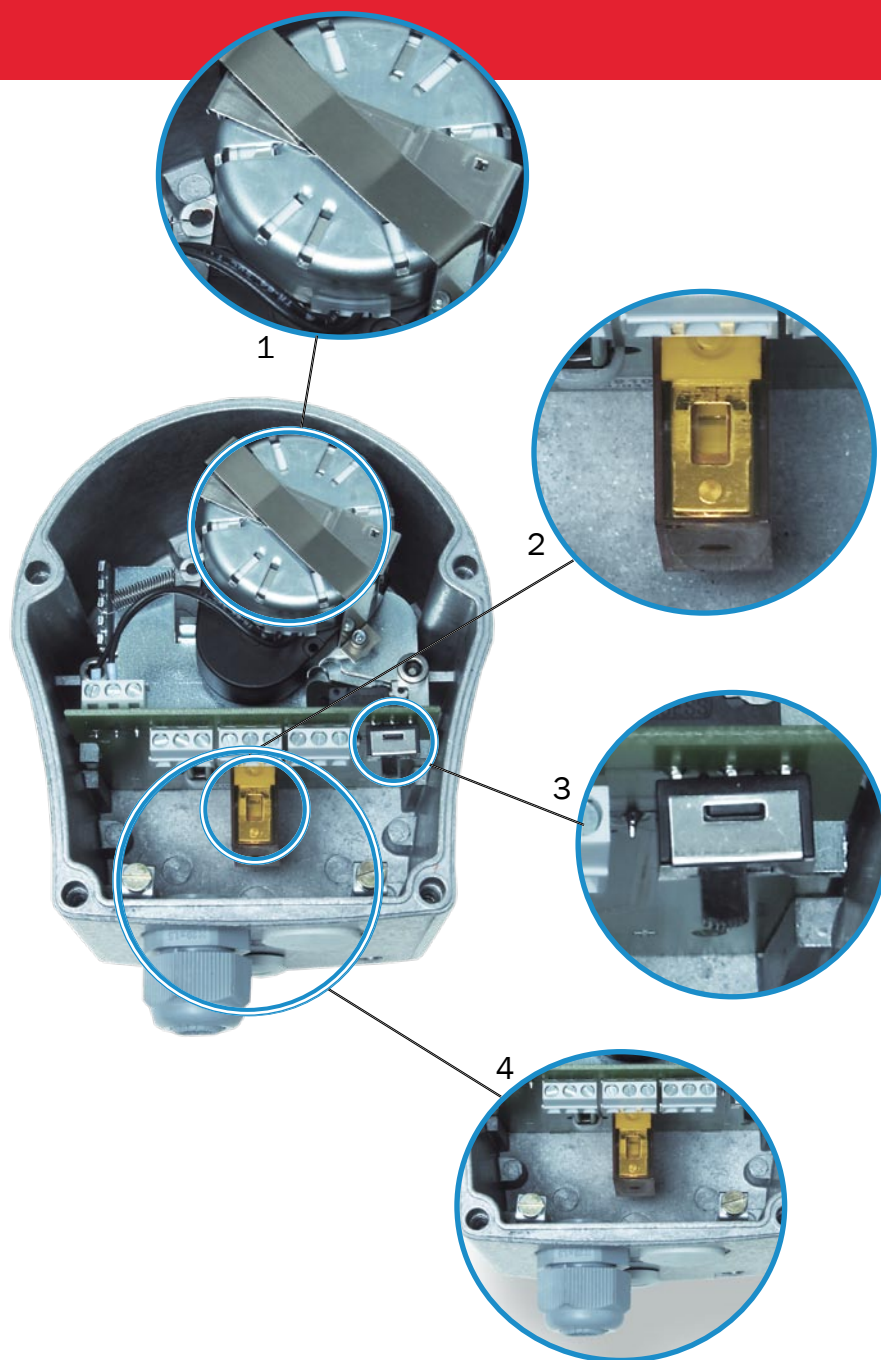
There is more space inside of the enclosure and a clear arrangement of the connecting terminals – that provides easy and safe electrical connection, even for very difficult mounting locations.

## 5 Increased safety due to self-monitoring

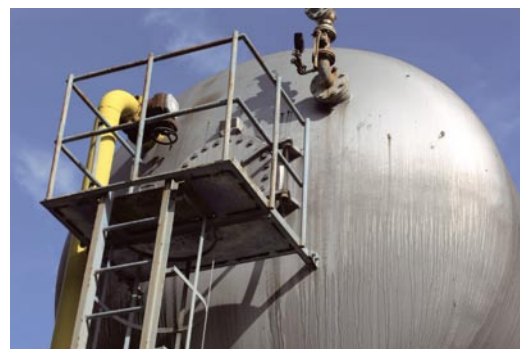
To increase the stability of your operation, you have the option to fit the models MBA220 and 230 with a monitoring logic for the shaft rotation. When the shaft stops, although it should be rotating according to the inbuilt switch status, a fault signal is given out. This also happens when the opposite case occurs.

## 6 Safe switching by using delayed switching – no fluttering of relays

The versions MBA220 and 230 contain a on/off delay switch. By activating this switch, faulty signals that are caused by falling or swirling around bulk material that may hit the paddle, are prevented.







#### 7 Plug-in instrument head turns replacement into simple job

The instrument head is easily separated from the process connection for repair or replacement. The mounting connection at the silo is thereby not affected and the silo remains closed. The instrument's head is just as easily remounted.

#### 8 Adjustable tension spring

The tension spring is an essential part of the rotating paddle switch. It provides the counter force to the paddle and assures the safe and reliable switching. In some applications the counter force needs to be adjusted. With the MBA200 this adjustment can be done easily by changing the pre-tension or by changing the spring. We supply 3 different types of springs with a soft, middle and hard tension.



#### 9 Stainless bearings – reliable function after a long standstill

The MBA200 remains shut down as long as the paddle is covered by the bulk material. This condition can last for a long time – e.g. with demand or empty indicators. Even after standstills over several months, the shaft must immediately rotate as soon as the paddle has been freed. Therefore, each MBA200 is equipped with ball bearings that are made of high quality, corrosion-resistant, stainless steel.

Technical data			
Instrument Type	MBA210	MBA220	MBA230
Power supply	230 V; 50/60 Hz 115 V; 50/60 Hz	24 V AC /DC	42, 115, 230 V, 50/60 Hz
Power consumption	3 VA	3 VA / 10 VA	3 VA / 10 VA
Microcontroller	No	Yes	Yes
Safety-orientated switching	Yes	Yes	Yes
On/Off delay	No	4 s	4 s
Operation monitoring	No	Optional	Optional
Switch contacts	One isolated change over Contact rating 250 V AC, 2A or 60 V DC, 1A		
Enclosure rating	IP 65		
Material	Cast aluminium		
Ambient temperature	-15 ... +60 °C, with heater -40 ... +60 °C		
Dust ex-certification	<div> <div> <div>Ex</div> <div>II 1/2D EX tD A20/21 IP65 T100 °C oder T200 °C oder T350 °C / T100 °C</div> </div> <div> <div>Ex</div> <div>II 1D EX tD A20 IP65 T100 °C oder T200 °C oder T350 °C / T100 °C</div> </div> <div> <div>CSA</div> <div>CSA for US and C; cCSAus for Class II, III Div. 1 Gr. E, F, G</div> </div> </div>		
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## Selection guide



### Rigid shafts



Rigid shafts are suitable for use in applications where the shaft is not subject to any great lateral stress. Short shafts can (as opposed to the table above) also be used for lateral, horizontal or angled installations as long as the bulk material doesn't bend the shaft.

### Shafts in protective tube



Shafts mounted in protective tubes (without a bearing) are used for vertical installations from the top. The protective tube offers additional protection from lateral forces or impacts from bulk material. Also, pulling forces which occur through friction of the product when the silo is emptied are diverted by the protective tube.

### Flexible shafts



The flexible shaft consists of an 8 or 12 mm rugged steel cable. The advantage of a flexible shaft: There is no continuous bending via lateral stress through movement in the bulk product or when the bulk material hits the steel cord and the paddle wheel. If the silo is empty, the steel cord is tightened with a tightening weight.



### Shafts in protective tube with bearing

Shafts in protective tubes with a bearing are used for horizontal or angled lateral installations. The bearing centers and supports the shaft inside of the protective tube and seals the tube against dust ingress.



### Shafts in an angled arm

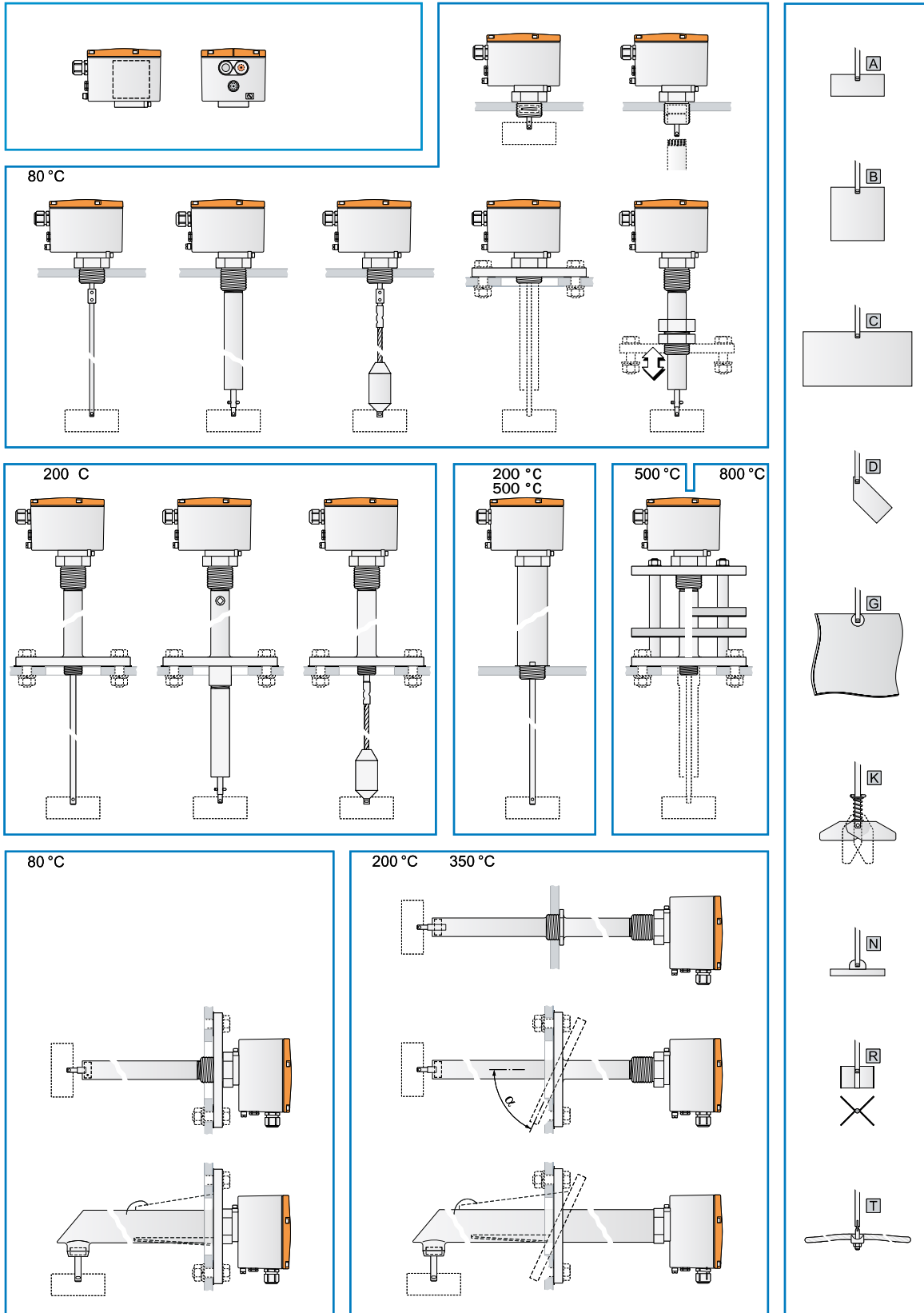
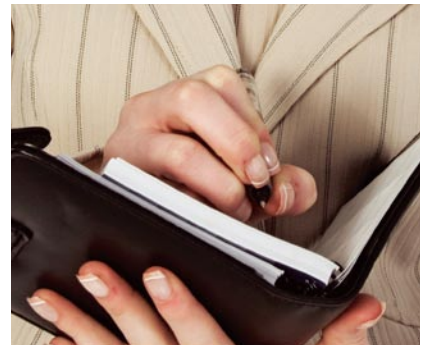
The shafts in an angled arm are protected with a very rugged steel tube. The paddle is mounted at a 90° angle down and therefore is best designed for horizontal or lateral installations. The angled arm can also be installed in flowing product e.g. as a tailback (jam) indicator.



### Reinforced arm

Extreme rugged angled arm with welded fins. Used for the horizontal installation, in heavy bulk material.

# Product selection



## PROCESS MEASUREMENT

### GROUP

Due to years of experience in the field of automatization we offer together with the SMB group any kind of automatic systems like filling stations, palletizers, conveyors and compact storage systems. In combination with our level measuring technique it's possible to design and produce belt conveyors, turn tables and shiploading systems with telescopic belts tailored on customers request. And of course worldwide.



### COMPETENCE

We offer our customers our comprehensive know how obtained over decades in different applications. Our strength is to combine standards and special solutions to meet customer specifications and to find the best solution for a turn key project.



### WORLDWIDE

Where ever you are, our global network of representatives and subsidiaries is able to supply qualified support when you need it. We deliver the equipment for your measuring tasks, provide documentation and training. Fast and competent support, short delivery times and a high level of delivery reliability – that's MBA Instruments staff is known for.



### COMPANY

MBA Instruments GmbH continues in developing, production and distribution of measuring technique "Type MAIHAK" and develops new ideas. Customers are our most important partners. If our partner is satisfied only than he is able to be successful. And we are also successful with him. Satisfaction of our customers is our success.

