

# MBA888

## Level switch for bulk materials

Installation, operation


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## 1. Safety information - for use in areas at risk of explosion (Ex Zones)

A level indicator of type MBA888 is only suitable for use in potentially explosive areas if the individual device specification permits this.

- Check device on the basis of the type plate for approval (ATEX).  
An approved device bears the identification:

 II 1/2 D Ex ta/tb IIIC T100°C Da/Db

- A suitable safety fuse with min. 1500A switch-off delay must be connected upstream.
- Observe the specifications of the approvals. The EC type examination certificate is an integral part of the operating instructions.
- Install equipotential bonding lead.
- Prevent sparks forming due to striking metal parts.
- Perform installation in accordance with the standard EN 60079-14
- Observe zone separation (see section 3)
- Only lay electrical installations in a suitable terminal enclosure.
- The enclosure must not be opened.
- With process temperatures in excess of 60°C it is necessary to implement suitable measures, to ensure that the enclosure temperature does not exceed a temperature of 60°C at the cable connection point at this process temperature.

## 2. Responsibility of the user

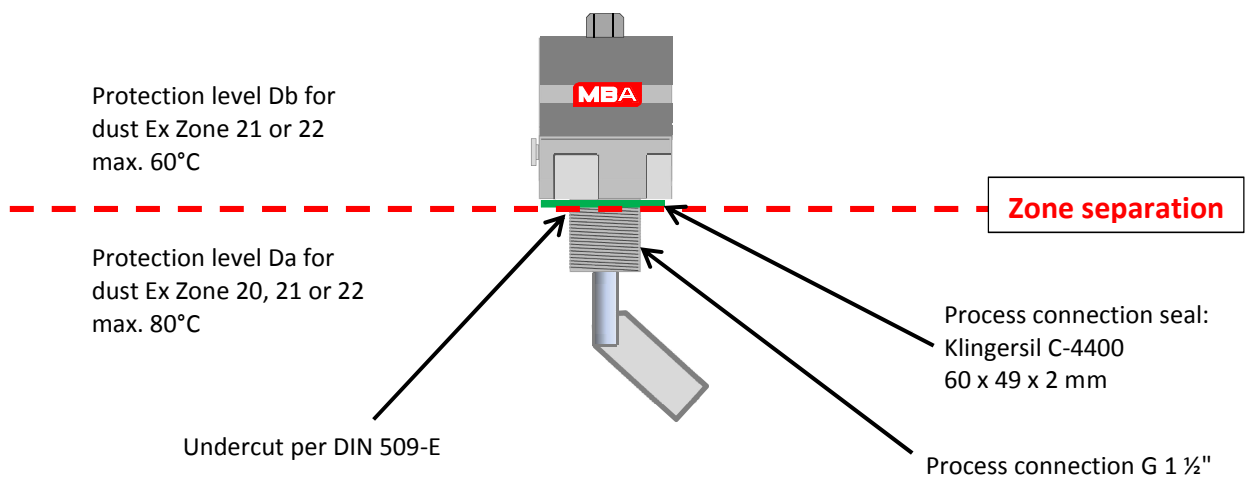
- Only use the device in the manner described in these operating instructions. The manufacturer accepts no responsibility and provides no warranty cover in case of any other uses.
- In addition to these operating instructions, also observe all local laws, technical rules and internal company instructions that apply at the place of use of the device.
- Observe the specifications regarding voltage and temperature on the type plate.

## 3. Use

The MBA888 is used as a level switch for all types of bulk materials. The device is only intended for fixed installation in industrial plants (large tools). The device is designed for zone 21. Furthermore, the shaft end and blade can be fed into zone 20, if a partition wall is installed over the process connection and the requisite leak-tightness is established with the installation. The leak-tightness of the process connection in terms of the zone separation has not been tested within the framework of EC type testing and must be ensured by the user.

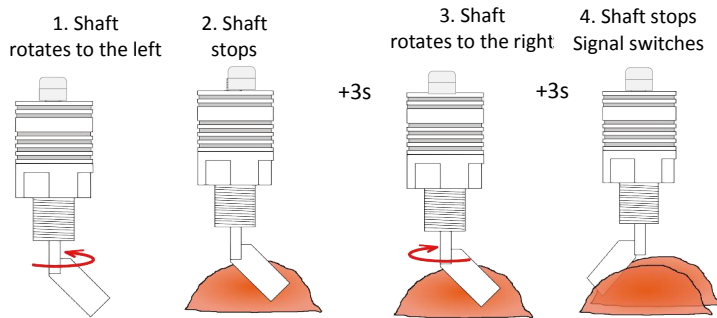
## 4. Conformity:

Explosion protection, general requirements:..... EN 60079-0 :2012  
Device dust explosion protection through enclosure "t" .... EN 60079-31:2014 + A11:2013  
EMC ..... EN 61000-6-4: Sept. 2011 (industrial area)  
..... EN 61000-6-2: March 2006 (industrial area)  
Vibration: ..... IEC 60068-2-6, IEC 60068-2-27  
Low voltage: ..... EN 61010-1: 2011



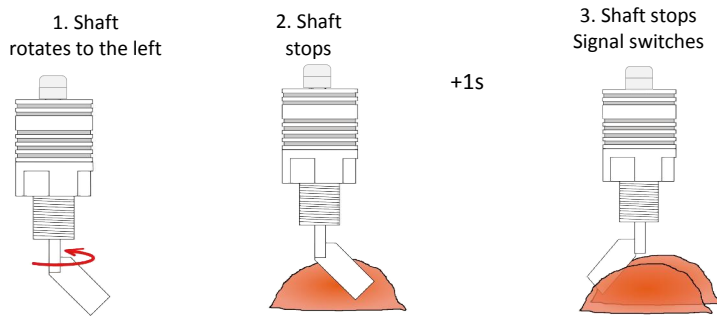
### 5. Function and switching behaviour

A motor turns a shaft, which has a blade fastened to its end. If the blade meets with the bulk material, the torque increases until the shaft stops. The shaft then changes rotational direction. If the shaft is blocked in both rotational directions then this switches signal



#### "Quick Switch" device version:

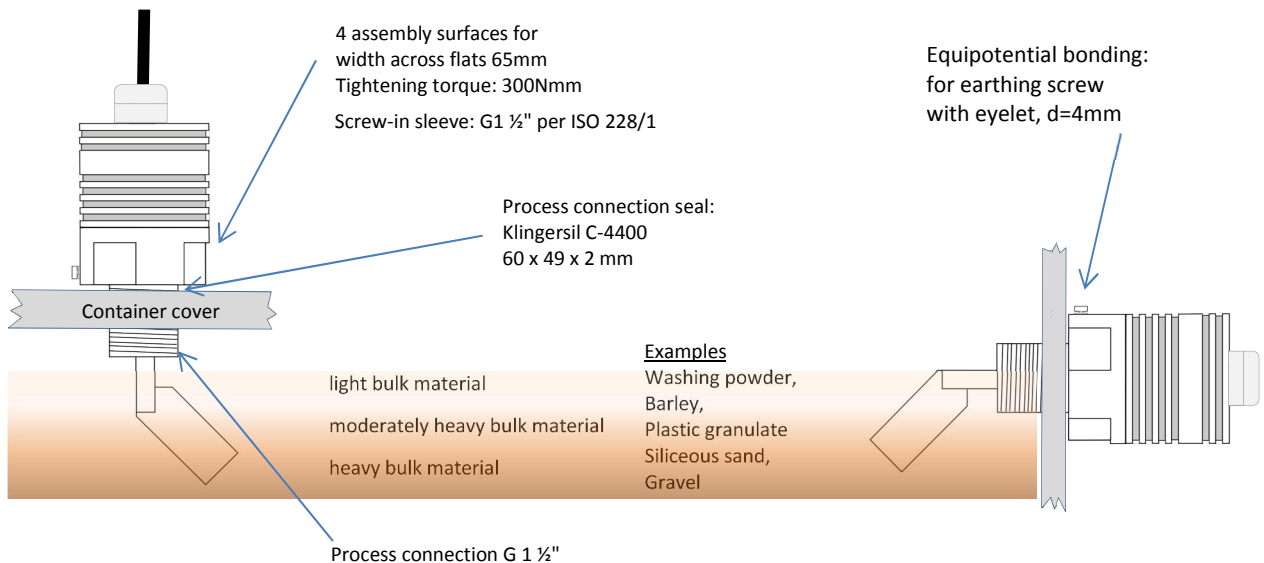
With this version, the MBA888 only checks for a blocking of the shaft rotation in one direction. Very rapid switching as a full indicator is therefore possible:



### 6. Assembly

The MBA888 is bolted with the process connection in a fitting sleeve. The assembly position must be selected such that the blade on the shaft end is covered by bulk material at the switching point. Light or fluid bulk material must cover the blade somewhat more than heavy bulk material. The measurement is independent of the installation position of the MBA888.

For use in accordance with II 1/2 D zone separation must be observed (see section 3)



## 7. Installation of MBA888 24V DC

24V DC version	The MBA888 is supplied with a prefabricated cable. The strands on the cable ends are numbered 1 to 4 and must be laid in a suitable terminal compartment. The housing is integrated in the equipotential bonding. The cable must be permanently installed!		
	<b>Terminal compartment with cable infeed for <math>\varnothing 7 - 12\text{mm}</math></b>		
	Strand		
	1	24 V DC $\pm 10\%$ operating voltage	
	2	0 V	
	3	Signal: 24V full / 0V empty, max. current: 1.2A	
	4	Ready for operation: 24V operation / 0V fault	
	Output signal		
	Strand 1 – 3	Behaviour	Cause
	+24V DC	Shaft rotates	Container is empty
0V	Shaft does not rotate	Container is full	
Operation monitoring			
Strand 1 – 4	Operating status	Measures	
+24V DC	Function is OK	none	
0V	Function error	Function test required	

## 8. Installation of MBA888 115 - 230V AC

115 - 230 V AC version	The MBA888 is supplied with a prefabricated cable. The strands on the cable ends are numbered 1 to 5 and must be laid in a suitable terminal compartment. The housing is integrated in the equipotential bonding. The cable must be permanently installed!		
	<b>Terminal compartment with cable infeed for <math>\varnothing 7 - 12\text{mm}</math></b>		
	Strand		
	1	115V - 230V AC operating voltage	
	2	N	
	3	Relay for main contact	
	4	Relay for switch contact 1	
	5	Relay for switch contact 2	
	The relay switches as a changeover. The contacts are potential-free.		
	Output signal		
Strand 3 – 4	Strand 3 – 5	Behaviour	Cause
Closed	Open	Shaft rotates	Container is empty
Open	Closed	Shaft does not rotate	Container is full
Safety-oriented switching as a full indicator			
If the MBA888 detects a malfunction or the operating voltage fails then its relay drops out and the status "Container is full" is indicated.			

## 9. Maintenance

The MBA888 is maintenance-free. However, the function should be checked regularly and at least 1x yearly.

### 10. Operating data

	MBA888 – 24V DC version	MBA888 – 115V - 230V AC version
Operating voltage:	24V DC	115V - 230V AC
Power consumption:	max. 750mA + current at the signal output	8W
Signal:	24/0 V DC max. 1.2A	Potential-free changeover
Operation monitoring:	24/0 V DC max. 1.2A	see "safety-oriented switching"
Connection cable:	LAB Ölflex Classic 400P 4x0.5mm <sup>2</sup> Standard length: 2m (other lengths on request)	LAB Ölflex Classic 400P 5x0.5mm <sup>2</sup> Standard length: 2m (other lengths on request)

Process temperature in the container (Ti): -20 to +80°C  
 Ambient temperature (Ta): -20 to +60°C  
 Ambient pressure: 0.8 to +1.1bar

Enclosure protection type: IP65 – watertight and dust-tight  
 Shaft: Ø12mm, stainless steel 1.4301  
 Immersion depths: 120mm or 180mm or 250mm  
 Blade: Stainless steel, welded to the shaft  
 Seals: VITON and PTFE gasket  
 Motor shaft additionally sealed (VITON)  
 Enclosure: Aluminium or stainless steel

#### Switch time

	Standard	Quick Switch
if shaft is blocked:	6s	1s
if shaft is clear:	3s	3s

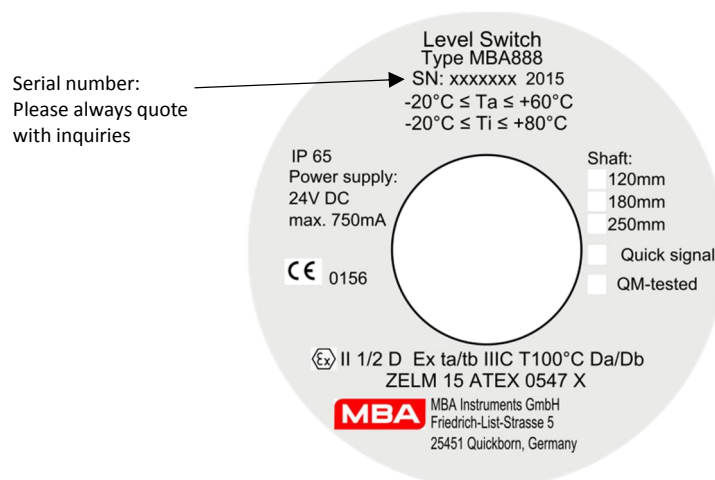
#### Ex identification

 II 1/2 D Ex ta/tb IIIC T100°C Da/Db

#### Type examination certificate

ZELM 15 ATEX 0547 X

### 11. Type plate (example)



## 12. Dimensions

