



By use in explosive hazardous areas read and follow the

## special conditions and instructions for safe application

of the attached

## explosive protection information

first and take notice of the operating instructions.

## Operating instructions

### 1. Description

#### 1.1 Intended use

The level indicator observes the filling level as a limit switch in silos and containers. It can be used as full, demand and empty indicator for dusty and powdery, granulated and grainy bulk goods with a max. grain size up to 30 mm and with a bulk weight of 0.3 ... 2.5 t/m<sup>3</sup>.

#### 1.2 Function

The bulk material presses with its weight against the membrane. A tappet directly transfers the pressure from the membrane to the switch. When the bulk goods are decreasing, pressure is taken off the membrane and the switch will be interconnected.

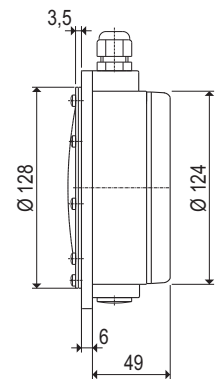
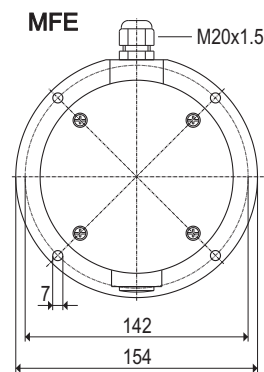
#### 1.3 Technical data

<b>Manufacturer</b>	<b>MOLLET</b>
	<b>Füllstandtechnik GmbH</b>
<b>Address</b>	Industriepark RIO 103 74706 Osterburken
<b>Name</b>	Membrane level indicator
<b>Type</b>	MFE (GRP) and MFE-A (alu) MFEF (GRP) and MFEF-A (alu)
<b>Temperature range</b>	GRP   aluminium -20 °C ... +60 °C   -25 °C ... +80 °C
<b>Signal contact</b>	change-over contact, potentialfree
<b>Capacity of the contact</b>	see Type plate
<b>Switching voltage</b>	see Type plate
<b>Sensitivity</b>	60 g ... 200 g adjustable
<b>Response delay</b>	none
<b>Cable entry</b>	cable gland M20x1.5
<b>Type of protection</b> acc. to DIN EN 60529	IP 40 IP 53 if compensating filter is downwards IP 65 with stainless steel membrane IP 66 with aluminium housing
<b>Overpressure safety</b>	up to 1 bar
<b>Weight</b>	MFE 0.48 kg    MFE-A 0.95 kg MFEF 0.49 kg    MFEF-A 1.00 kg
<b>Maintenance</b>	none
<b>Mounting position</b>	any position

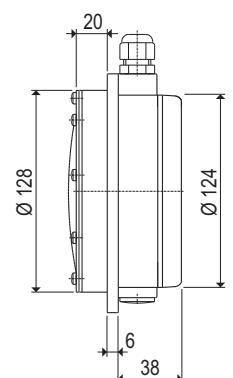
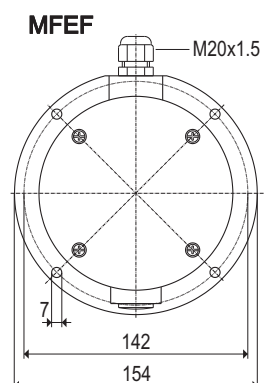
#### 1.4 Materials

Type	Housings	Membrane	Mounting ring
MFE(F)- ..	= GRP (glass-fibre reinforced plastics)		
MFE(F)-A ..	= aluminium		
MFE(F)- . NN	= NBR		steel, galvanized
MFE(F)- . VN	= Viton		steel, galvanized
MFE(F)- . NE	= NBR		stainless steel, 304
MFE(F)- . VE	= Viton		stainless steel, 304

#### 1.5 Dimensions



002-0203



002-0204

## 2. Mounting

### 2.1 Preparation

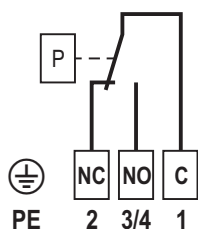
- Read and follow the safety instructions and the operating instructions before mounting the device!
- After unpacking, check by visual inspection if the membrane has any damages in transit.

### 2.2 Mechanical connections

- Put the membrane level indicator together with the sealing at the provided flange and screw it tightly with screws M6 and washers.

### 2.3 Electrical connection

connection plan



002-AP01

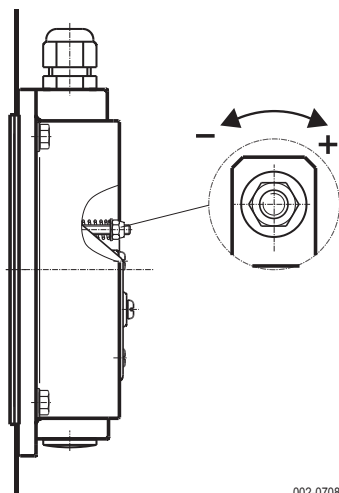
### 2.4 Cable gland

After the electrical connection

- the cable gland has to be screwed tightly,
- the cap nut has to be screwed until the cable gland is fixed and closed tightly.

## 3. Putting into operation

- Put the membrane level indicator into operation only, when the mounting in the container or silo has been done correctly and when it has been fixed tightly with the electrical connection.
- The membrane level indicator is presetted at a medium sensitivity.
- The sensitivity is adjustable with the adjusting screw.



002-0708

## 4. Utilization

### 4.1 Normal operation

- Use the membrane level indicator in its intended **application** only.
- **The membrane level indicator is provided for use in silos or containers with pressureless operation.**
- Comply with the details about max. temperatures, stated on the data plate. Check the membrane of the level indicator, when the permissible temperature **range has been exceeded** or has fallen **short off**.
- If the indicator will be damaged, take the device out of operation immediately.

### 4.2 Inexpert handling

- Ignoring of the safety instructions and the operating instructions.
- **Utilization** of the membrane level indicator in not intended use.
- Mounting of spare parts which are no original parts.
- Violation against applicable law and standards.

## 5. Maintenance and servicing

### 5.1 General informations

- Do maintenance work at the level indicator only, if the silo or the container is empty and if there is no overpressure or vacuum.
- Use original spare parts only.

### 5.2 Maintenance

- Inspect in **regular intervals** if there is any wear or abrasion at the indicator's membrane. Define the control intervals, depending on the characteristics of the bulk goods.
- In case of damage or abrasion, replace the membrane immediately with a new one.

### 5.3 Servicing

- Damaged parts, contacts or connections have to be repaired immediately or being replaced with parts of the same kind.
- Until the complete restoration of the proper function, the membrane level indicator must not be used any more.

## 6. Storage

- Store the membrane level indicator at a dry place.
- Protect the membrane from pointed objects as well as from strong radiation from the sun.

## 7. Disposal

- The level indicator can be recycled.
- The disposal applies to the valid environmental guidelines according to the location of the carrier and the local manufacturing conditions.

**Membrane level indicator**  
Level limit switch for bulk goods

Gas+  
Dust



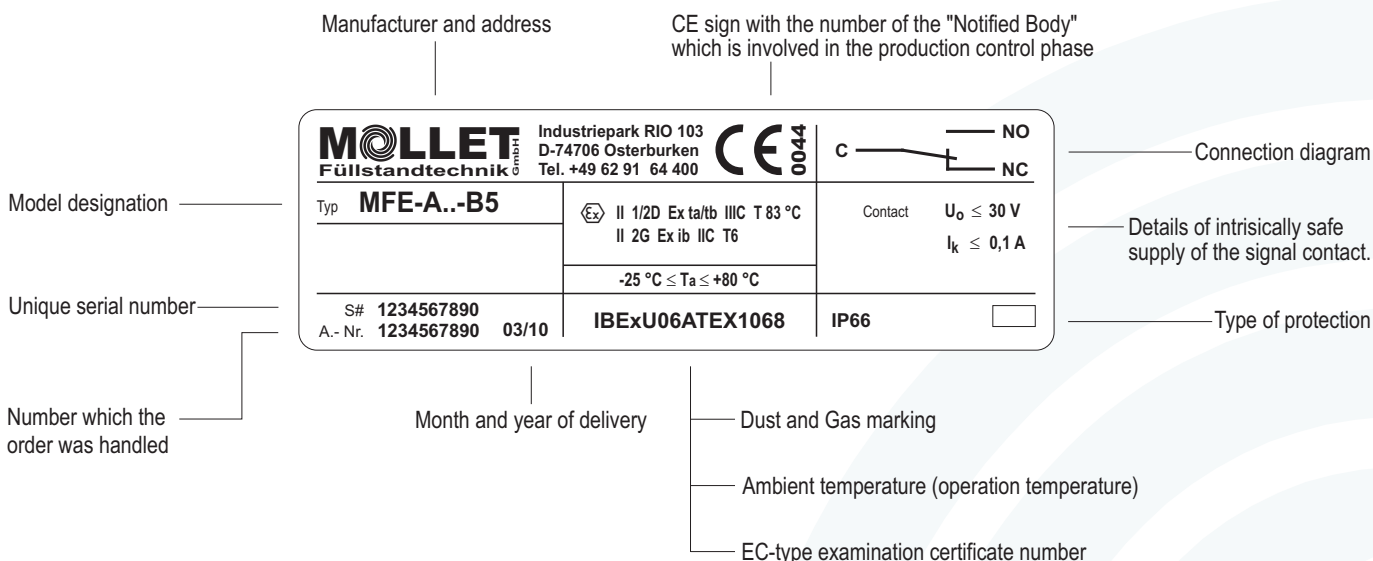
**Explosion protection information**  
and supplement to the operating instructions

**Type plate details B1**

<p>Manufacturer and address</p> <p><b>MOLLET</b> Industriepark RIO 103 Füllstandtechnik GmbH D-74706 Osterburken Tel. +49 62 91 64 400</p>		<p>CE sign with the number of the "Notified Body" which is involved in the production control phase</p> <p><b>CE</b> 0044</p>		<p>Connection diagram</p>	
<p>Model designation</p> <p>Typ <b>MFE-A.-B1</b></p>		<p>Dust marking</p> <p> II 1/2D Ex ta/tb III C T 83 °C</p>		<p>Details to loadability of the signal contact</p> <p>Contact <b>4 A 240 V~</b></p>	
<p>Unique serial number</p> <p>S# <b>1234567890</b> A.- Nr. <b>1234567890</b> 03/10</p>		<p>Ambient temperature (operation temperature)</p> <p><b>-25 °C ≤ Ta ≤ +80 °C</b></p>		<p>Type of protection</p> <p><b>IP66</b> <input type="checkbox"/></p>	
<p>Number which the order was handled</p>		<p>Month and year of delivery</p>		<p>EC-type examination certificate number</p> <p><b>IBExU06ATEX1068</b></p>	

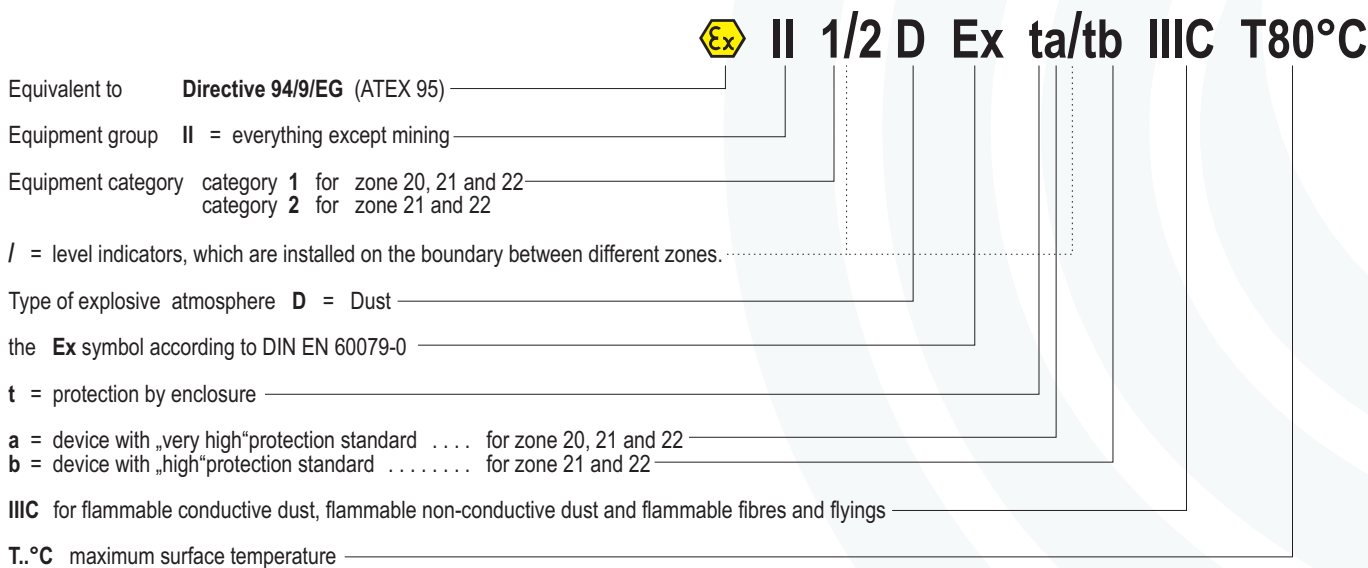
## Type plate details B5

Gas+Dust  and hybrid mixtures

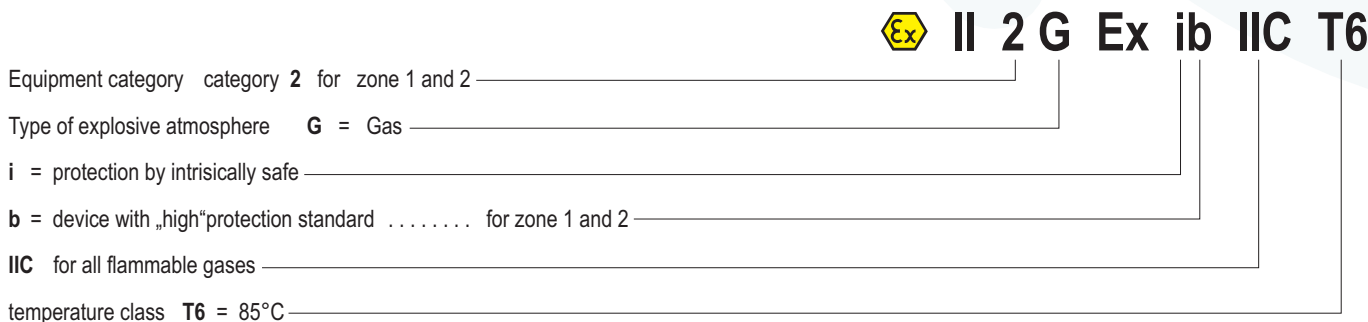


## Marking in accordance with ATEX 95 and DIN EN 60079-0:2009

Membrane level indicator for use on the boundary from zone 20 to zone 21



Membrane level indicator for use in zone 1



Order code **B1**

Marking: II 1D / 2D



## Equipment category appropriation by zones

Membrane level indicator for use on the boundary from zone 20 to zone 21

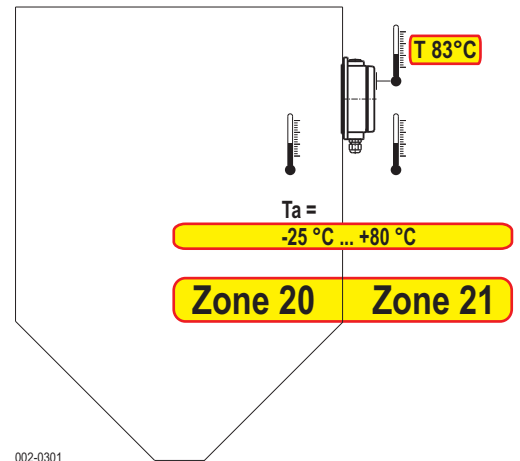
### Ambient temperatures $T_a$

The ambient temperature  $T_a$  defines the maximum operating temperature of the indicators. Inside the vessel this is process temperature (the air or the bulk goods temperature) nearby the device.

### maximum surface temperature $T$

The maximum surface temperature means the hottest point at the equipment.

<b>MOLLET</b> Füllstandtechnik GmbH Industriepark RIO 103 D-74706 Osterburken Tel. +49 62 91 64 400				NO NC
Typ <b>MFE-A..B1</b>		Contact 4 A 240 V~		
$-25\text{ °C} \leq T_a \leq +80\text{ °C}$				
S# 1234567890 A.-Nr. 1234567890 03/10	<b>IBExU06ATEX1068</b>	IP66		



Order code **B5**

Marking: II 1D / 2D

II 2G



## Equipment category appropriation by zones

Membran level indicator for use on the boundary from zone 20 to zone 21 and in zone 1

### Ambient temperatures $T_a$

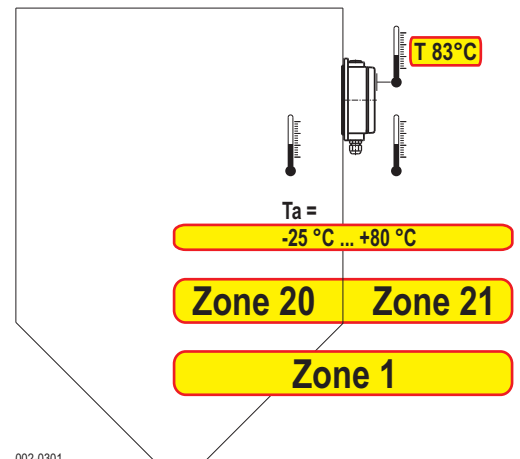
The ambient temperature  $T_a$  defines the maximum operating temperature of the indicators. Inside the vessel this is process temperature (the air or the bulk goods temperature) nearby the device.

### maximum surface temperature $T$

The maximum surface temperature means the hottest point at the equipment.

The device matches with temperature class **T 6**.

<b>MOLLET</b> Füllstandtechnik GmbH Industriepark RIO 103 D-74706 Osterburken Tel. +49 62 91 64 400				NO NC
Typ <b>MFE-A..B5</b>		Contact $U_o \leq 30\text{ V}$ $I_k \leq 0,1\text{ A}$		
$-25\text{ °C} \leq T_a \leq +80\text{ °C}$				
S# 1234567890 A.-Nr. 1234567890 03/10	<b>IBExU06ATEX1068</b>	IP66		





## Special conditions and instructions for safe application

- 1.1 The installation, maintenance, initial operation, removal and repair have to be controlled resp. checked by an “authorized person” for explosion protection.
- 1.2 For the electrical connection you have to take notice of the local and statutory requirements and/or the VDE 0100.
- 1.3 Take notice of the specifications on the data plate.
- 1.4 Using the device in ambient temperatures > +60 °C, the applied connection cables have to be made for temperatures of min. +80 °C.
- 1.5 As soon as the device will be brought into the explosion hazardous area it has to be mounted immediately at the precaused place and a cable has to be brought into the cable gland.
- 1.6 The cable gland were screwed and protected at the factory. Please check if the cable gland have loosened during on the mounting or at the transport. When it is loosened, it has to be fitted again.
- 1.7 To secure the type of protection, the screw nut of the cable gland has to be fixed at the installation with a torsional force of min. 5 Nm. **ATTENTION** If it will be fastened too strong, the IP-protection can be affected.
- 1.8 The earth connection of the device has to be installed in such a way that mechanical damage will be excluded.
- 1.9 The device may put into operation with built-in cap-sealing and when it is closed, only.
- 1.10 Switch off the power supply, before opening the device. (touchdangerous voltage)
- 1.11 Depending on the bulk goods characteristics and the wear, the carrier has to define resp. to find out in which intervals the membrane of the level indicator has to be checked for leakage to keep the type of protection (dust-proof). This inspection has to be repeated regularly. If there is a fault, the membrane has to be replaced with a new membrane.
- 1.12 Take notice of the requirements of DIN EN 61241-14 and DIN EN 60079-17 especially regarding the dust deposits and temperatures and follow the pertinent rules and regulations.

---

### For the version B1



- 2.1 A fuse (with max. 4A) has to be connected in series to the voltage supply.
- 2.2 Protect the signal contact from voltage peaks when inductive loads are connected.

---

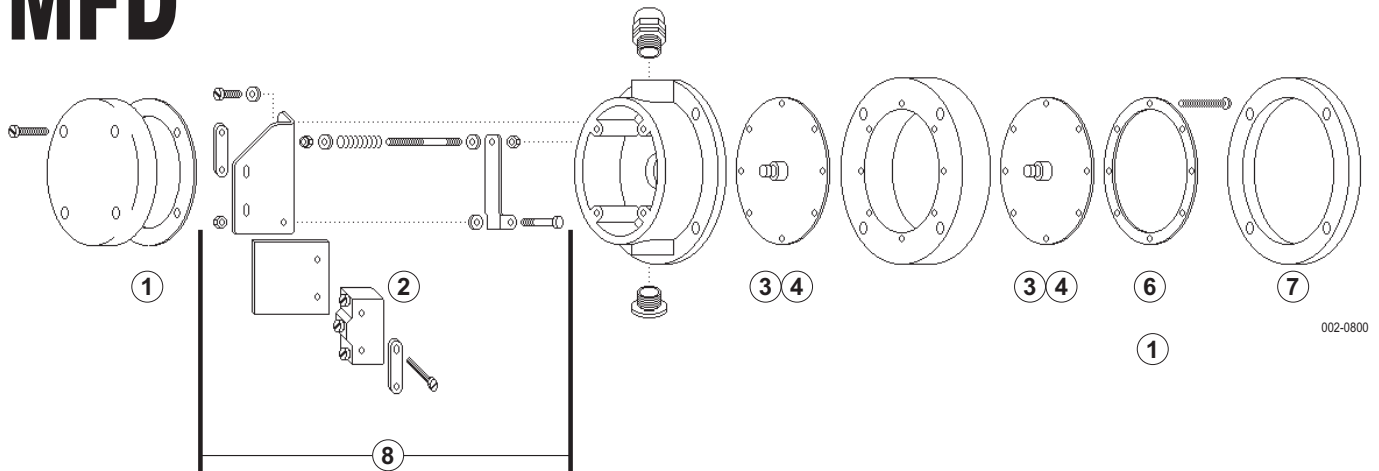
### For the version B5



- 3.1 **ATTENTION!**  
For load limitation a certified barrier or a certified isolation amplifier with an intrinsically safe circuit at least for the category “ib” has to be connected in series, witch is certified for gases of explosion group IIC.
- 3.2 Take additional notice of the requirements of EN 1127-1, especially regarding the temperatures and follow the pertinent rules and regulations.
- 3.3 The device with an intrinsically safe electric circuit can be used in dusty explosive hazardous areas.
- 3.4 **Hybrid Mixtures**  
The level indicator is approved for the use in hybrid mixtures.

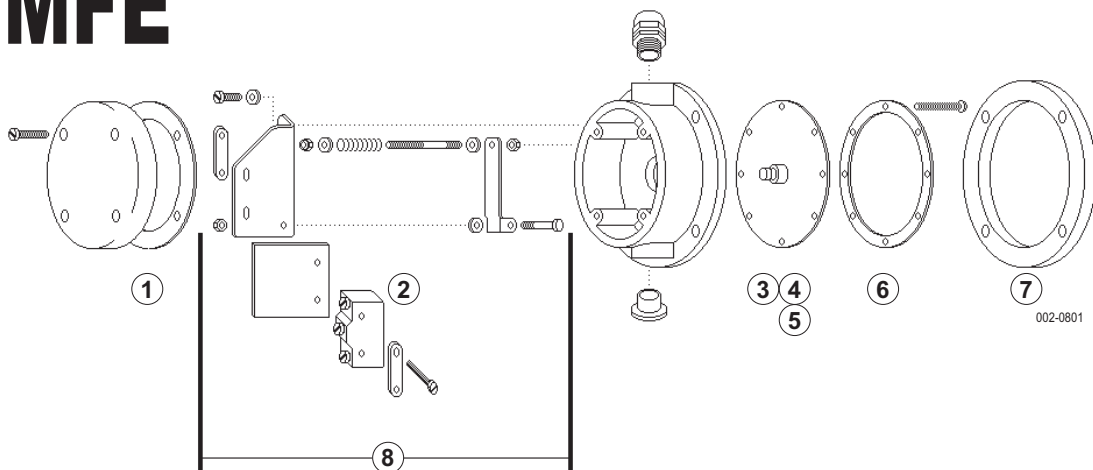
 Ersatzteile / spare parts

 **MFD**



Ersatzteile / spare parts

**MFE**



Pos.	Benennung / Reference	Artikel-Nr. / Order code	Werkstoff / Material
1	Deckeldichtung / cap seal	MF-DS001	NBR
2	Schalter / switch	BZ-2R-A2	
3	Stößel / tappet	MF-WE001	Aluminium
4	Membrane / membrane <b>N</b> . Membrane / membrane <b>V</b> .	MF-MB-NR MF-MB-VI	NBR VITON
5	Membrane / membrane <b>E</b> .	MF-MB-VA	1.4301 / stainless steel
6	Haltering / mounting ring <b>N</b> . Haltering / mounting ring <b>E</b> .	MF-HR-ST MF-HR-VA	Stahl, verzinkt / zinc-plated steel 1.4301 / stainless steel
7	Flanschdichtung / flange seal	MF-FD-NR	NBR-Schaumstoff / NBR foam
8	Ersatzteilpaket inkl. Schalter spare part kit incl. switch	MF-EP001 MF-EP001	







# EG-Konformitätserklärung EC-Declaration of Conformity

Wir/We

**MOLLET Füllstandtechnik GmbH**

Industriepark RIO 103  
D-74706 Osterburken  
Tel. 06291 64400 Fax 06291 9846

erklären hiermit, dass die Geräte:

declare that the devices:

**Membran-Füllstand-Grenzschalter**  
Membran-Füllstandanzeiger

**Membrane limit switch**  
Membrane level indicator

Typ **MFE-AEE-B1** und **MFEF-AEE-B1**

Type **MFE-AEE-B1** and **MFEF-AEE-B1**

auf die sich diese Erklärung bezieht, den folgenden Normen oder normativen Dokumenten entsprechen:

to which this declaration relates is in accordance with the following standards or other normative documents:

**Richtlinie 94/9/EG** (Explosionsschutz-Richtlinie)

**Directive 94/9/EC** (Directive ATEX)

und

and

**EN 60079-0:2009, EN 60079-31:2009**

**EN 60079-0:2009, EN 60079-31:2009**

Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt gemäß den Bestimmungen der Richtlinien und durch Einhaltung der Normen.

The Essential Health and Safety Requirements are assured by compliance with the directive and observance of the normative documents.

Die Geräte sind mit folgenden Angaben gekennzeichnet:

The marking of the equipment includes the following:

CE 0044 Ex II 1/2D Ex ta/tb IIIC T 83 °C

$-25\text{ °C} \leq T_a \leq +80\text{ °C}$

EG-Baumusterprüfbescheinigungsnummer

**IBExU06ATEX1068**

EC-type-examination Certificate Number

Osterburken, den 20.11.2010

Osterburken, November 20th 2010



Wolfgang Hageleit

Diese Erklärung darf nur unverändert weiterverbreitet werden.

This declaration is only allowed to hand out in unchanged form.

