

**1-CUBE s. r. o.**

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# **GMA**

**MEASURING DEVICE  
FOR CO<sub>2</sub> CONTENT IN FERMENTING TANKS AND KEGS:**

## **USER'S GUIDE**

### **Contents:**

- 1.0 Equipment**
- 2.0 Installation - maintenance**
- 3.0 Safety recommendations**
- 4.0 Technical data**
- 5.0 Operating instructions**
- 6.0 Service**

## 1. Range of supply

the own measuring device GMA.....	1 unit
set of slings.....	1 unit
user's guide.....	1 unit

### Accessories

withdrawal head for kegs with closing valve.....	1 unit
pressure reducing valve with manometer.....	1 unit
pump for air.....	1 unit
check valve.....	1 unit
plastic reduction.....	1 unit
rubber hose.....	2 units
(length and number of hoses according to customer's demand)	

Note: accessories is not part of the supply - only on customer's demand

## 2. Installation - putting the device into operation and its maintenance

The device is ready for measurement at the moment of delivery.

Preceding the own measurement the operator connects the device by fixing of inlet hose (3) to the withdrawal spot. The measured sample must flow through bigger stainless tube (4) to the bottom of the device vessel. The inlet hose (3) must be secured at the withdrawal spot not to fall out during the withdrawal.

The operator must discharge the sample after disconnection of the device from the withdrawal spot.

First: the operator disconnects and lifts up the inlet hose (3) over the device. The inlet hose (3) must be over the device during the whole time of discharge.

Second: the operator turns the device upside down, outlet hose (5) must be brought to the drain.

Third: the operator opens valve (2) after equalizing overpressure the operator opens valve (1).

Let the measured sample flow to the drain. The operator must discharge the sample after disconnection.

The device cleaning after all measurements (before storing) is easy and fast.

Both ball valves (1,2) are still open now. The operator connects the inlet hose (3) to the water supply.

Afterwards the operator opens slowly the water cock and rinses (cleans) the device by water.

**Warning!** Pressure of water must not exceed value 250kPa - on the device manometer.

Whole internal space of the vessel (6) must be filled with water during cleaning. During rinsing the operator pulls out and consequently depresses button (9) to rinse (clean) both pump and capillary.

After cleaning:

The operator switches off the water supply and disconnects the inlet hose (3) from the water cock. The operator must bring the outlet hose (5) to the drain and turn the device upside down. At the same time the inlet hose (3) must be over the device so that all rinsing (cleaning) water can flow out of the device. The operator must discharge all water out of the device. After this handling the device is ready for the next measurement.

**Warning!** After all measurements the operator must rinse (clean) the device by clean pressure water (before storing).

Switch on the Digital Thermometer with the On/Off key and be sure to use Celsius scale degrees.

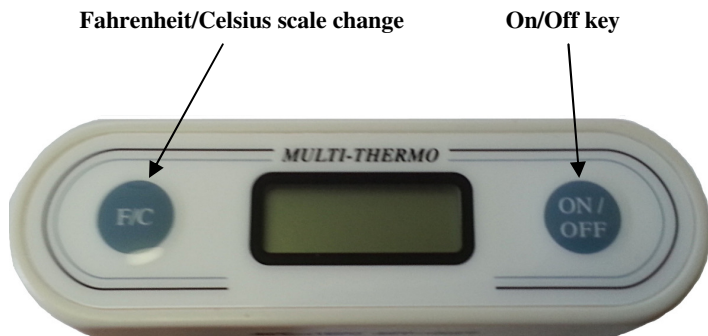
Replace battery type (393) when the low battery indicator appears on the screen. Unscrew the little cap on the bottom of the thermometer (see pic. below). Pay attention to the polarity (+ and -) of the original battery and install the new battery in the same way.

Note: If the battery is not well placed (polarity inversion) the thermometer can be damaged.

Batteries that are worn out or no longer required must be sent to a dedicated collection point and it must not be sent to an unsorted waste disposal point.



Location of the battery



### 3. Safety recommendations

Measuring device of CO<sub>2</sub> content - types GMA may be operated only by person who became completely acquainted with its function within the framework of the training, or who became thoroughly acquainted with the user's guide of this device.

Measuring device GMA can be used only for determination of CO<sub>2</sub> content in the range of measured values determined by technical conditions. Never connect the measuring device to the withdrawal spots where measured parameters are over measuring capacity of the device. It could cause device destruction and staff injury.

Check device before each measurement. Do not use visibly damaged device and contact the qualified service personnel who provides service for delivered device.

**Warning!** It is forbidden to use the device for pressure higher than 400kPa and for temperature higher than +40 degrees Celsius. It could cause device destruction and staff injury.

### 4. Technical data:

range of CO<sub>2</sub> measurement.....2 - 7,8 g/litre  
range of temperature measurement.....0 - +40 degrees Celsius  
range of pressure measurement.....0 - 400kPa  
accuracy of CO<sub>2</sub> content measurement.....+ - 0,2g/litre  
accuracy of temperature measurement.....+ - 0,5 degrees Celsius  
accuracy of pressure measurement.....+ - 2,5%  
dimensions.....245x210x110 mm  
weight (of empty device).....about 2 kg  
The device is industrial and working measuring instrument.

## 5. Operating instructions

### 5.1 Withdrawal of sample

Measuring device makes it possible to determine CO<sub>2</sub> content in cylindro-conical fermenters and fermenting tanks. It is possible to determine CO<sub>2</sub> content in kegs too but it is necessary to equip the measuring device with accessories for reliable withdrawal of sample from kegs.

Before each measurement it is necessary to check visually the device if it is not damaged. Button (9) on the top of the device must be secured in the lower position (10) before measurement.

**Warning!** Before withdrawal of sample from tank it is necessary to remove sedimented yeast so that filled beer or saturated drinks can be without these sedimented yeast.

1) Check button (9) on the top of the device if it is secured (10). Afterwards the operator connects the inlet hose (3) to the withdrawal spot. The inlet hose (3) must be secured not to fall out.

2) The operator brings the outlet hose (5) to the drain. During this handling the inlet ball valve (1) has to be already shut.

3) The outlet ball valve (2) is still open. Afterwards the operator opens valve of the withdrawal spot and beer or saturated drink can go into the inlet hose (3) to inlet valve (1).

4) The operator handles both inlet (1) and outlet valve (2) and fills the measuring vessel (6) by measured sample. The filled sample of beer or saturated drink should foam as little as possible. The whole measuring vessel (6) must be filled with beer or saturated drink and all foam must be forced out of the vessel. It is necessary to check it visually. The operator holds the device in a vertical position during filling of sample. The operator must try to fill the device vessel (6) without foaming. The operator can achieve it by handling with both valves (1,2).

5) After filling of measuring vessel (6) by beer or saturated drink the operator shuts first the outlet (1) and then the inlet (2) valve and afterwards the operator shuts the sampling valve of the withdrawal spot. After all this the operator opens shortly and shuts immediately the outlet valve (2). After this handling the pressure (in the measuring vessel (6)) is balanced to the zero value.

### 5.2 Measurement

1) After reaching the zero pressure in the vessel (6), the operator pulls out and consequently depresses (twice) the arrestment button (9) on the top of the device. After this handling dissolved CO<sub>2</sub> is fluttered. The operator arrests the button (9) of pump in secured position (10) by moving round.

**Notice!** The operator must always turn the button (9) in clock-wise direction.

Read the value of pressure on device's manometer and temperature on device's thermometer. Adjust the measured pressure against the measured temperature on device's nomogram. Then one can read corresponding CO<sub>2</sub> content on CO<sub>2</sub> scale.

**Warning!** The operator must convince if the closing valve on tank is shut and if internal space of the inlet hose (3) is not under pressure before disconnection of the inlet hose (3) from the withdrawal spot. Afterwards the operator can disconnect the inlet hose (3) from the withdrawal spot.

**Notice!** Plastic reduction can be used in case the diameter of the supplied inlet hose does not fit you. In such case slip the plastic reduction on the inlet hose (3), and slip the hose (with the desired diameter) on the opposite part of the plastic reduction.

## 6.0 Service

Service is provided by company:

**1-CUBE s.r.o.**

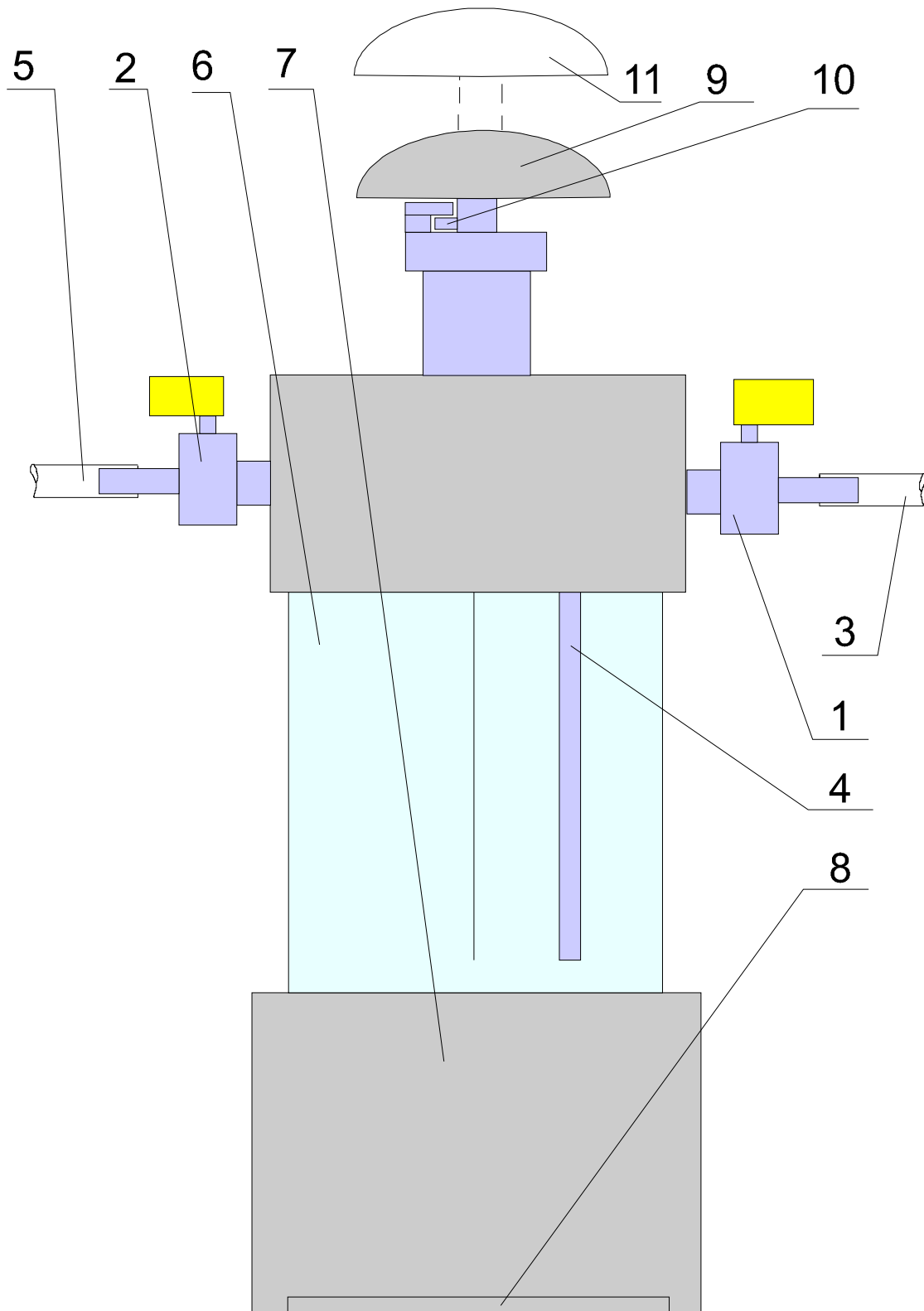
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NOTICE: It is forbidden for anyone except for the manufacturer or authorized company to repair the device.

The design of our devices optimally considers environmental compatibility. In accordance with the EC guideline 2002/96/EG devices that are worn out or no longer required must be sent to a dedicated collection point alternatively, must be sent to 1-CUBE for disposal.



**Symbol description:**

- |                  |                           |              |                               |
|------------------|---------------------------|--------------|-------------------------------|
| 1 - inlet valve  | 4 - bigger stainless tube | 7 -          | 10 - secured (lower) position |
| 2 - outlet valve | 5 - outlet hose           | 8 - nomogram | 11 - upper position           |
| 3 - inlet hose   | 6 - specific vessel       | 9 - button   |                               |