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ICD

**MEASURING DEVICE
FOR CO_2 CONTENT CONTENT AND AIR RESIDUE
IN BOTTLES AND CANS**

USER'S GUIDE

Contents:

1. Equipment

Basic Package:
the measuring device ICD…..…….....…….....1 unit
extra rubber seal..... 1 unit
user's guide.....1unit
Accessories
burette.....1unit
pressure reducing valve with manometer.....….....….....1unit
PET bottles holder…….....1unit
filter 1/2"…….....1unit
ball sample valve 1/2" with outlet for hose.....….....1unit
ball valve1/2"…….....1unit
fixing sleeves Rabow 1/2"…….…..2 units
tightening clamp 13-16 mm…….....2 units
rubber hose (length and number of hoses supplied according to customer's requirement, standard length is 1m)
Note: accessories are not part of the basic package however they are available by request for an additional fee

2. Installation and Maintenance

Place the apparatus on the horizontal and flat support plate (table) close to spout and inlet of pressure water. The lighting intensity should be at least 300 Lx at the workplace and the lighting of the scales should be at least 500 Lx.
Adjust the height of supporting block (4) over the centring dish (14) by the following way - loosen the adjusting srew (6) and shift the supporting block (4) to have the minimum distance between the piercing and withdrawal head (10) and the crown of the bottle placed on the centring dish (14). When you adjust the height in such way tighten the adjusting screw (6). Do it carefully not to strip the thread in the plastic supporting block (4).

Maintenance

We reccommend preceding the measurement to the operator to attach ball valve 1/2" , filter 1/2" to the inlet of waste water, reducing valve with manometer and ball sample valve 1/2" with outlet for hose at the filter's outlet. Max. pressure of the waste water has to be 1 bar i.e. 100kPa.The device is ready for measurement then.
Clean the apparatus always when you finish working with it. Keep the apparatus and place around it clean. The device cleaning after all measurements (before storing) is easy and fast. First adjust the plastic three-way valve in the way to let the washing water flow both into the instrument and waste hose.
First connect the rubber hose leading from ball valve (5) together with tightening clamp to the tap of water supply. Afterwards tighten the tightening clamp.
Shift out the withdrawal probe (3) and place the empty beer bottle on the centring dish (14) and shift the supporting block with the bottle (4) with the help of moving the lever (11). Insert the withdrawal probe (3) into the bottle and open the ball valve (5) of water inlet and appropriately the water cock. Then start to wash the device with water. The used water will be trapped both into the empty beer bottle and it will flow into the sink by waste hose too. Once the bottle is full of water shut the inlet ball valve and pull out and consequently depress button (1) to rinse (clean) pump (2).
After cleaning:
Shift out the withdrawal probe (3) and take out the beer bottle, press down the withdrawal probe (3) and dry it carefully with flannel. After this handling the device is ready for the next measurement.
Warning! Pressure of water must not exceed value 600kPa - on the device manometer and temperatures different from (+ 0,– + 30 degrees Celsius). The device can be damaged in the opposite case and the manufacturer is not responsible for the disfunction of the device in such case!!!
After all measurements the operator must rinse (clean) the device by clean pressure water (before storing).

3. Safety recommendations

Measuring device of CO_2 content - types ICD may be operated only by person who became completely acquainted with its function within the framework of the training, or who became thoroughly acquinted with the user's guide of this device. The person also has to be completely acquainted with work with caustics.
Measuring device ICD can be used only for determination of CO_2 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 600kPa and for temperature higher than +30 degrees Celsius. It could cause device destruction and staff injury.

4. Technical data:

range of CO_2 measurement.....……..1,0 - 9,9 g/litre
range of temperature measurement.....……...0 - +30 degrees Celsius
range of pressure measurement.....……...0 - 600kPa
accuracy of CO_2 content measurement...……..+ - 0,1g/litre
accuracy of temperature measurement....……..+ - 0,1 degrees Celsius
acuracy of pressure measurement.....……....+ - 0,5%
dimensions.....……....565x220x220 mm
weight (of empty device).....……..about 2 kg
The device is industrial and working measuring instrument.
range of air residue measurement in the bottle neck.....0 – 12 ml (scale division 0,1ml)
range of air measurement in the bottle neck…….....0 – 2,2 ml (scale division 0,01ml)

5.0Operating Instructions

5.1.1. Measuring device makes it possible to determine CO_2 content in beer bottles NRW, EURO of 0,5l or 0,33l , plastic bottles or cans.
Prior to measuring it is necessary to visually check the device for damage. Button (1) on the top of the device must be secured in the secured position before measurement.
Shift out the withdrawal probe (3) to the upper position to have the lower part of the withdrawal probe and the piercing and withdrawal head (10) at the same level. Shut both ball valves (5,7). Place the crowned beer bottle or the adapter for plastic bottles on the centring dish (14). Plastic bottle is placed in the adapter for the little neck of screw cap.
Move the lever (11) from the back position to have the bottle neck very close to piercing and withdrawal head (10). Place the bottle in the way having its crown just right in the middle of the piercing and withdrawal head (10) to avoid the inclination. Move the lever (11) in the direction to you to its very end. The crown is pierced with this movement. Insert the withdrawal probe (3) into the bottle. Insert the withdrawal probe into the bottle to the very end (the lower of the withdrawal probe will reach the lowest point in the bottle). Then open and immediatelly after shut the ball valve (7) to reach the zero pressure inside the bottle (can). After that unlock the button (1) on the top of the device and pull out and consequently depress (twice) button (1) after this step the dissolved CO_2 is fluttered.
The instrument is controlled (i.e. choice of measured parameters), savings and marking of the samples are controlled with the help of the keyboard (8) and display (17).

Note: During of measurement of CO2 dissolved in soda water it is necessary to follow this procedure: dip the lower part of the withdrawal probe (3) into the flask with prepared sugar solution or juice. Then pull out the button (1) to suck sugar solution or juice into the pump. Dose of sugar solution or juice is necessary to balance the state of pressure and temperature which requires Henry's law.
Shift out the withdrawal probe (3) to the upper position to have the lower part of the withdrawal probe and the piercing and withdrawal head (10) at the same level. Shut both ball valves (5,7). Place the crowned beer bottle or the adapter for plastic bottles on the centring dish (14). Plastic bottle is placed in the adapter for the little neck of screw cap.
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5.1. Determination of CO_2 content in regime of automatic numbering of measured samples:

5.1.2. press shortly key ON/OFF, text „unit“ will appear on the display

5.1.3. press (about 5s) key  , No. of last measured sample (for example 008) will appear on the display

and right after that "C 4,81"which is the CO2 content of the sample No 008

5.1.4. press key  , No. «009» will appear on the display and after some time the measured pressure

(432 kPa) and temperature (19,3C) will appear on the display and after that the CO2 content "C 4,81" in g/litre.

After that the measurement is over and measured values are saved in instrument’s memory as the number 009

5.1.5. Then open the ball valve (7) (water inlet) and bring the outlet hose to the drain and discharge the foam (it’s discharged with its own inner overpressure) to pressurize off the inner space of the bottle. Then move the lever (11) into the back position. Shift out the withdrawal probe (3).

5.1.6.If you také new measurement after switching off the device please follow the procedure described in 5.1.1., 5.1.2., 5.1.3., 5.1.4. and 5.1.5.

5.1.7. Now if you want to také new measurement without switching off the device please follow the procedure described in 5.1.1., 5.1.4. and 5.1.5.

Press shortly key ON/OFF to switch the device off

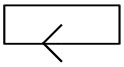
Note: the instrument can be used for measurement of pressure or temperature solely within the range of the device. The procedure of temperature and pressure measurement is described below.

Measurement of the pressure only in regime of automatic numbering of measured samples:

5.1.8. press shortly key ON/OFF, text „unit“ will appear on the display

5.1.9. press (about 5s) key  , No. of last measured sample (for example 009) will appear on the display

and right after that "C 4,81"which is the CO2 content of the sample No 009

5.1.10 then press twice key  and the letter «P» will display

5.1.11 press key  and the No. (010) of sample will appear on the display and the apparatus will measure

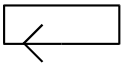
only the pressure in kPa After that the measurement is over and measured value of pressure is saved in instrument’s memory as the number 010**.**

Measurement of the temperature only in regime of automatic numbering of measured samples:

5.1.12. press shortly key ON/OFF, text „unit“ will appear on the display

5.1.13. press (about 5s) key  , No. of last measured sample (for example 010) will appear on the display

and right after that "p 4,81"which is the value of pressure of the sample No 010

5.1.14. press twice key  and "t" appear on the displey

5.1.15. press key  and the No. (011) of sample will appear on the display and the apparatus will measure

only the temperature in degrees Celsius. After that the measurement is over and measured value of pressure is saved in instrument’s memory as the number 010**.**

5. 2. Instrument behaviour and its handling

The instrument can monitor some functions automatically for example monitoring of battery state the others are ordered by the operator for example measurement of different quantities.

5. 3. Look-through of the measured data (results) in apparatus

The instrument has the inner memory for 700 hundred samples. Every record can contain value of pressure, temperature, CO2 content and No. of sample. Indication of the sample is three-digited.
You can record and look at one sample at one moment and go through the records of the samples with the help of the keys PLUS and MINUS. The memory of samples is cyclical (which means that it has no beginning and no end). The user follows the indication of the records. It is useful to remember the number of the last sample to be able to tart the measurement with the last sample and to avoid overwriting of some records.
If the the measured values are out of range the „oFL“ (overflow) will appear on the display and the value is not saved under its numebr in the memory.
Automatic sample increment
The first measurement is automatically saved into the present sample, each following measurement gives the following number.
During the measurement of the temperature, pressure and CO2 the red present LED and AUT the current regime.
During the sampling with automatic sample increment AUT blinks.

5. 4. Switching on and switching off the device, its charging:
- Switching on the switched off device:
a) press key ON/OFF on the membrane keyboard
b) connect the device to the adapter AC/DC
When the operator connects the device to the adapter the time charging by higher current is activated for 16 hours. After this period the charging current is automatically changed over to holding current.

Unscrew the connector of the withdrawal probe (18) and push it out carefully to connect the charging adapter AC/DC. Push in the connector of the adapter carefully into the counterpart of the connector of the withdrawal probe (18) in the way to push in the slot of the counterpart into the corresponding part of the connector of the adapter. Once the charging is over unscrew the connector of the adapter and push it carefully out of the counterpart of the connector of the withdrawal probe (18). Screw the connector of the withdrawal probe (18) back into its counterpart in the way to push in the slot of the counterpart into the corresponding part of the connector of the withdrawal probe (18).
Warning! In the case that the connectors won't be plugged in properly the contacts of the connectors will be damged. In such case the manufacturer is not responsible for the disfunction of the device!!!
We reccomenend to charge when the yellow LED winks, frequent charging of the accumulator decreases the lifetime of the accumulator.
- Switching off the switched on device:
a) press and release key ON/OFF on the membrane keyboard
b) disconnect the device from the charging adapter and press and release key ON/OFF on the membrane keyboard.
c) device is automatically interrupted if it is more than 10 minutes without service (without depression of any key on the keyboard), device peeps about 5 sec. before automatic interruption
d) device is automatically interrupted at discharge of the accumulator
- about 5-10 minutes before discharge of the accumulator yellow indicating LED BAT starts to wink
- about 20-30 minutes before discharge of the accumulator intermittent acoustic indication is activated

6.0 Service
Service is provided by company:

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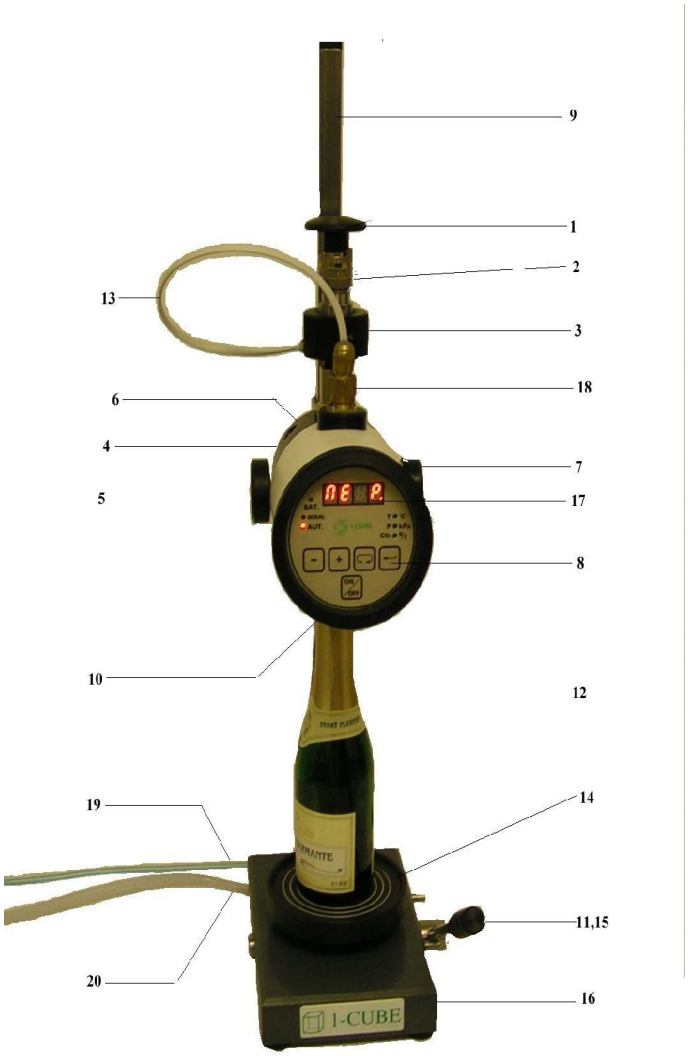
Pic.1. Measuring device



Symbol description:

1-button, 2- pump, 3-withdrawal probe, 4-supporting block, 5-valve - supply of CO2 into the burette, 6-adjusting screw, 7- valve- supply of rinsing water, 8-keyboard, 9-column, 10- piercing and withdrawal head, 11-lever, 12-bottle, 13-withdrawal probe cable, 14-centring dish, 15-lifting mechanism, 16-base, 17-display, 18-connector of withrawal probe and AC/DC-adapter, 19-hose for burette or oxygen meter, 20-hoses for washing and waste water