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LSN2

LABORATORY BEVERAGE CARBONATOR

USER'S GUIDE

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1. SCOPE OF DELIVERY

Standard instrument delivery scope:

LSN2	1 pc
Protective guard for big bottle	1 рс
Blow needle	1 рс
User's guide	1 рс
Warranty certificate	1 pc

Instrument accessories:

The accessories are not included in the instrument delivery and it is delivered on the customer's request only.

2. INSTRUMENT INSTALLATION AND MAINTENANCE INSTRUCTIONS

The LSN2 laboratory beverage carbonator (hereinafter the instrument) is delivered wrapped in the protective package together with the ordered accessories. The accessories above can be delivered as requested by the customer.

After the delivery of the instrument composed of two components - carbonator automatic system "B" and carbonator instrument "A" - it is necessary to unpack all the delivered parts carefully from their protective packages.

We recommend that you get firstly familiar with this user's guide and Figures 1, 2, and 3. These documents and the following text details depict all the parts you will come into contact with during your work.

Place the instrument on a horizontal underlay (workbench) near the power socket and the CO2 pressure bottle with the pressure reducing valve and the safety valve.

Once the working day is over, maintain and clean the instrument surface from the remainders of beer or carbonated beverages by using a wetted flannel (soft) cloth to wash the contaminated points while the instrument is disconnected from the mains.

Insert the end of pressure hose 4/2.5 mm into the quick-acting coupler **5** on the instrument and the other end into the quick-acting coupler on the gas distribution- carbon dioxide , hereinafter $-CO_2$.

Fit the CO₂ gas distribution with the following:

- shut-off valve
- pressure reducing valve that allows attainment of the CO₂ pressure in the gas distribution of up to 600 kPa
- safety valve that is sure to blow off when the pressure is higher than 600 kPa. Connect the safety valve into the gas distribution between the instrument and the pressure reducing valve and proceed in harmony with the safety valve manual!

We recommend to have the gas distribution assembled and tested by a specialized company.

Connect the two parts, carbonator automatic system "B" and carbonator instrument "A" as follows:

- insert the connector of the coiled cable 25 of the carbonation instrument "A" into socket **29** located on the front panel of the automatic system of carbonator "B"
- insert fully the free pressure hoses 4/2.5 mm located on the front panel of the automatic system of carbonator "**B**" into relevant quick-acting couplers according to Fig. 1 and Fig. 2.

Description:

- insert the top hose located on the front panel of the automatic system of carbonator "**B**" position **28**, into the quick-acting coupler **12** of the carbonation instrument "**A**"
- insert the pressure hose **26** of the CO2 return line of the automatic system of carbonator "**B**" into the quick-acting coupler **27** of the carbonation instrument "**A**"
- insert the CO2 return line pressure hose of the carbonation instrument "A" into the free quick-acting coupler **27** of the carbonation instrument "A"

3. SAFETY RECOMMENDATIONS

The instrument can be operated exclusively by the trained person who is familiarized with this user's guide.

Avoid carbonation without the bottle in the protective guard !

Avoid using higher bottle pressure (carbonation) than 550 kPa (5.5 bars, 80 PSI), for the procedure see 5.0

Avoid operating the instrument without correctly connected and adjusted pressure reducing valve and safety valve!

The instrument can be used exclusively within the value range specified by the technical specifications.

Before each use, the instrument must be checked to see whether or not it is visibly damaged.

Avoid operating the damaged instrument and hand it over to the specialized company for repair.

4. TECHNICAL SPECIFICATIONS

The instrument is used for quick preparation of the carbonated beverage samples for the laboratory tests.

The device is intended exclusively for the industrial applications in a normal environment.

voltage systemTN-S, 230 V/50 Hz or 110V/60Hz
protection element
protection classIP40
maximum operating temperature range+5°C to +40°C
maximum CO2 pressure
minimum sample volumeabout 0.1
maximum sample volumeabout 2l
CO_2 dosing range
CO_2 dosing accuracythe moment the carbonation finished, before the bottle is depressurized)
maximum size of the packagediameter 95mm, height 380mm
automatic system's dimensions530 x 300 x 420mm (h x w x d)
carbonation instrument dimensions900 x 245 x 290mm (h x w x d)
LSN2 instrument weightabout 15kg

5. OPERATING INSTRUCTIONS

5.1. OPERATION OF CARBONATION INSTRUMENT "A"

5.1.1 BEVERAGE CARBONATION IN A GLASS BOTTLE

The protective guard **121** is designed for your biggest glass bottle. The following paragraph applies for the smallersized bottles.

In case of the smaller-sized bottles, always put the insert **131** into the protective guard **121** for specific bottle type. When using the insert **131** apply the fixture **14** by screwing it into the insert **131**. Use the fixture **141** to locate the insert **131** into the protective guard **121**. It is necessary for the insert **131** to fit into the hole in the bottom of the protective guard **121**. Afterwards screw out the fixture **141** from the insert **131**.

Before loading the bottle with beverage into the protective guard **121** supply CO_2 through the blow needle **8** into the bottle neck in order to remove air from the bottle neck. Open slightly the valve on the blow needle **8**, check the CO_2 flow manually for its intensity, then insert the blow needle **8** into the bottle neck above the beverage level and use CO_2 to remove air from the bottle neck.

Once the air is expelled from the bottle neck, load the bottle with beverage into the protective guard **121**.

Adapt the free area under the carbonation needle **18** for insertion of the protective guard **121** to the bowl of lifter **7** by holding the carbonation head **13** in one hand while using your other hand to loosen the lock screw **10**. With the lock screw **10** released, shift the carbonation head **13** up along the guide bar **11** to the necessary height. Secure the position of carbonation head **13** by tightening the lock screw **10**.

Place the guard and bottle **121** on the lifter bowl **7**while taking care for the guide bar **11** to fit into both notches in the guard **121**.

Insert carefully the carbonation needle **18** into bottle with beverage by holding the carbonation head **13** in one hand while using your other hand to loosen the lock screw **10**. With the lock screw **10** released, shift the carbonation head **13** carefully down along the guide bar **11**. In doing so, introduce the carbonation needle **18** into the bottle neck. Place the stop **151** against the bottle neck and push the carbonation head **13** fully to the stop **151**. Check the foam sensor **16** for being inside of the bottle, then tighten adequately the lock screw **10**, take out the stop **151**, switch the lifter lever **161** from the rear position to the front position. Close the blow-off valve **14**.

Proceed further according to § 5.2.

5.1.2 BEVERAGE CARBONATION IN A PET BOTTLE

Use the protective guard for PET bottle and follow the same steps as in the glass bottle (§ 5.1.1)

5.2. OPERATION OF THE AUTOMATIC SYSTEM OF CARBONATOR "B"

After the instrument has been turned on using the main switch, the text below appears shortly on the display:

1-CUBE, and consequently:

ON carbonation F1 adjustment

It is the instrument's start position in the software navigation menu.

Press the ON key to initiate the automatic beverage carbonation process according to the last setting of the instrument.

Press the plus or minus key during the carbonation process to increase or decrease the carbonation speed. The maximum carbonation speed is 255 and the minimum carbonation speed is 0. The carbonation speed is displayed in the second line on the right behind the "**CO2** %=" symbol. Carbonation can also be terminated in any time by placing the main switch to Off.

Once the preset beverage carbonation value is reached the instrument warns operator of the fact the carbonation process is completed by hooting.

Stop hooting by pressing the "OFF" key.

5.2.1 BOTTLE REMOVAL FROM INSTRUMENT

You have to depressurize the bottle interiors now. To do so, insert the hose end from the blow-off valve **14** into the air trap and take care to open the blow-off valve **14** slightly while checking the bottle interiors for excessive generation of foam. Once the bottle is depressurized, switch the lifter lever **161** to the rear position and adapt the free area under the carbonation needle **18** for extraction of the protective guard **121** with the bottle out of the

instrument by holding the carbonation head **13** in one hand while using your other hand to loosen the lock screw **10**. With the lock screw **10** released, shift the carbonation head **13** up along the guide bar **11** to the necessary height. Secure the position of carbonation head **13** by tightening the lock screw **10**. Take the protective guard **121** and the bottle out from the instrument.

5.2.2 PARAMETERS SETTING

Pressing the *F1* key gives you a chance to alter the last instrument setting (the last setting remains saved in the instrument even after the instrument deactivation):

Selection step 1:

Display:

1= Glass , 2=PET 001

It is the operation mode selection. Press the + and - keys to change the value in the Line two.

001.....it corresponds to the **Glass** mode (it is entered for the glass bottle)- when in this mode the carbonator **carbonates the beverage**

002.....it corresponds to the **PET** mode (it is entered for the PET bottle)- when in this mode the carbonator carbonates the beverage

Confirm the selected operation mode by pressing the ENTER key, and the program will allow you to carry out

Selection step 2:

Display:

Bottle vol. [I]= (for the glass bottle) or Beverage vol.[I] (for the PET bottle) 00,525

Press the + and – keys to change the value in the Line two.

Caution:

the volume is set in litres and you have to state the real bottle volume you have measured.

Confirm the selected operation mode by pressing the ENTER key, and the program will allow you to carry out Selection step 3.

Selection step 3:

Display:

saturation [g/l] 05,0

Press the + and – keys to change the value in the Line two.

Confirm the selected operation mode by pressing the ENTER key, and the program will allow you to carry out Selection step 4:

Selection step 4:

Display:

1-Water, 2-Wine 3-Beer, 4-M.=001

Press the + and – keys to change the number at the end of Line two to the value that corresponds to the carbonated beverage you have selected, i.e. to: 001 for water, 002 for wine, 003 for beer with fixed preselected speed of carbonation for the specified beverages.

Value 004 allows you (consequently in Step 6) to preselect the carbonation speed for any beverage within 1 to 255 by pressing the + and – keys. Confirm the selected operation mode by pressing the ENTER key, and the program will allow you to carry out Selection step 5:

Selection step 5:

Display:

pres.bottle[kPa] 0550,0

Press the + and – keys to change the number in Line two to the value of the pressure that **must not be higher than** the maximum value of the operating pressure of the bottle you used expressed in kPa = (the bottle manufacturer's data). The maximum bottle pressure value that can be set in the instrument is 550 kPa.

Confirm the selected operation mode by pressing the ENTER key, and the program will allow you to carry out Selection step 6:

Selection step 6: (Remark: 6. the selection step is displayed and set only in the case you set the value 004 in the Selection step 4)

Display:

Speed saturation 255

Press the + and – keys to change the value in the Line two that corresponds to the carbonation speed in a range from 1 to 255.

Confirm the selected operation mode by pressing the ENTER key, and the program will allow you to carry out Selection step 7:

The values preset in Step 1, 2, 3, 4, 5, and 6 remain saved to the instrument memory for each next carbonation process. Should you intend to change them you have to perform the procedure above again.

Selection step 7:

Display:

Enter- Flushing OFF- End

By pressing the **OFF** key you immediately switch to the instrument's start position, and the text below appears on the display:

Display:

ON carbonation F1 adjustment

Once the **ENTER** key is pressed the contaminated CO_2 is discharged automatically from the instrument and the pure CO_2 is taken into the instrument consequently. The sequence of individual activities during the process of discharge is described on the display.

It is useless to do the specified task no more than once should you suspect the CO_2 in the instrument is not pure and that this CO_2 is enriched by the air from the package neck volume from the previous carbonation processes.

In case you use CO_2 , supplied from the carbonation needle **18** into the neck area, to blow out thoroughly the remaining air from the bottle neck before each carbonation there is no need to discharge CO_2 from the reservoir.

5.3. TROUBLESHOOTING

The following text may appear on the display after the carbonated beverage has been depressurized or during the process of carbonation:

text on the display once the instrument is switched on:

or text on the display during carbonation:

Wet sensor	Waiting to
clear, dry up !	drop Foam

The text appears each time the foam sensor is immersed in foam when the carbonated beverage is being carbonated or depressurized once the process of carbonation has been finished.

During the process of carbonation (the following text appears on the display: Waiting to drop Foam) check the filter **22** for the carbonated beverage. If it is not the case you can opt for one of the two options below:

a) continue the carbonation process :

you will have to perform continuous visual check to see whether or not the beverage enters the filter **22**, simultaneously press the minus key to reduce the carbonation speed. Hold the minus key depressed until the foam in the bottle neck drops down and the foam ceases to penetrate into the carbonation head **13**. In case the foam continues penetrating the carbonation head **13** terminate the carbonation by placing the main switch **20** to Off.

Once the preset beverage carbonation value is reached the instrument warns operator of the fact the carbonation process is completed by hooting.

Stop hooting by pressing the "OFF" key.

Now take out the bottle from the instrument by following the section 5.2.1 Removing Bottle from Instrument

b) Stop carbonation: place the main switch **20** to Off and take out the bottle from the instrument by following the section- *5.2.1 Removing Bottle from Instrument*

5.3.1 CLEANING AND DRYING THE FOAM SENSOR

Servicing the foam sensor 16 perform whenever the text below appears on the display:

"Wet sensor clear, dry up !"

The first thing you always need to do is depressurizing the bottle interiors, see the procedure above, and consequently :

use the plastic rinser and distilled water to rinse thoroughly the interiors of the foam sensor **16**, then use CO2 from the blow needle **8** to blow out and dry the foam sensor interiors. Perform servicing till the text below disappears from the display **24**:

Display:

Wet sensor clear, dry up !: should disappear

5.3.2 FILTER BLOWDOWN

In case the carbonated beverage enters the filter **22** during the process of carbonation, discontinue it and terminate carbonation by placing the main switch **20** to Off.

Now take out the bottle from the instrument by following the section- 5.2.1 Removing Bottle from Instrument

Then loosen the screw **21** on the filter. Place identical but empty bottle into the protective guard **121**. Slip the guard with empty bottle **121** to the lifter bowl **7** while taking care for the guide bar **11** to fit into both notches in the guard **121**.

Insert carefully the carbonation needle **18** into the empty bottle by holding the carbonation head **13** in one hand while using your other hand to loosen the lock screw **10**. With the lock screw **10** released, shift the carbonation head **13** carefully down along the guide bar **11**. In doing so, introduce the carbonation needle **18** into the bottle neck. Place the stop **151** against the bottle neck and shift the carbonation head **13** fully to the stop **151**. Check if the foam sensor **16** is in the bottle, then tighten adequately the lock screw **10**, take out the stop **151**, switch the lifter lever **161** over from the real position to the front position. Shut off the blow-off valve **14**.

After the instrument has been turned on using the main switch **20**, the text below appears shortly on the display: 1-CUBE, and consequently :

ON Carbonation F1 Adjustment

Pressing the ON key initiates automatic CO2 blowing of a beverage from the filter.

As soon as the beverage is removed from the filter **22**, stop the instrument using the main switch **20** and tighten the screw **21** on the filter. Now take out the bottle from the instrument by following the section *5.2.1 Removing Bottle from Instrument*

5.3.3 CARBONATION NEEDLE REPLACEMENT

Replace the carbonation needle 18 exclusively when the instrument is turned off by the main switch 20.

Replacement is necessary:

- when changing the type of the bottle you use use the carbonation needle designed for the specific bottle type
- if the carbonation needle 18 gets damaged in this case, use the carbonation needle of identical size

The carbonation needle **18** replacement procedure follows:

Use one hand to apply pulling grip at the carbonation needle **18** on the blue hosing while pushing the plastic ring of the quick-acting coupler **17** with the thumb and index finger of the other hand simultaneously in the opposite direction. By following this procedure you will push the carbonation needle **18** out from the quick-acting coupler **17**. Insert fully the new carbonation needle into quick-acting coupler **17** from the blue hosing side.

5.3.4 Shifting carbonation head 13 along the guide bar 11

If the carbonation head cannot move easily along the guide bar and it even gets stuck in certain points even with the lock screw **10** released, it is necessary to slide the carbonation head **13** out from the guide bar **11**. Before doing this, it is necessary to:

remove the blue tubings from the quick-acting couplers 27 and 28, and the connector 25 from the socket 29. Once the carbonation head 13 is pulled off the guide bar 11 release the stainless insert 30 that will reveal distortion in the point where the lock screw 10 is operated. You have to eliminate this distortion. To do so use hammer to carefully align this distortion or use a new stainless insert 30 instead of the damaged insert.

6. SERVICING

The instrument is serviced by the company below :

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The instrument contains neither any substances harmful to health nor the substances hazardous for the environment.

Once the product life expires we recommend that the product is disposed of according to the applicable waste category. Hand the metallic parts made of brass, iron, plastic parts, electronics, and package material over into the separated garbage collection as a secondary raw material.



Fig.1

1-2.5A fuse, 2-power supply cable ,**30**-stainless insert , 4-blowdown plug , 5-quick-acting coupler for CO2 supply from the pressure reducing valve of the CO2 distribution system, 6-quick-acting coupler for the blow needle connection, 7- lifter bowl, 9-air trap, 10-lock screw, 11-guide bar, 25-coiled cable connector, 121-protective guard, 161-lifter lever-front position





7-lifter bowl, **10**-lock screw, **11**-guide bar, **12**-quick-acting coupler of CO₂ supply into the carbonation instrument-A, **13**-carbonation head, **14**-quick-acting coupler with the blow-off valve, **15**-carbonation head nut, **18**-carbonation needle, **19**-blow-off hosing introduced into the air trap-**9**, **20**-main breaker of the carbonator's automatic system, **21**-filter screw, **22**-filter, **23**-RS 232 connector, **24**-keyboard with display, **25**-coiled cable for the foam sensor connection, **26**-pressure hosing of the CO₂ return line from the carbonation instrument, **27**-quick-acting coupler of the CO₂ return line from the carbonation instrument, **28**-pressure hosing of the CO₂ supply into the carbonation instrument, **29**-socket, **131**-insert, **141**-fixture, **151**-stop



Fig.3

10- lock screw, **16**-foam sensor, **17**-quick-acting coupler for the carbonation needle connection, **18**-carbonation needle