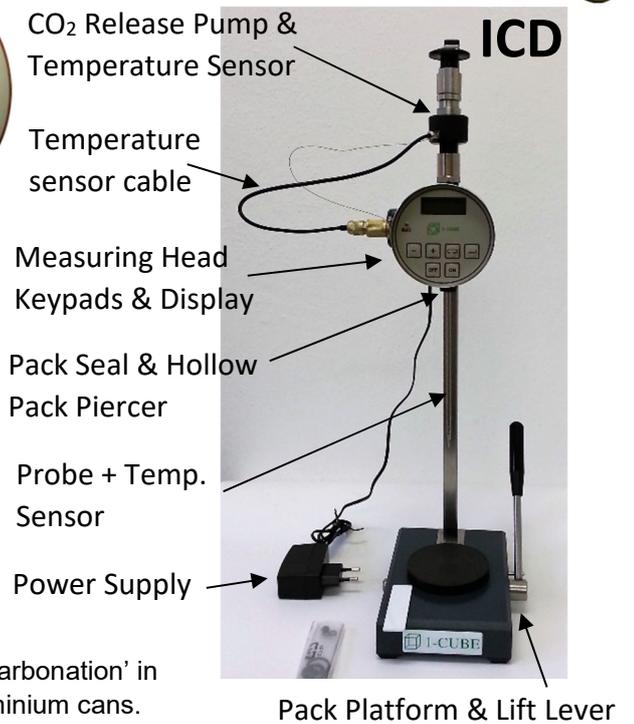


Please also read the 1-Cube User's Guide

Key pads on the instrument keypad:

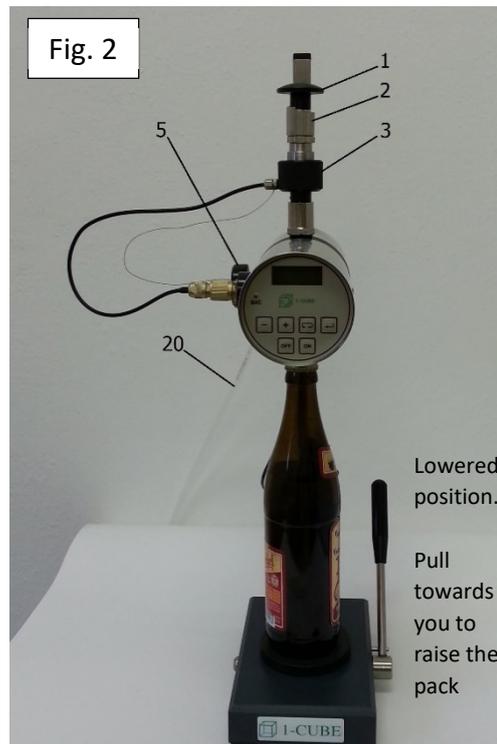
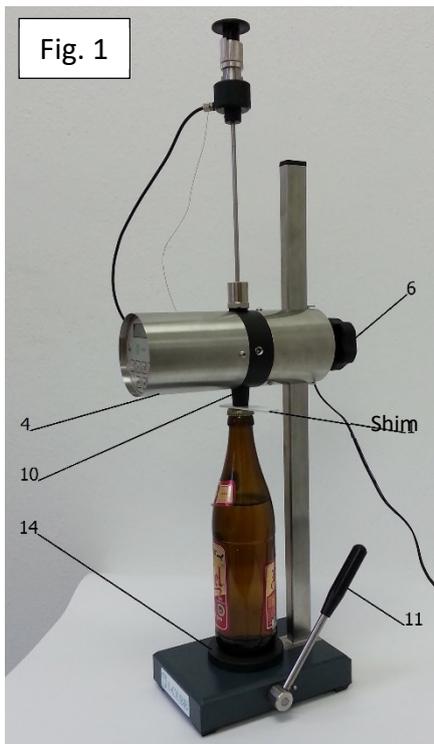
	ENTER symbol. Press to start the selected measuring sequence or to enter menu item.		
	Press + to read CO ₂ results from 'memory' in g/l. Displays results chronologically (oldest first). Memory capacity max. 450 readings.		
	Press - to DELETE Results Memory		Rotate function is not used in this version of ICD
	Press ON to start the ICD electronics		Press OFF to switch off the device.



The ICD is designed to determine the dissolved CO₂ content 'Carbonation' in beers and ciders packed in bottles with Crown Caps and in aluminium cans.

Pack Dimension Limits: Height: 50 to 360 mm. Dia.30 to 110 mm (For PET ask)

Before use, learn how an ICD operates. Please watch video: <https://www.youtube.com/watch?v=55tPq37e60k>
 After use the ICD will need to be cleaned, by flushing with clean water via the 6mm OD hose connected to the back of the instrument. Therefore, install it near a suitable water supply (max. 30°C, 4 bar g) and drain.



Typical piercing position on a can

Note: The hollow pack piercer 'knife' is screwed into the bottom of the measuring head (4). It is protected inside the rubber pack seal cone (10). Warning: The piercer 'knife' can be sharp. To reveal the piercer 'knife' pull down on and remove the conical rubber seal (10). Push the rubber seal back into position.

- 1) Connect the power supply (240v 1ph 50Hz). Do not switch on yet.
- 2) Carefully insert the 'probe & pump unit' (1, 2 & 3) into the measuring head (4). Leave the probe in the raises position as shown in Fig. 1. Note:
 - THE PROBE NEEDLE IS NOT THE PACK PIERCING NEEDLE.
 - The temperature sensor is built into the probe needle. It is delicate, treat it with care!

- 3) Carefully connect the temperature sensor cable to the measuring head (4).
- 4) Loosen the large locking screw (6) until the measuring head (4) can slide up/down. Raise the head (14) enough for a pack to be placed onto the platform (14). Slightly tighten screw (6).
- 5) Lower platform (14) using lever (11). Place the unopened pack on to the centre of the platform. To line-up with the pack seal (10). For cans the piercing point is normally to one side adjacent with tab.
- 6) Loosen locking screw (6). Raise or lower the head until there is a slight clearance between the cap top and the rubber seal (10), ca. 3.5 mm. The plastic shim may help. Cans often require a different clearance. Some experimentation is often required, especially with cans. Tighten locking screw (6).
- 7) Gently close valve screw (5). Do not over tighten! The thread in the ICD head is plastic.

You are now ready to pierce the pack.

- 8) Firmly move/pull lever (11) to lift platform (14) and the pack. In one movement, this first seals with pack top/cap, then pierces the pack. Finishing after a full movement, Lever (11) is horizontal/flat.
- 9) Gently lower 'probe & pump unit' (1, 2 & 3) into the pack, through the pierced hole (see fig. 2). **The probe needle should not touch the bottom of the pack.** If required, custom short probes are available on request.
 - DO NOT PUSH HARD ON PLUNGER (1). Note: If resistance is felt the piercing may be incomplete. If so, lift probe (1, 2 & 3) from the pack. Lower, remove & inspect pack. Note a hole should have been pierced right through the pack cap. If necessary slightly lower the head (4).
- 10) Open valve screw (5) for a very short time (about 1 second), to quickly release the head space pressure. Then close gently close valve screw (5). Do not over tighten!
Note: excess gas/waste is discharged via hose (20)
- 11) To encourage CO₂ out of solution from the product. First support the 'Probe & Pump unit' (1, 2 & 3), by holding the knurled collar (3). Then rotate Pump Plunger (1) to unlock. Pump the plunger THREE times with full strokes. Finally rotate and re-lock the pump plunger in the down position.

You are now ready to calculate the dissolved CO₂.

- 12) Connect power. Switch on ICD head. Red LED is on. Press ON keypad. Display = **ENT.meas +view**
- 13) To start the calculation process, press ENTER.
Display = 1st 'Measure' for 20 sec., 2nd Temp., 3rd Pressure, 4th Calculated **CO₂** in Vol and g/l
- 14) Press ENTER to stop and go back to the beginning.
- 15) Display = **ENT.meas +view**. The ICD ready for the next measure and calculation.
- 16) Press OFF to switch OFF. The ICD is power OFF automatically after several minutes of no use.

To view previous readings from the memory.

- 17) With ICD ON, Press + (plus). Up to 450 values are stored. They are displayed in chronological order, oldest values first. In grams per litre, not volumes. 655,35 appears after the last saved reading.
- 18) Press ENTER to stop reading. 19) To delete the memory, with ICD ON, Press - (minus).

Finally REMEMBER TO CLEAN the ICD after each session.

An empty and clean bottle with pierced or larger drilled cap is required to receive water. It is placed into the ICD in the same position as a bottle for measurement. Please organise connectors to suit your water supply (max. 4 bar, max. 30°C). A loose 6mm hose is supplied with '1/4" male x 6mm Push Fit' for connection to a clean water supply. ICD Hose (20) has a T with 3 connections (see hose labels):

1. From Water Supply, **2.** Water supply to ICD via hose (20), **3.** Open to drain (to avoid over pressure).

- 1) With valve (5) closed, connect the hoses to a clean water supply (turned OFF), ICD and open to drain.
- 2) Lift up the 'probe & pump unit' (1,2 & 3) to allow the empty bottle to be fitted, as above.
- 3) Place the empty bottle on the platform. Lift using lever (11) to create a seal (10). The hollow piercer should pass through the same hole.
- 4) Lower the 'probe & pump unit' (1,2 & 3) into the bottle. The probe should not touch the bottom.
- 5) Turn-on the water supply. Water will start running to drain.
- 6) Open valve (5). Water will flow up hose (20) through ICD measuring head (4) and into the bottle.
- 7) Close valve (5) when the bottle is full. Turn off the water supply. Now unlock and operate the pump about 5 times to flush out all product deposits.
- 8) Finally (carefully) lift out the 'probe & pump unit' (1,2 & 3). Lower and remove the bottle.
- 9) If necessary, operate the 'probe & pump' alone in a container of water. Then empty the pump.
- 10) Clean and carefully dry the probe with a soft cloth. 10) It is now ready for re-use.

This instrument uses a formula derived from learned research and the principle of gas solubility for a given gas in a given liquid described in 1803 by English Chemist Dr William Henry - '**Henry's Law of Partial Pressures**'. Other instruments in the market use the same principle, but with differences in their formulae. Some variance in results is normal. Beverages are complex and variable liquids, with different gas solubility characteristics.

*We hope you enjoy making great drinks, helped a little by your new 1-CUBE instrument.
There is more equipment for brewers on our websites. Ask if you have any questions..*

ICD1-1808