Nitro Dispenser
Operation Manual

230V / 50 Hz Models: ND-20-01-01 / ND-20-02-01

ND-20-01-01 CO / ND-20-02-01 CO

ATTENTION:
Before start of operation, study this manual

Carbotek Systems GmbH, Germany

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1. Safety Instructions

1.1. Setup / Commissioning

The use and maintenance of the machine shall be limited to trained personnel only.

Place the unit upright standing in a horizontal, level, dry, and clean place. Ensure that the power connection cable is routed directly to the socket. Do not locate multiple portable socket-outlets or portable power supplies at the rear of the appliance. The connecting cable must never be kinked or squeezed and the lateral openings require a free distance of 5 cm to provide the required air circulation. The free distance behind the dispenser must be as well 5 cm. The dispenser front, with the tap outlet must stay open and uncovered.

As an operator pay attention to the listed safety measures:

- Operate dispenser within a temperature range of +6 to +35°C
- Prevent dirt (dust, fibers, etc.) from entering the unit
- Connect only the specified supply voltage.
- The wall socket used must be connected to an overcurrent protection device (16A).
- The device may only be operated with a properly wired protective earth conductor.
- Protect the device against moisture
- Do not insert objects into rotating parts (fan or compressor)
- Observe the warning, safety and service instructions in this manual

1.2. Operations

The device described here may only be operated by suitably trained persons. Children shall not play with the machine. This machine can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision and instruction concerning use of the machine in a safe way and if they understand the hazards involved. Cleaning and user maintenance shall not be made by children.

Do not use a water jet for cleaning purposes.

Keep ventilation openings, in the appliance enclosure, clear of obstruction. The air circulation must be possible at any time.

Do not damage the refrigerant circuit. The R290 refrigerant is an extremely flammable gas.

Serious personal injury and material damage can be caused by:

- Improper use
- Incorrect installation or operation
- Unauthorized removal of the necessary protective covers or housings
- Invalid opening of the device during operation
- Failure to comply with the applicable legislation / standards for beverage dispense installations.
- Service and repair jobs where access to the machine inside is required, may only be carried out by a trained or instructed technician

If, for any reason, it can be assumed that the safety is impaired or when it is changed from normal operation, the appliance must be put out of service and marked so that it is not inadvertently put back into service by a third party. In addition, the customer service has to be notified. Safety may be impaired if the appliance is not working properly or is visibly damaged.

1.3. Spare Parts

If modules or parts are replaced, only identical & original assemblies or parts may be used.

1.4. Transport and Storage

Damages determined after delivery must be communicated immediately to the carrier. Commissioning may be excluded. The device must only be stored in a dry environment at temperatures of 0 to 60°C.

1.5. Electric Connections

All work must be carried out only if:

- The electrical system is switched off and protected against unintentional reconnection
- Verified that no current is present.
- It is ensured that additional monitoring and protection devices, which are provided for the operation of this control, are installed in a professional manner.

When connecting, ensure that applicable local standards and regulations are observed.

1.6. Service

For service and repair jobs please refer to the technical service manual.

1.7. Intended Usage

The Carbotek Nitro Dispenser is a ready-to-use dispenser to tap nitrogenated and cooled beverages in particular cold-brew coffee or coffee cocktails. This machine is intended for indoor use only. Such as: Small shops, convenience stores and kiosks, bars and restaurants, staff kitchen areas in shops, offices and other working environments, hotels and motels. It may be used in private households as well.

The device is only approved for this application and is not suitable for cooling hot liquids, unfiltered liquids, chemicals or similar.

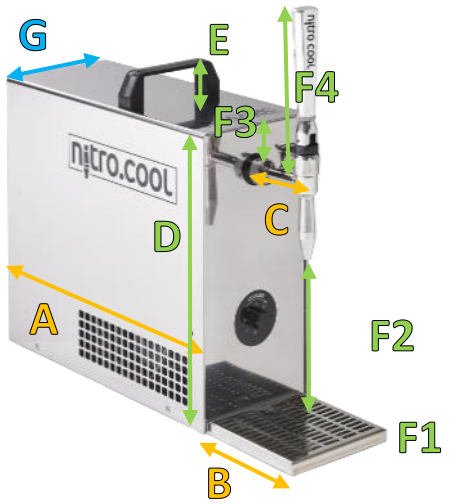
2. Before Start

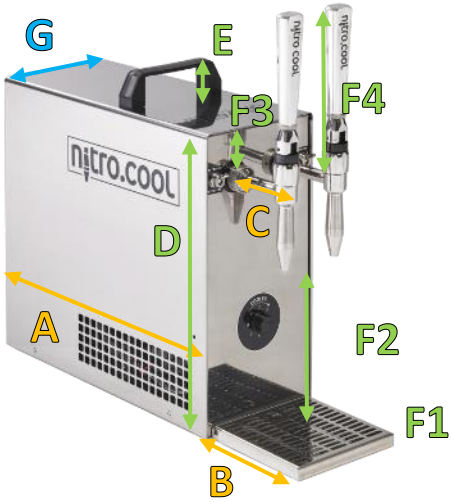
2.1 Dispenser Functionality

The Carbotek Nitro Dispenser combines different functions in one device.

- Suction of filtered liquids (e.g. cold-brew coffee) from an unpressurized or pressurized container, possibly from a bag-in-box.
- Cooling the liquid in the dispenser cooling block
- Injection of filtered compressed air into the liquid. The atmospheric nitrogen (78%) and the oxygen (21%) in the air creates the cascading nitro effect. A built-in compressor is used. There is no nitrogen generator embedded.
- The liquid and the gas are blended in the jet-nozzle spout of the tap.
- Dispense of nitrogenated beverages in the typical Guinness style.
- With a toggle switch the operator can switch between nitrogenated and non-nitrogenated drinks.
- Outlet temperature control.

2.2 Dimension





The outside dimensions between 1-tap and 2-tap versions are identical.

Depth

A :	body depth	40.5 cm
B :	drip tray	14.5 cm
C :	tap	10.5 cm
A + B :	total depth	55.0 cm

Height

D :	body height	37.5 cm
E :	handle height	4.5 cm
F1 :	drip tray	1.5 cm
F2 :	max glass height	20.5 cm
F3 :	above tap	5.0 cm
F4 :	tap with handle	20.5 cm
D – F3 + F4	total height	53.0 cm

Width

G :	width	17.5 cm

2.3 Technical Data and Properties

Taps	**1 Tap**	**2 Tap**
Model	**ND-20-01-01**	**ND-20-02-01**
Picture		
Beverages	Cold-Brew-Coffee, Tea, Coffee-Cocktails	
Electrical & refrigerant		
Power supply	220 – 240 V~ / 50 Hz	
Wattage / amperage	408 W / 1,7 A	
Refrigerant / amount	 R290, 47g **Propane is an extremely flammable gas**	
Electrical connection	C14 socket	
Power cable	Country specific plug with C13 plug	
Cooler type	dry	
Climatic class	N	
Accessories		
5l cleaning or product canister with ball-lock pin	1 x	2 x
Drip tray	1 x	
Intake hose with strainer and ball-lock coupler	1 x	2 x
Inlet strainer for particles > 0.1 mm	1 x	2 x
Cleaning agent	1 jar (566 g) of ONE PRO cleaner from URNEX	
Features		
Nitrogen source	Filtered compressed air (78% nitrogen)	
Jet nozzle with 2-hole disc (flowrate 0.6 l/min)	1 x	2 x
Nitro toggle switch to switch between NITRO and NON-NITRO	1 x	2 x (each tap)
Gas amount control	No adjustment – default factory setup	
Particle air-filter	Yes	
Nitro-Port to connect nitrogen bottles	No	

Temperature setup	5.0 – 6.0°C (at level 7 on front scale) can be adjusted to lower temperatures for alcoholic drinks. For Espresso Martini e.g. -1°C at level 7 on front scale.	
Liquid volume inside dispenser	1 x 370 ml	2 x 300 ml
Cooling effect during nonstop dispense	Δ 7.0°C (at 0.6 l/min)	Δ 7.0°C (at 0.6 l/min)
Continuous (non-stop) dispense is only possible until an ambient temperature of 30°C. Between 30 and 35°C non-stop dispensing is possible up to 30 min. Then the dispenser needs a recovery break of 15 min to cool down again.		
Device connections		
Product inlet	1 x CPC coupler 3/8” hose	2 x CPC coupler 3/8” hose
Available options		
Jet nozzle with 5-hole disc (flowrate 1.2 l/min)	available	available
Tap extension to place dispenser undercounter and dispense via dispensing tower.	available	available
Railing on dispenser top – instead of handle	available	available
Vitop couplers for intake line	available	available
Mix-Box add on module for a concentrate supply chain	available	not yet available
Customizable sticker	available	available
Espresso Martini gas nozzle for extra fine crema	available	available
Others		
Noise emission level	<= 64 dB	
Warranty	1 year	
Weight & dimensions		
Net / gross weight	20.9 kg / 23.3 kg	23.5 kg / 25.9 kg
Dispenser dimensions (H x W x D) including tap handle	53.0 x 19.5 x 55.0 cm	
Packaging dimensions (H x W x D)	70.0 x 25.5 x 50 cm	

2.4 Filtration

Ensure that the coffee was filtered with a fineness of at least **100 µm** (100 micron). Coarser filtration sizes lead to clogging of the filter in the intake line or in the jet-nozzle outlet-spout of the tap. Make sure the filter adapter is installed in the coffee intake line. The filter adapter provides a particle size filter of 100 µm.

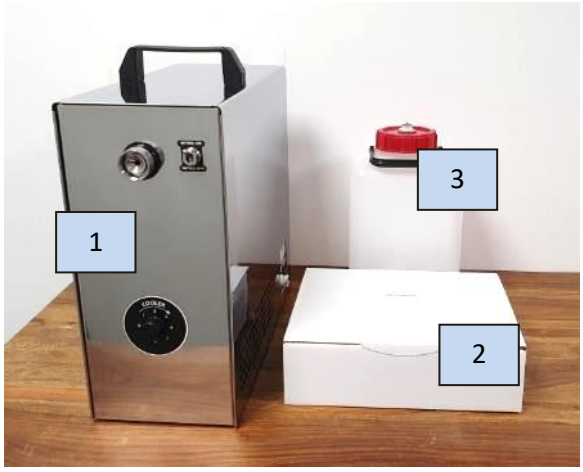
Attention!

By not using an appropriate intake filter the internal dispenser pump might be damaged or destroyed through coffee particles.

3. Commissioning

3.1. Scope of Supply

The Nitro Dispenser is delivered with the components as listed below. The model specific differences are listed in the table.

	1-tap Nitro Dispenser	2-tap Nitro Dispenser
	1) 1x Nitro Dispenser 2) 1x Accessories box 3) 1x 5l coffee canister	1) 1x Nitro Dispenser 2) 1x Accessories box 3) 2x 5l coffee canister
	**Accessories box parts** 2.1) 1x drip tray 2.2) 1x intake hose 2.3) 1x ONE-PRO cleaner 2.4) 1x dispenser tap 2.5) 1x tap handle 2.6) 1x tap & filter key 2.7) 1x power cord *1 2.8) 2x deflecting shield *	**Accessories box parts** 2.1) 1x drip tray 2.2) 2x intake hose 2.3) 1x ONE-PRO cleaner 2.4) 2x dispenser tap 2.5) 2x tap handle 2.6) 1x tap & filter key 2.7) 1x power cord *1 2.8) 2x deflecting shield *2

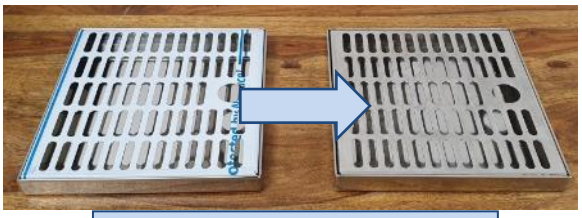
*1 : The power cord has a C13 plug to connect to the dispenser. The socket plug is country specific

*2 : The deflecting add on shields are only supplied in models for USA and Canada due to NSF requirements Those have no impact on the air inflow amount for ventilation. They only provide additional splash protection.

3.2. Setup and Start

The setup and starting procedure between one and two tap versions in principle is identical except the number of taps, intake hoses and canisters differ between the models.

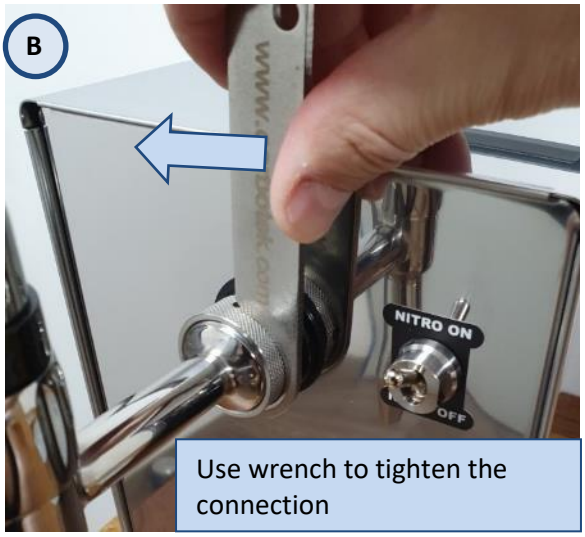
1. Remove foil from drip tray



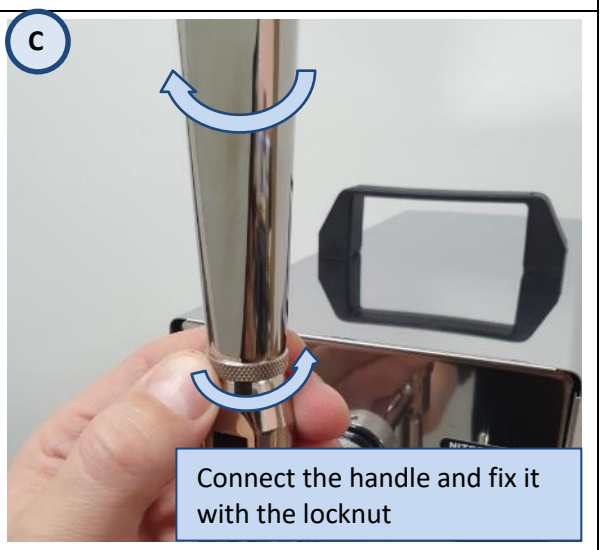
Remove foil from drip tray

2. Connect tap and handle to dispenser

Connect tap to the dispenser and fix it with nut

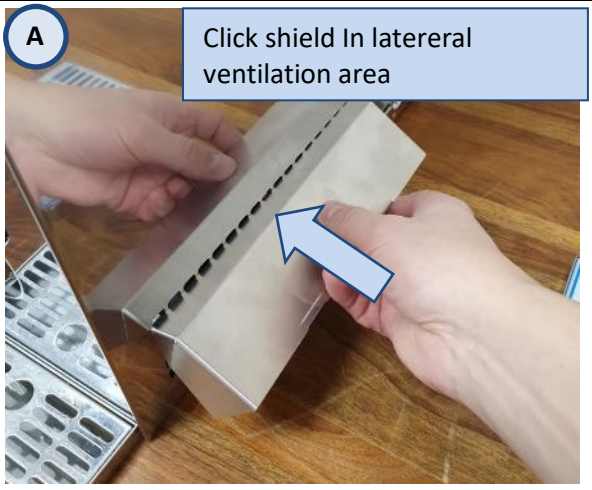


Use wrench to tighten the connection

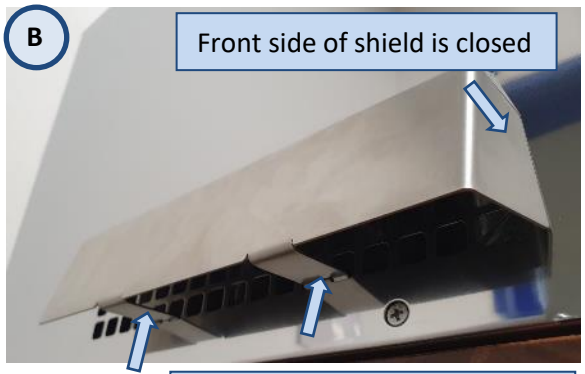


Connect the handle and fix it with the locknut

3. Attach deflecting shields (if included in your model)



Click shield In latereral ventilation area



Front side of shield is closed

Click in the shield feet as well.

4. Establish electrical connection

A

Connect power cord with C13 plug to the dispenser.

B

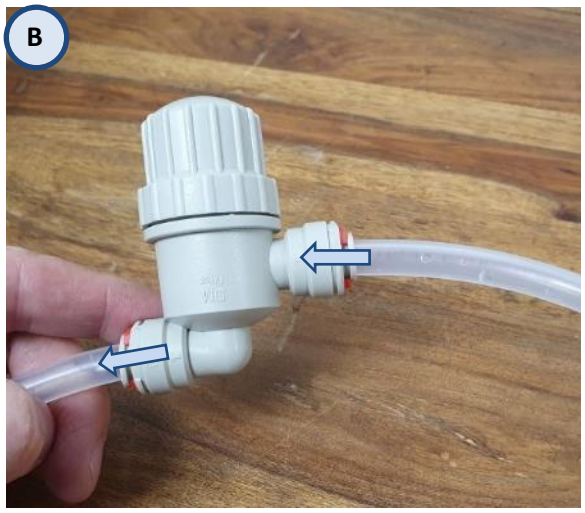
Connect to wall socket.

5. Connect canister and rinse with water

A

Fill canister half with water (about 2.5 l)

B

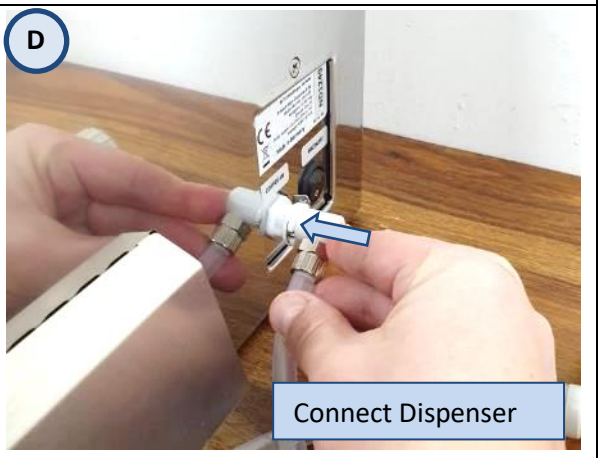


Check flow direction of your intake hose at the filter connection.

C

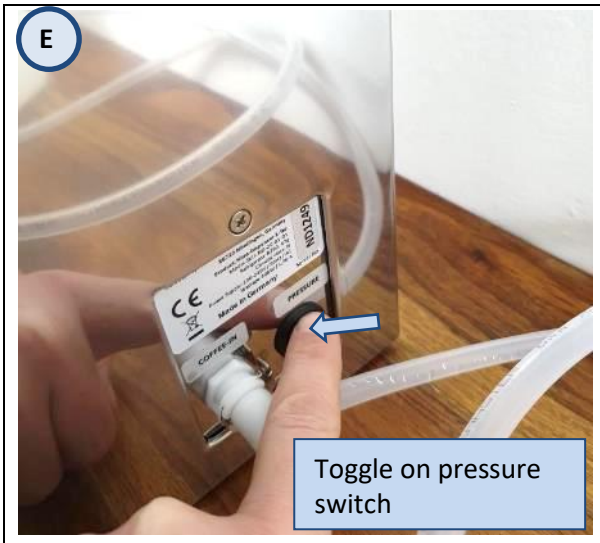
Connect canister

D



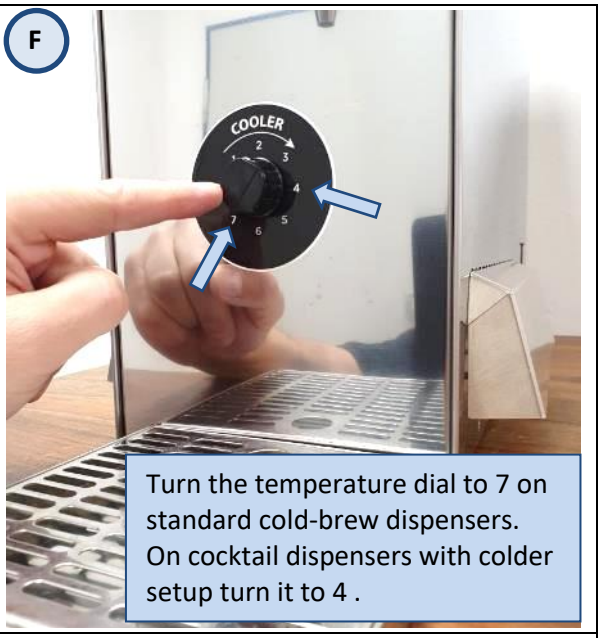
Connect Dispenser

E



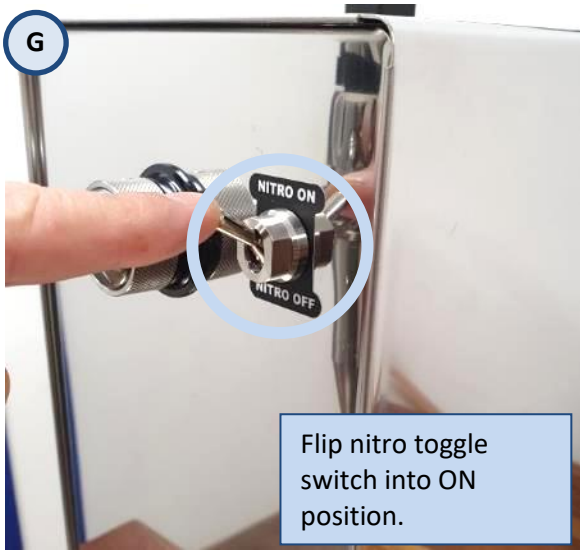
Toggle on pressure switch

F



Turn the temperature dial to 7 on standard cold-brew dispensers. On cocktail dispensers with colder setup turn it to 4 .

G



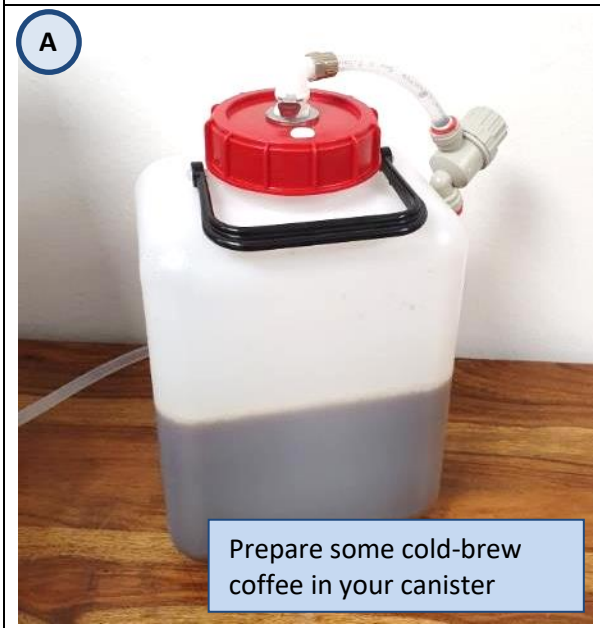
Flip nitro toggle switch into ON position.

H

Rinse the dispenser with water. Flowrate should be 0.6 l/min

6. Start product dispense

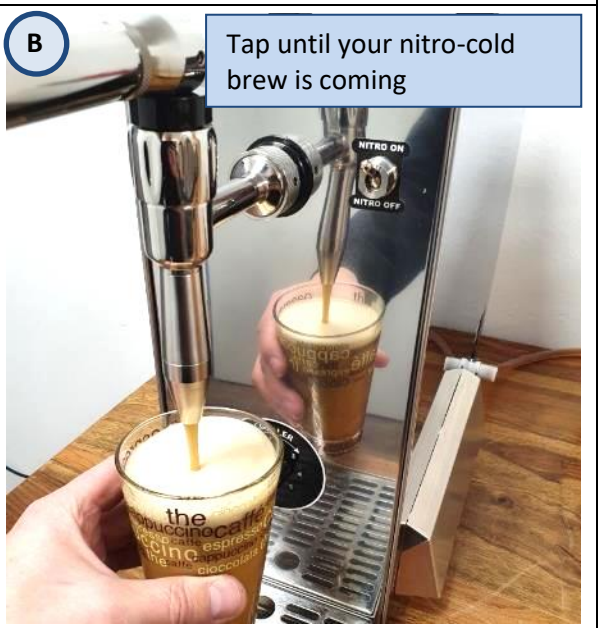
A



Prepare some cold-brew coffee in your canister

B

Tap until your nitro-cold brew is coming



3.3. Adjustments

Things that can be adjusted from the operator are:

1. Nitro On/Off Toggle-Switch
2. Target dispense temperature

1. Nitro On/Off Toggle-Switch

Nitro ON: Switch UP	Nitro OFF: Switch DOWN
	

When changing from NITRO-ON to NITRO–OFF it takes about 50 ml of coffee until the remaining nitro gas is out. Open & close the tap handle a couple of times (3-4) and dispense the 50 ml in small batches, like this the gas in the tap is flushed out faster.

2. Temperature

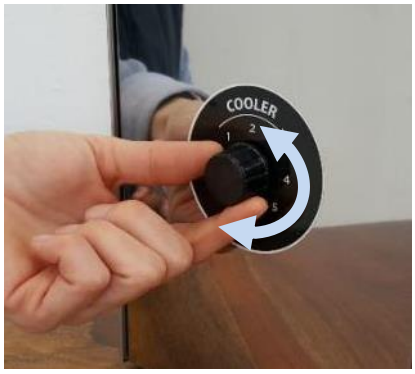
The target dispense temperature can be adjusted at the thermostat knob at the front within a range of 12°C.

Turning it clockwise = make it colder (max position is 7)

Turning it counter clockwise = make it warmer or switch cooling off at a position of 0.

Coldest temperature is: 5°C (+/- 1°C)

Warmest temperature is: 17°C



Dispensers used for coffee-cocktails can be set colder at customer's request. The temperature level is lowered by 6°C. The temperature of stage 7 is then: -1°C and the temperature of stage 1: 11°C. When tapping non-alcoholic beverages during cleaning and rinsing, the unit must be set to level 4 or lower (3,2,1) - otherwise the beverage may freeze. Level 4 corresponds to approx. 5°C.

The dispenser has an internal liquid buffer that is kept cold according to the thermostat settings. In a non-stop dispense situation the cooling effect is a reduction of Δ 7,0°C from the intake temperature of the coffee. (at a flowrate of 0.6 l/min)

4. Decommissioning

Before putting the dispenser out of service, we recommend a chemical cleaning – especially if you want to keep it out of service for a longer time.

1. Provide a chemical cleaning (as in chapter 5.4) OR flush the dispenser and canister with clean water.
2. Let the dispenser suck in air until air is coming out of the nozzle.
   Do NOT disconnect the intake line from the dispenser in order to suck air. The CPC coupler system has a check valve that prevents air sucking and by this the internal liquid buffer cannot be emptied.
3. Disconnect the intake line and remove power plug from electrical socket.
4. Pull handle to open tap and release internal pressure

Protect the dispenser against rain and dust and store it in a temperatures range between 0 °C and 60°C.

Protect the dispenser against rain and dust and store it in a temperatures range between 0 °C and 60°C.

5. Hygiene, Cleaning, Maintenance

5.1. Product shelf life after connection / opening

The product shelf life after connection to the dispensers depends on a couple of circumstances that are independent from the dispenser. Such as:

- Shelf life of product before and after connection
- Product type and product sensibility
- Ambient or cooled environment before and after connection
- Tapping frequency and break times

Carbotek recommends a weekly cleaning interval – however this is just a general recommendation. The appropriate, product specific shelf life after connection and the corresponding cleaning interval needs to be evaluated with the concrete product.

The product shelf life and the product quality are in the responsibility of the operator. Carbotek can just provide general recommendation at this stage.

5.2. Break times

Consider the points below only as a general guideline to provide enduring high coffee quality to your customers. Coffee / product specific differences exist.

- Keep the cooling on “max cold” during dispense break times
- If the dispense break is longer than 2 days, disconnect your coffee and flush the dispenser with fresh water before restart of coffee dispense
- If the break time is more than 4 days follow the “Decommissioning” steps in chapter 4.
- After a break time always check the coffee quality with a small sip, before restart of operations.

5.3. Recommended Cleaner and Strength

As a cleaner we recommend the product ONE-PRO from URNEX
with a strength of two teaspoons (11g / 0.4 oz) of powder
to 2.5 l (0.7 gal) of warm (40°C / 104°F) water.
ONE-PRO is a so called one-step cleaner that combines cleaning and disinfection.

2 x  of ONE-PRO powder (11g/0.4 oz)

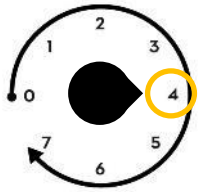
+ 2.5l of WARM WATER (40°C/104°F)

= 2.5l of CLEANING SOLUTION

5.4. Chemical Cleaning

Track the cleaning activities in a cleaning protocol in case cleaning records are requested from a food inspection.

If the machine is setup/used for coffee cocktails the dispensing temperature might drop below the water freezing point. In such cases we recommend to reduce the temperature settings during the cleaning process. The thermostat dial at the front should be set on pos 4 or less. Otherwise the rinsing water might freeze.

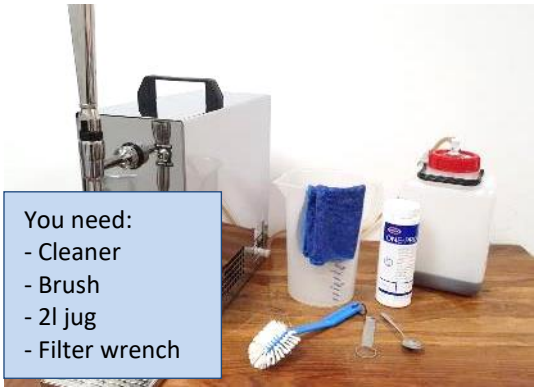


For 2-tap machines the procedure below is applied for each tap.

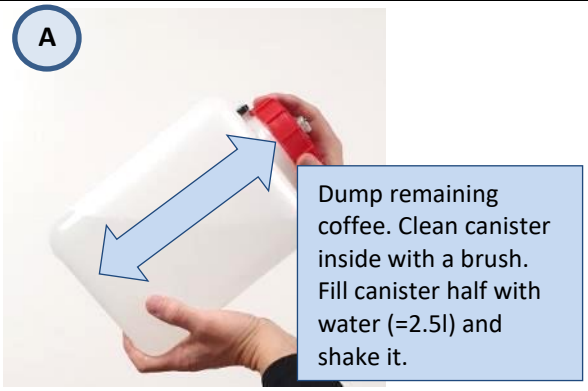
Consider wearing gloves and safety glasses when working with chemical detergents. Pay attention to the local safety standards.

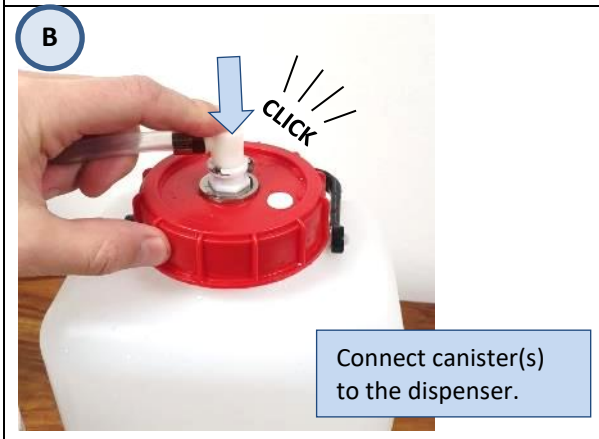
CLEANING PROCESS

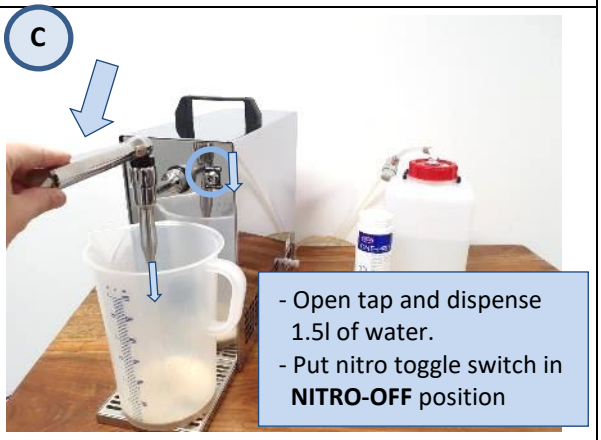
1. Cleaning equipment



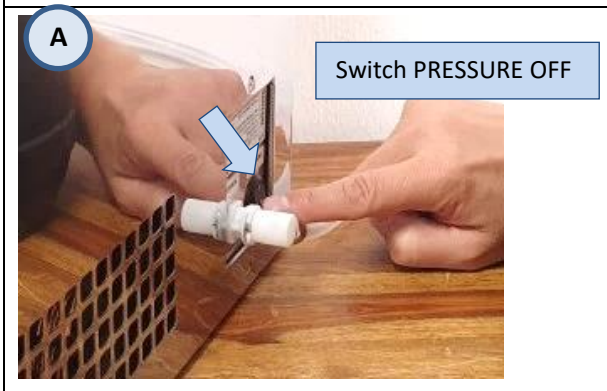
2. Rinse with water







3. Release system pressure

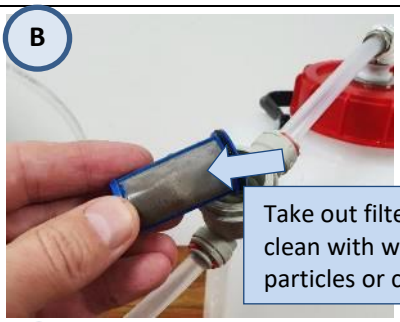


4. Check intake filter, jet-nozzle and tap valve

A

Open filter adapter(s) with wrench

B

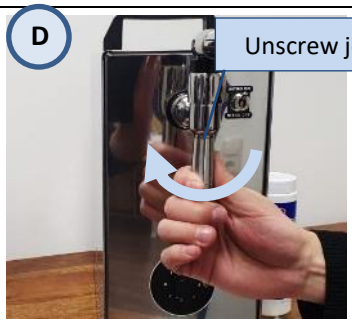


Take out filter element and clean with water in case of particles or clogging.

C

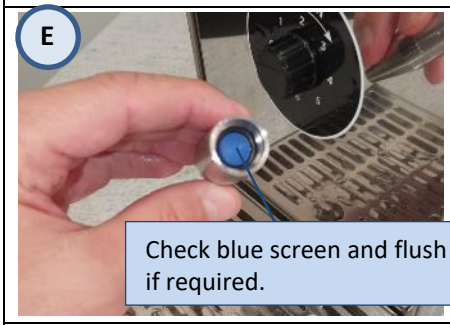
Close filter again

D



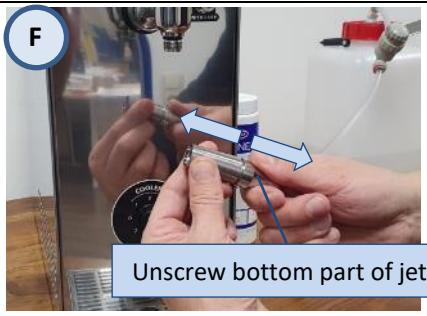
Unscrew jet nozzle upper part

E



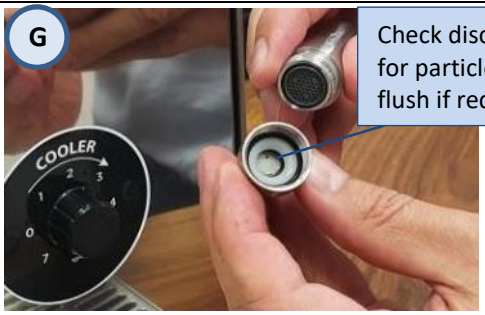
Check blue screen and flush with water if required.

F



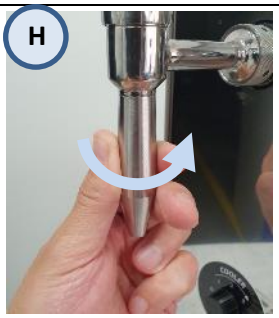
Unscrew bottom part of jet nozzle(s)

G



Check disc holes for particles and flush if required.

H



Put back the complete nozzle and reconnect it to the tap.

I

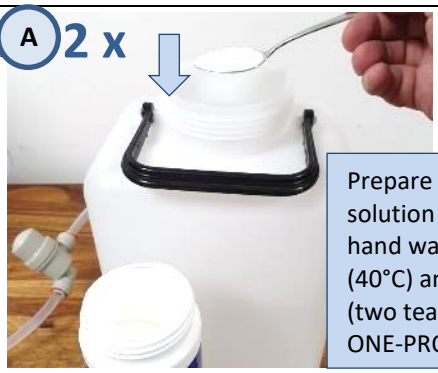
Unscrew the tap valve(s)

J

Check tap valve(s) and clean with a brush if required. Then put it back in its position.

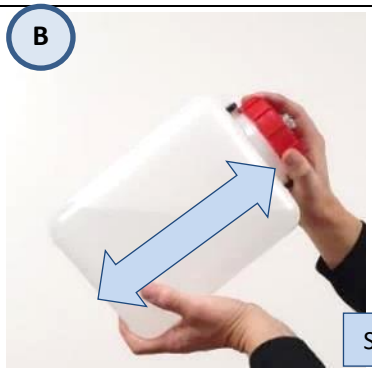
5. Prepare 2.5 l of cleaning solution and flush dispenser

A



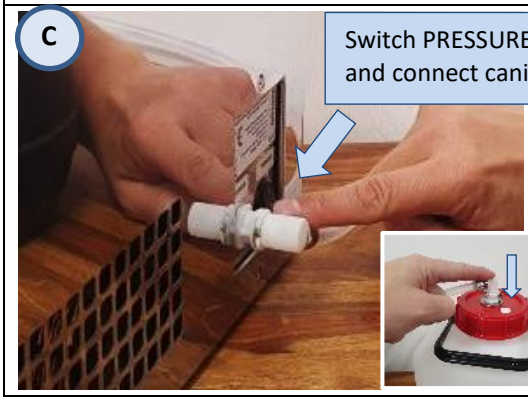
Prepare cleaning solution with 2.5 l hand warm water (40°C) and 11g (two teaspoons) of ONE-PRO powder.

B



Shake canister

C



Switch PRESSURE ON and connect canister

D

Tap 2.0 l of cleaning solution through the dispenser. Close the tap after.

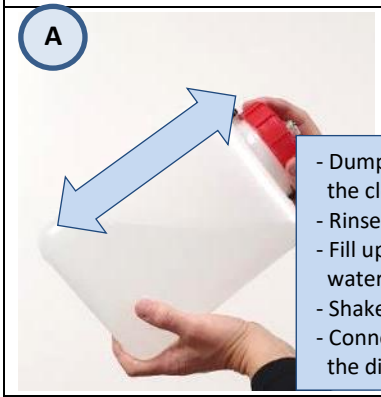
E

WAIT 10 MINU

Clean drip-tray mean-while

6. Rinse with water

A



- Dump the rest of the cleaning solution.
- Rinse canister with water
- Fill up canister with fresh water (around 2.0 l)
- Shake it
- Connect canister to the dispenser

B

If you want to continue with product dispense:
- Tap 1.5 l of water through the dispenser.
- Now connect back to your dispensing product

If you want to take the dispenser out of service:
- Keep tap open until canister is empty and air is coming through the tap nozzle

If required set the temperature back to the setting before start of the Cleaning Process

5.5. Preventive Maintenance

As preventive maintenance jobs are considered:

- **Rinse the vacuum valve at the canister with warm water. Every 4 weeks**
  This is required if the canister is used as a product canister for beverages.
  For sugary liquids this is recommended to be done with every cleaning cycle.

Take out the silicone vacuum valve at the canister lid.	
Rinse it with warm water to remove beverage residuals. These residuals might lead to a clogging effect of the vacuum valve.	

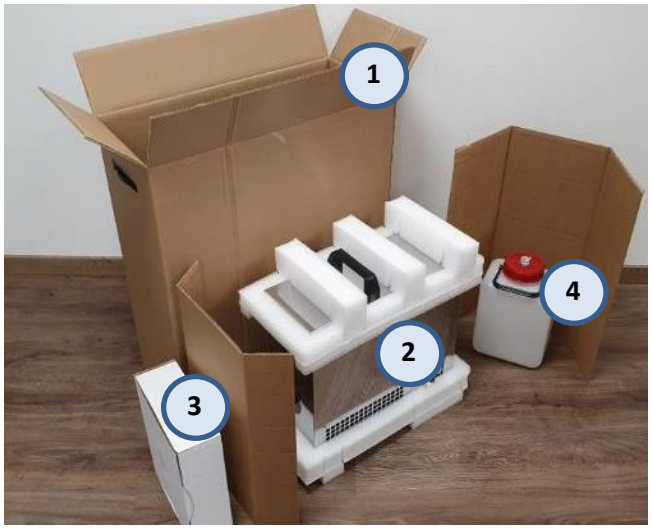
- **Dust removal from condenser grid at the backside Every 6 months**

Blow away the dust at the condenser grid with compressed air.	

6. Packaging and Shipping

If parcel shipping is intended, please ship the dispenser ONLY with the original packaging components as shown below.

Packaging Components

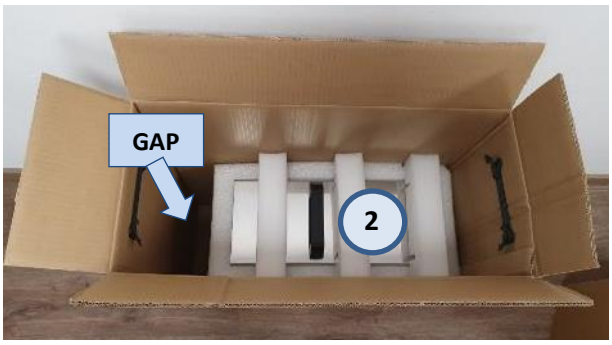


Part groups

1) Main Box
2) Bottom and top foam parts + Nitro-Dispenser
3) Accessories box + front separator
4) Canister + top separation lid

Step by Step

1. Put dispenser inside the main box

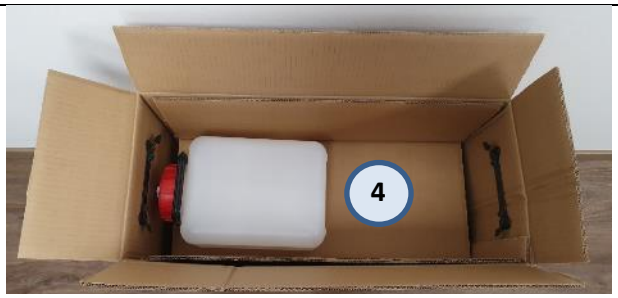


Detach the tap from the dispenser. Then put the dispenser with bottom and top foam parts (group 2) into the main box. Leave a gap on the left side.

2. Place the accessories box before

Now place the accessories box and the front separator before the dispenser (group 3)

3. Top separation lid + canister(s) on top



Now place the top sepration lid on top and put the canister(s) in as well (group 4) .

4. Close the box

7. Troubleshooting

Below find a table with potential problems, its causes and solutions.

Problem	Cause	Solutions
1) Not enough or too much foam	A change in the foaming behavior can be caused through a flowrate increase or decrease at the liquid side. This causes a liquid/gas mismatch and leads to a non-perfect dispensing result.	The standard target flowrate is 0.6 l/min (+/- 10%) with the 2-hole disc. Check the dispenser output with water.
	a) Clogging issues of intake filter, nozzle strainer or nozzle disc.	Check your filter in the intake line and remove any particles in it. Unscrew the tap nozzle upper part and check if particles have clogged the strainers. Unscrew the tap nozzle bottom part and check if the disc hole is clogged with particles.
	b) Flowrate reduction through scaling.	If the dispenser was standing unused for a longer time the nozzle disc holes might have closed through scaling. Unscrew the tap nozzle bottom part and puncture a small needle into the disc holes to remove sediments.
	c) If there is too much foam suddenly the dispenser might suck air in through the product intake line.	Check if all your connections between dispenser and coffee container are sealed well. Sometimes the John-Guest push-in system causes air leaks that need to be fixed. There must be no air bubbles coming through the intake line together with the product into the dispenser.
	d) Check the Nitro-ON/OFF toggle switch.	Change the direction of the Nitro-ON/OFF toggle SWITCH and try again.
	e) Product related. Certain recipes or ingredients are not foam stable.	Try pure cold-brew coffee as reference medium. It this works fine it's a product related issue.
	f) Traces of rinsing agent on the glass can destroy the foam as well	Try to use different glasses or single use plastic cups to verify this aspect.
2) Not cold enough	No electrical power or thermostat knob is turned off.	Check if dispenser has electrical power (does the air compressor run?). For max cooling turn the thermostat knob clockwise until 7 o'clock position. The 1 o'clock position is about 12°C warmer than the coldest position.

	The thermostat setup at the coldest position (7 o'clock position) is as below: Coffee dispensers: 5° (+/- 1° C) Coffee cocktails: -1° (+/- 1° C) The temperature can be adjusted or switched off through the thermostat knob at the front panel.	The thermostat setup can only be changed through the instructions in the service manual. If the cooling capacity of the device is not strong enough, you need to precool your coffee or reduce the inlet temperature of your product.
3) Flowrate is too fast or too slow.	The perforated disc, which is mounted in the tap nozzle outlet-spout (bottom part), determines the dispense flowrate.	The 2 hole disc provides a flowrate of 0.6 l / min. A 5 hole disc provides a flowrate of 1.2 l / min. This is available optionally. Put the suitable disc into the tap nozzle. Be aware that a faster flowrate lowers the cooling result at non-stop dispense.
4) The dispenser doesn't dispense coffee at all	a) Filter adapter in the intake line is clogged.	Check if the intake filter is clogged.
	b) Strainer of the jet-nozzles outlet spout is clogged (tap nozzle top part)	Check if jet-nozzle strainer is clogged.
	c) Little holes in the nozzle disc are blocked (tap nozzle bottom part)	Check if holes in the nozzle bottom part are free
	d) Air compressor is turned off or has no electrical power.	Check whether the PRESSURE switch at the side of the dispenser is turned on and if the dispenser has power.
	e) The CPC adapter of the intake line is not pushed properly into the dispenser socket.	Push intake line adapter properly into dispenser socket.
	f) Coffee is frozen To achieve the 5°C dispense temperature the dispenser inside cools down a bit lower. Sometime it overcools the liquid and the coffee can freeze.	Set the temperature knob on the front to 0 and wait about 30 minutes. Then try again.
	g) If the dispenser was used without filter adapter in the intake line, coffee particles (in case of insufficient filtration) can get into the pump and damage or block valve parts. This could lead to the situation that no liquid is sucked any more.	Pump must be exchanged as shown in service manual.

8. Disposal

The dispenser can be disposed in a recycling center for electrical appliances / refrigerators. Do not dispose it in domestic waste. Please notice the relevant national regulations.

9. Warranty

The guarantee and warranty period during proper and intended use is 1 year.

Defect components are replaced from Carbotek.

10. Declaration of Conformity

Carbotek Systems GmbH, Germany, declare under our sole responsibility that the product is in conformity with the following standards:

CE

CB

11. Contact Data

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12. Cleaning Protocol

Operator: _____ Dispenser serial number: _____

Date Time	Person	Detergent used Water amount	Dispenser cleaning & water rinsing	Intake filter CHECK	Tap nozzle upper CHECK	Tap nozzle bottom CHECK	Tap valve RINSE