Nitro Dispenser Service Manual

115V/60 Hz Models: ND-20-01-02 NE

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 +43 to +95°F
- 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 32 to 140°F.

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.

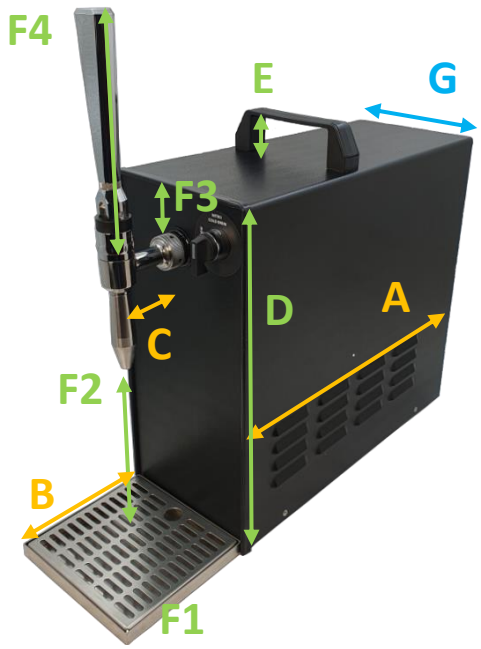
2. Before Start

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	16 in
B:	drip tray	5.7 in
C:	tap	4.1 in
A + B:	total depth	21.6 in
Height		
D:	body height	14.7 in
E:	handle height	1.7 in
F1:	drip tray	0.59 in
F2:	max glass height	8.07 in
F3:	above tap	1.9 in
F4:	tap with handle	8.07 in
D – F3 + F4	total height	20.86 in
Width		
G:	width	6.9 in

2.3 Technical Data and Properties

Taps	**1 Tap**
Model	**ND-20-01-02 NE**
Picture	
Beverages	Cold-Brew-Coffee, Tea, Coffee-Cocktails
Electrical & refrigerant	
Power supply	115 V / 60 Hz
Wattage / amperage	368 W / 3.2 A
Refrigerant / amount	 R290, 1.66 oz **Propane is an extremely flammable gas**
Electrical connection	C14 socket
Power cable	NEMA 5-15P plug (type B – grounded)
Cooler type	dry
Climatic class	N
Accessories	
5l cleaning or product canister with CPC socket	1 x
Intake hose with strainer and CPC coupler	1 x
Inlet strainer for particles > 0.04 in	1 x
Drip tray	1 x
Cleaning agent	1 jar (20oz.) of ONE-PRO cleaner from URNEX
Features	
Nitrogen source	Filtered compressed air (78% nitrogen)
Jet Nozzle Mono with spray crowns flowrate: 0.6 l (20 oz)/min	1 x
Nitro rotary switch to switch between NITRO COLD BREW and COLD BREW	1 x
Foam level control	No adjustment – default factory setup
Particle air-filter	Yes
Nitro-Port to connect nitrogen bottles	No

Temperature setup	41.0 – 43.0 °F
Liquid volume inside dispenser	1 x 370 ml (12.5 oz)
Cooling effect during nonstop dispense	Δ 13°F (at 0.6 l (20 oz)/min)
Continuous (non-stop) dispense is only possible until an ambient temperature of 86°F. Between 86 and 95°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
Others	
Noise emission level	<= 64 dB
Warranty	2 years (after date of production)
Weight & dimensions	
Net / gross weight	49.2 lb. / 54.2 lb.
Dispenser dimensions (H x W x D) including tap handle	20.86 x 7.6 x 21.65 in
Packaging dimensions (H x W x D)	27.0 x 10.0 x 23.2 in

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 particles in your liquid.

3. Commissioning

3.1. Scope of Supply

The Nitro Dispenser is delivered with the components as listed below.

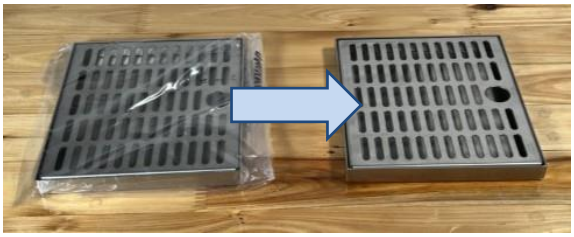
	1-tap Nitro Dispenser
	1) 1x Nitro Dispenser 2) 1x Accessories box 3) 1x 5l (170 oz) coffee or cleaning canister
	**Accessories box parts** 2.1) 1x drip tray 2.2) 1x intake hose 2.3) 1x ONE-PRO cleaner 2.4) 1x dispenser tap 2.5) 1x tap handle 2.6) 1x tap & filter key 2.7) 1x power cord *[1] 2.8) 1x User manual

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

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

A

Connect tap to the dispenser and fix it with nut

B

Use wrench to tighten the connection

C

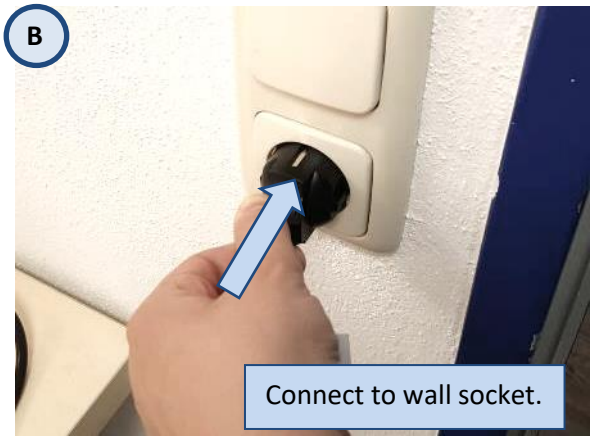
Connect the handle and fix it with the locknut

3. Establish electrical connection

A

Connect power cord with C13 plug to the dispenser.

B



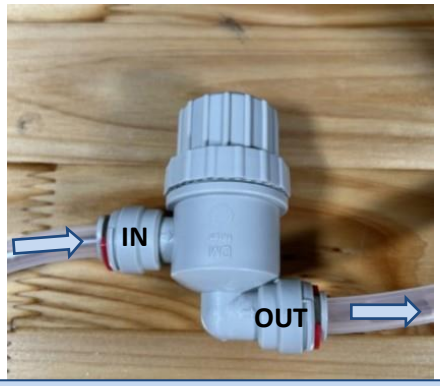
Connect to wall socket.

4. Connect canister and rinse with water

A

Fill canister half with water
About 2.5 l (85 oz)

B

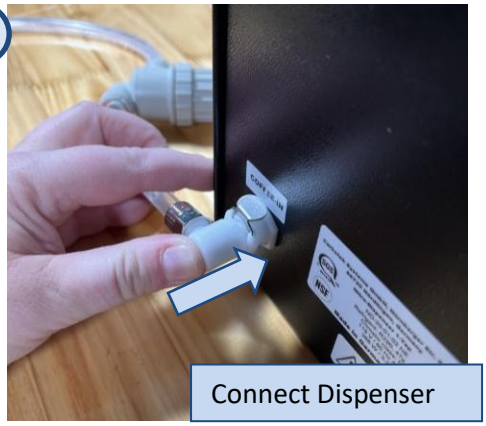


Check flow direction of your intake hose at the filter connection.

C

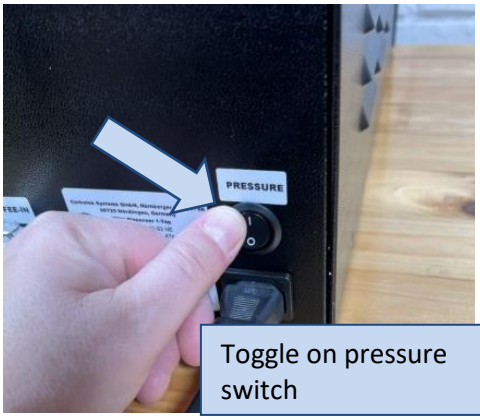
Connect canister

D



Connect Dispenser

E



Toggle on pressure switch

F

Flip nitro rotary switch into NITRO COLD BREW position.

G

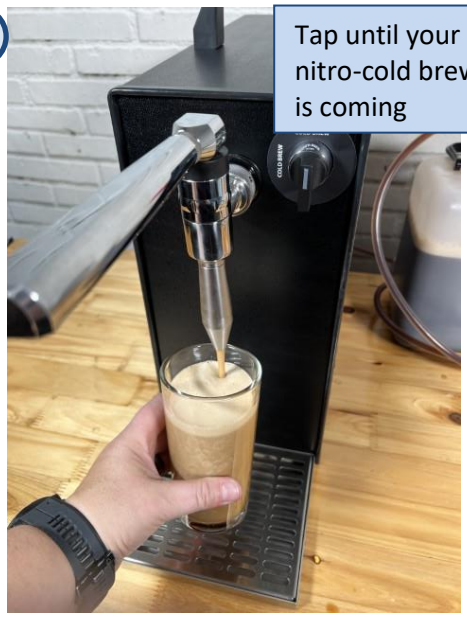
Rinse the dispenser with water. Flowrate should be 0.6 l (20 oz)/min

5. Start product dispense

A

Prepare cold-brew coffee in your canister

B

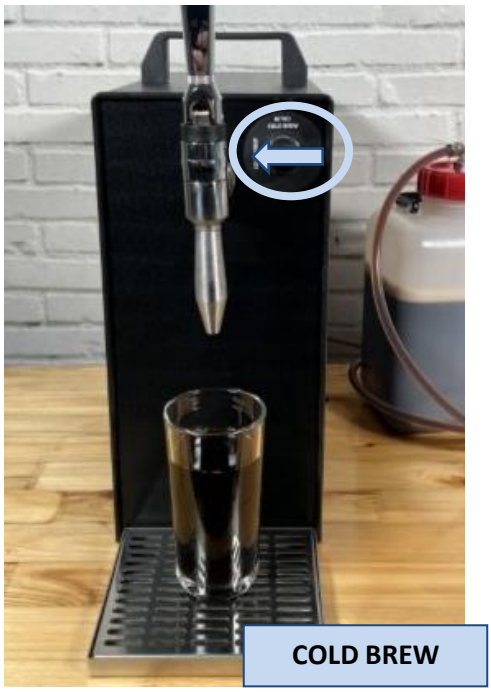


Tap until your nitro-cold brew is coming

3.3. Adjustments

Things that can be adjusted from the operator are:

1. **Choose Nitro Cold Brew/Cold Brew dispense mode through rotary-switch**

Nitro Cold Brew: Switch UP	Cold Brew: Switch LEFT
	

When changing from NITRO-COLD BREW to COLD BREW it takes about 50 ml (1.7 oz) 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 (1.7 oz) in small batches, like this the gas in the tap is flushed out faster.

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 32 °F and 140°C.

5. Hygiene, Cleaning, Maintenance

5.1. Product shelf life after connection / opening

The product shelf life after connection to the dispenser 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.

- 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 (85 oz) 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 (85 oz) of WARM WATER (40°C/104°F)

= 2.5l (85 oz) 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.

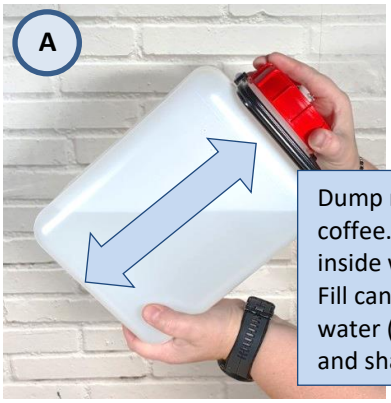
It's recommended to wear gloves and safety glasses when working with chemical detergents.
Pay attention to the local safety standards.

CLEANING PROCESS

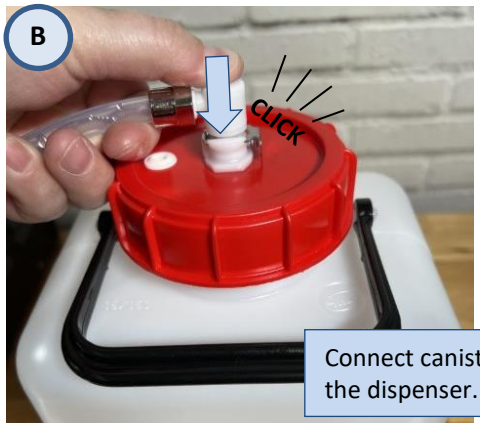
1. Cleaning equipment

You need:
- Cleaner
- Brush
- Teaspoon
- 2l (68 oz) jug
- Filter wrench

2. Rinse with water



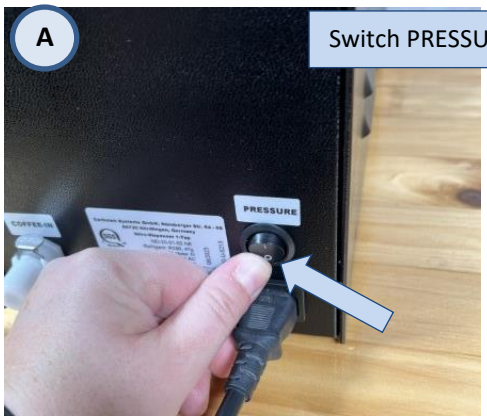
Dump remaining coffee. Clean canister inside with a brush. Fill canister half with water (=2.5l (85 oz)) and shake it.



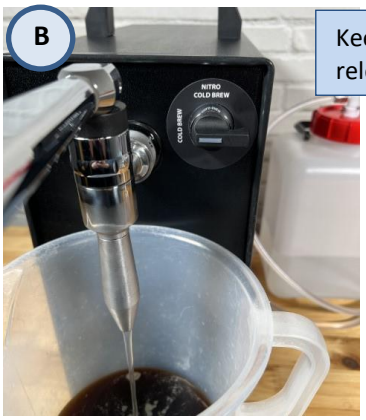
Connect canister to the dispenser.

- Open tap and dispense 1.5 l (50 oz) of water.
- Put nitro rotary switch in **Cold Brew** position

3. Release system pressure



Switch PRESSURE OFF



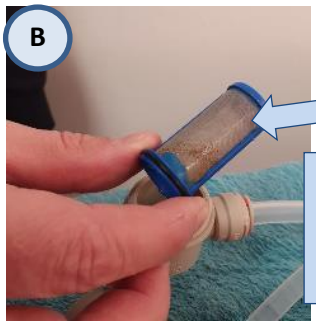
Keep the tap open to release pressure

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

A

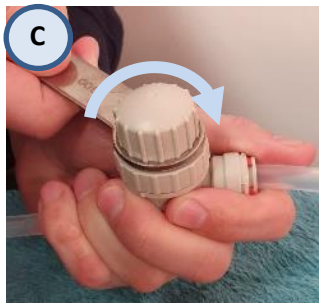
Open filter adapter with wrench

B



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

C

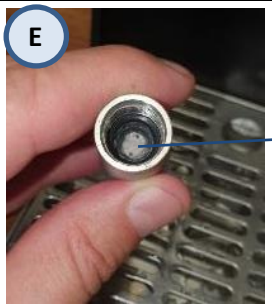


Close filter again

D

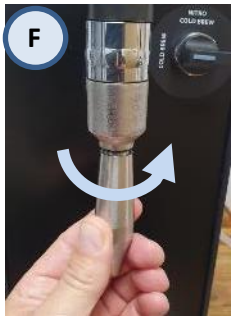
Unscrew the tap nozzle

E



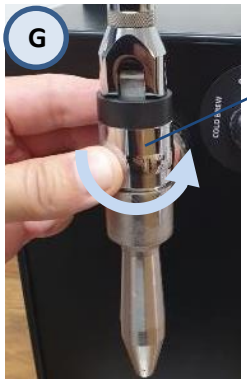
Check nozzle top. No particles should be there. If so, flush with water and/or clean with brush.

F



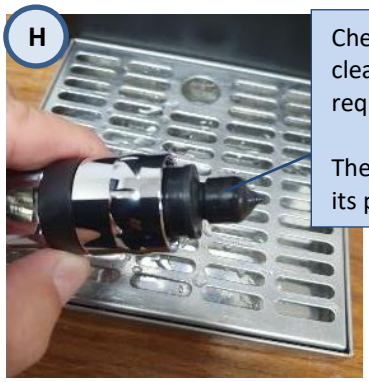
Reconnect the nozzle to the tap.

G



Unscrew the tap valve

H

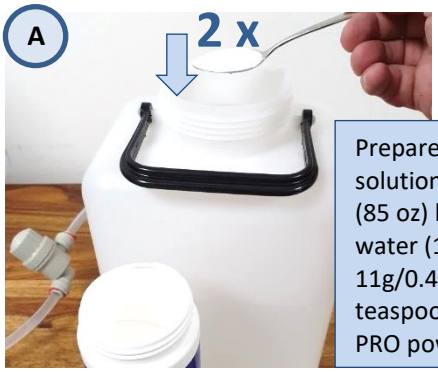


Check tap valve and clean with a brush if required.

Then put it back in its position.

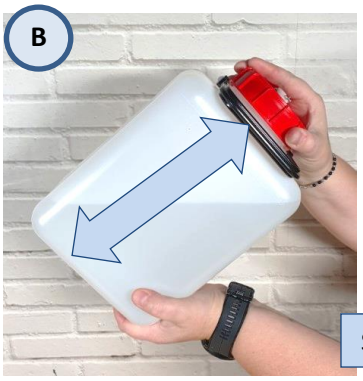
5. Prepare 2.5 l of cleaning solution and flush dispenser

A



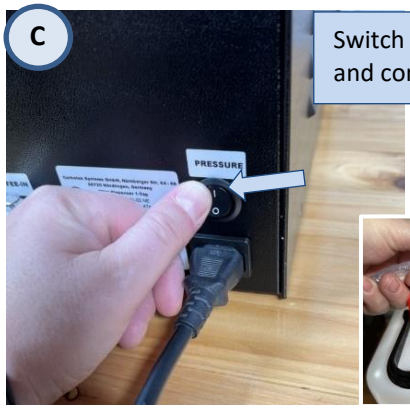
Prepare cleaning solution with 2.5 l (85 oz) hand warm water (104°F) and 11g/0.4 oz (two teaspoons) of ONE-PRO powder.

B



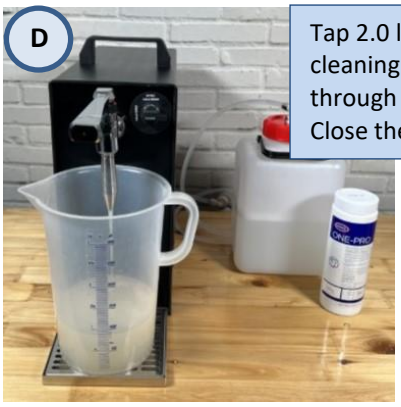
Shake canister

C



Switch PRESSURE ON and connect canister

D



Tap 2.0 l (68 oz) of cleaning solution through the dispenser. Close the tap after.

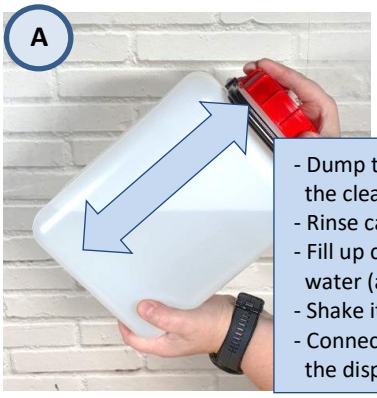
E

WAIT 10 MINUTES

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 (68 oz))
- Shake it
- Connect canister to the dispenser

B

If you want to continue with product dispense:
- Tap 1.5 l (50 oz) 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

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. The dispenser **tap must be detached** before packaging.

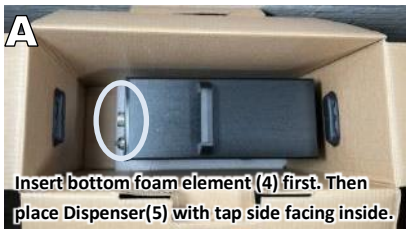
Packaging Components

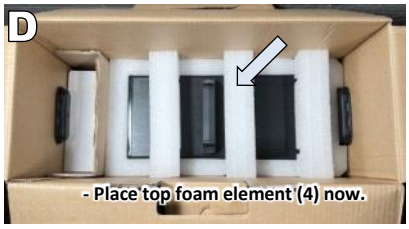
Parts and article numbers

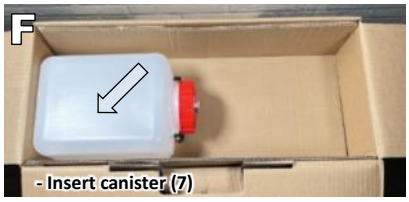
1) Transport carton (art 413) with handles (2 x 420)
2) Cardboard cut-outs front (art 417)
3) Cardboard cut-outs top (art 418)
4) Bottom and top foam elements (art 414)
5) Nitro-Dispenser
6) Accessories box
7) Canister

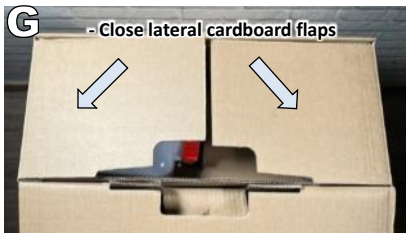
Transport carton SET ND 2020
419 = 413 + 417 + 418 + 420 (2x)
Foam elements not included!

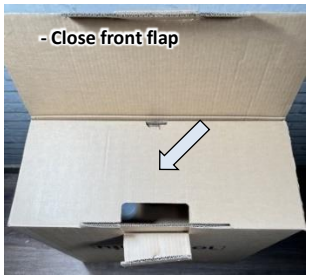
Step by Step (Tap must be detached)

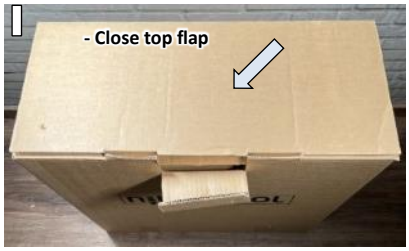












The box must be closed with adhesive tape at the top and at the bottom side!

7. Troubleshooting

7.1. Online

https://youtu.be/Ido13RVYFII

Nitro-Dispenser Service: Troubleshooting 1-Tap | black | 115V

Helping the operator to identify and resolve problems

7.2. Troubleshooting Matrix – Operator fixable

Technical problems, fixable through the operator					Operator experience ID							
					E1	E2	E3	E4	E5	E6	E7	E8
Problem ID	Problem	Effect	toDO	Verification	Too much foam during dispense	Not enough foam during dispense	Liquid flowrate is too slow	No liquid is coming out anymore	Drinks are not cold enough	Leaking	Bad taste / Collapsing canister	Others
CBP1	Pressure toggle switch OFF	No power built-up of the pneumatic circuit. -> No dispense happens, as the pumps runs on pneumatic pressure.	Switch pressure toggle switch in ON position	Dispensing becomes possible				X				
CBP2	No electrical power	Without electrical power no cooling and no air compressor runs. -> No dispensing, no cooling	Check if power cord properly is plugged in. Check if any fuse trapped. Check whether the dispenser makes any noise.	You should hear some noises when opening the tap. (e.g. pump, air-compressor, cooling-compressor)				X				
CBP3	CPC adapter intake line not properly connected.	The CPC adapter of the intake line is not pushed properly into the dispenser socket or the canister socket.	Check the socket connections of intake line and reestablish connection.	Visual check if intake line socket connections are ok.				X				
CBP4	High volume dispense	If there is high volume dispense in peak moments, the cooling compressor cannot cool down fast enough.	The canister connected to the dispenser must be pre cooled in a fridge. This reduces the required cooling energy for the dispenser.	In high volume nonstop dispense the cooling effect is only around 7°C between input and output. Target dispense temperature: 5° (+/- 1° C) 41°F (+/-2°F)					X			
CBP5	Intake filter clogged	Liquid flowrate too slow -> Mismatch of gas and liquid stream	Open and check intake filter	Target flowrate: 0.6 l/min (+/- 10%)	X		X	X				
CBP6	Tap outlet nozzle clogged	Liquid flowrate too slow -> Mismatch of gas and liquid stream	Open and check nozzle. Try to tap without nozzle.	Target flowrate: 0.6 l/min (+/- 10%)	X		X	X				

Technical problems, fixable through the operator					Operator experience ID							
					E1	E2	E3	E4	E5	E6	E7	E8
Problem ID	Problem	Effect	toDO	Verification	Too much foam during dispense	Not enough foam during dispense	Liquid flowrate is too slow	No liquid is coming out anymore	Drinks are not cold enough	Leaking	Bad taste / Collapsing canister	Others
CBP7	Smaller air leak at intake line	Together with the liquid, air is sucked into the dispenser through a leak in intake line or canister lid. -> Mismatch of gas and liquid stream	Check all connections at intake line and in canister lid.	Visible check: There must not be any air bubbles sucked into the dispenser during dispense.	X		X	X				
CBP8	Big air leak at intake line	Due to a loose connection at the intake line or canister lid, ambient air is sucked into the dispenser instead of product out of the canister.	Check all connections at intake line and in canister lid.	Visible check: There must not be any air bubbles sucked into the dispenser during dispense.				X				
CBP9	Recipe or glass issue	Ingredient based foam instability or detergent traces at glass border.	Dispenser cleaning. Use fresh ingredients. Clean glasses / cups properly and rinse with fresh water	Excellent foam quality is a MUST HAVE.		X						
CBP10	Tap valve not screwed in entirely	The valve is not in the end position. -> Liquid will spill out although tap is closed	Tighten tap valve to its end position.	No liquid must spill out when tap is closed.						X		
CBP11	Leaking in terms of liquid spilling or dropping out.	Leaking from intake hose are probably due to a bad hose connection. Leaking at the coupler are probably caused through a damaged O-ring. Leaking from inside the machine require service technician.	Reestablish connections at the intake hoses. Check the O-ring from CPC couplers at intake line. A bad O-ring at a coupler can be the problem.	No leaking from intake hose or coupler must occur.						X		
CBP12	No cleaning	Without regular cleaning, the quality of the drinks will suffer. The canister can collapse if the venting valve in the lid is not cleaned.	Apply cleaning procedure as described in manual chapter 5.4	After cleaning check smell / taste with pure water. There must NOT be any OFF taste.							X	
CBP13	Canister venting valve blocked	Canister is collapsing as venting valve does not open when liquid is sucked out through the dispenser.	Regular cleaning of venting valve in canister lid is required to avoid this. See cleaning procedure in manual chapter 5.5	When venting valve is cleaned it will open when product is sucked from canister.							X	
CBP14	Part damaged or broken	If parts are damaged those can be ordered through your suppler / service partner.										X

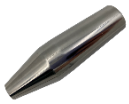
If the problem is different from the listed ones, the root cause is inside the dispenser.

7.3. Frequently noticed issues – Technician required

Technical problems, fixable through service technician only					Issue experience ID							
					E1	E2	E3	E4	E5	E6	E7	E8
Problem ID	Problem	Effect	toDO	Verification	Too much foam during dispense	Not enough foam during dispense	Liquid flowrate is too slow	No liquid is coming out anymore	Drinks are not cold enough	Leaking	Bad taste / Collapsing canister	Others
CBP21	Pump damaged through particles	The nitro dispenser pump cycles (you can identify the pump sound), but no liquid is pumped or primed any more. Root cause are coffee particles, which can damage the G55 pump. This pump model was used in dispensers with the serial numbers: ND-U-1010 - ND-U-3102 From ND-U-3103 on, the G80 pump model was used, which is much less particle sensitive.	Pump change as described in chapter "10.11 Pump exchange"	Liquid is pumped through the dispenser.				X				
CBP22	Air outlet adapter popped out or is damaged	The air compressor of the dispenser doesn't switch off any more it keeps running nonstop. However, the pump is not running all the time.	Air compressor outlet needs to be exchanged. Description can be found in chapter "10.15.8 Air-Outlet adapter exchange"	Air compressor must switch off and stay off when dispenser is not in use.				X				

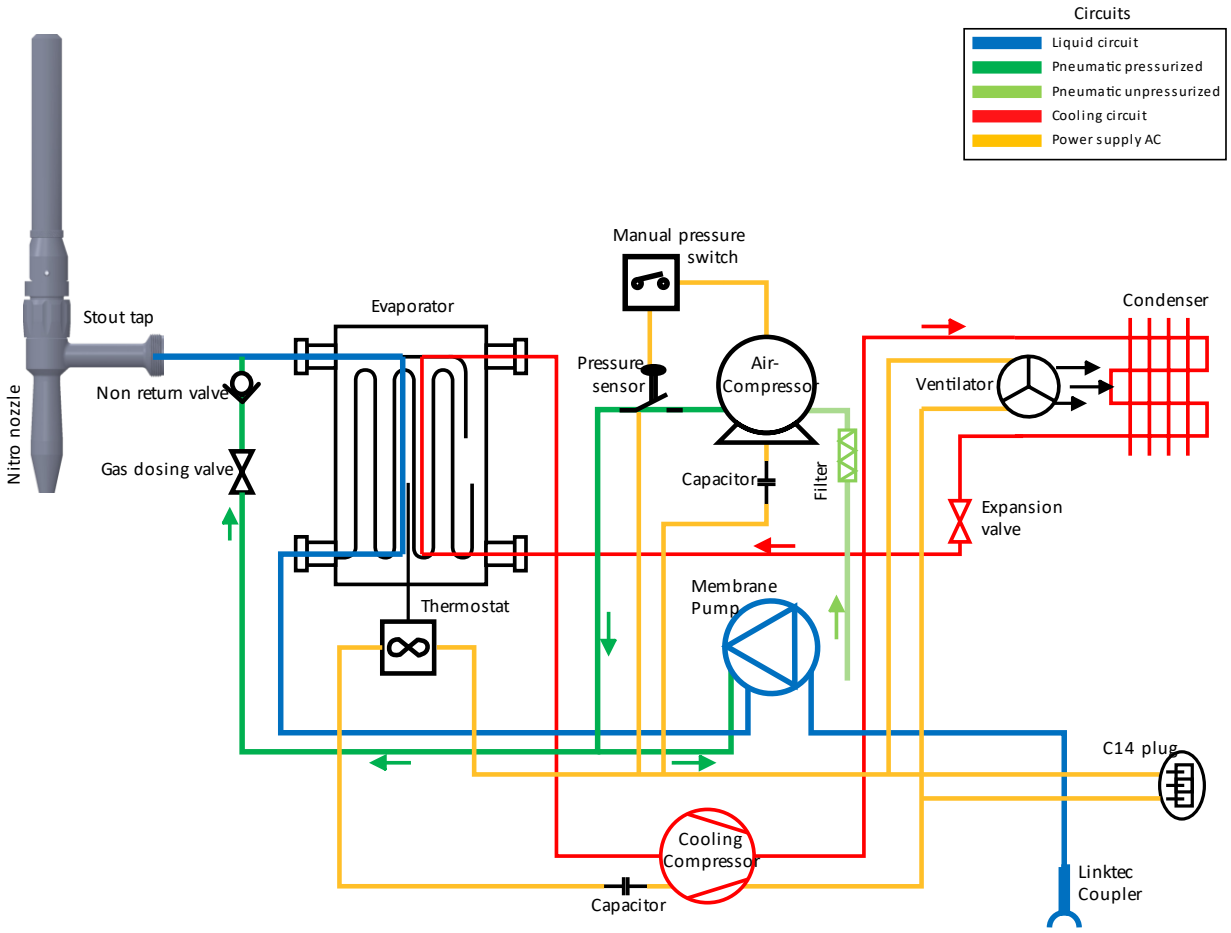
8. Spare Parts for Operators

Article Code	Picture	Article Text	Notes
432		Canister 5L, PE, food safe BLANK RED CAP	Canister for cleaning and / or product storage
495		Lid for 5L-canister with CPC Panel Mount Female 3/8	Lid with valve for canister (432)
659		Check valve - combination valve 7.7 mm material: ML-153 silicon white	Vacuum valve for lid (495)
196		Double click Intake hose CPC Coupler / 0.13 m hose / filter / 1.5 m hose /CPC Coupler	Intake hose
822		Strainer adapter, 100 micron for JG 3/8" intake line 3/8" - 3/8"	Intake filter

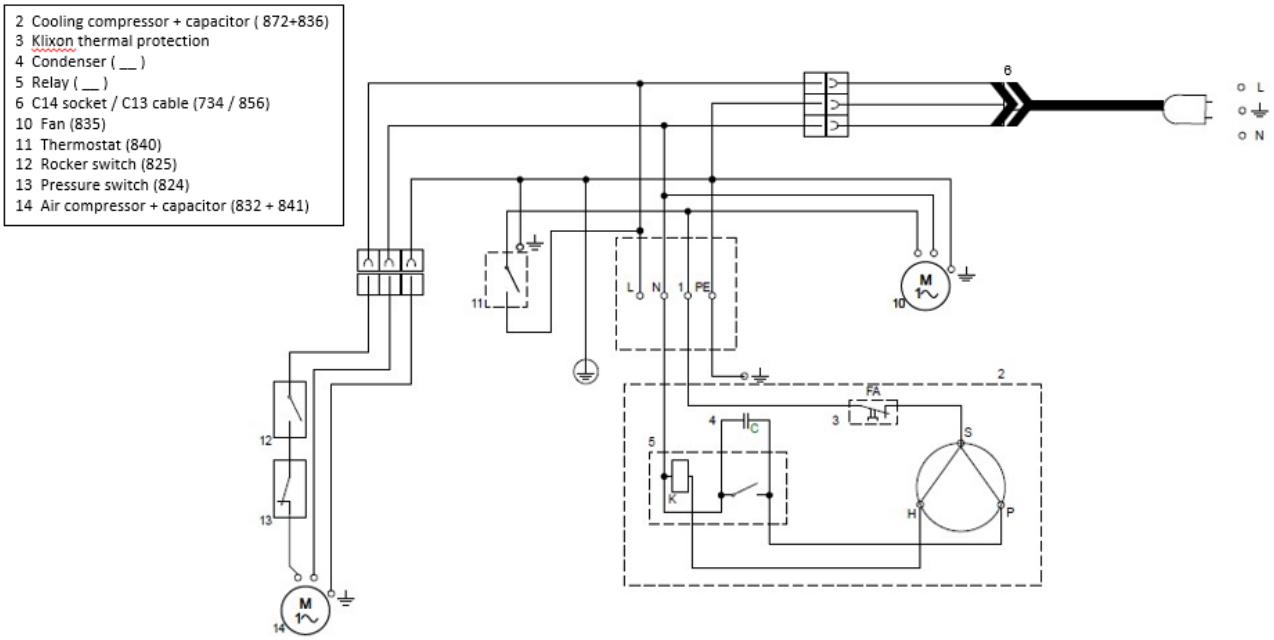
1179		Fine filter - strainer, 200 mesh per inch 100 micron particle size	Filter element of filter (822)
1316		CPC Elbow coupler 3/8 PTF - NSF valved, POM hose 9.5mm OD, 6.4mm ID	
1310-Q5		O-Ring 7.65 x 1.78 mm (QTY 5 each) for CPC Elbow-Coupler (1316) Type: AS568-011 / FDA Buna-N	O-Ring for CPC Elbow (1316)
382		Drip tray NSF compliant dimensions 165x150x16mm AISI 304	
1437		Tap handle - chrome plated plastic (BI)	
1447		Tap handle - stainless (BI)	
1411		Tap handle - Oak wood Height 16 cm, conical	
1472		Stout-Tap NSF (BI) without nozzle, handle and shank	
410		Jet Nozzle Mono (0.6 l/min) Connection thread IT: 9/16" - 26 TPI	
1419		Nitro Dispenser Combi-Key	Tool for filter (822) and tap (1472)
783		Rubber feet 7,2/11 LDPE, black	
856		Power plug cable North America type B - C13 plug / Nema 5-15 P 1.8 m	
1780		Accessories box Nitro-Dispenser (Spare part) All parts 1-tap NE (USA/CA)	All parts included as shown in manual
419		Transport carton SET ND 2020 slim with handles and carboard inserts Size: 650 x 255 x 590 mm (H x W x D)	Transport packaging components
414		Packaging foam parts ND 2020 slim	Transport packaging components
506		ONE-PRO Cleaner Jar 566 g (20 oz) Enough for approx. 100 cleaning cycles	

9. Circuits & Key Performance Parameters

9.1. Hydraulic Circuit



9.2. Electrical Circuit



9.3. Key Performance Parameters

With these performance parameters high quality dispense is granted.

ID	Parameter	Target	Tolerance	Notes
1.	Dispense Liquid Flowrate	0.2 l/min	+/- 10%	Coffee Flowrate If lower, probably Nozzle or intake filter is blocked
2.	Gas Flowrate at 3.2 bar gas pressure	0.2 l/min	+/- 10%	With electronic flowmeter
	Gas Flowrate	33 – 45 sec		With 113 ml syringe This is an alternative gas measuring concept if electronic flowmeter is not available.
3.	Max Pneumatic pressure	3.3 – 3.6 bar		The max pneumatic pressure, when the air compressor stops.
4.	Operating corridor Pneumatic pressure	2.5 – 3.6 bar		The gas pressure working corridor in the pneumatic system.
5.	Temp Setup	4.5 – 5.5 °C		Thermostat dial points to level 6. Arrow shows downwards. Verification method as described in: “10.19.2 Temperature adjustment”
6.	Tightness Pneumatic circuit Max pressure drop	0.02 bar	in 5 min	Check of tightness pneumatic circuit.
7.	Vacuum test Intake line and canister lid are included.	No liquid flow, after a short moment after opening the tap.		Check of liquid circuit tightness against vacuum. - Keep PRESSURE toggle switch ON - Switch in Nitro-Off mode - Close the inlet at the rising pipe below the canister lid. - Open tap

10. Service Works

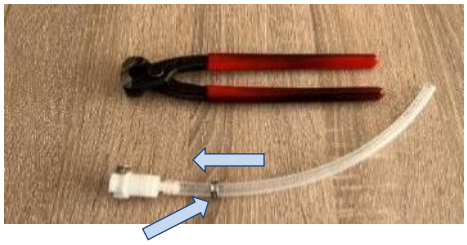
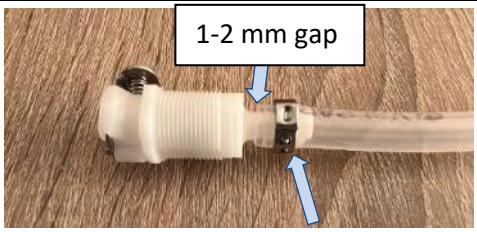
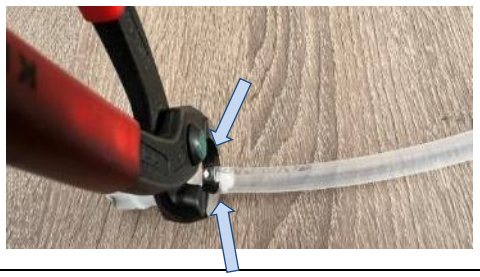
SAFETY WARNING

Service works must be done from technical experienced person only.

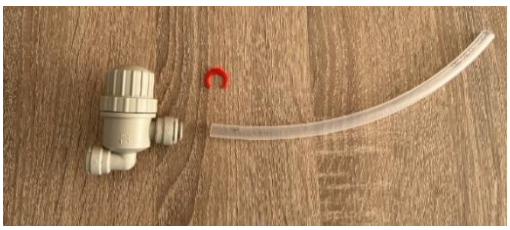
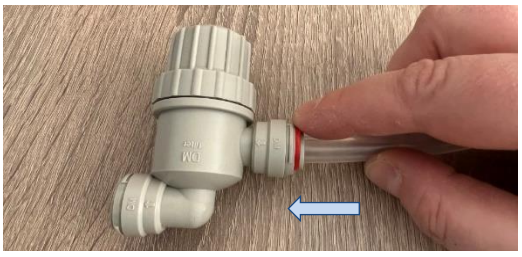
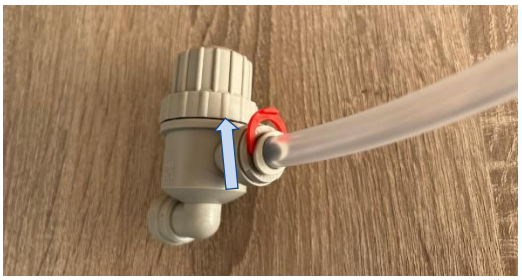
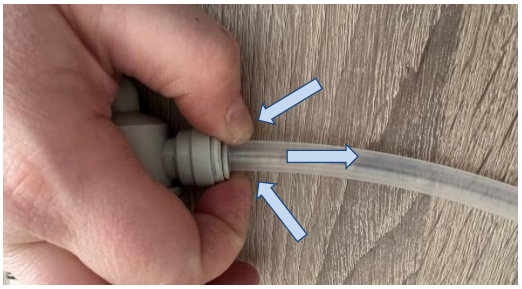
Before opening the Nitro-Dispenser, disconnect from electrical power.

If electrical power is required and cabinet is still open – be aware that some inside parts are under electrical voltage. When touching these parts there is the risk of severe electrical shocks which could be dangerous for your health and life.

10.1. General: Hose-Barb clamping

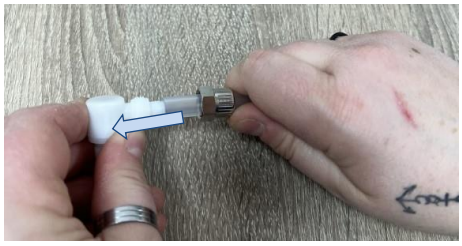
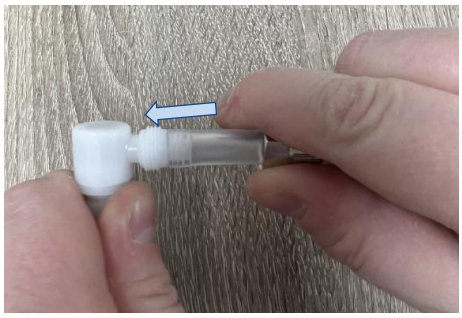
	General working instructions to clamp hoses on hose-barb-fittings with a one-ear-clamp. <u>Required tools and parts:</u> - 3/8 hose (art 106) - 1-ear-clamp (art 023) - Panel-Mount coupler (art 1312)
	Slide the 1-ear clamp over the hose and attach the hose to the panel mount coupler hose barb.
	Do not push the hose all the way in, as the hose may crack when getting clamped! Leave a gap of 1-2 mm. Position the 1-ear clamp on the first flank of the hose barb.
	Clamp the 1-ear clamp with the pliers.
	1-ear clamp properly clamped.

10.2. General: DMT/JG handling push Fitting

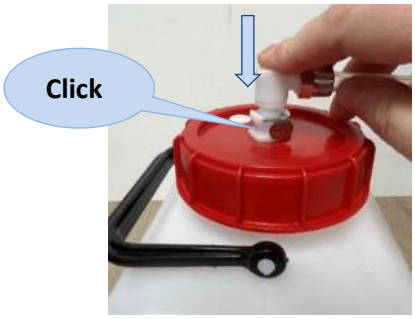
Establish a connection	
	<u>Required tools and parts:</u> - Straight cutted hose - Push-In adapter - Locking clip (not in all cases required)
	The hose generally can be pushed in about 1.5 cm into the socket. Push in the hose into the adapter until stop position (end position).
	Put in the locking clip to fix hose position The purpose of the locking clip is to - protect hose from becoming loose over time - minimize gaps inside the adapter (hygienic reason)
	Push the hose **<u>again</u>** into the adapter direction to close the remainiung gap (inside).
Release a connection	
	Remove the red locking clip
	To disconnect, ensure the system is depressurized. Then push the collet against the fitting. With the collet held in this position the tube can be removed.

10.3. General: CPC Coupler

10.3.1. PTF Nut

	General working instructions to establish / release a connection between PTF Nut fitting and a hose. Required tools and parts: - 3/8 hose (art 106) - CPC Elbow coupler (art 1316) - Open-end wrench (15 mm)
	Slide the union nut over the hose.
	Push the hose onto the CPC elbow coupler.
	Screw on the union nut and tighten with the wrench.
	Screw connection established.

10.3.2. CPC Coupler how to use

Establish a connection	
	• Position coupler centric over the socket and press it down. • If it doesn't move in, press the relief spring and try again. • When it clicks the connection is established.
Release a connection	
	To disconnect the coupler, press the relief spring at the socket and the coupler will pop out.
	Coupler has popped out.

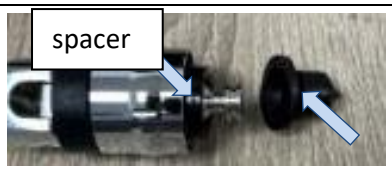
10.3.3. CPC Coupler O-Ring change

	General instructions for replacing the O-ring on a CPC coupler. <u>Required tools and parts:</u> - O-ring (art 1310) Type: AS568-011 / FDA Buna-N Metric: 7.65mm ID X 1.78mm - CPC elbow coupler (art 1316) - Dental hook instrument or similar tool
	Remove O-ring with the hook.
	Apply new O-ring.
	Put it into the right position.

10.4. Rubber Feet replacement

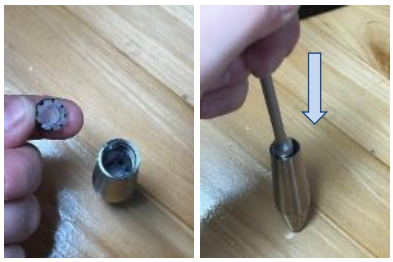
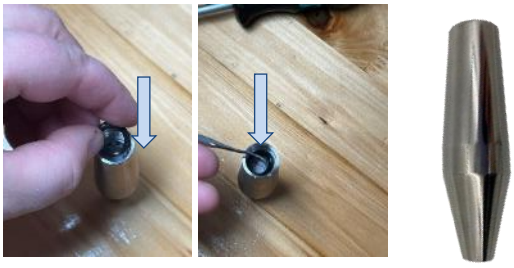
	General instructions for replacing/reinstalling the dispenser feet. <u>Required tools and parts:</u> - Rubber feet (art 783) - Pliers to remove the old / damaged feet
 	Remove old foot. Attach new foot and press in with a rotating movement.
	Rubber feet successfully applied.

10.5. Tap diaphragm change

	General instructions for replacing the tap diaphragm. <u>Required tools and parts:</u> - Tap diaphragm (BI) (art 1481) - Long nose pliers is helpful
	Make sure there is no pressure in the system. Pressure button should be switched off and liquid released before disassembly. Unscrew the tap valve.
	Pull off the valve diaphragm. Turn and pull at the same moment.
	When the valve diaphragm has been removed, keep the spacer ring behind in its position.
	Position the new valve diaphragm and push it carefully on the holding stem.
	Screw on the tap valve back on the tap shank by turning the nut clockwise. There must be no gap left between tap valve and tap body. Otherwise, liquid will spill out when pressurized. Tap diaphragm successfully replaced.

10.6. Jet Nozzle Mono

Disassembly	
	General instructions for dismantling and reinstalling the internal parts of the jet nozzle for cleaning purpose. <u>Required tools and parts:</u> - Jet nozzle (art 410) - Socket wrench (8 mm) - Hex-nut (6 mm) - Dental hook
	Unscrew the jet nozzle
	Remove the upper O-Ring with the hook.
	Carefully push out the internal components from the outlet side.
	All interior parts are out now and can be checked / cleaned accordingly.

Assembly	
	Instructions for replacing/reinstalling the internal parts of the Jet Nozzle. <u>Required tools and parts:</u> - Jet nozzle parts 1 x Lamination cone (art 1425) 3 x Spray crown (art 1352) 1 x O-Ring 10,77 x 2,62 mm (art 1430) - Socket wrench (8 mm) - Hex-nut (6 mm) - Dental hook
	Insert lamination cone with the tip pointing downwards.
	Insert the first spray crown and press down with the socket wrench.
	Insert the second spray crown and press down with the socket wrench.
	Insert the third and last spray crown and press down with the socket wrench.
	Insert the O-ring and place it in the intended groove using the hook. The assembling of the internal components of the Jet Nozzle is complete.

10.7. Opening / Closing the Case

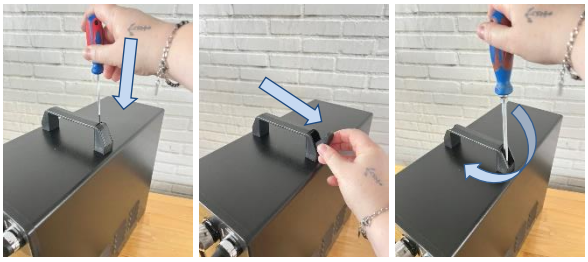
Opening the Case

Before opening the Nitro-Dispenser, disconnect from electrical power.

General instructions for opening / closing the appliance.

<u>Required tools and parts:</u>

- Cross screwdriver (PH2)
- Small slotted screwdriver (3 mm)



Remove the handle covers (2x) and unscrew the screws from the handle.

Unscrew all screws from the upper shell (4x).

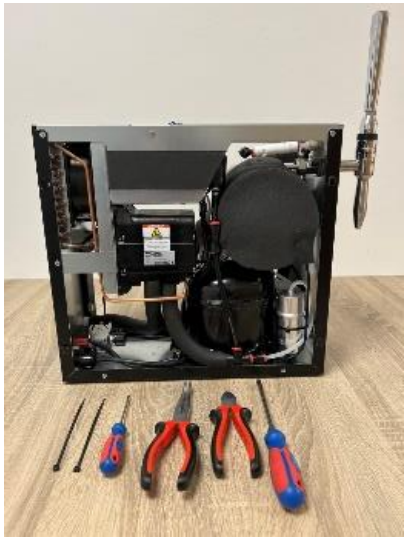
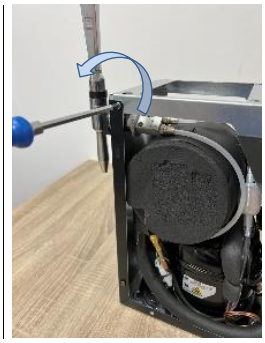
Lever the upper shell upwards, inserting the slotted screwdriver into the corners. This will allow the top shell to come off easily.

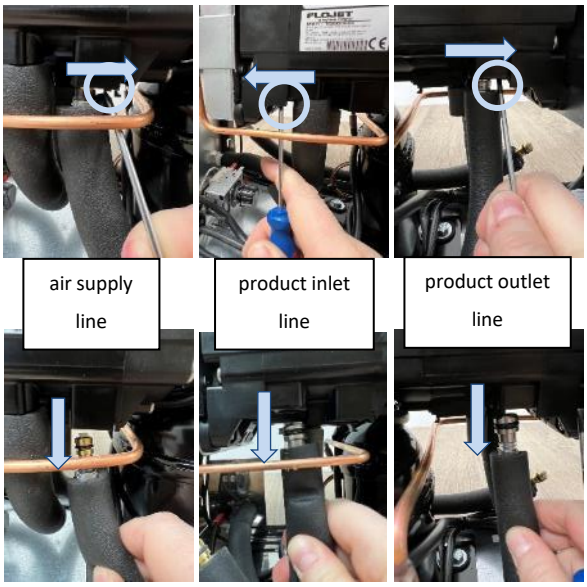
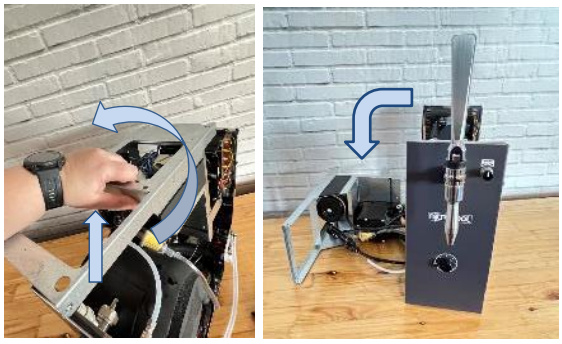
Pull the upper shell upwards and take it off.

Closing the Case	
	General instructions for opening / closing the appliance. <u>Required tools and parts:</u> - Cross screwdriver (PH2) - Small slotted screwdriver (3 mm)
 	Slightly bend outwards the 8 flaps of the lower case. There are 4 flaps on each.
    	Put the upper case onto the appliance and slide one lateral side downwards so that the upper case cut-outs snap into the flaps. Then slide down the other later side. All 8 flaps must be engaged with the upper case.
 	Insert all screws of the upper case (4x).
  	Tighten the two screws of the handle. Click in the handle covers (2x).

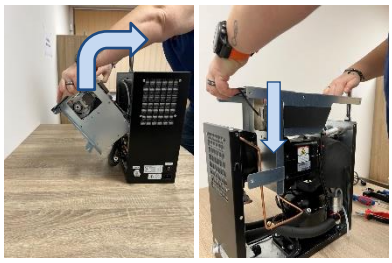
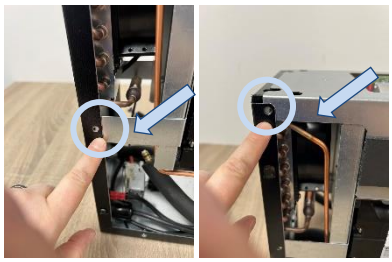
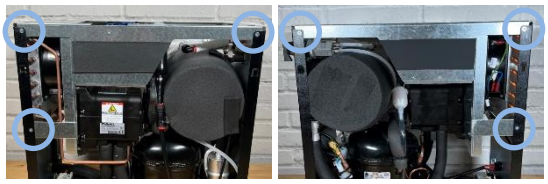
10.8. Disassembly & Assembly intermediate cabinet

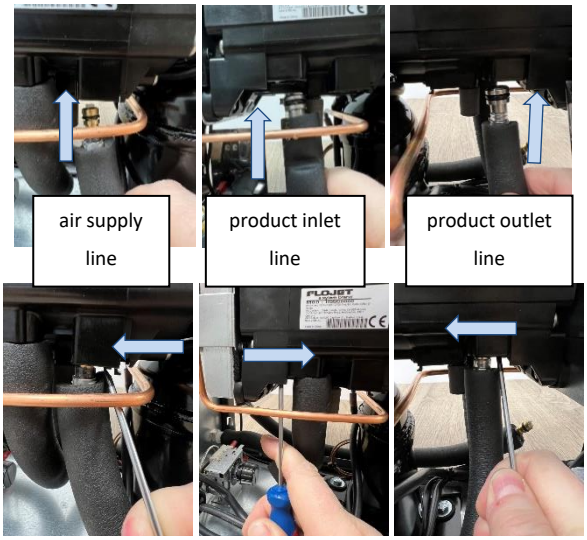
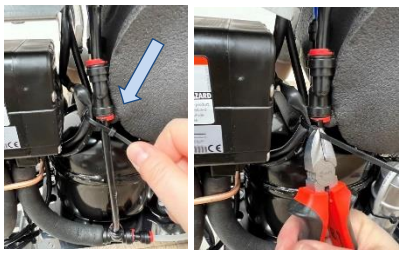
10.8.1. Disassembly

	General instructions for removing the intermediate cabinet. <u>Required tools and parts:</u> - Cross screwdriver (PH2) - Small slotted screwdriver (3 mm) - Pliers - Side cutter Disconnect the device from the power supply before starting work. Release pressurized liquid before disassembly start.
  	Unscrew the 6 cabinet screws.
 	Remove the locking clip and disconnect gas supply line.

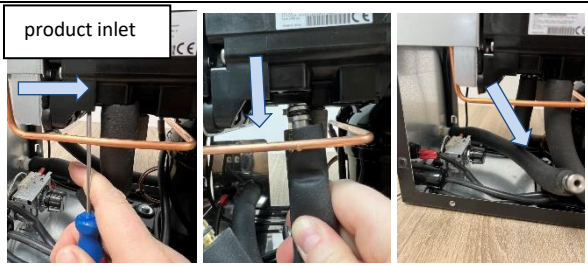
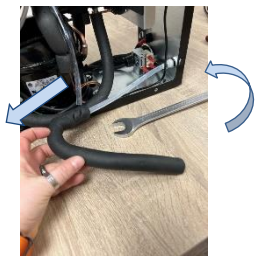
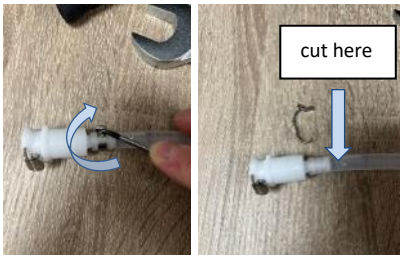
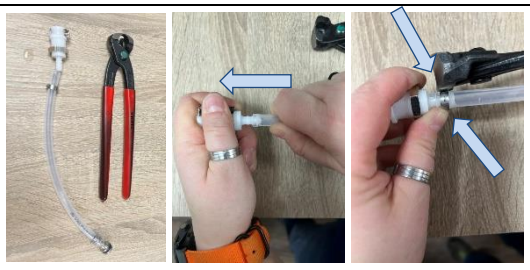
	Unlock and pull out the air supply line, product inlet line and product outlet line.
	Remove cable ties.
	Pull up the intermediate cabinet and set aside.
	Intermediate cabinet successfully removed.

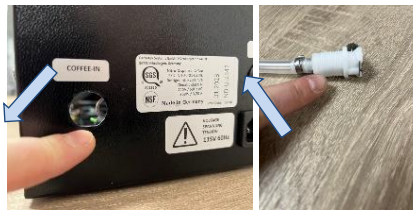
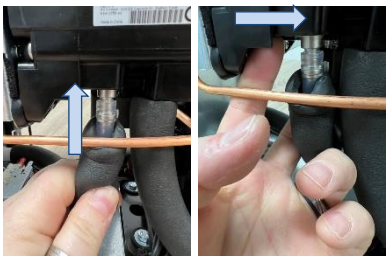
10.8.2. Reassembly

	General instructions for installing the Nitro Despenser intermediate cabinet. <u>Required tools and parts:</u> - Phillips screwdriver (PH2) - Small slotted screwdriver (3 mm) - Pliers - Side cutter - 2 x cable ties
	Pick up the intermediate cabinet and place it in the device.
	Make sure that the intermediate cabinet sheets are behind the metal elements of the lower case as marked in the picture beside.
	Insert all 6 cabinet screws.

	Insert the air supply line, the product inlet line and the product outlet line and secure the lines with the pump bars.
	Connect the air supply hose and secure it.
	Secure with cable ties and cut off the excess length.
	Secure with cable ties and cut off the excess length.
	Intermediate cabinet successfully reassembled.

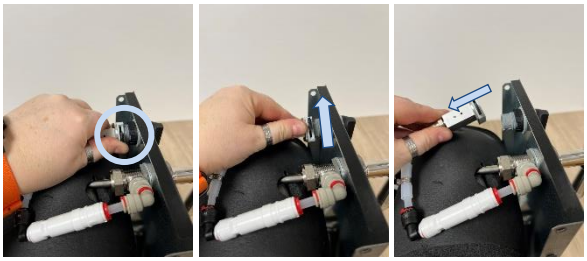
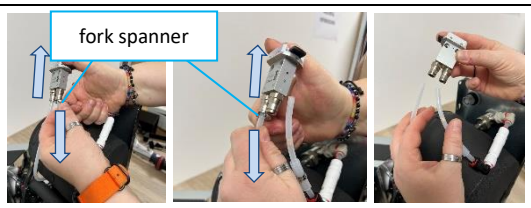
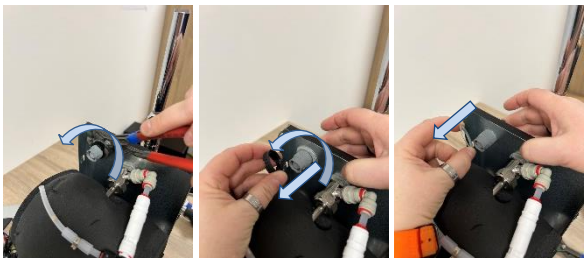
10.9. CPC socket change

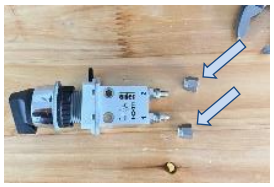
	General instructions to exchange the CPC socket adapter: <u>Required tools and parts:</u> - Small slotted screwdriver (3 mm) - Pliers for 1-ear clamp - Side cutter - Open-end spanner (21 mm) - CPC socket (art 1312) - 1-ear clamp (art 023) - 3/8 hose piece (art 106 : 25cm) - <u>EVENTUALLY</u> Before start: - Pump air through the system - Release pressure
	Unlock and unplug the product inlet line at the pump.
	Pull off the insulating sleeve from the product inlet.
	Unscrew the nut from the coupler and pull the product inlet line out of the machine.
	Open the 1-ear clamp on the coupler with a slotted screwdriver and cut off the hose. Remove the rest of the hose at the adapter hose-barb.
	Slide the 1-ear clamp over the loose hose piece, push the hose onto the coupler and use the pliers to clamp the 1-ear clamp in the first flank.

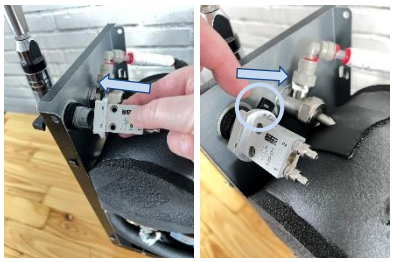
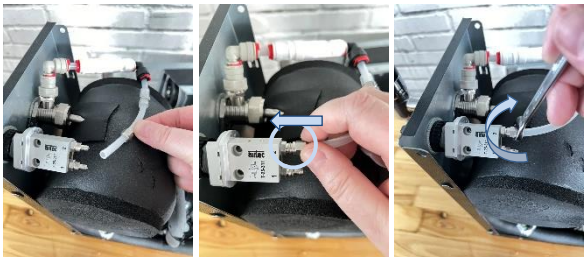
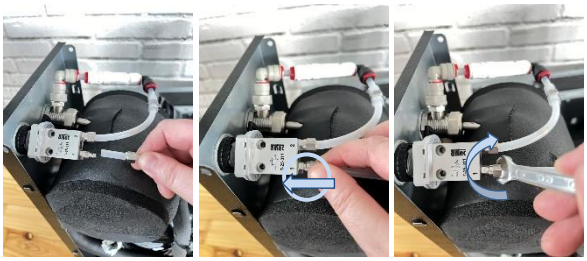
	New product inlet line is prepared now.
	Install the new product inlet line in the dispenser. Pay attention to the flat side of the CPC socket. Position the socket in a way that the flat side faces downwards.
	Fasten the coupler with the nut.
	Push the insulating sleeve over the inlet hose.
	Insert the product inlet nozzle into the pump and secure connection with pump bar.
	CPC socket successfully exchanged.

10.10. Nitro-Switch exchange

Exchange of the old nitro switch version

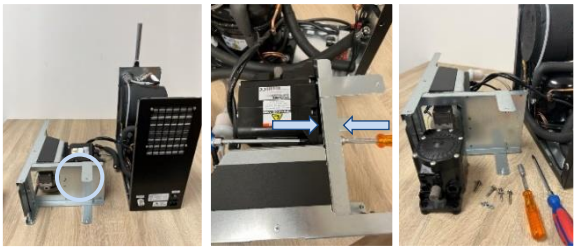
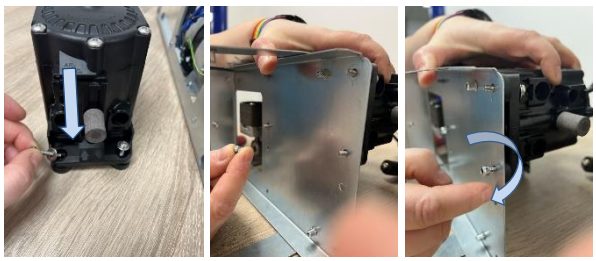
	General instructions to exchange the Nitro-Switch. <u>Required tools and parts:</u> - Pliers - Open-end spanner (8 mm and 9 mm) - Nitro-Rotary-Switch (art 341)
Step 1: Remove the intermediate cabinet as described in chapter “10.8.1 Disassembly”	
Step 2: Remove the installed rotary switch	
	Unlock the valve lever and remove the valve body.
	Disconnect the hoses by using a fork spanner
	• Loosen the union nut from valve actor • Then unscrew by hand • Remove it • Remove the lock washer
	Pull out the valve actuator from front side

Step 3: Installation of the spare Nitro-Rotary-Switch	
	Unscrew the two union nuts
 	Slide the two union nuts over the two open end hose pieces. Thread side facing to the end of the hose.
 	Disconnect the valve body from the valve actuator
 	Unscrew the valve nut and remove the washer
  	Insert the valve actuator from front side Pay attention to the recess in the metal sheet and the corresponding seat.
 	Attach the washer
  	Screw on union nuts and tighten carefully with pliers tool.

<table>
<tr><td>  </td><td>Attach and valve body and secure it with the bar.
Printed side of valve body must be visible.
Compare with picture beside.</td></tr>
<tr><td>  </td><td>Attach the nozzle hose and tighten the union nut
In position 2</td></tr>
<tr><td>  </td><td>Connect the gas supply hose and tighten the union nut
In position 1</td></tr>
<tr><td>  </td><td>Nitro rotary switch successfully exchanged

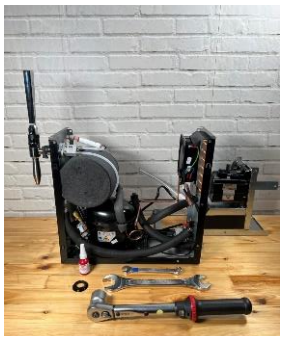
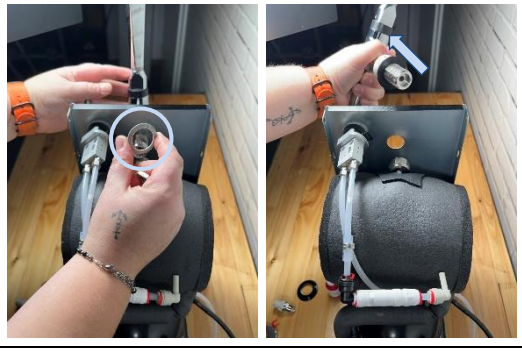
Insert the intermediate housing as in step "Reassembly 10.8.2"</td></tr>
<tr><td colspan="2">Step 4: Assemble the intermediate cabinet as described in chapter “10.8.2 Reassembly”</td></tr>
</table>

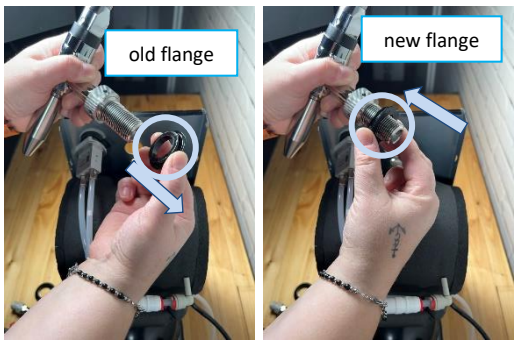
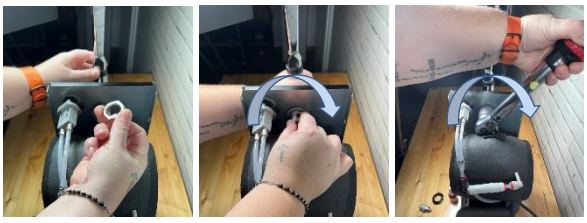
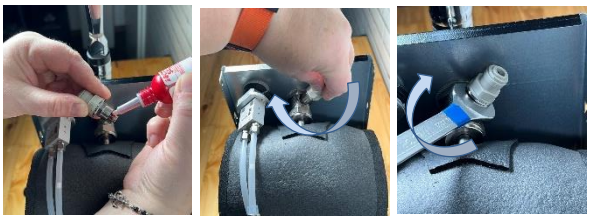
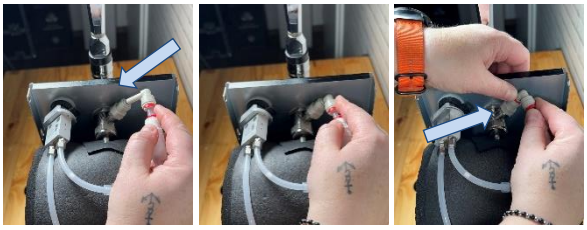
10.11. Pump exchange

<table>
<tr><td>  </td><td>General instructions for product pump exchange
<u>Required tools and parts:</u>
- Small slotted screwdriver (3mm)
- Cross screwdriver (PH2)
- Socket spanner (7mm)
- Pliers
- Side cutter
- Replacement pump (art 738)</td></tr>
<tr><td colspan="2">Remove the intermediate cabinet as described in chapter “10.8.1 Disassembly”.</td></tr>
<tr><td>  </td><td>Loosen the pump screw connections (4x) and set aside</td></tr>
<tr><td>  </td><td>Take new pump, insert screws with washer (4x) into the pump fixation recess.
Place the pump on the intermediate cabinet and push the screws through, now tighten the connection with the nut by hand.</td></tr>
<tr><td>  </td><td>Tighten the nut and screw until approx. 7 mm of the screw thread is visible.

Pump exchange finished.</td></tr>
<tr><td colspan="2">Assemble the intermediate cabinet as described in chapter “10.8.2 Reassembly”.</td></tr>
</table>

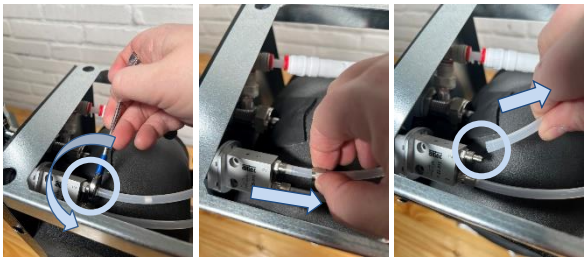
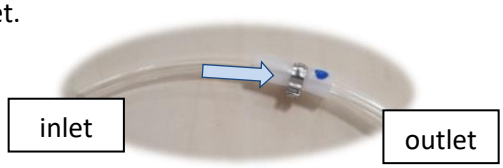
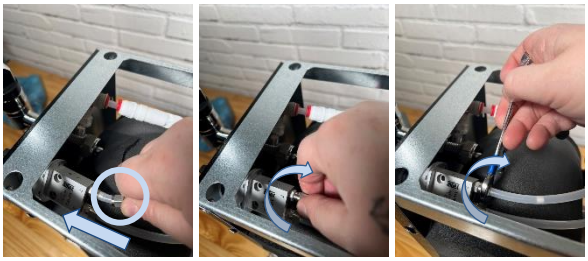
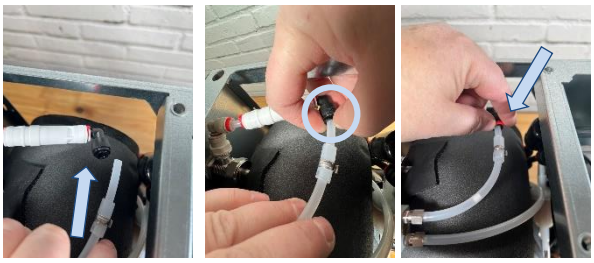
10.12. Tap Flange exchange

<table>
<tr><td>   </td><td>General instructions for replacing the tap flange.
<u>Required tools and parts:</u>
- Open-end spanner (14 and 25mm)
- Torque spanner up to 50N/m with 28 mm socket. (set to 30N/m)
- Thread locking gel (food safe)
- Tap-Shank Flange (art 1477)</td></tr>
<tr><td colspan="2">Remove the intermediate cabinet as described in chapter “10.8.1 Disassembly”.</td></tr>
<tr><td>  </td><td>Remove the locking ring and detach the nitro feed string.</td></tr>
<tr><td>  </td><td>Unscrew the gas inject adapter with the 14 mm spanner and set it aside.</td></tr>
<tr><td>  </td><td>Loosen and remove the union nut from the “cooling block – tap shank” connection with the 25 mm spanner</td></tr>
<tr><td>  </td><td>Unscrew the 28 mm nut from the tap connector and set aside</td></tr>
<tr><td>  </td><td>Take off lock washer and remove the tap</td></tr>
</table>

	Remove the tap shank flange and attach new flange to the tap.  tap flange
	Insert the tap through the case opening.
	Put the lock washer onto the tap shank. Caution: The lock washer shall touch the case on the outer area of the washer. The reason is the arch form of the washer.
	Place the 28 mm nut on the tap connector and tighten with the torque spanner (30N/m).
	Attach the 25 mm union nut from the cooling block. Verify that the shank gasket is seated correctly!
	Apply thread locking gel and screw in the gas inject adapter. Tighten with care.
	Connect the nitro feed string to the gas inject adapter. Secure with locking clip. Assemble the intermediate cabinet as described in chapter “10.8.2 Reassembly”.
Assemble the intermediate cabinet as described in chapter “10.8.2 Reassembly”.	

10.13. Gas Dosing Components

10.13.1. Gas Dosing String change

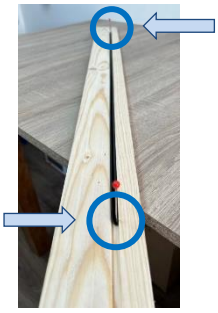
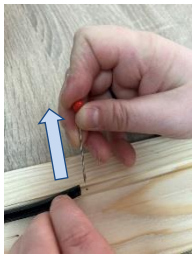
	General instructions for replacing the gas dosing hose. <u>Required tools and parts:</u> - Open end spanner (8 and 9mm) - Gas dosing hose (art 1791)
	Remove the retaining ring and pull out the gas dosing hose outlet.
	Loosen the union nut from the rapid screw adapter, unscrew and push back, then pull off the gas dosing hose inlet.
	Remove the union nut from the old gas dosing hose and put it onto the new gas dosing hose inlet. 
	Attach the gas dosing hose inlet to the rapid screw adapter, screw on the union nut and tighten with care.
	Connect gas dosing hose outlet to the gas feed (elbow) and secure connection with clip. Gas dosing hose successfully exchanged.

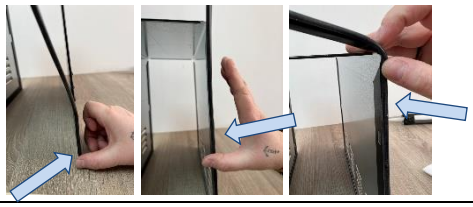
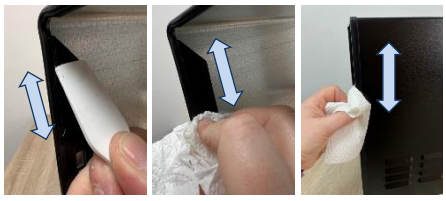
10.13.2. Gas Inject Adapter (1455) exchange

<table>
<tr><td>  </td><td>General instructions for exchanging the gas inject adapter.
<u>Required tools and parts:</u>
- Open-end spanner (14 mm)
- Slotted screwdriver (3 mm)
- Thread lock gel (food safe)
- Gas inject adapter (art 1455)
 
Release pressure from tap, before starting work.</td></tr>
<tr><td colspan="2">Remove the intermediate cabinet as described in chapter “10.8.1 Disassembly”.</td></tr>
<tr><td>  </td><td>Remove the locking ring and detach the gas feed line as shown on the picture.</td></tr>
<tr><td>  </td><td>Unscrew the gas inject adapter with 14 mm spanner and put aside.</td></tr>
<tr><td>  </td><td>Apply thread locking gel and screw in the gas inject adapter and tighten with care.</td></tr>
<tr><td>  </td><td>Connect the gas feed line to the gas inject adapter and secure it.

Gas inject adapter successfully exchanged.</td></tr>
<tr><td colspan="2">Assemble the intermediate cabinet as described in chapter “10.8.2 Reassembly”.</td></tr>
</table>

10.14. Apply Silicon Rubber U-profile

<table>
<tr><td>   </td><td>General instructions for replacing the black silicone U-profile at the upper shell front side.
<u>Required tools and parts:</u>
- Silicone U-profile, black (art 888), 89.5 mm
- Silicone adhesive: ELASTOSIL® E43
- Ethanol spray for cleaning
- Brush
- Cartridge squeezer
- Board (90 cm) with 8 x 5 mm groove
- 2 x needle for profile fixation</td></tr>
<tr><td colspan="2">Take off the upper shell as described in chapter “10.7 Opening / Closing the Case”.</td></tr>
<tr><td>   </td><td>Make a single board with a groove:
Groove dimensions:
- Width 8mm
- Depth 5mm</td></tr>
<tr><td>  </td><td>Fix the silicone U-profile in the groove with two needles, slightly tensioning the silicone profile.</td></tr>
<tr><td>   </td><td>Clean the upper case with ethanol spray.</td></tr>
<tr><td>    </td><td>Apply the E43 adhesive to the silicone U-profile, spread it with a brush and remove excess adhesive.</td></tr>
<tr><td>   </td><td>Remove the needle fixation and pick up the silicone U-profile</td></tr>
</table>

<table>
<tr><td>  </td><td>Press the silicone u-profile evenly onto the upper case.</td></tr>
<tr><td>  </td><td>Press the silicone U-profiles firmly into the corners.</td></tr>
<tr><td>  </td><td>Remove excess adhesive</td></tr>
<tr><td>  </td><td>Silicon profile was successfully applied.

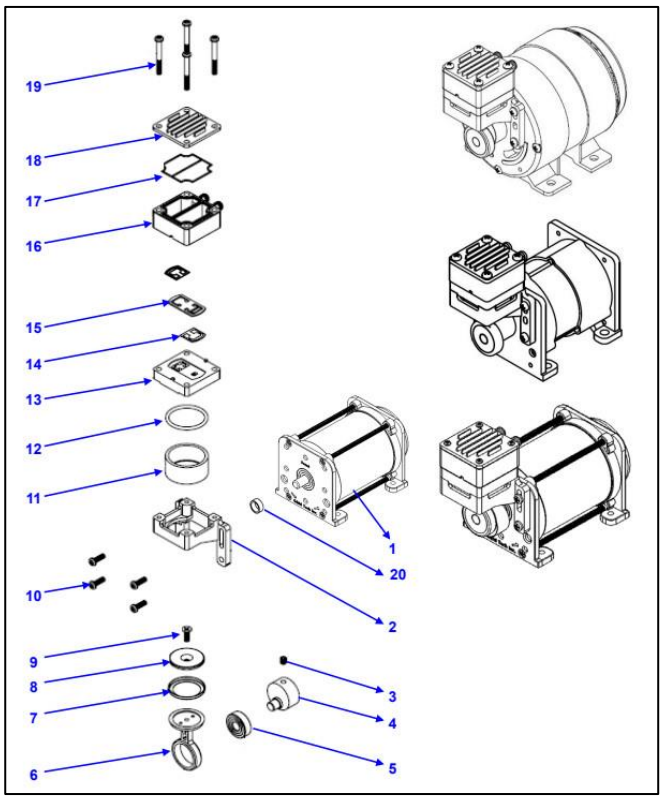
Let the adhesive dry for about <u>12 hours</u> before reassembling on the dispenser.</td></tr>
<tr><td colspan="2">Assemble the upper shell as described in chapter “10.7 Opening / Closing the Case”.</td></tr>
</table>

10.15. Air-Compressor

10.15.1. Parts

Most sensitive parts are:

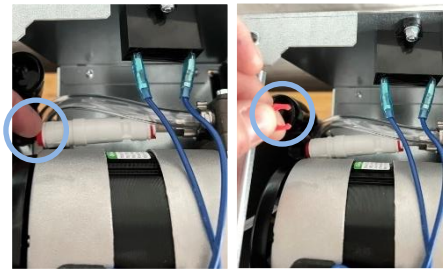
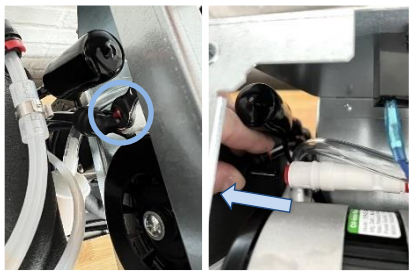
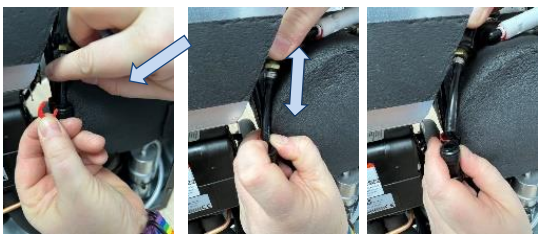
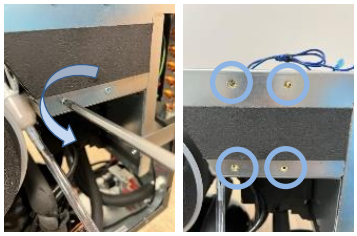
- #15 Silicone valve
- #7 Teflon cup

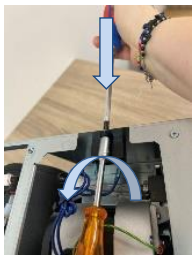
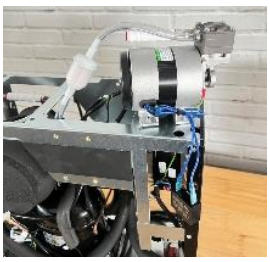


Parts #	Parts Name	Material	Q'ty	Remarks
1	Motor Assembly (AC, BLDC, BDC)		1	
2	Pump Body	ADC12	1	
3	Set Screw		1	M5
4	Eccentric	S454C	1	
5	Bearing		1	608ZZ
6	Rod	ADC12	1	M8
7	Teflon cup	PTFE	1	
8	Rod Cap	ADC12	1	
9	Rod Screw	STS	1	M4
10	Body Screw		4	M4
11	Cylinder	AL6061	1	Anodizing
12	O-Ring (Cylinder)	Sil. Rubber	1	Small
13	Valve Plate	ADC12	2	
14	Valve washer	STS		
15	Valve	Rubber	1	Large
16	Head	ADC12	2	M4
17	Rec-Ring(Head)	Sil. Rubber	1	
18	Head Cap	ADC12		
19	Head screw		4	M6
20	Gap jig (spacer)	Brass		Valid for AC & BDC

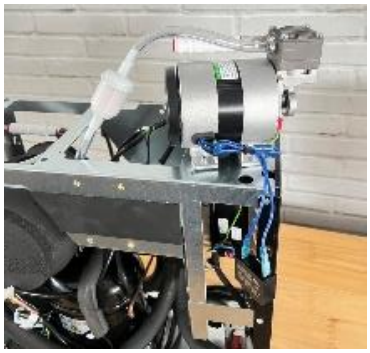
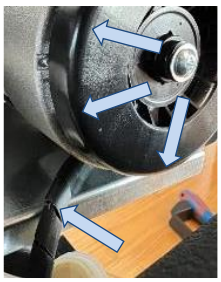
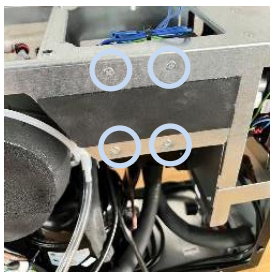
Available spare parts at Carbotek:
Art 831: Air-Compressor Teflon Cup (part #7)
Art 833: Air-Compressor 15 RAS spare gasket set (Consists of parts: #12, #14, #15, #17)

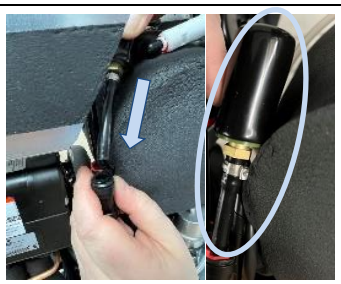
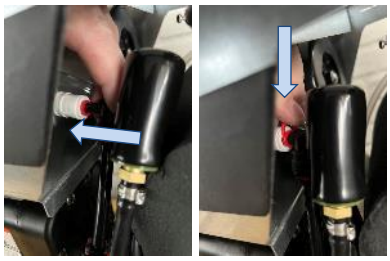
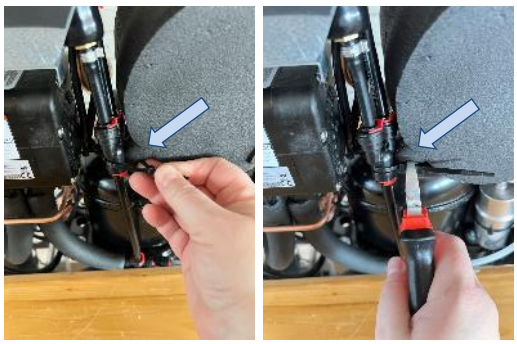
10.15.2. Air-Compressor take out

<table>
<tr><td>  </td><td>General instructions for taking out the air-compressor from the appliance.
<u>Required tools and parts:</u>
- Open-end spanner (7 mm)
- Cross screwdriver (PH2)
- Pliers
- Side cutter</td></tr>
<tr><td colspan="2">Disconnect from electrical power before start of work.</td></tr>
<tr><td>  </td><td>Remove cable ties as on picture</td></tr>
<tr><td>  </td><td>Disconnect retaining ring from air outlet string.</td></tr>
<tr><td>  </td><td>Use the 7 mm spanner to pull out the black elbow adapter from the double check valve.</td></tr>
<tr><td>  </td><td>Unlock and pull out the pressure switch
  </td></tr>
<tr><td>  </td><td>Unscrew al 4 screws from the air compressor</td></tr>
</table>

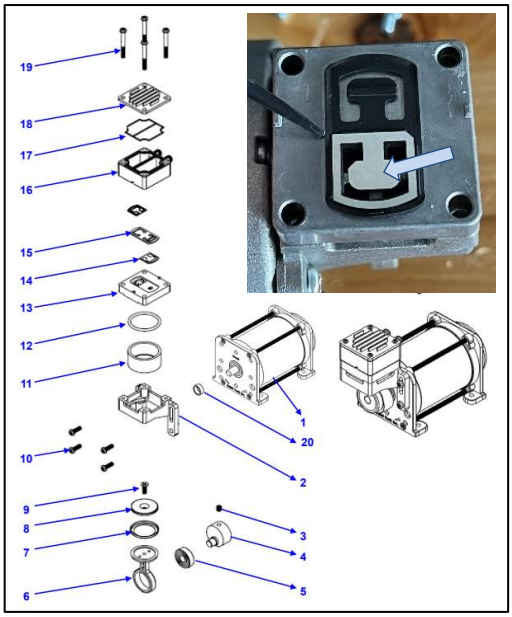
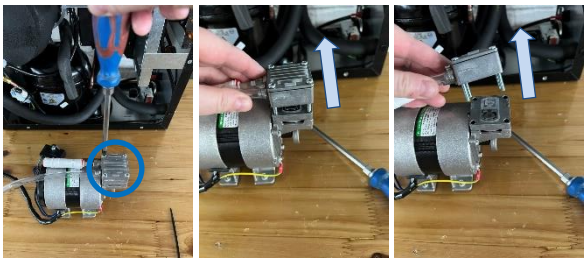
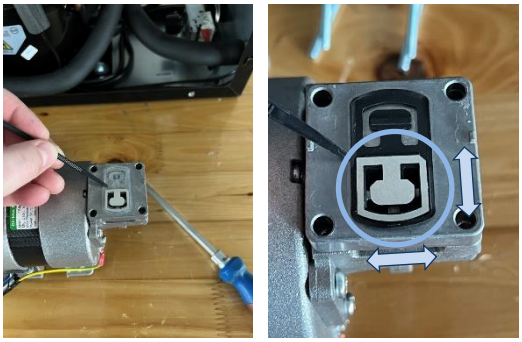
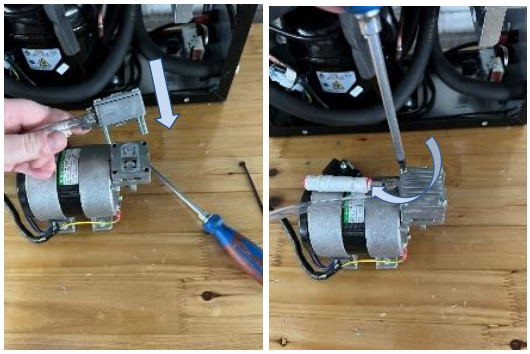
 	Loosen the screws from the air-compressor capacitor and set aside
 	Now take out the air compressor.

10.15.3. Air-Compressor reassembly

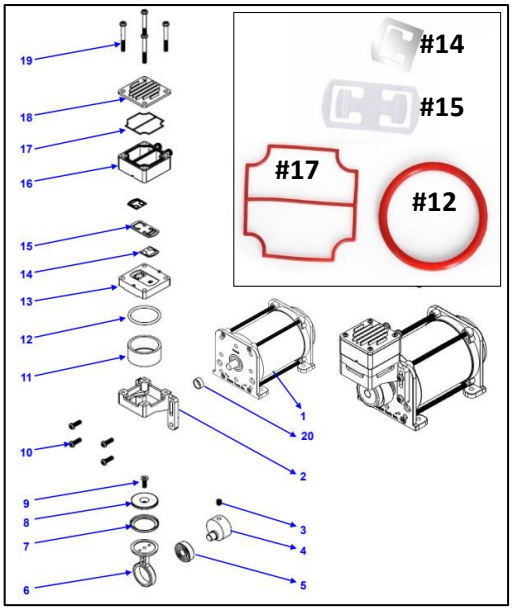
	General instructions for reassembly of the air-compressor into the appliance. <u>Required tools and parts:</u> - Open-end spanner (7 mm) - Cross screwdriver (PH2) - Pliers - Side cutter - Cable tie
	Route the power cable from the air-compressor downwards between the air-compressor feet.
 	Insert the air compressor at an angle. The air-compressor fan wheel must be free all round. No cables or hoses must touch the wheel as this could cause severe damages to the machine and impact it's functionality.
 	Screw the air compressor on with the 4 screws

	Screw the condenser back in.
	Push in the pressure switch to the Y-adapter and secure the connection with the retaining ring.
	Attach the black elbow of the compress air feed line to the white non-return valve and secure it with the retaining ring.
	Secure the air supply line with a cable tie and cut off the excess length.
	Secure the transparent air intake hose of the air-compressor with a cable tie and cut off the excess length.
	Air-compressor reassembly completed successfully.

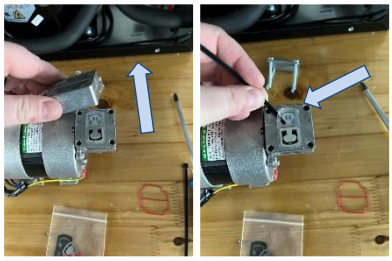
10.15.4. Reposition Metal Plate (#14)

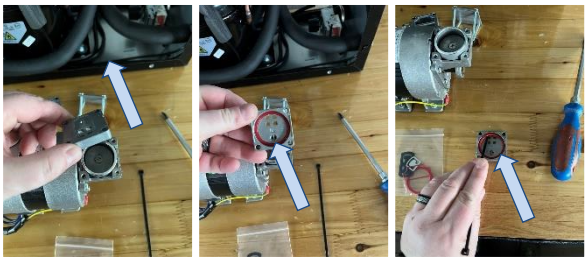
<table>
<tr>
<td> 
</td>
<td>General instructions for (re)-positioning the air-compressor metal plate (also called valve washer, #14).
Reason for repositioning the metal plate:
If metal plate is not in a perfect position the air-compressor has problems to kick in (start moving the piston). It sounds like that the air compressor wants to start moving the piston rod – but somehow cannot start moving. After a couple of seconds, the piston will start. However, this delay is unintended.
<u>Required tools and parts:</u>
- Cross screwdriver (PH2)
- Cable tie</td>
</tr>
<tr>
<td colspan="2">Take out the air compressor as described in chapter "10.15.2 Air-Compressor take out”.</td>
</tr>
<tr>
<td>  </td>
<td>Unscrew the 4 screws from the piston chamber lid (#18), lift the head cap as shown in pictures and put it aside.</td>
</tr>
<tr>
<td>  </td>
<td>Move the metal plate in the position as shown in the picture beside.</td>
</tr>
<tr>
<td>  </td>
<td>Close the chamber again.</td>
</tr>
<tr>
<td colspan="2">Put back the air-compressor in the appliance as described in chapter
"10.15.3 Air-Compressor reassembly”.</td>
</tr>
<tr>
<td colspan="2">Start system to test if metal plate repositioning was successful.
You might have to repeat the positioning procedure several times.</td>
</tr>
</table>

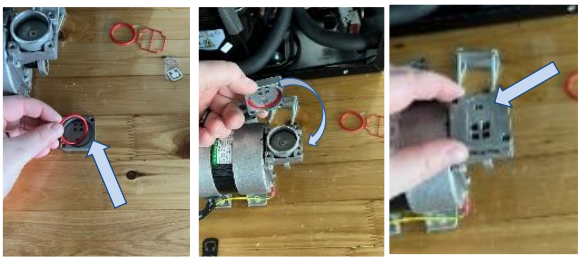
10.15.5. Apply spare gasket set (#12, #14, #15 und #17)

<table>
<tr><td> 
</td><td>General instructions to exchange the air-compressor spare gasket set.

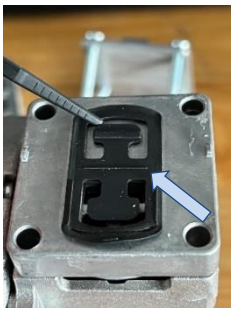
<u>Required tools and parts:</u>
- Cross screwdriver (PH2)
- Cable tie
- Spare gasket set (art 833)</td></tr>
<tr><td colspan="2">Take out the air compressor as described in chapter "10.15.2 Air-Compressor take out”.</td></tr>
<tr><td>  </td><td>Unscrew the 4 screws (#19) from the piston head cap (#18) and lift the head cap.

Remove the head seal (#17).</td></tr>
<tr><td>  </td><td>Now lift the head (#16), to get access to the diaphragm valve (#15) and the metal plate (#14).

Remove diaphragm valve (#15) and
metal plate (#14).</td></tr>
<tr><td>  </td><td>Remove the valve plate (#13) from the cylinder (#11) to get access to the cylinder O-ring (#12).

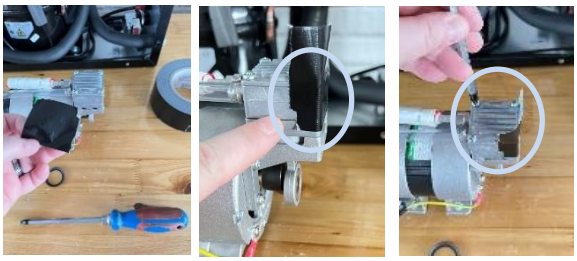
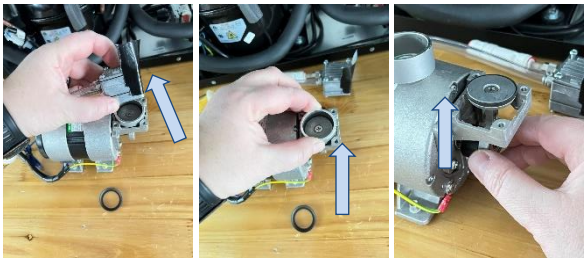
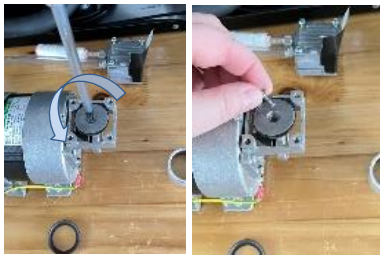
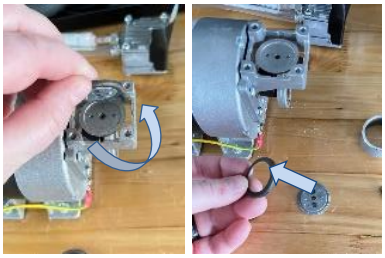
cylinder O-ring (#12).</td></tr>
<tr><td>  </td><td>Place new O-ring (#12) into bottom side of valve plate (#13).

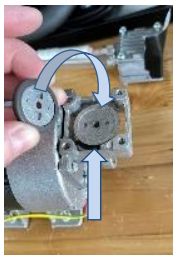
Put the valve plate (#13) back on the cylinder (#11).</td></tr>
</table>

 	Place new diaphragm valve (#15) on the top side of the valve plate (#13). Position it accurate as shown on the picture.
 	Place the air compressor metal plate (#14). Position it accurate as shown on the picture.
  	Insert the head seal (#17) into its groove in the head piece (#16). Close the head cap (#18) put the 4 screws (#19) already in.
 	Now place the head piece (#16) with the head cap (#18) on, carefully on the valve plate (#13). Pay attention that diaphragm valve (#15) or the metal plate (#14) is not moved into a different position. Finally tighten the 4 screws (#19).
	Spare gasket set successfully exchanged.
Put back the air-compressor in the appliance as described in chapter "10.15.3 Air-Compressor reassembly”.	

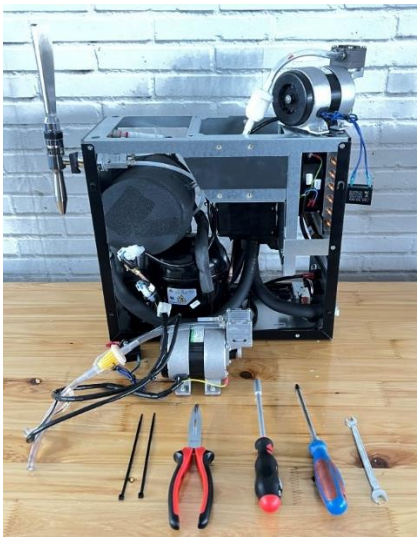
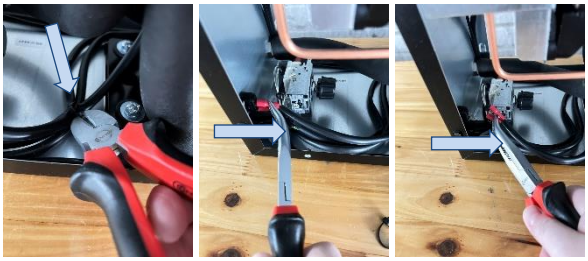
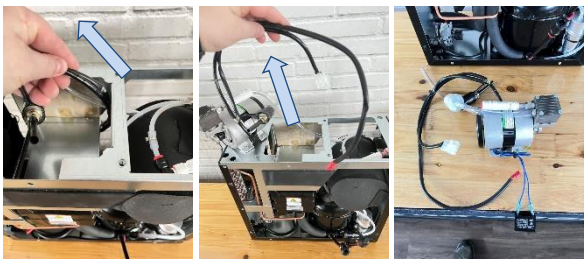
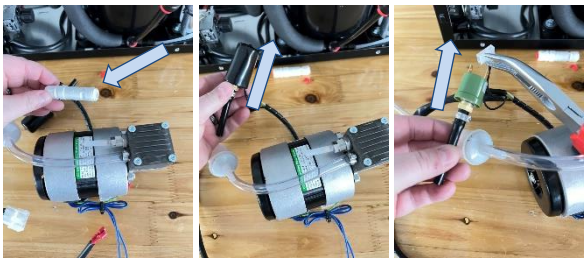
10.15.6. Teflon cup (#7) exchange

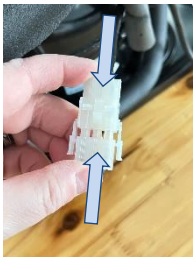
<table>
<tr><td>  </td><td>General instructions to exchange the air-compressor Teflon cup (#7).

<u>Required tools and parts:</u>
- Cross screwdriver (PH2)
- Adhesive tape
- Spare teflon cup (art 831)</td></tr>
<tr><td colspan="2">Take out the air compressor as described in chapter "10.15.2 Air-Compressor take out”.</td></tr>
<tr><td>  </td><td>Tear off a piece of adhesive tape and stick it around the piston chamber housing. This bounds the parts:
#18 : Head cap
#16 : Head body
#13 : Valve plate
The adhesive tape prevents the metal plate slipping into a different position.</td></tr>
<tr><td>  </td><td>Take off the chamber block (#18, #16, #13), pull out the metal cylinder (#11),
Move the piston rod (#6) upwards.</td></tr>
<tr><td>  </td><td>Unscrew the rod screw (#9)</td></tr>
<tr><td>  </td><td>Lift the rod cap (#8)
Take out the old Teflon cup (#7)</td></tr>
</table>

 	Place the new Teflon cup (#7) on the rod cap (#8) bottom side. Then put the rod cap on the rod (#6). Make sure that the holes are aligned and that it is in the correct position.
 	Screw in the rod screw (#9) to fix the rod cap (#8)
 	Move the cylinder ring (#11) on the rod (#6) slightly at an angle and with its rounding facing downwards. The Teflon cup wings must not flip in the opposite direction or otherwise get damaged.
  	Put back the chamber block (#18, #16, #13), Tighten the 4 screws and remove the adhesive tape.
	Teflon cup replacement completed.
Put back the air-compressor in the appliance as described in chapter "10.15.3 Air-Compressor reassembly".	

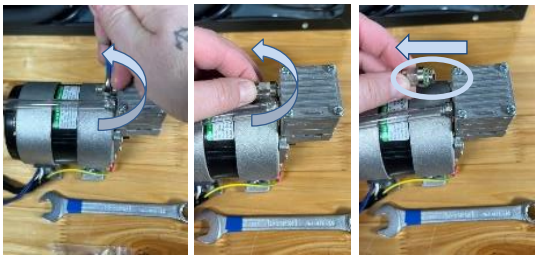
10.15.7. Air-Compressor (art 832) exchange

	General instructions for replacing the entire air-compressor. <u>Required tools and parts:</u> - Open-end spanner (7 + 8 mm) - Cross screwdriver (PH2) - Pliers - Side cutter - Cable ties - Air compressor 115 VAC / 60 Hz (art 832)
Take out the air compressor as described in chapter "10.15.2 Air-Compressor take out".	
	Disconnect the power connection while pressing the retaining clamps together.
	Cut the cable tie and remove both flat plugs from the PRESSURE toggle switch.
	Pull the cables out of the appliance and put the compressor aside.
	Unlock and disconnect the non-return valve from the old air compressor outlet. Remove the black cap from the pressure switch and disconnect the two plug connections from the pressure-switch.

  	Now connect and secure the non-return valve to the new air-compressor outlet. Connect the pressure switch flat plugs of the new air-compressor to the pressure-switch. Move the black cap on pressure-switch.
 	Slip power cable between cooling block and refrigerant circuit line.
  	Press the power connections together to establish a locked connection. Place the connection block under the cooling block.
 	Feed the power cable through to the rear.
 	Connect the flat plugs to the pins of the PRESSURE switch.
Now continue with the steps described in section: "10.15.3 Air-Compressor reassembly”.	
	Air-compressor exchange completed successfully.

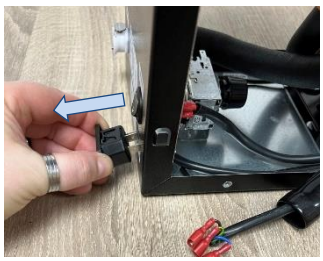
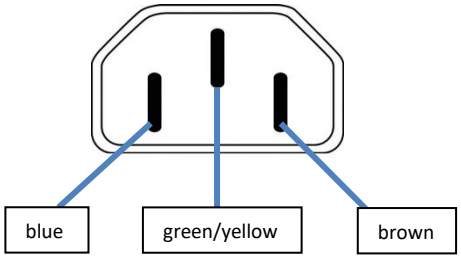
10.15.8. Air-Outlet adapter (art 1787) exchange

<table>
<tr><td>  </td><td>General instructions for replacing the air-compressor outlet adapter. Also called Rapidadapter.

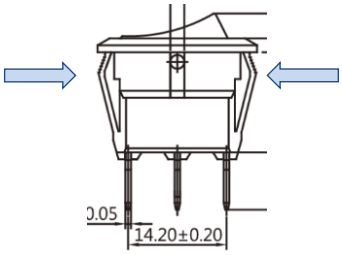
<u>Required tools and parts:</u>
- Open-end spanner (10 +11 mm)
- Replacement Rapidadapter (art 1787)</td></tr>
<tr><td colspan="2">Take out the air compressor as described in chapter "10.15.2 Air-Compressor take out”.</td></tr>
<tr><td>  </td><td>Unscrew old outlet adapter.</td></tr>
<tr><td>  </td><td>Screw in new Rapidadapter.</td></tr>
<tr><td>  </td><td>Rapidadapter exchange done.</td></tr>
<tr><td colspan="2">Put air-compressor back into the Nitro-Dispenser. See "10.15.3 Air-Compressor reassembly”.</td></tr>
</table>

10.16. Power Socket (C14) exchange

 	General instructions for replacing the built-in C14 inlet. <u>Required tools and parts:</u> - Slotted screwdriver (3 mm) - Pliers - C14 inlet (art 734)
 	Disconnect the main power cable.
 	Remove the protective cap inside.
	Disconnect all 3 blade terminals.
 	When removing the C14 inlet, please note: A large locking lug can be found at the upper side and two smaller locking lugs are at the bottom side. Those need to be pressed to get the C14 inlet out.
 	Press the upper locking lug to tip the C14 inlet out a bit.

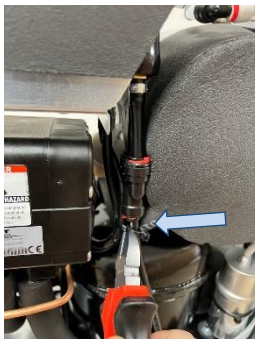
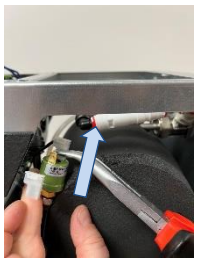
 	Open the pliers slightly and press the two locking lugs from the bottoms side. The C14 inlet adapter will pop out then.
 	Take the new C14 inlet adapter and push it in the case opening. Pay attention to the assembling direction. One locking lug side must face upwards.
Connection scheme, seen from inside of the dispenser 	Push the plugs on the blades according the connection scheme Ensure a proper connection.
	Slide protective cap over the plugs.
	Power socket change complete.

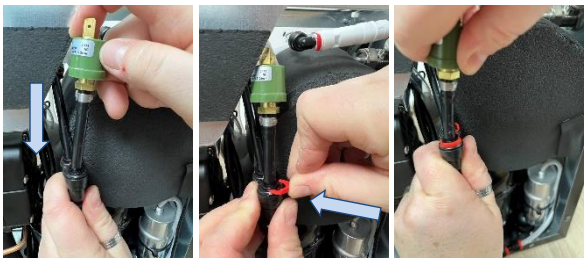
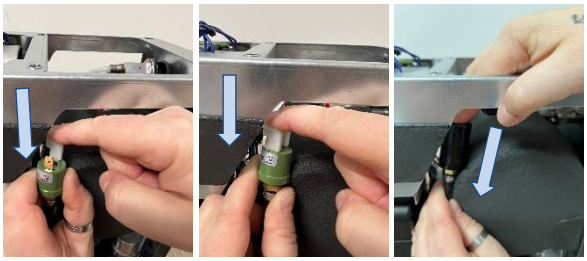
10.17. Manual Pressure Toggle Switch (art 825) change

 	General instructions for replacing the built-in pressure toggle switch (operated manually). <u>Required tools and parts:</u> - Pliers - Manual toggle switch (art 825)
 	Remove both flat plugs of the toggle switch.
	Retaining functionality: The toggle switch has two locking lugs that must be pressed simultaneously to release the switch.
 	Press both lugs together to remove the switch.
 	The case has a recess and the switch has a pin that fits into this recess, to ensure the correct assembling direction.

 	Position the switch and push it in until the locking lugs click in.
 	Reconnect both blade terminals of the plug. The position of the plugs (which plug to which blade) in this case is not relevant. Blades must be covered from the plugs completely.
	Pressure toggle switch successfully replaced.

10.18. Automatic Pressure-Switch (art 846) change

 	General instructions for exchanging the automatic pressure switch of the pneumatic circuit. <u>Required tools and parts:</u> - Pliers - Slotted screwdriver (8 mm) - Side cutter - Cable tie - Pressure-switch 2.8 – 3.2 bar (art 846)
 	Remove cable tie and clip.
 	Pull off the protective cap.
  	Remove both flat plugs.
 	Pull out pressure switch.

	Insert and secure new air pressure switch.
	Reconnect both flat plugs and slide on the protective cap.
	Secure the pneumatic tube with a cable tie on the refrigeration circuit.
	Pressure switch exchange completed.

10.19. Thermostat change & Temperature setup

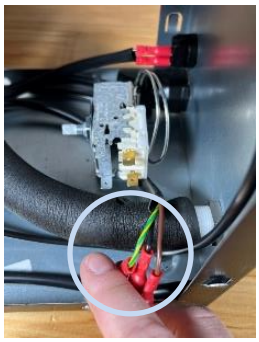
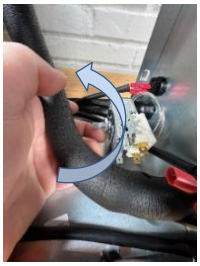
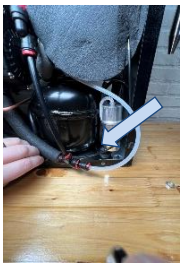
10.19.1. Thermostat change

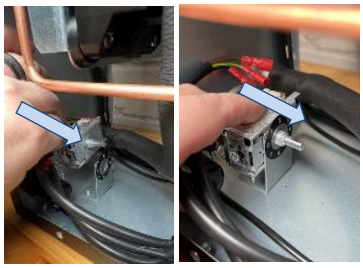
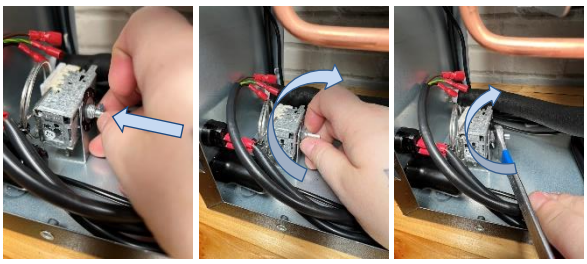
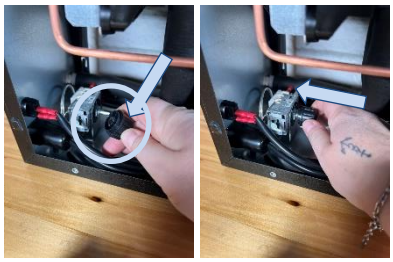
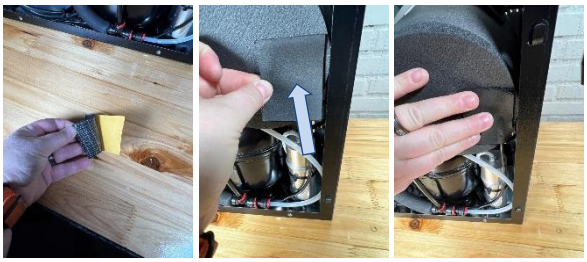
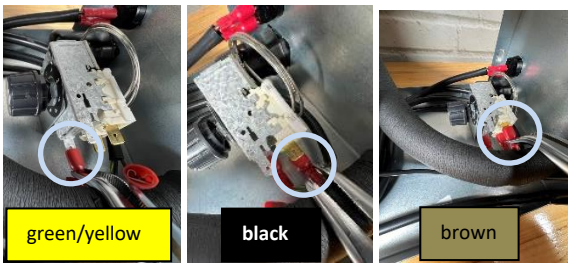
<table>
<tr>
<td> 

 </td>
<td>General instructions for exchanging the thermostat.

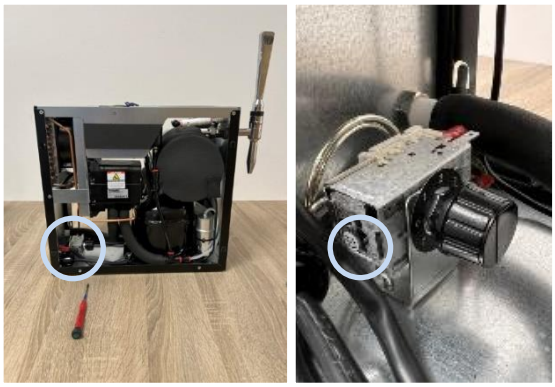
<u>Required tools and parts:</u>
- Folding ruler
- Pliers
- Side cutter
- Open-end spanner (14mm)
- “Edding” pen
- Cable ties
- Insulating tape
- Insulating tube for probe 50 cm (art 880)
- Thermostat RANCO S20026-K50B (art 840)</td>
</tr>
<tr>
<td> 

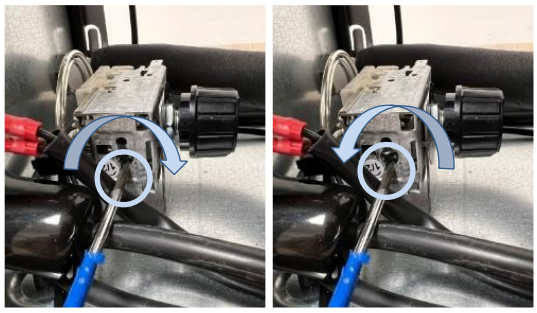
 </td>
<td>Preparation
• Unwind 63 cm of the thermostat probe.
• Move the insulation tube (50 cm) over the thermostat probe.
• Bend in a 90° ancle after a length of 13 cm.
• Coil the remaining thermostat probe wire and secure it with a cable tie.
• Cut off overhanging cable tie piece.</td>
</tr>
<tr>
<td> 
 </td>
<td>Pull off the thermostat knob.</td>
</tr>
</table>

 	Remove the 3 flat plugs that connect the thermostat to electrical power. Hint: Take a picture of the plug connection before disconnecting. This makes it easier when you reconnect the plugs.
  	Loosen fixation nut from thermostat and unscrew it.
 	Push the thermostat backwards and take it out.
 	Remove insulating tape at cooling block. Pull the old thermostat probe out of the cooling block.
	Remove old thermostat with its probe.
  	Insert the new thermostat probe (13 cm) into the cooling block inlet and route it along the bottom of the appliance.

	Position the new thermostat into the holder.
	Secure the thermostat with the fixation nut.
	Plug in the thermostat knob.
	Apply insulating adhesive tape over the cooling block insert of the thermostat probe.
	Connect the 3 flat plugs to the new thermostat. Left bottom: green/yellow cable Right upper: black cable Right bottom: brown cable
	The terminal connections must the covered from the plugs completely.

10.19.2. Temperature adjustment

<table>
<tr>
<td>  </td>
<td>General instructions how-to adjust the thermostat temperature.
<u>Required tools and parts:</u>
- Small cross screwdriver (PH0)

The thermostat temperature is a target temperature. When the liquid in the cooling block has reached this temperature, the cooling circuit switches off. I can take 3-4 minutes until target temperature was reached.</td>
</tr>
<tr>
<td>  </td>
<td>Turn the thermostat knob to position 6.
The arrow points downwards.</td>
</tr>
<tr>
<td>  </td>
<td>Turn the thermostat adjustment screw with the screwdriver.

Clockwise: One turn = + 3°C

Counter-clockwise: One turn = - 3°C</td>
</tr>
<tr>
<td>  </td>
<td>Temperature testing
1. Testing liquid must be between 15 – 25°C.
2. One liter must be tapped to fill liquid circuit and to restart the cooling compressor.
3. Wait until cooling compressor switches off.
4. Then measure the in-cup temperature of the second dispensed glass (size = 200 ml).
5. Now tap a few glasses and wait until cooling compressor switches off. Then repeat step 4.
6. Repeat procedure 5 again and measure 2nd glass after cooling compressor has switched off.

Target value of the in-cup temperature after the 3rd round: 4,5°C – 5,5°C
If the temperature is not in this corridor the thermostat setting must be adjusted again.</td>
</tr>
</table>

11. 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.

12. Warranty

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

Defect components are replaced from Carbotek.

13. Declaration of Conformity

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

14. Contact Data

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