



Cascata180
Nitro-Coffee Dispenser
Installation, Operation & Service Manual

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CORNELIUS INC



Important:

This manual contains important information. Please be sure to read and understand this manual before installation, operation and servicing. Users of the device are expected to be familiar with or trained on electronics, pipes, pneumatics, refrigeration and mechanical equipment. Operations must comply with safety specifications and meet local requirements for safety and operations, and all wiring and piping installation must comply with national and local codes. Failure to comply with these specifications and codes will likely lead to serious personal injury, death or damage to the device.

Contact us:

The product and technical information and explanations contained herein are not intended to cover all details or variations of the device, nor to provide for every possible contingency in installation, operation or maintenance of this device. These explanations are subject to change without notice from time to time. To familiarize yourself with the latest versions of this manual or other documents, or should you need technical supports for any Cornelius product, please contact local supporting technicians of Cornelius or obtain assistance through:

CORNELIUS INC, 12 Xin Tai Road, TEDA, Tianjin, PRC, 300457

www.cornelius.com.cn

+86-22-2529-0858

tech.service@cornelius.com

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Safety

Safety tips

- Read carefully and follow all safety information in this manual and safety signs (stickers, labels, cards) on the device.
- Before operating the device, read and understand all applicable safety regulations (for occupational safety and health administration).
- Keep safety signs in good conditions, and replace missing or damaged signs in a timely manner.
- Learn how to operate and control the device correctly.
- Ensure that the device is in normal working conditions, and unauthorized modification of the device is prohibited.

Identification of safety warning signs



Types of warning signs



Danger: there will be an imminent danger which, if it cannot be avoided, will result in serious injury, death or damage to the device.



Warning: there is a potential danger which, if it cannot be avoided, will result in serious injury, death or damage to the device.



Attention: there is a potential danger which, if it cannot be avoided, may result in slight injury, death or damage to the device.

Authorized service personnel

Warning:



The device should be serviced by trained and qualified electrician, pipe technician and refrigeration technician. All wiring and piping installation must be in accordance with national and local codes. Failure to comply with these codes will likely lead to serious personal injury, death or damage to the device.

Safety precautions

This device is specially designed to provide personal injury protection. To ensure effective protection, please observe the following precautions:



Danger:

Before service, please be sure to disconnect power supply and water supply, empty the regulator tank and quit all operations that have been executed by the user or it may cause accidents.



Do not open the metal enclosure of the product when device is in use; if it is necessary to do so, this must be done by authorized service personnel.

The enclosure of the device which has been serviced must be restored to its original status before operation of the device is resumed.

 **Warning:**

If a part is damaged, it must be replaced by the manufacturer or its agency or persons with equivalent qualification to avoid damage.

Children and those who have physical, sensory or mental disabilities or lack experiences and knowledge may not use the device; if it is necessary to use it, they must be supervised by qualified persons. Children may not play the product.

This device is not suitable for areas where water splash exists.

This device must be kept level.

This device shall not be flushed directly with water.

For the sake of safety and health, only those who have relevant knowledge and practical experiences have access to the service area.

This device is only intended to be installed and used in places where strictly trained personnel are available to service it.

 **Attention:**

Be sure to keep the periphery of the device clean and free of debris. Failure to keep its periphery clean may result in damage to device or personal injury.

Transportation and storage

 **Attention:**

Before transportation, storage or handling of the device, it must be sterilized and the disinfectant solution must be discharged from the system. The water in water tank and the regulator tank must also be drained from the system because a cold environment will lead to freezing of the remaining water or disinfectant residual in the device and thus result in damage to internal components.

Grounding instructions

 **Warning:** this device must be properly grounded. In the case of malfunction or short circuit of the product, grounding will reduce the risk of electric shock, while incorrect grounding connections impose risk of electric shock.

This device is supplied with a power cord and plug that contains a grounding wire, and the plug must be inserted in socket that has been installed as per specifications and properly grounded. Do not change the plug of the power cord supplied with the device; if the power cord plug and the socket are incompatible or if there is any doubt about grounding connection of the device, be sure to consult with qualified electrician or service personnel for confirmation.

General

Overview

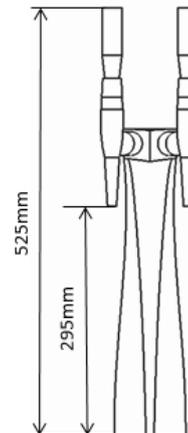
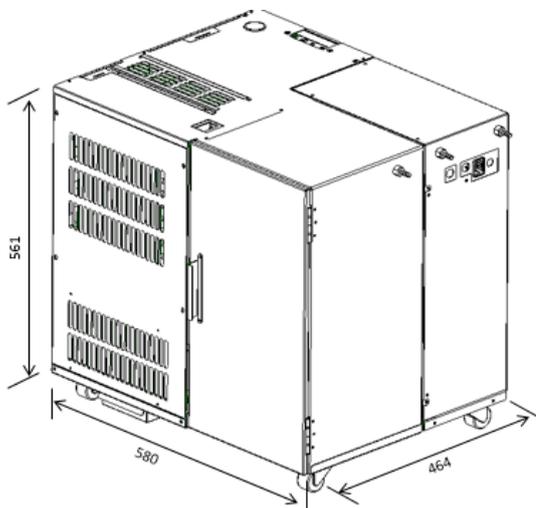
The manual serves as a guide for installation, operation and maintenance of the device. This section deals with description of the device, principles of operation and design data. The device must be installed and serviced by qualified service personnel. This device is supplied without any part used for servicing by the user.

Warranty information

| |
|----------------------------------|
| Warranty registration date: |
| Model of device: |
| Serial number of device: |
| Installation date: |
| Local authorized service center: |

Overview of the device

This device is used for infusion of nitrogen, cooling and dispensing of cold-brew coffee. This device is designed to provide an instant and reliable nitro coffee solution which is easy to use. This device is capable of dispensing quality coffee drinks on a constant basis, and it is simple to operate and service. The body of this product is intended to be installed under the counter and the valve tower which are equipped with two taps are intended to be installed on the counter.



Product specifications, parameters and explanation

| | | |
|-------------------------------------|--------------------------------------|---|
| Main performance parameters of body | Boundary dimensions (h * w * d) | 561*580*464 |
| | Weight | 54kg |
| | Input voltage | 220V 60Hz or 220V 50Hz (See nameplate) |
| | Rated current | 4 A |
| | Number of taps | 2 |
| | Pressure range of inlet nitrogen | 40~70 psi |
| | Pressure range of inlet coffee | 40~70 psi |
| | Temperature range of inlet coffee | 10~30 °C |
| | Ambient temperature range | 10~30 °C |
| | Outlet coffee temperature | < 7 °C |
| | Refrigerant and volume | R134a/145g |
| | Volume of chilled-water storage tank | 14 L |

Matched nitrogen cylinder and depressurization gauge bank

| | |
|--|---------------------------|
| Nitrogen cylinder and depressurization regulator | Depressurized to 40~70psi |
|--|---------------------------|

Matched coffee keg

| | |
|----------------------|-----|
| Volume of coffee keg | 9 L |
|----------------------|-----|

Warranty terms

This product is covered by the commercial warranty of Cornelius and subject to all constraints and limits of the commercial warranty. Cornelius will not be responsible for servicing, replacement and other services in case of loss of or damage to the product arising from (but not limited to) the following:

- (1) use of the product in conditions other than required normal conditions and for purposes other than intended purpose;
- (2) improper voltage;
- (3) improper wiring;
- (4) intentional damage;
- (5) accidents;
- (6) incorrect use; ;
- (7) servicing by unauthorized persons who are not qualified or trained;
- (8) inappropriate cleaning;
- (9) errors in installation, operation, cleaning and maintenance of the product;
- (10) use of non-original parts for modification and servicing (for example: parts are not 100% compatible with products);
- (11) Loss of efficacy or malfunction of parts as a result of change of beverage varieties or chemical composition

Installation



Warning – The device should be serviced by trained and qualified electrician, pipe technician and refrigeration technician. All wiring and piping installation must be in accordance with national and local codes.

Arrival inspections and unpacking

Inspection of packaging

The package is subject to immediate inspection after arrival. If the device is found damaged or incomplete, please retain evidence immediately by taking pictures or in other ways and notify the forwarder of the defects and submit a compensation order to it.

Unpacking

Remove the packing tape and other packing materials. Open the box and make sure that all parts are complete.

| Main parts | |
|-----------------------------------|----------|
| Name | Quantity |
| Tower and taps | 1 |
| Nitrogen infusion Unit | 1 |
| Pipes, fittings and accessory kit | 1 |
| Coffee keg | 2 |

Installation requirements

Minimum space for nitrogen infusion unit under the counter: 700mm (W) * 820mm (H) * 460mm (D)

Minimum space for gas cylinder under the counter: 200mm (W) * 820mm (H) * 460mm (D)

Ambient temperature: 10 °C to 30 °C indoor environment

Power supply parameter: 220V 60Hz or 220V 50Hz (See nameplate)



Danger

Be sure to use a separate and three-pin power socket with reliable grounding wire. The used circuit lines need to be able to withstand a current of 10A and above and the circuits must be connected to a 10A circuit breaker which has leakage protection function. All wiring must conform to national and local regulations.



Attention

-The machine is not suitable for areas where water splash exists as water splash may cause damage to the device.

-The device is only suitable for indoor (non-harsh environment) applications.

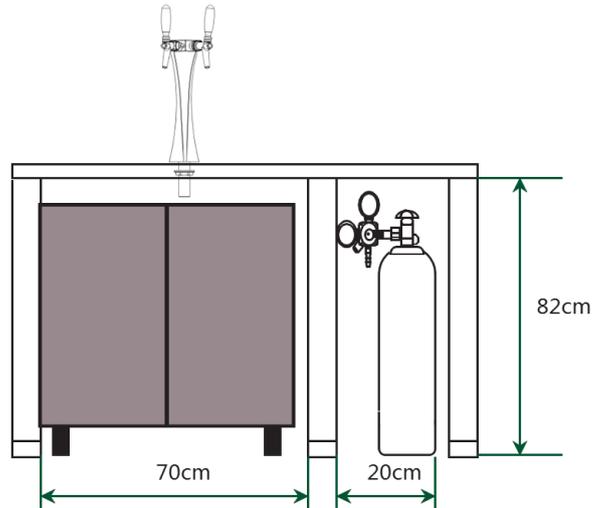
- Ambient (room) temperature should not exceed 30 °C and relative humidity should not exceed 75%. Using it at temperature higher than 30 °C may cause malfunction of the system.

-Do not place the device in environment where temperature is below 10 °C, or the device may not function properly.

-Remove any debris on heat exchange vent on the top and in the rear of the machine.

- To avoid overheating of and damage to the pre-cooling body, the top and external walls of the device must be at least 75mm away from the objects around it.

Installation steps

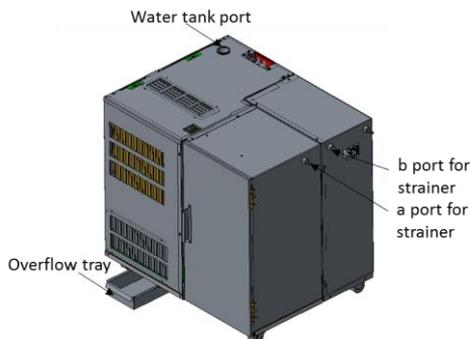


Installation of coffee tower and taps

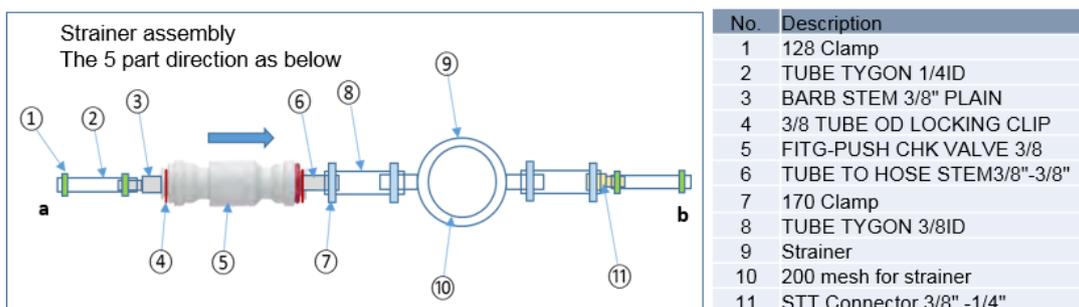
1. Make an opening in suitable position on the desktop as needed. To avoid the structure interference between tower and nitrogen infusion unit, the distance between this opening and near-edge of desktop should be 38 cm at least.
2. Install coffee tower vertically inside the opening and fix the part under counter using screws.

Installation of nitrogen infusion unit

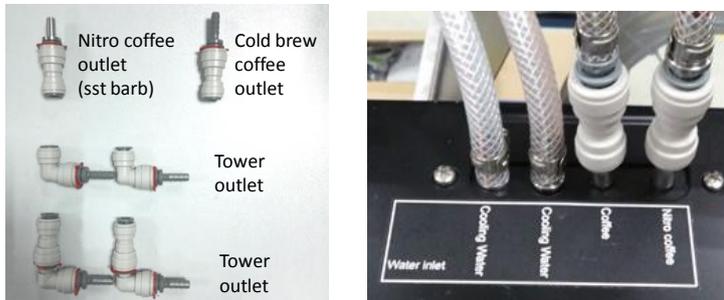
1. Filling of Ice-bank: pull the overflow tray at the bottom of device until the interior is seen. Open the red cap of water tank on the left side of the device, and fill water slowly into the water tank (about 14L) until overflow water could be observed in the overflow tray, and then put the top cover back.



2. Connect the strainer to the coffee machine: Assemble the coffee strainer as shown below. Make right direction of the check valve as below picture. The length of the tube tygon can be determined according to installation. Connect the “a” and “b” of the strainer to the coffee machine as above graphic. After the coffee machine is placed suitable position and then fix the strainer under the table.



3. Push the unit until it is in place (leave its air outlet facing outside to ensure good ventilation, and the device shall be at least 75mm away from left, right and rear panels for good heat dissipation)
4. Connect the nitrogen infusion unit with coffee tower with hose. Cut the hose to obtain appropriate length and attach it to the receiving port on unit and secure it reliably. Positions of nitro coffee outlet, non-nitrogen coffee outlet and cooling pipe port are shown by labels. Exposed parts should be covered with thermal insulation materials and erasable tape.



Connect nitrogen supply

1. Connect the gas inlet port to Nitrogen supply of which the pressure should be regulated at 40~70psi. Close the main valve of the cylinder unit all the connections have been completed.
2. If nitrogen supply is depressurized in two stages, the on-board pressure detection probe of the device may be used; in this case, regulate the readings on the depressurization gauge on nitrogen cylinder to obtain 100psi and regulate that on secondary depressurization gauge to obtain 40~70psi. Nitrogen pressure probe is located between the depressurization gauges in two stages.
3. Push the unit until it is in place and engage wheel brakes.



Danger

- Only pure food grade nitrogen (N₂) is permitted.
- Do not disconnect the nitrogen supply hose before closing the main valve on the cylinder.
- Set nitrogen pressure correctly, and the pressure of intake nitrogen may not exceed 70 PSI.
- Do not expel gas directly in narrow places; instead the device must be used in a well ventilated area.
- Nitrogen cylinder is expected to be stored and used only in upright posture, so please do not put them upside down.
- Please follow all necessary safety precautions during transportation and use of nitrogen cylinders. Nitrogen cylinders are under high pressure and if damaged, they may cause extreme damages and even death.
- Always store this nitro-coffee dispenser and nitrogen cylinders in places beyond the reach of children.
- This nitro-coffee machine and nitrogen cylinders are not expected to be used by children or persons who are not familiar with these safety procedures.
- Do not remodel any part of this nitro-coffee coffee machine and nitrogen cylinder accessories. Remodeling this device will invalidate the warranty and may result in personal injury or even death and other dangerous situations.

Connect coffee supply

1. Pour the prepared cold-brew coffee into disinfected and clean coffee keg.
2. Tighten the lid of coffee keg and connect the keg to the nitrogen and liquid pipelines of the body through white/black connectors respectively.
3. Place the coffee keg onto the weighing platform.



Coffee quick connectors (black, 3 pin) Nitrogen quick connectors (white, 2 pin)

Device commissioning

1. **Pressurization:** after confirming that the above installation steps have been completed, check and ensure that all pipes have been connected and secured with clamps, close the taps, and open the main valve on nitrogen cylinder gradually; keep a close eye on the system in boosting process to identify leakage of coffee and other defects, and in case of emergency, shut down the main valve on nitrogen cylinder.
2. **Power on:** after making sure that everything is OK, insert power plug into socket and turn on the main power switches on the device.
3. Check if the **inlet pressure** on body is 40~70psi (60 psi is recommended).
4. **Test pouring of coffee:** after powering up and cooling for 1 hour, adjust the **nitrogen regulator valve** (behind the door) according to the desired result of the coffee to regulate the foam effect: turn the regulating valve clockwise until it is closed, and then turn it **for about 1.2 digit counterclockwise starting from the closed position.** Hold the device for 1 minute and make test pouring. To get more foam, tune the knob finely counterclockwise; to get less foam, turn the knob clockwise. The effect of adjustment is not visible until after 2~3 cups of coffee is dispensed. (It is not needed to reset the regulator valve during routine replacement of coffee keg.)



Warning-please make sure that the machine's power supply has been disconnected before installation.



Warning -pipe joints, clamps and threads must be properly installed; otherwise, leakage of water or nitrogen may occur during use.



Attention -the device should be installed in the area where it is used and where the trained professional service personnel have easy access to it.

Operation

Startup and shutdown of the device

1. Turn on the main power switch and open the main valve on nitrogen cylinder.
2. Turn off the main power switch and close the main valve on nitrogen cylinder.

Filling coffee

Pour the pre-prepared cold-brew coffee into washed and clean coffee keg and tighten the lid, and then secure the nitrogen inlet (white) and pull the pressure relief ring for 1s to complete the process of coffee filling.

Selling coffee

Connect the body of prepared cold-brew coffee to nitrogen inlet (white) and coffee outlet (black), and push the body to its place, and now it is ready for dispensing.

Put the cup just under the tap. Press the handle of tap to dispense coffee and restore the handle to stop dispensing.

Replacing keg

It is possible to prepare another keg of coffee as needed with spare nitrogen lines so that the keg may be switched at any time during business.

Shutdown at night

Close the cylinder master switch and power switch at night when the business is closed.



Warning - the pre-prepared cold-brew coffee should not contain particles of which diameter is larger than 0.2mm, or it may cause clogging in the device.

Washing and maintenance



Warning

The device may be serviced only by those who have been trained or hold certificates of technicians in electronics, piping and refrigeration, etc. All electrical circuits and pipelines must conform to national and local regulations.



Warning

Before cleaning and servicing, please make sure the power is off before any work is undertaken on the device. The regulating tank shall be emptied before servicing the water system. Failure to follow these instructions will result in serious injury, death or damage to the device.

Washing and maintenance plans

| Item | Frequency |
|---|-----------------------------|
| Routine maintenance | Daily |
| Washing Coffee strainer | Daily or as needed |
| Washing and disinfection of piping system | Monthly or as needed |
| Pipe descaling, Clean the filter screen | Every 3 months or as needed |
| Inspection and Maintenance on the body (by service providers) | Annually |

Cleaning the device

Wash the coffee tower, drip box, out surface of keg, connectors and other parts with (b) multi-function detergent solution and flushed by clear water.



Attention: do not use metal scrapers, sharp objects or tools with rough surfaces for cleaning purpose to avoid damage to the device. Do not use water to flush the device directly. Use wrung rag to wipe the device as needed.

Routine maintenance

Preparation:

- (a) Multi-function detergent base liquid: 750ml water + 1 packet (59ml) of KAY® QSR HD Multi-Purpose Sink Detergent
- (b) Multi-function detergent solution: 3L water + 100ml base liquid
- (c) KAY® disinfectant: 100 ppm (refer to instruction of KAY® sanitizer)

Flushing empty coffee keg:

Use 3L (b) multi-function detergent solution and brush to flush the inside of the used keg. Drain the keg of the multi-function detergent solution, and use clear water to flush and drain the keg. Then fill 9 L of (c) KAY® disinfectant (100ppm) into the keg, shake the keg rigorously to ensure uniform contact of the disinfectant with the inner wall of



keg, holding the disinfectant inside of keg for 30 min and then pour it out. Use drinking water to flush in side of the keg repeatedly again and pour the water out. Leave the coffee keg in air to dry for next use.

Flushing valve nozzle, coffee strainer and disconnecter:

Remove the valve nozzle from the tap, soak it in (b) multi-function detergent solution for 10 min and flush it with drinking water. Soak it in (c) KAY[®] disinfectant (100ppm) for another 30 min and flush it with drinking water.

Remove the SST filter mesh from coffee strainer, soaking it in (b) multi-function detergent solution for 10 min and flush it with drinking water. Holding it in (c) KAY[®] disinfectant (100ppm) for 30 min and flush it with drinking water.

Remove the red disconnecter from coffee keg, soak it in (b) multi-function detergent solution for 10 min and flush it with drinking water. Soak it again in (c) KAY[®] disinfectant (100ppm) for 30 min and flush it with drinking water.

Washing and disinfection of piping system

The following method and equivalent method could be used for disinfection of piping system.

Preparation:

- (a) Multi-function detergent base liquid: 750ml water + 1 packet (59ml) of KAY[®] QSR HD Multi-Purpose Sink Detergent
- (b) Multi-function detergent solution: 3L water + 100ml mother liquor
- (c) KAY[®] disinfectant: 100 ppm (refer to instruction of Kay-5 sanitizer)

Step 1- flushing with detergent solution

Make sure gas inlet pressure is 60psig during disinfection process. Open the two taps to drain out all the liquid in system until coffee keg is emptied and a large volume of gas emits.

Fill an empty clean coffee keg with 9L (b) multi-function detergent solution, shake the keg at least 10 times to ensure uniform contact of the detergent with the inner wall of keg. Connect the keg to the system. Open the tap and use detergent solution to flush the pipes until light blue fluid flow out of the system. About 2 L detergent solution is drained from each tap. Then close the taps and holding the detergent inside the piping for 20 min.

Open the two taps to empty the pipes of the system, close the taps until coffee keg is emptied and a large volume of gas emits.

Step 2 - flushing with drinking water:



Fill the empty coffee keg with 9L drinkable filtered water or purified water (important!) and connect the keg to the system. Open two taps so that about 4.5L drinking water is drained from each tap, close the taps until coffee keg is emptied and a large volume of gas emits.

Step 3- flushing with disinfectant fluid

Charge the empty coffee keg with 9L (c) KAY® disinfectant (100 ppm), shake the keg fully to ensure uniform contact of the disinfectant with the inner wall of keg and connect the keg to the system.

Open the tap and use disinfectant to flush the pipes.

Shake the coffee strainer (in the pipe line between coffee keg and unit) during the drain process to secure uniform contact of the disinfectant with the inner wall of strainer and all the gas in the strainer is replaced by disinfectant. About 2 L light red fluid should be drain out from each tap.

Then close the taps and holding the disinfectant in system for 30 min.

Open the two taps to empty the pipes of the system , open and close the two taps during the drain out process until coffee keg is emptied and a large volume of gas emits. About 2.5L disinfectant should be drained from each tap.

Step 4 - flushing valve nozzle, coffee strainer and disconnecter:

Remove the valve nozzle from the tap, and remove the SST filter mesh from coffee strainer, and remove the red disconnecter from coffee keg,

holding them in (c) KAY® disinfectant (100ppm) for 30 min and flush it with drinking water.

Then install them into system except for tap nozzle.

Step 5 – Repeat step 3:

Repeat step 3 for another two times.

Step 6 – Repeat step 3:

Install tap nozzle into system, then repeat step 3 for another 1 time.

Step 7 - flushing with drinking water:

Fill the empty coffee keg with 9L drinkable filtered water or purified water (important!) and connect the keg to the system. Open two taps to drain out all the water in system. About 4.5L drinking water is drained from each tap, close the taps when coffee keg is emptied and a large volume of gas emits.



Warning: please follow the instructions as indicated on the device. Before dispensing coffee with the device, the device must be washed with drinkable water adequately by following the above operational steps, and after washing chlorine test paper may be used to detect the chlorine content and if the result is not acceptable, keep on flushing the pipeline to prevent the



residual disinfectant fluid from causing damage to health.

Descaling of piping system

Preparation:

(d) Descaling solution: 3.8L water (40~60°C) + a spoon of descaling powder (KAY® QSR Descaling)

Step 1- flushing with descaling solution

Charge the empty coffee keg with 3L (d) descaling solution, shake the keg at least 10 times gently to secure uniform contact of the descaling with the inner wall of keg. Connect the keg to the system and open the nitrogen valve. Prepare plastic keg or drainable drip box and put it under the tap to receive the effluent generated during cleaning. Open the tap and use descaling solution to flush the pipes until clear fluid flow out of the system. About 0.5L descaling solution is drained from each tap. Then close the tap and holding the descaling solution for 15 min. Empty the pipes of the system to remove any coffee residue, and until gas flows out of the tap outlet

Step 2 - flushing with drinking water:

Fill the empty coffee keg with drinkable filtered water or purified water (important!) At least 3L is needed. Connect the keg to the system, open two taps to remove the residual disinfectant fluid. About 1.5L drinking water is drained from each tap. The process is complete when coffee keg is emptied and a large volume of gas emits.

Cleaning the filter screen

Filter screen is used to protect the device and maintain the efficiency of the system, but the accumulation of dust and oily dirt during use will cause overheating of the system. In order to avoid overheating, filter screen should be cleaned regularly or as needed by observing the following steps.

1. Remove the air inlet filter from the device.
2. Use a vacuum cleaner or soft brush to clean the dust on filter screen.
3. Put the filter back on the device.

Troubleshooting

Important – only servicing personnel may repair internal parts or electronic circuits



Warning Prior to any servicing operations, make sure the power supply, gas supply and coffee keg have been disconnected and inner pressure has been released by operate taps. Failure to follow these instructions will result in serious injury, death or damage to the device. After any maintenance, be sure to restore the parts of the device to their original state.



Danger After the servicing, the unit and settings should be installed to the correct state. Failure to follow these instructions will result in serious injury, death or damage to the device.

| Fault/problem | Possible causes | Troubleshooting |
|---------------------------------------|---|---|
| Coffee flow at outlet is small | Coffee keg is not connected to the system | Secure the connectors of nitrogen and liquid pipelines on the coffee keg |
| | Valve nozzle on tap is blocked | Wash the valve nozzle of tap |
| | No reading on nitrogen pressure gauge, and main valve on nitrogen cylinder is not opened | Open the main valve of nitrogen cylinder |
| | Pressure readings on gas regulator is lower than set value | Insufficient nitrogen in nitrogen cylinder |
| Insufficient foam in coffee | Small coffee flow rate | Solve flow rate issue firstly |
| | The main valve of nitrogen cylinder is not open or pressure is insufficient | Ensure that there is sufficient nitrogen supply |
| | Dispense coffee again after disinfection of the device, but the first 3 cups must be abandoned. | Keep on dispensing to observe the bubbles |
| | It is needed to tune the nitrogen infusion rate control valve finely | Finely tune the volume of charged nitrogen if really needed |
| Excessive foam in coffee | Insufficient coffee in coffee keg | Replace it with filled coffee keg |
| | Dispense coffee again after disinfection of the device, but the first 3 cups must be abandoned. | Keep on dispensing to observe the bubbles |
| | It is needed to tune the nitrogen infusion rate control valve finely | Finely tune the volume of charged nitrogen as needed |
| Excessive coffee temperature | Power of the body is not on | Turn on the power of the body |
| | Overload protection | Press to reset overload protector |
| | Ice-bank is not filled with sufficient water (initial installation) | Add more water |
| | Overheating of pre-cooling body | Check if filter screen is blocked |
| | Fault of refrigeration system | Please contact device servicing personnel |
| Leakage on the device | Leakage of coffee or nitrogen | Turn off the main power supply and close the main nitrogen valve. Please contact device servicing personnel |
| | Damage of parts | Turn off the main power supply and close the main nitrogen valve. Please contact device servicing personnel |

Cornelius (Tianjin) Co., Ltd.

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