MAINTAINANCE

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Gas Cylinder

General

- Oxygen and nitrous oxide are oxidizing gases
- Gas cylinders have to be protected against tilting over

Oxygen

- gaseous (200 bar)
- Keep free of oil and fat– explosion hazard
- 3/4 inch connection
- Color coding: white

Nitrous

- Liquid gas (7,5 kg fill)
- Delivery with circa 50 bar at 20 °C
- 3/8 inch connection
- Color coding: blue

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MIXING CONCENTRATION

- MINIMUM **30 %** of OXYGEN (O2)
- MAXIMUM **70%** of NITROUS OXIDE (N2O)

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Nitrous Oxide N2O

Full N2O bottle
Liquid gas
(50 BAR)

Transformation on gaseous gas

10 liters
Size F
50 BAR

If you are getting to **30 BAR,** you will still have about **50/60 minutes** left to treat

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L’Oxygène O2

Full O2 bottle
Gaseos gas
200 BAR

If you are getting to **50 BAR** on the pressure reducer, you have about **50/60 minutes** left to treat

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Pressure Regulators

Ultra-fine O2 Pressure Regulator

with easy hand closure

→ Oxygen for the Nitrous Oxide System

Ultra-fine N2O Pressure Regulator

with easy hand closure

→ Nitrous Oxide for nitrous oxide system

With NIST- & DISS connection

Adjusted to 4.5 bar

Wrist connection for pressure cylinders

Quelle: Baldus Medizintechnik GmbH

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Change of gas cylinders

What do you have to consider for a cylinder change?

If you change the cylinders, the O-Ring of the gear hand expands.

That's why you would need to
wait 5-10 minutes.
(ONLY N2O)

YouTube
Baldus Medizintechnik GmbH

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Verification of tightness

All screw connections are
on the gas cylinders as well as on the mixer
to be checked for leaks

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Pressure Regulators

Quelle: Baldus Medizintechnik GmbH

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to bleed the System

DAILY, AFTER THE LAST TREATMENT

N2O and O2 bottle are open after the treatment

Close the N2O bottle

Open the N2O bottle and turn it up to the highest N2O concentraiton and turn up the flow,too

The needle of the pressure reducer decrease to 0 --> There is no N2O in the hose system

Close the O2 bottle

The flowmodulater has to be on the highest flow rate till the the needle of the O2 pressure reducer is on 0

The system is ventilated!

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Technical Control

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Technical Control

Control before every treatment

- Cylinder pressure
- suction
- Opened valves
- leaks (circuit points)

Monthly control

- Safety mechanisms
- Mix ratio & characteristics of flow display
- O_2-Flush
- Hose system and bag

Yearly control

- Service by a certified firm (MPG)

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What needs to be checked?

Mixer Unit

Pressure Reducer & Pressure Hose

Scavenger Breathing System

Breathing Bag

Medizintechnik Baldus

Medizinprodukte buch

Medical Devices Book

Nasal Masks

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Maintenance Instructions

START THE SERVICE AT:

A special workplace designed exclusively for the maintenance of nitrous oxide sedation or at the on-site dental office or dental practice

MAKE SURE THAT:

When working on and testing the unit that the location has adequate ventilation or that there is a way to remove nitrous oxide from the work area during the testing process.

→ ***If not, find a location that allows you to open a window or door.***

IF YOU HAVE ACCESS TO:

the dental chair or other suction system, it is recommended to connect the unit to the suction system to remove the nitrous oxide during the testing process.

AFTER THE COMPLETE SERVICE IS DONE:

fully ventilate the work area by opening a window / door or using the ventilation system

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Maintainance
Hygiene

Before starting any of the maintenance, the technician should disinfect their hands for proper hygiene.

→ **Recommendation = wear gloves!**

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Maintainance
Hygiene

Before or during the next step (Visual Inspection); it is recommended that you clean / disinfect the components for hygienic purposes.

- ✓ The device must also be cleaned / disinfected prior to maintenance.
- ✓ (Cold wipe with disinfectant cleaning wipes)

- ✓ Wipe down all hoses, tubes and contact surfaces on the mixing unit and pressure regulators with cold wipe or some sort of disinfectant wipe.

→**This can be done during the visual inspection process of the individual components**.

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Maintainance Hygiene

→ All parts of the components are important to be cleaned

→ **especially focus on the areas of the components that come in direct contact with the patient**

→ Make sure they are properly cleaned.

→ Any dirt or staining should be removed - if possible.

→ To ensure that the re-useable components are hygienically clean (scavenger system, masks, connectors, breathing bag), make sure they have been autoclaved.

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Maintainance
Visual inspection

- ✓ Do a visual inspection of all the parts for the nitrous oxide mixing system.
- ✓ Check for damage to hoses, tubes, mask, breathing bag.

- ✓ Damage would include cuts, cracks, or visual holes in the material.
- ✓ Check the colour of the silicone material.
- ✓ Is it still see through translucent, or is there yellowing or a slight orange tint to the material?

- ✓ Check to see when the last service was done on the unit and the components.
- ✓ Note this information in a medical device book.

- ✓ If the components (scavenger system, nasal mask, breathing bag) are already well over one year old, and the silicone material is starting to show signs of age (discoloration), it may be time to replace these components.
- ✓ Recommendation is 500 autoclave cycles or 2 years working time.

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Maintainance
Visual inspection

Inspect the pressure hoses

Run your hands over the outside of the tubing, and feel for cracks, cuts or any damage to the outside of the tubing.

Check the connection, around the knob (DISS & NIST).
These connections should always be hand tightened and no tools like a wrench or pilers should be used to tighten.

If such a tool was used, you may feel rough edges.
Inspect the roughness in the material to see that the damage (metal on metal) is light and only on the surface.

If there are deeper cuts or damage, it may be recommended to replace the pressure tubing.

At each end (DISS and NIST) pull back the connection & look at the end to make sure each end still has the black O-ring on the end.

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Maintainance
Visual inspection

Inspect the pressure regulators.

Is there any damage to the outside? Feel for any dents or other damage to the outside of the regulator. Make sure the glass cover for the indication is not cracked or broken.

Feel around the connection for pressure hose to make sure the threading is not damaged.

Check the connection fitting for the turn knob for the connection to the gas cylinder.

This connection should be hand tightened and no tools like a wrench or pillars should be used to tighten. Feel around the knob. If such a tool was used, you may feel rough edges.

Inspect the roughness in the material to see that the damage (metal on metal) is light and only on the surface.
If there are deeper cuts or damage, it may be recommended to replace the pressure regulator.

Check the inside of the pressure regulator connection to the gas cylinder to make sure the black O-Ring is there.

Note: Many times, during the visual inspection you may not see holes or leaks.
Later these components will be checked again for leaks and or cracks in the material in a real working condition.

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Maintainance
Tools needed

- ✓ Hex Key Size 5 (Ambient Air Valve)
- ✓ Hex Hey Size 15 (Non-Rebreathing Valve)

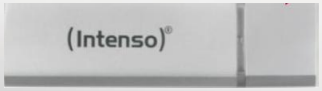
- ✓ Oxygen Flow Measuring Device
  Example: **Citrex H5 Testing** Unit, or other oxygen flow testing device
- ✓ CITREX: CITREX H5 • IMT Analytics

- ✓ Nitrous Oxide % Measuring Device
  Example: Citrex H5 Testing Unit, or other gas mixture testing device

- ✓ Dental Probe – Removing O-Rings

- ✓ Leak Detector Spray

- ✓ Service Dongle (Baldus Touch)



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Maintainance
Spare Parts which we do recommend

- ✓ Baldus Breathing Bag 15015 – 3L /2,3L/1L

- ✓ Baldus Scavenging system 16055 /16056

- ✓ Baldus pressure hoses N2O & O2
- ✓ 15006/15007 or 16038-1/16038-2

- ✓ Baldus Bag-T - H16001-3/1

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Maintainance
Spare Parts which we do recommend

1-Year service kit includes: 6 Packs of 10 O-Rings in Total

O-ring for the N2O pressure regulator
Pin Index : ME3547 1x
Standard (DIN German Standard) - 1209309 (1X)

O-ring for the O2 pressure regulator
Pin Index: ME3547 x
Standard(DIN Germany Standard) – 1125714 (1x)

O-Ring for O2 DISS pressure tubing – 1128791 (1x)

O-Ring for N2O DISS pressure tubing – 1125656 (1x)

O-Rings for N2O and O2 NIST pressure tubing – 1125621 (2x)

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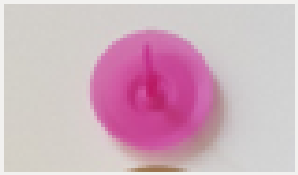
Maintainance
Spare Parts which we do recommend

2-Year service kit includes: 10 Packs of 6 O-Rings and 2 Membranes in Total

1x- Year service kit

2 x - Membrane for Bag T (ambient air & mixed gas valve outlet) – 15026



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Maintainance

Nitrous Oxide Mixing Units Inspection & CHECK

Baldus TOUCH Mixing Unit- 1st Inspection & Check before dissambly the device

- ✓ Inspect the front of the mixing unit.
- ✓ Check the touchscreen for scratches, cuts or damage to the touchscreen.
- ✓ Note the Serial Number of the unit being serviced from the back of the unit or from the Service menu on the display. Document the serial number in the Medical Device Booklet.
- ✓ Turn on the unit and the unit should go through the automatic Self-Test function.

Serial Number Location – Sticker on Back side of Baldus Touch

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Maintainance
Disassembly of the device

- Remove the old maintainance sticker from the trolley
- Unmount the device
- Take off the gas bottles , pressure regulators and hoses

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Maintainance
O-RING Change
Pressure hoses & pressure regulators

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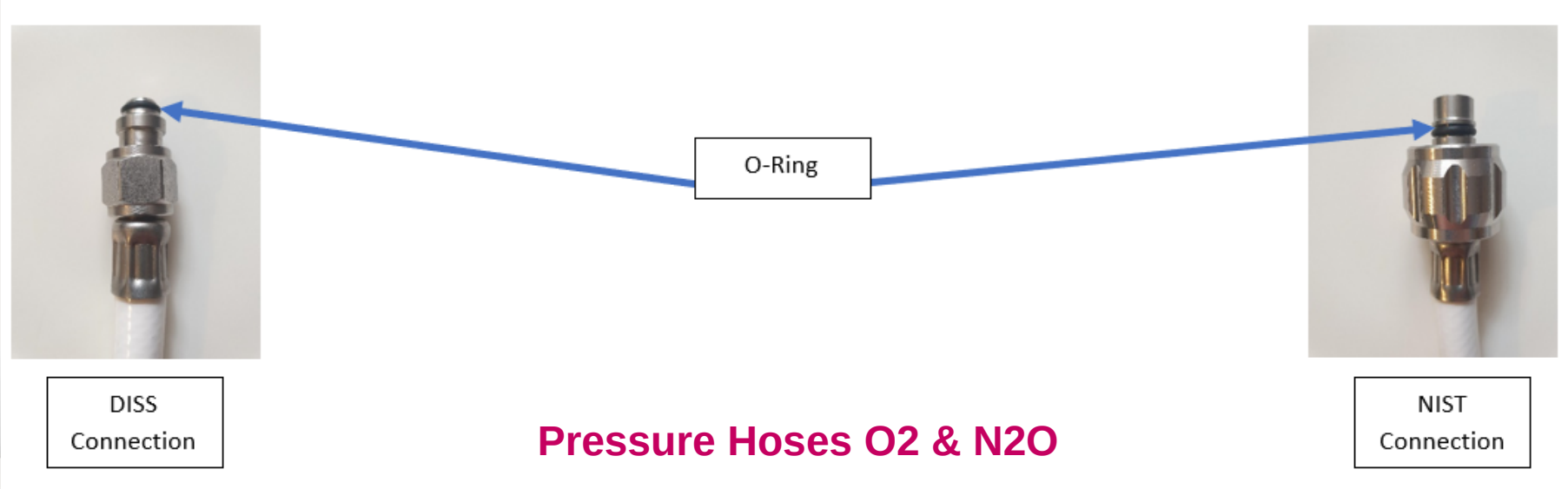
Maintainance

Replacement of the O-Rings of the pressure hoses

- On each end of the pressure hose for O2 & N2O there is a black O-Ring.
- One end NIST (Pressure Regulator Connection End) and the other end DISS (Mixing Unit Connection End).



Pressure Hoses O2 & N2O

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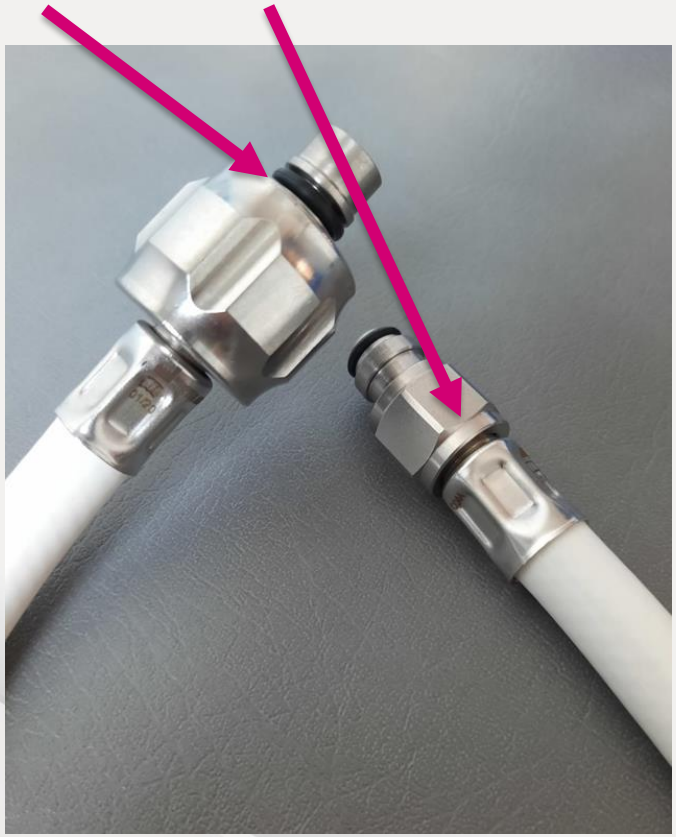
Maintainance

Replacement of the O-Rings of the pressure hoses

- Replace O2 Pressure Hose O-Rings (NIST and DISS)



Every year: Replacement of the O-RINGS

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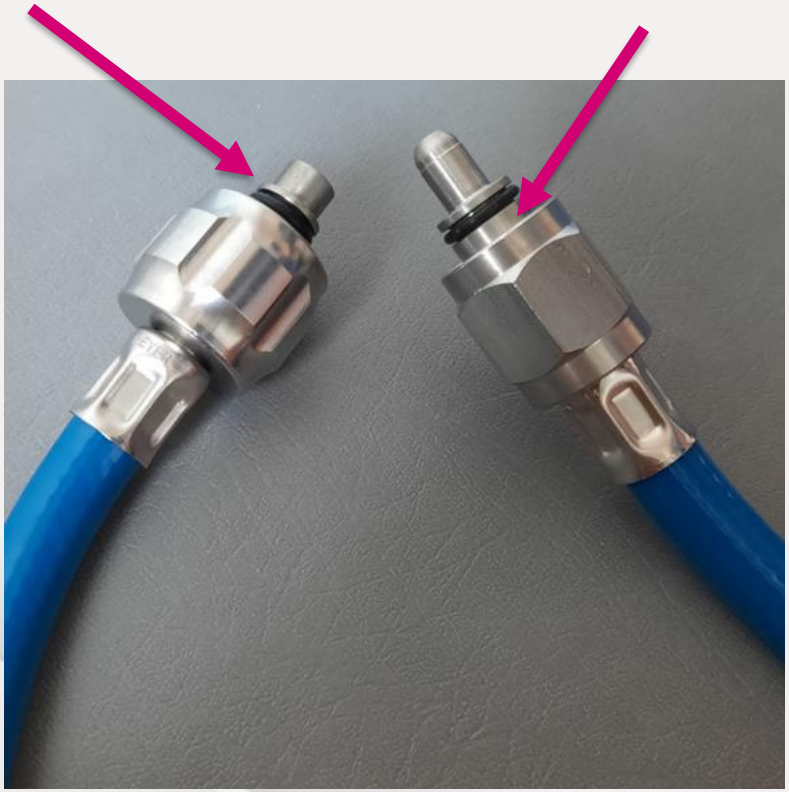
Maintainance

Replacement of the O-Rings of the pressure hoses

- Replace N2O Pressure Hose O-Rings (NIST and DISS)



Every year: Replacement of the O-RINGS

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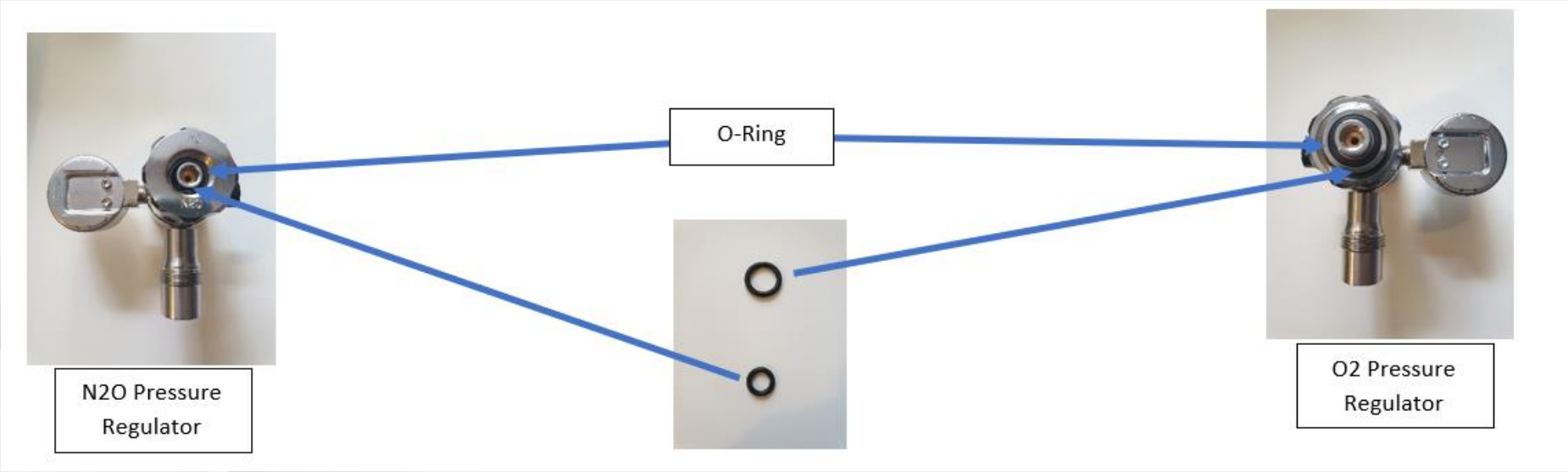
Maintainance

Replacement of the O-Ring of the pressure regulators

- The pressure regulator has one inlet (Connection to the gas cylinder) and an outlet (Connection to the gas hose).
- On the connection to the gas cylinder there is an O-Ring.
- The O-Ring for the O2 and N2O pressure regulator need to be replaced.



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Maintainance

Replacement of the O-Rings of the pressure hoses

- Replace O2 Pressure Regulator O-Ring

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Maintainance

Replacement of the O-Rings of the pressure hoses

- Replace N2O Pressure Regulator O-Ring

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Maintainance
Leak Detector Spray

Leaks in hoses or pressure regulators?
We recommend you to use a leak detector spray.

[Buy Leak detector online | WÜRTH (wuerth.de)]

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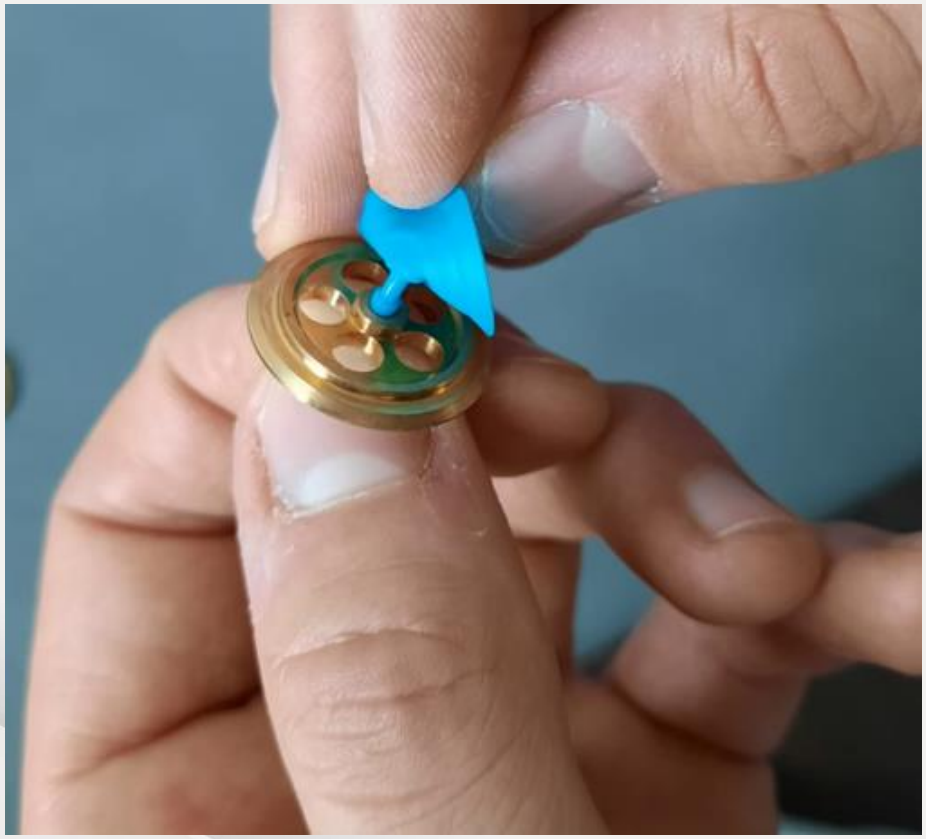
Maintainance

Replacement of the membranes of the Bag T



Every 2 years:

Replacement
of the 2 membranes of the BAG-T

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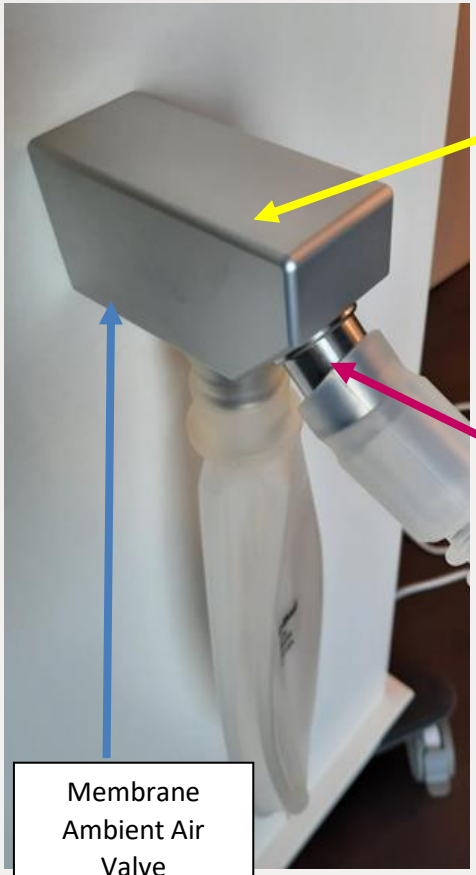
Maintainance

Replacement of the membranes of the Bag T



BAG - T

Membrane Non-Rebreathing Valve

Membrane Ambient Air Valve

Every 2 years:
Replacement of the 2 membranes of the BAG-T

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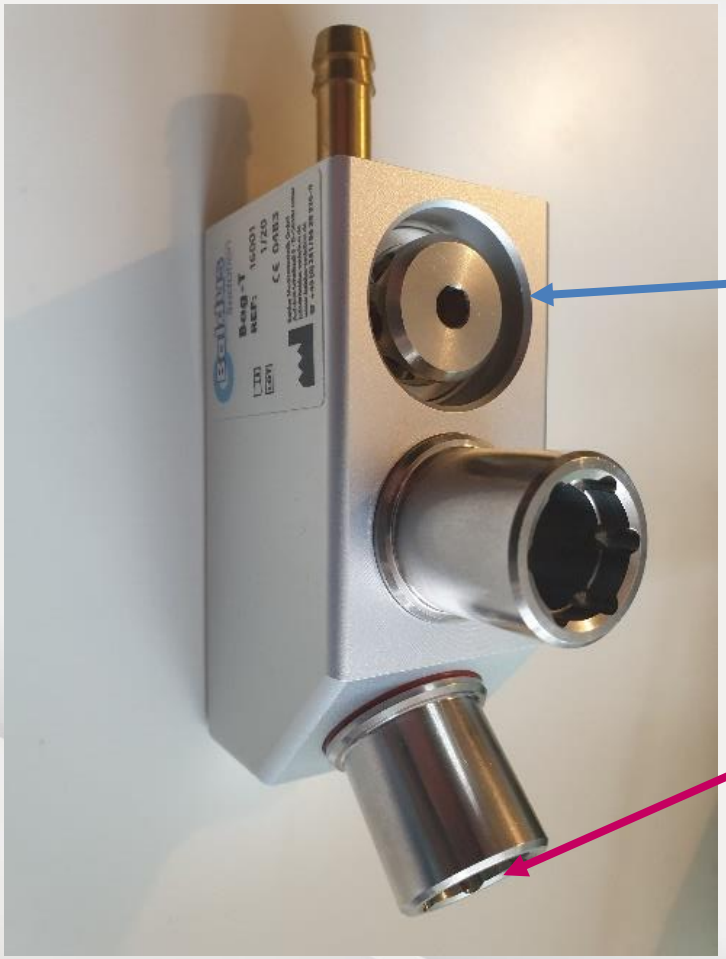
Maintainance

Replacement of the membranes of the Bag T



Membrane
Ambient Air
Valve

Membrane
Non-Rebreathing
Valve

<u>Every 2 years:</u>
Replacement
of the 2 membranes of
the BAG-T

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Maintainance

Replacement of the Ambiente Air membrane

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Maintainance

Replacement of the Ambiente Air membrane

- Using a **size 5 hex key** to open the ambient air valve.
- When opening you will have the outer silver protective housing, golden mesh plate and one blue or pink membrane.

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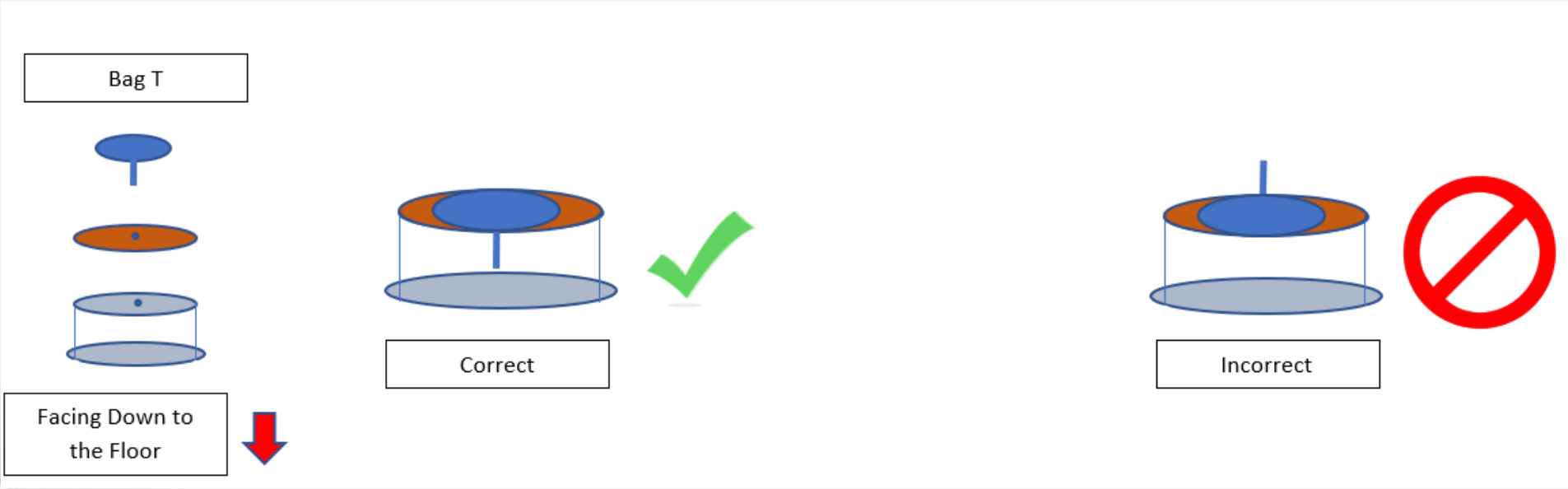
Maintainance

Replacement of the Ambiente Air membrane



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Maintainance

Replacement of the Non-Rebreathing valve membrane

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Maintainance

Replacement of the Non-Rebreathing valve membrane

- Using a **size 10 hex key** open the non-rebreathing valve.
- When opening you will have valve outlet, fine mesh screen, golden ring, golden mesh plate and one blue or pink membrane

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Maintainance

Replacement of the Non-Rebreathing valve membrane

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Maintainance

Replacement of the membranes of the Bag T

- Once the valve outlet has been screwed together of both membranes it should hold all the parts back together in place.
- With your size **10 & 5 hex key** gently and slowly turn the threads again to tighten.

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Maintainance

Testing the Assembly of Ambient Air Valve and Non-Rebreathing Valve

- Now we start with the control of both membranes
- At the same time, we assemble the Scavenging system and install the breathing bag

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Maintainance

Testing the Assembly of Ambient Air Valve and Non-Rebreathing Valve

To test to make sure the ambient air valve and non-rebreathing valve membranes are assembled correctly you can do a small test with the fresh gas tube

→ we recommend you have your own tube for testing
– and do not use the one used for the unit

22 mm Gas Supply Hose (Spiral Hose)

Details:

- Autoclavable
- Lenght: 90 cm, 180 cm
- Compatible for Baldus® Scavenger Breathing System

Art.-No.	Article
16013-90	90 cm Gas Supply Hose
16013-180	180 cm Gas Supply Hose

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Maintainance

Testing the Assembly of Ambient Air Valve

Ambient Air Valve Test

With the fresh gas tube connect it to the Bag T on the outlet.
You can test this with or without the breathing bag.
If you do not use the breathing bag, cover with one hand the breathing bag outlet to make sure no air can enter the valve.

If you test this with a breathing bag, make sure the breathing bag is empty of any air or hold the bag in one-hand, so no air is in the bag.
Take a breath in.
You should be able to get air (take a breath).

The ambient air valve should open and allow for air to come into the Bag T.

Put your fingers near the ambient air valve when taking a breath and you should feel air being pulled into the valve.

This means you have correctly assembled the ambient air valve and the membrane is assembled in the right way and with the stem facing down.

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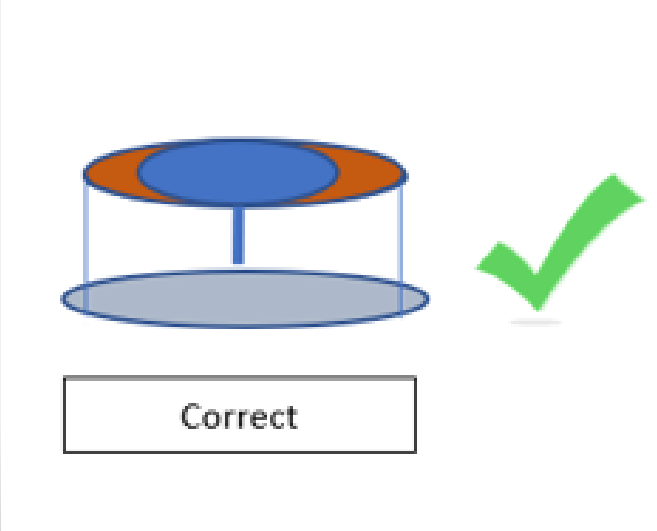
Maintainance

Testing the Assembly of Ambient Air Valve

FAILURE : Ambient Air Valve Test

If you do this test and you are not able to breathe (take a breath), most likely the membrane is facing in the wrong direction; and you need to open the valve and put the membrane in the other direction.

Again, check the membrane, and the stem should be facing downwards towards the floor.



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Maintainance

Testing the Assembly Non-Rebreathing Valve

Non-Rebreathing Valve Test

With the fresh gas tube connected to the Bag T on the outlet, you are now going to try to blow back into the unit.

Push air or blow back into the hose.

The non-rebreathing valve should not allow you to push air back into the system. You should not be able to blow back into the system.

If you are not able to force air back into the system, this means you have correctly assembled the non-rebreathing valve and the membrane is assembled in the right way and with the stem facing upwards, back towards the Bag T.

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Maintainance

Testing the Assembly Non-Rebreathing Valve

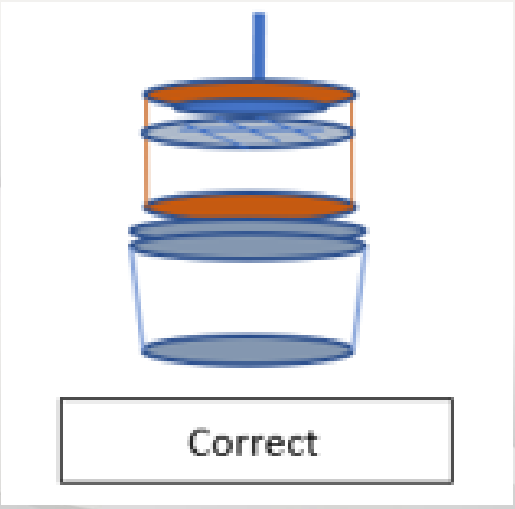
Failure: Non-Rebreathing Valve Test

If you do this test; and can push air back into the system, most likely the membrane is facing in the wrong direction; and you need to open the valve and put the membrane in the other direction.

It could also be that the membrane is not sitting flat on the mesh plate.

Check the direction of the membrane as well as to see that the membrane is not in any way folded or not sitting flat against the plate.

The membrane stem should be facing upwards towards the inside of the Bag T.



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Maintainance
Breathing Bag Test

- ✓ Cover the outlet for the gases on the front of the Bag T.

- ✓ Use a connector to connect both ends of the double tubing.
- ✓ In this way you are closing the circuit and oxygen cannot leave the system.

- ✓ Depress the red flush button and inflate the breathing bag with O2.

- ✓ Inflate the bag so that it is above the normal amount of gas that would be in the bag.
- ✓ Check the breathing bag for cracks, holes or any leaks.

- ✓ If there are any cracks, cuts or holes in the breathing bag, you will now see them or see that the bag is not holding the gas.

- ✓ Touch, feel or listen to the breathing bag for any leaks.

Reservoir Bag

Details:

- CE-marked
- Autoclavable and latex free
- Steam sterilization: 134°C, 5 min.

Art.-No.	Article
15015-3L	3-Liter Reservoir Bag (Adult)
15015-2,3L	2,3-Liter Reservoir Bag (Pedo)
15015-1L	1-Liter Reservoir Bag

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Maintainance
Breathing Bag Test

- If the bag goes down and loses gas, there is a hole or leak; and the bag needs to be replaced.
- If the bag holds the gas and does not go down in size; this means, there are no leaks or cracks.

Closed Circuit

Over Inflated Breathing Bag

- **Remove the breathing bag from the Bag T and place the red cap over the outlet or cover the breathing bag outlet for the next set of tests.**

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Maintainance
Breathing Bag Test

<u>Note:</u> Since N2O gas is heavier than air, it is best to do the oxygen flow test and nitrous oxide flow/mixture test without the breathing bag on the Bag T.

This will allow for the flow of both oxygen and nitrous oxide to be direct into the testing device used for measurement of these gases.

These gases will be coming directly out of the outlet for the gas tubing.

By doing these tests <u>without the breathing bag</u> you will get a more precise measurement of the gases.

Oxygen Flow & N2O Measuring Devices

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Maintainance
Nitrous Oxide Flow/Mixture Test

When testing the nitrous oxide flow you may use your measuring device.

Some devices can check O2 as well as N2O, so make the adjustment to the unit for checking N2O.

Device, what we recommend for the test of the Mix Ratio:
Imtmedical - CITREX H3
CITREX H3 • IMT Analytics AG

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Maintainance
Oxygen Flow Test

- ✓ Make sure you are not using the breathing bag.
- ✓ The breathing bag outlet needs to be closed with a cap or some other kind of stop.
- ✓ Start the flow of oxygen only.
- ✓ Do not add N2O to the mixture at all for this test.

Start with 5 liters per min (Min. Flow).
Check the flow rate and document.

Then go up to 10 liters per min.
Check flow rate and document.

Then go up the maximum flow of 18 liters.
Check flow rate and document.

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Maintainance

Oxygen Flow Test

Test

5 Liters per min.

10 Liters per min.

18 Liters per min. (Max Flow)

Start a sedation

and the menu will display the flow of O2 of 5 liters per min. and 0% N2O.

- The oxygen measuring device should show the level of flow
- Document this flow rate in Medical Device Booklet and Maintenance Report Document.
- It may take a few minutes for oxygen measuring device to show the level of total flow.

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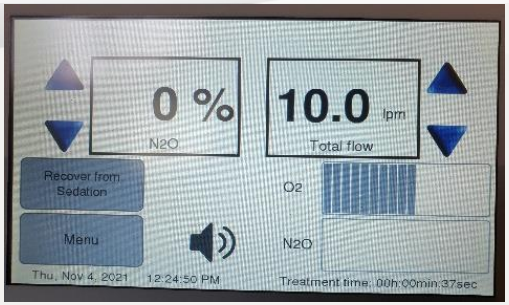
Maintainance

Oxygen Flow Test

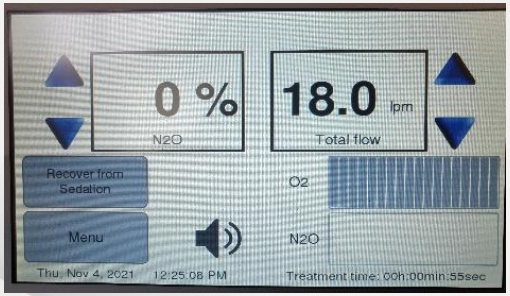


Increase the flow of O2 to 10 liters and 0% N2O

The oxygen measuring device should show the level of flow, document this flow rate in Medical Device Booklet and Maintenance Report Document.

It may take a few minutes for oxygen measuring device to show the level of total flow.

Increase the flow to the maximum level of 18 liters and 0% N2O (15l. Baldus Analog)



The oxygen measuring device should show the level of flow
Document this flow rate in Medical Device Booklet and Maintenance Report Document.
It may take a few minutes for oxygen measuring device to show the level of total flow.

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Maintainance
Oxygen Flow Test

Test Levels Overview:
N2O = 0%

0% N2O / 5 Liters per min.
0% N2O / 10 Liters per min.
0% N2O / 18 Liters per min. (Max Flow)

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Maintainance

Nitrous Oxide Flow/Mixture Test

Set the O2 Flow to 6 liters l/min

Start adding N2O to this mixture of flow (25% N20) wait a few minutes until the flow of N2O has reached and analyser for measurement.

As you add N2O to the O2 amount you will see that the measuring device will slowly analyse the amount. It takes a few minutes for the value to come to the level and stabilize on the device.

Once stabilized, this is the measurement you need to document.
It is acceptable to have a variance of (+ / -) of 2.5% in the value.

Document this flow rate in Medical Device Booklet and Maintenance Report Document.
It may take a few minutes for oxygen measuring device to show the level of total flow.

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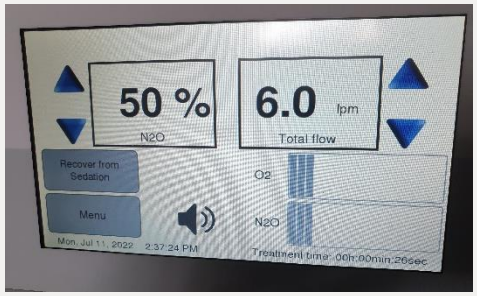
Maintainance

Nitrous Oxide Flow/Mixture Test

Set the O2 Flow to 6 liters l/min

Set the N2O to this mixture of flow (50% N20) wait a few minutes until the flow of N2O has reached and analyser for measurement. As you add N2O to the O2 amount you will see that the measuring device will slowly analyse the amount.

It takes a few minutes for the value to come to the level and stabilize on the device. Once stabilized, this is the measurement you need to document. It is acceptable to have a variance of (+ / -) of 2.5% in the value.



Document this flow rate in Medical Device Booklet and Maintenance Report Document.

It may take a few minutes for oxygen measuring device to show the level of total flow.

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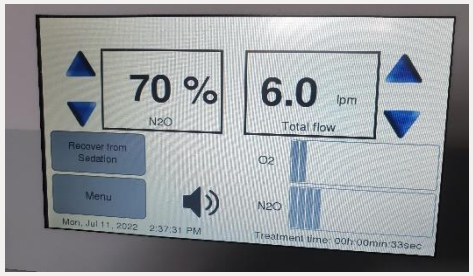
Maintainance

Nitrous Oxide Flow/Mixture Test

Set the O2 Flow to 6 liters l/min

Set the N2O to this mixture of flow (70% N20) wait a few minutes until the flow of N2O has reached and analyser for measurement. As you add N2O to the O2 amount you will see that the measuring device will slowly analyse the amount.

It takes a few minutes for the value to come to the level and stabilize on the device. Once stabilized, this is the measurement you need to document. It is acceptable to have a variance of (+ / -) of 2.5% in the value.



Document this flow rate in Medical Device Booklet and Maintenance Report Document.

It may take a few minutes for oxygen measuring device to show the level of total flow.

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Maintainance

Nitrous Oxide Flow/Mixture Test

Note *

Some nitrous oxide mixing units may be limited in the maximum amount of nitrous oxide they can give. (50%, 60%, 70%).

If the unit you are testing does not allow for the maximum amount of 70%, take the **maximum** measurement based on the maximum level the unit allows as the maximum.

Test Levels Overview:

O2 Flow 6 liters

25% N2O / 75% O2 - (+ / -) of 2.5%

50% N20 / 50% O2 - (+ / -) of 2.5%

70% N20 / 30% O2 . (+ / -) of 2.5%

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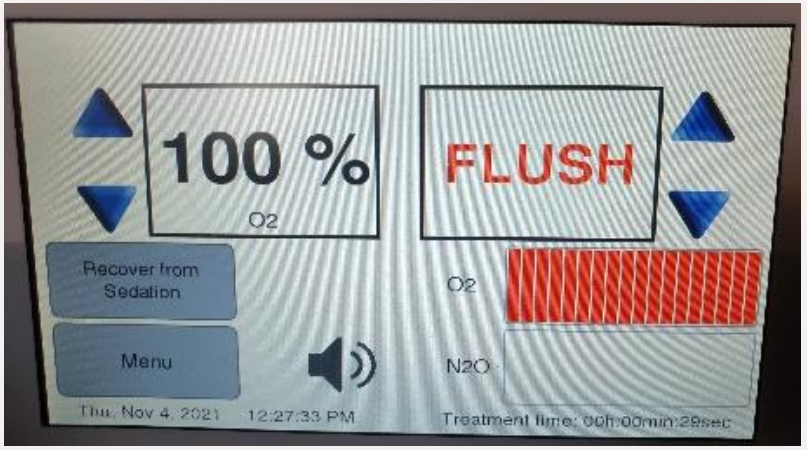
Maintainance
Flush Test

Depress the Red flush button and hold for at least 5 seconds.



- The oxygen measuring device should show the level of flush flow
- Document this flow rate in Medical Device Booklet and Maintenance Report Document.
- It may take a few minutes for oxygen measuring device to show the level of total flow.

Flow Rates should be:

Baldus Touch Flush Flow–Touch : **approx. >34 l/min**

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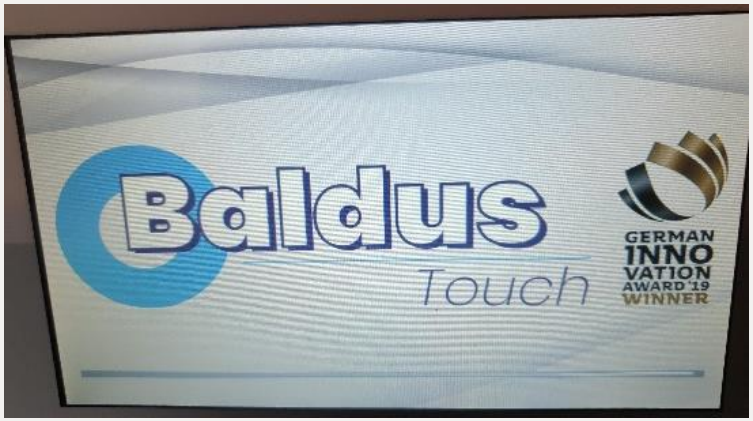
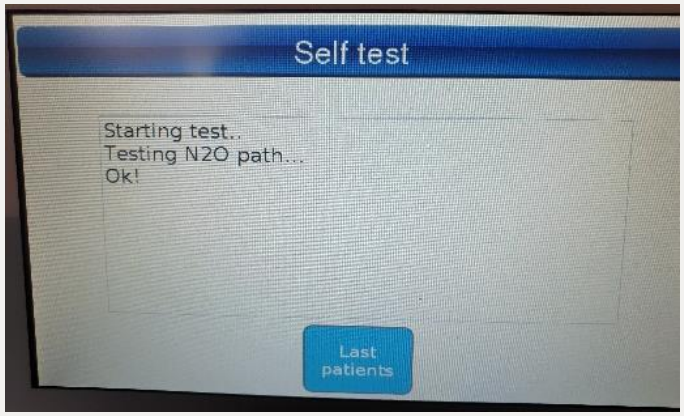
Maintainance

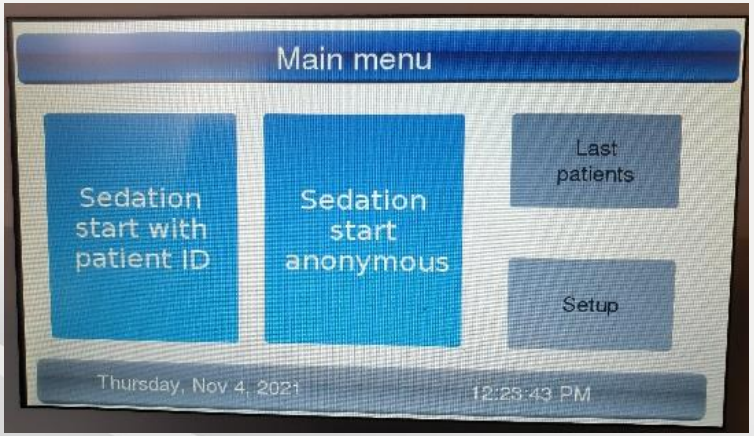
Nitrous Oxide Mixing Units Inspection & CHECK

Touch: Main Menu Function Test

✓ Once the unit has passed the self-test, it will go into the main menu function.







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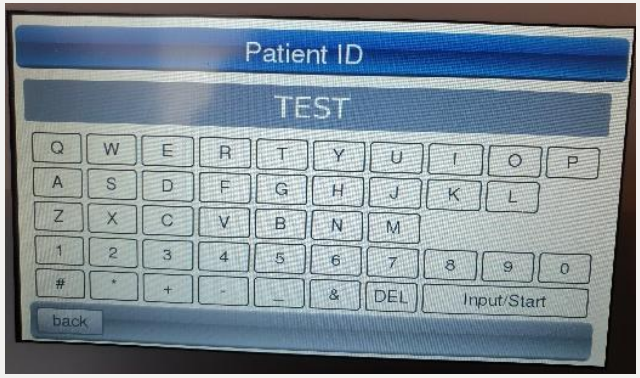
Maintainance

Nitrous Oxide Mixing Units Inspection & CHECK

Touch: Main Menu Function Test

- ✓ To test the unit and the menu start a sedation using a patient ID.
- ✓ In this case input the name “TEST”.



- ✓ The menu will then ask for you to confirm the name.

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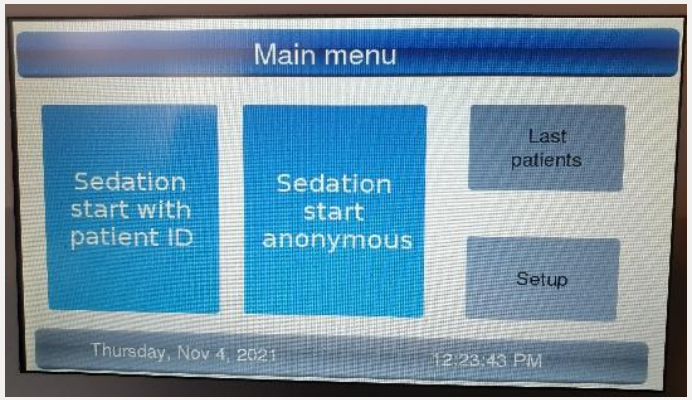
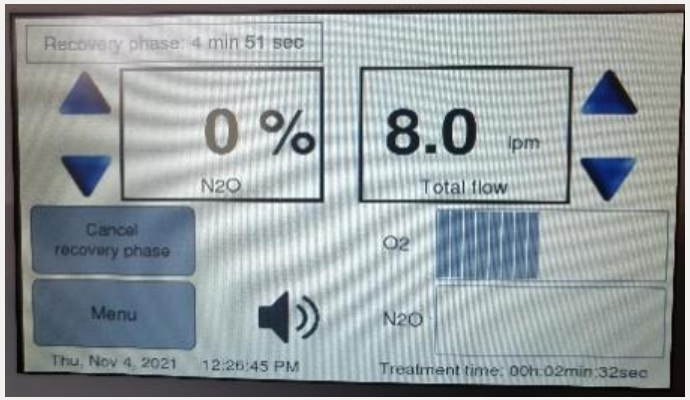
Maintainance

Recovery from Sedation (only Touch)

In the main menu start another sedation by choosing the “Sedation Start Anonymous”.
Set the O2 flow at 6 liters and N2O at 25%.





Once the sedation process has started press the “Recovery from Sedation”.
On the menu you should see an option appear asking you if you would like to stop the sedation asking “Yes” or “No”.

Press “YES” and you should see the % of N2O at 0% and the O2 flow of 6 liters.

In the top left corner, you should see the timer count down the 5 min. needed to recover from sedation. To end the timer, press the Menu on the screen to go back into the Main Menu.

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Maintainance

Stand-by Mode / I/O (On / Off) / Shutdown Tests (only Touch)

Depress the I/O (On / Off) button on the Baldus Touch for 3 Seconds

Stand-by Mode Test

- The unit should go into the stand-by mode.
- Check the LED indication light on the unit and it should show both red and green.
- The screen itself will go black and there will be nothing showing on the display.
- Depress the I/O (On / Off) button again while the unit is in the Stand-by mode.
- The unit should then go into the main menu function with the menu on the display.

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Maintainance

Stand-by Mode / I/O (On / Off) / Shutdown Tests (only Touch)

Stop Sedation Test Using I/O (On / Off)

- Start a sedation with 6 liters of oxygen flow and 20% nitrous oxide.
- Press the I/O (On /Off) button again.
- A window in the menu should appear “Do you really want to stop sedation” must appear.
- Press **Yes** and the unit should stop the sedation and go into the main menu.

Shut Down Test

- While in the main menu function press the I/O (On / Off) button and hold for 5 seconds.
- The unit should do a complete shutdown.
- The screen will go black, and the unit has now done a complete shutdown.

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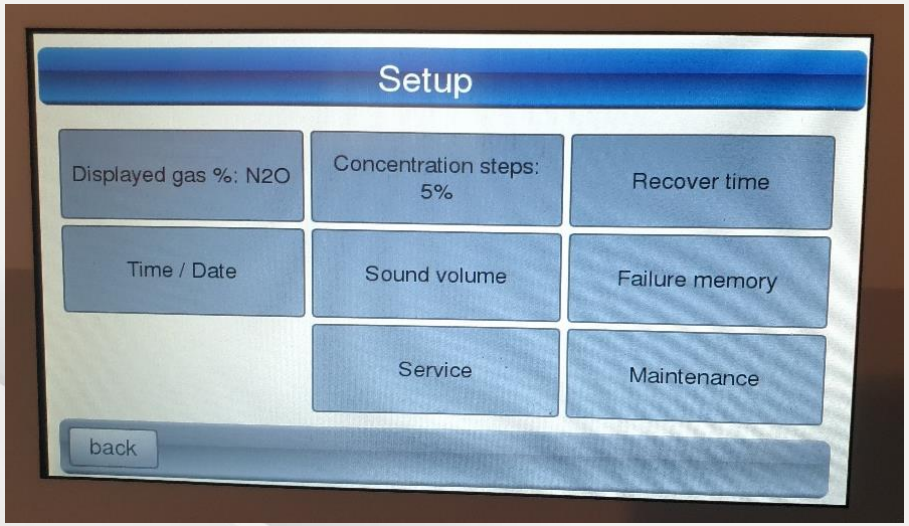
Maintainance

Service Dongle/Change Service Date

- You can now insert the service dongle into the USB Port on the right side of the Baldus Touch unit.
- Once you have inserted the USB Service Dongle go to the main menu.
- Press the option “Setup”.
- There should now be an additional menu on the screen called “Maintenance”.
- Press the Maintenance option.



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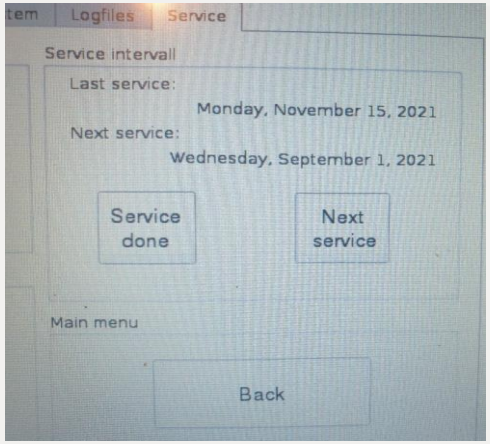
Maintainance

Service Dongle/Change Service Date



- Press the option “**Service Done**”.
- When you do this - the system automatically uses the date that day as the **service date**.
- The next option is then to press the option “**Next Service**”.

- You will then see a calendar.
- You can then **go 12 months / 1 year** into the future and set the next date for service on the unit.

- Once you have done this and changed the service date to the day you are doing the service and also defined a future service date **12 months / 1 year into the future**, press the **“Back”** option.
- This will take you back into the **“Setup”** menu.
- Go to the back of the unit and now remove the service dongle from the USB Port.

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Maintainance

Service Dongle/Change Service Date

- To make sure the dates have been accepted by the unit, after removing the USB service dongle from the unit, go back into the “Setup” menu.
- Press the **“Service”** option
- and you should see the date of the last service as being the date that you are doing the service as well as the next service date that you have set 12 months / 1 year into the future.
- You can take off the Service Dongle now.

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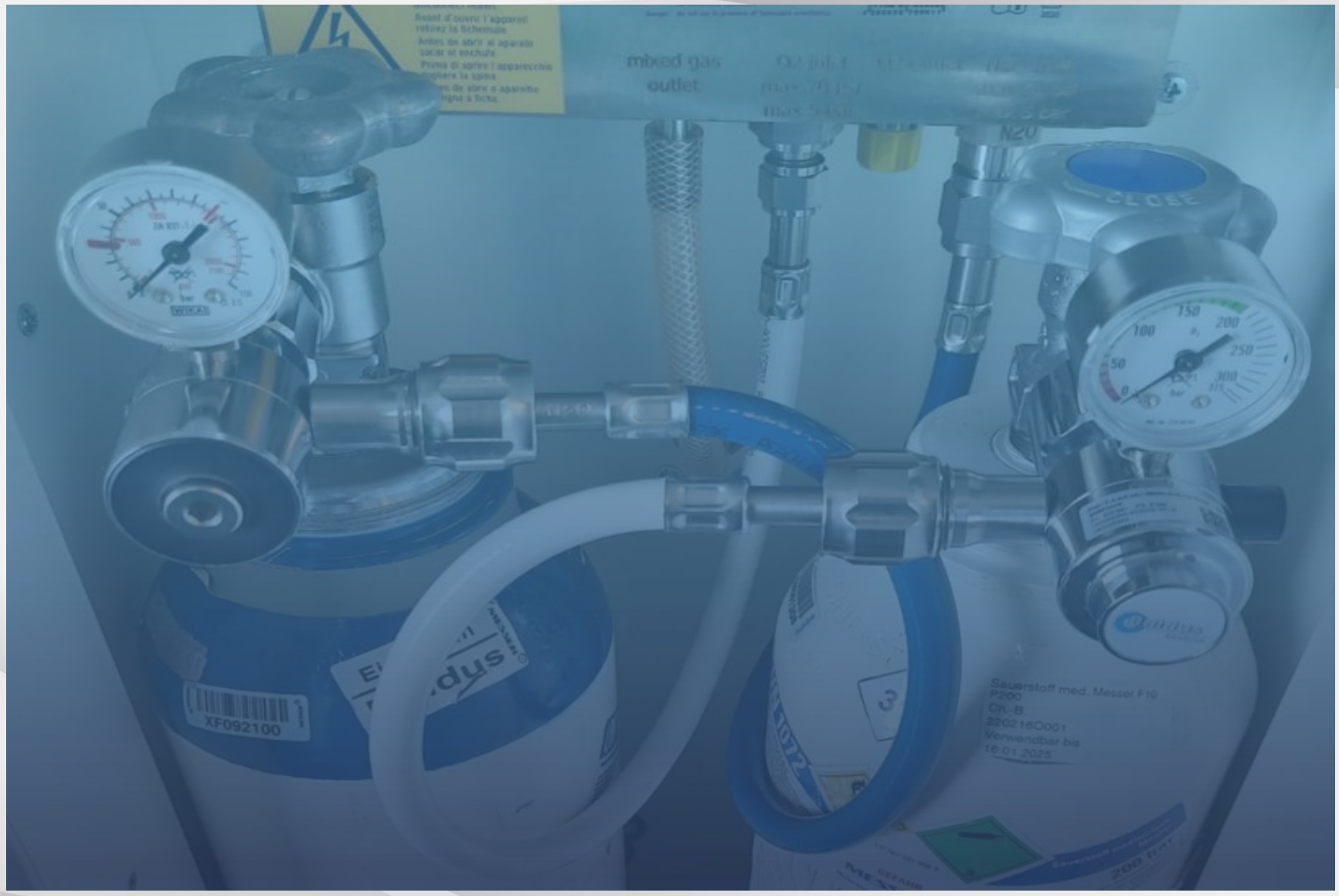
Maintainance

NITROUS OXIDE LOCK /OXYGEN STOP -TEST



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Maintainance

Nitrous Oxide Lock Test – Stop the flow of **Oxygen**

Start a sedation and have a total O2 flow of 6 liters per min. and a nitrous oxide flow of 25%.

On the back of the unit turn off the flow of the **oxygen cylinder**.

You will see the O2 pressure gauge slowly drop in pressure as you close the valve on the cylinder.

It may take a few seconds for the remaining pressure in the lines of the system to blead free of the pressure.

Once all the gas has expired out of the system, the display will start with a binging noise and the notification “Check Oxygen” will appear on the touchscreen display.

The mixture ratio bar will also show a red bar for O2, meaning you would need to change the cylinder for O2.

Since the flow of oxygen has stopped, the unit should also have stopped the flow of nitrous oxide.

This is the safety function that would never allow the patient to receive 100% nitrous oxide gas.

On the touchscreen display you will see that the 25% nitrous oxide flow we set in the beginning, now should show 0%.

No gas should be flowing at this time.

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Maintainance

Oxygen Stop Test – Stop the flow of **Nitrous Oxide**

Start a sedation and have a total O2 flow of 6 liters per min. and a nitrous oxide flow of 25%.

On the back of the unit turn off the flow of the **nitrous oxide cylinder**.

You will see the N2O pressure gauge slowly drop in pressure as you close the valve on the cylinder.

It may take a few seconds for the remaining pressure in the lines of the system to blead free of the pressure.

Once all the gas has expired out of the system, the display will start with a binging noise and the notification “Check Nitrous Oxide” will appear on the touchscreen display.

The mixture ratio bar will also show a red bar for N2O, meaning you would need to change the cylinder for N2O.

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Maintainance
Test Summary

The Baldus unit has passed the following tests:

- Visual Inspection – Mixing unit and all components
- Ambient Air Valve and Non-Rebreathing Valve Test
- Main Menu Function Test (Baldus Touch)
- Breathing Bag Test
- Oxygen Flow Test
- Nitrous Oxide Flow and Mixture Test
- Nitrous Oxide Lock Test
- Oxygen Stop Test

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Maintainance
Last Steps

- After all tests, assemble the device again
- Screw the two pressure reducers O2 and N2O back to the two gas cylinders O2 and N2O
- Install the 2 pressure tubes N2O and O2 as well (see picture below)

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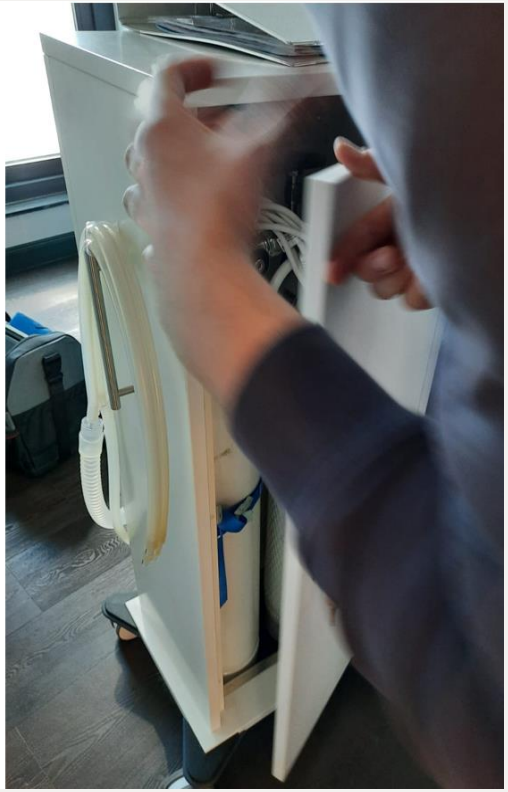
Maintainance
Last Steps

- Now open both gas bottles N2O and O2 and plug in the device
- The **Touch Device** does an automatic Self Test



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Maintainance
Last Steps

- Now, Ventilate the Baldus unit
- Always start with the bottle of N2O
- Close the N2O gas cylinder- wait until the needle is at 0
- Continue with the bottle of O2
- Close the O2 gas cylinder
- Wait until the needle is at 0.*
- ***this procedure can be accelerated by the O2 Flush Button***
- Now you have ventilated the system.

- At the end, please fill out and sign the Medical Device Book.
- **The maintenance is over ☺**

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Maintainance
Last Steps

Once the Baldus Touch unit has been serviced:

12 Months / 1 Year – Replacement of Pressure tubing O-rings / Replacement of Pressure regulator O-rings

And / Or

24 Months / 2 Years – Replacement of Pressure tubing O-rings / Replacement of Pressure regulator O-rings / Replacement of Ambient Air Valve and Non-Rebreathing Valve Membrane

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Baldus® Sedation

MANY THANKS FOR YOUR PARTICIPATION!

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