XO FLOW

INSTALLATION INSTRUCTIONS

CONTENTS

1 INTRODUCTION

Please read these installation instructions carefully before you start installing XO FLOW.

For further details concerning:

- how the unit is operated
- how the unit is configured
- infection control procedures
- maintenance
- lists of accessories, detachable parts and consumables
- legal information

please see XO FLOW, Instructions for use.

Please visit xo-care.com or contact us at info@xo-care.com for more information.

Best regards

XO CARE A/S

XO FLOW unit must be installed by authorized service personnel.

No unauthorized modification of this equipment is allowed!

2 REQUIREMENTS

2.1 DIMENSIONS OF OPERATORY

The unit is intended to be permanently installed in a dental operatory equal to or larger than the dimensions listed in Figure 1.

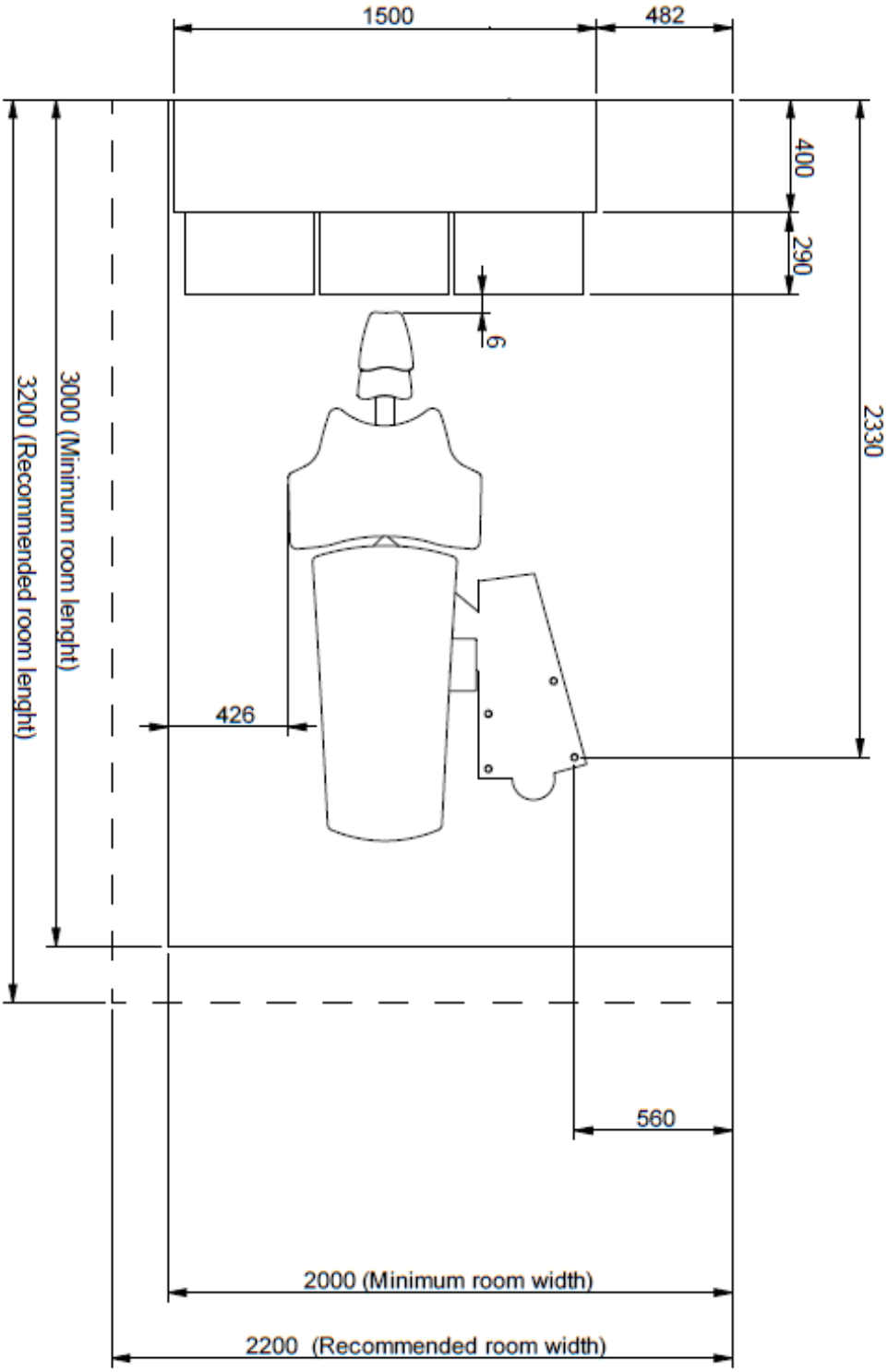

Figure 1 – Plan of installation XO FLOW unit and XO WORKTOP (all measures in cm)

Please check installation plans YC-002 (1:20) and YC-001 (1:1) carefully before finalizing the placement of the XO FLOW unit in the operatory.

The ceiling height of the room should preferably be 255 cm or more for easy installation of operating light arm – minimum height is 230 cm!

2.2 FLOOR

Please make sure that the floor construction is designed to carry the weight of the unit and withstand the forces generated.

The load-bearing capacity of the floor must be ≥ 500 kg/m².

The floor must have a tensile strength to accommodate a force on the four mounting bolts (see section 5.2.1 and 5.2.2) of ≥ 8kN.

Using the supplied expansion anchors and screws, the unit shall preferably be fixed to a concrete floor with the following minimum characteristics:

- Concrete class C20/25 to C50/60, not cracked
- Mounting bolts to be fixed at least 120 mm from the edge or other openings in the concrete

If it is not possible to drill holes in the floor or if the floor is not stable enough, the unit can be installed on an installation plate available at XO CARE A/S – see section 5.2.7.

2.3 SUPPLIES AND CONNECTIONS

Before installing the unit, please make sure that the installation supply requirements listed in Table 1 are available.

Table 1 – Installation requirements

Room	Requirement	
Width	Minimum in combination with XO WORKTOP = 200 cm (recommended 220 cm)	
Length	Minimum in combination with XO WORKTOP = 320 cm (recommended 340 cm).	
Ceiling height	> 230 cm (recommended 255 cm)	
Electrical & IT	**Requirement**	**Length above floor surface**
Mains supply	230 VAC ± 10%, 50 Hz. Min. 3 x 1.5 mm² PVC cable with earth rated for >75°	40 cm
Main fuse	The electrical installation must be secured with a 10 A fuse.	
Equipotential earth (if required by national law)	1 x 4.0 mm²	40 cm
Assistant call control cable	Max. 5A /30V DC or 3A/250V	50 cm

X-ray unit attached to the XO unit	Cable for X-ray must have its own installations pipe. Cable shall be connected to an installation box in the floor. Cables must be shielded and conform to the requirements in EN IEC 60601-1 and EN IEC 60601-1-2.	150 cm
Suction motor control cable	Max 5A /30V DC or 3A/250V AC.	50 cm
Ethernet cable	The unit may be connected to a network via a CAT6 S/FTP shielded ethernet cable. In this case, a two MOPP (Means Of Patient Protection as defined in IEC/EN 60601-1) isolator must be installed between the unit's internal ethernet port and the external port. For example, Network isolator emosafe EN-70HD from EMO systems.	70 cm
Positioning of cables in the floor	See installation drawing YC-001.	
Suction, air and water	**Requirement**	**Height above floor surface**
Suction	Suction machine power >600 l/min. Vacuum pressure at the connection point under static conditions: Min = -35 mbar, Max = -150 mbar.	
Suction pipe	Plastic pipe Ø 40 mm with socket – see YC-001.	6 cm max.
Incoming (compressed) air	Pipe 3/8" female internal thread – preferably fitted with a ball valve – see YC-001. Incoming air: • Air pressure 5.5 – 7,5 bar • Air flow rate > 55 l/min • Humidity dew point < -20°C at atmospheric pressure • Oil contamination max. 0.5 mg/m^3 • Particulate contamination < 100 particles/m^3 (particle size 1 – 5 µm) If the incoming air pressure exceeds 7,5 bar, a reduction valve must be fitted. Air quality must be in accordance with local air quality regulations.	7 cm max.
Incoming water	Pipe 3/8" female internal thread – preferably fitted with a ball valve – see YC-001. Incoming water: • Inlet pressure 2.5 – 6 bar • Water flow rate > 5 l/min • pH: 6.5 – 8.5 • Maximum particle size < 100 µm If the incoming water pressure exceeds 6 bar, a reduction valve must be mounted in front of the unit. Water quality must be in accordance with local drinking water regulations. Maximum inlet water conductivity: 850 µS/m	7 cm max.
Waste water	Plastic pipe Ø 32 mm with socket – see YC-001. Gradient of waste water lines ≥ 1% Drainage capacity ≥ 10 l/min	6 cm max.

To avoid the risk of electric shock, this equipment must be connected to a supply mains with protective earth.

To avoid the risk of electric shock always switch off the mains switch before opening or touching the internal components.

If the incoming water pressure exceeds 6 bar, a reduction valve must be mounted in front of the unit.

To ensure correct operation of the unit, the compressor must be an oil-free type and fitted with an air dryer.

If the incoming air pressure exceeds 8 bar, an appropriate reduction valve must be fitted.

2.4 OPERATING CONDITIONS

XO FLOW must be operated under the conditions shown below:

Table 2 – Operating conditions

Condition	Operation
Temperature	+15ºC – +35ºC
Relative humidity	20% – 95%
Air pressure	700 hPa – 1060 hPa
Installation altitude	Max. 2,000 meters above sea level

2.5 EXTERNAL EQUIPMENT

When external equipment is connected to the XO FLOW unit to create a medical electrical system, the requirements of IEC 60601-1, 3rd edition, must be complied with.

The external equipment must also comply with the applicable standards, e.g.:

- ***IEC 60950-1 (information technology equipment) or IEC 62368-1 (electronic equipment within the field of audio, video, information and communication technology), and***
- ***IEC 60601-1 (medical electrical equipment)***

It is the responsibility of the person/organization installing and/or modifying the equipment to ensure that the system conforms to applicable legislation, e.g. Directive 93/42/EEC, or Regulation (EU) 2017/745, and the requirements of IEC 60601-1, 3rd edition.

3 NECESSARY DOCUMENTATION AND TOOLS ETC.

The following is necessary for installing and adjusting XO FLOW:

3.1 DOCUMENTATION ETC.

- Installation drawing, 1:20 (YC-002)
- Installation drawing, 1:1 (YC-001)

3.2 STANDARD TOOLS

- Hammer drill for at least 18 mm concrete drill bit (SDS-system recommended)
- Carbide drill bit for concrete 18 mm (SDS-system)
- Carbide drill bit for concrete 10 mm (SDS-system)
- Wood bit 6 mm and 8 mm
- Spirit level 20 – 30 cm
- Combination wrench 17, 19 and 22 mm
- Socket spanner with extension 19 mm
- Torx screwdriver: T6, T8, T10, T15, T20, T25, T30 and T40
- Pozidrive screwdriver: PZ 1-2-3
- Allen key set: 1.5 – 10 mm
- Digital multi-meter

3.3 SPECIAL TOOLS SUPPLIED WITH THE UNIT

- Special wrench (MG-416)

3.4 NECESSARY SPECIAL TOOLS AVAILABLE FROM XO CARE A/S

- Manometer, four holes (ISO 9168:2009, type 3) – for adjustment and control of drive air pressure to air instrument (turbine) (FA-041)
- Four carrying handles for the unit stand (AN-181)
- Flowmeter – for adjustment and control of cooling air for motor (FA-400)
- Antistatic wristband (UC-600)
- Drill template 1:1 (AP-919)

3.5 OTHER SPECIAL NECESSARY TOOLS AND MATERIALS

- Torque wrench 75 Nm
- Two component flame retardant foam: Würth part nr 0893 303 200
- Water hardness test strips
- Main's connector tool – WAGO 890-383
- Ferrite core tool – Würth 815-0021

4 TRANSPORTATION AND UNPACKING

4.1 TRANSPORT AND STORAGE

XO FLOW must be transported and stored under the conditions shown below:

Table 3 – Transport and storage conditions

Condition	Transport and storage
Temperature	-40°C – +70°C
Relative humidity	10% – 95%
Air pressure	700 hPa – 1060 hPa

Upon arrival, check that no boxes suffered transportation damage.

Any signs of damage must be noted on the shipping documents and the transport company / forwarding agent must be contacted.

If the "shock indicator" attached to the patient chair box has turned red – please unpack the chair immediately and check that the chair did not suffer any damage!

4.2 UNPACKING

XO FLOW is delivered on two pallets, containing 4–7 boxes, depending on the configuration.

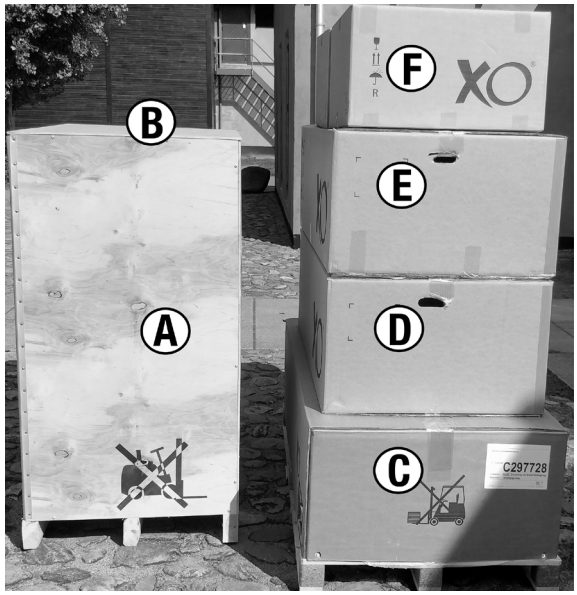

Figure 2 – XO FLOW packed in boxes

The boxes contain the following:

A. Unit stand, including foot control, installation kit, panels, instructions for use and accessories
B. Installation plate (if any)
C. Patient chair with upholstery
D. Dashboard
E. Navigator and operating light
F. XO stool and seat

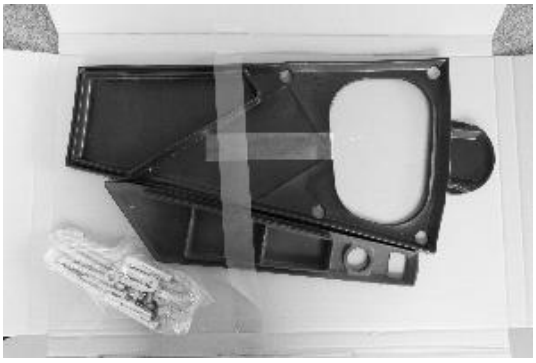

Figure 3 – Installation kit

Figure 4 – Unit stand

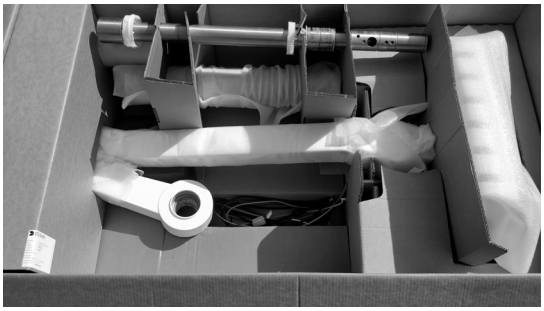

Figure 5 – Instrument bridge/Dashboard

Figure 6 – Operating light and Navigator

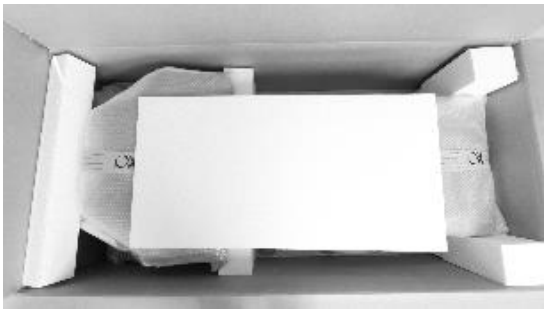

Figure 7 – Patient chair

Figure 8 – Instruments

Figure 9 – Panels

Open the boxes and check that the goods delivered correspond to the goods ordered. Then start to unpack the unit stand. If possible, leave the other components in the boxes until you need them.

The unit stand must only be lifted at its base using the carrying handles.

Never lift the unit stand at its top or in other ways!

5 INSTALLATION

5.1 INSTALLATION KIT

The included installation kit contains all necessary components for the installation – both for installation on concrete floor, wooden floor or on a steel installation plate.

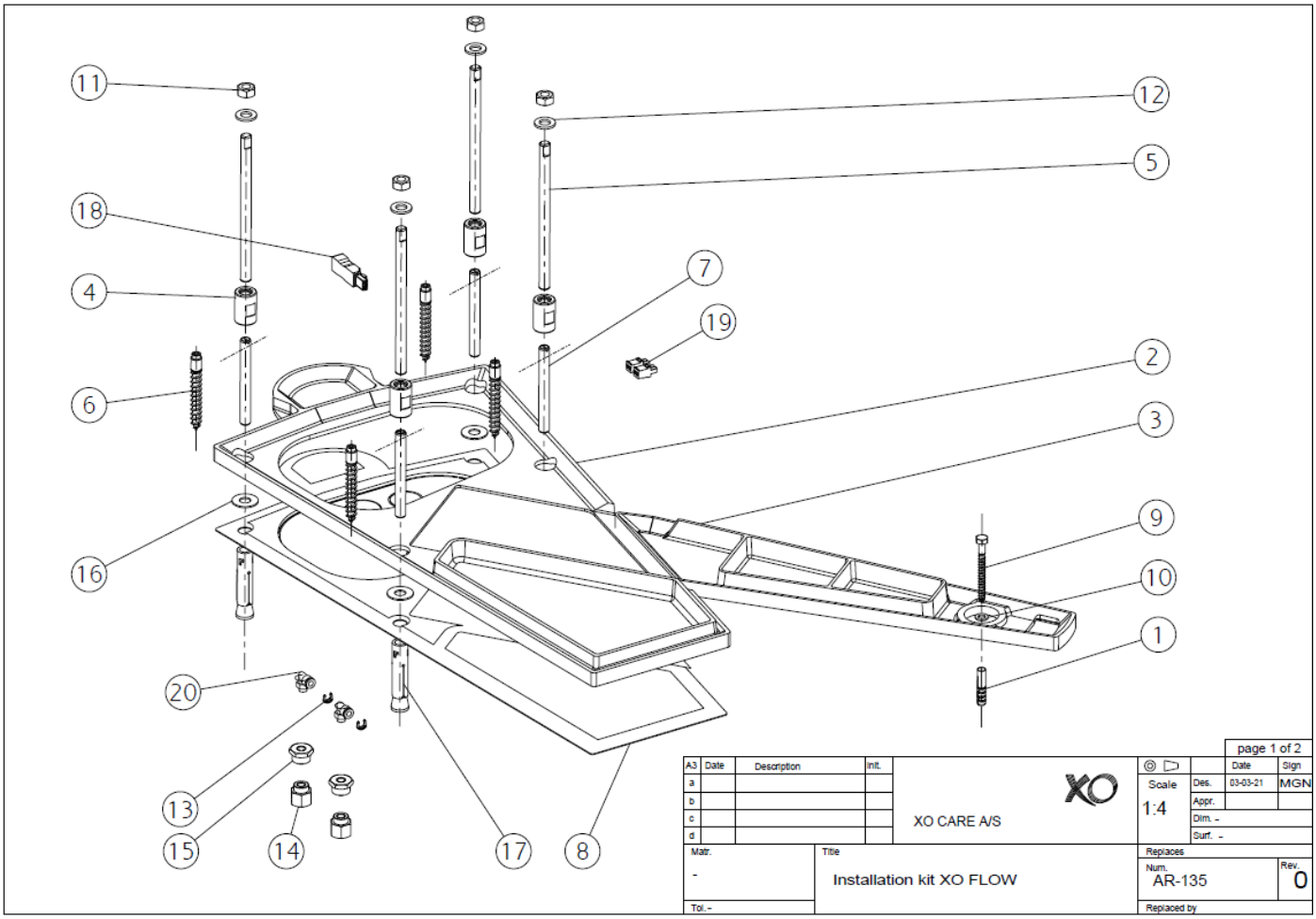

Figure 10 – Installation kit (AR-135)

5.2 INSTALLATION OF THE UNIT STAND

Make sure to place the unit stand correctly in the operatory. See Figure 1.

Prior to drilling holes in the floor, be sure that the supplies and connections have been laid out correctly in accordance with the requirements mentioned in section 2.

Start by placing the 1:1 installation plan (YC-001) on the floor and mark the five hole-positions shown on the drawing.
For this purpose, a drill template in steel can be supplied (AP-919).

As the floor in the dental operatory is not completely horizontal the unit stand is designed to be installed on bushings and lifted about 10 mm from the floor surface.

A rubber gasket is supplied to tighten the gap between floor and unit base.

5.2.1 INSTALLATION OF THE UNIT IN A CONCRETE FLOOR

1. Drill four holes for fitting the unit stand. Use drill Ø18, drilling depth min. 105 mm.
2. Drill one hole for fitting the support leg. Use drill Ø10, drilling depth min. 80 mm.

Make sure to drill the holes precisely with a tolerance of ± 2 mm.

Also, be sure to drill the holes perpendicular to the floor surface.

If the above is not completely respected, it will be difficult to push the rods through the holes of the unit base!

3. Remove dust from the holes.
4. Fit four expansion Ø18 anchors – (18) in Figure 10 – and one Ø10 expansion plug – (1) in Figure 10 – into the holes, flush with the floor surface, using a hammer.
5. Assemble the four parts as shown in Figure 11 – see also parts (4), (8) and (17) in Figure 10.

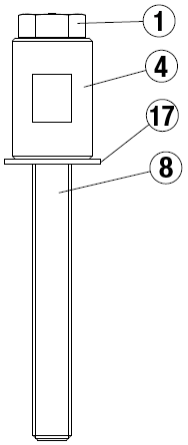

Figure 11 – Pre-assembly of mounting accessories

6. Use this assembly to secure the expansion anchors. Use a torque wrench and tighten to 75 Nm.
7. Once the expansion anchors are tightened to the correct torque, remove the hex cap screw at the top (1) in Figure 11. Use a wrench to hold the bushing (4) in Figure 11, while unscrewing the hex cap screw.
8. Remove the bushings and the washers and place the fire protection plate (9) in Figure 10. Re-mount the washers and the bushings and continue at 5.2.4

5.2.2 INSTALLATION OF THE UNIT STAND IN A WOODEN FLOOR STRUCTURE

1. Start by drilling the hole to fix the supporting leg, Ø 6 mm.
2. Then drill the four other holes, Ø 8 mm.

Make sure to drill the holes precisely with a tolerance of ± 2 mm.

Also, be sure to drill the holes perpendicular to the floor surface.

It the above is not completely respected, it will be difficult to push the rods through the holes of the unit base!

3. Insert the four mounting bolts – (6) in Figure 10 – in the 8 mm holes and tighten the screws until the heads are approx. 24 mm above the floor surface.
4. Remove the protective film from the fire protection plate and position the fire protection plate - (9) in Figure 10.
5. Fit four washers – (17) in Figure 10 – and four bushings – (4) in Figure 10.
6. Turn the bushings until they rest on the floor.

5.2.3 SEAL OPENING IN THE FLOOR

If the unit is supplied with, for example, air, water or power from an opening in the floor, the opening must be sealed with a flame-retardant foam as a precaution to prevent the spread of fire.

Two-component flame retardant foam from Würth (part number 0893 303 200) must be used.

The flame-retardant foam should be level with the floor, cover the entire opening in the floor and seal all around the edges of the fire protection plate.
If the hole in the floor for the ground installations is deep, rockwool can be used to fill out the hole and create a support for the flame-retardant foam.

	Please note that the foam hardens very fast, approx. 50 sec at 22°C. ***Ready for cutting after approx. 90 seconds***

Figure 12 – Sealing the floor installations with flame-retardant foam

5.2.4 POSITIONING THE UNIT STAND

Position the four long rods – (5) in Figure 10 – in the bushings.

Check that the bushings and long rods are perpendicularly in the floor using a spirit level.

If the long rods are out of level, try to straighten out the bushings by applying force to the side of the bushings.

Remove the four long rods to make installation of the unit easier.

Place the rubber unit base gasket on the floor over the long rods, as shown in Figure 13 and Figure 14.

Lift the unit stand and place it carefully on top of the rubber gasket, and make sure that the four bushings in the floor are placed precisely under the four adjustment nuts in the unit base.

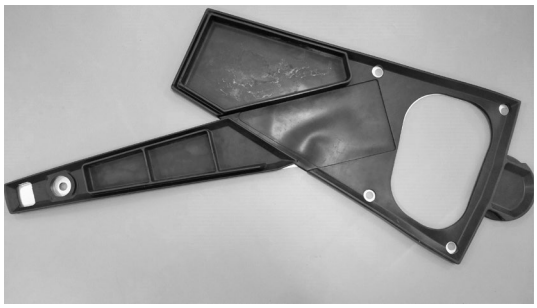

Figure 13 – Positioning of the rubber gasket

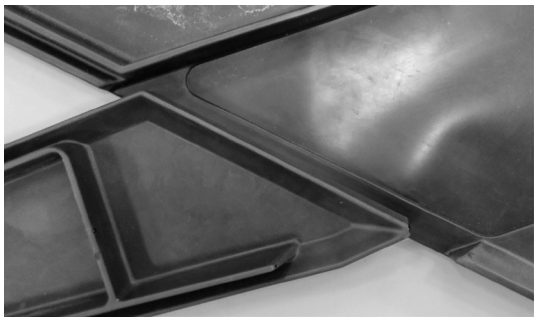

Figure 14 – Positioning of the two parts

When lifting the unit stand, use the carrying handles – see Figure 15.

Figure 15 – Lifting the unit stand

Adjust the rubber gasket for accurate positioning under the unit base and the supporting leg.

Place an Ø 8 mm washer – (10) in Figure 10 – and an M8 screw – (9) in Figure 10 – loosely into the supporting leg.

Insert the four long rods – (5) in Figure 10 – through the four holes of the unit base into the bushings in the floor and tighten.

Place four Ø 12 washers – (12) in Figure 10 – and M12 nuts – (11) in Figure 10 – loosely on the studs. See Figure 16 and Figure 17.

Figure 16 – Adjusting the unit base

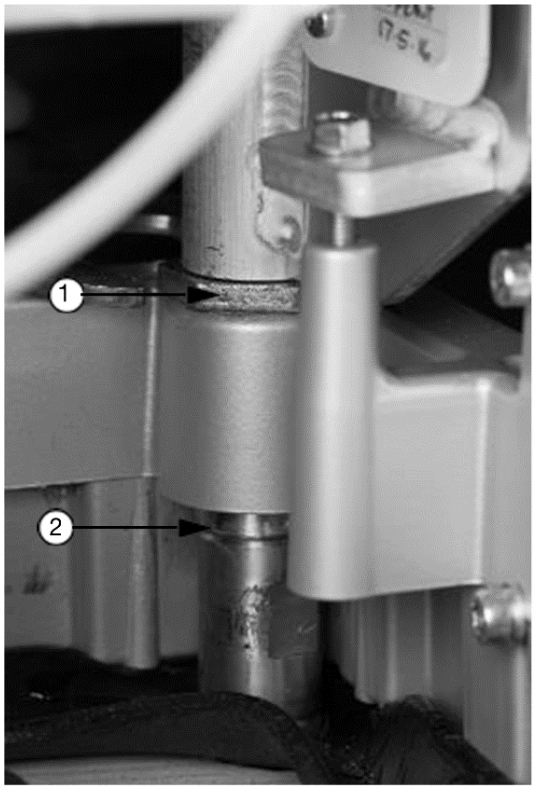

Figure 17 – Adjusting the unit base, (1) adjustment nut and (2) bushing in the floor

5.2.5 ALIGNMENT OF THE UNIT BASE

1. With the special wrench (MG-416), adjust the brass adjustment bushing – (5) in Figure 18 – in the supporting leg and allow for approximately 10 mm clearance between the supporting leg and the floor surface.
2. Fit the screw and the washer – (9) and (10) in Figure 10 – in the hole through the adjustment bushing – (5) in Figure 18 – do not tighten.
3. Turn the adjustment nuts – (1) – (4) in Figure 18 – into the unit base, allowing for approximately 5 mm clearance all the way between the unit base and the floor surface, and make sure that all four adjustment nuts are resting on the bushings in the floor. The nuts on top of the long rods should be loose.
4. Place a spirit level on top of the bridge arm post in the longitudinal direction – (A) in Figure 18 – see Figure 19.
5. Turn the adjustment nut – (2) in Figure 18 – until the post is plumb in the longitudinal direction and then tighten the nut on top of the long rod.
6. Turn the spirit level to adjust the unit stand in the cross-wise direction – (B) in Figure 18 – see Figure 20.
7. Turn the adjustment nut – (4) in Figure 18 – counter-clockwise and make sure it does not contact the bushing in the floor.
8. Turn the adjustment nut – (3) in Figure 18 – until the bridge arm post is horizontal in the cross-wise direction and tighten the nut on top of the long rod.
9. Turn the adjustment nut – (4) in Figure 18 – clockwise until it contacts the bushing in the floor and tighten the nut on top of the long rod.
10. Turn the adjustment nut – (1) in Figure 18 – clockwise until it contacts the bushing in the floor and tighten the nut on top of the long rod.

The four adjustment nuts must rest on the bushings in the floor.

The stability of the unit stand will otherwise be compromised!

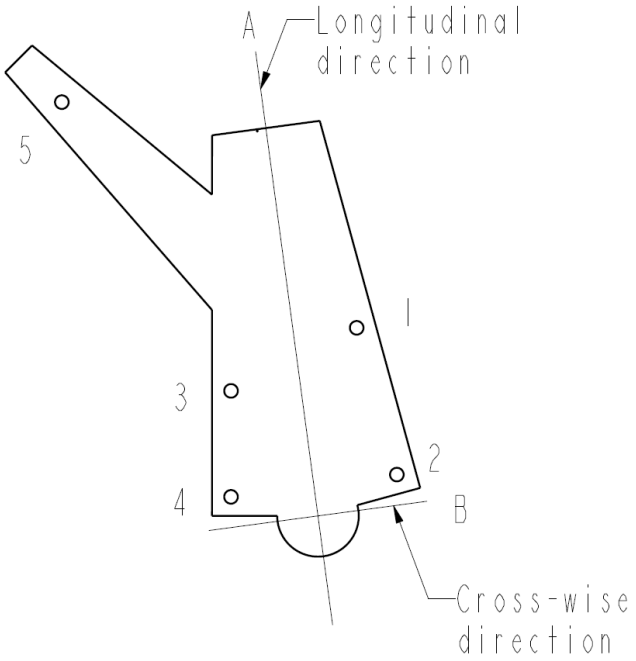

Figure 18 – Unit stand seen from above

Figure 19 – Adjustment of the unit stand in longitudinal direction (A)

Figure 20 – Adjustment of the unit stand in the cross-wise direction (B)

5.2.5 ALIGNMENT OF THE SUPPORTING LEG

When the unit stand is plumb, adjustment of the supporting leg and the chair lift can be performed!

Please note that the supporting leg and the chair lift can be adjusted independently of the unit stand.

1. Place the spirit level on the chair lift post as shown in Figure 21.
2. The chair lift is adjusted by turning the adjustment bushing in the supporting leg. See Figure 22. Use the special wrench (MG-416) for this adjustment.
3. When the chair lift is plumb, re-tighten the screw in the center of the adjustment bushing.

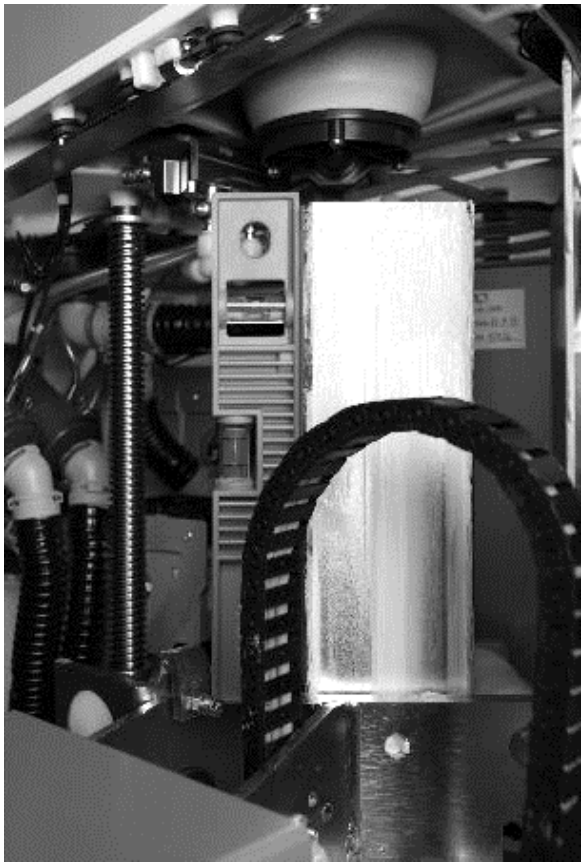

Figure 21 – Adjustment of the chair lift

Figure 22 – Adjustment of the supporting leg

5.2.6 CHECKING CLEARANCE BETWEEN BASE AND FLOOR

During adjustment, it may occur that the unit base or the supporting leg is pressed firmly against the floor, or alternatively that there is a gap between the rubber sealing and the floor of more than 10 mm.
In either case, the unit base and supporting leg must be re-adjusted using all five adjustment nuts (see Figure 18).
Note that one turn of an adjustment nut equals a vertical distance of 1.5 mm.

5.2.7 INSTALLATION OF THE UNIT ON AN INSTALLATION PLATE

If the unit cannot be mounted directly on the floor, an installation plate for installing the unit is available (XO-492).

Note that installation with steel plate is not allowed if the unit is delivered with X-Ray adaptor.

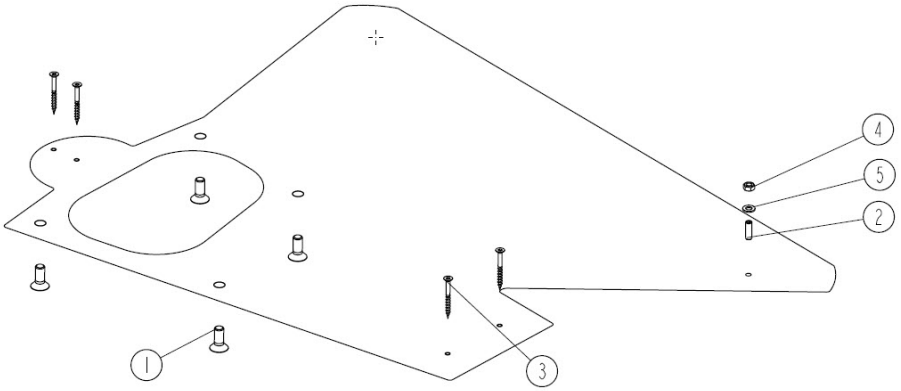

Figure 23 – Installation plate and necessary parts

1. Assemble the four bolts – (1) in Figure 23 – to the four bushings – (4) in Figure 10.
2. If installed on a wooden floor, place the installation plate on the floor and secure it to the floor with five 6 x 60 mm screws – (3) in Figure 23
3. With the special wrench (MG-416), adjust the brass adjustment bushing – (5) in Figure 18 – in the supporting leg and allow for approximately 5 mm clearance between the supporting leg and the steel plate surface.
4. Fit the long rod, washer and nut – (2), (5) and (4) in Figure 23 – in the hole through the adjustment bushing – (5) in Figure 18 – do not tighten.
5. Fit the four long rods – (5) in Figure 10 – through the holes in the unit base into the bushings.
6. Fit the washers and nuts – (12) and (11) in Figure 10 – onto the long rods; do not tighten.
7. Turn the adjustment nuts – (1) – (4) in Figure 18 – in the unit base, allowing for approximately 5 mm clearance all the way between the unit base and the steel plate surface, and make sure that all four adjustment nuts rest on the bushings in the steel plate. The nuts on top of the long rods should be loose.
8. Place a spirit level on top of the bridge arm post in the longitudinal direction – (A) in Figure 18 – see Figure 19.
9. Turn the adjustment nut – (2) in Figure 18 – until the post is plumb in the longitudinal direction and then tighten the nut on top of the long rod.
10. Turn the spirit level to adjust the unit stand in the cross-wise direction – (B) in Figure 18 – see Figure 20.
11. Turn the adjustment nut – (4) in Figure 18 – counter-clockwise and make sure it does not contact the bushing in the floor.
12. Turn the adjustment nut – (3) in Figure 18 – until the bridge arm post is horizontal in the cross-wise direction and tighten the nut on top of the long rod.
13. Turn the adjustment nut – (4) in Figure 18 – clockwise until it contacts the bushing in the floor and tighten the nut on top of the long rod.
14. Turn the adjustment nut – (1) in Figure 18 – clockwise until it contacts the bushing in the floor and tighten the nut on top of the long rod.

5.3 FITTING THE BRIDGE ARM AND INSTRUMENT BRIDGE

If the unit has been stocked/transported at a temperature of less than 10ºC for more than one hour, it needs to acquire room temperature before being connected to the mains supply.

1. Fit the bridge arm carefully by lowering it onto the bridge arm post; be careful not to tilt the arm and squeeze the bearings – see Figure 24.
2. Route the tubing and cables inside the outer cylinder as shown in Figure 25.
3. Route the tubing to the water/air side of the unit stand and conduct the cables to the electronics section.
4. Fasten cables and tubing with cable ties to the cable holders.
5. Check that cables and tubing move freely while the rear bridge arm rotates in its full range.

Figure 24 – Fitting the instrument bridge

Figure 25 – Cables shall be placed between the outer cylinder and bridge arm post

Connect cables and hoses to plugs and fittings, see Figure 26 – Figure 28.

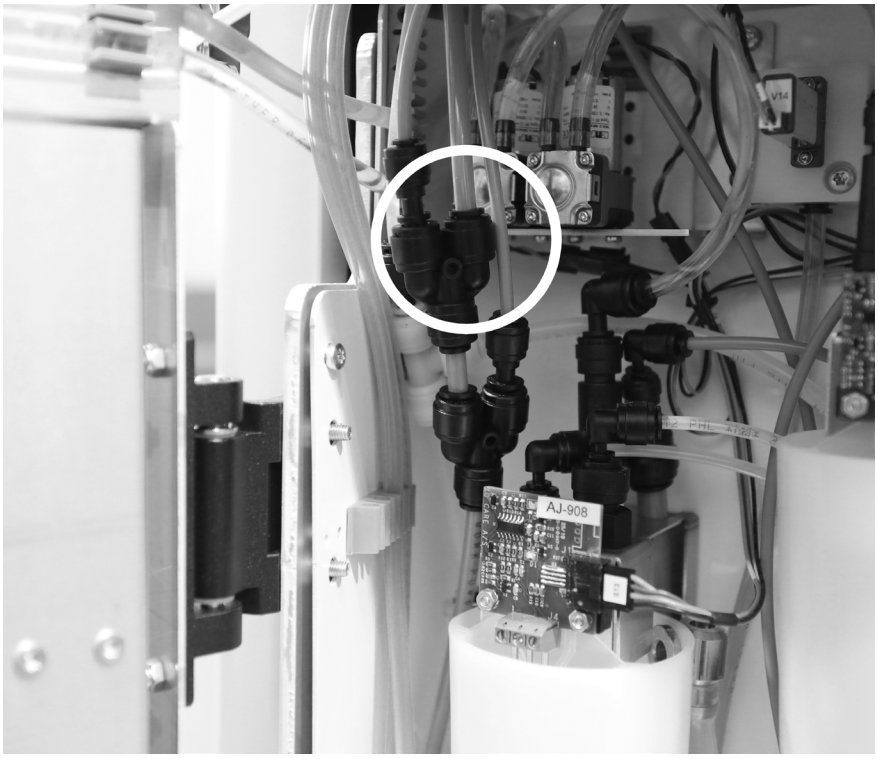

Figure 26 – Connect the blue 6 mm air tubing from the instrument bridge to the T-fitting

Figure 27 – Connecting the white 4 mm water tubing from the instrument bridge to the T-fitting

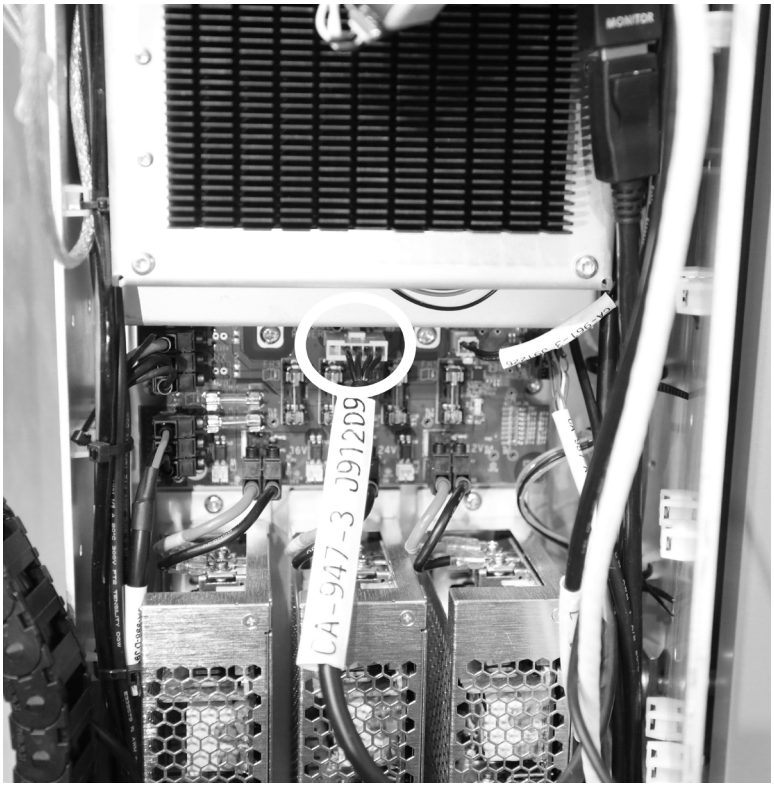

Figure 28 – Connecting cable CA-947 from the instrument bridge to BRIDGE POWER J91209

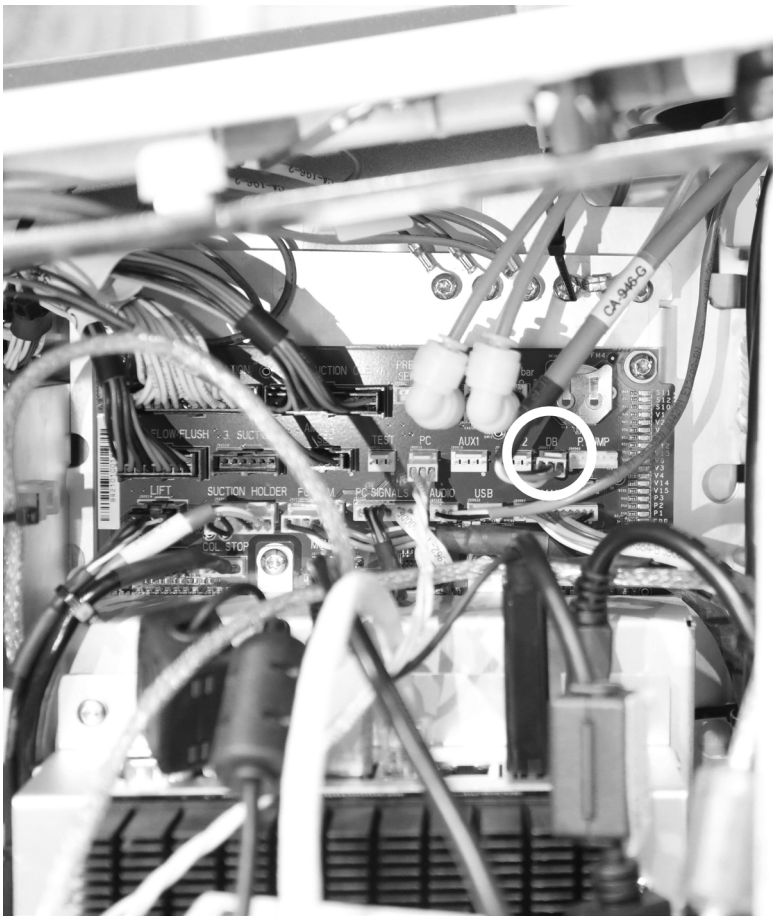

Figure 29 - Connecting cable CA-946 from the instrument bridge to DB COM J90017

Figure 30 - Connecting the display port cable from the Dashboard to the PC

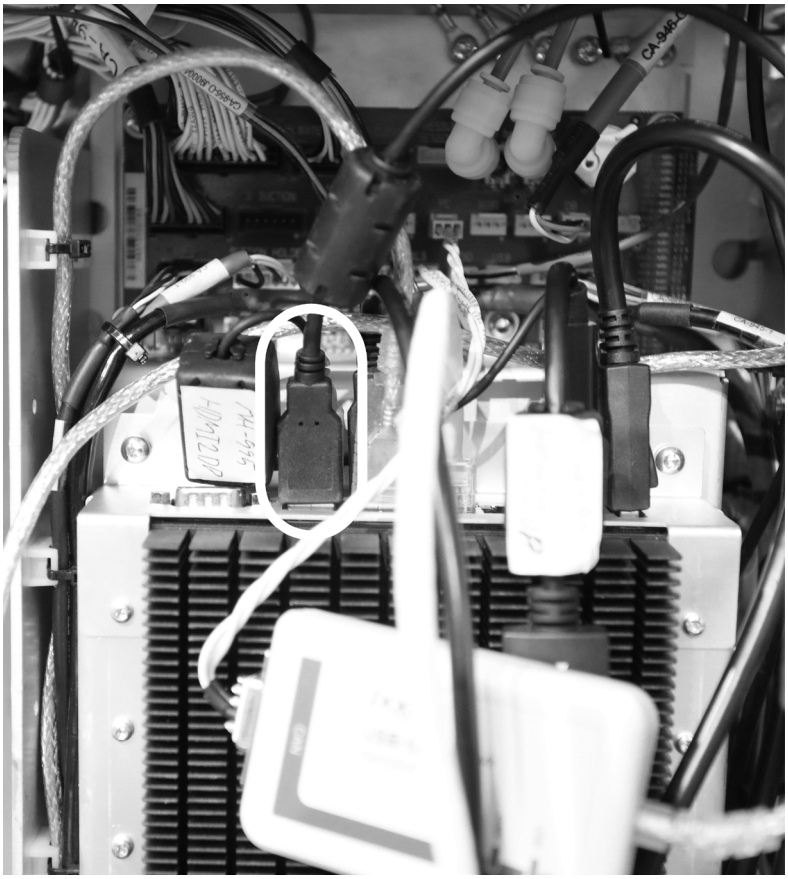

Figure 31 - Connecting the USB cable from the Dashboard to the PC

Figure 32 - Connecting the ground cable from the dashboard

Figure 33 - Connecting the Dashboard audio cable to J90026

5.4 OVER-THE-FLOOR INSTALLATION

If the installations cannot be fitted under the floor, they may run along the floor and into the unit as shown in Figure 34.
Remove the cylindric cover by loosening the two screws from within the unit stand.

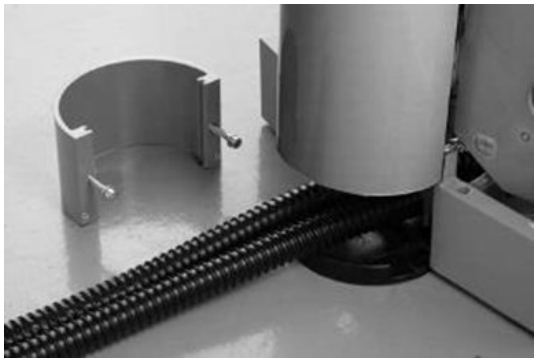

Figure 34 – Over-the-floor installation

5.5 X-RAY ADAPTOR

1. Route the cables through the x-ray adaptor using the search wire.
2. Fit the x-ray arm onto the x-ray adaptor on the XO FLOW unit.

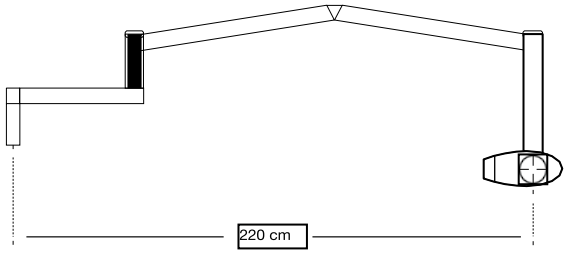

Figure 35 – Maximum arm reach of intraoral X-ray unit

For further instructions, please refer to the instructions supplied by the x-ray unit manufacturer.

The weight of the x-ray unit head may not exceed 8 kg, and the weight of the arm system may not exceed 17 kg.

The arm reach of the x-ray unit may not exceed 220 cm. See Figure 35.

An x-ray unit must only be installed if the unit is bolted directly to the floor. An x-ray unit must not be installed if the XO unit is fitted with a steel installation plate as the XO unit may not be stable!"

The x-ray unit must not be electrically connected to the XO unit!

5.6 FITTING THE LIGHT ARM POST

1. Fit the large nut to the bridge arm post (only until engaged by thread) by turning it on to the bridge arm post. See Figure 36.

2. Attach the light arm post to the nut and turn until the thread engages (NB: The upper part of the nut has a left-hand thread). See Figure 37.
3. Turn the nut clockwise without turning the light arm post – the nut will cause the light arm post and the bridge arm post to engage. Rotate the light arm post with the stop screw at the top of the post, pointing towards the chairside.
4. When the nut begins to tighten, turn the light arm post slowly until the two posts engage. Then tighten the nut even further by hand, approx. 1 turn. Finally, fasten the nut with the supplied special wrench (MG-416). See Figure 38.

Figure 36 – Fitting the nut onto the bridge arm post

Figure 37 – Light arm post fitted into the nut

Figure 38 – Fitting the light arm post

5.7 FITTING THE NAVIGATOR

The outer Ø100 mm cylinder is divided into two parts (an upper short and a lower long one) and the light arm post has separate friction adjustments for the Navigator arm and operating light arm.

1. Fit the light arm post as described in section 5.6.
2. When the light post has been tightened securely, the lower Ø 100 mm outer cylinder shall be fitted – see Figure 39.
3. Fit the Navigator arm – see Figure 40.
4. Fit the O-ring and the adjustable plastic ring on the light post over the display arm, as shown in Figure 40.
5. Route the cables from the Navigator through the groove in the plastic ring and through the hole in the light post. See Figure 41.
6. Push the cables through the post until they appear in the electronics side of the unit stand.
7. Check the movability of the Navigator arm and make sure that the cables do not obstruct the arm movements. The cables should be positioned like a small arc to allow for movement of the arm and secured under the non-adjustable plastic ring. The cables should furthermore be secured to the post with a cable tie. Please see Figure 42 & Figure 43.
8. Fit the O-ring and the non-adjustable plastic ring at the top of the light post.
9. Fit the stop screw for light arm in the threaded hole above the non-adjustable plastic ring.
10. Fit the wide-collar plastic ring in the groove above the stop screw, above which two bearing rings should be placed.
11. Fit the narrow-collar plastic ring on top of the bearing rings and secure them with an O-ring.
12. Fit the upper Ø 150 mm outer cylinder and check that there is equal space between the lower outer cylinder/screen arm and the upper outer cylinder/screen arm. If necessary, adjust the adjustable plastic rings.
13. Fit the friction brake in the rear arm of the display by turning the lower outer cylinder until the threaded hole aligns with the hole in the outer cylinder. See Figure 45.
14. Adjust the friction brake, following which the outer cylinder should be turned until the hole is pointing backwards.
15. Fit the cover plug into the hole of the outer cylinder. See Figure 54.
16. Route the cables from the display as shown in Figure 40.

17. Once the cables have been routed, check that the arm can rotate in its full range without pulling the cables.
18. Fit the operating light as described in section 5.6.

For safety reasons always remember to fit the cover plug into the hole of the outer cylinder. See Figure 54.

Figure 39 – Fitting of lower outer cylinder

Figure 40 – Fitting of the Navigator arm

Figure 41 – Routing the cables

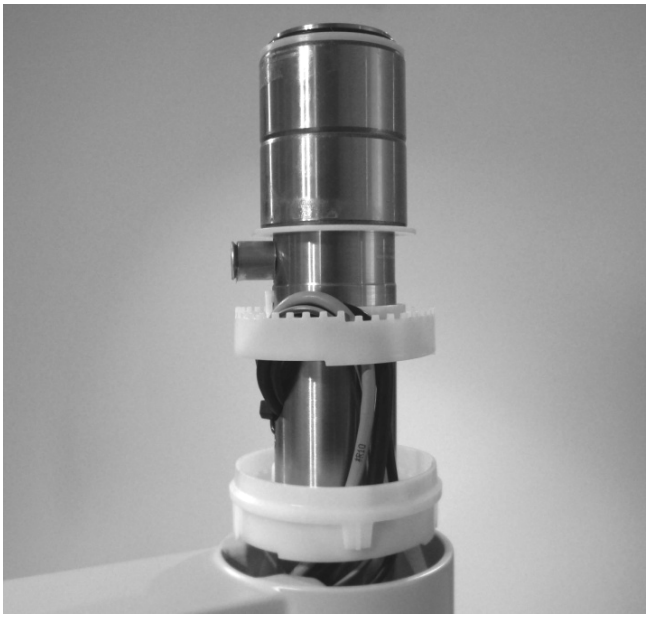

Figure 42 – Positioning of the cables

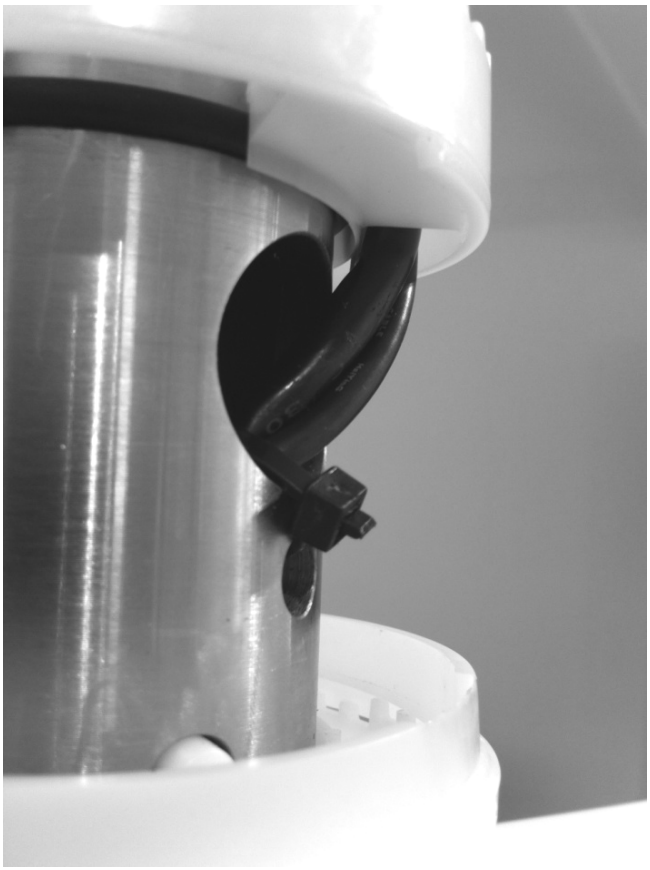

Figure 43 – Securing the cables

Figure 44 – Fitting the upper part of the outer cylinder

Figure 45 – Fitting the brake

Always remember to fit the cover plug into the hole of the outer cylinder after fitting the brake. See Figure 54.

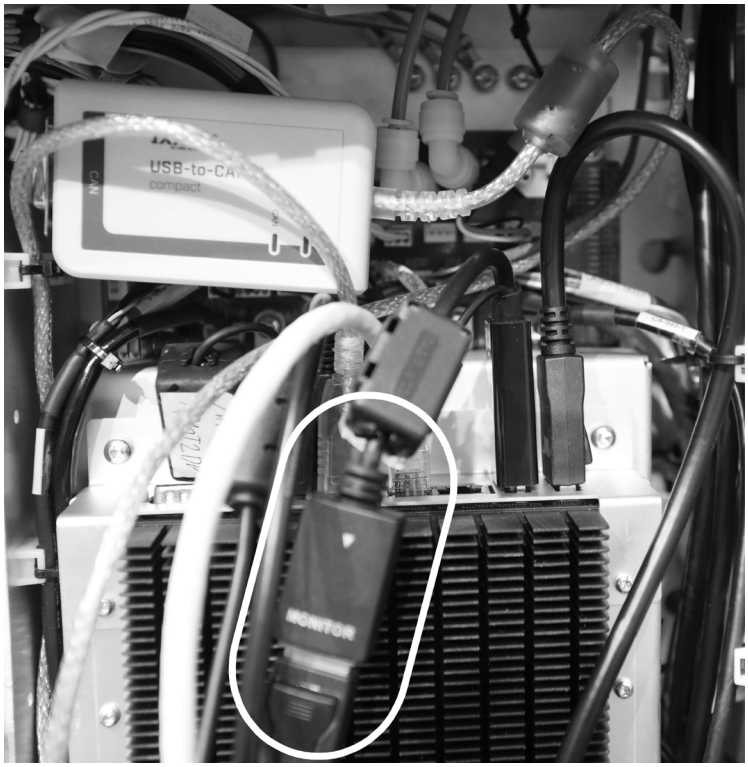

Figure 46 - Connecting the display port cable from the Navigator to the PC

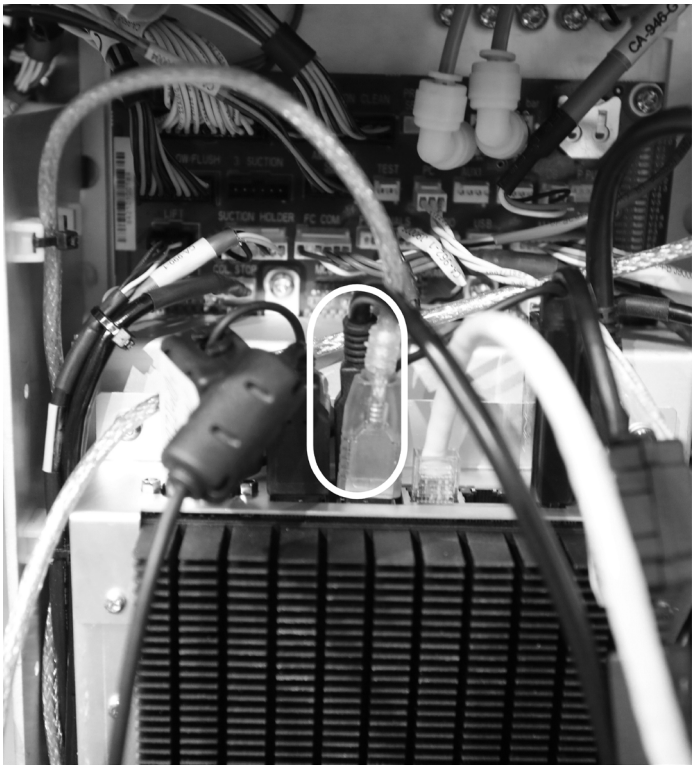

Figure 47 - Connecting the USB cable from the Navigator to the PC

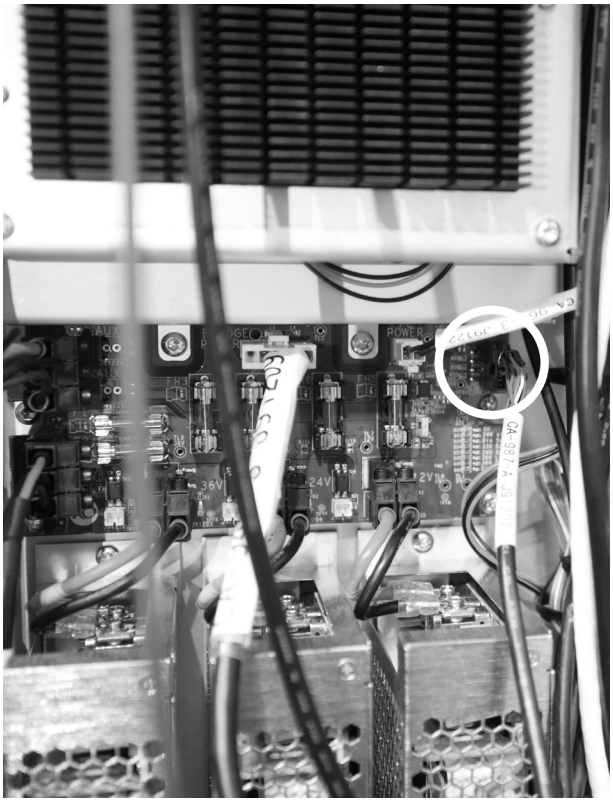

Figure 48 - Connecting the communication cable CA-987 from the Navigator to J91202

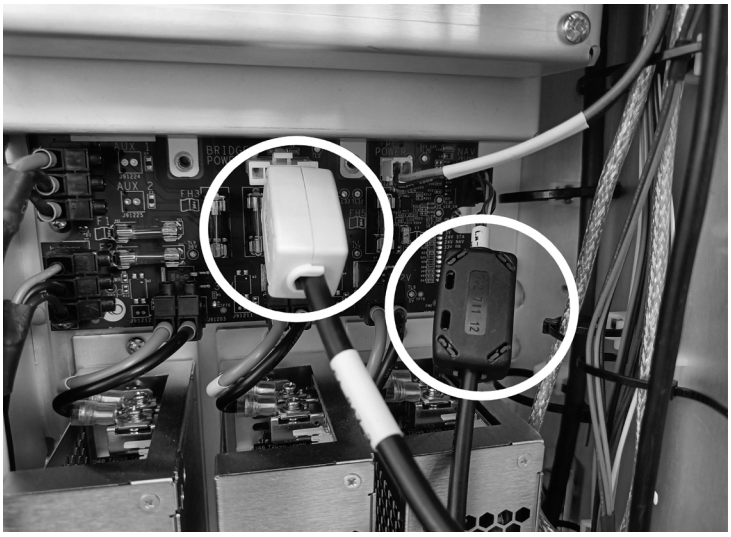

Figure 49 – Mounting the two ferrite cores onto cable CA-947 BRIDGE POWER and CA-987 Navigator communication cable

5.8 FITTING THE OPERATING LIGHT

5.8.1 UNPACKING THE OPERATING LIGHT

The operating light is delivered pre-assembled in the box with the Navigator.

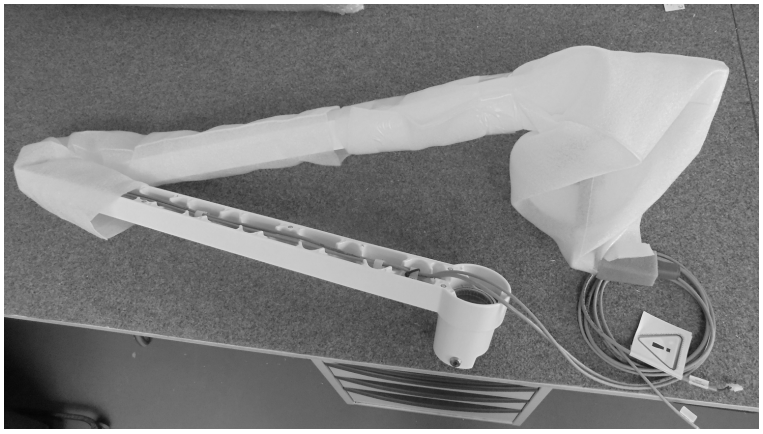

Figure 50 – Operating light arm

5.8.2 CEILING HEIGHT LESS THAN 255 CM

In case the ceiling height is 255 cm or more the outer cylinder of the light is to be fitted in the manner described above.
If the ceiling height is in the range 230 – 255 cm, however, the outer cylinder and the light arm post will need to be fitted simultaneously. The outer cylinder may be raised, tilted and supported on top of the lower plastic guide ring while the light arm post is fitted and fastened.

5.8.3 FITTING THE LIGHT ARM

The easiest way to fit the light arm is to start by fitting the arm and then routing the cables down through the light arm post.

1. Lower the light arm carefully onto the light arm post – be careful not to tilt the arm and squeeze the bearings. See Figure 51.
2. Route the cables through the light arm post and pull them from the hole of the electronics side of the unit stand. If necessary, use a piece of hard wire as a “search spring”. See Figure 52.

Figure 51 – Fitting the light arm

Figure 52 – Cable from OP Light

5.8.4 FITTING THE BRAKE

1. Turn the outer cylinder until the hole for the brake aligns with the hole in the outer cylinder. See Figure 53.
2. Fit the brake in the rear arm of the operating light through the hole in the outer cylinder
3. Adjust the brake to the desired friction:
    - Turn clockwise to increase friction
    - Turn counter-clockwise to decrease friction
4. Fit the cover plug into the hole of the outer cylinder – see Figure 54.

Figure 53 – Fitting the brake

Figure 54 – Fitting the cover plug

For safety reasons always remember to fit the cover plug into the hole of the outer cylinder. See Figure 54.

5.8.5 CONNECTING THE CABLE FROM THE OPERATING LIGHT

Connect cable CA-945 to connector marked OP LAMP on Stand control PCB. See Figure 55.

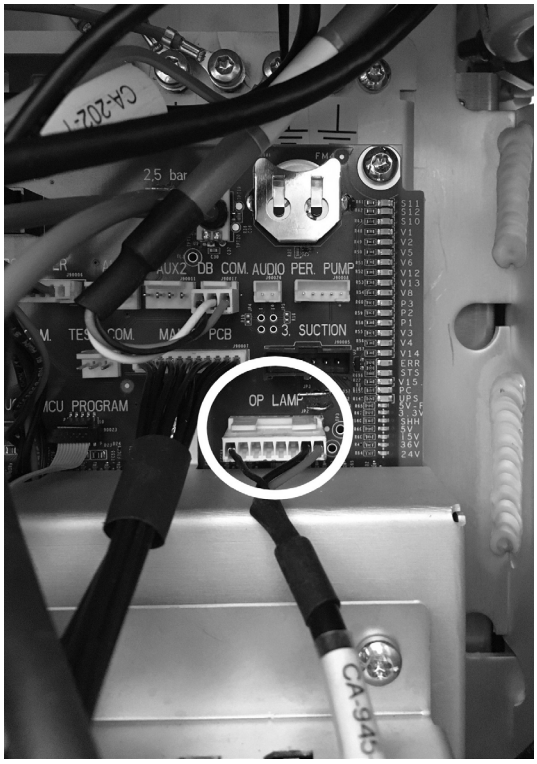

Figure 55 – Connecting cable CA-945 from OP LIGHT to J90012

5.9 ASSISTANT CALL

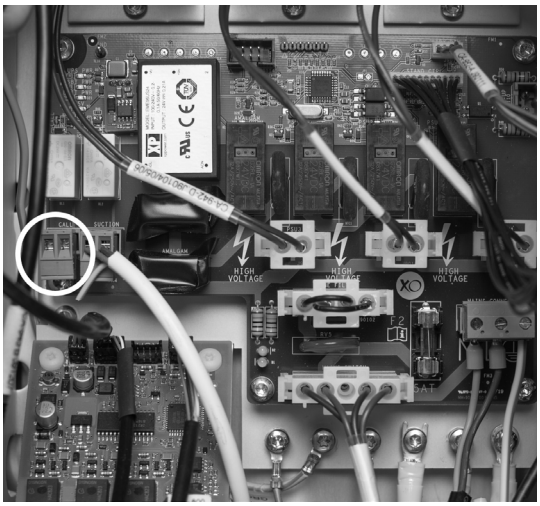

Figure 56 – Connection of assistant call

Connect the cable running from the call system to the Mains Board (marked CALL) using connector UH-507 from the installation kit AR-135.

5.10 ETHERNET CABLE

The unit may be connected to a network via a CAT6 S/FTP shielded ethernet cable.

In this case, a two MOPP (Means Of Patient Protection as defined in IEC/EN 60601-1) isolator must be installed between the unit's internal ethernet port and the external port. For example, Network isolator Emosafe EN-70HD from EMO systems. If the unit is required to access the internet a CAT6 ethernet cable may be connected to the internal PC's ethernet port.

5.11 SUCTION HOSES

Unpack the suction hoses and connect them in their designated places: the high-volume suction is positioned furthest away from the chair and next the saliva suction hose. See Figure 57.

Check that suction hoses in correct length are fitted. See Instructions for use!

Figure 57 – Connection of suction hoses

5.12 INSTALLATION OF THE INSTRUMENT BRIDGE MODULES

The instrument modules are placed as specified at the order form but can be placed according to the users' specification. Open the instrument bridge as shown in Figure 58 to access the modules:

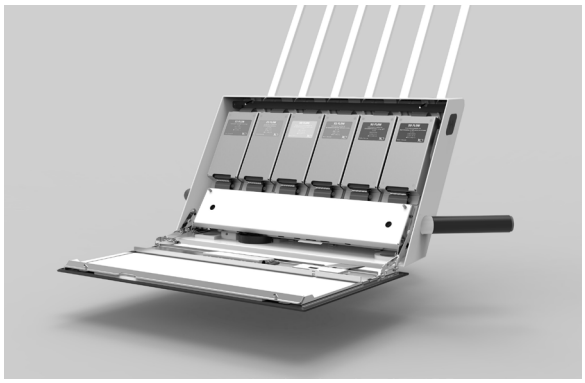

Figure 58 – Instrument bridge showing modules

Place the instrument modules according to the users' specification.

Connect the correct instrument hoses to the relevant module.

Figure 59 – Fitting the instrument suspensions and hoses

Fit the instrument holder.

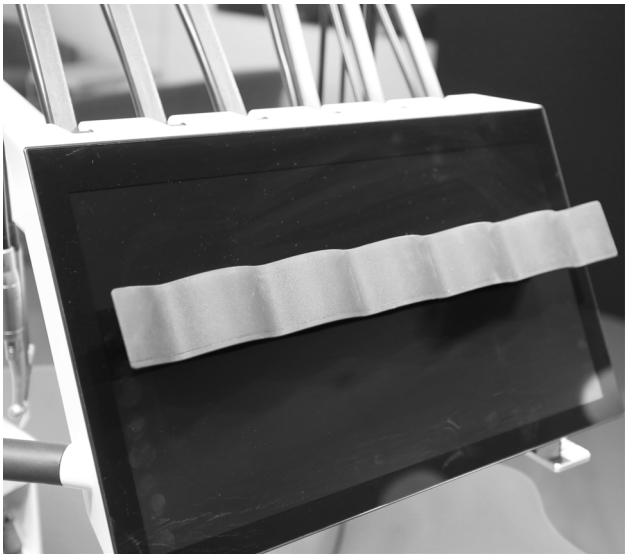

Figure 60 – Fitting the instrument holder

Mount the tray holder(s) under the bridge.

Figure 61 – Mounting the tray holder

5.13 CONNECTING WATER, COMPRESSED AIR, SUCTION/DRAIN AND POWER SUPPLY

1. Attach the water and air fittings to the ball valves in the floor.
2. Connect the 6mm white water hose and 6mm blue air hose as shown in Figure 62. Secure the hoses in the fittings with the locking clips supplied with the installation kit AR-135.
3. Connect the unit suction system to the suction installation.
4. Connect the drain hose from the unit to the wastewater installation.

Flush the water pipes and blow thoroughly through air pipe before connecting the unit.

The built-in water backflow prevention system is a legal requirement and must not be removed.

Figure 62 – Connecting incoming air and water

5.14 CONNECTING 230 VAC AND THE SUCTION MOTOR

5.13.1 CONNECTING THE POWER SUPPLY CABLE

Connect the mains supply cable to the unit as shown below in Figure 63 and position the connector inside of the rear halfpipe cover in the bottom next to the Mains switch:

Figure 63 – Mains supply cable

Assemble the socket CC-152 (supplied in the installation kit AR-135) to line (L), neutral (N) and earth (⏚) from the mains power supply cable and connect Mains to the Mains switch located on the rear of the unit base frame.

1. Strip 37mm of the outer insulation of the Mains cable as illustrated in Figure 64.
2. Strip 8mm of the inner insulation of the Mains cable as illustrated in Figure 64.
3. Terminate the conductors (solid conductors) by simply pushing them into the socket as illustrated in Figure 65. Mains connector tool is not needed with solid conductors but can be useful: WAGO 890-383.
4. Latch the wired connector into the base of the strain relief housing as illustrated in Figure 66.
5. Push down the strain relief clamp by hand as illustrated in Figure 67.
6. Latch the top of the strain relief housing as illustrated in Figure 68.

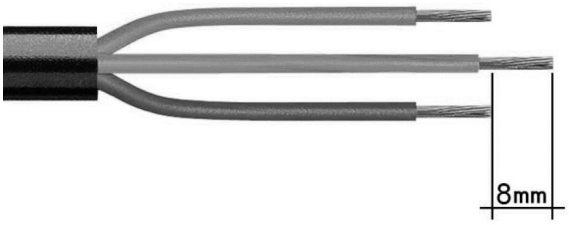

Figure 64 – strip the conductors

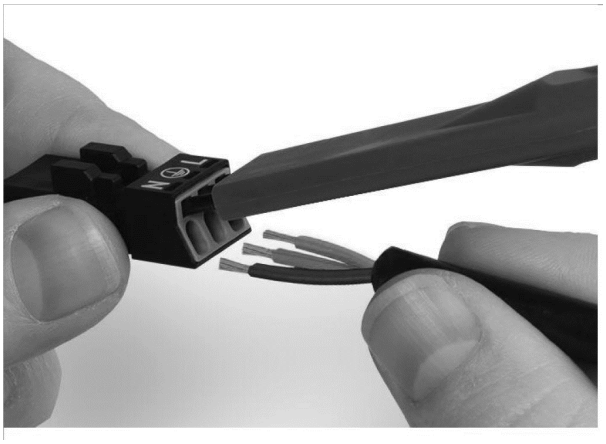

Figure 65 – terminate the conductors

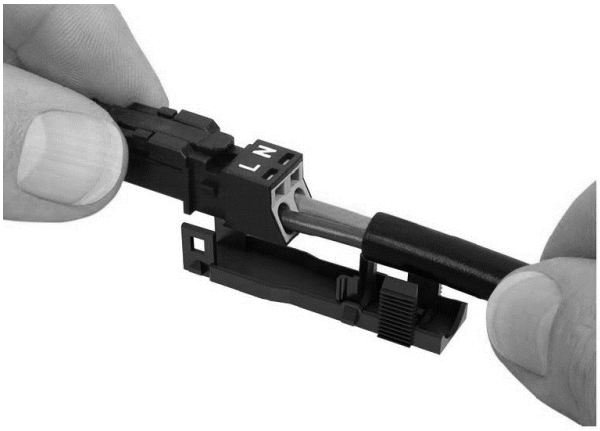

Figure 66 – Latch connector into base of strain relief

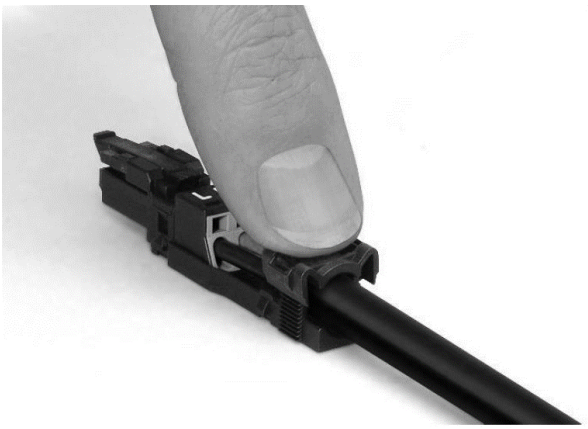

Figure 67 – push down strain relief

Figure 68 – Latch the top of strain relief

5.13.2 CONNECTING THE SUCTION CONTROL CABLE

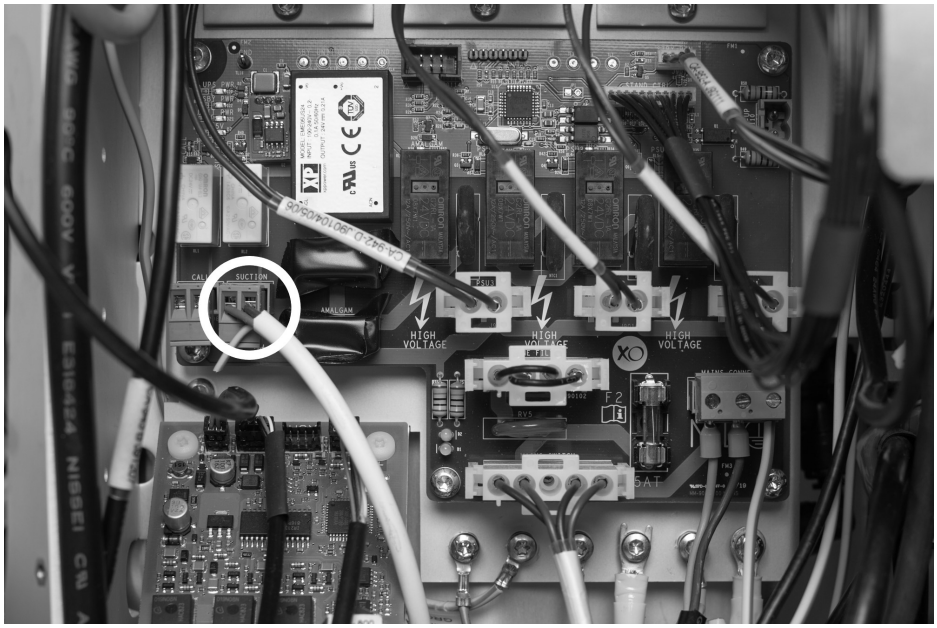

Figure 69 – Suction control cable connection

Connect suction motor control cable using connector UH-507 from the installation kit AR-135 to the terminal marked "SUCTION" on the Mains Board. See Figure 69.

5.15 FITTING THE PATIENT CHAIR

Remove the cover under the patient chair support.

Lift the patient chair onto the four rods of the chair support. See Figure 70.

Attach M12 nuts and washers to the four rods.

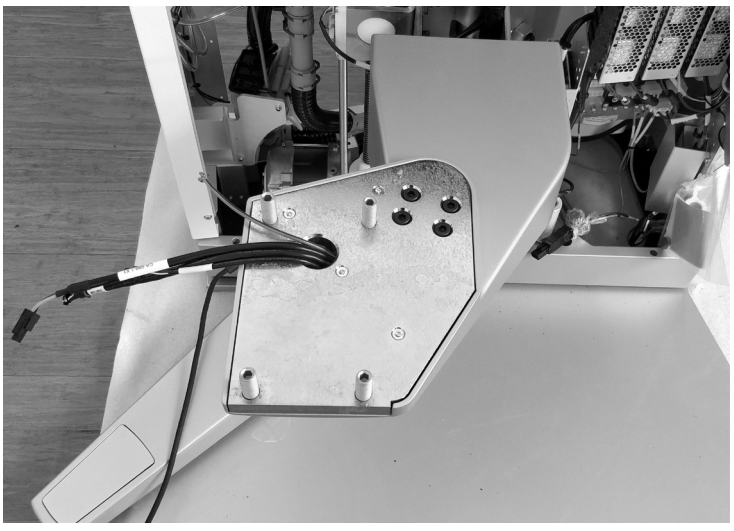

Figure 70 – Patient chair support

Tighten the nuts thoroughly with a 19 mm top wrench. See Figure 71.

Figure 71 – Fitting the patient chair

Route the chair cables through the hole in the patient chair support and attach the power cable (1) to the PCB connector X1, communication cable (2) to the PCB connector X3A, the suction holder cable (3) to the suction holder and the ground wire (4) to the motor. See Figure 72.

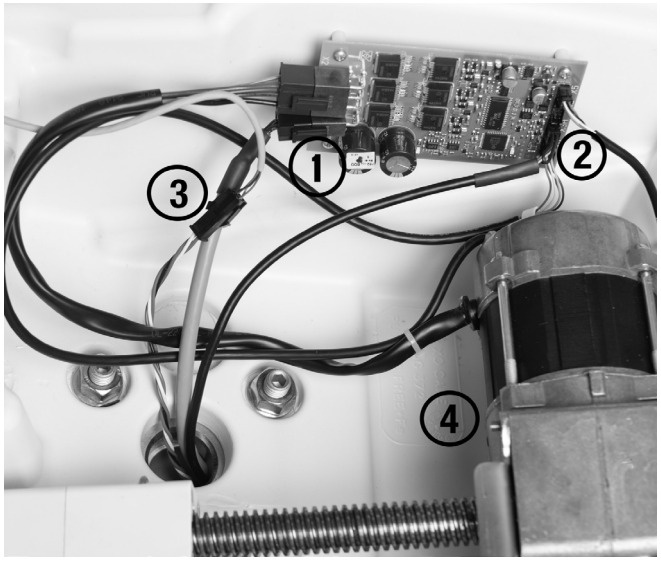

Figure 72 – Connecting the cables: (1) chair control cable, (2) chair power cable, (3) suction hose holder and (4) ground wire

Refit the cover under the patient chair support.

Install the neck rest and secure the end-stop bracket as illustrated in Figure 73.

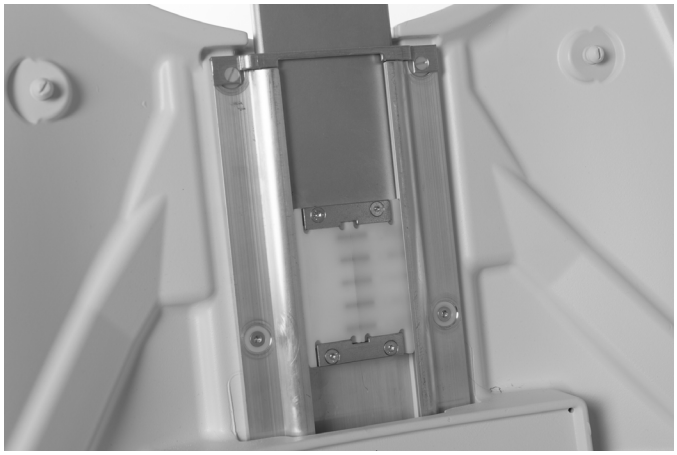

Figure 73 – Securing the end-stop bracket

5.15.1 ATTACH THE PATIENT CHAIR SEAT UPHOLSTERY

Unpack the upholstery and position it over the dowels embedded in the patient chair seat.
Press the upholstery into place.
Secure the seat upholstery with the four screws that should be inserted from under the chair.

5.15.2 CUSPIDOR BOWL AND CUP HOLDER (OPTION)

Fit the cuspidor protection disk, the cuspidor with gold trap, gold trap cover and the cup holder.

5.15.3 WATER SOFTENER

Fit the water softener cartridge as shown in Figure 74. Note the installation date on the cartridge.

Figure 74 – Water softener cartridge

5.15.4 WATER DISINFECTION AND SUCTION DISINFECTION CARTRIDGES

Fit the cartridges as shown in Figure 75.

Figure 75 – Water disinfection and suction disinfection cartridges

6 ADJUSTMENTS & SETTINGS

6.1 ADJUSTING THE INSTRUMENT BALANCE SUSPENSION

All instruments should be in perfect balance when lifted forward – i.e., you should feel no dragging from the instrument hose when holding an instrument!

If necessary, adjust the instrument balance suspensions as follows:

1. When the instrument is not activated, it is possible to adjust the instrument balance through a small hole at the rear side of the instrument bridge. See Figure 76.
2. Adjust the screw with a 2.5 mm Allen key.

Figure 76 – Adjustment of balance

6.2 ADJUSTING THE BALANCE SPRING AND FRICTION BRAKE IN THE INSTRUMENT BRIDGE ARM

When all instruments – incl. handpieces – are fitted to the bridge and each tray holder loaded with 0.75 kgs:

- ***The instrument bridge should be in balance in all positions and***
- ***It should be easy to maneuver with "two fingers"***

1. Move the instrument bridge to the highest, middle and lowest positions.
2. Adjust the balance spring with a 6 mm Allen key as shown in Figure 77.
3. If necessary, adjust friction at the specified load and adjust with 4 mm Allen key as shown in Figure 78.

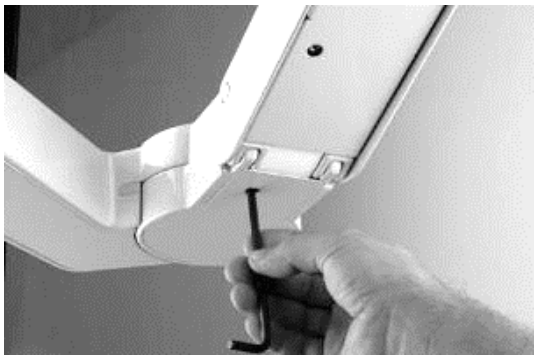

Figure 77 – Adjusting the balance spring in the bridge forearm

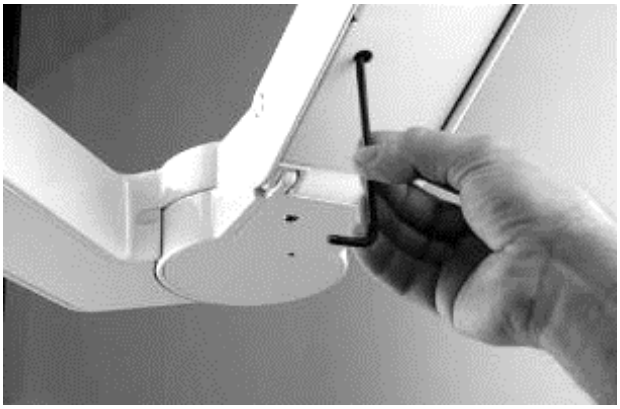

Figure 78 – Adjusting the friction brake in the bridge forearm

Do not tighten the friction brakes too much!

If the brake is too tight it may result in a mechanical hazard!

If it is not possible to keep the arms in balance without overtightening the brakes, the unit is not in level and the steps described in section 5.2.5 should be followed to level the unit.

6.3 ADJUSTING THE PIVOTING JOINTS OF THE BRIDGE ARM

The instrument bridge should be easy to move in the horizontal plane, and it should not move by itself.

The instrument bridge arm has three pivoting joints.
Each pivoting joint has its own friction brake adjustable with a 3 mm or a 6 mm Allen key. See Figure 79, Figure 80 and Figure 82.

The friction brake in the rear bridge arm is hidden behind the Ø 150 mm cylindrical panel covering the unit stand post. Remove the cover plug in the back of the cylinder to access the friction brake. See Figure 81.

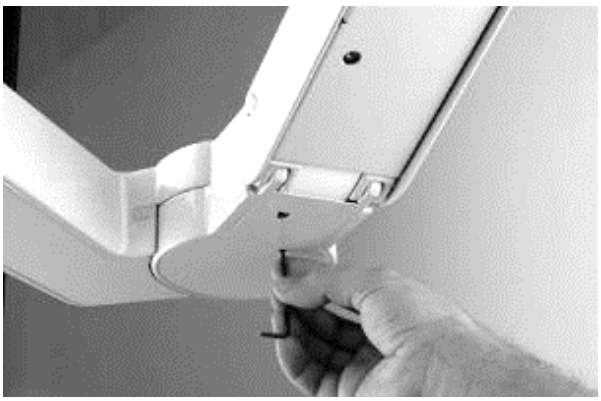

Figure 79 – Adjusting the friction brake in the swivel joint

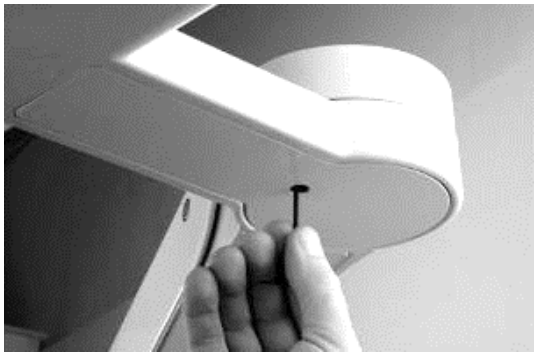

Figure 80 – Adjusting the friction brake in the swivel joint

Figure 81 – Removing the XO logo for access to friction brake

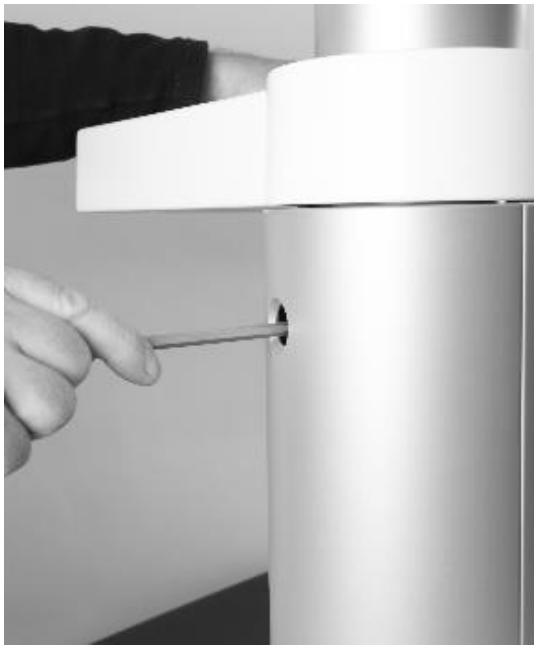

Figure 82 – Adjusting the friction brake of the rear arm

For safety reasons always remember to fit the cover plug into the hole of the outer cylinder after fitting the brake.

6.4 ADJUSTING THE FRICTION BRAKES IN THE OPERATING LIGHT ARM AND NAVIGATOR ARM

The arm for the operating light and the arm for the Navigator has three pivoting joints. The Navigator screen have one pivot joint. Each joint has its own friction brake, which can be adjusted with a 3mm - 6 mm Allen key.
Turn brakes clockwise to increase friction.
Turn brakes counter-clockwise to decrease friction.

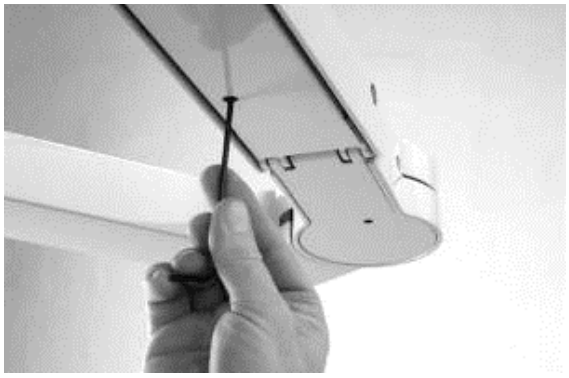

Figure 83 – Adjusting the vertical friction of the arm

Figure 84 – Adjusting the friction in the light head

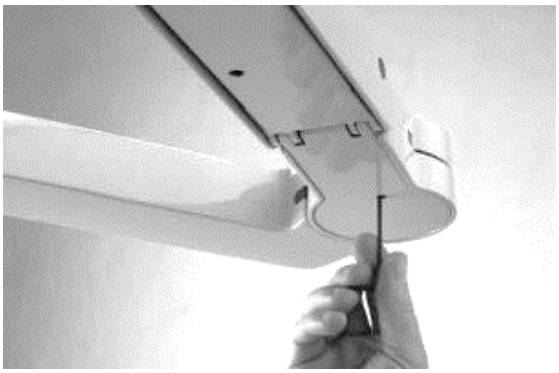

Figure 85 – Adjusting the friction in the middle joint

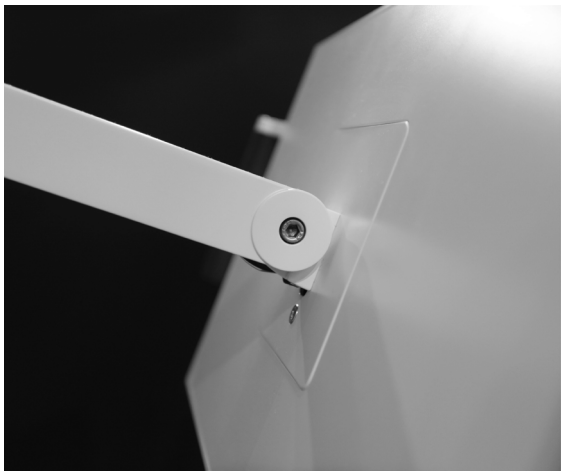

Figure 86 – Adjusting the friction brake of the Navigator

6.5 START-UP THE UNIT

Switch on the unit and check that water flows into the mixing cups. Wait 5 mins for the internal water container to be filled.
Lift forward the syringe and activate water until water path is free of air. Activate all water bearing instruments until their water paths are free of air.

6.5.1 ACCESSING TECHNICIAN AND UNIT SETTINGS

To finalize the installation, it is necessary to perform some adjustments via the Navigator. The relevant settings are divided into two apps: ⚙ “administration” and 🔧 “technical settings”.

Note that access to the technical settings app 🔧 is protected by a pin code. The pin code is the last four digits of the unit’s serial number in reverse order.

6.5.2 TIME AND DATE

The date, time and time zone of the unit must be set. This is accomplished from the date and time page 🕒 in the administration app ⚙.

6.5.3 UNIT/TREATMENT ROOM NAME

A name for the operatory the unit is in can be entered under the “unit/treatment room name” menu in the administration app .

6.5.4 LANGUAGE

Set the language in the administration app in the menu “Language”. Choose between Danish, English, French and German.

6.5.5 CALIBRATING THE WATER SOFTENER

Determine the water hardness of the incoming water using a water hardness test strip.
Adjust the water hardness value in the “Water Softener” menu in the technical settings app .

6.5.6 DATE OF ONE MONTH FOLLOW UP

Open the technical setting app and insert date for first follow up service one month from date of installation.

6.5.7 ADJUSTING THE DEFAULT AIR INSTRUMENT DRIVE AIR PRESSURE SETTINGS

To adjust the default pressure settings, you will need a test manometer (FA-041) and the air instrument that will be used with the unit (in most cases a turbine).

1) Attach the test manometer and the air instrument to the coupling of an air instrument hose

2) Open the technical settings app (see 6.5.1) and select “air instrument ” in the menu to the left

3) Adjust the minimum drive air flow using the slider so that the pressure measured using the test manometer equals 1.5 bar

4) Adjust the maximum drive air flow using the slider so that the pressure measured using the test manometer equals 3.5 bar

5) Adjust the anti-retraction air using the slider so that there is a low amount of airflow through the turbine handpiece after deactivating the turbine. The pressure should not allow the turbine to keep spinning after deactivation.

6) Perform the adjustments mentioned above individually for each turbine and micro motor suspension.

The range 1.5 to 3.5 bars are good for most turbines but in some cases another interval may be more appropriate. Please see the documentation for the air instrument(s) to be used.

Different air instruments (e.g. turbines) operate at different pressure settings. To get the best performance in a scenario where multiple different air instruments are used, the pressure settings must be adjusted to

each type of air instrument. With XO FLOW, the pressure settings can also be adjusted individually on a per-preset basis as an advanced option.

6.5.8 ADJUSTING THE MICROMOTOR COOL AIR

To adjust the micro motor cool air pressure setting, you will need a test flowmeter (FA-400).

1) Attach the test flowmeter to the micromotor.

2) Open the technical settings app (see 6.5.1) and select “micro motors” in the menu to the left.

3) Adjust the micromotor cool air using the slider to minimum 8 L/min.

6.5.9 XO ODONTOSCALER FOR ACTEON® COMPATIBLE TIPS

If the unit is fitted with a handpiece for ACTEON® compatible tips (marked with), the presets should be modified to match this handpiece and tips (marked with an “S” – for example 1US).

1) Open the user settings app on the Navigator.

2) Open the preset menu for “Scaler – XO Odontoscaler” and choose ACTEON®.

6.5.10 ADJUSTING THE CUSPIDOR AND CUP FILLER

Water flow for the cup filler and cuspidor are pre-adjusted at the factory.
However, the water flow for the cuspidor can be adjusted with the regulator shown in Figure 87.

Figure 87 - Adjustment of water flow for cuspidor

To adjust the time the cuspidor is activated tap on the Navigator. Please see Instruction for use for details.

To adjust the amount of water to the cup tap on the Navigator. Please see Instruction for use for details.

6.5.11 SAFETY TEST – INITIAL START-UP

Follow the instructions in the document YB-021 Safety test, XO Unit (part of the binder with IFU installation report etc.)

6.5.12 FIT THE PANELS

Fit the unit stand panels carefully.
Remember to connect the protective earth wires to each panel.

CHECK THE INSTALLATION

Please follow the check list in Table 4.

Table 4 – Checklist after installation

Place a cup in the cup holder and test the cup filler (if supplied with cup filler)
Test the cuspidor flush (if supplied with cuspidor). See 6.5.9 for adjustment
Test the suction hoses
Test instrument suspension individually, assess power and mechanical function
Test the foot control
Test the operating light
Test the patient chair
Test the patient chair collision stop
If installed, test the assistant call function
Test the suction disinfection system
Test the water disinfection system
Check the unit for leakages, water, air, suction and drain
Move the patient chair up and down and check the clearance between the panels, shall be equal from bottom to top
Check that the unit column gap cover guards are installed correctly
Check the unit for scratches or other handling damages

7.1.1 INSTALLATION REPORT

Fill in the Installation report and submit the report to technicalservice@xo-care.com.

8 HANDING THE UNIT OVER TO THE USERS

1. Explain the function of the unit as described in Instructions for use – and especially:
    a. Configuration of patient chair and light for each user
    b. Configuration of user profiles
    c. Configuration of Dashboard side menus and foot control
    d. Replacement of turbine return air filter, water softener filter cartridge and reset of water softener menu
    e. Basic function of instruments
    f. Instrument presets
    g. Instrument workflows
    h. Infection control procedures
2. Make sure that adjustments of instrument suspensions live up to the users' expectations
3. Make sure that the bridge arm, the Navigator arm and the operating light arm are adjusted as expected by the users
4. Explain XO CARE A/S' and the XO Partner's liability for defects
5. Inform about who to contact in case of problems or questions
6. Inform about the first check-up which will take place after approximately 1 month of operation

9 ONE MONTH FOLLOW-UP

One month after the date of installation please check the units and address any malfunctions.

Table 5 – One month follow up checklist

Check all arm systems for correct balance- and friction adjustment - arm systems shall be stable and not “moving away” during treatments.
Check all arm systems for abnormal noise when moving up and down and from side to side.
Check adjustment of instrument suspensions (with instruments, turbines, handpieces connected) – is the balance / tension appropriate?
Operate the patient chair up/down – any abnormal noises?
Ask the users if they have noted any complaints or comments that shall be addressed.
Check if the practice has a sufficient stock of consumables – see list of consumables in Instructions for use.

10 FUSES

Table 6 – Specification of fuses

PCB Name	PCB Number	Part identifier	Specifications	Dimensions	Notes
Cable, DP Switch to PCB Surge, Fused	CA-906	F1	F 5AL, 250V	5 x 20mm	
PCB, Power Distribution	AP-912	F1 + F2	T 20AL, 250V	5 x 20mm	
		F3 + F4	T 10AL 250V	5 x 20mm	
		F5	T 6.3AL, 250V	5 x 20mm	
		F6	T 1.6AL, 250V	5 x 20mm	
		F7	F 1.5AL, 125V	5 x 20mm	
PCB, Interface, Syringe Luzzani 3F/6F	AJ-956	F1	T 5AL, 125V	6.10mm x 2.69mm x 2.69mm	NANO²® 451
PCB, Interface, XO ODONTOSCALER	AJ-979	F1	T 1AL, 125V	6.10mm x 2.69mm x 2.69mm	NANO²® 451
Amalgam separator transformer	MH-649	F1	T 1AL, 250V	5 x 20mm	
		F2	T 4AL, 250V	5 x 20mm	

11 SYMBOLS

List of symbols used in these instructions.

Table 7 – List of symbols

List of symbols used in these instructions and on the product labeling:

	***General safety warning***
	***Safety warning: dangerous voltage***
	***Static electricity. The equipment must be turned off and you need to be electrically connected to the framework of equipment (earthed) when touching sensitive electronics components or installing cables and plugs. We recommend the use of a wrist band which can be supplied to you by XO.***
	***Safety related mandatory action***
	***Message/Notification***
	***Safety related prohibitive action***
	***General caution***
	***DataMatrix Code for product information including UDI (Unique Device Identification)***
	***Data structure in accordance with Health Industry Bar Code***
	***Serial Number***

	***Reference number***
	***Medical device***
	***Manufacturer***
	***Date of manufacture***
	***Do not dispose of with domestic waste***
	***Type B applied part (degree of protection against electrical shock)***
	***Type BF applied part (degree of protection against electrical shock)*** ***Intraoral camera***

For more symbols, please see Instructions for use.

XO FLOW
REF CF-001

Installation Instructions
REF YB-860
VER 1.40
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Subject to change

CE 2460

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