CEILING UNIT INSTALLATION GUIDE

For products:

FD-8000P1 / P1+ / P2 / P2+
FD-3600 / FD-5000

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CE 0537

Table of Contents

1 INTRODUCTION

This manual describes how to install Finndent 8000+ dental units, with or without Finndent 3600 and 5000 patient chairs. Depending on the unit and chair configurations, not all parts of the installation manual will apply.

Finndent products must be installed by a certified Finndent technician.

1.1 Incident Reporting

In the unlikely event of a safety incident involving a Finndent product, users should sent a report to their local Finndent Dealer or directly to Finndent Oy (support@finndent.com). Incident reports must include the following:

Dental clinic name, address, telephone number and e-mail
Name of the person reporting
Product details (model, serial number, purchase location)
Date and time of the incident
Relevant patient details (age, size, procedure being given, etc.)
Explain what happened in detail

1.2 Medical Device Tracking

Due to EU regulations on medical device tracking, Finndent must know the final installation location of all dental units and chairs. **If a unit is re-sold, Finndent must know the new location. Please contact Finndent Finland immediately with the new owner name, address and phone number.**

1.3 Warranty

The manufacturer gives two (2) years warranty for the unit and the chair. Warranty validation requires that the Warranty and Instruction Log are filled with the installation details and returned to the manufacturer within two (2) weeks of the date of installation.

If the warranty and log papers are not signed and returned, the unit and chair have no warranty!

The warranty period for the installed instruments (Micro motor, turbine multiflex, curing light, syringe, scaler) is that given by the manufacturer, usually one (1) year. The unit consumables such as the instrument pad, instrument tubes, doorio arms, membranes, valves, suction connectors, etc., have a warranty period of one (1) year.

The warranty includes only replacement of the faulty item. The costs of dispatch, freight and installation or repair labor are not included in the warranty.

Complete warranty conditions have been delivered with the unit to the Customer and Distributor.

2 SYMBOLS AND ABBREVIATIONS

~	Alternating current
A	Ampere
Hz	Hertz
| / O	On / Off (IEC 60417-5007/5008)
IPX1	Protected against dripping water (IEC 60529)
kPa	kiloPascal, pressure measurement, 100kPa = 1 bar = 13PSI
LED	Light emitting diode
N/A	Not applicable
PCB	Printed Circuit Board
PSI	Pounds per square inch, 13PSI = 1 bar = 100kPa
RPM	Revolutions per minute
TBA	To be announced, information will be added later
V	Voltage
W	Watt

T5AL250V Fuse description: T = Slow blow
5A = number of amperes, for example, 5 amp
L = low breaking capacity glass fuse
250V = rated for 250 volts
35A BC = Breaking capacity of 35A


/ L / N /G Protective Earth (IEC 60417-5019) / Line In / Neutral conductor connection /Earth ground


Warning: Dangerous voltage (IEC60878) Do not remove this cover unless the unit is disconnected from the power mains supply (building circuit breaker is turned off).


Protection class B (IEC 60417-5840)


Protection class BF (IEC 60417-5333)


European Community approval mark


Do not dispose in normal household waste (Directive 2002/96/EC)


General warning: read carefully before using the unit (ISO 7010-W001)


Refer to instruction manual / booklet (ISO 7010-M002)


Fragile


This End Up


Keep Dry


Temperature range


Air pressure range


Relative humidity range

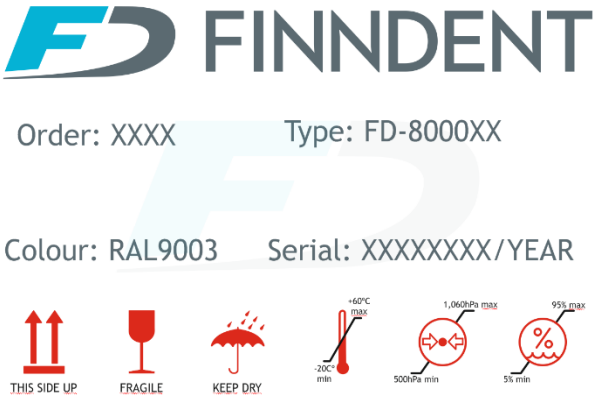
Symbols for the control panel are described on separate paragraphs.

Labels on Unit:

Water In – the connection from the water mains
Air In – the connection from the hygienic air supply
To Drain – the fluid that goes to the public sewer
Air Pressure – main air pressure regulator
Water Pressure – main water pressure regulator
Bottle Select – to use water from the bottle, turn valve toward Bottle Select (left side)
Main Water Select – to use water from the main water, turn valve toward Main Water Select (down)
Glass Fill – the valve to adjust the flow rate of the glass fill
Suction – the high volume suction tube
To Amalgam – the suction hoses output to the amalgam separator
-u+ - Flow rate increase or decrease


Wireless or RDIF point

Transportation conditions are on the packaging. For example:



3 WARNINGS AND SAFETY

3.1 General Warnings

Do not modify this equipment without authorization of the manufacturer.

Only service personnel authorized by Finndent are allowed to carry out repairs and annual maintenance. Repairs and maintenance performed by unauthorized technicians will carry no warranty.

Do not use the unit and chair where there is a risk of causing a fire or explosion; e.g., in the presence of flammable liquids, gasses or dust.

This product contains moving parts. Be careful when using it in close contact with other moving devices.

If the unit has been in an environment outside the allowable operating temperature and humidity, it must be allowed to return to operating temperature and humidity before installation or use.

3.2 Electrical Warnings

Turning the unit off with the building circuit breaker disconnects the live mains voltage from all components. The building circuit breaker should be equipped with a locking device to prevent accidentally turning the power on.

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

Turning the unit off with the main power switch disconnects the live mains voltage from all components.

This unit contains live mains voltage parts. Disconnect the live mains voltage before opening the unit transformer box or servicing the chair positioning motors.

The patient must not be in contact with instruments while being resuscitated with a defibrillator.

The unit should always be connected through a leakage current detector.

This unit and chair contain only 24V transformers.

Connections to protective earth are made with green and yellow cables and marked with the symbol  .

Circuit boards may be damaged by static electricity. When handling PCBs, it is recommended to wear wrist grounding straps and store the PCB in an anti-static bag.

EMC requirements must be considered when installing the unit. The unit can interfere with other devices due to its EMC characteristics. The device can be affected by other devices due to its EMC characteristics. Do not install the unit in close contact with sensitive devices or devices that create high levels of electromagnetic disturbance. It may be necessary to take mitigating measures, such as relocating or shielding the location.

Dental units can be affected by mobile telephones and radio-frequency (RFID) communication devices. For that reason, do not use mobile telephones when using the device.

Using 3rd party electrical components may increase electrical emissions or decrease immunity. Use only authorised Finndent parts and accessories. The use of other accessories will result in non-compliance.

3.3 Air, Water, Suction Warnings

National regulations concerning dental water must be followed (for example, EN 1717 for water supply installations, ISO 11144 for connections for supply and waste lines and EN 12056-1 for sewage installations).

National regulations concerning dental air must be followed (for example, EN 7494-2 for dental equipment water and air supply).

A water shut-off valve must be mounted on each unit. **Always close the water supply when the unit is not in use.**

3.4 Safety Switches

Safety switches may not be disabled or removed.

The dental unit and chair are fitted with several automatic safety switches. Safety switches may not be disabled or removed. The safety switches are located in the following places:

Chair motion limit switches
Rotating cuspidor limit switch
Chair seat frame
Chair lower cover switch (to prevent foot control being crushed)
Unit Door Safety switch
Suction arm limit switch

4 TECHNICAL SPECIFICATION

Manufacturer

FINNDENT Oy, Niittylänpolku 16, 00620 Helsinki, Finland
Phone: +358 20 743 5115, www.finndent.com

Electrical Protection Class / Grade

Unit: Class I Type B
Chair: Class I Type B

Operational Safety Grade

Standard. The unit is not suitable for use in an environment with a mixture of inflammable anaesthesia, oxygen or laughing gas and air.

Protection Against Fluids (Standard EN 60529 +A1 Degrees of protection provided by enclosures)

IPXI for foot control

Backflow Prevention (Standard EN 1717 Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow)

Category 4 with the prevention device on the mains water supply line.
Category 5 when used with the bottled water supply system.

Operating Conditions

	Temperature Ranges	Relative Humidity Range (no condensation)	Atmospheric Pressure
Operating Conditions:	15 – 40ºC	20 - 75%	80 kPa-110 kPa (0.8bar-1.1bar)
Storage Conditions:	0 - 50ºC	20 - 75% + Keep Dry	70 kPa – 110 kPa (0.7bar-1.1bar)
Transportation Conditions:	-20 - +60ºC	5 - 95% + Keep Dry	70 kPa – 110 kPa (0.7bar-1.1bar)

Table 1 Allowable Temperature and Humidity Ranges

Electrical Features

Supply Power:	230V / 50Hz or 60Hz
Unit power consumption:	500W
Chair power consumption:	700W
Unit + Chair power consumption:	1200W
Main fuse F3 (PCB):	T3.15AL250V (T3.15A slow blow fuse)
Main fuse F4 (unit + chair):	T6,3AL250V (T6,3A slow blow fuse)
Main chair fuse:	T5AL250V (T5A slow blow fuse)
Breaking capacity	35A BC
Volt-amperes of unit only	460VA

The power supply cord is non-detachable and may only be replaced by a technician. Power supply cord instructions are in Chapter 5.2.

Mode of Operation

Unit: Continuous operation.

Chair: Non-Continuous operation.
Suggested cycle time in normal use: 25s motors ON / 400s motors OFF
Cycle to overheat at 25ºC and 90kg load: 600s motors on / 240s motors off
Chair motors are equipped with an automatically re-setting thermal fuse. If the chair overheats, all motion will stop until the motors cool and the fuse re-sets.

Water Connection

Pressure range:	3-6 bar / 300-600 kPa / 0.3 – 0.6 MPa
Flow Rate:	≤ 4 l/minute maximum consumption
Quality:	particle size < 10µm
Hose Connector Size:	25mm

Water lines are always GREEN or CLEAR/WHITE.

Compressed Air Supply

Pressure range:	5.5-8 bar / 550-800 kPa / .55 – 0.8 MPa
Flow Rate:	≥ 55 l/minute maximum consumption
Quality:	dry, oil-free and hygienically clean (medical grade)
Hose Connector Size:	25mm

Hygienic air lines are always blue.

The turbine air return line is red in the instrument bridge and black in the unit.

Suction Connection

Vacuum range:	150 – 170mbar / 15-17kPa / 0.015 – 0.017MPa (less than 200mbar)
Flow Rate:	≥ 500-800 l/minute maximum consumption
Hose Connector Size:	25mm

Drain Connection

Capacity:	10l/minute minimum
Hose Connector Size:	25mm

Load Capacity

Patient Chair:	150kg
Instrument Tray:	1kg

Colour

White painted parts and plastics are RAL 9003 Signal White.
Upholstery colour is the client's own choice. Please contact your local dealer for information.

Minimum Computer Requirements

Windows operating system
USB ports

Installation and Disassembly

The dental unit and chair must be installed by a trained Finndent technician.

4.1 Disposal of Waste

Finndent products have been designed and manufactured to be as safe as possible. Any waste materials must be recycled or disposed of in an environmentally friendly manner according to national regulations.

Hazardous materials requiring special waste collection must be disposed of in accordance with national waste and environmental regulations.

When handling waste materials, all precautions must be taken to reduce the associated risks.

When the chair and unit reach the end of their service life, return them to your dealer for disposal.

Contact your local dealer or national governmental agency for more specific information.

Description	Main Materials	Recycle	Waste Disposal	Special Waste Collection
Unit and chair frames	Aluminium Galvanized steel	X X		
Chair covers	PUR	X		
Electronics, PCBs, motors	Copper Steel Other	X X		X - EC directive 2002/96
Rubber			X	
Glass		X		
Amalgam separator	Mercury, bio waste			X
Battery (for the clock)				X – See EC directive 2006/66/EEC
Cleaning products	Chemicals			X
Oil collector	Chemicals			X
Packaging	Wood Cardboard Paper Foam padding Other plastics	X X X X	 X	
Other accessories	See OEM Product Documentation	-	-	-

Table 2 Guideline for waste disposal

4.2 EMC Guidance

Finndent units are made to be used in an electromagnetic environment where radiated disturbances are controlled. These instructions will not cover all possible cases.

WARNING: Only Finndent approved spare parts, accessories and cables may be used with Finndent units. Use of all other parts may result in an increase or decrease of electromagnetic emissions.

This dental unit and patient chair should not be used adjacent to, or stacked with other equipment.

If stacking or use adjacent to other equipment is unavoidable, this dental unit and patient chair must be observed for normal function prior to use.

Guidance and manufacturer's declaration – electromagnetic emissions		
Finndent dental units and patient chairs are intended for use in the electromagnetic environment specified below. The customer or the user of the dental unit and patient chair should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment - guidance**
RF missions CISPR 11	Group 1	The dental unit uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF missions CISPR 11	Class B	The dental unit is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 6100-3-2	Class A	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	

Table 3 Guidance and manufacturer's declaration – electromagnetic emissions

Guidance and manufacturer's declaration – electromagnetic immunity			
Finndent dental units and patient chairs are intended for use in the electromagnetic environment specified below. The customer or the user of the dental unit and patient chair should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 2 kV line(s) to line(s) ± 1 kV line(s) to earth	± 2 kV line(s) to line(s) ± 1 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95% dip in U_T) for 0,5 cycle 40 % U_T (60% dip in U_T) for 5 cycles 70 % U_T (30% dip in U_T) for 25 cycles <5 % U_T (>95% dip in U_T) for 5s	<5 % U_T (>95% dip in U_T) for 0,5 cycle 40 % U_T (60% dip in U_T) for 5 cycles 70 % U_T (30% dip in U_T) for 25 cycles <5 % U_T (>95% dip in U_T) for 5s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the FD-8000 dental unit and patient chair requires continued operation during power mains interruptions, it is recommended that the FD-8000 dental unit and patient chair be powered from an uninterruptible power supply or a battery.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment. The power frequency magnetic field should be measured in the installation location.
NOTE U_T is the a.c. mains voltage prior to application of the test level.			

Table 4 Guidance and Manufacturer's declaration – electromagnetic immunity

Guidance and manufacturer's declaration – electromagnetic immunity			
Finndent dental units and patient chairs are intended for use in the electromagnetic environment specified below. The customer or the user of the dental unit and patient chair should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the FD-8000 dental unit, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$ 80 MHz to 2,5 GHz $d=2.3\sqrt{P}$ 800 MHz - 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b]
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m	
NOTE 1 At 80 MHz and 800MHz, the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the dental units are used exceeds the applicable RF compliance level above, the dental unit should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the dental unit b Over the frequency range 150kHz to 80 MHz, field strengths should be less than 3 V/m.			

Table 5 Guidance and Manufacturer's declaration – electromagnetic immunity RF

Users can prevent interference between the unit and radio frequency transmitters by keeping the minimum distance shown on the table below, depending on the power of the transmitter:

Recommended separation distances between portable and mobile RF communications equipment and the dental unit and patient chair			
The dental unit and patient chair are intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the dental units and patient chairs can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the dental unit and patient chair as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	Separation distance (m) according to frequency of the transmitter		
	150 kHz - 80 MHz d=12√P	80 MHz - 800 MHz d=12√P	800 MHz - 2,5 GHz d=23√P
0,01	0,2	0,2	0,3
0,1	0,4	0,4	0,7
1	1,2	1,2	2,4
10	4	4	8
100	12	12	24
The distance (d) in meters of the transmitters with power missing from the above table can be estimated using the equation for frequency range. P is the maximum nominal power (W) as provided by the manufacturer of the transmitter.			

Table 6 Recommended distances between the dental unit and devices using radio frequencies for communication

4.3 Maximum Cable Length 7m

Cables over 7m long can cause interference and signal degradation. For this reason, the maximum length of all ceiling unit cables is 7m.

All clinic designs must be measured for actual distances. The distances in this manual are for guidance only.

5 PRE INSTALLATION

Ceiling units are always custom made to fit the clinic.

Before ordering, Finndent and the technician need to know:

- Structural strength of the ceiling
- Type of ceiling (false ceiling, concrete)
- Ceiling height and false ceiling height
- Installation location of vertical column, distance from cabinets, walls, etc.
- Is the vertical column left-handed, right-handed or centre (ambidextrous)?
- Installation location of electrical box
- Installation location of wet system box
- Installation location of optional water bottle, suction cleaning system and suction arm

5.1 Ceiling and Bolt Strength

5.1.1 Loads and Forces

Component	Total Weight (kg)	Distance from Vertical Column (mm)	Moment – Torque Force of Component (Nm)
Wet System box	3	0	0
Electrical box	12	220	25,9
Faro lamp and lamp arm	7,5	1050	77,2
Monitor and monitor arm	11,3	400	44,3
Horizontal arms	9,3	700	63,9
Instrument bridge and hand tools	9	1100	97,1
Mounting frame	11	0	0
Vertical column	5,5	0	0
X-MIND DC x-ray and arm	16,8	1100	181,3
Maximum weight and distance:	**82,4kg**	--	

The maximum possible weight per bolt is 10,3kg.
With no x-ray, the maximum weight per bolt is 8,2kg.

With the arm lengths causing moments, the maximum moment per bolt is 95Nm.
With no x-ray, the maximum moment per bolt is about 76Nm.

5.1.2 Ceiling Material

It is forbidden to install a Finndent ceiling unit in a ceiling of unknown construction, wood or with cracks.

Concrete C20/25 to C50/60, non-cracked.
Concrete C12/15, natural stone with dense structure.
Normal reinforcement.

5.1.3 Approved Anchor Bolts (x8)

Only this anchor bolt is approved for use by Finndent: Würth Anchors W-TM/S Type A M10x62.

It is forbidden to install the unit will fewer than 8 anchor bolts.

Approvals:

European Technical Approval (DIBt, Berlin) using guideline ETAG 001-T2. ETA-10/0255 /2010/07/13

Proof of Performance (Pub) (published by Würth):

ETA-10/0255 for individual attachment, Option 7, non-cracked concrete, galvanised steel, M6–M12; dimensioned in accordance with the European Technical Approval Guidelines (ETAG) for "Metal Anchors for Use in Concrete", Appendix C, measurement process A.

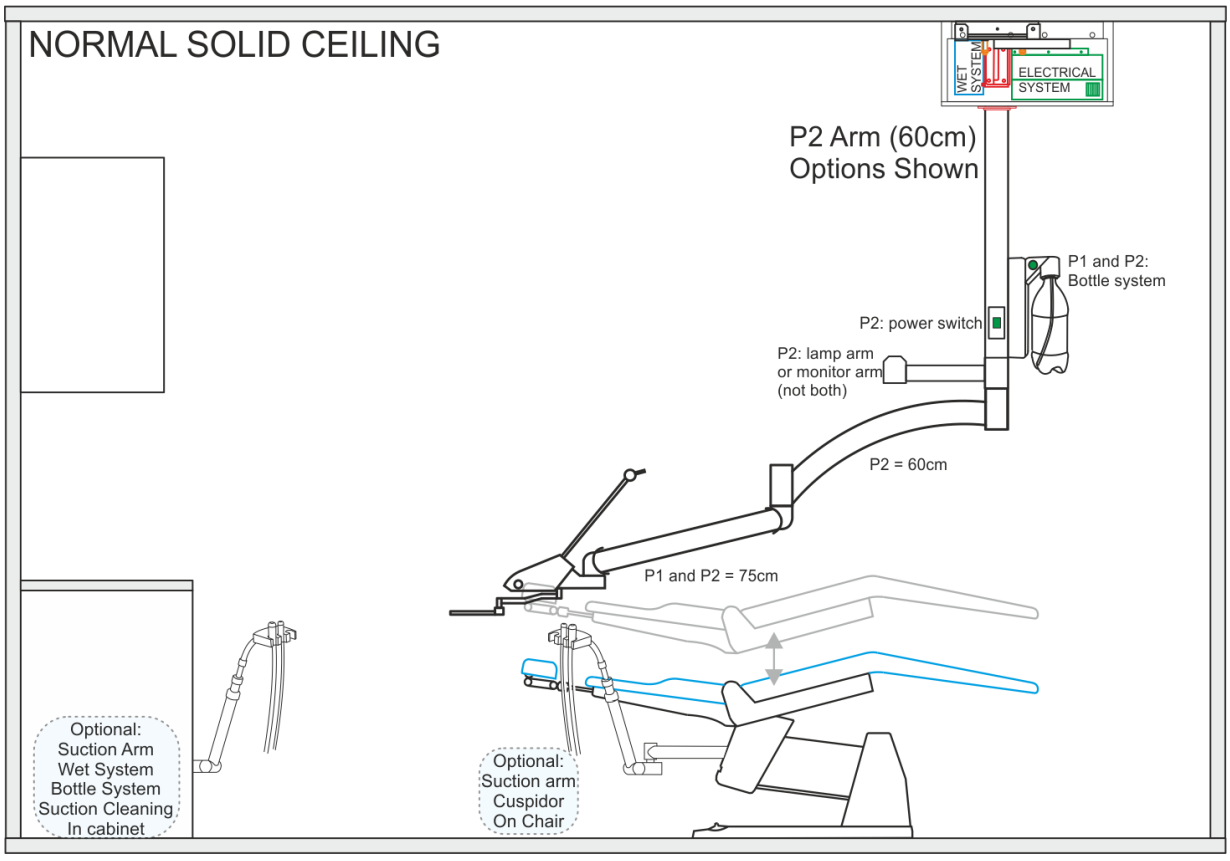
Application notes (published by Wurth):

The anchor has European Technical Approval for use in reinforced or non-reinforced standard concrete with strength class of minimum C20/25 and maximum C50/60 in accordance with EN 206:2000-12.
Can be used in concrete < C20/25, hard natural stone and solid brickwork (without approval).
The anchor is approved for use under predominantly static or quasi-static loads.
Individual attachment: Anchoring with European Technical Approval in non-cracked concrete.
Can be used only in dry indoor areas.

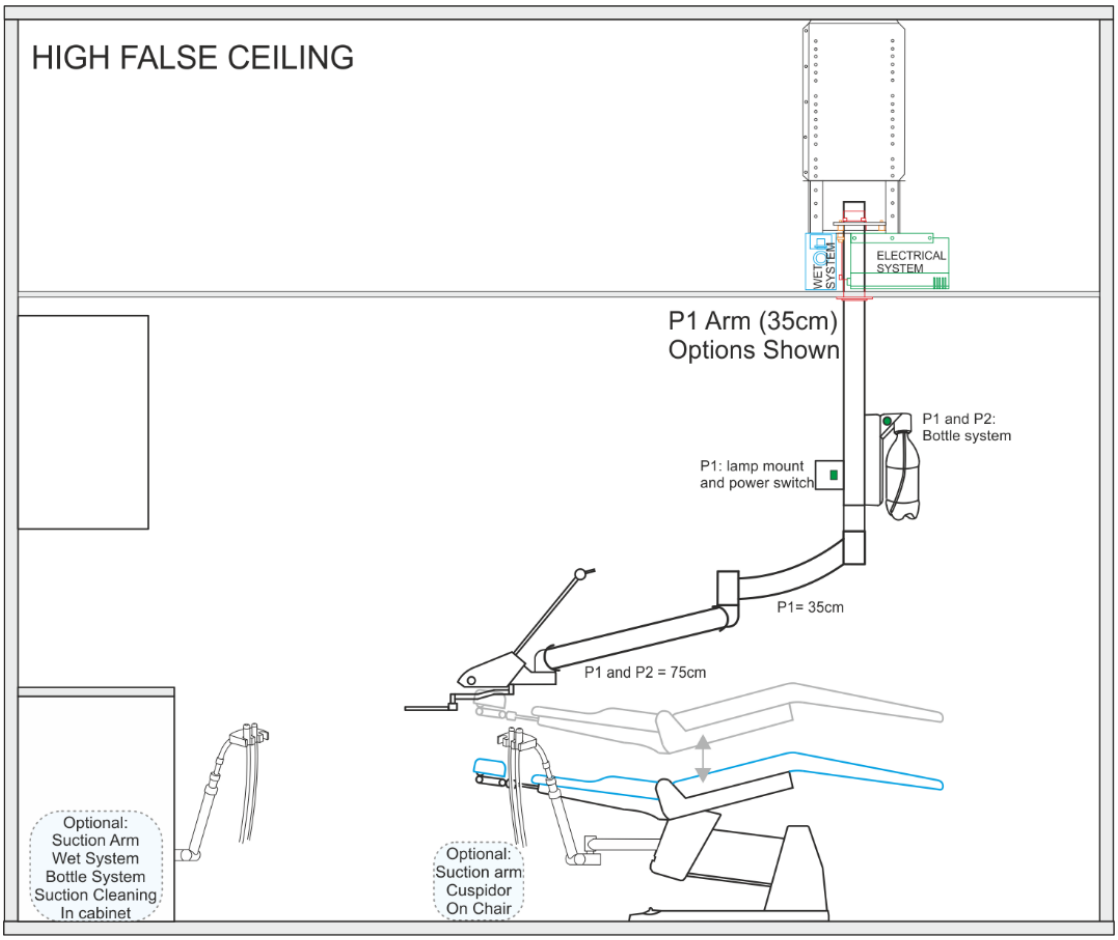
5.2 Ceiling and Unit Types

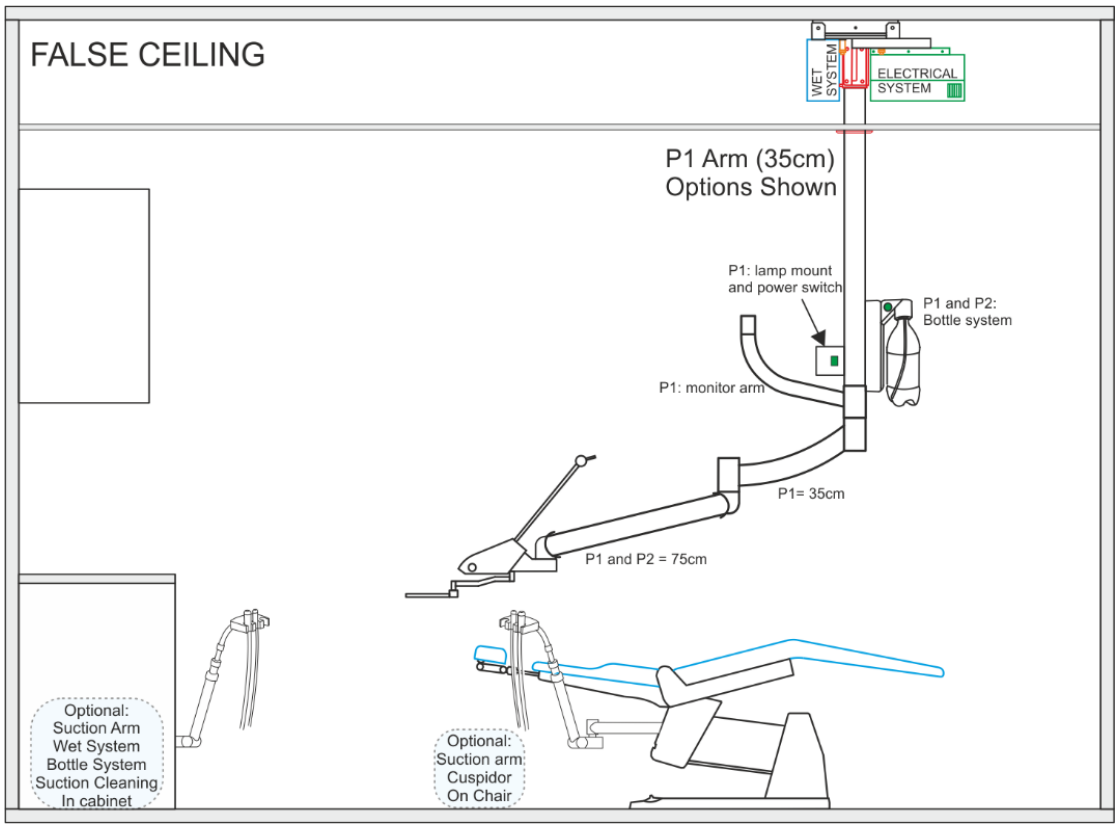
Normal units have no interior place to install the electrical system and mounting plates.

The P2 model horizontal arm is 60cm long.



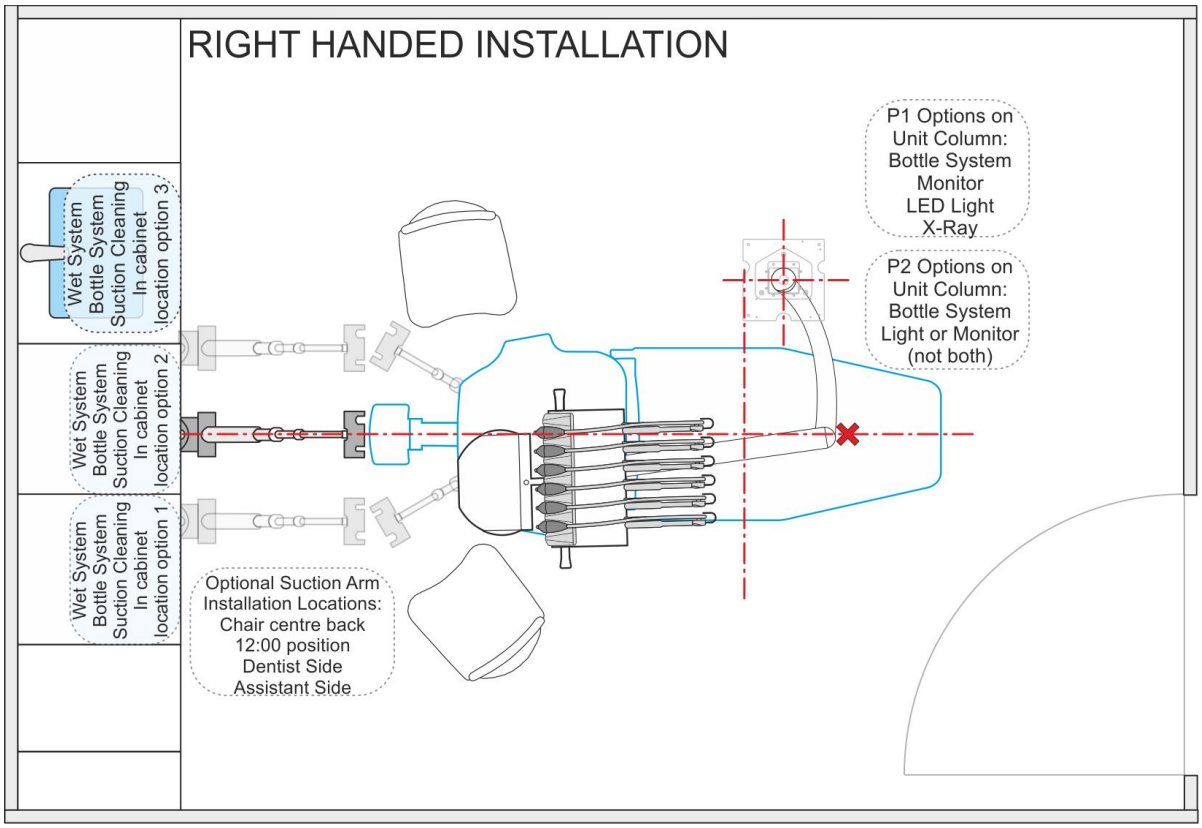
False ceilings are also called: hung ceilings / inner ceilings.
The P1 unit has a horizontal arm of 35cm.

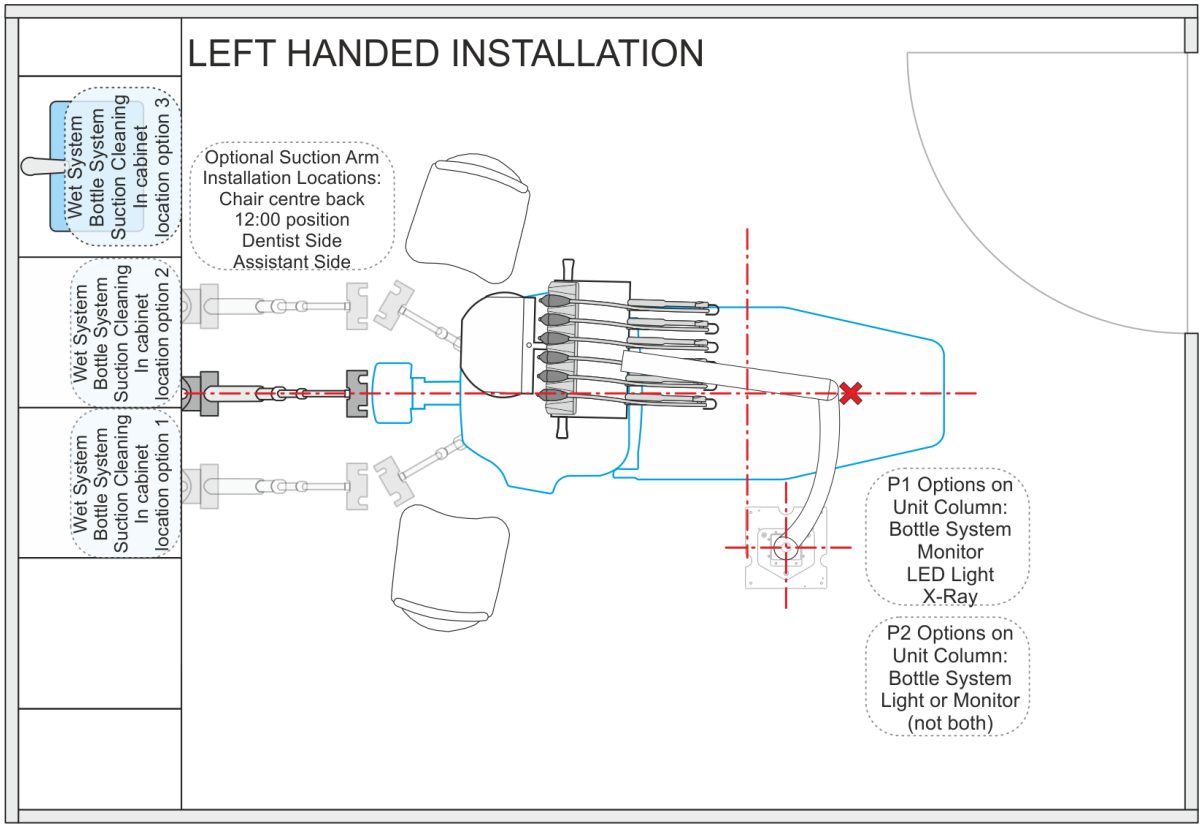




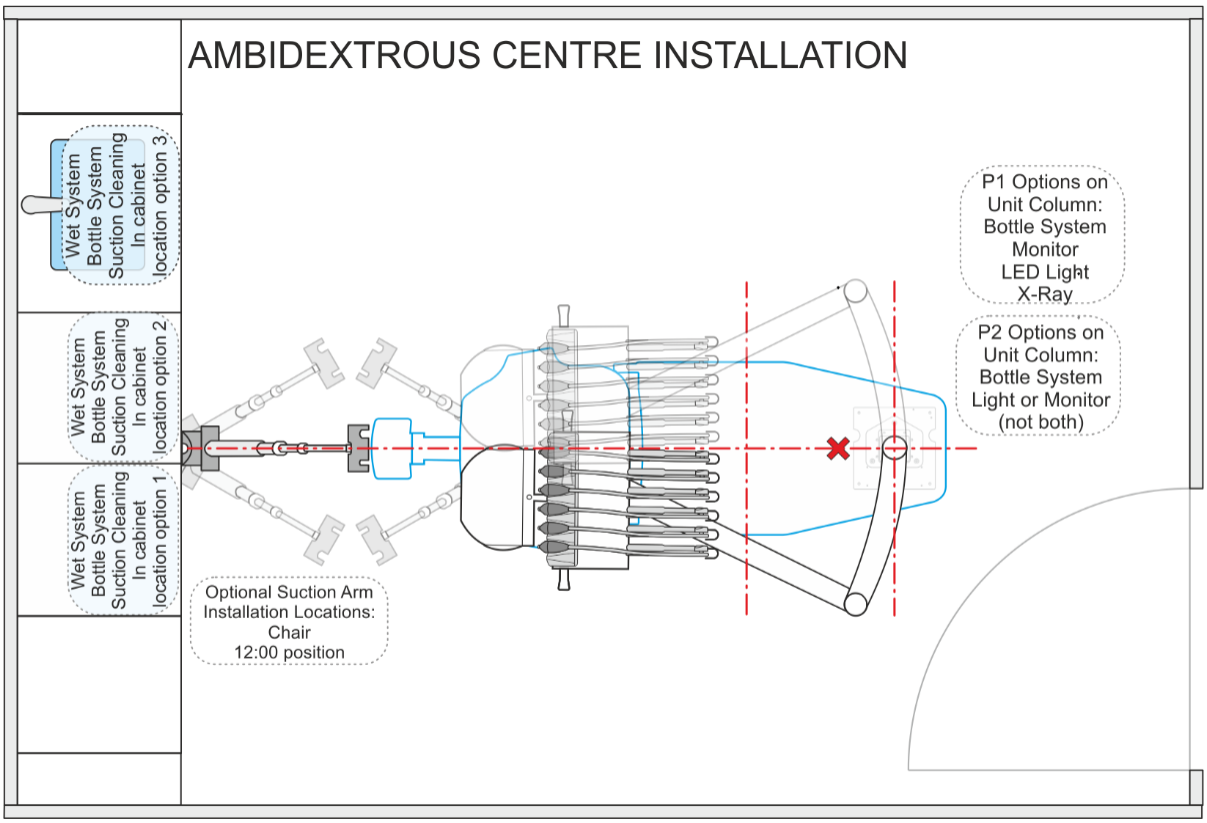
5.3 Room Layouts

Some options can be installed in several locations. A chair mounted suction arm can rotate left or right.
X marks the location of the suction hose access under the chair when the suction arm is chair mounted.





An ambidextrous centre installation is always custom – contact Finndent for details.



Only the standard P1 and P2 units will be covered in this manual.

For custom solutions and centre installation, contact Finndent.

5.4 Room Dimensions

Note: Faro lamp arms are available in different lengths from 750mm – 960mm, depending on the lamp model. The most common two lengths are used here.

In general:

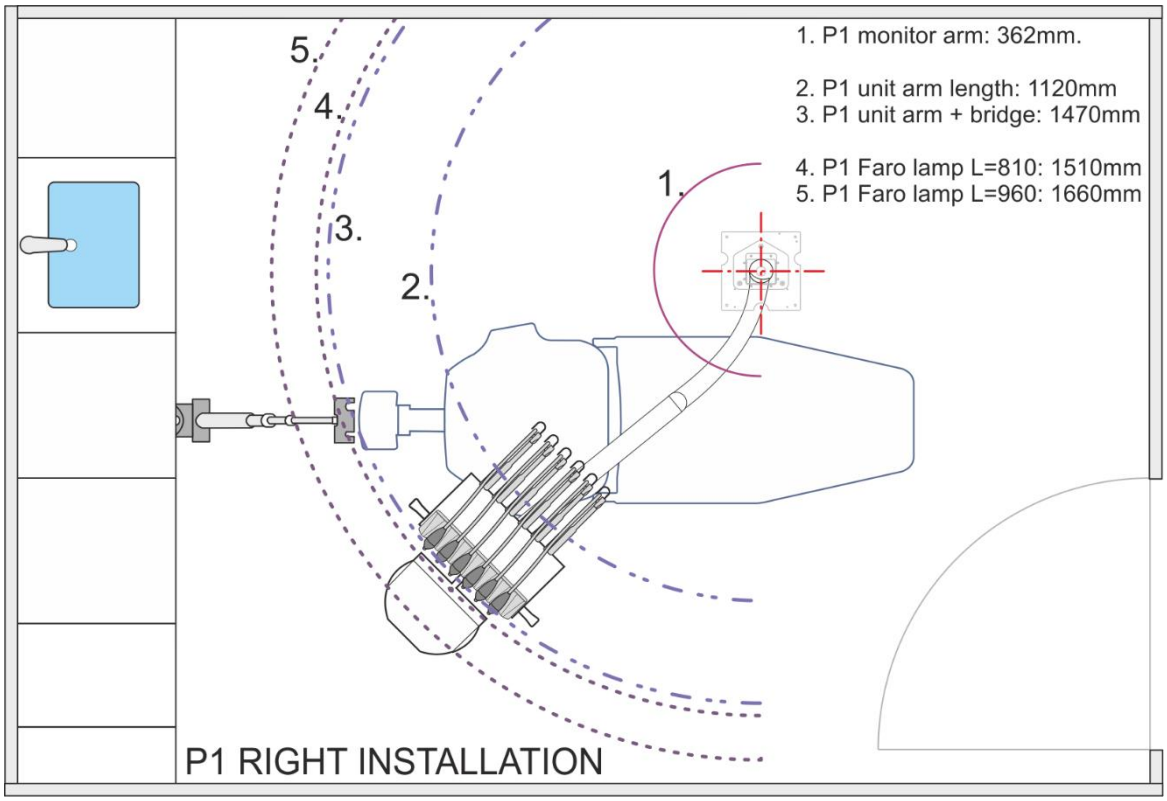
- the Faro lamp should extend to the tip of the headrest
- the instrument bridge should extend to halfway up the headrest
- arms can have 0, 1 or 2 joints.
- lengths are measured from the centre of the vertical column.

5.4.1 P1 Arm Lengths

P1 monitor arm is 362mm.

P1 unit arm length is 750mm + 370mm = 1120mm
P1 unit arm + bridge is 1120mm + 350mm = 1470mm

Shortest Faro lamp arm is 700mm + 810mm = 1510mm
Longest Faro 960mm lamp arm is 700mm + 960mm = 1660mm

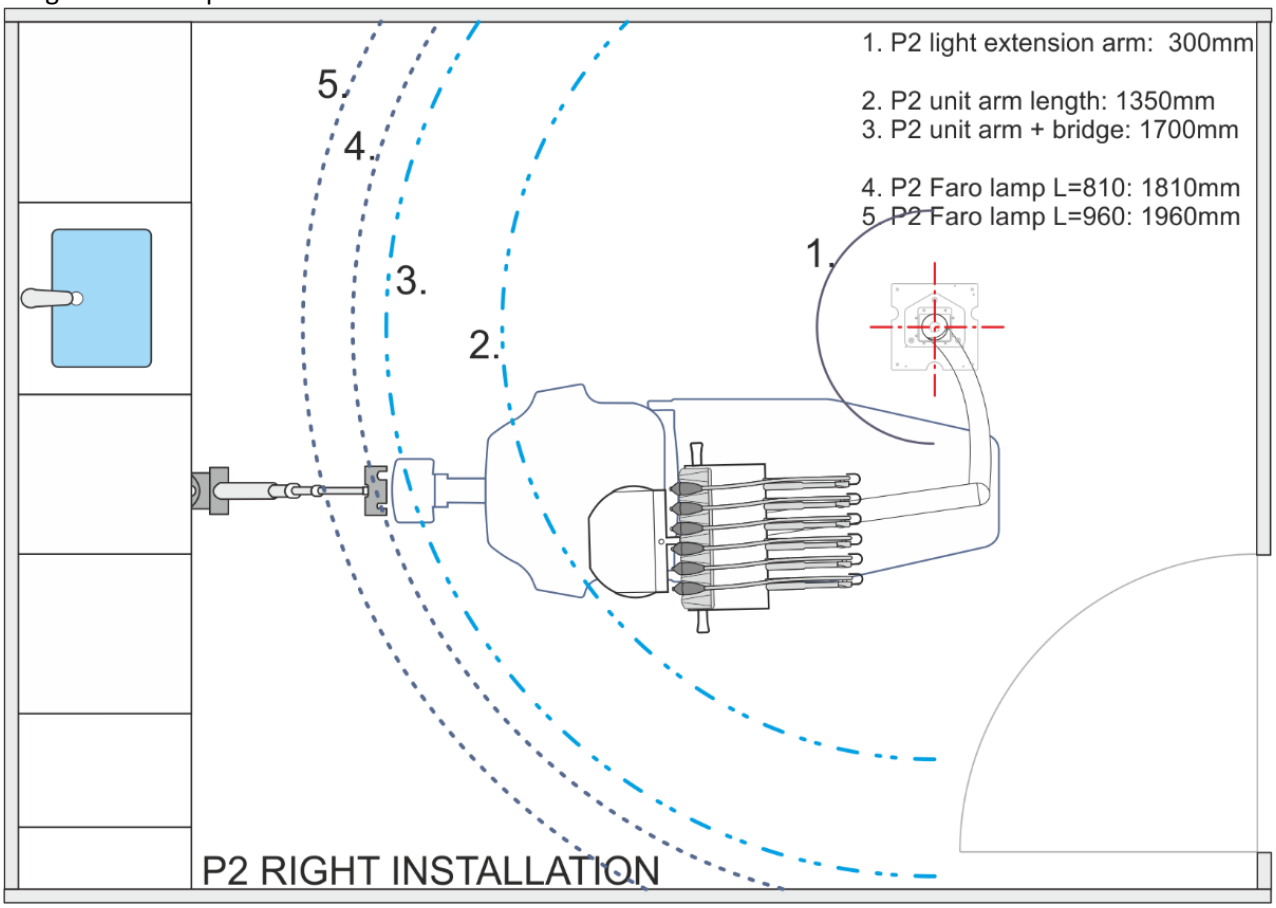


5.4.2 P2 Arm Lengths

P2 light extension arm is 300mm.

P2 unit arm length is 750mm + 600mm = 1350mm.
P2 unit arm + bridge is 1350mm + 350mm = 1700mm

Shortest Faro lamp arm is 300mm + 700mm + 810mm = 1810mm
Longest Faro lamp arm is 300mm + 700mm + 960mm = 1960mm



5.4.3 Unit and Chair Position

Horizontal Distances (recommended):

From headrest to cabinets is 700mm.
From vertical column to headrest is 1500mm.

Other distances:

Cable length inside the chair is 1500mm.
Electrical Box to Vertical Column Distance (ESVC) will depend on ceiling height and arm type.
Wet System Box to Unit Distance (WSBU) will depend on installation locations.

Maximum distance between any two parts 7000mm

5.4.4 Vertical Height of Column

The vertical column height is calculated using:

- The unit model (P1 or P2)
- Ceiling height (floor to concrete ceiling)
- Optional monitor and lamp arms
- Optional X-Ray (contact Finndent)

Vertical Heights:

Standard ceiling height is 2600mm
Standard false ceiling depth is 400mm
Standard distance from floor to the bottom of vertical column is 1600mm.
Standard vertical column height (SVCH) is 1500mm.

Maximum vertical column height (MVCH) is 2000mm.

P1 CEILING HEIGHT - 1500 – (optional monitor arm height 100mm)

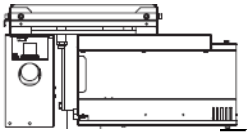
P2 CEILING HEIGHT – 1570 – (optional light arm height 100mm)

6 CEILING UNIT DESCRIPTION

6.1 FD-8000P Dental Unit

The ceiling mounted dental units may be mounted to the right or left side of the patient chair, or mounted directly above for ambidextrous working environments. They have the same instrument bridge as the floor units and accessories are fitting to the vertical arm connected to the ceiling. A bottle for water line disinfection is also attached to this adapter. The suction system and cuspidor are optional and installed separately from the unit. Suction may be installed from the dentist's cabinet or as a chair mounted system.

Control units (electronic plates, transformer etc.) and the wet system for the dental unit are installed between the concrete ceiling and the suspended ceiling of the clinic room. An installation box of white painted sheet metal is also available.

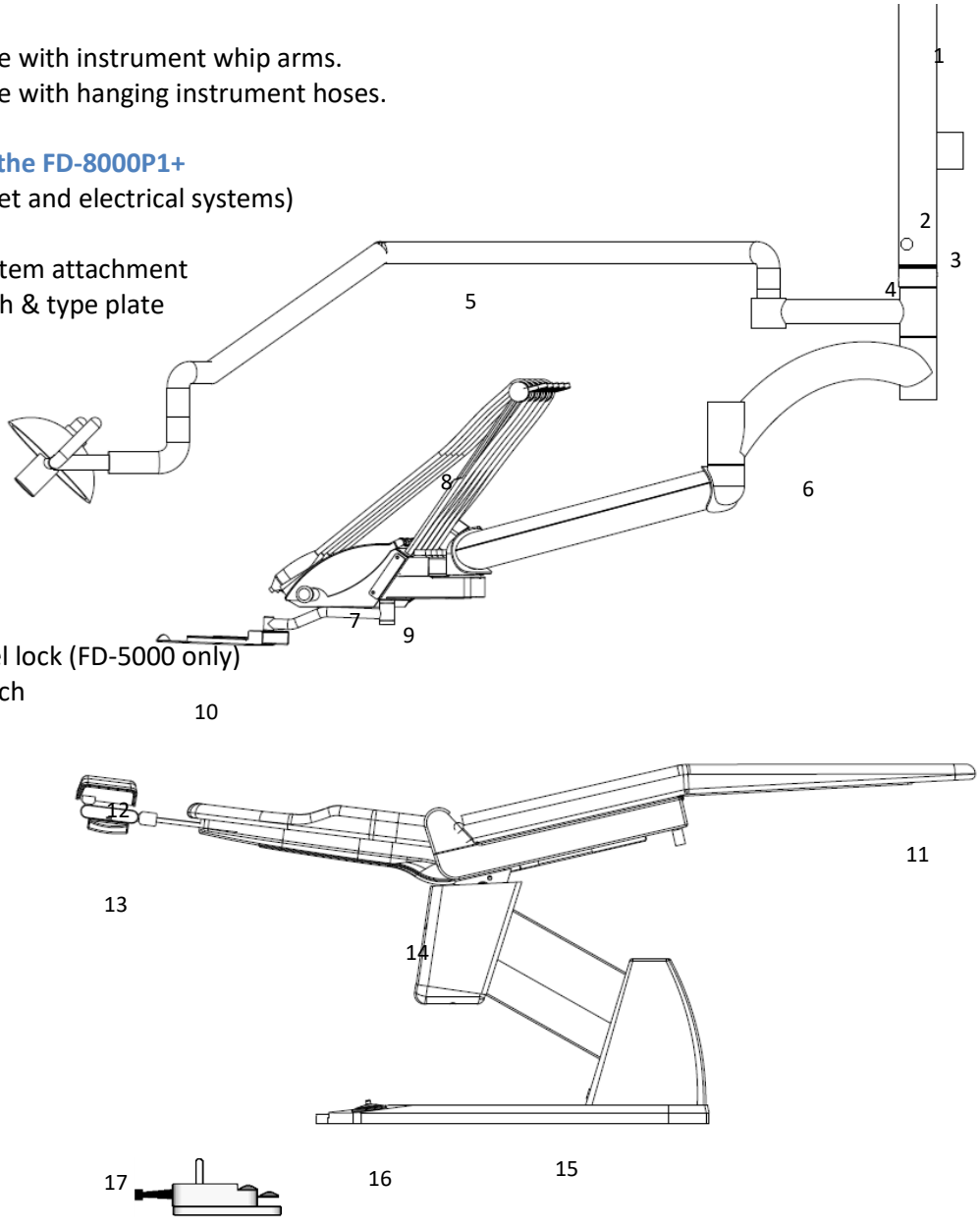


FD-8000P+ configurations come with 5 or 6 possible instrument places and an integrated instrument cleaning system. Available in whip arm or hanging hose versions.

FD-8000P1+ units come with instrument whip arms.
FD-8000P2+ units come with hanging instrument hoses.

6.1.1 Main Parts of the FD-8000P1+

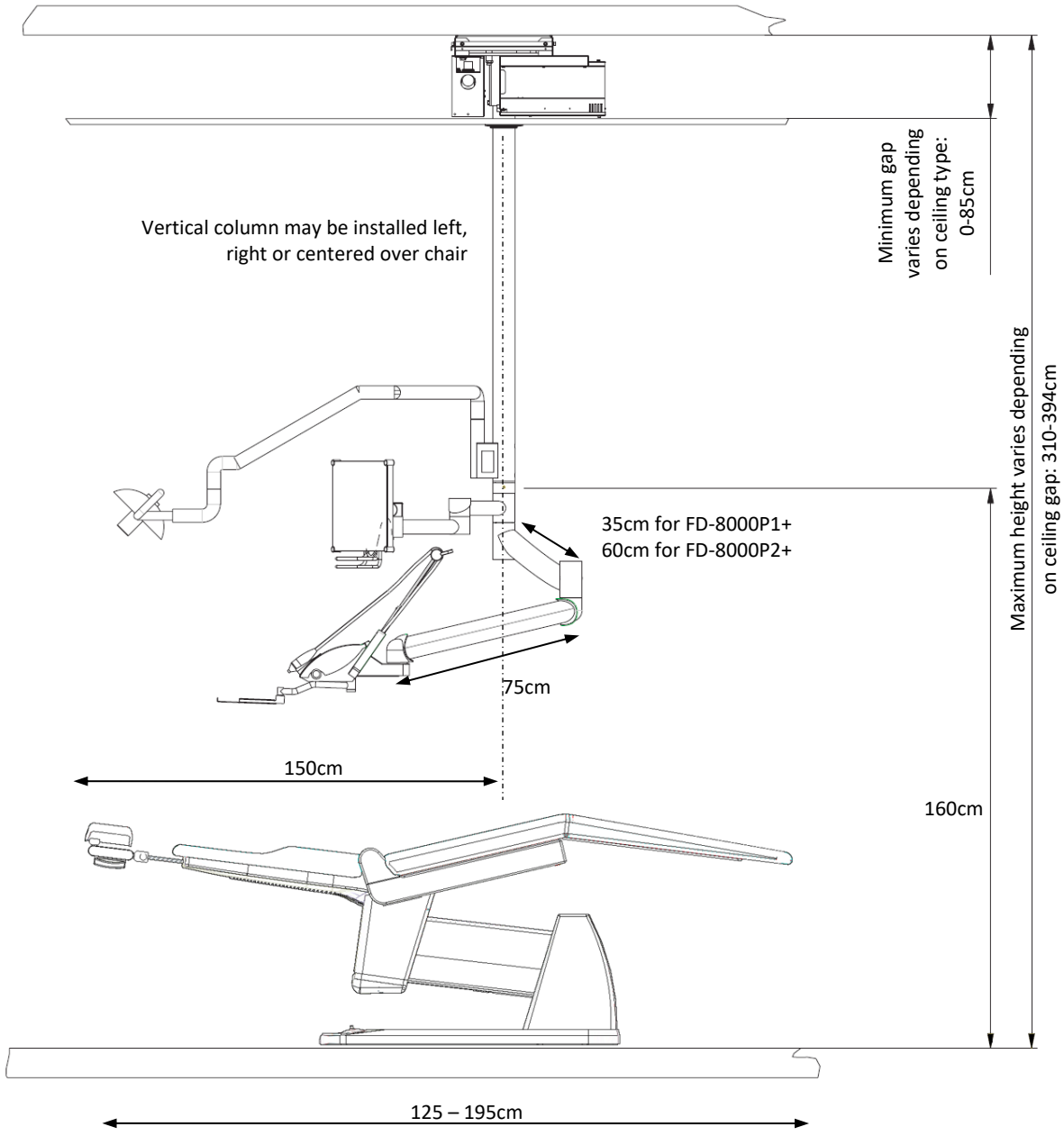
1. Installation box (wet and electrical systems)
2. Vertical column
3. Bottle cleaning system attachment
4. Unit ON/OFF switch & type plate
5. Dental light
6. Instrument arm
7. Instrument bridge
8. Whip arms
9. Control panel
10. Instrument tray
11. Foot rest
12. Neck rest
13. Neck rest lock
14. Patient chair swivel lock (FD-5000 only)
15. Chair ON/OFF switch
16. Chair foot control
17. Unit foot pedal



6.2 FD-8000P Dimensions

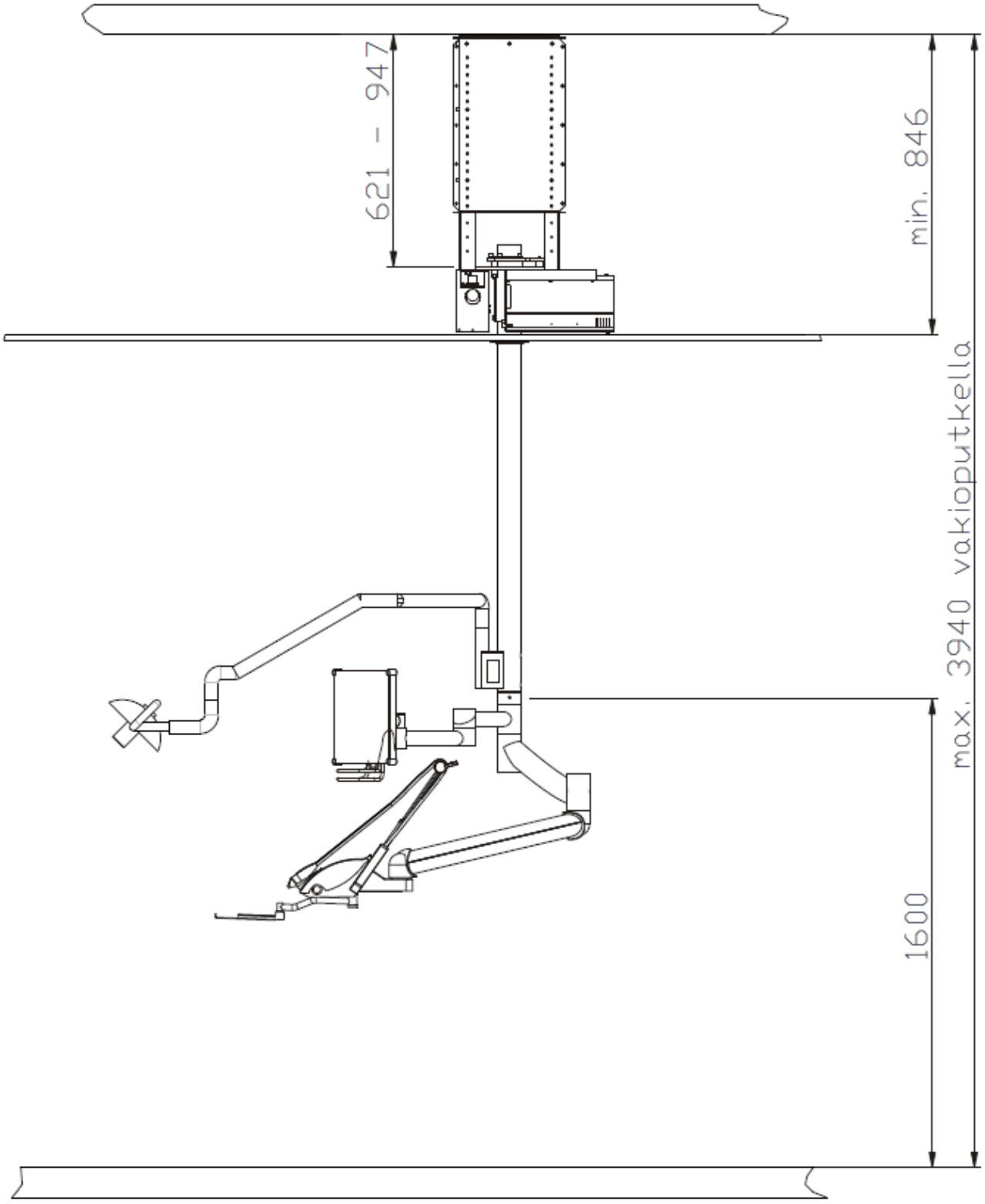
FD-8000P1 with dental light, monitor and in-ceiling installation. Installation may vary depending on the clinic.

Typical installation in ceiling:

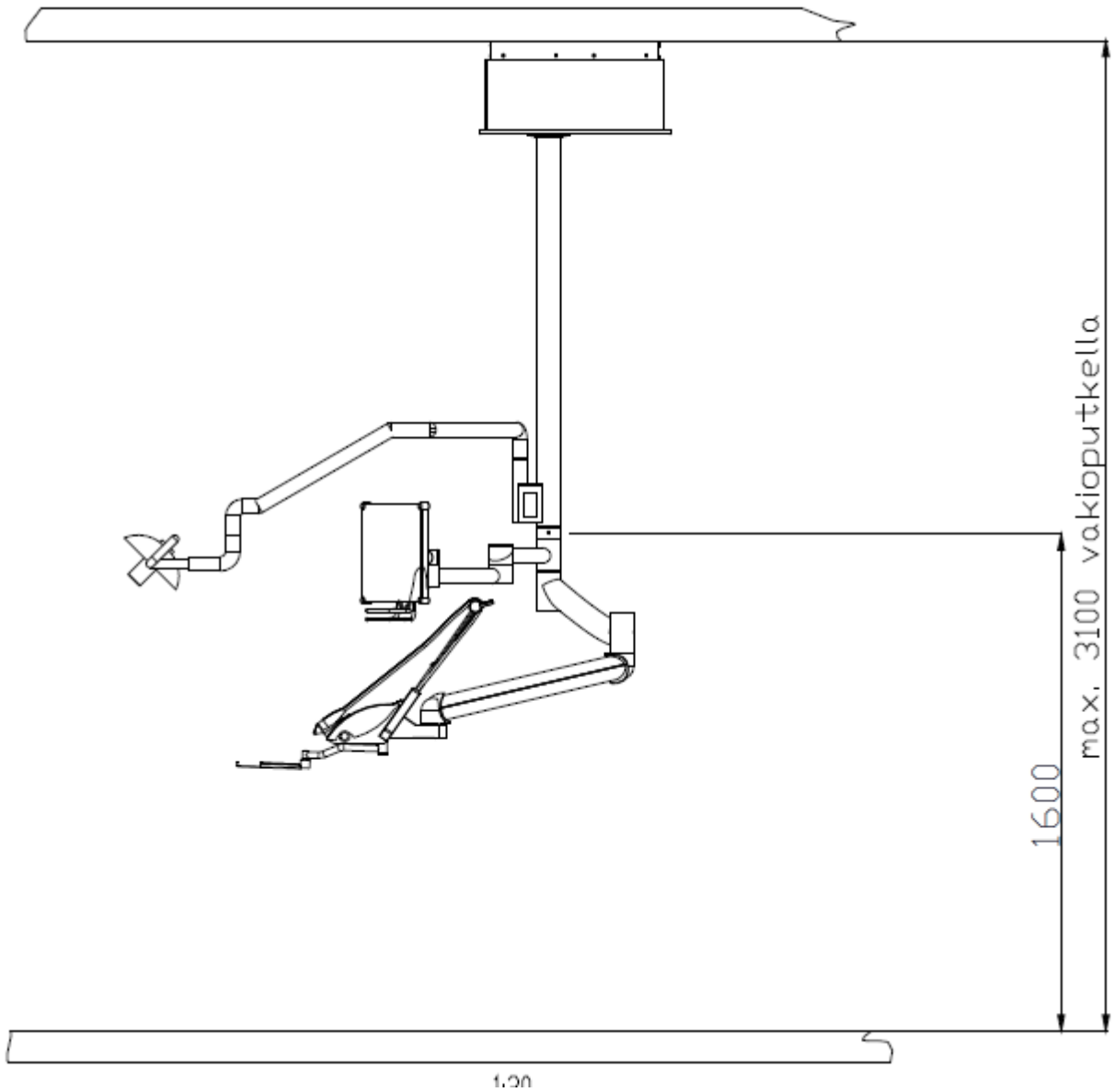


Chair length is 125cm in the sitting position and 195cm with the headrest full extended in the flat position. Typical working length is 185cm.

High ceiling installation:



Surface mounted on ceiling:



6.3 FD-3600 Patient Chair

This patient chair is built on a zinc-galvanized steel base and is covered with powder-coated PUR plastic parts. The head rest both tilts and extends in and out to fit the patient. The chair has fixed armrests attached to the back of the chair. The base of the chair has a dock for the foot control. Two chair foot controls are located on either side of the chair base.

1. Head rest
2. Back rest
3. Seat
4. Leg rest / Foot rest
5. Plastic cover
6. Type plate under foot rest
7. Base
8. Main power switch
9. Foot control
10. Lift mechanism
11. Frame cover
12. Swivel lock (FD-5000 only)
13. Arm rest
14. Programming button

A telescopic suction arm may be mounted on the back centre of the chair.

6.4 FD-5000 Patient Chair

This chair is built on a zinc-galvanized steel body with a molded and wet-painted aluminum backrest and seat. The head rest both tilts and extends in and out to fit the patient. The seat has a 25% rotation that makes it easier for patients to be seated and leave the chair. Two chair foot controls are located on either side of the chair base.

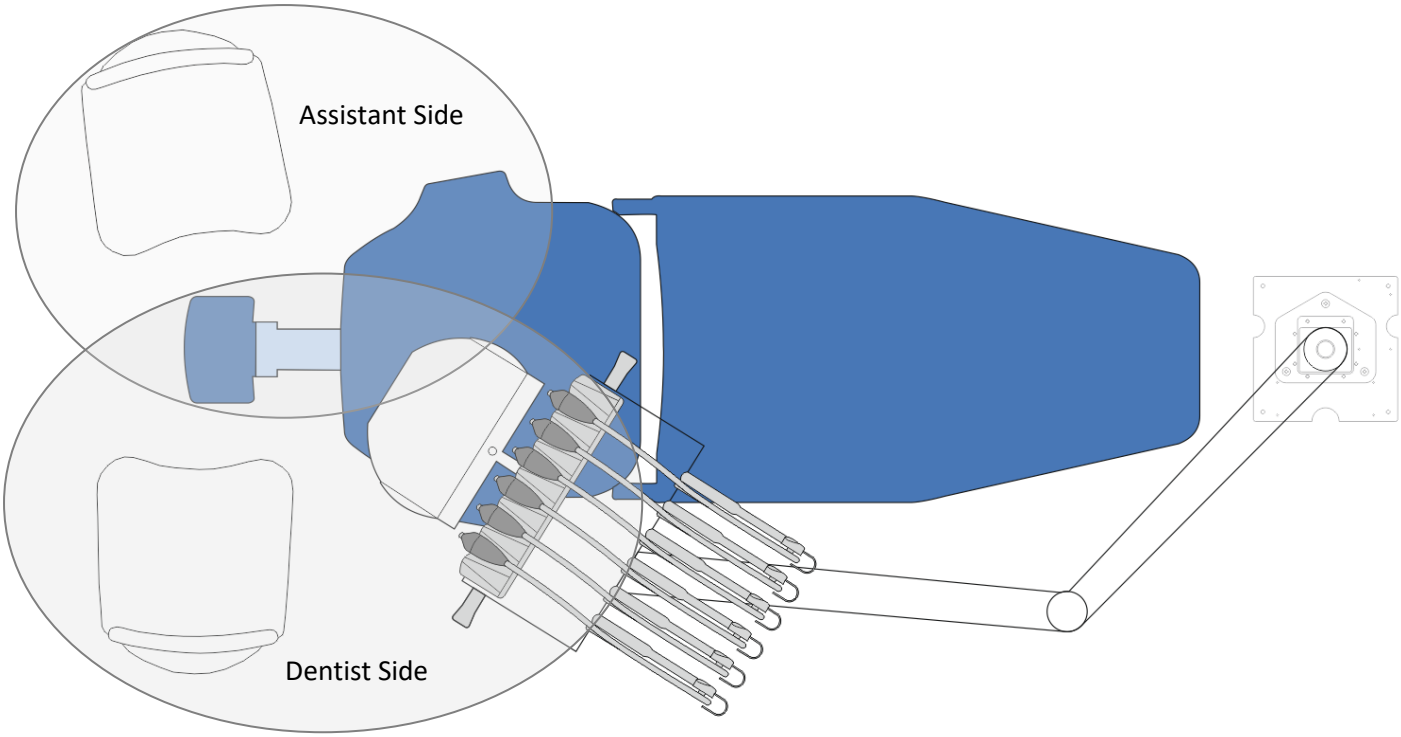
This chair may be delivered with fixed armrests or with movable armrests. When delivered without armrests, there is an option to have a broader backrest.

A suction arm may be mounted on the back centre of the chair.

6.5 Operator Positions

The following is one suggestion for the dentist and assistant during treatment (the actual positions may vary depending on working style and treatment). The patient must always be correctly positioned in the patient chair during treatment.

The positons can be reversed for left-handed dentistry.



7 CEILING UNIT CLINIC PHOTOS

Ceiling unit installed in the centre of the chair for left and right handed dentists, or 4-handed dentistry.

Chair mounted suction system also for left or right handed dentists, or for 4-handed dentistry.

Ceiling unit with lamp installed in the centre of the chair for left and right handed dentists, or 4-handed dentistry.

Cabinet mounted suction system extends outward. For left or right handed dentists, or for 4-handed dentistry.

Ceiling unit system is installed below the ceiling surface in an installation box.

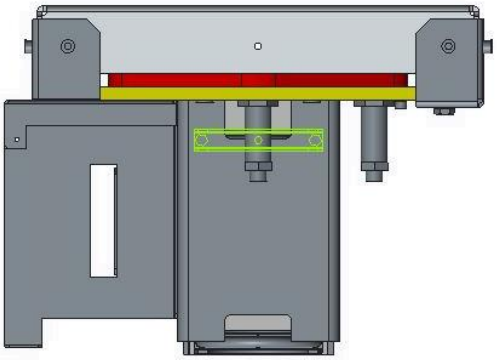
Ceiling unit installed in the centre of the chair for left and right handed dentists, or 4-handed dentistry.

Chair mounted suction system also for left or right handed dentists, or for 4-handed dentistry.

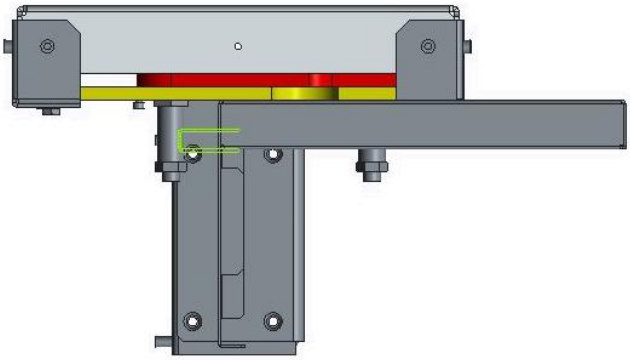
Ceiling unit system is installed inside the ceiling.

8 DIMENSIONS AND DRAWINGS

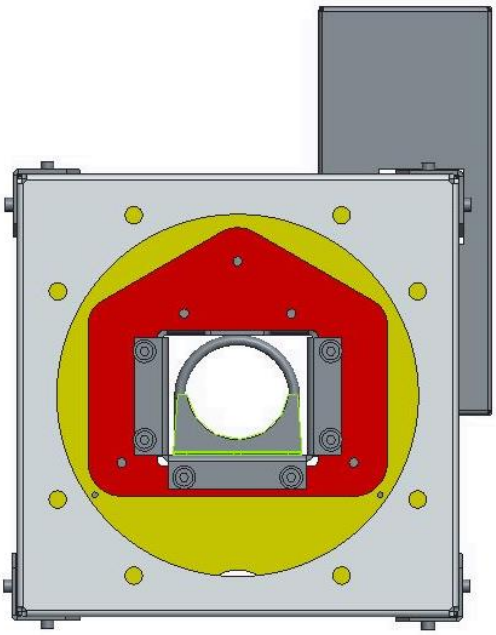
8.1 Ceiling Mount Mechanism



Side 1



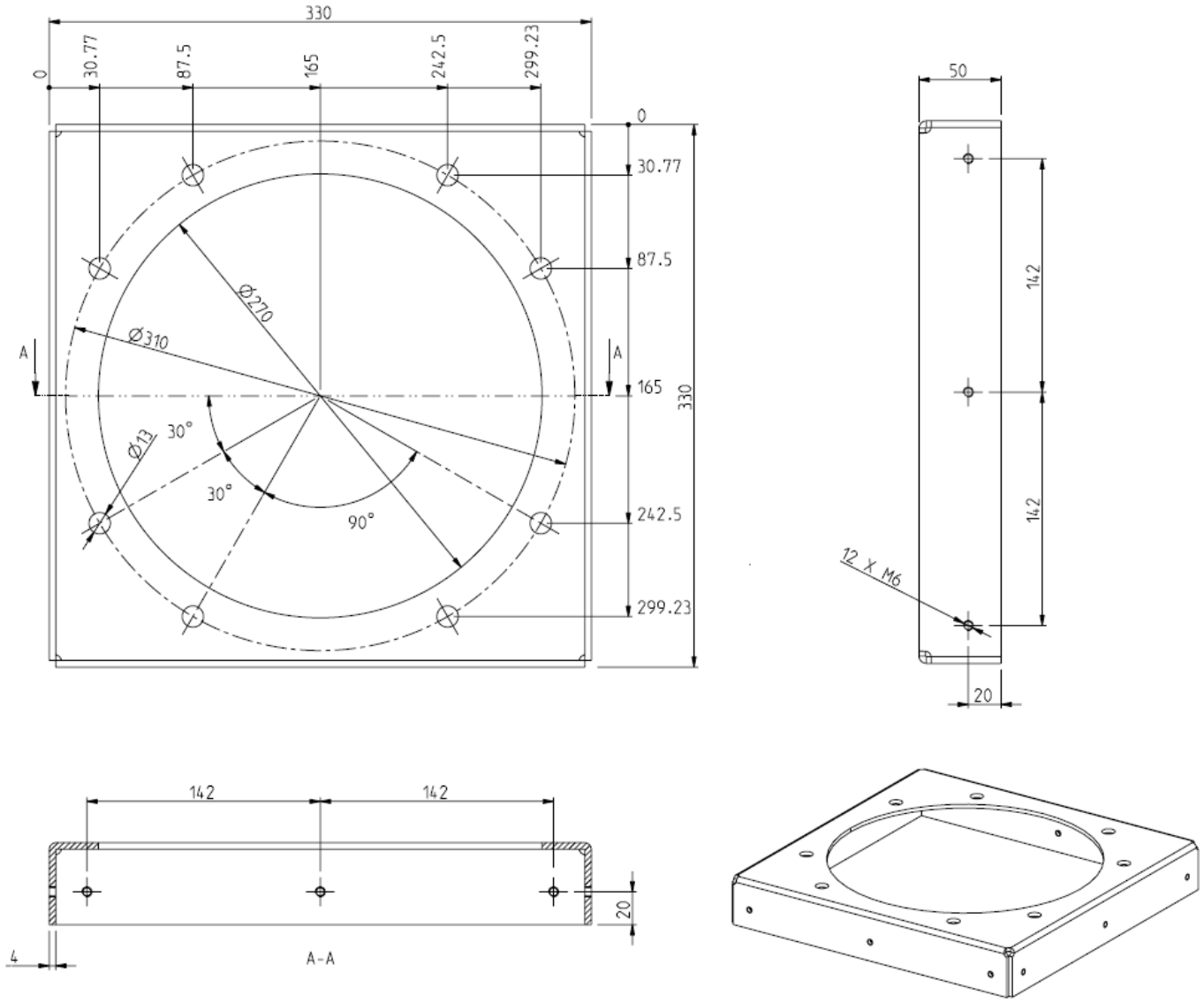
Side 2



Top view

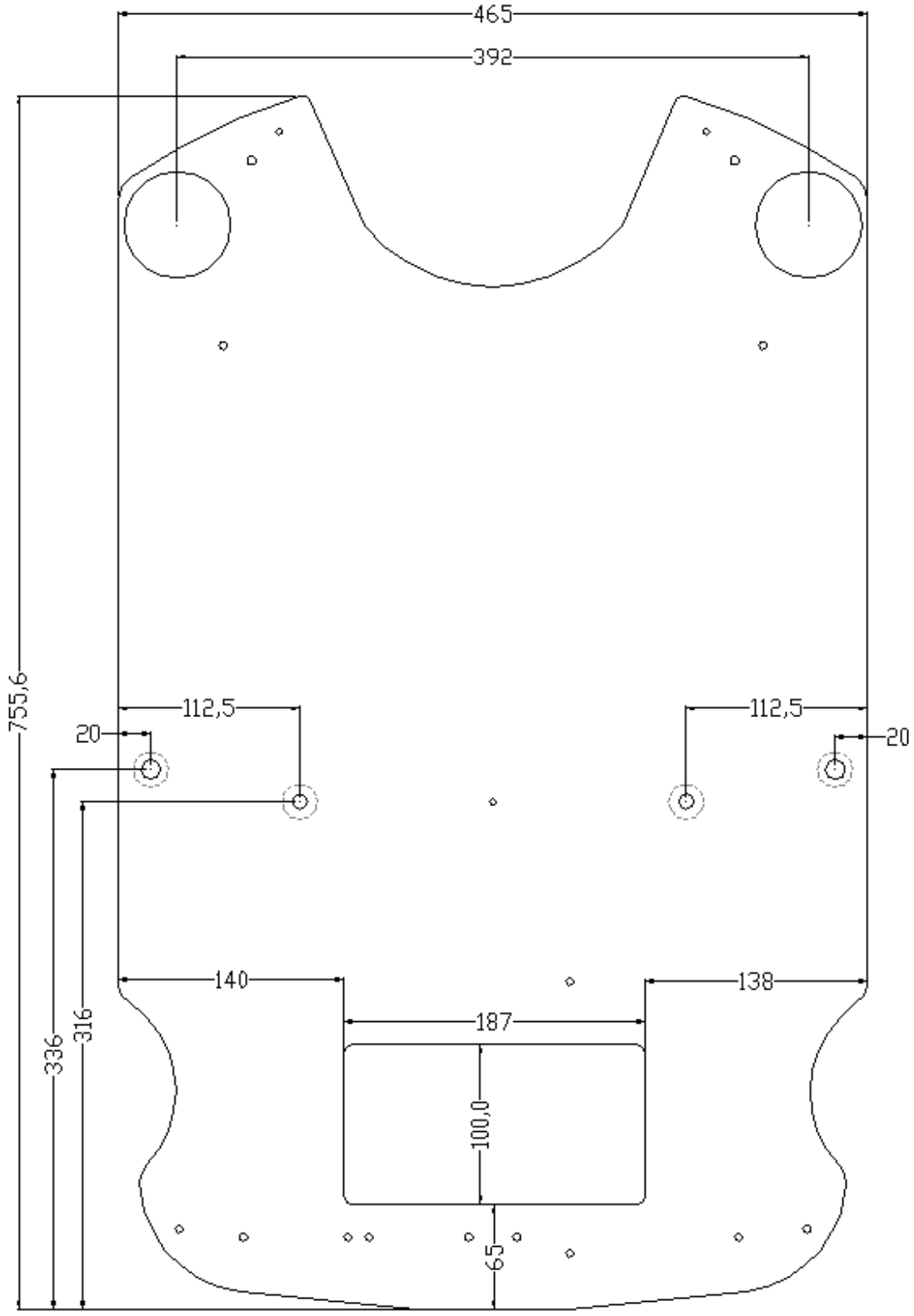
8.2 Ceiling Unit Mounting Plate

Drawing not to scale.
Mounting place P/N: 6402200C



8.3 Patient Chair Base

Drawing not to scale.
Base plate P/N: 6406800F


465
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755,6
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336
316
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65