New as of: 09.2011

sirona
The Dental Company

TENEO

Installation Requirements

English

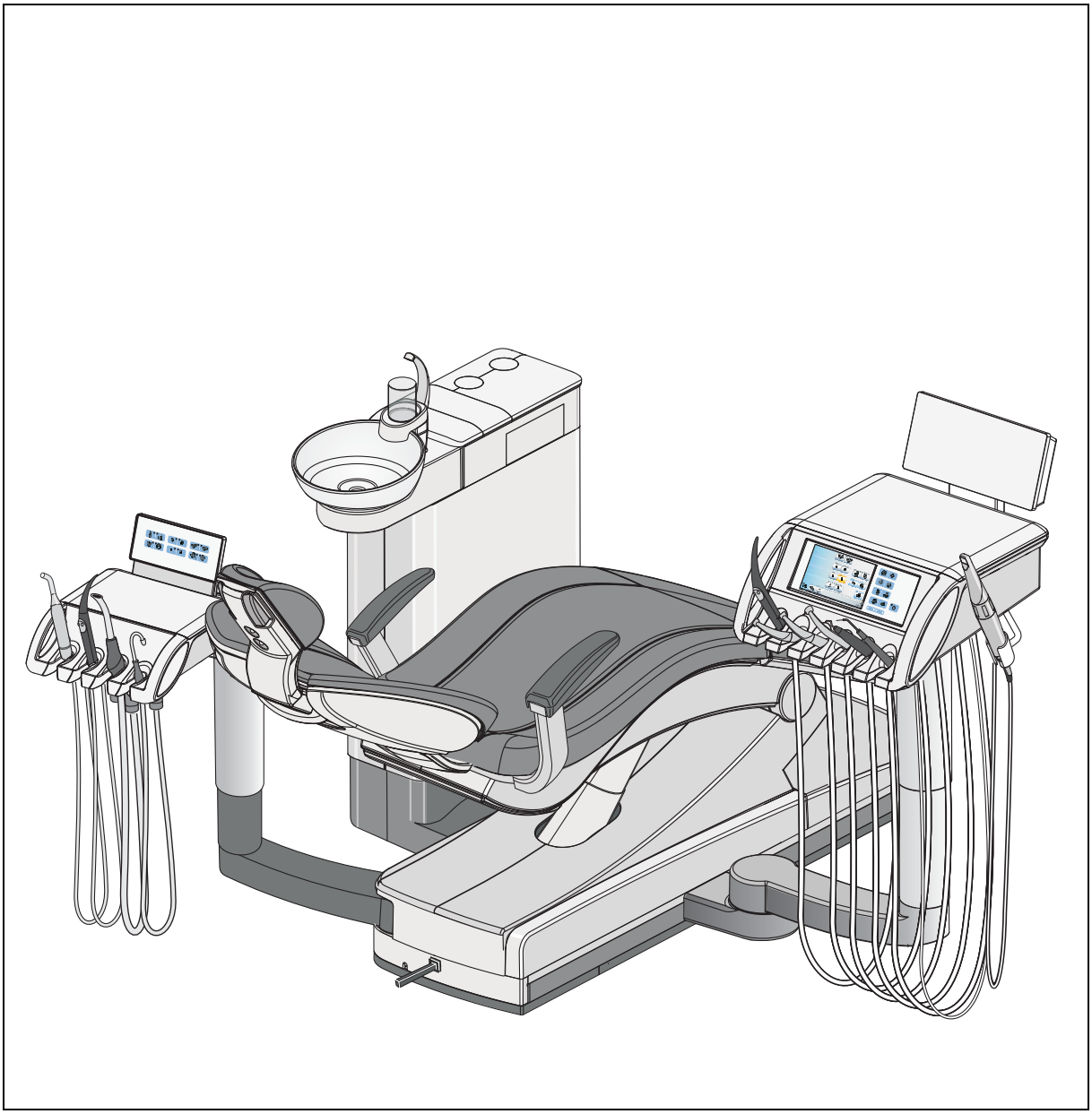


Table of contents

1 General information

1.1 Notes on the installation prerequisites

This document describes the installation prerequisites for the TENEO treatment center.

It contains the following information:

- Required information for practice planning.
- Information for the installer, such as how to implement the connections for air, water, waste water, suction air and the power supply.
- Information on the cabling of the PCs to be connected.
- Information about electromagnetic compatibility and the prerequisites for setting up the treatment center.
- A checklist to ensure that all installation requirements have been fulfilled.

The subsequent installation of the treatment center is described in the installation instructions (REF 61 93 689).

You will also need the drilling template (REF 61 94 000) for the safe and secure attachment of the treatment center to the floor.

1.2 Change history

Changed in version 2 Chapter: Mounting plates

Changed in version 3 Chapter: Dimensions, template for practice planning, technical data

Changed in version 4 Chapter: Dimensions, technical data, accessories

Changed in version 5 Chapter: Technical data

Changed in version 6 Chapter: Accessories

Changed in version 7 Chapter: Checklist

Changed in version 8 Chapter: Subfloor, floor, adapter plates, SIROLUX FANTASTIC not applicable, HDMI cable instead of XGA cable

1.3 Identification of danger levels

To prevent personal injury and material damage, please observe the warning and safety information provided in this document. Such information is highlighted as follows:

⚠ DANGER

Danger to life and limb

For an imminent danger that could result in bodily injury or death.

⚠ WARNING

Warning of bodily injury

For an possible danger that could result in light to serious bodily injury or death.

⚠ CAUTION

Caution against damage

For a possibly harmful situation which could lead to damage of the product or an object in its environment.

NOTICE

Information to make work easier

For application information and other useful information.

2 Safety information

2.1 Installation by qualified personnel

The installation of the supply connections must be carried out only by qualified personnel.

⚠ WARNING

Professional installation

Comply with the national regulations for electrical installations (e.g. VDE 0100, VDE 0100, Part 710).

Comply with the national regulations for water supply installations (e.g. EN 1717, DIN 1988) and sewage installations (e.g. EN 12056-1).

For suction lines: adhere to the specifications in the installation instructions for "Suction machines".

2.2 Cellular phones

Portable and mobile RF communications equipment may interfere with medical electrical equipment. Therefore, the use of mobile wireless phones in medical office or hospital environments must be prohibited.

2.3 Modifications and extensions of the system

Modifications to this system which might affect the safety of the system owner, patients or other persons are prohibited by law.

For reasons of product safety, this product may be operated only with original Sirona accessories or third-party accessories expressly approved by Sirona. The user assumes the risk of using non-approved accessories.

If any devices not approved by Sirona are connected, they must comply with the applicable standards, e.g.:

- IEC 60950 for information technology equipment (e.g. PC) and
- IEC 60601-1 for medical electrical equipment.

The treatment center monitor must fulfill the requirements of IEC 60950

The loudspeaker port of the monitor may be connected only to a device that complies with IEC 60950 (e.g. a PC) or
IEC 60601-1. Under no circumstances may it be connected to a stereo system, etc.

If a system is created during the installation process, the requirements of IEC 60601-1-1 must be fulfilled. The manufacturer of the system is responsible for its compliance with Directive 93/42/EEC.

2.4 Power connection

⚠ WARNING

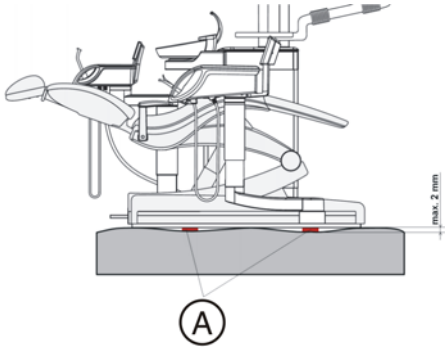
Shock hazard

It is essential that you switch off the power supply PRIOR TO beginning the installation. There is a risk of electric shock. People can be injured or electrical components of the unit destroyed.

3 On-site installation

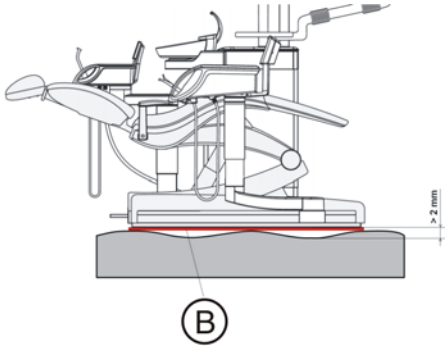
3.1 Substrate, floor

Unevenness



The floor must be level and horizontal in accordance with DIN 18 202.

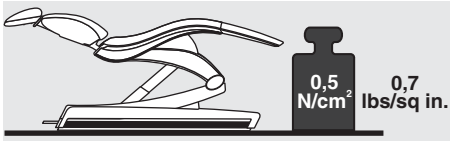
The shimming plates (A) in the accessory pack can be used for evennesses of up to 2 mm.



If the unevenness of the floor exceeds 2 mm over the total length of the chair base (approx. 1300 mm), the steel adapter plate (B) must be used; see Mounting plates [→ 24].

3.1.1 Pressure load

Load capacity:



The minimum load-bearing capacity of the floor must be 0.5 N/cm^2 (corresponds to around 500 kg/m^2).

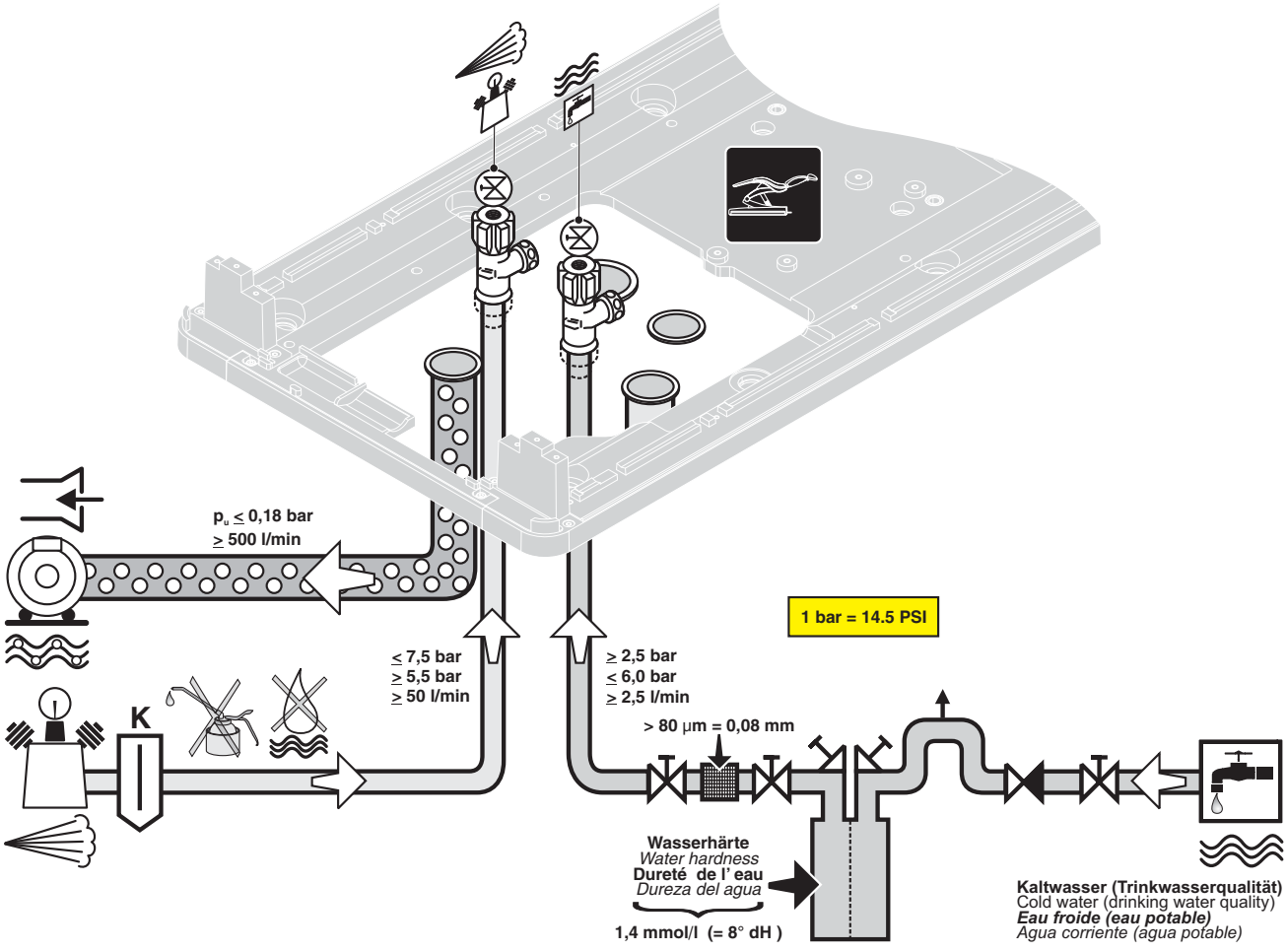
3.2 Connection to the public drinking water system

Provided it is equipped with a disinfection system, the treatment center provides free discharge in the water supply (isolating distance 20 mm). This isolates the public drinking water system from the water supplies following free discharge. The requirements of EN 1717 are thereby fulfilled.

The treatment center meets the requirements of the DVGW (German Gas and Water Association).
It is intrinsically safe in accordance with worksheet W540 and therefore fulfills the requirements of W270 and KTW (plastics in waterways). The German Gas and Water Association (DVGW) approval can be viewed on a label next to the rating plate.

Please always adhere to the national requirements with regard to connecting treatment centers to the public drinking water system.

3.3 Media quality



	Suction machine
	Compressed air (oil-free) The compressor must draw in hygienically faultless air.
	Cold water (drinking water quality)
K	Steam trap

Water quality

Lime deposits and corrosion residues in tap water can lead to the following malfunctions:

- Premature clogging of the filters in the unit
- Rapid clogging of the fine water paths and jets in the treatment instruments

For these reasons, the following points must be observed:

- Permitted water pressure: 2.5 bar (36.25 psi) to 6 bar (87 psi)
- Permitted minimum flow volume: 3 l/min
- For water hardness (total hardness) of 2.2 mmol/l (= 12° dH), install water softeners.
  Set the blend hardness to 1.4 mmol/l (= 8° dH).
- Install a conventional fine filter; fineness: > 80 µm (0.08 mm).
- Installation must be performed in compliance with the recommendations of the national installation requirements (e.g. EN 1717/DIN 1988).
- The water quality must comply with the national requirements for drinking water.
- The connection must be made to cold water.
- When laying the water pipe to the treatment center, comply with the following instructions to reduce the quantity of micro-organisms in the feed pipe:
  - Avoid long stub lines to the treatment center.
  - Carry out the installation so that other main consumers (e.g. sink) are fed from the same line.
  - Avoid laying the supply line parallel to hot water pipes.
- Please observe EN 1717 regarding protection of the public drinking water system:
  - Treatment center with disinfection system:
    The treatment center fulfills the requirements of EN 1717 and the German Gas and Water Association (DVGW). It is intrinsically safe in accordance with worksheet W540. It can be connected directly to the public drinking water system.

Air quality

The air for driving the turbines, for cooling the drives and for the cooling spray must be free from oil, dry and hygienically faultless.

Install a steam trap **K**.

- Permissible air pressure: 5.5 bar (80 psi to 7.5 bar (109 psi)
- Permissible minimum flow rate: 50 l/min

Suction pipe

With a vacuum of p_u > 0.18 bar back pressure, the treatment center must be retrofitted with the "Vacuum limiter" retrofit kit (REF 59 68 826).

- Minimum suction power: 500 l/min
- Maximum vacuum: 0.18 bar (2.6 psi)

3.4 Above-floor installation of supply lines

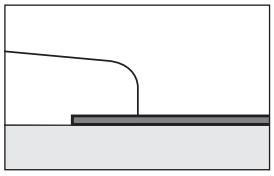
The supply lines can be installed above the floor (above-floor installation) or through the floor (underfloor installation).

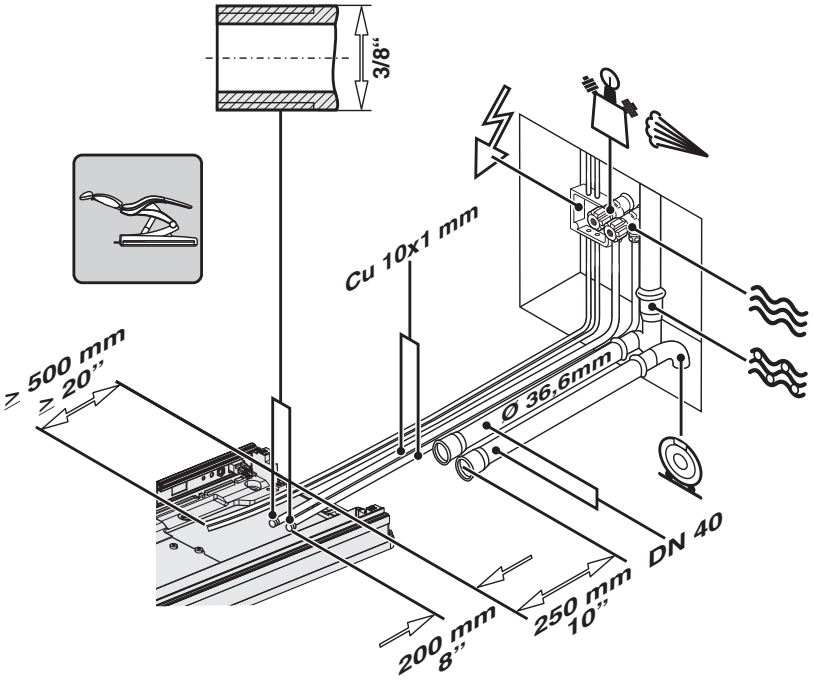
For the installation of the supply lines through the floor, see "Underfloor installation of supply lines" [→ 14].

✓ The retrofit kit "Above-floor installation" (Order No.: 62 05 004) is required for the connection.

➢ Lay the ends of the supply pipes, corner valves and lines as shown in the illustration.

↳ The supply lines are laid.



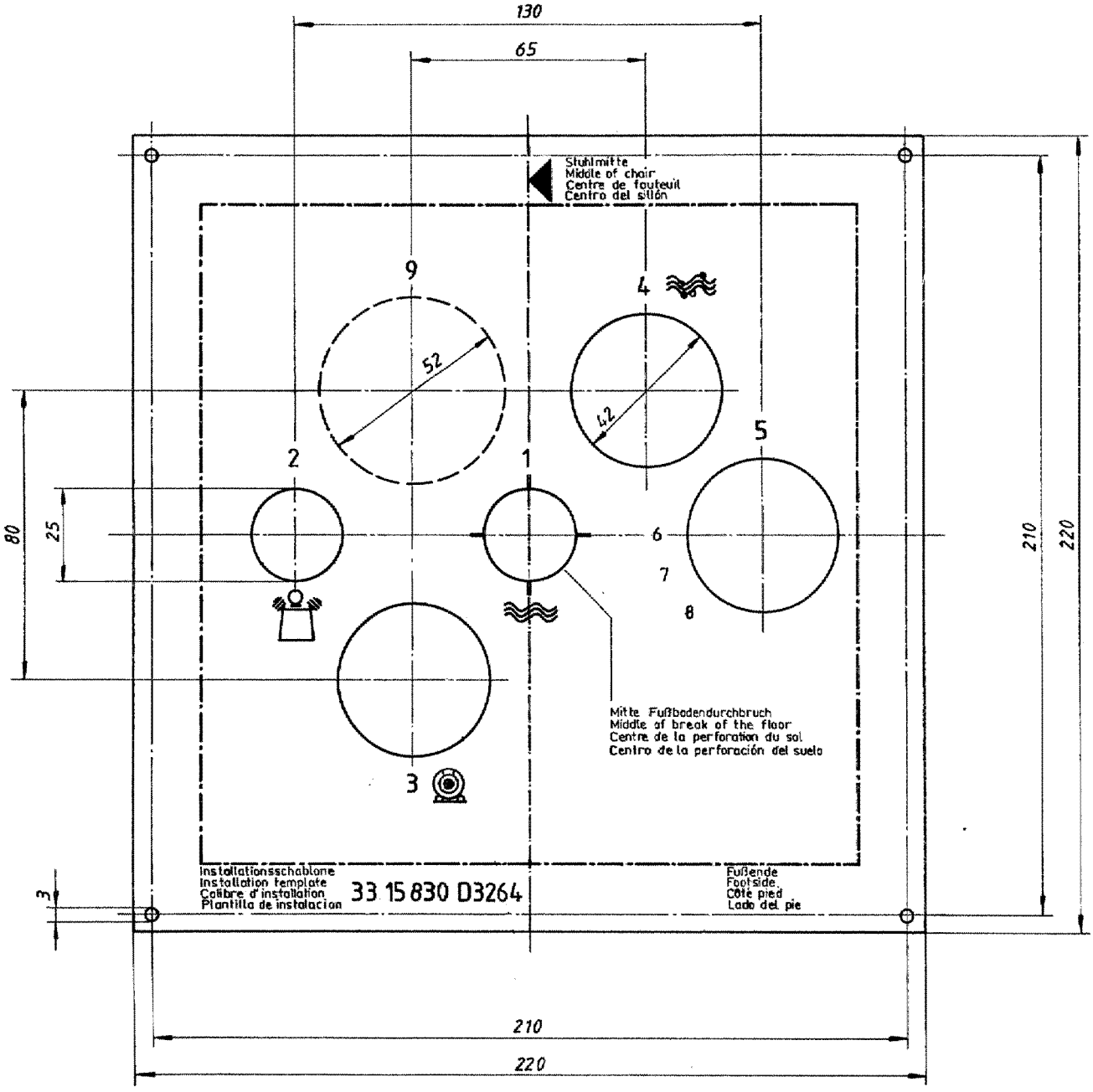


	Suction line DN40 HT-PP ISO 8283-3 (polypropylene, inner diameter 36.5 mm)
	Compressed air supply Pipe 10x1 mm, corner valve outlet 3/8"
	Water supply Pipe 10x1 mm, corner valve outlet 3/8"
	Water drainage DN40 HT-PP ISO 8283-3 (polypropylene, inner diameter 36.5 mm)
	Power supply 3x1.5 mm^2 Circuit breaker: for 230 VAC: 16 A slow-blow for 100-115 VAC: 20 A slow-blow Recommended: Type B automatic circuit breaker

3.5 Underfloor installation of supply lines

3.5.1 Installation template

We recommend that you order the installation template (REF 33 15 830) from Sirona for laying the pipe ends in the installation field. If necessary, you can also prepare the template yourself based on the diagram below.



1		Water supply Pipe 10x1 mm, corner valve outlet 3/8"
2		Compressed air supply Pipe 10x1 mm, corner valve outlet 3/8"
3		Suction line DN40 HT-PP ISO 8283-3 (polypropylene, inner diameter 36.5 mm)
4		Water drainage DN40 HT-PP ISO 8283-3 (polypropylene, inner diameter 36.5 mm)
5		Installation pipe DN40 HT-PP ISO 8283-3 (polypropylene, inner diameter 40 mm)
6		Control cable to relays for the suction machine (), call cable (🔔), Special function (#) 3 x 1.5 mm^2 (quality as in the power cable)
7		Power supply 3x1.5 mm^2 Circuit breaker: for 230 VAC: 16 A slow-blow for 100-115 VAC: 20 A slow-blow Recommended: Type B automatic circuit breaker
8		not connected
9		Installation pipe, inner diameter 50 mm (or corresponding flat conduit) for the PC connection

3.5.2 Installation of the supply line in the termination panel

✓ An installation template is available or was prepared.

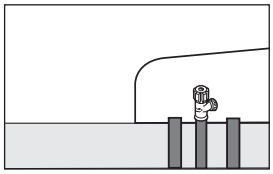
1. Check the position of the supply lines against the installation template as per the practice blueprint. Ensure that sufficient space is provided between the lines and the walls; see "Scale 1:20" [→ 20]. The center of the hole in the floor must be 269 mm (10 5/8") from the foot of the treatment center.
2. Lay the ends of the supply pipes, corner valves and lines as shown in the illustrations.

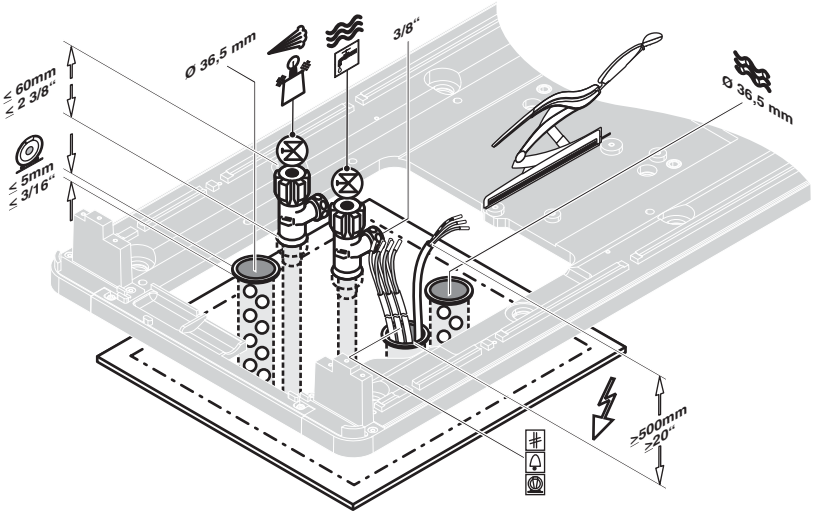
↳ The top edge of the corner valves for air and water must not project more than 60 mm from the top edge of the floor.

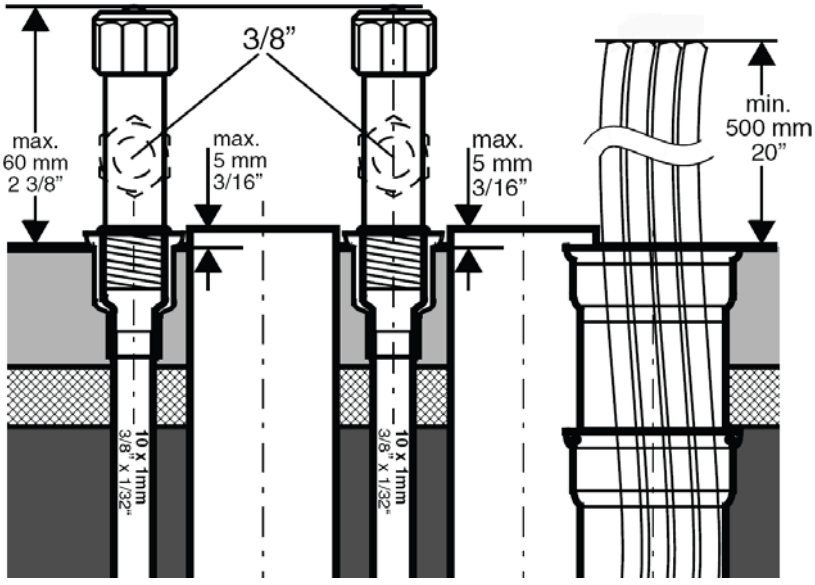
↳ The suction and drainage pipes must be flush with the top edge of the floor (a deviation of +5 mm is permissible). The inner diameter of both pipes is 36.5 mm.

↳ The electric lines must project by at least 500 mm.

↳ The supply lines are laid.







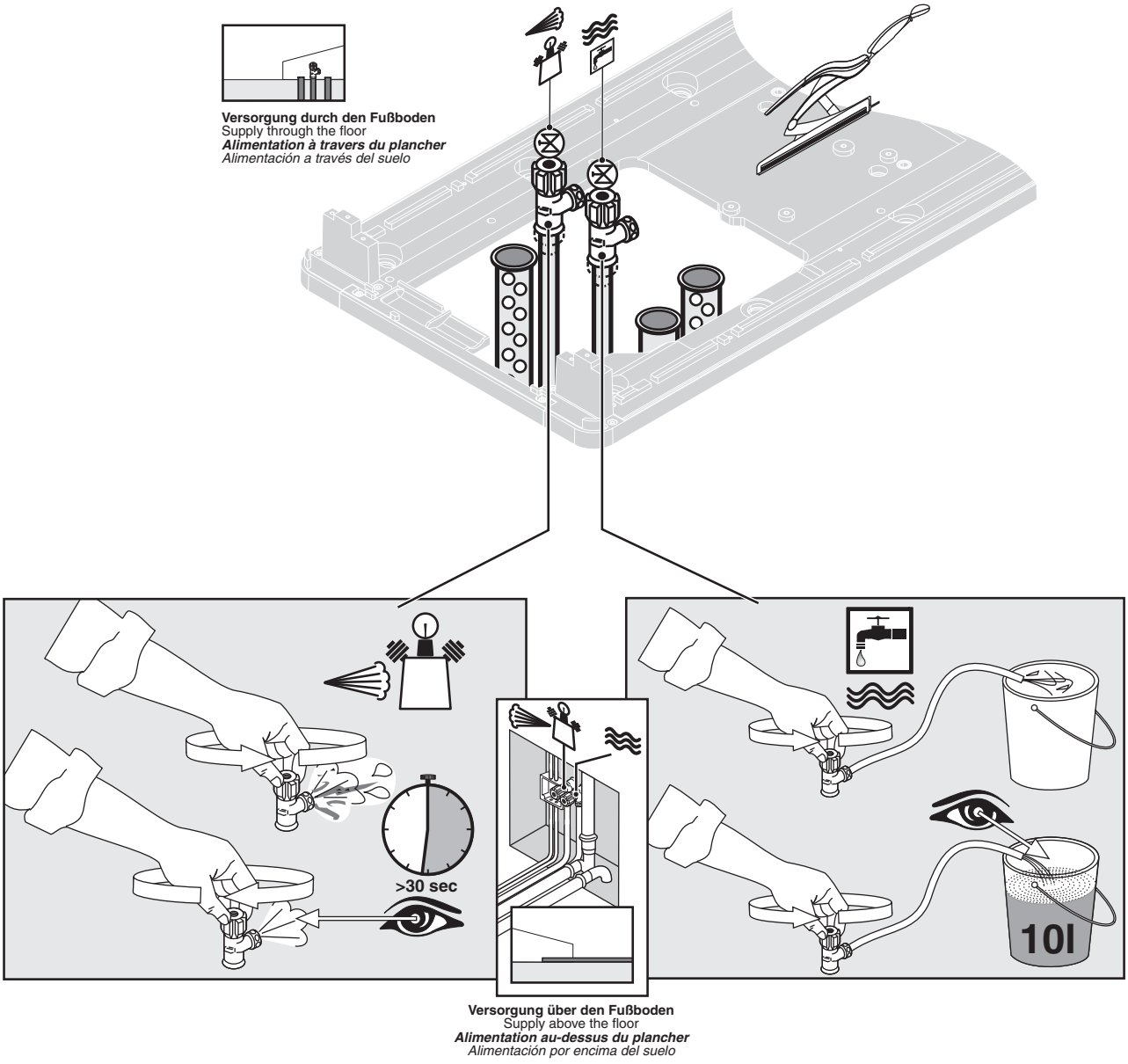
3.6 Cleaning the air and water pipes

NOTICE

Chips and other foreign materials could be flushed and/or blown into the treatment center.

Metal chips can cause malfunctions of the pneumatic components. The filters become clogged with foreign materials.

- ➢ During installation, ensure that no chips or other foreign materials enter the lines.
- ➢ Flush the water lines.
- ➢ Blow out the air lines.
- ➢ Ensure that no more foreign materials can enter the lines after they have been flushed or blown out.



Versorgung durch den Fußboden
Supply through the floor
Alimentation à travers du plancher
Alimentación a través del suelo

Versorgung über den Fußboden
Supply above the floor
Alimentation au-dessus du plancher
Alimentación por encima del suelo

3.7 Underfloor installation of the PC connections

Depending on the prevailing local conditions, the existing cable set can be installed in the cable duct of an underfloor installation by an installer prior to the installation of the treatment center.

The cable channel No. 9 of the installation template is used for this purpose. Installation template [→ 14].

- PC connection with HDMI and USB cable for camera SiroCam digital, REF 63 29 655

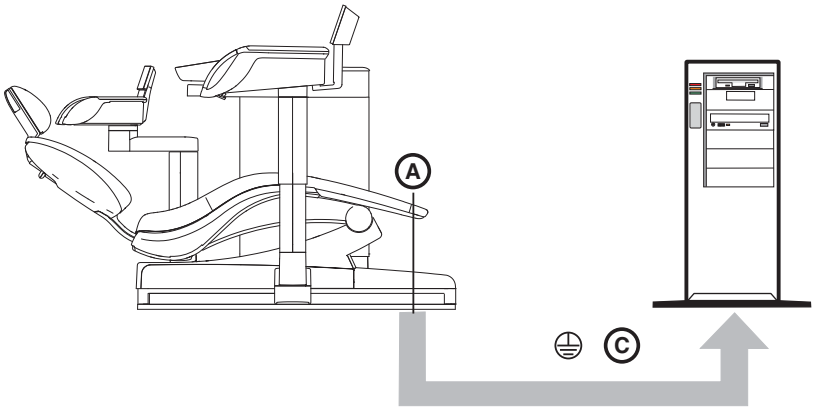
NOTICE

Electric lines are susceptible to breakages.

Any kinks or twists in the cables could damage their wires. You must then replace such cables.

➢ Ensure that electrical lines do not become kinked or twisted.

Running cables to the PC



Lines **L343** (USB repeater), **L339** (Ethernet), **L406** (HDMI) and **protective ground wire**. For PCs without a HDMI output, the **Audio** line is also required.

To prevent transmission interference, ensure that the cables are not crossed.

✓ A cable duct is laid from the treatment center to the location of the PC.

✓ Free length A of cables at the treatment center end:
Length **A** = 600 mm

1. Pull the lines **L343** (USB repeater), **L339** (Ethernet), **L406** (HDMI) and **protective ground wire** of the treatment center through the cable duct to the location of the PC **C**. For PCs without a HDMI output, insert the **Audio** line. For the USB line **L343** the TYPE A connector must be on the PC side and the TYPE B connector on the chair side.
2. Save the accessory parts for final installation!

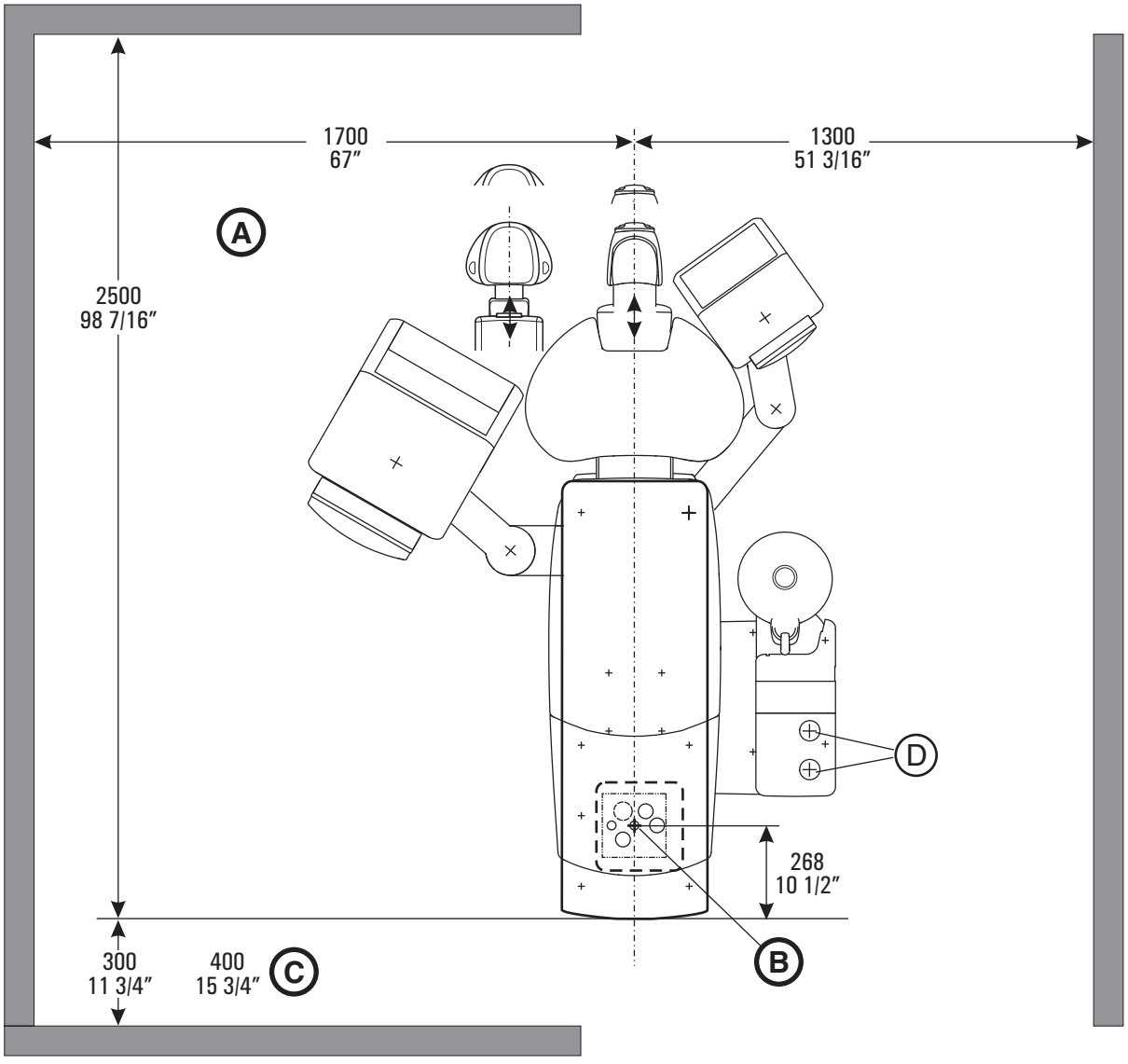
↳ The preparation of the connection for the underfloor installation of the PC is completed.

IMPORTANT
Minimum requirements for PC See document "Installation instructions and system requirements for PC configuration," (REF 61 94 075) SIVISION digital.

4 Dimensions, technical data

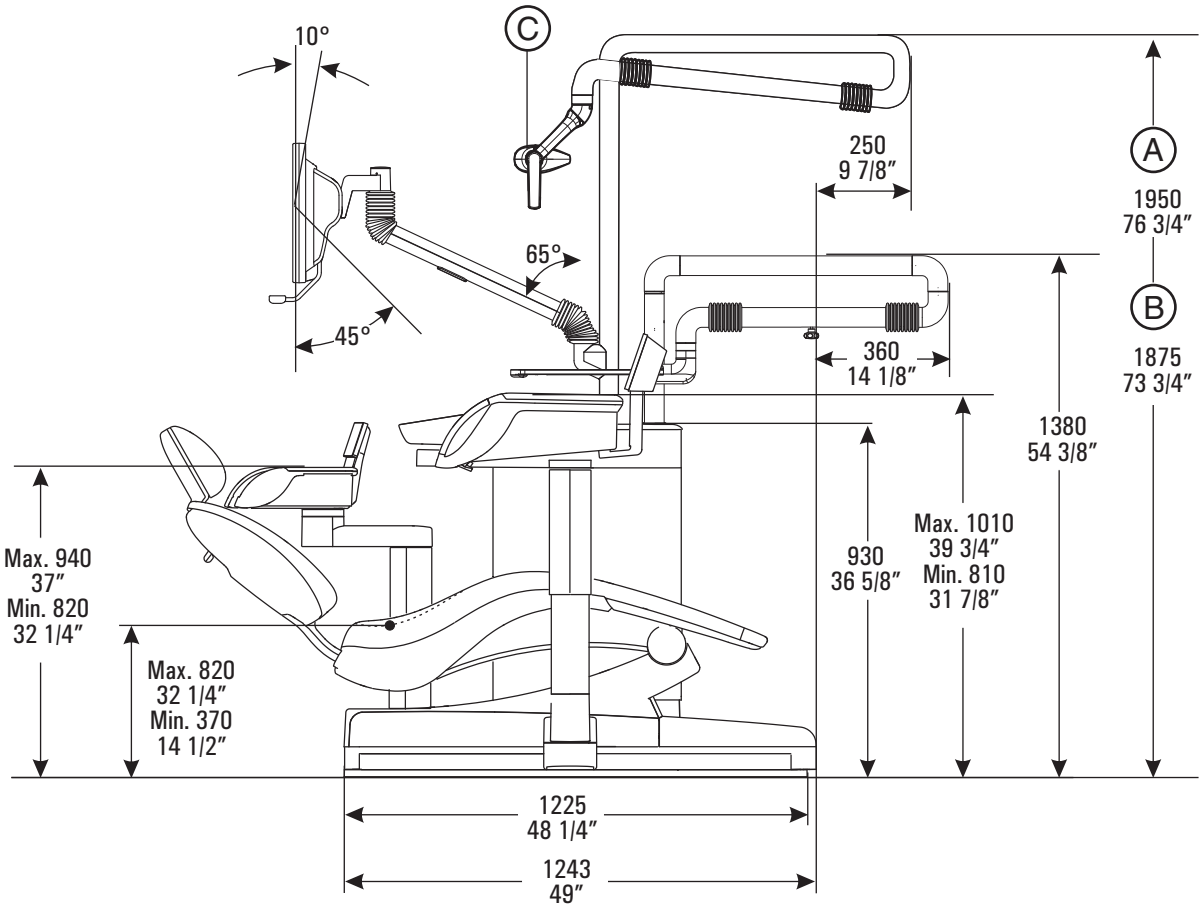
4.1 Scale 1:20

4.1.1 Dimensions of the treatment room



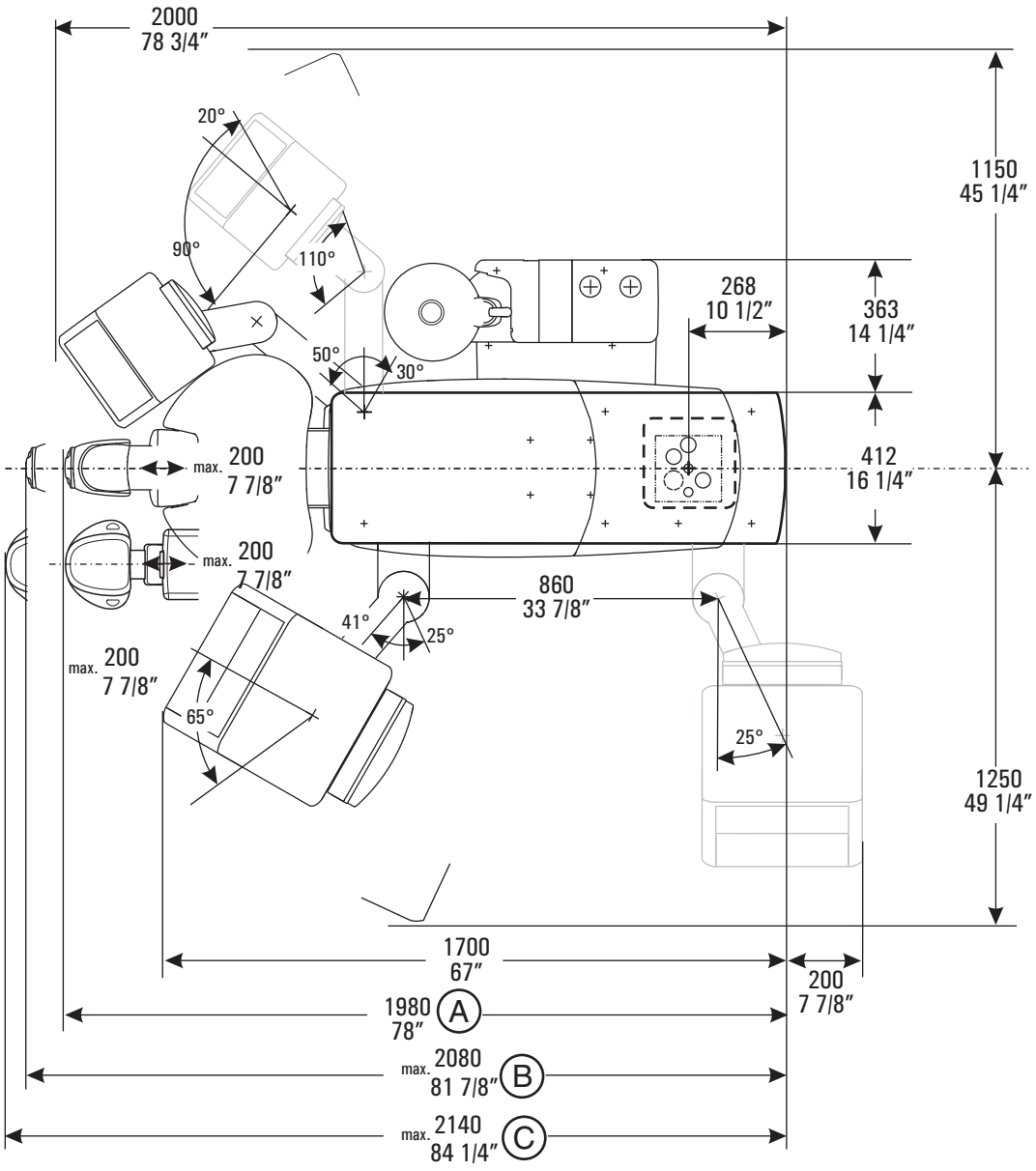
A	Recommended distances from cabinet or wall.
B	Center of the floor cut-out/installation area
C	Minimum distance with tray
D	Hazard warning: The lamp installed here and the tray have a swivel range which exceeds the specified distances!

4.1.2 Side view



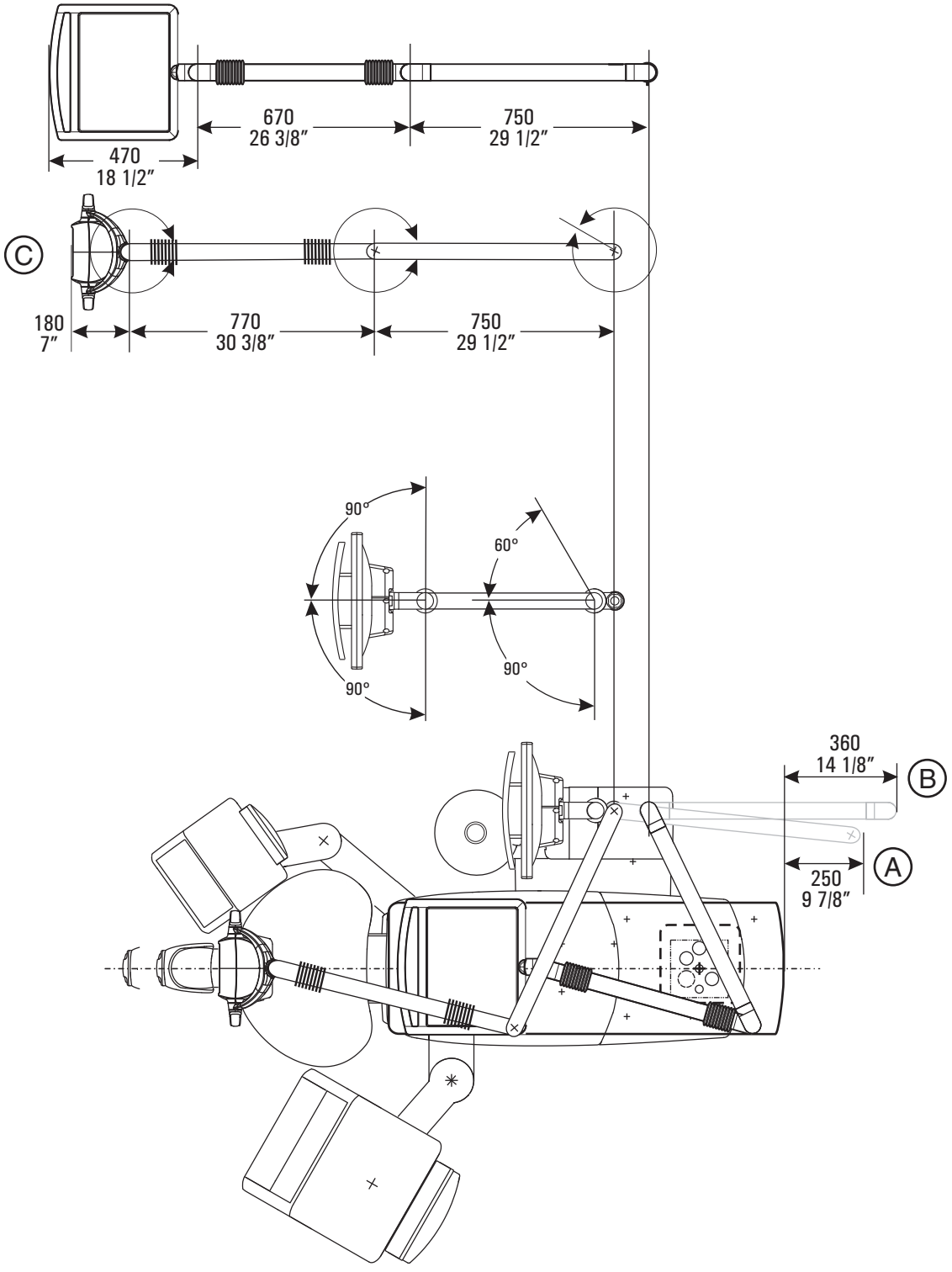
A	Height of the lamp with SIVISION digital on the support arm or lamp support tube
B	Height of the lamp without SIVISION digital or SIVISION digital on the tray
C	LEDview

4.1.3 Top view



A	Length of the treatment center with 176 cm tall patient and program 2 and fully extended headrest
B	Maximum length of the treatment center with motor-driven headrest
C	Maximum length of the treatment center with MultiMotion headrest

4.1.4 Top view with options



A	Projection of lamp arm
B	Projection of tray arm
C	LEDview

4.2 Mounting plates

Adapter plate

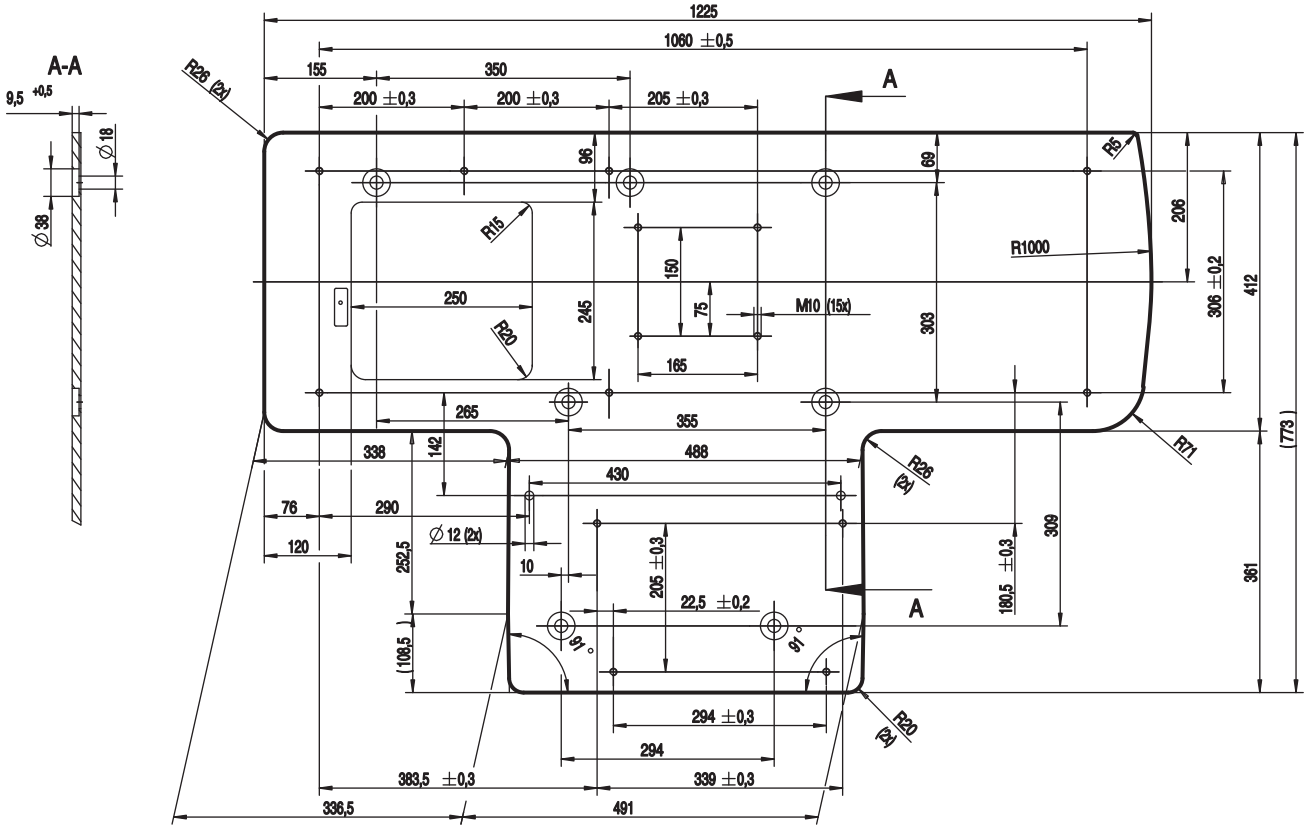
If the dental treatment center is being installed as a replacement for an M1 previously installed at this location, an adapter plate is available for this purpose. You can use the existing drill holes for fastening. Two additional drill holes are required only in the area of the water unit. The treatment center is screwed onto the steel plate using M10 screws. The adapter plate also must be used if the unevenness of the floor exceeds 2 mm in the vicinity of the base plate.

Note: If a C-Line unit (e.g. $C2^+$, $M1^+$) was previously installed, the fastening drill holes must be re-drilled.

Adapter plate thickness: 12 mm

Drilling with floor (7x)

REF 62 04 965



Demonstration chair plate

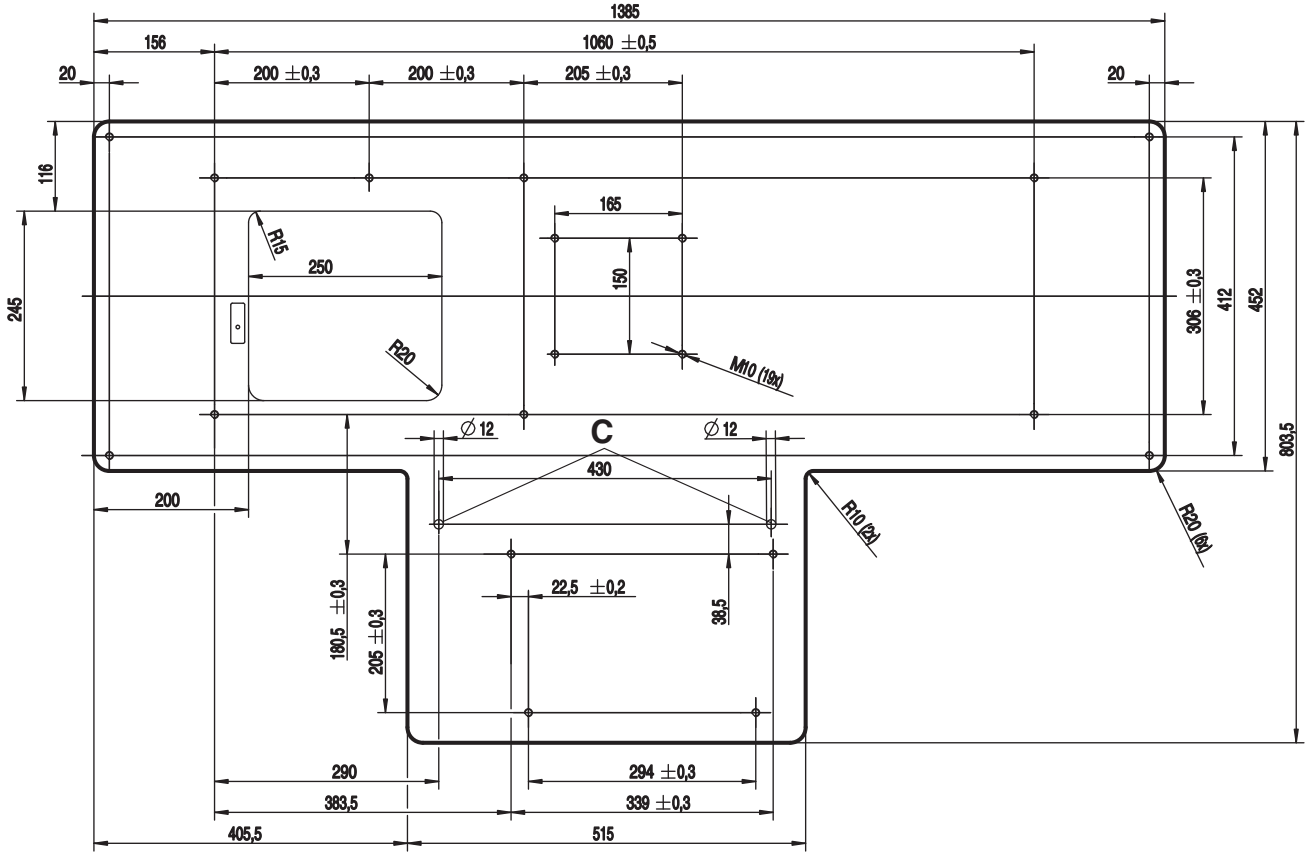
For floors which do not permit permanent connection of the unit (e.g. demo operation at a trade show, floor heating), installation on a steel demo plate is possible.

The treatment center is screwed onto the steel plate using M10 screws.

If the demo chair plate is **permanently** installed and whenever it is used for **medical purposes**, is must be screwed firmly to points **C** on the floor using two screws.

Demonstration plate thickness: 10 mm

REF 62 04 973



4.3 Information on planning for the practice

The following file(s) for practice planning are available for download in the dealer area of the Sirona website under DOWNLOADS => CAAD files:

- PDF file with print symbol - for to-scale printing on paper or adhesive film
- CAAD file(s) - for professional implementation planning with 2D/3D CAAD systems

4.4 Technical data

Model designation:	TENEO
Power connection:	100 - 230 V AC ± 10% 50/60 Hz
Rated current:	4.8 A at 230 V 9.6 A at 115 V 11 A at 100 V
Overvoltage category:	2 acc. to IEC 60664-1
Average power consumption (for dimensioning an air conditioning system):	0.35 kW
Power consumption in Standby mode:	3 W
Main building fuse:	Type B automatic circuit breaker 100 - 115 V AC: 20 A slow-blow 230 V AC: 16 A slow blow
Protection class:	Class **I** equipment
Degree of protection against electrical shock:	 Type **B** applied parts Except for the SIROTOM electrosurgical handpiece and the SiroCam digital intraoral camera. These are:  Type **BF** applied parts
Degree of protection against ingress of water:	Ordinary equipment (without protection against ingress of water) The foot control has an IP X1 degree of protection against liquids (drip-proof).
Mode of operation:	Continuous operation with intermittent loading corresponding to the dental mode of working. Permanently connected unit.
Transport and storage conditions:	Temperature: -40 °C – +70 °C (-40.00 °C – 70.00 °C) Relative humidity: 10 % – 95 % Barometric pressure: 500 hPa – 1060 hPa

Operating conditions:	Ambient temperature: 10°C – 40°C (50°F – 104°F) Relative humidity: 30 % – 85 % no condensation Barometric pressure: 700 hPa – 1060 hPa
Installation site:	≤ 3000 m above sea level
Pollution degree:	2 acc. to IEC 60664-1
Tests/Approvals:	See "Standards/Approvals“ [→ 29].
Year of manufacture:	 **20XX** (on the rating plate)
USB port:	corresponds to USB 2.0 standard
Weight (with packaging and accessories/without packaging):	Dentist element: 37 kg / 23.5 kg Assistant element: 25 kg / 16.6 kg Water unit: 63 kg / 48 kg Chair: 125 kg / 100 kg Upholstery: 8.5 kg / 5.5 kg
Dimensions of the packaging	Dentist element: 108 cm x 67 cm x 96 cm Assistant element: 108 cm x 67 cm x 35 cm Water unit: 83 cm x 69 cm x 115 cm Chair: 159 cm x 71cm x 85 cm Upholstery: 80 cm x 60 cm x 36 cm
Supply pressures (min./ max.):	Air: 5.5/7.5 bar Water 2.5/6 bar Suction air: p_u ≤ 0.18 bar; ≥ 500 l/min

Foot control wireless interface

Model designation:	nanoLOC AVR
Frequency:	2.4 GHz – 2.4835 GHz (ISM band)
Transmitting power:	< 2 mW (short-range device)
Modulation type:	MDMA
Range:	approx. 10 m
Approval:	See "Standards/Approvals“ [→ 29].

IMPORTANT

Minimum requirements for PC

See document "Installation instructions and system requirements for PC configuration," (REF 61 94 075) SIVISION digital.

4.5 Standards/Approvals

The TENEO® treatment center complies with the following standards, among others:

- IEC 60601-1 (electrical and mechanical safety)
- IEC 60601-1-2 (electromagnetic compatibility)
- IEC 60601-1-4 (software)
- IEC 60601-1-6 (serviceability)
- IEC 60601-2-2 (HF surgery)
- ISO 6875 (Patient chair)
- ISO 7494-1 (Dental treatment devices)
- ISO 9680 (Operating light)
- ISO 11143 (Amalgam separator), see also below
- EN 1717 (connection to the drinking water system), see also below and chapter Connection to the public drinking water system [→ 9]

Original language: German

Registration number: State Food and Drug Administration 2010, No. 2010 2552489

Serial number: YZB/GEM 1462-2010

CE 0123

This product bears the CE mark in accordance with the provisions of Council Directive 93/42/EEC of June 14, 1993 concerning medical devices.

The treatment center meets the requirements of the Canadian Standards Association (CSA) according to CAN/CSA-C22.2 No. 601.1-M90 (AM 1 + AM 2).

The treatment center is certified according to GOST R and thereby fulfills the statutory regulations for Russia.

ME20

SIRONA Dental Systems GmbH 64625 Bensheim Fabrikstrasse 31 Z-64.1-24

adf NF conseille Produit certifié

The amalgam separator achieves a separation efficiency of >98%. It therefore meets the requirements of the standard ISO 11143 and the German Institute for Structural Engineering (DIBT). The amalgam separator bears the Ü mark of the DIBT and the AFNOR mark (of the French Standards Institute).

Separating procedure type 1: Centrifugal system

DVGW CERT Anschlusssicher W 540

The treatment center complies with the technical rules and requirements on safety and hygiene for connection to the public drinking water supply. The unit is certified according to the requirements of the DVGW (Deutscher Verein für Gas und Wasser = German Gas and Water Association). It is intrinsically safe in accordance with worksheet W540. The unit thus fulfills the requirements of EN 1717, see also the chapter entitled "Connection to the public drinking water system" [→ 9].

This unit meets the requirements of BELGAQUA and may therefore be connected to the public drinking water supply in Belgium.

WaterMark
ATS 5200.104
Certificate No. 21208

This unit meets the requirements of ATS and may therefore be connected to the public drinking water supply in Australia.

The wireless modules in the wireless foot control and in the treatment center meet the requirements of the R&TTE directive 1999/5/'EC. Standards:

- EN 60950-1
- EN 301489-1, EN 301489-17, EN 300328

The modules meet the requirements of the Federal Communications Commission (Part 15 of the FCC Rules).

FCC ID: SIFNANOLOCAVR0108

Industry Canada

The modules meet the requirements of Industry Canada (RSS210).

IC: 7654A-nanoLOCAVR

The current approvals of the wireless foot control are listed on the rating label on the underside of the wireless foot control.

5 Electromagnetic compatibility

Observance of the following information is necessary to ensure safe operation regarding EMC aspects.

TENEO complies with the requirements for electromagnetic compatibility (EMC) according to IEC 60601-1-2:2001 and A1:2004.

TENEO is hereinafter referred to as "UNIT".

5.1 Accessories

Making the PC connection

The required interface cables can be ordered from Sirona.

Designation of the interface cables	Supplier
HDMI cable, 10 m (L406)	Sirona
USB 2 cable with repeater, 10 m (L343), connectors: Type A, Type B	Sirona
Ethernet cable, 10 m (L339)	Sirona
Audio cable, 10 m	Sirona
2nd protective ground wire, 2.5 mm^2, 10 m	Sirona

The **UNIT** may only be operated with accessories and spare parts approved by Sirona. Unapproved accessories and spare parts may lead to an increased emission or to a reduced immunity to interference.

The **UNIT** should not be operated in the immediate vicinity of other devices. If this proves to be unavoidable, the UNIT should be monitored to ensure that it is operating properly.

Accessories for EMC measurement

The EMC measurements were performed with the following PC:

PC as peripheral device for checking the interfaces with:	Fujitsu Siemens ESPRIMO Q series Mini PC Q5020
PC equipment:	
Processor	Intel Core 2 Duo; 1.4 GHz
RAM	2 GB DDR 2
Graphics card	Intel GMA 3100 on board
Hard disk drive	Serial ATA 80 GB (5400 rpm, 2.5")
Keyboard	Logitech Cordless Medic Board Pro (Bluetooth)
Mouse	
Interfaces:	1 x LAN; 4 x USB, Bluetooth
Software:	SIUCOM plus, SI-Video
Operating system	Microsoft Windows 7

5.2 Electromagnetic emission

The **UNIT** is intended for operation in the electromagnetic environment specified below.

The customer or user of the **UNIT** should make sure that it is used in such an environment.

Emission measurement	Conformity	Electromagnetic environment – guidance
RF emissions according to **CISPR 11**	Group 1[a]	The **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 emissions according to **CISPR 11**	Class B	The **UNIT** is intended for use in all facilities, including residential areas and in any facilities connected directly to a public power supply providing electricity to buildings used for residential purposes.
Harmonics according to **IEC 61000-3-2**	Class A	
Voltage fluctuations/flicker according to **IEC 61000-3-3**	Complies	

If an HF surgical unit is integrated, it must emit electromagnetic energy in order to function properly. When in operation, the HF surgical unit may cause interference in nearby electrical equipment. According to IEC 60 601-2-2, Chap.36, no limit values have been defined for active HF surgical units. They are therefore classified as Group 1 devices according to CISPR 11.

5.3 Interference immunity

The **UNIT** is intended for operation in the electromagnetic environment specified below.

The customer or user of the **UNIT** should make sure that it is used in such an environment.

Interference immunity tests	IEC 60601-1-2 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) according to **IEC 61000-4-2**	± 6 KV contact discharge ± 8 KV air discharge	± 6 KV contact discharge ± 8 KV air discharge	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 according to **IEC 61000-4-4**	± 1 kV for input and output lines ± 2 kV for power supply lines	± 1 kV for input and output lines ± 2 kV for power supply lines	The quality of the line power supply should be that of a typical commercial or hospital environment.
Surge voltages according to **IEC 61000-4-5**	± 1 kV differential mode ± 2 kV common mode voltage	± 1 kV differential mode ± 2 kV common mode voltage	The quality of the line power supply should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and variations of the power supply according to **IEC 61000-4-11**	<5% U_T for ½ period (>95% dip of U_T) 40% U_T for 5 periods (60% dip of U_T) 70% U_T for 25 periods (30% dip of U_T) <5% U_T for 5sec. (>95% dip of U_T	<5% U_T for ½ period (>95% dip of U_T) 40% U_T for 5 periods (60% dip of U_T) 70% U_T for 25 periods (30% dip of U_T) <5% U_T for 5sec. (>95% dip of U_T	The quality of the line power supply should be that of a typical commercial or hospital environment. If the user of the **UNIT** requires it to continue functioning following interruptions of the power supply, it is recommended to have the **UNIT** powered by an uninterruptible power supply or a battery.
Magnetic field of power frequencies (50/60 Hz) according to **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.
Remarks: U_T is the AC supply voltage prior to application of the test level.			
			Portable and mobile radio equipment must not be used within the recommended working clearance from the **UNIT** and its cables, which is calculated based on the equation suitable for the relevant transmission frequency. Recommended working clearance:

Interference immunity tests	IEC 60601-1-2 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF interference **IEC 61000-4-6**	3 V_{eff} 150 kHz to 80 MHz[1]	3 V_{eff}	$d= [1.2] \sqrt{P}$
Radiated RF interference **IEC 61000-4-3**	3 V/m 80 MHz to 800 MHz[1] 3 V/m 800 MHz to 2.5 GHz[1]	3 V_{eff} 3 V_{eff}	$d= [1.2] \sqrt{P}$ at 80 MHz to 800 MHz $d= [2.3] \sqrt{P}$ at 800 MHz to 2.5 GHz where P is the nominal transmitter output in watts (W) specified by the transmitter manufacturer and d is the recommended working clearance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[2] should be less than the compliance level[3] in each frequency range. Interference is possible in the vicinity of equipment bearing the following graphic symbol. 

1. The higher frequency range applies at 80 MHz and 800 MHz.
2. 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. An investigation of the location is recommended to determine the electromagnetic environment resulting from stationary RF transmitters. If the measured field strength in the location in which the **UNIT** is used exceeds the applicable RF compliance level above, the **UNIT** should be observed to verify normal operation. If unusual performance characteristics are observed, it may be necessary to take additional measures such as reorientation or repositioning of the **UNIT**.
3. Over the frequency range 150kHz to 80MHz, field strengths should be less than 3V/m.

5.4 Working clearances

Recommended working clearances between portable and mobile RF communication devices and the UNIT

The **UNIT** is intended for operation in an electromagnetic environment where radiated HF interference is checked. The customer or the user of the **UNIT** can help prevent electromagnetic interference by duly observing the minimum distances between portable and/or mobile RF communication devices (transmitters) and the **UNIT**. These values may vary according to the output power of the relevant communication device as specified below.

Rated maximum output power of transmitter [W]	Working clearance according to transmission frequency [m]		
	150 kHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
	$d= [1.2] \sqrt{P}$	$d= [1.2] \sqrt{P}$	$d= [2.3] \sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

For transmitters whose maximum nominal output is not specified in the above table, the recommended working clearance d in meters (m) can be determined using the equation in the corresponding column, where P is the maximum nominal output of the transmitter in watts (W) specified by the transmitter manufacturer.

Remark 1

The higher frequency range applies at 80 MHz and 800 MHz.

Remark 2

These guidelines may not be applicable in all cases. The propagation of electromagnetic waves is influenced by their absorption and reflection by buildings, objects and persons.

5.5 Foot control wireless interface

Insofar as the treatment center is equipped with a foot control, one wireless module each must be installed in the foot control and in the base of the chair of the treatment center. These modules transmit the foot control signals.

⚠ CAUTION

Interference with the wireless transmission

This wireless transmission may cause interference with or be disturbed by other radio services.

Wireless module in the wireless foot control and in the treatment center

Model designation:	nanoLOC AVR
Frequency:	2.4 GHz – 2.4835 GHz (ISM band)
Transmitting power:	< 2 mW (short-range device)
Modulation type:	MDMA
Range:	approx. 10 m
Approval:	See "Standards/Approvals“ [→ 29].

6 Checklist

6.1 Installation site

We recommend performing an inspection of the circumstances on location at least 4 weeks prior to installation. The checklist should help you when doing this. This can help ensure a smooth procedure on the day that the TENEO is actually installed.

Installation site:	
• Installation site:	
• Unit location:	
• Building number:	
• Room name/number:	

6.2 Construction requirements

Connections: Media (see On-site installation [→ 9])	☑
• Water supply Pipe 10x1 mm, corner valve outlet 3/8"	☐
• Compressed air supply line Pipe 10x1 mm, corner valve outlet 3/8"	☐
• Suction line DN 40 HT-PP ISO 8283-3, inner diameter 36.5 mm	☐
• Water drainage DN 40 HT-PP ISO 8283-3, inner diameter 36.5 mm	☐
• Installation pipe (power supplies) min. DN 40 HT-PP ISO 8283-3, inner diameter 40 mm	☐
• Installation pipe (IT) DN 40 HT-PP ISO 8283-3 (or corresponding flat conduit)	☐

Connections: Electrical (see On-site installation [→ 9])		☑
• Power cable: 3 x 1.5 mm^2		☐
• Type B automatic circuit breaker 230 V AC, 16 A slow-blow • or • Type B automatic circuit breaker 100-115 V AC, 20 A slow-blow		☐ ☐
• Suction machine control cable and call cable: 3 x 1.5 mm^2		☐
• Wireless systems in 2.4 GHz frequency range available? (e.g. room monitoring systems, video transmitters, etc.)	☐ Yes	☐ No
• If yes, this may damage the wireless foot control. Please consult our Product Service team.		

Uneven floors: Mounting plates (see Mounting plates [→ 24])	☑
• No plate required (unevenness max. 2 mm, shimming plates can be used)	☐
• Adapter plate, REF 62 04 965	☐
• Demo plate (demo operation at a trade show), REF 62 04 973	☐
• Load capacity of the floor is indicated (pressure and tensile loads).	☐
• The treatment center can be safely anchored in the load-bearing structure (concrete/wood; NOT screed).	☐

6.3 IT hardware

Mode of operation:	☑
• Stand-alone solution (mini PC required in the base of the chair).	☐
• PC in treatment room.	☐

PC system requirements:		☑
Operating systems:		
• Windows XP Professional (Service Pack 3)		☐
• Windows Vista (Service Pack 1)		☐
• Windows 7		☐
Processor:		
• Intel Core 2 Duo 1.8 GHz or higher		☐
• Graphics card: At least 16 MB memory		☐
• DVD/CD drive		☐
• USB 2.0 interface (on board, not front side)		☐
PC connection cable set:		
• SIVISION digital HDMI, long REF 63 29 655		☐
• or		
• SIVISION digital HDMI, short REF 63 29 648 (for Mini PC)		☐
Software:		
• SIDEXIS XG V2.3 or higher	Version:____	☐

Monitor:	☑
Dual Head graphics card:	
• Matrox Millenium G 450 (not supported under Windows 7)	☐
• Matrox Millenium G 550 (not supported under Windows 7)	☐
NOTICE! Please be aware that any deviations may cause malfunctions in camera mode. For further details, see document "Installation instructions and system requirements for PC configuration", (REF 61 94 075) SIVISION digital.	

6.4 Network

Network:	☑
• The entire network should be equipped with 100 MBit Ethernet. • - Cat 5 - Cat 6	 ☐ ☐ ☐ 10 Mbps ☐ 100 Mbps
• Network connection for TENEO available.	☐
• Network connection for external PC available.	☐
NOTICE! The use of routers between TENEO and the treatment center PC must be avoided.	
• Network configuration plan available.	☐
• Network jacks have been certified.	☐
• Network certificate present.	☐
• Network installation company.	☐
• Remarks/Tasks:	

6.5 Data processing

IP addresses/firewall:		
• TCP/IP address range:	_____ . _____. _____ . _____ - _____ . _____ . _____ . _____	
• Subnet mask:	_____ . _____ . _____ . ____	
• Are addresses already defined/present?	☐ Yes	☐ No
• Is there a DHCP server (dynamic TCP/IP address assignment)?	☐ Yes	☐ No
NOTICE! A static address should be assigned for the TENEO. It must not lie in the dynamic address range!		
• TENEO:	_____ . _____ . _____ . ____	
• Internal PC:	_____ . _____ . _____ . ____	
• External PC:	_____ . _____. _____ . _____ - _____ . _____ . _____ . _____	
• Standard gateway:	_____ . _____ . _____ . ____	
• Antivirus software available?	☐ Yes Name:	☐ No
• Is a firewall installed? Software or hardware firewall?	☐ Yes ☐ SW ☐ HW	☐ No
• Remarks/Tasks:		

Practice administration programs:		
• Are connections to the practice administration programs, etc. installed or planned?	☐ Yes	☐ No
• If so, which system (manufacturer + name)?		
• Remarks/Tasks:		

We reserve the right to make any alterations which may be required due to technical improvements.

D3509.021.01.08.02 09.2011
Sprache: englisch
Ä.-Nr.: 114 592
Printed in Germany

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