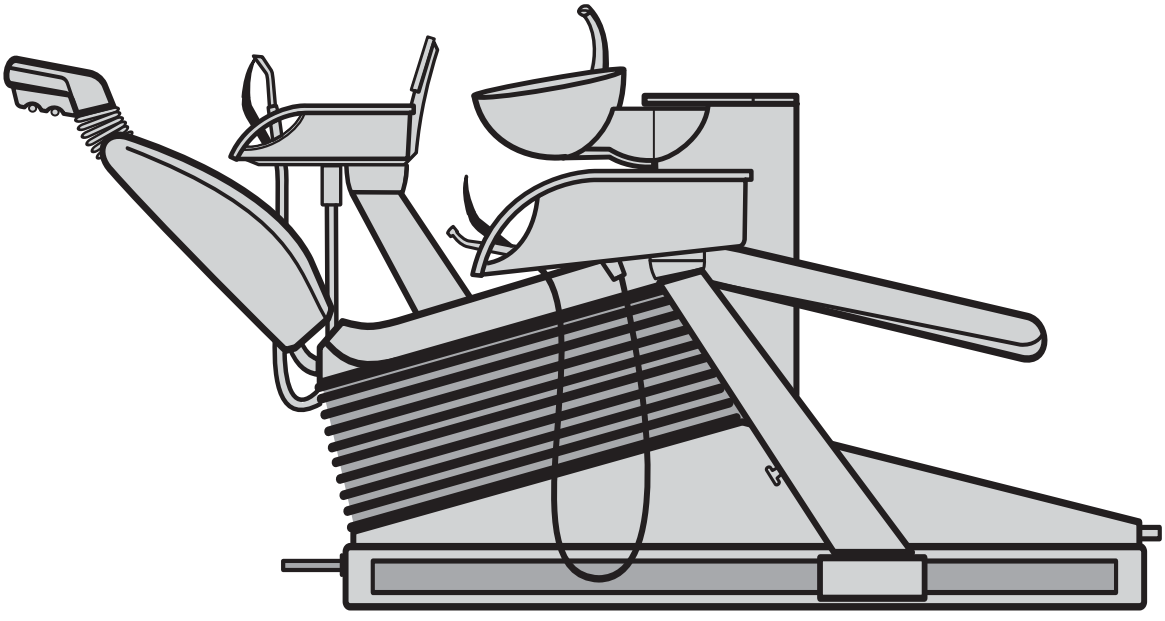
New as of: 09.2009

sirona
The Dental Company

C2+, M1+

Installation Requirements

English



General information

About this document

This document describes the installation requirements for the C2+, M1+ dental treatment centers.

Their subsequent installation is described in the Installation Instructions REF 59 58 470 (C2+) and REF 59 91 059 (M1+).

Besides you need the drilling template, REF 58 71 673, for secure fastening of the treatment center to the floor.

09.2009

Changes since the last version 06.2007:

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1 Preparations

C2+, M1+

1.1 Safety

ATTENTION

It is essential that you comply with the warning and safety information contained in the Installationsvoraussetzungen.

All such information is highlighted by the captions NOTE, ATTENTION, and CAUTION.

ATTENTION

For reasons of product safety, only original Sirona accessories approved for this product, or accessories from third parties approved by Sirona, may be used. The user is responsible for dangers resulting from the use of 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 and
• IEC IEC 60601-1 for medical electrical equipment
In case of doubt, contact the manufacturer of the system components.

ATTENTION

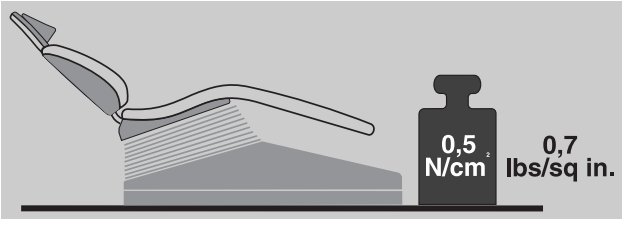
Any person who assembles or modifies a medical electrical system complying with the standard IEC 60 601-1-1 (safety requirements for medical electrical equipment) by combining it with other equipment (e.g. when connecting a PC) is responsible for ensuring that the requirements of this regulation are met to their full extent for the safety of the patients, the operators and the environment.

ATTENTION

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

ATTENTION

The floor must be flat and level (DIN 18 202). A steel plate must be used for uneven floors (see Section 1.5, "Mounting plates" on page 12).



ATTENTION

The floor must have a minimum loading capacity of 0.5N/cm².

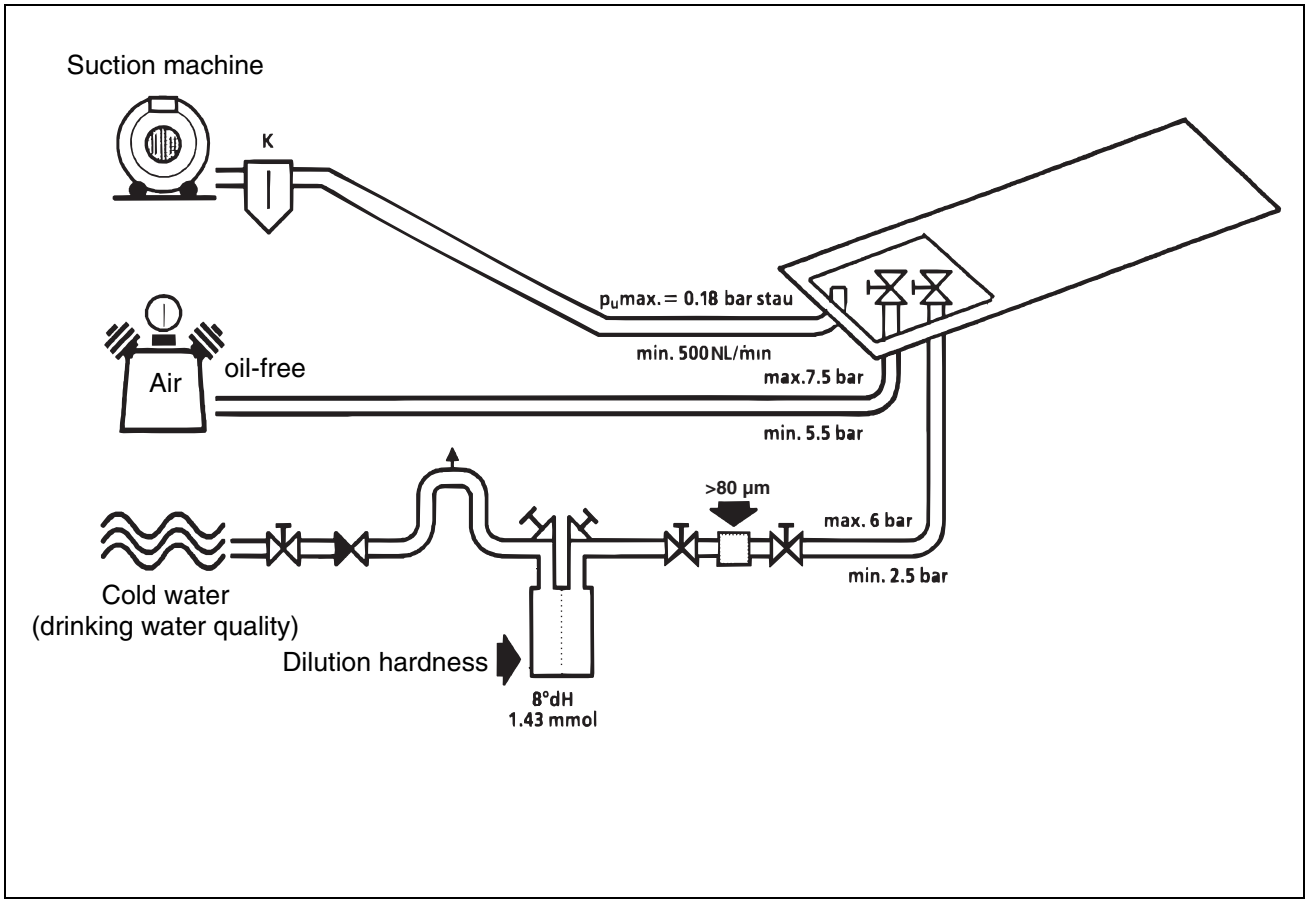
ATTENTION

Interference of electromedical devices caused by radio telephones:
To ensure the operational readiness of electromedical devices, the use of mobile radio telephones in the practice or hospital area is prohibited.

ATTENTION

***Electromagnetic compatibility:** 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 used properly.*

1.2 Media quality



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:

- If the water hardness exceeds 12° dH (=2.15 mmol), install a water softener.
- Set dilution hardness to 8° dH (1.43 mmol).
- 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. EN1717/DIN 1988).
- The water quality must comply with the national requirements for drinking water.
- The connection must be made to cold water.

Air quality

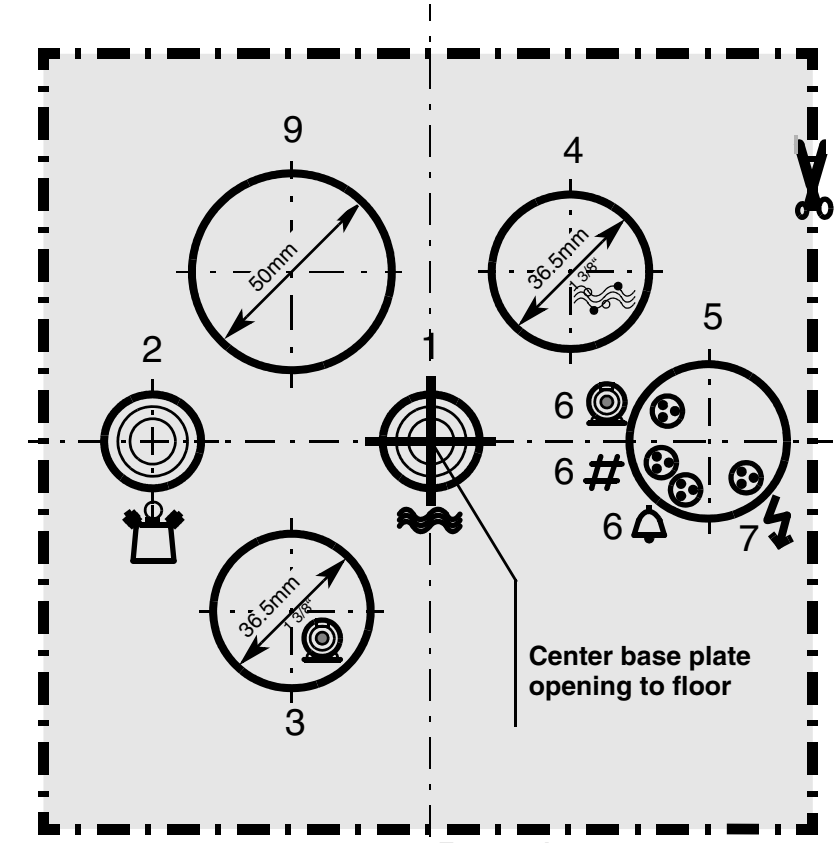
Oil-free, dry and hygienically perfect air is required for driving the highspeed handpiece, for cooling the burr drives and for the cooling spray.

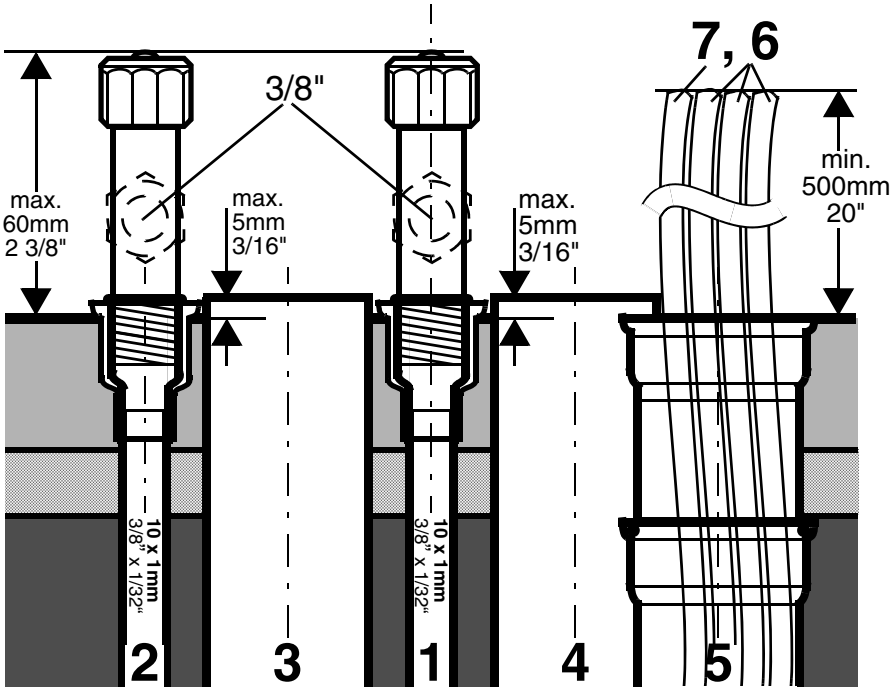
Suction pipe

Install steam trap **K**.

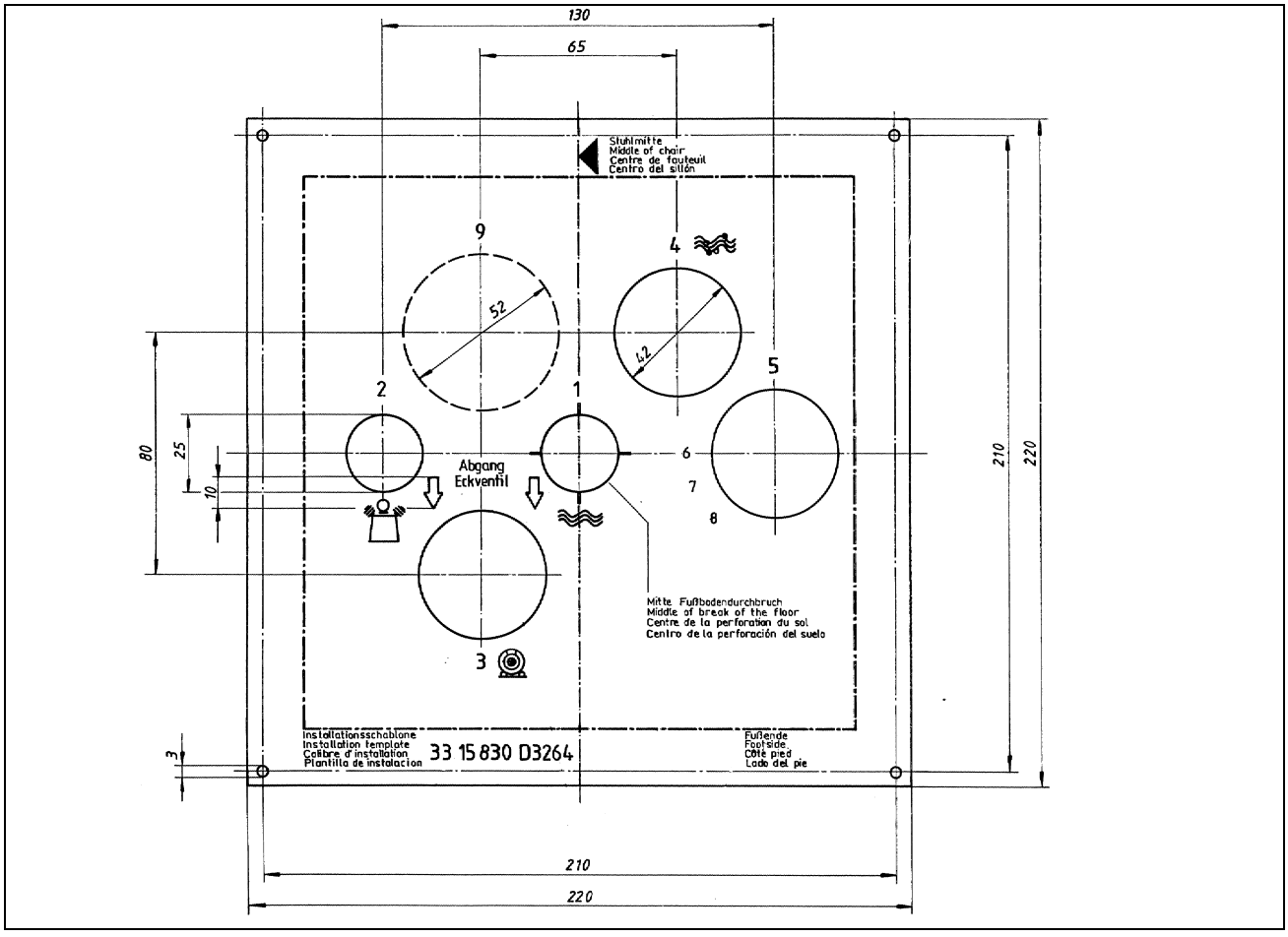
With a vacuum of pu >0.18 bar back pressure, the treatment center must be retrofitted with the “Vacuum limiter” retrofit kit (Order No.: 59 68 826).

1.3 Supply lines in the termination panel





Supply lines in the termination panel



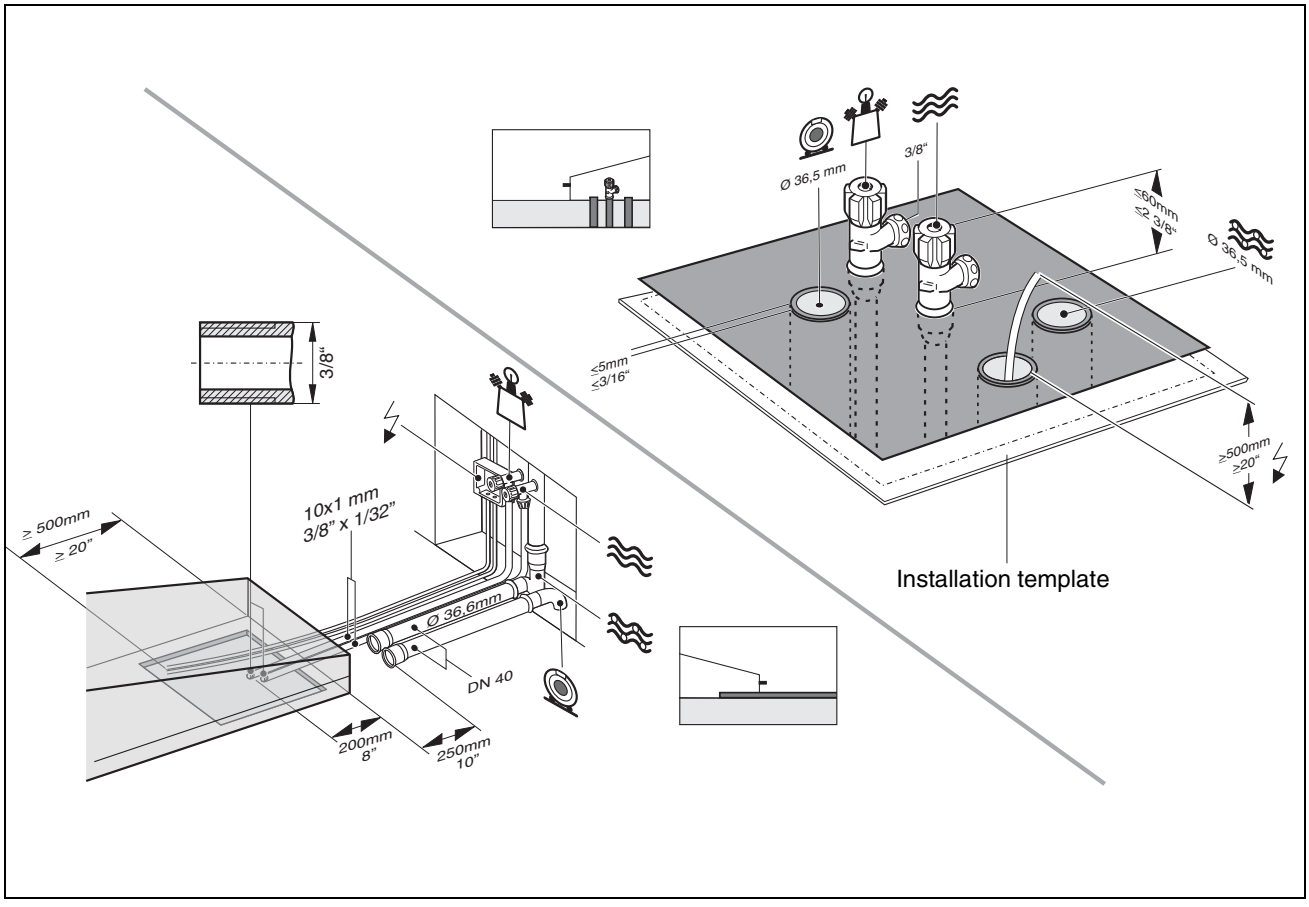
- Observe the national regulations for electrical installations (e.g. VDE 0100, VDE 0100, Part 710).
- Observe the national regulations for water supply installations (e.g. EN 1717, DIN 1988) and sewage installations (e.g. EN 12056-1).
- For the suction pipe, observe the instructions in the **Suction Machine Installation Instructions**.
- For fastening the pipe ends in the installation field, we recommend using an **installation template.** They can be ordered from Sirona under **REF 33 15 830**.

  If necessary, you can also prepare the template yourself based on the above sketch (not true to scale!).

Table 1: Supply lines

Item	Description
1	**Water inlet** pipe 10x1mm, corner valve outlet 3/8"
2	**Compressed aiir inlet** pipe 10x1mm, corner valve outlet 3/8"
3	**Suction pipe** DN40 HT-PP DIN 19560 (polypropylene, **inner diameter 36.5mm!**)
4	**Water drain** DN40 HT-PP DIN 19560 (polypropylene, **inner diameter 36.5mm!)**
5	**Installation pipe**, DN40 HT-PP DIN 19560 (polypropylene, 40mm!)
6	**Suction machine control cable** ( )and **call cables** (#,) 3x1.5mm^2
7	**Power cable** 3x1.5mm^2 Fuse: 16A slow-blow Recommended: Type B automatic circuit breaker
8	not applicable
9	Installation pipe (or corresponding flat duct) for additional requirement e.g. practice network connecting cable

Supply lines in the termination panel



Supply above the floor, "above-floor installation"

The supply pipe ends, corner valves and cables must be routed as shown above.

The retrofit kit for above-floor installation (33 17 265) is required for installation.

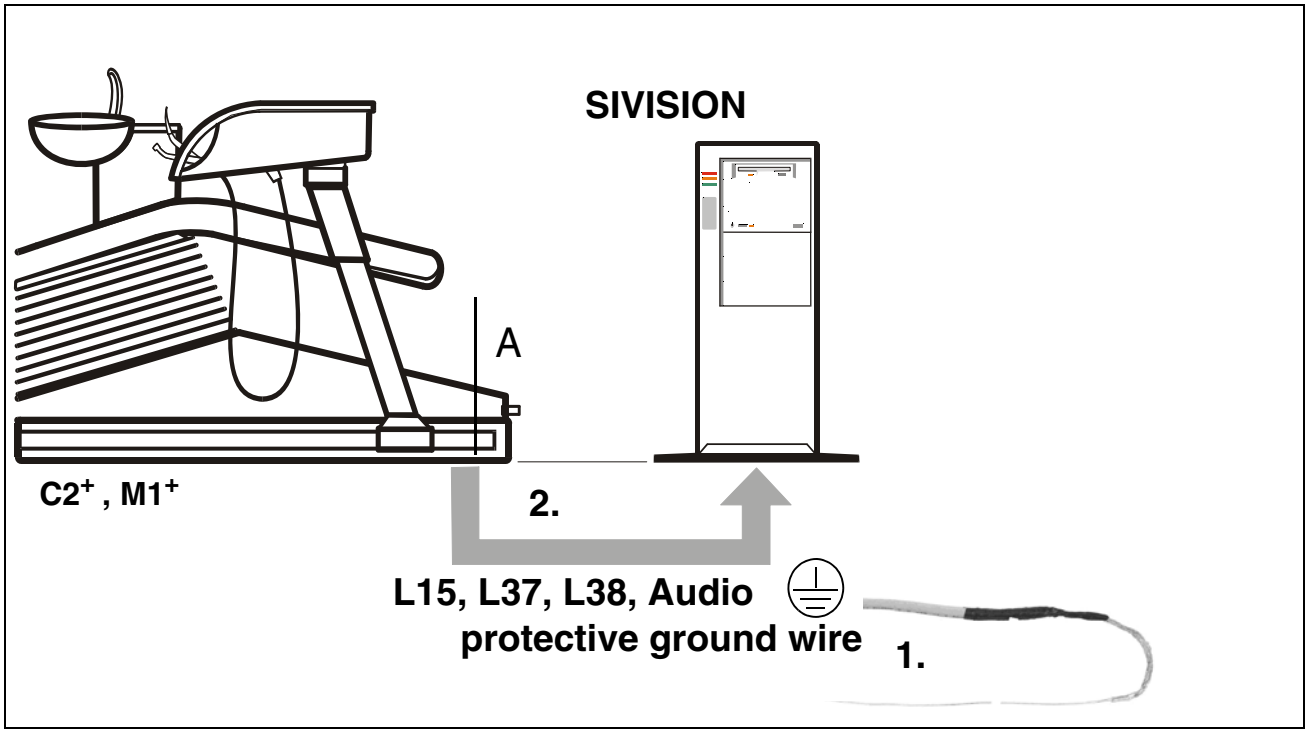
ATTENTION

For cleaning, rinse the air and water pipes thoroughly (metal chips!).

Supply through the floor, "underfloor installation"

1. The top edges of the corner valves for air and water must not protrude more than 60mm above the upper surface of the finished floor.
2. The suction and drain pipes must be flush with the upper surface of the floor (a deviation of +5mm is permissible).
   Internal diameter for both pipes: 36,5mm.
3. The electrical cables must protrude at least 500mm.

1.4 Underfloor installation of SIVISION connections



Important information for the installer

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 dental treatment center. In this case, please observe the following:

Proceed with **extreme care** when running the cables. Particularly cables **L15** and **L38** are very sensitive, and must never be kinked or twisted. The cables must **not overlap or cross one another**.

RS232 (**L37**) and the XGA cable (**L38**) are not yet cut to length and terminated on the PC side. It would be impossible to pull the cables through when installing them under floor level if a sub D connector were already connected. These cables should always be pulled.

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

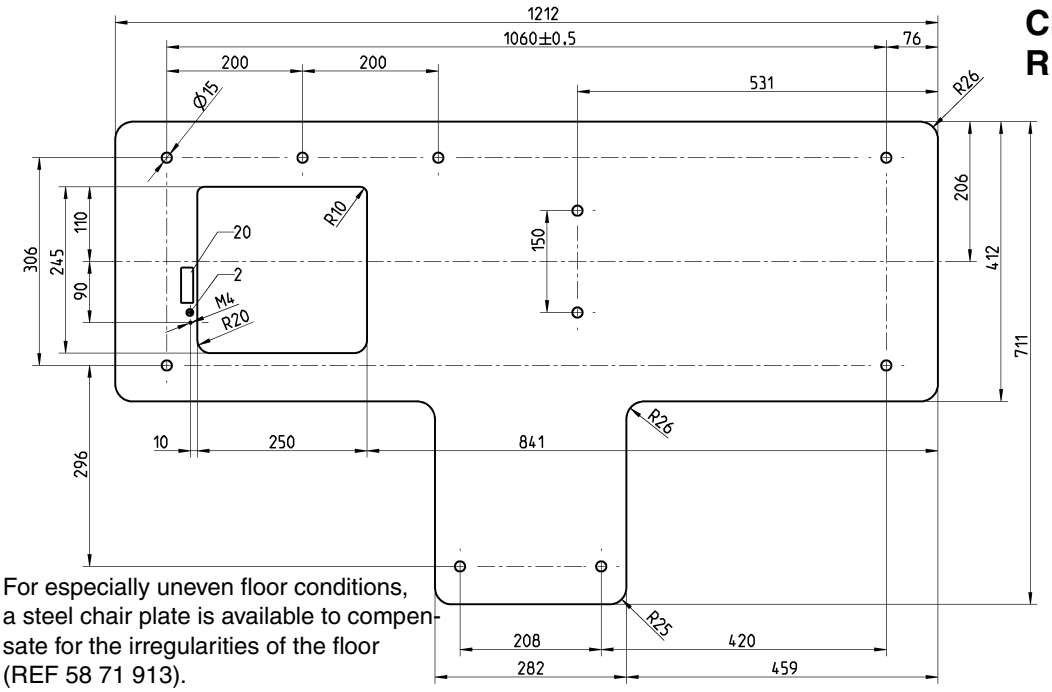
If S video cable **L15** is equipped with both a female and a male connector, make sure that the female connector (socket) points to the connection box of the treatment center.

1. Bend the wire at the front end of cables **L37** and **L38** to form a hook.
2. Pull cables **L15, L37** and **L38** as well as the **audio** and protective ground wire cables from the treatment center through the cable duct to the location of the SIVISION PC.

Save the accessory parts for final installation!

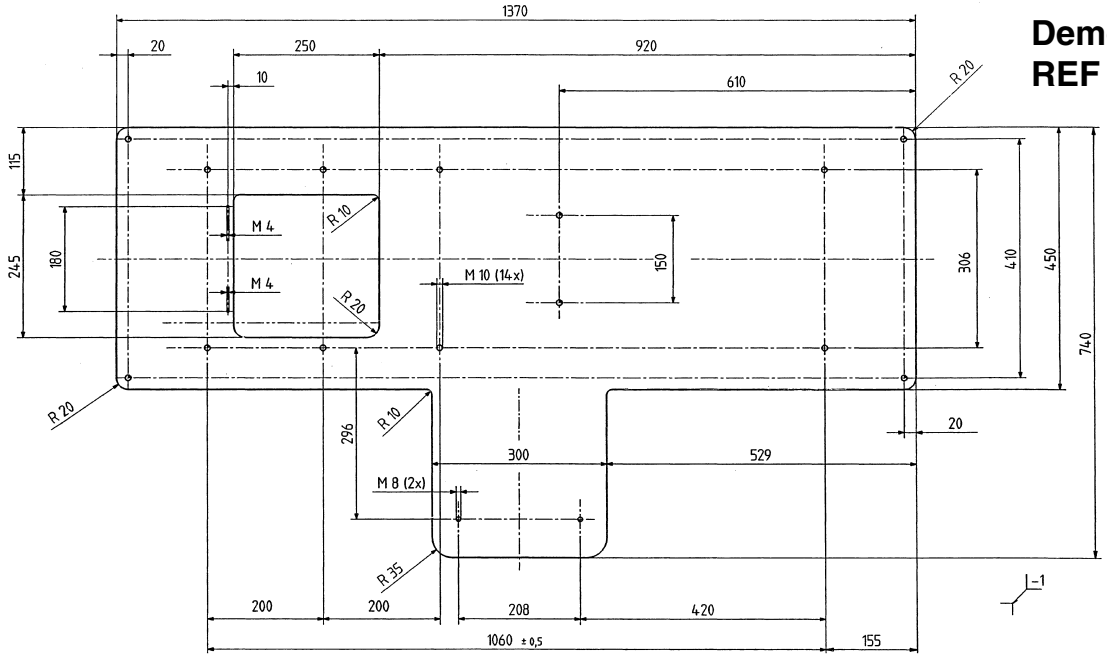
1.5 Mounting plates

Chair plate REF 58 71 913



For especially uneven floor conditions, a steel chair plate is available to compensate for the irregularities of the floor (REF 58 71 913).

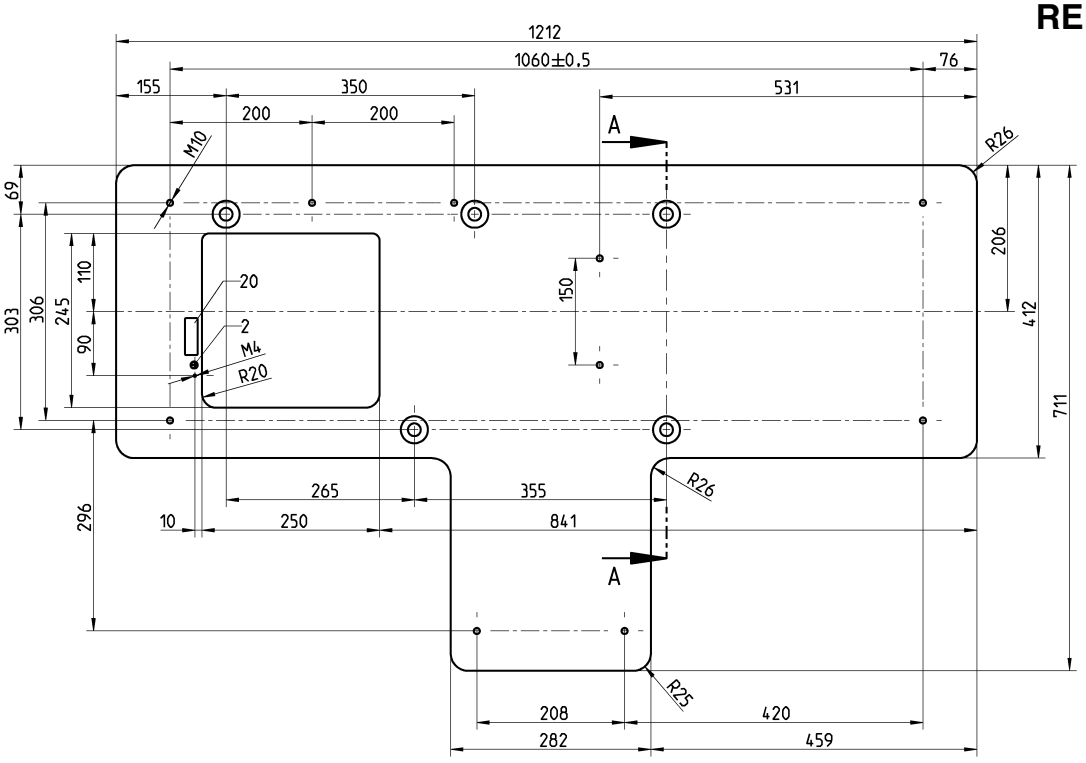
Demo plate REF 58 66 301

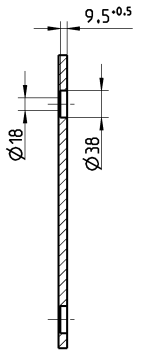


For floors which do not permit permanent connection of the unit (e.g. demo operation at a fair), installation on a steel demo plate is possible (REF 58 66 301).

Mounting plates

Adapter plate
REF 58 70 493





A-A

If the C2+ or M1+ is installed as a replacement for an M1 at this position, then an adapter plate, with the aid of which the existing mounting holes can be used, is available under the order number 58 70 493.

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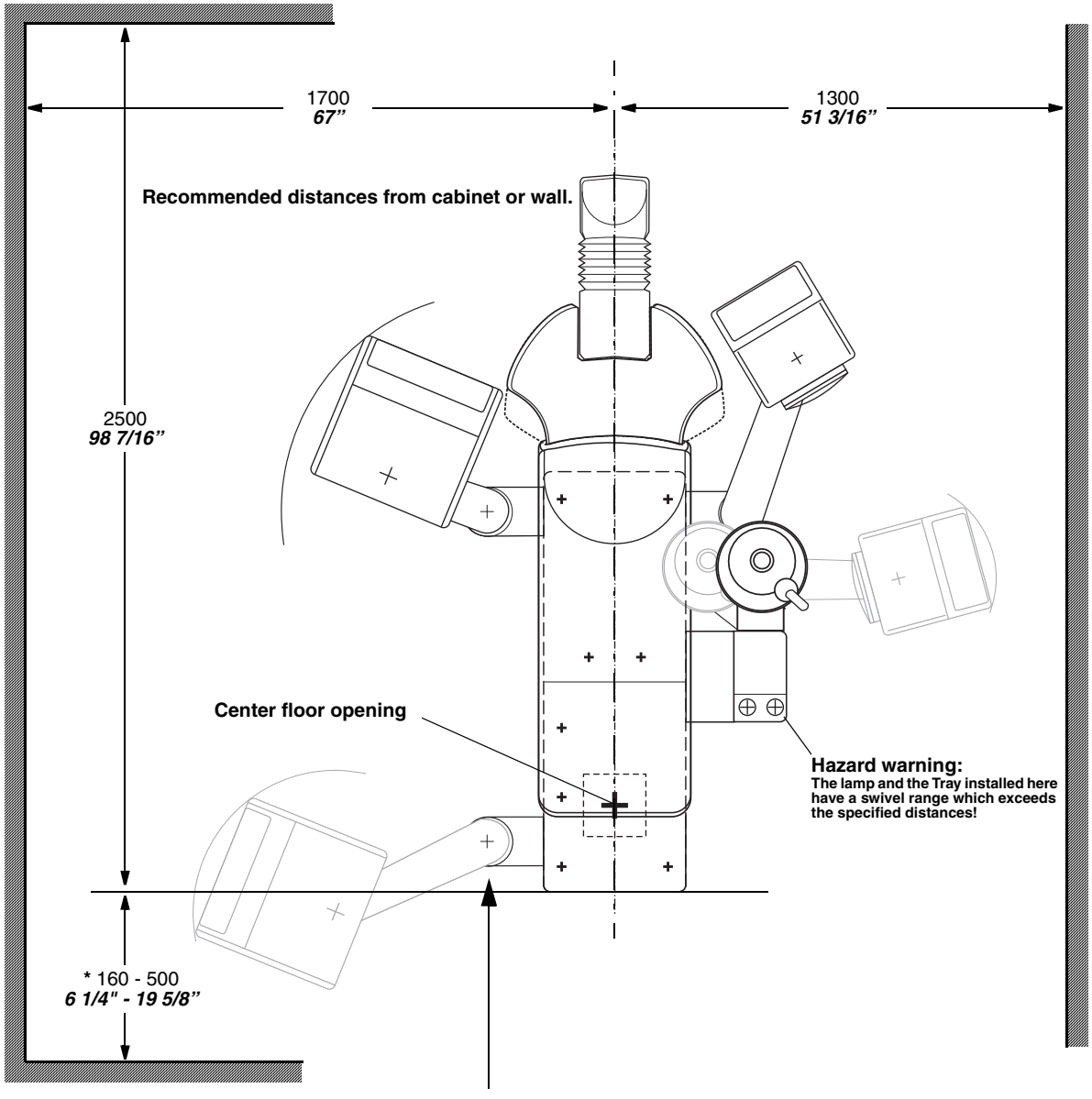
2 Dimensions, technical data

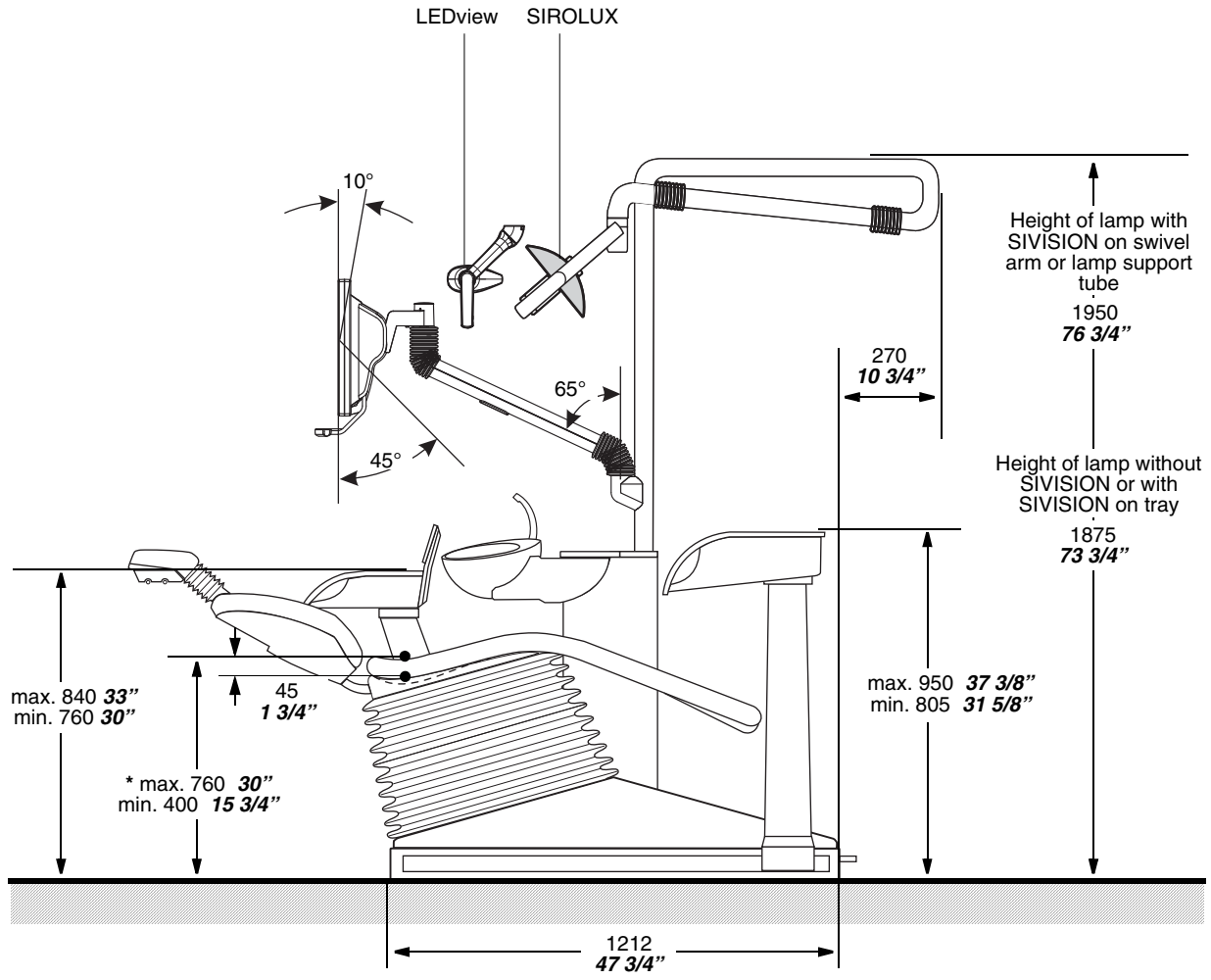
C2+, M1+

2.1 Dimensions of the C2+ 1:20



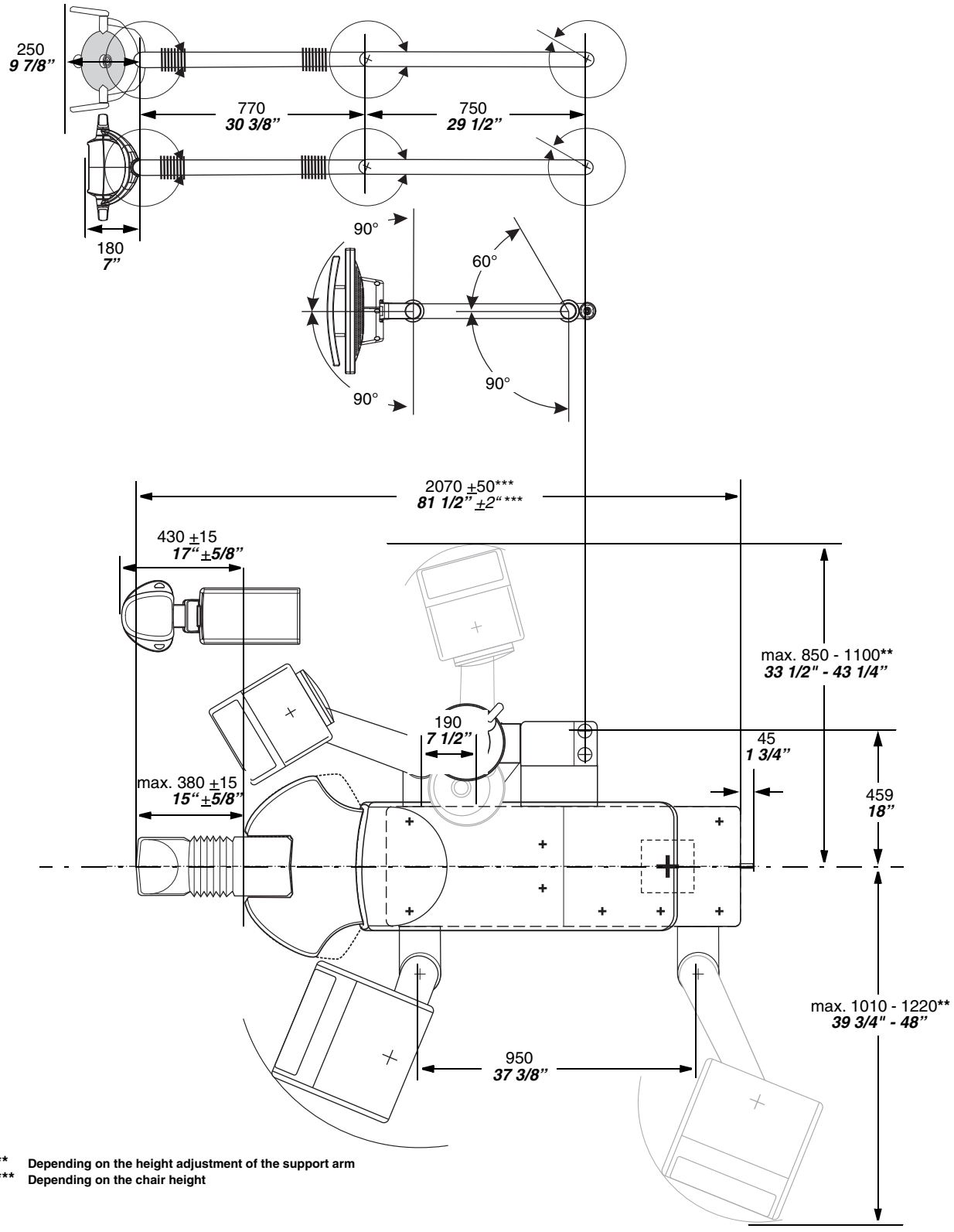
* Depending on the setting of the support arm stop (factory setting: 500mm)

Dimensions of the C2+ 1:20



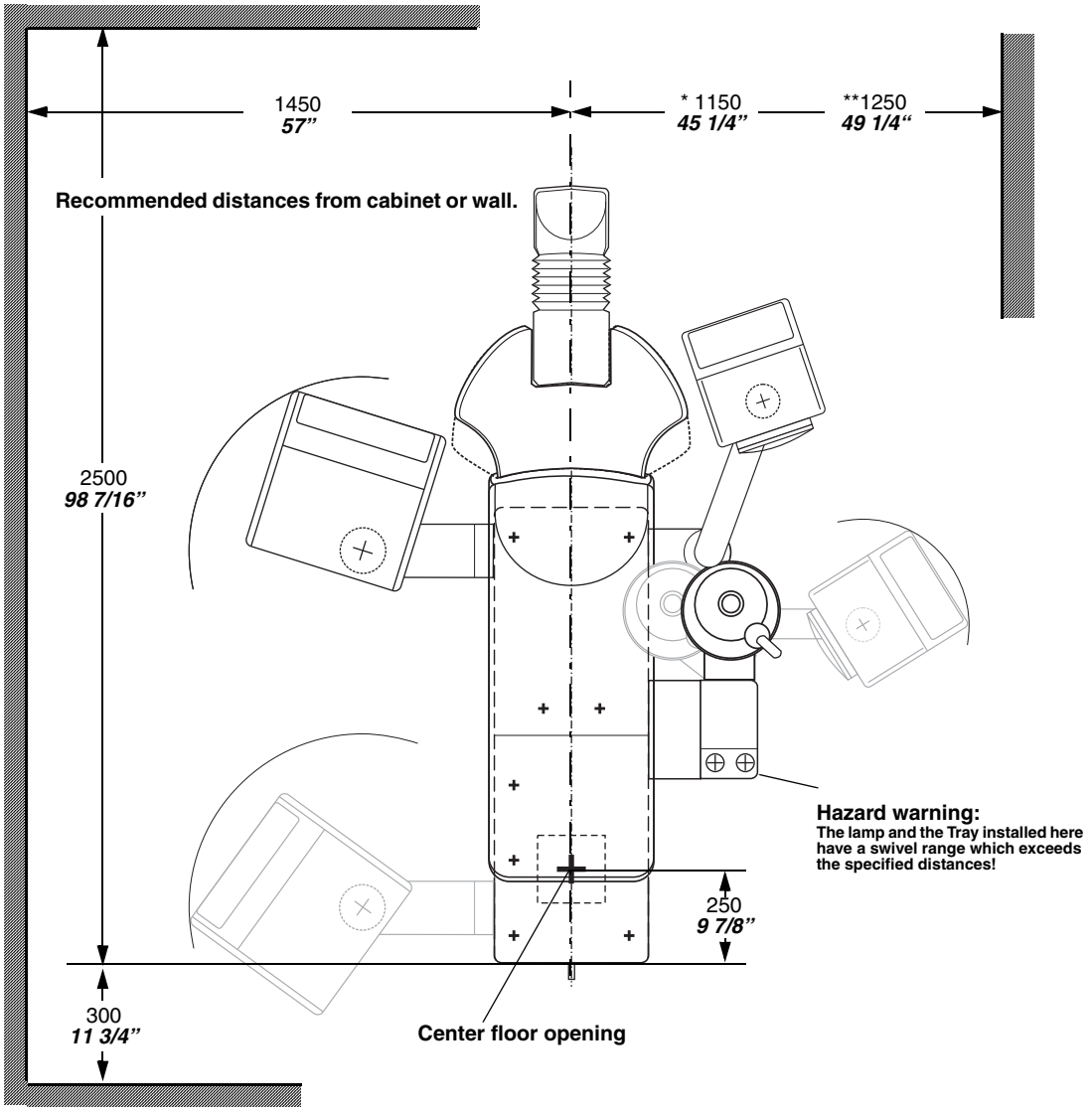
Standard upholstery
*** max.: backrest and chair in highest position**
min.: backrest and chair in lowest position

Dimensions of the C2+ 1:20



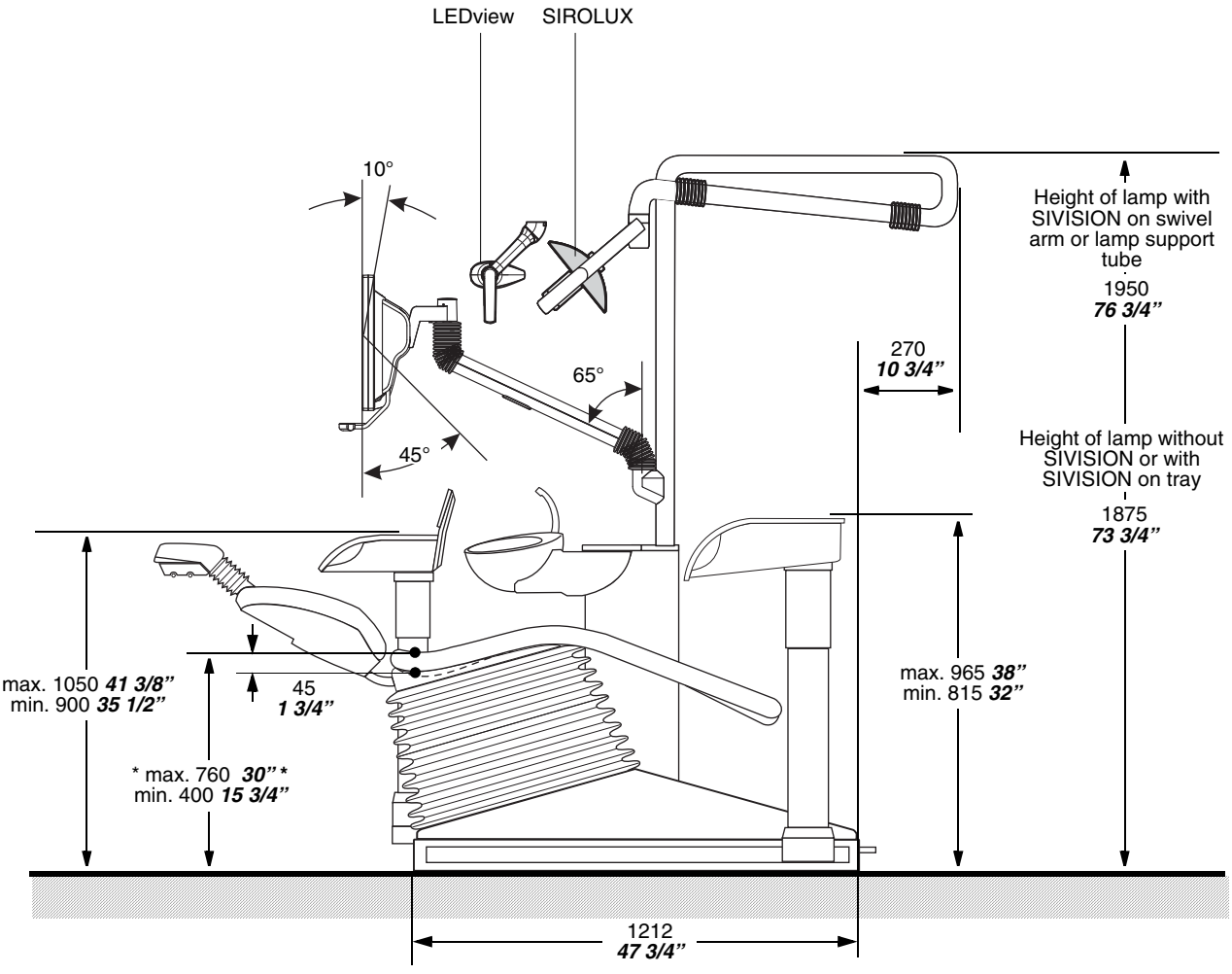
** Depending on the height adjustment of the support arm
*** Depending on the chair height

2.2 Dimensions of the M1+ 1:20



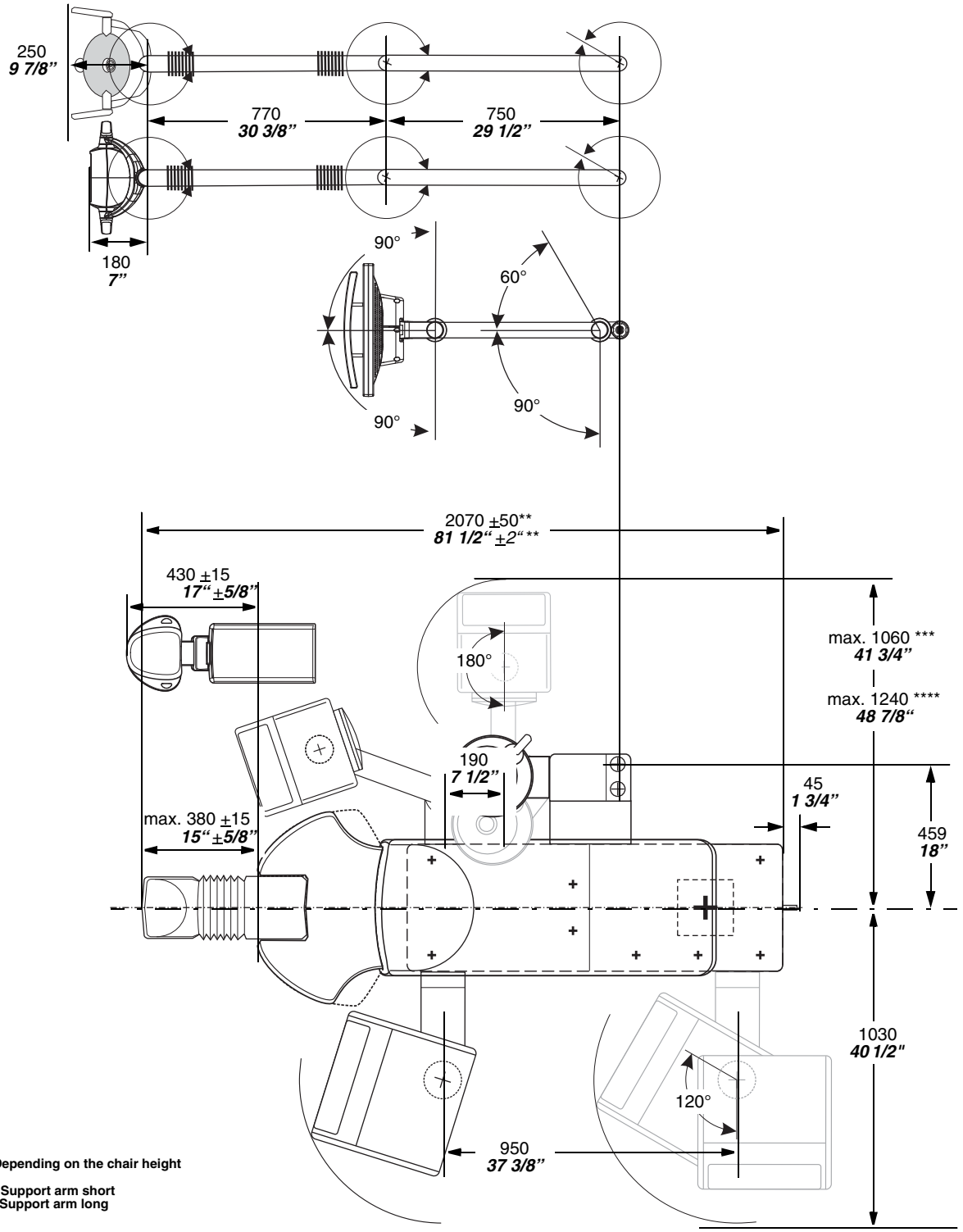
* Support arm short
** Support arm long

Dimensions of the M1+ 1:20 t



Standard upholstery
*** max.: backrest and chair in highest position**
min.: backrest and chair in lowest position

Dimensions of the M1+ 1:20



** Depending on the chair height

*** Support arm short
**** Support arm long

2.3 Technical data

C2+, M1+

Weight	C2+ incl. / without packaging	M1+
Dentist element, assistant element, water unit Chair Upholstery	90,5kg / 50,5kg 142kg / 112kg 13kg / 10kg	85,5kg / 64,5kg 142kg / 112kg 13kg / 10kg
Dimensions of the packaging	**C2+ / M1+**	
Dentist element, assistant element, water unit Chair Upholstery	122cm x 63cm x 137cm 153cm x 65cm x 83cm 120cm x 52cm x 40cm	
Power supply connection / Nominal current		
	at 230V, 50Hz at 115V, 50/60Hz at 100V, 50/60Hz	4,5A 9,5A 11,5A
On-site pressure readings		
Air min./max. Water min./max.	5.5 / 7.5bar 2.5 / 6bar	
Operating conditions		
	Ambient temperature: 10°C – 40°C (50°F – 104°F) Relative humidity: 30% – 75% Air pressure: 700hPa – 1060hPa	
Transport and storage conditions		
	Temperature: -40°C – +70°C (-40°F – 158°F) Relative humidity: 10% – 95% Air pressure: 500hPa – 1060hPa	
Protection class		
	Class **I** equipment	
Degree of protection against ingress of water		
	Ordinary equipment (not protected). The foot switch is protected against dripping water IPX 1.	
Mode of operation:		
	Continuous operation with intermittent loading corresponding to the dental mode of working.	
Tests / approvals		
	This dental treatment center complies with the requirements of **IEC 60601-1** (electrical and mechanical safety) **and of** **IEC 60601-1-2**(electromagnetic compatibility). **DVGW:** This unit complies with the technical rules and requirements on safety and hygiene for connection to the drinking water supply, provided that a disinfection system is installed. This product bears the CE marking in accordance with the provisions of the Council Directive 93/42/EEC of June 14, 1993 concerning medical devices.	

DVGW
CE
0123

3 Electromagnetic compatibility

C2+, M1+

NOTE

The C2+, M1+ fulfills all requirements for electromagnetic compatibility (EMC) compliant with IEC 60601-1-2.
*The C2+, M1+ is referred to as "**UNIT**" in the following.*

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

3.1 Accessories

Making the PC connection

Designation of interface cables for the PCs	Supplier
XGA cable, 10m (L38)	Sirona
S video cable, 10m (L15)	Sirona
RS232 cable, 10m (L37)	Sirona
Audio cable, 10m	Sirona
FireWire, 10m (for the CEREC-PC	Sirona
2nd protective ground wire, 1.5 mm^2, 10m	Sirona

- The **UNIT** may be operated only with accessories and spare parts approved by Sirona. Unapproved accessories and spare parts may lead to an increased emission of or a reduced immunity to interference.
- The **UNIT** should not be operated immediately adjacent to other devices. If this proves to be unavoidable, the **UNIT** should be monitored to check and make sure that it is used properly.

The EMC measurements were performed with the following PCs:

PC as peripheral device for checking the interfaces with:	PC 1: Siemens Fujitsu, Pentium III, 650 MHz

Extension of the PCs

Graphics card	PC 1: Graphik - Controller Matrox Millenium G450 DualHead
	PC 2: Graphik controller MS I NX 6800GT
Frame grabber card	PicPort Color frame grabber card (Leutron) REF: 46 93 961

3.2 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 guidelines
HF emission according to **CISPR 11**	Group 1[a]	The **UNIT** uses HF energy only for its internal function. The HF emission is therefore very low, and it is improbable that nearby electronic devices might be disturbed.
HF emission 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**	compliant	

a. If an HF electrosurgical unit is integrated, it must emit electromagnetic energy in order to function properly. Any electrical devices located nearby may be influenced whenever the HF surgical unit is active. According to IEC 60601-2-2, 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.

3.3 Immunity to interference

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.

Immunity interference tests	IEC 60601-1-2 test level	Conformance level	Electromagnetic environment guidelines
Electrostatic discharge (ESD) according to **IEC 61000-4-2**	± 6kV contact discharge ± 8 kV air discharge	± 6kV contact discharge ± 8kV air discharge	Floors should be made of wood or concrete or covered with ceramic tiling. If the floor surface consists of synethetic material, the relative humidity must be at least 30%.
Electrical fast transient/burst according to **IEC 61000-4-4**	± 1kV for input and output lines ± 2kV power cables	± 1kV for input and output lines ± 2kV power cables	The quality of the supply voltage should conform to the typical business or hospital environment.
Surge voltages according to **IEC 61000-4-5**	± 1kV push-pull voltage ± 2kV push-pull voltage	± 1kV push-pull voltage ± 2kV push-pull voltage	The quality of the supply voltage should conform to the typical business 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 supply voltage should correspond to the typical business 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	The power frequency magnetic fields should correspond to the typical values found in the relevant business and hospital environment.
Remarks: U_T is the AC supply voltage prior to application of the test level.			

Immunity interference tests	IEC 60601-1-2 test level	Conformance level	Electromagnetic environment guidelines
			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:
Conducted HF interference **IEC 61000-4-6**	3 V_{eff} 150 kHz to 80 MHz[a]	3 V_{eff}	$d = [1, 2]\sqrt{P}$
Radiated HF interference **IEC 61000-4-3**	3 V/m 80 MHz to 800 MHz[a]	3 V_{eff}	$d = [1, 2]\sqrt{P}$ at 80 MHz to 800 MHz
	3 V/m 800 MHz to 2.5 GHz[a]	3 V_{eff}	$d = [2, 3]\sqrt{P}$ 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). The field strength of stationary radio transmitters is based on a local investigation for all frequencies[b] less than the conformance level for all frequencies[c]. Interference is possible in the vicinity of equipment bearing the following graphic symbol. 

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

*b. The field strength of stationary transmitters such as the base stations of radio telephones and land mobile services, amateur radio stations as well as AM and FM radio and television broadcasting stations cannot be accurately predetermined. An investigation of the location is recommended to determine the electromagnetic environment resulting from stationary HF transmitters. If the field strength measured at the **UNIT** location exceeds the conformance level specified above, the **UNIT** must be observed with respect to its normal operation at each application site. If unusual performance characteristics are observed, it may be necessary to take additional measures such as reorientation or repositioning of the **UNIT**.*

c. A frequency range of 150 kHz to 80 MHz results in a field strength of less than 3 V/m.

3.4 Working clearances

Recommended working clearances between portable and mobile HF 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 HF communication devices (transmitters) and the **UNIT**. These values may vary according to the output power of the relevant communication device as specified above.

Nominal transmitter output [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.

Annotation 1
The higher frequency range applies at 80 MHz and 800 MHz.

Annotation 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.

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

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