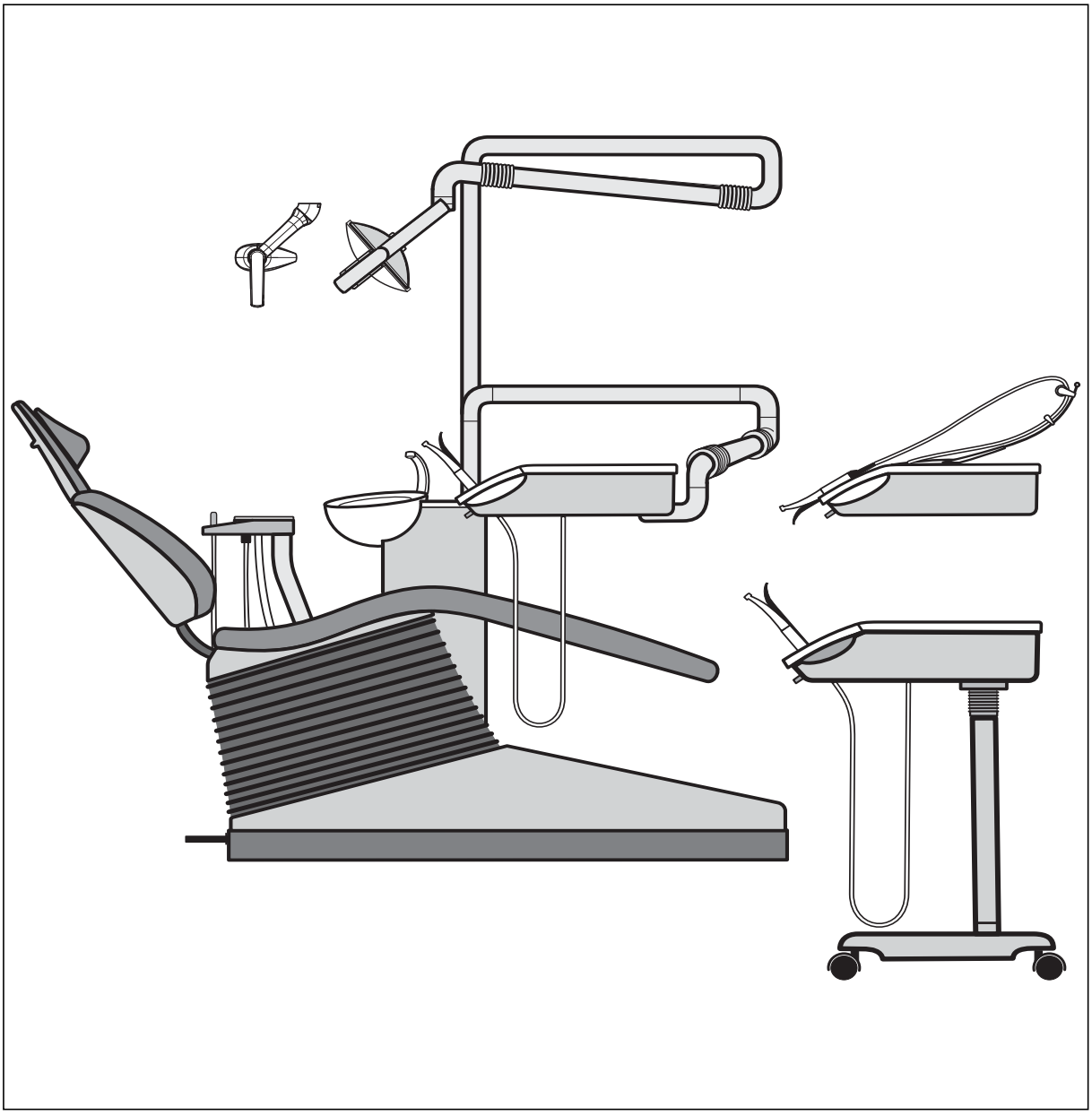
New as of: 10.2014

sirona
The Dental Company

C8+ / C8+ Turn

Installation Requirements

English



General information

About this document

This document describes the installation requirements for the C8+ / C8+ Turn / C8+ Turn treatment centers.

The following sets of Installation Instructions describe the subsequent installation procedure:

- REF 59 42 912 (C8+)
- REF 59 78 197 (C8+ Turn)

You will also need the following drilling template in order to fasten the treatment center securely to the floor:

- REF 59 66 911 (C8+, C8+ Turn)

New as of: 10.2014

Changes since the last version (09/2009):

Chapter or section,	page
Does not apply to the following products: C8+ Solo, C8+ Stand-Alone, C8+ Side delivery, C8+ Rear delivery	

Table of contents

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1 Preparations

C8+ / C8+ Turn

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 signal words NOTE, CAUTION or WARNING.

ATTENTION

The unit may only be operated by properly trained personnel. On-site installation must be performed in accordance with our specifications.
In our capacity as a manufacturer of medical electrical equipment, we only consider ourselves to be responsible for the safety characteristics of the unit if we perform maintenance and repair work on it ourselves or if this is performed by centers that we have expressly authorized to do so; and if defective components are replaced with original spare parts.
When this work is carried out, we recommend that you ask those responsible for the work to provide a certificate indicating the nature and scope of the work, including details of changes to rated data or the working area where applicable. This certificate should also be signed and dated, and should show information about the relevant company.

ATTENTION

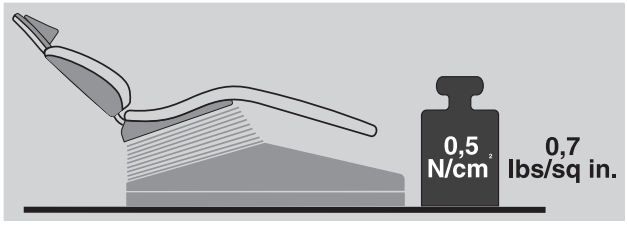
By law, any changes to this unit which may compromise the safety of operators, patients or third parties are not permissible.
For reasons of product safety, this product may only be operated with original Sirona accessories or accessories from third parties approved by Sirona. The user assumes the risk 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. PCs) and*
- *IEC 60601-1 for medical equipment.*

The monitor used at the treatment center must meet the requirements of IEC 60950. The loudspeaker port of the monitor may only be connected 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, for example.
If a system is being assembled during installation, the requirements of IEC 60601-1 (3rd edition) must be adhered to. The person assembling the system assumes responsibility for ensuring that it conforms to Directive 93/42/EEC.

ATTENTION

The floor must be flat and level (DIN 18 202). A mounting plate must be used for uneven floors (see Section 1.5, "Mounting plates C8+ (not for C8+ Turn)" on page 12).



ATTENTION

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

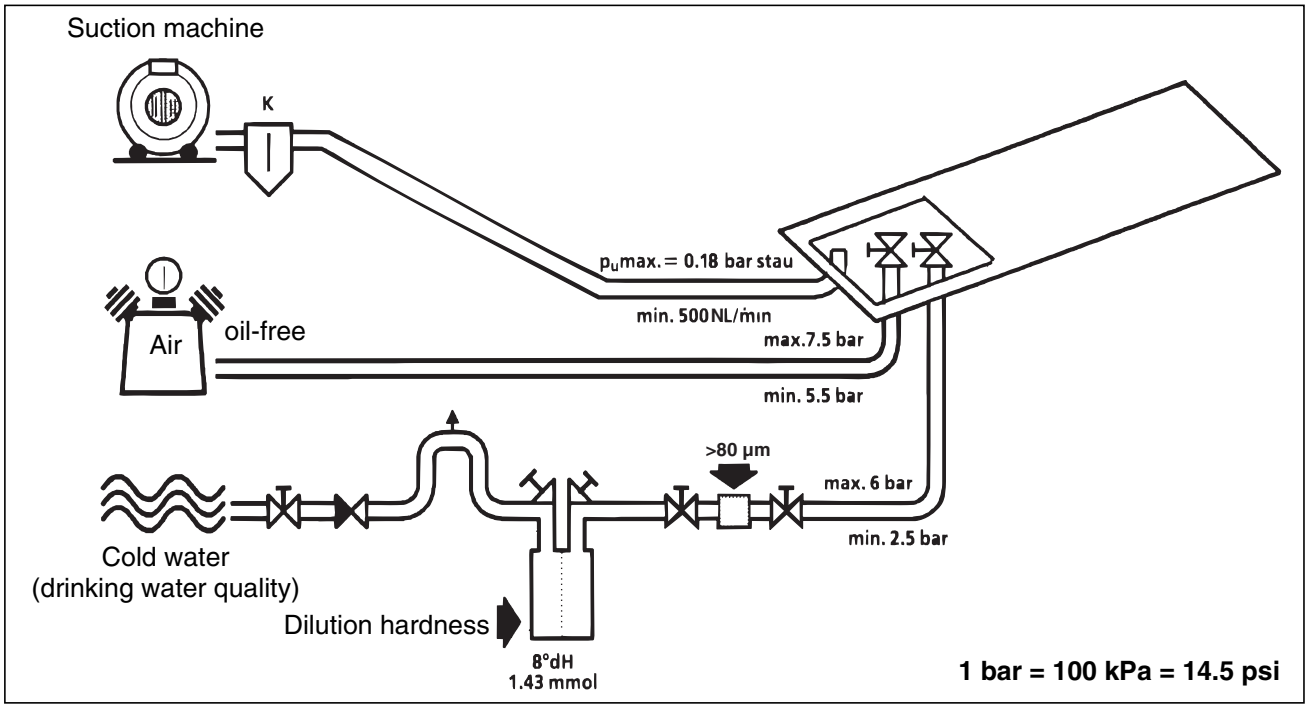
ATTENTION

Wireless phone interference with medical electrical equipment:
To ensure safe operation of medical electrical equipment, the use of mobile wireless phones in practice or hospital environments 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 operating 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:

- 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, where possible, other main consumers (such as the sink) are fed from the same line downstream of the treatment center connection.
  - Avoid laying the supply line parallel to hot water pipes.
- Observe EN 1717 for the protection of public drinking water.
  Provided a disinfection system is also installed, the treatment center fulfills the requirements of EN 1717 and of the DVGW (German Technical and Scientific Association for Gas and Water). It can be connected directly to the public drinking water system.

Air quality

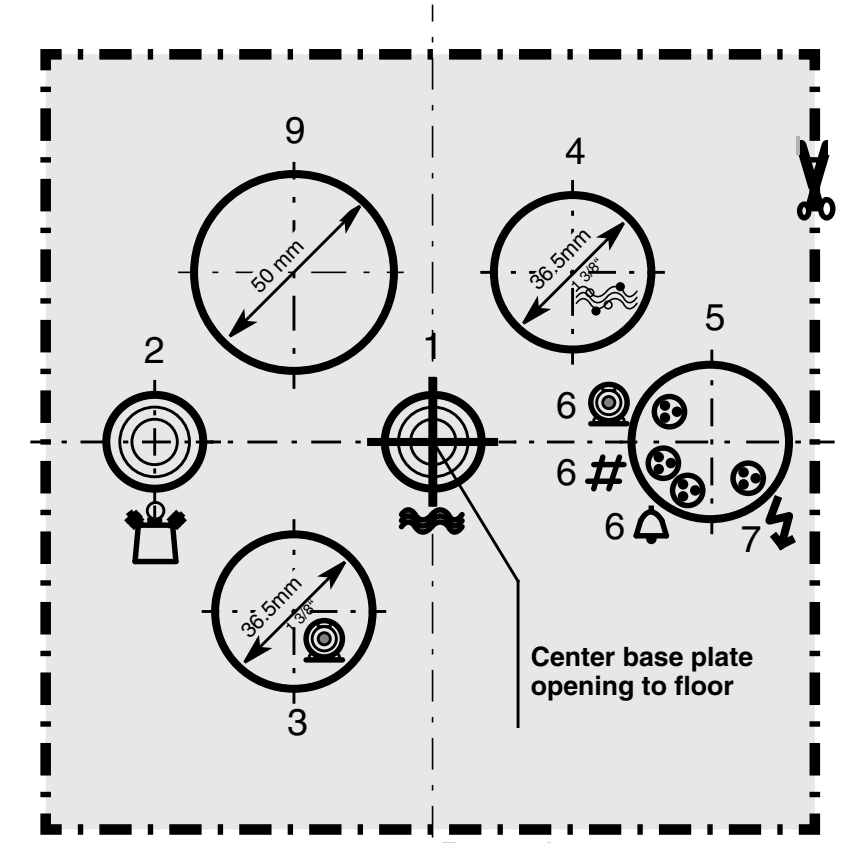
The air for driving the turbines, for cooling the drives and for the cooling spray must be free from oil, dry and hygienically faultless.

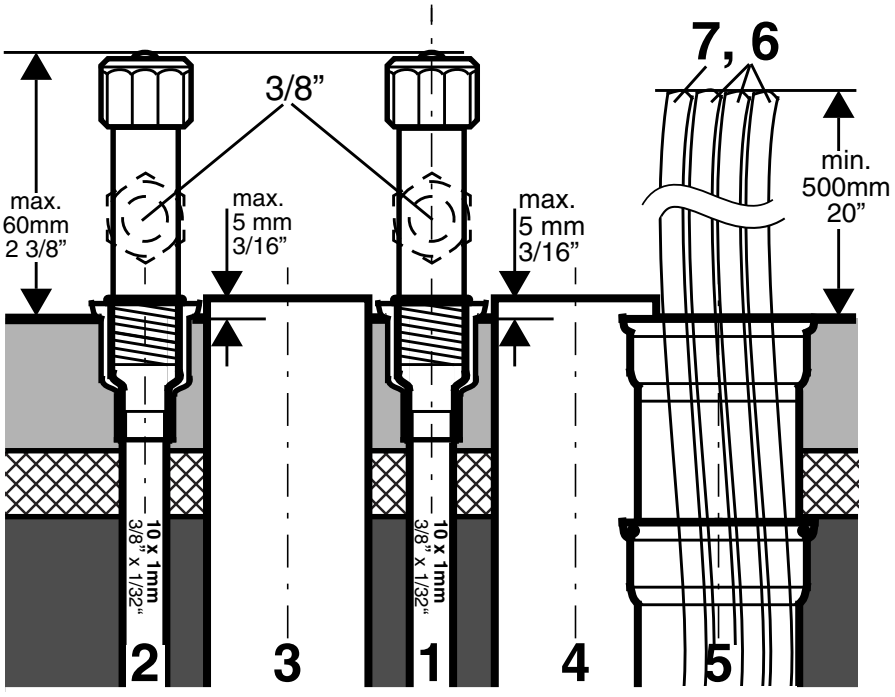
Suction pipe

Install steam trap **K**.

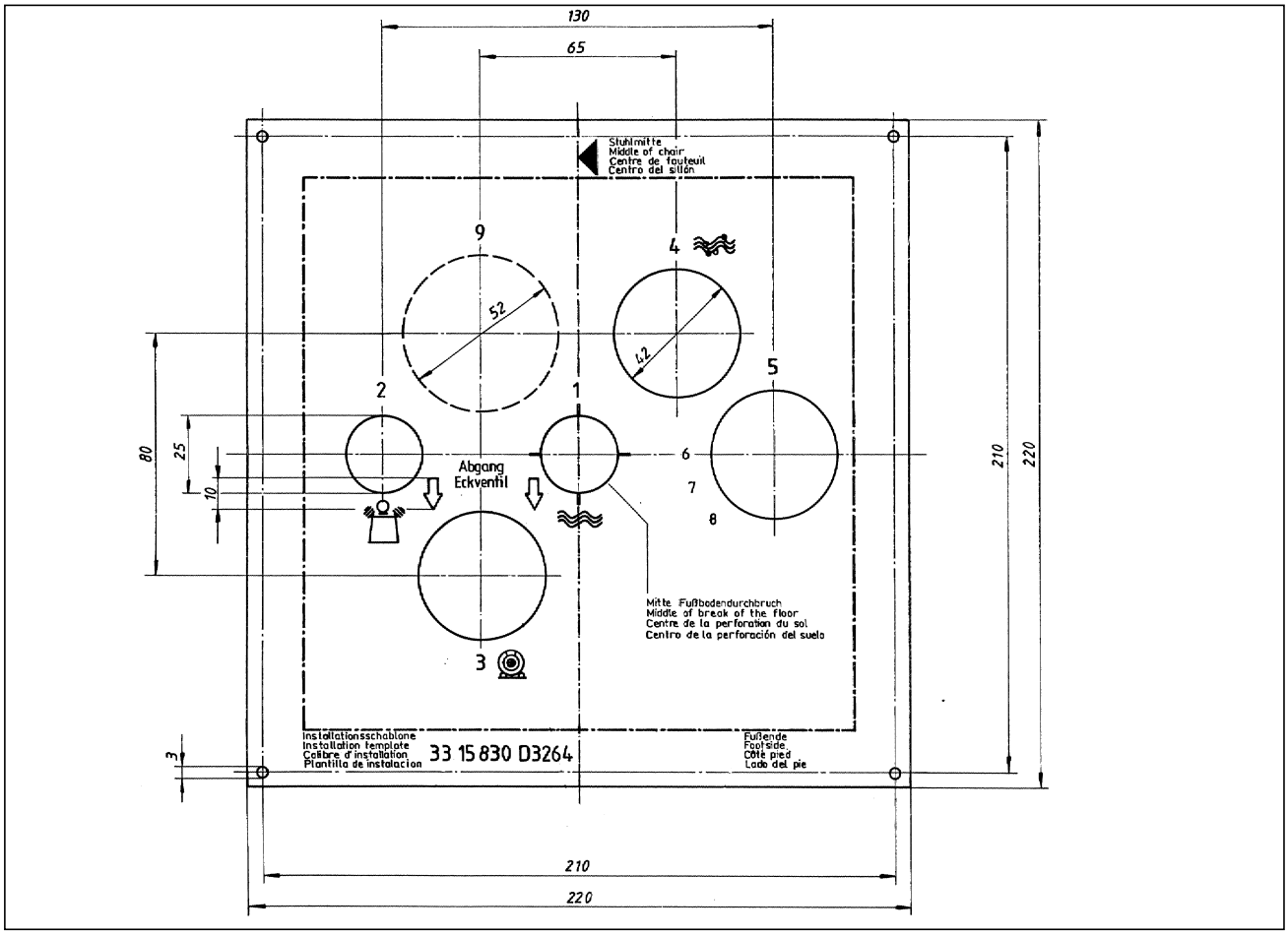
With a vacuum of pu >0.18 bar back pressure, the treatment center must be retrofitted with the "Vacuum limiter" retrofit kit
(REF 59 68 826).

1.3 Supply lines in the termination panel





Supply lines in the termination panel



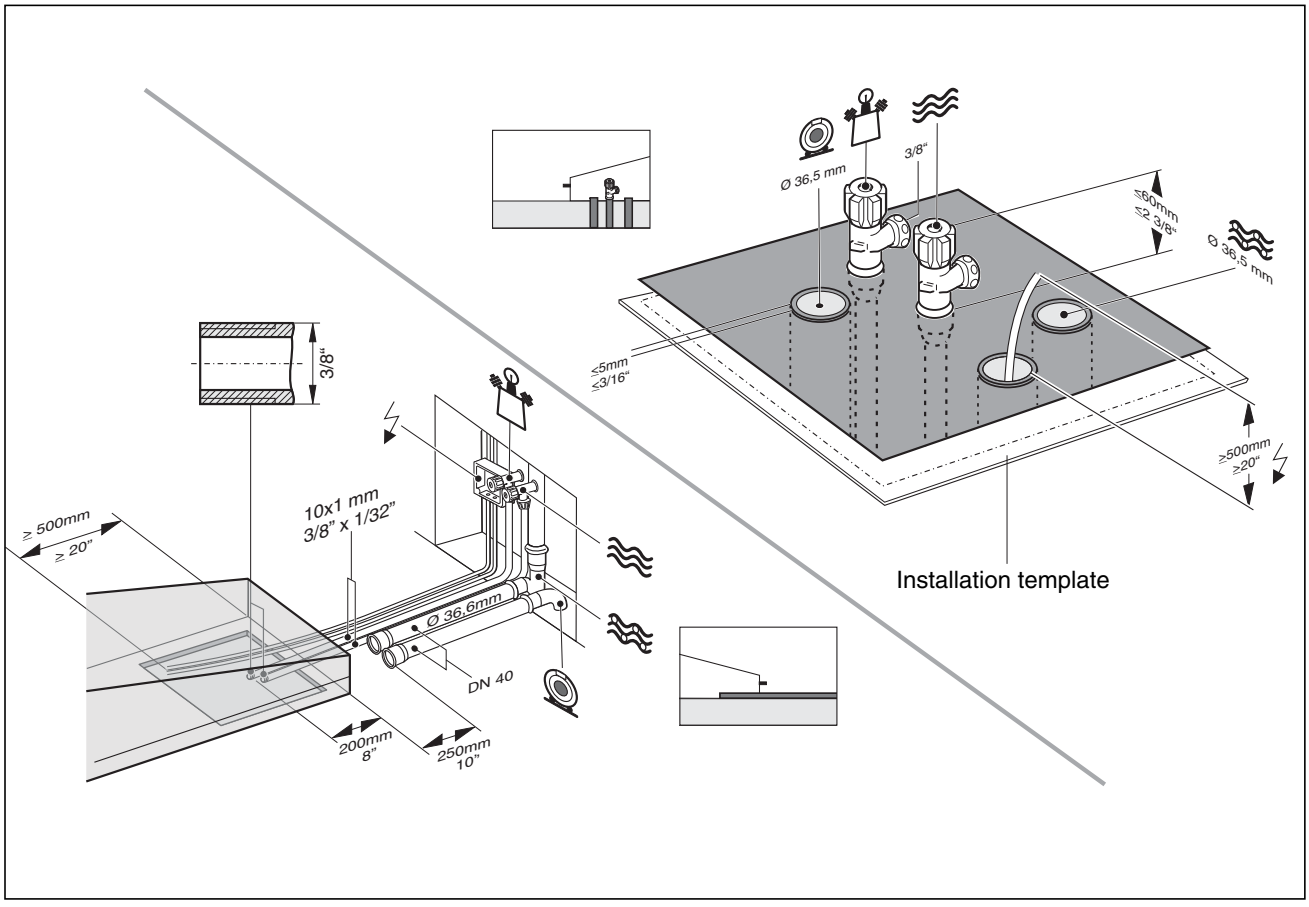
- Observe the national regulations for electrical installations (e.g. VDE 0100, VDE 0100, Part 710).
- Comply with the national regulations for water supply installations (e.g. EN 1717, DIN 1988) and sewage installations (e.g. EN 12056-1).
- For the suction pipe, observe the instructions in the **Suction 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 10x1 mm, corner valve outlet 3/8"
2	**Compressed air 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 (REF 33 17 265) is required for connection.

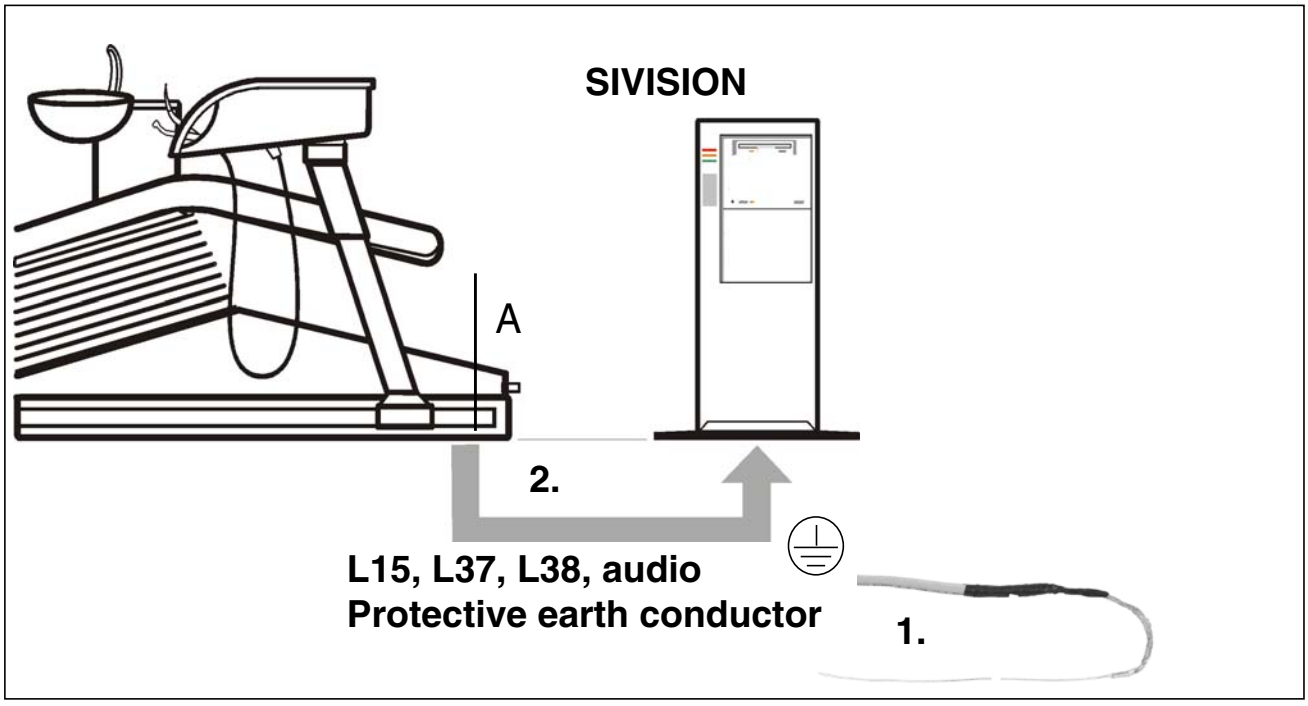
ATTENTION

For cleaning, flush 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 60 mm 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 +5 mm is permissible).
   Internal diameter for both pipes: 36.5 mm.
3. The electrical cables must protrude at least 500 mm.

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 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

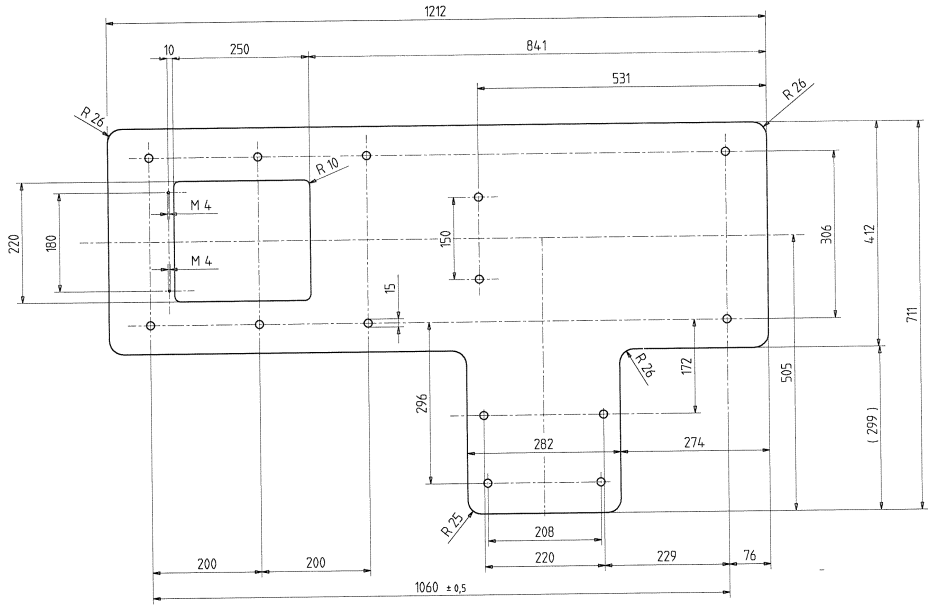
If S video cable **L15** is equipped with both a female and a male connector, make sure that the female connector (socket) points to the connection box of the treatment center.

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** cable and the protective earth conductor for the treatment center through the cable duct to the location of the SIVISION PC.

Save the accessory parts for final installation!

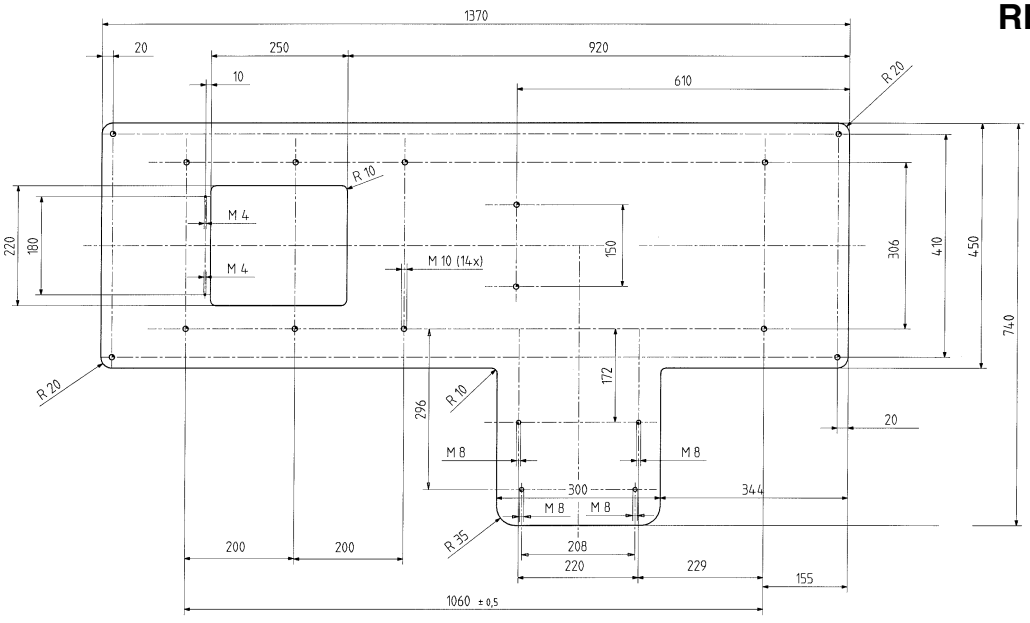
1.5 Mounting plates C8+ (not for C8+ Turn)

Mounting plate REF 58 26 511



For especially uneven floor conditions, a steel mounting plate is available to compensate for the irregularities of the floor (REF 58 26 511).

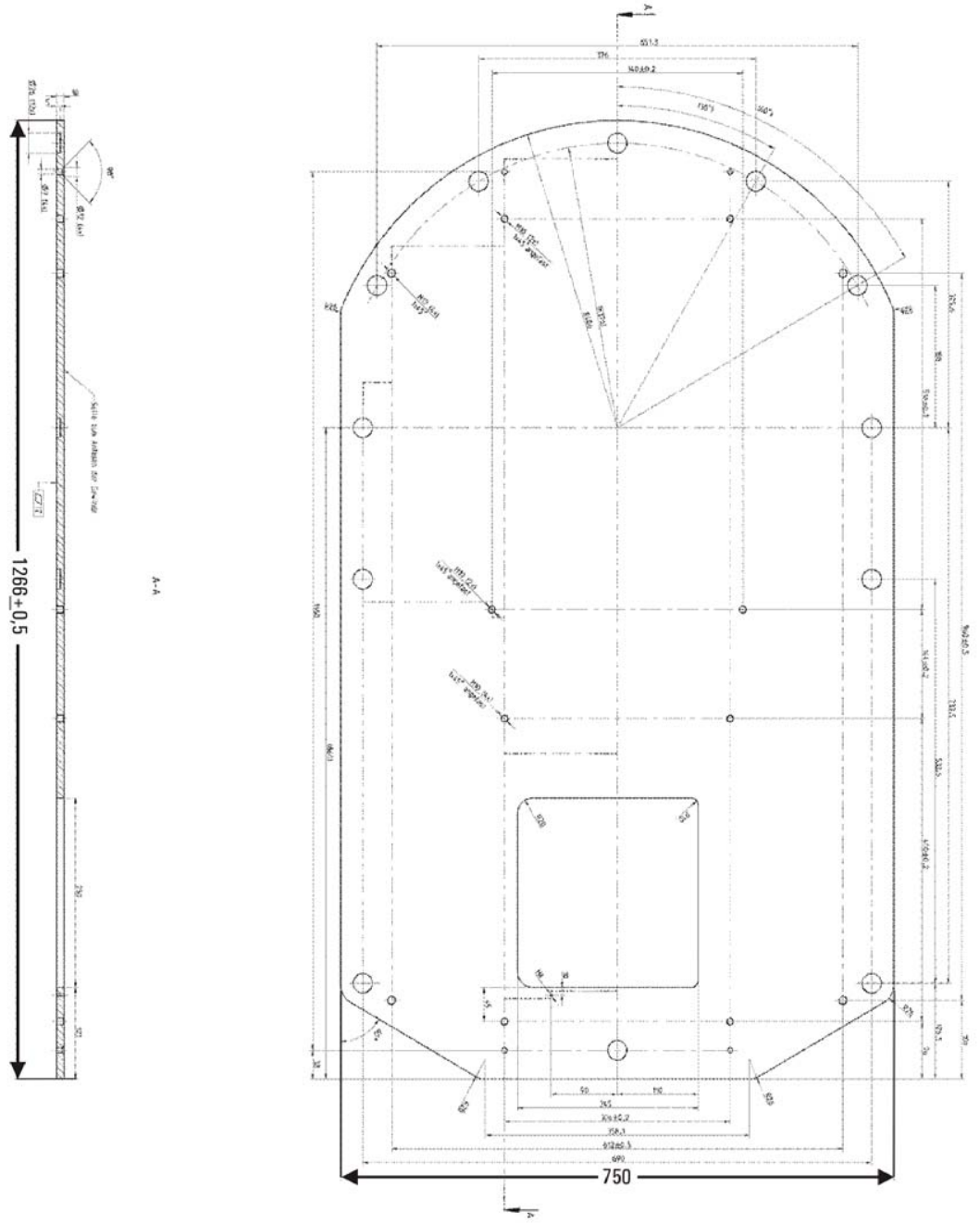
Demonstration chair plate REF 47 08 074



For floors which do not permit permanent connection of the unit (e.g. demo operation at a fair), installation on a steel demonstration chair plate is possible (REF 47 08 074).

1.6 Demonstration chair plate C8+ Turn

Demonstration chair plate
C8+ Turn
REF 59 46 269



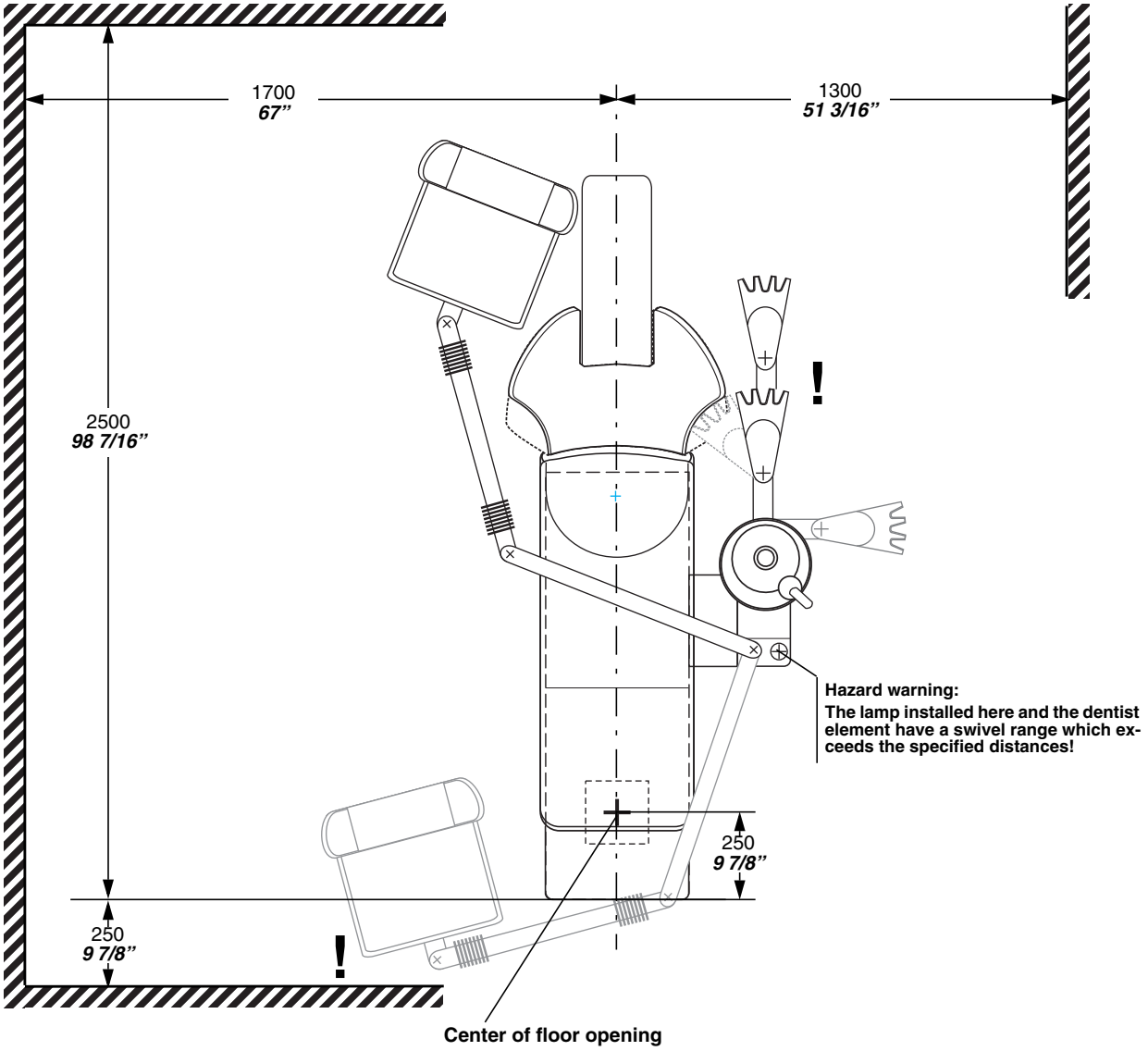
For floors which do not permit permanent connection of the unit (e.g. demo operation at a fair), installation on a steel demonstration chair plate is possible (REF 59 46 269).

2 Dimensions, technical data

C8+ / C8+ Turn

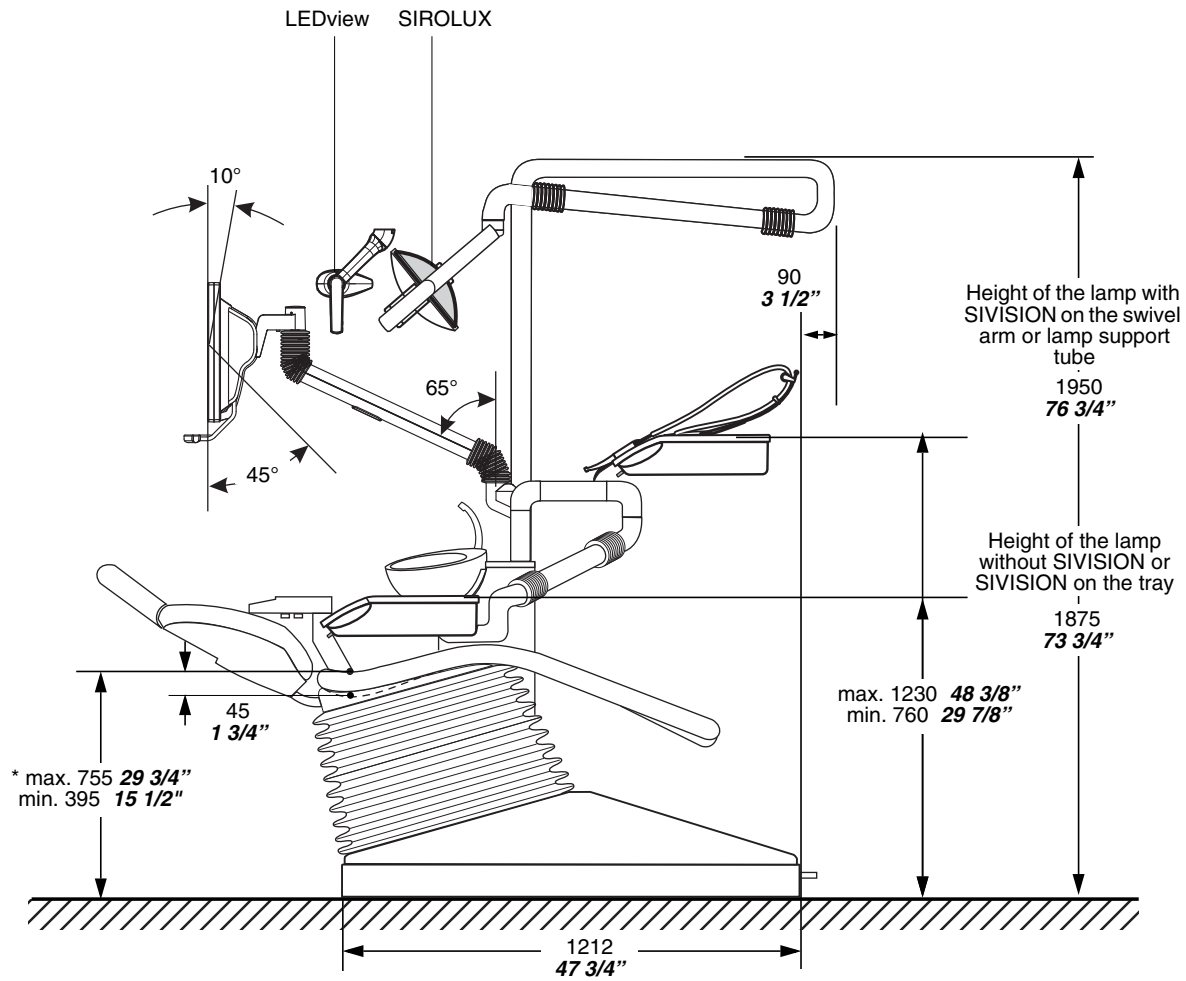
2.1 C8+ 1:20

Recommended distances from cabinet or wall



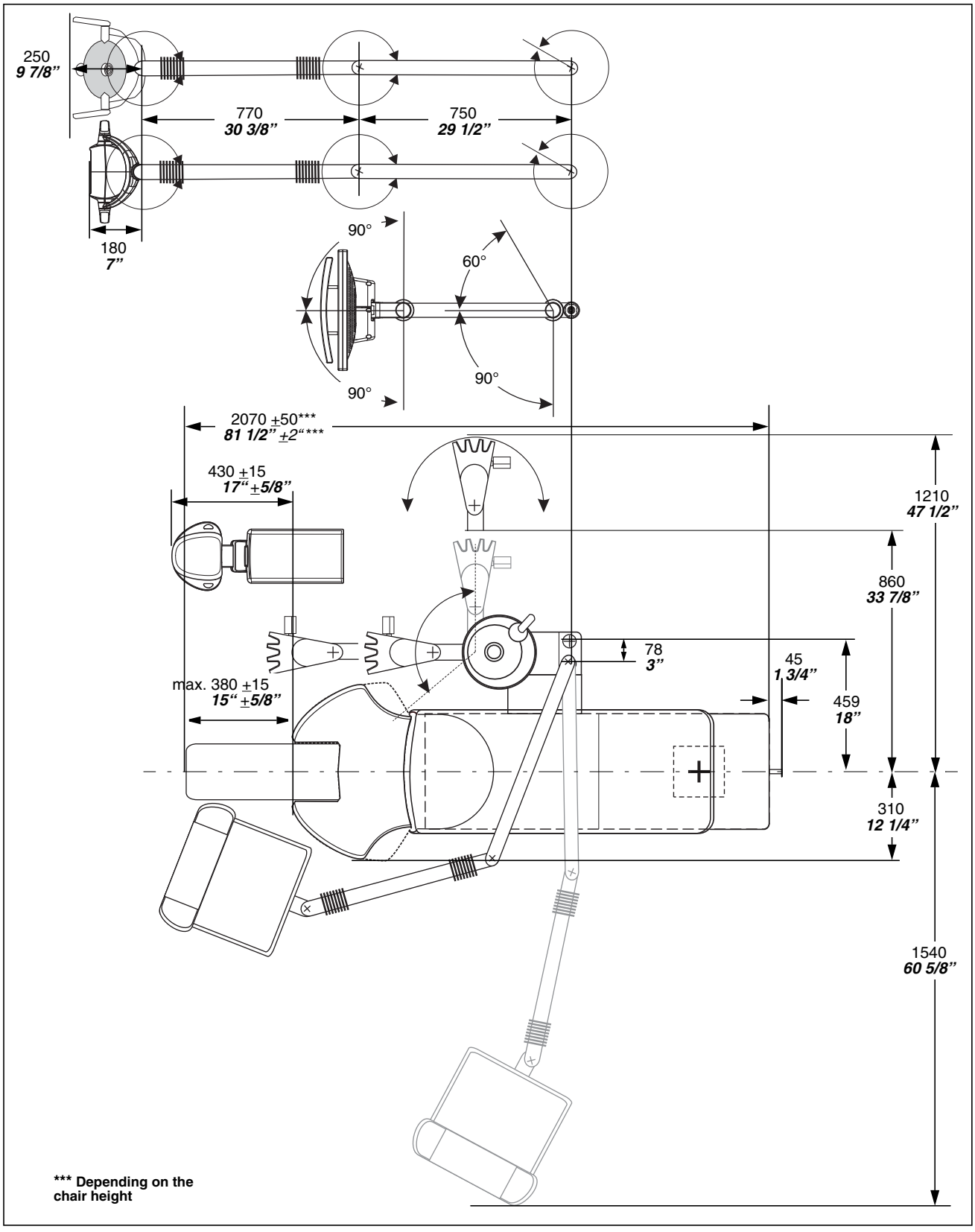
C8+ 1:20

With long support arm for the dentist element



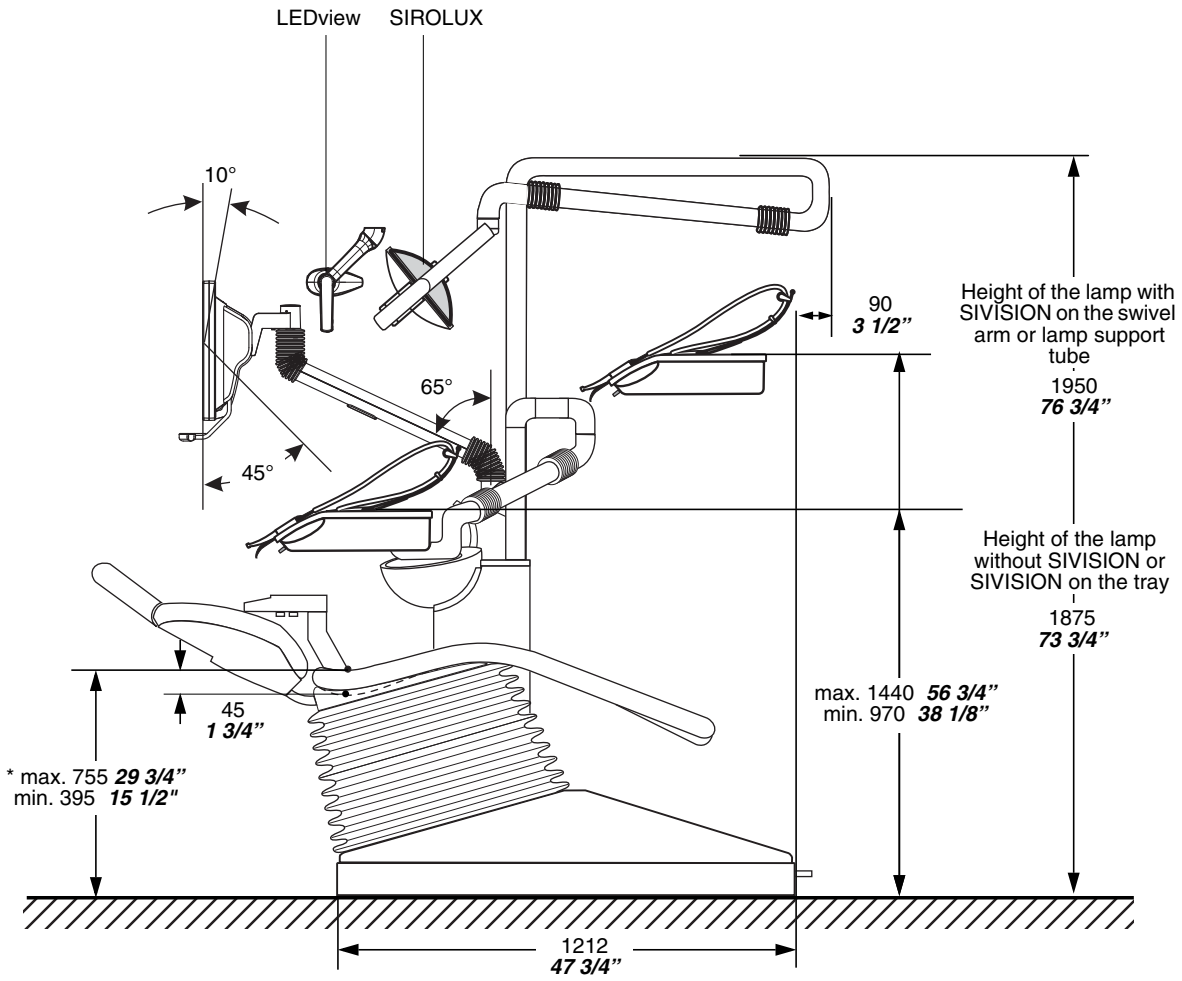
Standard upholstery
*** max.: backrest and chair at highest setting**
min.: backrest and chair at lowest setting

C8+ 1:20


250
9 7/8"
770
30 3/8"
750
29 1/2"
180
7"
90°
60°
90°
90°
2070 ±50***
81 1/2" ±2"***
430 ±15
17" ±5/8"
1210
47 1/2"
860
33 7/8"
78
3"
45
1 3/4"
459
18"
max. 380 ±15
15" ±5/8"
310
12 1/4"
1540
60 5/8"
*** Depending on the chair height

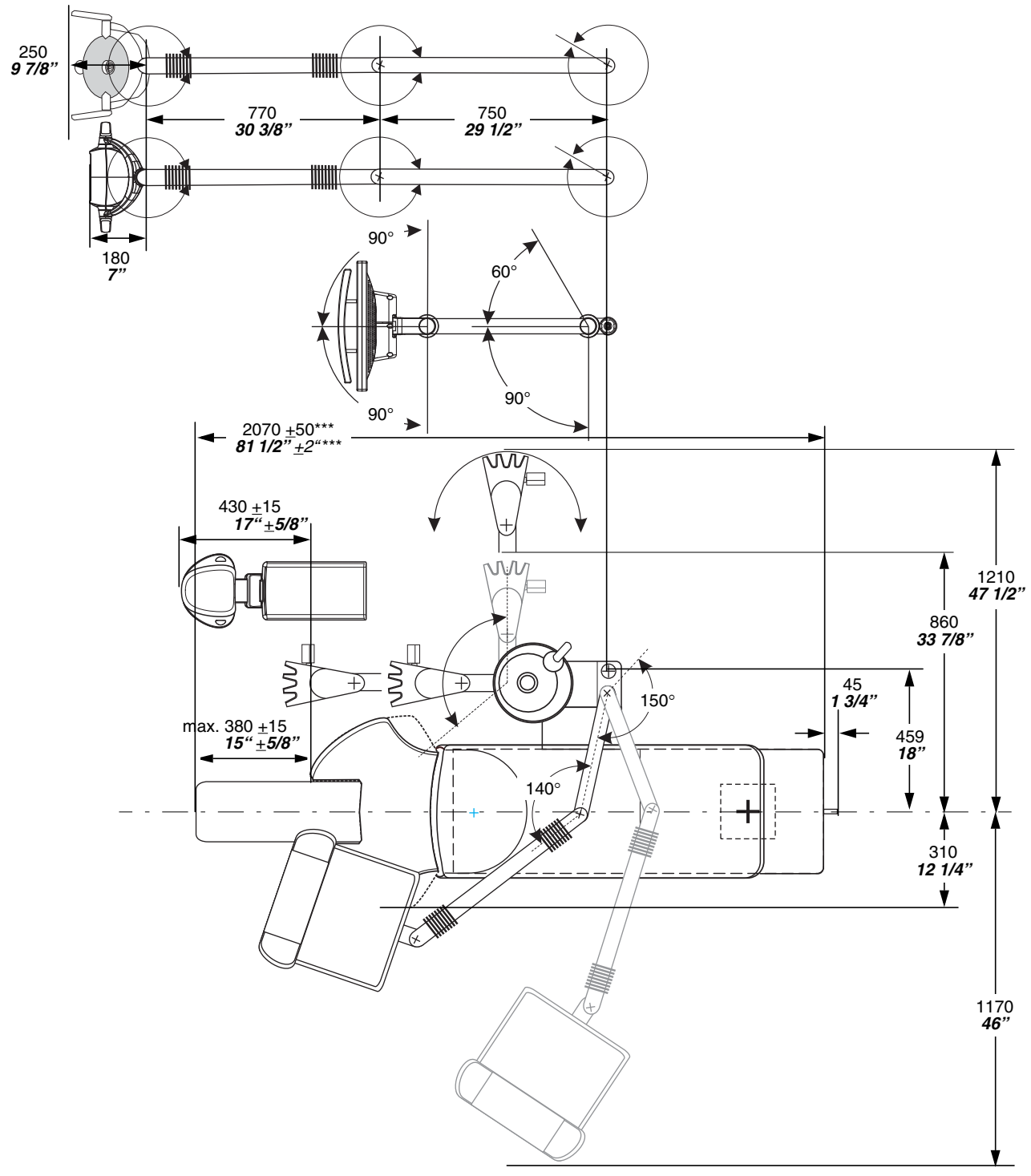
C8+ 1:20

With short support arm for the dentist element



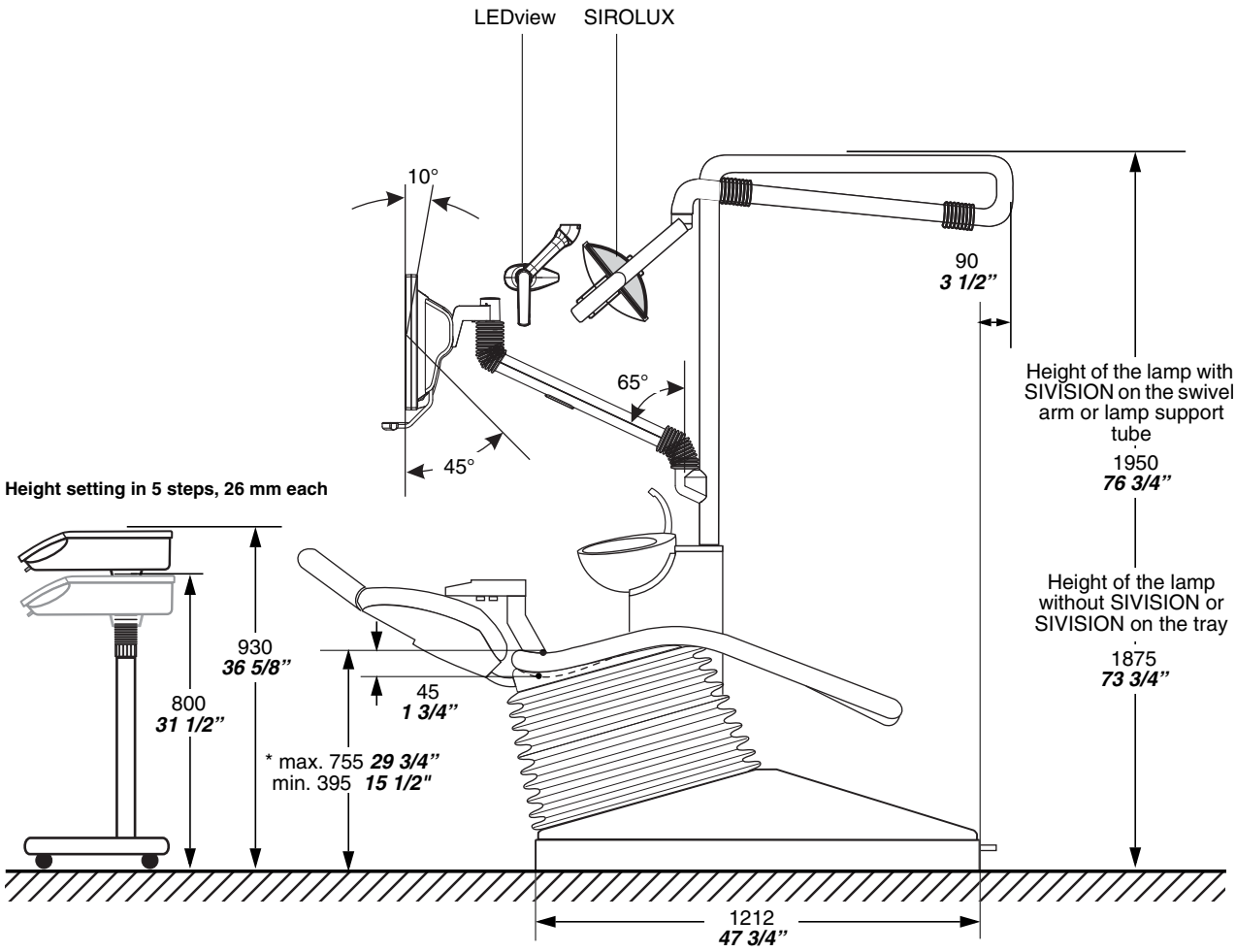
Standard upholstery
*** max.: backrest and chair at highest setting**
min.: backrest and chair at lowest setting

C8+ 1:20



*** Depending on the chair height

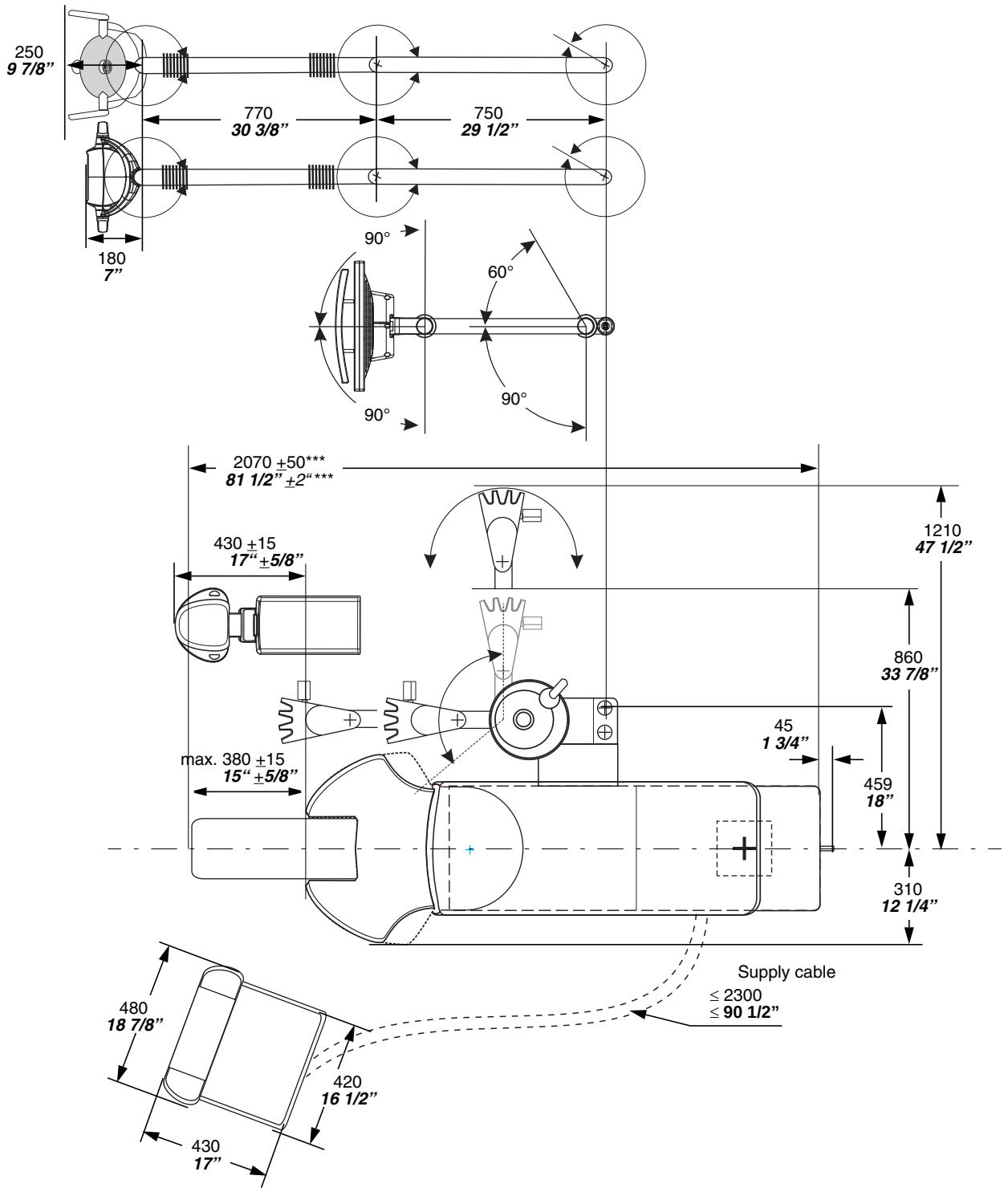
2.2 C8+ Cart 1:20



Standard upholstery

*** max.: backrest and chair at highest setting**
min.: backrest and chair at lowest setting

C8+ Cart 1:20



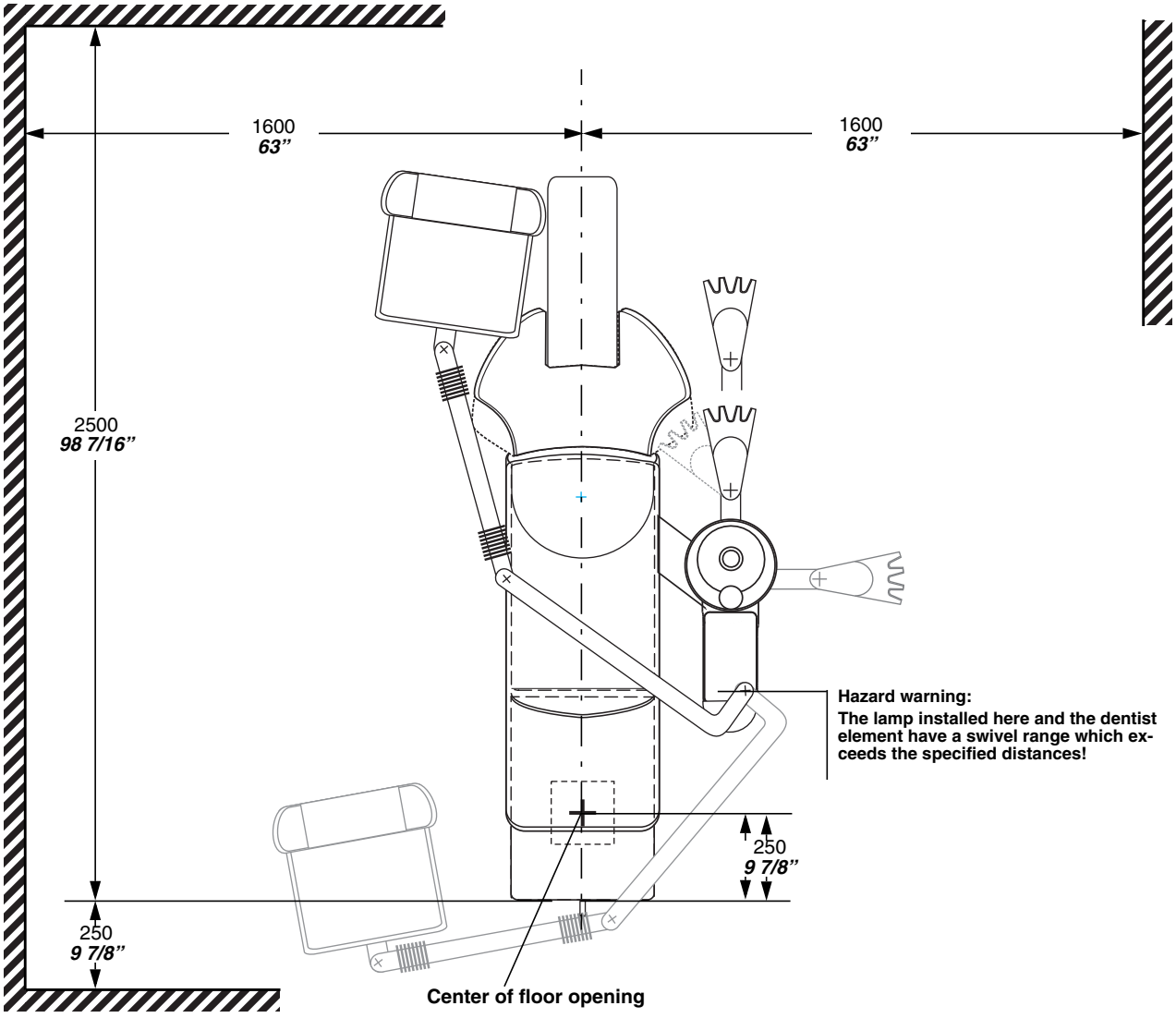
*** Depending on the chair height

2.3 C8+: Technical data

Technical data	
Power supply line	100 V / 115 V / 127 V / 230 VAC 50 / 60 Hz
Nominal current	11.5 A .....at 100 V AC 10 A .....at 115 V AC 9 A .....at 127 V AC 5 A .....at 230 V AC In addition, max. 6 A for external devices
Main unit fuse	T 10 A H, 250 V AC , REF 10 77 460
Transport and storage conditions	Temperature: -40°C – +70°C (-40°F – +158°F) Relative humidity: ..... 10% – 95% Air pressure: .....500hPa – 1060hPa
Operating conditions	Ambient temperature: ..... 10°C – 40°C (50°F – 104°F) Relative humidity: .....30% – 85% (no condensation) Air pressure: .....700hPa – 1060hPa
Maximum load capacity of the patient chair	135kg, including accessories
Installation site	≤ 3000 m above sea level
Pollution degree	2 acc. to IEC 60664-1
Protection class	Class I device
Device class in accordance with Directive 93/42/EEC	Class IIa equipment
Degree of protection against electric shock	Type B applied parts, except SIROCAM 3/SIROCAM C: Type BF applied parts 
Degree of protection against ingress of water	Ordinary equipment (not protected) The foot switch has an IPX1 degree of protection against liquids (drip-proof).
Operating mode	Continuous operation with intermittent loading corresponding to the dental mode of working. Permanently connected unit.
Year of manufacture	 ....(on rating plate of chair)
Dimensions of the packaging	
Dentist element, assistant element, C8+ Cart dentist element Water unit Chair Upholstery SIROLUX / LEDview	120cm x 63cm x 110cm 97.5cm x 50.5cm x 50.5cm 120cm x 63cm x 96cm 157cm x 64cm x 82 cm 120cm x 52cm x 40cm 10.5cm x 56cm x 28cm
Weight (1kg = 2.2lbs)	incl. / without packaging
Dentist element, assistant element, C8+ Cart dentist element Water unit Chair Upholstery SIROLUX / LEDview	37.5kg / 10kg + 3kg 17kg / 13kg 44kg / 16.5kg 120kg / 90kg 13kg / 9kg 14kg / 10kg
On-site pressure readings (1 bar = 100 kPa = 14.5 psi)	
Air min./max. Water min./max.	550 kPa / 750 kPa (5.5 / 7.5bar) 250 kPa / 600 kPa (2.5 / 6bar)

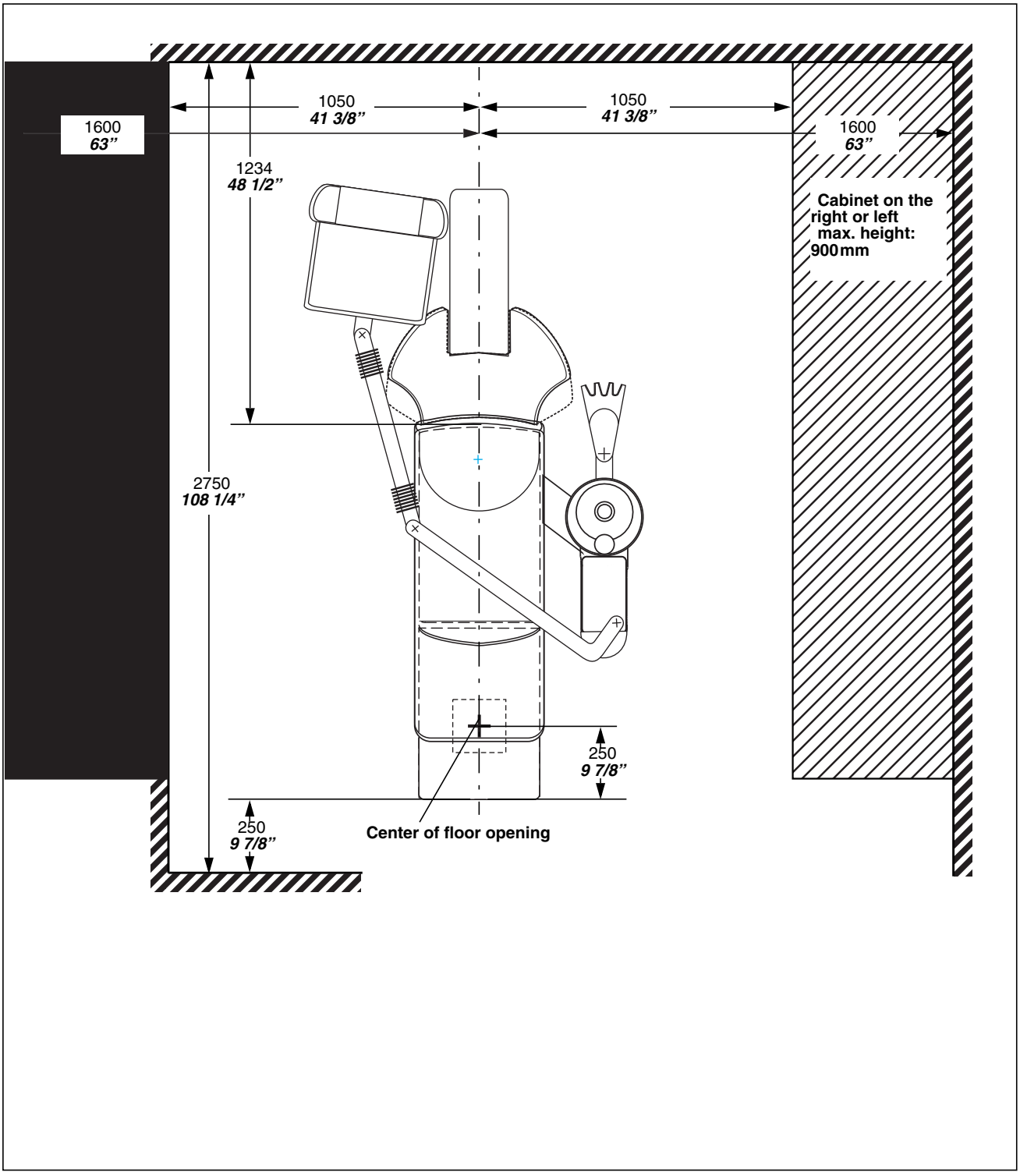
2.4 C8+ Turn 1:20

Recommended distances from cabinet or wall



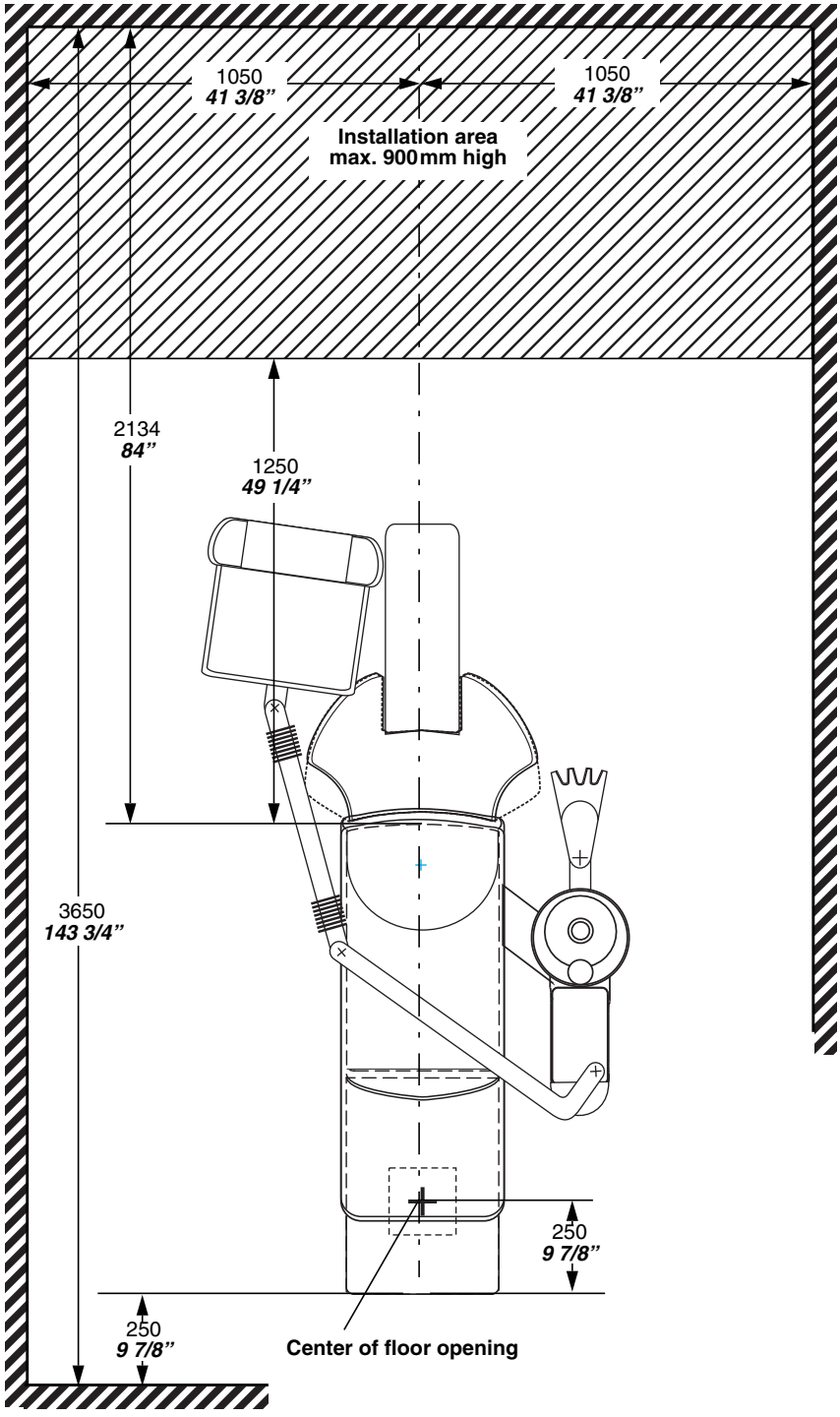
C8+ Turn 1:20

Minimum distances for conversion from right-handed to left-handed treatment center and vice versa
2700x2650 mm



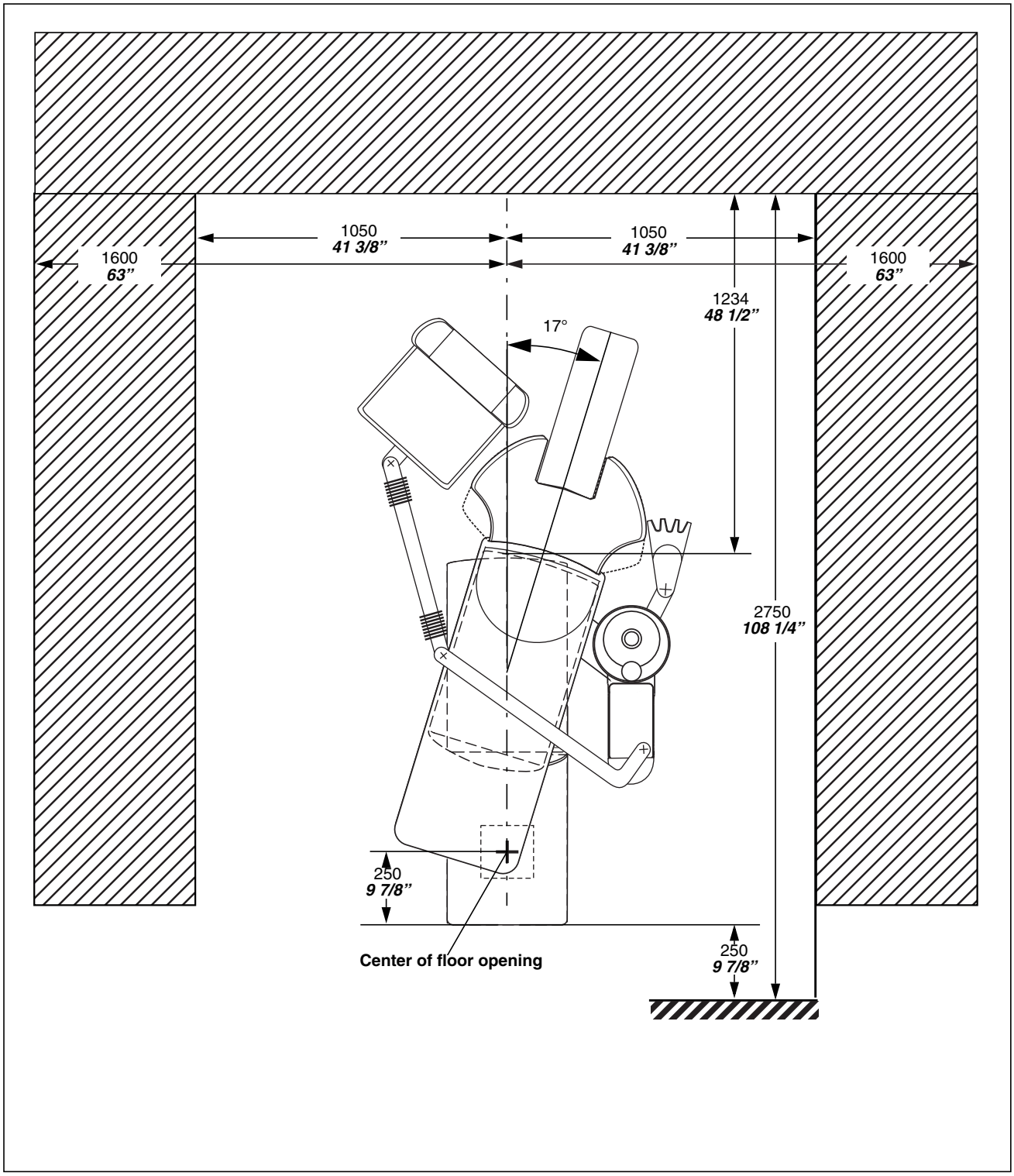
C8+ Turn 1:20

Minimum distances for conversion from right-handed to left-handed treatment center and vice versa in narrow spaces 3650x2100 mm



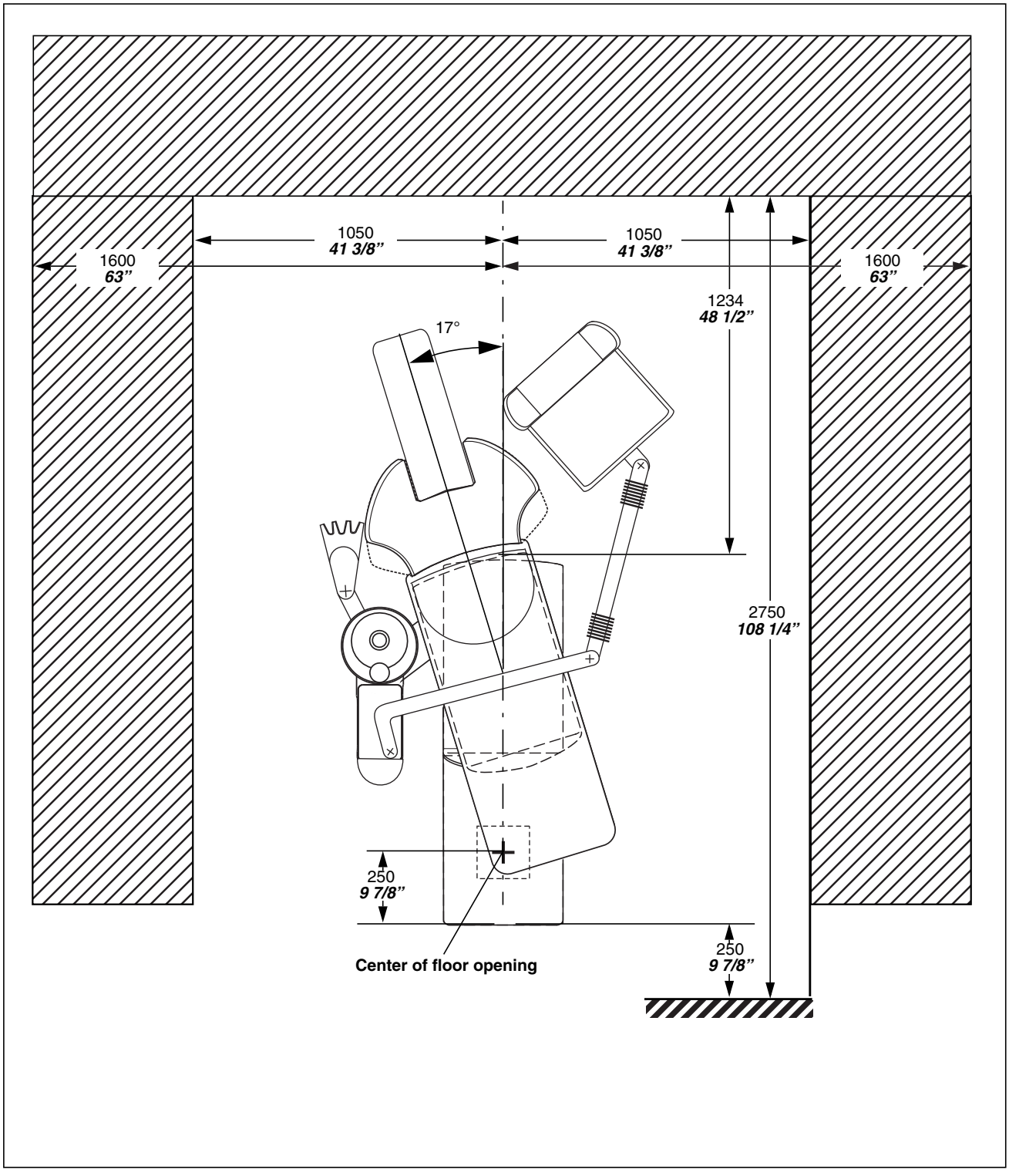
C8+ Turn 1:20

Identical working conditions for right-handed and left-handed operators:
Position for right-handed operators

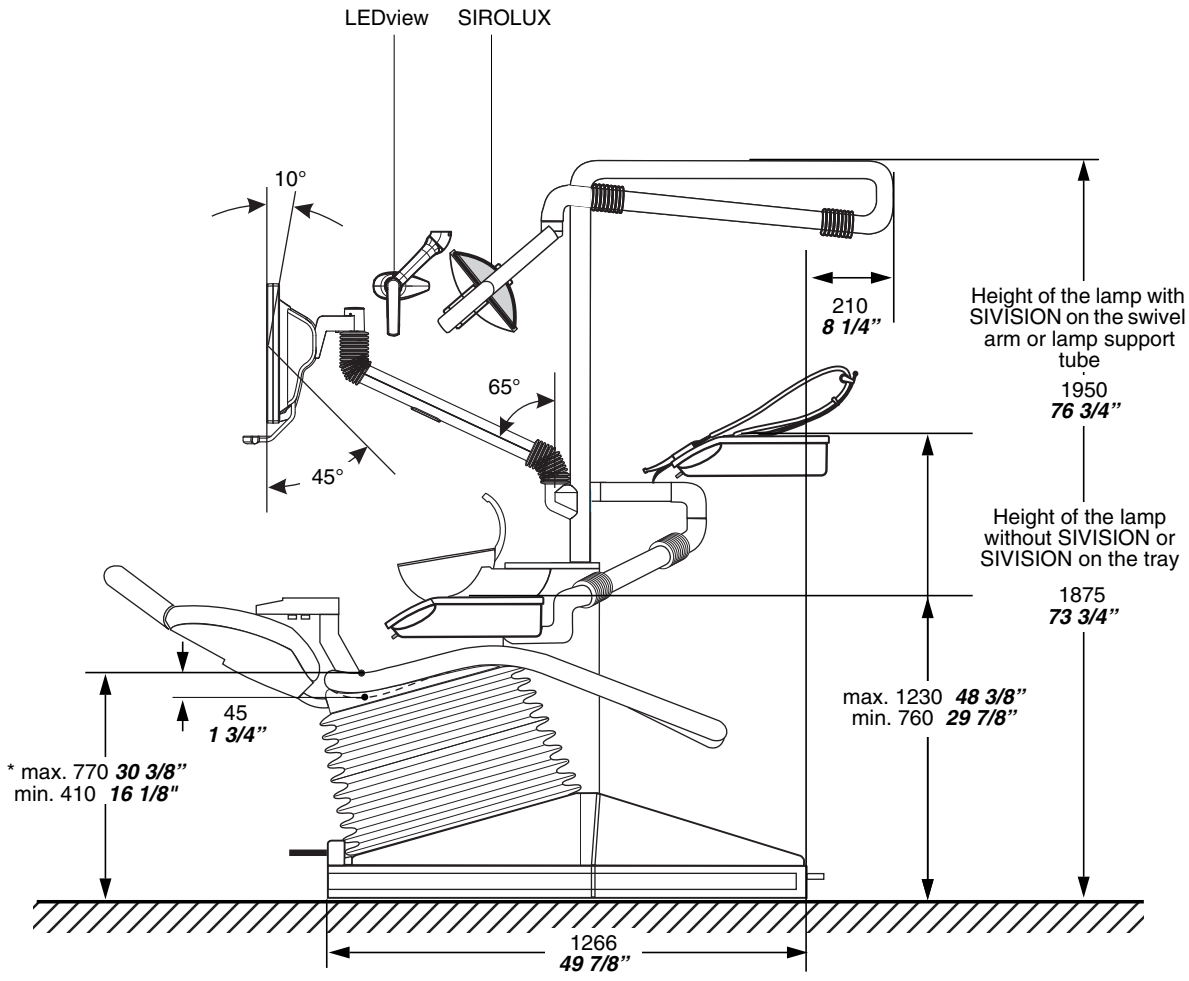


C8+ Turn 1:20

Identical working conditions for right-handed and left-handed operators:
Position for left-handed operators

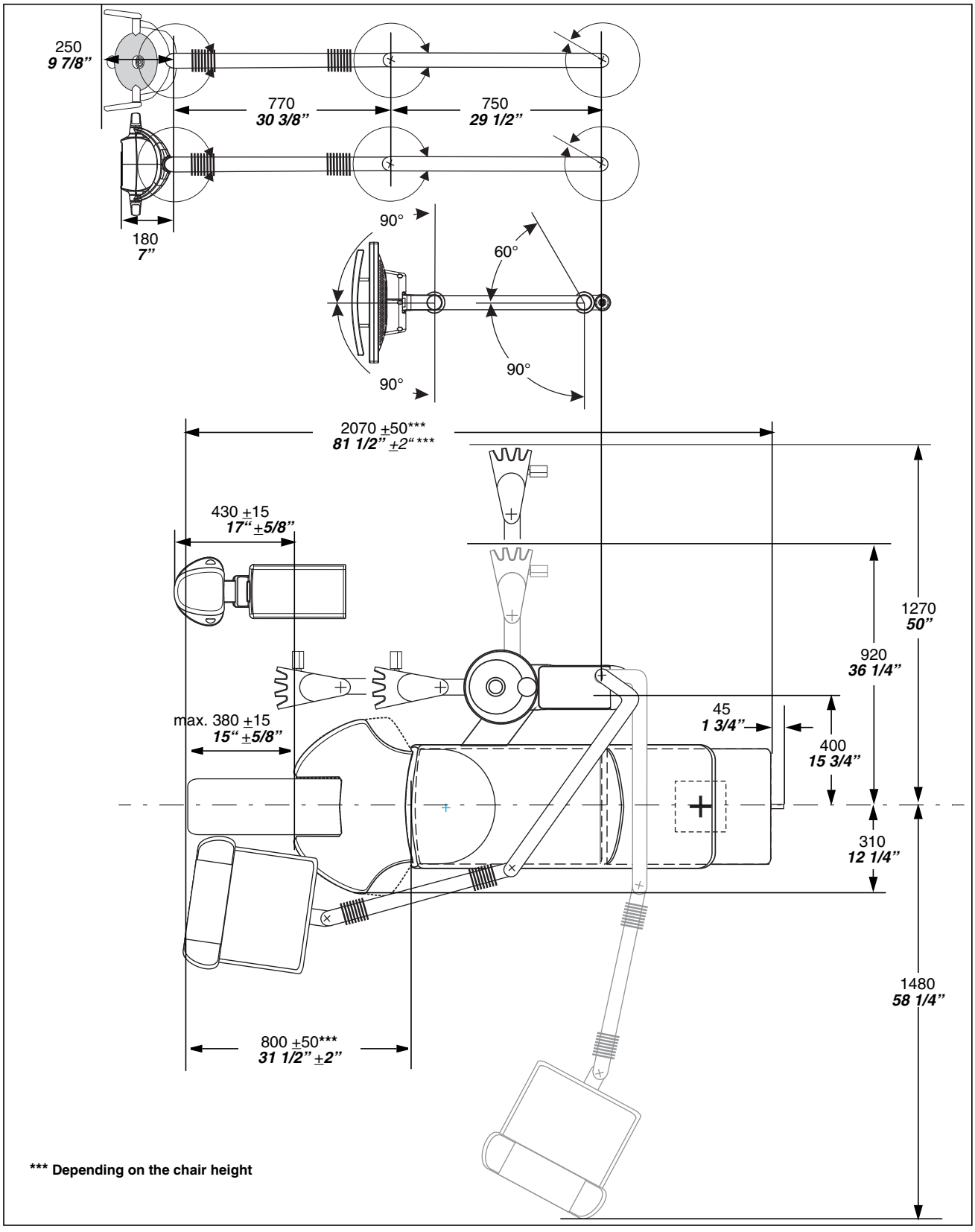


C8+ Turn 1:20



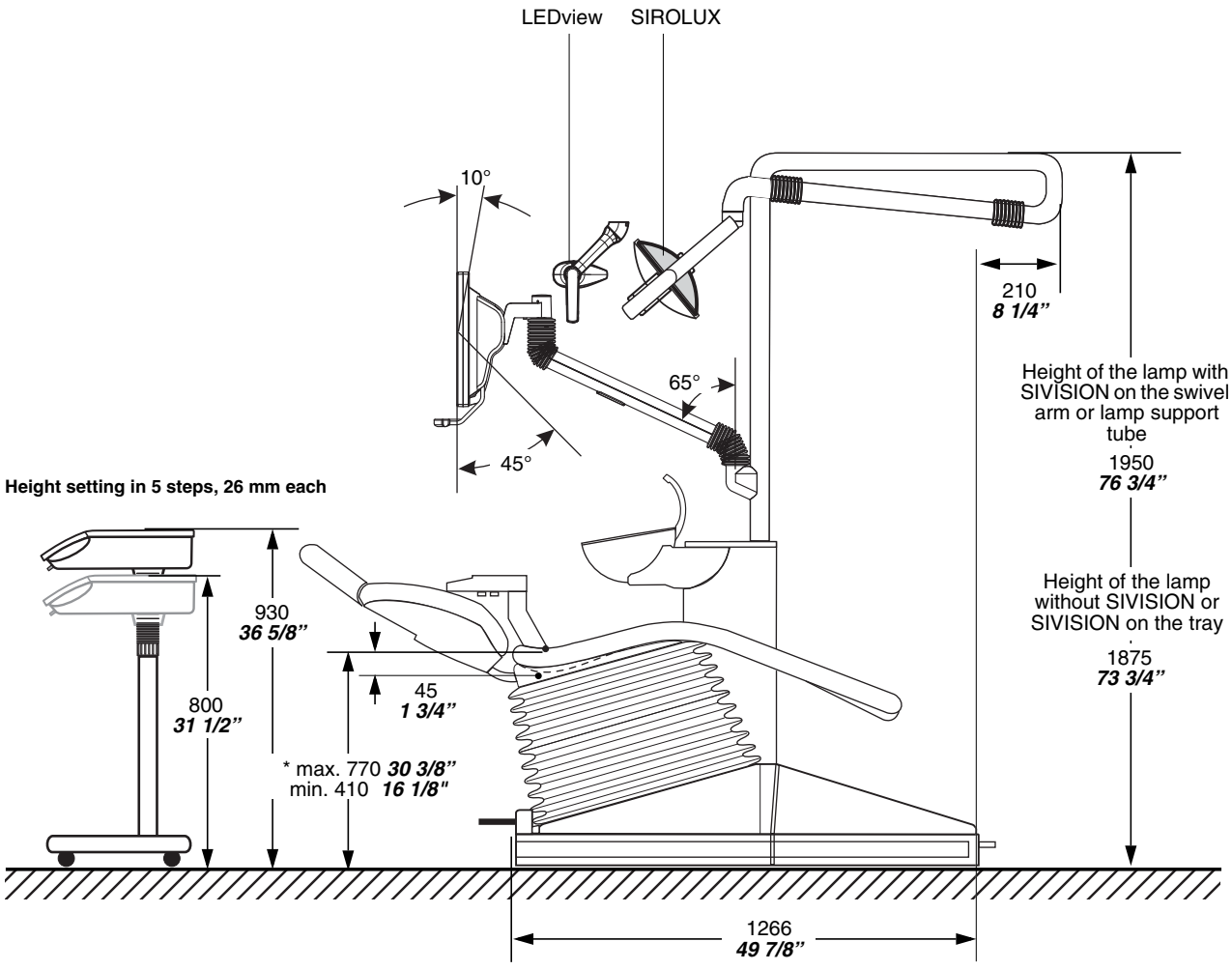
Standard upholstery
*** max.: backrest and chair at highest setting**
min.: backrest and chair at lowest setting

C8+ Turn 1:20



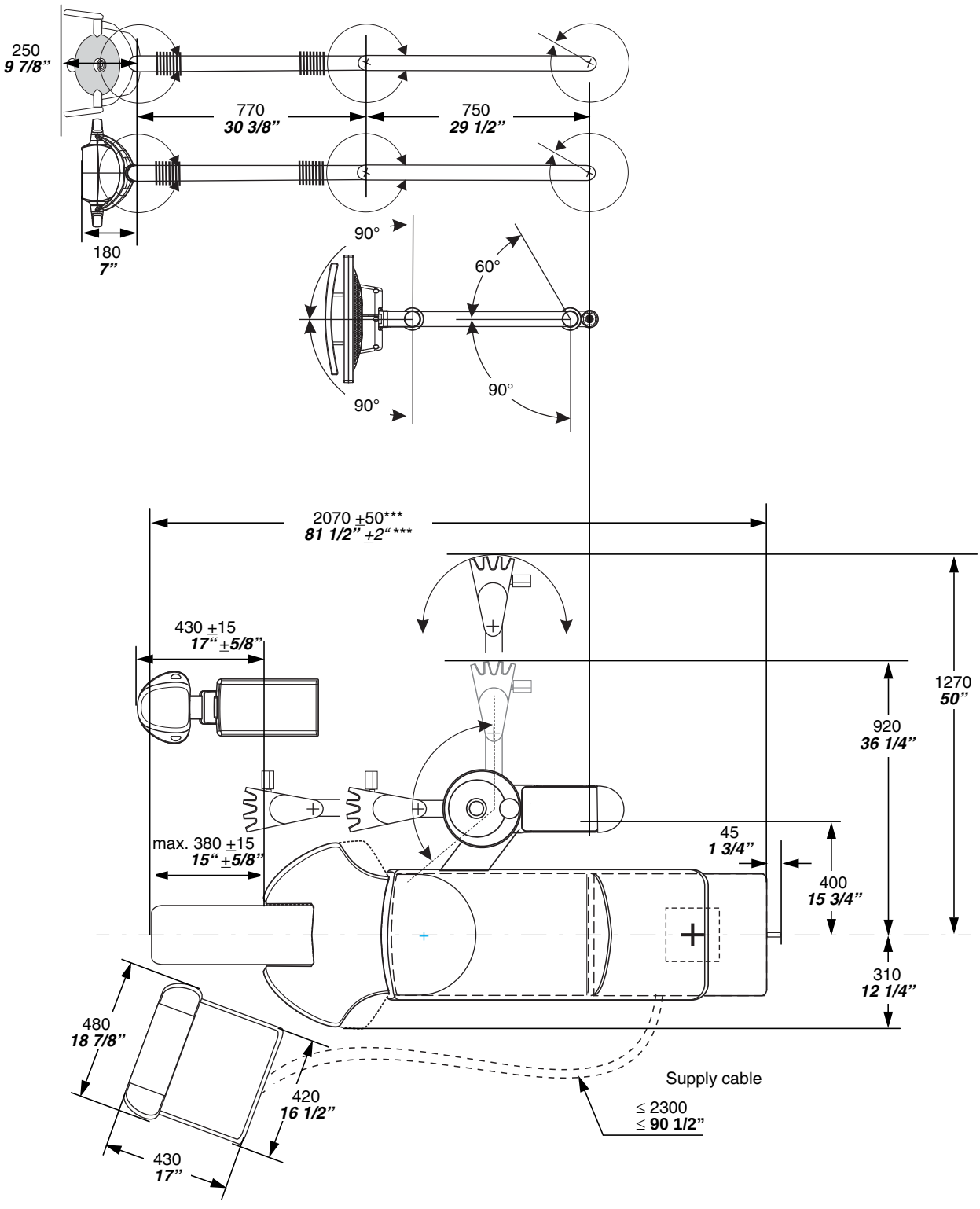
*** Depending on the chair height

2.5 C8+ Turn Cart 1:20



Standard upholstery
*** max.: backrest and chair at highest setting**
min.: backrest and chair at lowest setting

C8+ Turn Cart 1:20



*** Depending on the chair height

2.6 C8+ Turn: Technical data

Technical data	
Power supply line	100 V / 115 V / 127 V / 230 VAC 50 / 60 Hz
Nominal current	11.5 A .....at 100 V AC 10 A .....at 115 V AC 9 A .....at 127 V AC 5 A .....at 230 V AC In addition, max. 6 A for external devices
Main unit fuse	T 10 A H, 250 V AC , REF 10 77 460
Transport and storage conditions	Temperature: -40°C – +70°C (-40°F – +158°F) Relative humidity: ..... 10% – 95% Air pressure: .....500hPa – 1060hPa
Operating conditions	Ambient temperature: .....10°C – 40°C (50°F – 104°F) Relative humidity: .....30% – 85% (no condensation) Air pressure: .....700hPa – 1060hPa
Maximum load capacity of the patient chair	135kg, including accessories
Installation site	≤ 3000 m above sea level
Pollution degree	2 acc. to IEC 60664-1
Protection class	Class I device
Device class in accordance with Directive 93/42/EEC	Class IIa equipment
Degree of protection against electric shock	Type B applied parts, except SIROCAM 3/SIROCAM C: Type BF applied parts 
Degree of protection against ingress of water	Ordinary equipment (not protected) The foot switch has an IPX1 degree of protection against liquids (drip-proof).
Operating mode	Continuous operation with intermittent loading corresponding to the dental mode of working. Permanently connected unit.
Year of manufacture	 ....(on rating plate of chair)
Dimensions of the packaging	
Dentist element, assistant element, C8+ Turn Cart dentist element Water unit Chair Connection box Upholstery SIROLUX / LEDview	120cm x 63cm x 110cm 97.5cm x 50.5cm x 50.5cm 120cm x 63cm x 96cm 157cm x 64cm x 82 cm 72cm x 53.2cm x 44cm 120cm x 52cm x 40cm 10.5cm x 56cm x 28cm
Weight (1kg = 2.2lbs)	incl. / without packaging
Dentist element, assistant element, C8+ Turn Cart dentist element Water unit Chair Connection box Upholstery SIROLUX / LEDview	37kg / 10kg + 3kgkg 17kg / 13kg 58 kg / 36kg 177kg / 140kg 31kg / 25kg 13kg / 9kg 14kg / 10kg
On-site pressure readings (1 bar = 100 kPa = 14.5 psi)	
Air min./max. Water min./max.	550 kPa / 750 kPa (5.5 / 7.5bar) 250 kPa / 600 kPa (2.5 / 6bar)

3 Electromagnetic compatibility

C8+ / C8+ Turn

NOTE

The C8+ / C8+ Turn fulfills all requirements for electromagnetic compatibility (EMC) compliant with IEC 60601-1-2.
*The C8+ / C8+ Turn is referred to as "**UNIT**" in the sections that follow.*

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

3.1 Accessories

Making the PC connection

Designations of interface cables for PCs	Supplier
XGA cable, 10 m (L38)	Sirona
S video cable, 10 m (L15)	Sirona
RS232 cable, 10 m (L37)	Sirona
Audio cable, 10m	Sirona
2nd protective ground wire, 2.5 mm^2, 10m	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 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:	Siemens Fujitsu, Pentium IV, 3.0 GHz

Extension of the PC

Graphics card	NVIDIA GeForce 7300 LE
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
RF emissions according to **CISPR 11**	Group 1	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	

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.

Interference immunity tests	IEC 60601-1-2 test level	Compliance 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 finished with ceramic tiling. 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**	± 1kV for input and output lines ± 2kV for power cables	± 1kV for input and output lines ± 2kV for power cables	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**	± 1kV differential mode ± 2kV common mode	± 1kV differential mode ± 2kV common mode	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 5 sec. (> 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 5 sec. (> 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 uninterrupted 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.			

Interference immunity tests	IEC 60601-1-2 test level	Compliance 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 RF 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/m 800 MHz to 2.5 GHz[a]	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[b], should be less than the compliance level[c] in each frequency range. 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. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM/FM radio and TV broadcasts, 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**.*

c. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

3.4 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 RF 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 below.

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.

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.

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

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