Technical Services | Installation Instructions

METROTOM 800

ZEISS

1. Operation of X-ray systems

1.1 German X-ray Ordinance (RöV), information on radiation protection

The following information refers to the operation of X-ray systems in the Federal Republic of Germany. Other countries have varying regulations which must be observed by persons operating X-ray systems there.

The METROTOM 800 X-ray system complies with the provisions of Annex 2, Item 3 of the RöV, and is therefore classified as a fully protected device.

According to § 3 RöV, operation of the METROTOM 800 requires a license.

In order to obtain an operating license, the operator must

- have the METROTOM appraised by an independent authorized expert for technical inspection of X-ray systems following installation.
- authorize a radiation protection officer.
- duly submit an application for a license to the responsible regulatory authority, so that operation can begin as scheduled. The components of the licensing application include the results of the expert's report, information on the radiation protection author (personal data, certificate of qualification, certificate of appointment, etc.) and information on the radiation protection organization (personal data of the radiation protection supervisor).

The regulating authority may impose further conditions on operation in connection with the licensing notice.

According to § 18 RöV, the METROTOM must be subjected to a renewed expert appraisal after 5 years at the latest (recurring inspections).

The responsible regulating authority in the individual states is usually the trade supervisory authority, the employment protection agency or the regional council.

It is advisable to report a planned installation to the regulating authority in due time. In most cases, this means 2 to 3 weeks prior to the date of installation.

2. Machine components, installation site and installation conditions

When selecting the installation site, it is essential for you to ensure that the requirements specified below either already exist or will be created by you.

2.1 Components

The system comprises the following components:

- Full-protection enclosure
- Positioning unit
- Flatbed detector
- Microfocus X-ray tube
- Rotary table

2.2 Required room height

This dimensions equals the sum of the height of the METROTOM 800 and the minimum overhead clearance.

Example:

Height of METROTOM 800 ..... 1960 mm

Minimum overhead clearance ..... 500 mm

Required minimum room height above floor or foundation ..... 2460 mm

2.3 Required floor space

The dimensions of your METROTOM 800 are listed on pages page 11 ff.

In case you plan to draw up a floor plan on a CAD system, you can obtain a DXF and/or a DWG file with the dimensions of the Metrom from Carl Zeiss. Please feel free to consult your contact person at Carl Zeiss if any such needs arise.

When drawing up a floor plan, make sure that your CMM is readily accessible from all sides. Installation near transport lanes must be avoided in any case. Select the site so that the CMM is located at least 900 mm away from the wall and/or any other machines.

2.4 Transport lanes

Check the loading capacity of the floors and ceilings along transport lanes leading to the installation site. The doorways and transport lanes must be at least 10 cm wider and higher than the machine assemblies, including the transport vehicles. The dimensions and weights of the machine assemblies are listed in the present document.

2.5 Ambient conditions

MetroTomografie® measuring machines are technically sophisticated products. However, their specified quality can be attained only if you observe the following requirements.

Permissible storage temperature range

5°C to 40°C
Pay special attention to the storage temperature during the winter months. Avoid storing at temperatures below 5°C.

Ambient conditions for operational readiness

Permissible ambient temperature: +15°C bis +35°C

Permissible air humidity: 40% - 70% without condensation

Temperature conditions for operation of the CMM:

The measuring uncertainty specified for the METROTOM can be ensured under the following conditions:

1. Application of the measurement correction program including input of the workpiece and CMM temperature and of the workpiece material temperature expansion coefficient.

Observance of the following temperature conditions:

Machine type	Measuring reference temperature	Temperature gradient		
		per hour (K/h)	per day (K/d)	spatial (K/m)
METROTOM 800	+18°C to +22°C	1.0	2.0	3.0

Please make sure that sufficient lighting is available.

The use of heat sources near the METROTOM must be avoided in any case.

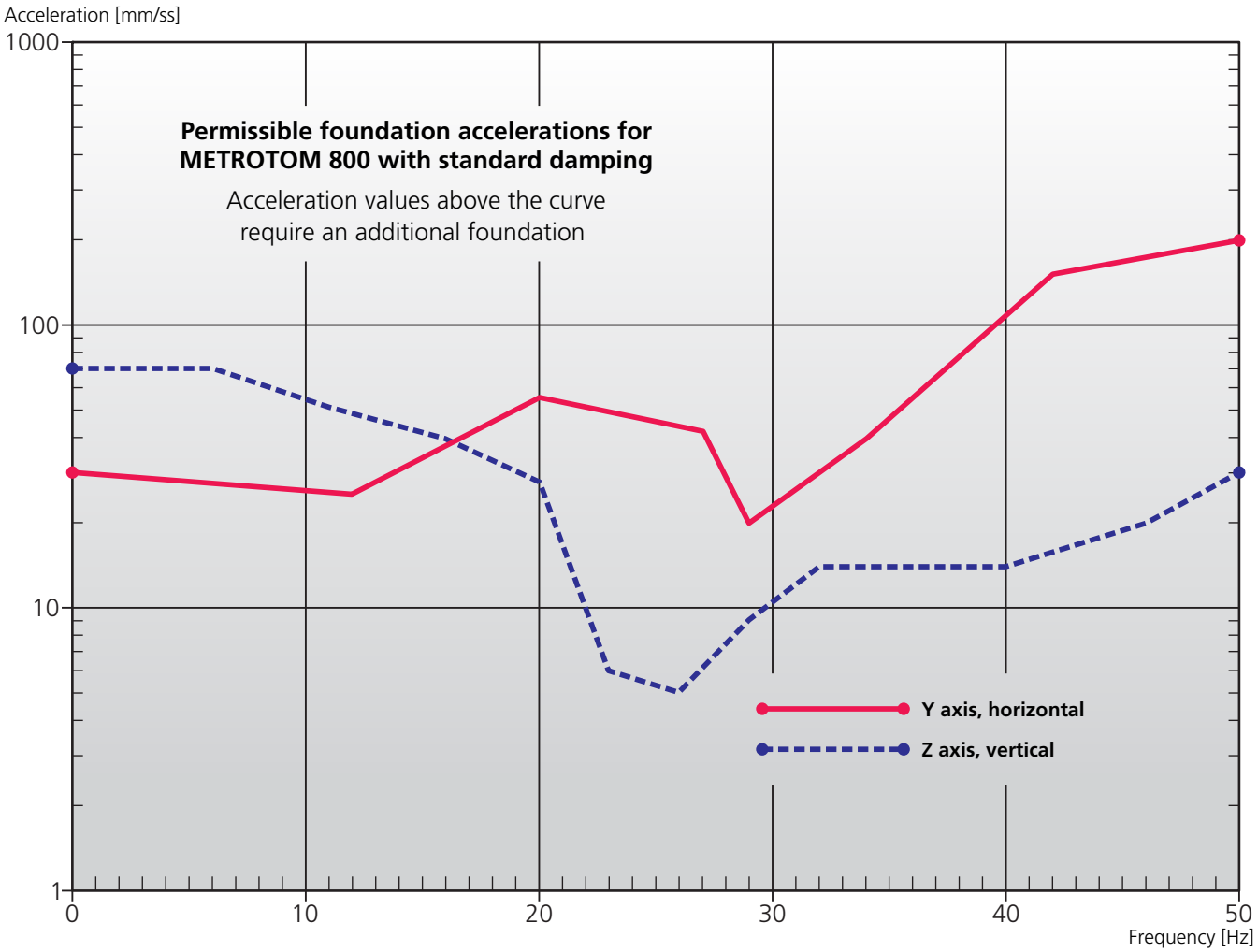
2.6 Floor Load

When calculating or planning any floor reinforcement (foundation etc.) which may be required, it is advisable to consult a statics engineer who is familiar with your local floor conditions. To determine the floor load exerted by the CMM, see the pertaining information in this brochure.

2.7 Vibrations at the Installation Site

The following diagram(s) show(s) the permissible floor vibrations. Vibrations are often caused by heavy processing machinery, transport vehicles (cranes or stackers) and stamping or forging machines located in adjacent rooms.

A measurement is required to determine the actual magnitude of local floor vibrations. You can order such a vibration analysis from Carl Zeiss Oberkochen. Please call or e-mail your contact person for more details. In any case, the results must be made available to CZO for evaluation.



3. Preparation for installation/Required connections/Transport/Storage

The following preparations must be made prior to the installation date:

3.1 Preparation of required floor space

The floor space must be clean.

Maximum difference in level of the 4 seating surfaces: ≤ 4 mm

Maximum slope per contact surface: 1 mm/m

3.2 Electric Power Supply

We recommend connecting the system to a power source which does not supply electricity to peak-load or high-consumption equipment (elevators, air conditioning systems). Due to the possibility of negative influences, avoid installing the CMM near

– **High-consumption equipment** (e.g. welding machines)

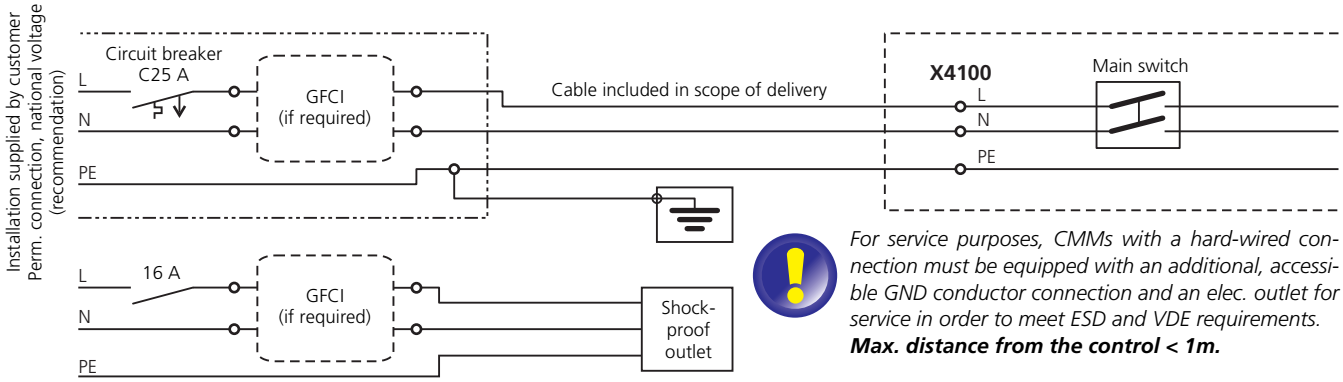
– **High-interference (EMI) equipment** (e.g. electron discharge machines).

The use of mobile telephones or walkie talkies within a radius of 3m surrounding the CMM is also prohibited. This precaution is necessary to prevent malfunctions, **especially in connection with data processing systems.**

The system should be provided with a permanent connection or, alternatively, a 3-pole CEE-form plug-and-socket connection. Protect this connection with an automatic cutout. As an alternative, protective devices of an equal rating may also be used. As a general protective measure against surge voltage, it is also advisable to install a lightning rod, e.g. Phoenix Flashtrab FLT 25-400.

We recommend making the connection as shown in the drawing below. **Please also note that all pertaining national regulations must be observed in the process.**

Connection of control cabinet MCC800



3.3 Electric power supply parameters

In order to ensure trouble free data traffic between the CMM and the data station, the mains power supply must have the following parameters.

Line voltage

– **with the MCC 800 controller:** 1/N/PE 100, 110, 115, 120, 125, 230, 240VAC

– **Voltage fluctuations:** max. ±10%

– **Frequency:** 47 - 63 Hz

Line fuse protection

– **At 230V or 240V:** C 25A

– **At 100V or 125V:** C 25A

Power consumption

– **Overall system with MCC800 :** max. 2500 VA

3.4 EMC

EN 61326-1 Table 2, Class A

Warning!

This is a Class A device. This device may cause radio interference in residential areas; in such cases, the operator must initiate the appropriate remedial measures and pay any costs thus incurred.

3.5 Stabilization of the power supply

If brief fluctuations occur in the root mean square value of the line voltage, a line voltage analysis must be performed. Contact us if you require this service. We will be glad to advise you and recommend suitable measures. A separate stub cable from the main distributing frame to the connecting point of METROTOM is sufficient in most cases.

3.6 Machine parameters

– **Overvoltage category:** III

– **Pollution degree:** 2

– **Protection class:** 1

3.7 Internet connection for teleservice

You will require an Internet connection for Teleservice. For more details, please refer to the **"Teleservice"** brochure.

3.8 Network topology

The networking of the system components is performed by the ZEISS service engineer according to the valid specifications during initial startup. These settings must not be modified by the customer. Any change could result in connection problems.

3.9 Computer operating system

If the required computers are provided by the customer, the operating system used must not show any limitations in comparison to the one used by ZEISS. Otherwise problems and additional costs may occur during startup.

3.10 Unloading/Transport vehicles

Remember that this CMM is a high-end, precision instrument. Always make sure that all CMMs and machine parts to be transported are securely fastened. They must not slip or slide, be jolted or fall off of the transport vehicle. Their center of mass also must be considered. ***These actions are necessary to prevent personal hazards and damage to the machines.***

The unloading and transport of packaged units may be performed only with hoisting rings or pallets; **the insulated pakkaging must not be damaged in the process**. Please ensure that suitable transport vehicles operated by qualified personnel are provided for unloading the crates and transporting them to their storage site. The type of transport vehicle used depends on local conditions. The load carrying capacity of the transport vehicles is specified on the following pages.

Suitable transport vehicles include e.g.:

● forklifts ● mobile cranes ● gantry cranes

Keep all transport paths free during installation to ensure a smooth workflow.

Transport locks, lashing straps, shipping crates and pallets must be returned.

Since packaging materials such as e.g. plastic foils or styrofoam chips are recycled by Zeiss, they can be returned along with the transport locks if they are clean and no dirt or debris is mixed in with them.

3.11 Storage/Unpacking

At outdoor temperatures of <0°C, CMM assemblies are shrinkwrapped in aluminum-coated foil (insulated packaging) after a desiccant is added instead of being wrapped in PVC protective foil.

Please store the packaged units in a sheltered storage area as close as possible to the installation site.

Adaptation to room temperature:

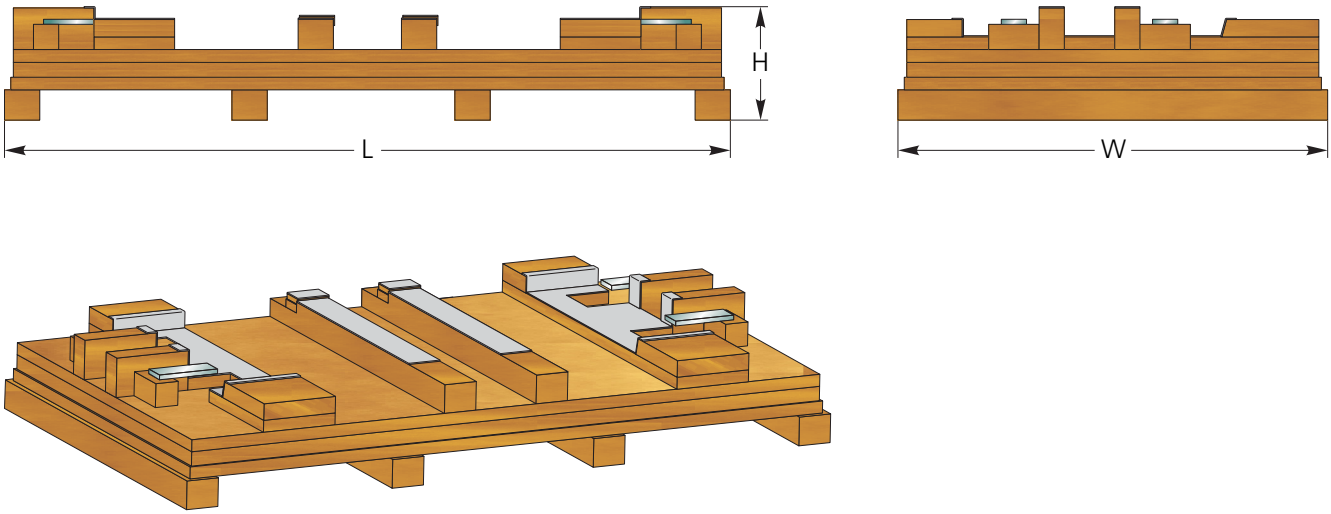
Bring the packaged units to a storage location with an ambient temperature of ≥ 15°C at least 3 days before our system specialist arrives. Unpacking and removal of the insulated packaging may be performed **only by our system specialist**! Please provide an appropriate location for storing the empty crates and containers etc.

3.12 Moving the METROTOM to another location

The METROTOM may be moved only with all transport braces and locks attached and in consultation with our system specialist.

4. Shipping crates

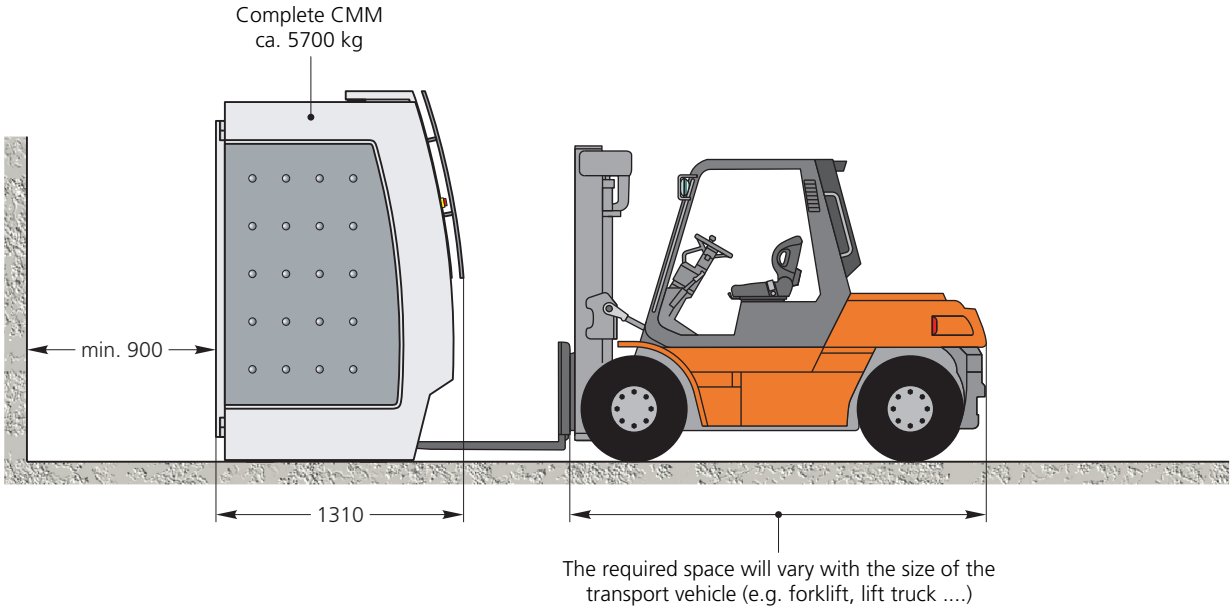
The METROTOM is delivered on transport pallets wrapped in insulated packaging. It is delivered in a transport crate only when shipped by air cargo or overseas.

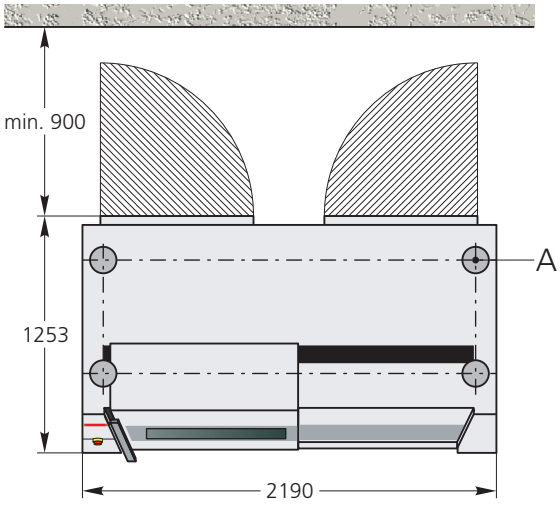


No.	Shipping crate or pallet for	Dimensions in mm (maximum)				m^3	Tare weight (kg)		Max. gross weight (kg)	
		L	W	H	Height of secured unit (max.)		Sea/air crate	Truck pallet	with sea/air crate	with pallet f. road
1	Pallet for CT METROTOM 800	2880	1705	445	2400	3.5	-	450	-	6150
2	Control cabinet MCC800	1300	1135	1000	-	1.5		37	-	190
3	Computer and accessories in Palbox (large)									
Data are not available for the transport crates										

Note: All values not entered are not currently available. For **production reasons**, the dimensions (L, W and H) of the transport crates may deviate by **as much as +50 mm**.

5. Required space for initial installation and maintenance





A* = Contact surfaces of machine screw feet for fine adjustment of leveling.

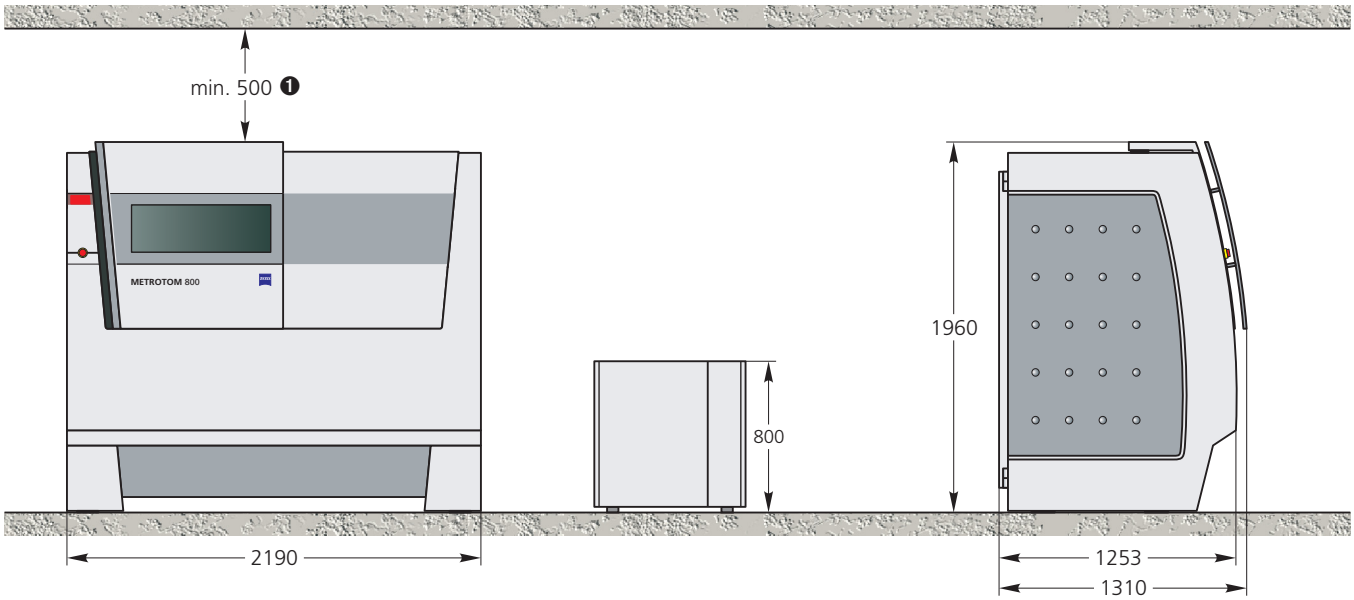
Material: Elastomer plastic

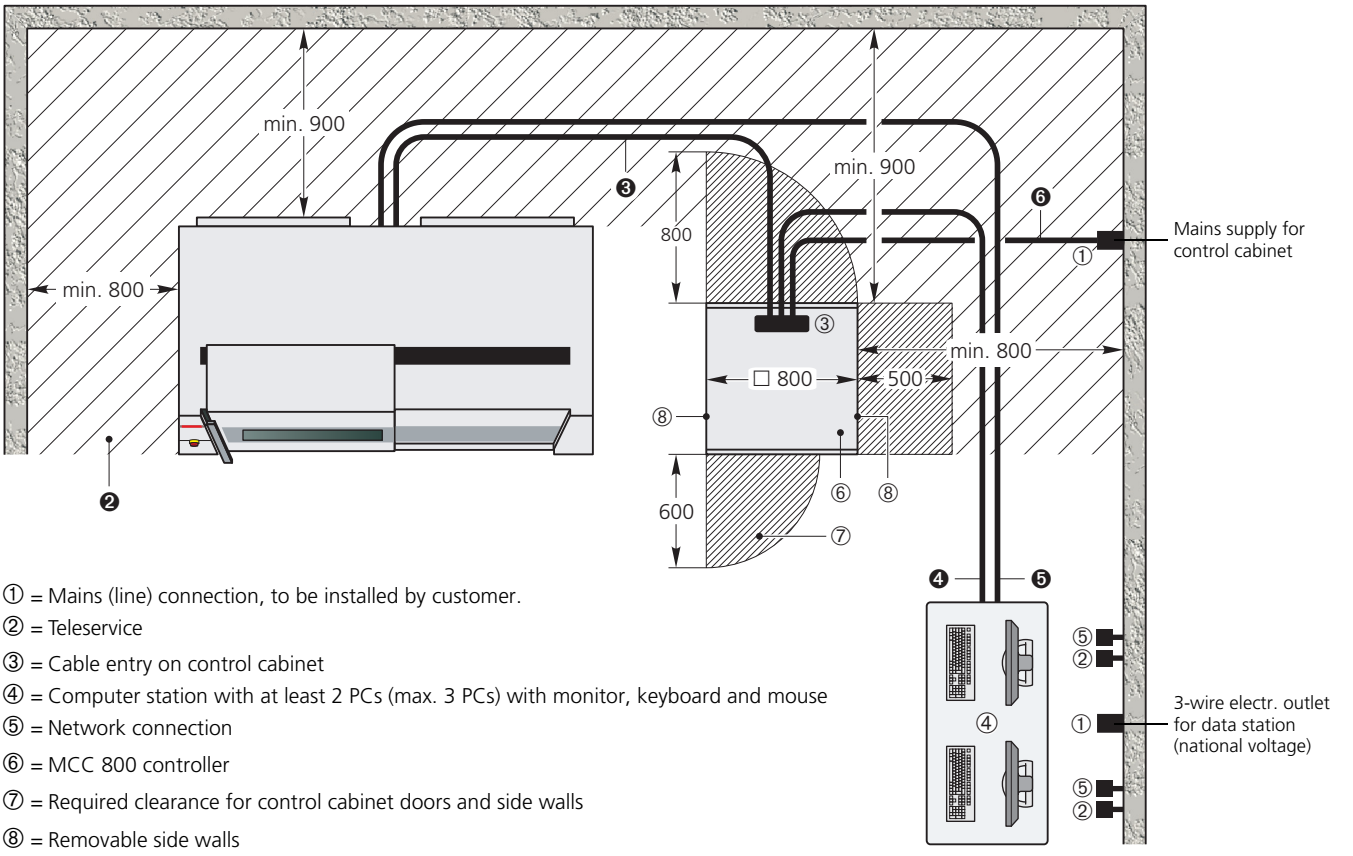
Contact surface: dia. 140 mm

*Average max. pressure exerted on contact surfaces: 1.56 N/mm^2 calculated from net weight of machine and max. permissible workpiece weight distributed over footprints of machine screw feet, measuring 15394 mm^2 each

Maximum difference in level of the 4 contact surfaces: ≤ 4 mm.
Maximum incline per contact surface: 1 mm/m

6. Installation dimensions & installation layout for the METROTOM 800





① = Mains (line) connection, to be installed by customer.
② = Teleservice
③ = Cable entry on control cabinet
④ = Computer station with at least 2 PCs (max. 3 PCs) with monitor, keyboard and mouse
⑤ = Network connection
⑥ = MCC 800 controller
⑦ = Required clearance for control cabinet doors and side walls
⑧ = Removable side walls
❶ = Required minimum clearance
❷ = The hatched area must be accessible for service purposes so that bulky and heavy components can be removed and installed. Transport to the left or right must be possible.
❸ = Cable: METROTOM - control cabinet, approx. 5 m (cable entry from below)
❹ = Cable: Control cabinet - computer station, approx. 7 m (cable entry from below)
❺ = Cable: METROTOM - computer station, approx. 7 m
❻ = Cable: Electric outlet - control cabinet, approx. 5 m (cable entry from below)

The computer station and control cabinet can also be installed in a separate room.

Net wt. of METROTOM	Max. permiss. workpiece wt.	Approx. wt. of control cabinet
ca. 5700 kg	4 kg	150 kg

Carl Zeiss 73446 Oberkochen

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