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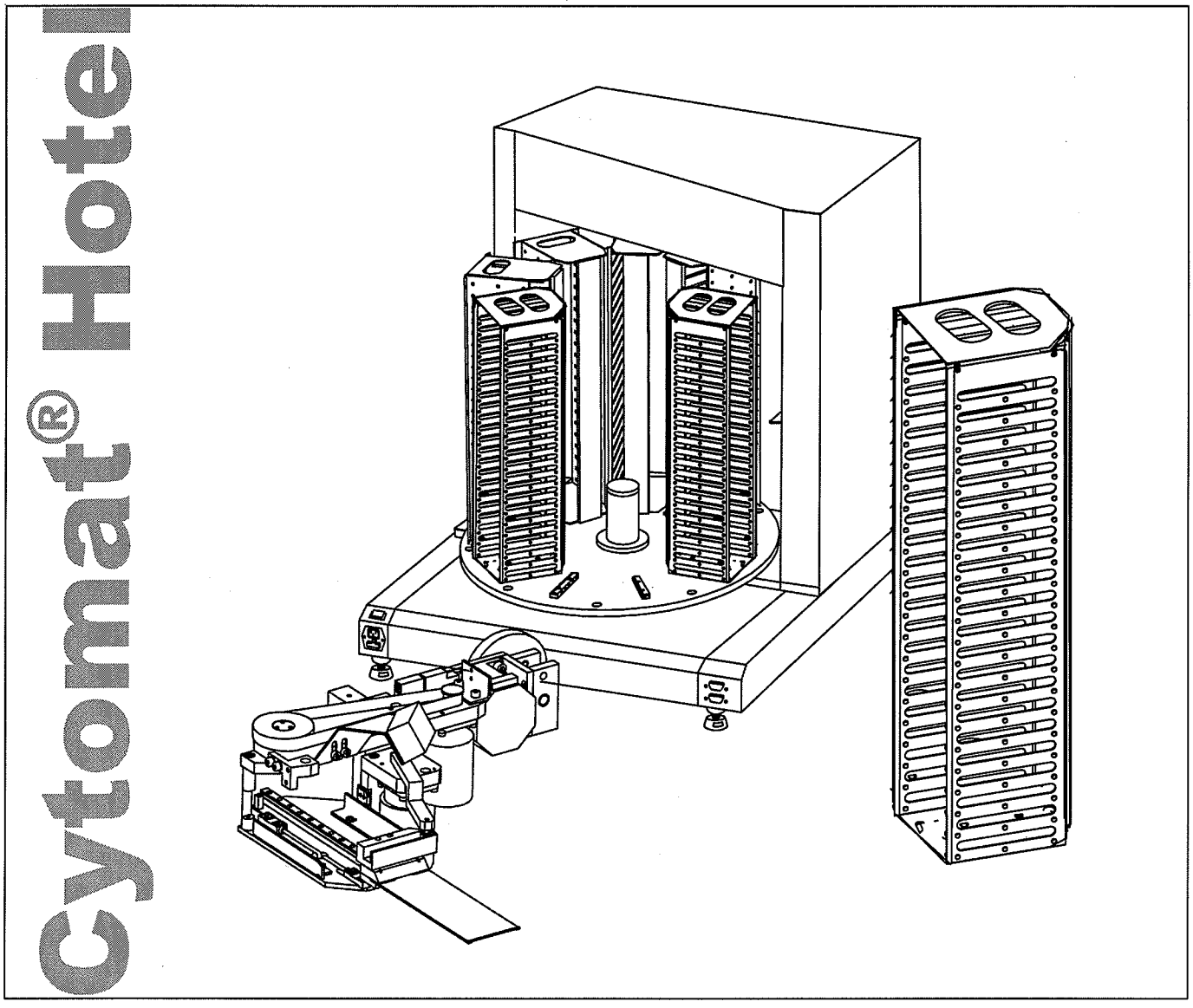
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Cytomat® Hotel

Operating Instructions



Valid: 10.2005 / 50074174 B

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Thermo Electron LED GmbH
Robert-Bosch-Strasse 1
D - 63505 Langenselbold
Germany

Below is a list of the international Thermo marketing organizations.

Postal address Germany
Thermo Electron LED GmbH
Robert-Bosch-Strasse 1
D - 63505 Langenselbold

Enquiries from Germany
Phone
Sales 0800 1 536376
Service 0800 1 112110
Fax
Sales / Service 0800 1 112114
Email info.labequipment.de@thermo.com

Enquiries from Europe, Middle East and Africa
Phone + 49 (0) 6184 / 90-6940
Fax + 49 (0) 6184 / 90-7474
Email info.labequipment.de@thermo.com

Postal address USA
Thermo Electron Corporation
275 Aiken Road
Asheville, NC 28804
USA

Enquiries from North America
Phone +1 800-879 7767
Fax +1 828-658 0363
Email info.labequipment@thermo.com

Enquiries from Latin America
Phone +1 828-658 2711
Fax +1 828-645 9466
Email info.labequipment@thermo.com

Enquiries from Asia Pacific
Phone +852-2711 3910
Fax +852-2711 3858
Email info.labequipment@thermo.com

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1. General notes

1.1 General instructions

These operating instructions describe the automated storage system Cytomat® Hotel. The Cytomat® Hotel has been manufactured in keeping with the latest technological developments and is operationally safe. However, the device may present potential hazards, particularly if it is operated by inadequately trained personnel or if it is not used in accordance with it's intended purpose. Therefore, the following must be observed to prevent accidents:

- The Cytomat® Hotel must only be operated by trained and authorized personnel.
- For personnel operating this device, the operator must prepare written instructions in a reasonable form based on these operating instructions, the safety data sheets, the hygiene regulations and the applicable Technical Guidelines.
- Any repairs to the device must only be performed by the Technical Sevice of Thermo Electron Corporation or by adequately trained and authorized expert personnel.
- If the Cytomat® Hotel is used in combination with devices or systems from third-party suppliers, these components must be described in a separate instruction supplied by the device manufacturer or supplier.
- Should you encounter problems that are not mentioned in these operating instructions, please contact Thermo Electron Corporation for the sake of your own safety.
- The contents of the operating instructions are subject to change without further notice.
- Concerning translations into foreign languages, the German version of these operating instructions is binding.
- Keep these operating instructions in the vicinity of the device so that safety instructions and important information are always accessible.

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1. General notes

1.2 Warranty

Thermo Electron Corporation warrant the operational safety and the operativeness of the Cytomat® Hotel only under the condition that:

- the device is operated and serviced exclusively in accordance with its intended purpose and as described in these operating instructions,
- the device is not modified,
- only original spare parts and accessories that have been approved by Thermo Electron Corporation are used,
- inspections and maintenance works are carried out at the specified intervals.

The warranty is valid from the date of delivery of the device to the operator.

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1. General notes

1.3 Explanation of symbols

1.3.1 Symbols used in the operating instructions:



WARNING!

is used if non-observance may cause serious or even lethal injuries.



CAUTION!

is used if non-observance may cause medium to minor injuries or damage.



NOTE

is used for applicational hints and useful information.



RECYCLING

Valuable raw materials can be reused.



Harmful liquids!



Electric shock!



Contusion hazard!

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1. General notes

1.3.2 Symbols on the device:

CE symbol



Observe operating instructions!



Unplug power plug before opening!



Contusion hazard!



Do not grab component!

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1. General notes

1.4 Intended purpose of the device

1.4.1 Correct use

The Cytomat® Hotel is a laboratory device for storing cell and tissue cultures. It has been designed for integrated application in computer-controlled systems, particularly for HTS procedures (High Throughput Random Screening). The device-integral Plate Shuttle™ System (PSS) allows the automated, selective access to the culture containers (particularly microtitre plates or similar containers). The transfer of the incubate to or from the integrator system or to and from other transport systems occurs at a defined position.
For this purpose, the Cytomat® Hotel must be integrated in a security system installed on-site that:

- effectively prevents a manual intervention of the automatic transfer area,
- is provided with an EMERGENCY OFF function of the device that is integrated logically into the overall system.

The Cytomat® Hotel is suited for installation and operation in laboratories and for permanent operation.

1.4.2 Incorrect use

Do not treat cell or tissue cultures in the device that are not in accordance with the regulations of safety levels L1, L2, and L3.
Do not use tissues, substances or liquids that:

- are easily combustible or explosive,
- release vapors that form combustible or explosive mixtures when exposed to air.

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1. General notes

1.5 Standards and safety regulations

The following safety regulations must be observed if the device is operated within the territory of the Federal Republic of Germany:

- ZH 1/10
- ZH 1/119
- ZH 1/342
- ZH 1/343
- ZH 1/598
- TRG 280
- EU Official Gazette, L 374
- Principles of good microbiological proceedings, notice of the trade association of the German chemical industry.

For other countries, the applicable national regulations are binding.

The device is in accordance with the following standards and safety requirements:

- EN 61010-1:1993
- EN 61010-1/A2:1995
- Low Voltage Guideline 73/23 EWG
- EMC Guideline 89/336 EWG
- DIN 12880 Part 1/11.78
- EN 61326 (EN 50081-1, EN 50082-2)
- UVV VBG 20

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2. Delivery of the device

2.1 Packaging

The Cytomat® Hotel is delivered in a stable packaging box.
The stackers and the transfer station are packed separately in the box.
All packaging materials can be separated and are reusable:

Packaging materials:

- Packaging carton Paper
- Foam elements Styrofoam (CFC-free)
- Packing box Wood
- Packaging film Polyethylene
- Packaging ribbons Polypropylene

2.2 Acceptance inspection

After unpacking the device, check the device components for possible transport damages and for completeness.
If damages are detected or if components are missing, please contact Thermo Electron Corporation.

2.3 Standard equipment

Description of the delivered components	Quantity
Cytomat® Hotel	1
Plate Shuttle™ System (PSS)	1
Connecting cable RS 232 interface	1
Special grease Lubricant	1
CD for test operation	1
Optional equipment	
Transfer station, standard with plate detection sensor	1
Transfer station, turnable (90°) with plate detection sensor	1
Transfer station, Swap station (180°) with plate detection sensor	1
Bar code laser scanner	1
Instructions	
Operating instructions	1
Software documentation for Plate Shuttle™ System (PSS)	1

NOTE – Accessories

A description of stackers as well as further accessories are listed in Section 11, Spare parts and accessories.

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3. Installation of the device

3.1 Ambient conditions

The device must only be operated at locations that meet the particular ambient conditions listed below.

- Draught-free and dry location.
- The minimal distance to adjacent surfaces must be observed on all sides (see Section 3.3.).
- The operating room must be equipped with an appropriate room ventilation (see Section 3.2.).
- Solid, level, fire-proof surface.
- Vibration-proof substructure (rack, lab table) capable of bearing the weight of the device and of accessories.
- The ambient temperature must be within a range of +18° C (min.) to maximum +30° C (max.).
- Relative humidity up to 60 % (max.).
- No direct exposure to sunlight.
- Devices that produce excessive heat are not allowed near the location of the Cytomat® Hotel.

3.2 Room ventilation

During continuous operation, the room climate may change due to energy released by the device.

- Therefore, operate the Cytomat® Hotel only in rooms with adequate ventilation.
- Do not install the device in room recesses without ventilation.
- The room ventilation should be a technical ventilation that is in accordance with the requirements of ZH 1/119 (Guidelines for laboritories) or some other suited ventilation system with appropriate capacity.

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3. Installation of the device

3.3 Space requirements

Fig. 1: When installing the device, make sure that electrical connections and interface cables remain freely accessible. The side distances mentioned are minimal distances.
To protect the Cytomat® Hotel against contamination, use a substructure even if the device is installed near the floor. The height of the substructure should not fall below 200 mm.
The minimal distance to adjacent surfaces at the sides and above the device must be 50 mm.

NOTE – Accessibility of the device

To ensure the accessibility of the device for care and maintenance works, keep larger side distances.

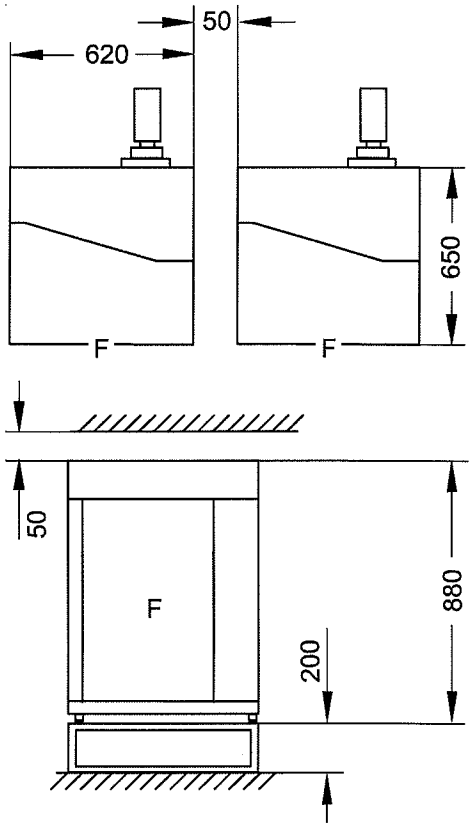


Fig. 1
Dimensions and minimal distances, values in mm,
F = Front

3.4 In-plant transport

Fig 2: Transport the device only in an upright position, the Plate Shuttle™ System (PSS) secured (handler in lower position) without stacker and culture containers.

NOTE – Lift points

Do not transport the device using the components attached to the device (e.g. the transfer station) as lift points. Lift the device only using the lift points shown in Fig. 2.

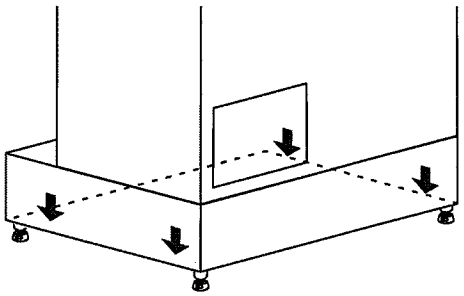


Fig. 2
Lift points at bottom of device,
F = Front

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4. Description of the device

4.1 Front view

[1] Plate Shuttle™ System (PSS) handler
[2] Plate Shuttle™ System (PSS) lift linkage
[3] Device stand, adjustable (total of 4)
[4] Plate Shuttle™ System (PSS) connection to main board
[5] RS 232 interface for Plate Shuttle™ System (PSS)
[6] RS 232 interface for barcode scanner (option)
[7] Power socket
[8] Power switch
[9] Plate Shuttle™ System (PSS) turntable
[10] Locking rail for stacker accommodation
[11] Plate Shuttle™ System (PSS) turntable stepper motor
[12] Stacker
[13] Plate Shuttle™ System (PSS) casing

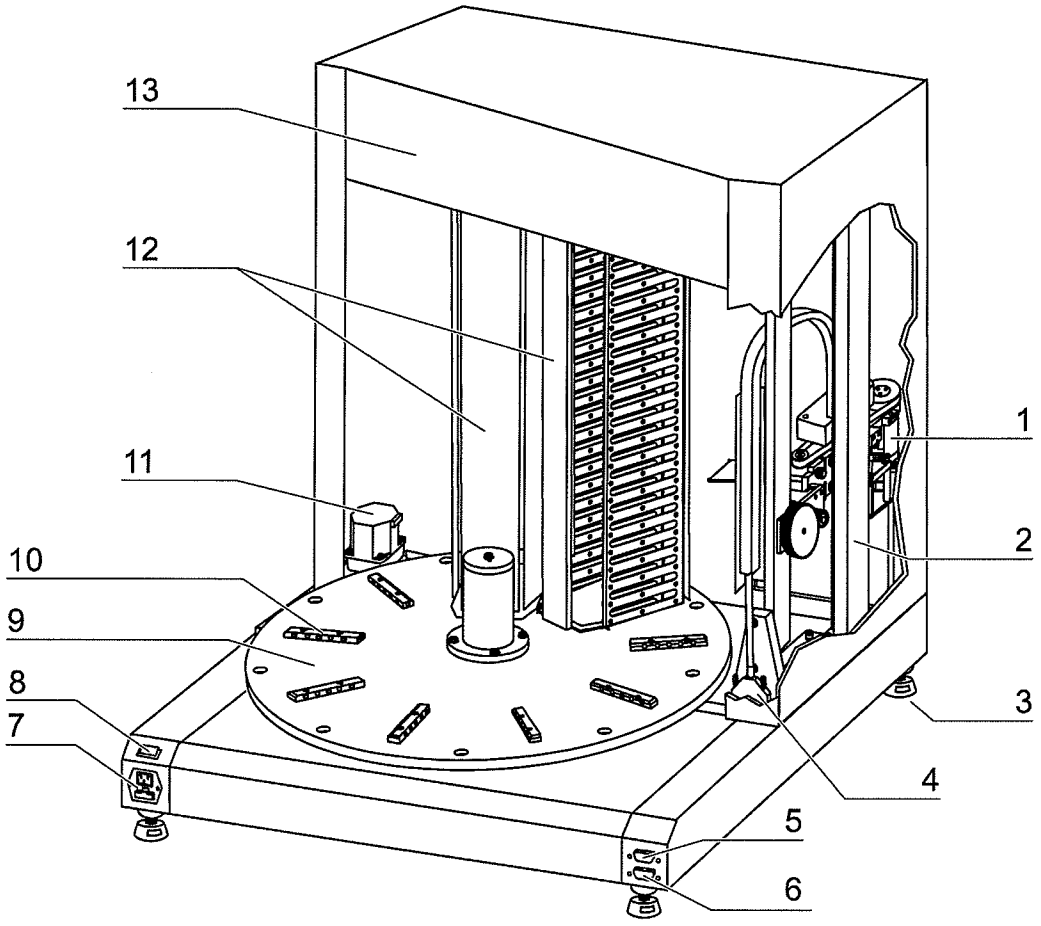


Fig. 3
Front view

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4. Description of the device

4.2 Rear view

[1] Plate Shuttle™ System (PSS) turntable
[2] Access opening for Plate Shuttle™ System (PSS) handler
[3] Transfer station sensor connector
[4] Transfer station mounting plate
[5] Transfer station plate detection sensor
[6] Transfer station platform (standard version)
[7] Plate Shuttle™ System (PSS) lift linkage

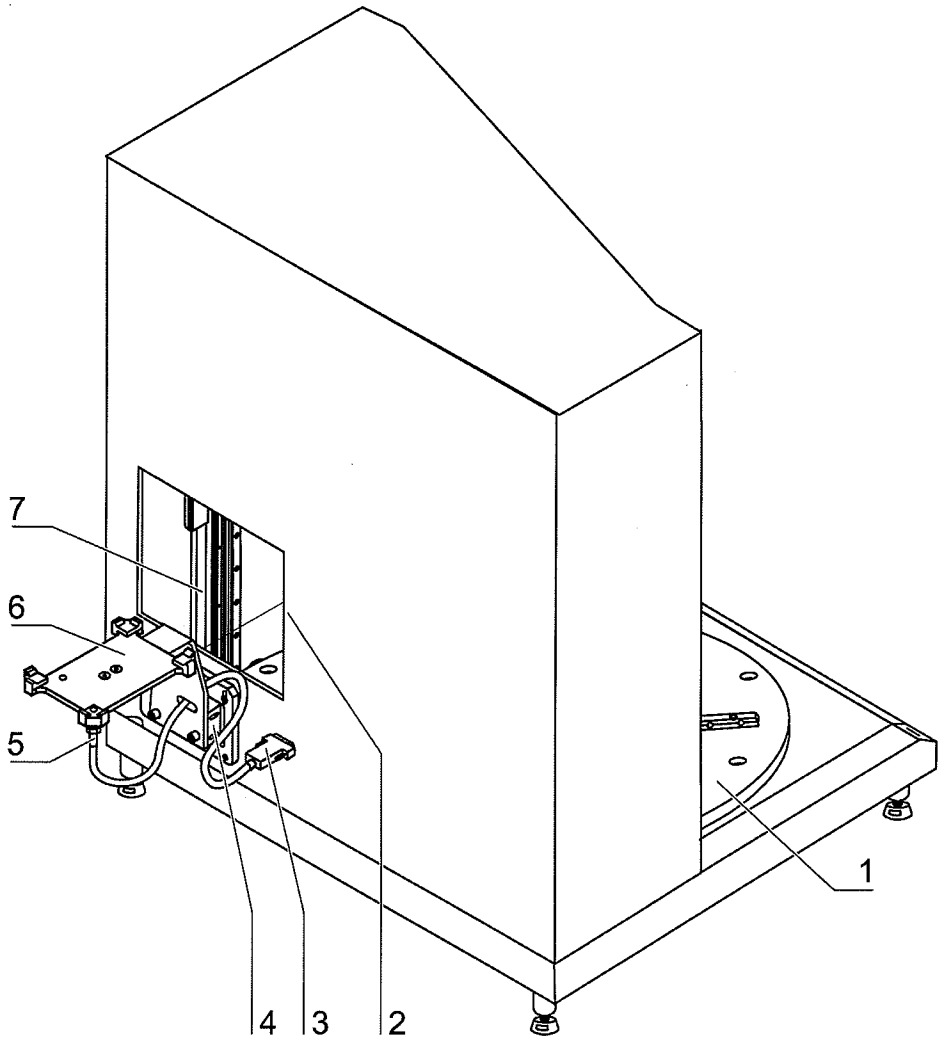


Fig. 4
Rear view

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4. Description of the device

4.3 Supply interfaces

Fig. 5: All supply interfaces are installed at the front of the device.

RS 232 interface for Plate Shuttle System (PSS):
The PC interface [5] connects the automatic incubator to the internal control system of the integrator which may be a PC workstation for an individual installation or a server for an integrated network.
The software control of the PSS is described in a separate documentation.

RS 232 interface for bar code scanner (optional):
Using the RS 232 interface for bar code scanners [2], the bar code descriptions on the culture container faces can be read.

Power supply connection:
The power is supplied to the device power socket [3] via a fused and grounded plug from the local power system.

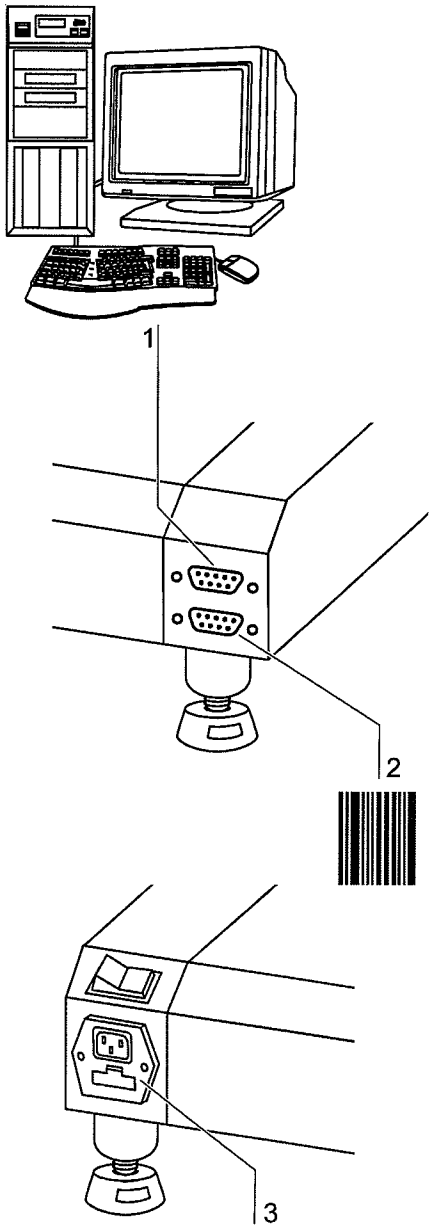


Fig. 5
Device connections

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4. Description of the device

4.4 Plate Shuttle System (PSS)

Fig. 6: The Plate Shuttle System (PSS) is the transport and storage system of the Cytomat® Hotel. It consists of the following components:

- Baseplate [4] with turntable [7] and locking rails [6] to accommodate stakkers [8],
- lift linkage [2] with handler [3].

The turntable [7] is centered on the baseplate [4] and driven by a stepper motor [1]. A flat belt transmits the power from the stepper motor to the turntable. The stepper motor drive has an integrated belt tensioner that automatically adjusts the tension as required.
The turntable has locking rails [6] to accommodate up to 9 stackers.
A rotating handler [3] at the lift linkage [2] moves vertically and transports the culture containers [9] from the stackers [8] to the transfer station where they are picked up by the integrator system or by some other transport system.
The handler has a stepper motor [12] for the vertical movement at the lift linkage. The two gear motors [13] and [14] are used as the drive for the horizontal rotational movements and for moving the shovel to the stackers and to the transfer station.
The culture containers can be transported with software commands to the addressed storage locations in the stackers. The handler shovel [15] deposits the culture container at the corresponding position in the stacker. As this happens, a barcode laser scanner (optional) [11] can read the description on the culture container face.
The plate detection sensor [10] is able to detect if the handler is empty or occupied to prevent the double loading of the handler, e.g. after a power reset.
A cable with connector [5] connects the Plate Shuttle™ System (PSS) to the main board of the device.

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4. Description of the device

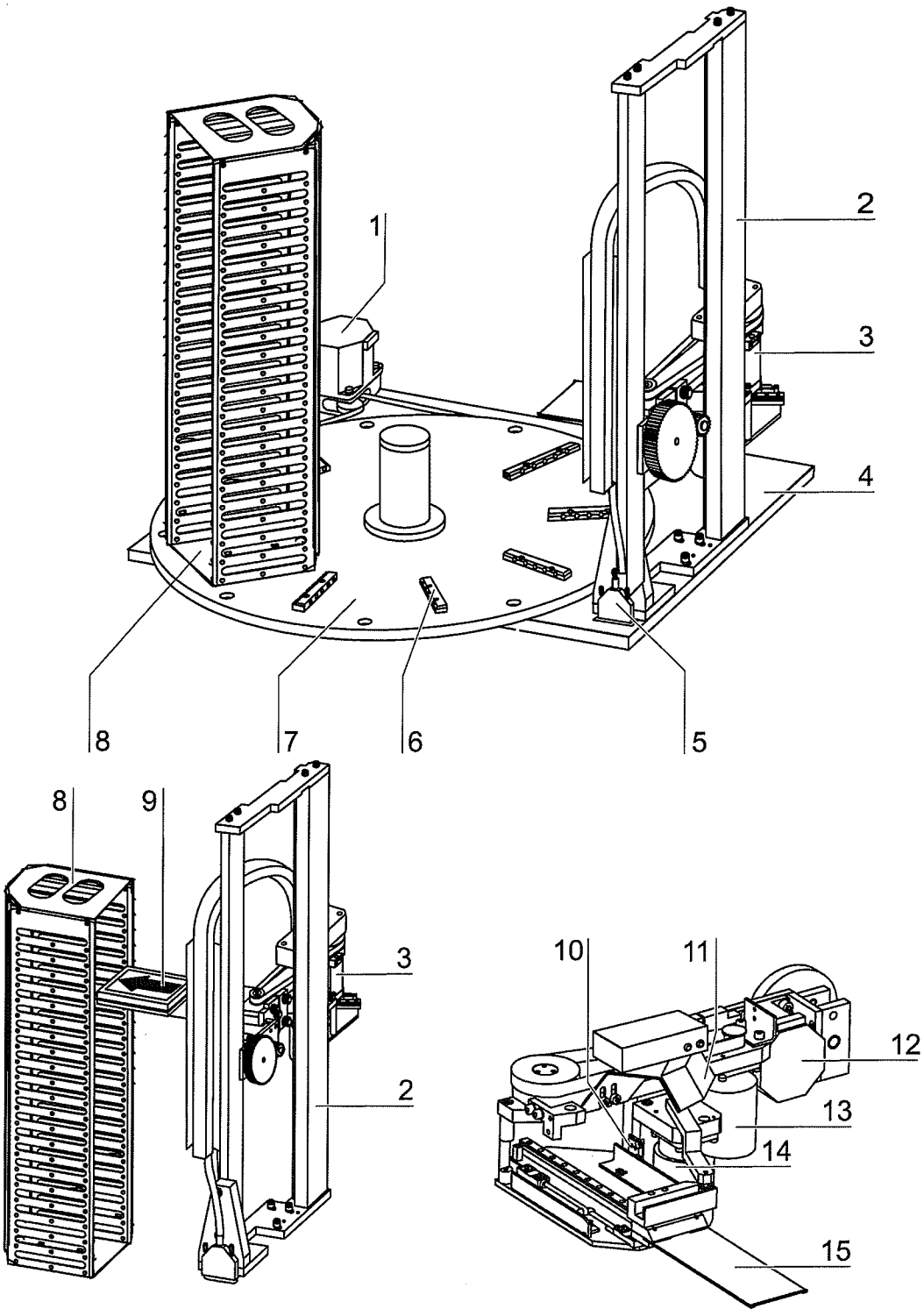


Fig. 6
Plate Shuttle™ System (PSS)

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4. Description of the device

4.5 Stackers (storage system)

Fig. 7: The stackers are used as the storage system of the Plate Shuttle™ System (PSS). The turntable [5] can accomodate 9 stackers. Each stacker is equipped with several support rails to accomodate culture containers [1]. The vertical distance between two support rails, the so-called pitch [3], indicates the number of levels in a stacker for storing culture containers.
Stackers are available with various pitches for different culture containers.

For a list of available stackers and part numbers, please refer to Section 11.

Stacker for	Pitch	Levels	max. Height
1536 well plates	17 mm	28	12 mm
96 well plates	23 mm	21	18 mm
Microplates	28 mm	17	23 mm
Microplates	29 mm	16	24 mm
Transwell plates	33 mm	15	28 mm
Deepwell plates	50 mm	10	45 mm
Tippbox	69 mm	9	64 mm

The support rails have locking tabs at the opening side of the stacker to prevent the accidental shifting of the installed culture containers.
The stackers are positioned on and engaged in the locking rails [4] of the turntable [5].

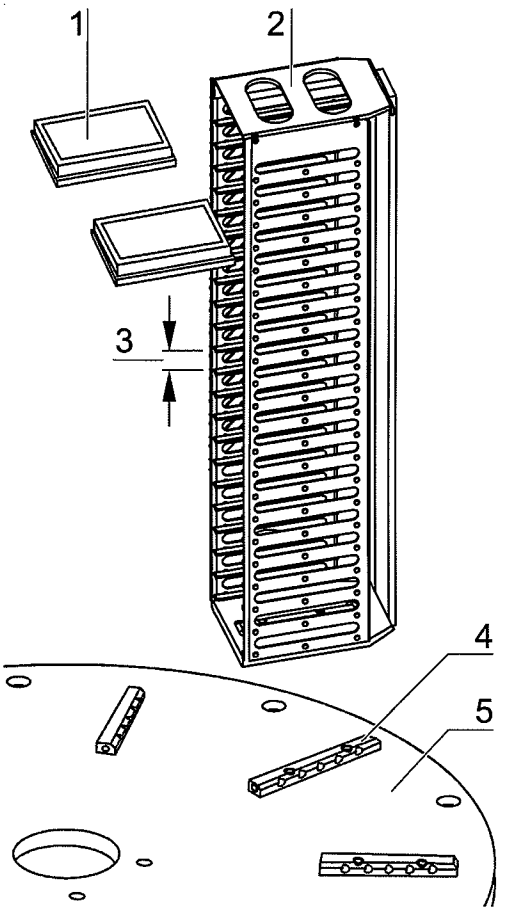


Fig. 7
Stackers

CAUTION – Handler collision!

The traveling motions of the handler are programmed for the individual pitch in the stakker.
If stackers with higher or lower pitches than originally provided are to be used, the handler shovel will collide with the culture containers.
When using stackers with different pitches, the traveling motion of the handler must be readjusted!

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4. Description of the device

4.6 Transfer station

Fig. 8: The transfer station [4] is the transfer system of the Plate Shuttle™ System (PSS) to the external, on-site transport system.
For the Cytomat® Hotel, three transfer station versions are available:

- Standard transfer station [4]
- 90° rotatable transfer station [6]
- 180° rotatable SWAP station [5]

The handler of the Plate Shuttle™ System (PSS) picks up the culture container from the addressed storage location of the stacker and delivers it through the access opening [2] to the on-site transport system. For this purpose, the culture container is deposited on the transfer station [4] where it is picked up by the transport system. The plate detection sensor [3] checks to see if the transfer station can be loaded by the handler.
The Plate Shuttle™ System (PSS) is enclosed by a casing [1].

CAUTION - Traveling motion intervention!

Any attempt to stop the traveling motion or to tamper with the motion manually bears the risk of crushing hands or fingers.
Do not tamper with the traveling motion!

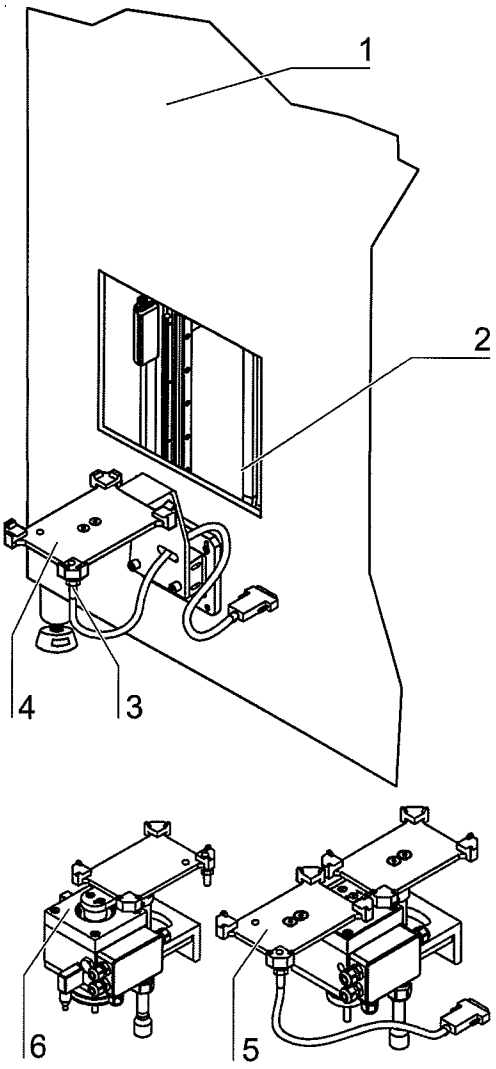


Fig. 8
Transfer station

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5. Start-up

5.1 Hygiene preparations

The Cytomat® Hotel is delivered in a clean, but not sterile state. Prior to the initial start-up, the device should be decontaminated for its intended purpose. For detailed information on cleaning and disinfecting the device, see Section 9.

5.2 Aligning the device

Prior to the initial operation of the Cytomat® Hotel, adjust the device stands to ensure that the baseplate of the Plate Shuttle™ System (PSS) is absolutely level in the horizontal plane.

1. Rotate the adjustable device stands using an open-end wrench (24 mm).
2. The adjustment of the device stands should be carried out from left to right and from front to rear.

NOTE – Lift linkage

Do not grasp the lift linkage when aligning or transporting the device.
If the linkage bends by tensile or compressive forces, the complete lift system may be damaged.

5.3 Installing the stacker

1. **Fig. 9:** Grasp the stacker at the handle plate [1].
2. Slightly tilt the stacker toward the front of the device, position it above the locking rail [3] and apply slight pressure until it is engaged.

NOTE – Handling stackers

The stackers are precision components whose form and orientation must not be tampered with. Stackers must not be installed or removed using excessive force or tools.

To ensure an absolutely plane position, the locking plate [2] at the bottom of the stackers and the turntable [4] of the magazine must be kept absolutely clean. Therefore, never deposit the stackers on the floor but only on the particle-free surfaces after they have been thoroughly cleaned.

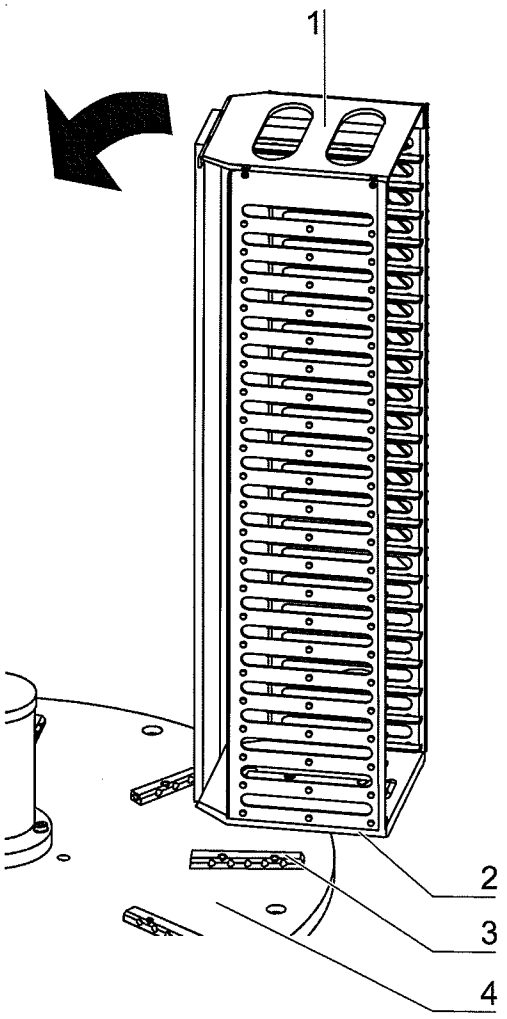


Fig. 17
Stacker installation

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5.4 Installing the transfer station

Fig. 10: The Cytomat® Hotel can be equipped with three different transfer stations:

- Standard transfer station [1],
- 90° rotatable transfer station [10] (optional),
- 180° rotatable Swap station [8] (optional).

The transfer station is matched to fit the position and the traveling motions of the Plate Shuttle™ System PSS at the factory and is then removed for the transport from the mounting plate [2] at the device rear panel.

NOTE – Table installation position

For the installation of the 90° rotatable transfer station [10] and of the Swap station [8], the transfer station tables must be rotated by 90° parallel to the device rear panel.

The transfer station is installed to the mounting plate [2].

1. Insert the screws [7] through the holes of the bracket into the two holes [5] at the mounting plate and tighten the screws:
   - standard version through holes [6],
   - 90° rotatable transfer station through holes [11],
   - Swap station through holes [9].

2. Connect the plug [4] of the plate detection sensor connecting cable to the interface socket [3].

NOTE – Mounting plate

The mounting plate has been adjusted in accordance with the movements of the Plate Shuttle™ System (PSS).
The position and the settings at the mounting plate must not be altered.

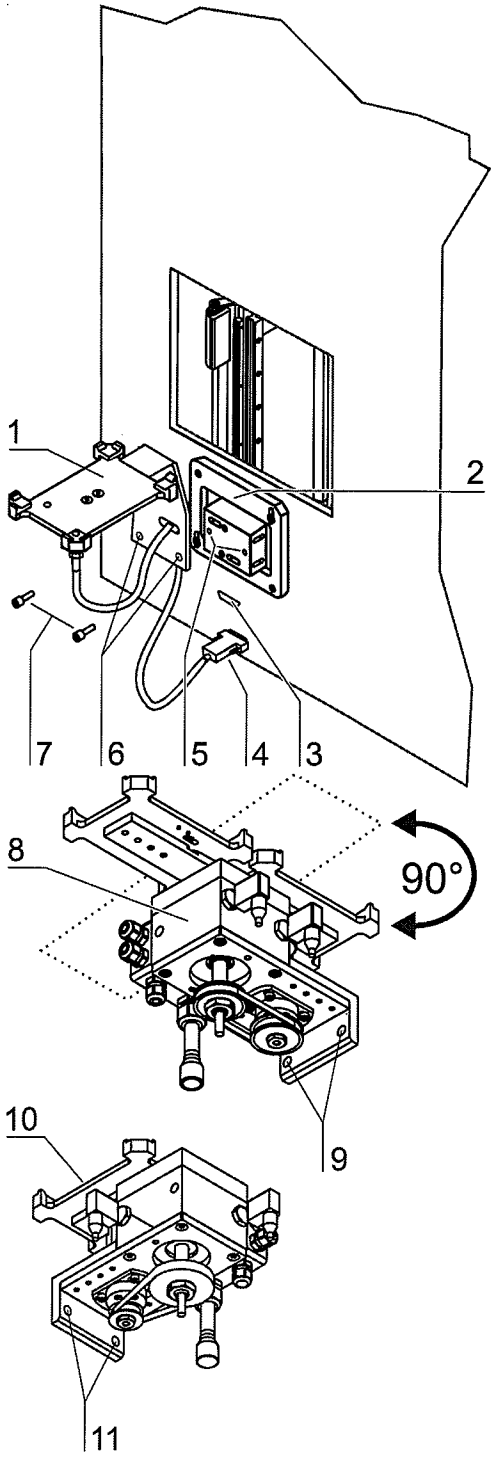


Fig. 10
Transfer station installation

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5. Start-up

5.6 Power supply connection

The device must be connected to a correctly installed and grounded power supply source:
- Fusing: T 16 A,
- Circuit breaker: G 16.

WARNING - Electric shock!

Contact with current-carrying components may cause a lethal electric shock.
Before connecting the device to the power supply, check plug and connection line for damage.
Do not use damaged components for connecting the device to the power supply!

1. Before connecting the device to the power supply, check to see if the voltage rating of the sockets corresponds with the specifications on the nameplate of the device. If the ratings given for voltage (V) and current (A) are not correct, the device must not be connected to the power supply.
2. **Fig. 11:** Connect the power plug [1] of the power supply cable to the socket [2] at the device.
3. Connect the power supply cable grounding plug [3] to a properly grounded and fused power socket.
4. Make sure the power supply cable is not subjected to tensile or compressive force.

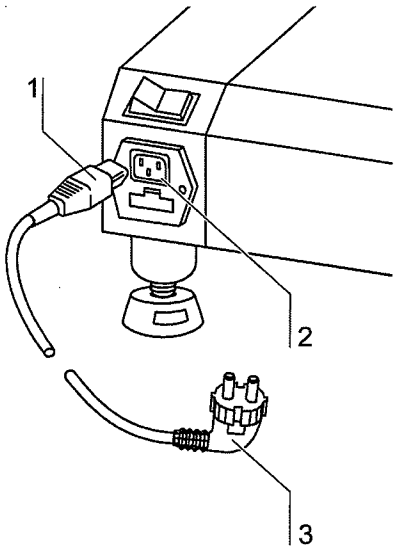


Fig. 11
Power supply connection

5.7 RS 232 interface for barcode scanner

RS 232 interface for barcode scanner (optional):
The RS 232 interface for a barcode scanner [1] can be used to read the barcode descriptions on the faces of the culture containers. Details about operating barcode scanners are listed in the annex of the software documentation for the automatic incubator Cytomat® 6000-6001/Cytomat® Hotel.

Connecting the device:
1. Turn computer system off.
2. **Fig. 12:** Connect the serial interface cable to the RS 232 interface PSS [1] of the Cytomat® Hotel and to a serial interface (COM 1/COM 2 etc.) of the external computer system.

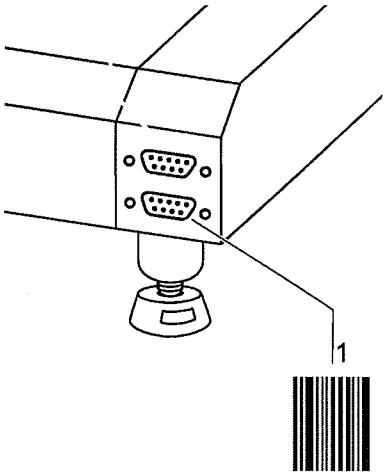


Fig. 12
RS 232 interface for barcode scanner

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5.7 Interface for Plate Shuttle™ System (PSS)

The RS 232 interface for the PSS connects the Cytomat® Hotel to the external control system of the integrator. This may be a PC workstation for an individual installation or a server for an integrated network. The entire motional procedure of the Plate Shuttle™ System (PSS) for the automated loading and unloading of the stackers and for picking up or depositing the culture containers at the transfer station is controlled by using this external computer system.

Connecting the device:

1. Turn computer system off.
2. **Fig. 13:** Connect the serial interface cable to the RS 232 interface PSS [1] of the Cytomat® Hotel and to a serial interface (COM 1/COM 2 etc.) of the external computer system.

NOTE - Initial start-up

For the initial start-up of the Cytomat® Hotel, the magazine should be empty (no culture containers).
For testing the device functions, use only the test software supplied with the device. This software gives you a good overview of the incubator functions.

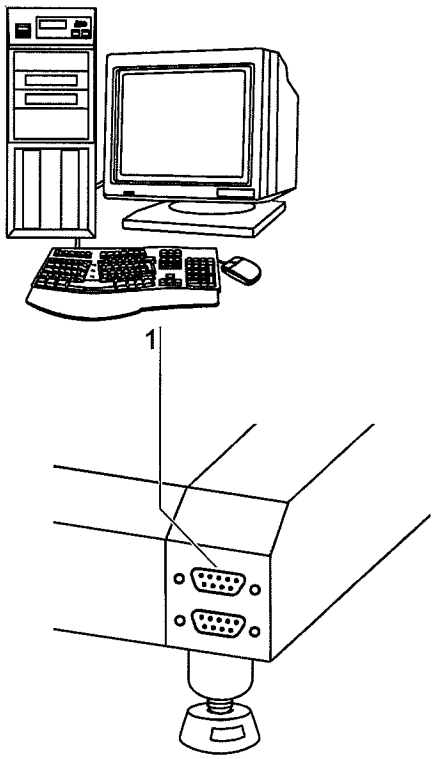


Fig. 13
Plate Shuttle™ System (PSS) connection

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6. Operation

6.1 Preparing the device

The device must only be released for operation after all major measures for the start-up, **particularly decontamination and test run**, have been taken.
Prior to starting operation, the following device components must be checked for their correct function:

- The components of the Plate Shuttle™ System (PSS) and the on-site transport system must be matched to fit each other
- The traveling motions of the Plate Shuttle™ System (PSS) must be synchronized without collision hazard.

NOTE – Hygiene regulations

Prior to any operation, the user must clean and disinfect the chamber in accordance with the hygiene regulations set forth by the operator to protect the cultures.
The "Principles of good microbiological proceedings" at the end of these instructions are to be used as safety information for personnel operating the device.

6.2 Starting operation

Starting and loading the device:Starting and loading the device:

1. Turn the device on using the power switch.
2. Run the Plate Shuttle™ System (PSS) start-up.
3. **The device is ready to be loaded.**

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7. Shut-down

7.1 Shutting the unit down

1. Unload stacker completely. Make sure that all culture containers have been removed from the turntable.
2. Switch device off using the main switch. Disconnect power plug and protect it from accidental reconnection.
3. Clean and disinfect the device.
4. Disconnect the power plug from the device and store it at a separate location.

NOTE – Handler malfunction

If the handler motion is blocked when the device is started up again, cancel operation immediately:

1. **Switch the device off and disconnect it from the power supply system.**
2. **Move all motor-driven handler components manually for a short while.**
3. **Reconnect device to the power supply system and switch it on. If the handler fails to move again, shut the device down. Do not repeatedly attempt to start the handler!**
4. **Contact Technical Service for repair.**

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8. Cleaning and decontamination

8.1 Preparations

The operator must prepare hygiene regulations for the decontamination of the device in accordance with the application of the device.



WARNING - Electric shock!



Contact with current-carrying components may cause a lethal electric shock.
Prior to cleaning and disinfection work, disconnect the device from the power supply!

- **Turn the device off using the power switch.**
- **Unplug power connector and protect it against accidental reconnection.**
- **Check to see if the device is de-energized.**



WARNING – Protective measures!

Contact with contaminated surfaces may cause infections. Disinfectants may contain harmful substances.
The operator must set cleaning and disinfection measures depending on the potential hazard of the experiments conducted with the device.

The disinfection is carried out in three stages:

- **Pre-disinfection,**
- **cleaning,**
- **final disinfection.**

The pre-disinfection of the Plate Shuttle™ System (PSS) is carried out with installed stackers. For cleaning and final disinfection, the stackers must be removed.

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8. Cleaning and decontamination

8.2 Wipe/spray disinfection

The wipe/spray disinfection procedure is used for the decontamination of the device surfaces and of the Plate Shuttle™ System (PSS) components. Only stakkers with metallic support rails can be autoclaved.



CAUTION – Fire hazard!



Disinfectants with an alcohol content of more than 10 % may form, in combination with air, easily combustible and explosive gas mixtures. When using such disinfectants, avoid open flames or exposure to excessive heat during the entire disinfection process!

- **Use such disinfectants only in adequately ventilated rooms.**
- **After the disinfectant has been allowed to react, wipe the cleaned device components thoroughly dry. Do not operate the device before all components are completely dry.**
- **Observe safety regulations to avoid fire and/or explosion hazard caused by alcohol-containing disinfectants.**



CAUTION – Harmful chemicals!



Chloride-containing disinfectants may corrode noble metals. Therefore, use only disinfectants that do not contain chloride or whose low content of chloride does not harm noble metals!

Alcohol dulls the protective foils of the photocells. The detection sensor of the transfer station, of the handler, and of the turntable must not be allowed to come into contact with alcohol!

Some exterior surfaces of the device are made of plastics. Solvents may dissolve plastics, and powerful acids or lyes may cause embrittlement of the plastics. Do not use hydrocarbon-containing solvents, detergents with an alcohol content of more than 10 % or powerful acids or lyes for cleaning plastic components!

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8. Cleaning and decontamination

Pre-disinfection:
1. Spray disinfectant onto all surfaces and device components or wipe surfaces and components clean using disinfectant.
2. Allow disinfectant to react as specified by manufacturer.

Cleaning:
1. Wipe the surfaces of the chamber and the removed device components clean with a solution of tepid water and domestic dishwashing agent or with a special cleaner (e.g. Liquinox). A solution of tepid water and dishwashing agent is also suited for removing stubborn deposits.
2. Rinse the cleaned surfaces with autoclaved water (3 to five cycles) to ensure that cleaning agent residues are removed completely.
3. Wipe the surfaces and the cleaned device components dry using a soft, sterile cloth.

Final disinfection:
1. Wipe the surfaces or the removed device components clean again using disinfectant.
2. Allow disinfectant to react as specified by manufacturer.

Cleaning the device exterior surfaces:
1. Wipe the exterior surfaces clean again using a solution of tepid water and domestic dishwashing agent.
2. Then, wipe surfaces thoroughly dry.

NOTE – Protection from leakage current

Do not allow moisture to enter the electrical connections of the Plate Shuttle™ System (PSS) as otherwise the device control may be impaired due to resulting leakage current. Prior to the next operation of the device, make sure that the connector pins are dry. Disconnect connector and blow connector and receptacle dry with compressed air, if required.

Disinfectant:
A surface disinfectant recommended by Thermo can be ordered under part number 50052425 (250 ml spray bottle) and 50051939 (500 ml refill bottle).
Details for efficiency and approvals are available on request.

As an alternative for the U.S.A., Thermo Electron recommends Microcide SQ. Microcide SQ is EPA-listed. Direct order: www.globalbio.com.

Cleaning agents:
Liquinox or domestic dishwashing agents based on soap lye.

Rinsing agents:
Distilled, preferably autoclaved water, not demineralized. Isopropanol p. a. (solution of 70 % alcohol).

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8. Cleaning and decontamination

8.3 Lubrication

Fig. 14: After each cleaning and disinfection, the moving components of the lift system must be lubricated using special grease.

NOTE - Lubrication of components

Apply grease to a clean, lint-free cloth and apply sparesly (thin film) to the following lift system components:

- **Plastic gear [2] of the handler and the related aluminum gear rack of the lift system. For the rack, lubricate the teeth [6] and the side surfaces [1].**
- **Guide rail [3] on both sides of the lift system.**
- **Teeth of the drive gear [4] and of the transfer gear [5] of the handler.**
- **Linear rail [7] below the shovel. If the rail is equipped with a lubricator nipple, lubricate it using a suited grease gun; otherwise the entire surface of the linear rail must be lubricated.**

Lubricant:
Heraeus special grease 3500 Lubricant is a special lubricant for sliding components.
Lubricant contains only substances that are in accordance with the purity requirements of FDA and is approved by USDA-H1 (United States Department of Agriculture).
Part No.: 76 003 500

Auxiliaries:
Lint-free, sterile cloths or sheets.

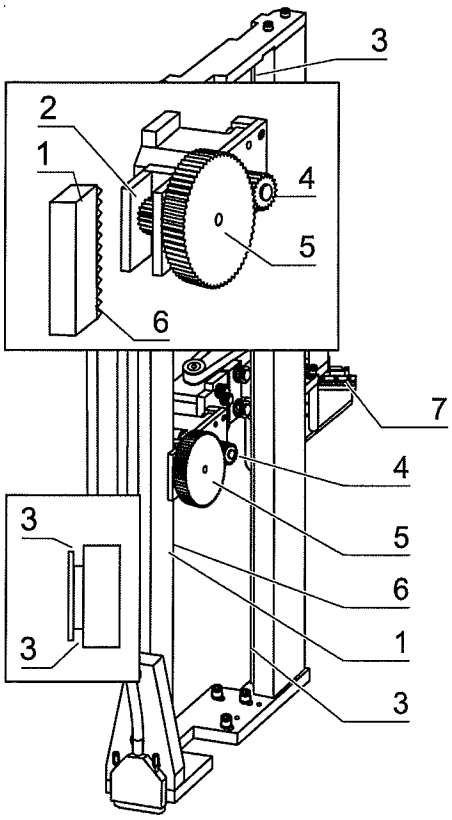


Fig. 14
Lubricating the Plate Shuttle™ System (PSS)

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9. Maintenance

9.1 Inspections and checks

To ensure the operativeness and the operational safety of the device, the functions and device components listed below must be checked at different intervals.

Annual inspection:
- Belt tension.
- Electrical safety check in accordance with the applicable national regulations (e.g. VBG 4).

NOTE – Functional check

If safety devices were removed or disabled for inspections, the device must not be operated before the safety devices have been reinstalled and checked for their correct function.

9.2 Service intervals

During running operation, the following service works must be performed:

3-month service:
- Check device for corrosion and remove any corrosion residues. Corrosion indications:
  - Aluminum corrosion: white
  - Steel corrosion: brown
- Basic cleaning of the Plate Shuttle™ System (PSS) components.

NOTE – Service contract

Thermo Electron offers a device-specific service contact that comprises all test and service works required.

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9. Maintenance

9.3 Inspection intervals for Plate Shuttle™ System (PSS)

		Inspect		Service		Replace	
		Months	Cycles	Months	Cycles	Months	Cycles
Lift system vertical guide	• Even grease film along entire guide length • No dust particles • No signs of wear • Remove old grease pack • Apply new grease pack • In case of excessive play, replace worn parts as required	2	2000	6	50000	--	--
Shovel linear guide	• Check maximal vertical and lateral play • Even grease film along entire guide length • No dust particles • No signs of wear • Remove old grease pack • Apply new grease pack • In case of excessive play, replace worn parts as required	2	2000	6	50000	--	--
Turntable drive belt	• Check flat belt for signs of wear • Belt edges must not be frayed • Belt tissue must not be visible • Tension belt as required	2	2000	6	50000	12	100000
Handler system toothed belt	• Check toothed belt for signs of wear • Belt edges must not be frayed • Belt tissue must not be visible • Tension belt as required	2	2000	6	50000	12	100000

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9. Maintenance

9.4 Replacing the device fuses

Fig. 15: The two identical device fuses are installed in the fuse compartment [1] below the power socket. The fusage ratings are:

- **Voltage 230 V**
  Two slow fuses [2] T 2 A
- **Voltage 100-120 V**
  Two slow fuses [2] T 2 A

1. Switch device off and disconnect the power plug.
2. The fuse holder [3] is installed to the fuse compartment. To remove, push the locking tab [4] slightly up and pull the fuse holder out of the fuse compartment.
3. Remove the blown fuse and insert a new fuse into the fuse holder.
4. Push the fuse holder into the fuse compartment until the locking tab engages.

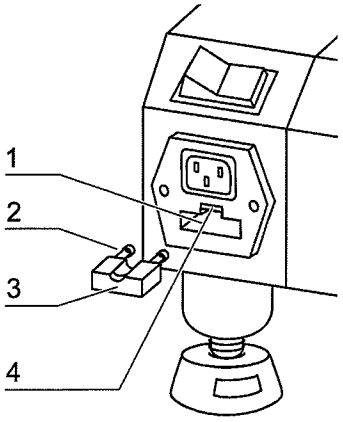


Fig. 15
Device fuse replacement

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10. Disposal

10.1 Disposal procedure

Discarded devices or worn device components contain reusable materials. All device components can be discarded properly after they have been decontaminated properly.

CAUTION – Contamination hazard!

The device can be used for preparing and processing infectious substances so that it may become contaminated.
Before device components are discarded, they must be decontaminated!

- **The device components must be cleaned thoroughly; after the cleaning, they must be disinfected or sterilized, as required by the application.**
- **Discarded devices or device components must be provided with an appropriate certificate showing the decontamination measures performed.**

Recyclable materials

Component	Material
Printed circuit boards	Enclosed electrical components coated with various plastics, equipped on epoxy resin-bound boards
Plastic components, general	Note material labelling
Exterior housing	Steel sheet, painted
Operating panel and indicator foil	Polyethylen
Plate Shuttle™ System (PSS)	Aluminum (anodized), stainless steel, various plastic components
Stacker	Aluminium (eloxiert), Edelstahl
Cables	Plastic-sheathed copper flexible
Packaging	Corrugated board, polyethylene film, wood

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11. Disposal

NOTE-WEEE Compliance:

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol:



Thermo Electron has contracted with one or more recycling/disposal companies in each EU Member State, and this product should be disposed of or recycled through them. Further information on Thermo Electron's compliance with these Directives, the recyclers in your country, and information on Thermo Electron products wich may assist the detection of substances subject to the RoHS Directive are available at **www.thermo.com/WEEERoHS**.

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11. Spare parts and accessories

11.1 List of spare parts and accessories

NOTE – Repairs

Use only original spare parts that have been tested and approved by Thermo Electron Corporation. The use of other spare parts presents potential hazards and will make the warranty void. When ordering spare parts, please have the device specifications of the nameplate available.

Description	Type	Part No.
Operating instructions	Cytomat® Hotel	50074174
Plate Shuttle System software documentation	Cytomat® Hotel	50072912
Device stand	height-adjustable	50029587
Device fuse	T 2 A (set of 2)	50044261
Device fuse 230 V	T 10 A (set of 2)	3700897
Device fuse 100 V -120 V	T 12 A (set of 2)	50034779
Power supply cable	EU	50043143
Power supply cable	GB	50047100
Power supply cable	CH	50047099
Power supply cable	USA	50035414
Power supply cable	IT	50047101
Power supply cable	AUS	50068738
Power supply cable	DK	50072450
Surface disinfectant, 500 ml, refill bottle		50051939
Surface disinfectant, 250 ml, spray bottle		50052425
Stacker / Levels		
96 well plates P23	21	50066776
384 well plates P23	21	50066776
1536 well plates P17	28	50067450
Transwell plates P33	15	50067452
Deep well plates P50	10	50067453
Pitch P28	17	50067451
Pitch P29	16	50067740
Pitch P69 / Tippbox	9	50067454

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12. Technical data

Item	Component		Data
1	**Ambient temperature**		+18° C (min.) to +30° C (max.)
2	**Max. rel. humidity at location**		60 %
3	**Dimensions** Exterior dimensions	 - Width: - Height: - Depth:	 620 mm 880 mm 650 mm (without transfer station)
4	**Weight**		approx 50 kg
5	**Power supply** Protection class Protection type Rated output Rated voltage/frequency		 I IP 20 0,07kW 100 - 230V AC 50 / 60 Hz, see nameplate
6	**Fusing**	On-site Device	T 16 A, 230V / T 15 A, 100V T 2 A

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12. Technical data

Dimensions I

Side views / Standard transfer station

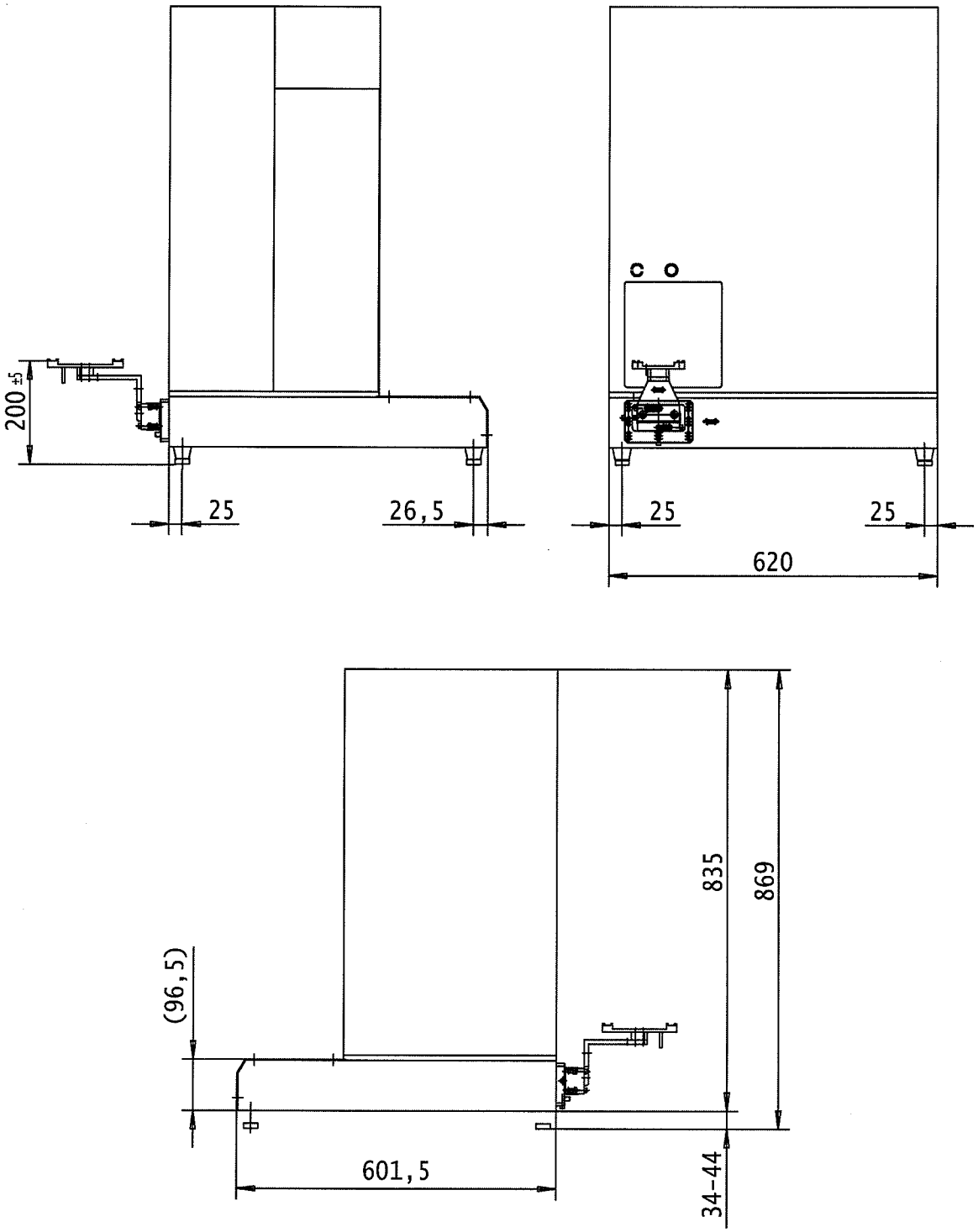


Fig. 16
Dimensions I, side view

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12. Technical data

Top view / Standard transfer station

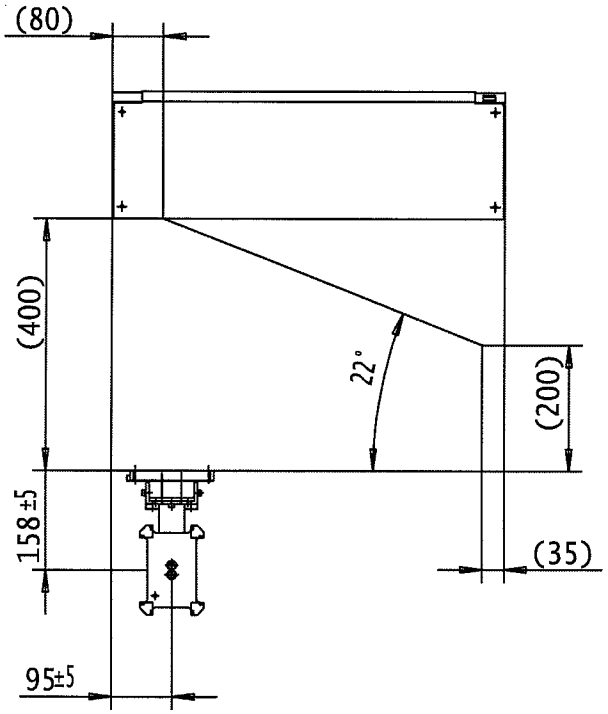


Fig. 17
Dimensions I, top view

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12. Technical data

Dimensions II

SWAP-Station 180° rotatable

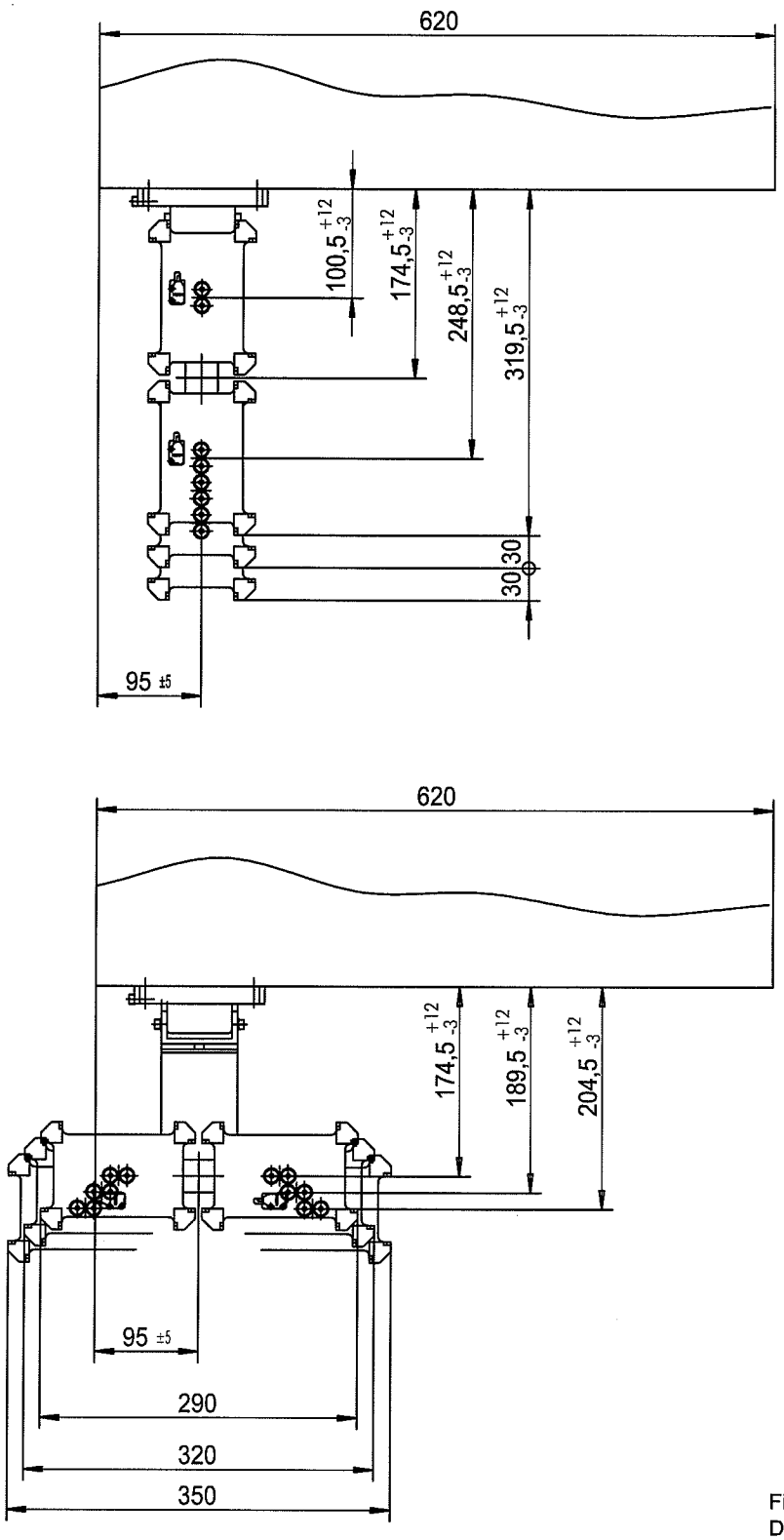


Fig. 18
Dimensions II, SWAP-station

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12. Technical data

Dimensions III

Transfer station 90° rotatable

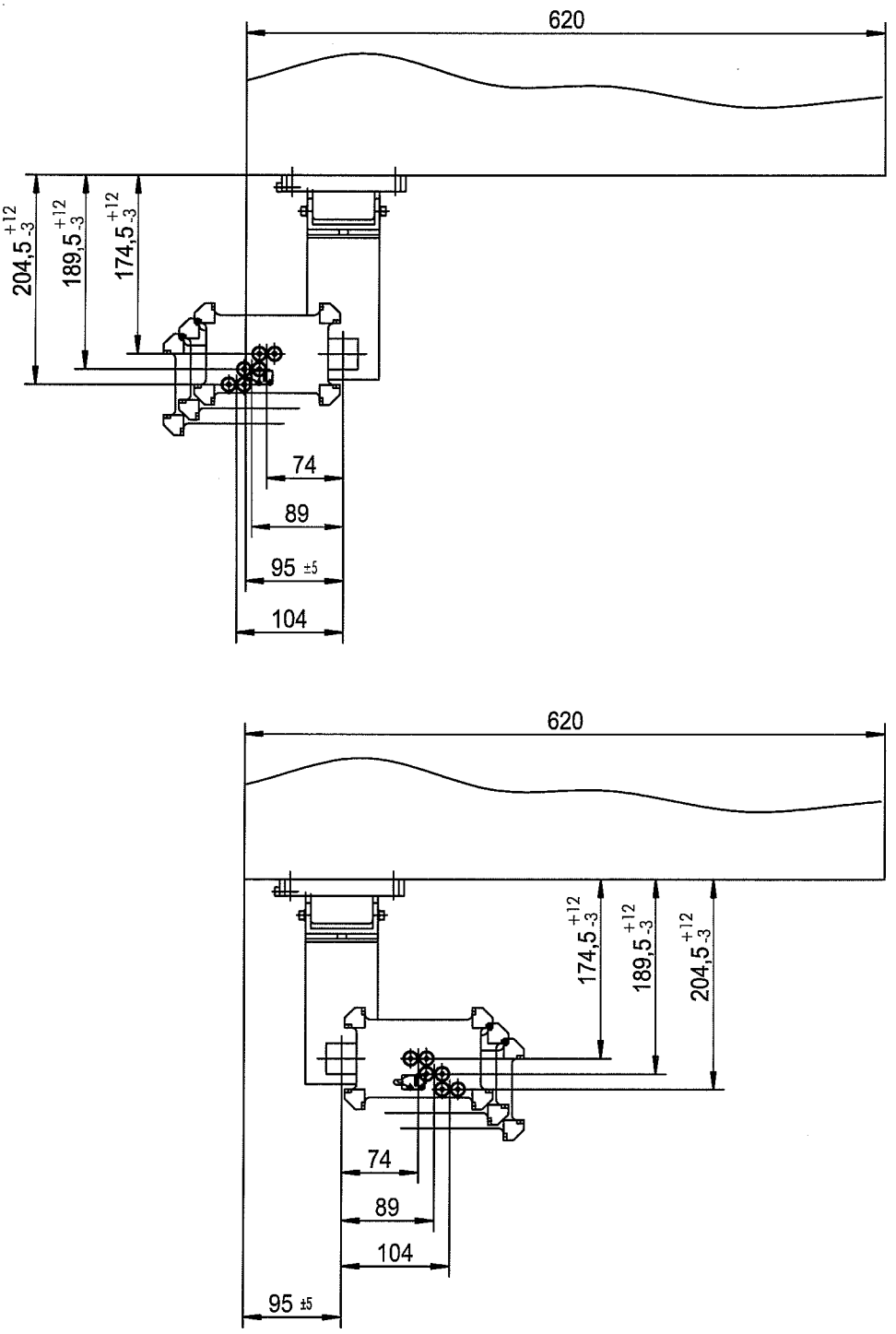


Fig. 19
Dimensions II, Transfer station 90° rotatable

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14. Principles of good microbiological proceedings[1]

General information:

- Keep windows and doors at the place of location closed while carrying out work.
- Do not eat, drink or smoke in the work area.
  Do not store food in the work area.
- Wear laboratory coats or other protective clothing in the work area.
- Always use auxiliaries when pipetting.
- Do not use syringes and hollow needles unless absolutely necessary.
- For all manipulators, try to avoid aerosol formation.
- After completion of the work and prior to leaving the work area, wash your hands thoroughly and disinfect and regrease them, as required.
- Keep the work area tidy and clean. The work tables should contain only the required devices and materials. Store stocks only in the designated containers and cabinets.
- Check the identity of the used agents at regular intervals as required for assessing the potential hazard. The intervals depend on the potential hazard.
- When handling agents, employees are subject to a verbal, job-related instruction prior to starting work and subsequently at least once a year.
- Employees with no or little experience in microbiology, virology or cellular biology must be carefully instructed, guided, and looked after.
- Vermin must be exterminated at regular intervals, as required.

The following additional principles apply to the handling of causatives:

- Disinfect all workplaces every day. If required, the growth of resistent germs must be prevented by using a different disinfectant.
- Do not wear protective clothing outside the work area.
- Autoclave or disinfect contaminated devices prior to cleaning.
- Germ-contaminated waste must be collected safely and destroyed by autoclaving or disinfecting.
- If infectious material is spilled, the contaminated area must be immediately blocked and disinfected.
- When handling humanopathogenic germs for which an effective vaccine is available, all employees must be vaccinated and immunity has to be chekked at regular intervals using appropriate measures.
- The health conditions of the employees must be monitored using occupational medicine check-ups, i.e. initial examination prior to starting work and annual follow-ups. For the check-ups, particularly the guidelines G24, “Skin Diseases”, and G42, “Infection Diseases”, of the German trade associations apply; these guidelines are used as generally acknowledged occupational medicine guidelines by physicians to rate, evaluate, and acquire examination results based on identical criteria.
- For handling genetically manipulated organisms, viruses, and subviral agents with potential hazards, proceeding according to guideline G43, “Biotechnology”, of the German trade associations is required.
- First aid instructions for accidents with pathogenic microorganisms and viruses must always be freely accessible in the work area. All accidents must be reported immediately to the supervisor in charge.

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14. Principles of good microbiological proceedings[1]

Further safety measures in dependence of the potential hazard:

- Usage of safety cabinets (airflow directed away from the experimentator) according to Class I, Class II (type-tested)[2] or Class III.
- Restriction and monitoring of the access to certain areas.
- Usage of special protective clothing and breathing equipment.
- Disinfection of all germ-contaminated materials before they are removed from the worktable.
- Constant vacuum in the work area.
- Reduction of the germ quantity in the exhaust air by suited measures, e.g. HEPA filters.

The following general directives apply to the handling of humanopathogenic and livestock-pathogenic biological agents:

- For handling humanopathogenic biological agents, a permission according to the German Federal Epidemic Act is required.
- For the handling of livestock epidemic germs, a permission in accordance with the German Livestock Epidemic Act and Livestock Epidemic Germ Directive is required.
- Pregnant women and breast-feeding mothers must not handle infectious humanopathogenic biological agents or materials containing these agents.

[1]To be applied accordingly to cell cultures.

[2]Manufacturers' references are published in the information bulletins "Safe Chemical Working" of the German chemical industry's trade association and of the German trade association for health and welfare service and also on demand by the inspection office of the expert commission "Health and Welfare Service".
The commission can be contacted at the trade association for health and welfare service, Pappelallee 35-37, D-2000 Hamburg

Reference: Notice B003, Issue 1/92 – ZH 1/343 of the trade association of the German chemical industry, published by Jedermann Verlag, Postfach 103140, D-69021 Heidelberg.

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14. Device log

Device type:		**Part number:**	
Serial number:		**Service number:**	
Location:		**Operator's note:**	

Work carried out	Notes	Date	Signature

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15. Certificate of decontamination

Customer certificate of decontamination for the execution of a service order.

Invoice recipient / Customer no.:			Location / Forwarding address:		
Year of manufacturer:	KC:	ST:	Name of technician:		Appointed date:
order date:	Ordered by:	Order no.:			
Type of device:			ID no. / Order no.:	Operating hours:	
Equipment no.:	Factory no.:	Service device no.:	Date of delivery:	Date of start-up:	Customer inventory no.:

Certficate of decontamination

Dear customer,

when using biological and chemical agents within and ouside of devices, hazards to the health of the operating personnel may be present and contamination of the surroundings of the device may occur when service or repair works are carried out.
Within the scope of national and international legal regulations, such as
- responsibility of a company for the protection of its employees,
- responsibility of the operator for the operational safety of devices,
all possible hazards must absolutely be prevented. Prior to any calibration, service, and repair works, prior to any relocation of a device, and prior to the shut-down of a device, the device must be decontaminated, disinfected, and cleaned as required by the work to be carried out.
Therefore, we ask you to fill in this certificate of decontamination before you start with the required work.

Yours sincerely

Thermo Electron LED GmbH

Works to be carried out (please mark where applicable)

Service	☐	Filter replacement	☐
Repair	☐	Relocation	☐
Calibration	☐	Transport	☐

Declaration of possible contamination (please mark where applicable)

The device is clear of biological material	☐	The device is clear of dangerous chemical substances	☐
The device is clear of radioactivity	☐	The device is clear of other dangerous substances	☐
The device is clear of cytostatic agents	☐		

Certification:

Prior to carrying out the required work, we have decontaminated, disinfected, and cleaned the device as described in the operating instructions of the device and in accordance with nationally applicable regulations.
The device does not present any hazards.

Note:

Date, legally binding signature, stamp

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