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BÜCHI Labortechnik AG
Meierseggstrasse 40
Postfach
CH-9230 Flawil 1
E-Mail: quality@buchi.com

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1 About this document

This operation manual is applicable for all variants of the instrument. Read this operation manual before operating the instrument and follow the instructions to ensure safe and trouble-free operation. Keep this operation manual for later use and pass it on to any subsequent user or owner. BÜCHI Labortechnik AG accepts no liability for damage, faults and malfunctions resulting from not following this operation manual.

If you have any questions after reading this operation manual:

► Contact BÜCHI Labortechnik AG Customer Service.

https://www.buchi.com/contact

1.1 Warning notices in this document

Warning notices warn you of dangers that can occur when handling the device. There are four danger levels, each identifiable by the signal word used.

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>DANGER</td>
<td>Indicates a danger with a high level of risk which could result in death or serious injury if not prevented.</td>
</tr>
<tr>
<td>WARNING</td>
<td>Indicates a danger with a medium level of risk which could result in death or serious injury if not prevented.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>Indicates a danger with a low level of risk which could result in minor or medium-severity injury if not prevented.</td>
</tr>
<tr>
<td>NOTICE</td>
<td>Indicates a danger that could result in damage to property.</td>
</tr>
</tbody>
</table>

1.2 Symbols

The following symbols are displayed in this operation manual or on the device:

1.2.1 Warning symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>![General warning]</td>
<td>General warning</td>
</tr>
<tr>
<td>![Hot surface]</td>
<td>Hot surface</td>
</tr>
<tr>
<td>![Breakable items]</td>
<td>Breakable items</td>
</tr>
<tr>
<td>![Hand injuries]</td>
<td>Hand injuries</td>
</tr>
<tr>
<td>![Flammable substances]</td>
<td>Flammable substances</td>
</tr>
</tbody>
</table>
1.2.2 Mark-ups and symbols

NOTE
This symbol draws attention to useful and important information.

☑ This character draws attention to a requirement that must be met before the instructions below are carried out.

▶ This character indicates an instruction that must be carried out by the user.

 ⇨ This character indicates the result of a correctly carried out instruction.

<table>
<thead>
<tr>
<th>Mark-up</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window</td>
<td>Software Windows are marked-up like this.</td>
</tr>
<tr>
<td>Tab</td>
<td>Tabs are marked-up like this.</td>
</tr>
<tr>
<td>Dialog</td>
<td>Dialogs are marked-up like this.</td>
</tr>
<tr>
<td>[Button]</td>
<td>Buttons are marked-up like this.</td>
</tr>
<tr>
<td>[Field names]</td>
<td>Field names are marked-up like this.</td>
</tr>
<tr>
<td>[Menu / Menu item]</td>
<td>Menus or menu items are marked-up like this.</td>
</tr>
<tr>
<td>Status</td>
<td>Status is marked-up like this.</td>
</tr>
<tr>
<td>Signal</td>
<td>Signals are marked-up like this.</td>
</tr>
</tbody>
</table>

1.3 Trademarks

Product names and registered or unregistered trademarks that are used in this document are used only for identification and remain the property of the owner in each case.
2 Safety

2.1 Proper use
The UniversalExtractor E-800 is designed for the extraction (solid-liquid extraction) of samples with known solvents or solvent mixtures and the reduction or drying of the extract. The UniversalExtractor E-800 can be used in laboratories for the following tasks:

- Economic Continuous Extraction (without chamber heater)
- Soxhlet Extraction (with and without chamber heater)
- Continuous Extraction (with and without chamber heater)
- Hot Extraction (with chamber heater)
- Soxhlet warm Extraction (with chamber heater)
- Twisselmann Extraction (with chamber heater)

2.2 Use other than intended
Use of any kind other than that described in Proper use and any application that does not comply with the technical specifications constitutes use other than that intended.
In particular, the following applications are not permissible:

- Use of the instrument in areas which require explosion-safe apparatus.
- Processing samples which could be caused to explode or ignite by impact, friction, heat or sparks (e.g. explosives).
- Use of the instrument with samples that react with solvent.
- Use of the instrument with solvents containing peroxides.
- Use of the instrument with other than original BUCHI glassware.
- Use of the instrument in overpressure situations.
- Use of the instrument with strong acids and alkaline solutions.
- Use of the instrument with solvents with boiling points which are less than 30 °C.
- Use of the instrument with solvents with boiling points which are more than 150 °C.
- Use of the instrument with solvents with ignition points which are less than 160 °C.

2.3 Staff qualification
Unqualified persons are unable to identify risks and are therefore exposed to greater dangers.
The device may only be operated by suitably qualified laboratory staff.
These operating instructions are aimed at the following target groups:
Users

Users are persons that meet the following criteria:

- They have been instructed in the use of the device.
- They are familiar with the contents of these operating instructions and the applicable safety regulations and apply them.
- They are able on the basis of their training or professional experience to assess the risks associated with the use of the device.

Operator

The operator (generally the laboratory manager) is responsible for the following aspects:

- The device must be correctly installed, commissioned, operated and serviced.
- Only suitably qualified staff may be assigned the task of performing the operations described in these operating instructions.
- The staff must comply with the local applicable requirements and regulations for safe and hazard-conscious working practices.
- Safety-related incidents that occur while using the device should be reported to the manufacturer (quality@buchi.com).

BUCHI service technicians

Service technicians authorized by BUCHI have attended special training courses and are authorized by BÜCHI Labortechnik AG to carry out special servicing and repair measures.

2.4 Location of warning signs on the product
2.5 Protection devices

![Protection devices figure]

Fig. 1: Protection devices

1 Protection shield  
2 Protection shield

2.6 Residual risks

The device has been developed and manufactured using the latest technological advances. Nevertheless, risks to persons, property or the environment can arise if the device is used incorrectly. Appropriate warnings in this manual serve to alert the user to these residual dangers.

2.6.1 Hot surfaces

The surfaces of the device can become very hot. If touched they can cause skin burns.

- Do not touch hot surfaces or else wear suitable protective gloves.

2.6.2 Empty beakers on heating plates

Empty beakers on active heating plates lead to very hot surfaces and can damage the instrument and the beakers.

- Remove empty beakers from the instrument.
- Deactivate heating positions not used.
- Use optimized extraction parameters, drying parameters and solvent amounts (e.g. from BUCHIs technical and application notes).

2.6.3 Mechanical damages

If a device is damaged, sharp edges, moving parts or exposed electrical wires can cause injuries.

- Check device regularly for visible damage.
Make sure that the locking mechanism of the protection shield is working properly.

If faults occur:

- Switch off the device immediately.
- Unplug the power cord.
- Inform the operator.
- Cool the device before taking any further action.
- Do not continue to use devices that are damaged.

### 2.6.4 Glass breakage

Broken glass can cause severe cuts.

Not visible cracks on glassware can lead to breakage.

- Wear protective gloves when handling broken glassware.
- Handle the glass components carefully and do not drop them.
- Always place the glassware in a suitable holder when they are not in use.
- Prevent any mechanical impact.
- Prevent thermal shocks on glassware (e.g. do not put hot glassware on cold surface).
- Always visually inspect glass components for damage every time they are used.
- Do not continue to use glass components that are damaged.
- Do not use beakers which have been heated empty on a heating plate for more than 20 minutes.

### 2.6.5 Glass damages during extraction process

Glass damages during the extraction process can cause instrument damages caused by solvents, coolant and fire.

If fault occurs:

- Switch off the device immediately.
- Unplug the power cord.
- Inform the operator.
- Let the temperature of the instrument decrease under observation until it is the same as the ambient.

### 2.6.6 Overfilled extraction beakers

Overfilled extraction beakers can cause spills and lead to instrument damage or fire.

- Do not fill more than the indicated maximum quantity. See Chapter 3.5 "Technical data", page 25

### 2.6.7 Spilled hazardous materials

It is the responsibility of the operator to ensure the safety of users and the selection of correct decontamination agents.

- Make sure that the personal protective equipment meets the requirements of the safety data sheets for the chemicals used.
- Make sure that the decontamination agent meets the requirements of the safety data sheets for the chemicals used.
- Make sure that the decontamination agent is compatible with the materials used. See Chapter 3.5 "Technical data", page 25
- If you have any further questions, contact BUCHI Customer Service.

2.6.8 Solvent leakages during extraction process
Solvent leaking systems can cause dangerous solvent vapors that lead to instrument damage or fire.
- Check proper installation of the sealings and condition of sealings before each use.
- Change seals if necessary.
- Check all the connections of solvent tubes after installation.
- Observe the instrument after the start of the extraction until the solvent condenses.

- If fault occurs:
  - Switch off the device immediately.
  - Unplug the power cord.
  - Inform the operator.
  - Let the temperature of the instrument decrease under observation until it is the same as the ambient.

2.6.9 Incorrect function of the Analyte Protection Sensors
- Do not cover or modify the analyte protection sensors.
- Only use clean beakers for extraction.
- Keep the reflector foils clean.

2.6.10 Traces of dark extracts or residuals of extract foam
Traces of dark extracts or residuals of extract foam on the beaker walls can lead to the incorrect functioning of the analyte protection sensor.

2.7 Personal protective equipment
Depending on the application, hazards due to heat and/or corrosive chemicals may arise.
- Always wear appropriate personal protective equipment such as safety goggles, protective clothing and gloves.
- Make sure that the personal protective equipment meets the requirements of the safety data sheets for all chemicals used.

2.8 Modifications
Unauthorized modifications may impair safety and lead to accidents.
- Use only genuine BUCHI accessories, spare parts and consumables.
- Technical modifications to the device or accessories should only be carried out with the prior written approval of BUCHI Labortechnik AG and only by authorized BUCHI technicians.

BUCHI accepts no liability whatsoever for damage arising as a result of unauthorized modifications.
3  Product description

3.1  Description of function

The UniversalExtractor E-800 is designed to carry out the following solid-liquid extraction methods:

- Economic Continuous Extraction (without chamber heater). See Chapter 3.1.1 "Economic Continuous Extraction (with extraction glass chamber Economic Continues Extraction)", page 15
- Soxhlet Extraction (with and without chamber heater). See Chapter 3.1.2 "Soxhlet Extraction (with extraction glass chamber universal)", page 16
- Continuous Extraction (with and without chamber heater). See Chapter 3.1.3 "Continuous Extraction (with extraction glass chamber universal)", page 16
- Hot Extraction (with chamber heater). See Chapter 3.1.4 "Hot Extraction (with extraction glass chamber universal)", page 17
- Soxhlet warm Extraction (with chamber heater). See Chapter 3.1.5 "Soxhlet Warm Extraction (with extraction glass chamber universal)", page 18
- Twisselmann Extraction (with chamber heater). See Chapter 3.1.6 "Twisselmann Extraction (with extraction glass chamber universal)", page 18

3.1.1 Economic Continuous Extraction (with extraction glass chamber Economic Continues Extraction)

Step 1 extraction

- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up around the sample to the condenser, condenses and drops back into extraction chamber through the sample into the beaker.

Step 2 drying

- The solvent is heated, vapor rises up around the sample to the condenser, condenses and flows into tank.
- The analyte remains in the beaker.
3.1.2 **Soxhlet Extraction (with extraction glass chamber universal)**

Step 1 extraction
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is closed, the solvent is collected up to the level sensor and extracts the analyte.
- When the optical sensor is reached, the magnetic valve opens and the solvent containing the analyte flows back into the beaker.

Step 2 rinsing
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is open, the solvent flows back into beaker, the solvent is not collected.

Step 3 drying
- The solvent is heated, vapor rises up to the condenser, condenses and flows into tank.
- The analyte remains in the beaker.

3.1.3 **Continuous Extraction (with extraction glass chamber universal)**

Step 1 extraction
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is open, the solvent extracts the analyte and flows back into the beaker.

Step 2 drying
- The solvent is heated, vapor rises up to the condenser, condenses and flows into the tank bottle.
- The analyte remains in the beaker.
3.1.4 **Hot Extraction (with extraction glass chamber universal)**

**Step 1 extraction**
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is closed, the solvent is collected up to the level sensor.
- The analyte is extracted.
- The solvent is heated in the extraction chamber, vapor rises up to the condenser, condenses and drops back into the extraction chamber.
- The magnetic valve opens regularly to release a small portion of extract into the beaker.

**Step 2 rinsing**
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is open, the solvent flows back into beaker, the solvent is not collected.

**Step 3 drying**
- The solvent is heated, vapor rises up to the condenser, condenses and flows into tank.
- The analyte remains in the beaker.
3.1.5 **Soxhlet Warm Extraction (with extraction glass chamber universal)**

Step 1 extraction
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The solvent in the extraction chamber is heated.
- The magnetic valve is closed, the solvent is collected up to the level sensor and extracts the analyte.
- When the optical sensor is reached, the magnetic valve opens and the solvent containing the analyte flows back into the beaker.

Step 2 rinsing
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is open, the solvent flows back into beaker, the solvent is not collected.

Step 3 drying
- The solvent is heated, vapor rises up to the condenser, condenses and flows into tank.
- The analyte remains in the beaker.

3.1.6 **Twisselmann Extraction (with extraction glass chamber universal)**

Step 1 extraction
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The magnetic valve is closed, the solvent is collected in the extraction chamber. The solvent is heated, vapor rises up to the condenser, condenses, and drops back through the sample into the extraction chamber.

Step 2 rinsing
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is open, the solvent flows back into beaker, the solvent is not collected.

Step 2 drying
- The solvent is heated, vapor rises up around the sample to the condenser, condenses and flows into the tank bottle.
- The analyte remains in the beaker.

3.1.7 **Description of the analyte protection**

The Analyte Protection protects the analyte from overheating.
The Analyte Protection triggers under the following situations:

<table>
<thead>
<tr>
<th></th>
<th>Economic Extraction</th>
<th>Soxhlet Extraction</th>
<th>Continuos Extraction</th>
<th>Hot Extraction</th>
<th>Warm Extraction</th>
<th>Twisselmann Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of beaker</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Presence of solvent</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(Level check)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraction step</td>
<td>X</td>
<td>X(^1)</td>
<td>X(^1)</td>
<td>X(^1)</td>
<td>X(^1)</td>
<td>X(^1)</td>
</tr>
<tr>
<td>Rinse step</td>
<td>-</td>
<td>X(^1)</td>
<td>-</td>
<td>X(^1)</td>
<td>X(^1)</td>
<td>X(^1)</td>
</tr>
<tr>
<td>Dry step</td>
<td>X</td>
<td>X(^1)</td>
<td>X(^1)</td>
<td>X(^1)</td>
<td>X(^1)</td>
<td>X(^1)</td>
</tr>
</tbody>
</table>

\(^1\) activation inert gas
3.2 Configuration

3.2.1 Front view (with chamber heater)

Fig. 2: Front view

1 Protection shield
2 Condenser rack
3 Chamber rack
4 Condenser tank bottle
5 Installation board
6 Tank bottle
7 Heating plate
8 Analyte protection sensor
9 Beaker rack
10 Chamber heater
11 Inert gas connection (option)
12 On/Off master switch
13 Pro Interface
3.2.2 Front View (without chamber heater)

Fig. 3: Front view

1 Protection shield
2 Condenser rack
3 Chamber rack
4 Condenser tank bottle
5 Tank bottle
6 Beaker rack
7 Installation board
8 Analyte protection sensor
9 Heating plate
10 On/Off master switch
11 Pro Interface
3.2.3 Rear view

Fig. 4: Rear view

1 Upper connections  2 Lower connections
See Chapter 3.2.4 "Upper connections on the rear side", page 22
See Chapter 3.2.5 "Lower connections on the rear side", page 23

3.2.4 Upper connections on the rear side

Fig. 5: Connections on the top

1 Standard BUCHI communication port (COM)  2 Standard BUCHI communication port (COM)
3 LAN port  4 Port for the cooling water valve
### 3.2.5 Lower connections on the rear side

![Diagram of connections](image)

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coolant water solvent tank in (marked <strong>IN</strong>)</td>
</tr>
<tr>
<td>2</td>
<td>Solvent in (marked <strong>TANK IN</strong>)</td>
</tr>
<tr>
<td>3</td>
<td>Fuse</td>
</tr>
<tr>
<td>4</td>
<td>Power supply connection</td>
</tr>
<tr>
<td>5</td>
<td>Fuse</td>
</tr>
<tr>
<td>6</td>
<td>Inert gas connection (option) (marked <strong>INERT</strong>)</td>
</tr>
<tr>
<td>7</td>
<td>Coolant water out (marked <strong>OUT</strong>)</td>
</tr>
<tr>
<td>8</td>
<td>Exhaust (marked <strong>EXHAUST</strong>)</td>
</tr>
<tr>
<td>9</td>
<td>Coolant water in (marked <strong>IN</strong>)</td>
</tr>
<tr>
<td>10</td>
<td>Type plate</td>
</tr>
<tr>
<td>11</td>
<td>Coolant water solvent tank out (marked <strong>OUT</strong>)</td>
</tr>
<tr>
<td>12</td>
<td>Solvent out (marked <strong>TANK OUT (SOLVENT)</strong>)</td>
</tr>
</tbody>
</table>
3.2.6 Installation board

Fig. 7: Installation board

1. Condenser rack Universal
2. FatExtractor E-500 only
3. Chamber rack Universal
4. FatExtractor E-500 only
5. Condenser rack Economic Continuous Extraction
6. FatExtractor E-500 only
7. Chamber rack Economic Continuous Extraction
8. FatExtractor E-500 only
9. Beaker rack Universal
10. Solvent collector tube
11. Sensor plugs
12. Attachment clip for tube
13. Lift

3.3 Type plate

The type plate identifies the instrument. The type plate is located at the rear of the instrument.
3.4 Scope of delivery

NOTE
The scope of delivery depends on the configuration of the purchase order.

Accessories are delivered as per the purchase order, order confirmation, and delivery note.

3.5 Technical data

3.5.1 UniversalExtractor E-800

<table>
<thead>
<tr>
<th>Specification</th>
<th>UniversalExtractor E-800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>1780 W</td>
</tr>
<tr>
<td>Connection voltage</td>
<td>200 - 240 ± 10 % VAC</td>
</tr>
<tr>
<td>Fuse</td>
<td>10 A</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 / 60 Hz</td>
</tr>
<tr>
<td>Overvoltage category</td>
<td>II</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2</td>
</tr>
<tr>
<td>Dimensions (W x D x H) (without glassware)</td>
<td>638 x 595 x 613 mm</td>
</tr>
<tr>
<td>Dimensions (W x D x H) (with glassware Universal)</td>
<td>638 x 595 x 752 mm</td>
</tr>
<tr>
<td>Weight (without glassware)</td>
<td>44.8 kg</td>
</tr>
</tbody>
</table>
### Specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>UniversalExtractor E-800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (with glassware Universal)</td>
<td>52.6 kg</td>
</tr>
<tr>
<td>Total heating power (rated)</td>
<td>1680 W</td>
</tr>
<tr>
<td>Total Heating power (maximum)</td>
<td>1680 W</td>
</tr>
<tr>
<td>Hose connection</td>
<td>6 / 9 mm</td>
</tr>
<tr>
<td>Allowed water pressure (nominal value)</td>
<td>6 bar</td>
</tr>
<tr>
<td>Allowed water pressure (maximum)</td>
<td>8 bar</td>
</tr>
<tr>
<td>Minimum water flow</td>
<td>100 mL/min</td>
</tr>
<tr>
<td>Inlet cooling medium temperature</td>
<td>25 °C below the boiling point of the solvent</td>
</tr>
<tr>
<td>Number of extraction positions</td>
<td>6</td>
</tr>
<tr>
<td>Solvent tank volume</td>
<td>2 L</td>
</tr>
<tr>
<td>Allowed inert gas pressure (maximum)</td>
<td>3 bar</td>
</tr>
<tr>
<td>Max. filling level (Extraction glass chamber Universal)</td>
<td>190 mL</td>
</tr>
<tr>
<td>Max. filling level (Extraction glass chamber Universal LSV)</td>
<td>315 mL</td>
</tr>
<tr>
<td>Max. working volumes (Beaker)</td>
<td>175 mL</td>
</tr>
<tr>
<td>Max. working volumes (Beaker LSV)</td>
<td>320 mL</td>
</tr>
<tr>
<td>Language</td>
<td>DE, EN, IT, ES, FR, JA, CN, PL, RU</td>
</tr>
<tr>
<td>Method storage (Pro interface)</td>
<td>40 methods</td>
</tr>
</tbody>
</table>

#### 3.5.2 Ambient conditions

For indoor use only.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. altitude above sea level</td>
<td>2000 m</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>5‒40 °C</td>
</tr>
<tr>
<td>Maximum relative humidity 80% for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>max. 45 °C</td>
</tr>
</tbody>
</table>
### 3.5.3 Materials

<table>
<thead>
<tr>
<th>Component</th>
<th>Materials of construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Steel 1.4301/304 with powder coating</td>
</tr>
<tr>
<td>Exhaust</td>
<td>Aluminium coated</td>
</tr>
<tr>
<td>Protection shield</td>
<td>PMMA GS</td>
</tr>
<tr>
<td>Glass ware</td>
<td>Borosilikat 3.3</td>
</tr>
<tr>
<td>Sealings glassware</td>
<td>PTFE (with FKM core)</td>
</tr>
<tr>
<td>Tank bottle</td>
<td>Borosilikat 3.3</td>
</tr>
<tr>
<td>Tank bottle valve</td>
<td>PTFE / FFKM</td>
</tr>
<tr>
<td>Sealing solvent connection</td>
<td>PTFE</td>
</tr>
<tr>
<td>Tubing</td>
<td>FEP</td>
</tr>
</tbody>
</table>
4 Transport and storage

4.1 Transport

**NOTICE**

Risk of breakage due to incorrect transportation

Make sure that the instrument is fully dismantled.

Pack every instrument components properly to prevent breakage. Use the original packaging whenever possible.

Avoid sharp movements during transit.

- After transporting, check the instrument and all glass components for damage.
- Damage that has occurred in transit should be reported to the carrier.
- Keep packaging for future transportation.

4.2 Storage

- Make sure that the ambient conditions are complied with (see Chapter 3.5 "Technical data", page 25).
- Wherever possible, store the device in its original packaging.
- After storage, check the device, all glass components, seals and tubing for damage and replace if necessary.

4.3 Lifting the instrument

**WARNING**

Danger due to incorrect transportation

The possible consequences are crushing injuries, cuts and breakages.

- The instrument should be transported by two persons at the same time.
- Lift the instrument at the points indicated.

**NOTICE**

Dragging the instrument can damage the feet of the instrument.

- Lift the instrument when positioning or re-locating.
Fig. 9: Lifting the instrument

- Lift the instrument – this requires two persons each lifting at the points indicated on the left and right side of the instrument.
5 Installation

5.1 Before installation

**NOTICE**

Instrument damage due to switching it on too early.

Switching on the instrument too early after transportation can cause damage.

- Climatize the instrument after transportation.

5.2 Installation site

The installation site must meet the following requirements:

- Firm, level surface
- Make sure that the installation site meets the requirements of the safety data sheets for all solvents and samples used.
- Make sure that no instruments generating heat or corrosive vapors are in the same fume hood (e.g. HydrolEx H-506).
- Take into account the maximum product dimensions and weight. See Chapter 3.5 "Technical data", page 25
- Do not expose the instrument to any external thermal loads, such as direct solar radiation or other ignition source.
- Do not place any flammable devices or substances close to the instrument, as they could ignite due to the heat from the heating plates.
- Make sure that cables / tubes can be routed safely.

**NOTE**

Make sure that the power supply can be disconnected at any time in an emergency.

5.3 Establishing electrical connections

**NOTE**

Observe the regulatory provisions when connecting the instrument to power supply.

- Use external main switches (e.g., emergency off) in accordance with the standards IEC 60947-1 and IEC 60947-3.
- Use additional electrical safety features (e.g., residual-current circuit breakers) to comply with local laws and regulations.

The power supply must fulfill the following conditions:

1. Provide the mains voltage and frequency specified on the type plate of the instrument.
2. Be designed for the load imposed by the instruments connected.
3. Be equipped with suitable fuses and electrical safety features.
4. Be equipped with a proper grounding.
5.4 Securing against earthquakes

The instrument has an earthquake fixing point to protect the device against falling.

![Securing against earthquakes](image)

Fig. 10: Securing against earthquakes

1. Lashing mount

Tie the lashing mount to a fixed point using strong cord or a wire.

5.5 Connecting the coolant hose

There are two possibilities for coolant supply:

- Cooling water valve
- BUCHI Recirculating Chiller

See Chapter 11.3 "Spare parts and accessories", page 81
Precondition:
☐ The coolant connection complies with the specified parameters. See Chapter 3.5 "Technical data", page 25
☐ Make sure that the instrument is not connected to the power supply.
► Install the inlet tube onto the connection marked CW IN.
► Attach the inlet tube in place with a hose clip.
► Install the drain tube onto the connection marked CW OUT.
► Attach the drain tube in place with a hose clip.

5.6 Connecting the solvent tubes to the condenser tank bottle

NOTE
Leave the connection nuts in place when disassembling.

Precondition:
☐ Make sure that the instrument is not connected to the power supply.
► Attach the inlet tube onto the connection marked TANK IN.
► Attach the drain tube onto the connection marked TANK OUT (SOLVENT).
► Attach a solvent connection nut with seals to the connection marked OUT.
► Attach a solvent connection nut with seals to the connection marked IN (SOLVENT).

► Attach the inlet tube onto the connection marked OUT.
► Attach the drain tube onto the connection marked IN (SOLVENT).
Make sure that the solvent collector circuit is complete. See Chapter 11.1 "Schematics", page 79

5.7 Connecting the coolant tubes to the condenser tank bottle

Precondition:
✓ Make sure that the instrument is not connected to the power supply.

- Install the inlet tube onto the connection marked CW TANK OUT.
- Attach the inlet tube in place with a hose clip.
- Install the drain tube onto the connection marked CW TANK IN.
- Attach the drain tube in place with a hose clip.
- Attach the inlet tube onto the connection marked CW IN.
- Attach the drain tube onto the connection marked CW OUT.

Make sure that the solvent collector circuit is complete. See Chapter 11.1 "Schematics", page 79

5.8 Connecting inert gas (option)

5.8.1 Connecting inert gas to the instrument (option)

Precondition:
✓ Make sure that the instrument is not connected to the power supply.

- Attach the inert gas tube onto the connection marked INERT.
5.8.2 Connecting inert gas to the extraction glass chamber (option)

- Attach the inert gas tube onto the connection.

- Attach the inert gas connection nuts onto the extraction glass chamber.

- Connect the inert gas tube.

5.9 Preparing the extraction glass chamber Economic Continuous Extraction

NOTICE! Make sure that the small gap of the sealing shows in the direction of the extraction glass chamber.

- Attach the sealing to the extraction glass chamber.
5.10 Installing the extraction glass chamber Economic Continuous Extraction

Precondition:
☑ The configuration is set to Economic Continuous Extraction. See Chapter 5.16 "Selecting a configuration", page 43

- Prepare the extraction glass chamber Economic Continuous Extraction. See Chapter 5.9 "Preparing the extraction glass chamber Economic Continuous Extraction", page 34

- Pull the chamber rack.

- Put the extraction glass chamber in the instrument.

- Push the chamber rack in the instrument.

5.11 Preparing the extraction glass chamber universal

NOTICE

Risk of broken parts by using tools

Using tools for preparing the instrument can break parts.

- Tighten all parts with your hands.
5.12 Installing the extraction glass chamber universal

**NOTICE**

An incorrect assembled extraction glass chamber can cause glass breakage.

- Install the extraction glass chamber according to following instructions.
Precondition:
☑️ The configuration is set to Universal.
   See Chapter 5.16 "Selecting a configuration", page 43

► Prepare the extraction glass chamber universal. See Chapter 5.11 "Preparing the extraction glass chamber universal", page 35

► Pull the chamber rack.

Precondition:
☑️ Start with the extraction glass chamber on the left side.
☑️ Make sure that the BUCHI Logo points to the front.

► Put the extraction glass chamber in the chamber rack.

► Turn the extraction glass chamber 45° counterclockwise.
Make sure that the extraction glass chamber locks at the hook.

Connect the valve with the socket for sensor on the installation board.

Push the chamber rack in the instrument.

5.13 Installing the protection shields

5.13.1 Installing two protection shields (extraction glass chamber universal only)

Make sure, that both protections shields fit together.
Hold both protection shields on both sides at the point indicated.

Put the rear protection shield on both sides into the rear slot at the same time.

Put the front protection shield on both sides into the front slot at the same time.

5.13.2 Installing one protection shield (extraction glass chamber ECE only)

Hold the protection shield on both sides at the point indicated.
NOTICE! An incorrectly installed protection shield causes an error message on the interface.

- Put the protection shield on both sides into the front slot at the same time.

### 5.14 Preparing the condenser

**NOTICE**

**Risk of broken parts by using tools**

Using tools for preparing the instrument can break parts.

- Tighten all parts with your hands.

**NOTICE! Make sure that the small gap of the sealing show in the direction of the condenser.**

- Put the sealing on the bottom of the condenser.

- Attach the solvent connection nut with the seal to the condenser.
- Connect the solvent collector tube.

**NOTICE! Do not use force to carry out this action step.**
- Put the condenser in the condenser rack.

- Secure the condenser with the flange lock.

- Turn the condenser.

- Connect the solvent collector tube to the installation board.
Attach the tubes with the attachment clip to the installation board.

Connect the condensers.

Establish a condenser circuit.

Make sure that the condenser circuit is complete. See Chapter 11.1 "Schematics", page 79

5.15 Preparing the tank bottle

NOTICE

Risk of broken parts by using tools

Using tools for preparing the instrument can break parts.

Tighten all parts with your hands.

Switch the On/Off master switch to Off.
Put the bottle cap on the bottle.

Put the tank bottle in the instrument.

Attach the joint clip.

### 5.16 Selecting a configuration

#### Navigation path

1. \[ \Rightarrow \] [Settings]

#### Precondition:

- Switch the On/Off master switch to On.
- Navigate to the [Settings] submenu via the navigation path.
- Tap the action [Select configuration].

The display shows a dialog with the selectable configurations.

- Tap the configuration according to the installed glass setup.

The configuration is selected.

The dialog box closes.

### 5.17 Disassembling the condenser circuit

- Disconnect the indicated condenser connection.
Make sure, that there is no coolant in the condenser circuit.

Disconnect the other condenser connections.

Remove the flange lock.

Pull the condenser out of the condenser rack.

Disconnect the solvent collector tube.

Disconnect the solvent collector tube from the installation board.

5.18 Mobile connection

5.18.1 Requirements for local network settings

- The following port has to be enabled in the firewall settings on the internet gateway:
  - TCP (HTTPS) traffics through remote port 443
In order to use the BUCHI Cloud a DNS server must be configured on the instrument.

**NOTE**
If there is no DNS server available enter the IP address for the BUCHI Cloud connection manually.

**NOTE**
If there is no DHCP server available enter the IP address, gateway subnet mask and DNS server manually.

### 5.18.2 Preparing the instrument for app using

**NOTICE!** Do not unplug the LAN cable while the unit is connected to the BUCHI Cloud Services.

- Connect the unit to the LAN (local area network).
- Restart the unit.

**Navigation path**

- ➔ [Settings] ➔ [Network]

- Navigate to [Network].
- Activate the function [DHCP].
- The unit is now ready.
6 Operating the interface pro

6.1 Layout of the interface pro

![Interface pro](image)

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Status bar</td>
<td>Shows the currently used solvent and extraction method.</td>
</tr>
<tr>
<td>2</td>
<td>Menu bar</td>
<td>Shows symbols representing the menus.</td>
</tr>
<tr>
<td>3</td>
<td>Content area</td>
<td>Shows current settings, submenus or actions depending on the current operation.</td>
</tr>
<tr>
<td>4</td>
<td>Function bar</td>
<td>Shows functions that can be performed according to the current operation.</td>
</tr>
</tbody>
</table>
| 5   | Stop button | The extraction stops.  
  \- The valves close.  
  \- The heaters switch off.  
  \- The coolant keeps running 15 min. |
| 6   | Navigation control | Used for navigating the user interface. Pressing the control performs the assigned function on the function bar. |

6.2 Function bar

The function bar shows available functions according to the current operation. The functions on the function bar are executed by tapping the relevant function buttons.
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[Back]</td>
<td>The display reverts to the previous view.</td>
</tr>
<tr>
<td>[OK]</td>
<td>[Confirm]</td>
<td>Confirms an entry.</td>
</tr>
<tr>
<td>[DELETE]</td>
<td>[Delete]</td>
<td>Deletes the selected entry.</td>
</tr>
<tr>
<td>[SAVE]</td>
<td>[Save]</td>
<td>Saves the setting.</td>
</tr>
<tr>
<td>[MENU]</td>
<td>[Menu]</td>
<td>Allows selection of a menu from the menu bar using the navigation con-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>trol.</td>
</tr>
<tr>
<td>[START]</td>
<td>[Start]</td>
<td>Starts an extraction process.</td>
</tr>
<tr>
<td>[STOP]</td>
<td>[Stop]</td>
<td>Aborts extraction on all extraction positions.</td>
</tr>
<tr>
<td>[UP]</td>
<td>[Up]</td>
<td>The lift moves up.</td>
</tr>
<tr>
<td>[DOWN]</td>
<td>[Down]</td>
<td>The lift moves down.</td>
</tr>
<tr>
<td>[QR Code]</td>
<td>[QR Code]</td>
<td>The display shows a QR Code which contains the data of all extraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>parameters.</td>
</tr>
<tr>
<td>[NEW]</td>
<td>[New]</td>
<td>Saves a new setup</td>
</tr>
<tr>
<td>[LOAD]</td>
<td>[Load]</td>
<td>Loads setup</td>
</tr>
</tbody>
</table>

### 6.3 Menu bar

The menus are represented by symbols on the menu bar. Navigation through the menus is by input controls.

The following menus are available:

<table>
<thead>
<tr>
<th>Menu symbol</th>
<th>Meaning</th>
<th>Submenu/Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Home]</td>
<td>[Home] menu</td>
<td>• Process control parameters</td>
</tr>
<tr>
<td>[Setup]</td>
<td>[Setup] menu</td>
<td>• For saving the individual settings for the extraction positions</td>
</tr>
<tr>
<td>[Method]</td>
<td>[Method] menu</td>
<td>• For saving extraction methods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Editing and activating</td>
</tr>
<tr>
<td>[Configuration]</td>
<td>[Configuration] menu</td>
<td>• Change settings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Service menu</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• System information</td>
</tr>
</tbody>
</table>
6.3.1 Home menu

![Home menu diagram]

Fig. 12: Home menu

1. Time remaining  
2. Method  
3. Status  
4. Extraction position  
5. Extraction time and heating level  
6. Rinsing time and heating level  
7. Drying time and heating level  
8. Control buttons

On the home menu the following control buttons are available:

<table>
<thead>
<tr>
<th>Button</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skips the actual step at the selected position.</td>
<td></td>
</tr>
<tr>
<td>Skips the actual step for all positions.</td>
<td></td>
</tr>
<tr>
<td>Aborts extraction on the selected extraction position.</td>
<td></td>
</tr>
<tr>
<td>Editing the running method.</td>
<td></td>
</tr>
</tbody>
</table>

---

**Menu symbol**  
**[Solvent] menu**  
**Submenu/Actions**

- Solvent library  
  See Chapter 11.2  
  "Solvent table",  
  page 80  
- Editing and saving solvents
6.3.2 Setup menu
The setup menu allows saving different methods for different extraction positions. See Chapter 6.5 "Selecting a method for an extraction position", page 51

6.3.3 Method menu
The [Method] menu allows saving methods. See Chapter 6.6 "Editing a method", page 52

6.3.4 Configuration menu
On the [Configuration] menu, you can enter a variety of settings and retrieve information.

Submenu Settings
The submenu [Settings] contains system settings for the instrument.

<table>
<thead>
<tr>
<th>Action</th>
<th>Option</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Language]</td>
<td>Choice of display language on the interface</td>
<td>The following languages are available: English/German/French/Italian/Spanish/Japanese/Chinese/Russian/Polish</td>
</tr>
<tr>
<td>[Date]</td>
<td>Date input</td>
<td>Enter in sequence: Day, month, year. Apply the settings by pressing [OK].</td>
</tr>
<tr>
<td>[Time]</td>
<td>Time input</td>
<td>Enter in sequence: Minutes, hours. Apply the settings by pressing [OK].</td>
</tr>
<tr>
<td>[Beeper]</td>
<td>Off/On</td>
<td>Setting for audible signal in response to input controls.</td>
</tr>
<tr>
<td>[Display brightness]</td>
<td>Enter setting</td>
<td>Display brightness level in %: 0 - 100</td>
</tr>
<tr>
<td>[Configuration]</td>
<td>Choice of glassware</td>
<td>The following glassware is available: Universal glass / ECE</td>
</tr>
<tr>
<td>[max. drying time]</td>
<td>Enter value</td>
<td>Enter the maximum drying time.</td>
</tr>
<tr>
<td>[Analyte protection]</td>
<td>View</td>
<td>Threshold for empty-no beaker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Threshold for full-empty beaker</td>
</tr>
<tr>
<td>[Mobile connection]</td>
<td>View</td>
<td>The control unit shows a QR code for connecting the Extraction Reports app with the instrument.</td>
</tr>
<tr>
<td>[QR code]</td>
<td></td>
<td>The following parameters can be edited: Device name/DHCP/MAC address/System IP address/Subnet mask/Gateway</td>
</tr>
<tr>
<td>[Network]</td>
<td>Enter value</td>
<td></td>
</tr>
<tr>
<td>[Delete app connection]</td>
<td>Confirmation question</td>
<td>Resets external connections to the instrument.</td>
</tr>
<tr>
<td>[Demo Mode]</td>
<td>On/Off</td>
<td>Simulate an extraction.</td>
</tr>
</tbody>
</table>
Submenu Service

⚠️ WARNING

Incorrect use of the actor settings.

Incorrect use of the actors settings can cause instrument damages and injuries.

- Carry out the actor setting as described.

<table>
<thead>
<tr>
<th>Action</th>
<th>Option</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Sensors]</td>
<td>View</td>
<td>All sensor signals can be observed:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Flow sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Level sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Analyte protection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Protection shield</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Valves</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lift current</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Line voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Line frequency</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[Actors]</th>
<th>Open / close</th>
<th>The following settings can be changed:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• Valves:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soxhlet valves See Draining solvent from Extraction glass chamber</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soxhlet Tank valves See Chapter 8.3 &quot;Draining solvent from the instrument&quot;, page 74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cooling water valve On/Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gas valve On/Off (option)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Heater On/Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pump (solvent tank pump) On/Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lift current</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Tap up or down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Display shows the actual current consumption.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Beeper On/Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Chiller On/Off (option)</td>
</tr>
</tbody>
</table>

Submenu System Information

The submenu [System information] contains details of the connected devices and information on network connection diagnosis.


<table>
<thead>
<tr>
<th>Action</th>
<th>Option</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| [Extraction unit]       | View   | The following information on the Extraction Unit is available:  
                                 - Serial number  
                                 - Firmware version  
                                 - Operating hours  
                                 - Board temperature  
                                 - Code |
| [Interface]             | View   | The following information on the interface is available:  
                                 - Serial number  
                                 - Firmware version  
                                 - Operating hours  
                                 - Board temperature  
                                 - Code  
                                 - 30 V Operating voltage  
                                 - 5 V Operating voltage |

**Submenu History QR code**
Shows the history list of the data export QR codes to export data. See Chapter 7.7 "Exporting extraction parameters", page 70

**Submenu Data use**

<table>
<thead>
<tr>
<th>Action</th>
<th>Option</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Number of extractions]</td>
<td>View</td>
<td>Shows the number of extractions performed with the instrument.</td>
</tr>
<tr>
<td>[Time of extraction]</td>
<td>View</td>
<td>Shows the time the instrument performed extractions.</td>
</tr>
</tbody>
</table>

**6.3.5 Solvent menu**
The solvent menu contains the available solvents for the extraction methods. The solvent menu allows editing individual solvents. See Chapter 6.7 "Editing a solvent", page 60

**6.4 Status bar**
The status bar shows actual information about the instrument (e.g. extraction method, LAN connection, etc.).

**6.5 Selecting a method for an extraction position**

**NOTE**
Combination of solvents with far apart boiling points.

- Do not use solvents with boiling point differences higher than 20 °C.
Navigation path

 Navigate to the [Home] menu via the navigation path.
 Navigate to the extraction position you wish to edit.
 The display shows a dialog box with selectable methods.
 Select a method.
 Tap the function [OK] on the function bar.
 Select a method for each extraction position by repeating the previous four steps.

Save the selection with the following process description

Navigation path

 Navigate to the [Setup] menu via the navigation path.
 Tap the function [New] on the function bar.
 The new setup is created with a default name.
 Tap the new setup.
 Tap the function [OK] on the function bar.
 The display shows a dialog with an alphanumeric input box.
 Enter a name for the set-up.
 Tap the function [Save] on the function bar.
 The name is saved.
 The dialog box closes.

6.6 Editing a method

The Pro interface can save up to 40 extraction methods.

6.6.1 Creating a new method

Navigation path

 Navigate to the [Method] menu via the navigation path.
 Tap the submenu [Define method].
 The display shows a dialog with the selectable methods.
 Tap the method you wish to use
 Tap the function [OK] on the function bar.
 The display shows the view Method.
 Tap the function [Save] on the function bar.
 The method is saved.

6.6.2 Changing the name of a method

Navigation path


Navigate to the [Method] menu via the navigation path.
- Tap the name of the method that you wish to edit.
  - The display shows the view Method.
- Tap the function [Edit] on the function bar.
- Tap the action [Method name].
  - The display shows a dialog with an alphanumeric input box.
- Enter a name for the method.
- Tap the function [Save] on the function bar.
  - The new name is saved.
  - The dialog box closes.

6.6.3 Setting the solvent of a method

**NOTE**
Solvents from the Solvent menu are selectable.

**Navigation path**

- Navigate to the [Method] menu via the navigation path.
- Tap the name of the method that you wish to edit.
  - The display shows the view Method.
- Tap the function [Edit] on the function bar.
- Tap the action [Solvent].
  - The display shows a dialog with the selectable solvents.
- Tap the solvent you wish to use.
- Tap the function [OK] on the function bar.
  - The dialog box closes.
- Tap the function [Save] on the function bar.
  - The solvent is saved.

6.6.4 Setting the inert gas (option)

**NOTE**
If the analyte protection sensor triggers inert gas is always released.

Enabling the action [Inert gas] enables the following actions:

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inert gas Extraction</td>
<td>Activating the checkbox enables the inert gas during the extraction steps.</td>
</tr>
<tr>
<td>Inert gas Rinse</td>
<td>Activating the checkbox enables the inert gas during the rinse step.</td>
</tr>
<tr>
<td>Inert gas Drying</td>
<td>Activating the checkbox enables the inert gas during the drying step.</td>
</tr>
</tbody>
</table>
6.6.5 Setting the extraction time of a method
Enter the duration of the extraction time in minutes.
- at least 0 minutes
- maximum 5940 minutes / 99 hours

Navigation path
➔ Navigate to the [Method] menu via the navigation path.
➔ Tap the name of the method that you wish to edit.
➔ The display shows the view Method.
➔ Tap the function [Edit] on the function bar.
➔ Tap the action [Inert gas].

6.6.6 Setting the extraction cycles of a method (Soxhlet and Soxhlet Warm Extraction)
The extraction time and the number of extraction cycles are interdependent.
- If the number of extraction cycles is set to zero, the extraction will finish after the selected time.
- If the extraction time is set to zero, the extraction will finish after the number of extraction cycles is reached.
- If the extraction time and a number of extraction cycles is set, the extraction will finish once both settings are fulfilled.
The number of extraction cycles is selectable from 0 to 5940.
Tap the name of the method that you wish to edit.

The display shows the view *Method*.

Tap the function [Edit] on the function bar.

Tap the action [Extraction cycle].

The display shows a dialog box with a numeric input box.

Enter the value in the numeric input box.

Tap the function [OK] on the function bar.

The dialog box closes.

Tap the function [Save] on the function bar.

The number of extraction cycles is saved.

### 6.6.7 Setting the extraction heating level of a method

The default setting for the heating level setting is depending on the selected solvent. Change the heating level to compensate ambient conditions.

**WARNING**

Setting the heating level too high

The consequences are device damage, serious injuries or death.

- Use the pre-set heating levels.
- Adjust the heating level to compensate the ambient conditions.

**Navigation path**

- Navigate to the [Method] menu via the navigation path.
- Tap the name of the method that you wish to edit.

The display shows the view *Method*.

- Tap the function [Edit] on the function bar.
- Tap the action [Extraction heating level].

The display shows a dialog box with a numeric input box.

- Enter the value in the numeric input box.
- Tap the function [OK] on the function bar.

The dialog box closes.

- Tap the function [Save] on the function bar.

The heating level is saved.

### 6.6.8 Setting the chamber heater (Soxhlet Warm, Hot and Twisselmann Extraction)

The heating steps are selectable from 0 to 10.

**Navigation path**

- Navigate to the [Method] menu via the navigation path.
- Tap the name of the method that you wish to edit.  
  ⇒ The display shows the view *Method*.  
- Tap the function *[Edit]* on the function bar. 
- Tap the action *[Chamber heater]*.  
  ⇒ The display shows a dialog box with a numeric input box.  
- Enter the value in the numeric input box.  
- Tap the function *[OK]* on the function bar.  
  ⇒ The dialog box closes.  
- Tap the function *[Save]* on the function bar.  
  ⇒ The drying heating level is saved.

### 6.6.9 Setting the Soxhlet valve open time of a method (Soxhlet and Soxhlet Warm Extraction)

The Soxhlet valve open time depends on the position of the level sensor and the sample structure.  
Set the Soxhlet valve opening time so that the extraction glass chamber universal is completely emptied.  

The following open times are available:

<table>
<thead>
<tr>
<th>Open time</th>
<th>Level sensor position</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[short]</td>
<td>bottom</td>
<td>The sample structure is easily releasing the solvent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hydrolysed sample in the glass sample tubes are extracted.</td>
</tr>
<tr>
<td>[mid]</td>
<td>middle</td>
<td>The sample structure is easily releasing the solvent.</td>
</tr>
<tr>
<td>[long]</td>
<td>bottom</td>
<td>The sample structure is slowly releasing the solvent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The extraction glass chamber universal LSV is used.</td>
</tr>
<tr>
<td></td>
<td>middle</td>
<td>The extraction glass chamber universal LSV is used.</td>
</tr>
<tr>
<td></td>
<td>top</td>
<td>The sample structure is easily releasing the solvent.</td>
</tr>
<tr>
<td>[max]</td>
<td>top</td>
<td>The extraction glass chamber universal LSV is used.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The sample structure is slowly releasing the solvent.</td>
</tr>
</tbody>
</table>

#### Navigation path

- Navigate to the *[Method]* menu via the navigation path.
6.6.10 Setting the rinse time of a method (Soxhlet, Soxhlet Warm, Hot and Twisselmann Extraction)

Enter the duration of the rinse step in minutes.

- at least 0 minutes
- maximum 5940 minutes / 99 hours

**Navigation path**

- Navigate to the [Method] menu via the navigation path.
- Tap the name of the method that you wish to edit.
  - The display shows the view Method.
- Tap the function [Edit] on the function bar.
- Tap the action [Rinse time].
  - The display shows a dialog box with a numeric input box.
- Enter the value in the numeric input box.
- Tap the function [OK] on the function bar.
  - The dialog box closes.
- Tap the function [Save] on the function bar.
  - The rinse time is saved.

6.6.11 Setting the rinse heating level of a method (Soxhlet, Soxhlet Warm, Hot and Twisselmann Extraction)

The default setting for the rinse heating level is depending on the selected solvent. Change the rinse heating level to compensate ambient conditions.

**WARNING**

Setting the heating level too high

The consequences are device damage, serious injuries or death.

- Use the pre-set heating levels.
- Adjust the heating level to compensate the ambient conditions.
6.6.12 Setting the number of dry steps
A maximum of three dry steps are possible.

**Navigation path**

- Navigate to the [Method] menu via the navigation path.
- Tap the name of the method that you wish to edit.
  - The display shows the view Method.
- Tap the function [Edit] on the function bar.
- Tap the action [Dry step].
  - A drying step is added.
- Tap the function [Save] on the function bar.
  - The new drying step is saved.

6.6.13 Setting the analyte protection for a dry step

**NOTICE**

Risk of beaker damage or deterioration of the analyte due to incorrect settings of the drying step.

Incorrect drying step settings can damage the analyte and the beaker.

- Use the analyte protection for the first drying step.
- Change the default setting to the optimized parameters of your application. See "Technical Note: Heating guide for UniversalExtractor E-800 ."
- Obey all safety precautions. See Chapter 2.6 "Residual risks", page 12

<table>
<thead>
<tr>
<th>Checkbox</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated</td>
<td>The analyte protection is enabled.</td>
</tr>
</tbody>
</table>
### Checkbox Explanation

<table>
<thead>
<tr>
<th>Checkbox</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deactivated</td>
<td>The analyte protection is disabled.</td>
</tr>
</tbody>
</table>

### Navigation path

- Navigate to the [Method] menu via the navigation path.
- Tap the name of the method that you wish to edit.
  - The display shows the view Method.
- Tap the function [Edit] on the function bar.
- Tap the action [Dry step] you wish to edit.
- Activate or deactivate the checkbox according to your requirements.
- Tap the function [Save] on the function bar.

### 6.6.14 Setting the time for a dry step

Next dry step starts under the following conditions:
- the time for the dry step is reached
- the analyte protection triggers

**NOTE**

If the dry time is set to 0 and the analyte protection is activated, the dry step continues until the analyte protection triggers.

### Navigation path

- Navigate to the [Method] menu via the navigation path.
- Tap the name of the method that you wish to edit.
  - The display shows the view Method.
- Tap the function [Edit] on the function bar.
- Tap the action [Dry step] you wish to edit.
- Tap the number next to [min].
  - The display shows a dialog box with a numeric input box.
- Enter the value in the numeric input box.
- Tap the function [OK] on the function bar.
  - The dialog box closes.
- Tap the function [Save] on the function bar.
  - The time for the drying step is saved.
6.6.15 Setting the heating level for a dry step

⚠️ WARNING

Setting the heating level too high
The consequences are device damage, serious injuries or death.
► Use the pre-set heating levels.
► Adjust the heating level to compensate the ambient conditions.

Navigation path

➔ Navigate to the [Method] menu via the navigation path.
➔ Tap the name of the method that you wish to edit.
⇒ The display shows the view Method.
➔ Tap the function [Edit] on the function bar.
➔ Tap the action [Dry step] you wish to edit.
➔ Tap the number next to heating level symbol.
⇒ The display shows a dialog box with a numeric input box.
➔ Enter the value in the numeric input box.
➔ Tap the function [OK] on the function bar.
⇒ The dialog box closes.
➔ Tap the function [Save] on the function bar.
⇒ The heating level for the drying step is saved.

6.7 Editing a solvent

The solvent menu contains the predefined solvents for the extraction procedures. Additional solvents can be added by following the instructions in Chapter 2 “Safety”, page 10.

6.7.1 Creating a new solvent

Navigation path

➔ Navigate to the [Solvent] menu via the navigation path.
➔ Tap the submenu [Create own].
⇒ The new solvent is created.

6.7.2 Changing the name of a solvent (own created solvents only)

Navigation path

➔ Navigate to the [Solvent] menu via the navigation path.
➔ Tap the name of the solvent you wish to edit.
⇒ The display highlights the selection in green.
6.7.3 Changing the chamber heating level (option)

**Navigation path**

1. Navigate to the [Solvent] menu via the navigation path.
2. Tap the name of the solvent you wish to edit.
3. The display highlights the selection in green.
4. Tap the function [OK] on the function bar.
5. The display shows the view Solvent.
6. Tap the action [Manually].
7. The display highlights the action [Chamber heater level] white.
8. Tap the action [Chamber heater level].
9. The display shows a dialog box with a numeric input box.
10. Enter a heating level for the solvent.
11. Tap the function [Save] on the function bar.
12. The new name is saved.
13. The dialog box closes.

6.7.4 Changing the heating level of a solvent

**Navigation path**

1. Navigate to the [Solvent] menu via the navigation path.
2. Tap the name of the solvent you wish to edit.
3. The display shows the view Solvent.
4. Tap the action [Manually].
5. The display highlights the action [Heating level] in white.
6. Tap the action [Heating level].
7. The display shows a dialog box with a numeric input box.
8. Enter a heating level for the solvent.
Tap the function [Save] on the function bar.
⇒ The new name is saved.
⇒ The dialog box closes.

6.7.5 Changing the boiling point of a solvent

Navigation path

Navigate to the [Solvent] menu via the navigation path.
Tap the name of the solvent you wish to edit.
⇒ The display highlights the selection in green.
Tap the function [OK] on the function bar.
⇒ The display shows the view Solvent.
Tap the action [Manually].
⇒ The display highlights the action [Boiling point] in white.
Tap the action [Boiling point].
Tap the function [OK] on the function bar.
⇒ The control panel shows a dialog box with a numeric input box.
Enter the boiling point for the solvent.
Tap the function [OK] on the function bar.
⇒ The value for the boiling point is saved.
⇒ The dialog box closes.

6.7.6 Changing the enthalpy of a solvent

Navigation path

Navigate to the [Solvent] menu via the navigation path.
Tap the name of the solvent you wish to edit.
⇒ The display highlights the selection in green.
Tap the function [OK] on the function bar.
⇒ The display shows the view Solvent.
Tap the action [Manually].
⇒ The display highlights the action [Enthalpy] in white.
Tap the action [Enthalpy].
Tap the function [OK] on the function bar.
⇒ The display shows a dialog box with a numeric input box.
Enter the enthalpy for the solvent.
Tap the function [OK] on the function bar.
⇒ The value for the enthalpy is saved.
⇒ The dialog box closes.
### 6.7.7 Changing the molecular weight of a solvent

**Navigation path**

1. Navigate to the [Solvent] menu via the navigation path.
2. Tap the name of the solvent you wish to edit.
   - The display highlights the selection in green.
3. Tap the function [OK] on the function bar.
   - The display shows the view Solvent.
4. Tap the action [Manually].
   - The display highlights the action [Mol weight] in white.
5. Tap the action [Mol weight].
6. Tap the function [OK] on the function bar.
   - The display shows a dialog box with a numeric input box.
7. Enter the mol weight for the solvent.
8. Tap the function [OK] on the function bar.
   - The value for the mol weight is saved.
   - The dialog box closes.

### 6.7.8 Changing the density of a solvent

**Navigation path**

1. Navigate to the [Solvent] menu via the navigation path.
2. Tap the name of the solvent you wish to edit.
   - The display highlights the selection in green.
3. Tap the function [OK] on the function bar.
   - The display shows the view Solvent.
4. Tap the action [Manually].
   - The display highlights the action [Density] in white.
5. Tap the action [Density].
6. Tap the function [OK] on the function bar.
   - The display shows a dialog box with a numeric input box.
7. Enter the density for the solvent.
8. Tap the function [OK] on the function bar.
   - The value for the density is saved.
   - The dialog box closes.
7 Performing an extraction

7.1 Preparing the instrument for an extraction

Precondition:
☑ All commissioning operations have been completed. See Chapter 5 "Installation", page 30
☑ Make sure that the tank bottle is empty and installed. See Chapter 5.15 "Preparing the tank bottle", page 42
☑ Make sure that no defective sealings or glass parts are used.

▸ Switch the On/Off master switch to On.
⇒ The instrument is starting up.

7.1.1 Putting the glass sample tube with frit in the extraction glass chamber

NOTE
Instead of glass sample tube with frit it is possible to insert a thimble.

▸ Put the holder for the glass sample tube with frit into the extraction chamber.

▸ Put the glass sample tube with frit into the holder in the extraction chamber.
7.1.2 Adjusting the optical sensor (Twisselmann and Continuous Extraction only)

- Adjusting the optical sensor on the extraction glass chamber universal.
- White line below the sample.

7.1.3 Adjusting the optical sensor (Soxhlet, Soxhlet Warm and Hot Extraction)

- Adjusting the optical sensor on the extraction glass chamber universal.
- White line to the top of the sample.

7.2 Preparing the extraction positions

There are three options to prepare the extraction positions:

<table>
<thead>
<tr>
<th>Option</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select a method for all extraction positions.</td>
<td>See Chapter 7.2.1 &quot;Selecting a method for all extraction positions&quot;, page 66</td>
</tr>
<tr>
<td>Select different methods for each extraction position.</td>
<td>See Chapter 7.2.2 &quot;Selecting different methods for each extraction position&quot;, page 66</td>
</tr>
<tr>
<td>Select a programmed setup.</td>
<td>See Chapter 7.2.3 &quot;Selecting a programmed setup&quot;, page 66</td>
</tr>
</tbody>
</table>
7.2.1 Selecting a method for all extraction positions

**Navigation path**

1. Navigate to the [Home] menu via the navigation path.
2. Tap the method.
   - The display shows a dialog with the selectable methods.
3. Select the method you wish to use.
4. Tap the function [OK] on the function bar.
   - The method is selected.
   - The status bar shows the method activated.

7.2.2 Selecting different methods for each extraction position

**NOTE**

Combination of solvents with far apart boiling points.

- Do not use solvents with boiling point differences higher than 20 °C.

**Navigation path**

1. Navigate to the [Home] menu via the navigation path.
2. Tap the extraction position you wish to edit.
3. The display shows a dialog box with selectable methods.
4. Select a method.
5. Tap the function [OK] on the function bar.

Select a method for each extraction position by repeating the previous four steps.

7.2.3 Selecting a programmed setup

**Navigation path**

1. Navigate to the [Setup] menu via the navigation path.
2. Select the setup you wish to use.
3. Tap the function [Load] in the function bar.
   - The setup is selected.

7.2.4 Selecting the extraction positions

The extraction positions can show the following status:

<table>
<thead>
<tr>
<th>Status</th>
<th>Meaning</th>
</tr>
</thead>
</table>
| ![Activated] | The extraction position is activated.  
The extraction position will be heated. |
| ![Not Activated] | The extraction position is not activated.  
The extraction position will not be heated. |
### Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>The extraction for this extraction position is aborted. The extraction position is not heated anymore.</td>
</tr>
</tbody>
</table>

#### Navigation path

- Navigate to the [Home] menu via the navigation path.
- Select the extraction position with the navigation control.
- Tap the function [OK] on the function bar.
- The status of the extraction position is changed.

## 7.3 Starting an extraction

### CAUTION

**Boiling retardation when using dichloromethane.**

Boiling retardation can cause spills and lead to skin burns or a building fire.

- Use boiling aids, e.g. PTFE boiling chips

### NOTE

**Boiling retardation**

- The beakers contain an integrated boiling surface.
- No boiling aids are needed.

#### Navigation path

- Precondition:
  - The instrument has been prepared. See Chapter 7.1 "Preparing the instrument for an extraction", page 64
  - The extraction positions are prepared. Chapter 7.2 "Preparing the extraction positions", page 65
  - The sample is prepared (in the glass sample tube or in the paper thimbles).
- Switch on the connected recirculating chiller or open the water tap.
- Pull the chamber rack out of the instrument.
- Place the prepared glass sample tube or paper thimble with the corresponding holder in the extraction chamber. See Chapter 7.1.1 "Putting the glass sample tube with frit in the extraction glass chamber", page 64
- Push the chamber rack back in the instrument.
- Set the optical sensor to the correct position.
- For Soxhlet, Soxhlet Warm and Hot Extraction. See Chapter 7.1.3 "Adjusting the optical sensor (Soxhlet, Soxhlet Warm and Hot Extraction)", page 65
- For Twisselmann Extraction. See Chapter 7.1.2 "Adjusting the optical sensor (Twisselmann and Continuous Extraction only)", page 65
Fill the organic solvent directly into the beakers.
Place the beakers on the corresponding positions directly on the heating plate.
Close the protection shield.
Navigate to the [Home] menu via the navigation path.
Tap the function [Down] on the function bar.
- The lift moves down.
Wait until the lift is in the lower position.
Make sure that all components of the glass setup are aligned.

Testing procedure:
- Move each condenser a small distance forward and backward.
- Tap the function [Start] on the function bar.
  - The display shows the [Home] menu with a black background.
  - The instrument is starting the selected method.
- Wait until the solvent boils and condenses.
- Make sure that there are no leaks.

7.4 Task during performing an extraction

7.4.1 Adding solvent through the condenser
There are two possibilities to add solvent through the condenser:
1. with a dispenser see Chapter "Adding solvent through the condenser with a dispenser", page 68
2. with a funnel Chapter "Adding solvent through the condenser with a funnel", page 69

Adding solvent through the condenser with a dispenser

⚠️ CAUTION

Not correctly installed condenser
A not correctly installed condenser can cause skin burns or a building fire
- A beaker is placed under the position.
- An extraction glass chamber is installed at the position.
- The lift is in the lower position.

- Insert the nozzle of the dispenser into the condenser.
- Add solvent with a dispenser.
Use the support solvent supply (option)

- Put a support solvent supply on the condenser.
- Insert the nozzle of the dispenser into the support solvent supply.
- Add solvent with a dispenser.

Adding solvent through the condenser with a funnel

⚠️ CAUTION

Not correctly installed condenser

A not correctly installed condenser can cause skin burns or a building fire

- A beaker is placed under the position.
- An extraction glass chamber is installed at the position.
- The lift is in the lower position.

- Put a funnel on the condenser.

- Add solvent through the funnel.
7.5 Ending an extraction

⚠️ WARNING
Risk of dangerous vapors, hot parts and hot glassware.
A hot instrument can cause building fire, skin burns or death.

- Wait 15 min before opening the lift.
- Do not touch hot parts or surfaces.
- Use pliers to remove the glassware.

Navigation path

Precondition:
- The [Home] menu is showing the status Finished.
- The instrument temperature is less than 150 °C.
- Tap the function [Up] on the function bar.
- The lift moves up.
- Open the protection shield.
- Remove the beaker for further processing.
- If necessary remove solvent from the extraction glass chamber. See Chapter 8.3 "Draining solvent from the instrument", page 74
- Switch off the connected recirculating chiller or close the water tap.
- Empty the solvent tank. See Chapter 8.2 "Removing the tank bottle", page 73

7.6 Shutting down the instrument

Navigation path

Precondition:
- The extraction process has ended.
- Switch the On/Off master switch to Off.

7.7 Exporting extraction parameters

NOTE
The number of saved QR Codes is limited.
- When the internal memory is full, the older QR Codes will be overwritten.

7.7.1 Exporting extraction parameters without cloud connection

Precondition:
- The App is installed on a mobile device.
- An extraction is finished.
- Tap the button [QR Code] on the function bar.
- The display shows a QR code.
Scan the QR code on the display with the camera function of the App.

### 7.7.2 Exporting extraction parameters with cloud connection

Precondition:
- Yes The App is installed on a mobile device.
- Yes An extraction is finished.
- Yes The instrument is connected via LAN cable. See Chapter 5.18 "Mobile connection", page 44

- The extraction parameters are automatically transferred to the App.
8 Cleaning and servicing

NOTE
Users may only carry out the servicing and cleaning operations described in this section.

Any servicing and repair work which involves opening up the casing may only be carried out by BUCHI service technicians.

8.1 Regular maintenance work

⚠️ CAUTION

Hot surfaces.
Skin burns from hot surfaces.

- Let the instrument cool down sufficiently before carrying out any maintenance work.

NOTE
It is the responsibility of the operators to select the correct cleaning agents and materials.

- Do not use abrasive cleaning material.
- Make sure that the cleaning agent meets the requirements of the safety data sheets for the chemicals used.
- Make sure that the cleaning agent is compatible with the materials used. See Chapter 3.5 "Technical data", page 25
- If you have any further questions, contact BUCHI Customer Service.

<table>
<thead>
<tr>
<th>Component</th>
<th>Action</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvent tank</td>
<td>▶ Empty the solvent tank. See Chapter 8.2 &quot;Removing the tank bottle&quot;, page 73</td>
<td>After every extraction</td>
</tr>
<tr>
<td>Glass parts</td>
<td>▶ Check all glass parts for defects.</td>
<td>Before every extraction</td>
</tr>
<tr>
<td></td>
<td>▶ If defective, replace defect glass parts</td>
<td></td>
</tr>
<tr>
<td>Sealings</td>
<td><strong>NOTICE! Do not clean in dishwasher.</strong></td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>▶ Check all sealings for scratches and other defects.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ If defective or damaged, replace the sealing.</td>
<td></td>
</tr>
<tr>
<td>Magnetic valve</td>
<td>▶ Check all magnetic valves for leaks.</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>▶ If leaking, contact BUCHI customer service.</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Action</td>
<td>Frequency</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Heating plate</td>
<td>▶ Wipe down the heating plate with a damp cloth.</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>▶ If heavily soiled, use ethanol or a mild detergent.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ If cracked or broken, contact BUCHI customer service.</td>
<td></td>
</tr>
<tr>
<td>Hoses and hose connections</td>
<td>▶ Check the hoses and hose connections for defects (cracks, brittle areas).</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>▶ If defective, replace defect hoses.</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>▶ Wipe down the housing with a damp cloth.</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>▶ If heavily soiled, use ethanol or a mild detergent.</td>
<td></td>
</tr>
<tr>
<td>Warning symbols</td>
<td>▶ Check that the warning symbols on the instrument are legible.</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>▶ If they are dirty, clean them.</td>
<td></td>
</tr>
<tr>
<td>Protection shields</td>
<td><strong>NOTICE! Do not use Acetone</strong></td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>▶ Wipe down the protection shields with a damp cloth.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Make sure that they click into place. If not, replace the gliding elements. See Replacing the gliding elements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ If defective or damaged, replace them.</td>
<td></td>
</tr>
<tr>
<td>Reflector foil for analyte protection</td>
<td><strong>NOTICE! Do not use any detergent</strong></td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>▶ Switch the On/Off master switch to Off.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Make sure that there are no extraction beakers in the instrument.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Check the reflector foil for dirt.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ If dirty, wipe down the reflector foil with a damp cloth.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Switch the <strong>On/Off</strong> master switch to On.</td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>▶ Wipe down the display with a damp cloth.</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

### 8.2 Removing the tank bottle

▶ Switch the **On/Off** master switch to Off.

▶ Remove the joint clip.
8.3 Draining solvent from the instrument

1. Switch on the pump. See Chapter 8.3.1 "Switch on the pump", page 74
2. Open the tank valves. See Chapter 8.3.2 "Open the tank valves", page 74
3. Switch off the valves. See Chapter 8.3.3 "Switch off the pump", page 75

8.3.1 Switch on the pump

Navigation path

[Service] ➔ [Actors]

Precondition:
☐ A tank bottle is installed. See Chapter 5.15 "Preparing the tank bottle", page 42

- Navigate to [Actors] via the navigation path.
- The display shows the view Actors.
- Enable the action [Pump].

8.3.2 Open the tank valves

Navigation path

[Service] ➔ [Actors] ➔ [Valves]

- Navigate to [Valves] via the navigation path.
- The display shows the view Valves.
- Select the position of the tank valve you wish to open.
- Open the tank valve.
- Wait until all solvent is in the tank bottle.
- Close the tank valve.

### 8.3.3 Switch of the pump

**Navigation path**

| → | [Service] | → | [Actors] |

- Navigate to [Actors] via the navigation path.
- The display shows the view *Actors*.
- Disable the action *Pump*.
## Help with faults

### 9.1 Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flange lock is not inserted completely</td>
<td>The condenser is not in the right position.</td>
<td>▶ Move the condenser flange a little bit until the lock falls into the wholes.</td>
</tr>
<tr>
<td>Instrument does not work</td>
<td>Instrument is not connected to the power supply.</td>
<td>▶ Make sure that the power supply is connected and switched on.</td>
</tr>
<tr>
<td>Method cannot start</td>
<td>Solvent tank is full</td>
<td>▶ Empty the solvent tank.</td>
</tr>
<tr>
<td></td>
<td>Protection shield is open</td>
<td>▶ Close the protective shield.</td>
</tr>
<tr>
<td></td>
<td>No solvent present</td>
<td>▶ Add solvent. See Chapter &quot;Adding solvent through the condenser with a funnel&quot;, page 69</td>
</tr>
<tr>
<td></td>
<td>Not enough solvent</td>
<td>▶ Add solvent. See Chapter &quot;Adding solvent through the condenser with a funnel&quot;, page 69</td>
</tr>
<tr>
<td>Method stops</td>
<td>Cooling water flow is too low</td>
<td>▶ Check the cooling water connection and all hoses for bends and remove them, if necessary.</td>
</tr>
<tr>
<td></td>
<td>Cooling water sensor is defective (may be the coolant is contaminated with algae, lime, etc.)</td>
<td>▶ Contact BUCHI Customer Service.</td>
</tr>
<tr>
<td></td>
<td>Protection shield lifted</td>
<td>▶ Close the protection shield.</td>
</tr>
<tr>
<td></td>
<td>Tank bottle full</td>
<td>▶ Empty the tank bottle. See Chapter 8.2 &quot;Removing the tank bottle&quot;, page 73</td>
</tr>
<tr>
<td></td>
<td>Not enough solvent</td>
<td>▶ Check for leaks. ▶ Add solvent. See Chapter &quot;Adding solvent through the condenser with a funnel&quot;, page 69</td>
</tr>
<tr>
<td>Loss of solvent</td>
<td>Seals wrong, deformed or damaged</td>
<td>▶ Exchange the seals.</td>
</tr>
<tr>
<td></td>
<td>Incorrect positioning of the beaker/ glassware and seals</td>
<td>▶ Contact BUCHI Customer Service.</td>
</tr>
</tbody>
</table>
### Problem | Possible cause | Action
--- | --- | ---
Boiling retardation | Incorrect positioning of the beaker | ▶ Place the beaker directly onto the heating plate.
| Too long waiting time between preparation of the instrument and start | | ▶ Start the instrument quickly after solvent was added.
| If dichloromethane is used | | ▶ Use boiling aids, e.g. PTFE boiling chips.
Dirty boiling surface | | ▶ Replace beaker.
Worn boiling surface | | ▶ Use boiling aids, e.g. PTFE boiling chips.
No boiling | Incorrect positioning of the beaker | ▶ Place the beaker directly onto the heating plate.
| Beaker position is not active | | ▶ Activate the beaker position.
| Heater power is set too low | | ▶ Adapt the heating power to the ambient conditions (temperature, level above sea).

## 9.2 Draining solvent from extraction glass chamber universal

### Navigation path

- ➔ [Service] ➔ [Actors] ➔ [Valves]

### Precondition:
- Solvent remains in the extraction glass chamber.
- The lift is in the lower position.
- The instrument has ambient temperature.
- A beaker is placed under the extraction glass chamber Soxhlet position.

- Navigate to [Valves] via the navigation path.
- The display shows the view *Valves*.
- Select the position of the Soxhlet valve you wish to open.
- Open the Soxhlet valve.
- Wait until the extraction glass chamber is empty.
- Close Soxhlet valve.
10 Taking out of service and disposal

10.1 Taking out of service
- Remove all solvents and coolants.
- Clean the instrument.
- Switch off the instrument and disconnect it from the mains power supply.
- Remove all tubing and communication cables from the device.

10.2 Disposal
The operator is responsible for proper disposal of the instrument.
- When disposing of equipment observe the local regulations and statutory requirements regarding waste disposal.
- When disposing, observe the disposal regulations of the materials used. Materials used see Chapter 3.5 "Technical data", page 25

10.3 Returning the instrument
Before returning the instrument, contact the BÜCHI Labortechnik AG Service Department.
https://www.buchi.com/contact
11 Appendix

11.1 Schematics

11.1.1 Condenser circuit

Fig. 13: Condenser circuit
### 11.1.2 Solvent collector schematic

![Solvent collector schematic](image)

Fig. 14: Solvent circuit

### 11.2 Solvent table

<table>
<thead>
<tr>
<th>Solvent name</th>
<th>Boiling point [°C]</th>
<th>Evaporation enthalpy [kJ/mol]</th>
<th>Molecular weight [g/mol]</th>
<th>Density (at 20 °C) [g/mL]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Propanol (Isopropanol, iPrOH)</td>
<td>82</td>
<td>39.85</td>
<td>60.1</td>
<td>0.78</td>
</tr>
<tr>
<td>Acetone (Propanon, AcMe)</td>
<td>56.05</td>
<td>29.1</td>
<td>58.08</td>
<td>0.791</td>
</tr>
<tr>
<td>Acetonitril (MeCN)</td>
<td>81.65</td>
<td>29.75</td>
<td>41.05</td>
<td>0.78</td>
</tr>
<tr>
<td>Benzene</td>
<td>80.09</td>
<td>30.72</td>
<td>78.11</td>
<td>0.8765</td>
</tr>
<tr>
<td>Butanon (Methylethylketon, AcEt)</td>
<td>79.59</td>
<td>31.3</td>
<td>72.11</td>
<td>0.805</td>
</tr>
</tbody>
</table>
### Solvent names

<table>
<thead>
<tr>
<th>Solvent name</th>
<th>Boiling point [°C]</th>
<th>Evaporation enthalpy [kJ/mol]</th>
<th>Molecular weight [g/mol]</th>
<th>Density (at 20 °C) [g/mL]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform (Trichloromethane)</td>
<td>61</td>
<td>29.24</td>
<td>119.38</td>
<td>1.48</td>
</tr>
<tr>
<td>Cyclohexane</td>
<td>80.73</td>
<td>29.97</td>
<td>84.16</td>
<td>0.78</td>
</tr>
<tr>
<td>Dichloromethane (DCM)</td>
<td>40</td>
<td>28.06</td>
<td>84.93</td>
<td>1.33</td>
</tr>
<tr>
<td>Diethylether</td>
<td>34.5</td>
<td>26.52</td>
<td>74.12</td>
<td>0.71</td>
</tr>
<tr>
<td>Pentane</td>
<td>36.06</td>
<td>25.79</td>
<td>72.149</td>
<td>0.6262</td>
</tr>
<tr>
<td>Ethanol (EtOH)</td>
<td>78.29</td>
<td>38.6</td>
<td>46.07</td>
<td>0.79</td>
</tr>
<tr>
<td>Ethyl acetate (EtOAc)</td>
<td>77.11</td>
<td>31.94</td>
<td>88.11</td>
<td>0.9</td>
</tr>
<tr>
<td>Methanol (MeOH)</td>
<td>64.6</td>
<td>35.21</td>
<td>32.04</td>
<td>0.79</td>
</tr>
<tr>
<td>Heptane</td>
<td>98.4</td>
<td>31.77</td>
<td>100.21</td>
<td>0.68</td>
</tr>
<tr>
<td>Hexane</td>
<td>68.73</td>
<td>28.85</td>
<td>86.18</td>
<td>0.66</td>
</tr>
<tr>
<td>Petroleum 40-60 °C</td>
<td>40-60</td>
<td>28.5</td>
<td>86.18</td>
<td>0.654-0.670</td>
</tr>
<tr>
<td>Tetrahydrofuran (THF)</td>
<td>65</td>
<td>29.81</td>
<td>72.11</td>
<td>0.89</td>
</tr>
<tr>
<td>Toluene</td>
<td>110.63</td>
<td>33.18</td>
<td>92.14</td>
<td>0.87</td>
</tr>
<tr>
<td>Water</td>
<td>100</td>
<td>40.65</td>
<td>18.0153</td>
<td>1</td>
</tr>
<tr>
<td>o-Xylene</td>
<td>144.5</td>
<td>36.24</td>
<td>106.17</td>
<td>0.88</td>
</tr>
<tr>
<td>m-Xylene</td>
<td>139.07</td>
<td>35.66</td>
<td>106.17</td>
<td>0.86</td>
</tr>
<tr>
<td>p-Xylene</td>
<td>138.23</td>
<td>35.67</td>
<td>106.17</td>
<td>0.86</td>
</tr>
</tbody>
</table>

### 11.3 Spare parts and accessories

Use only genuine BUCHI consumables and spare parts in order to ensure correct, safe and reliable operation of the system.

**NOTE**

Any modifications of spare parts or assemblies are only allowed with the prior written permission of BUCHI.

#### 11.3.1 Accessories

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>11067219</td>
<td><img src="holder_stainless_steel.png" alt="Image" /></td>
</tr>
<tr>
<td>11067220</td>
<td><img src="holder_ptfe.png" alt="Image" /></td>
</tr>
<tr>
<td>11068443</td>
<td><img src="holder_extraction_thimbles.png" alt="Image" /></td>
</tr>
</tbody>
</table>

---

Operation Manual UniversalExtractor E-800
<table>
<thead>
<tr>
<th>Item</th>
<th>Order no.</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraction beaker carrier</td>
<td>11067042</td>
<td><img src="image1.png" alt="image" /></td>
</tr>
<tr>
<td>Allows to carry 6 beakers (11067474)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraction beaker LSV carrier</td>
<td>11067715</td>
<td><img src="image2.png" alt="image" /></td>
</tr>
<tr>
<td>Allows to carry 6 beakers LSV 11067714</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set condenser insulations E-800, 6 pcs.</td>
<td>11069077</td>
<td><img src="image3.png" alt="image" /></td>
</tr>
<tr>
<td>The insulation of the condensers prevent condensing water and is recommended in high humidity environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set insulation cooling water hoses</td>
<td>11069079</td>
<td><img src="image4.png" alt="image" /></td>
</tr>
<tr>
<td>The insulation of the water hoses prevent condensing water and is recommended in high humidity environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support solvent supply</td>
<td>11068306</td>
<td><img src="image5.png" alt="image" /></td>
</tr>
<tr>
<td>Allows to fix the tubes of solvent dispensers to the condensers for convenient solvent addition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling water valve. 24VAC</td>
<td>031356</td>
<td><img src="image6.png" alt="image" /></td>
</tr>
<tr>
<td>Valve opens cooling water feed during distillation. Meant to be used with a vacuum controller/interface.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turning disk</td>
<td>11067985</td>
<td><img src="image7.png" alt="image" /></td>
</tr>
<tr>
<td>Allows for turning the instrument for easier access.</td>
<td></td>
<td></td>
</tr>
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### 11.3.2 Spare parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Order no.</th>
<th>Image</th>
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<tbody>
<tr>
<td>Extraction glass chamber universal</td>
<td>11062501</td>
<td><img src="image8.png" alt="image" /></td>
</tr>
<tr>
<td>Extraction chamber universal inert</td>
<td>11064849</td>
<td><img src="image9.png" alt="image" /></td>
</tr>
<tr>
<td>Extraction chamber universal LSV</td>
<td>11062502</td>
<td><img src="image10.png" alt="image" /></td>
</tr>
<tr>
<td>Extraction chamber universal LSV inert</td>
<td>11064850</td>
<td><img src="image11.png" alt="image" /></td>
</tr>
<tr>
<td>Component</td>
<td>Order no.</td>
<td>Image</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------</td>
<td>-------</td>
</tr>
<tr>
<td>Extraction glass chamber ECE</td>
<td>11062499</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>Set of beakers, 2 pcs.</td>
<td>11067474</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>Set of beakers LSV, 2 pcs.</td>
<td>11067714</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>Condenser E-800 cpl.</td>
<td>11067064</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>Condenser flange E-800</td>
<td>11067818</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>Condenser tank bottle</td>
<td>11065966</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>Tank bottle 2 L, GL 45</td>
<td>11070509</td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
<tr>
<td>Tank adapter, PTFE</td>
<td>11064590</td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
<tr>
<td>Joint clip</td>
<td>11070136</td>
<td><img src="image9.png" alt="Image" /></td>
</tr>
<tr>
<td>Soxhlet assembly cpl.</td>
<td>11067065</td>
<td><img src="image10.png" alt="Image" /></td>
</tr>
<tr>
<td>One part constiting of magnetic valve and level sensor for extraction glass chamber Soxhlet</td>
<td></td>
<td><img src="image11.png" alt="Image" /></td>
</tr>
<tr>
<td>Set of seals E-800, PTFE, 2 pcs.</td>
<td>11067483</td>
<td><img src="image12.png" alt="Image" /></td>
</tr>
<tr>
<td>Membrane with anchor for magnetic valve unit</td>
<td>037534</td>
<td><img src="image13.png" alt="Image" /></td>
</tr>
</tbody>
</table>
Protection shield top, cpl. 11067832

Protection shield bottom, cpl. 11067831

Set of gliding elements including magnets, 10 pcs. 11067827

Reflectorfoil analyte protection, 6 pcs. 11068522
Silicone hose D6/9 L=3 m 048355
Set of draining tube, FEP, Universal configuration, 6 pcs. 11067477
Set of draining tubes ECE, FEP 11067479

11.3.3 Conversion kits

The UniversalExtractor E-800 can be converted into another configuration with an easy change of glass assembly.

Conversion kit from Soxhlet / Universal to ECE 11068488
Includes 6 Extraction glass chamber ECE (11062499), set of draining tubes for ECE (11067479)

Conversion kit ECE to Universal 11068494
Includes 6 Universal glass chamber (11062501), set of draining tubes for Universal (11067477)

Conversion kit from ECE to Universal LSV 11068495
Includes 6 Universal LSV glass chamber (11062502), set of draining tubes for Universal (11067477)

11.3.4 Recirculating chiller

NOTE
Select a chiller according to your needs. See "A comprehensive guide to evaluate recirculating chillers for extraction units"

Recirculating Chiller F-308 11F30801
900 W at 15 °C, Display, 230 V
Cooling capacity 900 W at 15 °C, for temperatures from -10 to 25 °C

Recirculating Chiller F-308 11F30802
900 W at 15 °C, Display, 115 V
Cooling capacity 900 W at 15 °C, for temperatures from -10 to 25 °C
Recirculating Chiller F-314  
1400 W at 15 °C, Display, 230 V  
Cooling capacity 1400 W at 15 °C, for temperatures from -10 to 25 °C  

Recirculating Chiller F-314  
1400 W at 15 °C, Display, 115 V  
Cooling capacity 1400 W at 15 °C, for temperatures from -10 to 25 °C  

11.3.5 Consumables

Quartz sand 0.3 - 0.9 mm, 2.5 kg  
037689  

Celite® 545, 1 kg  
11068920  

Boiling stones, PTFE  
11068917  

11.3.6 Glass sample tubes and extraction thimbles

<table>
<thead>
<tr>
<th>Glass sample tubes with frit, long, 6 pcs.</th>
<th>Order no. 11067815</th>
</tr>
</thead>
<tbody>
<tr>
<td>The glass sample tubes with 150 mm length fit perfectly into the Universal glass extraction chamber.</td>
<td></td>
</tr>
<tr>
<td>Working volume: 106 mL</td>
<td></td>
</tr>
<tr>
<td>Filling volume: 123 mL</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Glass sample tubes with frit LSV, long, 6 pcs.</th>
<th>Order no. 11067816</th>
</tr>
</thead>
<tbody>
<tr>
<td>The glass sample tubes with 150 mm length fit perfectly into the Universal LSV glass extraction chamber.</td>
<td></td>
</tr>
<tr>
<td>Working volume: 180 mL</td>
<td></td>
</tr>
<tr>
<td>Filling volume: 216 mL</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Glass sample tubes with frit, 6 pcs.</th>
<th>Order no. 11067497</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working volume: 64 mL</td>
<td></td>
</tr>
<tr>
<td>Filling volume: 82 mL</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glass sample tubes LSV with frit, 6 pcs.</th>
<th>Order no. 11067814</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working volume: 116 mL</td>
<td></td>
</tr>
<tr>
<td>Filling volume: 144 mL</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extraction thimbles 25 x 100 mm, 25 pcs.</th>
<th>Order no. 018105</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working volume: 44 mL</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Extraction thimbles 33 x 94 mm, 25 pcs.</th>
<th>Order no. 11058983</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working volume: 64 mL</td>
<td></td>
</tr>
<tr>
<td>Extraction thimbles, Set. 25 pcs, 43 x 118 mm, cellulose</td>
<td>Order no.</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>For Soxhlet extraction unit.</td>
<td>018106</td>
</tr>
<tr>
<td>Working volume: 150 mL</td>
<td></td>
</tr>
<tr>
<td>Extraction thimbles 25 x 150 mm, 25 pcs.</td>
<td>11067445</td>
</tr>
<tr>
<td>The extraction thimbles with 150 mm length fit perfectly into the Universal glass extraction chamber, they need the holder 1167488 (d 25 mm)</td>
<td></td>
</tr>
<tr>
<td>Working volume: 66 mL</td>
<td></td>
</tr>
<tr>
<td>Extraction thimbles 33 x 150 mm, 25 pcs.</td>
<td>11067446</td>
</tr>
<tr>
<td>The extraction thimbles with 150 mm length fit perfectly into the Universal glass extraction chamber, they need the holder 1167490 (d33 mm)</td>
<td></td>
</tr>
<tr>
<td>Working volume: 120 mL</td>
<td></td>
</tr>
<tr>
<td>Extraction thimbles 43 x 150 mm, 25 pcs.</td>
<td>11067447</td>
</tr>
<tr>
<td>The extraction thimbles with 150 mm length fit perfectly into the Universal glass extraction chamber, they need the holder 1167491 (d 43 mm)</td>
<td></td>
</tr>
<tr>
<td>Working volume: 182 mL</td>
<td></td>
</tr>
</tbody>
</table>

### 11.3.7 Holder for extraction thimbles

<table>
<thead>
<tr>
<th>Holder for extraction thimbles</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holders for thimbles d25, PTFE, 3 pcs.</td>
<td>11067488</td>
</tr>
<tr>
<td>Holders for thimbles d33, PTFE, 3 pcs.</td>
<td>11067490</td>
</tr>
<tr>
<td>Holders for thimbles d43, PTFE, 3 pcs.</td>
<td>11067491</td>
</tr>
<tr>
<td>Holders for thimbles d25, stainless steel, 6 pcs.</td>
<td>11068484</td>
</tr>
<tr>
<td>Holders for thimbles d33, stainless steel, 6 pcs.</td>
<td>11068485</td>
</tr>
<tr>
<td>Holders for thimbles d43, stainless steel, 6 pcs.</td>
<td>11068486</td>
</tr>
<tr>
<td>Set of holders for glass sample tubes with frit, PTFE, 3 pcs.</td>
<td>11067485</td>
</tr>
<tr>
<td>Set of holders for LSV glass sample tubes, PTFE, 3 pcs.</td>
<td>11067486</td>
</tr>
</tbody>
</table>
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<td>+41 71 394 64 64</td>
<td><a href="mailto:buchi@buchi.com">buchi@buchi.com</a></td>
<td><a href="http://www.buchi.com">www.buchi.com</a></td>
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<td><a href="http://www.buchi.com/fr-fr">www.buchi.com/fr-fr</a></td>
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<td>800 414 0 414 0 (Toll Free)</td>
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<td><a href="mailto:china@buchi.com">china@buchi.com</a></td>
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<td>BUCHI Korea Inc.</td>
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<td>IN – Mumbai 400 055</td>
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<td>ID – Tangerang 15321</td>
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<td>Nihon BUCHI K.K.</td>
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<td><a href="http://www.buchi.com/br-pt">www.buchi.com/br-pt</a></td>
</tr>
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<td>USA/Canada</td>
<td>BUCHI Corporation</td>
<td>US – New Castle, DE 19720</td>
<td>+1 877 692 8344 (Toll Free)</td>
<td><a href="mailto:us-sales@buchi.com">us-sales@buchi.com</a></td>
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<td>South East Asia</td>
<td>BUCHI (Thailand) Ltd.</td>
<td>TH-Bangkok 10600</td>
<td>+66 2 862 06 51</td>
<td>+66 2 862 08 54</td>
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<td>BUCHI Latinoamérica</td>
<td>MX – Mexico City</td>
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