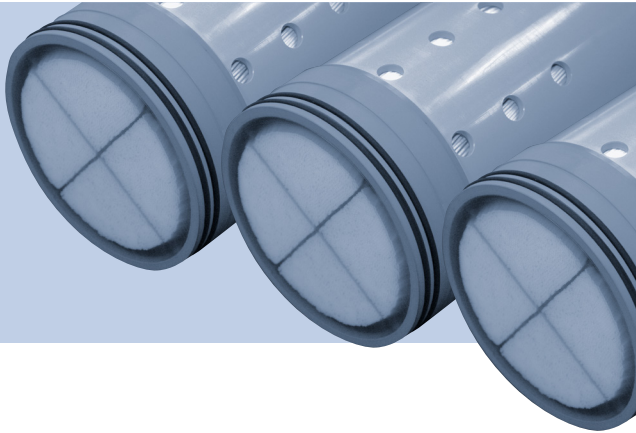
bürkert
FLUID CONTROL SYSTEMS

Type C-CUT

Capillary modules for micro and ultrafiltration
Kapillarmodule für die Mikro- und Ultrafiltration
Módulos capilares para micro y ultrafiltración



Quickstart

English Deutsch Español

MAN 1000297676 EN Version: CStatus: RL (released | freigegeben) printed: 09.03.2020

Operating Instructions 2003/02_EU-ML_00769963 / Original DE

MAN 1000297676 EN Version: CStatus: RL (released | freigegeben) printed: 09.03.2020

1 QUICKSTART GUIDE

The quickstart guide contains the most important information and notes regarding the use of the product. A detailed description can be found in the operating instructions for type C-CUT capillary module.

The operating instructions can be found on the Internet at: www.cut-membrane.com

Keep the quickstart guide in a location which is easily accessible to every user and make it available to every new owner of the device.

WARNING!

Important Safety Information.

Read Quickstart carefully and thoroughly. Study in particular the chapters entitled "Authorized Use" and "Basic Safety Instructions".

- Quickstart must be read and understood.

1.1 Product-specific Data Sheet

With each product, a product-specific data sheet is included containing information on the product. This information must be noted in addition to the operating instructions.

Should you no longer have the data sheet at your disposal, you can find it on the internet at: www.cut-membrane.com.

1.2 Definitions of Terms

In these instructions, the term „product" always refers to the C-CUT capillary module.

1.3 Symbols

The following symbols are used in these instructions:

DANGER!

Warns of an immediate danger.

- Failure to observe the warning will result in a fatal or serious injury.

WARNING!

Warns of a potentially dangerous situation.

- Failure to observe the warning may result in serious injuries or death.

CAUTION!

Warns of a possible danger.

- Failure to observe this warning may result in a moderate or minor injury.

NOTE!

Warns of damage to property.

Important tips and recommendations.

Refers to information in these operating instructions or in other documentation.

- Designates instructions for risk prevention.

→ Designates a procedure which you must carry out.

2 AUTHORIZED USE

Incorrect use of the C-CUT capillary module may be a hazard to people, nearby equipment and the environment.

- This product is designed to filter substances out of liquid media.
- The specification data, the operating conditions and conditions of use specified in the contract documents, operating instructions and product-specific data sheet must be observed during use.
- This product may only be used following detailed consultation with a representative of Bürkert Fluid Control Systems.
- Correct transportation, correct storage and installation and careful use and maintenance are essential for reliable and problem-free operation.
- Use the product only as intended.

2.1 Restrictions

If exporting the product, observe any restrictions in force.

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not make allowance for any

- contingencies and events which may arise during assembly, operation, and maintenance of the product.
- local safety regulations - the operator is responsible for observing these regulations, also in relation to the installation personnel.

DANGER!

Risk of poisoning, chemical burns, contamination from escaping medium.

- Check the product for leak-tightness prior to commencing use.
- When handling hazardous substances, always take appropriate precautionary measures and wear personal protective equipment in accordance with the requirements of the medium.
- Before disconnecting lines, the medium must be flushed from the entire system.

Risk of injury from high pressure in the system/product.

- Before working on the system or product, switch off the pressure and vent/drain the lines and product.

General hazardous situations:

To prevent injuries:

- Ensure that the system cannot be activated unintentionally.
- Installation and maintenance work may be carried out only by authorized technicians with the appropriate tools.
- After an interruption in the filtration process, ensure that the process is restarted in a controlled manner.
- The general rules of technology apply to application planning and operation of the product.

To prevent damage to the product:

- Protect the product from excessive exposure to UV radiation and from frost.
- Do not allow the product to come into contact with organic solvents. Remove contaminants with water or approved cleaning agents.
- Do not expose the product to heavy impacts.
- Always keep the interior of the product in a moist state.
- Do not exceed the maximum pressure drop.
- At the maximum permitted temperature, the module must not be operated at pressures higher than those specified in the product-specific data sheet.
- Do not make any external modifications to the product.
- Pressure surges, sudden increases in the solid content of the feed, heavy cross-flow drops and temperature shocks must absolutely be avoided.
- Only feed in the media types specified in Section "5.2.1 Compatible Media" to the media connections. The use of unnamed media is the responsibility of the user.
- Do not place a physical load on the module (e.g. by placing objects on it or standing on it).

4 GENERAL INFORMATION

4.1 Contact Address

Germany

Bürkert Fluid Control Systems
CUT Membrane Technology GmbH
Feldheider Str. 42
D-40699 Erkrath/Düsseldorf
Tel: +49 (0) 2104 - 176 32 0
Fax: +49 (0) 2104 - 176 32 22
E-Mail: info@cut-membrane.com

International

Contact addresses can be found in the internet at:
www.burkert.com

4.2 Warranty

The warranty is only valid if the type C-CUT capillary module is used correctly in accordance with the specified usage conditions.

4.3 Information on the Internet

The operating instructions and data sheets for the type C-CUT capillary module can be found on the Internet at: www.cut-membrane.com

5 TECHNICAL DATA

5.1 Product Data

Please refer to the product-specific data sheet for the product data.

5.2 Operating and Usage Conditions

NOTE!

- The operating conditions (cross-flow and trans-membrane pressure) are dependent on the specific filtration application and should be optimized by means of laboratory or pilot tests!
- The limit values for pressure and temperature must not be exceeded.
- The ambient temperature must not exceed the medium temperature and must not give rise to frost.

Please refer to the product-specific data sheet for further information on operating and usage conditions.

5.2.1 Compatible Media

Aqueous media (within certain pH and temperature ranges – please refer to product-specific data sheet for precise information).

When using media not specified in the product-specific data sheets, please consult a representative of Bürkert Fluid Control Systems beforehand. The use of unnamed media without such prior consultation is the responsibility of the user.

6 INSTALLATION AND PREPARATION FOR USE

6.1 Safety Instructions

DANGER!

Risk of poisoning, chemical burns, contamination from escaping medium.

- Check the product for leak-tightness prior to commencing use.
- When handling hazardous substances, always take appropriate precautionary measures and wear personal protective equipment in accordance with the requirements of the medium.
- Before disconnecting lines, the medium must be flushed from the entire system.

Risk of injury from high pressure in the system/product.

- Before working on the system or product, switch off the pressure and vent/drain the lines.

Risk of injury from improper operation.

Improper operation may result in injuries as well as damage to the product and the surrounding area.

- Before start-up, ensure that the operating personnel are familiar with and completely understand the contents of the operating instructions.
- Observe the safety instructions and intended use.
- Only adequately trained personnel may start up the equipment/ the product.

WARNING!

Risk of injury from improper installation.

- Installation may be carried out by authorized technicians only and with the appropriate tools.

Risk of injury from unintentional activation of the system and uncontrolled restart.

- Secure system against unintentional activation.
- Following installation, ensure a controlled restart.

6.2 Before Installation

NOTE!

Blocking of the module.

- Install a dirt filter upstream of the module. The filter fineness depends on the inner diameter of the diaphragm and can be found on the product-specific data sheet.

→ Only remove the module from its packaging immediately before installing it in the system. Once removed from the packaging, the module must be treated with particular care.

→ Examine the module for any external physical damage.

→ Clean the system and pipelines to ensure that soiling and oily substances cannot be flushed into the module from the system.

New modules are supplied dry or filled with a preservative fluid. If the module is filled with preservative fluid, please drain the module first immediately before installing it.

Dispose of the preservative fluid in accordance with the applicable waste disposal and environmental protection regulations.

6.3 Installation in a Filtration System

NOTE!

Risk of fibers breaking

- Attach and connect the module in such a way that vibrations from the system cannot be transferred to the module.

The module must be attached horizontally on the frame of the filtration system by a holder (e.g. 2 clamps) – preferred in vertical position.

It is not adequate to attach the module by the connections only.

→ Check the seals to ensure that they are clean. Only use clean seals.

→ Loosely connect the feed inlet first, then the concentrate outlet, and finally the permeate outlets of the pipe.

→ Ensure that the seals are not displaced when establishing the connections.

→ Check that none of the connections is subject to mechanical stresses.

→ Check that the seals are seated correctly.

→ Alternately tighten the connections.

NOTE!

Damage to the connections.

- Do not use force to tighten the connections! Use of excessive force in tightening may cause fractures in the connections.

6.4 Prior to Preparation for Use

During the initial start-up the modules should be flushed for 15 minutes with water (40 °C) and caustic soda (NaOH) at a pH value of 10.5 to convey the remaining preservation fluid out of the module. Then flush the modules again with pure water. The water flow can now be determined or switched directly to filtration mode.

Irrespective of whether the plant is put into operation for flushing, filtering or cleaning, please proceed as described under “6.5 Filtration”.

CAUTION!

Mildly toxic preservative fluid.

- Avoid contact with eyes and skin.

The water used for flushing purposes must satisfy certain purity requirements. These are product-specific and must be inquired about.

6.4.1 Determining the Water Flow Rate

The water flow rate is the maximum achievable permeate flow rate for a certain trans-membrane pressure value. As no separation of substances takes place at the membrane, no covering layer will develop and the permeate flow rate is determined solely by the hydrodynamic properties of the membrane.

The effectiveness of cleaning the membrane can be defined by measuring the water flow rate before and after cleaning and then comparing both measurements.

The use of demineralized water, pre-filtered to 10 µm, is recommended for determining the water flow rate.

Please consult a representative of Bürkert Fluid Control Systems if you wish to use tap water.

To avoid pressure surges, we recommend operating the module for around 2 minutes at low pressure before gradually increasing the pressure to the recommended values (refer to product-specific data sheet).

6.5 Filtration

→ Ensure that the permeate can flow out at zero pressure (open permeate valve(s)!).

When using centrifugal pumps for the feed:

→ Close the feed valve

→ Open the concentrate outlet valve

When using displacement pumps for the feed:

→ Leave the feed valve slightly open

→ Open the concentrate outlet valve

With either type of pump:

→ Switch on pump. Select low frequency for speed-controlled pump.

→ Open feed valve deliberately slowly to avoid pressure surges when deaerating the system.

The limit values for pressure and cross-flow rate must not be exceeded.

→ Ensure that the entire system (in particular the permeate areas of the modules) is deaerated.

→ Gradually increase the cross-flow rate and rinsing water pressure by carefully opening the feed valve further.

→ Adjust the trans-membrane pressure by carefully and gradually closing the valve on the concentrate outlet (pressure sustaining valve).

→ Check connections of the module for leaks. If leaks are determined, stop the operation and take countermeasures (if the seal is correctly positioned, it is usually adequate to tighten the clamps hand-tight).

NOTE!

Damage to the connections.

- If the surfaces of the seals on the connector and supply line are not flat on top of one another, do not use excessive force to tighten the connecting elements to ensure leak-tightness. Using excessive force may cause the connections to break.

→ After rinsing, drain the system and start filtration.

The concentrate pressure at the module output must always be greater than 0.5 bar.

The cross-flow rate specified in the data sheets for the recommended pressure drop applies to water (temperature 25 °C, viscosity 1 mPas). Please note that the maximum permissible pressure drop with feed solutions of a higher viscosity is reached with a considerably lower cross-flow rate.

7 CLEANING AND MAINTENANCE

Fouling of the membrane surface may result in a decline in the flow rate of the permeate. In most cases, the coatings can be removed from the membrane and the permeate flow rate can be for the most part restored.

Use authorized membrane cleaning agents only. Please contact our technical service before using cleaning agents which have not been authorized for the cleaning of membranes.

8 DISASSEMBLY

DANGER!

Risk of poisoning, chemical burns, contamination from escaping medium.

- When handling hazardous substances, always take appropriate precautionary measures and wear personal protective equipment in accordance with the requirements of the medium.
- Before disconnecting lines, the medium must be flushed from the entire system.

Risk of injury from high pressure in the system/product.

- Before working on the system or product, switch off the pressure and vent/drain the lines.

Risk of injury from improper disassembly.

- Only adequately trained personnel may remove the product.

→ Completely drain the system.

→ Flush out the rest of the feed solution with water until the concentrate is clear.

→ Flush the entire system for 20 minutes using warm water. Any concentrate or permeate generated is to be disposed of.

→ Completely drain the system.

→ Disconnect the connections. Remove the product.

Please consult a representative of Bürkert Fluid Control Systems if you have any questions.

9 NON-USE/MODULE STORAGE

Used membranes must be kept moist at all times. To inhibit bacterial growth during periods of non-use or module storage, moist membranes should be rinsed using suitable disinfectants.

We recommend storing the module inside the system.

9.1 Short-term Storage

Non-use up to 24 hours

→ No measures required.

Non-use between 24 hours and 7 days

→ Carefully rinse the module with a suitable disinfectant.

→ Perform a filtration once a day using clean water, permeate or cleaning agent.

9.2 Long-term Storage

Non-use between 7 days and 12 months

→ Clean the module prior to disinfection.

→ Fill module with preservative solution
1.0 % sodium bisulfite (NaHSO3) or
0.5 % formaldehyde (CH2O).
Causing a brief and slight cross-flow through the modules will ensure that the permeate chamber is completely filled with preservative solution.

→ Leave the solution in the module and replace it every 14 days.

Non-use Lasting Several Months/Years

→ Clean the module prior to disinfection.

→ Fill the entire system with 500 ppm benzoic acid, leave the fluid in the module.

10 PACKAGING AND TRANSPORT

NOTE!

Transport damage.

Inadequately protected products may be damaged during transportation.

- Protect the product against light, moisture and dirt in a horizontal position in shock-resistant packaging during transportation.
- Prevent the temperature from exceeding or dropping below the permitted storage temperature.
- Storage temperature 5 … 30 °C.

Damage to the environment caused by parts of the product contaminated with media.

- Dispose of the product and packaging in an environmentally friendly manner.
- Observe applicable waste disposal and environmental regulations.

bürkert
FLUID CONTROL SYSTEMS

www.burkert.com

MAN 1000297676 EN Version: CStatus: RL (released | freigegeben) printed: 09.03.2020