

Operating instructions

Turbo SMART II

Diaphragm dosing pump



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1 General information

1.1 Information about the operating instructions



CAUTION!

Read the instructions!

Prior to commencing any works and/or operating, appliances or machinery, these instructions must be read and understood as a strict necessity. In addition, always heed all the instructions relating to the product that are included with the product!

All instructions are also available for download if you have mislaid the original. Furthermore, you will always have the opportunity to get the latest version of the manuals. The German-language manual is the **original operating manual**, which is legally relevant. **All other languages are translations.**

Particular attention should be paid to the following:

- Personnel must have carefully read and understood all instructions belonging to the product before starting any work. The basic premise for safe operation is observing all safety instructions and work instructions in this manual.
- Figures in this manual are provided for basic understanding and may deviate from the actual product.
- All manuals and guides must be placed at the disposal of the operating and maintenance personnel at all times. Therefore, please store all manuals and guides as a reference for operation and service.
- If the system is resold, this manual must always be supplied with it.
- The relevant sections of this operating manual must be read, understood and noted before installing the system, using it for the first time, and before carrying out any maintenance or repair work.



WARNING!

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- Illustrations in this manual are provided to aid basic understanding and may deviate from the actual design.
- All instructions must be available to operating and maintenance personnel at all times. Therefore, please keep all manuals as a reference for operation and service.
- If the system is resold, the operating instructions must always be supplied with it.
- The relevant sections of these operating instructions must be read, understood and noted before installing the system, using it for the first time, and before carrying out any maintenance or repair work.



The most up-to-date and complete operating instructions are available online::

https://www.ecolab-engineering.de/fileadmin/download/bedienungsanleitungen/dosiertechnik/Dosierpumpen/417102229_TurboSMART_II.pdf

To download the operating instructions using a tablet or smartphone, scan the QR code:



Fig. 1: QR download code for the operating instructions

1.2 Retrieve the latest instructions

If an operating manual or software manual (hereinafter referred to as '*operating instructions*') is changed by the manufacturer, it will be put '*online*' immediately. This ensures that Ecolab Engineering GmbH complies with the requirements of the German Product Liability Law with regard to the '*product monitoring obligation*'.

All operating instructions are provided in PDF format .

To open and display the operating instructions, we recommend that you use Adobe 'Acrobat' PDF Viewer (<https://acrobat.adobe.com>).

Through the above measures, Ecolab provides various options for ensuring that you can access the most recent operating instructions at all times.

Accessing operating instructions using the website of Ecolab Engineering GmbH

You can search for and select the required instructions on the manufacturer's website (<https://www.ecolab-engineering.de>) under the menu item [Download] / [Operating instructions].

Accessing operating instructions using the 'DocuAPP' for Windows®

You can use the 'DocuApp' for Windows® (as of Version 10) to download, read and print all published operating instructions, catalogues, certificates and CE declarations of conformity on a Windows® PC.



To install this program, open the 'Microsoft Store' and enter "**DocuAPP**" in the search field. <https://www.microsoft.com/store/productId/9N7SHKNHC8CK>. Follow the installation instructions.

Accessing manuals using a smartphone/tablet

You can use the Ecolab **'DocuApp'**  to access all operating manuals, catalogues, certificates and CE declarations of conformity published by Ecolab Engineering on a smartphone or tablet (Android  & iOS  systems).

The documents shown in the **'DocuApp'**  are always up to date and new versions are displayed as soon as they are available. Further information about the **'DocuApp'**  is provided in a separate software description ((art. no. 417102298)).

'Ecolab DocuApp' guide for download



Further information about the **'DocuApp'**  is provided in a separate software description (art. no. MAN047590).

Download: https://www.ecolab-engineering.de/fileadmin/download/bedienungsanleitungen/dosiertechnik/Dosierpumpen/417102298_DocuAPP.pdf

The following section describes the installation of the **'Ecolab DocuApp'**  for **'Android'**  and **'iOS (Apple)'**  systems

Installing the 'Ecolab DocuApp' for Android

For Android-based smartphones , the **'Ecolab DocuApp'**  can be found in the Google Play Store .

1. ➤ Open the Google Play Store  on your smartphone/tablet.
2. ➤ Enter the name **"Ecolab DocuApp"** in the search field.
3. ➤ Use the search term **Ecolab DocuApp** and select **'Ecolab DocuApp'** with the icon .
4. ➤ Choose **[Install]**.
⇒ The **'Ecolab DocuApp'**  is installed.

The **'Ecolab DocuApp'**  can be accessed using the following link on a PC or in a browser: <https://play.google.com/store/apps/details?id=ecolab.docuApp>

Installing the 'DocuApp' for iOS (Apple)

For iOS-based smartphones , the **'Ecolab DocuApp'**  can be found in the App Store .

1. ➤ Open the App Store  on your smartphone/tablet.
2. ➤ Go to the search function.
3. ➤ Enter the name **"Ecolab DocuApp"** in the search field.
4. ➤ Use the search term **Ecolab DocuApp** and select **'Ecolab DocuApp'** with the icon .
5. ➤ Choose **[Install]**.
⇒ The **'Ecolab DocuApp'**  is installed.

1.3 Article numbers / EBS-Article numbers



Both item numbers and EBS numbers could be shown in these operating instructions. EBS numbers are Ecolab-internal item numbers and are used exclusively “internal within the group”.

1.4 Select copyright

This manual is copyright protected. All rights are reserved by the manufacturer.

Making this manual available to third parties, reproduction in any form, even partially, and the exploitation and/or disclosure of the contents without written permission from Ecolab Engineering (hereinafter “the manufacturer”) is prohibited except for internal purposes. Any contravention of this will result in claims for damages.

The manufacturer reserves the right to assert additional claims.

1.5 Symbols, highlighting and lists

Symbols, highlights and bulleted lists

Safety instructions in this manual are identified by symbols and introduced by signal words expressing the extent of the hazard.



DANGER!

Indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.



WARNING!

Indicates a potentially imminent danger that can lead to serious injuries or even death.



CAUTION!

Indicates a potentially hazardous situation which may result in minor or slight injury.



NOTICE!

Indicates a potentially dangerous situation that may result in property damage.



Tips and recommendations

This symbol highlights useful tips, recommendations and information for an efficient and trouble-free operation.

**ENVIRONMENT!**

Indicates potential hazards to the environment and identifies environmental protection measures.

Safety instructions in the operating instructions

Safety instructions can refer to specific, individual operating instructions. These safety instructions are embedded in the operating instructions, so they do not interrupt the reading flow when executing the action. The signal words described above are used.

Example:

1. ➤ Loosen screw.

2. ➤

**CAUTION!**

Risk of trapping on the cover!

Close the cover carefully.

3. ➤ Tighten screw.

**Tips and recommendations**

This symbol highlights useful tips, recommendations and information for an efficient and trouble-free operation.

Other markings

The following markings are used in these instructions to provide emphasis:

- 1., 2., 3. ... Step-by-step operating instructions
- Results of the operating steps
- ⇒ References to sections of these instructions and related documents
- Lists in no set order
- [Button] Controls (e.g. button, switch), indicators (e.g. signal lights)
- 'Display' Screen elements (e.g. buttons, assignment of function keys)

1.6 Transportation



NOTICE!

Material damage due to improper transportation!

Transport units can fall or tip over if improperly transported. This may result in material damage. During unloading, delivery or even during general shipping, proceed safely and pay attention to the symbols and the information on the packaging.

Transport inspection:

Examine the delivery for completeness and transportation damages and report all instances of damage. Damage claims can be filed only within the applicable period for complaints.

If transportation damage is visible from the outside:

Do not accept the delivery or accept it only under reservation. Note the extent of damage on transport documents Delivery note of the carrier and initiate a complaint immediately.

Preserve the packaging (original packaging and original packaging materials) for possible inspection by the shipper for transport damage or for a return shipment.

Packaging for returns:

- If both are no longer available:
Call in a packaging company with qualified personnel.
- The packaging dimensions and the weight of the packaging can be found in chapter ↗ *Chapter 8 'Technical data' on page 41*.
- If you have any questions about the packaging and transport fixings, please contact the ↗ *Chapter 1.11 'Manufacturer' on page 11*.

Danger of putting into operation a piece of transport equipment which has been damaged during transport:

If damages are discovered during unpacking, do not install or put unit into operation, as otherwise uncontrollable faults can occur.

1.7 Packaging

The individual packing items are packed to reflect the expected transport conditions. Only environmentally friendly materials were used for the packaging. The packaging is designed to protect the individual components against shipping damage, corrosion and other damage up to the point of assembly.

Therefore, do not destroy the packaging and only remove it just before assembly.



ENVIRONMENT!

Risk of environmental damage due to incorrect disposal.

Packaging materials are valuable raw materials and can, in many cases, be used again or be usefully processed and recycled.

Incorrect disposal of packaging materials can be a threat to the environment.

- Observe the locally applicable disposal regulations.
- Environmentally friendly disposal of packaging materials.
- If necessary, hire a specialist company to carry out disposal.

Symbols on the packaging

Symbol	Description	Description
	Top	The individual package must be transported, handled and stored in such a way that the arrows point upwards at all times. Rolling, flipping, strong tipping or tilting and other forms of handling must be avoided. ISO 7000, No 0623
	Fragile	This symbol is affixed to goods that are very fragile. Goods marked as such must be handled with care and in no way dropped or strapped with cord. ISO 7000, No 0621
	Protect against moisture.	Goods marked as such must be protected against excessive humidity and must therefore be stored in a covered location. If particularly heavy or bulky individual packages cannot be stored in warehouses or sheds, they must be covered with a canvas. ISO 7000, No 0626
	Protect against cold	Goods marked as such must be protected against excessive cold. These packages should not be stored outdoors.

1.8 Storage



Under certain circumstances, instructions for storage, which go beyond the requirements listed here, can be found on the package. These must be complied with accordingly.

- Do not store outdoors.
- Store in a dry and dust-free place.
- Do not expose to aggressive media.
- Protect from sunlight.
- Avoid mechanical vibrations.
- Storage temperature: +5 to 40° C.
- Relative humidity: max. 80 %.
- For storage periods of more than 3 months, check the general condition of all parts and packaging regularly. If necessary, refresh or renew the preservative.

1.9 Identification of the pump - nameplates



Information on equipment marking or the information on the identification plate can be found in the chapter on "Technical data".

It is important for all queries to state the correct name and type. This is the only way of ensuring fast and accurate processing of your enquiry.

The pump is fitted with a nameplate that provides the pump-specific data for identification.

The nameplate is located on the pump and is explained in:

🔗 Chapter 8.2 'Equipment marking / nameplate' on page 42

1.10 Warranty

The manufacturer provides a warranty for operational safety, reliability and performance under the following conditions only:

- Assembly, connection, adjustment, maintenance and repairs must be carried out by qualified and authorised specialists with the aid of the User Manual and all the provided documents.
- Our products are used in accordance with the instructions in the User Manual.
- Only OE spare parts must be used for repairs.



Our products are built, tested and CE certified in accordance with current standards/guidelines. They left the factory in a safe, faultless condition. To keep the equipment in this condition and to ensure risk-free operation, the user must observe the instructions/warnings, maintenance regulations, etc. contained in these operating instructions and, if applicable, affixed to the product.

The warranty and service conditions of the manufacturer also apply.

1.11 Manufacturer

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2 Safety

2.1 General safety information

**DANGER!**

If you believe that it can no longer be used safely, the pump must be switched off without delay and secured to prevent it being used accidentally.

This applies in the following cases:

- If there are visible signs of damage,
- If the pump no longer appears to be functional,
- After lengthy storage in adverse conditions (conduct a function test).

Comply with the following at all times:

- Before carrying out any work on electrical components, switch off the power supply and secure it to prevent it being switched on again.
- Obey all the safety regulations and where the specified protective clothing when handling chemicals.
- Obey all the information in the product data sheet of the metering medium used.
- The supply and control voltage may only be connected as described in the section entitled "Technical data".

2.2 Intended use

**NOTICE!**

Only Ecolab products approved for this dosing system may be used.
No liability is accepted for the use of products other than those approved!

**WARNING!****Intended use includes the following points in particular:**

- Only liquid, validated chemicals may be metered.
- The temperature application range, permissible ambient temperature and maximum media temperature are only permissible as indicated in the "Technical data".
- The operating voltage must be established only as described in the "Technical data".
- The pump has been developed, designed and built for industrial and commercial use. The unit is not intended for private use.

Any use that extends beyond or differs from the intended use is considered improper use.

Proper use also includes compliance with all control and operating instructions specified by the manufacturer, as well as with all maintenance and servicing conditions.

**WARNING!**

Danger in the event of improper use.

Improper use can lead to hazardous situations:

- Never use metering media other than the specified product.
- Never change the product metering specifications beyond the tolerable range.
- Never use in potentially explosive atmospheres.
- Installation, maintenance and repair work must be carried out only by trained personnel.
- Wear the appropriate personal protective equipment (PPE) when carrying out all installation, maintenance and repair work.

2.2.1 Reasonable foreseeable incorrect use

To maintain the function, we use this section in particular to draw your attention to ways in which you may use, according to the risk analysis conducted by the manufacturer, could result in reasonable foreseeable incorrect use.

- Incorrect use of design versions
(for example incorrect sealing materials, incorrect pump head materials).
- Operational incorrect voltage supplies.
- Excessive back-pressures.
- Excessive ambient temperatures.
- Excessive media temperature.
- Incompatible accessory parts.
- Incorrect dosing lines.
- Line cross-sections too small.
- Incorrect ambient temperatures or media temperatures.
- Excessive viscosities.
- Operation in potentially explosive atmospheres.
- Use of unsuitable dosing media.

2.2.2 Arbitrary conversion and spare parts production

**CAUTION!**

Changes or modifications are not permitted without prior, written permission from Ecolab Engineering GmbH and result in the forfeiting of any and all warranty entitlements. Original spare parts and accessories approved by the manufacturer to increase safety. The use of other parts excludes the warranty for the resulting consequences. **We would like to point out that the CE conformity expires in case of subsequent conversions!**

2.3 Service life

If maintenance is conducted properly (visual inspection, functional testing, replacement of parts, etc.), the life span of the pump is approximately 10 years.

Afterwards, a revision or a general overhaul may need to be done the manufacturer.

☞ Chapter 1.11 'Manufacturer' on page 11

2.4 Safety measures taken by the operator



NOTICE!

It is expressly up to the operator to train, monitor and instruct its operating and maintenance personnel so that they comply with all of the necessary safety measures. **The frequency of inspections and controls must be complied with and documented.**



WARNING!

Requirements for system components provided by the operator

To avoid personal injury and damage to the system, it must be ensured that the system components provided to you (pipe connections, flanges) have been correctly installed. We recommend compensators for the transition from plastic to stainless steel pipes in order to minimise loads during installation and operation. If the installation is not carried out by Ecolab Engineering GmbH Customer Support/Service, steps must be taken to ensure that all components consist of the correct materials and meet the applicable requirements.

Obligations of the operator



Valid guidelines

*In the EEA (European Economic Area), national implementation of the Directive (89/391/EEC) and corresponding individual directives, in particular the Directive (2009/104/EC) concerning the minimum safety and health requirements for the use of work equipment by workers at work, as amended, are to be observed and adhered to. If you are outside the EEA, the local regulations always apply. However, it is important to make sure that the EEA rules do not apply to your area, due to special agreements. **The operator is responsible for checking the terms and conditions that affect you.***

The operator must adhere to the local legal provisions for:

- The safety of personnel (within the Federal Republic of Germany, in particular the federal law and accident prevention regulations, workplace guidelines, e.g. operating instructions, also according to Section 20 Hazardous Substances Ordinance (GefStoffV), personal protective equipment (PPE), preventive investigations)
- The safety of work materials and tools (protective equipment, work instructions, procedural risks and maintenance)
- Product procurement (safety datasheets, list of hazardous substances)
- Disposal of products (Waste Act)
- Disposal of materials (decommissioning, Waste Act)
- Cleaning (detergents and disposal)
- and observe current environment protection regulations.

The owner is also required to:

- Provide personal protective equipment (PPE)
- Incorporate the measures into operating instructions and to instruct personnel accordingly
- For operating sites (from 1m above ground) To provide safe access
- The operator must provide lighting in workplaces in accordance with DIN EN 12464-1 (within the Federal Republic of Germany). Observe the local applicable regulations!
- To ensure that local regulations are complied with during installation and commissioning, if these procedures are conducted by the operator

2.5 Personnel requirements

Qualifications



DANGER!

Risk of injury if personnel are inadequately qualified!

If unqualified personnel carry out work or are in the danger area, dangers may arise which can lead to serious injuries and considerable damage to property.

All the activities may only be performed by personnel that is qualified and suitably trained for this purpose.

Keep unqualified personnel away from hazard areas.



NOTICE!

Only persons who can be expected to carry out their work reliably can be approved as personnel. People whose ability to react is impaired, for instance by drugs, alcohol or medication, are not permitted.

When selecting personnel, the age and occupation-specific regulations applicable at the place of use must be observed.

It is imperative to ensure that unauthorised persons are kept well away.

Mechanic

The mechanic is trained for the particular range of tasks in which s/he operates and knows the relevant standards and regulations. S/he can perform work on pneumatic and hydraulic systems because of his/her specialized training and experience and can independently recognise and avoid potential dangers.

Qualified electrician

Qualified electricians are able to carry out the work on electrical systems because of their technical training, knowledge and experience, as well as awareness of the relevant standards and regulations; qualified electricians are capable of independently identifying and preventing potential risks. He is specially trained and knows the relevant standards and regulations.

Service personnel

Certain work may only be carried out by service personnel of the manufacturer or by service personnel authorised or specially trained by the manufacturer. If you have any questions, please contact  *Chapter 1.11 'Manufacturer' on page 11*.

Specialist

A person with appropriate training, schooling and experience enabling him or her to identify risks and avert danger.

2.6 Personal protective equipment (PSA)

**DANGER!**

Personal protective equipment, hereinafter referred to as PPE, is used to protect personnel. It is imperative to pay attention to the PPE described in the product data sheet (safety data sheet) for the metered medium.

2.7 Explanation of the safety symbols used

2.7.1 Personal protective equipment - PPE

**WARNING!****Face guard**

A face mask must be worn when working in areas which are marked with the symbol opposite. The face protection is used to protect the eyes and face from flames, sparks or glow as well as hot particles, exhaust gases or liquids.

**WARNING!****Protective eyewear**

Goggles must be worn when working in areas marked with the symbol opposite. Protective eyewear protects the eyes against flying parts and liquid splashes.

**WARNING!****Protective work clothing**

In the event of works in areas, which are identified with an adjacent symbol, appropriate protective clothing is to be worn. Protective work clothing is close-fitting clothing with low resistance to tearing, close-fitting sleeves and no protruding parts.

**WARNING!****Chemical resistant protective gloves**

Suitable protective gloves must be worn when working in areas marked with the symbol opposite. Chemical resistant safety gloves protect the hands from aggressive chemicals.

**WARNING!****Protective gloves, mechanical hazards**

In the event of works in areas, which are identified with an adjacent symbol, appropriate protective gloves are to be worn. Safety gloves provide protection of the hands against friction, grazes, punctures or deeper wounds and against coming into contact with hot surfaces.

**WARNING!****Safety shoes**

Suitable protective shoes must be worn when working in areas marked with the symbol opposite. Safety shoes protect the feet from bruising, falling parts, slipping on surfaces and protecting against aggressive chemicals.

2.7.2 Indications of risks**Electrical dangers****DANGER!**

Electrical hazards are marked by the symbol opposite. Work in these areas may only be carried out by trained personnel with the appropriate authorisation.

Risk due to electrical energy**WARNING!**

The protective earth connection is marked by this symbol at the connection points.

**DANGER!****Risk of fatal injury from electric current!**

Electrical hazards are identified by the symbol opposite. Work on those places may only be carried out by skilled personnel who are duly trained and authorised.

Contact with live parts represents immediate danger to life due to electrocution. Damage to the insulation or individual components can be life-threatening.

- Before starting work, create a de-energised state and ensure this state is maintained for the duration of the work.
- If the insulation is damaged, switch off the power supply immediately and arrange for repairs.
- Never bridge or decommission fuses.
- When replacing fuses, comply with the rating.
- Do not expose live parts to moisture as this may cause short-circuits.

Risk of fire**DANGER!****Risk of fire**

If there is a risk of fire, it is imperative to use the designated extinguishing agent and to implement suitable safety measures to tackle the fire. It is also imperative here to comply with the safety data sheet for the chemicals you use to tackle the fire!

Risk of slipping



DANGER!

Risks of slipping are to be identified using the adjacent symbol. Spilled chemicals are a slipping hazard in wet conditions.



WARNING!

Risk of slipping due to fluid in the operation and provisioning area!

- Wear non-slip, chemically resistant shoes when working.
- Place product containers in a tank to prevent a slipping hazard caused by leaking fluids.



ENVIRONMENT!

Leaked, spilled metering media must be cleaned and disposed of correctly, according to the instructions on the safety data sheet. It is essential to ensure that the required personal protective equipment (PPE) is used.

Unauthorised access



DANGER!

Unauthorised access

The owner must ensure that unauthorised personnel are prevented from accessing the operating area.

Chemical hazards (metering medium/active substance)



DANGER!

Risk of injury to the skin and eyes caused by the chemical used (metering medium).

- Read the enclosed safety data sheet carefully before using the metering medium.
- The safety regulations and the required protective clothing when working with chemicals must be complied with.
- Attention must be paid to the information included on the product data sheet for the metering medium used.



DANGER!

Hands must be washed before breaks and at the end of the working day. Information about the usual precautions when handling chemicals and about the use of PPE can be found on the relevant safety data sheet for the chemical being used and must be complied with.



ENVIRONMENT!

Metering medium that leaks or spills may be harmful to the environment.

Leaks or spills of a metering medium must be cleaned up and disposed of correctly in accordance with the instructions on the safety data sheet. It is imperative to use the prescribed PPE.

Preventive action:

Place product containers in a tray to collect leaking fluids without harming the environment.



CAUTION!

- Make absolutely sure that all line connections are firmly mounted and leakproof.
- Improper assembly may lead to injury due to chemical leaks.
- Legal regulations and the applicable product data sheets must be taken into account for all chemicals.
- Wear personal protective equipment.

Hazard arising from automatic start-up



DANGER!

Automatic start-up poses a hazard in areas marked with the symbol opposite. An automatic start-up can be initiated as soon as the power supply is connected with no need to press a switch/button beforehand.



DANGER!

Danger of the pump starting automatically.

The pump is controlled via the power supply.

The automatic start of the pump is started as soon as the power supply is connected, without having to press a switch/button beforehand.

For safe handling of the pump, a safety switch must be connected on site or connected via the emergency stop function of the higher-level control unit.

2.7.3 Environmental protection measures



ENVIRONMENT!

The environmental symbol denotes environmental protection measures.

2.8 Obligations of the operator



Applicable Directives

In the EEA (European Economic Area), national implementation of the Directive (89/391/EEC) and corresponding individual directives, in particular the Directive (2009/104/EC) concerning the minimum safety and health requirements for the use of work equipment by workers at work, as amended, are to be observed and adhered to.

Should you be outside the scope of the EEA (European Economic Area), the regulations applicable to you shall always apply. Make sure, however, that the EEA regulations do not apply to you as a result of special agreements.

It is the responsibility of the operator to check the permissible regulations.

The operator must adhere to the local legal provisions for:

- the safety of the personnel (in the area of application of the Federal Republic of Germany in particular the BG and accident prevention regulations, workplace guidelines, e.g. operating instructions, also according to §20 GefStoffV, personal protective equipment (PPE), preventive medical check-ups);
- safety of work materials and tools (protective equipment, work instructions, procedural risks and maintenance);
- product procurement (safety data sheets, list of hazardous substances);
- disposal of products (Waste Act);
- disposal of materials (decommissioning, Waste Act);
- cleaning (detergents and disposal);
- as well as complying with current environment protection regulations.

The owner is also required:

- to provide personal protective equipment (PPE).
- to incorporate the measures into operating instructions and to instruct personnel accordingly;
- for operating sites (from 1m above ground): to provide safe access;
- The lighting of the workstations must be provided by the operator in accordance with DIN EN 12464-1 (within the scope of the Federal Republic of Germany). Observe the regulations applicable to you!
- to ensure that local regulations are complied with during installation and commissioning, if these procedures are conducted by the owner.

2.9 Installation, maintenance and repair work



NOTICE!

Material damage by using incorrect tools!

Material damage may arise by using incorrect tools. **Use the correct tools.**

**DANGER!**

Damage and injuries may occur if installation, maintenance or repair work is carried out incorrectly.

All installation, maintenance and repair work must only be performed by authorised and trained specialist personnel in accordance with the applicable local regulations. Safety regulations and prescribed protective clothing when handling chemicals should be followed. Attention must be paid to the information included on the product data sheet for the metering medium used. Prior to all work the feeding of the metering medium should be disconnected and the system cleaned.

**NOTICE!**

Only original equipment spare parts may be used for maintenance and repairs.

3 Scope of the equipment

The scope of the equipment consists of the following:



- Turbo SMART Pump II
Article no. see table ↗ *Further information on page 23*



- Screws for wall mounting (2 x)
Article no. 413059064, EBS no. upon request



- All-purpose spiral anchor for wall mounting (2 x)
Article no. 417200041, EBS no. upon request



- Washers for wall mounting (2 x)
Article no. 413500872, EBS no. upon request



- U-connector, long version (2 x)
Article no. 30605009, EBS no. upon request
- Screws for U-connector (4 x)
Article no. 413071170, EBS no. upon request



- Operating instructions for Turbo SMART II diaphragm metering pump
Article no. 417102229, EBS no. on request

4 Functional description

The pumps in the Turbo SMART II series are electronically operated diaphragm metering pumps suitable for use with uncontaminated, non-abrasive metering media (max. viscosity 1,100 mPas).



NOTICE!

Only Ecolab products approved for this dosing system may be used.
No liability is accepted for the use of products other than those approved!

An integrated stepper motor drives the pump.

The stepper motor is controlled by integrated electronics, which control the metering quantity by means of variable rotational speed. In addition, different dosing profiles/ operating modes (suction and dosing stroke speeds) can be set.

The Turbo SMART II is available in different versions:

Article no.	Pump head	Seals	Scope of the equipment	Suitable for
On request	PP	EPDM	EU, complete pump with accessories - packed	Base products
On request			EU, pump - unpacked	
On request			US, pump module - packed	
On request		FKM	EU, complete pump with accessories - packed	Acidic products
On request			EU, pump - unpacked	
On request			US, pump module - packed	
On request	PVDF	FKM	EU, complete pump with accessories - packed	Products containing peracetic acid
On request			US, pump module - packed	
On request		EPDM	US, pump module - packed	Products containing chlorine



DANGER!

Danger of the pump starting automatically.

The pump is controlled via the power supply.

The automatic start of the pump is started as soon as the power supply is connected, without having to press a switch/button beforehand.

For safe handling of the pump, a safety switch must be connected on site or connected via the emergency stop function of the higher-level control unit.

4.1 Layout

4.1.1 Overview

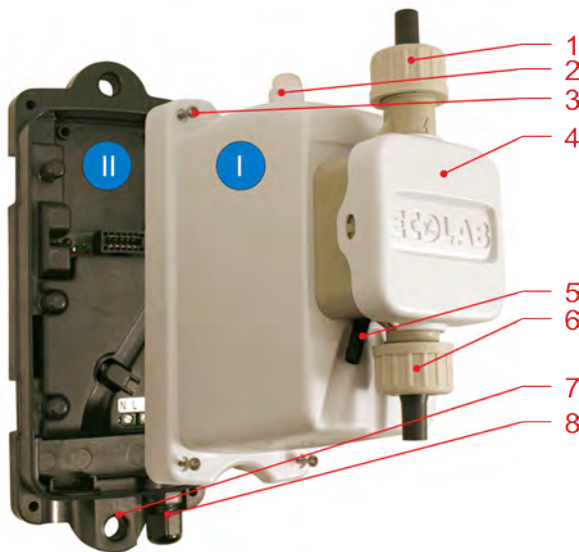


Fig. 2: Layout of Turbo SMART II

- | | | | |
|----|---|---|---|
| I | Pump module | 4 | Pump head (cover) |
| | ↳ Chapter 4.1.2 'Pump module' on page 24 | 5 | Safety drain (for diaphragm failure) |
| II | Back cover module | 6 | Coupling nut (connection on intake side) |
| | ↳ Chapter 4.1.3 'Back cover modules' on page 25 | 7 | Mounting lug (2 x) |
| 1 | Coupling nut (connection on discharge side) | 8 | Cable bushing for power supply connection |
| 2 | Signal LED | | for 24 V DC or 230 V AC depending on version, |
| 3 | Housing screw (4 x) | | ↳ Chapter 4.1.3 'Back cover modules' on page 25 |

4.1.2 Pump module

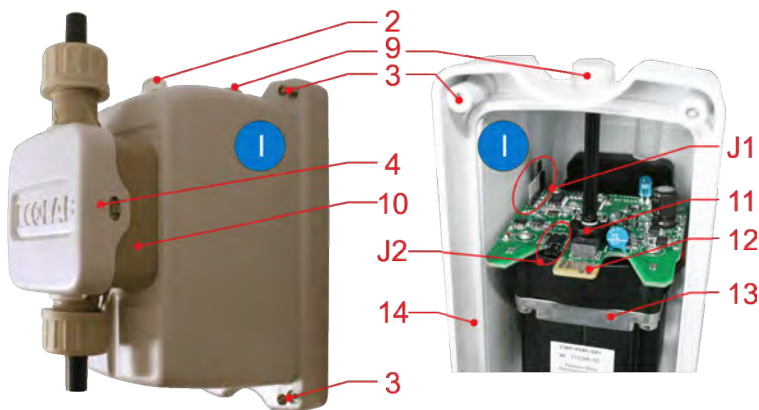


Fig. 3: Pump module

- | | | | |
|----|-----------------------------|----|---|
| I | Pump module | 12 | Motor board |
| 2 | Signal LED | 13 | Pump motor |
| 3 | Housing screw (4 x) | 14 | Labyrinth seal |
| 4 | Pump head (cover) | J1 | "Pump head adjustment" jumper |
| 9 | Cover plug/speed adjustment | J2 | "Flow rate" jumper (○ ■ delivery state) |
| 10 | Pump head | | |
| 11 | Potentiometer (Poti) | | |

4.1.3 Back cover modules

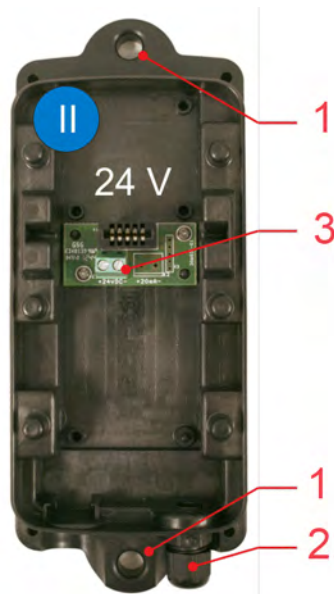


Fig. 4: Back cover modules

- II Back cover module (24 V or 230 V)
- 1 Mounting tab

- 2 Cable bushing
- 3 PCB, 24 V version



DANGER!

The protective cover (Fig. 4 , Pos. 15) may NOT be removed!

The electrical connection can also be made with mounted protective cover!

The cover was removed in the picture (Fig. 4) only to clarify the technical description and the illustration of the different circuit boards.

5 Device installation

- Personnel:
- Mechanic
 - Qualified electrician
 - Specialist
 - Service personnel



CAUTION!

- Install the metering unit in an easily accessible location protected against frost.
- Do not install the pump and product container under a window or air intake duct.
- Do not store new supply containers below 15 °C; cold chemicals can be viscous and cause system failures.
- Only operate the pump when it is connected to run-dry protection (e.g. empty signal suction lance). Air drawn in (e.g. from empty supply containers) may lead to malfunctions or pump failure.

5.1 Electrical installation



DANGER!

Risk of electric shock

General guidelines and local installation regulations must be observed.

Be sure to disconnect the power supply immediately and to secure against accidental switch-on.

Electrical installation may be performed only by qualified electricians and according to local regulations.

The Turbo SMART II is supplied **WITHOUT a power supply cable**.

An appropriate connector line and, if necessary, pump control must be connected before putting it into operation.

We recommend a cable cross-section of 0.5 mm² for the connection and the use of ferrules at the pump connection.



Cables with a cross-section up to 1 mm² and an outer diameter of max. 7 mm can be connected.

5.1.1 Separating the back cover module from the pump module

1. ➤ Open the pump using an appropriate Phillips head screwdriver. For this, release each of the four locking screws. The locking screws are protected against falling out and will remain in the pump module housing.
2. ➤ Remove the pump module.

5.1.2 Electrical installation - process



DANGER!

The protective cover (Fig. 4 , Pos. 15) may NOT be removed!

The electrical connection can also be made with mounted protective cover!

The cover was removed in the picture (Fig. 4) only to clarify the technical description and the illustration of the different circuit boards.



DANGER!

Danger of the pump starting automatically.

The pump is controlled via the power supply.

The automatic start of the pump is started as soon as the power supply is connected, without having to press a switch/button beforehand.

For safe handling of the pump, a safety switch must be connected on site or connected via the emergency stop function of the higher-level control unit.

1 Terminal strip power supply

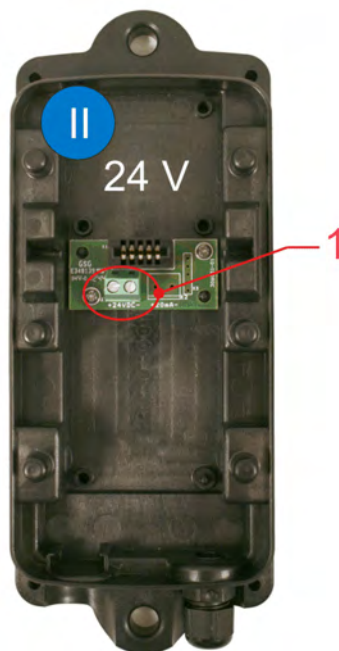
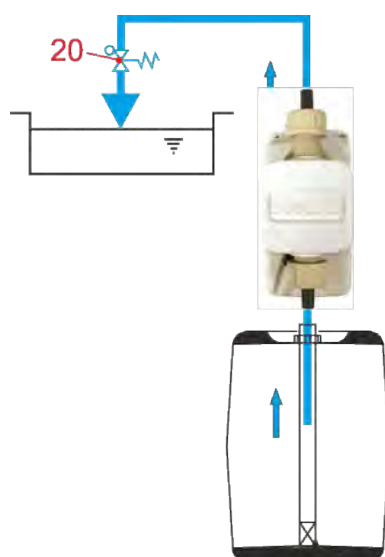


Fig. 5: Electrical connections

1. Assemble the connector line.
2. Route the connector cable through the cable feed-through (see chapter 4.1.1 'Overview' on page 24 , Further information on page 24 , item 8) and connect it (Further information on page 27 , item 1). For the correct assignment, see the labelling on the 24V PCB or the information engraved on the 230 V protective cover.
3. Slide connection cable into cable bushing so that the wires are not under tension.
4. Screw down the cable bushing (= strain relief) and check for proper strain relief by pulling on the connector line.

5.2 Hydraulic installation



20 Pressure control valve

Fig. 6: Hydraulic installation

The metering pump must be mounted at an easily accessible, frost-protected location:

- Ambient temperature: 15 - 40 °C
- Ambient humidity: Max. 95% (non-condensing)
- Max. metering back pressure: See rating plate
- Assembly height: Max. 1.8 m
- Suction line height: Max. 1.5 m
- Suction line length: Max. 2.5 m

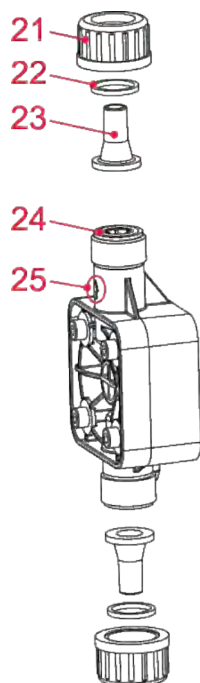


In the case of outgassing media as well as media with a high viscosity (> 1000 mPas using the Brookfield measuring method), this type of installation is not recommended. Flooded suction is recommended in such cases.

5.2.1 Connection: Suction/pressure line


DANGER!

Ensure that the required seal is achieved by mounting O-rings (item 24) on the connectors when connecting the suction and pressure lines.



Item	Description	Article no.	EBS no.
21	Union nut PP	34500228	On request
	or		
	Union nut PVDF	35200167	On request
22	Clamping piece, VA 1.5441	38610409	On request
23	Tapered part PP	38610408	10000482
	or		
	Tapered part PVDF	38610415	On request
24	O-ring (Ø 12 x 2.5 mm) - EPDM	417001102	10002916
	or		
	O-ring (Ø 12 x 2.5 mm) - FPM	417003334	On request
25	Pump head direction of flow (indicator arrow)		


NOTICE!

When you connect the suction/pressure line, make sure that the flow direction matches the arrow embossed on the pump head.

1. ➤ Cut off the hose with a straight cut.
2. ➤ Slide the union nut (item 21) and clamping piece (item 22) over the hose.
3. ➤ Press the hose onto the cone (item 23) up to the stop collar.
4. ➤ Check that the O-ring (item 24) is in the valve groove.
5. ➤ Tighten the union nut (item 21) by hand only (do not use tools).

5.3 Installation/Assembly

For media that tend towards sedimentation, the bottom suction valve or the foot valve of the suction line/suction lance must be mounted above the expected sediment layer. Install the appropriate filters in the suction line, since solid matter sucked in can block the pump.

Metering lines in systems with ambient pressure

A pressure control valve or metering valve must be installed at the end of the metering line.

The total of all pressure losses in downstream pipeline components (also pay attention to Δp as a result of height difference), check valves and pressure retention valves must not exceed the permitted metering back-pressure (see pump specification on nameplate).

Metering lines in systems with overpressure

The total of system overpressure and pressure loss in all downstream pipeline components (also pay attention to Δp as a result of height difference!), check valves and pressure retention valves may not exceed the permitted metering counter-pressure (see pump specification on name plate).

Suction line

Install line so it rises steadily from container to pump, keeping it as short as possible. An improper siphon-like arrangement of lines may lead to pump failure.

Data	Value	Unit
Suction height	Max. 1.5	m
Flow rate	Max. 0.2	m/s
Line cross-sections: Suction line and metering line	Min. 10	mm

5.4 Installation

5.4.1 Installation of several pumps in combination - wall mounting

Perform a simplified installation of several pumps in combination by means of U-connectors.



Fig. 7: Installation of several pumps in combination

1. ➤ Detach pump module (I) from back cover modules (II)
 ↳ Chapter 5.1.1 'Separating the back cover module from the pump module' on page 26 .
2. ➤ Line up back cover modules (Fig. 7 , item II) side by side and screw in place using U-connectors (item 26) (4 x screws, item 27 enclosed, tightening torque = 1.5 Nm).



Various widths of pump heads and pump modules are available. Be sure to take this into account and use suitable U connectors (short or long).

3. ➤ Use pre-assembled back cover module unit as drilling template.
4. ➤ Three mounting points are sufficient: mark right/left positions and one at bottom centre (✎).
5. ➤ Drill holes and mount the back cover module unit, using the mounting screws, dowels and washers included in the scope of the equipment.
 ↳ Chapter 3 'Scope of the equipment' on page 22
6. ➤ Complete the electrical installation.
 ↳ Chapter 5.1 'Electrical installation' on page 26
7. ➤ Mount the pump modules (I) again.
 ↳ Chapter 4.1.2 'Pump module' on page 24
8. ➤ Complete hydraulic installation.
 ↳ Chapter 5.2 'Hydraulic installation' on page 28

6 Start-up

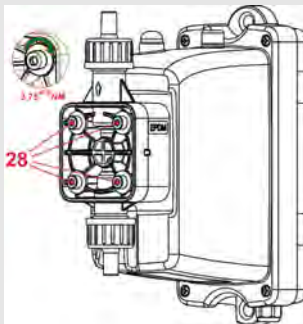
- Personnel:
- Mechanic
 - Qualified electrician
 - Specialist
 - Service personnel



DANGER!

- The metering pump must not be placed into operation without hose connections.
- The union nuts must be tightened.
- When putting into service, wear personal protective equipment and observe safety notes according to product data sheets.

IMPORTANT



Before starting up the pump, tighten the pump head screw cross-wise with 3.25 Nm.

1. Check for correct installation of suction and pressure lines.
2. Set the maximum metering rate
↳ Chapter 6.1.1 'Setting the metering capacity' on page 35 .
3. Start pump(s) (electrical connection/control)
4. Check the function of the pump(s)
5. Check the media-conveying components - and hose connections in particular - to make sure that they are leak-tight.

6.1 Function settings

Adjust pump capacity



DANGER!

Before opening the pump, switch off the supply voltage (disconnect) and ensure that it cannot be switched on again unintentionally.

1. ➤ *Chapter 5.1.1 'Separating the back cover module from the pump module' on page 26 .*
2. ➤ Set the "flow rate" jumper (*Chapter 4.1.2 'Pump module' on page 24 , item J2*) depending on the viscosity range and metering capacity according to *Table on page 33 , Table on page 34 and/or Table on page 34 .*



*The check LED of the pump lights only during the metering stroke.
The LED goes off during suction and when the pump is at rest.*

Standard setting (max. supply capacity: 20 l/h)

The pump is delivered with the following default setting for:

Low-viscosity products (e.g. water).

Jumper setting		Flow rate - Potentiometer setting	
	Jumper on the right 	Minimum	Maximum
	Metering capacity: Continuously variable setting from ... to ... [l/h]	1	20
	Suction stroke: Constant [sec]	0,15	
	Pressure stroke: Continuously variable setting from ... to ... [sec]	6,5	0,18
	Stroke quantity: Continuously variable setting from ... to ... [strokes/min]	9	180
	Max. metering back-pressure: [mPas (bar)]	0,2 (2)	

High-viscosity products (max. supply capacity: 15 l/h)

The pump must be converted by replugging the "flow rate" jumper

(↗ Chapter 4.1.2 'Pump module' on page 24 , item J2) if:

Higher viscosity products (maximum 1100 mPas) are to be metered.

The longer suction stroke results in a reduction in the maximum metering capacity.

Jumper setting		Flow rate - Potentiometer setting	
	Jumper on the left 	Minimum	Maximum
Metering capacity: Continuously variable setting from ... to ... [l/h]		1	15
Suction stroke: Constant [sec]		0,225	
Pressure stroke: Continuously variable setting from ... to ... [sec]		6,4	0,225
Stroke quantity: Continuously variable setting from ... to ... [strokes/min]		9	135
Max. metering back-pressure: [mPas (bar)]		0,2 (2)	

Reduced metering capacity (max. supply capacity: 2.6 l/h)

If metering quantities below 2.6 l/h are to be conveyed, the maximum pump metering capacity can be reduced by removing the "flow rate" jumper

(↗ Chapter 4.1.2 'Pump module' on page 24 , item J2)

The metering capacity can then be set more precisely between 0.1 (min.) and 2.6 l/h (max.) using the potentiometer (↗ Chapter 6.1.1 'Setting the metering capacity' on page 35).

In this setting, the longer suction stroke length enables the metering of both low- and high-viscosity products.

Jumper setting		Flow rate - Potentiometer setting	
	Without jumper 	Minimum	Maximum
Metering capacity: Continuously variable setting from ... to ... [l/h]		0,1	2,6
Suction stroke: Constant [sec]		0,225	
Pressure stroke: Continuously variable setting from ... to ... [sec]		66,4	2
Stroke quantity: Continuously variable setting from ... to ... [strokes/min]		0,9	27
Max. metering back-pressure: [mPas (bar)]		0,2 (2)	

6.1.1 Setting the metering capacity

The metering capacity of the Turbo SMART II can be continuously adjusted between min. and max. in the respective metering range of the three basic settings **Standard setting**, **High-viscosity products** and **Reduced metering capacity**.

Pump module - Detaching the cover plug for speed adjustment at potentiometer



Fig. 8: Detaching the cover plug for speed adjustment at potentiometer



NOTICE!

Without the cover plug, product and/or moisture can penetrate into the pump!

1. ➤



CAUTION!

When removing the cover plug (item 9), do not use pliers.

Risk of breakage: the plug and pump module can be destroyed.

2. ➤

Push a small screwdriver back into the notch, then pry up the cover (item 9) and remove it by hand.

Setting

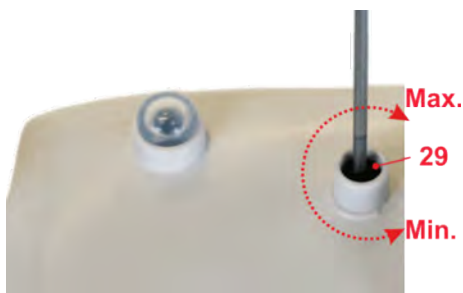


Fig. 9: speed adjustment at potentiometer

1. ➤

Make the desired presetting using the "flow rate" jumper
 ➤ Chapter 4.1.2 'Pump module' on page 24 , item J2, and ➤ Table on page 33 ,
 ➤ Table on page 34 and/or ➤ Table on page 34 .

2. ➤

Set the flow rate on the potentiometer's adjustment screw (item 29) with a small flat screwdriver.

3. ➤

After setting the potentiometer, replace the cover.



NOTICE!

Without the cover plug, product and/or moisture can penetrate into the pump!

Characteristic curves



The potentiometer has a progressive characteristic line.

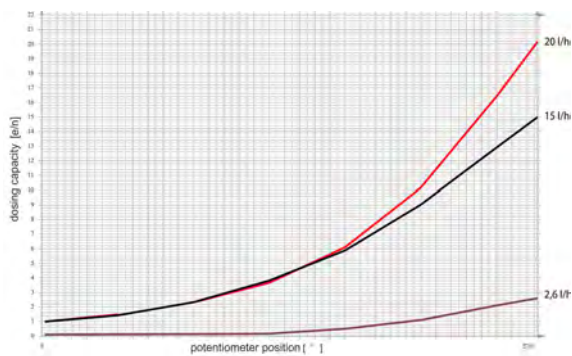


Fig. 10: Characteristic curves

7 Maintenance and spare parts

7.1 Maintenance

- Personnel:
- Mechanic
 - Qualified electrician
 - Specialist
 - Service personnel



NOTICE!

Only original spare parts may be used for maintenance and repairs.



CAUTION!

Metering pumps may be maintained only by trained and authorised persons.



DANGER!

Before performing maintenance, repairs or replacing parts/modules, disconnect pumps from all power sources and the primary control unit and ensure that they cannot be switched back on inadvertently.



DANGER!

- Legal regulations and the applicable product data sheets must be taken into account for all chemicals.
- Personal protective equipment (PPE) must be worn during maintenance work.
- Clean equipment with a damp cloth only (mild soap if necessary).
- Do not splash the pump with water or spray it.



Maintenance interval: At least once every 3 months

The following inspections are recommended:

- 1.** ➤ That the connections on the suction and pressure lines are not leaking
- 2.** ➤ That the suction/pressure valve (section) is free of dirt and sealed well.
⚡ *Chapter 5.2.1 'Connection: Suction/pressure line' on page 29*
- 3.** ➤ Check for correct flow rate setting.
- 4.** ➤ Check mounting screws on pump head (tight fit, 3.25 Nm).
⚡ *Chapter 6 'Start-up' on page 32*

7.1.1 Pump head replacement



WARNING!

Risk of slipping due to fluid in the operation and provisioning area!

- Wear non-slip, chemically resistant shoes when working.
- Place product containers in a tank to prevent a slipping hazard caused by leaking fluids.



DANGER!

Always wash hands before taking a break and at the end of a shift. Information about the usual precautions when handling chemicals and about the use of PPE can be found on the relevant safety data sheet for the chemical being used and must be complied with.



ENVIRONMENT!

Metering medium that leaks or spills may be harmful to the environment.

Leaks or spills of a metering medium must be cleaned up and disposed of correctly in accordance with the instructions on the safety data sheet. It is imperative to use the prescribed PPE.

Preventive action:

- Place product containers in a tank to collect leaking fluids without harming the environment.



DANGER!

Before replacing the pump head, the metering medium must be removed and all lines sufficiently flushed. Excess pressure in the pressure line must be released. Disassembled suction and pressure lines may drip. Wrap the lines with absorbent, lint-free rags.

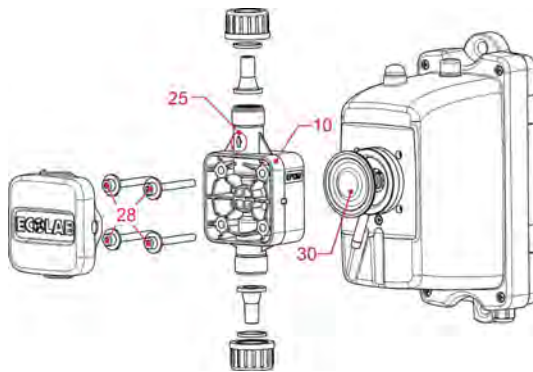
Replace pump head:


Fig. 11: Pump head replacement

1. Dismantle the suction and pressure valves.
2. Loosen pump head screws (item 28) crosswise by 90° each.
3. Again loosen the pump head screws crosswise by turning them through 90° each.
4. Completely unscrew the pump head screws.
5. Remove the pump head (item 10).
6. Unscrew the diaphragm (item 30) (rotate in an anticlockwise direction).
7. Clean diaphragm on both sides.
8. Check the diaphragm for wear (rips or chemical damage) and replace if necessary.
9. Screw in the diaphragm (M = 2.5 Nm).
10. Fit the new pump head in the proper position (metering direction arrow (item 25) must point up).
11. Insert pump head screws and manually screw in crosswise.
Without tool: The pump head must not be tilted/twisted.
12. In steps, tighten the pump head screws crosswise by 180° each until you feel a definite resistance and the pump head is completely in contact.
13. Tighten the pump head screws crosswise with 3.25 Nm.
14. Install suction and pressure lines, and tighten union nuts by hand only without using tools.
15. Put the pump into operation.
16. Vent the pump.
17. Check that all connections are tight.

7.2 Spare parts

Description	Article no. (EBS no.)
Pump head 20 l complete PPEPKE – O-rings in EPDM	206001 (10010658)
Pump head 20 l complete PPFPKE – O-rings in FPM	206002 (10010663)
Pump head 20 l complete PVDFEPKE – O-rings in EPDM	206003 (on request)
Pump head 20 l complete PVDFFPKE – O-rings in FPM	206004 (on request)
Diaphragm for 20 l pump head	30601023 (10010677)

	Spare parts TSP-II 5.0 l/h PP-EPDM-KE-24 VDC	Article no. (EBS no.)
1	Intermediate plate 2.5 l/h Noryl	34800150
1	Diaphragm 2.5 l/h PTFE 0.4	34800253
1	Pump head 2.5 l/h V3 PP	34800294
1	Cover plate /PK-PP (black)	54000188
2	SDV PPEPKE000 G3/8-G3-8-99	248116
2	Connection set PP G3/8 4/6, 6/8, 6/12	248492
2	Valve cartridge V3 EMP II EPKEPP	248435
1	Vent screw EMP II PP/EPDM	243078

	Spare parts TSP-II 2.8 l/h PP-EPDM-KE-24 VDC	Article no. (EBS no.)
1	Supporting disk 1.5 l/h V2A	34000158
1	Intermediate plate 1.4 l/h Noryl	34800133
1	Diaphragm 1.4 l/h PTFE	34800134
1	Pump head 1.4 l/h V3 PP pebble grey	34800400
1	Cover plate PP pebble grey	35200180
2	SDV PPEPKE000 G3/8-G3-8-99	248116
2	Connection set PP G3/8 4/6, 6/8, 6/12	248492
2	Valve cartridge V3 EMP II EPKEPP	248435
1	Vent screw EMP II PP/EPDM	243078

8 Technical data



All indicated values relate to water being used as the dosing medium at 20 °C.

Data	Value	Unit
Pump output, default setting* ☐ ☒	1 to 20	l/h
Pump output, high-viscosity products* ☒ ☐	1 to 15	l/h
Pump output, reduced metering capacity* ☐ ☐ ☐	0,1 – 2,6	l/h
Metering back-pressure	0,2 (2)	MPa (bar)
Rotational speed	0,9-180	rpm
Power supply (24 V, DC)	24 ±10 %	V / DC
Amps at 24 V	0.45, max 0.7	A
Power supply (115–240 V, AC)	115-240 (50/60) ±10 %	V/AC (Hz)
Amps at 115–240 V	Max. 0.25	A
Internal operating frequency	110	kHz
Type of protection	IP 52	
Insulation class	B 130	
Noise level	< 70	dB (A)
Flow rate	Max. 0.2	m/sec.
Ambient temperature	15 - 40	°C
Ambient humidity (non-condensing)	Max. 95	%
Line cross-section	Min. 10	mm
Installation height	Max. 1.8	m
Suction tube height:	Max. 1.5	m
Suction tube length:	Max. 2.5	m
Connections for hose	Size G 5/8	

* = see  Chapter 6.1 'Function settings' on page 33

8.1 Materials

Component	Pump version EPDM	Pump version FKM
Housing	Cover: ABS, back cover: PPE (Noryl)	
Pump head	PP (or PVDF)	
Diaphragm	EPDM/PA PTFE/brass	
Valve body	PP (or PVDF)	
Valve balls	Ceramic	
Seals	EPDM	FKM
Components in contact with media	PP (or PVDF) / EPDM (or FKM) / ceramic	
Colour	Cover: Ecolab grey, back cover: Black	

8.2 Equipment marking / nameplate

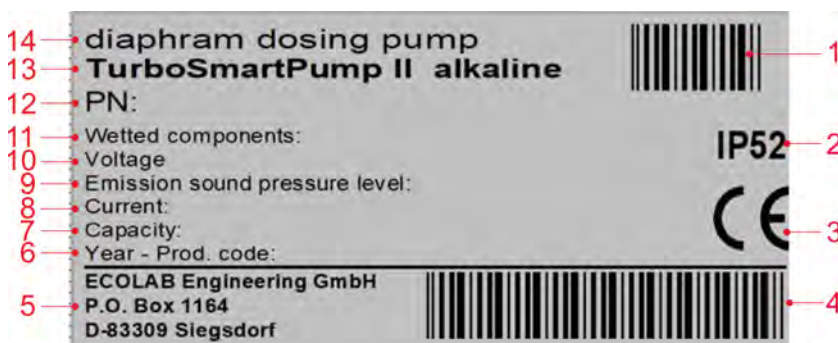
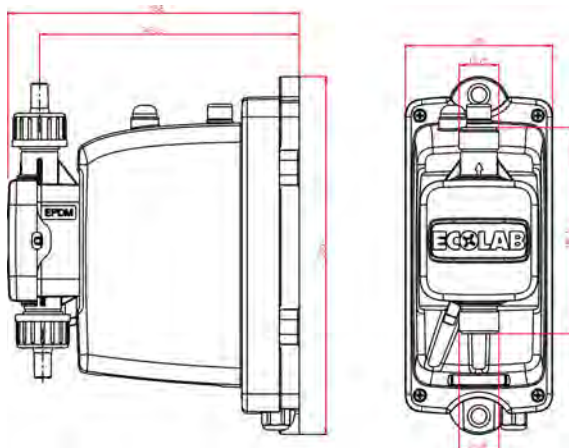


Fig. 12: Nameplate TurboSMART II

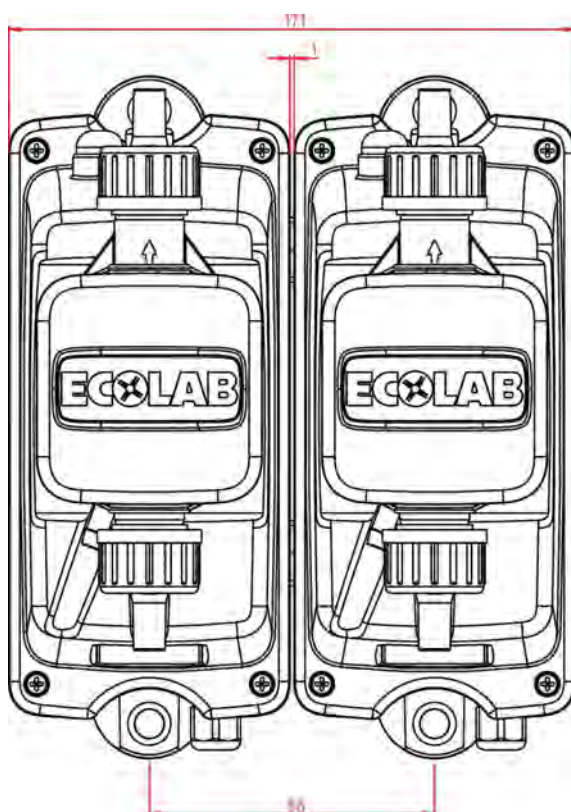
- | | |
|---|------------------------------|
| 1 Barcode with order number | 8 Power specification [A] |
| 2 Appliance class marking IP52 | 9 Noise level [(dB) A] |
| 3 CE marking | 10 Voltage specification [V] |
| 4 Barcode with the annual production code | 11 Installed materials |
| 5 Manufacturer's address | 12 Order number |
| 6 Annual production code | 13 Device type |
| 7 Pump capacity | 14 Device designation |

8.3 Dimensions

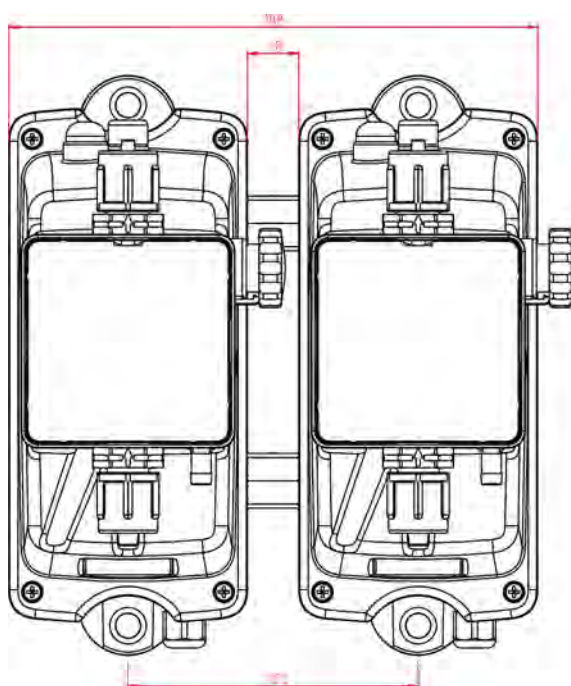
8.3.1 Turbo SMART II pump (single)



8.3.2 Distances - multiple installation with short U-connectors



8.3.3 Distances - multiple installation with long U-connectors



9 Malfunctions/repairs

9.1 Correction of operating faults

- Personnel:
- Mechanic
 - Qualified electrician
 - Specialist
 - Service personnel



DANGER!

- Always use the prescribed PPE for maintenance work. Observe the product data sheet of the dosing chemical used.
- Always flush the dosing head and relieve the pressure line.



DANGER!

- Electrical repairs may only be carried out by qualified electricians in accordance with local regulations!
- Before any adjustment, maintenance work, repair work or exchange of parts, the device must be disconnected from all sources of power if opening of the device is necessary.
- Live parts may be exposed when opening covers or removing parts (apart from covers that can be opened or parts that can be removed without using tools). Connection points may also be live.



DANGER!

Conditions for returns

Before being returned, all parts must be completely free of all chemicals! We would point out that only clean, rinsed parts that are free of all chemicals can be accepted by our service!

This is the only way of excluding the possibility of the risk of injury to our staff due to residues of chemical products. The goods sent in must, where possible, also be packed in a suitable bag preventing any leakage of liquid residues into the surrounding packaging. Enclose a copy of the product data sheet for the chemical used so that our Service staff can be prepared to use the necessary personal protective equipment (PPE).

Fault description	Cause	Remedy
No metering - metering pump rattles.	Back-pressure too high.	Reduce pressure at pressure retention valve.
	Discharge line and/or valve blocked.	Disassemble and clean valve(s) and lines on the pressure side, and clear blockage.
	Actual counter-pressure in equipment (= total of all pressure losses) is too high.	Determine and calculate pressure loss of entire system, and compare/check pump system layout.
Metering quantity too low.	Metering quantity setting incorrect.	Increase flow rate (<i>↪ Chapter 6.1.1 'Setting the metering capacity' on page 35</i>).
	Suction line leaking.	Check/service connections and suction line, and replace if necessary.
	Metering back pressure too high.	Check actual back-pressure (= total of all pressure losses) and valves and lines on pressure side - clear bottlenecks.
	Viscosity setting incorrect.	Check jumper position and viscosity (<i>↪ 'Setting' on page 35</i>).
	Wrong pump head	Install correct pump head
Metering pump not working.	Operating voltage too low/absent.	Check operating voltage/control unit.
	Mains cable damaged.	Change mains cable.
	Motor/electronics faulty.	Replace pump module (II).
	Switched-mode power supply (SMPS) faulty (in 230 V back cover modules).	Check SMPS: OK = LED lights up, if necessary replace the switched-mode power supply.
No suction by pump.	Suction line leaking.	Check and service suction line and connections, and replace if necessary.
	Storage container empty/fill level too low.	Fill/replace storage container.
	Air in pump head and suction line.	Briefly reduce metering counter-pressure and bleed pump.
	Sediment, valves sticking or blocked.	Flush pump head via suction line; remove and clean dispensing head, or replace if needed.
Pump head leaking.	Pump head mounting screws loose.	Tighten pump head screws crosswise (M = 3.75 Nm).
Medium escaping from diaphragm break drain	Tear in diaphragm.	Replace pump head and diaphragm.

9.2 Repairs by the manufacturer

Conditions for return



We ask for your understanding that we can only accept repair requests for system components that are in a risk-free condition.

The following requirements must be met in order for us to accept a repair request:

- Return form:
Request from tel. no. (+49) 8662 61-0 / fax no. (+49) 8662 61-258
Fill in correctly and completely
Send in advance by fax to: +49 (0) 8662 61258
- System components:
Free of dirt and chemical residues.
Always flush hydraulic systems with water.
Place in plastic packaging in the box to prevent the spillage of rinse water.
- Box:
Addressed to Ecolab repair service
📄 *Chapter 1.11 'Manufacturer' on page 11* .
Label or clear "REPAIR" lettering on the packaging.
Enclose the return form.

Return form

Please request the returns form from:

Ecolab Engineering GmbH
QUM Department
Raiffeisenstrasse 7
D-83313 Siegsdorf, Germany
Tel: (+49) 8662 61-0
Fax: (+49) 8662 61-258

10 Decommissioning, disassembly, environmental protection

- Personnel:
- Mechanic
 - Qualified electrician
 - Specialist
 - Service personnel



DANGER!

Risk of injury due to the disregard of the specified personal protective equipment (PPE)!

For all disassembly work, please respect the use of the PSA which is specified on the product data sheet.

10.1 Decommissioning



DANGER!

The procedures described here may only be carried out by skilled personnel as described at the start of the chapter, this may only be done using PPE.

The procedure for shutting down is as follows:

1. ➤ Before carrying out any subsequent work, isolate the electrical supply completely first of all and secure it against being switched on again.
2. ➤ Physically disconnect the entire power supply; dissipate stored residual energy.
3. ➤ Drain and remove operating fluids and consumables.
4. ➤ Remove the remaining processing materials and dispose of them in an environmentally-friendly way.

10.2 Dismantling



DANGER!

Danger of injury in case of improper removal!

Dismantling may only be carried out by qualified personnel using PPE.

Stored residual energy, components with sharp edges, points and corners, on and in the system, or on the required tools can cause injuries.

Thoroughly rinse all components that come into contact with the product to remove chemical residues.



DANGER!

Danger to life in case of contact with live components

Before commencing dismantling, ensure that the device has been fully isolated from the power supply. Activated electrical components can make uncontrolled movements and lead to serious injury.

**NOTICE!****Material damage by using incorrect tools!**

Material damage may arise by using incorrect tools. **Use the correct tools.**

The procedure for dismantling is as follows:

1. ➤ Make sure you have sufficient space before starting all tasks.
2. ➤ Drain operating fluids and consumables and remove the remaining processing materials; dispose of them in an environmentally-friendly way.
3. ➤ Clean assemblies and components properly and disassemble them in compliance with applicable local occupational health and safety and environmental protection regulations.
4. ➤ Always handle open, sharp-edged components carefully.
5. ➤ Keep the workplace tidy and clean. Loose components and tools lying on top of or around each other are sources of accidents.
6. ➤ Depressurise the system and pressure line.
7. ➤ Dismantle components properly.
8. ➤ Observe the heavy weight of some components. If required, use lifting gear.
9. ➤ Support the components to avoid them falling or tipping.

**NOTICE!**

In case of doubt, always consult the ↗ *Chapter 1.11 'Manufacturer' on page 11* .

10.3 Disposal and environmental protection

All components are to be disposed of in accordance with prevailing local environmental regulations. Dispose of them accordingly, depending on the condition, existing regulations and with due regard for current provisions and criteria.

Recycle the dismantled components:

- Scrap all metals.
- Electrical waste and electronic components must be recycled.
- Recycle all plastic parts.
- Dispose of all other components in line with their material characteristics.
- Hand in batteries at communal collection points or dispose of them through a specialist.



ENVIRONMENT!

Risk of environmental damage from incorrect disposal!

Incorrect disposal can be a threat to the environment.

- Electrical scrap, electronic components, lubricants and other operating fluids must be disposed of by approved waste disposal service providers
- If in doubt, contact your local authority, or an approved waste disposal service provider, for information on correct disposal.

Prior to disposal, all parts which are in contact with media must be decontaminated. Oils, solvents, detergents and contaminated cleaning tools (brushes, cloths, etc.) must be disposed of in compliance with local requirements, in accordance with the prevailing waste code and with due attention to the notes contained in the manufacturers' safety data sheets.



ENVIRONMENT!

Reduction or avoidance of waste from reusable raw materials

Do not dispose of any components in the domestic waste. Take them instead to the appropriate collection points for recycling.

Please follow the Directive on Waste Electrical and Electronic Equipment 2012/19/EU, the aim and purpose of which is the reduction or prevention of waste from recyclable raw materials. This directive requires member states of the EU to increase the collection rate of electronic waste so that it can be recycled.

10.4 Return to the manufacturer

All pumps that can no longer be used must be disposed of in accordance with the valid legal regulations. Naturally, you can also send them back to us in accordance with the instructions provided in ↻ 'Conditions for return' on page 46 .

11 CE Declaration of Conformity



Due to technical changes, an updated version of the 'Declaration of Conformity / CE Declaration' may apply. The most recent 'Declaration of Conformity / EC Declaration' will therefore be published on the Internet: To download the certificates, use the link below or scan the QR code.

CE Declaration for download

The most recent CE Declaration will be provided online.

To download the CE Declaration to a PC, tablet or smartphone, use the link below or scan the QR code provided.



Download of CE Declaration *Turbo SMART II* (article no. 32357102):
https://www.ecolab-engineering.de/fileadmin/download/bedienungsanleitungen/ce-konformitaetserklaerung/CE/CE_Turbo-SMART-Pump-II.pdf

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